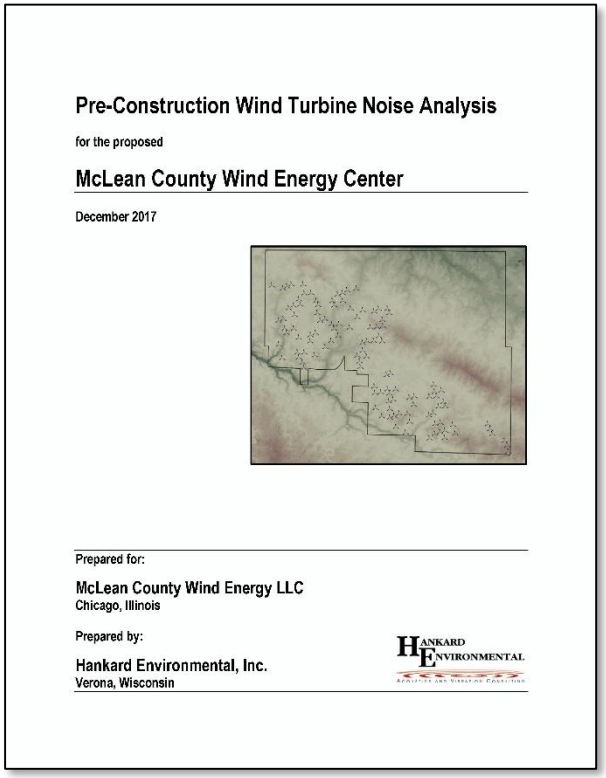
MCLEAN COUNTY WIND ENERGY CENTER NOISE ANALYSIS RESULTS

Presented to:
McLean County, IL
Zoning Board of Appeals

Presented by:
Michael Hankard, INCE ASA
Principal, Hankard Environmental
Verona, WI

January 4, 2018



Pre-Construction Wind Turbine Noise Analysis

for the proposed

McLean County Wind Energy Center

December 2017

Prepared for:

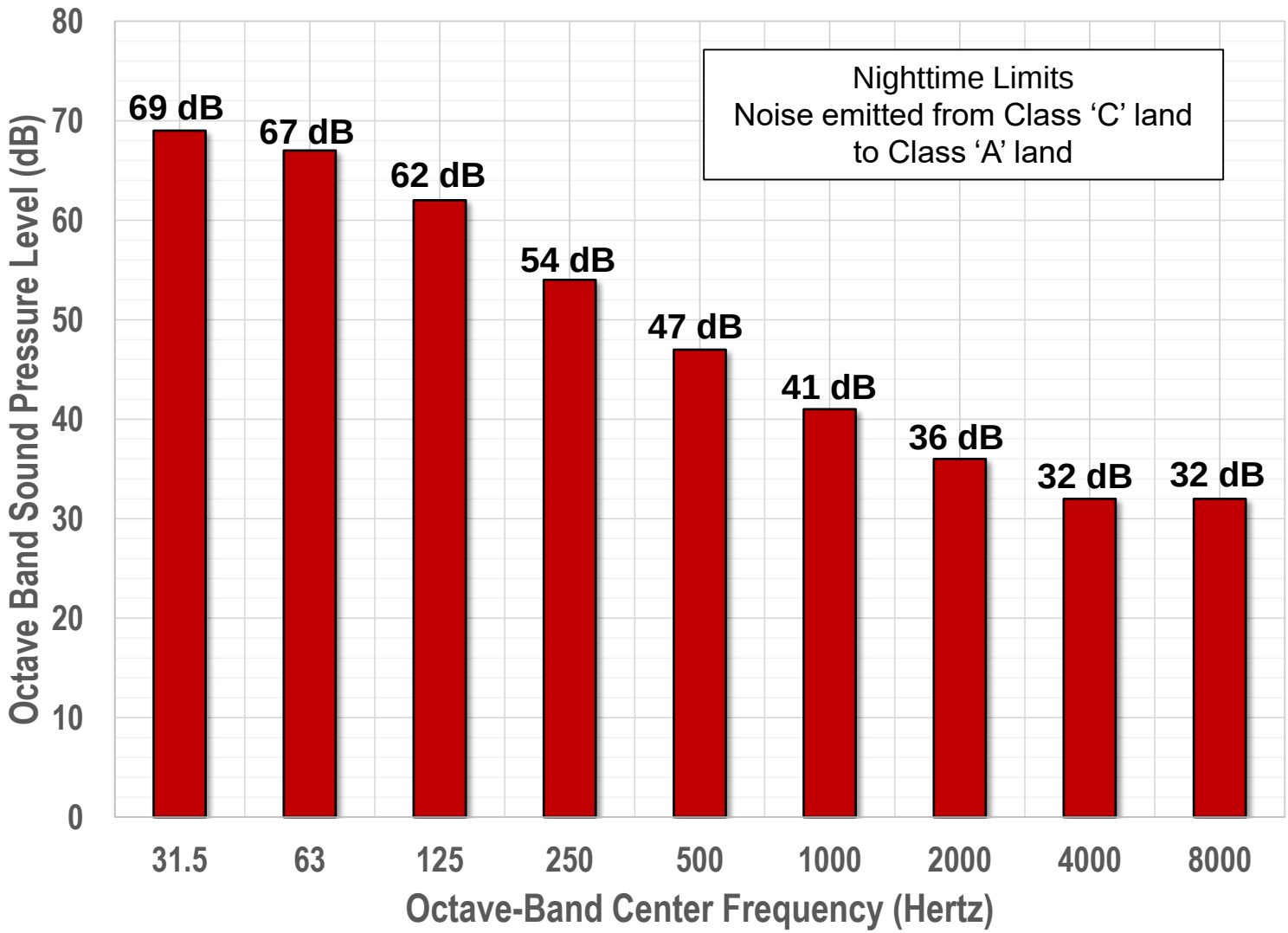
McLean County Wind Energy LLC
Chicago, Illinois

