SITE ASSESSMENT REPORT AND CUMULATIVE ENVIRONMENTAL ASSESSMENT

Battery Energy Storage System Project

Louisville Gas & Electric Company and Kentucky Utilities Company
E.W Brown Generating Station
815 Dix Dam Road
Harrodsburg, Kentucky 40330

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LIST OF ABBREVIATIONS

AADT	Annual Average Data Traffic
AKGWA	Assembled Kentucky Ground Water Database
BESS	Battery Energy Storage System
BLM	U.S. Bureau of Land Management
BMPs	Best Management Practices
CAA	Clean Air Act
CEA	Cumulative Environmental Assessment
CEMS	Continuous Emissions Monitoring
DB	Duct Burners
dBA	A-Weighted Decibel
DLN	Dry-Low-NO_X
DOW	Division of Water
FHWA	Federal Highway Administration
GHG	Greenhouse Gas
GPM	Gallons Per Minute
GSU	Generator Step-up Transformers
GT	Gas Combustion Turbine
HAPs	Hazardous Air Pollutants
HRSG	Heat Recovery Steam Generator
IDA	International Dark Sky Association
LG&E	Louisville Gas & Electric Company
KAR	Kentucky Administrative Regulations
KDAQ	Kentucky Division for Air Quality
KDEP	Kentucky Department for Environmental Protection
km/hr	Kilometers per Hour
KOP	Key Observation Points
KPDES	Kentucky Pollution Discharge Elimination System
KRS	Kentucky Revised Statutes
KU	Kentucky Utilities Company
KY	Kentucky Route
KYTC	Kentucky Transportation Cabinet
LAeq	A-Weighted Equivalent Sound Pressure
L_{dn}	Day-Night Sound Pressure
Leq	Equivalent Sound Pressure
Lmax	Maximum Sound Pressure
Lmin	Minimum Sound Pressure
LNBs	Low NO_X Burners
MMBtu	Million British Thermal Units
mph	Miles per Hour
MSD	Metropolitan Sewer District
MSL	Mean Sea Level
MW	Megawatts
NAAQS	National Ambient Air Quality Standards
NED	National Elevation Data
NESHAP	National Emission Standards for Hazardous Air Pollutants
NGCC	Natural Gas-fired Combined Cycle

NIST	National Institute of Standards and Technology
NSPS	New Source Performance Standards
PSD	Prevention of Significant Deterioration
Pc/h/ln	Passenger Cars per Hour per Lane
PVA	Mercer County Property Valuation Administrator
RCRA	Resource Conservation and Recovery Act
SAR	Site Assessment Report
SCR	Selective Catalytic Reduction
SIP	State Implementation Plan
SPCC	Spill Prevention, Control, and Countermeasure
ST	Steam Turbine
SWPPP	Stormwater Pollution Prevention Plan
USEPA	United States Environmental Protection Agency
USGS	U.S. Geologic Survey's
UTM	Universal Transverse Mercator
VRM	Visual Resources Management

1. INTRODUCTION

Louisville Gas and Electric Company (LG&E) is submitting this Site Assessment Report (SAR) and Cumulative Environmental Assessment (CEA) in compliance with KRS 278.708 and KRS 224.10-208. Kentucky Utilities Company (KU) currently operates an electric generation power plant, the E.W. Brown Generating Station (Brown Station), located in Mercer County, Kentucky. The current Brown Station facility consists of a coal boiler (Unit 3); seven natural gas-fired combustion turbines; coal, limestone, fly ash, PAC, and gypsum handling and storage operations; emergency equipment; miscellaneous organic liquids tanks; parts washers; cooling towers; general plant fugitive emissions; and numerous insignificant activities. In addition, the facility site includes an adjacent photovoltaic electrical generation installation, hydroelectric generation at the Dix Dam as well as an existing small scale battery electric storage test system and a small wind power generating plant.

LG&E is proposing to construct and operate a new approximately 125-megawatt (MW) battery energy storage system (BESS Facility) at the Brown Station, which is currently owned by KU. Specifically, the proposed BESS Facility will encompass approximately 7.5-acres within the northern portion of the existing Brown Station property. LG&E will utilize and optimize existing onsite infrastructure to the extent feasible to connect the new BESS Facility to the existing onsite transmission system; however, in addition to the batteries/enclosure structures, LG&E will also install secondary equipment including new inverters, a transformer, a substation, as well as other ancillary equipment.

As shown in **Figure 1-1**, the proposed BESS Facility will be located within the existing Brown Station property at 815 Dix Dam Road in southeastern Mercer County, Kentucky along the west shore of Lake Herrington in the Dix River Valley. The facility is generally located at geographic coordinates of 37.788490° North latitude and -84.712982° West longitude, corresponding to Universal Transverse Mercator (UTM) coordinates of 701,319 meters Easting, 4,184,791 meters Northing, in Zone 16s (horizontal datum WGS84). The site lies at an elevation of approximately 880 feet above mean sea level (msl) compared to the normal pool elevation of Lake Herrington adjacent to the site at approximately 740 feet msl.

As shown in **Figure 1-1**, the proposed BESS Facility will be located on property currently owned by KU and occupied by KU's existing Brown Station facility. The existing Brown Station facilities/components are depicted in **Figure 1-2**. Finally, **Figure 2-1** provides a detailed conceptual site layout of the proposed BESS Facility components relative to surrounding properties and the existing site operations. Note that the Project would be developed entirely within the boundary shown on **Figure 2-1,** within the footprint of KU's existing Brown Station property, and no offsite construction would be required.

Pursuant to KRS 278.216, a proposed generating facility over 10 megawatts (MW) must complete a SAR as follows:

> *"Except for a utility as defined under KRS 278.010(9) that has been granted a certificate of public convenience and necessity prior to April 15, 2002, no utility shall begin the construction of a facility for the generation of electricity capable of generating in aggregate more than ten megawatts (10MW) without having first obtained a site compatibility certificate from the commission." [KRS 278.216(1)]*
>
> *"An application for a site compatibility certificate shall include the submission of a site assessment report as prescribed in KRS 278.708(3) and (4), except that a utility which proposes to construct a facility on a site that already contains facilities capable of generating ten megawatts (10MW) or more of electricity shall not be required to*

comply with setback requirements established pursuant to KRS 278.704(3). A utility may submit and the commission may accept documentation of compliance with the National Environmental Policy Act (NEPA) rather than a site assessment report. " [KRS 278.216(2)]

The required contents of the SAR outlined in KRS 278.708(3)-(4) are detailed below:

(*3) A completed site assessment report shall include:*
(a) A description of the proposed facility that shall include a proposed site development plan that describes:
1. Surrounding land uses for residential, commercial, agricultural, and recreational purposes;
2. The legal boundaries of the proposed site;
3. Proposed access control to the site;
4. The location of facility buildings, transmission lines, and other structures;
5. Location and use of access ways, internal roads, and railways;
6. Existing or proposed utilities to service the facility;
7. Compliance with applicable setback requirements as provided under KRS 278.704(2), (3), (4), or (5); and
8. Evaluation of the noise levels expected to be produced by the facility;
(b) An evaluation of the compatibility of the facility with scenic surroundings;
(c) The potential changes in property values and land use resulting from the siting, construction, and operation of the proposed facility for property owners adjacent to the facility;
(d) Evaluation of anticipated peak and average noise levels associated with the facility's construction and operation at the property boundary; and
(e) The 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 vicinity of the facility.
(4) The site assessment report shall also suggest any mitigating measures to be implemented by the applicant to minimize or avoid adverse effects identified in the site assessment report.

Additionally, pursuant to KRS 224.10-280, prior to construction of a facility for generating electricity, a CEA must be completed. The requirements of the CEA as detailed in KRS 224.10-280 are:

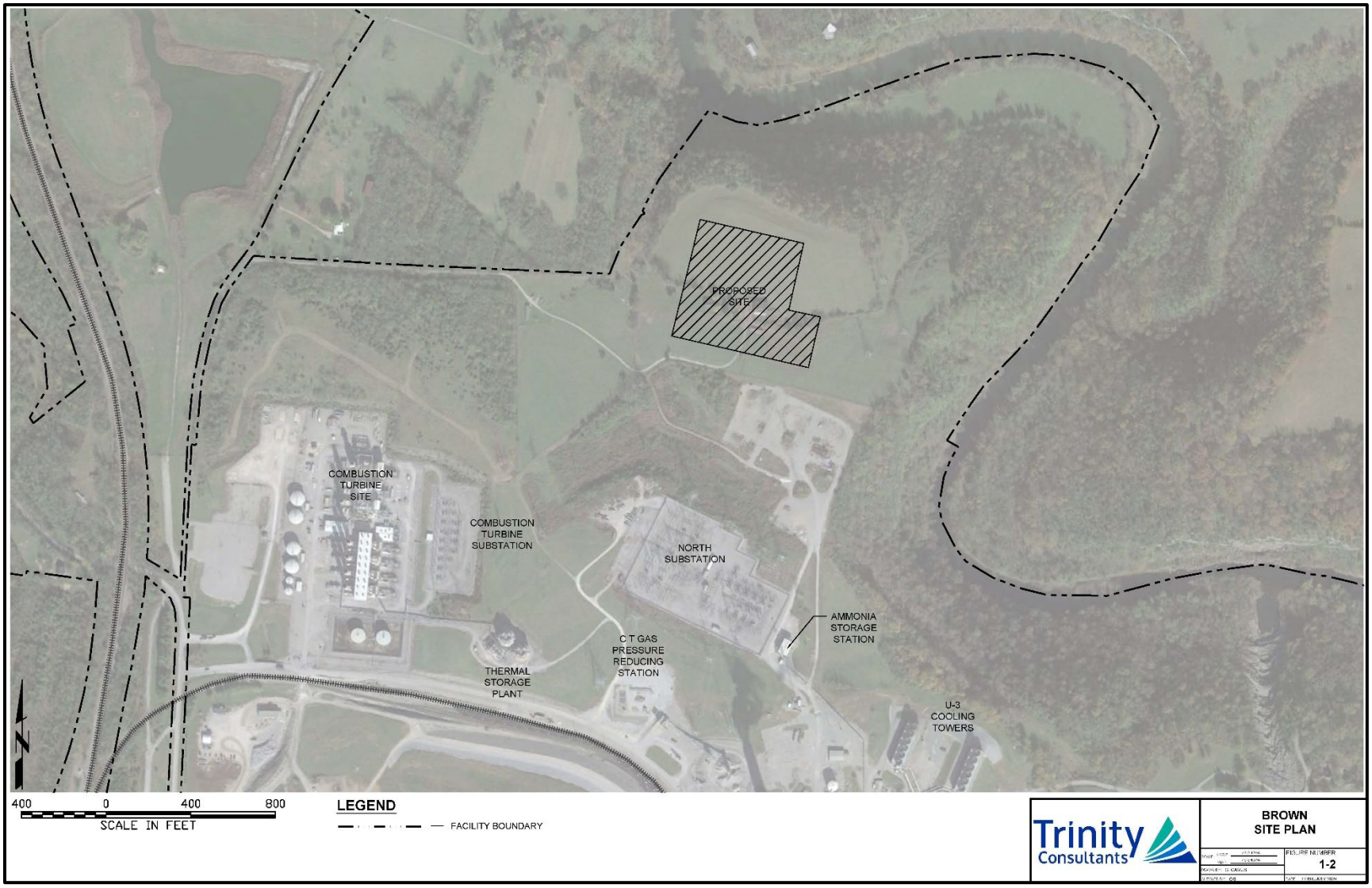
(3) The cumulative environmental assessment shall contain a description, with appropriate analytical support, of:
(a) For air pollutants:
1. Types and quantities of air pollutants that will be emitted from the facility; and
2. A description of the methods to be used to control those emissions;
(b) For water pollutants:
1. Types and quantities of water pollutants that will be discharged from the facility into the waters of the Commonwealth; and
2. A description of the methods to be used to control those discharges;
(c) For wastes:
1. Types and quantities of wastes that will be generated by the facility; and
2. A description of the methods to be used to manage and dispose of such wastes; and
(d) For water withdrawal:
1. Identification of the source and volume of anticipated water withdrawal needed to support facility construction and operations; and

2. A description of the methods to be used for managing water usage and withdrawal.

This SAR and CEA for the proposed BESS Facility at 815 Dix Dam Road, Kentucky has been prepared to meet the requirements of KRS 278 and 224.

Figure 1-1. Brown Station Proposed BESS Facility Site Map

Figure 1-2. Existing Brown Station Facility Components



2. PROJECT DESCRIPTION

2.1 Project Components

As stated above, LG&E is proposing to construct and operate a new approximately 125 MW BESS Facility at the existing Brown Station. The BESS Facility will provide KU supplemental onsite energy storage capacity, which in turn will provide more reliable on-demand power for peak needs and renewable integration. The proposed BESS will be located within the northern portion of the existing Brown Station property, specifically on an approximately 7.5-acre undeveloped plot of land to the north of the existing "North Substation" (see **Figure 1-2**). The facility has been designed to utilize existing onsite infrastructure, including transmission connectivity, to the extent feasible.

The BESS Facility will primarily consist of the battery packs, which would be individually housed in enclosures the size of a standard shipping container and arranged throughout the site. Ancillary equipment will include power inverters located within the central portion of the facility (between the battery enclosures), as well as a new main power transformer and interconnection substation located within the southeastern portion of the site. Other auxiliary/ancillary equipment and structures (panels, pads, internal roadways, etc.) would also be installed as needed. The BESS Facility will connect to the existing onsite transmission lines located to the south.

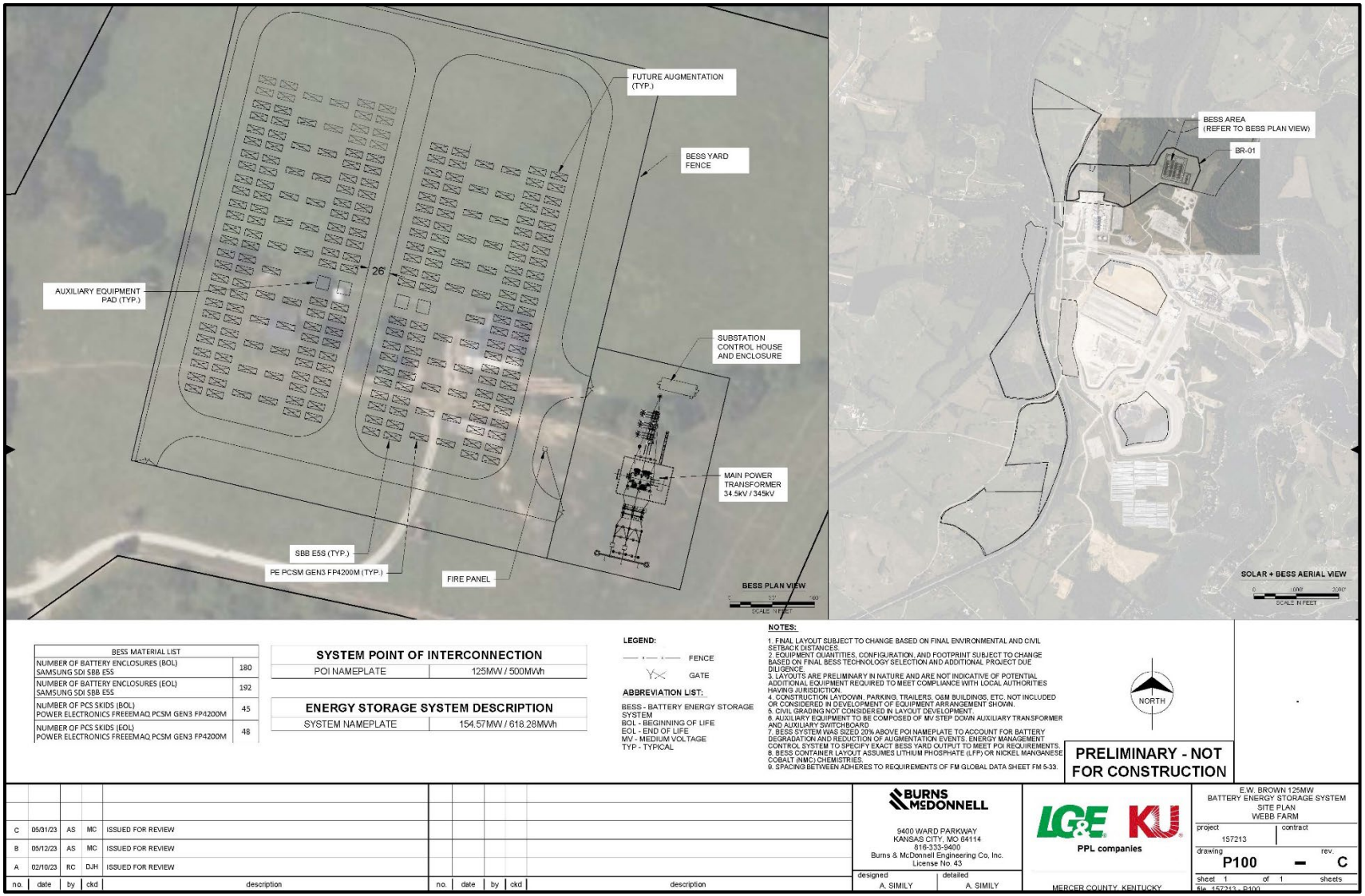
Figure 2-1 identifies the proposed layout of the equipment. The proposed BESS Facility is anticipated to include, but is not limited to, the following primary structures and approximate components:

- Up to 192 individual Samsung SDI ESS or equivalent batteries/enclosures;
- Up to 48 Freemaq PCSK or equivalent power inverters;
- Main power transformer; and
- Substation and control house enclosure.

