# St Patricks Plains Wind Farm

## Noise information session

Friday 18 February 2022 and Saturday 19 February 2022

Steppes Hall

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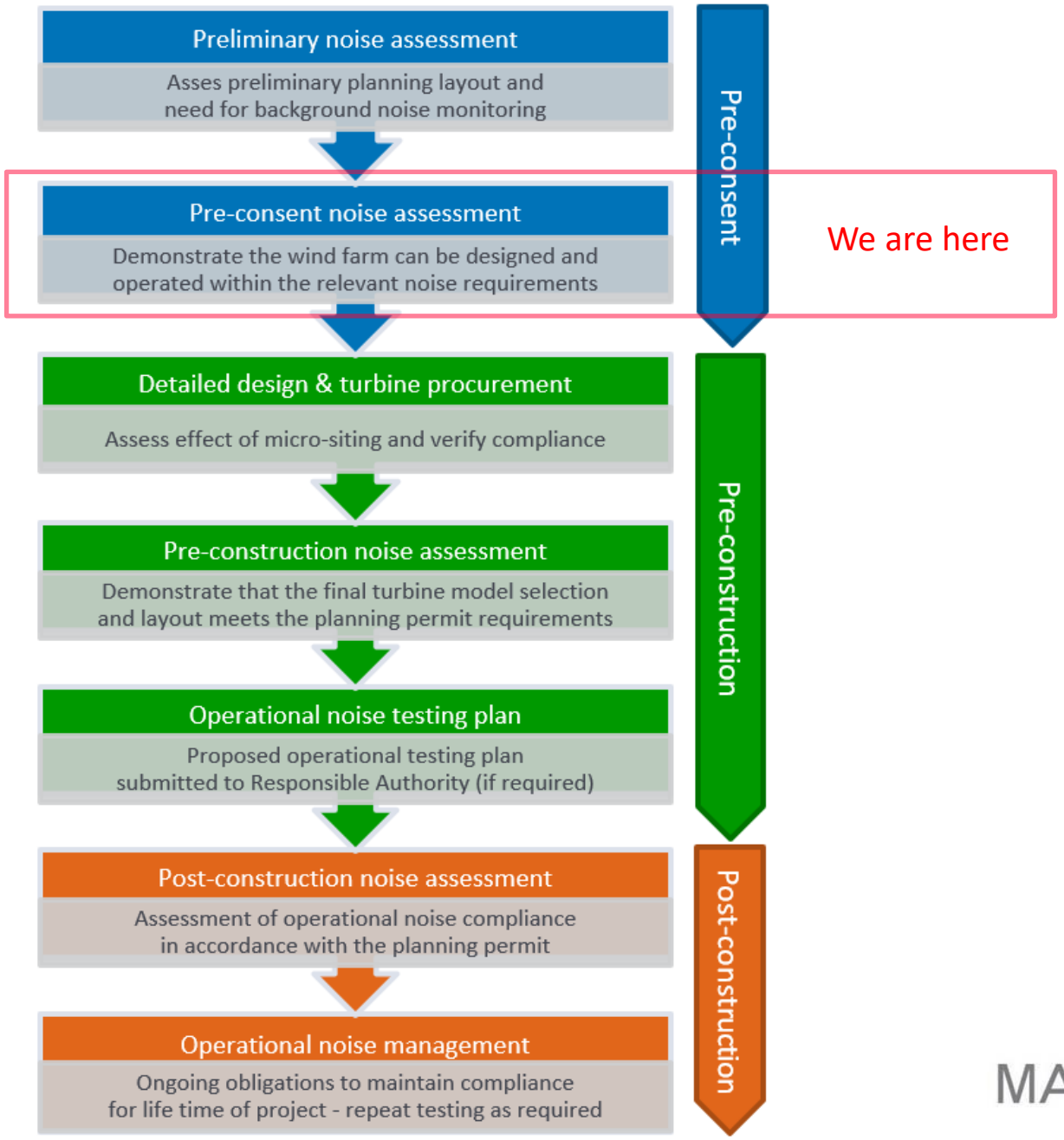


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# Relevant guidelines

- Tasmanian EPA
  - *Project Specific Guidelines for Preparing an Environmental Impact Statement for Epuron Projects Pty Ltd St Patricks Plains Wind Farm* dated October 2019 (Project Specific Guidelines)

- Section 6.4 of the Project Specific Guidelines
  - Tasmanian *Environment Protection Policy (Noise) 2009* (EPP)
  - Tasmanian EPA *Noise Measurement Procedures Manual*, dated July 2008 (NMPM)
  - New Zealand Standard 6808:2010 *Acoustics – Wind farm noise* (NZS 6808)

- Construction noise and vibration
  - Tasmanian *Environmental Management and Pollution Control (Noise) Regulations 2016* (EMPC)
  - NSW Roads and Maritime Service's publication *Construction Noise and Vibration Guideline* (NSW RMS Guideline)

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# Assessment method

## Operational noise

- Assess background noise levels at selected receivers around the project
  - Preliminary predictions indicated only 1 monitoring location technically required
  - Background noise monitoring at 7 receivers between August and November 2020
- Assess the land zoning of the project site and surrounding areas
  - Area within the predicted 35 dB $L_{A90}$ contour is identified as Rural Resource
  - Based on the land zoning, minimum noise limit of 40 dB $L_{A90}$ is applicable
- Establish suitable noise criteria accounting for background noise levels and land zoning
  - Wind turbines: NZS 6808 noise limit of 40 dB $L_{A90}$ or background noise + 5 dB, whichever is higher
  - Substation: EPP acoustic environment indicator level 45 dB $L_{Aeq}$, applicable outside bedrooms
- Predict noise levels from the proposed turbines and substation
  - Consideration of potential special audible characteristics penalties (only tonality pre-construction)
- Compare predicted noise levels with the applicable noise criteria

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# Assessment method

## Construction noise and vibration

- Establish suitable construction noise and vibration criteria (as relevant)

  *Noise*

  - EMPC defines prohibited hours for equipment and machinery used on construction sites

  *Vibration*

  - NSW Roads and Maritime Service's publication *Construction Noise and Vibration Guideline*
  - Sets out minimum working distances from sensitive receivers for typical items of vibration intensive plant

- Source empirical data for the noise produced by the proposed construction equipment
  - Australian Standard 2436:2010 (AS 2436)
  - British Standard 5228–1:2009+A1:2014 (BS 5228-1)
  - Reference data by MDA.

- Predict construction noise levels in accordance with AS 2436

- Recommend best practice measures to minimise the potential impact

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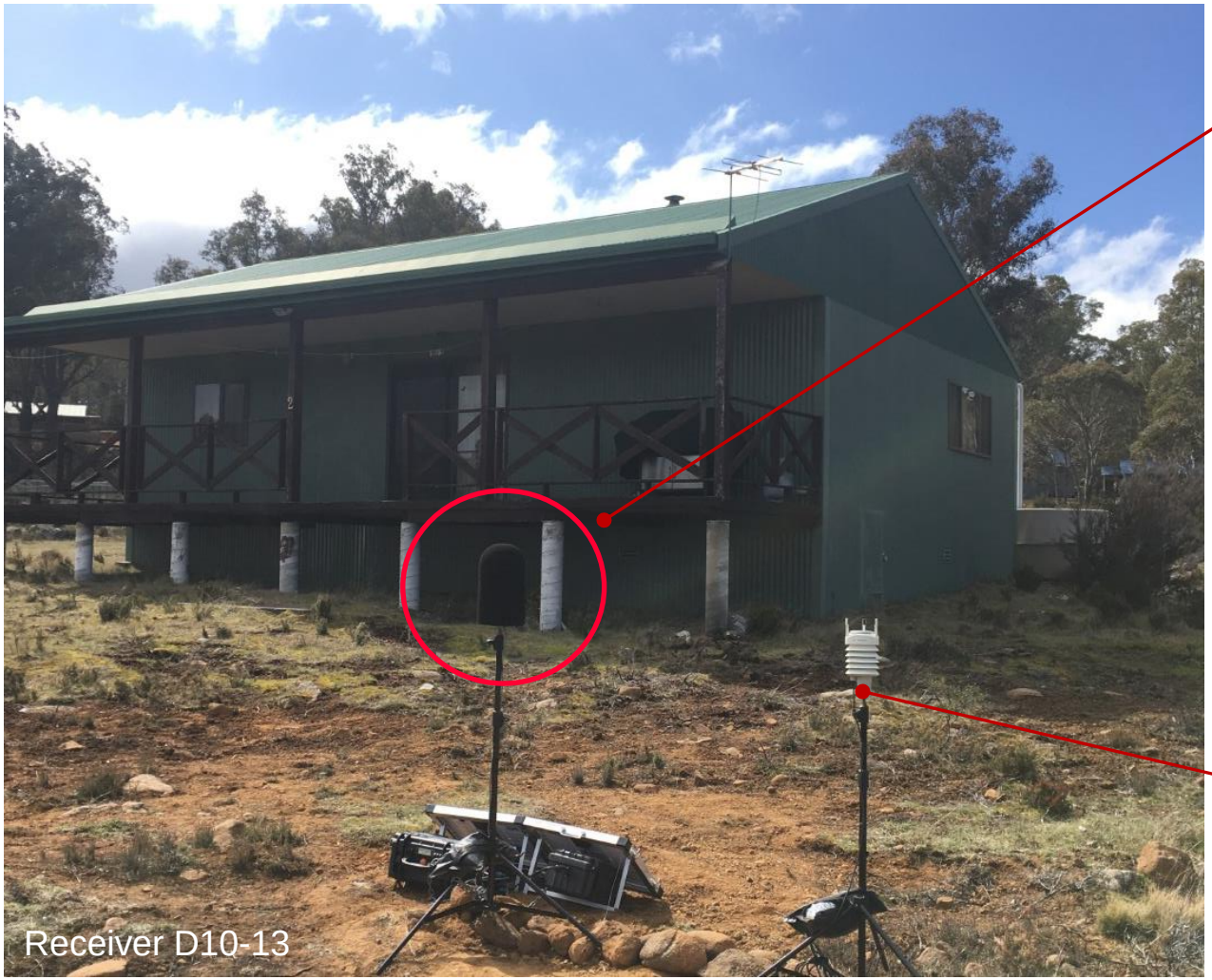
# Background noise monitoring




