

**HARRISON CCB LANDFILL
RUN-ON AND RUN-OFF CONTROL SYSTEM PLAN**

Prepared For:



**MONONGAHELA POWER COMPANY
A FIRSTENERGY COMPANY
HARRISON POWER STATION
HARRISON COUNTY, WEST VIRGINIA**

Prepared By:



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Civil & Environmental Consultants, Inc.

RUN-ON AND RUN-OFF CONTROL SYSTEM PLAN
HARRISON CCB LANDFILL

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2024 Phase 7 Run-on Run-off Plan Drawing

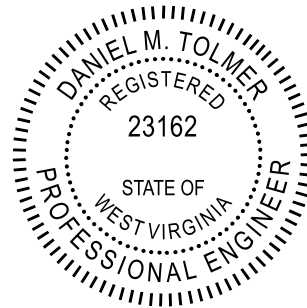
CERTIFICATION/STATEMENT OF PROFESSIONAL OPINION

The Run-on and Run-off Control System Plan (Plan) for the Harrison CCB Landfill was prepared by Civil & Environmental Consultants, Inc. (CEC). The document was based on certain information that, other than for information CEC originally prepared, CEC has relied on, but not independently verified. Therefore, this Certification/Statement of Professional Opinion is limited to the information available to CEC at the time this document was written. Subject to the preceding, it is my professional opinion as a Professional Engineer licensed in the State of West Virginia, that this document has been prepared in accordance with good and accepted engineering practices as exercised by other engineers practicing in the same discipline(s), under similar circumstances, and at the time and in the same locale. It is my professional opinion that the Plan was prepared consistent with the requirements of the United States Environmental Protection Agency's "Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments," published in the Federal Register on April 17, 2015, which became effective on October 4, 2016 with subsequent revisions, the final rule became effective on September 28, 2020. (40 CFR 257 Subpart D). This Certification/Statement of Professional Opinion is limited to §257.81 pertaining to Run-on and Run-off Controls for the Harrison CCB Landfill.

The use of the words "certification" and/or "certify" in this document shall be interpreted and construed as a Statement of Professional Opinion and is not and shall not to be interpreted or construed as a guarantee, warranty, or legal opinion.



Daniel M. Tolmer, P.E.
Principal
WV P.E. 23162



1.0 INTRODUCTION

The Harrison Power Station CCB Landfill (Landfill) is located approximately one mile north-northeast of the Harrison Power Station (Station), a coal-fired electric generating station located near the community of Shinnston in Harrison County, West Virginia (WV). The Landfill is a Class F Solid Waste Disposal Facility according to the WV Department of Environmental Protection (WVDEP).

Approximately 350 acres are currently permitted for landfill operations under WVDEP Permit No. WV0075795. Approximately 95 percent of the Coal Combustion Residuals (CCR) consist of fixated flue gas desulfurization material. Fly ash, bottom ash, and miscellaneous wastes compose the remaining five percent. The landfill is divided into three areas, referred to as the Lower Area, Upper Area, and Main Area.

The original Run-on and Run-off Control System Plan (Plan) was prepared in October 2016, and revised in December 2018 by GAI Consultants, Inc. The December 2018 revision was based on drainage modifications made as part of the landfill expansion for Phase 6A. The December 2018 Plan revision was entered into the operating record for the facility on February 26, 2019 in accordance with §257.105 (g)(3).

This Plan revision is based on drainage modifications that will be made as part of the landfill expansion for Phase 7. Phase 7 will consist of the Eastern and Saddle Expansion areas comprising approximately 14 acres of liner installation that will be adjacent to or overlay portions of the previously permitted liner areas.

A three-cell Sedimentation Pond (Pond) located near the toe of the Landfill is used as a settling pond for stormwater run-off and leachate flows. An 84-inch reinforced concrete pipe conveys run-on around the Pond from undisturbed areas, then discharges through a National Pollutant Discharge Elimination System Outlet into Robinson Run. The primary principal spillway of the Pond discharges to the West Fork River, while the overflow principal spillway and emergency spillway discharge to Robinson Run.

