

GEI Consultants

Regulation Compliance Report

Pleasant Prairie Power Plant Ash Landfill Run-on and Run-off Control Plan

Pleasant Prairie, Wisconsin

Submitted to:
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Project No. 2103683



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Standard Limitations and Disclaimer

This report was prepared exclusively for the use of WEC ENERGY GROUP. The findings and conclusions, if any provided by GEI in this report, are based solely on the information reported to GEI as of the date of this report. Future investigations or additional information not provided to GEI at the time of this report may result in modification of this report. GEI's scope of work did not include verifying the completeness or accuracy of information provided by others. Accordingly, GEI shall not be liable for any damages, costs, or other consequences resulting from reliance on such information if it is later determined to be inaccurate or incomplete. GEI's professional services for this project have been performed in a manner consistent with that degree of skill and care ordinarily exercised by members of the same profession currently practicing in the same locality, performing similar services under similar conditions. GEI makes no other representations and no warranties, express or implied.

Certification

This plan was completed under the direction of John, M. Trast, P.E. I am a licensed professional engineer in the State of Wisconsin in accordance with the requirements of ch. A-E 4, Wisconsin Administrative Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wisconsin Administrative Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in 40 CFR Part 257 Subpart D.



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Record of Revisions

Identification	Date	Description of Issued and/or Revision
Revision 0	October 2016	Initial submittal
Revision 1	October 2021	This plan was updated in accordance with § 257.81(c)(4) which required the owner or operator of the CCR unit to prepare periodic run-on and run-off control system plans every five years. Updated the existing site conditions and engineering calculations.
Revision 2	June 2022	Update of the October 2021 Run-on and Run-off Control Plan. This plan was updated in accordance with § 257.81(c)(2) which required the owner or operator of the CCR unit to amend the plan whenever there is a change in conditions that would substantially affect the written plan in effect. The landfill is now closed. The Wisconsin Department of Natural Resources approved the construction documentation report on June 17, 2022.
Revision 3	October 2026	This plan was updated in accordance with § 257.81(c)(4) which required the owner or operator of the CCR unit to prepare periodic run-on and run-off control system plans every five years. This update is occurring in October 2026 so all WEC Run-On and Run-off Control Plans are on the same schedule.

1. Introduction

WEC Energy Group (WEC) owns and operates a solid waste disposal facility adjacent to the Pleasant Prairie Power Plant (PPPP) in Section 9, Township 1 North, Range 22 East, in the village of Pleasant Prairie, Kenosha County, Wisconsin. The landfill property is bounded on the north by State Highway 50 (75th Street), on the south by Bain Station Road, and on the east and west by active rail lines. The WEC PPPP Ash Landfill is regulated as an industrial waste landfill by the Wisconsin Department of Natural Resources (WDNR) under the provisions of Chapter 289 Wisconsin State Statues, and all applicable requirements of Chapters NR 500 of the Wisconsin Administrative Code. The design, construction, operation, closure, and post-closure care requirements are specified in the WDNR conditionally approved Plan of Operations, License No. 2786, FID# 230056310. PPPP consists of one cell that went into operation during the 4th Quarter of 2014. Under normal conditions and circumstances, nearly 100 percent of CCR generated at the PPPP was beneficially used. Disposal activities at the landfill were generally limited to CCR system cleanings during PPPP outages and other special events. PPPP ceased commercial operation in early 2018. Final cover was installed over the eastern 2.6 acres of Cell 1 in 2018, the middle 3.2 acres of final cover was installed in 2020, and the final western 1.3 acres of final cover was installed over the landfill in 2021. The landfill began the 40-year long-term care period with the issuance of the Phase 3 Documentation Report approval from the Wisconsin Department of Natural Resources dated June 17, 2022.

In addition to the state regulations, the landfill is also required to comply with 40 CFR Part 257 Subpart D – *Standards for Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments* and is defined as a CCR unit and existing CCR landfill in accordance with § 257.53.

This report fulfills the requirements of § 257.81 - *Run-on and run-off controls for CCR landfills* for the PPPP Ash Landfill, Cell 1, which specifies that the owner or operator must complete the assessments required by these sections every five years. In accordance with 257.81(c)(1), this report describes how the run-on and run-off control systems have been designed and constructed to meet the applicable requirements and are supported by appropriate engineering calculations.

This run-off and run-on system control plan includes the following sections:

- Section 1 – Introduction
- Section 2 – Storm and Stormwater Volume Determination
- Section 3 – Run-on Control System
- Section 4 – Run-off Control System
- Section 5 – Conclusion
- Section 6 – References

2. Storm and Stormwater Volume Determination

§ 257.81 *Run-on and run-off controls for CCR landfills* requires that the owner or operator of an existing or new CCR landfill or any lateral expansion of a CCR landfill must design, construct, operate, and maintain a run-on control system to prevent flow onto the active portion of the CCR unit during the peak discharge from a 24-hour, 25-year storm; and a run-off control system from the active portion of the CCR unit to collect and control at least the water volume resulting from a 24-hour, 25-year storm.

PPPP Ash Landfill Cell 1 is approximately 7.1 acres in total size. At the date of this report, all 7.1 acres have received final cover, no active portions of the landfill exist, and any precipitation that falls on the final cover system is directed away from the closed landfill. Approximately 2.04 acres of land to the south of the covered waste also need drainage, bringing the total to 9.14 acres of run-off. This report documents the adequacy of the closed landfill stormwater management system to properly collect and control run-off flows. Drawings No. 1 – Final Cover Grades (Appendix A) shows the documented final landfill grades as of December 8, 2021.

The rainfall depth estimate for a 24-hour, 25-year storm for the PPPP Ash Landfill was determined following the procedures outlined in Precipitation-Frequency Atlas of the United States, Atlas 14, Volume 8, Version 2: Wisconsin. For the PPPP Ash Landfill a 24-hour, 25-year storm will result in 4.52 inches of rainfall. Calculations for determining the 24-hour, 25-year storm event are included in Appendix B: NOAA 14, Vol. 8 Rainfall Analysis and Run-off Volume.

Table 2-1 summarizes the storm recurrence interval, rainfall depth, lined area of the CCR landfill, and minimum stormwater volume required to be managed within Cell 1.

Table 2-1. Summary of Rainfall Precipitation and Run-off Volume Data

Storm Recurrence Interval	Rainfall Depth (inches)	Extents of Run-off (acres)	Run-off Volume (acre-ft)
24-hour, 25-year	4.52	9.14	3.44

3. Run-on Control System

§ 257.81(a)(1) requires a run-on control system to prevent flow onto the active portions of the CCR unit during the peak discharge from a 24-hour, 25-year storm. The federal rule defines "Run-on" as "any rainwater, leachate, or other liquid that drains over land onto any part of a CCR landfill."

Final cover was installed over the eastern 2.6 acres of Cell 1 in 2018, the middle 3.2 acres in 2020, and the final western 1.3 acres in 2021. Run-on control systems for PPPP Ash Landfill Cell 1 are not applicable to preventing flow onto active portions of the CCR during 24-hour, 25-year storm since there are no active portions of the landfill.

The perimeters on the north, west, and east sides of the landfill slope downward to convey stormwater away from the covered waste. Along the south side of the landfill, an intercell berm was constructed to prevent run-on from south of the landfill. A perimeter ditch along the outboard edge of the intercell berm directs run-on stormwater to the west and southwest away from the landfill as shown by the grades on Drawing 1 in Appendix A. Stormwater drainage in the perimeter ditch is then directed away from the landfill and eventually flows southward discharging to the unnamed tributaries of Jerome Creek.

Because Cell 1 is graded in such a way that does not allow run-on onto the cell, a HydroCAD model is not provided for this section. These features prevent run-on to the landfill system, so a numerical stormwater model was not completed to confirm that the current run-on control system for the closed landfill adequately manages a 24-hour, 25-year precipitation event. No active landfill surface is exposed to the atmosphere; therefore, contact stormwater cannot be generated.

The south side of the landfill, including the area permitted by the state of Wisconsin for future lateral expansion, is protected from the 1-percent-annual-chance or greater flood hazard by a levee system that has been accredited by the Federal Emergency Management Agency (FEMA), as shown in Appendix C – FEMA National Flood Insurance Rate Maps. The floodplain levee was constructed to protect a portion of the permitted landfill space from being within the 100-year floodplain of the Unnamed Tributary No. 2 and No. 3 to Jerome Creek. Based on a review of current topography and FEMA Flood Levee Certification (GEI, 2013) the PPPP Ash Landfill has an acceptable run-on control system that follows current engineering standards and is in compliance with § 257.81(a)(1).

