BURNS McDONNELL

EAST KENTUCKY POWER COOPERATIVE

SITE ASSESSMENT REPORT

COOPER COMBINED CYCLE PROJECT

PROJECT NO. 157787

REVISION 0

NOVEMBER 11, 2024

CONTENTS

FIGURES

TABLES

List of Abbreviations

Abbreviation	Term/Phrase/Name
BMCD	Burns & McDonnell
BMP	Best Management Practices
CTG	Combustion Turbine Generator
CCGT	Combined Cycle Gas Turbine
EKPC	East Kentucky Power Cooperative
ft	Foot
HRSG	Heat Recovery Steam Generator
KPDES	Kentucky Pollutant Discharge Elimination System
KRS	Kentucky Revised Statutes
kV	Kilovolts
kW	Kilowatt
KY	Kentucky
M&R	Metering and Pressure Regulating
MW	Megawatt
psig	Pounds per square inch (gauge)
SAR	Site Assessment Report
SCR	Selective Catalytic Reduction
STG	Steam Turbine Generator
SWPPP	Storm Water Pollution Prevention Plan
ULSD	Ultra Low Sulfur Diesel

Index and Certification

East Kentucky Power Cooperative
Site Assessment Report
Project No. 157787

Report Index

Certification

I hereby certify, as a Professional Engineer in the state of Kentucky, that the information in this document was assembled under my direct personal charge. This report is not intended or represented to be suitable for reuse by the East Kentucky Power Cooperative or others without specific verification or adaptation by the Engineer.

William B. Durant, P.E. (KY 40187)

Date: November 11, 2024

Bryan Durant
2024.11.11 16:36:54-06'00'

1.0 INTRODUCTION

East Kentucky Power Cooperative (Owner) plans to construct a new Combined Cycle Gas Turbine (CCGT) power plant facility (Project) located at the existing Cooper Power Station near Somerset, KY. The facility will produce approximately 775 MW net loaded generation.

The facility will utilize two (2) Siemens SGT6-5000F combustion turbine generators (CGTs), two (2) heat recovery steam generators (HRSG) and one (1) steam turbine generator (STG), with balance of plant equipment. Each CGT will produce up to approximately 265,500 kW of power and the STG will produce up to approximately 261,000 kW of power for a combined production of approximately 775 MW net.

The CTGs will be designed to burn two fuels to provide operational flexibility during emergency situations. The primary fuel source will be pipeline quality natural gas (also referred to as fuel gas), and the secondary fuel source will be Ultra-Low Sulfur Diesel (ULSD) fuel that is stored on site. The fuel gas will be filtered and regulated on site to meet pressure and cleanliness requirements for the CTGs. Pipeline supply pressure will be at least 600 psig and further compression is not required for CGT operations.

A new 161 kV switchyard and transmission lines will be installed to interconnect the output from the generating plant to match the high voltage transmission lines near the facility.

1.1 Applicable Statutes

This Site Assessment Report (SAR) has been prepared for Owner by Burns & McDonnell (BMCD), to meet Kentucky Revised Statutes (KRS) 278.708. KRS 278.708 requires *"any person proposing to construct a merchant electric generating facility shall file a site assessment report with the board as required by KRS 278.706(2)(1)".* As such, the following information is intended to fulfill the requirements of the statute.

1.1.1 Facility Description (278.708(3)(a))

A description of the proposed facility that shall include a proposed site development plan that describes the following:

1.1.1.1 Surrounding Land Uses

Define the surrounding land uses for residential, commercial, agricultural, and recreational purposes.

1.1.1.2 Proposed Site Legal Boundaries

Define the legal boundaries of the proposed site.

1.1.1.3 Proposed Site Access Control

Identify proposed access control to the site.

1.1.1.4 Facility General Arrangements

The location of facility buildings, transmission lines, and other structures.

1.1.1.5 Facility Accessways, Roads, and Railways

Location and use of access ways, internal roads, and railways.

1.1.1.6 Existing or Proposed Utilities for Facility

Identify existing or proposed utilities to service the facility.

1.1.1.7 Applicable Setback Requirements

Compliance with applicable setback requirements as provided under KRS 278.704(2), (3), (4), or (5).

1.1.1.8 Noise Evaluation

Evaluation of Noise levels expected to be produced by the facility.

1.1.2 Site Compatibility with Scenic Surroundings (278.708(3)(b))

The Site Compatibility with Scenic Surroundings will be addressed to identify components of the facility that would otherwise impact the cultural or scenic aesthetics of the surrounding areas. This section will identify if there are features of the facility that could affect visual perception of the surrounding area.

1.1.3 Property Value Impact (278.708(3)(c))

This section identifies the potential impacts to property values and land use as a result of the siting, construction, and operation of the facility for owners adjacent to the facility.

1.1.4 Acoustical Evaluation (278.708(3)(d))

This section discusses the anticipated noise levels for the surrounding areas during operation of the facility.

1.1.5 Impact on Road and Rail Traffic (278.708(3)(e))

This section addresses the potential impact of the facility's operation on road and rail traffic to and within the facility, including anticipated levels of fugitive dust created by the traffic and any anticipated degradation of roads and lands in the area near the facility.

2.0 FACILITY DESCRIPTION

The Cooper CCGT power plant facility will be located at EKPC's existing Cooper Power Station approximately 2 miles south of Somerset, Kentucky. Access to the site is from Kentucky State Highway 1247 (KY-1247) on C. Vanhook Road. The existing power plant entrances will be utilized for the Project. The Project will be constructed in the location of the existing coal pile at the site. The site layout considers access roads for delivery of equipment and materials during construction as well as operation, while also considering the privacy and road use of the nearby landowners.

The new facility will consist of a nominal output of approximately 775 MW net (annual average). This is a modern combined cycle plant design that is based on the Siemens SGT6-5000F combustion turbine and generators (CTGs) paired with unfired (no duct firing) HRSG's sending steam to a new steam turbine generator (STG). Most of the operating equipment will be located within enclosed structures to be insulated and heated, including the CTGs and STG. The STG will be cooled by a new counterflow cooling tower which will also serve as the cooling medium for the closed cooling water system used throughout the plant.

The CTGs will be designed to burn pipeline quality natural gas with ULSD fuel oil as a backup. A new natural gas supply pipeline will be installed to the site. The pipeline supply pressure of at least 600 psig will be adequate for the plant; fuel gas compression is not required due to adequate pipeline supply pressure.

A new Meter and Regulating (M&R) station for the natural gas supply will be installed on the far northwest side of the property and will be owned and operated by the pipeline operator.

A new switchyard located to the north of the new facility will be installed to interconnect the output from the plant to the existing high voltage transmission lines on the site. Existing transmission lines that traverse the site and would interfere with the new equipment will be relocated to the north end of the access road, south of the landfill.

2.1 Surrounding Land Use

The site is located on Owner property along KY-1247 and C. Vanhook Road which includes the existing Cooper Power Station.

The use of the surrounding land can be broken down into the following categories and percentage of use.

Table 2-1: Adjoining Use Breakdown

	Acreage	Parcels
Agricultural	75.43%	36.36%
Agri / Res	16.89%	18.18%
Residential	7.68%	45.45%
Total	100%	100%

Additional information regarding surrounding land use can be found in the Property Value Impact Study located in Appendix A.

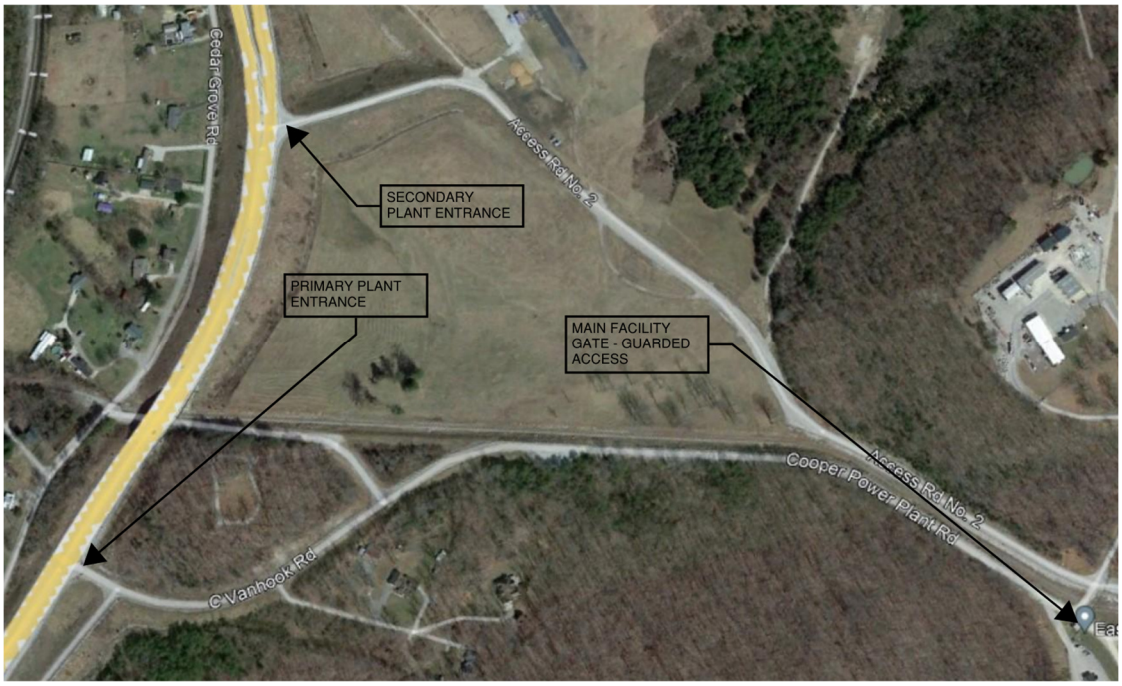
2.2 Proposed Site Legal Boundaries

The Boundary Survey and Recovery of John Sherman Cooper Power Station plan drawing and associated tract descriptions, found in Appendix B, identify the existing boundaries of the Cooper Power Plant. All construction for this Project is planned to be within the existing Plant boundaries. The Property Value Impact Study in Appendix A also outlines the proposed site boundaries identified with this tract of land.

2.3 Proposed Site Access Control

Access to the site will be provided via the two existing plant entrances off KY-1247. The main facility gate will be a controlled access point and will include security building and security personnel to minimize unauthorized access to the facility. All craft labor, vendors and deliveries will access the site through this main entrance. Labor and vendor access will be through either gated turnstile or through check in at the main entrance to the facility. The Project site is surrounded by a security fence.

Figure 2-1: Site Access Locations



A larger size Site Plan is included in Appendix B, that includes the detail cut above for frame of reference.

2.4 Facility General Arrangements

The Site Plan and General Arrangement Drawings are included in Appendix B. The Site Plan details the overall proposed plant layout in relation to the property lines and adjacent roads. The General Arrangement Drawings detail the proposed plant layout as well as the new Switchyard.

2.5 Facility Accessways, Roads, Railways

As previously stated, access to the site will be provided via State Highway 1247 through two existing entrances to the Cooper Power Station. Both entrances will lead to the main plant gate which will include a security building and personnel to provide security to the site.

The entire new facility will be located within the existing Cooper Power Station property boundary. Access roads for delivery of equipment and materials during construction as well as operation of the facility will remain the same as they are today. An asphalt paved loop road will enclose the areas of the new Project within the plant. Traffic in the area of the facility should only see an impact when employees are coming to work and leaving at the end of shift during the Project construction. All other traffic will be contained within the project boundaries.

For security and safety, the site is fenced and will include appropriate signage warning trespassers of the potential dangers.

There is currently a rail spur providing access to the Cooper Power Station, which will remain. Railway use is anticipated as part of this project for equipment and material deliveries. Overall, railway usage will be significantly less than the current usage due to significant reduction in coal deliveries.

2.6 Existing or Proposed Utilities for Facility

The location of the Cooper CCGT Project was chosen, in part, due to the proximity to the existing electrical and water utilities in the area.

A new natural gas pipeline is currently planned to be routed to the site from approximately 40 miles away to support this Project. Owner will contract with a gas pipeline company to bring the new gas pipeline branch to the site boundary complete with a new M&R station. The facility will have further fuel gas conditioning and treatment equipment for cleanliness prior to use in the CGTs.

The new switchyard and electrical transmission lines are located to the north of the new Project. The lines are 161kV and will be routed overhead on new transmission structures.

Water for the facility will be supplied from the existing facilities at the Cooper Power Station.

2.7 Applicable Setback Requirements

KRS Section 278.704(4) provides potential deviations that may be allowed for setback requirements and specifically references KRS Section 278.216. KRS Section 278.216(2) states that a facility constructed on a site containing existing facilities capable of generating ten megawatts (10MW) or more electricity shall not be required to comply with the setback requirements established pursuant to KRS 278.704(3). The proposed facility is being constructed on a site currently capable of generating in excess of 300MW of electricity and therefore is exempt from the setback requirements in KRS 278.704(3).

2.8 Noise Evaluation

An evaluation was performed to determine the expected noise levels for the site once the facility is constructed. The analysis of those sound levels along with recommended mitigation provisions can be found in the Sound Study Report found in Appendix C and summarized in Section 5.0.

3.0 SITE COMPATIBILITY WITH SCENIC SURROUNDINGS

The Project is located on the property of Owner's existing Cooper Power Station approximately 2 miles south of Somerset, Kentucky. Access to site is from KY-1247 highway. The plant property is heavily tree covered and hilly.

Residents, and traffic heading either direction along the KY-1247 highway will not have direct line of sight of the facility based on the hills and trees in the area and distance from the highway. The facility will be partially visible to the few residents to the south across the Cumberland River especially during the fall and winter as the trees lose their foliage. However, since there is already an existing power plant in the same area the view would not be appreciably different for the residents when the Project is completed.

New buildings, equipment, and storage facilities at the site will be neutral colored in order to blend with the local surroundings. Construction laydown and parking areas will be remediated to a natural condition and new grass seed will be planted to restore the area and blend with the local surroundings. The Project will work to minimize disturbance and incorporate the facility into the area with minimal visual impact.

4.0 PROPERTY VALUE IMPACT

A Property Value Impact Study was executed by Kirkland Appraisals, LLC, as part of this SAR. The completed Property Value Impact Study is included in Appendix A.

The study utilized baseline research looking at existing similar projects throughout the country, and nearby sales of residences in those areas. Seven locations were evaluated nationally to form the baseline, comparing sales of properties adjoining or near similar sites.

The Study concluded that the Project would not negatively impact the local property values.

5.0 ACOUSTICAL EVALUATION

BMCD conducted a sound study for the Cooper CCGT Power Plant Project. The study can be found in Appendix C. The objectives of this study were to identify the applicable noise regulations, model operational sound levels of the Project, and compare Project-generated sound levels to the applicable noise regulations. The State of Kentucky has not adopted noise statutes which limit noise levels according to defined standards. In the absence of these regulatory limits, the Project sound levels were modeled and compared to industry guidelines to limit noise impacts on the surrounding community. For this evaluation, the Environmental Protection Agency (USEPA) and the American National Standards Institute (ANSI) standard, ANSI S12.9 were used to define the targeted noise limits at the site boundary.

The Project operational sound levels, as currently designed, are expected to slightly exceed the recommended sound level guidelines provided by USEPA and ANSI at the nearest receptor. Mitigation upgrades, including upgraded exhaust stack silencers, low-noise fans and splash mats for the cooling tower, and enclosures on some of the surrounding auxiliary skids, have been included as part of the Project acoustic design to reduce base offering sound levels closer to the recommended sound levels. It should be noted that the USEPA guidelines and the ANSI informative standard are not intended to be construed as regulatory limits as they do not consider cost or engineering feasibility associated with additional mitigation. Instead, these should be used only as guidance for minimizing the potential for noise impacts on the surrounding community.

Figure 5-1 below shows the three noise receptor points that were modeled as part of this study. Table 5-1 contains the modeled sound level results at each of the three receptor points.

Figure 5-1: Noise Receptor Locations

Table 5-1: Modeled Sound Level Results

Receptor Name	Industry Noise Guidelines		Project-Only Sound Levels	
	USEPA Guidelines [a] (dBA)	Industry dBC Recommendation [b] (dBC)	(dBA)	(dBC)
R1	48.6	65-70	55	75
R2			43	66
R3			41	67

a) USEPA guidelines is recommended 55 dBA L_{dn} (48.6 dBA L_{eq}).
b) Industry recommended 65-70 dBC equivalent limit to reduce potential for low frequency impacts (ANSI S12.9).

6.0 IMPACTS ON ROAD AND RAIL TRAFFIC

A Traffic Study was performed by BMCD as part of this SAR and is included in Appendix D. The study used existing traffic data to establish historical daily traffic volumes along KY-1247 highway and C. Vanhook Rd, and to estimate the additional volume created during construction and post-construction activities. This data was used to determine the impact of the facility's operation on road traffic near the Project. Results of the Traffic Study showed that traffic would increase during peak construction, a period of approximately 16 months, especially during weekday morning hours between 5:00am and 8:00am, and to some extent during evenings between 4:00pm and 6:00pm. These hours are the scheduled start and end times for the work schedule. Weekend work is currently not anticipated for this Project. The site will be accessible from KY-1247 highway via C. Vanhook Rd. which is expected to experience congestion during the peak construction phase of the project. As a result, Access Rd No. 2 to the plant will also be utilized as recommended by the Traffic Study to significantly reduce congestion during peak construction. During the post-construction phase of the project, it is expected that traffic conditions will return to more normal levels with slight reductions for deliveries to the facility.

7.0 MITIGATION MEASURES

Potential impacts to the environment and the surrounding community will be mitigated and minimized by actions taken during the design, construction, operation, and maintenance of the facility.

7.1 Mitigation Measures During Design

The Project will work to minimize impact on existing riverine formation, trees, and stormwater runoff in the area. Minimal tree clearing is planned for this Project to help retain tree cover and to minimize impact on scenic surroundings. Engineer will design and specify sound mitigation as recommended in the Sound Study Report to minimize impacts to surrounding neighbors especially those to the south of the new facility across the Cumberland River.

7.2 Mitigation Measures During Construction

Prior to construction, the selected contractor will obtain all required federal, state, and local regulatory permits. Storm Water Pollution and Prevention Plan (SWPPP) and Kentucky Pollutant Discharge Elimination System (KPDES) will be developed to manage erosion and storm runoff associated with construction activities. The SWPPP will identify specific Best Management Practices (BMPs) to be installed prior to earth moving activities, such as silt fencing, sediment basins, rock check dams, and construction entrances. Stormwater management structures will be installed prior to installation of any equipment to control runoff during the construction phase of the Project.

7.3 Mitigation Measures During Operations

Upon completion of construction, vegetation, including vegetative buffers with trees, shrubs and grass cover, will be installed according to a yet to be developed landscaping plan. The landscaping as identified in that plan will be maintained and supplemented as necessary after construction.

The existing Cooper Power Station Emergency Response Plan will be updated as necessary by the Owner to include provisions for the new facilities installed at the site.

APPENDIX A – PROPERTY VALUE IMPACT STUDY

Kirkland Appraisals, LLC

Richard C. Kirkland, Jr., MAI
9408 Northfield Court
Raleigh, North Carolina 27603
Phone (919) 414-8142
rkirkland2@gmail.com
www.kirklandappraisals.com

November 11, 2024

Von P. Steiner, PE
Burns & McDonnell
250 W. Main Street, Suite 2110
Lexington, KY 40507

RE: Cooper Combined Cycle Project, Somerset, Pulaski County, KY

Mr. Steiner,

At your request, I have considered the impact of the Cooper Combined Cycle Project in Somerset, Pulaski County, Kentucky. This project entails decommissioning part of the existing coal power plant and replacing that with the two natural gas turbine combined cycle plant. The footprint of the new structures will be within the existing power plant area and largely located in the location of the existing coal pile. Specifically, I have been asked to give my professional opinion on the proposed changes to the power plant will have any impact on adjoining property value and whether "the location and character of the use, if developed according to the plan as submitted and approved, will be in harmony with the area in which it is to be located."

To form an opinion on these issues, I have researched existing power plants in Kentucky, researched articles through the Appraisal Institute and other studies, and discussed the likely impact with other real estate professionals. I have not been asked to assign any value to any specific property.

This letter is a limited report of a real property appraisal consulting assignment. My client is Burns & McDonnell represented to me by Mr. Von P. Steiner. My findings support the Kentucky Siting Board Application. The effective date of this consultation is November 11, 2024.

While based in NC, I am also a Kentucky State Certified General Appraiser #5522.

Conclusion

The adjoining properties are well set back from the existing facility and will remain at very similar distances after the proposed changes. There remains substantial landscaping screens around the power plant both before and after the changes to assist in screening the changes that are unlikely to be seen except possibly by the homes south of the river. The closest nearby homes are to the south across the river at 1,400 feet or more from the existing coal plant facility. Those homes will remain at the same distance from the power plant after the proposed changes to the facility. The nearby homes to the east across the river are 3,400 feet or more from the existing power plant and will remain at a similar distance after the changes. The adjoining parcels on the same side of the river range from 2,190 feet to over 5,000 feet from the existing power plant and will remain at similar distances after the proposed changes.

Sale/Resale analysis of homes in proximity to power stations that have done similar conversions support a finding of no impact on property value to a small positive impact on property value. Studies and articles noted later in this report support a finding of improved conditions due to improved air quality which were directly tied to increased property values where coal plants are

converted to natural gas. While those comments and studies are tied to full conversions, a partial conversion is likely to still have positive implications with no basis for an expectation of a negative impact.

Based on the data and analysis in this report, it is my professional opinion that the proposed changes at this power plant will not have a negative impact on the value of adjoining or abutting properties and that the proposed use is in harmony with the area in which it is located.

If you have any questions, please contact me.

Sincerely,

Richard C. Kirkland, Jr., MAI
NC Certified General Appraiser A4359
KY Certified General Appraiser #5522

Table of Contents

I. Proposed Project and Adjoining Uses

Proposed Use Description

The Cooper Combined Cycle Project is proposed to be developed in Somerset, Pulaski County, Kentucky. This project entails decommissioning part of the existing coal power plant and replacing that to the two natural gas turbine combined cycle plant. The footprint of the new structures will be within the existing power plant area and largely located in the location of the existing coal pile.

Adjoining Properties

I have considered adjoining uses and included a map to identify each parcel's location. I have included two measurements to each adjoining home. The first measurement is the distance from an adjoining home to the existing power plant active areas. The second measurement is the distance from an adjoining home to the power plant active areas as proposed to be modified. The point of these two measurements is to show that the proposed changes are mostly within the footprint of the existing power plant with minimal shifts in the distance to adjoining homes.

I have treated the homes across the river as non-adjoining as the river is a substantial dividing point. However, the homes directly south of the river will not be significantly closer to any of the power plant components than currently situated and the homes to the east across the river will also still have a similar proximity to the usable areas of the power plant. The main difference is that the coal pile and some equipment on the eastern side will be replaced by the natural gas plant and equipment.

The closest nearby homes are to the south across the river at 1,400 feet or more from the existing coal plant facility. Those homes will remain at the same distance from the power plant after the proposed changes to the facility. The nearby homes to the east across the river are 3,400 feet or more from the existing power plant and will remain at a similar distance after the changes. The adjoining parcels on the same side of the river range from 2,190 feet to over 5,000 feet from the existing power plant and will remain at similar distances after the proposed changes.

Adjoining land is primarily a mix of agricultural and residential uses once you get beyond the surrounding buffer land associated with the power plant. I also note that there is an elementary school to the south of the river that is in the process of moving to a site north of the river to the west of the existing power station. This shift will significantly reduce the visibility the school has of the existing and proposed power station.

The breakdown of those uses by acreage and number of parcels is summarized below.

Adjoining Use Breakdown

	Acreage	**Parcels**
Residential	7.68%	45.45%
Agricultural	75.43%	36.36%
Agri/Res	16.89%	18.18%
Total	**100.00%**	**100.00%**

GIS Aerial Map

Proposed Site Layout

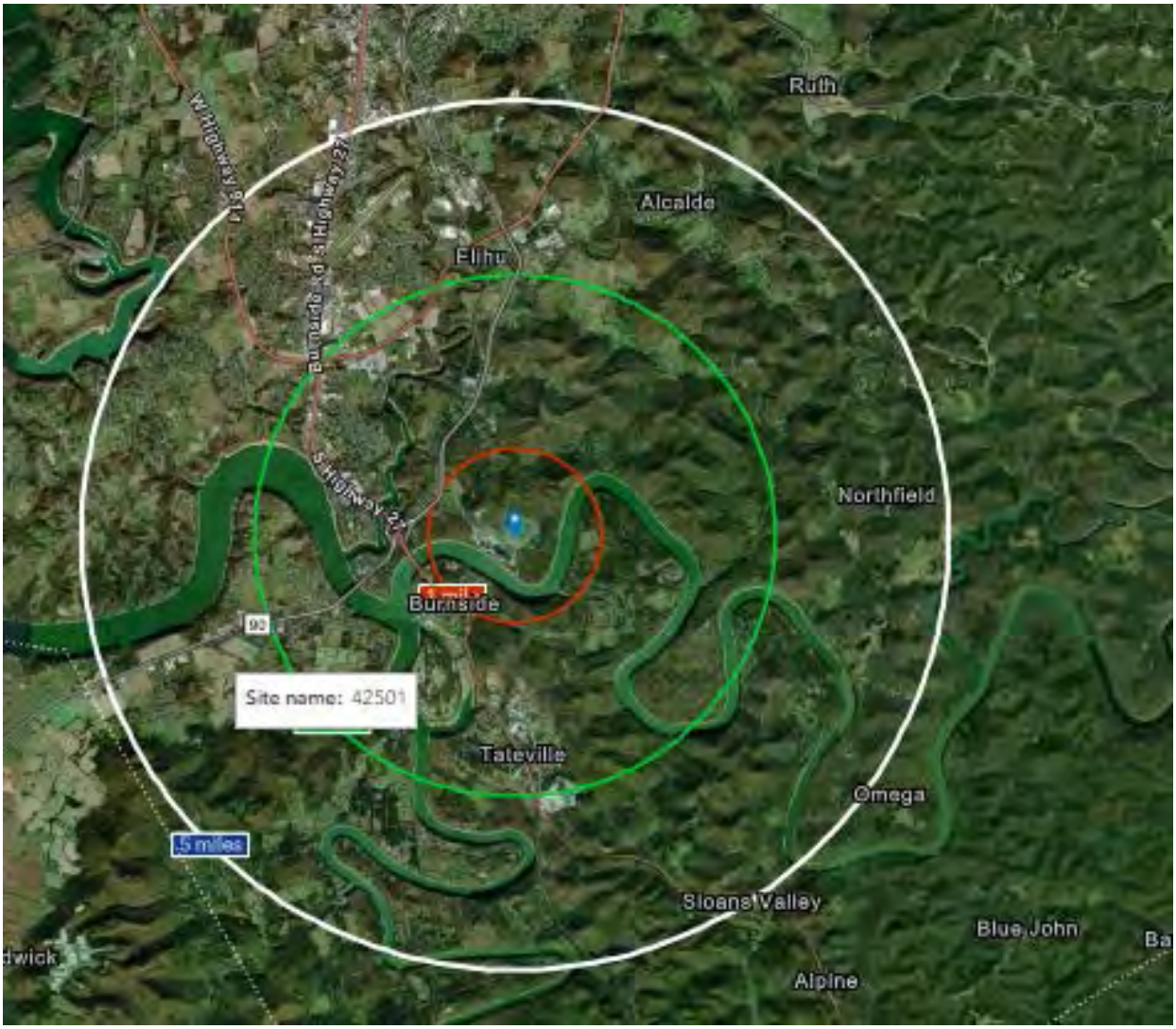
Adjoining Uses

#	MAP ID	Owner	GIS Data Acres	Present Use	Adjoin Acres	Adjoin Parcels	Distance (ft) As-Is	Distance (ft) Proposed
1	063-0-0-06	East Ky	179.00	Agricultural	45.50%	9.09%	N/A	N/A
2	078-2-0-04	Goff	10.61	Residential	2.70%	9.09%	5,545	5545
3	078-2-0-06	Goff	9.62	Residential	2.45%	9.09%	N/A	N/A
4	078-2-0-07	Goff	1.00	Residential	0.25%	9.09%	4,730	4730
5	078-2-0-12	Heath	3.00	Residential	0.76%	9.09%	4,845	4845
6	078-2-0-11	Heath	24.00	Agricultural	6.10%	9.09%	N/A	N/A
7	078-2-0-09.3	Goff	35.07	Agri/Res	8.92%	9.09%	5,190	5175
8	078-0-0-22	East KY	6.00	Residential	1.53%	9.09%	N/A	N/A
9	078-0-0-09.3	Claiborne	58.71	Agricultural	14.92%	9.09%	N/A	N/A
10	078-0-0-10	Caldon	35.00	Agricultural	8.90%	9.09%	N/A	N/A
11	063-9-0-24	Chaney	31.37	Agri/Res	7.97%	9.09%	2,190	2190
		Total	**393.380**		**100.00%**	**100.00%**	4,500	4,497

II. Demographics

I have pulled the following demographics for a 1-mile, 3-mile and 5-mile radius around the proposed facility.

