

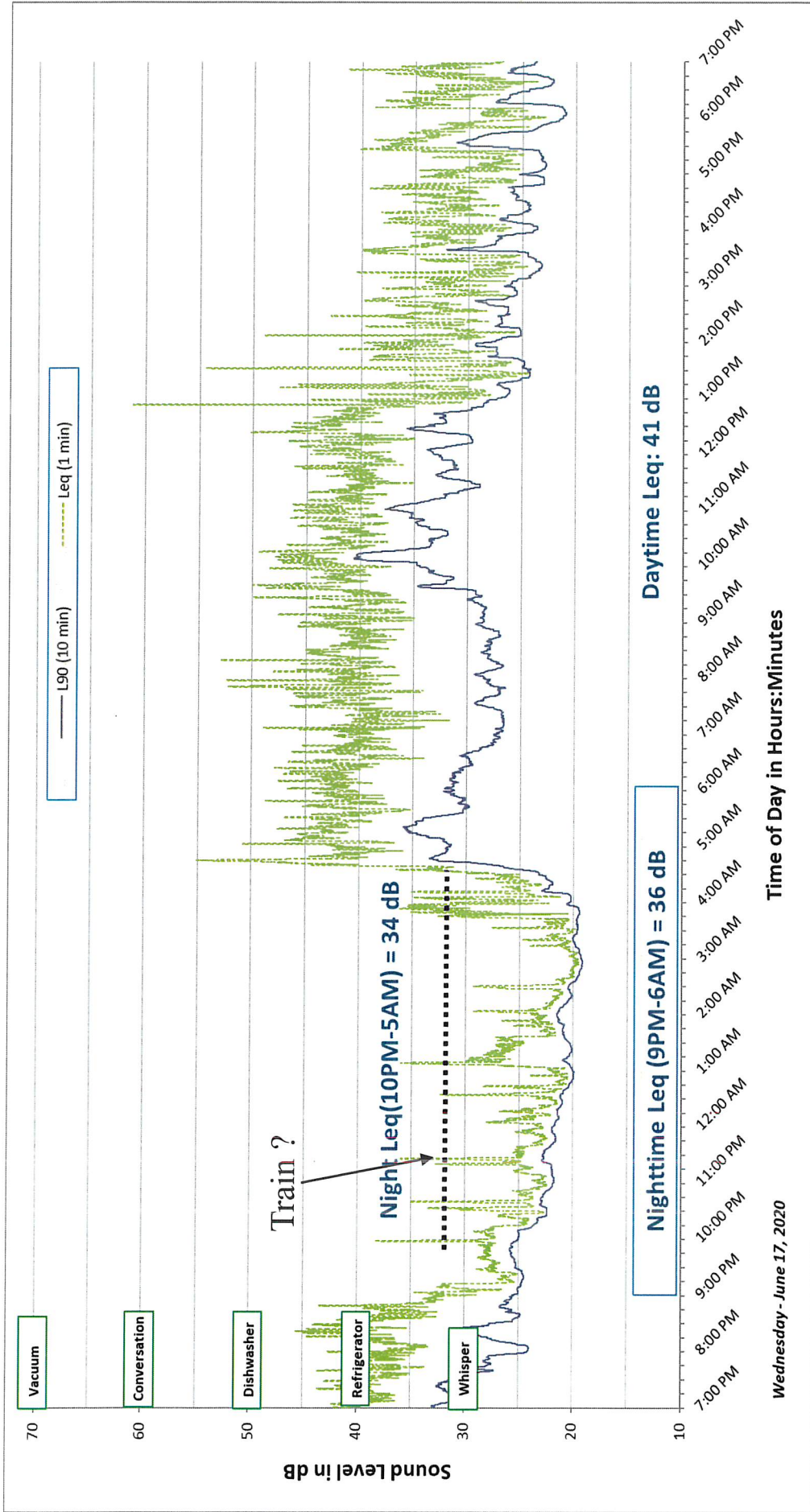
# ANSI S12.9

## Description and Measurement of Environmental Sound

### Secondly,

- Annoyance is largely judged by the **audibility** of the noise relative to the existing ambient sound as heard by receivers.
- This is why some codes establish a noise violation when the noise is “clearly” above the existing ambient noise. In acoustics, a noise is clearly audible when it rises 3-5 dB above the ambient level - especially if there is an adverse character to the noise.
- **The IPCB** gives a typical nighttime time-averaged level of a rural area as **35 dBA**. Hence, 45 dBA of noise in a 35 dBA ambient area would be twice as loud and would be more than “clearly” audible – and more like “loud or obnoxious.”
- Based on this, ANSI S12.9 recommends a limit that is effectively 6-7 dB lower for rural areas because of their quiet soundscapes.
- Accordingly, **per ANSI, the 1-hour limit should be 45 – 6/7 dB or 38-39 dBA.**

# Christian County Ambient Noise Study



In this 24-hour ambient noise study at a representative home, we found a nighttime level (9 PM- 6 AM) of 36 dB, which included the noise of several trains in the distance and the awakening of birds around 5:00 AM. This is consistent with the ANSI estimate of typical nighttime noise in a rural area (i.e., 35 dBA)

# Noise that meets the IPCBs 45 dB nighttime limit can still create an impact

While a limit of 39 dBA is not currently written in the IPCB regulations, there are two sections that allow such a lower limit if there is an impact. These are:

## **Section 900.102 – Prohibition of Noise Pollution**

*A person must not cause or allow the emission of sound beyond the boundaries of that person's property, as defined in Section 25 of the Environmental Protection Act [415 ILCS 5/25], that causes noise pollution in Illinois or violates any provision of this Chapter.*

AND

## **Section 900.101 Definitions:**

"Noise pollution": the emission of sound that unreasonably interferes with the enjoyment of life or with any lawful business or activity.

