

2019 Annual Landfill Inspection Report

CCR Landfill

**Turk Power Plant
Southwestern Electric Power Company
Fulton, Arkansas**

November 2019

Prepared for: Southwestern Electric Power Company – Turk Power Plant

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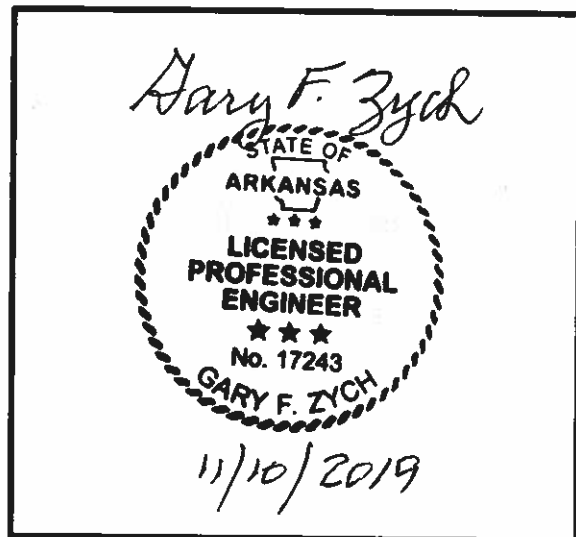
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Manager – AEP Geotechnical Engineering



I certify to the best of my knowledge, information and belief the information contained in this report meets the requirements of 40 CFR § 257.84(b).

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1.0 INTRODUCTION

This report was prepared by AEP- Geotechnical Engineering Services (GES) section, in part, to fulfill requirements of 40 CFR 257.84 and to provide the Turk Power Plant an evaluation of the facility.

Shah Baig of AEP-Geotechnical Engineering performed the 2019 inspection of the Landfill located at the Turk Power Plant, Fulton, AR. This report is a summary of the inspection and an assessment of the general condition of the facility. Greg Carter, AEP-SWEPCO Generation, Plant Engineering, Brent Ogden and Richard Hudler from Turk Plant coordinated and were present during the inspection. The inspection was performed on October 23, 2019. Weather conditions were clear skies, visibility was good, light wind, sunny, and the temperature ranged in 70's (°F) throughout the day. Some grassy areas already mowed before the inspection and remaining areas were planned to be mowed later.

2.0 DESCRIPTION OF LANDFILL

AEP-SWEPCO owns and operates the Turk Power plant and the CCR landfill facility. The site is located approximately 2.2 miles north of the Fulton (Hempstead County), Arkansas. The site location is exhibited on Figure 1 at Attachment A (Vicinity Map). The Power Plant has a 600 MW facility utilizing western subbituminous coal as a fuel for generating electricity. The landfill facility located to the south of the main plant is design, approved, and used for disposal of flyash, bottom ash, scrubber waste, and other byproducts from the coal-fired Power Plant. Figure 2 (Site Location Map) in Attachment A illustrates the CCR landfill facility location with respect to the power plant. The overall features of the landfill were categorized into the following components as a means of organizing the inspection and reporting; Leachate Collection Pond, Active Landfill Disposal Areas (Cell 1 and 2), Perimeter Berms and Haul Road, and Storm Water Pond and Drainage Ditches

The Active Landfill Disposal Area (Cell 1) had reached its maximum waste fill capacity and currently in final stages of finishing the final grades. Construction of Cell 2 (approximately 13.9 acres) is completed and currently accepting waste material. There are total of 1-5 cells that makes the total landfill footprint of 73 acres. The Leachate Collection Pond is located to the northwest of Cell 1 and collect leachate generated from the leachate collection system. The storm-water runoff pond is located to the northeast of Cell 1 and collects storm water from the perimeter storm water ditches around the landfill. The outer perimeter of the landfill consists of the perimeter berm and haul road.

3.0 REVIEW OF AVAILABLE INFORMATION (257.84(b)(1)(i))

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

4.0 INSPECTION (257.84(b)(1)(ii))

4.1 CHANGES IN GEOMETRY SINCE LAST INSPECTION (257.84(b)(2)(i))

Construction of landfill Cell 2 located adjacent to Cell 1 was complete in January 2019. The total active area combined of the landfill Cell 1 and Cell 2 is approximately 27.9 acre. In addition, the topography of the active disposal area has changed since the last year inspection.

