BURNS McDONNELL

OGLETHORPE

SOUND STUDY

SMARR POWER GENERATION STATION

PROJECT NO. 173086

REVISION 1

JANUARY 13, 2025

CONTENTS

Tables

List of Abbreviations

Abbreviation	Term/Phrase/Name
ACC	Air-cooled Condenser
ANSI	American National Standards Institute
CT	Combustion Turbine
dB	decibel
dBA	A-weighted decibel
dBC	C-weighted decibel
Hz	Hertz
L_{ANS}	A-weighted, noise compensated metric
L_{dn}	day-night average sound level
L_{eq}	equivalent-continuous sound level
L_{10}	10-percentile exceedance sound level
L_{50}	50-percentile exceedance sound level
L_{90}	90-percentile exceedance sound level
MW	megawatt
mph	miles per hour
NIST	U.S. National Institute of Standards and Technology
NSA	Noise Sensitive Area
Project	Smarr Combined Cycle Project
PWL	sound power level
SPL	sound pressure level
ST	Steam Turbine
USEPA	United States Environmental Protection Agency

Executive Summary

Burns & McDonnell conducted a sound study for the Oglethorpe Smarr Combined Cycle Project (Project), located in Monroe County, Georgia. The Project is a new development of a 1200-megawatt (MW) combined-cycle combustion turbine power generating facility built south of the existing Smarr Generating Station.

The objectives of the sound study were to identify the applicable sound level regulations, measure baseline sound levels near the Project property lines, and create an acoustical model to evaluate future sound impacts from the Project.

Neither the State of Georgia, nor Monroe County have numerical sound level limits that would be applicable to the Project. In absence of regulatory limits, guidance can be used from the United States Environmental Protection Agency (USEPA) and the American National Standards Institute (ANSI) to limit sound level impacts associated with the Project on the surrounding community. Additionally, Project sound levels can be compared to baseline sound levels to estimate potential acoustic impacts at the surrounding residences. Based on the existing sound levels, the future Project should target sound levels recommended from USEPA and ANSI S12.9 to limit the potential impacts to the surrounding community and be consistent with the existing ambient sound levels in the area. These would be recommended sound level criteria of 48.6 A-weighted decibels (dBA) and 68 C-weighted decibels (dBC) at the nearest residential receptors.

The Project, as designed, meets the USEPA recommended sound level of 48.6 dBA and ANSI 12.9 recommended sound level of 68 dBC at the nearest residential properties.

1.0 Acoustical Terminology

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

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

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

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

When audible noise observations and high-frequency octave band data (e.g., above 1,000 Hz) indicate that measured sound levels have a strong insect, bird, or leaf rustle noise component it may be appropriate to estimate what the sound levels would be without the influence of insect noise or other high-frequency sounds. The A-weighted, noise-compensated metric (ANS-weighted metric, “L_{ANS}”) can be used to filter out sounds above 1,000 Hz and more accurately characterize the environment sound levels without the high-frequency noise.

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

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

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

2.0 Applicable Regulations & Criteria

State and local sound level regulations were reviewed to determine the applicable Project sound level limits. The Project is located in Monroe County, Georgia. The State of Georgia does not have sound level limits applicable to the Project. Monroe County ordinances were reviewed, and no noise ordinances were found to be applicable to the Project. Based on available online zoning information, there are no applicable numerical regulatory noise limits for the Project.

2.1 USEPA

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

2.2 ANSI S12.9 Part 4

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

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

For sounds with strong low-frequency content, this would be approximately equivalent to a C-weighted sound level of 65 to 70 dBC. A target sound level of 68 dBC for the Project falls within this range and would help minimize the potential for low-frequency impacts based on the guidance from the ANSI standard.

2.3 Project Design Goal

Based on the USEPA and ANSI S12.9 Part 4 guidance for limiting sound level impacts to the surrounding community, the Project design goal is to limit Project-generated sound levels to 55 dBA L_{dn} (48.6 dBA L_{eq}) and 68 dBC at the nearest residential structures surrounding the Project.

3.0 Sound Level Measurements

Burns & McDonnell personnel took sound level measurements to establish the existing ambient sound levels in the areas surrounding the Project. Sound level measurements were made using sound level meters that met the American National Standards Institute (ANSI) S1.4 requirements for a Type 1 Precision Sound Level Meter. One-half inch random-incidence microphones were used on the meters. Microphone windscreens were used for all measurements. The sound level meters were calibrated before and after each set of measurements using a sound level calibrator. Calibration level changes did not exceed ± 0.5 dB during the measurements. The meters and calibrator were checked within a year prior of the measurements to verify compliance with the U.S. National Institute of Standards and Technology (NIST) specifications

Continuous, long-term sound level measurements were collected at three measurement locations surrounding the existing facility and future Project site. Long-term measurement locations are shown in Figure A-1 of Appendix A. The microphones were placed at a height of approximately five feet above the ground and mounted on a microphone pole which is connected to the monitoring system case.

The long-term monitors measured sound levels continuously over the course of two days from approximately 10:00 a.m. on June 26, 2024, to 9:00 a.m. on June 28, 2024. Over the course of the survey, the existing facility was operational from 8:00 a.m. on June 26, 2024, to 9:30 p.m. on June 27, 2024. The remainder of the survey, the existing facility was offline. The measured sound level data is shown in graph and tabular form in Appendix B, The graphs include the MW load for the existing facility over the course of the survey. Meteorological data is included from the nearby weather station. The wind speed shown in the graph has been adjusted down to microphone height, since the weather station reports at a 10-meter height. There were two rain events during the long-term monitoring period which are noted on the graphs as well.

Due to the time of year, there was a significant increase in insect noise over the nighttime hours. To show the approximate sound levels that could be expected for other times of the year when insect noise is much lower, the L_{ANS} values have been provided, which corrects for the insect noise by filtering out the high frequencies typically associated with insect noise. A summary of the data is shown in Table 3-1 below and is broken down by time of day (e.g., daytime/nighttime) and whether the existing facility was operational.

Table 3-1: Long-Term Measurement Summary

Measurement Location	Time of Day/ Operation	L_{Aeq} (dBA)	L_{A90} (dBA)	L_{ANS} (dBA)	L_{Ceq} (dBC)	L_{C90} (dBC)
LT1	Daytime (Units ON)	53	51	51	79	78
	Daytime (Units OFF)	47	42	45	60	57
	Nighttime (Units OFF)	47	45	44	62	56
LT2	Daytime (Units ON)	52	48	51	65	63
	Daytime (Units OFF)	50	46	49	61	58
	Nighttime (Units OFF)	55	53	52	62	60
LT3	Daytime (Units ON)	47	37	33	55	52
	Daytime (Units OFF)	46	39	39	53	49
	Nighttime (Units OFF)	**55**	**54**	**39**	**55**	**54**

4.0 Modeled Sound Levels

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

4.1 Sound Modeling Methodology and Input Parameters

Predictive noise modeling was performed using the industry-accepted sound modeling software CadnaA, version 2025. The software is a scaled, three-dimensional program, which considers air absorption, terrain, ground absorption, and reflections and shielding for each piece of noise-emitting equipment, and then predicts sound pressure levels at discrete locations and over a gridded area based on input source sound levels. The model calculates sound propagation based on International Organization for Standardization (ISO) 9613-2:2024, General Method of Calculation. ISO 9613-2 assesses the sound level propagation based on the octave band center-frequency range from 31.5 to 8,000 Hz.

