



Airport Link / Northern Busway Project

Monthly Environmental Monitoring Report

March 2011

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1.0 Report Purpose and Scope

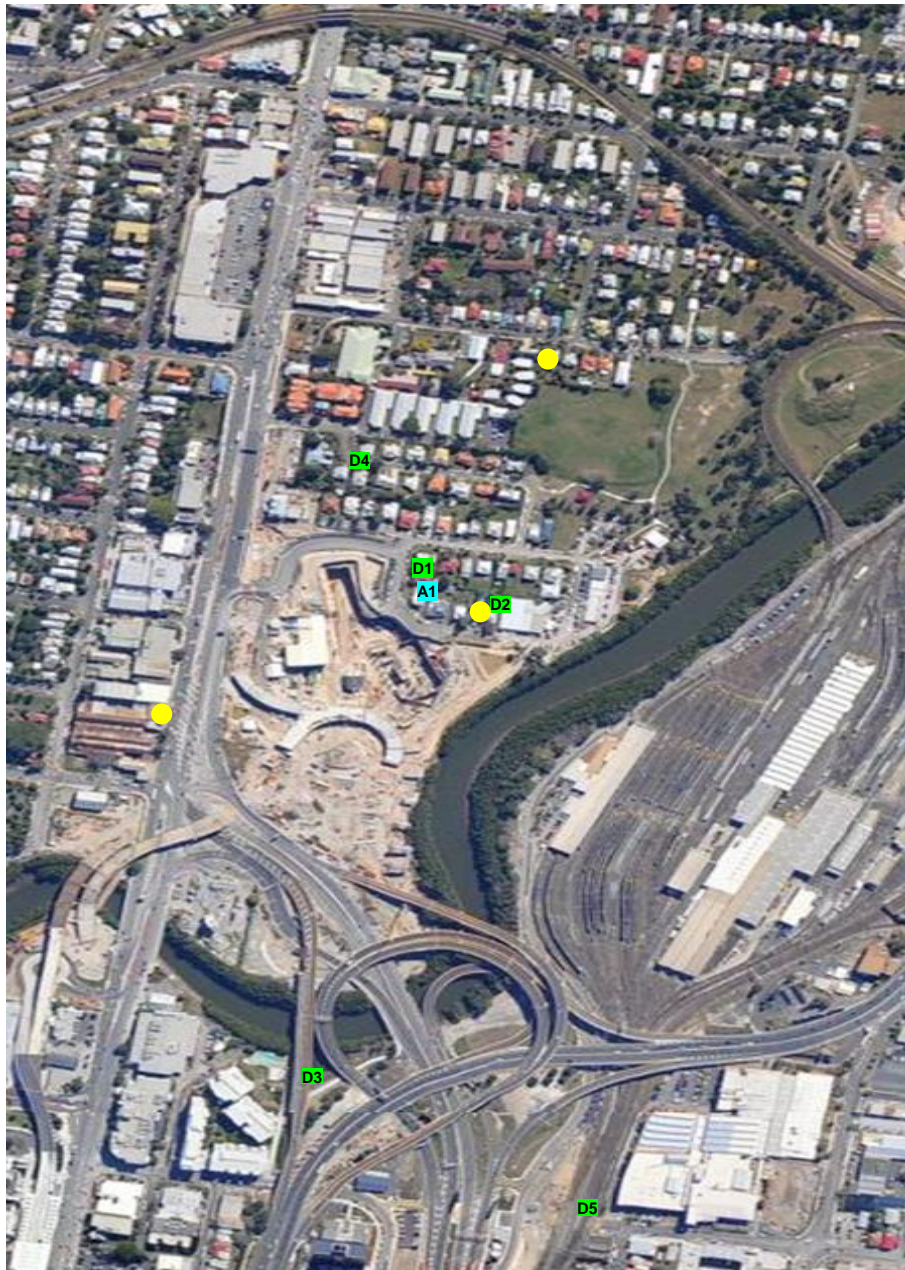
The report has been compiled to summarise the results of noise, air quality and vibration monitoring on the Airport Link and Northern Busway Project. The report also compares those results with compliance thresholds for environmental harm, community nuisance and loss of amenity nominated by the Coordinator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

The monitoring data covered in this report is for the March 2011 reporting period, from 16th February 2011 to 15th March 2011.

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 March 2011, though do serve a useful purpose in relating the monitoring locations to existing structures and infrastructure.

