
***SOUND COMPLIANCE MONITORING
FOR THE GAMESA WIND TURBINE
UD - LEWES, DELAWARE***

January 2011



**SOUND COMPLIANCE MONITORING
FOR THE GAMESA WIND TURBINE
AT THE UNIVERSITY OF DELAWARE
LEWES, DELAWARE**

Prepared for:

Gamesa Wind US
2050 Cabot Boulevard
Langhorne, PA 19047

Prepared by:

Tech Environmental, Inc.
303 Wyman Street, Suite 295
Waltham, MA 02451

Certified by Peter H. Guldberg, Acoustic Consultant
Associate Member INCE

January 3, 2011

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1.0 EXECUTIVE SUMMARY

A Gamesa G90 2.0-MW wind turbine operates at the University of Delaware (UD), Lewes campus on a parcel of land south of the UD College of Marine Studies. Prior to start-up of the wind turbine, an acoustic study was done that proved the project complies with the Delaware Noise Regulations.¹ After receiving complaints from residents living in the area, Gamesa commissioned this sound compliance study by Tech Environmental, Inc. (TE). A landowner in the area agreed to have the measurements taken on his property approximately 2,200 feet southeast of the wind turbine (16 Hoornkill Avenue).

The objective was to measure sound levels from the G90 wind turbine on the residential property when it was downwind of the wind turbine (northwest winds) and wind speeds were high enough for the G90 to produce maximum sound power, and to verify that the wind turbine complies with the Delaware Noise Regulations. The compliance sound monitoring was done on Monday December 6, 2010 and Tuesday December 7, 2010 under ideal conditions for measuring maximum wind turbine sound: hub height² winds were from the northwest and steady at a speed of 8.6 to 12.9 meters per second (m/s), there was no precipitation, the ground was dry, skies were partly cloudy and air temperatures were in the range of 30-40° F. The Gamesa G90 achieves its maximum sound power level (IEC 61400 test value of 106.4 dBA³) when the hub height wind speed is at and above 9.7 m/s, and it is within 0.4 dBA of the maximum sound power level when the hub height wind speed is 8.3 m/s (IEC 61400 test value of 106.0 dBA).⁴ Since the wind speed was at or above 8.6 m/s for all test intervals, all of the sound tests were done with the turbine producing maximum sound power and the 16 Hoornkill Avenue property was downwind of the G90 wind turbine for every test period. A Gamesa technician assisted TE in turning the turbine off (turbine paused) and on (turbine operational) for a series of 24 measurements made during both daytime and nighttime hours.

¹ Tech Environmental, Inc., “Acoustic Study of the University of Delaware/Gamesa Wind Turbine Project, Lewes, Delaware,” January 2010.

² 78 meters above grade.

³ A-weighted decibels.

⁴ Gamesa Wind, “G90 2MW 50/60 Hz Power Curve and Noise Emission,” Document GD022915-en, April 29, 2009, Section 5.4 – Table 6.

The study's results and conclusions are as follows:

- 1) The wind turbine sound was generally inaudible during the daytime periods due to masking by wind noise. At night, the swishing sound characteristic of a wind turbine was slightly audible above the background wind noise.
- 2) The Delaware Noise Regulations set average (L_{eq}) sound level limits at residential property of 65 dBA daytime and 55 dBA nighttime. Daytime turbine-operational L_{eq} sound levels at the 16 Hoornkill Avenue property ranged from 43.0 dBA to 51.3 dBA and are well below the daytime limit of 65 dBA. Nighttime turbine-operational L_{eq} sound levels ranged from 41.9 dBA to 45.1 dBA and are well below the nighttime limit of 55 dBA. Thus, the sound measurements demonstrate that the UD-Gamesa wind turbine complies with the broadband L_{eq} sound level limits in Section 6.0.1 of the Delaware Noise Regulations.
- 3) The Delaware Noise Regulations set an incremental limit of 10 dBA above the ambient (L_{90}) level for residential areas. Since all of the measurements were made with the turbine producing maximum sound power, the average of L_{90} measurements for turbine operational vs. turbine-paused conditions can be compared to obtain the incremental change in ambient sound levels. The data were examined two different ways in making this calculation. Analyzing daytime and nighttime periods separately and including all data points, the results show that the UD-Gamesa wind turbine increases the ambient L_{90} sound level by 1.1 dBA in the daytime and 2.9 dBA at night. Analyzing specific wind speed bins with an equal number of paired data points (turbine operational vs. turbine-paused) reveals the UD-Gamesa wind turbine increases the ambient L_{90} sound level by 4.6 dBA in the 10.0-10.6 m/s wind speed bin, and by 4.4 dBA in the 12.4-13.0 m/s wind speed bin. No matter which way the L_{90} data are analyzed, the incremental changes in ambient L_{90} sound levels comply with the 10 dBA incremental limit in Section 6.0.2 of the Delaware Noise Regulations.
- 4) Analysis of the 1/3-octave band measurements reveals no pure tones occurred in either the L_{eq} or L_{90} sound level frequency spectra when the wind turbine was operational. Thus, no adjustments to the L_{eq} or incremental L_{90} limits occur under Section 6.0.3 of the Delaware Noise Regulations.

In conclusion, the sound level measurements presented in this study confirm that the UD-Gamesa wind turbine fully complies with the Delaware Noise Regulations at the 16 Hoornkill Avenue residential property.

2.0 COMMON MEASURES OF COMMUNITY SOUND

All sounds originate with a source – a human voice, vehicles on a roadway, or an airplane overhead. The sound energy moves from the source to a person’s ears as sound waves, which are minute variations in air pressure. The loudness of a sound depends on the sound pressure level⁵, which has units of decibel (dB). The decibel scale is logarithmic to accommodate the wide range of sound intensities to which the human ear is subjected. On this scale, the quietest sound we can hear is 0 dB, while the loudest is 120 dB. Every 10-dB increase is perceived as a doubling of loudness. Most sounds we hear in our daily lives have sound pressure levels in the range of 30 dB to 90 dB.

A property of the decibel scale is that the numerical values of two separate sounds do not directly add. For example, if a sound of 70 dB is added to another sound of 70 dB, the total is only a 3-decibel increase (or 73 dB) on the decibel scale, not a doubling to 140 dB. In terms of sound perception, 3 dB is the minimum change most people can detect. Table 1 describes the subjective effect of different changes in sound levels.

TABLE 1
SUBJECTIVE EFFECT OF CHANGES IN SOUND PRESSURE LEVELS

Change in Sound Level	Apparent Change in Loudness
3 dB	Just perceptible
5 dB	Noticeable
10 dB	Twice (or half) as loud

⁵ The sound pressure level is defined as $20 \cdot \log_{10}(P/P_0)$ where P is the sound pressure and P_0 is the reference pressure of 20 micro-Pascals (20 μ Pa), which by definition corresponds to 0 dB.

Sound exposure in a community is commonly expressed in terms of the A-weighted sound level (dBA); A-weighting approximates the frequency response of the human ear. Typical sound levels associated with various activities and environments are presented in Table 2.

Sound levels change from moment to moment. Some are sharp impulses lasting one second or less, while others rise and fall over much longer periods of time. There are various measures of sound pressure designed for different purposes. To establish the ambient sound level in an area, the L_{90} metric, which is the sound level exceeded 90 percent of the time, is sometimes used. The L_{90} represents the quietest 10 percent interval of any time period. The L_{eq} , or equivalent sound level, is the steady-state sound level over a period of time that has the same acoustic energy as the fluctuating sounds that actually occurred during that same period. It is commonly referred to as the average sound level.

Sound level measurements typically include an analysis of the sound spectrum into its various frequency components to determine tonal characteristics. The unit of frequency is Hertz (Hz), measuring the cycles per second of the sound pressure waves, and typically the frequency analysis examines nine octave bands from 32 Hz to 8,000 Hz.

TABLE 2**COMMON INDOOR AND OUTDOOR SOUND PRESSURE LEVELS**

Outdoor Sound Levels	Sound Pressure (μPa)	Sound Level (dBA)	Indoor Sound Levels
	6,324,555	110	Rock Band at 5 m
Jet Over-Flight at 300 m		105	
	2,000,000	100	Inside New York Subway Train
Gas Lawn Mower at 1 m		95	
	632,456	90	Food Blender at 1 m
Diesel Truck 60 mph at 15 m		85	
Noisy Urban Area--Daytime	200,000	80	Garbage Disposal at 1 m
		75	Shouting at 1 m
Automobile 45 mph at 15 m	63,246	70	Vacuum Cleaner at 3 m
Suburban Commercial Area		65	Normal Speech at 1 m
	20,000	60	
Quiet Urban Area--Daytime		55	Quiet Conversation at 1m
	6,325	50	Dishwasher Next Room
Quiet Urban Area--Nighttime		45	
	2,000	40	Empty Theater or Library
Quiet Suburb--Nighttime		35	
	632	30	Quiet Bedroom at Night
Quiet Rural Area--Nighttime		25	Empty Concert Hall
Rustling Leaves	200	20	Average Whisper
		15	Broadcast and Recording Studios
	63	10	
		5	Human Breathing
Reference Pressure Level	20	0	Threshold of Hearing

Notes: μPa, or micro-Pascals, describes sound pressure (force/area). dBA, or A-weighted decibels, describes sound the pressure level on a logarithmic scale with respect to 20 μPa (the reference pressure).

3.0 DELAWARE NOISE REGULATIONS

The Department of Natural Resources and Environmental Control administers the Delaware Noise Regulations (Part VII, 7 Del. C., Chapter 71), the full text for which is provided in Appendix A. Section 6.0.1 establishes a sound limit using the L_{eq} metric for a new sound source that depends on the emitting and receiving noise zone. Class A noise zone includes single or multiple-family homes, hotels, or land intended for residential use. Class B noise zone includes colleges and universities, government lands, commercial and institutional uses, and agricultural lands. The Gamesa G90 wind turbine is in a Class B noise zone and the 16 Hoornkill Avenue property is Class A receiving lands. The L_{eq} sound limit for a Class A noise zone is 65 dBA in the daytime (7 a.m. to 10 p.m.) and 55 dBA at night (10 p.m. to 7 a.m.); these are the limits that apply to the 16 Hoornkill Avenue property.

Section 6.0.2 sets an incremental limit of 10 dBA above the ambient level for Class A noise zones. The ambient level is defined as the L_{90} sound level (see Section 3.0.23). This limit also applies to the 16 Hoornkill Avenue property.

Section 6.0.3 states that for any stationary source which emits a pure tone, the previously discussed decibel limits are reduced by 5 dBA. A source creates a pure tone (defined in Section 3.0.25) if acoustic energy is concentrated in a narrow frequency range and a 1/3-octave band has a sound level 5 to 15 dB greater than both adjacent bands (5 dB for high frequencies, 8 dB for middle frequencies, and 15 dB for low frequencies).

4.0 SOUND LEVEL MEASUREMENTS AND COMPLIANCE ASSESSMENT

4.1 Sound Monitoring Approach

Sound compliance measurements were made between 3:20 p.m. on Monday December 6, 2010 and 12:20 a.m. on Tuesday December 7, 2010 in the back yard of the residence at 16 Hoornkill Avenue with a clear view to the wind turbine to the northwest. Photographs of the UD-Gamesa turbine and the sound monitoring equipment are provided in Appendix B. All sound level measurements were made with a CEL Model 593 real-time sound level analyzer, which is equipped with a precision condenser microphone having an operating range of 5 dB to 140 dB, and an overall frequency range of 3.5 to 20,000 Hz. The CEL 593 meets or exceeds all requirements set forth in the American National Standards Institute (ANSI) Standard S1.4 for Type I (high-precision) instruments. All equipment had been laboratory calibrated to NIST standards within the previous 12 months and was field calibrated with an ANSI Type I calibrator. The microphone was tripod-mounted and equipped with an ACO Pacific WS7-80T 7-inch wind screen that is specially designed to screen out wind noise. Consistent with ANSI Standard S12.9-1993/Part 3, the microphone height was between 1 and 2 m above ground and the microphone was located at least 7.5 m (25 feet) from any reflecting surface.

The TE acoustic engineer made 24 sound pressure level measurements, logging 10-minute L_{eq} and L_{90} levels (broadband and 1/3-octave band) for comparison and analysis with 10-minute hub-height wind speeds. A Gamesa technician assisted TE in turning the turbine off (turbine paused) and on (turbine operational) for a series of measurements made during both daytime and nighttime hours. Twelve measurements were made with the turbine on, and twelve measurements were made with the turbine off. Half the measurements were made in the daytime from 3:20 p.m. to 5:40 p.m. and the other half were made at night from 10:40 p.m. to 12:20 a.m. The sound measurement data are summarized in Table 3. The wind turbine sound was generally inaudible during the daytime periods due to masking by wind noise. At night, the swishing sound characteristic of a wind turbine was slightly audible above the background wind noise.

The compliance sound monitoring was done under ideal conditions for measuring maximum wind turbine sound: hub height⁶ winds were from the northwest and steady at a speed of 8.6 to 12.9 meters per second (m/s), there was no precipitation, the ground was dry, skies were partly cloudy and air temperatures were in the range of 30-40° F. The Gamesa G90 achieves its maximum sound power level (IEC 61400 test value of 106.4 dBA) when the hub height wind speed is at and above 9.7 m/s, and it is within 0.4 dBA of the maximum sound power level when the hub height wind speed is 8.3 m/s (IEC 61400 test value of 106.0 dBA).⁷ Since the wind speed was at or above 8.6 m/s for all test intervals, all of the sound tests were done with the turbine producing maximum sound power and the 16 Hoornkill Avenue property was downwind of the G90 wind turbine for every test period.

4.2 Results and Compliance Assessment

Table 3 summarizes the 24 sound level measurements (L_{eq} and L_{90}) along with the corresponding measured hub-height wind speed and wind direction for each 10-minute period. Figure 2 provides a scatter plot of the L_{eq} sound levels vs. wind speed, while Figure 3 presents a similar plot for L_{90} sound levels vs. wind speed. The CEL 593 data sheets are provided in Appendix B.

4.2.1 Pure Tone Test

Analysis of the 1/3-octave band measurements reveals no pure tones in either the L_{eq} or L_{90} sound level frequency spectra when the wind turbine was operational. Thus, no adjustments to the L_{eq} or incremental L_{90} limits occur under Section 6.0.3 of the Delaware Noise Regulations. A pure tone was measured in the L_{eq} 1,250 Hz 1/3-octave band during one 10-minute interval (December 6, 4:00 to 4:10 p.m.) when the turbine was paused and this was caused by a school bus idling nearby for period of three minutes.

⁶ 78 meters above grade.

⁷ Gamesa Wind, "G90 2MW 50/60 Hz Power Curve and Noise Emission," Document GD022915-en, April 29, 2009, Section 5.4 – Table 6.

