

Report 2 – Evaluation of Location Restrictions

SWEPCO – John W. Turk, Jr. Power Plant

Class 3N Landfill

Permit No. 0311-S3N-R1

AFIN: 29-00506

September 2016

Project No. 35157126



A unit of American Electric Power

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Terracon

Environmental



Facilities



Geotechnical



Materials

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1.0 Objective

The purpose of this Location Restriction Evaluation Report (LRER) is to evaluate compliance with location restrictions (LRs) with the EPA Coal Combustion Residuals (CCR) regulations at the SWEPCO – John W. Turk, Jr Power Plant Class 3N Landfill (Permit No. 0311-S3N-R1) facility. Southwestern Electric Power Company (SWEPCO) is a unit of American Electric Power (AEP).

2.0 Background Information

2.1 Facility Location Description

Southwestern Electric Power Company owns and operates a coal-fired power plant (John W. Turk, Jr. Power Plant) with a Class 3 Non-Commercial (3N) solid waste facility (Class 3N Landfill) associated with the Power Plant. The site is located approximately 2.2 miles north of Fulton (Hempstead County), Arkansas. The Power Plant produces up to 600 Megawatts (MW) of electrical power utilizing western subbituminous coal. The Class 3N Landfill is used for disposal of fly ash, bottom ash, and other byproducts from the coal-fired Power Plant. The waste materials are non-hazardous and non-putrescible. (**FIGURE 1 & 2**)

2.2 Description of CCR Unit

2.2.1 Embankment Configuration

The landfill embankments are being constructed with 3:1 interior slopes. The outside embankment slopes are approximately 3:1. A composite liner system and a leachate collection system have been installed. (**2011 Permit Application, Volume 3, Appendix B Design Drawings, Terracon Consultants Inc., February 2011**)¹

2.2.2 Area/Volume

The Solid Waste Landfill permit 0311-S3N-R1, with an effective date of July 15, 2011, grants the Turk Facility Landfill 73 acres of disposal area. This disposal area correlates to 6,884,226 Cubic Yards of disposal Volume. Currently 14 acres (Cell 1) of the 73 acre Class 3N landfill have been constructed and are active.

2.2.3 Construction and Operational History

During field activities, groundwater monitoring wells were installed around the Class 3N Landfill in accordance with the approved Groundwater Monitoring Well Installation Workplan, Revised August 1, 2011.

The monitoring wells are identified as MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, MW-9D, and MW-10. The 10 monitoring wells were installed to depths ranging from 20 to 148 feet below ground surface (bgs). Each well installation was performed in accordance with ASTM D 5092-90 Design and Installation of Groundwater Monitoring Wells in Aquifers.

Each monitoring well was constructed using 2-inch diameter 0.010 slotted PVC screen. A 5-inch bottom cap was installed on the bottom of each screened interval. The screened interval was threaded to a solid 2-inch diameter PVC riser to bring the well to approximately 3 feet above ground. The annulus of each well was filled with 12/20 mesh silica sand from the bottom of the boring to a minimum of two feet above the screened interval. A minimum of two feet of coated bentonite pellets were then placed in the annulus on top of the sand filter pack and then hydrated. The remaining annulus was filled with bentonite chips to within approximately 1 foot of ground surface. A tremmie pipe was utilized to install sand, coated bentonite pellets, and bentonite chips in deep monitoring well MW-9D. A cement seal was then installed to ground surface.

The solid PVC riser in each well was brought to approximately 3 feet above ground surface. A 4-foot long metal protective locking collar was then installed over the PVC. A concrete pad with four (4) bollard posts was constructed around each well. (**Groundwater Monitoring Well Installation Report, Terracon Consultants Inc., December 2011**)²

An additional monitoring well, MW-11, was installed on March 24, 2016. MW-11 is just north of the landfill boundary. The well was added to bring the groundwater monitoring network into compliance with CCR requirements.

2.2.4 Surface Water Control

The site has been designed with a series of berms, ditches, and drainage conveyances to direct stormwater away from and around the active disposal area. Stormwater diversion is necessary and desirable to minimize contact with waste while limiting the potential for leachate production. Each active waste cell will be constructed with a perimeter diversion berm to assist in separating leachate and stormwater.

The surface of the Landfill will be shaped and contoured to promote proper drainage away from Landfill. A series of internal ditches will be necessary to divert stormwater run-off from the Landfill to the perimeter ditches. The final cover system will also include a series of drainage

conveyances designed to control drainage off the Landfill surface while minimizing erosion. Surface water run-off will be directed to stormwater sediment ponds located adjacent to the proposed disposal area footprint. All ditches, swales, berms, conveyances, and stormwater sedimentation basins have been designed to control the run-off from a 25-year, 24-hour storm event.

2.3 Previous Investigations

Geotechnical

§ Hydrogeologic and Geotechnical Report, Terracon, Revised October 2010

Groundwater and Other Environmental

§ Hydrogeologic and Geotechnical Report, Terracon, Revised October 2010

§ Groundwater analysis reports are done quarterly throughout each year

§ Annual Engineering Inspections reports are done yearly.

§ Groundwater Separation Distance Determination Report, Turk Permit Application, Volume 4, Appendix K.

2.4 Hydrogeologic Setting

2.4.1 Climate

The climate in this area of the state is humid with warm summers. Mean temperatures range from 81.6 °F in July to 45.7 °F in January. The average annual temperature is 64.1 °F. Recorded temperature extremes are 114 °F and -5 °F. The average annual rainfall is about 49 inches a year (**U.S.D.A Soil Conservation Commission, Arkansas State Water Plan, Feb. 1987, pg. 7**)³.

