2021 USEPA CCR RULE PERIODIC OPERATING RECORD RUN-ON AND RUN-OFF CONTROL PLAN REVIEW REPORT §257.81 LANDFILL Coffeen Power Plant Coffeen, Illinois

Submitted to

Illinois Power Generating Company

134 Cips Lane
Coffeen, Illinois 62017

Submitted by

Geosyntec consultants

engineers | scientists | innovators

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October 11, 2021

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EXECUTIVE SUMMARY

This Periodic Operating Record Run-on and Run-off Control Plan Review Report (Report) for the CCR Landfill (LF) at the Coffeen Power Plant (CPP), also known as the Coffeen Power Station (COF), has been prepared in accordance with Rule 40, Code of Federal Regulations (CFR) §257 herein referred to as the "CCR Rule" [1]. The CCR Rule requires that initial run-on and run-off control system plans for existing CCR landfills, completed in 2016 [2], be updated on a five-year basis. All reviews are to be posted on the Illinois Power Generating Company (IPGC) CCR Website.

The review concluded that no significant updates to the existing run-on and run-off control plan are required. The initial run-on and run-off control system plan developed in 2016 [2] was independently reviewed by Geosyntec. Field observations, interviews with plant staff, and evaluations were performed to evaluate conditions in 2021 relative to the 2016 initial run-on and run-off control plan [2]. The current conditions do not indicate changes are necessary because there are no significant observed changes at the LF since development of the initial plan that would potentially affect the runoff control system plan. **Table 1** provides a summary of the initial 2016 run-on and run-off control plan [2] and conditions observed in 2021.

Table 1 – Periodic Run-on and Run-off Control System Plan Review

CCR Rule Reference	Requirement Summary	2016 Initial Certification		2021 Periodic Certification	
		Requirement Met?	Comments	Requirement Met?	Comments
§257.81 (a)(1)	Prevent flow onto the active portion of the CCR unit during peak discharge from a 24-hr, 25-yr storm.	Yes	Surface water is not allowed to enter the LF due to perimeter berms being present. Run-on is directed to the Southwest Detention Pond [2].	Yes	No changes were identified that may affect this requirement.
§257.81 (a)(1)	Collect and control run-off from the active portion of the CCR unit during the 24-hr, 25-yr storm.	Yes	Run-off from the LF is managed by perimeter ditches and an outlet structure. The outlet structure leads to the Southwest Detention Pond, which discharges into Coffeen Lake. All structures were designed for the 25-year, 24-hr rainfall event [2].	Yes	No changes were identified that may affect this requirement.
§257.81(b)	Handle run-off from the active portion of the CCR Unit in accordance with surface water requirements under the Clean Water Act (40 CFR §257.3-3)	Yes	Run-off from the LF is routed to the Southwest Detention Pond which discharges to Coffeen Lake at a NPDES-permitted outfall [2]	Yes	No changes were identified that may affect this requirement.

SECTION 1

INTRODUCTION AND BACKGROUND

This Periodic Operating Record Run-on and Run-off Control Plan Review Report (Report) was prepared by Geosyntec Consultants (Geosyntec) for Illinois Power Generation Company (IPGC). The review is required by the United States Environmental Protection Agency (USPA) Coal Combustion Residual (CCR) Rule [1] to document compliance with the CCR Rule for the CCR Landfill (LF) at the Coffeen Power Plant (CPP), also known as the Coffeen Power Station (COF).

CPP is located at 134 Cips Lane, Coffeen, Illinois, 62017. The location of CPP is illustrated in **Figure 1**, and a site plan showing the location of the LF, among other closed and open CCR and non-CCR surface impoundments, is provided in **Figure 2**.