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

The modeled atmospheric conditions were assumed to be calm, and the temperature and relative humidity were left at the program's default values. Reflections and shielding were considered for sound waves encountering physical structures. Sound levels around the site can be influenced by the sound reflections from physical structures onsite. The area surrounding the Project has mild elevation changes, which scatter and absorb the sound waves. Thus, terrain was included to account for surface effects such as ground absorption. Average ground absorption for the Project site and surrounding area was set to be 0.0 to approximate the hard reflective pavement, and surrounding area was set to a value of 0.8 to account for the mostly soft vegetative ground and forestry surrounding the site . The modeling assumptions are outlined in Table 4-1. This model is exclusive of noise sources not associated with the Project (e.g., traffic noise and local fauna). Only Project sound levels have been evaluated.

Table 4-1: Sound Modeling Parameters

Model Input	Parameter Value
Ground Absorption (Onsite)	0.0
Ground Absorption (Offsite)	0.8
Number of Reflections	2
Receptor Height	5 feet above grade
Terrain	USGS topographic land data
Temperature	50 °F
Humidity	70%

4.2 Equipment Sound Levels

The Project general arrangement is included as Figure A-2 of Appendix A. The Project is expected to include two (2) 1x1 combined-cycle power blocks. Each power block is expected to include an outdoor combustion turbine (CT), a steam turbine (ST) building, an air-cooled condenser (ACC), a fin-fan cooler, and associated auxiliary equipment (e.g., skids, blowers, pumps, transformers, etc.). The steam turbine equipment is located inside a building. It is assumed the building is constructed of typical insulated building materials for the walls and roof with up to four ventilation louvers included.

All equipment is expected to include a near-field sound pressure level specification of 85 dBA at 3-feet as part of its base-package offering. The modeled equipment octave-band sound levels used for each piece of equipment are included in Appendix C.

4.3 Model Results

Project sound levels were modeled for normal operation, steady-state condition. The acoustic model results are only for the new Project and do not include any contributions for existing ambient sound sources, including the existing Smarr Generating Station. The predicted A-weighted sound level contours, based on the Project's current design, are shown in Figure A-3 of Appendix A. The Project sound levels predicted at nearby NSAs (i.e., residential areas) are provided in Table 4-2 below.

Table 4-2: Model Results

Receptor Name	Model Sound Level Results (dBA)	Model Sound Level Results (dBC)
NSA1	49*	64
NSA2	41	59
NSA3	32	54
NSA4	32	54

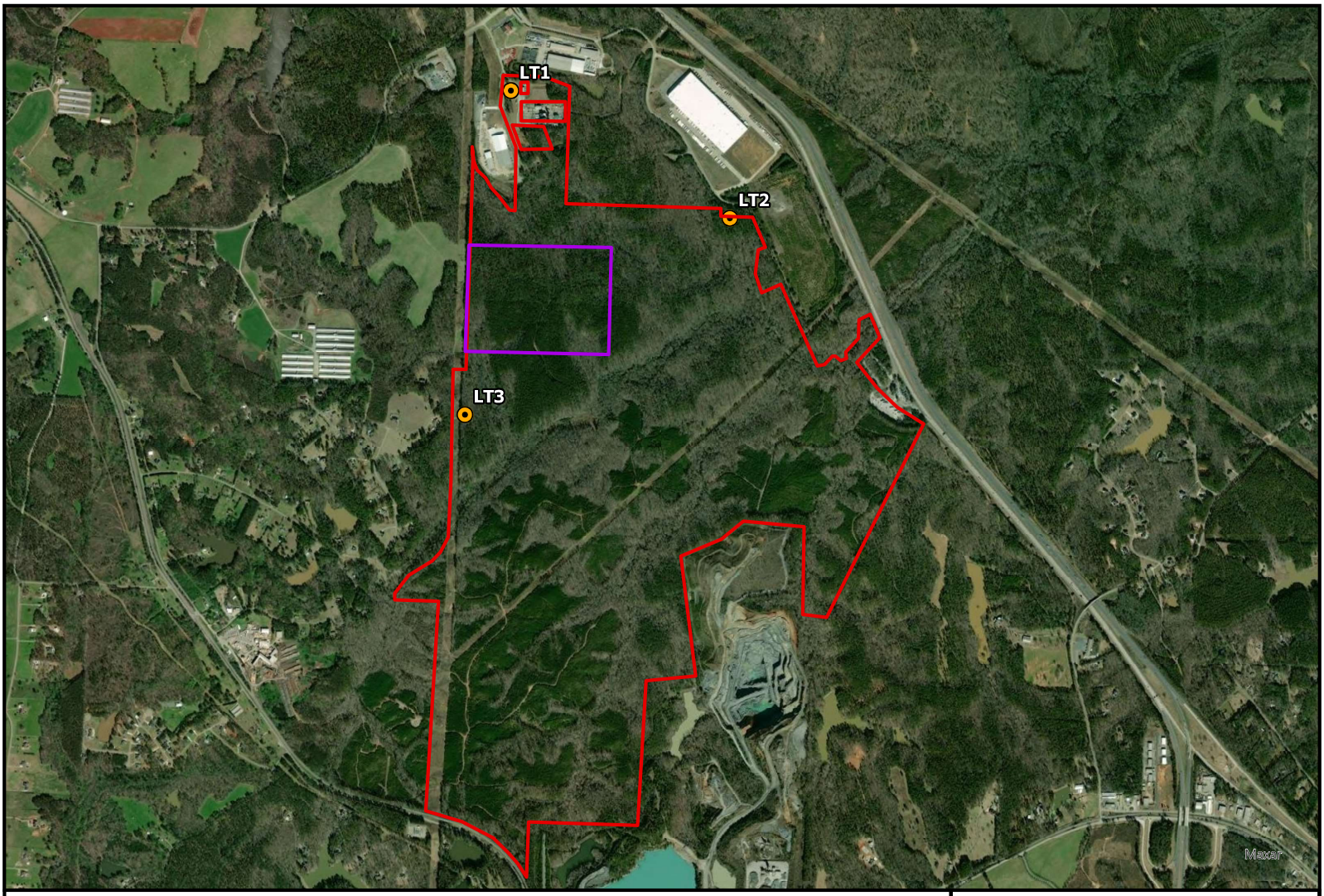
*NSA1 sound level is predicted to be 48.6 dBA

5.0 Conclusion

Burns & McDonnell conducted a sound study for the Smarr Combined Cycle Project, located in Monroe County, Georgia. The study included a review of the applicable sound level regulations for the Project, existing ambient sound level measurements and acoustic modeling to predict future sound levels from the Project.