2.4.2 Regional and Local Geologic Setting

The landfill is located within the Gulf Coastal Plain Physiographic Province and underlain by Cretaceous Age sediments. The landfill is underlain by the Arkadelphia Marl Formation. Quaternary terrace deposits are present to the south of the site and Quaternary alluvial deposits associated with Bridge Creek are present just to the north of the site; however, Quaternary deposits are not present within the landfill area.

The hydrogeologic investigation conducted in February through May, 2008 confirmed that the site is underlain by the Cretaceous Age Arkadelphia Marl, which is then underlain by the Nacatoch Sand Formation. The hydrogeologic units identified during the investigation were grouped together based upon similar geologic, geotechnical and hydrogeologic properties. Hydrogeologic “Unit A” is part of the Arkadelphia Marl Geologic Unit and contains clay with some intermittent Chert gravel. Some silty clay and sandy clay is present. Clayey gravel intervals are present primarily in the northern portion of the site. Gypsum veins are generally

present near the lower contact of the unit. The Hydrologic Characteristics include: Groundwater can occur as secondary porosity in gypsum veins under confined conditions, groundwater is also present in gravel intervals in the northern portion of the site, groundwater may move through the formation due to the blocky fissile nature of the material, average vertical permeability of 5.21×10^{-8} cm/sec based on lab geotechnical samples, average horizontal conductivity of 6.47×10^{-5} cm/sec based on slug tests, and average horizontal conductivity of 8.33×10^{-4} cm/sec based on pump test data. Hydrogeologic “Unit B” is part of the Arkadelphia Marl Geologic Unit and contains Shaley Clay/Clayey Shale, is hard, and fissile in nature. Trace bivalve fossils are present and strong HCL reaction. The Hydrologic Characteristics include: Average vertical permeability of 1.13×10^{-7} cm/sec based on lab geotechnical samples. Hydrogeologic “Unit C” is part of the Nacatoch Formation Geologic Unit and contains Sandstone with calcareous cement overlying fine grained, loosely cemented sand. The Hydrologic Characteristics include: Groundwater occurs under confined conditions within the loosely cemented sand. Average horizontal conductivity is 4.25×10^{-4} cm/sec based on slug test data.

The Arkadelphia Marl is mostly a dark gray to black marl or marly clay with some limy, gray sandstone, gray sandy clay, sandy limestone, concretionary limestone, with to light brown impure chalk. The sandy marls and limestone are found at or near the base of the unit, while the impure chinks are found closer to the top. The Arkadelphia Marl rests with slight unconformity upon the Nacatoch Sand. The marl is 120 to 160 feet thick. (R.T. Hill – 1888). The underlying Nacatoch Sand is composed of cross-bedded, yellowish and gray fine quartz sand; hard, fossiliferous sandy limestone; coarse, highly glauconitic sand; fine-grained, argillaceous blue-black sand; bedded light-gray clay and marl. The sands in the Nacatoch are generally unconsolidated. At the base of the unit hard, fossiliferous limestone and marl are found. The Nacatoch Sand appears to have an unconformity at its base. The unit is 150 to 400 feet thick.

2.4.3 Surface Water/Groundwater Interactions

The site is drained primarily to the south and east toward the perennial stream Bridge Creek. Bridge Creek flows into Boise d’Arc Creek approximately five miles southeast of the site. The southern portion of the site drains south toward unnamed intermittent drainages that flow into the Red River near Fulton, Arkansas. (Terracon Consultant’s Inc., Permit Modification Application, Volume 4, pg. 3)⁴. Groundwater elevations are show on **FIGURES 4 & 5**.

In 2012 Cell 1 an engineered designed cell with a composite liner system was constructed to meet CCR requirements. With this liners system in place there should be no interaction between the landfill and groundwater or surface water. In addition a groundwater monitoring system is in place to detect any interaction (ie, release) should it occur. The groundwater potentiometric map shows groundwater flowing toward Bridge Creek. Bridge Creek is likely a gaining stream at this location. Surface water does impact groundwater. Periodically there has been evidence of temporary groundwater mounding as noted during the February 3, 2015 sampling event at MW-3.

2.4.4 Water Users

A water well inventory was conducted on wells within a one-half mile radius of the Class 3N landfill. The well inventory was conducted by utilizing Water Well Construction reports on file at the Arkansas Geological Commission.

Water well inquiry forms were submitted to property owners located within ½-mile radius of the site. Mr. Rosenbaum (property owner located approximately 2,000 feet west of the proposed landfill boundary), on July 10, 2010, verbally stated there are three (3) wells at his home and near the adjacent chicken houses. Water well construction reports were not identified for the wells. The estimated locations of the wells are shown on **FIGURE 6. (Terracon Consultant's Inc., Permit Modification Application, Volume 4, pg. 7)**⁵

3.0 Required Isolation from Uppermost Aquifer

Not all of the new CCR rules (§257.60 through §257.64) apply to existing landfills.

3.1 Aquifer Description and Piezometric Analysis

This section is not applicable since CCR rule §257.60 does not apply to existing landfills. This section applies to new landfills or lateral expansions to existing landfills.

3.2 Compliance

This section is not applicable since CCR rule §257.60 does not apply to existing landfills. This section applies to new landfills or lateral expansions to existing landfills.

4.0 Wetlands Impact

4.1 Review of Local Wetlands

This section is not applicable since CCR rule §257.61 does not apply to existing landfills. This section applies to new landfills or lateral expansions to existing landfills.

4.2 Compliance

This section is not applicable since CCR rule §257.61 does not apply to existing landfills. This section applies to new landfills or lateral expansions to existing landfills.

5.0 Fault Area

5.1 Description of Regional Geologic Structural Features and Tectonic History

This section is not applicable since CCR rule §257.62 does not apply to existing landfills. This section applies to new landfills or lateral expansions to existing landfills.

5.2 Compliance

This section is not applicable since CCR rule §257.62 does not apply to existing landfills. This section applies to new landfills or lateral expansions to existing landfills.

