



Airspace Management Report

Southeastern Public Service Authority

Regional Landfill, Cells V and VI

Suffolk, Virginia

Issued for Review January 6, 2023





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Purpose

This Airspace Management Report has been prepared to assist the Southeastern Public Service Authority (SPSA) with management of the remaining airspace for the Regional Landfill Cells V and VI. The report describes the assumptions and calculations used to estimate the remaining airspace, municipal solid waste (MSW) in-place density, and remaining life expectancy of the landfill.

Tonnage Data

HDR Engineering, Inc. (HDR) has compiled the following information regarding the quantity of waste accepted at the landfill.

- Based on scale records provided by SPSA, a total of **12,440,691 tons** of MSW, construction demolition debris (CDD), and ash were disposed of in Cells V and VI at the Regional Landfill from May 2000 through December 15, 2022. A total of **302,212 tons** were disposed in the 2022 reporting period December 15, 2021 – December 15, 2022. See attached Tonnage Between Survey Dates Summary Table.
- Over the last three years the average monthly disposal rate for MSW, CDD, and ash is **25,871 tons per month (tpm)**. Figure A (attached) shows the monthly and rolling 12-month average tonnage disposed at the landfill through **December 2022**.
- The average monthly disposal rate for just MSW and CDD at the landfill over the last three years is **11,898 tpm**.
- The average monthly disposal rate for ash (ash and non-qualifying ash) at the landfill over the past three years is **13,973 tpm**.

Operating Airspace

Topography

Since Cell V began operation in May 2000, annual topographic surveys have been prepared to assist in managing the landfill airspace. Cell VI began accepting part of the incoming waste in May 2006, but did not take all of the incoming waste until November 2006, when Cell V stopped taking waste. The following topographic files have been utilized in determining consumed and remaining airspace including the in-place density of the compacted MSW in Cells V and VI.

- July 28, 2000, As-Built Regional Landfill Cell V prepared by G.R. Jenkins – Land Surveyor.
- May 11, 2006, Cell VI Phase 1 operational cover as-built prepared by Bateman Civil Survey Company, P.C.
- November 30, 2007, Cell VI Phase 2 operational cover as-built prepared by Bateman Civil Survey Company, P.C.
- December 17, 2021 topography prepared from aerial drone photography by SPSA utilizing Propeller Trimble Stratus software.



- December 21, 2022 topography prepared from aerial drone photography by SPSA utilizing Propeller Trimble Stratus software.

Airspace

The AutoCAD Civil 3D program was used to calculate remaining and consumed gross volume. A three-dimensional surface was created for the operational cover surface for Cell V and VI and the **December 21, 2022** topo. The 3-D surfaces were compared to determine volumes. As appropriate, volumes representing final cover system thickness were accounted for in determining the operating airspace. Operating airspace is defined as the volume determined between the top of operational cover and the bottom of the final cover system and is comprised of MSW and daily and intermediate cover.

In addition to determining operating airspace, the volumes were utilized to determine cumulative in-place densities. In-place densities were determined by dividing tonnage by consumed airspace. The following table summarizes the periodic consumption of airspace and densities.

To keep records of the landfill development, drawings have been prepared to indicate the consumption of available airspace. Drawings C-01 and C-02 depict the existing conditions as of the surveys on December 17, 2021 and December 21, 2022. Drawings C-03 through C-06 include the calculations of airspace consumed over the last year, airspace remaining, recoverable airspace remaining (neglects minor fills on lower slopes of Cell V and revised filling to accommodate existing roadway and settlement of slopes), and total airspace consumed to date. Drawings C-07 through C-09 depict several cross-sections of the landfill depicting the bottom of waste, filling completed in 2022, airspace gained in 2022 through settlement, the permitted final top of waste grades, and the recoverable top of waste grades.



Table A

Airspace Management Report	Survey Date	Disposed To Date (Tons) ⁽¹⁾	Airspace Consumed To Date (CY)	Operating Airspace Remaining (CY)	Disposed In-place Density (lbs/CY) ^(1, 2)	Periodic Airspace Consumed (CY) ⁽⁴⁾	Operational In-place Density (lbs/CY) ⁽⁴⁾
February 2008 (V&VI)	12/27/07	6,753,342	7,942,485	7,292,881	1,701		-
February 2009	12/28/09	7,768,309	9,310,547	6,144,716	1,669		-
November 2009	10/29/09	8,274,614	9,550,947	5,712,089	1,733		-
January 2011	1/5/11	8,618,420	9,859,976	5,395,091	1,748		-
February 2012	1/31/12	8,825,464	9,808,952	5,419,716	1,799		-
February 2013	2/14/13	9,078,922	9,901,716	5,336,169	1,833		-
March 2014 ⁽³⁾	3/18/14	9,647,921	10,075,542	5,173,609	1,915		-
March 2015	3/15/15	9,992,157	10,320,231	4,918,558	1,900		-
November 2015	11/24/15	10,274,587	10,489,200	4,740,401	1,959		-
January 2017	1/19/17	10,627,401	10,697,546	4,543,105	1,987	278,569	2,533
December 2017	12/16/17	10,865,168	10,831,703	4,412,901	2,008	204,462	2,326
December 2018 ⁽⁵⁾	12/17/18	11,177,785	11,152,613	3,728,814	2,005	337,261	1,854
December 2019 ⁽⁵⁾	12/5/19	11,466,983	11,423,983	3,408,065	2,008	332,716	1,738
December 2020 ⁽⁵⁾	12/15/20	11,805,770	11,821,884	3,036,939	1,999	355,981	1,903
December 2021 ⁽⁵⁾	12/17/21	12,110,991	12,083,851	2,644,503	2,006	343,303	1,773
December 2022 ⁽⁵⁾	12/21/22	12,410,547	12,400,113	2,323,999	2,002	330,303	1,830

- (1) Disposed includes both MSW and ash up to survey dates. Tonnage of clean soil fill from Clearfield and other imported soil used for daily and intermediate cover have been deducted from the disposed tons in 2022.
- (2) Density reported is cumulative since the beginning of operations in May 2000.
- (3) The March 2014 report figures shown include soils used for Cell V regrading, which is responsible for the large increase in Disposed In-place Density.
- (4) Operational In-Place Density calculated from the periodic airspace consumed in the active fill area and tons disposed and does not consider site wide airspace consumed and settlement of waste.
- (5) The Operating Airspace Remaining for 2018, 2019, 2020, 2021 and 2022 are calculated for recoverable airspace which is adjusted for settlement of existing surfaces at the limit of filling, and the configuration of existing access roadway.

Remaining Site Life

We understand that the current landfill operations include receipt of MSW ash residue and MSW waste materials from western SPSA communities. This operation is likely to remain similar through at least June 30, 2024 at which time the contract with Wheelabrator will be terminated. Following termination of the agreement it is anticipated that approximately 506,000 tons per year of MSW and other wastes will be disposed of at the Regional Landfill. This acceptance rate assumes that all the SPSA member communities MSW (450,000 tons) and the other waste materials (41,000 tons) with a nominal 1% annual growth are disposed at the Regional Landfill. Operations have been successful in achieving a high in place density of waste, ash and cover materials and in 2022 they achieved **1,830 lbs/CY** based on the periodic airspace consumed in the active filling area of 330,303 CY and **302,212 Tons** disposed between the December 17, 2021 and December 15, 2022.

Figure B depicts the tonnage and airspace scenario for Cell V and VI based on varying waste acceptance rates, the current 1,830 lbs/CY or 0.915 tons/CY operational in-place density, and

an assumed MSW waste density of 0.800 or 1600 lb/CY following the termination of the Wheelabrator agreement. If the current waste disposal rate and operational in-place density were to continue to June 30, 2024 Cell V and VI remaining capacity could be consumed by late May 2027. Under a 1% annual tonnage increase scenario, the capacity could be reached in late April 2027.

Figure C depicts the tonnage and airspace scenario for varying in-place densities after June 30, 2024. If SPSA continues to accept 301,511 tons per year of ash, MSW and CDD for disposal until June 30, 2024, and then waste acceptance rates increase to 506,000 tons per year, Cell VI could reach capacity as early as January 2027 if the operational in-place density approaches 1400 lbs/CY. If operations are able to successfully work and compact the waste materials to maintain the airspace utilization rate at 1600 lbs/CY or 1800 lbs/CY, then capacity would not be reached until June 2027 or October 2027, respectfully.

Findings

The remaining airspace volume has not been adjusted to address the fact that there may be difficulty in maintaining the outside slopes at or above the proposed elevations as the height of the fill progresses or to address the relocation of the access road. As the waste settles and degrades over the next few years, the 3H: 1V slopes may become flatter. The most critical area to meet or become steeper than the proposed contours is the first couple of lifts above the stormwater benches. This is the most difficult area to revisit with waste placement and it has the most effect on the capacity at higher grades. It is difficult to predict how settlement will affect the slopes during the remaining active life.

Review of the existing topographic surveys indicates that the exterior slopes of the landfill are being filled in general accordance with the permit slopes of 3H:1V and fill plan. As waste filling elevations continue to go higher in Cell V and as Cell VI is further developed, conformance with the exterior permit slopes should be confirmed in order to utilize as much of the available capacity as practical.

The operational in-place density, or airspace consumed in the active filling areas for 2022 has been maintained around 1,800 lb/CY over the last two years. Through thoughtful planning and sequencing of filling, the landfill operations are realizing the available capacity to the extent practical.

SPSA should plan to have additional constructed capacity available for disposal in mid-2026 to accommodate variations in waste acceptance rates, densities and to support initial operations Cell VII – Phase 1. As is demonstrated from the various remaining site life projections, Cells V and VI airspace will be consumed by the middle of 2027.

Future Capacity

In addition to Cells V and VI, the SPSA Regional Landfill includes a 56-acre lateral expansion known as Cell VII. Cell VII was approved by the Virginia Department of Environmental Quality on June 8, 2011. The permitted capacity of Cell VII is approximately 10,800,000 cubic yards of operating airspace. A major permit modification was submitted to VDEQ in December 2022 to



modify the base grades for Cell VII to create three phases of development. The proposed Phase 3 area consists of the overlap between Cell VII and Cell V and its construction and operation will likely be deferred until after Cells VIII or IX are filled. The revised Cell VII grading provides 10,573,452 CY of disposal airspace, with 8,243,331 CY within Phases 1 and 2. Site life estimates for Cell VII and life estimate of future phases for various disposal rates and densities are included as an attachment. Drawing C-10 is also enclosed to depict the Master Plan Buildout and life for the future cells based on current disposal rates and density.



Attachments

- Figure A, Tonnage History
- Figure B, Tonnage Scenario
- Figure C, Varying Density Calculations
- Tonnage Reports
- Airspace Calculations
- Cell VII –XII Life Estimates
- Airspace Drawings



Figure A

Tonnage History

SPSA Regional Landfill Cells V & VI

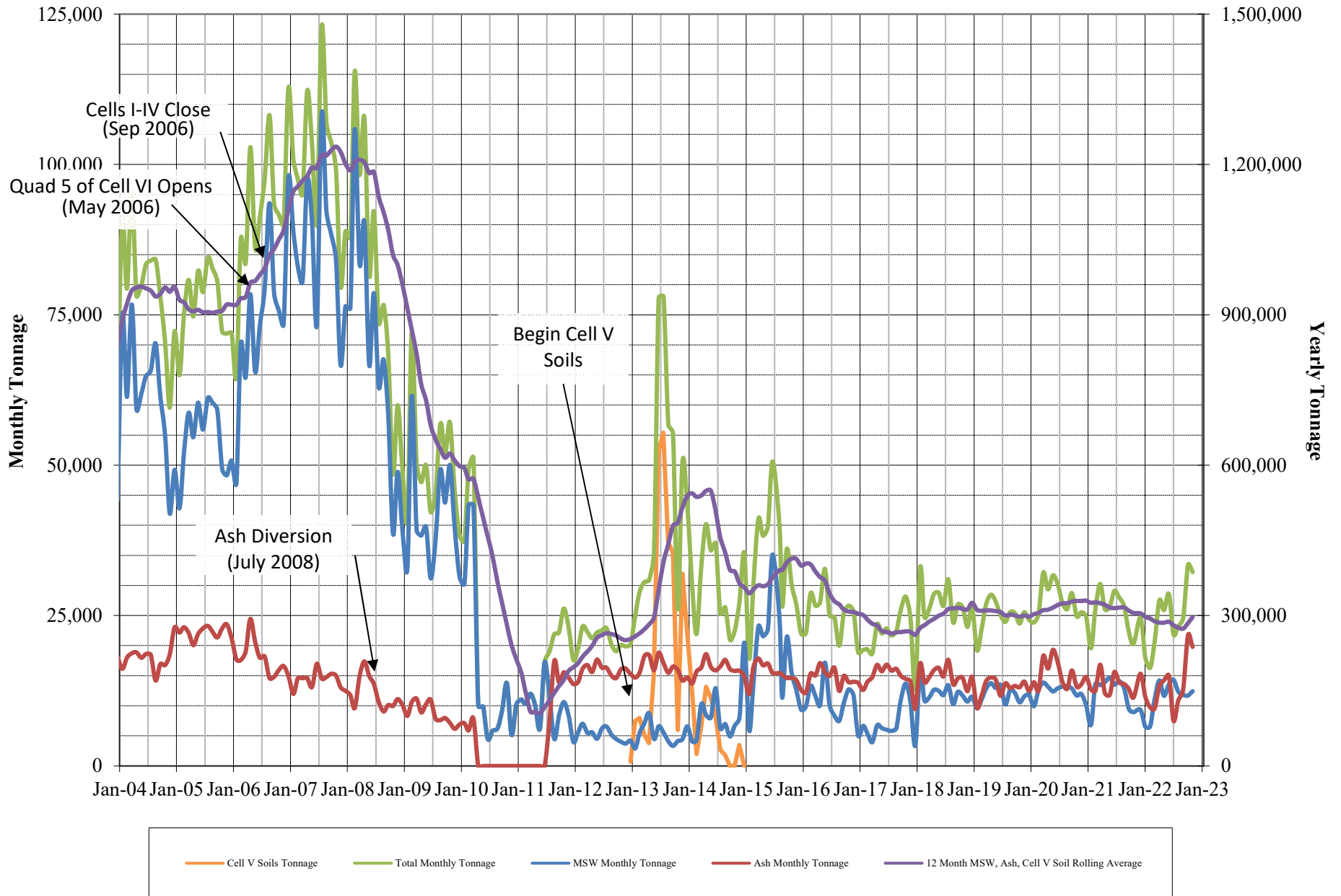


Figure B
Tonnage Scenario
 SPSA Regional Landfill Cells V & VI
 Density 1600 lbs/CY after June 2024