4.2.2 Compliance with L_{eq} Limit

Table 3 and Figure 2 reveal that the average L_{eq} sound levels when the turbine is operational are a few decibels above the L_{eq} sound levels when the turbine is paused for comparable wind speeds. Since the difference is small, the turbine-operational L_{eq} sound levels are compared to the Delaware Noise Regulation limits without correction for existing background L_{eq} noise. Daytime turbine-operational L_{eq} sound levels range from 43.0 dBA to 51.3 dBA and are well below the Delaware daytime limit of 65 dBA. Nighttime turbine-operational L_{eq} sound levels ranged from 41.9 dBA to 45.1 dBA and are well below the Delaware nighttime limit of 55 dBA. Thus, the UD-Gamesa wind turbine complies with the broadband L_{eq} sound limits in Section 6.0.1 of the Delaware Noise Regulations.

4.2.3 Compliance with L_{90} Incremental Limit

Figure 3 reveals that ambient L_{90} sound levels when the turbine is operational are a few decibels above the L_{90} sound levels when the turbine is paused for comparable wind speeds. Since all of the measurements were made with the turbine producing maximum sound power, the average of L_{90} measurements for turbine operational vs. turbine-paused conditions can be compared to obtain the incremental change in ambient sound levels. Tables 4 and 5 group the data in two different ways in making this calculation. Table 4, which uses all of the data points, provides the best overall measure of incremental change in ambient sound levels. Table 5, which examines specific wind speed bins, presents a worst case in terms of incremental change.

Table 4 analyzes daytime and nighttime periods separately and reveals the UD-Gamesa wind turbine increases the ambient L_{90} sound level by 1.1 dBA in the daytime and 2.9 dBA at night. Table 5 analyzes the data in two wind speed bins. To provide a proper comparison, an equal number of turbine data points were paired up from Figure 3 for the wind speed ranges of 10.0-10.6 m/s and 12.4-13.0 m/s. Table 5 reveals the UD-Gamesa wind turbine increases the ambient L_{90} sound level by 4.6 dBA in the 10.0-10.6 m/s wind speed bin, and by 4.4 dBA in the 12.4-13.0 m/s wind speed bin. No matter which way the L_{90} data are analyzed, the incremental changes in ambient L_{90} sound levels comply with the 10 dBA incremental limit in Section 6.0.2 of the Delaware Noise Regulations.

TABLE 3
GAMESA WIND TURBINE SOUND MONITORING SUMMARY
FOR 16 HOORNKILL AVENUE, LEWES, DELAWARE

Date	Time	Turbine	L₉₀ (dBA)	L_{eq} (dBA)	Wind Speed (m/s)	Wind Direction (degrees)
12/6/2010	15:20-15:30	Operational	47.0	51.3	12.4	337
12/6/2010	15:30-15:40	Operational	47.0	51.2	12.9	335
12/6/2010	15:40-15:50	Operational	43.0	45.7	10.4	338
12/6/2010	16:00-16:10	Paused	42.0	49.4	11.8	345
12/6/2010	16:10-16:20	Paused	44.0	47.6	12.2	345
12/6/2010	16:20-16:30	Paused	43.0	47.0	12.4	345
12/6/2010	16:30-16:40	Paused	40.0	47.1	11.1	345
12/6/2010	16:40-16:50	Paused	45.0	50.1	12.7	345
12/6/2010	16:50-17:00	Paused	39.0	50.5	12.1	345
12/6/2010	17:10-17:20	Operational	39.0	43.0	8.6	326
12/6/2010	17:20-17:30	Operational	42.0	45.9	10.2	333
12/6/2010	17:30-17:40	Operational	42.0	47.8	9.3	333
12/6/2010	22:00-22:10	Operational	40.0	43.3	9.1	321
12/6/2010	22:10-22:20	Operational	41.0	44.1	9.5	328
12/6/2010	22:20-22:30	Operational	40.0	42.3	9.4	322
12/6/2010	22:40-22:50	Paused	37.0	41.4	10.5	323
12/6/2010	22:50-23:00	Paused	37.0	42.1	10.8	323
12/6/2010	23:00-23:10	Paused	37.0	42.0	10.8	323
12/6/2010	23:10-23:20	Paused	39.0	43.7	10.6	323
12/6/2010	23:20-23:30	Paused	36.0	39.9	10.8	323
12/6/2010	23:30-23:40	Paused	38.0	41.2	10.0	323
12/6/2010	23:50-0:00	Operational	39.0	41.9	9.5	324
12/7/2010	0:00-0:10	Operational	39.0	44.7	9.6	324
12/7/2010	0:00-0:20	Operational	42.0	45.1	10.3	328

TABLE 4

**MEASURED INCREASE IN THE L₉₀ SOUND LEVEL (dBA)
FROM THE UD-GAMESA WIND TURBINE, ANALYZED BY TIME OF DAY
AT 16 HOORNKILL AVENUE, LEWES, DELAWARE**

Turbine	Average Daytime L₉₀ Sound Level	Average Nighttime L₉₀ Sound Level
Operational	43.3	40.2
Paused	42.2	37.3
Increase Due to Wind Turbine	1.1	2.9

TABLE 5

**MEASURED INCREASE IN THE L₉₀ SOUND LEVEL (dBA)
FROM THE UD-GAMESA WIND TURBINE, ANALYZED BY WIND SPEED BINS
AT 16 HOORNKILL AVENUE, LEWES, DELAWARE**

Turbine	Wind Speed Bin 10.0 – 10.6 m/s	Wind Speed Bin 12.4 – 13.0 m/s
Operational	42.3	47.0
Paused	37.7	42.6
Increase Due to Wind Turbine	4.6	4.4



FIGURE 1.
*Sound Monitoring and G90 Turbine Location
Lewes, Delaware*

FIGURE 2. L_{eq} Sound Levels vs. Wind Speed

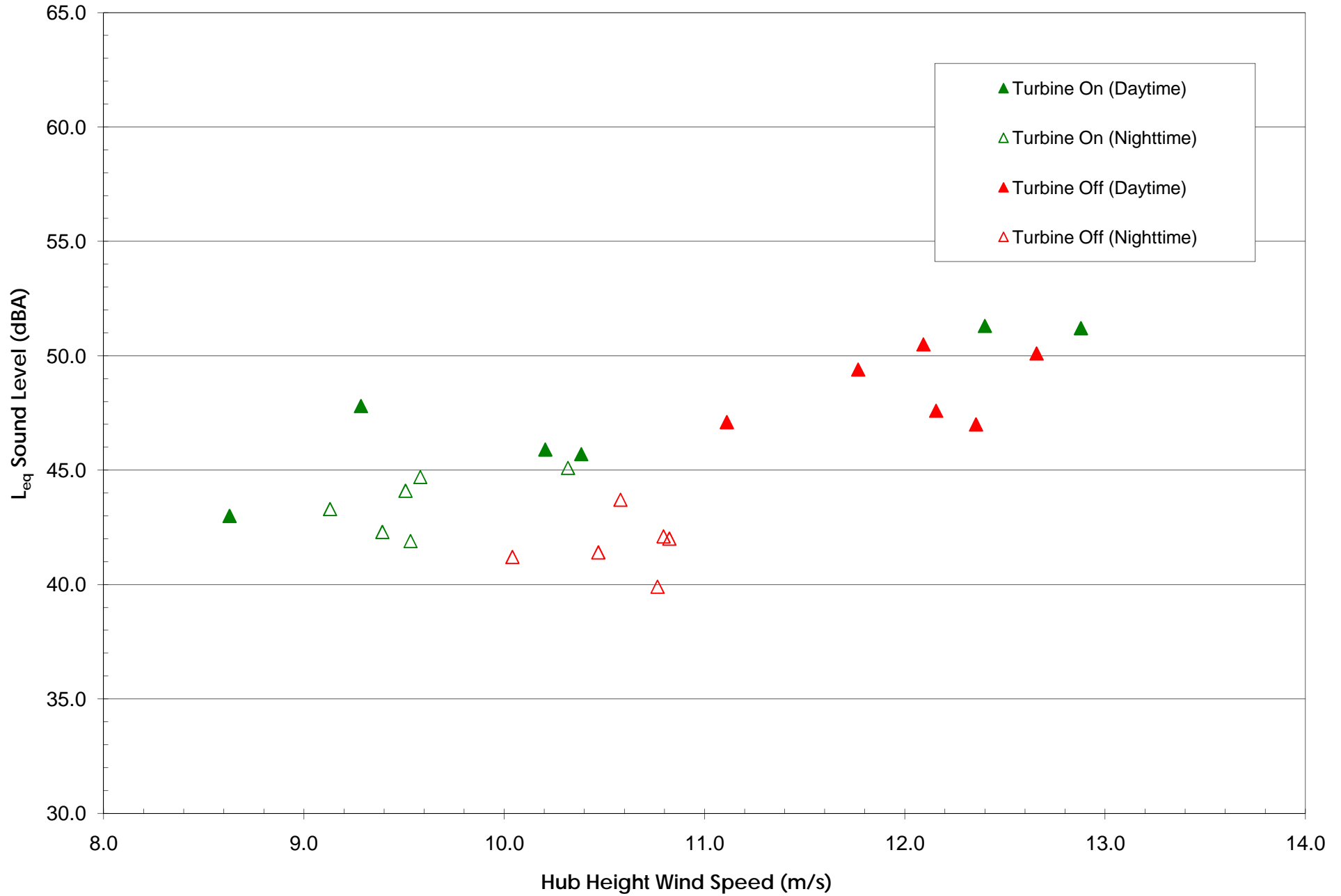
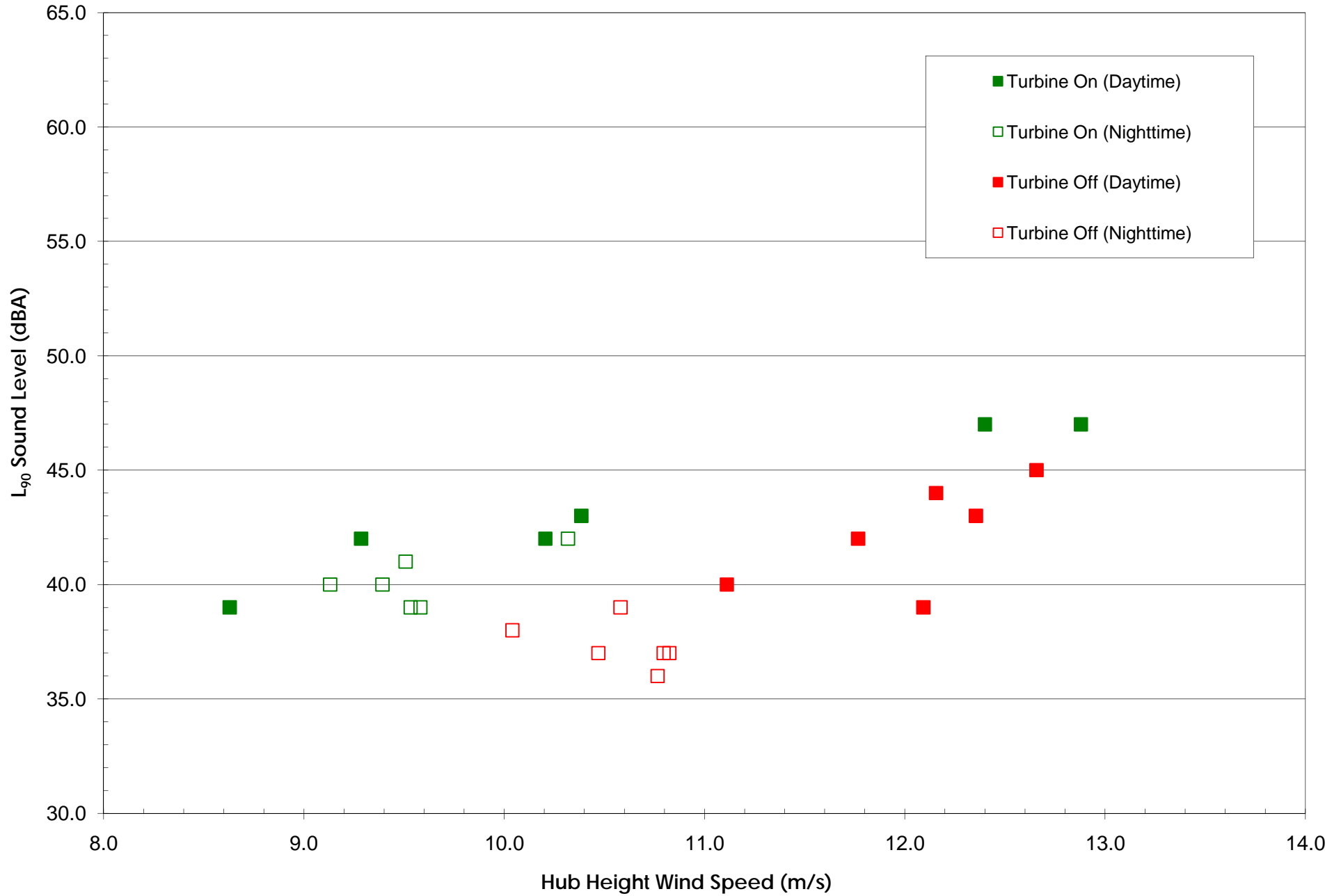


FIGURE 3. L_{90} Sound Levels vs. Wind Speed



APPENDIX A

DELAWARE NOISE REGULATION

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
& ENVIRONMENTAL CONTROL
DIVISION OF ENVIRONMENTAL CONTROL
AIR RESOURCES SECTION
EDWARD TATNALL BUILDING
PO Box 1401
DOVER, DELAWARE 19901

TELEPHONE (302) 736 - 4791

Pursuant to Provisions of
Part VII, 7 Del. C., Chapter 71, Section 7105
Regulations Governing the Control of Noise
Per Order No. 82-A-2 of January 20, 1982
As Amended July 8, 1982

Sec. 71-I-1 Short Title

These regulations may be cited as the "Noise Regulations of the State of Delaware".

Sec. 71-I-2 Scope

Pursuant to the provisions of Part VII, Title 7, Chapter 71 of the Delaware Code, these regulations are to prevent, prohibit and provide for the abatement of excess and unnecessary noise and/or vibration which may endanger the health, safety and welfare, jeopardize the value of property and erode the integrity of the environment of the people of this state.

Sec. 71-I-3 Definitions

3.0.1 "Ambient Noise" means the all-encompassing background noise associated with a given environment without the sound contribution of the specific source in question.

3.0.2 "A-Weighted Sound Level" means the sound pressure level in decibels as measured with a sound level meter using the A-weighting network, which compensates for human hearing characteristics. The level so read is designated dB(A) or dBA.