6.0 Seismic Impact Zone

6.1 Seismic Impact Zone – Definition and Regional Information

This section is not applicable since CCR rule §257.63 does not apply to existing landfills. This section applies to new landfills or lateral expansions to existing landfills.

6.2 Compliance

This section is not applicable since CCR rule §257.63 does not apply to existing landfills. This section applies to new landfills or lateral expansions to existing landfills.

7.0 Unstable Areas

7.1 Unstable Areas – Definition and Review of Local Conditions

Unstable area means a location that is susceptible to natural or human induced events or forces capable of impairing the integrity, including structural components of some or all of the CCR units that are responsible for preventing releases from such units. Unstable areas can include poor foundation conditions, areas susceptible to mass movements, and karst terrains as defined by 40 CFR 257 §257.64.

Applicability – Owners or operators of existing or new CCR landfills or any lateral expansion of a CCR unit must not be located in an unstable area. The owner or operator must consider the following factors, at a minimum, when determining whether an area is unstable: (1) On-site or local soil conditions that may result in significant differential settling; (2) On-site or local geologic or geomorphologic features; and (3) On-site or local human-made features or events (both surface and subsurface). The following sections analyze each of these factors as they relate to the landfill

7.1.1 – On-Site and Local Soil Conditions

The site soil conditions at the Turk facility do not meet the criteria for unstable conditions. Unstable conditions are usually associated with geological conditions such as Karst features. Characteristic physiographic features associated with Karst terrain such as sinkholes, sinking streams, caves, large springs, and blind valleys are not present on the site. **Section 2.4.2** of this document describes the local and regional soil properties. **FIGURE 7** is a soil map of the CCR unit.

7.1.2 – On-Site or Local Geologic or Geomorphologic Features

Based on the site specific boring logs, as well as published local and regional geologic and geomorphic information, there are no known on-site or adjacent geologic or geomorphic features which could adversely affect the stability of the surface impoundment as defined by 40 CFR 257 §257.64. Information regarding the hydrogeologic, geologic and geotechnical conditions in the vicinity of the site are described in detail in **Section 2.4.2** of this document.

7.1.3 – On-Site or Local Human-Made Features or Events Affecting Stability

Looking at previous investigations, including slope stability analysis, hydrogeologic, and geotechnical reports, the site is not located in an unstable area. The site is in compliance with 40 CFR 257 §257.64.

7.2 Compliance

Looking at previous investigations, including slope stability analysis and geotechnical reports, the site is not located in an unstable area. The site is in compliance with 40 CFR 257 §257.64.

8.0 Summary and PE Certification



8.1 Summary

Southwestern Electric Power Company owns and operates a coal-fired power plant (John W. Turk, Jr. Power Plant) with a Class 3 Non-Commercial (3N) solid waste facility (Class 3N Landfill) associated with the Power Plant. The facility consists of a permitted approximately 73-acre disposal area. The location restrictions given in 40 CFR 257.60 through 257.63 concerning placement of above the uppermost aquifer, wetlands, fault areas, and seismic impact zones do not apply to this existing CCR landfill. The hydrogeologic investigation conducted in February through May, 2008 confirmed that the site is underlain by the Cretaceous Age Arkadelphia Marl, which is then underlain by the Nacatoch Sand Formation. The site soil conditions at the Turk facility do not meet the criteria for unstable conditions. Looking at previous investigations, including slope stability analysis, hydrogeologic, and geotechnical reports, the site is not located in an unstable area. The site is in compliance with 40 CFR 257 §257.64.

8.2 Limitations

The findings and conclusions resulting from this investigation are based upon information derived from the on-site activities and other services performed under the scope of work as described in this report; such information is subject to change over time if additional information is obtained. Please note that Terracon does not warrant the work of laboratories, regulatory agencies or other third parties supplying information used in the preparation of the report.

8.3 PE Certification

Name: 	Date: 9/30/2016	 Stamp
Company: Terracon COA #223	Expiration Date: 12/31/17	