Solar powered
noise monitoring unit
with enhanced wind shield

Weather station

(rainfall, wind speed, wind direction)

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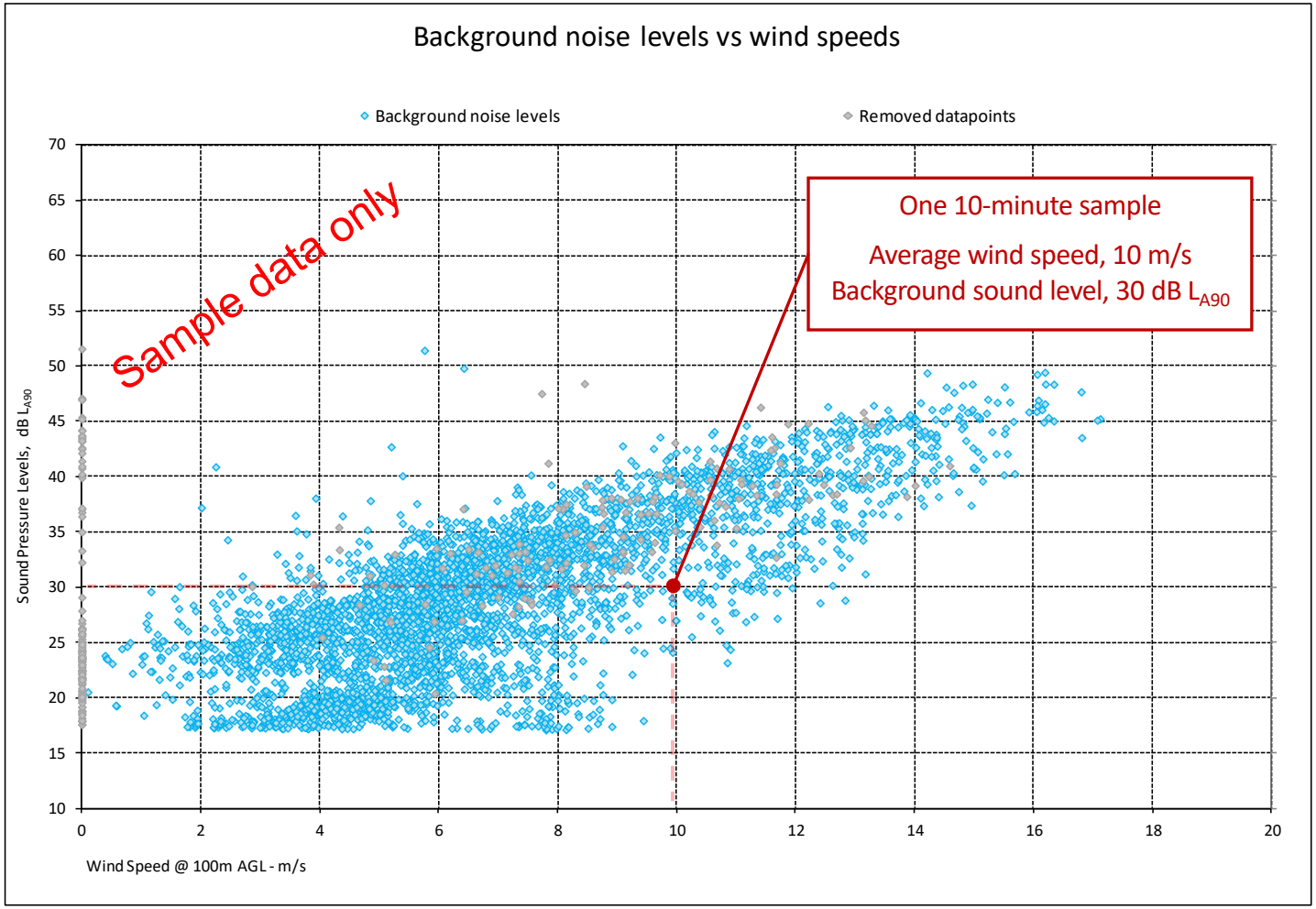
# Background noise monitoring

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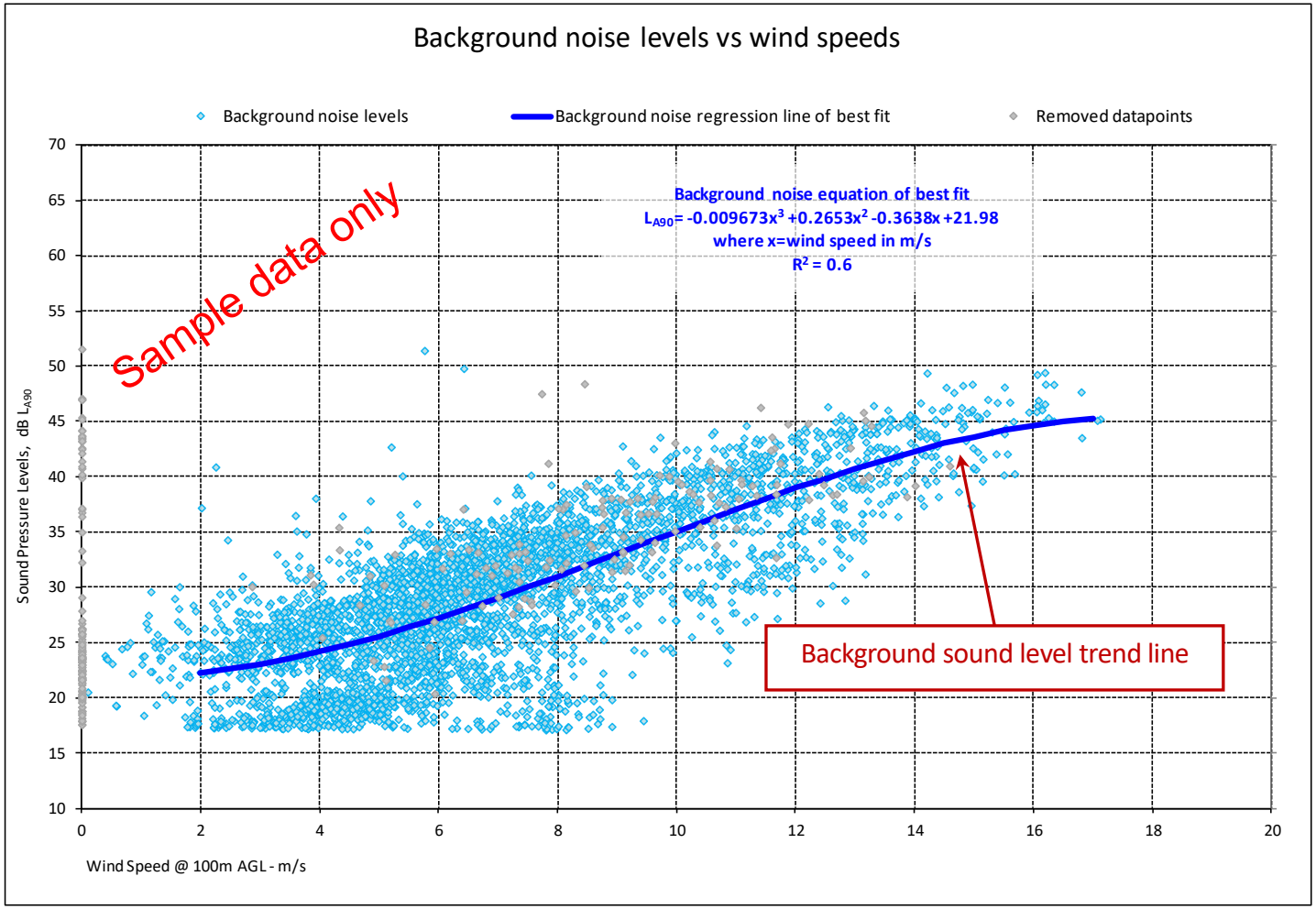
# Background noise monitoring