3.0.3 "Best Practical Noise Control Measures" means noise control devices, technology, and procedures determined or approved by the Secretary to be the best practical, taking into consideration the age of the equipment and facilities involved, the process employed, capital expenditures, maintenance cost, technical feasibility and the engineering aspects of the applicable noise control techniques in relation to the control achieved and the non-noise control environmental impact.

REGULATIONS GOVERNING THE CONTROL OF NOISE - page two

3.0.4 "Commercial Area" means land used for purposes such as retail sales, personal services, civic centers, hotels, offices and office buildings, wholesale and warehouse storage.

3.0.5 "Construction" means any site preparation, assembly, erection, placement, demolition, substantial repair, alteration or similar action for public or private rights-of-way, structures, utilities or similar property.

3.0.6 "Day" means the hours between 7:00 a.m. and 10:00 p.m.

3.0.7 "Day-Night Average Sound Level (Ldn)" means the 24-hour energy average of the A-weighted sound pressure level, with the levels during the period 10:00 p.m. to 7 a.m. weighted by 10 dBA before averaging.

3.0.8 "Decibel (dB)" means a standard unit for measuring the sound pressure level. It is equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to a reference pressure, which is 20 micropascals.

3.0.9 "Emergency" means any occurrence or set of circumstances involving actual or imminent physical trauma or property damage which demands immediate actions.

3.0.10 "Equivalent A-Weighted Sound Level, abbreviated Leq (x)dB(A), means the constant sound level that, in a given situation and time period (x), contains the same sound energy as the actual time-varying A-weighted sound.

3.0.11 "Farm Vehicle" means a wheeled device used for transportation in farming operations.

3.0.12 "Hertz (Hz) means a unit of measurement of frequency formerly stated as, and numerically equal to, cycles per second.

3.0.13 "Impulse Sound" means sound of short duration, much less than one second, with an abrupt onset and rapid decay, separated in time by at least one second.

3.0.14 "Industrial Area" means land used for purposes such as publishing, research, development, testing, manufacturing, processing, fabricating or repairing, and may include residential land use, for a caretaker, watchman or janitor.

3.0.15 "Infrasonic Sound" means sound pressure levels having frequencies below 16 Hz.

3.0.16 "Intrusion Alarm" means a device with an audible signal which, when activated, indicates intrusion by an unauthorized person.

REGULATIONS GOVERNING THE CONTROL OF NOISE - page three

3.0.17 "Intrusive Noise" means unwanted sound which intrudes over and above the existing noise at a given location. The relative intrusiveness of the sound depends upon its amplitude, duration, frequency, time of occurrence and tonal or informational content as well as the prevailing ambient noise level. A sound pressure level of 3 dB(A) above the ambient level is normally just discernable, with levels of 5 dB(A) to 10 dB(A) the lower level region for complaints.

3.0.18 "Motorboat" means any vessel which operates on water and is propelled by machinery.

3.0.19 "Night" means the hours between 10:00 p.m. and 7:00 a.m.

3.0.20 "Noise" means any sound which annoys or disturbs humans or which causes or tends to cause an adverse psychological or physiological effect on humans, excluding all aspects of noise regulated by the Federal Occupational Safety and Health Act.

3.0.21 "Noise Disturbance" means any sound which (a) endangers or injures the safety or health of humans or animals, or (b) annoys or disturbs a reasonable person of normal sensitivities, or (c) jeopardizes the value of property and erodes the integrity of the environment. Compliance with Sec. 71-I-6 herein shall constitute elimination of a noise disturbance.

3.0.22 "Octave" means the interval embracing eight diatonic degrees between two sounds having a basic frequency ratio of two. (One unit of the musical scale).

3.0.23 "Percentile Level" means the sound levels exceeded for the percentage of time in any measured period. L10, L50 and L90, the levels exceeded for 10%, 50% and 90% of the time, are frequently used as measures of peak, average and ambient levels respectively.

3.0.24 "Person" means any individual(s), corporation, company, association, society, firm, partnership or joint stock company, and includes the State and all of its political subdivisions, agencies and instrumentalities as well as any department, board or agency of the government of the United States.

3.0.25 "Pure Tone" means any sound which can be distinctly heard as a single pitch or a set of single pitches. For the purpose of this section, a pure tone shall exist if the one-third octave band sound pressure level in the band with the tone exceeds the arithmetic average of the sound pressure levels of the two contiguous one-third octave bands by 15 dB for bands with center frequencies less than 160 Hz, by 8 dB for bands with center frequencies of 160 Hz to 400 Hz, and by 5 dB for bands with center frequencies greater than 400 Hz.

REGULATIONS GOVERNING THE CONTROL OF NOISE - page four

3.0.26 "Real Property Boundary" means an imaginary line along the ground surface, and its vertical extension, which separates the real property owned by one person from that owned by another person, but not including intra-building real property divisions.

3.0.27 "Residential Area" means land used for the primary purpose of providing human living accommodations.

3.0.28 "Secretary" means the Secretary of the Department of Natural Resources and Environmental Control.

3.0.29 "Sound" means an oscillation in pressure, particle displacement, particle velocity or other physical parameters, in a medium with internal forces that causes compression and rarefaction of that medium. The description of sound may include any characteristic of such sound, including duration, intensity and frequency.

3.0.30 "Sound Amplifying Equipment" means any device for increasing the magnitude of the human voice, music or other sound.

3.0.31 "Sound Level" means the sound pressure level (SPL) obtained by the use of a sound level meter and frequency weighting network, such as A, B or C as specified in American National Standards Institute specifications for sound level meters (ANSI S1.4-1971, or the latest approved revision thereof). The unit of measurement is the decibel. If the frequency weighting employed is not indicated, the A-weighting shall apply.

3.0.32 "Sound Pressure" means the instantaneous difference between the actual pressure and the average or barometric pressure at a given point in space, as produced by sound energy.

3.0.33 "Stationary Noise Source" means a device which creates sound while fixed in position, including but not limited to residential, commercial or industrial machinery, pumps, fans, compressors, air conditioners and refrigeration equipment.

3.0.34 "Ultrasonic Sound" means sound pressure levels above 20,000 Hz. having frequencies

3.0.35 "Vibration" means an oscillatory motion of solid bodies of deterministic or random nature described by displacement, velocity, or acceleration with respect to a reference point, such that;

Peak

$v = 2\pi f d$ where v = Velocity, f = Frequency and d = Displacement

$a = 2\pi f v$ where a = Acceleration Amplitude

3.0.36 "Weekday" means any day Monday through Friday which is not a legal holiday.

REGULATIONS GOVERNING THE CONTROL OF NOISE - page five

Sec. 71-1-4 Prohibited Acts

4.0.1 Noise Disturbance Prohibited - No person shall make, continue, or cause to be made or continued, any noise disturbance. Non-commercial public speaking and public assembly activities conducted on any public space or public right-of-way shall be exempt from this section provided they conform to all local ordinances.

4.0.2 Specific Prohibitions

(1) Radios, Television Sets, Musical Instruments and Similar

Devices - Operating, playing or permitting the operation or playing of any radio, television, phonograph, drum, musical instrument, sound amplifier, automobile radio, automobile stereo or high fidelity equipment or similar device which produces, reproduces or amplifies sound:

(a) In such a manner as to create a noise disturbance within a receiving property.

(b) In such a manner as to create a noise disturbance within any receiving property when operated in or on a motor vehicle on a public right-of-way or public space, or in a boat on public waters.

(c) In such a manner as to create a noise disturbance to any person other than the operator of the device, when operated by any passenger on a common carrier.

(2) Animals and Birds - Owning, possessing, harboring or controlling any animal or bird which barks, bays, cries, squawks or makes any other noise continuously or incessantly for a period of ten minutes or makes such noise intermittently for one-half hour or more causing a noise disturbance within a receiving property; provided, however, that at the time the animal or bird is making such noise no person is trespassing or threatening to trespass upon private property in or upon which the animal or bird is situated or for any other legitimate cause which teased or provoked the animal or bird.

REGULATIONS GOVERNING THE CONTROL OF NOISE - page six

(3) Loading or Unloading - Loading, unloading, opening, closing, or other handling of boxes, crates, containers, building materials, garbage cans, or similar objects between the hours of 10:00 p.m. and 7:00 a.m. the following day in such a manner as to cause a noise disturbance within a Class A receiving property. This section shall not apply during an emergency.

(4) Construction - Operating or permitting the operation of any tools or equipment used in construction, drilling, or demolition work:

(a) Between the hours of 10:00 p.m. and 7:00 a.m. the following day, on weekdays and Saturdays, or at any time on Sundays or holidays, such that the sound therefrom creates a noise disturbance within a Class A receiving property, except during an emergency.

(b) At any other time such that the sound level within any receiving property exceeds an Leq of 85 dBA for a period of one hour.

(c) This section shall not apply to the use of domestic power tools subject to Section 4.0.2(8).

(5) Vehicle, Motorboat, or Aircraft Repairs and Testing - Repairing, rebuilding, or testing any motor vehicle, motorcycle, motorboat, or aircraft in such a manner as to cause a noise disturbance within a Class A receiving property between the hours of 10 p.m. and 7 a.m.

(6) Places of Public Entertainment - Operating, playing, or permitting the operation or playing of any radio, television, phonograph, drum, musical instrument, sound amplifier or any other device which produces, reproduces, or amplifies sound within any place of public entertainment at a sound level greater than 85 dB(A) as read by the slow response on a sound level meter at any point that is normally occupied by a customer unless a conspicuous and legible sign is located outside such place, near each public entrance stating "WARNING: SOUND LEVELS WITHIN MAY CAUSE PERMANENT HEARING IMPAIRMENT". All places of public entertainment shall also be required to comply with all of the provisions of this Regulation, specifically Section 6.

REGULATIONS GOVERNING THE CONTROL OF NOISE - page seven

(7) Explosives, Firearms, and Similar Devices - The use or firing of explosives, firearms, or similar devices which create impulsive sound so as to cause a noise disturbance within a Class A receiving property or on a public right-of-way, except for licensed game-hunting activities on property where such activities are authorized.

(8) Domestic Power Tools - Operating or permitting the operation of any mechanically powered saw, drill, sander, grinder, lawn or garden tool, snowblower, or similar device in residential areas between the hours of 10:00 p.m. and 7:00 a.m. so as to cause a noise disturbance within a Class A receiving property.

(9) Tampering

(a) No person shall operate any equipment unless all noise and/or vibration control devices installed hereon are in full operation.

(b) No person shall tamper with, circumvent or remove any sound level monitoring instrument, meter or device positioned by or for the Department.

(c) No person shall remove or deface a noise label on any product.

4.0.3 Motor Vehicle Prohibitions.

(1) Motor Vehicle and motorcycles on Public Rights-of-Way.

No person shall operate or cause to be operated a public or private motor vehicle or motorcycle, or any equipment attached to such a vehicle, on a public right-of-way at any time in such a manner that the sound level emitted by the motor vehicle or motorcycle, or any equipment attached to such a vehicle, exceeds the level set forth in Title 7, Chapter 71, Subchapter II, Delaware Motor Vehicle Noise Regulations.

REGULATIONS GOVERNING THE CONTROL OF NOISE - page eight

(2) Standing Motor Vehicles and Motorcycles - No person shall operate or permit the operation of any motor vehicle, motorcycle, or any auxiliary equipment attached to such a vehicle in such a way as to cause a noise disturbance within a Class A receiving property, for a period longer than twenty minutes in any hour while the vehicle is stationary, for reasons other than traffic congestion. (Also see Sec. 71-I-4.02 (3) Loading or Unloading).

(3) Unnecessary Horn Blowing - No person shall at any time sound the horn or other warning device of a vehicle in such a way as to cause a noise disturbance within a Class A receiving property except when absolutely necessary as a warning while actually driving such vehicle. Sec. 71-1-5 Classification of Land According to Use

5.01 Class A noise zone

Lands designated Class A shall generally be residential areas where human beings sleep or areas where serenity and tranquility are essential to the intended use of the land.

The land uses, in this category shall include, but not be limited to, single and multiple family homes, hotels, prisons, hospitals, religious facilities, cultural activities, forest preserves, and land intended for residential or special uses requiring such protection.

5.0.2 Class B noise zone

Lands designated Class B shall generally be commercial in nature, areas where human beings converse and such conversation is essential to the intended use of the land.

The land uses in this category shall include, but not be limited to, retail trade, personal, business and legal services, educational institutions, government services, amusements, agricultural activities, and lands intended for such commercial or institutional uses.

5.0.3 Class C noise zone

Lands designated Class C shall generally be industrial where protection against damage to hearing is essential, and the necessity for conversation is limited.

The land uses in this category shall include, but not be limited to, manufacturing activities, transportation facilities, warehousing, military bases, mining, and other lands intended for such uses.

REGULATIONS GOVERNING THE CONTROL OF NOISE - page nine

5.0.4 Mixed Class Noise Zone

Good land planning arranges for Class A zones to be buffered from Class C zones by a Class B zone. Some areas are mixed zones in practice, wherein Class C land uses abut, adjoin or include Class A use. Whenever this situation comes to the attention of the Department, the person responsible for the objectionable noise source shall make every effort to conform with Section 71-1-6. A final acceptable noise limit shall be determined by the Secretary based on Best Practical Noise Control Measures.

Sec. 71-1-6 Maximum Noise and Vibration Limits

6.0.1 No person(s) shall operate or cause to be operated any stationary source of sound in such a manner as to create a 24-hour equivalent A-weighted sound level which exceeds the Leq limits set forth for the receiving land use category in Table I when measured at the point of complaint origination within the property boundary of the receiving land use. Any exceedence of these values shall constitute a noise disturbance.

Table I Sound Levels by Receiving Land Use Zones, Leq (24) dBA

Emitter(s)	Receptor-C	Receptor-B	Receptor A 7 a.m. - 10 p.m.	Receptor A 10 p.m. - 7a.m.
A	65	65	65	55
B	75	75	65	55
C	85	75	65	55

6.0.2 INTRUSIVE NOISE LEVEL

NOT WITHSTANDING THE PROVISIONS OF SECTION 6.0.1 A SOURCE SHALL BE CONSIDERED TO CAUSE A NOISE DISTURBANCE IF THE SOUND LEVEL, OTHER THAN AN IMPULSE, INFRASONIC OR ULTRASONIC SOUND,

EMITTED BY SUCH SOURCE EXCEEDS THE AMBIENT NOISE LEVEL BY 10

dBA WHEN MEASURED AT THE POINT OF COMPLAINT ORIGINATION WITHIN THE RECEIVING PROPERTY.

Note: The relative intrusiveness of sound depends upon its amplitude, duration, frequency, time of occurrence and tonal or informational content as well as the prevailing ambient noise level. A sound pressure level of 3 dB(A) above the ambient level is normally just discernable, with levels of 5 dB(A) to 10 dB(A) the lower level region for complaints.

