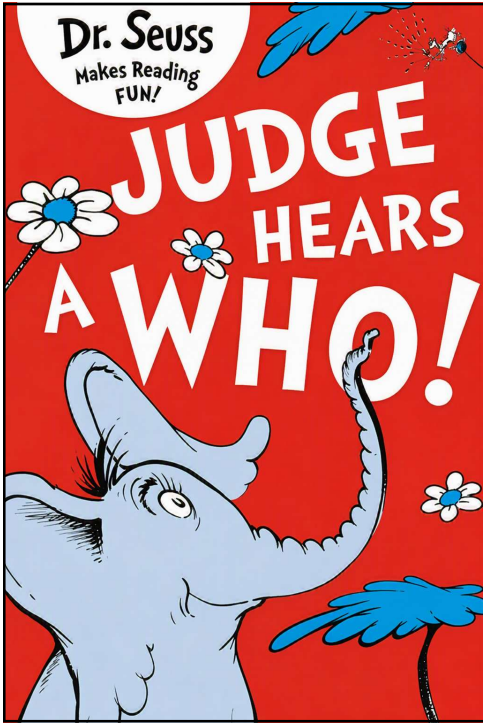




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New Zealand Environment Court Implementation of the 2021 World Health Organization Air Quality Guidelines for Industrial Resource Consenting

Paul Crimmins
Technical Director – Air Quality

Trevor Everett
Environmental Scientist – Air Quality

Pattle Delamore Partners

 
TODAY SHAPES TOMORROW

1



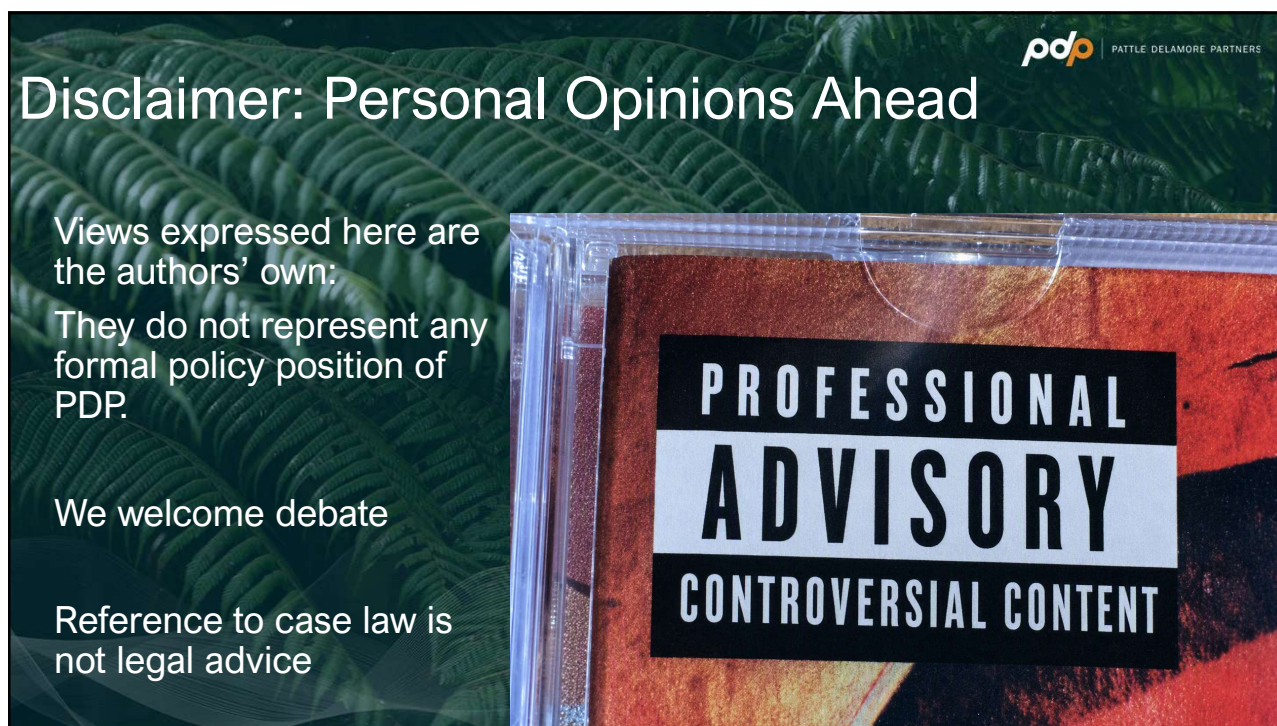
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Paul Crimmins
Technical Director – Air Quality
CAQP | MSc(Hons) | BA
15+ years implementing air quality standards and guidelines
Industrial resource consenting and health risk assessments

Trevor Everett
Environmental Scientist – Air Quality
3+ years field testing against air quality standards
and resource consenting works



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Disclaimer: Personal Opinions Ahead

Views expressed here are the authors' own:
They do not represent any formal policy position of PDP.