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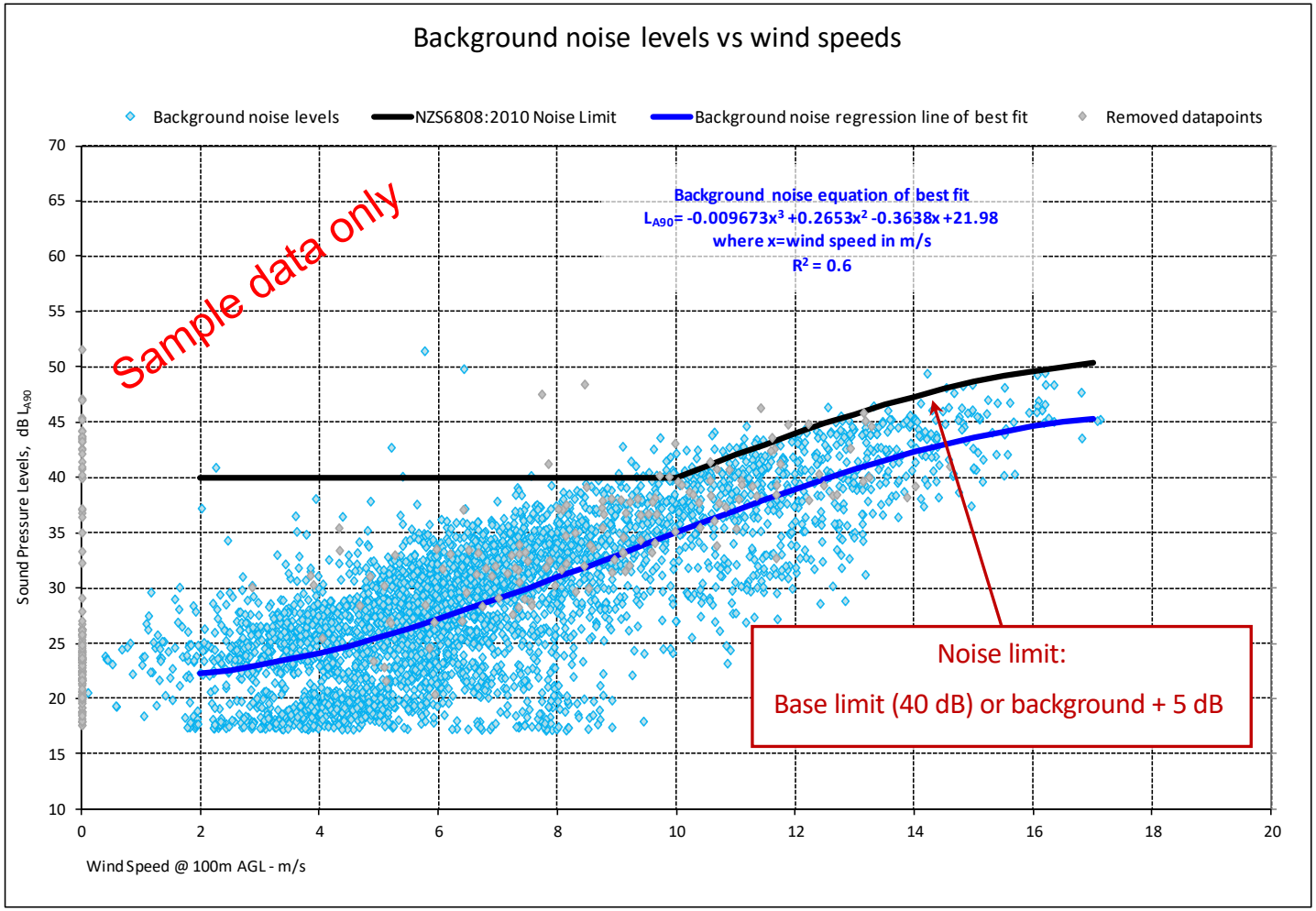
# Background noise monitoring

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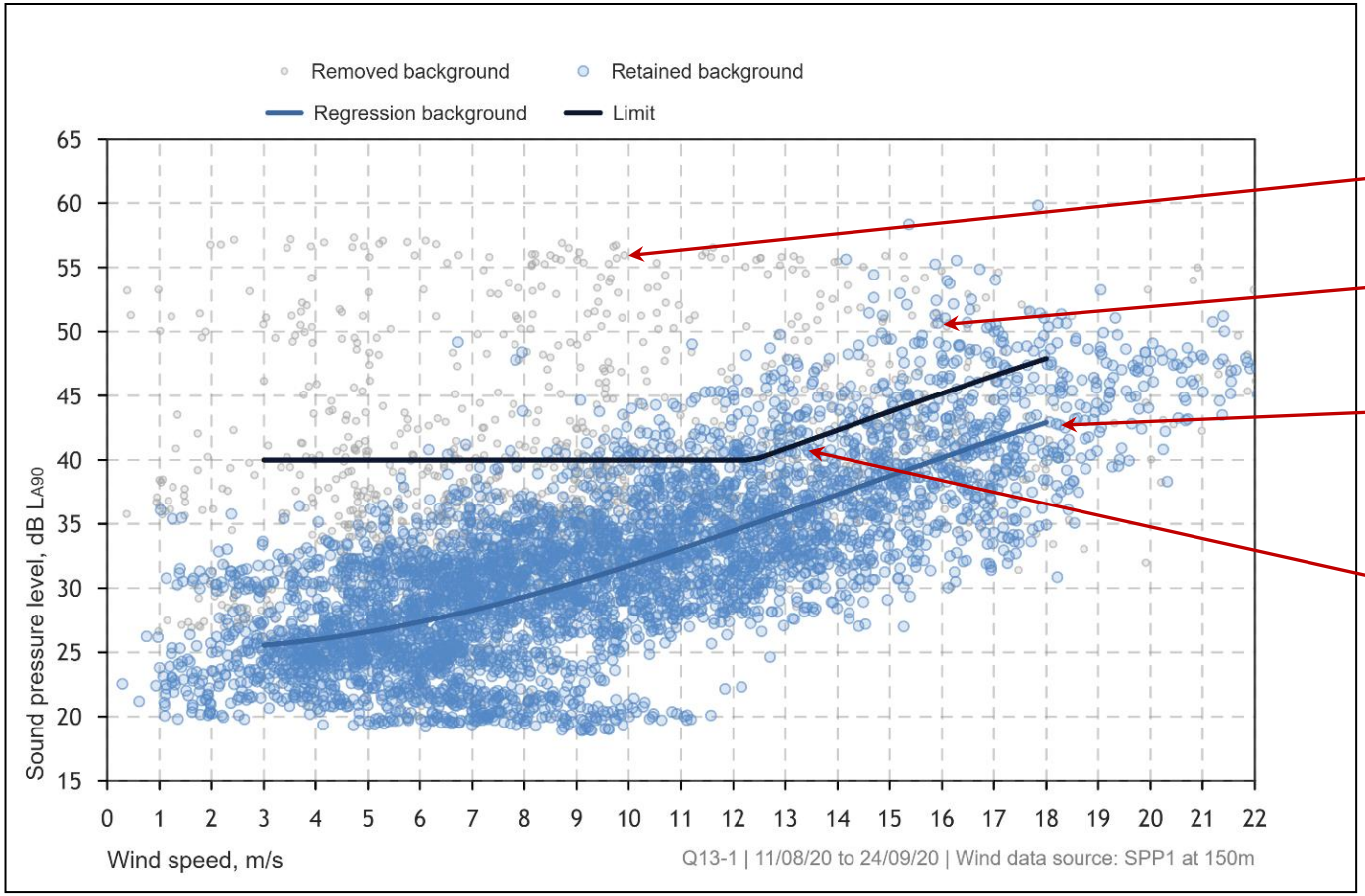
# Example background noise plot




