

Air Quality Assessment overview

- Approach similar to other WestConnex, Western Harbour Tunnel and Beaches link F6 Extension air quality assessments
- Characterisation of the existing environment
- Emissions and dispersion modelling for surface roads and ventilation outlets

Project modelling domain

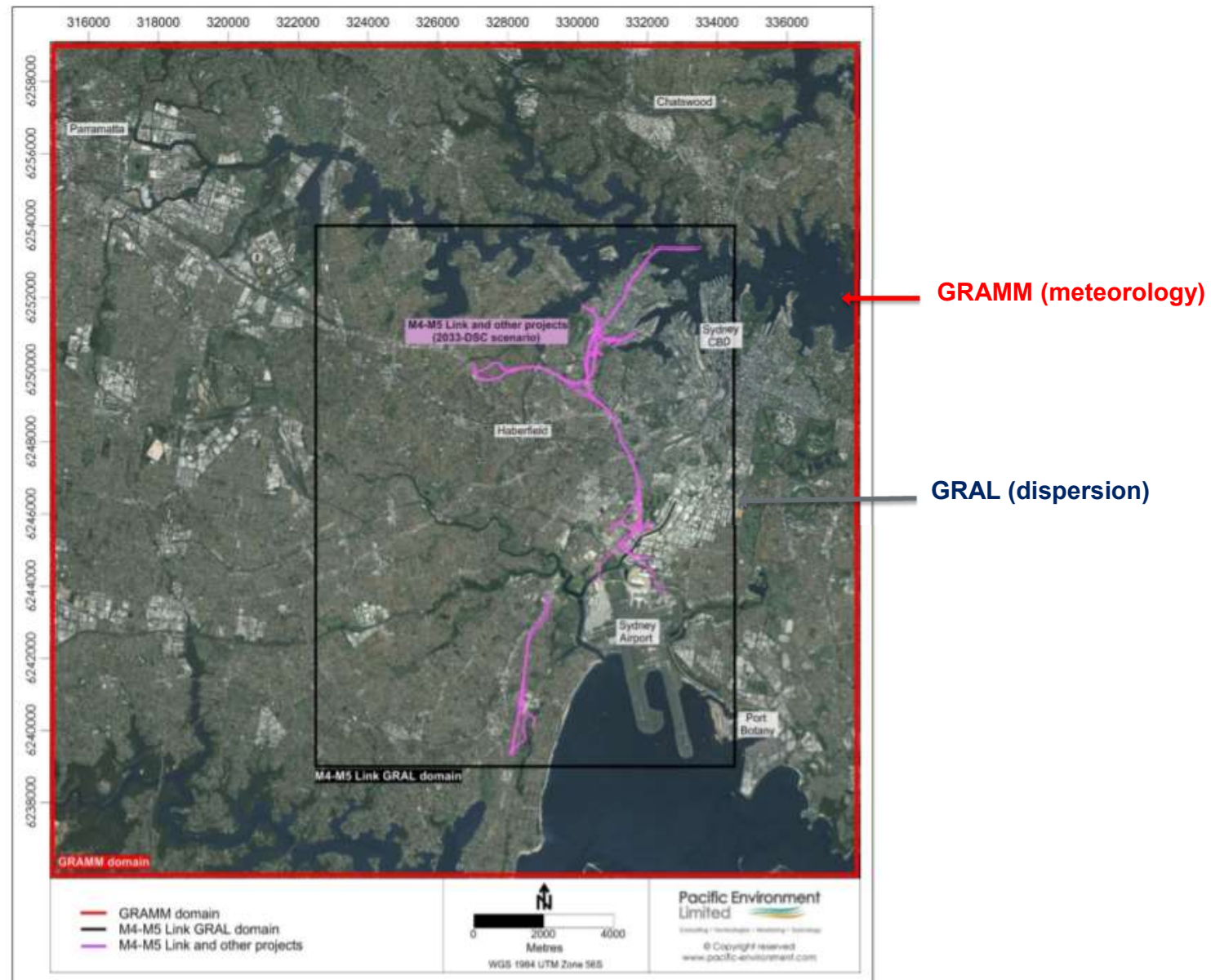


Figure 9-3 Modelling domains for GRAMM and GRAL (grid system MGA94)

