



Gainesville Regional Utilities Deerhaven Generating Station



Coal Combustion Residual Units Annual Inspection Report (11 December 2019 – 10 December 2020)

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1 Introduction

The Deerhaven Generating Station (site) has two coal combustion residuals (CCR) units: a surface impoundment system and a landfill. The surface impoundment system is comprised of two ash ponds (i.e., Ash Cell #1, Ash Cell #2) located within the same slurry wall containment system. These cells receive cooling tower blowdown and bottom ash sluice water from the site's coal-fired combustion unit (i.e., Unit #2) through a piping network that allows discharge to either cell. Cooling tower blowdown represents the largest discharge stream routed to these cells, and sluiced ash constitutes a relatively small portion of the discharges received by these cells. As the water moves through the ash cells, bottom ash settles and the decant water gravity drains to adjacent pump back ponds (i.e., Pump Back Cell #1, Pump Back Cell #2) through subsurface culverts, which run beneath the embankment separating each ash cell from its adjacent pump back cell. The culvert inlets are enclosed within stoplog structures (located inside the ash cells near the embankment separating each ash cell from the adjacent pump back pond) to minimize ash entering the culverts. The adjacent pump back cells are exclusively used to store the decant water prior to treatment and re-use in plant operations. The slurry wall containment system is located beneath the peripheral embankment, which encompasses the surface impoundment system, the pump back cells, and two front-end treatment (FET) lime sludge cells. The slurry wall is keyed into an existing, underlying clay layer. Figure 1 presents a layout view of the surface impoundment system and the two adjacent pump back cells at the site. The locations of several piezometers, which are used to qualitatively monitor for seepage through the exterior embankments, are also shown.



Figure 1. Layout of the CCR Surface Impoundment System, Adjacent Pump Back Cells, and Piezometers

The CCR landfill primarily accepts flue gas desulfurization byproduct from the Unit #2 scrubbing process. The landfill also accepts the bottom ash that is periodically (i.e., approximately every five years) excavated from the surface impoundment system and lime sludge that is periodically dredged from front-end treatment sludge ponds. Occasionally, fly ash is also deposited in the landfill when it is not hauled offsite for beneficial use. The landfill is comprised of four cells (i.e., Cells 1-4), sequentially arranged from west to east. The bottom of each landfill cell is graded to drain contact water (i.e., water that contacts CCR) intercepted by the cell bottom. Perforated PVC pipes were installed at the base of the cells. Specifically, these pipes are located in the middle of each cell and between each cell intercept and gravity-drain the contact water to a drainage ditch located along the northern toe of the landfill (i.e., the Northern Drainage Ditch).

Similar to the surface impoundment system, a slurry wall containment system, which is keyed into an existing underlying clay layer, encompasses the landfill and the Northern Drainage Ditch. A series of stormwater ditches located outside the slurry wall route stormwater to either a wetland area located just west of the landfill or to a stormwater pond located to the southeast of the landfill. Currently, Cell 1 and Cell 2 of the CCR landfill are actively receiving CCR and other non-CCR materials. Figure 2 presents an aerial layout of the CCR landfill at the site, facing west.



Figure 2. Aerial Image of CCR Landfill Facing West

Title 40 Code of Federal Regulations (CFR) 257.83(b) and 257.84(b) requires that CCR units be annually inspected by a qualified professional engineer to ensure that the design, construction, operation, and maintenance of each CCR unit is consistent with recognized and generally accepted good engineering standards. 40 CFR 257.53 defines a qualified professional engineer as “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”. This report was prepared under the supervision of Pradeep Jain, who is a licensed professional engineer in the State of Florida (FL PE License No. 68657).