The Project does not have any applicable numerical regulatory noise limits. Guidance was used from USEPA and ANSI to create design goals to limit sound level impacts associated with the Project on the surrounding community. Project sound levels have been predicted based on acoustic modeling of the expected equipment associated with the Project. The Project, as designed, meets the USEPA recommended sound level of 48.6 dBA and ANSI 12.9 recommended sound level of 68 dBC at the nearest residential properties.

APPENDIX A – FIGURES



LEGEND

- Approximate Property Boundary
- New Project Area
- Long-term Measurement Locations

REFERENCE

0 0.25 0.5
MILES

0 0.3 0.6
KILOMETERS

N

Figure A-1
Long-term Measurement Locations

LOCATION:	Monroe County, GA
CLIENT:	Oglethorpe Power Corporation
PROJ. NO.:	173086
CREATED:	10/01/2024

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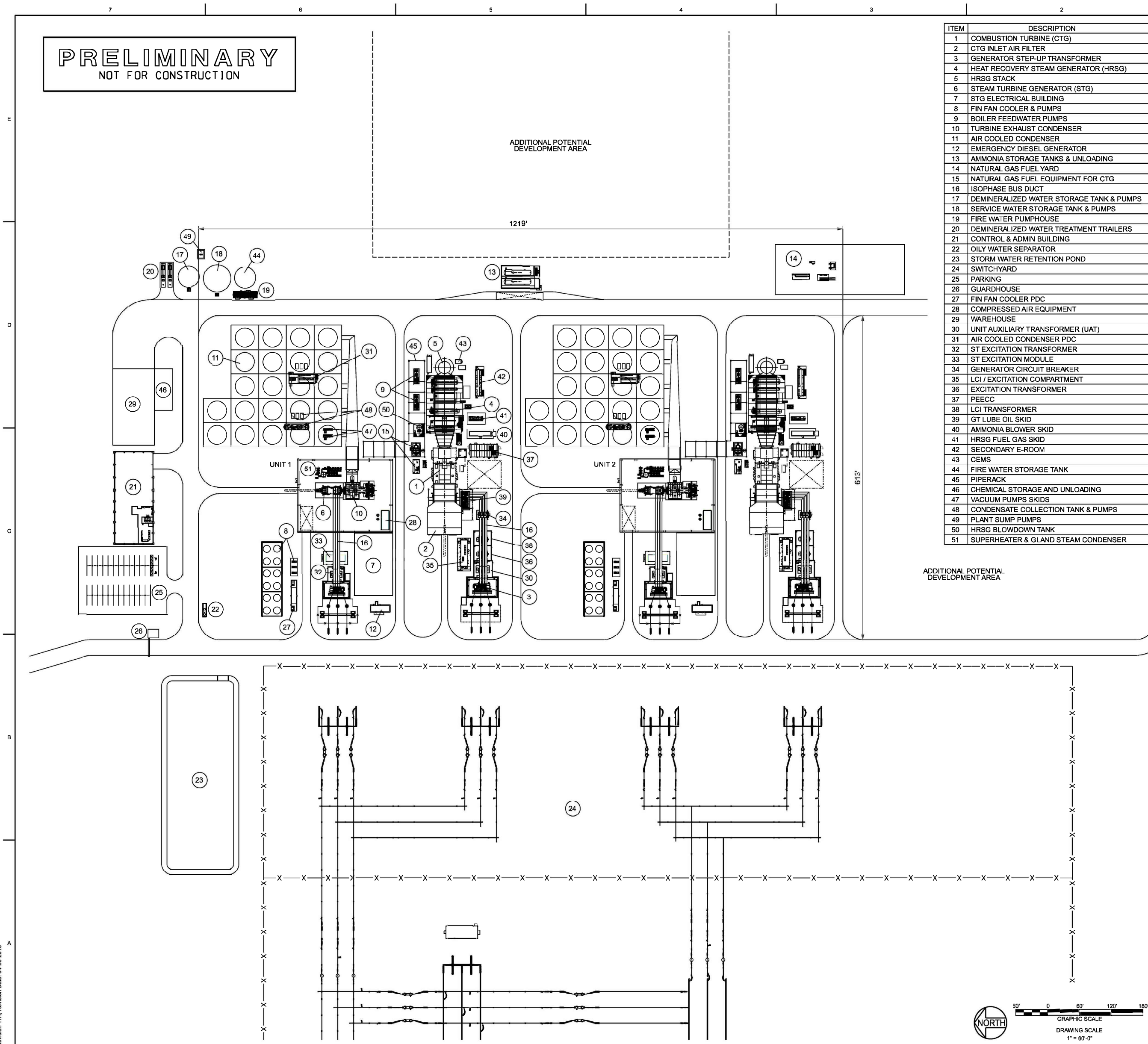

ITEM	DESCRIPTION
1	COMBUSTION TURBINE (CTG)
2	CTG INLET AIR FILTER
3	GENERATOR STEP-UP TRANSFORMER
4	HEAT RECOVERY STEAM GENERATOR (HRSG)
5	HRSG STACK
6	STEAM TURBINE GENERATOR (STG)
7	STG ELECTRICAL BUILDING
8	FIN FAN COOLER & PUMPS
9	BOILER FEEDWATER PUMPS
10	TURBINE EXHAUST CONDENSER
11	AIR COOLED CONDENSER
12	EMERGENCY DIESEL GENERATOR
13	AMMONIA STORAGE TANKS & UNLOADING
14	NATURAL GAS FUEL YARD
15	NATURAL GAS FUEL EQUIPMENT FOR CTG
16	ISOPHASE BUS DUCT
17	DEMINERALIZED WATER STORAGE TANK & PUMPS
18	SERVICE WATER STORAGE TANK & PUMPS
19	FIRE WATER PUMPHOUSE
20	DEMINERALIZED WATER TREATMENT TRAILERS
21	CONTROL & ADMIN BUILDING
22	OILY WATER SEPARATOR
23	STORM WATER RETENTION POND
24	SWITCHYARD
25	PARKING
26	GUARDHOUSE
27	FIN FAN COOLER PDC
28	COMPRESSED AIR EQUIPMENT
29	WAREHOUSE
30	UNIT AUXILIARY TRANSFORMER (UAT)
31	AIR COOLED CONDENSER PDC
32	ST EXCITATION TRANSFORMER
33	ST EXCITATION MODULE
34	GENERATOR CIRCUIT BREAKER
35	LCI / EXCITATION COMPARTMENT
36	EXCITATION TRANSFORMER
37	PEECC
38	LCI TRANSFORMER
39	GT LUBE OIL SKID
40	AMMONIA BLOWER SKID
41	HRSG FUEL GAS SKID
42	SECONDARY E-ROOM
43	CEMS
44	FIRE WATER STORAGE TANK
45	PIPERACK
46	CHEMICAL STORAGE AND UNLOADING
47	VACUUM PUMPS SKIDS
48	CONDENSATE COLLECTION TANK & PUMPS
49	PLANT SUMP PUMPS
50	HRSG BLOWDOWN TANK
51	SUPERHEATER & GLAND STEAM CONDENSER

HOLD INFORMATION

NO.	DESCRIPTION

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUB-CONTRACTOR(S)) PERFORMING THE WORK.