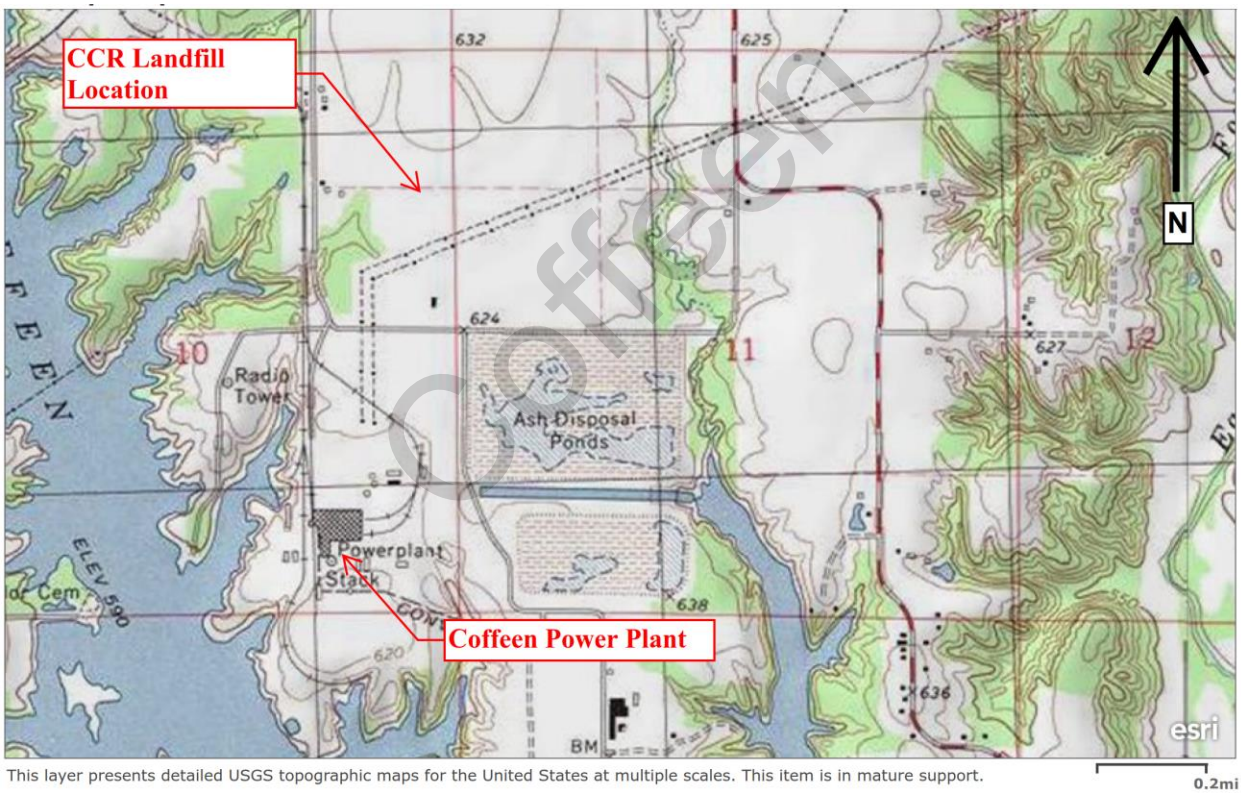


Figure 1 – Site Location Map (from ESRI, 2021)

Figure 2 – Site Plan (modified from AECOM, 2016)

1.1 Landfill Description

The LF was constructed for the disposal of CCR generated at CPP and has a current, active area of approximately 21 acres, which is a single cell. The placement of material into the LF ceased when CPP was retired in 2019. The LF is surrounded by earthen perimeter berms that direct stormwater flow away from the LF and into the adjacent Southwest Detention Pond. Stormwater run-off is managed by a series of ditches and culverts that also drain to the Southwest Detention Pond. The Southwest Detention Pond discharges to Coffeen Lake via National Pollutant Discharge Elimination System (NPDES) Outfall 018.

The initial run-on and run-off control system plan (§257.81) was completed by Hanson Professional Services, Inc. (Hanson) in 2016 and subsequently posted to IPGC's CCR Website [2]. Additional documentation for the initial plan, including calculations and other information, was prepared by Hanson [3] but not posted to IPGC's CCR Website.

1.2 Report Objectives

The objectives of this report are to:

- Compare site conditions from 2015/2016, when the initial run-on and run-off control system plan ([2], [3]) was prepared, to current site conditions in 2020/2021, and evaluate if updates are required to the initial plan based on changes at the site.

- Independently review the initial run-on and run-off control plan ([2], [3]) to determine if updates may be required based on technical considerations.

- Confirm that the LF meets all of the requirements associated with §257.81, or, if the LF does not meet any of the requirements, provide recommendations for compliance with that section of the CCR Rule [1].