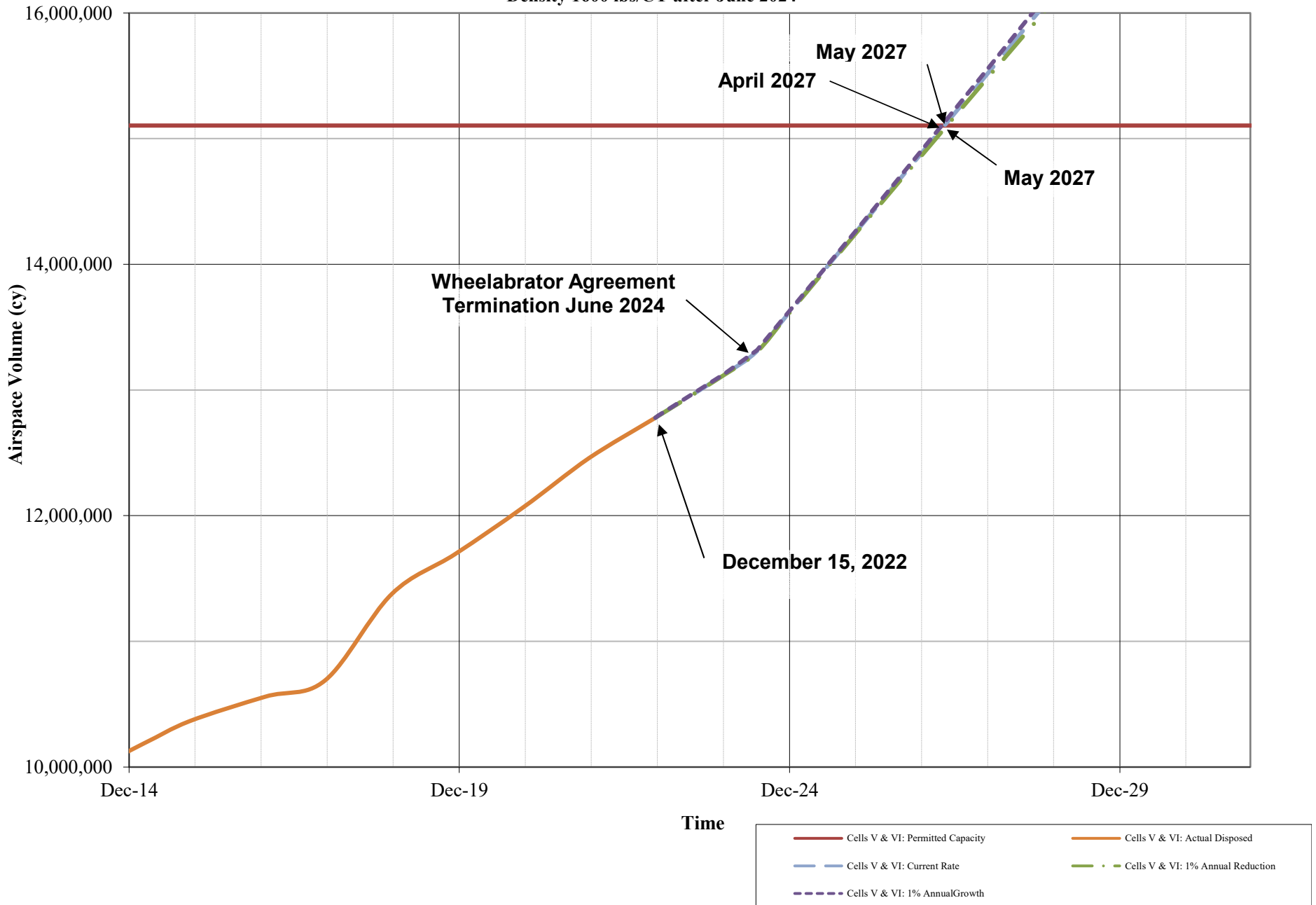
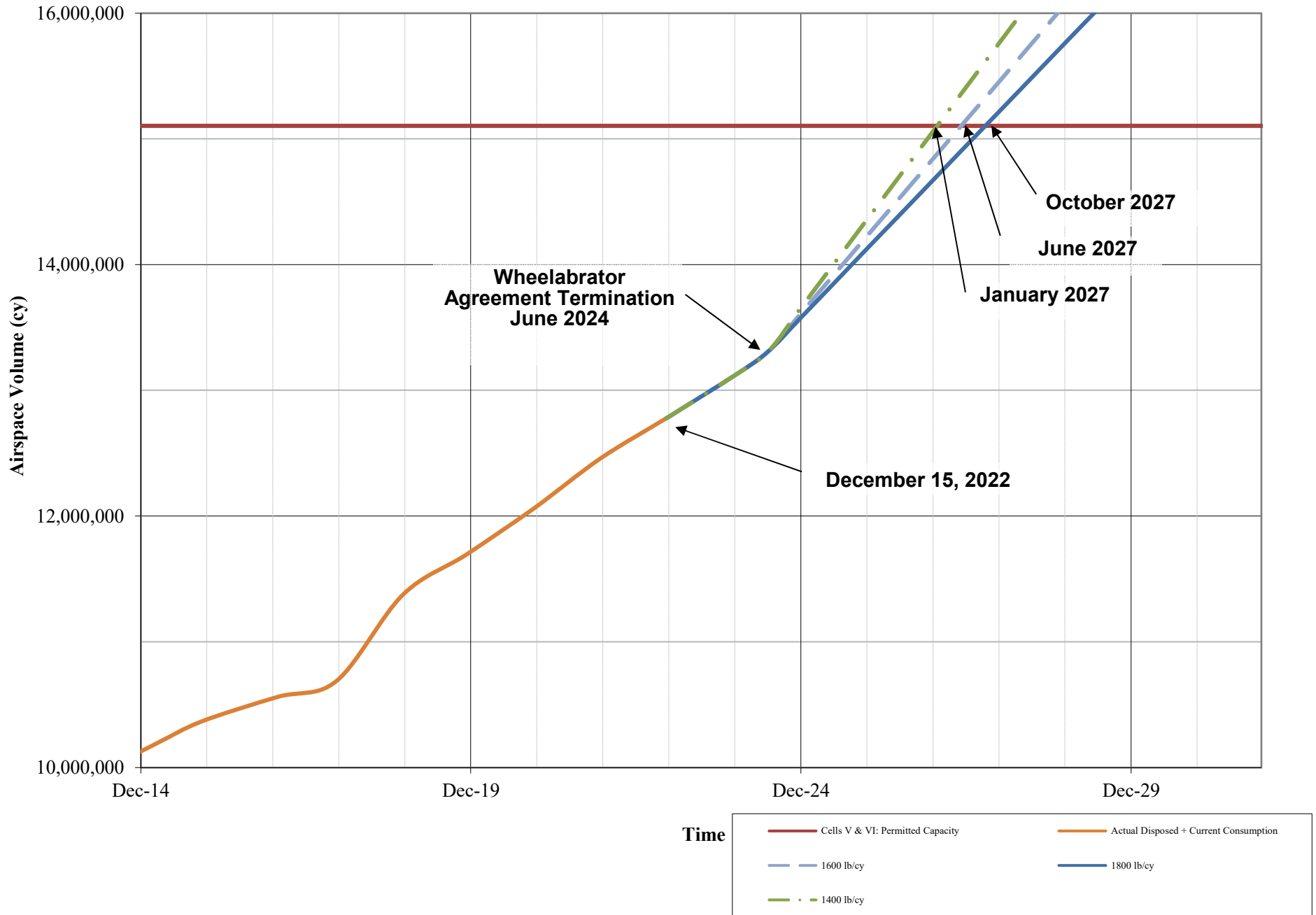


Figure C Varying Density Scenario SPSA Regional Landfill Cells V & VI



**Regional Landfill Waste Stream
Calendar Year 2022**

Types of Waste (tons)	12/1/21 - 12/17/21	12/18/21 - 12/31/21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	FY2022	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	12/15/2022	Total CY (12/18/21 - 12/21/22)
CDD	374	306	483	574	494	683	573	643	8,753	664	630	711	666	681	343	8,023
Sludge - Norfolk	294	288	549	571	461	585	552	502	6,935	659	673	605	609	570	234	7,153
Sludge - Suffolk	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Industrial Waste	-	13	0	4	6	-	-	-	87	10	0	0	0	19	1	52
Fines C&D	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Soils	18	110	0	354	556	437	360	366	4,422	255	530	674	370	521	221	4,772
Brick & Block	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Clean Fill	0	-	874	0	39	9	5,337	21,574	27,887	1,335	48	0	0	804	123	30,144
Peanut Dust/Peanut Hulls	175	80	319	370	337	299	349	258	4,301	303	220	497	330	233	148	3,919
Municipal Solid Waste ¹	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Suffolk Municipal NP Solid Waste	26	3	25	27	9	17	26	30	311	29	51	35	34	23	15	350
Southampton Cty Municipal NP Solid Waste	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Chesapeake Municipal NP Solid Waste	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Portsmouth Municipal NP Solid Waste	0	-	0	0	0	0	36	66	102	66	52	115	74	21	0	431
Virginia Beach Municipal NP Solid Waste	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Norfolk Municipal NP Solid Waste	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	-
NP from Municipal HHW Users	23	64	66	54	93	94	92	41	976	43	61	51	48	53	11	793
Navy Waste ¹	3	-	44	21	33	5	11	40	219	41	38	46	19	27	24	351
Contract Processable Waste	0	5	0	0	0	0	0	0	9	0	0	0	20	0	0	25
Non-Processible Commercial Waste ²	39	33	97	116	165	269	135	240	2,011	215	331	227	324	198	112	2,500
Non Contract/Non Municipal	0	-	0	0	0	0	0	0	0	0	0	0	4	0	0	4
Concrete/Asphalt	0	-	0	0	0	0	0	0	0	29	0	0	9	0	0	9
Shredded Tires	398	209	853	600	141	94	1,244	1,816	9,596	785	1,028	740	899	685	545	10,035
Ash	7,529	6,065	10,308	8,499	8,211	11,775	8,130	10,012	143,354	6,225	9,039	12,006	19,318	17,324	9,609	144,050
Non-Qualifying Ash	861	891	1,201	1,244	1,301	1,510	6,105	5,021	27,981	1,299	1,888	718	2,398	2,472	1,508	28,418
MSW from Tsf Stations	3,267	2,698	3,891	3,889	6,879	8,355	8,242	6,870	92,197	5,361	6,042	5,742	5,940	6,317	2,816	76,309
Clean Fill - Clearfield (1.35 factor)	0	2,873	6,332	3,440	4,914	7,371	4,271	2,892	56,643	4,366	4,649	5,160	3,175	4,876	4,253	58,571
Clearfield Residual (1.35 factor)	0	38	113	0	95	38	57	57	605	95	95	95	85	76	47	888
Non-Processible Waste (from Tsf Stations)	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Non-Processible Waste (from RDF)	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Diverted Processible Waste (from RDF)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Diverted Processible Waste (from Tsf Stations)	662	211	73	0	1,531	3,363	0	2,616	10,676	5,829	2,593	2,292	2,268	3,018	686	25,142
Total	13,669	13,885	25,227	19,762	25,465	34,903	35,519	53,045	397,093	27,579	27,967	29,713	36,592	37,918	20,696	401,940
Total Ash	8,389	6,957	11,509	9,743	9,512	13,284	14,235	15,033	171,334	7,524	10,927	12,724	21,717	19,796	11,117	172,468
Total Without Cleanfill	13,668.87	11,012.63	18,022.02	16,321.73	20,512	27,523	25,910	28,579	312,563	21,878	23,270	24,553	33,417	32,238	16,320	313,225