2 CCR Surface Impoundment System

2.1 Review of Relevant Information

2.1.1 Overview

The following documents have been reviewed by Innovative Waste Consulting Services LLC (IWCS) doing business as Innovative Technical Solutions (ITS) to understand the design and operation of the CCR surface impoundment system located at the site while preparing previous annual inspection reports:

- Construction drawings for the surface impoundment system certified as conforming to construction records (B&M 1981)
- Bid documents for the site including construction specifications for the surface impoundment system (B&M 1980)
- A Site Certification Application for Unit 2 (RUB 1977)
- A State of Florida Department of Environmental Regulation Electric Power Plant Site Certification Review FDER (1978)
- A slope stability and liquefaction potential analysis conducted for the surface impoundment system (UES 2015)
- A topographic survey of the surface impoundment system (DSI 2015)
- CCR Surface Impoundment System Hazard Potential Classification (UES 2016a)
- CCR Abutment and Base Surface Impoundment System Evaluation (UES 2016b)
- CCR Surface Impoundment System and Landfill Groundwater Monitoring Systems Design and Construction (UES 2017); UES completed the installation and development of the groundwater monitoring wells around each of the CCR units in March 2017.
- Groundwater Sampling and Analysis Plan for the Coal Combustion Residuals Units (IWCS 2017c); the plan provides details on the methodology to be used for sampling and analyzing groundwater data collected from the monitoring well networks of each CCR unit.

No modification has been made to the design and operational procedures of the surface impoundment system or the landfill since the last inspection. The CCR landfill run-on and run-off control plan was updated to reflect the landfill condition in 2020 (IWCS 2020). Two new groundwater monitoring wells and a piezometer were installed in June 2020 for a better characterization of the groundwater flow direction on the western side of the landfill. The groundwater monitoring design report was updated to reflect this

change (UES 2020a). An update of the safety factor report (§257.74(e)) was also completed for the CCR impoundment system (UES 2020b). The following additional documents developed since the previous annual inspection were reviewed for this report preparation:

- IWCS (2020). Coal Combustion Residuals Landfill Run-on and Run-off Control System Plan (Version 2.0). Prepared by Innovative Waste Consulting Services LLC for Gainesville Regional Utilities, September 2020.
- UES (2020a). Coal Combustion Residuals (CCR) Surface Impoundment System and Updated Landfill Groundwater Monitoring Systems Design and Construction, prepared by Universal Engineering Services for Gainesville Regional Utilities and Innovative Waste Consulting Services, LLC, November 2020.
- UES (2020b). Slope Stability and Liquefaction Potential Analysis CCR Impoundment System, Deerhaven Generating Station (DGS), prepared by Universal Engineering Services for Gainesville Regional Utilities and Innovative Waste Consulting Services, LLC, November 2020.
- Fifty-two (52) weekly (7-day) inspection worksheets
- Twelve (12) monthly (30-day) inspection worksheets

2.1.2 Review of Weekly and Monthly Inspection Worksheets

Weekly and monthly inspection worksheets for the CCR surface impoundment system have been completed and placed in the operating record since 19 October 2015. ITS reviewed the worksheets for all the weekly and monthly inspections conducted since the previous annual inspection. Documentation reporting that the deficiencies identified during the previous annual inspection have been addressed is available on GRU's publicly accessible internet site.

40 CFR 257.83(a)(1)(i) and (iii) respectively establish maximum time intervals for weekly (i.e., 7 days) and monthly (i.e., 30 days) inspections of the surface impoundment system. There were 6 and 4 instances where this maximum time interval was exceeded for weekly and monthly inspections, respectively.

The following unusual conditions were reported in weekly and monthly inspection worksheets covering the current annual inspection period:

- Elevated Ash Cell Water Levels – The top of the peripheral berm surrounding each of the ash cells is at an elevation of 195 feet, referenced to the National Geodetic Vertical Datum of 1929 (NGVD29). The ash cells are operated with a normal maximum operating level of 193 feet (NGVD29) to provide 2 feet of freeboard in case of heavy rain/storm events. Water levels higher than 193 ft NGVD29 were observed for two (2) weeks and five (5) weeks for Ash Cell #1 and Ash Cell #2, respectively, during the time period covered by this report.

