



2021 Annual Inspection of CCR Unit

**W. A. Parish Electric Generating Station
Thompsons, Texas**

January 2022

Prepared For

NRG Texas Power LLC

CERTIFICATION

Annual Inspection of CCR Unit

W. A. Parish Electric Generating Station

I, the undersigned Texas Professional Engineer, hereby certify that I am familiar with the technical requirements of Title 40 Code of Federal Regulations Part 257 Subpart D (§257). I also certify that it is my professional opinion that, to the best of my knowledge, information, and belief, that the information in this demonstration is in accordance with current good and accepted engineering practice(s) and standard(s), and meets the requirements of §257.83 and §257.84. I certify that this Report was prepared by me and that I am a registered professional engineer under the laws of the State of Texas.

For the purpose of this document, "certify" and "certification" shall be interpreted and construed to be a "statement of professional opinion". The certification is understood and intended to be an expression of my professional opinion as a Texas Licensed Professional Engineer, based upon knowledge, information, and belief. The statement(s) of professional opinion are not and shall not be interpreted or construed to be a guarantee or a warranty of the analysis herein.

Richard D. Varnell, P.E.



Signature of Professional Engineer

135525

Texas License Number

1/11/2022

Date



FIRM# 3775

TABLE OF CONTENTS

CERTIFICATION.....	i
TABLE OF CONTENTS.....	ii
1. EXECUTIVE SUMMARY	1
2. INTRODUCTION.....	2
3. PURPOSE/OBJECTIVE	2
3.1. LANDFILL INSPECTION.....	2
4. CCR LANDFILL DESIGN & BACKGROUND.....	3
4.1. CELL 3	3
4.2. CELL 2A.....	3
4.3. CELL 1C.....	4
4.4. CELL 2B.....	4
5. CCR LANDFILL INSPECTION OBSERVATIONS & FINDINGS.....	4
5.1. CELL 3	5
5.2. CELL 2A.....	5
5.3. CELL 1C.....	5
5.4. CELL 2B.....	6
6. REVIEW OF WEEKLY INSPECTIONS.....	6
7. REVIEW OF CCR INVENTORY	7
8. MAINTENANCE RECOMMENDATIONS.....	7
9. CRITERIA.....	7
10. LIMITATIONS	7
11. REFERENCES.....	7
12. CONCLUSIONS.....	8
FIGURE	9
PHOTOGRAPHS	11

1. EXECUTIVE SUMMARY

On November 30, 2021, a representative of TRC Environmental Corporation (TRC) performed an inspection of the CCR multiunit landfill (Solid Waste Management Unit 001) at the W. A. Parish Generating Station, located at 2500 Y U Jones Road near Thompsons, Texas. This work was performed to satisfy the requirement for an annual inspection by a qualified professional engineer, as required by 40 CFR Part 257, the US Environmental Protection Agency rule on Disposal of Coal Combustion Residuals (CCR) From Electric Utilities, which is referred to herein as the Federal CCR Rule.

The SWMU 001 Landfill multiunit was visually inspected by Mr. Richard Varnell, P.E. (Licensed in Texas). The inspection included performing a visual inspection of the SWMU 001 Landfill multiunit to identify any areas requiring maintenance and showing signs of distress or malfunction. TRC also reviewed the available documentation related to the SWMU 001 Landfill multiunit at the W. A. Parish Generating Station (Station).

This inspection evaluated the SWMU 001 Landfill multiunit, which consists of the following four individual cells:

- Cell 3,
- Cell 2A,
- Cell 1C, and
- Cell 2B.

The provisions of the Federal CCR Rule do not apply to CCR units that no longer receive CCR after the effective date of the Federal CCR Rule on October 19, 2015, portions of the CCR multiunit landfill that were closed prior to October 19, 2015 were not inspected during the 2020 annual inspection. TRC did not observe any evidence of ongoing or imminent failure of this CCR unit. There were no structural deficiencies noted based on TRC's observations. No changes in geometry were noted.