¹ Represents CDD from Suffolk Contractors
² Boats, Flour, Frozen Foods, Other items too large for Suffolk Transfer Station, SW Unacceptable at Tsf Stations, Scrap Tires

Project:	SPSA	Computed: JSM	1/6/2023
Subject:	Regional Landfill Cell V & VI	Checked: TMY	1/6/2023
Task:	Airspace Calculations	Sheet: 1	Of: 1

Base Drawing for volume calculations: Cell V Design Subgrade (Design Bottom of Clay) and Cell VI Operational Cover

A 15,103,930 cy Permit Net Airspace Capacity for MSW, D&I Cover (No Final Cover)
(Permitted operational capacity; refer to permit for Cell VI)

B 12,400,113 cy Volume Consumed as of 12-17-21 (AutoCADD, Base Drawings vs. 12-21-22 Survey)

C 0 cy Cell V subgrade surface modified to top of operational cover in 2018
44.6 Acres
1.1 Clay Liner, assumed additional 0.1' of over build
1.6 Op Cover, assumed additional 0.1' of over build

D 12,400,113 cy Airspace Consumed as of 12-17-21	(B-C)
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Includes MSW, D&I Cover

Airspace Consumption Check

E 12,165,187 cy Airspace Consumed in Cells V&VI as of 12-17-21 (Base Drawing vs. 12-17-21 Survey)

F 330,303 cy Airspace Consumed between 12-17-21 and 12-21-22 (12-17-21 Survey vs. 12-21-22 Survey)
(includes only volume consumed within active fill area)

G 12,495,490 cy Airspace Consumed as of 12-21-22 based on the 12-21-22 survey and the 12-17-21 survey (E + F)

-0.77% % Difference of the Consumed AutoCADD and calculated Consumed Airspace (I-G/D)

H 12,447,802 cy Airspace Consumed (avg of AutoCADD volume and calculated volume) (Average of D & G)

-0.38% % Difference of the Consumed Average and calculated Consumed Airspace (I-H/D)

Airspace Remaining Check

I 2,846,008 cy Remaining Airspace as of 12-21-22 (12-21-22 survey vs. 3:1 Top of Waste, AutoCAD)

J 2,703,817 cy calculated Remaining Airspace as of 12-17-21 (A - D)
(Permit Net Airspace less Airspace Consumed)

K 5.26% % Difference of the Remaining AutoCADD and calculated Remaining Airspace (I-I/J)

L 2,323,999 cy Recoverable Remaining Airspace as of 12-21-22 (12-21-22 vs Revised Top of Waste, AutoCADD)

M 22.46% % Difference Calculated vs Recoverable Airspace (I-I/L)

N 2,846,008 cy Total Remaining Airspace as of 12-17-21	(I)
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Includes MSW, D&I Cover

O 2,323,999 cy Recoverable Airspace Remaining as of 12-17-21	(L)
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Includes MSW, D&I Cover

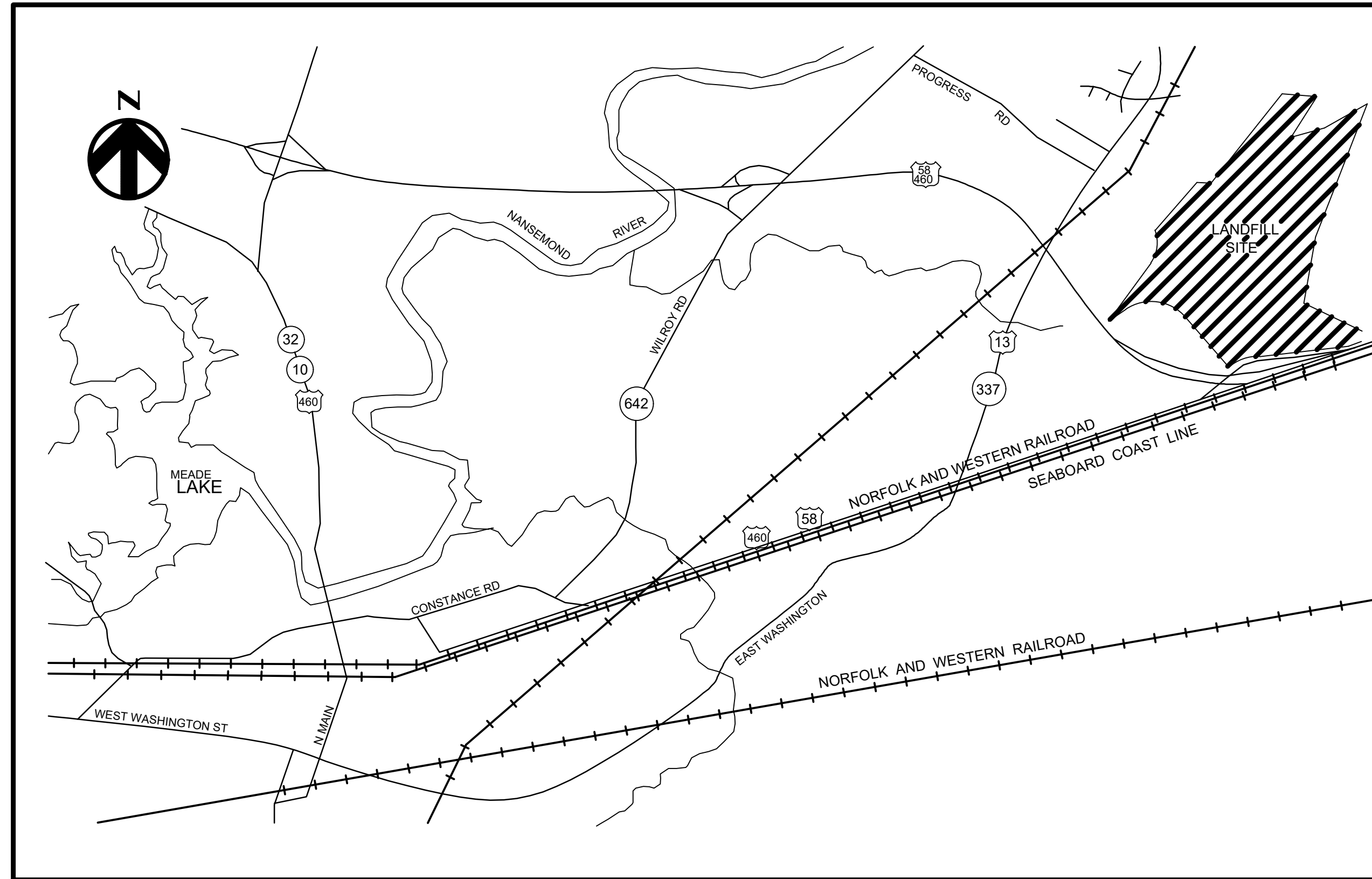
Project:	SPSA Life Projections	Computed: JSM	Date: 1/6/23
Subject:	Varying Disposal Materials	Checked:	Date: 1/6/23
Task:	Airspace & Timeline For MSW	Sheet: 1	Of: 1

			Capacity Tons	
Date of Survey:	12/21/2022			
Permitted airspace for Cells 5 and 6	15,103,930 cy		13,593,537	
Airspace consumed as of December 21, 2022	12,400,113 cy		11,160,102	
Calculated Airspace Remaining for Cells 5-6	2,703,817 cy		2,433,435	
Recoverable Airspace Remaining for Cells 5-6	2,323,999 cy		2,091,599	1800
Permitted Airspace for Cell 7 (Phase 1 and 2)	8,243,331	10,567,330	5,770,332	1400
Estimated Airspace for Cells 8 and 9	13,970,463	24,537,793	9,779,324	
Estimated Airspace for Cells 10-12	21,326,523	45,864,316	14,928,566	

Year Site Life Expires

Incoming waste volume, tons/yr	Cumulative Life Estimations			
	Cells 5/6	Cell 7	Cells 8/9	Cells 10/11/12
	2.64M CY 2.38M Tons	8.24M CY 5.8M Tons	13.97M CY 9.8M Tons	21.3M CY 14.9M Tons
200,000	2033	2062	2119	2193
300,000	2029	2049	2087	2136
400,000	2028	2042	2071	2108
500,000	2027	2038	2061	2091
600,000	2026	2036	2055	2079
700,000	2025	2034	2050	2071

- Notes:
- 1 Assume 0.70 tons MSW per cubic yard density for filling in Cells 7-12. Life of Cell 5/6 assumes 0.9 tons/CY for existing conditions
 - 2 Life estimates based on 2.3 M CY of recoverable airspace remaining in Cell 5/6 as of December 21, 2022
 - 3 Cell 7 volume assumes capacity based on major permit modification with no overlap onto Cell V (Phase 3)
 - 4 Cells 8 and 9 volumes are based on preliminary grading and reduced footprint as proposed in Draft EIS
 - 5 Cells 10 through 12 volumes are estimated as a 20' max depth and 200' top elevation



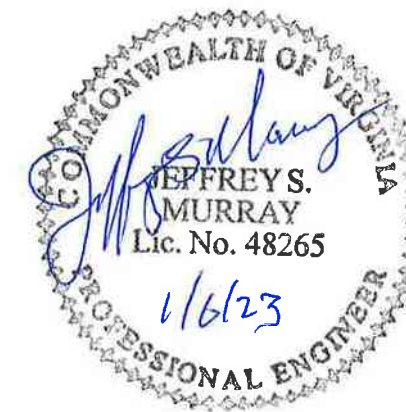
LOCATION MAP
1" = 2000'

