Kentucky Power Company
KPSC Case No. 2022-00118
Commission Staff's Second Set of Data Requests
Dated July 21, 2022

DATA REQUEST

KPSC 2_1 Provide any summaries, reports, or presentations produced in relation to any wetland delineation or stream identification survey, bat study, study of other specific sensitive species, Phase I cultural resources survey, or any other on-site field study Kentucky Power has conducted in relation to the Wooton-Stinnett 161 kV Transmission Rebuild Project. Consider this an ongoing request during the pendency of this application.

RESPONSE

No surveys or reports regarding any of the above tasks have been completed at this time. Threatened and Endangered bat surveys are planned to begin in August 2022. Other surveys such as cultural resource surveys and Waters of the United States surveys (i.e. wetlands and streams) will be conducted later this fall.

Witness: Emily S. Larson

DATA REQUEST

KPSC 2_2 Refer to Kentucky Power's response to Commission Staff's First Request for Information (Staff's First Request), Items 3, 7 and 14.

a. Explain whether Kentucky Power is aware of any other encroachments on its other transmission lines and, if so, identify the location and type of encroachment.

b. Confirm that the referenced "AEP's Guidelines For Transmission Owner Identified Needs" filed November 23, 2021, is the same document entitled, "AEP Transmission Planning Criteria and Guidelines for End-of-Life and Other Asset Management Needs dated December 2020," found in Exhibit 21 of Case No. 2021-00346,[2] filed November 8, 2021. If not, provide a copy of "AEP's Guidelines For Transmission Owner Identified Needs."

RESPONSE

a. The Company's last desktop review of possible encroachments within Kentucky Power's ROW was completed in 2017 using the best aerial photography available at that time. The 2017 review indicates 1,213 encroachments (of which 673 are potentially habitable obstructions) possibly located in the Company's 1,226 miles of transmission line ROW. The exact location or condition of any encroachment, along with the accuracy or completeness of the aerial data, has not been fully verified with ground inspections. See KPCO_R_KPSC_2_2_Attachment1 which describes how the data was created, its intended use, and limitations.

b. The Company cannot confirm the statement. The two documents differ.

The document entitled "Kentucky Power's Transmission Facility Inspection Guidelines" referenced in response to KPSC 1-7(b) and (d) was emailed directly to the Executive Director (PSCED@ky.gov and linda.bridwell@ky.gov) to comply with 807 KAR 5, Section 26. A copy of "Kentucky Power's Transmission Facility Inspection Guidelines" as filed November 23, 2021 is attached as KPCO_R_KPSC_2_2_Attachment2.

The document entitled “AEP’s Guidelines For Transmission Owner Identified Needs” referenced in the Company’s response to KPSC 1-7(c) and KPSC 1-14 was provided as Exhibit 19 to this Application. This document is the same as Exhibit 21 in Case No. 2021-00346, filed November 8, 2021.

Witness: Nicolas C. Koehler (subpart b)
Witness: Emily S. Larson (subpart a)

Description

In 2017, WSP was hired by American Electric Power (AEP) to conduct a desktop inventory of habitable and non-habitable obstructions within or near AEP's transmission rights-of-way (ROW). The inventory was conducted as a desktop level analysis using Geographic Information System (GIS) software to perform aerial photo interpretation of potential habitable and non-habitable obstructions within AEP's transmission rights-of-way.

Bing Maps aerial imagery was the primary imagery source for this effort. Supplemental imagery resources included more recent or higher resolution imagery that was publicly available in a given area as of late-summer 2017, such as imagery from ESRI World Imagery, National Agricultural Imagery Program (NAIP), Earth Resources Observation and Science (EROS), Google Street View, or state specific imagery services.

The transmission centerline GIS data was provided to WSP by AEP. To prevent digitizing incorrect potential habitable and non-habitable obstructions, WSP compared the AEP transmission centerline data to the transmission centerline in the aerial imagery at an absolute scale between 1:500 and 1:1500. In places where the transmission line deviated > 5 feet from the transmission structures visible on the aerial imagery, editors moved the transmission line vertices to the base of the transmission structures. Contiguous segments of transmission lines that ran through rural areas with no potential obstructions were not edited to match the aerial imagery and marked as "Skipped" in the attribute table.

