Johnson, Sabrina O

From: Joshua L. Younce < Joshua. Younce@citrusbocc.com>

Sent: Monday, January 11, 2021 4:09 PM

To: Morgan, Steve; SWD_Waste

Cc: Henry C. Norris; Dan S. Sherlock; Troy Hays (thayes@jonesedmunds.com); Madden, Melissa; Black,

Alexis

Subject: WACS ID 39859 2020 Site Life Calculations

Attachments: 2020 Site Life Calculations E-Signature.pdf; Site Life Calculations Cover Letter.pdf; 2020 Site Life

Calculations.pdf

Dear Mr. Morgan:

Attached please find the 2019 – 2020 Site Life Calculations Report and supporting documentation prepared by the Citrus County Division of Engineering for the Citrus County Central Landfill.

If you should have any questions regarding this matter, please do not hesitate to contact me.

Regards,

Joshua Younce

Compliance Manager Citrus County Solid Waste Management Division 230 W. Gulf to Lake Hwy. Lecanto, FL. 34461

Office: (352) 527-7679

Joshua.Younce@citrusbocc.com

Board of County Commissioners



DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING

3600 W. Sovereign Path, Suite 241 Lecanto, Florida 34461

Telephone: (352) 527-5446 Fax: (352) 527-5482 Citrus Springs/Dunnellon/Inglis/Yankeetown area - Toll Free (352) 489-2120 TTY Telephone: (352) 527-0825 or (352) 527-5312

Engineer's Electronic Signature File

Permit Number:

21375-025-S0-01

Project Name:

Citrus County Landfill Annual Airspace Report

12/16/20

Date of Transaction:

Professional Engineer:

Mark E Schroder

Professional License Number:

67585

The following documents have been submitted to FDEP

1. Title:

2020_Site_Life_Calc_Report_e-sig

Description:

Report, Calculations and Plans

SHA1 Key:

d5d43e1fcfb4bed1b022ee0eb52276a368745b7b

No. 67585

STATE OF

CONIDA

CHAPTER

ONAL

ENGINE

NO. 67585

Mark E. Schroder, P.E. Florida License #67585



DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING

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CITRUS COUNTY CENTRAL LANDFILL OCTOBER 2020 SITE LIFE CALCULATION ANNUAL REPORT

FDEP PERMIT NO.: 21375-025-S0-01

(Replaces Permit No.: 21375-018-SO-01)

WACS FACILITY ID NO.: 39859

PHASES 1/1A, 2 and 3

Located in S1/T19S/R18E, Citrus County, Florida

Prepared for:

Citrus County Department of Public Works
Solid Waste Management Division
Attn: Henry Norris, Director
230 W. Gulf-to-Lake Highway
Lecanto, FL 34461
(352) 527-7670

Prepared on December 16, 2020

This item has been electronically signed and sealed by Mark E Schroder, P.E. on December 16, 2020 using a SHA1 authentication code. Printed copies of this document are not considered signed and sealed and the SHA1 authentication code must be verified on any electronic copies.

Mark E Schroder, P.E. FL. License No. 67585

Citrus County's Department of Public Works - Division of Engineering has calculated the remaining site life for Phases 1/1A, 2 and 3 of the Citrus County Central Landfill based on the past twelve months of data. The remaining site life was estimated using population projections, projections of future waste receipts and topographic survey efforts performed by the Citrus County Survey Section and Dragonfly Aerosolutions. All topographic information is based on NAVD88 datum. The original design closure elevations were based on NGVD29 datum and have been converted to NAVD88 Datum for the purposes of this report

Phases 1/1A,2, and 3:

The airspace consumed from October 2019 to September 2020 was calculated by comparing the digitally generated surfaces from a Drone mounted RTK system performed in September 2019 and September 2020. The airspace consumed during the 2019-2020 time period was 121,421CY, as shown on sheet 1 of 3 in attachment A. Waste tonnage records supplied by Citrus County Solid Waste Management Division for the same period recorded 108,373 tons entering the landfill. This translates to an effective airspace consumption rate of 1,785 LB/CY or 1.12 CY/TN of waste disposed. The volume of the Cap was entered on the calculation as zero. For the calculations, the final closure surface has been lowered by two feet and the final 4' cap will be installed after 2' of settlement. Therefore the volume of the cap was entered into the calculations as 0CY assuming that the airspace will be available before placement.