Prepared by:

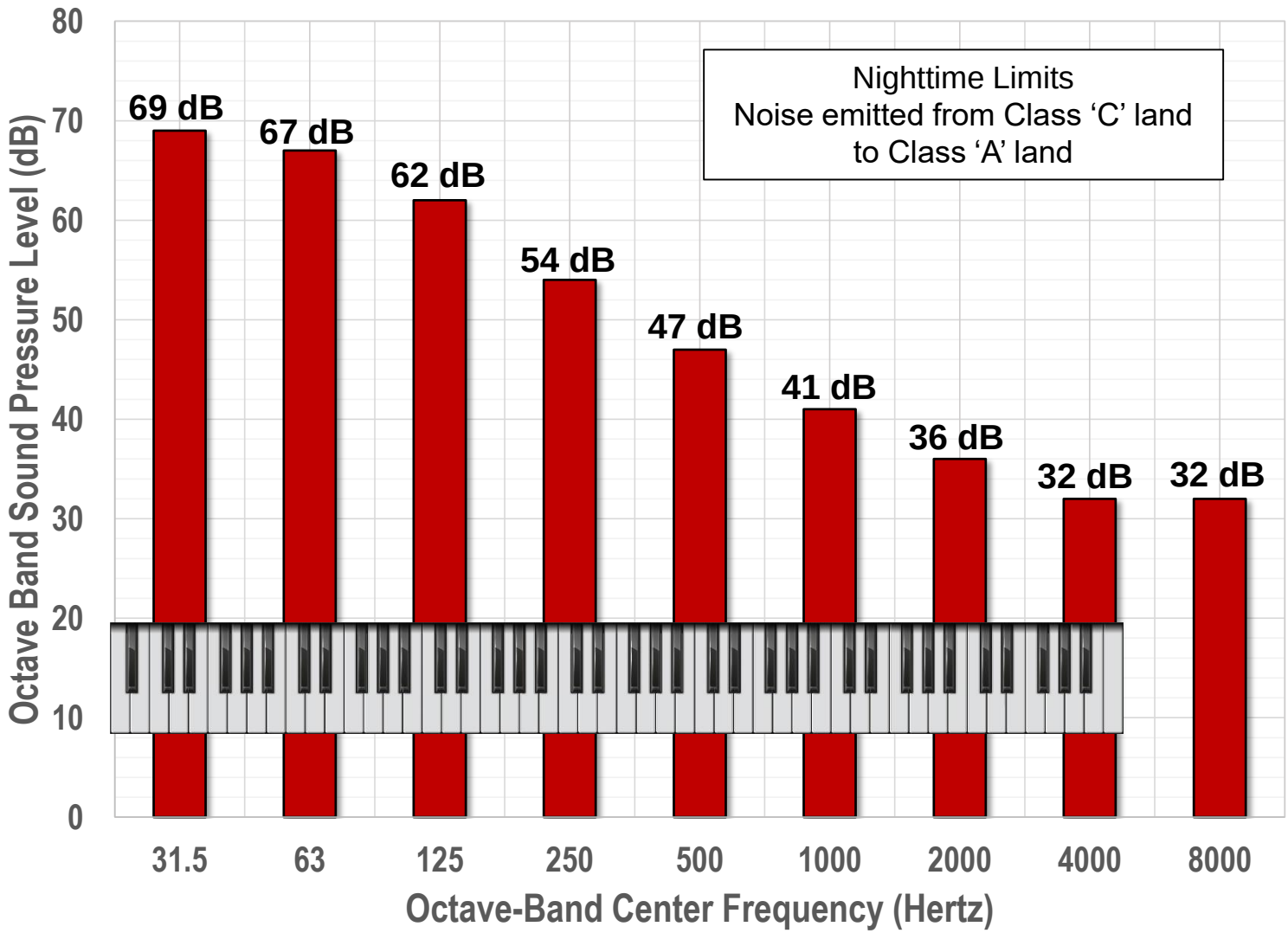
Hankard Environmental, Inc.
Verona, Wisconsin