Additionally, the proposed BESS Facility is anticipated to include, but is not limited to, the following structures:

- Onsite storage structures;
- Fire suppression equipment/systems;
- Facility access and interior roadways;
- Underground cable connections; and,
- Perimeter security fencing.

Figure 2-1. Brown Station BESS Facility Components and Arrangements



2.2 Surrounding Land Uses for Residential, Commercial, Agricultural, and Recreational Purposes

KU's Brown Station is located in southeastern Mercer County, Kentucky along the west shore of Lake Herrington in the Dix River Valley. The site is located 25 miles southwest of Lexington, Kentucky and approximately 7.5 miles east-northeast of Harrodsburg, Kentucky.

The proposed BESS Facility will be developed entirely within the existing Brown Station site boundary. The existing Brown Station site is located between a residential area to the south and east and agricultural land to the northwest and west. The majority of the existing Brown Station site is located within a zoning district that is designated as Heavy Industrial (I-2), which is established by Mercer County to preserve areas for industrial and related uses of such a nature that do not create serious problems of compatibility with other kinds of land uses. However, the approximately 7.5-acre area where the proposed BESS Facility would be installed is currently designated by Mercer County as Agricultural – Rural Residential (A-2).

The area directly to the south and east of the Brown Station is zoned for residential land uses (R-3) with the region currently utilized for single family residential land use. To the northwest and west, the area is zoned for agricultural and rural residential use (A-2).

As shown in **Figure 2-2** on the follow pages, and **Figure 3-7** in **Section 3.3**, residential properties occur in the area surrounding the proposed BESS Facility at the following distances:

- Approximately 0.7 miles south (zoned R-3, Multi-Family Residential);
- Onsite and immediately northwest/west (zoned A-2, Agricultural – Rural Residential); and
- The Dix River lies approximately 0.2 miles north and east of the site, and Herrington Lake lies approximately 0.8 miles southeast of the proposed BESS Facility. Land use across the Dix River and Herrington Lake to the east is mostly residential and agricultural land.

2.3 Legal Boundaries of the Proposed Site

As shown in **Figure 1-1**, the Brown Station property is an approximately 1,222-acre contiguous site, currently owned by KU. The proposed BESS Facility would be constructed on an approximately 7.5-acre site within the north portion of the Brown Station property, specifically within a portion of Parcel ID No. 078.00-00018.00. This parcel is described in the following Deed Books and Pages:

- Parcel ID No. 078.00-00018.00 Deed Book 370, Page 885-892

Additional parcels owned by KU within the Brown Station site may also be used temporarily during project construction; however, permanent BESS Facility components are not anticipated to be installed on other parcels.

Complete legal descriptions of the Brown Station site properties are provided in **Appendix A**.

2.4 Proposed Access Control to the Site

Access to the site is currently controlled with security fencing around the perimeter of the Brown Station property. Site access is controlled and maintained via an attendant at the guard shack, video surveillance

and security patrols. The existing access control facilities will be modified and extended as necessary to control access to this site during construction and operation of the proposed BESS Facility.

2.5 Location of Facility Buildings, Transmission Lines, and Other Structures

Figure 2-1 in **Section 1** shows the detailed conceptual site plan for the proposed BESS Facility site layout. Specifically, **Figure 2-1** further depicts the relative locations of the battery structures/enclosures, inverters, the transformer and substation, as well as related structures and ancillary equipment at the site.

2.6 Location and Use of Access Ways, Internal Roads, and Railway

As shown on **Figure 3-10** in **Section 3.4**, the existing Brown Station operations and proposed BESS Facility are currently served by rail and vehicular access. Rail access occurs via internal rail spurs, which is accessible by the Norfolk Southern Railway line to the west of the facility.

The proposed BESS Facility will be installed within the northern portion of Brown Station, northeast of Dix Dam Road and north of the Norfolk Southern Railway line spur, both of which branch into the Brown Station's property boundaries. Relative to the railway, the BESS Facility will be located approximately 0.4 miles north of the existing internal railway spur.

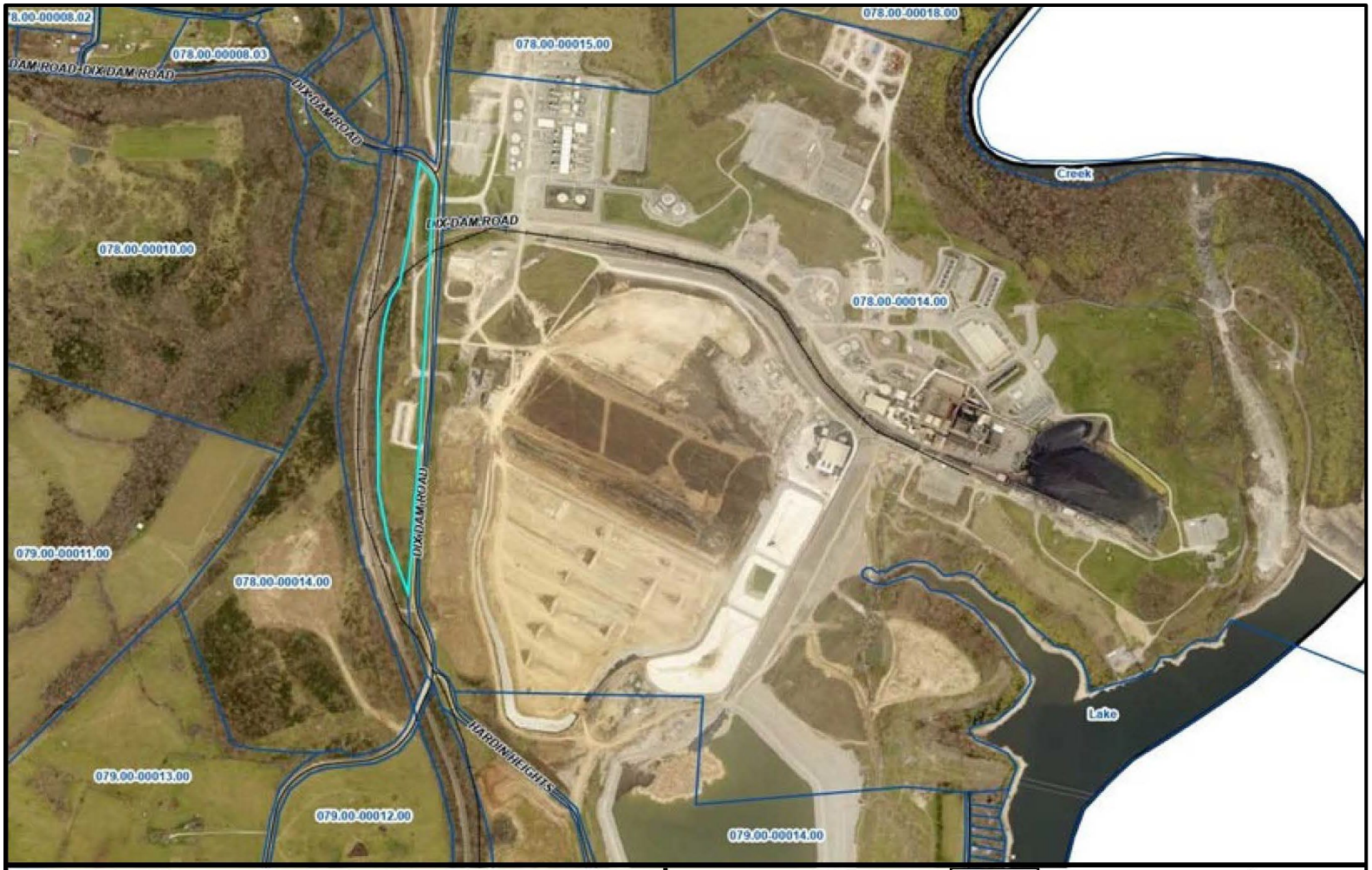
Dix Dam Road is a two-lane undivided roadway, which connects from Kentucky Route (KY) 342 at the northwest end of the Brown Station property. Dix Dam Road provides direct vehicular access to the facility and neighboring industrial areas. The road leads to the Brown Station's primary entrance, then runs laterally through the Brown Station to provide the facility's vehicular access, and terminates at the east end of the facility, near the Dix Dam Spillway. It is anticipated that traffic associated with the BESS construction will utilize KY 342 connecting to Dix Dam Road to access the site; however, some vehicular access during construction may also be provided via Webb Road, which connects to Dix Dam Road/Curdsville Road Extension to the north.

According to the Kentucky Transportation Cabinet's (KYTC) Department of Highways traffic count database, existing 2021 annual average data traffic (AADT) volume on KY 342/Dix Dam Road is 431 average vehicles per day.

2.7 Existing or Proposed Utilities to Service the Facility

The BESS Facility will utilize the existing onsite electrical transmission system to connect to KU's existing Brown Station transmission infrastructure to the south. Additional utility service connections are not proposed.

Figure 2-2. Brown Station Parcel Boundary



Source: ArcGIS - Trinity Consultants (2022)

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Trinity Consultants

FIGURE 2-2	LEGAL BOUNDARIES / PARCELS Site Assessment Report - BESS Facility E.W. Brown Generation Station Harrodsburg, Kentucky		
PROJECT #:	221801.0123	DATE:	11/27/22
SCALE:	N/A	DRAWN BY:	DS

2.8 Compliance with Setback Requirements (KRS 278.704 (2-5))

Pursuant to KRS §278.704 (2-5), a proposed merchant generating facility must comply with the following setback requirements:

> *"Except as provided in subsections (3), (4), and (5) of this section, no construction certificate shall be issued to construct a merchant electric generating facility unless the exhaust stack of the proposed facility and any wind turbine is at least one thousand (1,000) feet from the property boundary of any adjoining property owner and all proposed structures or facilities used for generation of electricity are two thousand (2,000) feet from any residential neighborhood, school, hospital, or nursing home facility. For purposes of applications for site compatibility certificates pursuant to KRS 278.216, only the exhaust stack of the proposed facility to be actually used for coal or gas-fired generation or, beginning with applications for site compatibility certificates filed on or after January 1, 2015, the proposed structure or facility to be actually used for solar or wind generation shall be required to be at least one thousand (1,000) feet from the property boundary of any adjoining property owner and two thousand (2,000) feet from any residential neighborhood, school, hospital, or nursing home facility."*

The proposed regulated generation will contain no exhaust stacks nor solar/wind generation facilities, and therefore will implicitly be in compliance with a portion of KRS 278.704 (2). Further, for the setback requirements of "at least one thousand (1,000) feet from the property boundary of any adjoining property owner and two thousand (2,000) feet from any residential neighborhood, school, hospital, or nursing home facility," these setbacks are superseded by the provisions of subsection (3) as follows:

> *"If the merchant electric generating facility is proposed to be located in a county or a municipality with planning and zoning, then setback requirements from a property boundary, residential neighborhood, school, hospital, or nursing home facility may be established by the planning and zoning commission. Any setback established by a planning and zoning commission for a facility in an area over which it has jurisdiction shall:*
>
> *(a) Have primacy over the setback requirement in subsections (2) and (5) of this section; and*
> *(b) Not be subject to modification or waiver by the board through a request for deviation by the applicant, as provided in subsection (4) of this section"*

Mercer County has planning and zoning requirements and a review process. The County has decided not to define explicit setbacks or requirements for battery installations. As a result, the Project will remain in compliance with Mercer County zoning and setback requirements which supersede those enumerated at KRS 278.704 (2). Finally, the companies are exempt from planning and zoning law pursuant to KRS 100.324 and *Oldham County Planning and Zoning Commission v. Courier Communications Corporation,* 722 S.W.2d 904 (Ky. App. 1987). No additional setback requirements are identified for the proposed BESS Facility.

3. ENVIRONMENTAL IMPACT ASSESSMENT

The following subsections define the technical contents that are required within the SAR as outlined in KRS 278.708(3)-(4). Within each technical assessment, the assessment methodologies, data sources, analysis results and proposed mitigations are detailed for the Brown Station BESS Facility project.

3.1 Ambient Noise Impact Assessment

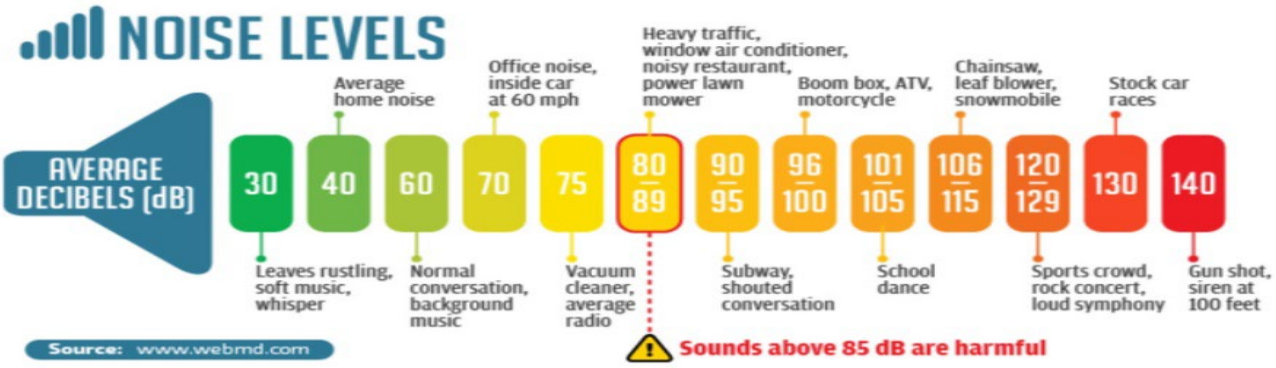
As discussed above, LG&E plans to construct and operate a new approximately 125 MW BESS Facility within the northern portion of the existing Brown Station. The BESS Facility will occupy an approximately 7.5-acre area within the existing approximately 1,222-acre Brown Station site located in the southeast portion of Mercer County, Kentucky.

