

**2021 USEPA CCR RULE PERIODIC
OPERATING RECORD RUN-ON AND RUN-
OFF CONTROL PLAN REVIEW REPORT**

§257.81

**CCR LANDFILL
Joppa Power Plant
Joppa, Illinois**

Submitted to

Electric Energy Incorporated

**2100 Portland Road
Joppa, Illinois 62953**

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 Joppa Power Plant (JPP), also known as the Joppa Power Station (JOP), 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 Electric Energy, Incorporated (EEI) 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 Summary

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	The LF is separated from adjacent areas by berms and stormwater channels; these structures are designed based on hydraulic calculations for at least the 25-yr, 24-hr storm event [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 active portions of the LF drained into the Detention Pond using culverts and a channel; these structures are designed based on hydraulic calculations to convey flow for at least the 25-yr, 24-hr storm 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 Illinois River in accordance with a NPDES-permit, which includes specific permit requirements related to §257.3-3 [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 Electric Energy, Inc. (EEI). 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) [2] at the Joppa Power Plant (JPP), also known as the Joppa Power Station (JOP).

JPP is located at 2100 Portland Road, Joppa, Illinois, 62953. The location of JPP is illustrated in **Figure 1**, and a site plan showing the location of the LF, the JPP, and the other active CCR unit (the East Ash Pond) is provided in **Figure 2**.