Report 2 – Evaluation of Location Restrictions

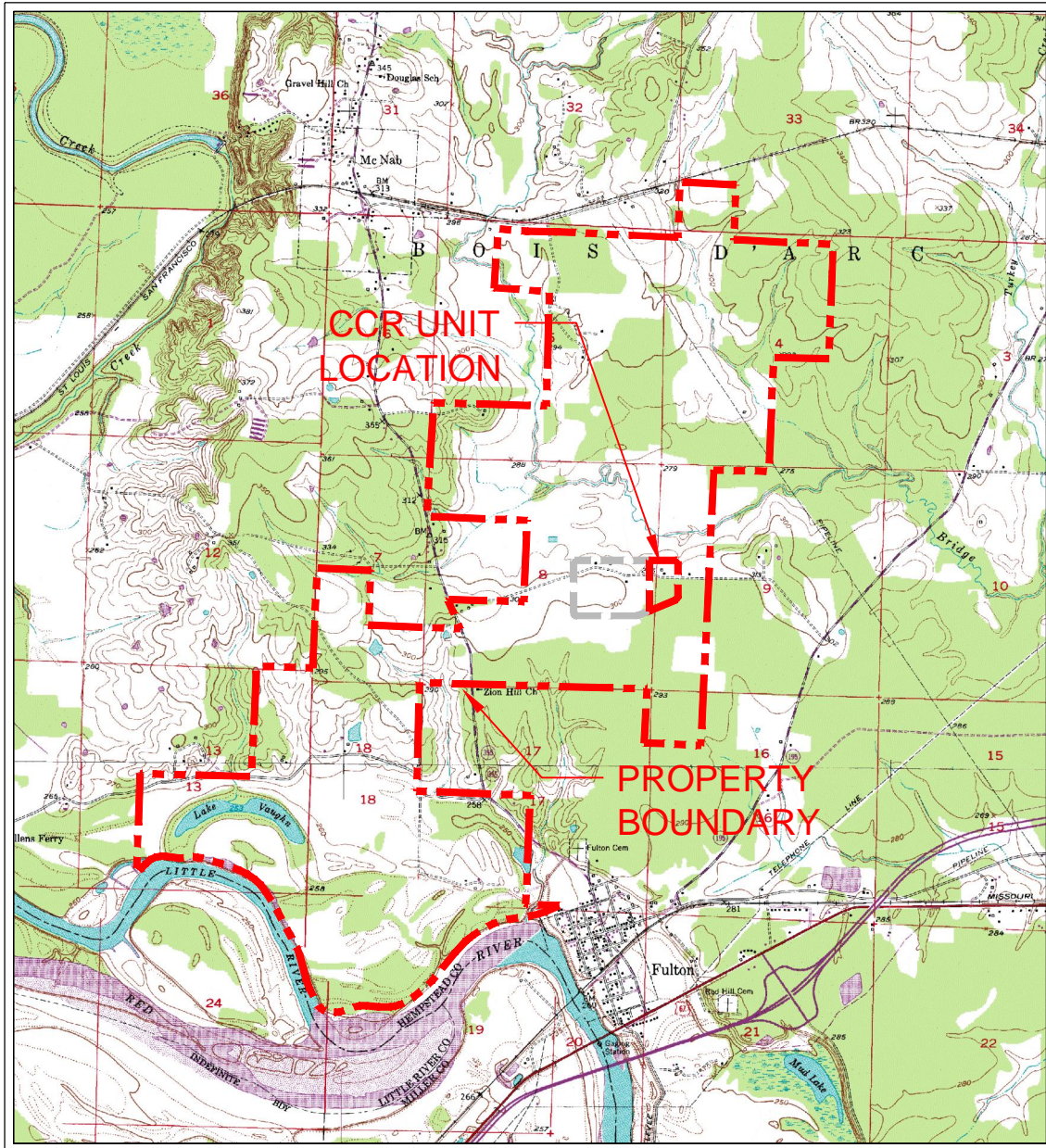
John W Turk, Jr ■ Class 3N Landfill

Project No. 35157126 ■ September 2016

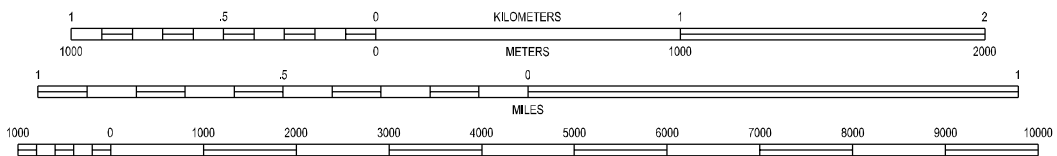


Bibliography

1. 2011 Permit Application, Volume 3, Appendix B Design Drawings, Terracon Consultants Inc., February 2011.
2. Groundwater Monitoring Well Installation Report, Terracon Consultants Inc., December 2011
3. U.S.D.A Soil Conservation Commission, Arkansas State Water Plan, Feb. 1987, pg. 7
4. Terracon Consultant's Inc., Permit Modification Application, Volume 4, pg. 3
5. Terracon Consultant's Inc., Permit Modification Application, Volume 4, pg. 7



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)