4.2 VOLUME (257.84(b)(2)(ii))

The total estimated disposal capacity of the landfill (Cells 1-5) is 6,884,235 cubic-yard. The total volume of CCR disposed in the landfill from the period 11/2012 through 10/2019 is estimated to be 789,851 tons (576,533 cubic-yard), using a unit conversation of 1.37 tons/cubic-yard.

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 (slopes) is large scale movement of Coal Combustion Byproducts, structural fill or other earthen materials associated with the landfill. 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 (257.84(b)(1)(ii))

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, completed and open cells of the landfill, and appurtenances.

Overall, the facility is in good condition. The landfill is functioning as intended with no signs of potential structural weakness or conditions, which are disrupting to the safe operation of the landfill.

Inspection Photograph Location Map and Photographs are at Attachment B. Additional pictures taken during the inspection could be available to the Owner upon request.

Leachate Collection Pond

1. The south slope of the leachate pond adjacent to the landfill is shown in Photographs 1 and 2. The slope appeared in good and stable condition. Intermittent bare spots with lack of vegetation were noticed at this slope. The south perimeter ditch (Photograph No. 1) appeared in functional condition with positive drainage.
2. There are three leachate drainpipes (southeast, center, and southwest) on the south slope of the leachate pond. Leachate enters the pond from the Cell 1 leachate collection system through a pipe at the southeast corner of the pond (Photograph No. 3). Leachate was being generated at the time of the inspection and the drain pipe was functioning as designed. The center leachate pipe (Photograph No. 4) and revetment protection appeared in good condition.
3. As part of the leachate pond improvements, three riprap lined letdown channels were installed at the interior slope to manage runoff. The letdown channels area located at the northwest corner, southwest corner, and south slope of the pond. Photograph No. 5 illustrates typical letdown channel. All the letdown channels appeared to function as designed and appeared in good and stable condition.
4. The pond consists of north, south, and east slope covered with vegetation. A slip had occurred at the west slope few years ago. In 2018, the west slope was repaired by replacing soil cover with the HDPE liner. Photograph No. 6 illustrates typical condition of the interior vegetated slopes. The interior vegetated slope appeared in good and stable condition. Small area at the northeast side upper section of the north slope was not mowed as marked in the photograph. Photograph No. 7 shows the west slope after the completion of the slip repair and HDPE liner. The slope and the liner appeared in good and stable condition and functioning as design.
5. The leachate pond inlet structure is illustrated in Photograph No. 8. It was surrounded with overgrown vegetation.

Active Landfill Disposal Area, Perimeter Berm and Haul Road

6. Photograph No. 9 shows Cell 1 and Cell 2. Cell 2 was recently completed and active waste disposal. Cell 1 is close to reaching its final disposal design grades (capacity) and thus the contractor is working on the final grading. Both cells appeared in good and stable condition. Plans are to place temporary cover over the constructed portion of finally graded slopes of Cell 1.
7. Overall condition of the landfill Cell 1 and Cell 2 is illustrated in Photograph No. 10. This photograph was taken from top of Cell 1 looking down towards Cell 2. Existing landfill Cell 1 and newly completed Cell 2 were in good condition with no sign of instability and significant erosion of the slopes.
8. A perimeter berm with a toe ditch was constructed for the landfill to support the landfill and control runoff from the landfill. The south perimeter berm is shown in Photographs No. 11 and 12. The slope of the berm consists of artificial turf appeared in good and stable condition. It appears that some of the sand that was placed as ballast over the artificial turf may have by runoff into the toe ditch. The eastern end of the toe ditch exhibited overgrown vegetation.
9. Typical condition of the perimeter haul road is exhibited in Photograph No. 13. The haul road appeared in good condition with no sign of noticeable settlement, misalignment, and cracks/erosion. Significant amounts of sediments were seen on the haul road mostly carried by the runoff water.
10. A test pad using closure turf for the permanent cover system installation was completed in October 2019 at the southeast slope of the landfill (Photograph No. 14). The closure turf cover system is designed to be in compliance with the CCR rules and approved by the ADEQ for the test pad. The test pad of the cover system appeared in good intact and stable condition.
11. The east perimeter berm, road, and toe ditch is shown in Photographs No. 15. This slope of the berm consists of artificial turf appeared in good and stable condition. Some ruts were observed at the haul road, but road appeared in stable condition with no sign of settlement or misalignment. The toe ditch exhibited overgrown vegetation. The north slope of the landfill

