

# 2021 Annual Landfill Inspection Report

**Landfill**

**Northeastern Plant**

**Public Service Company of Oklahoma**

**Oologah, OK**

**October 2021**

Prepared for: Public Service Company of Oklahoma – Northeastern Plant

Prepared by: American Electric Power Service Corporation

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# 2021 Annual Landfill Inspection Report

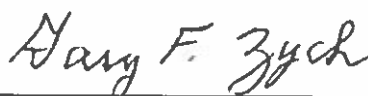
**Northeastern Plant  
Landfill**

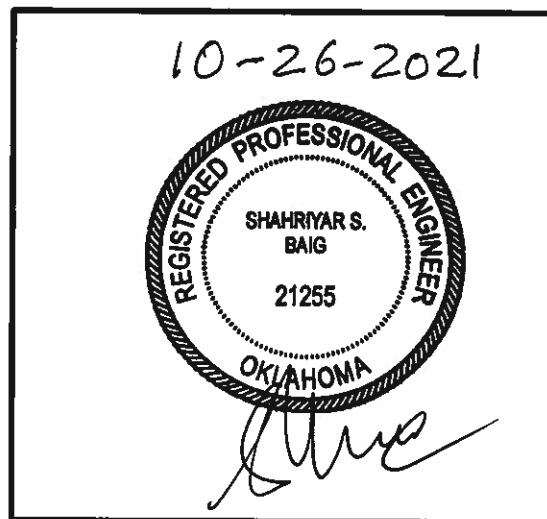
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I certify to the best of my knowledge, information and belief the information contained in this report meets the requirements of OAC § 252:517-13-5.

**2021 Annual Landfill Inspection Report  
Northeastern Plant Landfill  
Oologah, OK**

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Inspection Photographs

# **2021 Annual Landfill Inspection Report Northeastern Plant Landfill Oologah, OK**

## **1.0 INTRODUCTION**

This report was prepared by AEP- Geotechnical Engineering Services (GES) section, in part, to fulfill requirements of OAC 252:517-13-5 and to provide the Northeastern Plant an evaluation of the facility.

Shah Baig, P.E. performed the 2021 inspection of the Landfill at the Northeastern Plant. This report is a summary of the inspection and an assessment of the general condition of the facility. Bryan White, plant staff, was also present during the inspection. The inspection was performed on September 23, 2021. Weather conditions were overcast and the temperature was in the low 80's (°F), sunny, breezy, and clear skies. There was no recorded precipitation over the seven days prior to the inspection.

## **2.0 DESCRIPTION OF LANDFILL**

The Public Service Company of Oklahoma (PSO), Northeastern Power Station is located at the junction of U.S. Highway 169 and Oklahoma highway 88, approximately 1 mile south of Oologah, Rogers County, Oklahoma. The onsite landfill is located southeast side of the power plant, adjacent to the Verdigris River. Figure 1 (Site Location Map) of Appendix A illustrates the location of the landfill with respect to the power plant, ash pond, and coalyard.

The overall features of the landfill were categorized into the following components as a means of organizing the inspection and reporting:

- Active Landfill Disposal Area (Cell 2)
- Inactive Landfill Areas (Cells 1, 3 and 4)
- Leachate Collection Pond
- Storm Water Drainage Ditches
- Perimeter Berm

These features are shown on Figure 2 of Appendix A.

The Active Landfill Disposal Area (Cell 2) is currently where waste is being placed. There were no active disposal operations at the time of the inspection.

Inactive Landfill Areas (Cells 1, 3 and 4) consists for the remaining portions of the landfill. The intermediate liner system has a 2-foot thick protective cover. Portions of the inactive area (Cell 1) has a temporary geomembrane cover (rainflap) to prevent infiltration. Plant is planning to cover Cell 2, 3, and 4 with temporary cover and start using Cell 1 for waste placement. At this time, plant is transitioning from Cell 2 to Cell 1 for future waste placement.