SECTION 2

COMPARISION OF INITIAL AND PERIODIC SITE CONDITIONS

2.1 Overview

This section describes the comparison of conditions at the LF between the start of the initial CCR certification program in 2015 and 2016 (initial conditions) and subsequent collection of periodic certification site data in 2020 and 2021 (periodic conditions).

2.2 Review of Annual Inspection Reports

Annual onsite inspections of the LF were performed between 2015 and 2020 ([4], [5], [6], [7], [8], [9]) and were certified by a licensed professional engineer in accordance with §257.84(b). Each inspection report stated that the following information, relative to the previous inspection:

- No changes in geometry were present,
- No appearances of actual or potential structural weakness of the CCR were observed,
- No existing conditions were occurring that were or had the potential to disrupt the operation or safety of the LF,
- No other changes were observed which may have affected the ability or operation of the LF; and
- Approximate CCR volumes in the LF increased from 340,000 CY in 2015 to 610,000 CY in 2020; and
- The 2018, 2019, and 2020 inspections ([7], [8], [9]) also noted that routine periodic maintenance was being performed to address minor erosion and maintain the capacity of drainage features.

In summary, the reports did not indicate any significant changes to the LF between 2015 and 2020, outside of continued CCR placement.

2.3 Comparison of Initial and Periodic Surveys

The initial survey of the LF, conducted at the site by Weaver Consultants (Weaver) in 2015 [10], was compared to the periodic survey of the LF, conducted by IngenAE, LLC (IngenAE) in 2020 [11], using AutoCAD Civil3D 2021 software. This comparison was intended to quantify changes in the volume of CCR placed within the LF, evaluate potential changes in surface stormwater drainage around the LF, and evaluate if CCR may have been placed outside of the grades of the LF used for the existing run-on, run-off control plan ([2], [3]). This comparison is presented in a

plan view side-by-side of the surveys in **Drawing 1** and an isopach map denoting changes in ground surface elevation in **Drawing 2**. A summary of the changes in CCR volumes is provided in **Table 2**.

Table 2 – Comparison of Initial to Periodic Survey

Total Change in CCR Volume (CY)	+288,661 (Fill)
Were there significant changes in exterior stormwater drainage?	No (see below)
Was CCR placed outside of the design grades of the LF?	No

The comparison indicated that approximately 289,000 CY of CCR was placed in the LF between the 2015 and 2021 surveys. The comparison also indicated a slightly reduction in elevations of the perimeter berms and channels, however this may be due to differences in survey equipment and/or vegetation height at the time of the surveys, as no changes occurred based on the annual inspection reports ([4], [5], [6], [7], [8], [9]). The comparison did not indicate that CCR had been placed outside the design grades of the LF.

2.4 Comparison of Initial to Periodic Aerial Photography

Initial aerial photographs of the LF collected by Weaver Consultants in 2015 [10] were compared to periodic aerial photographs collected by IngenAE, LLC in 2020 [11] to visually evaluate if potential site changes (i.e., construction of new ditches, changes in site operations, or changes to other appurtenances) may have occurred between 2015 and 2020. A comparison of these aerial photographs is provided in **Drawing 3**, and the following change was identified:

- Additional CCR was placed inside the LF, and a haul route shown in the 2015 imagery was no longer present. This change is not expected to affect the run-on and run-off control system plan.

2.5 Periodic Site Visits

A periodic site visit was conducted by Geosyntec on May 27, 2021, with Mr. Lucas P. Carr, P.E. conducting the site visit. The site visit was intended to evaluate potential changes at the site since development of the initial run-on and run-off control plan ([2], [3]) (i.e., modifications to stormwater drainage system(s), modifications to adjacent structures that may route run-on towards the landfill), in addition to performing visual observations of the LF and surrounding area to evaluate if potential maintenance to existing run-on and run-off control systems were required. The site visit is documented in a photographic log provided in **Appendix A**. A summary of significant findings from the site visit is provided below:

- Overall site maintenance appeared to be good.

- Geomembrane liner was being placed in stormwater ditches on the active, non-covered surface of the CCR landfill to reduce percolation and leachate production.

- CCR placement was not occurring as the CPP was retired in December of 2019.