No maintenance items were identified in this annual inspection. Ongoing maintenance efforts to promote grass vegetation, stabilize roads and slopes, and mitigate damage from feral hogs should continue.

Based on a review of available documents and the visual inspection, it is TRC's opinion that the SWMU 001 Landfill multiunit has been designed, constructed, is currently operated, and is maintained in a manner that is consistent with and in accordance with recognized and generally accepted good engineering practice.

2. INTRODUCTION

This document presents the observations and findings of the 2021 annual inspection for the SWMU 001 Landfill multiunit at the Station. The Station is located near Thompsons, Texas, in Fort Bend County. The Station is owned and operated by NRG Texas Power LLC (NRG).

The Station includes four coal fired generating units with a total gross rated capacity of 2667 megawatts (MW) from the coal fired units. The Station is fueled by coal imported from the Powder River Basin in Wyoming.

The location of the SWMU 001 Landfill multiunit and the four individual cells are depicted in Figure 1.

In addition to the SWMU 001 Landfill multiunit, two CCR surface impoundments (FGD Emergency Pond and the Air Preheater Pond) are located at the Station. Per §257.73(a), the FGD Emergency Pond is incised and the APH Pond does not meet the criteria provided in §257.73(b)(1) or (b)(2). Therefore, per §257.83(b), an annual inspection is not required for either CCR surface impoundment.

3. PURPOSE/OBJECTIVE

This report has been prepared to document compliance with the annual inspection requirements for CCR unit as required by 40 CFR Part 257, the US Environmental Protection Agency rule on Disposal of Coal Combustion Residuals (CCR) From Electric Utilities (Reference 1). Specifically:

- Section 257.84(b) pertains to the annual inspection requirements for CCR landfills.

This report documents the annual inspection by a qualified Texas professional engineer for the currently active areas of the SWMU 001 Landfill multiunit (areas that received CCR after October 19, 2015). NRG provided prior reports and design drawings to TRC as inputs for this inspection. The following CCR unit was inspected:

- SWMU Unit 001 Multiunit Landfill.

3.1. LANDFILL INSPECTION

The tasks performed as part of the annual inspection (40 CFR Part 257.84(b)) and documented in this report are listed below.

- Inspection of the landfill by a qualified Texas professional engineer to evaluate if the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering practice.
- Review of available operational records and information concerning the status and condition of the CCR unit, including, but not limited to, files available in the operating record, and the results of weekly inspections by a qualified person, and the prior annual inspection report.
- Visual inspection of the CCR unit to identify signs of distress or malfunction of the CCR unit and appurtenant structures.
- Preparation of this annual inspection report, as required by the Federal CCR Rule, to address the following:
 - Any changes in geometry of the CCR unit since the previous annual inspection;

- The approximate volume of CCR contained in the unit at the time of inspection;
- Any appearances of actual or potential structural weaknesses of the CCR unit, in addition to any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the CCR unit and appurtenant structures; and
- Any other change(s) which may have affected the stability or operation of the CCR unit since the previous annual inspection.

4. CCR LANDFILL DESIGN & BACKGROUND

The SWMU 001 Landfill multiunit is designated as a Class II Industrial Waste Landfill under the criteria of the Texas Commission on Environmental Quality (TCEQ) (Reference 2). The SWMU 001 Landfill is managed as a multiunit landfill under the Federal CCR Rule and consists of the following four individual cells:

- Cell 3,
- Cell 2A,
- Cell 1C, and
- Cell 2B.

The following paragraphs summarize the design, construction, and operation of the four cells and application of the Federal CCR Rule to their management.

4.1. CELL 3

Cell 3 receives bottom ash, which is trucked from the Station. The bottom ash is staged and stored in Cell 3. Bottom ash can be reused on-site or is sold to third parties for use as road base material and other, similar beneficial reuses.