Project Mngr:	DCM
Drawn By:	TLB
Checked By:	TLB
Approved By:	DCM

Project No.	216-002-35157126
Scale:	AS SHOWN
File No.	R-2/001
Date:	8/17/16

Terracon
Consulting Engineers and Scientists

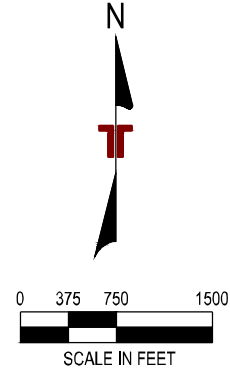
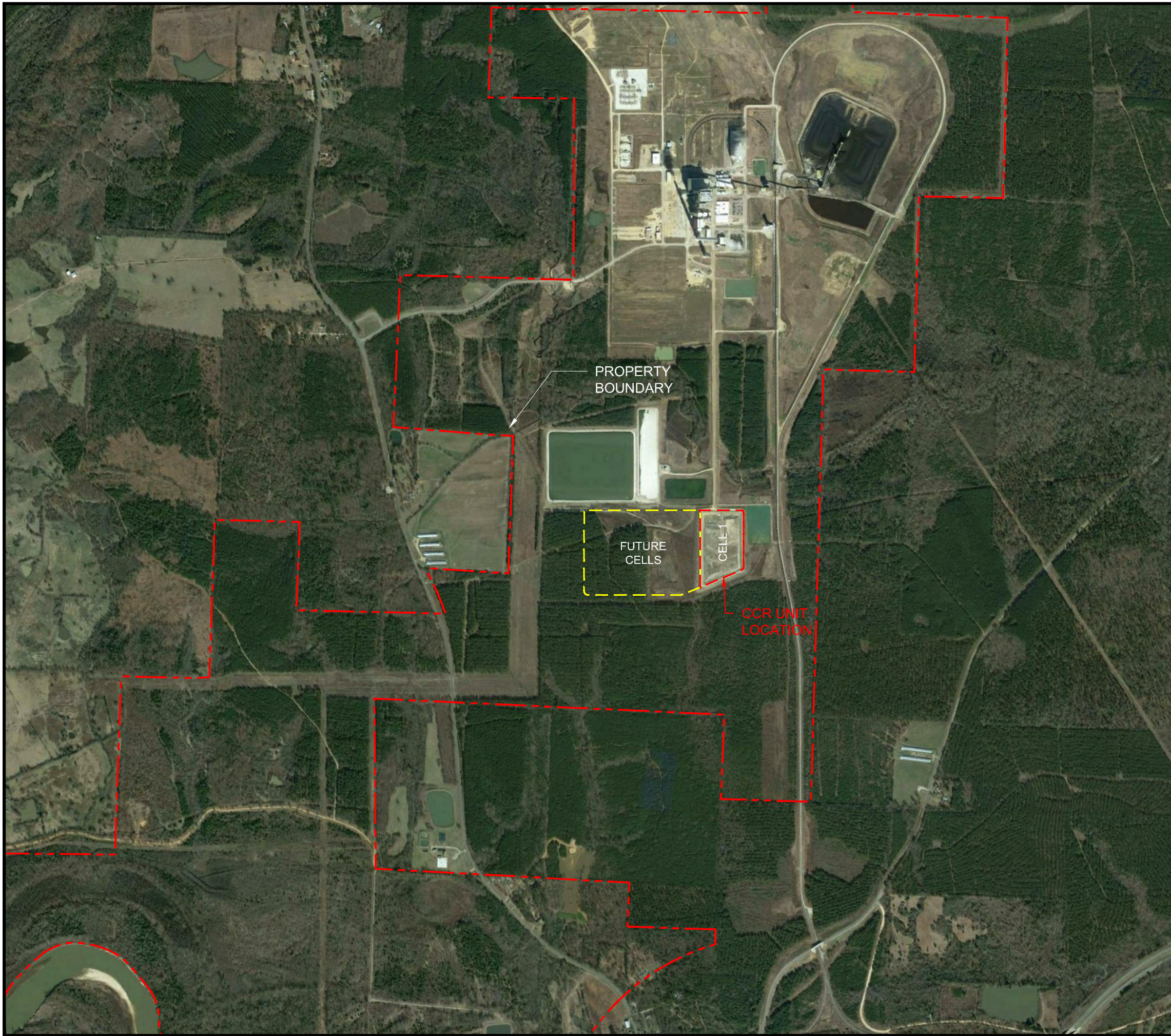
25809 I-30 SOUTH BRYANT, AR 72022
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SITE LOCATION MAP

EVALUATION OF LOCATION RESTRICTIONS
AMERICAN ELECTRIC POWER
JOHN W. TURK, JR. POWER PLANT

FULTON ARKANSAS

FIG. No.	1
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NOTE:
FUTURE CELLS ARE NOT PART
OF THE CURRENT CCR UNIT.

REV.	DATE	BY	DESCRIPTION

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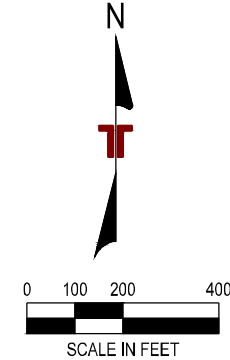
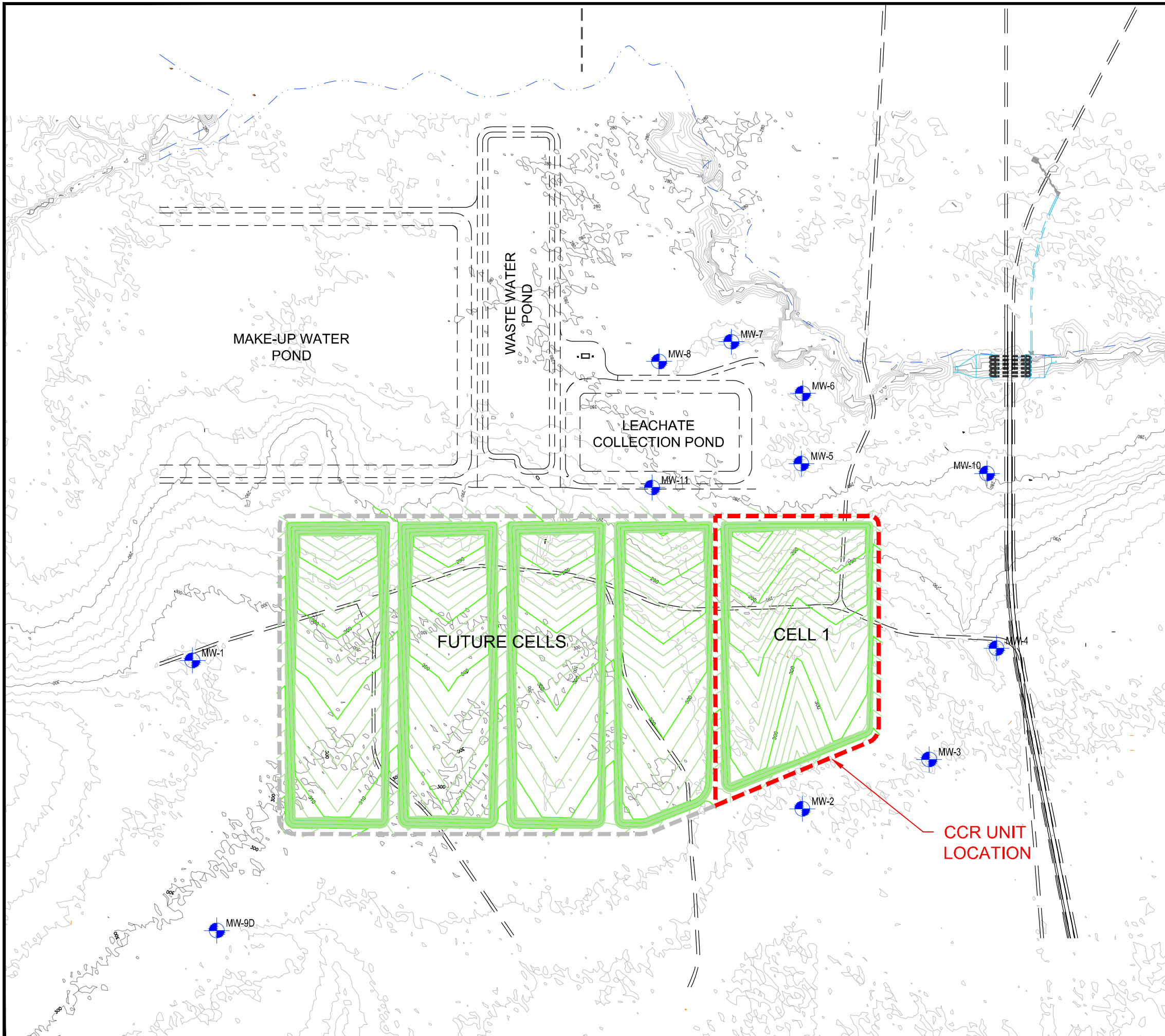
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FAX. (501) 847-9210