### **3.0 REVIEW OF AVAILABLE INFORMATION (252:517-13-5 (b)(1)(A))**

A review of available information regarding the status and condition of the Landfill has been conducted. This information includes files available in the operating record, such as design and construction information, previous 7-day inspection reports, and previous annual inspections. Based on the review of the data there were no signs of actual or potential structural weakness or adverse conditions.

### **4.0 INSPECTION (252:517-13-5 (b)(1)(B))**

#### **4.1 CHANGES IN GEOMETRY SINCE LAST INSPECTION (252:517-13-5(b)(2)(A))**

No modifications have been made to the geometry of the Landfill since the last annual inspection. The geometry of the landfill has remained essentially unchanged, except for the change in topography of the active disposal area.

#### **4.2 VOLUME (252:517-13-5(b)(2)(B))**

The total volume of CCR disposed in the landfill as of the inspection date is estimated to be 1,688,230 cubic yards (1,674,012 in 2020 + 14,218 in 2021 based on the tonnage during reporting year October 2020 – October 2021). Reported tonnages were; Fly Ash = 9,748 tons, Byproduct = 4,470 tons.

#### **4.3 DEFINITIONS OF VISUAL OBSERVATIONS AND DEFICIENCIES**

This summary of the visual observations uses terms to describe the general appearance or condition of an observed item, activity or structure. The meaning of these terms is as follows:

- Good: A condition or activity that is generally better or slightly better than what is minimally expected or anticipated from a design or maintenance point of view.
- Fair/Satisfactory: A condition or activity that generally meets what is minimally expected or anticipated from a design or maintenance point of view.
- Poor: A condition or activity that is generally below what is minimally expected or anticipated from a design or maintenance point of view.
- Minor: A reference to an observed item (e.g., erosion, seepage, vegetation, etc.) where the current maintenance condition is below what is normal or desired, but which is not currently causing concern from a structure safety or stability point of view.
- Significant: A reference to an observed item (e.g. erosion, seepage, vegetation, etc.) where the current maintenance program has neglected to improve the condition. Usually conditions that have been identified in the previous inspections, but have not been corrected.

Excessive: A reference to an observed item (e.g., erosion, seepage, vegetation, etc.) where the current maintenance condition is above or worse than what is normal or desired, and which may have affected the ability of the observer to properly evaluate the structure or particular area being observed or which may be a concern from a structure safety or stability point of view.

This document also uses the definition of a “deficiency” as referenced in the CCR rule section §257.84(b)(5) Inspection Requirements for CCR Landfills. This definition has been assembled using the CCR rule preamble as well as guidance from MSHA, “Qualifications for Impoundment Inspection” CI-31, 2004. These guidance documents further elaborate on the definition of deficiency. Items not defined by deficiency are considered maintenance or items to be monitored.

A “deficiency” is some evidence that a landfill has developed a problem that could impact the structural integrity of the landfill. There are four general categories of deficiencies. These four categories are described below:

1. Uncontrolled Seepage (Leachate Outbreak)  
Leachate outbreak is the uncontrolled release of leachate from the landfill.
2. Displacement of the Embankment  
Displacement of the embankment is large scale movement of part of the dam. Common signs of displacement are cracks, scraps, bulges, depressions, sinkholes and slides.
3. Blockage of Control Features  
Blockage of Control Features is the restriction of flow at spillways, decant or pipe spillways, or drains.
4. Erosion  
Erosion is the gradual movement of surface material by water, wind or ice. Erosion is considered a deficiency when it is more than a minor routine maintenance item.

#### **4.4 VISUAL INSPECTION (252:517-13-5(b)(1)(B))**

A visual inspection of the Landfill was conducted to identify any signs of distress or malfunction of the landfill and appurtenant structures. Specific items inspected included all structural elements of the landfill perimeter berms, temporary and final covers, drainage features, leachate ponds, open cells, and appurtenances such as chimney drains etc.

Overall, the facility is in good condition. The landfill is functioning as intended with no signs of potential structural weakness or conditions that are disrupting to the safe operation of the landfill. Inspection Map and photographs are included in Appendix B.. Additional pictures taken during the inspection can be made available to the Owner upon request.

