M5 East Motorway
Report 6: In-Tunnel Air Quality Monitoring

February 2017
## Document Control

### Revision History

<table>
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<th>Version</th>
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<tr>
<td>001</td>
<td>03/03/2017</td>
<td>Joanna Trube</td>
<td>Final</td>
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### References

| Document name | Version | Abbreviation |
|---------------|---------|--------------|------------|
Summary

- This report is provided consistent with Exhibit 1 of the O&M Contract (SSR, Appendix 24, Item 21).

- CCTV cameras are used to monitor conditions within the tunnels and jet fans are used to increase tunnel ventilation, in response to in-tunnel conditions, to ensure that tunnel air quality remains within specified limits.

- Erroneous visibility data in the main tunnel, westbound, occurred following calibration and cleaning of instrumentation during the planned closure in December. Units that are still affected include AQS402 and AQS604. Ecotech have been engaged to inspect the remaining visibility faults during the March closure. AQS404 was attended to during the February closure and is now operating correctly.
Preamble

Air Quality Report: In-Tunnel Air Quality Monitoring

This report shows the carbon monoxide (CO) and visibility levels in the M5 East Tunnel (Main Tunnel) and the Cooks River Tunnel (CRX).

Carbon Monoxide

Carbon monoxide (CO) is monitored in the tunnel because exposure to high levels can be harmful to people’s health. The limits in the tunnel are based on World Health Organisation guidelines for short term exposure to CO. The limit for CO in the tunnel is 87 parts per million (ppm) for 15 minutes and maintaining levels below this limit is a requirement under the Ministerial Conditions of Approval for the M5 East Motorway. The level of CO in the tunnel is continually measured and the ventilation system is adjusted to ensure that the concentration of CO within the tunnel remains below the required levels.

Visibility

Visibility is measured in the tunnel because poor visibility can make driving conditions dangerous. The major cause of reduced visibility or haze in the tunnel is from smoky vehicles, mainly for diesel trucks. Visibility limits used in the tunnel are taken from the World Road Association guidelines which recommend the tunnel is closed if the visibility reaches 0.012/m.

15-minute time-weighted average

This refers to the CO or visibility readings averaged over a 15 minute period with this reading being updated every 15 minutes.
M5 East Main Tunnel Ventilation System

The arrows show the direction of air flow.

- Red: Air flow in the western end of tunnels
- Black: Air flow in the eastern end of tunnels
- Red with a black outline: Fresh air in through western tunnel portals
- Grey: Fresh air in through eastern tunnel portals

AQS303
AQS304
AQS604
AQS402
Graphical Representation of Data

Main Tunnel Westbound
CO Levels (15min time-weighted average)

Date

CO Limit
AQS402 CO (ppm)
AQS403 CO (ppm)
AQS404 CO (ppm)
AQS604 CO (ppm)
Graphical Representation of Data

Main Tunnel Eastbound
CO Levels (15min time-weighted average)
Graphical Representation of Data

CRX Tunnel
CO Levels (15min time-weighted average)
Graphical Representation of Data

Main Tunnel Westbound
Visibility (15min time-weighted average)
Graphical Representation of Data

Main Tunnel Eastbound
Visibility (15min Time Weighted Average)
Graphical Representation of Data
Graphical Representation of Data

CRX Tunnel
Visibility (15min time-weighted average)