Bowen Hills Monitoring Locations



Source: NearMap 2010

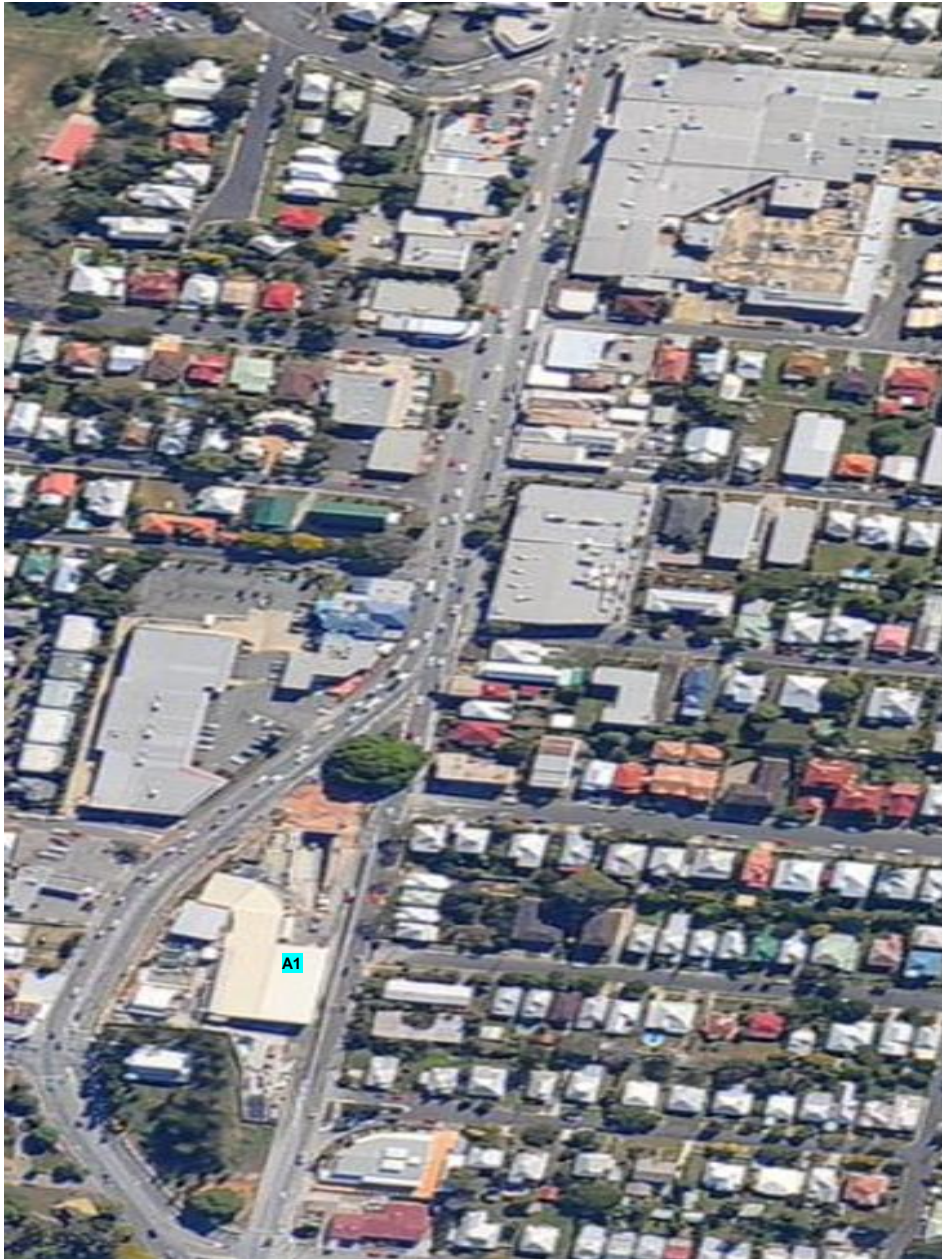
Figure 2.1 – Bowen Hills Monitoring Locations

Legend

- Noise (during construction)
- Vibration
- Air (PM₁₀)
- Air (Dust Deposition)