Digitized potential obstruction points were placed at the edge of the obstruction closest to the transmission centerline. An obstruction is any object that may pose an access or constructability concern. Habitable and non-habitable obstruction classes were determined using aerial and Google Street View interpretation. Industrial and other obstructions fell in both classifications dependent upon assumed obstruction type and use. Potential obstructions classified as habitable and non-habitable are defined in Table 1 below.

Table 1. Classification of Obstruction Types

Obstruction Type	Habitable	Non-Habitable
Apartment	X	
Commercial	X	
Cemetery		X
Church	X	
Industrial*	partial	partial
Large Outbuilding	X	
Residential	X	
School	X	
Small Outbuilding		X
Other* (in-ground pool, sign, trampoline, ect.)	partial	partial

**Any obstruction classified as "other" or "industrial" were reviewed individually to determine if it was habitable or not. For that reason, obstruction classification "Other" and "Industrial" are represented as "Partial".*

Conductor zones and ROW widths can vary along any given transmission line based on a variety of factors including span length, transmission structure types, conductor type, tension, and terrain, etc. So, generalized buffer categories were created based solely on transmission line voltage. Potential obstructions were grouped into two distance categories: within the assumed conductor zone, or within the assumed right of way area. If the digitized potential obstruction fell within the Digitizing Zone Corridor and outside either distance category, it was not grouped into any distance group and left blank. Assumed conductor zones and assumed right of way corridor widths were approximated by line voltage according to Table 2 below:

Table 2. Assumed ROW, Conductor Zone, and Digitization Corridor Widths

Line Voltage	Right of Way Corridor2 (feet)	Conductor Zone Corridor2 (feet)	Digitizing Zone Corridor (feet)
23-69 kV	50	15	100
88-161 kV	100	25	150
230 kV	130	70	200
345 kV	150	70	200
500-765 kV	200	100	250

Each transmission line was assigned a level rating of one through five based on the count of potential habitable obstructions within the assumed conductor zone and assumed right of way. The ranges in Table 3 below were determined by the use of a histogram and through judgement based off subject matter experience.

Table 3. Assumed ROW and Conductor Zone Obstruction Levels

Obstruction Level	Habitable Obstructions in Assumed Right of Way	Habitable Obstructions in Assumed Conductor Zone
1	0	0
2	1 to 5	1 to 2
3	6 to 15	3 to 5
4	16 to 25	6 to 10
5	>25	>10

Terms of Use

The use of this data is intended to identify areas for further analysis and to assist AEP Transmission Planning and Asset Management when determining preliminary cost estimates and schedules for brownfield rebuild projects. This data is not intended to replace functional scoping. All digitized obstruction points are potential obstructions. Detailed on-the-ground surveys and/or right-of-way documentation searches will provide a more detailed and accurate assessment of any asset limitations.

Assumed Conductor zone and assumed ROW corridor widths can vary greatly due a multitude of factors including span length, transmission structure types, conductor type, tension, and terrain, etc. That level of information was not available for this effort so generalized buffer categories were created by a team of subject matter experts based solely on transmission line voltage.

Assumed ROW and Assumed Conductor Zone Obstruction Levels rating system is an approximation with the publicly available data and should not be used to replace functional and detailed scoping methods. The intent of this rating system is to communicate potential impact to scope, schedule and cost when Planning is identifying upcoming line rebuild projects.

The digitized potential obstructions and obstruction level rating system was done with AEP transmission centerline data from 2017. This means there are transmission lines included that have changed names and/or were rebuilt since 2017. Any transmission lines that were rebuilt after 2017 could be represented differently in the existing AEP Transmission GIS data.