Air quality monitoring sites

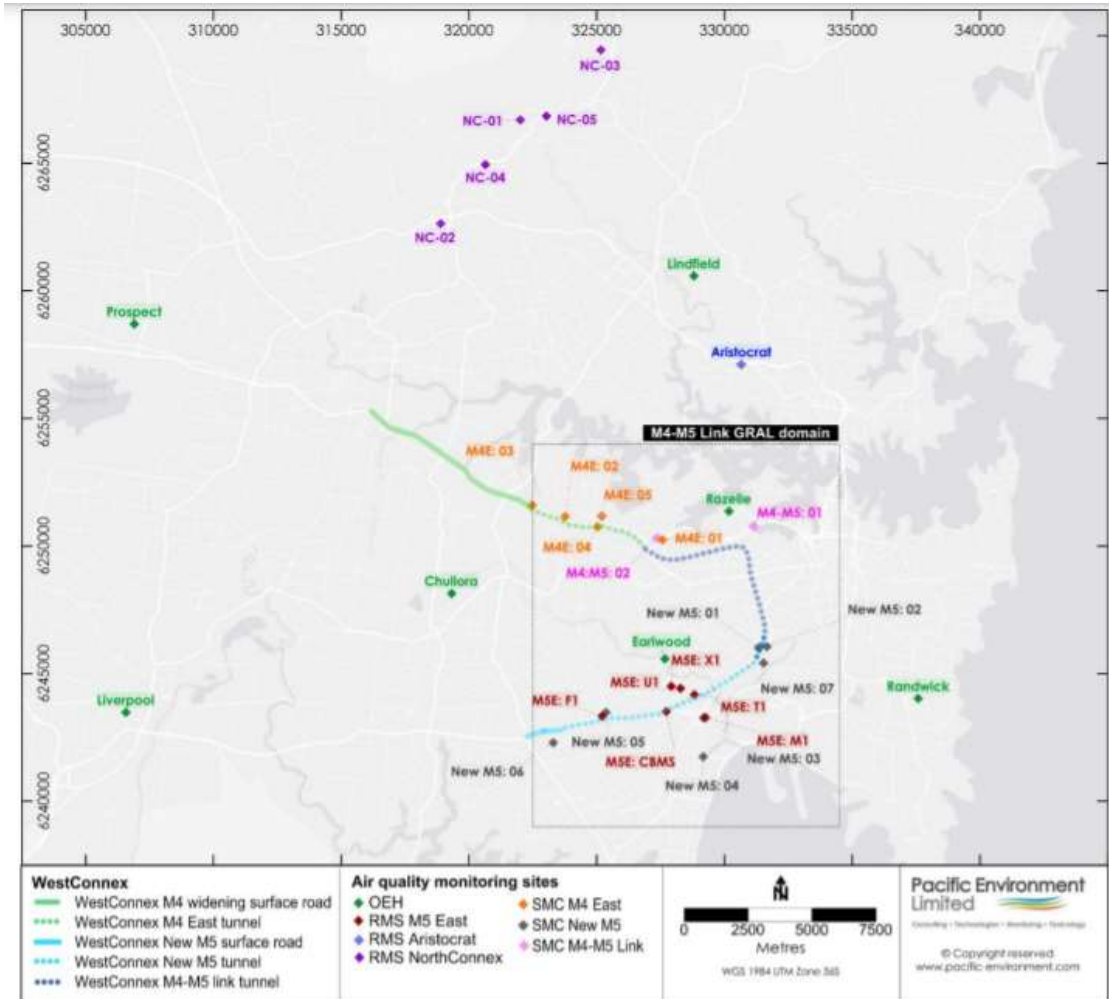


Figure F-1 Locations of air quality monitoring sites