The remaining life through build out of Phases 1/1A, 2 and 3 was estimated by multiplying the future projected quantities of waste by the current effective airspace consumption rate. Waste tonnage was assumed to increase each year at the same rate as the population. Population growth in Citrus County from 2019 to 2020 was a little less than last year. This year, population growth has been estimated using the "Medium" projections published in the University of Florida Bureau of Economic and Business Research (BEBR) population projections for Citrus County. The actual growth of the Citrus County population closely matched the Medium Growth rate published in Volume 53, Bulletin 186, January 2020 – Florida Population Studies. The projected waste tonnage for each year is multiplied by the effective airspace consumption rate to obtain the airspace volume consumed each year. This is then subtracted from the remaining airspace for each year until the available airspace is depleted. The calculations indicate that Phases 1/1A, 2, and 3 have approximately 1,346,288CY of available airspace as of the September 15, 2020 survey (Attachment #1, Sheet 2) and that this airspace could be completely utilized by April of 2030. This assumes that waste will continue to be added to the landfill at the current generation rates and effective density. For quick reference, the previous Site Life Calculation Report prepared on January 2, 2019 estimated this date to be November 2028 using BEBR Medium projection.

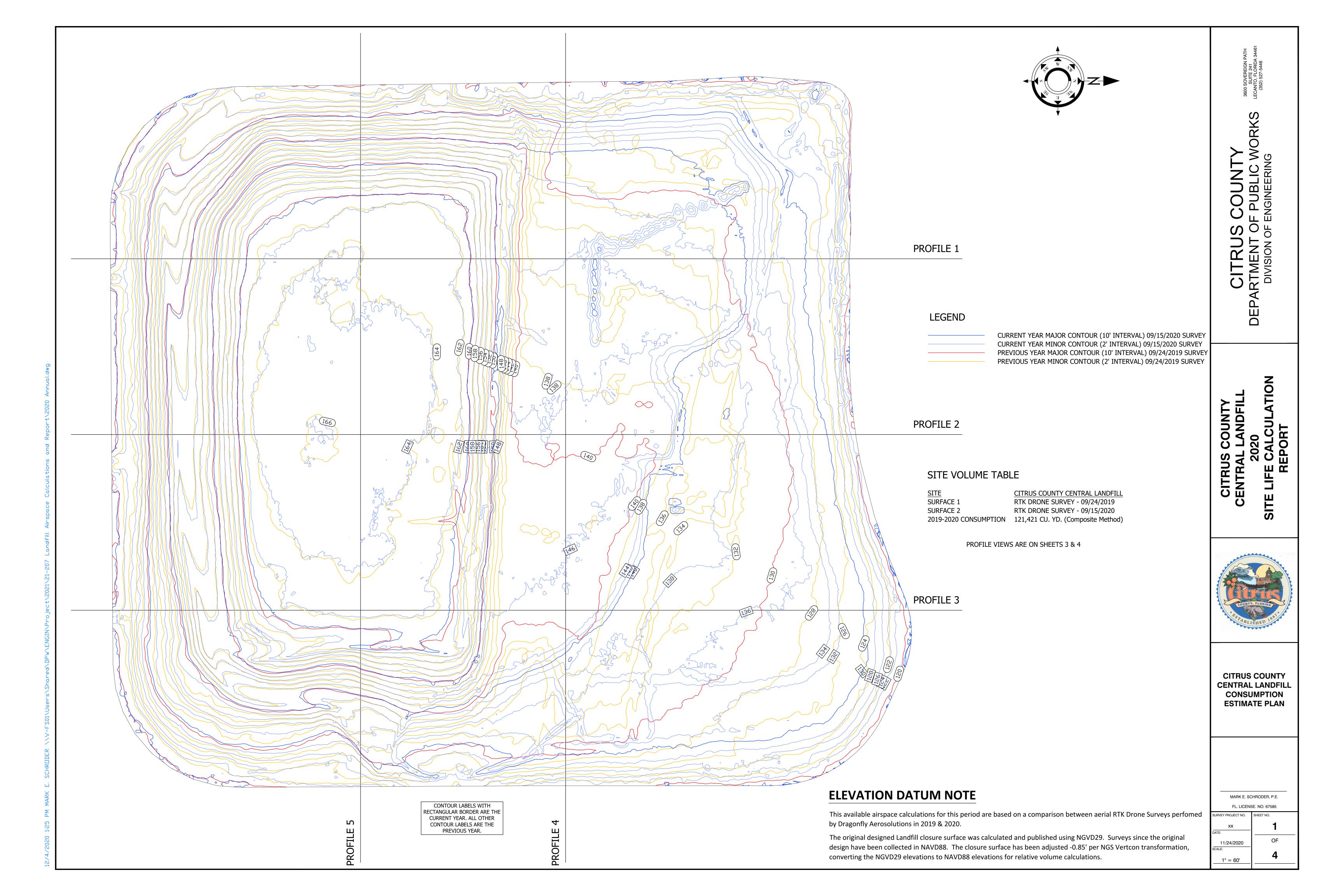
Phases 1/1A, 2, and 3

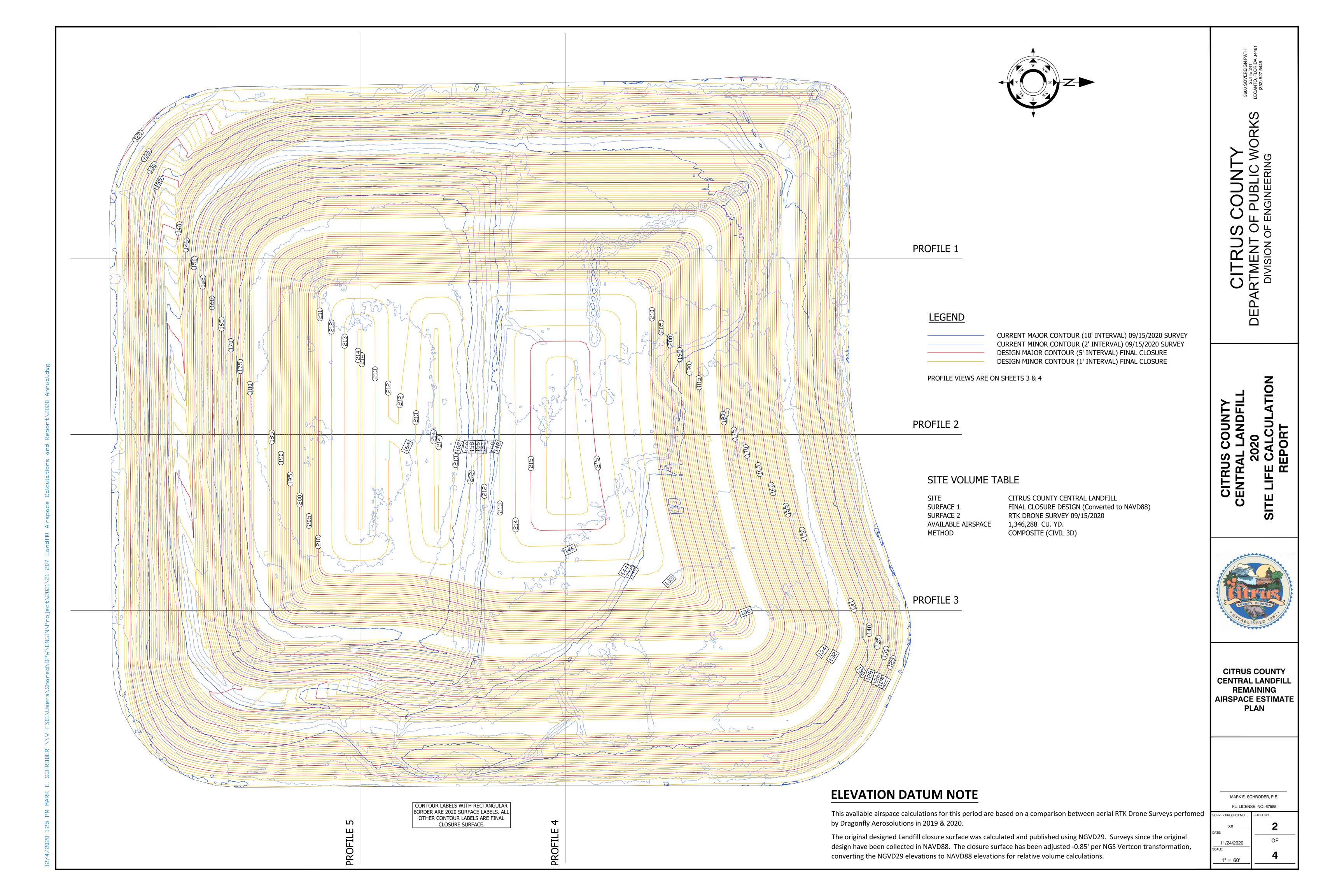
Landfill Side Slopes

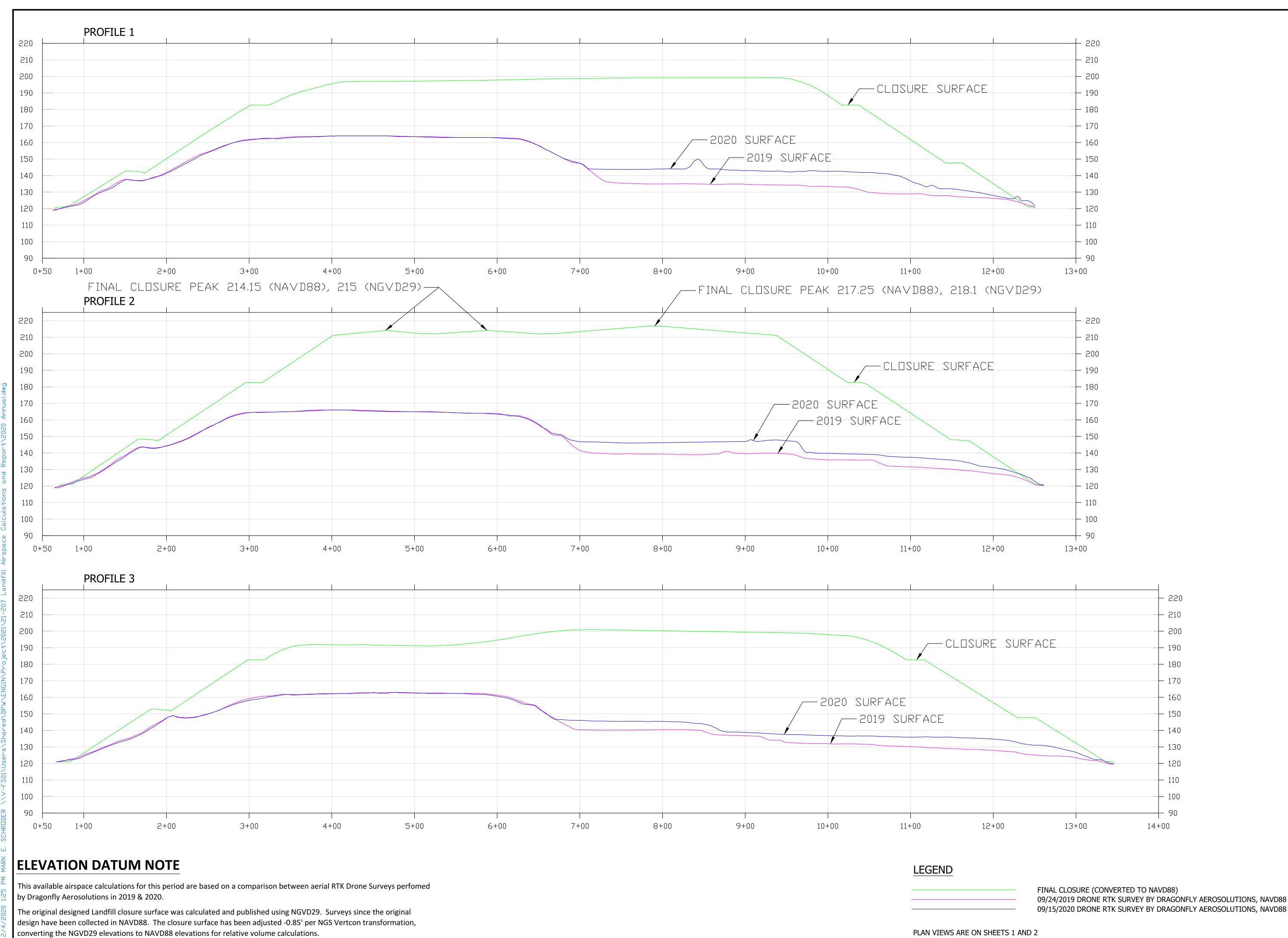
Specific Condition C.13.f of the site's FDEP Permit (Permit No. 21375-008-S0/01) requires that the disposal capacity and site life calculations submitted each year be