PLANT & CCR UNIT LOCATION MAP

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

FIGURE 2

DESIGNED BY:	DCM
DRAWN BY:	TLB
APPRD. BY:	DCM
SCALE:	SEE BARSCALE
DATE:	8-17-16
JOB NO.:	216-002-351517126
ACAD NO.:	R-2/002
SHEET NO.:	2 OF 7



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

REV.	DATE	BY	DESCRIPTION

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CCR UNIT LAYOUT & WELL LOCATIONS

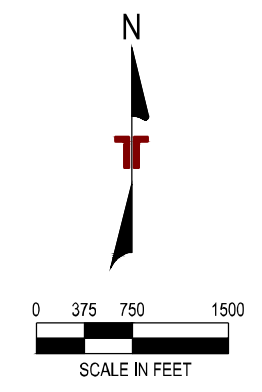
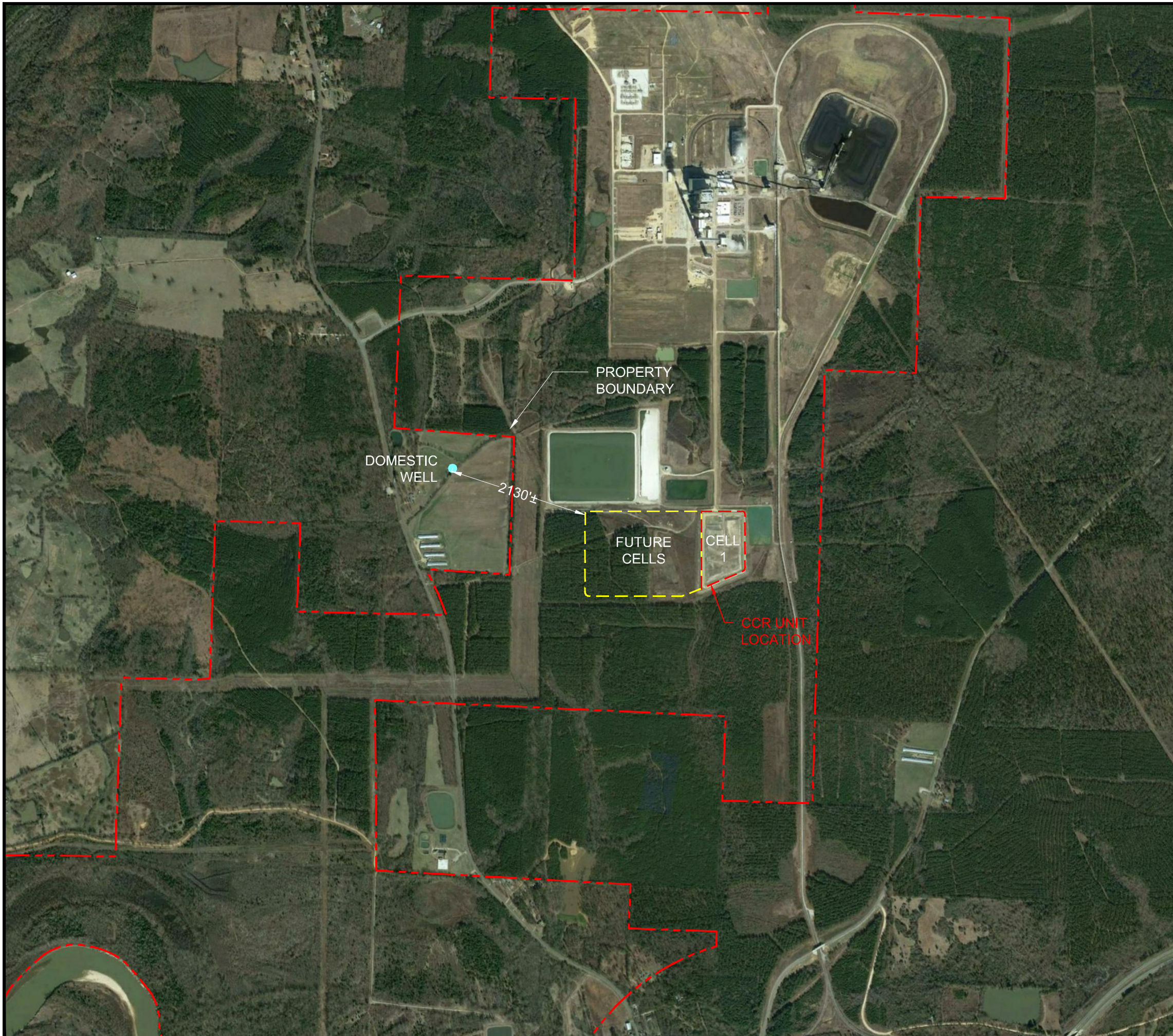
EVALUATION OF LOCATION RESTRICTIONS