HANKARD ENVIRONMENTAL
ACOUSTICS AND VIBRATION CONSULTING

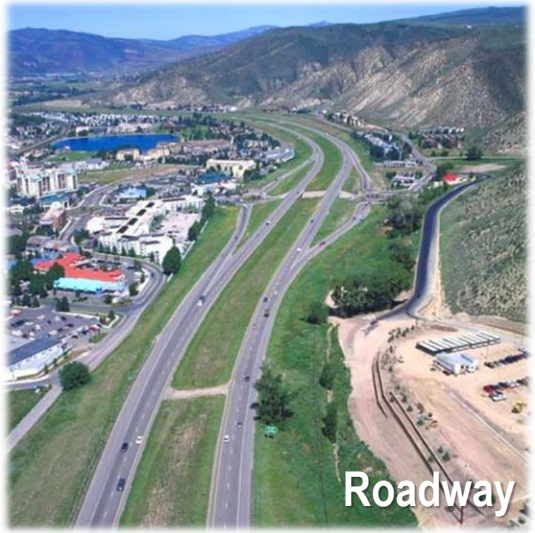
IPCB Nighttime Noise Limits



IPCB Nighttime Noise Limits

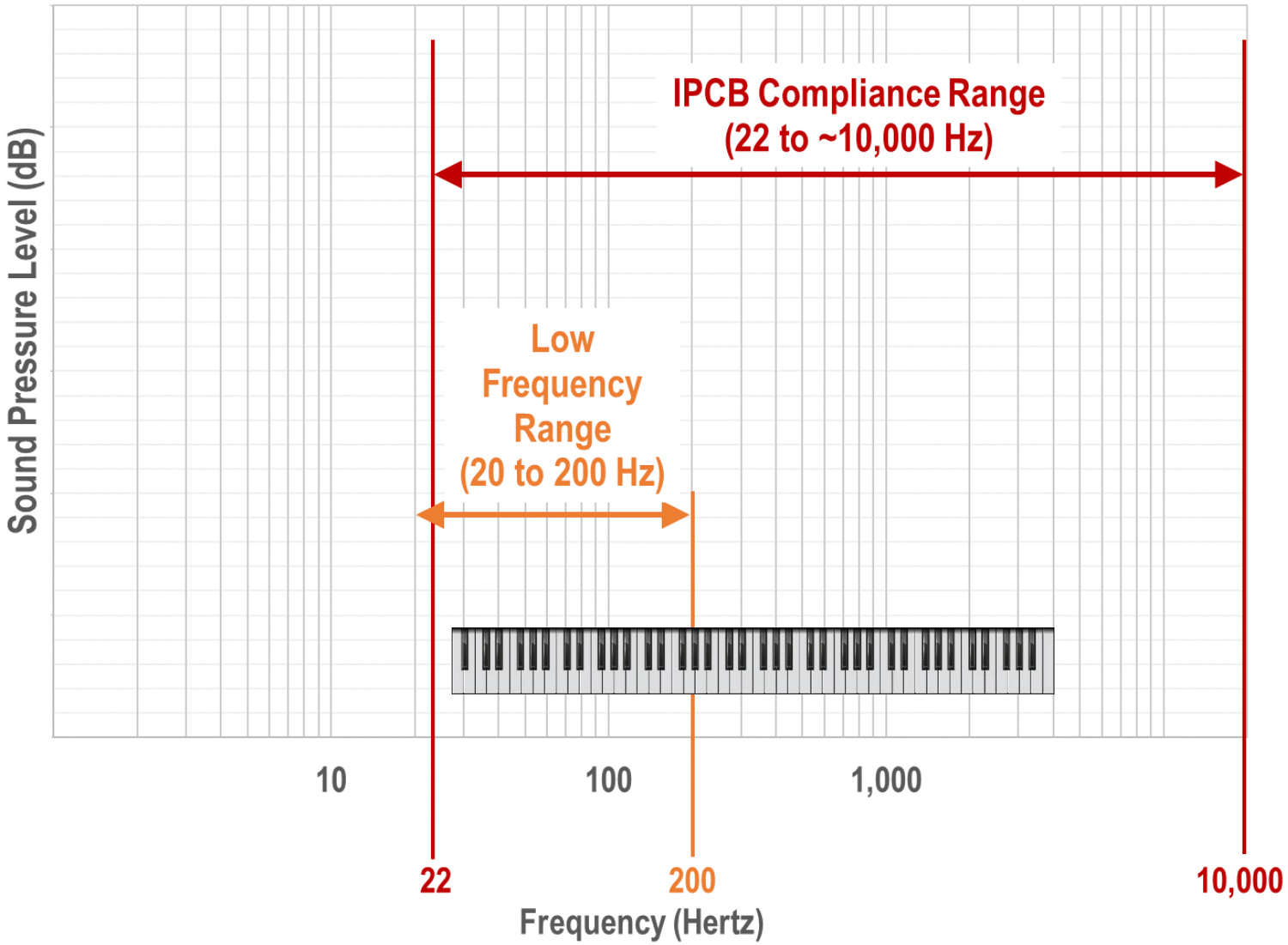


Environmental Noise Experience



- 27 Years of experience with environmental noise measurements and analyses
- Principally involved in over 500 projects
- Projects located across the U.S. and internationally
- Worked in multiple industries, and for developers and local agencies
- Also conduct research and provide expert testimony

