



# **Airport Link / Northern Busway Project**

## **Monthly Environmental Monitoring Report**

**September 2010**

## TABLE OF CONTENTS

<b>1.0</b>	<b>Report Purpose and Scope.....</b>	<b>3</b>
<b>2.0</b>	<b>Monitoring Locations.....</b>	<b>3</b>
<b>3.0</b>	<b>Noise Monitoring.....</b>	<b>10</b>
<b>3.1</b>	<b>Overview of Noise Mitigation Measures.....</b>	<b>10</b>
<b>3.2</b>	<b>Noise Monitoring Results.....</b>	<b>10</b>
<b>3.3</b>	<b>Compliance with Noise Goals.....</b>	<b>26</b>
<b>4.0</b>	<b>Air Quality Monitoring.....</b>	<b>26</b>
<b>4.1</b>	<b>Overview of Air Quality Mitigation Measures.....</b>	<b>26</b>
<b>4.2</b>	<b>Air Quality Monitoring Results – PM10/TSP.....</b>	<b>27</b>
<b>4.3</b>	<b>Air Quality Monitoring Results – Dust Deposition Results.....</b>	<b>32</b>
<b>4.4</b>	<b>CO/NO<sub>2</sub> Monitoring – Wooloowin Worksite.....</b>	<b>40</b>
<b>4.5</b>	<b>Compliance with Air Quality Goals.....</b>	<b>40</b>
<b>5.0</b>	<b>Vibration Monitoring.....</b>	<b>41</b>
<b>5.1</b>	<b>Overview of Vibration Mitigation Measures.....</b>	<b>41</b>
<b>5.2</b>	<b>Vibration Monitoring Results.....</b>	<b>41</b>
<b>5.3</b>	<b>Compliance with Vibration Goals.....</b>	<b>46</b>
<b>6.0</b>	<b>Community Enquiries and Complaints.....</b>	<b>46</b>
<b>6.1</b>	<b>Top 10 Issues Raised.....</b>	<b>47</b>

## **1.0 Report Purpose and Scope**

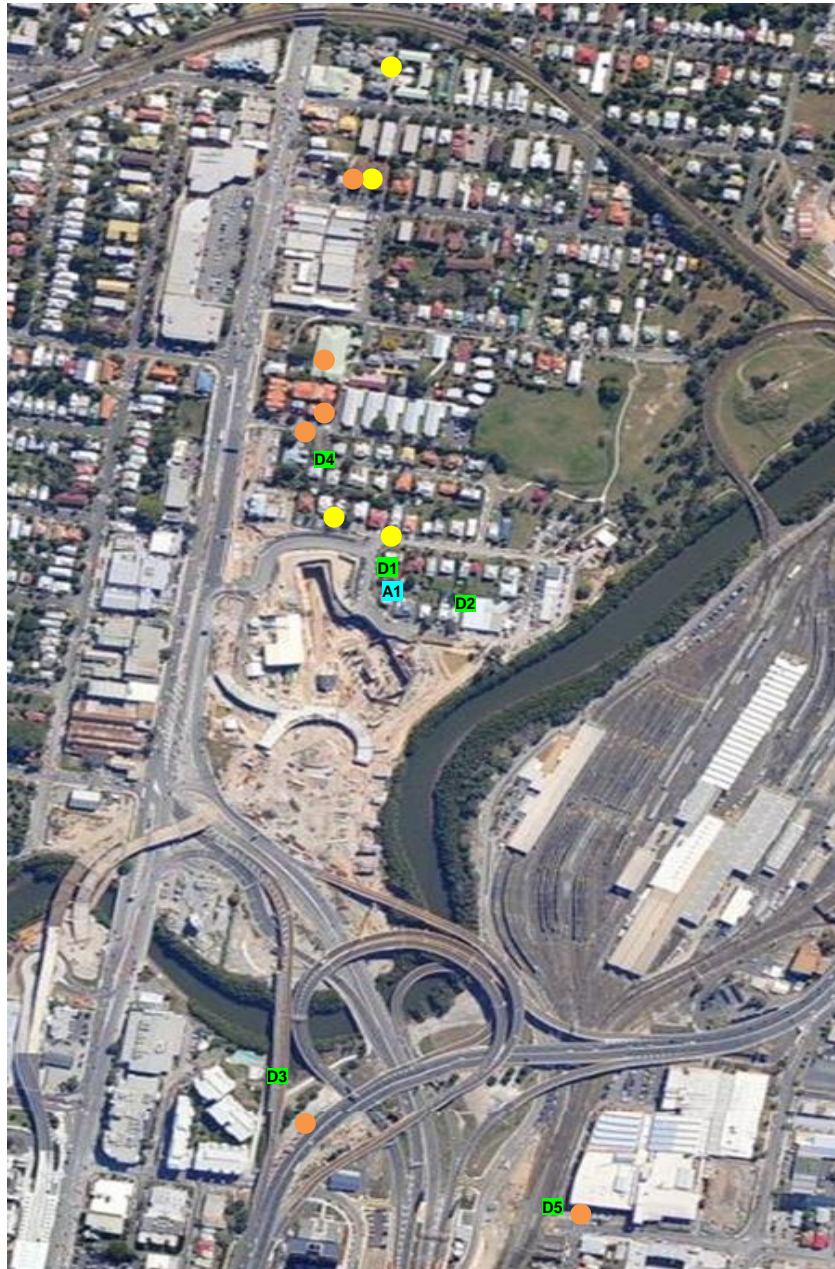
The report has been compiled to summarise the results of noise, air quality and vibration monitoring on the Airport Link and Northern Busway project. The report also compares those results with compliance thresholds for environmental harm, community nuisance and loss of amenity nominated by the Coordinator General (Change Report July 2008 and Woolloowin Worksite Report October 2009).

The monitoring data covered in this report is for the September 2010 reporting period, from 15<sup>th</sup> August 2010 to 15<sup>th</sup> September 2010.

## **2.0 Monitoring Locations**

Several monitoring locations exist within the project area as described in Figures 1-5. Note that the aerial photograph overlays used in Figures 1-5 do not accurately portray the extent of the project's progress to September 2010, though do serve a useful purpose in relating the monitoring locations to existing structures and infrastructure.

## Bowen Hills Monitoring Locations



Source: NearMap 2010

Figure 2.1 – Bowen Hills Monitoring Locations

### Legend

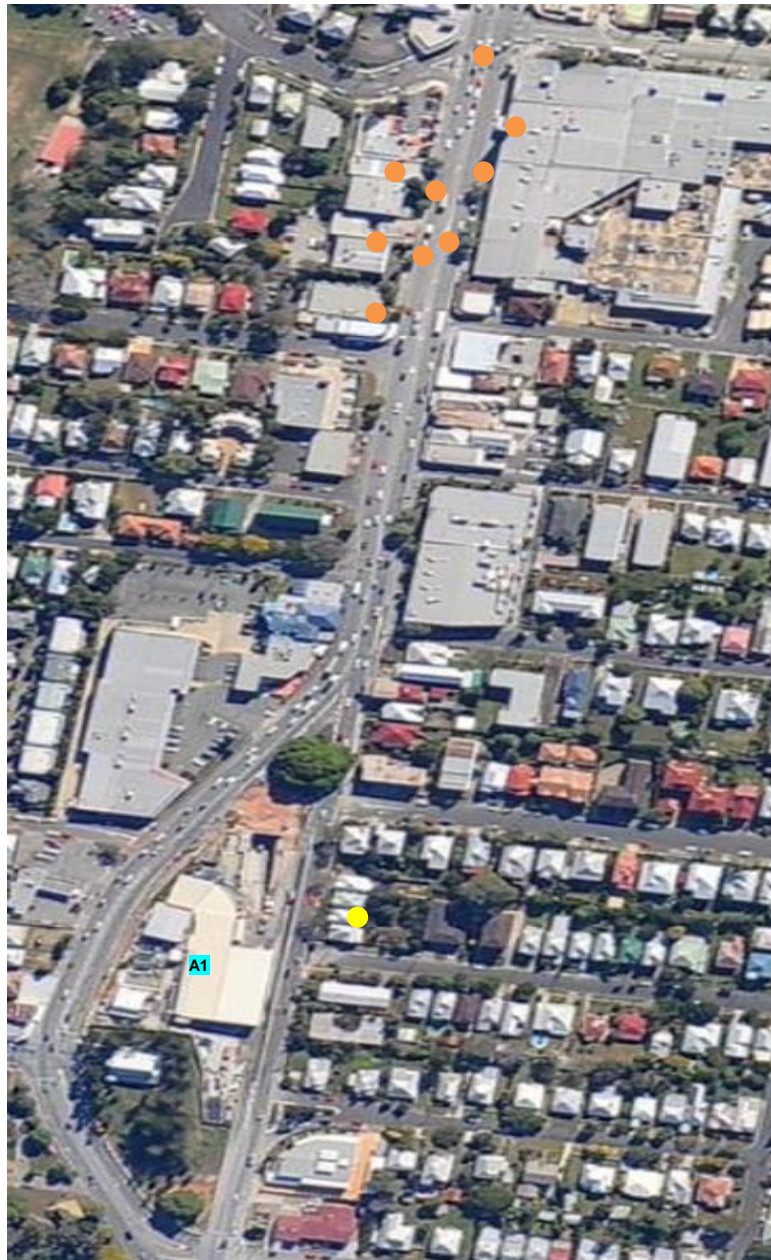
- Noise (during construction )
- Vibration
- Air (PM<sub>10</sub>)
- Air (Dust Deposition)

Note: QNP is not shown due to map extremities – physical location 41 Campbell Street Bowen Hills

Note: 252 Lutwyche Road is not shown due to map extremities

Note: locations are indicative only





## Truro Street Mid Tunnel Monitoring Locations



Source: NearMap 2010

Figure 2.2 – Truro Street Mid Tunnel Monitoring Locations

### Legend

- |  |   |
|--|---|
|  Noise (during construction ) |  Air (PM <sub>10</sub> ) |
|  Vibration                    |  Air (Dust Deposition)   |

Note: locations are indicative only

### Northern Busway Monitoring Locations



Source: NearMap 2010

Figure 2.3 – Nthn Busway Monitoring Locations

**Legend**

- Noise (during construction )
- Vibration

- Air (PM<sub>10</sub>)
- Air (Dust Deposition)

Note: locations are indicative only

## Kedron Monitoring Locations



Source: NearMap 2010

**Figure 2.4 – Kedron Monitoring Locations**

**Legend**

- Noise (during construction )
- Vibration

- Air (PM<sub>10</sub>)
- Air (Dust Deposition)

**Note:** locations are indicative only

## Woolloowin Monitoring Locations



Source: Nearmap 2010.

Figure 2.5 – Woolloowin Monitoring Locations

### Legend

- |  |   |
|--|---|
| <span style="color: yellow;">●</span> Noise (during construction ) | <span style="color: blue;">●</span> Air (PM <sub>10</sub> )         |
| <span style="color: orange;">●</span> Vibration                    | <span style="color: green;">●</span> Air (Dust Deposition)          |
|  | <span style="color: purple;">●</span> Air (CO and NO <sub>2</sub> ) |

Note: locations are indicative only.

## Toombul Monitoring Locations



Source: Nearmap 2010.

**Figure 2.6 – Toombul Monitoring Locations**

**Legend**

- Noise (during construction)
- Vibration
- Air (PM<sub>10</sub>)
- Air (Dust Deposition)

**Note:** locations are indicative only.

### 3.0 Noise Monitoring

TJH undertakes regular monitoring of noise levels at a variety of locations across the project to help measure impacts and assist the team plan works and appropriate mitigations if required. The type and timing of monitoring is influenced by the activities being undertaken and relevant Noise Goals (inside buildings and residents living areas where allowed at night and during the day)

Monitoring involves 'attended' monitoring (where a member of the TJH environment team is observing noise sources and durations whilst noise measurements are taken).

#### 3.1 Overview of Noise Mitigation Measures

Generally the main strategies adopted in order to mitigate noise during construction works have included the following:

1. Undertake noise modelling for sections of works adjacent to sensitive receptors.
2. Reasonable and practical mitigation measures that have been implemented to date include the following:
  - a. Temporary noise barriers (precast concrete barrier and plywood):
    - i. Lutwyche Road (Lutwyche, Kedron)
    - ii. Gympie Road (Kedron)
    - iii. Truro Street on all sides of works (Lutwyche)
    - iv. Federation/Morris Street (Bowen Hills)
    - v. Stafford Road (Kedron)
    - vi. Rose St (Wooloowin)
    - vii. Kalinga Park (Toombul)
    - viii. KBB Worksite (Kedron)
  - b. Temporary noise barrier (shipping container) installations:
    - i. Perry Street, (Kedron)
    - ii. Kalinga Park (Toombul)
  - c. Acoustic shed has been built around the tunnel portals / shafts at:
    - i. Truro Street
    - ii. Wooloowin
    - iii. Kalinga Park (410 launch box)
    - iv. TBM spoil shed (Hendra)
  - d. Consultation with property owners prior to commencing works and during construction works
  - e. Installation of mitigation measures at affected residents on a case-by-case basis
  - f. Investigating the early installation of permanent noise barriers at early stages.
  - g. Acoustic shielding of various plant
  - h. Regular awareness, training and reinforcement of work behaviours of staff, subcontractors, spoil haulage drivers, and delivery drivers to prevent or minimise noise generation in work areas
  - i. Use of temporary acoustic treatment (e.g. sound curtains around onsite generators and access/ egress from sites)
  - j. Installation of directional reversing alarms (e.g. 'squawkers') on plant (especially those working out of normal working hours)

#### 3.2 Noise Monitoring Results

The results of TJH monitoring efforts are summarised for each project area in Tables 3a-g.

