2018 Annual Inspection Report

for Compliance with the Coal Combustion Residuals Rule (40 CFR Part 257)

Valmont Station

1800 North 63rd Street
Boulder, Colorado 80301

January 18, 2019

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Appendices

Certification

Valmont Station CCR Unit 2018 Annual Inspection for Compliance with the Federal Coal Combustion Residuals Rule

I hereby certify that the Coal Combustion Residuals (CCR) unit (i.e. the landfill) at Valmont Station meets the inspection and operation standards specified in 40 CFR Part 257.84(b) of the Federal CCR Rule. The Valmont Station is owned by the Public Service Company of Colorado (PSCo), an Xcel Energy Company.

I am duly licensed Professional Engineer under the laws of the State of Colorado.

Brian Brown, PE

Colorado PE License 0041644

License renewal date October 31, 2019

1 Introduction

On April 17, 2015 the U.S. Environmental Protection Agency (EPA) published regulations under Subtitle D of the Resources Conservation and Control Act (RCRA) meant to control the safe disposal of coal combustion residuals (CCR) generated by coal fired electric utilities. The rule defines a set of requirements for the disposal and handling of CCR within CCR units (defined as either landfills or surface impoundments). As specified in 40 CFR 257.84(b), *"Existing and new CCR landfills and any lateral expansion of a CCR landfill must be inspected on a periodic basis by a qualified professional engineer to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards."* Valmont Station has one (1) CCR landfill subject to the inspection requirements.

This is the fourth annual inspection report for the existing Valmont CCR landfill. This report must be completed and placed into the facility operating record no later than January 18, 2019.

The requirements of the annual inspection include:

- A review of available information regarding the status and condition of the CCR unit - §257.84 (B)(1)(i),
- A visual inspection of the CCR unit to identify signs of distress or malfunction - §257.84 (B)(1)(ii),
- An inspection report that includes the following:
  - Changes in geometry since the last inspection - §257.84 (B)(2)(i)
  - Approximate volume of CCR in unit at time of inspection - §257.84 (B)(2)(ii)
  - Appearance of actual or potential structural weakness of the CCR unit - §257.84 (B)(2)(iii)
  - Any other changes which may have affected the stability or operation of the CCR unit since the last inspection - §257.84 (B)(2)(iv)

2 Site Inspection

In accordance with §257.84(b)(ii), a site inspection of the Valmont CCR Landfill was conducted by an independent Professional Engineer on November 27, 2018. The inspection was conducted by Brian Brown of HDR Engineering Inc. (HDR) and Jennifer McCarter, Rebecca Sturgeon, Luke Wolfe, and Marie Vagher of PSCo. This site inspection was performed well in advance of the CCR submittal deadline to ensure that the inspection was completed prior to snow covering the ground.

The weather during the site visit was sunny with temperatures around 60 degrees Fahrenheit. The site was free of snow cover.

3 Review of Available Information

Numerous documents pertaining to the site operation and structural integrity were reviewed including:

1. Engineering Design and Operation Plan (EDOP), Revision January, 2009 by PSCo. PSCo reported no change in document and still operating under this document. Document not reviewed again since the document is unchanged.

2. Cell D and E Design Modification and Closure Plan, March 2018, by HDR Engineering Inc.

3. Available Weekly CCR Landfill Inspection Forms (per Section 257.84(a)).

4. Topographic Map of site post 2018 fill activity at CCR landfill, flown date 10-12-2018, by Great Lakes Environmental & Infrastructure. Figure date 11-15-2018.

Review of the above documents did not contain any indications of continuing operational, safety, or structural concerns regarding the CCR landfill.

4 Visual Inspection

The site inspection included walking or driving the entire perimeter of the landfill, the interior access road, and select intermediate elevations along the exterior fill embankment.

The site inspection included an evaluation of the following landfill features:

1. landfill side slope toe of slope;

2. Landfill side slope benches;

3. Riprapped stormwater drainage conveyance channels on southwest side (Areas Q-1 and A-3) of landfill and east end (Area B-1) of landfill; and

4. Most recent CCR fill areas (Area D-1, C-1, and E-1).

The following are the findings of the site inspection:

The landfill side slopes showed no signs of operational or functional concerns. Areas of erosion are noted below:

- The landfill side slopes along the southwest and west side of Area Q-1 have minimal vegetation cover. Despite the presence of regular benches to slow the stormwater flow, these areas show signs of rill and some gulley erosion. These areas require continued monitoring and may require additional topsoil cover and revegetation to minimize future rill erosion.

