



**NRG TEXAS POWER, LLC
WA PARISH STATION, UNITS 5, 6, 7, & 8**

ANNUAL INSPECTION OF CCR IMPOUNDMENTS AND LANDFILL

S&L Report No.: SL-013202

Issue: Rev. 0

Date: January 18, 2016

Project No.: 12661-038

Prepared by



55 East Monroe Street
Chicago, IL 60603-5780 USA
312-269-2000

www.sargentlundy.com



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Annual Inspection of CCR
Impoundments and Landfill
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ISSUE SUMMARY AND APPROVAL PAGE

This is to certify that this report has been prepared, reviewed and approved in accordance with Sargent & Lundy's Standard Operating Procedure SOP-0405, which is based on ANSI/ISO/ASSQC Q9001 Quality Management Systems.

Prepared by:

Jan. 18, 2016

David E. Nielson
Sr. Geotechnical Engineer

Reviewed by:

1/18/2016

Daniel C. Kocunik
Geotechnical Discipline Manager

Approved by:

1-18-2016

James H. Staehlin, P.E
Project Manager



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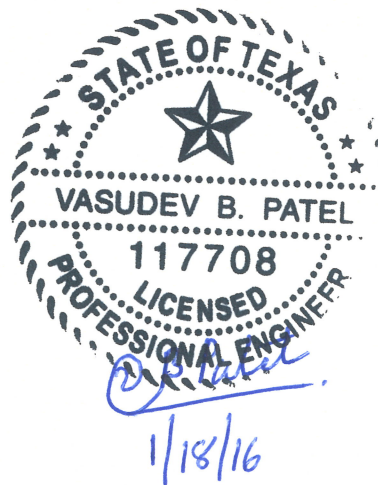
CERTIFICATION PAGE

I certify that this report was prepared by me or under my supervision and that I am a registered professional engineer under the laws of the State of Texas.

This document is released for use under the authority of Vasudev B. Patel, Texas PE #117708 on January 18, 2016. Sargent & Lundy, LLC Texas Registered Engineering Firm # F-2202.

Certified By: *V. B. Patel* Date: *1/18/16*
 Vasudev B. Patel, P.E.

Seal:





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1 EXECUTIVE SUMMARY

On December 1, 2015, Sargent & Lundy, LLC (S&L) inspected the CCR impoundments (ponds) and landfill at the WA Parish Station, near Thompsons, Texas. Specifically, 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 From Electric Utilities.

This inspection included two licensed professional engineers (one licensed in Texas and one in Illinois) performing a visual inspection of the applicable ponds and landfill cells to identify areas requiring maintenance and signs of distress or malfunction of the CCR ponds and landfill cells. S&L also reviewed the available documentation related to the CCR Units at the WA Parish Station.

This inspection evaluated:

- FGD Emergency Pond (E-Pond),
- Air Preheater Pond,
- Landfill Cell 3,
- Landfill Cell 2A,
- Landfill Cell 1C, and
- Landfill Cell 2B.

S&L did not observe any evidence of ongoing or imminent failure of these ponds or landfill cells. No structural deficiencies were noted based on S&L's observations.

It is the opinion of S&L that FGD Emergency Pond does not require an annual inspection since it is fully incised and that the Preheater Pond does not require inspection since it has a height of less than 20 ft. and a capacity less than 20 acre-ft. Moreover, since the Federal CCR Rule does not apply to landfills that no longer receive CCR materials after October 19, 2015, closed landfill cells (Cells 1, 1A, 1B, 2, 2A, which are not shown on Figure 1 for clarity) were not inspected in this work.

Several maintenance recommendations are presented in Section 9 of this report that should be implemented in addition to the ongoing maintenance program.

Based on review of available documents and the visual inspection, it is S&L's opinion that Landfill Cells 3, 2A, 1C and 2B have been designed, constructed, are currently operated, and are maintained in a manner that is consistent with and in accordance with recognized and generally accepted good engineering standards.

2 INTRODUCTION

This report presents the observations and findings of the first annual inspection at the WA Parish Generating Station. The WA Parish Generating Station is located near Thompsons, in Fort Bend County Texas. The power station is owned and operated by NRG Texas Power, LLC.

The WA Parish Generating Station includes 4 coal fired generating units with a total gross rated capacity of 2667 MW from the coal fired units. The station is fueled by coal imported from the Powder River Basin in Wyoming.

The general arrangement of the station is depicted in Figures 1 and 2.

3 PURPOSE/OBJECTIVE

This report is prepared to provide compliance with the annual inspection requirements for CCR Units as required by 40 CFR part 257, the US Environmental Protection Agency rule on Disposal of Coal Combustion Residuals From Electric Utilities (Reference 1), which is referred to as the Federal CCR Rule in this report. Specifically, Sections 257.83(b) and 257.84(b) of the Federal CCR Rule pertain to the annual inspection requirements for CCR Surface Impoundments and CCR Landfills, respectively.

4 SCOPE OF WORK

This report documents the annual inspection by a qualified professional engineer for all existing landfills (landfills that receive CCR material after October 19, 2015) and also for surface impoundments that have either:

- A height of 5 feet or more **and** a storage volume of 20 acre-ft. or more; **or**
- A height of 20 feet or more.

The Federal CCR Rule does not apply to landfills that do not receive CCR material after October 19, 2015 (Reference 1, §257.50(d)), thus landfill cells that have been closed are not considered herein.

This work includes:

- Annual inspections by a qualified professional engineer to evaluate if the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards.
- A review of available information regarding the status and condition of the CCR unit, including, but not limited to, files available in the operating record, previous periodic structural stability assessments, and the results of “weekly” inspections by a qualified person;
- A visual inspection of the CCR unit to identify signs of distress or malfunction of the CCR unit and appurtenant structures; including a visual inspection of any hydraulic structures underlying the base of the CCR unit or passing through the dike of the CCR unit for structural integrity and continued safe and reliable operation.

Preparation of this inspection report which, as required by the Federal CCR Rule, addresses the following:

- Any changes in geometry of the impounding structure since the previous annual inspection;
- The location and type of existing instrumentation and the maximum recorded readings of each instrument since the previous annual inspection;
- The approximate minimum, maximum, and present depth and elevation of the impounded water and CCR since the previous annual inspection;
- The storage capacity of the impounding structure at the time of the inspection;
- The approximate volume of the impounded water and CCR at the time of the inspection;
- Any appearances of an actual or potential structural weakness 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 impounding structure since the previous annual inspection.