Contract Drawings For

Regional Landfill

2023 Airspace Management

Issued for Review
January 2023



Project No.
10354196

Suffolk, Virginia

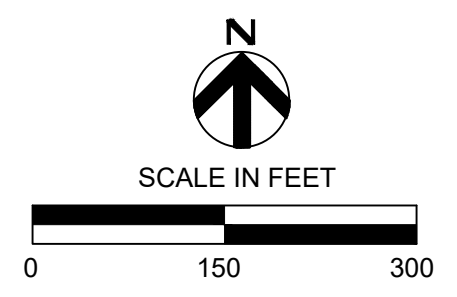
INDEX OF DRAWINGS

GENERAL

00G-01 COVER SHEET

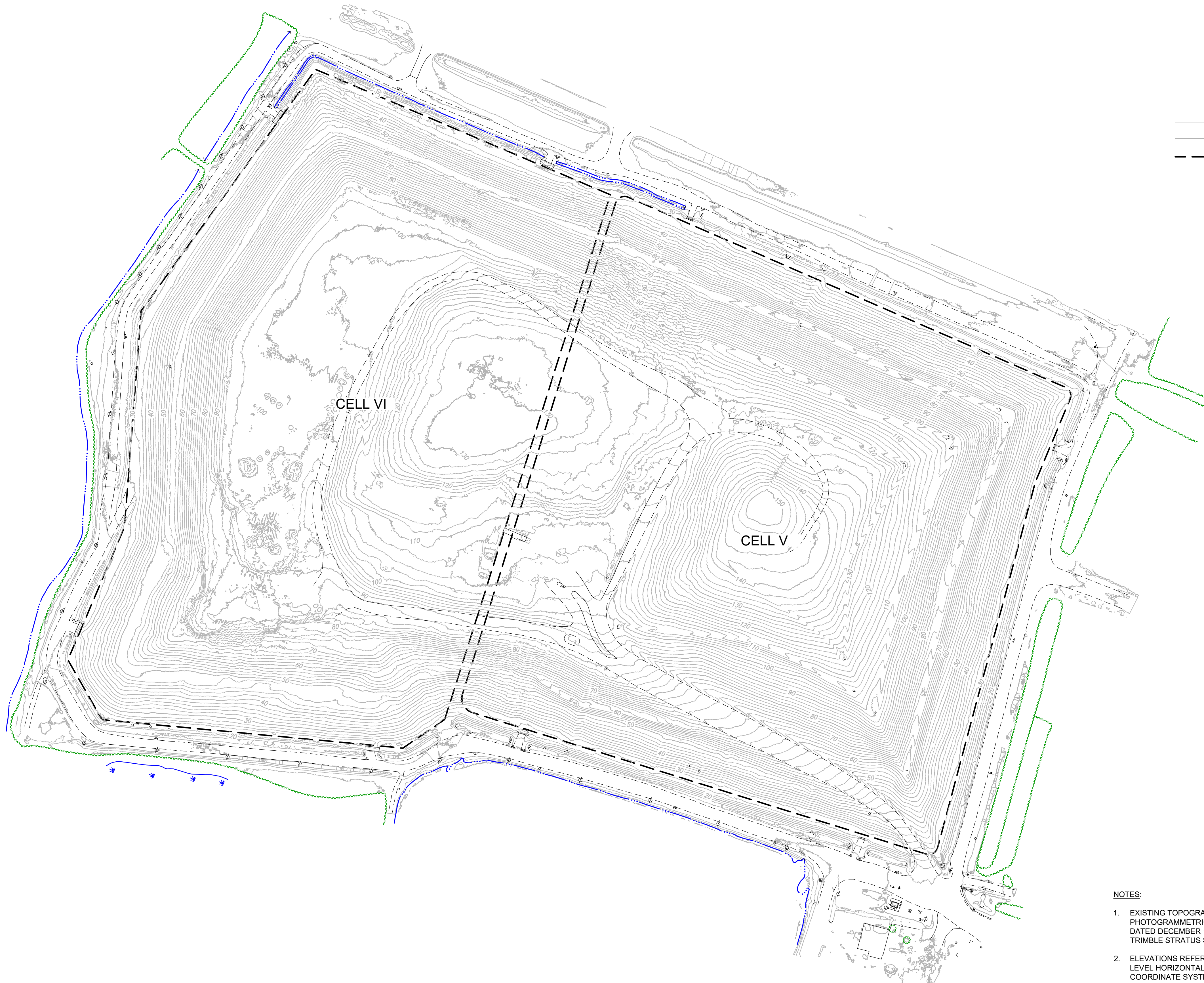
CIVIL

- 00C-01 EXISTING SITE CONDITIONS (DECEMBER 17, 2021)
- 00C-02 EXISTING SITE CONDITIONS (DECEMBER 21, 2022)
- 00C-03 AIRSPACE CONSUMED - 2021 VS 2022
- 00C-04 AIRSPACE REMAINING - 2022 VS TOP OF WASTE
- 00C-05 RECOVERABLE AIRSPACE - 2022 VS TOP OF WASTE RECOVERABLE
- 00C-06 TOTAL AIRSPACE CONSUMED - BOTTOM OF WASTE VS 2022
- 00C-07 SITE CROSS SECTIONS (SHEET 1 OF 3)
- 00C-08 SITE CROSS SECTIONS (SHEET 2 OF 3)
- 00C-09 SITE CROSS SECTIONS (SHEET 3 OF 3)
- 00C-10 MASTER PLAN BUILDOUT

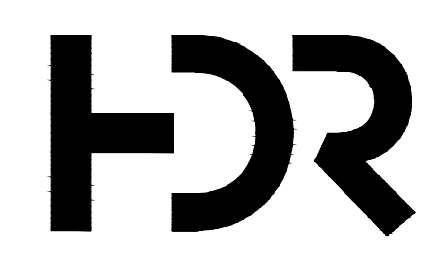


LEGEND

	EXISTING MINOR CONTOUR
	EXISTING MAJOR CONTOUR
	PHASE BOUNDARY LIMITS

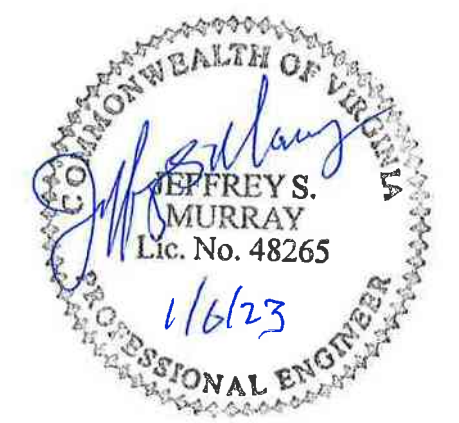


- NOTES:**
- EXISTING TOPOGRAPHY SHOWN HEREON COMPILED BY PHOTOGRAMMETRIC METHODS FROM AERIAL DRONE PHOTOGRAPHY DATED DECEMBER 17, 2021 AND PREPARED BY SPSA UTILIZING PROPELLOR TRIMBLE STRATUS SOFTWARE.
 - ELEVATIONS REFER TO NATIONAL GEODETIC SURVEY (NGS) NGS MEAN SEA LEVEL HORIZONTAL CONTROL BASED UPON VIRGINIA STATE PLANE COORDINATE SYSTEM SOUTH ZONE NORTH AMERICAN DATUM (NAD) 1983.



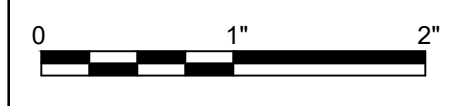
ISSUE	DATE	DESCRIPTION
A	01/2023	ISSUED FOR REVIEW

PROJECT MANAGER	J. MURRAY, P.E.
DESIGNED BY	A. FAIR
DRAWN BY	A. FAIR
CHECKED BY	T. YANOSCHAK, P.E.
PROJECT NUMBER	10354196



**REGIONAL LANDFILL
2023 AIRSPACE MANAGEMENT**

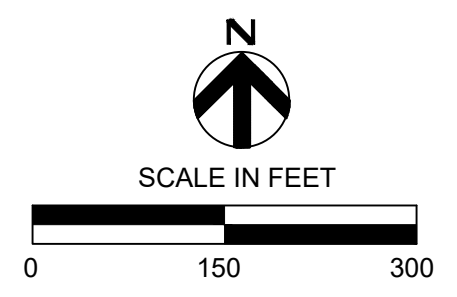
**EXISTING SITE CONDITIONS
DECEMBER 17, 2021**



FILENAME | 00C-01.DWG
SCALE | 1"=150'

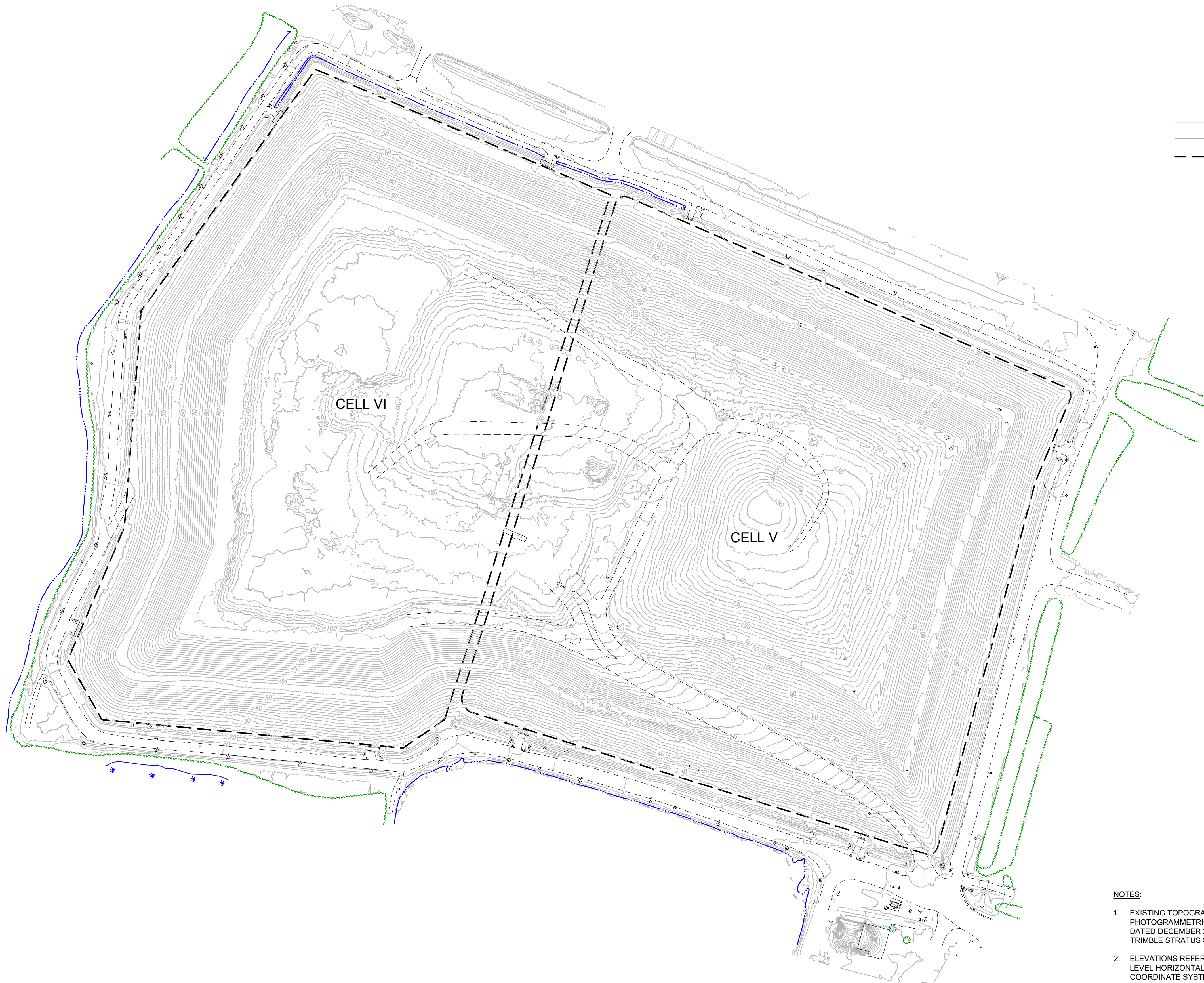
SHEET | **00C-01**

DWG NO. | XXX



LEGEND

	EXISTING MINOR CONTOUR
	EXISTING MAJOR CONTOUR
	PHASE BOUNDARY LIMITS



- NOTES:**
- EXISTING TOPOGRAPHY SHOWN HEREON COMPILED BY PHOTOGRAMMETRIC METHODS FROM AERIAL DRONE PHOTOGRAPHY DATED DECEMBER 21, 2022 AND PREPARED BY SPSA UTILIZING PROPELLER TRIMBLE STRATUS SOFTWARE.
 - ELEVATIONS REFER TO NATIONAL GEODETIC SURVEY (NGS) NGS MEAN SEA LEVEL HORIZONTAL CONTROL BASED UPON VIRGINIA STATE PLANE COORDINATE SYSTEM SOUTH ZONE NORTH AMERICAN DATUM (NAD) 1983.



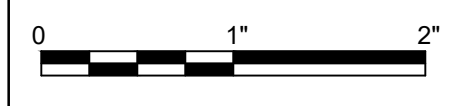
ISSUE	DATE	DESCRIPTION
A	01/2023	ISSUED FOR REVIEW

PROJECT MANAGER	J. MURRAY, P.E.
DESIGNED BY	A. FAIR
DRAWN BY	A. FAIR
CHECKED BY	T. YANOSCHAK, P.E.
PROJECT NUMBER	10354196



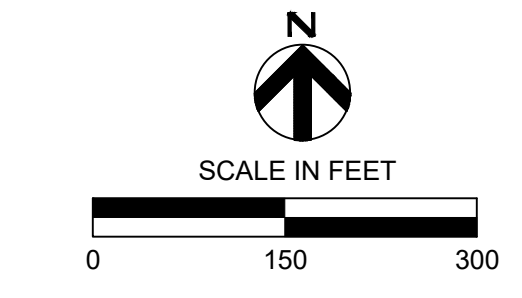
**REGIONAL LANDFILL
2023 AIRSPACE MANAGEMENT**

**EXISTING SITE CONDITIONS
DECEMBER 21, 2022**



FILENAME | 00C-02.DWG
SCALE | 1"=150'

SHEET | **00C-02** | DWG NO. | XXX



LEGEND

	EXISTING MINOR CONTOUR
	EXISTING MAJOR CONTOUR
	PHASE BOUNDARY LIMITS
	ACTIVE FILLING AREA LIMITS
	CUT
	FILL

ENTIRE LANDFILL AREA			
	SETTLEMENT (CY)	FILL (CY)	NET AIRSPACE CONSUMED (CY)
2021 TO 2022	28,931	345,127	316,196

ACTIVE FILLING AREA ONLY			
	SETTLEMENT (CY)	FILL (CY)	NET AIRSPACE CONSUMED (CY)
2021 TO 2022	918	331,221	330,303

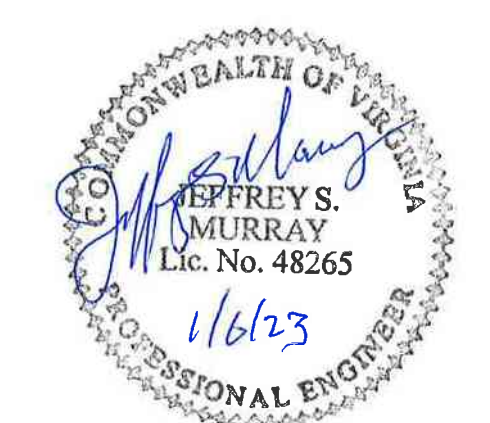
NOTES:

- ELEVATIONS AND CORRESPONDING COLORS REPRESENT DIFFERENCE BETWEEN DECEMBER 17, 2021 AND DECEMBER 21, 2022 SURVEYS.

