

Pre-Construction Noise Impact Assessment

for the proposed

Red Oak Ridge Energy Center

December 4, 2025



Prepared for:

Red Oak Ridge Energy Center LLC
Chicago, Illinois

Prepared by:

Hankard Environmental, Inc.
Verona, Wisconsin



Contents

Executive Summary	1
1. Facility Description.....	4
2. Sound Monitoring Results.....	13
3. Sound Modeling Results.....	18
4. Noise Impact Assessment.....	35
APPENDIX A Photographs of Measurement Locations	A-1
APPENDIX B Long-term Measurement Time Histories	B-1
APPENDIX C Receptor Locations and Predicted Noise Levels.....	C-1
APPENDIX D Long-term Measurement Octave Band Noise Levels	D-1

Figures

Figure 1-1. Project Location	5
Figure 1-2. Proposed Site Plan and Noise-Producing Equipment	6
Figure 1-3. Alternative Site Plan and Noise-Producing Equipment.....	7
Figure 1-4. Alternative Site and Existing Noise Sources	8
Figure 1-5. Receptors and Ambient Measurement Locations at Proposed Site	11
Figure 1-6. Receptors and Ambient Measurement Locations at Alternative Site	12
Figure 2-1. Spectrogram of Paris Generating Station Monitor	14
Figure 2-2. Long-Term Background Noise Levels at MP1 – Proposed Site	16
Figure 2-3. Long-Term Background Noise Levels at MP11 – Alternative Site.....	17
Figure 3-1. Sample 3D View of the Proposed Site SoundPLAN Noise Model.....	19
Figure 3-2. Proposed Site Predicted Noise Level Contours (dBA).....	26
Figure 3-3. Proposed Site Predicted Noise Level Contours (dBA) Zoomed.....	27
Figure 3-4. Proposed Site Predicted Noise Level Contours (dBC).....	28
Figure 3-5. Alternative Site Predicted Noise Level Contours (dBA)	32
Figure 3-6. Alternative Site Predicted Noise Level Contours (dBA) Zoomed	33
Figure 3-7. Alternative Site Predicted Noise Level Contours (dBC).....	34

Tables

Table ES-1. Summary of Noise Impacts – Proposed Site.....	3
Table ES-2. Summary of Noise Impacts – Alternative Site	3
Table 2-1. Proposed Site Long-term Sound Level Measurement Results	15
Table 2-2. Alternative Site Long-term Sound Level Measurement Results	15
Table 2-3. Proposed Site Attended Sound Level Measurement Results	15
Table 2-4. Alternative Site Attended Sound Level Measurement Results	15
Table 3-1. Noise Emission Factors	21
Table 3-2. Optional Low-Noise Equipment Noise Emission Factors.....	22
Table 3-3. Estimated Durations of Construction Phases.....	22
Table 3-4. Equipment in Operation on Site During Construction Phases.....	23
Table 3-5. Predicted Construction Noise Levels – Proposed Site.....	24
Table 3-6. Predicted Construction Noise Levels – Alternative Site.....	24
Table 3-7. Loudest Predicted Noise Levels – Proposed Site	25
Table 3-8. Loudest Predicted Noise Levels - Alternative Site.....	29
Table 3-9. Predicted Cumulative Noise Levels - Alternative Site	31
Table 4-1. Increase in Noise Level over Daytime Ambient Level – Proposed Site	38
Table 4-2. Increase in Noise Level over Nighttime Ambient Level – Proposed Site	39
Table 4-3. Increase in Noise Level over Daytime Ambient Level – Alternative Site.....	40
Table 4-4. Increase in Noise Level over Nighttime Ambient Level – Alternative Site.....	41
Table 4-5. Kenosha County Property Line Limits	42
Table 4-6. Loudest Property Line Predicted Noise Levels – Proposed Site	43
Table 4-7. Loudest Property Line Predicted Noise Levels – Alternative Site.....	43
Table C-1. Noise Sensitive Receptor Locations – Proposed Site.....	C-2
Table C-2. Noise Sensitive Receptor Locations – Alternative Site	C-3
Table C-3. Predicted Operational Noise Levels – Proposed Site.....	C-4
Table C-4. Predicted Operational Noise Levels – Alternative Site.....	C-6
Table D-1. Measured L_{eq} Octave Band Noise Levels – Proposed Site	D-2
Table D-2. Measured L_{90} Octave Band Noise Levels – Proposed Site	D-2
Table D-3. Measured L_{eq} Octave Band Noise Levels – Alternative Site	D-3
Table D-4. Measured L_{90} Octave Band Noise Levels – Alternative Site	D-3

Executive Summary

Red Oak Ridge Energy Center LLC (“Red Oak”), a wholly-owned subsidiary of Invenergy Clean Power LLC, is preparing to submit an application for a Certificate of Public Convenience and Necessity (CPCN) to the Public Service Commission (PSC) of Wisconsin to construct and place in service the Red Oak Ridge Energy Center (Project, Facility), a natural gas-fired simple-cycle combustion turbine-based electric generating facility generating up to 1,186 megawatts of electrical power (MW). Red Oak contracted Hankard Environmental, Inc. to conduct a Pre-Construction Noise Impact Assessment to support the CPCN application.

This report describes the results of that analysis, which consisted of determining the location of all nearby noise-sensitive receptors, measuring existing noise levels near the Project, predicting both construction and operational noise levels at all identified noise-sensitive receptors, and comparing the resulting levels to acoustic standards. The analysis was carried out in accordance with the PSC’s September 2025 *Protocol for Noise Assessment of Proposed and Existing Electrical Power Plants* (Protocol).

The Proposed Site is located along the west side of Interstate 94 (I-94) which creates a substantial amount of noise during the daytime and at night. In general, land use in the area is industrial (asphalt plant), commercial (warehouses), and agricultural. The nearest noise-sensitive receptors (residences) are located 700 to 1,300 feet south of the acoustic center of the Facility. The Project is negotiating with these residents for the purchase of their homes or the signing of a neighbor agreement. Other residences are located 2,600 feet to the north near the intersection of I-94 and Somers Road, and approximately one mile to the west along 136th Ave.

The Alternative Site is located approximately four miles northwest of the Proposed Site, east of the Great Lakes Dragaway. In general, land use in the area is industrial (Paris Solar Farm, Paris Energy Storage, Paris Generating Station) and agricultural. The nearest noise-sensitive receptors (residences) are located along 172nd Avenue 2,500 feet east of the acoustic center of the Facility. Other residences are located 3,100 feet to the north along 1st Street, and approximately 3,200 feet southeast on 180th Avenue.

An ambient noise level survey was conducted between October 16 and November 6, 2025. Noise monitors were placed at the Proposed and Alternative Sites and left to continuously measure noise levels for approximately two weeks. In addition, short-term noise levels were measured near the closest residences to each site. At the Proposed Site, for both day and night, existing noise levels at the residences located south and north of the Facility range from 56 to 62 dBA. At the residences to the west, for both day and night, existing noise levels range from 44 to 57 dBA. At the Alternative Site, existing noise levels at the residences north of the Project range from 34 to 63 dBA. At the residences to the southeast, existing noise levels range from 36 to 65 dBA.

An acoustic model of the Facility was generated for each Site in the SoundPLAN software program and used to predict noise levels at nearby receptors. The model is based on noise emission data provided by the manufacturers of each major piece of equipment to be installed, the physical layout of the Facility, and the effect of the extensive set of noise reduction measures

that have been included in the design. Predicted noise levels were evaluated against two project noise goals designed to prevent adversely impacting nearby noise-sensitive receptors:

1. Noise levels will not exceed 50 dBA at any receptor. 50 dBA is a common noise level limit in the U.S., and one that has been used on numerous Wisconsin PSC electricity generation cases. This is viewed as an appropriate noise level goal given the fact that the Facility will operate only approximately 20% of the year and existing background noise at the Proposed Site often exceeds 50 dBA, rendering noise from the Facility barely audible or inaudible.
2. Noise levels will not exceed 75 dBC at any receptor to minimize the potential for noise-induced vibrations. The 75 dBC threshold is based on the American Society of Mechanical Engineers (ASME) B133.8 standard for Gas Turbine Installation Sound Emissions.

Table ES-1 lists the predicted Facility noise levels at the nearest residences to the Proposed Site. With the exception of the two closest residences, noise levels at all residences are lower than the Project's noise level design goals of 50 dBA and 75 dBC. Furthermore, due to the near constant noise being emitted by traffic on I-94, little to no increase in A-weighted noise levels is expected. C-weighted levels are predicted to increase by a moderate amount (3 to 18 dBC).

Table ES-2 lists the predicted Facility noise levels at the nearest residences to the Alternative Site. Noise levels at all residences are lower than the Project's noise design goals of 50 dBA and 75 dBC. In the absence of wind and traffic, background A-weighted noise levels are typically in the mid-30s, and the Project is predicted to increase these levels by up to 13 dBA at the nearest residences. During periods of high ground-level winds or increased traffic, background levels rise into the high 50s to low 60s, at which point the Project would not be audible. C-weighted levels are predicted to increase by up to 26 dBC.

If required by the PSC to comply with the September 24, 2025 *Protocol for Noise Assessment of Proposed and Existing Electrical Power Plants*, within twelve months of the date when the project is fully operational, sound level measurements adhering to the postconstruction Protocol as defined in a PSC certificate shall be completed.

Table ES-1. Summary of Noise Impacts – Proposed Site

Receptors	A-weighted Noise Levels (dBA)			C-weighted Noise Levels (dBC)		
	Existing	Project	Increase	Existing	Project	Increase
South (in negotiations)	56 - 61	55 - 59	1 - 5	61 - 71	80 - 83	9 - 22
South	56 - 61	42 - 48	0 - 1	61 - 71	71 - 74	3 - 13
North	59 - 62	46 - 48	None	64 - 72	74 - 75	4 - 11
West	44 - 57	42 - 43	0 - 2	53 - 65	71 - 71	7 - 18

Table ES-2. Summary of Noise Impacts – Alternative Site

Receptors	A-weighted Noise Levels (dBA)			C-weighted Noise Levels (dBC)		
	Existing	Project	Increase	Existing	Project	Increase
East	34 - 65	48 - 48	0 - 13	49 - 70	71 - 75	6 - 26
North	34 - 63	43 - 46	0 - 13	48 - 70	71 - 73	4 - 25
Southeast	36 - 65	44 - 47	0 - 11	51 - 70	72 - 74	5 - 24

1. Facility Description

The Project is located in the town of Paris in Kenosha County, Wisconsin as shown in Figure 1-1. The Facility will consist of five GE 7F05 simple-cycle gas turbines and A35 air-cooled generators. Each gas turbine generator (GTG) will have an individual electrical generating capacity of approximately 238 MW, for a total installed capacity of approximately 1,186 MW.

At the time of this report, the Project is considering two distinct sites near the town of Paris, a Proposed Site, located along Interstate 94, and an Alternative Site located near the existing Paris Solar Battery Park. Figures 1-5 and 1-6 show the locations of the Proposed and Alternative Sites. The Alternative Site is located near existing energy facilities, therefore its noise impact assessment incorporated modeling and monitoring to quantify the impact of the proposed and existing facilities in accordance with the Protocol. Figure 1-2 shows the Facility site plan for the Proposed Site with primary noise-producing elements of Facility operation labeled. Figure 1-3 shows the Facility site plan for the Alternative Site with primary noise producing elements of Facility operation labeled.

Although the Facility will be designed for continuous service, Red Oak anticipates it will primarily operate during periods of peak electrical demand. The Facility and each GTG are expected to have annual gross and net capacity factors of approximately 20%, with monthly and seasonal variations. Daily and weekly capacity factors may be as high as 100%.

Land use within the Project Areas is primarily agricultural, including fields, barns and other outbuildings, farmhouses, and rural residences. Existing sources of noise in the area include Interstate 94 (I-94) that runs directly east of the Proposed Site, Highway 45 that runs west of the Alternative Site, commercial and industrial facilities near both sites, and a car racing venue west of the Alternative Site. As shown in Figure 1-4, the Alternative Site has nearby existing and proposed energy facilities; therefore, its noise assessment incorporated the additional requirements for sites with existing generation, including modeling and measuring the noise levels from the existing and proposed facilities.

There are 50 noise-sensitive receptors within one mile of the Proposed Site noise sources and 76 noise-sensitive receptors within one mile of the Alternative Site noise sources. The locations of the receptors for the Proposed and Alternative Sites are shown in Figures 1-5 and 1-6, respectively. All receptor locations are listed in Appendix C.

In consultation with PSC staff, twelve ambient noise measurement locations were selected. These locations are shown in Figures 1-5 and 1-6. Locations labeled MP indicate long-term noise monitoring sites, while those labeled ST indicate short-term noise measurement points, consistent with the PSC's protocol.

Construction of the Project will involve the use of typical construction equipment and will take approximately 18 to 24 months to complete. Construction equipment and noise levels are discussed in Section 3.

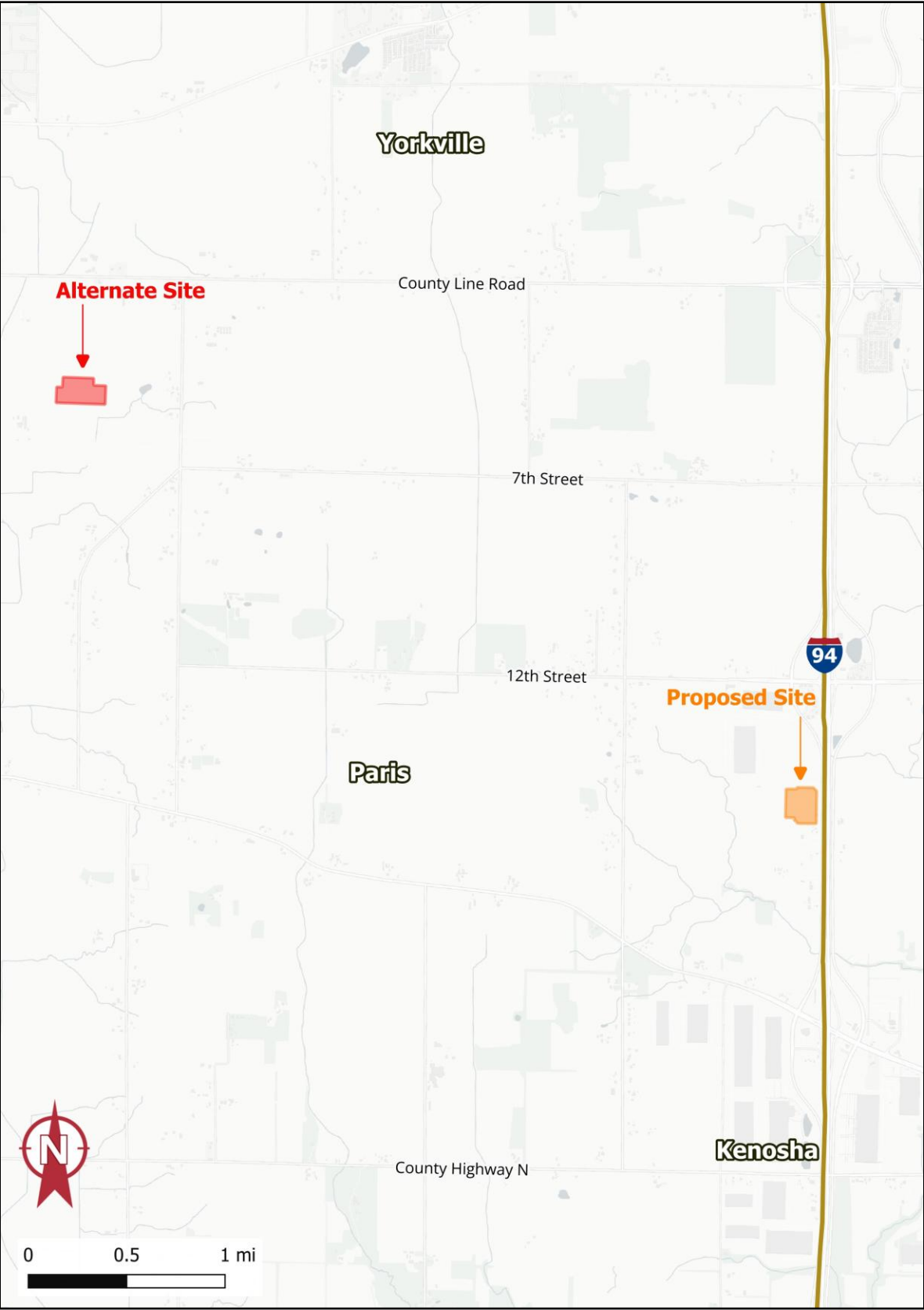


Figure 1-1. Project Location

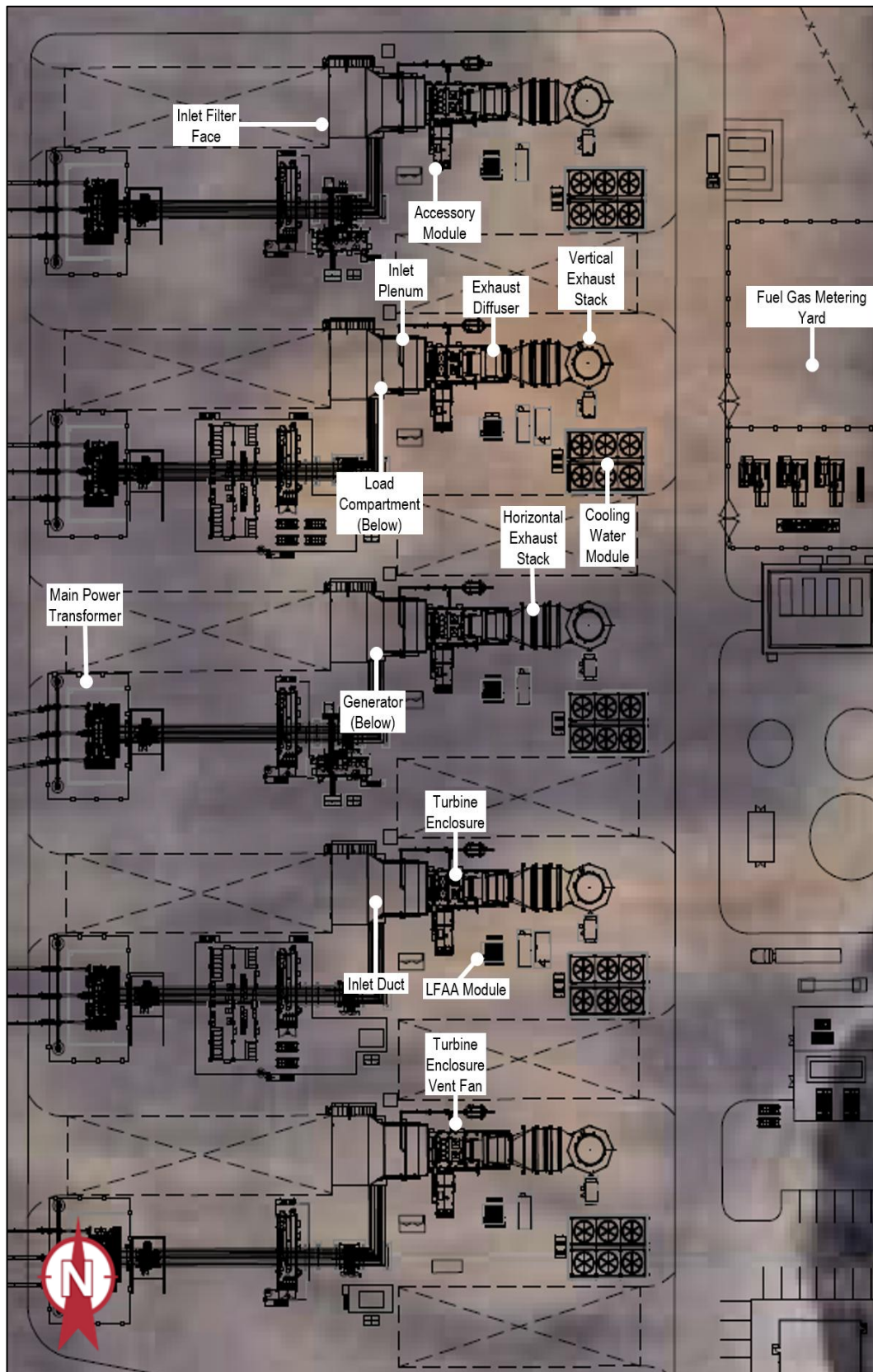


Figure 1-2. Proposed Site Plan and Noise-Producing Equipment

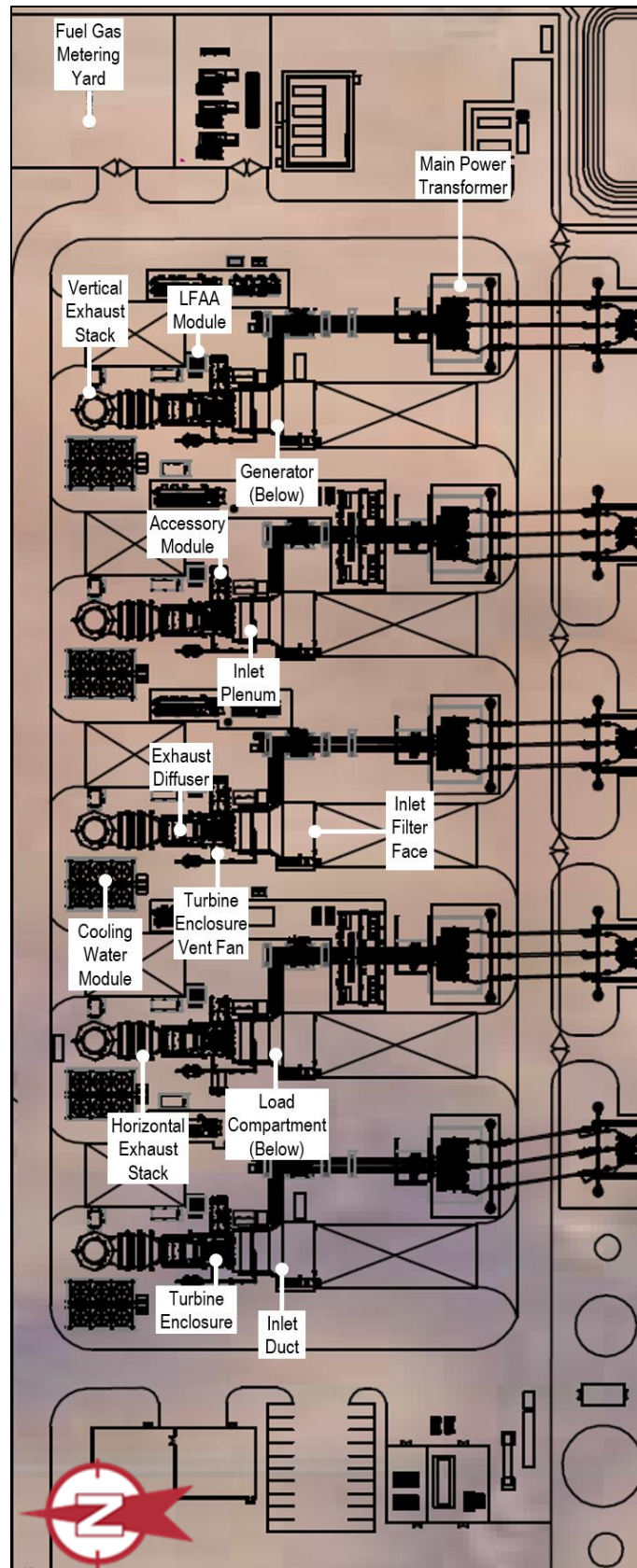


Figure 1-3. Alternative Site Plan and Noise-Producing Equipment

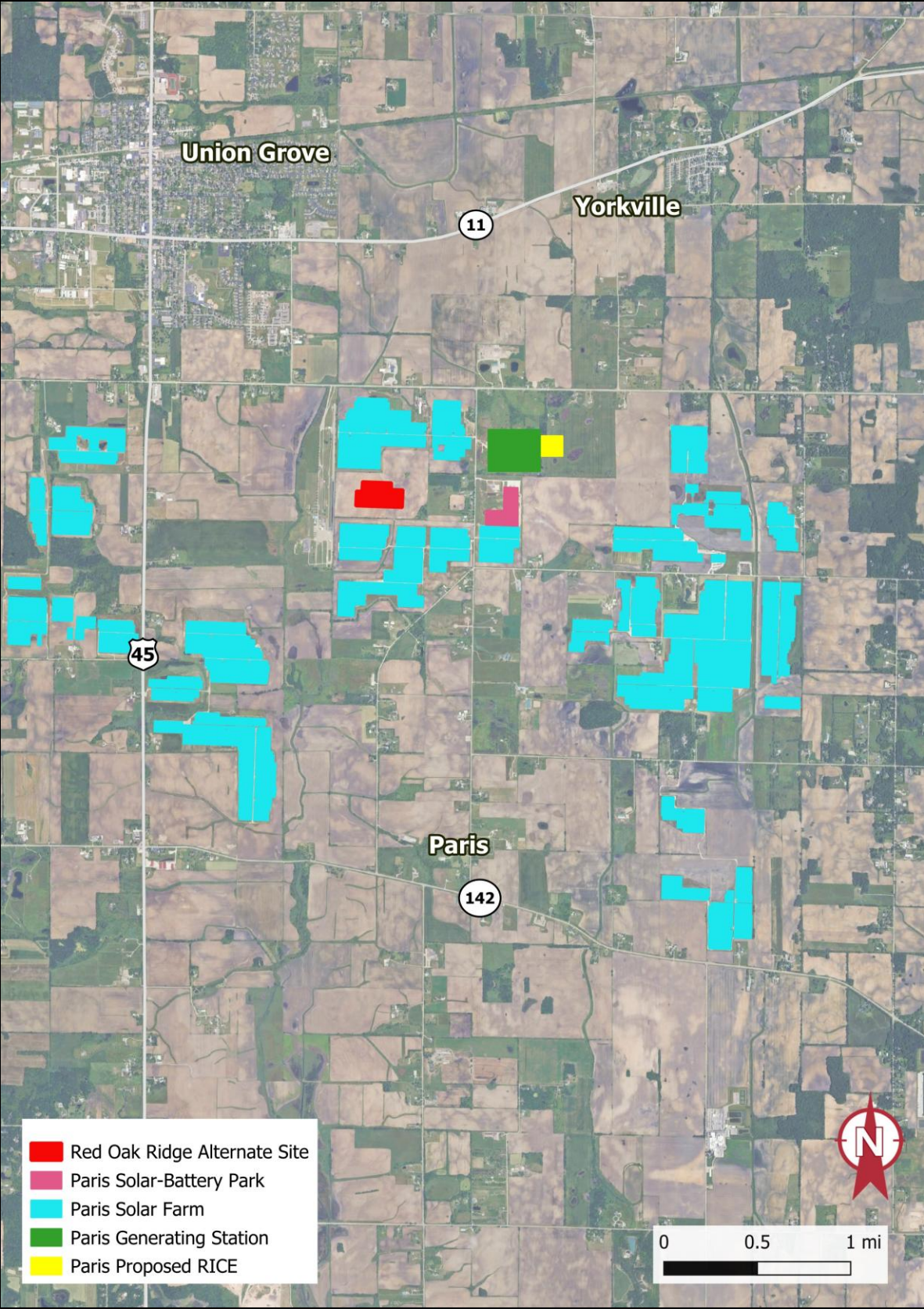


Figure 1-4. Alternative Site and Existing Noise Sources

Measurement Locations

Noise monitors were placed at three long-term locations near the Proposed Site and three long-term locations near the Alternative Site to continuously measure ambient noise levels for two weeks. Attended measurements were taken at four short-term locations near the Proposed Site and two short-term locations near the Alternative Site. Selection of measurement locations considered the following factors:

- Proximity of existing receptors (primarily residences).
- Geographical distribution of measurement locations across the entire study area.
- Existing sources of noise. These include I-94 that runs directly east of the Proposed Site, Highway 45 that runs west of the Alternative Site, manufacturing facilities near both sites, and a car racing venue south of the Alternative Site.

Given this, and in consultation with PSC staff, the following 12 measurement locations were selected. These locations are shown in Figure 1-5 and Figure 1-6, for the Proposed and Alternative Sites, respectively. The long-term locations are identified as MP1 through MP3 and MP11 through MP13 for the Proposed and Alternative Sites, respectively.

The short-term locations are identified as ST4 through ST7 and ST14 and ST15, for the Proposed and Alternative Sites, respectively. Photographs of the measurement locations are provided in Appendix A.

Proposed Site:

- MP1 is located along the Facility's eastern fence line and close to the exhaust stacks. The closest proposed facility equipment at the Proposed site is approximately 30 feet west of MP1.
- MP2 is located 90 degrees from and approximately 400 feet west of MP1 along the Facility's northern fence line. The closest proposed facility equipment at the Proposed site is approximately 100 feet south of MP2.
- MP3 is located approximately 450 feet south of MP1. It is representative of the closest residences south of the Facility. Note, if located as prescribed in the PSC Protocol, MP3 would be situated on the other side of I-94 where there are no receptors. The closest proposed facility equipment at the Proposed site is approximately 10 feet north of MP3.
- ST4 is located northwest of the Facility along County Highway MB. It is representative of the closest residences northwest of the Facility. The closest proposed facility equipment is approximately 5,000 feet to the east of ST4.
- ST5 is located southwest of the Facility along County Highway MB. It is representative of the closest residences southwest of the Facility. The closest proposed facility equipment at the Proposed site is approximately 5,000 feet to the east of ST5.
- ST6 is located north of the Facility near Somers Road. It is representative of the closest residences north of the Facility. The closest proposed facility equipment at the Proposed site is approximately 2,500 feet south of ST6.

- ST7 is located south of the Facility along the I-94 frontage road. It is representative of the closest residences south of the Facility. The closest proposed facility equipment at the Proposed site is approximately 2,000 feet north of ST7.

Alternative Site:

- MP11 is located along the Facility's southern fence line and as close as possible to the exhaust stacks. The closest proposed Facility equipment at the Alternative Site is approximately 100 feet north of MP11.
- MP12 is located 90 degrees to and approximately 800 feet east of MP11 along the Facility's eastern fence line. The closest proposed equipment at the Alternative Site is approximately 20 feet southwest of MP12.
- MP13 is located north of the Facility approximately 1,200 feet from MP11. Note that there are no proximate receptors south of MP11, which is where MP13 would be located as directed by the PSC protocol, and no land within the Project's control exists in that direction. MP13 was located to the north, as the Project has land control there. The closest proposed equipment at the Alternative Site is approximately 600 feet south of MP13.
- ST14 is located southeast of the Facility along 172nd Ave. and is representative of the nearby residences. The closest proposed equipment at the Alternative Site is approximately 2,000 feet northwest of ST14.
- ST15 is located northeast of the Facility along 172nd Ave. and is representative of the nearby residences. The closest proposed equipment at the Alternative Site is approximately 2,000 southwest of ST15.

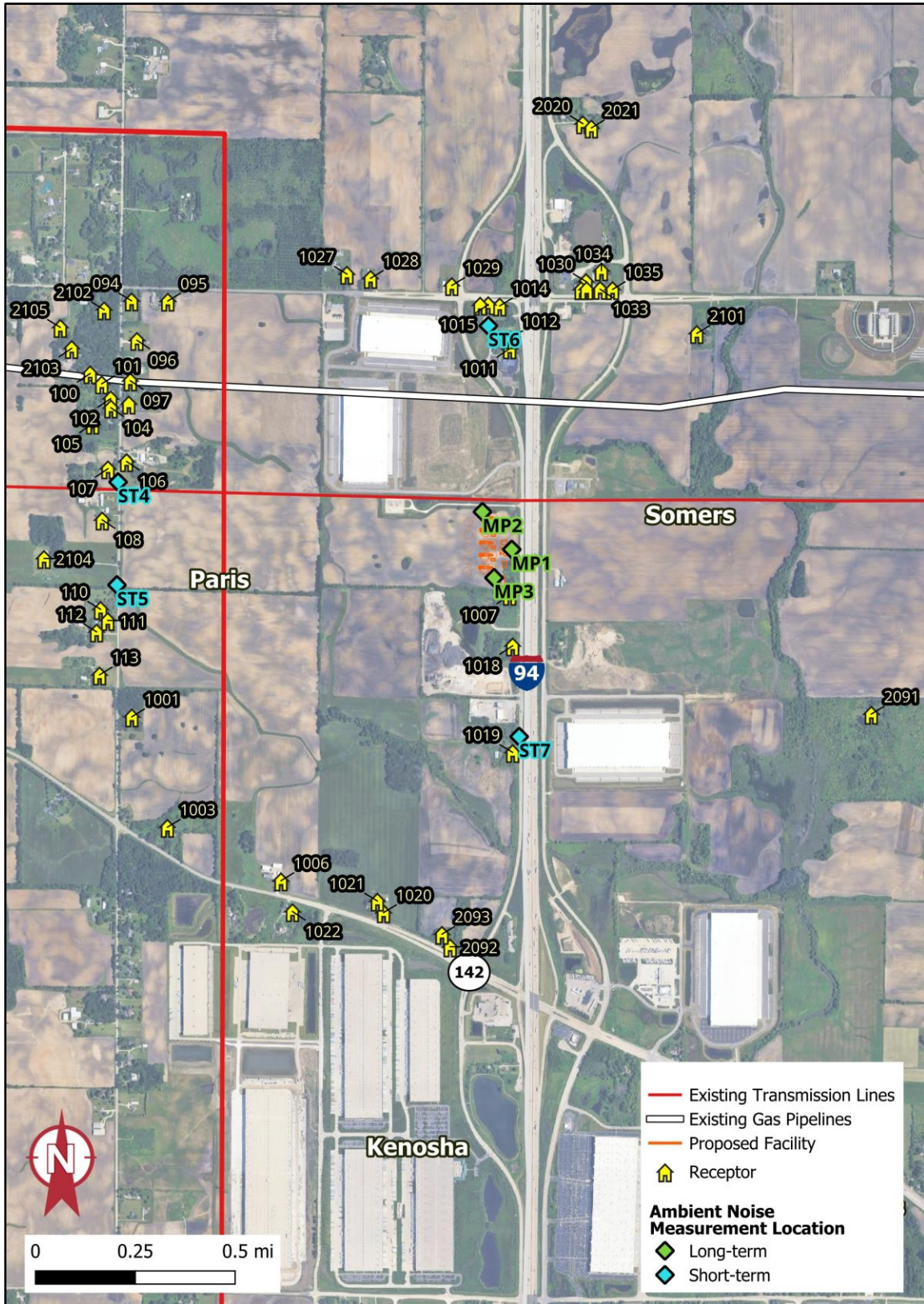


Figure 1-5. Receptors and Ambient Measurement Locations at Proposed Site

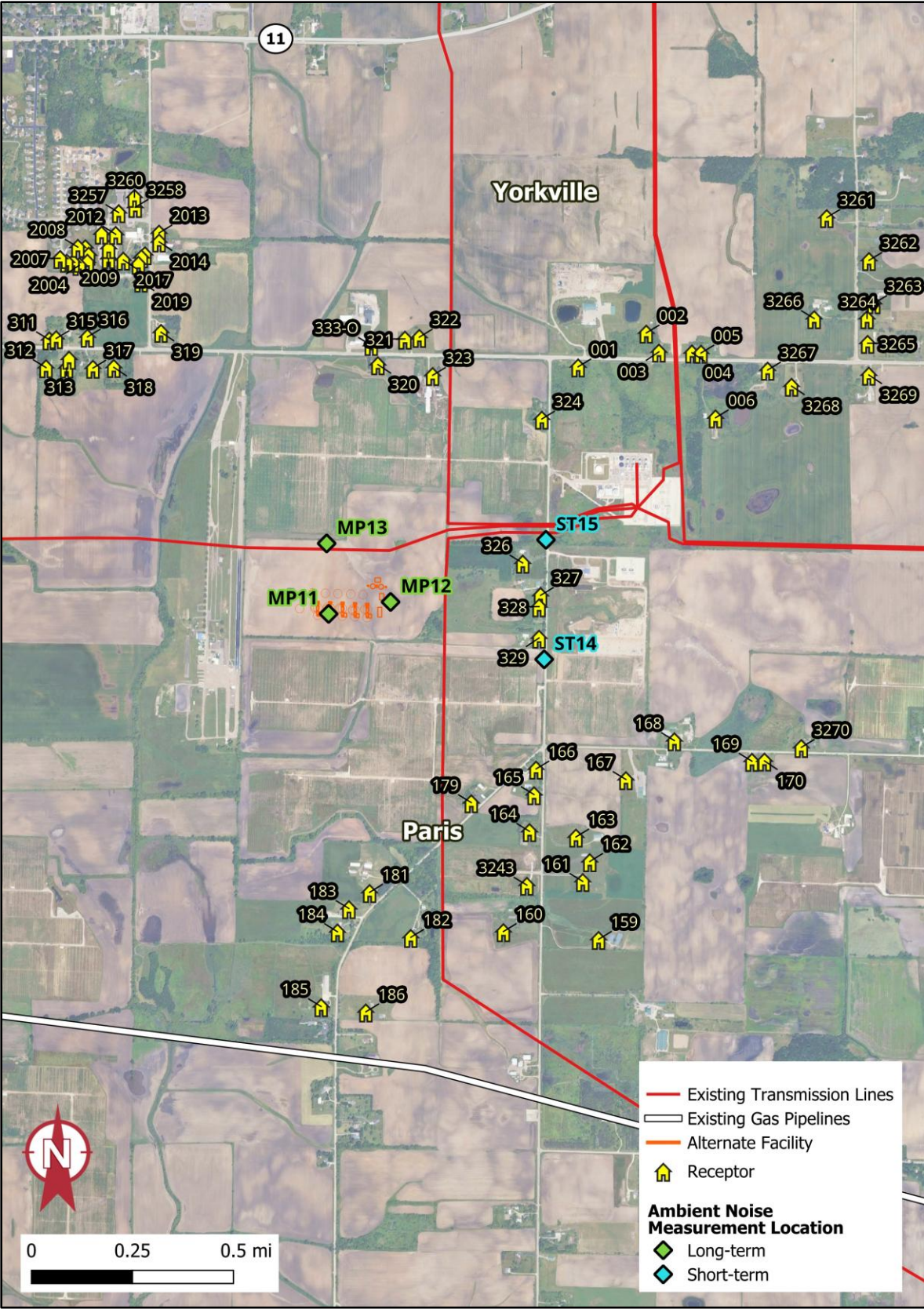


Figure 1-6. Receptors and Ambient Measurement Locations at Alternative Site

2. Sound Monitoring Results

An ambient noise level survey was conducted between October 17 and November 7, 2025 to characterize current conditions near the Project. The survey was carried out in conformance with the requirements of the PSC's Protocol.

Measurement Procedures

Six long-term noise monitors continuously measured ambient sound levels over the course of three weeks. Three long-term monitors (MP1, MP2, MP3) were located at the Proposed Site and three long-term monitors (MP11, MP12, MP13) were located at the Alternative Site. Attended noise measurements (10-minutes) were also taken at four additional locations (ST4, ST5, ST6, ST7) near the Proposed Site and at two locations (ST14 and ST15) near the Alternative Site during various daytime and nighttime periods.

Sound levels were measured using Larson Davis models 831 and LxT meters that meet the provisions for Type 1 meters per ANSI S1.4. All sound level meters were calibrated on location prior to the measurements using a handheld calibrator and were calibrated by an accredited laboratory within two years of use.

The microphones were covered with hydrophobically treated, seven-inch diameter, 80 pores-per-inch density windscreens to reduce the influence of wind-induced noise. The microphones were mounted on a fixed post or tripod and positioned five feet above the ground and at least 25 feet away from acoustically reflective surfaces per ANSI S12.9 Part 3. Wind speeds were measured continuously at the long-term monitoring sites using a Vaisala sonic anemometer.

The sound level meters were configured to collect the following data in 10-minute intervals: unweighted octave band and one-third octave band noise levels (16 through 8,000 Hz), overall, A-weighted noise levels in the following metrics: L_{ave} (i.e., L_{eq}), L_{10} , L_{50} , and L_{90} , and overall, C-weighted noise levels in the following metrics: L_{ave} (i.e., L_{eq}), L_{10} , L_{50} , and L_{90} .

Time periods that are considered acoustically invalid, based on any of the following conditions, were excluded from the results: ground-level wind gust speeds above 5 m/s, precipitation, temperature or humidity outside of the specifications of the sound level meter or microphone.

For the long-term monitors located at the Alternative Site, time periods where the Paris Generating Station was operating were also considered invalid. The monitor located at the Paris Generating Station was used to determine the generators' operating periods. The operating periods exhibited the following pattern: a 15–20 minute broadband increase, followed by several hours of a steady 25 Hz one-third-octave-band tone, followed by a brief broadband spike. Figure 2-1 provides an example of the spectrogram plots that were used in the analysis. This pattern was used to manually identify all generator operating periods throughout the monitoring period.

The data from the monitor located near the Paris Solar and BESS facilities did not show an indicator of whether the BESS and Solar facilities were on or off. Further, the levels measured near the Solar and BESS facilities were similar to levels measured at nearby measurement locations. Therefore, it was assumed that the operation of the Paris Solar and BESS facilities does

not affect the ambient levels measured at the Alternative Site long-term monitors and their operation was not considered when excluding invalid data.

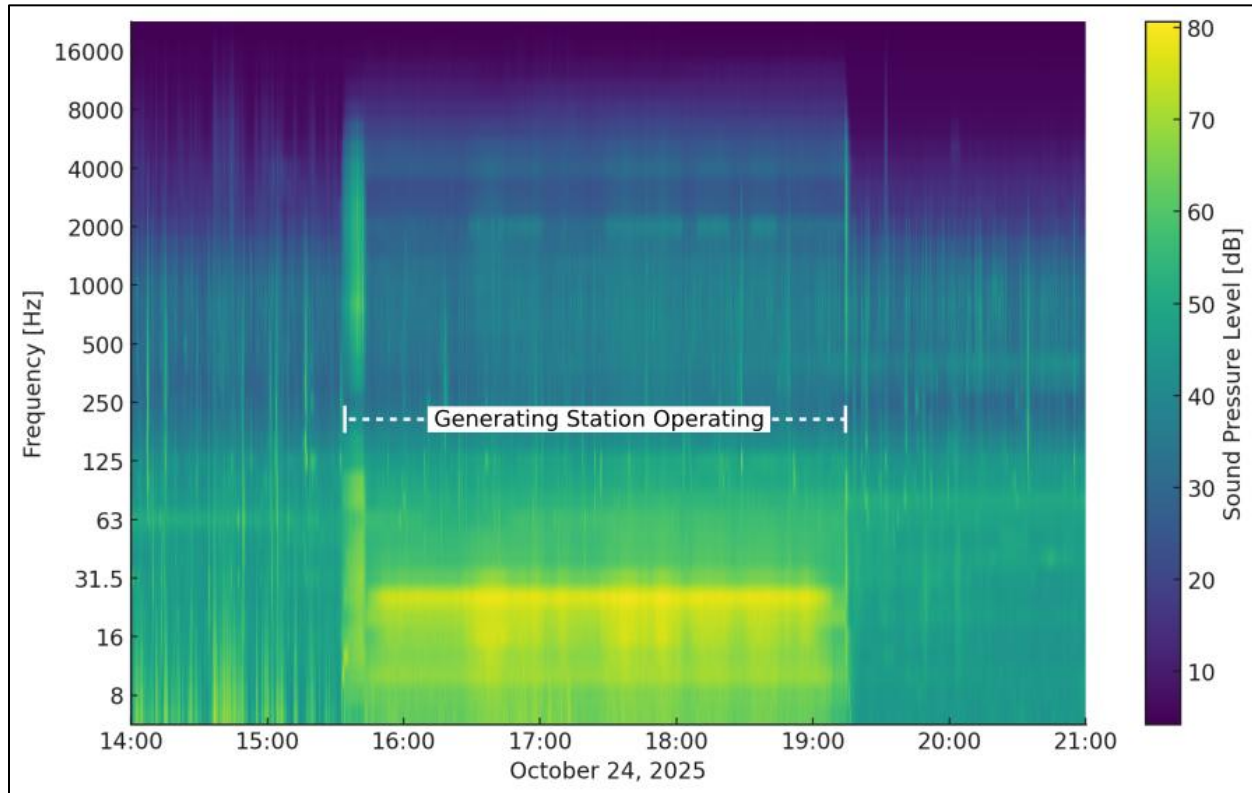


Figure 2-1. Spectrogram of Paris Generating Station Monitor

Measurement Results

Sources of existing sound observed in the area included those from natural sources, such as bird calls, wind-induced noise on the ears of listeners and microphones, and wind blowing through vegetation. Man-made noise was also present, from sources such as distant traffic, local traffic, and aircraft passing overhead.

The results of both long-term and short-term measurements are summarized herein and include the following metrics: the A-weighted and C-weighted L_{eq} , which is the average level over the measurement interval (10 minutes for this analysis), and is influenced by high-level extraneous noises such as wind gusts and local traffic, and the A-weighted L_{90} , L_{50} , L_{10} , and C-weighted L_{90} which represent the level exceeded 90%, 50%, 10%, and 90% of the time over the measurement interval, respectively. The L_{90} filters out sporadic noises to some degree and is representative of the quiet, consistent levels occurring within the interval.

Also presented are the ANS-weighted overall levels, which were calculated using the procedures outlined in ANSI S12.100. The purpose for reporting ANS-weighted levels is to minimize influence from high frequency natural sounds (HFNS), such as frogs and crickets, that do not occur year-round. Per ANSI S12.100-2014, *Methods to Define and Measure the Residual Sound in Protected Natural and Quiet Residential Areas*, to calculate the ANS, only the data in the one-third

octave bands up through 1,250 Hz should be included. This process removes the HFNS and is more representative of all months that may not have insect activity.

The measured sound levels (dBA) at each long-term location are listed in Table 2-1 and Table 2-2 for the Proposed and Alternative Sites, respectively. The measured sound levels at each short-term location are listed in Table 2-3 and 2-4 for the Proposed and Alternative Sites, respectively.

Table 2-1. Proposed Site Long-term Sound Level Measurement Results

Site	Leq dB(A)		Leq dB(C)		L10 dB(A)		L50 dB(A)		L90 dB(A)		L90 dB(C)		Leq dB(ANS)	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
MP1	65	64	75	73	66	65	63	62	61	59	68	65	65	63
MP2	60	60	70	68	59	60	57	57	55	55	64	61	60	59
MP3	61	60	71	68	60	61	58	58	57	56	64	61	60	60

Table 2-2. Alternative Site Long-term Sound Level Measurement Results

Site	Leq dB(A)		Leq dB(C)		L10 dB(A)		L50 dB(A)		L90 dB(A)		L90 dB(C)		Leq dB(ANS)	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
MP11	56	49	65	60	48	41	42	36	38	33	53	48	56	48
MP12	52	45	64	59	47	40	41	35	37	33	52	48	51	45
MP13	53	47	63	59	47	41	41	36	38	34	52	48	53	46

Table 2-3. Proposed Site Attended Sound Level Measurement Results

Site	Time Period	Leq (dBA)	Leq (dBC)	L10 (dBA)	L50 (dBA)	L90 (dBA)	L90 (dBC)	Audible Sources
ST4	Day	56	65	50	45	44	53	Local and distant traffic, birds, rustling vegetation
	Night	52	60	51	48	46	54	Local and distant traffic, insects, rustling vegetation, aircraft overhead
ST5	Day	57	63	54	47	45	53	Local and distance traffic, birds, insects, rustling vegetation, aircraft overhead
	Night	52	61	52	49	47	55	Local and distant traffic, insects
ST6	Day	62	72	64	62	59	66	Local traffic, birds, insects, roosters, rustling vegetation
	Night	61	70	63	61	59	64	Local traffic, insects
ST7	Day	74	81	75	72	70	74	Local traffic, birds, insects
	Night	70	77	72	69	65	69	Local traffic, rustling vegetation

Table 2-4. Alternative Site Attended Sound Level Measurement Results

Site	Time Period	Leq (dBA)	Leq (dBC)	L10 (dBA)	L50 (dBA)	L90 (dBA)	L90 (dBC)	Audible Sources
ST14	Day	65	70	63	44	38	53	Local and distant traffic, birds, insects, rustling vegetation, aircraft overhead, car racing
	Night	57	63	47	38	36	51	Local and distant traffic, insects, car racing
ST15	Day	63	70	59	43	38	53	Local and distant traffic, birds, insects, rustling vegetation, aircraft overhead, aircraft overhead, distant sirens, electrical hum, low rumbling
	Night	60	63	56	40	37	49	Local and distant traffic, insects, rustling vegetation, rattling electrical wires

Figures 2-2 and Figure 2-3 show the sound levels measured by the long-term continuous monitors over the course of one day for MP1 and MP11 respectively. The time histories for each long-term location on a one-day basis are shown in Appendix B. The time histories show the L_{eq} , L_{90} , L_{50} , and L_{10} sound levels (10-minute dBA), the L_{eq} sound levels (10-second, dBA), the wind speed (10-second and 10-minute) and direction. The time histories also show time periods where the data is acoustically invalid.

Octave band noise level measurements from the continuous monitors, for both L_{eq} and L_{90} noise metrics, are provided in Appendix D.

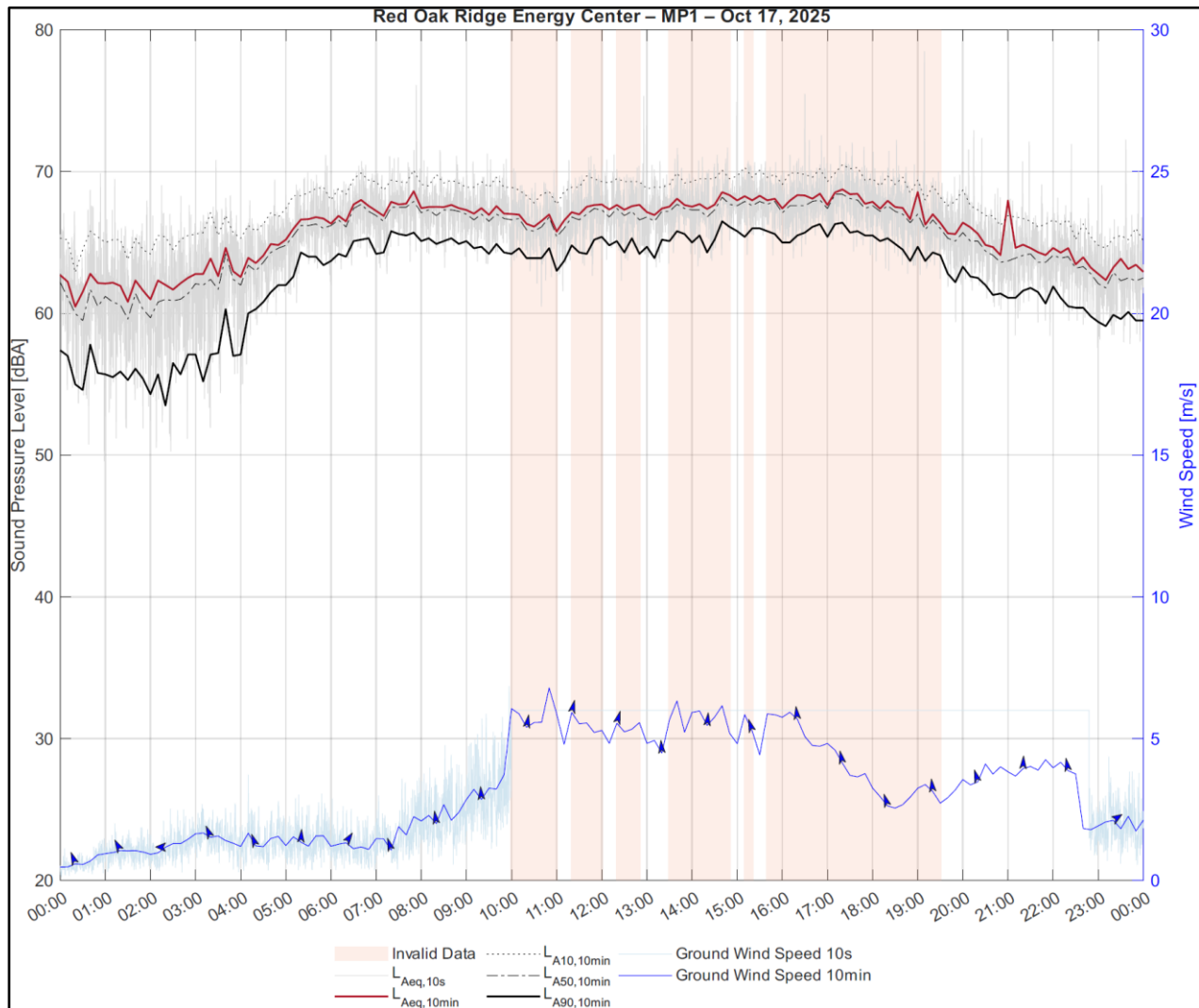


Figure 2-2. Long-Term Background Noise Levels at MP1 – Proposed Site

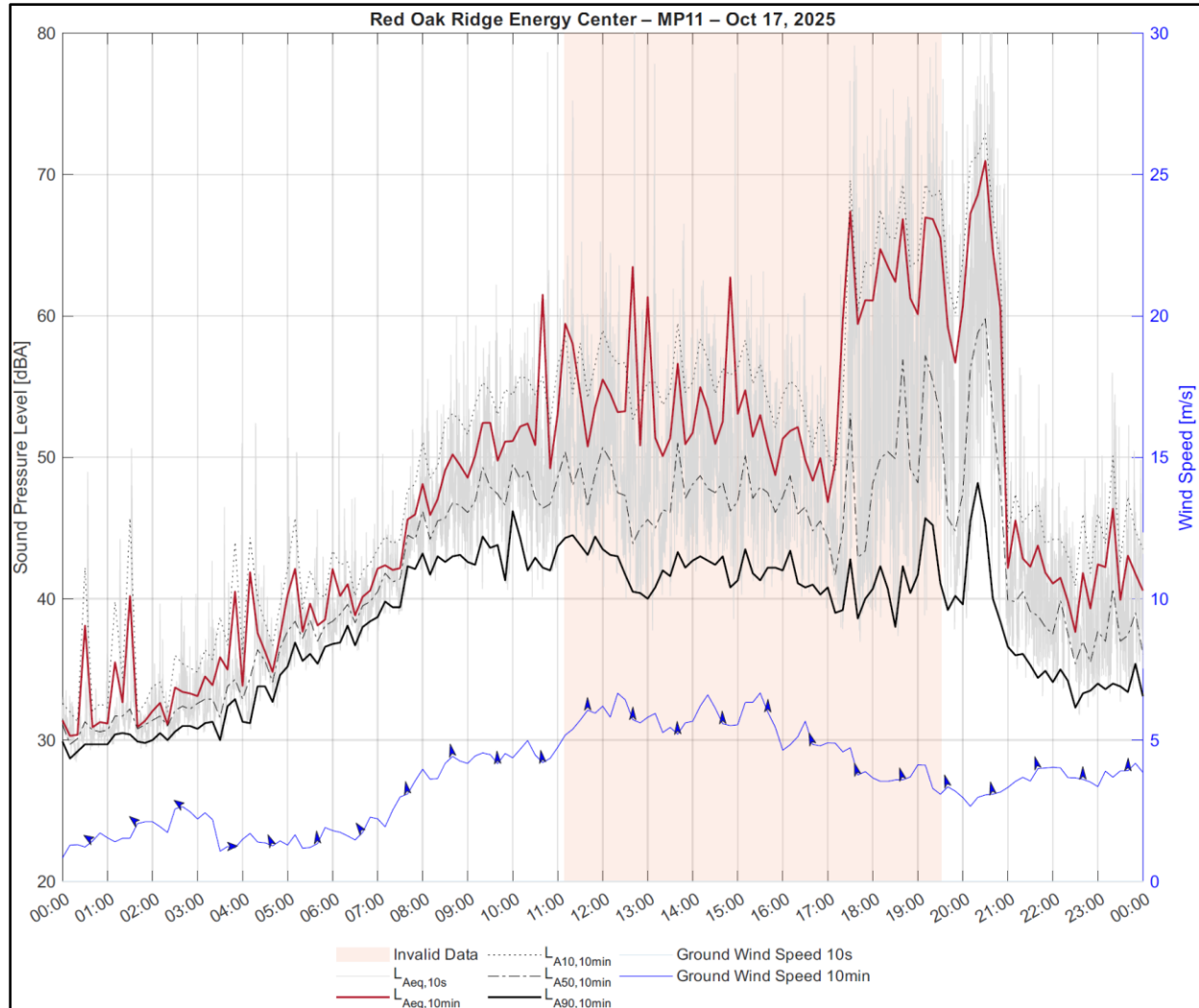


Figure 2-3. Long-Term Background Noise Levels at MP11 – Alternative Site

3. Sound Modeling Results

Noise levels from the proposed Project were predicted using the International Organization for Standardization (ISO) Standard 9613-2:2024, *Attenuation of Sound During Propagation Outdoors - Part 2: General method of calculation*. The calculations were made using the SoundPLAN v9.1 software program. Parameters in the ISO 9613-2:2024 method include the locations of the noise sources and receivers, noise source emission levels and spectral characteristics, terrain and ground type, and atmospheric conditions. The ISO 9613-2:2024 method assumes optimal acoustic propagation in all directions, specifically that a “well-developed, moderate ground-based temperature inversion” is present or, equivalently, that all receptors are downwind of all noise sources at all times. The sections below describe the modeling assumptions.

The PSC has not established decibel-based noise standards that apply to natural gas electric generation facilities. Absent a specific limit, the Project has elected to design the Facility such that predicted noise emissions are less than or equal to the following two project noise goals to prevent adversely impacting nearby noise-sensitive receptors:

1. Noise levels will not exceed 50 dBA at any receptor. Fifty dBA is a common noise level limit in the U.S., and one that has been used on numerous Wisconsin PSC electricity generation cases. This is viewed as an appropriate noise level goal given the fact that the Facility will operate only approximately 20% of the year and existing background noise at the Proposed Site often exceeds 50 dBA, making the Facility’s noise barely audible or inaudible.
2. Noise levels will remain below 75 dBC at any receptor to minimize the potential for noise-induced vibrations. The 75 dBC threshold is based on the American Society of Mechanical Engineers (ASME) B133.8 standard for Gas Turbine Installation Sound Emissions.

Operational Noise Sources

The sound power levels for the equipment used in the analysis are shown in Tables 3-1 and 3-2 and are based on manufacturer’s data or measurements by Hankard Environmental. The model of noise from operations assumed that all equipment is operating at full capacity. Noise-producing equipment at the 138kV substation consists of five 285 MVA generator step-up transformers. The sound power levels for the transformers were estimated using industry standard methods and manufacturer measured data of similar-sized units. The generator step-up transformers were modeled at a height of three meters above the ground. All other equipment was modeled at the heights shown in the mechanical outline drawings (7F.05 *Stack Drawings.pdf*, 2020-10-09).

Atmospheric Conditions

The air temperature, relative humidity, and atmospheric pressure were set to 10°C, 70%, and 1 atmosphere, respectively. Per ISO 9613-2:2024, these values result in the least amount of atmospheric sound absorption and the highest levels of sound reaching the receivers.

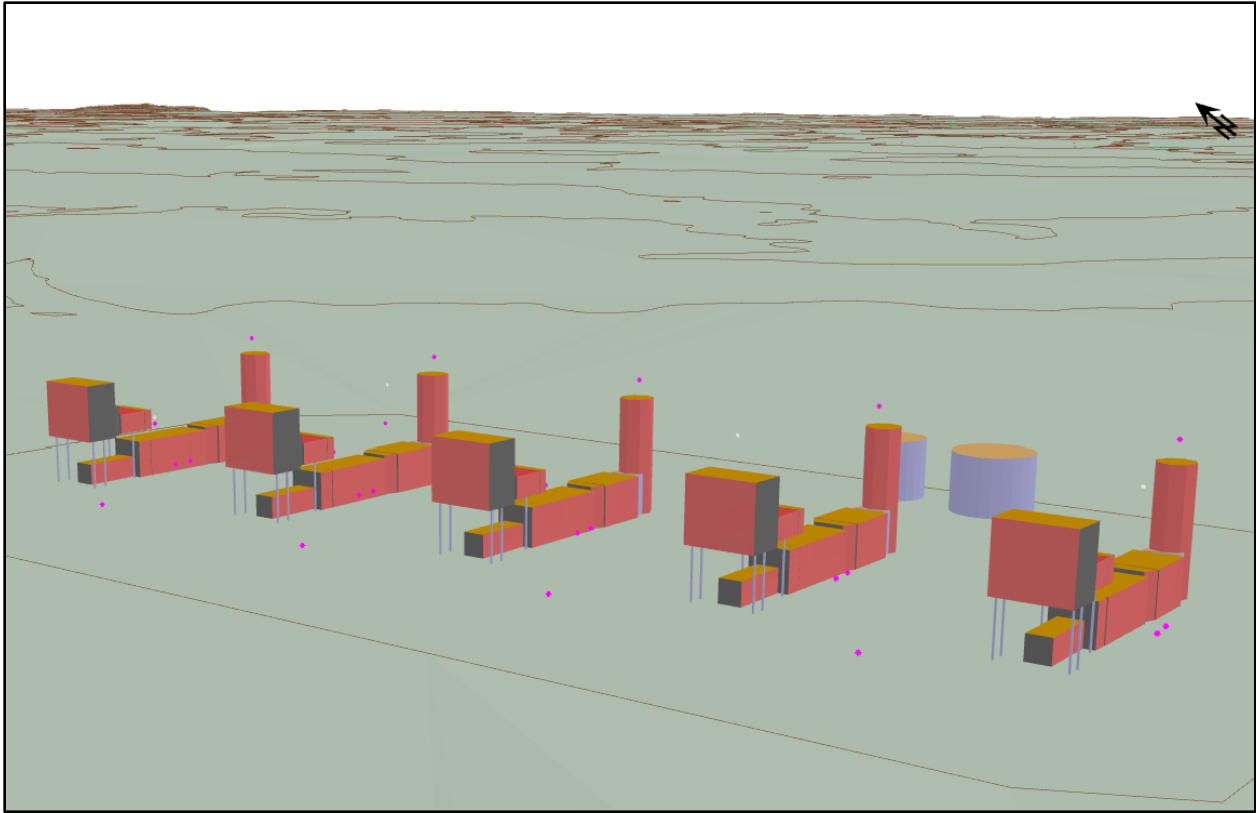


Figure 3-1. Sample 3D View of the Proposed Site SoundPLAN Noise Model

Terrain and Ground Effect

The acoustical effect of the ground was modeled using the ISO 9613-2:2024 General Method. This method requires the selection of ground factors for the ground near the source, near the receiver, and in between. A ground factor of 0.0 represents a completely reflective surface such as pavement, which would result in a higher level of sound reaching a receiver. A ground factor of 1.0 represents absorptive ground such as thick grass or fresh snow, resulting in a lower level of sound reaching the receiver. For this analysis a ground factor of 0.5 was used for the surrounding area which represents a mix of reflective and porous ground. This is a conservative assumption given that most of the land near the Project is agricultural fields.

Receptors

Noise levels were predicted at 50 receptor locations for the Proposed Site and 76 receptor locations for the Alternative Site. Receptors are shown graphically in Figures 1-5 and 1-6, and also in Figures 3-2 through 3-5. Receptors include all residences and other noise-sensitive uses located within approximately one mile of the Project. Noise levels will be lower at receptors farther from the Project. For this analysis, all receptors were assumed to be multi story. As a result, the height above the ground for each receptor was set to four meters in accordance with the PSC protocol.

Noise Mitigation Measures

The noise analysis was based on the general arrangement of noise-producing components shown in Figures 1-2 and 1-3 and the sound power levels provided in Table 3-1. Because the analysis is specific to this design configuration, significant changes to the site layout may necessitate adjustments to the noise mitigation measures to ensure compliance with the Project's noise goals. Significant changes to equipment sound power levels may also require modifications to the mitigation measures. For the analysis results presented herein, the sound power levels shown in Table 3-1 were replaced with the low-noise variants presented in Table 3-2 for the following equipment:

- Inlet Filter Face
- Inlet Plenum
- Load Compartment
- Generator
- Turbine Compartment Vent Fans
- Exhaust Exit and Breakout Noise
- Power Transformers

Table 3-1. Noise Emission Factors

Equipment Description	Quantity	Source Type	Octave-Band Sound Power Level (dB)									Overall Sound Power Level (dBA)
			31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1,000 Hz	2,000 Hz	4,000 Hz	8,000 Hz	
Inlet Ducting ¹	5	Area	104	98	100	102	96	81	95	82	57	99
Inlet Filter Face ¹	5	Area	111	103	99	90	87	86	91	99	93	102
Accessory Module	5	Area	101	103	99	98	97	96	96	97	88	103
Inlet Plenum ¹	5	Area	98	96	95	90	94	99	100	96	86	104
Turbine Compartment ¹	5	Area	104	101	99	93	95	95	99	104	92	107
LFAA Module ¹	5	Area	101	102	99	98	97	96	96	97	88	103
Exhaust Diffuser ¹	5	Area	105	112	96	92	86	84	85	88	75	94
Load Compartment ¹	5	Area	92	98	97	92	92	98	98	93	83	103
Generator ¹	5	Area	98	191	107	94	98	99	100	95	84	105
Turbine Vent Fans ¹	5	Point	102	102	110	101	98	95	94	98	95	104
Cooling Water Module ²	5	Area	99	99	113	105	104	104	94	89	91	107
Exhaust Stack Exit ³	5	Point	136	126	110	98	97	94	99	112	105	114
Lower Stack Breakout ³	5	Area	129	119	103	86	81	82	85	80	58	96
Upper Stack Breakout ³	5	Area	128	114	86	61	53	53	60	68	51	91
Gas Metering Yard ⁴	1	Point	29	16	6	86	83	84	93	91	85	97
Main Power Transformer ⁵	5	Point	63	83	95	97	103	100	96	91	82	106

¹ 1670773_Invenenergy Red Oak_7F05_GE_PWL_RevC

² Based on data from GE on a similar unit.

³ Based on email correspondence with Invenenergy and GE on Oct 8, 2025

⁴ Based on measurements conducted by Hankard Environmental on a similar unit

⁵ Based on IEEE C57.12.90 standard and manufacturer measurements for similar units. Assumes a +5 dB penalty for tonality.

Table 3-2. Optional Low-Noise Equipment Noise Emission Factors

Equipment Description	Octave-Band Sound Power Level (dB)									Overall Sound Power Level (dBA)
	31.5	63	125	250	500	1,000	2,000	4,000	8,000	
	Hz	Hz	Hz	Hz	Hz	Hz	Hz	Hz	Hz	
Low-Noise Inlet Filter Face	111	102	97	86	77	74	77	83	82	89
Low-Noise Inlet Plenum	98	96	87	80	82	84	82	75	63	88
Low-Noise Load Compartment	87	92	89	82	80	83	80	72	60	86
Low-Noise Generator	93	95	99	84	86	84	82	74	61	90
Low-Noise Turbine Vent Fan	91	85	80	88	87	86	91	89	83	95
Low-Noise Lower Stack Breakout	129	119	103	86	81	82	85	80	58	96
Low-Noise Upper Stack Breakout	128	114	86	61	53	53	60	68	51	91
Low-Noise Exhaust Stack Exit	136	126	110	98	97	94	99	112	105	114
Low-Noise Main Power Transformer	57	77	89	91	97	94	90	85	76	100

Predicted Construction Noise Levels – Both Sites

Noise will be generated during construction of the Facility. Noise levels at nearby residences will vary depending on the phase of construction, proximity of construction activities, and other factors. For example, noise levels during foundation work and installation of underground facilities are expected to be 5–6 dBA higher than during other construction phases. Construction of the Facility is expected to be completed over a 13-to-16-month period. For the purposes of this analysis, construction of the Facility was divided into the three main phases listed in Table 3-3, which also lists the estimated total length of time for each phase.

Table 3-3. Estimated Durations of Construction Phases

Site Activity	Estimated Duration (weeks)
Foundations and Underground Facilities	32 - 36
Building and Equipment Erection	20 - 24
Commissioning and Final Site Work	6 - 8

Table 3-4 lists the type and quantity of construction equipment expected to be employed during each phase of construction, the percentage of time that each piece of equipment is expected to be used at full capacity (usage factor), and the maximum sound pressure level of each unit at a 50-foot distance (L_{eq} at full throttle). Construction noise emission levels are estimates based on either the measurement of construction equipment noise conducted by Hankard Environmental on previous projects, equipment manufacturers data available online, or those published by the

Federal Highway Administration's Roadway Construction Noise Model (RCNM) v1.1. Usage factors were estimated or obtained from the RCNM model.

Table 3-4. Equipment in Operation on Site During Construction Phases

Construction Equip. Type & HP	Foundations & UG Facilities	Bldg. & Equip. Erection	Final Site Work	Usage Factor (%)	Sound Pressure Level at 50 ft (dBA)
Small Tracked Excavator (Cat 316) - 117 HP	2		1	40	80.7
Medium Tracked Excavator (Cat 330) - 202 HP	1			40	80.7
Compact Track Loader (Bobcat T550) - 68 HP			2	40	79.1
Small Wheel Loader (Cat 926M) - 168 HP	2	1	1	40	79.1
Medium Wheel Loader (Cat 966) - 321 HP	1			40	79.1
Medium Backhoe (Cat 415) - 70 HP			1	40	77.6
Vibratory Soil Compactor (Cat CS54B) - 131 HP	1			20	83.2
Vibratory Tandem Roller (Cat CB10) - 120 HP			1	20	80.0
Trench Roller (Wacker RTKx-SC3) - 21 HP	3			80	74.0
Asphalt Paver (Astec RP175) - 173 HP			1	50	77.2
Small Dozer (Cat D3) - 104 HP	1		1	40	81.7
Articulated Dump truck (Cat 725) - 338 HP	2			40	76.5
Semi Truck Low Boy - 505 HP	1	1	1	40	74.3
Semi Truck deliveries - 480 HP	2	2	1	40	74.3
Tri-axle Dump Truck - 415 HP	2		2	40	76.5
Semi Truck Dump Trailer - 505 HP	2		2	40	76.5
Concrete Ready Mix Truck - 410 HP	5			40	78.8
Concrete Pump Truck (Alliance 50M - 415 HP	2			20	81.4
Power Trowel (Multiquip HTX6H) - 70 HP	3			80	86.0
240 ton Mobile Crane (Liebherr LTM 1200-5.1) - 197 HP		2		16	80.6
120 ton Mobile Crane (Liebherr LTM 1100-4.2) - 175 HP	1	1	1	16	80.6
300 ton Mobile Crane (Liebherr LTM 1250-5.1) - 215 HP		1		16	80.6
40 ton Boom Truck (National NBT40-1) - 245 HP		1		40	74.3
Small Telehandler (JLG G5-18A) - 74 HP	2	2	1	80	69.0
Medium Telehandler (JLG 943) - 110 HP	1	1		80	69.0
125' Boom Lift (JLG 1250AJP) - 74 HP		1		80	74.0
80' Boom Lift (JLG 800AJ) - 67 HP		2		80	74.0
60' Boom Lift (JLG 600AJ) - 49 HP		2	1	80	74.0
33' Scissor Lift (JLG RT3394) - 25 HP		2		80	74.0
53' Scissor Lift (JLG RT5394) - 31 HP		2	1	80	74.0
150 kVA 3 PH Generator (MQ Power DCA150SSJU4F) - 240 HP	1	1		50	80.6

Tables 3-5 and 3-6 list the one-hour average noise level ($L_{eq(1hr)}$) predicted at the Proposed and Alternative Site receptors. These are the average levels expected over one hour assuming that a portion of the time, some equipment will be idle or off. The loudest $L_{eq(1hr)}$ levels at the nearest receptors ranged from about 44 to 67 dBA at the Proposed Site and 44 to 55 dBA at the Alternative Site.

Table 3-5. Predicted Construction Noise Levels – Proposed Site

Receiver	Foundations & UG Facilities	Bldg. & Equip. Erection	Final Site Work
1007	67	61	61
1018	61	55	55
1011	55	48	48
1019	54	48	48
1012	54	47	48
1013	53	46	47
1014	53	46	46
1015	53	46	46
1016	53	46	46
1036	52	45	46
1029	52	45	46
1030	51	45	45
1031	51	45	45
1032	51	45	45
1033	51	44	45
1035	51	44	45

Table 3-6. Predicted Construction Noise Levels – Alternative Site

Receiver	Foundations & UG Facilities	Bldg. & Equip. Erection	Final Site Work
320	55	49	49
325	55	48	49
326	55	48	49
323	55	48	49
333	54	48	48
327	54	47	48
328	54	47	48
321	54	47	48
322	54	47	47
329	53	47	47
324	53	46	46
319	52	45	45
318	51	45	45
179	51	44	45
317	51	44	45
1	51	44	44

Considering the temporary nature of construction activities, that most construction will take place during the daytime, and that much of the time the noise levels will be less than the predicted levels described herein, construction noise from the Project can be reasonably controlled and mitigated to minimize the impacts to nearby receptors by taking the following measures:

- Utilize temporary noise barrier walls where necessary and feasible. Noise walls should be large enough (both height and width) to block the line of sight from the nearest receptors to the subject equipment. The contractor will ensure that the installed shielding will be free of any gaps within or between wall segments, and that the wall will be massive enough to reduce noise, such as one-inch-thick plywood.
- Maintain equipment to manufacturers' specifications, particularly mufflers.
- Use ambient controlled broadband backup alarms versus tonal backup alarms if using mobile equipment at night.
- Minimize backing up on site of delivery trucks to the degree practicable.
- Educate contractors and subcontractors on the need to minimize noise emissions.
- Provide a 24-hour telephone number for residents to use if needed.
- Contact all complainants and attempt to resolve any legitimate problems or issues in a prompt manner.
- Notify residents of the expected construction schedule for the Project.

Predicted Operational Noise Levels - Proposed Site

Table 3-7 lists the loudest noise levels predicted at receptors within one mile of the Proposed Site. The predicted octave band noise levels from 31.5 Hz to 125 Hz are also provided in Table 3-7, as required by the PSC Protocol. The Protocol also requires an assessment of 16 Hz octave band levels. However, 16 Hz octave band emission levels are not available from the equipment manufacturer.

Overall predicted noise levels at all receptors near the Proposed Site ranged from approximately 40 dBA to 59 dBA (L_{eq}) and 70 dBC to 83 dBC (L_{eq}). Maximum predicted operational noise levels for the Proposed Site are illustrated graphically in Figures 3-2 through 3-4. These figures show the extent to which noise emissions from the Project reach various levels (noise level contours). At more distant locations (outward from the contours shown), noise levels will be lower.

Table 3-7. Loudest Predicted Noise Levels – Proposed Site

Receptor	L_{eq} (dBA)	L_{eq} (dBC)	Octave Band Sound Pressure Level (dB)		
			31.5 Hz	63 Hz	125 Hz
1007	59	83	85	75	61
1018	55	80	82	72	58
1019	48	74	77	66	52
1011	48	75	77	67	51
1012	48	74	77	66	51
1014	46	74	76	66	50
1015	46	73	76	66	49
1016	46	74	76	66	49
1031	45	73	76	65	49
1032	45	73	76	65	49

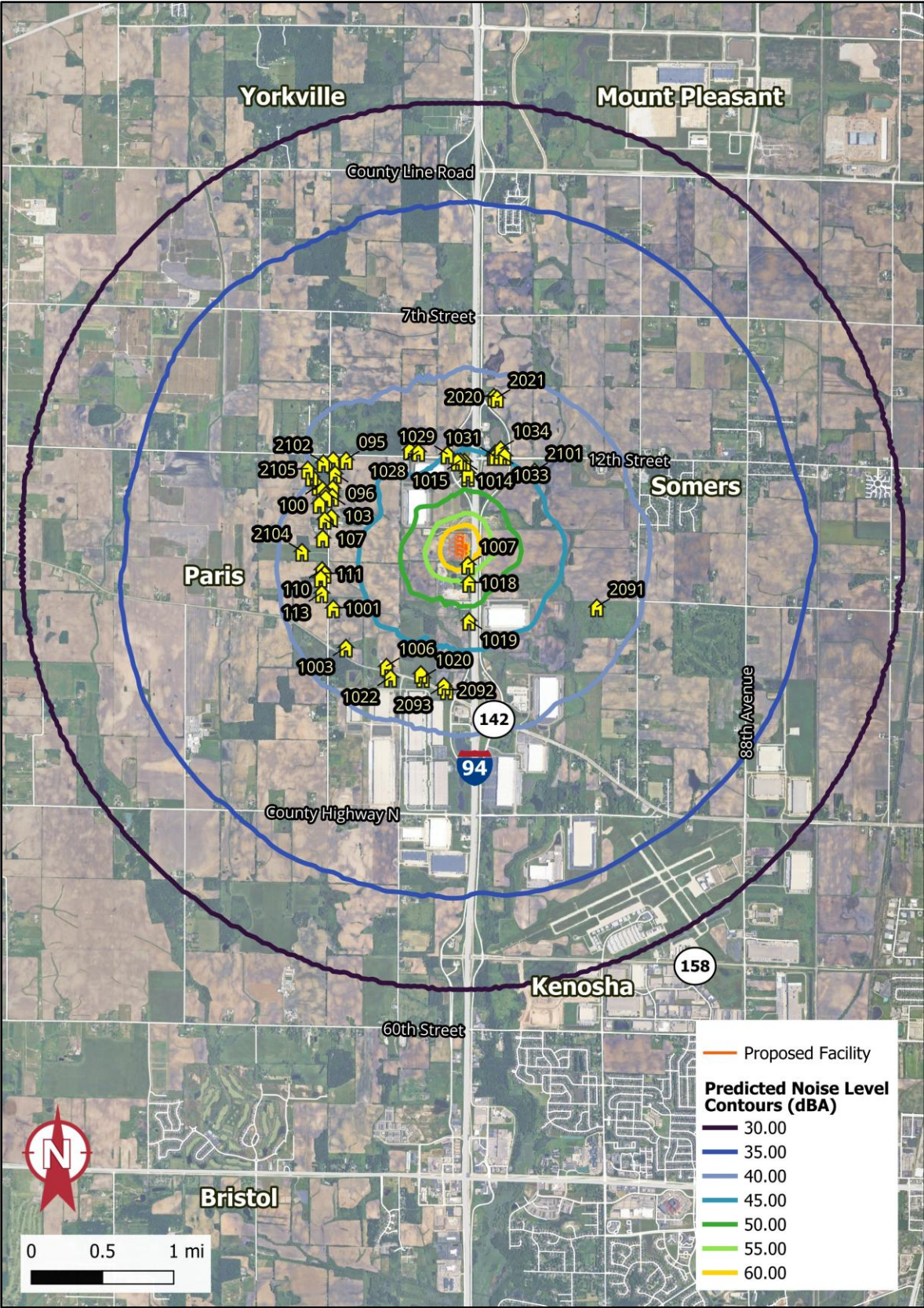


Figure 3-2. Proposed Site Predicted Noise Level Contours (dBA)

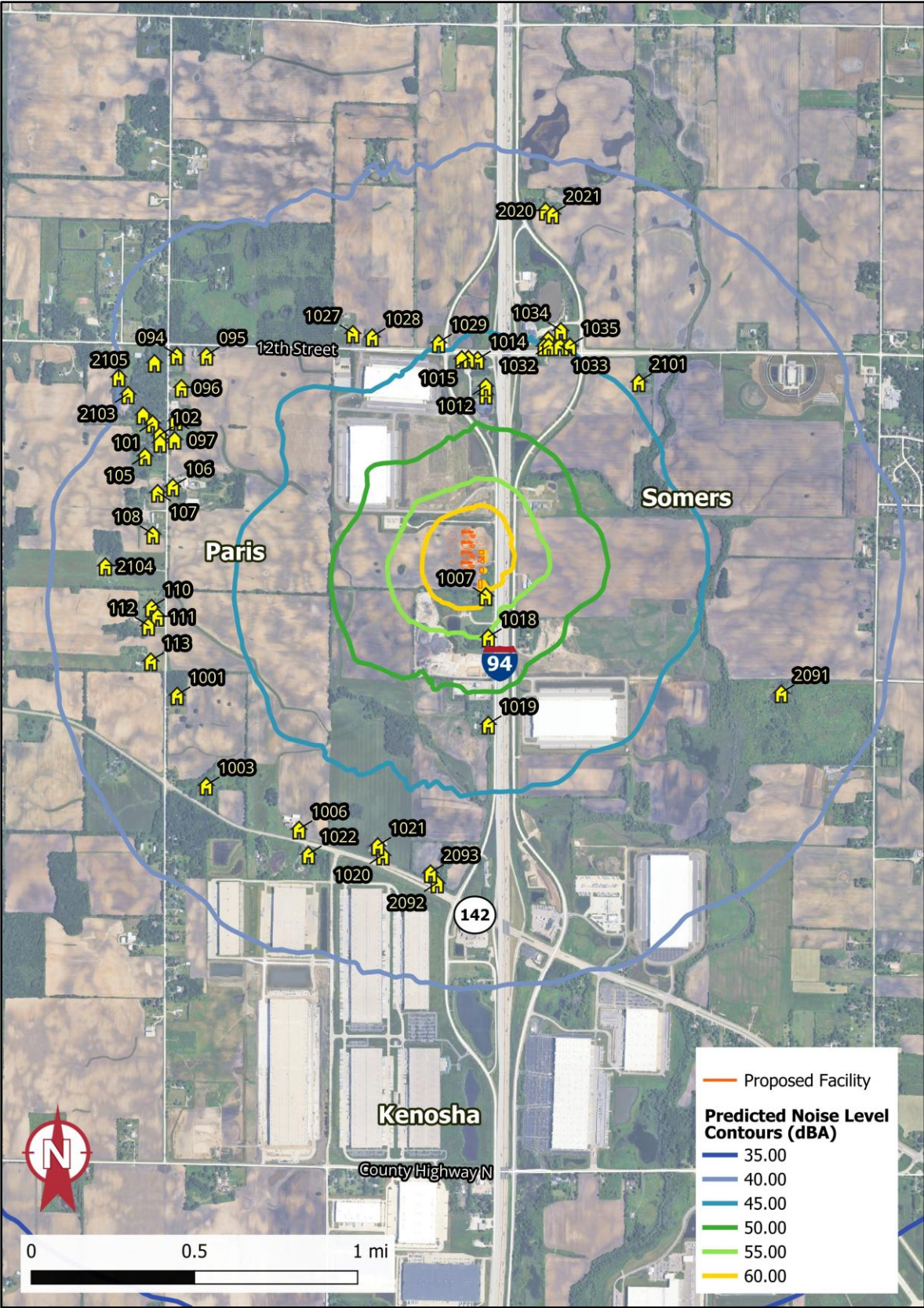


Figure 3-3. Proposed Site Predicted Noise Level Contours (dBA) Zoomed

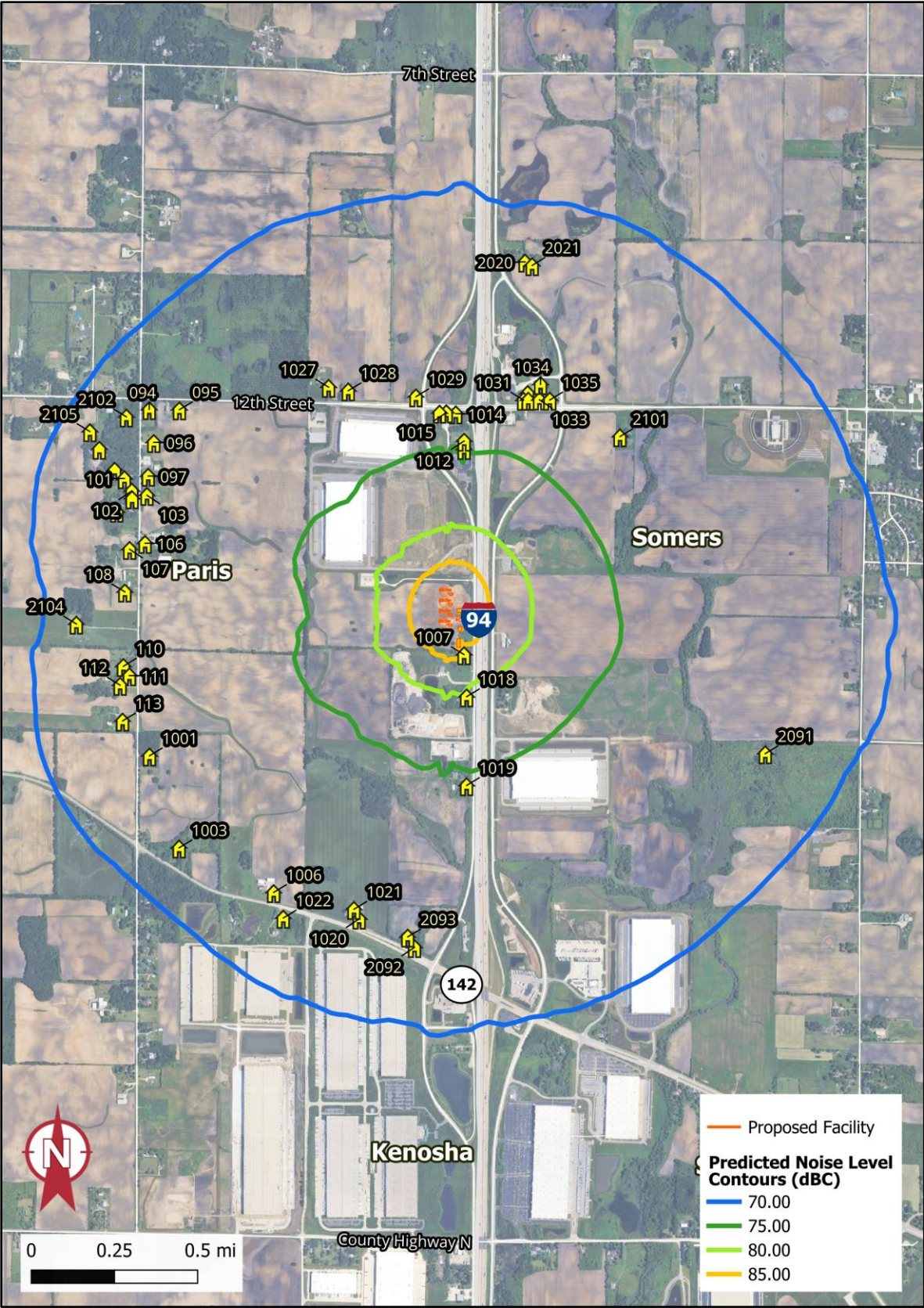


Figure 3-4. Proposed Site Predicted Noise Level Contours (dBC)

Predicted Operational Noise Levels - Alternative Site

Table 3-8 lists the noise levels predicted at the top receptors within one mile of the Alternative Site noise sources. The predicted octave band noise levels from 31.5 Hz to 125 Hz are also provided in Table 3-8, as required by the PSC protocol. The Protocol also requires an assessment of 16 Hz octave band levels. Sound power level data, including the 16 Hz octave band levels, was requested from GE; however, the Project was informed that this data was unavailable. As a result, the 16 Hz octave band levels could not be predicted at the time of this report. Overall predicted noise levels at all receptors near the Alternative Site ranged from approximately 39 dBA to 48 dBA (L_{eq}) and 69 dBC to 75 dBC (L_{eq}). Maximum predicted operational noise levels for the Alternative Site are illustrated graphically in Figures 3-5 through 3-7.

Table 3-8. Loudest Predicted Noise Levels - Alternative Site

Receptor	L_{eq} (dBA)	L_{eq} (dBC)	Octave Band Sound Pressure Level (dB)		
			31.5 Hz	63 Hz	125 Hz
326	48	75	77	67	53
328	48	75	77	67	52
327	48	75	77	67	52
329	48	74	77	67	52
179	47	74	77	66	51
166	46	74	76	66	50
323	46	73	76	65	50
320	46	73	75	65	50
165	46	74	76	65	50
181	46	74	76	65	49

Cumulative Noise Levels - Proposed Site

There are no existing or proposed electric generating facilities located near the Proposed Site. Therefore, for the purposes of this study, the Proposed Site is considered a “site with no existing generation” and no cumulative noise impact assessment is proposed.

Cumulative Noise Levels - Alternative Site

There are four existing or proposed electric generating facilities located near the Alternative Site: the Paris Solar Farm, Paris Solar-Battery Park, the gas-fired Paris Combustion Turbine (CT) Generating Station, and the proposed gas-fired Paris reciprocating internal combustion engine RICE Facility. The approximate locations of these facilities are shown in Figure 1-4. While none of these facilities are directly related to the proposed Facility, for the purposes of this study the Alternative Site is being considered a “site with existing generation.” Noise from these existing and proposed energy facilities was estimated using publicly available noise data from the PSC docket, estimates from the measurement of existing noise levels, and Hankard Environmental data from other Projects. Table 3-9 lists the predicted cumulative noise levels at the Alternative Site. A summary of the assumptions and data used for each facility in the cumulative noise model is provided below.

In terms of A-weighted noise levels, the receptors with the highest predicted cumulative levels are Receptors 324 to 329 and Receptor 6, where cumulative noise is expected to exceed 50 dBA. For Receptors 324 to 329, the predicted cumulative A-weighted levels are driven by contributions from both the Paris BESS and Solar Facilities, with Red Oak Ridge also contributing significantly. At Receptor 6, the predicted cumulative A-weighted noise levels are driven primarily by the Paris RICE Facility, with additional influence from the Paris CT Station.

Similarly, in terms of C-weighted noise levels, the receptors with the highest predicted cumulative levels are Receptors 324 to 329, where cumulative noise levels range from 74 to 76 dBC, and Receptors 1 to 6, where cumulative noise levels range from 71 to 75 dBC. For Receptors 324 to 329 the predicted cumulative C-weighted noise levels are driven by Red Oak Ridge, with some contributions from the Paris CT Station. At Receptors 1 to 5, the predicted cumulative C-weighted noise levels are also primarily driven by Red Oak Ridge, with increased contributions from the Paris CT Station, and Paris RICE Facility. At Receptor 6, the predicted cumulative C-weighted noise levels are 75 dBC, with roughly equal contributions from Red Oak Ridge, the Paris RICE Facility, and the Paris CT Station. At all other receptors, cumulative C-weighted noise levels are driven primarily by Red Oak Ridge.

Paris CT Generating Station

The Paris Generating Station is a natural gas-fired peaking plant that has been in operation since 1995. Due to its age, noise data for the facility could not be located on the PSC docket or in other publicly available sources. As a result, onsite measurement data was used to estimate a single overall sound power level for the Facility, which was then used to predict cumulative noise impacts.

Paris Solar Farm

Docket ID: 9801-CE-100 <https://psc.wi.gov/Pages/CommissionActions/CasePages/ParisSolarProject.aspx>
Information on the Paris Solar Farm noise emissions, including equipment types, locations and acoustic data, was obtained from the Paris Solar Pre-Construction Noise Impact Assessment (February 2020). Updated information on the sound power levels for solar inverters and substation equipment was provided by Invenergy. Final locations for equipment were adjusted based on aerial imagery.

Paris Solar-Battery Park

Docket ID: 9801-CE-100 <https://psc.wi.gov/Pages/CommissionActions/CasePages/ParisSolarProject.aspx>
Information on the Paris Solar Battery Park noise emissions, including equipment types, locations and acoustic data, was obtained from the Paris Solar Energy Center Noise Analysis Update (September 2021). Updated information on the sound power levels for inverters, battery storage systems, and substation equipment was provided by Invenergy.

Paris RICE Facility

Docket ID: 6630-CE-316 <https://psc.wi.gov/Pages/CommissionActions/CasePages/ParisGeneration.aspx>
Sound pressure levels from the operation of the proposed Paris (RICE) facility are based on the data presented in the Sound Assessment Study (September 2024) conducted by Burns and McDonnell.

Table 3-9. Predicted Cumulative Noise Levels - Alternative Site

Receptor	L _{eq} (dBA)	L _{eq} (dBC)	Receptor	L _{eq} (dBA)	L _{eq} (dBC)
1	48	73	327	52	75
2	47	72	328	52	75
3	48	73	329	52	75
4	48	73	333	47	73
5	48	73	2001	43	71
6	53	75	2002	43	71
159	44	71	2003	43	71
160	45	72	2004	43	71
161	46	72	2005	43	71
162	46	72	2006	43	71
163	47	73	2007	43	71
164	47	73	2008	43	71
165	48	74	2009	43	71
166	49	74	2010	43	71
167	47	73	2011	43	71
168	47	73	2012	43	71
169	46	71	2013	43	71
170	46	71	2014	43	71
179	49	75	2015	43	71
181	47	74	2016	43	71
182	46	73	2017	43	71
183	47	73	2018	44	71
184	46	73	2019	44	72
185	44	72	3243	46	73
186	44	72	3257	43	71
311	44	71	3258	43	71
312	44	71	3260	42	71
313	44	72	3261	42	70
314	44	72	3262	42	70
315	44	71	3263	42	70
316	44	72	3264	43	70
317	45	72	3265	43	70
318	45	72	3266	44	70
319	45	72	3267	47	72
320	48	73	3268	47	71
321	47	73	3269	44	70
322	47	73	3270	46	71
323	49	74			
324	50	74			
326	51	76			

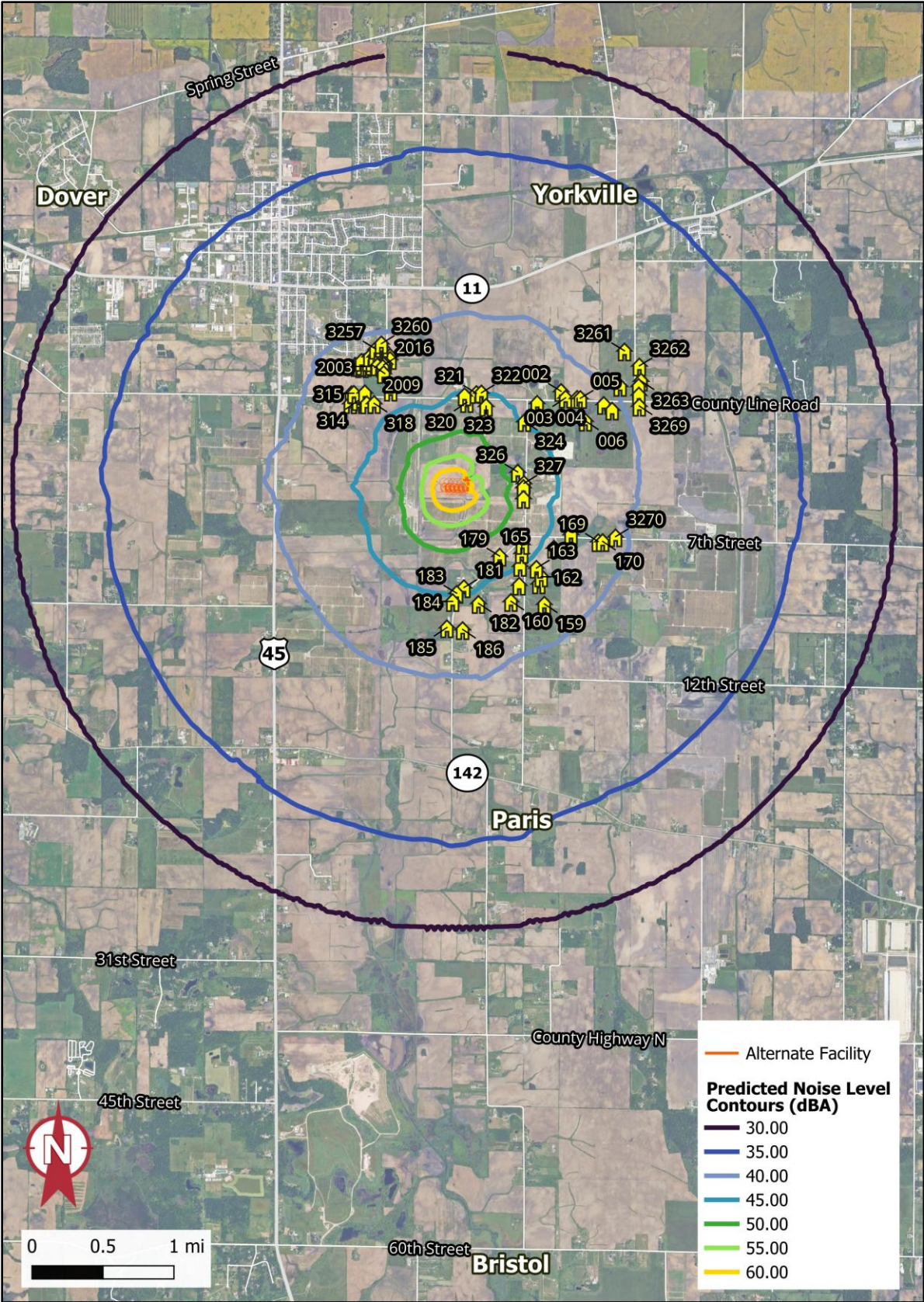


Figure 3-5. Alternative Site Predicted Noise Level Contours (dBA)

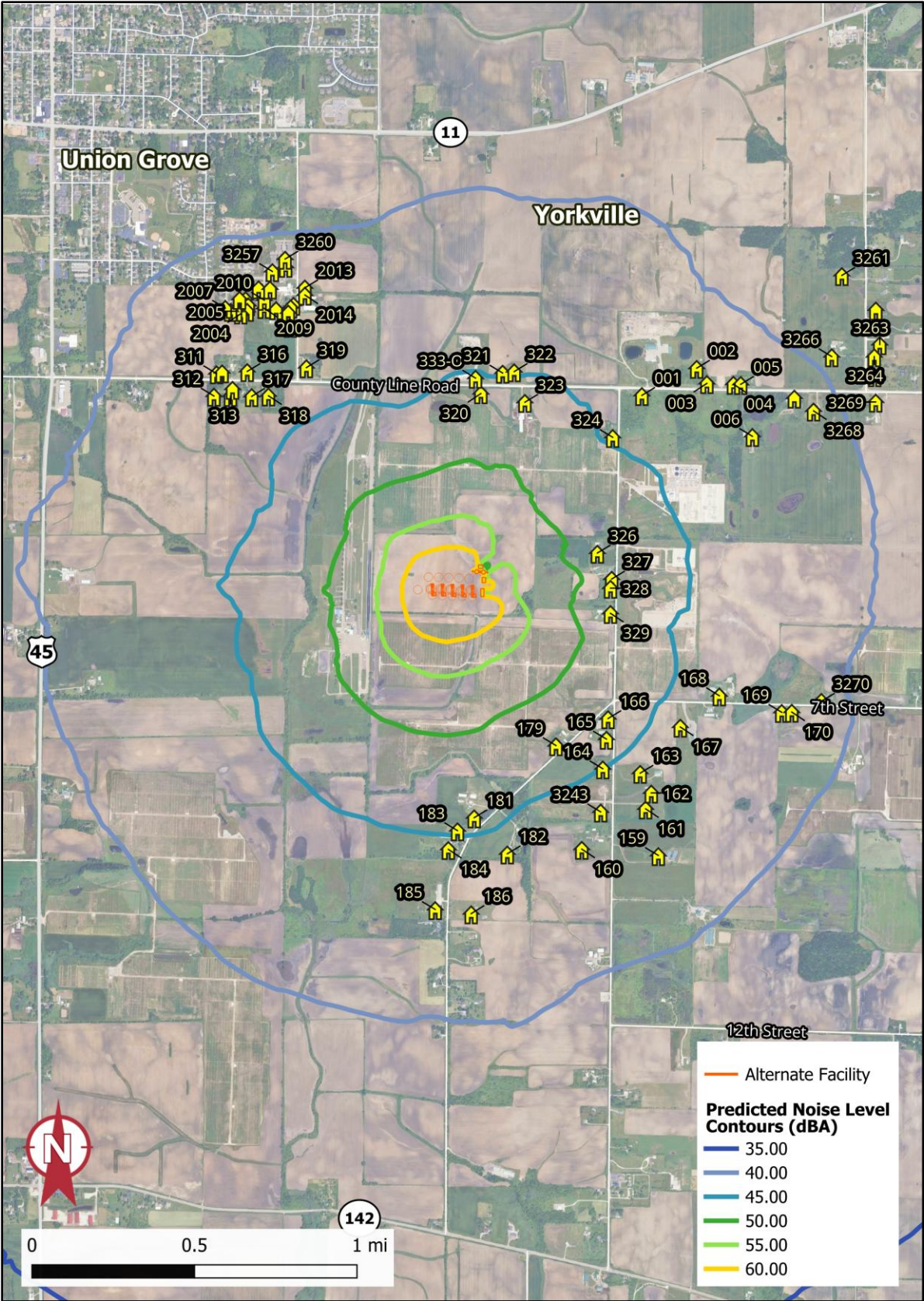


Figure 3-6. Alternative Site Predicted Noise Level Contours (dBA) Zoomed

4. Noise Impact Assessment

The noise impact assessment follows the framework described in the PSC's *Protocol for Noise Assessment of Proposed and Existing Electrical Power Plants* (September 2025). That framework first asks if noise from the Project will exceed existing sound levels by 3 decibels (dB) or more at any nearby noise-sensitive receptor (e.g., residence). While the Proposed Site identified for the Project is located directly along Interstate 94, and as such existing sound levels are relatively high, there are some receptors where a 3 dB increase is predicted. Therefore, as directed by the framework, a noise impact assessment was conducted.

The following are responses to questions that the PSC's noise impact framework directs the Project to address.

- a) *Would the project produce noise in excess of any clearly written village, town, county, state, and federal noise standards which directly apply to the project?*

There are no state or federal noise standard applicable to the Project. Kenosha County and the village of Somers have enacted property line noise and vibrations limits, which are discussed in more detail below.

- b) *Could the sound levels or noise characteristics offend the sensibilities of individuals working or living nearby?*

The Project is proposing two noise level goals to prevent adversely impacting nearby noise-sensitive receptors. The first is no more than 50 dBA at any receptor. Fifty dBA is an overwhelmingly common noise level limit in the U.S., and one that has been used on numerous Wisconsin PSC electricity generation cases. This is viewed as an appropriate noise level goal given the fact that the Facility will operate only approximately 20% of the time in any given year. Furthermore, particularly at the Proposed Site, existing noise levels regularly exceed 50 dBA, thus rendering the Facility barely audible or even inaudible.

The second goal, no more than 75 dBC at any noise-sensitive receptor, is designed to minimize the potential for noise-induced vibrations (e.g., strong low-frequency noise has the potential to rattle windows). The 75 dBC threshold is based on the American Society of Mechanical Engineers (ASME) B133.8 standard for Gas Turbine Installation Sound Emissions.

Would the project nighttime noise levels have the potential to disturb sleep at any neighboring residences?

No. Except for two residences near the Proposed Site for which purchase or neighbor agreements are being pursued, and one residence where the Facility will be inaudible due to ever-present highway noise, predicted noise levels at receptors around both sites are 48 dBA or less. At these levels no sleep interference is expected. This is based on studies conducted by the World Health Organization (WHO) and the U.S. EPA.

Would the project generate excessive low-frequency noise?

The Facility is predicted to generate C-weighted levels less than 75 dBC. This threshold is designed to minimize the potential for noise-induced vibrations (e.g., strong low-frequency noise has the potential to rattle windows) based on the American Society of Mechanical Engineers (ASME) B133.8 standard for Gas Turbine Installation Sound Emissions.

Discuss in the context of sleep disturbance guidelines in the literature, such as those from WHO, WHO Europe, and the U.S. EPA.

WHO 2009 and 2018 recommend annual average noise level of 40 dBA or less at night to protect against the possibility of sleep interference. Studies conducted by the U.S. EPA recommend an annual average day-night level (L_{DN}) of 55 dBA or less. Noise from the Facility is predicted to meet these standards at all receptors except the two closest to the Proposed Site noted above. That is, combining the maximum predicted Facility noise level of 48 dBA, the operating scenario of 20% or less of the time, and the L_{DN} nighttime weights, annual average noise levels are predicted to be less than the WHO and EPA recommendations.

c) *Could the applicant implement reasonable actions to mitigate the noise impacts?*

Yes, and it has. The Project has included numerous low-noise elements in the design of the Facility, including:

- Low-noise inlet filter face and low-noise inlet plenum,
- Low-noise load compartment
- Low-noise generator
- Low-noise turbine vent fan
- Low-noise lower and upper stack breakout
- Low-noise exhaust stack exit
- Low-noise main power transformer

Noise Impact Assessment - Proposed Site

Tables 4-1 and 4-2 list the predicted Facility noise levels at the nearest residences to the Proposed Site, as well as the expected increase over existing noise levels. With the exception of the two closest residences, of which purchase or neighbor agreement is being pursued, noise levels at all residences are lower than the Project's noise design goals of 50 dBA and 75 dBC. Furthermore, due to the near constant noise being emitted by traffic on I-94, little to no increase in A-weighted noise levels is expected. C-weighted levels are predicted to increase by a moderate amount (3 to 18 dBC).

