

**ANNUAL INSPECTION REPORT
EXISTING COAL COMBUSTION RESIDUE (CCR) LANDFILL
MUSCATINE POWER & WATER**

REPORT DATE: DECEMBER 23, 2022

A. Rule Requirement – Federal CCR Rule §257.84(b)

Under Federal Rule §257.84(b), existing coal combustion residue (CCR) landfills and any lateral expansion of a CCR landfill must be inspected on a periodic basis by a Qualified Professional Engineer to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards. This document comprises the Inspection Report for 2021 required under this rule.

B. Documents Used to Review Status and Conditions – §257.84(b)(i)

1. This facility is regulated under Iowa Department of Natural Resources (DNR) Sanitary Disposal Project Permit No. 70-SDP-06-82P which was reissued on August 8, 2020. The permit expires August 8, 2030.
2. Water discharge from this facility is regulated under Iowa Department of Natural Resources National Pollutant Discharge Elimination System (NPDES) Permit No. 7000109 which was issued on January 19, 2010 and expired on January 18, 2015. An application for permit renewal was submitted to the DNR on July 18, 2014. DNR ruling on this renewal is pending. This permit requires monitoring of specified constituents at the Farm Pond discharge outfall.
3. Landfill Development, Plans and Specifications, and Reports

	Title
STATE	
11/01/91	-Closure/Post Closure Plan. Original date 11/01/91, revised January 1996 and December 2009
11/21/91	-Supporting Documentation Plans and Specifications (DOPS).
01/29/93	-Supplemental Plan Sheet 16.
Various	-Supplemental information dated 10/02/08, 12/17/09, and 03/30/10.
1/17/12	-CCR Landfill Cell Development – Phase II (Drawings)
10/3/18	-Unstable Areas Determination
Various	-Annual Groundwater and Surface Water Monitoring Report
Various	-Annual Leachate Control System Performance Evaluation Report
4/3/19	-CCR Landfill Cover Improvements –Drawings
10/16/20	- Construction Documentation Report, CCR Landfill Cover Improvements
FEDERAL	
10/19/15	-CCR Fugitive Dust Prevention and Control Plan; updated 12/5/2018
05/18/16	-Groundwater Monitoring System and Sampling and Analysis Program
10/17/16	-Run-on and Run-off Control System Plan, updated October, 2021.
10/17/16	-Closure and Post-Closure Plan
Various	-Annual CCR Fugitive Dust Control Report
Various	-Annual Inspection Report

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C. Visual Inspection of the CCR Landfill – §257.84(b)(ii)

The existing landfill was visually reviewed by a Qualified Professional to identify signs of distress or malfunction of the CCR unit. The review was assisted by MP&W staff.

CCR Unit Location: SW½, Section 16, T76N R3W, Muscatine County, Iowa

Date of Inspection: October 14, 2022

Weather: Partly cloudy, 60 degrees, wind 15-20 mph

Field Observation By: Rose Amundson; HR Green, Inc.

Others Present: Sam Bennet; Muscatine Power and Water

D. Inspection Report – §257.84(b)(2)

§257.84(b)(2)(i) Changes in Landfill Geometry Since Previous Annual Inspection

The basic geometry of the structure remains largely unchanged since the previous inspection with no significant changes to the geometry of the structure since 2019 and 2020. Since the time of the last inspection in 2021, the only changes in geometry of structure were due to continued disposal of CCR within the designated active operations area. Since that time, approximately 14,000 tons (9,000 cy) of CCR were placed.

§257.84(b)(2)(ii) CCR In-Place Volume

The total approximate volume of the unit at the time of the inspection was 805,000 cubic yards. This volume was estimated from cut and fill calculations using updated survey information in 2018 plus additional volume placed since that time, calculated from MP&W records of CCR hauled to the landfill. The hauling weight of CCR was used to estimate additional volume of in-place material. CCR in-place volume will be updated annually based on the best available data (survey, reports, or combination).

§257.84(b)(2)(iii) Structural or other issues affecting operation

There are no obvious appearances of an actual or potential structural weakness of the CCR unit. There are no known existing conditions that are disrupting or have the potential to disrupt the operation and safety of the CCR unit.

§257.84(b)(2)(iv) Other changes

There are no known change(s) which may have affected the stability or operation of the CCR unit since the previous annual inspection.

Other Comments

The following additional comments are based on site inspection, review of pertinent documents, and knowledge of the site and operations.

- Development and Operations
 - The landfill is operated in accordance with existing permits and amendments.
 - Summary status of landfill development – 2022 (unchanged from previous inspection)