AMERICAN ELECTRIC POWER

JOHN W. TURK, JR. POWER PLANT
FULTON ARKANSAS

FIGURE 3

DESIGNED BY:	TLB
DRAWN BY:	SRE
APP'D BY:	DCM
SCALE:	SEE BARS/SCALE
DATE:	08-17-16
JOB NO.:	216-002-35157126
ACAD NO.:	R-2/003
SHEET NO.:	3 OF 7



LEGEND:
● DOMESTIC WELLS

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

REV.	DATE	BY	DESCRIPTION

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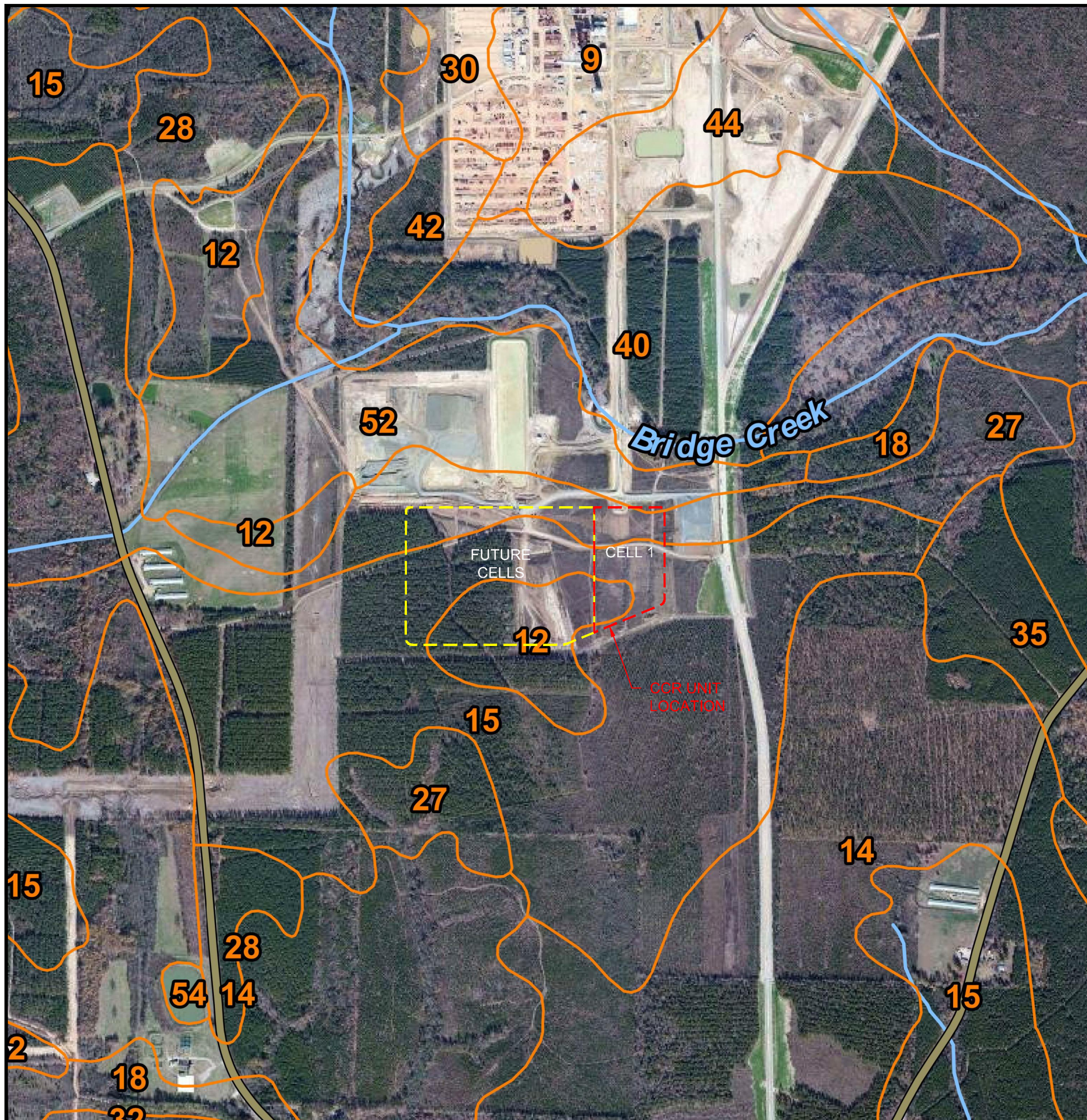
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NEAREST DOMESTIC WELL LOCATOPN MAP
 EVALUATION OF LOCATION RESTRICTIONS
AMERICAN ELECTRIC POWER
 JOHN W. TURK, JR. POWER PLANT
 FULTON ARKANSAS

FIGURE 6

DESIGNED BY:	DCM
DRAWN BY:	TLB
APPVD. BY:	DCM
SCALE:	SEE BARS/SCALE
DATE:	8.17.16
JOB NO.:	216-002-35157126
ACAD NO.:	R-2/006
SHEET NO.:	6 OF 7



Map Unit Symbol	Map Unit Name
2	Bowie fine sandy loam, 1 to 3 percent slopes
9	Guyton silt loam, occasionally flooded
12	Houston clay, 1 to 3 percent slopes
14	Kipling loam, 1 to 3 percent slopes
15	Kipling silty clay loam, 3 to 8 percent slopes, eroded
18	Latanier silty clay, occasionally flooded
27	Oktibbeha silty clay loam, 3 to 8 percent slopes, eroded
28	Oktibbeha clay, 8 to 12 percent slopes, eroded
30	Ora fine sandy loam, 3 to 8 percent slopes
32	Perry clay, 0 to 1 percent slopes, occasionally flooded
35	Sacul fine sandy loam, 3 to 8 percent slopes
37	Sacul-Kirvin association, rolling
40	Sardis silt loam, occasionally flooded
42	Savannah fine sandy loam, 3 to 8 percent slopes
44	Sawyer loam, 3 to 8 percent slopes
47	Sterlington very fine sandy loam, 0 to 2 percent slopes
51	Tuscumbia clay, occasionally flooded
52	Una silty clay loam, occasionally flooded
54	Water