2.0 PLAN OVERVIEW

This Plan was prepared in accordance with the requirements set forth in 40 CFR § 257.81. Relevant supporting engineering calculations for the following control systems for the Landfill are provided in the Permit Applications listed in Section 5.0:

- Stormwater Run-on Control System
 - Diversion Channel Design.
- Stormwater Run-off Control System
 - Collection Channel and Sedimentation Pond Design.

Stormwater run-off and run-on controls are a series of collection and diversion channels located around the perimeter of the landfill. These channels are shown on the attached 2024 Phase 7 Run-on Run-off Plan drawing. Existing and future temporary channels will be replaced with permanent diversion and collection channels that will be constructed as landfill development proceeds toward the proposed ultimate final landfill configuration. The Landfill has a dual-channel perimeter system, which collects contact run-off in collection (interior) channels and diverts non-contact upslope stormwater run-on in diversion (exterior) channels. A riser pipe system has been installed in the CCR material to control contact water. This riser system directs water to the collection channels. Collection channels accept stormwater run-off from the Landfill and drain to the Pond. Diversion Channels are used to prevent run-on by collecting upslope stormwater and diverting flow around the Pond. Depending on the phase of landfill development, diversion channels may be routed to collection channels and drain to the Pond.

All collection channels have been designed for the 25-year, 24-hour storm. Diversion channels, except for temporary construction stormwater control channels, have been designed for the 25-year, 24-hour storm. The permanent diversion channels, collection channels, and the Pond for the Landfill will meet the requirements set forth in 40 CFR § 257.81. Refer to Sections 3.0 and 4.0 and the attached 2024 Phase 7 Run-on Run-off Plan drawing for details regarding the Run-on and Run-off Control Systems.

3.0 STORMWATER RUN-ON CONTROL SYSTEM

Stormwater run-on to the Landfill is controlled by diversion features. The installed features are designed to divert up to the peak discharge from a 25-year, 24-hour storm. Control features consist of diversion channels and culverts. During construction of the Phase 7 Expansion, portions of the existing channels will be removed and reconstructed in areas adjacent to the Phase 7 Expansion.

3.1 Diversion Channel Design

Permanent perimeter diversion channels located along the outside of the Landfill are designed to direct flow of stormwater run-on from the 25-year, 24-hour storm event that would otherwise run-on to the Landfill. The re-directed flow can be routed to an 84-inch pipe that conveys the run-on around the Pond then discharges to Robinson Run, a tributary to the West Fork River. The Western Diversion System carries non-impacted stormwater from the western side of the landfill area to discharge into Robinson Run through Monitoring Point 018. The Eastern Diversion System drains to existing twin 72-inch pipes at the Phase 4 landfill toe. Depending on site operations one of the two 72-inch pipes can be blocked to direct flow to discharge to Robinson Run through monitoring point 018 or to direct flow to Sedimentation Pond No. 1. The channels on the west side of the landfill discharge to either Sedimentation Pond No. 1 or discharge to Robinson Run through Monitoring Point 018, based on landfill operations.

Design calculations for the diversion channels can be found in the Permit Applications listed in the references in Section 5.0.

4.0 STORMWATER RUN-OFF CONTROL SYSTEM

Stormwater that encounters the CCR is collected prior to off-site discharge through a permitted outfall. Stormwater run-off collection systems are sized to accommodate the volume of water from a 25-year, 24-hour storm event through a series of channels, culverts, and the Pond.

4.1 Collection Channel Design

The design of the collection channels meets the applicable requirements of § 257.81 of the Federal CCR Rule. Design calculations for the collection channels can be found in the Permit Applications noted in Section 5.0.

Impacted stormwater within the active working area flows through constructed collection channels along the west side of the permitted area and drains to Sedimentation Pond 1. Run-off is also collected from the active surface by a riser pipe system. The riser pipes and the collection channels drain to the Pond. The collection channels gather run-off contacting the Landfill in the inner channels of the dual-channel system that are located along the perimeter of the Landfill. The riser pipes and the collection channels drain to the Pond.