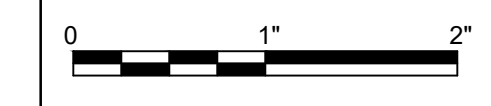


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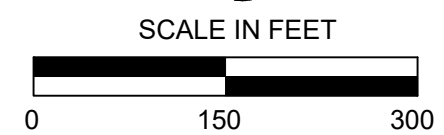


**REGIONAL LANDFILL
2023 AIRSPACE MANAGEMENT**



**AIRSPACE CONSUMED
2021 AERIAL SURVEY VS 2022 AERIAL SURVEY**

FILENAME	00C-03.DWG	SHEET	00C-03	DWG NO.	XXX
SCALE	1"=150'				



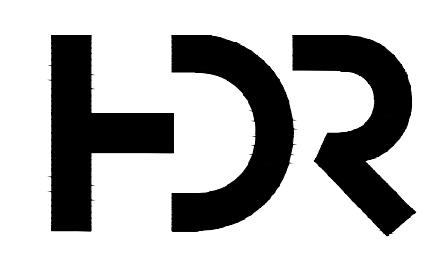
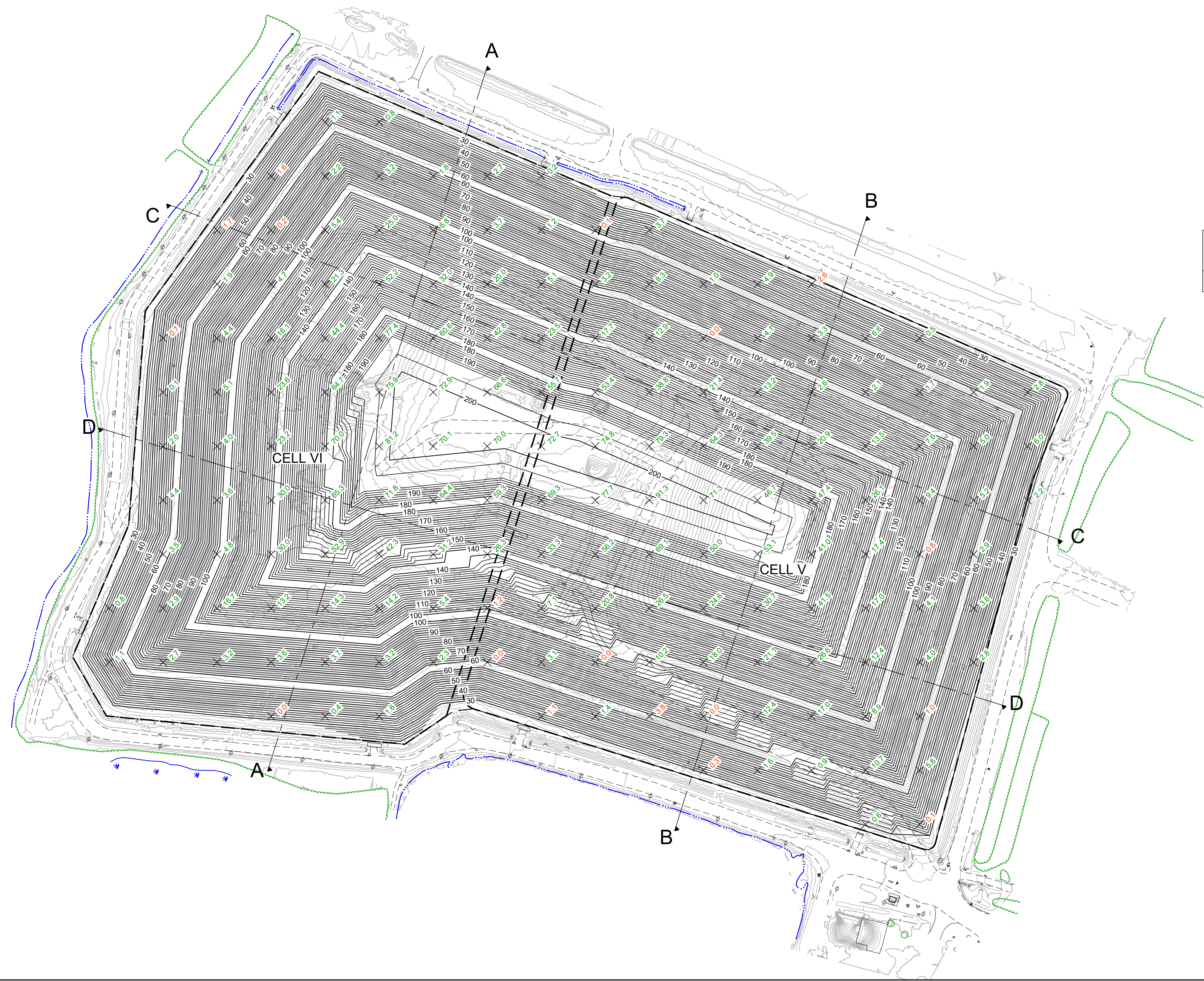
LEGEND

- EXISTING MINOR CONTOUR
- 170 EXISTING MAJOR CONTOUR
- PHASE BOUNDARY LIMITS
- 170 PROPOSED MAJOR CONTOUR
- x 16.5 CUT
- x 16.5 FILL

	CUT (CY)	FILL (CY)	NET AIRSPACE REMAINING (CY)
2022 TO TOP OF WASTE	16,550	2,862,558	2,846,008

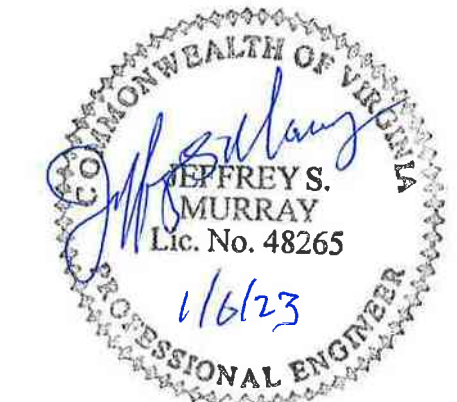
NOTES:

1. ELEVATIONS AND CORRESPONDING COLORS REPRESENT DIFFERENCE BETWEEN 2022 AERIAL SURVEY AND TOP OF WASTE GRADES.
2. PROPOSED GRADES REPRESENT TOP OF WASTE (INTERMEDIATE COVER), OR 3.5' BELOW PERMITTED FINAL GRADES.



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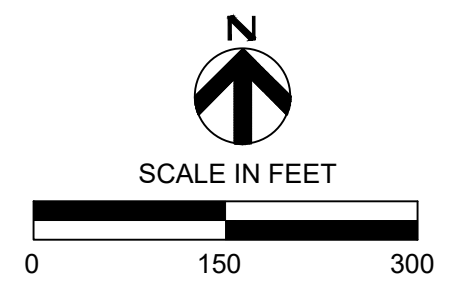
**REGIONAL LANDFILL
2023 AIRSPACE MANAGEMENT**



FILENAME | 00C-04.DWG
SCALE | 1" = 150'

**AIRSPACE REMAINING
2022 AERIAL SURVEY VS TOP OF WASTE GRADES**

SHEET | **00C-04** | DWG NO. | XXX



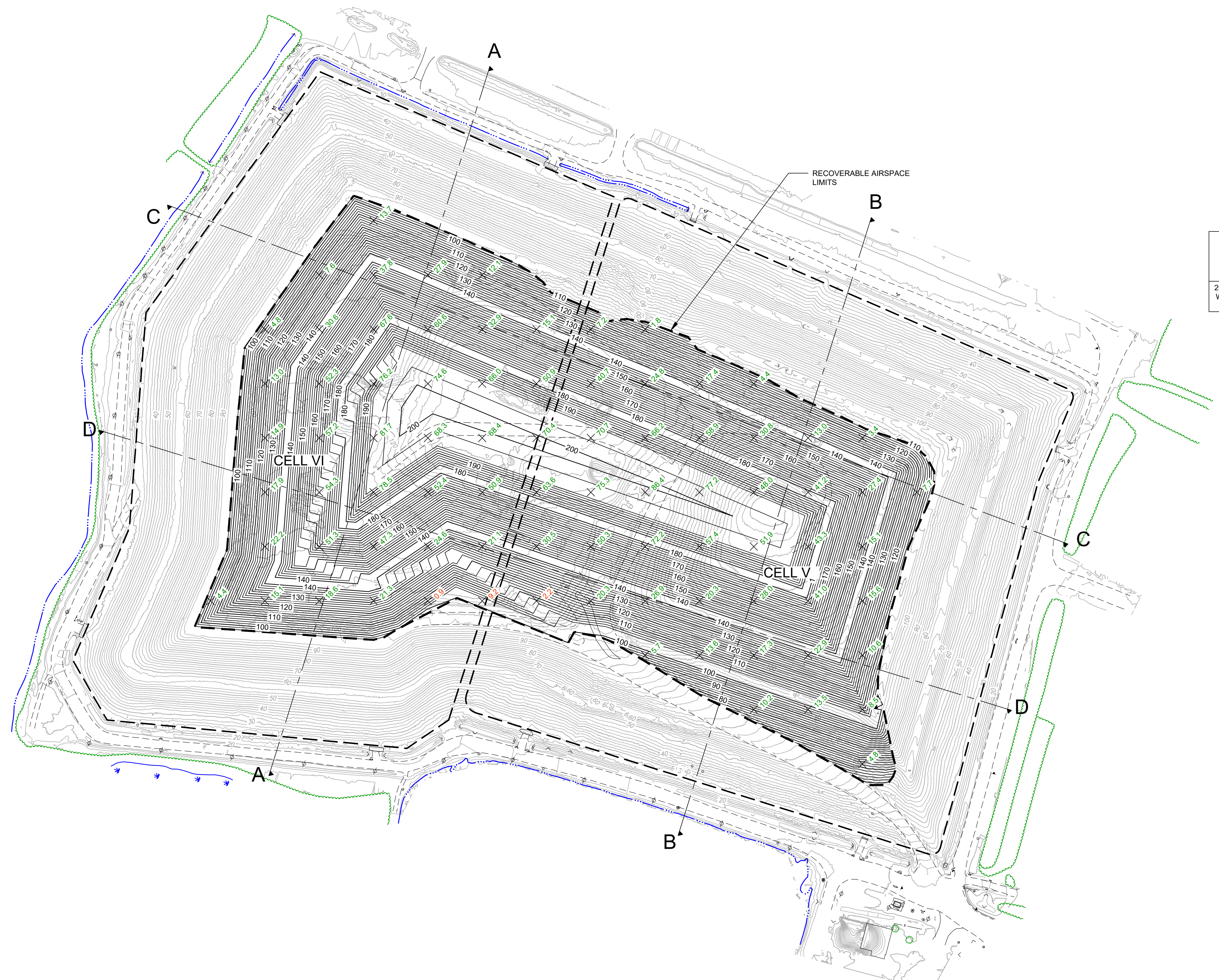
LEGEND

- EXISTING MINOR CONTOUR
- 170 — EXISTING MAJOR CONTOUR
- - - PHASE BOUNDARY LIMITS
- 170 — PROPOSED MAJOR CONTOUR
- x 16.5 CUT
- x 16.5 FILL

	CUT (CY)	FILL (CY)	NET RECOVERABLE AIRSPACE REMAINING (CY)
2022 TO TOP OF WASTE WITHIN RECOVERABLE AIRSPACE LIMITS	3,030	2,327,029	2,323,999

NOTES:

1. ELEVATIONS AND CORRESPONDING COLORS REPRESENT DIFFERENCE BETWEEN 2022 AERIAL SURVEY AND RECOVERABLE TOP OF WASTE GRADES.
2. PROPOSED RECOVERABLE AIRSPACE FINAL GRADES WERE DEVELOPED TO COORDINATE WITH EXISTING GRADES AND AREAS WHERE FILLING CAN BE ACHIEVED DURING OPERATION OF CELL VI.
3. PROPOSED GRADES REPRESENT TOP OF WASTE (INTERMEDIATE COVER), OR 3.5' BELOW REVISED RECOVERABLE GRADES.