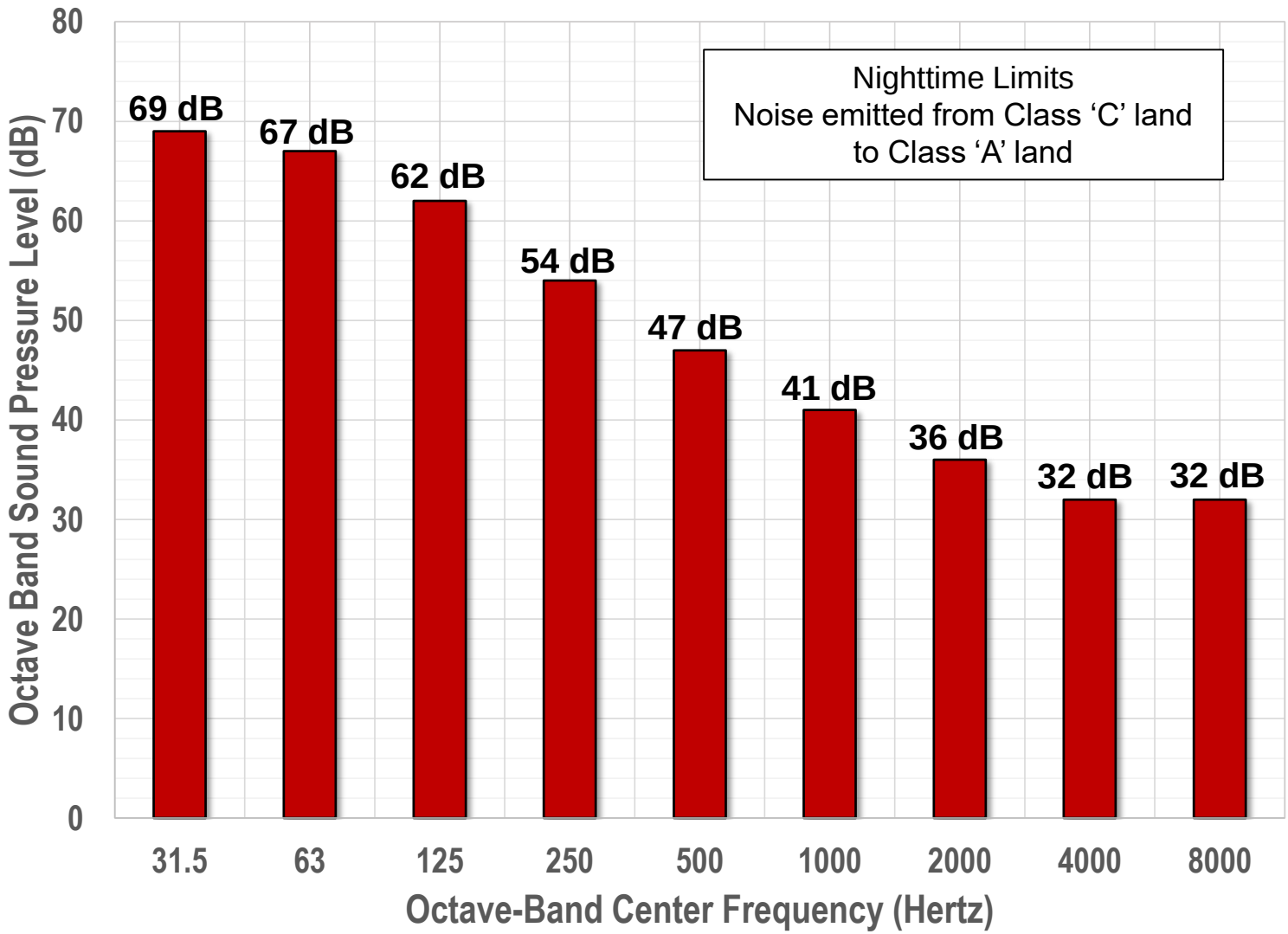
The Entire Frequency Range of Interest



Wind Turbine Noise Measurements

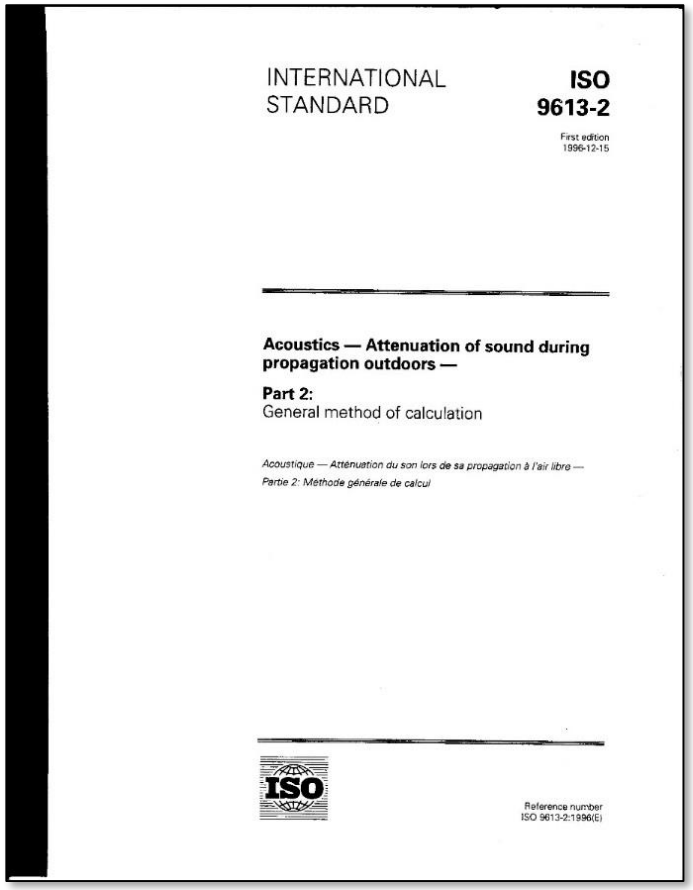
- Conducted detailed, long-term wind turbine noise level measurements on eight projects located across the U.S.
- Illinois noise study (3.5 months, IPCB compliance)
- Designed and managed multi-year compliance program for wind farm in Western U.S.
- Spent significant time in the field listening/measuring at residences
- Apply latest measurement techniques
- Developed advanced data analysis techniques based on ANSI standards