RELEASE INFORMATION

REV.	DATE	DESCRIPTION
A	03/29/2024	FOR CLIENT COMMENT
B	05/07/2024	FOR CLIENT COMMENT
C	06/25/2024	FOR CLIENT COMMENT
D	07/01/2024	FOR CLIENT COMMENT
E	08/01/2024	FOR CLIENT COMMENT

ISSUE PURPOSE: FOR CLIENT COMMENT
SPECIFICATION: ----
PROJECT NO.: A15212.001

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF ENTER NAME.

ENTER NAME
ENTER DATE

MY LICENSE RENEWAL DATE IS: ENTER DATE
PAGES OR SHEETS COVERED BY THIS SEAL:
THIS DOCUMENT ONLY.

CERTIFICATE OF AUTHORIZATION (WHEN REQ'D)

CAD FILE NAME: SK-GA-OP-SMR-0001.DGN
PREPARED BY: RM
REVIEWED BY: RAM
APPROVED BY: HE

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OglethorpePower

PROJECT

SMARR COMBINED CYCLE
ENERGY FACILITY
GE 7HA.03 (2) 1 X1 X1

Figure A-2

DRAWING TITLE

GENERAL ARRANGEMENT
SITE PLAN

DRAWING NUMBER: SK-GA-OP-SMR-0001
REVISION: E

SHEET 01 OF 01

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Revision 11A, Revision Date: 04-30-2010

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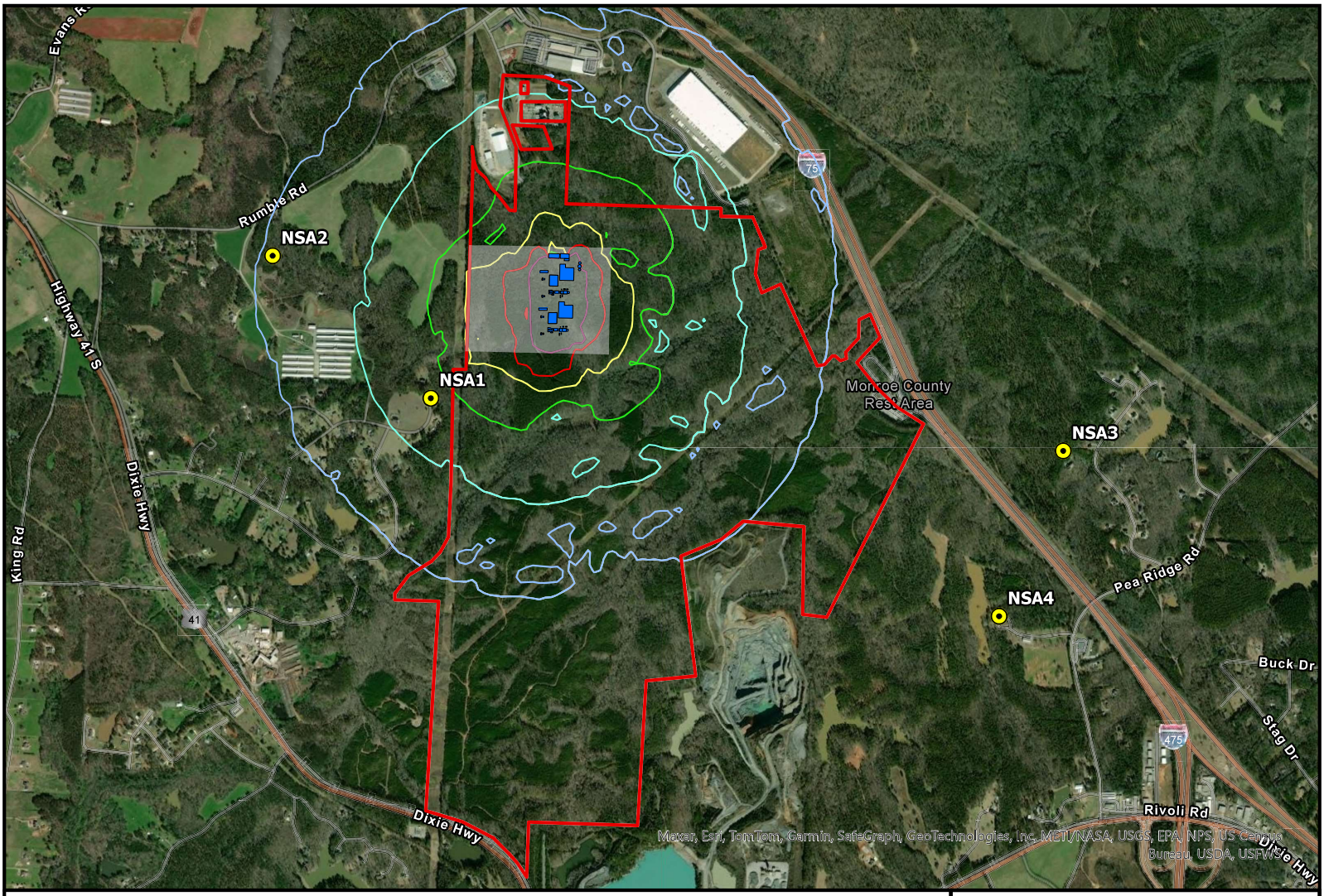

LEGEND

- Approximate Property Boundary
- New Project Area
- Structures
- NSA receptors
- 40 dBA
- 45 dBA
- 50 dBA
- 55 dBA
- 60 dBA
- 65 dBA

REFERENCE

0 0.25 0.5
MILES

0 0.3 0.6
KILOMETERS

N

Figure A-3
Sound Level Contours

LOCATION:	Monroe County, GA
CLIENT:	Oglethorpe Power Corporation
PROJ. NO.:	173086
CREATED:	01/08/2025

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APPENDIX B – MEASUREMENT DATA