4. Run-off Control System

§ 257.81(a)(2) requires a run-off control system from the active portion of the CCR unit to collect and control at least the water volume resulting from a 24-hour, 25-year storm. The federal rule defines "Run-off" as "any rainwater, leachate, or other liquid that drains over land from any part of a CCR landfill."

A stormwater run-off model was completed to confirm that the current run-off control system for the operation of PPPP Ash Landfill Cell 1 can adequately manage a 24-hour, 25-year precipitation event of 4.52 inches. Stormwater flow was modeled using HydroCAD 10.0 to evaluate the landfill in its post-closure condition. The stormwater model details and run-off calculations are included in Attachment D – Stormwater Run-off Calculations.

Stormwater on the closed cell was divided into two subcatchments. The first consists of the northern 4.46 acres of final cover area and flow from here is directed away from the covered waste and is allowed to infiltrate into the ground. The second subcatchment includes the southern 2.64 acres of final cover and an additional 2.04 acres of conveyance ditch area. Run-off from here goes to the west outlet ditch which is directed southward away from the landfill discharging to unnamed tributaries of Jerome Creek.

Based on the analysis, the run-off control system for PPPP Ash Landfill Cell 1 is able to manage and control the run-off from a 24-hour, 25-year precipitation event. The estimated peak water level in the west conveyance channel is 0.94 feet. The minimum depth of the channel is 2 feet. Based on stormwater run-off analysis, the current run-off control system for Cell 1 will be able to handle the 24-hour, 25-year precipitation event without the west outlet ditch overflowing.

5. Conclusion

The PPPP Ash Landfill is regulated under 40 CFR Part 257 Subpart D as an existing CCR landfill. The rule specifies that an existing CCR landfill must develop plans to meet certain meet operating criteria designated by October 17, 2016, and that the owner or operator must also conduct and complete the assessments required by this section every five (5) years maximum based on the completion date of this plan. In addition, the written plan must be amended whenever there is a change in conditions that would substantially affect the current written plan. This revision is an update to the June 2022 plan. The revised plan must be placed in the facility's operating record as required by §257.105(g). The owner or operator of the CCR unit must comply with the recordkeeping requirements specified in § 257.105(g), the notification requirements specified in § 257.106(g), and the internet requirements specified in § 257.107(g).

This report documents that the PPPP Ash Landfill has an established run-on and run-off control system design capable of controlling the peak discharge from a 25-year, 24-hour storm event and complies with § 257.81 Run-on and run-off controls for CCR landfills. All leachate that is collected at the PPPP Landfill is hauled to the Kenosha Water Utility wastewater treatment facility; thus, it complies with § 257.3-3.

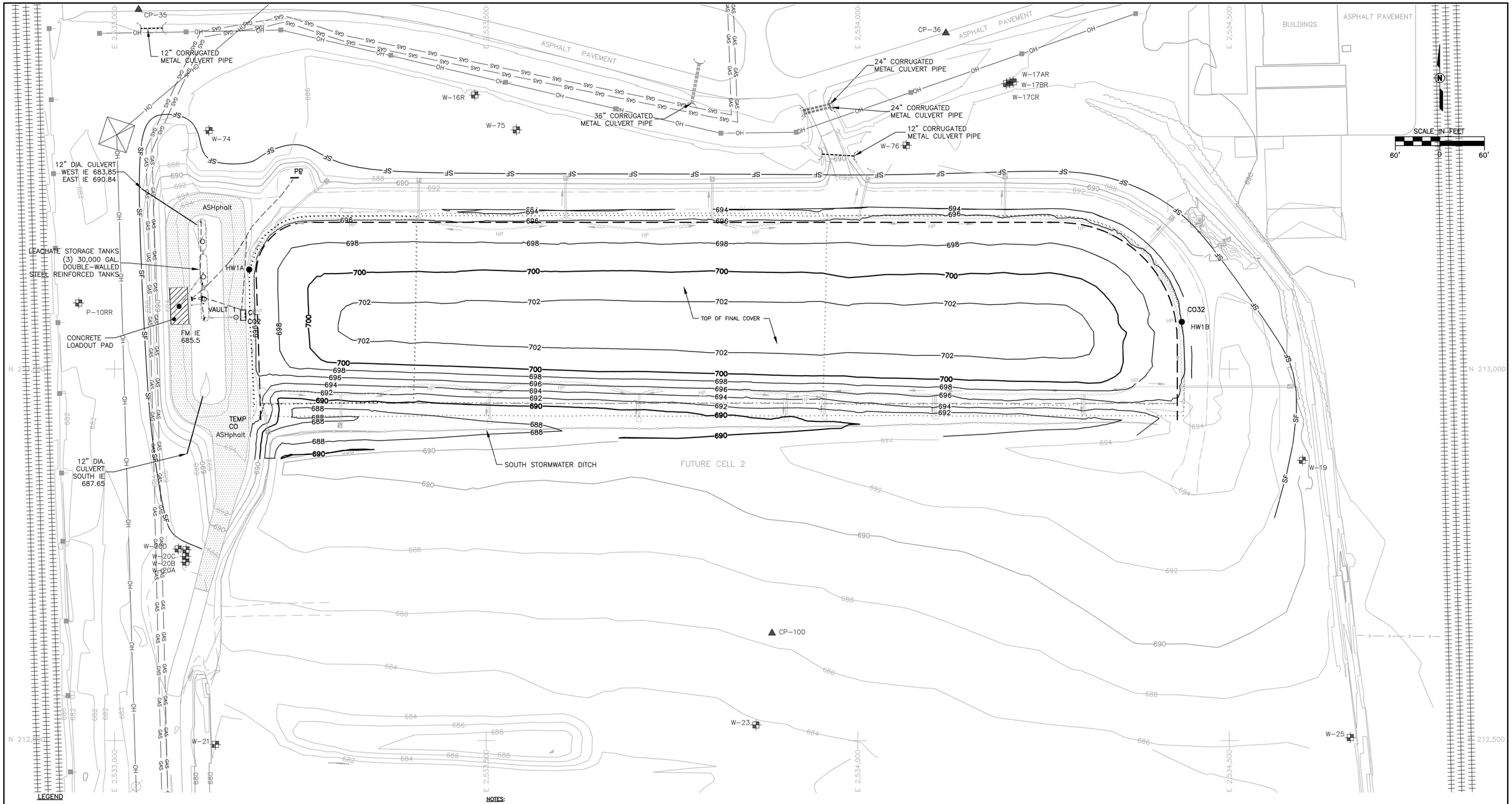
6. References

AECOM (2012). Plan of Operation Modification, Pleasant Prairie Power Plant Ash Landfill, WDNR License #2786; FID # 230056310, Pleasant Prairie, Wisconsin. April 4, 2012.

GEI (2013). FEMA Floodplain Levee Certification. We Energies Pleasant Prairie Ash Landfill Floodplain Levee Certification, Pleasant Prairie, Wisconsin. June 5, 2013.

Perica, S., D. Martin, S. Pavlovic, I. Roy, M. St. Laurent, C. Trypaluk, D. Unruh, M. Yekta, G. Bonnin (2013). NOAA Atlas 14 Volume 8 Version 2.0, Precipitation-Frequency Atlas of the United States, Midwestern States. National Oceanic and Atmospheric Administration, National Weather Service, Silver Spring, Maryland.

Appendix A Drawing No. 1 – Final Cover Grades



LEGEND

- EXISTING GROUND SURFACE CONTOUR
- ROAD, NON PAVED
- ROAD, PAVED
- FENCE
- TREES/BRUSH
- CULVERT
- BUILDINGS
- GAS PIPE
- FIBER COMMUNICATIONS
- OVERHEAD ELECTRIC
- ELECTRIC TOWER
- RAILROAD TRACKS
- LANDFILL LIMIT OF WASTE
- LANDFILL CELL BOUNDARY
- MONITORING WELL
- SURVEY CONTROL MONUMENT
- STEEL POLE ELECTRIC TRANSMISSION TOWER
- RAILROAD TELEPHONE POLE
- MONUMENT FOUND
- GEOMEMBRANE ANCHOR TRENCH
- LEACHATE COLLECTION CLEANOUT
- LEACHATE COLLECTION VAULT
- LEACHATE TRANSFER PIPE
- LEACHATE HEADWELL
- WISDOT E1 BITUMINOUS ASHphalt PAVEMENT
- ASH CONTOUR (5/18/2021)
- SILT FENCE
- FINAL COVER CONTOUR WITHIN FINAL COVER AREA (12/8/2021)
- DOCUMENTATION POINT NUMBER & DESCRIPTION
- FINAL COVER GEOMEMBRANE LIMIT
- COVER DRAIN PIPE & TOP OF PIPE ELEV. (PERFORATED)
- COVER OUTLET DRAIN PIPE & TOP OF PIPE ELEV. (NON-PERFORATED)

NOTES:

1. HORIZONTAL DATUM BASED ON WISCONSIN STATE PLANE COORDINATES SOUTH ZONE, NAD 83.
2. VERTICAL DATUM BASED ON REFERENCE MARK, WISCONSIN DIVISION OF HIGHWAYS. ALUMINUM CAP SET IN TOP OF EAST END OF CONCRETE BRIDGE WALL, 2.7' ABOVE GROUND, ELEVATION 715.42. CAP IS LOCATED 1.2' WEST OF TOP BEVEL. THE CONCRETE BRIDGE IS LOCATED WHERE STH "50" CROSSES THE CP RAILROAD TRACKS ON THE NORTHWEST SIDE OF THE SITE. ELEVATIONS REFERENCED TO NAVD 88.
3. CELL 1 CONSTRUCTION DOCUMENTATION SURVEY PERFORMED BY CQM, INC. ON NOVEMBER 21, 2013.
4. CELL 1 TOP OF FINAL COVER AREA DRAINAGE PIPE SURVEY PERFORMED BY EDGERTON ON DECEMBER 1, 2021.
5. CELL 1 TOP OF FINAL COVER SURVEY PERFORMED BY EDGERTON ON DECEMBER 8, 2021.