I note that the population is already projected to decline within the 1 mile and 3 mile radius rings and the 5 mile radius shows a very slight growth rate over the coming years.



esri
THE SCIENCE OF WHERE

Housing Profile

42501
42501, Somerset, Kentucky
Ring: 1 mile radius

Prepared by Esri
Latitude: 36.99985
Longitude: -84.58544

Population		Households	
2020 Total Population	304	2024 Median Household Income	$48,236
2024 Total Population	281	2029 Median Household Income	$55,615
2029 Total Population	274	2024-2029 Annual Rate	2.89%
2024-2029 Annual Rate	-0.50%		

	Census 2020		2024		2029	
Housing Units by Occupancy Status and Tenure	Number	Percent	Number	Percent	Number	Percent
Total Housing Units	144	100.0%	144	100.0%	144	100.0%
Occupied	93	64.6%	100	69.4%	99	68.8%
Owner	68	47.2%	74	51.4%	75	52.1%
Renter	25	17.4%	26	18.1%	24	16.7%
Vacant	39	27.1%	44	30.6%	44	30.6%

	2024		2029	
Owner Occupied Housing Units by Value	Number	Percent	Number	Percent
Total	73	100.0%	75	100.0%
<$50,000	17	23.3%	16	21.3%
$50,000-$99,999	20	27.4%	19	25.3%
$100,000-$149,999	12	16.4%	12	16.0%
$150,000-$199,999	7	9.6%	6	8.0%
$200,000-$249,999	2	2.7%	2	2.7%
$250,000-$299,999	3	4.1%	4	5.3%
$300,000-$399,999	5	6.8%	6	8.0%
$400,000-$499,999	5	6.8%	7	9.3%
$500,000-$749,999	0	0.0%	0	0.0%
$750,000-$999,999	0	0.0%	0	0.0%
$1,000,000-$1,499,999	2	2.7%	3	4.0%
$1,500,000-$1,999,999	0	0.0%	0	0.0%
$2,000,000+	0	0.0%	0	0.0%
Median Value	$98,750		$110,417	
Average Value	$170,205		$199,000	

Census 2020 Housing Units	Number	Percent
Total	144	100.0%
Housing Units In Urbanized Areas	83	57.6%
Rural Housing Units	61	42.4%

Census 2020 Owner Occupied Housing Units by Mortgage Status	Number	Percent
Total	69	100.0%
Owned with a Mortgage/Loan	34	49.3%
Owned Free and Clear	35	50.7%

Data Note: Persons of Hispanic Origin may be of any race.
Source: Esri forecasts for 2024 and 2029. U.S. Census Bureau 2020 decennial Census data.

November 01, 2024

esri
THE SCIENCE OF WHERE

Housing Profile

42501
42501, Somerset, Kentucky
Ring: 3 mile radius

Prepared by Esri
Latitude: 37.09985
Longitude: -84.58544

Population		Households	
2020 Total Population	6,212	2024 Median Household Income	$40,086
2024 Total Population	6,169	2029 Median Household Income	$44,652
2029 Total Population	6,143	2024-2029 Annual Rate	2.18%
2024-2029 Annual Rate	-0.08%		

	Census 2020		2024		2029	
Housing Units by Occupancy Status and Tenure	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Total Housing Units	3,142	100.0%	3,170	100.0%	3,175	100.0%
Occupied	2,555	81.3%	2,575	81.2%	2,577	81.2%
Owner	1,708	54.4%	1,731	54.6%	1,791	56.4%
Renter	847	27.0%	844	26.6%	786	24.8%
Vacant	685	21.8%	595	18.8%	597	18.8%

	2024		2029	
Owner Occupied Housing Units by Value	**Number**	**Percent**	**Number**	**Percent**
Total	1,730	100.0%	1,791	100.0%
<$50,000	282	16.3%	266	14.9%
$50,000-$99,999	348	20.1%	342	19.1%
$100,000-$149,999	281	16.2%	278	15.5%
$150,000-$199,999	280	16.2%	269	15.0%
$200,000-$249,999	169	9.8%	184	10.3%
$250,000-$299,999	38	2.2%	42	2.3%
$300,000-$399,999	86	5.0%	106	5.9%
$400,000-$499,999	96	5.5%	121	6.8%
$500,000-$749,999	31	1.8%	37	2.1%
$750,000-$999,999	2	0.1%	3	0.2%
$1,000,000-$1,499,999	116	6.7%	142	7.9%
$1,500,000-$1,999,999	1	0.1%	1	0.1%
$2,000,000+	0	0.0%	0	0.0%
Median Value	$141,815		$151,766	
Average Value	$235,217		$258,864	

Census 2020 Housing Units	**Number**	**Percent**
Total	3,142	100.0%
Housing Units In Urbanized Areas	2,072	65.9%
Rural Housing Units	1,070	34.1%

Census 2020 Owner Occupied Housing Units by Mortgage Status	**Number**	**Percent**
Total	1,709	100.0%
Owned with a Mortgage/Loan	957	56.0%
Owned Free and Clear	752	44.0%

Data Note: Persons of Hispanic Origin may be of any race.
Source: Esri forecasts for 2024 and 2029. U.S. Census Bureau 2020 decennial Census data.

November 01, 2024

esri
THE SCIENCE OF WHERE

Housing Profile

42501
42501, Somerset, Kentucky
Ring: 5 mile radius

Prepared by Esri
Latitude: 37.09985
Longitude: -84.58544

Population		Households	
2020 Total Population	17,367	2024 Median Household Income	$45,204
2024 Total Population	17,597	2029 Median Household Income	$51,085
2029 Total Population	17,704	2024-2029 Annual Rate	2.48%
2024-2029 Annual Rate	0.12%		

	Census 2020		2024		2029	
Housing Units by Occupancy Status and Tenure	Number	Percent	Number	Percent	Number	Percent
Total Housing Units	9,283	100.0%	9,415	100.0%	9,459	100.0%
Occupied	7,358	79.3%	7,446	79.1%	7,488	79.2%
Owner	4,874	52.5%	4,973	52.8%	5,166	54.6%
Renter	2,484	26.8%	2,473	26.3%	2,322	24.5%
Vacant	1,984	21.4%	1,969	20.9%	1,971	20.8%

	2024		2029	
Owner Occupied Housing Units by Value	Number	Percent	Number	Percent
Total	4,973	100.0%	5,166	100.0%
<$50,000	588	11.8%	549	10.6%
$50,000-$99,999	720	14.5%	690	13.4%
$100,000-$149,999	656	13.2%	633	12.3%
$150,000-$199,999	938	18.9%	896	17.3%
$200,000-$249,999	692	13.9%	758	14.7%
$250,000-$299,999	243	4.9%	256	5.0%
$300,000-$399,999	263	5.3%	320	6.2%
$400,000-$499,999	350	7.0%	432	8.4%
$500,000-$749,999	173	3.5%	205	4.0%
$750,000-$999,999	68	1.4%	87	1.7%
$1,000,000-$1,499,999	271	5.4%	328	6.3%
$1,500,000-$1,999,999	11	0.2%	12	0.2%
$2,000,000+	0	0.0%	0	0.0%
Median Value	$177,852		$189,676	
Average Value	$263,935		$287,263	

Census 2020 Housing Units	Number	Percent
Total	9,283	100.0%
Housing Units In Urbanized Areas	6,482	69.8%
Rural Housing Units	2,801	30.2%

Census 2020 Owner Occupied Housing Units by Mortgage Status	Number	Percent
Total	4,873	100.0%
Owned with a Mortgage/Loan	2,740	56.2%
Owned Free and Clear	2,133	43.8%

Data Note: Persons of Hispanic Origin may be of any race.
Source: Esri forecasts for 2024 and 2029. U.S. Census Bureau 2020 decennial Census data.

November 01, 2024

III. Methodology and Discussion of Issues

Standards and Methodology

Typically, I would use a Matched Pair Analysis (aka Paired Sales Analysis) or a Sale/Resale Analysis to address property value impacts. This methodology is outlined in **The Appraisal of Real Estate**, Twelfth Edition by the Appraisal Institute pages 438-439. It is further detailed in **Real Estate Damages**, Third Edition, pages 33-36 by Randall Bell PhD, MAI. Paired sales analysis is used to support adjustments in appraisal work for factors ranging from the impact of having a garage, golf course view, or additional bedrooms. The paired sales analysis is based on the theory that when two properties are in all other respects equivalent, a single difference can be measured to indicate the difference in price between them. Dr. Bell describes it as comparing a test area to control areas. In the example provided by Dr. Bell he shows five paired sales in the test area compared to 1 to 3 sales in the control areas to determine a difference.

The difficulty with using Matched Pair Analysis and Sale/Resale Analysis is that this is a very narrow shift that is very difficult to isolate. National studies have consistently shown minor negative impacts on homes within proximity to coal power plants. The shift occurring at this location will be a reduction in the coal plant, which suggests a positive implication, but including a natural gas plant component that would be a lesser negative impact compared to coal based on the literature. Finding examples of combined coal/natural gas plants in proximity to housing is challenging and requires a comparison of the home sales prior to the colocation of those powerplants to sales after the colocation occurred. Alternatively, I would have to compare impacts in proximity to a coal plant and then compare those impacts to a collocated system, but there are a lot of factors that come into play which makes this challenging. It is certainly possible to construct such an analysis, but it would require a significant investment in time to organize and given the difficulties in isolating other impacts that often are located near power plants adds the complexity.

For this reason, I have instead taken a step back on how to address this question to focus on what is actually happening at the location in terms of proximity to adjoining homes and associating that with national studies on natural gas plants versus coal plants related to property value.

Determining what is an External Obsolescence

An external obsolescence is a use of property that, because of its characteristics, might have a negative impact on the value of adjacent or nearby properties because of identifiable impacts. Determining whether a use would be considered an external obsolescence requires a study that isolates that use, eliminates any other causing factors, and then studies the sales of nearby versus distant comparable properties. The presence of one or a combination of key factors does not mean the use will be an external obsolescence, but a combination of these factors tend to be present when market data reflects that a use is an external obsolescence.

External obsolescence is evaluated by appraisers based on several factors. These factors include but are not limited to:

1) Traffic. The proposed changes at the facility is not expected to have a significant difference in traffic.

2) Odor. The emissions from the shift from coal to natural gas are intended to be a significant reduction. This is not necessarily a shift in odor, but the change is a reduction in airborne pollution which is a positive outcome based on the proposed change.

3) Noise. There is no expectation of significant increase in noise based on the proposed change.

4) Environmental. The shift from coal to natural gas is generally seen as a positive change.

5) Appearance/Viewshed. As noted earlier, the nearby homes will remain at very similar distances to the existing setbacks indicating no significant shift in the appearance or viewshed.

6) Other factors. Natural gas plants are generally seen as a cleaner and superior power plant source which suggests this is a positive change at this location.

Later in this report I cite a number of studies and papers on these issues to support the comments noted above.

Market Imperfection

Throughout this analysis, I have specifically considered the influence of market imperfection on data analysis. Market imperfection is the term that refers to the fact that unlike a can of soup at the supermarket or in your online shopping cart, real estate cannot be comparison shopped for the best price and purchased at the best price for that same identical product. Real estate products are always similar and never identical. Even two adjacent lots that are identical in almost every way, have a slight difference in location. Once those lots are developed with homes, the number of differences begin to multiply, whether it is size of the home, landscaping, layout, age of interior upfit, quality of interior upfit, quality of maintenance and so on.

Neoclassical economics indicates a perfectly competitive market as having the following: A large number of buyers and sellers (no one person dominates the market), no barriers or transaction costs, homogeneous product, and perfect information about the product and pricing. Real estate is clearly not homogeneous. The number of buyers and sellers for a particular product in a particular location is limited by geography, financing, and the limited time period within a property is listed. There are significant barriers that limit the liquidity in terms of time, costs and financing. Finally, information on real estate is often incomplete or partial – especially at the time that offers are made and prices set, which is prior to appraisals and home inspections. So real estate is very imperfect based on this definition and the impact of this is readily apparent in the real estate market.

What appear to be near-identical homes that are in the same subdivision will often sell with slight variations in price. When multiple appraisers approach the same property, there is often a slight variation among all of those conclusions of value, due to differences in comparables used or analysis of those comparables. This is common and happens all of the time. In fact, within each appraisal, after making adjustments to the comparables, the appraiser will typically have a range of values that are supported that often vary more than +/-5% from the median or average adjusted value.

Based on this understanding of market imperfection, it is important to note that very minor differences in value within an impact study do not necessarily indicate either a negative or positive impact. When the impacts measured fall within that +/-5%, I consider this to be within typical market variation/imperfection. Therefore, it may be that there is a negative or positive impact identified if the impact is within that range, but given that it is indistinguishable from what amounts to the background noise or static within the real estate data, I do not consider indications of +/-5% to support a finding of a negative or positive impact.

Impacts greater than that range are, however, considered to be strong indications of impacts that fall outside of typical market imperfection. I have used this as a guideline while considering the impacts identified within this report.

IV. Studies and Papers Considered

A. The Effect of Power Plants on Local Housing Values and Rents – Review of Economics and Statistics, Lucas W. Davis, 2011

This study focused on power plants built between 1993 and 2000 and identified "3% to 7% decreases in housing values and rents, with some evidence of larger decreases within 1 mile and for large-capacity plants." This study did not differentiate between coal and natural gas plants though it specifically notes problems associated with coal power plants as disamenities but still combines all fossil fuel plants into one category for the analysis.

B. The Effect of Electric Utility Power Plant Location on Area Property Value, Land Economics Vol. 50, No. 1, Glenn Blomquist, 1974

This study is clearly older but found a disamenity of 10% within 11,500 feet of a power plant. The data was derived focusing on Winnetka Power Plant in Illinois, which is a coal fired plant.

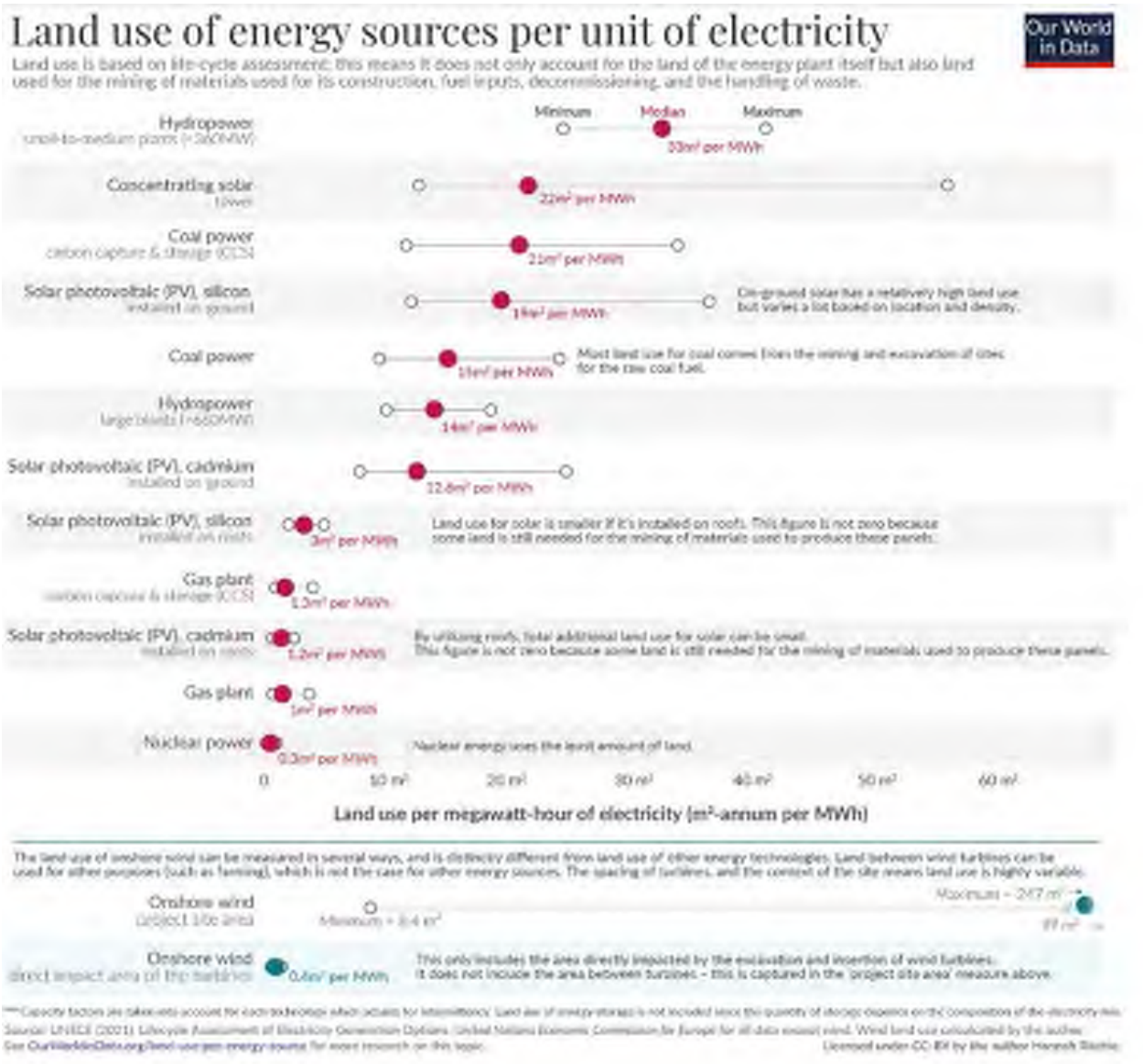
C. Do homeowners benefit when coal-fired power plants switch to natural gas? Evidence from Beijing, China, Journal of Environmental Economics and Management, Volume 110, Yingdan Mei, 2021

This study is clearly not based on sales activity in the United States, but it directly addresses the exact question being posed by this shift. This study focused on transaction data from 2011 through 2015 and showed "results, although marginally significant, show that coal-to-gas conversion leads to a positive price premium of 11% for nearby properties." The analysts attribute this shift to the reduction in air pollutants.

While this data is from China and addresses a total conversion from coal to natural gas, it illustrates an active market that shows a direct impact on the real estate market in a positive fashion from this conversion. This supports a conclusion that the partial conversion is a generally positive change and unlikely to show any negative impact. This study also highlights the improvement in air quality associated with this conversion.

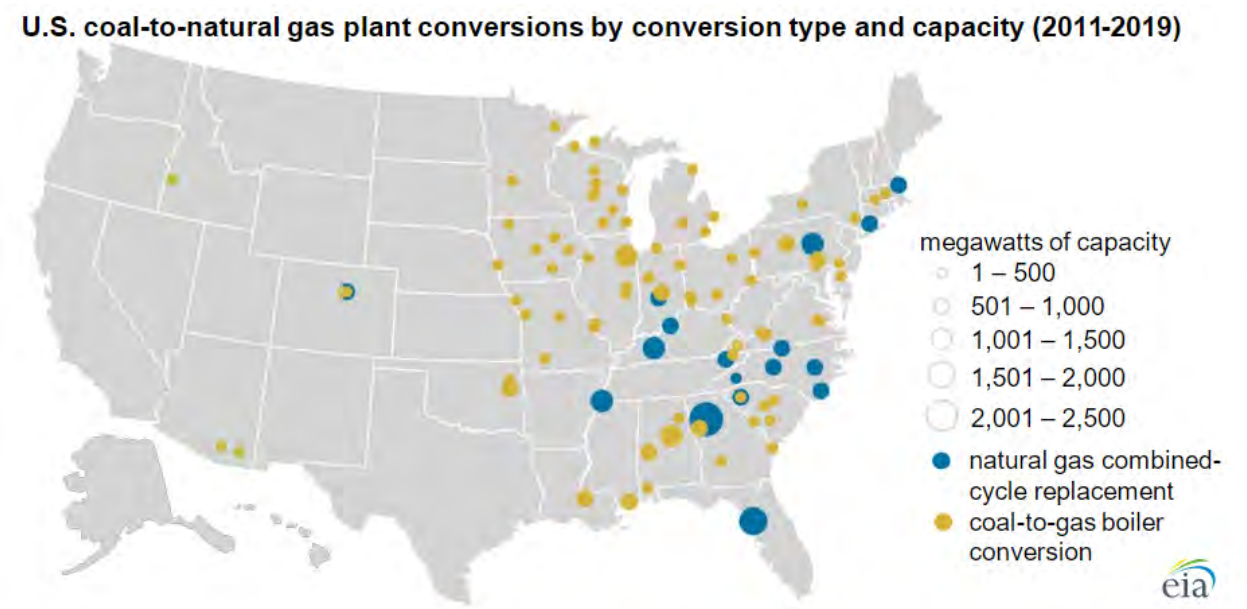
D. How does the land use of different electricity sources compare? Our World in Data, Hannah Ritchie 2022

This study does not provide any direct answers to the question of this report, but does provide an interesting data point in comparing the amount of power associated with the total land area required to support that energy source. The amount of total land area required to support coal power plants is shown as substantially higher than a gas plant. They include coal and gas as stand alone as well as those plants with carbon capture & storage and gas plants are substantially less land at 1 meter squared per MWh as compared to 15 meters squared per MWh for coal plants. Those total land areas include the mining, fuel inputs, decommissioning, and handling of waste.



E. More than 100 coal-fired plants have been replaced or converted to natural gas since 2011, US Energy Information Administration, Lindsay Aramayo, 2020

This does not really address the issue, other than to show this is a fairly common type of conversion in the industry and has been ongoing especially on the eastern side of the United States.



Source: U.S. Energy Information Administration, *Annual Electric Generator Report* and Preliminary Monthly Electric Generator Inventory

F. Why power plants are using natural gas instead of coal, The Gazette.com, Brittney Miller 2022

This article focuses on power plants in Iowa that are transitioning from coal to natural gas and explains the reasons for the conversion. The author interviewed Robert Brown and engineering professor at Iowa State University for this article. Mr. Brown was quoted as saying that natural gas is easier to start and stop and makes the comparison between a charcoal grill and a natural gas grill as an illustration. He notes that the real reason operators would want to switch to natural gas is "it has 60 percent lower carbon-dioxide emissions than coal." He also notes that done properly, natural gas is much more efficient. He noted that for neighbors of the power plant being converted, "Let's say you live near the power plant. From that perspective, it would be a breath of fresh air for them, I think."

G. Unlocking the benefits of natural gas conversion for coal-fired power plants, Power Engineering, Brian King with Burns & McDonnell, 2024

This article addresses the technical advantages of conversion and the advantages of lower emissions and enhanced reliability. This article is useful in addressing emissions, but otherwise does not address the impact on adjoining property values directly.

V. Research on Coal/Natural Gas Power Plants in Area

I have identified 5 power plants in the Kentucky and nearby Indiana area. These facilities were specifically chosen based on proximity to adjoining/nearby housing and are not intended to reflect an average site for such a facility. As I am testing for home value impacts as typically the most sensitive use to adjoining externalities, I focused on areas that were most likely to provide usable data for the analysis.

1: EW Brown, Harrodsburg, Mercer County, KY

This project is located on 732.06 acres and includes a combined coal/natural gas plant and an adjoining solar project. The coal plant was built in 1957 and the natural gas plant was built in 1994.

The closest adjoining home is 1,050 feet away and the average distance to nearby homes is 2,882 feet.

2: Clifty Creek Plant, North Madison, Jefferson County, IN

This project was built in 1955 and located on a portion of 140.60 acres for this coal power plant. The closest adjoining home is 1,900 feet to the south across the river. The structure directly to the north is Clifty Inn associated with Clifty Falls State Park, which advertises the view overlooking the Ohio River, though the images on the website do show an angle on the river that excludes the powerplant to show the view to the southeast and not the south.

Also of note is Madison Correctional Facility that is located on Adjoining Parcel 5 and other parcels extending to the north east.

3 – Trimble County Power, Bedford, Trimble County, KY

This natural gas power plant was built in 1990 on a portion of a 657.33-acre assemblage. The GIS image above does not show the facility so the following map from Google Earth is included. The closest adjoining home is 665 feet from the plant and the average distance is 1,421 feet.

The most recent home sale is at 388 Wises Landing Road that is 2,200 feet from the power plant to the south. This home sold on May 13, 2024 for $120,000 for this 3 BR, 1 BA 2,908 s.f. ranch built in 1852 on 3.44 acres. This is an historic home which makes impact analysis significantly challenging and unreliable.

4 – R. Gallagher Station, New Albany, Floyd County, IN

This coal fired power plant facility was initially built in 1958 on a portion of a 221.02-acre assemblage of land. The closest adjoining home is 225 feet from power plant improvements and 413 feet on average.

A home located at 1738 State Road 111, New Albany just to the north of this plant sold for $335,000 on June 21, 2024. This two-story dwelling with 3,532 s.f., 4 BR, 3 BA built in 1900 on 1.53 acres has substantial upgrades and was used as an Air B&B while being listed. The nearby power plant was not identified in the listing nor was the Trans Montaigne Diesel Fuel Depot to the north noted. This site is located with a good view of the Ohio River and was noted as private. This home is about 1700 feet from the power plant active areas. The age and renovations to the home as well as the diesel fuel station are all complications to any analysis of this home.

5 – Cane Run Generating Station, Louisville, KY

This natural gas power plant was built in 1962 on a portion of a 415-acre assemblage. The closest adjoining home is 1,055 feet away from the nearest power plant active area and 1,403 feet on average.

