August 30, 2019
File No. 09218500.08

Mr. Phillip J. Ciaravella
Florida Department of Environmental Protection
Solid Waste Section, MS 4565
2600 Blair Stone Road
Tallahassee, Florida, 32399-2400

SUBJECT: Remaining Disposal Capacity and Site Life – Reporting Year 2019
Phases I-VI and Capacity Expansion Area (Sections 7, 8, and 9)
Southeast County Landfill
Permit No.: 35435-026-SO-MM

Dear Mr. Ciaravella,

On behalf of the Hillsborough County Public Utilities Department, Solid Waste Management Division (SWMD), SCS Engineers (SCS) has prepared the remaining disposal capacity and site life estimates for Phases I-VI and the Capacity Expansion Area (CEA) (Permit No 35435-025-SO-MM), Southeast County Landfill (SCLF), Hillsborough County, Florida. This letter is in accordance with Rule 62-701.500(13)(c) and Specific Condition Part C.16.b of the facility's solid waste operations permit.

ANNUAL TOPOGRAPHIC SURVEY AND REMAINING CAPACITY ANALYSIS

The aerial topographic survey was performed by Pickett and Associates, Inc. (Pickett) on July 5, 2019 (**Attachment 1**). The survey demonstrates that Phases I-VI and the CEA Sections 7, 8, and 9 have been filled in general accordance with the permitted operations sequence plans including that the side slopes are no greater than 4H to 1V (Phases I-VI) and 3H to 1V (CEA Sections 7, 8, and 9). In addition, the peak elevations do not exceed the permitted maximum design height elevation of 255 feet NGVD and 285 feet NGVD for Phases I-VI and the CEA Sections 7, 8, and 9, respectively. Waste has not been placed outside the permitted limits of waste/liner in either Phases I-VI or the CEA Sections 7, 8, and 9.

Using AutoCAD software, the gross remaining airspace volumes were calculated by comparing the permitted conceptual final build-out contours for the Phases I-VI and the CEA Sections 7, 8, and 9 to the July 5, 2019 topographic survey (refer to attachments for volume summaries). The estimated gross remaining airspace for the Phases I-VI and the CEA Sections 7, 8, and 9 is 7,750,034 cubic yards (cy) based on the airspace analyses performed using AutoCAD. The estimated gross remaining airspace does not include volume that may be regained through the removal of intermediate cover soil or landfill settlement.

WASTE FILLING FROM JULY 2018 THROUGH JUNE 2019

Based on the information provided by the SWMD, approximately 357,405 tons of municipal solid waste (MSW) was disposed of at the SCLF between July 1, 2018 and June 30, 2019. This is 61,533 tons more than reported during the same time period the previous year. The total volume used between July 2018 and July 2019 was 296,551 cy.

In accordance with the permitted operating sequence plan, waste was placed in Phases I-VI from July 1, 2018 through June 30, 2019.

REMAINING CAPACITY ANALYSIS METHOD

SCS used the most recent topographic data to evaluate the remaining site life of the SCLF using our Remaining Capacity Method, developed by SCS founder Bob Sterns. This method differs from previous SCLF site life evaluations submitted by SCS in that historic volume utilization is used to predict remaining available tonnage, encompassing tonnage and density trends into one number.

The Remaining Capacity Method includes a graph that plots cumulative net remaining volume versus utilized tonnage. A trend line is added to the known data points from the previous five years to estimate the maximum available tonnage remaining based on historic Airspace Utilization Factor (AUF). The AUF is a measurement of waste in place density (lbs/cy). We have included a graph that utilizes historic volume and tonnage data to estimate remaining available tonnage as Attachment 2.

COMBINED FACILITY SITE LIFE

In previous site life evaluations, SCS and other engineering consultants assumed that future waste density would be comparable to previously observed density and that tonnage trends would be directly proportional to population growth; however, tonnage records from recent years indicate that incoming waste is increasing at a rate greater than the unincorporated County population growth rate. Additionally, the waste composition ratio of MSW to ash is increasing. This is at least partly attributable to increased waste diversion from the Resource Recovery Facility (RRF).

Below, Table 1 summarizes the annual and cumulative net remaining volume, tonnages, and AUF for 2014 through 2019. The estimated tonnages for future years are based on an annual increase of 27,707 tons per year, the observed average annual increase from 2014 through 2019. The net remaining volume is defined as the gross available volume minus final cover, ash study area piles, and biosolids composting windrows.