This section assesses the potential noise impacts from the construction and operation of the proposed BESS Facility. Specifically, this section will assess the following:

- Evaluation of the noise levels expected to be produced by Brown Station operations;
- Evaluation of anticipated peak and average noise levels associated with the proposed BESS Facility construction at the property boundary; and
- Evaluation of anticipated peak and average noise levels associated with the proposed BESS Facility's operation at the property boundary.

The proposed BESS Facility will contribute sounds to the existing environment through equipment operations during construction and subsequently during operations of the proposed BESS Facility. Trinity has assessed the potential impacts from both the construction phase and the operational phase of the BESS Facility at nearby sensitive points of receptions (i.e., residential, community gathering places, schools, etc.).

The noise impact study is quantified using the A-weighted decibel scale (dBA). The A-weighted scale is used for judging loudness that corresponds to the hearing thresholds of the human ear. The following illustration provides examples of typical sound levels in dBA and the corresponding sources of noise. A 3 dB change in a continuous broadband sound is generally considered "just barely perceptible" to the average listener, a 6 dB change is generally considered "clearly noticeable" and a 10 dB change is generally considered a doubling (or halving) of the apparent loudness.



3.1.1 Applicable Noise Regulations

The noise assessment is being completed as per Kentucky Revised Statues (KRS) 278.708. Trinity has reviewed applicable Local, State, and Federal regulations, law and ordinance for Brown Station. KRS 224.30-050 is the directly applicable law and it does not contain numerical limits for sound levels. Therefore, there were no identified, enforceable sound level limits that would be applicable to Brown Station.

The following guidelines from the United States Environmental Protection Agency (USEPA) do contain numerical sound level limits to evaluate the noise impact for the proposed BESS Facility:

- Public Health and Welfare Criteria for Noise. United States Environmental Protection Agency, EPA 550/9-73-002 (July 1973); and
- Protective Noise Levels. United States Environmental Protection Agency, EPA 550/9- 79-200 (1978).

The USEPA guidance documents are not enforceable, but rather contain recommendations for evaluation of potential noise impacts. The noise exclusionary limits are summarized in **Table 3-1**.

Table 3-1. USEPA Noise Guidelines

Zoning District Classifications	Limits (dBA)		
	The Day-Night Sound Level (L_{dn})	Daytime (7:00 a.m. – 10:00 p.m.)	Nighttime (10:00 p.m. – 7:00 a.m.)
Outdoors in sensitive areas	55[1]	55	45

1. This would be a 24-hour average sound level with a 10 dB penalty applied to the nighttime sound levels (i.e., 10:00 p.m. – 7:00 a.m.). Hence, the daytime limit evaluating to 55 dBA during the daytime and 45 dBA during the nighttime.

USEPA emphasizes that since the protective sound levels were derived without concern for technical or economic feasibility and contain a margin of safety to ensure their protective value, they must not be viewed as standards, criteria, regulations, or goals. They should be viewed as a level below which there is no reason to suspect that the general population will be at risk from any adverse effects of noise.

3.1.2 Existing Noise Conditions

Trinity completed a noise monitoring program to measure the baseline levels of the current operations of Brown Station. Six locations along the facility's boundary were chosen to complete the noise baseline measurements of the current noise levels associated with the existing Brown Station. **Figure 3-1** depicts the location of the facility and the measurement locations for assessing existing noise conditions.

At each monitoring location, sound pressure level measurements were obtained utilizing a Larson Davis 831C sound pressure meter. Best monitoring practices were utilized at each of the ambient monitoring locations. Explicitly at each location, a National Institute of Standards and Technology (NIST) traceable Larson Davis 831C Type 1 1/3 octave band sound pressure meter was mounted on a tripod and left undisturbed. For each of the monitoring locations, sound pressure levels were monitored for 10–15-minute periods. The sound pressures were logged on a one-minute basis in A-weighted decibels at a slow response rate and using a 3-decibel exchange rate. For each site, sound pressure levels were logged for maximum sound pressure (Lmax), average equivalent sound pressure (Leq) and minimum sound pressure (Lmin). Additionally, ⅓ octave band pressure levels were logged to determine pure tone impacts. The meter was calibrated prior to and after each session to ensure accuracy. To ensure only the facility noise impacts were

assessed, the ambient conditions, noise sources, and sound pressure level results of each monitoring event were recorded to filter sound pressure levels.

As discussed above, the City of Harrodsburg is located approximately 7 miles west-southwest of the project site. The existing acoustical environment surrounding the Brown Station property is generally rural. Specifically, Herrington Lake runs along the eastern boundary of the site, and Dix Dam Road runs north-south near the western boundary of the BESS Facility site. Additionally, Hardin Heights Road wraps through the southern/central portion of the facility, connecting to small residential neighborhoods to the east on the banks of Herrington Lake. Peninsula Golf Resort is located to the southeast of the BESS Facility site across Herrington Lake. The primary sources of noise include environmental and vehicle sounds. The primary sources of natural noise include insects, birds, and dogs. Areas surrounding the existing Brown Station property experience noise associated with its ongoing operation and areas adjacent to roadways experience intermittent vehicle noise. In general, noise from the existing facility ranges from inaudible to noticeable at residences in the surrounding area.

Figure 3-1. Existing Background Noise Monitoring Locations and Conditions

The following six locations were assessed for existing background noise impacts:

- Location 1: Brown Station eastern existing property boundary – Ron Clar Drive
- Location 2: Brown Station southeastern existing property boundary – Hunter Drive
- Location 3: Brown Station southern existing property boundary – Hardin Heights North Road
- Location 4: Brown Station southwestern existing property boundary – Hardin Heights Road
- Location 5: Brown Station western existing property boundary – Curdsville Road Extension
- Location 6: Brown Station northwestern existing property boundary – Webb Road

The following photos display the monitoring location surrounding the existing Brown Station. The same monitoring location and set up was utilized during the daytime and the nighttime monitoring period.

Photo Location #1: Brown Station eastern existing property boundary – Ron Clar Drive.

Photo Location #2: Brown Station southeastern existing property boundary – Hunter Drive.

Photo Location #3: Brown Station southern existing property boundary – Hardin Heights North Road.

Photo Location #4: Brown Station southwestern existing property boundary – Hardin Heights Road.

Photo Location #5: Brown Station western existing property boundary – Curdsville Road Extension.

Photo Location #6: Brown Station northwestern existing property boundary – Webb Road.

Table 3-2 displays the measured sound levels during the monitoring program and **Appendix B** provides the graphical representation of the monitored data.

Table 3-2. Monitored Sound Level

Locations	Measurement Levels (dBA)	
	Daytime (7:00 a.m. – 10:00 p.m.)	Nighttime (10:00 p.m. – 7:00 a.m.)
1	42.9	36.0
2	43.0	41.9
3	39.5	40.6
4	55.8	33.1
5	40.1	63.3
6	44.6	47.1

3.1.3 Construction Noise Emissions

During the construction phase of the BESS Facility project, the equipment used will be typical to site development: site preparation, foundation setting, equipment installation, and demobilization. Trinity was provided a list of construction equipment anticipated to be used during the construction phase by the LG&E team for the noise assessment (see **Table 3-3** and **Table 3-4)**. The construction noise will primarily occur during daylight hours with occasional off-shift work performed on night shift. Also, concrete pours could be scheduled to be performed through the nighttime period if temperatures dictate.

Trinity has conservatively assumed the worst-case noise level for each source of construction noise and assumed all sources of noise would be located at the worst-case location nearest to the sensitive areas. The sound pressure at a distance of 50 feet and the acoustical factor for each source is based on the U.S. Department of Transportation, Federal Highway Administration (FHWA). **Table 3-3** displays the proposed equipment used for the construction phase of the BESS Facility project.

Table 3-3. Primary Construction Equipment and Corresponding Sound Pressure Level at 50 Feet

Equipment	Typical Noise Levels (Lmax) for Construction Equipment (A-weighted, dBA) - Equipment Item Noise Level at 50 Feet (FHWA)	Acoustical Usage Factor (%) (FHWA)	Number of Equipment Operating
Generator	82	50	10
Excavator	85	40	1
Auger Drill Rig	85	20	2
Concrete Pumps	82	20	1
Pumps	81	50	1
Rollers	85	20	1
Air Compressors	80	40	1
Cranes	85	16	2
Skid steer	80	40	3
Water Truck	84	40	1
Front-End Loader	80	40	1
Graders	85	40	1
Welders	74	40	1
Man Lift	85	20	2

There are also two additional pieces of proposed construction equipment that will be used for trenching for which manufacturer's data was used to obtain appropriate sound power levels associated with each proposed equipment. Since the FHWA does not have specific acoustical factors, Trinity made the conservative assumptions that these equipment pieces could operate for 90% of the time during a given construction period. **Table 3-4** displays the additional proposed equipment used for the construction phase of the BESS Facility.

Table 3-4. Additional Construction Equipment and Corresponding Sound Pressure Level at 50 Feet

Equipment	Sound Power based on Manufacturer's Data	Conservative Acoustical Usage Factor (%)	Number of Equipment Operating
Trencher Ditch Witch RT45 or Equivalent	108	90	2
Trench Compactor Bomag BMP 8500 or Equivalent	103	90	3

Assuming the equipment summarized above would operate onsite to construct the BESS Facility, **Figure 3-2** displays the expected levels of noise at each monitoring location during the construction phase and the noise contour levels to the surrounding area. As shown below, based on the current construction phase it is expected that construction noise levels would be in compliance with applicable USEPA standards. While

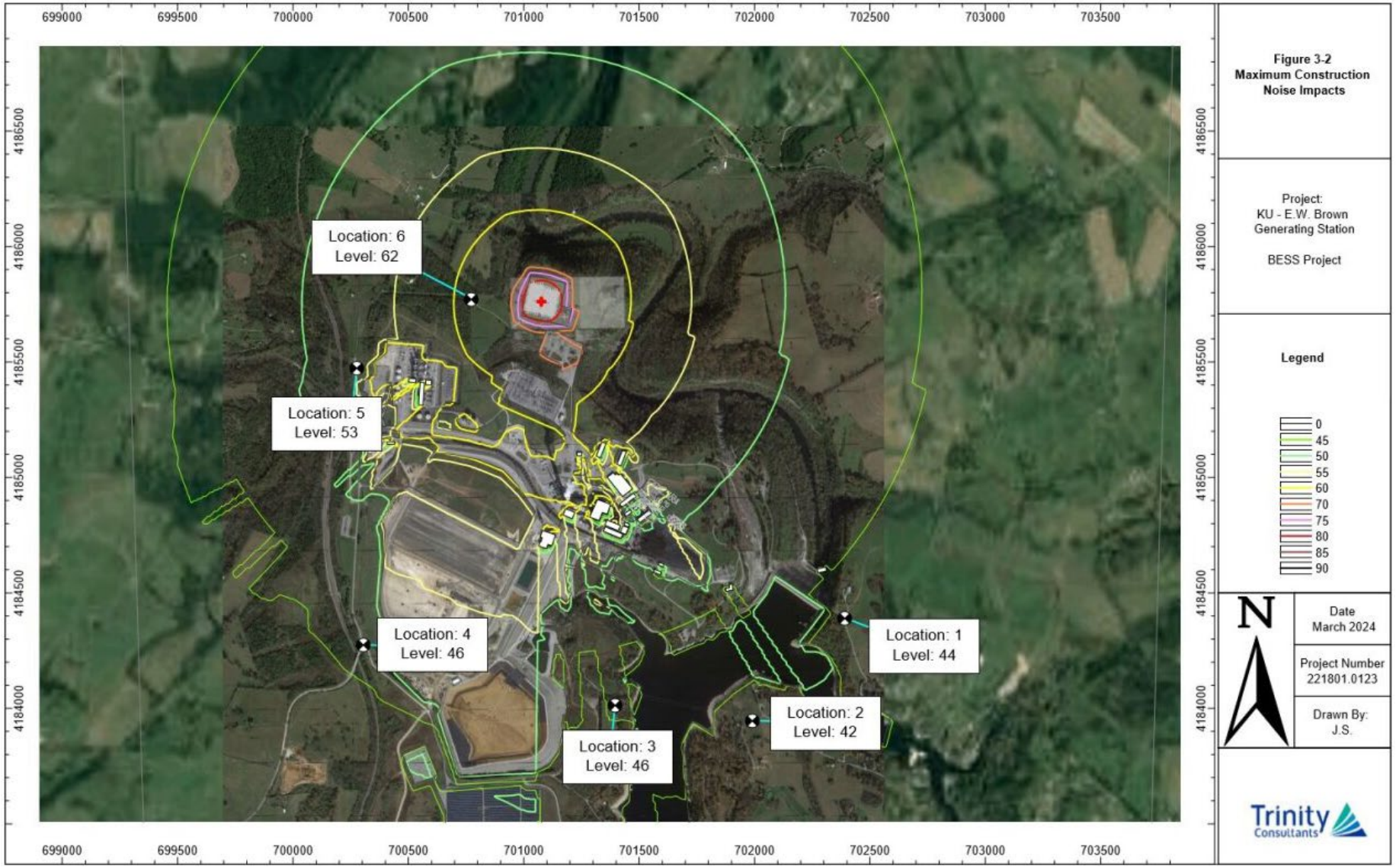
noise levels would be acceptable per the USEPA, based on the existing monitored values and the rural area, construction activities could be noticeable at certain sensitive areas. **Table 3-5** displays the predicted sounds levels at each monitored location. Nighttime activity includes a 10 dB penalty in the determination of impacts included in **Table 3-5**.

Table 3-5. Construction Acoustic Assessment Summary Table

Locations	Predicted Levels (dBA)	
	Daytime (7:00 a.m. – 10:00 p.m.)	Nighttime (10:00 p.m. – 7:00 a.m.)
1	43.7	43.7
2	41.6	41.6
3	45.5	45.5
4	46.0	46.0
5	53.0	53.0
6	62.1	62.1

As previously discussed, this is a conservative assessment of the noise that will be generated from the BESS Facility construction equipment. The worst-case sound level and worst-case location were used for this assessment. Further reductions are anticipated based on average construction activity.

Figure 3-2. Maximum Construction Noise Impacts



3.1.4 Operational Noise Emissions of the Proposed Facility

During the operational phase of the BESS Facility, noise-generating equipment would be typical of a battery facility of this size and design. The sound levels for onsite operational equipment were provided to Trinity by LG&E and are consistent with modern, well-controlled BESS installations. The operational noise was conservatively assumed to occur continuously up to 24 hours per day for the assessment of operational noise impacts. **Table 3-6** displays the worst-case noise sources used for the normal operation of the BESS Facility and its corresponding sound power levels.

Table 3-6. BESS Facility Significant Noise Sources and Corresponding Sound Power Levels

Noise Source	Sound Pressure level (dBA) and Distance	Number of Equipment Operating
ESS Containers (Purpose Built Enclosures)	85 dBA at 3 feet	192
Power Conversion Systems	80 dBA at 3 feet	48
Transformer (GSU)	85 dBA at 3 feet	1

Figure 3-3 displays the expected levels of noise at each monitoring location during the operating phase of the BESS Facility and the noise contour levels to the surrounding area. Based on the current information for the proposed operation of the BESS Facility, operational noise levels are expected to be in compliance with the applicable USEPA exclusionary limits. While noise levels would be acceptable per the USEPA standards, based on the existing monitored values, it is expected that the operational noise could be noticeable at Location #6 during the daytime and nighttime period; and potentially Location #4 during the nighttime. **Table 3-7** displays the predicted sounds levels at each monitored location.