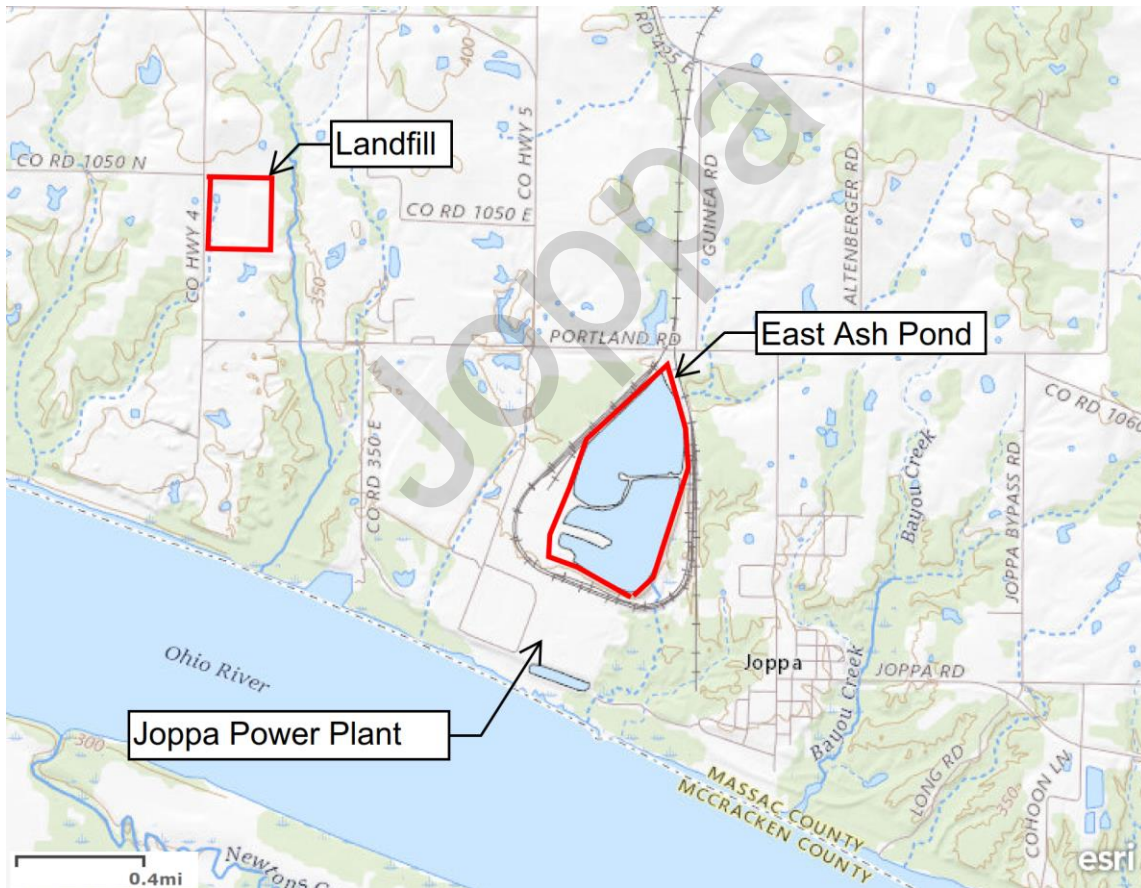


Figure 1 – Site Location Map (modified from ESRI, 2021)



Figure 2 – Site Plan (modified from Google Earth Pro, 2021)

1.1 Landfill Description

The LF design consists of approximately 28 acres, split over two cells, Cell L1 and Cell L2. Only Cell L1 (14 acres in area) has been constructed to date. The LF was constructed for the disposal of CCR generated at JPP. However, CCR was never placed in the LF for disposal ([3], [4], [5], [6], [7], [8]). The LF currently retains a small amount of impounded stormwater and no known waste material. The LF is surrounded by perimeter berms and ditches to reduce stormwater run-on. A temporary separation berm allows stormwater to be directed around Cell L1 through the proposed future footprint of Cell L2. Stormwater from the LF is directed into the Detention Pond, which is a non-CCR impoundment south of the LF. The Detention Pond discharges to the Ohio River via an unnamed tributary under National Pollutant Discharge Elimination System (NPDES) Permit No. IL0078751 [2].

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 EEI's CCR Website [2]. Additional documentation for the initial plan, including calculations and other information, was prepared by Hanson [9] but not posted to EEI'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], [9]) 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], [9]) to determine if updates may be required based on technical considerations.

If updates are required, they will be performed and documented within this Report.

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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 ([3], [4], [5], [6], [7], [8]) and were certified by a licensed professional engineer in accordance with §257.84(b). Each inspection report stated the following information, relative to the previous inspection:

- No changes in geometry were identified
- The LF had not received any CCR,
- 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, and
- No other changes were observed which may have affected the ability or operation of the LF.

In summary, the reports did not indicate any significant changes to the LF between 2015 and 2020. No CCR or other material was observed to have been placed in the LF prior to or during this this time.

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 evaluate potential changes in surface stormwater drainage around the LF. Volumetric estimations of CCR placed within the LF were not performed as reportedly no CCR has been placed in the LF and the 2020 survey was performed using LiDAR and did not include bathymetry; therefore, the elevation within the LF footprint is the impounded water elevation. 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

Initial Survey Ponded Water Elevation (ft)	364.77
Periodic Survey Ponded Water Elevation (ft)	365.45
Were there significant changes in exterior stormwater drainage?	No

The comparison did not indicate any significant changes in interior or exterior stormwater drainage around the LF. Apparent minor changes in grades are presumed to be due to differences in survey data, which was collected utilizing different methods and different survey contractors.

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**. No significant changes were identified in this comparison.

2.5 Periodic Site Visit

A periodic site visit was conducted by Geosyntec on May 26, 2021, with Mr. Lucas P. Carr, P.E. and Mr. Pourya Kargar 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], [9]) (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 good.
- Approximately 1 ft of standing water was observed within the LF, around the side slopes. Water depths in the middle of the LF were unable to be evaluated.
- No significant changes to the LF were observed.

2.6 Interview with Power Plant Staff

An interview with Mr. Bruce Parker and Mr. Roger Faughn of JPP was conducted by Mr. Lucas P. Carr, P.E. of Geosyntec on May 26, 2021. At the time of the interview, Mr. Parker had been employed at JPP for 32 years as the manager of environmental and chemistry, with the responsibility of managing the LF from an environmental standpoint. Mr. Faughn had been

employed by JPP for one year and was part of the JPP environmental group, with the responsibility of supporting environmental compliance for the LF. 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], [9]). 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?
 - No.
- Have there been any changes to operational and/or maintenance programs for the LF since 2015?
 - No. The LF is mowed approximately one to two times and year and erosion gullies are repaired.
- Have any other changes and the LF occurred since 2015 that may substantially affect the existing run-on and run-off control plan [2]?
 - No known changes have occurred.
- Have there been any instances of uncontrolled stormwater run-on to the LF since 2015?
 - No known instances have occurred.
- Have there been any instances of uncontrolled stormwater run-off from the LF since 2015?
 - No known instances have occurred.