At the Proposed Site, it is expected that noise impacts from the operation of the Project will be low for a majority of the time due to: (1) the relatively low levels of noise emitted from the Project, (2) the Project only operating approximately 20% of the year, (3), the moderate levels of ambient noise present near the Proposed Site, particularly during the daytime, (4) the fact that the model is considered to be conservative (overpredict actual noise levels), and (5) the fact that the

atmosphere is not often as conducive to sound propagation as assumed in this analysis, particularly on sunny days, due to atmospheric mixing.

Noise Impact Assessment - Alternative Site

As required by the Protocol, Tables 4-3 and 4-4 list the predicted Facility noise levels at the nearest residences to the Alternative Site, as well as the expected increase over existing noise levels. Noise levels at all residences are lower than the Project's noise design goals of 50 dBA and 75 dBC. A-weighted noise levels are predicted to increase by up to 13 dBA, and C-weighted levels are predicted to increase by up to 26 dBC.

Similarly, at the Alternative Site, the Project is predicted to emit relatively low levels of noise and will be operating only approximately 20% of the year. Predicted noise levels are considered to be conservative (greater than actual noise levels) and the atmosphere is not often as conducive to sound propagation as assumed in this analysis, particularly on sunny days, due to atmospheric mixing.

Table 4-1. Increase in Noise Level over Daytime Ambient Level – Proposed Site

Direction	Receptor	Ambient - Day				Project Maximum Operations				Total Noise				Increase Over Day Ambient			
		Leq	L90	Leq	L90	Leq	L90	Leq	L90	Leq	L90	Leq	L90	Leq	L90	Leq	L90
		(dBA)	(dBA)	(dBC)	(dBC)	(dBA)	(dBA)	(dBC)	(dBC)	(dBA)	(dBA)	(dBC)	(dBC)	(dBA)	(dBA)	(dBC)	(dBC)
South (in negotiations)	1007	61	57	71	64	59	59	83	83	63	61	83	83	2	4	12	19
	1018	61	57	71	64	55	55	80	80	62	59	80	80	1	2	9	16
South	1019	61	57	71	64	48	48	74	74	61	57	76	75	0	1	5	11
	2092	61	57	71	64	42	42	71	71	61	57	74	72	0	0	3	8
	2093	61	57	71	64	42	42	71	71	61	57	74	72	0	0	3	8
	1021	61	57	71	64	43	43	71	71	61	57	74	72	0	0	3	8
	1006	61	57	71	64	43	43	71	71	61	57	74	72	0	0	3	8
North	1011	62	59	72	66	48	48	75	75	62	60	76	75	0	0	5	9
	1012	62	59	72	66	48	48	74	74	62	60	76	75	0	0	4	9
	1014	62	59	72	66	46	46	74	74	62	60	76	75	0	0	4	9
	1015	62	59	72	66	46	46	73	73	62	60	76	74	0	0	4	8
	1016	62	59	72	66	46	46	74	74	62	60	76	74	0	0	4	8
West	106	56	44	65	53	42	42	71	71	56	46	72	71	0	2	7	18
	107	56	44	65	53	42	42	71	71	56	46	72	71	0	2	7	18
	108	56	44	65	53	42	42	71	71	56	46	72	71	0	2	7	18
	110	57	45	63	53	42	42	71	71	57	47	72	71	0	2	9	18
	111	57	45	63	53	43	43	71	71	57	47	72	71	0	2	9	18
	112	57	45	63	53	42	42	71	71	57	47	72	71	0	2	9	18
	113	57	45	63	53	42	42	71	71	57	47	72	71	0	2	9	18

Table 4-2. Increase in Noise Level over Nighttime Ambient Level – Proposed Site

Direction	Receptor	Ambient - Night				Project Maximum Operations				Total Noise				Increase Over Night Ambient			
		Leq (dBA)	L90 (dBA)	Leq (dBC)	L90 (dBC)	Leq (dBA)	L90 (dBA)	Leq (dBC)	L90 (dBC)	Leq (dBA)	L90 (dBA)	Leq (dBC)	L90 (dBC)	Leq (dBA)	L90 (dBA)	Leq (dBC)	L90 (dBC)
South (in negotiations)	1007	60	56	68	61	59	59	83	83	63	61	83	83	2	5	15	22
	1018	60	56	68	61	55	55	80	80	61	58	80	80	1	3	11	18
South	1019	60	56	68	61	48	48	74	74	60	56	75	75	0	1	7	13
	2092	60	56	68	61	42	42	71	71	60	56	73	71	0	0	4	10
	2093	60	56	68	61	42	42	71	71	60	56	73	72	0	0	5	10
	1021	60	56	68	61	43	43	71	71	60	56	73	72	0	0	5	10
	1006	60	56	68	61	43	43	71	71	60	56	73	71	0	0	4	10
North	1011	61	59	70	64	48	48	75	75	62	60	76	75	0	0	6	11
	1012	61	59	70	64	48	48	74	74	62	59	76	75	0	0	6	10
	1014	61	59	70	64	46	46	74	74	62	59	75	74	0	0	5	10
	1015	61	59	70	64	46	46	73	73	62	59	75	74	0	0	5	10
	1016	61	59	70	64	46	46	74	74	62	59	75	74	0	0	5	10
West	106	52	46	60	54	42	42	71	71	52	48	72	71	0	1	11	17
	107	52	46	60	54	42	42	71	71	52	48	72	71	0	1	11	17
	108	52	46	60	54	42	42	71	71	52	48	71	71	0	1	11	17
	110	52	47	61	55	42	42	71	71	52	48	71	71	0	1	11	16
	111	52	47	61	55	43	43	71	71	52	48	72	71	0	1	11	16
	112	52	47	61	55	42	42	71	71	52	48	71	71	0	1	11	16
	113	52	47	61	55	42	42	71	71	52	48	71	71	0	1	11	16

Table 4-3. Increase in Noise Level over Daytime Ambient Level – Alternative Site

Direction	Receptor	Ambient - Day				Project Maximum Operations				Total Noise				Increase Over Day Ambient			
		L _{eq}	L ₉₀	L _{eq}	L ₉₀	L _{eq}	L ₉₀	L _{eq}	L ₉₀	L _{eq}	L ₉₀	L _{eq}	L ₉₀	L _{eq}	L ₉₀	L _{eq}	L ₉₀
		(dBA)	(dBA)	(dBC)	(dBC)	(dBA)	(dBA)	(dBC)	(dBC)	(dBA)	(dBA)	(dBC)	(dBC)	(dBA)	(dBA)	(dBC)	(dBC)
East	326	63	38	70	53	48	48	75	75	63	49	76	75	0	10	7	23
	327	63	38	70	53	48	48	75	75	63	49	76	75	0	10	6	22
	328	65	38	70	53	48	48	75	75	65	49	76	75	0	10	6	22
	329	65	38	70	53	48	48	74	74	65	48	76	74	0	10	6	22
North	312	53	38	63	52	43	43	71	71	54	44	72	71	0	6	9	19
	313	53	38	63	52	43	43	72	72	54	44	72	72	0	6	9	20
	317	53	38	63	52	43	43	72	72	54	45	72	72	0	6	10	20
	318	53	38	63	52	44	44	72	72	54	45	72	72	0	7	10	20
	333-O	53	38	63	52	45	45	72	72	54	46	73	72	1	8	10	20
	320	53	38	63	52	46	46	73	73	54	47	73	73	1	9	11	21
	323	53	38	63	52	46	46	73	73	54	47	74	73	1	9	11	21
	324	63	38	70	53	45	45	73	73	63	46	75	73	0	7	5	20
Southeast	001	63	38	70	53	43	43	72	72	63	44	74	72	0	6	4	19
	166	65	38	70	53	46	46	74	74	65	47	75	74	0	9	6	21
	165	65	38	70	53	46	46	74	74	65	47	75	74	0	8	5	21
	179	65	38	70	53	47	47	74	74	65	47	76	74	0	9	6	22
	181	65	38	70	53	46	46	74	74	65	46	75	74	0	8	5	21
	183	65	38	70	53	45	45	73	73	65	46	75	73	0	8	5	21
	184	65	38	70	53	45	45	73	73	65	45	74	73	0	7	5	20
	167	65	38	70	53	44	44	73	73	65	45	74	73	0	7	5	20
3243	3243	65	38	70	53	44	44	72	72	65	45	74	72	0	6	5	20

Table 4-4. Increase in Noise Level over Nighttime Ambient Level – Alternative Site

Direction	Receptor	Ambient - Night				Project Maximum Operations				Total Noise				Increase Over Night Ambient			
		Leq	L90	Leq	L90	Leq	L90	Leq	L90	Leq	L90	Leq	L90	Leq	L90	Leq	L90
		(dBA)	(dBA)	(dBC)	(dBC)	(dBA)	(dBA)	(dBC)	(dBC)	(dBA)	(dBA)	(dBC)	(dBC)	(dBA)	(dBA)	(dBC)	(dBC)
East	326	60	37	63	49	48	48	75	75	60	49	75	75	0	12	13	26
	327	60	37	63	49	48	48	75	75	60	49	75	75	0	12	12	26
	328	57	36	63	51	48	48	75	75	58	49	75	75	1	13	12	24
	329	57	36	63	51	48	48	74	74	58	48	75	74	0	12	12	24
North	312	47	34	59	48	43	43	71	71	48	43	72	71	1	9	13	23
	313	47	34	59	48	43	43	72	72	49	43	72	72	1	10	13	23
	317	47	34	59	48	43	43	72	72	49	44	72	72	2	10	13	23
	318	47	34	59	48	44	44	72	72	49	44	72	72	2	10	13	24
	333-O	47	34	59	48	45	45	72	72	49	46	72	72	2	12	14	24
	320	47	34	59	48	46	46	73	73	50	46	73	73	2	13	14	25
	323	47	34	59	48	46	46	73	73	50	47	74	73	3	13	15	25
	324	60	37	63	49	45	45	73	73	60	45	73	73	0	9	11	24
Southeast	001	60	37	63	49	43	43	72	72	60	44	72	72	0	7	9	23
	166	57	36	63	51	46	46	74	74	58	47	74	74	0	11	11	23
	165	57	36	63	51	46	46	74	74	58	46	74	74	0	10	11	23
	179	57	36	63	51	47	47	74	74	58	47	75	74	0	11	11	24
	181	57	36	63	51	46	46	74	74	58	46	74	74	0	10	11	23
	183	57	36	63	51	45	45	73	73	58	46	74	73	0	10	11	23
	184	57	36	63	51	45	45	73	73	58	45	73	73	0	9	10	22
	167	57	36	63	51	44	44	73	73	58	45	73	73	0	8	10	22
	3243	57	36	63	51	44	44	72	72	58	44	73	72	0	8	10	22

Applicable Local Limits

Kenosha County and the Village of Somers have enacted property line noise level limits that apply to any noise source. These limits are written in terms of noise metrics no longer used (old octave bands), and, as shown in Tables 4-5 through 4-7, are not met. These limits are relatively restrictive, particularly given that adjacent land use is not residential (with the exception of the two closest residences, of which purchase or neighbor agreement is being pursued). Furthermore, as shown in Appendix D, existing noise levels at the Proposed Site exceed these limits, and existing noise levels at the Alternative Site also surpass the limits at certain times. In lieu of these limits the Project is proposing to meet limits at nearby noise-sensitive receptors (e.g., residences), not the property line, as discussed in item b), below.

Additionally, Kenosha County and the village of Somers have enacted limits on the amount of ground vibration a facility can produce off-site. The ordinances state that no ground vibration shall be detectable off-site without the use of instrumentation. The ANSI S2.71 threshold for vibration perception by the most sensitive people is 0.0001 m/s or less at all frequencies. The gas turbines and other Facility equipment are maintained to strict vibration tolerances, as the turbines themselves have a low tolerance for vibration. For foundations or baseplates of large gas turbines, typical vibration targets are less than 0.002 m/s⁶. Vibrations below this range are associated with normal operation, while any higher levels could indicate a malfunction or abnormal condition in the equipment, potentially triggering alarms or shutdown trips of the units. Furthermore, the ground is not an efficient medium through which vibration can travel. Based on the values above, vibrations from the Facility would become imperceptible to people beyond a hundred feet of the Facility and are not expected to be detectable by humans outside of the Facility premises.

Table 4-5. Kenosha County Property Line Limits

Octave Band Frequencies (Hz)	Octave Band Sound Pressure Level (dB)	Updated Octave Band Center Frequency (Hz)
20 - 75	65	31.5
75 - 150	55	63
75 - 150	55	125
150 - 300	50	250
300 - 600	45	500
600 - 1200	40	1,000
1200 - 2400	40	2,000
Above 2400	35	4,000
Above 2400	35	8,000

⁶ Bielecki, Marcin & Costagliola, Salvatore & Gebalski, Piotr. (2016). Support Vibration Diagnostics and Limits in Gas Turbines.

Table 4-6. Loudest Property Line Predicted Noise Levels – Proposed Site

Property Line Receptor	Octave Band Sound Pressure Level (dB)									Overall Level (dBA)
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	
North	93	82	70	61	60	61	57	61	47	67
East	90	80	67	58	58	59	55	58	41	65
South	89	79	68	60	60	61	57	57	41	65
West	78	68	53	45	45	45	38	28	-38	49
Kenosha County Limits	65	55	55	50	45	40	40	35	35	-
Compliance?	No	No	No	No	No	No	No	No	No	

Table 4-7. Loudest Property Line Predicted Noise Levels – Alternative Site

Property Line Receptor	Octave Band Sound Pressure Level (dB)									Overall Level (dBA)
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	
North	84	74	61	52	52	53	47	47	15	57
East	82	72	58	48	48	48	42	42	6	53
South	92	82	69	59	59	61	57	60	42	66
West	83	72	57	49	48	47	46	44	10	54
Kenosha County Limits	65	55	55	50	45	40	40	35	35	-
Compliance?	No	No	No	No	No	No	No	No	No	

APPENDIX A

Photographs of Measurement Locations

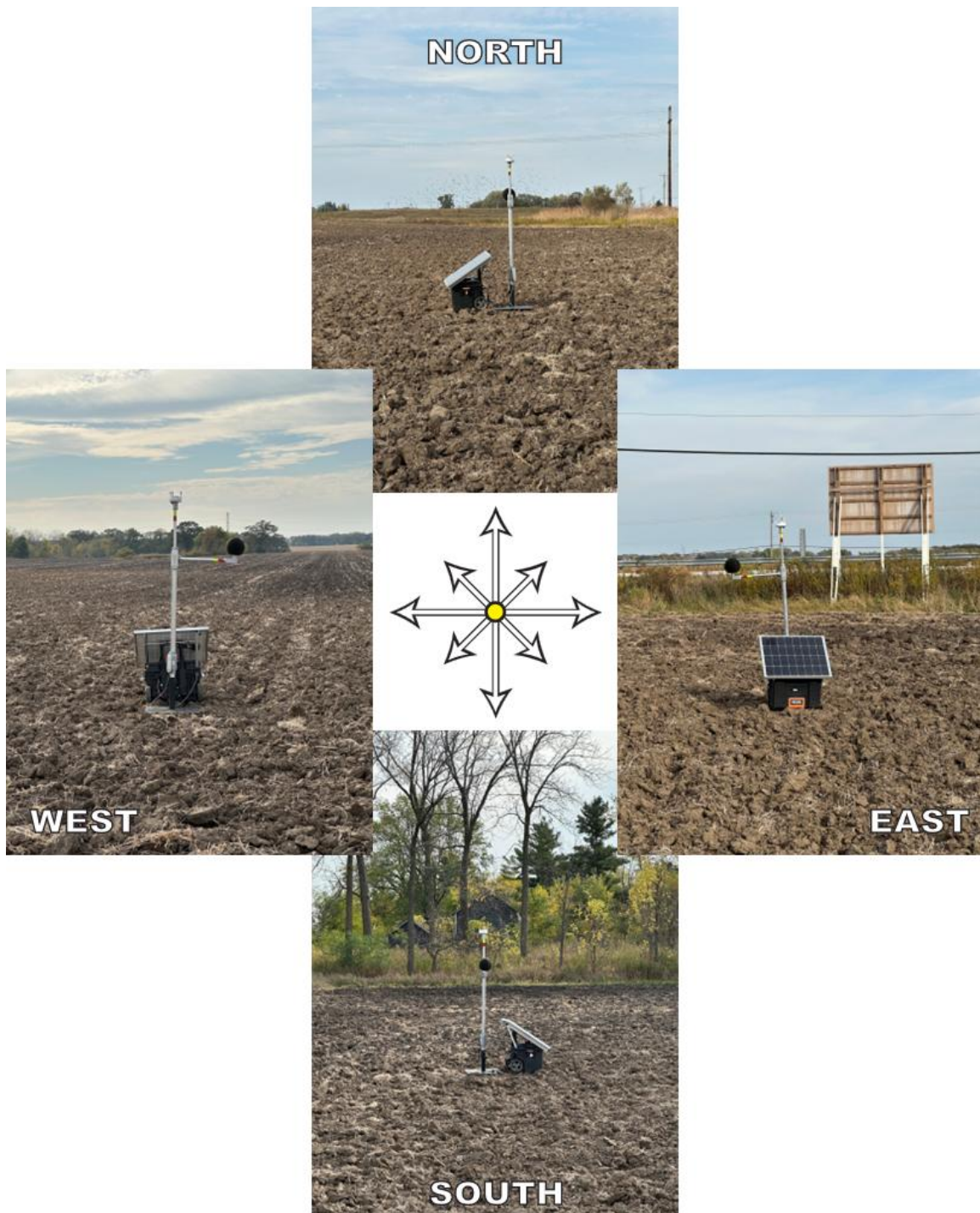


Figure C-1 – Photographs of Location MP1.

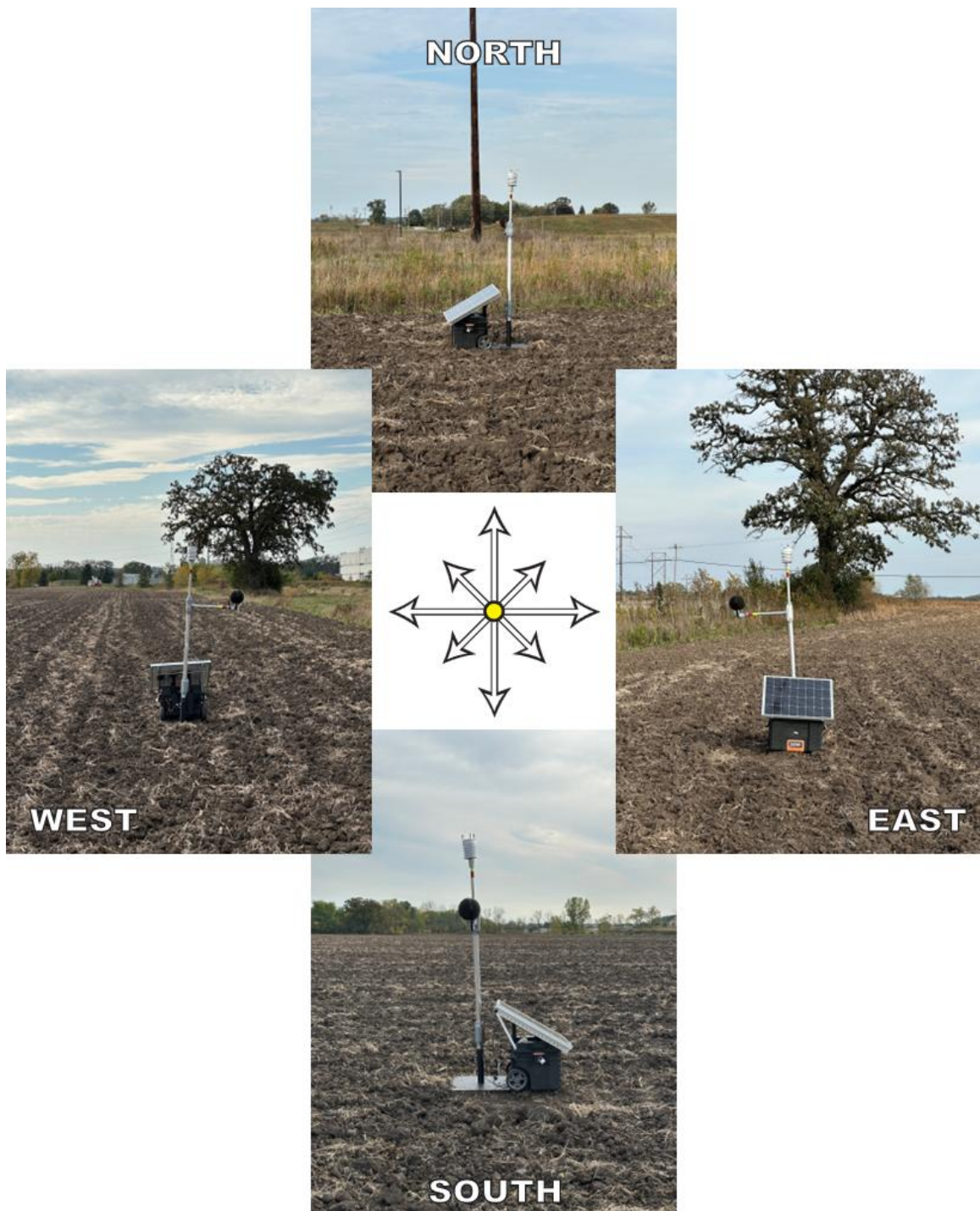


Figure C-2 – Photographs of Location MP2.

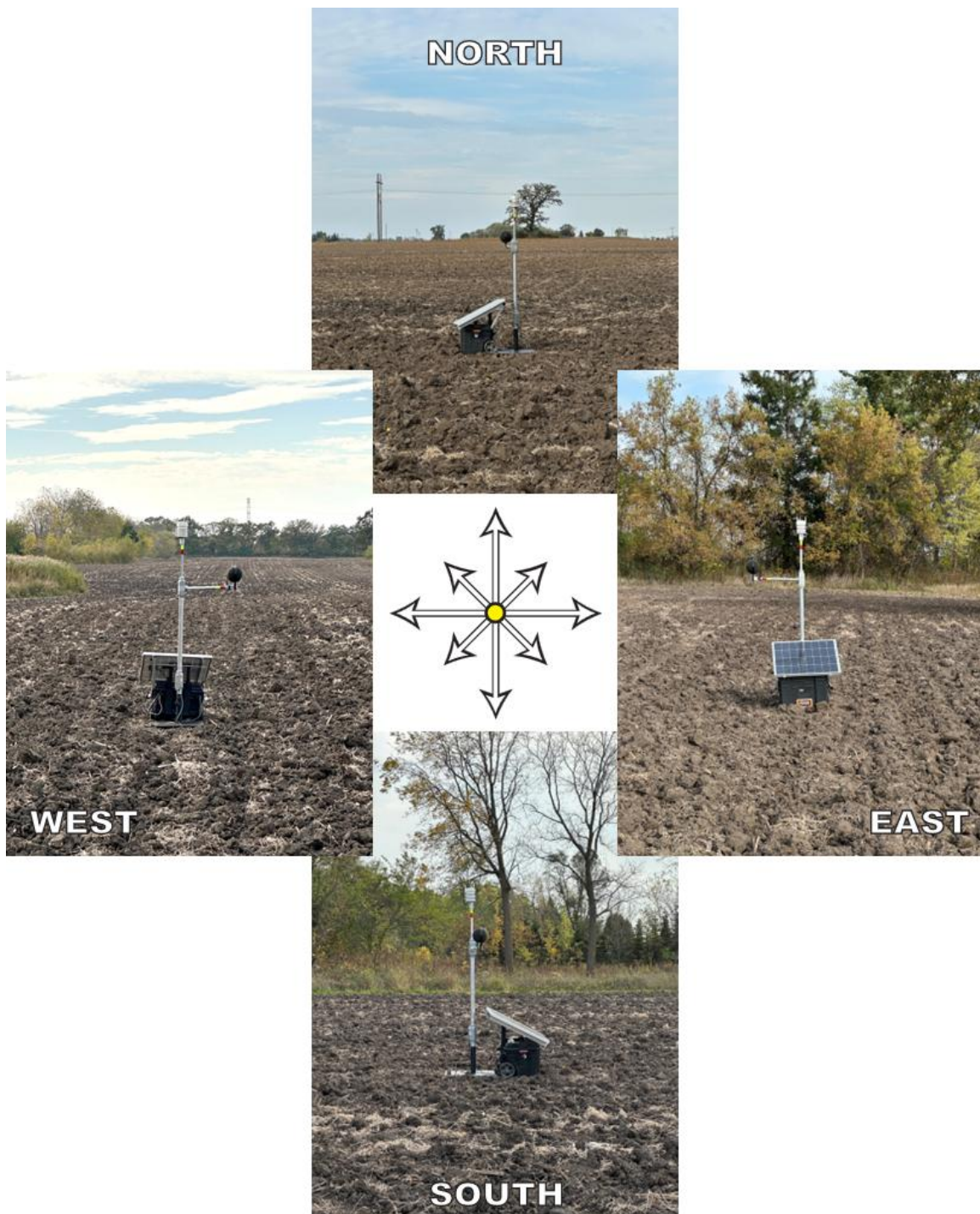


Figure C-3 – Photographs of Location MP3.

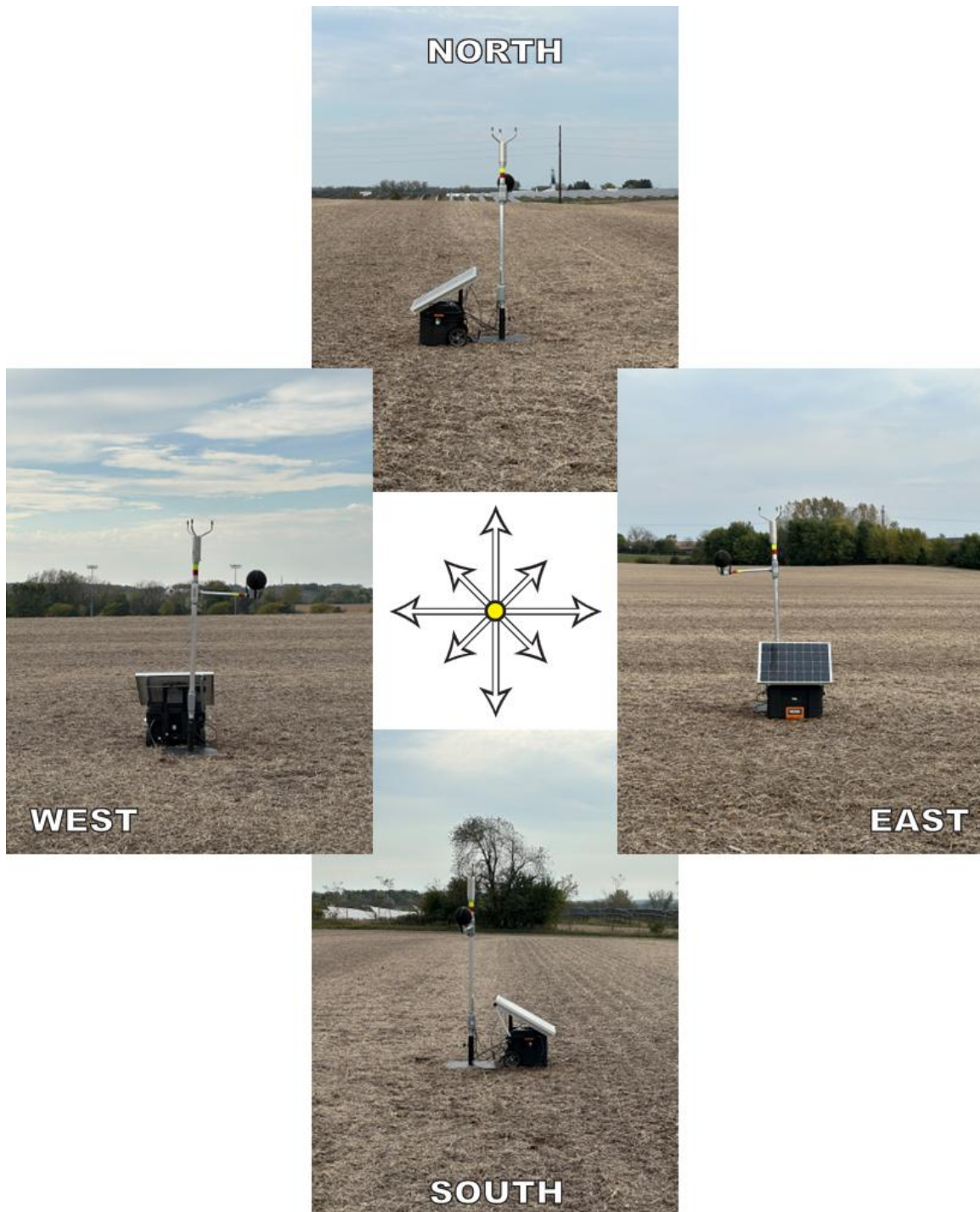


Figure C-4 – Photographs of Location MP11.

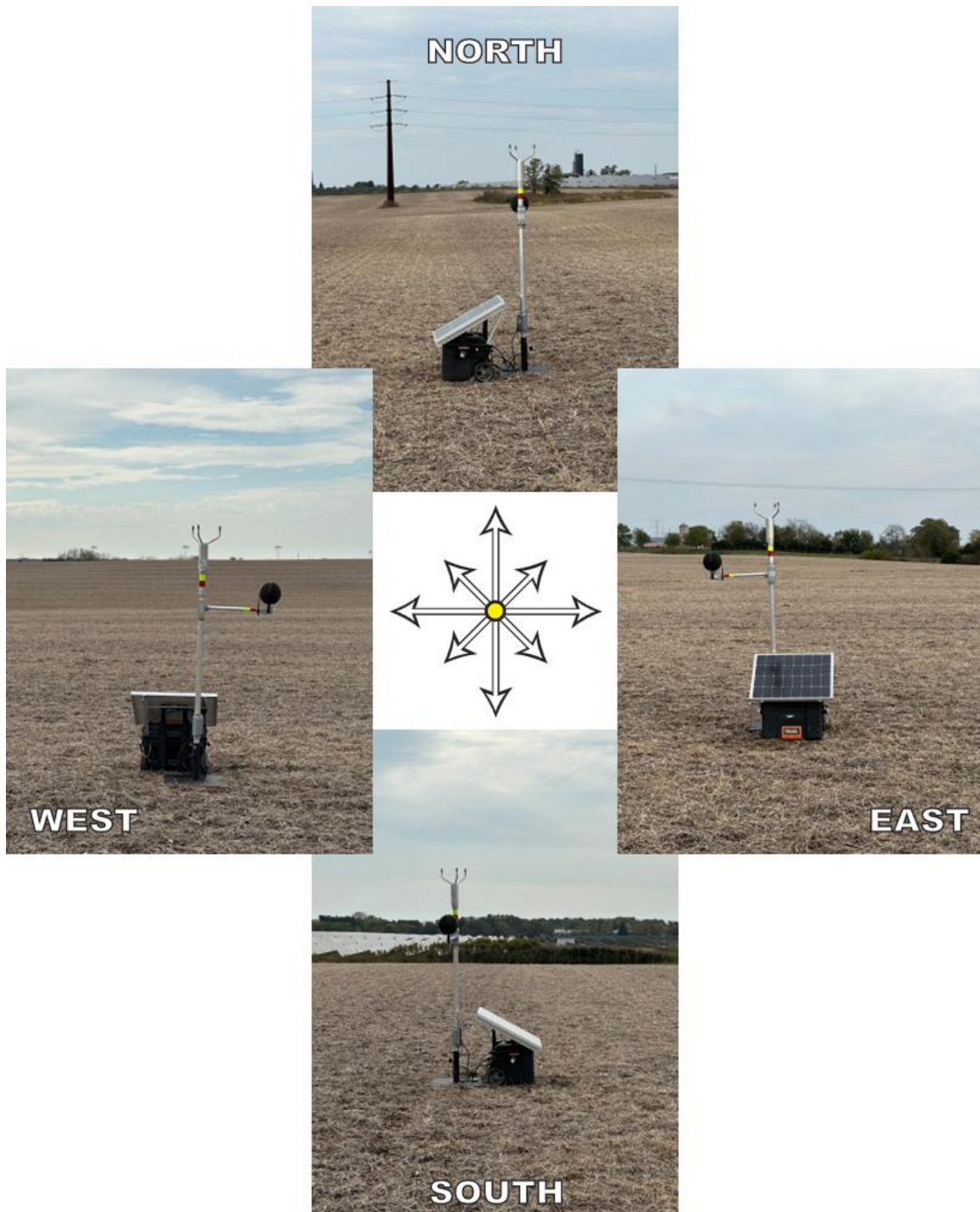


Figure C-5 – Photographs of Location MP12.

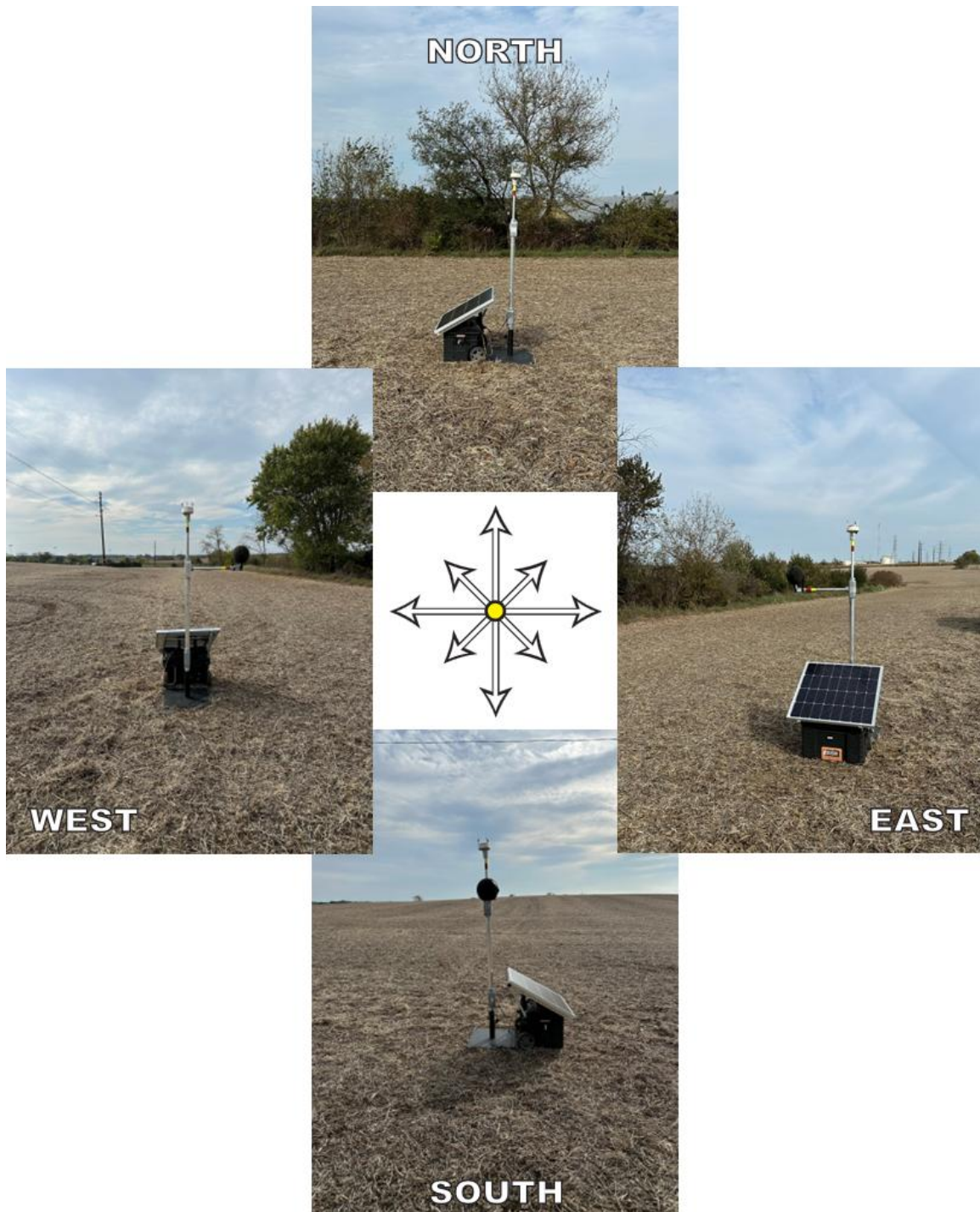


Figure C-6 – Photographs of Location MP13.

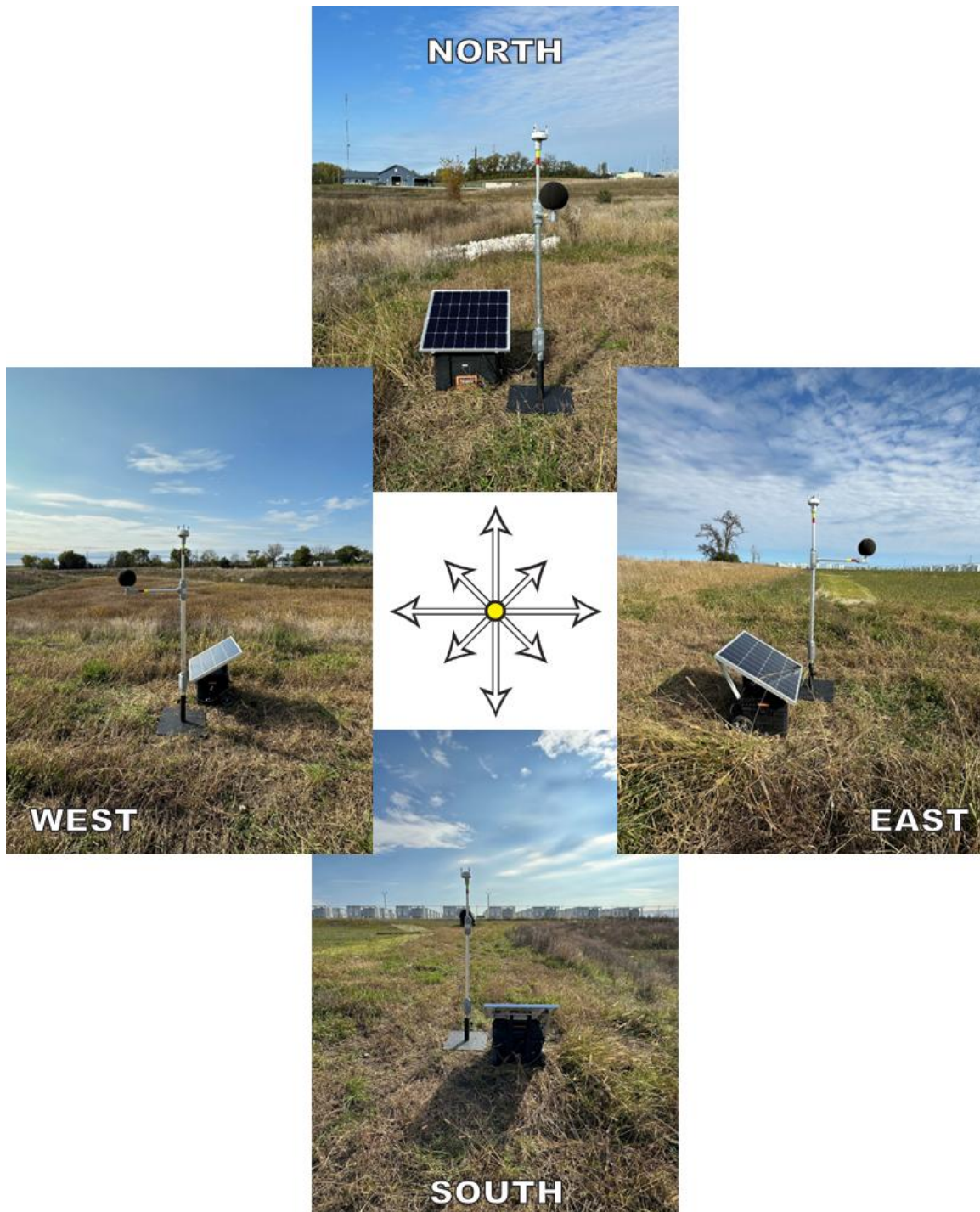


Figure C-7 – Photographs of Location Paris Battery Storage.

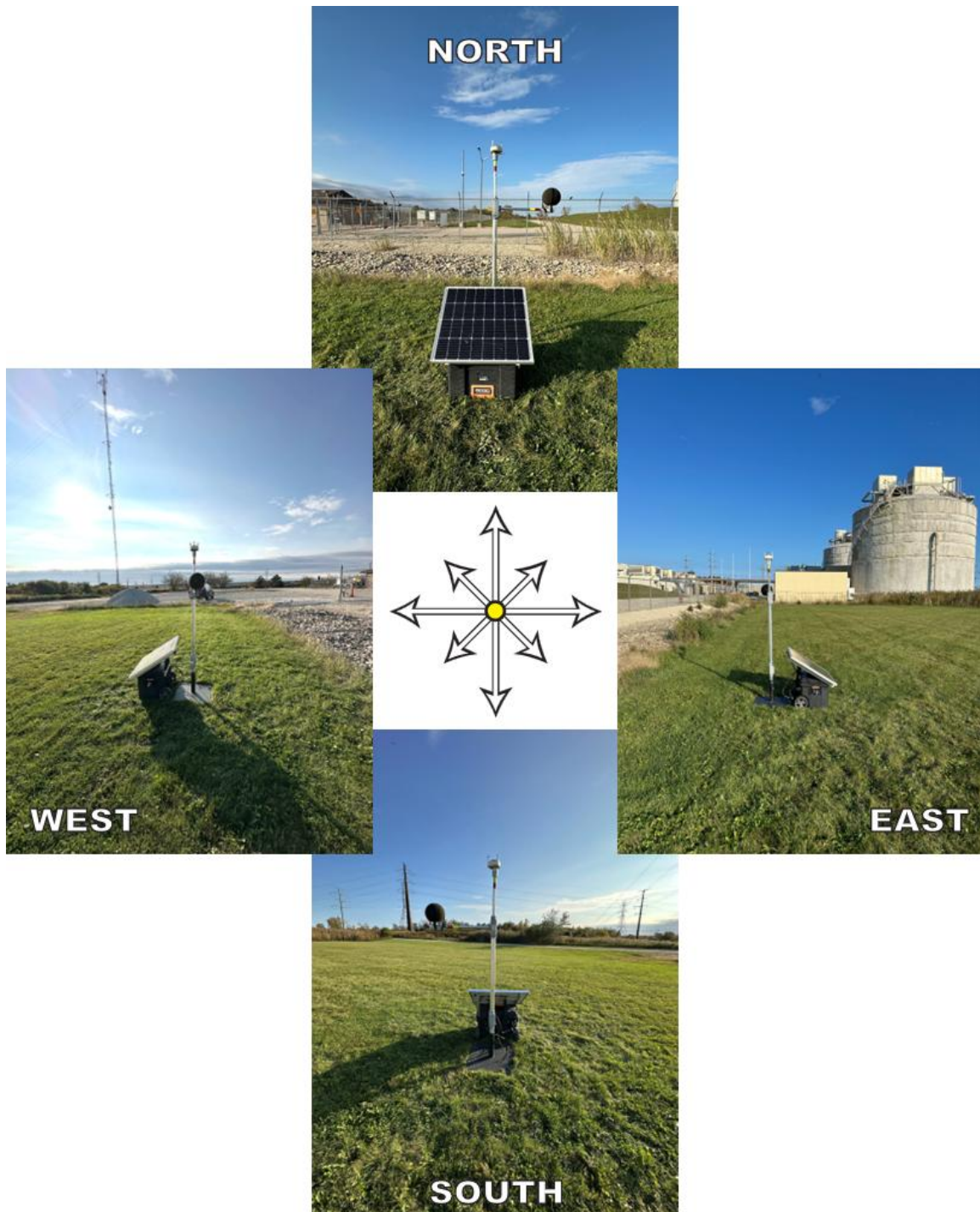


Figure C-8 – Photographs of Location Paris Generating Station.

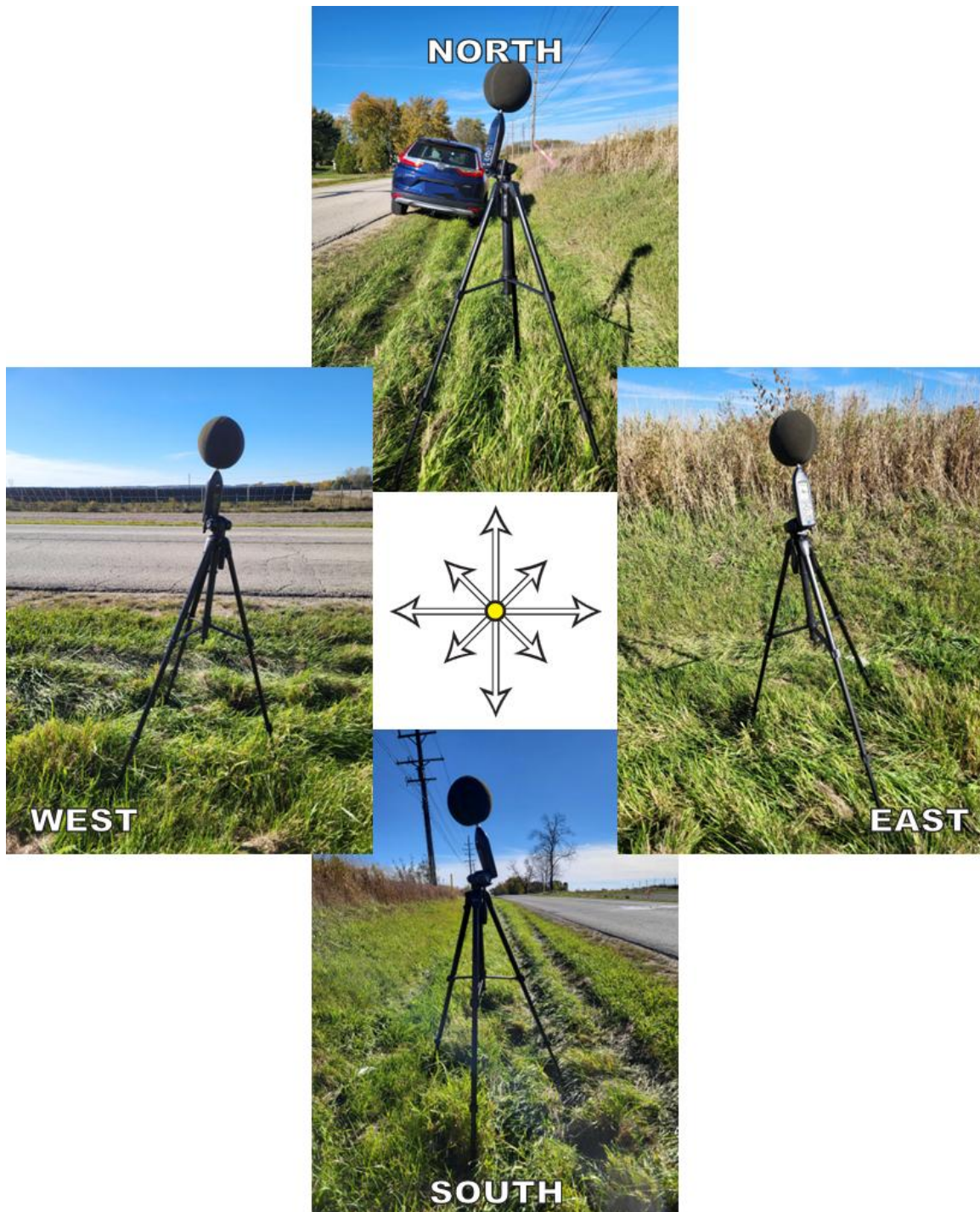


Figure C-9 – Photographs of Location ST14.

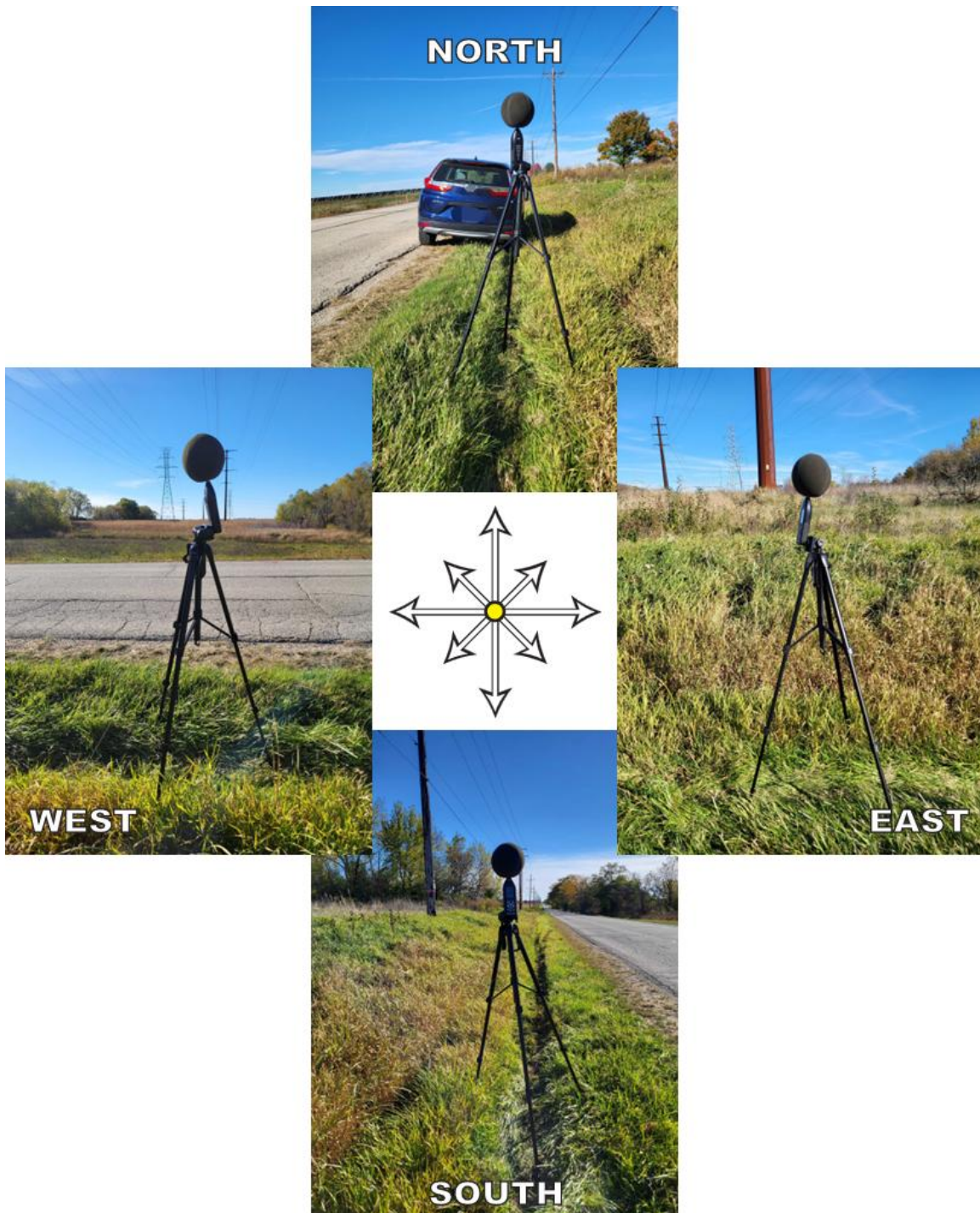


Figure C-10 – Photographs of Location ST15.

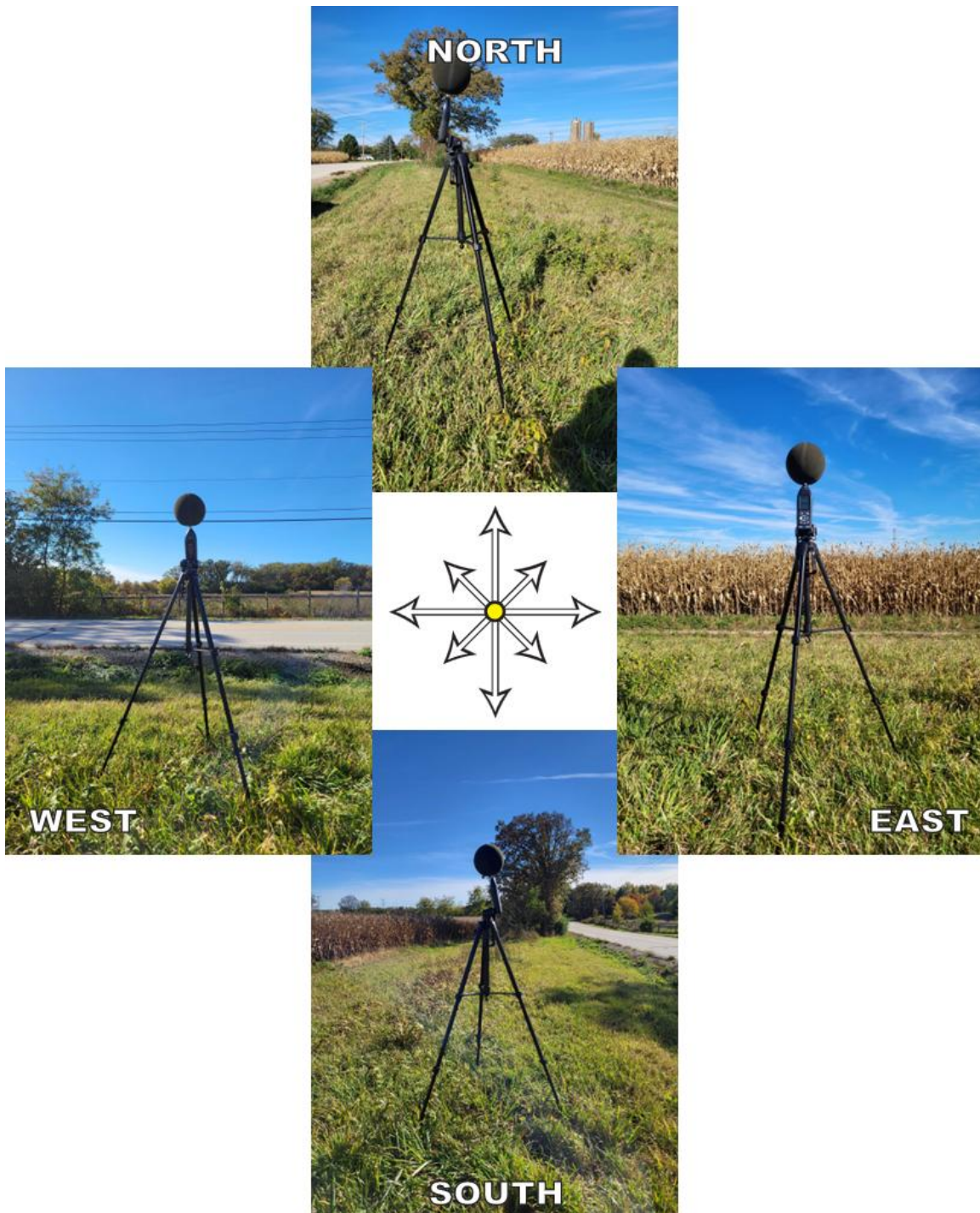


Figure C-11 – Photographs of Location ST4.



Figure C-12 – Photographs of Location ST5.



Figure C-13 – Photographs of Location ST6.

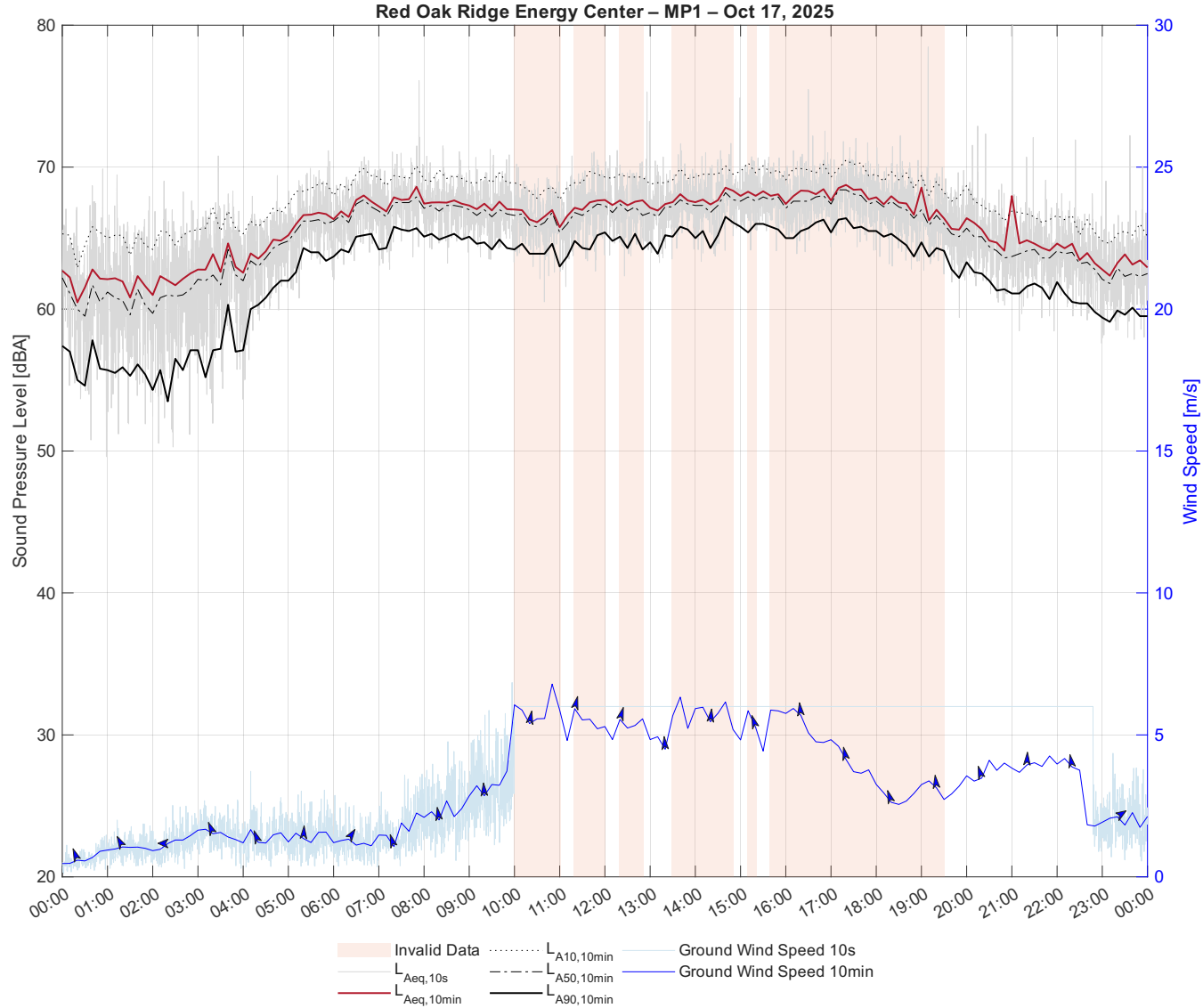


Figure C-14 – Photographs of Location ST7

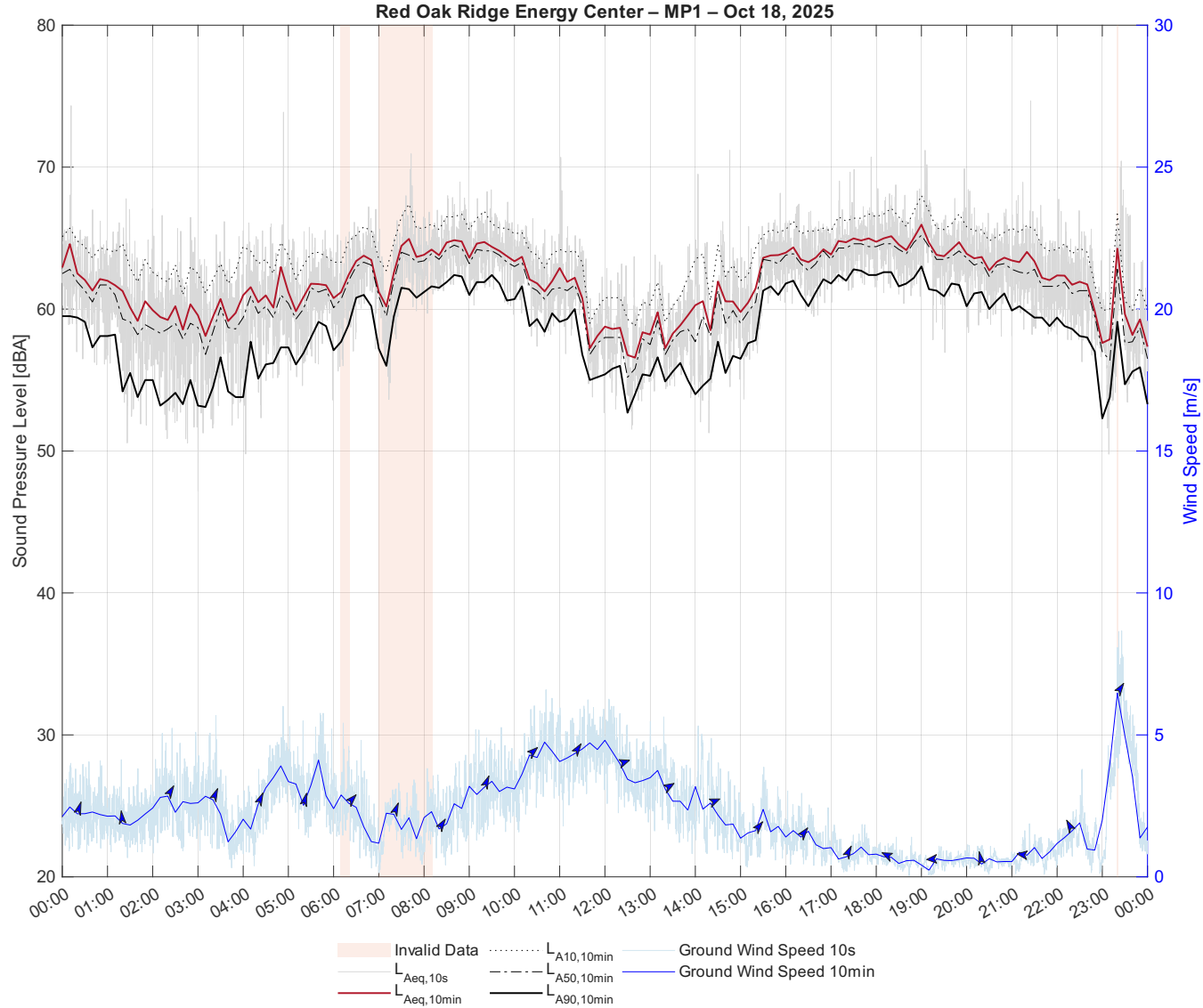
APPENDIX B

Long-term Measurement Time Histories

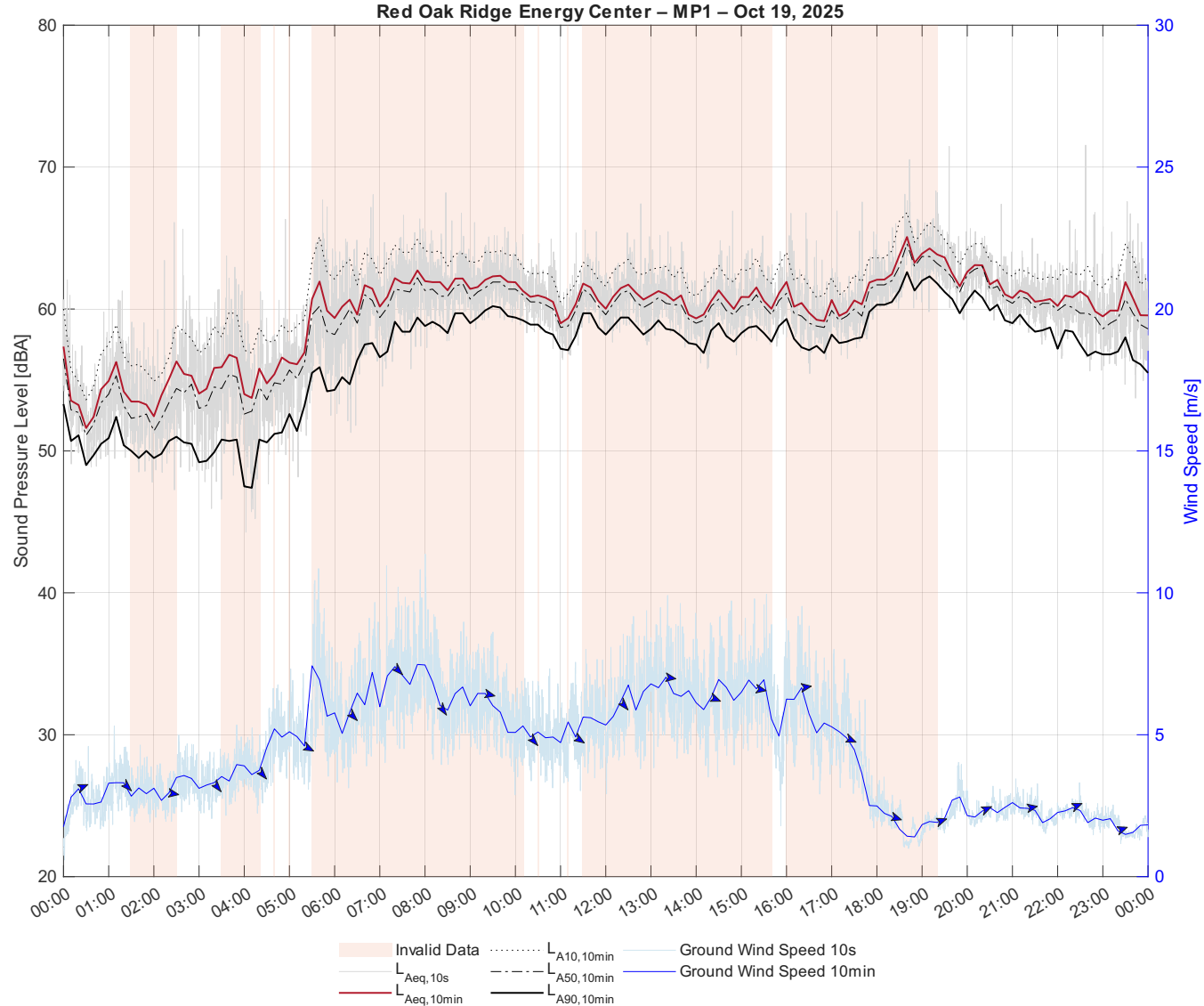
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



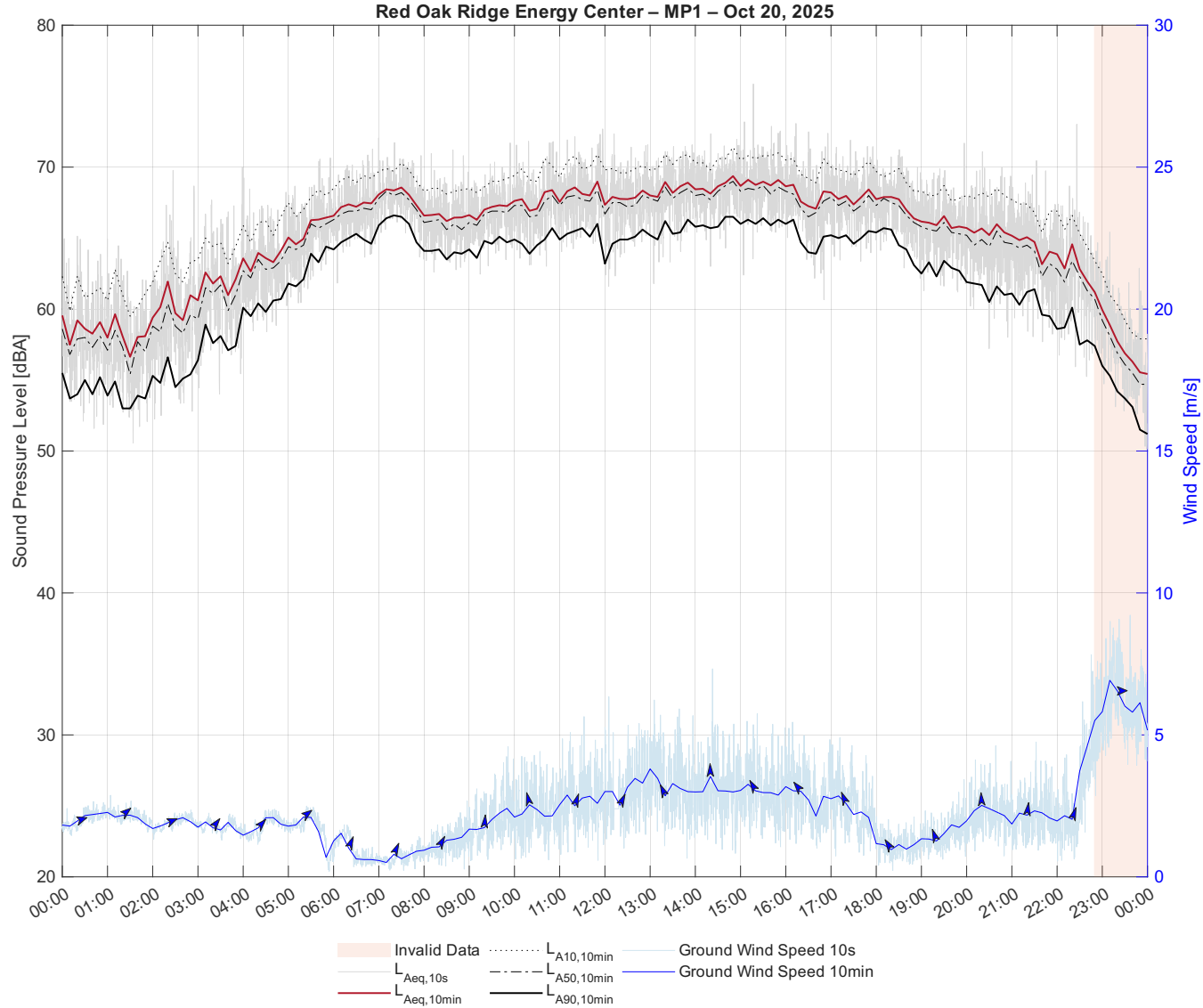
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



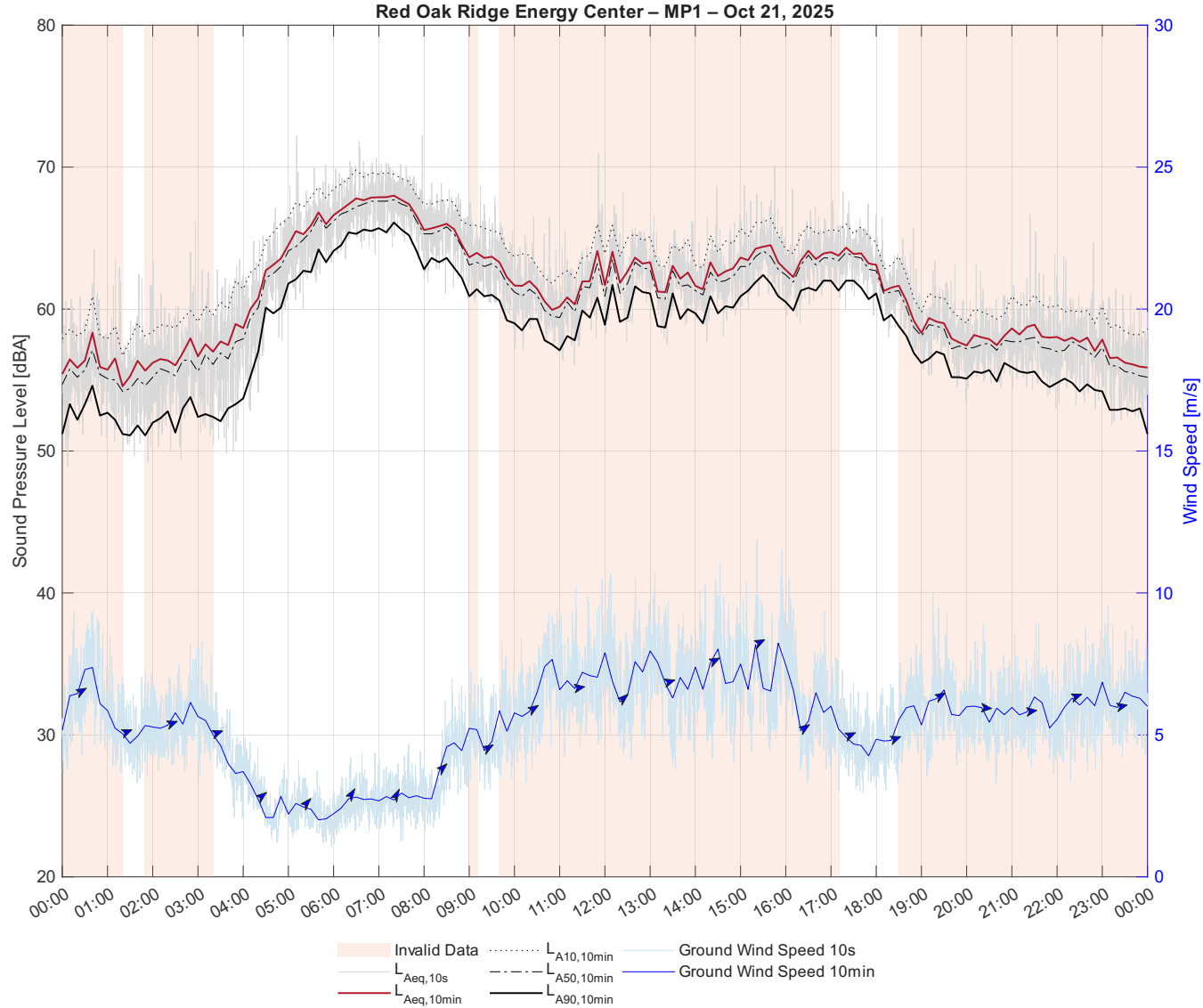
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



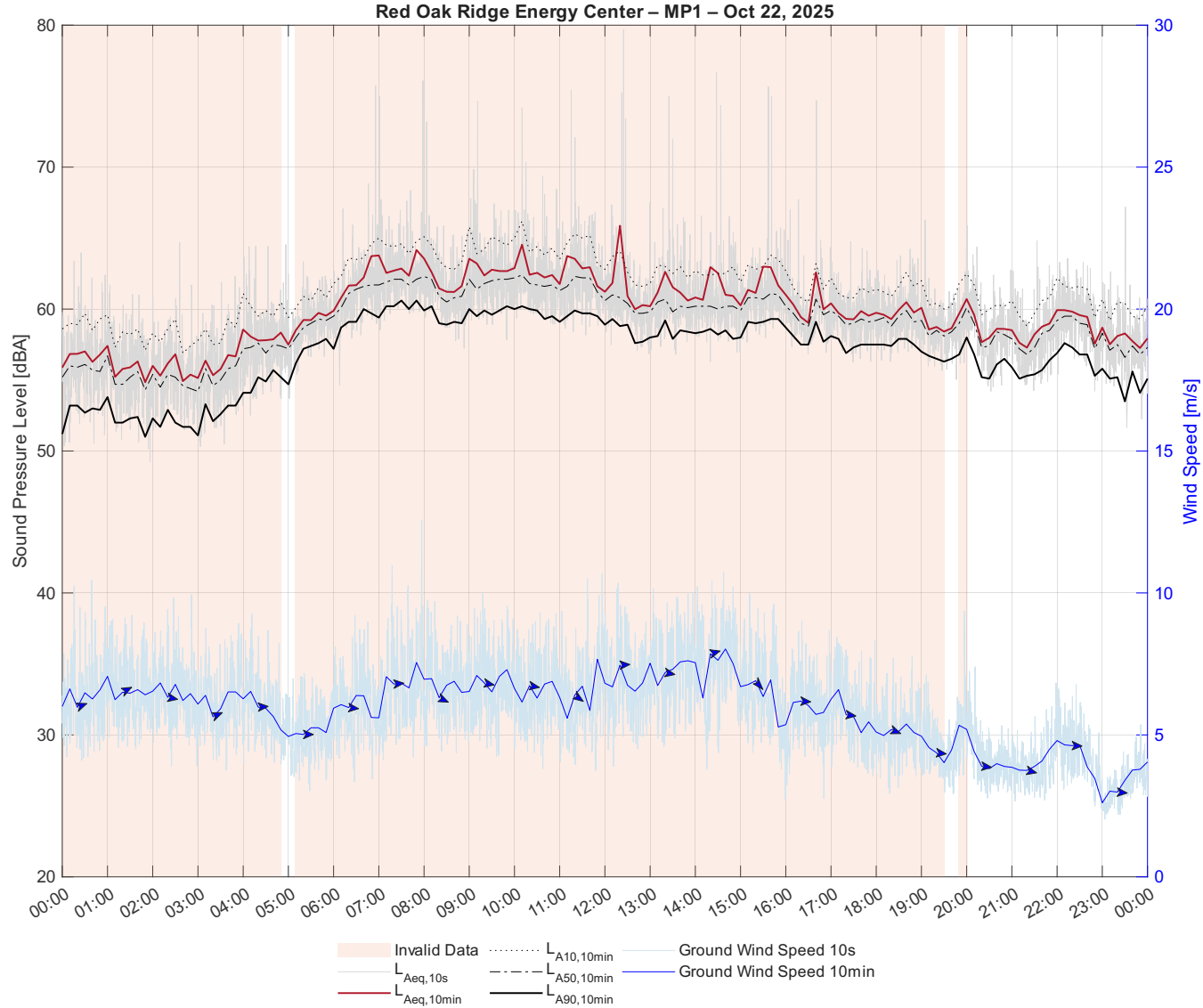
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



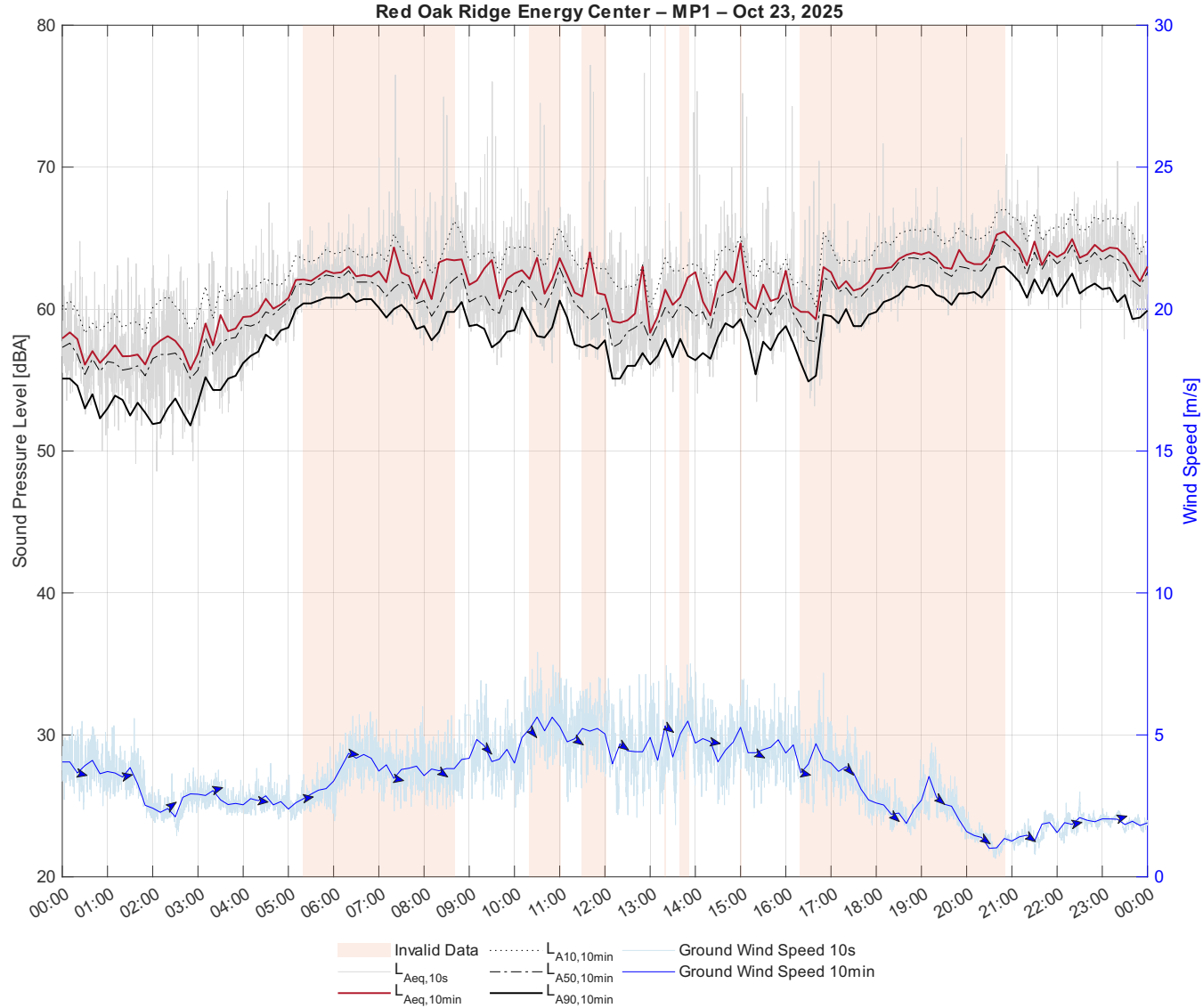
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



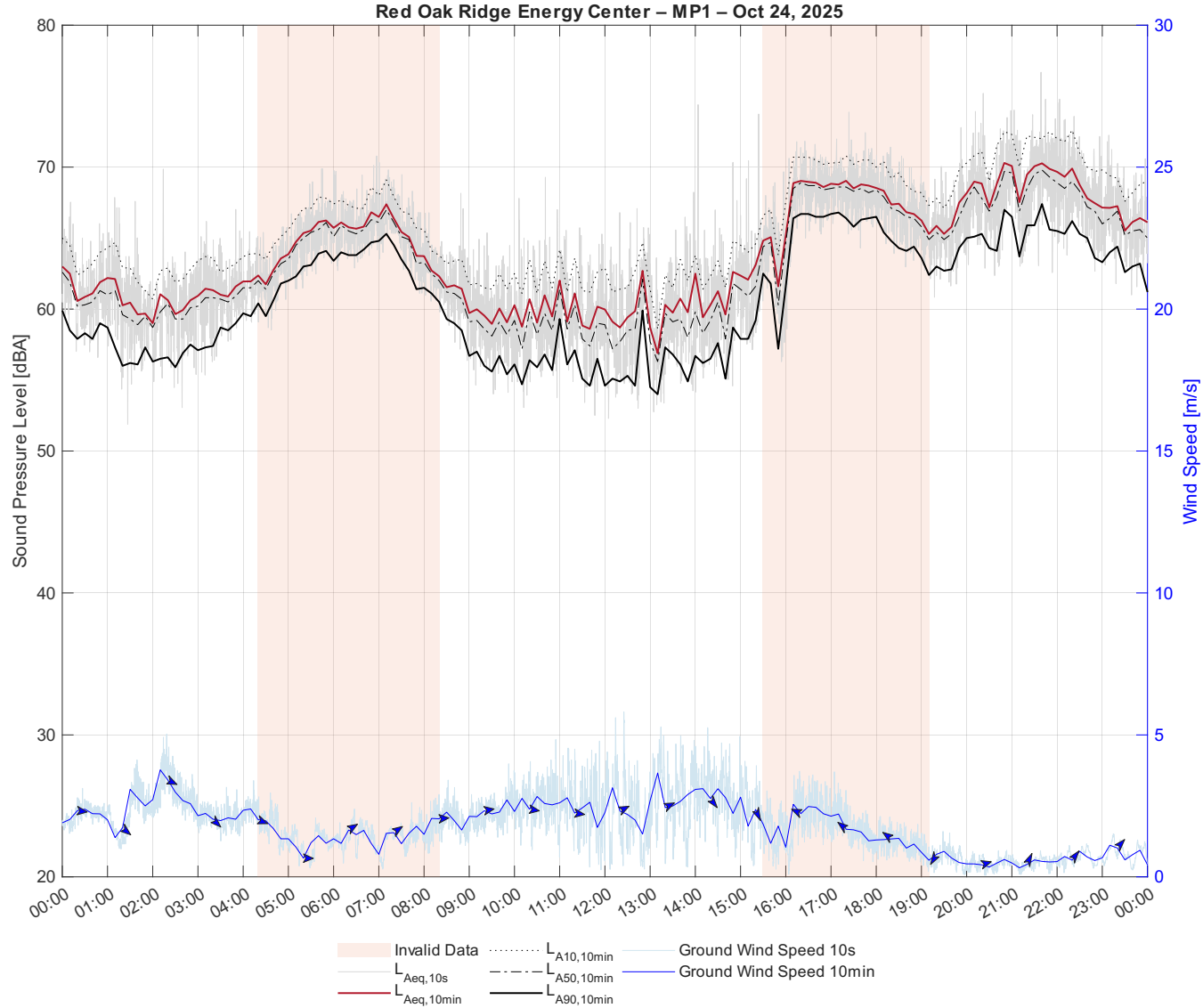
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



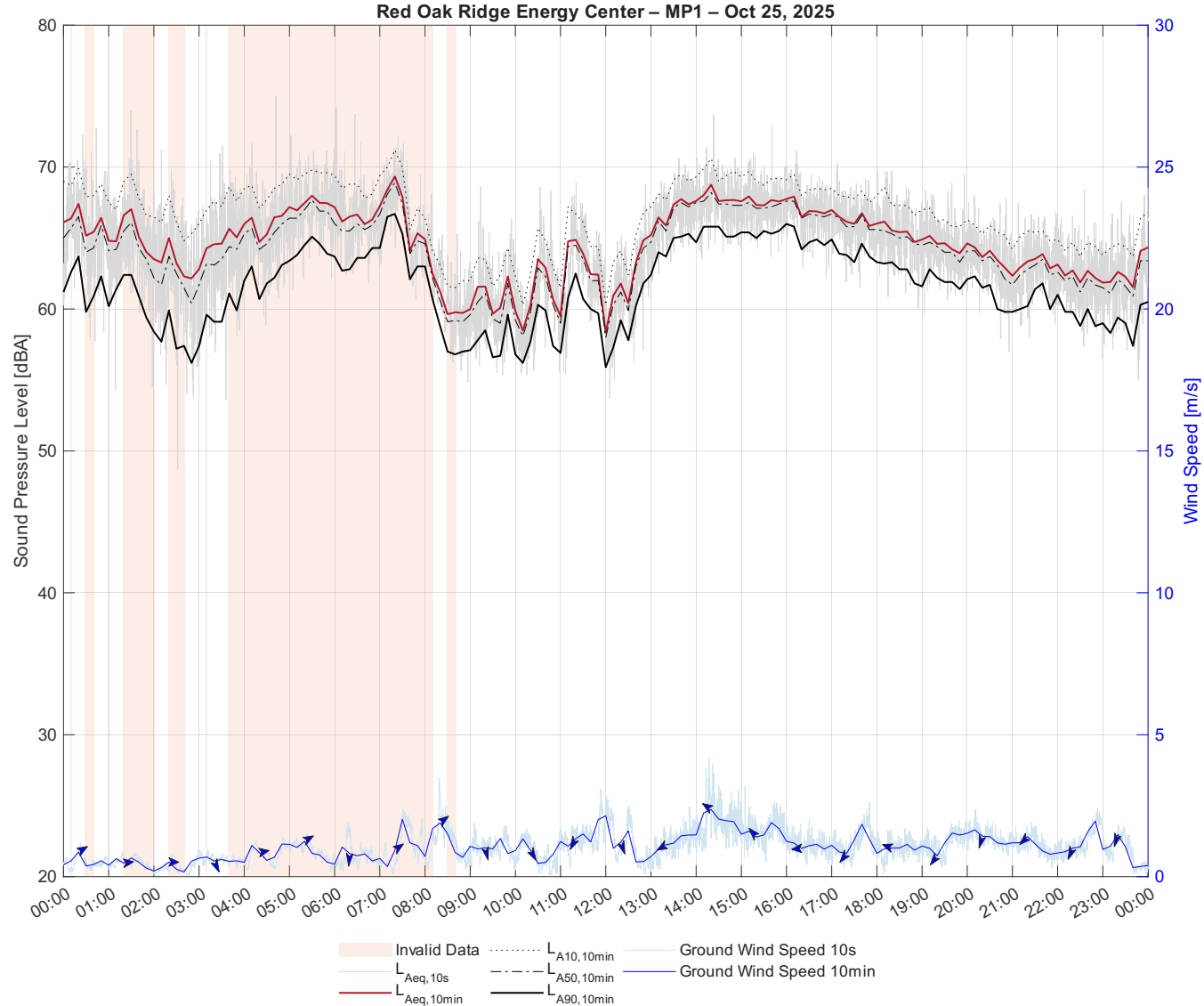
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



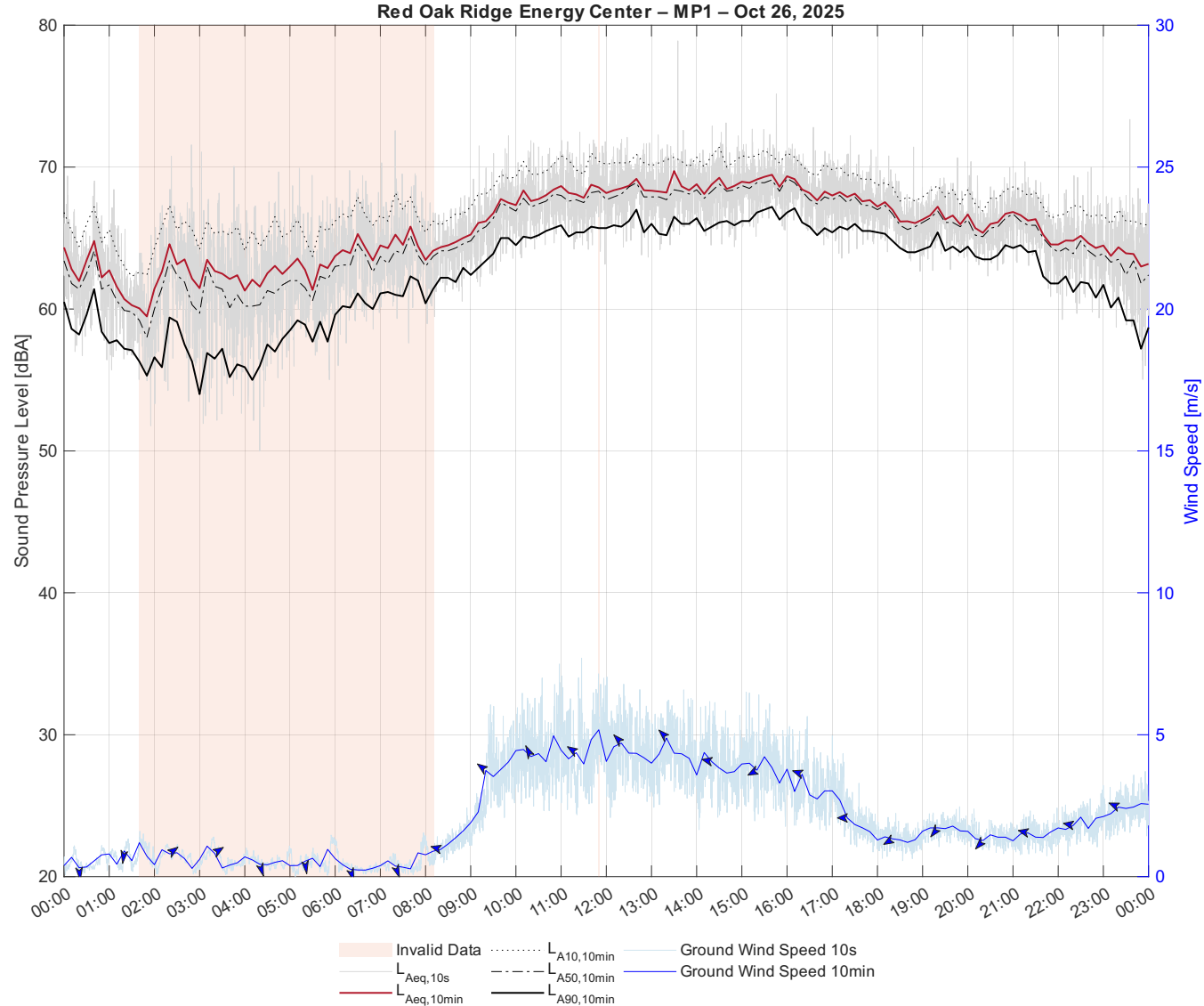
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



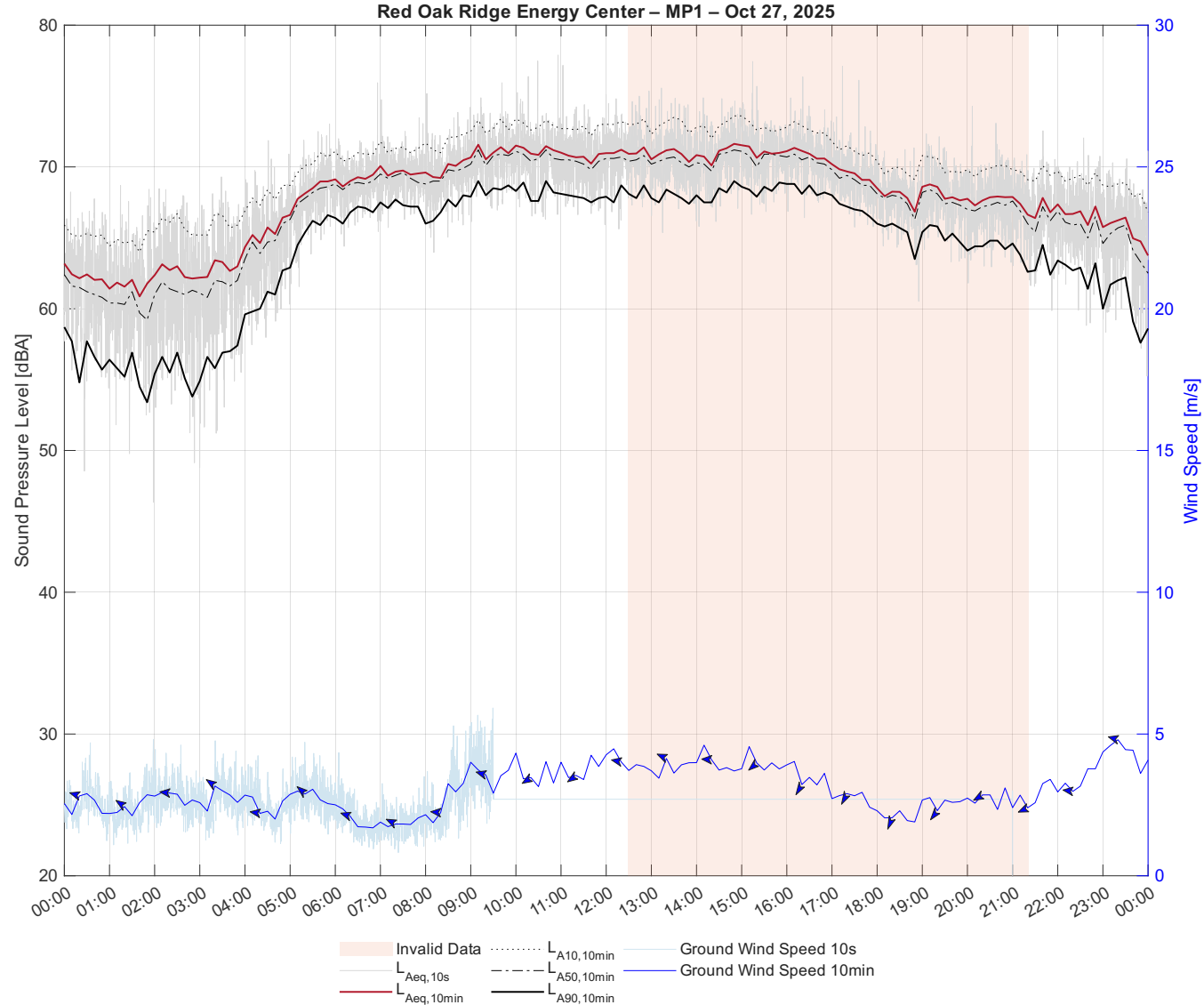
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



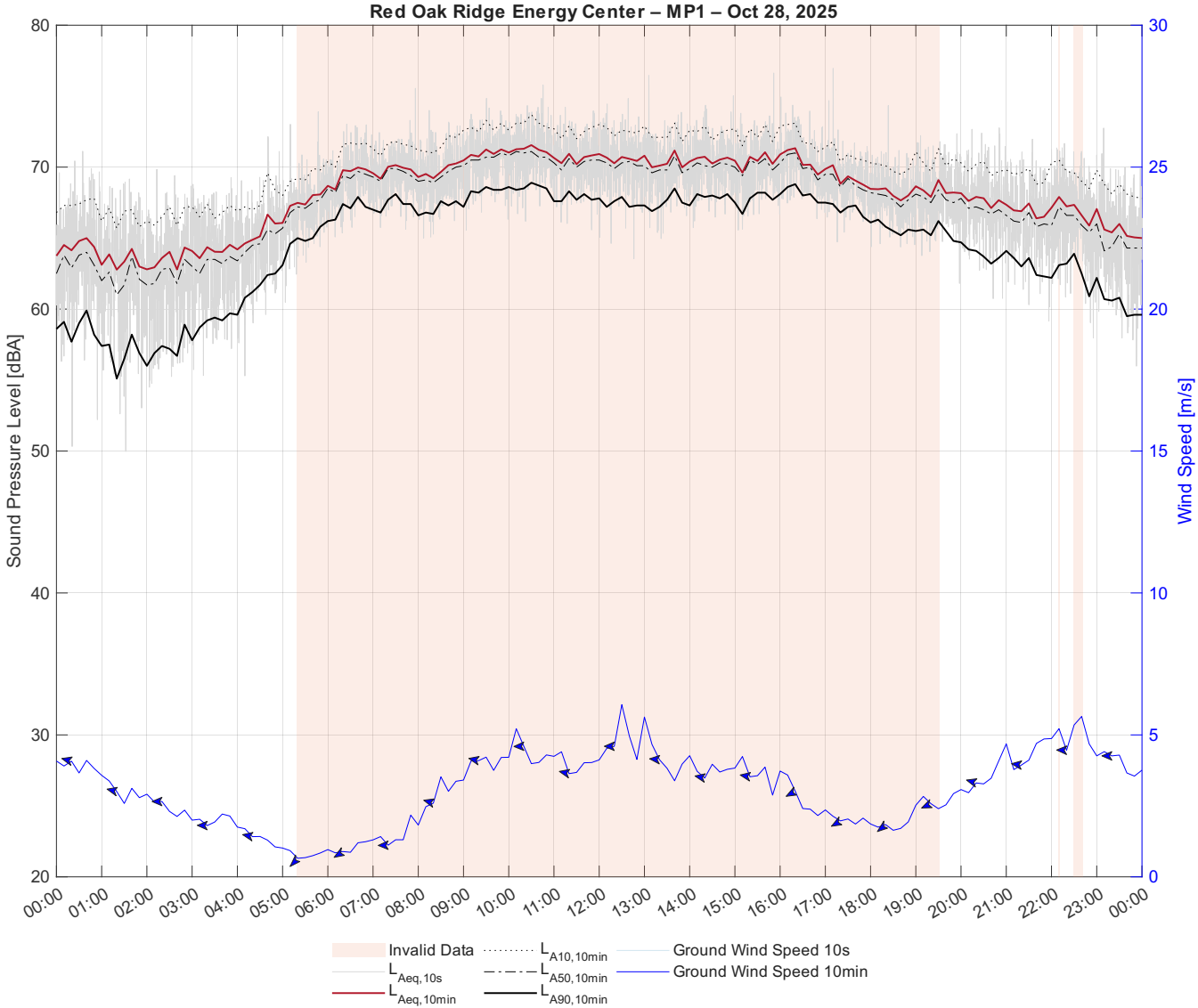
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



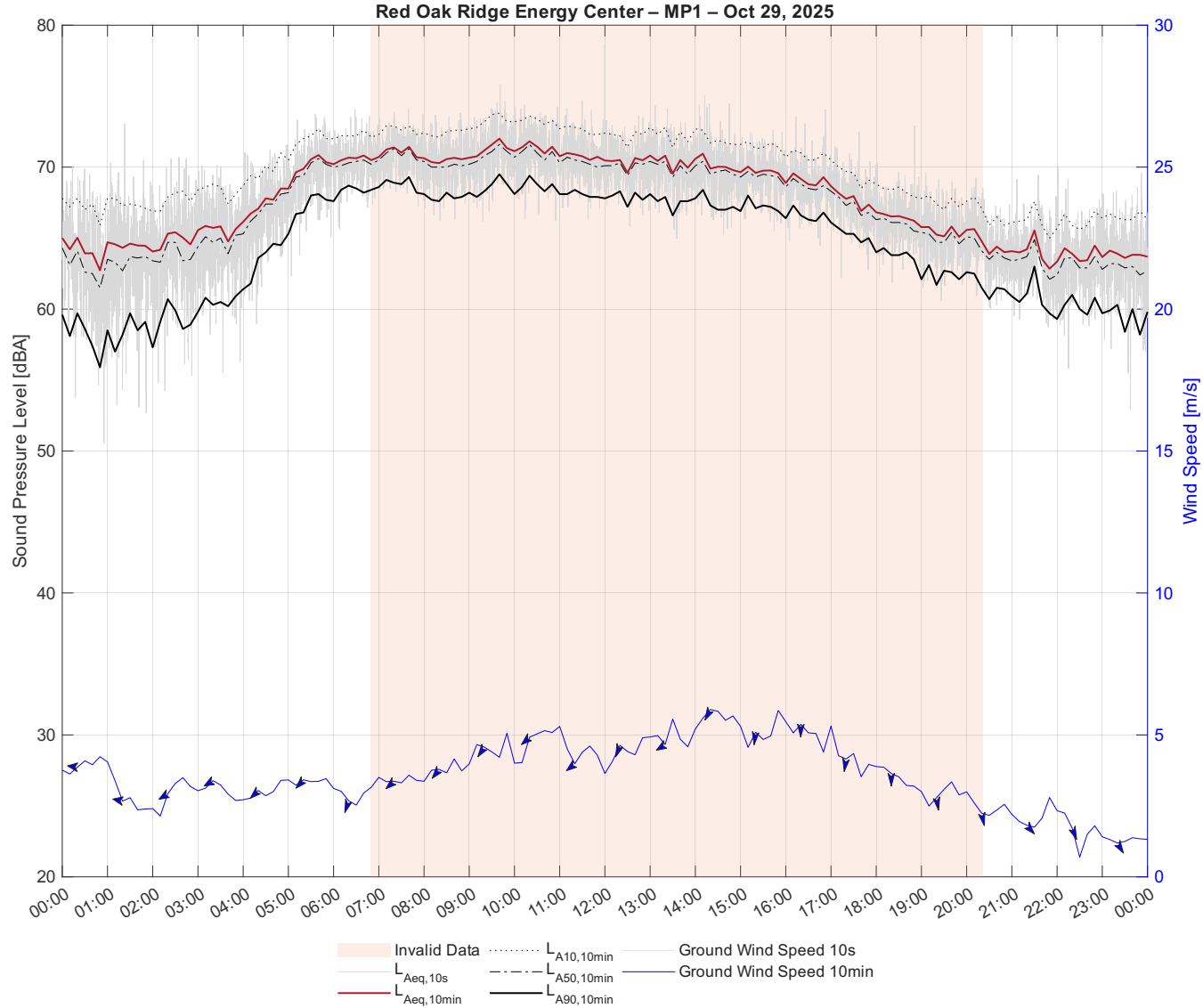
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