accompanied by a survey indicating that the actual above grade side slopes are no greater than the design slopes and that the top elevation does not exceed the design elevation. As shown in the cross-sections provided on Sheets 3 & 4 of Attachment #1, the side slopes appear to be less than or equal to the design slopes, and the design top elevation of the landfill has not been attained.

ATTACHMENT 1 VOLUME CALCULATION DRAWINGS

(Refer to 24"x36" Drawings)

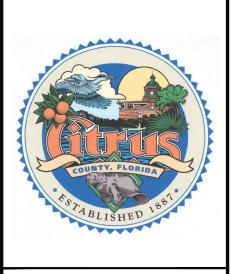






CITRUS COUNTY
DEPARTMENT OF PUBLIC WORKS
DIVISION OF ENGINEERING

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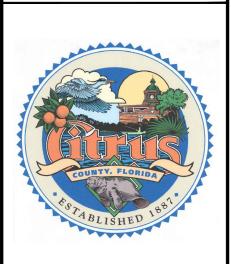


CITRUS COUNTY CENTRAL LANDFILL NORTH-SOUTH PROFILES

> MARK E. SCHRODER, P.E. FL. LICENSE. NO. 67585

11/24/2020 1" = 60'

CITRUS COUNTY
DEPARTMENT OF PUBLIC WORKS
DIVISION OF ENGINEERING





MARK E. SCHRODER, P.E. FL. LICENSE. NO. 67585

SURVEY PROJECT NO.