IPCB Nighttime Noise Limits: with A-weighting



Estimating Noise Levels at Residences: ISO 9613-2

International Organization for Standardization Method 9613-2



INTERNATIONAL STANDARD

ISO 9613-2

First edition 1996-12-15

Acoustics — Attenuation of sound during propagation outdoors —

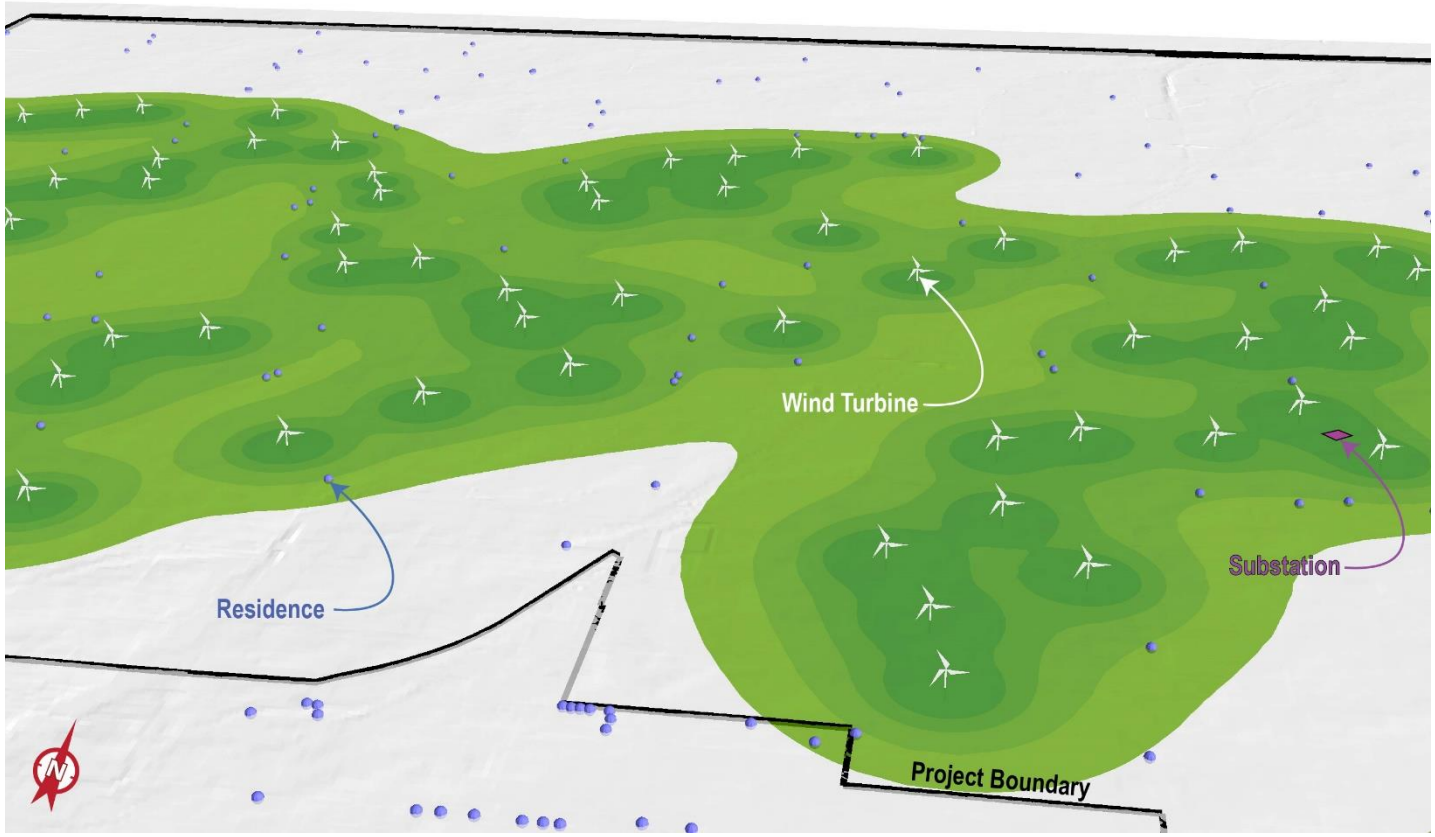
Part 2:
General method of calculation