Appendix B
Smarr Energy Facility
Ambient Measurement Data

	LT1					LT2					LT3				
	L_{Aeq}	L_{A90}	L_{ANS}	L_{Ceq}	L_{C90}	L_{Aeq}	L_{A90}	L_{ANS}	L_{Ceq}	L_{C90}	L_{Aeq}	L_{A90}	L_{ANS}	L_{Ceq}	L_{C90}
Time	(dBA)	(dBA)	(dBA)	(dBC)	(dBC)	(dBA)	(dBA)	(dBA)	(dBC)	(dBC)	(dBA)	(dBA)	(dBA)	(dBC)	(dBC)
6/26/24 10:00 AM											41	31	35	50	47
6/26/24 11:00 AM	54	50	53	77	76	41	39	40	62	61	40	32	33	54	51
6/26/24 12:00 PM	51	50	50	77	76	43	40	42	63	61	37	32	34	53	50
6/26/24 1:00 PM	52	51	51	79	77	43	40	43	65	62	37	32	34	55	51
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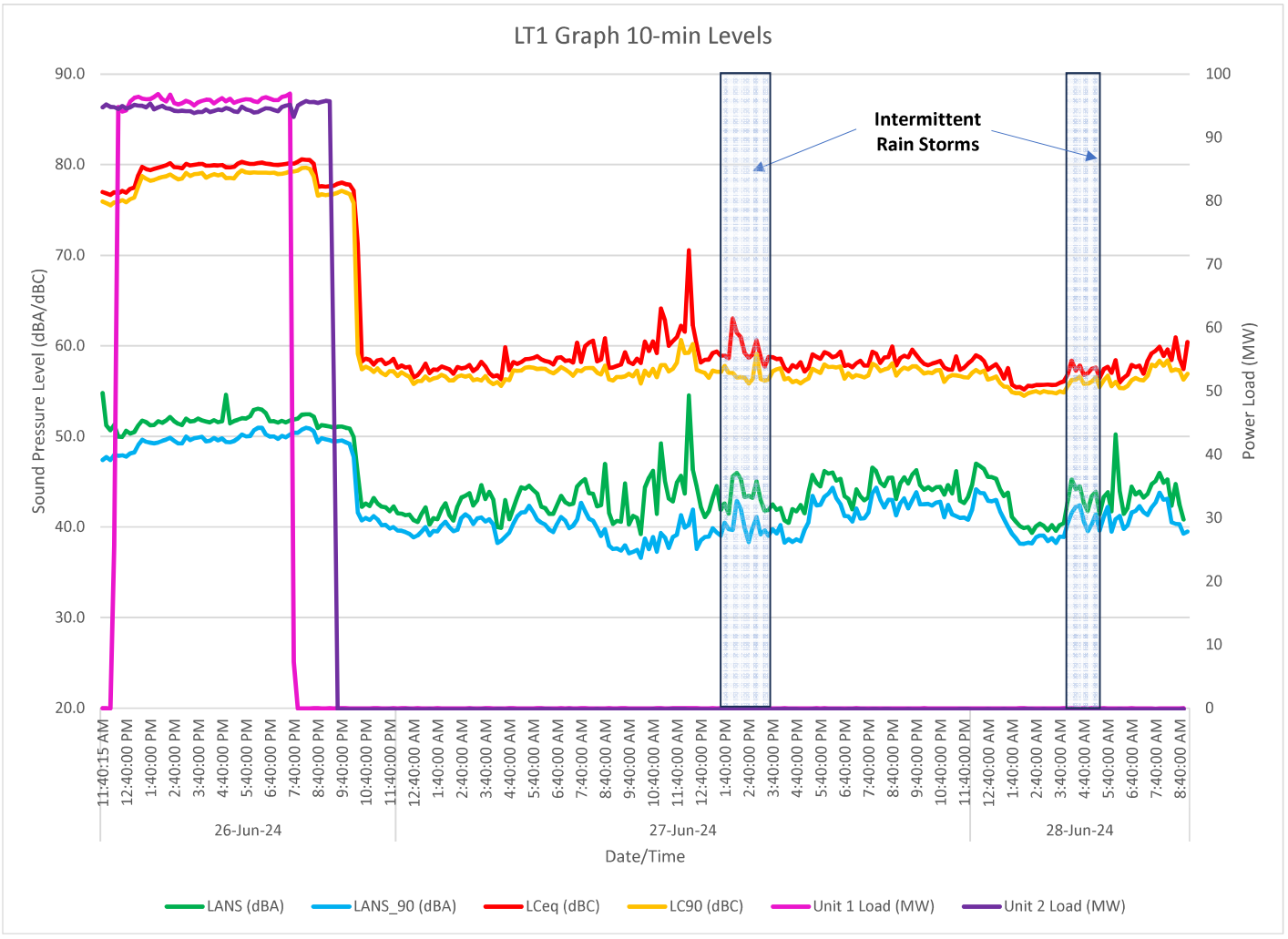
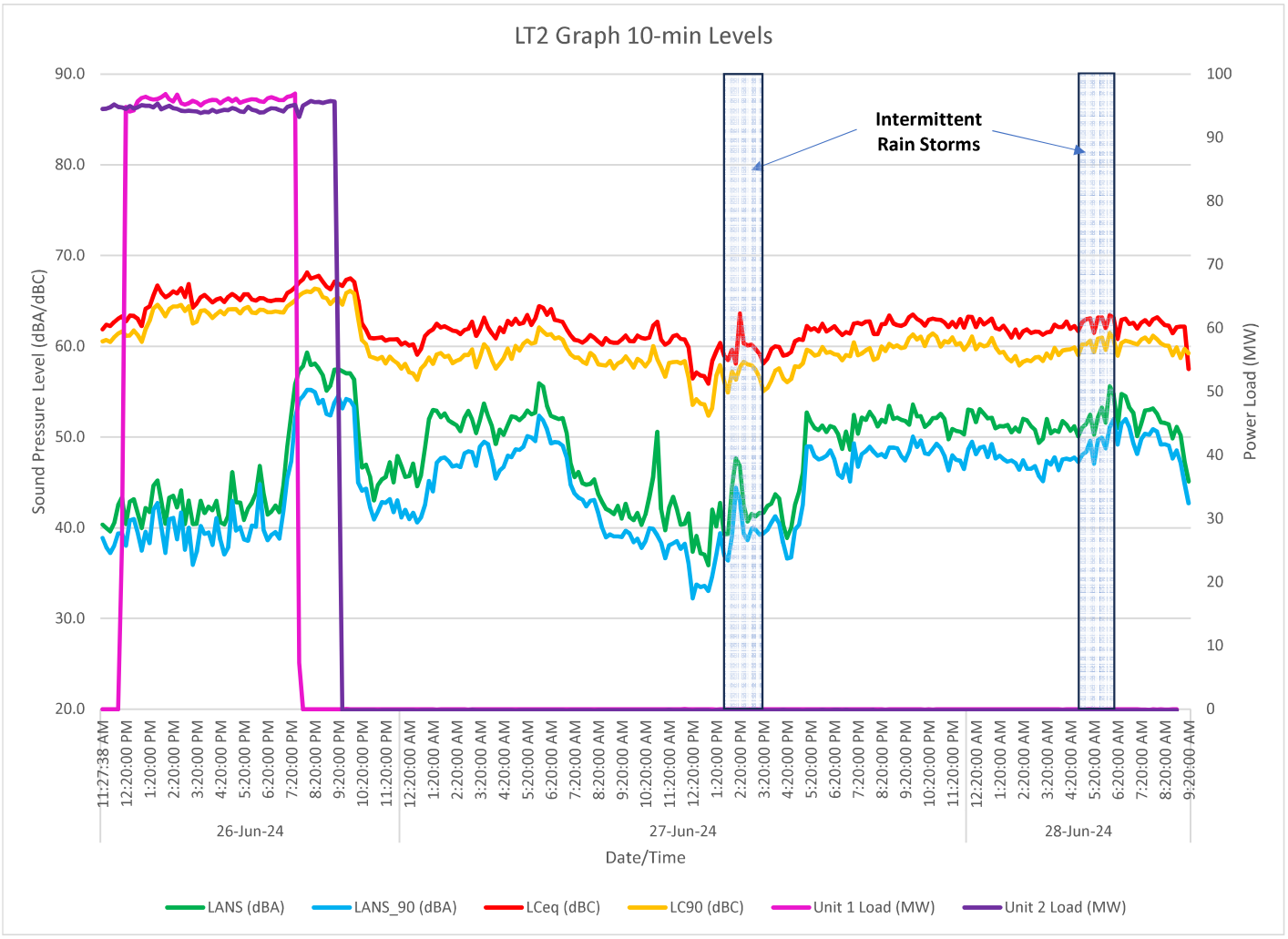
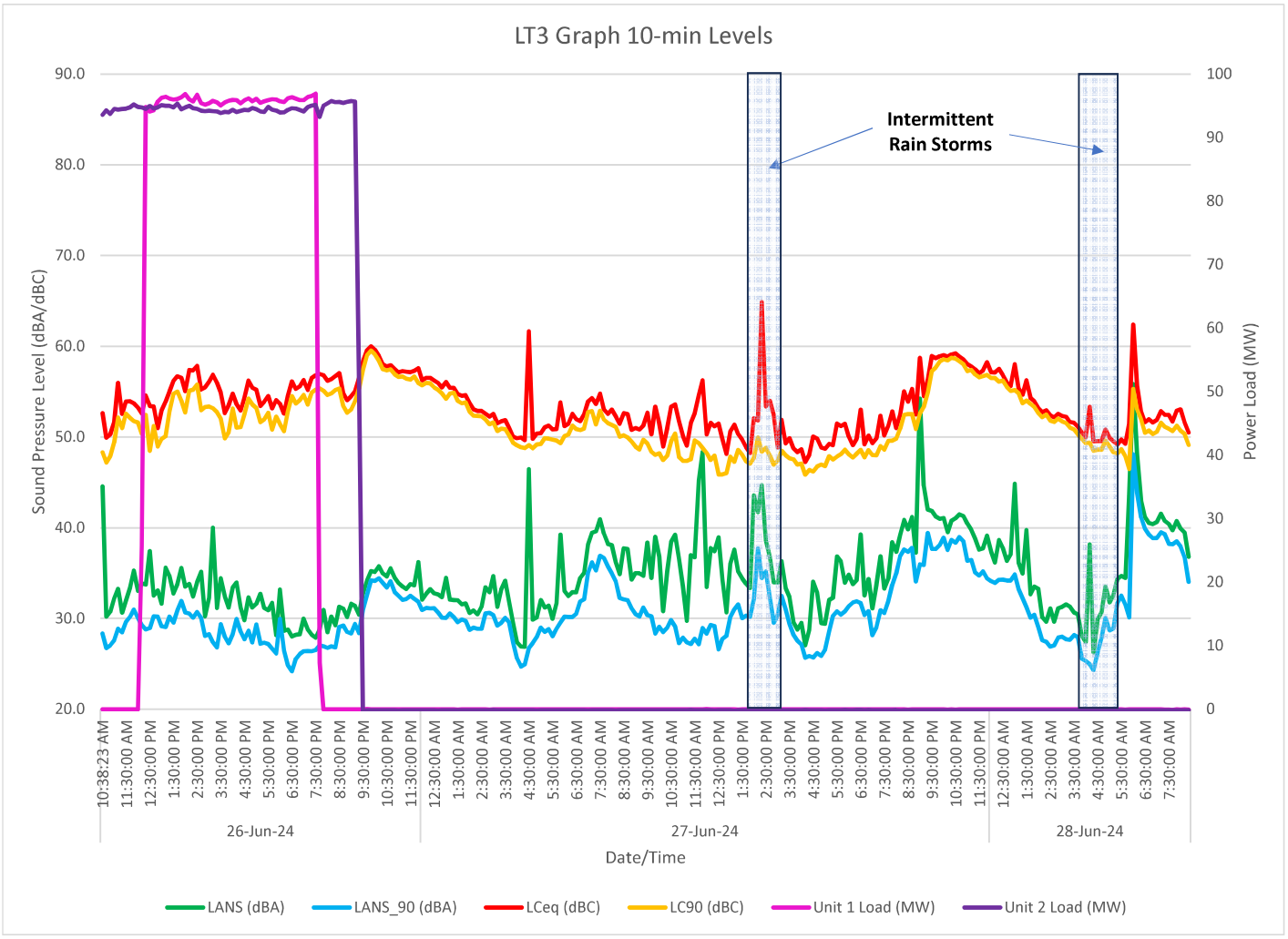
6/28/24 2:00 AM	45	44	40	56	55	54	52	51	62	58	53	53	31	53	52
6/28/24 3:00 AM	44	43	40	56	55	52	50	51	62	59	51	50	31	52	50
6/28/24 4:00 AM	45	43	44	57	56	52	50	51	62	60	48	47	33	51	49
6/28/24 5:00 AM	45	42	43	57	56	52	50	52	63	60	46	41	38	50	48
6/28/24 6:00 AM	49	43	45	57	56	57	53	54	63	60	56	46	49	57	51
6/28/24 7:00 AM	46	43	45	59	57	53	50	52	63	61	47	44	41	52	51
6/28/24 8:00 AM	49	43	44	59	57	52	50	51	62	60	43	41	39	50	50
6/28/24 9:00 AM	47	43	46	61	57	52	46	49	62	59					
Daytime Average (Units On)	**53**	**51**	**51**	**79**	**78**	**52**	**48**	**51**	**65**	**63**	**47**	**37**	**33**	**55**	**52**
Daytime Average (Units Off)	**47**	**42**	**45**	**60**	**57**	**50**	**46**	**49**	**61**	**58**	**46**	**39**	**39**	**53**	**49**
Nighttime Average (Units Off)	**47**	**45**	**43**	**58**	**56**	**55**	**53**	**52**	**62**	**60**	**55**	**53**	**39**	**55**	**54**