#### **Inactive Landfill Disposal Areas**

1. Photograph No. 1 illustrates Cell 3 surface of the inactive disposal areas graded for temporary cover to be placed. The containment berm and the geomembrane lined perimeter ditch are illustrated in Photograph No. 2. There were no observations of erosion or other unsatisfactory conditions of the Cell 3 areas. The perimeter berm and ditch are functioning as designed and the liner was intact and in good condition.

2. The exterior south slope (Photograph No. 3), adjacent to the river is very steep. Observation of the slope from the chainlink fence indicated the slope was heavily vegetated with mature trees and small bushes. The slope appeared to be in good and stable condition.
3. Photograph No. 4 illustrate cleaning the existing geosynthetic liner in an anticipation of preparation for the installation of temporary geomembrane (impermeable cover) in Cell 3 in order to minimize leachate generation. There was no water ponding or erosion and the surface was in good and stable condition.
4. The access road adjacent to Cell 4 is illustrated in Photograph No. 5. The road was in good condition with no sign of misalignment, settlement, or excessive erosion. The perimeter ditch was functioning as designed and the liner was intact and in good condition. The exterior slope adjacent to the Cell 4 appeared in good and stable condition (Photograph No. 6).
5. Overall view of Cells 3 and 4 is illustrated in Photograph No. 7. Both cell surfaces were well maintained and had not water ponding, erosion, or instability. Temporary geomembrane cover is also planned to be installed over the surface of both cells.

#### **Active Landfill Disposal Areas**

6. Photograph No. 8 illustrate typical condition of Cell 2. The surface appeared graded and free of ponding water. Temporary grades are maintained to allow drainage of runoff to the perimeter ditch. Cell 2 area of the landfill appeared in good and stable condition.
7. Cell 1 area is located adjacent to Cell 2 and the interim grades are slightly at a lower level (Photograph No. 9). There was no erosion, ponding of water, or instability noticed throughout the area. The eastern most portion of the Cell 1 is shown in Photograph No. 10. Previously Cell 1 had a temporary geomembrane liner to cover the waste surface. About 2/3<sup>rd</sup> of the temporary liner is removed from Cell 1 area for the placement of landfill waste.

#### **Storm Water Drainage Ditches**

8. Overall the perimeter ditches were in good condition and functioning as designed. The ditches are currently lined with geomembrane. There were some local areas of very shallow ponding due to either minor sediment or small wrinkles in the geomembrane. Photograph Nos. 11 and 12 illustrates the north ditch with excessive vegetation but no water ponding was observed.
9. The north and south perimeter ditches also includes pipe box culverts at the east end of the landfill limit (Photographs Nos. 13-16). These pipe box culverts were clear of any debris and indicated no obstruction to flow. Minor water ponding was observed in the south ditch (Photograph No. 15).

#### **Leachate Collection Pond**

10. Photograph No. 17 illustrate the leachate pump station. As needed a portable pump is used to pump leachate from the leachate pond instead of the pump station (Photograph No. 21). The interior slope of the pond was in fair condition (Photograph Nos. 19-21). The northwest and the southeast dikes of the leachate pond (Photograph Nos. 16 and 20) consists of a very small crest (< 1-foot). The pond had about 2-feet of water. The outlet of the two leachate pipes that discharge into the pond were visible (Photograph Nos. 19 and 21).
11. The splitter dike between the leachate pond and Basin C is illustrated in Photograph No. 18. The splitter dike appeared in good and stable condition without any settlement or misalignment.

### **Basin C**

12. The runoff from the landfill is discharged into Basin C. Photograph Nos. 22 and 23 illustrates the inlets of the north and the south discharge pipes. At the time of inspection, the condition was dry and no water flowing from the pipes.
13. The crest and interior slope of Basin C appeared in good condition (Photograph Nos. 24 and 25). The geosynthetic liner was in place, intact and in good condition without any tear or damage. The crest also used as haul road of the north dike appeared in good and stable condition (Photograph No. 26)

### **4.5 CHANGES THAT EFFECT STABILITY OR OPERATION (252:517-13-5(b)(2)(D))**

Based on interviews with plant personnel and field observations there were no changes to the Landfill since the last annual inspection that would affect the stability of the Landfill.