Acoustique — Atténuation du son lors de sa propagation à l'air libre — Partie 2: Méthode générale de calcul

Reference number ISO 9613-2:1996(E)

- Emission levels
- Directivity
- Divergence
- Atmospheric absorption
- Ground effects
- Barriers
- Vegetation
- Meteorology

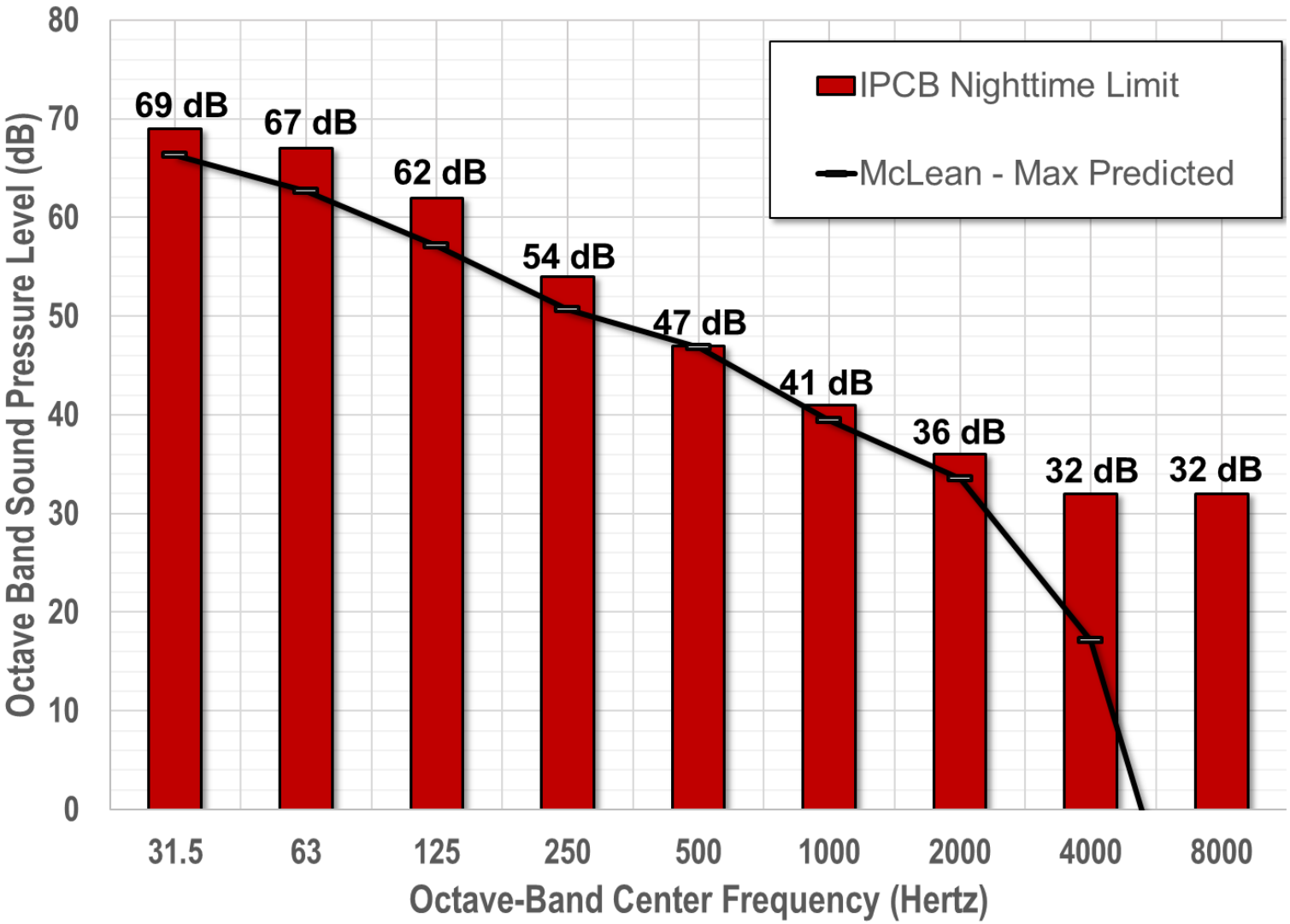
Distributed Nature of Wind Turbine Farm Noise