Since this is the first annual inspection under the Federal CCR Rule, the rule requirements of comparison since the prior annual inspection are not included herein.

5 ASSUMPTIONS/INPUTS

There are no assumptions that require verification for this work.

NRG provided prior reports and design drawings as inputs to this inspection.

6 CCR IMPOUNDMENTS & LANDFILL DESIGN & BACKGROUND

The following CCR Units are considered in this annual inspection:

- FGD Emergency Pond (E-Pond),
- Air Preheater Pond,
- Landfill Cell 3,
- Landfill Cell 2A,
- Landfill Cell 1C,
- Landfill Cell 2B.

The following paragraphs summarize the design and construction of these CCR Units and evaluate the applicability of the Federal CCR Rule to each CCR Unit.

6.1 FGD EMERGENCY POND (E-POND)

The FGD Emergency Pond (E-Pond) is in the power block area as shown in Figure 2. The FGD Emergency Pond is approximately 200 ft. by 110 ft. and is about 0.5 acres in aerial extent, not including the adjacent slab for dewatering CCR material that is removed from the pond. The pond was constructed by excavating the entire pond below the surrounding ground surface prior to installation of the concrete floors and walls. The outlet structure includes an overflow weir, which is piped into a sump where the overflow water is pumped back into plant processes. The pond receives stormwater runoff from the FGD dewatering area and also blowdown from the FGD system. When the FGD system goes off line, this pond may also receive the contents of an FGD process vessel.

The Federal CCR Rule (Reference 1 §257.53) states:

“Incised CCR surface impoundment means a CCR surface impoundment which is constructed by excavating entirely below the natural ground surface, holds an accumulation of CCR entirely below the adjacent natural ground surface, and does not consist of any constructed diked portion.”

Moreover, the preamble to the Federal CCR Rule (Reference 1, Page 21395) states:

“Incised CCR surface impoundments, as defined in § 257.53 are not subject to the annual inspection requirements.”

Since the FGD Emergency Pond is fully incised, annual inspections are not required and it is not fully inspected nor fully evaluated in subsequent sections of this annual inspection report.

6.2 AIR PREHEATER POND

The Air Preheater Pond is located south of the main power block near the Coal Pile Runoff Pond as shown in Figure 2. The Air Preheater Pond receives two CCR material waste streams. Effluent from air preheater wash and boiler cleaning wash (consisting of fly ash or economizer ash particles and water) is pumped to the Air Preheater Pond.

The Air Preheater Pond is reportedly constructed with a clay liner and protective cover over the clay liner. The outlet from the Air Preheater Pond is either by an overflow channel on the western edge of the pond or by a portable pump.

The Air Preheater Pond is approximately 170 ft. by 350 ft. NRG has reported the area of the pond as 1.2 acres and the total storage capacity of the Air Preheater Pond is 3.7 acre-ft.

Since the Air Preheater Pond is smaller than 20 acres and has an impounded height less than 20 ft., the Federal CCR Rule does not require an annual inspection as discussed in Section 4 of this report. Thus, the Air Preheater Pond is not fully inspected nor fully evaluated in subsequent sections of this annual inspection report.

6.3 LANDFILL CELL 3

Landfill Cell 3 receives bottom ash, which is trucked from the plant. The landfill is constructed over a significant deposit of in-situ clay soils. Stormwater is directed to a stormwater collection pond in the western portion of Cell 3. The stormwater outlet from this pond is pumped on an as needed basis to provide cooling and other water for the plant.

Landfill Cell 3 is designed as a Class 2 non-hazardous landfill under criteria of the Texas Environmental Quality Commission (TEQC).

Since Landfill Cell 3 is an active landfill, an annual inspection is required as documented in subsequent sections of this report.

6.4 LANDFILL CELL 2A

Landfill Cell 2A is a small active portion of Cell 2A which has been closed. This open portion of Cell 2A is an active pugmill operation for mixing and stabilizing CCR material for disposal in other landfill cells or for beneficial use outside the landfill cells. The landfill 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 and is pumped into an above ground water storage tank for the pugmill process.

Landfill Cell 2A is designed as a Class 2 non-hazardous landfill under criteria of the Texas Environmental Quality Commission (TEQC).

Since Landfill Cell 2A is an active landfill, an annual inspection is required as documented in subsequent sections of this report.

6.5 LANDFILL CELL 1C

Landfill Cell 1C receives nonmarketable CCR materials, which are trucked from the plant. The landfill is constructed over a significant deposit of in-situ clay soils. Stormwater is directed to a stormwater collection pond in the western portion of Cell 1C. The stormwater outlet from this pond is pumped on an as needed basis to provide cooling and other water for the plant.

Landfill Cell 1C is designed as a Class 2 non-hazardous landfill under criteria of the Texas Environmental Quality Commission (TEQC).

Since Landfill Cell 1C is an active landfill, an annual inspection is required as documented in subsequent sections of this report.

6.6 LANDFILL CELL 2B

Landfill Cell 2B receives marketable CCR materials, which are trucked from the plant. The landfill is constructed over a significant deposit of in-situ clay soils. Stormwater is directed to a stormwater collection pond in the southern portion of Cell 2B. The stormwater outlet from this pond is pumped on an as needed basis to provide cooling and other water for the plant.

Landfill Cell 2B is designed as a Class 2 non-hazardous landfill under criteria of the Texas Environmental Quality Commission (TEQC).

Since Landfill Cell 2B is an active landfill, an annual inspection is required as documented in subsequent sections of this report.

7 CCR IMPOUNDMENTS & LANDFILL INSPECTION OBSERVATIONS & FINDINGS

On December 1, 2015, Mr. Vasudev Patel, PE (TX, WI) and Mr. David Nielson, PE (WA, IN, MI, IL, NV) of S&L along with Rick Brown, PE of NRG, visually inspected the CCR impoundments and landfills (CCR Units) at the WA Parish Generating Station. This visual inspection was performed to evaluate if the design, construction, operation, and maintenance of each applicable CCR unit is consistent with recognized and generally accepted good engineering standards.