Filtered data points

Analysed data points

Background sound level trend line

Noise limit:

Base limit (40 dB) or background + 5 dB

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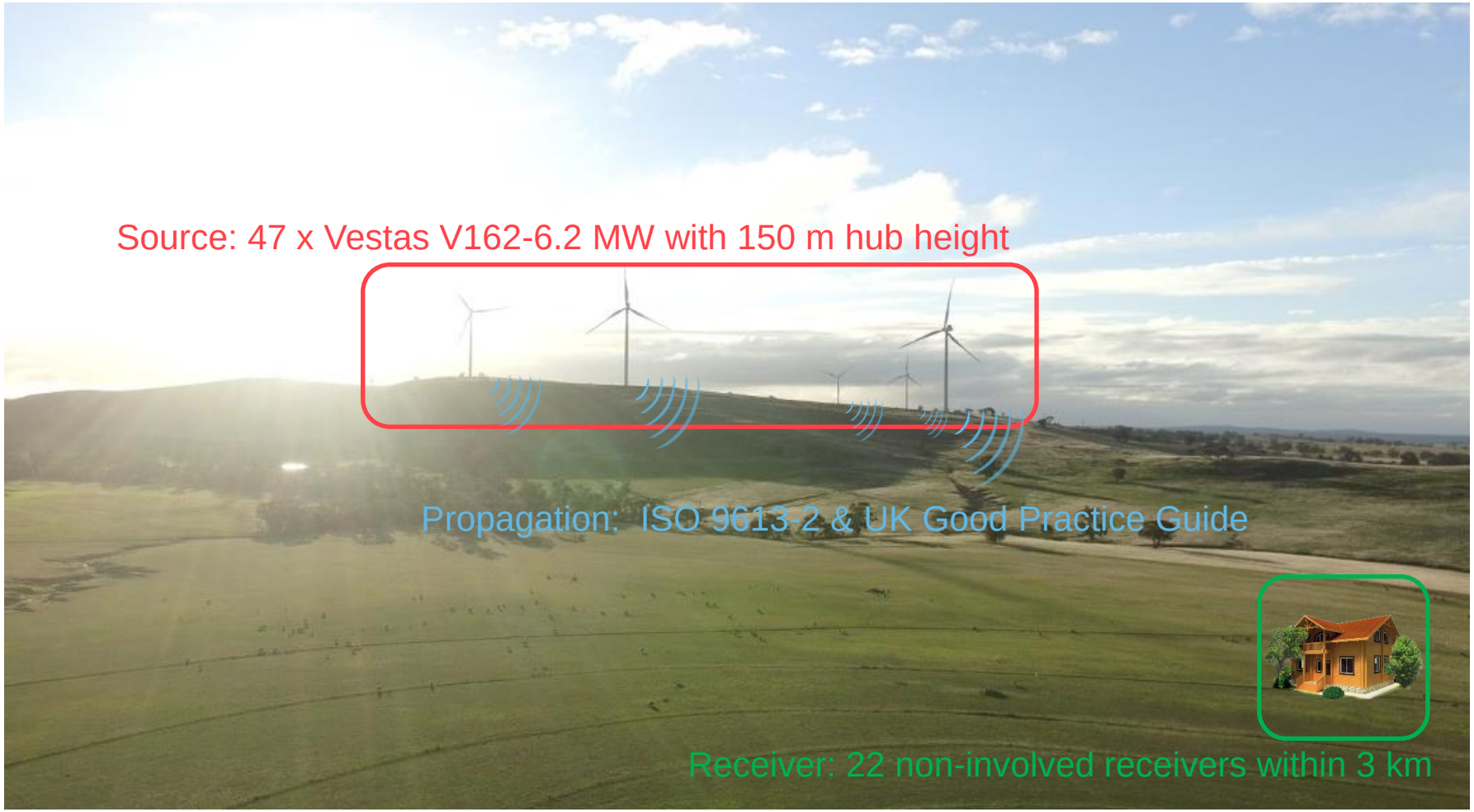
# Wind turbine noise prediction

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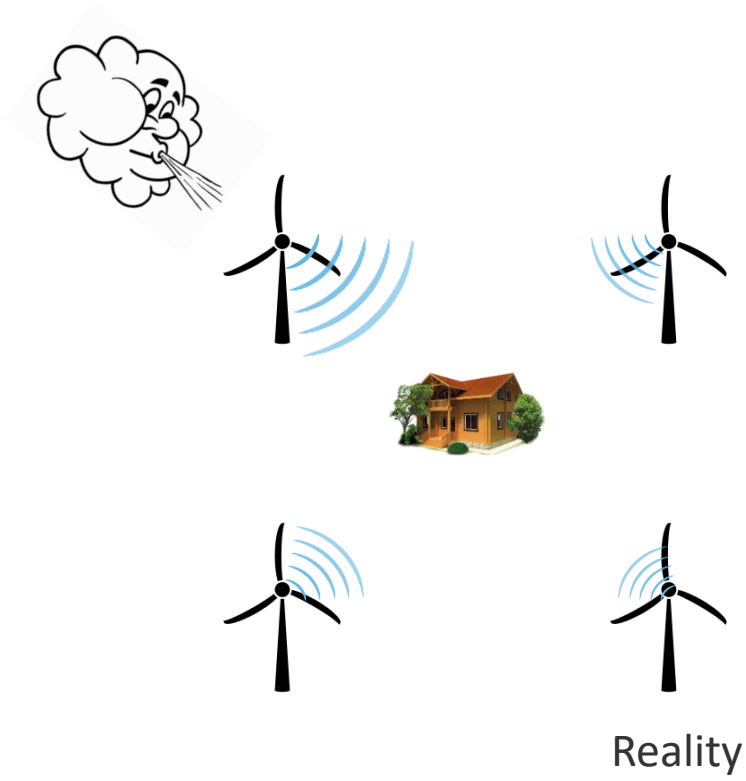
# Noise prediction method

## ISO 9613-2

- Conservative assessment method that gives a typical worst case wind farm noise level
- Assumes simultaneous downwind propagation from every turbine to every calculation point
- All turbine simultaneously generating emissions 1 dB higher than specified by the manufacturer
- Accounts for the unique terrain and ground conditions of the site
  - Digital model of the ground profile of the area
  - Conservative characterisation of the ground conditions



Reality

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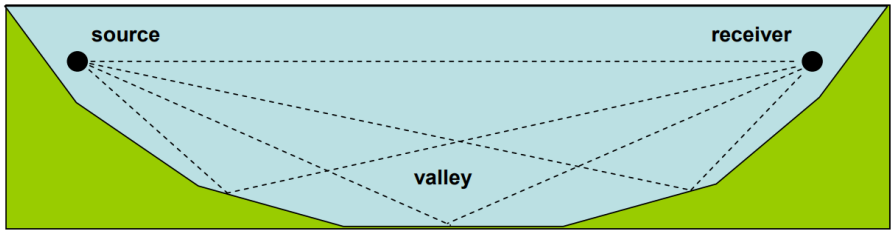
# Noise prediction method