We welcome debate

Reference to case law is not legal advice

**PROFESSIONAL
ADVISORY
CONTROVERSIAL CONTENT**

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Presentation Outline

- WHO AQG 2021
 - Challenges
 - Benefits
- Industrial Consenting in NZ
 - Existing Requirements
 - Good Practice Guides
- Case Law Implementation of WHO AQG 2021
 - Mount Maunganui Air Quality Background
 - Environment Court Interpretation
- Recommended Approaches for Implementing the WHO AQG 2021 for industrial air discharge consenting in NZ

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World Health Organization: Air Quality Guidelines 2021



WHO AIR QUALITY GUIDELINE LEVELS ARE LOWER THAN 15 YEARS AGO

Fine particulate matter	PM _{2.5}	5 µg/m ³	2005 long-term Air Quality Guideline levels
Particulate matter	PM ₁₀	15 µg/m ³	2021 long-term Air Quality Guideline levels
Ozone (in peak season)	O ₃	60 µg/m ³	
Nitrogen dioxide	NO ₂	10 µg/m ³	

Recommended annually

WHO Air Quality Guidelines set goals to protect millions of lives from air pollution.

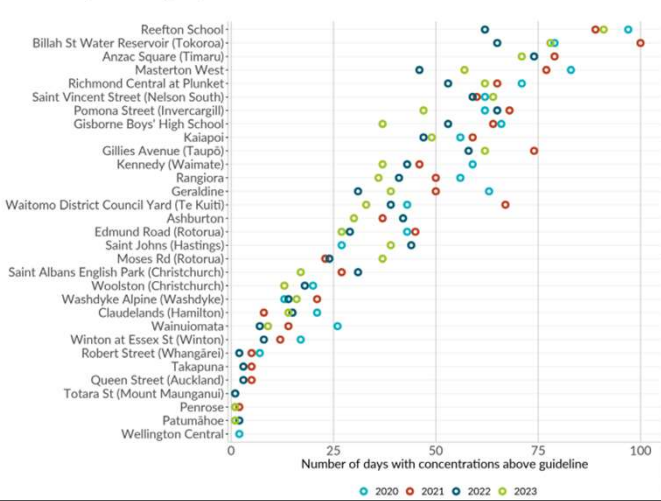
CLEAN AIR FOR HEALTH #AirPollution World Health Organization

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Our Air: New Zealand vs. WHO AQGs

PM_{2.5} concentrations continue to improve at most sites, but all sites were above the 24-hour WHO guideline between 2020 and 2023

Figure 4: Days above 24-hour 2021 World Health Organization air quality guideline for PM_{2.5}, by monitoring site, 2020–23



Reefton School
Billah St Water Reservoir (Tokoroa)
Anzac Square (Timaru)
Masterton West
Richmond Central at Plunket
Saint Vincent Street (Nelson South)
Pomona Street (Invercargill)
Gisborne Boys' High School
Kaiapoi
Gillies Avenue (Taupō)
Kennedy (Waimate)
Rangiora
Geraldine
Waitomo District Council Yard (Te Kuiti)
Ashburton
Edmund Road (Rotorua)
Saint Johns (Hastings)
Moses Rd (Rotorua)
Saint Albans English Park (Christchurch)
Woolston (Christchurch)
Washdyke Alpine (Washdyke)
Claudelands (Hamilton)
Wainuiomata
Winton at Essex St (Winton)
Robert Street (Whangārei)
Takapuna
Queen Street (Auckland)
Totara St (Mount Maunganui)
Penrose
Patumahoe
Wellington Central