7.1 FGD EMERGENCY POND (E-POND)

The location and general arrangement of the FGD Emergency Pond are depicted on Figures 1 and 2 and also Photograph P-1, which were all obtained from Google Earth Pro®. This Google Earth Pro image appears to accurately represent the general configuration and conditions observed at the FGD Emergency Pond by S&L on December 1, 2015, with the exception that the water level in the pond was higher in Photograph P-1 than it was at the time of the inspection.

Although the Federal CCR Rule requirement for annual inspection does not apply to the FGD Emergency Pond as discussed in Section 6.1, Photographs P-1 through P-5 (found in Appendix A) are presented to validate the fully incised condition. The pond was at a lower than typical water level at the time of the inspection. Photograph P-3 indicates the operating water level based on the elevation of markings on the concrete wall in the background as well as the level of the top of sediment in the right hand portion of the pond.

It should be noted that the soil stockpile in the background of Photographs P-2 and P-3 are of soil associated with the ongoing carbon capture construction work, and not CCR material excavated from the FGD Emergency Pond.

There was no apparent misalignment, rotation or significant damage to the concrete walls of the FGD Emergency Pond. The FGD Emergency Pond was found to be in excellent condition as observed, without observed indications of risk of catastrophic or operational failure.

7.2 AIR PREHEATER POND

The location and general arrangement of the Air Preheater Pond are depicted on Figures 1 and 2 and also on Photograph P-6, which were all obtained from Google Earth Pro®, dated July 2015. Photograph P-6 appears to accurately represent the configuration and conditions observed at the Air Preheater Pond by S&L on December 1, 2015, except for the following improvements that have been made since the Google photograph was taken:

- Dredging of accumulated CCR materials has been completed;
- Improvements have been made to protect the dike area in the vicinity of the inlet pipe; and
- Vegetation control on the outside slopes have been improved, including cutting tall vegetation on the western outside slope and establishing better grass cover on the other outside slopes.

Although the Federal CCR Rule requirement for annual inspection does not apply to the Air Preheater Pond as discussed in Section 6.2, this section documents the general condition and small size of the pond.

The Air Preheater Pond contained little exposed CCR material, with a relatively small area of CCR material exposed only near the discharge area of the inlet pipe (Photograph P-9). The freeboard of the Air Preheater Pond was estimated to be 5 ft. ± at the time of the inspection.

The dikes are shown in Photographs P-7, P-8 and P-9. The dikes were found to be in good condition with generally good vegetation, good slope alignment and appropriate grades.

The Air Preheater Pond was found to be in excellent condition as observed, without observed indications of risk of catastrophic or operational failure.

7.3 LANDFILL CELL 3

The location and general arrangement of Landfill Cell 3 are depicted on Figure 1 and also Photograph P-10, both of which were obtained from Google Earth Pro®. Photograph P-10 appears to accurately represent the conditions observed at Landfill Cell 3 by S&L on December 1, 2015, with the exception that accumulated CCR material shown by Google Earth in the northern end of the stormwater pond inside Cell 3 has been dredged.

Landfill Cell 3 consists of an active marketable bottom ash storage area and a stormwater detention pond (approximately 4 acres), located within the perimeter berm in the western portion of the landfill cell. The interface between the higher ash storage area and the stormwater pond is shown in Photographs P-21 and P-23.

Visually, at the time of the inspection, it appears the water level in the stormwater pond was approximately equal to the ground surface outside the western and southern dikes of the pond. Thus, on this date the lateral pressure on the stormwater dikes was minimal.

The perimeter berms (intended to retain CCR material) and dikes (intended to retain water in ponds) are shown in Photographs P-11, P-13, P-14, and P-17 through P-21. In general, the perimeter berms and dikes are well vegetated and demonstrate good alignment and slope grade. However, it should be noted that the inside slope of the dikes around the stormwater pond appeared to be benched with a steep section near the top of the dike and a flatter section near the water line as shown in Photographs P-14, P-18, P-19 and P-21. This appears to be the result of dredging the pond, but could also be the result of wave action. It is more likely a result of the profile from prior dredging work. This slope appears to be stable in its current configuration and should be monitored for change. At the time of this inspection, the inside slopes near the stormwater pond needed to be mowed to reduce the vegetation height.

An erosional void was observed on the inside slope of north dike at the discharge for a pipe entering the pond as shown in Photograph P-22. In this area the loose and disturbed material should be removed and the erosional void filled with compacted clay soil. A splash pad or other erosion control measures could be constructed to prevent future erosion.

The access road on the perimeter berms/dikes is surfaced with a stabilized material that has experienced shrinkage and has cracked as shown on Photograph P-12. See Section 7.4 for a more thorough discussion of this condition. This condition does not require repairs.

The stormwater pond discharge is pumped to the west in an HDPE pipeline. An exposed pipe elbow in this pipeline was observed on the outside slope of the western dike of the stormwater pond. Specifically, this fitting is located west of the pump station as shown in Photograph P-14 in line with the valve control shown in Photograph P-16. This exposed fitting has experienced significant damage as shown in Photograph P-15, likely as a result of recent mowing. This fitting should be evaluated by engineering or maintenance staff qualified to evaluate its operational functionality. If the integrity of the fitting is in question, it should be replaced. To prevent further damage to this fitting, bollards could be placed around the fitting or additional fill could be placed to bury the fitting.

The inspection of the outlet pipe area did not indicate evidence of seepage or other adverse conditions.

Landfill Cell 3 was found to be in good condition as observed without indications of risk of catastrophic or operational failure. Following the repairs of the erosional void identified in the northern dike, protection of the outlet pipe fitting and more aggressive mowing on the inside slopes of dikes of the stormwater pond, the cell will be considered to be in excellent condition.

7.4 LANDFILL CELL 2A

The location and general arrangement of Landfill Cell 2A are depicted on Figure 1 and also Photograph P-24, which were both obtained from Google Earth Pro®. Photograph P-24 appears to accurately represent the condition of the berms observed at Landfill Cell 2A by S&L on December 1, 2015.