- For any given area, the availability of high resolution, clear imagery is not guaranteed. Line placement and identification in some areas may be less accurate due to the increased difficulty of interpreting lower quality aerial imagery, although using the same aerial imagery source and the same editor for each line help ensure that data is placed with higher precision (i.e., if the line is inaccurate, it is at least consistently inaccurate in relation to the points digitized along it).
- Aerial imagery web services are compiled from multiple sensors with varying spatial and temporal resolutions. Imagery along a single transmission line may have been taken in different years and during different weather conditions, resulting in discrepancies when aligning the transmission line and identifying/locating transmission structures.
- Orthorectification of different imagery sources also introduces error when comparing transmission structure locations between multiple imagery sources; in some places, a secondary imagery source may shift a transmission line in excess of 20 feet from where it is shown in the primary imagery source.
- It is not always possible to determine which imagery source is the most recent, and the most recent imagery is not always the highest quality imagery. Lines marked in this dataset can only be as recent and accurate as the imagery sources used to correct them, and they do not necessarily represent current ground conditions, as transmission lines may have been built or re-built since aerial imagery was last taken.
- Imagery web services are controlled remotely and are subject to change. For example, in some areas, Bing imagery was updated between when a potential obstruction was originally digitized and when it was reviewed, and the USGS EROS high-resolution orthoimagery web service was shut down in October, preventing further use of this service. New spatial, temporal, and meteorological errors will be introduced in each new imagery update, making the corrected transmission lines appear to be placed incorrectly in reference to the new imagery. For this reason, lines in this dataset should not be considered as the "one true location" of any given transmission line; this data is a snapshot in time and should only be used to gauge relative distances from a transmission line centerline to any potential encroachment.

AEP Transmission - Kentucky
Overhead Periodic Inspection Program
October 27, 2021

The following program is for transmission and sub-transmission line assets, located within the State of Kentucky, with voltages ranging from 34.5kV to 765kV.

Inspection and maintenance of AEP's transmission and sub-transmission system assures that the lines provide optimum service and reliability to our customers. Periodic line inspections allow T-Line personnel to observe and report the present physical condition of the transmission line and right-of-way. AEP's transmission inspection program ensures that each transmission line inspection is performed in a uniform and consistent manner so that a fair evaluation is given to each transmission line throughout the entire AEP Transmission System.

Inspections of all types provide information on the general condition of the transmission system, in addition to indicating equipment or areas requiring immediate corrective action. Items found during routine inspection that appear to require urgent attention are scheduled as soon as possible for repair. Inspections can also reveal certain trends, such as increasing structure or hardware deterioration, which allows for future planning, budgeting and scheduling of resources to remedy the situation. Inspections, combined with follow-up corrective maintenance, provide a safe environment for the public and company personnel and maintain system reliability.

Routine Aerial Inspection

Routine aerial inspections of the transmission lines are performed at intervals not to exceed six (6) months. These patrols are used to identify potentially severe conditions associated with a line and its right-of-way that may affect the performance of the circuit. This inspection shall be performed from a helicopter, fixed-wing aircraft, or unmanned aircraft system. In locations where aerial inspections are prohibitive, an alternate method of inspection shall be substituted.

Inspect the company line at a macro level, which should include the following items:

- Major line components; e.g., broken cross arms or braces, missing members, excessive decay
- Vegetation encroaching upon conductor/structures
- Right-of-way encroachments – Locations of Concern (LOCs)
- Land use (surrounding right-of-way) changes or incompatibilities with the electric line operation
- Foundation and land stability, major problems or changes

Comprehensive Ground Inspection

Comprehensive ground inspections are scheduled on a cyclical basis. These inspections focus on the details of the components of a transmission line and could identify physical conditions that are not outage related, but that need attention. This is intended to be detailed inspection of the right-of-way and of each structure and span, specifically the hardware, insulators, structural members, conductors, dampers, spacers, etc.

- Wood Structures < 69 kV completed once every 2 years
- All other Wood Structures completed once every 6 years
- Non-Wood Structures completed once every 12 years

The right-of-way should be inspected for encroachments due to non-compatible vegetation, buildings, other above-grade obstructions, and land use (swimming pools, ponds, storm water detention areas, etc.). Land stability issues should also be identified. Identified conditions should be reported.

Structural defects, hardware defects, conductor and conductor accessory defects, insulation defects, grounding system defects, foundation instability, and erosion should be identified and reported. If a structure is not climbed, inspection of above-grade components should be performed with binoculars or other suitable method.

If transmission management or the transmission inspector requires a more detailed inspection of a structure, hardware conductors, or conductor accessories, the structure may be climbed or a comprehensive aerial inspection may be conducted. A routine ground-based inspections may be complemented by, or supplemented by, a comprehensive aerial inspection.