For Ash Cell #1, the first occurrence of elevated water levels was reported on 3/2/2020 due to Unit #2 outage. Water from the cooling tower, boiler, and air heater wash was pumped into the pond causing the elevated water level in the pond. The water level in Ash Cell #1 continued to remain over 193 feet for another week. The water level in Ash Cell #1 was reported to be back below 193 ft elevation starting 3/16/2020.

For Ash Cell #2, the first incidence of elevated water levels was reported on 3/9/2020 due to Unit #2 outage. Water from the cooling tower, boiler, and air heater wash was pumped into the pond causing the elevated water level in the pond. The water level in Ash Cell #2 continued to remain over 193 feet for another four weeks. On 3/16/2020, Ash Cell #2 was reported to be isolated from the water systems to avoid a further rise in water level. The water level in Ash Cell #2 was reported to be back to be below 193 ft elevation starting 4/6/2020.

The operators closely monitored pond levels and adjusted process water and stormwater pumping to the ponds to reduce the ash pond levels expeditiously during these events.

- Discoloration. Discoloration of water in Ash Cells 1 and 2 was reported in the week on 3/2/2020. The discoloration was reported to be a typical occurrence during the outage and associated with the air heater wash pumped to the ash cells during Unit 2 outage. The discoloration was not reported as an issue during the subsequent weekly inspections.

During each monthly inspection, depth-to-liquid readings in the piezometers located on the embankments of Ash Cell #1 and Ash Cell #2 were measured. The water level measured in these piezometers are used to qualitatively assess potential embankment seepage areas; Piezometer P-2, P-3, and P-4 are used to monitor exterior embankments for Ash Cell #1, and P-1 is used to monitor the exterior embankment of Ash Cell #2. The liquid elevation in the piezometers was compared to the liquid elevation in each adjacent ash pond. Figures 3 and 4 present a comparison of the measured liquid levels for Ash Cell #1 and corresponding piezometers and Ash Cell #2 and corresponding piezometer(s), respectively. The measurements taken by ITS engineers on the day of the annual inspection were consistent with those measured by GRU during the most recent monthly inspection.