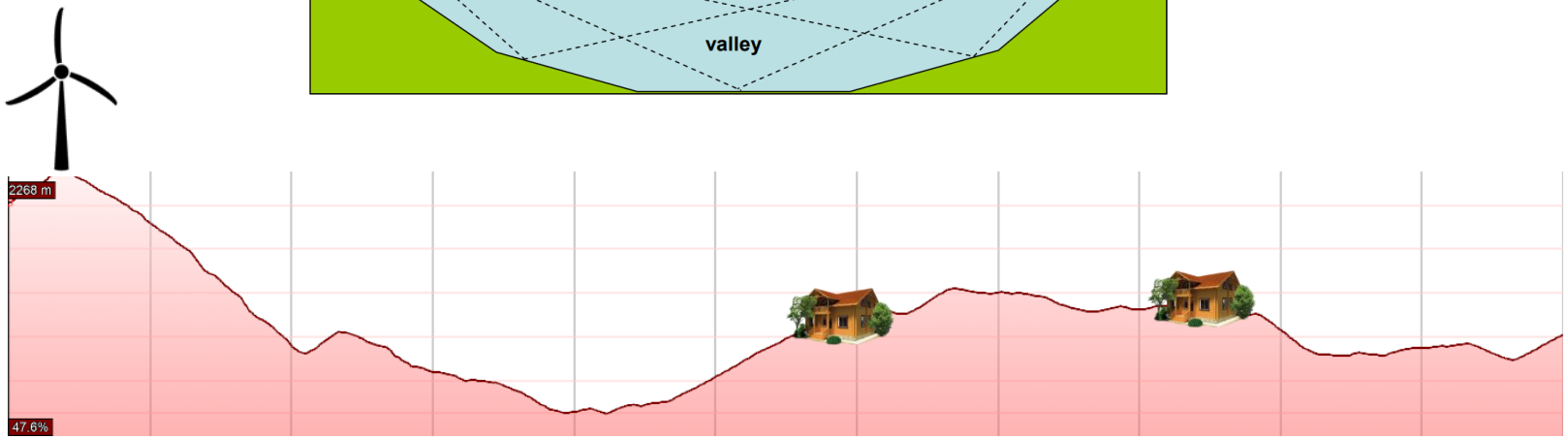
## IoA UK Good Practice Guide

- UK Institute of Acoustics Good Practice Guide, May 2013

  *A good practice guide to the application of ETSU-R-97 for the assessment and rating of wind turbine noise*

  - Addition of 1 dB uncertainty margin on manufacturer specification
  - Limitation of topographic shielding of the terrain at 2 dB
  - Potential increase in noise levels to account for valley effects

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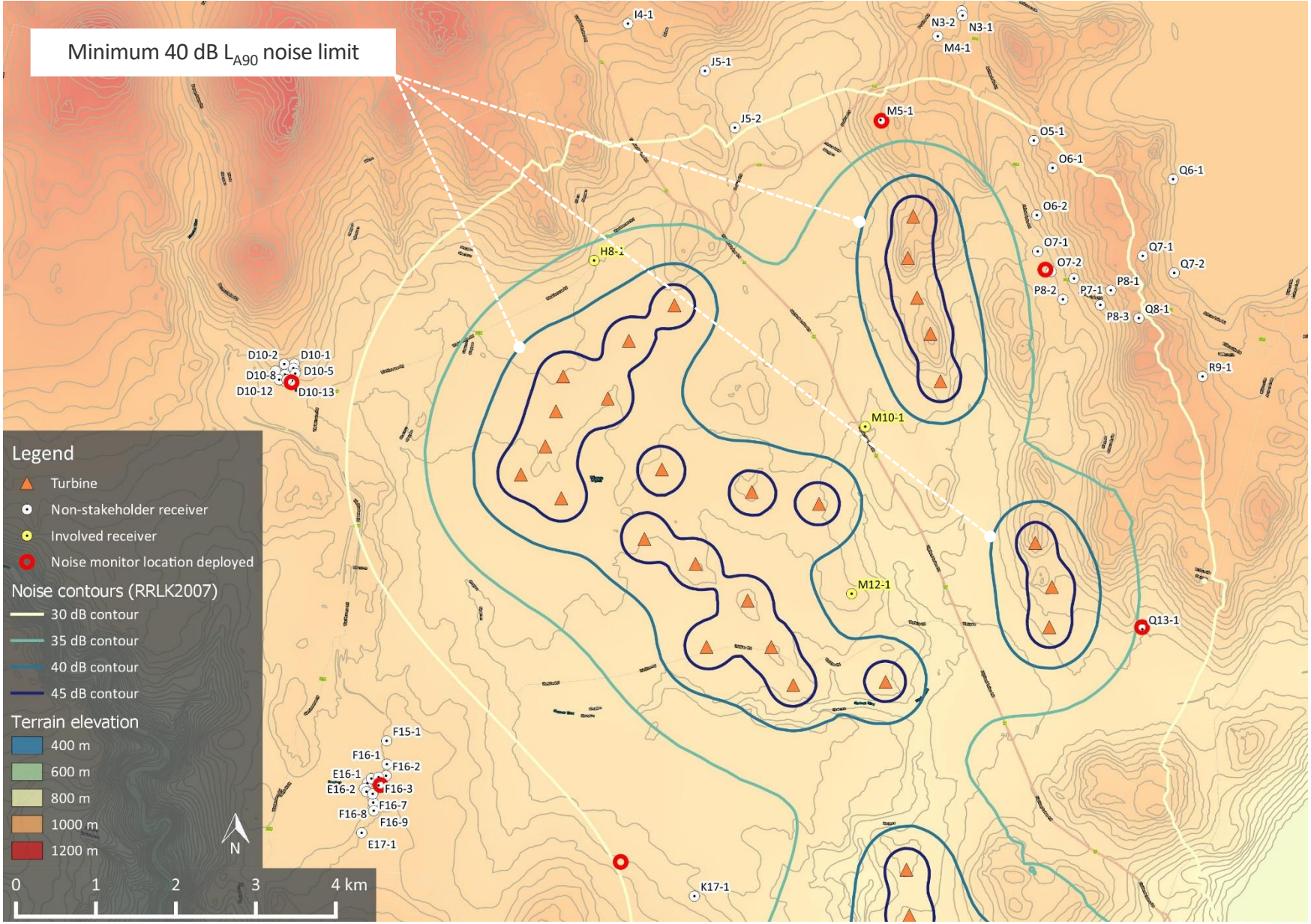


Downwind predicted noise levels in all directions

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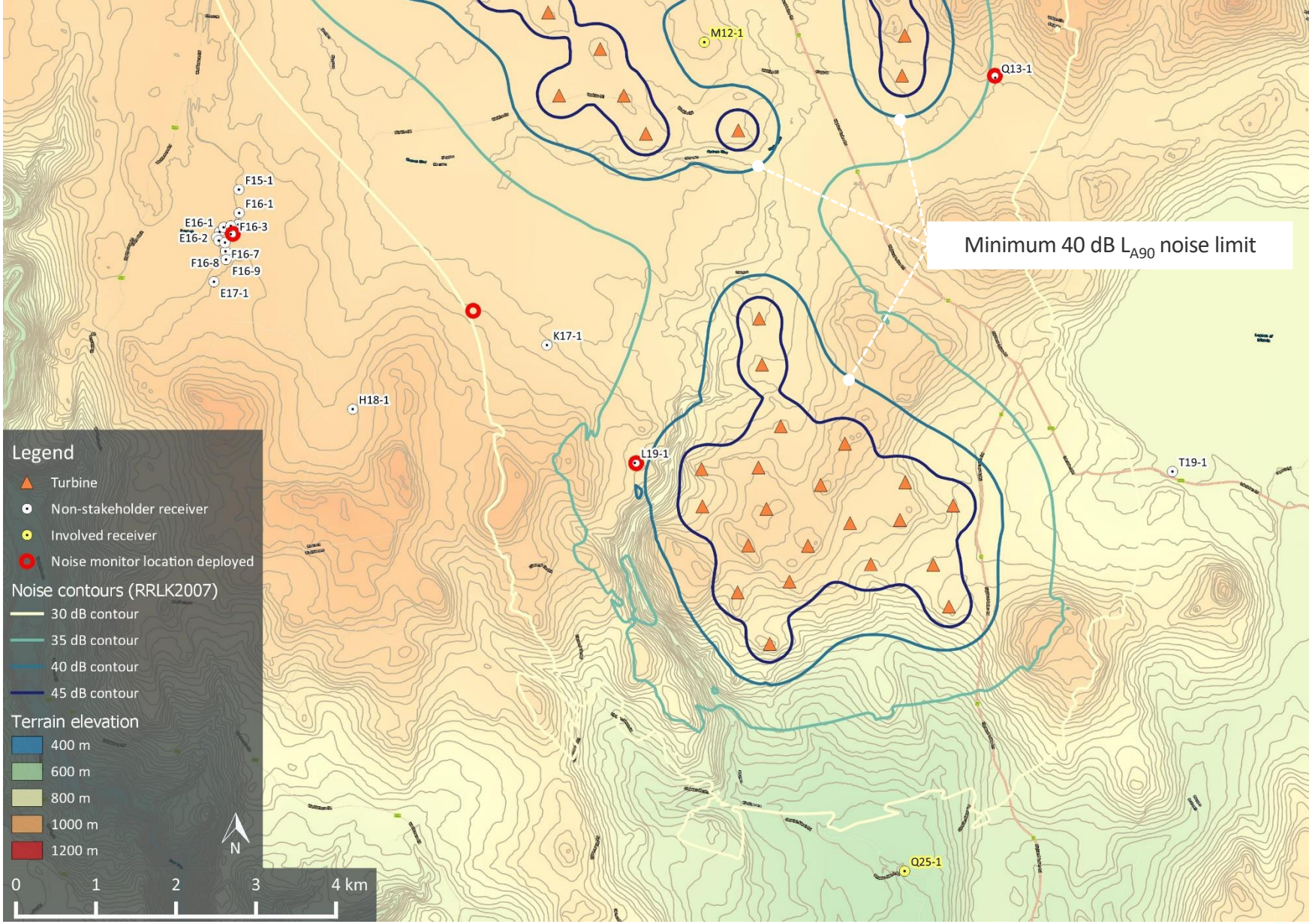