REGULATIONS GOVERNING THE CONTROL OF NOISE - page ten

6.0.3 Correction for Character of Sound

For any stationary source of sound which emits a pure tone, cyclically varying sound or repetitive impulse sound, the limits set forth in Sec. 71-I-6 shall be reduced by 5 dBA.

6.0.4 Impulse Peak Limit

For any source of sound which emits an impulse (duration less than one second with an abrupt onset and rapid decay) including metal to metal impacts or exploding impacts, shall not exceed the peak levels set forth below when measured at the point of complaint origination within the receiving property.

Class A zone Nighttime ----- 80 dB

Anytime Any Zone except the above ----- 100 dB

6.0.5 Infrasonic and Ultrasonic Peak Limit

For any source of sound which emits infrasound (below 16 Hertz) or ultrasound (above 20 kHz) frequencies, the sound pressure level shall not exceed 100 dB when measured at the point of complaint origination within the receiving property.

6.1.0 Maximum Permissible Vibration Levels

No person shall operate or cause to be operated any single vibration source or combination of sources in such a manner as to cause vibration levels in excess of those set forth below as measured at the point of complaint origination within the boundary of the receiving property.

- a) Class A Zone Stationary Source --- Velocity of 0,15 inch per second
- b) Class A Zone Temporary or Mobile Source --- Velocity of 0.7 inch per second
- c) Class B Zone --- Velocity of 0.7 inch per second
- d) Any Zone under any condition --- Velocity of 3 inches per second. (Caution level for structure damage)

REGULATIONS GOVERNING THE CONTROL OF NOISE - page eleven

Sec. 71-I-7 Exceptions.

Exempted from these regulations are:

7.0.1 FAA Controlled Operations - Noise directly caused by aircraft flight operations specifically preempted by the Federal Aviation Administration.

7.0.2 Recreational, Sports and Musical Activities - Noise created by the use of property for the purposes of recreational, sports or musical activities, provided such exemption is effective only during the specific period of time authorized by the political subdivision or government entity having lawful jurisdiction to sanction such use.

7.0.3 Emergencies - Noise created as a result of, or related to, an emergency, including (a) the emission of sound for the purpose of alerting persons to the existence of an emergency, or (b) the emission of sound in the performance of emergency work.

7.0.4 Emergency Signaling Device Tests -

(a) Testing of emergency signaling devices the same time of day each time such tests are performed, using a minimum cycle test time.

(b) Testing of the complete emergency signaling system, including the function of signaling devices and the personnel response to the signal, shall not occur more than once in each calendar month.

7.0.5 Religious Activities - Sounds created by bells, carillons or chimes associated with religious observances.

7.0.6 Public Celebrations - Patriotic or public celebrations not extending more than one day or as authorized by the public subdivision or government entity empowered to sanction such activity.

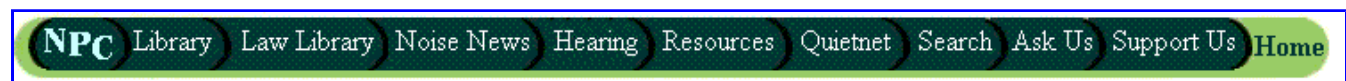
7.0.7 Farm - All farm vehicles are exempt while engaged in farming operations.

7.0.8 The Unamplified Human Voice - including children at schools, playgrounds, etc.

7.0.9 Interstate Railway Locomotives and Rail Cars - Noise directly caused by railway operations specifically preempted by the Federal Government.

Sec. 71-1-8 Validity of Regulations

If any section or subsection of these regulations is found invalid the remainder shall continue to be valid and enforceable.



APPENDIX B

PHOTOGRAPHS AND SOUND LEVEL MEASUREMENTS



**View of the UD-Gamesa wind turbine from a location on UD land
approximately 1,200 feet to the south.**



View of the UD-Gamesa wind turbine from the base of the tower.



View of the tripod-mounted CEL 593 sound analyzer and wind screen in the back yard of the 16 Hoornkill Avenue property looking northwest toward the UD-Gamesa wind turbine (approximately 2,200 feet in the distance).



View of the tripod-mounted CEL 593 sound analyzer and wind screen in the back yard of the 16 Hoornkill Avenue property looking toward the house.

Sound Monitoring Results - Lewes, Delaware
Daytime Compliance at 16 Hoornkill Avenue
UD Turbine: Operational

CEL SoundTrack - dB2 3.0 © CEL Instruments Ltd 1998

- Run summary -

Instrument	CEL-593.C1T Version 7.21 Type 1
Instrument ID (DPB)	112240
Run mode	Third-octave band Environmental
Run start	12/06/2010 15:22:26
Run end	12/06/2010 15:52:30
Run duration	000 00:30:04.86
Last calibration	12/06/2010 15:08:21
Measurement range	5 - 80 dB
Microphone response	Free Field
Polarizing voltage	Off
Time weighting	F
Frequency weighting	L, A
Exchange rate (Q)	3
Period time	10 min
Periods too short for LNs	No
Profiles recorded	No
Profile sample interval	1 s
Number of records	3
Events enabled	No
Overload occurred	Yes
Low battery occurred	No
Pause was used	No

Sound Monitoring Results - Lewes, Delaware
 Daytime Compliance at 16 Hoornkill Avenue
 UD Turbine: Operational

- Period results -

Record number 1 : 3
 Record start 12/06/2010 15:22:26.0
 Period time 10 min
 Periods too short for LNs No
 Overload occurred Yes
 Overload %time 0.55
 Low battery occurred No
 Pause was used No
 Paused all the time No

Band (Hz)	Fw	Leq (dB)	SPLMAX F (dB)	LN10.0% F (dB)	LN50.0% F (dB)	LN90.0% F (dB)
Broadband	L	69.6	79.7	74.0	67.0	60.0
Broadband	A	51.3	65.3	54.0	50.0	47.0
12	L	58.4	72.6	62.0	54.0	44.0
16	L	57.0	71.0	61.0	52.0	43.0
20	L	55.9	71.3	60.0	50.0	42.0
25	L	54.3	68.6	58.0	49.0	42.0
32	L	52.8	68.5	56.0	48.0	43.0
40	L	51.7	67.8	55.0	47.0	43.0
50	L	51.1	70.2	53.0	47.0	43.0
63	L	51.4	69.1	53.0	49.0	46.0
80	L	49.0	68.1	51.0	46.0	42.0
100	L	48.2	66.7	50.0	45.0	42.0
125	L	47.1	64.8	49.0	45.0	42.0
160	L	46.5	64.4	49.0	44.0	41.0
200	L	47.5	64.2	50.0	45.0	41.0
250	L	48.1	64.2	51.0	45.0	41.0
315	L	46.9	62.2	50.0	44.0	41.0
400	L	45.7	65.0	48.0	43.0	40.0
500	L	45.1	64.5	47.0	42.0	40.0
630	L	44.3	64.7	47.0	41.0	39.0
800	L	42.6	60.3	45.0	40.0	38.0
1k	L	42.6	61.6	45.0	41.0	38.0
1k25	L	42.1	61.4	44.0	40.0	36.0
1k6	L	40.8	59.2	44.0	38.0	35.0
2k	L	39.0	57.8	42.0	36.0	32.0
2k5	L	37.5	59.8	40.0	34.0	30.0
3k15	L	36.2	55.0	39.0	33.0	28.0
4k	L	34.9	55.1	37.0	31.0	27.0
5k	L	34.5	55.4	36.0	30.0	26.0
6k3	L	33.9	56.1	35.0	29.0	25.0
8k	L	33.7	55.8	34.0	28.0	24.0
10k	L	33.5	57.3	32.0	27.0	23.0
12k5	L	31.8	55.9	31.0	26.0	22.0
16k	L	30.4	55.4	28.0	23.0	19.0
20k	L	29.0	54.1	23.0	18.0	15.0

Sound Monitoring Results - Lewes, Delaware
 Daytime Compliance at 16 Hoornkill Avenue
 UD Turbine: Operational

- Period results -

Record number 2 : 3
 Record start 12/06/2010 15:32:26.0
 Period time 10 min
 Periods too short for LNs No
 Overload occurred Yes
 Overload %time 0.70
 Low battery occurred No
 Pause was used No
 Paused all the time No

Band (Hz)	Fw	Leq (dB)	SPLMAX F (dB)	LN10.0% F (dB)	LN50.0% F (dB)	LN90.0% F (dB)
Broadband	L	69.9	80.4	74.0	67.0	60.0
Broadband	A	51.2	60.2	54.0	51.0	47.0
12	L	58.4	73.7	63.0	54.0	44.0
16	L	57.3	71.9	62.0	52.0	42.0
20	L	56.5	71.8	61.0	51.0	42.0
25	L	54.7	71.6	59.0	49.0	42.0
32	L	53.5	70.6	57.0	48.0	42.0
40	L	52.7	70.5	56.0	48.0	43.0
50	L	52.0	71.0	54.0	47.0	43.0
63	L	52.6	69.5	54.0	50.0	47.0
80	L	50.4	69.3	51.0	46.0	42.0
100	L	49.5	68.0	50.0	46.0	42.0
125	L	48.6	66.3	49.0	45.0	42.0
160	L	48.0	66.5	49.0	45.0	41.0
200	L	48.4	65.9	51.0	45.0	41.0
250	L	48.5	65.8	52.0	46.0	41.0
315	L	47.4	64.7	50.0	45.0	41.0
400	L	46.1	64.6	48.0	44.0	41.0
500	L	45.3	61.7	47.0	43.0	40.0
630	L	44.8	62.9	47.0	42.0	39.0
800	L	43.4	63.6	44.0	41.0	38.0
1k	L	42.9	60.4	44.0	41.0	38.0
1k25	L	42.1	58.8	44.0	40.0	37.0
1k6	L	40.9	57.3	43.0	39.0	35.0
2k	L	39.2	56.8	41.0	37.0	33.0
2k5	L	37.6	58.0	39.0	35.0	30.0
3k15	L	36.7	62.9	38.0	33.0	29.0
4k	L	35.2	55.8	36.0	32.0	27.0
5k	L	34.9	54.8	36.0	31.0	26.0
6k3	L	34.8	54.9	34.0	30.0	25.0
8k	L	35.0	56.1	33.0	29.0	24.0
10k	L	35.5	57.8	32.0	28.0	23.0
12k5	L	33.3	56.1	30.0	26.0	21.0
16k	L	32.1	55.3	28.0	23.0	18.0
20k	L	31.1	53.7	23.0	19.0	15.0

Sound Monitoring Results - Lewes, Delaware
Daytime Compliance at 16 Hoornkill Avenue
UD Turbine: Operational

- Period results -

Record number 3 : 3
 Record start 12/06/2010 15:42:26.0
 Period time 10 min
 Periods too short for LNs No
 Overload occurred Yes
 Overload %time 0.00
 Low battery occurred No
 Pause was used No
 Paused all the time No

Band (Hz)	Fw	Leq (dB)	SPLMAX F (dB)	LN10.0% F (dB)	LN50.0% F (dB)	LN90.0% F (dB)
Broadband	L	64.8	79.0	69.0	61.0	56.0
Broadband	A	45.7	62.8	47.0	45.0	43.0
12	L	53.0	69.0	57.0	47.0	38.0
16	L	51.6	67.7	56.0	45.0	38.0
20	L	50.2	66.8	54.0	44.0	38.0
25	L	48.3	64.1	52.0	44.0	38.0
32	L	47.7	64.5	51.0	45.0	40.0
40	L	47.0	64.3	50.0	44.0	41.0
50	L	46.4	65.9	49.0	44.0	41.0
63	L	49.0	65.7	51.0	48.0	44.0
80	L	44.6	66.5	46.0	42.0	39.0
100	L	43.5	65.7	46.0	42.0	39.0
125	L	43.1	63.1	45.0	42.0	40.0
160	L	41.2	56.2	43.0	40.0	38.0
200	L	40.5	55.8	43.0	39.0	37.0
250	L	41.1	61.3	43.0	40.0	37.0
315	L	40.8	58.4	43.0	40.0	38.0
400	L	40.8	56.6	43.0	40.0	38.0
500	L	39.8	57.4	41.0	39.0	37.0
630	L	38.7	58.1	40.0	37.0	35.0
800	L	37.1	59.5	38.0	36.0	34.0
1k	L	36.4	57.7	38.0	35.0	33.0
1k25	L	34.9	51.8	37.0	34.0	31.0
1k6	L	33.5	51.9	36.0	32.0	28.0
2k	L	29.7	44.7	32.0	28.0	24.0
2k5	L	27.5	42.8	30.0	26.0	22.0
3k15	L	26.4	45.2	29.0	25.0	21.0
4k	L	24.8	43.4	27.0	23.0	19.0
5k	L	24.6	43.8	27.0	23.0	19.0
6k3	L	24.0	44.7	26.0	22.0	18.0
8k	L	23.4	48.6	26.0	22.0	18.0
10k	L	22.5	48.7	25.0	21.0	17.0
12k5	L	20.8	43.1	24.0	19.0	16.0
16k	L	18.3	42.3	21.0	17.0	14.0
20k	L	15.1	41.6	17.0	14.0	12.0

Sound Monitoring Results - Lewes, Delaware
Daytime Compliance at 16 Hoornkill Avenue
UD Turbine: Paused

CEL SoundTrack - dB2 3.0 © CEL Instruments Ltd 1998

- Run summary -

Instrument	CEL-593.C1T Version 7.21 Type 1
Instrument ID (DPB)	112240
Run mode	Third-octave band Environmental
Run start	12/06/2010 16:02:22
Run end	12/06/2010 17:02:26
Run duration	000 01:00:04.54
Last calibration	12/06/2010 15:08:21
Measurement range	5 - 80 dB
Microphone response	Free Field
Polarizing voltage	Off
Time weighting	F
Frequency weighting	L, A
Exchange rate (Q)	3
Period time	10 min
Periods too short for LNs	No
Profiles recorded	No
Profile sample interval	1 s
Number of records	6
Events enabled	No
Overload occurred	Yes
Low battery occurred	No
Pause was used	No

Sound Monitoring Results - Lewes, Delaware
 Daytime Compliance at 16 Hoornkill Avenue
 UD Turbine: Paused

- Period results -

Record number 1 : 6
 Record start 12/06/2010 16:02:22.0
 Period time 10 min
 Periods too short for LNs No
 Overload occurred Yes
 Overload %time 0.05
 Low battery occurred No
 Pause was used No
 Paused all the time No