Number of days with concentrations above guideline

2020 2021 2022 2023

Our air 2024

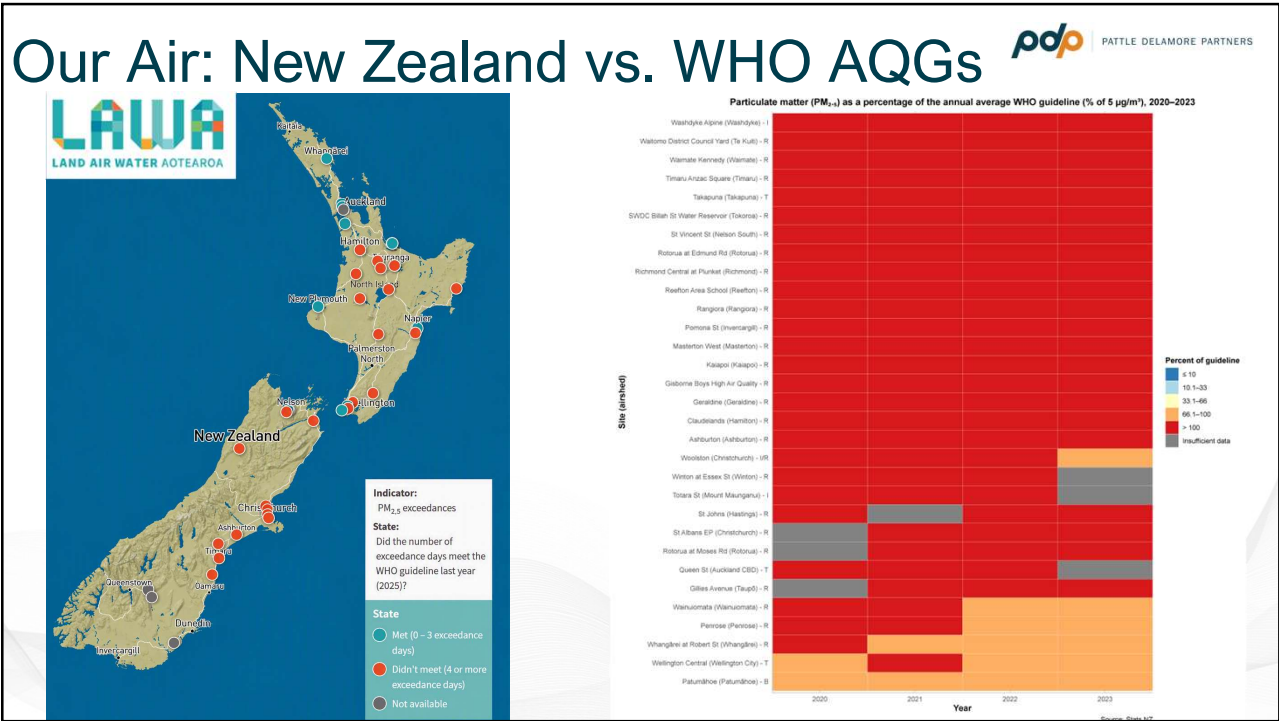
Tō tātou hau takiwā

New Zealand's Environmental Reporting Series

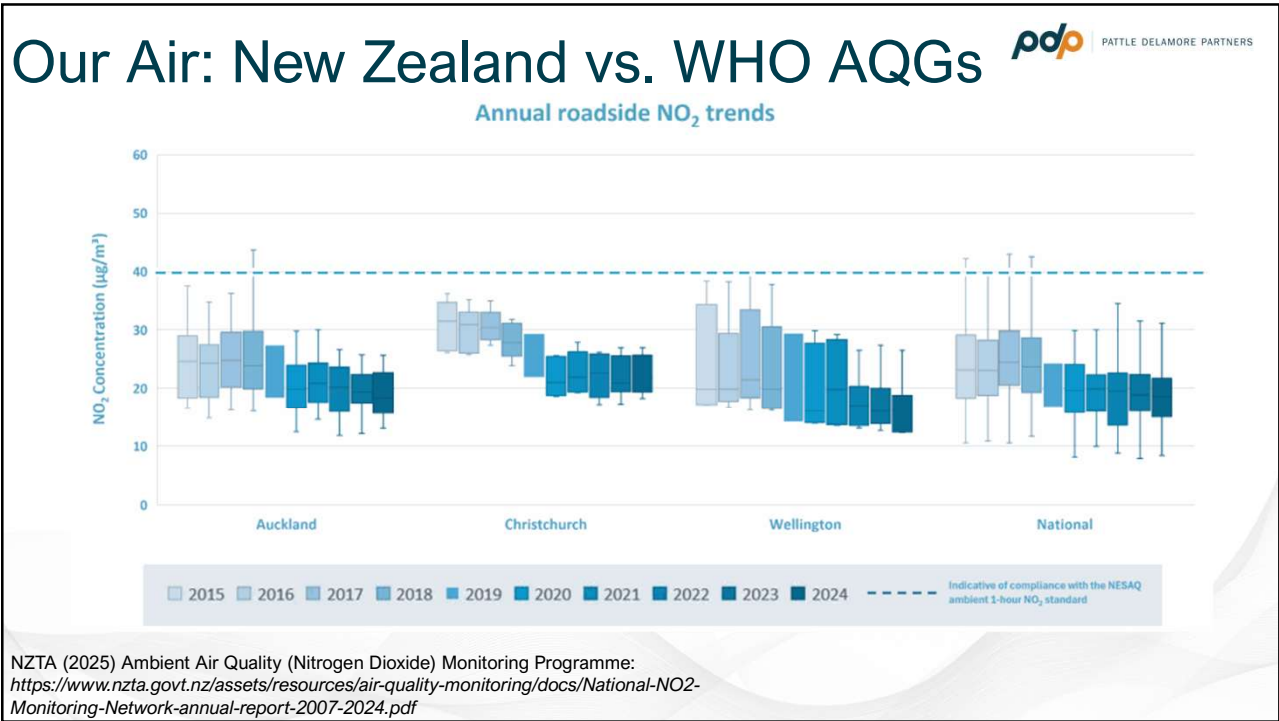
Ministry of the Environment
Environment NZ

Stats NZ

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Environment

Ministry of the

Good Practice Guide for
Assessing Discharges to Air
from Industry



newzealand.govt.nz

NES:AQ 2004

AAQG 2002 / Regional Plan Guidelines

WHO AQG 2005

California RELs / US EPA RfCs

Texas ESLs

Health Risk Assessment Hierarchy

Reference or

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Air Contaminant	Averaging Period	Current NZ AQ Standard or Guideline (GPG Hierarchy)			WHO AQG 2021	
		µg/m³	Exceedances per year	Source	µg/m³	Exceedances per year