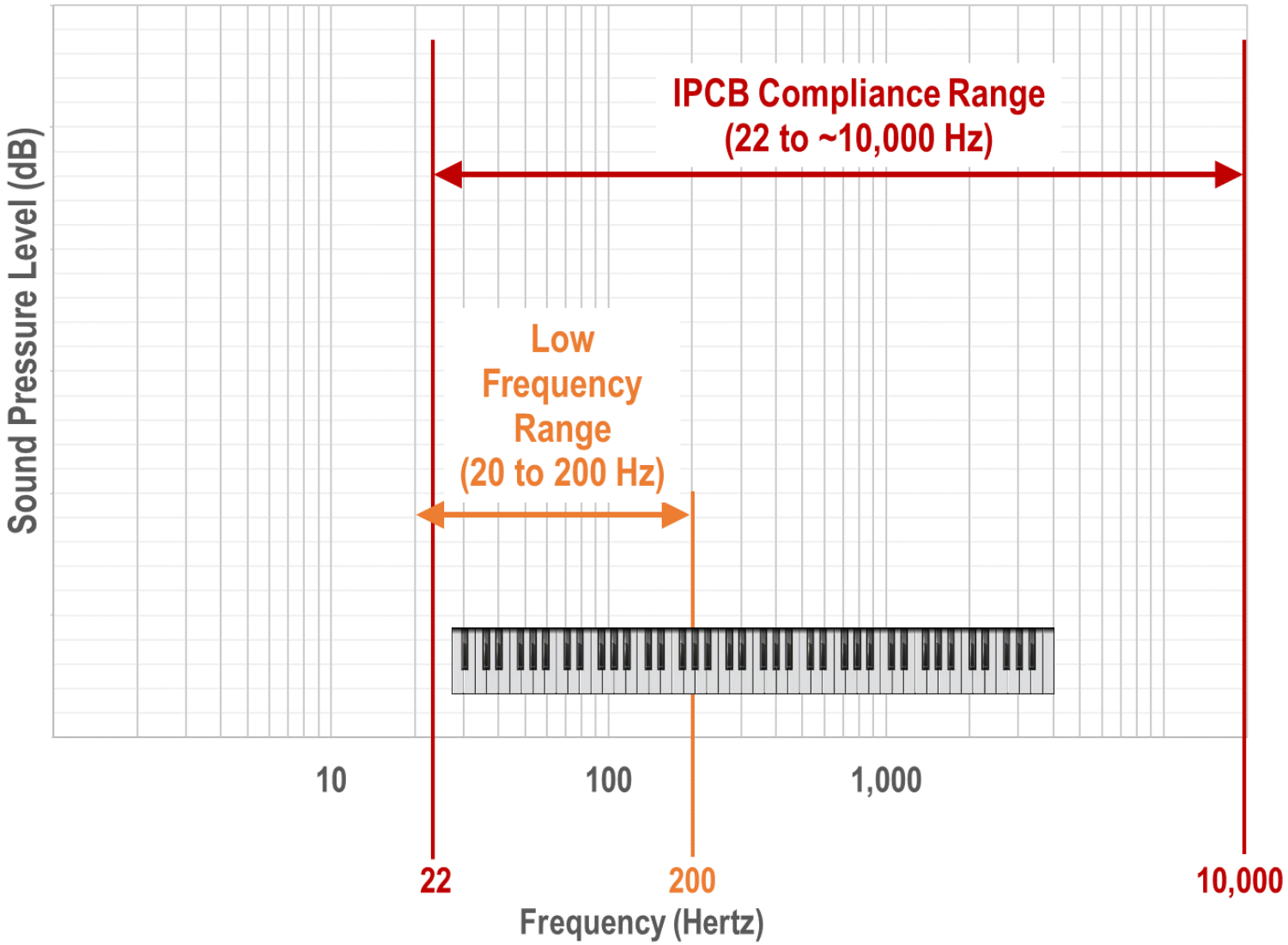
The “Loudest Hour”