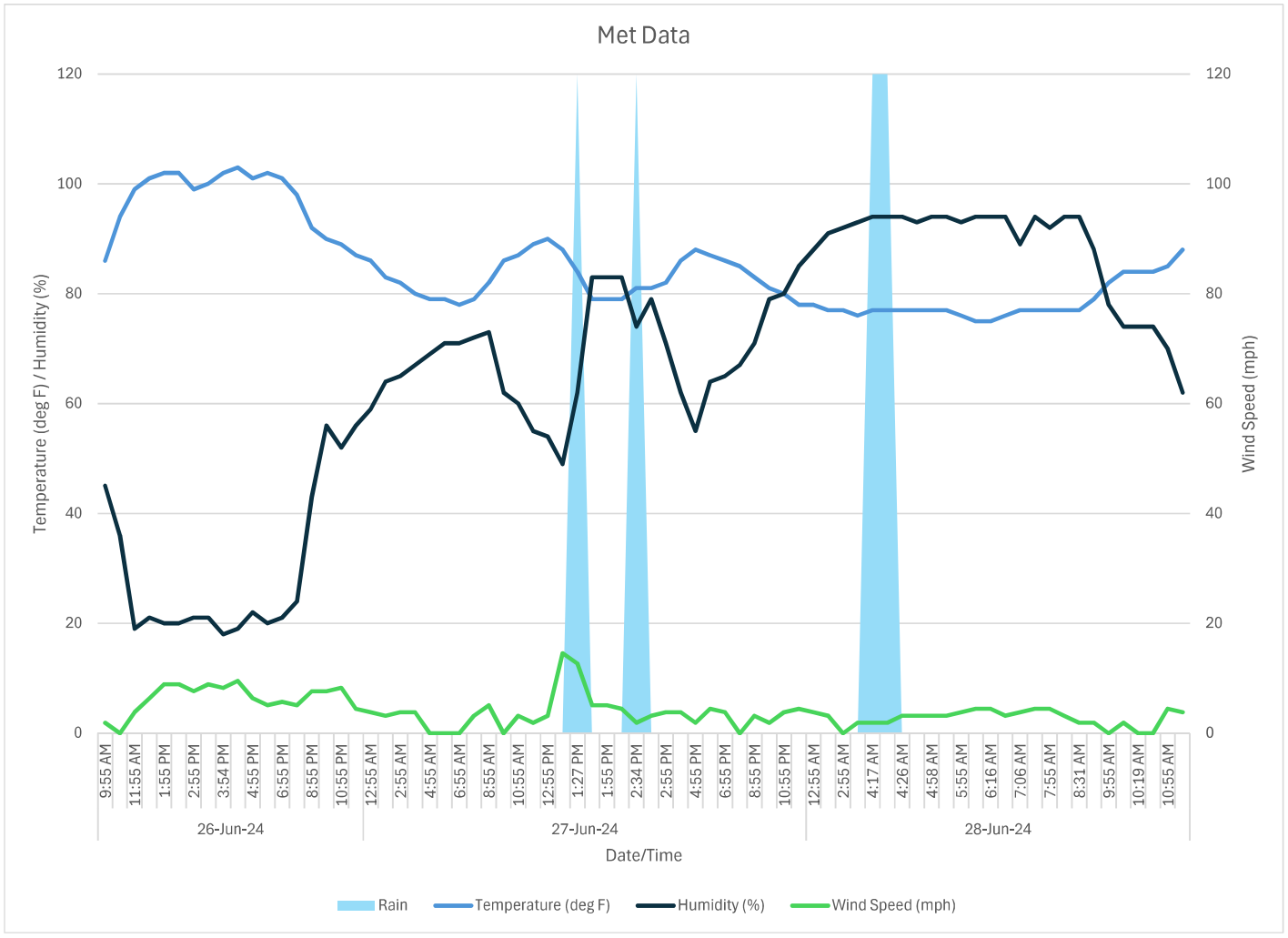
**Daytime is from 7 AM to 10 PM, and nighttime is from 10 PM to 7 AM*

