

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

REPORT DATE: DECEMBER 23, 2021

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

Under Federal Rule §257.84(b), existing 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 inspected by a Professional Engineer to identify signs of distress or malfunction of the CCR unit.

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

Date of Inspection: October 19, 2021

Weather: Mostly sunny, 55 degrees, wind 10-15 mph

Field Observation By: Jon Scharf, PE; HR Green, Inc.

Others Present: Neil Hoskins, 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

Significant changes to the geometry of the structure occurred in 2019 and 2020, including mass grading, final and temporary cover construction, and infrastructure improvements. The construction was completed and disturbed areas outside of the CCR active operations area were stabilized.

Since the time of the last inspection in 2020, the only changes in geometry of structure were due to continued disposal of CCR within the designated active operations area. Since that time, approximately 17,000 tons (11,000 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 796,000 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.

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- Development and Operations
 - The landfill is operated in accordance with existing permits and amendments.
 - Summary status of landfill development – 2021 (unchanged from previous inspection)
 - 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 our inspection, some adjustment to fill operations is recommended. To accommodate continued filling and haul traffic in the active operations area, the operator built up the existing berm several feet higher along the west fill boundary of Phase II with CCR. At the time of our inspection, the new slope appeared to be eroding with potential of sedimentation occurring outside (west) of the designated fill area. We recommend the following.

 - Survey control is required. Provide permanent markers to delineate the edge of the landfill. These should be long steel posts set 50 to 100 feet apart.
 - If a slope is built along the landfill boundary, we 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 2021 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.
 - It was noted that the concrete pad at monitoring well MW-27 (installed in 2020) is

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attached to the well but elevated above the ground. Apparently this was caused by subsidence or frost heave around the well. This concrete pad should be removed and replaced, or if possible, fill underneath and around the sides with soil and seeded.

- Access to surface water and groundwater cutoff drain monitoring locations is difficult due to excessive vegetation. We recommend that paths to these locations be cleared and mowed 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 establishment of vegetative cover has significantly improved since the last inspection in 2020. With a couple exceptions listed below, the vegetative cover is well established over the landfill with minimal bare spots. 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.
 - Since grass is well established, existing silt fence ditch checks are no longer providing benefit for soil stabilization. In a number of locations the ditch checks are a detriment. Storm water has been undercutting and allowing erosion to occur on the ends of the silt fence. Since the established vegetation in the ditches otherwise appears to be good, we recommend that the silt fence ditch checks be removed. The erosional areas 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. Our 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. We 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) must be clear of debris and vegetation that could impede drainage. We recommend that vegetation around the inlet cages be killed with herbicide. This should be part of the facility's regular maintenance schedule.
 - It was noted that the elevation of the inlet cage of letdown LD-1 was below surrounding rip rap and appeared to be partially silted in, possibly impacting the efficacy of this intake. To restore the drainage capability of this structure, we recommend that the large rock near the cage be removed such that the entire inlet cage and top rim of the letdown structure is exposed.

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

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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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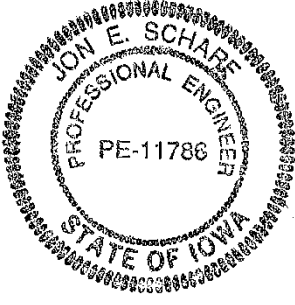
CERTIFICATION

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>Jon E. Scharf</i> _____ Jon E. Scharf, P.E. License No. 11786 My renewal date is December 31, 2021 Pages or sheets covered by this seal: ENTIRE DOCUMENT</p> <p>Date: <u>12/23/2021</u></p>

Reviewed By:

Name: Rose Amundson, CGP
Certified Groundwater Professional

Signature: *Rose Amundson*

Date: December 23, 2021

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