Downwind predicted noise levels in all directions

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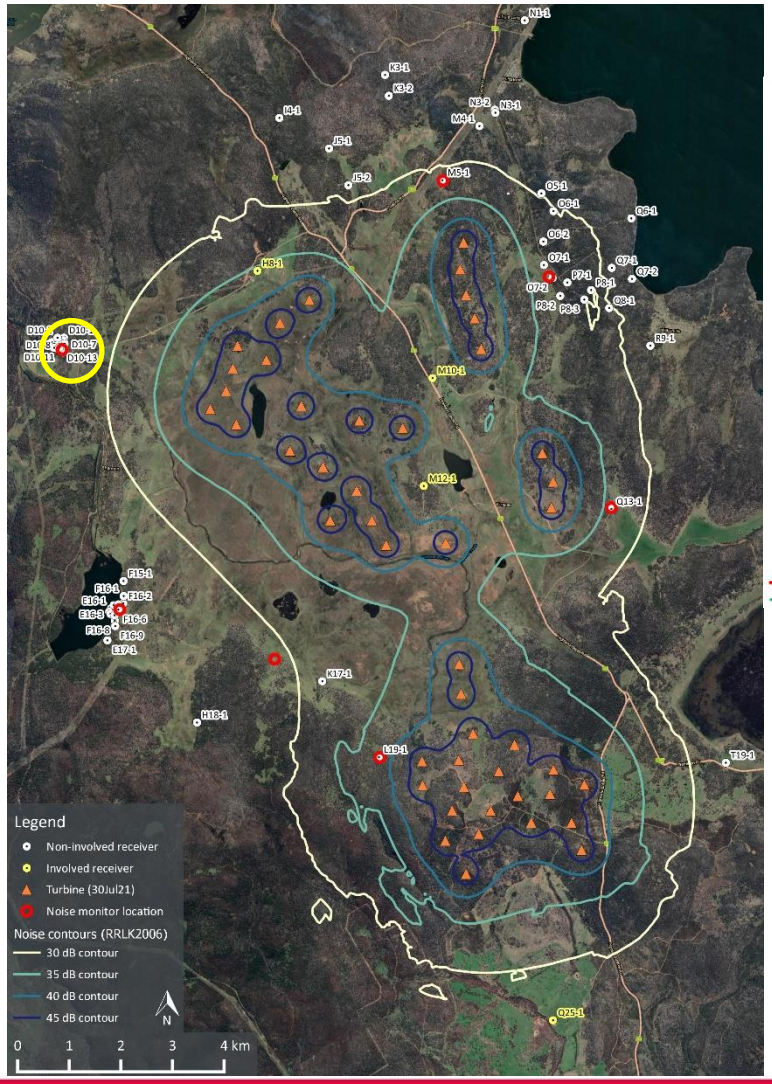
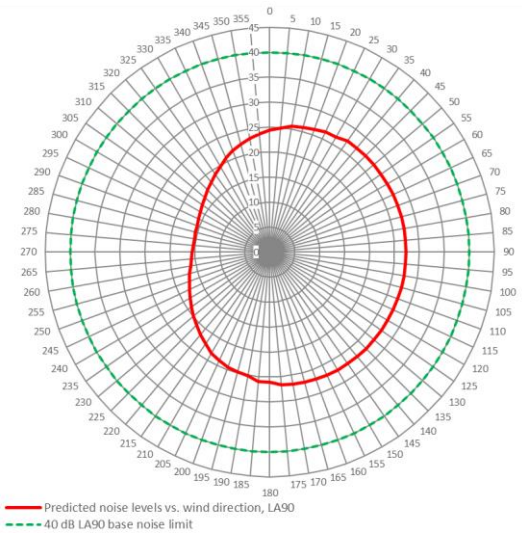
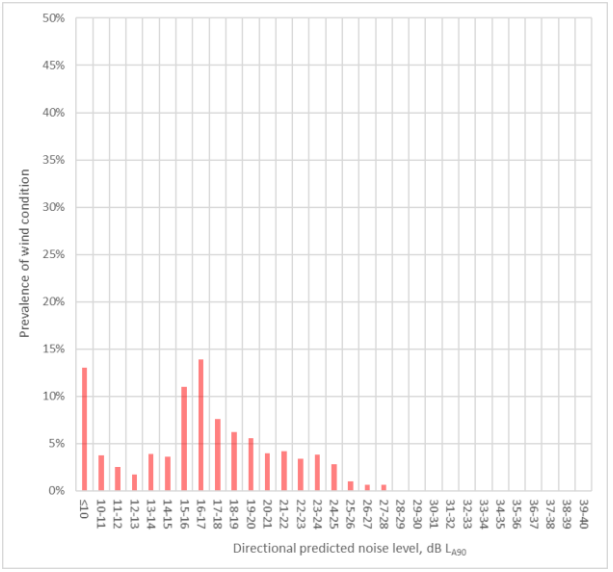
# Wind turbine noise prediction

## Directional analysis – D10-13

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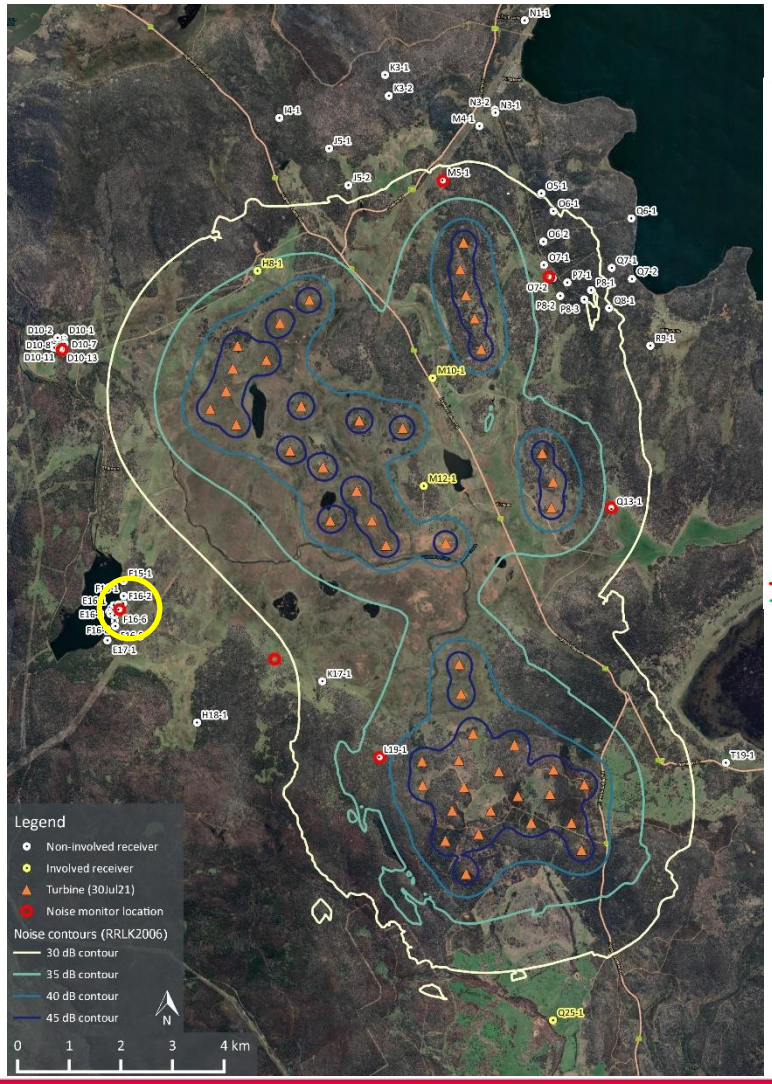
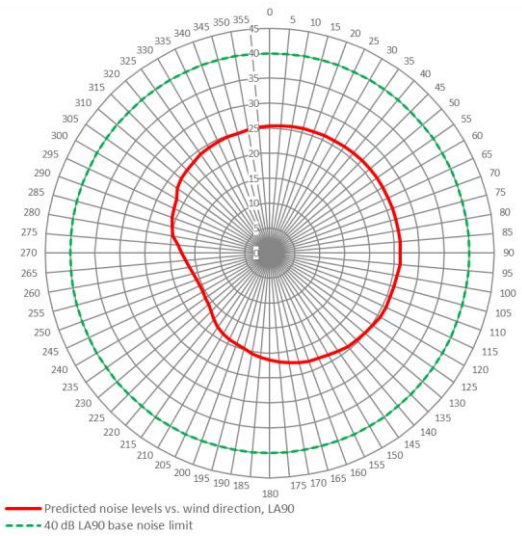
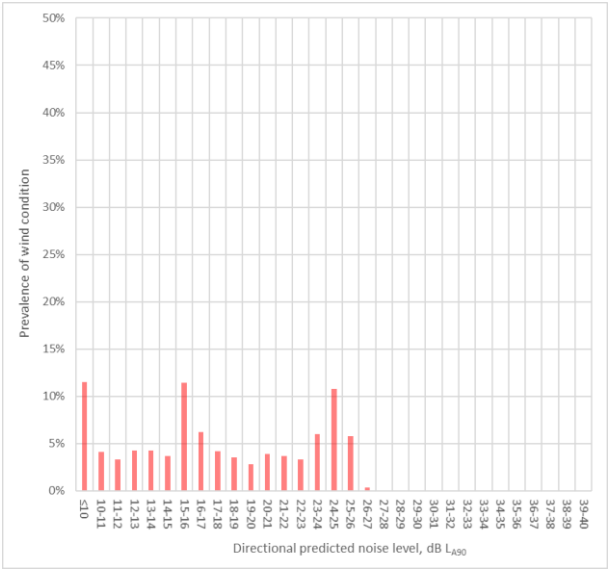
# Wind turbine noise prediction