Note: locations are indicative only

Truro Street Mid Tunnel Monitoring Locations



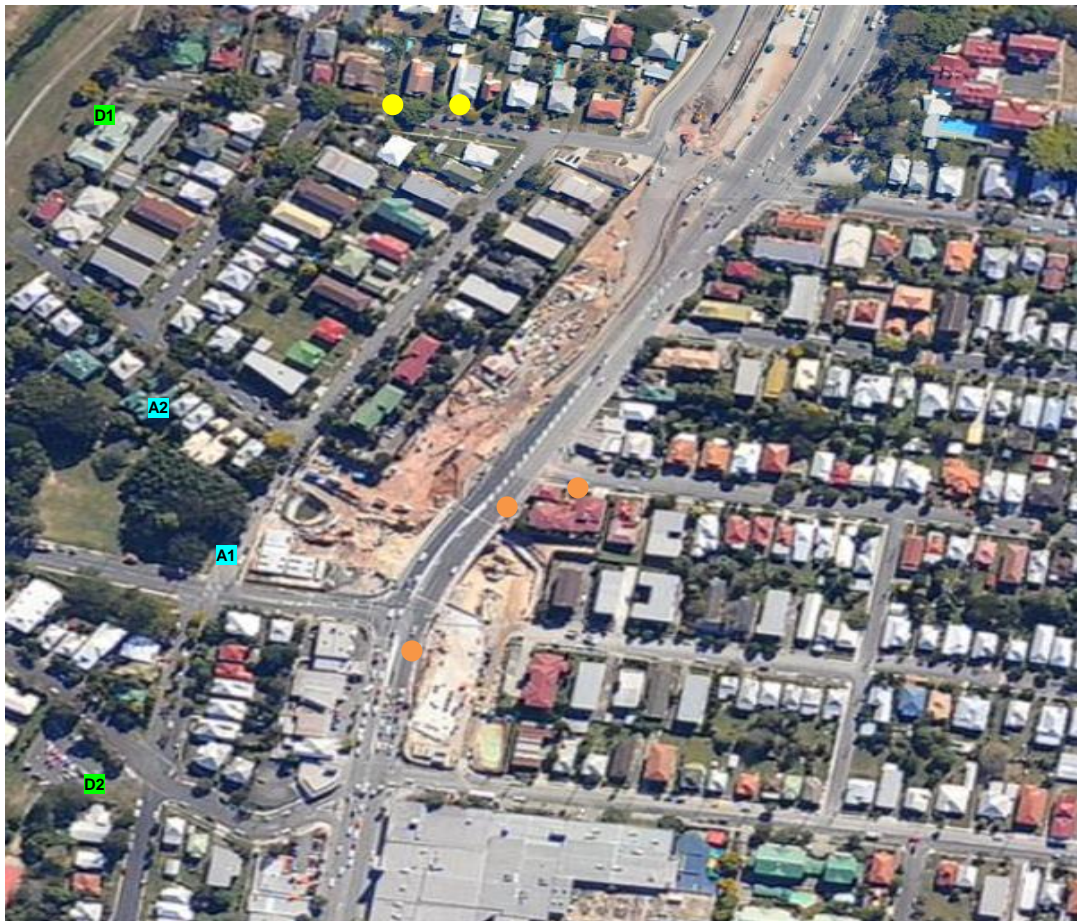
Source: Nearthmap 2010

Figure 2.2 – Truro Street Mid Tunnel Monitoring Locations

Legend

- | | |
|--------------------------------|---------------------------|
| ● Noise (during construction) | ● Air (PM ₁₀) |
| ● Vibration | ● Air (Dust Deposition) |
- Note: locations are indicative only

Northern Busway Monitoring Locations



Source: Nearthmap 2010

Figure 2.3– Northern Busway Monitoring Locations

Legend

● Noise (during construction)

● Air (PM₁₀)

● Vibration

● Air (Dust Deposition)

Note: locations are indicative only

Kedron Monitoring Locations



Source: Nearmap 2010

Figure 2.4 – Kedron Monitoring Locations
Legend

- Noise (during construction)
- Air (PM₁₀)
- Vibration
- Air (Dust Deposition)