**Table 3a: Noise Monitoring Results – Northern Busway**

Location	Monitoring Period	Average L <sub>Aeq</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	Average L <sub>A10</sub> (15 min) (dBA)	CoG Goal L <sub>A10</sub> (15 min) (dBA)	Comments
<b>Unit 2 / 37 Lamington Avenue, Lutwyche</b>						
Ground Floor Unit (Living Room)	24/08/2010 8:30am-8:44am	37.9	45	37.7	55	<p><b>Monitoring Type</b> Attended. Internal. Windows and Doors closed</p> <p><b>Noise Sources</b> The dominant noise source throughout the period was a piling rig working on the southern end of CC701. A rock hammer working in the Bus Station excavation was noted intermittently. Other noise sources included traffic on Lutwyche Road and internal noise</p> <p><b>Discussion</b> Monitoring was to assess the level of impact which was being caused to residents adjacent to the Northern Busway worksite. The noise level recorded was below CoG goals</p> <p><b>Mitigation</b> Mitigation was not required as results were within CoG goals</p>
Ground Floor Unit (Living Room)	09/09/2010 9:20am-9:24am	41.6	45	38.7	55	<p><b>Monitoring Type</b> Attended. Internal. Windows and Doors closed</p> <p><b>Noise Sources</b> The dominant noise source throughout the period was a piling rig working on the southern end of CC701. Haulage trucks moving through site were noted intermittently. Other noise sources included traffic on Lutwyche Road and internal noise</p> <p><b>Discussion</b> Monitoring was to assess the level of impact which was being caused to residents adjacent to the Northern Busway worksite. The noise level recorded was below CoG goals</p> <p><b>Mitigation</b> Mitigation was not required as results were within CoG goals</p>
<b>Unit 2 / 63 Lamington Avenue, Lutwyche</b>						
Ground Floor Unit (Living Room)	25/08/2010 8:11am-8:25am	39.6	45	39.9	55	<p><b>Monitoring Type</b> Attended. Internal. Windows and Doors closed</p> <p><b>Noise Sources</b> The dominant noise source throughout the period was traffic on Lutwyche Road. TJH noise sources included an excavator working on the Busway Station bulk excavation, a bobcat moving around site and a squawker from a franna crane working on the CC701 site</p> <p><b>Discussion</b> Monitoring was to assess the level of impact which was being caused to residents adjacent to the Northern Busway worksite. TJH works were audible throughout the session. The results were within CoG goals</p> <p><b>Mitigation</b> Mitigation was not required as results were within CoG goals</p>

Location	Monitoring Period	Average L <sub>Aeq</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	Average L <sub>A10</sub> (15 min) (dBA)	CoG Goal L <sub>A10</sub> (15 min) (dBA)	Comments
<b>Unit 4 / 30 Bradshaw Road, Lutwyche</b>						
2 <sup>nd</sup> Storey Unit (Living Room)	08/09/2010 8:14am-8:28am	40.3	45	39.4	55	<p><b>Monitoring Type</b> Attended. Internal. Windows and Doors closed</p> <p><b>Noise Sources</b> The dominant noise source throughout the period was traffic on Lutwyche Road. Internal noise was noted intermittently. TJH activities were not noted during the session</p> <p><b>Discussion</b> Monitoring was to assess the level of impact which was being caused to residents adjacent to the Northern Busway worksite. TJH works were not audible throughout the session. The results were within CoG goals</p> <p><b>Mitigation</b> Mitigation was not required as results were within CoG goals</p>

**Table 3b: Noise Monitoring Results – Bowen Hills Civils**

Location	Monitoring Period	Average L <sub>Aeq</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	Average L <sub>A10</sub> (15 min) (dBA)	CoG Goal L <sub>A10</sub> (15 min) (dBA)	Comments
<b>14 Gallway Street, Windsor</b>						
Single Storey Brick House (Living Room)	25/08/2010 2:16pm-2:30pm	50.6	45	51.8	55	<p><b>Monitoring Type</b> Attended. Internal. Windows and Doors closed</p> <p><b>Noise Sources</b> The dominant noise source throughout the period was a rock hammer operating in the Formule 1 carpark. No other noise sources were noted.</p> <p><b>Discussion</b> Monitoring was to assess the level of impact which was being caused to residents adjacent to the resurfacing working in the Formule 1 carpark. The level recorded for L<sub>Aeq</sub> was above the CoG goal. This was as a result of the rock hammering activities in the carpark. NCR report has been raised regarding this issue and corrective actions have been implemented.</p> <p><b>Mitigation</b> The Community team will liaise with the stakeholder regarding potential mitigation prior to any further works that are expected to cause excessive noise in the area</p>

Location	Monitoring Period	Average L <sub>Aeq</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	Average L <sub>A10</sub> (15 min) (dBA)	CoG Goal L <sub>A10</sub> (15 min) (dBA)	Comments
<b>39 Galloway Street, Windsor</b>						
Two Storey Timber House (Living Room)	15/09/2010 3:11pm-3:25pm	46.2	45	46.4	55	<p><b>Monitoring Type</b> Attended. Internal. Windows and Doors closed</p> <p><b>Noise Sources</b> The dominant noise source throughout the period was internal noise. Traffic was noted intermittently throughout the session. Audible TJH noises included a rock bolter and hammering in CC101</p> <p><b>Discussion</b> The noise level recorded for LA<sub>eq</sub> was as a result of internal noise (i.e. resident walking through house and talking). TJH activities did not result in an increase in the noise level</p> <p><b>Mitigation</b> No mitigation was required as TJH activities did not result in an increased noise level</p>

**Table 3c: Night Time Noise Monitoring Results – Bowen Hills Tunnels**

Location	Monitoring Period	Average L <sub>Aeq</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	Average L <sub>Amax</sub> (15 min) (dBA)	CoG Goal L <sub>Amax</sub> (15 min) (dBA)	Comments
<b>Unit 3 / 16 Granston Street, Windsor</b>						
2 <sup>nd</sup> Storey Unit (Main Bedroom)	25/08/2010 7:23pm-7:37pm	37.7	40	39.7	50	<p><b>Monitoring Type</b> Attended. Internal. Windows and Doors closed</p> <p><b>Noise Sources</b> The dominant noise source throughout the period was traffic moving along Lutwyche Road. The roadheader cutting in the southbound tunnel was noted intermittently</p> <p><b>Discussion</b> Monitoring was to assess the level of impact which was being caused as a result of tunnelling works in the southbound tunnel. TJH tunnelling activities were noted intermittently during the session. The results recorded were below CoG goals</p> <p><b>Mitigation</b> Mitigation was not required as results were within CoG goals</p>

Location	Monitoring Period	Average L <sub>Aeq</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	Average L <sub>Amax</sub> (15 min) (dBA)	CoG Goal L <sub>Amax</sub> (15 min) (dBA)	Comments
<b>Unit 15 / 14 LeGeyt Street, Windsor</b>						
3 <sup>rd</sup> Storey Unit (Main Bedroom)	31/08/2010 8:11pm-8:25pm	31.0	40	49.6	50	<p><b>Monitoring Type</b> Attended. Internal. Windows and Doors closed</p> <p><b>Noise Sources</b> The dominant noise source throughout the period was traffic moving along Lutwyche Road. Other noise sources included a train on the adjacent Ferry Grove railway line and internal noise.</p> <p><b>Discussion</b> Monitoring was to assess the level of impact which was being caused as a result of tunnelling works in the southbound tunnel. TJH tunnelling activities were not noted during the session. The results recorded were below CoG goals.</p> <p><b>Mitigation</b> Mitigation was not required as results were within CoG goals</p>

**Table 3d: Noise Monitoring Results – Truro Street Mid Tunnel**

Location	Monitoring Period	Average L <sub>Aeq</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	Average L <sub>Amax</sub> (15 min) (dBA)	CoG Goal L <sub>Amax</sub> (15 min) (dBA)	Comments
<b>Unit 15/ 17 Truro Street, Windsor</b>						
Ground Floor Studio (Centre of room)	23/08/2010 8:09pm-8:23pm	39.0	40	38.3	50	<p><b>Monitoring Type</b> Attended. Internal. Windows and Doors closed</p> <p><b>Noise Sources</b> The dominant noise source throughout the period was traffic moving along Truro Street. Other noise sources included the loader moving in the acoustic shed and internal noise.</p> <p><b>Discussion</b> Monitoring was to assess the level of impact which was being caused to residents adjacent to the Truro St worksite. The majority of noise resulted from the traffic moving along Truro St. The results were within CoG goals.</p> <p><b>Mitigation</b> Mitigation was not required as results were within CoG goals.</p>

**Table 3e: Noise Monitoring Results – Kedron**

Location	Monitoring Period	L <sub>Aeq</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	L <sub>Amax</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	Comments
<b>19 Colton Ave, Lutwyche</b>						
Single Storey Timber House (Office/Kitchen)	19/08/2010 10:12 am – 10:27am	51.4	45	48.8	55	<p><b>Monitoring Type</b> Internal attended monitoring, doors and windows closed</p> <p><b>Noise Sources</b> The dominate noise sources were piling rigs operating and sheet pile removal on the Kedron VE200/CC214 work site. Humming plant and general construction activities were also audible intermittently</p> <p><b>Discussion</b> The levels recorded were a result of the piling rigs operating and earthworks. Non-TJH noise sources were also present during the monitoring including petrol pressure washer next door to the monitoring location. Individual property mitigation has been provided to this property, which was not used during this monitoring session to determine the effectiveness of the property mitigation.</p> <p><b>Mitigation Measures</b> A 4m noise wall and double stacked shipping containers border the VE200 work site. Individual property mitigation has been provided to this property</p>
Single Storey Timber House (Office/Kitchen)	19/08/2010 10:35am – 10:50am	52.8	45	53.3	55	<p><b>Monitoring Type</b> Internal attended monitoring, doors and windows closed</p> <p><b>Noise Sources</b> The dominate noise source during this session was the TJH-provided air conditioning unit (as mitigation). Piling rigs, non-TJH hammering and non-TJH traffic was also audible intermittently, but not distinguishable over the air conditioning unit</p> <p><b>Discussion</b> The levels recorded were a result of the mitigation on site in the form of an air conditioning unit. A spot check of noise levels produced by the a/c unit indicated an average sound level of 51.8dba. This resulted in both the TJH and non-TJH noise sources becoming indistinguishable</p> <p><b>Mitigation Measures</b> An air conditioning unit is provided to this premises as mitigation. A 4m noise wall and double stacked shipping containers border the VE200 work site.</p>

Location	Monitoring Period	L <sub>Aeq</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	L <sub>Amax</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	Comments
<b>14 Erskine Avenue, Kedron</b>						
2 Storey Timber House (Lounge Room)	1/09/2010 1:51pm – 2:05pm	51.3	45	48.7	55	<p><b>Monitoring Type</b> Internal attended monitoring, doors and windows open</p> <p><b>Noise Source</b> The predominate noise source monitored was from non-TJH activities, primarily traffic from Gympie Road. Earth works and soil nailing in Kedron North was audible, but was the non-dominate source and difficult to distinguish over the traffic noise</p> <p><b>Discussion</b> This monitoring session was undertaken to assess the mitigation provided from a shipping container noise wall placed to the rear of this property. Monitoring indicates that while levels were exceeding CoG goals, this could not be attributed to TJH works. The predominate noise source monitored was from non-TJH activities, primarily traffic from Gympie Road.</p> <p><b>Mitigation Measures</b> Monitoring will continue to occur in this area if necessary to ascertain the extent of any TJH construction noise. The shipping container noise wall will remain in place for the present time</p>
2 Storey Timber House (Lounge Room)	1/09/2010 2:31pm – 2:27pm	42.7	45	44.4	55	<p><b>Monitoring Type</b> Internal attended monitoring, doors and windows closed</p> <p><b>Noise Source</b> The predominate noise source monitored was from non-TJH activities, primarily traffic from Gympie Road. Earth works and soil nailing in Kedron North was audible, but was the non-dominate source and difficult to distinguish over the traffic noise</p> <p><b>Discussion</b> This monitoring session was undertaken to assess the mitigation provided from a shipping container noise wall placed to the rear of this property. Monitoring indicates that while levels were within CoG goals, this could not be attributed to TJH works</p> <p><b>Mitigation Measures</b> Monitoring will continue to occur in this area if necessary to ascertain the extent of any TJH construction noise. The shipping container noise wall will remain in place for the present time</p>