At the time of the S&L inspection, Landfill Cell 2A was not used to store or dispose of significant quantities of CCR material. Moreover, mixing ash products for stabilization was not in progress during the inspection. Since the cell did not contain significant CCR materials, the lateral loads on the perimeter berms was minimal.

The inside slopes of the perimeter berms are shown in Photographs P-25, P-26, P-27, P-28, P-30, and P-35. These slopes typically exhibited good alignment, grades and vegetation. No adverse conditions were identified for the inside slopes of the perimeter berm.

The outside slopes of the perimeter berms are shown in Photographs P-29, P-34, P-36, and P-40. These slopes typically exhibited good alignment, grades and vegetation. Several areas of taller vegetation were noted (see Photograph P-29) that should be mowed to aid in the establishment of a grass protective layer. Photograph P-29 also documented some standing water at the toe of the outside slope. This water is the result of precipitation preceding the inspection. No significant adverse conditions were identified for the outside slopes of the perimeter berm.

The crest of the berms around Cell 2A are free of rutting and misalignment as shown in Photographs P-28, P-29, P-30, P-37, and P-39. However, cracks in the surface material on the perimeter road are evident. The perimeter road has been surfaced with a stabilized product similar to the other landfill cells. Photograph P-31 shows a typical crack, while Photograph P-32 is of a wider crack that was probed to a depth of 12 inches as shown in Photograph P-33. These cracks are not considered to indicate movement of the berm. Instead, the cracks are likely a result of shrinkage of the stabilized material. To reduce the stormwater infiltration and the resultant potential of softening or weakening of the berm core, consideration should be given to filling these cracks with fine sand to fine gravel sized particles.

The stabilized material in the cell appeared to be relatively strong and stable as demonstrated in Photograph P-38, which shows a cut with vertical walls through the stabilized material. The apparent purpose of this trench is to allow stormwater and excess mixing water to be returned to the water storage tank (Photograph P-26) for use in the stabilization process.

Landfill Cell 2A was found to be in excellent condition as observed, without indications of risk of catastrophic or operational failure. Although more aggressive vegetation mowing is not required by the Federal CCR Rule for non-water retaining berms on landfills, it is recommended to promote a more vigorous grass protective layer on the slopes of the landfill berms.

7.5 LANDFILL CELL 1C

The location and general arrangement of the Landfill Cell 1C are depicted on Figure 1 and also Photograph P-41, which were both obtained from Google Earth Pro®. Photograph P-41 appears to accurately represent the condition of the berms and dikes observed at the Landfill Cell 1C by S&L on December 1, 2015.

At the time of the S&L inspection, Landfill Cell 1C was used to store or dispose nonmarketable CCR material. Given the volume of CCR material stored in the cell, the only area where inside berms were observable was in the vicinity of the stormwater pond in the southwest portion of the cell.

A stormwater pond is located in the southwest corner of the cell. The stormwater is pumped from the pond using a portable pump as shown in Photograph P-46.

The inside slopes of the perimeter dikes on the west and south sides of the stormwater pond contained inside Cell 1C are shown in Photographs P-44 through P-47. These slopes typically exhibited good alignment and grades. However, significant woody and grass vegetation is present that should be mowed to aid in the establishment of a grass protective layer. No adverse stability or erosion conditions were identified for the inside slopes of the perimeter dikes around the stormwater pond.

The outside slopes of the perimeter berms and dikes are shown in Photographs P-42, and P-43. These slopes typically exhibited good alignment and grades. However, significant vegetation was present that warrants mowing. No significant adverse conditions were identified for the outside slopes of the perimeter berm.

The crest of the berms and dikes around Cell 1C are generally free of rutting and misalignment as shown in Photographs P-43, P-44, and P-47.

Landfill Cell 1C was found to be in good condition as observed, without indications of risk of catastrophic or operational failure. Upon more aggressive vegetation control on the slopes of the berms and dikes, this landfill cell is considered to be in excellent condition.

7.6 LANDFILL CELL 2B

The location and general arrangement of the Landfill Cell 2B are depicted on Figure 1 and also Photograph P-48, which were both obtained from Google Earth Pro®. Photograph P-48 appears to accurately represent the condition of the berms and dikes observed at Landfill Cell 2B by S&L on December 1, 2015. One notable difference in the observed condition and the Google photograph is the water level in the stormwater pond was higher during the inspection and more of the cell floor near the eastern berm was inundated.

At the time of the S&L inspection, Landfill Cell 2B was used to store and/or dispose of marketable CCR material.

A stormwater pond is located in the southwest corner of the cell. The stormwater is pumped from the pond using a portable pump from the pump location shown in Photograph P-68.

The outside slopes of the perimeter berms and dikes are shown in Photographs P-57, P-58, P-63, P-66, P-67, P-69, P-70, and P-71. These slopes typically exhibited good alignment and grades. However, several areas of significant vegetation damage was observed as shown in Photographs P-66, P-67, and P-71. A close-up of the damage is shown on Photograph P-72. This damage was likely caused by feral hogs. Given the robust nature of the grass vegetation around the damaged areas, it is anticipated that the grass may become reestablished with little action by the station. This area should be monitored. However, measures should be taken to control the feral hog population throughout the landfill area. There were no observed indications of instability of the outside slopes of the perimeter berms and dikes.

The crest of the berms and dikes around Cell 2B are generally free of rutting and misalignment as shown in Photographs P-49, P-50, P-54, P-57, P-59, and P-70. Some minor ponding of water was observed in Photograph P-50. Cracks in the roadway surface were observed that had been filled as shown in Photograph P-54. They are similar to those discussed in Section 7.4 of this report.

The inside slopes of the perimeter dikes and berms around Cell 2B are shown in Photographs P-51, P-52, P-53, P-55, P-56, P-59, P-60, P-61, P-62, P-64, P-65, P-68. In general these slopes do not contain sufficient grass vegetation to prevent long-term erosion of the berms and dikes. Grass vegetation should be established and maintained on the inside slopes of the berms and dikes.