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- Total Landfill Area: 33.5 acres
- Currently Permitted and Under Development: (Phase I & II): 22.7 acres
- Final Cover Constructed Pre-1991: 3.2 acres (Phase I)
- Final Cover Constructed 2019-2020: 7.7 acres (Phase I)
- Current Active Operations Area 2020: 5.2 acres (Phase I & II)
- Current Temporary Covered Area 2020: 6.6 acres (Phase I & II)
- MP&W's operator is generally proceeding in accordance with approved plans and specifications, including fill areas, slopes, height, access roads, monitoring wells, etc.
- Based on the inspection, some adjustment to fill operations is recommended. Along the western extent of the active fill area erosion was observed with potential sedimentation occurring outside (west) of the designated fill area. The following are recommend:
 - If a slope is built along the landfill boundary, it is recommend it be built in a manner to eventually accommodate final cover. The CCR should be placed no higher than 3 feet below final cover grade. Final cover grade is determined from a slope of 5:1 extended from the top edge of the landfill Phase II liner. Slopes built along the current Phase II fill boundary should be stabilized with one foot of temporary soil cover and seeded.
 - Building a slope along the fill boundary as described above is technically difficult, requires survey control, and may not be necessary for general fill operations. Haul road CCR berms can be constructed on the landfill as long as contact water can be intercepted by a temporary ditch or berm without topping an existing stabilized berm, and directed to the contact water collection drains within the active operations area.
 - As a temporary measure, silt fence should be installed and maintained to reduce sedimentation that could occur from un-stabilized CCR slopes near the landfill boundary.
- Fugitive Dust Prevention and Control
 - Dust is controlled as described in the *CCR Fugitive Dust Prevention and Control Plan* dated October 19, 2015, updated December 2018, and in the most recent Annual CCR Fugitive Dust Control Report.
- Groundwater Monitoring System
 - Semi-annual sampling of both groundwater monitoring wells and surface water points were completed in 2022 as required by the site permit. Under Federal Rule Part 257.93, groundwater sampling events were completed for a different list of federal constituents as required.
 - During the inspection, the casing lid (J-plug) was observed on the ground next to the steel casing. Unlocking and opening the well identified that the casing of the well is too high in relation to the steel casing to place the lid on the PVC casing and close the steel casing. It is recommended that the inner casing lid be replaced with a lid that will fit in the steel casing or cut the PVC down to allow closure of the well with the inner lid in place. If the PVC casing is cut, survey the new TOC of casing elevation to include in reports and facility records.
 - It was noted that the concrete pad at monitoring well MW-27 (installed in 2020) is attached to the well but elevated above the ground and the pad of MW-26 (installed in 2020) had broken up into several large pieces. Apparently this was caused by

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subsidence or frost heave around the well. These concrete pads should be removed and replaced, or if possible, fill underneath and around the sides with soil and seeded.

- It was noted that the concrete pads associated with MW-10 and MW-11 appeared to gap at the ground surface. This could be caused by borrowing of animals or erosion over time. The concrete pads otherwise appeared to be in good condition. The voids should be filled with soil and seeded.
- Access to SW-22 is difficult due to excess vegetation. It is recommend that a path be cleared at least once per year or as needed to facilitate access.

- Leachate Collection System
 - The system appeared to be operating as intended. During this inspection, there were no apparent changes to this operation. The system is evaluated and reported annually in the Annual Water Quality Report (AWQR) to the IDNR by February 15.

- Erosion Control and Storm Water Management
 - The vegetative cover is well established over the landfill with minimal bare spots, with a couple exceptions listed below. As part of MP&W's routine inspections, vegetated areas should continue to be monitored to assure that minor bare spots do not develop into erosional areas that would require more extensive repairs.
 - Possible stressed vegetation was observed in localized spot along the eastern/northeastern slope of Phase I and at two locations along the western slope of Phase I. During inspections, these areas should be monitored to assess if vegetation coverage has established there or if additional steps should be taken.
 - Silt fence ditch checks were removed before the 2022 inspection. Ditch locations where the silt fencing was removed showed signs of erosion. This was observed more frequently along the east and south side of Phase I. Ditch extents where silt fencing was removed and erosion is present should be filled with soil, seeded, and mulched.

- Undesirable Vegetation:
 - The presence of woody vegetation on landfill cover is generally not desired. Left unchecked, woody plants will grow, shade out grasses, promote presence of borrowing animals, and increase permeability (and infiltration) of cover soil. The inspection noted the presence of saplings growing on the north slope of Phase I. This is the area that was filled and covered in the early 1990's. It is recommend that this woody vegetation be eradicated. This is typically accomplished with application of herbicide or possibly a brush mower.

- Storm water letdown structures and culverts
 - The inlets of the four existing storm water letdown structures (LD1- LD4) and stormwater structures (S-10 and S-11) must be clear of debris and vegetation that could impede drainage. It is recommend that vegetation around the inlet cages be killed with herbicide. This should be part of the facility's regular maintenance schedule.

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A copy of this report will be placed in the operating record as required under §257.105(g)(9).

Under §257.84(c) Muscatine Power & Water intends to comply with the recordkeeping requirements specified in §257.105(g)(9), the notification requirements specified in §257.106(g)(7), and the public internet site requirements specified in § 257.107(g)(7).

As required under §257.84(b)(4), the deadline for completing the next annual inspection report is established as no later than one year following the Report Date on this document.


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CERTIFICATION

ANNUAL INSPECTION REPORT

**CCR LANDFILL
Permit No. #70-SDP-06-82P-CCR**

**MUSCATINE POWER & WATER
MUSCATINE, IOWA**

	<p>I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.</p> <p><i>Stacy E. Woodson</i></p> <p>Date: <u>12/23/2022</u></p>
	<p>Stacy E. Woodson, P.E. License No. 17389 My renewal date is December 31, 2022 Pages or sheets covered by this seal: ENTIRE DOCUMENT</p>

Prepared By:

Name: Rose Amundson, CGP
Certified Groundwater Professional

Signature: *Rose Amundson*

Date: December 23, 2022

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