Note: locations are indicative only

Woolloowin Monitoring Location



Source Nearmap 2010

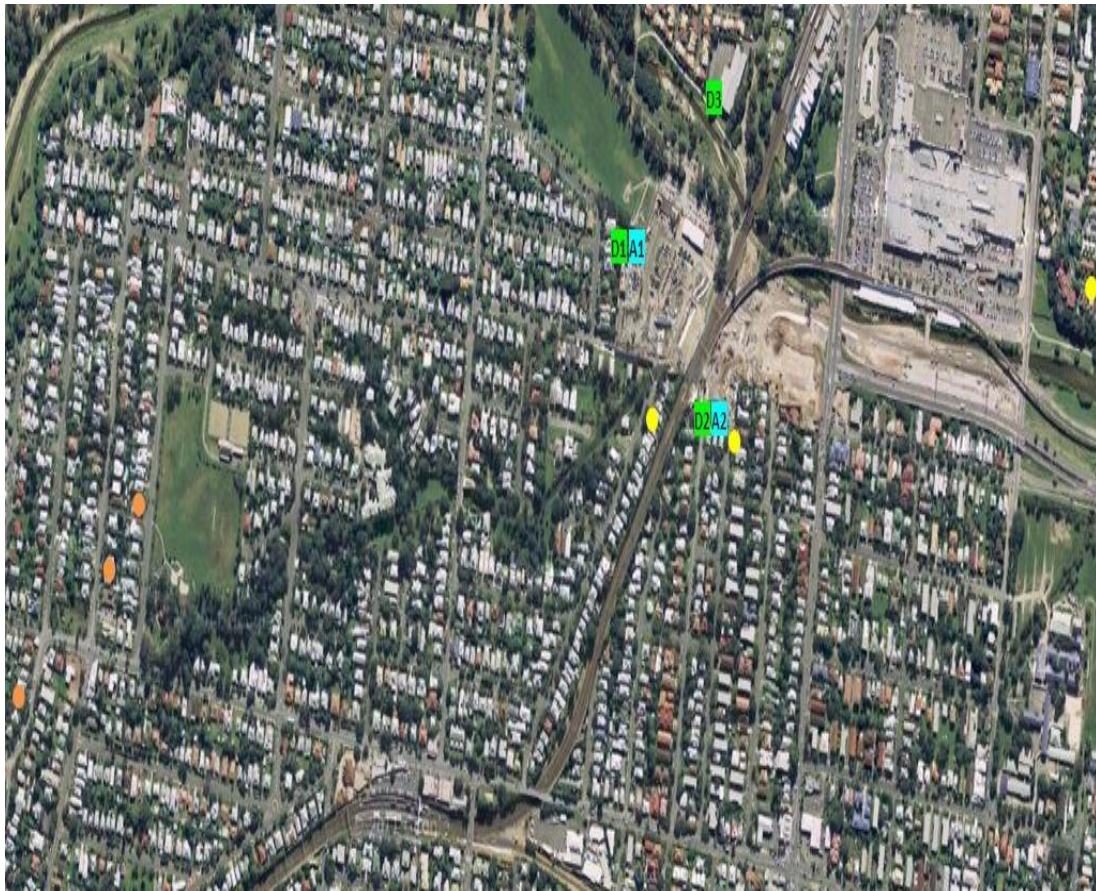
Figure 2.5 – Woolloowin Monitoring Reports

Legend

- | | |
|---------------------------------|-------------------------------|
| ● Noise (during construction) | ● Air (PM ₁₀ /TSP) |
| ● Vibration | ● Air (Dust Deposition) |
| ● Air (CO and NO ₂) | |

Note: locations are indicative only

Toombul Monitoring Locations



Source: Google 2011

Figure 2.6 – Toombul Monitoring Locations

Legend

- Noise (during construction)
- Vibration

- Air (PM₁₀)
- 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. Stafford Road (Kedron)
 - v. Rose St (Wooloowin)
 - vi. Kalinga Park (Toombul)
 - vii. KBB Worksite (Kedron)
 - b. Temporary noise barrier (shipping container) installations:
 - i. Perry Street, (Kedron)
 - ii. Kalinga Park (Toombul)
 - iii. Federation/Morris Street (Bowen Hills)
 - c. Acoustic shed has been built around the tunnel portals / shafts at:
 - i. Truro Street
 - ii. Wooloowin
 - iii. Kalinga Park (410 launch box)
 - 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-f.

Table 3a: Noise Monitoring Results – Bowen Hills Civils

Location	Monitoring Period	Average L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	Average L _{A10} (15 min) (dBA)	CoG Goal L _{A10} (15 min) (dBA)	Comments
51 Cartwright Street, Bowen Hills						
Two Storey House (Living Room)	14/03/2011 7:03am - 7:18am	44.4	45	44.9	55	<p>Monitoring Type Attended. Internal. Windows and Doors closed</p> <p>Noise Sources The dominant noise sources throughout the period were internal noises, i.e. fridge humming. No TJH noise sources were noted throughout the monitoring period. Other noise sources included birds traffic, and trains</p> <p>Discussion Monitoring was to assess the level of impact being caused to residents in proximity to the CC102 bulk excavation works. Results were within CoG goals</p> <p>Mitigation Mitigation was not required as results were within CoG goals</p>
40 Federation Street, Bowen Hills						
Two Storey House (Living Room)	14/03/2011 10:02am - 10:16am	39.3	45	39.8	55	<p>Monitoring Type Attended. Internal. Windows and Doors closed</p> <p>Noise Sources The dominant noise source throughout the period was insects. The only TJH noise source noted was a truck working onsite. Other noise sources included internal noise, insects and trains</p> <p>Discussion Monitoring was to assess the level of impact being caused to residents in proximity to the Bowen Hills worksite. Results were within CoG goals</p> <p>Mitigation Mitigation was not required as results were within CoG goals</p>
30 Victoria Street, Bowen Hills						
Two Storey House (Bedroom)	01/03/2011 9:07pm - 9:22pm	30.7	40	45.5	50	<p>Monitoring Type Attended. Internal. Windows and Doors closed</p> <p>Noise Sources The dominant noise source throughout the period was birds and insects. No TJH noise sources were noted throughout the monitoring period. Other noise sources included internal noise and traffic</p> <p>Discussion Monitoring was to assess the level of impact being caused to residents in proximity to the Bowen Hills worksite. Results were within CoG goals</p> <p>Mitigation Mitigation was not required as results were within CoG goals</p>