- All turbines operating at full acoustic power output
- Non-turbulent atmosphere
- Presence of temperature inversion
- Receptors downwind of nearest turbines
- Occurs mainly at night
- Our model is tied to this condition
- Wind turbine noise levels will generally be lower than predicted

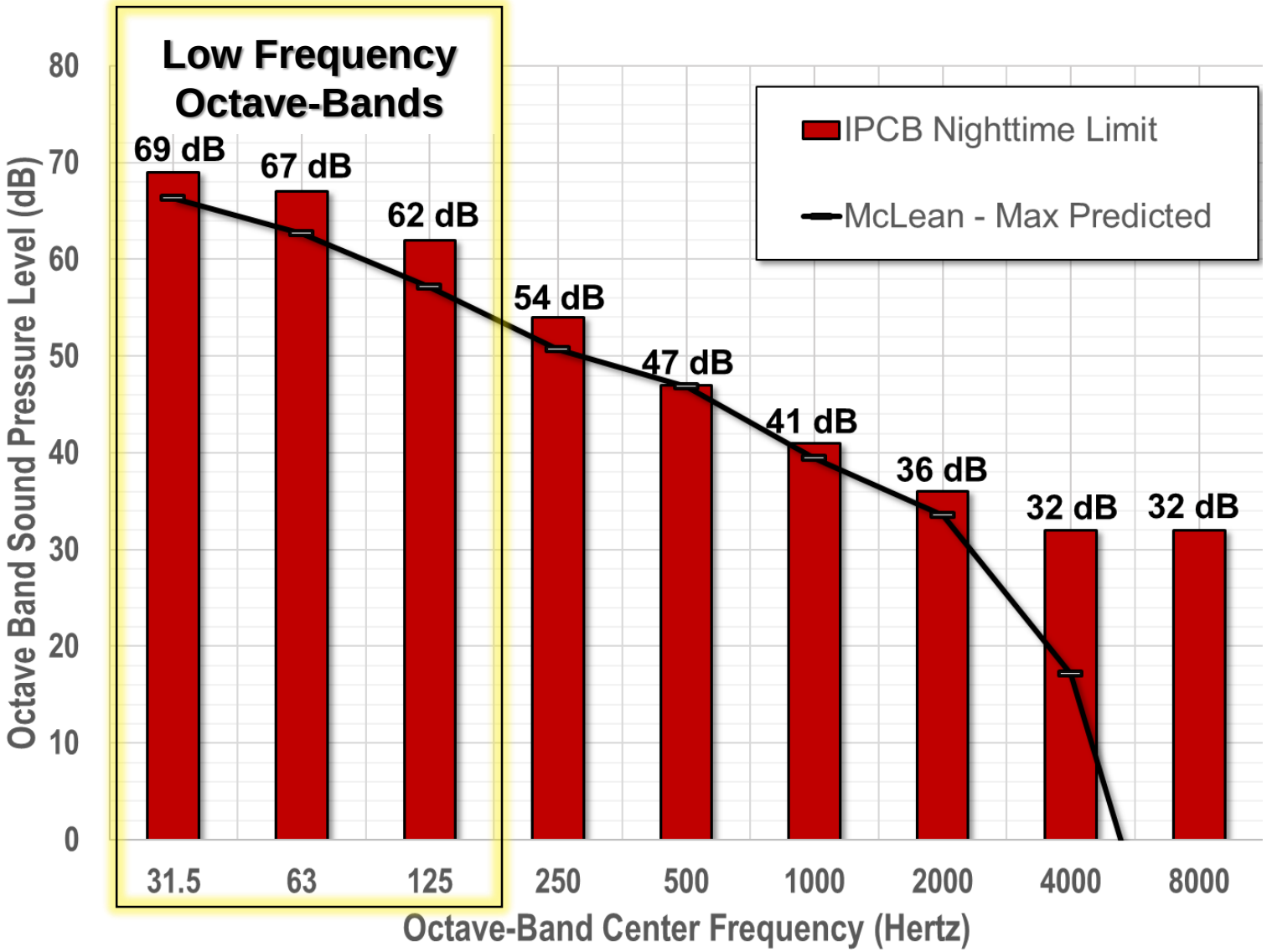
Loudest Expected McLean Wind Noise Levels



The Entire Frequency Range of Interest



Wind Turbine LFN Levels Below IPCB Limits



McLean County Wind Noise Analysis Summary

The Noise Analysis Conducted for the McLean County Wind Energy Center Cleary Demonstrates that Noise Levels Will Be Lower Than IPCB Limits

- Wind Turbines were sited more than 1,500 feet from residences.
- Siting based on a noise analysis methodology that is conservative and proven based on measurements.
- Model validated against loudest conditions, therefore compliance is expected at all times and under all atmospheric conditions.
- Noise levels will be less than those predicted a majority of the time.
- Predicted Low Frequency Noise levels are lower than IPCB standards.