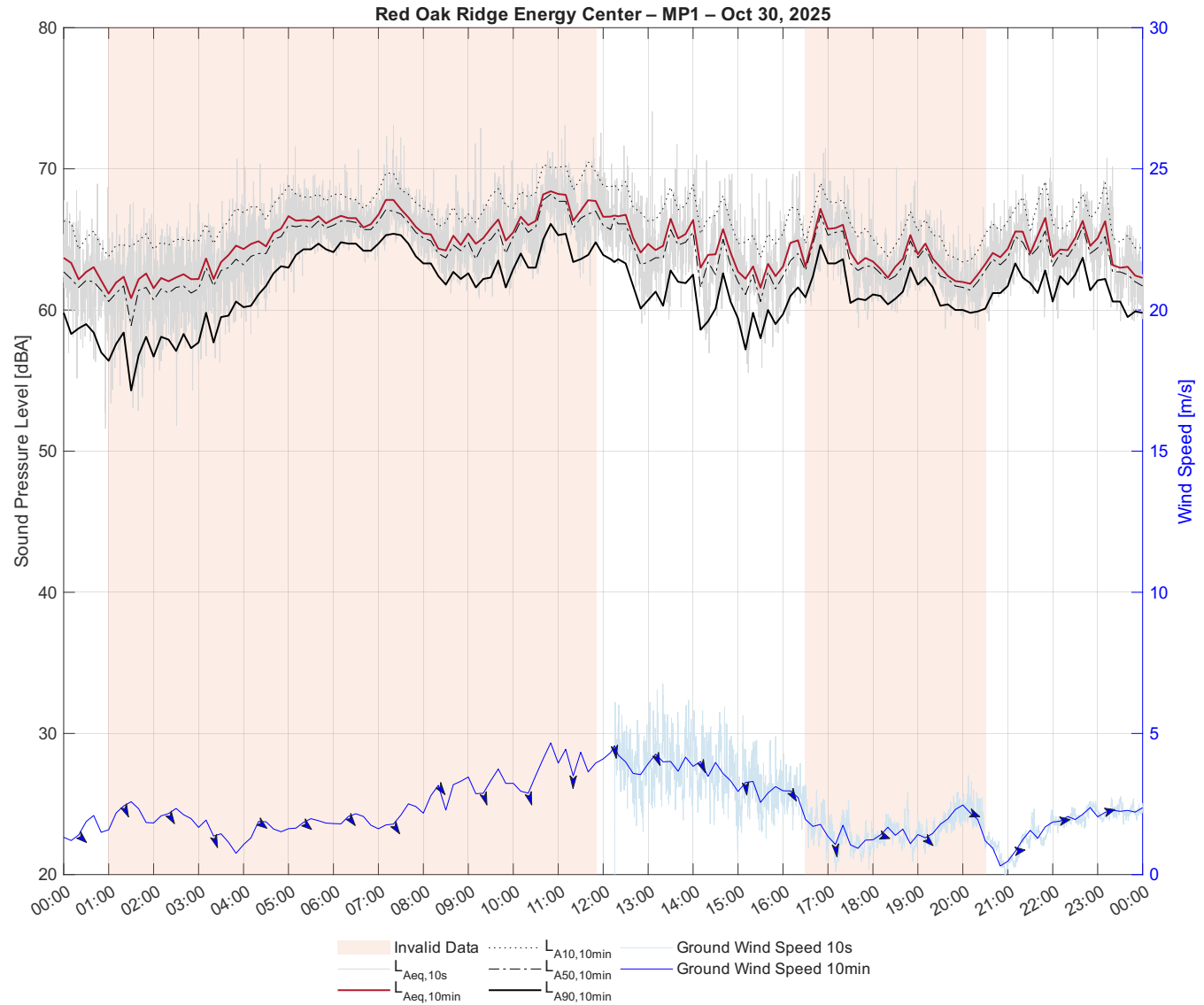
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



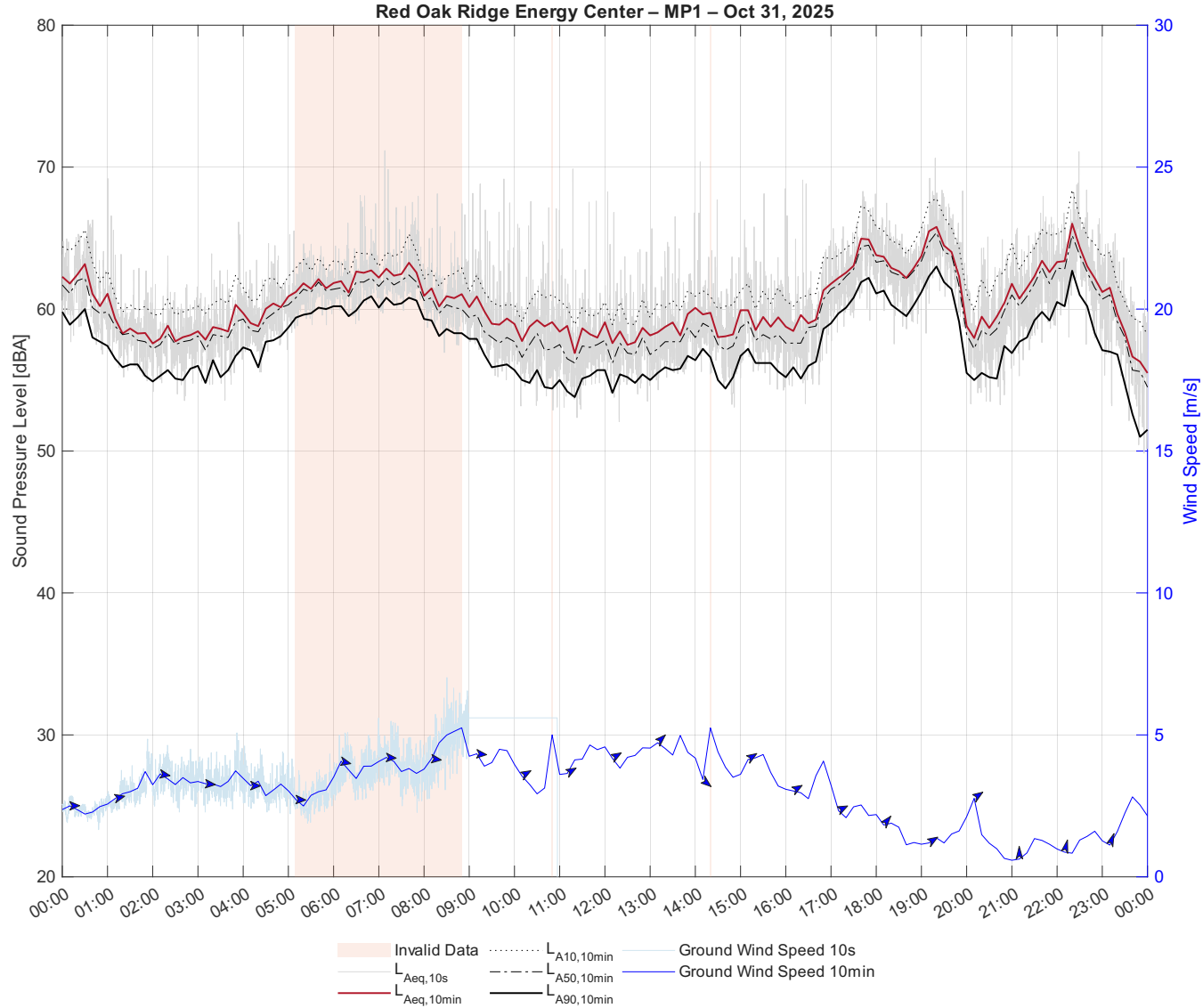
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



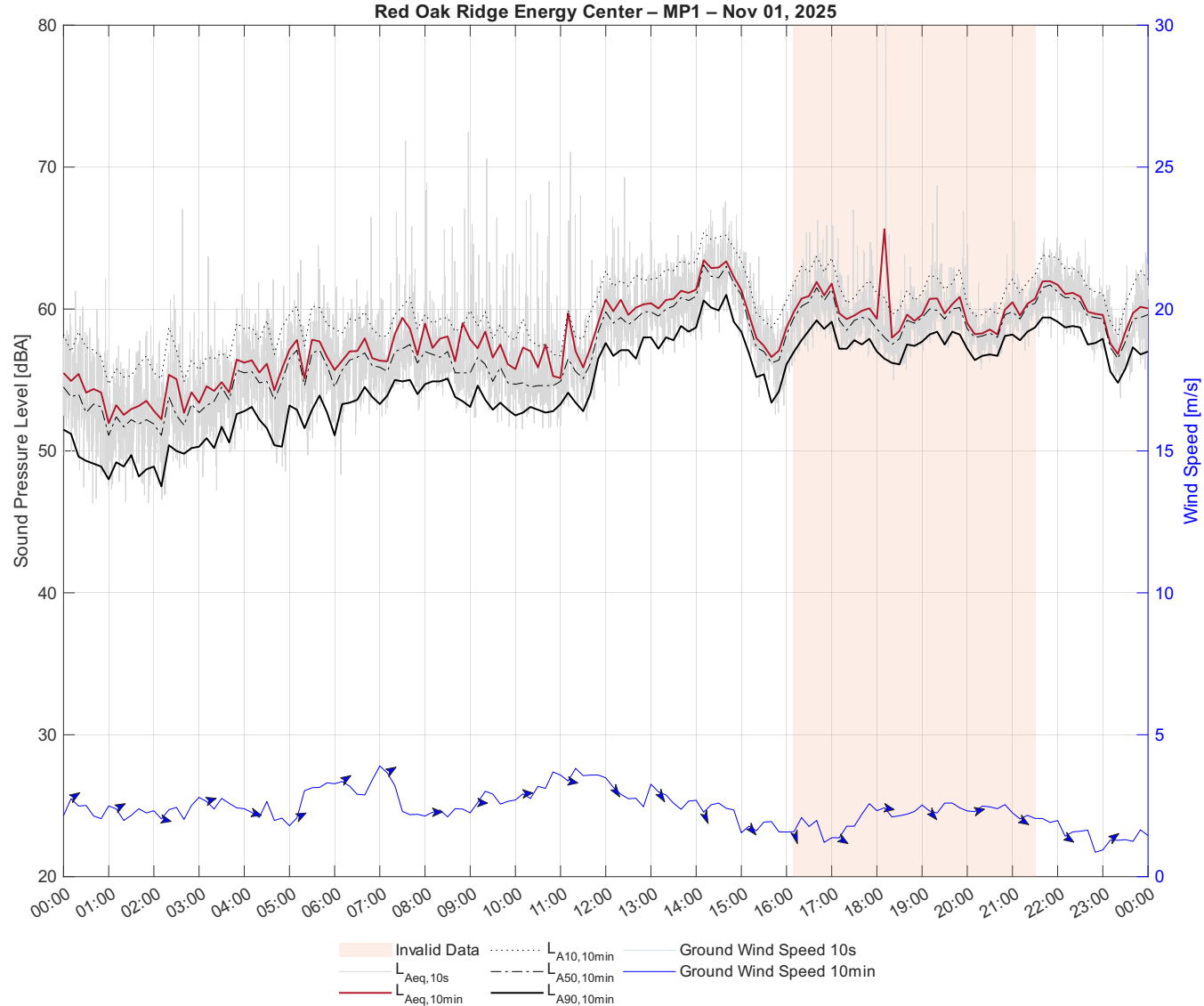
*Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center*



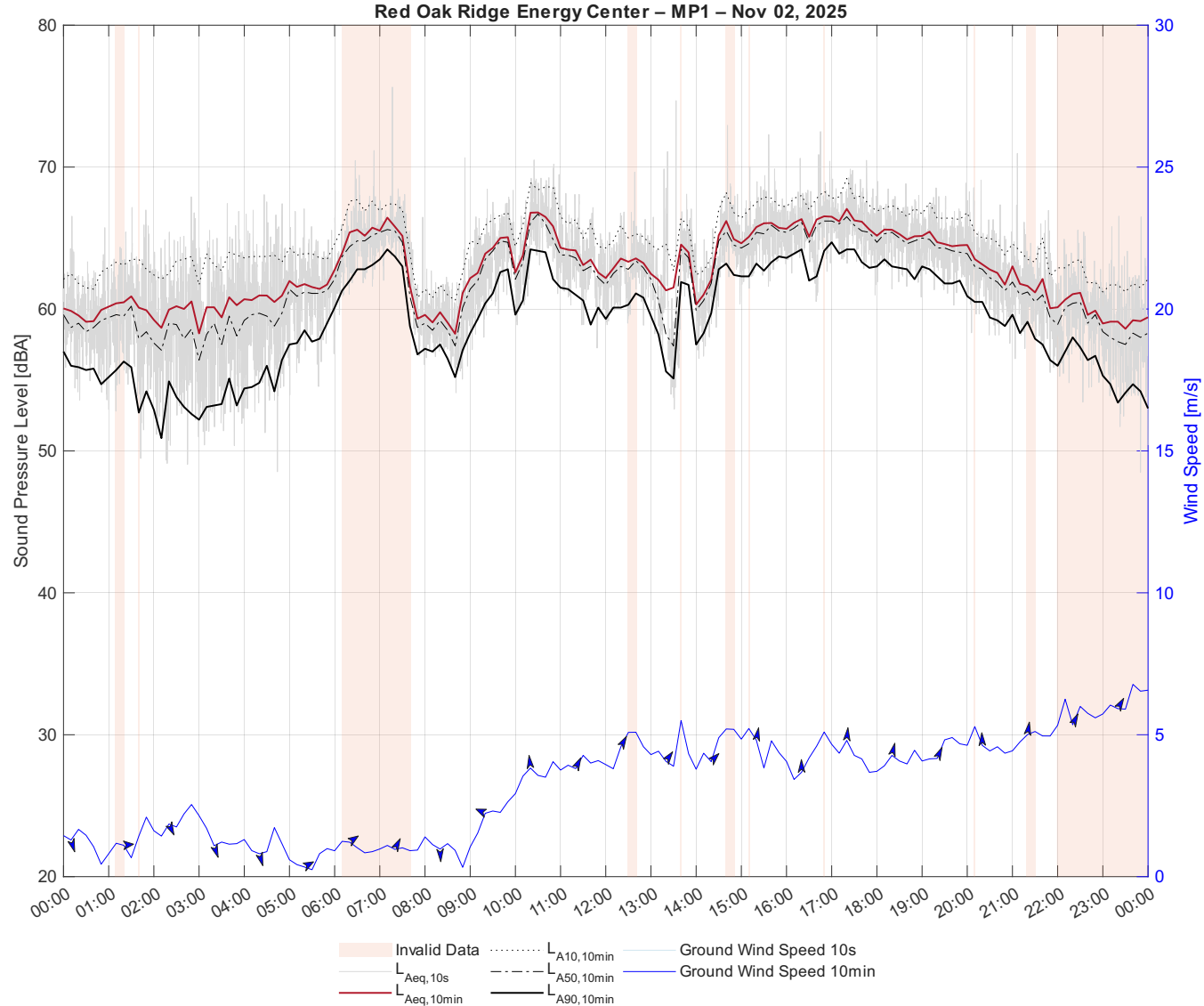
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



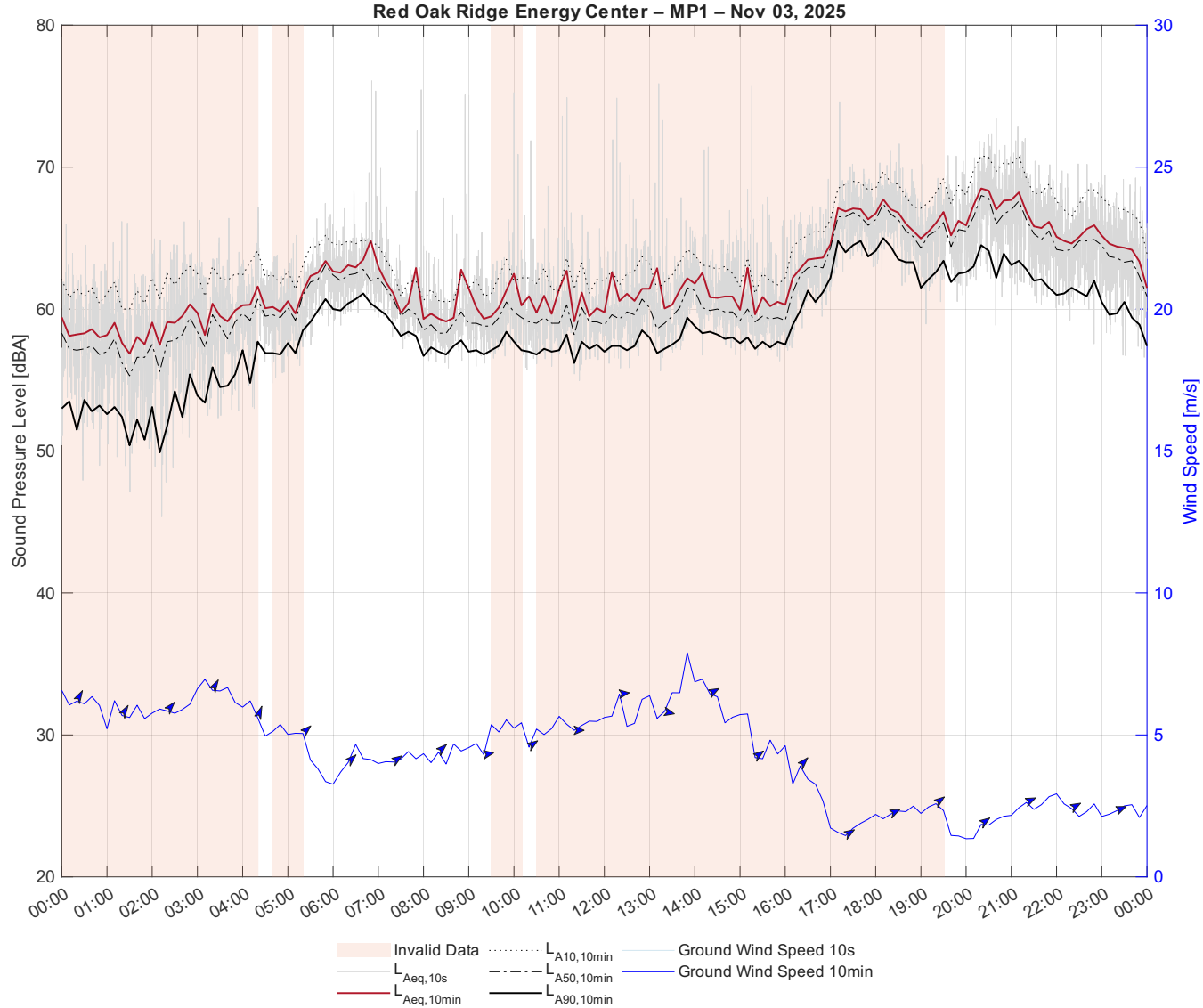
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



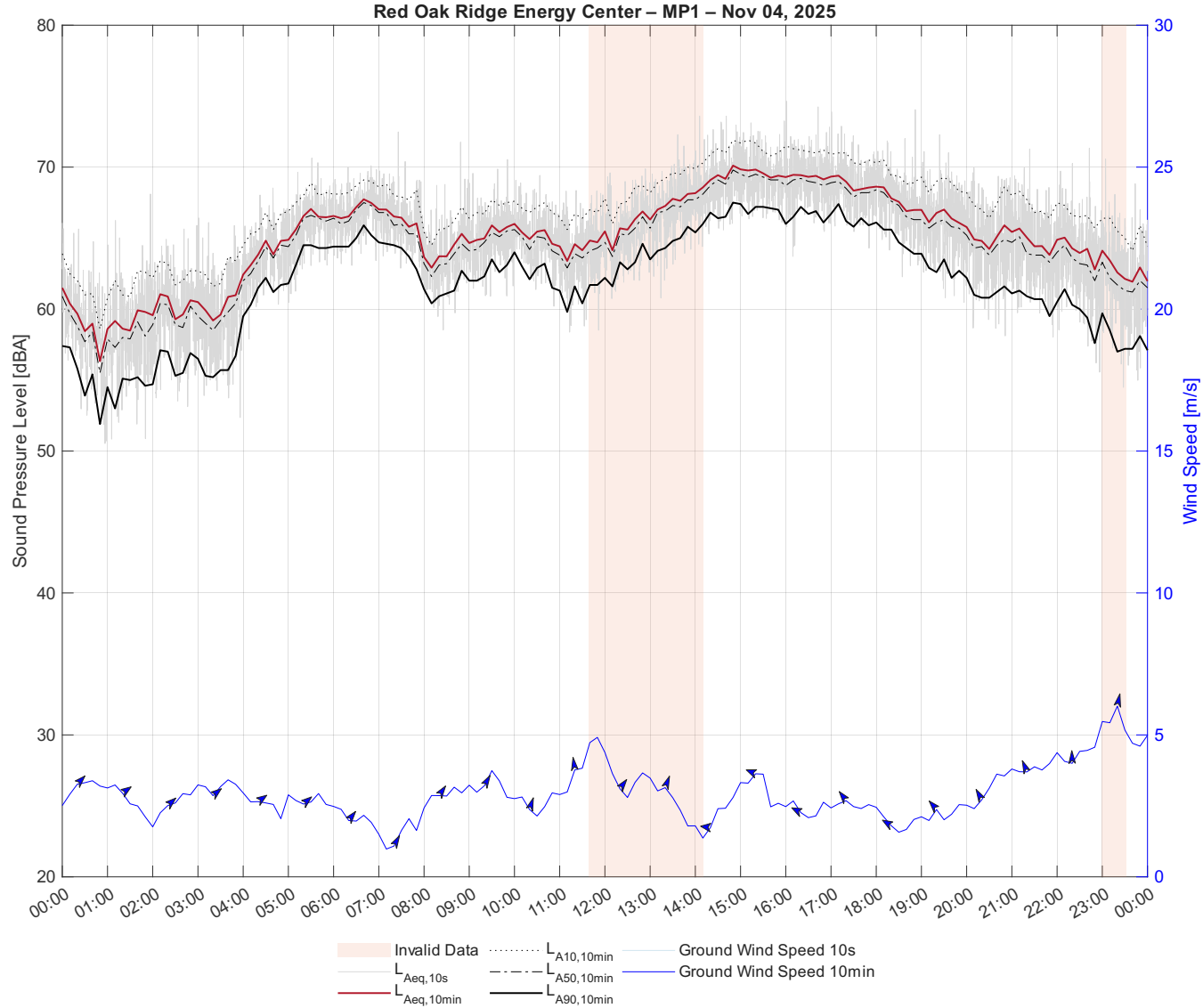
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



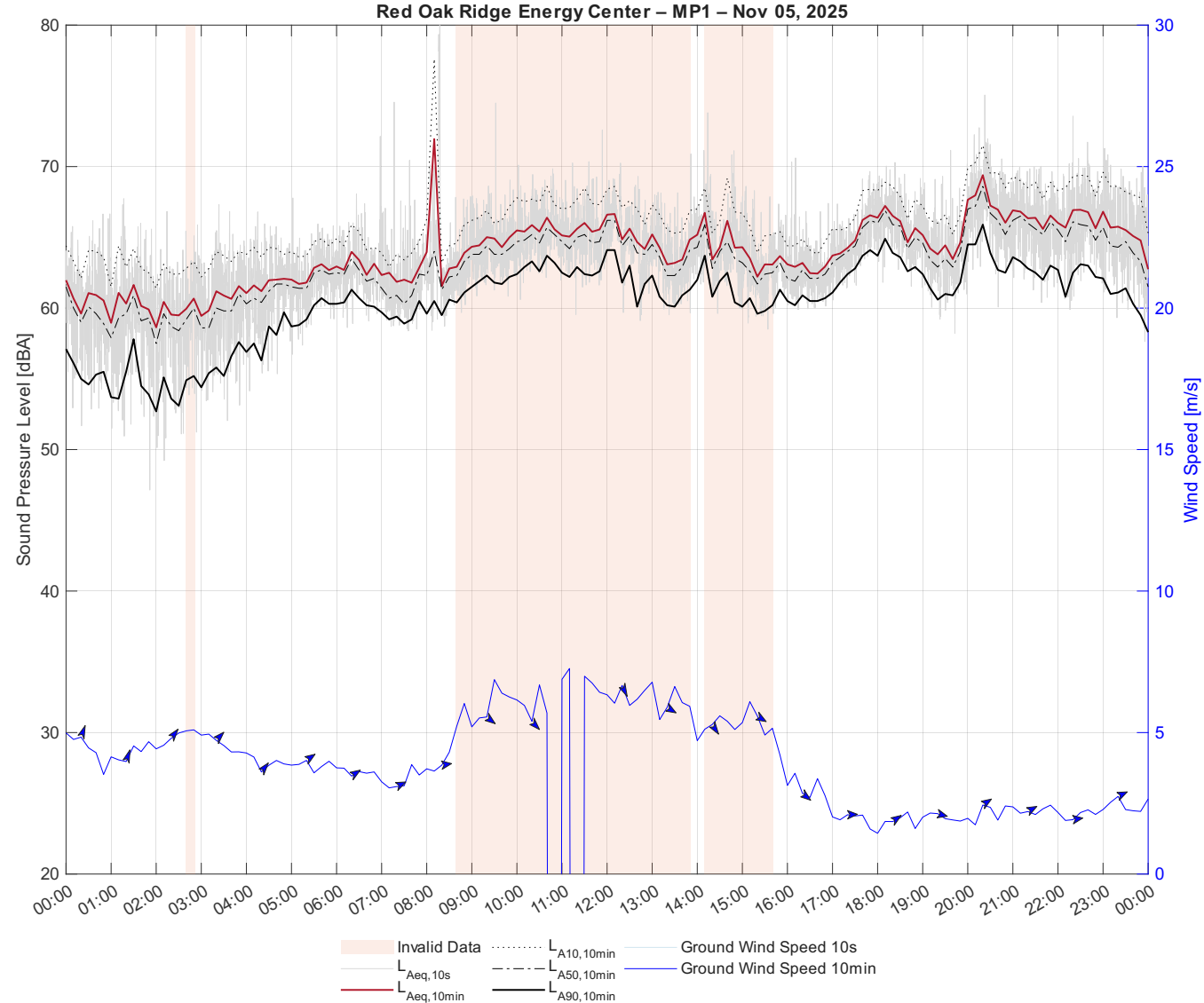
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



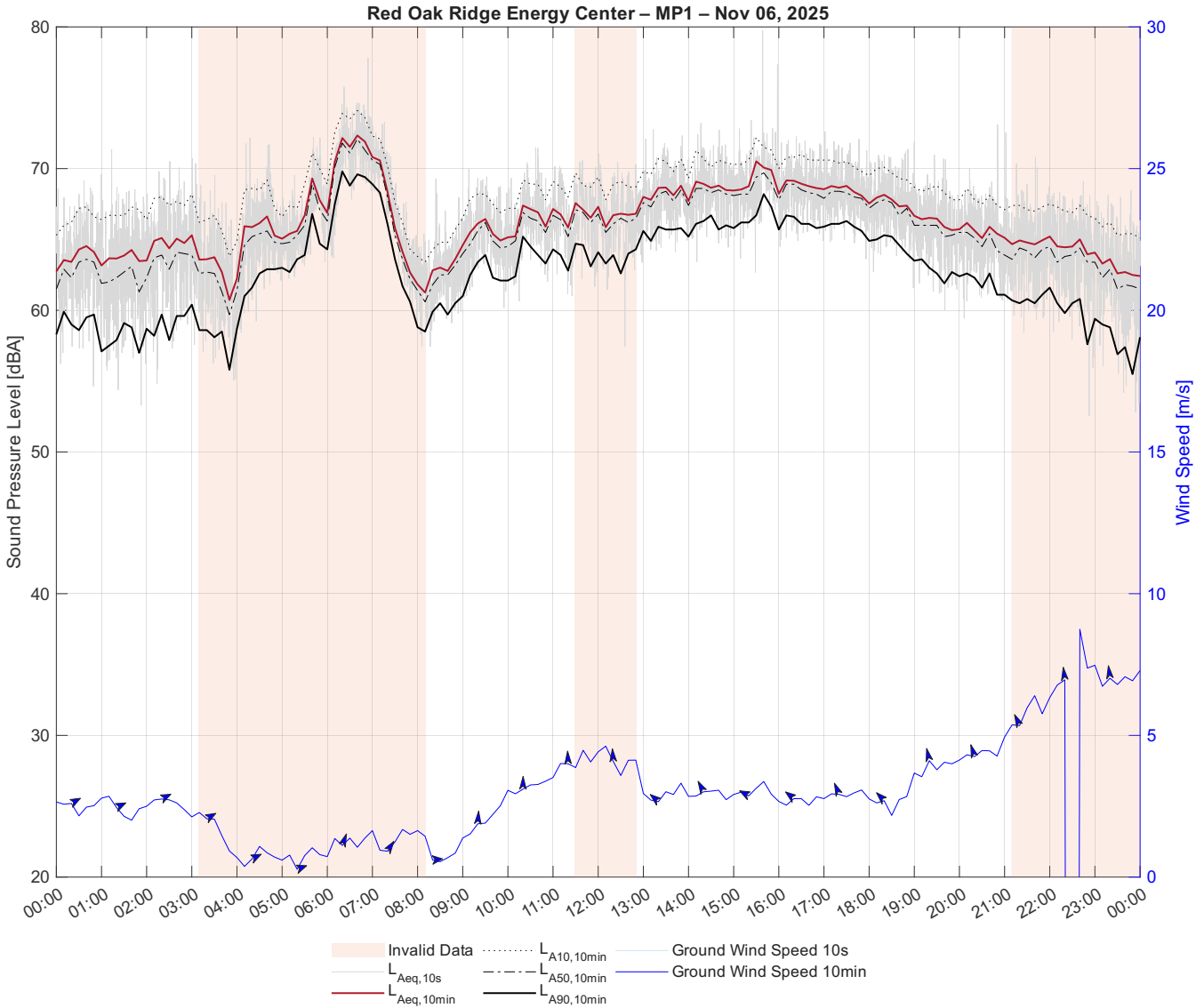
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



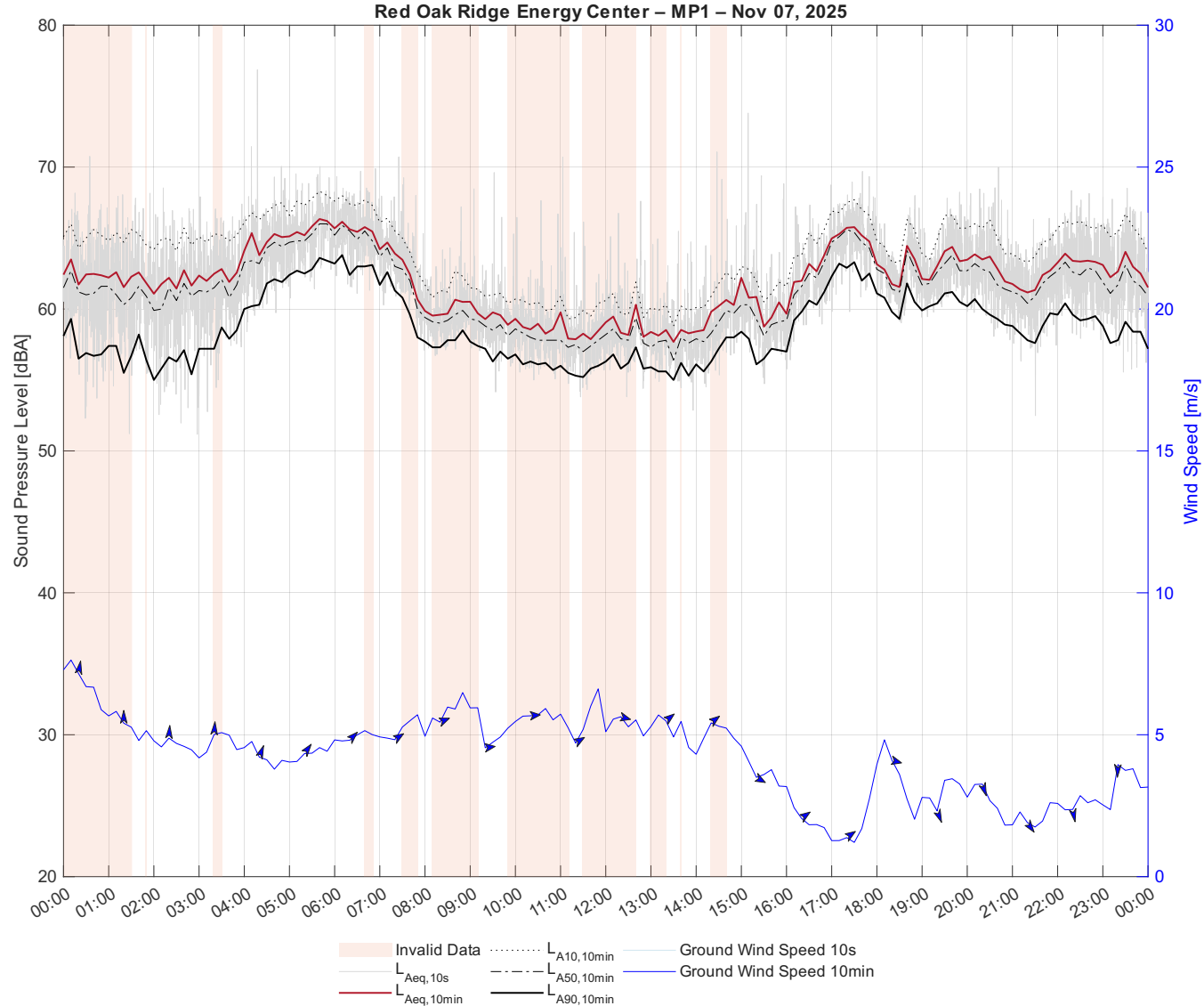
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



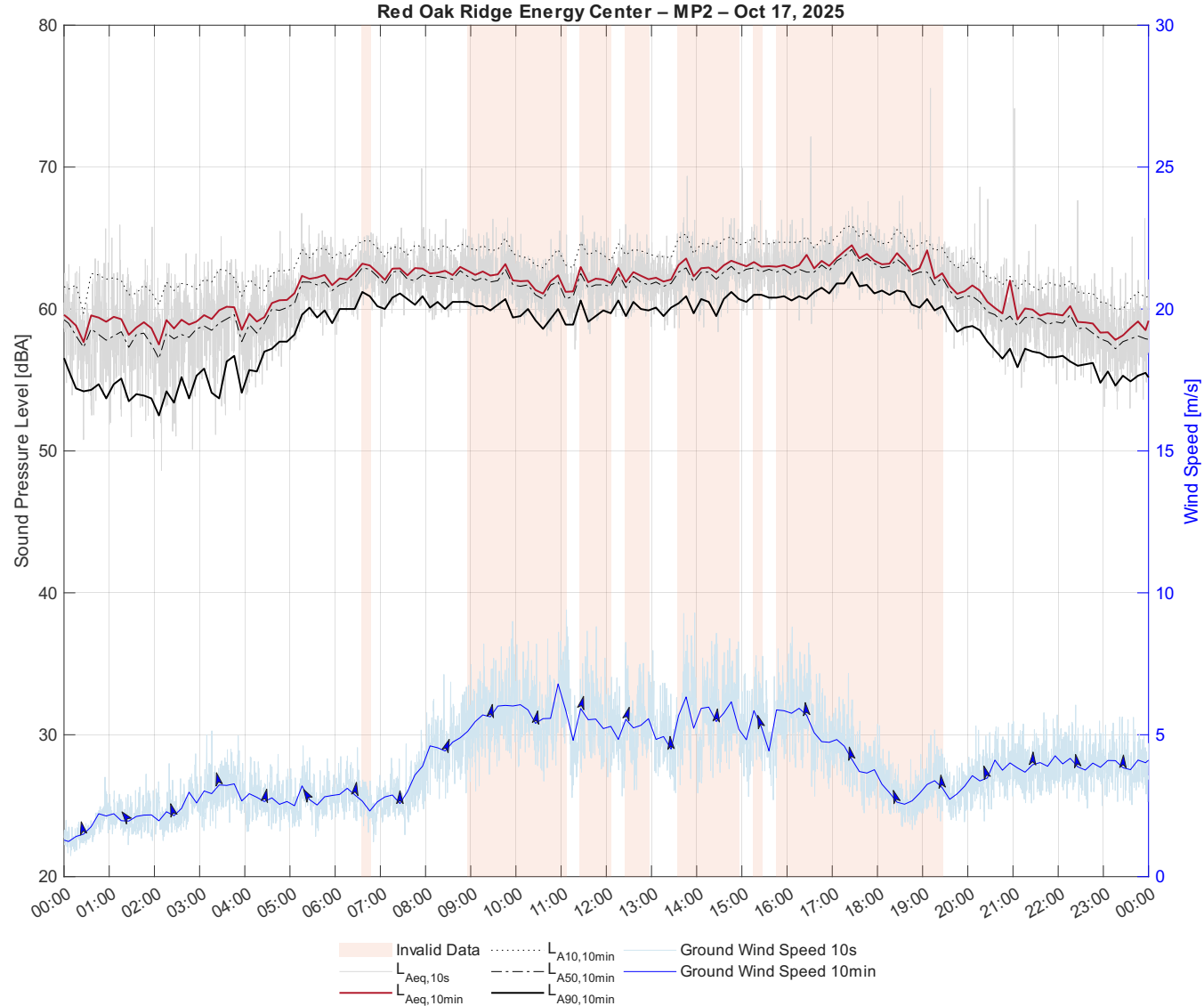
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



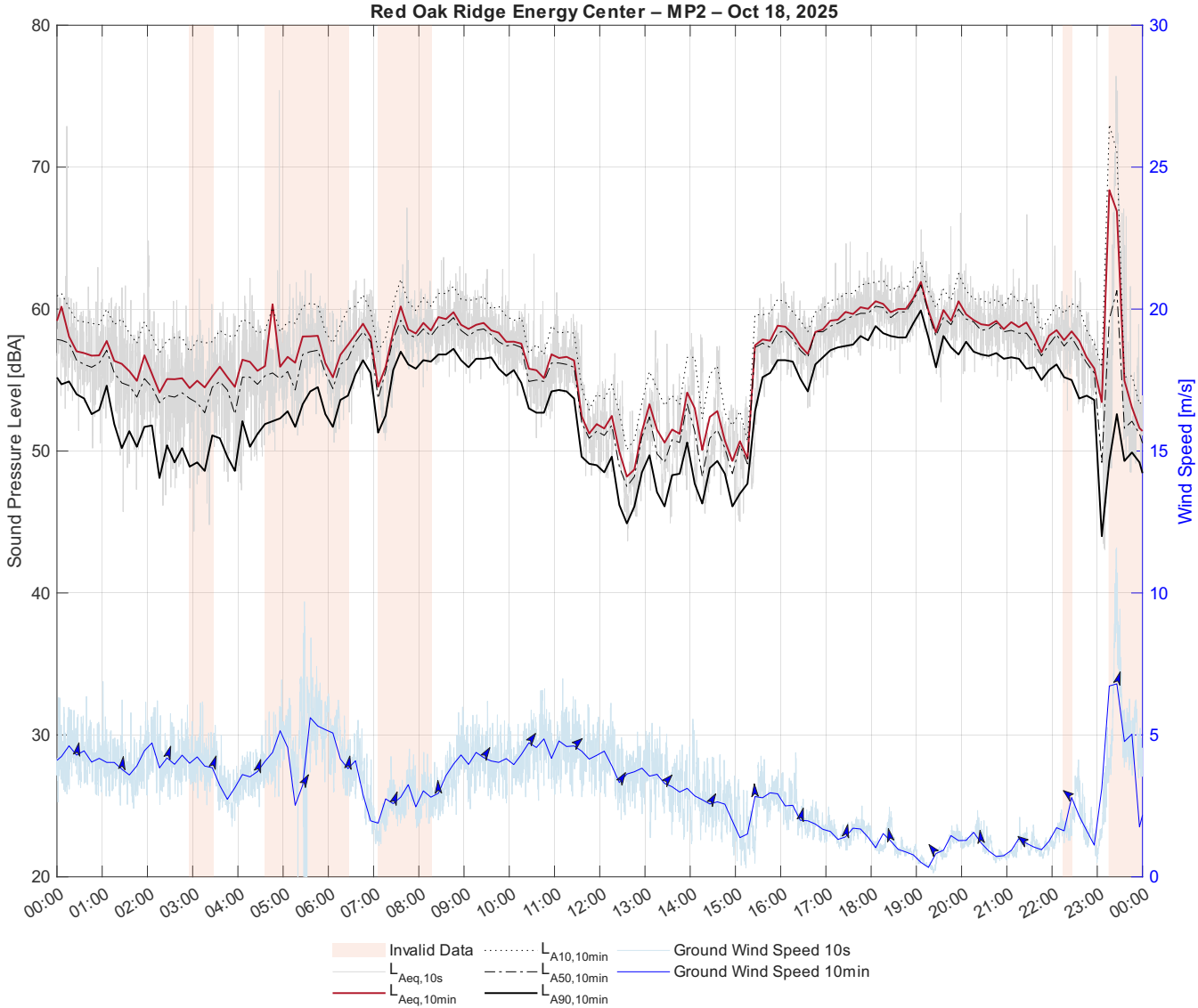
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



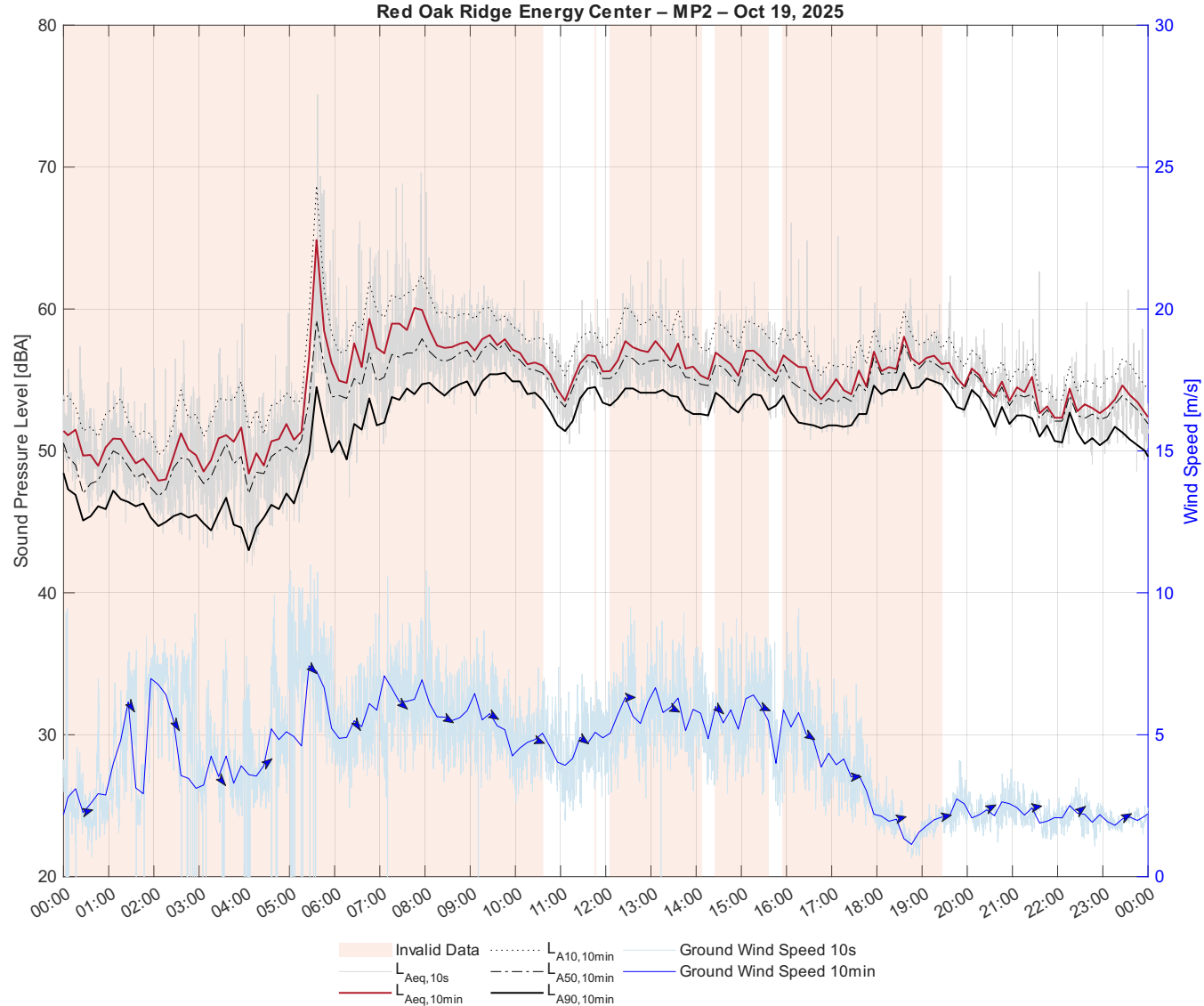
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



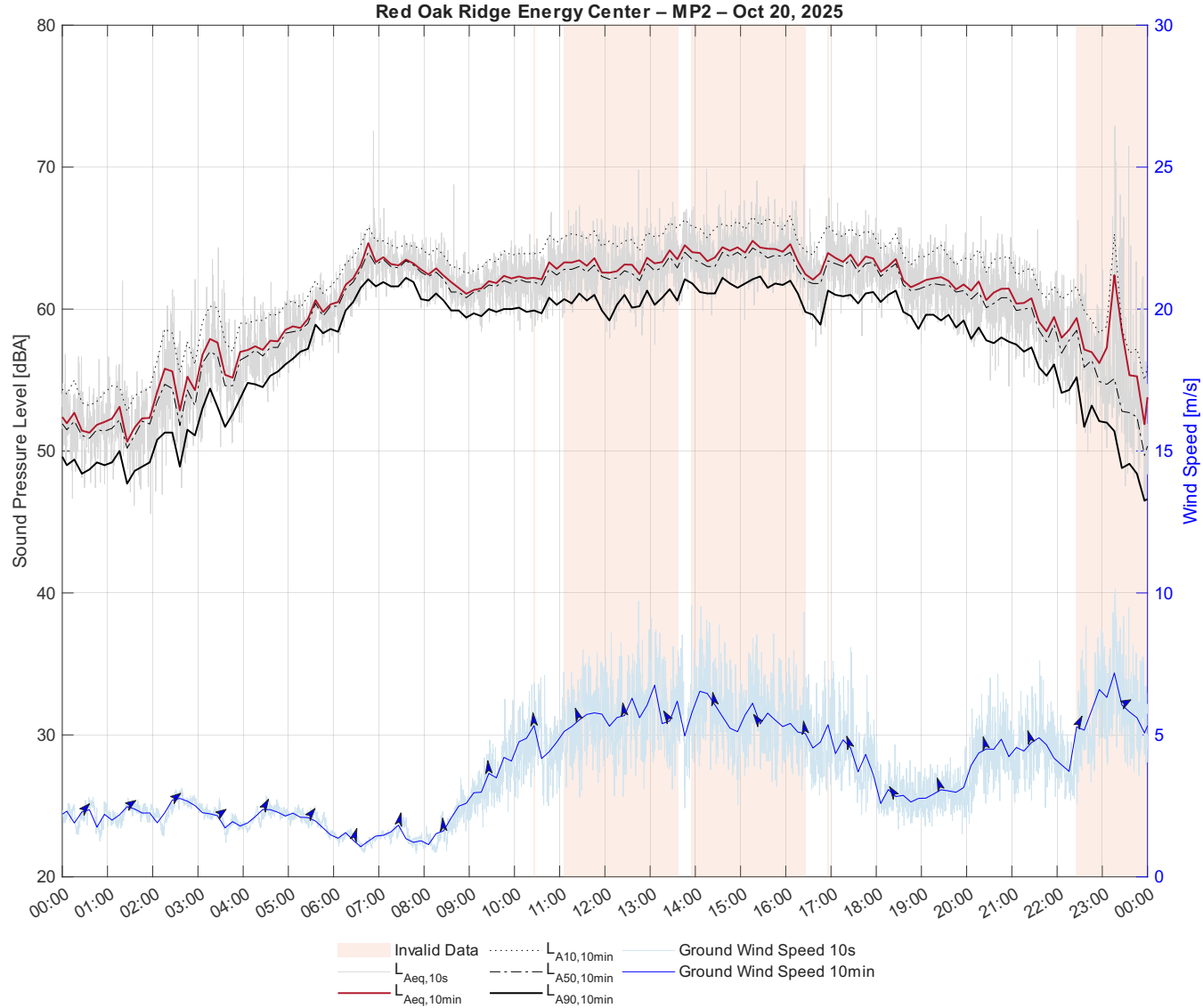
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



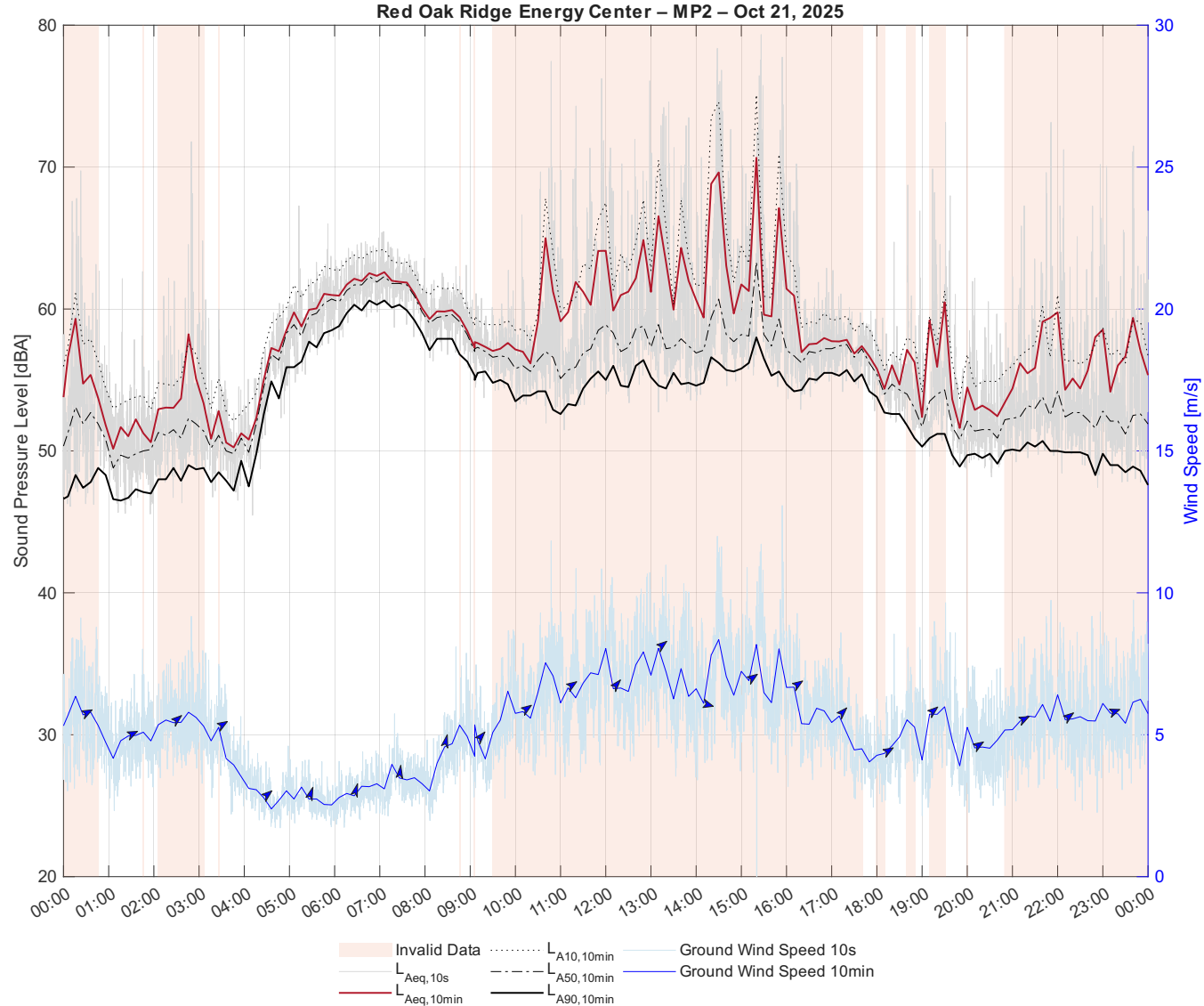
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



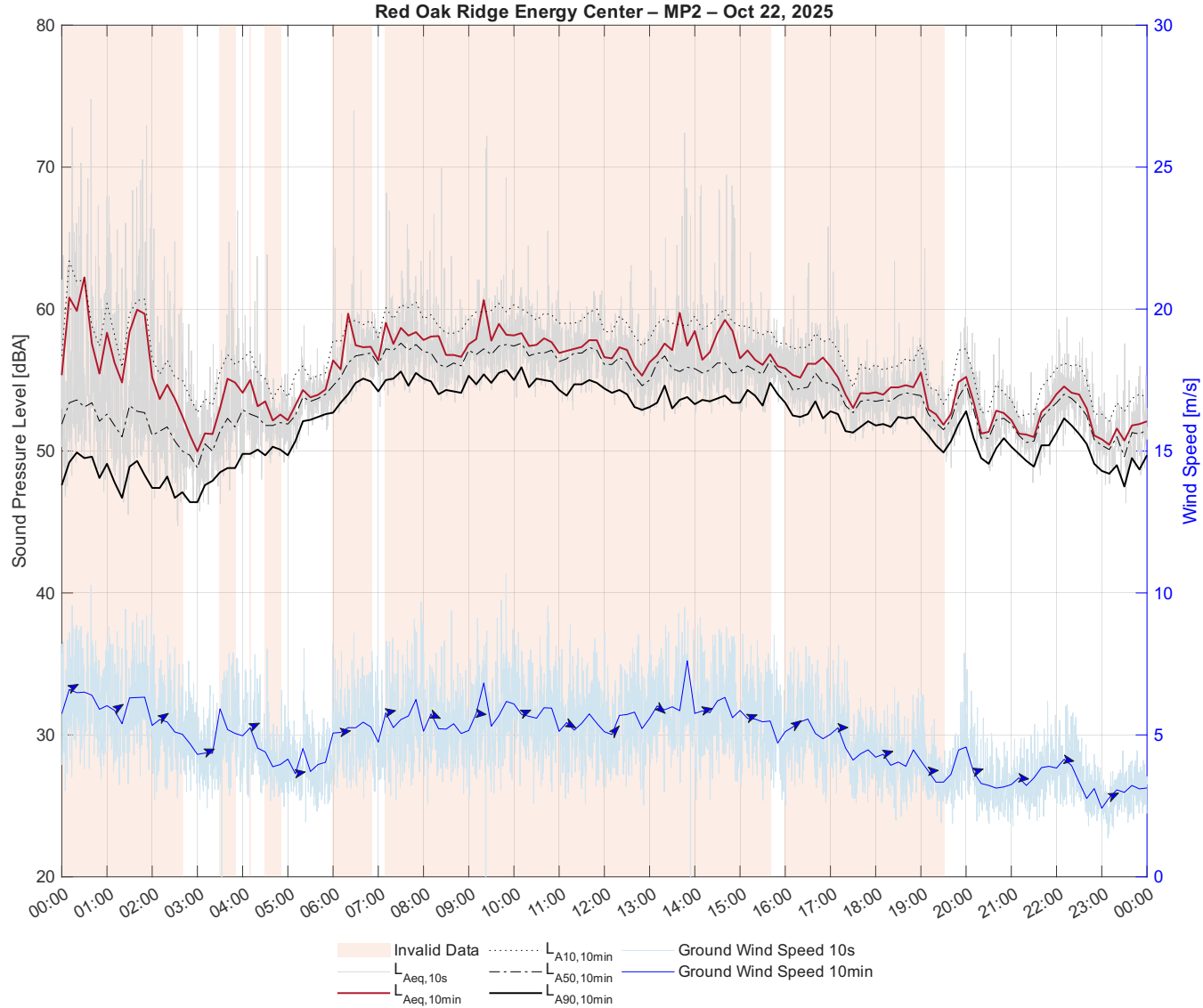
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



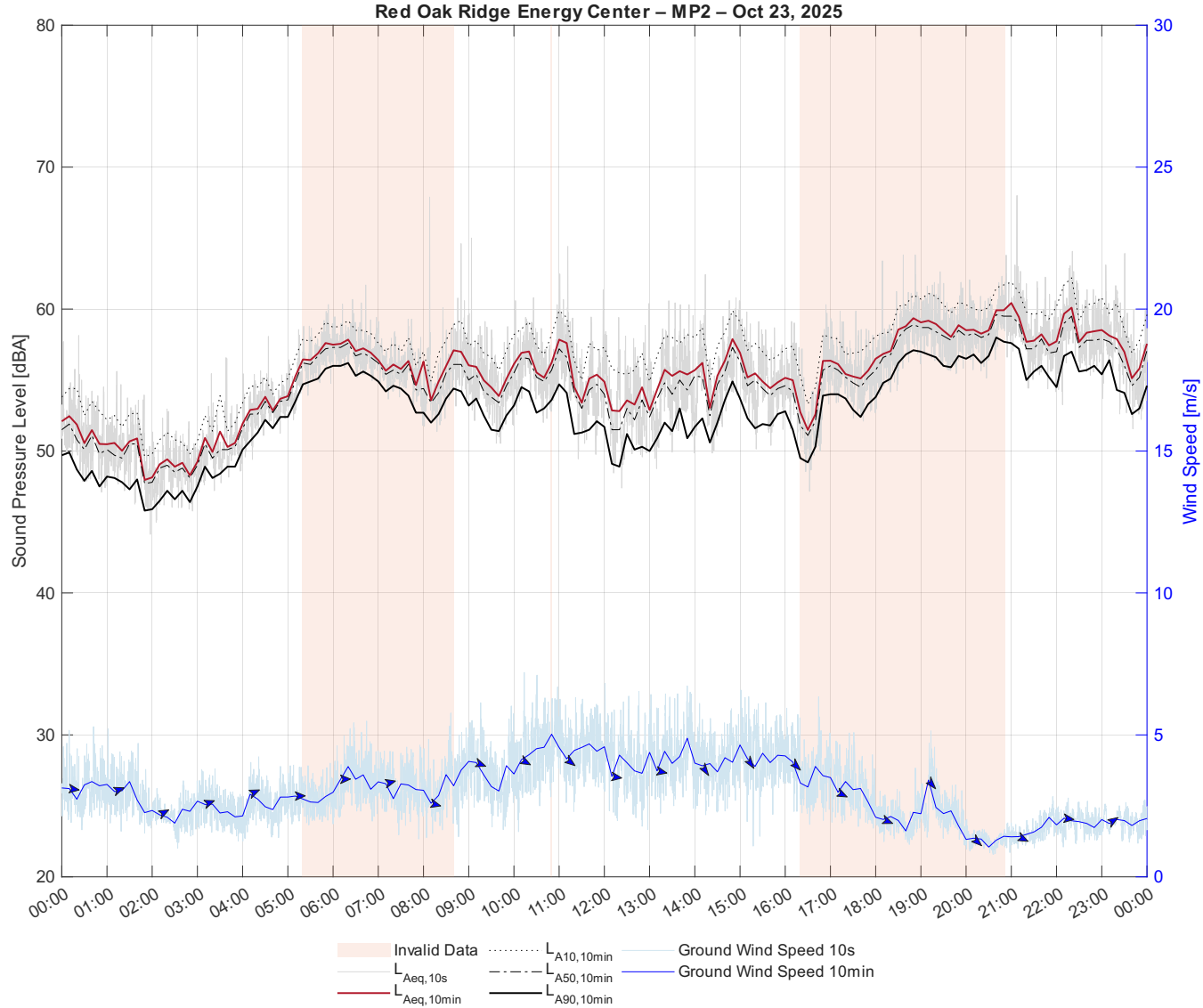
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



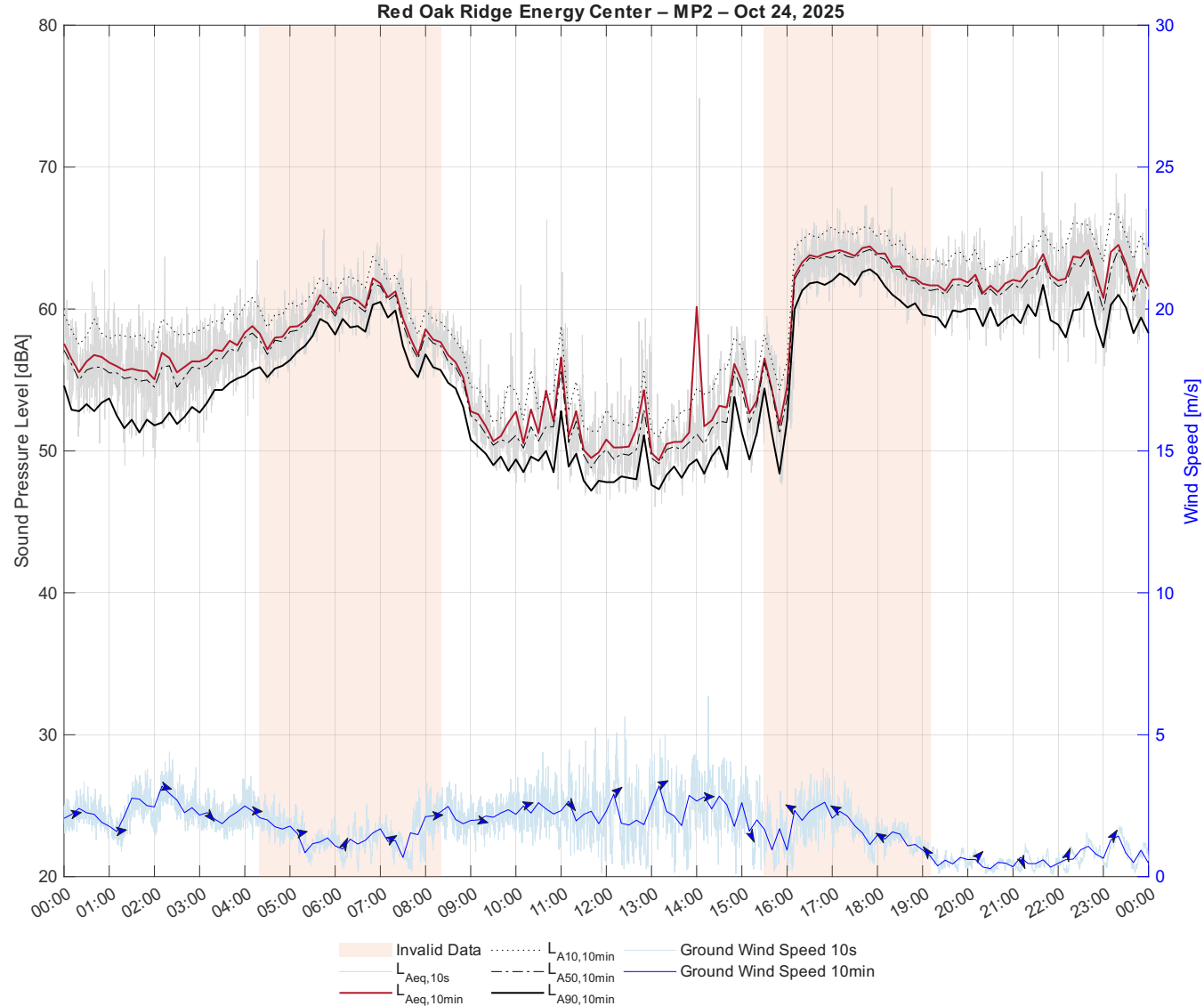
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



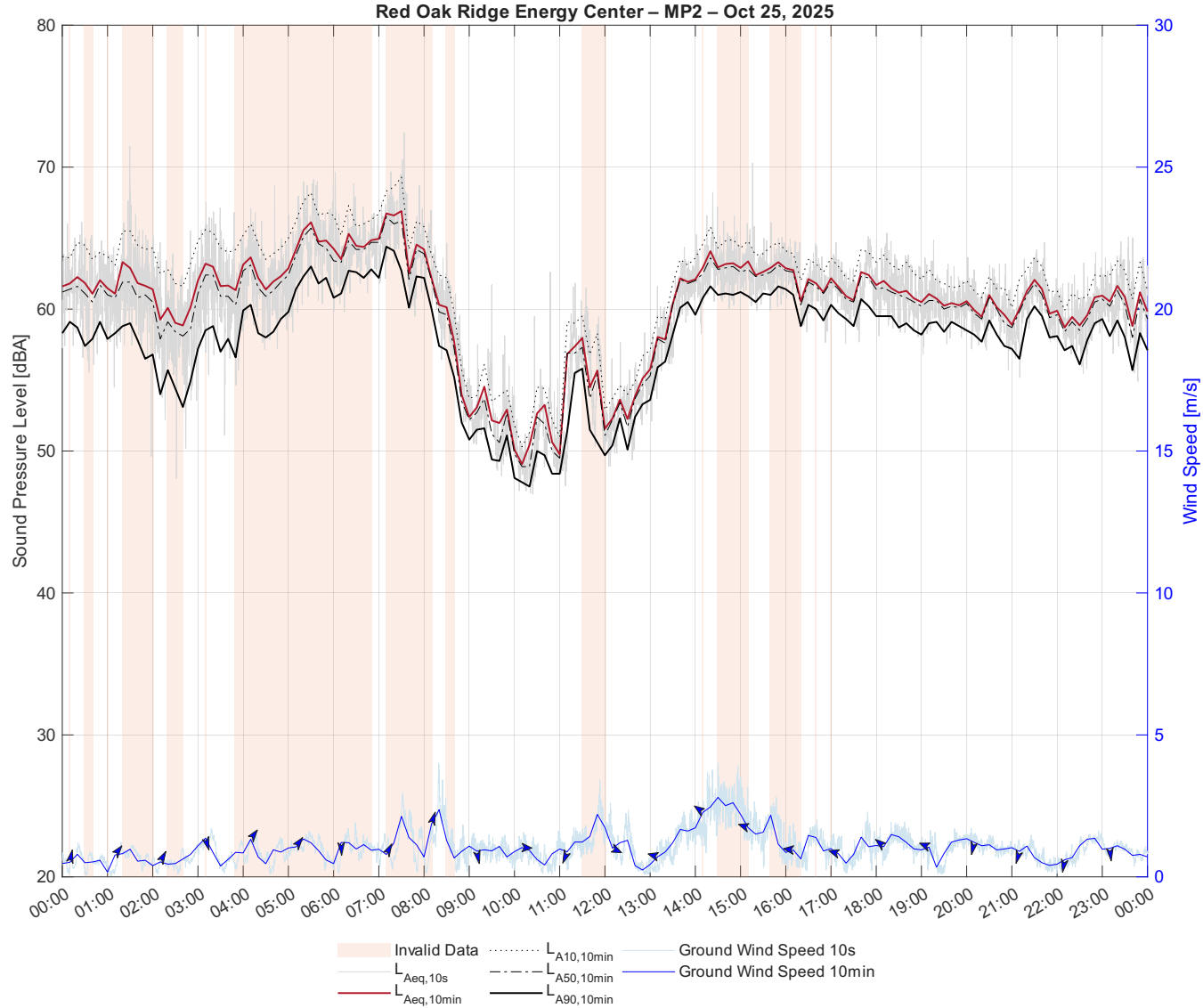
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



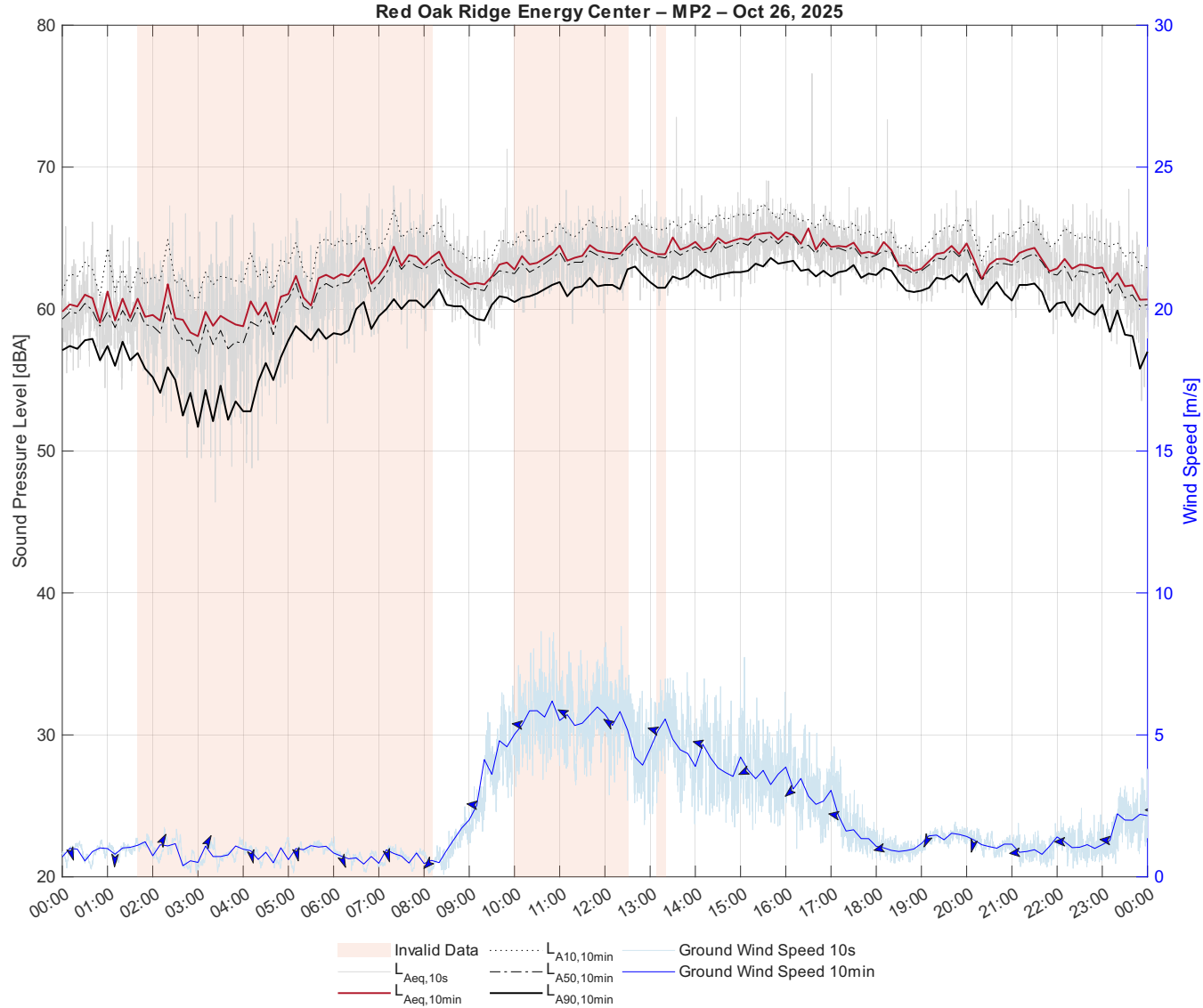
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



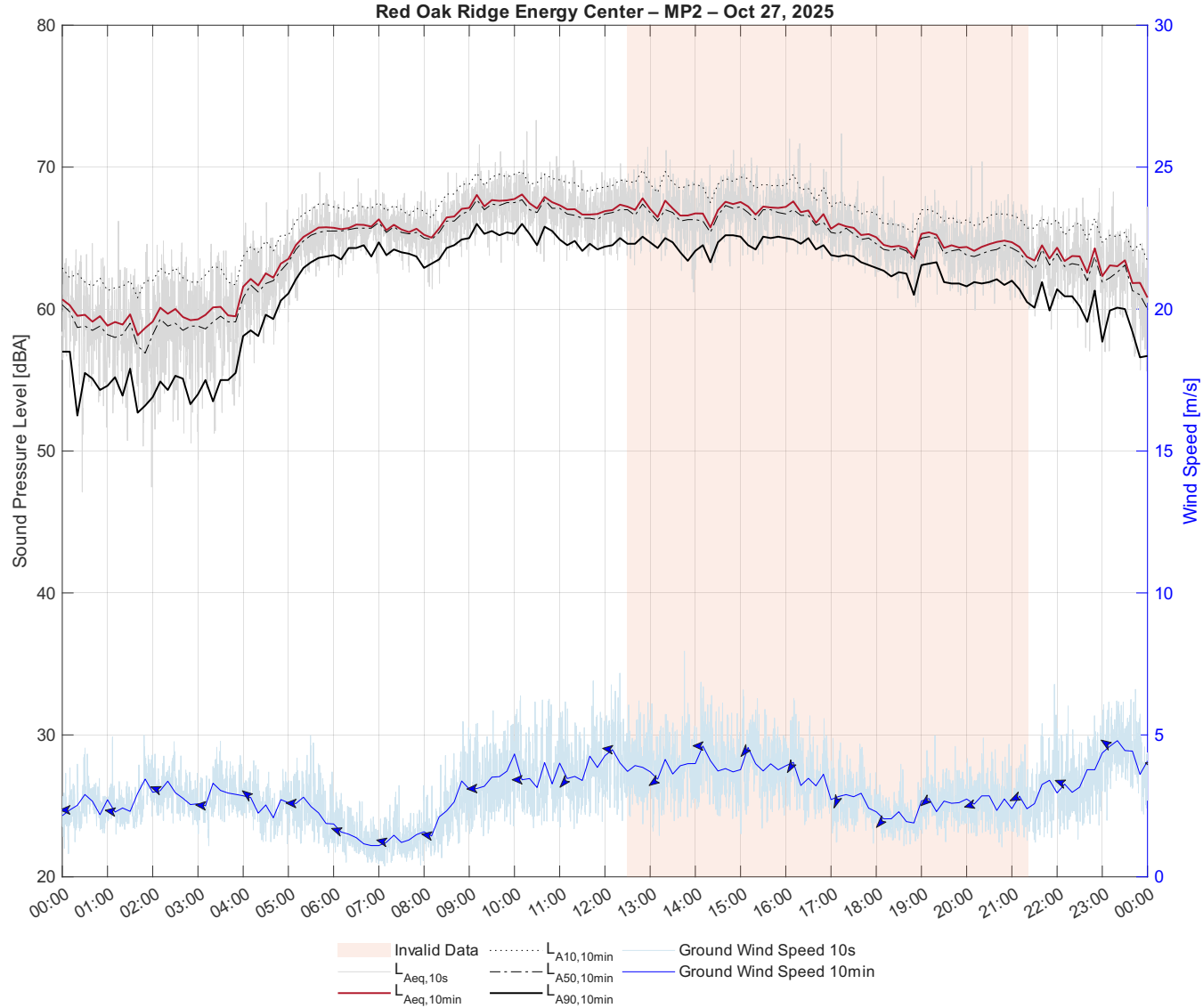
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



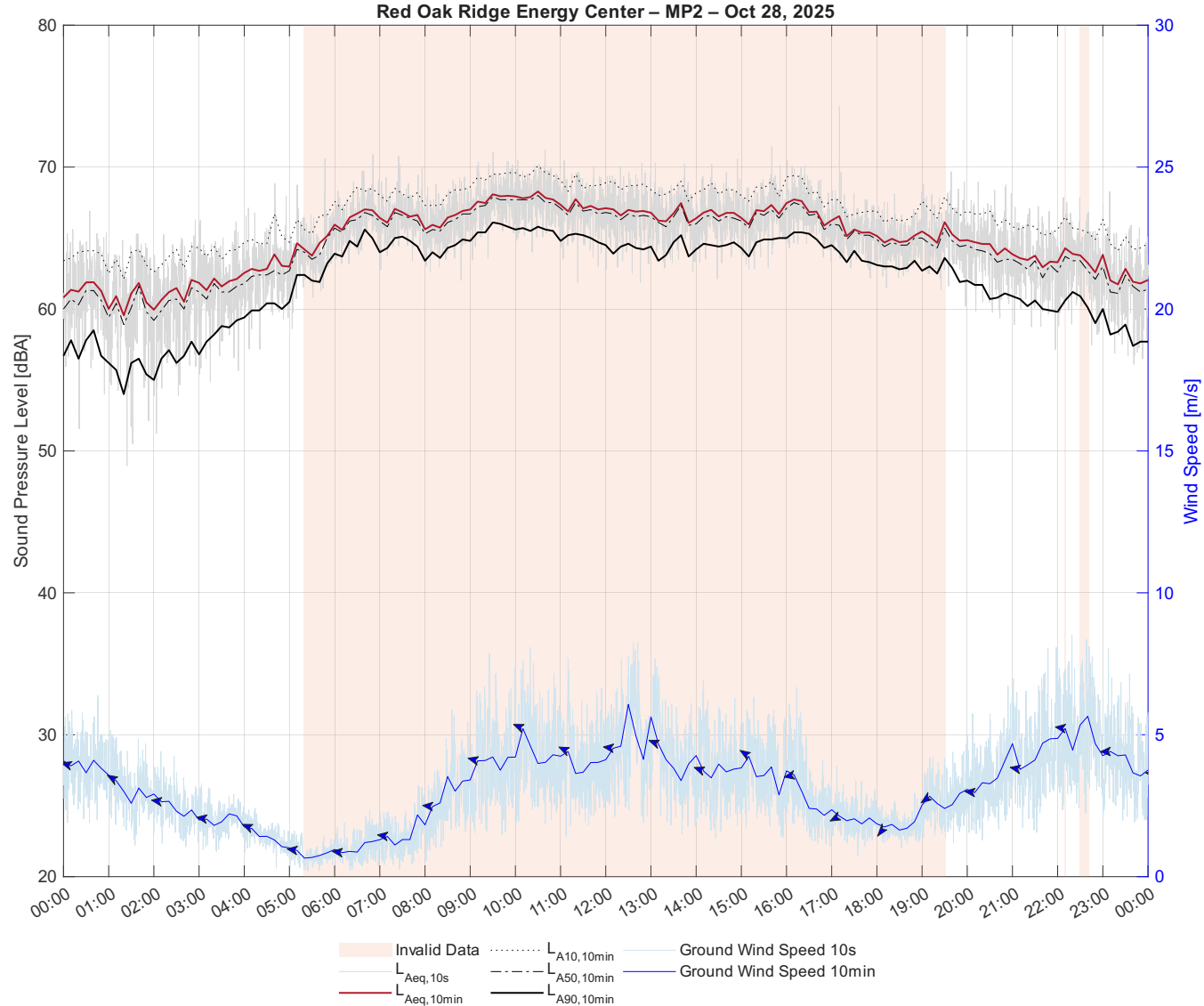
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



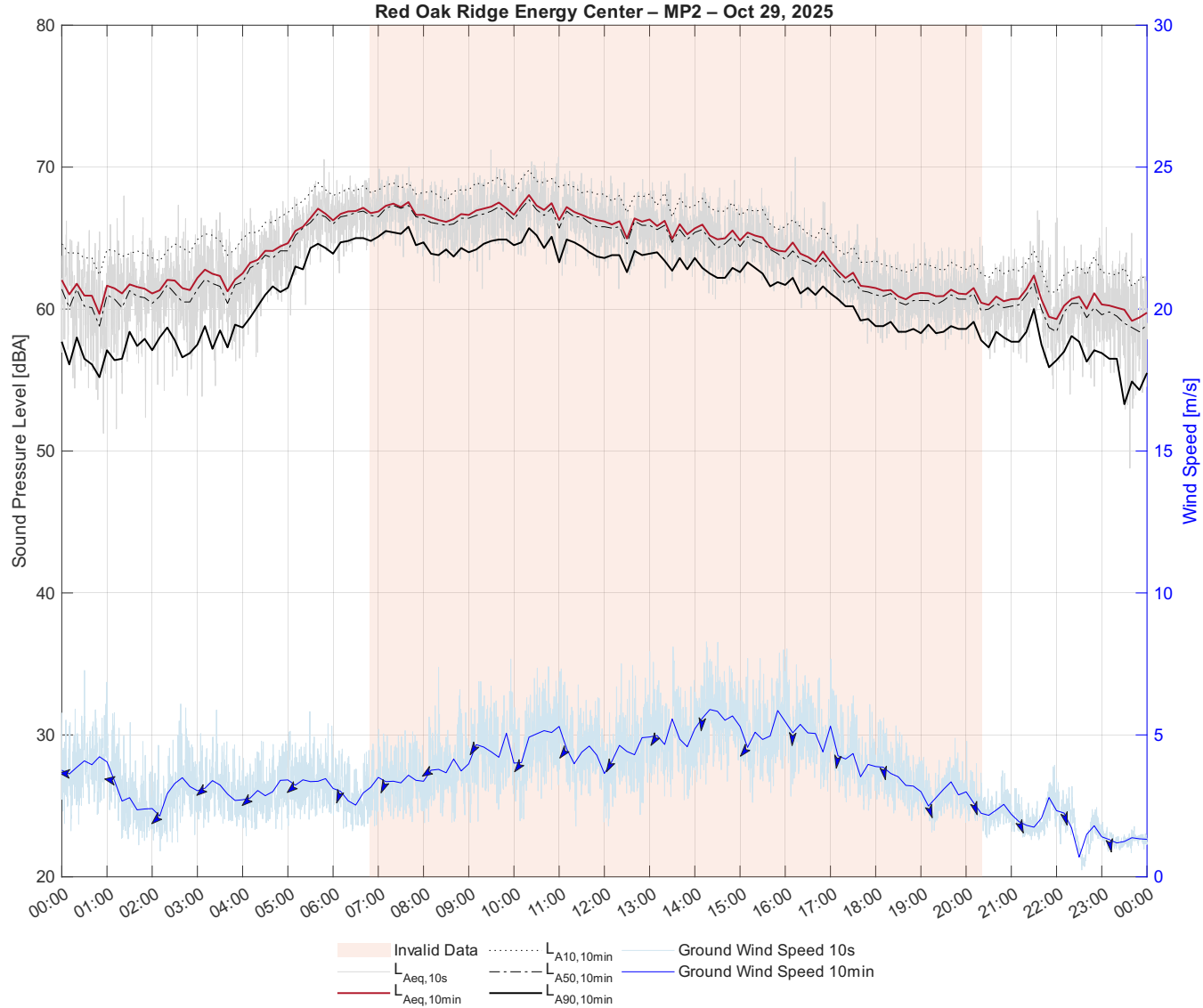
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



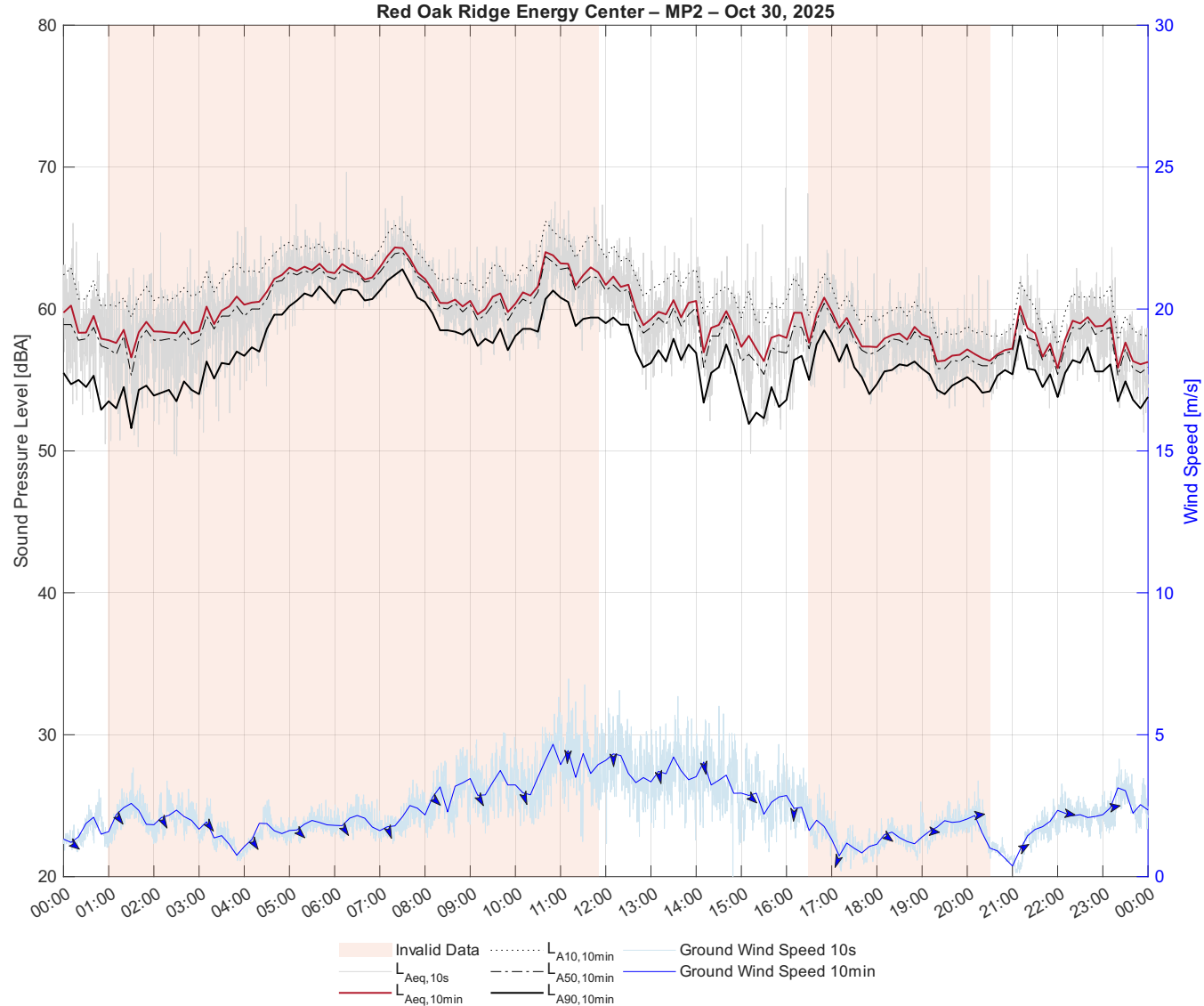
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



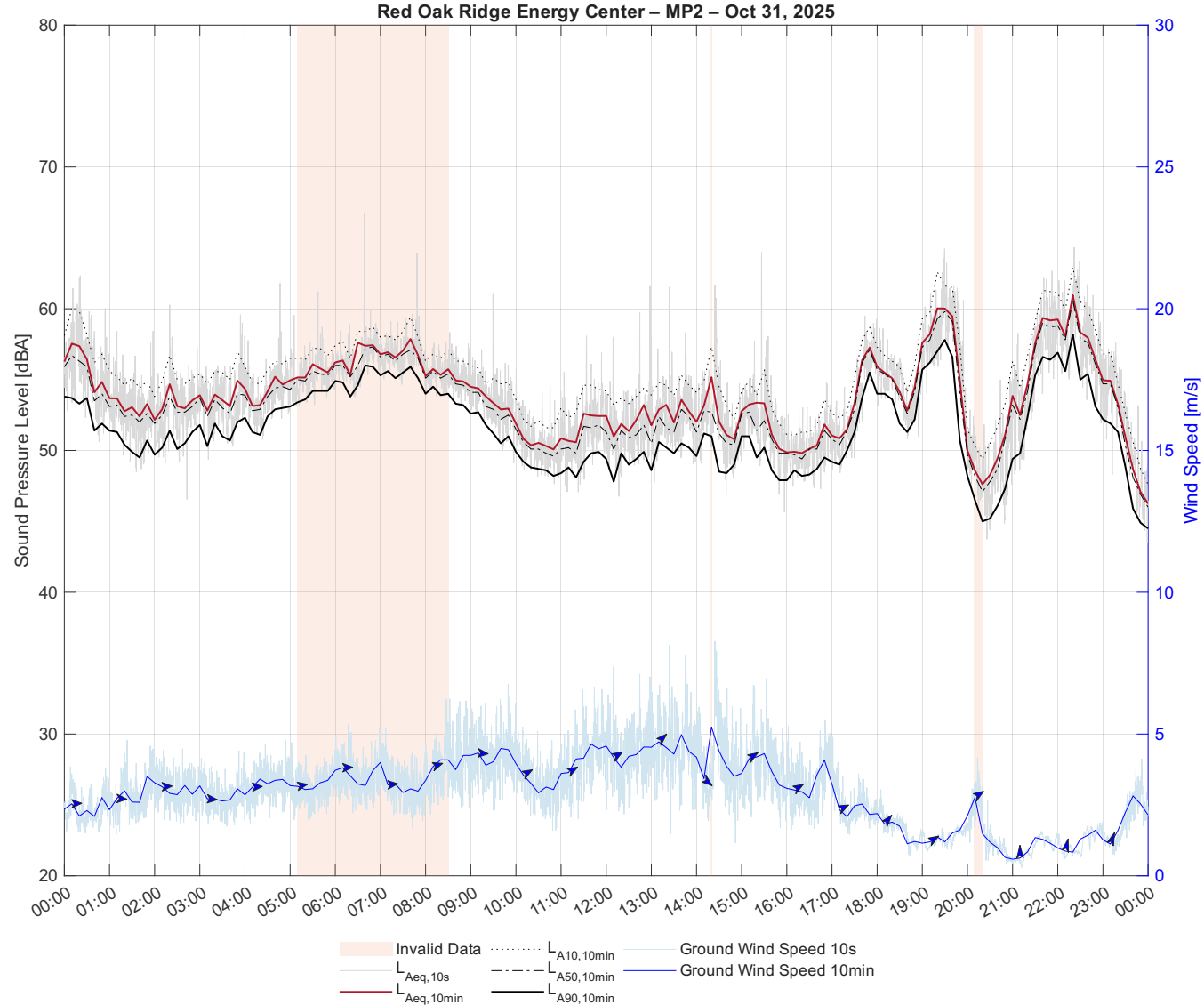
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



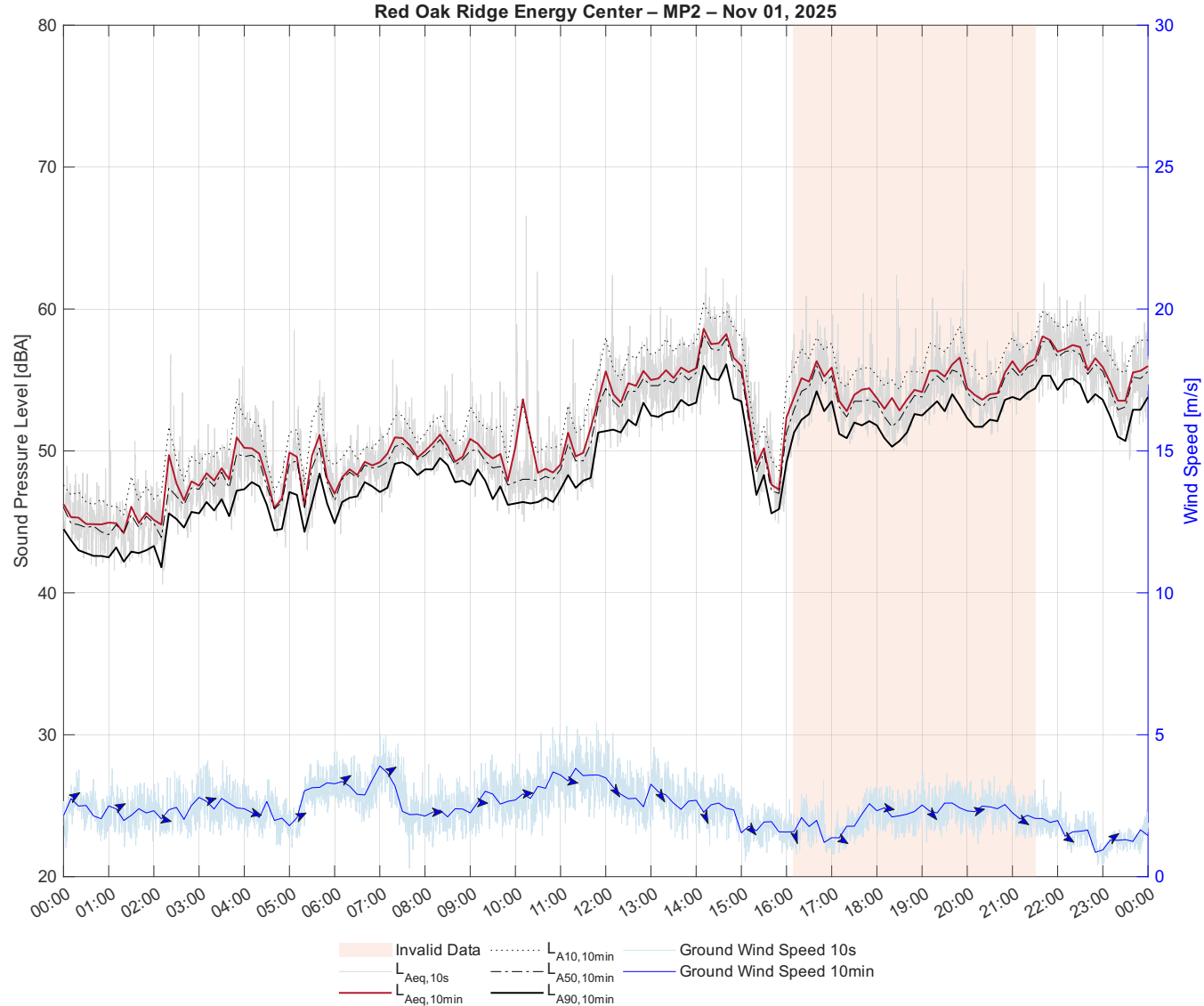
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



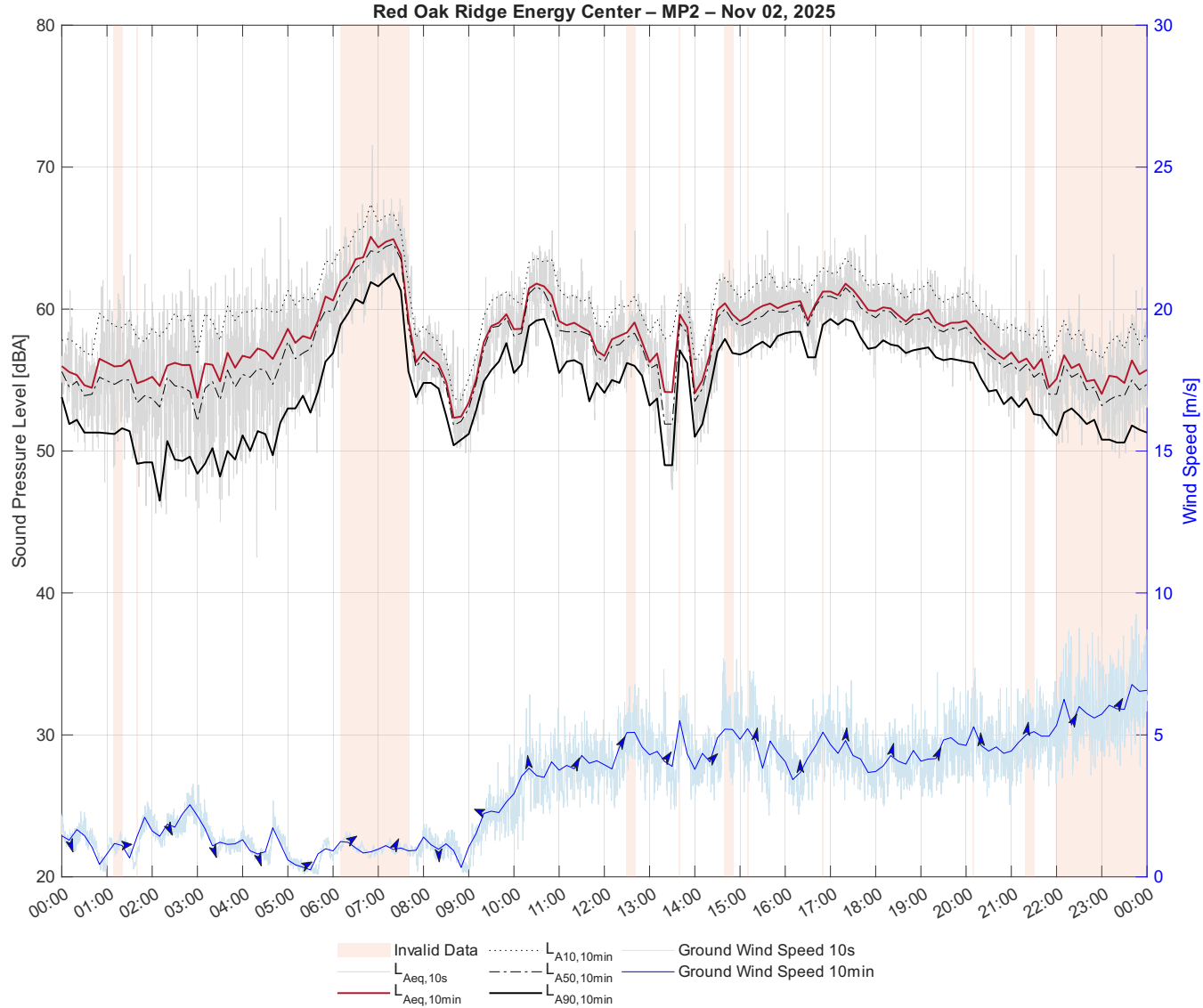
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



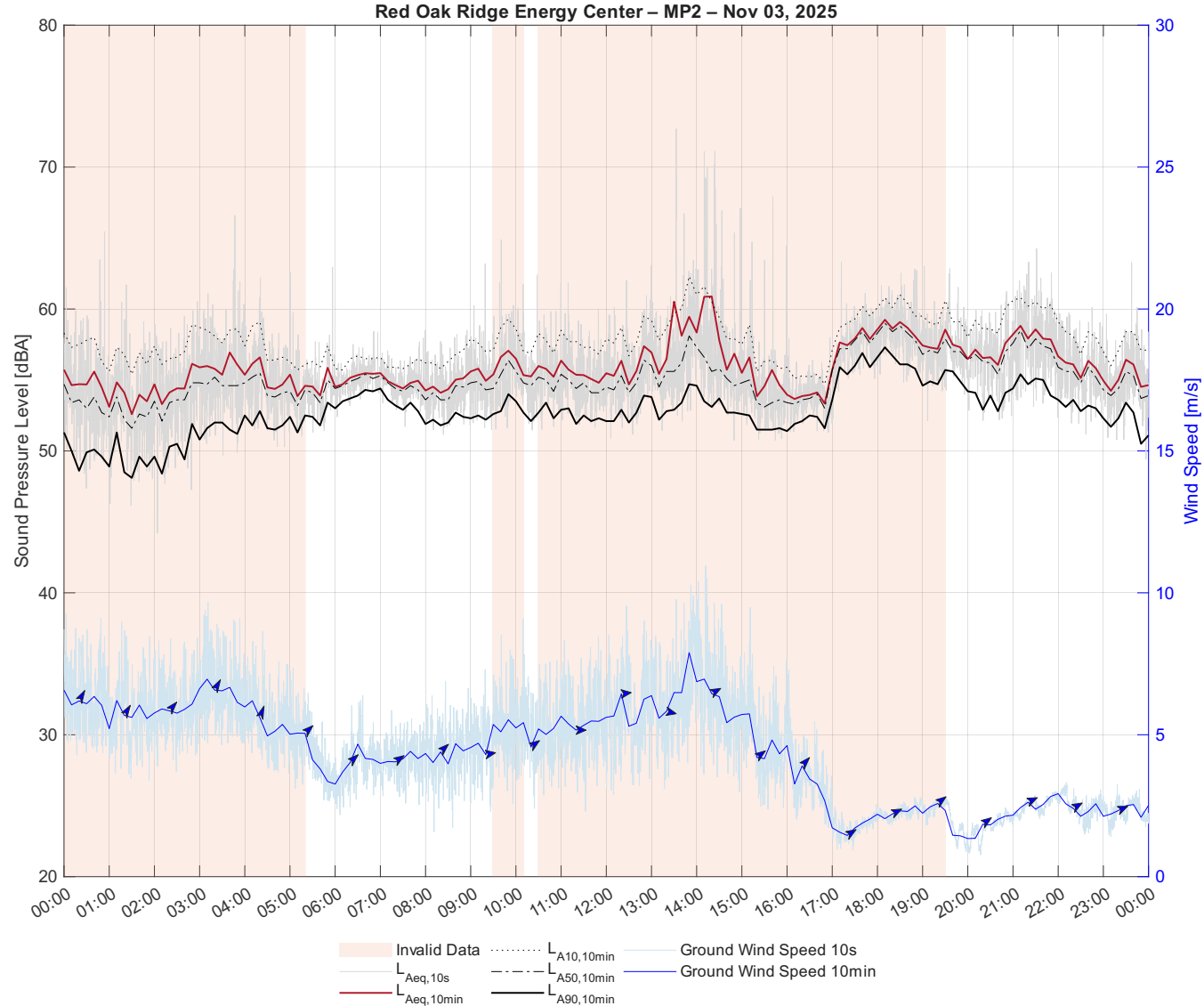
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



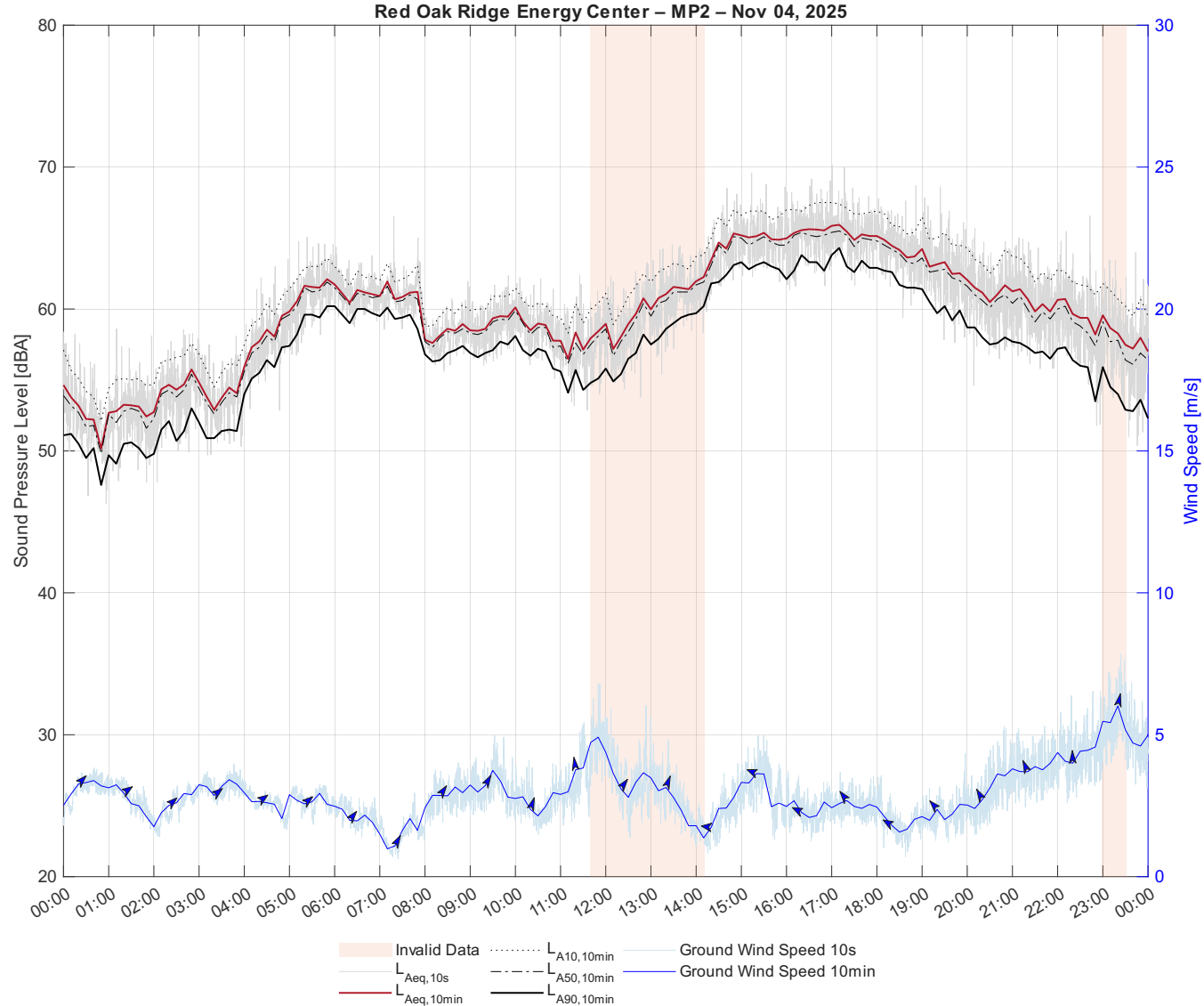
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