Cell 3 is constructed over a significant deposit of in situ clay soils. Stormwater is directed to a stormwater collection pond located within the Cell 3 boundary at the western portion of Cell 3. Stormwater from the stormwater ponds associated with the other active cells is also pumped to the Cell 3 stormwater pond. In accordance with the facility's Texas Pollutant Discharge Elimination System (TPDES) Permit, water from the Cell 3 stormwater pond is discharged through Outfall 004 to Smithers Lake if it reaches an elevation above the natural grade of the area.

Generally, perimeter berms have been constructed around the boundaries of Cell 3. The exterior slopes of the perimeter berms are vegetated and the surfaces of the inner side slopes and crest consist of stabilized CCR to control vegetation and act as an erosion protection layer.

4.2. CELL 2A

Cell 2A is a small active portion of Cell 2, which has been closed. A pugmill operation for mixing and stabilizing CCR for disposal in other cells or for beneficial reuse outside the SWMU 001 Landfill multiunit is located at Cell 2A. Waste is not stored permanently in Cell 2A, rather it is mixed and then staged temporarily prior to being sold as product, used beneficially, or moved to another landfill for disposal.

Cell 2A is constructed over a significant deposit of in situ clay soils. Stormwater is directed to the southwestern portion of Cell 2A, where it enters a sump. The sump drains to a stormwater pond

located in the southwest corner of closed Cell 2. Stormwater is pumped to the Cell 3 stormwater pond on an as needed basis.

The exterior slopes of the perimeter berms are vegetated. The berm crest is surfaced with stabilized CCR to provide a driving surface and act as an erosion protection layer. The interior slopes of the perimeter berms are either well vegetated or surfaced with stabilized CCR to control vegetation and act as an erosion protection layer.

4.3. CELL 1C

Cell 1C receives nonmarketable CCR and Class 2 industrial wastes, which are trucked from the Station.

Cell 1C is constructed over a significant deposit of in situ clay soils. Stormwater is directed to a stormwater collection pond located inside the Cell 1C boundary in the southwestern portion of Cell 1C. Stormwater is pumped to the Cell 3 stormwater pond on an as needed basis.

The exterior slopes of the perimeter berms are vegetated and the surfaces of the inner side slopes and crest consist of stabilized CCR to control vegetation and act as an erosion protection layer.

4.4. CELL 2B

Cell 2B receives marketable CCR, which is trucked from the Station. Cell 2B receives CCR from the Flue Gas Desulfurization (FGD) system on Unit 8 at the Station. This material is currently stored on the north side of Cell 2B. While there are markets for this CCR, it is currently not being sold for beneficial reuse. Cell 2B also receives fly ash, which is stored in the central portion of Cell 2B. NRG uses fly ash on-site to stabilize roads and slopes and sells fly ash as a concrete additive to third parties. Essentially all the fly ash generated at the Station is either sold or beneficially reused on-site. Fly ash is also sold as a base material called "Flexbase."

Cell 2B is constructed over a significant deposit of in situ clay soils. Stormwater is directed to a stormwater collection pond located inside the Cell 2B boundary in the southern portion of Cell 2B. Stormwater is pumped to the Cell 3 stormwater pond on an as needed basis.

The exterior slopes of the perimeter berms are vegetated and the surfaces of the inner side slopes and crest consist of stabilized CCR to control vegetation and act as an erosion protection layer.

5. CCR LANDFILL INSPECTION OBSERVATIONS & FINDINGS

On November 30, 2021, Mr. Richard Varnell, PE (TX) visually inspected the SWMU 001 Landfill multiunit at the Station. This visual inspection was performed to evaluate if the design, construction, operation, and maintenance of the SWMU 001 Landfill multiunit is consistent with recognized and generally accepted good engineering practice.

No changes in geometry were observed at the SWMU 001 Landfill multiunit. In addition, each cell was observed to be in good condition, with no significant issues noted. Observations and findings for each of the four cells at the SWMU 001 Landfill multiunit are summarized below.