and perimeter haul road, and berm are exhibited in Photograph No. 16. The berm with the haul road appeared in good and stable condition.

Storm Water Pond and Drainage Ditches

12. The storm water pond is located to the east of the landfill and receives non-contact storm water run-on from areas outside the active Cells of the landfill. The pond appeared to be functioning as designed (Photograph No. 17).

13. The inlet and outlet of the overflow pipe structure of the storm-water pond are exhibited in the Photographs No. 18 and 19. The overflow pipe structure appeared in good condition. No water was flowing at the time of inspection from the outlet pipe.

4.5 CHANGES THAT EFFECT STABILITY OR OPERATION (257.84(b)(2)(iv))

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

In general, the landfill is functioning as intended. The landfill areas are in good and stable condition. The storm water ditches and the south perimeter haul road are in fair condition due to sediments and overgrown vegetation. The leachate pond is in good and stable condition and all the slip repairs and improvement work are completed. The storm-water pond is functioning as designed and adequately handling the runoff water.

5.2 MAINTENANCE ITEMS

1. The east and south perimeter ditch those being filled with sediments needs to be excavated from the perimeter ditch to maintain the design hydraulic capacity and also to control run-on from the slopes. All the overgrown vegetation should be cleared from the ditch and the ditch should be restored to its design condition.

2. Minor rutting of the haul road should be repaired by regrading and keeping up regular maintenance in future.

3. The south haul road covered with sediments should be removed and properly maintained to avoid sediments accumulation in future.

5.3 ITEMS TO MONITOR

The exposed slopes of the landfill without soil cover should be monitor for any excessive erosion.