Meteorological monitoring sites

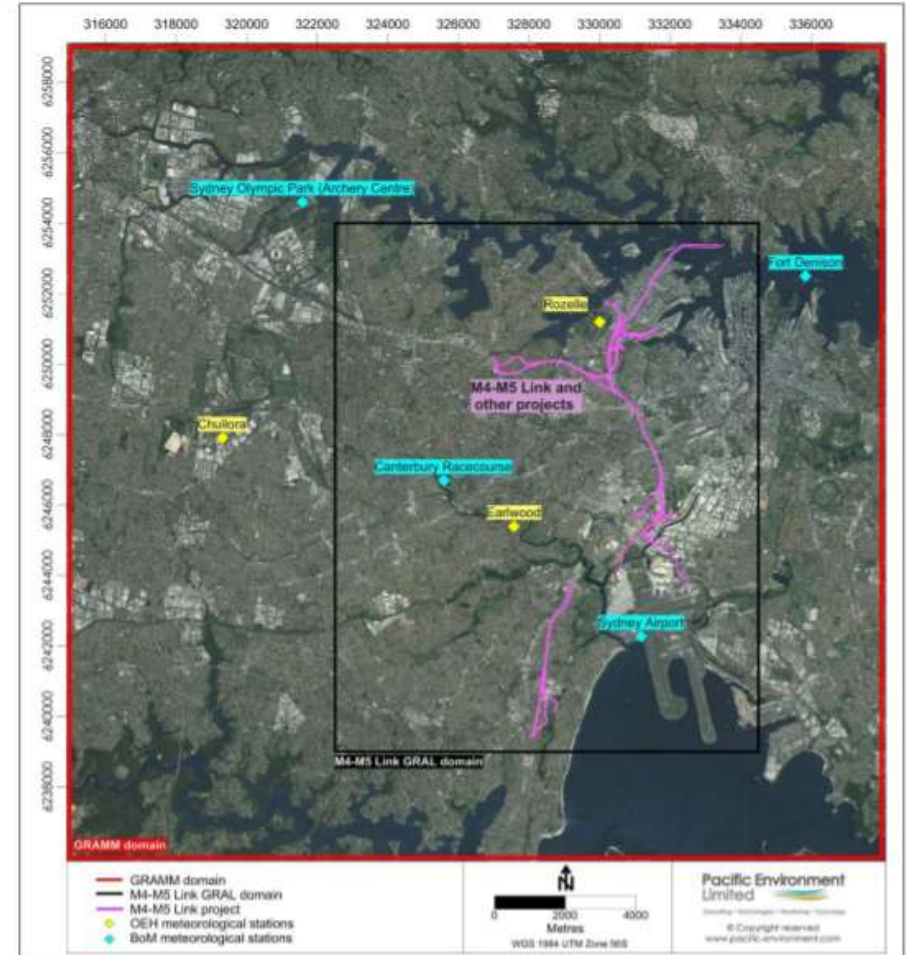


Figure 9-9 Meteorological stations in the model domains (grid system MGA94)