Recent nearby home sales include:
5345 Cane Run Road that sold on May 30, 2023 for $108,000 for a 2 BR, 1 BA, 904 s.f. home built in 1930 on a 0.25-acre lot.
5309 Cane Run Road that sold on March 29, 2022 for $215,000 for a 3 BR, 2 BA, 2,402 s.f. home built in 1965 on a 0.20-acre lot.

I have not attempted a paired sales analysis as any such analysis would note an impact due to proximity to a natural gas plant, but would not indicate a shift from a coal power plant to a natural gas plant.

Summary of Findings

Sales Data

While I have identified some sales data in proximity to some of these power plants and I could potentially find a lot more, it would take a lot more to be able to identify impacts from coal plants, impacts from natural gas plants, and impacts from coal/natural gas combined plants in order to adequately address the shift in impact from an all coal use to a partial coal use power plant.

The expectation from the literature identified earlier in this report is that there would be a slightly larger impact on property values versus combined coal/natural gas and an even less impact on all natural gas plants. But in order to illustrate that I would need a lot more data points than I have identified to make any distinction between these factors. Especially given the much older nature of most of the home sales that I have identified near these power plants. Older homes, historic homes, and homes with significant renovations/updates are all poor choices for paired sales analysis.

Ideally, I would find good examples of where a conversion has partially shifted or added natural gas to a power plant where I could then compare a home sale both before and after that shift, but even that scenario would only work well if the new power plant improvements included a reduction in coal power at the adjoining location in tandem with the inclusion of the natural gas plant. This type of research is beyond the scope of this assignment, but could provide a more targeted approach to addressing this question in future analysis.

Physical Data and Adjoining Uses

#	Name	City	County	Fuel	Acres	Adjoin Parcels	Adjoin Residential Parcels	% Adjoin Parcels Residential	Closest Home	Avg. Dist Home
SP	Cooper Power	Somerset	Pulaski, KY	*	433	11	5	45%	2,195	4,746
1	EW Brown	Harrodsburg	Mercer, KY	Coal/Gas	732	29	21	72%	1,050	2,882
2	Clifty Creek	North Madiso	Jefferson, IN	Coal	141	8	3	38%	1,900	N/A
3	Trimble County	Bedford	Trimble, KY	Gas	657	15	5	33%	665	1,421
4	Gallagher	New Albany	Floyd, IN	Coal	221	22	20	91%	225	413
5	Cane Run	Louisville	Jefferson, KY	Gas	415	51	41	80%	1,055	1,403
	Average				433		**Average**	60%	1,182	2,173
	Median				424		**Median**	59%	1,053	1,421
	High				732		**High**	91%	2,195	4,746
	Low				141		**Low**	33%	225	413

The mix of adjoining uses at Cooper Power are similar to the other facilities and actually has fewer adjoining homes and the closest home to this power station is further than the comparables. Even including the homes across the river that are 1,400 feet away, they are further away than these comparable power plants.

The distance to adjoining homes for gas plants and coal plants are mixed with the closest homes actually being next to a coal plant so there is no specific distinction that I can draw from those figures.

However, the fact that the distances between the existing use as a coal plant and the proposed use as a mixed coal/gas plant are virtually the same, there is no real basis or expectation for a change in values to neighboring properties.

Demographic Data

		2024 1 - Mile Demographics			2024 3-Mile Demographics			County Demographics	
#	Name	Popl.	Med Inc.	Avg. House	Popl.	Med Inc.	Avg. House	Med Inc.	Avg. House
SP	Cooper Power	281	$48,236	$170,205	6,169	$40,086	$235,217	$47,306	$252,260
1	EW Brown	78	$68,983	$279,412	2371	$70,709	$294,119	$63,860	$261,651
2	Clifty Creek	1,039	$61,276	$259,375	14,487	$53,952	$220,370	$61,317	$230,497
3	Trimble County	58	$54,361	$240,000	804	$60,992	$231,306	$67,507	$247,324
4	Gallagher	1,509	$35,867	$279,748	46,767	$36,498	$225,468	$78,552	$310,890
5	Cane Run	1,546	$47,262	$287,869	32,740	$56,224	$242,279	$67,776	$321,815
	Average	752	$52,664	$252,768	17,223	$53,077	$241,460	$64,386	$270,740
	Median	660	$51,299	$269,394	10,328	$55,088	$233,262	$65,684	$256,956
	High	1,546	$68,983	$287,869	46,767	$70,709	$294,119	$78,552	$321,815
	Low	58	$35,867	$170,205	804	$36,498	$220,370	$47,306	$230,497

I looked at the population within 1 mile and 3 miles of the noted power plants. I have compared those to the county wide demographics for comparison. The average home price near Cooper Station is significantly lower than the county average before the proposed changes where it is currently only using coal.

The average home price near EW Brown which is a mix of coal and natural gas is actually higher within 1 mile radius and the 3 mile radius of the power plant when compared to the county average.

The average home price near Clifty Creek is higher within 1 mile and similar to the county average at 3 miles for this coal fired plant.

The average home price within 1 mile and 3 miles of Trimble County is very similar to the county average for this natural gas plant.

The average home price for Gallagher is lower at 1 mile and even significantly lower at 3 miles than the county average for this coal plant.

The average home price for Cane Run is lower at 1 mile and significantly lower at 3 miles than the county average for gas fired plants.

I have summarized those findings below in relation to the fuel type and average distance to home. I identified whether or not the average home price was higher or lower than the county average for both the 1-mile radius and 3-mile radius and then showed the breakdown by the fuel type and closest distance for each indicator.

As can be seen, most of the findings show homes within 1 and 3 miles being lower than the county average, but the EW Brown plant with a mix of coal and natural gas is actually showing a higher value in both the 1-mile radius and the 3-mile radius which suggests that there are positive impacts from such a transition. The fact that the natural gas only plants are not showing the same findings however works against such a conclusion.

The data from the demographics is therefore simply mixed with no strong indication on property value impacts. Even if there was, it would only be suggestive as demographics do not take into account the size and quality of homes and therefore does not get to the heart of the question. Demographics analysis of this type is simply suggestive and in this case it is not making a strong case for any conclusion.

#	Name	City	County	Fuel	Avg. Dist Home	1 Mile	3 Mile	Indication
SP	Cooper Power	Somerset	Pulaski, KY	Coal	4,746	Lower	Lower	Lower
1	EW Brown	Harrodsburg	Mercer, KY	Coal/Gas	2,882	Higher	Higher	Higher
2	Clifty Creek	North Madison	Jefferson, IN	Coal	N/A	Higher	Lower	Mixed
3	Trimble County	Bedford	Trimble, KY	Gas	1,421	Lower	Lower	Lower
4	Gallagher	New Albany	Floyd, IN	Coal	413	Lower	Lower	Lower
5	Cane Run	Louisville	Jefferson, KY	Gas	1,403	Lower	Lower	Lower

Coal	Lower	413	2	3	2
	Higher	N/A	1	0	0
Gas	Lower	1,403	2	2	2
	Higher	N/A	0	0	0
Mixed	Lower	N/A	0	0	0
	Higher	2,882	1	1	1

VI. Research on Coal/Natural Gas Power Plants - Supplemental

I have also considered the following plants that have converted from coal to natural gas for additional information.

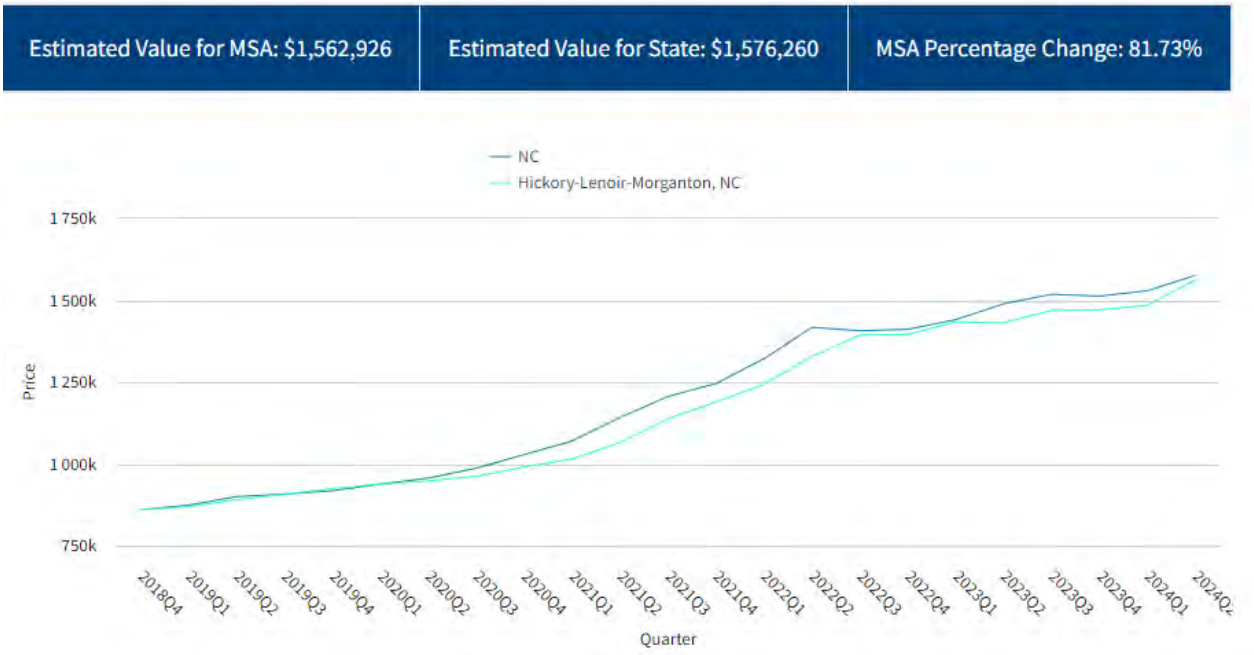
1 – Duke Energy Marshall Steam Station, Sherrills Ford, NC

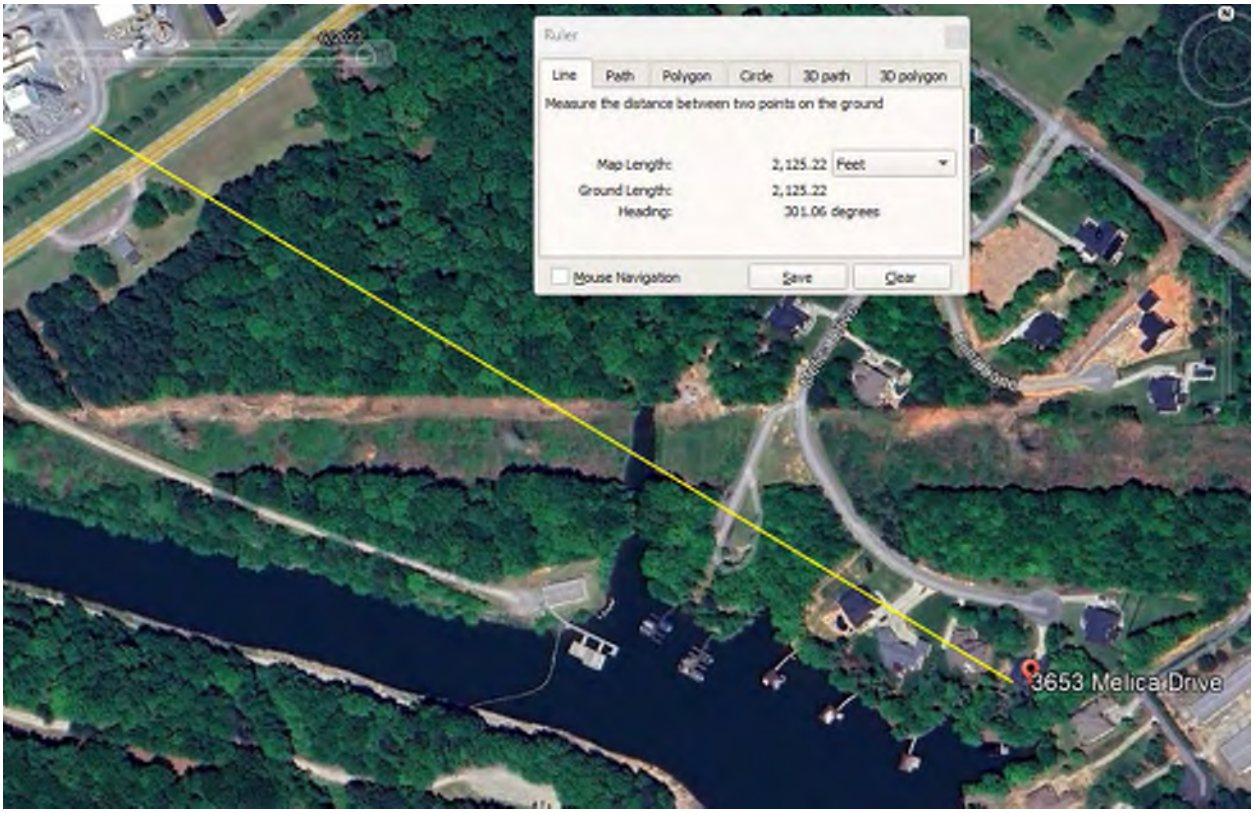
This4-unit coal plant was converted to a combined fuel of coal and gas in 2022. This project is in close proximity to Lake Norman which has many high-end housing communities with the lake as a focal point. This is effectively a bedroom community for Charlotte, NC but far enough out that it maps to the Hickory MSA.

This project allows for a good sample size for testing property value using a Sale/Resale analysis.

1 - I considered 3653 Melica Drive, Terrell, NC that sold on August 29, 2024 for $1,640,000 for this two story home with 3,556 s.f., 4 BR, 3.5 BA, 3-car garage, boat slip and lake frontage, built in 2018 on 0.72 acres. This home previously sold on December 27, 2018 for $860,024. Adjusting for the FHFA HPI rate as shown below this home should have appreciated to $1,562,926. The home sold for $77,074 higher than that rate which supports a positive indication on home value of +5%.

This home is 2,125 feet from the nearest part of this plant as shown on the map after the FHFA HPI Calculation.

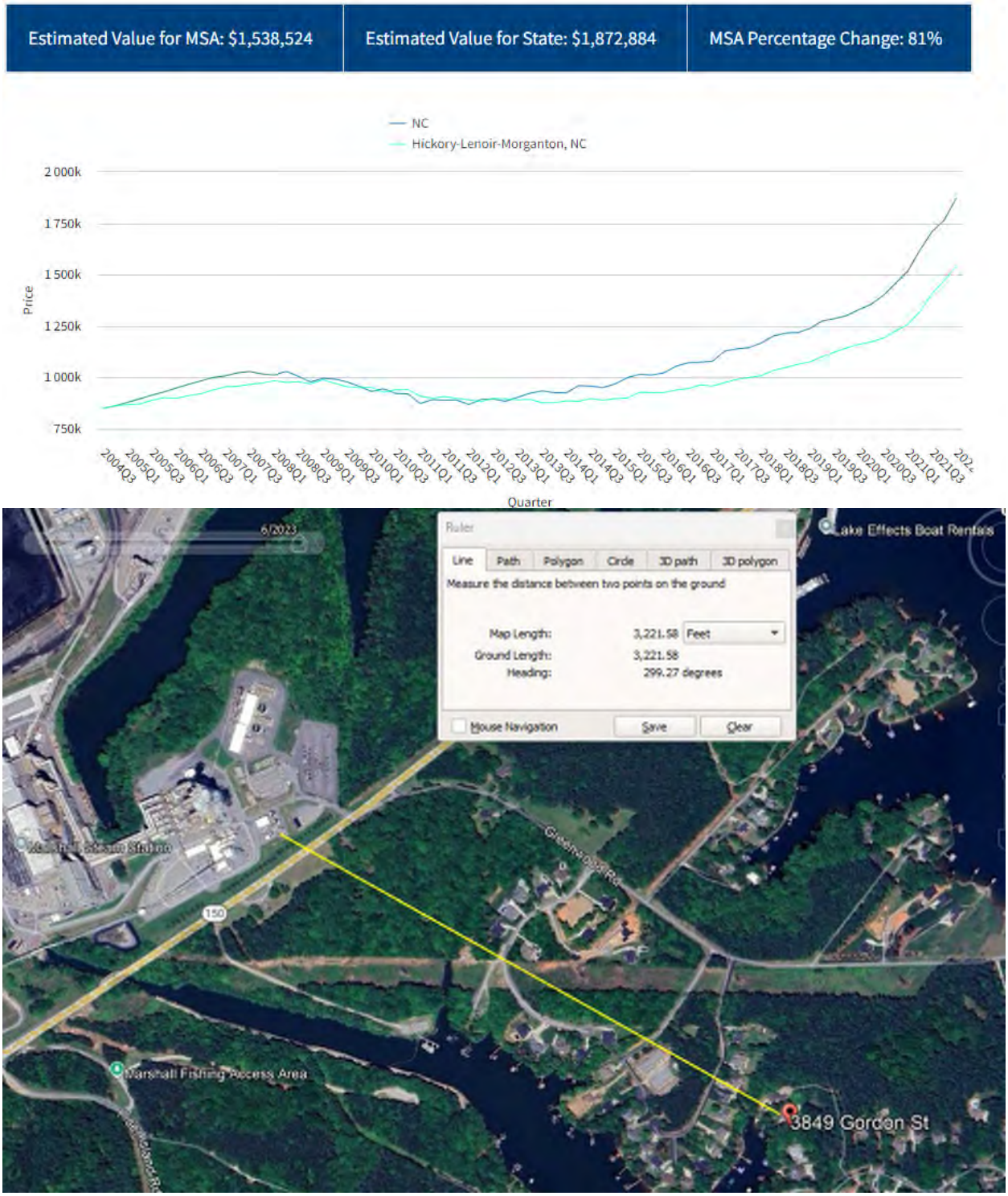




2 - I considered 3849 Gordon Street, Terrell, NC that sold on March 15, 2022 for $1,925,000 for this two-story with finished basement home with 6,320 s.f., 4 BR, 4.5 BA, 3-car garage, boat slip and lake frontage, inground pool, built in 2004 on 1.50 acres. This home previously sold on September 8, 2004 for $850,000. Adjusting this upward based on the FHFA HPI (see calculation below) for growth in this area over that time difference, the anticipated sales price just for growth over time is $1,538,524. The home sold for $386,476 more than that rate which supports a positive indication on home value of 25%. However, this is an 18-year time period that this was adjusted for. Note

that the first example I considered only required a 6-year time adjustment for comparison. I have not relied heavily on this indicator, but I have included it for completeness.

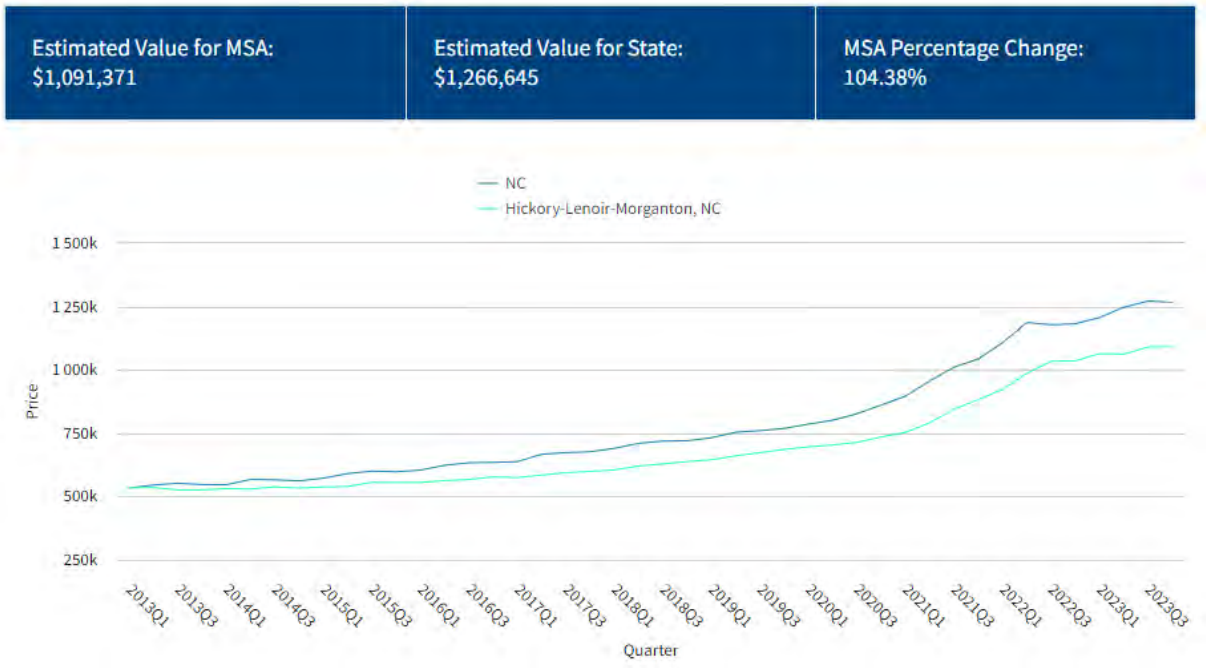
This home is 3,220 feet from the nearest active area of the power plant.

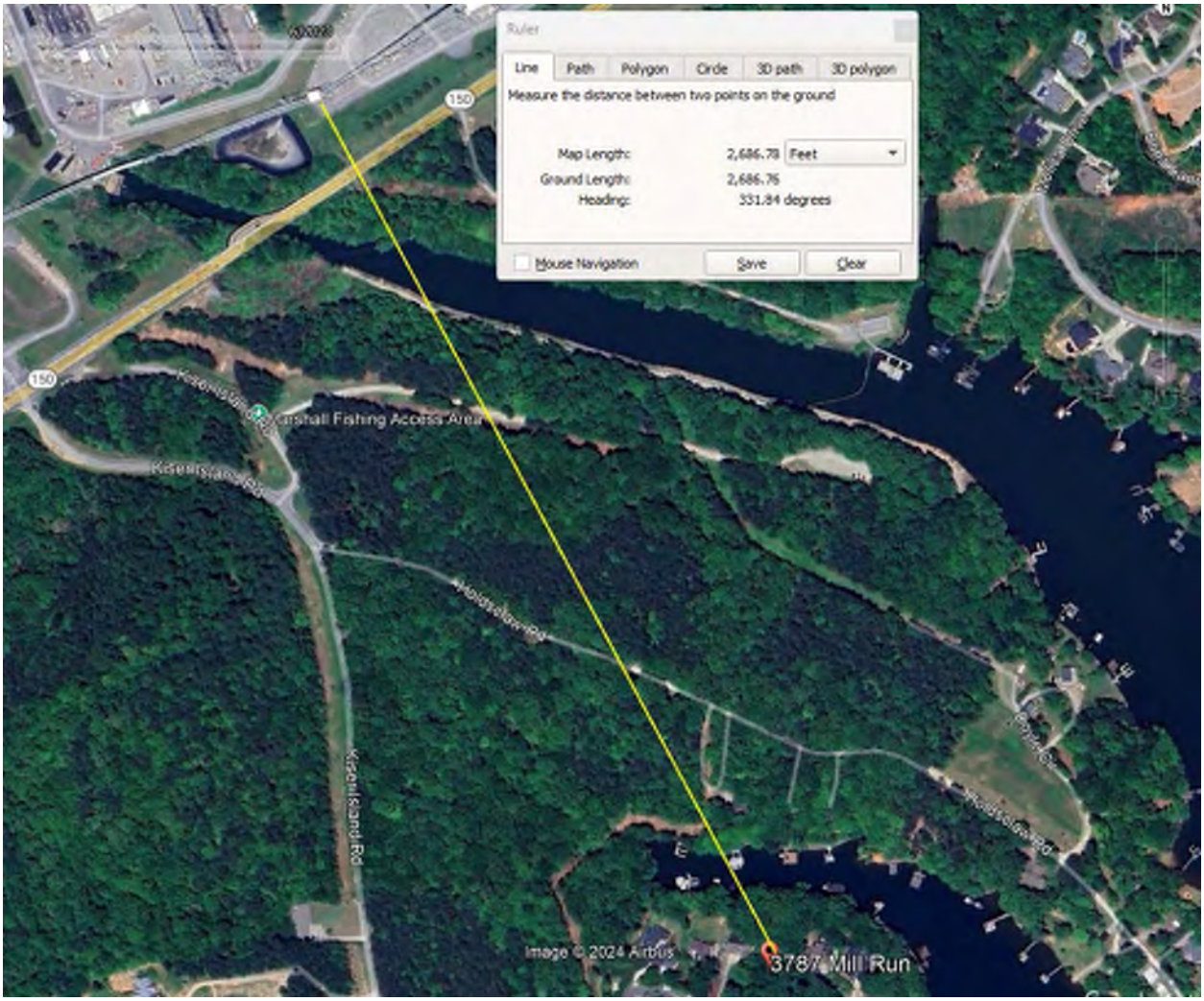


3 - I considered 3787 Mill Run, Terrell, NC that sold on November 8, 2023 for $1,120,000 for this two-story home with 2,622 s.f., 3 BR, 2.5 BA, 3-car garage, boat slip and lake frontage, built in 1988

on 0.68 acres. This home previously sold on February 12, 2013 for $534,000. Adjusting this upward based on the FHFA HPI (see calculation below) for growth in this area over that time difference, the anticipated sales price just for growth over time is $1,091,371. The home sold for $28,629 more than that rate which supports a positive indication on home value of +3%.

This home is 2,685 feet from the active area of this power plant.