Run-off water is directed to the Pond where it undergoes primary sedimentation before being discharged to the West Fork River under a West Virginia-issued NPDES Permit.

4.2 Sedimentation Pond Design

Sedimentation Pond No. 1 is the final significant structure used for run-off and run-on control. The Pond is designed in a three-cell configuration (A, B, and C) as shown on the attached 2024 Phase 7 Run-on Run-off Plan drawing. The cells are separated by internal dikes to provide individual settling areas. The Primary principal spillway conveys flow to the West Fork River. The Overflow principal spillway and Emergency spillway discharge to Robinson Run. Sedimentation Pond No. 1 calculations show that adequate freeboard is maintained between the top of the embankment and the maximum water surface elevation that occurs during a 25-year, 24-hour event. Design calculations for Sedimentation Pond No. 1 can be found in the Permit Applications listed in the references in Section 5.0.

5.0 REFERENCES

GAI Consultants Inc. 2002.

"Application for Lateral Expansion Permit No. WV0075795 Phase IV CCB Landfill,"
September 2002.

GAI Consultants Inc. 2011.

*"Application for Lateral Expansion Permit No. WV0075795 Phase 5 CCB Landfill
Expansion,"* January 2011.

GAI Consultants Inc. 2016.

"Application for Renewal Permit No. WV0075795 Phase 6 Expansion," February 2016.

GAI Consultants Inc. 2017.

"Permit Modification, Application for Phase 6A Expansion," November 2017.

GAI Consultants Inc. 1994.

"APSC-Harrison Power Station LTV Expansion, Appendix D," May 1994.

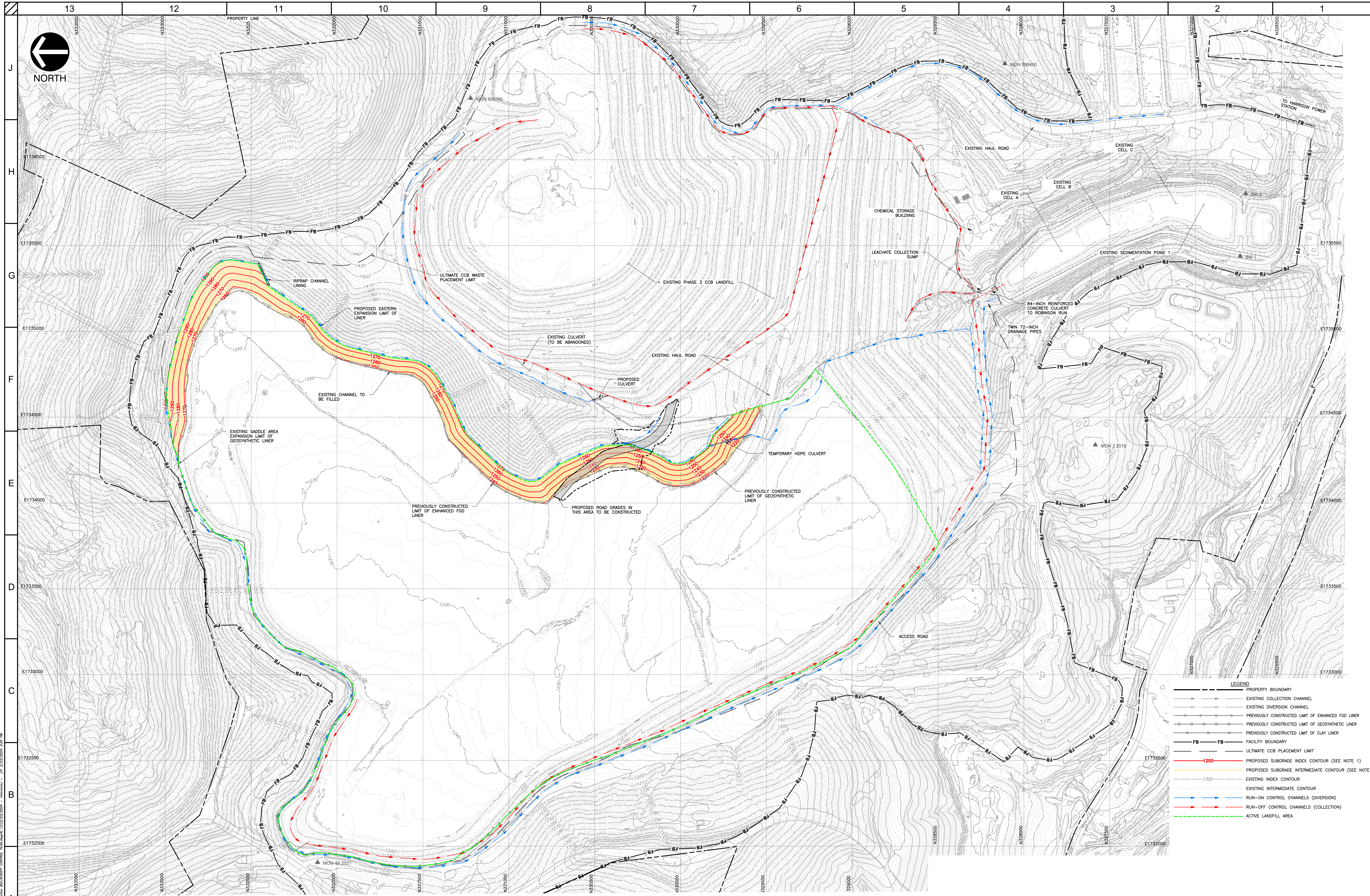
Civil & Environmental Consultants, Inc. 2021