2.6 Interview with Power Plant Staff

An interview with Mr. John Romang of CPP was conducted by Mr. Lucas P. Carr, P.E. of Geosyntec on May 28, 2021. Mr. Romang, at the time of the interview, had been employed at CPP for 20 years as the environmental and chemistry manager and supervisor. His responsibilities included general oversight and environmental compliance, including weekly landfill inspections and identifying items requiring repair. The interview included a discussion of potential changes that may have occurred at the LF since development of the initial run-on and run-off control plan ([2], [3]). A summary of the interview is provided below.

- Were any construction projects completed for the LF since 2015, and, if so, are design drawings and/or details available?
    - A small rock check dam was installed in the channel leading from the Landfill to the Southwest Detention Pond but subsequently removed in 2020.
    - Geomembrane liner (at the time of the interview) was actively being installed on the interior stormwater ditches within the active landfill to reduce percolation into the leachate collection system.
- Have there been any changes to operational and/or maintenance programs for the LF since 2015?
    - No changes occurred outside of CPP retirement and the cessation of CCR placement into the LF in 2019.
- Have any other changes and the LF occurred since 2015 that may substantially affect the existing run-on and run-off control plan ([2], [3])?
    - No, other than the placement of liner in stormwater ditches.
- Have there been any instances of uncontrolled stormwater run-on to the LF since 2015?
    - No.
- Have there been any instances of uncontrolled stormwater run-off from the LF since 2015?
    - No.

SECTION 3

RUN-ON AND RUN-OFF CONTROL PLAN - §257.81

3.1 Overview of Initial RRCSP

The Initial Run-on and Run-off Control System Plan (Initial RRCSP) was prepared by Hanson in 2016 ([2], [3]) following the requirements of §257.81. The Initial RRCSP included the following information

- A description of the run-on control features designed for a 25-year, 24-hour storm event;
- A description of the run-off control features designed for a 25-year, 24-hour storm event;
- Detailed discussion of calculations supporting the design of the control features;
- A discussion of the National Pollutant Discharged Elimination System (NPDES) permitting for the CPP, as it pertained to run-off management; and
- Operations and maintenance procedures to be followed.

The Initial RRCSP concluded that the LF met the requirements of §257.81, as the run-on control system was designed to prevent flow into the LF, the run-off control system was designed to control and collect the runoff volume resulting from the active portion of the LF during the 25-year, 24-hour storm event. Runoff from the LF was discharged in accordance with the requirements of NPDES Permit No. IL0000108.

3.2 Review of Initial RRCSP

Geosyntec performed a review of the Initial RRCSP ([2], [3]), in terms of technical approach, input parameters, and assessment of the results. The review included the following tasks:

- Reviewing the rainfall depth and distribution for appropriateness;
- Performing a high-level review of the inputs to the hydrologic modeling;
- Performing a high-level review of the design approach to the hydrologic modeling;
- Reviewing the adequacy of stormwater control features versus the applicable requirements of the CCR Rule; and
- Performing a high-level review of the network of stormwater control features.

No significant technical issues were noted within the technical review, although a detailed review (e.g., check) of the calculations was not performed.

3.3 Summary of Site Changes Affecting Initial RRCSP

No changes between 2015 and 2021 were identified that would require updates to the Initial RRCSP. Updates to the Initial RRCSP are not recommended at this time.

SECTION 4

CONCLUSIONS

The LF run-on and run-off controls system plan (§257.81) was evaluated relative to the USEPA CCR Rule periodic assessment requirements. Based on these evaluations, the referenced requirements are satisfied for run-on and run-off control system planning, and updates to the initial run-on and run-off control plan ([2], [3]) are not required at this time.