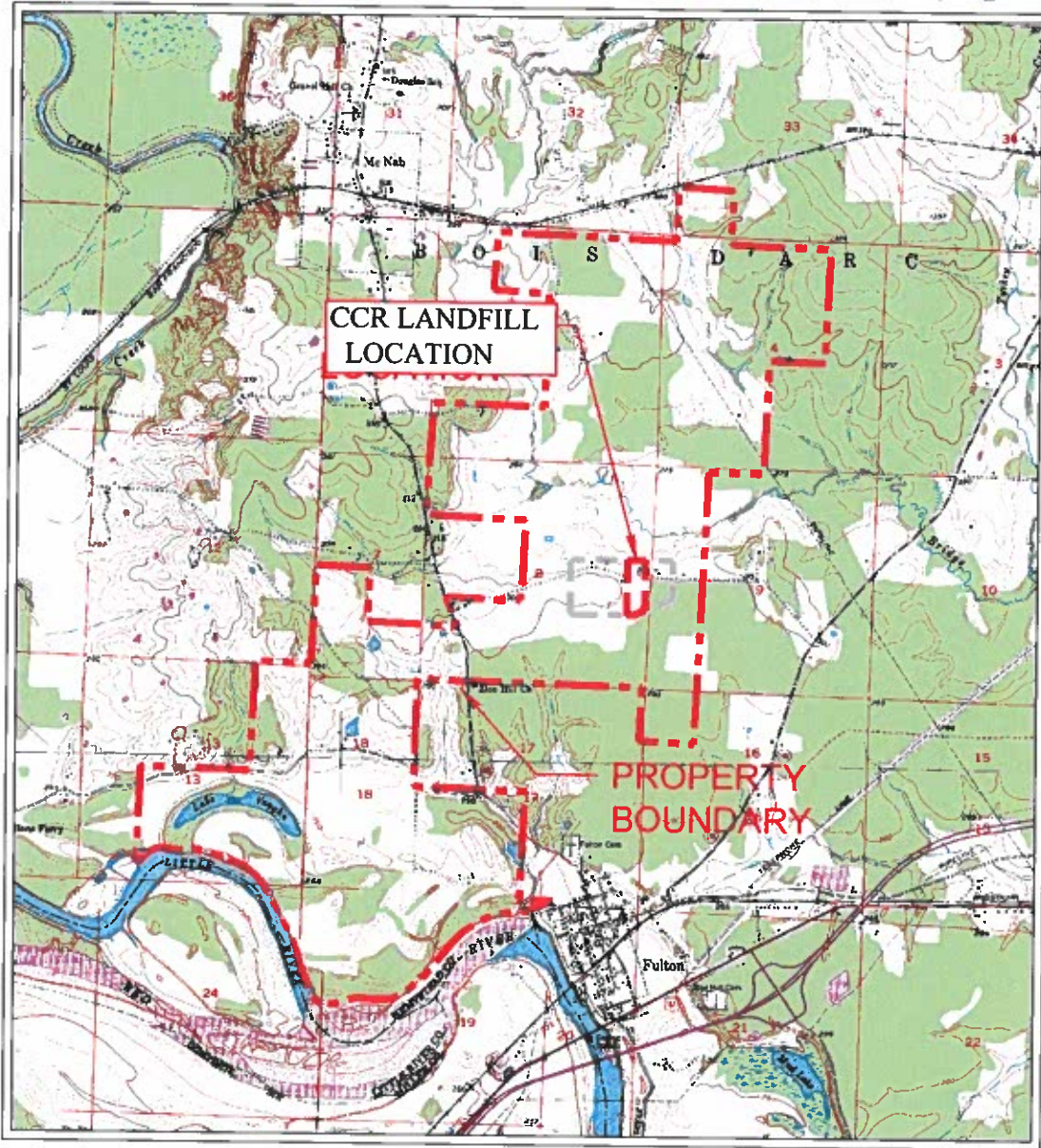
5.4 DEFICIENCIES (257.84(b)(2)(iii))

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 inspection. If any deficiency occurs until the next inspection contact AEP Geotechnical Engineering immediately.

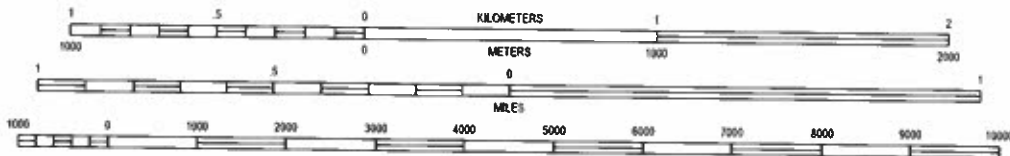
If you have any questions with regard to this report, please contact Shah Baig at Audinet: 200-2241, or 614-716-2241 (email: sbaig@aep.com) or Gary Zych at Audinet: 200-2917, or 614-716-2917 (email: gfzych@aep.com).

ATTACHMENT A

- **FIGURE 1, VICINITY MAP**
- **FIGURE 2 , LANDFILL SITE LOCATION MAP**



SCALE 1:24 000



CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

FULTON / MCNAB
QUADRANGLES
1951 - Revised 1970 & 1975
7.5 MINUTE SERIES (TOPOGRAPHIC)



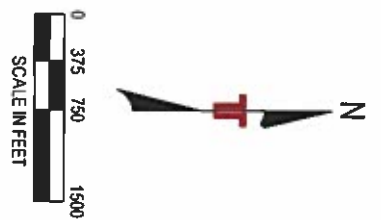
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Drawn By	TLB
Checked By	TLB
Approved By	DCM
Project No.	216-002-35177127
Scale	AS SHOWN
File No.	401
Date	07/02/2018

Terracon
Consulting Engineers and Scientists

25809 I-30 SOUTH BRYANT, AR 72022
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VICINITY MAP
EVALUATION OF CELL 2 LOCATION RESTRICTIONS
AMERICAN ELECTRIC POWER
JOHN W. TURK, JR. POWER PLANT
FULTON ARKANSAS

FIG. No.
1



NOTE:
FUTURE CELLS ARE NOT PART
OF THE CURRENT CCR UNIT.