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], [9]), 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 24-year, 24-hour storm event;
- Detailed discussion of the calculations supporting the design of the control features; and
- A discussion of National Pollutant Discharge Elimination System (NPDES) permitting for the JPP, as it pertains run-off management; and
- Operation and maintenance procedures to be followed.

The Initial IDF 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 water from within the LF, and discharge from the LF was routed to a NPDES-permitted outfall during the 25-year, 24-hour design storm event.

3.2 Review of Initial RRCSP

Geosyntec performed a review of the Initial RRCSP ([2], [9]), 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.

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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], [9]) are not required at this time.

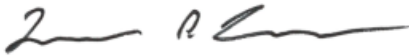
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SECTION 5

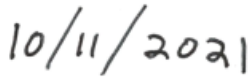
CERTIFICATION STATEMENT

CCR Unit: Electric Energy Incorporated, Joppa Power Plant, CCR Landfill

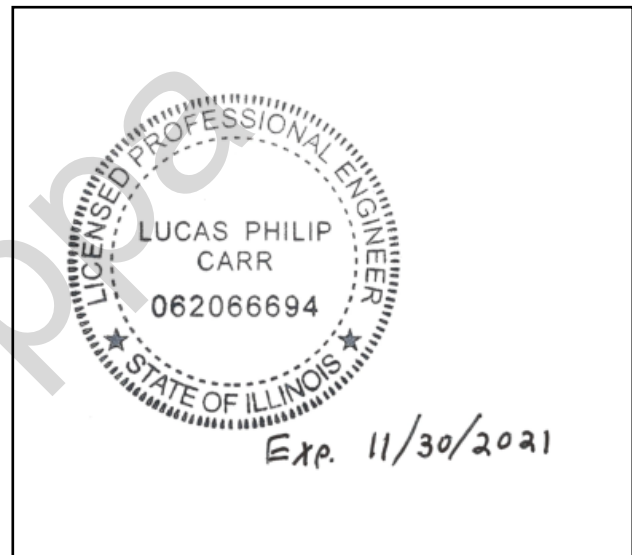
I, Lucas P. Carr, being a Registered Professional Engineer in good standing in the State of Illinois, do hereby certify, to the best of my knowledge, information, and belief that the information contained in this 2021 USEPA CCR Rule Periodic Certification Report, has been prepared in accordance with 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