PM _{2.5}	24-hour	25		WHO 2005	15	"3 to 4"
	Annual	10		WHO 2005	5	
PM ₁₀	24-hour	50	1	NES:AQ	45	"3 to 4"
	Annual	20		AAQG	15	
NO ₂	1-hour	200	9	NES:AQ		
	24-hour	100		AAQG	25	"3 to 4"
	Annual	40		WHO 2005	10	
SO ₂	1-hour	570	0	NES:AQ		
	1-hour	350	9	NES:AQ		
	24-hour	120		AAQG	40	"3 to 4"
CO	1-hour	30,000		AAQG		
	8-hour	10,000	1	NES:AQ		
	24-hour	10,000		WHO 2005	4,000	"3 to 4"

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Air Contaminant	Averaging Period	Current NZ AQ Criteria (µg/m³)	WHO AQG 2021 (µg/m³)	% Reduction
PM _{2.5}	24-hour	25	15	40%
	Annual	10	5	50%
PM ₁₀	24-hour	50	45	10%
	Annual	20	15	25%
NO ₂	1-hour	200		
	24-hour	100	25	75%
	Annual	40	10	75%
SO ₂	1-hour	570		
	1-hour	350		
	24-hour	120	40	67%
CO	1-hour	30,000		
	8-hour	10,000		
	24-hour	10,000	4,000	60%