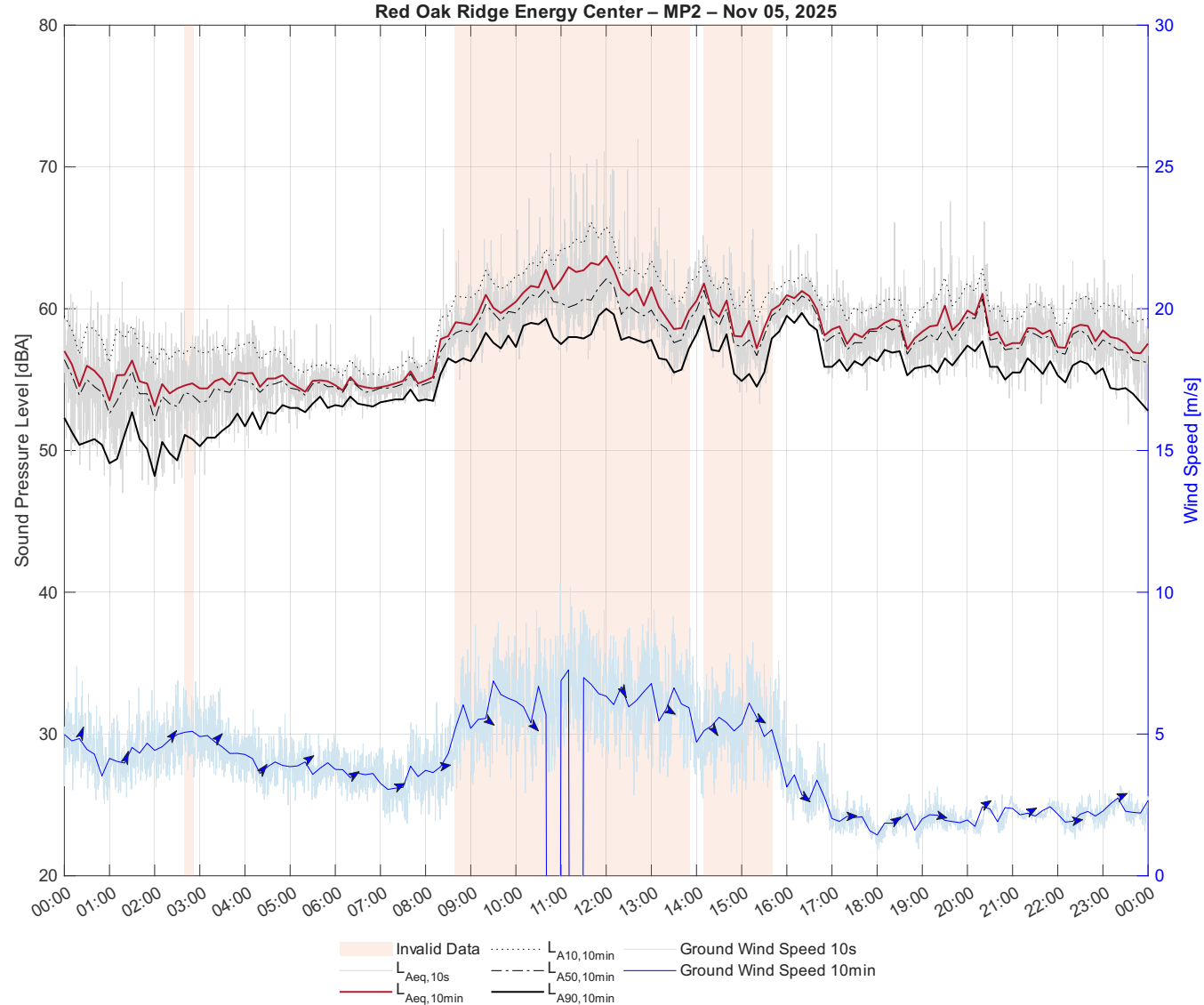
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



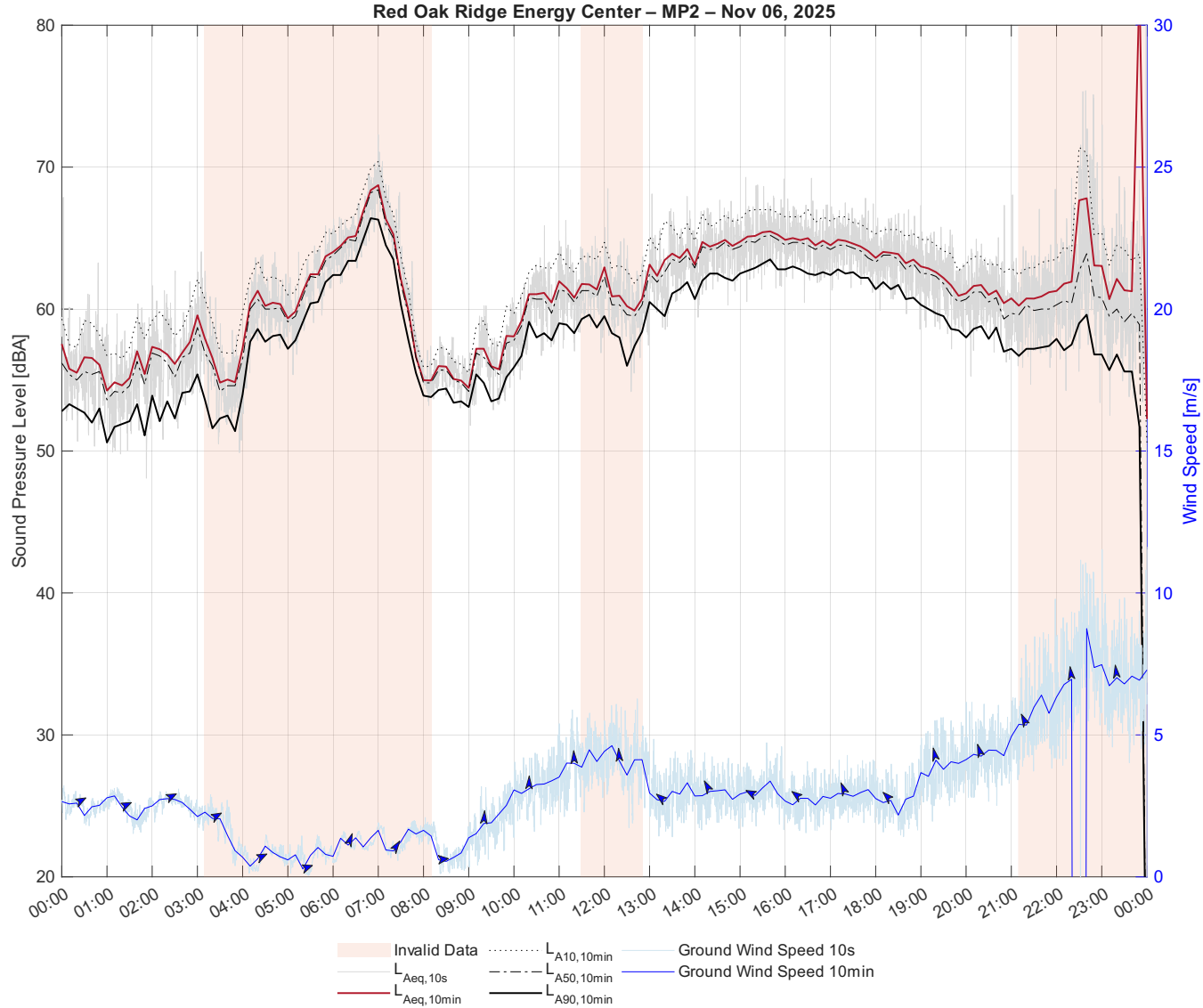
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



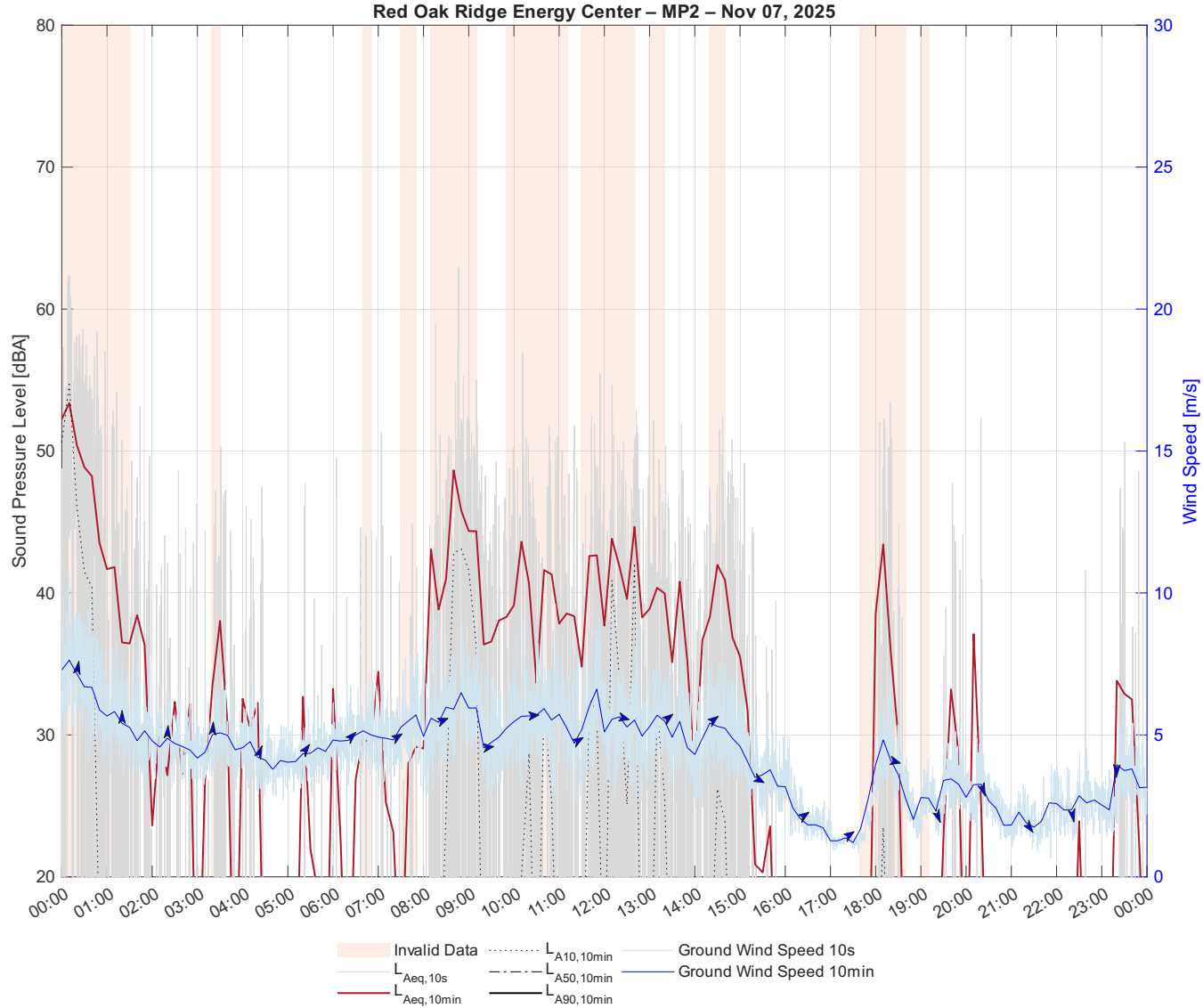
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



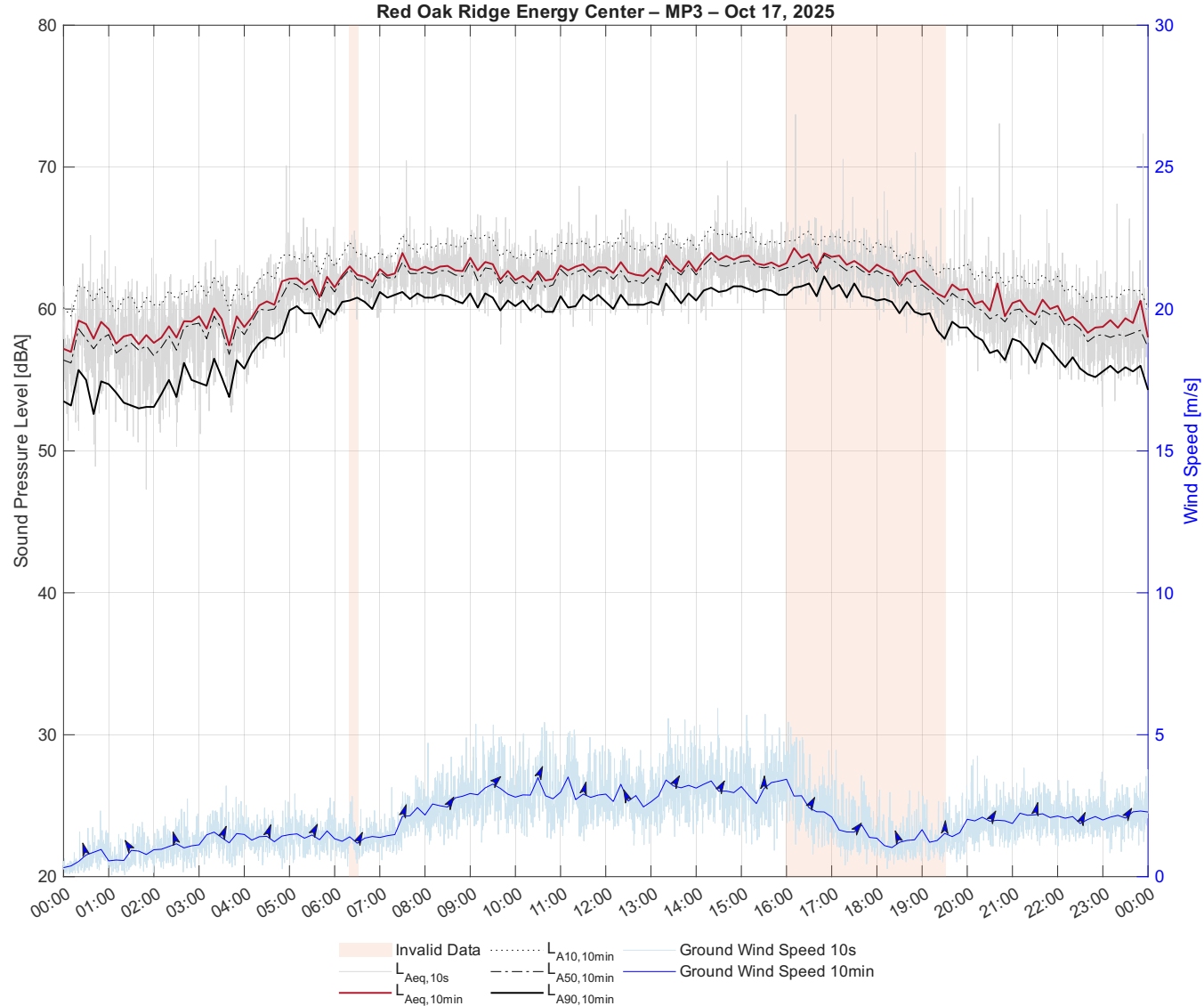
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



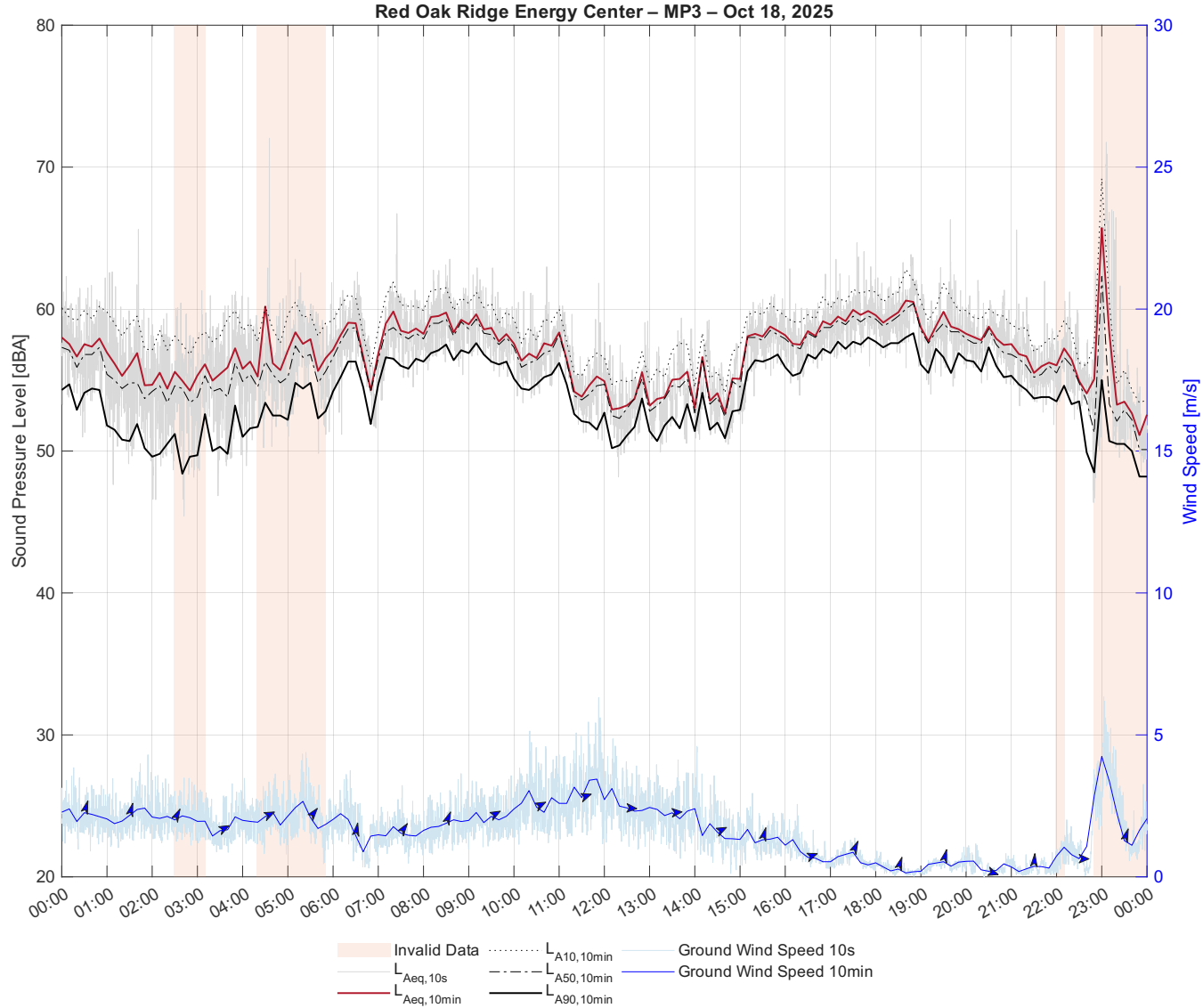
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



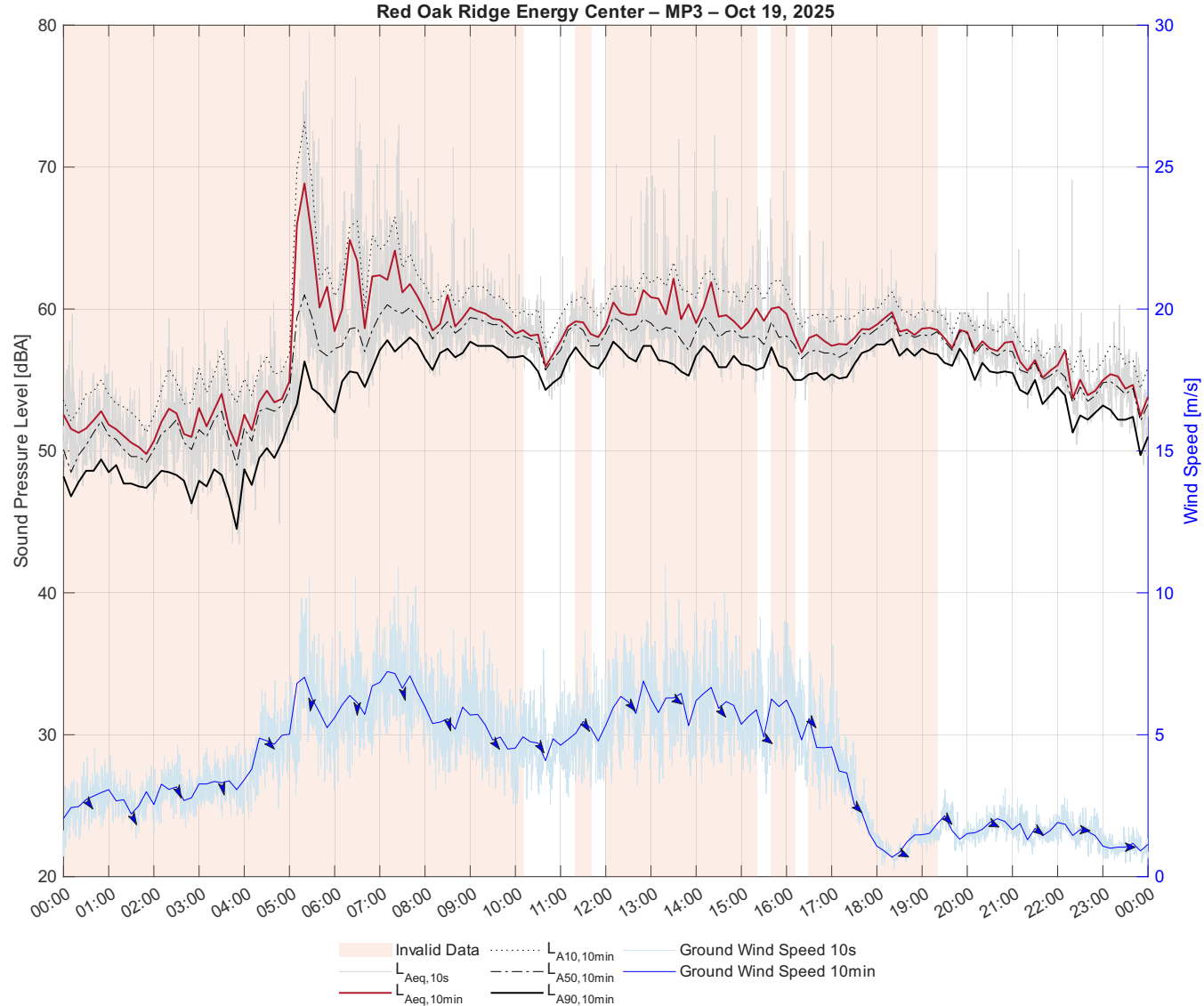
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



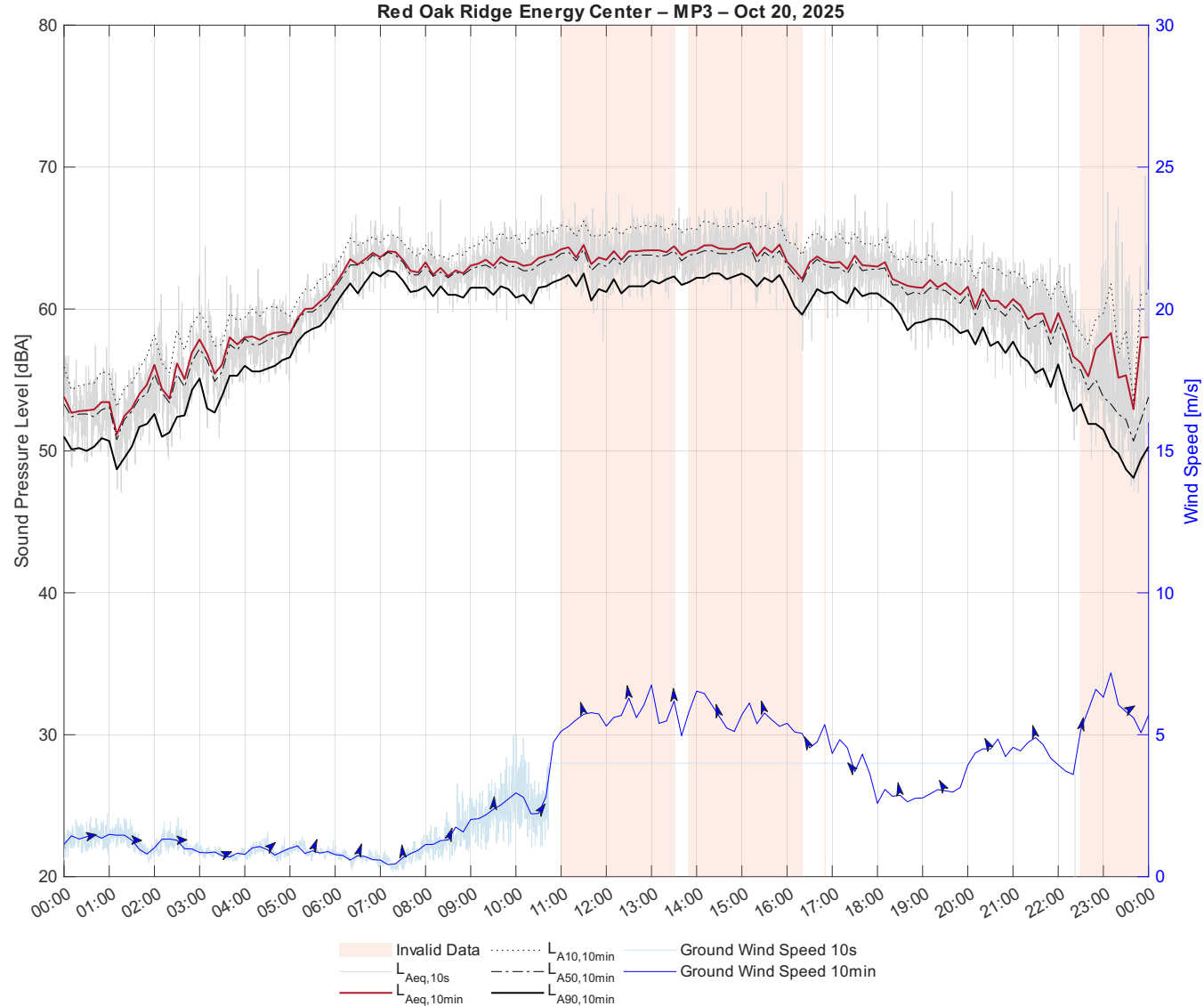
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



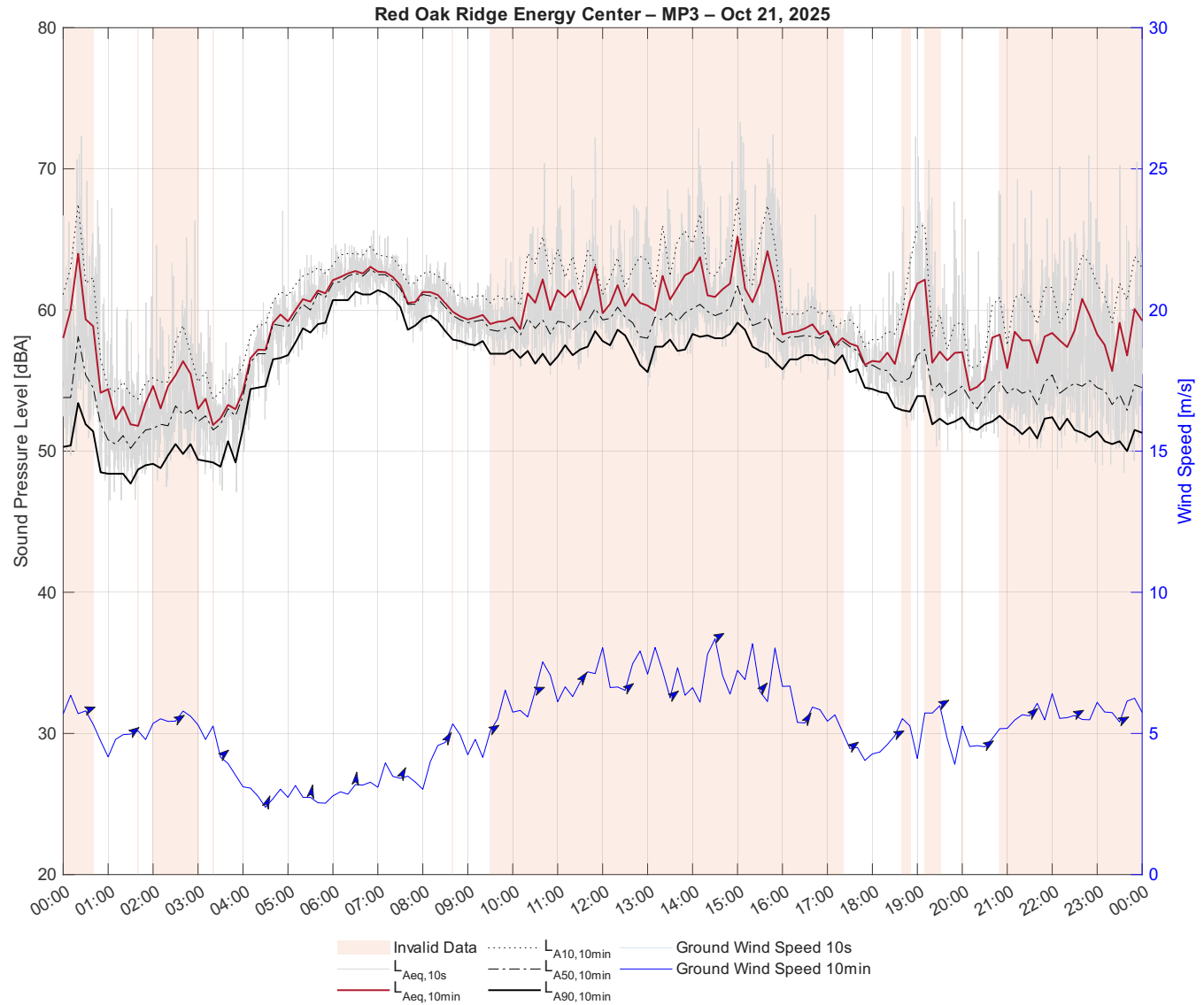
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



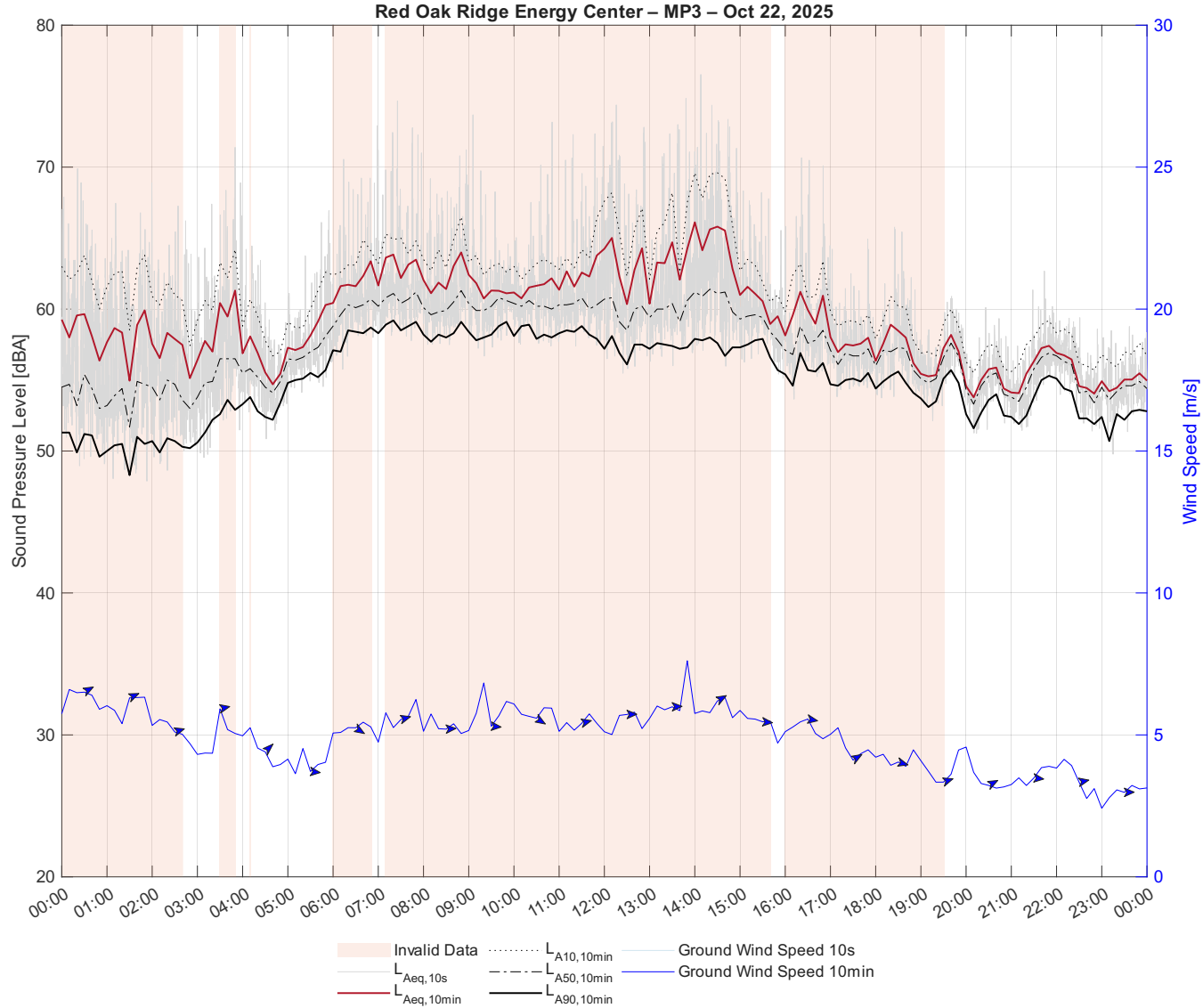
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



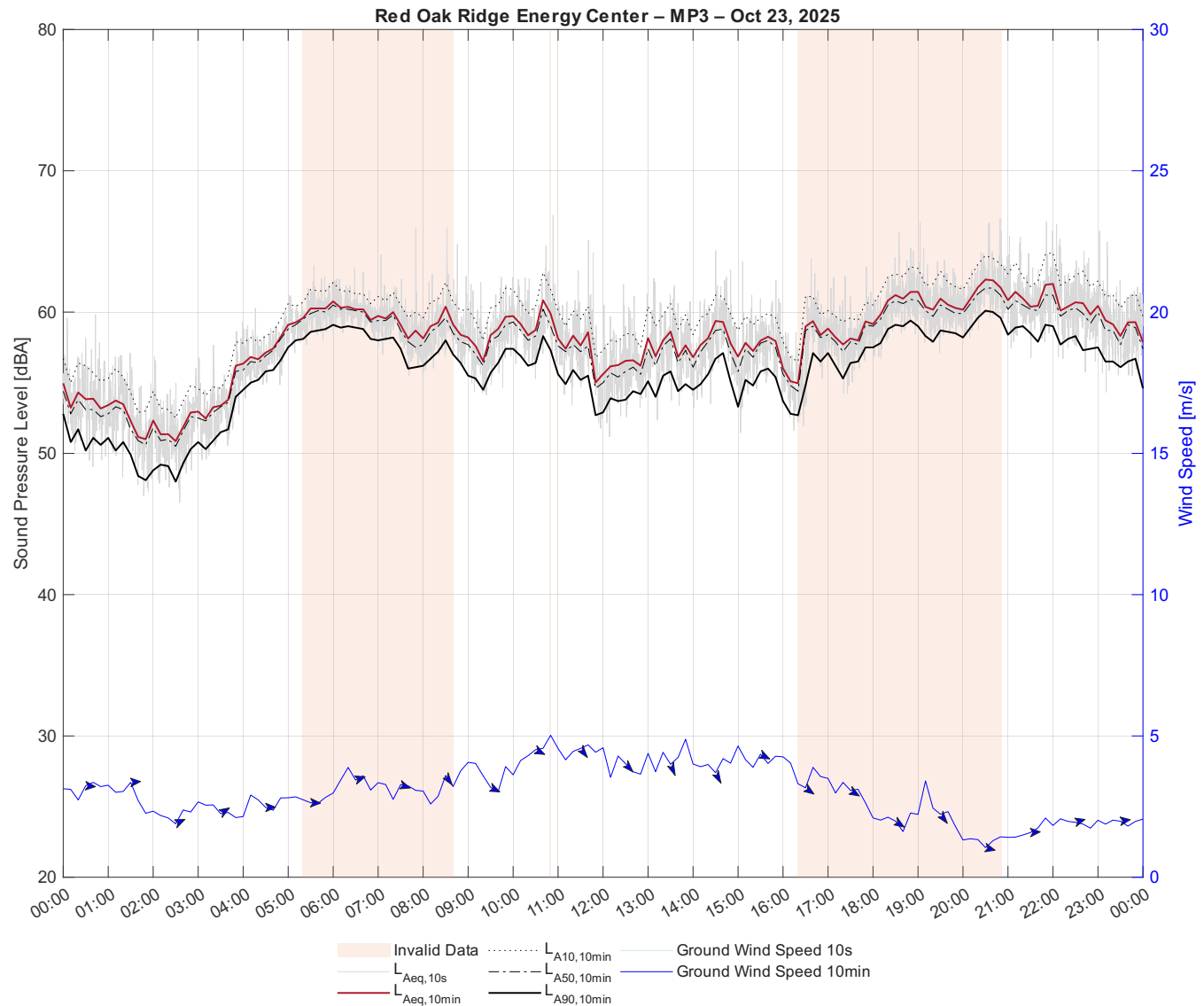
*Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center*



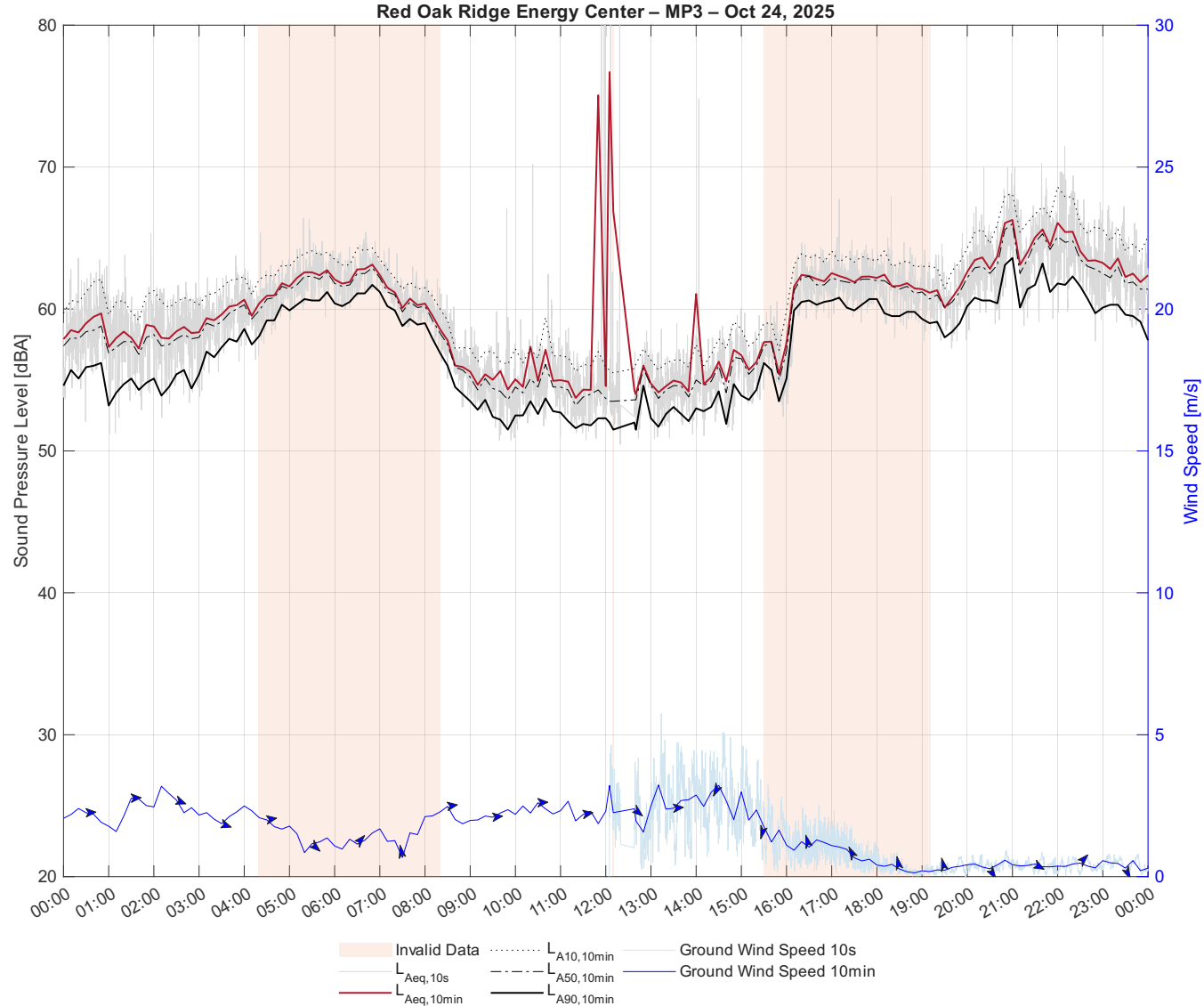
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



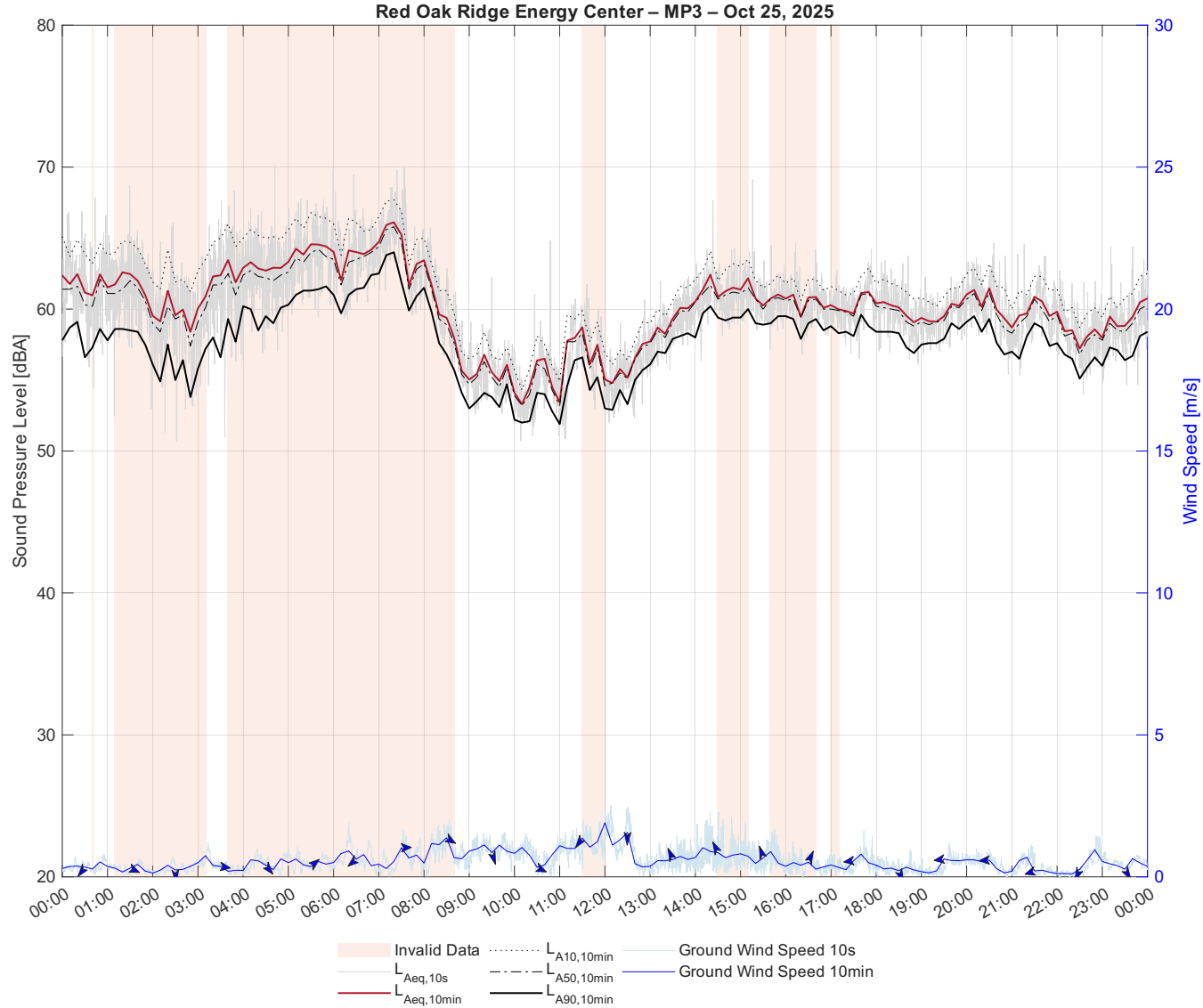
*Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center*



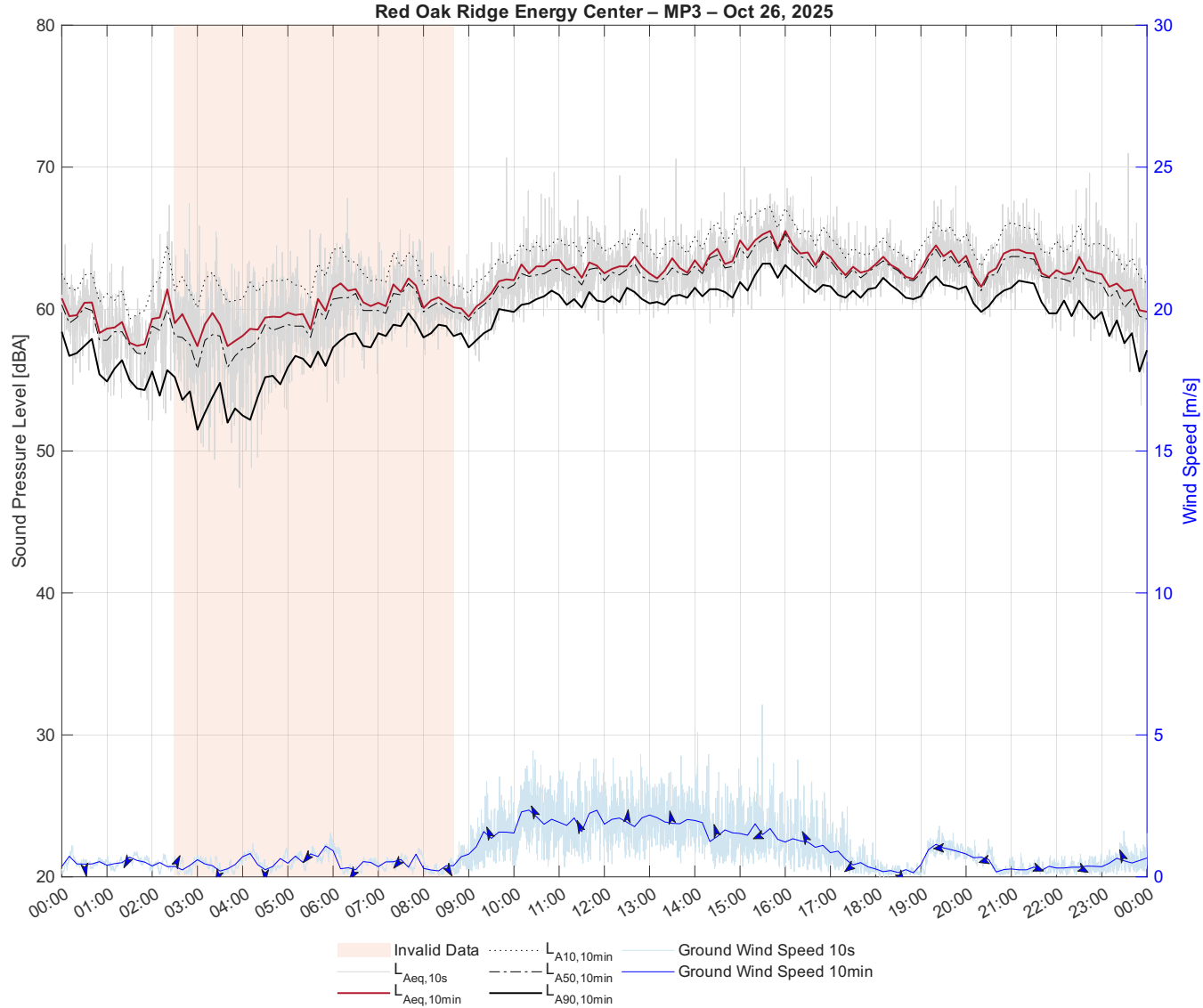
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



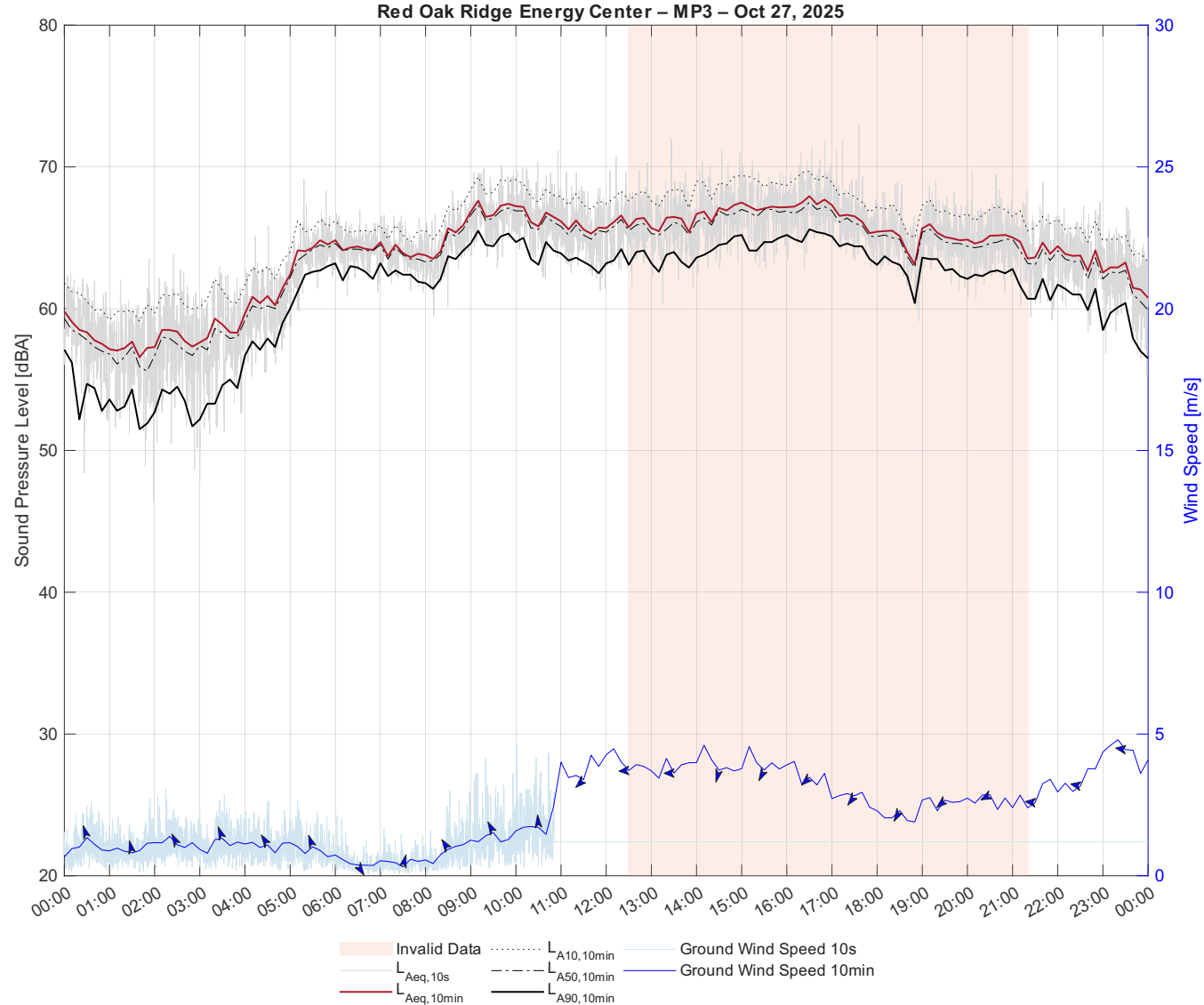
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



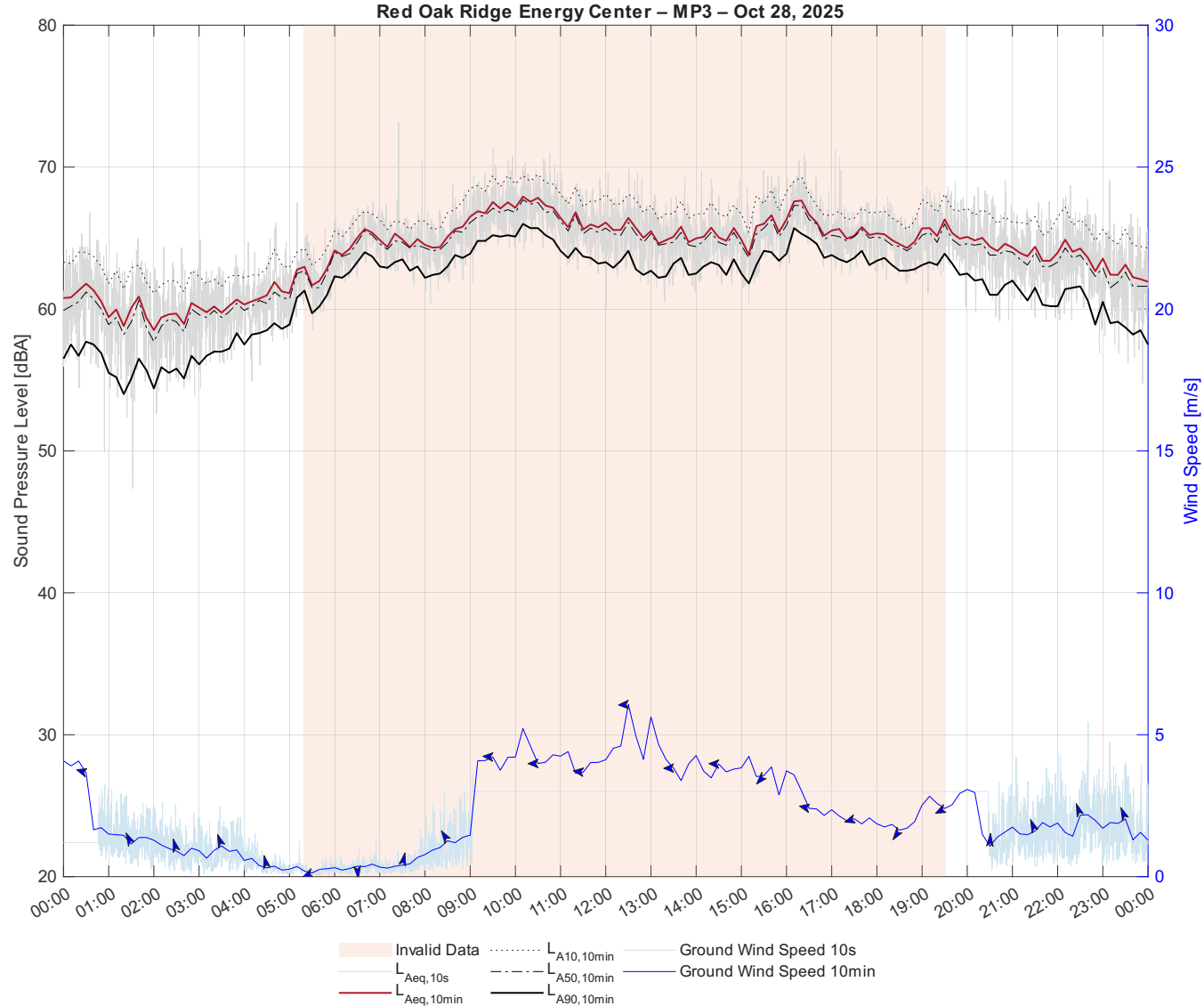
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



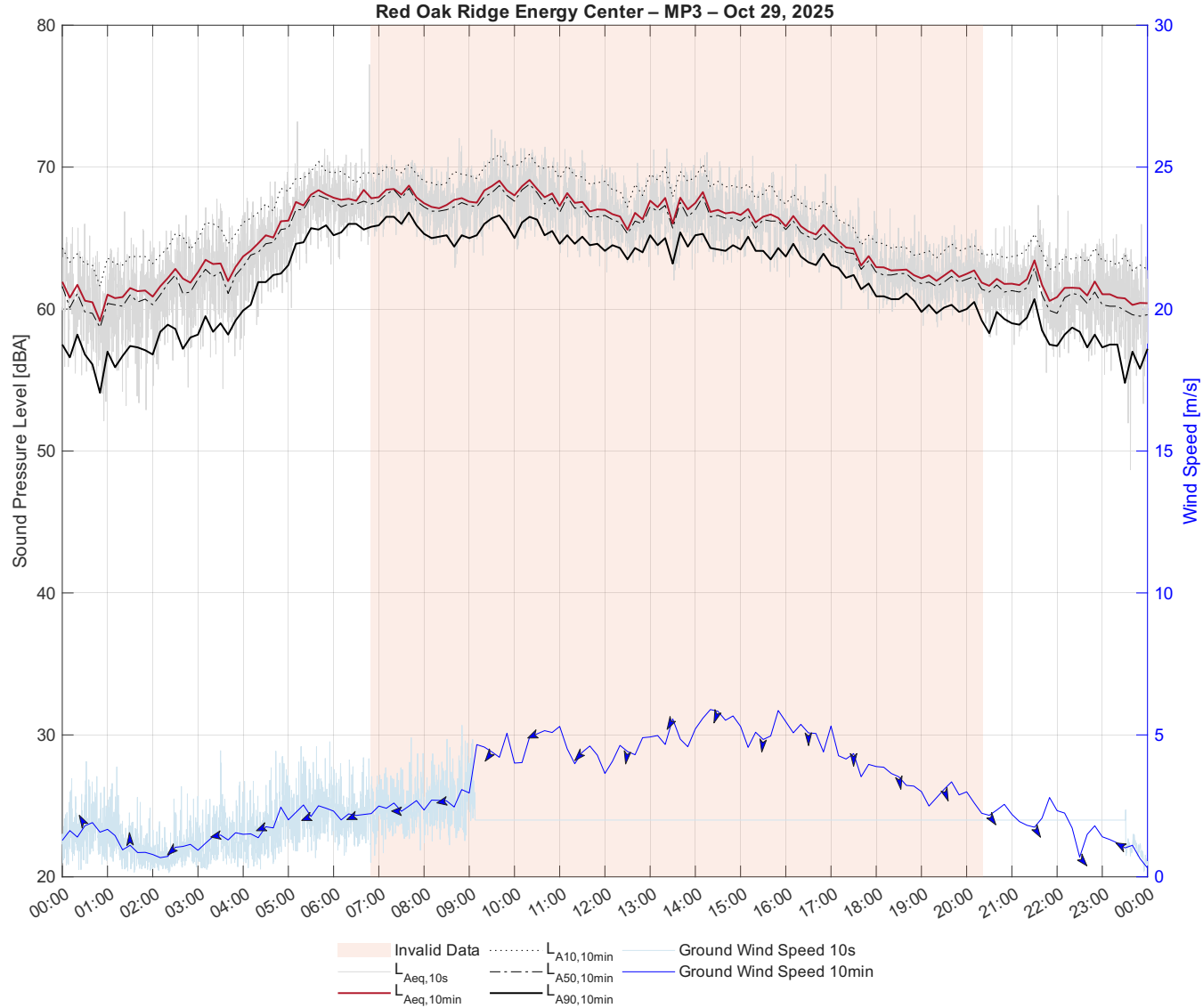
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



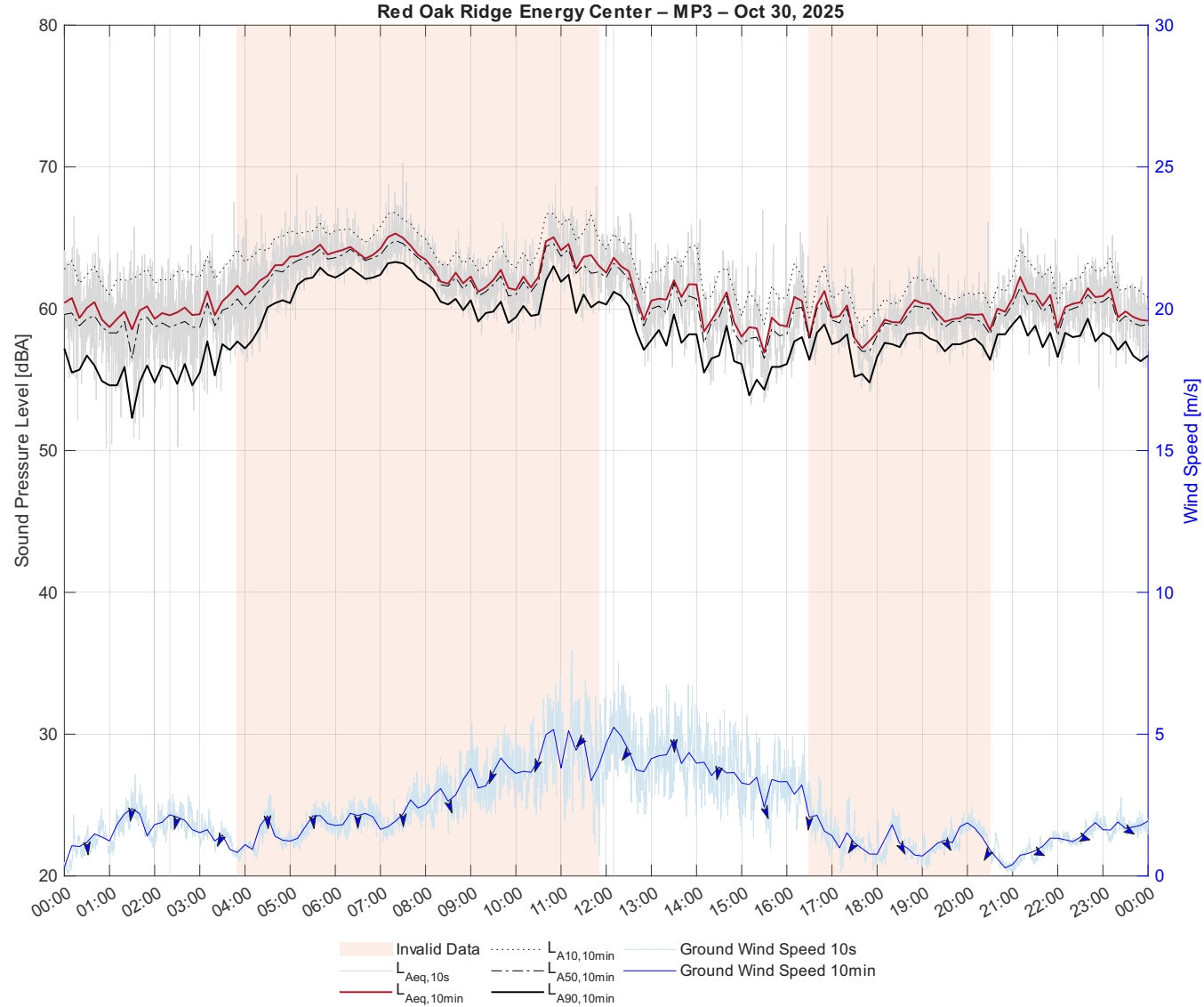
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



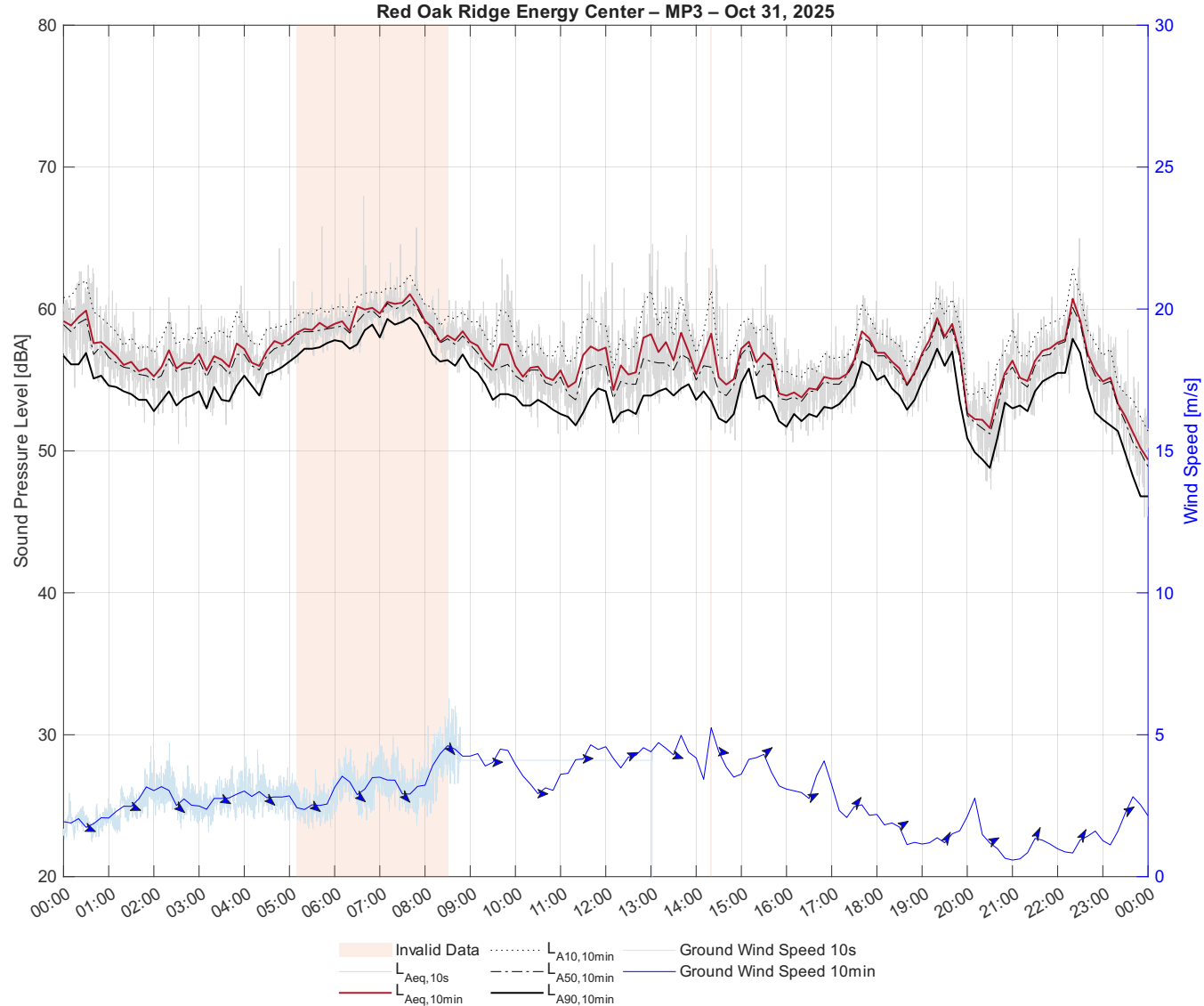
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



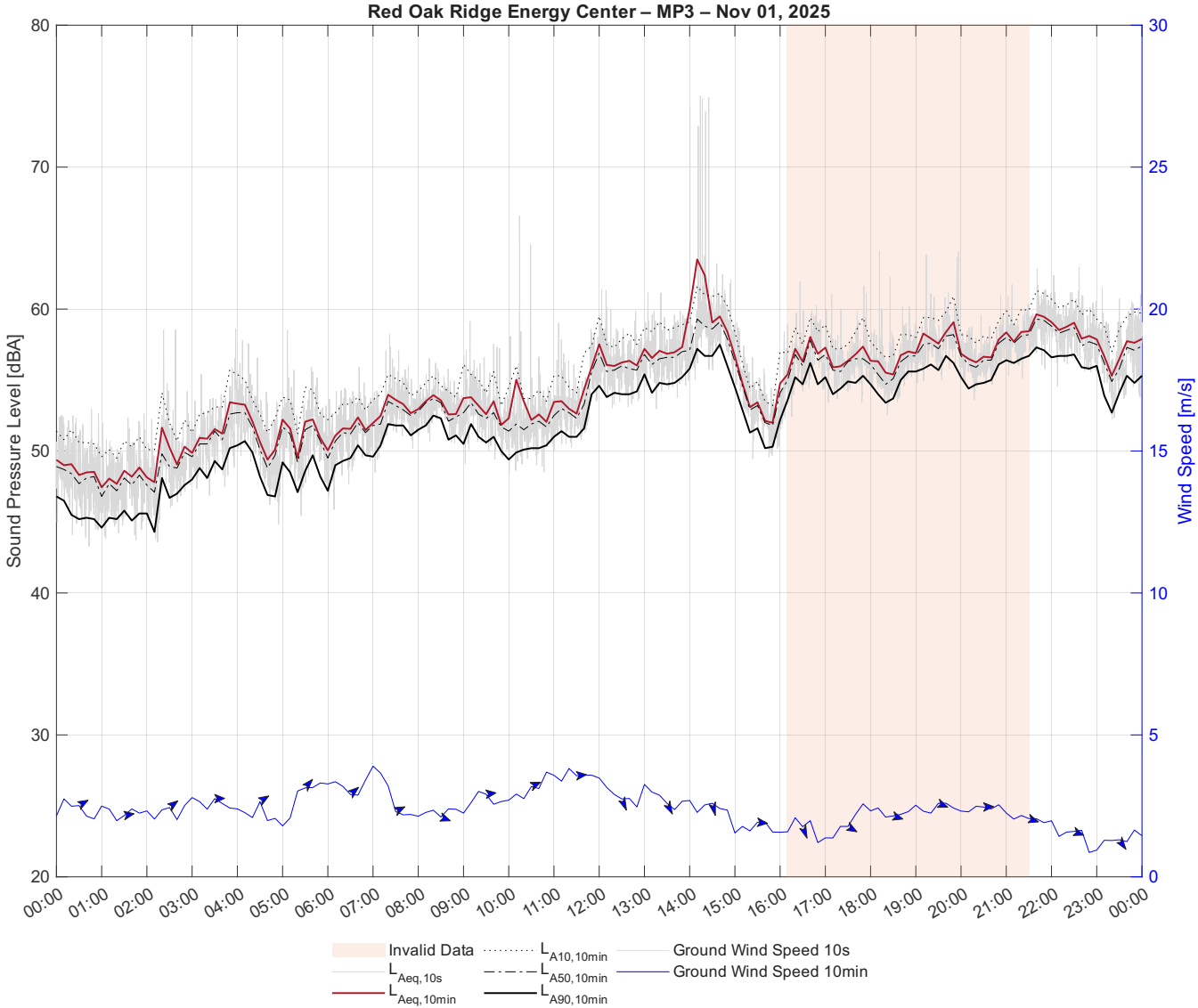
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



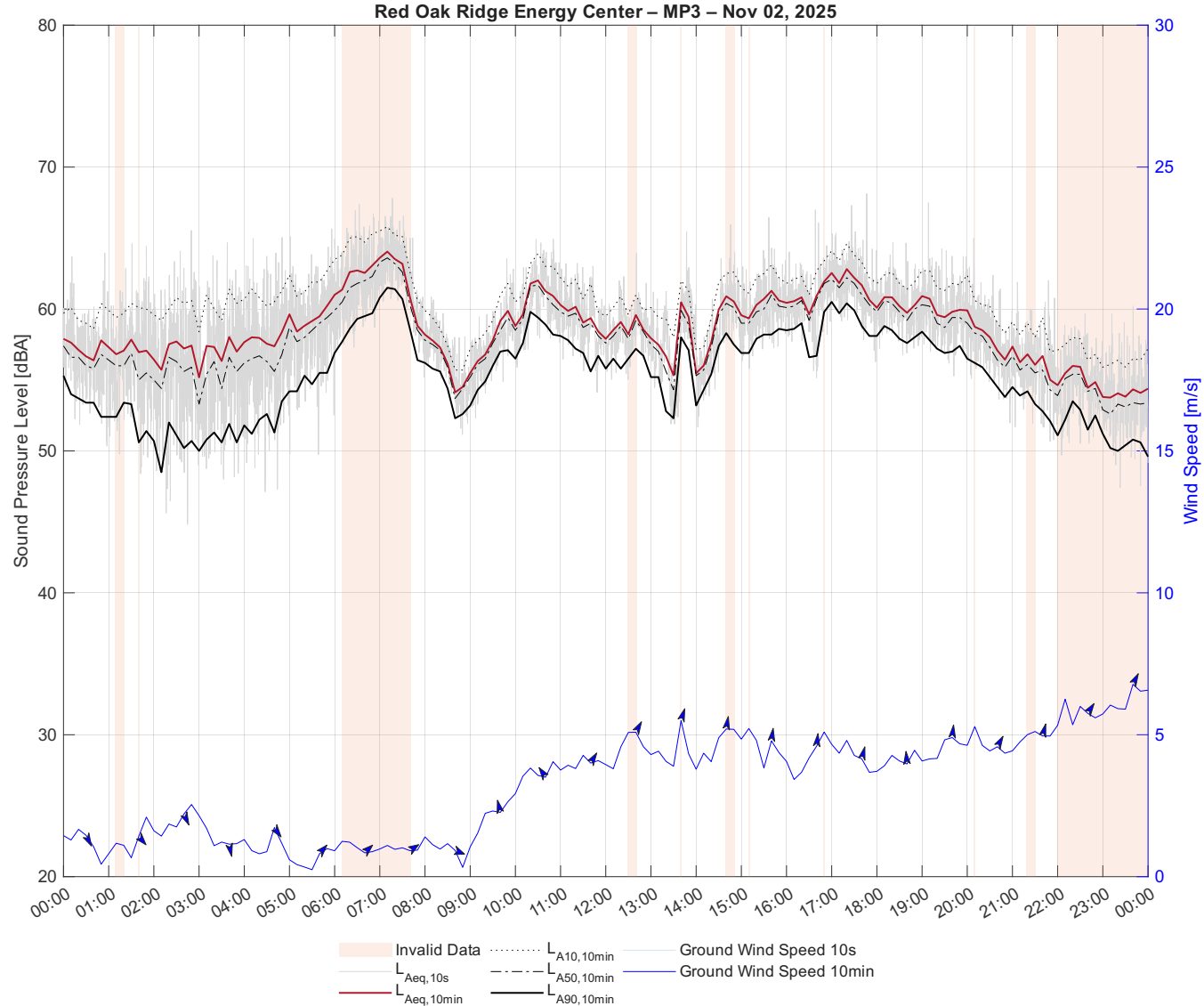
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



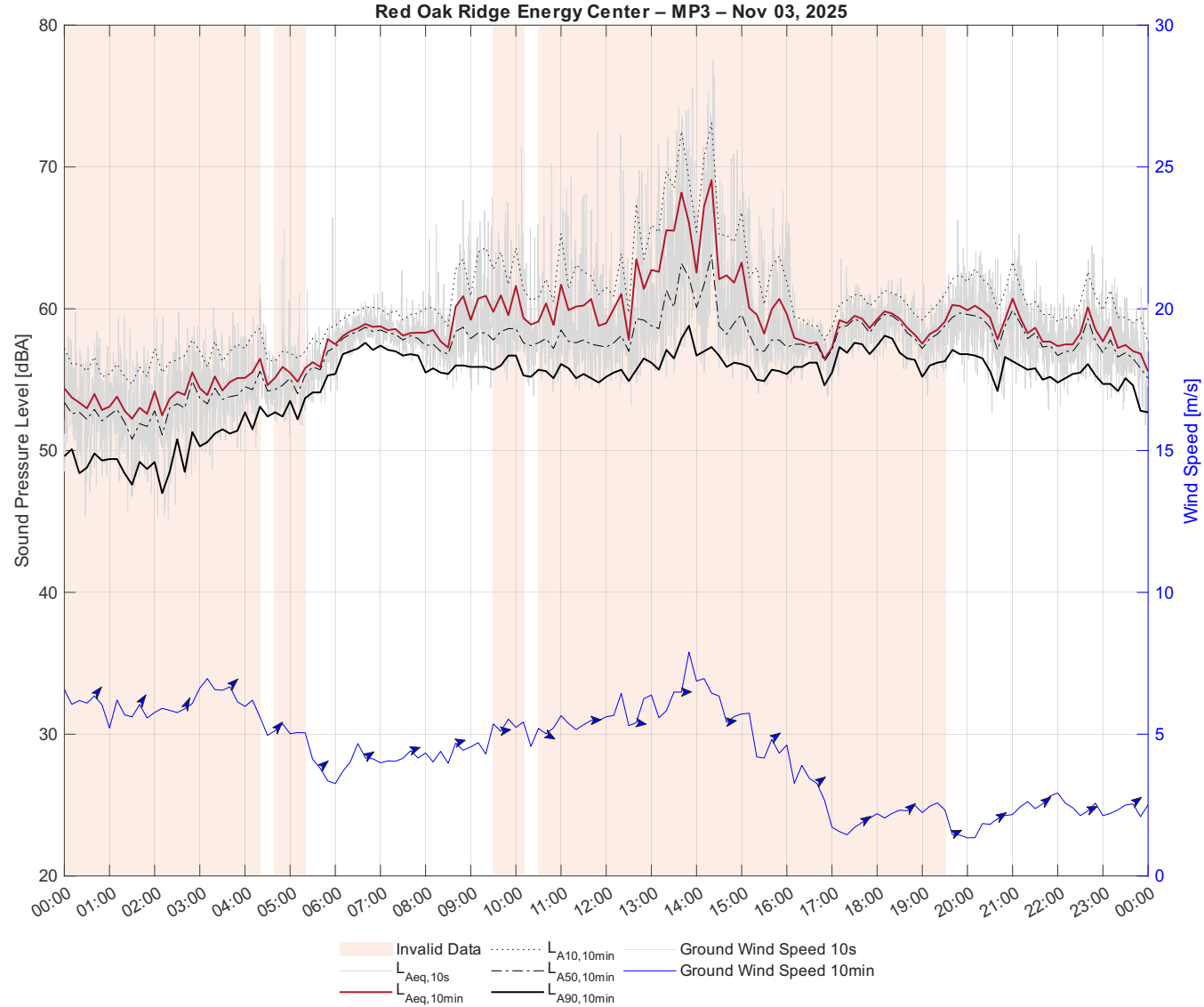
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



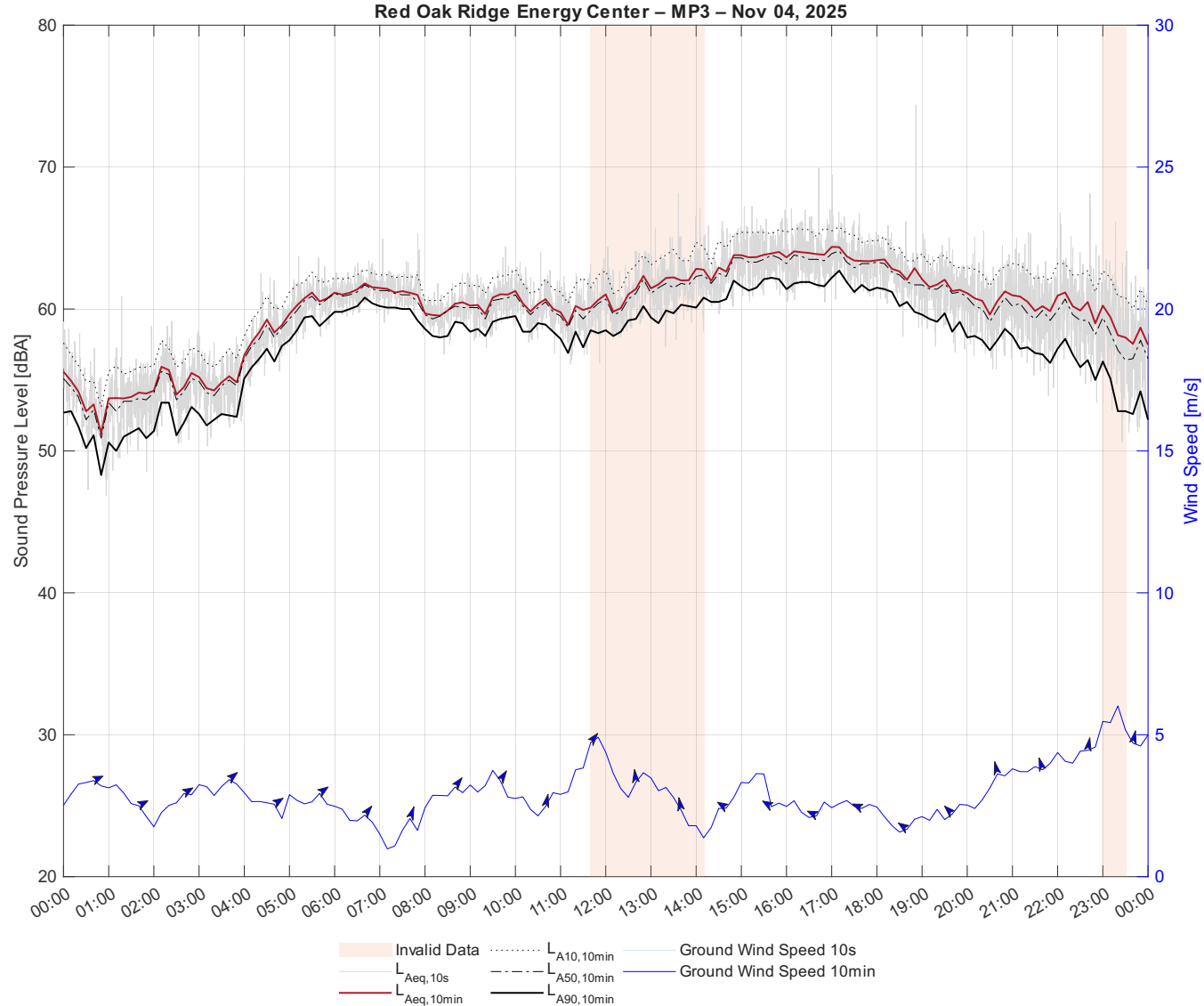
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



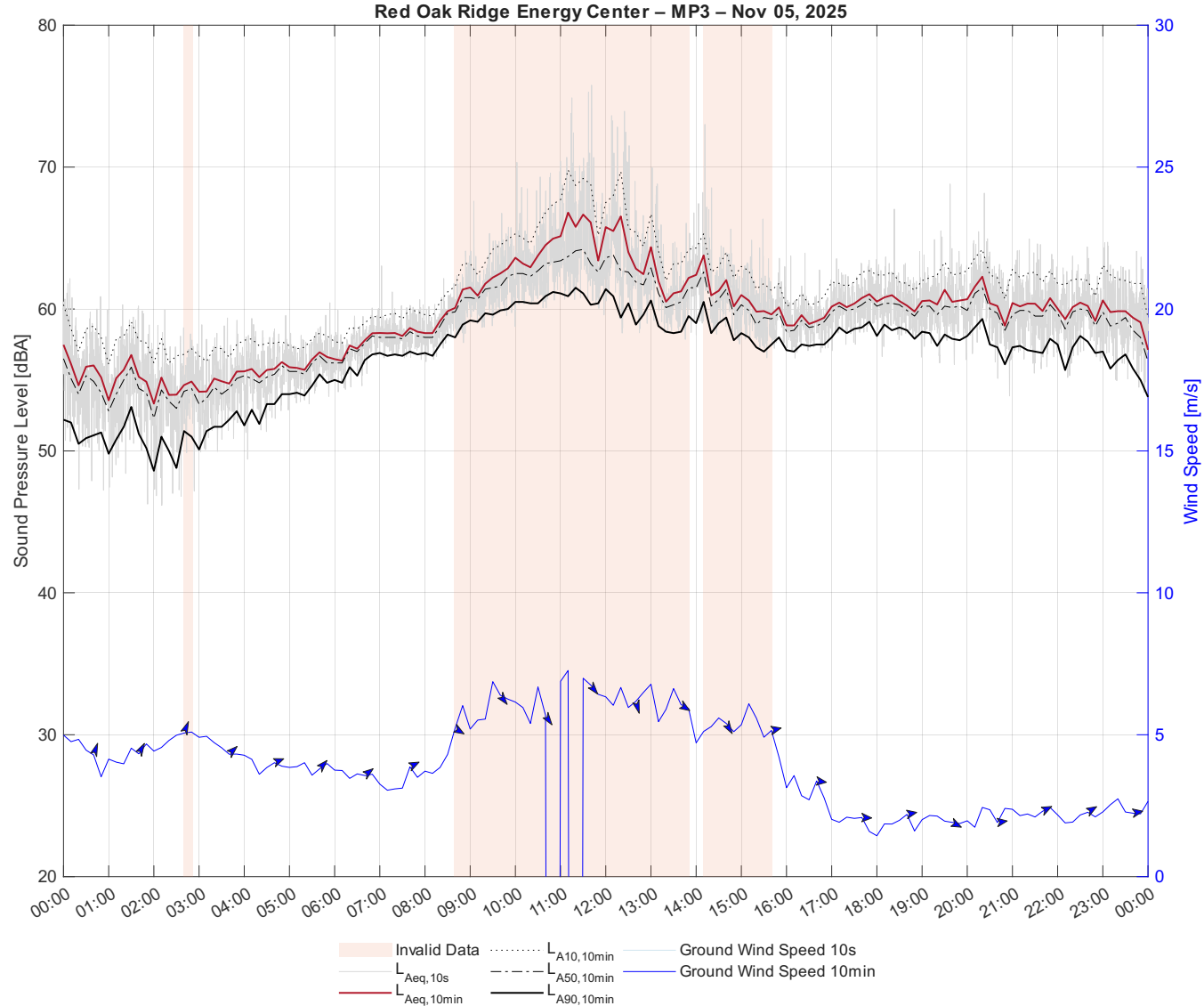
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



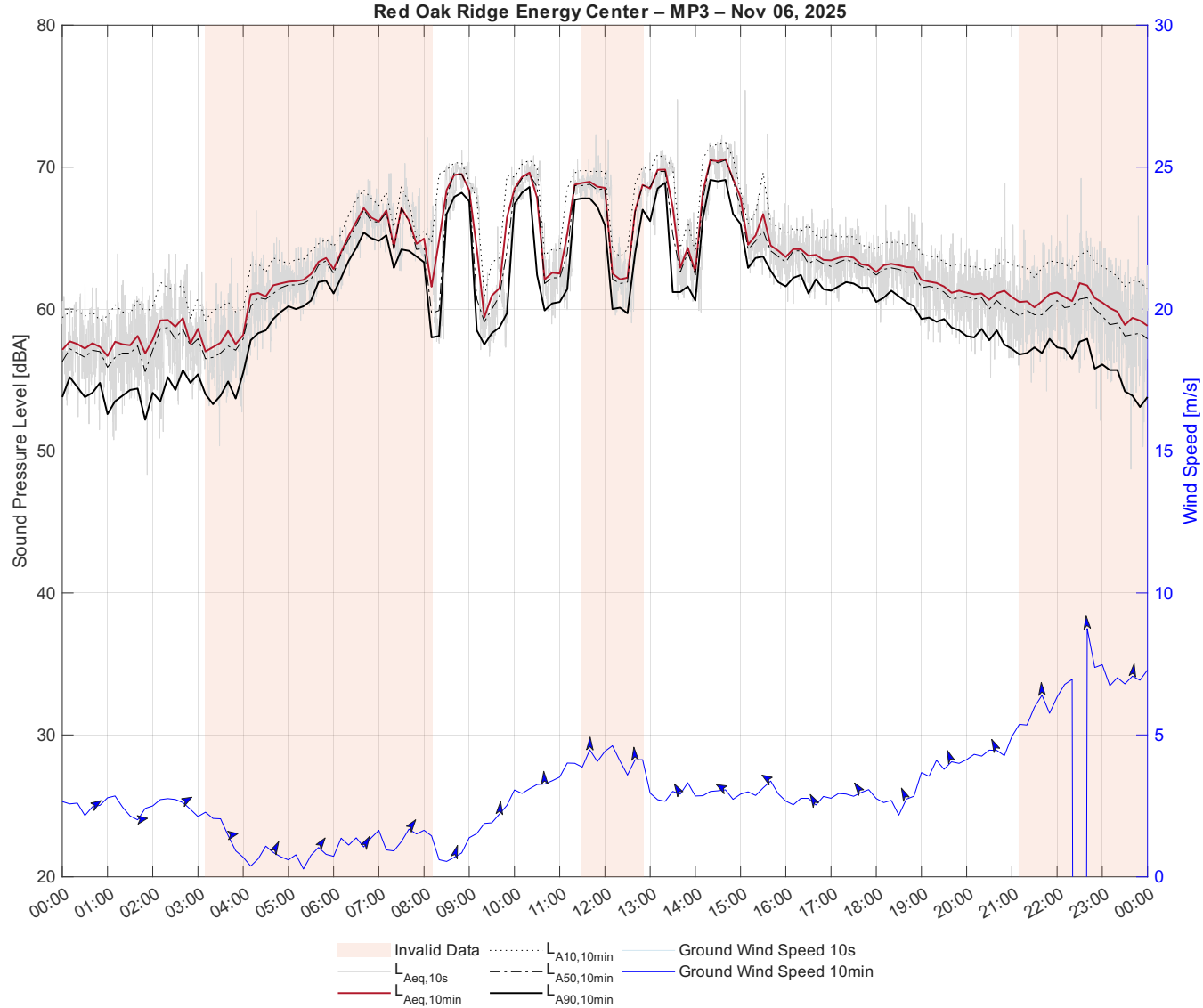
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



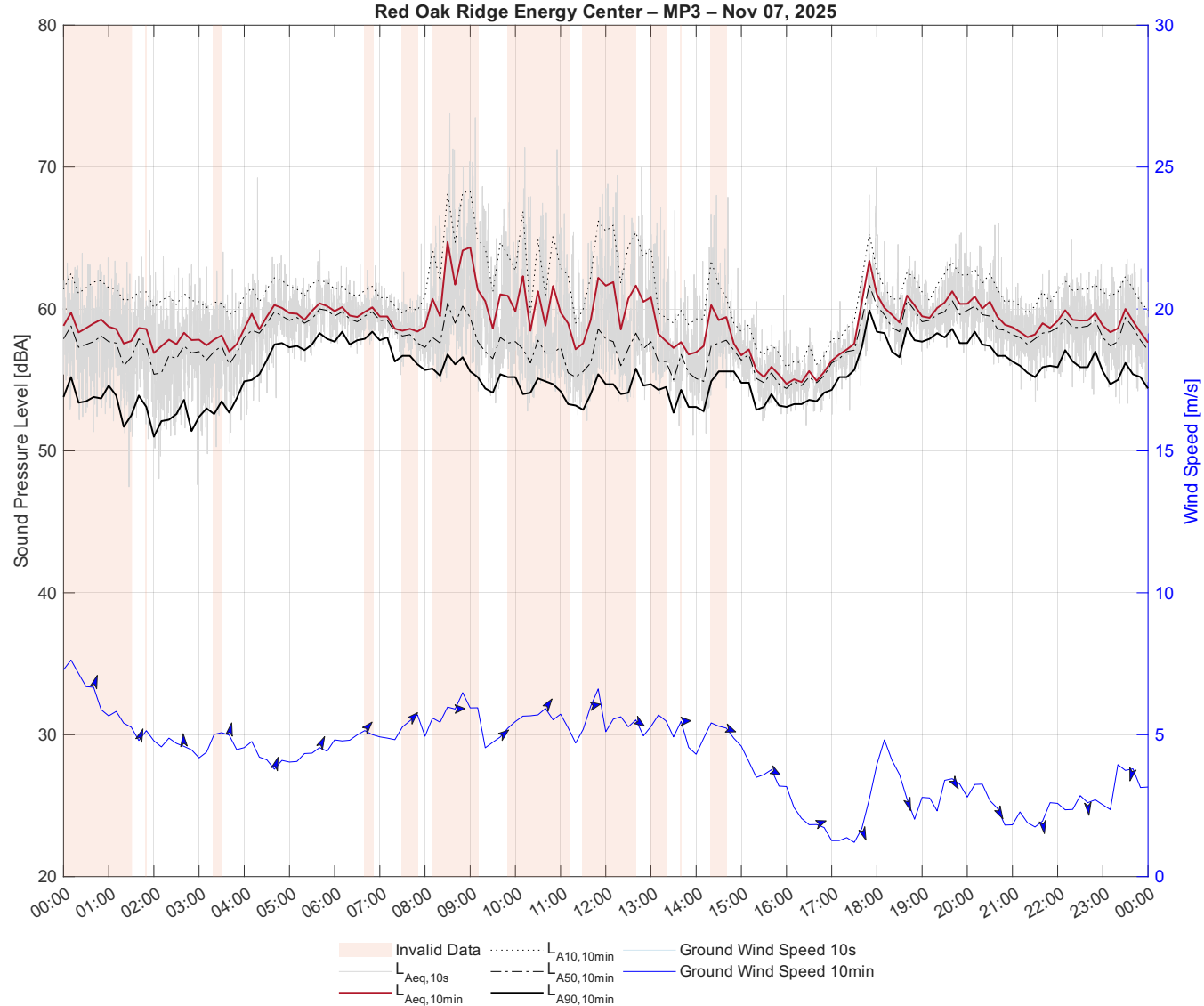
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



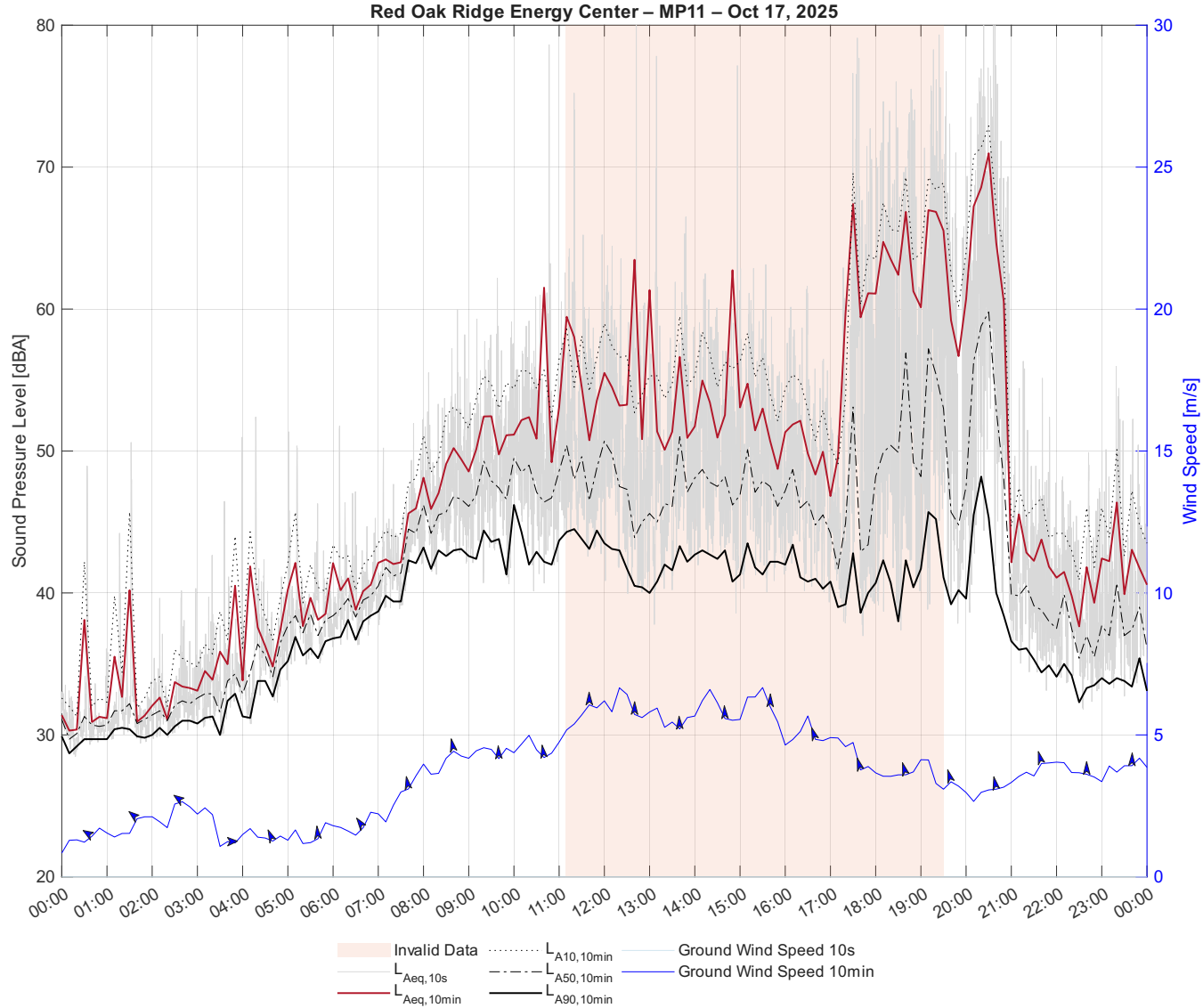
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



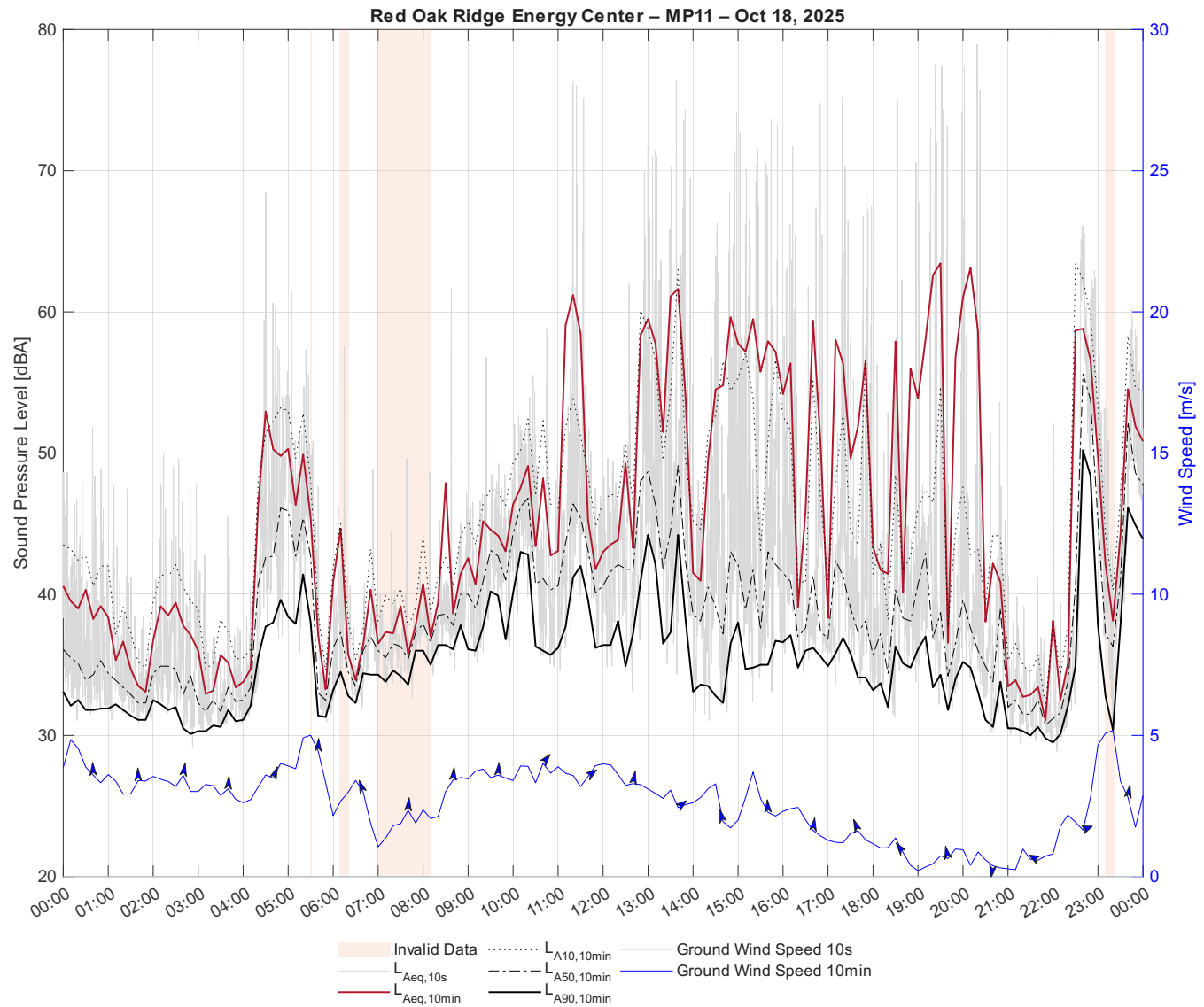
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



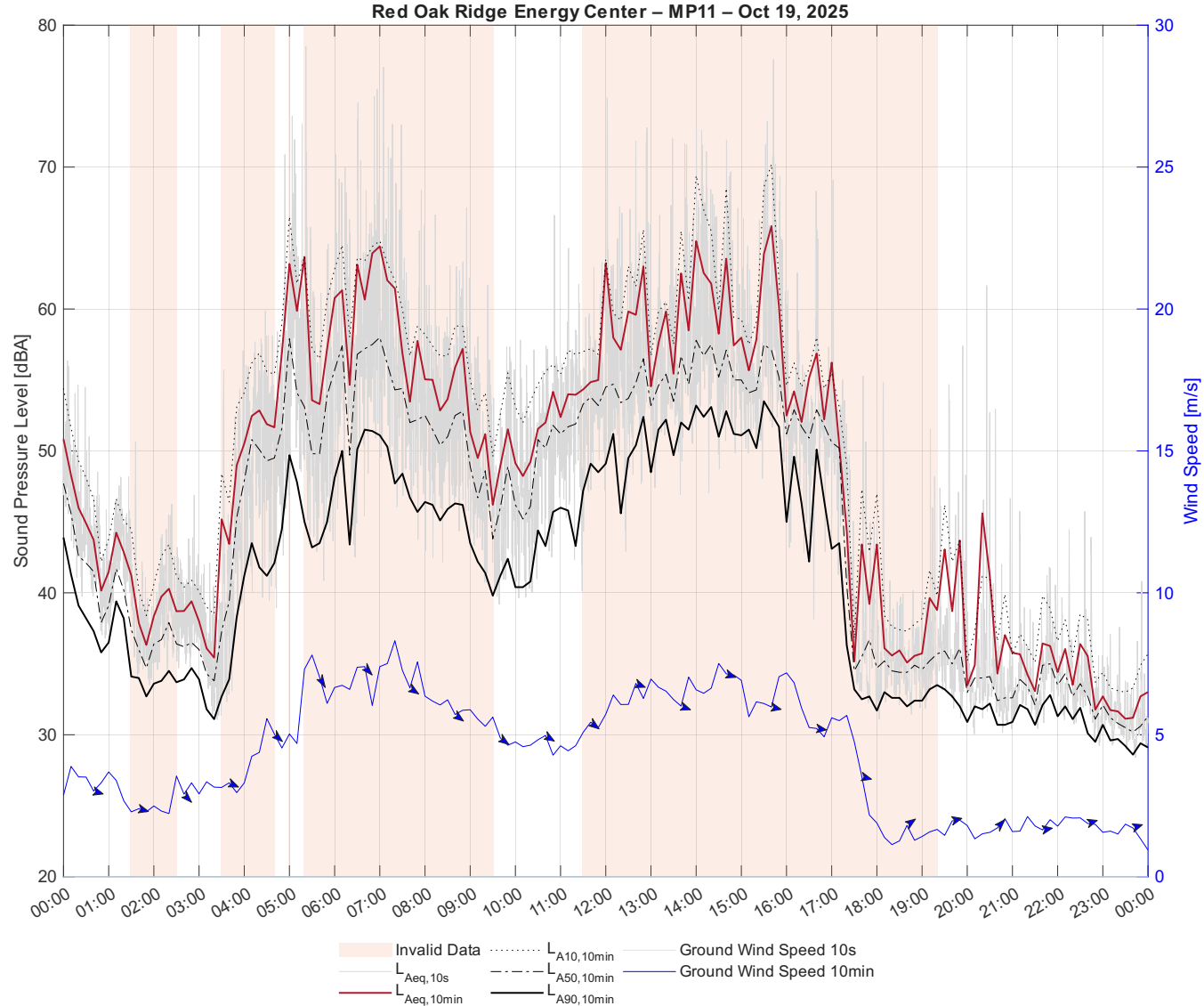
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