Highlighted times are when units are online for measurement period


LT1 Graph 10-min Levels
Intermittent
Rain Storms
Sound Pressure Level (dBA/dBC)
Power Load (MW)
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
100
90
80
70
60
50
40
30
20
10
0
11:40:15 AM
12:40:00 PM
1:40:00 PM
2:40:00 PM
3:40:00 PM
4:40:00 PM
5:40:00 PM
6:40:00 PM
7:40:00 PM
8:40:00 PM
9:40:00 PM
10:40:00 PM
11:40:00 PM
12:40:00 AM
1:40:00 AM
2:40:00 AM
3:40:00 AM
4:40:00 AM
5:40:00 AM
6:40:00 AM
7:40:00 AM
8:40:00 AM
9:40:00 AM
10:40:00 AM
11:40:00 AM
12:40:00 PM
1:40:00 PM
2:40:00 PM
3:40:00 PM
4:40:00 PM
5:40:00 PM
6:40:00 PM
7:40:00 PM
8:40:00 PM
9:40:00 PM
10:40:00 PM
11:40:00 PM
12:40:00 AM
1:40:00 AM
2:40:00 AM
3:40:00 AM
4:40:00 AM
5:40:00 AM
6:40:00 AM
7:40:00 AM
8:40:00 AM
26-Jun-24
27-Jun-24
28-Jun-24
Date/Time
LANS (dBA)
LANS_90 (dBA)
LCeq (dBC)
LC90 (dBC)
Unit 1 Load (MW)
Unit 2 Load (MW)


LT2 Graph 10-min Levels
Intermittent Rain Storms
Sound Pressure Level (dBA/dBC)
Power Load (MW)
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
100
90
80
70
60
50
40
30
20
10
0
11:27:38 AM
12:20:00 PM
1:20:00 PM
2:20:00 PM
3:20:00 PM
4:20:00 PM
5:20:00 PM
6:20:00 PM
7:20:00 PM
8:20:00 PM
9:20:00 PM
10:20:00 PM
11:20:00 PM
12:20:00 AM
1:20:00 AM
2:20:00 AM
3:20:00 AM
4:20:00 AM
5:20:00 AM
6:20:00 AM
7:20:00 AM
8:20:00 AM
9:20:00 AM
10:20:00 AM
11:20:00 AM
12:20:00 PM
1:20:00 PM
2:20:00 PM
3:20:00 PM
4:20:00 PM
5:20:00 PM
6:20:00 PM
7:20:00 PM
8:20:00 PM
9:20:00 PM
10:20:00 PM
11:20:00 PM
12:20:00 AM
1:20:00 AM
2:20:00 AM
3:20:00 AM
4:20:00 AM
5:20:00 AM
6:20:00 AM
7:20:00 AM
8:20:00 AM
9:20:00 AM
26-Jun-24
27-Jun-24
28-Jun-24
Date/Time
LANS (dBA)
LANS_90 (dBA)
LCeq (dBC)
LC90 (dBC)
Unit 1 Load (MW)
Unit 2 Load (MW)


LT3 Graph 10-min Levels
Intermittent
Rain Storms
Sound Pressure Level (dBA/dBC)
Power Load (MW)
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
100
90
80
70
60
50
40
30
20
10
0
10:38:23 AM
11:30:00 AM
12:30:00 PM
1:30:00 PM
2:30:00 PM
3:30:00 PM
4:30:00 PM
5:30:00 PM
6:30:00 PM
7:30:00 PM
8:30:00 PM
9:30:00 PM
10:30:00 PM
11:30:00 PM
12:30:00 AM
1:30:00 AM
2:30:00 AM
3:30:00 AM
4:30:00 AM
5:30:00 AM
6:30:00 AM
7:30:00 AM
8:30:00 AM
9:30:00 AM
10:30:00 AM
11:30:00 AM
12:30:00 PM
1:30:00 PM
2:30:00 PM
3:30:00 PM
4:30:00 PM
5:30:00 PM
6:30:00 PM
7:30:00 PM
8:30:00 PM
9:30:00 PM
10:30:00 PM
11:30:00 PM
12:30:00 AM
1:30:00 AM
2:30:00 AM
3:30:00 AM
4:30:00 AM
5:30:00 AM
6:30:00 AM
7:30:00 AM
26-Jun-24
27-Jun-24
28-Jun-24
Date/Time
LANS (dBA)
LANS_90 (dBA)
LCeq (dBC)
LC90 (dBC)
Unit 1 Load (MW)
Unit 2 Load (MW)