Location	Monitoring Period	L <sub>Aeq</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	L <sub>Amax</sub> (15 min) (dBA)	CoG Goal L <sub>Amax</sub> (15 min) (dBA)	Comments
<b>23/12 Suez Street, Gordon Park</b>						
Townhouse complex, 3 <sup>rd</sup> floor (Bedroom)	02/09/2010 10:42pm – 10:57pm	34.4	40	49.9	50	<p><b>Monitoring Type</b> Night time internal attended monitoring, doors and windows closed</p> <p><b>Noise Source</b> The TJH noise sources occurring throughout the session were from earthworks (Kedron South). External noise sources included local traffic and internal noises. The night time works were being undertaken under a special circumstance work permit</p> <p><b>Discussion</b> This monitoring session was undertaken to assess potential impacts from night time noise during special circumstances work on Lutwyche Rd. Although special circumstance works are not bound to the CoG night time noise goals, monitoring indicates compliance in both LAeq and LAmax goals</p> <p><b>Mitigation Measures</b> Monitoring will continue to occur in this area if necessary to ascertain the extent of any TJH construction noise. No mitigation measures are proposed at this time</p>
Townhouse complex, 3 <sup>rd</sup> floor (Bedroom)	06/09/2010 9:31pm – 9:46pm	38.5	40	49.5	50	<p><b>Monitoring Type</b> Night time internal attended monitoring, doors and windows closed</p> <p><b>Noise Source</b> The TJH noise sources occurring throughout the session were from earthworks (Kedron South). External noise sources included local traffic and internal noises. The night time works were being undertaken under a special circumstance work permit</p> <p><b>Discussion</b> This monitoring session was undertaken to assess potential impacts from night time noise during special circumstances work on Lutwyche Rd. Although special circumstance works are not bound to the CoG night time noise goals, monitoring indicates compliance in both LAeq and LAmax goals</p> <p><b>Mitigation Measures</b> Monitoring will continue to occur in this area if necessary to ascertain the extent of any TJH construction noise. No mitigation measures are proposed at this time</p>

**Table 3f: Noise Monitoring Results – Toombul**

Location	Monitoring Period	L <sub>Aeq</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	L <sub>A10</sub> (15 min) (dBA)	CoG Goal L <sub>A10</sub> (15 min) (dBA)	Comments
<b>5/23 Walkers Way, Nundah</b>						
Unit block, lounge room (1 <sup>st</sup> Floor)	24/08/2010 9:03 – 9:34 am	48.9	45	48.5	55	<p><b>Monitoring Type</b> Internal attended monitoring, windows closed and back door open</p> <p><b>Noise Sources</b> TJH noise sources (conveyer, truck crossing Widdop Street, reverse beeper, haul road) plus Non-TJH sources (wind, house, bird, train, neighbour, plane, traffic)</p> <p><b>Discussion</b> Monitoring indicates CoG goals are being exceeded. Combination of non-TJH noise sources and TJH noise sources contributed to this exceedence. When isolated non-TJH noise sources could be excluded, the CoG goals were still exceeded – 48.5 dB. At the time of monitoring TJH was installing conveyer cover between east of Widdop Street and Hedley Avenue. NCR was raised regarding this noise exceedence.</p> <p><b>Mitigation Measures</b> 650 mm noise panel has been installed between east of Widdop Street and Hedley Avenue. Works are currently underway (conveyer cover) to mitigate noise from the conveyer belt.</p>
Unit block, lounge room (1 <sup>st</sup> Floor)	24/08/2010 9:20 – 9:34 am	37.81	45	38.6	55	<p><b>Monitoring Type</b> Internal attended monitoring, windows closed and door closed</p> <p><b>Noise Sources</b> TJH noise sources (conveyer, bang, reverse beeper, truck crossing Widdop Street, franna, traffic on haul road) plus Non-TJH sources (unknown noise).</p> <p><b>Discussion</b> Monitoring indicates CoG goals are being met</p> <p><b>Mitigation Measures</b> 650 mm noise panel has been installed between east of Widdop Street and Hedley Avenue. Works are currently underway (conveyer cover) to mitigate noise from the conveyer belt.</p>

Location	Monitoring Period	L <sub>Aeq</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	L <sub>A10</sub> (15 min) (dBA)	CoG Goal L <sub>A10</sub> (15 min) (dBA)	Comments
<b>5/23 Walkers Way, Nundah</b>						
Unit block, lounge room (1 <sup>st</sup> Floor)	1/09/2010 10:08 – 10:22 am	47.6	45	48.5	55	<p><b>Monitoring Type</b> Internal attended monitoring, windows closed and back door open</p> <p><b>Noise Sources</b> TJH noise sources (conveyer, trucks crossing Widdop Street, rumble pad, reverse beeper) plus Non-TJH sources (traffic, birds, yelling, wind)</p> <p><b>Discussion</b> This monitoring session was undertaken to assess the mitigation provided from conveyor cover and 650 mm noise panel between east of Widdop street and Hedley Avenue. Monitoring indicates CoG goals are being exceeded. Combination of non-TJH noise sources and TJH noise sources contributed to this exceedence. No isolation of noise sources was possible during this period due to continuous traffic along Widdop Street.</p> <p><b>Mitigation Measures</b> 650 mm noise panel has been installed between east of Widdop Street and Hedley Avenue. TJH has offered individual property mitigation.</p>
Unit block, lounge room (1 <sup>st</sup> Floor)	1/09/2010 10:25 – 10:39 am	36.5	45	37.4	55	<p><b>Monitoring Type</b> Internal attended monitoring, windows closed and door closed</p> <p><b>Noise Sources</b> TJH noise sources (traffic, piling bang, reverse beeper, rumble pad, banging, squawker, horn) plus Non-TJH sources (resident, fridge, birds, train)</p> <p><b>Discussion</b> Monitoring indicates CoG goals are being met</p> <p><b>Mitigation Measures</b> 650 mm noise panel has been installed between east of Widdop Street and Hedley Avenue.</p>
<b>83 Stuckey Road, Clayfield</b>						
Front Lounge Room, 1 <sup>st</sup> Floor	2/09/2010 9:06 – 9:20 am	41.6	45	42.2	55	<p><b>Monitoring Type</b> Internal attended monitoring, windows and doors closed, air-conditioning on</p> <p><b>Noise Sources</b> TJH noise sources (jet blasting, tower crane, banging, Stuckey gate, EWP, horn, machine idle) plus non-TJH sources (television, birds, resident, train)</p> <p><b>Discussion</b> Monitoring indicates that CoG goals are being met</p> <p><b>Mitigation Measures</b> Include a 6m noise wall and double stack containers. This property has received air conditioning and external blinds from TJH to further mitigate noise. At the time of monitoring, this air conditioner was in use and the windows and doors were closed</p>

Location	Monitoring Period	L <sub>Aeq</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	L <sub>A10</sub> (15 min) (dBA)	CoG Goal L <sub>A10</sub> (15 min) (dBA)	Comments
Front Lounge Room, 1 <sup>st</sup> Floor	2/09/2010 9:21 – 9:35 am	42.8	45	42.5	55	<p><b>Monitoring Type</b> Internal attended monitoring, windows and doors closed, air-conditioning on</p> <p><b>Noise Sources</b> TJH noise sources (machine hum, banging, jet blasting, tower crane, EWP, horn) plus non-TJH sources (train, television, birds, resident, traffic)</p> <p><b>Discussion</b> Monitoring indicates that CoG goals are being met</p> <p><b>Mitigation Measures</b> Include a 6m noise wall and double stack containers. This property has received air conditioning and external blinds from TJH to further mitigate noise. At the time of monitoring, this air conditioner was in use and the windows and doors were closed</p>
<b>83 Stuckey Road, Clayfield</b>						
Front Lounge Room, 1 <sup>st</sup> Floor	2/09/2010 12:51 – 1:05 pm	39.5	45	40.2	55	<p><b>Monitoring Type</b> Internal attended monitoring, windows and doors closed, air-conditioning on</p> <p><b>Noise Sources</b> TJH noise sources (horn, machine hum, bang, squawker, siren, Stuckey gate, jet blasting, excavator, truck, beeper) plus non-TJH sources (resident, train, postman)</p> <p><b>Discussion</b> Monitoring indicates that CoG goals are being met.</p> <p><b>Mitigation Measures</b> Include a 6m noise wall and double stack containers. This property has received air conditioning and external blinds from TJH to further mitigate noise. At the time of monitoring, this air conditioner was in use and the windows and doors were closed</p>
Front Lounge Room, 1 <sup>st</sup> Floor	2/09/2010 1:06 – 1:20 pm	40.1	45	41.0	55	<p><b>Monitoring Type</b> Internal attended monitoring, windows and doors closed, air-conditioning on</p> <p><b>Noise Sources</b> TJH noise sources (horn, truck, squawker, machine hum, bang, EWP, Stuckey gate, tower crane, beeper, jet blasting, franna) plus non-TJH sources (resident, train, birds)</p> <p><b>Discussion</b> Monitoring indicates that CoG goals are being met</p> <p><b>Mitigation Measures</b> Include a 6m noise wall and double stack containers. This property has received air conditioning and external blinds from TJH to further mitigate noise. At the time of monitoring, this air conditioner was in use and the windows and doors were closed</p>

Location	Monitoring Period	L <sub>Aeq</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	L <sub>A10</sub> (15 min) (dBA)	CoG Goal L <sub>A10</sub> (15 min) (dBA)	Comments
<b>78 Elliot Street, Clayfield</b>						
Two Storey Timber House (Living Room)	3/09/2010 2:01 – 2:15 pm	59.5	45	64.8	55	<p><b>Monitoring Type</b> Internal attended monitoring, windows and doors closed</p> <p><b>Noise Sources</b> TJH noise sources (jet blasting, banging, horn) and non-TJH sources (resident, dog barking, birds, train, wind, plane)</p> <p><b>Discussion</b> Monitoring indicates that CoG goals for LAeq are being exceeded. The predominant noise source was from resident/s (phone call, discussion, and birds). Very few TJH noise sources could be isolated from these sources</p> <p><b>Mitigation Measures</b> Include a 6m noise wall and double stack containers and air conditioning</p>
Two Storey Timber House (Living Room)	3/09/2010 2:20 – 2:34 pm	38.8	45	38	55	<p><b>Monitoring Type</b> Internal attended monitoring, windows and doors closed</p> <p><b>Noise Sources</b> TJH noise sources (drop, banging, engine revving) and non-TJH sources (resident, plane, train, traffic, dog barking, bird, people, wind)</p> <p><b>Discussion</b> Monitoring indicates that CoG goals are being met</p> <p><b>Mitigation Measures</b> Include a 6m noise wall and double stack containers and air conditioning</p>
<b>89 Jackson Street, Clayfield</b>						
Two Storey Timber House (Front Bedroom)	10/09/2010 9:02 – 9:22 am	41.5	45	41.5	55	<p><b>Monitoring Type</b> Internal attended monitoring, windows and doors open</p> <p><b>Noise Sources</b> TJH noise sources (machine hum/vents, bang/drops, hammering, crane, excavator, grinder) plus non-TJH sources (lawn mower, birds, train, traffic, resident, plumbing)</p> <p><b>Discussion</b> Monitoring indicates that CoG goals are being met</p> <p><b>Mitigation Measures</b> Include a 6m noise wall</p>
Two Storey Timber House (Front Bedroom)	10/09/2010 9:21 – 9:35 am	37.9	45	38.3	55	<p><b>Monitoring Type</b> Internal attended monitoring, windows and doors closed</p> <p><b>Noise Sources</b> TJH noise sources (squawker, bang/drops, rattle gun, hammering, jet blasting, crane) plus non-TJH sources (lawn mower, birds, train, dog)</p> <p><b>Discussion</b> Monitoring indicates that CoG goals are being met</p> <p><b>Mitigation Measures</b> Include a 6m noise wall</p>

**Table 3f: Night Shift Noise Monitoring Results – Toombul**

Location	Monitoring Period	L <sub>Aeq</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	L <sub>Amax</sub> (15 min) (dBA)	CoG Goal L <sub>Amax</sub> (15 min) (dBA)	Comments
<b>7 Wallaby Street, Nundah</b>						
Two storey timber house, bedroom	17/08/2010 21:01 – 21:16 pm	34.3	35	37.5	50	<p><b>Monitoring Type</b> Internal attended monitoring, windows and doors closed.</p> <p><b>Noise Sources</b> TJH noise sources (conveyer) plus non-TJH sources (traffic)</p> <p><b>Discussion</b> Monitoring indicates that CoG goals are being met</p> <p><b>Mitigation Measures</b> This property has no mitigation installed. Works are currently underway to mitigate noise from the conveyer belt</p>