SECTION 5

CERTIFICATION STATEMENT

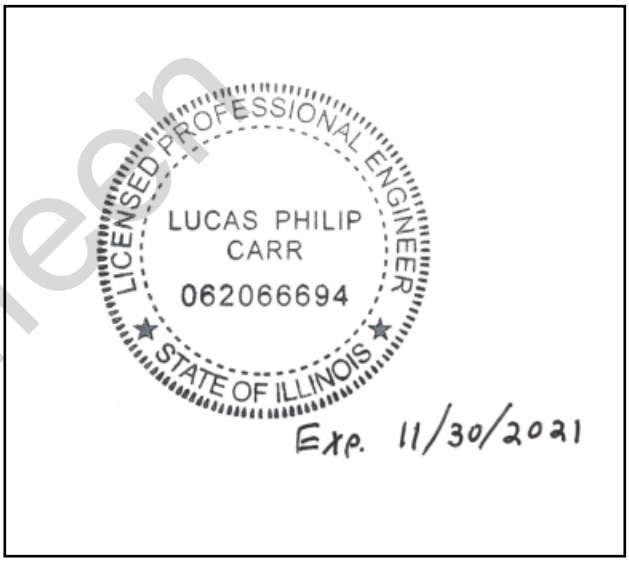
CCR Unit: Illinois Power Generating Company, Coffeen Power Plant, CCR Landfill

I, Lucas P. Carr, being a Registered Professional Engineer in good standing in the State of Illinois, do hereby certify, to the best of my knowledge, information, and belief that the information contained in this 2021 USEPA CCR Rule Periodic Certification Report, has been prepared in accordance with the accepted practice of engineering. I certify, for the above-referenced CCR Unit, that the periodic assessment of the run-on and run-off control system plan, dated October 2021, was conducted in accordance with the requirements of 40 CFR §257.81.

Lucas P. Carr

10/11/2021

Date



SECTION 6

REFERENCES

[1] United States Environmental Protection Agency, 40 CFR Parts 257 and 261; Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule, 2015.

[2] Hanson Professional Services, "CCR Rule Report: Run-on and Run-off Control System Plan, Coffeen Power Station, CCR Landfill, Montgomery County, Illinois," October 2016.

[3] Hanson Professional Services, "Run-on and Run-off Control System Documentation, Coffeen Power Station, CCR Landfill, Montgomery County, Illinois," October 2016.

[4] D. B. Hoots, "Annual Inspection by a Qualified Professional Engineer, 40 CFR § 257.84(b), Coffeen Power Station, CCR Landfill," January 14, 2021.

[5] D. B. Hoots, "Annual Inspection by a Qualified Professional Engineer, 40 CFR § 257.84(b), Coffeen Power Station, CCR Landfill," January 12, 2017.

[6] D. B. Hoots, "Annual Inspection by a Qualified Professional Engineer, 40 CFR § 257.84(b), Coffeen Power Station, CCR Landfill," December 14, 2017.

[7] D. B. Hoots, "Annual Inspection by a Qualified Professional Engineer, 40 CFR § 257.84(b), Coffeen Power Station, CCR Landfill," December 10, 2018.

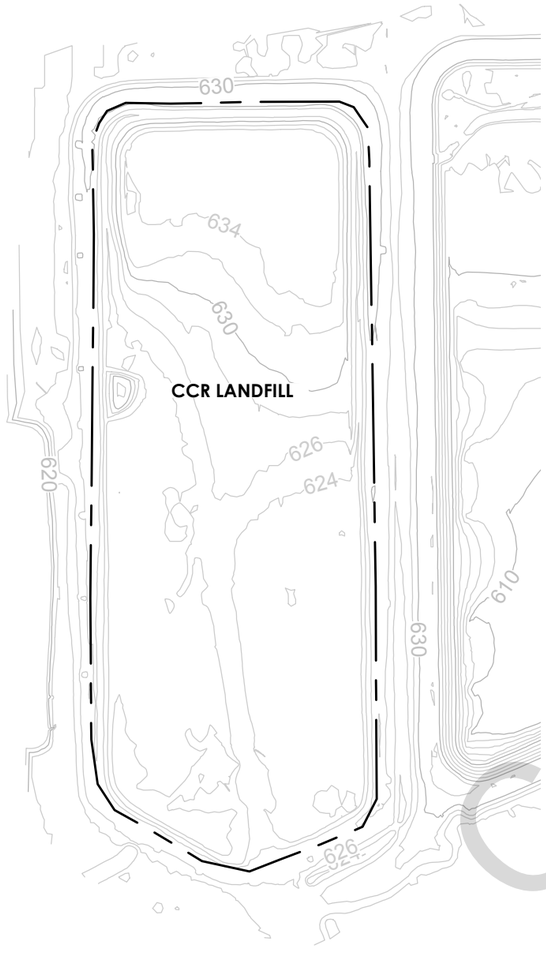
[8] D. B. Hoots, "Annual Inspection by a Qualified Professional Engineer, 40 CFR § 257.84(b), Coffeen Power Station, CCR Landfill," October 18, 2019.