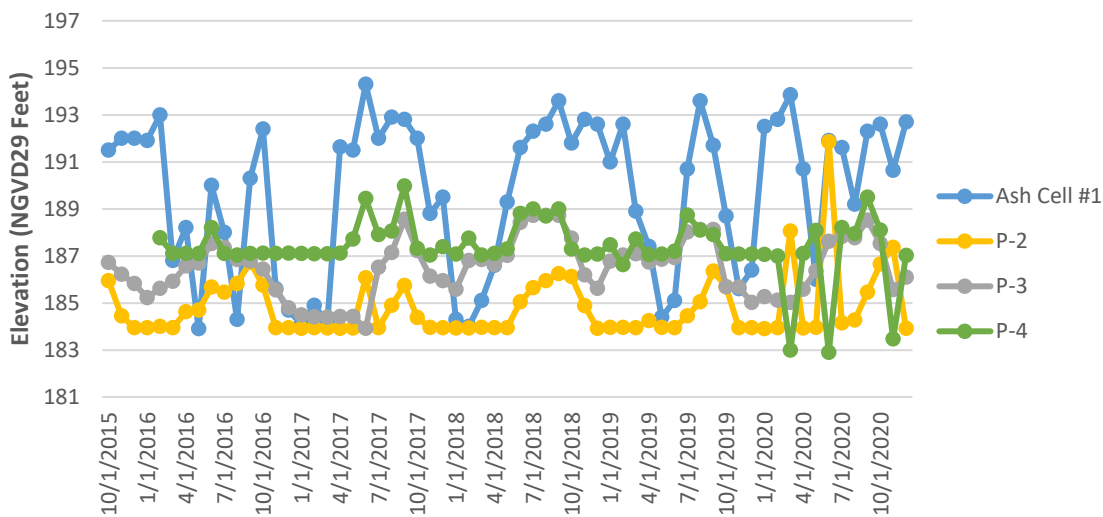


Figure 3. Liquid Elevations for Ash Cell #1 and Piezometers

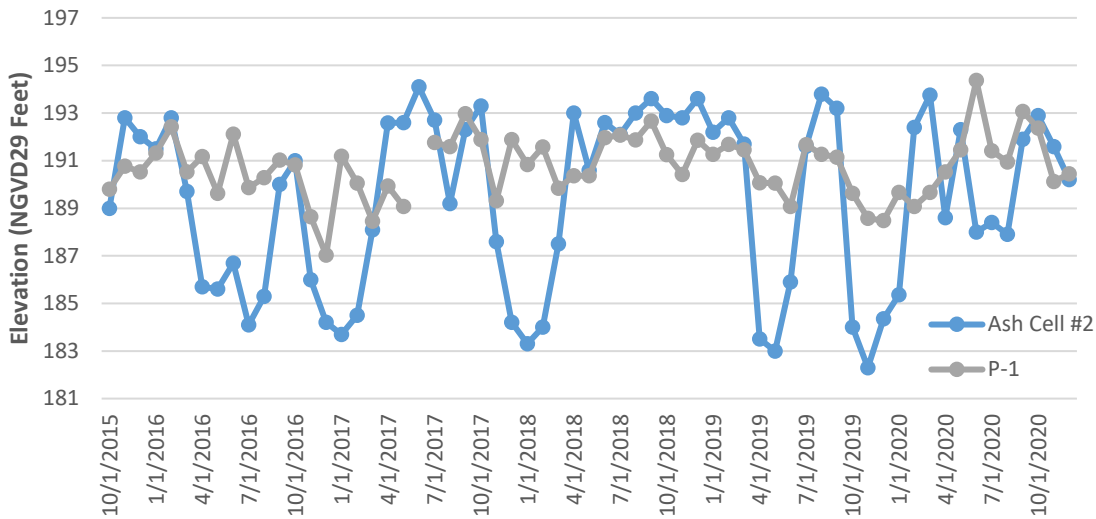


Figure 4. Liquid Elevations for Ash Cell #2 and Piezometer

2.2 Field Inspection

ITS inspected the CCR surface impoundment system on December 9-11, 2020. The following section describes the observations made during the inspection.

2.2.1 Signs of Distress or Malfunction of CCR Unit or Appurtenant Structures

No sign of distress or malfunction was observed for the visible sections of the ash ponds or the stoplog structures. The condition of the submerged interior slopes and the stoplogs could not be visually inspected in the ash ponds.

2.2.2 Hydraulic Structures

ITS was not able to inspect the subsurface culverts which connect each ash cell to its adjacent pump back pond as these were submerged below the water levels in the ash ponds and pump back ponds. ITS recommends that GRU conduct a dry/semi-dry inspection of the culverts to assess their structural integrity.

2.2.3 Geometrical Changes of CCR Unit

ITS conducted a topographic survey of select features of the surface impoundment system on 9 December 2020. A comparison of the topographic conditions collected during this survey to those observed in the survey conducted by DSI (2015) does not suggest any significant deviations in geometry from those observed during the previous annual inspection. Appendix A includes a comparison between the elevations of the features during this inspection to those presented by DSI (2015). Please note that the survey equipment used by ITS has a manufacturer-listed maximum accuracy of 4 inches. The surveyed elevations should be considered as rough approximations as the survey was not performed by a licensed surveyor.

2.2.4 Instrumentation Locations and Maximum Readings

Apart from a groundwater monitoring system (separately discussed in detail in annual groundwater monitoring and corrective action reports), the piezometers located adjacent to each of the two ash ponds are the only instruments used to monitor the surface impoundment system. Table 1 presents the location of the piezometers, along with their maximum recorded readings over the last annual inspection period. Please note that the easting and northing coordinates are referenced to US State Plane 1983 Florida North 0903. The maximum reading liquid elevations are referenced to NGVD29. As a point of comparison, the elevation of the top of the peripheral berm surrounding each of the ash cells is at an elevation of 195 feet NGVD29. The maximum elevations observed during the reporting period for all the piezometers were higher than those observed during the previous reporting period. The maximum elevations observed during the reporting period for P-1, P-2, P-3, and P-4 were 2.7, 5.5, 0.4, and 0.8 ft, respectively, higher than those observed during the previous reporting period.