SCS assumes that the AUF will decrease as the RRF reaches capacity and a higher percentage of landfilled waste is composed of MSW (as opposed to RRF ash). Therefore, SCS assumed that the future AUF will be 90% of the 5-year observed AUF of 2,010 lbs/cy or 1,809 lbs/cy.

Table 1. Southeast County Landfill Combined Site Life Estimate

Survey Date	Per Year			Cumulative		
	Volume Used Between Air Surveys (cy)	Waste Disposed Between Air Surveys (tons)	Airspace Utilization Factor Between Air Surveys (lb/cy)	Volume Remaining (cy)[1]	Waste Disposed (tons)	Airspace Utilization Factor (lb/cy)
July 2014	-	218,868	-	8,260,576	218,868	-
July 2015	275,823	211,808	1,536*	7,984,753	430,676	1,536
July 2016	165,321	206,761	2,501*	7,819,432	637,437	1,898
July 2017	248,414	256,689	2,067*	7,571,018	894,126	1,959
July 2018	335,902	295,872	1,762*	7,235,116	1,189,998	1,894
July 2019	296,551	357,405	2,410*	6,938,565	1,547,403	2,010
July 1, 2020	425,801	385,112	1,809**	6,512,764	1,932,515	1,961
July 1, 2021	456,435	412,819	1,809**	6,056,329	2,345,334	1,929
July 1, 2022	487,070	440,526	1,809**	5,569,259	2,785,860	1,908
July 1, 2023	517,704	468,233	1,809**	5,051,555	3,254,093	1,892
July 1, 2024	548,338	495,940	1,809**	4,503,217	3,750,033	1,880
July 1, 2025	578,973	523,647	1,809**	3,924,244	4,273,680	1,870
July 1, 2026	609,607	551,354	1,809**	3,314,637	4,825,034	1,863
July 1, 2027	640,242	579,061	1,809**	2,674,395	5,404,095	1,856
July 1, 2028	670,876	606,768	1,809**	2,003,519	6,010,863	1,851
July 1, 2029	701,510	634,475	1,809**	1,302,009	6,645,338	1,847
July 1, 2030	732,145	662,182	1,809**	569,864	7,307,520	1,843
April 2031	**569,864**	**515,409**	**1,809****	**0**	**7,822,929**	**1,841**

* Annual Airspace Utilization Factors not used in calculations.
** Future Airspace Utilization Factor assumed to be 90% of 5-year cumulative Airspace Utilization Factor

As discussed in the previous section, the Remaining Capacity Method uses known airspace utilization to estimate remaining available tonnage. The five-year trend line on the site life graph estimates that the SCLF can accept approximately 7,000,000 more tons based on historic AUF. SCS had added an additional trend line (red) that is based on the annual tonnage increase of 27,707 tons per year and a future AUF of 90% of the five-year AUF.

Assuming that the future AUF averages 90% of the historic AUF and that annual tonnage will increase at 27,707 tons per year, the effective site life for the facility (Phases I-VI and the CEA) is 11.7 years, with a projected final closure in 2031.

REMAINING DISPOSAL CAPACITY AND SITE LIFE FOR PHASES I-VI

The estimated remaining disposal capacity (remaining airspace) of Phases I-VI is 6,050,639 cy (87% of the total available disposal volume) which was calculated by subtracting the final cover soil volume of 665,869 cy from the gross remaining air space (not including ash stockpiles) of 6,716,508 cy. The remaining site life of Phases I-VI is estimated to be approximately 10.2 years based on an annual tonnage increase of 27,707 tons per year and an assumed AUF of 1,809 lbs/cy (90% of 5-year observed AUF).

The estimated remaining site life will fluctuate depending on the future waste composition (MSW vs RRF ash), disposal rates, and in-situ waste density. SCS memorandums containing AutoCAD volume calculations are included as **Attachment 3**.

REMAINING DISPOSAL CAPACITY AND SITE LIFE FOR THE CEA (SECTION 7, 8, AND 9)

The estimated remaining disposal capacity (remaining airspace) of CEA Sections 7, 8, and 9 is 887,926 cy. This was calculated by subtracting the final cover soil volume of 145,600 cy from the gross remaining air space (not including biosolids composting windrows) of 1,033,526 cy. The remaining site life of the CEA is estimated to be approximately 1.5 years based on an annual tonnage increase of 27,707 tons per year and an assumed AUF of 1,809 lbs/cy (90% of 5-year observed AUF).