Date



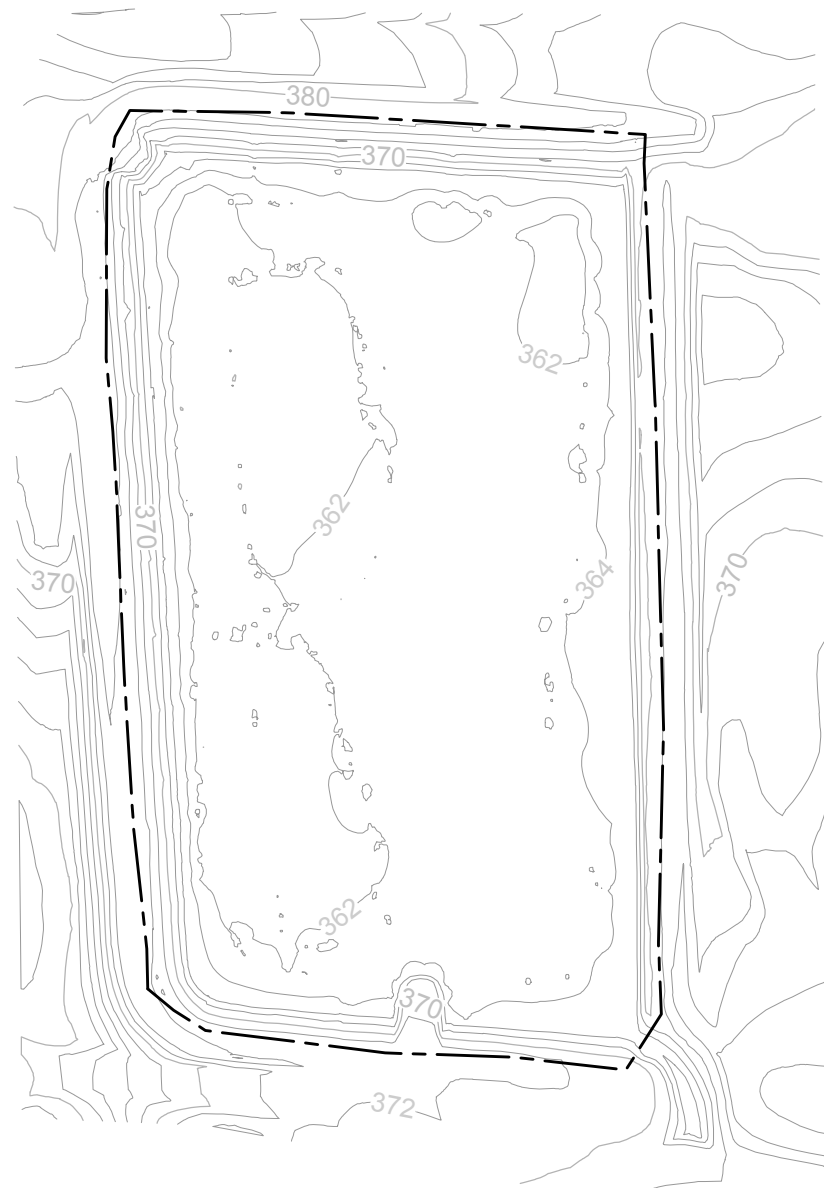
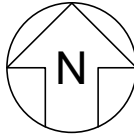
SECTION 6