5.1. CELL 3

The location of Cell 3 within the SWMU 001 Landfill multiunit is depicted on Figure 1 and Photographs P-1, P-2, and P-3.

At the time of the inspection, the water level in the stormwater pond appeared to be lower than the ground surface outside the western and southern berms of Cell 3. Thus, lateral pressure from the water in the stormwater pond on the landfill berms appeared to be minimal.

In general, the exterior slopes of the perimeter berms were well vegetated and demonstrated good alignment and slope grade. The crests of the berms around Cell 3 were free of rutting and misalignment.

Cell 3 was observed to be in good condition without indications of risk of catastrophic or operational failure. The Cell 3 perimeter berms were observed to be in excellent condition.

5.2. CELL 2A

The location of Cell 2A is depicted on Figure 1 and Photographs P-4, P-5, and P-6. At the time of the inspection, Landfill Cell 2A was not used to store or dispose of significant quantities of CCR. Mixing CCR for stabilization was not in progress during the inspection, but TRC observed CCR stockpiled in Cell 2A. Based on the location of the stockpiles and the nature of the material stored there, the lateral loads on the perimeter berms appeared to be minimal.

At the time of the inspection, the water level in the stormwater pond appeared to be lower than the elevation of the ground surface outside the western berm of Cell 2A. Thus, lateral pressure from the water in the stormwater pond on the landfill berms appeared to be minimal.

In general, the exterior slopes of the perimeter berms are well vegetated and demonstrate good alignment and slope grade. The surfaces of portions of the interior slopes were either well vegetated or stabilized with CCR. The berm crests were also stabilized with CCR.

Cell 2A was observed to be in good condition without indications of risk of catastrophic or operational failure. The Cell 2A perimeter berms were observed to be in good condition.

5.3. CELL 1C

The location of Cell 1C is depicted on Figure 1 and Photographs P-7, P-8, and P-9. Due to the volume of CCR stored in Cell 1C, inner berms were only observed in the vicinity of the stormwater pond located at the southwest portion of Cell 1C.

At the time of the inspection, the water level in the stormwater pond was at approximately the same elevation as the ground surface outside the western berm of Cell 1C. Thus, lateral pressure from the water in the stormwater pond on the landfill berms appeared to be minimal.

In general, the exterior slopes of the perimeter berms are well vegetated and demonstrate good alignment and slope grade. No significant adverse conditions were identified for the outside slopes of the perimeter berms. The crests of the perimeter berms were generally free of rutting and misalignment as shown on Photographs P-7 through P-9.

The interior slopes of Cell 1C exhibited good alignment, grades, and vegetation or erosion resistant stabilized CCR. No adverse conditions were identified for the inner slopes of the perimeter berms. Minor sloughing of berm slopes occurred in 2021. In January 2021 a minor slough on the interior slope was repaired in the southwest corner of the landfill (adjacent to the Cell 1C stormwater pond). Another minor slough was observed on the northern, exterior berm sidewall of Cell 1C in February and repaired shortly thereafter. Both of these slopes are stabilized with a sacrificial layer of CCR, versus being vegetated. Both areas were observed to be in good condition during TRC's visual inspection.

Cell 1C was observed to be in good condition without indications of risk of catastrophic or operational failure.

5.4. CELL 2B

The location of Cell 2B is depicted on Figure 1 and Photographs P-10, P-11, and P-12. During the November 19, 2020 inspection, the stormwater pond was dry. During the inspection, the water level in the stormwater pond was lower than the elevation of the ground surface outside the western, southern, and eastern perimeter berms of Cell 2B. Thus, lateral pressure from the water in the stormwater pond on the landfill berms appeared to be minimal.

In general, the outside slopes of the perimeter berms exhibited good alignment, grades and vegetation. There were no observed indications of instability of the outside slopes of the perimeter berms and the inner berms.