Terrain

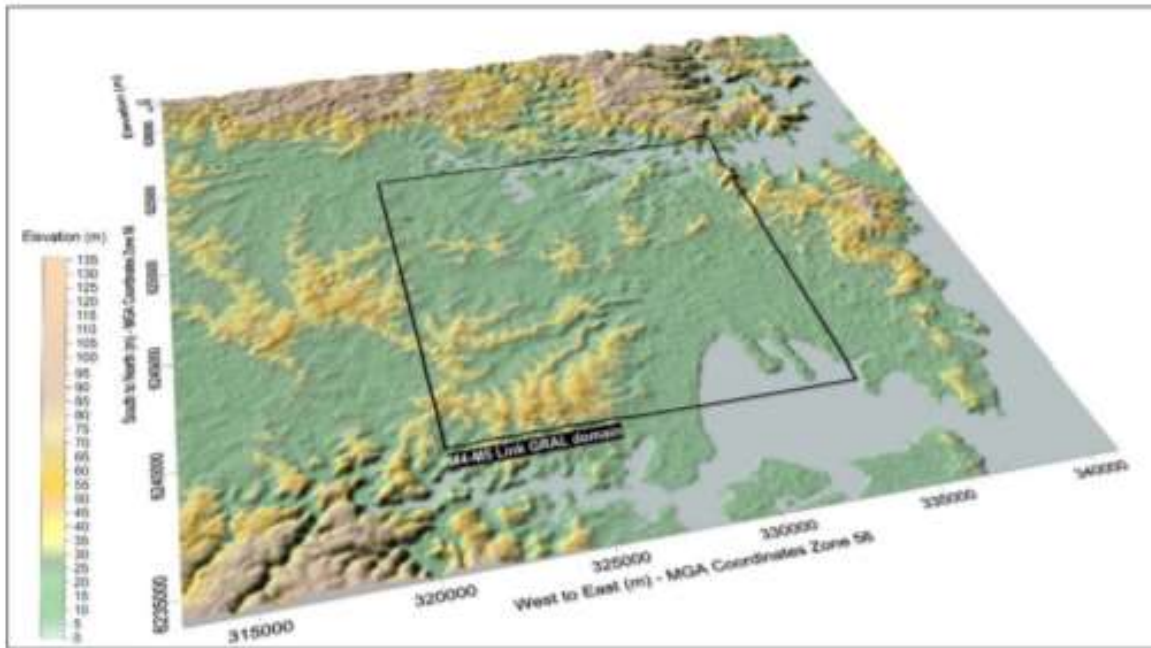


Figure 9-8 Terrain in the GRAMM domain (grid system MGA94)

Wind Field

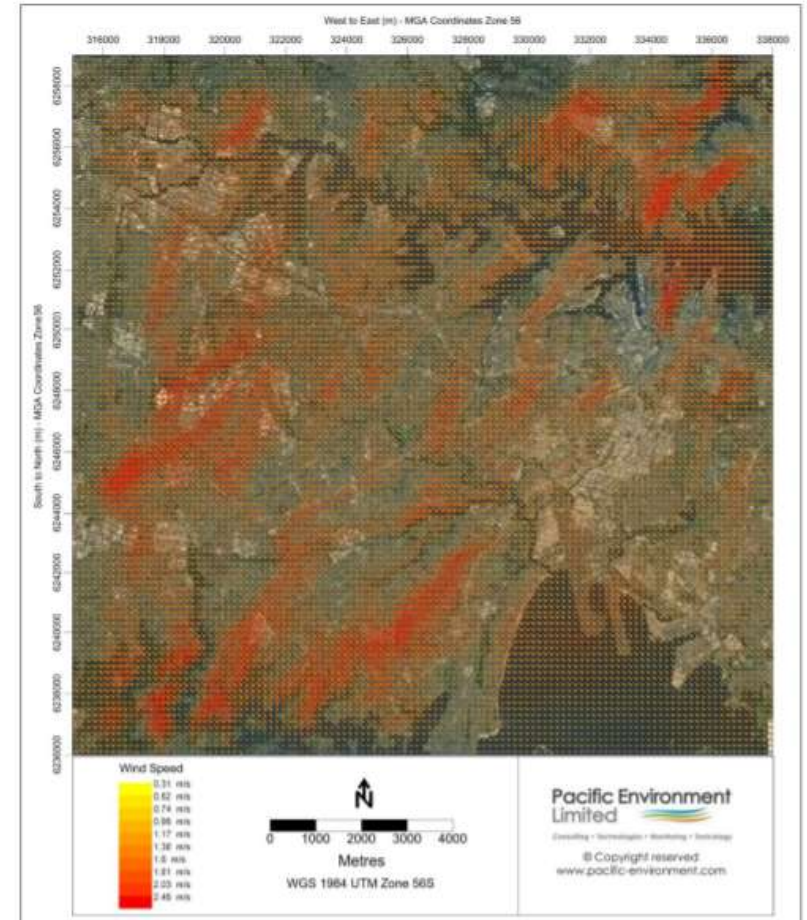


Figure 8-9 Example of a wind field across the GRAMM domain (grid system MGA94)