Location	Monitoring Period	Average L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	Average L _{A10} (15 min) (dBA)	CoG Goal L _{A10} (15 min) (dBA)	Comments
Two Storey House (Bedroom)	10/03/2011 11:02pm -11:17pm	31.6	40	50	50	<p>Monitoring Type Attended. Internal. Windows and Doors closed</p> <p>Noise Sources The dominant noise source throughout the period was traffic moving along Lutwyche Rd. No TJH noise sources were noted throughout the monitoring period. Other noise sources included internal noise and trains</p> <p>Discussion Monitoring was to assess the level of impact being caused to residents in proximity to the Bowen Hills worksite. Results were within CoG goals</p> <p>Mitigation Mitigation was not required as results were within CoG goals</p>

Table 3b: Noise Monitoring Results – Northern Busway

Location	Monitoring Period	Average L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	Average L _{A10} (15 min) (dBA)	CoG Goal L _{A10} (15 min) (dBA)	Comments
15 Norman Avenue, Lutwyche						
2 Storey Brick House (Living Room)	25/02/2011 2:50pm - 3:04pm	40.6	45	41.3	55	<p>Monitoring Type Attended. Internal. Windows and Doors closed</p> <p>Noise Sources The dominant noise source throughout the period was traffic moving along Lutwyche Road. TJH noise sources included trucks moving onsite, a crane, grinding and a PUP's wacker packer operating on Norman Avenue. Other noise sources included a lawn mower and birds</p> <p>Discussion Monitoring was to assess the level of impact being caused to residents adjacent to the Northern Busway worksite. TJH works were noted throughout the session. Results were within CoG goals</p> <p>Mitigation Mitigation was not required as results were within CoG goals</p>

Location	Monitoring Period	Average L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	Average L _{A10} (15 min) (dBA)	CoG Goal L _{A10} (15 min) (dBA)	Comments
2 Storey Brick House (Living Room)	02/03/2011 8:52am - 9:12am	38.8	45	39.9	55	<p>Monitoring Type Attended. Internal. Windows and Doors closed</p> <p>Noise Sources The dominant noise source throughout the period was air blasting which was occurring on the adjacent Northern Busway worksite. Other TJH noise sources noted included hand held hammering and a squawker. Traffic on Lutwyche Road was noted intermittently throughout the session</p> <p>Discussion Monitoring was to assess the level of impact being caused to residents adjacent to the Northern Busway worksite. TJH works were noted throughout the session. Results were within CoG goals</p> <p>Mitigation Mitigation was not required as results were within CoG goals</p>
21 Norman Avenue, Lutwyche						
2 Storey Brick House (Living Room)	08/03/2011 7:34am - 7:48am	37.0	45	36.6	55	<p>Monitoring Type Attended. Internal. Windows and Doors closed</p> <p>Noise Sources The dominant noise source throughout the period was traffic moving along Lutwyche Road. TJH noise sources included high pressure blasting on the CC701 roof structure and a concrete agitator. Other noise sources included internal noise, a plane and birds</p> <p>Discussion Monitoring was to assess the level of impact being caused to residents adjacent to a concrete pour on the Northern Busway worksite. TJH works were noted throughout the session. Results were within CoG goals</p> <p>Mitigation Mitigation was not required as results were within CoG goals</p>