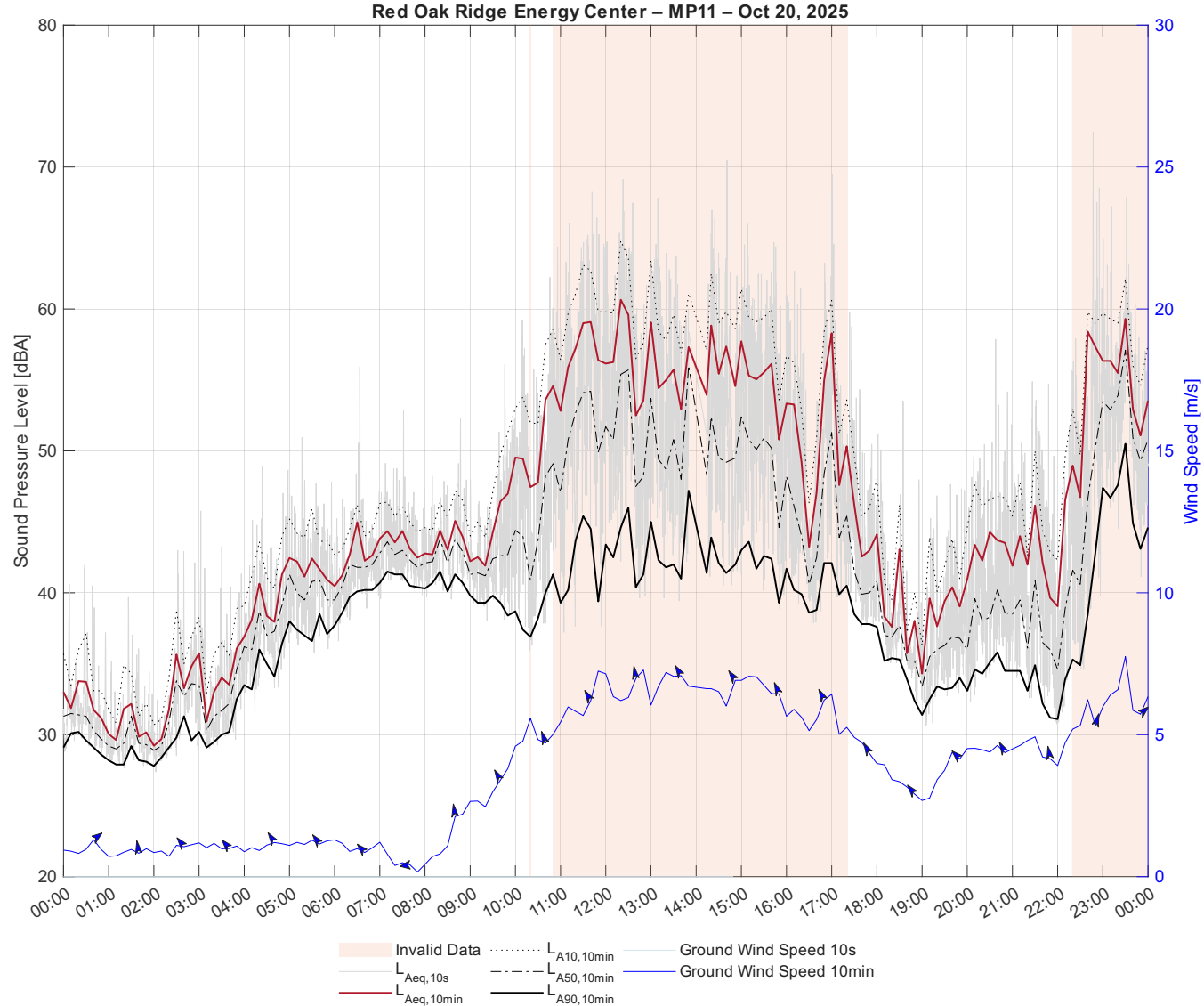
*Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center*



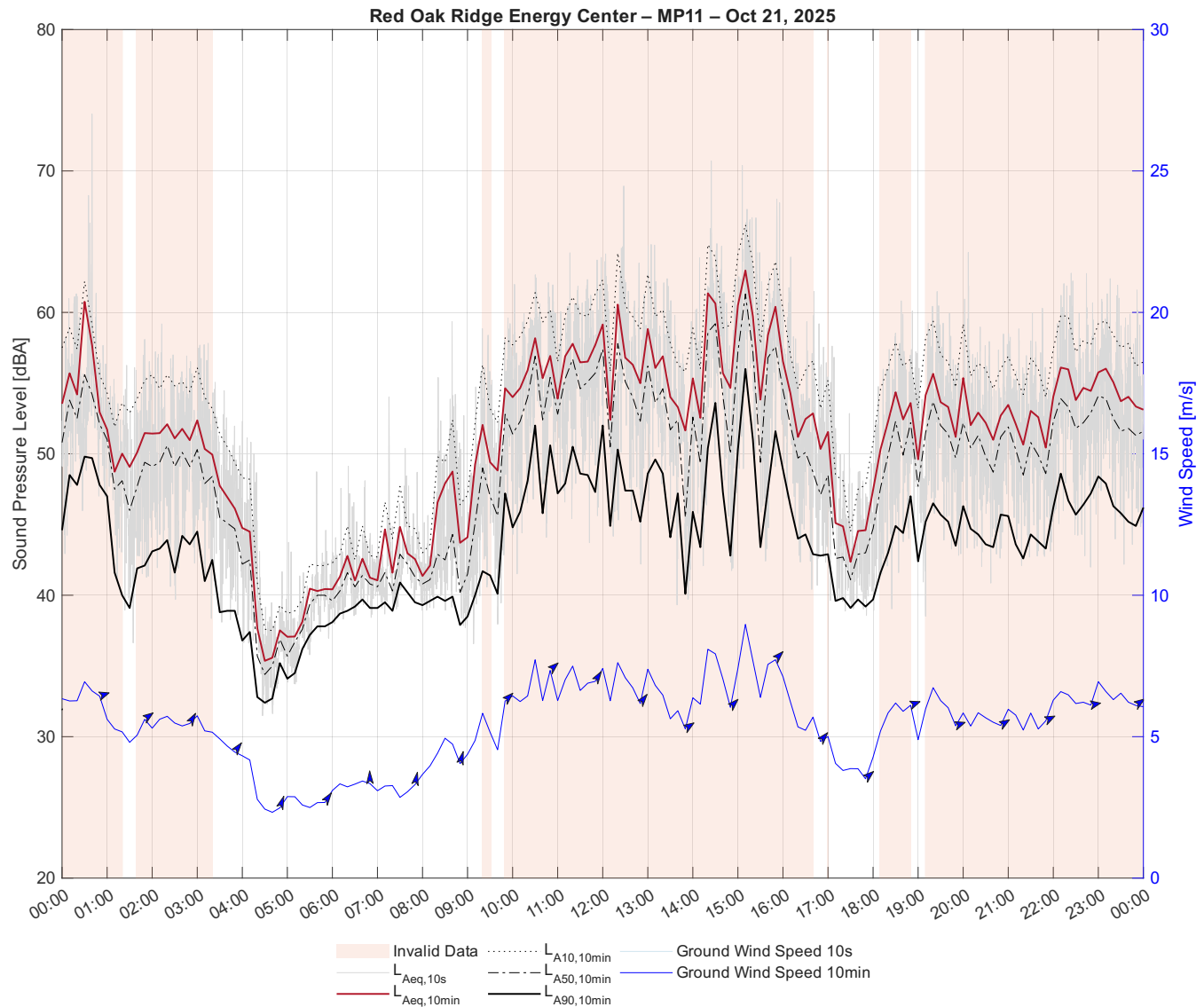
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



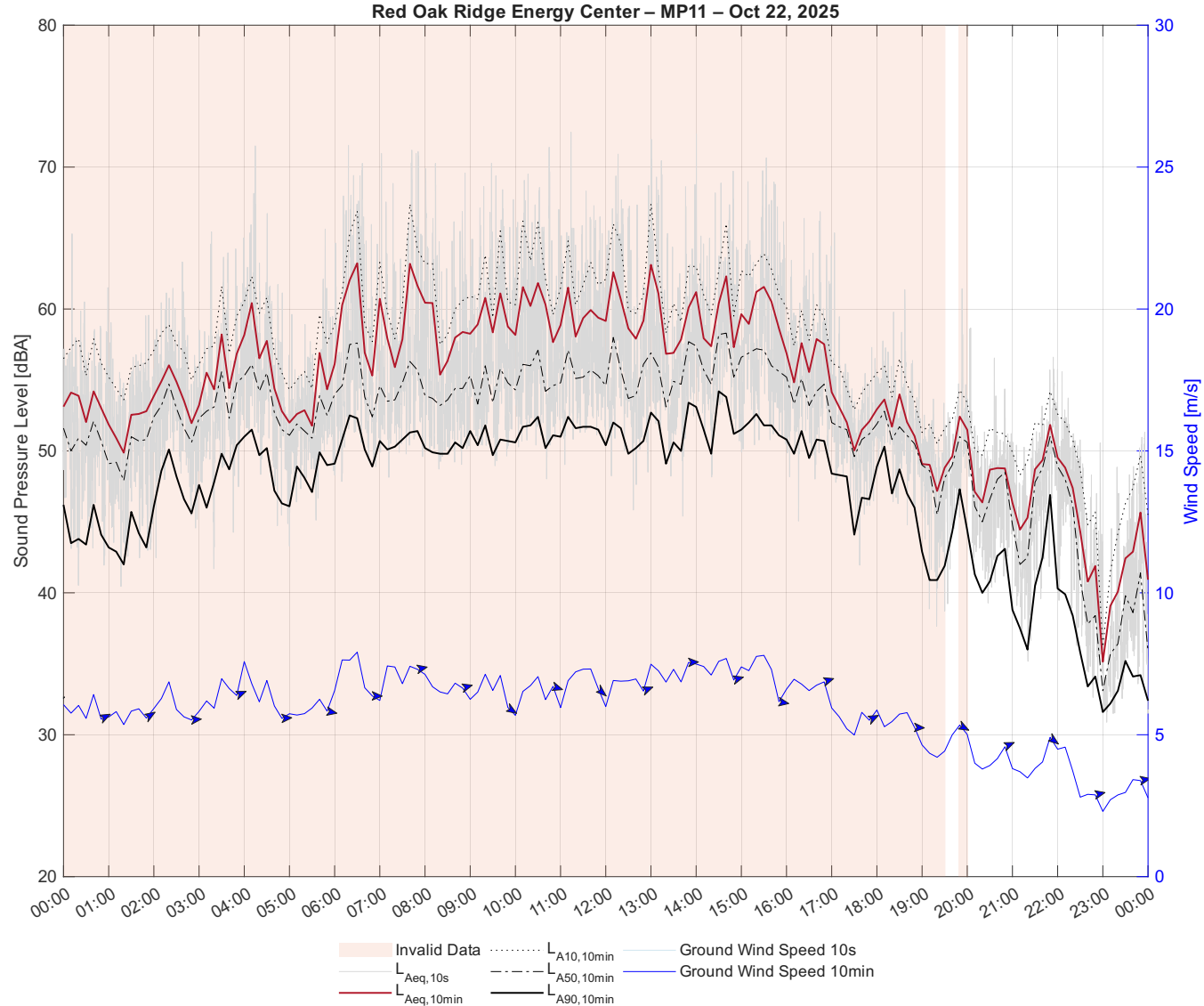
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



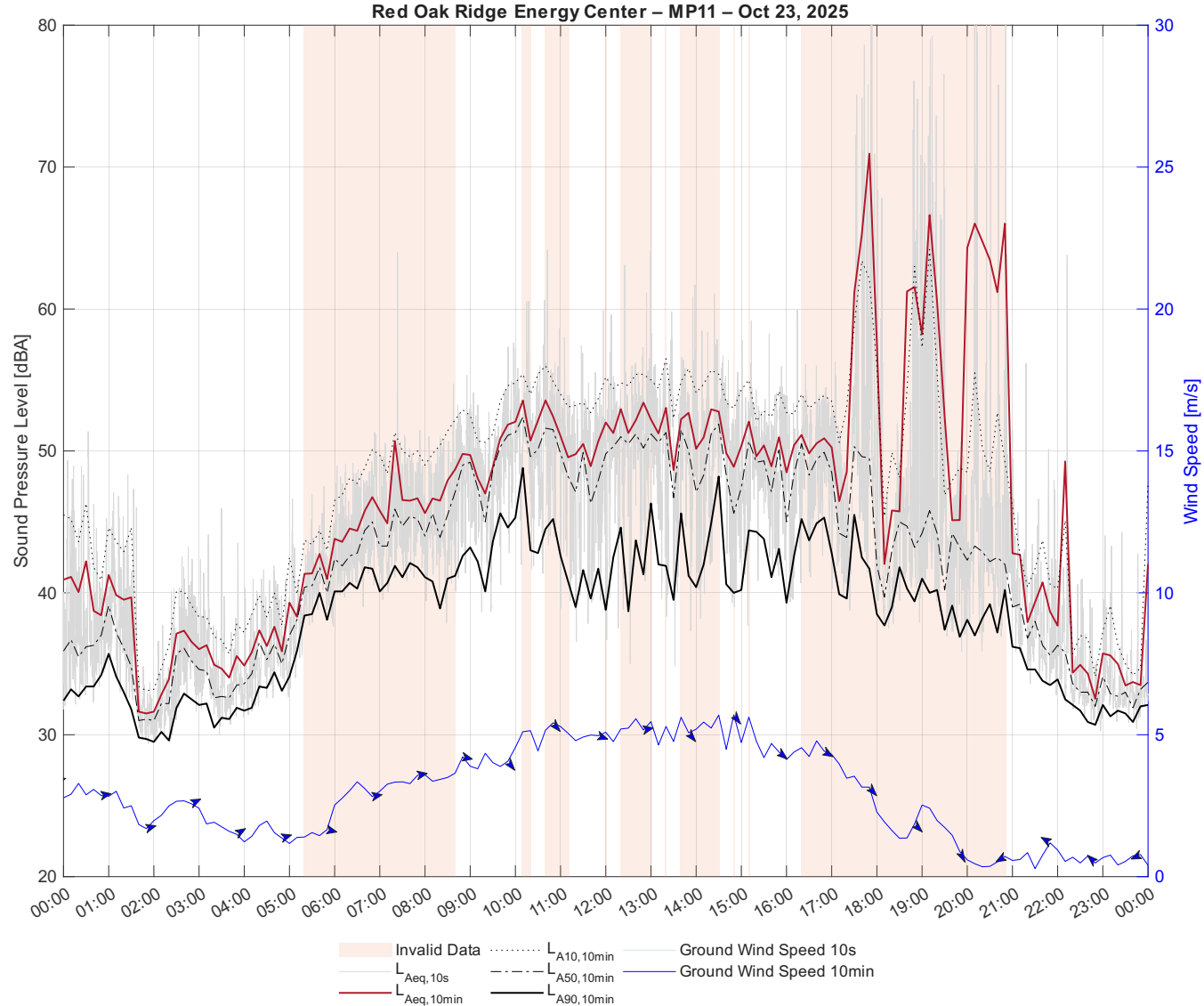
*Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center*



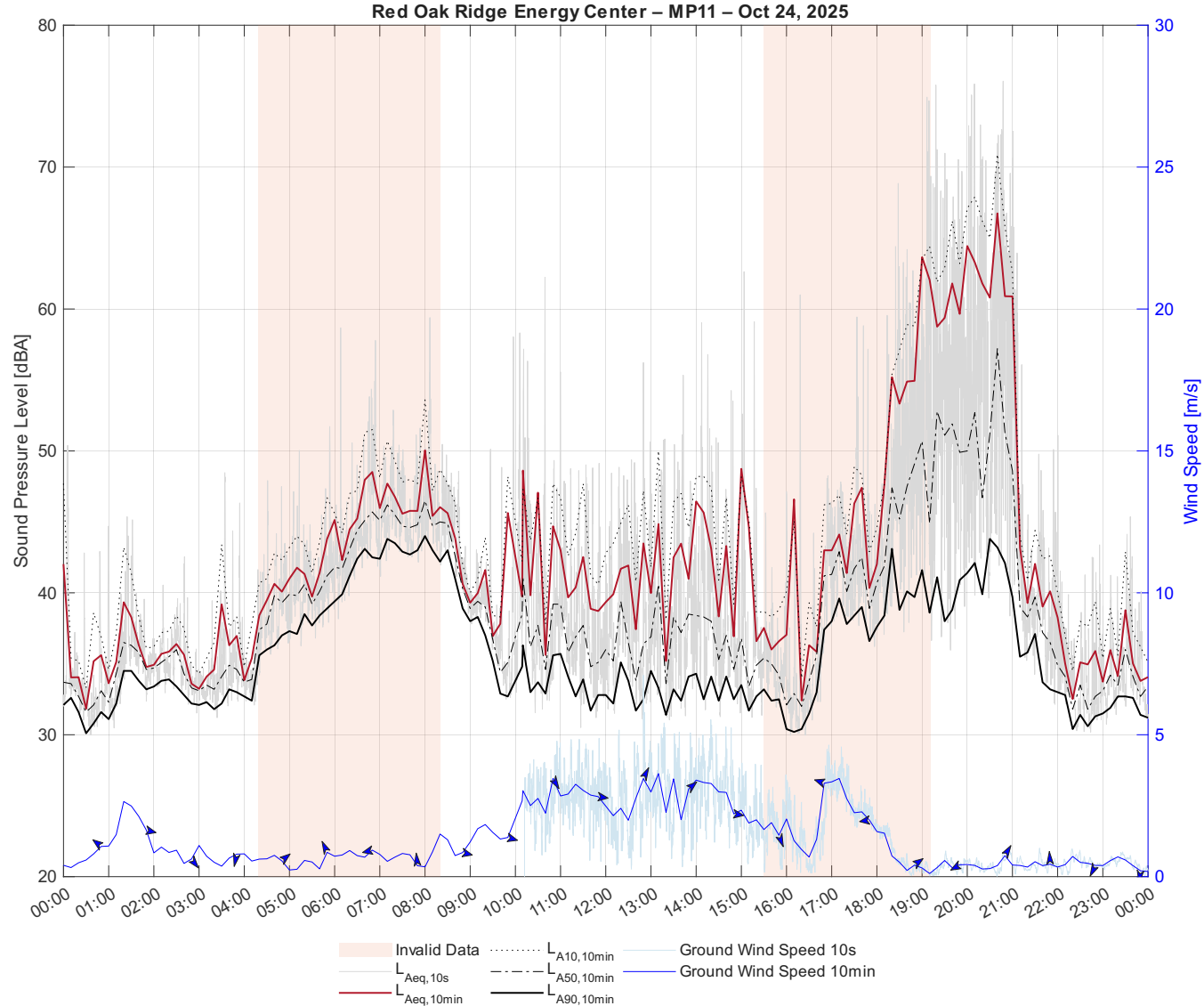
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



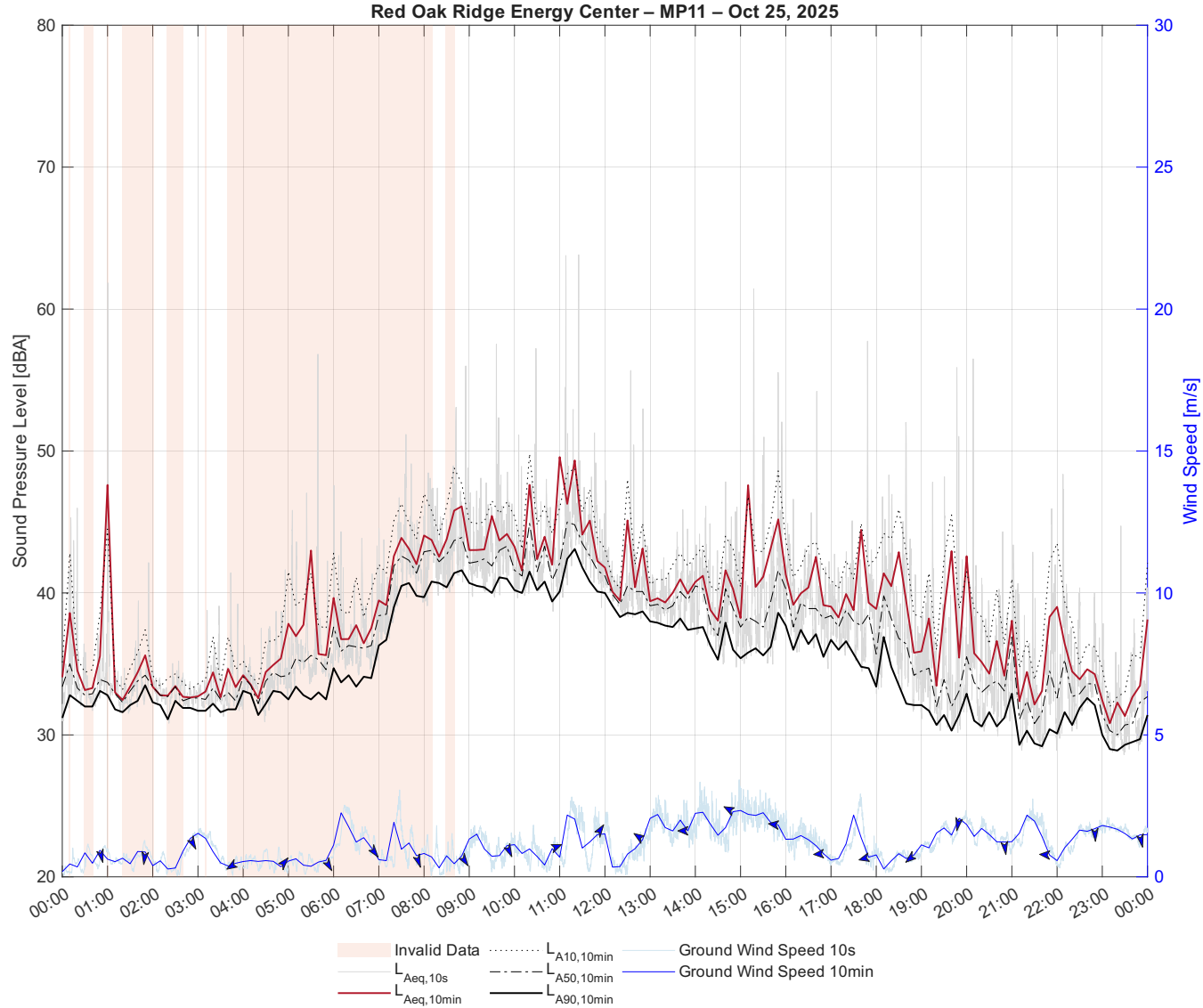
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



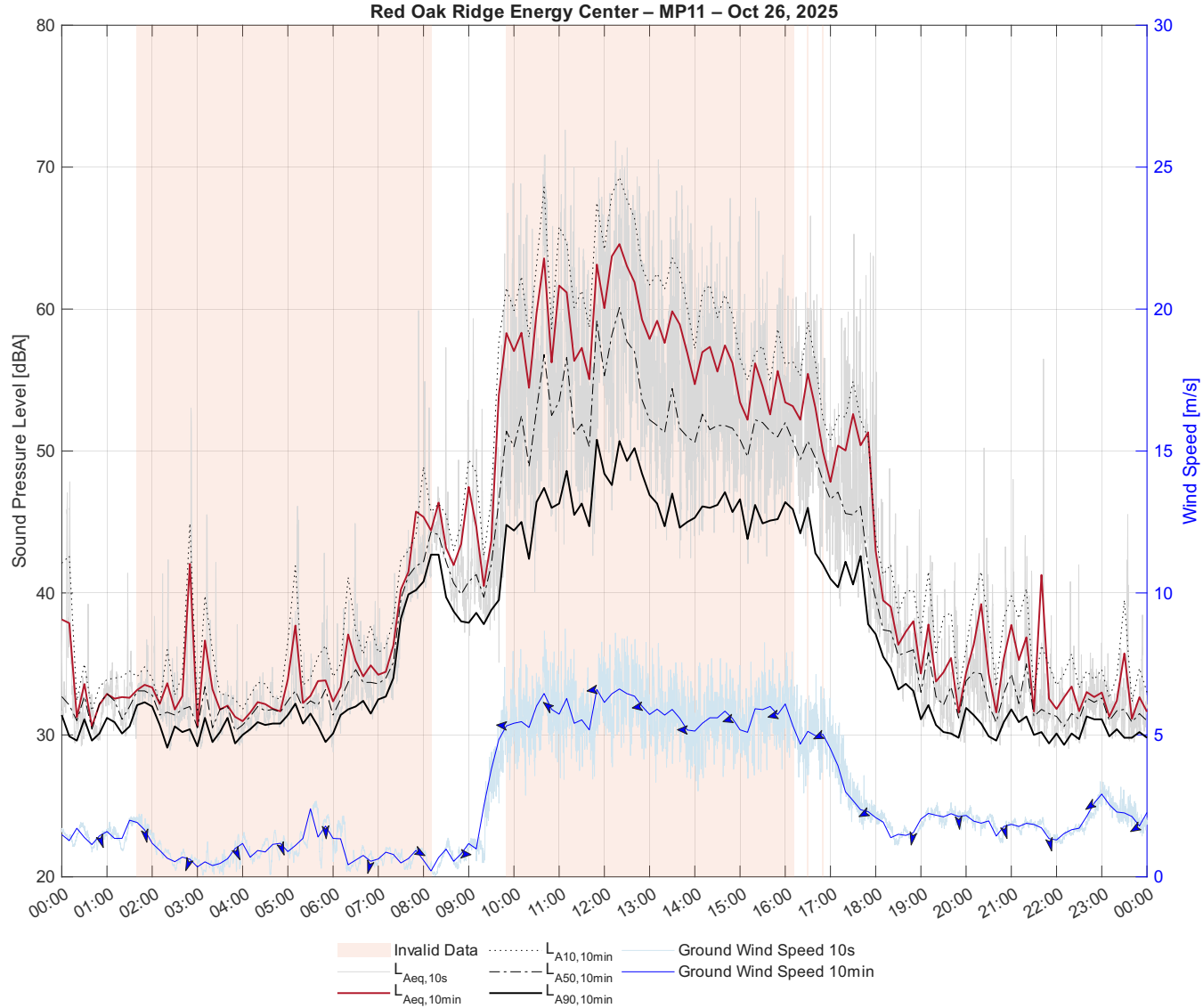
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



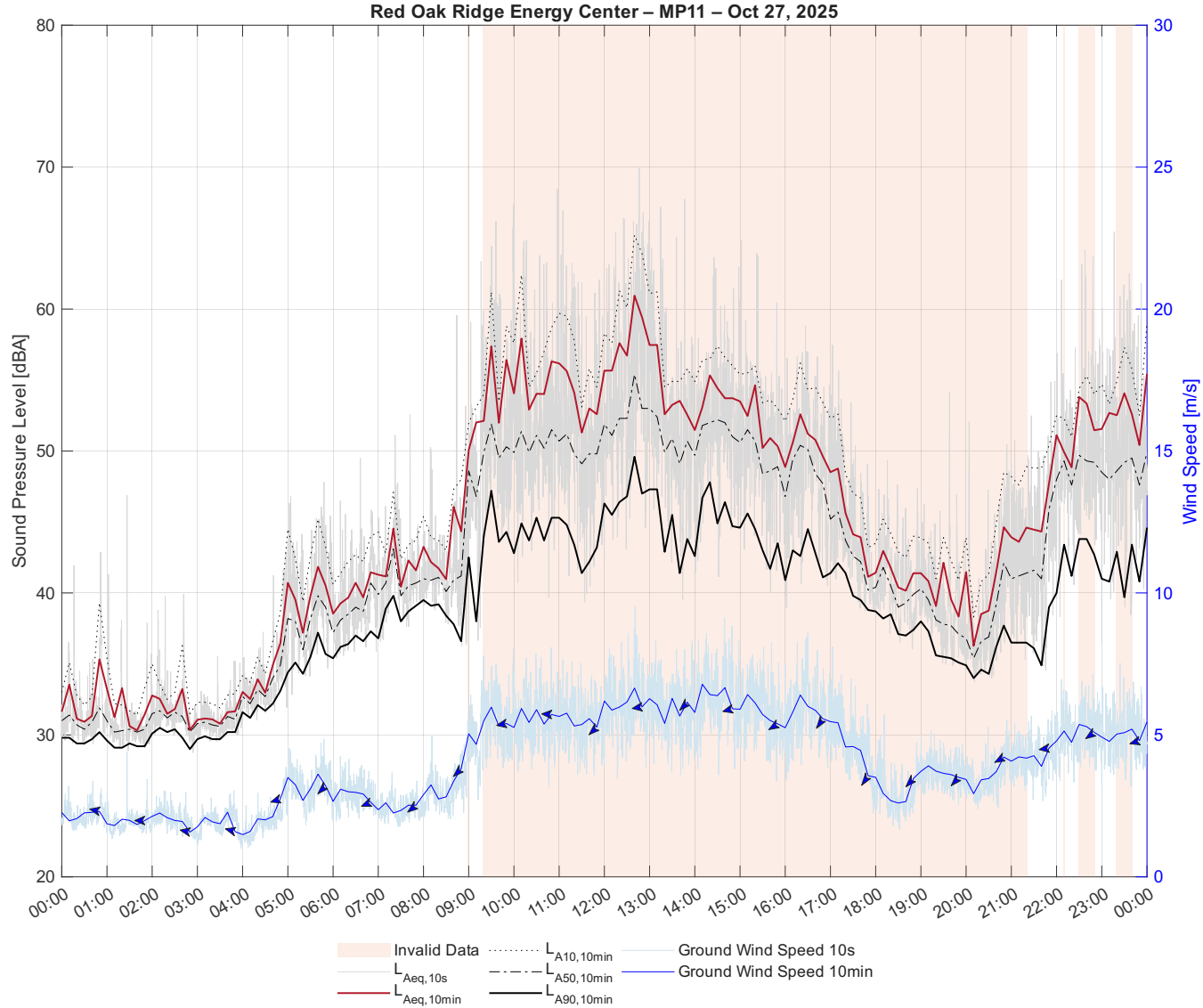
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



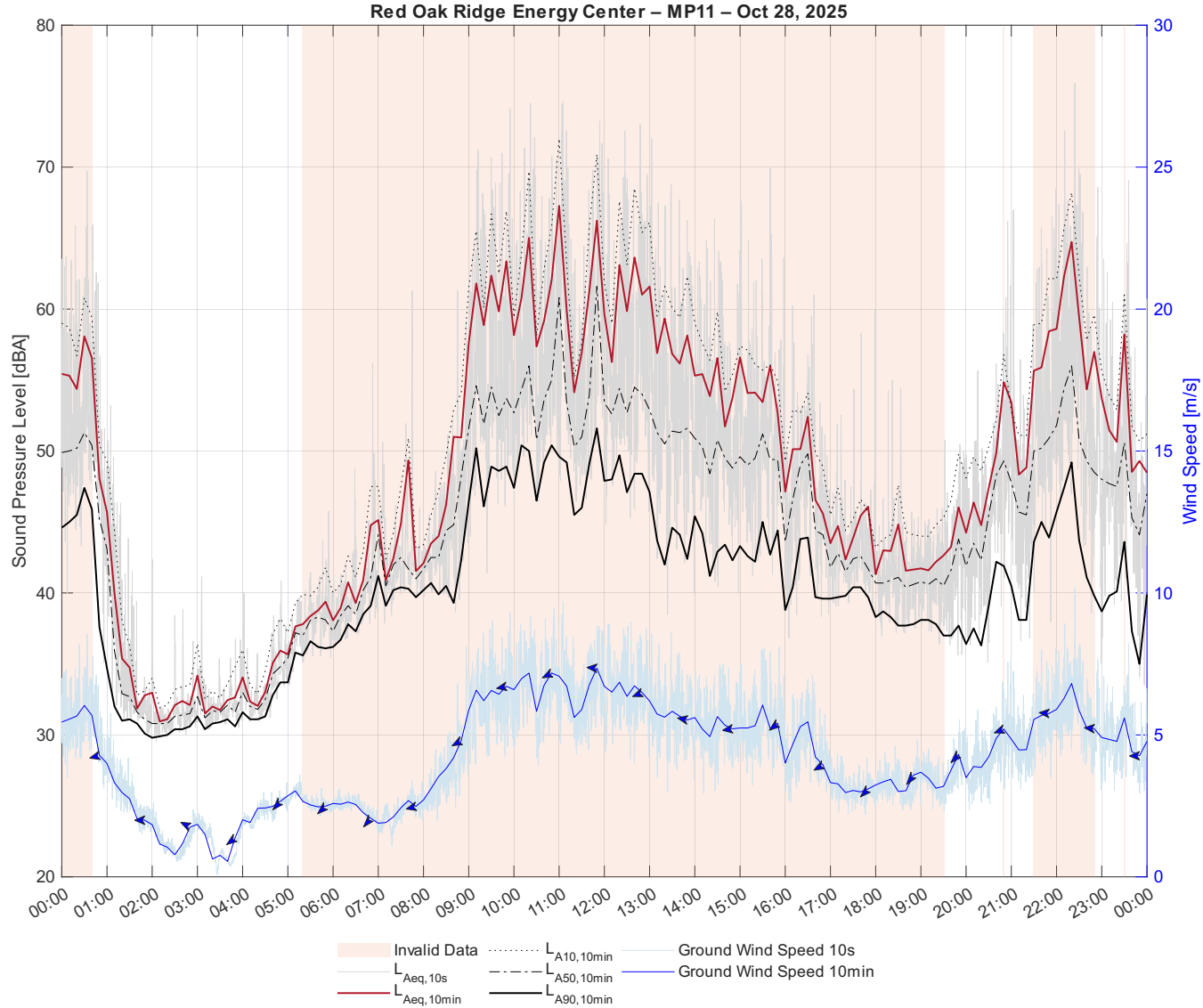
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



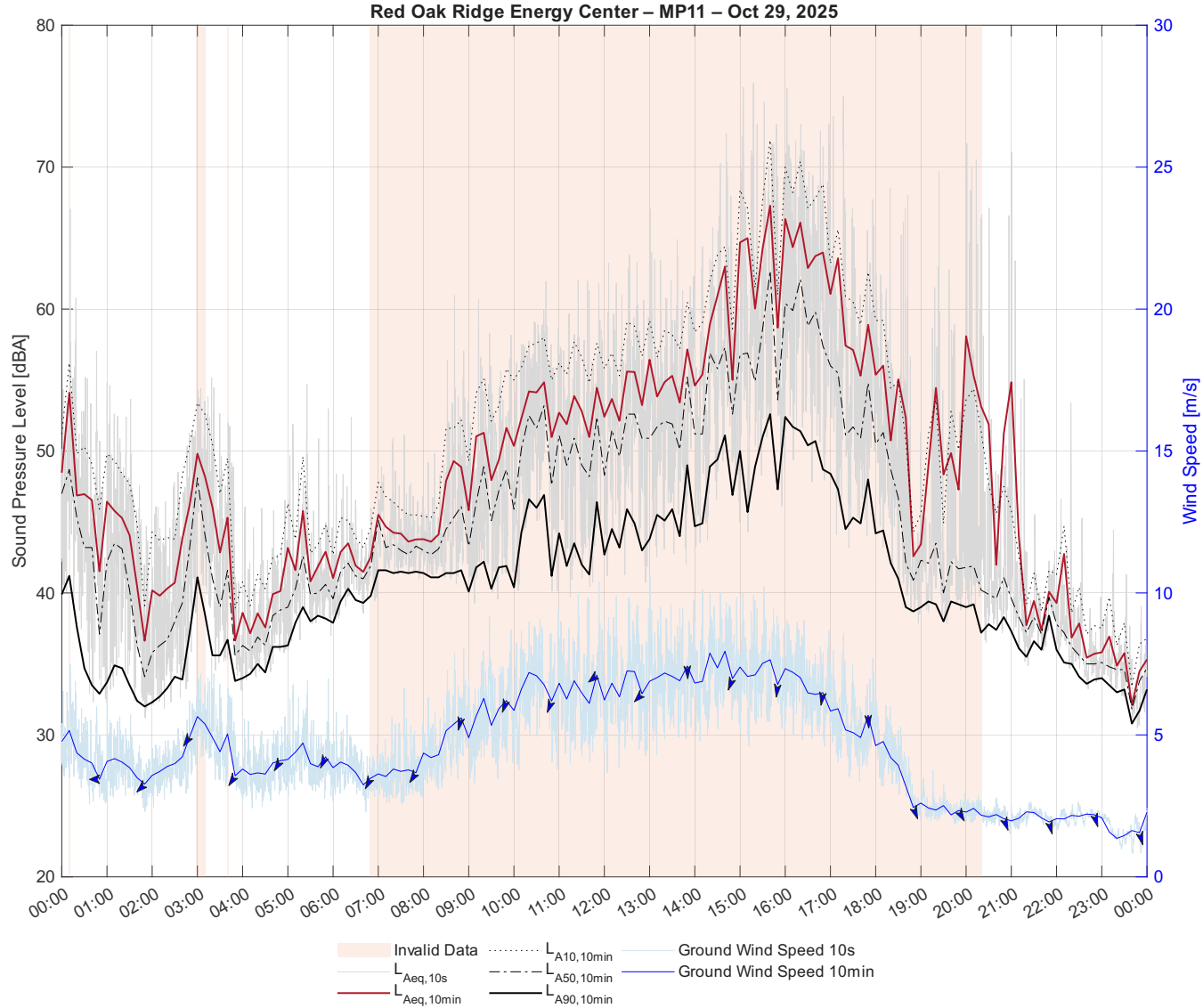
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



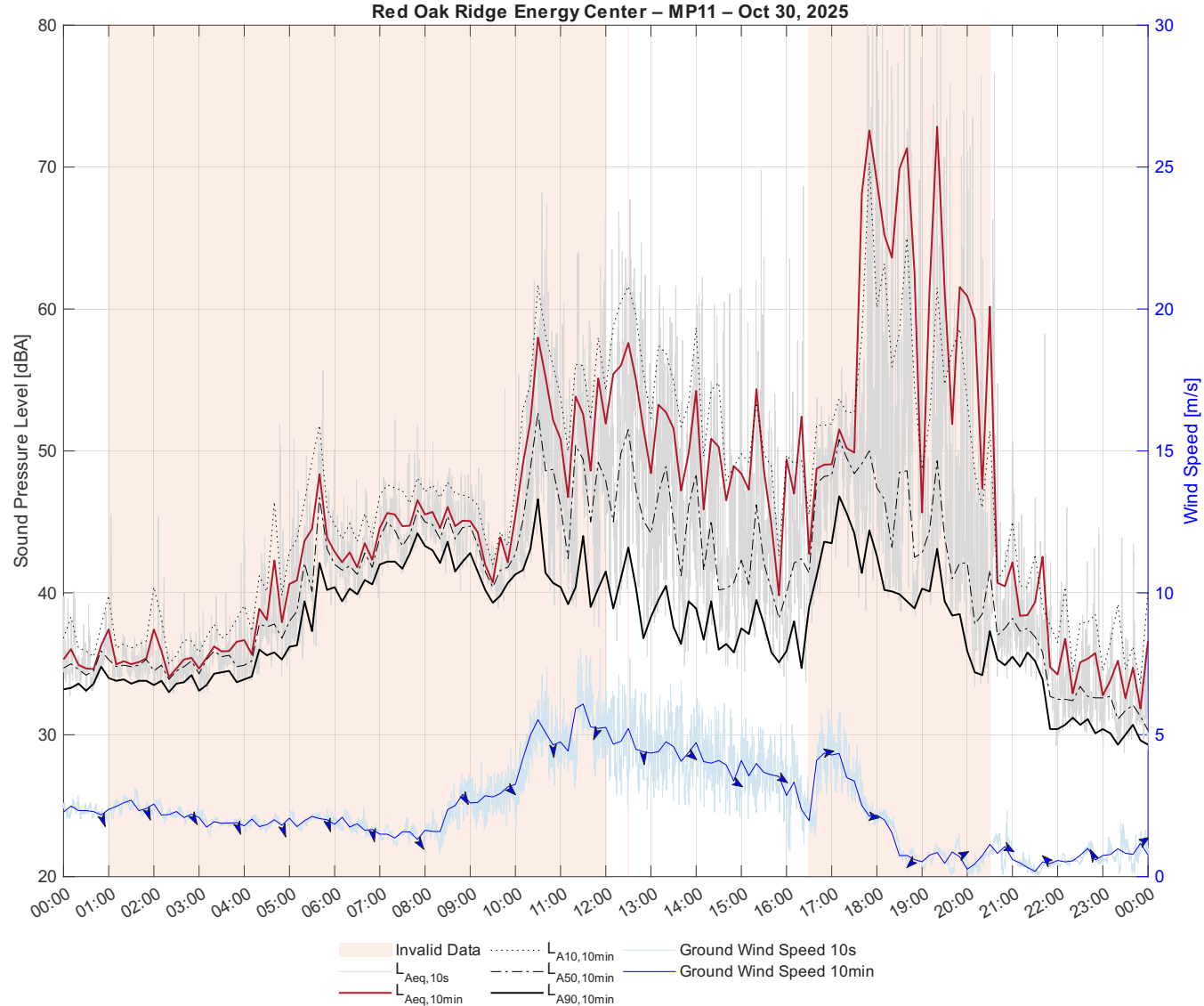
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



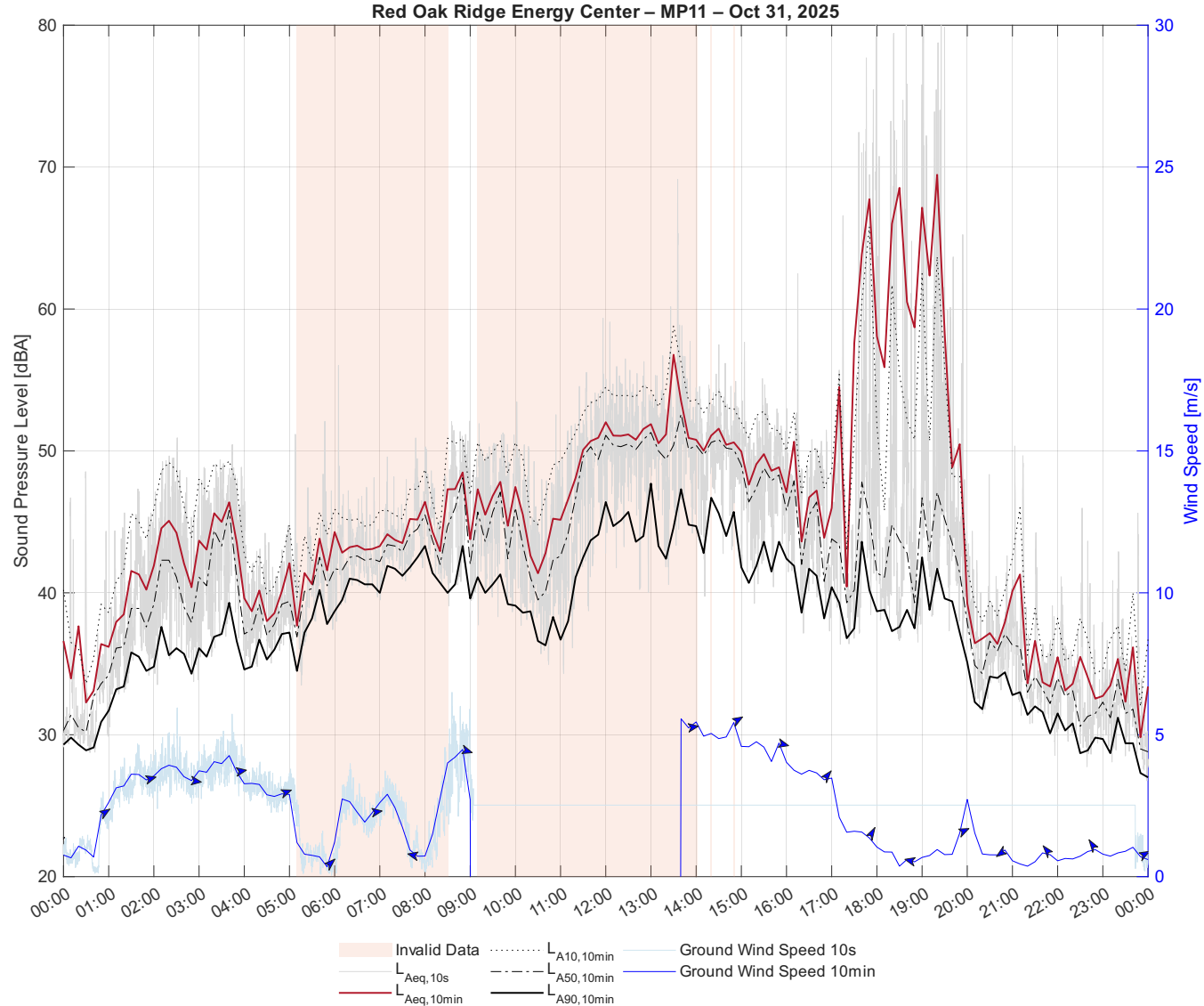
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



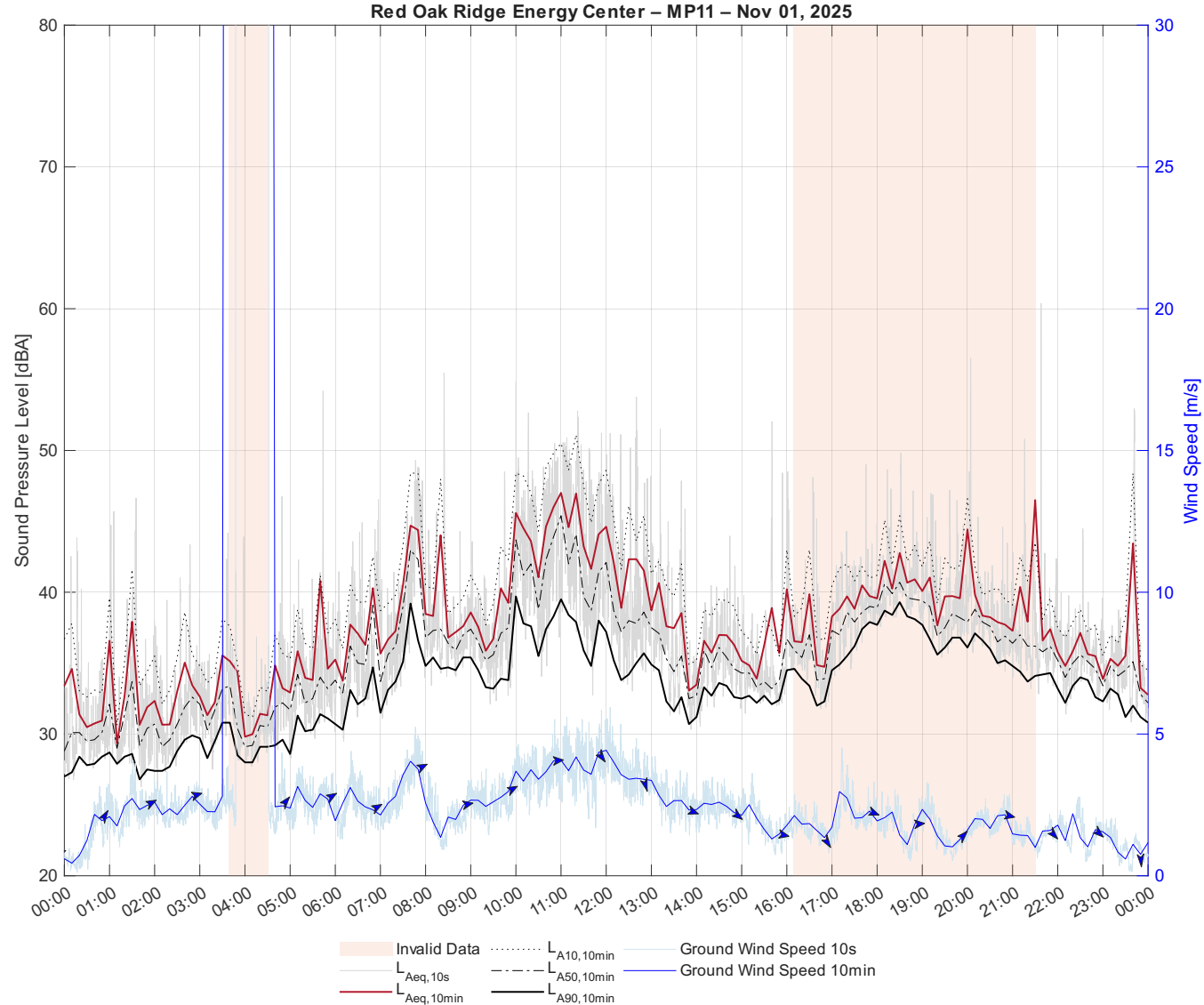
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



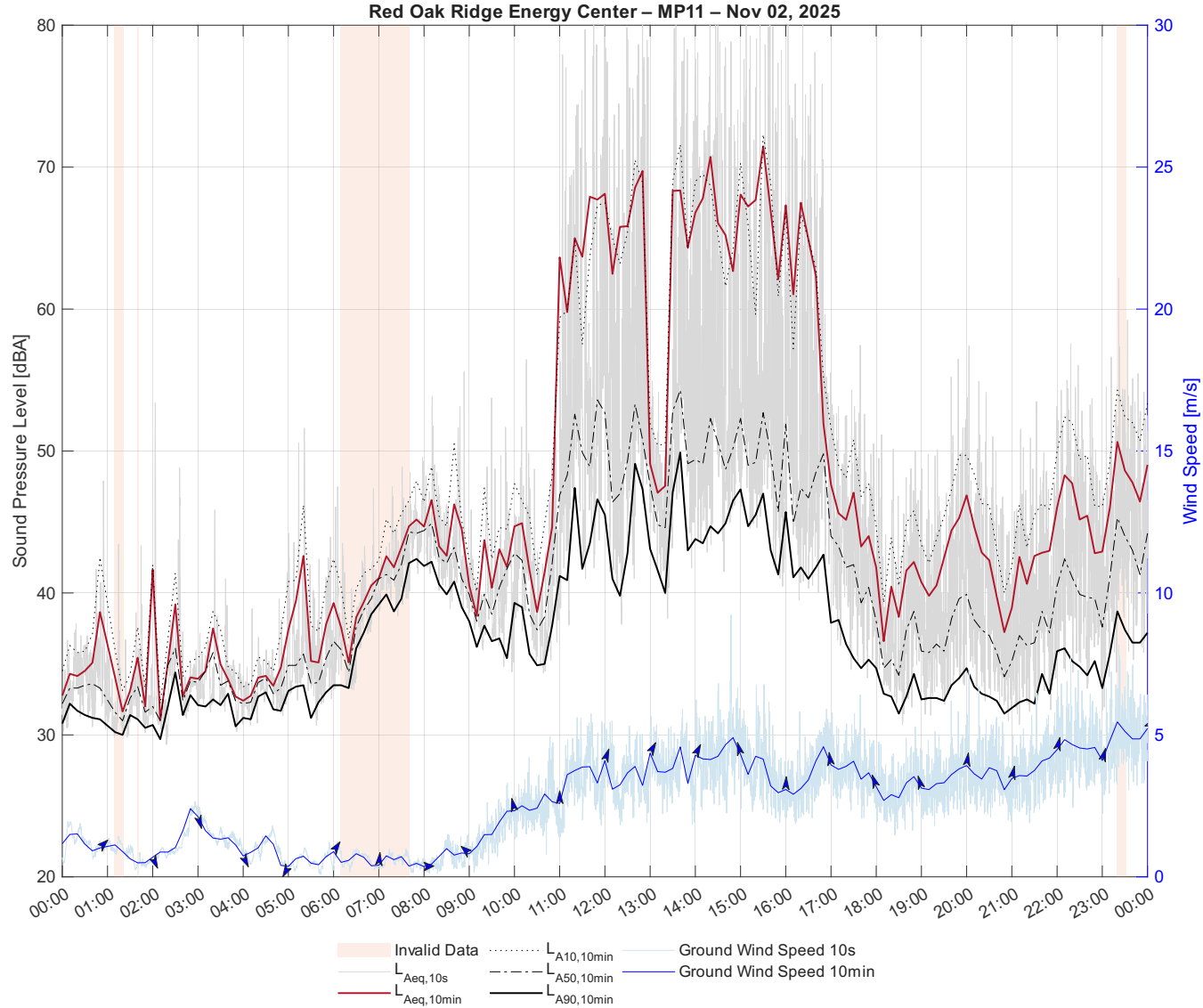
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



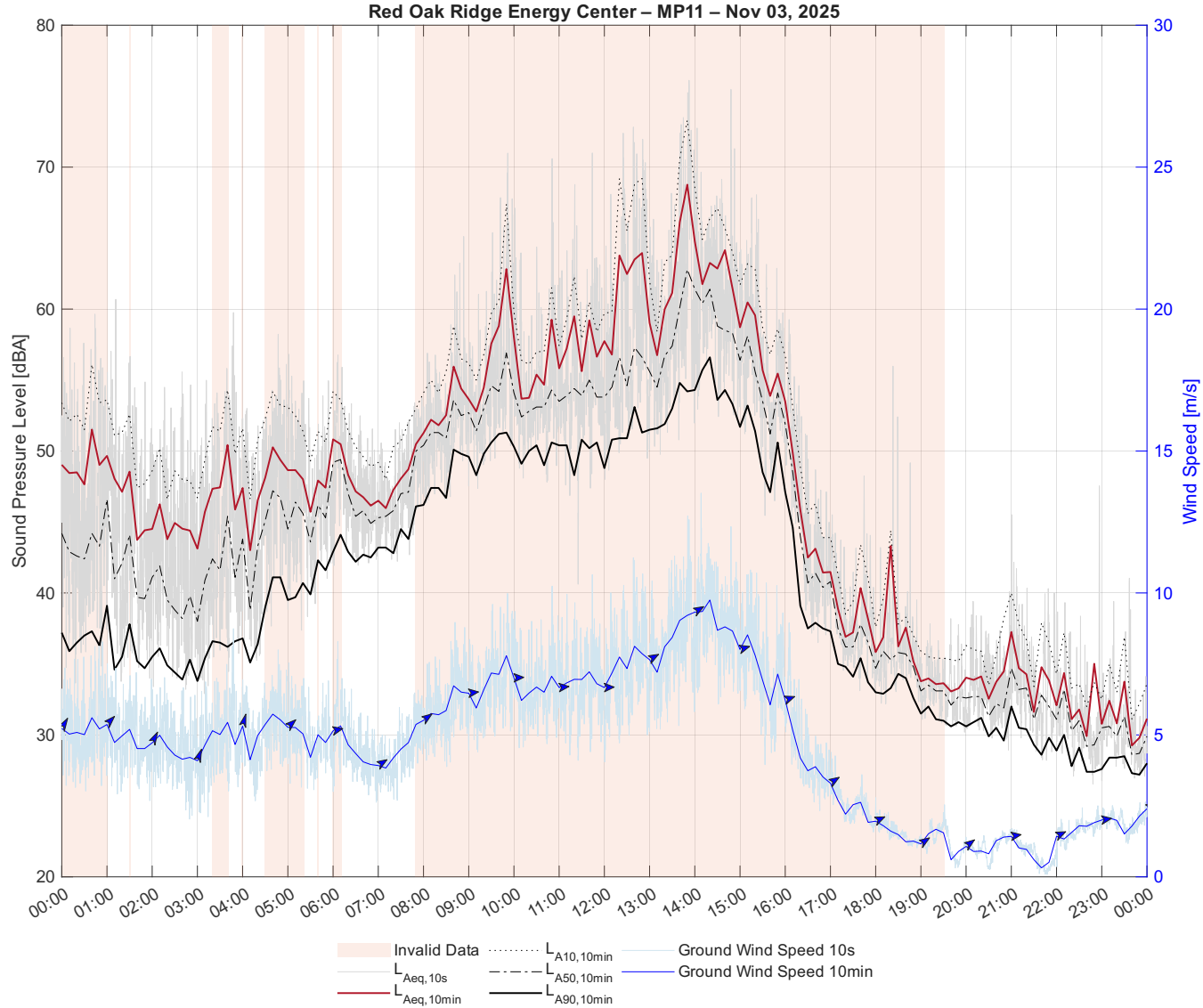
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



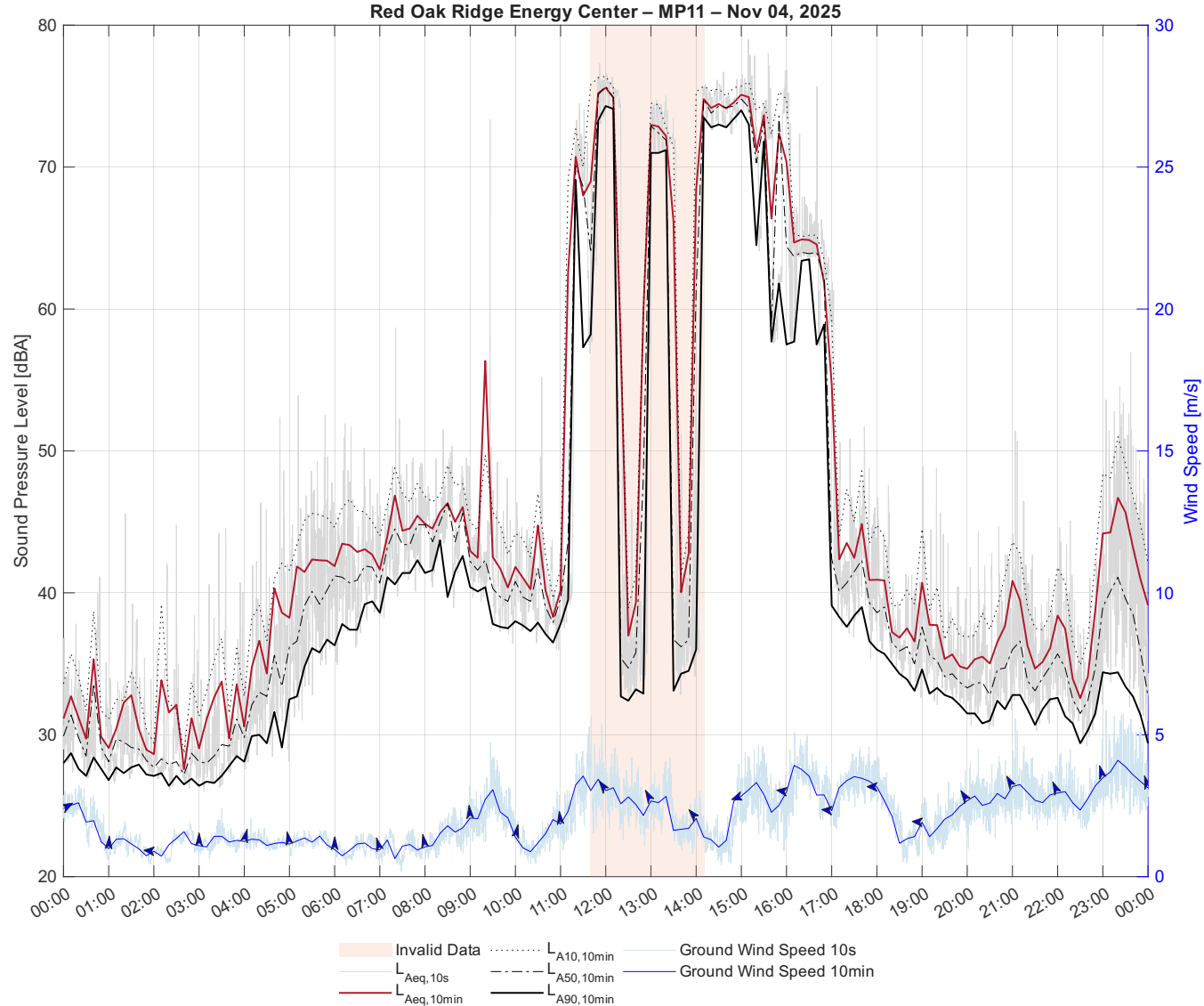
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



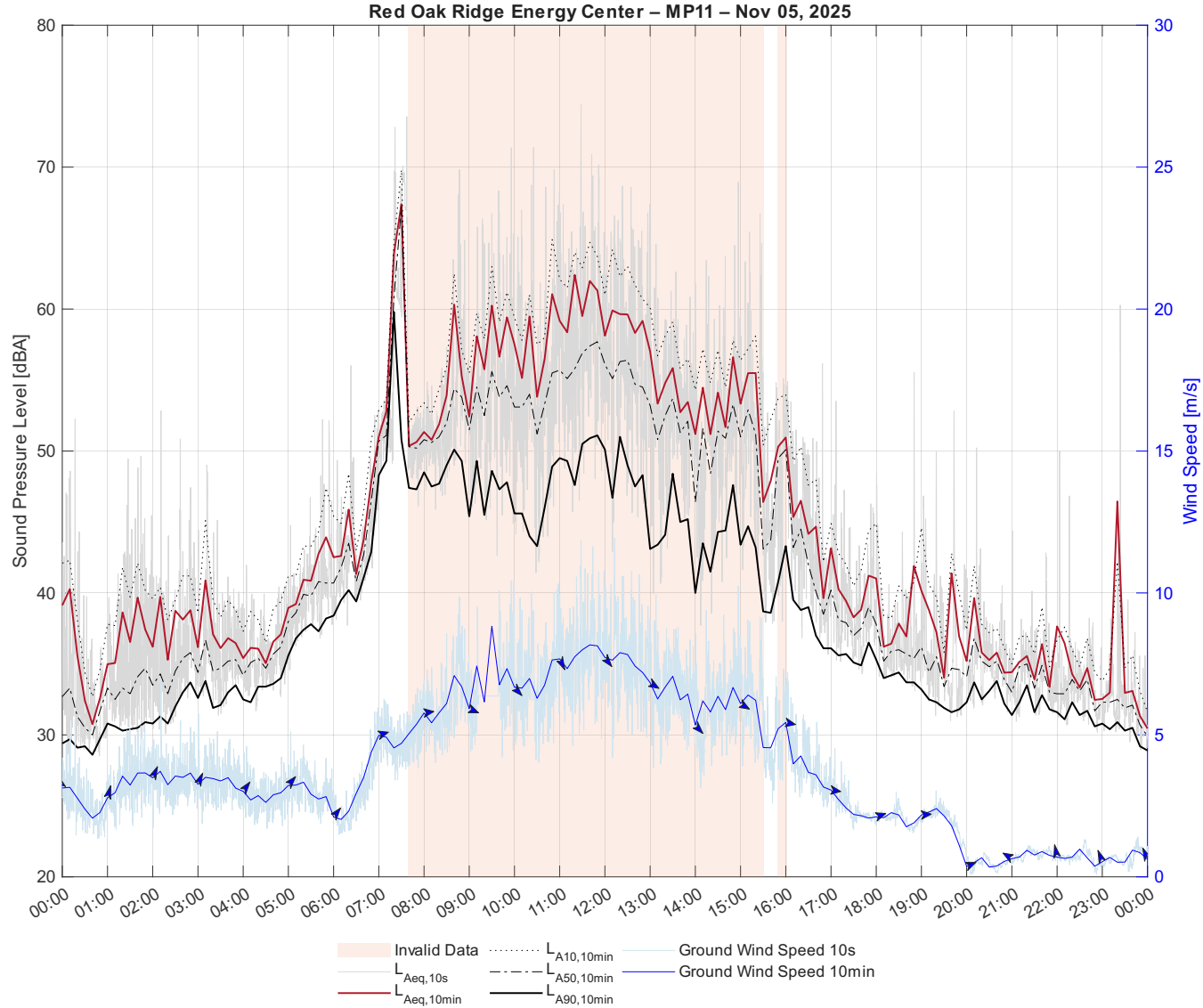
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



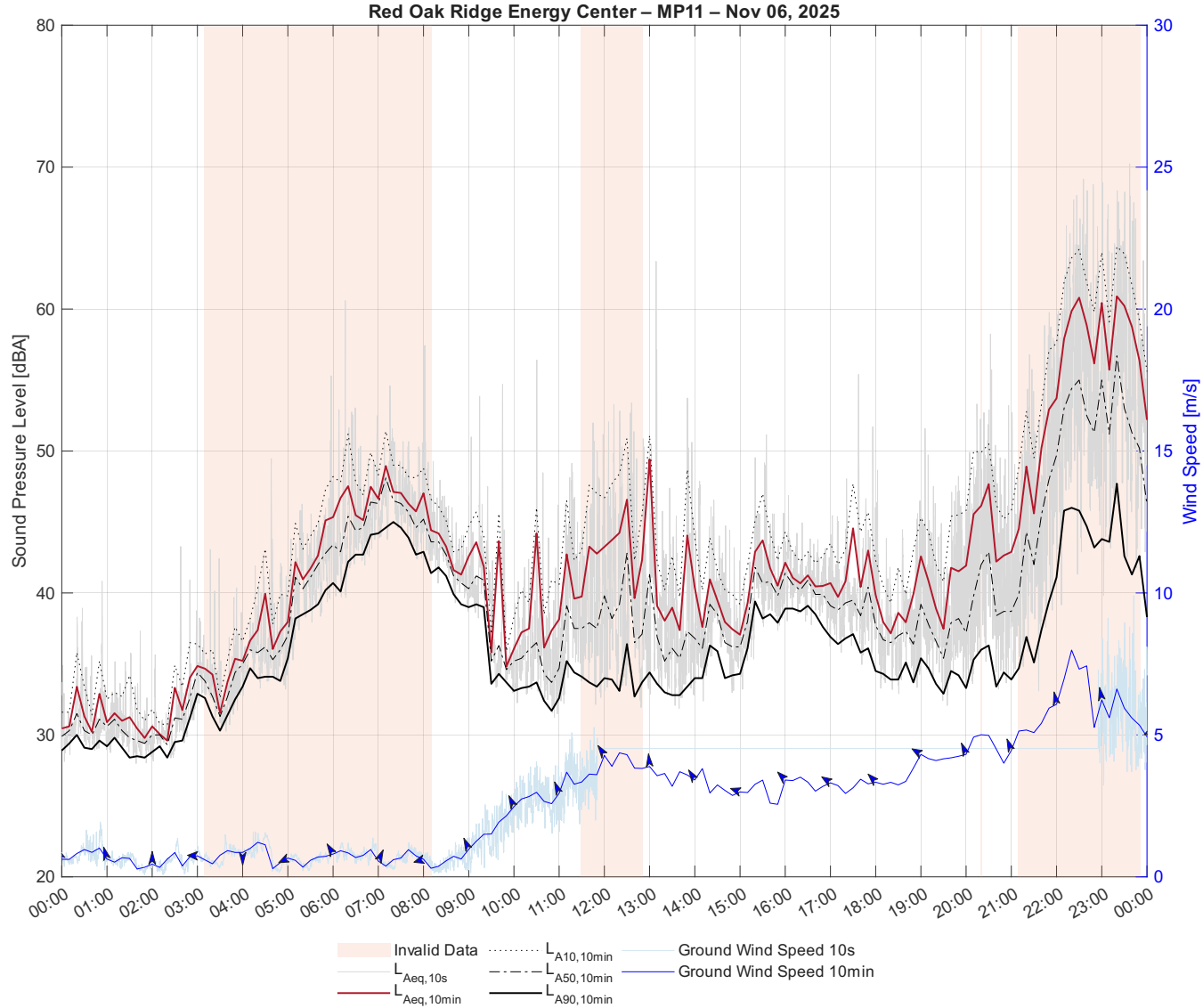
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



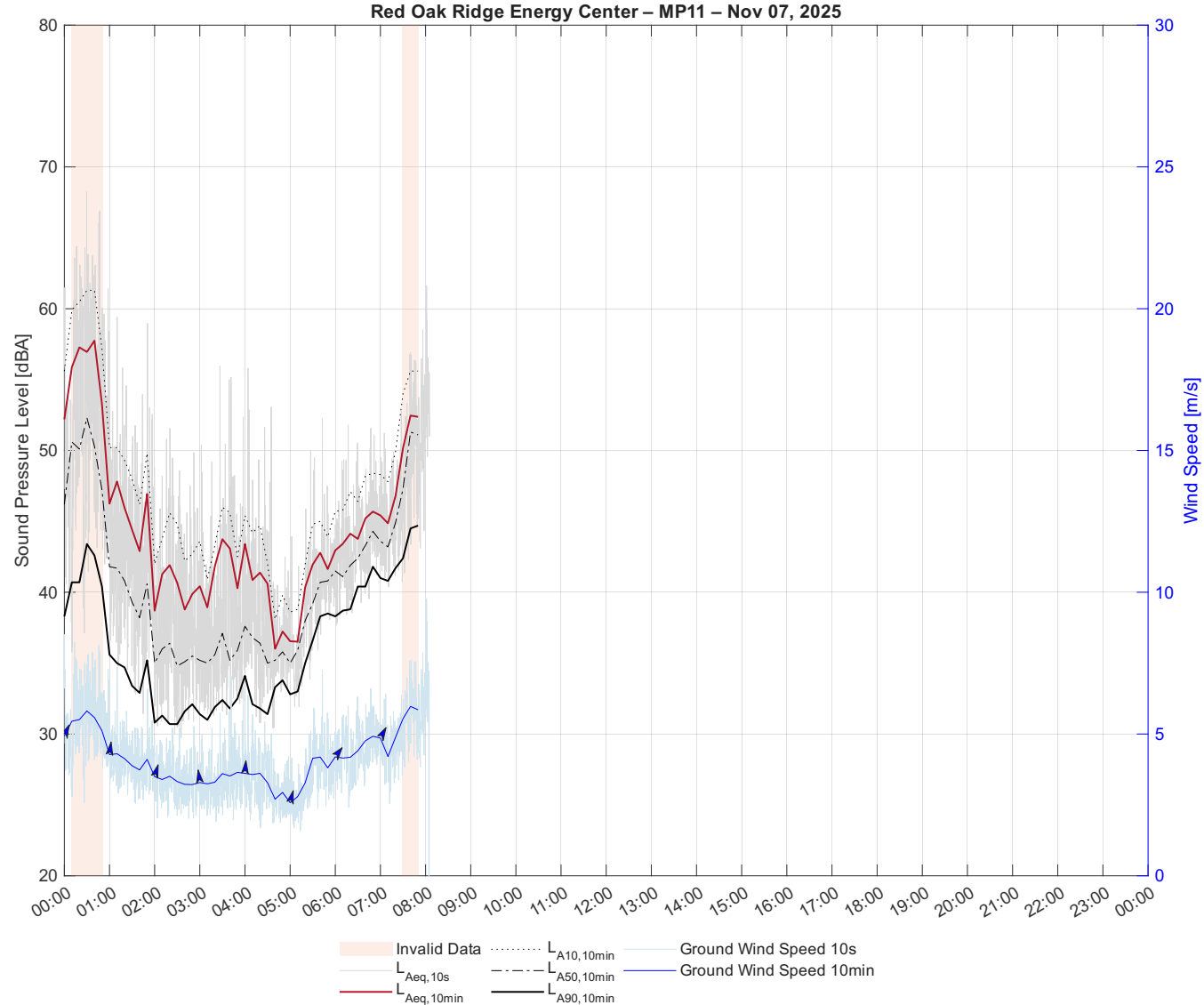
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



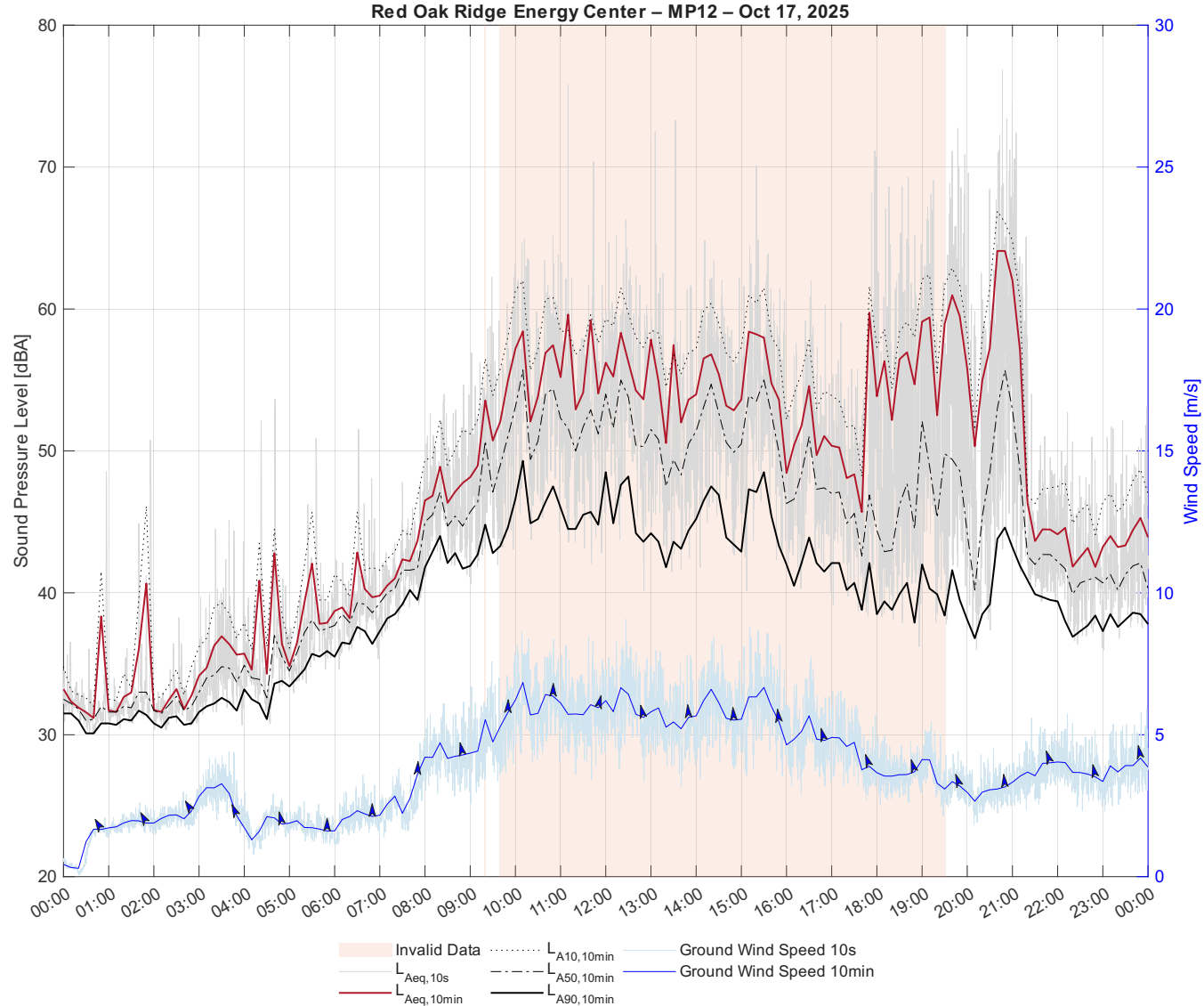
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



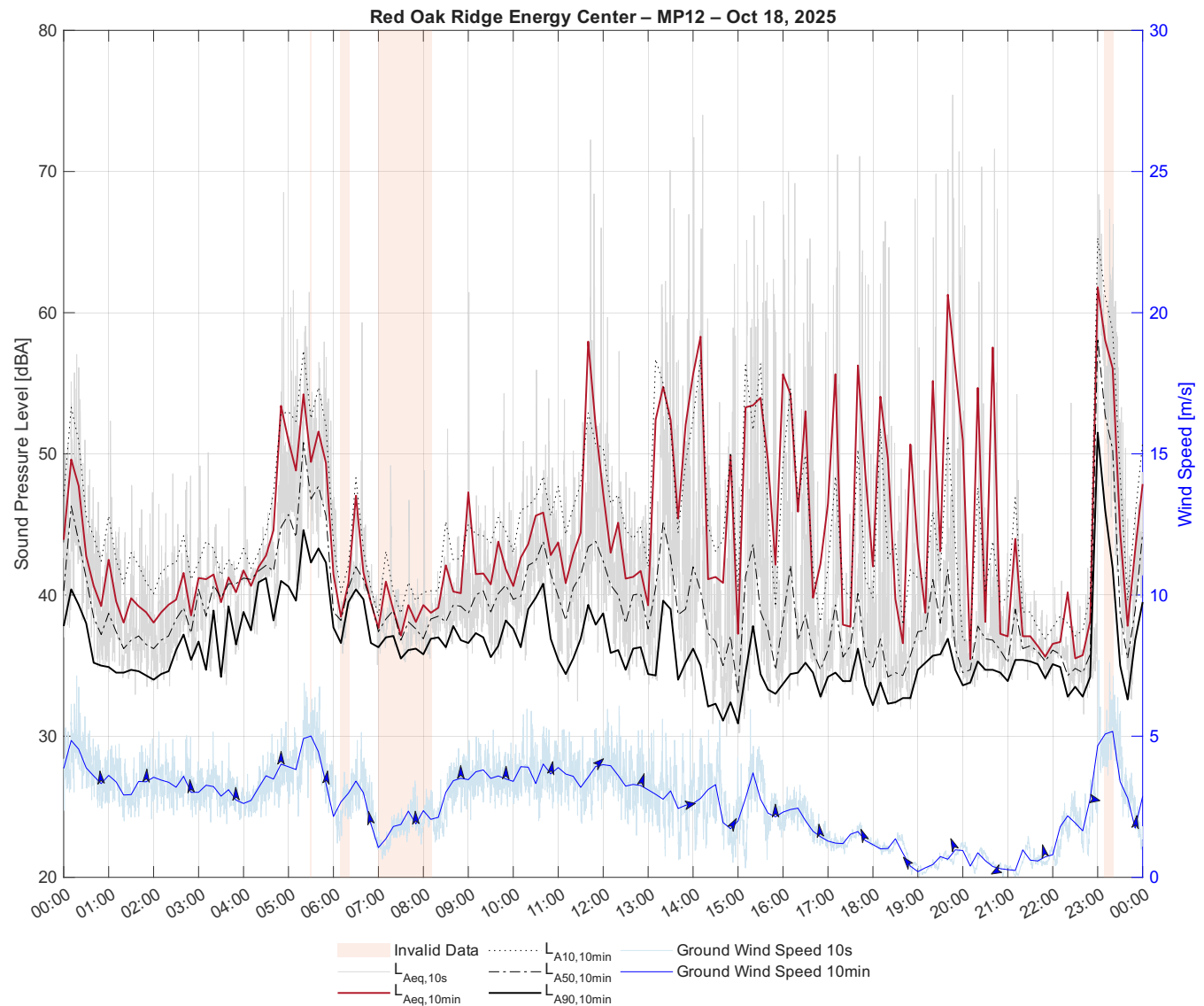
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



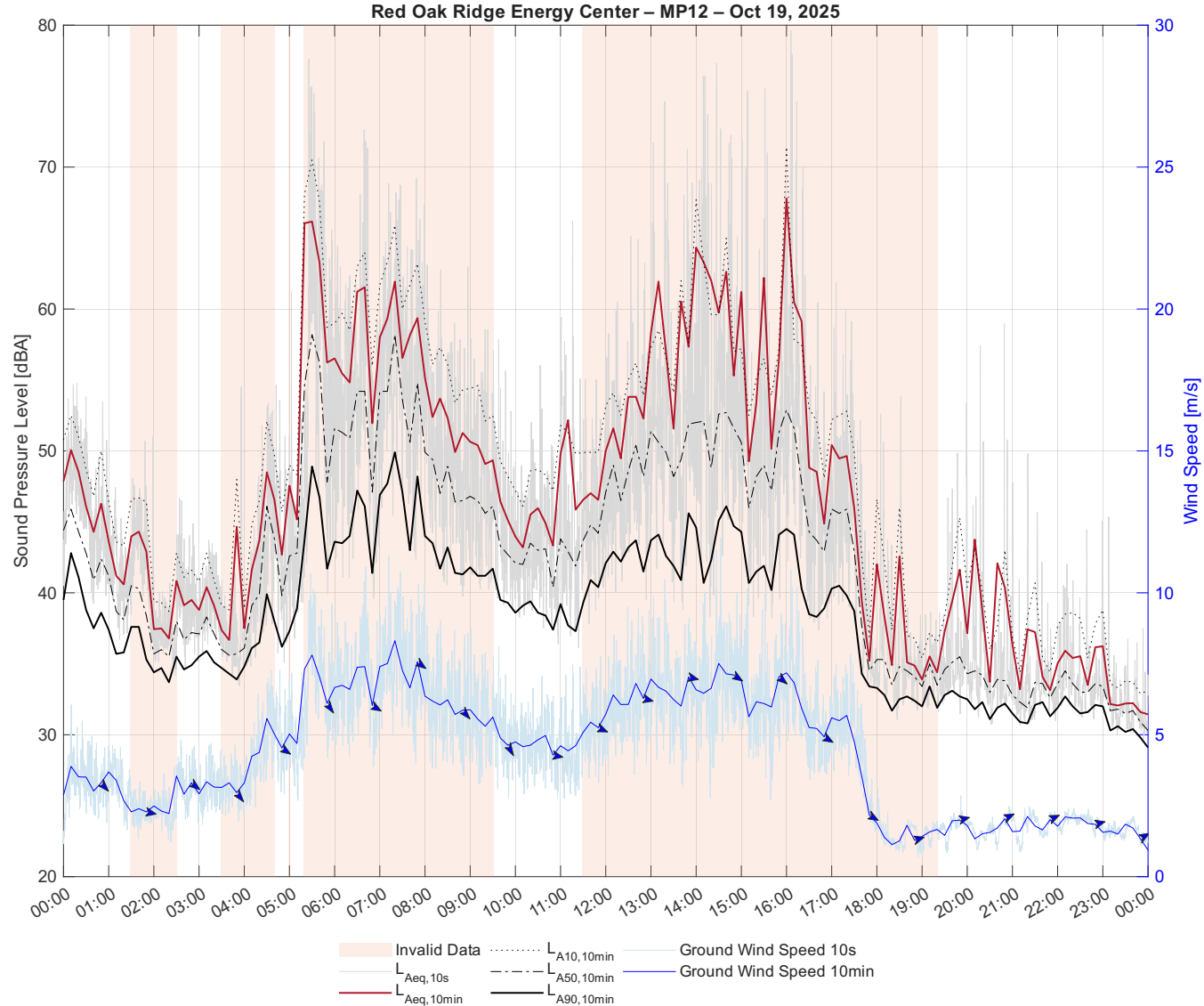
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



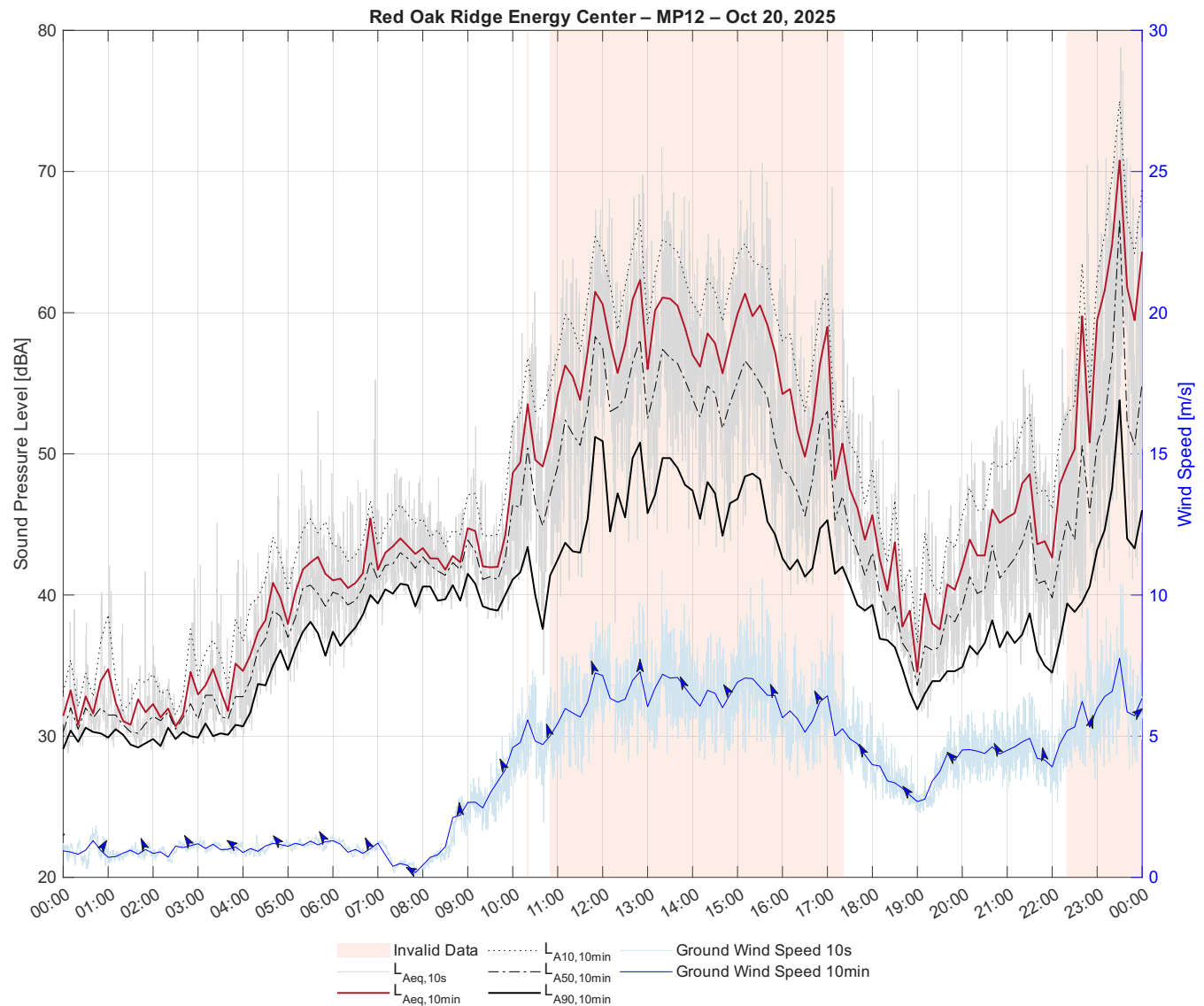
*Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center*



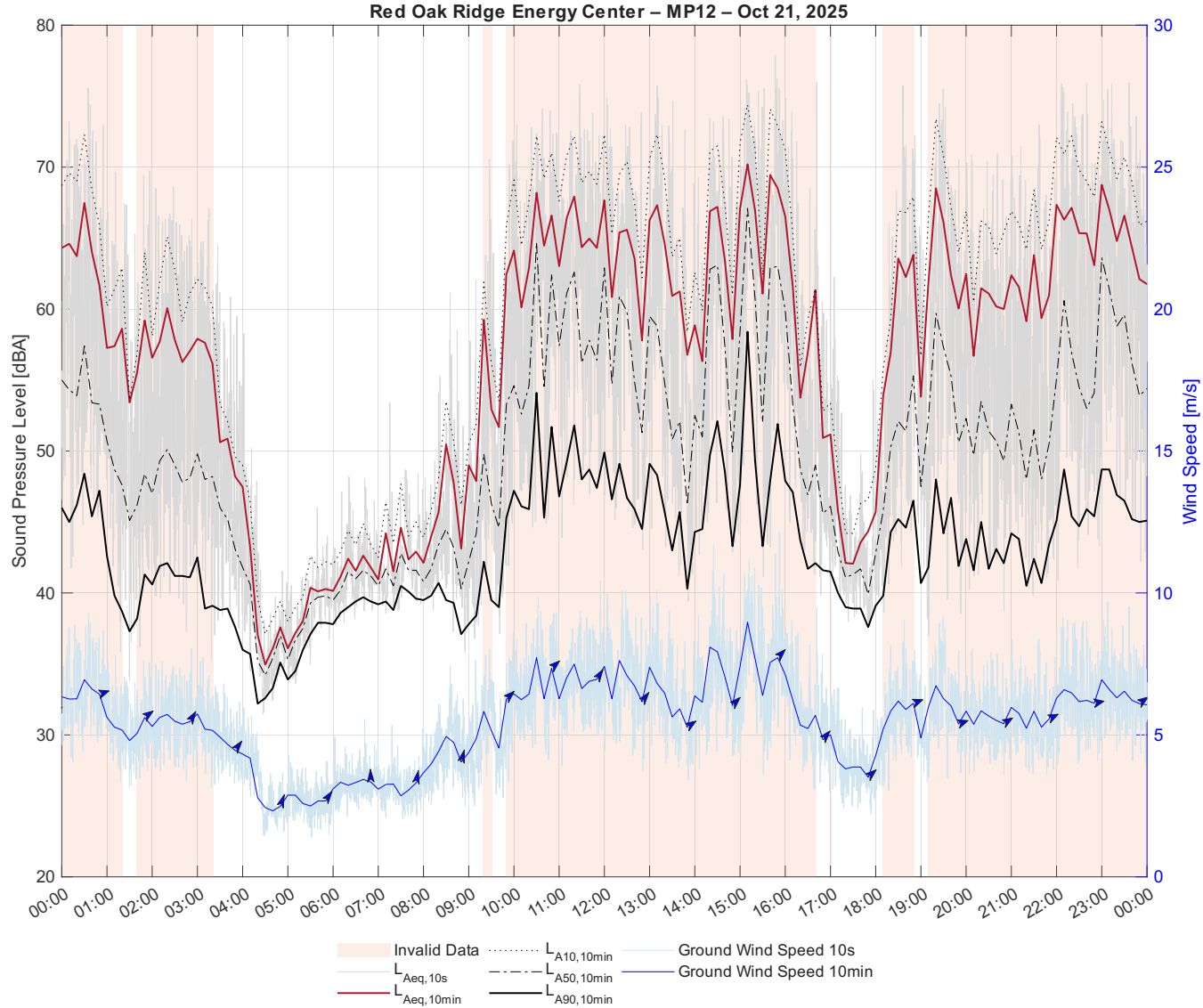
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



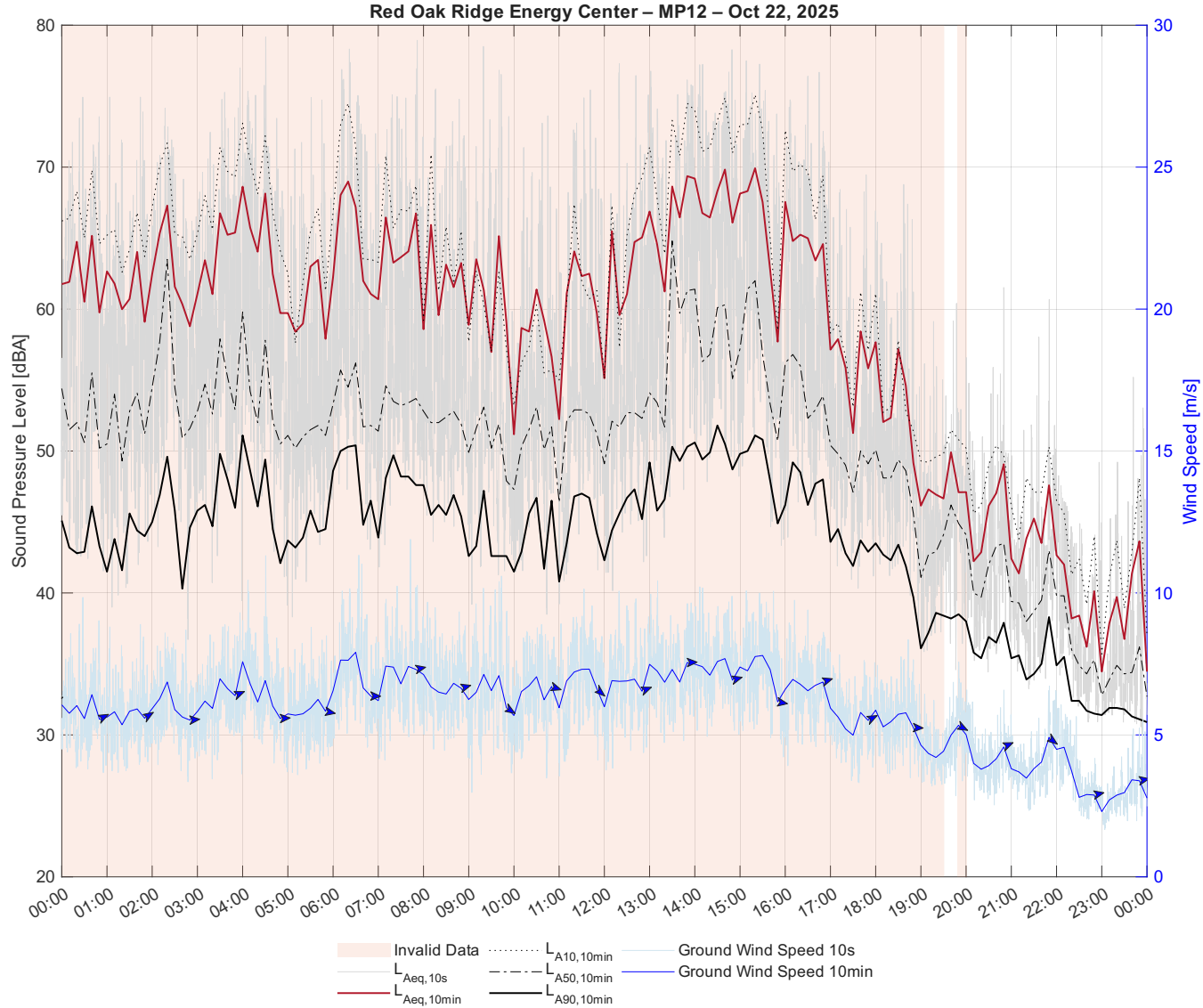
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



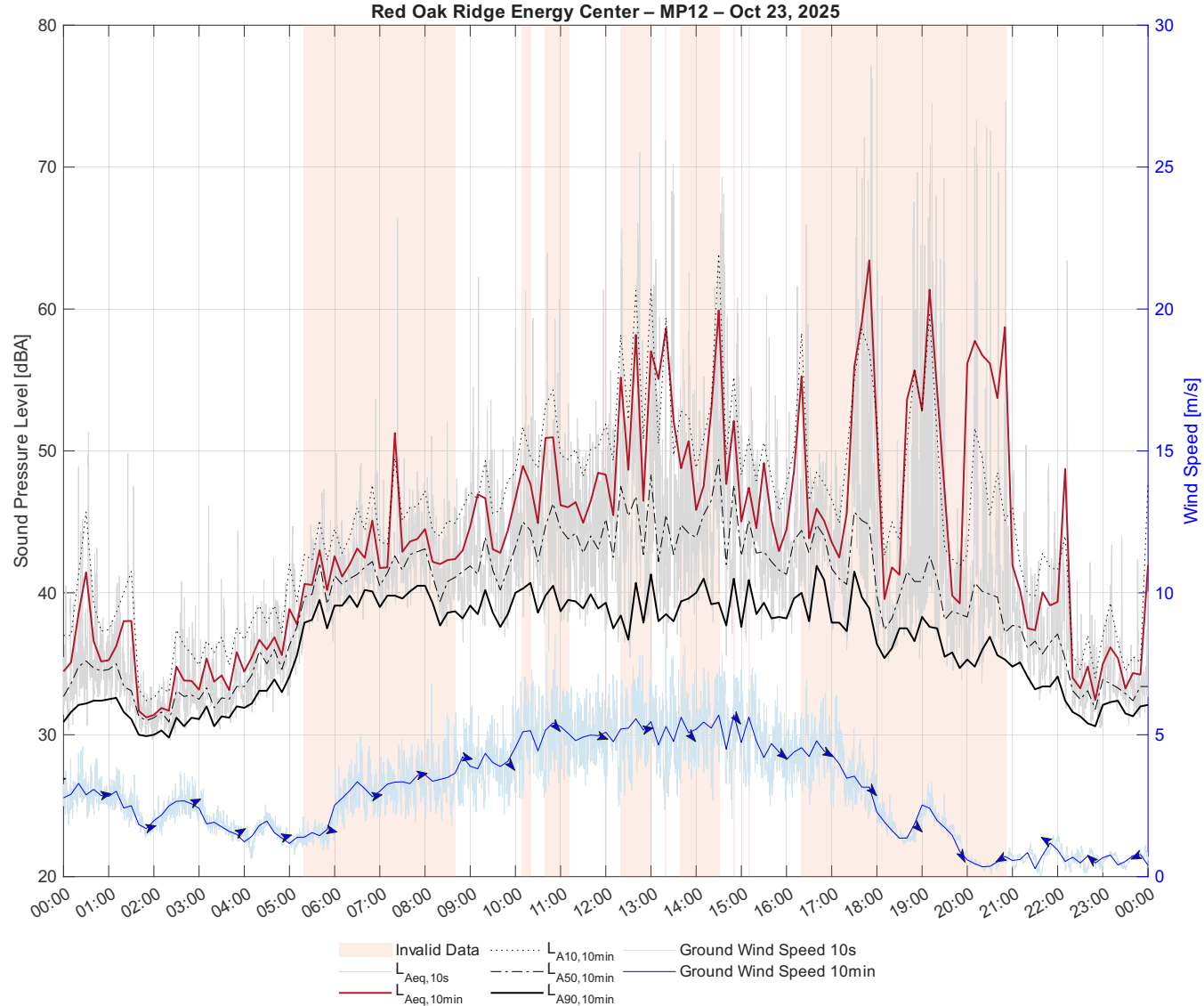
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



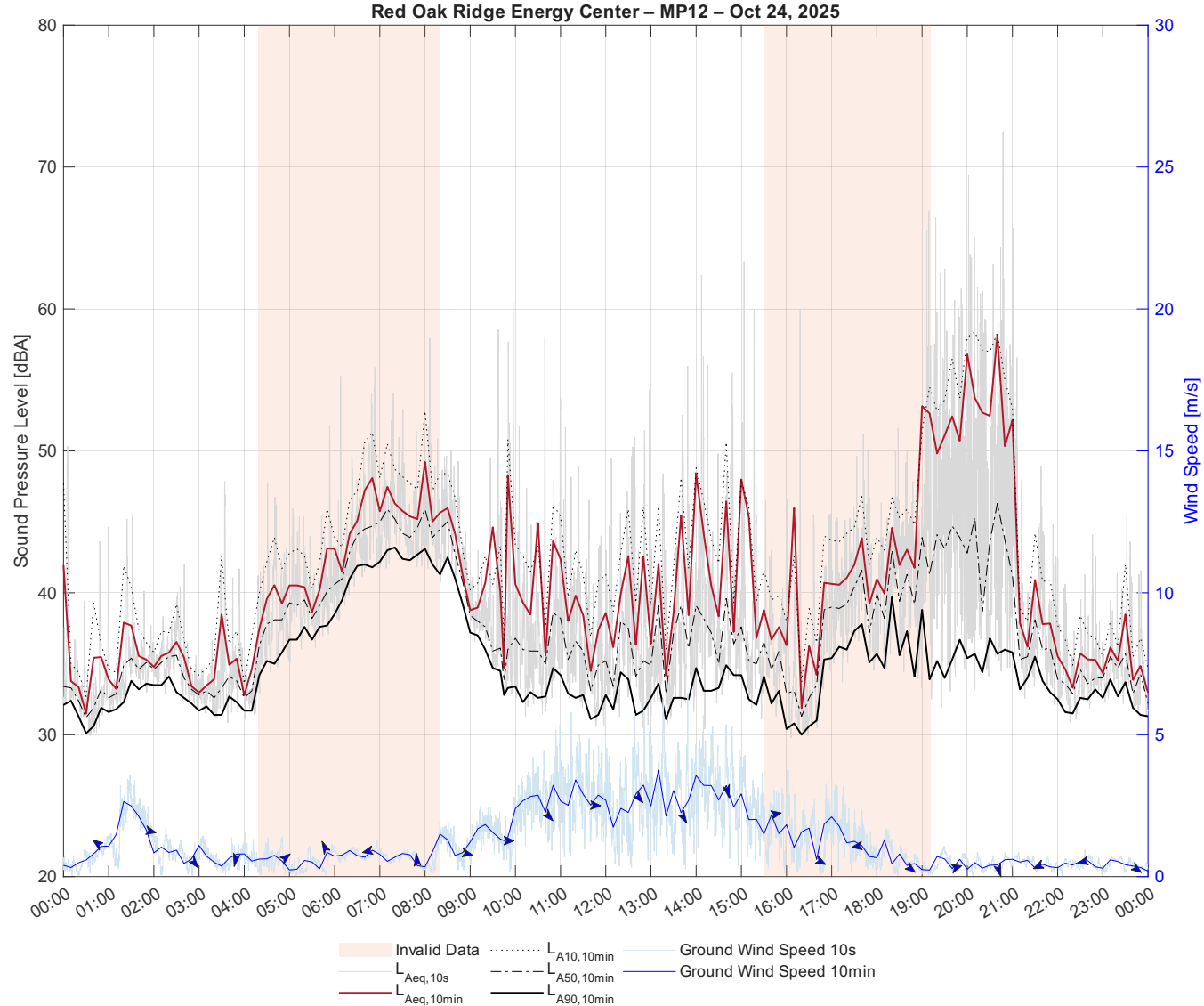
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



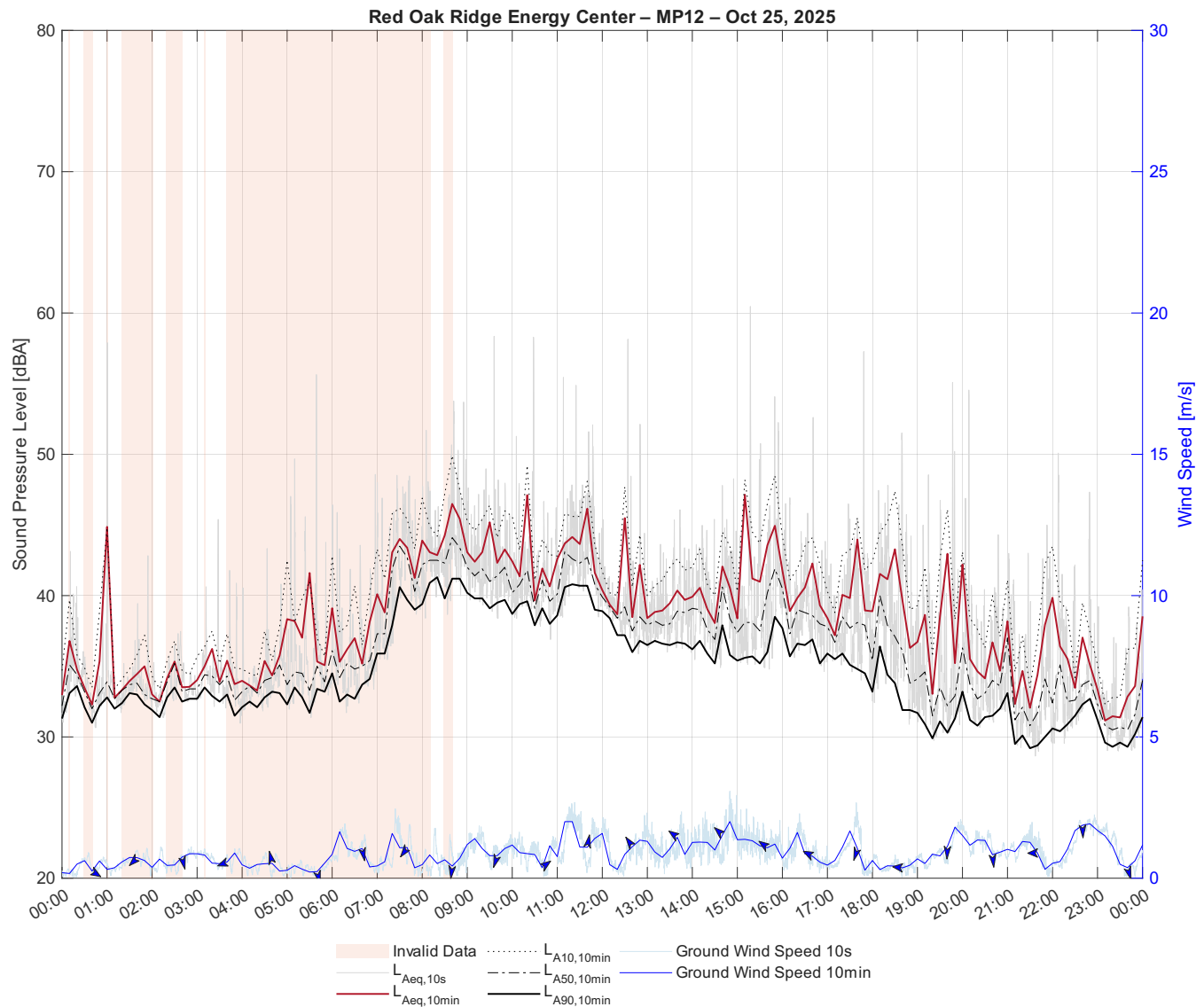
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