FIGURE 7

DESIGNED BY: DCM
 DRAWN BY: TLB
 APPVD. BY: DCM
 SCALE: SEE BARSCALE
 DATE: 8-17-16
 JOB NO.: 216-002-351517126
 ACAD NO.: R-2/007
 SHEET NO.: 7 OF 7

NEARBY UNSTABLE AREAS

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

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REV.	DATE	BY	DESCRIPTION

TABLE 1 A
 SWEPCO - JOHN W. TURK, JR. POWER PLANT
 CLASS 3N LANDFILL
 MONITORING WELL DATA
 POTENTIOMETRIC GROUNDWATER ELEVATIONS (FMSL)

Well	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9D	MW-10	MW-11
Date											
9/20/2011	284.28	264.25	266.16	273.23	273.26	261.26	270.28	<261.23	251.67	<262.99	-
12/30/2011	294.89	267.24	265.19	273.16	278.16	270.17	272.10	280.34	254.14	272.41	-
2/28/2012	295.83	267.40	269.42	272.69	278.33	271.15	272.41	279.96	254.54	274.22	-
5/17/2012	295.27	267.59	269.65	272.62	277.92	271.96	272.94	278.48	254.47	276.64	-
8/8/2012	293.35	267.64	269.64	272.51	275.16	271.78	271.46	275.80	252.43	276.89	-
11/7/2012	292.20	267.72	269.59	272.44	272.90	270.85	271.53	279.69	253.02	275.49	-
2/28/2013	294.29	267.94	270.03	272.32	278.71	272.53	272.77	280.87	253.93	278.06	-
5/20/2013	294.37	268.11	270.28	273.27	278.36	272.76	273.37	280.44	255.10	276.59	-
8/6/2013	293.69	267.99	270.68	273.31	278.35	273.03	272.89	279.61	253.71	277.66	-
11/4/2013	298.59	271.85	270.50	273.63	279.94	273.59	273.07	280.23	253.54	278.40	-
2/10/2014	296.87	268.35	270.65	275.18	279.81	274.90	273.79	281.08	254.15	278.94	-
5/5/2014	296.76	268.56	271.07	276.06	278.96	274.63	273.70	279.02	255.96	279.88	-
8/5/2014	297.03	272.81	276.01	276.03	279.77	277.85	274.02	280.09	254.21	278.59	-
11/5/2014	295.99	268.82	271.78	275.88	278.99	275.91	273.30	279.07	254.44	279.86	-
2/3/2015	298.75	272.90	286.87	276.30	279.89	278.41	274.00	280.64	253.31	280.42	-
5/5/2015	296.47	275.43	275.97	276.93	280.17	277.74	274.32	279.80	252.04	277.62	-
8/19/2015	295.02	270.66	274.04	277.45	277.96	273.69	272.99	277.97	252.65	280.05	-
11/18/2015	297.20	295.53	288.05	276.84	280.71	277.66	273.82	280.73	254.36	279.13	-
3/23/2016	297.35	281.27	282.69	277.92	280.25	277.87	274.09	279.08	256.98	280.60	-
4/26/2016	296.72	281.44	282.40	278.08	280.25	277.61	273.74	-	257.37	271.37	283.83
Seasonal High	298.75	295.53	288.05	278.08	280.71	278.41	274.32	281.08	257.37	280.60	283.83

Note: MW-9D is in the lower aquifer.

TABLE 1 B
 SWEPCO - JOHN W. TURK, JR. POWER PLANT
 CLASS 3N LANDFILL
 PIEZOMETER DATA
 POTENTIOMETRIC GROUNDWATER ELEVATIONS (FMSL)

Well	PZ-1I	PZ-2I	PZ-3I	PZ-4I
Date				
5/15/2008	288.51	297.72	287.68	285.15
7/2/2008	284.96	296.36	286.07	283.45
8/8/2008	283.64	295.35	285.11	282.69
2/9/2009	288.39	297.47	287.74	286.19
3/3/2009	288.02	292.73	287.89	286.12
6/22/2009	288.00	297.04	288.47	286.37
10/6/2009	287.27	297.10	287.59	295.72
12/22/2009	288.70	297.49	288.81	286.95
4/14/2010	288.23	296.93	288.88	296.77
7/21/2010	285.91	294.85	287.20	285.52
10/27/2010	284.47	294.17	285.81	283.56
1/31/2011	284.40	294.07	285.20	283.41
4/28/2011	284.82	294.71	285.08	283.45
7/26/2011	284.29	294.25	285.50	283.69
2/28/2013	284.12	293.92	284.78	282.17
5/20/2013	284.27	294.13	285.33	283.60
8/6/2013	282.91	292.53	283.95	284.25
11/4/2013	285.75	292.80	284.76	284.30
2/10/2014	287.28	295.13	285.64	285.15
5/5/2014	286.05	296.52	286.25	285.90
8/5/2014	286.38	296.65	286.12	286.08
11/5/2014	286.07	296.42	285.78	286.08
3/2/2015	288.03	297.62	289.18	287.98
5/5/2015	287.28	295.83	289.59	287.20
8/19/2015	285.62	295.70	287.84	287.71
11/18/2015	287.31	296.55	289.88	289.12
3/23/2016	287.00	296.96	287.47	287.58
4/26/2016	-	-	-	-
Seasonal High	288.70	297.72	289.88	296.77