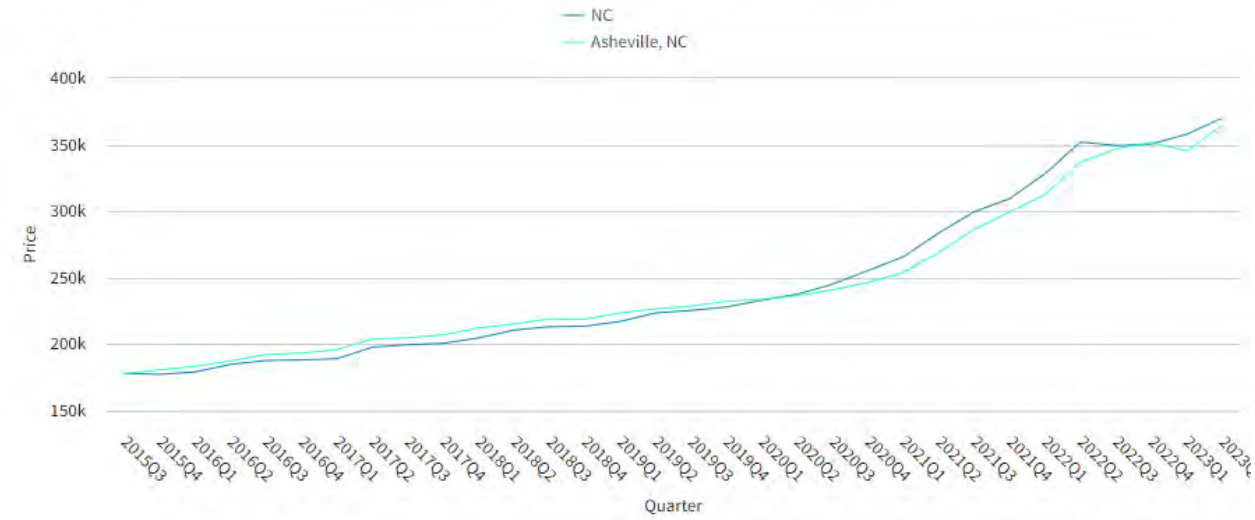

Ruler
Line
Path
Polygon
Circle
3D path
3D polygon
Measure the distance between two points on the ground
Map Length:
2,686.78
Feet
Ground Length:
2,686.76
Heading:
331.84 degrees
Mouse Navigation
Save
Clear
150
Marshall Fishing Access Area
Kiser Island Rd
Image © 2024 Airbus
3787 Mill Run

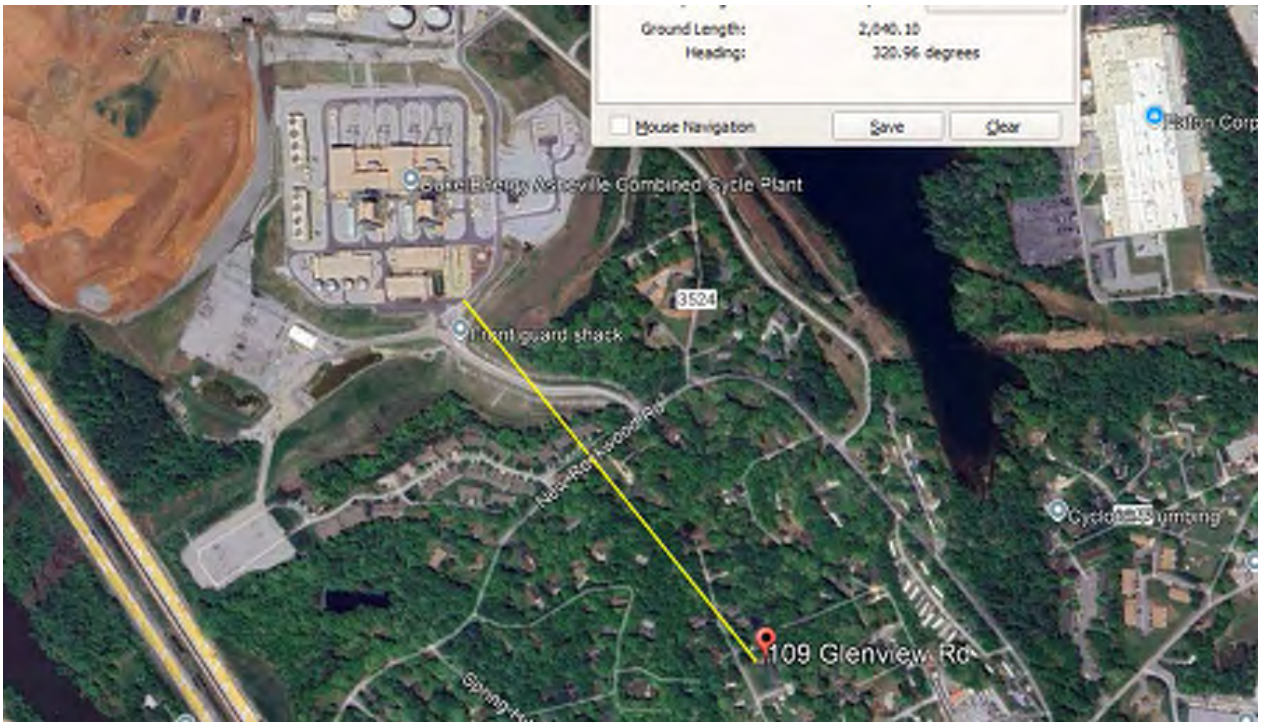
2 – Duke Energy Asheville Combined Cycle Plant, Arden, NC

This coal plant was converted to a combined cycle plant in 2020. The closest homes to the south are townhomes, which I have not focused on. There are some older sales along New Rockwood Road that could be considered, but they are in varying condition and most of the time periods between sales are significant enough to limit reliability.

The best nearby home sale for Sale/Resale that I found is 109 Glenview Road, Arden, NC that sold on July 5, 2023 for $365,000 for this 2,076 s.f. one story home with partially finished basement, 4 BR, 2 BA, with basement garage built in 1979 on 0.34 acres. This home previously sold on August 10, 2015 for $178,000. Adjusting this for time by the FHFA HPI, I derive an anticipated increase in value to $364,915, which is essentially exactly what it sold for. This supports a finding of no impact on value due to the conversion of the power plant. This home is 2,040 feet from the power plant.

Estimated Value for MSA: $364,915	Estimated Value for State: $369,943	MSA Percentage Change: 105.01%





Conclusion

The proposed changes at this facility will involve the decommissioning of part of the coal plant and inclusion of a two gas turbines to be located at and to replace the existing coal storage pile. The distances to adjoining homes are virtually the same with no change in distances or any significant change in view. The shift from coal to natural gas is supported as an improvement to the area based on the research provided earlier in this report from an air quality point of view as well as the study out of China that indicated significant improvements in nearby property value specifically from converting power plants from coal to natural gas.

The sales data identified in Kentucky are inadequate to address the question; however, the supplemental data from North Carolina provides a strong indication supporting the conversion and is very helpful as it is more targeted to the question at hand.

The demographic data is not a reliable indicator for this use.

This leaves me with three alternative sources for coming to a reasonable conclusion based on the research outlined in the original scope of work.

1 - The first is reliance on actual sales data of homes near power plants that have converted from coal to gas as outlined by the comparables in Sherrills Ford/Terrell, NC as well as Arden, NC. This data consistently shows that the Sale/Resale analysis of homes near the powerplants with the first sale prior to the conversion and the second sale after the conversion from coal to gas. This is very strong evidence as it addresses the question at hand and includes recent sales activity for homes in the $300,000 price range up to the almost $2 million price range. These homes were generally located between 2,000 and 3,200 feet from the power plants being tested for. The homes at the subject property are all at distances of 1,400 feet for those across the river to over 2,000 feet for all of the homes on the same side of the river as the power plant. I consider these sales to be strong indicators of no impact on property value based on these comparable projects.

2 - The second is reliance on research papers, which is an accepted appraisal practice. The research papers identified earlier in this report includes an analysis that directly addresses this exact question and is very recent which makes it a very reliable source for answering the question at hand. The only limiting factor is that it is based on sales data from China and not the United States. Still the data is considered reliable and on point and makes for a strong case for a positive impact on property value due to converting coal to natural gas. I consider this to be a very strong indicator and the limitation related to the data coming from a foreign country supports being conservative with this data. Furthermore, the research identified full conversion of coal to gas for the significant positive impacts. Assuming that a partial conversion would have a lesser positive impact is reasonable. Assuming that even allowing for differences in markets and culture, the data at least supports a finding of no negative impact is also reasonable.

3 - The third source for a reasonable conclusion is basic logic. The data and research supports that the air quality from the natural gas plant is superior to the air quality from a coal plant. All other things being equal, then the natural gas plant is therefore more desirable than a coal fired plant for adjacency. Even a partial conversion provides for cleaner and healthier air. The equipment and plant will remain at very similar distances from adjoining homes so there would be no anticipation of a change in viewshed. Given that the primary change is a positive change and the others are very minor shifts in the footprint, it stands to reason that at a minimum the proposed changes would have no negative impact on property value. As noted in the research papers and comments from some of the other articles, the neighbors will likely appreciate the positive changes.

VII. Certification

I certify that, to the best of my knowledge and belief:

1. The statements of fact contained in this report are true and correct;

2. The reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conditions, and are my personal, unbiased professional analyses, opinions, and conclusions;

3. I have no present or prospective interest in the property that is the subject of this report and no personal interest with respect to the parties involved;

4. I have no bias with respect to the property that is the subject of this report or to the parties involved with this assignment;

5. My engagement in this assignment was not contingent upon developing or reporting predetermined results;

6. My compensation for completing this assignment is not contingent upon the development or reporting of a predetermined value or direction in value that favors the cause of the client, the amount of the value opinion, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of the appraisal;

7. The reported analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the requirements of the Code of Professional Ethics and Standards of Professional Appraisal Practice of the Appraisal Institute;

8. My analyses, opinions and conclusions were developed, and this report has been prepared, in conformity with the Uniform Standards of Professional Appraisal Practice.

9. The use of this report is subject to the requirements of the Appraisal Institute relating to review by its duly authorized representatives;

10. I have not made a personal inspection of the property that is the subject of this report, and;

11. No one provided significant real property appraisal assistance to the person signing this certification.

12. As of the date of this report I have completed the continuing education program for Designated Members of the Appraisal Institute;

13. I have not performed services, regarding the property that is the subject of this report within the three-year period immediately preceding acceptance of this assignment.

Disclosure of the contents of this appraisal report is governed by the bylaws and regulations of the Appraisal Institute and the National Association of Realtors.

Neither all nor any part of the contents of this appraisal report shall be disseminated to the public through advertising media, public relations media, news media, or any other public means of communications without the prior written consent and approval of the undersigned.

Richard C. Kirkland, Jr., MAI
State Certified General Appraiser

Kirkland Appraisals, LLC

Richard C. Kirkland, Jr., MAI
9408 Northfield Court
Raleigh, North Carolina 27603
Mobile (919) 414-8142
rkirkland2@gmail.com
www.kirklandappraisals.com

Professional Experience

Kirkland Appraisals, LLC, Raleigh, N.C. — 2003 – Present
Commercial appraiser

Hester & Company, Raleigh, N.C.
Commercial appraiser — 1996 – 2003

Professional Affiliations

MAI (Member, Appraisal Institute) designation #11796 — 2001
NC State Certified General Appraiser # A4359 — 1999
VA State Certified General Appraiser # 4001017291
SC State Certified General Appraiser # 6209
KY State Certified General Appraiser # 5522
TN State Certified General Appraiser # 6240
FL State Certified General Appraiser # RZ3950
GA State Certified General Appraiser # 321885
MI State Certified General Appraiser # 1201076620
PA State Certified General Appraiser # GA004598
OH State Certified General Appraiser # 2021008689
IN State Certified General Appraiser # CG42100052
IL State Certified General Appraiser # 553.002633
LA State Certified General Appraiser # APR.05049-CGA
TX State Certified General Appraiser # 1380528 G

Education

Bachelor of Arts in English, University of North Carolina, Chapel Hill — 1993

Continuing Education

Michigan Appraisal Law	2024
Uniform Standards of Professional Appraisal Practice Update	2024
ASFMRA Integrated Approaches to Value (A360)	2024
ASFMRA Best in Business Ethics	2023
Appraising Natural Resources Series – Oil, Gas & Minerals	2023
Appraisal of Industrial and Flex Buildings	2023
Commercial Land Valuation	2023
Fair Housing, Bias and Discrimination	2023
Pennsylvania State Mandated Law for Appraisers	2023
What NOT to Do (NCDOT Course)	2023
The Income Approach – A Scope of Work Decision	2023
Valuation of Residential Solar	2022
Residential Property Measurement and ANSI	2022
Business Practices and Ethics	2022

Uniform Standards of Professional Appraisal Practice Update	2022
Sexual Harassment Prevention Training	2021
Appraisal of Land Subject to Ground Leases	2021
Michigan Appraisal Law	2020
Uniform Standards of Professional Appraisal Practice Update	2020
Uniform Appraisal Standards for Federal Land Acquisitions (Yellow Book)	2019
The Cost Approach	2019
Income Approach Case Studies for Commercial Appraisers	2018
Introduction to Expert Witness Testimony for Appraisers	2018
Appraising Small Apartment Properties	2018
Florida Appraisal Laws and Regulations	2018
Uniform Standards of Professional Appraisal Practice Update	2018
Appraisal of REO and Foreclosure Properties	2017
Appraisal of Self Storage Facilities	2017
Land and Site Valuation	2017
NCDOT Appraisal Principles and Procedures	2017
Uniform Standards of Professional Appraisal Practice Update	2016
Forecasting Revenue	2015
Wind Turbine Effect on Value	2015
Supervisor/Trainee Class	2015
Business Practices and Ethics	2014
Subdivision Valuation	2014
Uniform Standards of Professional Appraisal Practice Update	2014
Introduction to Vineyard and Winery Valuation	2013
Appraising Rural Residential Properties	2012
Uniform Standards of Professional Appraisal Practice Update	2012
Supervisors/Trainees	2011
Rates and Ratios: Making sense of GIMs, OARs, and DCFs	2011
Advanced Internet Search Strategies	2011
Analyzing Distressed Real Estate	2011
Uniform Standards of Professional Appraisal Practice Update	2011
Business Practices and Ethics	2011
Appraisal Curriculum Overview (2 Days – General)	2009
Appraisal Review - General	2009
Uniform Standards of Professional Appraisal Practice Update	2008
Subdivision Valuation: A Comprehensive Guide	2008
Office Building Valuation: A Contemporary Perspective	2008
Valuation of Detrimental Conditions in Real Estate	2007
The Appraisal of Small Subdivisions	2007
Uniform Standards of Professional Appraisal Practice Update	2006
Evaluating Commercial Construction	2005
Conservation Easements	2005
Uniform Standards of Professional Appraisal Practice Update	2004
Condemnation Appraising	2004
Land Valuation Adjustment Procedures	2004
Supporting Capitalization Rates	2004
Uniform Standards of Professional Appraisal Practice, C	2002
Wells and Septic Systems and Wastewater Irrigation Systems	2002
Appraisals 2002	2002
Analyzing Commercial Lease Clauses	2002
Conservation Easements	2000
Preparation for Litigation	2000
Appraisal of Nonconforming Uses	2000
Advanced Applications	2000
Highest and Best Use and Market Analysis	1999
Advanced Sales Comparison and Cost Approaches	1999

Advanced Income Capitalization	1998
Valuation of Detrimental Conditions in Real Estate	1999
Report Writing and Valuation Analysis	1999
Property Tax Values and Appeals	1997
Uniform Standards of Professional Appraisal Practice, A & B	1997
Basic Income Capitalization	1996

APPENDIX B – SITE PLANS & LEGAL BOUNDARIES

PRELIMINARY - NOT FOR CONSTRUCTION

no.	date	by	ckd	description
E	01/17/24	CWR	-	PRELIMINARY
D	12/12/23	CWR	-	PRELIMINARY
C	12/01/23	CWR	-	PRELIMINARY
B	11/20/23	CWR	-	PRELIMINARY
A	10/16/23	WRL	-	PRELIMINARY

no.	date	by	ckd	description
K	08/08/24	TLB	-	ISSUED WITH PROJECT SCOPING REPORT
J	05/28/24	CWR	-	ISSUED WITH PROJECT SCOPING REPORT
H	05/02/24	CWR	-	ISSUED WITH PROJECT SCOPING REPORT
G	03/15/24	CWR	-	PRELIMINARY
F	02/19/24	CWR	-	PRELIMINARY

OVERALL SITE PLAN

0 100' 200'
SCALE IN FEET

NORTH

BURNS McDONNELL
9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
Burns & McDonnell Engineering Company, Inc.
FIRM LICENSE NO.

designed | detailed
W. LESNIAK

EAST KENTUCKY POWER COOPERATIVE

PULASKI COUNTY, KENTUCKY

COOPER POWER PLANT
2 x1 CCGT PLANT
OVERALL SITE PLAN NEW COOLING TOWER
BASED ON SIEMENS GTG's

project 157787 | contract

drawing **GA200** | rev. **K**

sheet of sheets

file 157787_2X1-SIEMENS-COOPER-GA200.DWG

Z:\CLIENTS\ENR\EKPC\156007_NEWCCGT\2_DESIGN\MECH\DWGS\GNRL_ARRANGMNT\COOPER POWER PLANT\157787_2X1-SIEMENS-COOPER-GA200.DWG 8/8/2024 1:15 PM TBROSS

DWG REF	DESCRIPTION NEW SITE EQUIPMENT
001	UNIT 3 GAS TURBINE (GT)
002	UNIT 3 HEAT RECOVERY STEAM GENERATOR (HRSG)
003	UNIT 4 GAS TURBINE (GT)
004	UNIT 4 HEAT RECOVERY STEAM GENERATOR (HRSG)
005	UNIT 5 STEAM TURBINE GENERATOR (STG)
006	COOLING TOWER (CT) (SEE GA-202)
007	BOILER FEEDWATER PUMP
008	GT FUEL GAS FILTER / SEPARATOR
009	GT FUEL OIL PUMP SKID
010	SCR LOADING ZONE
011	AMMONIA FLOW CONTROL UNIT
012	HRSG BLOWDOWN TANK
013	OIL WATER SEPARATOR
014	BLOWDOWN SUMP

DWG REF	DESCRIPTION NEW SITE EQUIPMENT
015	HRSG CHEMICAL FEED (PHOSPHATE)
016	SAMPLE PANEL
017	COOLING TOWER (CT) ELECTRICAL BUILDING (SEE GA-202)
018	CT SS TRANSFORMER (SEE GA-202)
019	STG ELECTRICAL ROOM
020	STG SS TRANSFORMERS
021	STG GSU TRANSFORMER
022	GLAND STEAM CONDENSER BLOWER SKID
023	NOT USED
024	CLOSED COOLING WATER HEAT EXCHANGER
025	CLOSED COOLING WATER PUMPS
026	LP ECONOMIZER RECIRCULATION PUMPS
027	CEMS
028	FUEL GAS PILOT FILTER/SEPARATOR

DWG REF	DESCRIPTION NEW SITE EQUIPMENT
029	STG EXCITER TRANSFORMER
030	ROTOR AIR COOLER
031	GT WATER INJECTION PUMP SKID
032	WATER WASH/FALSE START DRAINS TANK
033	GENERATOR CIRCUIT BREAKER
034	GT AUXILIARY TRANSFORMER
035	GT GSU TRANSFORMER
036	EMERGENCY DIESEL GENERATOR (SEE GA-202)
037	MAIN GT ELECTRICAL BUILDING
038	MAIN GT ELECTRICAL BDLG SS TRANSFORMERS (TOTAL 4)
039	ADMINISTRATION ROOMS
040	I&C TECH SHOP (SEE GA-202)
041	MAINTENANCE SHOP (SEE GA-202)
042	CONTROL ROOM

DWG REF	DESCRIPTION NEW SITE EQUIPMENT
043	AQUEOUS AMMONIA FORWARDING PUMPS (SEE GA-200)
044	STG EXCITATION COMPARTMENT
045	WATER TREATMENT BUILDING
046	DEMINERALIZED WATER STORAGE TANK
047	GT CONTROL OIL PACKAGE
048	STG BRIDGE CRANE
049	NOT USED
050	SFC CROSSOVER SWITCH CUBICLE
051	GT SEE TRANSFORMER
052	GT SFC TRANSFORMER
053	GT VT & SURGE CUBICLE WITH SFC SWITCH
054	GT SEE / SFC PACKAGE
055	GT AIR COMPRESSOR
056	FUEL GAS DEWPOINT HEATER

DWG REF	DESCRIPTION NEW SITE EQUIPMENT
057	COALESCING FILTER SEPARATOR
058	FUEL GAS REGULATING/METERING STATION
059	LIFTING BAY
060	GT LUBE OIL PACKAGE
061	FUEL OIL STORAGE TANK (SEE GA-202)
062	FUEL OIL UNLOADING PUMPS (SEE GA-202)
063	FUEL OIL FORWARDING PUMPS (SEE GA-202)
064	RTU / DAC BUILDING
065	SUMP TANK
066	FUEL OIL HEATERS (SEE GA-202)
067	GLAND STEAM CONDENSER
068	AIR COMPRESSORS
069	WET AIR RECEIVER
070	AIR DRYER SKIDS
071	DRY AIR RECEIVER
072	SANITARY LIFT STATION
073	GT ELECTRICAL PACKAGE
074	GT FIRE PROTECTION PACKAGE
075	STEAM TURBINE LUBE OIL MODULE
076	TEMP DEMIN TRAILERS
077	GT PORTABLE COMPRESSOR WASHING UNIT
078	FUEL OIL CONTAINMENT (SEE GA-202)
079	AQUEOUS AMMONIA STORAGE TANK (SEE GA-200)
080	AQUEOUS AMMONIA CONTAINMENT (SEE GA-200)
081	CT CHEMICAL FEED ENCLOSURE (SEE GA-202)
082	ST SEAL OIL SKID

DWG REF	DESCRIPTION NEW SITE EQUIPMENT
083	U3 CTG CEMS
084	U3 HRSG ELECTRICAL BUILDING
085	NOT USED
086	U4 CTG CEMS
087	U4 HRSG ELECTRICAL BUILDING
088	NOT USED
089	CLOSED COOLING WATER FILTERS
090	AUX BOILER BLOWDOWN TANK
091	AUX BOILER
092	DEAERATOR
093	AUX BOILER FUEL REGULATING SKID
094	CIRCULATING WATER PUMPS (SEE GA-202)
095	AUXILIARY CIRCULATING WATER PUMP (SEE GA-202)
096	CIRCULATING WATER PIPE
097	CT ACID STORAGE TANK (SEE GA-202)
098	CT SODIUM HYPOCHLORITE STORAGE TANK (SEE GA-202)
099	CO2 TUBE TRAILER
100	NITROGEN TUBE TRAILER
101	BULK H2 STORAGE TANKS
102	CONDENSATE PUMPS
103	VACUUM PUMP SKID
104	CHEMICAL FEED EQUIPMENT (AMINE/AMMONIA)
105	CLOSED COOLING WATER CHEMICAL POT FEEDER
106	CLOSED COOLING WATER HEAD TANK (MEZZANINE FLOOR)
107	SEAL STEAM SUPERHEATER (MEZZANINE FLOOR)
108	H2 TRUCK UNLOADING
109	EMERGENCY CO2 BOTTOM STORAGE
110	STG ATM DRAINS TANK
111	CONDENSER
112	BULK CO2 STORAGE
113	HYDROGEN GENERATOR
114	STG VT & SURGE CUBICLE
115	PIPE RACK
116	PERFORMANCE HEATER
117	CLARIFIED WATER STORAGE TANK
118	CLARIFIED WATER FORWARDING PUMPS
119	SERVICE/FIRE WATER STORAGE TANK
120	SERVICE WATER PUMPS
121	FIRE WATER PUMP ENCLOSURE (AS REQUIRED)
122	AUX BOILER CHEMICAL FEED SKID
123	AUX BOILER FEED WATER PUMPS
124	ULTRA FILTRATION (UF) SKID
125	WATER TREATMENT CLARIFIER
126	REVERSE OSMOSIS (RO) SKID
127	SLUDGE HOLDING TANK
128	FILTER PRESS FEED PUMP SKID
129	POTABLE WATER TANK AND BOOSTER PUMP SKID
130	DEMIN WATER PUMPS
131	WATER TREATMENT FILTER PRESS & UNLOADING BAY
132	WATER TREATMENT BLDG SUMP/PUMPS
133	MMF AIR BLOWER SKID
134	WATER TREATMENT BUILDING AIR RECEIVER
135	CLEARWELL SUMP PUMPS
136	WASTE WATER LIFT STATION (SEE GA-202)
137	WASTEWATER STORAGE TANK
138	WASTE WATER PUMPS
139	WATER TREATMENT ELECTRICAL ROOM
140	WASTE WATER SUMP PUMPS
141	CLARIFIER SLUDGE RECYCLE SKID
142	CLARIFIER SLUDGE WASTE SKID
143	COOLING TOWER MAKEUP PUMPS
144	MULTIMEDIA FILTER (MMF)
145	STRAINER SKID
146	MMF BACKWASH PUMPS
147	UF FEED PUMPS
148	UF FORWARDING PUMPS
149	UF BACKWASH PUMPS
150	UF PERMEATE TANK
151	NEUTRALIZATION TANK
152	NEUTRALIZATION PUMP SKID
153	RO PERMEATE TANK
154	RO FORWARDING PUMPS
155	SERVICE DEIONIZATION (SDI) BOTTLES
156	SDI MANIFOLD
157	CLEAN-IN-PLACE (CIP) TANK AND PUMP SKID
158	SULFURIC ACID STORAGE TANK
159	SULFURIC ACID METERING PUMPS
160	SODIUM HYDROXIDE STORAGE TANK
161	SODIUM HYDROXIDE METERING PUMPS
162	ANTISCALANT TOTE AND METERING PUMPS
163	SODIUM BISULFATE TOTE AND METERING PUMPS
164	COAGULANT STORAGE TANK
165	COAGULANT METERING PUMPS
166	SODIUM HYPOCHLORITE STORAGE TANK
167	SODIUM HYPOCHLORITE METERING PUMPS
168	POLYMER TOTE AND METERING PUMPS
169	WATER TREATMENT BLDG SS TRANSFORMERS
170	NITROGEN BOTTLE RACK
171	HRSG ELEVATOR
172	CLARIFIER MAKEUP PUMPS
173	COAL PILE RUNOFF POND LIFT STATION
174	LANDFILL LEACHATE POND LIFT STATION
175	UNIT 1 & 2 WWT DRAINS AND CLARIFIER LIFT STATION

EXISTING TREATED WASTEWATER TO OUTFALL 003 (TO BE RELOCATED)

EXISTING TOTAL PLANT WASTEWATER DISCHARGE TO WWT (TO BE RELOCATED)

EXISTING COAL POND PUMP DISCHARGE LINE (TO BE DEMO'D)

WASTEWATER TREATMENT OVERFLOW/RECIRC TO COAL POND (TO BE RELOCATED)

EXISTING DUCTBANK

EXISTING FIRE PROTECTION

POWER BLOCK TOC EL.827'-6"

FUTURE CONDENSATE POLISHER AREA

UNIT 5

UNIT 3

UNIT 4

160'-0"

EXISTING COOLING TOWER BLOW DOWN LINE (TO BE RELOCATED)

EXISTING COOLING TOWER CHEMICAL FEED BUILDING SUMP DISCHARGE LINE (TO BE RELOCATED)

DIVIDER WALL TO MINIMIZE COAL DUST

MATCHLINE DWG GA202

Scale For Microfilming

Millimeters

Inches

BUILDING HEIGHTS

DESCRIPTION	TOS EAVE HEIGHT
STEAM TURBINE BLDG (3)	110'-0"
MAIN GT ELECTRICAL BUILDING (4)	30'-0"
ADMINISTRATION (5)	30'-0"
WATER TREATMENT BDLG (6)	25'-0"
WATER TREATMENT ELECT ROOM (7)	25'-0"
MAINTENANCE SHOP (8)	40'-0'
WATER TREATMENT MEZZANINE (9)	45'-0"

STACK COORDS

ITEM	NORTHING	EASTING	HEIGHT
UNIT 3	N: 1883903.276	E: 1979598.870	
UNIT 4	N: 1883806.802	E: 1979726.512	

EQUIPMENT COORDS

ITEM	NORTHING	EASTING	HEIGHT
DIESEL FIRE WATER PUMP	N: 1884284.000	E: 1979569.000	
AUX BOILER	N: 1883780.504	E: 1979953.892	
GAS DEWPOINT HEATER 1	N: 1884350.500	E: 1979667.500	
GAS DEWPOINT HEATER 2	N: 1884334.000	E: 1979655.250	