Table 3-7. BESS Facility Acoustic Assessment Summary Table

Locations	Predicted Levels (dBA)	
	Daytime (7:00 a.m. – 10:00 p.m.)	Nighttime (10:00 p.m. – 7:00 a.m.)
1	34.7	34.7
2	32.7	32.7
3	36.2	36.2
4	37.2	37.2
5	44.0	44.0
6	53.2	53.2

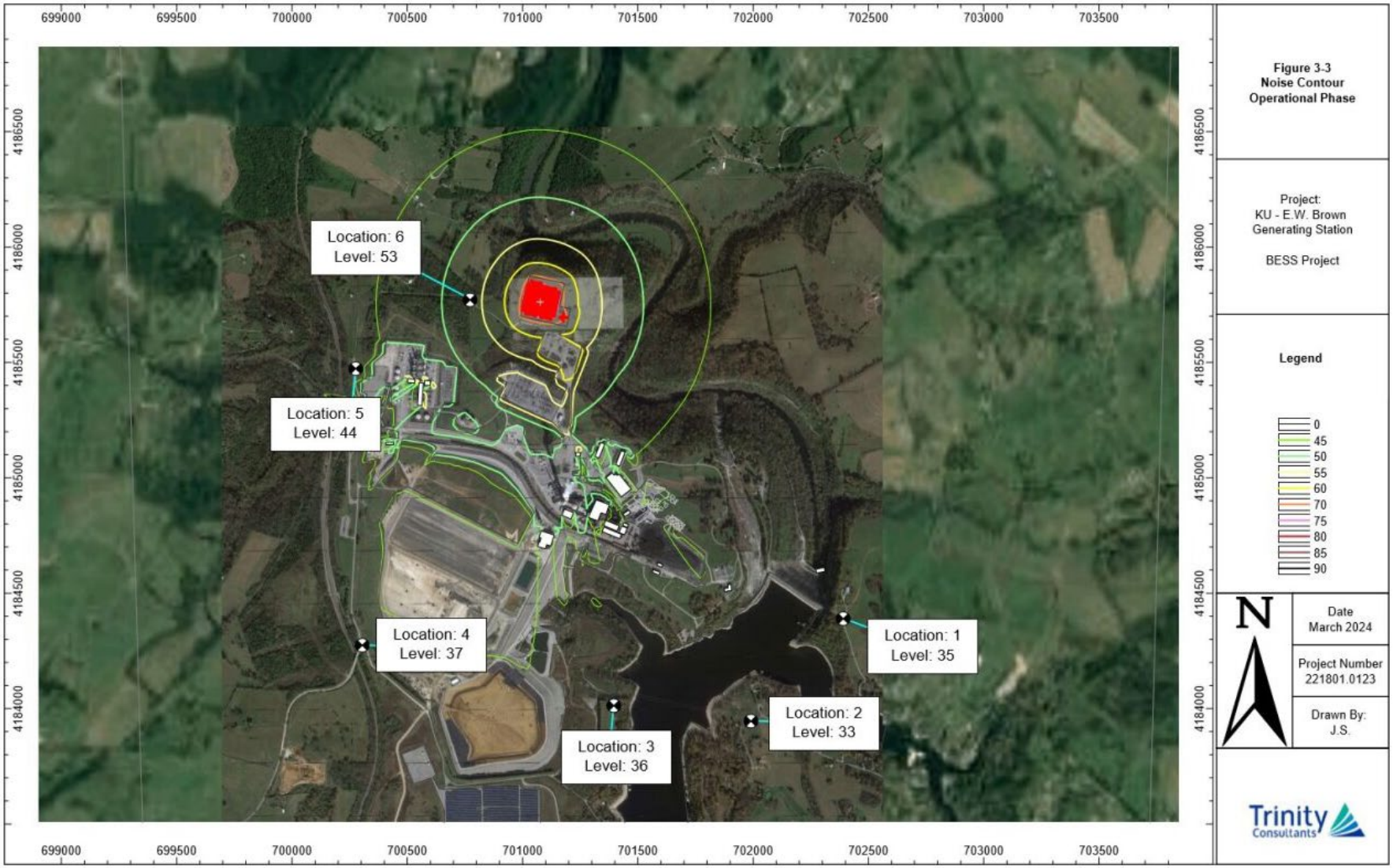
As previously discussed, this is a conservative assessment of the BESS Facility equipment, which assumes that the equipment operates continuously. It is Trinity's understanding that the building near Location #6 is owned by KU, therefore it is expected that the BESS Facility would be in compliance with the applicable USEPA sound level limits. Average operations are not anticipated to be noticeable at any locations.

3.1.5 Mitigation

Based on the noise impact assessment described above, and the assessment of existing noise conditions at the Brown Station site, the BESS Facility construction and operation phases are not anticipated to generate noise levels that exceed the applicable USEPA guidance limits. The worst-case noise impacts are predicted

to potentially be slightly above the existing levels in limited locations; however, modeled sound levels on average are lower than the observed sound levels. Therefore, no additional mitigation should be required.

Figure 3-3. Maximum Operational Noise Impacts



3.2 Visual Impact Assessment

In accordance with Kentucky Revised Statutes (Title XXIV – Public Utilities) §278.708(3)(b), this SAR has been prepared to complete "an evaluation of the compatibility of the facility with scenic surroundings" for the proposed BESS Facility. Therefore, the purpose of this visual analysis is to evaluate the potential visual effects of installing the proposed BESS Facility within the northern portion of KU's existing Brown Station. Visual impacts are presented and quantified utilizing applicable assessment practices employed by the Bureau of Land Management (BLM), and mitigation measures are recommended to protect viewsheds if visual impacts were determined to be potentially significant.

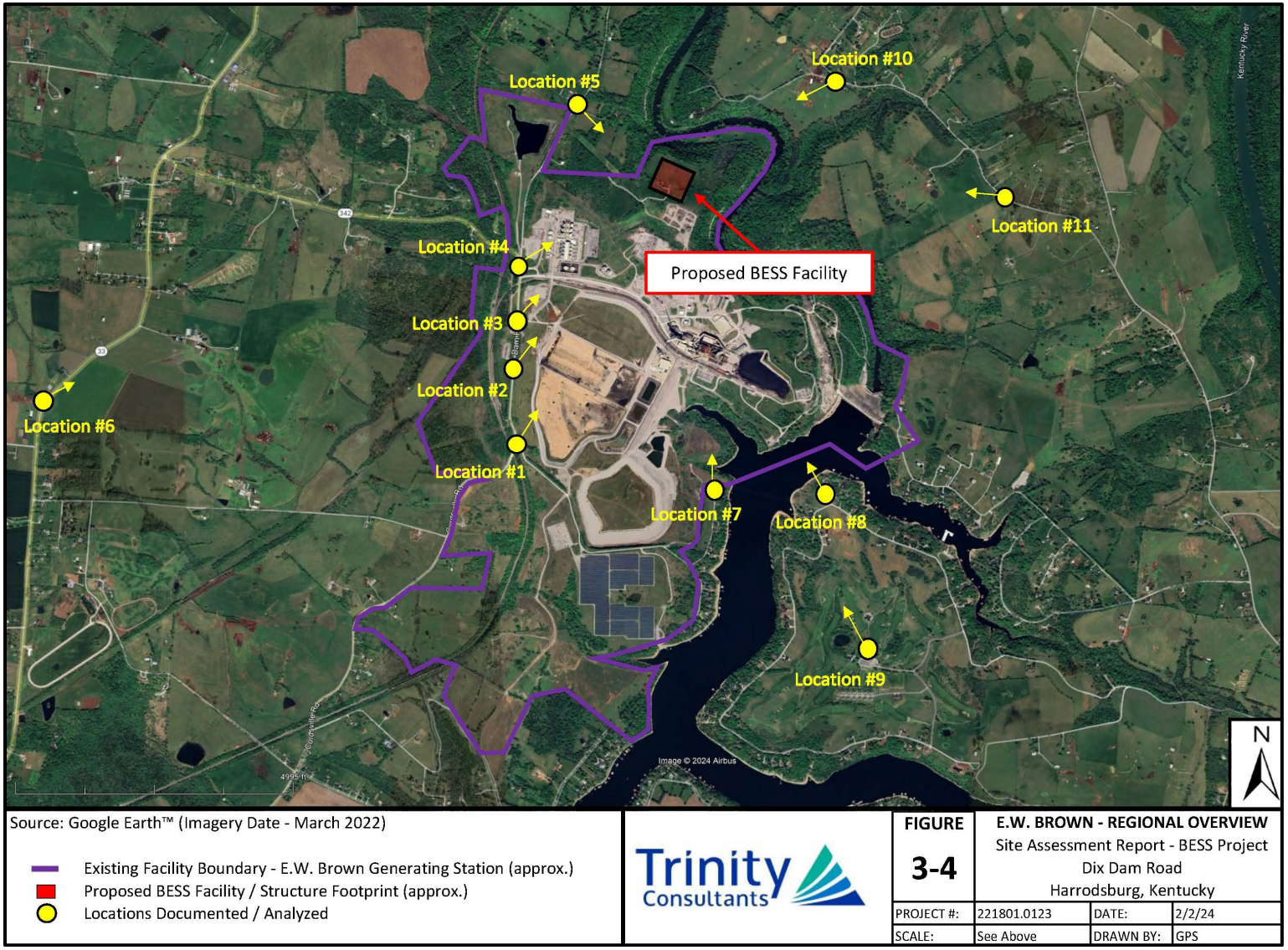
3.2.1 Existing Facility and BESS Project Area

As discussed previously, the existing Brown Station is a unique KU power facility in that it currently utilizes four different types of electricity-producing facilities, specifically a hydroelectric plant, a coal-fired generating unit, natural-gas fired combustion turbines, and a universal solar facility. Brown Station sits on an approximately 1,222-acre property within the southeast portion of Mercer County, Kentucky. The City of Harrodsburg is located approximately 7 miles west-southwest of the Brown Station site.

Herrington Lake runs along the eastern boundary of the site, and Dix Dam Road runs north-south along the western boundary of the site. Additionally, Hardin Heights Road wraps through the southern/central portion of the facility, connecting to small residential neighborhoods located to the east, on the banks of Herrington Lake. The Peninsula Golf Resort is located to the southeast of the Project site across Herrington Lake, with residences located around the outside of the Peninsula Golf Resort, adjacent to Herrington Lake. Farmland and scattered rural residences are also located to the north and east of the site, across the Dix River.

The areas surrounding the BESS Facility site are generally comprised of low-rolling hills and open meadows, with no elevated viewpoints or topographic features of note. Various agricultural fields and rural residences are scattered throughout the Project region. Refer to **Figure 3-4** below, which displays the Brown Station and surrounding environment.

Figure 3-4. Brown Station BESS Facility Visual Resource Overview



Due to its larger footprint and the height of existing structures, KU's existing Brown Station is one of the more readily visible features within the existing environmental setting. Specifically, the facility has numerous exhaust stacks associated with the active and retired coal-fired units, which are estimated to extend approximately 500-feet above the native ground surface. Additionally, the existing combustion turbine site and associated substation located within northwest corner of the Brown Station are clearly visible features from nearby Dix Dam Road/Kentucky State Route 342 (KY 342), located to the west. The exhaust stacks, as well as the underlying structures/facilities, are clearly and distinctly visible from many surrounding viewpoints. In addition to the primary energy generation facilities summarized above, the Brown Station also houses transmission towers and lines, coal combustion byproduct storage areas, access roads, parking, administration buildings, equipment buildings, storage ponds and other smaller ancillary facilities.

The following photos display the existing Brown Station from various viewpoints surrounding the facility. Note, potential visual effects resulting from installation of the BESS Facility are evaluated below from these nine public viewpoints. In addition to the nine viewpoints summarized below, a Google Earth™ ground-level view analysis was also completed from two additional viewpoints (i.e., Locations #10 and #11) that were not photo documented (see **Appendix C**).

Photo Location #1: Looking northeast from intersection of Dix Dam Road and Hardin Heights Road.

Photo Location #2: Looking east from Dix Dam Road.

Photo Location #3: Looking east from Brown Station's secondary (Gate 5) facility entrance along Dix Dam Road.

Photo Location #4: Looking southeast from the Brown Station main entrance along Dix Dam Road.

Photo Location #5: Looking southeast from the northern boundary of the Brown Station property from Curdsville Road.

Photo Location #6: Looking east from the Shawnee Run Baptist Church along Shakertown Road/Kentucky State Route 33 (KY 33).

Photo Location #7: Looking north from the residences at the end of N. Hardin Heights Road.

Photo Location #8: Looking northwest from the intersection of Hunter Drive/Domar Drive, across Herrington Lake.

Photo Location #9: Looking northwest from the Peninsula Golf Resort clubhouse/main parking lot.

3.2.2 BESS Facility Overview/Design

As discussed previously, LG&E plans to construct and operate a new BESS Facility and ancillary equipment/structures on a 7.5-acre area within the northern portion of the Brown Station facility. To support the BESS Facility, LG&E will utilize and optimize the current electrical transmission system to the extent feasible. See **Figure 1-2** in **Section 1** which shows the approximate footprint, as well as **Figure 2-1** in **Section 2** for the conceptual design and configuration, of the new BESS Facility, which would be constructed and operated entirely within the existing Brown Station footprint.

The new BESS Facility is a relatively compact and low-lying facility and would not require the installation of large above-ground structures such as stacks or towers. **Figure 3-5** below which shows an aerial view of a similar BESS Facility. As shown **Figure 3-5** and confirmed by LG&E, the bulk of the BESS Facility would be the battery enclosures, which would sit approximately 8 to 10 feet above the existing ground surface. These battery structures would be the tallest structures installed onsite. The battery's structural profiles were considered in the context of this project to complete the visual assessment and line-of-sight evaluation presented below.

Figure 3-5. Similar BESS Facility Photo Layout

The photo shown above was taken of another BESS facility similar to the one proposed to be constructed and operated at the Brown Station. Note the relatively compact and low profile of the battery packs and ancillary structures/equipment (especially when compared to the larger existing coal-fired plants found at Brown Station).

3.2.3 Visual Assessment Methodology

The BLM has developed the Visual Resources Management (VRM) System to objectively rate the quality of visual resources and evaluate changes in scenic quality attributed to a proposed change in land use. This methodology is based on the BLM visual impact assessment procedures provided in the "VRM Manual"

Section 8400 (BLM, 1984). The BLM system uses quantitative and qualitative methods to measure potential visual impacts. This method includes defining the project setting and viewshed, identifying sensitive view receptors for assessment, analyzing the baseline visual quality and character of the identified views, depicting the visual appearance of the project from the identified views, assessing the project's impacts to those views in comparison to their baseline visual quality and character, and proposing methods to mitigate any potentially significant visual impacts identified.

The BLM developed the VRM system to objectively rate the quality of visual resources and evaluate changes in scenic quality attributed to a proposed change in land use, in this case LG&E's proposal to develop the new BESS Facility at their existing Brown Station. By comparing the difference in visual quality ratings from the baseline ("before" condition) to post-project ("after" condition) visual conditions, the severity of project related visual impacts can be quantified. However, in some cases, visual changes caused by projects may have a beneficial visual effect and may enhance scenic quality. The Kentucky Revised Statutes do not specify recommended methodologies for evaluating scenic resources within a site assessment (Title XXIV – Public Utilities, §278.708(3)(b)). Although the BESS Facility has no Federal nexus, use of the VRM is considered appropriate as it allows visual resources and impacts to be subjectively quantified. Therefore, in the absence of state-adopted regulatory thresholds for evaluating the significance of visual impacts, the following BLM protocols are used, herein, to rank the significance of the BESS Facility's visual effects.

Per BLM guidance, "visual quality" is a measure of a landscape or a view's visual and aesthetical appeal. While there are a number of standardized methods for rating visual quality, the "Scenic Quality Rating Criteria" method utilized by the BLM is believed to be superior because it allows the various landscape elements that comprise visual quality to be easily quantified and rated, while minimizing issues of ambiguity or subjectivity. According to this method, visual quality is rated according to the presence and characteristics of seven key components of the landscape. Specifically, these components include landform, vegetation, water, color, adjacent scenery, scarcity and cultural modifications.