REFERENCES

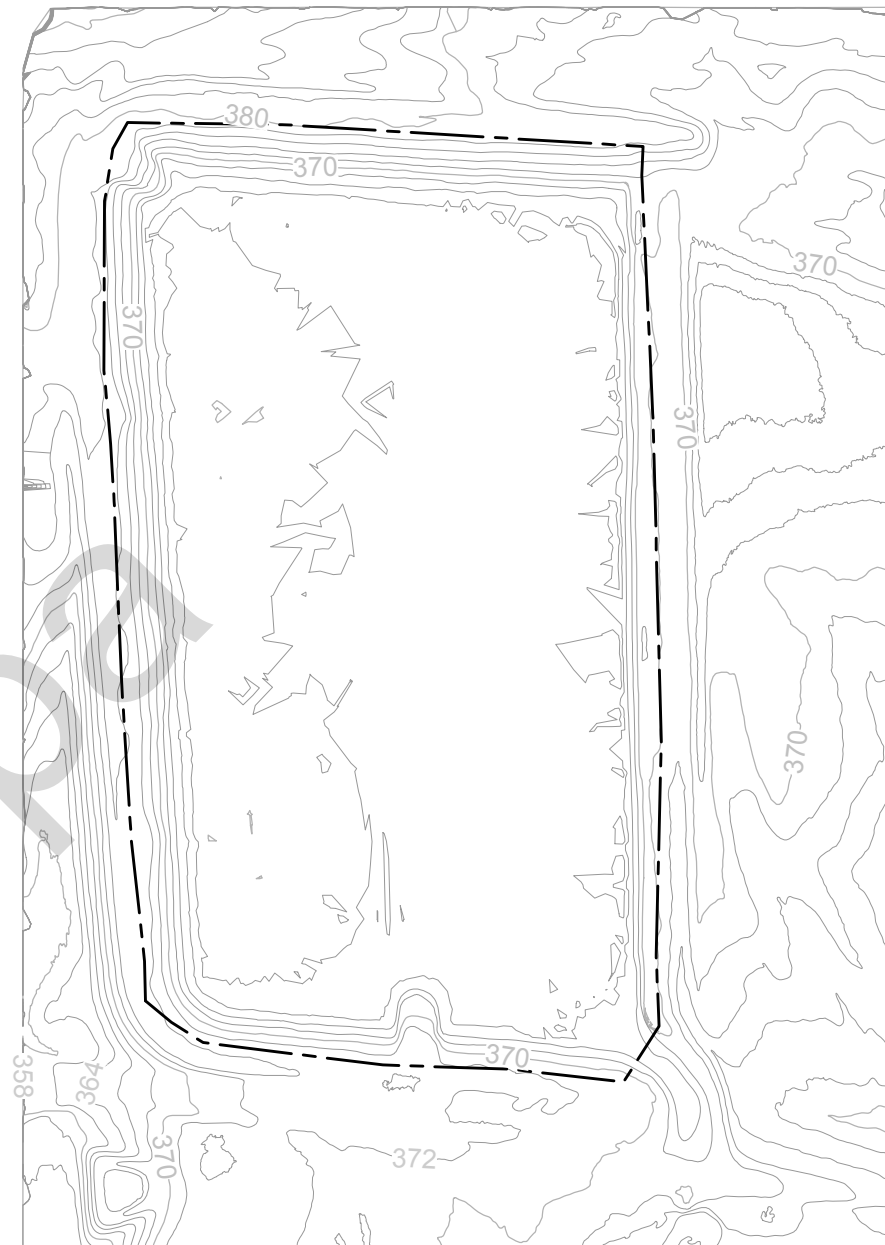
- [1] United States Environmental Protection Agency, 40 CFR Parts 257 and 261; Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule, 2015.
- [2] Hanson Professional Services, Inc., "CCR Rule Report: Run-on and Run-off Control System Plan, Joppa Power Station CCR Landfill, Massac County, Illinois," October 2016.
- [3] D. B. Hoots, *Annual Inspection by a Qualified Professional Engineer, 40 CFR §257.84(b), CCR Landfill, Joppa Power Station*, January 14, 2016.
- [4] D. B. Hoots, *Annual Inspection by a Qualified Professional Engineer, 40 CFR §257.84(b), CCR Landfill, Joppa Power Station*, January 12, 2017.
- [5] D. B. Hoots, *Annual Inspection by a Qualified Professional Engineer, 40 CFR §257.84(b), CCR Landfill, Joppa Power Station*, December 14, 2017.
- [6] D. B. Hoots, *Annual Inspection by a Qualified Professional Engineer, 40 CFR §257.84(b), CCR Landfill, Joppa Power Station*, December 10, 2018.
- [7] D. B. Hoots, *Annual Inspection by a Qualified Professional Engineer, 40 CFR §257.84(b), CCR Landfill, Joppa Power Station*, October 18, 2019.
- [8] D. B. Hoots, *Annual Inspection by a Qualified Professional Engineer, 40 CFR §257.84(b), CCR Landfill, Joppa Power Station*, October 18, 2020.
- [9] Hanson Professional Services, "Run-on and Run-off Control System Documentation, Joppa Power Station, CCR Landfill, Massac County, Illinois," October 2016.
- [10] Weaver Consultants Group, "Dynegy, Collinsville, IL, 2015 - Joppa Existing Topography," Collinsville, Illinois, December 2015.
- [11] IngenAE, "Luminant, Electric Energy, Inc., Joppa Power Station, December 2020 Topography," Earth City, Missouri, May 20, 2021.