Along the eastern berm, the inside slopes are locally estimated to be somewhat steeper than 2H:1V. Significant erosion and or shallow surficial sloughing of the inside slope in these areas is evident in Photographs P-52, P-55, P-56, P-60, P-61, P-62, P-64, and P-65. Photographs P-56, P-61, and P-62 show erosion or shallow surficial sloughing that has progressed to allow undermining of the stabilized road surface. Maintenance activities to remedy this condition are evident in Photographs P-53, P-59, P-60, P-61, and P-62, where it appears that granular material has been placed from the top of the berm crest and graded over the edge onto the slope. This results in an uncompacted, highly erodible fill that will likely continue to erode.

At this time, the shallow surficial sloughing or erosion of material from the inside berm slopes does not threaten the operational integrity of the eastern berm nor the adjacent portions of the northern berm and southern dike. However, the berms and dike in this area should be maintained to prevent this condition from worsening. Repair and maintenance steps including, but not limited to the following should be implemented:

- Prevent all vehicle traffic from the areas where the stabilized road surface has become undermined.
- Regrade the slopes to a more gradual slope of 2 ½ H:1V by cleaning up the inside slopes and placing compacted fill in lifts.
- Establish a robust grass erosion protection layer and maintain it to prevent woody vegetation from becoming established.

- As an alternate to reconstructing the slopes as detailed above, the inside slopes of the eastern berm and adjacent sections of the northern berm and southern dike could be buttressed by placing CCR fill against the existing berms to provide a wider and flatter cross section of the berms and dike to alleviate erosion concerns.

Landfill Cell 2B was found to be in fair to good condition as observed, without indications of risk of imminent catastrophic or operational failure. Upon more aggressive slope stabilization and vegetation control on the slopes of the berms and dikes, this landfill cell could be considered to be in good to excellent condition.

8 REVIEW OF WEEKLY INSPECTIONS & AVAILABLE INSTRUMENTATION

The weekly inspections by a qualified person (by NRG) have been performed and S&L has reviewed the reports. The inspections appear to be thorough and appropriately executed. The minor items noted, such as vegetation removal and seeding some areas, have been implemented.

The WA Parish CCR facilities do not have any instrumentation such as piezometers, slope indicators or settlement survey points that require monitoring under the Federal CCR Rule.

9 MAINTENANCE RECOMMENDATIONS

Based on the observations made by S&L on December 1, 2015, the following maintenance recommendations are made:

9.1 LANDFILL CELL 2B REPAIR OF INSIDE SLOPE OF EASTERN BERM

Along the eastern berm and adjacent portions of the northern berm and eastern dike, the inside slopes have exhibited significant erosion and/or shallow surficial sloughing as shown in Photographs P-52, P-55, P-56, P-60, P-61, P-62, P-64, and P-65.

It is recommended that all vehicle traffic be prevented from approaching the areas where the stabilized road surface has become undermined as shown in Photographs P-56, P-61, and P-62.

The eastern berm and adjacent portions of the northern berm and eastern dike should be repaired to prevent the observed conditions from progressing to become significant operational concerns. Repair and maintenance steps including, but not limited to, the following should be implemented:

- Regrade the slopes to a more gradual slope of 2 ½ H:1V by cleaning up the inside slopes and placing compacted fill in lifts, **and**
- Establish a robust grass erosion protection layer and maintain it to prevent woody vegetation from becoming established, **or**
- As an alternate to reconstructing the slope that requires ongoing vegetation control, the inside slopes of the berm sections could be buttressed by placing CCR fill against existing berms to provide a sufficient cross section of the berm to alleviate erosion concerns.

9.2 CELL 3 STORMWATER POND REPAIR OF EROSIONAL FEATURE

An erosional feature was noted in the inside face of the north dike of the stormwater pond in landfill Cell 3 (Photograph P-22). It is recommended that the loose and disturbed material be removed and the erosional void enlarged as necessary to allow it to be filled with properly compacted clay soil. A splash pad or other erosion control measures could be constructed to prevent future erosion.

9.3 CELL 3 REPAIR & PROTECTION OF DAMAGED PIPE ELBOW

The exposed pipe fitting discussed in Section 7.3 of this report and shown in Photograph P-15 has experienced significant damage. This fitting should be evaluated by engineering or maintenance staff qualified to evaluate its operational functionality. If the integrity of the fitting is in question, it should be replaced. To prevent further damage to this fitting, bollards could be placed around the fitting or additional fill could be placed to bury the fitting.

9.4 GRASS VEGETATION

Since a well-established grass cover is easy to maintain and an excellent erosion protection layer, all dike slopes should be well vegetated with appropriate grass species. This maintenance item should be performed at:

- Air Preheater Pond: The inside slopes of dike should be seeded to promote a protective grass cover layer (Photograph P-9);
- Cell 3: The inside slopes of the dike around the stormwater pond should be mowed and maintained with a maximum vegetation height of 6 inches (Photograph P-23) and small trees growing in these dikes should be removed;
- Cell 2B: The inside slopes of the perimeter dikes and berms should be seeded to establish an appropriate grass protective cover (Photographs P-51, P-52, P-53, P-55, P-59, P-60, P-61, P-62, P-64, P-65, and P-68). Additionally, small trees growing in these dikes and berms should be removed;
- Cell 1C: Although more aggressive vegetation mowing is not required by the Federal CCR Rule for non-water retaining berms on landfills, mowing is recommended to promote a more vigorous grass protective layer on all slopes of the landfill berms; and
- Other areas that do not have substantial grass cover should be seeded to establish an appropriate grass cover and areas of excessively tall grass, weeds or woody vegetation should be mowed.

9.5 FERAL HOG CONTROL & REPAIR

Ongoing control of feral hogs (Photographs P-66, P-67, P-71 and P-72) in the vicinity of the CCR landfill should be continued. Although the most significant damage from feral hogs was at Cell 2B, hogs should be controlled throughout the landfill facility. It appears the damage from feral hogs is more prevalent near wooded areas. Reseeding of areas damaged by hogs may be required if the root structure is damaged sufficiently to inhibit the growth of new grass vegetation.

9.6 LANDFILL CELL CREST MAINTENANCE

The cracks in the road surfacing around most landfill cells will allow precipitation to enter the berm/dike subgrade, which could soften and weaken the core of the berms and dikes. Filling the cracks with relatively fine granular fill similar to what has been done at Cell 2B should be considered.