Per BLM guidelines, in the visual resource inventory process public lands are given an A, B, or C rating based on the apparent scenic quality, which is determined using the seven key factors described above. During the rating process, each of these key factors are ranked on a comparative basis with similar features within the physiographic province. **Table 3-8** below displays the point values associated with the seven key factors. Based on this point system, a score of 19 or more receives an A rating, a score between 12 and 18 receives a B rating, and a score of 11 or less receives a C rating.

Table 3-8. BLM Scenic Quality Inventory and Evaluation Chart

Key Factors	Rating Criteria and Score		
Landform	High vertical relief as expressed in prominent cliffs, spires, or massive rock outcrops, or severe surface variation or highly eroded formations including major badlands or dune systems; or detail features dominant and exceptionally striking and intriguing such as glaciers. **Score 5**	Steep canyons, mesas, buttes, cinder cones, and drumlins; or interesting erosional patterns or variety in size and shape of landforms; or detail features which are interesting though not dominant or exceptional. **Score 3**	Low rolling hills, foothills, or flat valley bottoms; or few or no interesting landscape features. **Score 1**

Key Factors	Rating Criteria and Score		
Vegetation	A variety of vegetative types as expressed in interesting forms, textures, and patterns. **Score 5**	Some variety of vegetation, but only one or two major types. **Score 3**	Little or no variety or contrast in vegetation. **Score 1**
Water	Clear and clean appearing, still, or cascading white water, any of which are a dominant factor in the landscape. **Score 5**	Flowing, or still, but not dominant in the landscape. **Score 3**	Absent, or present, but not noticeable. **Score 0**
Color	Rich color combinations, variety or vivid color; or pleasing contrasts in the soil, rock, vegetation, water or snow fields. **Score 5**	Some intensity or variety in colors and contrast of the soil, rock and vegetation, but not a dominant scenic element. **Score 3**	Subtle color variations, contrast, or interest; generally mute tones. **Score 1**
Influence of Adjacent Scenery	Adjacent scenery greatly enhances visual quality. **Score 5**	Adjacent scenery moderately enhances overall visual quality. **Score 3**	Adjacent scenery has little or no influence on overall visual quality. **Score 0**
Scarcity	One of a kind; or unusually memorable, or very rare within region. Consistent chance for exceptional wildlife or wildflower viewing, etc. **Score 5+[1]**	Distinctive, though somewhat similar to others within the region. **Score 3**	Interesting within its setting, but fairly common within the region. **Score 1**
Cultural Modifications	Modifications add favorably to visual variety while promoting visual harmony. **Score 2**	Modifications add little or no visual variety to the area and introduce no discordant elements. **Score 0**	Modifications add variety but are very discordant and promote strong disharmony. **Score -4**

Source: BLM Manual H-8410-1 – Visual Resource Inventory (BLM, 1984).
1. A rating of greater than 5+ can be given but must be supported by written justification.

An important premise of the VRM evaluation method is that views with the most variety and most harmonious composition have the greatest scenic value. Another important concept is that man-made features within a landscape do not necessarily detract from the scenic value. In fact, certain man-made features that complement the natural landscape may enhance overall visual quality. As such, in making a determination it is important to assess the project's effect relative to the "visual character" of the project setting.

In addition to BLM's scenic quality and visual character guidance described above, BLM's Manual H-8431 – Visual Resource Contrast Rating also outlines a contrast rating system that can be used to analyze potential visual impact of proposed projects and activities. The degree to which a specific activity affects the visual quality of a landscape depends on the visual contrast created between a project and said landscape, which

can be measured by comparing the project features with the existing major features in the landscape. The basic design elements of form, line, color, and texture are used to make this comparison and to describe the visual contrast created by a project. Using these criteria, the degree of contrast can be classified as one of the four determinations summarized in **Table 3-9** below.

Table 3-9. BLM Degree of Contrast Criteria

Degree of Contrast	Criteria
None	The element contrast is not visible or perceived.
Weak	The element contrast can be seen but does not attract attention.
Moderate	The element contrast begins to attract attention and begins to dominate the characteristic landscape.
Strong	The element contrast demands attention, will not be overlooked, and is dominant in the landscape.

Both the BLM's visual and scenic quality metrics, as well as the contrast rating, are utilized below to evaluate potential visual impacts resulting from the BESS Facility.

3.2.3.1 Local Viewpoints and Scenic Vistas

To assess the state of visual resources within the BESS Facility vicinity, and to quantify the visual and aesthetical impacts resulting from development of the proposed project, numerous viewsheds were mapped and photographed in the field by Trinity staff on November 4th, 2022. On the day the photos were collected, the atmospheric conditions were clear, calm, and sunny, and therefore represent conditions under which the highest level of potential BESS Facility visibility would occur. The chosen viewsheds were established by determining the surrounding areas within an approximately 2-mile radius from the Brown Station perimeter that would have a potentially unobstructed or partial line-of-sight view of the proposed BESS Facility. As described previously, the areas surrounding the BESS site are mostly flat with few buildings/structures and minimal existing vegetation, other than those areas immediately adjacent to the Dix River which has taller trees along its banks. For this reason, the BESS Facility viewshed is generally limited to the publicly accessible areas located adjacent to the perimeter of the Brown Station site along publicly accessible roadways, and those located adjacent to/across Herrington Lake to the southeast.

Consistent with the BLM's guidance, which requires that key observation points (KOP) be evaluated, **Table 3-10** summarizes the viewpoints within the project vicinity selected for further evaluation below. These locations were selected as they represent areas considered to have high visual sensitivity, both surrounding the Brown Station and along nearby routes of travel. Additionally, visual impacts at these closest viewpoints conservatively account for potentially affected views at locations farther from the site. Refer to **Figure 3-4** above which displays the location of these sensitive viewpoints in relation to the BESS Facility site.

Table 3-10. Summary of Potentially Sensitive Viewpoints

Map Reference	Location	Distance to Project Site (Approximate)	Description
Location #1	Southwest of project site (Dix Dam Road/Hardin Heights Road)	1.1 miles away	This viewpoint is located near the intersection of Dix Dam Road and Hardin Heights Road, looking northeast toward the site.

Map Reference	Location	Distance to Project Site (Approximate)	Description
Location #2	Southwest of project site (Dix Dam Road)	1.0 miles away	This viewpoint is located about 200-feet south of an existing unpaved parking lot, along Dix Dam Road, looking northeast toward the site.
Location #3	Southwest of project site (Brown Station secondary [Gate 5] entrance)	0.6 miles away	This viewpoint is located at the secondary (Gate 5) entrance to the Brown Station (i.e., Webb Road), along Dix Dam Road looking northeast toward the site.
Location #4	Southwest of project site (Brown Station main entrance)	0.5 miles away	This viewpoint is located at the main entrance to the Brown Station, along Dix Dam Road, looking northeast toward the site.
Location #5	Northwest of project site (Curdsville Road)	0.3 miles away	This viewpoint is located at the northern property boundary of the Brown Station, along the Curdsville Road, looking southeast toward the site.
Location #6	Southwest of project site (Shawnee Run Baptist Church)	2.2 miles away	This viewpoint is located at the Shawnee Run Baptist Church, along Shakertown Road looking northeast toward the site.
Location #7	South of project site (Hardin Heights Road)	1.0 miles away	This viewpoint is located at the end of Hardin Heights Road, within a residential neighborhood, looking north toward the site.
Location #8	Southeast of project site (Hunter Drive)	1.2 miles away	This viewpoint is located near the intersection of Hunter Drive and Donmar Drive, within a residential neighborhood across Herrington Lake, looking northwest toward the site.
Location #9	Southeast of project site (Peninsula Golf Resort)	1.7 miles away	This viewpoint is located adjacent to the clubhouse/parking lot within the center of the Peninsula Golf Resort, across Herrington Lake looking northwest toward the site.
Location #10	Northeast of project site (High Bridge Road/ George Lane Road)	0.6 miles away	This viewpoint is located near the intersection of High Bridge Road and George Lane Road, within an agricultural/residential area, looking southwest toward the site.
Location #11	East of project site (High Bridge Road)	1.1 miles away	This viewpoint is located along High Bridge Road within an agricultural/residential area, looking west toward the site.

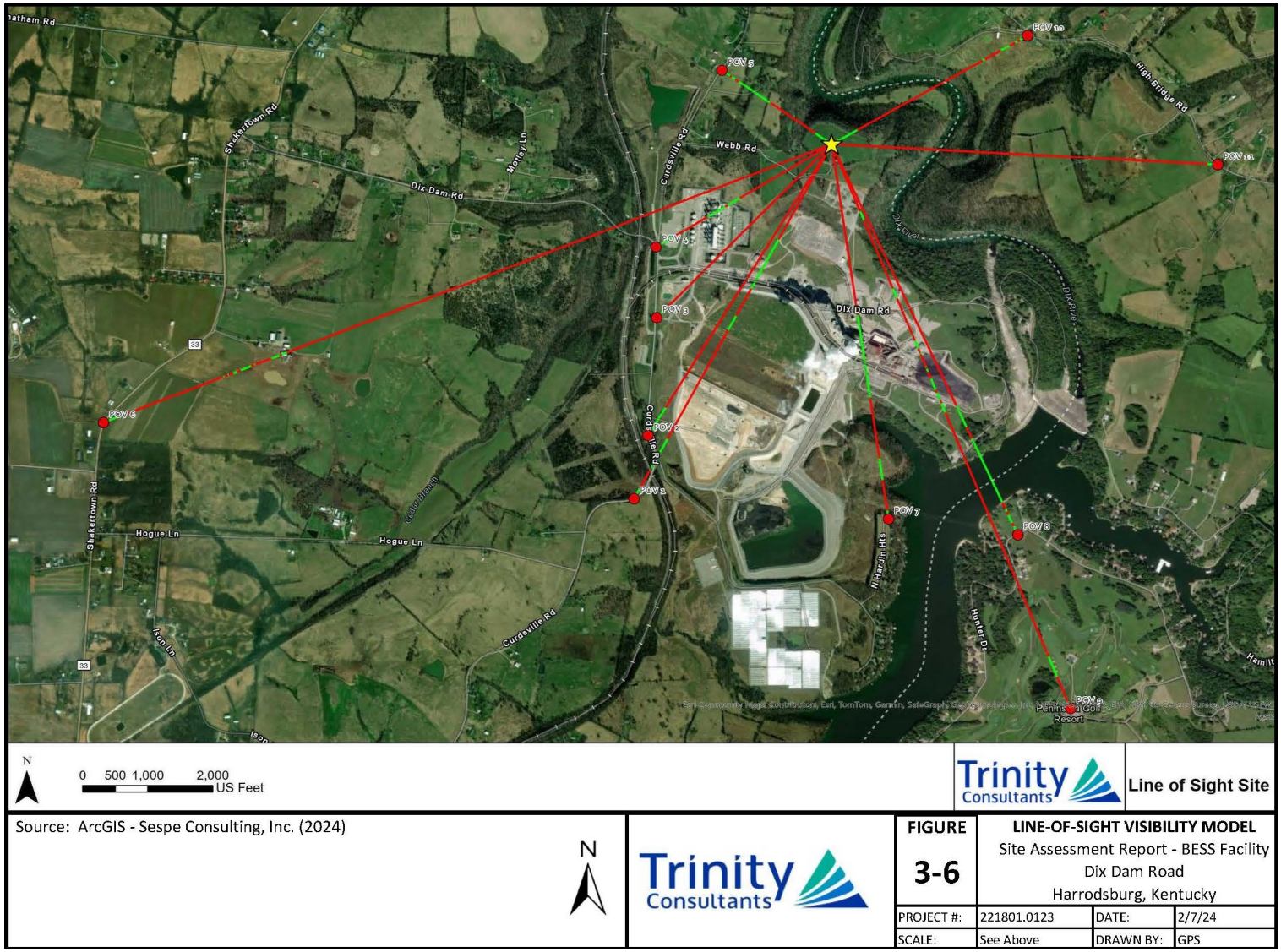
3.2.3.2 Line-of-Sight Profiles

In addition to the photo/ground-level view assessment, line-of-sight profiles were also developed to approximate the extent to which the new BESS Facility would be visible from the viewpoints analyzed. Specifically, a digital elevation model for the BESS site and surrounding areas was developed using publicly available topographic data taken from the U.S. Geologic Survey's (USGS's) National Elevation Data (NED) set. Using the USGS topographic data, a digital terrain model with an approximately 10-meter (i.e., 1/3 arc-second) resolution was created in ArcGIS, line-of-sight profile lines were then created from the eleven viewpoints summarized in **Table 3-10** above, assuming a 6-foot-high viewer were looking toward the site from each location.

Figure 3-6 shows the line-of-sight profiles. Areas shown in green represent areas where the viewer would have potential visibility, while areas shown in red represent areas where existing topography would be expected to block line-of-sight between the viewpoint and the BESS Facility site/equipment. Therefore, those viewpoints that show green areas in and around the BESS site would have potential visibility, and therefore be potentially visually affected. As shown below, with the exception of Locations #5 and #10 to the north, the topographic line-of-sight model shows that the BESS Facility site is expected to be fully shielded from the surrounding viewpoints (i.e., is shown in red), and therefore proposed onsite structures would not be readily visible.

While the model shows that viewpoints to the north of the BESS Facility could have partial visibility to onsite structures, it's important to note that this line-of-sight model only accounts for topography, and conservatively does not account for intervening structures or vegetation. Therefore, while small portions of the BESS structures may be visible from Locations #5 and #10, visibility would be limited and most likely obstructed partially or fully by trees and other existing vegetation, especially along the Dix River. Additionally, due to the relative low resolution of USGS's topographic data, there is a margin of error inherent to the in-of-sight profiles shown below. Nonetheless, **Figure 3-6** provides a useful model for conservatively determining possible visibility of the BESS Facility from the chosen viewpoints.

Figure 3-6. Brown Station BESS Facility Viewpoint Line-of-Sight Summary



3.2.3.3 Additional Methodologies/Assumptions

In addition to the methodologies described above, the following assumptions and project elements were accounted for within this visual assessment:

- Only minimal grading and site preparation would be required to construct the new BESS Facility, and the project would generally be developed on top of the existing site topography, at-grade, to the extent feasible. Note, some new raised slopes/fill areas would need to be constructed along the west and north side of the BESS Facility to ensure a level construction surface.
- While the line-of-sight profiles do not account for vegetative screening, as shown in the baseline photos above (see **Section 3.2.1**), there is extensive existing vegetation which limits project visibility from certain viewpoints. Specifically, numerous lines of tall trees existing along Dix River, public roadways, as well as interior portions of the Brown Station, which provide significant visual screening. Additionally, note that the baseline photos were taken during the fall, and the effectiveness of vegetative screening could be seasonally limited (i.e., presume trees would shed leaf cover during the colder winter months).
- As discussed above, on average the new BESS Facility is expected to have a much lower and more compact structural profile compared to the existing Brown Station coal-fire units, which have much larger and taller exhaust stacks. Additionally, because the Brown Station is an existing large power plant, the addition of the new BESS Facility would not be inconsistent with the existing visual character of the site/surrounding area.
- Consistent with KU's existing protocols, any new exterior lighting installed at the site would be minimized to the extent feasible and would primarily be installed for safety and security purposes only. Any new lighting fixtures installed would be downcast, and light would be confined to areas within the existing facility footprint. Where feasible, fixtures consistent with the lighting currently used on exterior areas of the station (or equivalent International Dark Sky Association [IDA]-approved fixtures) would be used. Where required, structures would be painted using natural muted tones that blend in with the existing environment/existing power plant structures. Additionally, structures would be coated with non-reflective surfaces to minimize glare.