## Directional analysis – F16-6

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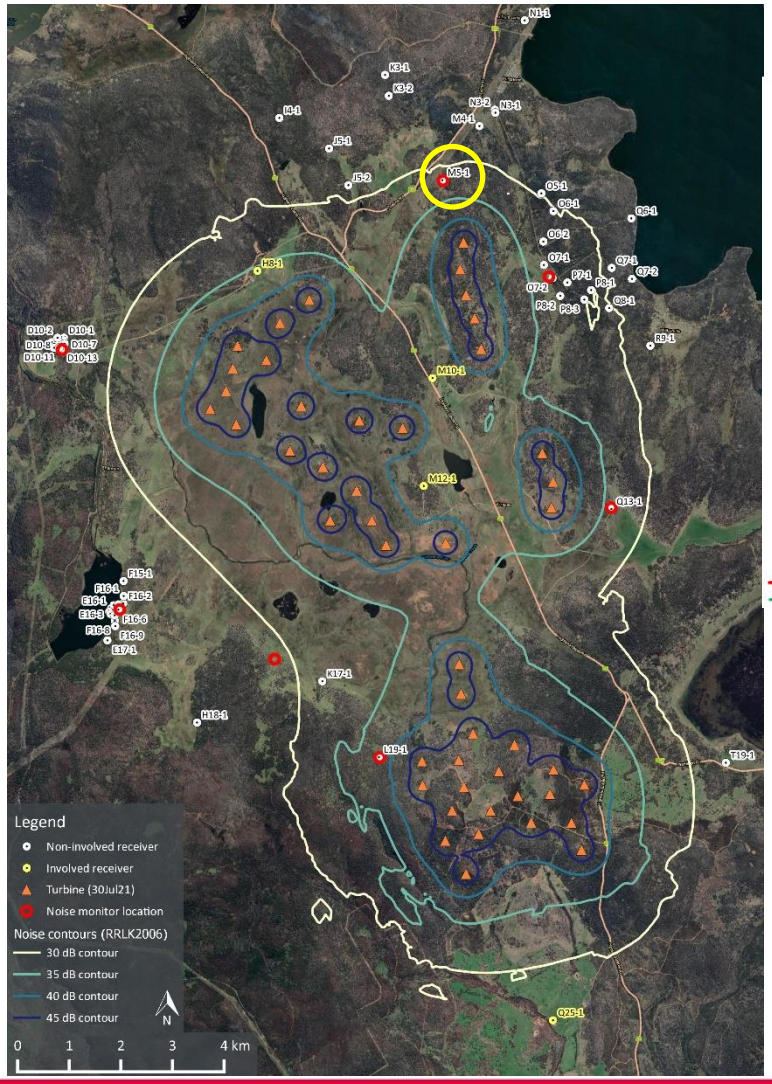
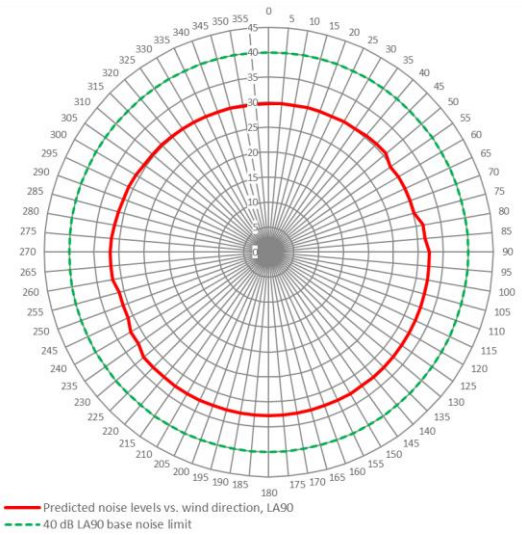
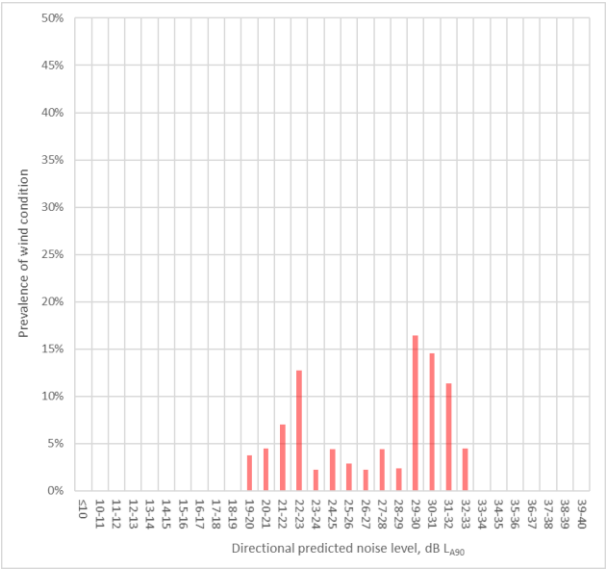
# Wind turbine noise prediction