XX

DATE:

11/24/2020
SCALE:

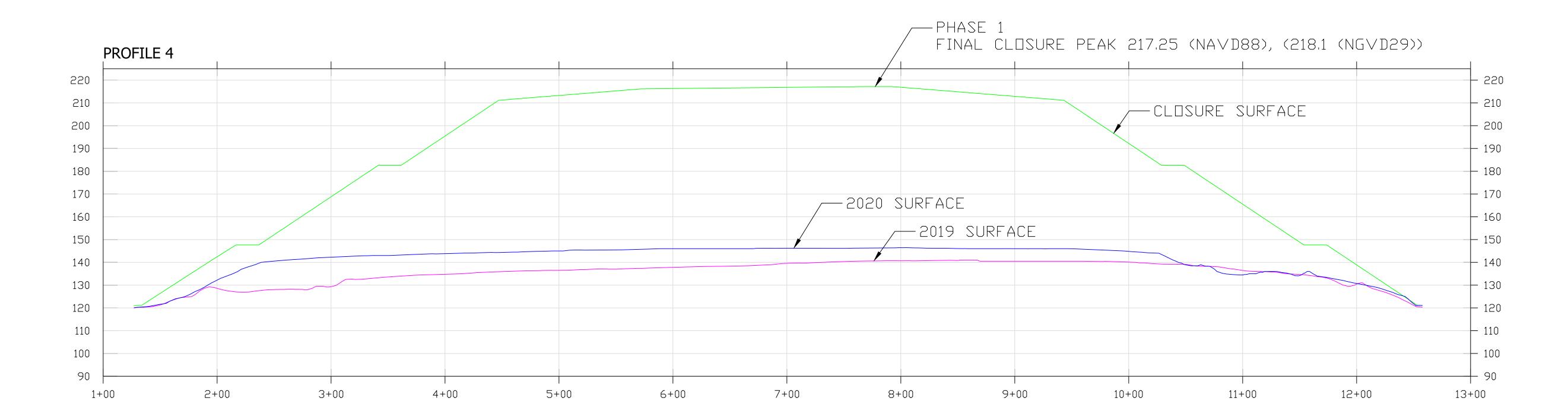
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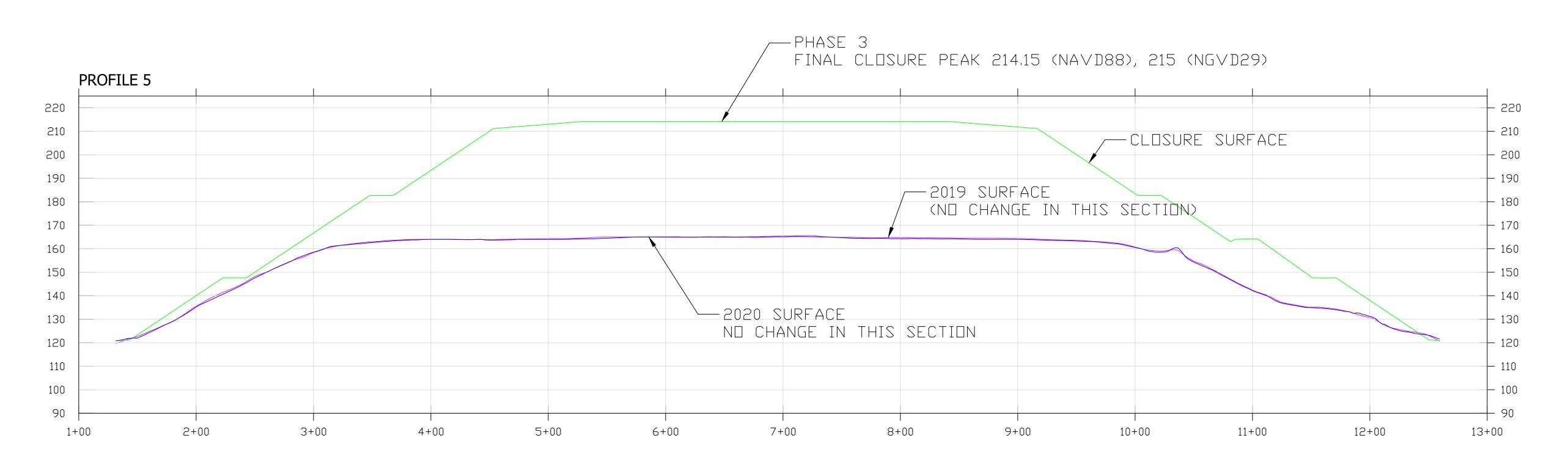
SHEET NO.