- The western side slopes of the landfill also had numerous prairie dog burrows. These burrows should continue to be monitored as they can impact local slope stability and become conduits for stormwater flow. PSCo reported that it has implemented measures to minimize prairie dog burrow impacts in the soil cover, with limited success. PSCo has indicated that ongoing maintenance will be implemented to will continue to address this issue.
- The southern slopes of Area Q-1 had some apparently inactive rill erosion near the top of the slope that should be monitored.
- The inactive southeastern and eastern side slopes have a continuous grade that generally ranges from approximately 2 horizontal to 1 vertical (2H:1V) to 3H:1V with some steeper sections, no benches, and a dense stand of vegetation.
    - There is a riprap run down on the east slope (Area B-1) with no visible erosion or stability concerns.
    - The south slope is an area where sloughing and localized instability is visible about one quarter down from the top plateau (against a degraded line of straw bales). This area is heavily vegetated but should be monitored for future sloughing or movement. The consensus of the HDR engineers was to continue monitoring the area. No additional movement, including surface tension cracks, or sloughing was observed since the prior annual inspection.
- The interior access road leading to the active landfill fill area has steep soil embankments. Minimal erosion was observed during the inspection indicating that the access road embankments do not receive enough surface water run-on flow to create excessive rill or gulley erosion. The roadway embankments should be monitored for localized or general sloughing, though none was observed.
- The north facing landfill embankment of areas D1, E1 and B1 are graded to a uniform slope. This slope does not have benches but does have a dense cover of vegetation. No erosion or sloughing was noted.
- Area D-1 areas impacted by construction were observed to be soil covered but no vegetation was established by the time of inspection. Areas within D-1, particularly to the east end of the cell, that were not disturbed by construction were soil and vegetation covered.
- No ash disposal or compaction was observed during the site visit.
- There was no standing water observed in the ash cells.

5 Changes in Geometry

The Federal CCR Rules require that site geometry changes be identified since the last inspection. The site footprint remains the same since the prior site visit. The material placed in the landfill, comprised of CCR, coal, or a mix of CCR/coal/soil, filled the former borrow excavation in cell D-1, a depth of roughly 32 feet, and placed material over the majority of cell D-1 to a depth of up to 10 feet above the 2017 D-1 cell surface elevations. The cell D-1 surface slopes were predominately modified to positively drain north and east across D-1 discharging via overland flow onto E-1 then B-1 and leaving the landfill area via the designed stormwater

rundown on the east end of the landfill. The far southern edge of cell D-1 continued to surface flow south via overland flow.

There was a minor amount of CCR/coal placed in the Emergency Ash Holding Area in cell C-1 in 2018. This area was historically used to temporarily stockpile CCR when access to the active pit landfill area was inaccessible due to road conditions. Approximately up to 4 feet of CCR/coal fill was placed in the holding area and then covered with a minimum of 2 feet of soil cover and graded to create positive surface drainage to the east.

No structural or safety concerns were observed from the continued site filling. The Landfill is expected to be idle in 2019, and receive additional waste in 2020. The landfill was temporarily closed at end of 2018, and is fully covered with permanent and intermediate soil cover.

6 Approximate CCR Volume

The CCR within the disposal area as of November 2015 was estimated by PSCo based on volume estimates that utilized topographic surveys, disposal records, ash generation volumes, and extrapolation of generation volumes. The total combined volume of CCR deposited within the landfill through November 2017 is estimated to be 1,415,710 cubic yards. The additional CCR deposited from December 2017 through November 2018 is estimated to be 94,248 CY, assuming one cubic yard of CCR/coal material equates to one ton. The total CCR volume in the landfill through November 2018 is estimated to be 1,509,960 CY. Disposal in 2018 included material from the removal of CCR in and around the CCR impoundments (Ash Ponds 3A and 3B). This cleanup was completed in 2018. The landfill is expected to be idle during 2019 and receive additional approved non-CCR waste from a scheduled on-site project in 2020.