PRELIMINARY - NOT FOR CONSTRUCTION

no.	date	by	ckd	description
E	01/17/24	CWR	-	PRELIMINARY
D	12/12/23	CWR	-	PRELIMINARY
C	12/01/23	CWR	-	PRELIMINARY
B	11/20/23	CWR	-	PRELIMINARY
A	10/16/23	WRL	-	PRELIMINARY

no.	date	by	ckd	description
K	08/08/24	TLB	-	ISSUED WITH PROJECT SCOPING REPORT
J	05/28/24	CWR	-	ISSUED WITH PROJECT SCOPING REPORT
H	05/02/24	CWR	-	ISSUED WITH PROJECT SCOPING REPORT
G	02/19/24	CWR	-	PRELIMINARY
F	02/05/24	CWR	-	PRELIMINARY

SITE PLAN
0 30' 60'
SCALE IN FEET

NORTH

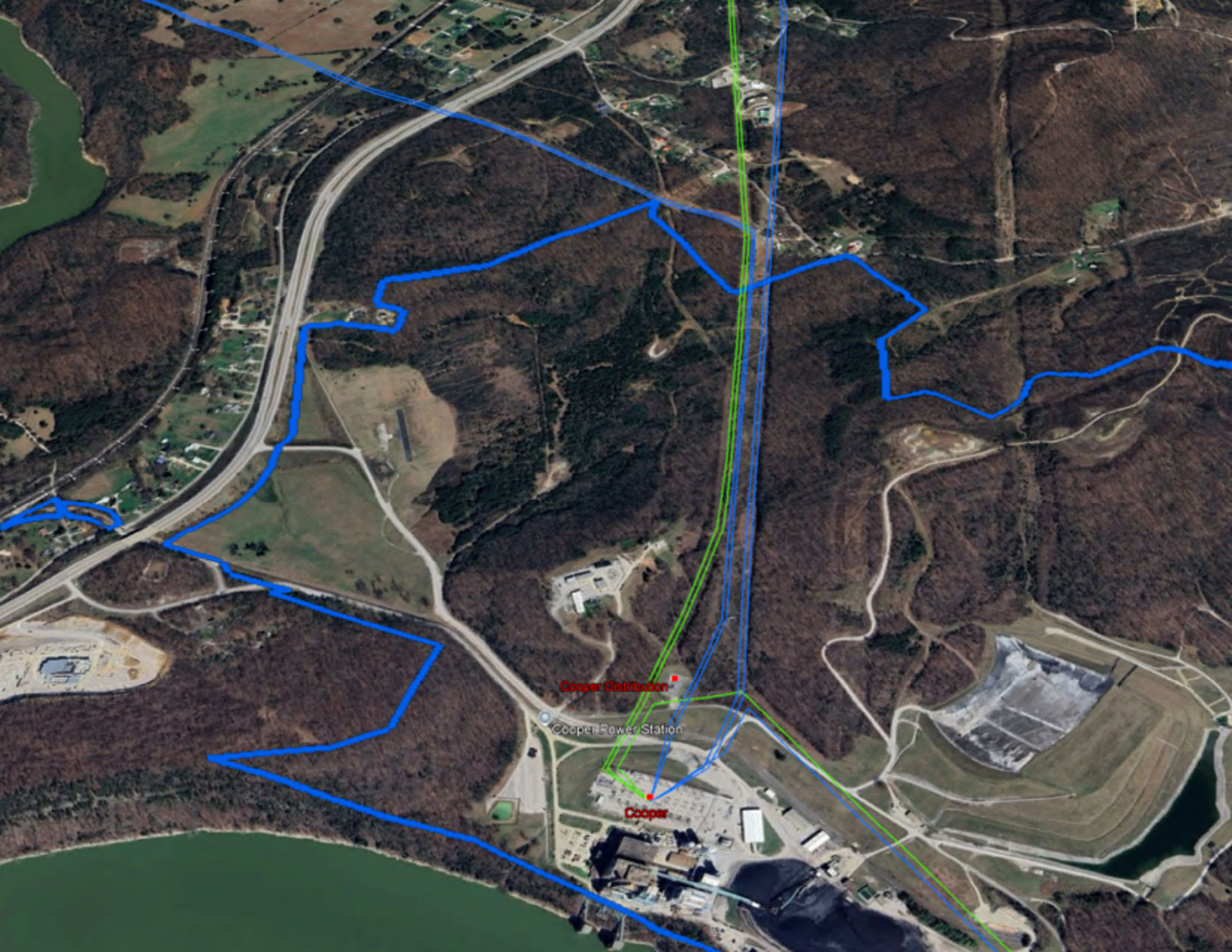
BURNS McDONNELL
9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
Burns & McDonnell Engineering Company, Inc.
FIRM LICENSE NO.
designed W. LESNIAK
detailed

EAST KENTUCKY POWER COOPERATIVE
PULASKI COUNTY, KENTUCKY

COOPER POWER PLANT
2 x1 CCGT PLANT
ENLARGED PLAN - NEW COOLING TOWER
BASED ON SIEMENS GTG's

project 157787 | contract
drawing GA201 – rev. K
sheet of sheets
file 157787_2X1-SIEMENS-COOPER-GA201.DWG

Z:\CLIENTS\ENR\EKPC\156007_NEWCCGT\2_DESIGN\MECH\DWGS\GNRL_ARRANGMNT\COOPER POWER PLANT\157787_2X1-SIEMENS-COOPER-GA201.DWG 8/8/2024 4:24 PM TBROSS


Cooper Distribution
Cooper Power Station
Cooper

NORTH INDICATED IS IN RELATION TO KY STATE PLANE COORDINATES, SOUTH ZONE, NAD 27.

AREA SUMMARY

TRACT 1	823.72± ACRES	(EXTERIOR PLANT SITE)
+TRACT 2	1.06± ACRES	(RAILWAY)
+TRACT 3	0.70± ACRES	(RAILWAY)
–	0.06± ACRES	(Goff Cemetery)
–	0.32± ACRES	(Owens Cemetery)
	825.10± ACRES	TOTAL (see note 3)

TRACT 1
823.72± ACRES
(See Area Summary)

TRACT 2
1.06± ACRES

TRACT 3
0.70± ACRES

Chestina Burton
(D.B. 594 Pg. 131)

John R. Minton
(D.B. 9 Pg. 31)

James Goff
(D.B. 582 Pg. 589)

Mary Catherine Goff
(D.B. 446 Pg. 307)

Mary Goff
(D.B. 803 Pg. 583)

Barry Hall
(D.B. 820 Pg. 180)

Eddie Phelps
(D.B. 315 Pg. 114)

David Pittman
(D.B. 704 Pg. 53)

Harmon Mounce
(D.B. 511, Pg. 22)

Dale VanHook
(D.B. 701, Pg. 627)

Cecil Goff Jr.
Douglas A. Goff
Russell W. Goff
(D.B. 850, Pg. 632)

Kentucky Hardwood
(D.B. 632, Pg. 263)

John Caldon
(D.B. 462, Pg. 345)

Cecil E. Chaney
Betty J. (wife)
(D.B. 500, Pg. 439)

Cloverleaf Ventures
(D.B. 797, Pg. 465)

Goff Cemetery
0.06± Acres

Owens Cemetery
0.32± Acres

OLD JACKSBORO ROAD (see note 7)

CEDAR GROVE ROAD

HARRISON LANE

KY 1247

COOPER STATION ROAD

SOUTHERN RAILROAD

P.O.B.

UNITED STATES OF AMERICA

LAKE CUMBERLAND

0 300 600 900 1200 1500
GRAPHIC SCALE

LEGEND

- ● . . . . . CONCRETE MONUMENT
- ⊙ . . . . . ANCHOR BOLT
- ○ . . . . . IRON PIN & CAP *
- ◕ . . . . . CONCRETE NAIL
- × . . . . . CHISELED X
- . . . . . TREE
- ⊗ . . . . . POST
- ——x——x—— . . . . . FENCE
- (S) . . . . . SET

* #5 REBAR 24" LONG WITH CAP PLS 2726

NOTES

1. Property platted hereon is subject to any existing easements, recorded or unrecorded.
2. All corner monumentation indicated was recovered this survey (September 2010), and as otherwise noted.
3. Area indicated based on ties to U.S. Government boundary. Not all US Government boundary was field verified.
4. Right-of-way of KY 1247 by plans dated 2005 and deed recorded in Road Book 22, Page 231 in the Pulaski County Clerk's Office.
5. Right-of-way of Cedar Grove Road is subject to provisions of KRS 178.025.
6. A report of survey, dated September 2010, has been prepared for this project and is an integral part of this survey.
7. Old Jacksboro Road was closed by order and judgement of Pulaski County Court dated September 16, 1961.

J:\Surveys\EKP Cooper 2010 Boundary\COOPER BOUNDARY 2010 10-02-10

BOUNDARY SURVEY AND RECOVERY
OF
JOHN SHERMAN COOPER POWER STATION
FOR
EAST KENTUCKY POWER COOPERATIVE, INC.
BURNSIDE, KENTUCKY

PALMER ENGINEERING COMPANY
400 SHOPPERS DRIVE
P.O. BOX 747
WINCHESTER, KENTUCKY 40392

DRAWN : JDM	DATE : 9-15-10	JOB : 10666
CHECKED : TLE	SCALE : 1"=300'	BOOKS : DC

1. **All the tracts of property comprising the site of the John Sherman Cooper Power Station as follows:**

Tract C-1

Parcel 1 – A certain parcel of land lying and being in Pulaski County, Kentucky on the waters of Pitman Creek and bounded and described as follows, to wit:

Beginning on the east side of Smith Ferry Road at the corner of a tract of land sold to William Loveless; thence east with said Loveless line 1700 feet more or less to a point in the Heath line; thence north with the said Heath line 558 feet with the first described line 1700 feet more or less to the east side of Smith's Ferry Road 558 feet, more or less to the beginning corner and containing 21 acres more or less. It is understood that the East Kentucky Rural Electric Cooperative has an easement across this property for transmission lines, and this deed is made subject to said easement.

Parcel 2 – Tract 1 – A certain tract or parcel of land in Pulaski County, Kentucky, on the east side of Jacksboro Road, and bounded as follows, to wit:

Beginning on a white oak and cedar, William Wait's and James Heath's corner; thence due S 35-1/3 poles to a stone; thence S 56 W 25-1/3 poles to a stone; thence due north 25-1/3 poles to a stone; thence N 56 E 25-1/3 poles to the beginning, containing four (4) acres.

Tract II – A certain tract of eleven (11) acres, more or less, of land located and being in Pulaski County, Kentucky, on the waters of Cumberland River and described s follows, to wit: Beginning on a small walntu (sic) tree on east side of Smith Ferry Road at Cy Loveless corner; thence eastward with old line; 1263 feet more or less to a cedar tree, corner of Flynn yard; thence northeast with old survey line 420 feet more or less to a cedar tree, corner Jones, Heath garden; thence N 250 feet to stake; thence W 1683 feet more or less to a rock at Smith Ferry Road; thence S 400 feet to the beginning. Except a small parcel heretofore sold, and at one time belonging to Homer Losey. In said deed a right of way is reserved and second parties to have said right of way.

Tract III – A certain tract or parcel of land lying and being in Pulaski County, Kentucky, and more particularly described as follows:

Beginning at the Jacksboro Road at a stone running NE following the Barneum line 18 poles 17 feet to a walnut tree and a stone, running from the walnut tree and a stone due S 22 poles 31 feet to a stone at McMullin's line, running from the stone following the McMullin line SW 18 poles 17 feet to

a walnut tree following the Jacksboro Road 22 poles 31 feet back to the beginning, corner at a stone, containing 1-1/2 acres, more or less. Said property being in Cedar Creek.

Being the same property conveyed from Charles R. Cox and Hazel A. Cox, his wife, to East Kentucky Power Cooperative, Inc., by Deed dated May 15, 1975, and recorded in Deed Book 353, Page 662, Pulaski County Clerk's Office.

Tract C-2

Beginning at a stake on the north side of the Minton Road line; thence a northerly direction a distance of 150 feet to a stake; thence an easterly direction 100 feet to a stake; thence in a southerly direction 150 feet to a stake, Minton's road, this line being parallel to the first call; thence from said stake with the Minton Road line a distance of 100 feet to a stake to the beginning.

Being the same property conveyed from Raymond Bell, et ux, to East Kentucky Power Cooperative, Inc., by Deed dated May 30, 1975, and recorded in Deed Book 354, Page 251, Pulaski County Clerk's Office.

Tract C-3

Beginning at an elm at old Military Road from Somerset to Burnside, Kentucky; thence S 86 E 1100 feet to a stone, about 30 feet south of the barn; thence S 88 E 1541 feet to a stone in Smith's line; thence N 36 E 870 feet with Smith's line to a hickory on the Jacksboro Road; thence with the meanders of the said road, N 3 E 957 feet; N 5 W 544 feet to a stake in the branch; Carr's corner; thence N 83 W 2125 feet to a walnut and cedar; thence N 7 E 625 feet to a post oak and stone, Gover's corner; thence S 71 W 687 feet to the Military Road; thence with said road due south 443 feet; S 4-1/2 E 700 feet; S 16-1/2 W 1055 feet; S 59 W 200 feet to the beginning, containing 145 acres, more or less, with the exception of five (5) acres, more or less, which was sold off this tract heretofore.

There is excepted therefrom, the following property which is the subject of a Contract for the Sale of Real Estate, recorded in Contract Book 5, Page 265, to William C. Jones, et ux, and being described as follows:

A certain tract or parcel of land, lying and being in Pulaski County, Kentucky, off Kentucky #1247, described as follows:

BEGINNING on an iron pin in the north right of way line to the Southern Railroad spur line to Cooper Power Plant, the southwest corner to the property herein described; thence N 18°14' E 88.5 feet to an iron pin; thence

N 29°12’ E 266.2 feet to an iron pin and a fence corner; thence with the fence S 62°11’ E 125.8 feet to an iron pin; thence S 18°00’ W 239.5 feet to an iron pin; thence N 75°40’ W 26.3 feet to an iron pin; thence S 17°57’ W 102.6 feet to the point of beginning, containing 1.17 acres.

Being the same property conveyed from Correll Properties, Inc. to East Kentucky Power Cooperative, Inc., by Deed dated April 24, 1975, and recorded in Deed Book 353, Page 343, Pulaski County Clerk’s Office.

Less and except a portion of that tract identified as Parcel 32 and containing 15.723 acres that was conveyed by East Kentucky Power Cooperative, Inc. to the Commonwealth of Kentucky for the use and benefit of The Transportation Cabinet, Department of Highways, by deed dated September 23, 2005, and recorded in Road Deed Book 22, at Page 231.

Tract C-4

Beginning at a stone on the South side of the Minton Road, corner to Henry Hamm; thence a southeastwardly direction with Hamm’s line 587 feet to a stone, corner to Henry Hamm and J. B. Carr; thence northeastwardly with J. B. Carr’s line 487 feet to a stone at the Minton Road; thence westwardly with the Minton Road 1, 080 feet to the beginning, being a triangular shaped tract, consisting of 3 ½ acres more or less.

Being the same property conveyed from Ruby Hall, et ux, to East Kentucky Power Cooperative, Inc. by Deed dated June 23, 1975, and recorded in Deed Book 354, Page 649, Pulaski County Clerk’s Office.

Tract C-5

Beginning on a stake on the west side of the Minton Road; thence North West 210 feet to a stake near a hickory; thence West 210 feet to a stake; thence South East 210 feet to a stake; thence East 210 feet to a stake the beginning corner. Contains one acre.

Being the same property conveyed from Fred Haynes, et al, to East Kentucky Power Cooperative, Inc. by Deed dated May 28, 1975, and recorded in Deed Book 354, Page 366, Pulaski County Clerk’s Office.

Tract C-6

Beginning at a stone at the intersection of Smith Ferry Road and a branch; thence N 48°57 min. W 9.63 poles to a stone in the center of said road; thence N 1°27 min. W 11.73 poles to a stone in the center of said road; thence N 19°57 min. W 18.03 poles to a stone on the west side of said road; thence N 82°10 min. W 42.25 poles to a stone; thence S 5° 25 min. W 33.41 poles to a

stone in Henry Hamm's line; thence S 82° 10 min. E 59 poles to the beginning, containing 10 acres more or less.

Being the same property conveyed from Wilson Lloyd to East Kentucky Power Cooperative, Inc. by Deed dated May 20, 1975, and recorded in Deed Book 354 Page 12, Pulaski County Clerk's Office.

Tract C-7

Beginning on a white oak and cedar, William Wait's corner; thence with his line S 56 W 92 poles to a stake at the Jacksboro Road; thence due South 16 poles to two small cedars; thence S 59 E 72 poles to a small hornbeam and black walnut and cliff of rocks; thence with said cliff N 60 E 10 poles to a cedar; thence N 10 E 9 poles to a cedar; thence N 5 W 8 poles to a cedar; thence N 7 E 14 poles to a dogwood; thence N 30 E 6 poles to a cedar; thence N 39 E 16 poles to a small hickory in James Heath's line; thence with his line due north 46 poles to the beginning, containing 26 ¼ acres, more or less.

There is EXCEPTED from the above boundary of land and not conveyed, a certain tract of land heretofore sold and conveyed to William Loveless, said tract so conveyed containing about 4 acres, more or less and being off of the northeast corner of the tract of land above described.

There is also EXCEPTED from the above boundary of land and not conveyed, a certain lot 110 X 50 heretofore sold and conveyed to Everett Loveless.

Being the same property conveyed from the Pulaski Special Commissioner to East Kentucky Power Cooperative, Inc. by Deed dated March 8, 1976, and recorded in Commissioner's Deed Book 11, Page 53, Pulaski County Clerk's Office.

Tract C-8

Tract No. 1: Beginning at a cedar on the east side of the old Jacksboro Road, a corner common to parties of the first part and lands formerly owned by William J. Oder, thence, running N 00°37'E a distance of 199.8 feet, more or less, to a point in the old Jacksboro Road; thence, running N 13°37'E a distance of 213.7 feet, more or less, to a point in the old Jacksboro Road; thence, running N 03°07'E a distance of 271.8 feet, more or less, to a point (Iron Pin) on the east side of the old Jacksboro Road; thence, leaving the road and running S 33°04'E a distance of 1080.3 feet, more or less, to a point in an existing fence, a distance of 222.4 feet, more or less, to a point (Fence Corner & Iron Pin); thence, running N 08°12'W and with the fence, a distance of 358.2 feet, more or less, to a point (Fence Post); thence, running S

86°11'W and with the fence, a distance of 407.9 feet, more or less, to the point of beginning, containing 5.0 acres, more or less.

Tract No. 2: Beginning at a fence post, on the south side of the Minton Road, a point which bears S 79°46'E a distance of 782.5 feet, from a hickory, on the south side of the road, and N 77°02'E a distance of 39.6 feet from an iron pin on the east side of Kentucky State Highway #1247; thence, running (from the point of beginning at fence post) S 79°46'E a distance of 206.0 feet, more or less, to a point (Power Pole); thence, running N 79°49' E a distance of 46.9 feet, more or less, to a point; thence running N 41°37'E a distance of 114.0 feet, more or less, to a point; thence, running N 75°16'E a distance of 249.8 feet, more or less, to a point; thence, running N 74°20'E a distance of 249.8 feet, more or less, to a point; thence, running N 25°18' E a distance of 111.0 feet, more or less, to a point; thence, running N 78°58'E a distance of 77.0 feet, more or less, to a point (Iron Pin); thence, running N 17°50'E a distance of 248.2 feet, more or less, t a point (Post); thence, running S 84°14'E a distance of 649.9 feet, more or less, to a point (Rock & Post) on the west side of the old Jacksboro Road; thence running N 08°14'E a distance of 138.0 feet, more or less, to a point (Cedar), and said point being on the east side of the old Jacksboro Road, and said point further being the beginning point for description of Tract #1; thence, running N 00°37'E a distance of 199.8 feet, more or less, to a point in the old Jacksboro Road; thence, running N 13°37'E a distance of 213.7 feet, more or less, to a point in the old Jacksboro Road; thence, running N 03°07'E a distance of 271.8 feet, more or less, to a point (Iron Pin) on the east side of the old Jacksboro Road; thence, running N 88°29'W a distance of 30.1 feet, more or less, to a point on the west side of the road; thence, running N 09°21'E a distance of 214.9 feet, more or less, to a point on the west side of the old Jacksboro Road, and said point being the south right of line of steel tower power line (50 feet from center of line); thence, leaving the road and running N 57°34'W with the power line right of way a distance of 513.2 feet, more or less, to a point, and said point being 50 feet from the center of power line; thence, leaving the power line right of way and running S 33°20'W a distance of 1330.9 feet, more or less, to a point (Rock); thence, running S 77°16'W a distance of 728.3 feet, more or less, to a point (Rock & Forked Cedar); thence, running S 08°09'W a distance of 245.2 feet, more or less, to a point (Iron Pin) a common corner to Phelps; thence, S 79°28'E and with Phelps line a distance of 209.5 feet, more or less, to a point (concrete post); thence, S 01°09'W and with point of beginning; containing 27.710 acres, more or less, however there are two (2) exceptions to the above described tract, namely the Bell tract containing 0.342 acres, more or less, and the Haynes tract containing 1.450 acres, more or less, descriptions for these tracts are made a part of this instrument and follow. Total acres for Tract #2 is 25.918 acres, more or less.

Exception for Haynes Tract.

Beginning at a point (Hickory tree), and said point bearing N 4°00'W, a distance of 116.0 feet, from a corner fence post, thence, running S 14°40'W a distance of 311.3 feet, more or less to a point (Post & Iron Pin); thence, running N 62°27'W a distance of 230.9 feet, more or less, to a point (Cedar Tree); thence, running N 08°05'E a distance of 220.5 feet, more or less, to the point of beginning, containing 1.450 acres, more or less, for this exception.

Exception for Bell Tract.
Commencing at a fence post (the point of beginning for description of Tract #2), thence, running S 79°46'E a distance of 206.0 feet, more or less, to a point (Power Pole); thence, running N 79°49'E a distance of 46.9 feet, more or less, to a point; thence, running N 41°37'E a distance of 114.0 feet, more or less, to a point; thence, running N 75°16'E a distance of 105.5 feet, more or less, to a point; thence, running N 09°06'W a distance of 31.2 feet, more or less, to a point (Iron Pin); and this point further being the Point of Beginning; thence, running N 09°06'W a distance of 150.0 feet, more or less, to a point (Iron Pin); thence, running N 72°45'E a distance of 98.8 feet, more or less, to a point (Iron Pin); thence, running S 09°37'E a distance of 150.0 feet, more or less, to a point (Iron Pin); thence, running S 72°34'W a distance of 100.2 feet, more or less, to the point of beginning, containing 0.342 acres, more or less, for this exception.

Being the same property conveyed from John H. Minton, et ux, to East Kentucky Power Cooperative, Inc. by Deed dated September 28, 1976, and recorded in Deed Book 366, Page 303, Pulaski County Clerk's Office.

LESS AND EXCEPT all that property remised, released and forever quitclaimed to Lee Hill and Michael Hill, her husband, by that Boundary Line Agreement and Quitclaim Deed dated January 19, 1988, and recorded in Deed Book 612, at Page 73.

Tract C-9

Parcel I: A certain tract or parcel of land, located and being in Pulaski County, Ky. lying and being East of the Smith Ferry Road and being just east of the present school grounds, known as Cedar Grove School, adjoining the same and beginning at a southeast corner of present school house lot; thence running eastward 12 2/3 poles to a stake; thence north, parallel with east line of old school house lot 12 2/3 poles to a stake; thence west parallel with first line herein 12 2/3 poles to a stake, the northeast corner of old school house lot; thence south with the east line of old school house lot 12 2/3 poles to the beginning, containing 1 acre, more or less.

Second Tract: Beginning at a stone in the Smith Ferry Road, thence south 6 east 12 2/3 poles to a stone in said road; thence N 84 E 12 2/3 poles to a stone;

thence north 6 west 12 2/3 poles to a stone; thence south 84 west 12 2/3 poles to the beginning, containing 1 acres, more or less.

Parcel II: Beginning on a cedar and sugar tree, then south 73 W, 40 poles to a small red Elm at Jacksboro Road, then with said road, N 19 W 10 poles, N.W. 20 polses (sic) N. 12 E 20 poles N. 11 ½ WW (sic) poles to a water Oak and sugar tree and cedar by the side of the said road. S, 60 E 2 poles to a small cedar Lovelass corner. then S 59 E 72 poles at a horn beam and balck (sic) walnut on a cliff of rock Lovelass corner, the S 60 W 8 poles to a hornbeam and hickory. S 50 W 18 poles to 2 dogwood S 30 __ 10 poles to the beginning. Contains 15 ½ acres be same more or less.

Parcel III: Beginning on a Dogwood at Ernie Loveless and the County Road known as the Jacksboro Road; thence with his line 412 feet to a stone; thence 140 feet NW 74 degrees; thence 412 feet southeast about 50 degrees to the County Road; thence the County Road back to the beginning about 314 feet 70" southwest back to the beginning Dogwood.

Being the same property conveyed from William J. Oder, et ux, to East Kentucky Power Cooperative, Inc. by Deed dated May 30, 1975, and recorded in Deed Book 354, Page 189, Pulaski County Clerk's Office.

Tract C-10

Beginning at the head of a cove at a point designated as "Q" of Tract Z2645 of the land condemned and purchased by the Federal Government for the impoundment of Wolf Creek Reservoir; also common corner of Persie Ward; thence with east side of said cove S. 00°45'W.30 poles; thence S.53°45'E 40 poles; thence S.84°30'E 30 poles; thence N.46°45'E. 42.5 poles; thence N. 22°30'E. 56 poles; thence N. 14°30'E. 99.5 poles; thence N. 12°15'E. 135 poles; thence N. 33°15'E. 69 poles, all of which aforesaid calls constitute the government line and bind on the west bank of Lake Cumberland; thence leaving the government line and running s. 64 W. 82 poles more or less to a hickory at corner of S. B. Heath and Persie Ward; thence S.W. 160 poles with Persie Ward line to a white oak; thence S.40-1/2 E. 10 poles crossing the branch to a rock, continuing with Persie Ward's line; thence S.W. with Persie Ward's line and the meanders of a branch, passing an elm marked as a line tree to a stone; thence continuing southwardly with the branch and the Persie Ward line to the point of beginning, and containing 332.2 acres more or less.

There is excepted from the foregoing boundary the Goff Cemetery which is enclosed by a fence, and a 15-foot right-of-way to the cemetery, leading from the Jacksboro Road.

There is also excepted from the foregoing description a tract of land previously conveyed to the party of the second part from Frazer D. LeBus

(Sr.), single, by deed dated August 24, 1961, and recorded in Deed Book 237 at page 400 in the Pulaski County Clerk's office, containing 31.3 acres more or less and described as follows:

BEGINNING at an iron pin, corner of U.S. Government line, East Kentucky R.E.C.C. and Frazier D. LeBus; thence with Lebus' line N. 64 degrees – 00' E – 1200.36 feet to a stake; thence still with LeBus' N 55 degrees – 17 W 400 feet to East Ky. R.E.C.C. and LeBus' corner; thence with East Ky. R.E.C.C. line S 34 degrees 33' W 250 feet to a white oak; thence S 39 degrees 37' E 179.025 feet to a stake; thence S 29 degrees 19 W – 569.25 feet to a stake; thence S 22 degrees 25' W 825 feet to a stake; thence S 01 degrees – 59' E 264 feet to a stake; thence S 12 degrees – 34' W 392.7 feet to an iron pin, the point of beginning and containing 31.3 acres more or less.