**Table 3g – Noise Monitoring Results Wooloowin**

Location	Monitoring Period	Average L <sub>Aeq</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	Average L <sub>A10</sub> (15 min) (dBA)	CoG Goal L <sub>A10</sub> (15 min) (dBA)	Average L <sub>AMAX</sub> (15 min) (dBA)	CoG Goal L <sub>AMAX</sub> (15 min) (dBA)	Comments
<b>71 Park Road, Wooloowin</b>								
Single level brick flat (Dining Room)	25/08/2010 11:52am – 12:06pm	37.0	45	37.7	55	N/A	N/A	<p><b>Monitoring Type</b> Attended Noise Monitoring. Doors and Windows Closed</p> <p><b>Noise Sources</b> Site noise included: scrubber, diesel engines, loader, banging, trucks being loaded and metal on metal. Other noise sources were, traffic and birds</p> <p><b>Discussion</b> Monitoring indicates that CoG daytime goals were met</p> <p><b>Mitigation Measures</b> An acoustic shed and noise wall is in place around Wooloowin Site. 71 Park Road is owned by DMR and is used by TJH for monitoring purposes</p>
Single level brick flat (Dining Room)	30/08/2010 8:20am – 8:37am	37.3	45	38.4	55	N/A	N/A	<p><b>Monitoring Type</b> Attended Noise Monitoring. Doors and Windows Closed</p> <p><b>Noise Sources</b> Site noise included: scrubber, diesel engines, loader, banging (barely audible), trucks being loaded and metal tools. Other noise sources were, traffic, birds, beep-beep of a car being automatically opened, plane and horn</p> <p><b>Discussion</b> Monitoring indicates that daytime CoG goals are being met.</p> <p><b>Mitigation Measures</b> An acoustic shed and noise wall is in place around Wooloowin Site. 71 Park Road is owned by DMR and is used by TJH for monitoring purposes</p>
Single level brick flat (Dining Room)	30/08/2010 8:51pm – 9:06pm	35.8	40	N/A	N/A	46.4	50	<p><b>Monitoring Type</b> Attended Noise Monitoring. Doors and Windows Closed</p> <p><b>Noise Sources</b> Site noise included: scrubber, diesel engines, door closing and banging. Other noise sources were, traffic, train voices and plane</p> <p><b>Discussion</b> Monitoring indicates that night CoG goals are being met</p> <p><b>Mitigation Measures</b> An acoustic shed and noise wall is in place around Wooloowin Site. 71 Park Road is owned by DMR and is used by TJH for monitoring purposes</p>

Location	Monitoring Period	Average L <sub>Aeq</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	Average L <sub>A10</sub> (15 min) (dBA)	CoG Goal L <sub>A10</sub> (15 min) (dBA)	Average L <sub>AMAX</sub> (15 min) (dBA)	CoG Goal L <sub>AMAX</sub> (15 min) (dBA)	Comments
Single level brick flat (Dining Room)	1/09/2010 5:05pm – 5:19am	34.7	40	N/A	N/A	49.3	50	<p><b>Monitoring Type</b> Attended Noise Monitoring. Doors and Windows Closed</p> <p><b>Noise Sources</b> Site noise included: scrubber, diesel engines, gate opening, voices and banging. Other noise sources were traffic, plane, train, siren and car doors / starting</p> <p><b>Discussion</b> Monitoring indicates that night CoG goals are being met</p> <p><b>Mitigation Measures</b> An acoustic shed and noise wall is in place around Woolloowin Site. 71 Park Road is owned by DMR and is used by TJH for monitoring purposes</p>
Single level brick flat (Dining Room)	7/09/2010 11:45am – 11:59am	40.8	45	41.3	55	N/A	N/A	<p><b>Monitoring Type</b> Attended Noise Monitoring. Doors and Windows Closed</p> <p><b>Noise Sources</b> Site noise included: Loader, banging, concrete truck, voices, car doors, and scrubber. Other noise sources included: traffic, helicopter, birds, dog barking</p> <p><b>Discussion</b> Monitoring indicates that daytime CoG goals are being met</p> <p><b>Mitigation Measures</b> An acoustic shed and noise wall is in place around Woolloowin Site. 71 Park Road is owned by DMR and is used by TJH for monitoring purposes</p>
Single level brick flat (Dining Room)	9/09/2010 9:37am – 9:51am	39.1	45	40.1	55	N/A	N/A	<p><b>Monitoring Type</b> Attended Noise Monitoring. Doors and Windows Closed</p> <p><b>Noise Sources</b> Site noise included: reverse beeper, loader, banging, trucks being loaded, door, bucket scrape on concrete and metal tools. Other noise sources included: traffic, birds, plane and house creaking</p> <p><b>Discussion</b> Monitoring indicates that daytime CoG goals are being met</p> <p><b>Mitigation Measures</b> An acoustic shed and noise wall is in place around Woolloowin Site. 71 Park Road is owned by DMR and is used by TJH for monitoring purposes</p>

Location	Monitoring Period	Average L <sub>Aeq</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	Average L <sub>A10</sub> (15 min) (dBA)	CoG Goal L <sub>A10</sub> (15 min) (dBA)	Average L <sub>AMAX</sub> (15 min) (dBA)	CoG Goal L <sub>AMAX</sub> (15 min) (dBA)	Comments
Single level brick flat (Dining Room)	14/09/2010 2:44pm – 2:59pm	40.8	45	41.6	55	N/A	N/A	<p><b>Monitoring Type</b> Attended Noise Monitoring. Doors and Windows Closed</p> <p><b>Noise Sources</b> Site noise included: loader, lawnmower and banging. Other noise sources included: traffic, birds, dog barking and house creaking</p> <p><b>Discussion</b> Monitoring indicates that daytime CoG goals are being met</p> <p><b>Mitigation Measures</b> An acoustic shed and noise wall is in place around Woolloowin Site. 71 Park Road is owned by DMR and is used by TJH for monitoring purposes</p>

### **3.3 Compliance with Noise Goals**

Exceedences of the Coordinator General's Noise Goals as a result of TJH construction activities (or a combination of external and TJH construction activities) have been found during this monitoring period at a number of locations, these include:

- 14 Gallway Street, Bowen Hills
- 5/23 Walker's Way, Nundah

### **4.0 Air Quality Monitoring**

TJH undertakes regular monitoring of air quality levels at a variety of locations across the project to help measure impacts and assist the team to plan works and appropriate mitigations if required.

Monitoring involves sampling of dust deposition (monthly), and real-time respiratory dust (PM10) at a number of locations nominated by the Coordinator General. Real-time monitoring of Total Suspended Particulates (TSP) and CO/NO<sub>2</sub> is also occurring at a location in the vicinity of the Wooloowin Worksite.

Results of monitoring are compared to Air Quality Goals nominated by the Coordinator General (Change Report July 2008 & Wooloowin Worksite Modification October 2009) for the Airport Link and Northern Busway projects.

#### **4.1 Overview of Air Quality Mitigation Measures**

The key strategies adopted to mitigate dust and air quality impacts during construction works have included the following:

1. Continual use of water carts
2. Covering of haul vehicles
3. Stabilisation of cleared areas with hardstand materials such as concrete and crushed rock
4. Hydro-mulching and laying geofab to batters
5. Reduction of cleared / exposed soils with concrete paving and geo-fabric installation
6. Road sweepers

## 4.2 Air Quality Monitoring Results – PM10/TSP

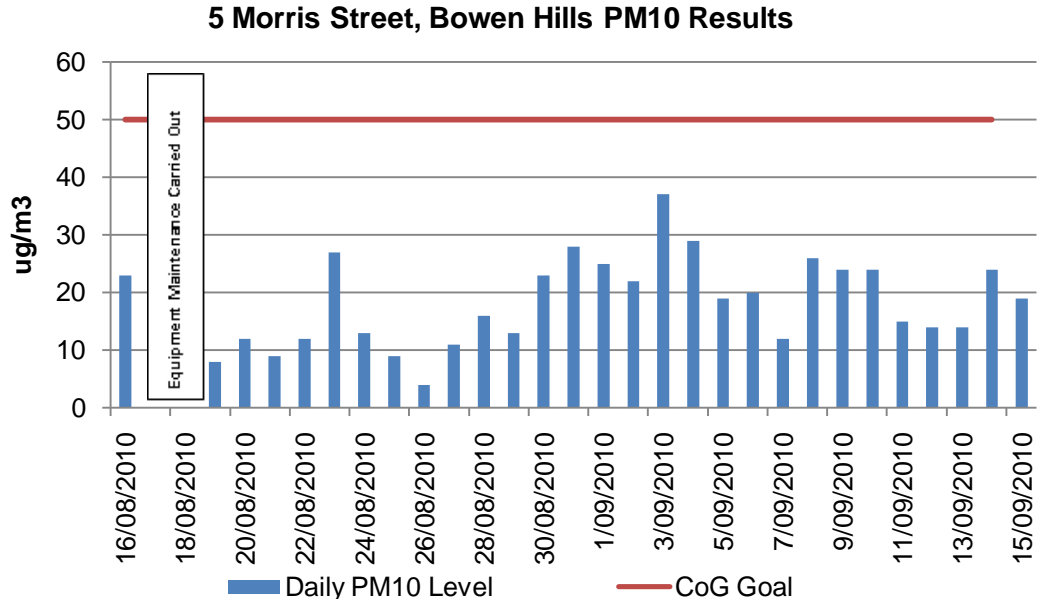


Figure 4.2.1 5 Morris Street, Bowen Hills PM10 Results (for monitor location see figure 2.1 – A1)

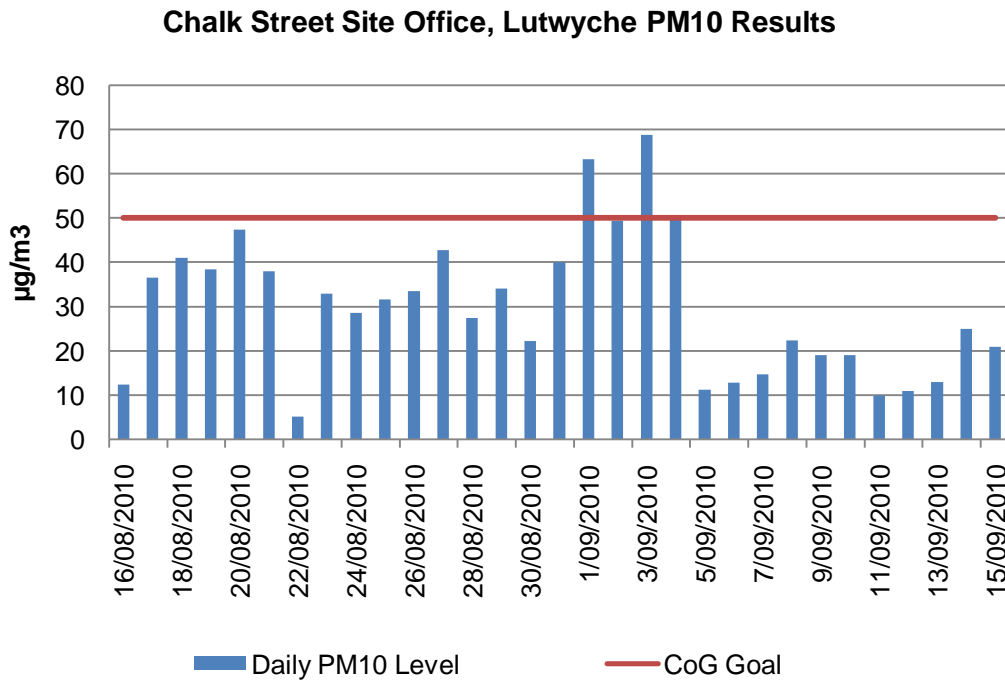


Figure 4.2.2 Northern Busway Site Office, Lutwyche PM10 Results (for monitor location see figure 2.3 – A1)