CONTROL POINT DATA

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
10	213741.91	2532958.45	715.42	BM B-30-48-78: ALUMINUM CAP ON TOP OF CONCRETE WALL
30	211877.98	2533092.40	684.09	CUT CROSS
31	210593.02	2533131.43	683.92	CUT CROSS
32	208734.70	2533178.76	681.48	MAG NAIL
33	209470.52	2534928.84	683.53	IPI1" W/CAP
34	211916.15	2534703.67	682.90	IPI1" W/CAP
35	213483.71	2533032.15	686.41	MAG NAIL
36	213452.09	2534118.49	687.83	MAG NAIL
100	212644.65	2533884.50	691.25	RBR W/CAP

Attention:

0 1"

If this scale bar does not measure 1" then drawing is not original scale.

NO.	DATE	ISSUE/REVISION	APP
0	X	X	X

Designed: JXT
Checked: JXT
Drawn: JLC
Submittal Date: 2/16/2022

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PLEASANT PRAIRIE POWER PLANT
ASH LANDFILL
CELL 1 PHASE 3 PARTIAL CLOSURE
CONSTRUCTION DOCUMENTATION

FINAL COVER GRADES

DWG. NO. 1

SHEET NO. 1

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Appendix B NOAA 14, Vol 8 Rainfall Analysis and Run-off Volume

GEI Consultants	**Client**	WEC Energy Group			**Page**	1 of 4
	Project	PPPP LF Run-on and Run-off Control Plan			**Rev.**	0
	By	A. Schwoerer	**Chk.**	J. Trast	**App.**	J. Trast
	Date	10/5/2026	**Date**	10/16/2026	**Date**	10/16/2026
GEI Project No.	2103683	**Document No.**	N/A			
Subject	NOAA 14, Vol. 8 Rainfall Analysis and Run-off Volume					

Purpose:

The purpose of this calculation is to estimate the 24-hr, 25-yr precipitation event at Pleasant Prairie Power Plant (PPPP) landfill. The 24-hr, 25-yr precipitation event is required for the run-on and run-off control system plan for the landfill.

Procedure:

The rainfall depth estimation follows the procedures outlined in Precipitation-Frequency (PF) Atlas of the United States (Atlas 14, Volume 8, Version 2: Wisconsin).

As instructed in Atlas 14, the user is referred to the NOAA Precipitation Frequency Data Server (PFDS) http://hdsc.nws.noaa.gov/hdsc/pfds/index.html. The approximate center of the landfill was inputted into the PFDS and the PF estimates were returned.

Landfill Centroid Coordinates

42°33'53.64"N 42.5649°

87°54'6.84"W -87.9019°



Tabular Output from the PFDS:

PDS-based precipitation frequency estimates with 90% confidence intervals (in inches)[1]