The above-described property which is being conveyed by this deed has been re-surveyed as of May 28, 1981, by Bobby Hudson, Land Surveyor, Somerset, Kentucky, and reads as follows:

BEGINNING at Government corner #Z-2645-6, which said corner is the south west corner of a 31.3 acre tract belonging to East Kentucky R.E.C.C.; thence leaving East Kentucky R.E.C.C. with the Corps of Engineer line as follows:
S02°18'41"W 654.38' to a corner Z-2645-7; thence S10°02'26"W 491.28' to a corner Z-2645-8; thence S47°47'27"E 506.76' to a corner Z-2645-9; thence N88°59'48"E 508.70' to a corner Z-2645-10; thence N59°57'43"E 687.32' to a corner Z-2645-11; thence N21°36'30"E 1079.78' to a corner Z-2650-1; thence N10°12'38"E 2350.75' to a corner Z-26-50-2; thence N06°46'17"E 1929.70' to a corner Z-2650-3; thence N62°35'58"E 835.90' to a corner Z-2650-4; thence leaving Government line S75°04'14"W 1270.00' to a 30" oak & iron pin, which is the north east corner of East Kentucky R.E.C.C.; thence with East Kentucky line, S35°58'58"W 2383.97' to an iron pin; thence S55°11'17"E 399.99' to a 4 inch iron post; thence S08°46'00"E 1498.22' to a 4 inch iron post; thence S63°57'18"W 1202.11' to the point of beginning, containing 159.0781 acres more or less.

Being the same property conveyed from Frazer D. Lebus, Jr., et al, to East Kentucky Power Cooperative, Inc. by Deed dated June 1, 1981, and recorded in Deed Book 410, Page 136, Pulaski County Clerk's Office.

Tract C-11

BEGINNING at an iron pin, corner of U.S. Government line, East Kentucky R.E.C.C. and Frazer D. LeBus; thence with LeBus' line N 64 degrees – 00' E – 1200.36 feet to a stake; thence still with LeBus' line N 02 degrees – 00' W – 1496.44 feet to a stake; thence still with LeBus' line N 55 degrees – 17 W 400 feet to East Ky. R.E.C.C. and LeBus' corner; thence with East Ky.

R.E.C.C. line S 34 degrees 33’ W 250 feet to a white oak; thence S 39 degrees 37’ E 179.025 feet to a stake; thence S 29 degrees 19 W – 569.25 feet to a stake; thence S 22 degrees 25’ W 825 feet to a stake; thence S 01 degrees – 59’ E 264 feet to a stake; thence S 12 degrees – 34’ W 392.7 feet to an iron pin, the point of beginning and containing 31.3 acres more or less.

There is excepted from this above described tract, a small tract known as the Goff Cemetery, with the right of ingress and egress to the cemetery.

Being the same property conveyed from Frazier D. LeBus to East Kentucky Rural Electric Cooperative Corporation by deed dated August 24, 1961, and recorded in Deed Book 237, Page 400, Pulaski County Clerk’s Office.

Tract C-12

BEGINNING at an iron pin, also corner to the U.S. Government; running thence with said Government line N 51 degrees 30 minutes W 40 poles to a stake; thence N 40 E 5 poles to a stake; thence N 47 W 9.5 poles to a stake, N 76 W 18 poles to a stake; thence N 49 W 24 poles to a stake; thence N 45 degrees 30 minutes W 164 poles to a stake in the U.S. Government line; thence leaving said U.S. Government line N 38 degrees 31 minutes E 36.4 poles to two poplars; thence N 56 degrees 56 minutes E 39 poles to a cedar and thorn; thence N 0 degrees 36 minutes W 201 poles to a stake, formerly two hickories; thence N 74 degrees 43 minutes E 7.9 poles to a sugartree stump; thence N 66 degrees 43 minutes E 8 poles to a stake; thence S 62 degrees 22 minutes E 4.8 poles to a stake; thence S 57 degrees 52 minutes E 13.8 poles to a stake; thence S 60 degrees 22 minutes E 10.6 poles to a sugartree; thence N 51 degrees 38 minutes E 10.3 poles to a walnut stump; thence N 39 degrees 53 minutes E 8.4 poles to a walnut stump; thence N 18 degrees 56 minutes E 10.4 poles to a cedar stump; thence N 60 degrees 26 minutes E 9 poles to a stake; thence S 48 degrees 34 minutes E 2.8 poles to a stake; thence S 82 degrees 4 minutes E 14 poles to a stake; thence N 69 degrees 18 minutes E 27.5 poles to an elm stump; thence S 67 degrees 57 minutes E 82.5 poles to a stake; thence ____ poles to a white oak; thence S 39 degrees 37 minutes E 10.85 poles to a stake; thence S 29 degrees 19 minutes W 34.5 poles to an elm; thence S 22 degrees 25 minutes W 50 poles to a rock; thence S 1 degree 59 minutes E 16 poles to a stake; thence S 12 degrees 34 minutes W 23.8 poles to an iron pin; corner in the U.S. Government line; thence with the U.S. Government lien S 18 degrees W 39.6 poles to a stake; thence S 39 degrees W 27.7 poles to an iron pin in the U.S. Government line, the point of beginning.

There is excepted from the above a certain cemetery located within the boundary of the above tract and described as follows:

Beginning at a stake running N 46 degrees 15 minutes W 7.85 poles to a stake; N 41 degrees 30 minutes E 5.45 poles; N 70 degrees 30 minutes E 3.88 poles; S 14 E 5.5 poles to a stake; S 29 W 6 poles to a stake.

Being the same property conveyed from Ransom H. Wall, et ux, to East Kentucky Rural Electric Cooperative Corporation by Deed dated August 27, 1960, and recorded in Deed Book 230, Page 556, Pulaski County Clerk's Office.

Tract C-13

BEGINNING on a rock, a common corner to the U.S. Government and the Wall lands; running thence with the U.S. Government line N 45 degrees 30 minutes W 23.4 poles to a stake; N 80 degrees W 28 poles to a stake; N. 61 degrees W 29.7 poles to a stake in a branch, also the corner of Howard Smith lands; thence with Howard Smith's line N 29 degrees 31 minutes E 13.2 poles to a poplar, dogwood and mulberry trees; N 70 degrees W 65.5 poles to a stake; S. 29 degrees 31 minutes W 16.4 poles to a stake, also corner in U.S. Government line; thence with said U.S. Government line N 75 degrees 15 minutes W 38.1 poles to a stake in a fence, also corner of Cross lands; thence with Cross line N 80 degrees 57 minutes E 39.3 poles to a cedar, also corner of Cross and Vanhook lands; thence with Vanhook line N 60 degrees E 19.7 poles to an old elm corner; N 16 degrees 32 minutes E 46.5 poles to a maple tree corner; thence N 7 degrees 26 minutes W 9.9 poles to a rock corner; thence N 26 degrees 45 minutes E 24 poles to a rock and fence, corner of Vanhook and Flynn lands; thence with Flynn line S 87 degrees 30 minutes E 25.1 poles to a rock in fence corner; N 41 degrees 13 minutes E 52.7 poles to a hickory and rock corner; also corner of Flynn and Oder lands; thence with Oder line S 1 degree 58 minutes E 25.5 poles to a stake; S 16 degrees 15 minutes E 10 poles to a red elm; thence N 74 degrees 31 minutes E 41 poles to a sugar tree and cedar stump, also corner of Oder and Loveless lands; thence with Loveless line N 4 degrees 26 minutes W 9.7 poles to a stake formerly two dogwoods; thence N 46 degrees 40 minutes E 7 poles to a redbud, also corner of Loveless and Craig lands; thence with Craig line S 79 degrees 25 minutes E 41.9 poles to a stake, also corner of Craig and Wall lands; thence with said Wall line S 0 degrees 36 minutes E 132.8 poles to a cedar and thorn tree; thence S 56 degrees 56 minutes W 39 poles to two poplars; thence S 38 degrees 31 minutes W 36.4 poles to a rock, the point of beginning. The same containing 150.25 acres, be the same more or less.

Being the same property conveyed from Ruth Kramer, et al to East Kentucky Rural Electric Cooperative Corporation by Deed dated November 12, 1960, and recorded in Deed Book 232, Page 172, Pulaski County Clerk's Office.

Tract C-14

Beginning at a stone in a branch in the U.S. Government line also a corner of the Smith heirs' land; thence running with said Smith heirs' line N 29 degrees 31 minutes E 13.2 poles to a poplar, dogwood and mulberry trees; thence still with Smith heirs' line N 70 W 65.5 poles to a stake; thence S 29 degrees 31' W 16.4 poles to a stake in the U.S. Government line; thence with said U.S. Government line S 75 degrees 15' E 54.4 poles to a stake in said government line; thence still with the U.S. Government line S 61 degrees E 17.3 poles to the stake in the branch, the point of beginning, containing 5.125 acres.

Being the same property conveyed from Howard S. Smith, et ux, to East Kentucky Rural Electric Cooperative Corporation by Deed dated November 15, 1960, and recorded in Deed Book 232, Page 245, Pulaski County Clerk's Office.

Tract C-15

Beginning at a point now marked by an iron stake on the State Highway #1247 right of way line and Carodine Edwards corner and proceeding on a bearing of S – 67 degrees E a distance of 1108 feet. (This line having been established as the boundary line between James Van Hook and Carodine Edwards). Thence with said line S – 87 degrees 30 minutes E a distance of 1128.5 feet to a stone (stake) at East Kentucky RECC, Vanhook and Carodine Edwards corner. Thence: S-26 degrees 45 minutes W a distance of 396 feet to a point (stone) in the line between James Vanhook and East Kentucky RECC. Thence: S – 7 degrees 26 minutes W with said line a distance of 163.35 feet to a maple tree now a corner between James Vanhook and East Kentucky RECC. Thence: S – 16 degrees 32 minutes W a distance of 73 feet to a point (iron stake). Thence: N – 67 degrees 22 minutes W a distance of 1622.4 feet to an iron stake. Thence: N – 66 degrees 16 - W a distance of 568.5 feet to an iron stake; Thence: N – 31 degrees 05 minutes a distance of 89 feet to an iron stake in fence. Thence: N – 87 degrees 41 minutes a distance of 55.5 feet to an iron stake in Highway Right of Way line. Thence: with said Highway #1247 Right of Way line on a bearing of N – 60 degrees 30 minutes E a distance of 214 feet to the beginning. The above described tract contains 15.5 acres more or less.

Being the same property conveyed from Hettie Vanhook, et vir, to East Kentucky Rural Electric Cooperative Corporation by Deed dated August 19, 1961, and recorded in Deed Book 237, page 298.

Less and except a portion of that tract identified as Parcel 32 and containing 15.723 acres that was conveyed by East Kentucky Power Cooperative, Inc. to the Commonwealth of Kentucky for the use and benefit of The Transportation Cabinet, Department of Highways, by deed dated September 23, 2005, and recorded in Road Deed Book 22, at Page 231.

Tract C-16

Beginning at a corner with Johnie McDaniel and Southern Railroad S 41 degrees 30' E, 20 feet to a point in fence; thence 60 feet in a southeasterly direction and parallel to a 10 degree curve surveyed by Southern Railway Company Engineers (curve data being as follows: Angle = 81 degrees 35' Rt., D = 10 degrees, P.I. = 7 + 58.67, R = 573', T = 495.05, PC = 2+63.62, LC = 815.83, PT = 10+79.45) to a point in fence line along road (a point which bears N – 25 degrees W, 136' from Neely's and McDaniels corner). Thence along road N 25 degrees W, 192.35' to a corner with Southern Railroad R.O.W., thence with Railroad R.O.W. fence S 44 degrees W, 385.5' to the point of beginning, containing 0.77 acres more or less.

Being the same property conveyed from Johnie McDaniel, et ux, to East Kentucky Rural Electric Cooperative Corporation by Deed dated August 19, 1961, and recorded in Deed Book 237, Page 300, Pulaski County Clerk's Office.

Tract C-17

Beginning at a point in fence line 84' in a southeasterly direction from a corner of Jesse and Magadeline Cook and Southern Railroad and 60' from and parallel to a 10 degree curve surveyed by Southern Railway Company Engineers (curve data being as follows: Angle = 81° 35' Rt., D = 10°, P. I. = 7 + 5867, T = 495.05, PC = 2 + 63.62, LC = 815.83, R = 573', PT = 10 + 79.45) to a point in fence line which is property line Jesse and Magadeline Cook and this point being at right angles and 60' to the left of Station 10 + 29 Southern Railroad Survey. Thence on a bearing of S 24° 5 SE 129.5 ft. to a corner of Bates at Kentucky state highway #1247 R/W. Thence on a bearing of So. 68° 28' W to a point in R/W fence a distance of 74'. Thence in a Northwesterly direction and parallel to a 10° curve a distance of 64' from corner of Jesse and Magadeline Cook and on a bearing of N 25° W. Thence a distance of 138' N 25° W to the beginning. This tract contains 1.17 acres more or less.

Being the same property conveyed from Jesse Cook, et ux, to East Kentucky Rural Electric Cooperative Corporation by Deed dated August 19, 1961, and recorded in Deed Book 237, Page 296, Pulaski County Clerk's Office.

Tract C-18

Beginning on an iron pin in the North right-of-way line of the Southern Railroad spur line to Cooper Power Plant the southwest corner to the property herein described; thence N 18 14' E, 88.5 feet to an iron pin; thence N 29 12' E 266.2 feet to an iron pin and a fence corner; thence with the fence 62 11' E, 125.8 feet to an iron pin; thence N 75 40' W, 26.3 feet to an iron pin; thence S 17 57' W, 102.6 feet to the point of beginning, containing 1.17 acres.

Being the same property conveyed from Diane Jones, et al, to East Kentucky Power Cooperative, Inc. by Deed dated January 19, 1998, and recorded in Deed Book 612, Page 70, Pulaski County Clerk's Office.

Tract C-19

Beginning at a hickory Cy Loveless corner; thence his line S 39 W 16 poles to a cedar; S 30 W 6 poles to a dogwood; S 7 W 14 poles to a cedar; S 5 E 8 poles to a cedar; S 10 W 9 poles to a cedar; S 60 W 10 poles to a hornbeam and black walnut, Loveless and Cross corner; thence Cross line S 50 W 11 poles to a red bud; thence S 80 E 33 ½ poles to a stone in old line; thence old line N 65 poles to the beginning, containing 6 acres by survey.

Being the same property conveyed from Jerry Ikerd, Et Ux to East Kentucky Power Cooperative, Inc. by Deed dated September 26, 2014, and recorded in Deed Book 920, Page 496, Pulaski County Clerk's Office.

APPENDIX C – SOUND STUDY REPORT

BURNS McDONNELL

EAST KENTUCKY POWER COOPERATIVE

SOUND STUDY REPORT

COOPER POWER PLANT

PROJECT NO. 157787

REVISION 1

OCTOBER 2024

CONTENTS

TABLES

List of Abbreviations

Abbreviation	Term/Phrase/Name
ANSI	American National Standards Institute
BOP	Balance of Plant
CadnaA	Computer Aided Noise Abatement
dB	decibel
dBA	A-weighted decibel
dBC	C-weighted decibel
EKPC	East Kentucky Power Cooperative
Hz	Hertz
ISO	International Organization for Standardization
L_{dn}	day-night average sound level
L_{eq}	equivalent-continuous sound level
L_{10}	10-percentile exceedance sound level
L_{50}	50-percentile exceedance sound level
L_{90}	90-percentile exceedance sound level
MP	measurement point
mph	miles per hour
Project	Cooper Power Plant
PWL	sound power level
SPL	sound pressure level
USEPA	United States Environmental Protection Agency

Executive Summary

Burns & McDonnell conducted a sound study for the East Kentucky Power Cooperative (EKPC) Cooper Power Plant (Project), located in Pulaski County, KY. The Project is a new 2x1 F-Class power generation facility with combustion turbines and heat recovery steam generators (HRSG) located outside, an indoor steam turbine generator, and associated balance-of-plant (BOP) equipment.

The objectives of this study were to identify the applicable noise regulations, model operational sound levels of the Project, and compare Project-generated sound levels to the applicable noise regulations. As of this version of the report, existing ambient sound level measurements have not been completed.

The State of Kentucky does not have applicable noise statutes which limit noise from the Project nor does Pulaski County. In the absence of regulatory limits, Project sound levels were compared to industry guidelines for limiting noise impacts on the surrounding community. For A-weighted sound levels, the United States Environmental Protection Agency (USEPA) has guidance to limit sound levels at nearby residential receptors to a day-night sound level (L_{dn}) of 55 dBA, which is equivalent to a constant sound level of less than 48.6 dBA. In the interest of potential low-frequency impacts, the American National Standards Institute (ANSI) standard, ANSI S12.9, provides guidance that low-frequency sound levels in the 16, 31.5, and 63-Hz octave bands less than 65 dB generally result in minimal annoyance. This would be approximately equivalent to a C-weighted sound level of 65 to 70 dBC for sources with strong low frequency content.

The Project operational sound levels, as currently designed, are expected to slightly exceed the recommended sound level guidelines provided by USEPA and ANSI at the nearest receptor. Mitigation upgrades, including upgraded exhaust stack silencers, low-noise fans and splash mats for the cooling tower, and enclosures on some of the surrounding auxiliary skids, have been included as part of the Project acoustic design to reduce base offering sound levels closer to the recommended sound levels. It should be noted that the USEPA guidelines and the ANSI informative standard are not intended to be construed as regulatory limits as they do not consider cost or engineering feasibility associated with additional mitigation. Instead, these should be used only as guidance for minimizing the potential for noise impacts on the surrounding community.

1.0 Acoustical Terminology

The term “sound level” is often used to describe two different sound characteristics: sound power and sound pressure. Every source that produces sound has a sound power level (PWL). The PWL is the acoustical energy emitted by a sound source and is an absolute number that is not affected by the surrounding environment. The acoustical energy produced by a source propagates through media as pressure fluctuations. These pressure fluctuations, also called sound pressure levels (SPL), are what human ears hear and microphones measure.

Sound is physically characterized by amplitude and frequency. The amplitude of sound is measured in decibels (dB) as the logarithmic ratio of a sound pressure to a reference sound pressure (20 micropascals). The reference sound pressure corresponds to the typical threshold of human hearing. To the average listener, a 3-dB change in a continuous broadband sound is generally considered “just barely perceptible”; a 5-dB change is generally considered “clearly noticeable”; and a 10-dB change is generally considered a doubling (or halving, if the sound is decreasing) of the apparent loudness.

Sound waves can occur at many different wavelengths, also known as the frequency. Frequency is measured in hertz (Hz) and is the number of wave cycles per second that occur. The typical human ear can hear frequencies ranging from approximately 20 to 20,000 Hz. Normally, the human ear is most sensitive to sounds in the middle frequencies (1,000 to 8,000 Hz) and is less sensitive to sounds in the lower and higher frequencies. As such, the A-weighting scale was developed to simulate the frequency response of the human ear to sounds at typical environmental levels. The A-weighting scale emphasizes sounds in the middle frequencies and de-emphasizes sounds in the low and high frequencies. Any sound level to which the A-weighting scale has been applied is expressed in A-weighted decibels, or dBA. For reference, the A-weighted sound pressure level and subjective loudness associated with some common sound sources are listed in Table 1-1. The C-weighting scale has more of an emphasis on low frequency content than the A-weighting scale and is generally used to describe the low frequency characteristics of sound levels (e.g., “rattling” or “rumbling” associated with sound levels).

Sound in the environment is constantly fluctuating, as when a car drives by, a dog barks, or a plane passes overhead. Therefore, sound metrics have been developed to quantify fluctuating environmental sound levels. These metrics include the exceedance sound level. The exceedance sound level is the sound level exceeded during “x” percent of the sampling period and is also referred to as a statistical sound level. Common exceedance sound level values are the 10-, 50-,90-percentile exceedance sound levels, denoted by L_{10}, L_{50}, and L_{90}. The equivalent-continuous sound level (L_{eq}) is the arithmetic average of the varying sound over a given time period and is the most common metric used to describe sound. The USEPA uses a noise metric called the day-night average sound level (L_{dn}) which is a 24-hour average sound level, with a 10-dBA penalty applied to sound measured during nighttime hours (10:00 PM to 7:00 AM).

Table 1-1: Typical Sound Pressure Levels Associated with Common Sound Sources

Sound Pressure Level (dBA)	Subjective Evaluation	Environment
140	Deafening	Jet aircraft at 75 feet
130	Threshold of pain	Jet aircraft during takeoff at a distance of 300 feet
120	Threshold of feeling	Elevated train
110	Very loud	Jet flyover at 1,000 feet
100		Motorcycle at 25 feet
90	Moderately loud	Propeller plane flyover at 1,000 feet
80		Diesel truck (40 mph) at 50 feet
70	Loud	B-757 cabin during flight
60	Moderate	Air-conditioner condenser at 15 feet
50	Quiet	Private Office
40		Farm field with light breeze, birdcalls
30	Very quiet	Quiet residential neighborhood
20		Rustling leaves
10	Just audible	--
0	Threshold of hearing	--

Sources:
(1) Adapted from *Architectural Acoustics*, *M. David Egan, 1988*
(2) *Architectural Graphic Standards*, Ramsey and Sleeper, 1994

2.0 Applicable Regulations & Criteria

State and local noise regulations were reviewed to determine Project noise limits. The State of Kentucky, nor Pulaski County, have applicable noise requirements which limit noise from the Project. In the absence of local noise limits, Project sound levels can be compared to USEPA guidelines and the ANSI S12.9 standard.

2.1 USEPA Guidelines

In 1974 the USEPA published *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety.* As part of this document, the recommended noise limit is a day-night level, L_{dn}, of 55 dBA at the nearest noise sensitive receptors (i.e., residents). This would be equal to an equivalent continuous sound level, L_{eq}, of 48.6 dBA for a constant source operating continuously (i.e., 24-hours). The USEPA notes that these recommended sound levels are not to be construed as regulatory limits as they do not account for costs or feasibility associated with meeting these target sound levels. However, they are generally appropriate levels to protect the health and welfare of the community.

2.2 ANSI S12.9 Part 4

Since there is potential for low-frequency noise to be emitted from the Project, ANSI S12.9 Part 4 provides informative guidance for sounds with strong low-frequency content. Section D.2 states the following:

> *"Generally, annoyance is minimal when octave-band sound pressure levels are less than 65 dB at 16, 31.5, and 63-Hz midband frequencies."*

For sounds with strong low-frequency content, this would be approximately equivalent to a C-weighted sound level of 65 to 70 dBC.

3.0 Modeled Sound Levels

Operational sound levels for the proposed Project were performed using the Computer Aided Noise Abatement (CadnaA) modeling software. Equipment sound levels used for modeling were based on a combination of supplier provided data and in-house data based on experience with similar make and sized equipment. This model was used for determining expected sound levels due to the Project and the associated impacts to the existing ambient sound levels at the nearest noise sensitive receptors.

3.1 Sound Modeling Methodology and Input Parameters

Predictive noise modeling was performed using the industry-accepted sound modeling software CadnaA, version 2024. The software is a scaled, three-dimensional program, which considers air absorption, terrain, ground absorption, and reflections and shielding for each piece of noise-emitting equipment, and then predicts sound pressure levels at discrete locations and over a gridded area based on input source sound levels. The model calculates sound propagation based on International Organization for Standardization (ISO) 9613-2:2024, General Method of Calculation. ISO 9613-2 assesses the sound level propagation based on the octave band center-frequency range from 31.5 to 8,000 Hz.

The ISO standard considers sound propagation and directivity. The sound-modeling software calculates omnidirectional, downwind sound propagation using worst-case directivity factors, in tandem with user-specified directivities and propagation properties. Empirical studies accepted within the industry have demonstrated that modeling may over-predict sound levels in certain directions, and as a result, modeling results generally are considered a conservative measure of the Project's actual sound level.

The modeled atmospheric conditions were assumed to be calm, and the temperature and relative humidity were left at the program's default values. Reflections and shielding were considered for sound waves encountering physical structures. Sound levels around the site can be influenced by the sound reflections from physical structures onsite. The area surrounding the Project has mild elevation changes, which scatter and absorb the sound waves. Thus, terrain was included to account for surface effects such as ground absorption. Average ground absorption for the Project site and surrounding area was set to a value of 0.5 to account for the mix of hard pavement and soft vegetative ground. The modeling assumptions are outlined in Table 3-1. This model is exclusive of noise sources not associated with the Project (e.g., traffic noise and local fauna). Only Project sound levels have been evaluated.

The Project general arrangement is included as Figure A-1 of Appendix A. The modeled equipment octave-band sound levels for each piece of equipment are included in Appendix B. A summary of the Project's expected acoustical design is shown in Table 3-2.

Table 3-1: Sound Modeling Parameters

Model Input	Parameter Value
Ground Absorption	0.5
Number of Reflections	2
Receptor Height	5 feet above grade
Terrain	USGS topographic land data
Temperature	50 °F
Humidity	70%

Table 3-2: Project Expected Acoustical Design

Equipment	QTY	Base Sound Level	Notes
Siemens Equipment			
Exhaust Stack Exit	2	L_w = 104 dBA	Upgraded silencers
Combustion Turbine Train[a]	2	L_p = 85 dBA at 3 feet	See appendix for full package incl. aux skids
Water Injection Skid	2	L_w = 95 dBA	Low-noise enclosure
Fuel Oil Pump Skid	2	L_w = 96 dBA	Low-noise enclosure
Steam Turbine Building Interior[b]	1	L_p = 90 dBA average interior	Standard insulated metal panel (STC 35)[c]
BOP Equipment			
New Cooling Tower	1	L_p = 61 dBA at 400 feet	Low-noise fans and splash mats
Boiler Feed Pumps	4	L_p = 85 dBA at 3 feet	Low-noise enclosure
All Pumps, valves, etc.	Varies	L_p = 85 dBA at 3 feet	

*L_w – sound power level, L_p – sound pressure level at distance
a) Includes HRSG, Stack Exit, Gas Turbine, Generator, and Intake. Doesn't include auxiliary skids. See appendix for full package equipment sound levels.
b) Includes Steam Turbine, Generator, Condenser, and associated equipment inside building.
c) Steam Turbine building assumed to have insulated metal panel wall/roof with minimum sound transmission class rating (STC) of 35.

3.2 Sound Modeling Results

The Project will operate at fairly constant sound levels when operational. Therefore, steady-state sound level predictions were completed. The predicted overall steady-state operational A-weighted sound levels, which do not include contributions from ambient sound sources, are shown with 5-dB contours in Figure A-2 of Appendix A. The predicted C-weighted sound level contours are shown in Figure A-3. The Project-generated sound levels were also calculated at the nearest residential properties. Table 3-3 show the predicted Project sound levels at the nearest residential receptors.

Table 3-3: Modeled Sound Levels – Base Design New Cooling Tower

Receptor Name	Industry Noise Guidelines		Project-Only Sound Levels	
	USEPA Guidelines [a] (dBA)	Industry dBC Recommendation [b] (dBC)	(dBA)	(dBC)
R1	48.6	65-70	55	75
R2			43	66
R3			41	67

a) USEPA guidelines is recommended 55 dBA L_{dn} (48.6 dBA L_{eq}).
b) Industry recommended 65-70 dBC equivalent limit to reduce potential for low frequency impacts (ANSI S12.9).

