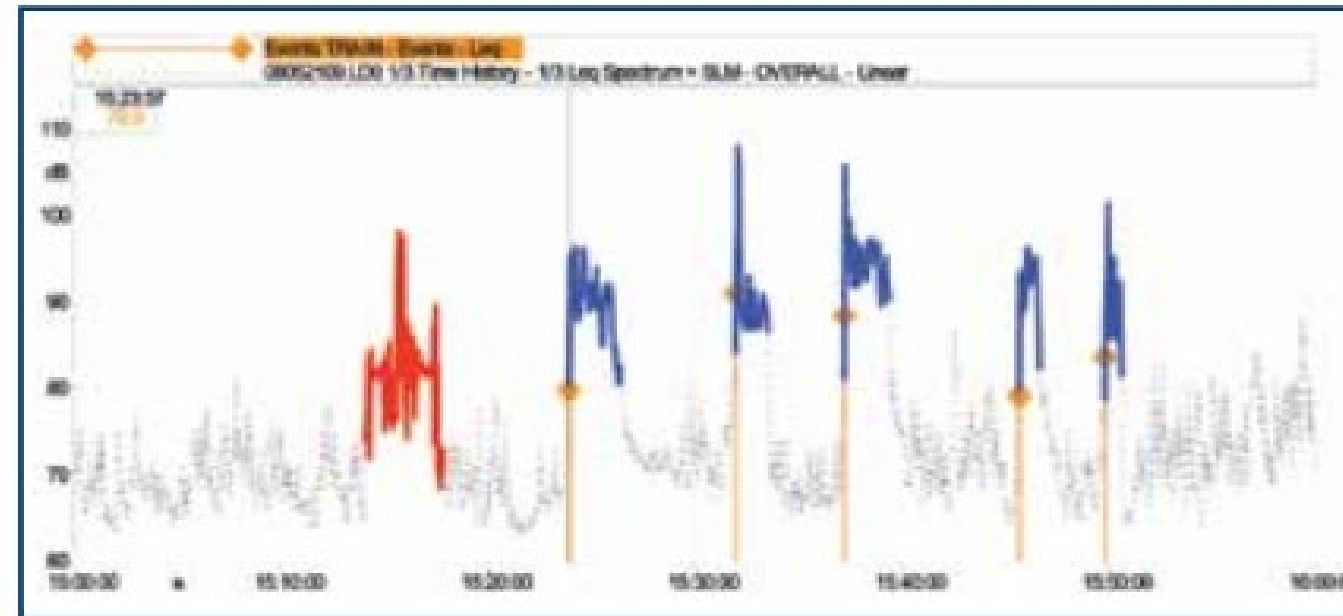
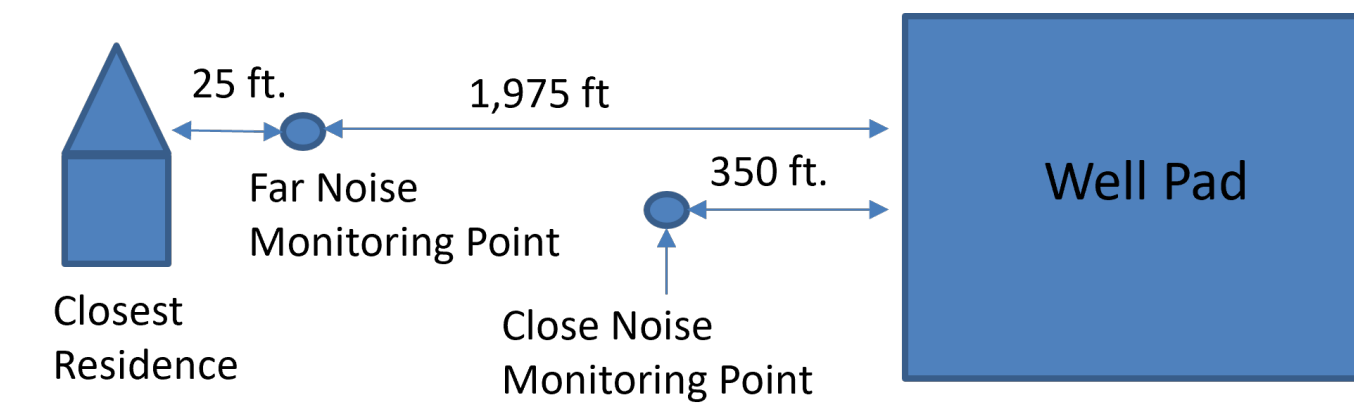


# Monitoring Noise from Oil and Gas Development

## Measurements



### Measurement Device: Larson Davis NMS044

- Field-deployed noise monitoring equipment
- Solar panel powered

### Measurements

- Continuous noise measurement
- 1-second intervals, dBA, dBC
- 1/3 Octave bands for noise character
- Triggered recording for review of noise sources

## When and Where



### Monitor at least two well-pads All phases of operations

- Baseline
- Pre-development construction
- Drilling
- Hydraulic fracturing
- Flowback

### Other data collected

- Wind speed, Snow cover, Temperature
- COGCC Complaint data
- Operator monitoring data?

### Site Characteristics

- Number of wells
- Well pad size
- Presence and type of sound walls
- Phase of operation
- Site equipment inventory?
- Worker noise monitoring data?

## Outputs

Description	Time Period	Units
Leq: average sound pressure level over monitoring period	24 -hour	dBA
Leq-Day: Average sound pressure level (7 AM to 7 PM)	12-hour	dBA
Leq-Night: Average sound pressure level (7 PM to 7 AM)	12-hour	dBA
Ldn: Day-night average sound level	24-hour	dBA
L10: Noise level exceeded 10% of the time	24-hour	dBA
CNEL: Community Noise Equivalent Level	24-hour	dBA
Exceedance Fraction: 65 dBA day	12-hour	%
Exceedance Fraction: 60 dBA night	12-hour	%
Exceedance Fraction: 65 dBC day	12-hour	%
Exceedance Fraction: 65 dBC night	12-hour	%

### Noise levels:

- Described by phase of operation and site equipment profile
- Compared by sound wall type
- Compared to state regulations
- Compared to other environmental noise sources
- Adjusted Using triggered recording analysis
  - Exclude truck traffic
  - Exclusion on non-oil and gas noise sources

## Outcomes

- Published data on O&G noise by phase of operation for health risk assessment
- Data for operators on equipment or operational characteristics associated with higher noise levels
- Information to the public on expected noise levels including levels, variability, and duration