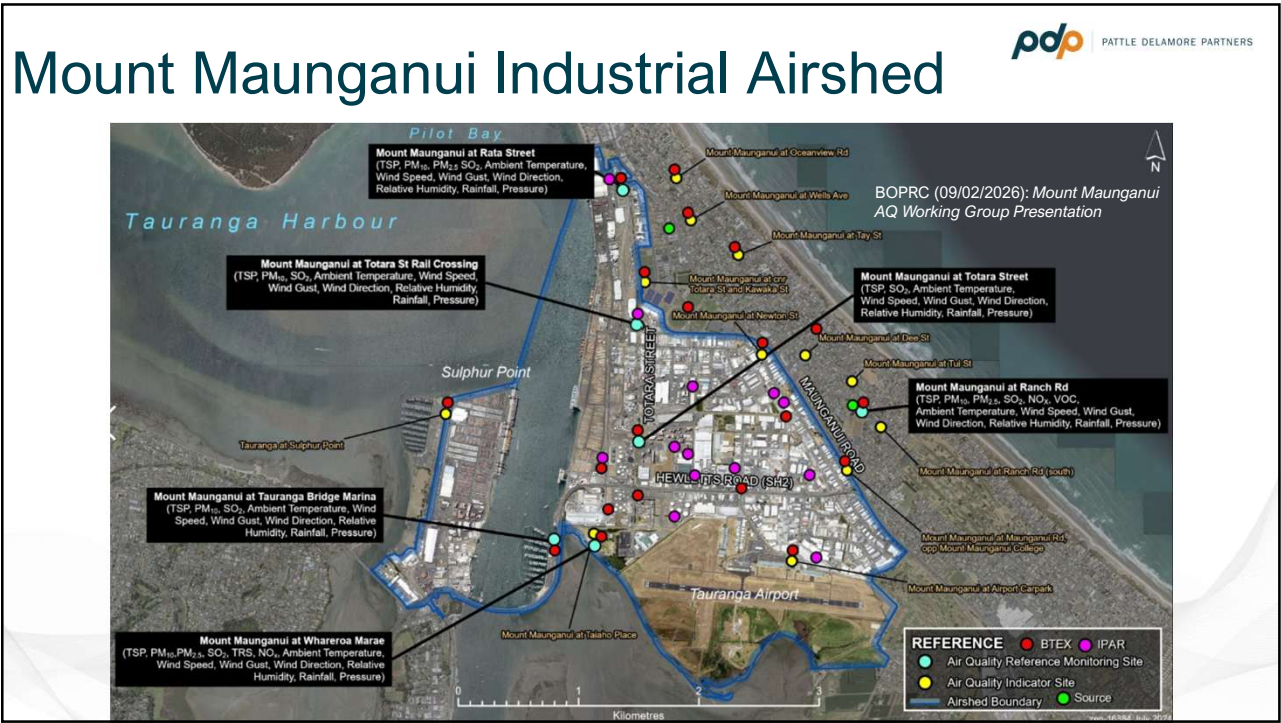
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Environment Court Case Law



*Allied Asphalt Limited
v Bay of Plenty
Regional Council:
[2024] NZEnvC 247*

Asphalt plant seeking
new air discharge
consent and to
replace plant for
increased production

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Environment Court Case Law



*Allied Asphalt Limited v
Bay of Plenty Regional
Council: [2024] NZEnvC
247*

Key Issues:

- Odour
- Polluted Airshed
- Cultural Effects
(Proximity to Marae)
- Health Effects (Proximity
to Residential)

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Environment Court Case Law

Swap Stockfoods Limited v Bay of Plenty Regional Council: [2025] NZEnvC 139

Plan Change 13:
Iterative Air Quality Management Policy:

- Improve cumulative air quality so that MMA complies with limits as soon as reasonably practical;
- Must avoid air discharges that may cause an exceedance