Table 1. Location, Type, and Maximum Recorded Readings of Existing Instrumentation

Piezometer	Easting	Northing	Max Elevation (NGVD29)
P-1	2636972.5	284823.8	194.4
P-2	2636725.5	284571.1	191.9
P-3	2636691.7	284443.8	188.5
P-4	2636873.5	284259.3	189.5

2.2.5 Elevation of CCR and Impounded Water

Table 2 presents a comparison of the water levels observed on the day of inspection with the maximum and minimum levels recorded by GRU staff during weekly and monthly inspections; the water levels in the ponds are tracked with a staff gauge painted on one of the concrete walls of the stoplog structure in each ash pond. It should be noted that all liquid depths in each pond were calculated assuming the bottom of the ash ponds is located at 179 feet NGVD29, as indicated in the B&M (1981) drawing set. The surface of the settled bottom ash is not evenly distributed – the elevations presented in Table 2 correspond to the water elevation of the ponds.

Table 2. Maximum, Minimum, and Present Depth and Elevation of CCR and Water

Location	Media	Parameter	Unit	12/9/20	Minimum of the Weekly and Monthly Measurements	Maximum of the Weekly and Monthly Measurements
Ash Cell #1	Water	Elevation	feet (NGVD29)	191.4	186	193.9
		Depth	feet	12.4	7	14.9
Ash Cell #2	Water	Elevation	feet (NGVD29)	191.1	184.4	193.8
		Depth	feet	12.1	5.4	14.8

2.2.6 Storage Capacity and Volume of CCR and Impounded Water

A large portion of the CCR surface in the ash ponds was inundated at the time of this inspection (as shown in Figure 1 aerial image); the current CCR storage capacity of the surface impoundment systems could not be estimated. However, based on construction records, it is estimated that the CCR surface impoundment

system has a total volumetric capacity of 16.9 million gallons (or approximately 83,700 cubic yards) not including the capacity associated with the 2 feet of freeboard.

Based on the present (i.e., 9 December 2020) water elevations in each of the ash cells, the total in-place volume of water and CCR in the ash cells is roughly estimated to be 11.6 million gallons (or approximately 57,600 cubic yards).

2.2.7 Structural Weaknesses and Adverse Conditions

ITS visually inspected the external side slopes of the surface impoundment system and the pump back cells to identify any potential indicators of structural weakness or any other adverse condition including signs of erosion; bulging; depressions; cracks; animal forage holes; boils; or excessive, turbid, or sediment-laden seepage. One animal forage hole was found on the external slopes of the surface impoundment system. Figure 5 shows the animal forage hole found during the annual inspection process; the forage hole was approximately 4-6 inches wide and 10-12 inches deep.

The height of grass on 11 December 2020, on the southern and western slopes of the surface impoundment system was found to be greater than the maximum 6-inch requirement (§257.74(d)(iv)). Additionally, the presence of previously cut grass on the side slopes of the impoundment system was noticed. As shown in Figure 6, the height of grass was approximately 8-9 inches. Figure 7 shows the grass clippings build-up on the side slopes of the impoundment system. Grass greater than 6 inches tall or the accumulation of grass clippings on the side slopes of the impoundment can conceal conditions such as animal burrows, erosion rills, and seeps that impact the structural integrity of the impoundment embankments.