10 CRITERIA

This inspection been performed in accordance with the inspection requirements of the Federal CCR Rule (Reference 1) and generally accepted engineering practice. The Texas Commission on Environmental Quality 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.

11 LIMITATIONS

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

Given the work in progress nature of active pond and landfilling operations, this report only considers the conditions present at the time of the S&L field inspection.

12 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.

13 CONCLUSIONS

This annual inspection considered the following CCR Units:

- FGD Emergency Pond (E-Pond),
- Air Preheater Pond,
- Landfill Cell 3,
- Landfill Cell 2A,
- Landfill Cell 1C, and
- Landfill Cell 2B.

S&L did not identify any evidence of ongoing or imminent failure of these ponds or landfill. No structural deficiencies were noted based on S&L's observations.

It is the opinion of S&L that the FGD Emergency Pond does not require an annual inspection since it is fully incised. Moreover, it is the opinion of S&L that the Air Preheater Pond does not require an annual inspection since it is less than 20 ft. high and has a stored capacity of less than 20 acre-ft.

Based on the review of available documents and the visual inspection, it is S&L's opinion that Landfill Cell 3, Landfill Cell 2A, Landfill Cell 1C and Landfill Cell 2B have been designed, constructed, are currently operated, and are maintained in a manner that is consistent with recognized and generally accepted good engineering standards.

Several maintenance recommendations are presented in Section 9 of this report that should be implemented in addition to the ongoing maintenance program that has been implemented.



WA Parish Station
Annual Inspection of CCR
Impoundments and Landfill
SL Project No.: 12661-038

A large, stylized, grey graphic element resembling a curved 'S' or a swoosh, positioned behind the Sargent & Lundy logo text.

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FIGURES



NOTES

1. AERIAL IMAGE SHOWN ON THIS DRAWING OBTAINED USING GOOGLE EARTH PRO v6.2.

WA PARISH STATION - FIGURE 1
GENERAL ARRANGEMENT OF CCR IMPOUNDMENTS AND
LANDFILL CELLS
01/18/2016 REV: 0



NOTES
 1. AERIAL IMAGE SHOWN ON THIS DRAWING OBTAINED USING GOOGLE EARTH PRO v6.2.

WA PARISH STATION - FIGURE 2
 GENERAL ARRANGEMENT OF CCR IMPOUNDMENTS AND
 LANDFILL CELLS
 01/18/2016 REV: 0



WA Parish Station
Annual Inspection of CCR
Impoundments and Landfill
SL Project No.: 12661-038

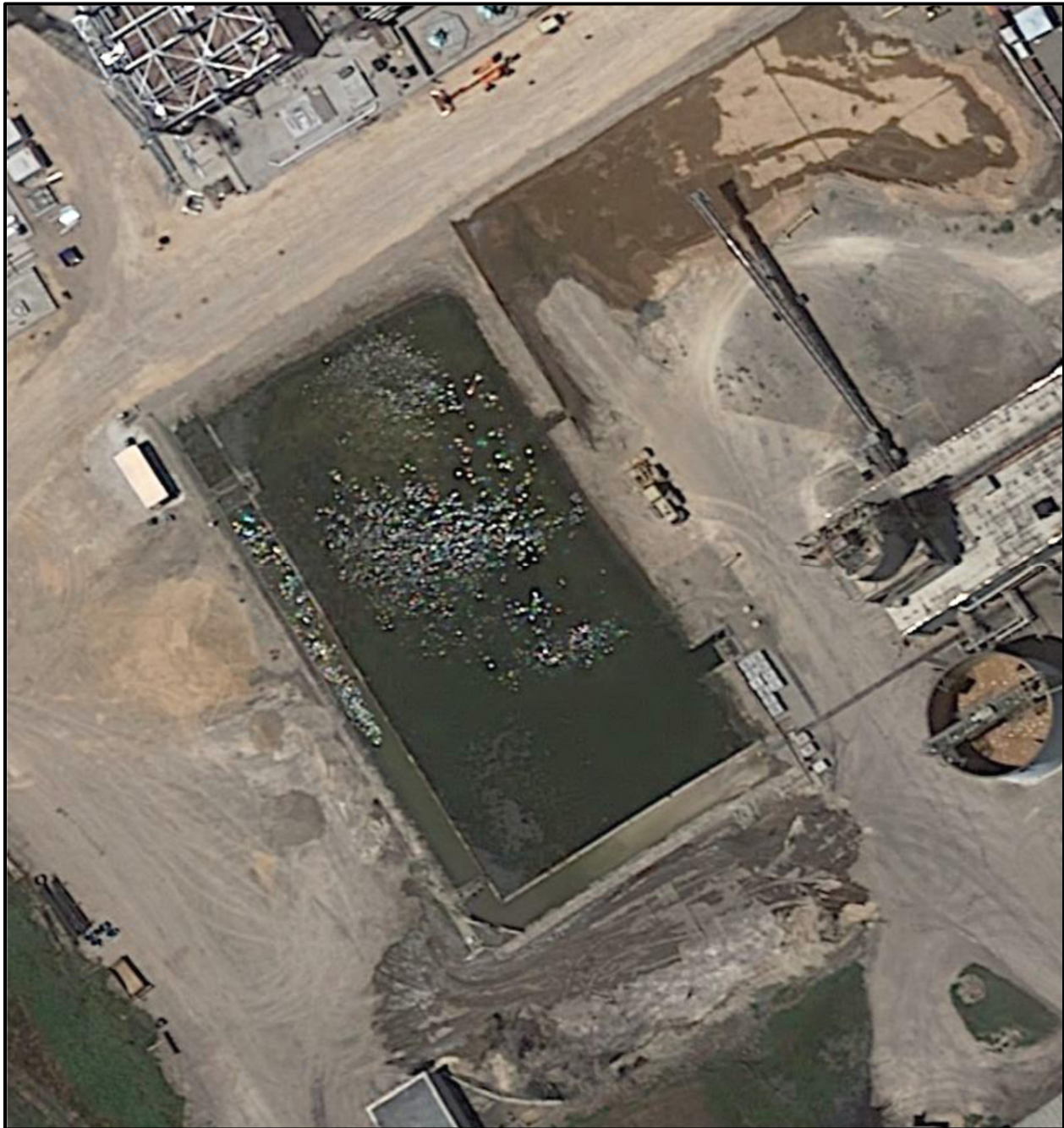


Sargent & Lundy^{LLC}

The logo for Sargent & Lundy, featuring a stylized, grey, curved shape that resembles a drop or a wave, positioned to the left of the company name.