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Environment Court Case Law

Allied Asphalt Limited v BOPRC: [2024] NZEnvC 247

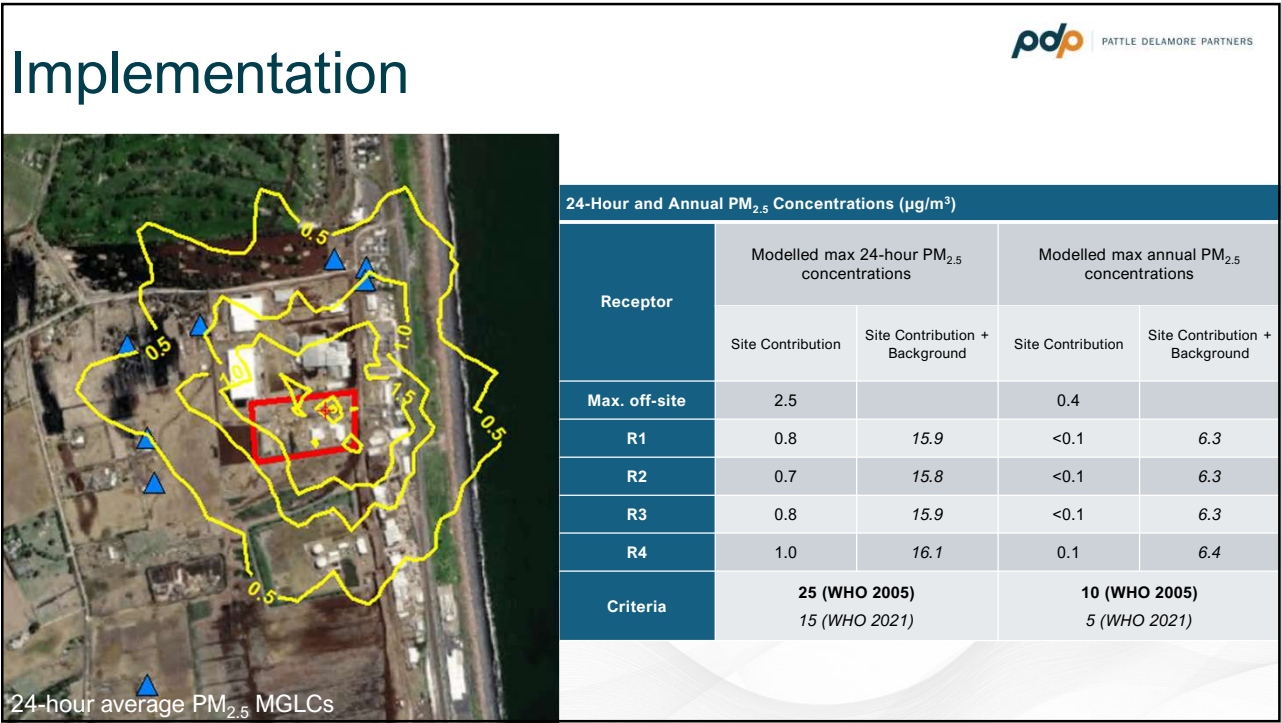
WHO AQG as supplementary but not determinative assessment criteria:

“the MfE has not provided any indication of the regulatory or policy response to the latest [2021 WHO AQG] guidelines in New Zealand.

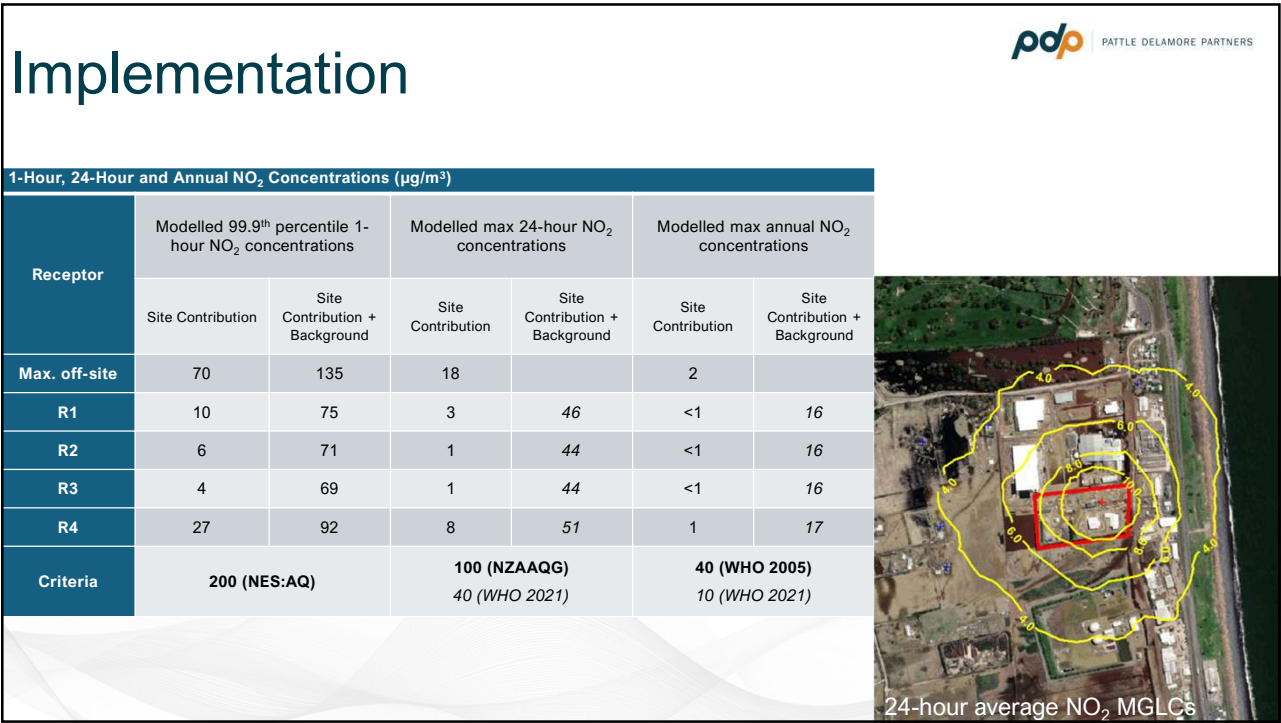
While it would be premature for these guidelines to be adopted as assessment criteria, the modelling predictions were considered against the relevant WHO 2021 guidelines to provide a complete assessment.”



