

INFLOW DESIGN FLOOD CONTROL PLAN PERIODIC 5-YEAR REVIEW

CFR 257.82

East Bottom Ash Pond

Rockport Plant
Rockport, Indiana

October 2021

Prepared for: Indiana Michigan Power Company

Prepared by: American Electric Power Service Corporation

1 Riverside Plaza

Columbus, OH 43215



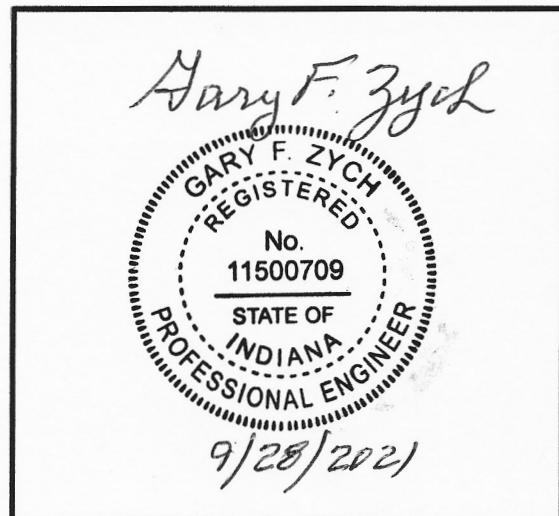
GERS-21-029

INFLOW DESIGN FLOOD CONTROL PLAN
PERIODIC 5-YEAR REVIEW
CFR 257.82
ROCKPORT PLANT
EAST BOTTOM ASH POND

PREPARED BY *Dan Murphy* DATE 9/20/2021
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Gary F. Zych, P.E.
Section Manager – AEP Geotechnical Engineering



I certify to the best of my knowledge, information, and belief that the information contained in this inflow design flood control plan meets the requirements of 40 CFR § 257.82

Table of CONTENTS

1.0 OBJECTIVE	4
2.0 DESCRIPTION OF THE CCR UNIT	4
3.0 INFLOW DESIGN FLOOD 257.82(a)(3)	4
4.0 FLOOD CONTROL PLAN 257.82(c)	4

Attachment A – Hydrologic and Hydraulic Analysis of Rockport East & West Bottom Ash Ponds

1.0 OBJECTIVE

This report was prepared by AEP- Geotechnical Engineering Services (GES) section to fulfill requirements of CFR 257.82 for the hydrologic and hydraulic evaluation of CCR surface impoundments. This report is a summary of the periodic 5-year review of the initial evaluation.

2.0 DESCRIPTION OF THE CCR UNIT

The Rockport Plant is located in Spencer County, Indiana. It is owned and operated by Indiana Michigan Company (IMCO).

The west bottom ash pond and the east bottom ash pond are operated in tandem with their respective waste water ponds. The waste water ponds are capable of discharging to the reclaim water pond (RCWP) or to the clear water pond (CWP).

The bottom ash ponds discharge to their respective waste water ponds via a reinforced concrete vertical drop inlet connected to a 48-inch-diameter pipe. The waste water ponds discharge through a gated structure to either the reclaim pond or to the clear water pond. The reclaim pond discharges to the clear water pond through a 42-inch-diameter pipe. The clear water pond discharges to the Ohio river via a 66-inch-diameter corrugated metal pipe.

3.0 INFLOW DESIGN FLOOD 257.82(a)(3)

The facility is classified as a Low Hazard Potential Dam. This classification has not changed since the initial evaluation. The Inflow Design Flood is the 100-year flood.

4.0 FLOOD CONTROL PLAN 257.82(c)

The catchment area for the East Bottom Ash Pond is limited to the actual pond area itself. In April 2021, a small catchment area of 13 acres was diverted to the east and south of the pond area and no longer drains into the East Bottom Ash Pond.

Attachment A details calculations for passing the inflow design flood. The calculations show that the facility has the capacity to manage the inflow design flood, as well as larger flood events.