4

OF

4





ELEVATION DATUM NOTE

This available airspace calculations for this period are based on a comparison between aerial RTK Drone Surveys perfomed by Dragonfly Aerosolutions in 2019 & 2020.

The original designed Landfill closure surface was calculated and published using NGVD29. Surveys since the original design have been collected in NAVD88. The closure surface has been adjusted -0.85' per NGS Vertcon transformation, converting the NGVD29 elevations to NAVD88 elevations for relative volume calculations.

LEGEND

FINAL CLOSURE (CONVERTED TO NAVD88)
09/24/2019 DRONE RTK SURVEY BY DRAGONFLY AEROSOLUTIONS, NAVD88
09/15/2020 DRONE RTK SURVEY BY DRAGONFLY AEROSOLUTIONS, NAVD88

PLAN VIEWS ARE ON SHEETS 1 AND 2

ATTACHMENT 2 SITE LIFE CALCULATIONS

CITRUS COUNTY SOLID WASTE MANAGEMENT DIVISION CENTRAL LANDFILL SITE LIFE CALCULATION DECEMBER 2020 REPORT

Objective: Calculate the 2020 remaining site life for Phases 1/1a, 2 & 3 using waste tonnage records from Citrus County and

calculated waste generation projections.

Approach:

1. Calculate the available airspace as of the most recent survey.

- 2. Calculate the "Effective Density" using volume consumed between October 2019 through September 2020.
- 3. Use the effective density to calculate the remaining life of the available airspace.

Available Airspace Calculation:

Airspace available from Sep 2020 to Final Grade = 1,346,288 CY (From Surveys)

Air volume consumed Oct 2019 through September 2020 = 121,421 CY (Calculated)

Effective Density Calculation:

Waste Disposed of between 10/2019 through 09/2020 = 108,373 tons (From Landfill Records)

 Effective Density=
 108,373 | ten | 2,000 | lbs | 1,785 | lbs/CY
 1 | 1,785 | lbs/CY

 121,421 | CY | ten | CY | 1.12 | CY/ton | CY | 1.12 | CY/ton | CY/ton

Effective Airspace Consumption Rate= 121,421 CY 1.12 CY/ton 108,373 ton

Assuming the waste will be filled up to the final capacity and allowed to settle before placing the cover soil.

Cap Volume = 0 CY

Subtract Cap Volume from air volume (airspace available) to determine useable waste volume for site life calculation.

Remaining Volume = 1,346,288 CY - 0 CY = 1,346,288 CY

Site Life Calculation

The site life calculation is based on Citrus County waste tonnage records and population projections from the University of Florida Bureau of Business and Economic Research (BEBR). The historic population growth trends have been in between the BEBR Low and Medium estimates. This year population growth rate was just above the BEBR Medium estimate growth rates. The Medium population projection was used for this year's estimate.

Danart Vaar	FIGORI VEAD	TONNAGE	VOLUME CONOLIMED (OV)	NET REMAINING
Report Year	FISCAL YEAR	TONNAGE	CONSUMED (CY)	AIRSPACE (CY)
2019	2018-2019	99,280	111,233	1,346,288
2020	2019-2020	108,373	121,421	1,224,867
2021	2020-2021	109,493	122,676	1,102,191
2022	2021-2022	110,612	123,930	978,261
2023	2022-2023	111,732	125,185	853,077
2024	2023-2024	112,852	126,439	726,638
2025	2024-2025	113,971	127,694	598,944
2026	2025-2026	114,915	128,750	470,194
2027	2026-2027	115,858	129,807	340,387
2028	2027-2028	116,801	130,863	209,524
2029	2028-2029	117,744	131,920	77,604
2030	2029-2030	118,687	132,977	-55,373
2031	2030-2031	119,456	133,838	-189,211
2032	2031-2032	120,225	134,700	-323,911
2033	2032-2033	120,994	135,562	-459,473
2034	2033-2034	121,763	136,423	-595,896
2035	2034-2035	122,532	137,285	-733,181
2036	2035-2036	123,141	137,968	-871,148
2037	2036-2037	123,751	138,650	-1,009,799
2038	2037-2038	124,360	139,333	-1,149,132
2039	2038-2039	124,970	140,016	-1,289,147