Table 3c: Noise Monitoring Results - Kedron

Location	Monitoring Period	Average L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	Average L _{A10} (15 min) (dBA)	CoG Goal L _{A10} (15 min) (dBA)	Comments
4/21 Haines Street, Kedron						
Bottom Floor Lounge/Kitchen (windows closed)	04/03/2011 6:55am – 7:10am	38.9	45	38.6	55	<p>Monitoring Type Attended. Internal</p> <p>Noise Sources The dominant noise sources throughout the period were non-TJH background noises, including a refrigerator, cars using Haines Street, plane and birds. Other audible noise sources included a franna, squawkers and metal on metal banging</p> <p>Discussion Internal noise goals were not exceeded.</p> <p>Mitigation Measures N/A</p>
Lounge/Kitchen (windows closed)	04/03/2011 7:18am – 7:33am	39.0	45	38.4	55	<p>Monitoring Type Attended. Internal</p> <p>Noise Sources The dominant noise sources throughout the period were non-TJH background noises, including a refrigerator, cars using Haines Street, plane and birds, a franna and squawkers. Other audible noise sources included metal banging, plant humming and air brakes</p> <p>Discussion Internal noise goals were not exceeded.</p> <p>Mitigation Measures N/A</p>
228 Gympie Road, Kedron						
Living Room (windows and door open)	14/03/2011 3:33pm – 3:48pm	59.5	45	56.6	55	<p>Monitoring Type Attended. Internal</p> <p>Noise Sources The dominant noise sources throughout the period were Gympie Road traffic, a smoke detector that needed new batteries and a franna engine idling. Other audible noise sources included resident and operator interference, plane, water cart and a horn</p> <p>Discussion Internal LAeq and LA10 noise goals were exceeded as a result of Gympie Road traffic and the smoke detector . No noise complaints were received on this date.</p> <p>Mitigation Measures None</p>

<p>Living Room (windows and door closed)</p>	<p>14/03/2011 3:33pm – 3:48pm</p>	<p>55.8</p>	<p>45</p>	<p>42.5</p>	<p>55</p>	<p>Monitoring Type Attended. Internal</p> <p>Noise Sources The dominant noise sources throughout the period were Gympie Road traffic (including compression braking), a smoke detector that needed new batteries and a franna engine idling. Other audible noise sources included birds, siren, faint hammering/banging and a street sweeper</p> <p>Discussion Internal LAeq noise goals were exceeded as a result of Gympie Road traffic and the smoke detector. No noise complaints were received on this date</p> <p>Mitigation Measures None</p>
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Table 3d: Noise Monitoring Results – Wooloowin

Location	Monitoring Period	Average L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	Average L _{A10} (15 min) (dBA)	CoG Goal L _{A10} (15 min) (dBA)	Average L _{AMAX} (15 min) (dBA)	CoG Goal L _{AMAX} (15 min) (dBA)	Comments
71 Park Road, Wooloowin								
Single level brick Flat (Dining Room)	21/02/2011 2:45pm - 2:59pm	44.0	45	44.8	55	-	-	<p>Monitoring Type Attended Noise Monitoring. Doors and Windows Closed</p> <p>Noise Sources Site noise included: Hum from fans and banging. Other noise sources included: Birds, gecko, traffic, lawn mower and plane</p> <p>Discussion The main fan in the shed sucks air into the tunnel. Monitoring indicates that day time CoG goals were met</p> <p>Mitigation Measures 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)	24/02/2011 11:46am - 12:00pm	39.1	45	40.2	55	-	-	<p>Monitoring Type Attended Noise Monitoring. Doors and Windows Closed</p> <p>Noise Sources Site noise included: Hum from fans and site noise which included banging, engine revving and loading. Other noise sources included: Birds, gecko, traffic and dog barking</p> <p>Discussion The main fan in the shed sucks air into the tunnel. The sound from the fans was constant throughout the monitoring session. Monitoring indicates that day time CoG goals were met</p> <p>Mitigation Measures 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)	02/03/2011 11:09am - 11:23am	38.9	45	39.6	55	-	-	<p>Monitoring Type Attended Noise Monitoring. Doors and Windows Closed</p> <p>Noise Sources Site noise included: Hum from fans and site. Other noise sources included: Lawnmower/whipper-snipper, plane, birds, creak (inside the unit) and traffic</p> <p>Discussion The shed is now sealed and air is neither sucked in nor blown out. The sound from the fans was constant throughout the monitoring session. Monitoring indicates that day time CoG goals were met</p>

Location	Monitoring Period	Average L_{Aeq} (15 min) (dBA)	CoG Goal L_{Aeq} (15 min) (dBA)	Average L_{A10} (15 min) (dBA)	CoG Goal L_{A10} (15 min) (dBA)	Average L_{AMAX} (15 min) (dBA)	CoG Goal L_{AMAX} (15 min) (dBA)	Comments
								Mitigation Measures 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
Single Level Brick Flat (Dining Room)	14/03/2011 8:45am - 9:00am	40.3	45	41.8	55	-	-	Monitoring Type Attended Noise Monitoring. Doors and Windows Closed Noise Sources Site noise included: Hum from fans and banging (metal on metal). Other noise sources included: Traffic, train/horn, birds and fauna Discussion The shed is now sealed and air is neither sucked in nor blown out. The sound from the fans was constant throughout the monitoring session. Monitoring indicates that day time CoG goals were met Mitigation Measures 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