The estimated remaining site life will fluctuate depending on the future waste composition (MSW vs RRF ash), disposal rates, and in-situ waste density. SCS memorandums containing AutoCAD volume calculations are included as **Attachment 3**.

SUMMARY

The effective site life for the facility as of July 1, 2019, which includes Phases I-VI and the CEA, is 11.7 years. The estimated life of Phases I-VI is 10.2 years and the estimated life of the CEA is 1.5 years. The projected final closure of the landfill is 2031.

Please call us if you require any clarifications or additional information.

Sincerely,

KOLLAN LEE SPRADLIN
LICENSE
No. 82852
STATE OF FLORIDA
PROFESSIONAL ENGINEER
08/30/2019

Kollan L. Spradlin, P.E.
Project Professional
SCS Engineers

Robert B. Curtis, P.E.
Senior Project Manager
SCS Engineers

KLS/RBC:kls

cc: Kimberly Byer, SWMD
Larry Ruiz, SWMD
Ron Cope, EPC

Attachments

ATTACHMENT 1

PICKETT – SEMI-ANNUAL TOPOGRAPHIC SURVEY

SURVEYOR'S REPORT

Southeast Landfill
Hillsborough County, Florida

Prepared for:

WASTE MANAGEMENT

Prepared by:

PICKETT
SURVEYING • ENGINEERING

PICKETT AND ASSOCIATES PROJECT NO.: 11994-19
TITLE/TYPE OF SURVEY: TOPOGRAPHIC SURVEY
DATE OF SURVEY: 07/05/19

NOTE: THIS REPORT AND ACCOMPANYING MAP TITLED SOUTHEAST LANDFILL ARE NOT FULL AND COMPLETE WITHOUT THE OTHER AND ARE NOT VALID WITHOUT THE SIGNATURE AND ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER.

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

ACCURACY STATEMENT: The following stated plus or minus tolerances encompass a minimum of 90% of the difference between photogrammetrically measured values and any ground truth of all well-identified features. Mapped features will meet or exceed the Florida Standards of Practice.

VERTICAL: Contours may be measured to an estimated vertical positional accuracy of 0.5'. Spot elevations and well-identified features have been measured to an estimated vertical accuracy of 0.25'.

HORIZONTAL: Well-identified features have been measured to an estimated horizontal positional accuracy of 1.66', as per Florida Standards of Practice. All measurements are in U.S. Survey Feet.

MAP PLOTTING: This map is intended to be displayed at a scale of 1" = 50' (1:600) or smaller.

DATUM:

HORIZONTAL: Coordinates are referenced to the West Zone of the Florida State Plane Coordinate System, NAD 83/90 adjustment. Referenced to Hillsborough County Horizontal Control Monuments LW-E and LW-D.

VERTICAL: Elevations are to National Geodetic Vertical Datum of 1929, and are referenced to Hillsborough County Horizontal Control Monuments LW-E and LW-D.

Control Points Used for Image Rectification:

Pt#	Easting	Northing	Elevation
10000	596658.59	1249409.50	126.59
10002	594444.64	1249416.46	127.42
10004	598710.90	1249383.77	126.01
10006	598999.12	1250855.31	137.37
10014	599697.57	1251577.37	134.55
10021	598104.00	1254421.53	114.20
10023	595105.45	1254273.93	96.12
16273	596207.45	1252551.28	127.03
4532	594975.02	1250721.80	130.97
6426	600531.06	1252289.80	148.43
92529	597302.98	1253570.42	126.15
96069	601089.83	1254397.19	122.54

Measurement Methods:

Color digital imagery was acquired at an average altitude of 3054' using a metric precision digital camera whose focal length is 70.3mm. The planimetrics shown are limited to those features visible on aerial imagery. Mapping was performed using LiDAR and softcopy photogrammetric techniques. The LiDAR data has an estimated point sample distance of 0.5 foot and a density of 4.095 points per square foot (±44.08 points per square meter). For a vertical accuracy check, the LiDAR data was compared to the twelve (12) points set as targets for aerial imagery. The Root Mean Square Error of the Elevations (RMSEZ) is 0.101 foot, being the equivalent of 0.198' FGDC/NSSDA Vertical Accuracy. All measurements are in U.S. Survey Feet.