[9] D. B. Hoots, "Annual Inspection by a Qualified Professional Engineer, 40 CFR § 257.84(b), Coffeen Power Station, CCR Landfill," October 18, 2020.

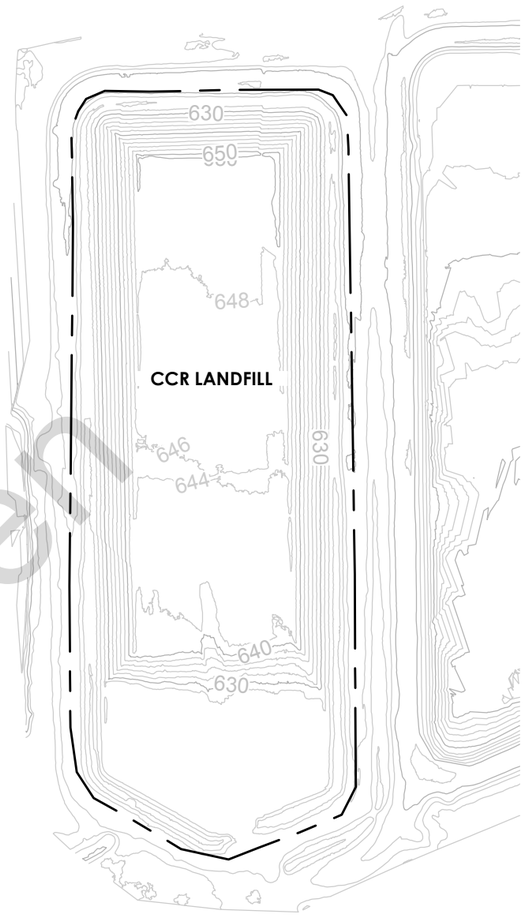
[10] Weaver Consultants Group, "Dynegy, Collinsville, IL, 2015 - Coffeen Topography," December 1, 2015.

[11] IngenAE, "Luminant, Illinois Power Generating Company, Coffeen Power Station, December 2020 Topography," February 26, 2021.

DRAWINGS



INITIAL SURVEY
12-01-2015 TOPOGRAPHY



PERIODIC SURVEY
02-26-2021 TOPOGRAPHY

0 300
SCALE IN FEET

NOTES:

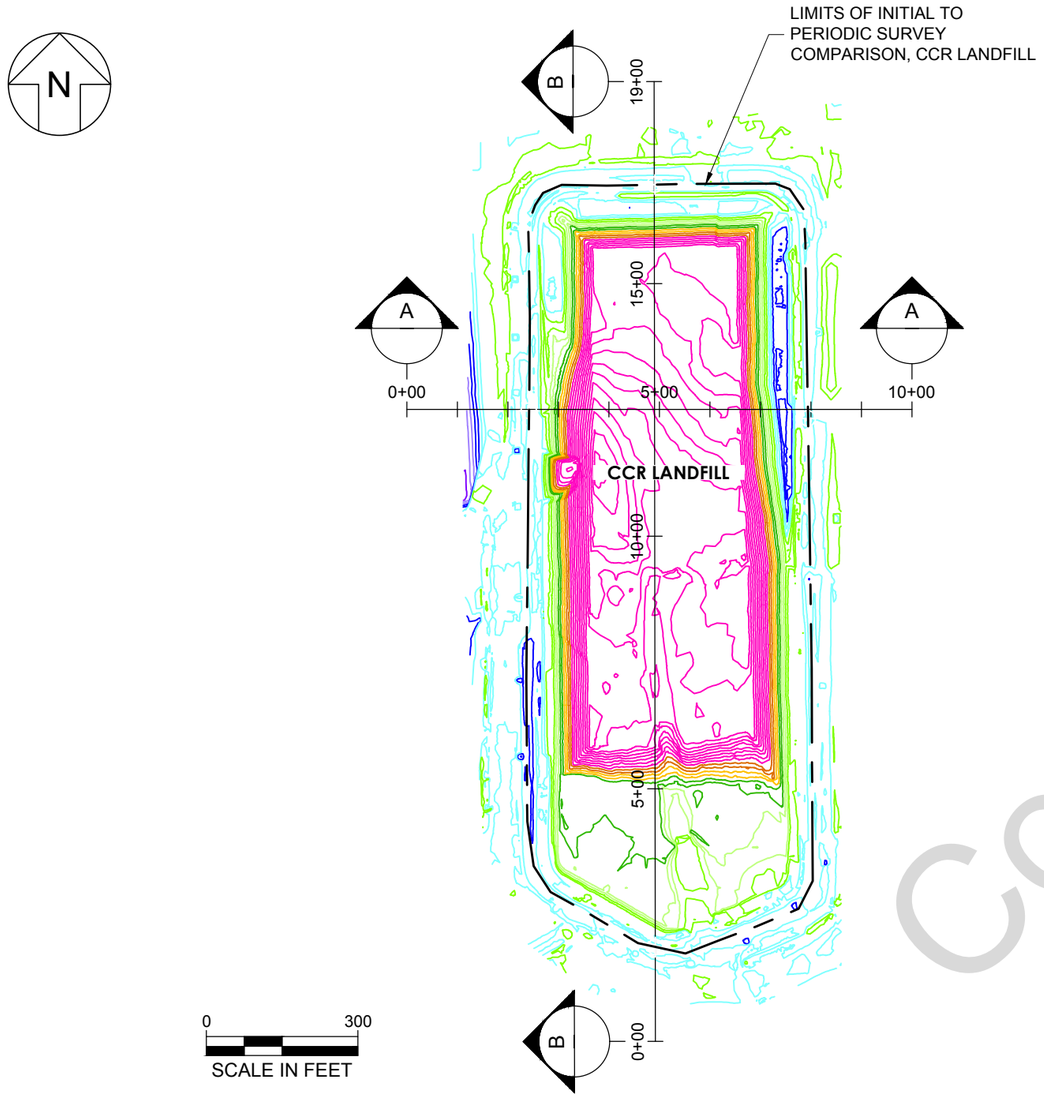
1. THE INITIAL SURVEY WAS TAKEN FROM THE DRAWING PACKAGE TITLED “DYNEGY, COLLINSVILLE, ILLINOIS, 2015 - COFFEEN TOPOGRAPHY”, PREPARED BY WEAVER CONSULTANTS GROUP, DATED DECEMBER 1, 2015.
2. THE PERIODIC SURVEY WAS TAKEN FROM THE DRAWING PACKAGE TITLED “LUMINANT, ILLINOIS POWER GENERATING COMPANY, COFFEEN POWER STATION, DECEMBER 2020 TOPOGRAPHY”, PREPARED BY INGENAE, DATED FEBRUARY 26, 2021.
3. ALL SURVEY DATA WAS COLLECTED IN THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) AND NORTH AMERICAN DATUM OF 1983 (NAD83) FOR VERTICAL AND HORIZONTAL COORDINATES, RESPECTIVELY.

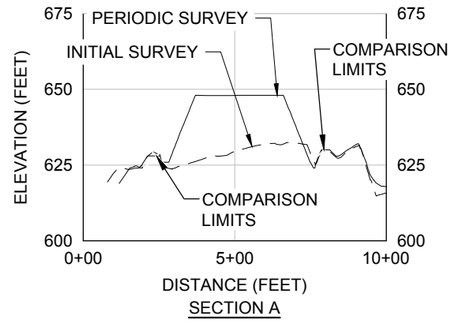
INITIAL TO PERIODIC SURVEY COMPARISON
CCR LANDFILL
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

Geosyntec consultants

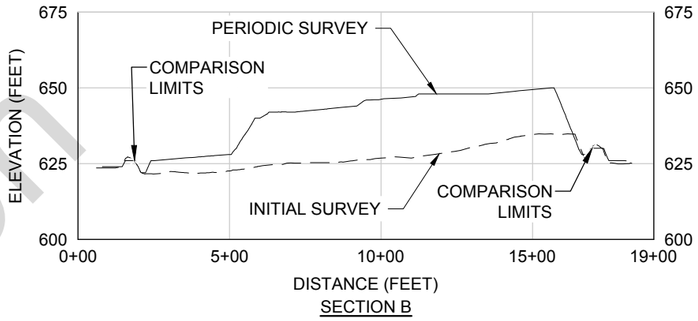
DRAWING 1

GLP8027.02 | MAY 2021





SECTION A



SECTION B

ISOPACH CONTOUR KEY		
COLOR	MIN ELEV	MAX ELEV
	-8	-6
	-6	-4
	-4	-2
	-2	0
	0	2
	2	4
	4	6
	6	8
	8	10
	10	25

NOTES:

1. THE INITIAL SURVEY WAS TAKEN FROM THE DRAWING PACKAGE TITLED “DYNEGY, COLLINSVILLE, ILLINOIS, 2015 - COFFEEN TOPOGRAPHY”, PREPARED BY WEAVER CONSULTANTS GROUP, DATED DECEMBER 1, 2015.
2. THE PERIODIC SURVEY WAS TAKEN FROM THE DRAWING PACKAGE TITLED “LUMINANT, ILLINOIS POWER GENERATING COMPANY, COFFEEN POWER STATION, DECEMBER 2020 TOPOGRAPHY”, PREPARED BY INGENAE, DATED FEBRUARY 26, 2021.
3. ALL SURVEY DATA WAS COLLECTED IN THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) AND NORTH AMERICAN DATUM OF 1983 (NAD83) FOR VERTICAL AND HORIZONTAL COORDINATES, RESPECTIVELY.

INITIAL TO PERIODIC SURVEY COMPARISON SUMMARY			
CCR UNIT	CUT	FILL	NET (CU. YD.)
CCR LANDFILL	4,531	293,193	288,661 (FILL)

SURVEY COMPARISON ISOPACH
CCR LANDFILL
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

Geosyntec consultants

DRAWING 2

GLP8027.02 | MAY 2021

INITIAL AERIAL
12-01-2015 IMAGERY

PERIODIC AERIAL
02-26-2021 IMAGERY

0 300
SCALE IN FEET

NOTES:

1. THE INITIAL IMAGERY WAS TAKEN FROM THE DRAWING PACKAGE TITLED “DYNEGY, COLLINSVILLE, ILLINOIS, 2015 - COFFEEN TOPOGRAPHY”, PREPARED BY WEAVER CONSULTANTS GROUP, DATED DECEMBER 1, 2015.
2. THE PERIODIC IMAGERY WAS TAKEN FROM THE DRAWING PACKAGE TITLED “LUMINANT, ILLINOIS POWER GENERATING COMPANY, COFFEEN POWER STATION, DECEMBER 2020 TOPOGRAPHY”, PREPARED BY INGENAE, DATED FEBRUARY 26, 2021.

INITIAL TO PERIODIC AERIAL IMAGERY
COMPARISON
CCR LANDFILL
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

Geosyntec consultants

DRAWING
3

GLP8027.02 | MAY 2021

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ATTACHMENTS

Attachment A

LF Site Visit Photolog

GEOSYNTEC CONSULTANTS
Photographic Record

Geosyntec consultants

Site Owner: Illinois Power Generating Company **Project Number:** GLP8027

CCR Unit: CCR Landfill (LF) **Site:** Coffeen Power Plant

Photo: 01 **Date:** 05/28/2021 **Direction Facing:** NW **Comments:** South side overview	
Photo: 02 **Date:** 05/28/2021 **Direction Facing:** NW **Comments:** South side overview	

GEOSYNTEC CONSULTANTS
Photographic Record

Geosyntec consultants

Site Owner: Illinois Power Generating Company **Project Number:** GLP8027

CCR Unit: CCR Landfill (LF) **Site:** Coffeen Power Plant

Photo: 03 **Date:** 05/28/2021 **Direction Facing:** N **Comments:** West side overview	

Photo: 04 **Date:** 05/28/2021 **Direction Facing:** E **Comments:** North side overview	

GEOSYNTEC CONSULTANTS **Photographic Record**	Geosyntec consultants
Site Owner: Illinois Power Generating Company	**Project Number:** GLP8027
CCR Unit: CCR Landfill (LF)	**Site:** Coffeen Power Plant

Photo: 05	
Date: 05/28/2021	
Direction Facing: S	
Comments: East side overview	