DRAWINGS

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INITIAL SURVEY
12-01-2015 TOPOGRAPHY



PERIODIC SURVEY
03-09-2021 TOPOGRAPHY



NOTES:

1. THE INITIAL SURVEY WAS TAKEN FROM THE DRAWING PACKAGE TITLED "DYNEGY, COLLINSVILLE, ILLINOIS, 2015 - JOPPA EXISTING TOPOGRAPHY", PREPARED BY WEAVER CONSULTANTS GROUP, DATED DECEMBER 1, 2015.
2. THE PERIODIC SURVEY WAS TAKEN FROM THE DRAWING PACKAGE TITLED "LUMINANT, ELECTRIC ENERGY, INC., JOPPA POWER STATION, DECEMBER 2020 TOPOGRAPHY", PREPARED BY INGENAE, DATED MARCH 9, 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.
4. THE PERIODIC SURVEY DID NOT INCLUDE A BATHYMETRIC SURVEY OF THE LANDFILL. THE SURVEYED ELEVATIONS WITHIN THE LANDFILL THEREFORE CORRESPOND TO THE IMPOUNDED WATER SURFACE. REPORTEDLY, NO CCR WAS PLACED IN THE LANDFILL.

INITIAL TO PERIODIC SURVEY COMPARISON
LANDFILL
JOPPA POWER PLANT
JOPPA, ILLINOIS

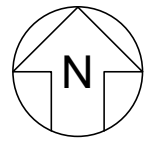


DRAWING

1

GLP8027.06

JUNE 2021



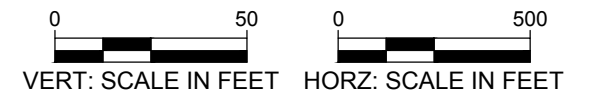
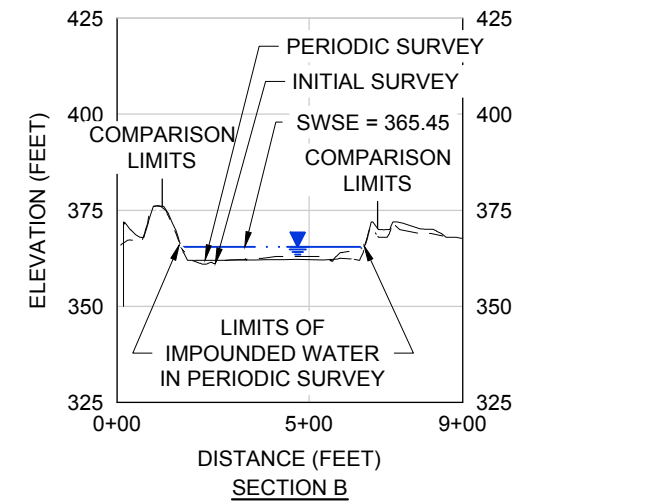
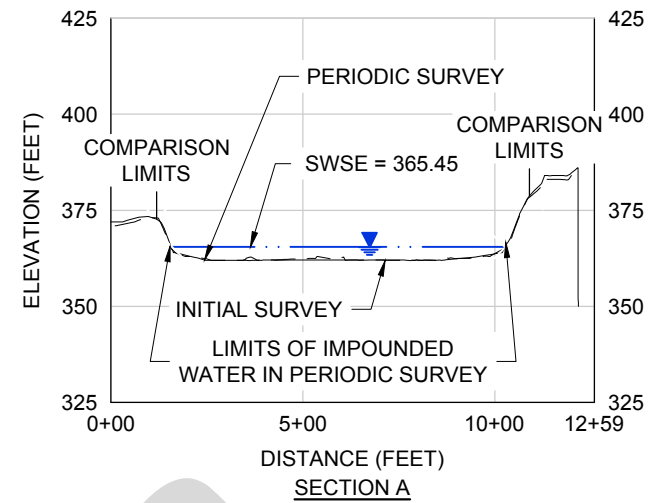
LIMITS OF INITIAL TO PERIODIC SURVEY COMPARISON, LANDFILL

LIMITS OF IMPOUNDED WATER IN PERIODIC SURVEY - EL. 365.45 FT

ISOPACH CONTOUR KEY		
COLOR	MIN ELEV	MAX ELEV
Blue	-4	-3
Light Blue	-3	-2
Dark Blue	-2	-1
Cyan	-1	0
Light Green	0	1
Green	1	2
Yellow	2	3
Orange	3	4
Pink	4	5
Red	5	6

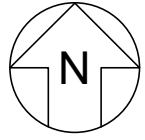
NOTES:

1. THE INITIAL SURVEY WAS TAKEN FROM THE DRAWING PACKAGE TITLED "DYNEGY, COLLINSVILLE, ILLINOIS, 2015 - JOPPA EXISTING TOPOGRAPHY", PREPARED BY WEAVER CONSULTANTS GROUP, DATED DECEMBER 1, 2015.
2. THE PERIODIC SURVEY WAS TAKEN FROM THE DRAWING PACKAGE TITLED "LUMINANT, ELECTRIC ENERGY, INC., JOPPA POWER STATION, DECEMBER 2020 TOPOGRAPHY", PREPARED BY INGENAE, DATED MARCY 9, 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.
4. THE PERIODIC SURVEY DID NOT INCLUDE A BATHYMETRIC SURVEY OF THE LANDFILL. THE SURVEYED ELEVATIONS WITHIN THE LANDFILL THEREFORE CORRESPOND TO THE IMPOUNDED WATER SURFACE. REPORTEDLY, NO CCR WAS PLACED IN THE LANDFILL.

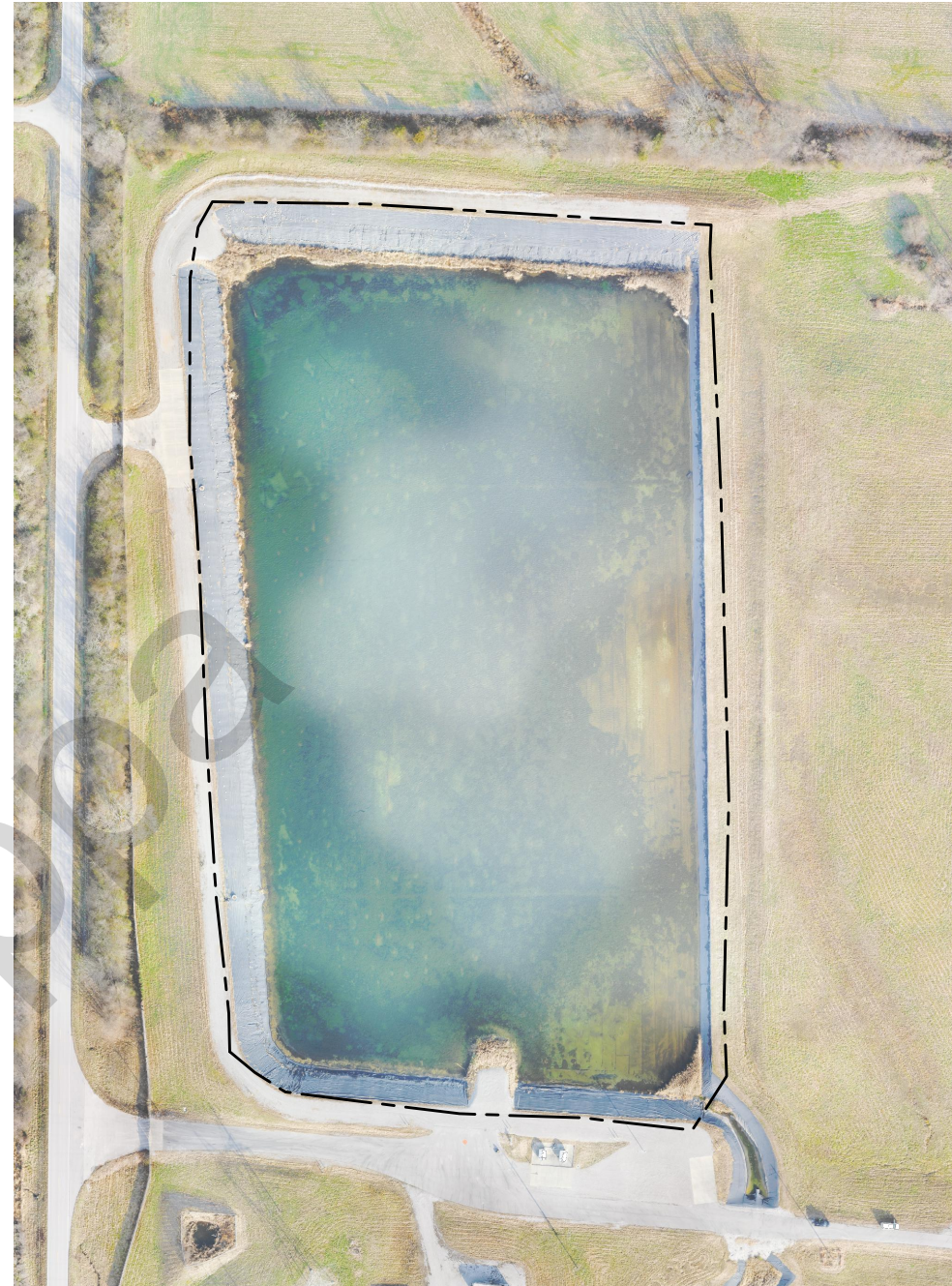


INITIAL TO PERIODIC SURVEY COMPARISON SUMMARY	
CCR UNIT	IMPOUNDED WATER
LANDFILL	4,354

SURVEY COMPARISON ISOPACH LANDFILL JOPPA POWER PLANT JOPPA, ILLINOIS	
GLP8027.06	JUNE 2021
DRAWING	
2	



INITIAL AERIAL
12-01-2015 IMAGERY



PERIODIC AERIAL
03-09-2021 IMAGERY



NOTES:

1. THE INITIAL IMAGERY WAS TAKEN FROM THE DRAWING PACKAGE TITLED "DYNEGY, COLLINSVILLE, ILLINOIS, 2015 - JOPPA EXISTING TOPOGRAPHY", PREPARED BY WEAVER CONSULTANTS GROUP, DATED DECEMBER 1, 2015.
2. THE PERIODIC IMAGERY WAS TAKEN FROM THE DRAWING PACKAGE TITLED "LUMINANT, ELECTRIC ENERGY, INC., JOPPA POWER STATION, DECEMBER 2020 TOPOGRAPHY", PREPARED BY INGENAE, DATED MARCH 9, 2021.

INITIAL TO PERIODIC AERIAL IMAGERY COMPARISON LANDFILL JOPPA POWER PLANT JOPPA, ILLINOIS	
GLP8027.06	MAY 2021
DRAWING 3	