REV.	DATE	BY	DESCRIPTION

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BRYANT, AR 72022
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SITE LOCATION MAP

EVALUATION OF CELL 2 LOCATION RESTRICTIONS
AMERICAN ELECTRIC POWER
JOHN W. TURK, JR. POWER PLANT
FULTON ARKANSAS

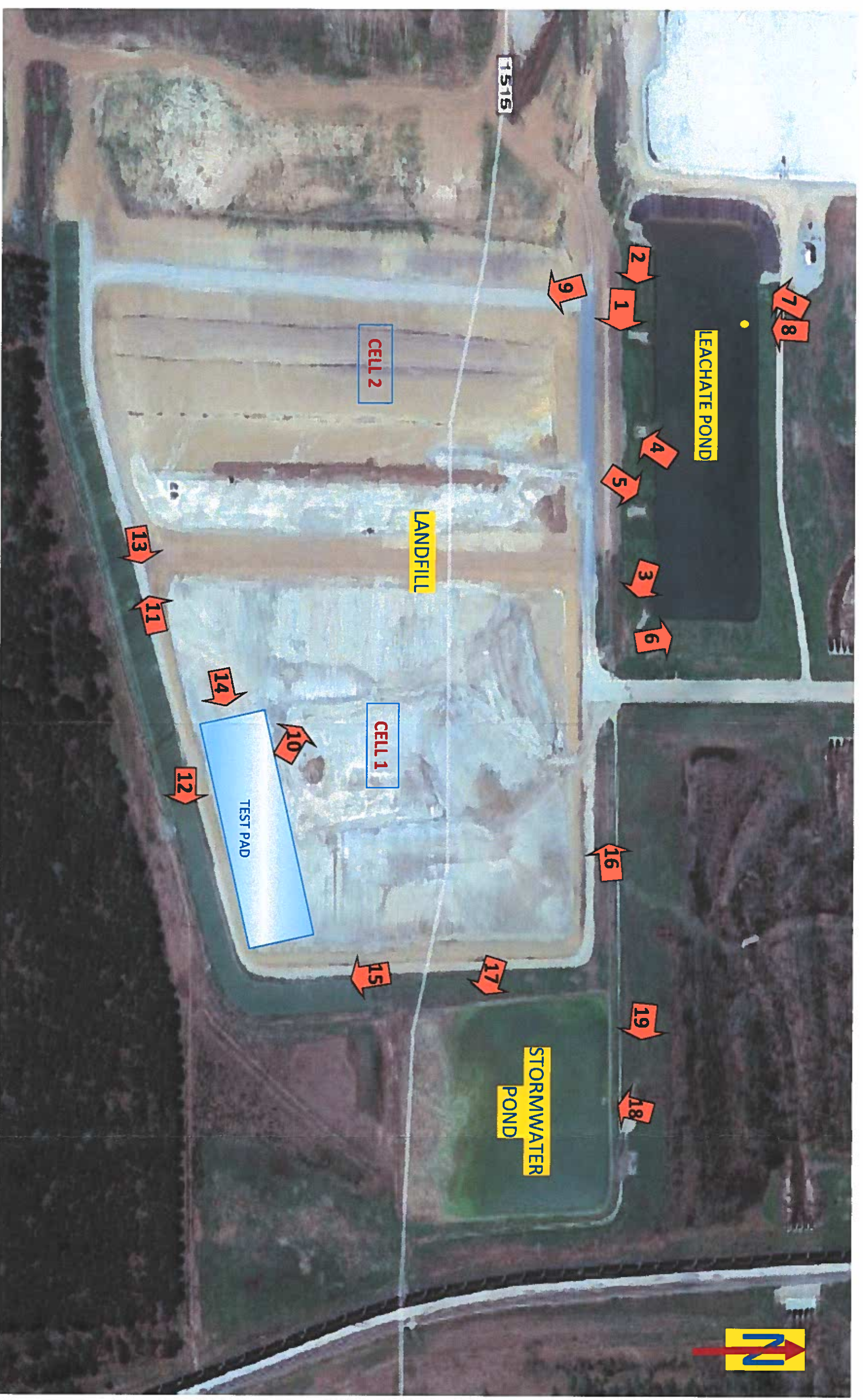
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DRAWN BY:	TLB
APPVD. BY:	DCM
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DATE:	07/02/2018
JOB NO.:	216-002-35177127
ACAD NO.:	402
SHEET NO.:	2 OF 9