AEP Transmission - Kentucky
Overhead Periodic Inspection Program
October 27, 2021

Emergency Patrol

Emergency patrols are performed as needed. This patrol type is typically prompted by unplanned events, such as Transmission line operation problems, storms, outages, etc.

Emergency patrols may be performed via unmanned aircraft system, from an aircraft, by walking, by driving, or some combination thereof, as needed to identify line defects.

DATA REQUEST

KPSC 2_3 Kentucky Power's response to Staff's First Request, Item 7(c), is not sufficiently responsive. Explain the extent of damage required to be present on an open condition before it is repaired or replaced by Kentucky Power.

RESPONSE

There is no single determinant of when an open condition will be repaired or the asset or component replaced. An asset's condition is evaluated in its entirety; a decision to replace the asset or repair the condition will made based upon the risk presented by the open condition, both in isolation and in connection with other open conditions affecting the asset, to the safety of the public and Kentucky Power's employees and contractors, as well as the reliability of the Company's transmission system. Open conditions, both in isolation and in connection with other open conditions affecting the asset, that present an immediate risk to the safety of the public and Kentucky Power's employees and contractors, or the reliability of the Company's transmission system, are addressed promptly. Such conditions may be stabilized pending subsequent repair or replacement, or may be promptly repaired or replaced.

Kentucky Power classifies conditions as Category A1, Category A2, Category A3, or Category B. Descriptions of each category follow:

Category A1

Any condition that is to be replaced, repaired, or otherwise stabilized immediately.

Examples of A1 conditions include: floating energized phase wire without adequate clearances, split cross arms involved in interstate highway or school yard crossings, and broken poles that cannot support the applied everyday loads. In each of these cases, it may or may not be necessary to make permanent repairs immediately; the condition will be secured and stabilized as soon as practicable. For example, temporary reinforcement, such as slings, could be used to stabilize a split cross arm until permanent repairs can be completed later as scheduled work.

Category A2

Any condition that can be reasonably expected to sustain the applied loads until it can be permanently repaired later as part of scheduled work.

An example of a condition rated as an A2 category is a cross arm split at the pole mounting bolt, but with the cross arm and conductor being stabilized by a knee brace. This condition will be evaluated; immediate maintenance is required if it is determined that the cross arm/knee brace can no longer provide reliable service. The concept of the A2 category is to identify and monitor conditions and make corrections prior to the loss of reliable service. In this example, although the cross arm is split, an analysis has determined that it is still a functioning structural member.

Category A3

These are also conditions that will be repaired as a part of future work plan.

The difference between an A2 and an A3 condition may be:

1. The priority of the circuit in which the condition is found in relationship to other circuits (a radial tap, direct customer impact, importance to the system, etc.).

2. The location of the condition (lines crossing roads, residential areas, etc.).

3. The performance of the circuit is less than desirable (high impact to customers, a constant problem line, etc.).

4. Other factors as determined by the appropriate personnel.

A2 conditions require attention first, and then the A3 conditions can be addressed.

Category B

All other conditions.

Examples of B conditions include missing guy markers, missing structure numbers, and vines growing up a structure but still well away from the phase conductors. B conditions will not be scheduled for repair or correction unless the work is done in conjunction with addressing A1, A2, or A3 conditions. B conditions are recorded so they can be considered for repair during future work plans or when a new projects are being considered. For example if a line has an increasing number of B conditions added during an inspection cycle, it could indicate the overall condition of the line is deteriorating.

Lower category conditions may be repaired or replaced in conjunction with the repair or replacement of assets exhibiting higher category conditions when doing so is cost-effective or will result in lower costs. For example, a Category B condition may be addressed on a structure while performing work on a Category A condition on an adjoining or nearby structure.

Kentucky Power addresses open conditions and acts to prevent conditions on the existing infrastructure through planned, holistic solutions utilizing the process outlined in the Guideline for Transmission Owner Identified Needs (see Application Exhibit 19.

Witness: Nicolas C. Koehler

Kentucky Power Company
KPSC Case No. 2022-00118
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DATA REQUEST

KPSC 2_4 Provide the number of miles of Kentucky Power's current transmission system that were installed prior to 1950.

RESPONSE

Kentucky Power's transmission system has approximately 264 miles of transmission lines currently in-service that were installed prior to 1950 based on conductor age or date the date that the line was initially placed in service. Over time, components of these transmission lines may have been replaced. Specifically, structure replacements typically occur more frequently than conductor replacements.