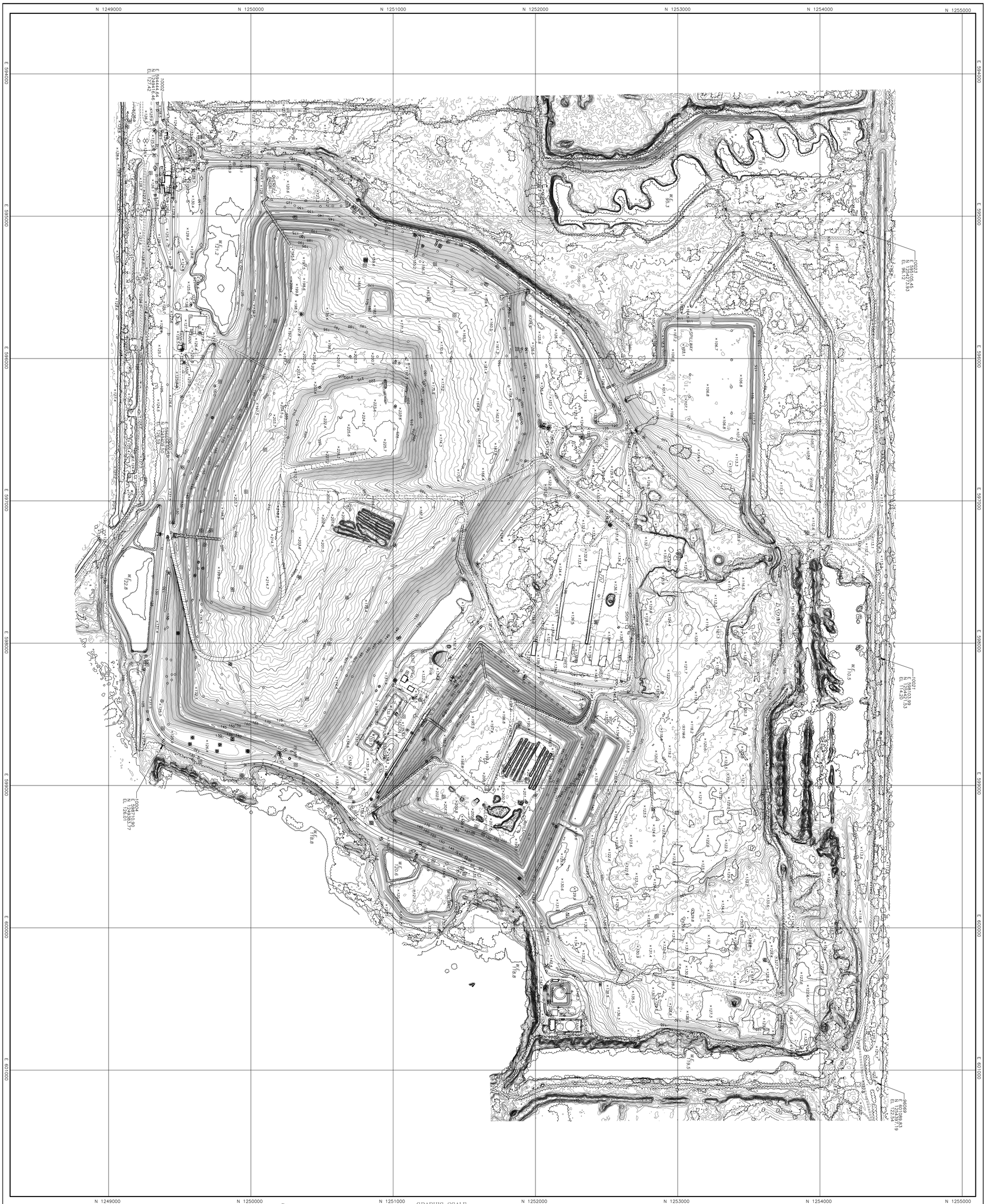
Limitations:

This mapping should be used for preliminary design work only and should not replace an actual field survey where the required accuracy is greater than the accuracy stated in this report. No responsibility is assumed for areas outside the contracted scope.