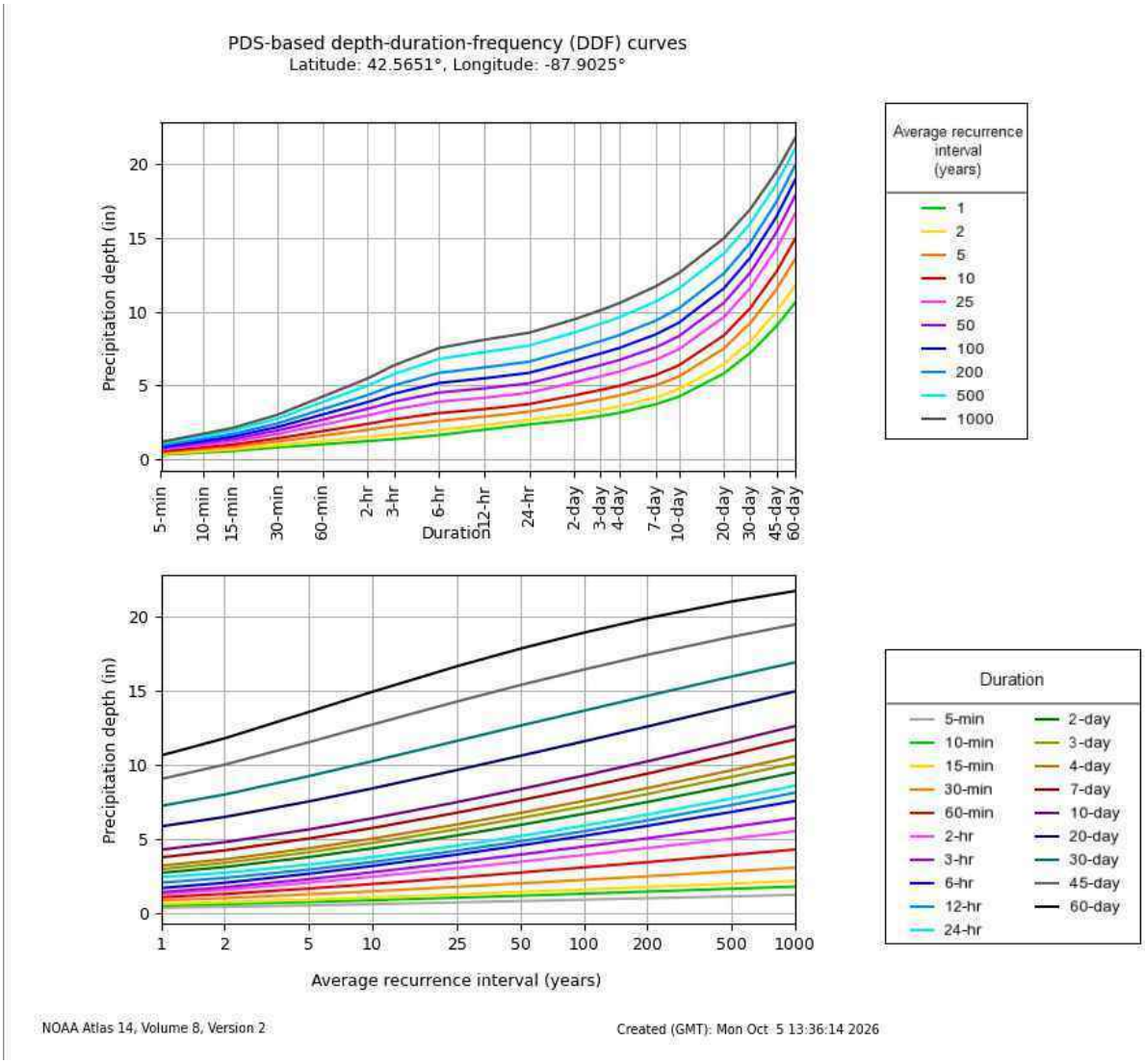
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.333** (0.266-0.415)	**0.392** (0.313-0.488)	**0.491** (0.390-0.611)	**0.573** (0.453-0.716)	**0.690** (0.529-0.879)	**0.782** (0.587-1.00)	**0.875** (0.636-1.14)	**0.971** (0.680-1.28)	**1.10** (0.743-1.48)	**1.20** (0.791-1.62)
10-min	**0.488** (0.390-0.607)	**0.575** (0.458-0.715)	**0.718** (0.571-0.895)	**0.840** (0.664-1.05)	**1.01** (0.775-1.29)	**1.14** (0.859-1.47)	**1.28** (0.932-1.67)	**1.42** (0.995-1.88)	**1.61** (1.09-2.16)	**1.76** (1.16-2.38)
15-min	**0.595** (0.475-0.740)	**0.701** (0.559-0.872)	**0.876** (0.696-1.09)	**1.02** (0.810-1.28)	**1.23** (0.945-1.57)	**1.40** (1.05-1.79)	**1.56** (1.14-2.03)	**1.73** (1.21-2.29)	**1.96** (1.33-2.64)	**2.14** (1.41-2.90)
30-min	**0.831** (0.663-1.03)	**0.982** (0.783-1.22)	**1.23** (0.980-1.54)	**1.44** (1.14-1.80)	**1.74** (1.34-2.22)	**1.97** (1.48-2.53)	**2.21** (1.61-2.87)	**2.45** (1.72-3.24)	**2.78** (1.88-3.73)	**3.03** (2.00-4.10)
60-min	**1.04** (0.833-1.30)	**1.26** (1.01-1.57)	**1.62** (1.29-2.02)	**1.93** (1.53-2.41)	**2.36** (1.81-3.02)	**2.70** (2.03-3.47)	**3.05** (2.22-3.97)	**3.41** (2.38-4.50)	**3.89** (2.63-5.22)	**4.26** (2.81-5.76)
2-hr	**1.26** (1.02-1.54)	**1.54** (1.24-1.90)	**2.02** (1.62-2.48)	**2.42** (1.94-2.99)	**2.99** (2.32-3.77)	**3.43** (2.61-4.36)	**3.89** (2.87-5.01)	**4.36** (3.10-5.70)	**5.00** (3.42-6.64)	**5.49** (3.67-7.35)
3-hr	**1.38** (1.12-1.69)	**1.71** (1.39-2.09)	**2.26** (1.83-2.76)	**2.73** (2.20-3.34)	**3.39** (2.66-4.26)	**3.92** (3.00-4.95)	**4.46** (3.31-5.71)	**5.02** (3.59-6.53)	**5.78** (4.00-7.64)	**6.37** (4.30-8.48)
6-hr	**1.66** (1.36-2.00)	**2.01** (1.66-2.43)	**2.62** (2.15-3.17)	**3.15** (2.57-3.82)	**3.92** (3.11-4.88)	**4.53** (3.53-5.68)	**5.18** (3.91-6.58)	**5.86** (4.26-7.56)	**6.80** (4.78-8.92)	**7.54** (5.16-9.94)
12-hr	**2.03** (1.69-2.41)	**2.34** (1.95-2.79)	**2.90** (2.41-3.47)	**3.41** (2.82-4.09)	**4.18** (3.38-5.16)	**4.81** (3.80-5.98)	**5.49** (4.21-6.93)	**6.22** (4.60-7.98)	**7.26** (5.19-9.45)	**8.09** (5.63-10.6)
24-hr	**2.38** (2.01-2.81)	**2.69** (2.27-3.17)	**3.24** (2.72-3.83)	**3.75** (3.13-4.44)	**4.52** (3.71-5.53)	**5.17** (4.14-6.35)	**5.86** (4.56-7.32)	**6.62** (4.97-8.40)	**7.70** (5.59-9.93)	**8.57** (6.06-11.1)
2-day	**2.69** (2.30-3.13)	**3.08** (2.62-3.58)	**3.75** (3.18-4.36)	**4.34** (3.67-5.07)	**5.21** (4.31-6.26)	**5.92** (4.80-7.17)	**6.67** (5.25-8.20)	**7.47** (5.68-9.34)	**8.58** (6.32-10.9)	**9.47** (6.80-12.1)
3-day	**2.94** (2.53-3.40)	**3.36** (2.88-3.88)	**4.08** (3.49-4.71)	**4.71** (4.01-5.46)	**5.63** (4.69-6.72)	**6.38** (5.21-7.66)	**7.16** (5.69-8.75)	**8.00** (6.14-9.94)	**9.16** (6.80-11.6)	**10.1** (7.31-12.8)
4-day	**3.17** (2.74-3.63)	**3.60** (3.10-4.13)	**4.34** (3.74-4.99)	**4.99** (4.28-5.76)	**5.95** (4.99-7.06)	**6.72** (5.52-8.04)	**7.54** (6.02-9.16)	**8.40** (6.49-10.4)	**9.61** (7.18-12.1)	**10.6** (7.71-13.4)
7-day	**3.73** (3.26-4.24)	**4.20** (3.66-4.78)	**5.00** (4.35-5.70)	**5.71** (4.94-6.52)	**6.74** (5.71-7.91)	**7.58** (6.29-8.96)	**8.45** (6.83-10.2)	**9.38** (7.33-11.5)	**10.7** (8.08-13.3)	**11.7** (8.65-14.7)
10-day	**4.25** (3.74-4.80)	**4.76** (4.17-5.37)	**5.62** (4.92-6.35)	**6.37** (5.55-7.22)	**7.45** (6.36-8.68)	**8.33** (6.97-9.79)	**9.24** (7.52-11.0)	**10.2** (8.04-12.4)	**11.5** (8.81-14.3)	**12.6** (9.39-15.8)
20-day	**5.82** (5.18-6.48)	**6.45** (5.74-7.20)	**7.50** (6.66-8.38)	**8.39** (7.40-9.39)	**9.62** (8.29-11.0)	**10.6** (8.96-12.2)	**11.6** (9.53-13.6)	**12.6** (10.0-15.1)	**13.9** (10.8-17.0)	**14.9** (11.3-18.5)
30-day	**7.20** (6.46-7.96)	**7.97** (7.14-8.82)	**9.21** (8.23-10.2)	**10.2** (9.10-11.4)	**11.6** (10.0-13.1)	**12.6** (10.7-14.4)	**13.6** (11.3-15.9)	**14.6** (11.8-17.4)	**15.9** (12.4-19.3)	**16.9** (12.9-20.8)
45-day	**9.02** (8.15-9.89)	**9.98** (9.02-11.0)	**11.5** (10.4-12.7)	**12.7** (11.4-14.0)	**14.2** (12.4-15.9)	**15.4** (13.2-17.4)	**16.4** (13.7-18.9)	**17.4** (14.1-20.5)	**18.6** (14.6-22.4)	**19.4** (15.0-23.8)
60-day	**10.6** (9.64-11.6)	**11.8** (10.7-12.8)	**13.5** (12.3-14.8)	**14.9** (13.4-16.4)	**16.6** (14.5-18.4)	**17.8** (15.3-20.0)	**18.9** (15.9-21.6)	**19.9** (16.2-23.2)	**21.0** (16.6-25.0)	**21.7** (16.9-26.4)

[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.

Graphical Output from the PFDS:



GEI Consultants	Client	WEC Energy Group			Page	4 of 4
	Project	PPPP LF Run-on and Run-off Control Plan			Rev.	0
	By	A. Schwoerer	Chk.	J. Trast	App.	J. Trast
	Date	10/5/2026	Date	10/16/2026	Date	10/16/2026
GEI Project No.	2103683	Document No.	N/A			
Subject	NOAA 14, Vol. 8 Rainfall Analysis and Run-off Volume					

Regulations:

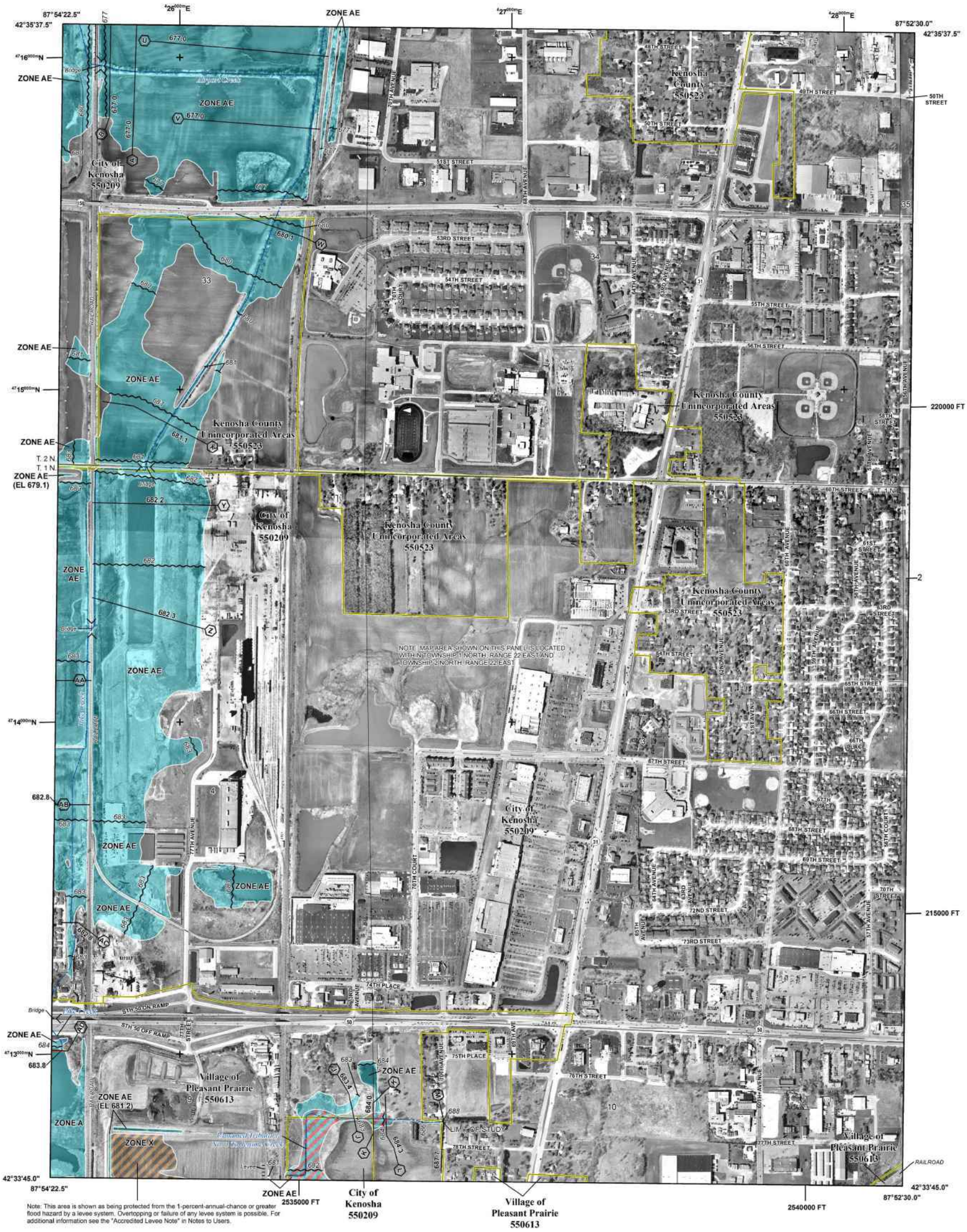
The PPPP Landfill is regulated under 40 CFR Part 257 Subpart D – Standards for Disposal of Coal Combustion Residuals (CCR) in Landfills and Surface Impoundments as an existing landfill. The regulations specify that the landfill must have the following plans in place:

- A run-on control system to prevent flow onto the active portion of the CCR unit during the peak discharge from a 24-hour, 25-year storm.
- A run-off control system from the active portion of the CCR unit to collect and control at least the water volume resulting from a 24-hour, 25-year storm.

Conclusion:

The 24-hour, 25-year storm for the PIPP Landfill is 4.52 inches. This value will be utilized in the stormwater run-off model (under a separate calculation package).

Appendix C FEMA National Flood Insurance Rate Maps



Note: This area is shown as being protected from the 1-percent-annual-chance or greater flood hazard by a levee system. Overtopping or failure of any levee system is possible. For additional information see the "Accredited Levee Note" in Notes to Users.

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT HTTP://MSC.FEMA.GOV

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2 % Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee See Notes. *Zone X*

OTHER AREAS
- NO SCREEN Areas of Minimal Flood Hazard *Zone X*
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 18.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Base map information shown on this FIRM derived from digital orthophotography provided by Southeastern Wisconsin Regional Planning Commission (SEWRPC). The Orthoimagery was collected in Spring of 2010 and produced at a resolution of three-inch pixel size.

ACCREDITED LEVEE NOTES TO USERS: Check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection for areas on this panel. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at http://www.fema.gov/business/nfip/index.shtm.

SCALE

Map Projection:
NAD 1983 UTM Zone 16N;
Western Hemisphere; Vertical Datum: NAVD 88

1 inch = 500 feet 1:6,000

0 500 1,000 2,000 Feet

0 125 250 500 Meters

PANEL LOCATOR

Kenosha County	0182	0201
0183	0184	0203*
0191	0192	0211

*PANEL NOT PRINTED

FEMA

National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

KENOSHA COUNTY, WI
and Incorporated Areas

PANEL 184 OF 331

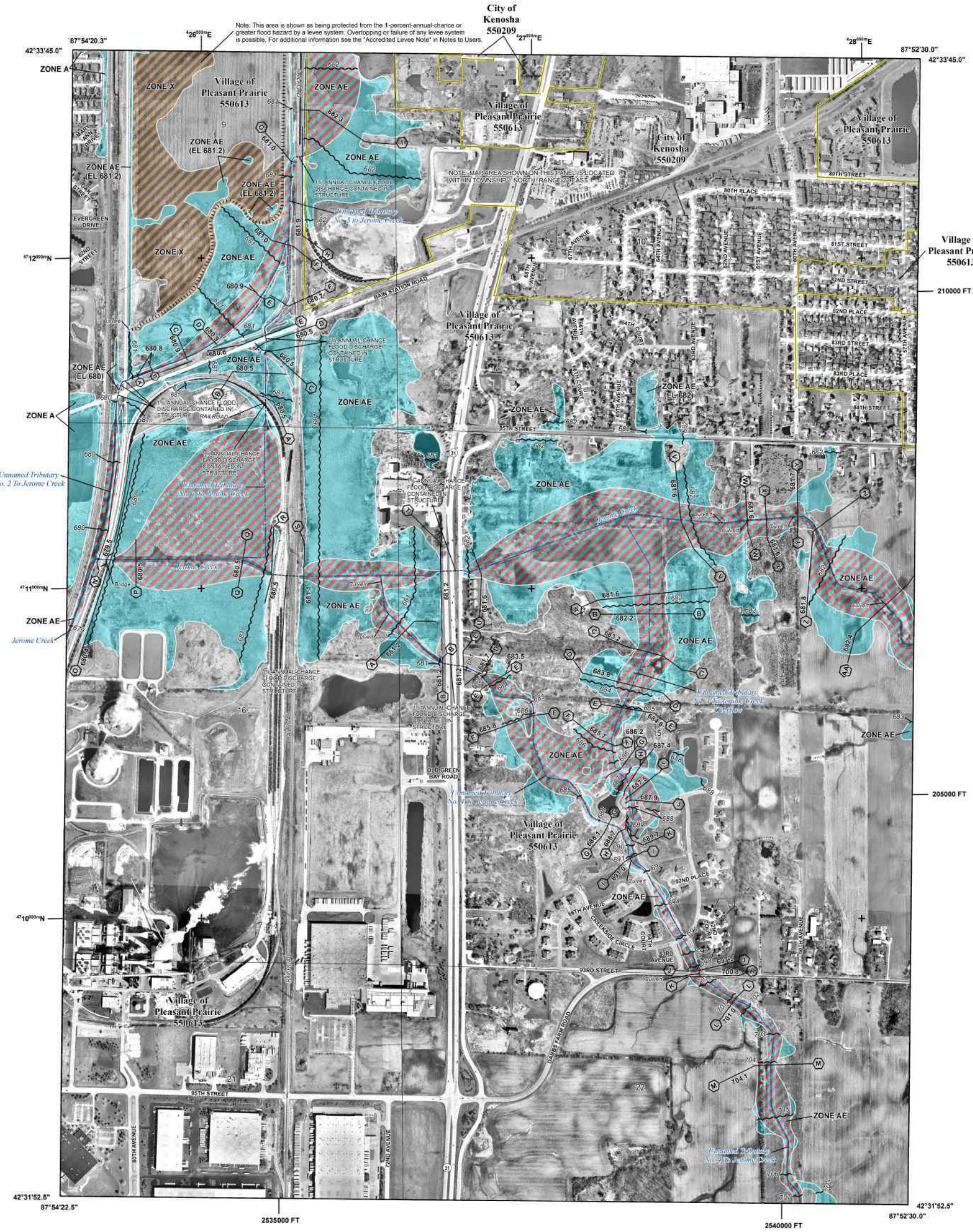
Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
KENOSHA COUNTY	550523	0184	E
KENOSHA, CITY OF	550209	0184	E
PLEASANT PRAIRIE, VILLAGE OF	550613	0184	E

VERSION NUMBER
2.3.3.0

MAP NUMBER
55059C0184E

MAP REVISED
MARCH 7, 2017



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT HTTP://MSC.FEMA.GOV

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OTHER AREAS OF FLOOD HAZARD
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- NO SCREEN Areas of Minimal Flood Hazard *Zone X*
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OTHER FEATURES
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- Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

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ACCREDITED LEVEE NOTES TO USERS: Check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection for areas on this panel. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at http://www.fema.gov/business/nfip/index.shtm.