### Truro Street Site Office, Lutwyche PM10 Results

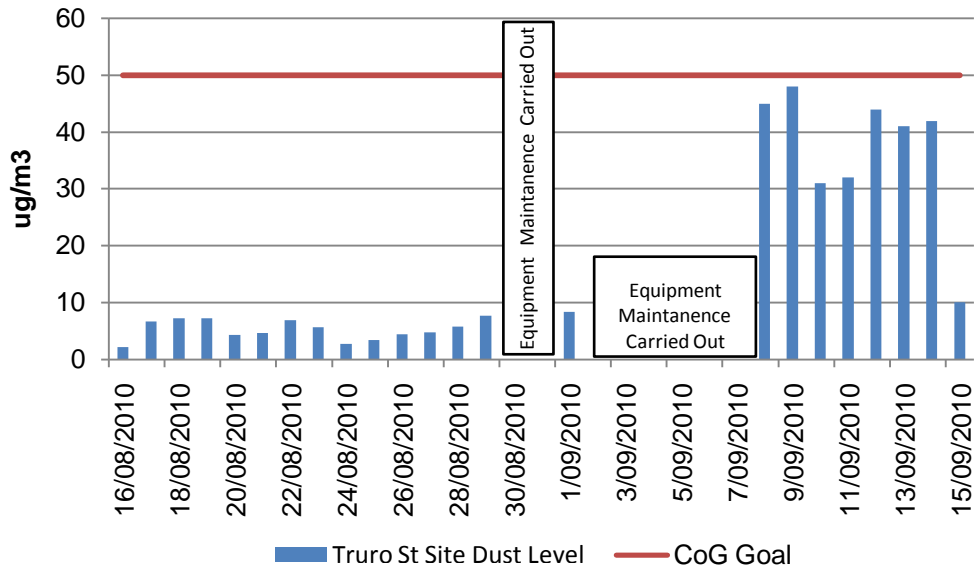


Figure 4.2.3 Truro Street Site Office, Windsor PM10 Results (for location see figure 2.2 – A1)

### Woolloowin State School, Woolloowin PM10 Results

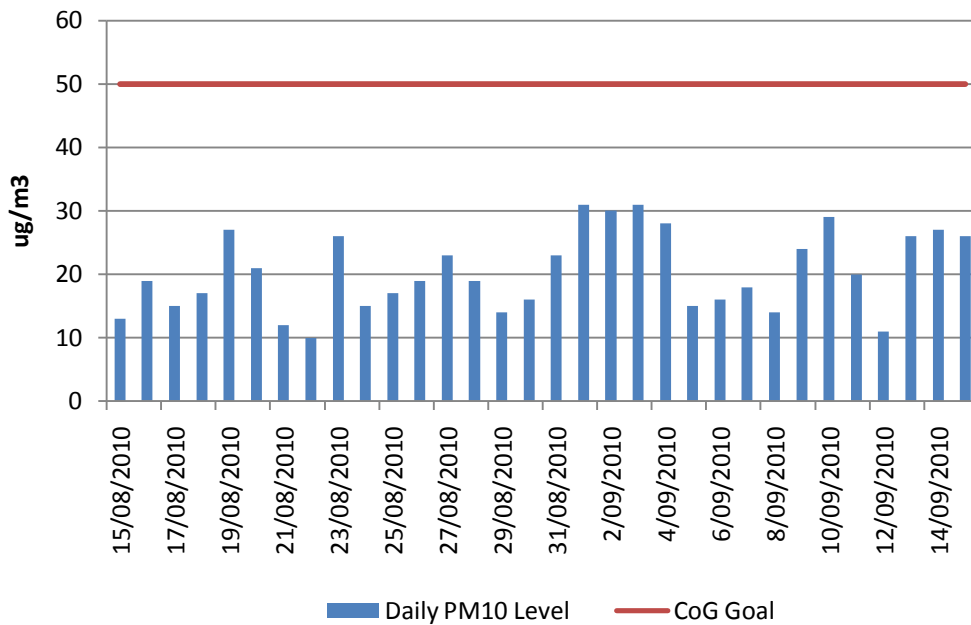


Figure 4.2.4 Woolloowin State School, Lutwyche PM10 Results (for monitor location see figure 2.4 – A4)

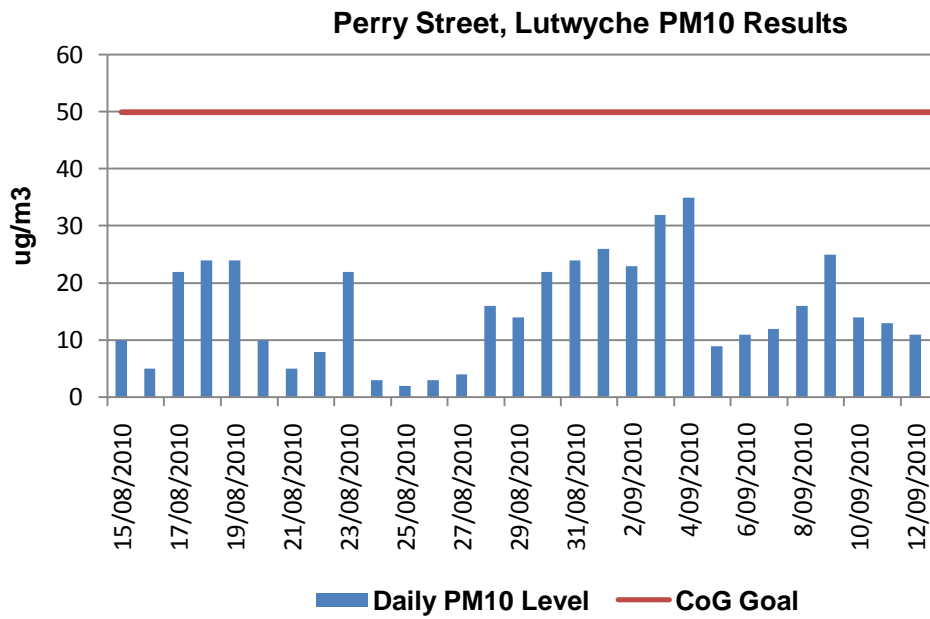


Figure 4.2.5 Perry Street, Lutwyche PM10 Results (for monitor location see figure 2.4 – A3)

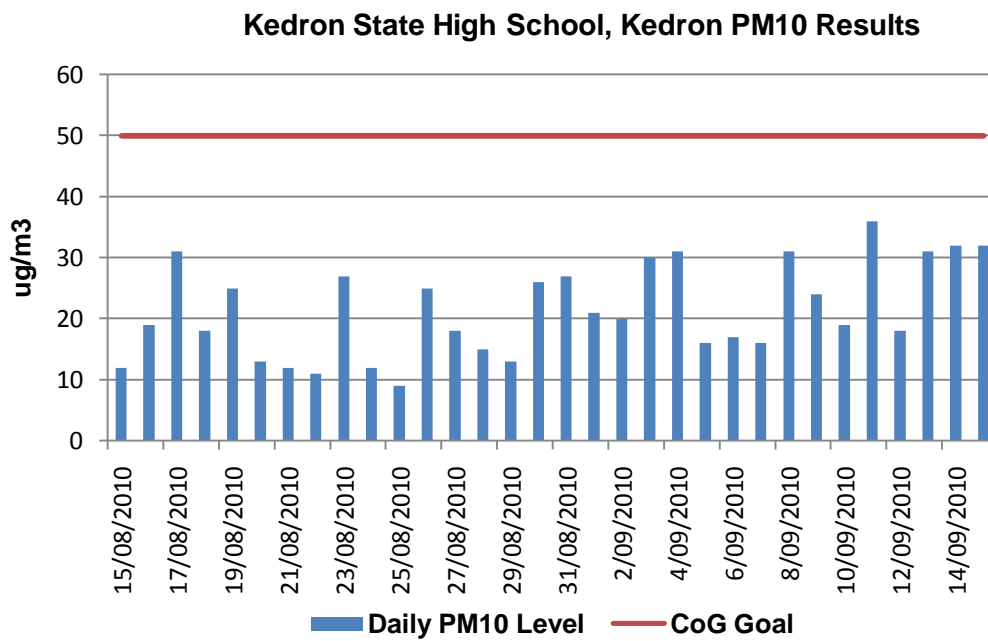


Figure 4.2.6 Kedron State High School (Adj), Kedron PM10 Results (for monitor location see figure 2.4 – A2)

### Erskine Ave, Kedron PM10 Results

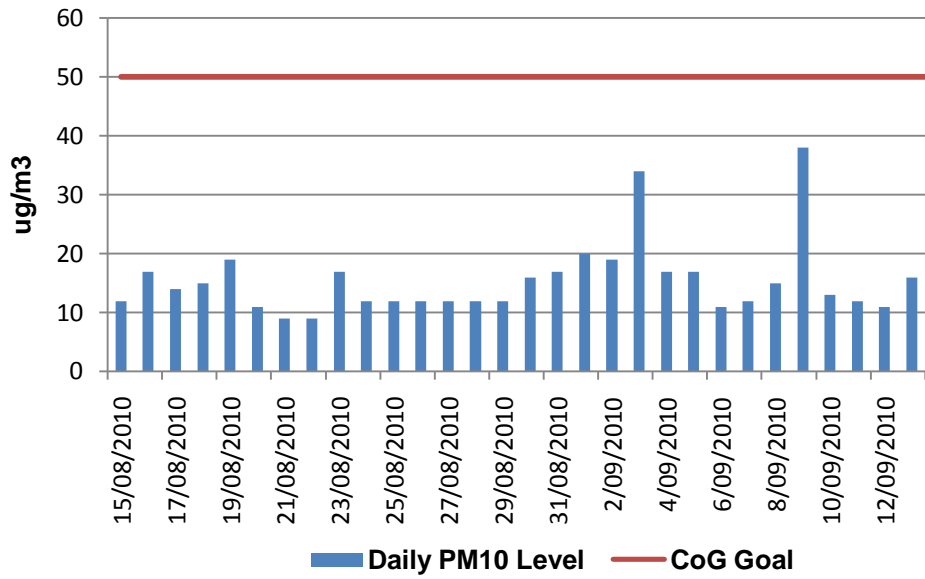


Figure 4.2.7 Erskine Avenue, Kedron PM10 Results (for monitor location see figure 2.4 – A1)

### 56 Kalinga Street, Clayfield PM10 Results

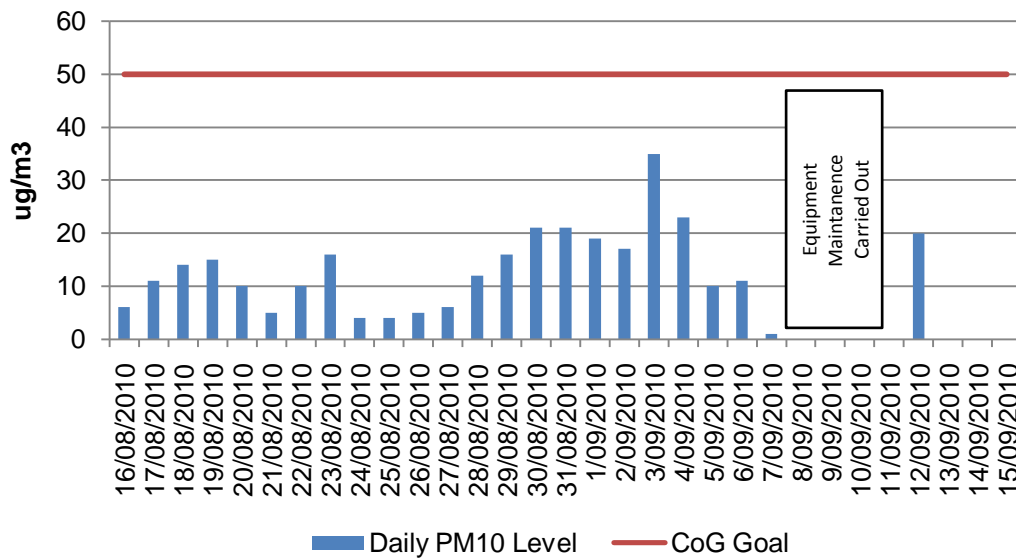


Figure 4.2.8 56 Kalinga Street, Toombul PM10 Results (for monitor location see figure 2.6 – A1)

### 5 Mabel Street, Clayfield PM10 Results

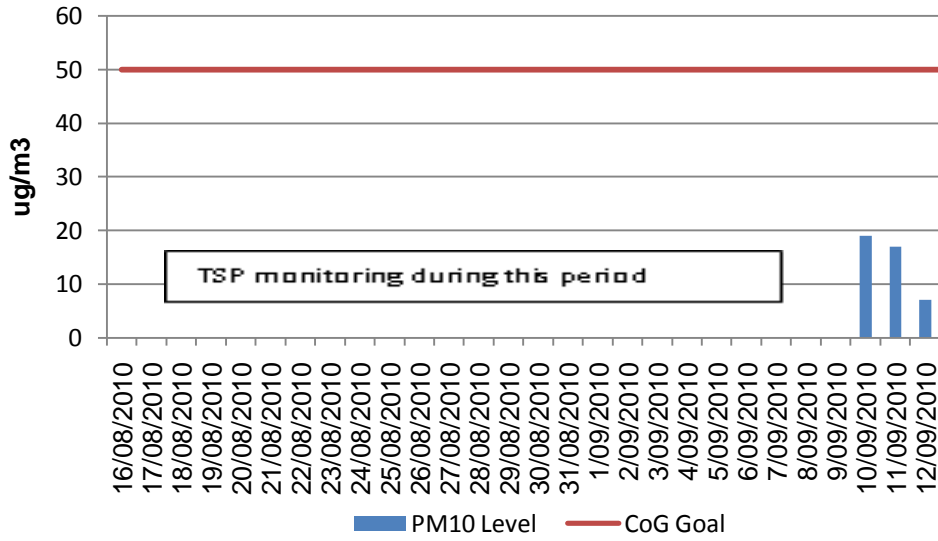


Figure 4.2.9 Kalinga Park Adj Alma Road, Toombul PM10 Results (for monitor location see figure 2.6- A2)