Band (Hz)	Fw	Leq (dB)	SPLMAX F (dB)	LN10.0% F (dB)	LN50.0% F (dB)	LN90.0% F (dB)
Broadband	L	65.9	79.0	70.0	62.0	56.0
Broadband	A	49.4	69.0	50.0	45.0	42.0
12	L	54.4	70.0	59.0	48.0	38.0
16	L	52.6	70.8	57.0	46.0	37.0
20	L	51.2	69.7	55.0	45.0	37.0
25	L	49.6	66.5	53.0	43.0	37.0
32	L	47.9	64.9	51.0	44.0	40.0
40	L	47.7	67.5	50.0	44.0	40.0
50	L	49.9	71.4	53.0	45.0	40.0
63	L	49.3	68.6	51.0	47.0	43.0
80	L	46.0	66.9	48.0	43.0	39.0
100	L	44.6	65.8	46.0	42.0	38.0
125	L	45.0	64.0	47.0	43.0	39.0
160	L	45.7	69.7	46.0	41.0	37.0
200	L	43.0	63.3	46.0	41.0	37.0
250	L	41.9	62.4	45.0	39.0	36.0
315	L	40.3	61.0	43.0	38.0	36.0
400	L	39.8	60.2	42.0	38.0	36.0
500	L	39.3	58.1	42.0	38.0	35.0
630	L	38.6	57.6	41.0	37.0	34.0
800	L	37.2	60.0	39.0	35.0	33.0
1k	L	37.6	56.4	40.0	36.0	33.0
1k25	L	46.4	68.3	40.0	34.0	31.0
1k6	L	35.5	54.0	38.0	33.0	29.0
2k	L	31.9	51.0	35.0	29.0	25.0
2k5	L	30.3	48.7	34.0	27.0	23.0
3k15	L	28.3	49.7	32.0	25.0	21.0
4k	L	27.1	50.3	30.0	24.0	20.0
5k	L	27.0	50.2	29.0	23.0	20.0
6k3	L	26.0	50.9	28.0	23.0	19.0
8k	L	25.3	50.9	27.0	22.0	19.0
10k	L	24.6	51.3	26.0	21.0	17.0
12k5	L	22.9	50.2	25.0	20.0	16.0
16k	L	20.8	48.8	22.0	17.0	14.0
20k	L	19.0	48.2	18.0	14.0	12.0

Sound Monitoring Results - Lewes, Delaware
 Daytime Compliance at 16 Hoornkill Avenue
 UD Turbine: Paused

- Period results -

Record number 2 : 6
 Record start 12/06/2010 16:12:22.0
 Period time 10 min
 Periods too short for LNs No
 Overload occurred Yes
 Overload %time 0.15
 Low battery occurred No
 Pause was used No
 Paused all the time No

Band (Hz)	Fw	Leq (dB)	SPLMAX F (dB)	LN10.0% F (dB)	LN50.0% F (dB)	LN90.0% F (dB)
Broadband	L	67.2	79.4	72.0	63.0	57.0
Broadband	A	47.6	56.4	50.0	47.0	44.0
12	L	56.4	72.6	60.0	50.0	39.0
16	L	54.6	72.0	59.0	48.0	38.0
20	L	53.3	70.5	57.0	46.0	38.0
25	L	51.3	67.3	55.0	45.0	38.0
32	L	49.9	66.3	53.0	45.0	40.0
40	L	48.9	67.7	52.0	45.0	40.0
50	L	47.3	67.0	50.0	43.0	39.0
63	L	46.7	66.9	49.0	44.0	40.0
80	L	45.8	66.4	48.0	43.0	40.0
100	L	45.0	65.4	48.0	43.0	39.0
125	L	43.9	64.7	46.0	42.0	38.0
160	L	42.9	63.8	45.0	41.0	37.0
200	L	43.4	63.0	46.0	42.0	38.0
250	L	43.8	62.1	47.0	41.0	38.0
315	L	42.1	63.8	45.0	40.0	37.0
400	L	41.3	60.2	44.0	40.0	37.0
500	L	41.2	65.6	43.0	39.0	37.0
630	L	40.7	63.6	43.0	38.0	36.0
800	L	39.3	59.8	41.0	38.0	35.0
1k	L	39.6	62.7	41.0	38.0	35.0
1k25	L	38.6	59.3	41.0	37.0	33.0
1k6	L	37.1	57.8	39.0	35.0	32.0
2k	L	34.3	57.7	37.0	32.0	28.0
2k5	L	32.2	55.3	35.0	30.0	25.0
3k15	L	30.8	54.9	33.0	29.0	24.0
4k	L	29.4	52.0	32.0	27.0	22.0
5k	L	29.2	52.7	31.0	26.0	22.0
6k3	L	29.3	55.8	30.0	26.0	21.0
8k	L	29.1	54.8	29.0	25.0	21.0
10k	L	29.5	56.7	28.0	24.0	20.0
12k5	L	26.9	54.5	27.0	22.0	19.0
16k	L	25.7	53.1	24.0	20.0	16.0
20k	L	24.2	52.5	20.0	16.0	13.0

Sound Monitoring Results - Lewes, Delaware
 Daytime Compliance at 16 Hoornkill Avenue
 UD Turbine: Paused

- Period results -

Record number 3 : 6
 Record start 12/06/2010 16:22:22.0
 Period time 10 min
 Periods too short for LNs No
 Overload occurred Yes
 Overload %time 0.10
 Low battery occurred No
 Pause was used No
 Paused all the time No

Band (Hz)	Fw	Leq (dB)	SPLMAX F (dB)	LN10.0% F (dB)	LN50.0% F (dB)	LN90.0% F (dB)
Broadband	L	66.4	78.8	71.0	63.0	56.0
Broadband	A	47.0	57.9	50.0	46.0	43.0
12	L	54.9	72.4	59.0	49.0	39.0
16	L	53.1	70.4	57.0	47.0	38.0
20	L	51.8	68.8	56.0	46.0	38.0
25	L	50.0	65.9	54.0	44.0	37.0
32	L	48.7	67.1	52.0	44.0	39.0
40	L	48.0	69.1	51.0	44.0	40.0
50	L	46.3	68.4	49.0	43.0	39.0
63	L	45.6	66.0	48.0	43.0	39.0
80	L	45.0	64.3	48.0	42.0	38.0
100	L	45.0	65.6	47.0	42.0	38.0
125	L	43.8	64.2	46.0	42.0	39.0
160	L	43.4	63.6	46.0	41.0	38.0
200	L	45.7	66.5	46.0	41.0	37.0
250	L	43.3	61.9	46.0	40.0	37.0
315	L	41.5	61.2	45.0	39.0	36.0
400	L	40.4	59.5	43.0	39.0	36.0
500	L	39.7	60.8	42.0	38.0	35.0
630	L	39.3	63.7	42.0	37.0	34.0
800	L	37.7	58.0	41.0	36.0	33.0
1k	L	38.2	58.5	41.0	37.0	33.0
1k25	L	37.4	61.0	40.0	36.0	32.0
1k6	L	35.9	55.8	39.0	34.0	30.0
2k	L	33.4	53.2	36.0	31.0	27.0
2k5	L	31.6	51.9	35.0	29.0	24.0
3k15	L	29.9	50.8	33.0	27.0	23.0
4k	L	28.7	52.7	31.0	26.0	21.0
5k	L	28.2	54.1	30.0	25.0	21.0
6k3	L	27.4	52.7	29.0	24.0	20.0
8k	L	27.2	52.7	28.0	24.0	20.0
10k	L	27.6	56.7	27.0	23.0	19.0
12k5	L	24.9	50.9	25.0	21.0	18.0
16k	L	23.4	52.0	23.0	19.0	15.0
20k	L	21.6	50.5	19.0	15.0	13.0

Sound Monitoring Results - Lewes, Delaware
 Daytime Compliance at 16 Hoornkill Avenue
 UD Turbine: Paused

- Period results -

Record number 4 : 6
 Record start 12/06/2010 16:32:22.0
 Period time 10 min
 Periods too short for LNs No
 Overload occurred Yes
 Overload %time 0.20
 Low battery occurred No
 Pause was used No
 Paused all the time No

Band (Hz)	Fw	Leq (dB)	SPLMAX F (dB)	LN10.0% F (dB)	LN50.0% F (dB)	LN90.0% F (dB)
Broadband	L	66.8	80.0	71.0	62.0	53.0
Broadband	A	47.1	58.6	51.0	44.0	40.0
12	L	55.6	72.2	60.0	48.0	35.0
16	L	53.9	71.5	58.0	46.0	35.0
20	L	53.1	70.1	57.0	44.0	35.0
25	L	51.4	69.9	55.0	43.0	35.0
32	L	50.0	69.1	53.0	43.0	38.0
40	L	49.1	67.4	52.0	44.0	39.0
50	L	47.7	69.6	50.0	42.0	37.0
63	L	47.2	69.8	49.0	42.0	38.0
80	L	46.4	68.0	48.0	41.0	37.0
100	L	45.3	67.8	47.0	40.0	36.0
125	L	44.7	67.2	46.0	41.0	37.0
160	L	43.7	65.9	46.0	39.0	35.0
200	L	44.0	64.7	47.0	38.0	34.0
250	L	44.2	64.2	48.0	38.0	34.0
315	L	43.0	63.5	46.0	37.0	34.0
400	L	42.1	65.9	44.0	37.0	34.0
500	L	41.2	62.3	43.0	37.0	33.0
630	L	40.8	62.9	43.0	36.0	32.0
800	L	39.4	64.5	41.0	35.0	30.0
1k	L	38.8	60.1	41.0	36.0	31.0
1k25	L	37.9	58.2	41.0	35.0	29.0
1k6	L	36.9	58.4	40.0	33.0	26.0
2k	L	35.0	58.0	38.0	30.0	23.0
2k5	L	33.2	56.3	36.0	27.0	21.0
3k15	L	31.7	56.5	35.0	26.0	20.0
4k	L	30.4	53.8	33.0	24.0	18.0
5k	L	30.1	54.0	32.0	24.0	18.0
6k3	L	30.3	56.1	31.0	23.0	18.0
8k	L	30.9	55.4	30.0	23.0	18.0
10k	L	30.8	55.9	29.0	22.0	17.0
12k5	L	28.9	55.8	27.0	20.0	15.0
16k	L	27.7	54.3	25.0	18.0	13.0
20k	L	26.4	53.5	20.0	14.0	11.0

Sound Monitoring Results - Lewes, Delaware
 Daytime Compliance at 16 Hoornkill Avenue
 UD Turbine: Paused

- Period results -

Record number 5 : 6
 Record start 12/06/2010 16:42:22.0
 Period time 10 min
 Periods too short for LNs No
 Overload occurred Yes
 Overload %time 0.65
 Low battery occurred No
 Pause was used No
 Paused all the time No

Band (Hz)	Fw	Leq (dB)	SPLMAX F (dB)	LN10.0% F (dB)	LN50.0% F (dB)	LN90.0% F (dB)
Broadband	L	69.8	80.2	74.0	67.0	59.0
Broadband	A	50.1	59.2	53.0	49.0	45.0
12	L	58.7	73.4	63.0	54.0	44.0
16	L	57.4	73.2	62.0	53.0	43.0
20	L	56.4	71.8	61.0	51.0	42.0
25	L	54.6	70.9	58.0	49.0	41.0
32	L	52.9	69.3	56.0	48.0	41.0
40	L	52.3	69.0	55.0	47.0	42.0
50	L	51.1	70.9	54.0	46.0	41.0
63	L	50.2	70.2	52.0	46.0	41.0
80	L	49.4	69.4	51.0	45.0	41.0
100	L	48.5	68.0	50.0	45.0	40.0
125	L	47.6	67.3	49.0	44.0	41.0
160	L	46.7	67.3	48.0	44.0	39.0
200	L	46.9	65.1	49.0	44.0	39.0
250	L	47.1	64.2	50.0	44.0	39.0
315	L	46.0	63.6	49.0	43.0	39.0
400	L	44.9	63.1	47.0	42.0	39.0
500	L	44.3	65.4	46.0	41.0	38.0
630	L	43.8	65.4	46.0	41.0	37.0
800	L	42.0	61.2	43.0	39.0	36.0
1k	L	41.9	60.8	44.0	40.0	36.0
1k25	L	41.2	59.0	43.0	39.0	35.0
1k6	L	40.0	58.2	43.0	38.0	33.0
2k	L	38.4	58.1	41.0	35.0	30.0
2k5	L	36.6	57.8	39.0	33.0	28.0
3k15	L	35.0	55.4	37.0	32.0	26.0
4k	L	33.9	55.2	36.0	30.0	24.0
5k	L	33.8	55.0	35.0	29.0	24.0
6k3	L	33.7	55.7	34.0	28.0	23.0
8k	L	34.1	56.1	33.0	28.0	23.0
10k	L	34.7	57.0	31.0	27.0	22.0
12k5	L	32.2	55.1	30.0	25.0	20.0
16k	L	31.6	55.5	27.0	22.0	18.0
20k	L	30.2	54.3	23.0	18.0	14.0

Sound Monitoring Results - Lewes, Delaware
 Daytime Compliance at 16 Hoornkill Avenue
 UD Turbine: Paused

- Period results -

Record number 6 : 6
 Record start 12/06/2010 16:52:22.0
 Period time 10 min
 Periods too short for LNs No
 Overload occurred Yes
 Overload %time 0.10
 Low battery occurred No
 Pause was used No
 Paused all the time No

Band (Hz)	Fw	Leq (dB)	SPLMAX F (dB)	LN10.0% F (dB)	LN50.0% F (dB)	LN90.0% F (dB)
Broadband	L	63.4	80.2	67.0	58.0	51.0
Broadband	A	50.5	78.6	50.0	44.0	39.0
12	L	51.7	71.3	55.0	44.0	34.0
16	L	50.1	69.6	53.0	42.0	33.0
20	L	49.0	70.1	51.0	41.0	34.0
25	L	47.7	70.6	50.0	41.0	34.0
32	L	46.4	67.0	48.0	41.0	36.0
40	L	45.9	68.9	48.0	42.0	39.0
50	L	44.5	70.0	46.0	41.0	36.0
63	L	43.8	68.3	46.0	41.0	36.0
80	L	42.8	66.1	45.0	40.0	36.0
100	L	41.8	65.4	44.0	39.0	35.0
125	L	41.5	64.2	43.0	40.0	36.0
160	L	40.5	64.4	42.0	38.0	34.0
200	L	40.7	66.2	43.0	38.0	34.0
250	L	40.6	64.9	43.0	38.0	34.0
315	L	39.6	63.8	41.0	37.0	33.0
400	L	41.6	70.3	40.0	37.0	34.0
500	L	43.5	75.7	39.0	36.0	33.0
630	L	44.3	74.4	40.0	35.0	31.0
800	L	43.6	75.0	41.0	35.0	30.0
1k	L	40.3	67.6	41.0	36.0	30.0
1k25	L	40.9	69.3	41.0	34.0	28.0
1k6	L	41.7	66.0	43.0	33.0	25.0
2k	L	38.1	65.7	38.0	29.0	22.0
2k5	L	34.3	62.3	34.0	26.0	19.0
3k15	L	32.5	61.3	32.0	25.0	18.0
4k	L	31.1	59.3	30.0	23.0	17.0
5k	L	30.0	57.6	29.0	23.0	17.0
6k3	L	28.2	58.0	27.0	22.0	17.0
8k	L	28.4	58.9	26.0	21.0	16.0
10k	L	28.7	60.0	25.0	20.0	16.0
12k5	L	27.8	56.7	24.0	19.0	14.0
16k	L	25.9	56.0	21.0	16.0	12.0
20k	L	24.9	55.5	17.0	13.0	11.0