SCALE

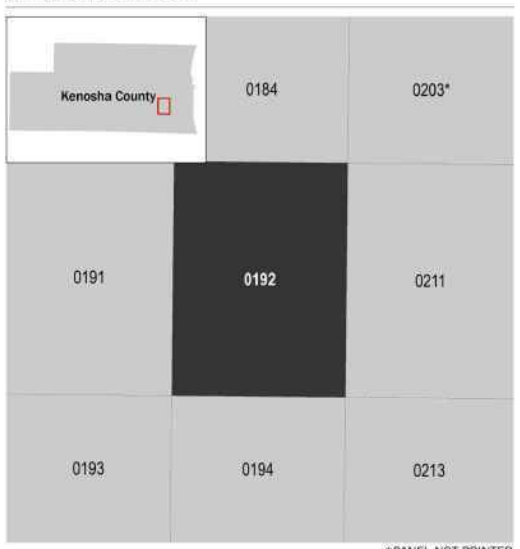
Map Projection:
NAD 1983 UTM Zone 16N;
Western Hemisphere; Vertical Datum: NAVD 88

1 inch = 500 feet 1:6,000

0 500 1,000 2,000 Feet

0 125 250 500 Meters

PANEL LOCATOR



*PANEL NOT PRINTED

FEMA

National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

KENOSHA COUNTY, WI
and Incorporated Areas

PANEL 192 OF 331

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
KENOSHA COUNTY	550209	0192	E
PLEASANT PRAIRIE, VILLAGE OF	550613	0192	E

VERSION NUMBER
2.3.3.0

MAP NUMBER
55059C0192E

MAP REVISED
MARCH 7, 2017

Appendix D Stormwater Run-off Calculations

GEI Consultants	**Client**	WEC Energy Group			**Page**	1
	Project	PPPP LF Run-on and Run-off Control Plan			**Rev.**	0
	By	A. Schwoerer	**Chk.**	J. Trast	**App.**	J. Trast
	Date	10/5/2026	**Date**	10/16/2026	**Date**	10/16/2026
GEI Project No.	2103683	**Document No.**	N/A			
Subject	Stormwater Run-off Calculations					

Purpose:

The purpose of this calculation is to model the stormwater run-off associated with 24-hour, 25-year precipitation event at Pleasant Prairie Power Plant (PPPP) Landfill from Cell 1. In addition, this analysis was completed to confirm the current run-off control system for the construction of Cell 1 can adequately manage the 24-hour, 25-year precipitation event.

Design Criteria and Assumptions:

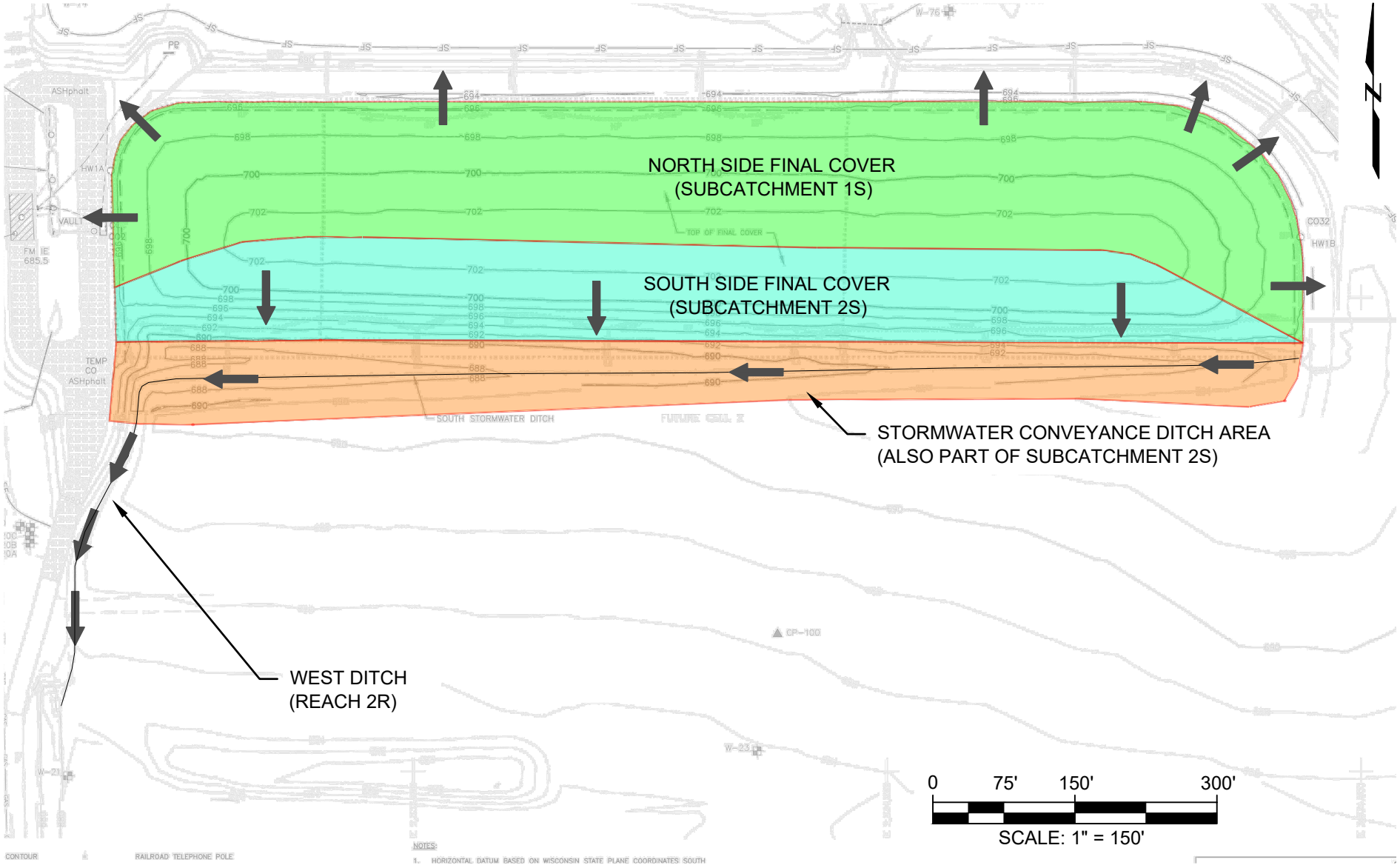
1. The rainfall depth estimation for the 24-hour, 25-year event was determined to be 4.52 inches (included under a separated calculation package). The rainfall depth was determined by following procedures outlined in Precipitation-Frequency (PF) Atlas of the United States (Atlas 14, Volume 8, Version 2: Wisconsin).
2. Stormwater on the active portion of the Cell was divided into two subcatchments. Subcatchment 1S consists of the northern 4.46 acres of final cover area, as shown on Figure 1. Run-off from 1S flows away from the covered waste and is allowed to infiltrate into the ground. Subcatchment 2S includes the southern 2.64 acres of final cover and an additional 2.04 acres of conveyance ditch area. Run-off from 2S goes to the west outlet ditch which is directed southward away from the landfill discharging to unnamed tributaries of Jerome Creek. Stormwater flowlines, subcatchments, and the conveyance ditch area are shown on Figure 1.
3. The west outlet ditch is modeled conservatively as 12-feet wide, 2-feet deep, with a bottom width of 2 feet.
4. HydroCAD 10.0 was used to model the stormwater associated with Cell 1 of the PPPP landfill.
5. Subcatchment, reach, and detention parameters are included in the attached HydroCAD Report.

Results:

The attached HydroCAD report includes input and output for the stormwater run-off model developed for Cell 1 of the PPPP landfill. The estimated peak water level in the west outlet ditch is 0.94 feet, which is less than the minimum depth of 2 feet. Based on stormwater run-off analysis, the current run-off control system for Cell 1 of PPPP landfill will be able to handle the 24-hour, 25-year precipitation event without the west outlet ditch overflowing.