### 74 Alma Road, Clayfield PM10 Results

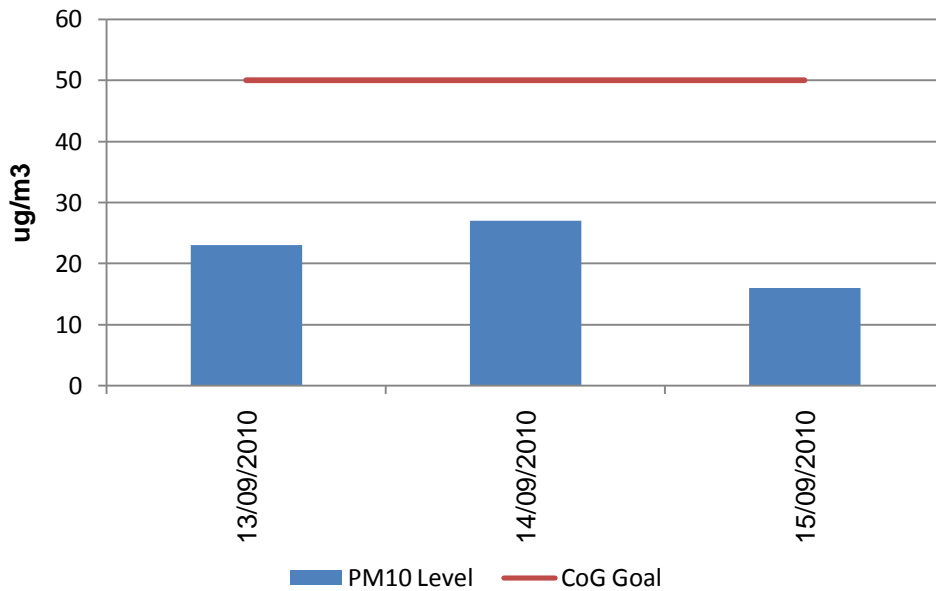


Figure 4.2.10 74 Alma Road, Clayfield PM10 Results (for monitor location see figure 2.6- A3)

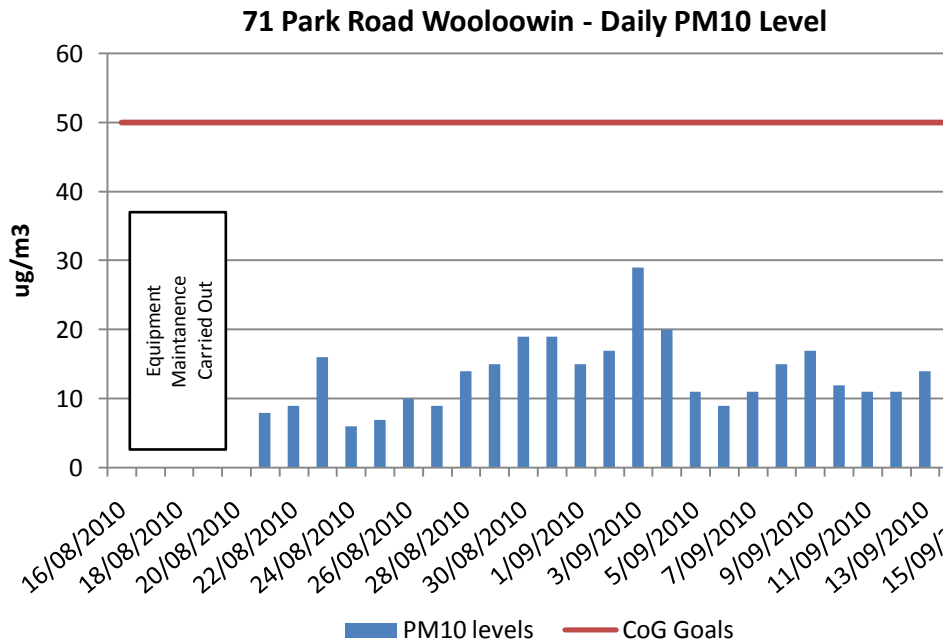


Figure 4.2.11 71 Park Road, Woolloowin PM10 Results (for monitor location see figure 2.5)

### 4.3 Air Quality Monitoring Results – Dust Deposition Results

Dust deposition monitoring is undertaken on a monthly basis using a bottle and funnel placed 2m ± 0.2m above ground level in accordance with Australian Standard AS 3580.10.1: 2003. It should be noted that in most locations the placement of the deposition gauges does not meet the standard due to location and security issues. Note: due to lab processing times and field placement some results are not available at time of report writing thus will be included in next month's report.

### 5 Morris Street, Bowen Hills Dust Fallout April - Sep 2010

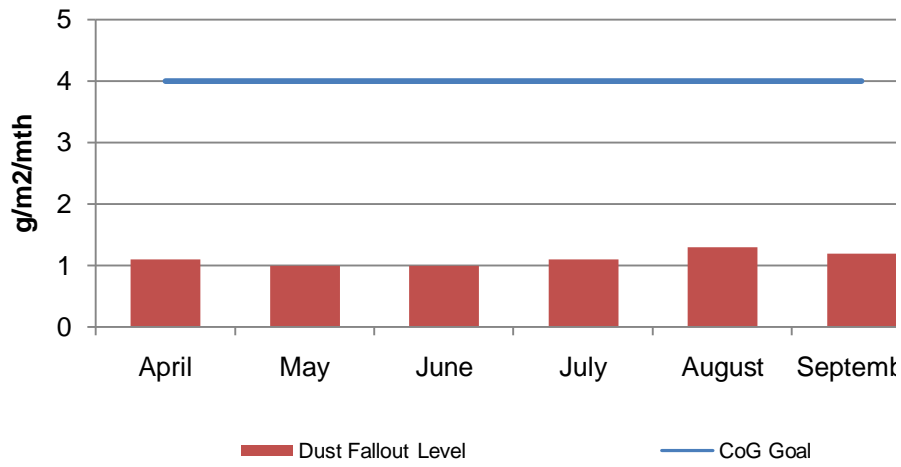


Figure 4.3.1 5 Morris Street, Bowen Hills Dust Deposition Results (for monitor location refer to figure 2.1 – D1)

### Site Office, Bowen Hills Dust Fallout April - September 2010

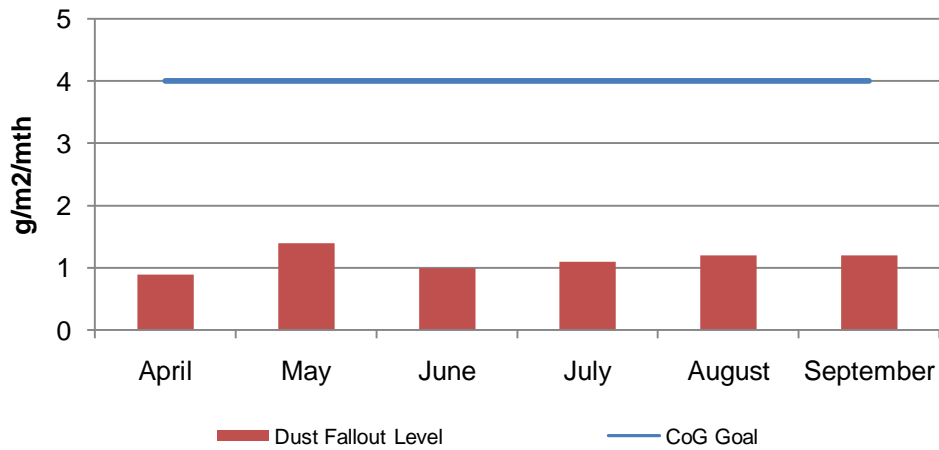


Figure 4.3.2 Site Office, Bowen Hills Dust Deposition Results (for monitor location refer to figure 2.1- D2)

### Mews Apartments, Bowen Hills Dust Fallout July- September 2010

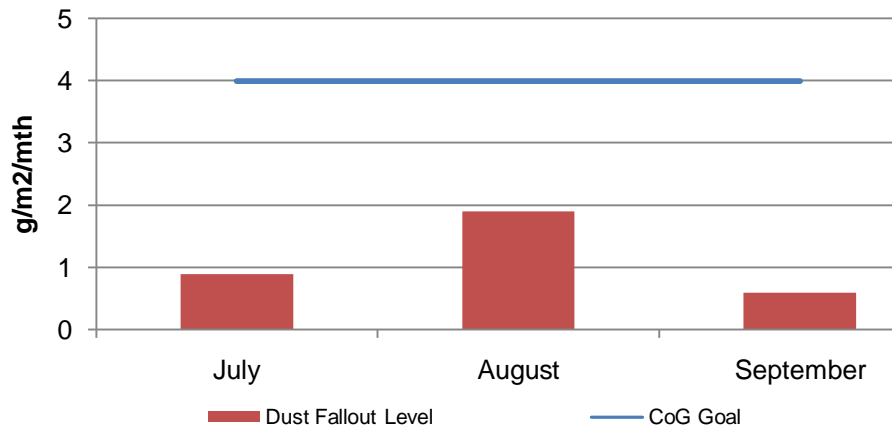


Figure 4.3.3 Mews Apartments, Bowen Hills Dust Deposition Results (for monitor location refer to figure 2.1- D3)

### 11 Bryden Street, Bowen Hills Dust Fallout July- September 2010

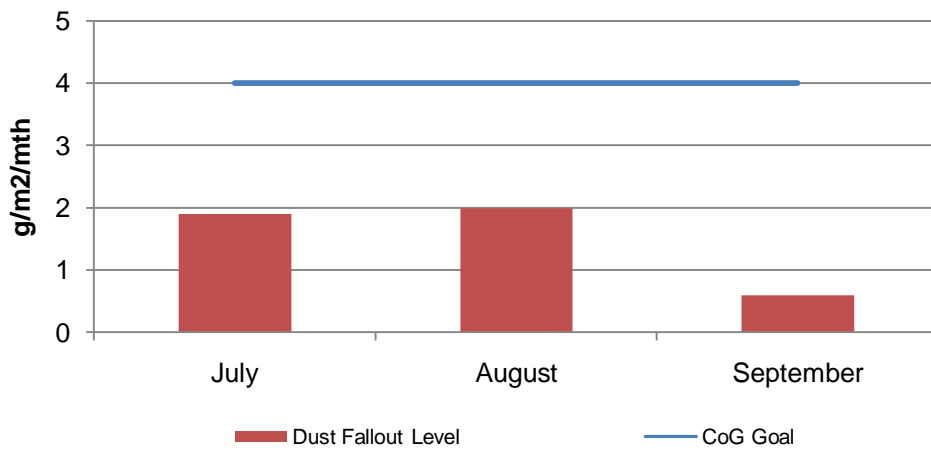


Figure 4.3.4 11 Bryden Street, Bowen Hills Dust Deposition Results (for monitor location refer to figure 2.1- D4)

### QLD Newspapers, Bowen Hills Dust Fallout April - September 2010

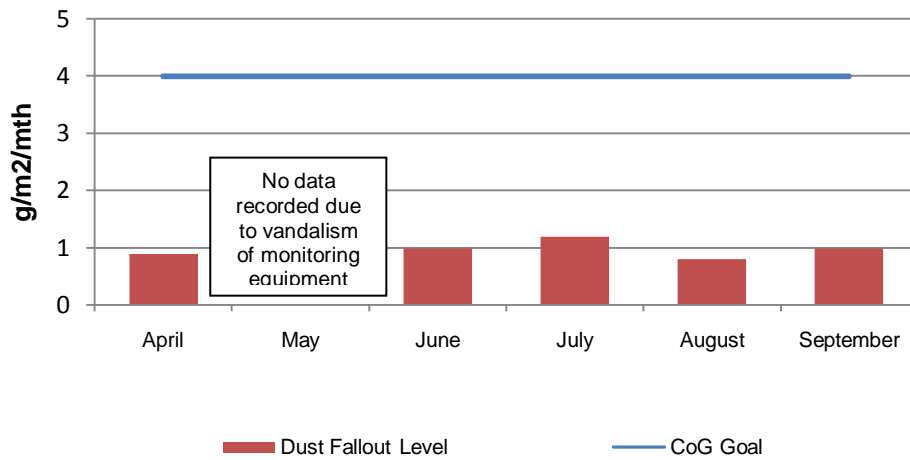


Figure 4.3.5 Queensland Newspapers, Bowen Hills Dust Deposition Results (for monitor location refer to figure 2.1- D5)