Sound Monitoring Results - Lewes, Delaware
Daytime Compliance at 16 Hoornkill Avenue
UD Turbine: Operational

CEL SoundTrack - dB2 3.0 © CEL Instruments Ltd 1998

- Run summary -

Instrument	CEL-593.C1T Version 7.21 Type 1
Instrument ID (DPB)	112240
Run mode	Third-octave band Environmental
Run start	12/06/2010 17:12:35
Run end	12/06/2010 17:42:37
Run duration	000 00:30:02.50
Last calibration	12/06/2010 15:08:21
Measurement range	5 - 80 dB
Microphone response	Free Field
Polarizing voltage	Off
Time weighting	F
Frequency weighting	L, A
Exchange rate (Q)	3
Period time	10 min
Periods too short for LNs	No
Profiles recorded	No
Profile sample interval	1 s
Number of records	3
Events enabled	No
Overload occurred	Yes
Low battery occurred	No
Pause was used	No

Sound Monitoring Results - Lewes, Delaware
 Daytime Compliance at 16 Hoornkill Avenue
 UD Turbine: Operational

- Period results -

Record number 1 : 3
 Record start 12/06/2010 17:12:35.0
 Period time 10 min
 Periods too short for LNs No
 Overload occurred Yes
 Overload %time 0.00
 Low battery occurred No
 Pause was used No
 Paused all the time No

Band (Hz)	Fw	Leq (dB)	SPLMAX F (dB)	LN10.0% F (dB)	LN50.0% F (dB)	LN90.0% F (dB)
Broadband	L	59.2	77.8	62.0	53.0	50.0
Broadband	A	43.0	58.6	46.0	41.0	39.0
12	L	46.5	65.0	49.0	38.0	30.0
16	L	44.8	66.7	47.0	37.0	31.0
20	L	43.6	65.5	46.0	37.0	32.0
25	L	42.9	63.0	45.0	38.0	33.0
32	L	42.4	61.1	45.0	40.0	36.0
40	L	43.4	60.3	46.0	42.0	38.0
50	L	42.0	60.0	44.0	40.0	37.0
63	L	41.5	60.8	44.0	40.0	36.0
80	L	41.7	65.7	43.0	39.0	36.0
100	L	40.9	64.5	43.0	38.0	35.0
125	L	40.6	58.6	43.0	39.0	36.0
160	L	42.2	62.6	41.0	36.0	33.0
200	L	43.1	64.2	40.0	34.0	31.0
250	L	39.2	55.7	41.0	35.0	32.0
315	L	39.0	54.5	42.0	38.0	34.0
400	L	39.2	52.6	42.0	38.0	35.0
500	L	36.9	53.2	39.0	36.0	34.0
630	L	34.5	52.5	37.0	33.0	31.0
800	L	33.2	47.4	36.0	32.0	29.0
1k	L	32.9	46.8	36.0	31.0	27.0
1k25	L	31.4	49.5	35.0	29.0	24.0
1k6	L	30.3	48.2	34.0	27.0	21.0
2k	L	26.1	44.0	30.0	21.0	16.0
2k5	L	23.2	41.4	26.0	18.0	14.0
3k15	L	22.0	43.4	25.0	18.0	14.0
4k	L	20.0	38.6	23.0	17.0	13.0
5k	L	20.3	38.6	23.0	17.0	13.0
6k3	L	19.8	45.4	23.0	16.0	13.0
8k	L	18.5	30.9	22.0	16.0	13.0
10k	L	17.6	27.1	21.0	16.0	13.0
12k5	L	16.4	32.4	20.0	14.0	12.0
16k	L	14.2	22.5	17.0	12.0	11.0
20k	L	12.0	18.3	14.0	11.0	10.0

Sound Monitoring Results - Lewes, Delaware
 Daytime Compliance at 16 Hoornkill Avenue
 UD Turbine: Operational

- Period results -

Record number 2 : 3
 Record start 12/06/2010 17:22:35.0
 Period time 10 min
 Periods too short for LNs No
 Overload occurred Yes
 Overload %time 0.10
 Low battery occurred No
 Pause was used No
 Paused all the time No

Band (Hz)	Fw	Leq (dB)	SPLMAX F (dB)	LN10.0% F (dB)	LN50.0% F (dB)	LN90.0% F (dB)
Broadband	L	65.4	79.6	69.0	60.0	54.0
Broadband	A	45.9	55.9	49.0	44.0	42.0
12	L	54.1	72.9	58.0	46.0	37.0
16	L	52.2	70.0	56.0	44.0	36.0
20	L	51.5	70.9	54.0	44.0	37.0
25	L	49.6	69.4	52.0	43.0	37.0
32	L	48.3	69.3	50.0	43.0	38.0
40	L	48.0	69.4	50.0	43.0	40.0
50	L	46.9	68.6	48.0	43.0	39.0
63	L	46.2	69.0	47.0	43.0	39.0
80	L	45.3	69.3	47.0	42.0	38.0
100	L	44.2	66.9	46.0	41.0	38.0
125	L	43.6	66.3	45.0	41.0	39.0
160	L	42.1	66.4	44.0	39.0	37.0
200	L	41.9	64.2	44.0	39.0	36.0
250	L	42.3	62.1	45.0	39.0	36.0
315	L	41.6	61.4	44.0	40.0	37.0
400	L	41.1	61.3	43.0	39.0	37.0
500	L	39.6	60.3	41.0	38.0	36.0
630	L	38.8	58.5	41.0	36.0	34.0
800	L	37.2	58.2	39.0	35.0	33.0
1k	L	37.2	56.6	39.0	36.0	32.0
1k25	L	36.4	58.2	39.0	34.0	31.0
1k6	L	35.1	55.8	38.0	32.0	28.0
2k	L	32.3	54.1	35.0	29.0	24.0
2k5	L	30.2	52.0	33.0	26.0	21.0
3k15	L	29.1	50.0	32.0	24.0	20.0
4k	L	27.5	51.0	30.0	23.0	19.0
5k	L	27.7	50.2	29.0	22.0	18.0
6k3	L	27.5	52.9	29.0	22.0	18.0
8k	L	27.2	52.0	28.0	22.0	18.0
10k	L	28.0	53.8	27.0	21.0	17.0
12k5	L	25.8	52.2	26.0	19.0	16.0
16k	L	24.1	52.4	23.0	17.0	14.0
20k	L	22.2	49.7	19.0	14.0	12.0

Sound Monitoring Results - Lewes, Delaware
 Daytime Compliance at 16 Hoornkill Avenue
 UD Turbine: Operational

- Period results -

Record number 3 : 3
 Record start 12/06/2010 17:32:35.0
 Period time 10 min
 Periods too short for LNs No
 Overload occurred Yes
 Overload %time 0.00
 Low battery occurred No
 Pause was used No
 Paused all the time No

Band (Hz)	Fw	Leq (dB)	SPLMAX F (dB)	LN10.0% F (dB)	LN50.0% F (dB)	LN90.0% F (dB)
Broadband	L	61.5	77.7	65.0	58.0	54.0
Broadband	A	47.8	62.0	52.0	45.0	42.0
12	L	49.4	70.7	52.0	42.0	34.0
16	L	47.4	67.3	50.0	41.0	34.0
20	L	46.0	62.9	49.0	41.0	34.0
25	L	44.4	64.3	47.0	40.0	35.0
32	L	44.2	66.4	47.0	41.0	37.0
40	L	44.5	64.8	47.0	43.0	39.0
50	L	42.7	63.9	45.0	41.0	38.0
63	L	42.5	64.7	45.0	41.0	38.0
80	L	45.7	67.2	50.0	42.0	38.0
100	L	47.7	66.5	50.0	42.0	38.0
125	L	44.8	62.7	48.0	42.0	38.0
160	L	43.6	61.2	47.0	41.0	36.0
200	L	43.6	59.6	47.0	40.0	35.0
250	L	42.9	59.0	46.0	41.0	36.0
315	L	41.1	58.2	43.0	40.0	37.0
400	L	40.7	59.3	43.0	40.0	37.0
500	L	38.7	54.3	41.0	38.0	35.0
630	L	37.1	54.2	40.0	36.0	33.0
800	L	34.8	54.2	37.0	34.0	32.0
1k	L	34.5	52.6	37.0	34.0	31.0
1k25	L	41.5	53.4	46.0	33.0	29.0
1k6	L	40.1	55.3	46.0	32.0	26.0
2k	L	32.1	51.7	36.0	28.0	23.0
2k5	L	31.8	49.5	36.0	26.0	20.0
3k15	L	30.3	47.2	35.0	24.0	19.0
4k	L	29.0	47.9	33.0	23.0	18.0
5k	L	26.4	45.8	30.0	22.0	17.0
6k3	L	24.8	45.5	28.0	22.0	17.0
8k	L	22.6	44.8	25.0	21.0	17.0
10k	L	20.8	44.9	23.0	19.0	16.0
12k5	L	19.1	45.7	21.0	17.0	14.0
16k	L	16.3	39.9	19.0	15.0	12.0
20k	L	13.9	42.8	15.0	12.0	11.0

Sound Monitoring Results - Lewes, Delaware
Nighttime Compliance at 16 Hoornkill Avenue
UD Turbine: Operational

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- Run summary -

Instrument	CEL-593.C1T Version 7.21 Type 1
Instrument ID (DPB)	112240
Run mode	Third-octave band Environmental
Run start	12/06/2010 22:02:11
Run end	12/06/2010 22:32:45
Run duration	000 00:30:34.46
Last calibration	12/06/2010 21:57:22
Measurement range	5 - 80 dB
Microphone response	Free Field
Polarizing voltage	Off
Time weighting	F
Frequency weighting	L, A
Exchange rate (Q)	3
Period time	10 min
Periods too short for LNs	No
Profiles recorded	No
Profile sample interval	1 s
Number of records	3
Events enabled	No
Overload occurred	Yes
Low battery occurred	No
Pause was used	No

Sound Monitoring Results - Lewes, Delaware
 Nighttime Compliance at 16 Hoornkill Avenue
 UD Turbine: Operational

- Period results -

Record number 1 : 3
 Record start 12/06/2010 22:02:11.0
 Period time 10 min
 Periods too short for LNs No
 Overload occurred Yes
 Overload %time 0.00
 Low battery occurred No
 Pause was used No
 Paused all the time No

Band (Hz)	Fw	Leq (dB)	SPLMAX F (dB)	LN10.0% F (dB)	LN50.0% F (dB)	LN90.0% F (dB)
Broadband	L	60.2	78.2	63.0	56.0	51.0
Broadband	A	43.3	55.7	46.0	43.0	40.0
12	L	48.1	67.3	51.0	41.0	33.0
16	L	46.5	67.4	50.0	40.0	34.0
20	L	45.3	64.8	48.0	40.0	35.0
25	L	44.4	61.6	47.0	40.0	35.0
32	L	43.7	61.1	46.0	41.0	37.0
40	L	43.9	62.9	46.0	42.0	39.0
50	L	42.7	64.7	45.0	41.0	37.0
63	L	42.6	64.5	46.0	41.0	36.0
80	L	41.3	65.8	43.0	40.0	36.0
100	L	40.6	66.1	43.0	39.0	36.0
125	L	40.3	62.9	42.0	39.0	37.0
160	L	37.7	58.9	40.0	37.0	33.0
200	L	37.3	52.6	40.0	36.0	32.0
250	L	38.7	60.9	41.0	37.0	34.0
315	L	39.6	59.7	42.0	39.0	36.0
400	L	39.2	54.8	42.0	38.0	36.0
500	L	36.7	56.6	39.0	36.0	33.0
630	L	35.2	54.2	37.0	34.0	31.0
800	L	33.8	53.4	36.0	33.0	30.0
1k	L	34.1	51.9	37.0	33.0	29.0
1k25	L	33.2	50.4	36.0	32.0	27.0
1k6	L	31.2	48.7	34.0	29.0	23.0
2k	L	28.3	45.3	32.0	26.0	19.0
2k5	L	25.9	44.0	29.0	24.0	17.0
3k15	L	25.5	47.1	28.0	23.0	16.0
4k	L	23.2	45.4	26.0	21.0	15.0
5k	L	23.7	47.2	26.0	21.0	15.0
6k3	L	22.2	47.0	25.0	20.0	14.0
8k	L	21.1	45.0	24.0	20.0	14.0
10k	L	20.2	46.0	23.0	19.0	13.0
12k5	L	18.6	43.2	21.0	17.0	12.0
16k	L	16.3	42.4	19.0	15.0	11.0
20k	L	13.6	41.8	15.0	12.0	10.0

Sound Monitoring Results - Lewes, Delaware
 Nighttime Compliance at 16 Hoornkill Avenue
 UD Turbine: Operational

- Period results -

Record number 2 : 3
 Record start 12/06/2010 22:12:11.0
 Period time 10 min
 Periods too short for LNs No
 Overload occurred Yes
 Overload %time 0.00
 Low battery occurred No
 Pause was used No
 Paused all the time No

Band (Hz)	Fw	Leq (dB)	SPLMAX F (dB)	LN10.0% F (dB)	LN50.0% F (dB)	LN90.0% F (dB)
Broadband	L	62.5	76.9	66.0	58.0	53.0
Broadband	A	44.1	55.2	47.0	43.0	41.0
12	L	51.0	69.6	54.0	43.0	35.0
16	L	49.6	69.1	52.0	43.0	35.0
20	L	48.3	66.7	51.0	42.0	36.0
25	L	47.2	67.4	50.0	42.0	37.0
32	L	46.1	62.3	49.0	43.0	38.0
40	L	46.1	64.4	49.0	43.0	39.0
50	L	44.8	62.6	48.0	42.0	38.0
63	L	43.2	57.8	46.0	41.0	37.0
80	L	42.5	64.6	45.0	40.0	37.0
100	L	41.2	62.6	44.0	39.0	36.0
125	L	41.1	56.8	43.0	40.0	38.0
160	L	39.2	52.2	42.0	38.0	35.0
200	L	38.9	53.1	42.0	37.0	34.0
250	L	39.3	52.6	42.0	38.0	35.0
315	L	39.5	55.1	42.0	39.0	36.0
400	L	38.9	49.2	41.0	38.0	36.0
500	L	36.9	47.2	39.0	36.0	34.0
630	L	35.9	48.8	38.0	34.0	32.0
800	L	34.5	46.1	37.0	33.0	31.0
1k	L	34.8	46.1	37.0	34.0	30.0
1k25	L	34.1	46.4	37.0	33.0	29.0
1k6	L	32.6	46.4	36.0	31.0	25.0
2k	L	30.1	46.7	34.0	28.0	22.0
2k5	L	27.0	43.5	30.0	25.0	19.0
3k15	L	26.4	46.9	29.0	23.0	18.0
4k	L	24.2	44.6	27.0	22.0	17.0
5k	L	24.2	46.9	26.0	21.0	17.0
6k3	L	22.8	41.8	25.0	21.0	17.0
8k	L	21.6	35.0	25.0	20.0	16.0
10k	L	20.6	30.1	24.0	19.0	16.0
12k5	L	19.0	28.4	22.0	18.0	14.0
16k	L	16.6	27.7	20.0	15.0	12.0
20k	L	13.3	22.3	16.0	13.0	11.0