The crests of the berms around Cell 2B were generally free of rutting and misalignment. The berm crest and roadway surface were well maintained and were in good condition.

The surfaces of the majority of the inside slopes of the perimeter berms around Cell 2B as well as the berm crests were surfaced with stabilized CCR to prevent erosion. In general, these slopes were well graded and uniform in slope. The portion of the interior slope that was not surfaced with stabilized CCR was a recently repaired section of the perimeter berm.

Minor sloughing of the interior slope of the southern berm has been a reoccurring issue in 2021. Sloughing was observed in the southwest corner of the landfill and near the center of the southern berm. A slough in the center of the interior slope of the southern berm was repaired in January 2021. A slough reoccurred in this area in May 2021, and was documented in weekly inspection reports until its final repair in October 2021. No sloughing was observed during the November 30, 2021 site visit.

This area was observed to be in good condition during TRC's visual inspection. Cell 2B was observed to be in good condition without indications of risk of imminent catastrophic or operational failure.

6. REVIEW OF WEEKLY INSPECTIONS

The weekly inspections by a qualified person (by NRG) have been performed and TRC has reviewed the reports. The inspections appear to be thorough and appropriately executed. Maintenance items were identified, resolved, and documented in subsequent inspections.

7. REVIEW OF CCR INVENTORY

The approximate volume of stored CCR in the SWMU 001 Landfill multiunit, as provided by NRG, is:

- Cell 1C: Approximately 382,500 cubic yards (cy).
- Cell 2A: Approximately 400 cy. This material is just staged in this location prior to its imminent sale, use, or disposal.
- Cell 2B: Approximately 562,200 cy.
- Cell 3: Approximately 717,700 cy.

8. MAINTENANCE RECOMMENDATIONS

At the time of the inspection, there were no repairs needed that pose immediate operational or safety concerns for the CCR units inspected. Based on the observations made by TRC on November 30, 2021, TRC recommends that the current maintenance practices be continued. These practices include control of vegetation and feral hogs, maintenance of the stabilized CCR material used on the interior slopes of the landfill cells, and repair of minor erosion areas before they become significant. In addition, to prevent minor sloughing the stabilized CCR surface on interior slopes should be replaced, repaired, and/or maintained, particularly in areas where it was removed as part of a slough repair or other maintenance activity. If this is impracticable, it is suggested that the internal slopes, particularly repaired portions of internal slopes, be well vegetated with grass as soon as possible after the repair is complete.

9. CRITERIA

This inspection has been performed in accordance with the inspection requirements of the Federal CCR Rule (Reference 1) and generally accepted engineering practice. The TCEQ Guidelines for Operation and Maintenance of Dams in Texas (Reference 2) is considered to represent generally accepted practices and is considered to be an applicable criterion.

10. LIMITATIONS

Given the visual nature of this inspection, it must be recognized that latent conditions may be present that are not visually evident.

TRC reviewed operation and maintenance records provided by the Station. TRC is not responsible for the content, accuracy or comprehensiveness of the records provided. Records were reviewed for completeness and compliance with the regulations and permit conditions.

Given the work in progress nature of the landfilling operations, this document only considers the conditions present at the time of the inspection and information provided by NRG.

11. REFERENCES

1) 40 CFR Part 257, Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Final Rule, April 17, 2015.

2) Texas Commission on Environmental Quality, Guidelines for Operation and Maintenance of Dams in Texas, November 2006.

3) 2020 Annual Inspection of CCR Landfill Cells, W. A. Parish Electric Generating Station, January 2021.

12. CONCLUSIONS

This annual inspection considered the SWMU 001 Landfill multiunit, which consists of the following individual cells:

- Cell 3,
- Cell 2A,
- Cell 1C, and
- Cell 2B.

TRC did not identify any evidence of ongoing or imminent failure of the SWMU 001 Landfill multiunit. No structural deficiencies were noted during the 2020 inspection.