Although Project sound levels are expected to slightly exceed the recommended sound levels at R1, additional mitigation may not be considered feasible from a cost or performance basis since the USEPA and ANSI recommended levels are only for guidance and not a regulatory limit.

4.0 Conclusions

Burns & McDonnell conducted a preliminary sound study for the proposed EKPC Cooper Project. This preliminary study consists of predictive sound modeling of the Project to analyze potential offsite sound impacts from operation of the Project.

There are no regulatory noise limits for the Project. Recommendations from the USEPA and ANSI S12.9 could be used as guidance to minimize potential for A-weighted and C-weighted sound level impacts on the nearby residential receptors. The Project, as currently designed with low-noise options included, is expected to be below these guidelines at all receptors except near R1, where the sound levels are expected to slightly exceed these guideline sound levels.

The base design incorporates significant low-noise mitigation options to the stack exhaust silencer, the cooling tower, and some of the more significant noise source auxiliary skids. Additional mitigation may not be feasible or reasonable, as the USEPA and ANSI guidelines are not regulatory limits and should only be used as guidance to help minimize potential noise impacts from the Project to the nearby residential receptors.

APPENDIX A – FIGURES

Figure A-1 - General Arrangement

PRELIMINARY - NOT FOR CONSTRUCTION

no.	date	by	chkd	description
E	01/17/24	CWR	-	PRELIMINARY
D	12/12/23	CWR	-	PRELIMINARY
C	12/01/23	CWR	-	PRELIMINARY
B	11/20/23	CWR	-	PRELIMINARY
A	10/16/23	WRI	-	PRELIMINARY
K	08/08/24	TLB	-	ISSUED WITH PROJECT SCOPING REPORT
J	05/28/24	CWR	-	ISSUED WITH PROJECT SCOPING REPORT
H	05/02/24	CWR	-	ISSUED WITH PROJECT SCOPING REPORT
G	03/15/24	CWR	-	PRELIMINARY
F	02/19/24	CWR	-	PRELIMINARY

OVERALL SITE PLAN

SCALE: 0 100' 200' (1" = 200')

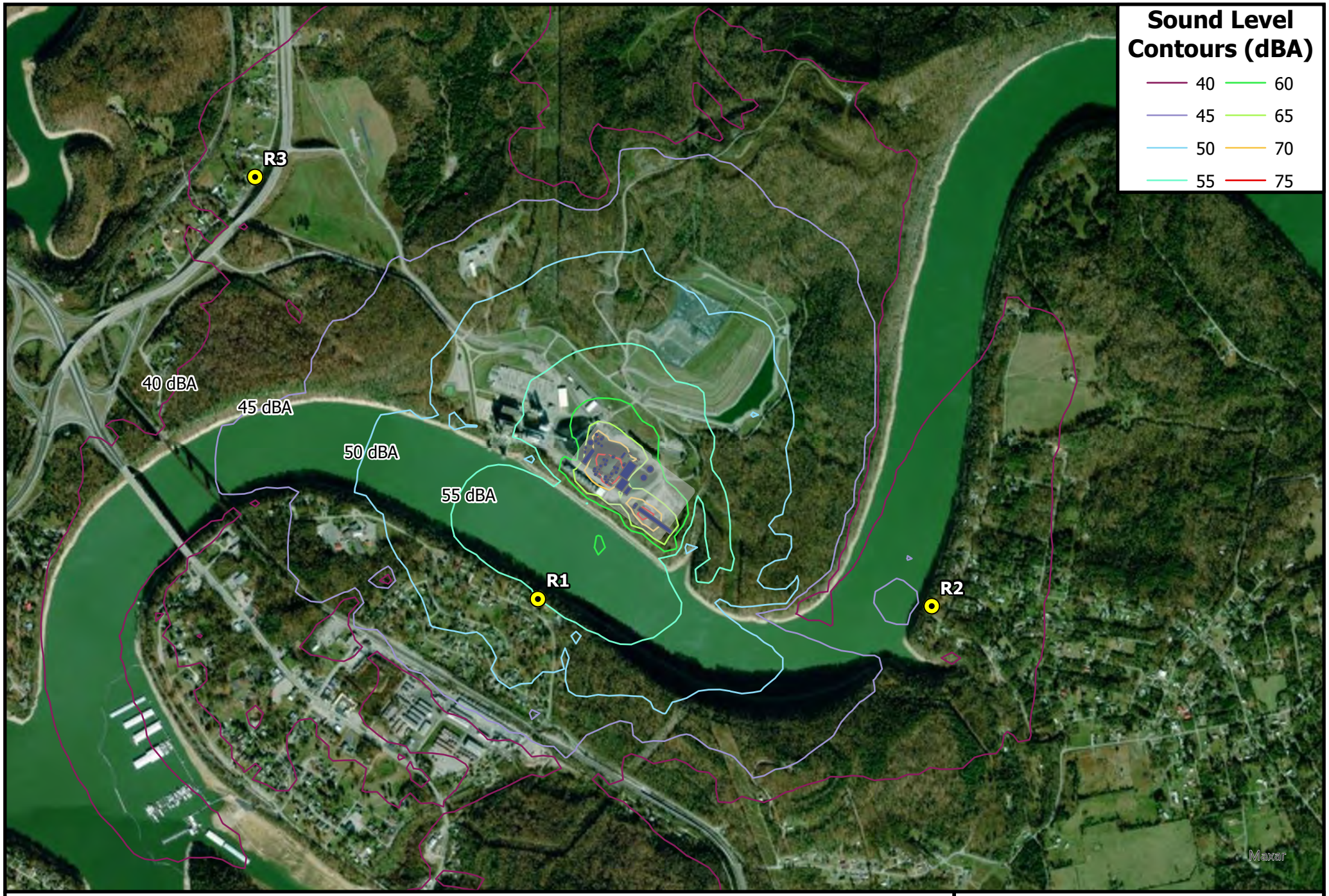
NORTH

BURNS McDONNELL
9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
Burns & McDonnell Engineering Company, Inc.
FIRM LICENSE NO.
designed: W. LESNIAK
detailed:

PULASKI COUNTY, KENTUCKY

COOPER POWER PLANT
2 x1 CCGT PLANT
OVERALL SITE PLAN NEW COOLING TOWER
BASED ON SIEMENS GTG's

project: 157787
contract:
drawing: GA200
rev.: K
sheet: of sheets:
file: 157787_2X1-SIEMENS-COOPER-GA200.DWG



LEGEND

- Structures
- Project Area
- Receptors

REFERENCE

0 0.2 0.4
MILES

0 0.2 0.4
KILOMETERS

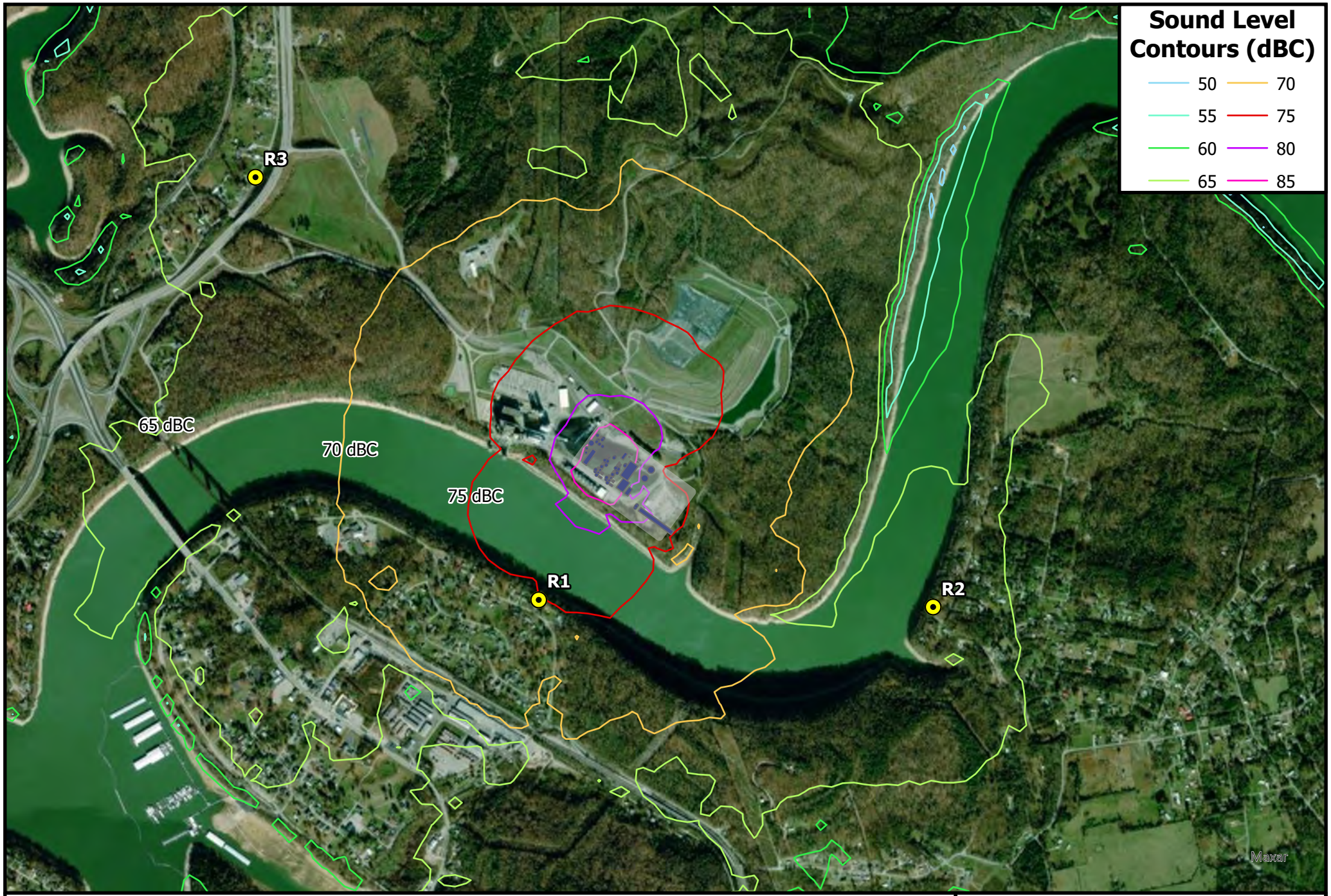
N

Figure A-2 - Project Sound Level Contours (dBA)

LOCATION:	Pulaski County, KY
PROJECT:	EKPC Cooper
PROJ. NO.:	157787
CREATED:	10/24/2024

BURNS McDONNELL
www.burnsmcd.com

Path: Z:\Clients\ENR\EKPC\157787_SMITHCCGTSTUDY\7_Studies\Permitting\Modeling\Noise\GIS\EKPC Cooper\EKPC Cooper.aprx



LEGEND

- Structures
- Project Area
- Receptors

REFERENCE

0 0.2 0.4
MILES

0 0.2 0.4
KILOMETERS

N

Figure A-3 - Project Sound Level Contours (dBC)

LOCATION:	Pulaski County, KY
PROJECT:	EKPC Cooper
PROJ. NO.:	163618
CREATED:	10/24/2024

BURNS McDONNELL
www.burnsmcd.com

Path: Z:\Clients\ENR\EKPC\157787_SMITHCCG\TSTUDY\7_Studies\Permitting\Modeling\Noise\GIS\EKPC Cooper\EKPC Cooper.aprx

APPENDIX B – MODELED SOUND POWER LEVELS

Appendix B - Modeled Sound Power Levels

EKPC

Cooper Power Plant Expansion

Name	Number of Sources	Sound Power Level (dB)[1] Octave Band Frequency (Hz) 31.5	63.0	125	250	500	1000	2000	4000	8000	Overall (dBA)	Notes
Air Compressor	2	90	89	89	88	91	94	94	92	89	**100**	Estimated 85 dBA @ 3ft
Cooling Tower Aux Pump	1	87	88	89	91	91	94	91	87	81	**98**	Estimated 85 dBA @ 3ft
Circulating Water Pump	2	93	94	95	97	97	100	97	93	87	**104**	Estimated 85 dBA @ 3ft
Dew Point Exaust Stack	2	119	101	93	88	89	95	93	92	91	**100**	In-house
Forwarding Pump	4	87	88	89	91	91	94	91	87	81	**98**	Estimated 85 dBA @ 3ft
Fuel Gas Separator	2	105	97	96	89	85	86	84	81	76	**91**	Estimated 85 dBA @ 3ft
Fuel Oil Heaters	2	105	97	96	89	85	86	84	81	76	**91**	In-house
Gas Valve	1	104	100	89	81	80	86	88	91	89	**96**	Estimated 85 dBA @ 3ft
GT Air Discharge Vents	4	89	98	93	92	89	94	99	91	86	**102**	In-house
GT Air Inlet Vents	4	89	98	93	93	90	93	98	91	87	**101**	In-house
HRSG Blowdown Tank Exhaust	2	103	98	100	93	93	91	94	91	88	**99**	Estimated 85 dBA @ 3ft
HRSG Steam Vent	2	103	98	100	93	93	91	94	91	88	**99**	Estimated 85 dBA @ 3ft
Recirc Pump	2	87	88	89	91	91	94	91	87	81	**98**	Estimated 85 dBA @ 3ft
SEE Transformer	2	78	86	87	94	85	75	69	59	50	**87**	Estimated 75 dBA @ 3ft
SFC Transformer	2	78	86	87	94	85	75	69	59	50	**87**	Estimated 75 dBA @ 3ft
Exhaust Stack Exit - Mitigated	2	129	117	114	109	99	85	70	75	70	**104**	In-house Silencer Data
Fuel Gas Piping	1	104	100	89	81	80	86	88	91	89	**96**	Estimated 85 dBA @ 3ft
Performance Heater	2	105	97	96	89	85	86	84	81	76	**91**	In-house
Air Inlet Duct	2	109	105	101	92	85	100	84	86	93	**101**	Estimated 75 dBA @ 3ft
Ammonia Flow Skid	2	87	88	89	91	91	94	91	87	81	**98**	Estimated 85 dBA @ 3ft
Aux Transformer	3	84	92	93	100	91	81	75	65	56	**93**	Estimated 75 dBA @ 3ft
BFP	2	92	93	94	96	96	99	96	92	86	**103**	Estimated 93 dBA @ 3ft
Cooling Tower Fan Deck (Mit CT)	1	72	85	95	99	101	102	95	91	85	**104**	Mitigated (61 dBA @ 400 ft)
Cooling Tower Intake (Mit CT)	2	59	78	85	90	89	93	95	96	93	**101**	
Dew Point Heater	2	109	101	100	93	89	90	88	85	80	**95**	Estimated 75 dBA @ 3ft
Exhaust Diffuser & Exp Duct	2	133	126	115	116	112	106	105	102	82	**114**	In-house
Fuel Oil Pump Skid (Mit)		88	88	89	90	91	89	91	89	83	**96**	Mitigated (e.g., low-noise enclosure)
Generator	2	111	118	110	93	88	86	88	85	77	**98**	Estimated 75 dBA @ 3ft
GSUT	2	97	105	106	103	104	94	88	78	69	**103**	Estimated 85 dBA @ 3ft
GT Enclosure	2	94	99	91	87	82	86	90	84	75	**94**	In-house
HRSG Body	2	131	132	117	113	108	104	99	99	82	**111**	In-house
Lube Oil Package	2	94	94	100	95	97	92	89	85	80	**98**	In-house
Roto Air Cooler	2	107	105	100	96	94	89	85	83	79	**96**	In-house
ST Building Interior sound pressure level	1	97	96	97	91	86	84	82	81	77	**91**	Average Interior Sound Pressure Level
Steam Turbine Step Up Xfmr	1	97	105	106	103	104	94	88	78	69	**103**	Estimated 85 dBA @ 3ft
Water Injection Pump Skid (Mit)	2	89	90	87	87	87	87	88	90	83	**95**	Mitigated (e.g., low-noise enclosure)
Water Treatment Building Interior	1	74	75	76	78	78	81	78	74	68	**85**	Average Interior Sound Pressure Level
GT Filter Face	1	121	115	108	102	90	92	81	97	104	**105**	In-house
Exhaust Stack Casing (Lower Section)	2	114	109	99	100	92	93	88	86	69	**98**	In-house

Notes:

1. All sound levels are inclusive of Project designed noise mitigation. Interior sound levels are average sound pressure levels.


BURNS McDONNELL

APPENDIX D – TRAFFIC STUDY

Technical Memorandum

Date: November 5, 2024

To: East Kentucky Power Cooperative, Inc.

From: Burns & McDonnell

Subject: EKPC Cooper Traffic Assessment

Table of Contents

Project Description

East Kentucky Power Cooperative, Inc. (EKPC) plans to construct and operate the Cooper Combined Cycle at the existing Cooper Station located in Somerset, KY. This facility will have a 24-hour staffed control room and on-site maintenance personnel. Construction is set to begin in July 2027 and is anticipated to be completed in December 2030. This traffic study analyzes the construction and permanent traffic generated by the facility and sight distance availability at the intersection of KY 1247 and C Vanhook Rd.

The intersection of KY 1247 and C Vanhook Rd will be impacted by the site traffic and has been modeled and reviewed for capacity. KY 1247 is a north-south 4-lane highway with a two-way left turn lane, no pedestrian facilities, and a posted speed limit of 55 mph. C Vanhook Rd is an east-west 2-lane road with an assumed speed limit of 25 mph. KY 1247 is free-flowing, while C Vanhook Rd is stop-controlled. A site map is provided in Appendix A.

Existing Traffic Volumes

Traffic counts were collected utilizing available Kentucky Transportation Cabinet (KYTC) traffic volume data to establish historical daily traffic volumes in the project area. 2019 KYTC traffic counts on KY 1247, approximately 1.6 miles north of the intersection of KY 1247 and C Vanhook Rd, indicate the following volume data that was used to support this assessment. The raw data is provided in Appendix B, and an existing volume diagram is provided in Appendix C.

- AADT – 7,528
- K Factor – 9.50
- D Factor – 51.00
- % Trucks – 11.18%

Additionally, an elementary school, previously located on the other side of the river, is being constructed and relocated near the site. The traffic effects were assumed to be part of the background growth and any overlap in traffic is likely limited to the AM peak hour.

Vehicle Trip Generation

Historic ADT volumes from Kentucky Transportation Cabinet (KYTC) were used to calculate a growth rate for KY 1247. Based on these 2016 and 2019 traffic volumes, an annual growth rate of 1.78% was determined.

Existing conditions experience 62 vehicles entering and exiting the site during peak hours. During peak construction, an estimated 630 vehicles are expected during both AM and PM peak hours. After construction is completed, the permanent traffic during peak hours is anticipated to increase to approximately 80 vehicles. A North-South split of 51%/49% is used for existing traffic volume. This is expected to be the same split used for vehicles generated by construction. Note the following considerations and assumptions for this memo:

- It is assumed that all employees and construction vehicles enter the site at the KY 1247 and C Vanhook Rd intersection.
- All vehicles are assumed to enter and exit the site during the AM and PM peak hours, respectively. While the construction peak hour likely precedes the roadway peak hour, this assumption will be utilized to ensure a conservative analysis.
- The higher directional volume is assumed to be traveling to the site from the south in the AM and returning to the south in the PM. This assumption is made because traffic traveling to and from Somerset would split to access the site from either the north or south, depending on the location within the city, while traffic from the smaller cities of Burnside and Tateville would approach from the south.
- It is assumed that construction workers will arrive semi-linearly throughout the AM and PM peak hours and not all at once, similar to a shift change. If workers arrive simultaneously in the AM and depart simultaneously in the PM, it may significantly negatively impact traffic operations.
- The 630 peak construction vehicles are anticipated to be personal vehicles, not heavy trucks. Heavy truck material deliveries are primarily assumed to occur during off-peak hours and enter the site via Access Rd No. 2.
- All traffic on C Vanhook Rd is assumed to be traffic associated with the Cooper Power Plant.
- Because the most recent KYTC traffic counts on KY 1247 are 2019 counts, a growth rate of 1.78% per year will be used to predict existing and future volumes. This growth rate is calculated based on previous KYTC traffic counts at the same location.
- Peak construction and permanent conditions are assumed to be in the year 2030. KY 1247 volumes are projected by applying the 1.78% annual growth rate to the 2019 baseline counts, resulting in estimated traffic volumes for both the peak construction period and for long-term operational use in 2030.

The future traffic volumes during the existing, peak construction, and permanent conditions are summarized in Table 1 below.

Table 1: Intersection AM & PM Peak Hour Volumes

	Movement Volume - AM						Movement Volume - PM					
2024 Existing Conditions	WBL	0	NBL	0	SBL	31	WBL	32	NBL	0	SBL	0
	WBT	0	NBT	399	SBT	383	WBT	0	NBT	383	SBT	399
	WBR	0	NBR	32	SBR	0	WBR	31	NBR	0	SBR	0
2030 Construction Conditions	WBL	0	NBL	0	SBL	309	WBL	322	NBL	0	SBL	0
	WBT	0	NBT	444	SBT	426	WBT	0	NBT	426	SBT	444
	WBR	0	NBR	322	SBR	0	WBR	309	NBR	0	SBR	0
2030 Permanent Conditions	WBL	0	NBL	0	SBL	40	WBL	41	NBL	0	SBL	0
	WBT	0	NBT	444	SBT	448	WBT	0	NBT	426	SBT	444
	WBR	0	NBR	41	SBR	0	WBR	40	NBR	0	SBR	0

Volume diagrams during existing conditions, peak construction conditions, and permanent conditions are also provided in Appendix C.

Traffic Operations Analysis

Synchro 12 was used to analyze the level of service, delay, and queue lengths of the critical roadways serving the project site. Synchro 12 uses the Highway Capacity Manual (HCM) 7th Edition methodology to determine the level of service. Table 2 presents the level of service results during existing conditions, peak construction conditions, and permanent conditions.

Table 2: AM & PM Peak Hour Intersection Analysis

	Metric	Overall		Turning Movement AM (PM)											
		AM (PM)		WBL		WBR		NBT		NBR		SBL		SBT	
2024 Existing Conditions	LOS	A	(A)	A	(B)	A	(B)	A	(A)	A	(A)	A	(A)	A	(A)
	Delay (sec)	0.3	(0.9)	0	(11.5)	0	(11.5)	0	(0)	0	(0)	8.4	(0)	0	(0)
	95th Percentile Q (veh)	-	-	0	(0.4)	0	(0.4)	0	(0)	0	(0)	0.1	(0)	0	(0)
2030 Construction Conditions	LOS	A	(E)	A	(F)	A	(F)	A	(A)	A	(A)	B	(A)	A	(A)
	Delay (sec)	2.6	(48.9)	0	(116.4)	0	(116.4)	0	(0)	0	(0)	12.6	(0)	0	(0)
	95th Percentile Q (veh)	-	-	0	(23.3)	0	(23.3)	0	(0)	0	(0)	2.1	(0)	0	(0)
2030 Permanent Conditions	LOS	A	(A)	A	(B)	A	(B)	A	(A)	A	(A)	A	(A)	A	(A)
	Delay (sec)	0.4	(1)	0	(12.2)	0	(12.2)	0	(0)	0	(0)	8.6	(0)	0	(0)
	95th Percentile Q (veh)	-	-	0	(0.5)	0	(0.5)	0	(0)	0	(0)	0.1	(0)	0	(0)

The Synchro analysis indicates that, for existing and permanent conditions, the intersection of KY 1247 and C Vanhook Rd is expected to operate at LOS B or better operations and with minimal 95th percentile queues during both peak hours. LOS D or better operations are typically considered acceptable during existing conditions and LOS E or better typically considered acceptable during permanent conditions. Therefore, no permanent mitigation is needed. The analysis also indicates that the PM peak hour during peak construction will see unacceptable operations for vehicles exiting the site. In particular, the left turning movement from C Vanhook Rd onto KY 1247 SB will experience significant delays and long queues. To address this LOS, see the Alternatives Analysis section. Full Synchro reports are provided in Appendix D.

Alternatives Analysis

Given the delays during construction and insufficient sight distance, two alternatives should be explored:

- **Alternative 1**: Provide additional site access via Access Rd No. 2.
- **Alternative 2**: Provide a temporary turn lane on C Vanhook Rd.

Alternative 1

The preferred alternative is to provide additional site access via Access Rd No. 2 in addition to C Vanhook Rd. All existing employees will continue to use the C Vanhook Rd entrance, but construction vehicles will split evenly between the two entrances. In this alternative, both intersections will remain unsignalized. The AM & PM peak hour volumes are provided below in Table 3, and Synchro intersection results are summarized below in Table 4. The analysis of this concept results in a LOS A for the peak construction traffic demand, with an acceptable LOS C or better for all movements.

Table 3: Alternative 1 AM & PM Peak Hour Volumes

		Movement Volume - AM						Movement Volume - PM					
2030 Construction Conditions Alternative 1	KY 1247 & C Vanhook Rd	WBL	0	NBL	0	SBL	170	WBL	177	NBL	0	SBL	0
		WBT	0	NBT	589	SBT	426	WBT	0	NBT	426	SBT	589
		WBR	0	NBR	177	SBR	0	WBR	170	NBR	0	SBR	0
	KY 1247 & Access Rd No. 2	WBL	0	NBL	0	SBL	139	WBL	145	NBL	0	SBL	0
		WBT	0	NBT	444	SBT	596	WBT	0	NBT	596	SBT	444
		WBR	0	NBR	145	SBR	0	WBR	139	NBR	0	SBR	0

Table 4: Alternative 1 AM & PM Peak Hour Intersection Analysis

		Metric	Overall		Turning Movement AM (PM)											
			AM (PM)		WBL		WBR		NBT		NBR		SBL		SBT	
2030 Construction Conditions Alternative 1	KY 1247 & C Vankhook Rd	LOS	A	(A)	A	(C)	A	(C)	A	(A)	A	(A)	B	(A)	A	(A)
		Delay (sec)	1.3	(5.9)	0	(23.1)	0	(23.1)	0	(0.0)	0	(0)	10.8	(0)	0	(0.0)
		95th Percentile Q (veh)	-	-	0	(4.9)	0	(4.9)	0	(0.0)	0	(0)	0.9	(0)	0	(0.0)
	KY 1247 & Access Rd No. 2	LOS	A	(A)	A	(C)	A	(C)	A	(A)	A	(A)	A	(A)	A	(A)
		Delay (sec)	1	(5.2)	0	(24.1)	0	(24.1)	0	(0.0)	0	(0)	9.6	(0)	0	(0)
		95th Percentile Q (veh)	-	-	0	(4.3)	0	(4.3)	0	(0)	0	(0)	0.6	(0)	0	(0)

Alternative 2

An additional alternative is to construct a temporary lane to split left turns and right turns from C Vanhook Rd onto KY 1247. This could help to reduce delays and clear queues quicker at this intersection. A sketch of this concept is provided in Appendix E.

The analysis of this concept results in an LOS A for the peak construction traffic demand, with an acceptable LOS D or better for all movements. The Synchro intersection results are summarized below in Table 5. The full AM and PM peak hour Synchro reports are provided in Appendix D.