ATTACHMENT B

- INSPECTION PHOTOGRAPH LOCATION MAP




- PHOTOGRAPHS




FIGURE 3 – PHOTOGRAPH LOCATION MAP
TURK PLANT, FULTON, AR






<p>Photo #1 North perimeter diversion ditch at the south slope (looking east).</p>	 A wide-angle photograph showing a long, straight, earthen diversion ditch running through a field of dry, brownish vegetation. In the background, a large, white, domed structure, likely a landfill cover, is visible under a clear blue sky.
<p>Photo #2 South interior slope of the leachate pond (looking east).</p>	 A photograph of a grassy slope leading down to a small, shallow pond. The vegetation is sparse and dry. The sky is clear and blue.
<p>Photo #3 Typical condition of the leachate drain pipe and wing wall.</p>	 A close-up photograph of a concrete leachate drain pipe and its wing wall. The pipe is partially filled with dark, murky liquid. The surrounding area is rocky and covered with dry, scrubby vegetation.

<p>Photo #4</p> <p>Typical condition of the leachate drain pipe with riprap revetment.</p>	
<p>Photo #5</p> <p>Typical condition of the riprap letdown channel.</p>	
<p>Photo #6</p> <p>Typical condition of the interior slope.</p>	

<p>Photo #7 West slope lined with HDPE liner.</p>	
<p>Photo #8 Leachate pond inlet structure covered with vegetation.</p>	
<p>Photo #9 Landfill Cell 1 and Cell 2.</p>	

<p>Photo #10 Overall view of the landfill.</p>	 A wide-angle photograph showing a large, flat, reddish-brown area, likely a landfill, under a clear blue sky. In the distance, a tall, thin structure, possibly a smokestack or chimney, is visible against the horizon.
<p>Photo #11 South perimeter berm slope and toe ditch.</p>	 A photograph showing a green grassy slope on the left, a dark, narrow ditch or berm in the middle, and a dirt road on the right. A red and white traffic cone is visible on the dirt road. The background shows a line of trees under a blue sky.
<p>Photo #12 Close up view of the south perimeter berm toe ditch.</p>	 A close-up photograph of a green grassy slope and a dark, narrow ditch. A chain-link fence is visible in the background, and there are some trees and bushes. The ground appears to be a mix of grass and dirt.

<p>Photo #13 Typical condition of the south perimeter haul road.</p>	 A wide gravel haul road runs parallel to a green grassy area. The road is composed of light-colored gravel and extends into the distance. The grassy area is well-maintained and vibrant green. The sky is clear and blue. In the background, there is a line of trees and a slight rise in the land.
<p>Photo #14 Closure turf test pad area in the southeast corner of Cell 1.</p>	 A gravel test pad area is visible, adjacent to a grassy slope. The gravel is light-colored and appears to be a different texture or composition than the main haul road. The grassy area is green and slopes upwards. The sky is clear and blue. A utility pole is visible in the distance on the grassy slope.
<p>Photo #15 Typical condition of the east perimeter berm and toe ditch.</p>	 A gravel berm and toe ditch area is shown, with sparse vegetation. The gravel is light-colored and appears to be a different texture or composition than the main haul road. The vegetation is sparse and dry, with some yellow and brown patches. The sky is clear and blue. A line of trees is visible in the background.




<p>Photo #16 The north side of the landfill Cell 1 area.</p>	
<p>Photo #17 Overall view of the storm water pond</p>	
<p>Photo #18 The inlet of the overflow discharge structure.</p>	

Photo #19
The overflow pipe
discharge structure.