CONCLUSION: Estimated Phases 1/1A, 2 & 3 Fill Completion Date = April 2030

CITRUS COUNTY CENTRAL LANDFILL WASTE TONNAGE PROJECTION

Year	*Population (BEBR Medium	% Change in	
real	Estimate)	Population	Tons/Year
2015 ⁽¹⁾	141,501		82,992
2016 ⁽¹⁾	143,054	1.10%	88,186
2017 ⁽¹⁾	143,801	0.52%	91,890
2018 ⁽¹⁾	144,552	0.52%	97,064
2019 ⁽¹⁾	147,744	2.21%	99,280
2020 ⁽¹⁾	149,383	1.11%	108,373
2021	150,926	1.03%	109,493
2022	152,470	1.02%	110,612
2023	154,013	1.01%	111,732
2024	155,557	1.00%	112,852
2025	157,100	0.99%	113,971
2026	158,400	0.83%	114,915
2027	159,700	0.82%	115,858
2028	161,000	0.81%	116,801
2029	162,300	0.81%	117,744
2030	163,600	0.80%	118,687
2031	164,660	0.65%	119,456
2032	165,720	0.64%	120,225
2033	166,780	0.64%	120,994
2034	167,840	0.64%	121,763
2035	168,900	0.63%	122,532
2036	169,740	0.50%	123,141
2037	170,580	0.49%	123,751
2038	171,420	0.49%	124,360
2039	172,260	0.49%	124,970
2040	173,400	0.66%	125,797
2041	173,940	0.31%	126,188
2042	174,780	0.48%	126,798
2043	175,620	0.48%	127,407
2044	176,460	0.48%	128,017
2045	177,300	0.48%	125,564

^{*}Population projection data for Citrus County originated from the University of Florida Bureau of Economic and Business Research (BEBR) Florida Population Studies (Volume 53, Bulletin 186, January 2020). A linear interpolation for yearly population increase was performed between the years in bold.

The "Tons/Year" amount is based on scale house data (monthly collection reports over the previous year) as supplied by the Waste Management Department.

⁽¹⁾ Annual Population reported in the BEBR Bulletins for the year.

Cut/Fill Report

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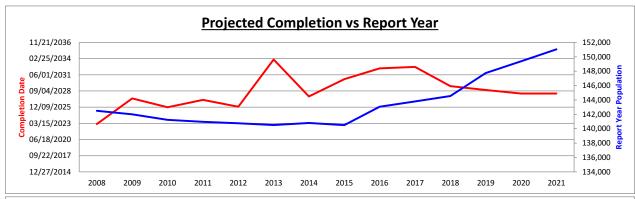
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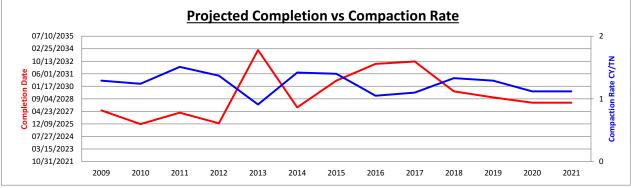
207 Landfill Airspace Calculations and Report\2020 Annual.dwg

Volume Summary							
Name	Туре	Cut Factor	Fill Factor	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
2019 to 2020	full	1.000	1.000	1351080.65	8794.46	130214.99	121420.52 <fill></fill>
2020 to Closure	full	1.000	1.000	1348324.90	3351.56	1349639.76	1346288.21 <fill></fill>

Totals				
	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
Total	2699405.55	12146.02	1479854.75	1467708.73 <fill></fill>

^{*} Value adjusted by cut or fill factor other than 1.0





Report Year	BEBR Estimate Used	Completion Date	Report Year Population	Growth Rate	Compaction Rate	Basis for Population
2008	High	02/01/2023	142500			SWAG - No Data Available
2009	High	06/01/2027	142000	-0.35%	1.29	SWAG - No Data Available
2010	High	12/01/2025	141236	-0.54%	1.24	Census
2011	High	03/01/2027	140956	-0.20%	1.51	BEBR Estimated for Year
2012	High	01/01/2026	140761	-0.14%	1.37	BEBR Estimated for Year
2013	High	01/01/2034	140519	-0.17%	0.91	BEBR Estimated for Year
2014	High	10/01/2027	140798	0.20%	1.42	BEBR Estimated for Year
2015	Low	09/01/2030	140501	-0.21%	1.40	BEBR Estimated for Year
2016	Medium	07/01/2032	143054	1.82%	1.05	BEBR Estimated for Year
2017	Medium	10/01/2032	143801	0.52%	1.10	BEBR Estimated for Year
2018	Medium	07/01/2029	144552	0.52%	1.33	Linear Growth Estimate
2019	Medium	11/01/2028	147744	2.21%	1.29	BEBR Estimated for Year
2020	Medium	04/01/2028	149383	1.11%	1.12	BEBR Medium Estimated for 2020
2021	Medium	04/01/2028	151040	1.11%	1.12	Linear Growth Estimate

BEBR Estimate is future population growth as report in the Florida Population Studies Bulletin

Completion Date is based on constant BEBR estimated growth until completion and airspace consumption at the report year rate Growth Rate is calculated from Report Year Population Estimate as Reported by BEBR