T. JEFFREY YOUNG, PSM, CP
FLORIDA REGISTRATION NO. 5440
PICKETT AND ASSOCIATES, INC.
FLORIDA REGISTRATION NO. 364

7/5/19

SURVEY DATE



TOPOGRAPHIC SURVEY

SOUTHEAST LANDFILL

LOCATED IN SECS 14,15,22,&23 TWP 32S

RNG 23E, HILLSBOROUGH COUNTY, FLORIDA

PREPARED FOR: WASTE MANAGEMENT

PROJECT No.	11994-19
DRAWING No.	LD-5572
No.	1
OF	1

SURVEYOR'S NOTES:

1.) North, the grid, and the coordinates shown hereon are referenced to the West Zone of the Florida State Plane Coordinate System, NAD 83, 1990 adjustment

2.) Elevations are to National Geodetic Vertical Datum of 1929.

3.) This topographic survey was prepared by photogrammetric and LIDAR methods. See the attached report for map accuracy and surveyor's signature and seal.

PICKETT
SURVEYING • ENGINEERING

PICKETT AND ASSOCIATES, INC.
475 SOUTH FIRST AVENUE BARTOW, FLORIDA 33830
PHONE: (863)-533-8095
FAX: (863)-534-1464
LICENSED BUSINESS No. LB364

Horiz. Scale: 1" = 200'	Edited by: RP	Compiled by: PL	Flight Date: 7/5/19
Contour Interval: 1'			Drawing Name: 11994-19.DWG

THIS MAP AND ATTACHED REPORT ARE NOT FULL AND COMPLETE WITHOUT THE OTHER AND ARE NOT VALID WITHOUT THE SIGNATURE AND THE ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER

No.	DATE	APPROVED	REVISION
O.R.	7/23/19	TJY	ORIGINAL RELEASE

LEGEND:

(THESE FEATURES ARE REPRESENTED BY SYMBOLS NOT TO SCALE)

- CONTROL
- TARGET NUMBER
- N NORTHING
- E EASTING
- EL ELEVATION
- UTILITY POLE
- LIGHT POLE
- SIGN
- POST
- CATCH BASIN
- MISCELLANEOUS SYMBOL
- K CULVERT
- SWAMP/MARSH
- MANHOLE
- HYDRANT
- TREE
- PALM
- SHRUB

(THESE FEATURES ARE TO SCALE)

- PAVED ROAD
- CONCRETE SURFACE
- UNPAVED ROAD
- FENCE
- GUARDRAIL
- WALL
- STRUCTURE
- TREE LINE
- SHRUB LINE
- PIPELINE
- EDGE OF WATER
- SWAMPLINE

(THESE INFORMATIVE LABELS ARE NOT SCALE DEPENDENT)