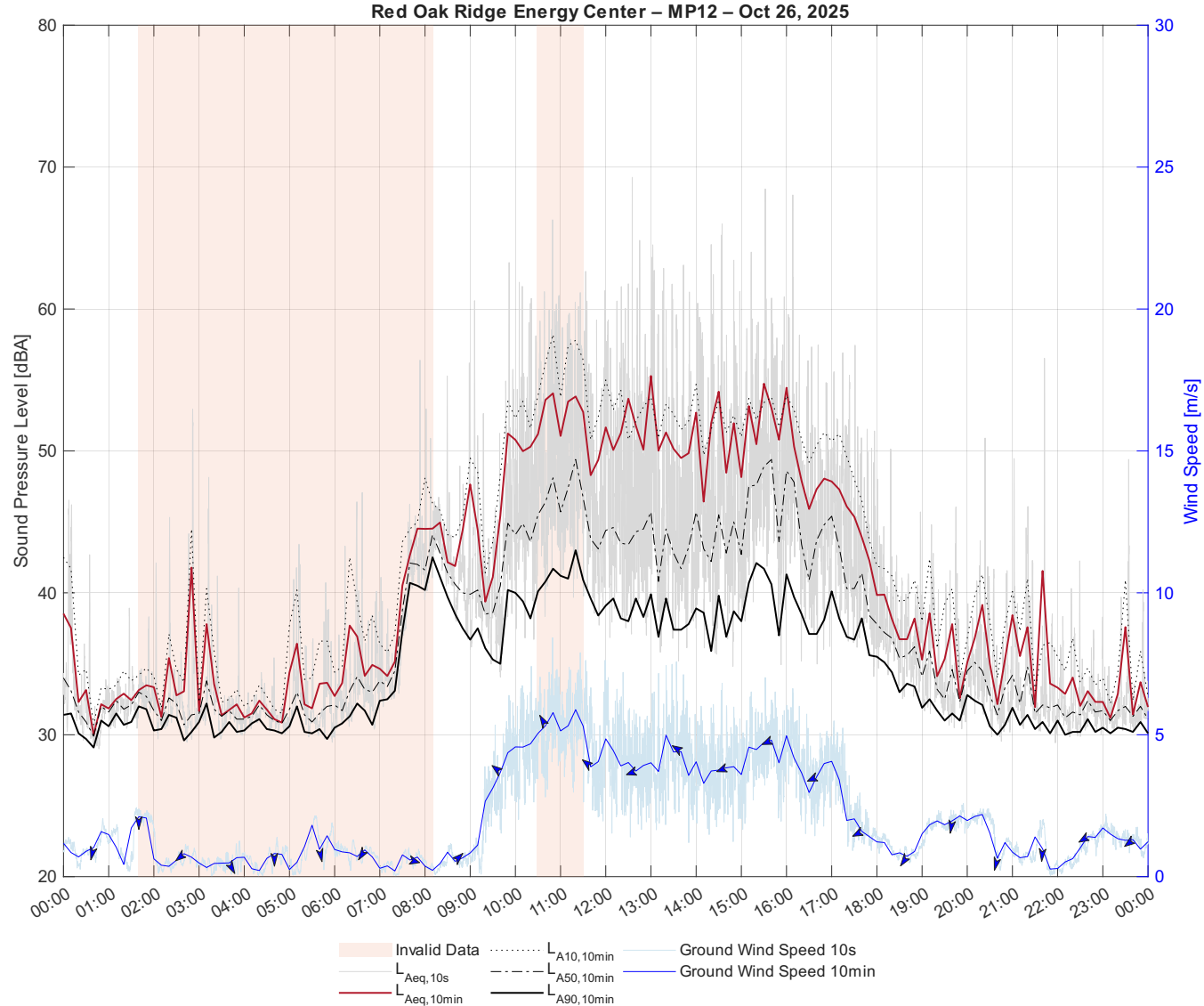
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



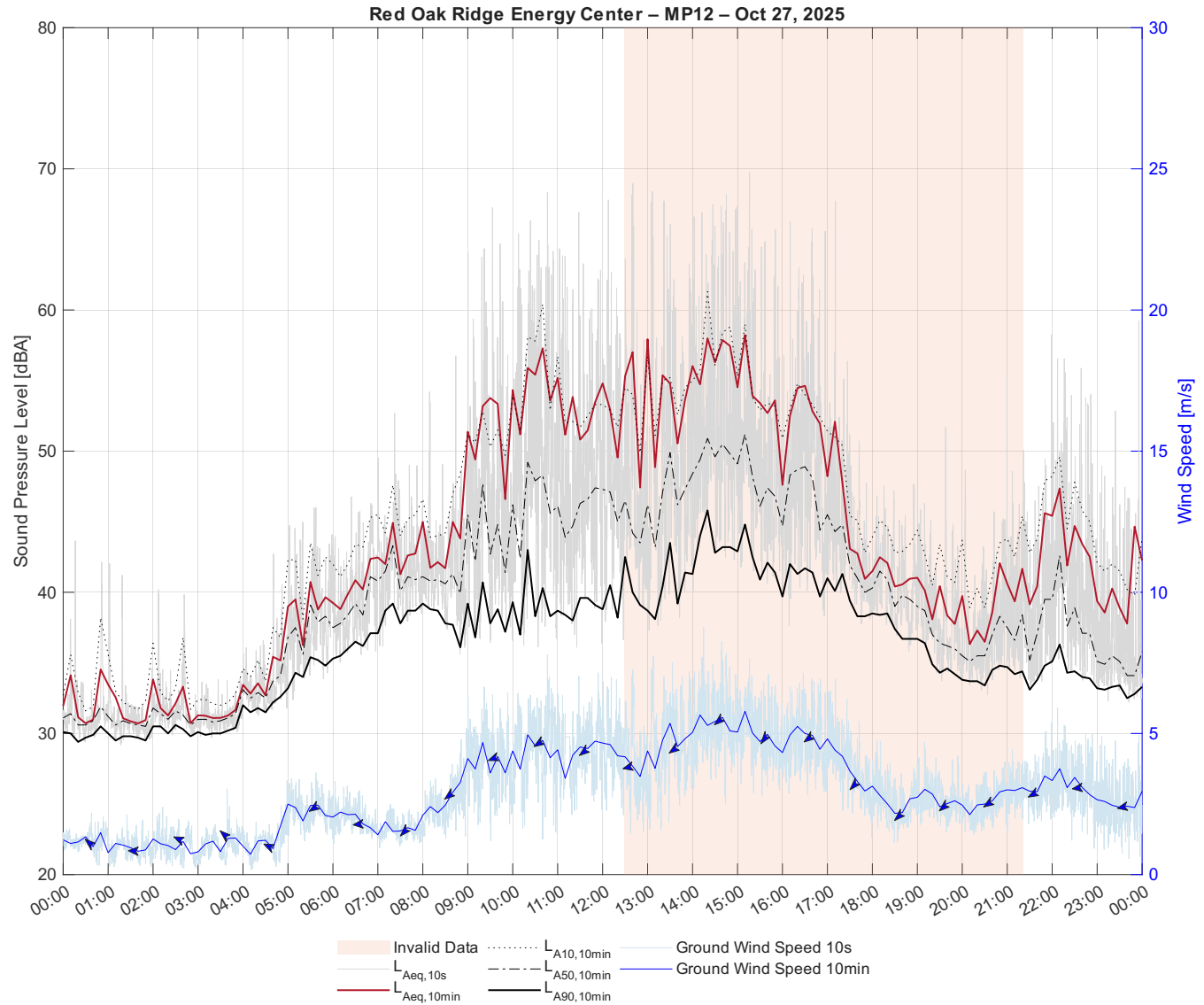
*Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center*



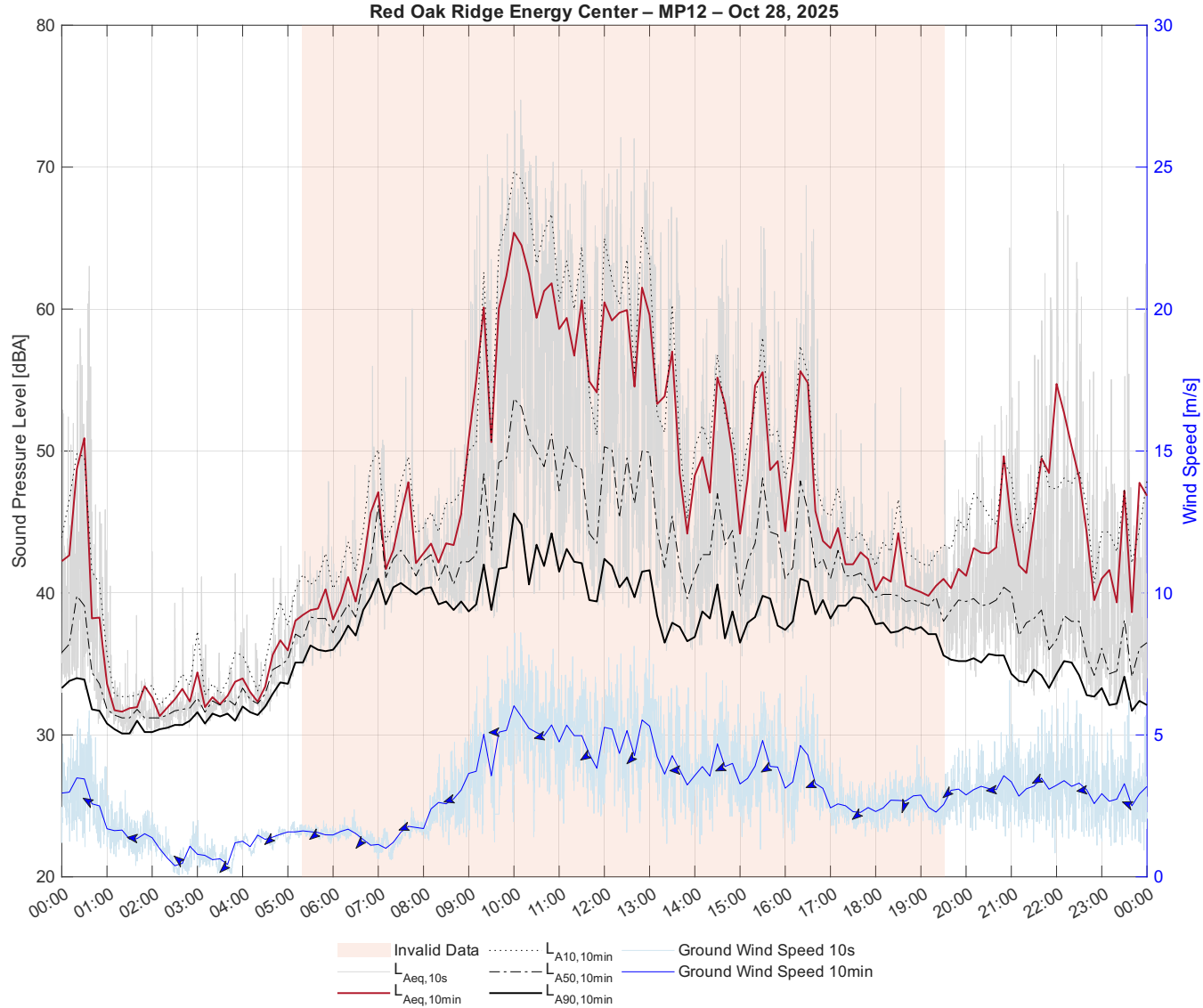
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



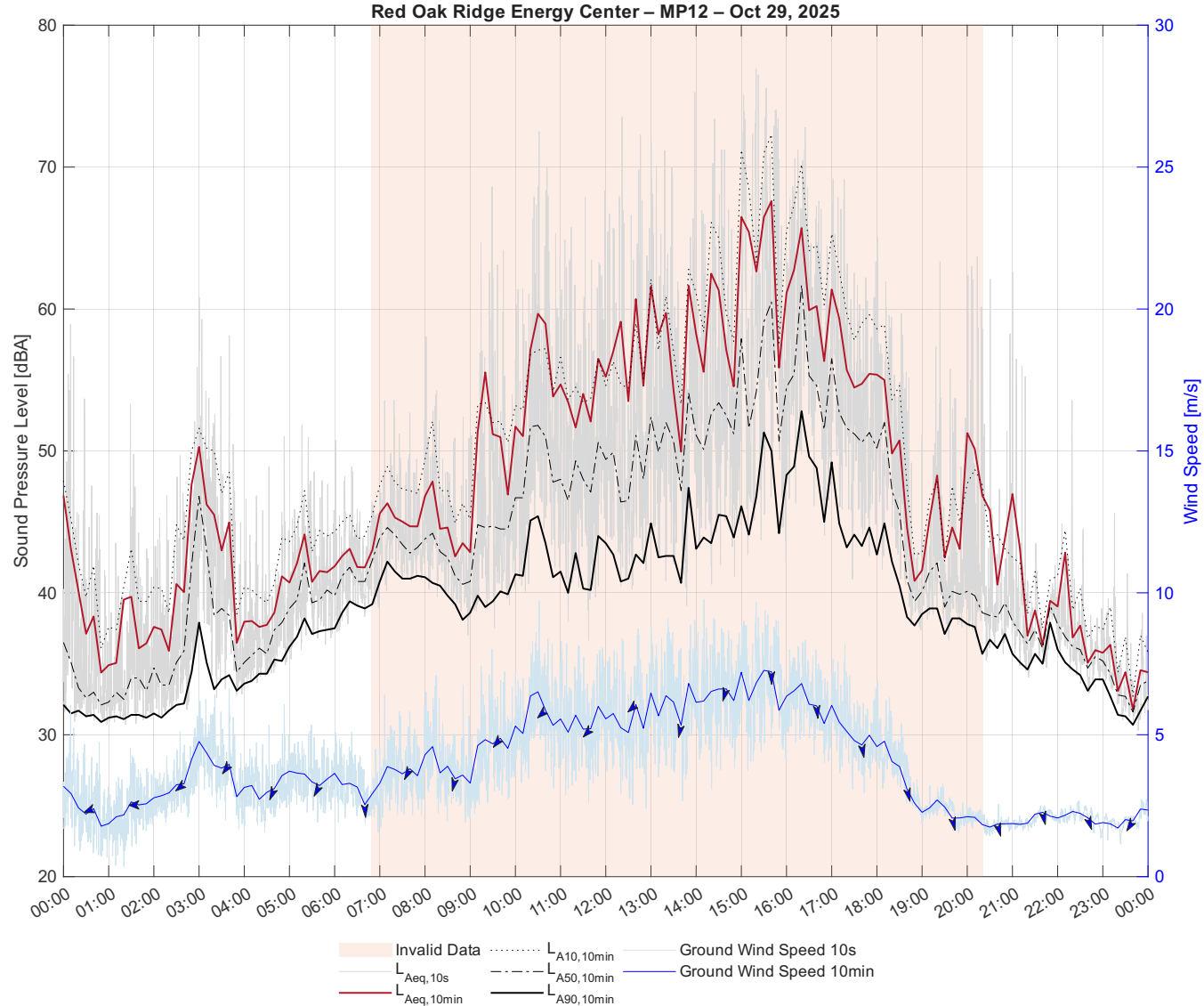
*Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center*



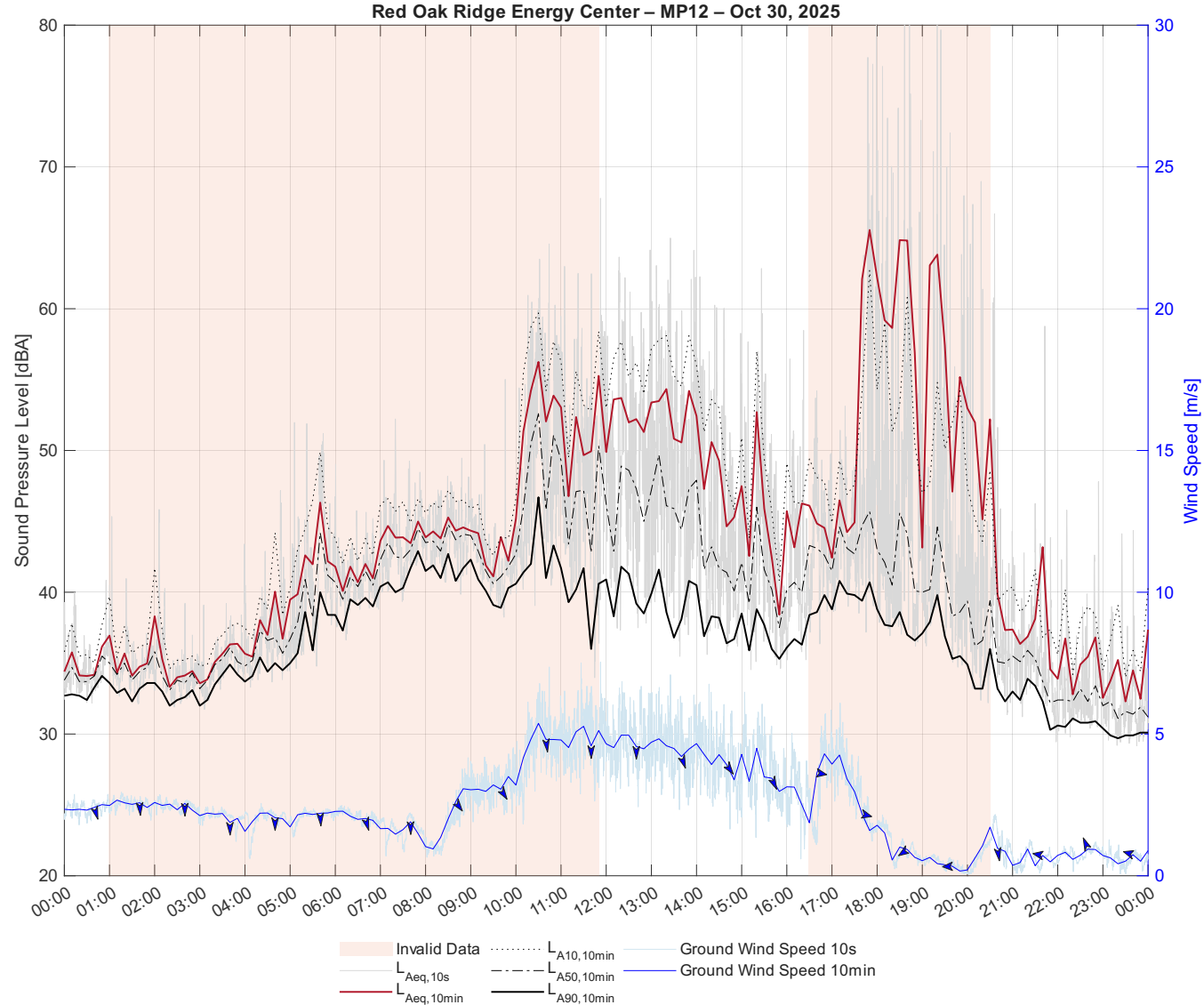
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



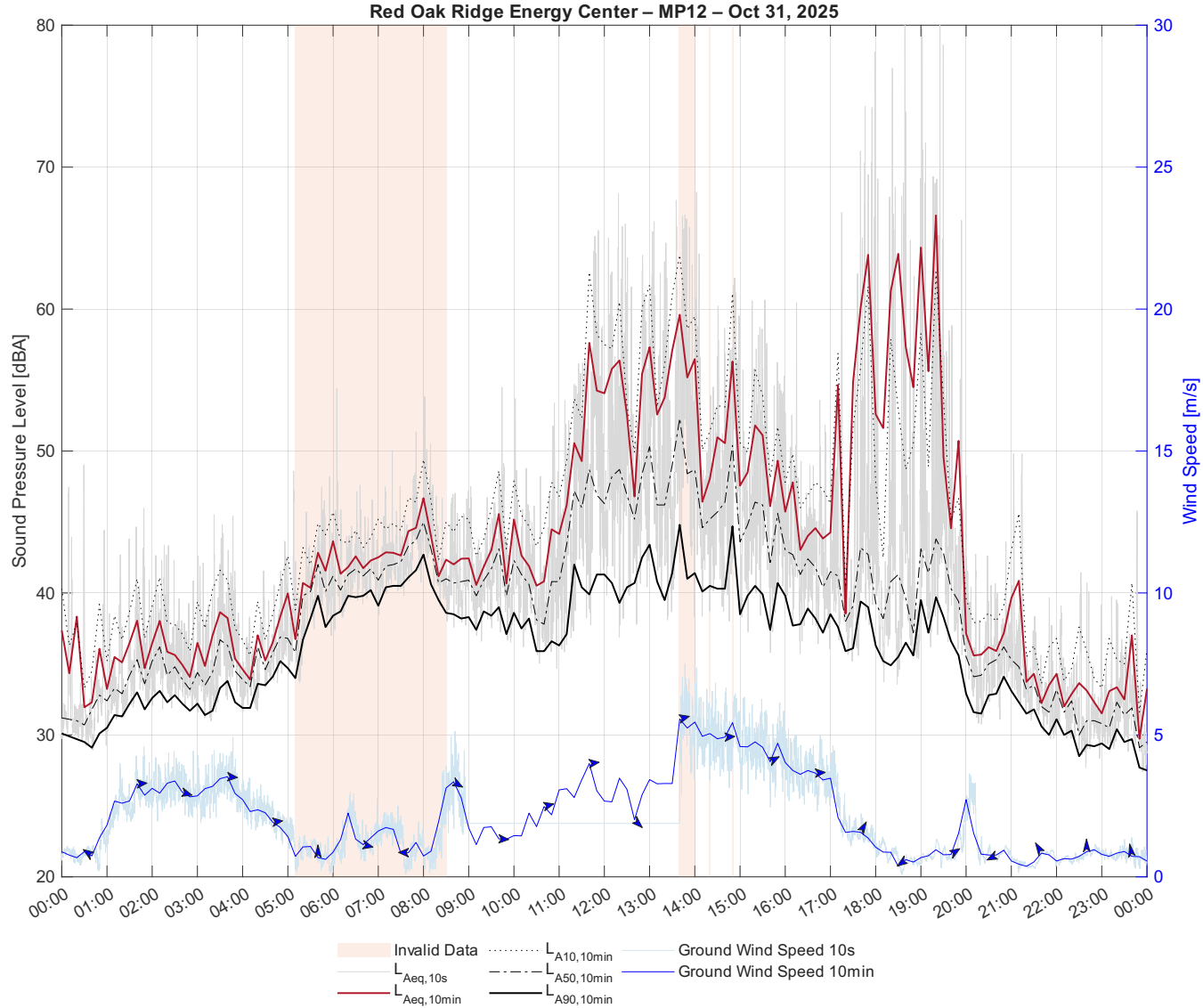
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



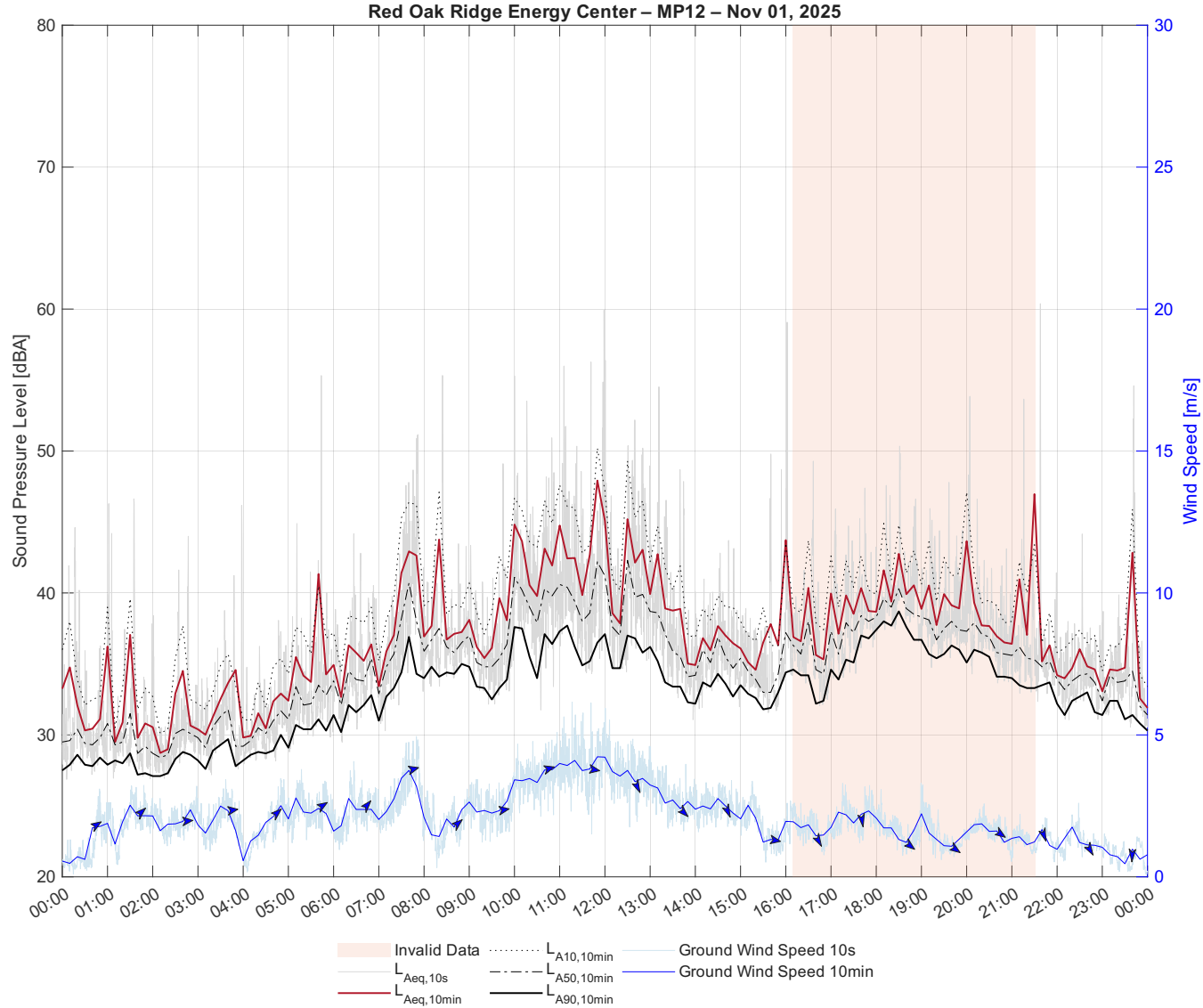
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



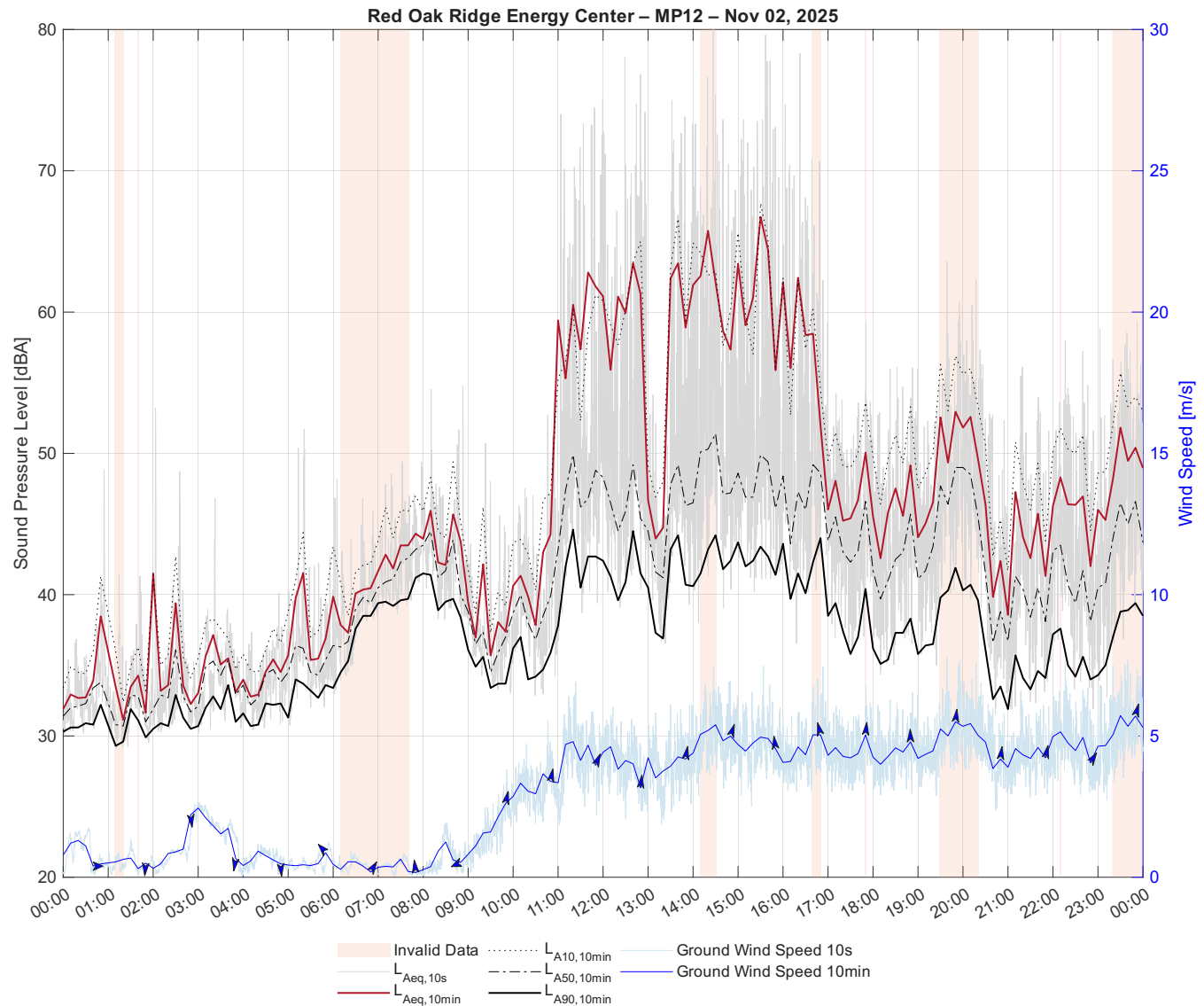
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



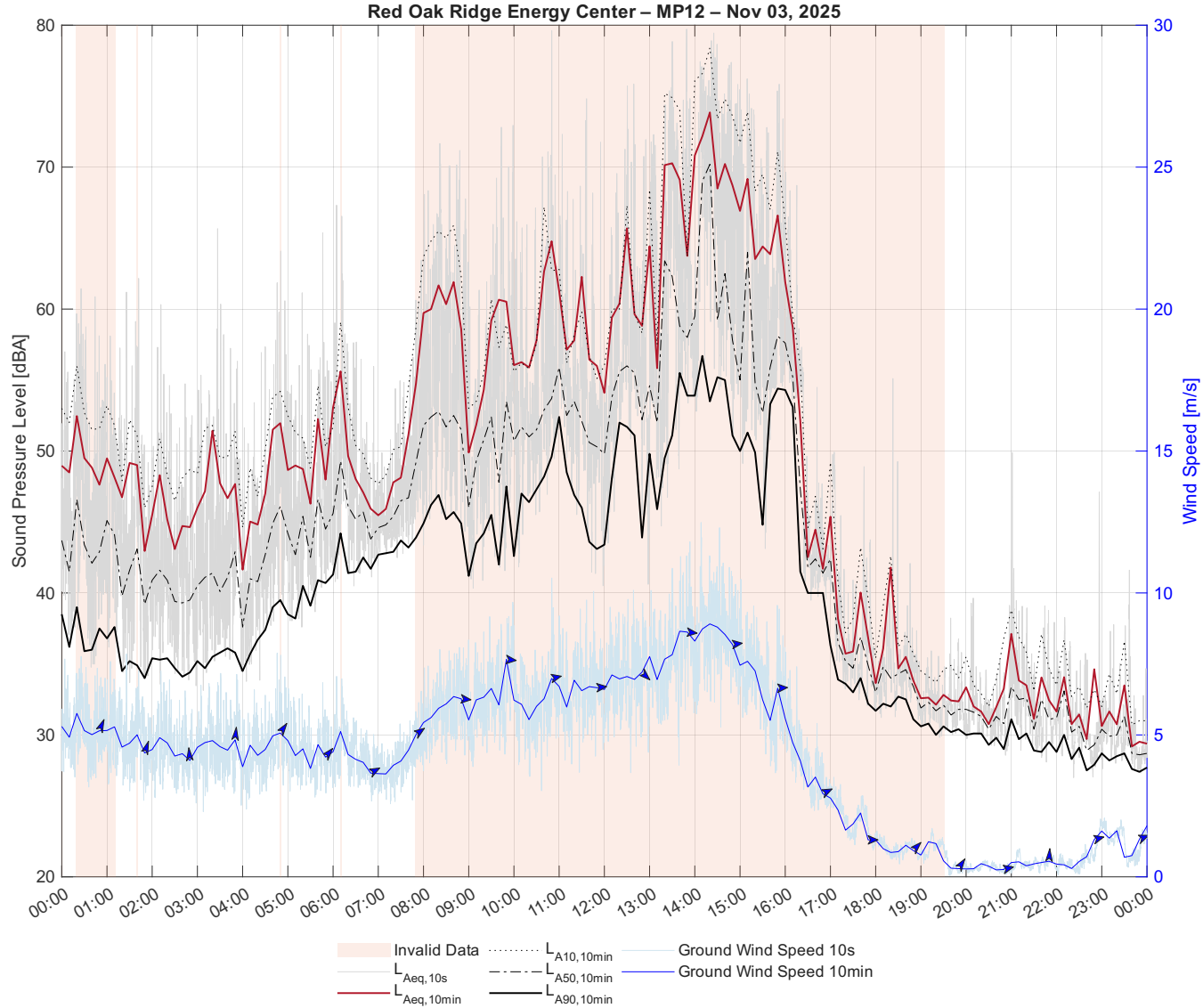
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



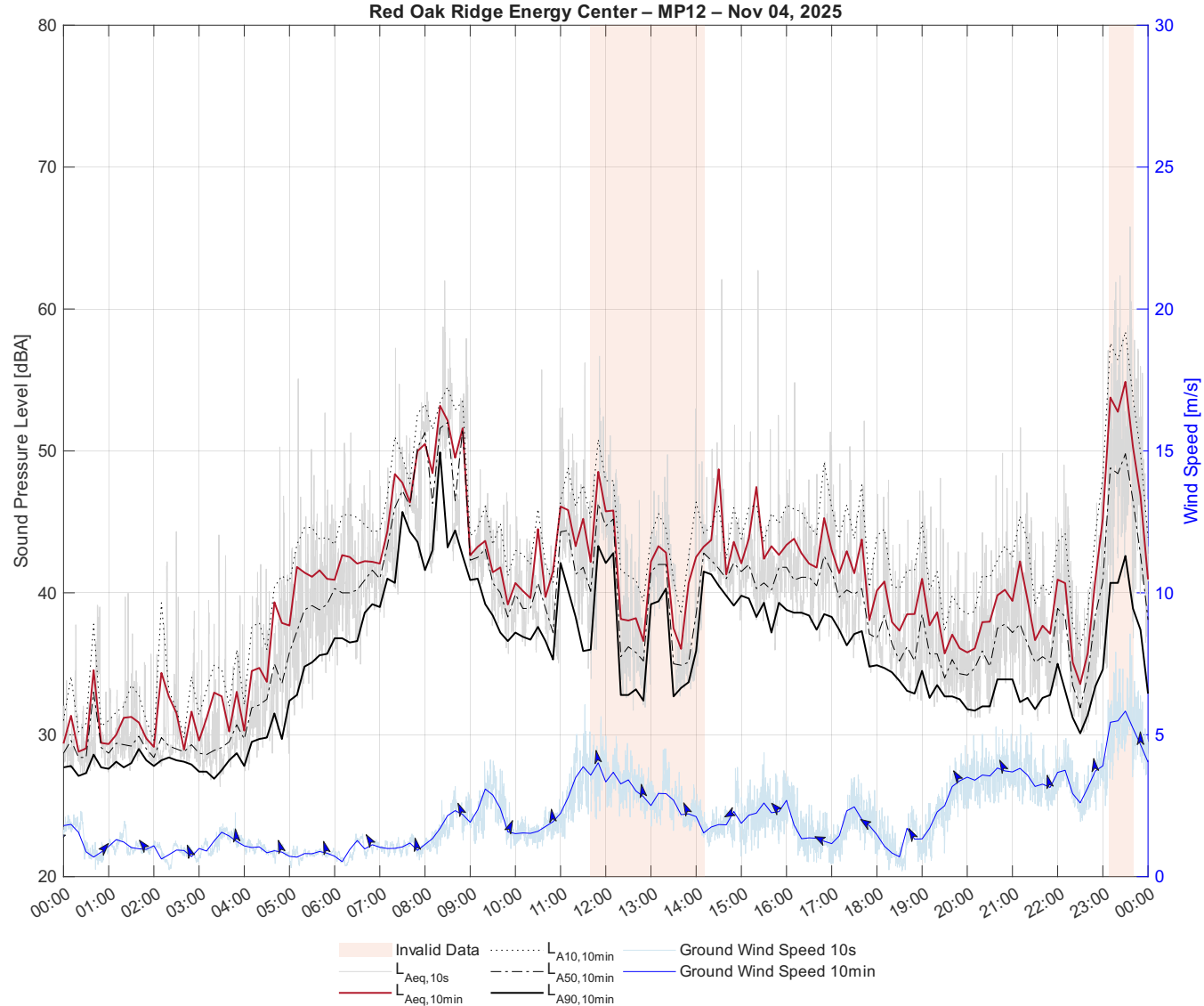
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



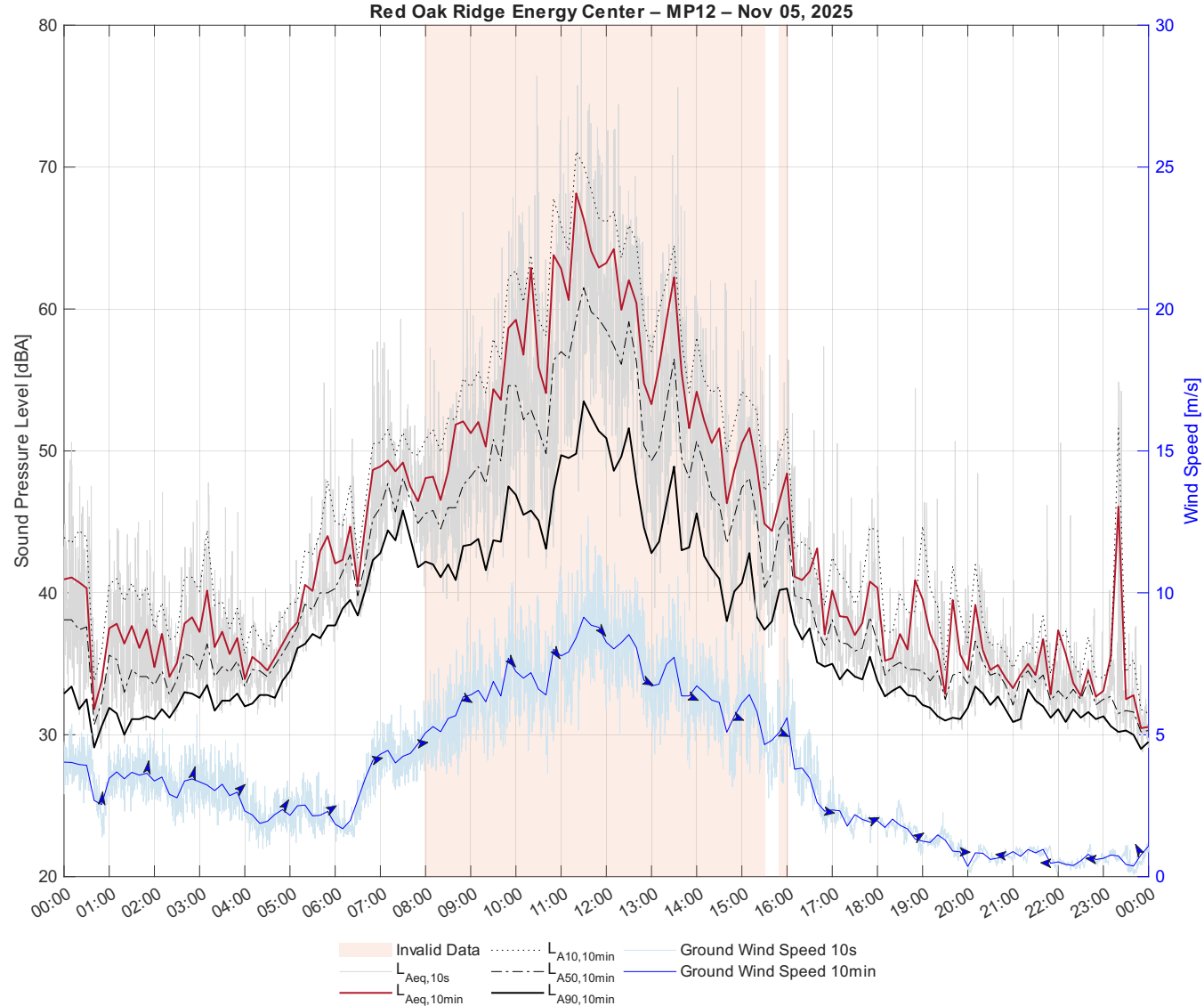
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



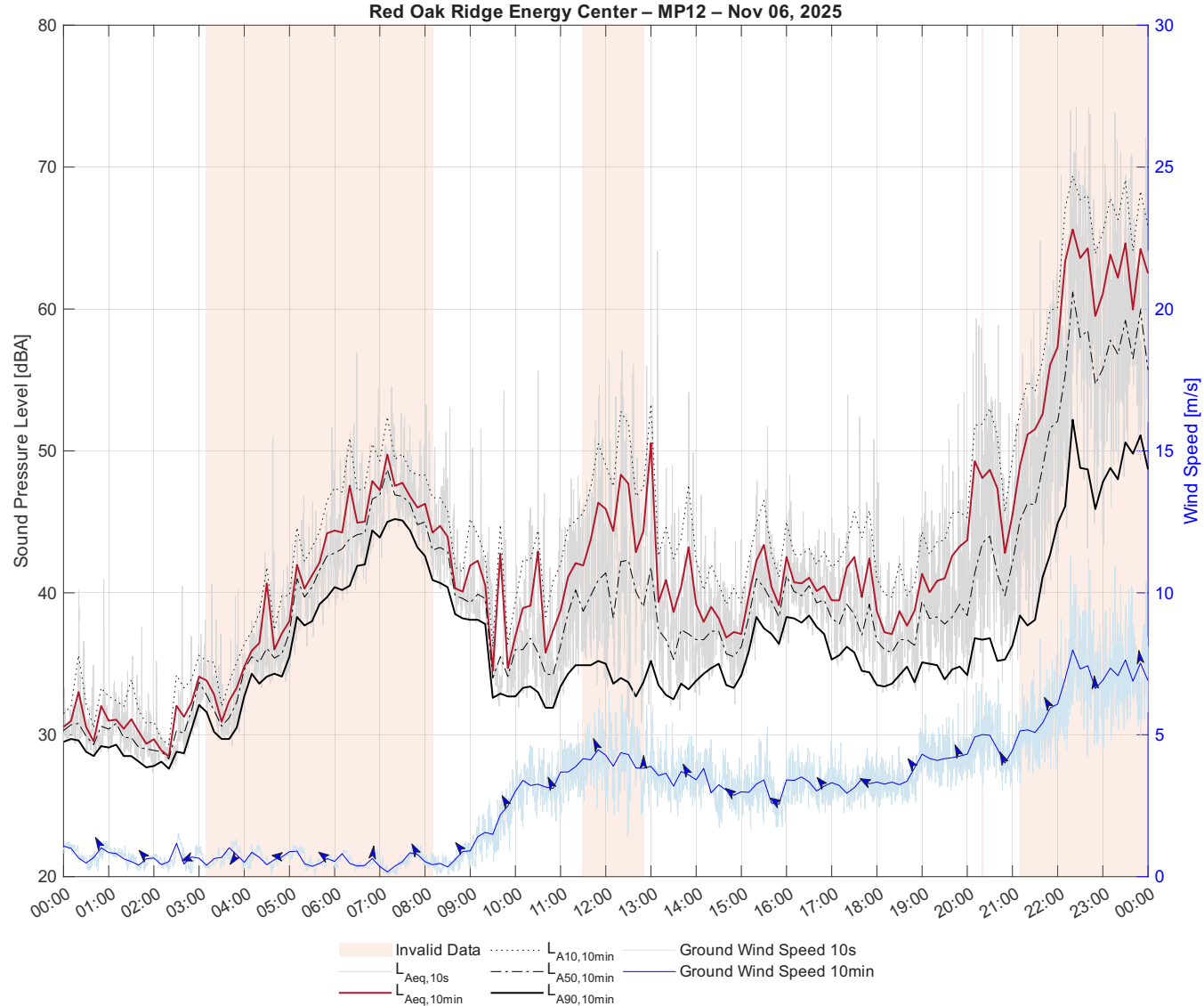
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



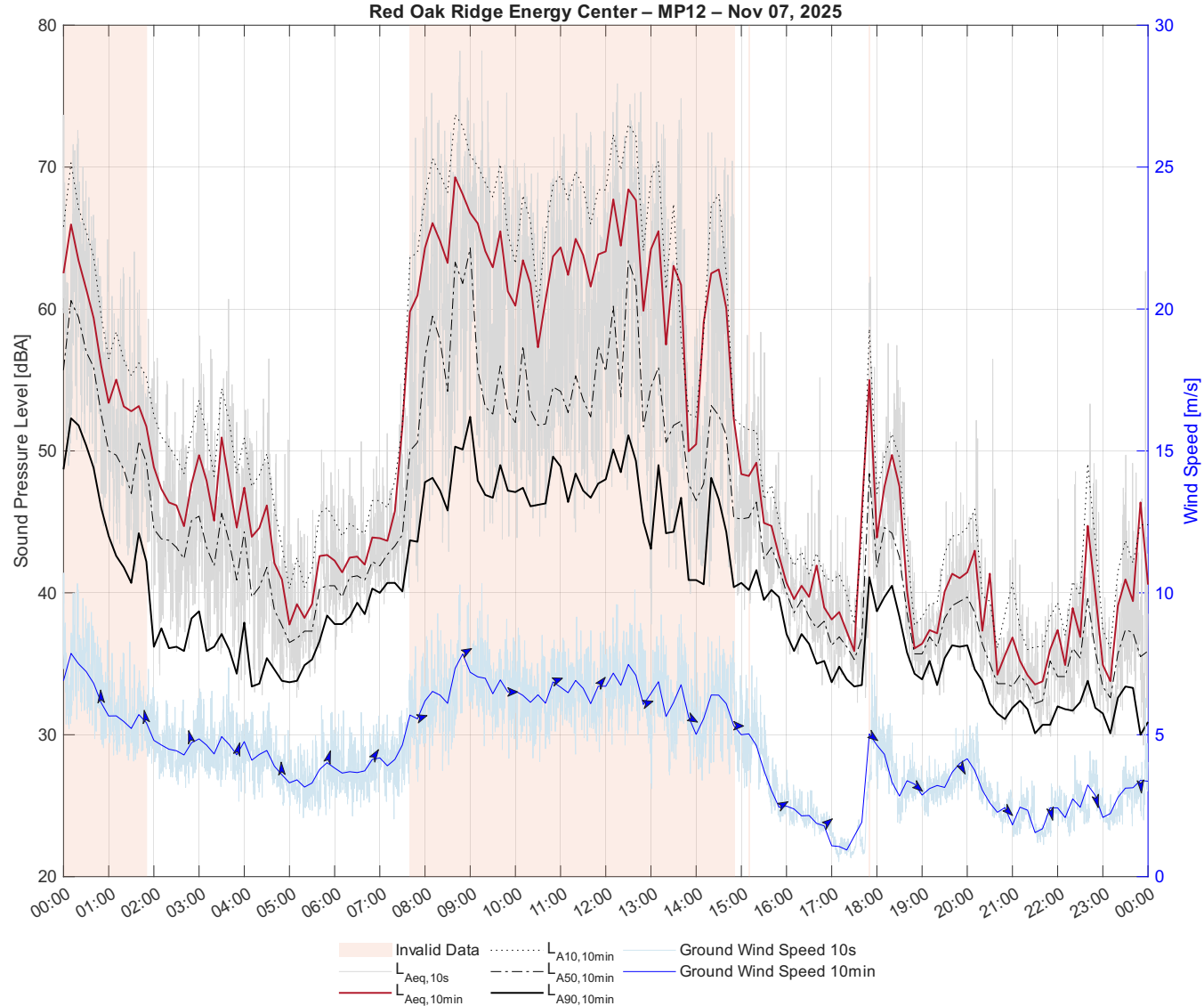
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



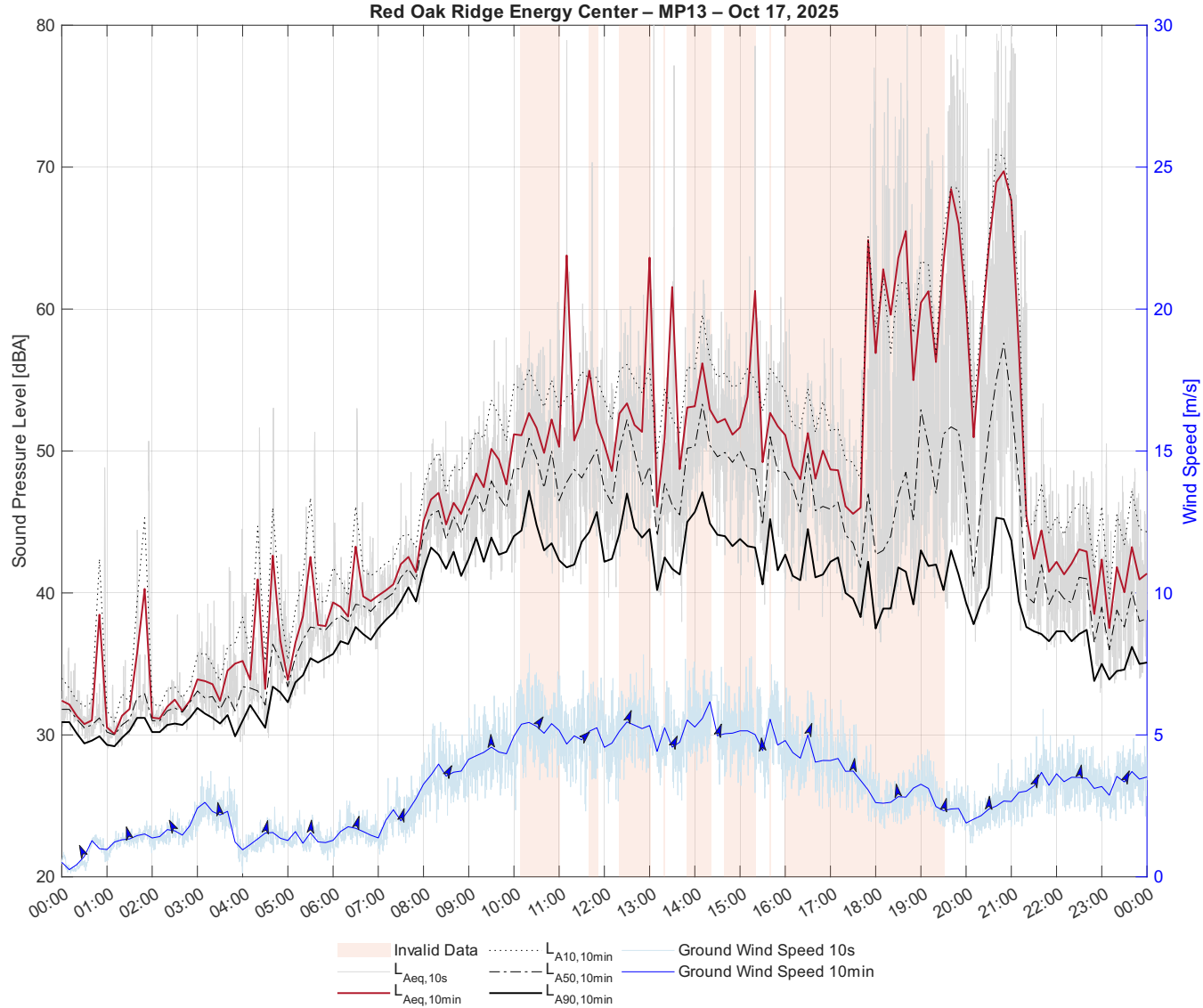
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



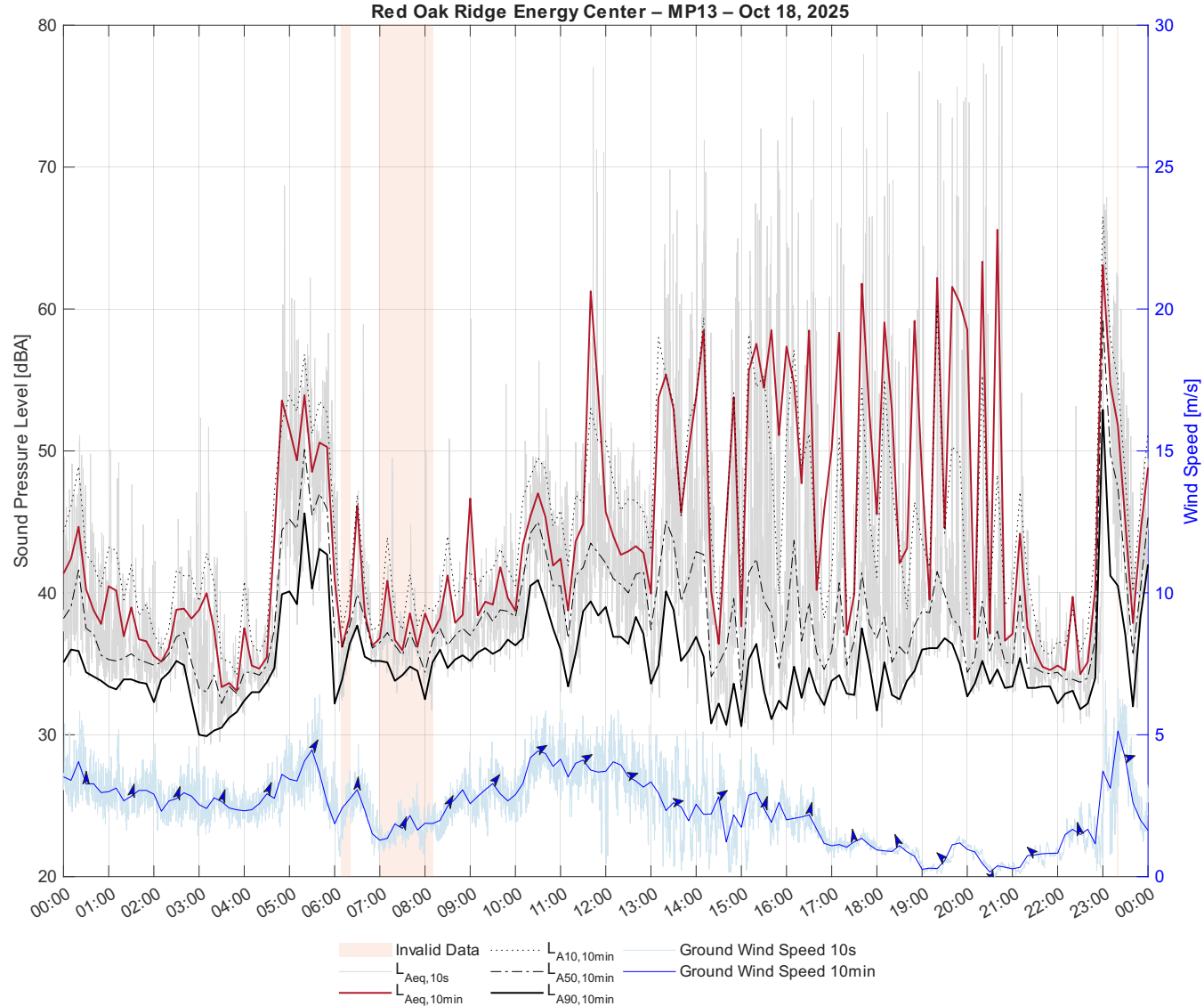
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



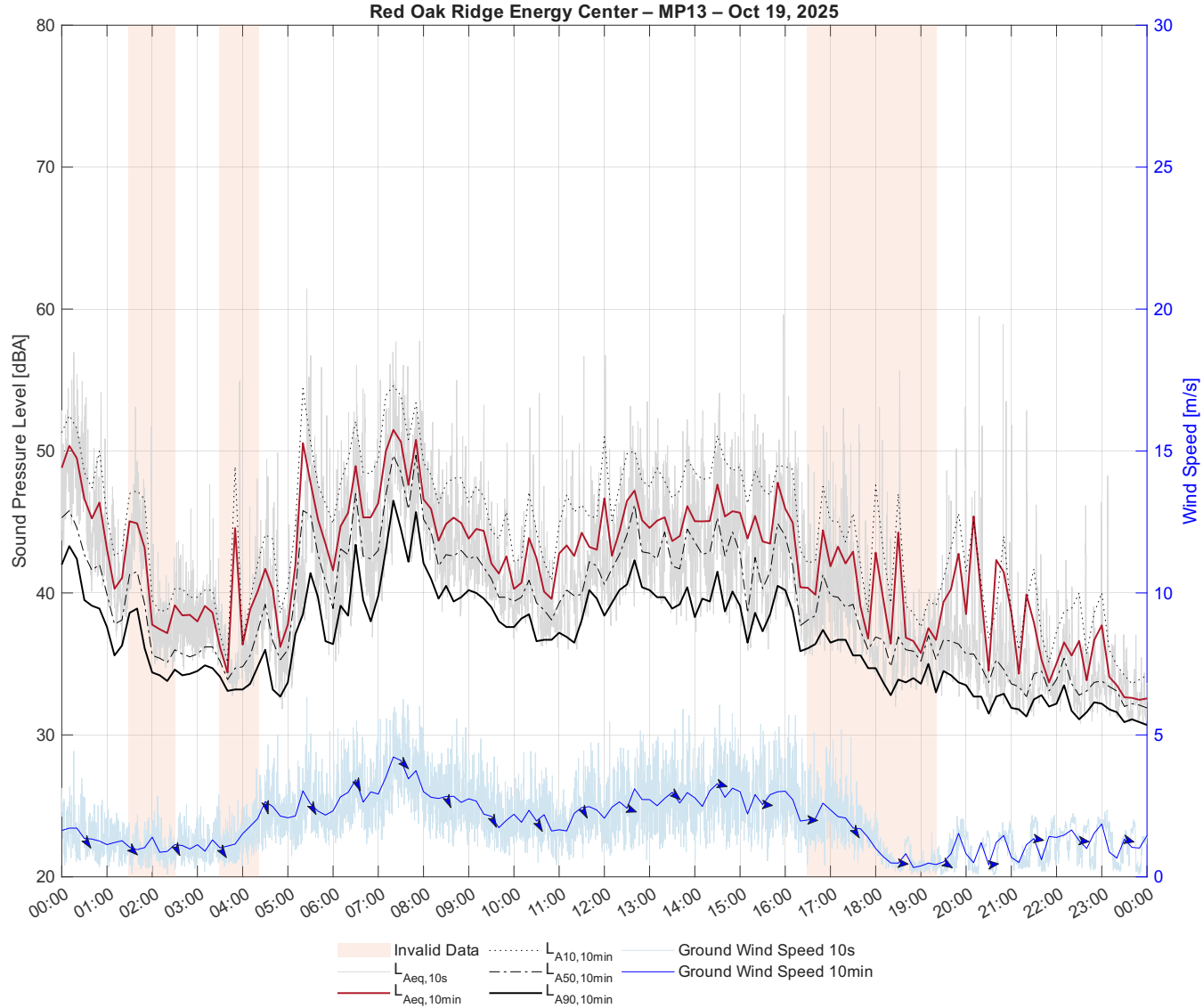
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



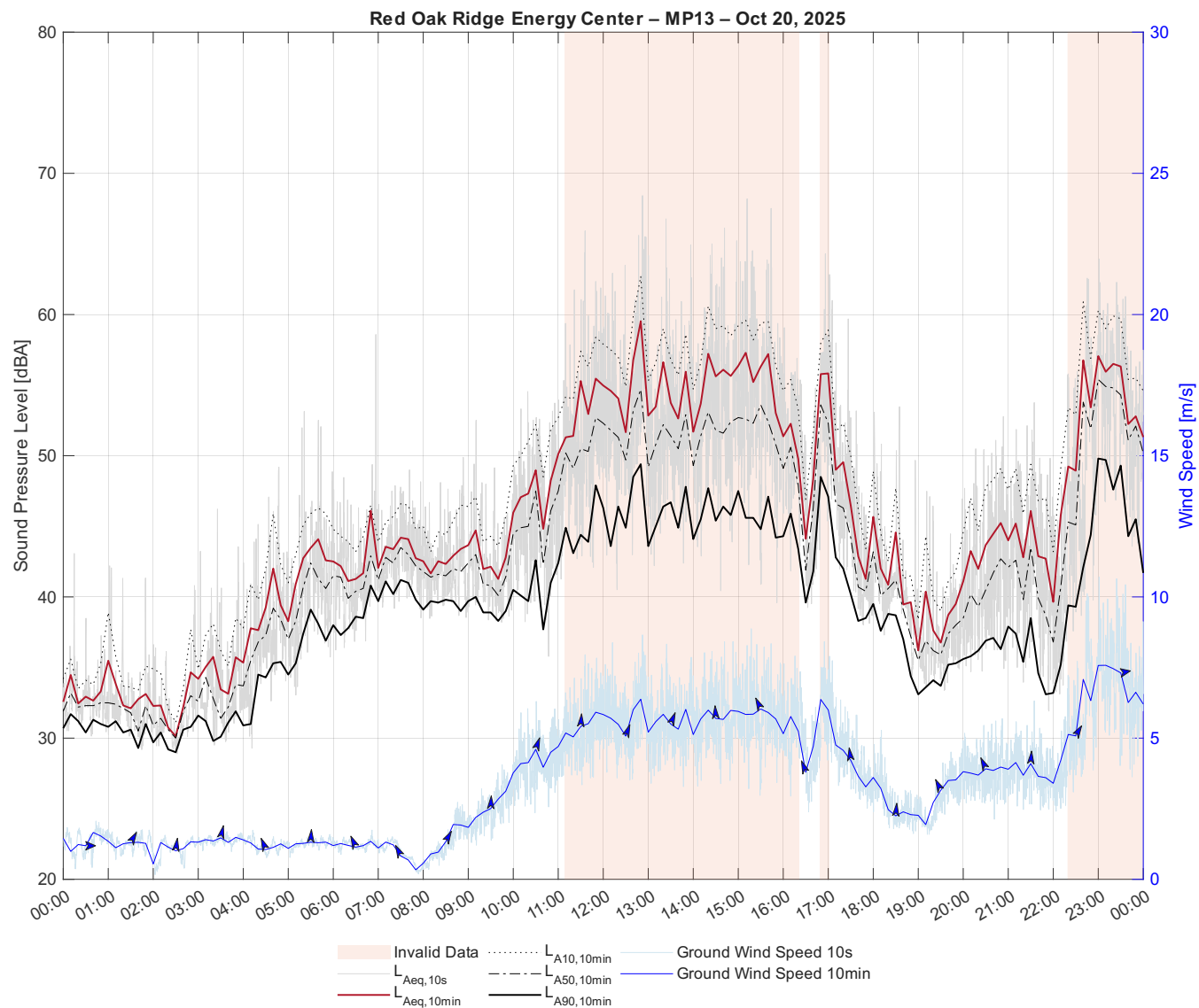
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



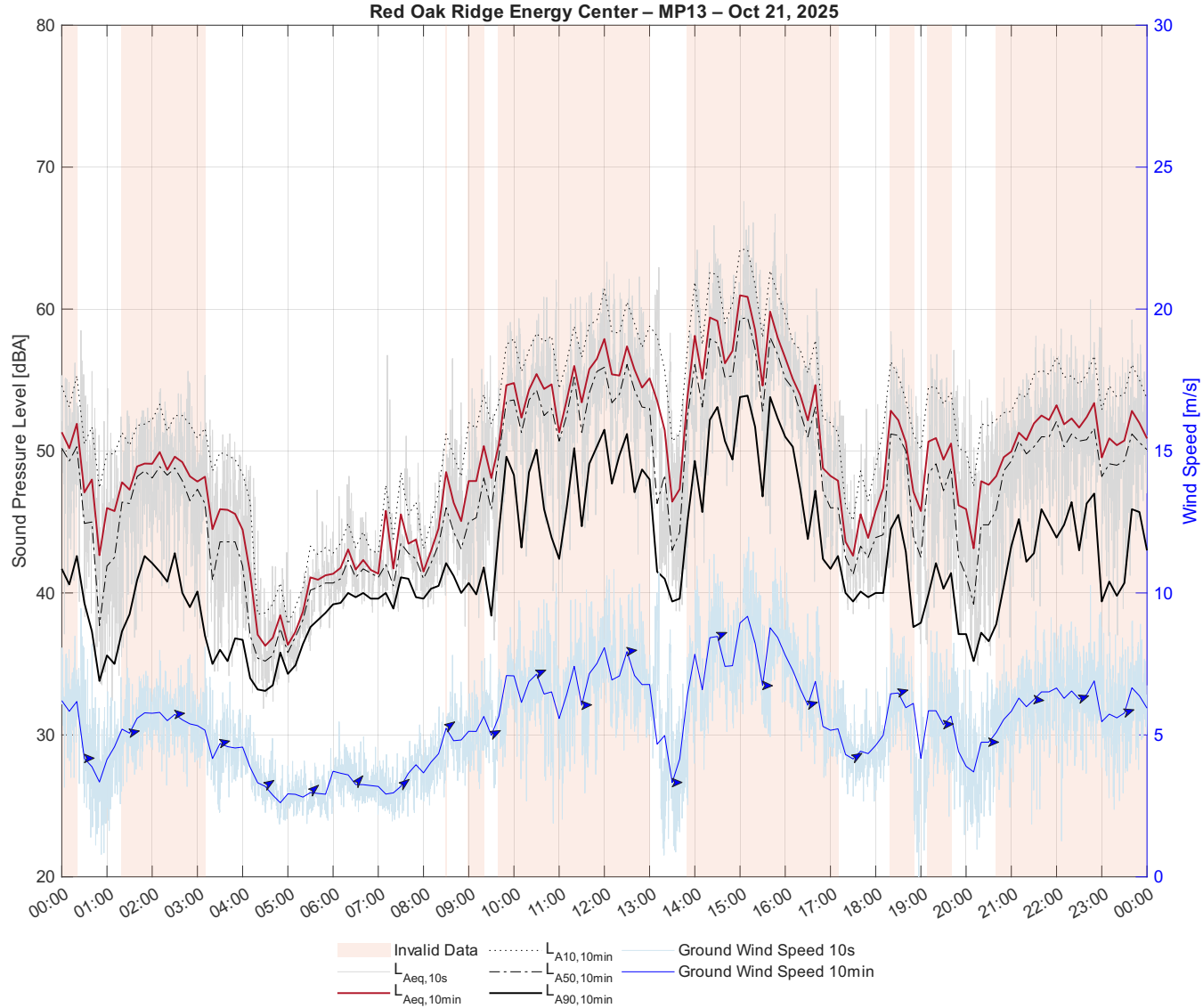
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



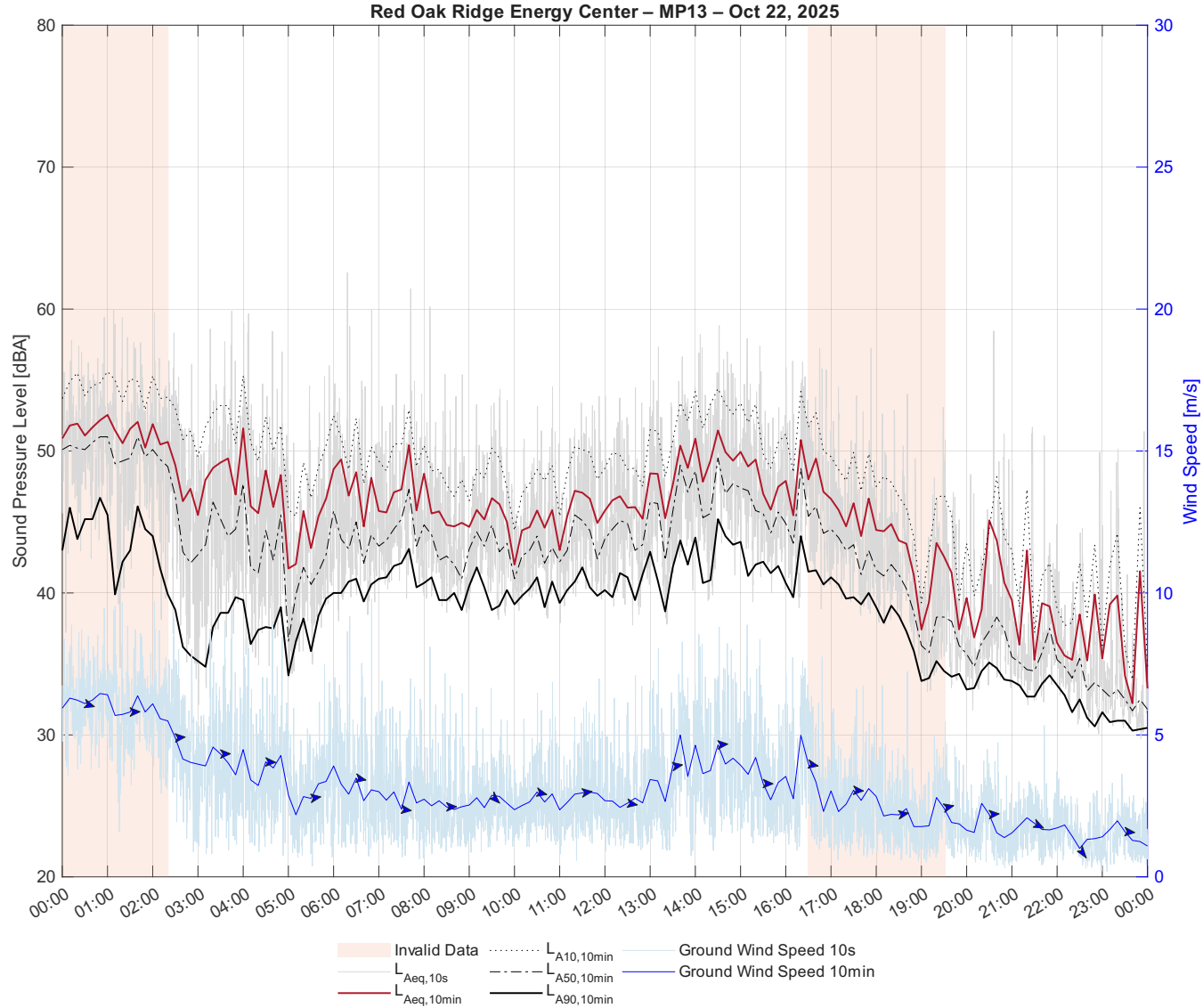
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



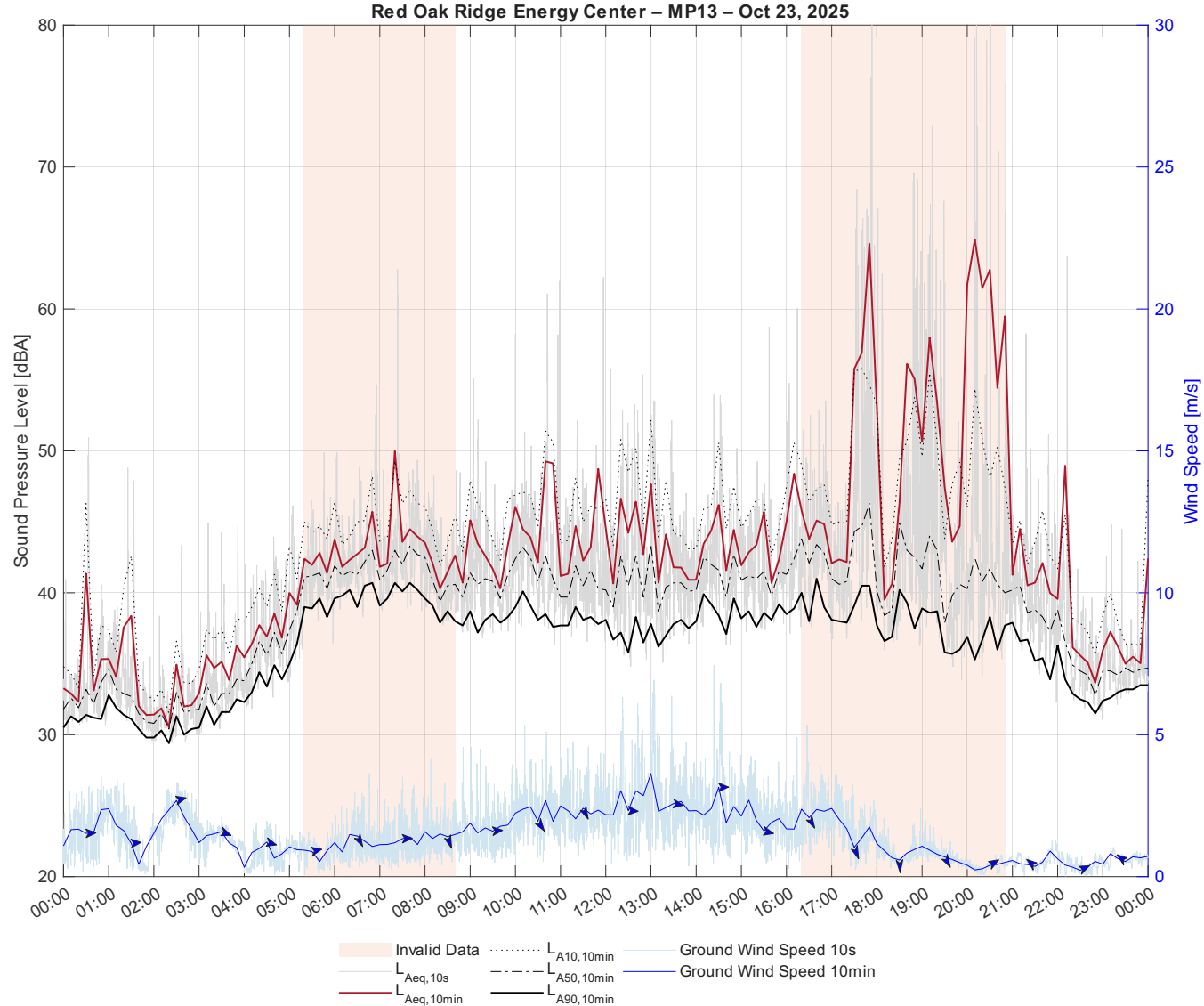
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



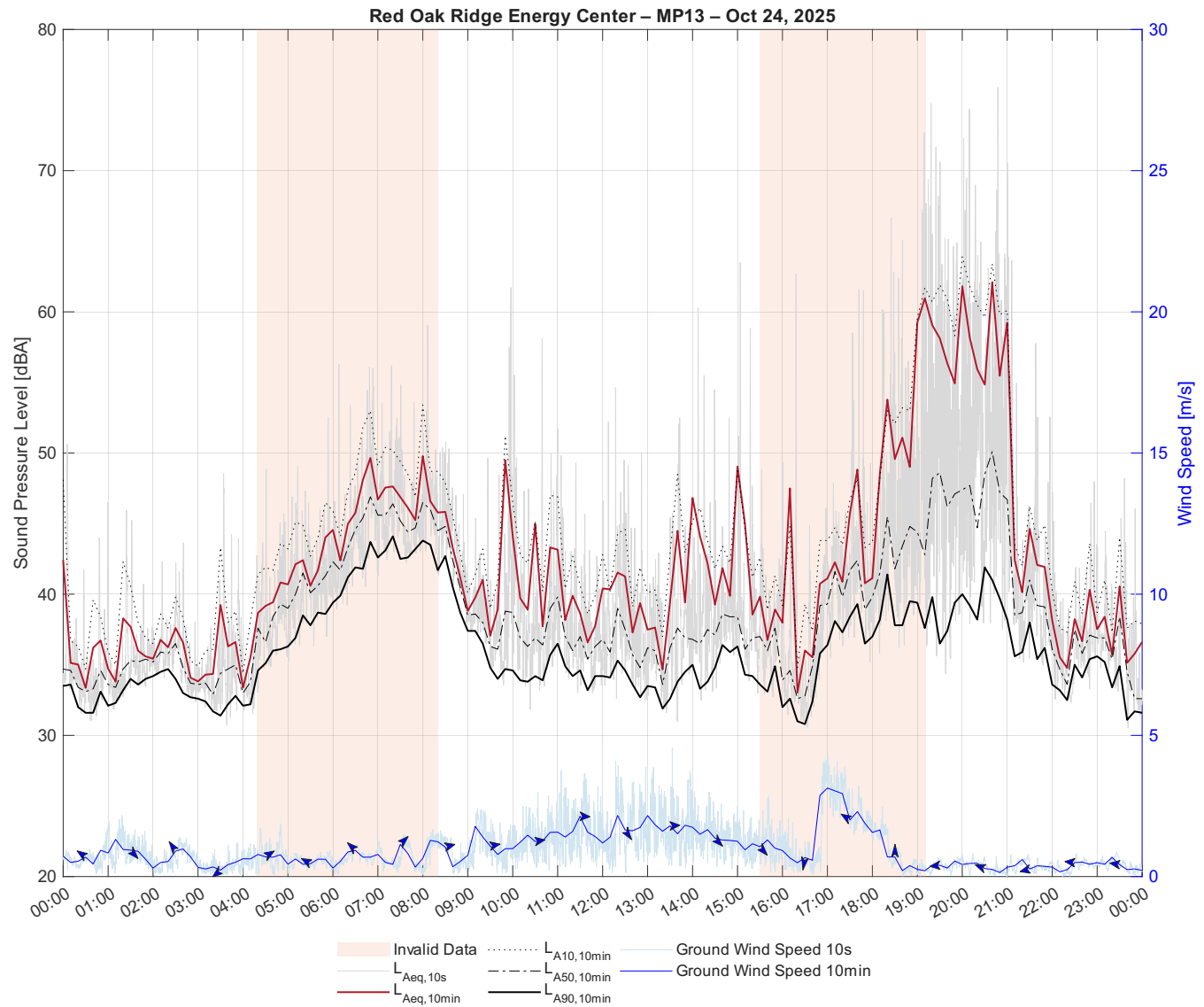
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



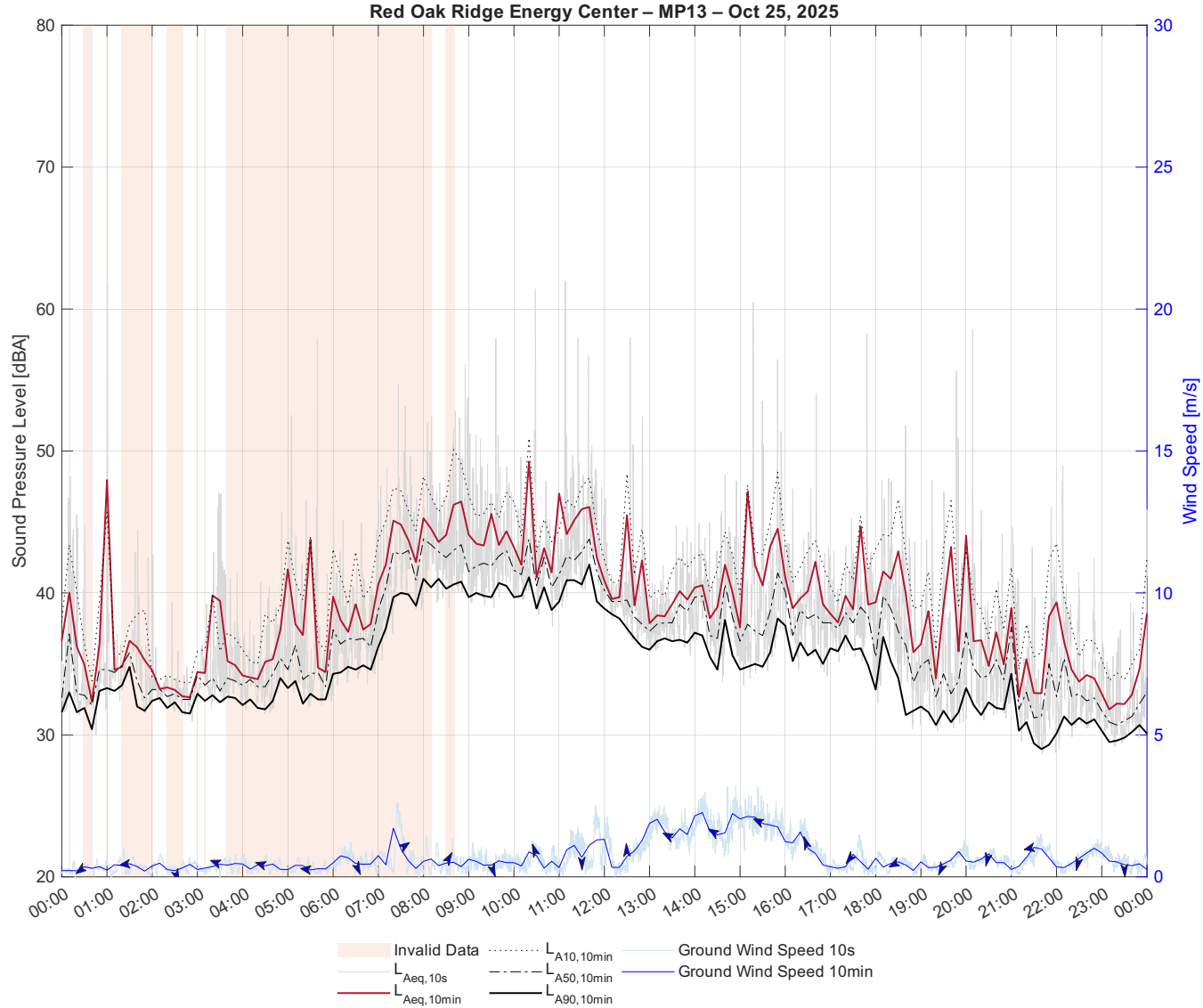
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



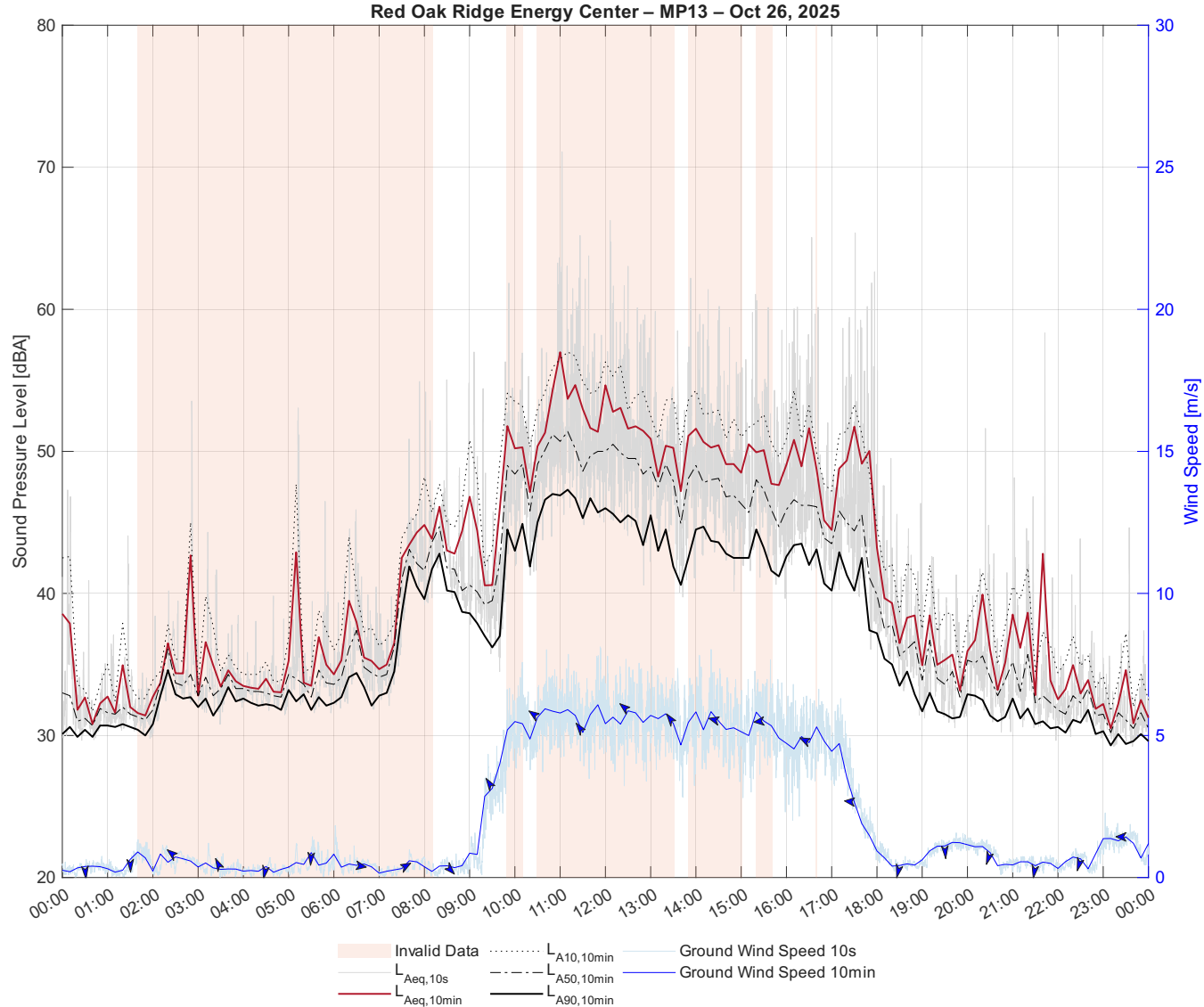
*Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center*



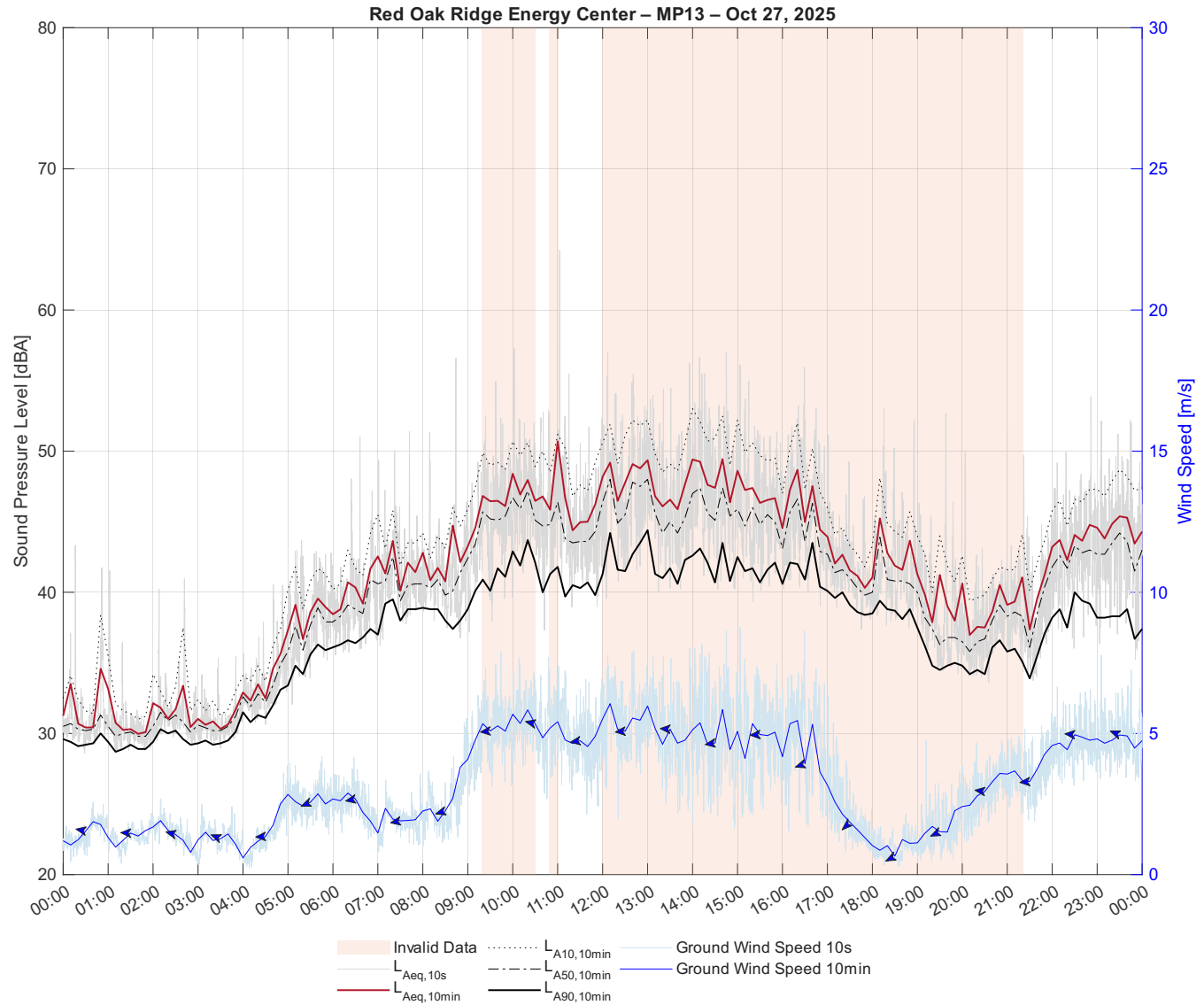
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



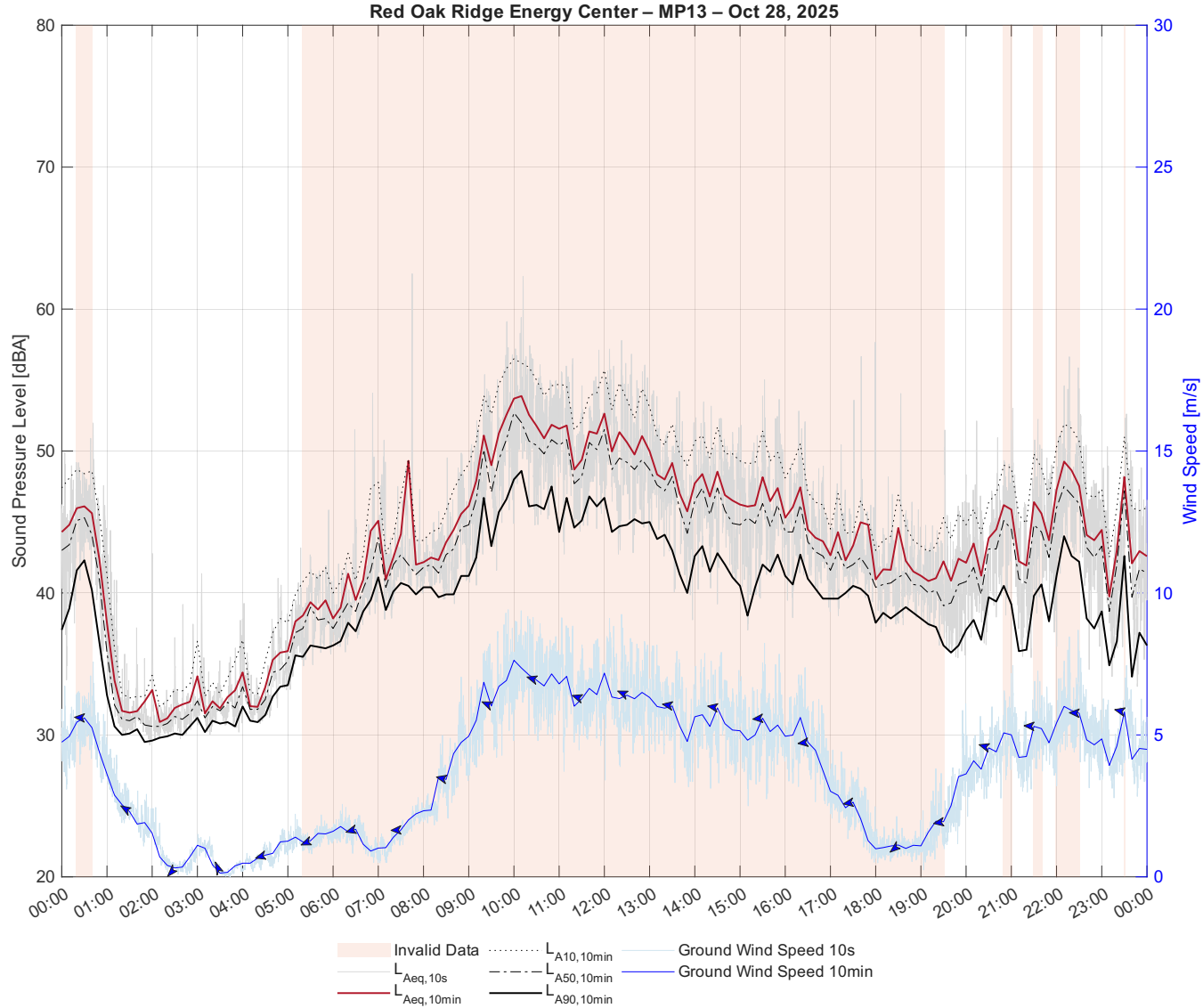
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



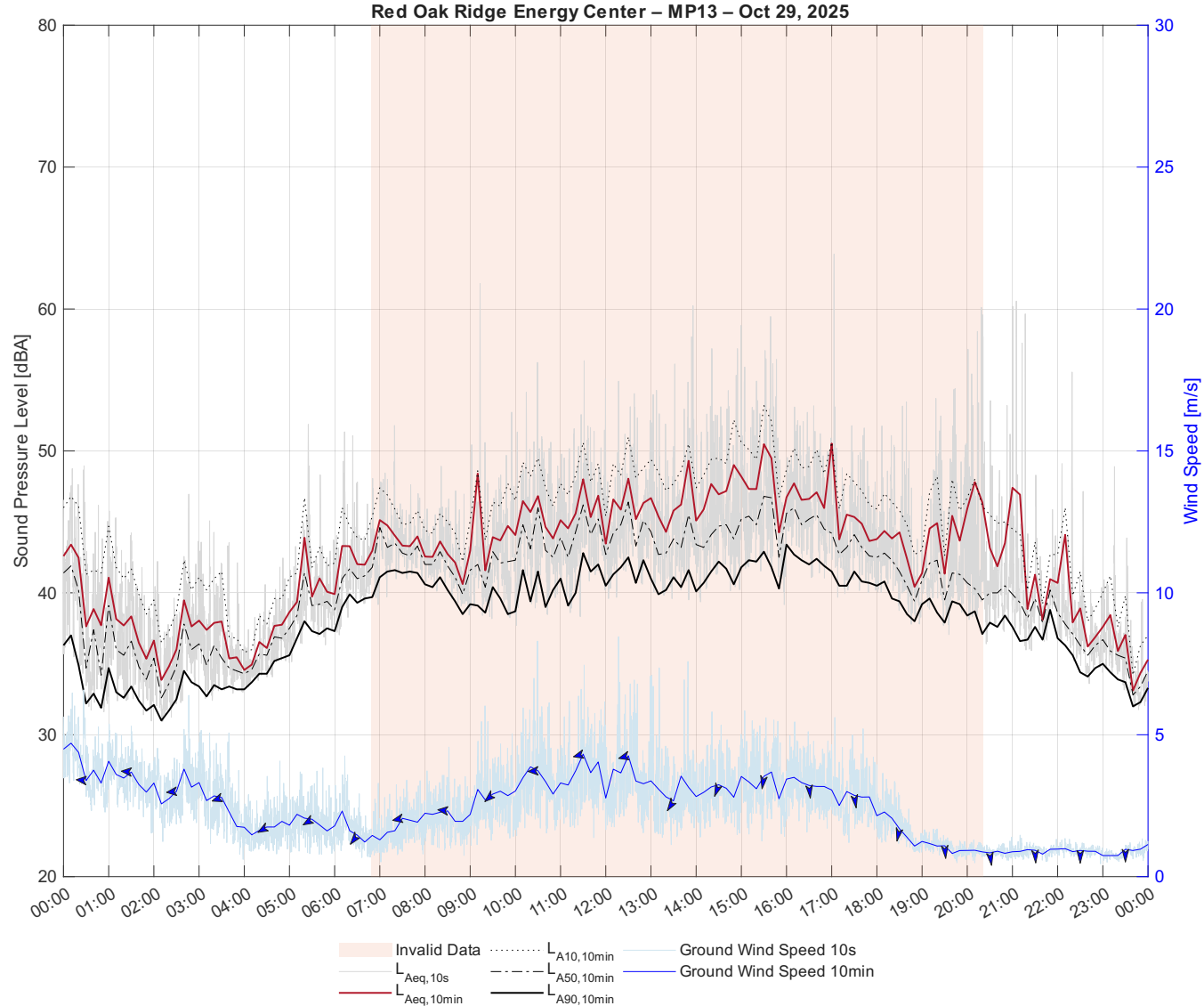
*Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center*



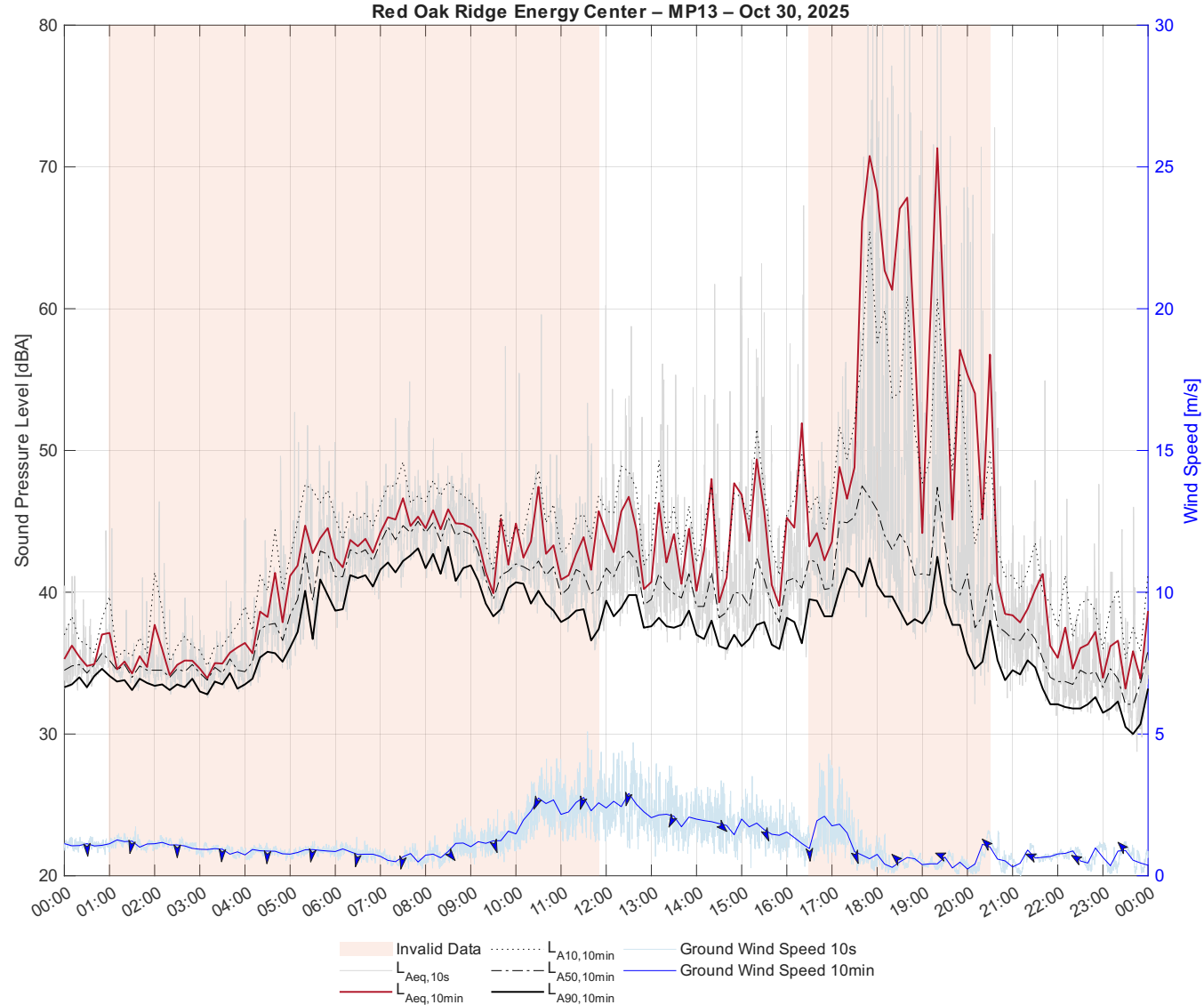
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