7 Appearance of Structural Weakness

Based on the site inspection, no apparent or potential structural weaknesses were observed. Per Section 4 above, continued monitoring and minor repairs should be implemented as needed to address rill erosion, prairie dog burrows, and apparent localized sloughing, and prevent development of areas of structural weakness.

8 Changes Affecting Stability or Operation

The Federal CCR Rule requires that changes that affect site stability or operation be identified since the last inspection. Since the last annual inspection, there were no observed nor reported operational changes or site conditions that indicate issues of stability or safety.

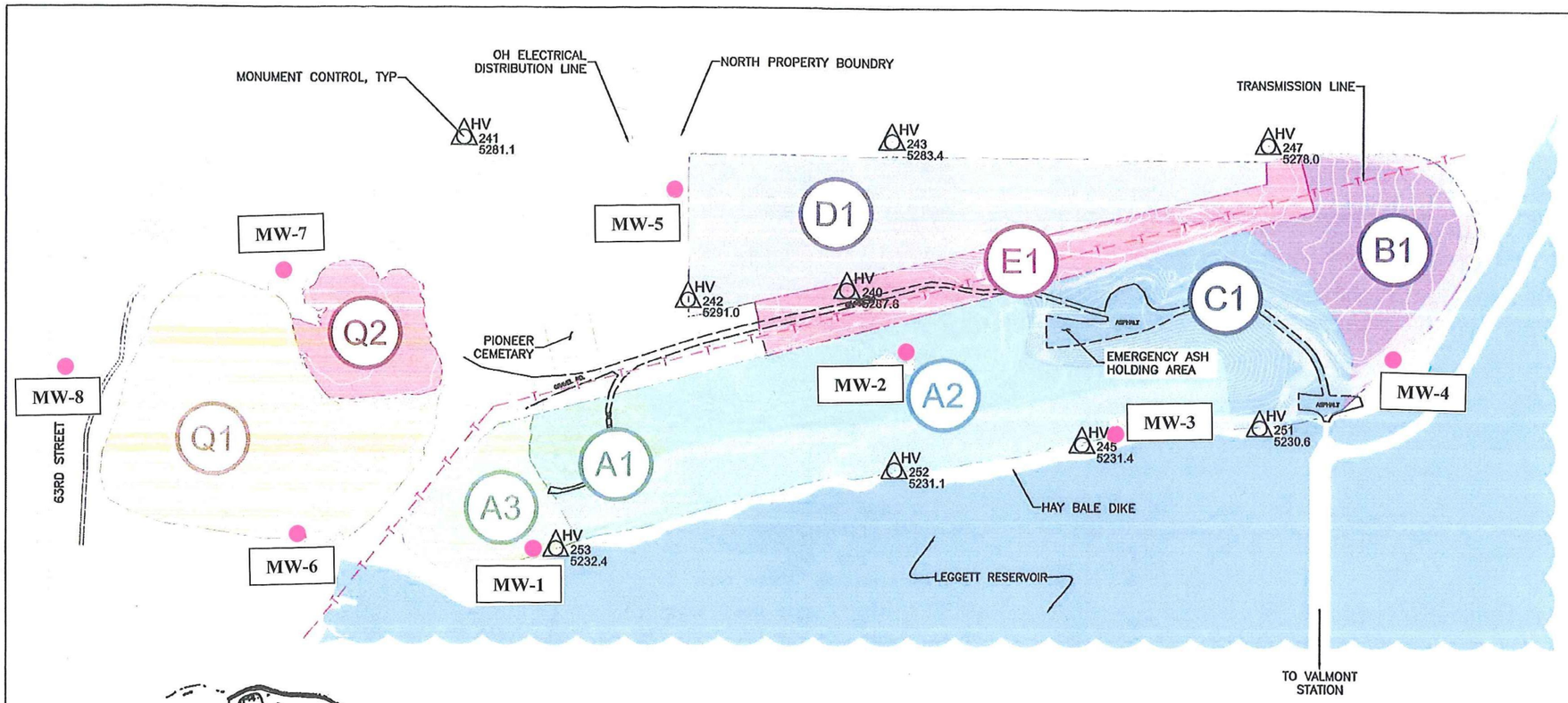
Appendix A – Landfill Site Maps

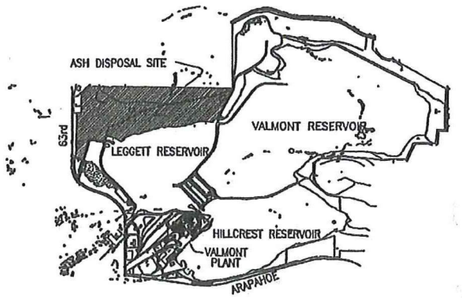
Attachments:

CCR Jan 2019 Annual Report Fig 1

CCR Jan 2019 Annual Report Fig 2

CCR Jan 2019 Annual Report Fig 3





VICINITY PLAN
SCALE: NTS

LEGEND	
	A–1
	A–2
	A–3
	B–1
	C–1
	D–1
	E–1
	Q–1
	Q–2
HV	MONUMENT
—T—	TRANSMISSION LINE
MW	GW MONITOR WELL

MONUMENT CONTROL SCHEDULE

CONTROL POINT NUMBER	MODIFIED NAD83 (1992) NORTHING	MODIFIED NAD83 (1992) EASTING	ELEVATION
240	1253563.43	3083969.33	5287.75
241	1253989.48	3082897.93	5281.08
242	1253532.52	3083523.78	5291.01
243	1253980.56	3084091.23	5283.43
245	1253132.36	3084626.33	5231.38
247	1253974.13	3085140.27	5277.96
251	1253180.17	3085119.97	5230.59
252	1253058.55	3084101.66	5231.14
253	1253835.34	3083158.54	5232.40

AREA TABLE

AREA NAME	AREA (AC)	ESTIMATED STORAGE CAPACITY		CLOSURE DATE
		VOLUME (CY)	LIFE (YR)	
A–1	3.02	0	0.0	7/09
A–2	12.20	0	0.0	7/09
A–3	2.82	0	0.0	7/09
B–1	5.55	0	0.0	12/08
C–1	6.83	85,534	0.7	7/14
D–1	9.67	254,357	2.1	7/13
E–1	4.90	5,200	0.0	7/13
Q–1	10.29	245,768	2.0	12/11
Q–2	2.76	0	0.0	12/11
		590859	4.8	7/14

Red text box added by HDR for Jan 2019 CCR annual Report.
CCR Jan 2019 Annual Report Figure 1

N

GRAPHIC SCALE
100 0 50 100 200 400
(IN FEET)