- 200 m by 200 m grid
- 15 vertical layers

Receptors

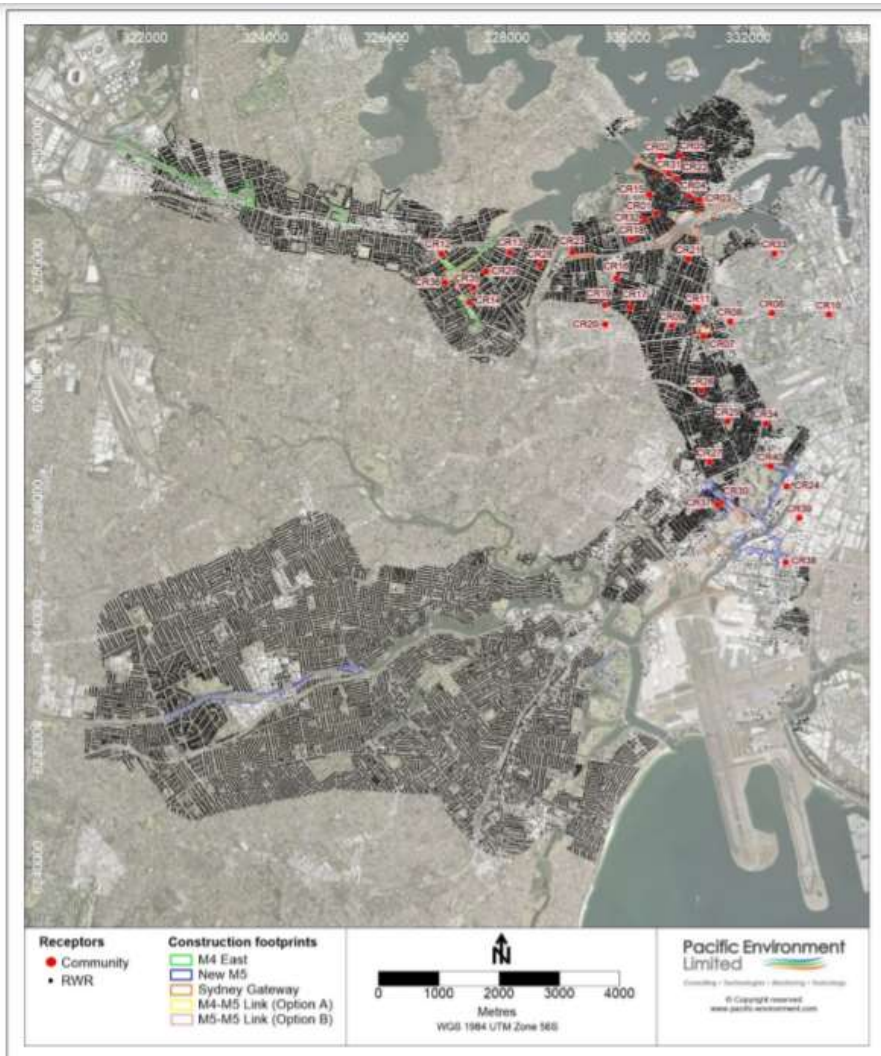


Figure 9-4 Modelled discrete receptor locations

- ~ 1.8 million gridded receptors across (10 m spacing)
- 86,375 RWR receptors (residential, workplace, recreational)
 - Maximum concentrations from a whole year
 - Background added to the maximum
- 40 Community receptors
 - Predictions analysed for each hour of the year (8760 hours)
 - Background added to each hour