## **5.0 SUMMARY OF FINDINGS**

### **5.1 GENERAL OBSERVATIONS**

The following general observations were identified during the visual inspection:

- 1) In general, the landfill is functioning as intended. All areas of the facility are maintained and in good condition.
- 2) The Plant is performing regular maintenance and inspections as required.
- 3) Plant is planning to installed temporary rainflap in Cell 2, 3, and 4 in order to better manage the leachate generation.

### **5.2 MAINTENANCE ITEMS**

The following specific maintenance items were identified during the visual inspection.

- 1) Mow the exterior slope and ditch of the north containment berm to control woody vegetation.
- 2) It is suggested that the crest of the northwest and southeast dike should be widen on the top in order to be accessible from the safety point of view. The crest should be widen 3-4 feet in order to make it accessible for inspection, operation, and maintenance activities.

### **5.3 ITEMS TO MONITOR**

No specific issues or areas were identified during the visual inspection as items to be monitored.



#### **5.4 DEFICIENCIES (252:517-13-5(b)(5))**

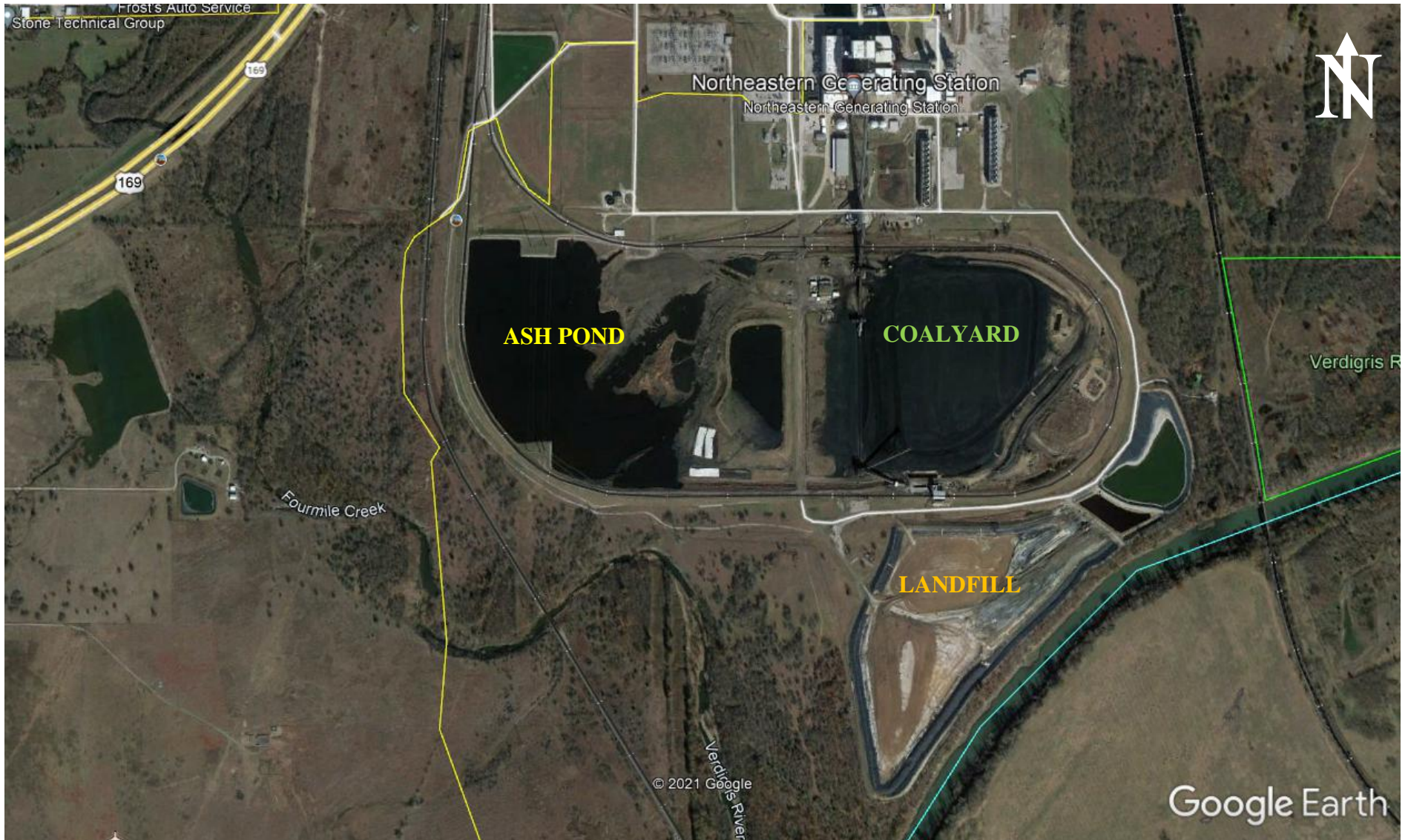
There were no signs of structural weakness or disruptive conditions that were observed at the time of the inspection that would require additional investigation or remedial action. There were no deficiencies noted during this inspection or during any of the periodic 7-day inspections. A deficiency is defined as either:

- 1) Uncontrolled seepage (leachate outbreak),
- 2) Displacement of the embankment,
- 3) Significant blockage of drainage features or drain pipes, or
- 4) Erosion, more than minor maintenance.

In general, routine inspections, monitoring and maintenance by plant personnel should continue. If you have any questions with regard to this report, please contact Shah Baig, P.E. at (Ph: 614-716-2241, email: [sbaig@aep.com](mailto:sbaig@aep.com)) or Gary Zych, P.E. (Ph: 614-716-2917, email: [gfzych@aep.com](mailto:gfzych@aep.com)).

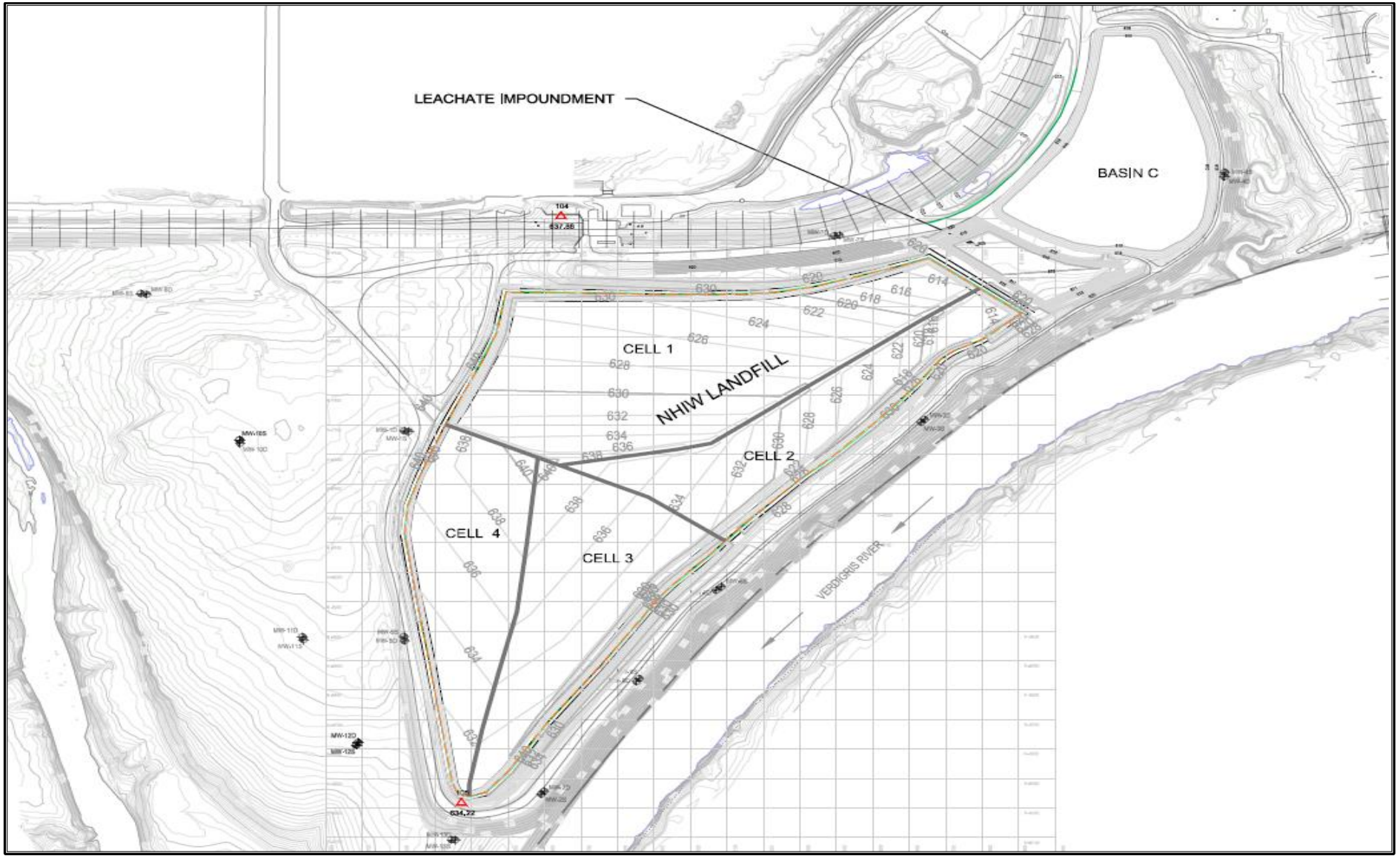
## **APPENDIX A**

**Figure 1 – Site Location Map**  
**Northeastern Landfill**  
**Northeastern Plant, Oologah, OK**





**Figure 2 – Landfill Facility Map**  
**Northeastern Landfill**  
**Northeastern Plant, Oologah, OK**



## **APPENDIX B**

**Figure 3 – Inspection Photograph Location Map**  
**Northeastern Landfill**  
**Northeastern Plant, Oologah, OK**








**Figure 4 – Inspection Photograph Location Map**  
**Northeastern Landfill Leachate Pond and Basin C**  
**Northeastern Plant, Oologah, OK**





<p>Photograph No. 1 Cell 3 and perimeter berm (looking northeast).</p>	
<p>Photograph No. 2 Cell 3 perimeter berm and runoff channel.</p>	
<p>Photograph No. 3 Side slope adjacent to the River.</p>	



<p>Photograph No. 4 Cleaning existing liner at Cell 3.</p>	 A large white industrial truck with a long discharge pipe is positioned on a gravel area, spraying water onto a large, dark, wrinkled liner that has been partially cleaned. Several workers in orange safety gear are visible near the truck. The background shows a clear blue sky and some distant trees.
<p>Photograph No. 5 Access road adjacent Cell 4 (looking south).</p>	 A wide, gravel-paved access road stretches into the distance. To the left, a large area of land is covered with a dark, wrinkled liner. To the right, a chain-link fence runs parallel to the road, with trees and vegetation behind it. The sky is clear and blue.
<p>Photograph No. 6 Area outside the fence.</p>	 A dense thicket of green trees and tall grasses, representing the area outside the fence. The vegetation is lush and appears to be in a natural, uncultivated state.