Figure 5. Forage Hole Observed on External Slope of the Surface Impoundment System



Figure 6. Grass Height Greater than 6 inches Observed on External Slopes of the Surface Impoundment System



Figure 7. Accumulated Grass Clippings Observed on the External Side Slopes of the Surface Impoundment System

2.2.8 Other Changes Affecting Stability or Operation

No other changes or circumstances, which may impact the stability or operation of the surface impoundment systems, were noted during the inspection.

3 CCR Landfill

3.1 Review of Relevant Information

A total of 52 weekly CCR landfill inspection worksheets were reviewed; these worksheets covered the period from 11 December 2019 through 10 December 2020. 40 CFR 257.84(a)(1)(i) establishes a maximum

time interval of 7 days for weekly inspections of the CCR landfill. All 52 weekly CCR landfill inspections were performed without exceeding the maximum time interval.

The worksheets allow the inspector to categorize observations as *Acceptable*, *Area of Concern*, or *Needs Attention*. *Area of Concern* is defined in the worksheet as “may develop into a *Needs Attention* area if not addressed. Monitor the situation and reevaluate during the next inspection. Address as necessary.” It should be noted that an *Area of Concern* is not indicative of a problem but is used to proactively identify and monitor circumstances that have an elevated chance of developing into a problem. *Needs Attention* is defined in the worksheet as “currently or imminently presents a human-health, operation or environmental hazard/problem. Address as soon as possible.”

Twenty-one (21) *Needs Attention* observations were reported in the weekly inspection worksheets reviewed for this report. The majority of these observations appear to be because of the presence of loose ash piles that were not spread and compacted (9 occasions), and high water level in the Northern Drainage Ditch (4 instances). Based on supervisor notes included in the inspection worksheets, it appears that these issues were addressed expeditiously and were generally resolved within a day of the observation.

The *Needs Attention* observations corresponded to the following 9 categories:

- 1) **Loose Piles of CCR (9 instances)** – loose piles of CCR accumulated on the landfill surface were observed – these piles have the potential to contribute to dust emissions. The presence of loose piles was a frequently occurring issue during the reporting period. Four of these observations were associated with the dozer breakdown in May-Jun 2020.
- 2) **Water Level Above Underdrain Outlets (4 instances)** – four underdrain pipes collect and transport CCR contact water to the Northern Drainage Ditch. One of these observations is directly related to heavy rainfall. Heavy rains on 6/6/2020, 6/7/2020, and 6/8/2020 (cumulative precipitation of 3.84 inches (NOAA 2020) resulted in elevated water levels in the Northern Drainage Ditch. On all occasions, the Northern Drainage Ditch was pumped down as soon as feasible following these observations. Elevated water levels in the Northern Drainage Ditch were never observed in two consecutive inspections.
- 3) **Access Road Erosion/Rutting (3 instances)** – Erosion spots were observed on the access road and the ramp at the southwest corner of the landfill on three instances. While one of the observations was directly related to heavy rains, the other two occasions were observed during two consecutive weeks and were due to wear and tear caused by everyday heavy vehicle traffic.
- 4) **Potential Dust Emissions (1 instance)** – Access road onto the landfill was observed to be dry. The access road was wetted on the day of observation.
- 5) **Overgrown Vegetation (1 instance)** – Vegetation on the side slopes of the CCR landfill was observed to be taller than 6 inches. Mowing activities were performed in the week of observation.
- 6) **Erosion Around Groundwater Monitoring Wells (1 instance)** – Erosion of soil was observed under one of the groundwater monitoring wells. The soil was packed and seeded in the week of observation.

- 7) **Soil Erosion (2 instances)** – Erosion caused by heavy rains was observed in the active CCR disposal area on one instance. On a different occasion, minor erosion was observed near a stormwater culvert. Both the areas were stabilized in the week of observation.