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Suggested Approach

```
graph TD; A[Cumulative Concentration at a Receptor Location:  
Site Contribution + Background] --> B{Exceeds WHO AQG?}; B -- No --> C[Low risk]; B -- Yes --> D{Site Contribution >10% of WHO AQG OR  
>10% of Existing Elevated Background?}; D -- No --> C; D -- Yes --> E[Further health risk assessment];
```

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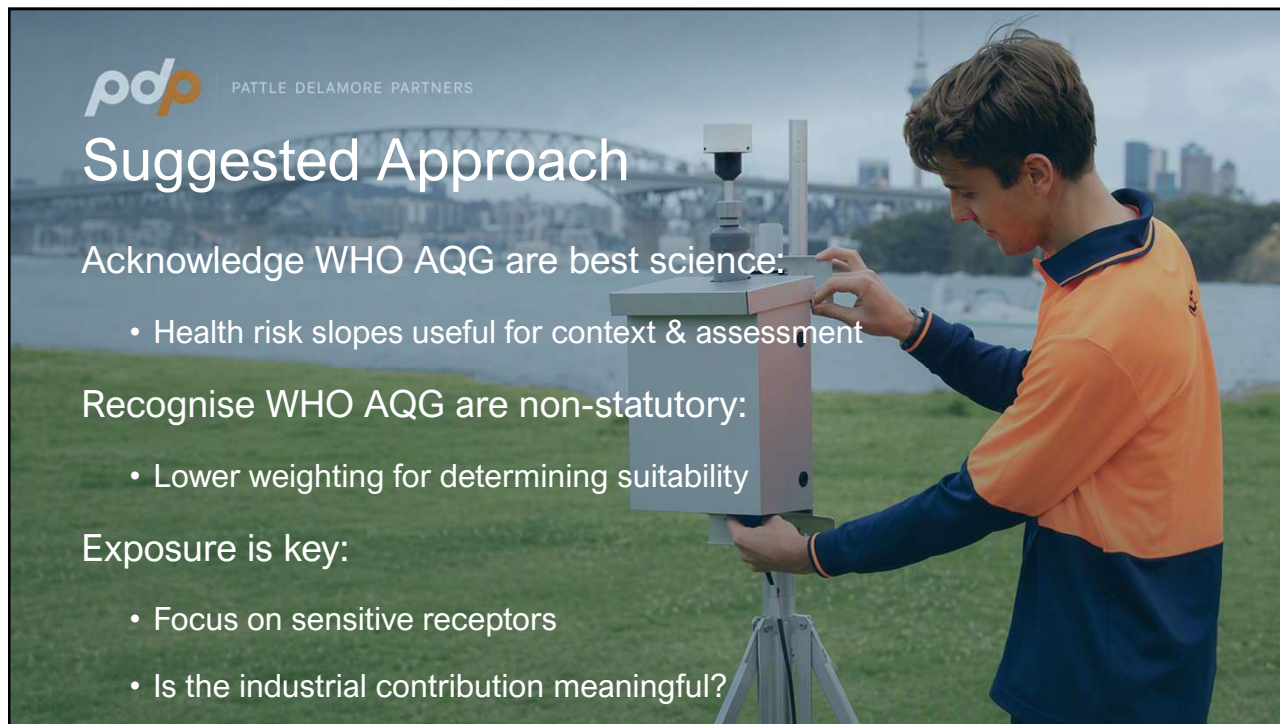
Suggested Approach