*"Application for Renewal Solid Waste Permit No. WV 0075795 And Proposed Phase 7
Expansion Areas, Harrison Power Station,"* March 2021.

United States Environmental Protection Agency.

40 CFR 257, *Criteria for Classification of Solid Waste Disposal Facilities and Practices.*

2024 PHASE 7 RUN-ON RUN-OFF PLAN DRAWING



- REFERENCE**
1. THE GRID SHOWN ON THIS DRAWING IS APPROXIMATE AND IS BASED ON THE WEST VIRGINIA STATE PLANE COORDINATE SYSTEM, NORTH ZONE, 1983 NORTH AMERICAN DATUM.
 2. EXISTING TOPOGRAPHY PROVIDED BY FIRST ENERGY, DATED MARCH 6, 2023.
 3. THE SADDLE AREA EXPANSION LIMIT OF LINER IS IFC AS PREPARED BY CEC DATED JUNE 2021.



- LEGEND**
- — PROPERTY BOUNDARY
 - — EXISTING COLLECTION CHANNEL
 - — EXISTING DIVERSION CHANNEL
 - — PREVIOUSLY CONSTRUCTED LIMIT OF ENHANCED FGD LINER
 - — PREVIOUSLY CONSTRUCTED LIMIT OF GEOSYNTHETIC LINER
 - — PREVIOUSLY CONSTRUCTED LIMIT OF CLAY LINER
 - FB — FB — FACILITY BOUNDARY
 - — ULTIMATE CCB PLACEMENT LIMIT
 - — PROPOSED SUBGRADE INDEX CONTOUR (SEE NOTE 1)
 - — PROPOSED SUBGRADE INTERMEDIATE CONTOUR (SEE NOTE 1)
 - — EXISTING INDEX CONTOUR
 - — EXISTING INTERMEDIATE CONTOUR
 - — RUN-ON CONTROL CHANNELS (DIVERSION)
 - — RUN-OFF CONTROL CHANNELS (COLLECTION)
 - — ACTIVE LANDFILL AREA

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PROJECT NUMBER: _____

REFERENCE DRAWINGS

ENGINEERING	DATE
JML	1/18/2024
CHD	1/18/2024
DRAFT	1/18/2024
SCALE	1/18/2024

CWB NO: _____ TITLE: _____

**CCB LANDFILL 2024 PHASE 7 LINER CONSTRUCTION
RUN-ON AND RUN-OFF CONTROL PLAN**

FACILITY: HARRISON UNIT: COMMON

MonPower
DWG. NO. _____ SCALE: _____ REV. 1