John Edward Pierre
31732
1-28-09
COLORADO REGISTERED PROFESSIONAL ENGINEER

NO	DATE	DWN	CHK	REVISION
0	01/19/09	DR	JP	ISSUE FOR CONSTRUCTION PER JULY, 2008 SURVEY – 1904293

MF C M E

VALMONT SEGS – COMMON
ASH DISPOSAL FACILITY
AREA MAP

PUBLIC SERVICE COMPANY OF COLORADO
AN XCEL ENERGY COMPANY

FILENAME: 25–2.73 SH1
R–CODE: 1380029
SCALE: NTS

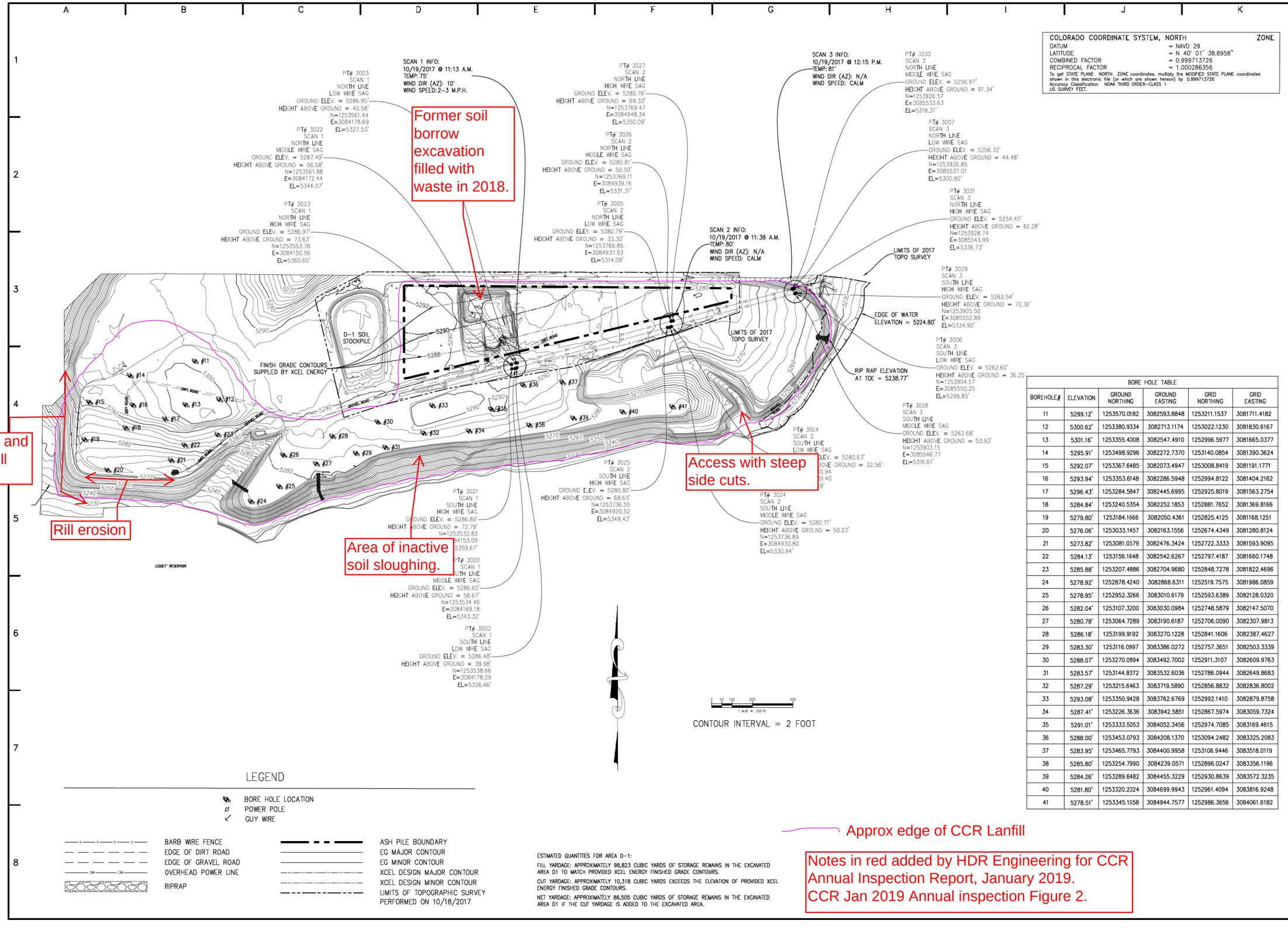
FIG 0–1

DWN: TC	DATE: 07/27/06
CHK: JH	DATE:

25–2.73

SHEET 1 | REV 0

MF NO
FILENAME: 25–2.73 SH.1



COLORADO COORDINATE SYSTEM, NORTH ZONE

DATUM	= NAD 29
LATITUDE	= N 40° 01' 38.8958"
COMBINED FACTOR	= 0.999713726
RECIPROCAL FACTOR	= 1.000286356

To get STATE PLANE NORTH ZONE coordinates, multiply the MODIFIED STATE PLANE coordinates shown in this electronic file (or which are shown hereon) by 0.999713726
Accuracy Classification: NOAA THIRD ORDER-CLASS 1
US SURVEY FEET.