24-hour average PM_{2.5} MGLCs

24-Hour and Annual PM _{2.5} Concentrations (µg/m ³)				
Receptor	Predicted 24-hour PM _{2.5} concentrations		Predicted annual PM _{2.5} concentrations	
	Site Contribution	Site Contribution + Background	Site Contribution	Site Contribution + Background
Max. off-site	2.5		0.4	
R1	0.8	15.9	<0.1	6.3
R2	0.7	15.8	<0.1	6.3
R3	0.8	15.9	<0.1	6.3
R4	1.0	16.1	0.1	6.4
Criteria	25 (WHO 2005) 15 (WHO 2021)		10 (WHO 2005) 5 (WHO 2021)	

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Suggested Approach

Acknowledge WHO AQG are best science:

- Health risk slopes useful for context & assessment

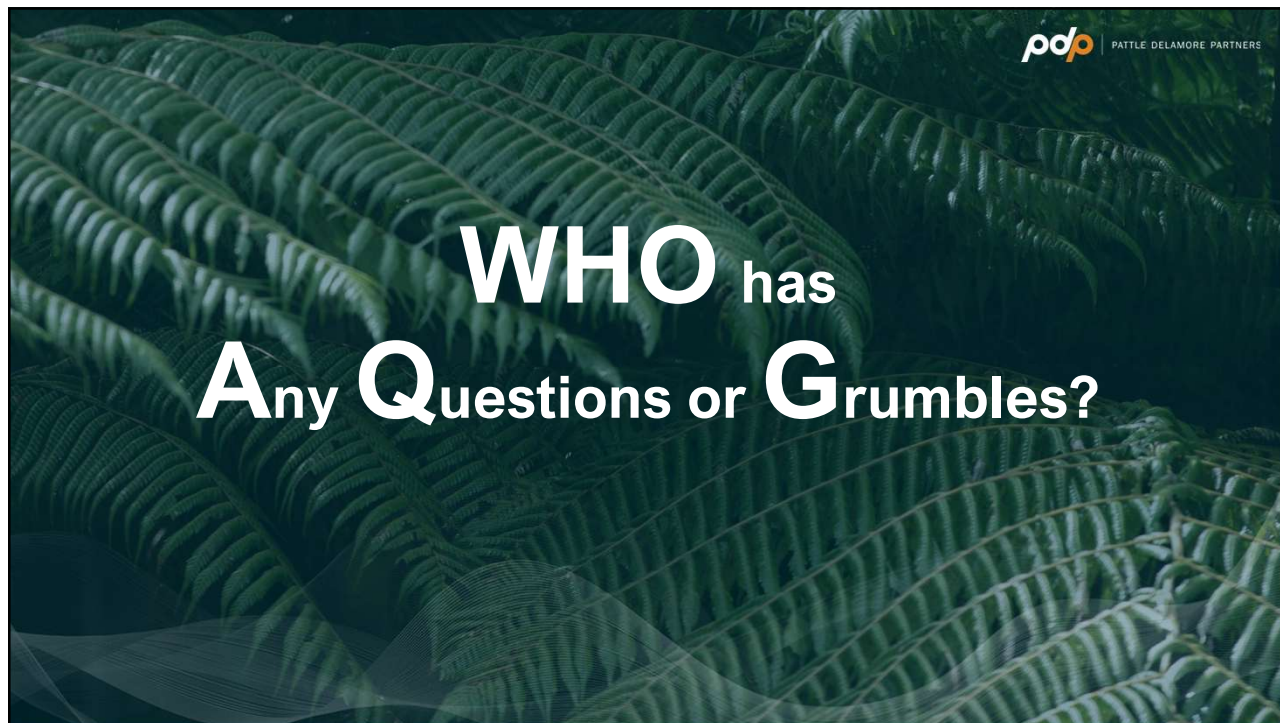
Recognise WHO AQG are non-statutory:

- Lower weighting for determining suitability

Exposure is key:

- Focus on sensitive receptors
- Is the industrial contribution meaningful?

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WHO has Any Questions or Grumbles?

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