Twenty-four (24) “Areas of Concern” were noted. These are listed as follows:

1. Grass and other vegetation height on external slopes (7 instances; 2 of these were reported in consecutive weekly inspection reports),
2. Access roads and ramps (6 instances; 2 of these were reported in consecutive weekly inspection reports),
3. Ponding of water on active surface area (3 instances),
4. Erosion of active surface area (3 instances),
5. Thick vegetation around underdrain outfalls (1 instance)
6. Ponded stormwater run-off in the stormwater channel on the south and west of the landfill (1 instance),
7. Hay bales rotting (2 instances in two consecutive weekly inspections).
8. Sediment built-up around Cell 1 downcomer (1 instance)

Based on supervisor notes included in the inspection worksheets, it appears that these issues were addressed expeditiously and were generally resolved within a day of the observation. Except for the three instances noted above, the issues were not observed in two consecutive inspections.

3.2 Field Inspection

ITS inspected the CCR landfill on 9-10 December 2019. The following section describes observations made during the inspection event.

3.2.1 Signs of Distress or Malfunction

No sign of distress or malfunction was observed on the CCR Landfill.

3.2.2 Geometrical Changes of CCR Landfill

In accordance with the landfill filling plan, the interior of Cell 1 and Cell 2 and the peripheral berm on the external side slopes of Cell 1 and Cell 2 are progressively raised by approximately 4 feet for each lift of deposited CCR. No changes in the geometry of the landfill indicative of structural instability or weakness were noted.

3.2.3 Volume of CCR

ITS conducted a topographic survey of the landfill on 9 December 2020 and used AutoCAD Civil 3D 2013 cut-and-fill procedures to estimate the in-place CCR volume; the landfill bottom elevation was assumed to be 184 feet NGVD29 (as approximately shown in B&M 1981). Approximately 490,230 cubic yards of CCR and other materials (i.e., cover soil, FET lime sludge) have been deposited in the landfill to date. The topographic survey and the estimated in-place volume should be considered as a rough approximation as the survey was not performed by a licensed surveyor.

3.2.4 Structural Weaknesses and Adverse Conditions

ITS performed a visual inspection of all exterior slopes of the CCR landfill for any appearance of actual or potential structural weakness, including signs of erosion, bulging, depressions, cracks; animal forage holes; boils, or excessive, turbid, or sediment-laden seepage. No signs of structural weakness and adverse conditions were observed.

Patches of weeds taller than 6 inches were observed on the northern slopes of CCR Landfill on 10 December 2020. Vegetation taller than 6 inches tall on the side slopes can conceal conditions such as animal burrows, erosion rills, and seeps that impact the structural integrity of the landfill side slopes. As shown in Figure 8, the height of weeds was approximately 10-11 inches. Figure 9 shows the patches of weeds on the northern slope of the CCR Landfill.



Figure 8. Weed Height Greater than 6 inches Observed on Northern Slope of the CCR Landfill



Figure 9 Patches of Tall Weeds on the Northern Slope of CCR Landfill

3.2.5 Other Changes Affecting Stability or Operation

No other changes or circumstances, which may impact the stability or operation of the landfill, were noted during the inspection.

4 Summary of Deficient Conditions and Recommendations

Table 3 presents a summary of the locations of each deficient condition observed during the annual inspection.

Table 3. Location Summary of Deficient Conditions Observed During the Annual Inspection

CCR Unit	Location	Condition
Surface Impoundment System	Southern slope	Animal forage hole
	Southern and Western slopes	Grass was observed to be taller than 6 inches.
CCR Landfill	Northern Slope	Tall weeds

All deficiencies identified for the CCR units were brought to the attention of GRU on 15 December 2020. ITS makes the following recommendations to address the deficiencies identified during this annual inspection:

1. GRU should relocate resident animal(s) (if any) and backfill the animal forage hole in accordance with federal, state, and local law.
2. GRU should mow/trim the grass and ensure it is not taller than 6 inches. ITS recommends GRU to keep the external slopes of CCR units clear of cut grass.

Per §257.83(b)(5) and §257.84(b)(5), GRU is required to address these identified deficiencies as soon as feasible and document the corrective measures taken.