3.2.4 Scenic Assessment and Project Visual Impacts

To quantify and evaluate potential visual impacts resulting from the proposed BESS Facility, both the BLM's VRM scenic quality and visual contrast rating systems were utilized. Both the pre-project/existing views and the post-project views were considered. The eleven viewpoints evaluated offer different perspectives of the proposed BESS Facility and therefore differ in their evaluation of the contrast rating and whether they are compatible with the surrounding environment. In this evaluation, each viewpoint is assessed for its effect on the existing visual quality and scenic character, as well as contrast with the existing setting, with a discussion of whether the design would conflict with the surrounding scenery and warrant mitigation measures. Note the technical assumptions summarized in **Section 3.2.3.3** above.

Table 3-11 below displays the relevant BLM ratings criteria scores at each location following installation of the approximately 155 MW BESS Facility on the northern portion of the Brown Station, comparing the pre-Project/existing views and the post-Project views, on the basis of the seven key landscape components summarized in **Table 3-8** above. See **Appendix C** for additional detail as well as the individual scores assigned to pre-/post-Project viewpoints for each of the seven landscape components.

Table 3-11. BLM Scenic Quality Change at Viewpoints

Viewpoint #	Existing View Rating	Post-Project View Rating	Ratings Change due to Project	Change?
Location #1	5	5	0	No Change
Location #2	7	7	0	No Change
Location #3	8	8	0	No Change
Location #4	5	5	0	No Change
Location #5	13	12	-1	Slight Decrease
Location #6	10	10	0	No Change
Location #7	9	9	0	No Change
Location #8	14	14	0	No Change
Location #9	15	15	0	No Change
Location #10	14	13	-1	Slight Decrease
Location #11	15	15	0	No Change

In addition to the scenic quality ratings, total visibility and the degree of contrast resulting from the proposed BESS Facility were also determined, and the results are summarized in **Table 3-12** below. Also see **Appendix C** for photographs and additional discussion related to the degree of visual contrast associated with the proposed BESS Facility.

Table 3-12. BLM Contrast Rating at Viewpoints

Viewpoint #	Project Visible?	Degree of Contrast (compared to existing conditions)	Discussion
Location #1	No	None	The proposed facility would not be visible from this location. Due to the large distance to this viewpoint, the facility would be fully obscured from view by the existing Brown Station structures, as well as topography and vegetation. The existing exhaust stacks would remain the only visible onsite structure from this location.
Location #2	No	None	The proposed facility would not be visible from this location. Due to the large distance to this viewpoint, the facility would be fully obscured from view by the existing Brown Station structures, as well as topography and vegetation. The existing exhaust stacks would remain the only visible onsite structure from this location.
Location #3	No	None	The proposed facility would not be visible from this location. The facility would be fully obscured from view by the existing Brown Station structures and topography. The existing exhaust stacks would remain the only visible onsite structure from this location.

Viewpoint #	Project Visible?	Degree of Contrast (compared to existing conditions)	Discussion
Location #4	No	None	The proposed facility would not be visible from this location. The facility would be fully obscured from view by the existing Brown Station structures and topography. The existing exhaust stacks would remain the only visible onsite structure from this location.
Location #5	Yes	Weak	The proposed facility is expected to be minimally visible from this location; however, existing vegetation and trees are expected to block line-of-sight to the majority (if not all) of the new onsite structures. Even if partially visible, views of the BESS would not contrast with the existing visual character of the area (i.e., the existing power generating facilities/industrial infrastructure).
Location #6	No	None	The proposed facility would not be visible from this location. Due to the large distance to this viewpoint, the facility would be fully obscured from view by existing topography and vegetation. The existing exhaust stacks would remain the only visible onsite structure from this location.
Location #7	No	None	The proposed facility would not be visible from this location. Due to the large distance to this viewpoint, the facility would be fully obscured from view by the existing Brown Station structures, as well as topography and vegetation. The existing exhaust stacks would remain the only visible onsite structure from this location.
Location #8	No	None	The proposed facility would not be visible from this location. Due to the large distance to this viewpoint, the facility would be fully obscured from view by the existing Brown Station structures, as well as topography and vegetation. The existing exhaust stacks would remain the only visible onsite structure from this location.
Location #9	No	None	The proposed facility would not be visible from this location. Due to the large distance to this viewpoint, the facility would be fully obscured from view by the existing Brown Station structures, as well as topography and vegetation. The existing exhaust stacks would remain the only visible onsite structure from this location.

Viewpoint #	Project Visible?	Degree of Contrast (compared to existing conditions)	Discussion
Location #10	Yes	Weak	The proposed facility is expected to be minimally visible from this location; however, existing vegetation and trees are expected to block line-of-sight to the majority (if not all) of the new onsite structures. Even if partially visible, views of the BESS would not contrast with the existing visual character of the area (i.e., the existing power generating facilities/industrial infrastructure).
Location #11	No	None	The proposed facility is not expected to be visible from this location. Existing vegetation and trees are expected to block line-of-sight to new onsite structures, and the existing onsite exhaust stacks would remain the dominant visible feature.

3.2.4.1 Conclusion

Referring to **Table 3-11** and **Table 3-12** above, views from the surrounding viewpoints are not anticipated to be significantly changed or be adversely impacted as a result of the proposed BESS Facility. Due to the onsite location of the BESS Facility, which would be setback from adjacent public roadways, and the low-lying nature of the proposed battery and ancillary structures (estimate the battery structures would sit no more than 10-feet above the ground surface), the proposed project is not expected to be visible from the majority of the locations analyzed. While some viewpoints located to the north may have partial visibility of the BESS Facility, these views would be limited and most likely be partially or fully obscured by the existing vegetation and thick trees that border the Brown Station and the Dix River. Furthermore, the new BESS Facility would be much smaller in footprint, size, and height compared to KU's existing much larger coal-fired plants, and therefore any fleeting views of the BESS Facility would not be incompatible or incongruous with the existing facility/surrounding landscape in terms of visual quality and contrast. Additionally, KU has operated the existing Brown Station for decades, and therefore views of the power generation structures and battery storage equipment are not inconsistent with the historical character of the area. Therefore, the BESS Facility would not have a substantial adverse effect on visual/scenic resources surrounding the Brown Station site.

3.2.5 Mitigation

Based on the conclusions of the scenic assessment described above, the proposed BESS Facility will not have a significant impact on the surrounding visual/scenic environment. Given the low profile of the batteries and ancillary structures, the project is not expected to be visible from most offsite locations, other than those immediately north of the Brown Station property. However, even at the viewpoints to the north, where topography does not break line-of-sight, there is existing vegetation and trees that would most likely fully obscure views of the BESS Facility. Therefore, taken in context with the existing setting, which is already dominated by the existing stacks and associated coal/gas-fired and supporting power generating infrastructure at the Brown Station, visual changes resulting from development of the new BESS Facility are anticipated to be minimal to none across the region. Based on these circumstances, it is concluded that the proposed BESS Facility development does not result in any significant impact on the surrounding scenic environment, and no mitigation measures are required. Note, the BESS Facility shall incorporate the project

design features noted in **Section 3.2.3.3** above to ensure and potential visual effects are minimized to the extent feasible.

3.3 Property Valuation Impact Assessment

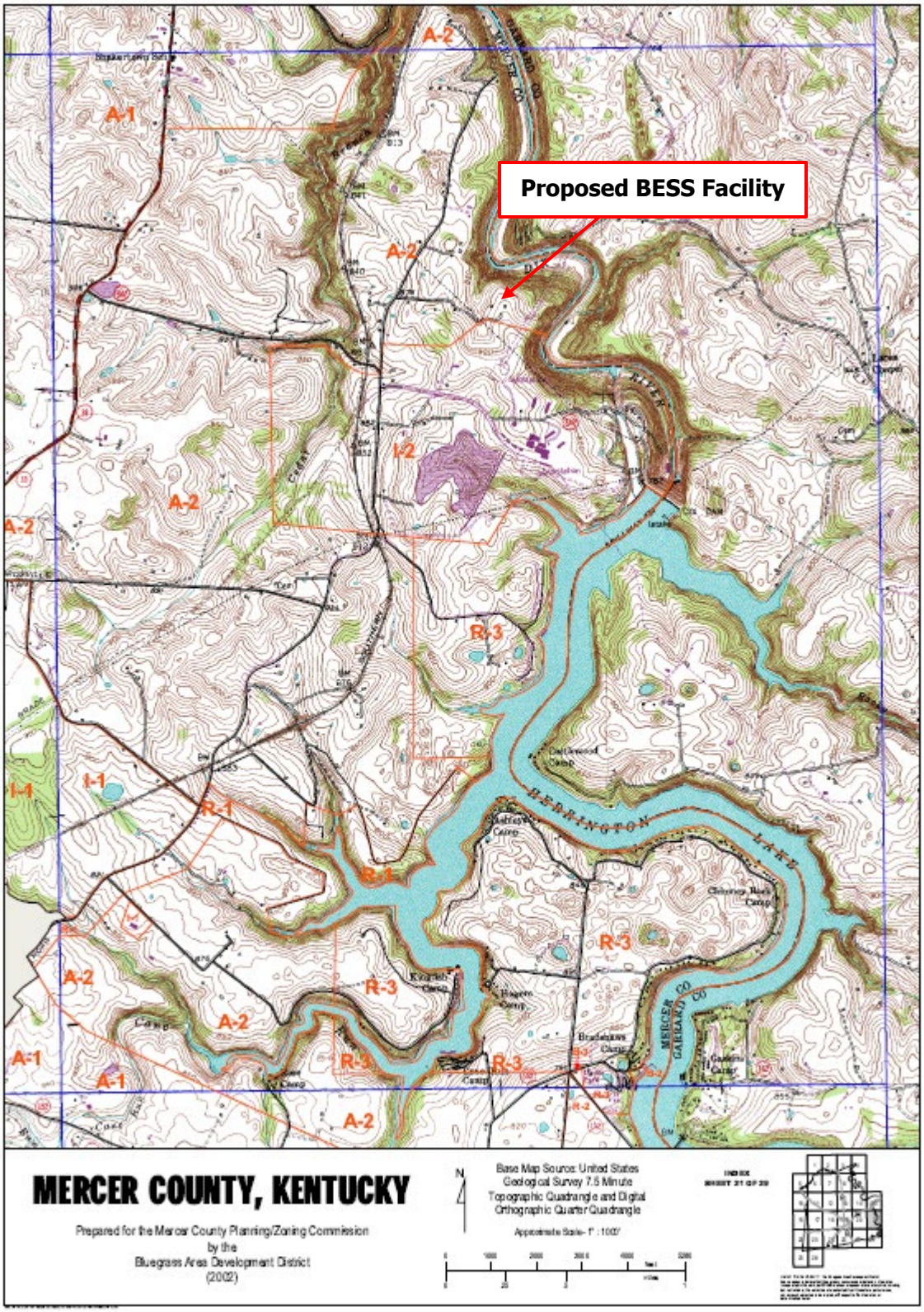
Pursuant to KRS §278.708(3)(c), the SAR must evaluate the potential impacts of the BESS Facility's siting, construction, and operation on property values and land use for adjacent property owners. The following sections assess these impacts on land use and property values. Note, this property value impact assessment takes into consideration the effects of both construction and operation of the BESS Facility when evaluating the impacts of the project on the property values in the surrounding area.

3.3.1 Land Use Compatibility

As shown in **Figure 3-7**, the majority of the existing Brown Station site (labelled as "Substation" in the center of the map) and the immediate surrounding area are designated with the I-2 (Heavy Industrial) zoning district, which represents heavy industrial areas; however, as discussed above, the approximately 7.5-acre area where the proposed BESS Facility would be installed is currently designated with the A-2 (Agricultural – Rural Residential) zoning district. North, West, and Southwest of the onsite I-2 and A-2 zones, the Brown Station property lies near large portions of A-2 rural residential agricultural lands. To the south, there are some multi-family residential parcels, zoned R-3 (Multi-Family Residential). Since the BESS Facility is a utility power storage facility, ancillary to a utility power plant, it is compatible with the conditional land use allowed under the I-2 zoning code (see Section 660(B)(ii) of the Mercer County Zoning Ordinance). Furthermore, it's assumed that the proposed BESS Facility is also conditionally compatible with the A-2 zoning code, as it is similar to other conditional uses listed within Section 620(A)(iii) and (B)(iii) of the Mercer County Zoning Ordinance.[1]

[1] https://mercercounty.ky.gov/Documents/Mercer%20County%20Zoning%20Ordinance.pdf

Figure 3-7. Brown Station Land Use and Zoning Map



As proposed, the BESS Facility and related equipment will be installed at KU's existing Brown Station. The proposed changes will not result in a change in the facility's zoning applicability, as the existing Brown Station will remain a utility power plant that is compatible with the heavy industrial (I-2) area zoning designation, and the BESS Facility is considered a conditionally acceptable use within the agricultural/rural residential (A-2) area zoning designation. Brown Station resides next to the Dix River and Herrington Lake and is adjacent to the Dix Dam—a hydroelectric generating station on the Dix River. Along the eastern border of Brown Station and further south, the R-3 zone consists of lower-density residential properties, including lakefront households. With the exception of those residential areas, the immediate one-mile vicinity surrounding Brown Station consists primarily of medium agricultural use.

About two miles north of Brown Station lies Shakertown, which is a historic village located in an A-1 farming-oriented agricultural zone, with light residential use as well. Burgin is a small city situated approximately three miles southwest of the Facility and consists of medium agricultural and residential uses, as well as light commercial use.

Accounting for the current County zoning designations, surrounding land use, and existing use for power generation, the land use of the property is compatible with the proposed BESS Facility.

3.3.2 Property Value Assessment

In order to evaluate the potential impacts on property values, the data in this section was obtained from the Mercer County Property Valuation Administrator (PVA) in collaboration with Valbridge Property Advisors.

Table D-1 in **Appendix D** provides assessed values for the 38 properties located within a two-mile radius from the Facility. Based on this data, **Figure 3-8** displays the total assessed value of each property, as compared to its distance from the Facility. Using linear regression, the overall trendline demonstrates a reduction in total assessed value as the distance increases. However, the coefficient of determination (R^2) is 0.0024, so the regression model serves as an incomplete representation of the dataset and there is no correlation between assessed value and distance.