ATTACHMENTS

Attachment A
LF Site Visit Photolog

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GEOSYNTEC CONSULTANTS
Photographic Record



Site Owner: Electric Energy Inc.

Project Number: GLP8027

CCR Unit: CCR Landfill (LF)

Site: Joppa Power Plant

Photo: 01

Date: 05/26/2021

Direction Facing:
N

Comments:
Overview of landfill interior. No CCR was observed to be present.



Photo: 02

Date: 05/26/2021

Direction Facing:
NW

Comments:
Overview of landfill interior.



GEOSYNTEC CONSULTANTS
Photographic Record



Site Owner: Electric Energy Inc.

Project Number: GLP8027

CCR Unit: CCR Landfill (LF)

Site: Joppa Power Plant

Photo: 03

Date: 05/26/2021

Direction Facing:
NE

Comments:
Overview of
landfill interior.



Photo: 04

Date: 05/26/2021

Direction Facing:
E

Comments:
Overview of
landfill interior.



Site Owner: Electric Energy Inc.

Project Number: GLP8027

CCR Unit: CCR Landfill (LF)

Site: Joppa Power Plant

Photo: 05

Date: 05/26/2021

Direction Facing:

N

Comments:

Perimeter road and ditch.



Photo: 06

Date: 05/26/2021

Direction Facing:

NE

Comments:

Perimeter road and ditch/berm.



GEOSYNTEC CONSULTANTS
Photographic Record



Site Owner: Electric Energy Inc.

Project Number: GLP8027

CCR Unit: Landfill (LF)

Site: Joppa Power Station

Photo: 07

Date: 05/26/2021

Direction Facing:
E

Comments:
Perimeter road and
ditch/berm.



Photo: 08

Date: 05/26/2021

Direction Facing:
S

Comments:
Overview of east
berm and ditch.