Surface roads

Do Something scenario

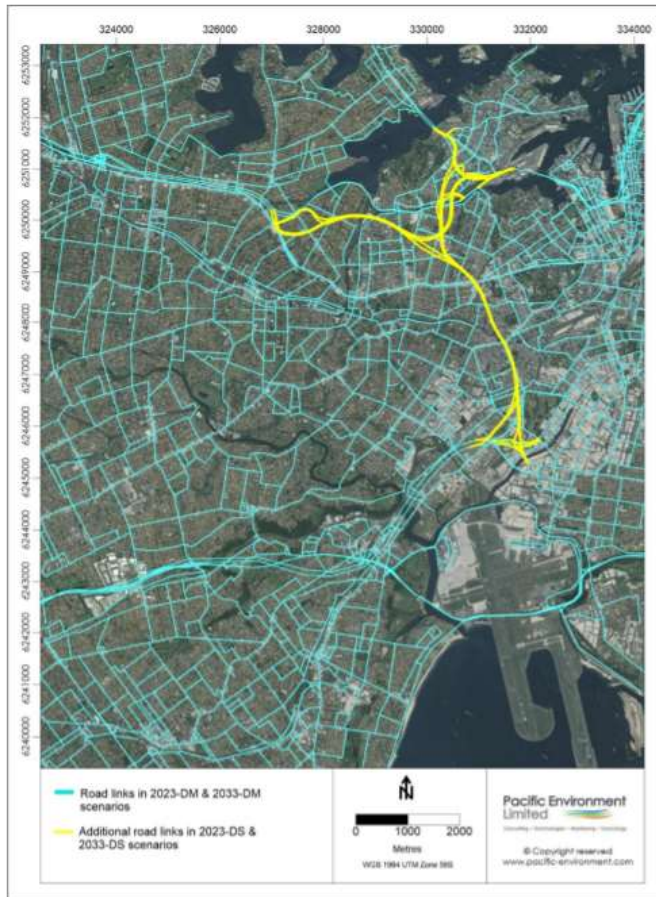


Figure 8-2 Road links in the Do Minimum scenarios, and additional links in the 2023-DS and 2033-DS scenarios (grid system MGA94)

Cumulative scenario



Figure 8-4 Road links in the Do Minimum scenarios, and additional links in the 2033-DSC scenario (grid system MGA94)

Ventilation outlets

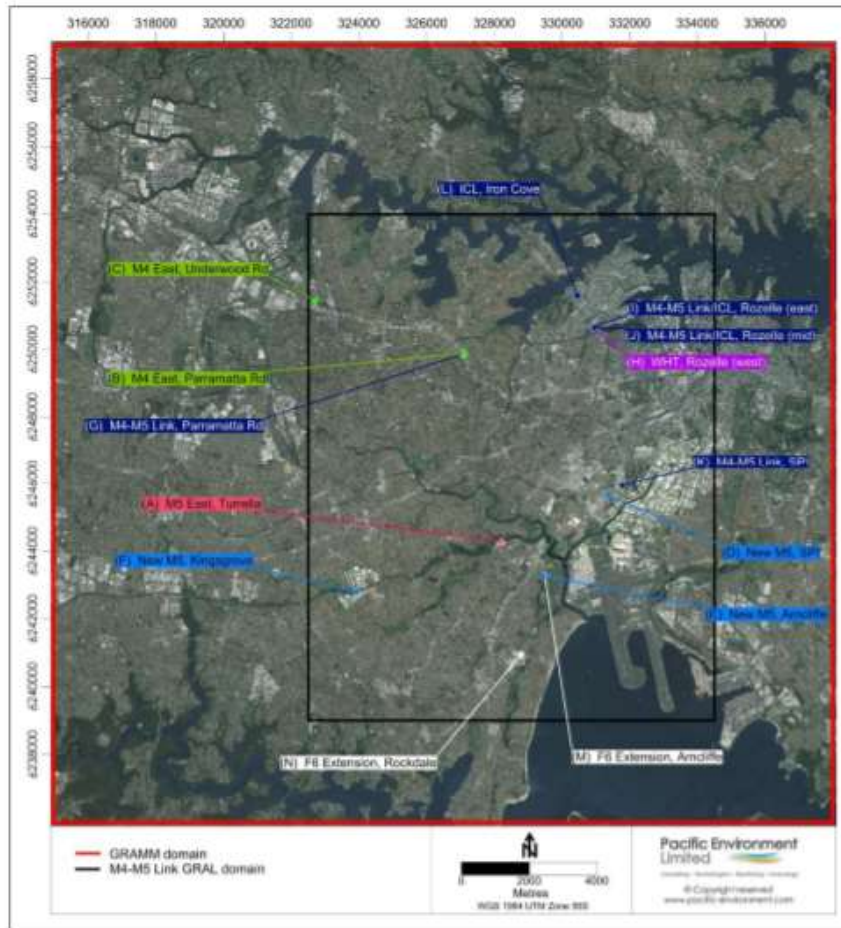


Figure 8-1 Locations of all tunnel ventilation outlets included in the assessment (grid system MGA94)

The
assessment
was
designed to
answer two
main
questions:

**What are the cumulative
impacts of the project?**

**How does the project
change things?**

What are the cumulative impacts of the project? Annual PM_{2.5}

2033-DM

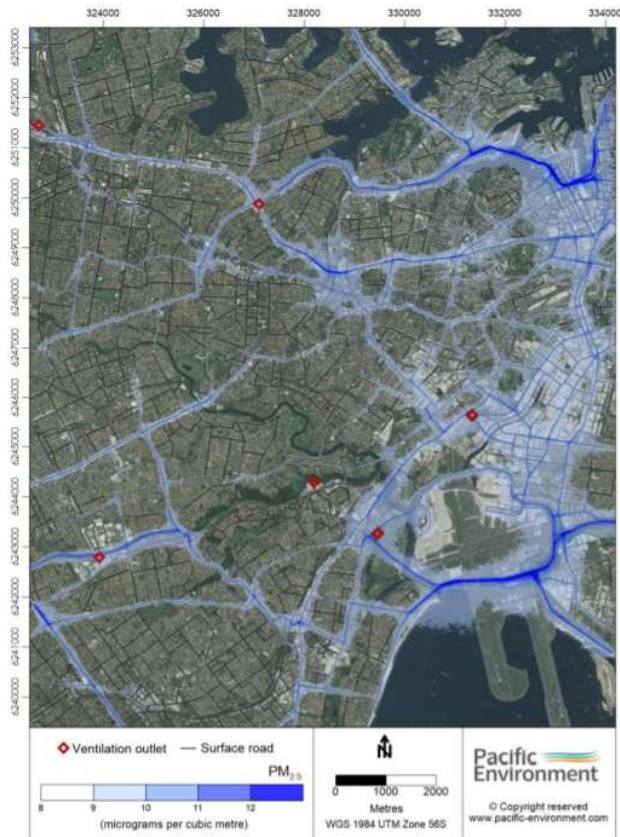


Figure 8-76 Contour plot of annual mean PM_{2.5} concentration in the 2033 Do Minimum scenario (2033-DM)

2033-DSC

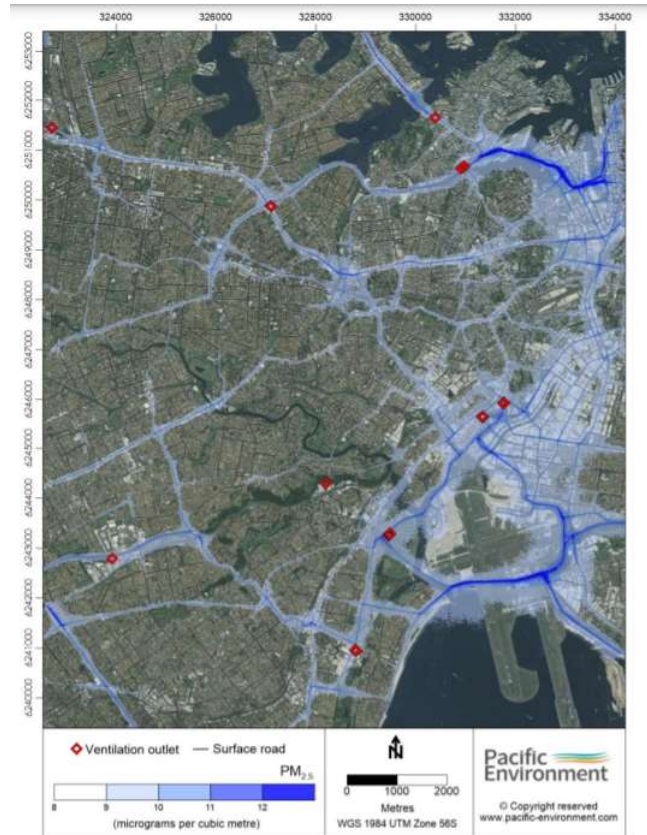


Figure 8-77 Contour plot of annual mean PM_{2.5} concentration in the 2033 cumulative scenario (2033-DSC)

How does the project change things?