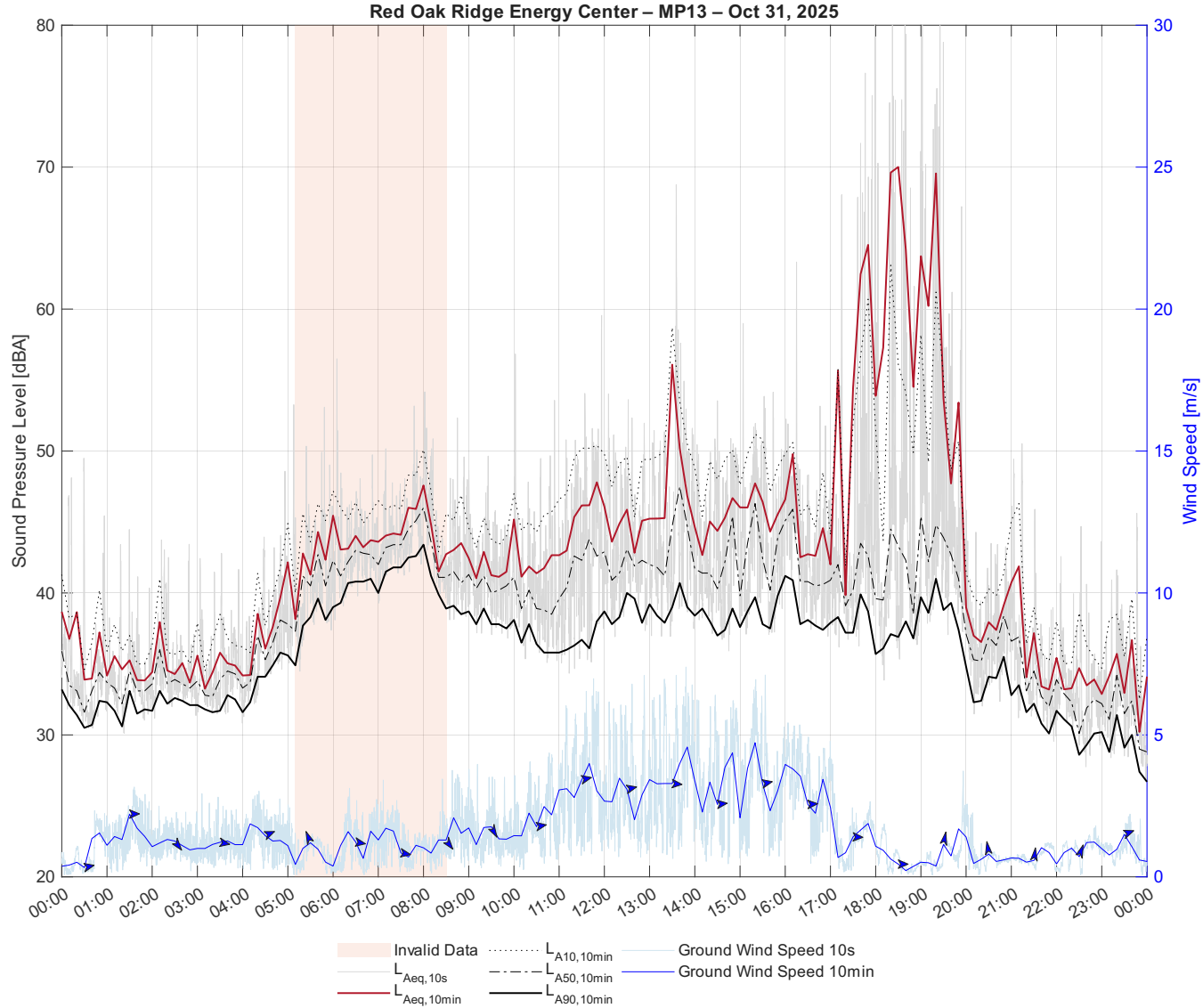
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



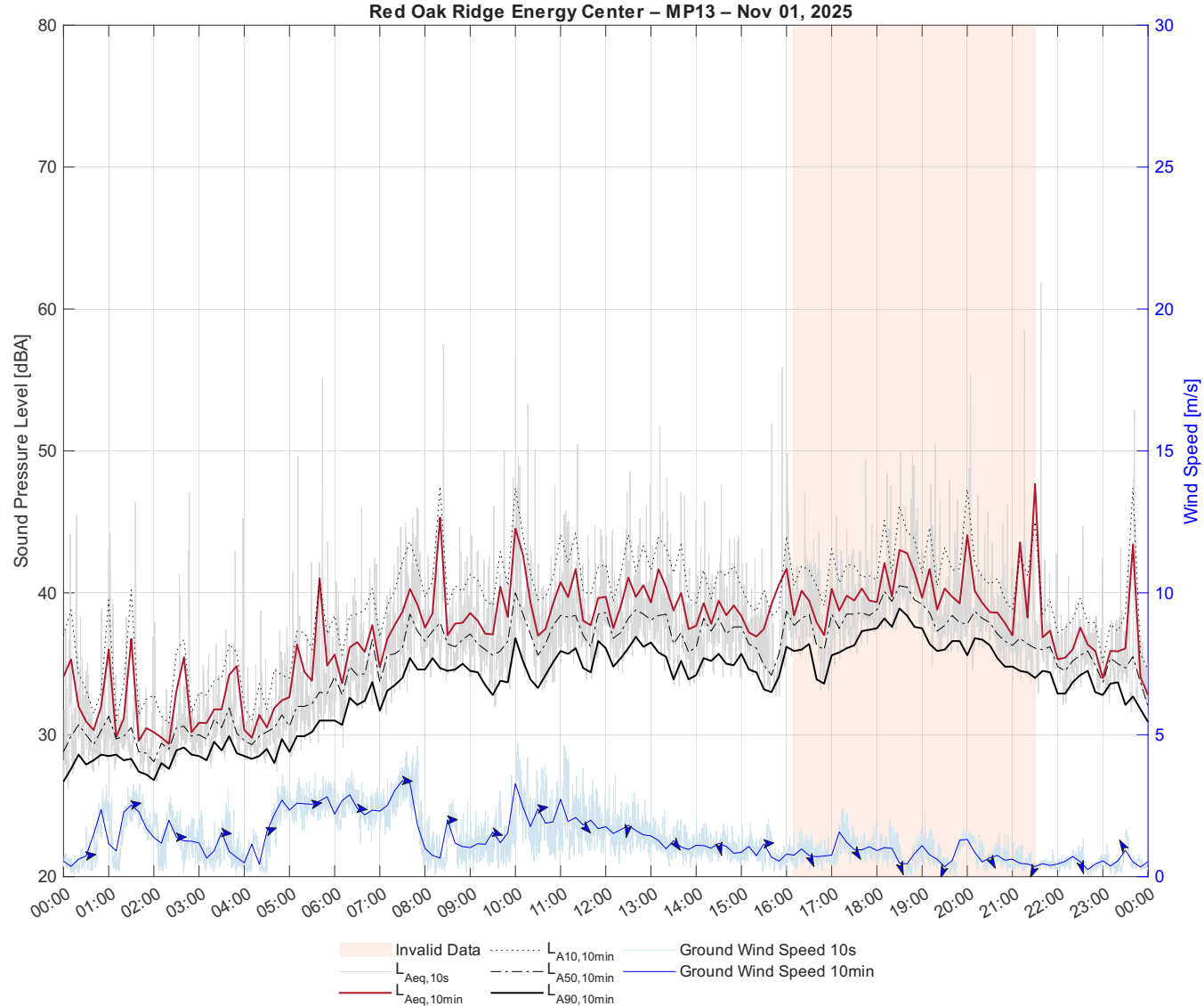
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



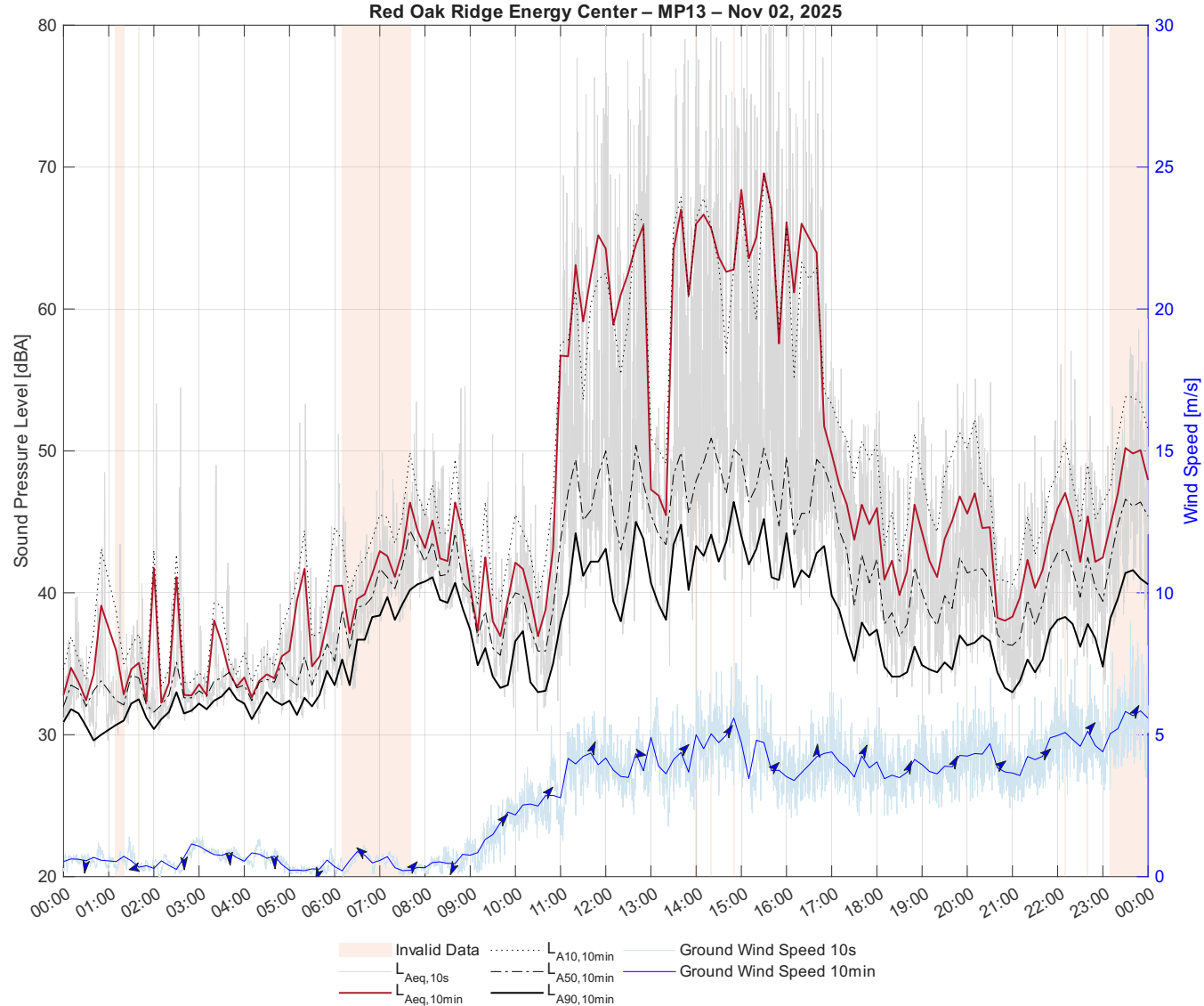
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



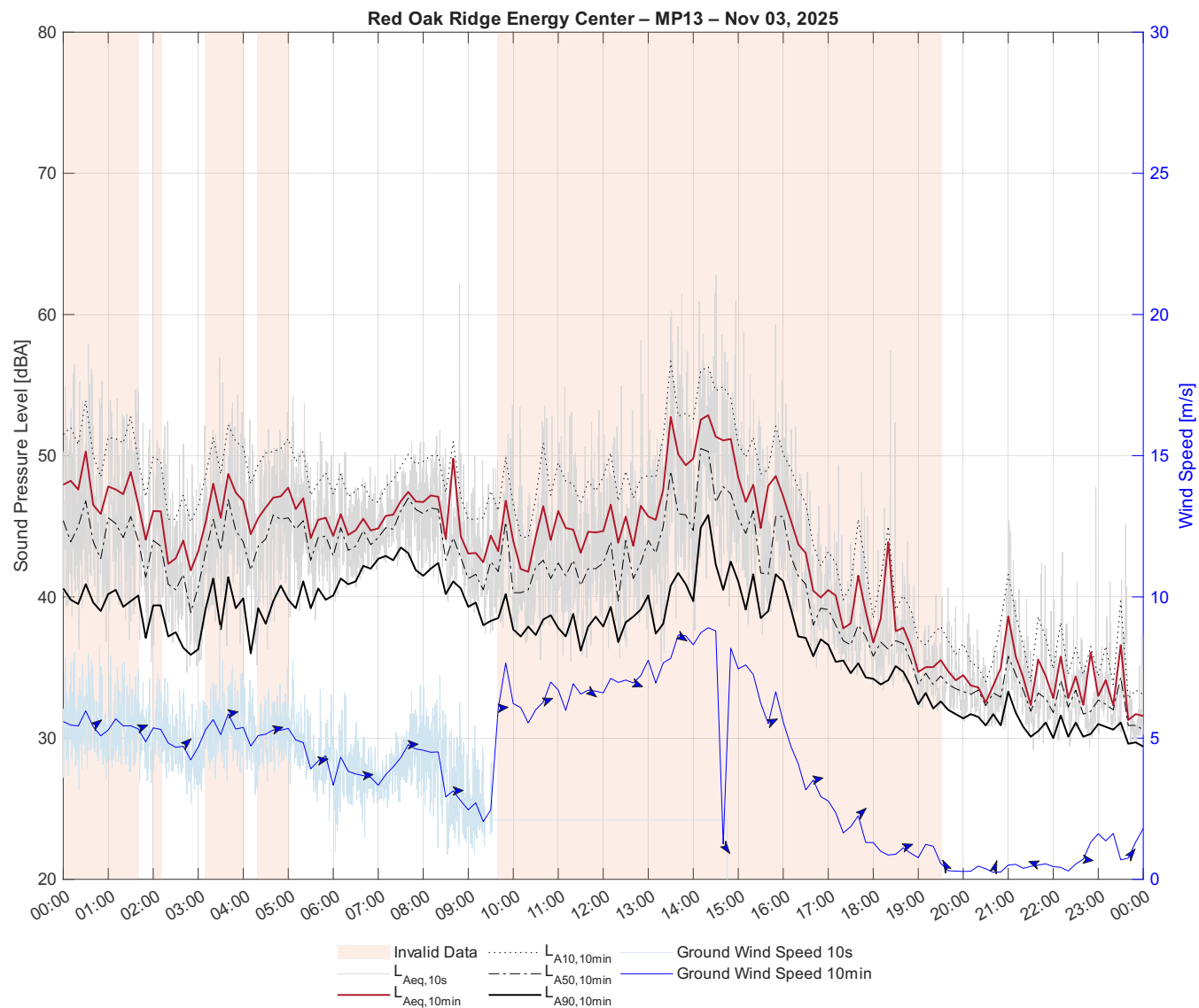
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



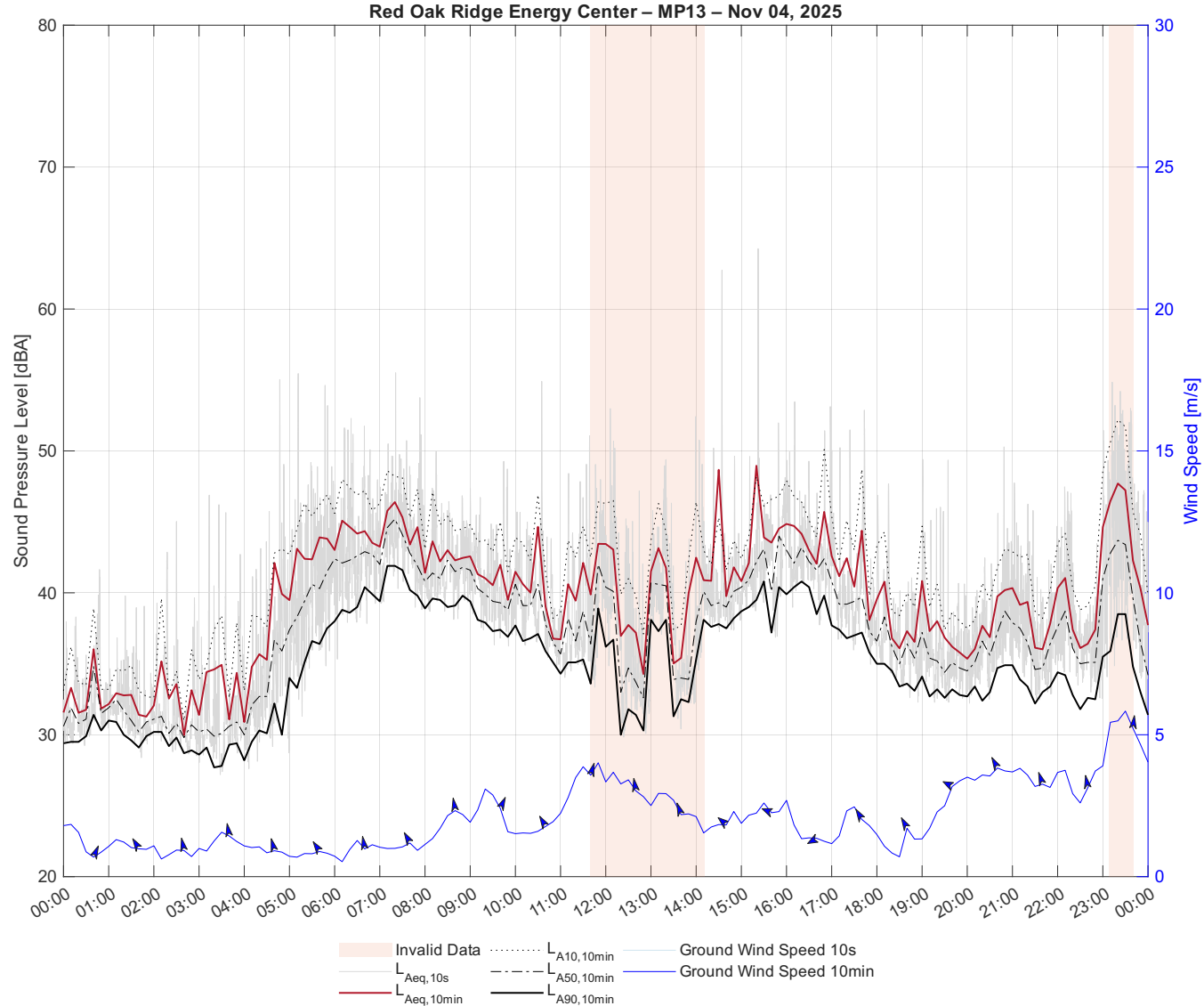
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



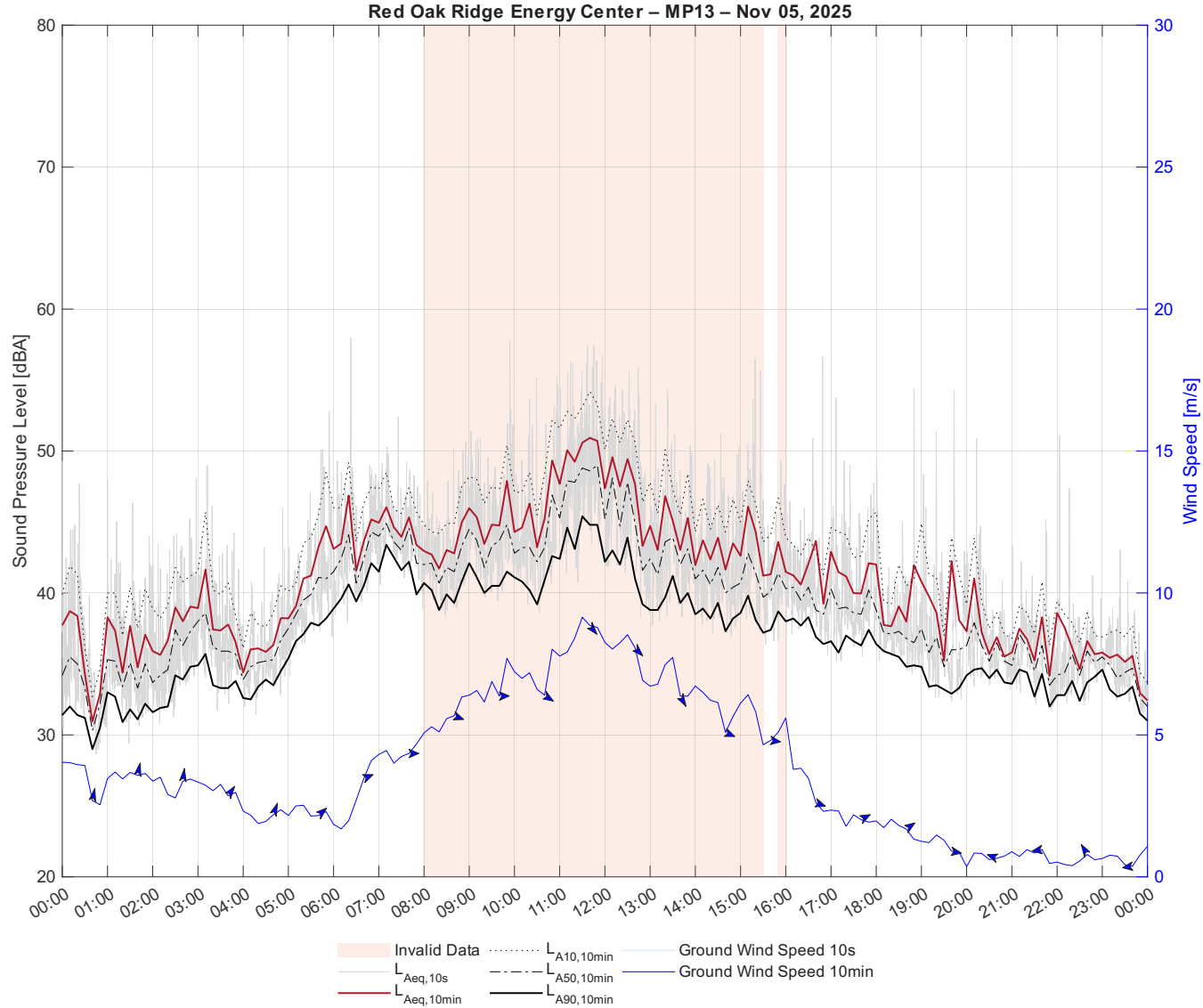
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



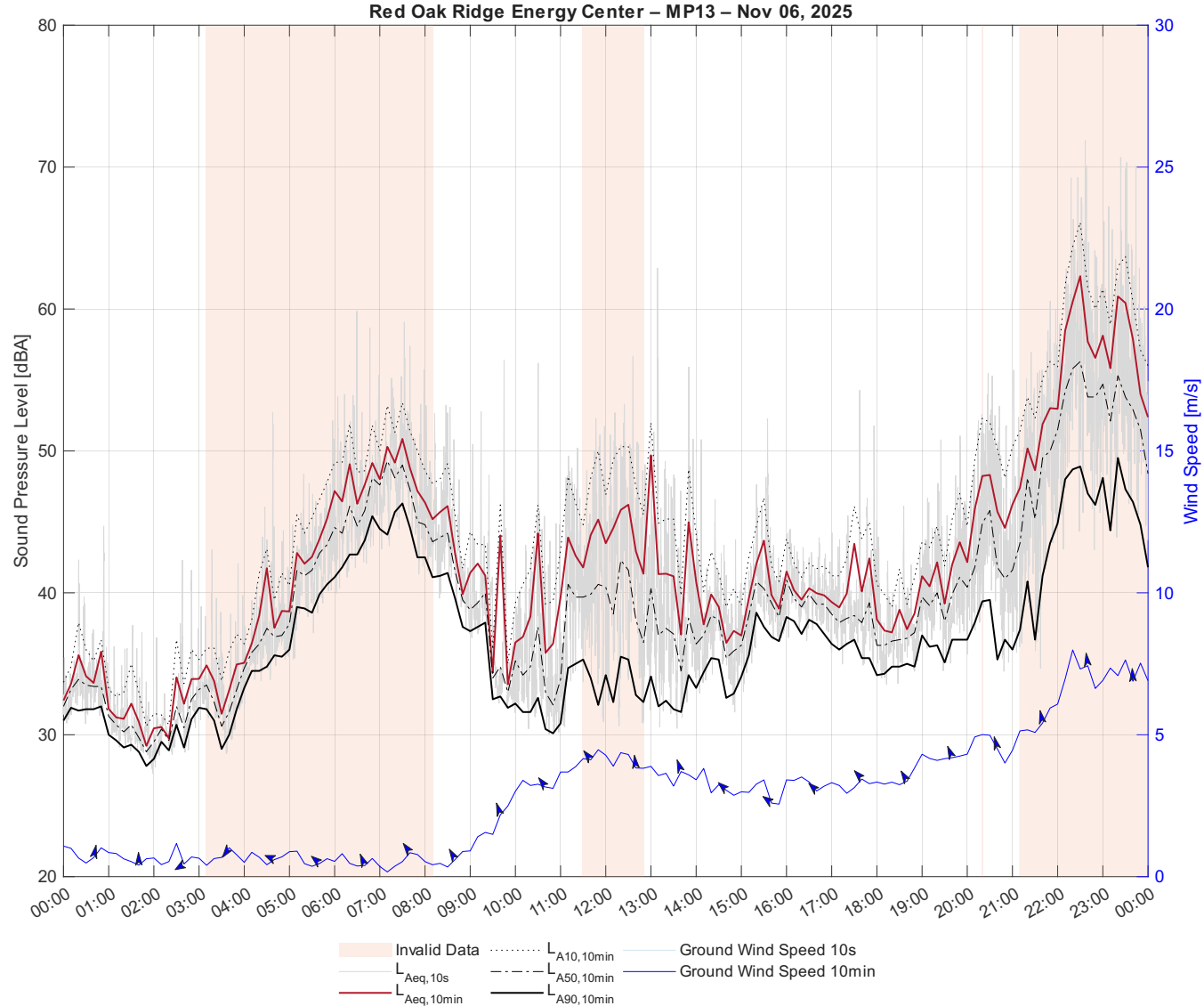
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



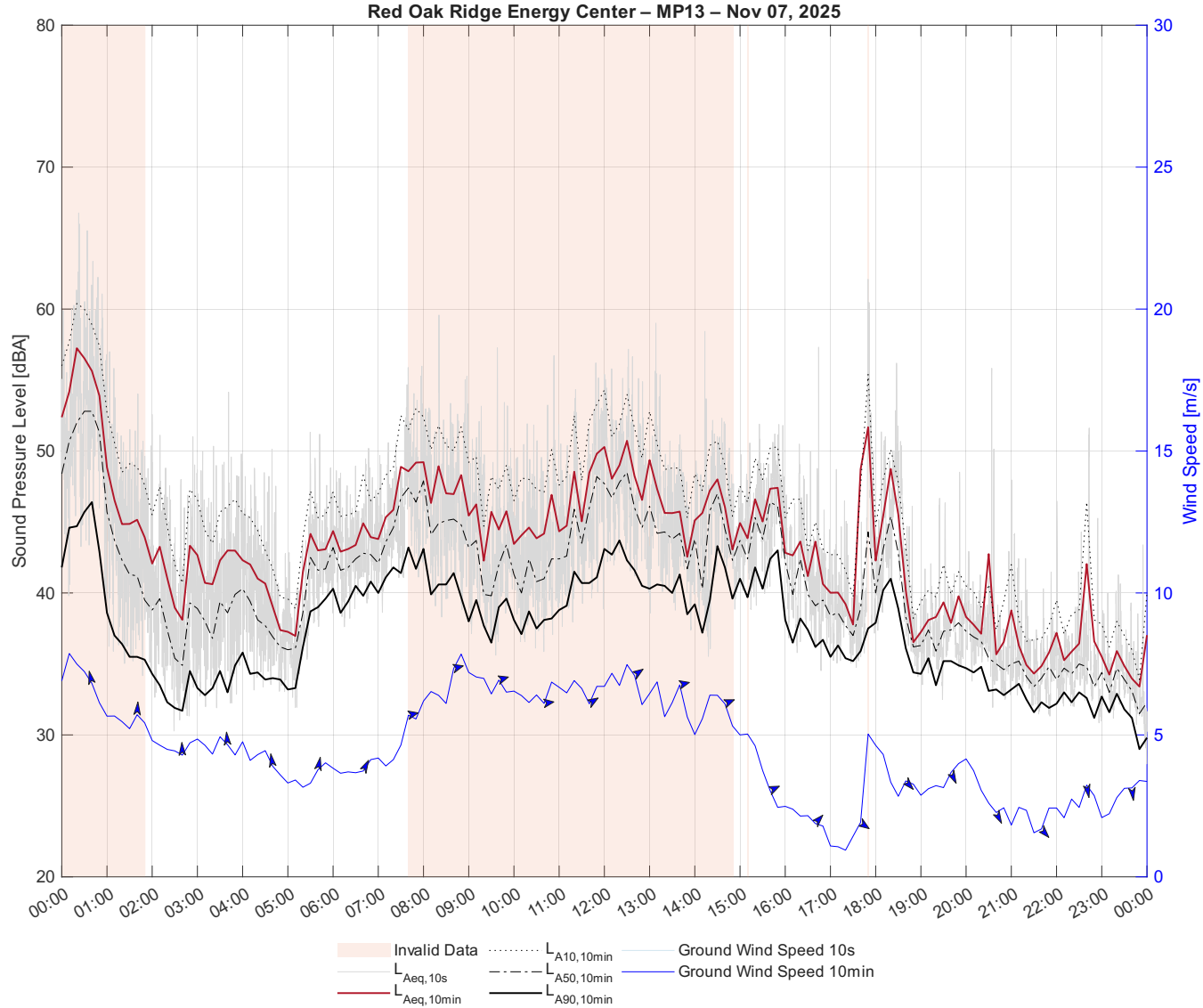
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



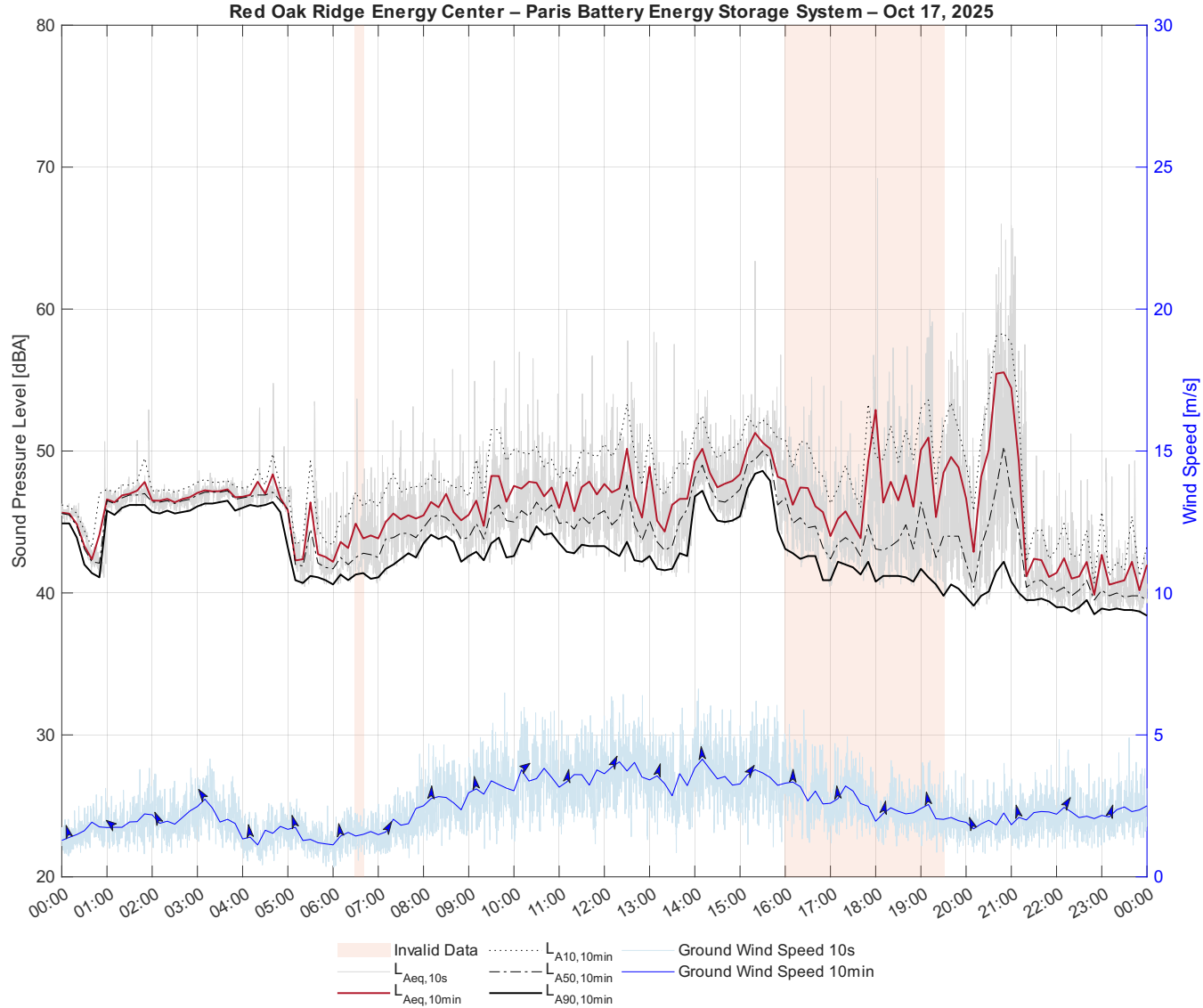
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



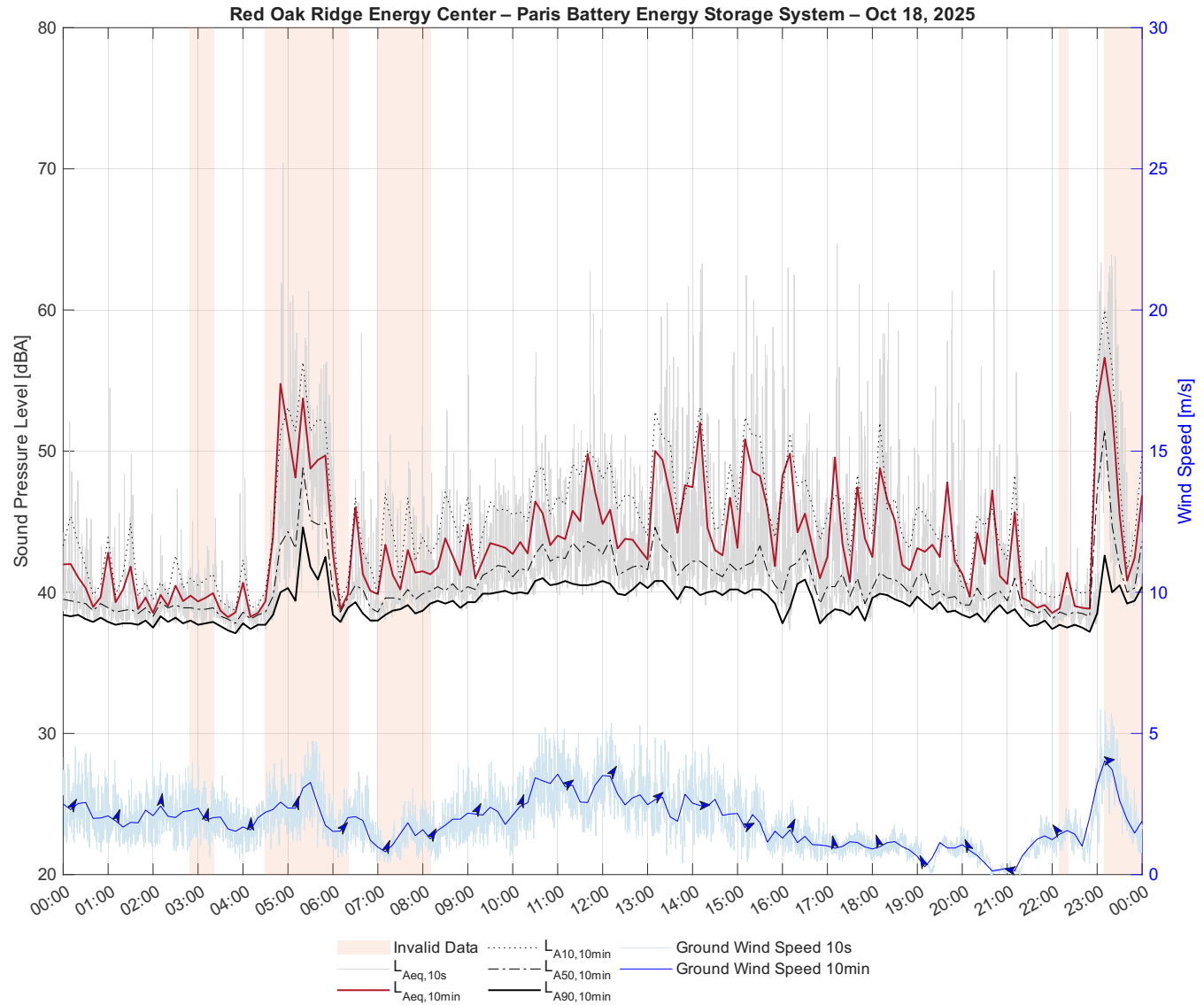
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



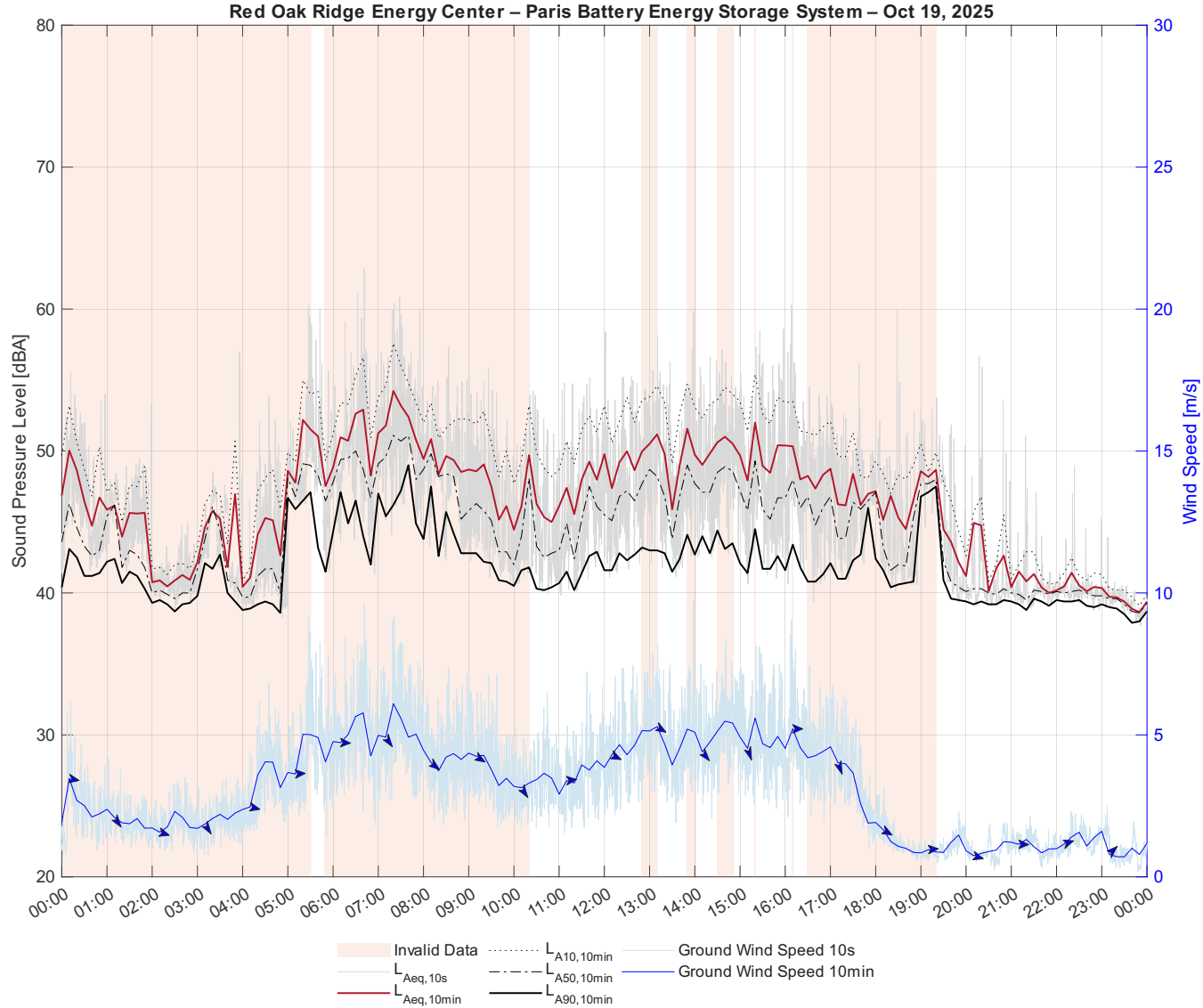
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



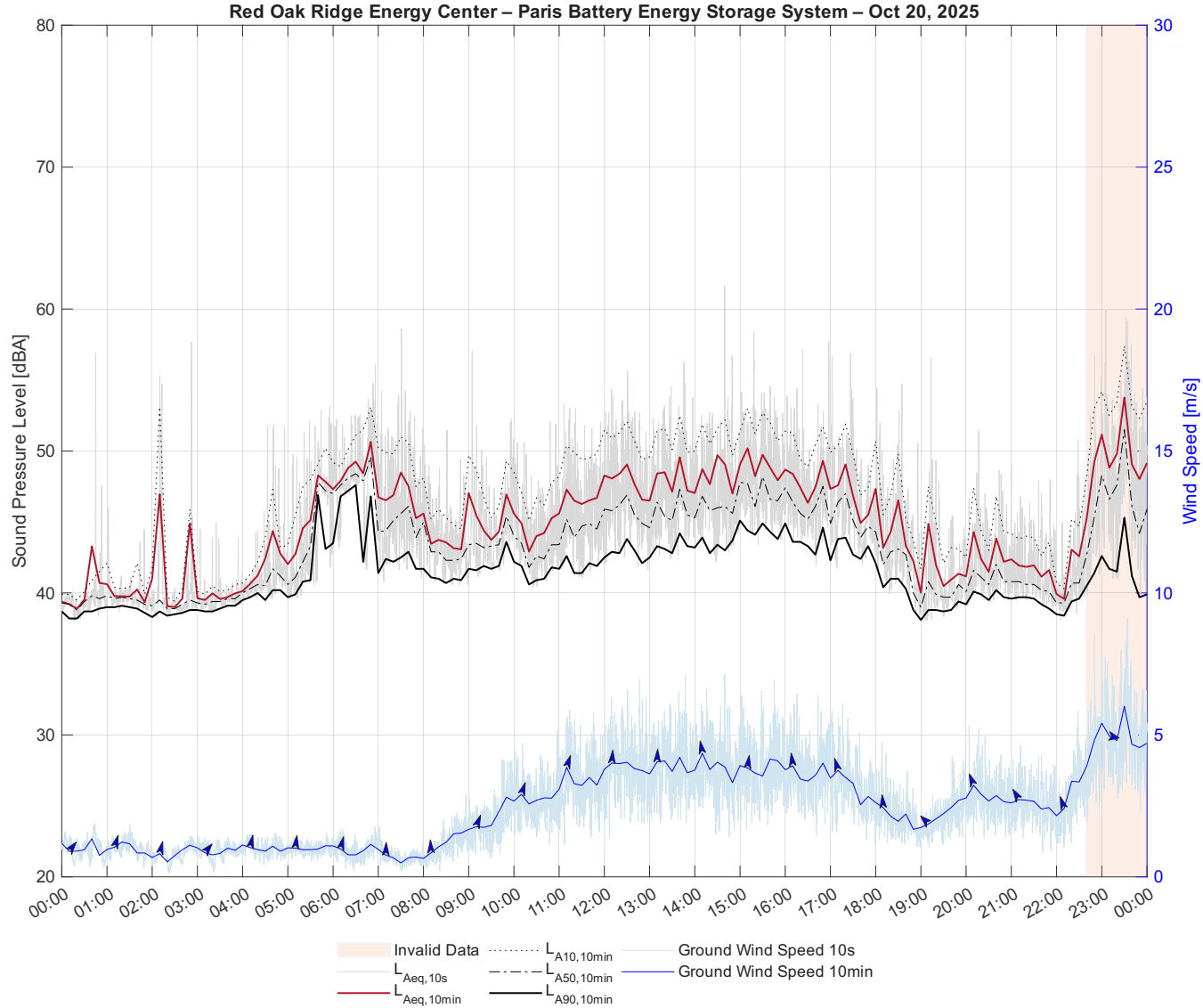
*Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center*



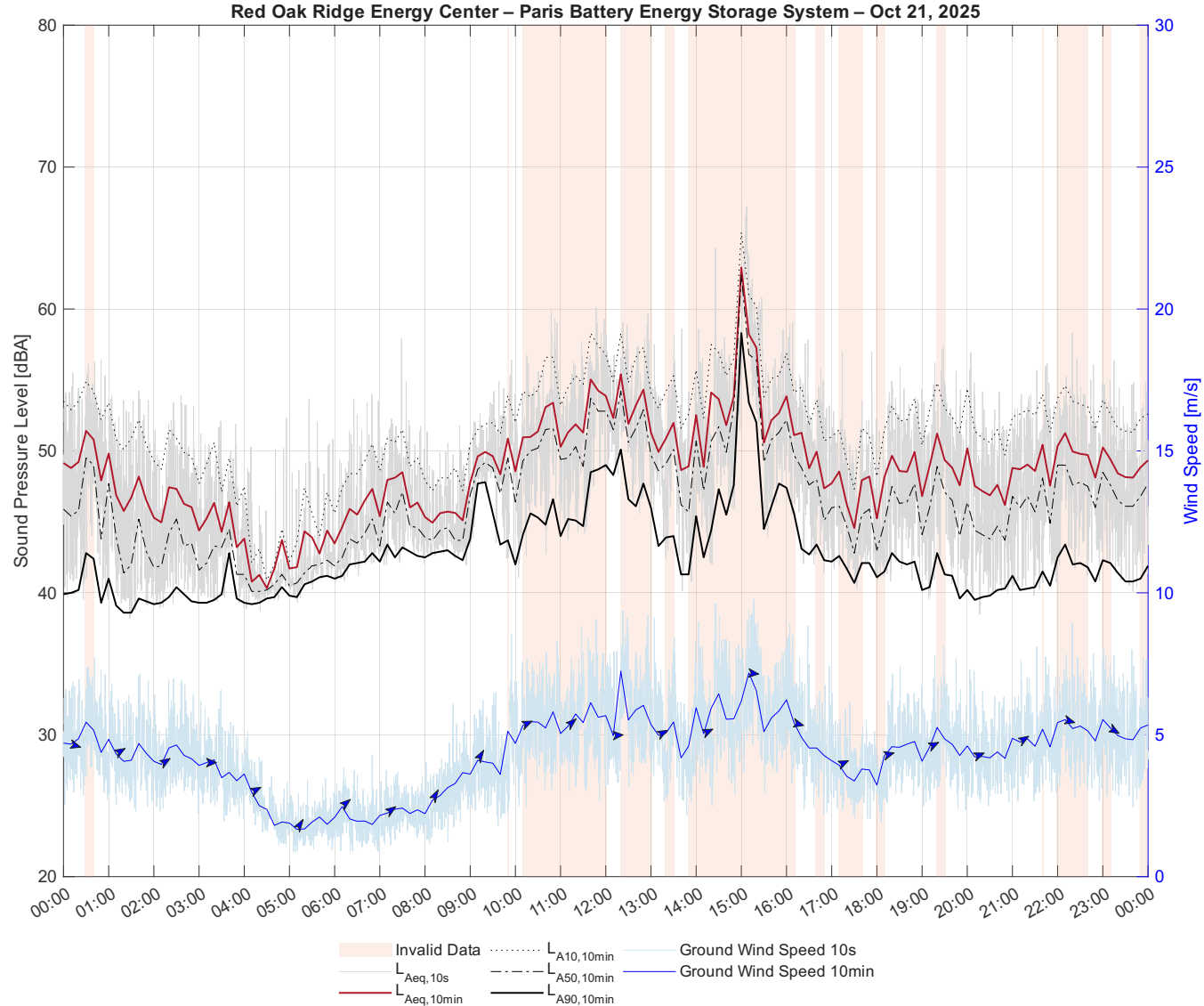
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



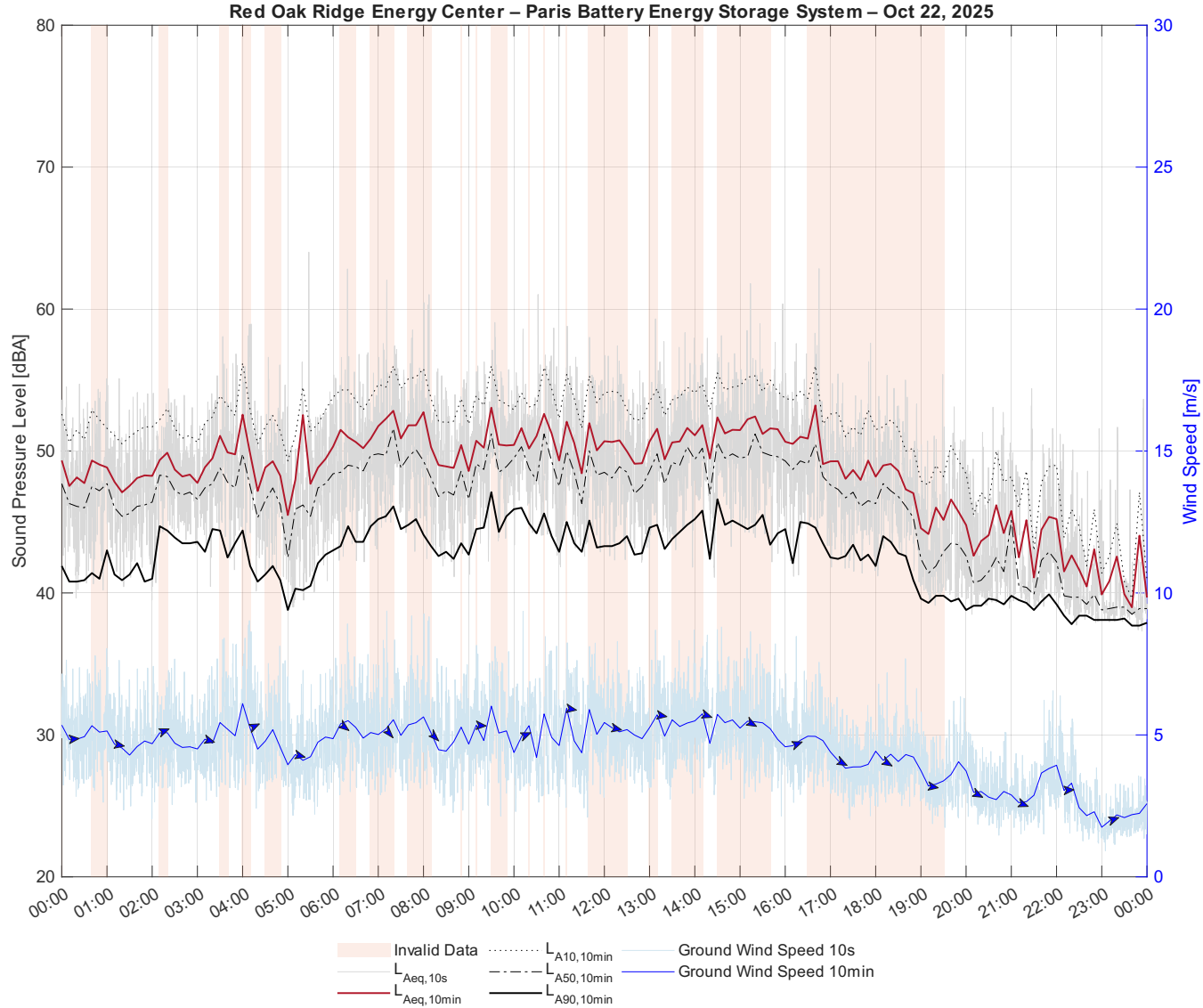
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



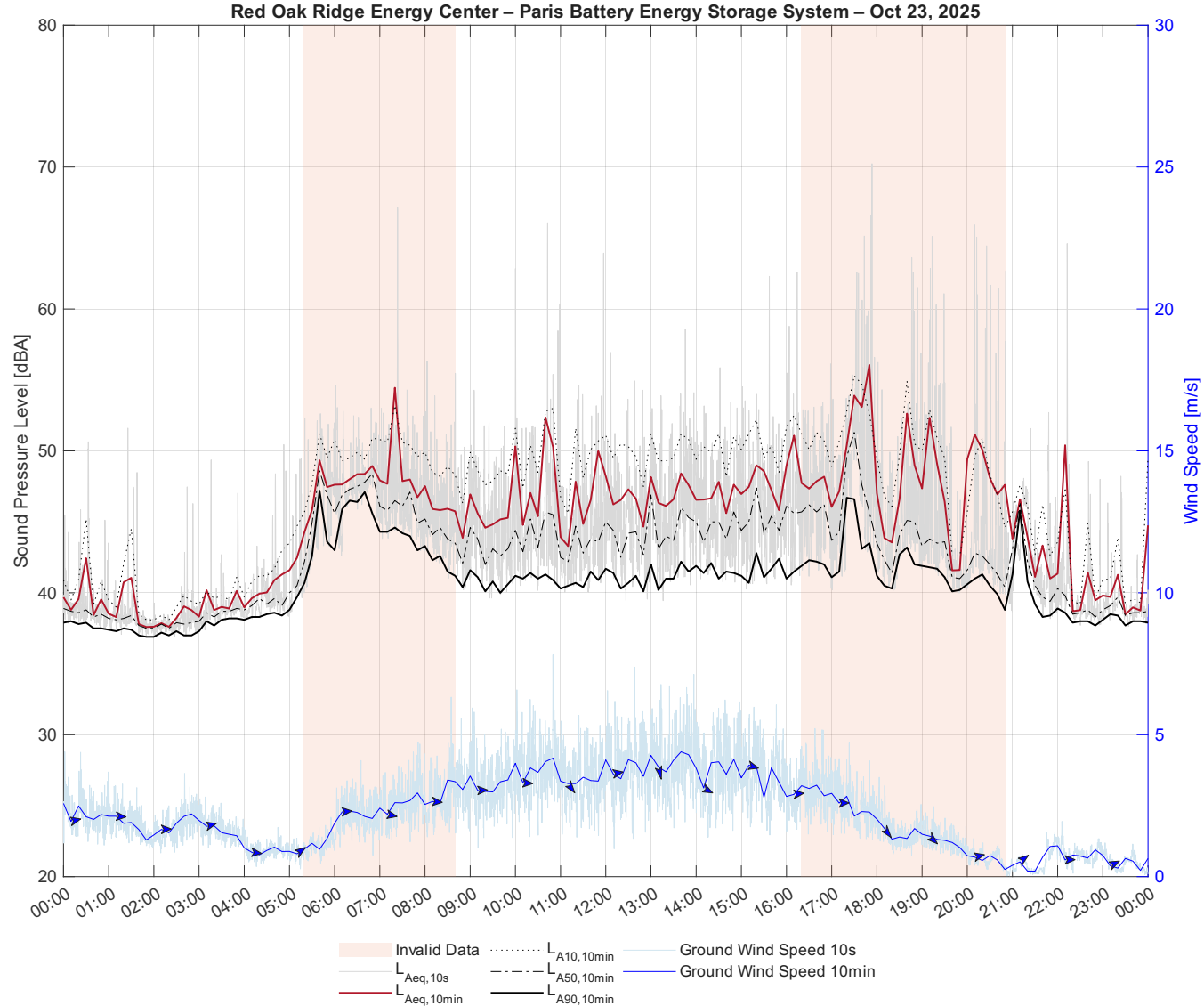
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



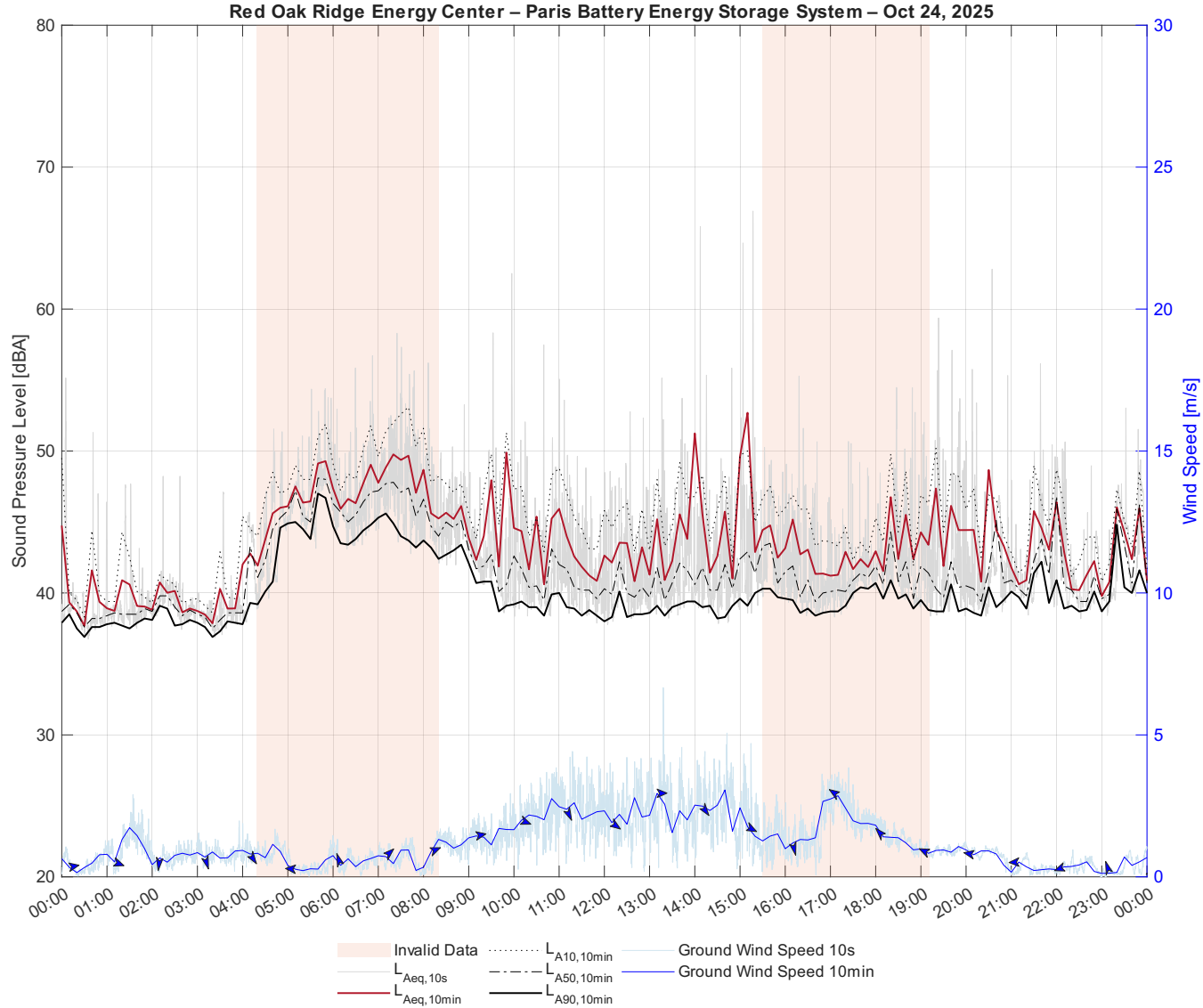
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



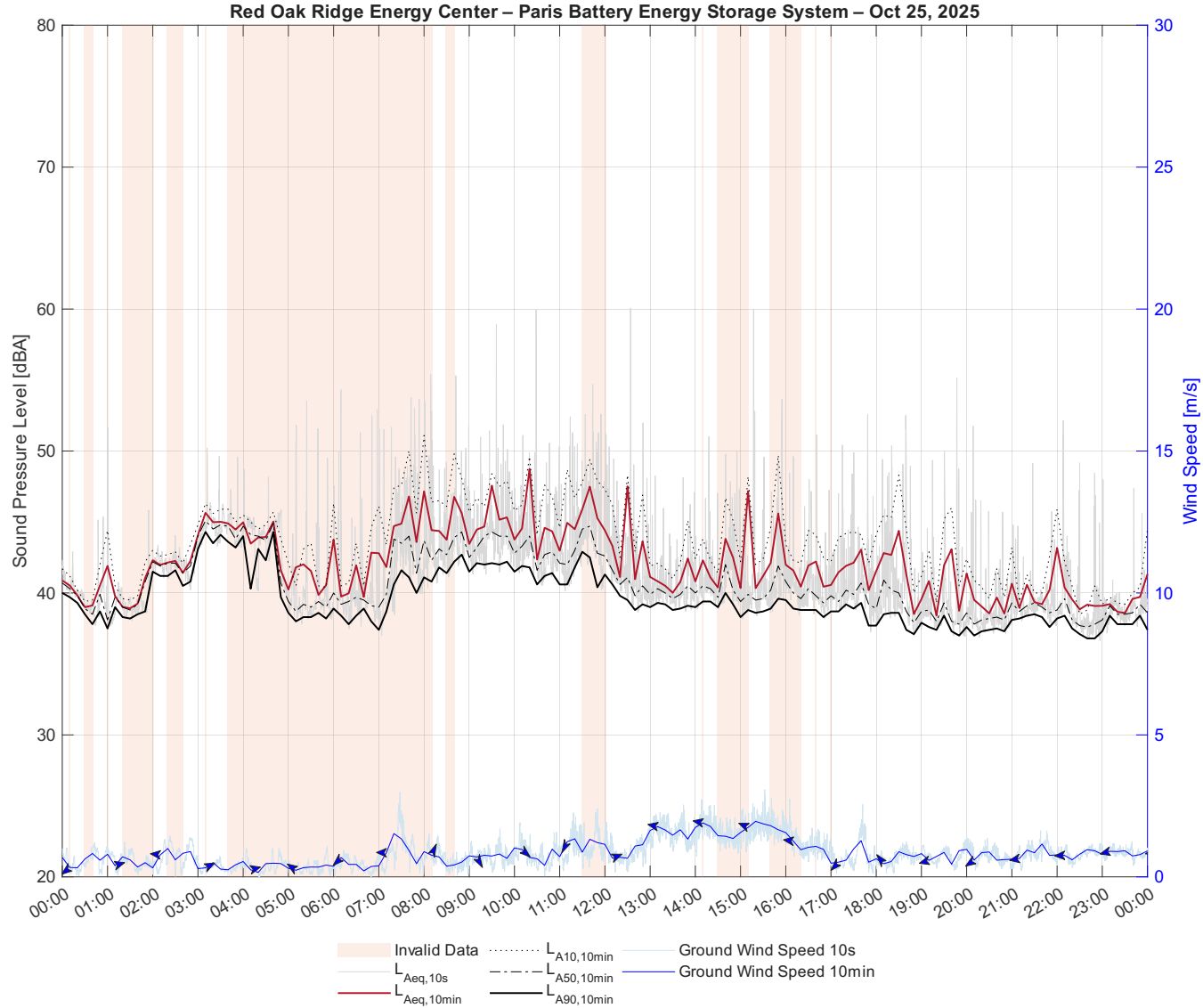
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



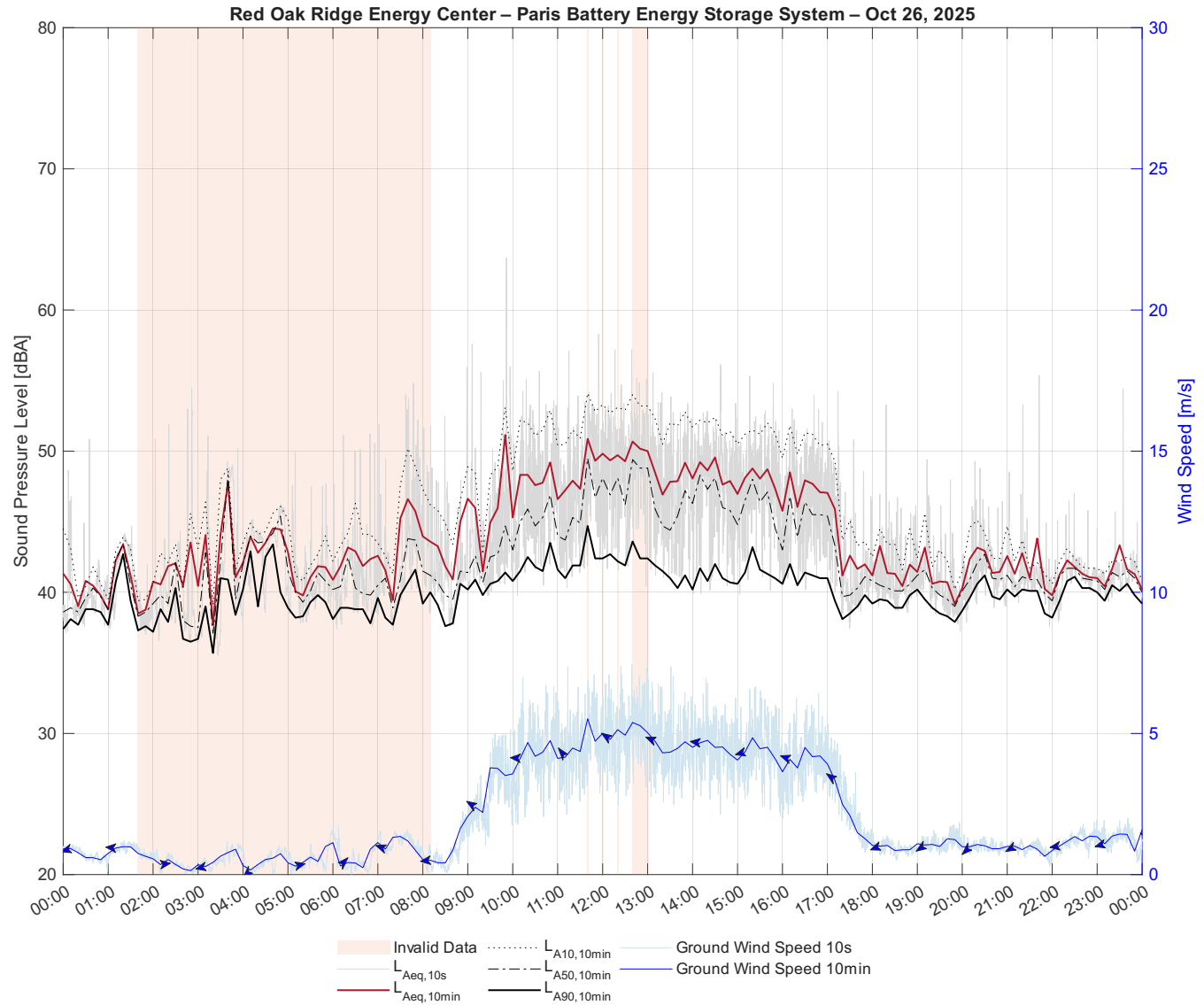
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



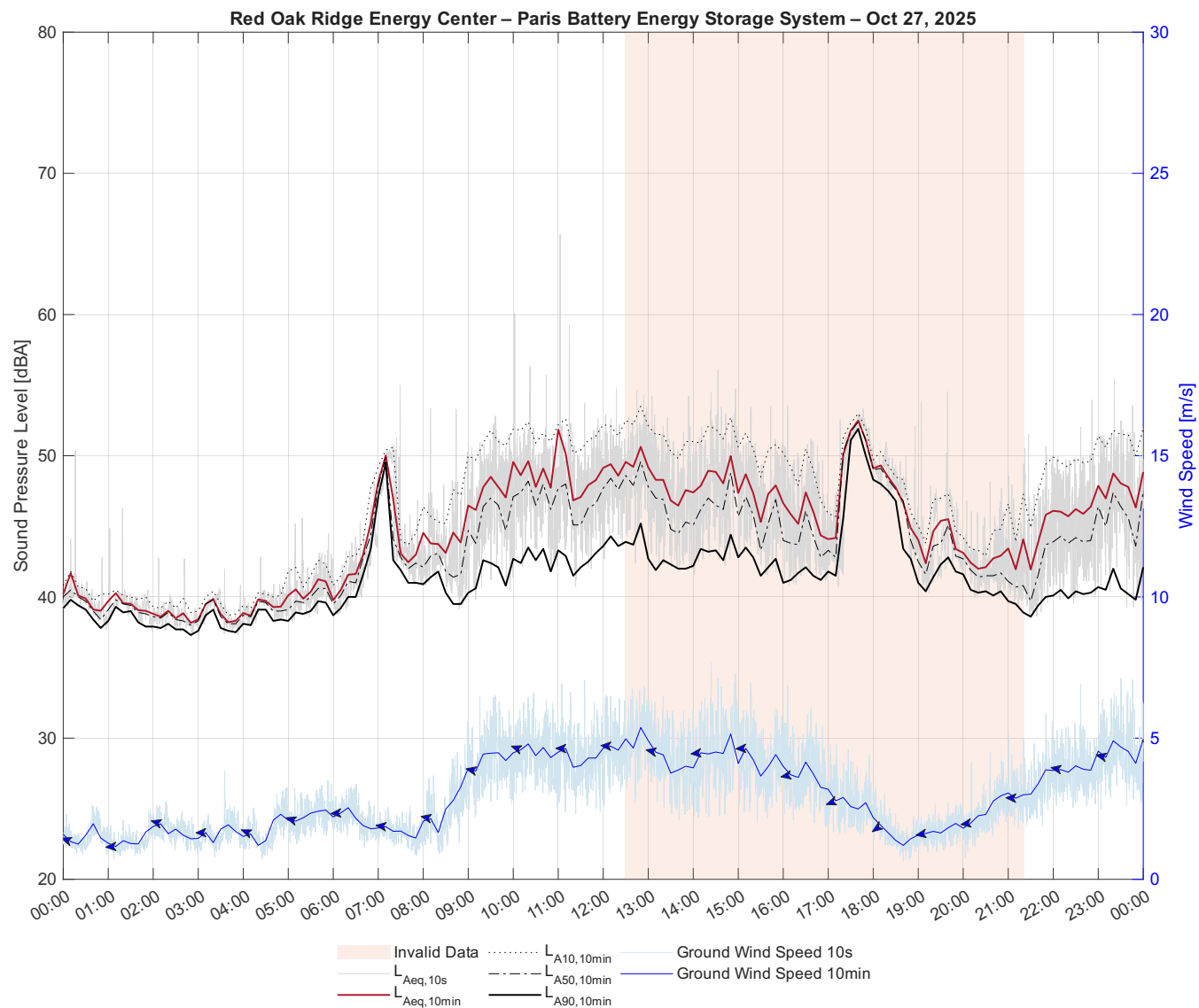
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



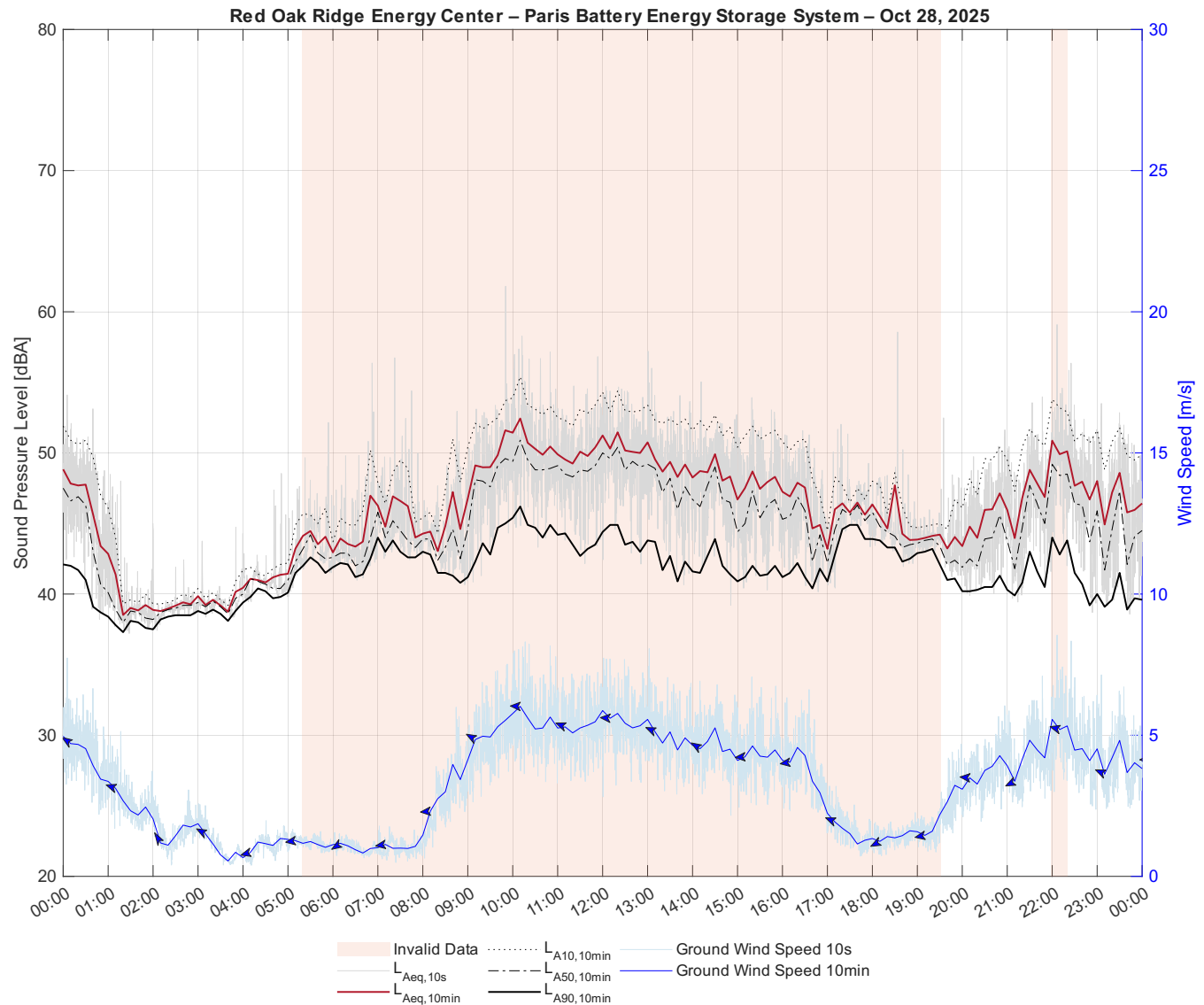
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



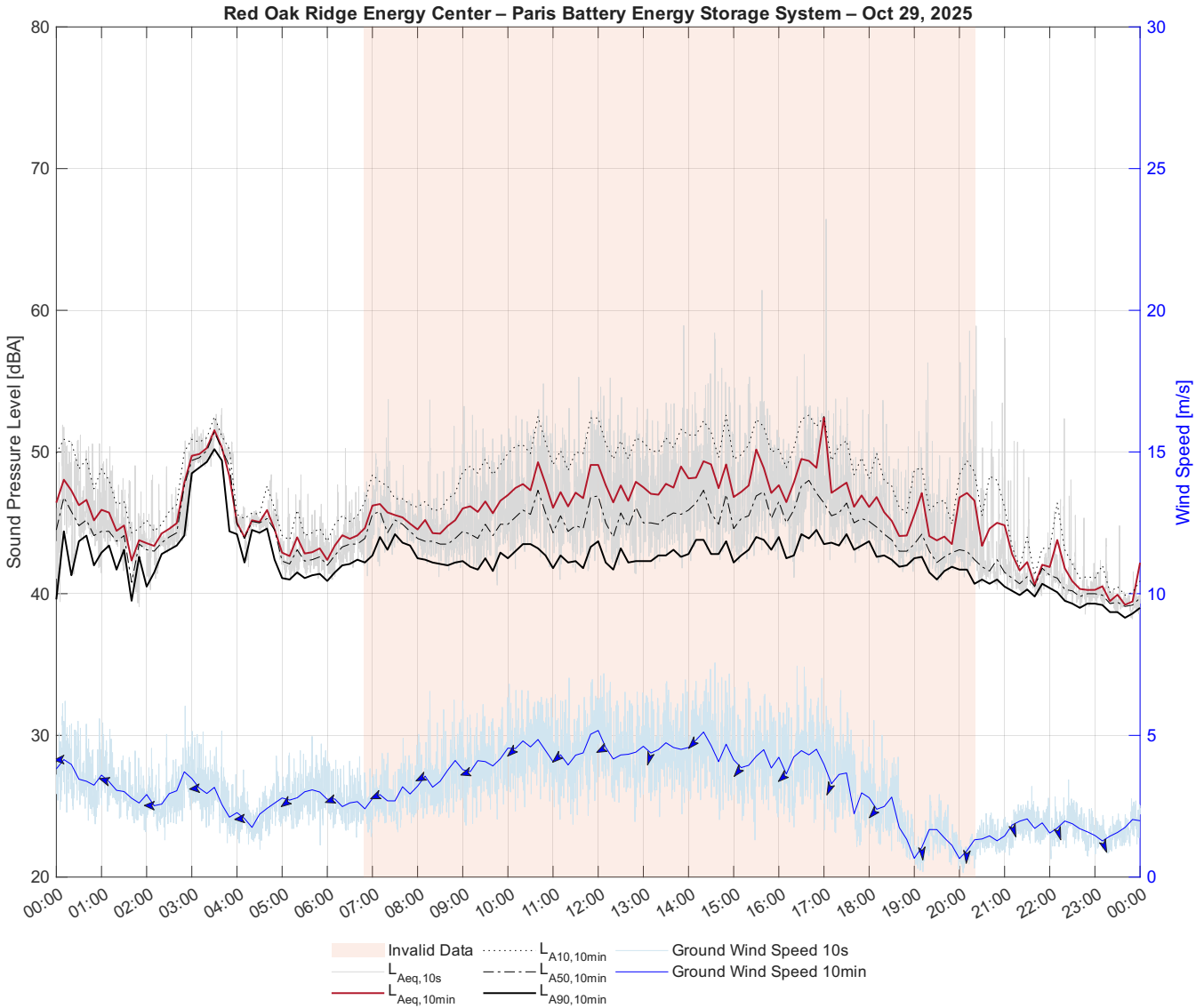
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



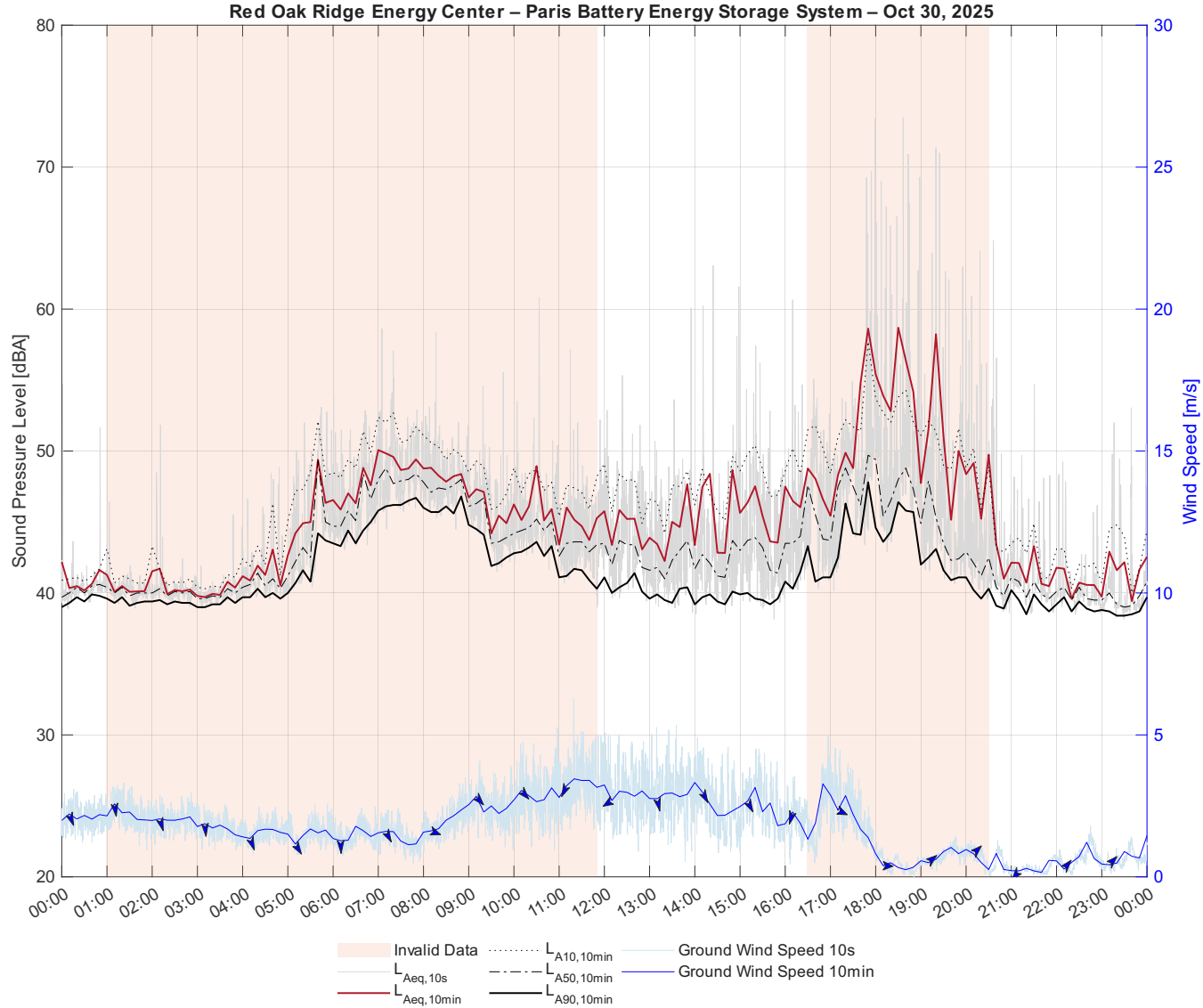
*Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center*



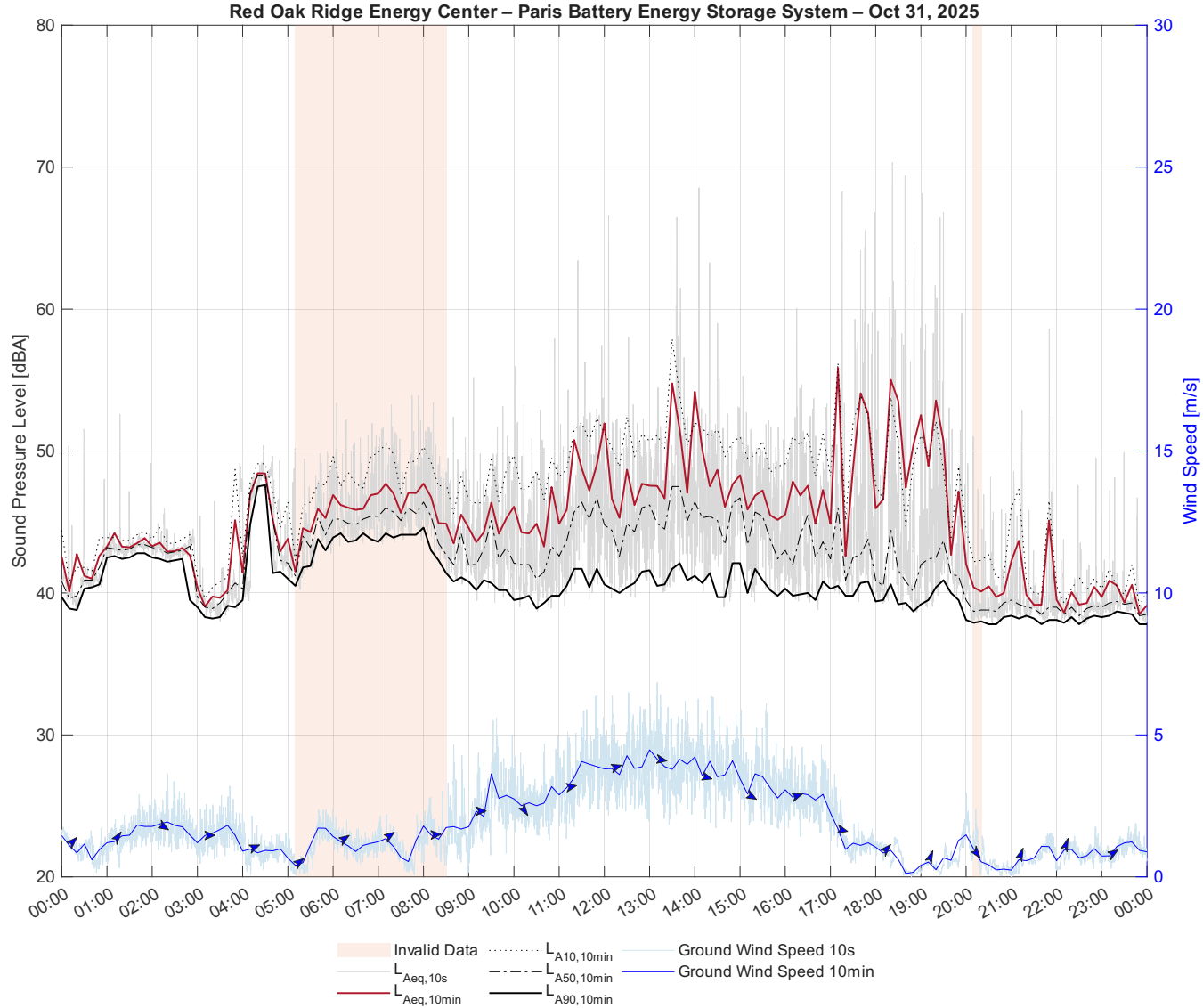
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



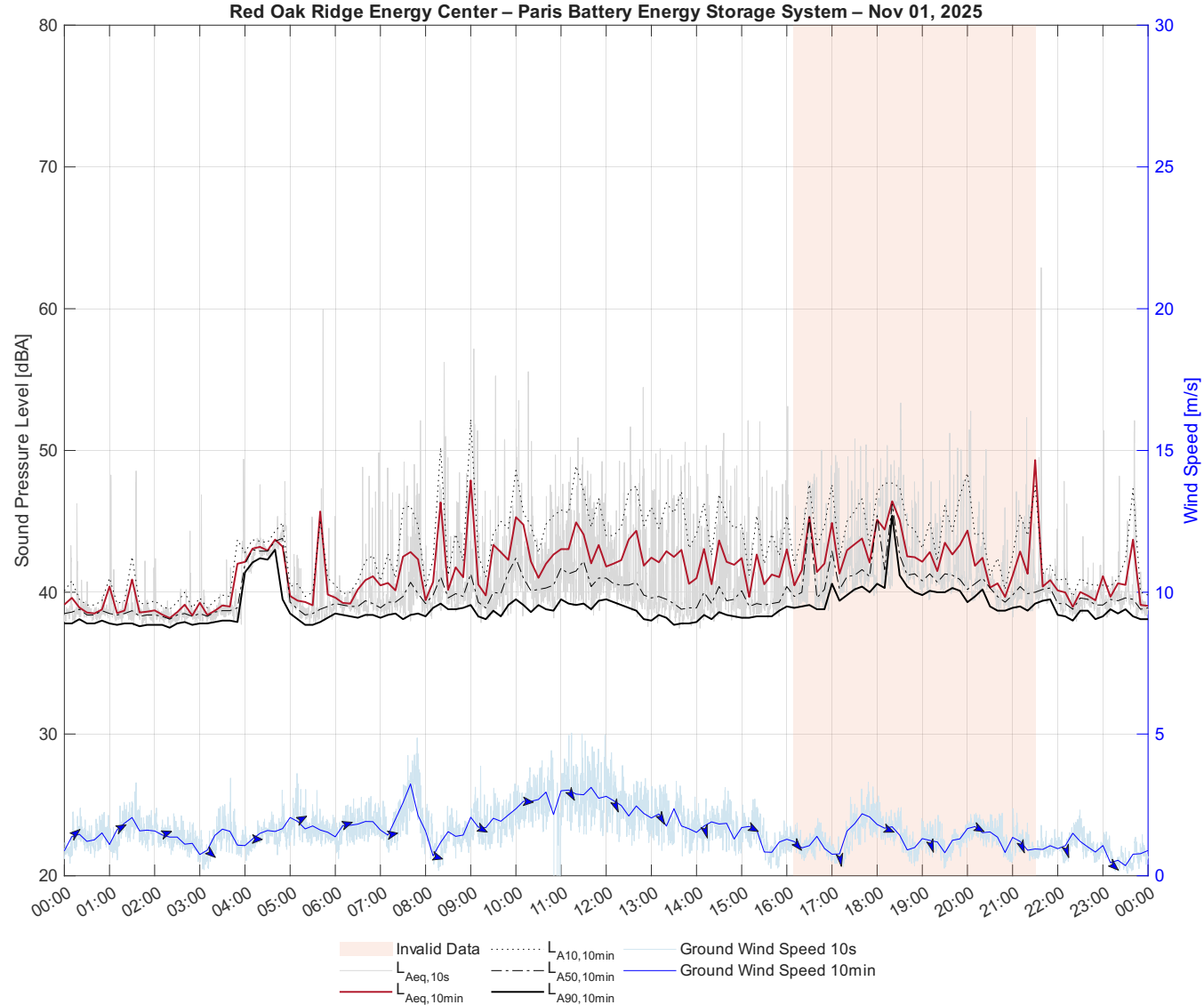
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



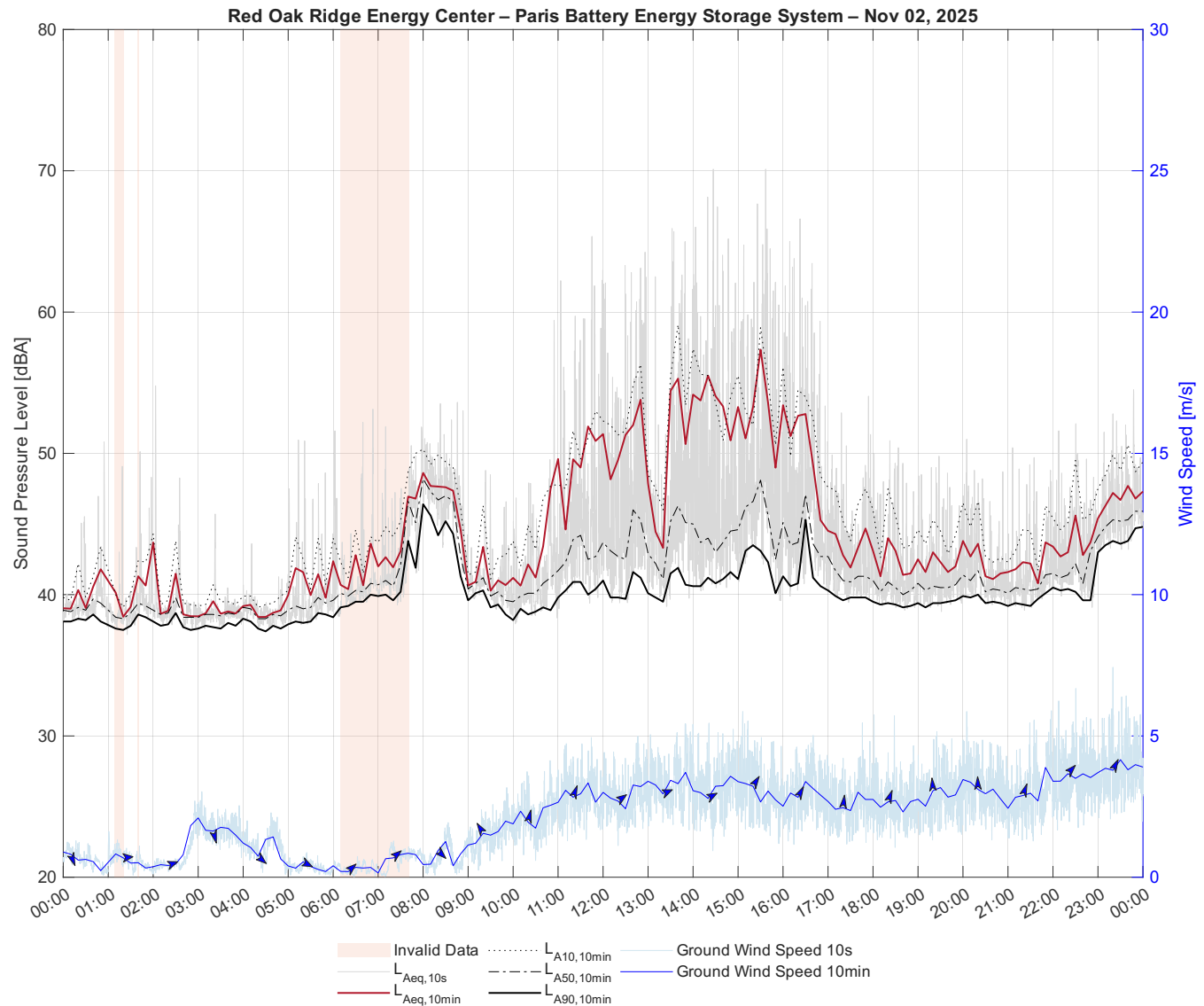
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



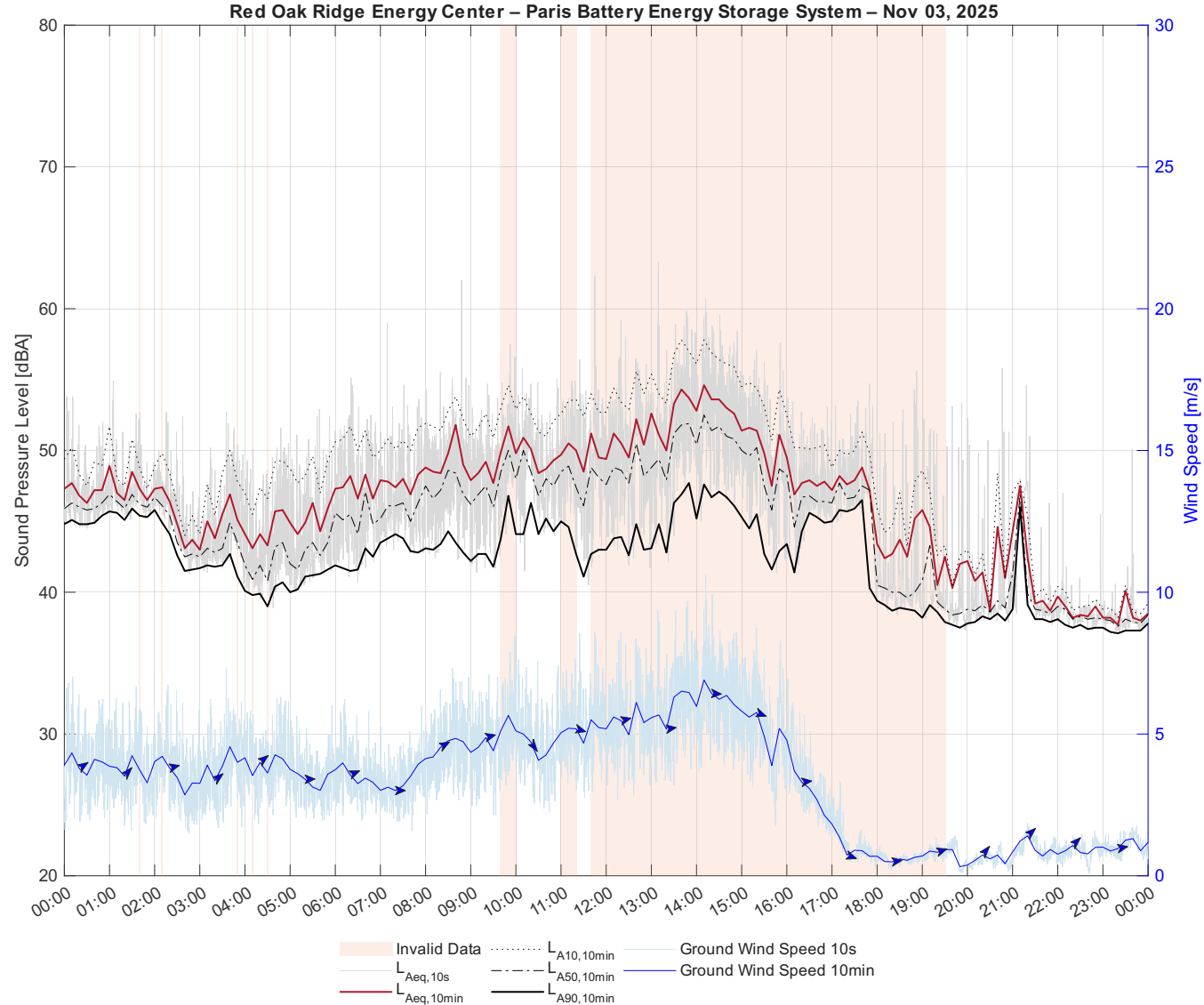
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



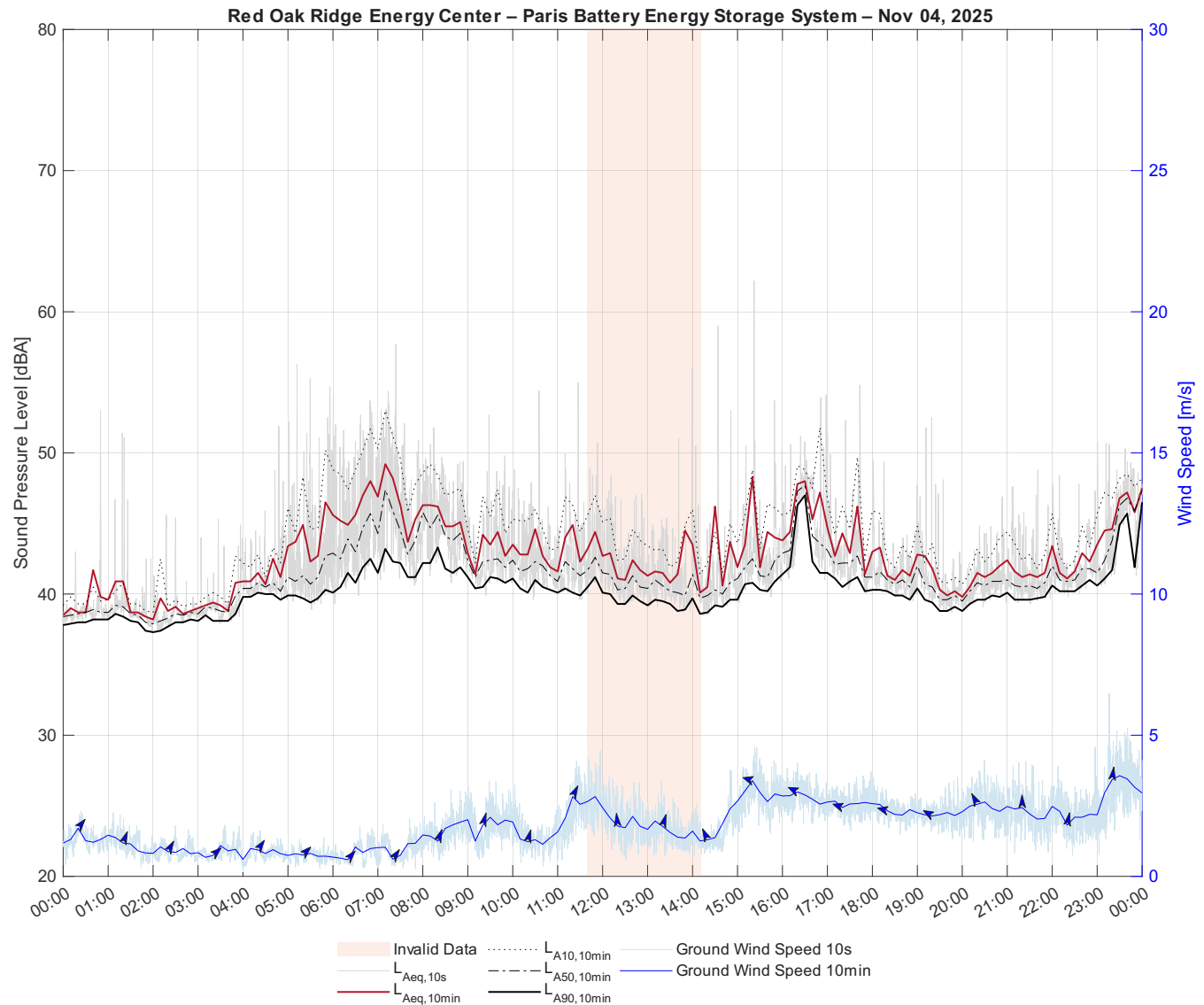
*Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center*



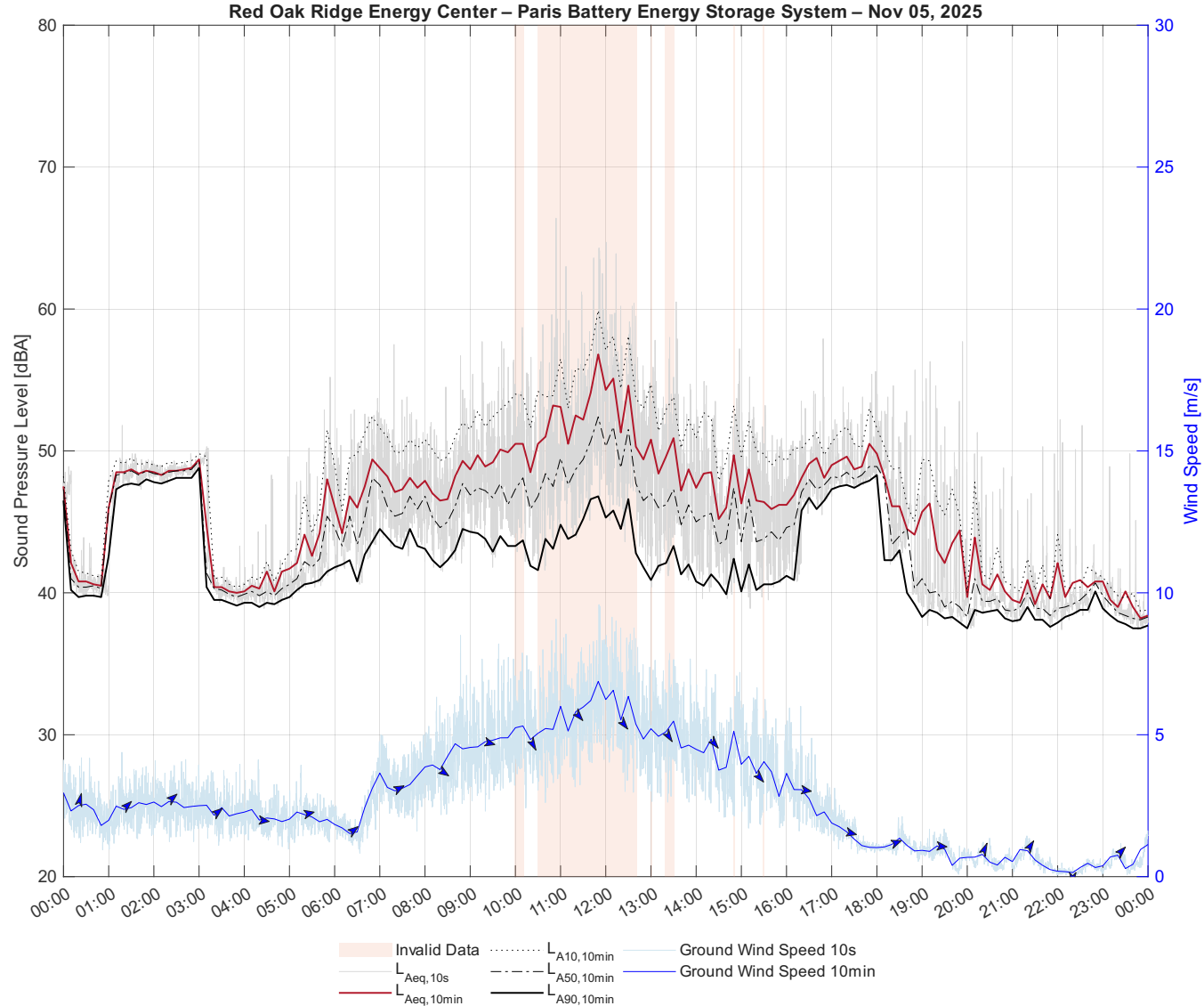
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