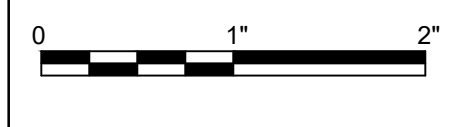


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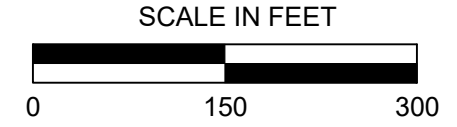
REGIONAL LANDFILL
2023 AIRSPACE MANAGEMENT



FILENAME | 00C-05.DWG
SCALE | 1" = 150'

RECOVERABLE AIRSPACE REMAINING
2022 AERIAL SURVEY VS
TOP OF WASTE GRADES RECOVERABLE

SHEET | 00C-05 | DWG NO. | XXX



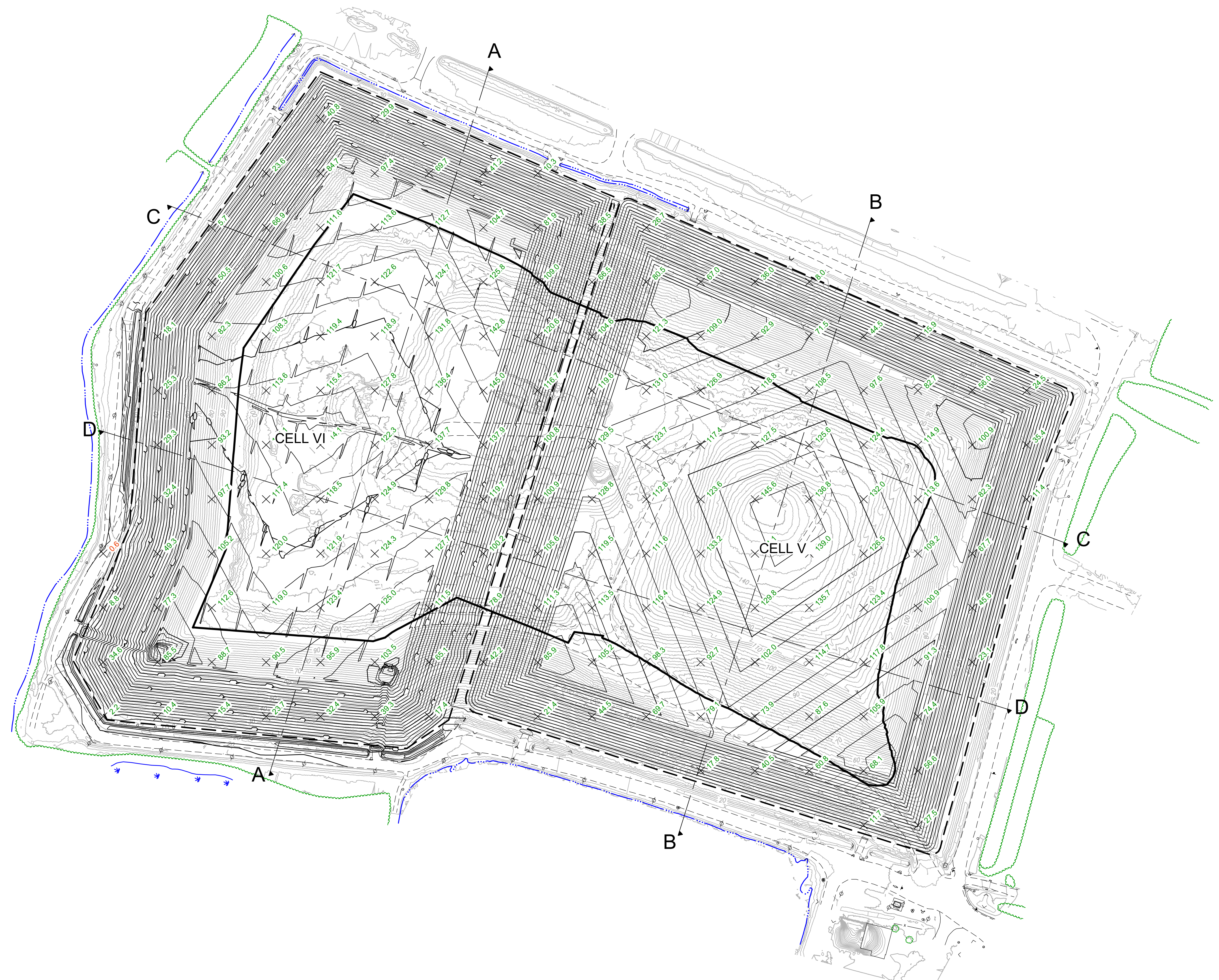
LEGEND

- EXISTING MINOR CONTOUR
- 170 — EXISTING MAJOR CONTOUR
- - - PHASE BOUNDARY LIMITS
- 170 — PROPOSED MAJOR CONTOUR
- x 16.5 CUT
- x 16.5 FILL

	AIRSPACE CONSUMED (CY)
BOTTOM OF WASTE VS 2022	12,400,113

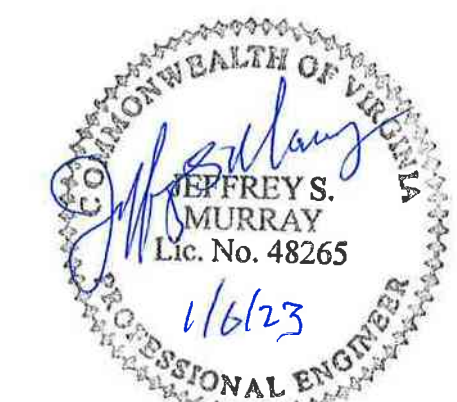
NOTES:

1. ELEVATIONS AND CORRESPONDING COLORS REPRESENT DIFFERENCE BETWEEN BOTTOM OF WASTE GRADES AND 2022 AERIAL SURVEY.
2. BOTTOM OF WASTE GRADES REPRESENT OPERATIONAL COVER.

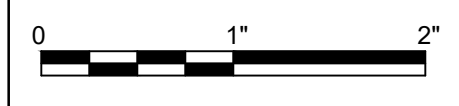


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PROJECT NUMBER	10354196



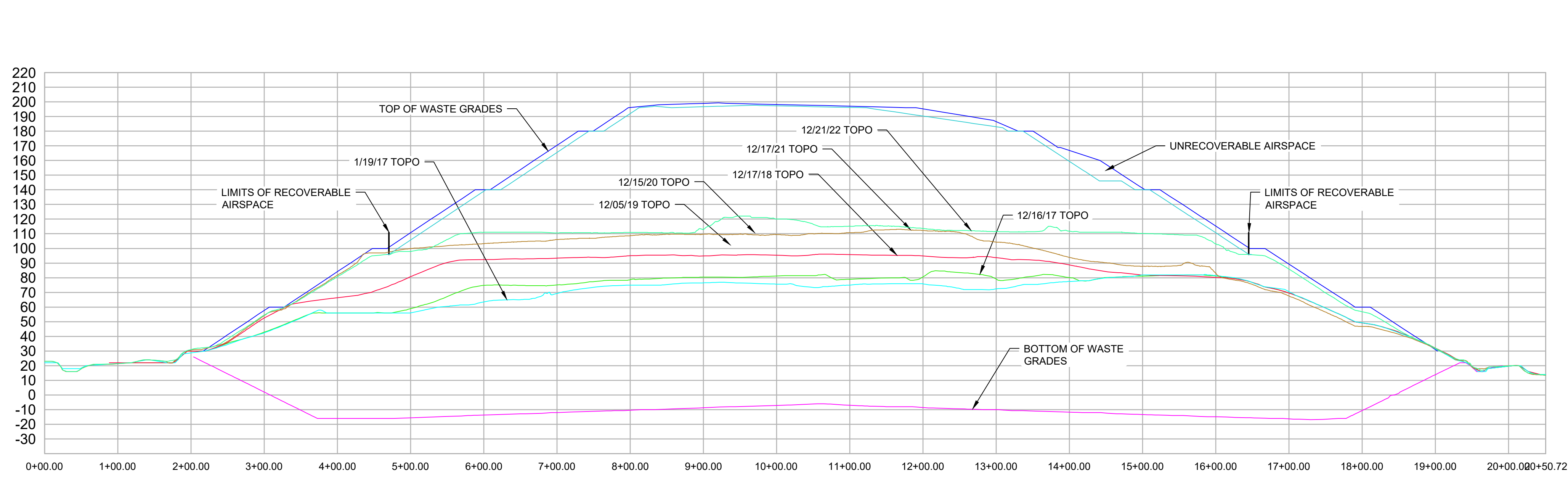
**REGIONAL LANDFILL
2023 AIRSPACE MANAGEMENT**



FILENAME | 00C-06.DWG
SCALE | 1"=150'