BORE HOLE TABLE

BOREHOLE#	ELEVATION	GROUND NORTHING	GROUND EASTING	GRID NORTHING	GRID EASTING
11	5299.12'	1253570.0182	3082593.8848	1253211.1537	3081711.4182
12	5300.62'	1253380.9334	3082713.1174	1253022.1230	3081830.6167
13	5301.16'	1253355.4008	3082547.4910	1252996.5977	3081665.0377
14	5295.91'	1253498.9296	3082272.7370	1253140.0854	3081390.3624
15	5292.07'	1253367.6485	3082073.4947	1253008.8419	3081191.1771
16	5293.94'	1253353.6148	3082286.5948	1252994.8122	3081404.2162
17	5296.43'	1253284.5847	3082445.6995	1252925.8019	3081563.2754
18	5284.84'	1253240.5354	3082252.1853	1252881.7652	3081369.8166
19	5279.80'	1253184.1666	3082050.4361	1252825.4125	3081168.1251
20	5276.06'	1253033.1457	3082163.1556	1252674.4349	3081280.8124
21	5273.82'	1253081.0579	3082476.3424	1252722.3333	3081593.9095
22	5284.13'	1253156.1648	3082542.6267	1252797.4187	3081660.1748
23	5285.88'	1253207.4886	3082704.9680	1252848.7278	3081822.4696
24	5278.92'	1252878.4240	3082868.6311	1252519.7575	3081986.0859
25	5278.95'	1252952.3266	3083010.6179	1252593.6389	3082128.0320
26	5282.04'	1253107.3200	3083030.0984	1252748.5879	3082147.5070
27	5280.78'	1253064.7289	3083190.6187	1252706.0090	3082307.9813
28	5286.18'	1253199.9192	3083270.1228	1252841.1606	3082387.4627
29	5283.30'	1253116.0997	3083386.0272	1252757.3651	3082503.3339
30	5288.07'	1253270.0894	3083492.7002	1252911.3107	3082609.9763
31	5283.57'	1253144.8372	3083532.6036	1252786.0944	3082649.8683
32	5287.29'	1253215.6463	3083719.5890	1252856.8832	3082836.8002
33	5293.08'	1253350.9428	3083762.6769	1252992.1410	3082879.8758
34	5287.41'	1253226.3636	3083942.5851	1252867.5974	3083059.7324
35	5291.01'	1253333.5053	3084052.3456	1252974.7085	3083169.4615
36	5288.00'	1253453.0793	3084208.1370	1253094.2482	3083325.2083
37	5283.95'	1253465.7793	3084400.9958	1253106.9446	3083518.0119
38	5285.80'	1253254.7990	3084239.0571	1252896.0247	3083356.1196
39	5284.26'	1253289.6482	3084455.3229	1252930.8639	3083572.3235
40	5281.80'	1253320.2024	3084699.9943	1252961.4094	3083816.9248
41	5278.51'	1253345.1558	3084944.7577	1252986.3656	3084061.6182

ESTIMATED QUANTITIES FOR AREA D-1:

FILL YARDAGE: APPROXIMATELY 98,823 CUBIC YARDS OF STORAGE REMAINS IN THE EXCAVATED AREA D1 TO MATCH PROVIDED XCEL ENERGY FINISHED GRADE CONTOURS.

CUT YARDAGE: APPROXIMATELY 10,318 CUBIC YARDS EXCEEDS THE ELEVATION OF PROVIDED XCEL ENERGY FINISHED GRADE CONTOURS.

NET YARDAGE: APPROXIMATELY 86,505 CUBIC YARDS OF STORAGE REMAINS IN THE EXCAVATED AREA D1 IF THE CUT YARDAGE IS ADDED TO THE EXCAVATED AREA.

Notes in red added by HDR Engineering for CCR Annual Inspection Report, January 2019.
CCR Jan 2019 Annual inspection Figure 2.