## Directional analysis – M5-1

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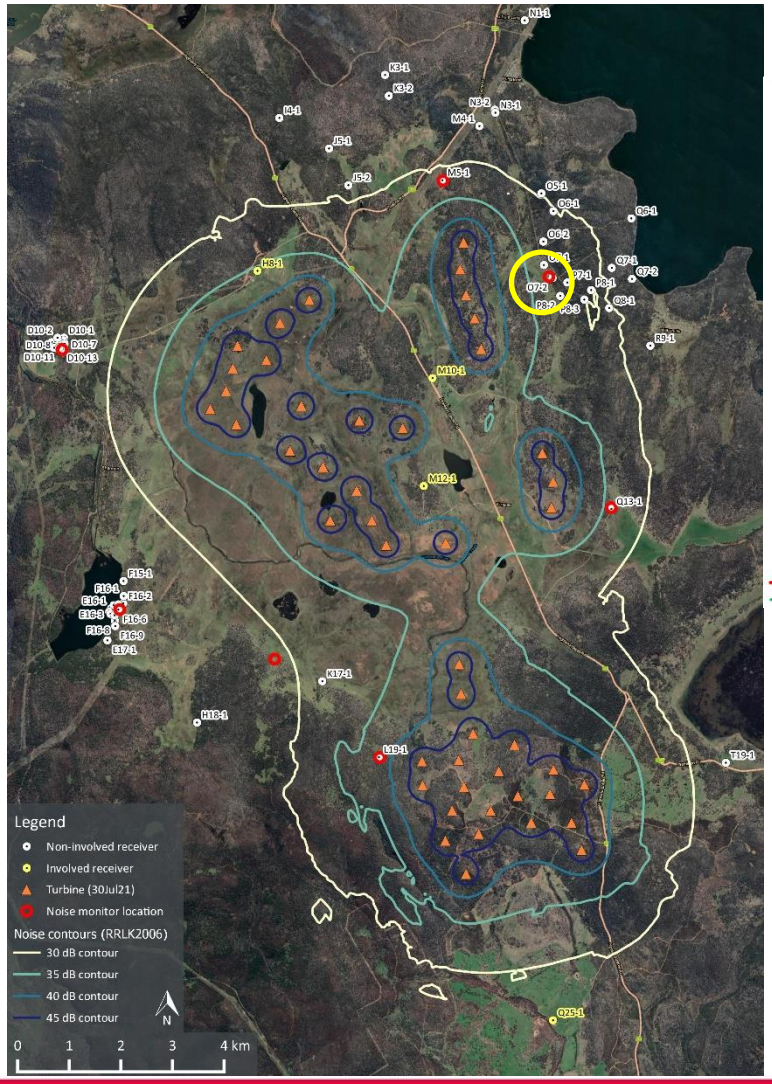
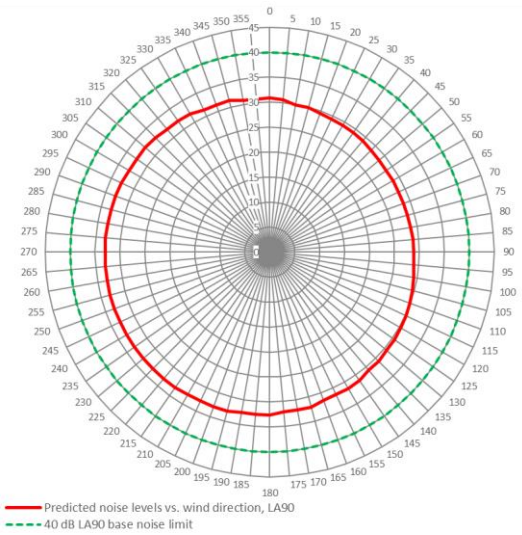
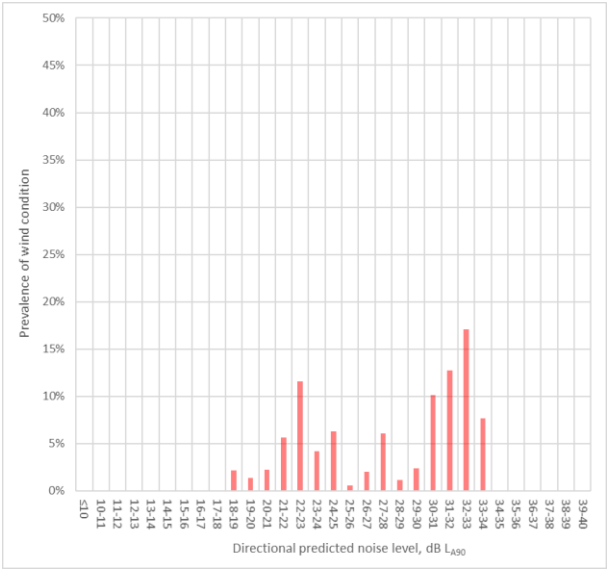
# Wind turbine noise prediction

## Directional analysis – O7-2

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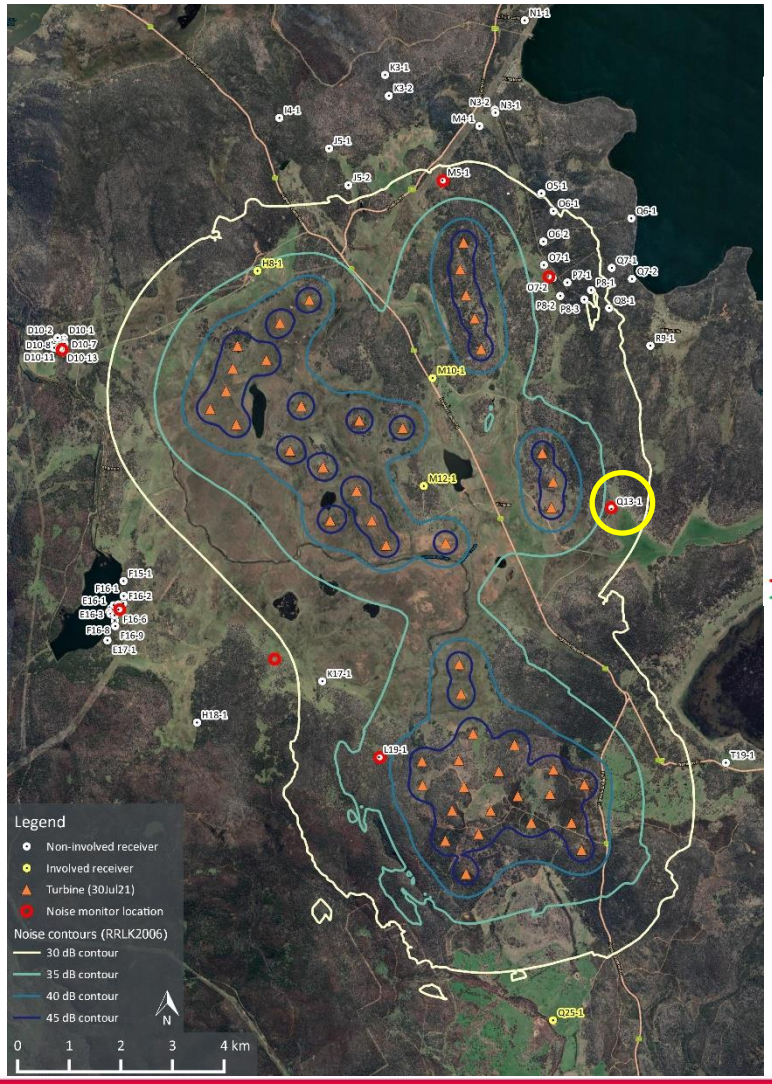
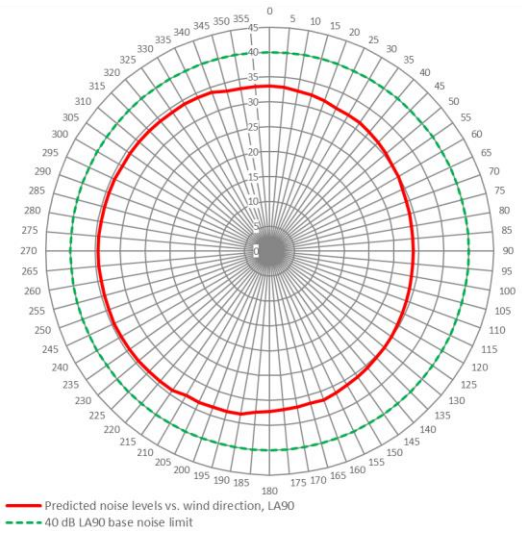
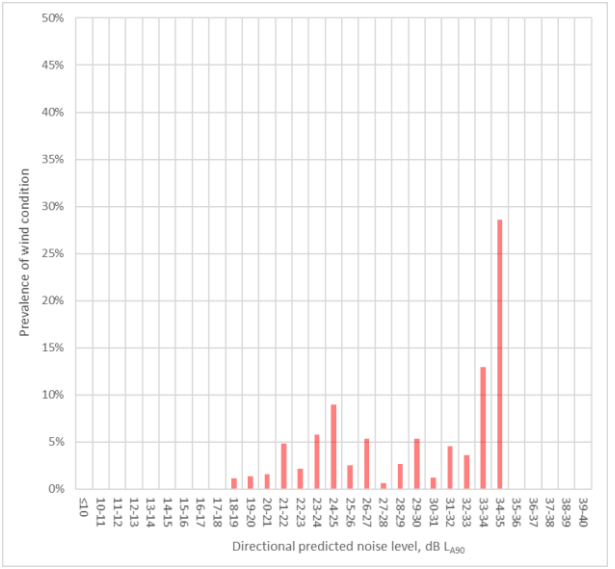
# Wind turbine noise prediction

## Directional analysis – Q13-1

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# Summary

- Assessment undertaken in accordance with the Project Specific Guidelines
- Noise modelling based on Vestas V162-6.2MW candidate turbine model
- Operational wind turbine noise levels predicted to comply with NZS 6808
- Operational substation noise levels predicted to be significantly lower than the applicable EPP outdoor acoustic environment indicator level
- Construction noise primarily addressed by restricted hours and control of equipment emissions
- Wind farm can be designed and developed in accordance with the requirements detailed in the Project Specific Guidelines

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Thank you

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