40 CFR 257.83(a)(1)(i) and (iii) respectively establish maximum time intervals for weekly (i.e., 7 days) and monthly (i.e., 30 days) inspections of the surface impoundment system. There were 6 and 4 instances where this maximum time interval was exceeded for weekly and monthly inspections for the impoundment system, respectively. Similarly, 40 CFR 257.84(a)(1)(i) establishes a maximum time interval of 7 days for weekly inspections of the CCR landfill. All the weekly inspections were performed within this maximum time interval of 7 days. GRU is recommended to perform the weekly and monthly inspections within these maximum intervals.

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UES (2020a). Geotechnical Consulting Services – Coal Combustion Residuals (CCR) Surface Impoundment System and Updated Landfill Groundwater Monitoring Systems Design and Construction, Deerhaven Generating Station (DGS), 10001 NW 13th Street, Gainesville, Alachua County, Florida. Prepared for Innovative Waste Consulting Services, LLC by Universal Engineering Sciences, November 2020.

UES (2020b). Slope Stability and Liquefaction Potential Analysis CCR Impoundment System, Deerhaven Generating Station (DGS), prepared by Universal Engineering Services for Gainesville Regional Utilities and Innovative Waste Consulting Services, LLC, November 2020.

6 Professional Engineer Certification

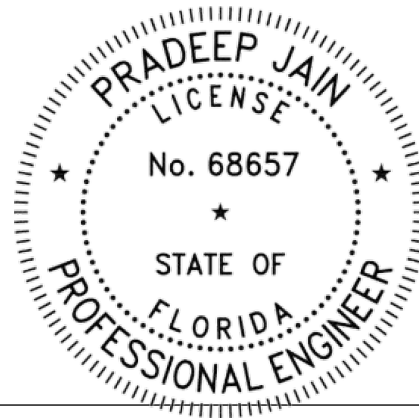
This plan was prepared under the supervision, direction and control of the undersigned, registered professional engineer (PE). The undersigned PE is familiar with the requirements of 40 CFR 257.83(b) and 84(b). The undersigned PE certifies that this CCR unit annual inspection report meets the requirements of 40 CFR 257.83(b) and 84(b).

Name of Professional Engineer: Pradeep Jain

Company: Innovative Waste Consulting Services, LLC

PE Registration State: Florida

Florida PE License No.: 68657



This item has been digitally signed and sealed by Pradeep Jain, PE, on the date adjacent to the seal. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Appendix A

Comparison Table of Surface Impoundment System Elevations from DSI (2015) and Elevations Observed by ITS 9 December 2020

Surface Impoundment System Feature	9 December 2020 Elevation (feet NGVD29)	DSI (2015) Survey Elevation (feet NGVD29)
Top of Embankment - Ash Cell 1	195.2 – 195.5	194.9 - 195.9
Top of Embankment - Ash Cell 2	195.9 – 196.5	194.7 - 195.6
Top of Embankment - Pump Back Cell 1	188.6 – 188.7	187.6 - 188.7
Top of Embankment - Pump Back Cell 2	188.5 – 188.7	188.1 - 188.8
Stoplog Structure - Ash Cell 1	195.5	195.3
Stoplog Structure - Ash Cell 2	195.3	195.2
Stoplog Bridge Abutment - Ash Cell 1	195.1	194.8 - 194.9
Stoplog Bridge Abutment - Ash Cell 2	194.9	194.8 - 194.9
Top of North Splash Block Ash Cell 1	195.1	194.7
Top of South Splash Block Ash Cell 1	195.1	194.7
Top of North Splash Block Ash Cell 2	195.0	194.7
Top of South Splash Block Ash Cell 2	194.9	194.6 - 194.7
Electrical Equipment Building Retaining Walls	188.3 – 188.5	188.1 - 188.4
Ash Pipe Drain Pit	180.2	179.6 - 180.3
Ash Cell 1 Outer Embankment Toe	182.8 – 183.4	182.6 - 182.7
Ash Cell 2 Outer Embankment Toe	182.6– 182.8	182.1 - 182.7