Figure 3-8. Brown Station Surrounding Property Assessed Values

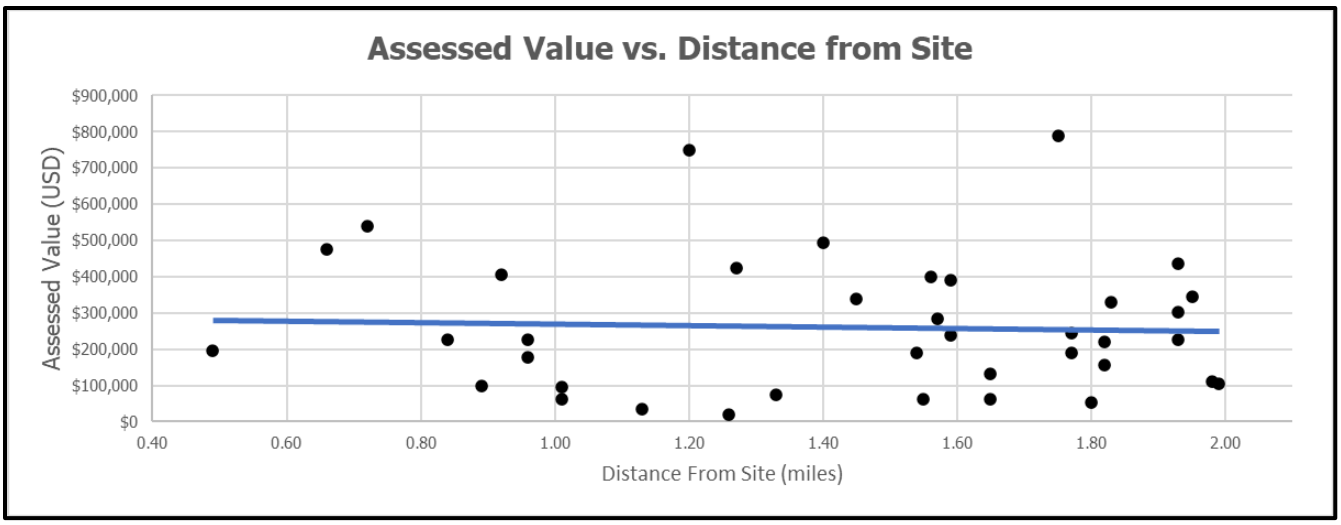
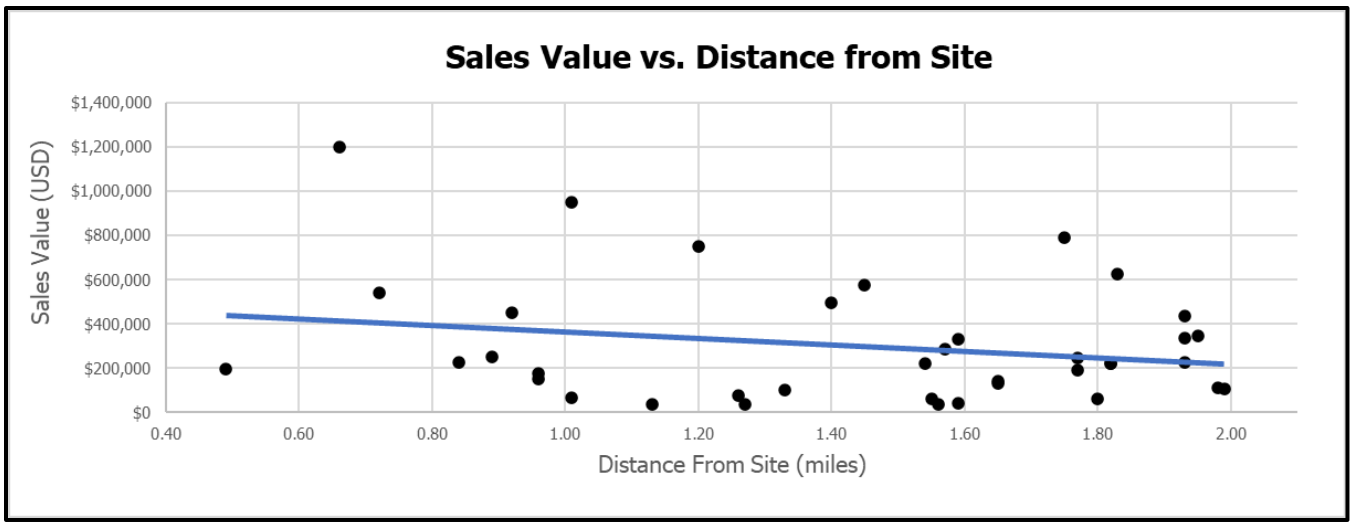


Table D-2 in **Appendix D** provides sales prices for the aforementioned properties. Sales data for the properties included in the table span from 2020 to 2022, and the most recent sale price for a given property is used. **Figure 3-9** provides a visual representation of the relationship between a given property's distance from Brown Station and the most recent sales price. As with the assessed property values, linear regression is used to determine whether a correlation exists between the distance of a given property from Brown Station and the most recent sale value for that property. The linear regression indicates a decrease in sales value as the distance increases; however, the coefficient of determination (R^2) is 0.05, so there is no notable correlation between sales value and distance from the facility.

Figure 3-9. Brown Station Surrounding Property Sales Values



3.3.3 Property Valuation Impact Assessment Findings

Considering the proposed BESS Facility will be constructed within the bounds of the existing Brown Station property, the BESS Facility is compatible with the current land use at the site. Furthermore, evaluation of

the land use and zoning designations for the surrounding area supports the BESS Facility's compatibility in the region.

Based on the analysis of assessed and sales values for surrounding properties, there is no correlation between a property's value and its distance from Brown Station. Therefore, the models suggest there will be no measurable detriment to property value with the installation of the proposed BESS Facility.

Given the lack of existing evidence indicating a negative impact on property values for the surrounding area or an incompatibility with the area's designated land use, it is reasonable to conclude that the proposed BESS Facility will not have a negative impact on local property values.

3.4 Traffic and Rail Impact Assessment

Pursuant to KRS §278.708(3)(e), the SAR must evaluate the potential "impact of the facilities on road and rail traffic to and within the facility (during both construction and operation), including anticipated levels of fugitive dust created by the traffic and any anticipated degradation of roads and lands in the vicinity of the facility". As such, the following section assesses the proposed BESS Facility's potential impacts on road and rail traffic.

3.4.1 Local Roadways

Brown Station is located north of Herrington Lake in Mercer County within central Kentucky. The proposed BESS will be installed within the northern portion of the existing Brown Station property, south and east of Dix Dam Road/Curdsville Road Extension and north of the Norfolk Southern Railway line spur, both of which branch into the Brown Station's property boundaries. **Figure 3-8** depicts these roadways relative to the Brown Station.

Direct vehicular access to the proposed BESS Facility will primarily be provided via Dix Dam Road, which is a two-lane, undivided local road which connects from Kentucky State Highway 342 (KY 342) at the northwest end of the Brown Station's property. Dix Dam Road leads to Brown Station's primary entrance, runs laterally internally to provide the Brown Station's vehicular access, and terminates at the east end of the Brown Station, near the Dix Dam Spillway. Dix Dam Road also turns into Curdsville Road Extension, which connects to Webb Road near the northwest corner of the Brown Station. Webb Road may also be used as an alternative access point during construction of the BESS Facility.

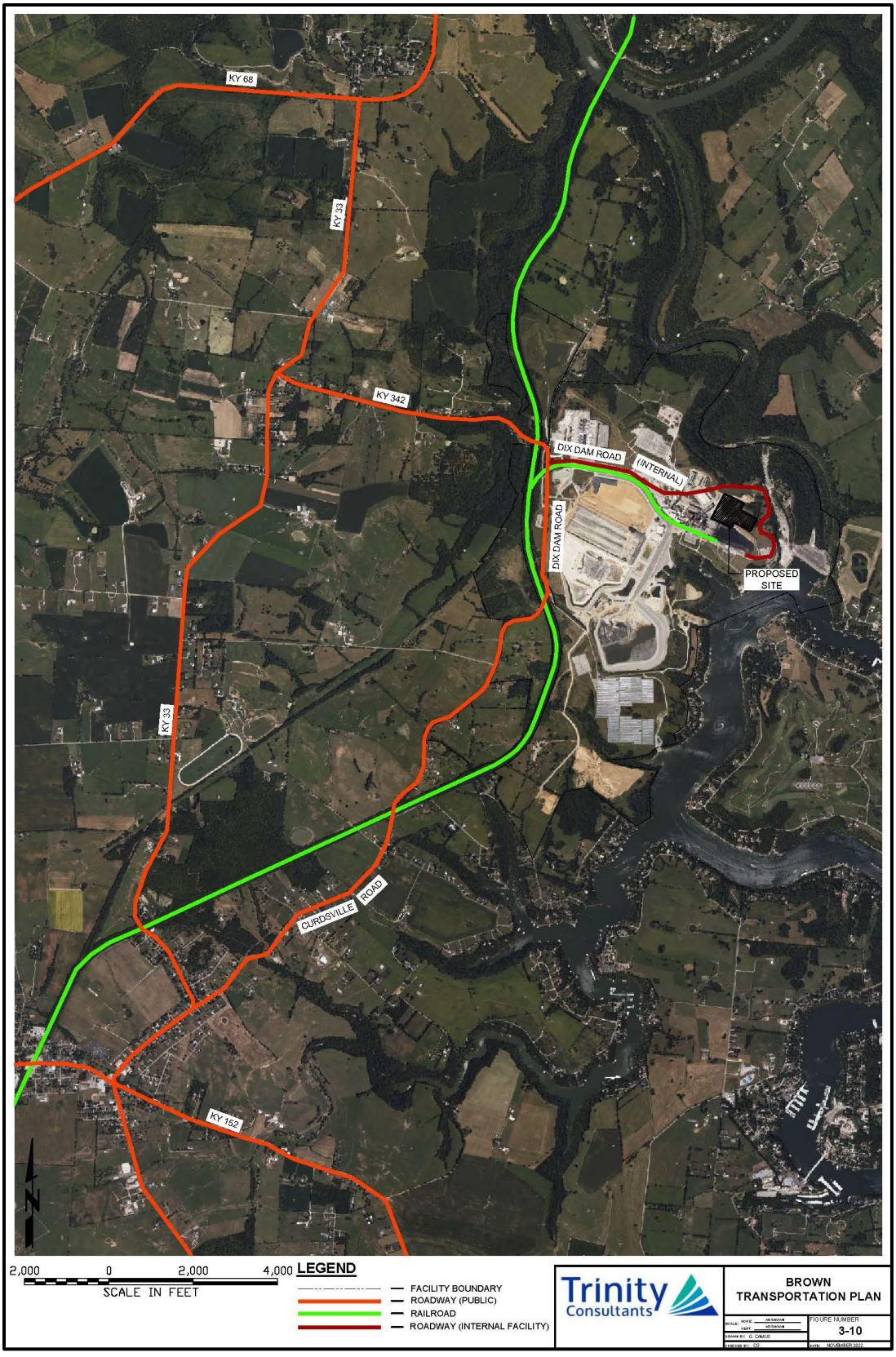
A roadway capacity analysis was performed for the main highways near the Brown Station that are expected to accommodate travel through Mercer County to the Brown Station. The roadways analyzed and the associated 2020, 2021, and 2022 annual average daily traffic (AADT), which represent the most recent data source from the Kentucky Transportation Cabinet (KYTC), include the following, and are depicted in **Figure 3-8**:

- US Highway 68 – two-lane undivided rural major collector arterial running southwest – northeast across Mercer County. AADT volume of 2,641 (2021) east/north of KY 33 and 2,055 (2021) west of KY 33.
- KY 152 – two-lane undivided rural major collector running east – west across Mercer County. AADT volume of 3,492 (2022) west of KY 342/KY 33 and 1,689 (2020) east of KY 342/KY 33.
- KY 33 – two-lane undivided rural major collector running south from its intersection with US Highway 68 and into Boyle County. AADT of 1,047 (2021) for the portion from US 68 to KY 152, and 2,039 (2020) south of KY 152.
- KY 342 (Dix Dam Road) – two-lane undivided rural local road running approximately 3.25 miles northeast from its intersection with KY 33 near Burgin, Kentucky, until becoming Dix Dam Road, then

running west until again intersecting with KY 33 northwest of the Brown Station. Dix Dam Road as an AADT of 431 (2020) from the northern intersection with KY 33 to Normans Camp Road and 1,340 (2021) south of Normans Camp Road until the southern intersection with KY 33. An AADT of 431 is conservatively chosen to represent all of KY 342 for this analysis.

The AADT numbers presented above are based on actual traffic count data provided by the KYTC. Hourly peak-hour volume data was not available; therefore, based on the American Association of State Highway and Transportation Officials: A Policy on Geometric Design of Highways and Streets, a typical factor of 15 percent of the average daily traffic is considered the hourly peak-hour volume. Using this assumption, **Table 3-13** below presents the estimated existing peak hour traffic volume for US Highway 68, KY 33, KY 152, and KY 342 (Dix Dam Road). Additionally, based on the Transportation Research Board Highway Capacity Manual, the capacity of a two-lane roadway, such as the affected roadways surrounding the Brown Station, is 3,200 vehicles per hour or 1,700 vehicles per hour in one direction.

Figure 3-10. Brown Station BESS Traffic and Vehicle Access Map



3.4.2 Potential Impacts from Construction Activities

For the construction of the proposed BESS Facility, site labor is estimated to peak at approximately 60 onsite construction personnel between Months 7 and 10 of the project's construction phase. It is assumed that 70 percent of the construction personnel will drive their vehicle to the site and the remaining 30 percent will carpool and be contained within the 70 percent driving personal vehicles. The resulting peak volume is approximately 42 vehicles entering and leaving the site on a daily basis during construction. The site-generated traffic will most likely occur from 6:00 a.m. to 6:00 p.m. on weekdays, with site-generated peak traffic likely occurring during typical morning (7:00 a.m. to 9:00 a.m.) and evening (4:00 p.m. to 6:00 p.m.) workday peak periods. Although not anticipated, the construction contractor may add a night shift at their discretion/if necessary.

Construction personnel will access onsite parking from the Brown Station access road on Dix Dam Road, which connects to an internal construction access road. As discussed above, Webb Road connecting to Dix Dam Road/Curdsville Road Extension may also be used as an access point during the project's construction phase. Variations in the number of construction personnel and work schedule may occur; however, these variations would be infrequent, and would only be expected to affect a small portion of the total construction personnel.

Construction truck deliveries are expected to peak between Months 4 and 7 of the BESS's construction phase. The daily truck deliveries will vary from approximately 0 to 14 trucks throughout the construction phase. The delivery times for the trucks will typically be limited to 8:00 a.m. to 3:00 p.m. These deliveries will include the battery packs and ancillary equipment (e.g., inverter and transformer parts, etc.) and typical construction materials, such as mechanical and electrical equipment, construction supplies, concrete, and other miscellaneous structure components.

Various auxiliary service and support vendors will also access the site during construction. These services may include portable restrooms, communications, and other support services. The vendors' vehicle activity was captured within the peak construction personnel estimate of 42 vehicles per day during the peak construction period.

In summary, during the peak construction period, there will be an estimated maximum of 56 construction-related vehicles (42 individual and carpooling personnel + 14 trucks) entering and leaving the site on a daily basis. It is expected that half of the construction traffic will come from the north on KY 33 and the other half from the south on KY 33. Based on existing travel patterns, 25 percent of traffic from the north is anticipated to travel to and from the west on US Highway 68 and 25 percent to and from the east on US Highway 68. For the traffic coming from the south, 25 percent is anticipated to travel to and from the west on KY 152, 12 percent is expected to travel to and from the east on KY 152, and 13 percent to travel to and from the south on KY 33. To determine the total peak-hour and peak-direction volume, a typical 60% (north)/40% (south) directional split was applied to the existing traffic and a 90% (north)/10% (south) directional split was applied to the construction traffic.

Utilizing these directional assumptions, **Table 3-13** below summarizes the existing peak hour traffic volumes on US Highway 68, KY 33, KY 152 and KY 342 (Dix Dam Road), as well as the estimated peak hour traffic volumes that would be added to these roadways during the BESS Facility construction phase. As shown in the table, the estimate peak one-way traffic levels, even when taking into account the additional project vehicles travelling to and from the site during construction, would be well below the estimated capacity limits. As such, although the project would temporarily increase daily and peak-hour traffic on Highway 68, KY 33, KY 152 and KY 342 (Dix Dam Road), the increase would be minimal, and the roadway has sufficient capacity to accommodate these additional vehicles and trucks. Therefore, based on the peak-

hour and peak-direction total volume on the studied roadways, the construction traffic is not expected to adversely affect the roadway usability. See the results summarized in **Table 3-13** for additional detail.

Table 3-13. Impacts to Roadway Capacity from Construction

Roadway	No. of Lanes	Existing Volume			Construction Trips		Total Volume Peak-hour Peak Direction	One-way Roadway Capacity (v/h)	Meets Capacity? (Y/N)
		AADT	Peak Hour Volume	Peak-Hour Peak Direction	Distribution	Peak-hour Peak Direction			
US Highway 68 (West of KY 33)	2LU	2,055	309	186	25%	13	199	1,700	Y
US Highway 68 (East of KY 33)	2LU	2,641	397	239	25%	13	252	1,700	Y
KY 33 (from US 68 to KY 152)	2LU	1,340	201	121	50%	26	147	1,700	Y
KY 33 (South of KY 152)	2LU	2,039	306	184	13%	7	191	1,700	Y
KY 152 (West of KY 33)	2LU	3,492	524	315	25%	13	328	1,700	Y
KY 152 (East of KY 33)	2LU	1,689	254	153	12%	7	160	1,700	Y
KY 342 (Dix Dam Road section)	2LU	431	65	39	100%	51	90	1,700	Y

3.4.3 Fugitive Dust

Potential for fugitive dust emissions, specifically due to on-/off-road vehicles, will be of most concern during construction activities. During BESS construction, potential fugitive dust emissions will be associated with ground excavation, cut-and-fill operations, on-site transport of materials and equipment, operation of heavy equipment, and other activities. Vehicles travelling on unpaved and/or un-swept roadways also have the potential to generate fugitive dust. The amount and expanse of fugitive dust will vary from day-to-day, depending on the level of activity, onsite control/cleanup measures implemented, and weather.