Met Data
Temperature (deg F) / Humidity (%)
Wind Speed (mph)
120
100
80
60
40
20
0
9:55 AM
11:55 AM
1:55 PM
2:55 PM
3:54 PM
4:55 PM
6:55 PM
8:55 PM
10:55 PM
12:55 AM
2:55 AM
4:55 AM
6:55 AM
8:55 AM
10:55 AM
12:55 PM
1:27 PM
1:55 PM
2:34 PM
2:55 PM
4:55 PM
6:55 PM
8:55 PM
10:55 PM
12:55 AM
2:55 AM
4:17 AM
4:26 AM
4:58 AM
5:55 AM
6:16 AM
7:06 AM
7:55 AM
8:31 AM
9:55 AM
10:19 AM
10:55 AM
26-Jun-24
27-Jun-24
28-Jun-24
Date/Time
Rain
Temperature (deg F)
Humidity (%)
Wind Speed (mph)

APPENDIX C – MODELED SOUND LEVELS

Appendix C - Base Design Modeled Sound Power Levels

Oglethorpe Power Corporation
Smarr Combined Cycle Expansion

Name	Number of Sources	Sound Power Level (dB)[1] Octave Band Frequency (Hz) 31.5	63.0	125	250	500	1000	2000	4000	8000	Overall (dBA)	Notes
CT Package												62 dBA @ 400-ft
Ammonia Blower	2 (1 per unit)	92	92	92	91	90	89	88	87	86	**95**	Estimated 85 dBA @ 3-ft
HRSG Blowdown (Normal Ops)	2 (1 per unit)	80	88	96	100	97	94	90	86	64	**99**	Estimated 85 dBA @ 3-ft
HRSG Stack Exit	2 (1 per unit)	117	117	110	103	101	98	87	82	60	**103**	GE Provided
HRSG Vents	8 (4 per unit)	106	110	109	103	94	90	78	69	62	**99**	GE Provided
Load Compartment	2 (1 per unit)	87	93	93	87	87	93	94	88	78	**98**	GE Provided
Exhaust Diffuser	2 (1 per unit)	104	118	105	99	92	92	94	86	72	**100**	GE Provided
Filter House	2 (1 per unit)	108	98	99	99	92	88	102	99	83	**105**	GE Provided
Generator	2 (1 per unit)	100	105	107	96	102	100	100	95	84	**106**	GE Provided
HRSG Body (Total)	2 (1 per unit)	123	117	113	104	100	101	100	98	80	**107**	GE Provided
HRSG Fuel Gas Skid	2 (1 per unit)	107	103	92	84	83	89	91	94	92	**99**	Estimated 85 dBA @ 3-ft
Inlet Duct	2 (1 per unit)	108	98	99	99	92	88	102	99	83	**105**	GE Provided
Lube Oil Skid	2 (1 per unit)	102	104	100	99	98	97	97	98	90	**104**	GE Provided
Turbine Compartment	2 (1 per unit)	106	103	101	95	97	97	101	106	94	**109**	GE Provided
Turbine Compartment Vent Fan	4 (2 per unit)	102	102	110	101	98	95	94	98	95	**104**	GE Provided
Inlet Filter Face	2 (1 per unit)	111	102	96	85	76	75	88	97	88	**99**	GE Provided
Inlet Plenum	2 (1 per unit)	102	100	99	94	95	98	98	95	90	**103**	GE Provided
ACC Package												
Condensate Pump	6 (3 per ACC)	89	88	90	90	90	90	90	87	80	**96**	Estimated 85 dBA @ 3-ft
Vacuum Pumps	4 (2 per ACC)	93	92	94	94	94	94	94	91	84	**100**	Estimated 85 dBA @ 3-ft
ACC Fans	2 (1 per block)	117	118	117	114	109	107	101	95	89	**112**	59 dBA @ 400-ft
STG Building Indoor Equipment												
Steam Turbine	2 (1 per bldg)	104	104	108	107	105	103	103	99	93	**109**	GE Provided
Steam Turbine Generator	2 (1 per bldg)	99	105	107	96	102	100	100	94	84	**106**	GE Provided
ST Lube Oil	2 (1 per bldg)	98	109	107	106	102	97	91	79	69	**103**	Estimated sound level
ST Gland Steam Condenser	2 (1 per bldg)	87	93	92	92	92	88	84	83	77	**94**	Estimated sound level
ST Gland Steam Condenser Vent	2 (1 per bldg)	75	91	86	92	99	92	83	85	78	**98**	Estimated sound level
Fuel Gas Piping	Multiple	111	107	96	88	87	93	95	98	96	**102**	Estimated sound level
Steam Piping	2 (1 per bldg)	85	93	101	105	102	99	95	91	68	**104**	Estimated sound level
ST Building Vent	8 (4 per bldg)	90	91	89	87	85	83	82	79	74	**89**	Calculated based on interior
Vacuum Pumps	2 (per bldg)	97	103	101	95	96	105	103	99	89	**109**	Estimated sound level

Appendix C - Base Design Modeled Sound Power Levels

Oglethorpe Power Corporation
Smarr Combined Cycle Expansion

Name	Number of Sources	Sound Power Level (dB)[1] Octave Band Frequency (Hz) 31.5	63.0	125	250	500	1000	2000	4000	8000	Overall (dBA)	Notes
BOP Equipment												
Ammonia Pumps	2	89	88	90	90	90	90	90	87	80	**96**	Estimated 85 dBA @ 3-ft
BFP Preheater Pump	4 (2 per block)	89	88	90	90	90	90	90	87	80	**96**	Estimated 85 dBA @ 3-ft
FFC Cooling Water Pumps	6 (3 per block)	93	92	94	94	94	94	94	91	84	**100**	Estimated 85 dBA @ 3-ft
Fuel Gas Valve	2	106	102	91	83	82	88	90	93	91	**98**	Estimated 85 dBA @ 3-ft
ACC Steam Piping	2 (1 per block)	66	74	82	86	83	80	76	72	50	**104**	Estimated 85 dBA @ 3-ft
Fuel Gas Piping	1	103	99	88	80	79	85	87	90	88	**95**	Estimated 85 dBA @ 3-ft
Boiler Feedwater Pumps	4 (2 per block)	93	99	97	91	92	101	99	95	85	**105**	Estimated 85 dBA @ 3-ft
CT Aux Transformer	2 (1 per block)	91	91	95	95	95	79	74	67	62	**93**	Estimated 75 dBA NEMA
CT GSUT	2 (1 per block)	100	100	104	104	104	88	83	76	71	**102**	Estimated 80 dBA NEMA
Fin Fan Cooler	2 (1 per block)	97	97	94	94	100	96	89	83	76	**100**	Estimated 80 dBA @ 3-ft
ST Aux Transformer	2 (1 per block)	91	91	95	95	95	79	74	67	62	**93**	Estimated 75 dBA NEMA
ST GSUT	2 (1 per block)	100	100	104	104	104	88	83	76	71	**102**	Estimated 80 dBA NEMA

Notes:

1. All sound levels are inclusive of any noise mitigation


BURNS McDONNELL