ATTACHMENT A

Hydrologic and Hydraulic Analysis of Rockport East & West Bottom Ash Ponds

Project Rockport Bottom Ash Pond Inflow Flood Control
 Prepared By: Dan Murphy
 Date: 10-Sep-21

Rainfall Inputs from NOAA Atlas 14	
24 HR- 100 YR Rainfall	7.23 inches
24 HR- 200 YR Rainfall	8.09 inches
24 HR- 500 YR Rainfall	9.32 inches
24 HR- 1,000 YR Rainfall	10.3 inches

West Bottom Ash Pond	24 HR- 100 YR	24 HR- 200 YR	24 HR- 500 YR	24 HR- 1,000 YR
Catchment Area = Pond Area (acre)	30	30	30	30
Initial WSEL (Max. Operating Pool)	396	396	396	396
Storm water Volume (acre-ft)	18.075	20.225	23.3	25.75
Post Storm Peak Pond Water Level	396.6	396.7	396.8	396.9
Top of Dam Elevation	399	399	399	399
Freeboard (feet)	2.4	2.3	2.2	2.1

East Bottom Ash Pond	24 HR- 100 YR	24 HR- 200 YR	24 HR- 500 YR	24 HR- 1,000 YR
Catchment Area = Pond Area (acre)	30	30	30	30
Initial WSEL (Max. Operating Pool)	396	396	396	396
Storm water Volume (acre-ft)	18.075	20.225	23.3	25.75
Post Storm Peak Pond Water Level	396.6	396.7	396.8	396.9
Top of Dam Elevation	399	399	399	399
Freeboard (feet)	2.4	2.3	2.2	2.1

Assumptions:

1. The Bottom Ash Ponds are operating at the maximum pool levels as shown on AEP Drawing 30027-8 at the start of the storm.
2. The water discharging through the primary discharge structure is equal to the influent discharge rate (i.e. water in = water out).
3. Increased discharge through the outlet structure resulting from increased static water level in the ponds are considered relatively small and are ignored. This is a conservative assumption.
4. Drainage basins for the ponds are equal to the pond areas.

Precipitation Frequency Data Server



NOAA Atlas 14, Volume 2, Version 3
 Location name: Rockport, Indiana, USA*
 Latitude: 37.9171°, Longitude: -87.0363°
 Elevation: 397.71 ft**
* source: ESRI Maps
 ** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M. Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aerials](#)