Table 5: Alternative 2 AM & PM Peak Hour Intersection Analysis

		Metric	Overall		Turning Movement AM (PM)											
			AM (PM)		WBL		WBR		NBT		NBR		SBL		SBT	
2030 Construction Conditions Alternative 2	KY 1247 & C Vankhook Rd	LOS	A	(A)	A	(D)	A	(B)	A	(A)	A	(A)	B	(A)	A	(A)
		Delay (sec)	2.6	(9.3)	0	(30.6)	0	(13.1)	0	(0)	0	(0)	12.6	(0)	0	(0)
		95th Percentile Q (veh)	-	-	0	(6.0)	0	(2.2)	0	(0)	0	(0)	2.1	(0)	0	(0)

Sight Distance Evaluation

A desktop sight distance evaluation was performed at the intersection of KY 1247 and C Vanhook Rd. The required sight distance was determined based on procedures outlined in *A Policy on Geometric Design of Highways and Streets*, published by the American Association of State Highway and Transportation Officials (AASHTO). The available sight distance, as evident from a desktop review, was then compared to the minimum required stopping sight distance (SSD) and intersection sight distance (ISD) for the design speed of 55 mph for KY 1247.

The calculated ISD for this intersection is 930’ and the calculated SSD for the intersection is 513’. Based on the desktop review, the available sight distance to/from the north is approximately 480’. The full evaluation is provided in Appendix F.

Conclusions

The peak construction workforce levels at the proposed facility are expected to be 630 employees during both AM and PM peak hours and reduced to 80 employees after construction. A capacity analysis of the intersection of KY 1247 and C Vanhook Rd indicates significant delays during the peak construction PM peak hour, however, roadway capacity after construction is satisfactory. To alleviate the delays during construction, two alternatives were evaluated. The recommended alternative is to have the construction traffic use both the north and south intersections. Additionally, a desktop sight distance assessment was conducted for the intersections. If the sight distance becomes a concern or issue, mitigation measures can be put in place these may include an intersection warning system, signal, or other alternative intersection design.

APPENDIX

APPENDIX A

Site Map

05.7 Site Access Plan

- MATERIAL LAYDOWN SPACE
- CRAFT & STAFF TRAILER AREAS
- WAREHOUSE/ LAYDOWN AREA
- CRAFT PARKING
- STAFF PARKING

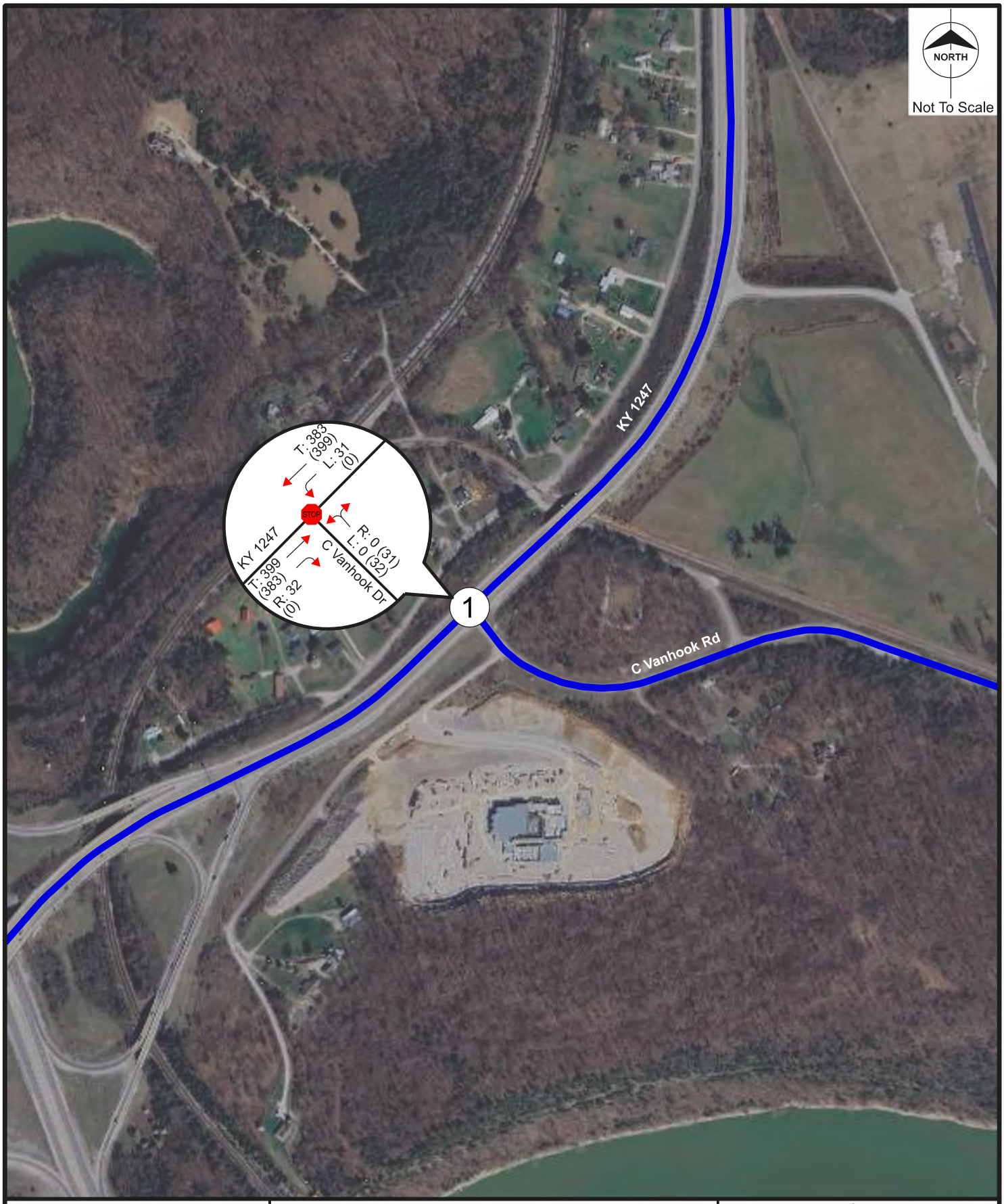
APPENDIX B

KYTC Traffic Volume Data


1247
Info
(1 of 2)
Clear
Zoom to
Clear Selected
100-KY 1247 -000
Route 100-KY-1247 -000
Beginning Milepoint 0.000
Ending Milepoint 3.950
County Pulaski
Station ID 100368
Station Type Classification
AADT 7,526
Year 2019
Single Truck AADT 477.00
Combo Truck AADT 365.00
% Single Trucks 6.34
% Combo Trucks 4.84
% Peak Trucks Single 0.41
% Peak Trucks Combo 0.07
K Factor 9.50
D Factor 51.00

APPENDIX C

Volume Diagrams



BURNS McDONNELL

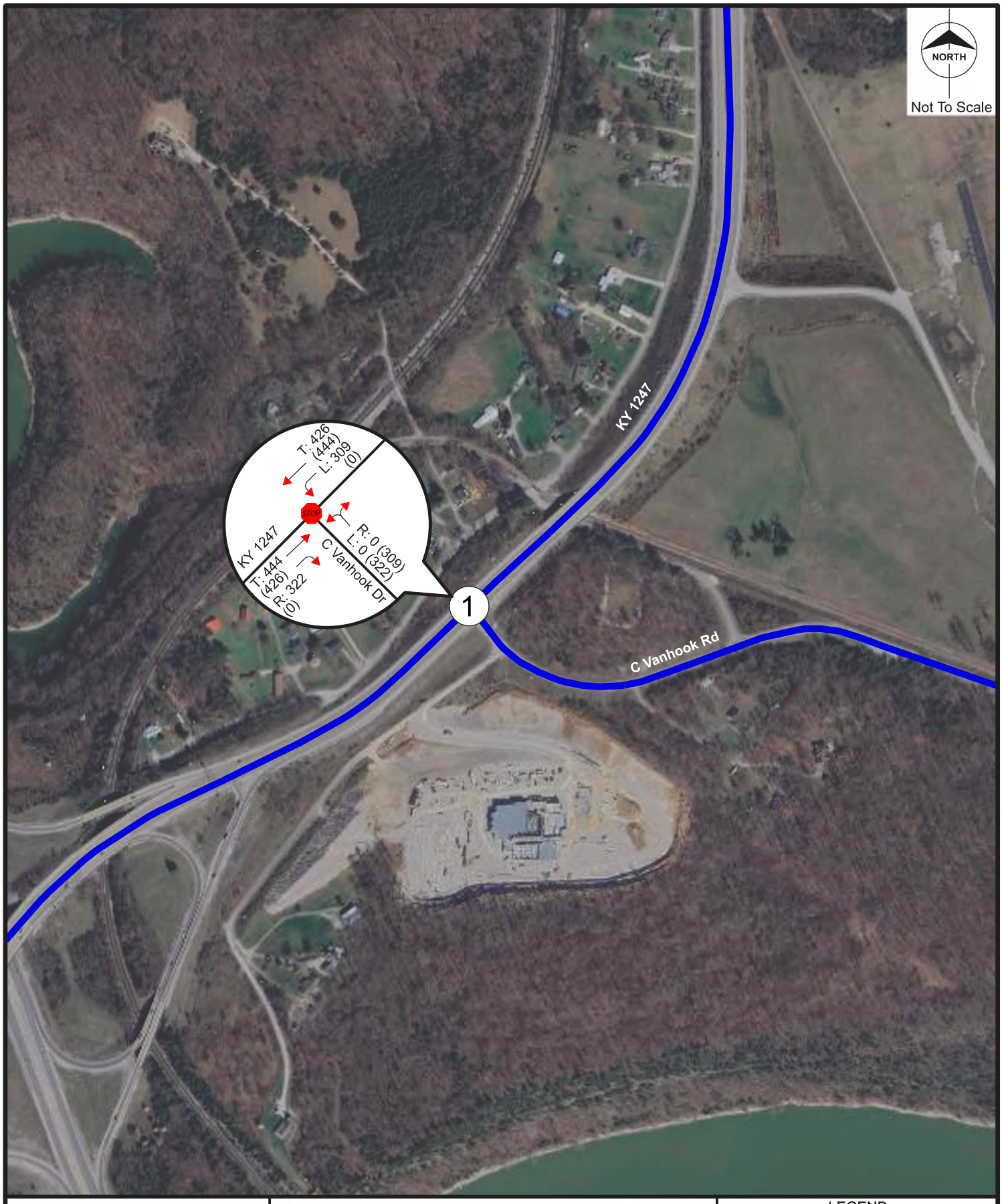
date	October 2024
designed	B. White

Cooper EKPC
Traffic Assessment Figure

2024 Current Conditions
Lane Use, Traffic Control & Volumes

LEGEND

X	Study Intersection
STOP	Stop Controlled
	Study Area
XX (XX)	AM (PM) Peak Hour Volumes



BURNS McDONNELL

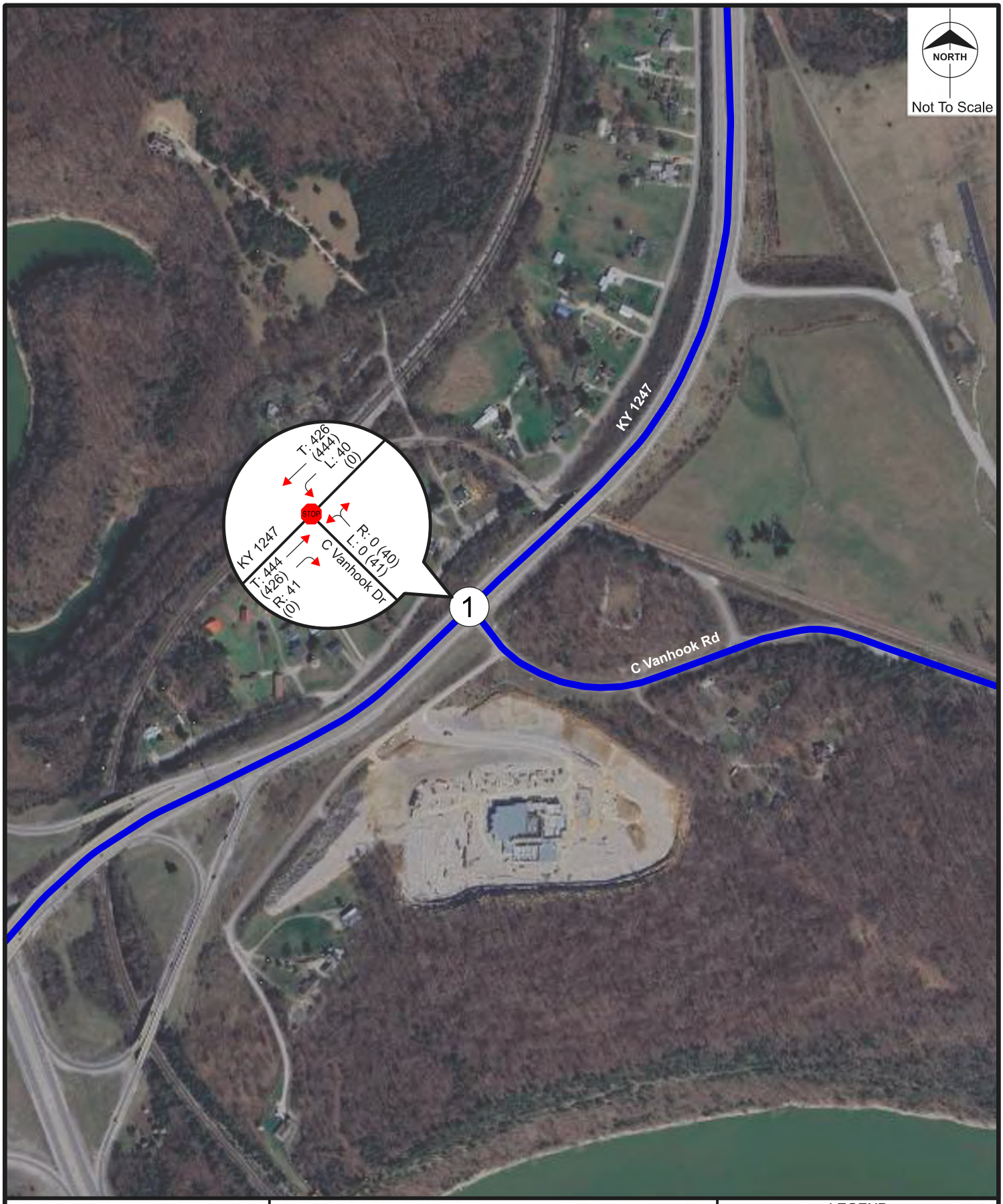
date	October 2024
designed	B. White

Cooper EKPC
Traffic Assessment Figure

2030 Peak Construction Conditions
Lane Use, Traffic Control & Volumes

LEGEND

X	Study Intersection
STOP	Stop Controlled
	Study Area
XX (XX)	AM (PM) Peak Hour Volumes



BURNS McDONNELL

date	October 2024
designed	B. White

Cooper EKPC
Traffic Assessment Figure

2030 Permanent Conditions
Lane Use, Traffic Control & Volumes

LEGEND

X	Study Intersection
STOP	Stop Controlled
	Study Area
XX (XX)	AM (PM) Peak Hour Volumes

APPENDIX D

Synchro Reports

Intersection	
Int Delay, s/veh	0.3

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	0	0	399	32	31	383
Future Vol, veh/h	0	0	399	32	31	383
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	11	0	0	11
Mvmt Flow	0	0	434	35	34	416

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	727	234	0	0	468	0
Stage 1	451	-	-	-	-	-
Stage 2	276	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	364	774	-	-	1104	-
Stage 1	614	-	-	-	-	-
Stage 2	752	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	352	774	-	-	1104	-
Mov Cap-2 Maneuver	463	-	-	-	-	-
Stage 1	614	-	-	-	-	-
Stage 2	729	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s/v	0	0	0.63
HCM LOS	A		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	-	1104	-
HCM Lane V/C Ratio	-	-	-	0.031	-
HCM Control Delay (s/veh)	-	-	0	8.4	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.9

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	32	31	383	0	0	399
Future Vol, veh/h	32	31	383	0	0	399
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	11	0	0	11
Mvmt Flow	35	34	416	0	0	434

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	633	208	0	0	416	0
Stage 1	416	-	-	-	-	-
Stage 2	217	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	417	804	-	-	1154	-
Stage 1	640	-	-	-	-	-
Stage 2	804	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	417	804	-	-	1154	-
Mov Cap-2 Maneuver	509	-	-	-	-	-
Stage 1	640	-	-	-	-	-
Stage 2	804	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s/v	11.51	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	622	1154	-
HCM Lane V/C Ratio	-	-	0.11	-	-
HCM Control Delay (s/veh)	-	-	11.5	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.4	0	-

Intersection	
Int Delay, s/veh	2.6

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	0	0	444	322	309	426
Future Vol, veh/h	0	0	444	322	309	426
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	11	0	0	11
Mvmt Flow	0	0	483	350	336	463

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1561	416	0	0	833	0
Stage 1	658	-	-	-	-	-
Stage 2	903	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	105	591	-	-	809	-
Stage 1	483	-	-	-	-	-
Stage 2	361	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	61	591	-	-	809	-
Mov Cap-2 Maneuver	157	-	-	-	-	-
Stage 1	483	-	-	-	-	-
Stage 2	211	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s/v	0	0	5.29
HCM LOS	A		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	-	809	-
HCM Lane V/C Ratio	-	-	-	0.415	-
HCM Control Delay (s/veh)	-	-	0	12.6	-
HCM Lane LOS	-	-	A	B	-
HCM 95th %tile Q(veh)	-	-	-	2.1	-

Intersection	
Int Delay, s/veh	48.9

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	322	309	426	0	0	444
Future Vol, veh/h	322	309	426	0	0	444
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	11	0	0	11
Mvmt Flow	350	336	463	0	0	483

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	704	232	0	0	463	0
Stage 1	463	-	-	-	-	-
Stage 2	241	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	376	777	-	-	1109	-
Stage 1	606	-	-	-	-	-
Stage 2	782	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	376	777	-	-	1109	-
Mov Cap-2 Maneuver	477	-	-	-	-	-
Stage 1	606	-	-	-	-	-
Stage 2	782	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s/veh	16.38	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	588	1109	-
HCM Lane V/C Ratio	-	-	1.166	-	-
HCM Control Delay (s/veh)	-	-	116.4	0	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	23.3	0	-

Intersection	
Int Delay, s/veh	0.4

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	0	0	444	41	40	426
Future Vol, veh/h	0	0	444	41	40	426
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	11	0	0	11
Mvmt Flow	0	0	483	45	43	463

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	823	264	0	0	527	0
Stage 1	505	-	-	-	-	-
Stage 2	318	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	316	741	-	-	1050	-
Stage 1	577	-	-	-	-	-
Stage 2	716	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	302	741	-	-	1050	-
Mov Cap-2 Maneuver	422	-	-	-	-	-
Stage 1	577	-	-	-	-	-
Stage 2	686	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s/v	0	0	0.74
HCM LOS	A		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	-	1050	-
HCM Lane V/C Ratio	-	-	-	0.041	-
HCM Control Delay (s/veh)	-	-	0	8.6	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0.1	-

Intersection	
Int Delay, s/veh	1

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	41	40	426	0	0	444
Future Vol, veh/h	41	40	426	0	0	444
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	11	0	0	11
Mvmt Flow	45	43	463	0	0	483

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	704	232	0	0	463	0
Stage 1	463	-	-	-	-	-
Stage 2	241	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	376	777	-	-	1109	-
Stage 1	606	-	-	-	-	-
Stage 2	782	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	376	777	-	-	1109	-
Mov Cap-2 Maneuver	477	-	-	-	-	-
Stage 1	606	-	-	-	-	-
Stage 2	782	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s/v	12.18	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	589	1109	-
HCM Lane V/C Ratio	-	-	0.149	-	-
HCM Control Delay (s/veh)	-	-	12.2	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.5	0	-

Intersection	
Int Delay, s/veh	1.3

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	0	0	589	177	170	426
Future Vol, veh/h	0	0	589	177	170	426
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	11	0	0	11
Mvmt Flow	0	0	640	192	185	463

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1338	416	0	0	833	0
Stage 1	736	-	-	-	-	-
Stage 2	601	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	147	591	-	-	809	-
Stage 1	440	-	-	-	-	-
Stage 2	516	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	113	591	-	-	809	-
Mov Cap-2 Maneuver	242	-	-	-	-	-
Stage 1	440	-	-	-	-	-
Stage 2	398	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s/v	0	0	3.07
HCM LOS	A		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	-	809	-
HCM Lane V/C Ratio	-	-	-	0.228	-
HCM Control Delay (s/veh)	-	-	0	10.8	-
HCM Lane LOS	-	-	A	B	-
HCM 95th %tile Q(veh)	-	-	-	0.9	-

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	444	145	139	596
Future Vol, veh/h	0	0	444	145	139	596
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	500	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	483	158	151	648

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1188	320	0	0	640	0
Stage 1	561	-	-	-	-	-
Stage 2	626	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	181	676	-	-	940	-
Stage 1	535	-	-	-	-	-
Stage 2	495	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	152	676	-	-	940	-
Mov Cap-2 Maneuver	281	-	-	-	-	-
Stage 1	535	-	-	-	-	-
Stage 2	416	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	0	0	1.81
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	940	-
HCM Lane V/C Ratio	-	-	-	0.161	-
HCM Control Delay (s/veh)	-	-	0	9.6	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0.6	-

Intersection	
Int Delay, s/veh	5.9

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	177	170	426	0	0	589
Future Vol, veh/h	177	170	426	0	0	589
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	11	0	0	11
Mvmt Flow	192	185	463	0	0	640

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	783	232	0	0	463	0
Stage 1	463	-	-	-	-	-
Stage 2	320	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	335	777	-	-	1109	-
Stage 1	606	-	-	-	-	-
Stage 2	715	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	335	777	-	-	1109	-
Mov Cap-2 Maneuver	450	-	-	-	-	-
Stage 1	606	-	-	-	-	-
Stage 2	715	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s/v	23.07	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	567	1109	-
HCM Lane V/C Ratio	-	-	0.665	-	-
HCM Control Delay (s/veh)	-	-	23.1	0	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	4.9	0	-

Intersection	
Int Delay, s/veh	5.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	145	139	596	0	0	444
Future Vol, veh/h	145	139	596	0	0	444
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	500	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	158	151	648	0	0	483

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	889	324	0	0	648	0
Stage 1	648	-	-	-	-	-
Stage 2	241	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	283	672	-	-	934	-
Stage 1	483	-	-	-	-	-
Stage 2	776	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	283	672	-	-	934	-
Mov Cap-2 Maneuver	388	-	-	-	-	-
Stage 1	483	-	-	-	-	-
Stage 2	776	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	24.12	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	489	934	-
HCM Lane V/C Ratio	-	-	0.631	-	-
HCM Control Delay (s/veh)	-	-	24.1	0	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	4.3	0	-

Intersection	
Int Delay, s/veh	2.6

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	0	0	444	322	309	426
Future Vol, veh/h	0	0	444	322	309	426
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	11	0	0	11
Mvmt Flow	0	0	483	350	336	463

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1561	416	0	0	833	0
Stage 1	658	-	-	-	-	-
Stage 2	903	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	105	591	-	-	809	-
Stage 1	483	-	-	-	-	-
Stage 2	361	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	61	591	-	-	809	-
Mov Cap-2 Maneuver	157	-	-	-	-	-
Stage 1	483	-	-	-	-	-
Stage 2	211	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s/v	0	0	5.29
HCM LOS	A		

Minor Lane/Major Mvmt	NET	NER	NWLn1	NWLn2	SWL	SWT
Capacity (veh/h)	-	-	-	-	809	-
HCM Lane V/C Ratio	-	-	-	-	0.415	-
HCM Control Delay (s/veh)	-	-	0	0	12.6	-
HCM Lane LOS	-	-	A	A	B	-
HCM 95th %tile Q(veh)	-	-	-	-	2.1	-

Intersection	
Int Delay, s/veh	9.3

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	322	309	426	0	0	444
Future Vol, veh/h	322	309	426	0	0	444
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	11	0	0	11
Mvmt Flow	350	336	463	0	0	483

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	704	232	0	0	463	0
Stage 1	463	-	-	-	-	-
Stage 2	241	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	376	777	-	-	1109	-
Stage 1	606	-	-	-	-	-
Stage 2	782	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	376	777	-	-	1109	-
Mov Cap-2 Maneuver	477	-	-	-	-	-
Stage 1	606	-	-	-	-	-
Stage 2	782	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s/v	22.05	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NER	NWLn1	NWLn2	SWL	SWT
Capacity (veh/h)	-	-	477	777	1109	-
HCM Lane V/C Ratio	-	-	0.734	0.432	-	-
HCM Control Delay (s/veh)	-	-	30.6	13.1	0	-
HCM Lane LOS	-	-	D	B	A	-
HCM 95th %tile Q(veh)	-	-	6	2.2	0	-

APPENDIX E

Alternative 2 Sketch

BURNS McDONNELL

date	October 2024
designed	B. White

Cooper EKPC
Traffic Assessment Figure

Alternative 2

APPENDIX F

Sight Distance Evaluation

Stopping Sight Distance

V = Speed (mph)
G = Grade (%)
t = Brake Reaction Time (s)
a = Deceleration Rate (ft/s^2)

V = 55 mph
G = -2 %
t = 2.5 s
a = 11.2 ft/s^2

Brake Reaction Distance = 1.47Vt = 1.47(55)(2.5)
Brake Reaction Distance = 205 ft

Braking Distance = $V^2/(30((a/32.2)+(G/100)))$ = $55^2/(30((11.2/32.2)+(-2/100)))$
Braking Distance = 308 ft

Stopping Sight Distance = Brake Reaction Distance + Braking Distance
Stopping Sight Distance = 513 ft

Source: A Policy on Geometric Design of Highways and Streets, 2018, 7th Edition, prepared by AASHTO, p. 3-4, 3-4.

Intersection Sight Distance

V = Speed (mph)
t_g = Time Gap (s)

V = 55 mph

t_g = 7.5 s Passenger Car Left Turn
t_g = 9.5 s Single-Unit Truck Left Turn
t_g = 11.5 s Combination Truck Left Turn

t_g = 6.5 s Passenger Car Right Turn
t_g = 8.5 s Single-Unit Truck Right Turn
t_g = 10.5 s Combination Truck Right Turn

Intersection Sight Distance = 1.47Vt = 1.47(55)(11.5)
Intersection Sight Distance = 930 ft (Combination Truck Left Turn)

Intersection Sight Distance = 1.47Vt = 1.47(55)(10.5)
Intersection Sight Distance = 850 ft (Combination Truck Right Turn)

Source: A Policy on Geometric Design of Highways and Streets, 2018, 7th Edition, prepared by AASHTO, p. 9-44, 9-45.

BURNS McDONNELL

date	October 2024
designed	B. White

Cooper EKPC
Traffic Assessment Figure

Intersection Sight Triangles

LEGEND

a_1 = 20.5 ft
a_2 = 56.5 ft
b_1 = 850 ft
b_2 = 930 ft

✳ Maximum Available Sight Distance


BURNS McDONNELL