Attachments:

- Figure 1 –Stormwater Conveyance Diagram
- HydroCAD Summary Report

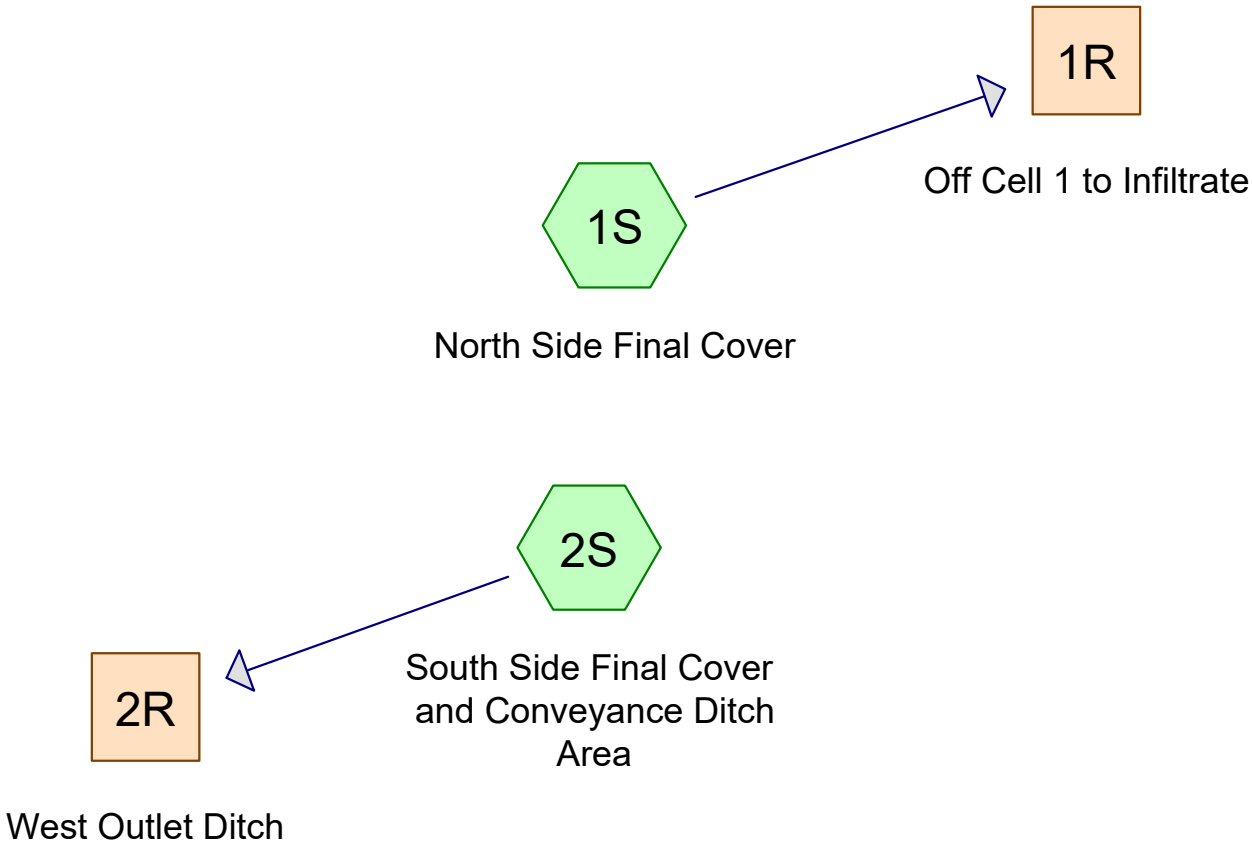


SOURCE:

1. PLAN BASED ON DWG 1, PPPP ASH LANDFILL CELL 1, SUBMITTAL DATE 2/16/2022

Run-on and Run-off Control Plan Revision 2 Pleasant Prairie Ash Landfill Cell #1 Pleasant Prairie, Wisconsin	GEI Consultants	Run-Off Stormwater Flow Diagram
We Energies Milwaukee, Wisconsin	Project 2103683	February 2022 Fig. 1

\\grb-pzcc-1\ J:\Landfills\WE - P4\1610534_run-on run-off control plan\dwgs\2022_Rev2\2103683_SW_Calc Figure.dwg - 2/17/2022



Subcat Reach Pond Link

Routing Diagram for C2103683_Cell1 Stormwater Runoff
Prepared by GEI Consultants, Printed 2/18/2022
HydroCAD® 10.00-25 s/n 11294 © 2019 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
9.132	86	Pasture/grassland/range, Poor, HSG C (1S, 2S)
9.132	**86**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
9.132	HSG C	1S, 2S
0.000	HSG D	
0.000	Other	
9.132		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	9.132	0.000	0.000	9.132	Pasture/grassland/range, Poor	1S, 2S
0.000	**0.000**	**9.132**	**0.000**	**0.000**	**9.132**	**TOTAL AREA**	

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: North Side Final Cover Runoff Area=194,197 sf 0.00% Impervious Runoff Depth=3.02"
Flow Length=150' Slope=0.0500 '/' Tc=10.2 min CN=86 Runoff=19.85 cfs 1.123 af

Subcatchment2S: South Side Final Cover Runoff Area=203,581 sf 0.00% Impervious Runoff Depth=3.02"
Flow Length=1,296' Tc=21.5 min CN=86 Runoff=14.90 cfs 1.177 af

Reach 1R: Off Cell 1 to Infiltrate Inflow=19.85 cfs 1.123 af
Outflow=19.85 cfs 1.123 af

Reach 2R: West Outlet Ditch Avg. Flow Depth=0.94' Max Vel=2.33 fps Inflow=14.90 cfs 1.177 af
n=0.030 L=313.0' S=0.0050 '/' Capacity=88.17 cfs Outflow=14.54 cfs 1.177 af

Total Runoff Area = 9.132 ac Runoff Volume = 2.299 af Average Runoff Depth = 3.02"
100.00% Pervious = 9.132 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: North Side Final Cover

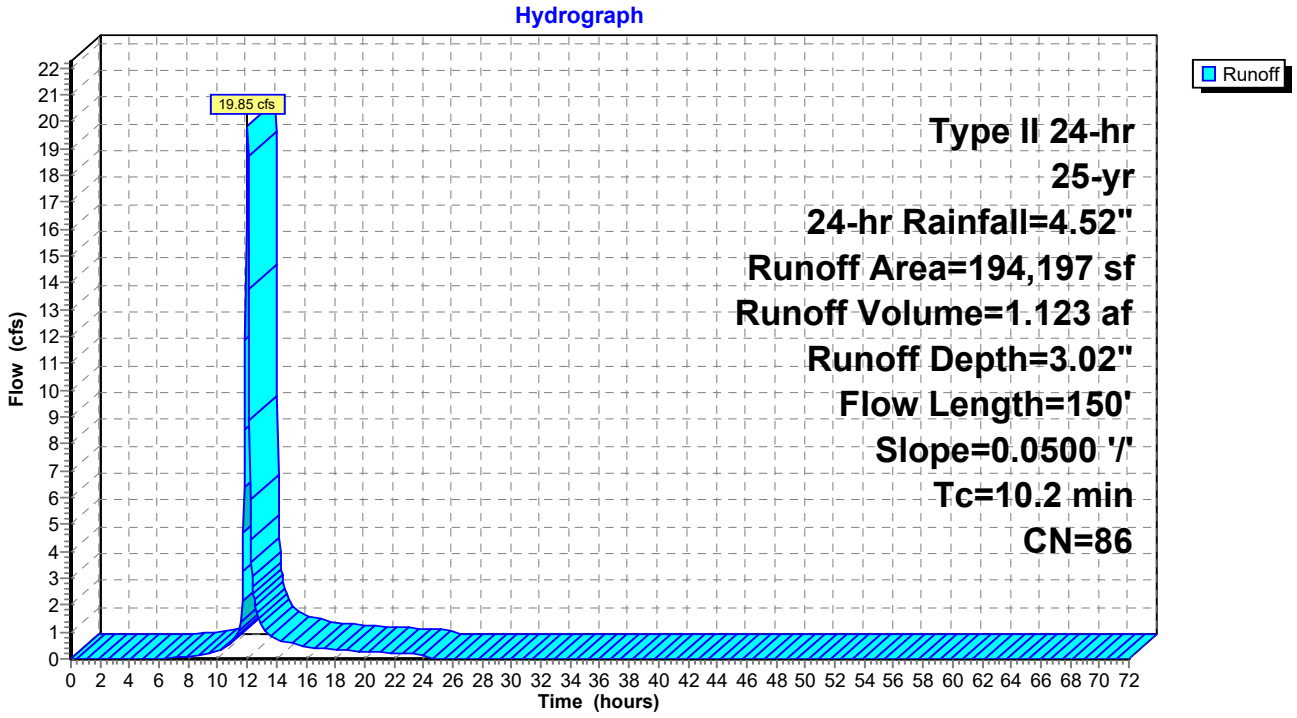
Runoff = 19.85 cfs @ 12.01 hrs, Volume= 1.123 af, Depth= 3.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr, 24-hr Rainfall=4.52"

Area (sf)	CN	Description
194,197	86	Pasture/grassland/range, Poor, HSG C
194,197		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	150	0.0500	0.24		**Sheet Flow, Side Slopes** Grass: Short n= 0.150 P2= 2.69"