Based on the review of available documents and the visual inspection, it is TRC's opinion that the SWMU 001 Landfill multiunit has been designed, constructed, is currently operated, and is maintained in a manner that is consistent with recognized and generally accepted good engineering practice.

Based on the good condition of the SWMU 001 Landfill multiunit observed during the inspection, it is evident that the NRG's ongoing weekly inspection and maintenance activities at the CCR unit are effective.

As discussed in Section 8, the ongoing maintenance efforts to promote grass vegetation, control erosion, and mitigate damage from feral hogs should continue. No other maintenance items were identified in this annual inspection.

FIGURE



SOURCE: (12/10/2018) USDA FARM SERVICE, NAIP IMAGERY



1" = 2,500'
1:30,000

0 2,500
FEET



505 East Huntland Drive
Suite #250
Austin, TX 78752
Phone: 512.329.6080

PROJECT:	NRG W. A. PARISH STATION
TITLE:	LOCATION OF CCR LANDFILL CELLS

DRAWN BY:	MJAGOE
CHECKED BY:	RDV
APPROVED BY:	
DATE:	JANUARY 2020
PROJ. NO.:	294645.0001.0000
FILE:	294645.0001_Figure1.mxd
FIGURE 1	

PHOTOGRAPHS

Photographic Log – 2021 W. A. Parish Annual Inspection of CCR Landfill Cells



Photograph P-1: View looking south-southwest of Cell 3 from top of north berm. Bottom ash material is visible to the left; the area where bottom ash is being excavated from the landfill is visible in the center of the photograph, and the Cell 3 storm water pond is visible to the right. The interior slopes and crest roads of the berms have been stabilized with a cemented fly ash mixture. The remainder of the berms are well vegetated.



Photograph P-2: View looking west of Cell 3's south berm. The crest road was well maintained, exterior slopes well vegetated without erosion issues, and interior slope either improved with stabilized CCR material or vegetated.

Photographic Log – 2021 W. A. Parish Annual Inspection of CCR Landfill Cells



Photograph P-3: View looking west of interior of Cell 3 landfill and Cell 3 Coal Combustion Residual (CCR) waste piles. Trucks waiting to be loaded with salable bottom ash are visible in this photograph.



Photograph P-4: View looking west along the south berm of Cell 2A (the Pugmill Area). Stockpiled, salable CCR material is visible on the right side of this photograph.

Photographic Log – 2021 W. A. Parish Annual Inspection of CCR Landfill Cells



Photograph P-5: View looking east along the northern berm of Cell 2A, the Pugmill Area. Pugmill equipment and mixed CCR material are visible in this photograph.



Photograph P-6: View looking north across the contact water pond in Cell 2A. Slopes were either stabilized or well vegetated.

Photographic Log – 2021 W. A. Parish Annual Inspection of CCR Landfill Cells



Photograph P-7: View looking northeast along the western berm of Cell 1C. Slopes were well stabilized. Although not visible, the crest road was stabilized with no significant rutting.



Photograph P-8: View looking north of the western berm of Cell 1C. The Cell 1C storm water pond is visible on the far right of this photograph.

Photographic Log – 2021 W. A. Parish Annual Inspection of CCR Landfill Cells



Photograph P-9: View looking northeast of the contact water pond in Cell 1C. Picture was taken from berm at southwest corner of Cell 1C.



Photograph P-10: View looking southeast of Cell 2B's southern berm from southwest corner of landfill. The Cell 2B stormwater pond is visible to the left.

Photographic Log – 2021 W. A. Parish Annual Inspection of CCR Landfill Cells



Photograph P-11: View looking southeast of the exterior slope of Cell 2B's southern berm. The exterior slope is well vegetated.



Photograph P-12: View looking northeast from southern berm across storm water pond at waste stored in Cell 2B. Stockpiled fly ash is visible in the center of the photograph, while CCR waste from the Flue Gas Desulfurization system is visible beyond the fly ash.