Best management practices will be used during construction to limit fugitive dust emissions. Measures will include watering unpaved roadways, daily sweeping/maintenance of paved roadways, limiting the area of open excavation/grading areas, and providing temporary cover for soil stockpiles. Standard erosion and soil stabilization measures would also be employed throughout the BESS's construction phase. These strategies are anticipated to be incorporated in the construction stormwater permit that will be obtained for the construction operations and disturbances.

Access throughout the proposed site will use existing paved roads in conjunction with temporary internal unpaved roadways installed during construction. These roads provide direct access to locations necessary for construction activities and therefore fugitive dust emissions should be minimal from onsite traffic. New ground disturbance will be minimized to the extent feasible.

3.4.4 Roadway Degradation

As previously discussed, daily construction truck deliveries will vary from approximately 0 to 14 trucks per day maximum. These deliveries will include typical construction materials, as well as pre-fabricated structures such as the battery packs and containers. These supplies would be delivered using typical flat-bed and enclosed delivery trucks. As such, equipment and supplies delivered by trucks using the local roadways are expected to include few, or possibly no, oversized or heavy loads that would have the potential to degrade roadways beyond existing levels. It is also important to note that the project area is an industrial power generation facility (i.e., Brown Station), and therefore affected roadways have been designed to handle higher volumes of larger trucks. Therefore, interference with traffic flow and/or damage to local roadways due to oversized loads is not expected as a result of the project.

3.4.5 Potential Impacts from Facility Operation

As discussed in Section 3.4.2, the roadway analysis of the construction phase indicates that roadways will have adequate capacity for the additional traffic that will be temporarily generated as a result of the BESS Facility. The project's construction phase is only expected to last approximately 15 months total. Therefore, any effects resulting from the additional construction vehicles would be temporary in nature.

After construction is complete, the commercialization of the BESS Facility would commence. Unlike construction, operation of the BESS will not result in permanent additional onsite personnel, as existing onsite employees would be sufficient to operate the new facility. Therefore, once construction is complete and the BESS Facility is placed into operation, traffic volumes associated with the existing Brown Station are anticipated to return to baseline levels/conditions. The baseline traffic volume is included in existing AADT counts noted in **Table 3-13** above, which are well within the allowable capacity for the affected roadways. For these reasons, no permanent impacts are anticipated on roadway capacity as a result of commercialization and operation of the proposed BESS Facility, and similarly there would be no increase in potential road degradation or congestion.

3.4.6 Rail and Barge Traffic

The nearest railroad is Norfolk Southern Railway line located just west of the Brown Station. There is a spur from this rail line that terminates within the middle of the Brown Station, which has historically been the primary mode of transporting coal shipments. The BESS Facility will not utilize trains, nor will any equipment or materials be delivered to the site via rail.

The nearby Dix River and Herrington Lake do not support barge traffic. Therefore, the BESS Facility would not involve the use of barges or watercraft of any kind, and there will be no impacts to barge traffic.

3.4.7 Mitigation

The only potential impact on roadway traffic will result during the construction of the BESS Facility. As discussed above, at its peak, the construction phase of the project is anticipated to contribute an additional 56 vehicles on Dix Dam Road and other potentially affected roadways (i.e., US Highway 68, KY 33 and KY 152). Project traffic is expected to be divided in the north and south direction by a 50%/50% directional split. At most, the peak hourly one-way traffic is anticipated to increase by 51 vehicles on KY 342/Dix Dam Road during the peak construction months.

Based on the analysis, assessed roadways in the vicinity of the BESS Facility (US Highway 68, KY 33 and KY 152, and KY 342/Dix Dam Road) have sufficient roadway capacity to handle the temporary traffic generated during construction. LG&E would also clearly delineate onsite access routes and ensure that vehicles and trucks travelling within the site would do so in a safe manner. Additionally, as noted above, there would be no permanent change or increase in traffic levels once the BESS Facility is operational, as existing employees would operate the new equipment. As such, after commercialization, the construction traffic will cease, and overall regional vehicle trips would return to existing/baseline levels. Therefore, no significant impacts to roadway capacity are anticipated as a result of construction and operation of the proposed BESS Facility.

For these reasons, no mitigation is merited for potential impacts on the surrounding transportation infrastructure based on the results of this analysis. Although the roadway capacities surrounding the Brown Station are sufficient to handle the construction and operation of the BESS Facility, consistent with KU's existing protocols, carpooling and other trip reduction measures in the area will continue to be encouraged to the extent feasible.

4. CUMULATIVE ENVIRONMENTAL ASSESSMENT

4.1 Air Resource Assessment

The Brown Station is currently comprised of one coal-fired generator and seven natural gas-fired turbines, and is a Prevention of Significant Deterioration (PSD) major source. In addition, the facility site includes an adjacent photovoltaic electrical generation installation, hydroelectric generation at the Dix Dam as well as an existing small scale battery electric storage test system and a small wind power generating plant.

As summarized above, LG&E is proposing to install a new BESS Facility within the northern portion of the existing Brown Station property (see **Figure 1-1**). Regionally, the proposed BESS Facility will be located in southeastern Mercer County to the northeast of Harrodsburg, Kentucky. Mercer County has been designated by the United States Environmental Protection Agency (USEPA) as "attainment" or "unclassifiable" for all criteria pollutants. Designated 8-hour ozone non-attainment areas in the region include the Louisville, Cincinnati and Indianapolis metropolitan areas. The nearest Federal PSD Class I area is Mammoth Cave National Park, located approximately 80 miles (130 kilometers) southwest of the proposed project.

Air quality regulation and permitting in Mercer County, Kentucky is administered by the Kentucky Division for Air Quality (KDAQ). The USEPA has given KDAQ authority to implement and enforce the federal Clean Air Act (CAA) provisions and state air regulations under its approved State Implementation Plan (SIP).

The proposed BESS Facility is to be constructed within an approximately 7.5-acre footprint immediately north of the existing "North Substation" facility at the Brown Station. The footprint is on parcel/property owned by KU and consists of approximately 69 acres of disturbed but currently undeveloped landscaped grassy area.

Potential impacts to ambient air quality will be minimal and will primarily be limited to activities associated with the construction of the Project. Earth moving during the construction phase has the potential to generate some fugitive dust emissions. Additionally, mobile equipment operation will result in exhaust emissions during construction. Following completion of construction and commencement of operation, no potential impacts to air quality from on-going operation of the BESS Facility have been identified and none are expected. No air registrations or permitting are anticipated to be required for the facility since there are no sources of emissions expected as part of facility operation. Mitigation strategies will be implemented as described in **Section 5** to reduce impacts from air emissions during construction.

4.2 Water Resource Assessment

The most prominent surface water feature in the area is Herrington Lake, which lies approximately 1,300 feet southeast of the BESS Facility site. Herrington Lake is roughly 1,300 feet wide in the vicinity of the site and was formed by construction of the Dix Dam on the Dix River. According to data developed by the United States Geological Survey (USGS), flow rates in the Dix River at Dix Dam range from around 750 cubic feet per second during periods of low-flow to approximately 1,900 cubic feet per second during high-flow. The Dix River discharges into the Kentucky River approximately 2.6 miles north of the BESS Facility site.

Once constructed, drainage from the proposed BESS site will flow in various direction, but primarily to the north-northwest via unnamed perennial drainage ways into the Dix River located approximately 0.1 miles to the north of the project site (see **Figure 1-1**). From here, the Dix River flows from south to north toward its confluence with the Kentucky River. The Kentucky River Basin is one of Kentucky's 12 major drainage

basins. With headwaters in Lee County, the 260-mile-long Kentucky River drains an area of over 7,000 square miles in east central Kentucky before discharging into the Ohio River near Carrollton at River Mile 545.

The existing Brown Station discharges cooling water and ash treatment basin effluent into Herrington Lake via Outfalls 001, 002, 003, and 006 pursuant to its Kentucky Pollution Discharge Elimination System (KPDES) Permit No. KY0002020. In addition, Brown Station withdraws water for steam generation, cooling/quenching, and make-up water from Herrington Lake at a point identified as Outfall 005 in its KPDES permit.

Based on Trinity's review of the Kentucky Groundwater Data Repository – Water Well and Spring Location Map and query of the Kentucky Geological Survey Water Well & Spring Records Database, multiple water wells and a spring are inventoried within a one-mile radius of the BESS Facility site. All of the wells are either inactive or are only monitoring wells not used for withdrawal of usable water. The closest spring (Webb Spring, AKGWA No. 90001873) is located approximately 300-feet west of the proposed BESS Facility.

No other domestic use, industrial, municipal, monitoring, agricultural, public, or mining wells were depicted on the site or within one mile of the proposed BESS Facility site.

The Kentucky Department for Environmental Protection (KDEP) Division of Water (DOW) administers the federal Clean Water Act and state water protection program. Water quality is maintained by the establishment of water quality standards and regulation of all discharges of pollutants to waters of the Commonwealth. Discharge standards are established for particular sources and activities, and wastewater and storm water discharges from industrial activities such as power generation must obtain a KPDES permit.

The existing Brown Station currently maintains a KPDES permit (No. KY0002020). This permit generally establishes discharge limits and monitoring and reporting requirements for the management and discharge of wastewater and stormwater at the Brown Station. The KPDES permit pertains to the Brown Station and will be revised to encompass the project property and include any additional wastewater and/or stormwater associated with the proposed BESS Facility, prior to construction.

As stated above, the proposed BESS Facility is to be constructed within an approximately 7.5-acre footprint immediately north of the existing "North Substation" facility at the Brown Station. The footprint is on property/parcel owned by KU and consists of approximately 69 acres of disturbed but currently undeveloped landscaped grassy area. In compliance with the DOW, KU will continue to implement their existing stormwater pollution prevention plan and will update the plan as needed, prior to construction of the BESS Facility. Furthermore, LG&E and KU will ensure that the BESS Facility complies with the Brown Station's existing Best Management Practice (BMP) plan.

4.2.1 Water Pollutant Impacts

Construction operations, in particular site clearing and grading in preparation for installation of structures associated with the proposed BESS Facility, represent potential for increased erosion and sediment discharge from the site during development. The greatest potential for impacts to surface water quality from construction activities is sediment loading from erosion. Construction materials delivered to the site, including chemicals, fuels, and lubricants, also pose a threat if not properly managed.

Once constructed and commercialized, there will be no wastewater discharges associated with operation of the proposed BESS Facility. However, installation of the battery structures, industrial equipment, support concrete and associated access drives/pathways will decrease the overall surface permeability of the area

within the drainage basin containing the development. This will result in a slight increase in peak discharge rates during storm events. Cursory evaluation indicates an increase in peak discharge rate may conservatively triple due to development of the facility when comparing the undeveloped site to the conditions following installation of the BESS Facility.[2] However, the batteries/containers will be spread throughout the project area and have gaps between each unit. Any runoff from the individual battery enclosures will be deposited to the ground surrounding each unit. Preliminary review suggests that existing drainage paths are adequate to accommodate these flows even for significant storm events without adverse hydraulic consequences; however, provisions for erosion prevention and sediment control may still require implementation during operation of the proposed BESS Facility.

The project includes installation of a new transformer. At this point in the project development, the exact transformer unit for the project has not been selected; however, there is a potential an oil-filled unit could be installed. In the event that oil-filled units are selected (typical volumes in the range of 400 gallons per unit, or 4,000 gallons for development of the facility), LG&E will provide necessary secondary containment and comply with requirements of 40 CFR Part 112 by updating their existing Spill Prevention, Control, and Countermeasure Plan (SPCC) as needed to account for the BESS Facility.

In addition to the transformer, the batteries themselves and other ancillary equipment include the storage and usage of oils and chemicals within the industrial equipment. Quantities of oils and chemicals found within operating BESS equipment would be nominal, and the BESS Facility will be constructed so that stormwater will not contact these potential pollutant sources, nor will there be releases to wastewater containing pollutants from oils or chemicals onsite.

Water pollutant impacts from construction and operation will be limited to potential sediment loading in stormwater, especially during construction, and will be managed using mitigations detailed in **Section 5.2**.

4.2.2 Water Withdrawal Impacts

No water withdrawal or significant water use is required for the construction and operation of the proposed BESS Facility. Water may potentially be used for dust suppression during construction. In this event, water for dust suppression will be sourced from existing connections at the Brown Station and transported to the site, as needed, using a mobile water truck, eliminating the need for use of new on- or near-site surface water or groundwater resources.

4.3 Solid and Hazardous Waste Assessment

The KDEP Division of Waste Management regulates the treatment, storage, and disposal of solid, special, and hazardous wastes. Kentucky Revised Statute, Chapter 224, identifies requirements for permitting, licensing, and operating facilities generating and managing hazardous wastes. Hazardous waste generators must also register with the USEPA.

During construction of the proposed BESS, potential waste would include earth and land clearing debris, metal scraps, electrical wiring and cable, surplus consumable materials (e.g., paints, greases, lubricants, and cleaning compounds), packaging materials, and office waste. Prior to conducting any land clearing or demolition, surveys for regulated substances (e.g., oil drums, asbestos containing materials, and other

[2] Assumes stormwater runoff coefficients of 0.25 for steep lawn with heavy soil and 0.75 for heavy industrial. Conservatively applying this increase to entirety of the approximately 7.5-acre Project site results in an approximate tripling of stormwater runoff. Runnoff coefficients from 2011 California Waterboards Runoff Coefficient Fact Sheet accessed November 29, 2022 from https://www.waterboards.ca.gov/water_issues/programs/swamp/docs/cwt/guidance/513.pdf.

regulated wastes) would be conducted. Should any be found, these materials would be managed in accordance with applicable regulations. In general, construction wastes would be typical of the construction of any commercial or industrial facility. Any potentially reusable materials would be retained for future use, and recyclable materials would be periodically collected and transferred to recycling facilities. Metal scraps unsuitable for reuse would be sold to scrap dealers, while the other remaining materials would be collected in dumpsters and periodically trucked offsite by a waste management contractor for disposal in a licensed landfill. Other materials would include packaging material (e.g., wooden pallets and crates), support cradles used for shipping of large vessels and heavy components, and cardboard and plastic packaging.

Potential impacts to soil, groundwater, and surface water resulting from project construction can arise from accidental releases of hazardous substances or wastes. If an accidental release occurs, it could result in surface soil and/or subsurface soil contamination, depending upon the location of the spill and the quantity spilled. Similarly, it is possible groundwater could be impacted if hazardous materials or waste are released onto the soil and the substance is not remedied in a timely manner. Potentially, an accidental release during construction could extend to nearby surface water bodies like Herrington Lake, possibly resulting in surface water contamination.

Potential impacts to soil and surface water are much less likely once the construction phase is completed, due in part to the BESS Facility design as there will be virtually no hazardous materials in storage or use at the site, other than chemicals found within the equipment while operating. Solid waste generated at the proposed BESS Facility will be minimal, and mostly generated from routine maintenance operations. Routine maintenance may generate small quantities of used oil, which would be recycled or disposed of offsite via licensed contractors, or dirt and sludge from equipment cleaning that would be transferred to a commercial landfill offsite. No significant generation of solid waste is anticipated during operation of the proposed BESS.