Subcatchment 1S: North Side Final Cover



Summary for Subcatchment 2S: South Side Final Cover and Conveyance Ditch Area

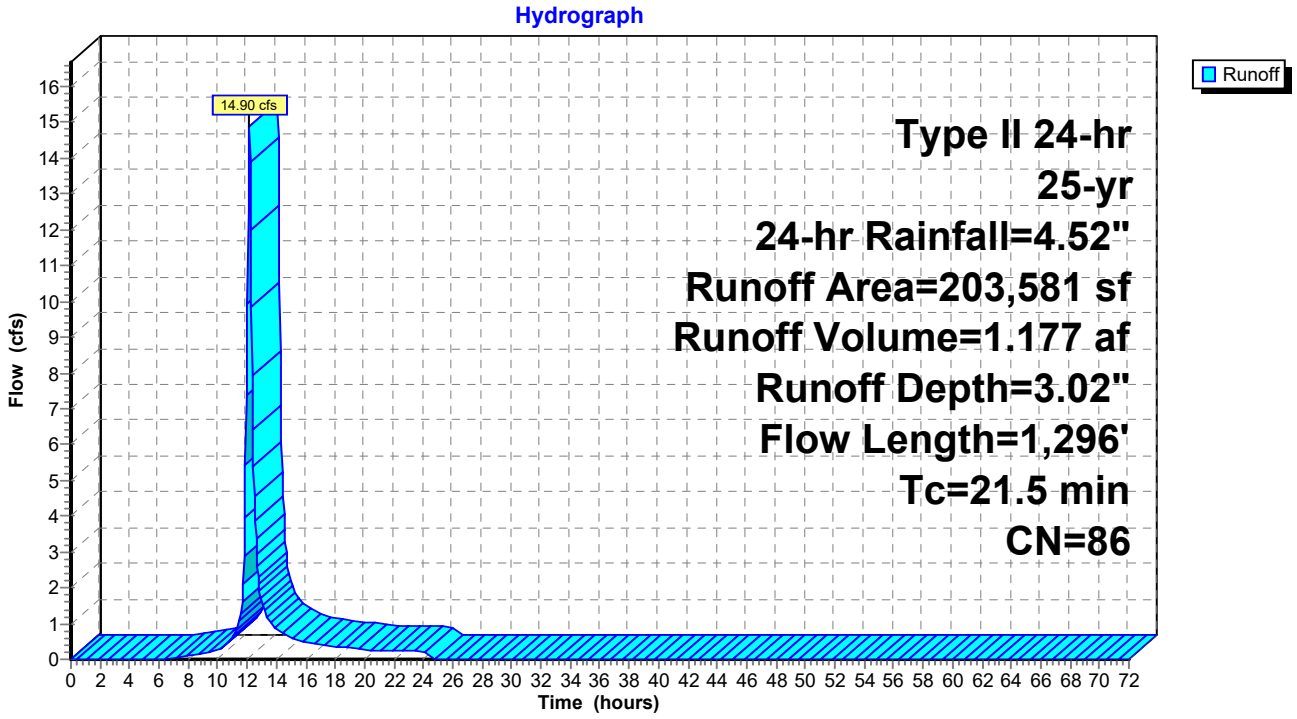
Runoff = 14.90 cfs @ 12.14 hrs, Volume= 1.177 af, Depth= 3.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr, 24-hr Rainfall=4.52"

Area (sf)	CN	Description
203,581	86	Pasture/grassland/range, Poor, HSG C
203,581		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	32	0.2500	0.34		**Sheet Flow, Side Slopes** Grass: Short n= 0.150 P2= 2.69"
19.9	1,264	0.0050	1.06		**Shallow Concentrated Flow, drainage swale** Grassed Waterway Kv= 15.0 fps
21.5	1,296	Total			

Subcatchment 2S: South Side Final Cover and Conveyance Ditch Area



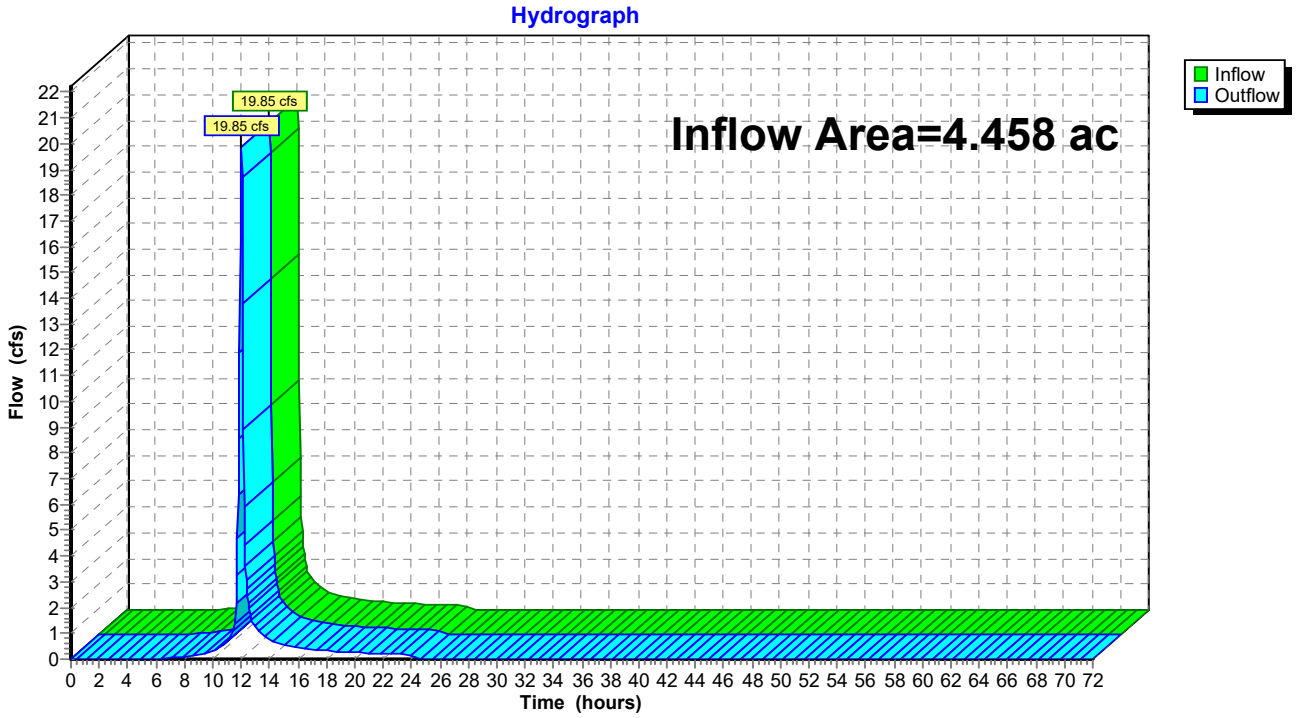
Summary for Reach 1R: Off Cell 1 to Infiltrate

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.458 ac, 0.00% Impervious, Inflow Depth = 3.02" for 25-yr, 24-hr event
Inflow = 19.85 cfs @ 12.01 hrs, Volume= 1.123 af
Outflow = 19.85 cfs @ 12.01 hrs, Volume= 1.123 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach 1R: Off Cell 1 to Infiltrate



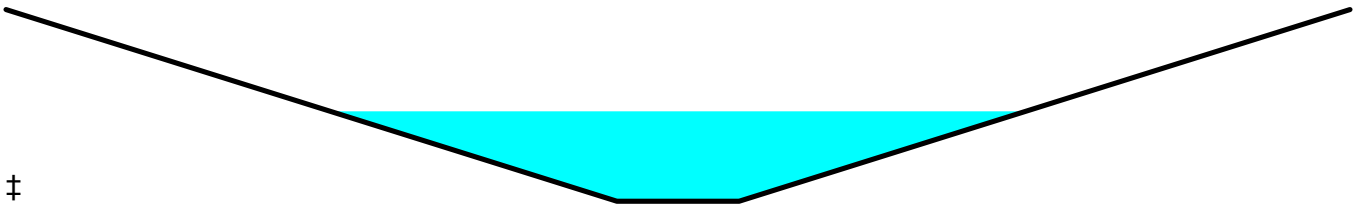
Summary for Reach 2R: West Outlet Ditch

Inflow Area = 4.674 ac, 0.00% Impervious, Inflow Depth = 3.02" for 25-yr, 24-hr event
Inflow = 14.90 cfs @ 12.14 hrs, Volume= 1.177 af
Outflow = 14.54 cfs @ 12.21 hrs, Volume= 1.177 af, Atten= 2%, Lag= 4.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.33 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 0.78 fps, Avg. Travel Time= 6.7 min

Peak Storage= 1,967 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.94'
Bank-Full Depth= 2.00' Flow Area= 24.0 sf, Capacity= 88.17 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 5.0 '/' Top Width= 22.00'
Length= 313.0' Slope= 0.0050 '/'
Inlet Invert= 686.00', Outlet Invert= 684.43'



‡

Reach 2R: West Outlet Ditch