<p>Photograph No. 7 Cell 3 and 4 (looking south).</p>	 A wide-angle photograph of a large, flat, brownish-grey area, likely a landfill cell. The ground is uneven and appears to be covered in a layer of soil or ash. In the distance, a white pickup truck is parked on the left side. The background shows a line of green trees under a clear blue sky.
<p>Photograph No. 8 Cell 2 area graded (looking northeast).</p>	 A photograph showing a large, flat, brownish-grey area, likely a landfill cell. The ground is uneven and appears to be covered in a layer of soil or ash. In the distance, a yellow piece of heavy machinery is visible. The background shows a line of green trees under a clear blue sky.
<p>Photograph No. 9 Cell 1 surface graded. Cell 2 to the left in this photo.</p>	 A photograph showing a large, flat, brownish-grey area, likely a landfill cell. The ground is uneven and appears to be covered in a layer of soil or ash. In the distance, a metal structure is visible. The background shows a line of green trees under a clear blue sky.



<p>Photograph No. 10 Cell 1 eastern portion with rainflap.</p>	 A wide-angle photograph showing a large, flat, brownish-grey area, likely a rainflap or runoff area, extending towards the horizon. The foreground is dominated by a rocky, uneven terrain with scattered grey stones and some sparse green vegetation. The sky is clear and blue.
<p>Photograph No. 11 Cell 1 area runoff perimeter stormwater ditch (looking west).</p>	 A photograph showing a runoff perimeter stormwater ditch covered with black plastic liner. The ditch is filled with water and surrounded by tall green grass and weeds. In the background, there is a large industrial building with a conveyor system, and a yellow truck is visible near the building. The sky is clear and blue.
<p>Photograph No. 12 Cell 1 area runoff perimeter stormwater ditch (looking east).</p>	 A photograph showing a runoff perimeter stormwater ditch covered with black plastic liner. The ditch is filled with water and surrounded by tall green grass and weeds. In the background, there is a large industrial building with a conveyor system, and a yellow truck is visible near the building. The sky is clear and blue.



Photograph No. 13  
North side perimeter  
runoff ditch pipe  
culvert inlet.



Photograph No. 14  
North side perimeter  
runoff ditch pipe  
culvert outlet.



Photograph No. 15  
South side perimeter  
runoff ditch.





Photograph No. 16  
South side perimeter  
runoff ditch pipe  
culvert outlet.



Photograph No. 17  
The leachate pump  
system.



Photograph No. 18  
Splitter dike between  
the leachate pond and  
Basin C.





<p>Photograph No. 19</p> <p>Interior slope of the leachate pond adjacent to the landfill.</p>	 A wide-angle photograph showing the interior slope of a leachate pond. The ground is a mix of brown soil and gravel. A large, dark, curved pipe or structure is visible in the foreground, extending towards the water. In the background, there is a metal fence, some industrial structures, and a clear blue sky.
<p>Photograph No. 20</p> <p>Interior slope of the leachate pond adjacent to the north ditch.</p>	 A photograph showing the interior slope of a leachate pond. A gravelly slope leads down to a body of water. To the right, there is a concrete structure with two openings, possibly a ditch or culvert, surrounded by a pile of large grey rocks. A white pickup truck is parked in the distance on a gravel area.
<p>Photograph No. 21</p> <p>South leachate pipe.</p>	 A photograph showing a large, red, flexible pipe being used to pump leachate from a pond. The pipe is connected to a black pump unit on a trailer. In the background, there is a small white shed with a red life preserver on its side. The pond's surface is calm, reflecting the sky and the surrounding area.



Photograph No. 22  
Interior slope and  
south runoff water  
pipe at Basin C.



Photograph No. 23  
Interior slope and  
north runoff water  
pipe at Basin C



Photograph No. 24  
Typical Interior Slope  
and crest of Basin C.





<p>Photograph No. 25</p> <p>Overall view of interior slope.</p>	 A wide-angle photograph showing a large, flat area covered in a dark, textured material, likely a liner or soil, with some lighter patches. The background shows a line of trees under a clear blue sky.
<p>Photograph No. 26</p> <p>Haul road and crest of Basin C.</p>	 A photograph showing a gravel haul road in the foreground, leading towards a large, flat area covered in a dark material. The background shows a line of trees and a clear blue sky.