### Cnr of Thistle & Lucas Street, Lutwyche Dust Fallout April - September 2010

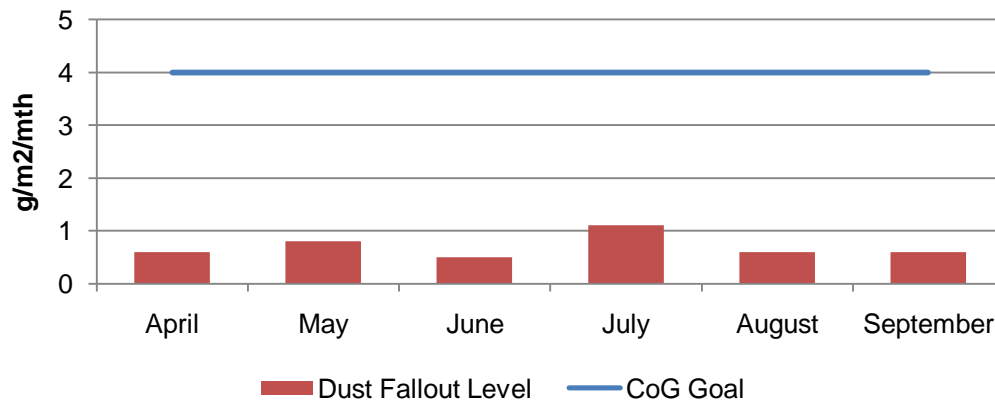


Figure 4.3.6 Cnr of Thistle & Lucas Street, Lutwyche Dust Fallout Results (location refer to figure 2.3 - D2)

### Kedron Brook Reserve, Northern Busway Dust Fallout April-September 2010

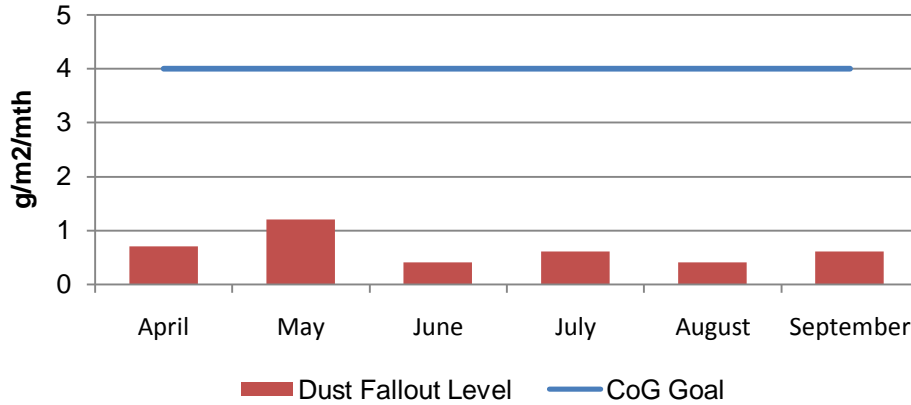


Figure 4.3.7 Kedron Brook Reserve, Northern Busway Dust Fallout Results (location refer to figure 2.3 – D1)

### Dust Fallout Perry Street January 2010 - August 2010

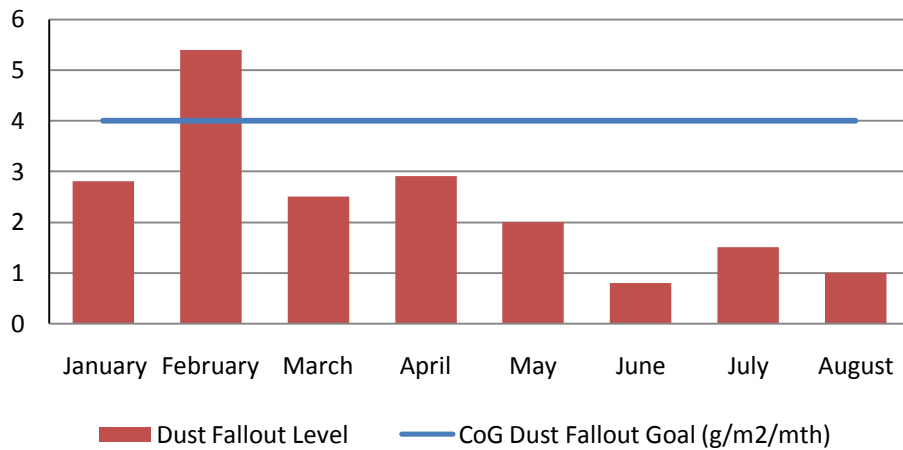


Figure 4.3.8 Perry Street, Lutwyche Dust Fallout Dust Fallout March 2010 – August 2010 (location refer to figure 2.4 – A3)

### Dust Fallout Erskine Avenue March - August 2010

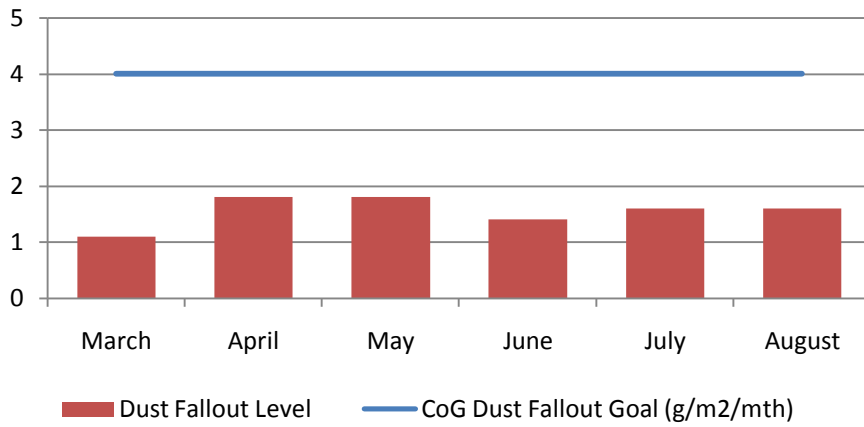


Figure 4.3.9 Erskine Avenue, Kedron Dust Fallout Dust Fallout March 2010 – August 2010 (location refer to figure 2.4 – A1)

### Dust Fallout Wooloowin State School March- August 2010

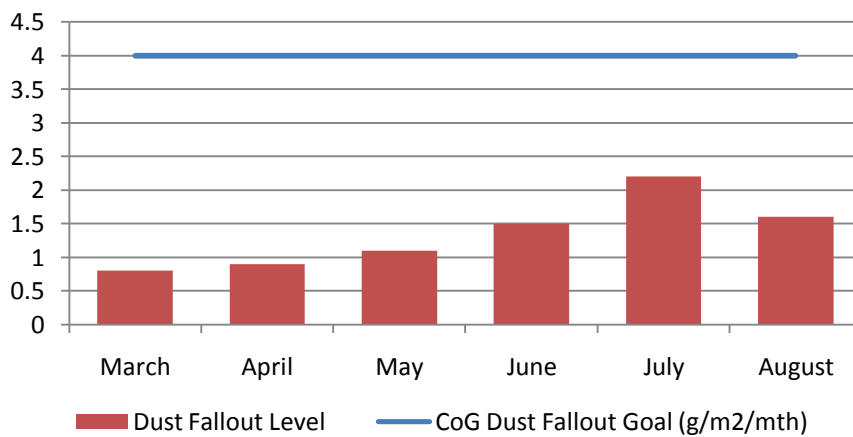


Figure 4.3.10 Wooloowin State School, Dust Fallout March 2010 – August 2010 (location refer to figure 2.4 – A4)

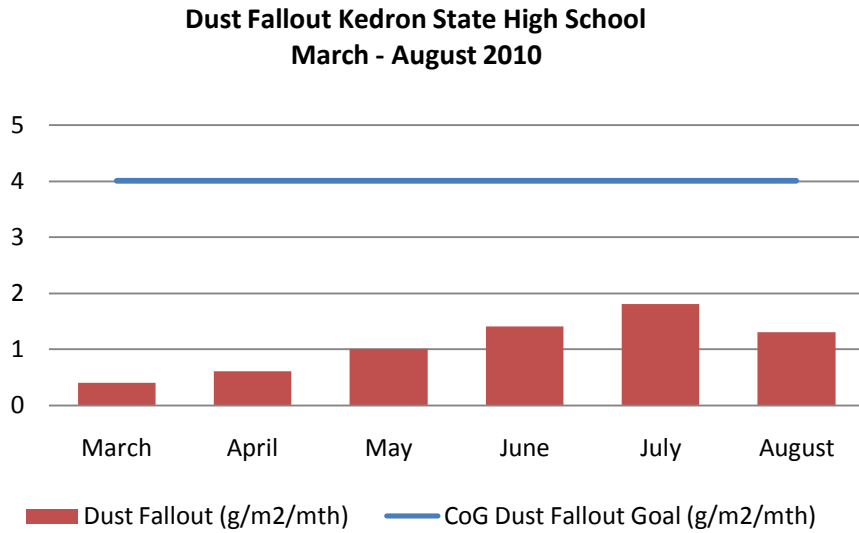


Figure 4.3.11 Kedron State High School, Dust Fallout Dust Fallout March 2010 – August 2010 (location refer to figure 2.4 A2)

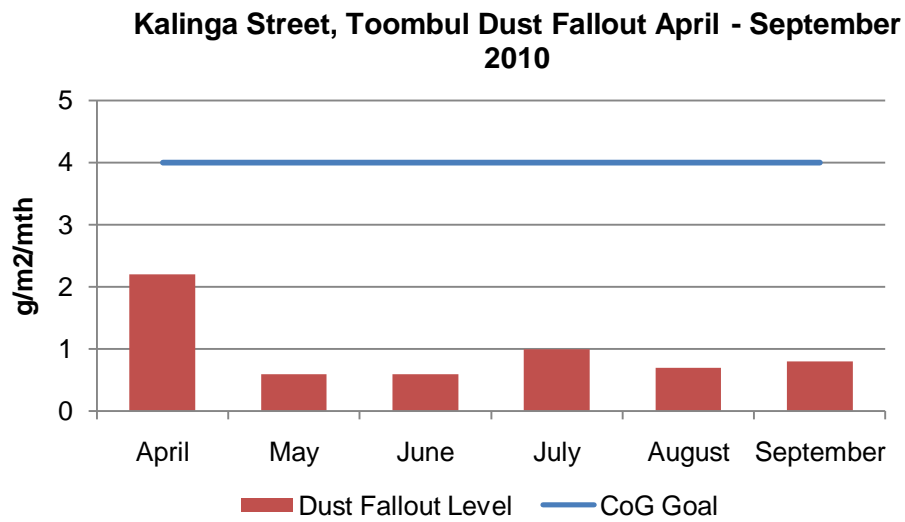


Figure 4.3.12 56 Kalinga Street Toombul, Dust Fallout (location refer to figure 2.6 – D1)

### Mabel Street, Toombul Dust Fallout Level April - September 2010

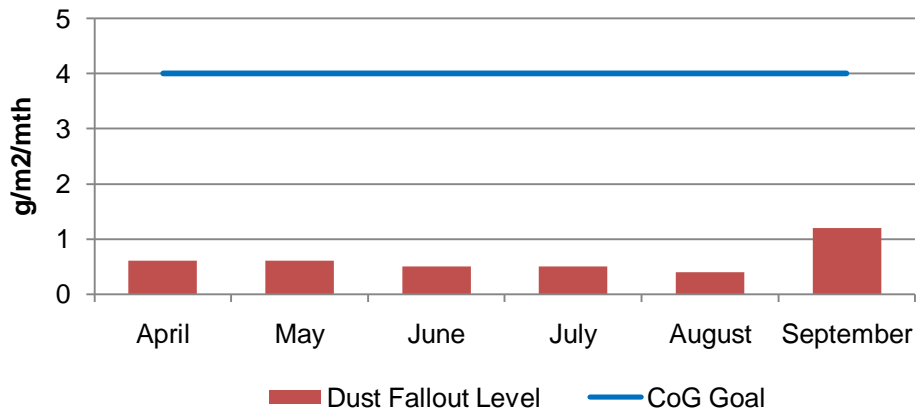


Figure 4.3.13 Mabel Street Toombul, Dust Fallout (location refer to fig 2.6 – D2)

### 64 Park Road, Woolloowin Dust Fall Out September 2010

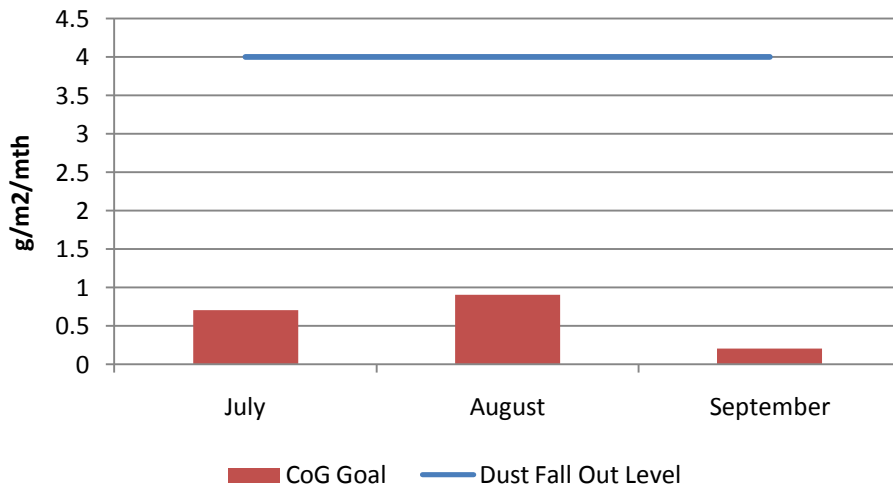


Figure 4.3.14 64, Park Road, Wo Dust Fallout (location refer to fig 2.5 )

Note: The dust deposition gauge at 64 Park Road, Woolloowin is not height compliant with AS/NZS 3580.1.1:2007 due to site constraints and trying to achieve a 120° clear sky angle.