Sound Monitoring Results - Lewes, Delaware
 Nighttime Compliance at 16 Hoornkill Avenue
 UD Turbine: Operational

- Period results -

Record number 3 : 3
 Record start 12/06/2010 22:22:11.0
 Period time 10 min
 Periods too short for LNs No
 Overload occurred No
 Overload %time 0.00
 Low battery occurred No
 Pause was used No
 Paused all the time No

Band (Hz)	Fw	Leq (dB)	SPLMAX F (dB)	LN10.0% F (dB)	LN50.0% F (dB)	LN90.0% F (dB)
Broadband	L	57.8	73.8	61.0	55.0	51.0
Broadband	A	42.3	50.4	44.0	42.0	40.0
12	L	45.2	64.4	49.0	40.0	33.0
16	L	43.8	63.1	47.0	39.0	33.0
20	L	42.7	62.6	46.0	39.0	34.0
25	L	42.2	59.6	45.0	40.0	35.0
32	L	42.4	59.0	45.0	41.0	37.0
40	L	42.5	55.2	45.0	41.0	38.0
50	L	41.0	55.2	43.0	40.0	37.0
63	L	41.4	54.1	45.0	40.0	36.0
80	L	39.3	51.1	42.0	38.0	35.0
100	L	38.2	49.7	41.0	37.0	35.0
125	L	39.2	47.5	41.0	39.0	36.0
160	L	36.6	45.3	39.0	36.0	33.0
200	L	35.8	45.0	38.0	35.0	32.0
250	L	37.5	49.6	40.0	36.0	34.0
315	L	38.9	52.2	41.0	38.0	35.0
400	L	38.7	48.4	41.0	38.0	35.0
500	L	36.0	47.1	38.0	35.0	33.0
630	L	34.1	48.8	36.0	33.0	31.0
800	L	32.7	42.0	35.0	32.0	30.0
1k	L	32.8	43.2	35.0	32.0	29.0
1k25	L	31.7	41.7	34.0	30.0	27.0
1k6	L	29.9	44.0	33.0	28.0	24.0
2k	L	26.8	43.6	29.0	24.0	20.0
2k5	L	24.1	41.8	27.0	22.0	18.0
3k15	L	22.7	42.9	25.0	21.0	17.0
4k	L	20.8	36.0	23.0	19.0	16.0
5k	L	22.1	46.7	23.0	19.0	16.0
6k3	L	20.5	41.3	23.0	19.0	16.0
8k	L	19.4	34.6	22.0	18.0	15.0
10k	L	18.5	28.8	21.0	18.0	15.0
12k5	L	17.0	27.3	19.0	16.0	13.0
16k	L	14.8	22.6	17.0	14.0	12.0
20k	L	12.0	18.7	14.0	12.0	10.0

Sound Monitoring Results - Lewes, Delaware
Nighttime Compliance at 16 Hoornkill Avenue
UD Turbine: Paused

CEL SoundTrack - dB2 3.0 © CEL Instruments Ltd 1998

- Run summary -

Instrument	CEL-593.C1T Version 7.21 Type 1
Instrument ID (DPB)	112240
Run mode	Third-octave band Environmental
Run start	12/06/2010 22:43:14
Run end	12/06/2010 23:43:17
Run duration	000 01:00:03.02
Last calibration	12/06/2010 21:57:22
Measurement range	5 - 80 dB
Microphone response	Free Field
Polarizing voltage	Off
Time weighting	F
Frequency weighting	L, A
Exchange rate (Q)	3
Period time	10 min
Periods too short for LNs	No
Profiles recorded	No
Profile sample interval	1 s
Number of records	6
Events enabled	No
Overload occurred	Yes
Low battery occurred	No
Pause was used	No

Sound Monitoring Results - Lewes, Delaware
 Nighttime Compliance at 16 Hoornkill Avenue
 UD Turbine: Paused

- Period results -

Record number 1 : 6
 Record start 12/06/2010 22:43:14.0
 Period time 10 min
 Periods too short for LNs No
 Overload occurred Yes
 Overload %time 0.00
 Low battery occurred No
 Pause was used No
 Paused all the time No

Band (Hz)	Fw	Leq (dB)	SPLMAX F (dB)	LN10.0% F (dB)	LN50.0% F (dB)	LN90.0% F (dB)
Broadband	L	61.1	78.4	65.0	55.0	49.0
Broadband	A	41.4	56.3	44.0	40.0	37.0
12	L	49.6	68.3	53.0	40.0	30.0
16	L	48.9	71.3	51.0	38.0	30.0
20	L	47.0	69.9	49.0	38.0	31.0
25	L	45.2	68.9	47.0	38.0	33.0
32	L	44.9	67.3	47.0	40.0	36.0
40	L	44.3	64.1	46.0	41.0	38.0
50	L	43.0	69.3	45.0	39.0	35.0
63	L	42.1	69.0	45.0	37.0	33.0
80	L	41.4	66.8	43.0	37.0	33.0
100	L	40.2	66.6	42.0	35.0	32.0
125	L	40.2	65.2	42.0	38.0	35.0
160	L	37.0	63.8	39.0	34.0	30.0
200	L	36.6	63.3	39.0	33.0	29.0
250	L	36.5	62.5	39.0	34.0	30.0
315	L	34.9	60.2	37.0	33.0	30.0
400	L	34.3	59.6	36.0	32.0	30.0
500	L	34.6	59.3	36.0	32.0	29.0
630	L	34.6	59.4	36.0	31.0	29.0
800	L	32.5	56.0	34.0	30.0	27.0
1k	L	33.1	53.4	35.0	31.0	28.0
1k25	L	32.5	52.9	35.0	30.0	26.0
1k6	L	30.8	55.1	34.0	27.0	23.0
2k	L	27.6	50.2	31.0	24.0	20.0
2k5	L	25.2	49.6	28.0	22.0	17.0
3k15	L	24.4	49.5	27.0	21.0	16.0
4k	L	22.3	45.4	25.0	19.0	15.0
5k	L	23.8	51.4	25.0	19.0	15.0
6k3	L	23.2	53.2	24.0	19.0	15.0
8k	L	22.3	50.3	24.0	18.0	15.0
10k	L	22.7	54.1	23.0	18.0	14.0
12k5	L	19.6	49.0	21.0	16.0	13.0
16k	L	18.5	50.0	19.0	14.0	11.0
20k	L	16.2	47.4	15.0	12.0	10.0

Sound Monitoring Results - Lewes, Delaware
 Nighttime Compliance at 16 Hoornkill Avenue
 UD Turbine: Paused

- Period results -

Record number 2 : 6
 Record start 12/06/2010 22:53:14.0
 Period time 10 min
 Periods too short for LNs No
 Overload occurred Yes
 Overload %time 0.00
 Low battery occurred No
 Pause was used No
 Paused all the time No

Band (Hz)	Fw	Leq (dB)	SPLMAX F (dB)	LN10.0% F (dB)	LN50.0% F (dB)	LN90.0% F (dB)
Broadband	L	60.7	77.3	64.0	56.0	50.0
Broadband	A	42.1	54.2	45.0	40.0	37.0
12	L	49.2	67.5	52.0	41.0	32.0
16	L	47.3	66.2	50.0	40.0	32.0
20	L	46.0	64.5	49.0	40.0	33.0
25	L	44.4	62.5	47.0	39.0	33.0
32	L	43.8	60.2	46.0	40.0	35.0
40	L	44.1	59.1	47.0	42.0	38.0
50	L	41.7	55.9	44.0	39.0	35.0
63	L	41.6	58.9	45.0	39.0	34.0
80	L	39.5	59.8	42.0	38.0	34.0
100	L	38.3	60.1	41.0	36.0	33.0
125	L	39.8	60.7	42.0	39.0	36.0
160	L	37.4	62.0	41.0	34.0	31.0
200	L	37.4	62.3	42.0	33.0	30.0
250	L	37.8	61.9	42.0	34.0	31.0
315	L	35.6	61.1	39.0	33.0	30.0
400	L	34.8	58.8	38.0	33.0	30.0
500	L	33.6	51.9	37.0	32.0	30.0
630	L	33.2	49.8	36.0	31.0	29.0
800	L	32.2	55.6	35.0	30.0	28.0
1k	L	33.9	52.4	37.0	32.0	29.0
1k25	L	33.2	49.0	37.0	31.0	27.0
1k6	L	31.0	47.5	35.0	28.0	24.0
2k	L	28.3	42.1	32.0	25.0	21.0
2k5	L	26.4	48.4	30.0	22.0	18.0
3k15	L	25.6	46.5	29.0	21.0	17.0
4k	L	23.6	46.9	27.0	19.0	16.0
5k	L	24.6	48.7	27.0	19.0	16.0
6k3	L	22.7	45.5	26.0	19.0	16.0
8k	L	21.5	47.4	25.0	18.0	15.0
10k	L	20.4	48.1	24.0	17.0	14.0
12k5	L	18.6	43.1	22.0	16.0	13.0
16k	L	16.4	42.3	20.0	14.0	12.0
20k	L	13.8	41.6	16.0	12.0	10.0

Sound Monitoring Results - Lewes, Delaware
 Nighttime Compliance at 16 Hoornkill Avenue
 UD Turbine: Paused

- Period results -

Record number 3 : 6
 Record start 12/06/2010 23:03:14.0
 Period time 10 min
 Periods too short for LNs No
 Overload occurred Yes
 Overload %time 0.00
 Low battery occurred No
 Pause was used No
 Paused all the time No

Band (Hz)	Fw	Leq (dB)	SPLMAX F (dB)	LN10.0% F (dB)	LN50.0% F (dB)	LN90.0% F (dB)
Broadband	L	60.6	77.8	64.0	55.0	49.0
Broadband	A	42.0	54.2	45.0	41.0	37.0
12	L	49.3	69.4	52.0	40.0	31.0
16	L	47.4	68.8	49.0	38.0	30.0
20	L	45.4	63.9	48.0	38.0	31.0
25	L	44.1	63.9	46.0	37.0	31.0
32	L	43.5	64.3	45.0	38.0	34.0
40	L	42.9	62.1	45.0	40.0	37.0
50	L	40.7	58.2	43.0	38.0	34.0
63	L	39.4	56.9	42.0	37.0	33.0
80	L	39.6	62.9	41.0	37.0	33.0
100	L	38.5	61.8	40.0	36.0	32.0
125	L	39.0	55.7	41.0	38.0	35.0
160	L	35.6	49.0	38.0	34.0	30.0
200	L	36.1	49.6	39.0	34.0	30.0
250	L	36.5	49.0	39.0	34.0	30.0
315	L	34.8	52.3	38.0	33.0	30.0
400	L	34.0	46.9	37.0	33.0	30.0
500	L	33.6	48.1	36.0	33.0	30.0
630	L	33.3	48.8	36.0	32.0	29.0
800	L	32.1	44.3	35.0	31.0	27.0
1k	L	34.0	45.0	37.0	33.0	28.0
1k25	L	33.2	44.7	36.0	32.0	27.0
1k6	L	31.7	43.0	35.0	30.0	24.0
2k	L	28.8	43.0	32.0	26.0	20.0
2k5	L	26.0	43.8	29.0	24.0	18.0
3k15	L	25.0	45.5	28.0	23.0	17.0
4k	L	23.0	40.2	26.0	21.0	16.0
5k	L	24.3	48.9	26.0	21.0	16.0
6k3	L	22.4	43.7	25.0	20.0	15.0
8k	L	20.9	35.5	24.0	20.0	15.0
10k	L	19.9	33.3	23.0	19.0	14.0
12k5	L	18.5	37.9	21.0	17.0	13.0
16k	L	16.0	27.4	19.0	15.0	11.0
20k	L	13.0	19.9	15.0	12.0	10.0

Sound Monitoring Results - Lewes, Delaware
 Nighttime Compliance at 16 Hoornkill Avenue
 UD Turbine: Paused

- Period results -

Record number 4 : 6
 Record start 12/06/2010 23:13:14.0
 Period time 10 min
 Periods too short for LNs No
 Overload occurred Yes
 Overload %time 0.00
 Low battery occurred No
 Pause was used No
 Paused all the time No

Band (Hz)	Fw	Leq (dB)	SPLMAX F (dB)	LN10.0% F (dB)	LN50.0% F (dB)	LN90.0% F (dB)
Broadband	L	62.0	78.9	66.0	58.0	52.0
Broadband	A	43.7	53.9	46.0	43.0	39.0
12	L	50.9	69.1	55.0	44.0	34.0
16	L	49.0	67.3	53.0	42.0	33.0
20	L	47.2	64.6	51.0	41.0	33.0
25	L	45.5	65.4	49.0	40.0	34.0
32	L	44.4	62.4	48.0	41.0	36.0
40	L	44.6	60.6	47.0	42.0	38.0
50	L	42.8	64.5	45.0	40.0	36.0
63	L	42.7	65.0	45.0	41.0	35.0
80	L	41.3	65.4	44.0	39.0	35.0
100	L	40.2	65.1	43.0	38.0	34.0
125	L	40.3	63.9	43.0	39.0	36.0
160	L	38.0	61.9	41.0	36.0	32.0
200	L	38.3	58.6	41.0	36.0	31.0
250	L	38.4	53.0	41.0	36.0	32.0
315	L	36.8	59.9	40.0	35.0	31.0
400	L	35.6	59.0	38.0	34.0	31.0
500	L	34.9	54.3	37.0	34.0	31.0
630	L	34.9	56.7	37.0	33.0	31.0
800	L	33.7	54.6	36.0	33.0	30.0
1k	L	35.4	52.6	38.0	34.0	30.0
1k25	L	34.9	51.2	38.0	33.0	29.0
1k6	L	33.4	49.4	37.0	31.0	26.0
2k	L	30.8	51.1	34.0	28.0	23.0
2k5	L	28.3	46.2	31.0	26.0	21.0
3k15	L	27.3	45.9	30.0	25.0	20.0
4k	L	25.1	43.4	28.0	23.0	19.0
5k	L	25.9	45.7	28.0	23.0	18.0
6k3	L	24.4	45.6	26.0	22.0	18.0
8k	L	22.8	45.9	25.0	21.0	17.0
10k	L	21.8	48.5	24.0	20.0	17.0
12k5	L	20.6	47.4	22.0	19.0	15.0
16k	L	17.7	42.4	20.0	16.0	13.0
20k	L	14.6	41.8	16.0	13.0	11.0

