



CCR CLOSURE PLAN
Iatan CCR Landfill
Iatan Generating Station

20250 Hwy. 45 North
Weston, Missouri

Evergy Metro, Inc.

October 14, 2016
Revised June 22, 2022

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**IATAN GENERATING STATION
CCR LANDFILL
CCR CLOSURE PLAN
REVISION HISTORY**

Revision Number	Revision Date	Sections Revised	Summary of Revisions
1	6/22/2022	1, 2, 3, 4	Company name, updated cover description with ClosureTurf™ cover design, revised construction methods, how design meets performance standards & revised maximum closure acres and volume per Missouri DNR permit modification plan.

Revisions are accomplished in accordance with Section 5.

SECTION 1

BACKGROUND

The purpose of this CCR Closure Plan (Plan) is to identify and describe the Coal Combustion Residuals Rule (CCR Rule) measures needed to close the Iatan Generating Station (Iatan) CCR landfill consistent with recognized and generally accepted good engineering practices and in accordance with the CCR Rule. The following sections provide background information on the facility and related regulatory requirements.

1.1 Facility Information

Name of Facility: Iatan Generating Station

Name of CCR Unit: CCR Landfill

Name of Operator: Evergy Metro, Inc (Evergy)

Facility Mailing Address: 20250 Hwy. 45, Weston, MO 64098

Location: Approximately five miles northwest of Weston, Missouri.

Facility Description: The Iatan Generating Station has two coal-fired units that produce fly ash, bottom ash, and gypsum. CCR not beneficially used is transported to the on-site landfill for disposal. Related landfill facilities include a groundwater monitoring system, storm water and leachate management systems, and haul/access roads.

1.2 Regulatory Requirements

This plan has been developed for the Iatan Generating Station CCR Landfill in accordance with 40 CFR 257.102 (b). The CCR Rule requires preparation of a Closure Plan for all existing CCR landfills and surface impoundments in operation as of October 19, 2015, the effective date of the CCR Rule.

The owner or operator of a CCR unit must prepare a written closure plan that includes, at a minimum, the information specified in 40 CFR 257.102 (b) (1) (i) through (vi). These items and the section of this plan responsive to each follows:

40 CFR 257.102 (b) Written Closure Plan

(1) Content of the Plan

- (i) Narrative description of how the CCR unit will be closed in accordance with 40 CFR 257.102 (Section 2.1).
- (ii) If closure of the CCR unit will be accomplished through removal of CCR from the CCR unit, a description of the procedures to remove the CCR and decontaminate the CCR unit in accordance with 40 CFR 257.102 (c). This section is not applicable since the unit will be closed in place (N/A).
- (iii) If closure of the CCR unit will be accomplished by leaving CCR in place, a description of the final cover system and methods and procedures used to install the final cover. The closure plan must also discuss how the final cover system will achieve the performance standards specified in 40 CFR 102 (d) (Section 2.1).
- (iv) Estimate of the maximum inventory of CCR ever on-site over the active life of the CCR unit (Section 2.2).
- (v) Estimate of the largest area of the CCR unit ever requiring a final cover (Section 2.2).
- (vi) Schedule for completing all activities necessary to satisfy the closure criteria in this section, including an estimate of the year in which all closure activities for the CCR unit will be completed. The schedule should provide sufficient information to describe the sequential steps that will be taken to close the CCR unit, including major milestones and the estimated timeframes to complete each step or phase of CCR unit closure (Section 2.3).

40 CFR 257.102 (b) (1) (iii) requires, when a CCR unit closure is accomplished in place, that the plan describe how the performance standards specified in 40 CFR 102 (d) will be achieved:

40 CFR 257.102 (d) (1)

- (i) Control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere (Section 3.1).
- (ii) Preclude the probability of future impoundment of water, sediment, or slurry (Section 3.2).

- (iii) Include measures that provide for major slope stability to prevent the sloughing or movement of the final cover system during the closure and post-closure care period (Section 3.3).
- (iv) Minimize the need for further maintenance of the CCR unit (Section 3.4).
- (v) Be completed in the shortest amount of time consistent with recognized and generally accepted good engineering practices. (Section 3.5)

40 CFR 257.102 (d) (2) – Drainage and Stabilization of CCR Surface Impoundments (not applicable for landfill units)

- (i) Free liquids must be eliminated by removing liquid wastes or solidifying the remaining wastes and waste residue (N/A).
- (ii) Remaining wastes must be stabilized sufficiently to support the final cover system (N/A).

40 CFR 257.102 (d) (3) A final cover system must be installed to minimize infiltration and erosion, and at minimum, meets the requirements of (d) (3) (i) (A) through (D) below, or the requirements of an alternative final cover system (Section 4).

- (A) The permeability of the final cover system must be less than or equal to the permeability of any bottom liner system or natural subsoils present, or a permeability no greater than 1×10^{-5} cm/sec, whichever is less. (Section 4.1)
- (B) The infiltration of liquids through the closed CCR unit must be minimized by the use of an infiltration layer that contains a minimum of 18 inches of earthen material. (Section 4.1)
- (C) The erosion of the final cover system must be minimized by the use of an erosion layer that contains a minimum of six inches of earthen material that is capable of sustaining native plant growth. (Section 4.2)
- (D) The disruption of the integrity of the final cover system must be minimized through a design that accommodates settling and subsidence. (Section 4.3)

Selected definitions from the CCR Rule are provided below.

Closed means placement of CCR in a CCR unit has ceased, and the owner or operator has completed closure of the CCR unit in accordance with § 257.102 and has initiated post-closure care in accordance with § 257.104.

CCR (coal combustion residuals) means fly ash, bottom ash, boiler slag, and flue gas desulfurization materials generated from burning coal for the purpose of generating electricity by electric utilities and independent power producers.

CCR Landfill means an area of land or an excavation that receives CCR and which is not a surface impoundment, an underground injection well, a salt dome formation, a salt bed formation, an underground or surface coal mine, or a cave. For purposes of this subpart, a CCR landfill also includes sand and gravel pits and quarries that receive CCR, CCR piles, and any practice that does not meet the definition of a beneficial use of CCR.

CCR Unit means any CCR landfill, CCR surface impoundment, or lateral expansion of a CCR unit, or a combination of more than one of these units, based on the context of the paragraph(s) in which it is used. This term includes both new and existing units, unless otherwise specified.

Qualified Professional Engineer means an individual who is licensed by a state as a Professional Engineer to practice one or more disciplines of engineering and who is qualified by education, technical knowledge and experience to make the specific technical certifications required under this subpart. Professional engineers making these certifications must be currently licensed in the state where the CCR unit(s) is located.

SECTION 2

CLOSURE DESCRIPTION

This Plan describes the steps needed to close the Iatan CCR Landfill at any point during the active life of the unit in accordance with the CCR Rule and recognized and generally accepted good engineering practices. This Plan does not apply to areas in where final cover has been constructed prior to October 19, 2015. Plan items required under the CCR Rule described in this section fall into the general categories of Closure Description, Area and Volume Estimates, and Closure Schedule. This initial or any subsequent Plan may be amended pursuant to 40 CFR 257.102 (b) (3) at any time as discussed in Section 5. The current plan is to close the unit in place.

2.1 Closure Description

2.1.1 Description

The final cover system design and basis is described in Section 4, but in general includes an alternative cover system design utilizing ClosureTurf® system over six inches of compacted soil in accordance with standard engineering practices that meets the requirements of 40 CFR § 257.102 (d) (3) (ii). This cover design has also been approved by the Missouri Department of Natural Resources, Waste Management Program.

ClosureTurf® is a geomembrane installed over a compacted soil subgrade, made of three basic components: structured geomembrane, engineered turf, and sand infill. The structured geomembrane is a highly impermeable layer with a hydraulic conductivity of less than 2×10^{-13} cm/sec based on typical values from manufacturers. The structured geomembrane is spiked on the bottom to increase interface friction with the underlying subgrade. The top layer is studded to help with surface water drainage. The engineered turf consists of HDPE “grass blades” attached to a woven geotextile which provides the look of grass and protects the geomembrane from weathering, while also helping to anchor the sand infill. The sand infill, which is placed in a minimum layer of ½-inch thickness, protects the geotextile from weathering and from wind uplift by providing a buffer against wind loadings. The sand infill also provides a cushion over the geotextile to support light traffic. HydroBinder® will be used in lieu of a sand infill in areas where high stormwater runoff velocities are expected (i.e., letdown channels or perimeter ditches). HydroBinder® is a cementitious infill with a minimum 28-day compressive strength of 5,000 psi.

The final cover slopes are designed with a maximum slope of 25%, a minimum slope of 1%, and will be graded to convey stormwater runoff to perimeter berms to convey the surface water to drainage channels for removal from the landfill cover system.

2.1.2 Construction Methods and Procedures

Soil and underlying CCR material will be added and graded to achieve final design subgrade slopes and grades using appropriate earthmoving equipment. In the event closure is required before the landfill is filled to capacity, the unit will be brought to grade using soil and underlying CCR material to achieve revised design grades as needed for surface water drainage. The geomembrane will be installed in direct contact with the compacted soil subgrade, which will be placed and graded in an approximate six-inch compacted layer using earthmoving equipment such as dozers and soil compactors. Soil will be tested during construction to meet moisture, density, and permeability requirements. Elevations will be surveyed on a 100-ft grid before and after construction of the six-inch compacted soil layer. A discussion of how this system meets the performance standards of 40 CFR 257.102 (d) is provided in Section 3.

2.2 Area and Volume Estimates

The maximum inventory of CCR ever planned on-site over the active life of the CCR unit is approximately 12.7 million cubic yards. The largest area of the unit that may ever require final cover at any time during the unit's active life is estimated to be approximately 73 acres.

2.3 Closure Schedule

The size of area and time of year closure construction takes place will vary, therefore closure construction schedules will vary. The schedule provided in this section is therefore a general estimation.

2.3.1 Commencement of Closure

2.3.2 Closure Schedule

The milestones and the associated timeframes in this section are initial estimates. Some of the activities associated with the milestones will overlap.

Estimated Closure Schedule

Written Closure Plan	June 22, 2022
Notification of Intent to Close Placed in Operating Record	No later than the date final closure of the CCR unit is initiated. Closure will commence per applicable timeframes in 40 CFR 257.102 (e). ¹
Initiation of Closure / Coordinating with and obtaining necessary approvals and permits from other agencies	Month 0 - 1
Mobilization	Month 1 - 3
Installation of the final cover system	Month 1 – 6
Month all closure activities for the CCR unit will be completed	Month 3 – 6 ²

Notes

1. Initiation of Closure may be extended for multiple two year periods in accordance with 40 CFR 257.102 (e) (2) (ii) and (iii).
2. Final closure of CCR landfills must be completed within six months of commencing closure unless a demonstration is placed in the operating record document (40 CFR 257.102 (f) (2)).

SECTION 3

CLOSURE PERFORMANCE STANDARDS

3.1 Liquid Infiltration Control

Post-closure infiltration of liquids is minimized by use of sideslopes coupled with a surface water management system and a constructed infiltration barrier. The top surface of the landfill is designed with a minimum slope of 1% and sideslopes of 25% to enhance runoff. The infiltration layer includes a 40-mil LLDPE geomembrane and six-inches of earthen material. The earthen material will be installed with a design maximum permeability of 1×10^{-5} cm/sec.

3.2 Liquid Impoundment Control

The probability of future impoundment of liquids on the landfill is minimized by use of 1% top slopes and 25% sideslopes coupled with an engineered surface water removal system consisting of benches, berms, swales, channels, culverts and letdown channels designed with typical slopes of between 0.5% and 25%. Layered compaction of the underlying CCR material (fly ash and FGD gypsum) and the soil infiltration layer will also minimize the likelihood of settlement that could result in ponding on the landfill surface. These design features preclude the probability of future impoundment of liquids on the landfill.

3.3 Slope Stability

The final cover is designed with a minimum 1% slope, and a maximum of 25% slope. Drainage channels are designed with a minimum of 0.5% slope. Drainage channels are designed with ClosureTurf^{fTM} with hydrobinder, grass, erosion control mats, riprap, and geotextile where required to reduce the potential for erosion. Geotechnical analyses determined the designed slopes and cover will meet the stability requirements to prevent sloughing or movement of the final cover system.

3.4 Minimization of Maintenance

The final cover will be graded, covered with ClosureTurf^{fTM} (Phases IB through IV), vegetated (north Phase 1A slope only), and mowed (north Phase 1A slope only) to minimize erosion and maintenance. One of the primary reasons ClosureTurf^{fTM} was selected was because of the greatly reduced maintenance requirements as demonstrated in other Evergy ClosureTurf^{fTM} projects.

3.5 Minimization of the Closure Period

Final closure is estimated to be completed no later than six months after commencing final closure activities.

SECTION 4

COVER DESIGN

Phase IA of the Iatan CCR Landfill was covered in 2013, prior to the promulgation of the CCR Rule, in accordance with the facility's Missouri solid waste permit. Phases IB through IV will utilize a cover design developed in accordance with 40 CFR 257.102 (d) (3) (ii). This design meets the criteria of 40 CFR 257.102 (d) (3) (i) (A) through (D).

4.1 Permeability, Infiltration and Erosion

The final cover system for the Iatan CCR Landfill Phases IB through IV with ClosureTurfTM is designed with, from the bottom up:

1. An infiltration layer consisting of a minimum of six inches of compacted earthen material with a maximum permeability of 1×10^{-5} cm/sec and
2. A minimum 40-mil structured geomembrane;
3. An erosion layer with a geotextile material with interwoven HDPE "grass" blades; and a
4. Minimum ½" sand or hydrobinder (in areas with a high water velocity) layer.

The base liner system of the Iatan CCR Landfill is designed, from the bottom up, with:

1. 24" compacted earthen material with a maximum permeability of 1×10^{-5} cm/sec;
2. 60-mil high density polyethylene (HDPE) geomembrane; and
3. A drainage layer constructed with sand or geocomposite materials.

The permeability of the final cover system described above will be equal to or less than the permeability of the existing bottom liner system.

4.2 Accommodation of Settling and Subsidence

The final cover is designed with minimum slopes of 1%. Review of past topographic mapping indicates no measureable settlement to date at the landfill, which is as expected given the stable nature of the combined fly ash and FGD gypsum.

Geotechnical calculations indicate maximum calculated settlement resulting from consolidation of the underlying soils for a completed landfill to be approximately 10 inches, which would not impact the performance of the landfill final cover and surface water management systems.

SECTION 5

AMENDMENT OF CCR CLOSURE PLAN

The initial or any subsequent written closure plan developed pursuant to 40 CFR 257.102 (b) (1) may be amended at any time.

The Plan must be amended whenever:

- There is a change in the operation of the CCR unit that would substantially affect the written closure plan in effect; or
- Before or after closure activities have commenced, unanticipated events necessitate a revision of the written closure plan.

The written closure plan must be amended at least 60 days prior to a planned change in the operation of the facility or CCR unit, or no later than 60 days after an unanticipated event requires the need to revise an existing written closure plan. If a written closure plan is revised after closure activities have commenced for a CCR unit, the current closure plan must be amended no later than 30 days following the triggering event.

A written certification from a qualified professional engineer that the initial and any amendment of the written closure plan meets the requirements of § 257.102 (b) must be obtained.

Plan changes will be documented using the Revision History which prefaces this Plan. Substantial changes to this plan will be certified by a Qualified Professional Engineer.

SECTION 6

ENGINEERING CERTIFICATION

Pursuant to 40 CFR 257.102 (b) (4) and by means of this certification, I attest that:

- (i) I am a Qualified Professional Engineer licensed in the State of Missouri;
- (ii) I am familiar with the requirements of the CCR Rule (40 CFR 257);
- (iii) I, or my agent, have visited and examined the Iatan Generating Station landfill;
- (iv) I do hereby certify to the best of my knowledge, information, and belief that this Closure Plan has been prepared in accordance with good engineering practice, including consideration of applicable industry standards, and with the requirements of the CCR Rule;
- (v) this CCR Closure Plan meets the requirements of 40 CFR 257.102 (b); and
- (vi) the pages certified herein include Pages i, ii, 1 through 12, altogether a total of 14 pages in a protected Adobe™ document.

Walter J. Martin, P.E.

Printed Name of Qualified Professional Engineer
1200 Main St, Kansas City, MO 64105, 816-652-1365

P.E. SEAL, STATE OF MISSOURI



June 22, 2022