- W.E. WATER ELEVATION
- × 129.1 SPOT ELEVATION
- MISC MISCELLANEOUS

ATTACHMENT 2

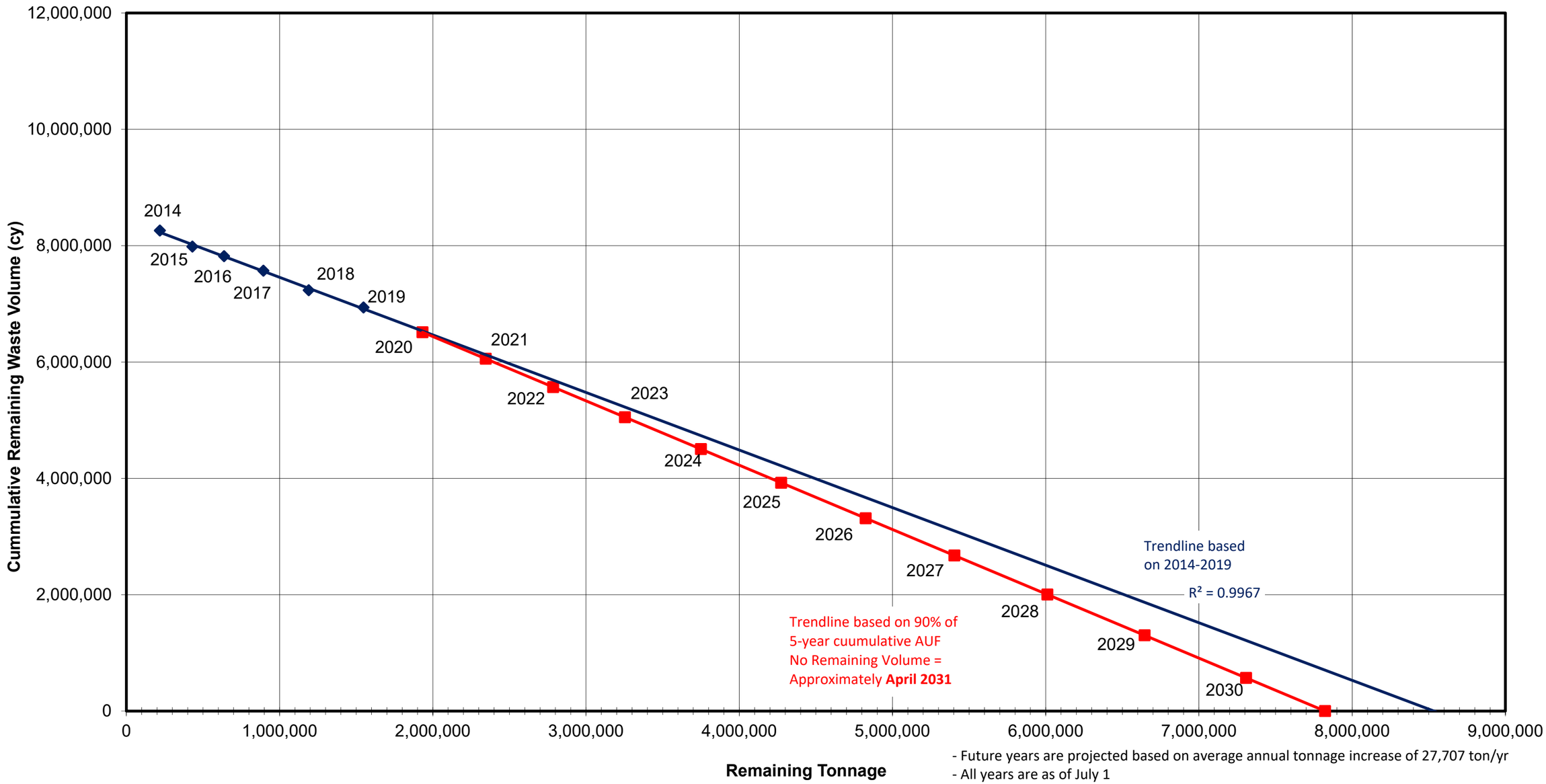
SITE LIFE GRAPH

Southeast County Landfill Site Life
Phases I-VI and Capacity Expansion Area
Total Remaining Disposal Volume

5-year Airspace Utilization Factor = 2,010 lb/cy

Assumed future Airspace Utilization Factor 90% of current= 1,809 lb/cy

Average Tonnage Increase Per Year = 27,707 tons



- Future years are projected based on average annual tonnage increase of 27,707 ton/yr
- All years are as of July 1

ATTACHMENT 3

SCS VOLUME MEMORANDUMS

August 23, 2019
File No. 09215600.08

MEMORANDUM

TO: Kollan Spradlin, P.E., Bob Curtis, P.E.

FROM: Caroline Devitt, E.I.T. CED

SUBJECT: **SCLF - Phases I-VI**
Semi-Annual Volume Calculations – July 2019

Below I have included the available volume in Phases I-VI. The Lift 23 Permitted conceptual final build-out contours from HDR were compared to the July 5, 2019 semi-annual topographic survey by Pickett using AutoCAD Civil 3D 2018.

The results from Phase I-VI are as follows:

CAD File – 070519 Phase I-VI Ash Piles Removed vs Buildout

Volume Surface: Phase I-VI 7-5-19 vs Buildout
Description: Full Volume Remaining for Phases I-VI

Volume Fill: 6,716,508.37 Cubic Yards

Compare Surface: PHI- VI_Lift 23 Updated Final
Base Surface: 070519 Phases I-VI Ash Piles Removed

Total Remaining Volume Following Restoration of Ash Study Area: 6,716,508.37

Gross Remaining Volume Per Phase:

Phase I - **CAD File –** 070519 Phase I vs Buildout

Volume Surface: Phase I 7-5-19 vs Buildout
Description: Full Volume remaining for Phase I-VI (limited to Phase I Boundary)

Volume Fill: 910,635.79

Compare Surface: PHI- VI_Lift 23 Updated Final
Base Surface: 070519 Phase I Ash Piles Removed