Annual $PM_{2.5}$

2033-DM

2033-DSC

2033-DSC minus 2033-DM



Figure 8-76 Contour plot of annual mean $PM_{2.5}$ concentration in the 2033 Do Minimum scenario (2033-DM)

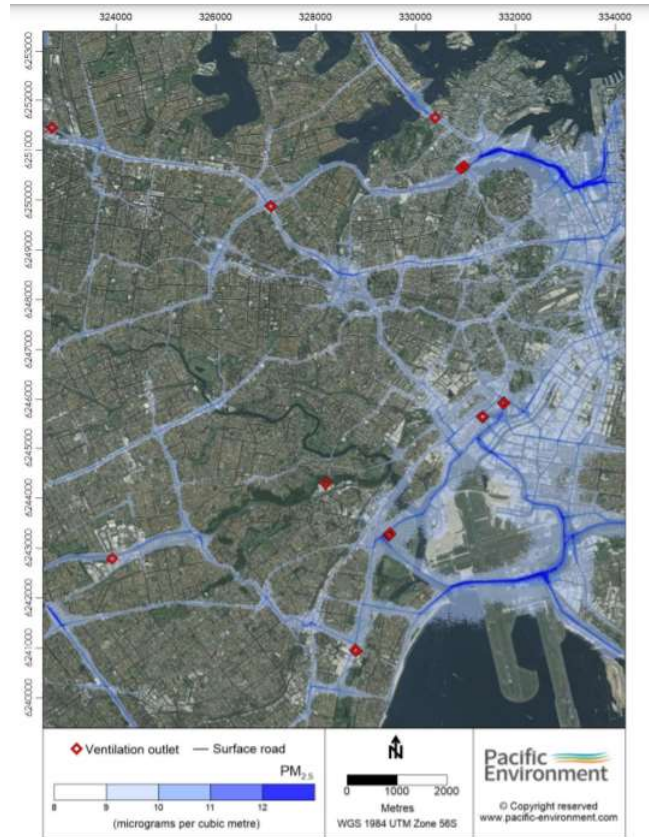


Figure 8-77 Contour plot of annual mean $PM_{2.5}$ concentration in the 2033 cumulative scenario (2033-DSC)

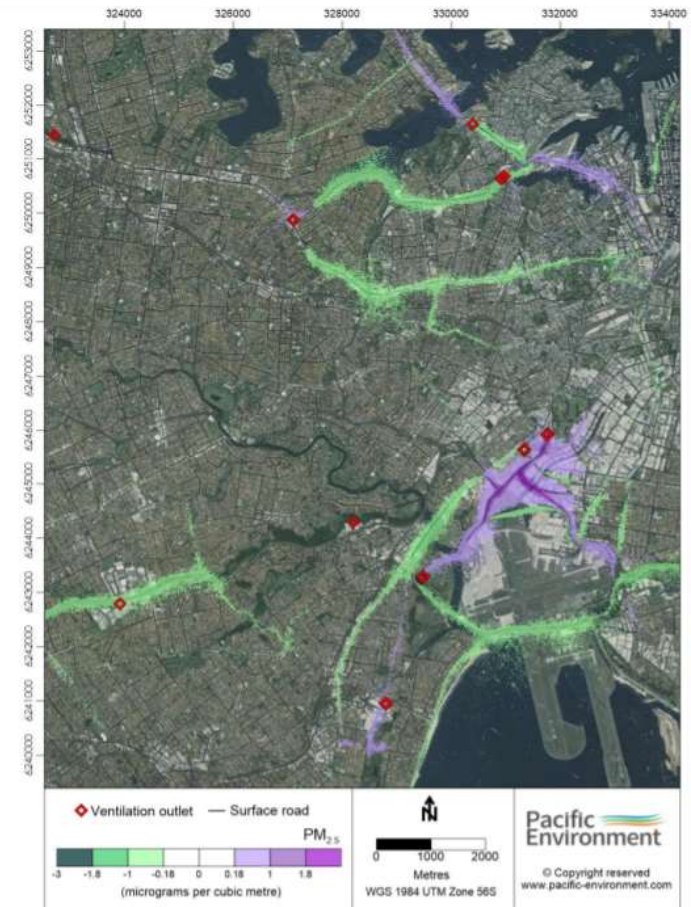


Figure 8-78 Contour plot of change in annual mean $PM_{2.5}$ concentration in the 2033 cumulative scenario (2033-DSC minus 2033-DM)

What is the contribution of the ventilation outlets?

- Maximum surface road contribution $5.56 \mu\text{g}/\text{m}^3$
- Largest contribution from ventilation outlets $0.25 \mu\text{g}/\text{m}^3$

Annual $\text{PM}_{2.5}$ (RWR receptors) 2023-DSC