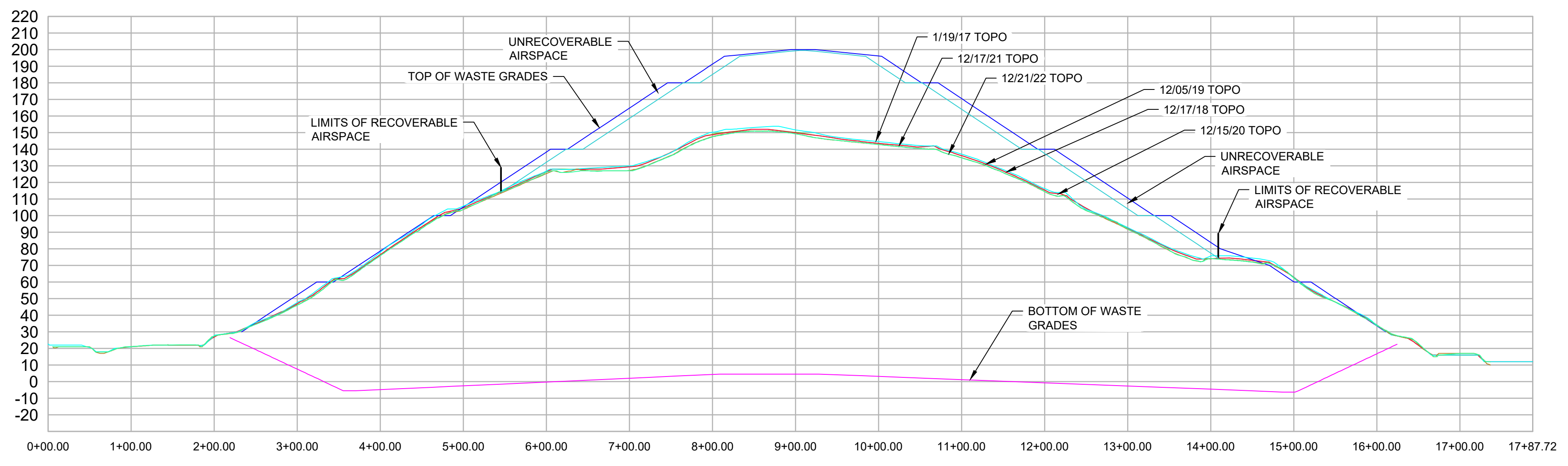
**TOTAL AIRSPACE CONSUMED
BOTTOM OF WASTE GRADES VS 2022 AERIAL SURVEY**

SHEET | **00C-06** | DWG NO. | XXX

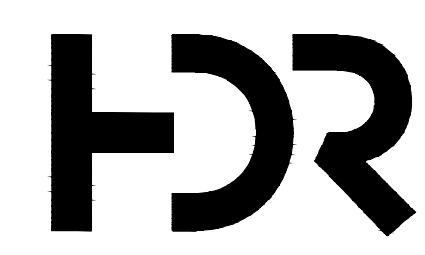
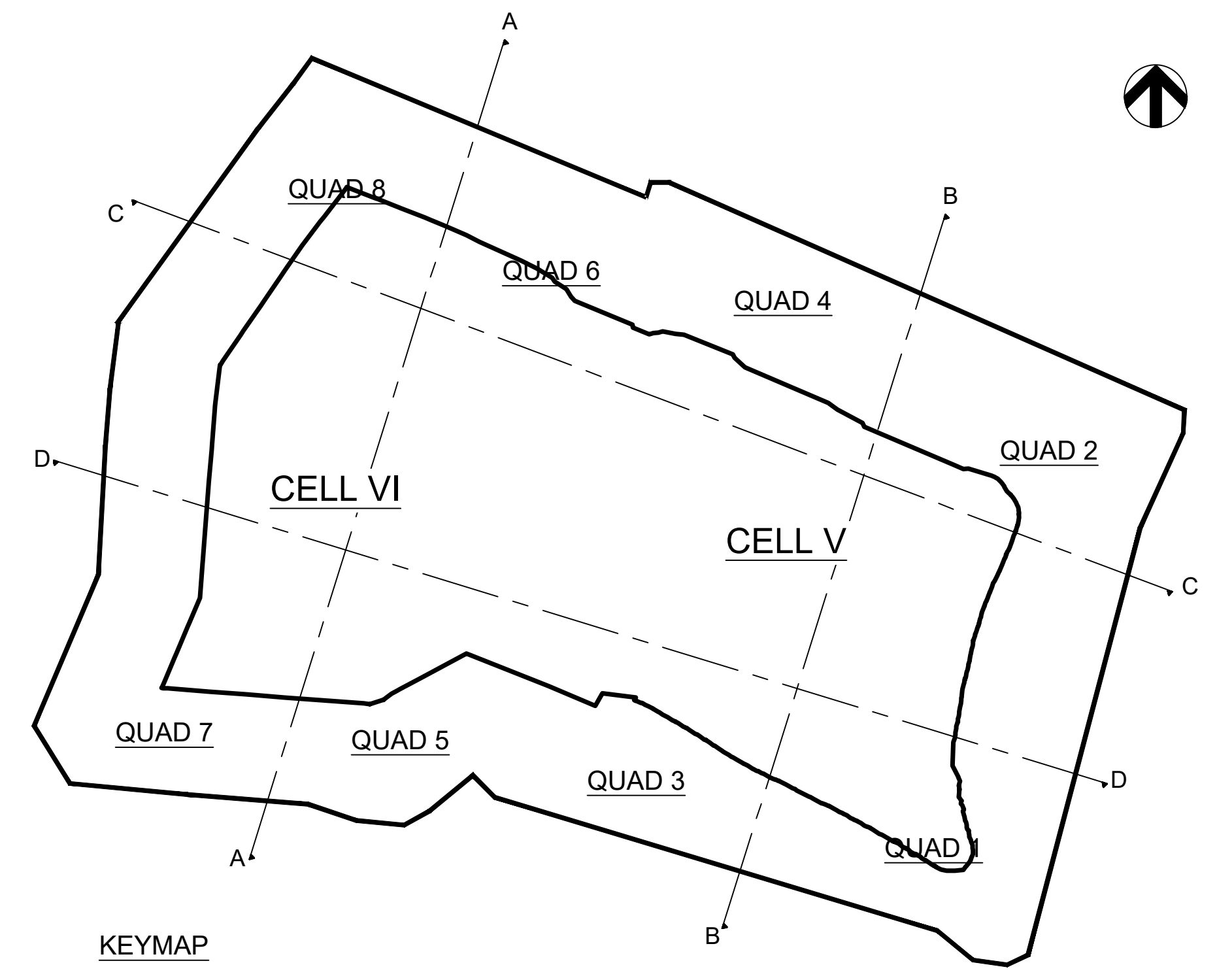
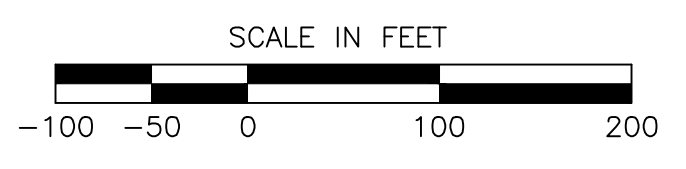


SECTION A
H: 1"=100' ; V: 1"=50'

- TOP OF WASTE RECOVERABLE GRADES
- TOP OF WASTE GRADES
- BOTTOM OF WASTE GRADES
- 1/19/17 TOPO
- 12/16/17 TOPO
- 12/17/18 TOPO
- 12/05/19 TOPO
- 12/15/20 TOPO
- 12/17/21 TOPO
- 12/21/22 TOPO



SECTION B
H: 1"=100' ; V: 1"=50'



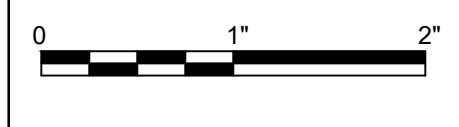
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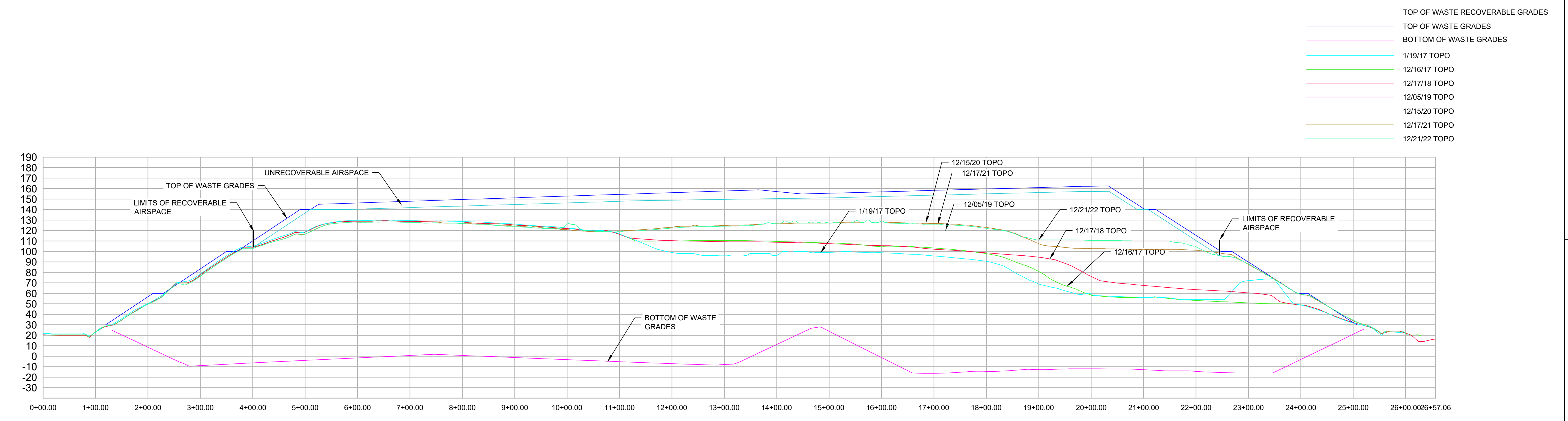
**REGIONAL LANDFILL
2023 AIRSPACE MANAGEMENT**

**SITE CROSS SECTIONS
(SHEET 1 OF 3)**

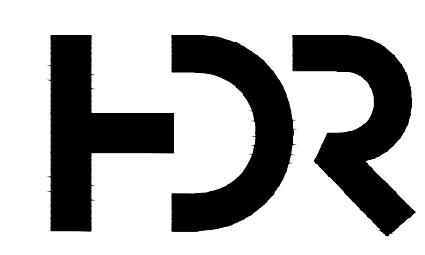
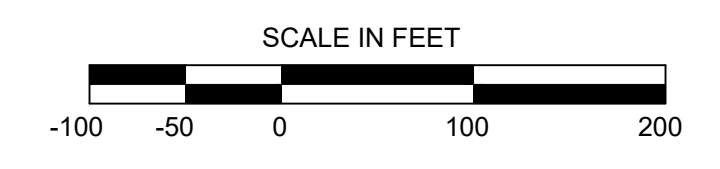
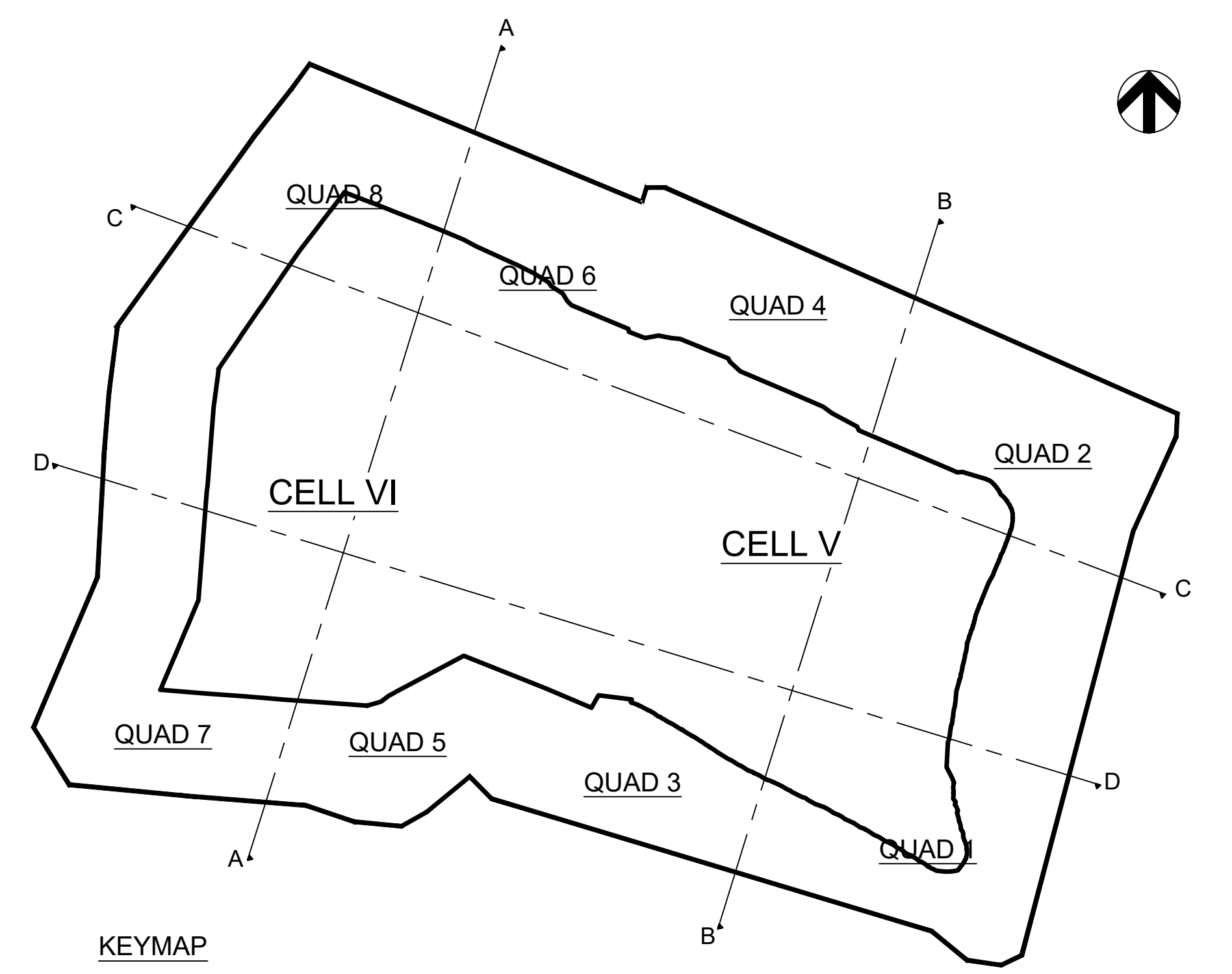


FILENAME | 00C-07.DWG
SCALE | 1" = 100'

SHEET | 00C-07
DWG NO. | XXX

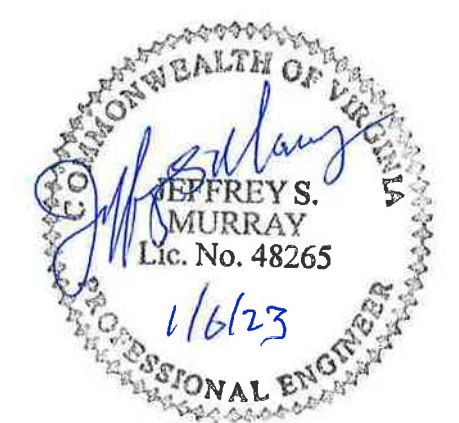


SECTION C
H: 1"=100' ; V: 1"=50'



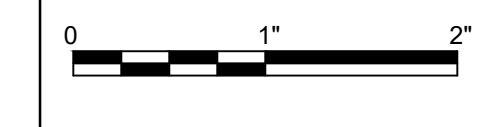
ISSUE	DATE	DESCRIPTION
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PROJECT MANAGER	J. MURRAY, P.E.
DESIGNED BY	A. FAIR
DRAWN BY	A. FAIR
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PROJECT NUMBER	10354196



**REGIONAL LANDFILL
2023 AIRSPACE MANAGEMENT**

**SITE CROSS SECTIONS
(SHEET 2 OF 3)**

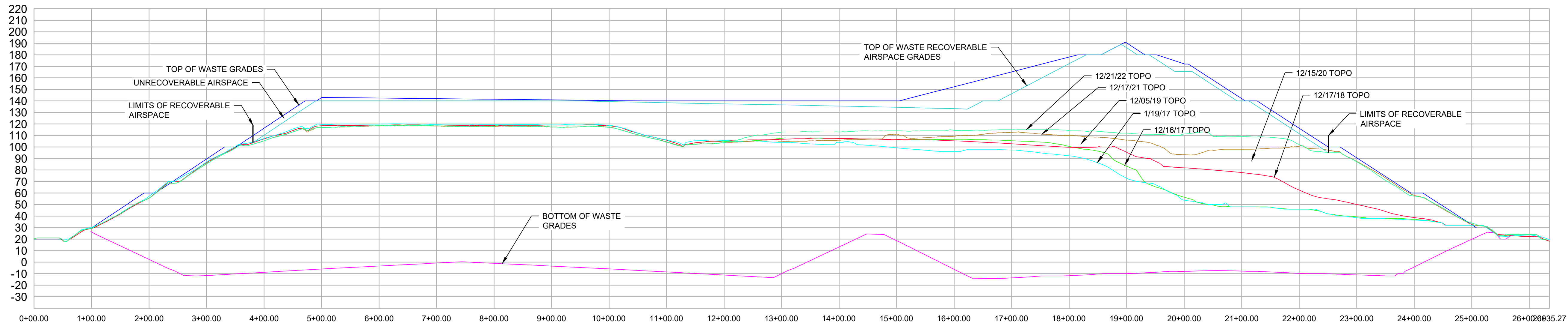


FILENAME | 00C-08.DWG
SCALE | 1" = 100'