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APPENDIX A – SITE PHOTOGRAPHS



Photograph P-1 – From Google Earth Pro, dated July 2015. Downloaded January 11, 2016.
FGD Emergency Pond (E-Pond): Aerial view of incised FGD Emergency Pond.
Also shown is the gypsum dewatering slab and stack out area
(east of pond, where front end loader is located).





Photograph P-2 – Taken December 1, 2015 by David E. Nielson
FGD Emergency Pond: Looking south at the southern and western banks, which are incised.
This verifies that the Federal CCR Rule regarding inspections is not applicable to
the FGD Emergency Pond.



Photograph P-3 – Taken December 1, 2015 by David E. Nielson
FGD Emergency Pond: Looking southwest at the western bank, which is incised.
The dark horizontal line on the concrete wall in the background, as well as the level of the top
of sediment in the right hand portion of the pond indicate the operating water level of the pond,
which is well below the surrounding land surface (incised).



Photograph P-4 – Taken December 1, 2015 by David E. Nielson
FGD Emergency Pond: Looking west at the northern end of FGD Emergency Pond,
which is incised.



Photograph P-5 – Taken December 1, 2015 by David E. Nielson
FGD Emergency Pond: Looking northwest at the junction of the northeast corner of FGD
Emergency Pond and the adjacent depressed drainage slab, which is an incised area where
excavated CCR materials are allowed to dry. This verifies that the Federal CCR Rule regarding
inspections does not apply to the FGD Emergency Pond.



Photograph P-6 – From Google Earth Pro, dated July 2015. Downloaded January 8, 2016.
Air Preheater Pond: Aerial view of Air Preheater Pond. Note pond dredging is underway at the time of the photograph. Also note the overflow channel from the western portion of the pond into the coal yard runoff pond to the west.





Photograph P-7 – Taken December 1, 2015 by David E. Nielson
Air Preheater Pond: Looking northwest along exterior slope and crest of western dike.
Note minor vegetation deficiencies as the recent seeding of grass becomes established.
The grass vegetation has become well established since Photograph P-6 was taken.



Photograph P-8 – Taken December 1, 2015 by David E. Nielson
Air Preheater Pond: Looking northwest along the exterior slope of the eastern dike.
Note good vegetation.



Photograph P-9 – Taken December 1, 2015 by David E. Nielson
Air Preheater Pond: Looking north at northern inside slope of dike.
Note the well armored area around the inlet pipe discharge into the pond that was not evident in Photograph P-6. The back of the required impoundment identification marker is shown beyond the riprap inlet. Also note the poor vegetative cover.



Photograph P-10 – From Google Earth Pro, dated July 2015. Downloaded January 8, 2016.
Landfill Cell 3: Aerial view of Landfill Cell 3 and
stormwater runoff pond inside western edge of Cell 3.





Photograph P-11 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 3: Looking west along the outside slope of the south slope of landfill berm.
Note good vegetation.



Photograph P-12 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 3: Looking west at the roadway along the crest of the landfill cell berm.
Note the hard surfacing on this and other berm roads was a stabilized product that exhibited significant shrinkage cracks. These cracks are not indicative of berm instability.



Photograph P-13 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 3: Looking east along the inside slope of the south berm.



Photograph P-14 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 3: Looking north along the west dike of the stormwater pond in Cell 3 (also western extent of Cell 3) and the pump, which pumps water from the stormwater pond back to plant operations. Note some benching of the west dike of the pond. This appears to be the result of prior dredging activities to remove CCR material from the pond.



Photograph P-15 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 3: Looking at an exposed elbow of the discharge line from the stormwater pond. Note the damaged fitting appears to be from mowing equipment. This exposed fitting should be protected with bollards or buried after determination if it should be replaced.



Photograph P-16 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 3: Looking west from the southwest corner of the landfill cell at the damaged fitting on the discharge pipe and valve control in the background.



Photograph P-17 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 3: Looking north along outside slope of western dike of the stormwater pond.
No instability or erosion was observed.



Photograph P-18 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 3: Looking south along inside slope of western dike of the stormwater pond.
Benching appears to be a result of pond cleaning activities, not dike instability or wave erosion.



Photograph P-19 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 3: Looking south at inside slope of west dike
of the stormwater pond and dike crest.
Note it appears that significantly less CCR material is stored in the pond
than is shown in Photograph P-10.



Photograph P-20 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 3: Looking south at outside slope of western dike of stormwater pond.



Photograph P-21 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 3: Looking east along inside slope of northern edge of pond, and at the interface of the ash storage area and the stormwater pond, which is incised relative to the closed landfill cell to the north.



Photograph P-22 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 3: Looking north at discharge from stormwater pipe inlet into stormwater pond. Note the absence of a splash pad and the occurrence of erosion. The vegetation should be removed, the erosional void backfilled and a splash pad or other erosion control measure may be installed.



Photograph P-23 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 3: Looking south at inside slope of eastern boundary
of stormwater pond and active landfill area.



Photograph P-24 – From Google Earth Pro, dated July 2015. Downloaded January 11, 2016.
Landfill Cell 2A: Aerial view of open area of Cell 2A,
which contains a pugmill to stabilize CCR materials for disposal in other cells.
The closed portions of Cell 2A are north and west of the active area.





Photograph P-25 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2A: Looking west along the inside slope of the southern berm.
This berm abuts closed Cell 1B, which is higher in elevation.
Note well established grass and uniformity of slope.



Photograph P-26 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2A: Looking east along the inside slope of southern dike.
Note large water tank in center of photograph is water storage for pugmill operations
(inside cell in photograph background).



Photograph P-27 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2A: Looking north along toe of inside slope of western berm.



Photograph P-28 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2A: Looking north along the crest of the western berm.
Note closed sections of Cell 2A in background.
Also note longitudinal crack in crest roadway surfacing.



Photograph P-29 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2A: Looking north along the outside slope and crest of the western berm.
Note the standing water is from precipitation prior to the inspection not seepage.