In essence, if the noise source becomes clearly audible, then an impact begins. To answer this question, the existing ambient noise must be assessed. A setback distance is then determined that would allow the noise to drop to a level that does not significantly exceed the ambient level.

## **Recommended limit to protect against the adverse effects of wind turbine noise.**

- Adjusting the current IPCB nighttime limit of 45 dBA by the ANSI 6-7 dB adjustment for a rural area brings the limit to 38-39 dBA
- Our short survey shows a nighttime time-averaged level of 34 dBA for the hours from 10 PM to 5 AM. A “significant” level above this would be 3-5 dB higher. This brings the limit to 37-39 dB.

**1-hour Leq = 39 dBA**

# Conclusion

## Because wind turbines will:

1. Generate a unique sound character,
2. Operate day and night, and
3. Run in quiet rural areas,

... they should be set back from residential land by a distance such that the noise does not exceed a 1-hour time-average of 39 dBA. This is 6 dB below the IPCB's current limit of 45 dBA.

We cannot expect a homeowner to close their windows to block the noise, to retreat indoors to lower the noise, to wear earplugs at night to sleep, or to erect a tall noise barrier to shield the noise. Therefore, controlling the noise must be accomplished by:

1. Lowering the sound emissions of the wind turbine,
2. Locating the towers far enough from the residential landowners to allow the noise to dissipate, or
3. Limiting the operation during critical nighttime hours.

# Need for an Environmental Impact Statement

**Before siting the towers, an EIS must be prepared that:**

1. Identifies the noise-sensitive uses, i.e., schools, churches, hospitals, residents, etc., in and surrounding the project area,
2. Gives the sound emissions data of the make and model of wind turbine to be erected based on accepted international (ISO) standards and in terms of 1/3 OB levels from 16-16,000 Hz,
3. Generates A-weighted sound level contours at 5 dB increments for the areas surrounding the towers using ISO methods of sound propagation,
4. Reveals the results of 24-hour ambient noise testing at representative noise-sensitive sites in the area giving hourly Leq, and
5. States a plan to compensate the surrounding property owners in an amount commensurate with the level above 39 dB.