PF tabular

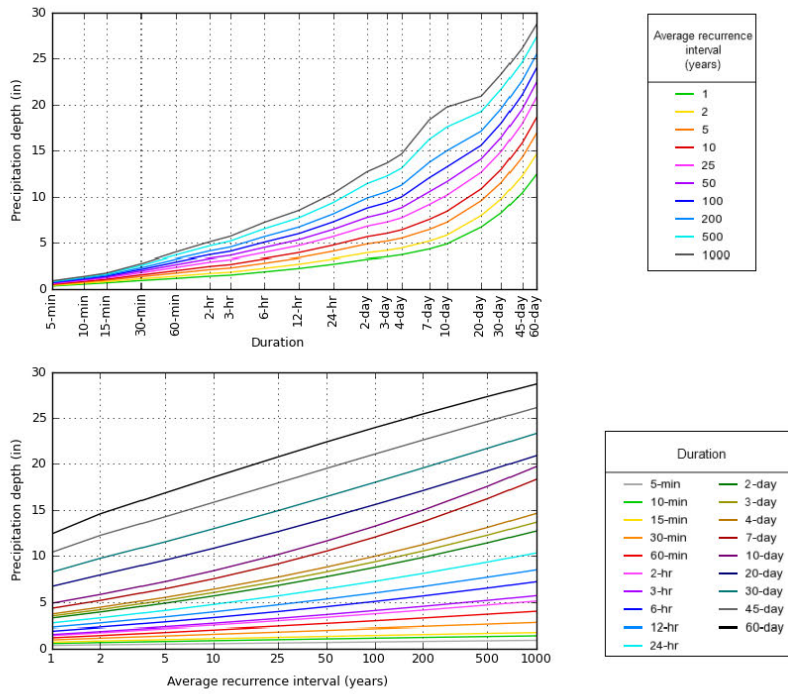
PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches) ¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.362 (0.331-0.396)	0.427 (0.391-0.468)	0.498 (0.456-0.545)	0.556 (0.507-0.607)	0.629 (0.572-0.687)	0.686 (0.620-0.749)	0.739 (0.665-0.807)	0.795 (0.711-0.889)	0.866 (0.768-0.947)	0.919 (0.809-1.01)
10-min	0.571 (0.522-0.625)	0.675 (0.618-0.740)	0.790 (0.724-0.865)	0.877 (0.800-0.959)	0.985 (0.895-1.08)	1.07 (0.966-1.17)	1.15 (1.03-1.25)	1.23 (1.10-1.34)	1.33 (1.18-1.46)	1.40 (1.24-1.54)
15-min	0.709 (0.648-0.776)	0.841 (0.770-0.921)	0.987 (0.904-1.08)	1.10 (1.00-1.20)	1.24 (1.12-1.35)	1.34 (1.21-1.47)	1.44 (1.30-1.58)	1.54 (1.38-1.69)	1.67 (1.48-1.82)	1.76 (1.55-1.93)
30-min	0.960 (0.877-1.05)	1.15 (1.05-1.26)	1.38 (1.27-1.52)	1.57 (1.43-1.71)	1.80 (1.64-1.97)	1.98 (1.79-2.17)	2.16 (1.95-2.36)	2.34 (2.10-2.56)	2.58 (2.29-2.82)	2.76 (2.44-3.03)
60-min	1.19 (1.09-1.30)	1.43 (1.31-1.56)	1.76 (1.61-1.93)	2.02 (1.84-2.21)	2.37 (2.16-2.59)	2.66 (2.40-2.90)	2.95 (2.65-3.21)	3.25 (2.90-3.55)	3.66 (3.24-4.00)	3.98 (3.50-4.36)
2-hr	1.43 (1.31-1.56)	1.73 (1.59-1.88)	2.15 (1.97-2.34)	2.49 (2.28-2.71)	2.95 (2.69-3.20)	3.32 (3.01-3.60)	3.70 (3.34-4.02)	4.10 (3.68-4.46)	4.65 (4.13-5.06)	5.09 (4.48-5.55)
3-hr	1.54 (1.42-1.68)	1.86 (1.71-2.03)	2.31 (2.12-2.52)	2.68 (2.46-2.92)	3.20 (2.91-3.47)	3.62 (3.28-3.93)	4.05 (3.65-4.40)	4.51 (4.04-4.90)	5.16 (4.56-5.61)	5.67 (4.98-6.19)
6-hr	1.89 (1.74-2.07)	2.28 (2.09-2.49)	2.83 (2.60-3.09)	3.29 (3.01-3.59)	3.94 (3.58-4.28)	4.47 (4.04-4.85)	5.04 (4.53-5.47)	5.64 (5.03-6.12)	6.49 (5.71-7.06)	7.19 (6.26-7.83)
12-hr	2.26 (2.07-2.47)	2.72 (2.50-2.98)	3.37 (3.09-3.69)	3.91 (3.57-4.27)	4.67 (4.24-5.10)	5.30 (4.79-5.78)	5.96 (5.38-6.50)	6.67 (5.95-7.27)	7.67 (6.76-8.38)	8.48 (7.39-9.29)
24-hr	2.71 (2.52-2.93)	3.26 (3.03-3.52)	4.06 (3.74-4.38)	4.71 (4.36-5.08)	5.65 (5.19-6.08)	6.42 (5.87-6.91)	7.23 (6.56-7.81)	8.09 (7.28-8.76)	9.32 (8.27-10.1)	10.3 (9.05-11.3)
2-day	3.25 (3.01-3.51)	3.90 (3.61-4.22)	4.85 (4.49-5.25)	5.64 (5.21-6.10)	6.78 (6.22-7.34)	7.73 (7.05-8.38)	8.74 (7.90-9.51)	9.84 (8.81-10.7)	11.4 (10.1-12.5)	12.7 (11.1-14.1)
3-day	3.46 (3.22-3.74)	4.15 (3.86-4.49)	5.17 (4.79-5.59)	6.01 (5.55-6.49)	7.23 (6.64-7.82)	8.25 (7.53-8.94)	9.35 (8.46-10.2)	10.5 (9.45-11.5)	12.2 (10.8-13.5)	13.7 (11.9-15.1)
4-day	3.68 (3.42-3.97)	4.41 (4.10-4.76)	5.48 (5.09-5.92)	6.38 (5.90-6.89)	7.68 (7.07-8.30)	8.77 (8.02-9.51)	9.95 (9.02-10.8)	11.2 (10.1-12.3)	13.1 (11.6-14.4)	14.6 (12.8-16.2)
7-day	4.30 (3.98-4.67)	5.15 (4.78-5.59)	6.42 (5.94-6.97)	7.51 (6.92-8.15)	9.12 (8.35-9.90)	10.5 (9.54-11.4)	12.0 (10.8-13.1)	13.7 (12.2-15.0)	16.2 (14.1-17.9)	18.3 (15.7-20.4)
10-day	4.85 (4.49-5.25)	5.80 (5.38-6.29)	7.20 (6.66-7.80)	8.39 (7.73-9.09)	10.1 (9.28-11.0)	11.6 (10.6-12.6)	13.2 (11.9-14.4)	15.0 (13.4-16.4)	17.6 (15.4-19.4)	19.7 (17.1-21.9)
20-day	6.68 (6.27-7.13)	7.93 (7.45-8.47)	9.54 (8.94-10.2)	10.8 (10.1-11.6)	12.6 (11.8-13.5)	14.1 (13.0-15.1)	15.6 (14.3-16.7)	17.1 (15.7-18.4)	19.2 (17.4-20.9)	20.9 (18.7-22.8)
30-day	8.23 (7.76-8.74)	9.73 (9.17-10.3)	11.5 (10.8-12.2)	13.0 (12.2-13.7)	14.9 (14.0-15.8)	16.4 (15.3-17.5)	18.0 (16.7-19.2)	19.6 (18.1-20.9)	21.7 (19.8-23.3)	23.3 (21.1-25.2)
45-day	10.4 (9.84-11.0)	12.2 (11.6-12.9)	14.3 (13.5-15.0)	15.8 (15.0-16.7)	17.9 (16.9-18.9)	19.5 (18.3-20.6)	21.1 (19.7-22.4)	22.6 (21.1-24.1)	24.6 (22.8-26.3)	26.1 (24.0-28.1)
60-day	12.4 (11.7-13.1)	14.6 (13.8-15.4)	16.9 (16.0-17.8)	18.6 (17.6-19.6)	20.8 (19.6-21.9)	22.4 (21.1-23.7)	23.9 (22.5-25.4)	25.4 (23.8-27.0)	27.3 (25.4-29.1)	28.7 (26.6-30.7)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