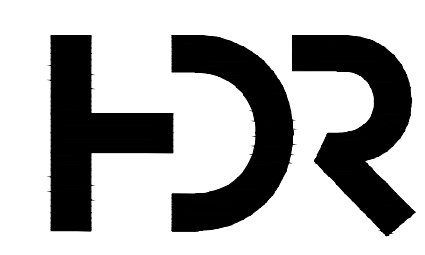
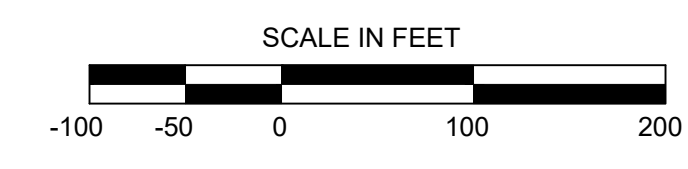
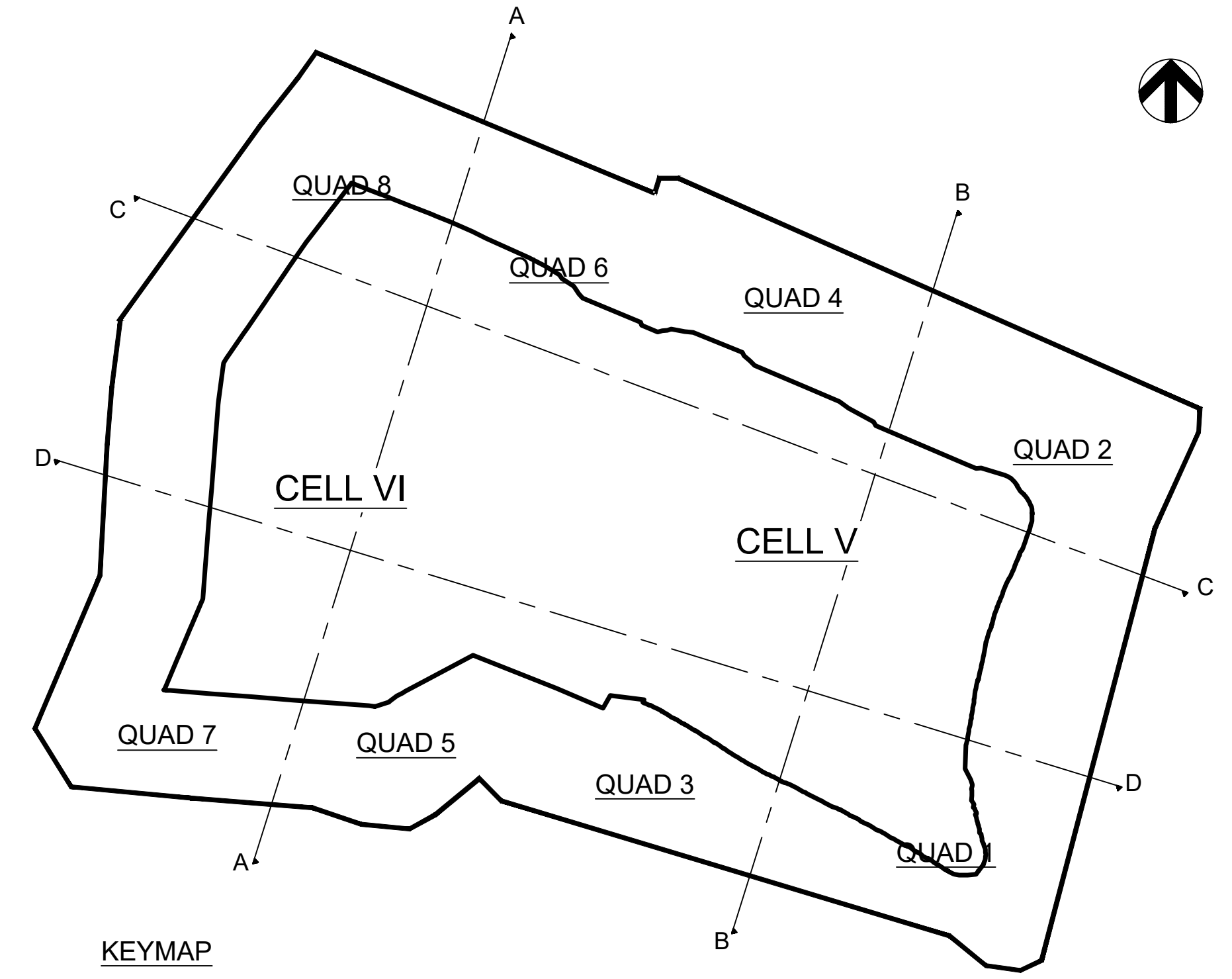
SHEET | **00C-08**

DWG NO. | XXX

- TOP OF WASTE RECOVERABLE GRADES
- TOP OF WASTE GRADES
- BOTTOM OF WASTE GRADES
- 1/19/17 TOPO
- 12/16/17 TOPO
- 12/17/18 TOPO
- 12/05/19 TOPO
- 12/15/20 TOPO
- 12/17/21 TOPO
- 12/21/22 TOPO



SECTION D
H: 1"=100' ; V: 1"=50'

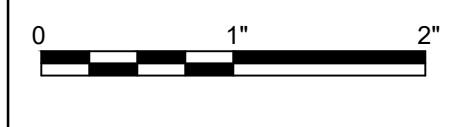


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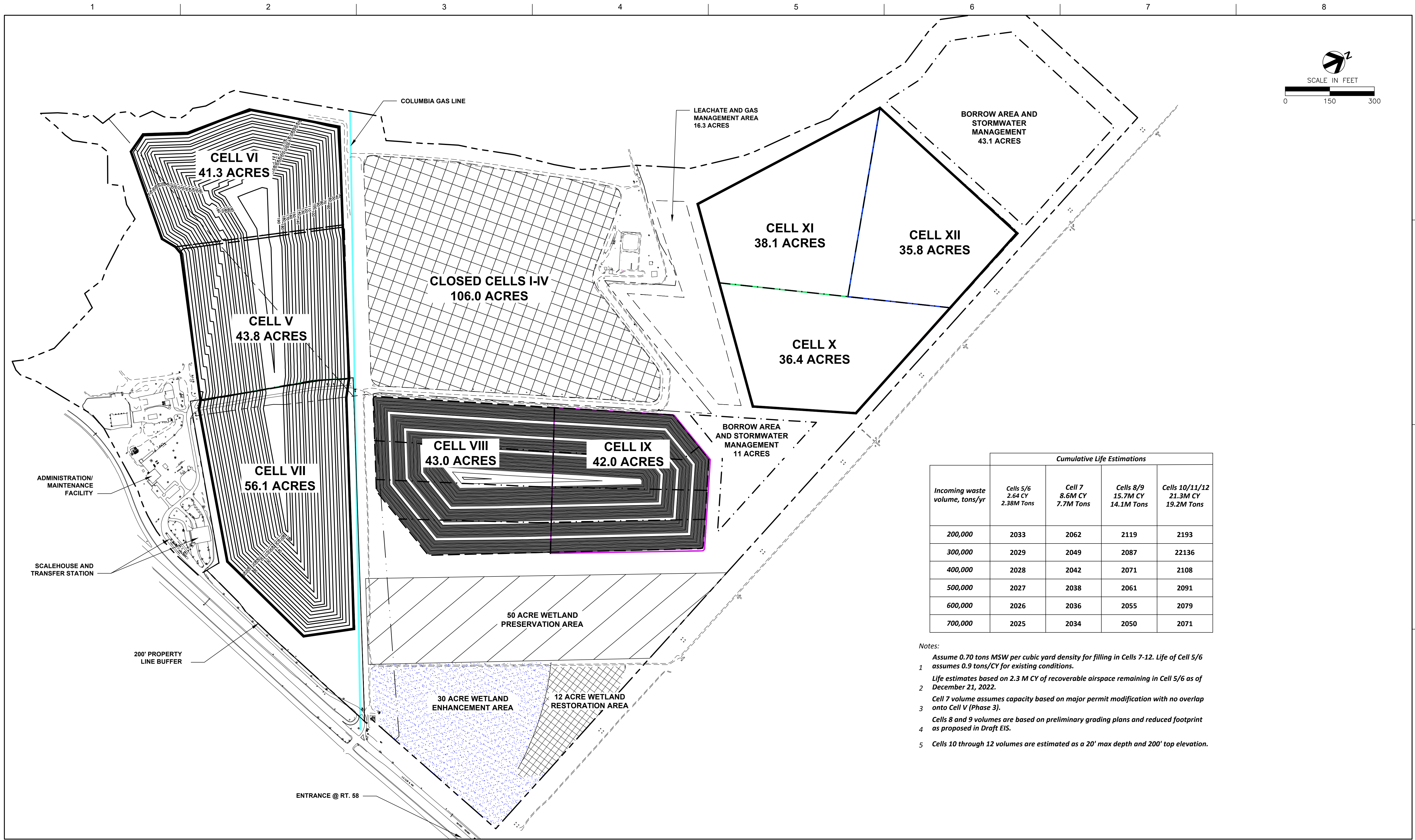
**REGIONAL LANDFILL
2023 AIRSPACE MANAGEMENT**



**SITE CROSS SECTIONS
(SHEET 3 OF 3)**

FILENAME | 00C-09.DWG
SCALE | 1" = 100'

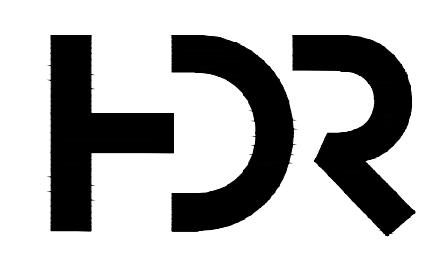
SHEET | **00C-09** | DWG NO. | XXX



Incoming waste volume, tons/yr	Cumulative Life Estimations			
	Cells 5/6 2.64 CY 2.38M Tons	Cell 7 8.6M CY 7.7M Tons	Cells 8/9 15.7M CY 14.1M Tons	Cells 10/11/12 21.3M CY 19.2M Tons
200,000	2033	2062	2119	2193
300,000	2029	2049	2087	22136
400,000	2028	2042	2071	2108
500,000	2027	2038	2061	2091
600,000	2026	2036	2055	2079
700,000	2025	2034	2050	2071

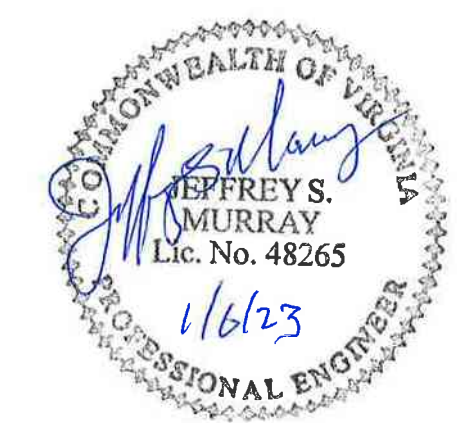
Notes:

- Assume 0.70 tons MSW per cubic yard density for filling in Cells 7-12. Life of Cell 5/6 assumes 0.9 tons/CY for existing conditions.
- Life estimates based on 2.3 M CY of recoverable airspace remaining in Cell 5/6 as of December 21, 2022.
- Cell 7 volume assumes capacity based on major permit modification with no overlap onto Cell V (Phase 3).
- Cells 8 and 9 volumes are based on preliminary grading plans and reduced footprint as proposed in Draft EIS.
- Cells 10 through 12 volumes are estimated as a 20' max depth and 200' top elevation.

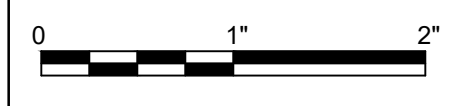


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**REGIONAL LANDFILL
2023 AIRSPACE MANAGEMENT**



MASTER PLAN BUILDOUT

FILENAME | 00C-10.DWG
SCALE | 1"=150'

SHEET | 00C-10
DWG NO. | XXX