BEBR = Bureau of Economic and Business Research at the University of Florida

Projections of Florida Population by County, 2020–2045, with Estimates for 2019

County	Estimates	Projections, April 1					
and State	April 1, 2019	2020	2025	2030	2035	2040	2045
ALACHUA Low Medium High	267,306	258,900 269,800 280,500	262,300 281,500 299,400	264,300 291,600 318,000	265,100 300,200 334,300	264,500 307,400 348,800	262,300 313,300 361,400
BAKER Low Medium High	28,249	27,100 28,500 29,900	27,500 29,900 32,400	27,700 31,100 34,900	27,700 32,000 37,300	27,600 32,900 39,700	27,300 33,600 41,900
BAY Low Medium High	167,283	168,500 175,300 182,500	173,300 185,700 198,500	176,400 193,700 213,700	178,400 200,300 228,000	179,400 206,000 241,000	179,700 210,900 253,800
BRADFORD Low Medium High	28,682	27,400 28,800 30,200	26,900 29,200 31,700	26,300 29,500 33,100	25,600 29,800 34,500	24,900 30,000 35,900	24,300 30,300 37,200
BREVARD Low Medium High	594,469	577,900 602,400 626,000	594,000 637,600 678,100	603,000 665,000 725,700	608,300 687,900 766,900	610,400 707,400 805,100	612,200 726,000 843,700
BROWARD Low Medium High	1,919,644	1,862,500 1,941,200 2,017,700	1,899,500 2,039,000 2,168,500	1,917,100 2,115,200 2,307,300	1,924,900 2,179,100 2,426,900	1,923,700 2,233,900 2,537,300	1,920,500 2,285,100 2,646,600
CALHOUN Low Medium High	14,067	14,100 14,900 15,600	14,200 15,400 16,700	14,100 15,800 17,800	13,900 16,200 18,800	13,800 16,500 19,800	13,600 16,800 20,800
CHARLOTTE Low Medium High	181,770	175,300 184,700 193,800	181,500 198,100 213,800	185,200 208,700 232,500	187,200 217,400 250,200	188,200 225,200 266,900	188,900 232,500 284,600
CITRUS Low Medium High	147,744	143,300 149,400 155,300	146,600 157,100 168,000	149,000 163,600 180,400	150,300 168,900 192,100	150,800 173,400 202,600	150,900 177,300 213,100
CLAY Low Medium High	215,246	210,100 219,000 227,600	220,600 236,800 251,800	229,300 252,500 276,000	235,200 265,000 296,600	239,300 275,600 315,700	242,400 285,100 334,100
COLLIER Low Medium High	376,706	365,000 384,600 403,400	385,500 421,200 451,600	400,300 451,700 497,500	410,800 477,200 538,500	416,600 498,400 575,500	420,100 517,400 611,300
COLUMBIA Low Medium High	70,492	67,700 70,500 73,300	68,600 73,500 78,600	69,200 76,000 83,800	69,300 78,000 88,600	69,100 79,700 92,900	68,700 81,200 97,100
DESOTO Low Medium High	36,065	34,900 36,300 37,800	35,000 37,500 40,100	34,800 38,300 42,200	34,500 38,900 44,100	34,100 39,500 45,700	33,500 39,900 47,400
DIXIE Low Medium High	16,610	15,900 16,700 17,500	15,500 16,900 18,300	15,100 17,000 19,000	14,600 17,100 19,700	14,200 17,100 20,300	13,700 17,100 21,000



Board of County Commissioners DEPARTMENT OF PUBLIC WORKS SOLID WASTE MANAGEMENT DIVISION

P.O. Box 340, Lecanto, Florida 34460 Telephone: (352) 527-7670 FAX: (352) 527-7672 TDD Telephone 527-5303

email: landfillinfo@bocc.citrus.fl.us Citrus Springs/Dunnellon/Inglis/Yankeetown area Toll Free (352) 489-2120

January 11, 2021

Mr. Steve Morgan Manager, Air & Solid Waste Permitting Florida Department of Environmental Protection 13051 North Telecom Parkway Temple Terrace, FI 33637-0926

Re: Citrus County Central Class I Landfill (FDEP Permit No. 21375-025-SO-01/026-SO-MM) Annual Site Life Calculation Transmittal for Phases 1/1A, 2 and 3

Dear Mr. Morgan:

Specific Condition # C.13.e. of the subject landfill operation permit requires that the annual landfill site life calculations be submitted no later than January 15th of each year. Enclosed please find the 2019-2020 Site Life Calculations Report and supporting documentation prepared by the Citrus County Division of Engineering.

If you should need additional information, please let me know.

Sincerely,

Henry C. Norris, Jr.

Director, Division of Solid Waste Management

CC: Randall Olney, P.E., Public Works Director