Sound Monitoring Results - Lewes, Delaware
 Nighttime Compliance at 16 Hoornkill Avenue
 UD Turbine: Paused

- Period results -

Record number 5 : 6
 Record start 12/06/2010 23:23:14.0
 Period time 10 min
 Periods too short for LNs No
 Overload occurred No
 Overload %time 0.00
 Low battery occurred No
 Pause was used No
 Paused all the time No

Band (Hz)	Fw	Leq (dB)	SPLMAX F (dB)	LN10.0% F (dB)	LN50.0% F (dB)	LN90.0% F (dB)
Broadband	L	58.6	74.9	62.0	54.0	49.0
Broadband	A	39.9	53.0	42.0	39.0	36.0
12	L	46.2	64.0	50.0	39.0	30.0
16	L	44.3	63.0	48.0	37.0	30.0
20	L	43.1	63.8	46.0	37.0	30.0
25	L	41.4	62.0	44.0	36.0	31.0
32	L	40.7	58.5	43.0	38.0	33.0
40	L	41.3	54.7	44.0	40.0	36.0
50	L	39.1	53.7	42.0	37.0	34.0
63	L	39.3	56.2	43.0	37.0	33.0
80	L	37.4	62.4	39.0	36.0	32.0
100	L	36.7	61.8	39.0	35.0	32.0
125	L	38.7	55.2	41.0	38.0	36.0
160	L	34.6	49.1	38.0	33.0	30.0
200	L	33.7	49.5	37.0	32.0	29.0
250	L	33.8	49.0	37.0	32.0	30.0
315	L	32.6	47.5	35.0	32.0	29.0
400	L	32.0	46.1	34.0	31.0	29.0
500	L	31.4	44.4	33.0	31.0	29.0
630	L	31.1	45.2	33.0	30.0	28.0
800	L	29.8	41.4	32.0	29.0	27.0
1k	L	31.7	42.9	34.0	31.0	28.0
1k25	L	31.2	43.3	34.0	30.0	26.0
1k6	L	29.4	43.9	33.0	27.0	23.0
2k	L	27.0	47.6	29.0	23.0	20.0
2k5	L	23.3	43.7	26.0	21.0	17.0
3k15	L	23.7	45.8	24.0	20.0	16.0
4k	L	20.2	38.0	22.0	19.0	15.0
5k	L	22.1	49.3	23.0	18.0	15.0
6k3	L	20.3	44.3	22.0	18.0	15.0
8k	L	18.6	33.5	21.0	18.0	15.0
10k	L	17.5	30.3	20.0	17.0	14.0
12k5	L	16.2	31.2	19.0	15.0	13.0
16k	L	14.0	25.0	17.0	13.0	11.0
20k	L	11.6	20.9	13.0	11.0	10.0

Sound Monitoring Results - Lewes, Delaware
 Nighttime Compliance at 16 Hoornkill Avenue
 UD Turbine: Paused

- Period results -

Record number 6 : 6
 Record start 12/06/2010 23:33:14.0
 Period time 10 min
 Periods too short for LNs No
 Overload occurred Yes
 Overload %time 0.00
 Low battery occurred No
 Pause was used No
 Paused all the time No

Band (Hz)	Fw	Leq (dB)	SPLMAX F (dB)	LN10.0% F (dB)	LN50.0% F (dB)	LN90.0% F (dB)
Broadband	L	59.0	74.9	62.0	55.0	50.0
Broadband	A	41.2	52.8	43.0	41.0	38.0
12	L	47.3	67.0	50.0	40.0	31.0
16	L	45.5	68.1	48.0	39.0	31.0
20	L	43.4	61.2	47.0	38.0	32.0
25	L	41.9	58.8	45.0	38.0	32.0
32	L	41.7	60.1	44.0	39.0	35.0
40	L	42.2	57.4	45.0	41.0	37.0
50	L	39.8	54.4	42.0	38.0	35.0
63	L	39.6	56.7	43.0	37.0	34.0
80	L	38.2	57.9	41.0	37.0	34.0
100	L	36.9	59.2	39.0	35.0	33.0
125	L	38.4	52.7	41.0	38.0	35.0
160	L	35.6	47.9	38.0	34.0	31.0
200	L	35.6	48.8	38.0	34.0	31.0
250	L	35.5	49.0	38.0	34.0	31.0
315	L	34.3	49.6	36.0	33.0	31.0
400	L	33.3	44.9	35.0	33.0	31.0
500	L	32.7	47.7	34.0	32.0	30.0
630	L	32.2	47.1	34.0	32.0	29.0
800	L	31.2	42.0	33.0	31.0	28.0
1k	L	32.9	43.8	35.0	32.0	29.0
1k25	L	32.3	44.5	35.0	31.0	27.0
1k6	L	31.0	46.6	34.0	29.0	24.0
2k	L	28.0	45.0	31.0	26.0	21.0
2k5	L	25.3	45.1	27.0	23.0	18.0
3k15	L	23.8	44.4	26.0	22.0	18.0
4k	L	22.5	47.0	24.0	21.0	17.0
5k	L	22.7	43.6	24.0	21.0	16.0
6k3	L	21.3	39.7	23.0	20.0	16.0
8k	L	20.3	32.7	23.0	20.0	16.0
10k	L	19.4	28.6	22.0	19.0	15.0
12k5	L	18.0	31.6	20.0	17.0	14.0
16k	L	15.6	25.4	18.0	15.0	12.0
20k	L	12.8	19.8	15.0	12.0	10.0

Sound Monitoring Results - Lewes, Delaware
Nighttime Compliance at 16 Hoornkill Avenue
UD Turbine: Operational

CEL SoundTrack - dB2 3.0 © CEL Instruments Ltd 1998

- Run summary -

Instrument	CEL-593.C1T Version 7.21 Type 1
Instrument ID (DPB)	112240
Run mode	Third-octave band Environmental
Run start	12/06/2010 23:52:08
Run end	12/07/2010 00:22:12
Run duration	000 00:30:04.30
Last calibration	12/06/2010 21:57:22
Measurement range	5 - 80 dB
Microphone response	Free Field
Polarizing voltage	Off
Time weighting	F
Frequency weighting	L, A
Exchange rate (Q)	3
Period time	10 min
Periods too short for LNs	No
Profiles recorded	No
Profile sample interval	1 s
Number of records	3
Events enabled	No
Overload occurred	Yes
Low battery occurred	No
Pause was used	No

Sound Monitoring Results - Lewes, Delaware
Nighttime Compliance at 16 Hoornkill Avenue
UD Turbine: Operational

- Period results -

Record number 1 : 3
 Record start 12/06/2010 23:52:08.0
 Period time 10 min
 Periods too short for LNs No
 Overload occurred No
 Overload %time 0.00
 Low battery occurred No
 Pause was used No
 Paused all the time No

Band (Hz)	Fw	Leq (dB)	SPLMAX F (dB)	LN10.0% F (dB)	LN50.0% F (dB)	LN90.0% F (dB)
Broadband	L	59.6	74.2	63.0	55.0	51.0
Broadband	A	41.9	52.6	44.0	41.0	39.0
12	L	48.3	66.8	51.0	40.0	33.0
16	L	46.4	64.0	49.0	40.0	33.0
20	L	44.9	63.6	48.0	39.0	34.0
25	L	43.2	60.5	46.0	39.0	35.0
32	L	42.7	58.4	45.0	40.0	36.0
40	L	42.8	56.8	45.0	41.0	38.0
50	L	41.4	54.6	44.0	40.0	37.0
63	L	39.7	55.3	42.0	38.0	35.0
80	L	39.2	58.9	42.0	38.0	35.0
100	L	38.6	58.2	41.0	38.0	35.0
125	L	39.6	54.5	42.0	39.0	37.0
160	L	36.7	48.2	40.0	35.0	32.0
200	L	35.6	48.0	39.0	34.0	31.0
250	L	37.4	48.8	40.0	36.0	33.0
315	L	38.8	50.5	41.0	38.0	34.0
400	L	38.5	48.6	41.0	38.0	35.0
500	L	35.8	49.3	38.0	35.0	33.0
630	L	33.8	45.7	36.0	33.0	31.0
800	L	32.4	43.9	35.0	32.0	29.0
1k	L	32.2	42.8	35.0	31.0	28.0
1k25	L	31.0	42.6	34.0	29.0	26.0
1k6	L	28.9	44.2	32.0	26.0	22.0
2k	L	26.2	44.2	30.0	23.0	18.0
2k5	L	23.3	40.3	27.0	21.0	16.0
3k15	L	23.4	48.9	25.0	19.0	15.0
4k	L	20.5	42.1	24.0	18.0	14.0
5k	L	21.8	44.8	24.0	18.0	14.0
6k3	L	20.1	39.9	23.0	17.0	14.0
8k	L	18.9	34.4	22.0	17.0	14.0
10k	L	17.9	29.4	21.0	16.0	13.0
12k5	L	16.5	31.8	20.0	15.0	12.0
16k	L	14.2	23.2	17.0	13.0	11.0
20k	L	11.6	18.6	14.0	11.0	10.0

Sound Monitoring Results - Lewes, Delaware
Nighttime Compliance at 16 Hoornkill Avenue
UD Turbine: Operational

- Period results -

Record number 2 : 3
 Record start 12/07/2010 00:02:08.0
 Period time 10 min
 Periods too short for LNs No
 Overload occurred Yes
 Overload %time 0.00
 Low battery occurred No
 Pause was used No
 Paused all the time No

Band (Hz)	Fw	Leq (dB)	SPLMAX F (dB)	LN10.0% F (dB)	LN50.0% F (dB)	LN90.0% F (dB)
Broadband	L	62.9	78.1	67.0	58.0	52.0
Broadband	A	44.7	56.5	48.0	43.0	39.0
12	L	51.7	69.7	55.0	43.0	34.0
16	L	50.1	68.1	54.0	41.0	34.0
20	L	48.8	69.3	52.0	41.0	34.0
25	L	46.8	64.8	50.0	40.0	35.0
32	L	45.6	64.9	49.0	41.0	36.0
40	L	45.1	62.8	48.0	42.0	38.0
50	L	43.6	63.1	46.0	41.0	37.0
63	L	43.2	61.7	46.0	41.0	37.0
80	L	43.2	64.9	44.0	39.0	36.0
100	L	47.3	69.4	44.0	39.0	35.0
125	L	47.7	72.0	45.0	40.0	37.0
160	L	45.3	63.8	47.0	38.0	34.0
200	L	41.0	60.4	44.0	38.0	33.0
250	L	40.6	60.9	44.0	39.0	34.0
315	L	40.5	61.2	43.0	39.0	35.0
400	L	39.6	60.2	42.0	39.0	36.0
500	L	37.4	59.0	39.0	36.0	34.0
630	L	36.1	55.9	38.0	34.0	32.0
800	L	34.5	53.2	37.0	33.0	30.0
1k	L	34.8	55.5	38.0	33.0	29.0
1k25	L	34.0	50.3	38.0	32.0	27.0
1k6	L	32.5	52.9	36.0	29.0	24.0
2k	L	30.6	54.4	34.0	26.0	20.0
2k5	L	27.9	52.0	31.0	23.0	18.0
3k15	L	26.4	50.8	30.0	22.0	17.0
4k	L	25.0	50.2	28.0	21.0	16.0
5k	L	25.2	46.7	28.0	21.0	15.0
6k3	L	23.8	47.4	27.0	20.0	15.0
8k	L	22.8	51.3	26.0	20.0	15.0
10k	L	21.7	51.0	24.0	19.0	14.0
12k5	L	20.2	49.3	23.0	17.0	13.0
16k	L	17.4	45.5	20.0	15.0	11.0
20k	L	14.5	43.6	16.0	12.0	10.0

Sound Monitoring Results - Lewes, Delaware
Nighttime Compliance at 16 Hoornkill Avenue
UD Turbine: Operational

- Period results -

Record number 3 : 3
 Record start 12/07/2010 00:12:08.0
 Period time 10 min
 Periods too short for LNs No
 Overload occurred Yes
 Overload %time 0.00
 Low battery occurred No
 Pause was used No
 Paused all the time No

Band (Hz)	Fw	Leq (dB)	SPLMAX F (dB)	LN10.0% F (dB)	LN50.0% F (dB)	LN90.0% F (dB)
Broadband	L	64.0	78.4	68.0	60.0	54.0
Broadband	A	45.1	54.1	47.0	44.0	42.0
12	L	52.4	68.9	56.0	46.0	37.0
16	L	51.5	69.6	55.0	44.0	36.0
20	L	50.1	68.4	53.0	43.0	36.0
25	L	48.0	66.4	51.0	42.0	36.0
32	L	46.8	67.0	49.0	42.0	38.0
40	L	46.2	68.1	49.0	43.0	39.0
50	L	44.6	67.9	47.0	42.0	38.0
63	L	43.4	66.8	46.0	41.0	37.0
80	L	42.2	65.3	45.0	40.0	37.0
100	L	41.5	61.1	44.0	40.0	36.0
125	L	41.5	64.8	44.0	40.0	38.0
160	L	39.6	59.7	42.0	38.0	35.0
200	L	39.7	61.1	43.0	38.0	34.0
250	L	41.1	59.3	44.0	39.0	36.0
315	L	40.3	58.5	43.0	39.0	36.0
400	L	39.4	57.6	42.0	39.0	36.0
500	L	37.7	60.0	39.0	37.0	34.0
630	L	37.3	63.7	39.0	36.0	33.0
800	L	36.0	63.5	37.0	35.0	32.0
1k	L	36.2	59.0	38.0	35.0	32.0
1k25	L	35.4	54.5	38.0	34.0	31.0
1k6	L	33.9	56.9	37.0	32.0	28.0
2k	L	31.4	48.3	34.0	29.0	25.0
2k5	L	29.7	49.7	32.0	27.0	23.0
3k15	L	28.4	49.2	31.0	26.0	22.0
4k	L	26.6	48.3	29.0	24.0	20.0
5k	L	26.9	51.1	29.0	24.0	20.0
6k3	L	25.7	52.5	27.0	23.0	19.0
8k	L	25.0	54.7	26.0	23.0	19.0
10k	L	24.5	55.4	25.0	22.0	18.0
12k5	L	21.8	50.2	24.0	20.0	16.0
16k	L	19.9	50.5	21.0	17.0	14.0
20k	L	17.3	49.8	17.0	14.0	11.0