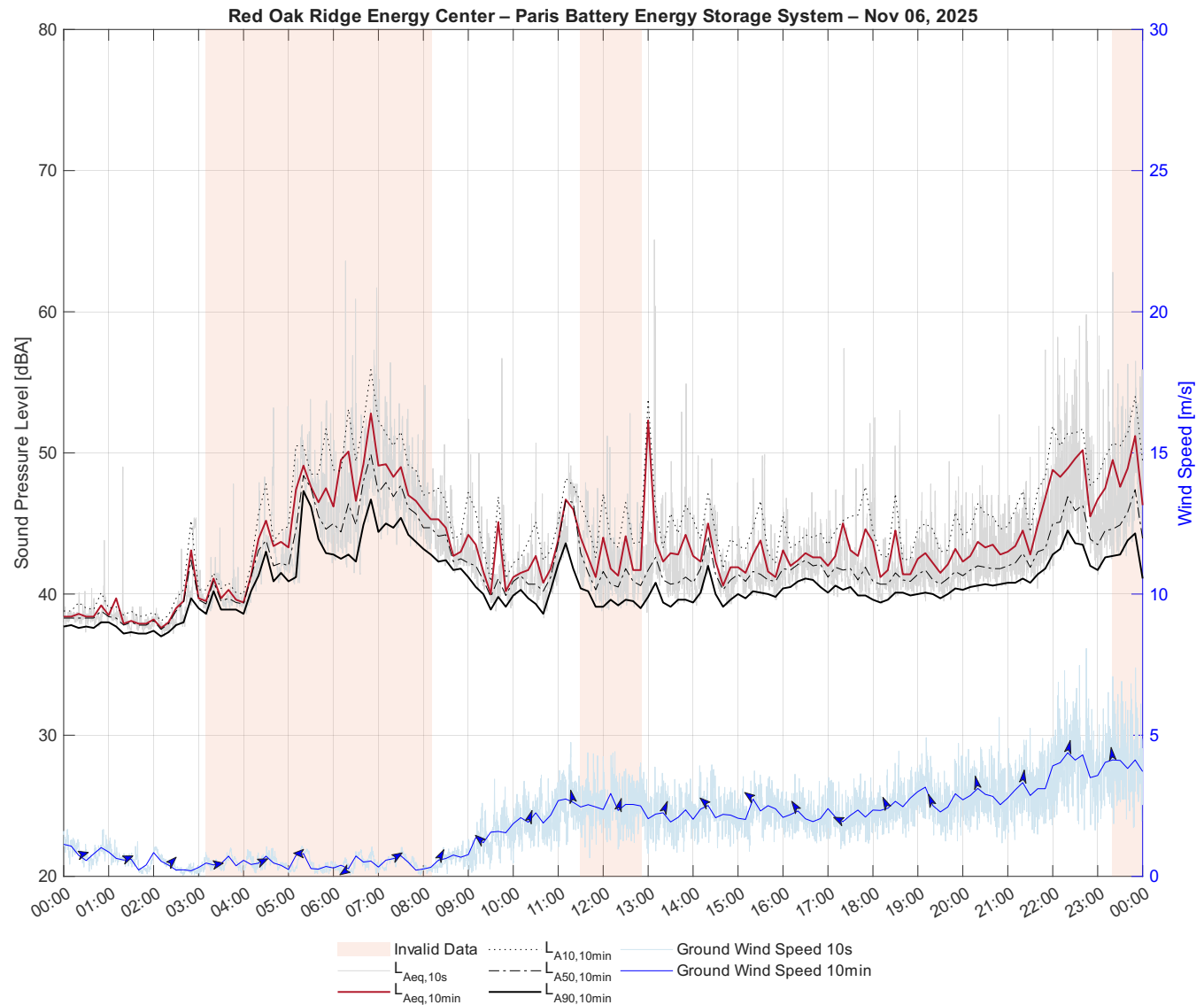
*Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center*



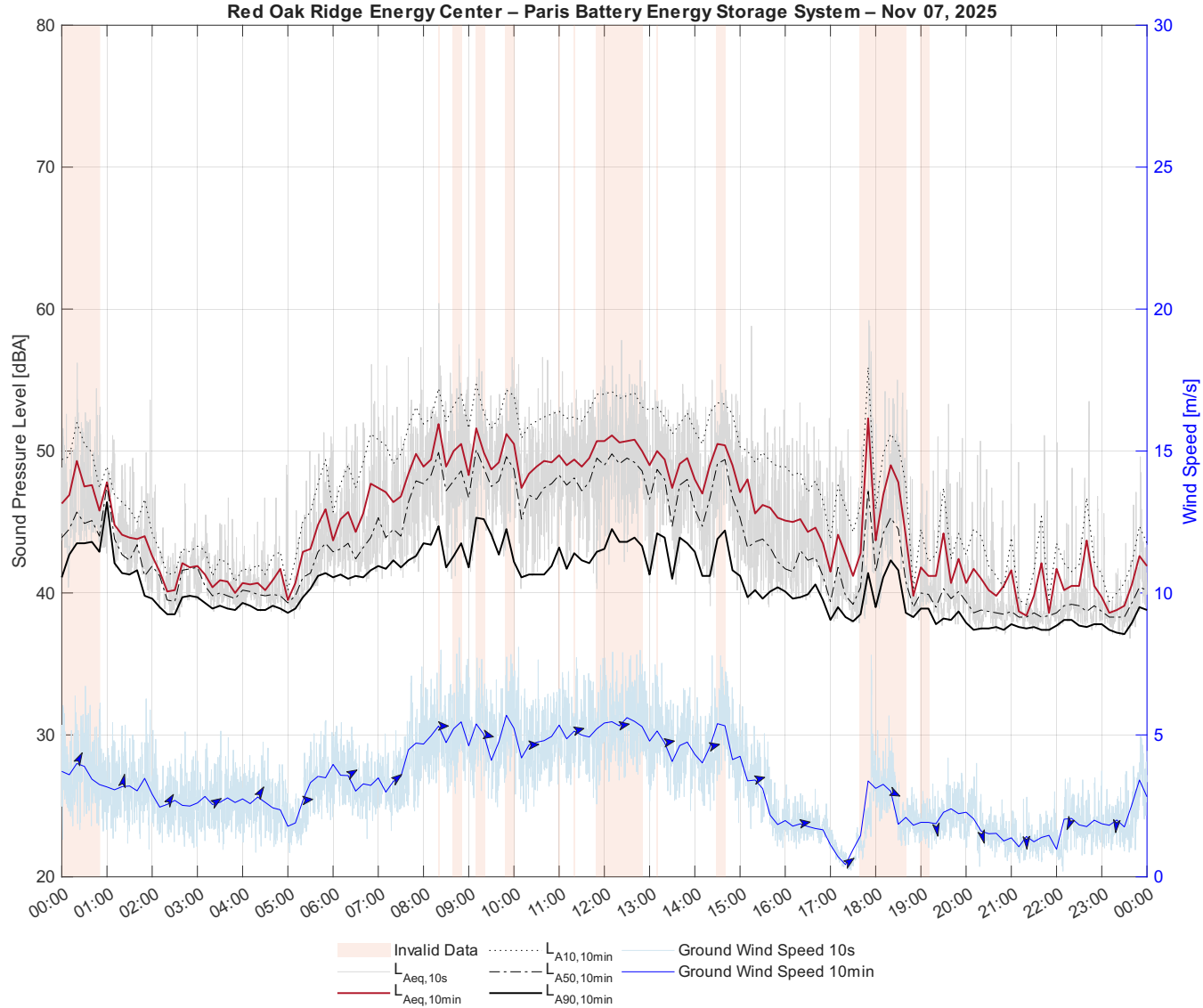
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



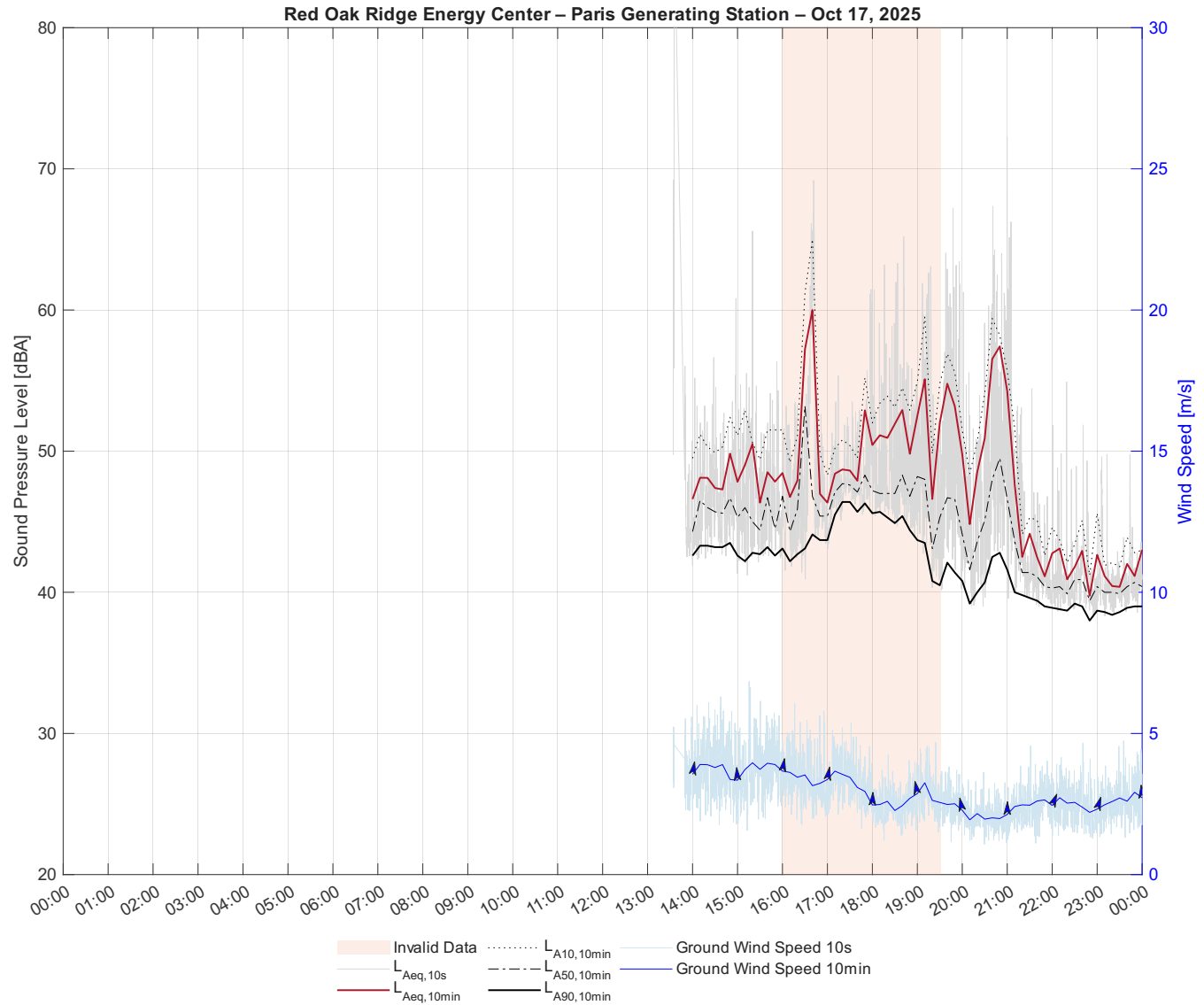
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



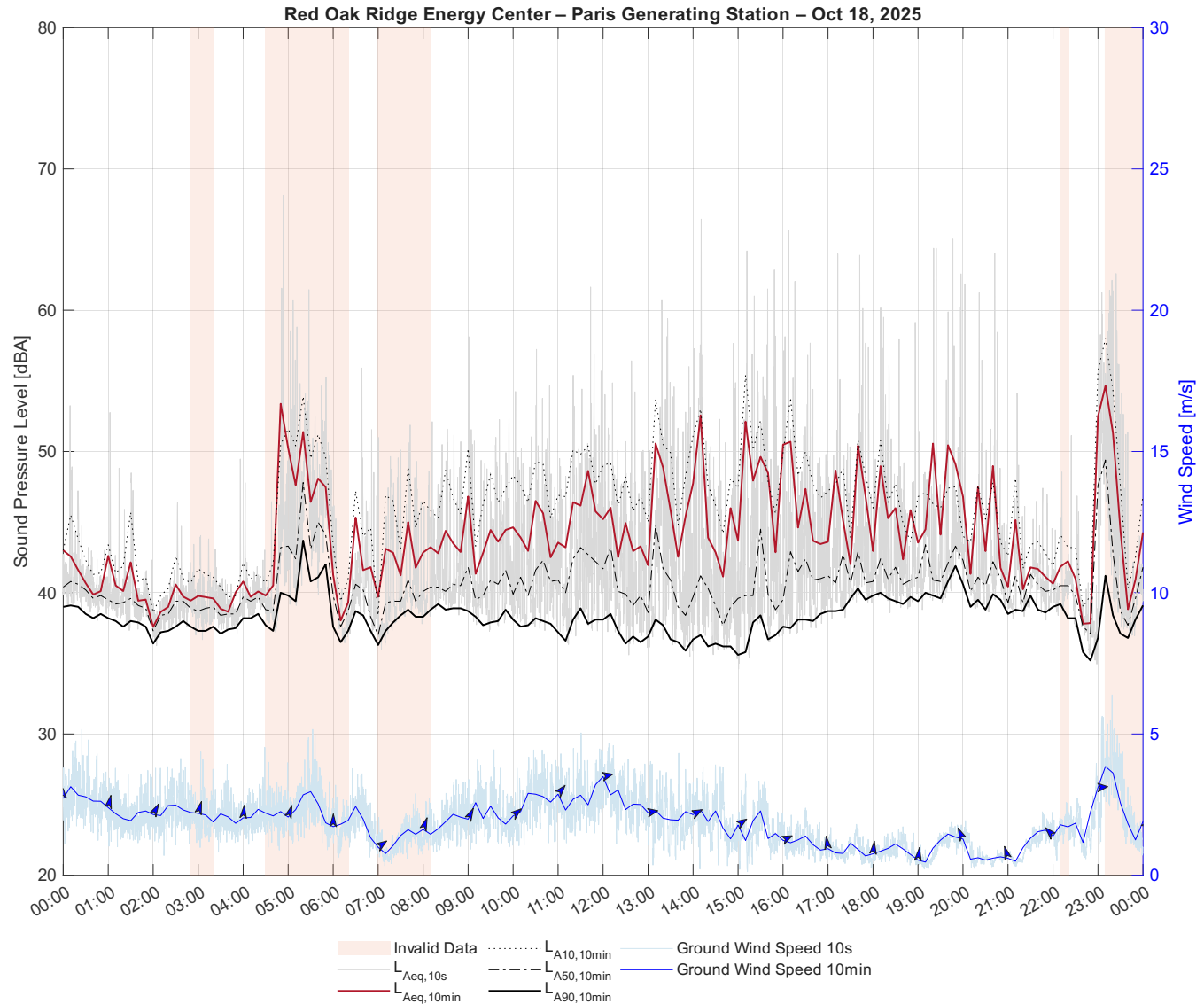
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



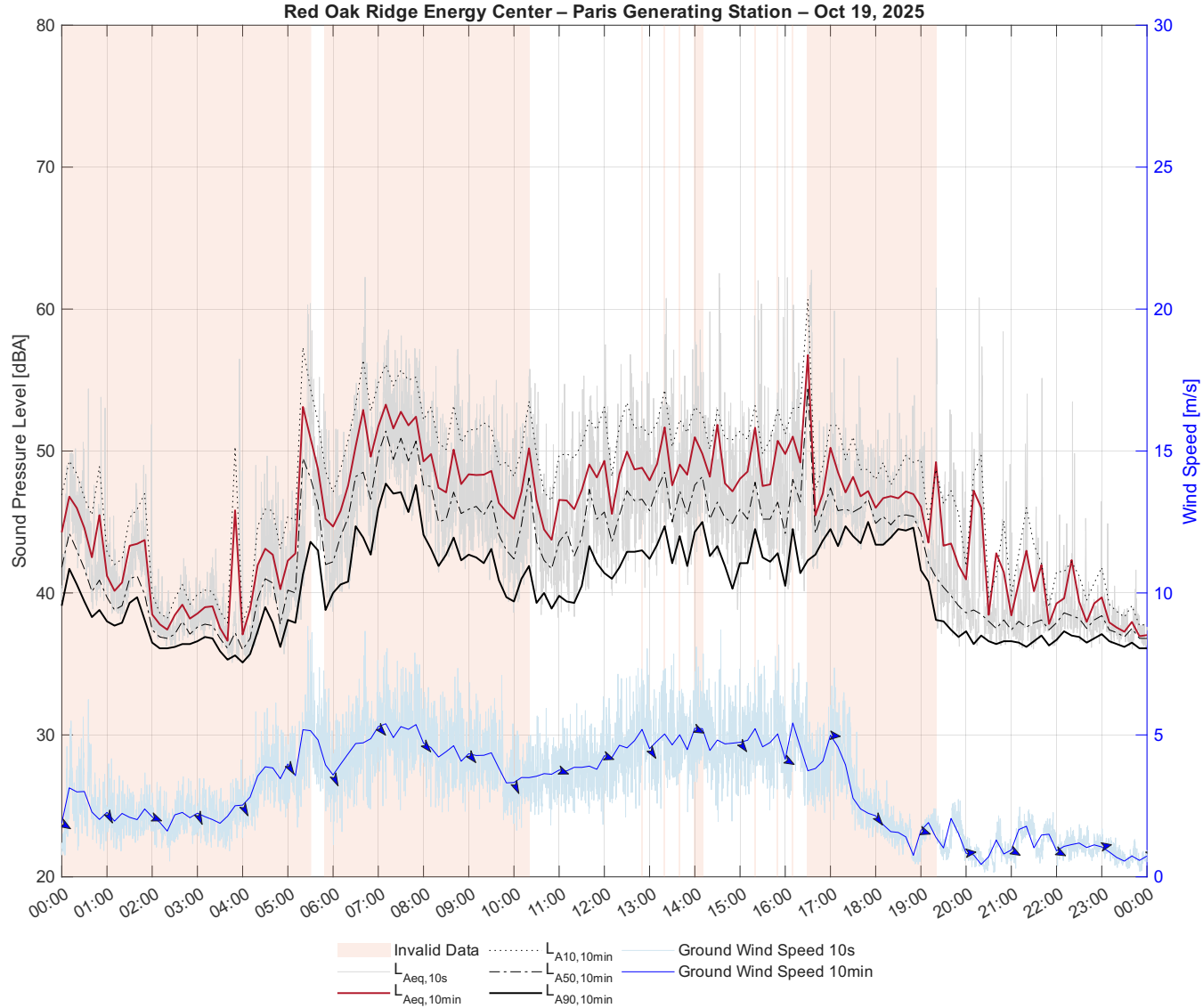
*Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center*



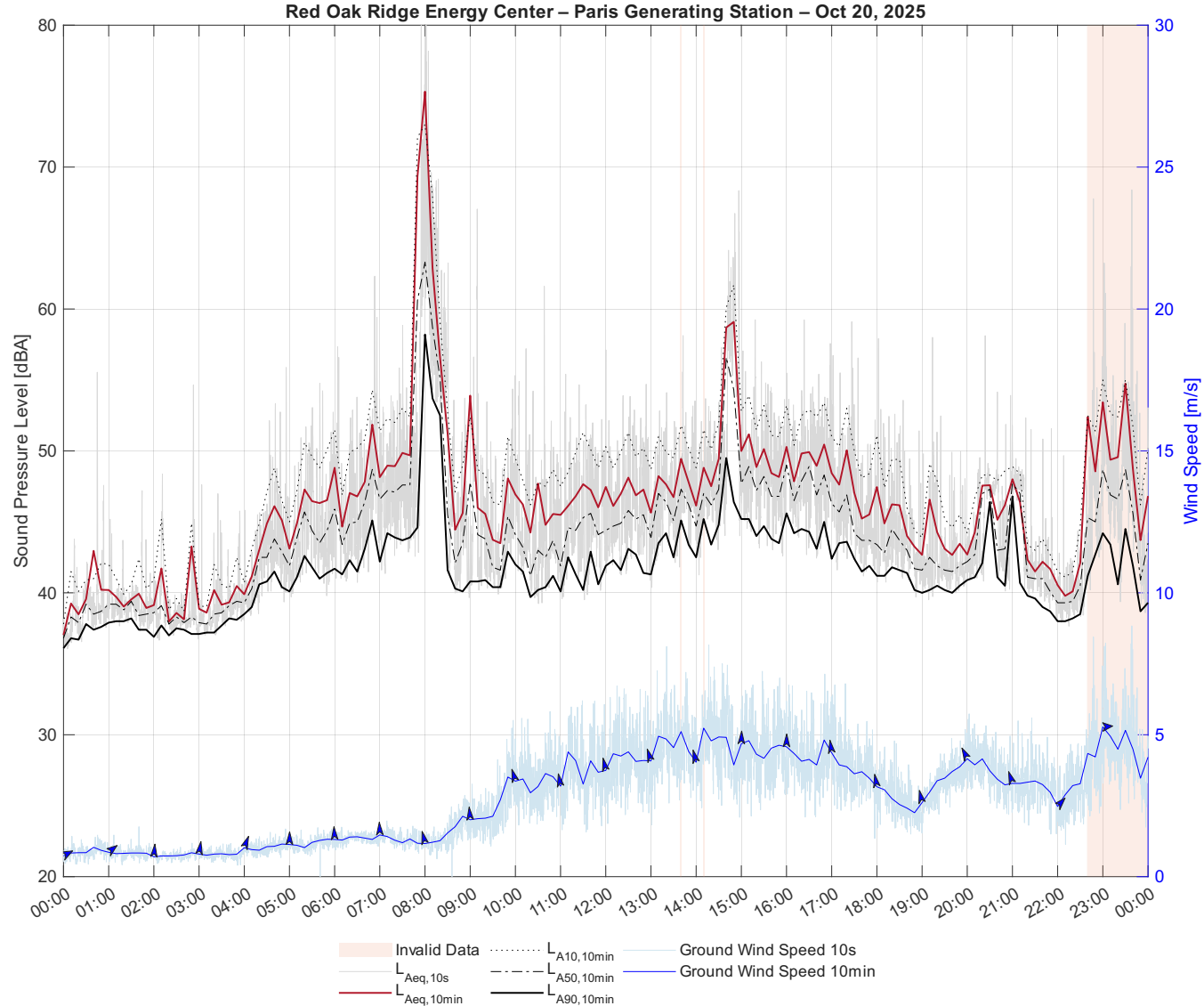
*Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center*



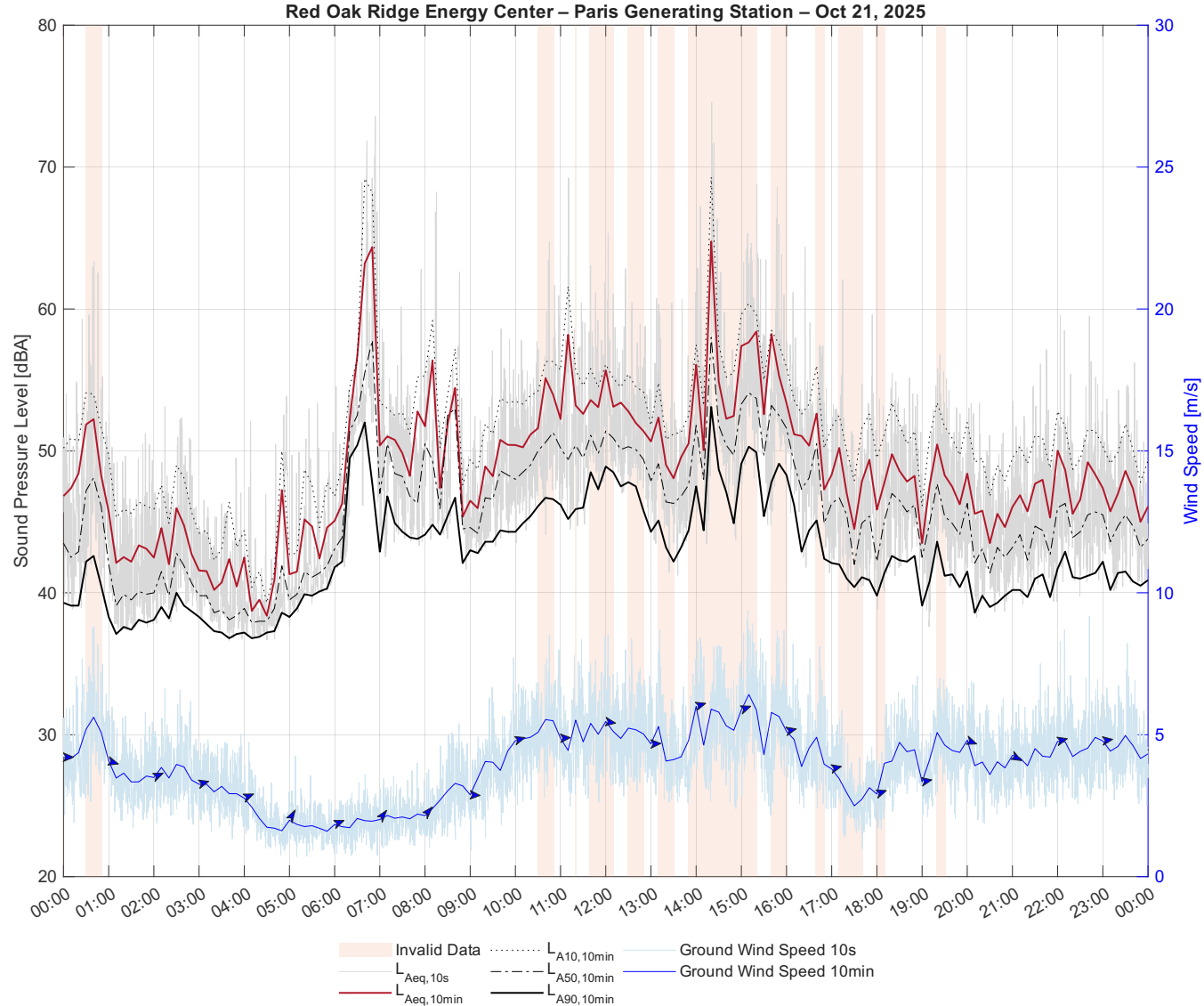
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



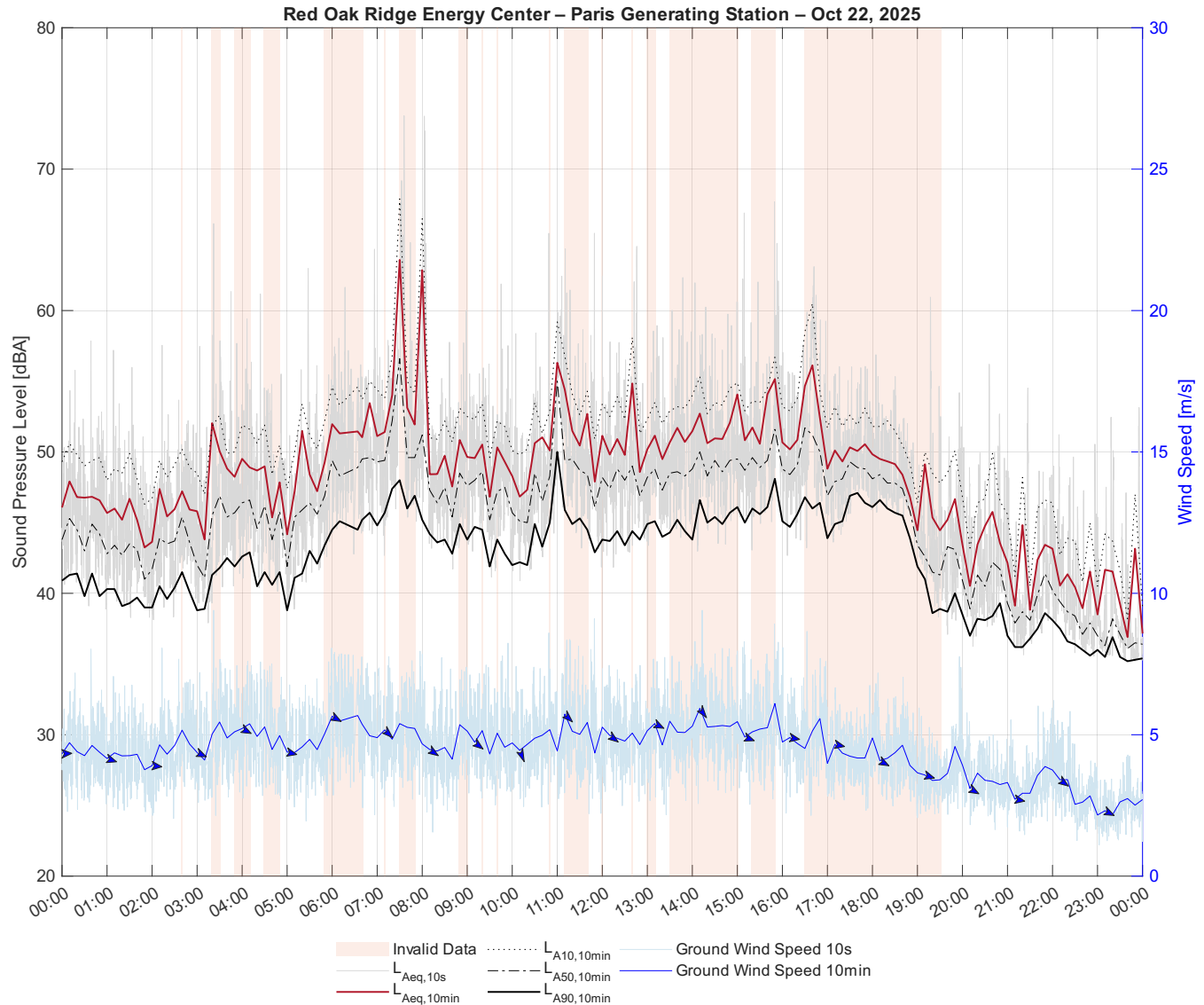
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



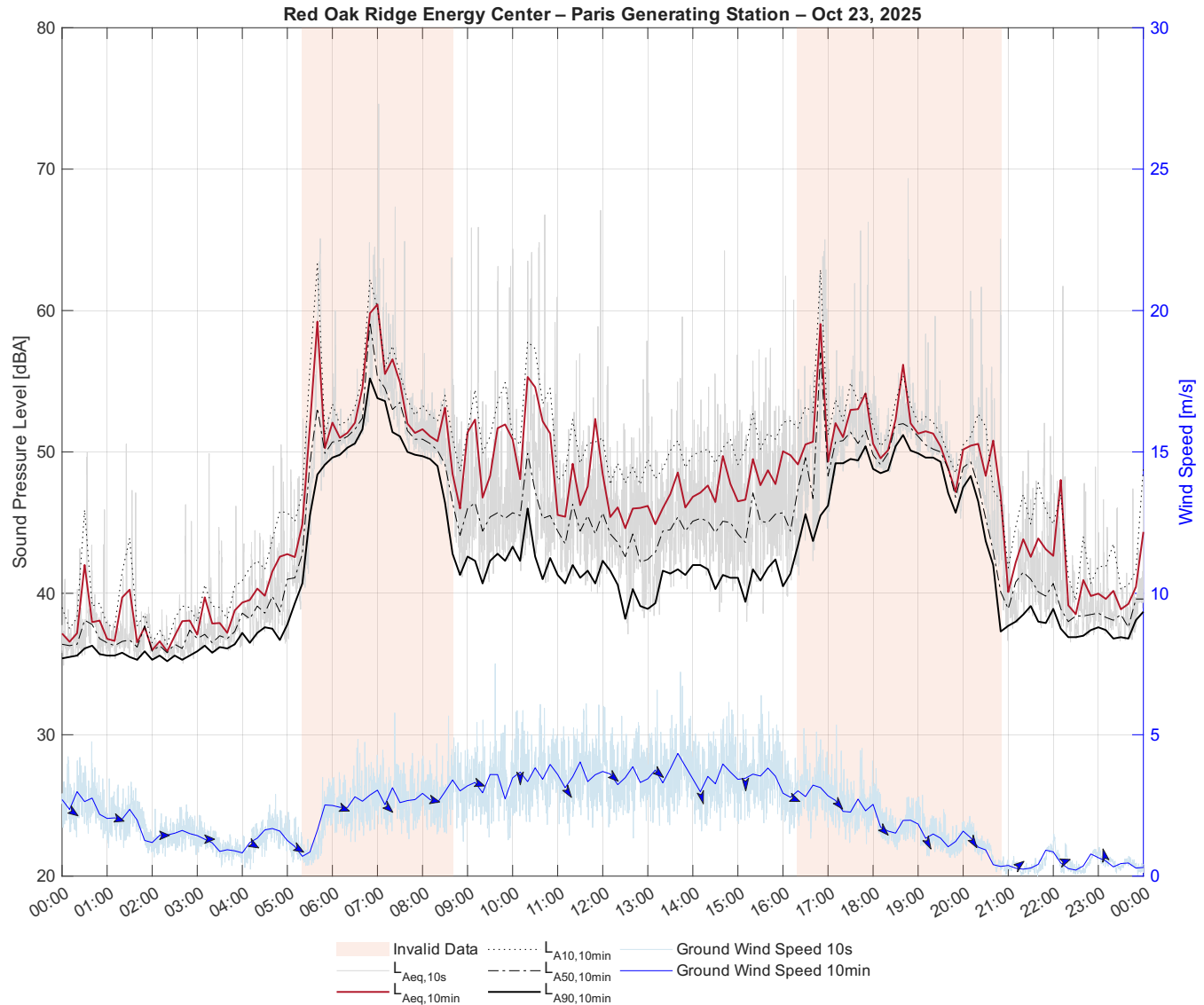
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



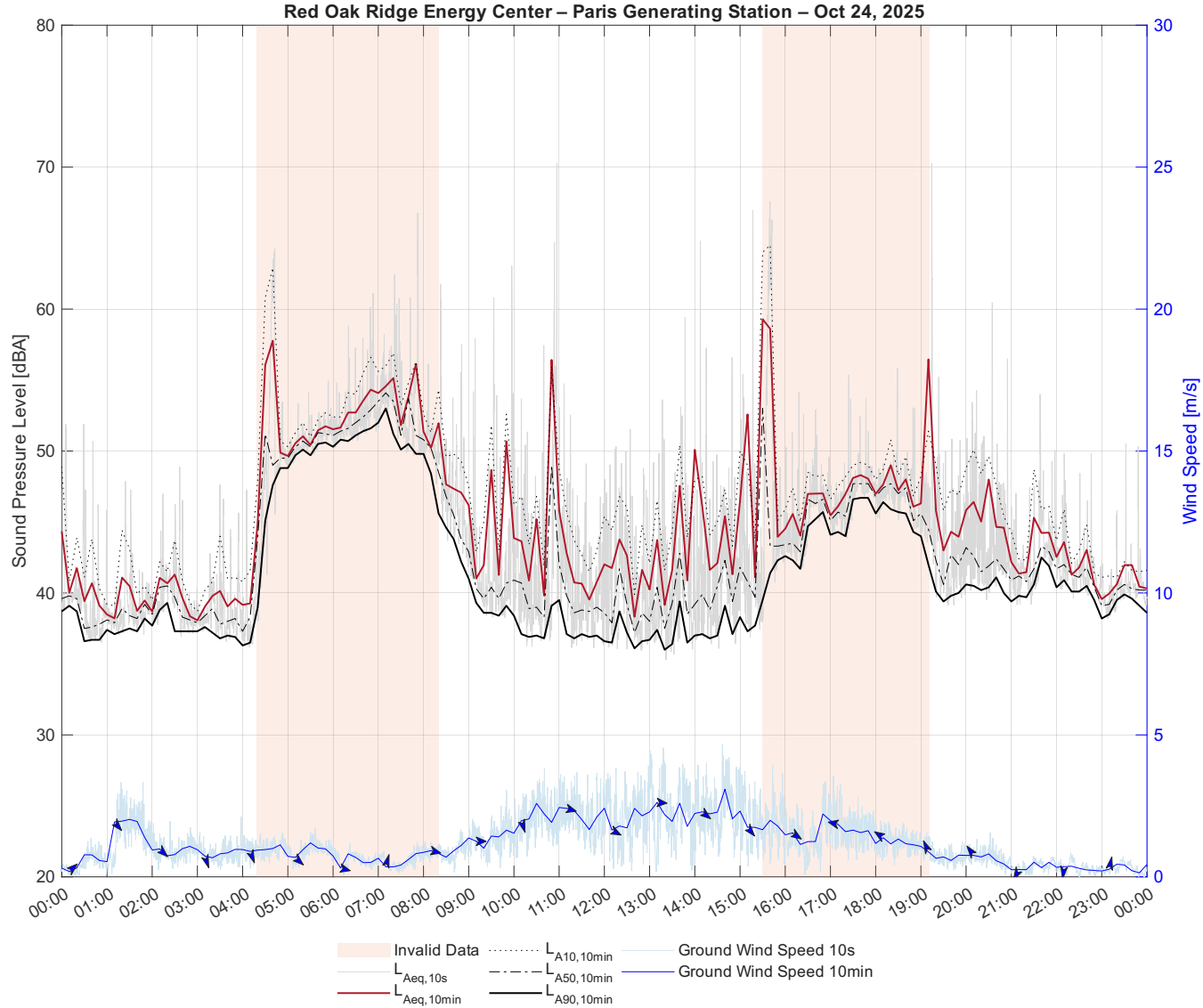
*Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center*



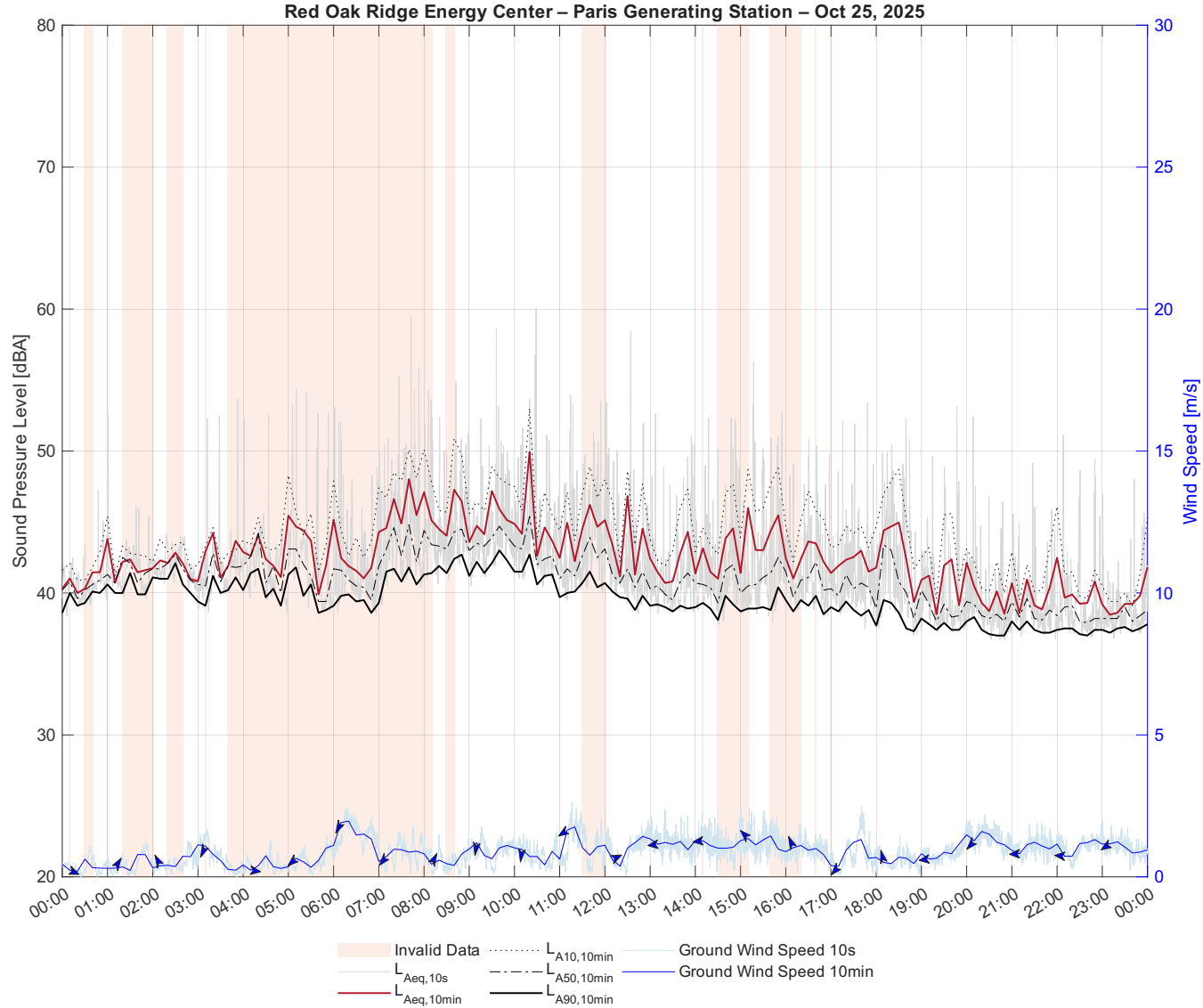
*Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center*



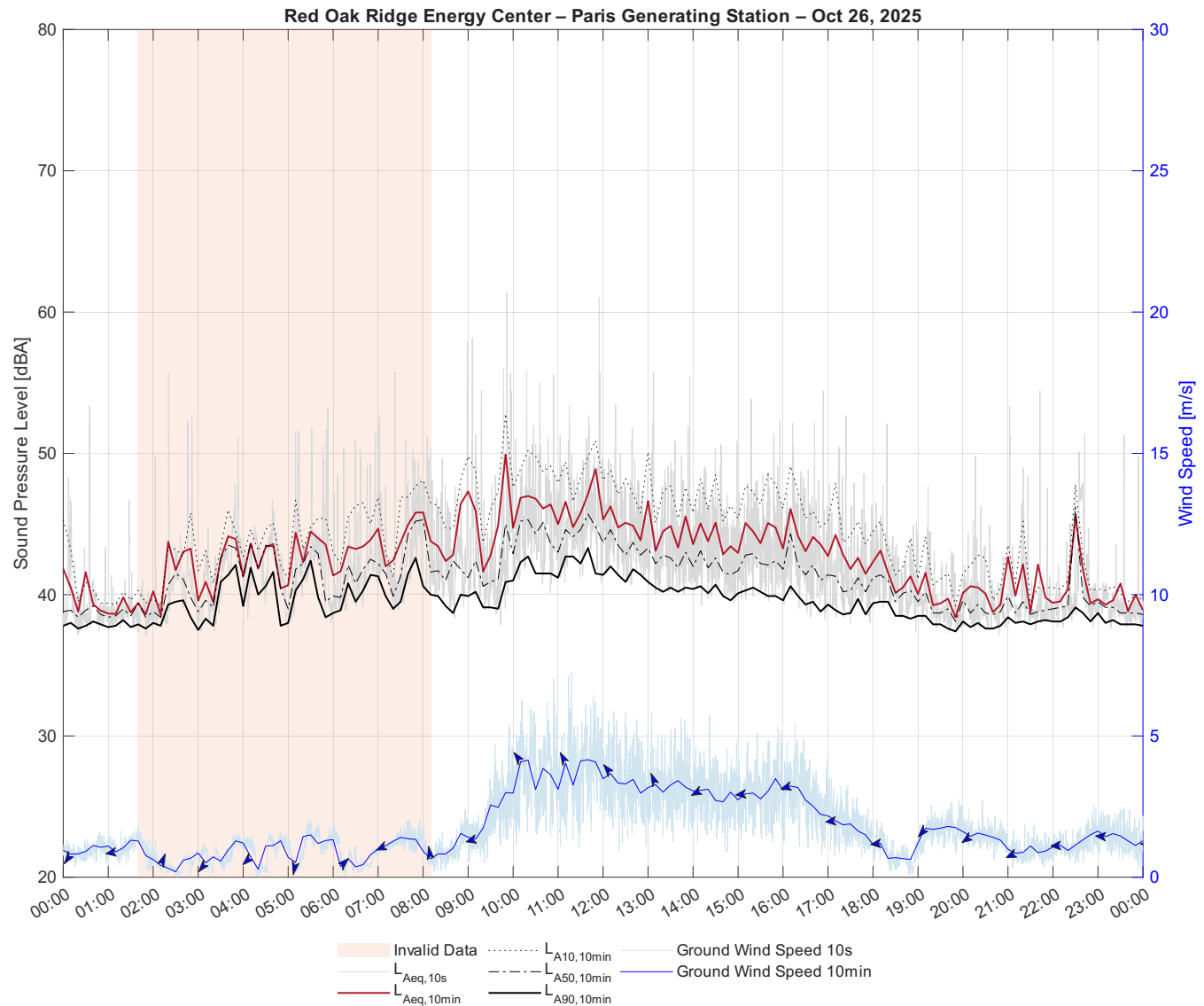
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



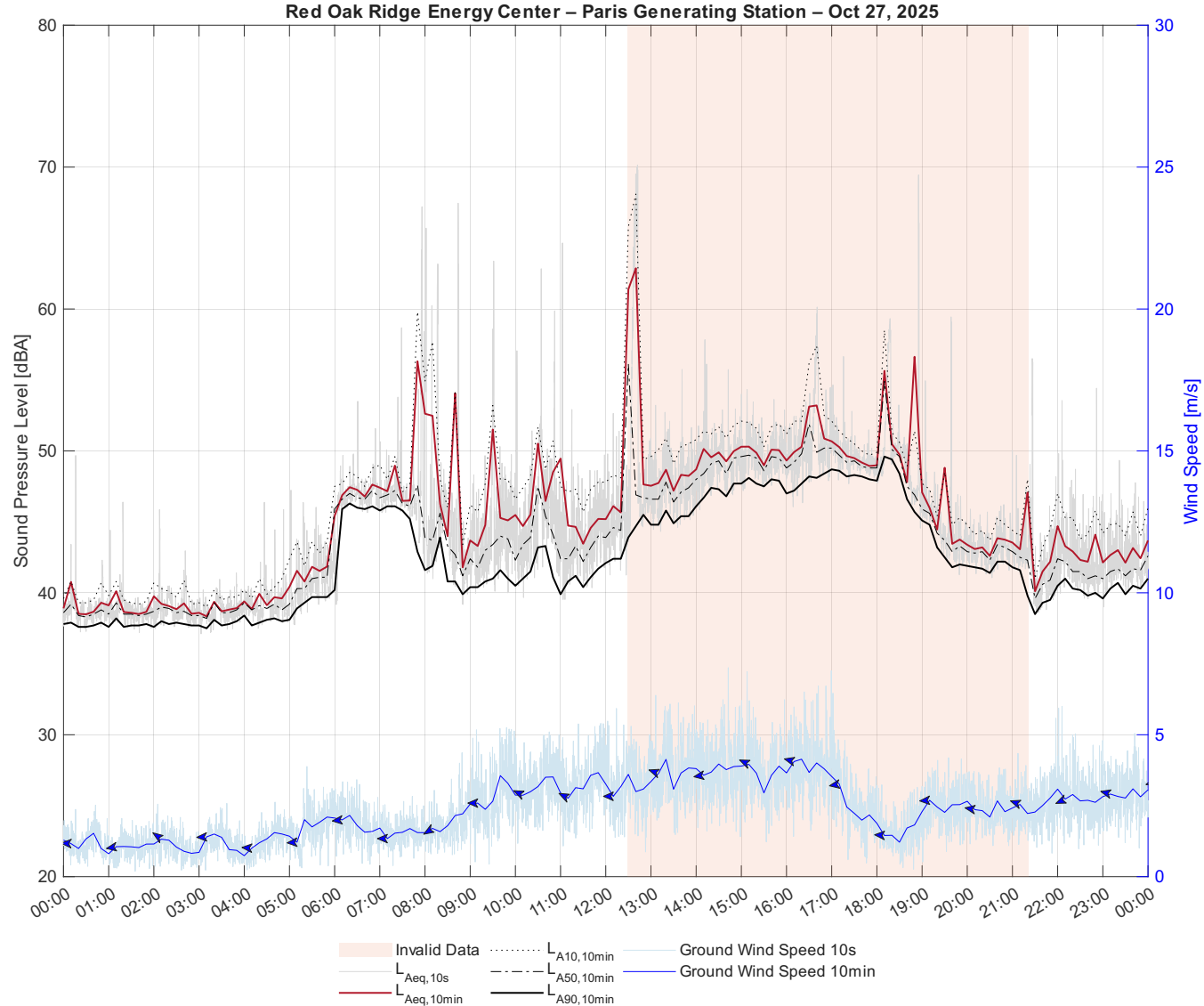
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



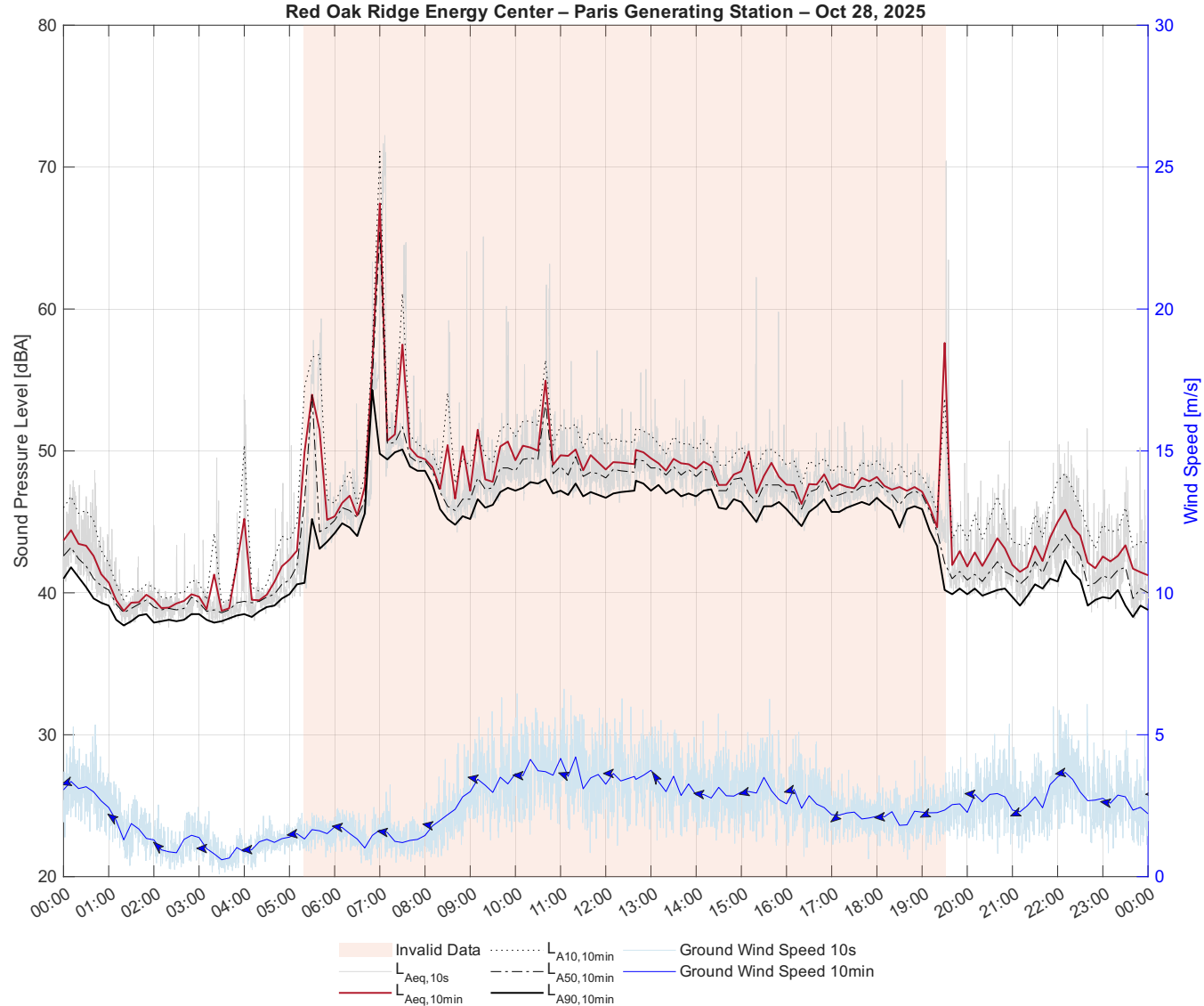
*Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center*



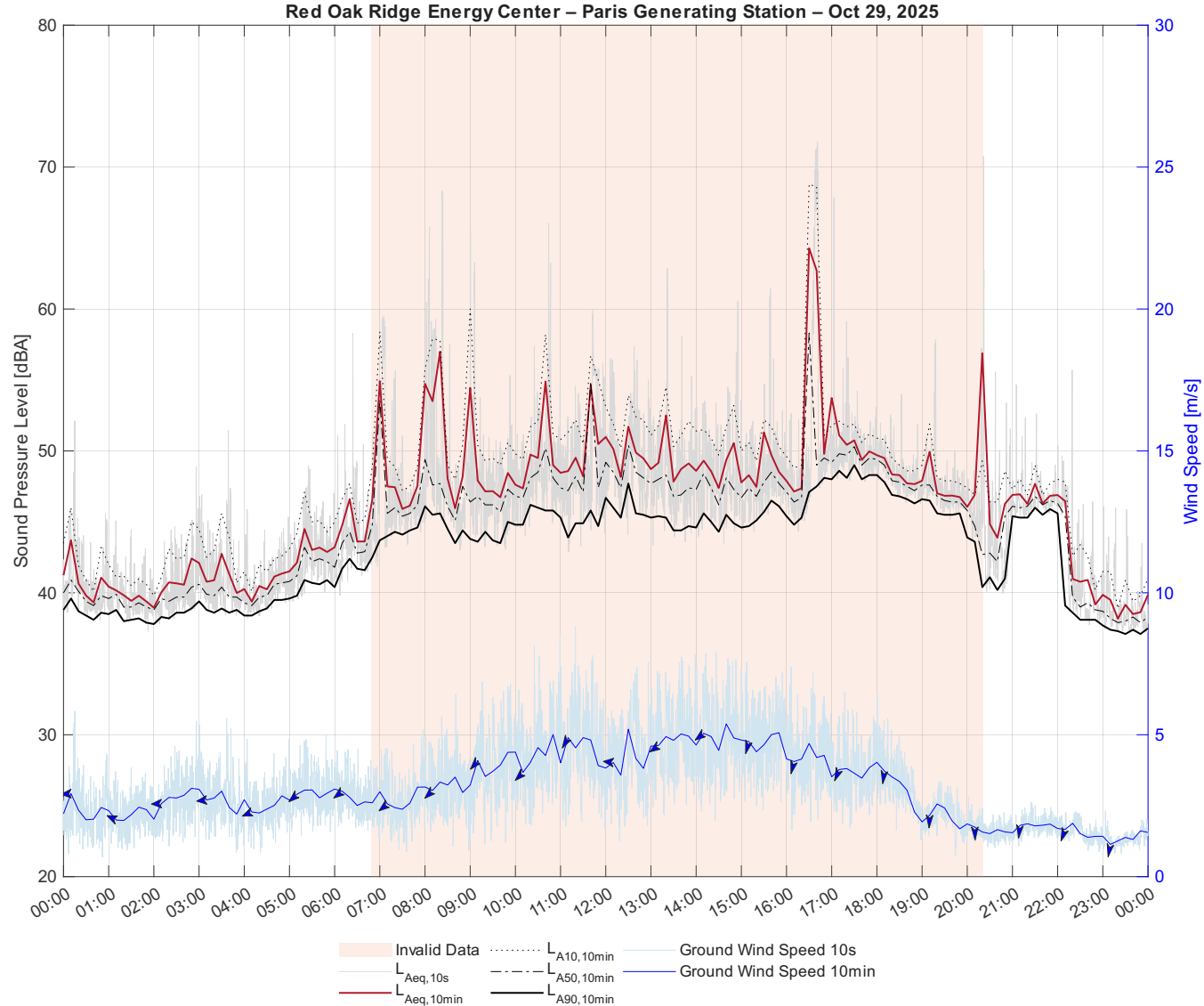
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



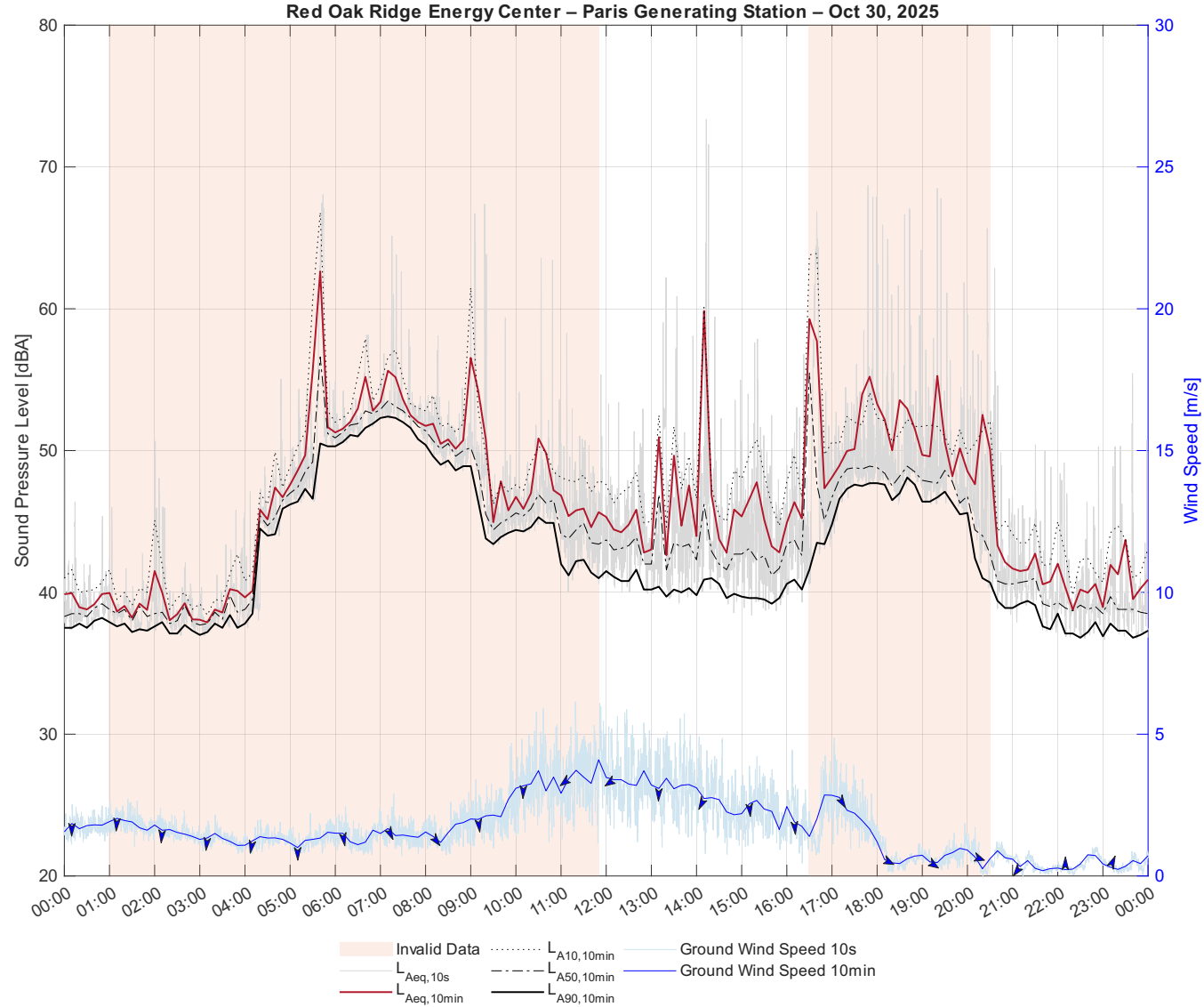
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



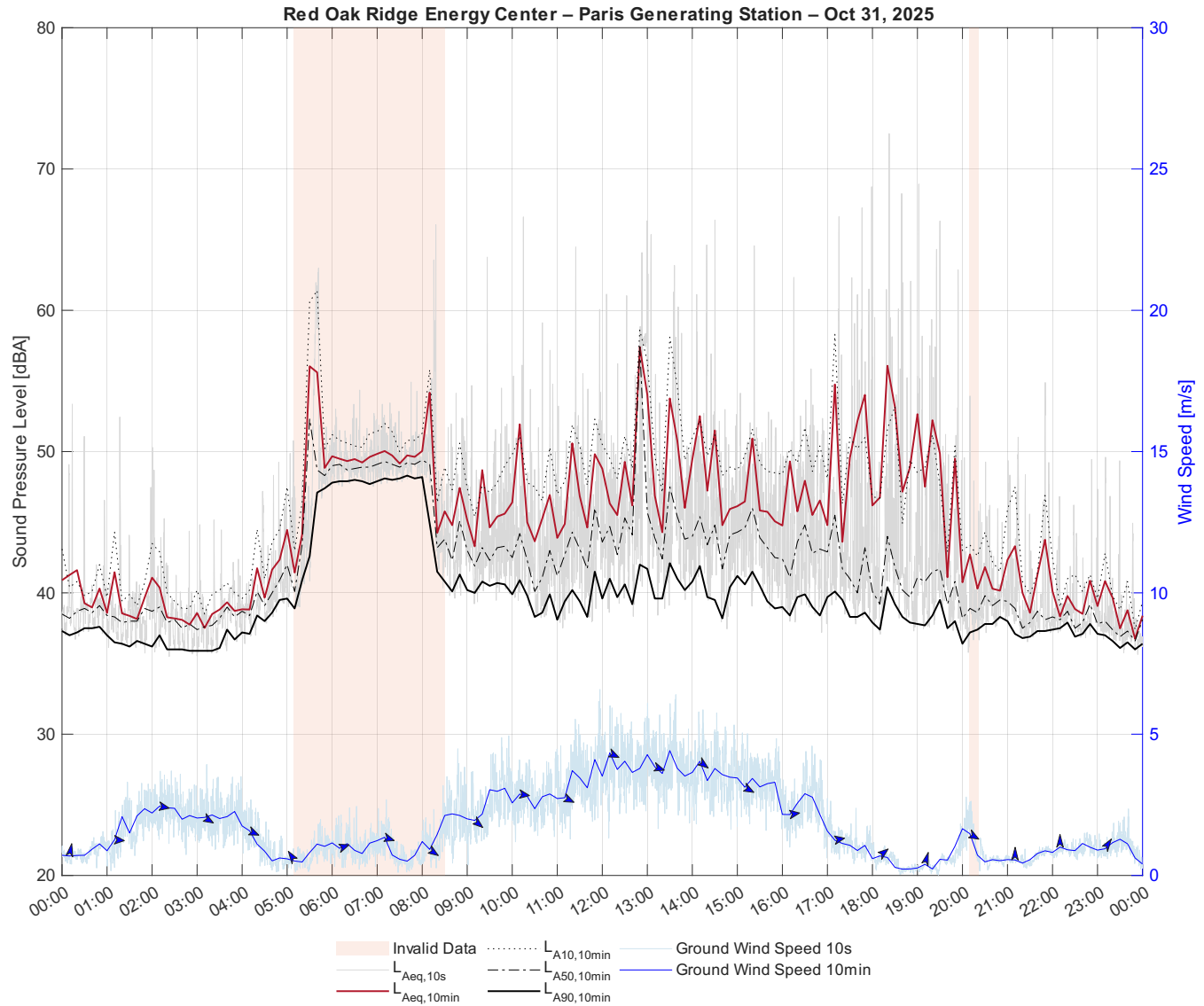
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



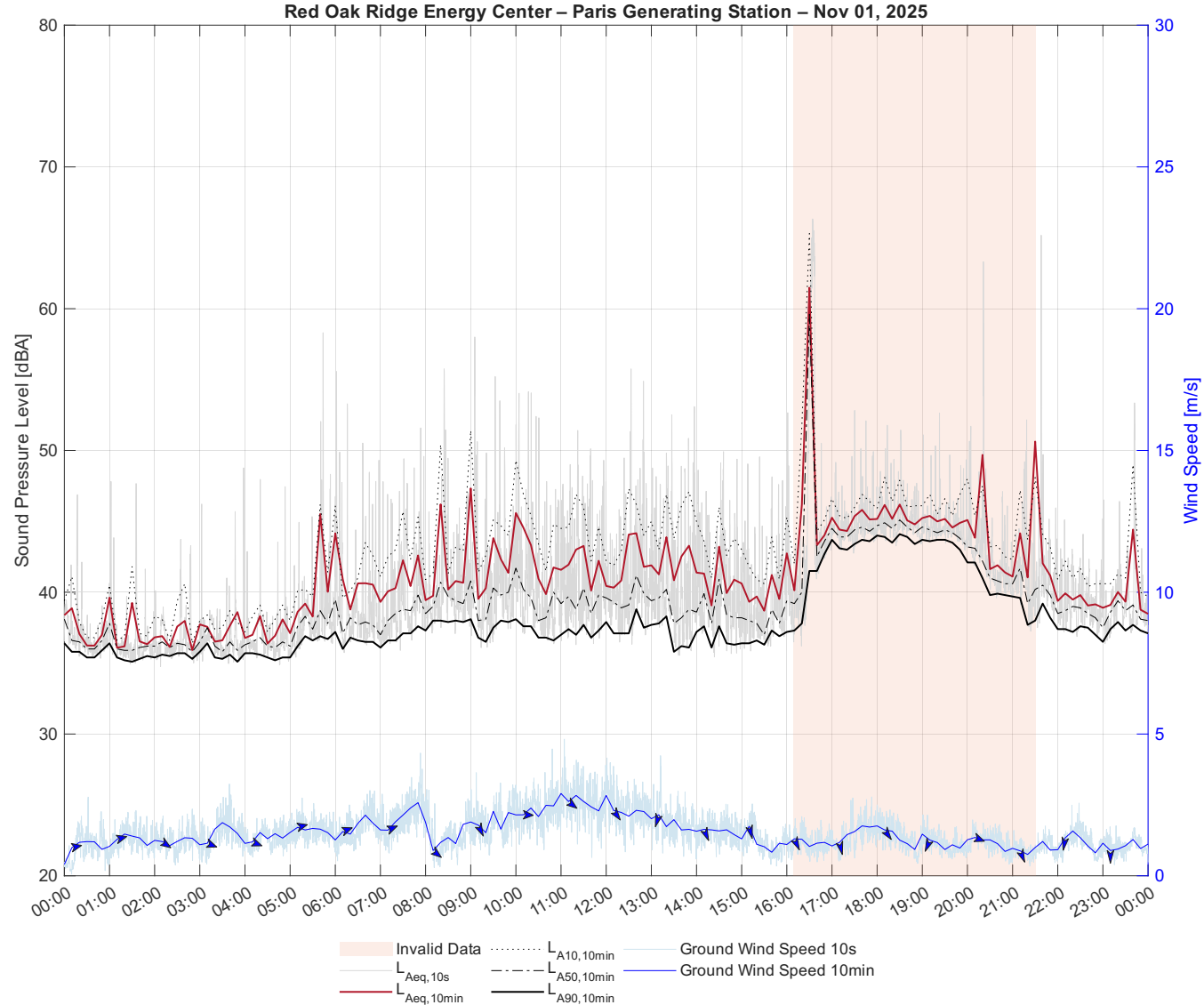
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



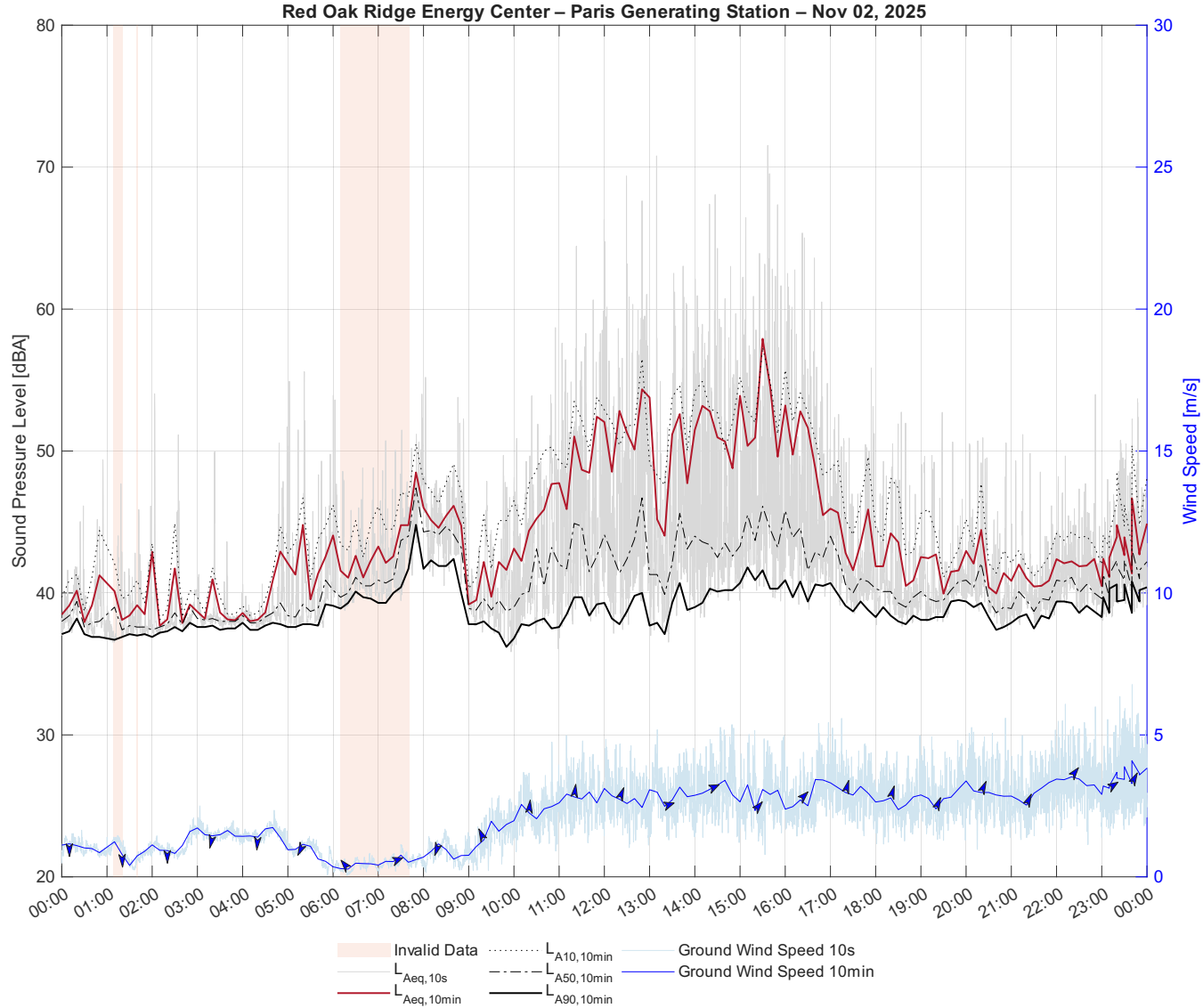
*Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center*



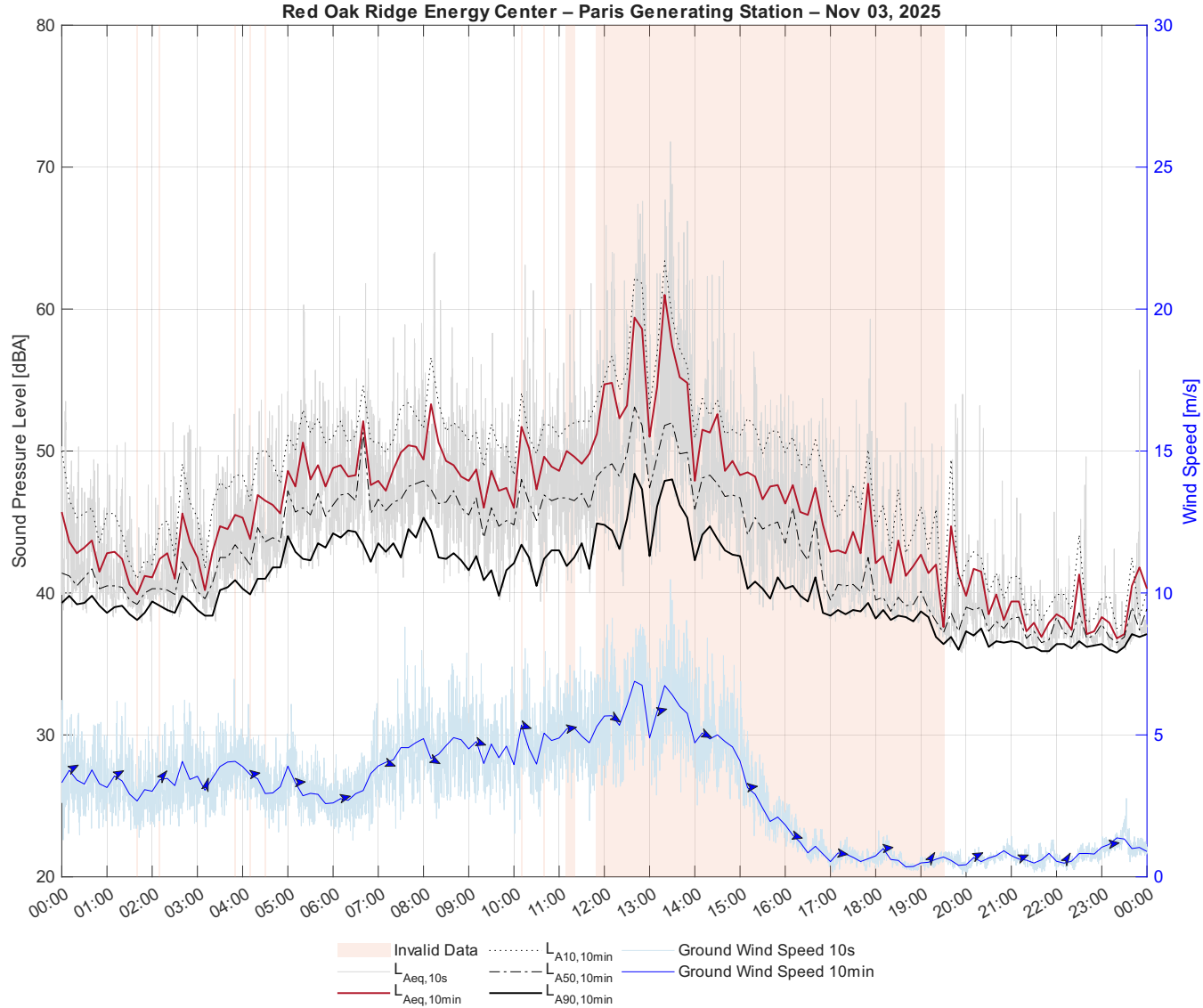
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



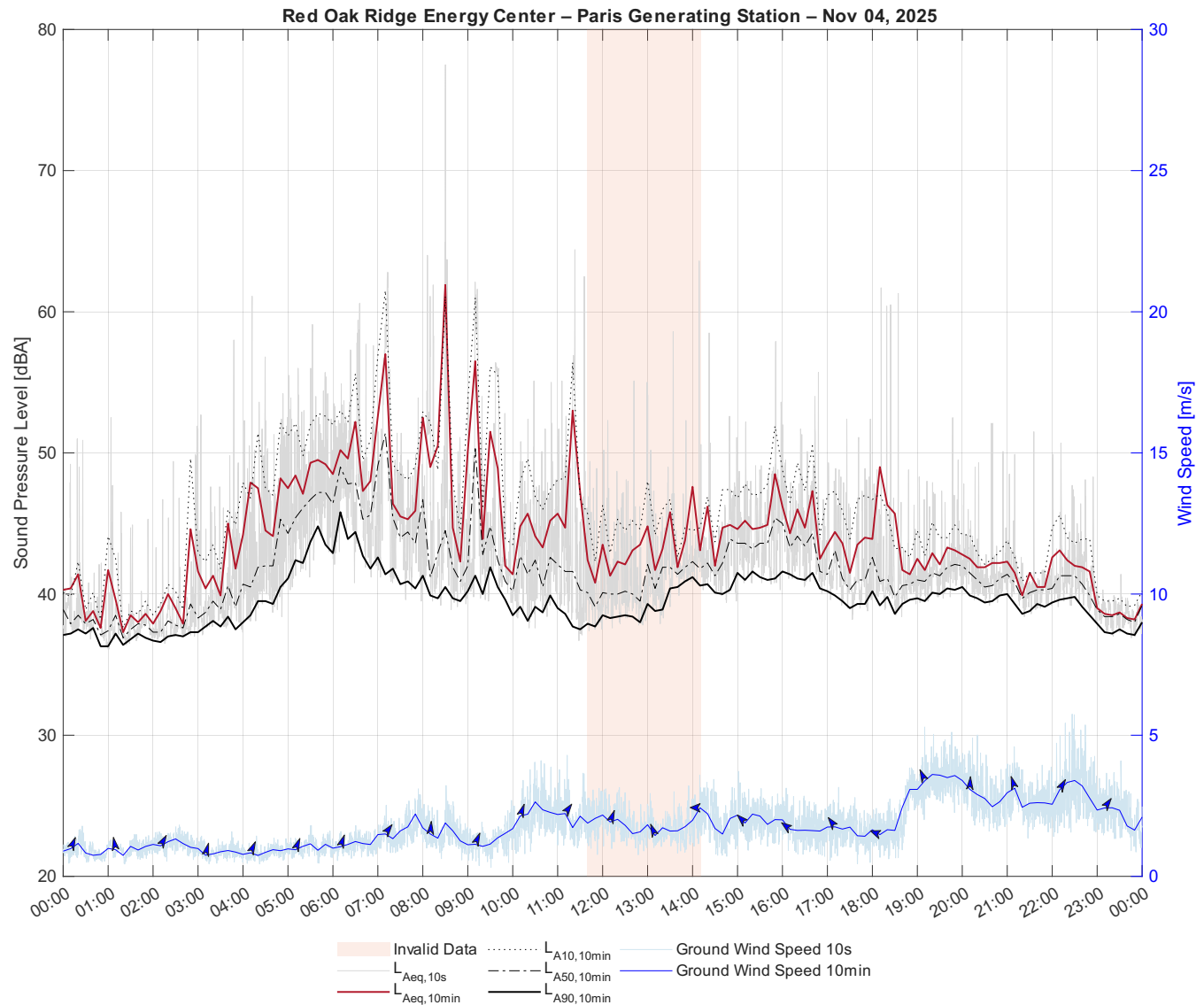
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



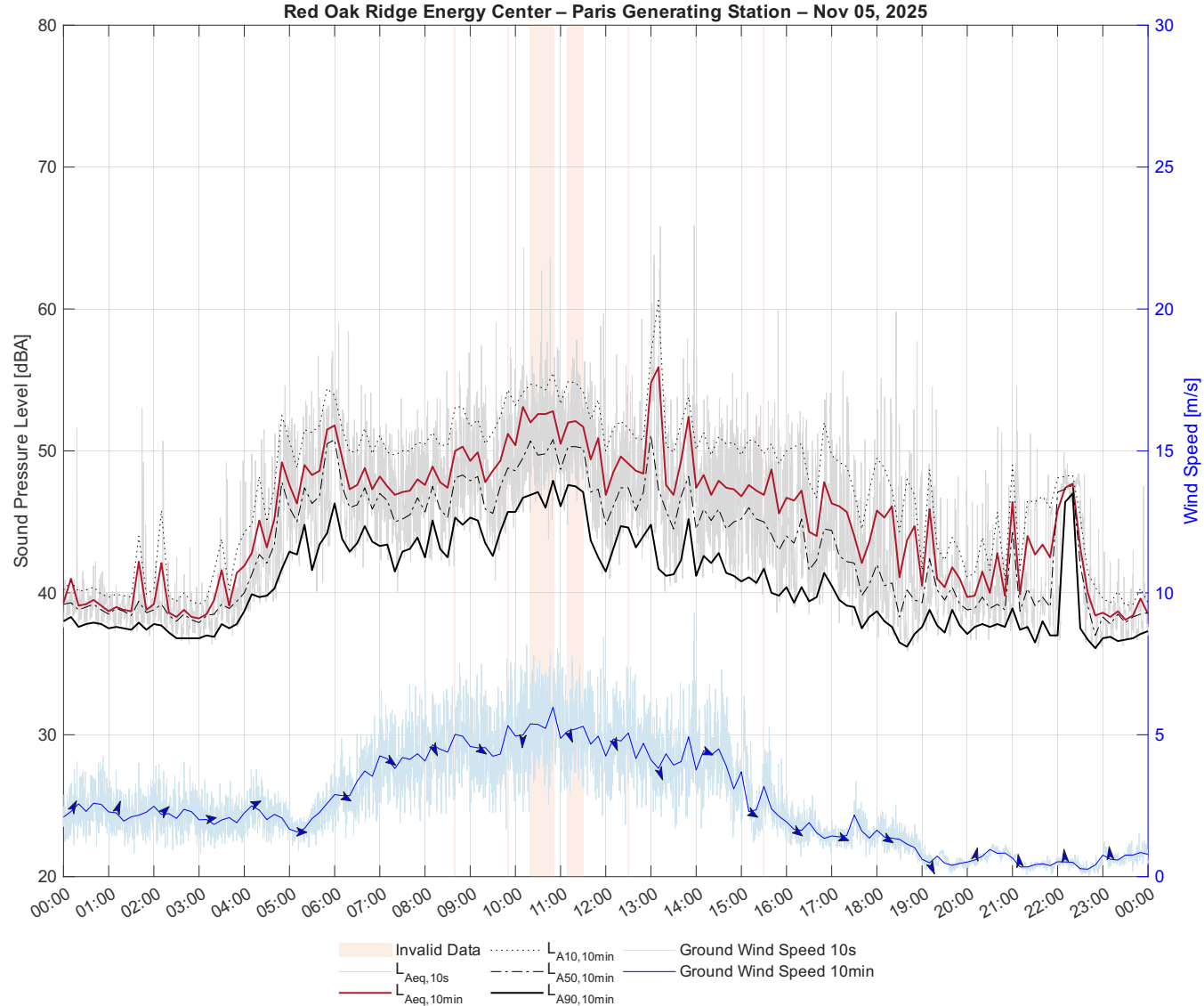
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



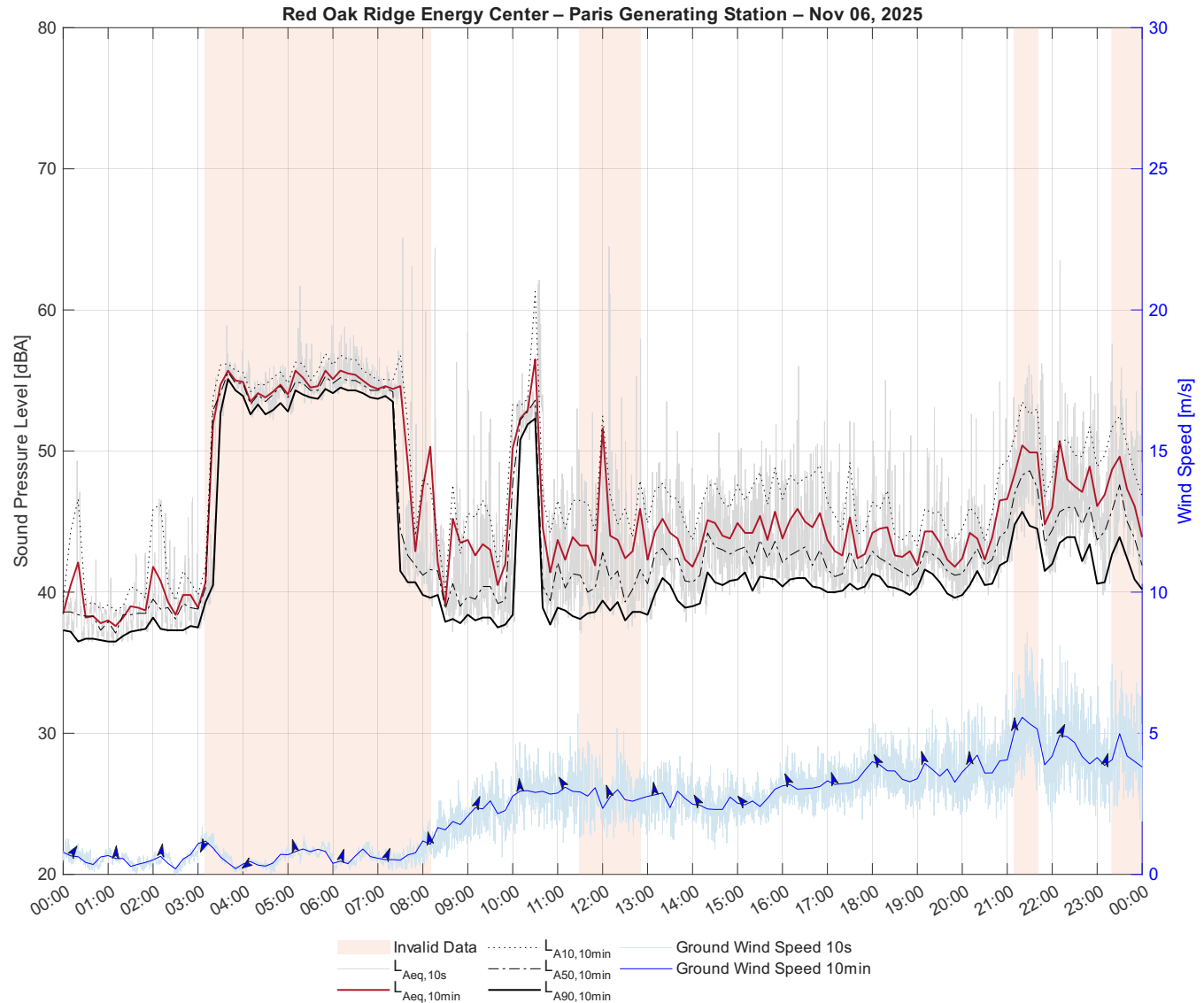
*Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center*



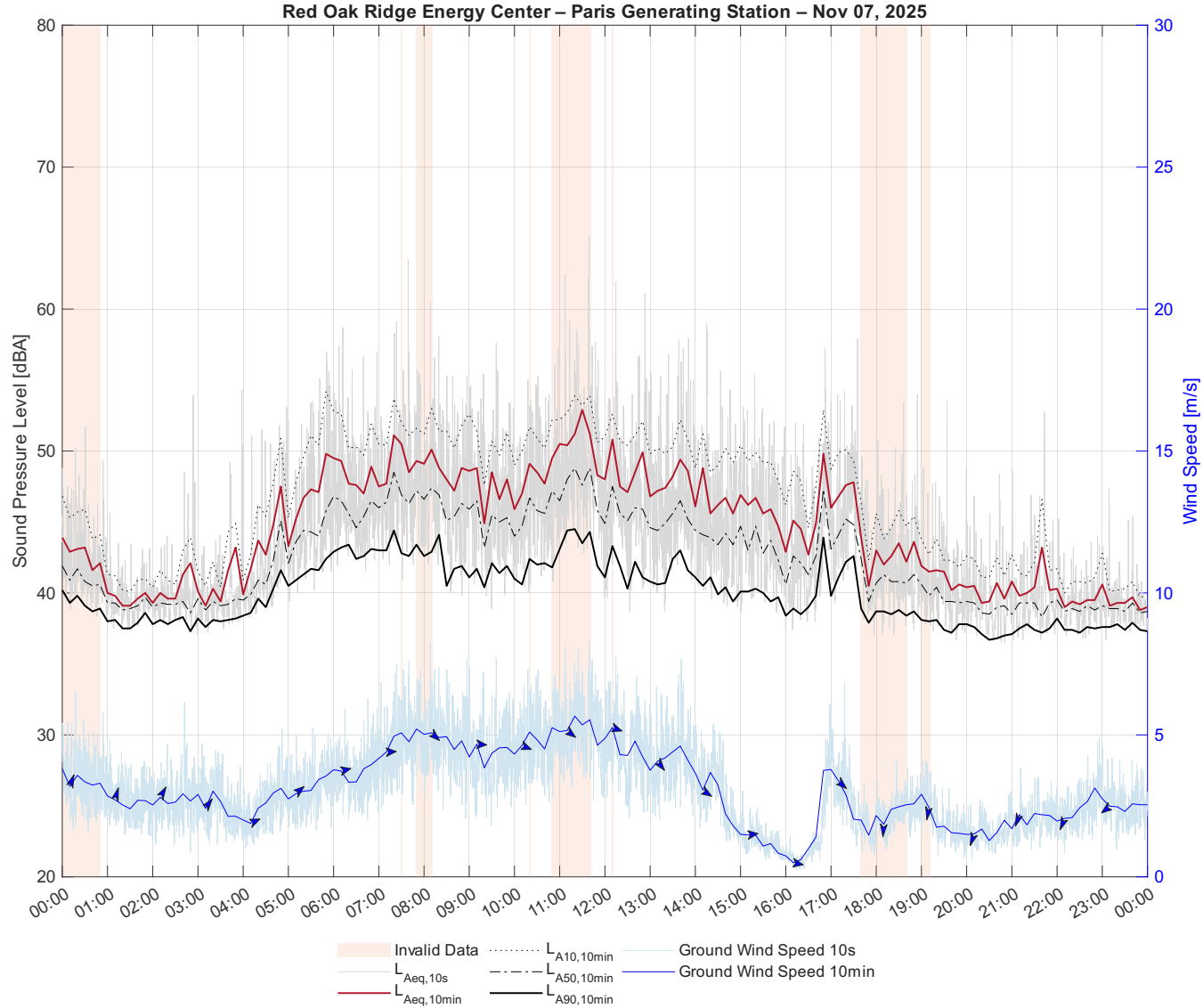
Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



*Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center*



Pre-Construction Noise Impact Assessment
for the proposed Red Oak Ridge Energy Center



APPENDIX C

Receptor Locations and Predicted Noise Levels

Table C-1. Noise Sensitive Receptor Locations – Proposed Site

UTM16 – NAD83				UTM16 – NAD83			
ID	Easting (m)	Northing (m)	Ground Elevation (m)	ID	Easting (m)	Northing (m)	Ground Elevation (m)
94	420282	4721313	236	1034	422175	4721434	220
95	420428	4721312	235	1035	422220	4721359	220
96	420304	4721154	235	2020	422101	4722026	220
97	420277	4720991	237	2021	422135	4722009	220
100	420115	4721020	240	2091	423263	4719649	221
101	420162	4720979	240	2092	421566	4718712	225
102	420198	4720919	239	2093	421533	4718763	224
103	420271	4720898	237	2101	422560	4721182	220
104	420199	4720882	239	2102	420171	4721277	238
105	420125	4720817	240	2103	420041	4721121	241
106	420262	4720666	236	2104	419929	4720276	235
107	420187	4720637	238	2105	419995	4721206	241
108	420164	4720431	235				
110	420157	4720071	235				
111	420186	4720026	234				
112	420141	4719980	235				
113	420153	4719807	235				
1001	420283	4719638	231				
1003	420427	4719194	230				
1006	420884	4718978	225				
1007	421805	4720128	227				
1011	421806	4721120	225				
1012	421806	4721161	225				
1014	421765	4721292	225				
1015	421719	4721298	225				
1016	421687	4721296	226				
1018	421818	4719924	225				
1019	421818	4719495	223				
1020	421298	4718850	225				
1021	421273	4718896	225				
1022	420931	4718854	225				
1027	421150	4721421	230				
1028	421245	4721404	230				
1029	421573	4721375	226				
1030	422113	4721391	222				
1031	422094	4721358	222				
1032	422116	4721359	222				
1033	422170	4721359	221				

Table C-2. Noise Sensitive Receptor Locations – Alternative Site

UTM16 – NAD83				UTM16 – NAD83			
ID	Easting (m)	Northing (m)	Ground Elevation (m)	ID	Easting (m)	Northing (m)	Ground Elevation (m)
1	416743	4724589	232	328	416588	4723633	231
2	417015	4724724	235	329	416588	4723508	229
3	417065	4724649	236	333	415920	4724675	221
4	417197	4724645	240	2001	414781	4725064	233
5	417233	4724644	240	2002	414794	4725035	233
6	417291	4724386	240	2003	414789	4725007	233
159	416825	4722307	232	2004	414757	4724994	233
160	416446	4722338	224	2005	414732	4725007	234
161	416762	4722538	235	2006	414707	4725007	235
162	416790	4722617	236	2007	414680	4725022	235
163	416735	4722715	237	2008	414751	4725066	234
164	416550	4722737	230	2009	414873	4725021	232
165	416568	4722884	230	2010	414873	4725061	233
166	416576	4722986	230	2011	414845	4725119	235
167	416934	4722944	240	2012	414902	4725117	235
168	417127	4723099	240	2013	415074	4725123	235
169	417436	4723017	240	2014	415074	4725087	235
170	417486	4723018	240	2015	415018	4725037	235
179	416318	4722852	225	2016	415004	4725024	235
181	415913	4722494	222	2017	414932	4725015	234
182	416077	4722315	225	2018	414992	4724998	233
183	415830	4722430	223	2019	415003	4724927	230
184	415785	4722337	221	3243	416540	4722523	225
185	415720	4722039	225	3257	414914	4725204	234
186	415898	4722018	232	3258	414979	4725225	235
311	414637	4724697	235	3260	414976	4725265	232
312	414624	4724586	232	3261	417734	4725184	240
313	414706	4724585	231	3262	417902	4725013	240
314	414716	4724620	232	3263	417922	4724842	240
315	414664	4724702	235	3264	417894	4724782	240
316	414789	4724708	233	3265	417897	4724683	240
317	414811	4724584	230	3266	417684	4724782	240
318	414894	4724587	227	3267	417499	4724576	240
319	415082	4724727	225	3268	417594	4724512	240
320	415946	4724598	223	3269	417902	4724556	240
321	416054	4724700	224	3270	417633	4723072	239
322	416111	4724707	225				
323	416164	4724555	230				
324	416599	4724381	239				
326	416523	4723807	230				
327	416594	4723678	230				

Table C-3. Predicted Operational Noise Levels – Proposed Site

Receptor ID	L _{eq} (dBA)	L _{eq} (dBC)	Octave Band Levels (dB)								
			31 (Hz)	63 (Hz)	125 (Hz)	250 (Hz)	500 (Hz)	1000 (Hz)	2000 (Hz)	4000 (Hz)	8000 (Hz)
94	42	71	73	63	46	38	38	34	21	-10	
95	42	71	73	63	46	39	39	35	22	-6	
96	42	71	73	63	46	39	38	33	22	-7	
97	41	71	74	63	46	38	37	32	22	-5	
100	41	71	73	63	45	37	36	30	20	-11	
101	41	71	73	63	45	37	36	30	21	-9	
102	41	71	74	63	45	38	36	31	21	-7	
103	41	71	74	63	46	38	37	31	22	-4	
104	41	71	74	63	46	38	36	31	21	-6	
105	41	71	73	63	46	38	36	31	21	-8	
106	42	71	74	64	47	39	38	34	23	-2	
107	42	71	74	63	46	39	38	34	22	-4	
108	42	71	73	63	46	40	39	35	23	-4	
110	42	71	73	63	46	40	39	35	23	-5	
111	43	71	74	63	47	40	39	35	24	-4	
112	42	71	73	63	46	39	39	35	23	-6	
113	42	71	73	63	46	39	39	35	23	-7	
1001	43	71	74	63	46	39	39	36	24	-5	
1003	42	71	73	63	46	39	39	36	23	-10	
1006	43	71	73	63	47	40	40	36	25	-5	
1007	59	83	85	75	61	53	53	50	49	54	33
1011	48	75	77	67	51	45	45	42	36	26	-42
1012	48	74	77	66	51	45	44	42	36	24	-47
1014	46	74	76	66	50	43	43	41	34	19	-63
1015	46	73	76	66	49	43	43	40	34	19	-63
1016	46	74	76	66	49	42	43	40	33	19	-63
1018	55	80	82	72	58	52	51	49	44	42	6
1019	48	74	77	66	52	46	45	43	35	23	-49
1020	43	71	74	63	46	40	39	35	24	-3	
1021	43	71	74	63	46	40	40	36	25	-1	
1022	42	71	73	63	46	40	39	35	24	-8	
1027	43	72	75	65	47	40	39	35	28	9	-98
1028	44	73	75	65	48	41	39	35	29	11	-90
1029	45	73	76	65	48	41	42	38	31	16	-75
1030	45	73	75	65	49	43	41	38	29	13	-83
1031	45	73	76	65	49	43	42	39	29	14	-79
1032	45	73	76	65	49	43	42	38	29	14	-80
1033	45	73	76	65	49	43	41	38	29	13	-83

Receptor ID	L _{eq} (dBA)	L _{eq} (dBC)	Octave Band Levels (dB)								
			31 (Hz)	63 (Hz)	125 (Hz)	250 (Hz)	500 (Hz)	1000 (Hz)	2000 (Hz)	4000 (Hz)	8000 (Hz)
1034	44	73	75	65	49	42	41	38	28	10	-91
1035	45	73	75	65	49	42	41	38	29	12	-85
2020	41	71	73	63	45	38	37	32	21	-9	
2021	41	71	73	63	45	38	37	32	21	-9	
2091	42	71	73	63	46	40	39	35	23	-8	
2092	42	71	73	63	46	40	39	35	24	-5	
2093	42	71	73	63	46	40	39	35	25	-4	
2101	45	73	75	65	49	42	41	38	29	10	-93
2102	41	71	73	63	45	38	37	32	20	-13	
2103	40	71	73	63	45	37	35	30	18	-14	
2104	41	70	73	63	45	38	37	33	20	-13	
2105	40	70	73	62	44	37	35	30	18	-17	

Table C-4. Predicted Operational Noise Levels – Alternative Site

Receptor ID	L _{eq} (dBA)	L _{eq} (dBC)	Octave Band Levels (dB)								
			31 (Hz)	63 (Hz)	125 (Hz)	250 (Hz)	500 (Hz)	1000 (Hz)	2000 (Hz)	4000 (Hz)	8000 (Hz)
1	43	72	74	64	46	40	39	35	25	4	-116
2	41	71	73	63	46	38	37	33	22	-7	
3	42	71	73	63	46	39	38	34	22	-6	
4	41	71	73	63	46	39	37	33	21	-10	
5	41	71	73	63	46	39	37	33	20	-11	
6	42	71	73	63	46	40	38	34	22	-7	
159	42	71	74	63	46	39	38	34	22	-7	
160	43	72	74	64	47	40	39	36	25	1	
161	43	72	74	64	47	41	39	36	25	1	
162	43	72	74	64	48	41	40	37	26	3	-118
163	44	73	75	65	48	42	41	38	27	7	-105
164	45	73	75	65	49	43	42	39	29	12	-88
165	46	74	76	65	50	43	43	40	31	15	-76
166	46	74	76	66	50	44	43	41	32	18	-68
167	44	73	75	64	48	41	40	38	27	6	-106
168	43	72	74	64	48	41	40	37	25	2	-119
169	42	71	73	63	46	39	38	34	20	-9	
170	41	71	73	63	46	39	37	34	20	-11	
179	47	74	77	66	51	45	44	41	33	20	-61
181	46	74	76	65	49	43	43	40	31	13	-88
182	44	73	75	64	48	42	41	37	28	5	-112
183	45	73	76	65	49	43	42	39	30	11	-95
184	45	73	75	65	48	42	41	38	28	7	-107
185	43	72	74	64	47	40	39	35	24	-3	
186	43	72	74	64	47	40	39	35	24	-4	
311	42	71	73	63	46	39	39	35	25	-4	
312	43	71	74	63	46	39	39	35	25	-2	
313	43	72	74	64	46	40	40	36	26	0	
314	43	71	74	64	46	40	40	36	26	0	
315	42	71	74	63	46	39	39	35	25	-4	
316	43	71	74	64	46	40	40	36	26	-1	
317	43	72	74	64	47	40	41	37	27	3	-118
318	44	72	74	64	47	41	41	37	28	5	-112
319	44	72	74	64	47	41	40	36	28	5	-113
320	46	73	75	65	50	43	43	40	31	16	-76
321	45	73	75	65	49	42	42	39	28	12	-90
322	45	73	75	65	49	42	42	39	29	11	-92
323	46	73	76	65	50	44	44	41	31	16	-76

Receptor ID	Leq (dBA)	Leq (dBC)	Octave Band Levels (dB)								
			31 (Hz)	63 (Hz)	125 (Hz)	250 (Hz)	500 (Hz)	1000 (Hz)	2000 (Hz)	4000 (Hz)	8000 (Hz)
324	45	73	75	65	49	42	42	38	30	13	-85
326	48	75	77	67	53	46	45	43	35	27	-38
327	48	75	77	67	52	45	45	43	36	26	-43
328	48	75	77	67	52	46	45	43	36	26	-42
329	48	74	77	67	52	45	45	42	35	26	-42
333-O	45	72	75	65	49	43	43	40	30	13	-85
2001	41	71	73	63	45	39	38	33	22	-11	
2002	41	71	73	63	45	39	38	33	22	-10	
2003	42	71	73	63	46	39	38	33	22	-9	
2004	42	71	73	63	46	39	38	33	22	-10	
2005	41	71	73	63	45	39	38	33	22	-11	
2006	41	71	73	63	45	39	38	33	22	-11	
2007	41	71	73	63	45	39	38	33	21	-12	
2008	41	71	73	63	45	39	38	33	21	-12	
2009	42	71	73	63	46	39	38	34	23	-8	
2010	42	71	73	63	46	39	38	33	22	-9	
2011	41	71	73	63	45	39	38	33	22	-12	
2012	41	71	73	63	45	39	38	33	22	-11	
2013	42	71	73	63	46	39	38	33	23	-8	
2014	42	71	73	63	46	39	38	33	23	-7	
2015	42	71	74	63	46	39	38	34	23	-6	
2016	42	71	74	63	46	39	38	34	24	-6	
2017	42	71	73	63	46	39	38	34	23	-7	
2018	42	71	74	63	46	39	38	34	24	-5	
2019	42	71	74	63	46	40	39	35	25	-3	
3243	44	72	75	64	48	41	40	37	27	6	-109
3257	41	71	73	63	45	38	37	32	21	-13	
3258	41	71	73	63	45	38	37	32	21	-13	
3260	41	71	73	63	45	38	37	32	20	-14	
3261	39	69	71	61	43	35	33	28	11	-36	
3262	39	69	71	61	43	36	34	28	11	-37	
3263	39	69	72	61	43	36	34	29	12	-34	
3264	39	69	72	61	43	36	34	29	13	-32	
3265	39	69	72	61	43	36	34	30	13	-31	
3266	40	70	72	62	44	37	35	31	15	-26	
3267	41	70	73	62	45	38	37	33	18	-17	
3268	41	70	72	62	45	38	36	32	18	-19	
3269	39	70	72	62	44	37	35	30	14	-29	
3270	41	70	73	62	45	38	36	32	18	-15	

APPENDIX D

Long-term Measurement Octave Band Noise Levels

Table D-1. Measured L_{eq} Octave Band Noise Levels – Proposed Site

Measurement Location	Time	Octave Band Levels (dB)								
		31 (Hz)	63 (Hz)	125 (Hz)	250 (Hz)	500 (Hz)	1000 (Hz)	2000 (Hz)	4000 (Hz)	8000 (Hz)
MP1	Day	71	72	67	56	61	63	56	44	28
MP2		67	67	58	51	56	58	49	35	19
MP3		68	67	60	53	56	58	50	36	21
MP1	Night	69	70	64	54	60	62	54	41	26
MP2		66	65	55	50	57	58	48	33	16
MP3		66	65	56	52	57	58	48	33	18

Table D-2. Measured L_{90} Octave Band Noise Levels – Proposed Site

Measurement Location	Time	Octave Band Levels (dB)								
		31 (Hz)	63 (Hz)	125 (Hz)	250 (Hz)	500 (Hz)	1000 (Hz)	2000 (Hz)	4000 (Hz)	8000 (Hz)
MP1	Day	64	65	60	50	55	58	51	38	22
MP2		61	61	52	44	49	52	44	28	15
MP3		61	61	51	46	51	54	46	32	16
MP1	Night	61	61	55	48	53	56	48	34	18
MP2		59	58	48	44	50	52	42	26	13
MP3		59	58	47	46	51	53	44	28	15

Table D-3. Measured L_{eq} Octave Band Noise Levels – Alternative Site

Measurement Location	Time	Octave Band Levels (dB)								
		31 (Hz)	63 (Hz)	125 (Hz)	250 (Hz)	500 (Hz)	1000 (Hz)	2000 (Hz)	4000 (Hz)	8000 (Hz)
MP11	Day	59	61	58	49	52	54	47	34	17
MP12		58	58	60	52	50	48	38	24	15
MP13		58	58	53	46	50	51	43	32	22
MP11	Night	56	54	54	44	46	46	38	28	21
MP12		54	52	53	45	44	41	31	26	18
MP13		55	53	48	42	44	45	37	29	22

Table D-4. Measured L_{90} Octave Band Noise Levels – Alternative Site

Measurement Location	Time	Octave Band Levels (dB)								
		31 (Hz)	63 (Hz)	125 (Hz)	250 (Hz)	500 (Hz)	1000 (Hz)	2000 (Hz)	4000 (Hz)	8000 (Hz)
MP11	Day	50	50	46	35	33	32	21	14	14
MP12		50	50	44	34	33	31	21	14	13
MP13		50	50	43	34	34	32	23	17	15
MP11	Night	46	46	41	30	30	26	16	13	14
MP12		46	46	40	30	30	25	16	13	13
MP13		46	46	39	31	31	27	18	15	14