Witness: Nicolas C. Koehler

Kentucky Power Company
KPSC Case No. 2022-00118
Commission Staff's Second Set of Data Requests
Dated July 21, 2022

DATA REQUEST

KPSC 2_5 Provide the number of transmission structures in Kentucky Power's current transmission system that were constructed prior to 1950.

RESPONSE

Kentucky Power's transmission system has approximately 1,346 transmission structures currently in-service that were initially constructed prior to 1950 based on structure age or the date that the line was initially placed in service.

Witness: Nicolas C. Koehler

Kentucky Power Company
KPSC Case No. 2022-00118
Commission Staff's Second Set of Data Requests
Dated July 21, 2022

DATA REQUEST

KPSC 2_6 Provide the number of open conditions that currently exist across Kentucky Power's entire system.

RESPONSE

Kentucky Power's transmission system currently has 7,301 open conditions as of July 20, 2022.

Witness: Nicolas C. Koehler

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Koehler W-S Discovery Verification.doc

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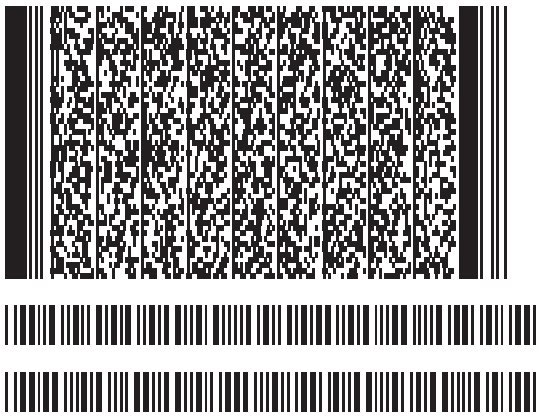
E-Signature Summary

E-Signature 1: Nicolas C Koehler (NCK)
July 29, 2022 10:16:16 -8:00 [24265D4FEFD8] [167.239.221.102]
nckoehler@aep.com (Principal) (Personally Known)

E-Signature Notary: Jennifer Young (JAY)
July 29, 2022 10:16:16 -8:00 [3E06A3A86B6D] [161.235.221.104]
jayoung1@aep.com
I, Jennifer Young, did witness the participants named above electronically sign this document.



VERIFICATION

The undersigned, Nicolas C. Koehler, being duly sworn, deposes and says he is the Director of Transmission Planning for American Electric Power Service Corporation, that he has personal knowledge of the matters set forth in the forgoing responses, and the information contained therein is true and correct to the best of his information, knowledge and belief after reasonable inquiry.

Nicolas C Koehler
Signed on 2022/07/29 10:16:16 -8:00

Nicolas C. Koehler

Commonwealth of Kentucky)
) Case No. 2022-00118
County of Boyd)

Subscribed and sworn to before me, a Notary Public in and before said County and State, by Nicolas C. Koehler, on ___July 29, 2022_____.

Signed on 2022/07/29 10:16:16 -8:00

Notary Public

JENNIFER A. YOUNG
ONLINE NOTARY PUBLIC
STATE AT LARGE KENTUCKY
Commission # KYNP31964
My Commission Expires Jun 21, 2025

Notary Stamp 2022/07/29 10:16:16 PST 3E06A3A86B6D

Notarial act performed by audio-visual communication

My Commission Expires ____06/21/2025_____

Notary ID Number _____KYNP31964_____

VERIFICATION

The undersigned, Emily S. Larson, being duly sworn, deposes and says she is the Manager of Transmission Line Siting for American Electric Power Service Corporation, that she has personal knowledge of the matters set forth in the foregoing responses, and the information contained therein is true and correct to the best of her information, knowledge, and belief.

Emily S. Larson

Commonwealth of Kentucky)
) Case No. 2022-00118
County of Boyd)

Subscribed and sworn before me, a Notary Public, by Emily S. Larson this 28th day of July, 2022.

Scott E. Bishop
Notary Public

My Commission Expires June 24, 2025

KYNP 32110

SCOTT E. BISHOP
Notary Public
Commonwealth of Kentucky
Commission Number KYNP32110
My Commission Expires Jun 24, 2025