Photograph P-30 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2A: Looking south along the inside slope and crest of western berm.
Note significant crack in roadway surfacing. Cracks are also shown on
Photographs P-31, P-32 and P-33. These cracks are not considered to be
from shrinkage of the stabilized material not berm instability.



Photograph P-31 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2A: Looking at typical crack in stabilized roadway surfacing.



Photograph P-32 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2A: Looking at wider than typical crack in stabilized roadway surfacing.



Photograph P-33 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2A: Looking at wider than typical crack in stabilized roadway surfacing. The crack extended 1 foot below the roadway surface.



Photograph P-34 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2A: Looking south along the outside face of the western berm.



Photograph P-35 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2A: Looking east along the inside slope of northern berm.
Note small trees that should be removed.



Photograph P-36 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2A: Looking east at outside slope of the northern berm.



Photograph P-37 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2A: Looking west along the northern dike crest. Note shrinkage crack in the road surfacing material.



Photograph P-38 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2A: Looking south into the active portion of Cell 2A along a vertical wall ditch cut in the stabilized material that has cured in place. These vertical walls demonstrate the long-term properties of the stabilized CCR materials.



Photograph P-39 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2A: Looking south along the crest of the eastern berm.



Photograph P-40 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2A: Looking south at outside slope of the eastern berm.



Photograph P-41 – From Google Earth Pro, dated July 2015. Downloaded January 11, 2016.
Landfill Cell 1C: Aerial view of Landfill Cell 1C and stormwater runoff pond inside the cell.





Photograph P-42 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 1C: Looking south along the outside slope of the western berm.
Note vegetation control is warranted.



Photograph P-43 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 1C: Looking north along the outside crest of the western berm.



Photograph P-44 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 1C: Looking south along inside slope of western dike of stormwater pond.
Note small trees that should be removed.



Photograph P-45 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 1C: Looking north along the inside slope of the western dike.
Note small trees that should be removed.



Photograph P-46 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 1C: Looking east along the inside slope of the southern dike
of the stormwater pond.
Note vegetation control is warranted.



Photograph P-47 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 1C: Landfill Cell 1C: Looking east along the crest of the southern dike
of the stormwater pond and then the western berm of the landfill.



Photograph P-48 – From Google Earth Pro, dated July 2015. Downloaded January 11, 2016.
Landfill Cell 2B: Aerial view of Landfill Cell 2B and stormwater runoff pond inside the cell.





Photograph P-49 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2B: Looking east along the crest of the northern berm.
Note significant soil stockpile north of the berm crest.



Photograph P-50 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2B: Looking west along the crest of the northern berm and the soil stockpile.



Photograph P-51 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2B: Looking west along the inside slope of the northern berm. Note accumulation of stormwater.



Photograph P-52 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2B: Looking south along the inside slope and toe of slope of the eastern dike/berm.

Note the significant erosion on the inside face of the northern berm. The erosional voids should be filled and the source of run-on water should be diverted to a rundown structure or the slope should be armored to prevent further erosion.



Photograph P-53 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2B: Looking south along the inside slope of the eastern berm. Note crack formation along edge of the road and the steepness of some slope sections.



Photograph P-54 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2B: Looking south along the road on the crest of the eastern berm. Note shrinkage crack in roadway surface material has been partially filled. See Photographs P-30 through P-33 and P-37 for other photographs of this type of crack. This is considered to be shrinkage of the stabilized road surface and not evidence of berm instability.



Photograph P-55 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2B: Looking south along the inside slope of the eastern berm.
Note vegetation irregularities and erosion.



Photograph P-56 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2B: Looking up at significant erosion of the inside slope of the eastern berm. Note the stabilized road surface has been undermined (circled in red). The disturbed soils should be removed, the erosional void should be backfilled and adequate erosion control measures should be implemented. In the interim, traffic should not be allowed near the edge of the roadway.



Photograph P-57 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2B: Looking south along the crest of the
outside slope of the eastern berm.



Photograph P-58 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2B: Looking south along the toe of the
outside slope of the eastern berm.



Photograph P-59 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2B: Looking south along the inside slope of the eastern berm.
Note the evidence of recent maintenance activities to protect the
edge of the roadway and mitigate steep inside slopes.



Photograph P-60 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2B: Looking south along the inside slope of the eastern berm.
Note the evidence of recent maintenance activities to protect the edge of the road.



Photograph P-61 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2B: Looking south along the inside slope of the eastern berm.
Note undermining of the stabilized roadway and the steep nature of the inside slope.



Photograph P-62 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2B: Looking south along the inside slope of the eastern berm.
Note sharp drop off at edge of road.
This area should be protected from traffic near the edge of the road.



Photograph P-63 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2B: Looking north along the outside slope of the eastern berm. Note generally good vegetation cover, uniform slopes and absence of erosion.



Photograph P-64 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2B: Looking north along the inside slope of the landfill berm.
Note ongoing erosion. Measures should be taken to mitigate erosion damage.



Photograph P-65 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2B: Looking west along inside slope of southern berm/dike.
Note sparse grass and small trees. Revegetation of slope is recommended.



Photograph P-66 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2B: Looking west along outside slope of southern berm/dike.
Note ongoing feral hog damage to vegetation.



Photograph P-67 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2B: Looking west along outside slope of southern berm/dike.
Note significant damage to the vegetation by feral hogs.



Photograph P-68 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2B: Looking north along the inside slope of the west berm/dike at the area where
a mobile pump is placed to remove stormwater collected in the cell.
Note the slope is somewhat steep in the area of the ramp.



Photograph P-69 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2B: Looking north along the exterior slope of the western dike/berm.
Note uniformity of slope and generally good vegetation cover with
feral hog damage near toe of slope.



Photograph P-70 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2B: Looking south along crest and outside slope of western berm/dike.



Photograph P-71 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2B: Looking south along toe of western slope with damaged vegetation in foreground. Standing water in some areas is from precipitation not from seepage.



Photograph P-72 – Taken December 1, 2015 by David E. Nielson
Landfill Cell 2B: Looking at damage to vegetation shown in Photograph P-71, which was caused by feral hogs.
Note shallow depth of disturbance and likelihood of re-vegetation due to intact grass roots.