#### 4.4 CO/NO<sub>2</sub> Monitoring – Wooloowin Worksite

TJH undertakes regular monitoring of CO/NO<sub>2</sub> in the vicinity of the Wooloowin Worksite. Monitoring involves real-time sampling and results of monitoring are compared to Air Quality Goals nominated by the Coordinator General in the Wooloowin Worksite Modification Change Report - October 2009.

Gas Monitor at 71 Park Road, Wooloowin					
Date	Peak Date and Time	CO (mg/m <sup>3</sup> ) Peak	CoG CO Limit (mg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> ) Peak	CoG NO <sub>2</sub> Limit (µg/m <sup>3</sup> )
16/08/2010 to 15/09/2010	18/08/2010 01:45	0.87	11	-	-
	07/09/2010 19:00	-	-	66.32	250

Note:

For Carbon monoxide (CO) an 8 hour averaging period is used

For Nitrogen dioxide (NO<sub>2</sub>) a 1 hour averaging period is used

#### 4.5 Compliance with Air Quality Goals

On two occasions this month the daily average recorded by the Dust Trak for PM10 on the Chalk Street site Northern Busway was above the CoG goal. This goal is adopted from the *Environmental Protection (Air) Policy 2008*. This policy states that the limit of 50µg/m<sup>3</sup> should not be exceeded more than 5 times per year. An onsite investigation was completed to determine the cause of the higher values. The higher values have been attributed to a line driller that was completing works for the Lutwyche Busway retaining wall. Work practises for line drilling onsite have now changed to include dust suppression. Revised work practises in the weeks following have resulted in reduced levels.

Dust deposition gauge at Toombul sports complex, Toombul was vandalised during this monitoring period.

## 5.0 Vibration Monitoring

TJH undertakes monitoring of vibration levels at a variety of locations across the project to help measure impacts and assist the team plan works and appropriate mitigations if required. Monitoring involves measuring peak particle velocity (mm/s) at a number of sensitive receptors.

Results of monitoring are compared to Vibration Goals adopted as listed by the Coordinator General (Change Report June 2008 & Wooloowin Worksite Change Report October 2009) for the Airport Link and Northern Busway projects.

### 5.1 Overview of Vibration Mitigation Measures

The key strategies adopted during this monitoring period to mitigate vibration impacts during construction works have included:

1. Predictive modelling of anticipated risks and impacts.
2. Building condition surveys of properties which are likely to experience vibration levels in excess of the levels for minimal risk of cosmetic damage outlined in the CoG Report.
3. Selection of alternative construction equipment / methodology where possible
4. Review of monitoring data for the activities undertaken

### 5.2 Vibration Monitoring Results

Monitoring has been undertaken at a variety of sites along the Airport Link Project alignment this period. Results are detailed in Tables 5a-h.

**Table 5a: Vibration Monitoring Results Summary – Bowen Hills Tunnels**

Location	Monitoring Period	Peak Particle Velocity (mm/s)	CoG Vibration Goal (mm/s)	Comments
Skilmorlie House	16/08/10-18/08/10	0.25	2	Results are within CoG goals
213 Lutwyche Road (Ultimate Car Care)	20/08/10-24/08/10	0.25	5	Results are within CoG goals
Arthritis Qld (Rosemount complex)	16/08/10-26/08/10	1.02	2	Results are within CoG goals
Bryden Street Worksite	02/09/10-15/09/10	0.64	5	Results are within CoG goals

**Table 5b: Vibration Monitoring Results Summary – Bowen Hills**

Location	Monitoring Period	Peak Particle Velocity (mm/s)	CoG Vibration Goal (mm/s)	Comments
Queensland Newspapers	16/08/10-15/09/10	0.254	5	Results are within CoG goals
Area 6 (Adjacent to Mews Apartments Boundary)	08/09/10-15/09/10	0.381	5	Results are within CoG goals

**Table 5c: Vibration Monitoring Results Summary – Northern Busway**

Location	Monitoring Period	Peak Particle Velocity (mm/s)	CoG Vibration Goal (mm/s)	Comments
Lutwyche Centro (Nth End of Building)	16/08/10-14/09/10	1.32	5	Results are within CoG goals

**Table 5d: Blast Monitoring Summary – Truro Street Tunnel (K1 and K2 tunnel)**

Location	Monitoring Period	Peak Particle Velocity (mm/s)	Vibration Goal (mm/s)	Comments
<b>24<sup>th</sup> August (K2 Tunnel)</b>				
Southwest Corner of Lutwyche Centro	60 seconds	5.71	25	Results are within CoG goals
Lower level carpark adjacent to Western footings	60 seconds	3.91	25	Results are within CoG goals
Footpath adjacent to Airport Link Information Centre	60 seconds	7.75	25	Results are within CoG goals
Centre of lower level carpark	60 seconds	6.10	25	Results are within CoG goals
Corner of Chalk Street and Lutwyche Road	60 seconds	<2.5	25	The trigger level on the vibration monitor was set at 2.5mm/s. The blast did not trigger the monitor. Results are within CoG goals
<b>1<sup>st</sup> September (K2 Tunnel)</b>				
Southwest Corner of Lutwyche Centro	60 seconds	3.05	25	Results are within CoG goals
Lower level carpark adjacent to Western footings	60 seconds	1.52	25	Results are within CoG goals
Footpath adjacent to Airport Link Information Centre	60 seconds	5.59	25	Results are within CoG goals

Location	Monitoring Period	Peak Particle Velocity (mm/s)	Vibration Goal (mm/s)	Comments
Centre of lower level carpark	60 seconds	6.35	25	Results are within CoG goals
Corner of Chalk Street and Lutwyche Road	60 seconds	<2.5	25	The trigger level on the vibration monitor was set at 2.5mm/s. The blast did not trigger the monitor. Results are within CoG goals
<b>7<sup>th</sup> September (K1 Tunnel)</b>				
Southwest Corner of Lutwyche Centro	60 seconds	11.9	25	Results are within CoG goals
508 Lutwyche Road (Ray White)	60 seconds	7.6	25	Results are within CoG goals
Footpath adjacent to Airport Link Information Centre	60 seconds	16.9	25	Results are within CoG goals
524 Lutwyche Road (Coronis Real Estate)	60 seconds	12.1	25	Results are within CoG goals
<b>10<sup>th</sup> September (K2 Tunnel)</b>				
Southern end of lower level carpark	60 seconds	5.7	25	Results are within CoG goals
Centre of lower level carpark	60 seconds	10.9	25	Results are within CoG goals
Northern end of lower level carpark	60 seconds	8.64	25	Results are within CoG goals
Corner of Chalk Street and Lutwyche Road	60 seconds	<2.5	25	The trigger level on the vibration monitor was set at 2.5mm/s. The blast did not trigger the monitor. Results are within CoG goals

**Table 5e: Blast Monitoring Summary - Kedron**

Location	Monitoring Period	Peak Particle Velocity (mm/s)	CoG Vibration Goal (mm/s)	Comments
134 Kedron Park Road (Substation 8)	15/08/2010-15/09/2010	0.59	2	Monitoring road header tunnelling Results within Goals for heritage building

**Table 5f: Blast Monitoring Results Summary - Kedron Tunnels Blasting**

Location	Monitoring Period	Peak Particle Velocity (mm/s)	CoG Vibration Goal Day time (mm/s)	Comments
25/08/2010				
Woolloowin State School (Air Quality Station)	25/08/2010 20 Seconds	6.4	25	Results are within adopted goals
Woolloowin State School (south boundary)	25/08/2010 20 Seconds	4.6	25	Results are within adopted goals
Woolloowin State School (next to office)	25/08/2010 20 Seconds	8.5	25	Results are within adopted goals
Anglican Church	25/08/2010 20 Seconds	2.2	25	Results are within adopted goals
26/08/2010				
94 Kedron Park Road	26/08/2010 20 seconds	18.3	25	Results are within adopted goals
91 Kedron Park Road	26/08/2010 20 seconds	13.7	25	Results are within adopted goals
92 Kedron Park Road	26/08/2010 20 seconds	13.2	25	Results are within adopted goals
102 Kedron Park Road	26/08/2010 20 seconds	13.3	25	Results are within adopted goals
673 Lutwyche Rd	26/08/2010 20 seconds	3.43	25	Results are within adopted goals

Location	Monitoring Period	Peak Particle Velocity (mm/s)	CoG Vibration Goal Day time (mm/s)	Comments
1/09/2010				
94 Kedron Park Road	01/09/2010 20 seconds	7.37 mm/s	25	Results are within adopted goals
28 Eveleigh Street	01/09/2010 20 seconds	6.86 mm/s	25	Results are within adopted goals
34 Park Road	01/09/2010 20 seconds	2.92 mm/s	25	Results are within adopted goals
91 Kedron Park Road	01/09/2010 20 seconds	4.19 mm/s	25	Results are within adopted goals
94 Kedron Park Road (2 <sup>nd</sup> location)	01/09/2010 20 seconds	9.14	25	Results are within adopted goals
3/09/2010				
124 Kedron Park Road	3/09/2010 20 seconds	19.3	25	Results are within adopted goals
673 Lutwyche Road	3/09/2010 20 seconds	7.1.4	25	Results are within adopted goals
92 Kedron Park Road	3/09/2010 20 seconds	15.9	25	Results are within adopted goals
679 Lutwyche Road	3/09/2010 20 seconds	15.7	25	Results are within adopted goals
8/09/2010				
94 Kedron Park Road	8/09/2010 20 seconds	17.7	25	Results are within adopted goals
28 Eveleigh Street	8/09/2010 20 seconds	5.6	25	Results are within adopted goals

34 Park Road	8/09/2010 20 seconds	805	25	Results are within adopted goals
91 Kedron Park Road	8/09/2010 20 seconds	8.5	25	Results are within adopted goals
18 Eveleigh Street	8/09/2010 20 seconds	9.1	25	Results are within adopted goals

**Table 5g: Vibration Monitoring Results Summary - Woolloowin**

Location	Monitoring Period	Peak Particle Velocity (mm/s)	CoG Vibration Goal (mm/s)	Comments
71 Park Road, Woolloowin	9:37am, 24/08/2010 to 10:25am, 8/09/2010	3.05	5	Results are within CoG goals. PPV occurred on 3:54pm 1/09/2010 for this monitoring period.
71 Park Road, Woolloowin	6:25am, 9/09/2010 to 10:15am, 16/09/2010	2.03	5	Results are within CoG goals. PPV occurred on 3:02pm 14/09/2010 for this monitoring period.

### 5.3 Compliance with Vibration Goals

Vibration results across the project were in compliance with CoG goals

### 6.0 Community Enquiries and Complaints

A total of 285 community complaints were reported to the project between 16 August and 15 September 2010. Issues raised are outlined in the table below. For further details on how we are managing community issues, please refer to the [Community Enquiries and Complaints](#) page of the project website which is updated each month.

Complaints Raised – 16 August to 15 September 2010		
Issues	No.	No. of stakeholders
Site noise out-of-hours	45	28
Parking	34	23
Construction vehicle movements	24	17
Driver Behaviour	23	23
Site dust	16	16
PUPs noise out-of-hours	15	12
Site out-of-hours	13	12
Spoil haulage routes and queuing	13	8
Site noise	13	12

Complaints Raised – 16 August to 15 September 2010		
Issues	No.	No. of stakeholders
Traffic Management	12	11
General Construction	12	10
Spoil haulage noise	12	10
Road condition	11	10
Spoil haulage driver behaviour	9	8
Building Damage	9	7
Worker Behaviour	8	7
Vehicle Damage	8	8
Mitigation	8	8
Tunnelling	7	7
Other	125	119
<b>Total complaints</b>	<b>285</b>	<b>192</b>

### 6.1 Top 10 Issues Raised:

