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Emergency Action Plan

Grand Tower Energy Center, LLC (GTEC)
Inactive Ash Basin

PREPARED FOR

Grand Tower Energy Center, LLC
1820 Power Plant Rd
Grand Tower, IL 62942

DATE

February 2024

REFERENCE

0604244



Emergency Action Plan

Grand Tower Energy Center, LLC (GTEC) Inactive Ash Basin

0604244

LICENSED PROFESSIONAL ENGINEER SIGNATURE

I hereby affirm that this Emergency Action Plan is true and accurate to the best of my knowledge and was completed in accordance with Ill. Adm. Code 845.520.

Chris Mettler, P.E.
300 West Summit Ave, Suite 330
Charlotte, NC 28203

Signature: _____



Date: 02/02/2024



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APPENDIX A FINAL CLOSURE CROSS-SECTION PLAN

APPENDIX B DOWNSTREAM MAP AND DESCRIPTION OF THE CLOSED CCR IMPOUNDMENT

ACRONYMS AND ABBREVIATIONS

CCR	Coal Combustion Residuals
EAP	Emergency Action Plan
ESDA	Emergency Services Disaster Agency
GMZ	Groundwater Management Zone
GTEC	Grand Tower Energy Center
IDOT	Illinois Department of Transportation
IEPA	Illinois Environmental Protection Agency
NPDES	National Pollution Discharge Elimination System
RCRA	Resource Conservation and Recovery Act
USEPA	U.S. Environmental Protection Agency

1. PURPOSE

The purpose of this Emergency Action Plan (EAP) is three-fold:

- A. to define the procedures that will be used to identify unusual conditions which may endanger the closed coal combustion residuals (CCR) impoundment at the Grand Tower Energy Center (GTEC) and specify the actions to be taken to mitigate any such dangerous condition;
- B. to define specific responsibilities and procedures that will be followed to notify appropriate Rockland Capital personnel; and
- C. to safeguard lives and reduce property damage in the event of an emergency. Pursuant to 35 Ill. Adm. Code 845.520(b) the EAP must:
 1. Define the events or circumstances involving the CCR surface impoundment that represent a safety emergency, along with a description of the procedures that will be followed to detect a safety emergency in a timely manner;
 2. Define responsible persons, their respective responsibilities, and notification procedures for a safety emergency involving the CCR surface impoundment;
 3. Provide contact information of emergency responders;
 4. Include a map that delineates the downstream area that would be affected if a CCR surface impoundment fails and a physical description of the CCR surface impoundment; and
 5. Include provisions for an annual face-to-face meeting or exercise between representatives of the owner or operator of the CCR surface impoundment and the local emergency responders.

2. BACKGROUND

In October 2014, GTEC hired ERM to evaluate closure options for an inactive impoundment. ERM prepared a Technical Memorandum in 2015. In November 2015, field exploratory activities were conducted to validate the "Close-In-Place" option. ERM remained in regular communication with the Illinois Environmental Protection Agency (IEPA) to discuss planned activities and permitting requirements. GTEC announced that they planned to close the impoundment using a "Close-In-Place" method, in accordance with Federal Rule Part 257, pending the results of the exploratory work. At the time, IEPA did not have specific regulations for the closure of CCR facilities.

The U.S. Environmental Protection Agency (USEPA) published the final rule on the disposal of coal combustion residuals (CCR) as a solid waste in 2015, as part of the Resource Conservation and Recovery Act (RCRA) in 40 CFR Parts 257 and 261. The rule applies to new and existing CCR landfills, surface impoundments, and certain inactive CCR surface impoundments at coal-burning



electric utility sites that still produce electricity. The GTEC CCR impoundment is considered an inactive ash basin since it has not received CCR materials since 2001. The original rule exempted inactive ash basins from most requirements if they planned to close before April 2018, however, the Rule (257.100) was amended in 2016 to include inactive ash basins in regulatory requirements with a delayed compliance schedule.

ERM submitted a request for a Groundwater Management Zone (GMZ) in January 2017, which was approved by the IEPA in July 2017. The plan includes maintenance activities for the final cover, groundwater monitoring wells, and erosion and sedimentation control systems, detailed in Section 4.0 of the Post-Closure Care Plan.

The IEPA reviewed the GTEC Annual Groundwater Monitoring Report, which assessed groundwater sampling data from existing and new wells around the site. The report found six Appendix III or IV parameters, as defined in Federal Rule Part 257, impacting groundwater around the ash basin. The report was approved via email on 8 November 2018.

In March 2019, ERM submitted a GMZ application for the impoundment, which was approved by the IEPA on 15 November 2019, resulting in corrective actions and final closure of the GTEC CCR impoundment.

3. DESCRIPTION

GTEC CCR impoundment is located on 300 acres of land and was a merchant facility, which sold energy and capacity into the Midcontinent Independent System Operator (MISO) system until approximately December 2020 when the facility was idled.

The IEPA approved the National Pollution Discharge Elimination System (NPDES Permit No. ILR10BB17) permit to manage stormwater discharge during the construction period involving impoundment closure on 15 October 2019. Construction activities associated with the CCR impoundment were initiated in December 2019 and were completed by December 2020.

The impoundment consists of an erosion layer, protective soil layer, drainage layer, and a barrier layer. Post-closure activities were to begin immediately after construction activities were completed and continue for a minimum of five years, potentially increasing to 30 years based on IEPA's approved GMZ. The site is to remain owned and maintained by GTEC, with public access prohibited. No alternative uses are currently planned for the Site post-closure.

Illinois proposed a new regulation in 2020 for the disposal and storage of CCR in surface impoundments. This regulation, part of Title 35 of the Administrative Code, covers design, construction, operation, groundwater monitoring, corrective action, closure, and post-closure maintenance. The Illinois EPA's program includes federal standards, a permitting program, financial assurance, public participation, closure alternative analysis, and prioritization requirements. Part 845 became effective on 21 April 2021.

ERM has completed the installation, monitoring, inspection, and testing of the Impoundment Closure, constructed by NorthStar, Inc. The closure was approved by IEPA and documented based on technical specifications and ERM's Construction Quality Assurance Plan. The Owner/Operator



submitted an operating permit to the IEPA on 29 October 2021, which was prior to the deadline of 31 October 2021. Individual sections of the Construction Quality Assurance Plan describe the materials and testing/inspection procedures used for:

- Introductory and Regulatory Background
- Site Preparation and Subgrade Certification
- Cap System
- Post Construction Stormwater and Site Drainage
- Photograph Documentation

4. CLASSIFICATION OF EMERGENCY CONDITIONS

4.1 FAILURE HAS OCCURRED OR IS IMMINENT – CONDITION A

Failure shall be deemed imminent for any of the following conditions:

- A. a breach in the earthen embankment surrounding the closed CCR impoundment; or
- B. sudden and severe sliding or cracking of the earthen embankment surrounding the closed CCR impoundment.

4.2 POTENTIAL FAILURE SITUATION IS DEVELOPING – CONDITION B

This is a situation where a failure may eventually occur, but actions may be taken to moderate or alleviate failure. A failure situation shall be deemed to be developing for any of the following conditions:

- A. unaccounted seepage or any increase in the flow rate of existing seepage;
- B. muddy water discharge from any part of the earthen embankment surrounding the closed CCR impoundment;
- C. “boils” forming in the embankment surrounding the closed CCR impoundment or downstream areas.
- D. Failure of the close CCR impoundment composite cap system

5. PROBLEMS - DETECTION, EVALUATION AND RESPONSE

The following sections detail indicators of a potential or actual emergency.

5.1 BURROW HOLES

Animal burrows should be backfilled as fully as possible with compacted soil as soon as practicable upon their discovery and reseeded. If rodents become a nuisance, an effective rodent control program approved by the Illinois Department of Natural Resources (IDNR) District Wildlife Biologist should be implemented. Note: some animal holes (such as crayfish) will have soil pushed out around the hole in a circular fashion which may look like a ‘boil’ (see further discussion in Section



5.4). These areas should be observed for the movement of water and soil particles from the holes to determine whether they are boils.

5.2 CRACKS

Surface, longitudinal, and transverse cracks can develop on the embankment surrounding the closed CCR impoundment, as well as on the composite cap system associated with the closed CCR impoundment. The following sections discuss each of these potential conditions.

- A. Some cracking of the surface soils on the embankment surrounding the closed CCR impoundment, as well as the composite cap system may occur when they become dry and is to be expected during prolonged periods of little or no rain. No action is required for this situation except to monitor the condition to ensure the detection of possible more serious problems as described below.
- B. A longitudinal crack can indicate the beginning of a slide or an uneven settlement of the embankment surrounding the closed CCR impoundment, as well as the composite cap system and therefore must be periodically monitored. If appreciable growth in any dimension is noted, a qualified engineer should be contacted for assistance in the evaluation of the crack and recommended repairs.
- C. A transverse (across from upstream to downstream) crack can indicate uneven settlement or the loss of support below the crack and therefore must be periodically monitored. If appreciable growth in any dimension is noted, a qualified engineer should be contacted for evaluation of the crack and recommended action.

5.3 SEEPAGE

Seepage can develop along the embankment surrounding the closed CCR impoundment, as well as on the composite cap system. The following sections discuss each of these potential conditions.

- A. Seepage areas on the downstream slope of the embankment surrounding the closed CCR impoundment, as well as on the composite cap system. or in any other area downstream of the embankment, may exhibit little or no surface water or very minor seeps. This condition may be caused by infiltration of rainwater and is typically not serious. No action is required for this situation except to note the location and monitor the condition to ensure the detection of possible more serious problems as described below.
- B. If a wet area develops moderate seeps of clear or relatively clear water but the rate of flow is not increasing, the flow should be measured periodically and observed for any changes in water clarity. No immediate action is required except to note and record the flow rate and clarity for future comparison.
- C. If a wet area develops moderate seeps of clear or relatively clear water and the rate of flow is increasing, the flow must be measured periodically and any changes in water clarity must be noted and recorded. The downstream area should be



inspected for any new seeps and a qualified engineer should be contacted for an immediate inspection. The condition should be observed and monitored constantly for any further changes in flow rate or clarity unless directed otherwise by the engineer.

5.4 BOILS

Boils are deposits of soil particles in the form of a cone around a point of discharging water. Boils can vary from a few inches to several feet in diameter and may occur two to three feet apart or in isolated locations. Evaluation of and response to the problem is the same as Section 5.3 for the various flow conditions, i.e., clear and constant, clear and increasing, and cloudy or muddy and increasing.

5.5 SLIDES

A slide is the movement of a portion of the embankment surrounding the closed CCR impoundment, as well as on the composite cap system, either the upstream or downstream slope, towards the toe of the embankment. The following are two possible slide conditions, listed in order of severity.

- A. The slide does not pass through the crest. A qualified engineer should be consulted before any repairs are initiated to determine the cause of the slide and to recommend any modifications to prevent future slides. The downstream side of the embankment should be observed for the emergence of any water through the slide or opposite the slide. If discharging water is noted, the area of the slide should be treated as a seepage location and monitored as detailed in Section 5.3.
- B. The slide passes through the crest. This condition is critical. A qualified engineer shall be retained immediately for inspection, evaluation, and recommended action.

6. SPECIFIC RESPONSIBILITIES UNDER THE PLAN

6.1 ROCKLAND CAPITAL PERSONNEL RESPONSIBILITIES

A. Onsite Personnel

The GTEC CCR impoundment has not been in operation since December 2020 due to significant mechanical failures. All buildings and structures still remain on site. GTEC still owns and maintains the property while restricting public access. GTEC does not have any employees at the site on a regular basis; therefore, GTEC will subcontract and environmental consulting firm to monitor the post-closure conditions of the impoundment on a regular basis (monthly at a minimum). The consulting firm will also be tasked with completing and recording any maintenance and repairs to the impoundment cap and associated areas. Other individuals enter the site for purposes of monitoring post-closure conditions as provided in the IEPA-approved post-closure plan.



B. EAP Coordinator

Rockland Capital's Vice President(s) of Asset Management, Keith Feemster, is the EAP coordinator and will be responsible for all EAP-related activities, including preparing revisions to the EAP and conducting exercises related to the EAP. Mr. Feemster is the EAP contact if any involved parties have questions about the plan. Mr. Feemster's contact information is as follows:

Keith Feemster
 VP of Asset Management, Rockland Capital
 keith.feemster@rocklandcapital.com
 (409) 988-4624

Following the termination of any emergency, the EAP coordinator will complete a follow-up evaluation with all responders during the emergency. The results of the evaluation and any recommended procedural changes to the Emergency Action Plan will be documented in a written report. The report will be provided to any emergency responders whose responsibilities may be affected by the changes.

C. Annual Meeting

GTEC CCR has not been operational since 2020 and the impoundment was capped and closed in 2020 and is being monitored under the terms of the IEPA-approved post-closure care plan. Because of the minimal risk of any emergency impacting human health or the environment due to the site already being in post-closure, Rockland Capital/GTEC has not been conducting annual face-to-face meetings or exercises with local emergency responders since post-closure began. In 2024, Rockland Capital/GTEC and their environmental consultant will begin holding an annual meeting with local emergency responders. Rockland Capital will document the annual meetings with local emergency responders as required by Section 845.520(b)(5) and places the documentation in the facility's operating record as required by Section 845.800(d)(11).

6.2 NON-ROCKLAND CAPITAL PERSONNEL NOTIFICATION RESPONSIBILITIES

A. Jackson County 911 Communication Center

For Emergency Condition A, the Jackson County 911 Communication Center will:

- a. contact the Jackson County Emergency Management Agency (EMA) Coordinator;
- b. contact the Illinois Department of Transportation (IDOT) operations office and communication center concerning the emergency; and
- c. contact the Jackson County Highway Department.

For Emergency Condition B, the Jackson County 911 Communication Center will contact the Jackson County EMA Coordinator.

B. Jackson County Sheriff



As appropriate, the Jackson County Sheriff's Office will coordinate the closure of affected local roads with county and township personnel.

C. Jackson County EMA Coordinator

As appropriate, the Jackson County EMA Coordinator will provide supporting services during and after the emergency. The EMA Coordinator's direct phone number is 618-534-9224, and his office number between 8am-4pm is 618-684-3137.

7. INUNDATION AREA

7.1 INUNDATION MAPS

In 2019, a static slope stability analysis was conducted on the proposed closure of the CCR impoundment considering construction conditions at maximum height before the application of the cover system. The site's location along the Mississippi River banks, where flood events are expected, complicated the stability analysis. The "absolute worst-case" scenario involved rapid drawdown after a 100-year flood event. Dynamic conditions were not evaluated.

Determining design parameters for CCR-pile base closure is challenging due to limited site-specific explorations and testing data. Field and laboratory tests were used to assess potential contaminant releases, providing an indication of the closure design configuration's adequacy, although these may differ from actual testing.

The CCR-pile's soft clays and silts act as a contaminant migration barrier, while the riverine stratigraphy is deposited by flood events in the Mississippi River, causing groundwater level variances in monitoring wells. Site stability is assessed based on soft foundation soils and potential ash saturation.

ERM identified the critical section of the impoundment area as Section C-C' in the Grand Tower Inactive CCR Impoundment drawings (attached as Appendix A), with a typical design slope of four horizontal to one vertical and a maximum elevation difference of 52 feet. The geometry for the impoundment was entered into the Geo-5™ software, and the stability of the impoundment was analyzed using the Bishop method for circular analysis and the Janbu method for polygonal analysis.

The analysis surveyed the Mississippi River gauge from the site's western edge to the impoundment's eastern edge, focusing on soil characteristics and layer thicknesses, with the silty-clay layer being the only known.

When analyzing the critical section, three water level conditions were evaluated, all intended to represent worst-case construction-phase scenarios:

- a. Normal pool water level conditions in the Mississippi River with the groundwater at approximately 348 feet mean sea level (msl);
- b. The 100-year recurrence interval flood event in the river with a commensurate rise in the groundwater elevation to approximately 371 feet msl; and



- c. Rapid drawdown of the flood event prior to the ash re-achieving drained conditions.

Three analyses were conducted to analyze failure modes for different water levels: circular analysis for slope safety, broader circular failures between CCR pile and river, and mass block failure for river movement.

The study found that the most critical slip surface is on the western side of the ash impoundment, with a safety factor of 2.60. The failure surfaces are controlled by the underlying silt and clay layer, in addition to the ash. To address this issue, slope stability was assessed for reduced strength conditions in the underlying silt and clay layer.

During a 100-year flood stage, a critical slip surface with a safety factor of 2.02 exceeded the long-term stability target of 1.5, with a 7.93 for the most critical slope and a 2.64 factor of safety.

Following a flood, groundwater receded rapidly, causing a rapid drawdown scenario. The river stage returned to normal, but soil layers remained saturated. The ash showed slope failures, but a rotational failure reached the silty-clay layer, achieving a minimum factor of safety above 1.1.

In conclusion, the CCR pile was designed for stability during construction, but rapid floodwater drawdown could cause localized sloughing. Safety concerns are minimal, as construction is not anticipated during or after such events. Even if a rotational failure occurs, it will not reach the Mississippi River, limiting potential property damage and construction work loss.

7.2 POTENTIALLY IMPACTED STRUCTURES LIST

ERM has not identified any residential or other structures that could potentially be impacted in an emergency.



8. COMPLIANCE INFORMATION

- A. The information in this EAP shall be evaluated for accuracy every five years, at minimum.
- B. This EAP must be implemented once events or circumstances involving the closed CCR surface impoundment that represent a safety emergency are detected, including conditions identified during any structural stability assessment, annual inspections, and inspections by a qualified person. GTEC must submit records documenting all activations of the EAP to the IEPA and place the documentation in the facility's operating record as required by Section 845.800(d)(10).



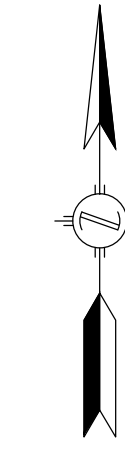


APPENDIX A FINAL CLOSURE CROSS-SECTION PLAN



APPENDIX B

DOWNSTREAM MAP AND DESCRIPTION OF
THE CLOSED CCR IMPOUNDMENT



SCALE 1" = 100'
0 100 200 300 FEET

LEGEND

- CLOSED CCR IMPOUNDMENT
- - - - - APPROXIMATE EXTENTS OF DOWNSTREAM IMPACTED AREA IF CCR IMPOUNDMENT FAILURE WERE TO OCCUR

DESCRIPTION

THE GTEC COAL COMBUSTION RESIDUALS (CCR) ASH BASIN WAS CAPPED AND CLOSED IN 2020, AND IS SUBJECT TO USEPA RULE 257 AND IEPA RULE 845, AS APPLICABLE. APPROXIMATELY 235,000 CUBIC YARDS OF CCR ARE PRESENT IN THE CLOSED IMPOUNDMENT. THESE MATERIALS HAVE BEEN EXCAVATED, STOCKPILED, AND COVERED BY A 40-MIL LLDPE LINER, COVER SOIL, AND GEOTEXTILE LINER WHICH COVERS AN 14-ACRE FOOTPRINT WITHIN THE SITE.

FILE PATH: C:\Users\lvasson\Documents\Grand Tower\CCR Impoundment Figure and Description.dwg (3-PARCELS). PRINTED ON: 12/11/2023 BY: LV Sissons

Rev.	Date	Description	By	Chk
00	12/11/23	DRAFT	LS	CM



FIGURE AND DESCRIPTION OF THE CLOSED CCR IMPOUNDMENT			DISCIPLINE NO. C-02
GRAND TOWER ENERGY CENTER, LLC			REV. 0
JACKSON COUNTY, IL			
SCALE N.T.S.	DESIGNED BY LS	PROJECT NUMBER 0599247	SHEET NO. 01
DATE DRAWN 12/11/2023	DRAWN BY LS		
Environmental Resources Management, Inc.			



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