[Back to Top](#)

PF graphical

PDS-based depth-duration-frequency (DDF) curves
 Latitude: 37.9171°, Longitude: -87.0363°



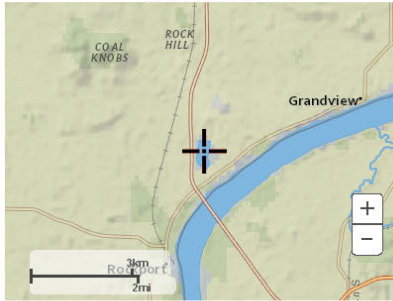
NOAA Atlas 14, Volume 2, Version 3

Created (GMT): Mon Sep 13 12:55:48 2021

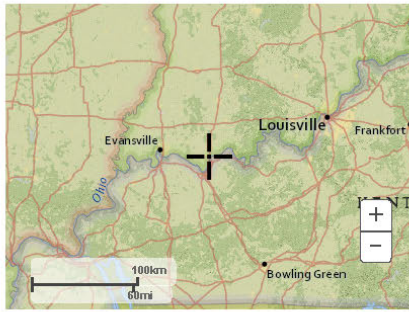
[Back to Top](#)

Maps & aeriels

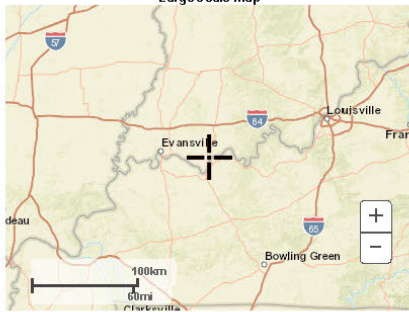
Small scale terrain



Large scale terrain



Large scale map



Large scale aerial



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