MERRICK & COMPANY

DRAWING TITLE: REFERENCE DRAWINGS

DWG NO	MANUFACTURER

REVISION	NO	ZONE	DATE	BY	CHK

VALMONT ASH PILES
OCTOBER 2017 ASH QUANTITIES AND BOREHOLE LOCATINOS

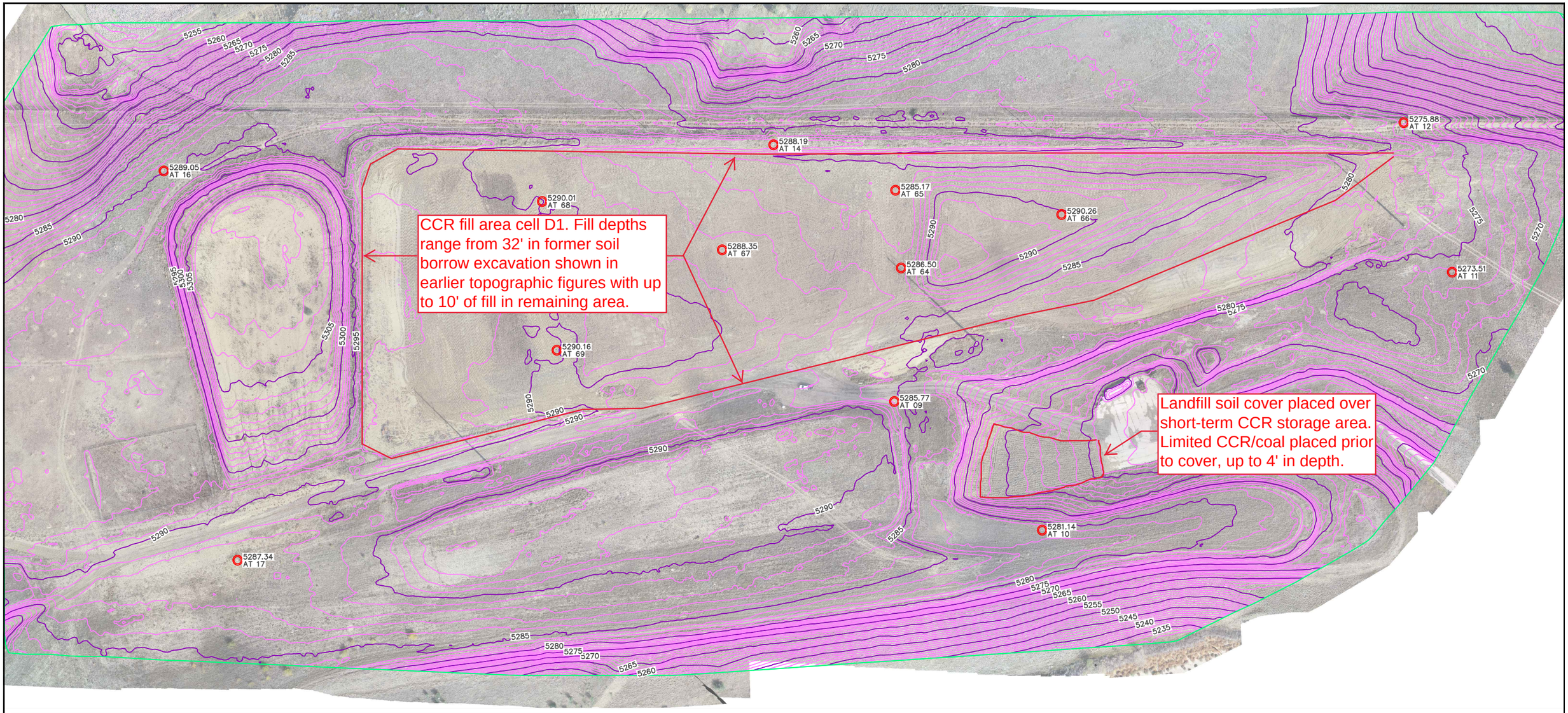
PUBLIC SERVICE COMPANY OF COLORADO
an XCEL ENERGY company

FILENAME: Valmont Ash Disposal Topo 2017.dwg
R-CODE: 011578
SCALE: 1" = 200'

DWN: SCB DATE: 10/31/2017
CHK: JF DATE: 10/31/2017

SHEET 1 REV

MF NO



NOTES:

1. THE AERIAL IMAGE SHOWN IS FROM THE 10/12/18 DRONE FLIGHT.
2. THE SURFACE INFORMATION SHOWN REPRESENTS THE FINAL GRADE OF THE ADF. THE DATA IS TAKEN FROM THE 10/12/18 DRONE FLIGHT.
3. AREAS WITH CONSISTENT THICK VEGETATION CAN CAUSE THE DRONE DATA TO INCORRECTLY INDICATE THE TOP OF VEGETATION AS TOP OF SURFACE DATA. SOME OF THIS HAS BEEN MITIGATED BY THE DRONE DATA PROCESSING SOFTWARE, BUT SOME INACCURACIES MAY STILL REMAIN WITHIN THESE VEGETATED AREAS.

Red boxed text added by HDR as part of Site CCR Landfill Annual Inspection, reporting date January 2019
CCR Annual Report Figure 3.

NORTH

GREAT LAKES ENVIRONMENTAL & INFRASTRUCTURE
6025 S. Quebec Street, Suite 300
Centennial, CO 80111
Telephone: 720-266-6030
Fax: 720-266-6031

DRAWN BY: H. WHEELER
SCALE: 1" = 150'
DATE: 11/15/18

XCEL ENERGY - VALMONT ASH IMPOUNDMENT CLOSURE
ASH DISPOSAL FACILITY FINAL GRADE
BOULDER, CO

SHEET NUMBER
1
OF 1