Phase II - **CAD File –** 070519 Phase II vs Buildout

Volume Surface: Phase II 7-5-19 vs Buildout
Description: Full Volume remaining for Phase I-VI (limited to Phase II Boundary)

Volume Fill: 1,490,850.85

Compare Surface: PHI- VI_Lift 23 Updated Final
Base Surface: 070519 Phase II Ash Piles Removed

Phase III – **CAD File –** 070519 Phase III vs Buildout

Volume Surface: Phase III 7-5-19 vs Buildout
Description: Full Volume remaining for Phase I-VI (limited to Phase III Boundary)

Volume Fill: 1,263,907.25

Compare Surface: PHI- VI_Lift 23 Updated Final
Base Surface: 070519 Phase III Ash Piles Removed

Phase IV - **CAD File –** 070519 Phase IV vs Buildout

Volume Surface: Phase I-VI 7-5-19 vs Buildout
Description: Full Volume remaining for Phase I-VI (limited to Phase IV Boundary)

Volume Fill: 698,508.88

Compare Surface: PHI- VI_Lift 23 Updated Final
Base Surface: 070519 Phase IV Ash Piles Removed

<u>Phase V</u> – **CAD File** – 070519 Phase V vs Buildout

Volume Surface: Phase V 7-05-19 vs Buildout
Description: Full Volume remaining for Phase I-VI (limited to Phase V Boundary)

Volume Fill: 571,306.13

Compare Surface: PHI- VI_Lift 23 Updated Final
Base Surface: 070519 Phase V Ash Piles Removed

<u>Phase VI</u> - **CAD File** – 070519 Phase VI vs Buildout

Volume Surface: Phase VI 7-5-19 vs Buildout
Description: Full Volume remaining for Phase I-VI (limited to Phase VI Boundary)

Volume Fill: 1,781,302.82

Compare Surface: PHI- VI_Lift 23 Updated Final
Base Surface: 070519 Phase VI Ash Piles Removed

August 23, 2019
File No. 09215600.08

MEMORANDUM

TO: Kollan Spradlin, P.E., Bob Curtis, P.E.

FROM: Caroline Devitt, E.I.T. CED

SUBJECT: **SCLF - Capacity Expansion Area Sections 7, 8, and 9 Semi-Annual Volume Calculations – July 2019**

Below I have included the available volume in Section 7-9. The Lift 18 Permitted conceptual final build-out contours from HDR were compared to the July 5, 2019 semi-annual topographic survey by Pickett using AutoCAD Civil 3D 2018.

The results from Capacity Expansion Area (CEA) are as follows:

CAD File – 070510 Sections 7-9 Compost Piles Removed vs Buildout

Volume Surface: Sections 7-9 7-5-19 vs Buildout
Description: Full Volume Remaining for Sections 7-9

Volume Fill (Total Remaining Volume Following Restoration of the Biosolids Composting Area):
1,033,525.76 Cubic Yards

Compare Surface: CEA_SEQ-18_FULLBUILD
Base Surface: 20190705 CEA Compost Piles Removed

Gross Remaining Volume Per Phase:

Section 7 - **CAD File –** 070519 Section 7 Compost Piles Removed vs Buildout

Volume Surface: Section 7 7-5-19 vs Buildout
Description: Full Volume Remaining for Sections 7-9 (Limited to Section 7 Boundary)

Volume Fill: 441,913.67

Compare Surface: CEA_SEQ-18_FULLBUILD
Base Surface: 20190705 CEA Compost Piles Removed

<u>Section 8</u> - **CAD File** – 070519 Section 8 Compost Piles Removed vs Buildout

Volume Surface: Section 8 7-5-19 vs Buildout
Description: Full Volume Remaining for Sections 7-9 (Limited to Section 8 Boundary)

Volume Fill: 156,836.98

Compare Surface: CEA_SEQ-18_FULLBUILD
Base Surface: 20190705 CEA Compost Piles Removed

<u>Section 9</u> - **CAD File** – 070519 Section 9 Compost Piles Removed vs Buildout

Volume Surface: Section 9 7-5-19 vs Buildout
Description: Full Volume Remaining for Sections 7-9 (Limited to Section 9 Boundary)

Volume Fill: 434,760.81

Compare Surface: CEA_SEQ-18_FULLBUILD
Base Surface: 20190705 CEA Compost Piles Removed