Table 3e: Noise Monitoring Results – Toombul

Location	Monitoring Period	L_{Aeq} (15 min) (dBA)	CoG Goal L_{Aeq} (15 min) (dBA)	L_{A10} (15 min) (dBA)	CoG Goal L_{A10} (15 min) (dBA)	Comments
89 Jackson Street, Clayfield						
Double Storey Timber House (Front Bedroom)	03/03/2011 9:12am – 9:26am	37.2	45	37.3	55	Monitoring Type Internal attended monitoring, windows and doors closed Noise Sources TJH noise sources (site hum, TBM alarm, TJH horn) plus non-TJH sources (resident/house, birds, train, traffic, planer) Discussion Monitoring indicates that CoG goals are being met Mitigation Measures Include a 6m noise wall

Double Storey Timber House (Front Bedroom)	03/03/2011 9:30am – 9:44am	39.6	45	38.9	55	<p>Monitoring Type Internal attended monitoring, windows and doors open</p> <p>Noise Sources TJH noise sources (site hum, bang/drop, TJH horn, TBM alarm, hammering, gantry alarm, engine rev) plus non-TJH sources (planer, birds, resident/house, train)</p> <p>Discussion Monitoring indicates that CoG goals are being met</p> <p>Mitigation Measures Include a 6m Noise Wall</p>
Double Storey Timber House (Front Bedroom)	03/03/2011 1:52pm – 2:06pm	42.4	45	40.7	55	<p>Monitoring Type Internal attended monitoring, windows and doors open</p> <p>Noise Sources TJH noise sources (concrete pump, bang/drop, hammering, TBM alarm, TJH horn, Stuckey Road site gate) plus non-TJH sources (birds, train, traffic, resident, dog)</p> <p>Discussion Monitoring indicates that CoG goals are being met</p> <p>Mitigation Measures Include a 6m noise wall</p>
Double Storey Timber House (Front Bedroom)	03/03/2011 2:10pm – 2:24pm	35.9	45	36.4	55	<p>Monitoring Type Internal attended monitoring, windows and doors closed</p> <p>Noise Sources TJH noise sources (concrete pour/site hum, TJH horn, hammering, bang/drop, TBM alarm) plus non-TJH sources (resident, birds, plane, train)</p> <p>Discussion Monitoring indicates that CoG goals are being met</p> <p>Mitigation Measures Include a 6m noise wall</p>
5 Wattle Street, Nundah						
Double Storey Brick & Weatherboard House (Upstairs Living Room)	03/03/2011 11:11am – 11:25am	51.6	45	52.5	55	<p>Monitoring Type Internal attended monitoring, windows and doors open</p> <p>Noise Sources TJH noise sources (EWA works/pour, conveyor) plus non-TJH sources (resident, birds, EWA traffic, animals, plane)</p> <p>Discussion Monitoring indicates that CoG goals for LAeq are being exceeded. It should be noted that the session was heavily influence by non-TJH noise sources including resident (and dog), animals (cicadas) and birds. The specific LAeq level for TJH noise sources could not be isolated from non-TJH noise sources.</p> <p>Mitigation Measures Include acoustic cladding on section of conveyor</p>

Double Storey Brick & Weatherboard House (Upstairs Living Room)	03/03/2011 11:30am – 11:44am	44	45	44.5	55	<p>Monitoring Type Internal attended monitoring, windows and doors closed</p> <p>Noise Sources TJH noise sources (conveyor, EWA works/pour, bang/drop) plus non-TJH sources (resident, birds, train, animals, EWA traffic)</p> <p>Discussion Monitoring indicates that CoG goals are being met</p> <p>Mitigation Measures Include acoustic cladding on section of conveyor</p>
83 Stuckey Road, Clayfield						
Double Storey Queenslander, (Lounge Room)	07/03/2011 9:10am – 9:24am	44.6	45	44.3	55	<p>Monitoring Type Internal attended monitoring, doors open, air-conditioning off</p> <p>Noise Sources TJH noise sources (jet blasting, engine rev, bang/drop, TJH horn, hammering, Stuckey Road site gate) plus non-TJH sources (resident, train, dogs, plane, birds)</p> <p>Discussion Monitoring indicates that CoG goals are being met</p> <p>Mitigation Measures 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 not in use and the doors were open</p>
Double Storey Queenslander, (Lounge Room)	07/03/2011 9:28am – 9:42am	43.5	45	44.1	55	<p>Monitoring Type Internal attended monitoring, doors closed, air-conditioning on</p> <p>Noise Sources TJH noise sources (concrete pour, Stuckey Road site gate, TJH horn, bang/drop, jet blasting) plus non-TJH sources (train, resident, birds, dog)</p> <p>Discussion Monitoring indicates that CoG goals are being met</p> <p>Mitigation Measures 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 doors were closed</p>

Double Storey Queenslander, (Lounge Room)	07/03/2011 2:19pm – 2:33pm	40.9	45	40.1	55	<p>Monitoring Type Internal attended monitoring, doors closed, air-conditioning on</p> <p>Noise Sources TJH noise sources (hammering, bang/drop, engine rev, site hum, CC422 concrete pour) plus non-TJH sources (birds, train, traffic, resident)</p> <p>Discussion Monitoring indicates that CoG goals are being met</p> <p>Mitigation Measures 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 doors were closed</p>
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Table 3f: Night Shift Noise Monitoring Results – Toombul

Location	Monitoring Period	L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	L _{Amax} (15 min) (dBA)	CoG Goal L _{Amax} (15 min) (dBA)	Comments
83 Stuckey Road, Clayfield						
Double Storey Queenslander, (Lower bedroom)	22/02/2011 20:35pm–20:50pm	33.03	40	39.1	50	<p>Monitoring Type Internal attended monitoring, windows and doors closed, air-conditioning on</p> <p>Noise Sources TJH noise sources (cranes, hammering/steel fixing, engine rev) plus non-TJH sources (car horn, resident, clock, traffic, crickets)</p> <p>Discussion Monitoring indicates that CoG goals are being met</p> <p>Mitigation Measures 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 doors were closed</p>

<p>Double Storey Queenslander, (upper bedroom)</p>	<p>22/02/2011 20:55pm– 21:10pm</p>	<p>34.02</p>	<p>40</p>	<p>37.8</p>	<p>50</p>	<p>Monitoring Type Internal attended monitoring, windows and doors closed, air-conditioning on</p> <p>Noise Sources TJH noise sources (hammering/steel fixing, crane engine rev) plus non-TJH sources (air conditioner vent outlet)</p> <p>Discussion Monitoring indicates that CoG goals are being met</p> <p>Mitigation Measures 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 doors were closed</p>
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3.3 Compliance with Noise Goals

There were no noise exceedances as a result of TJH construction activities during this monitoring period.

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), particulate matter (PM2.5) and CO/NO₂ is also occurring at a location in the vicinity of the Woolloowin Worksite.

Results of monitoring are compared to Air Quality Goals nominated by the Coordinator General (Change Report July 2008 & Woolloowin 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

5 Morris Street, Bowen Hills PM10 Results

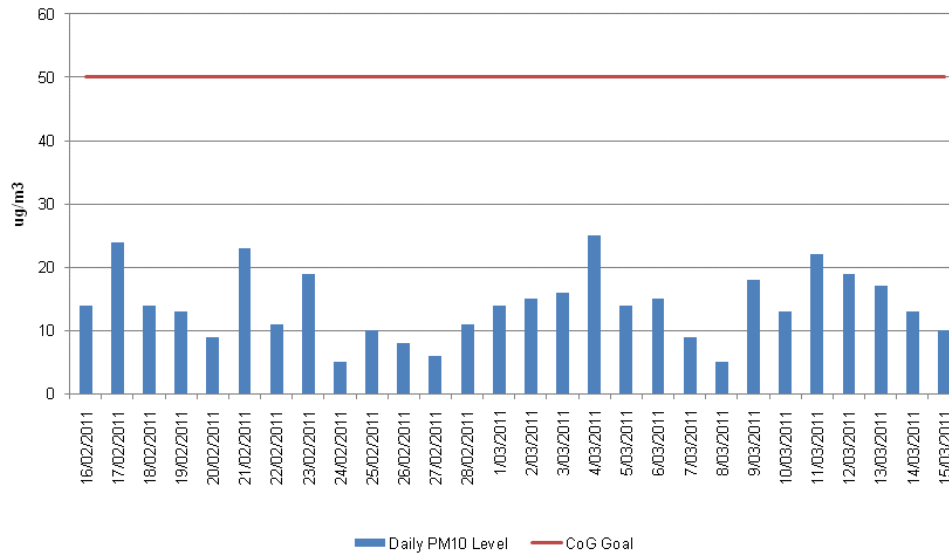


Figure 4.2.1: 5 Morris Street, Bowen Hills PM10 Results (for monitor location see figure 2.1 – A1)

Northern Busway Site Office, Lutwyche PM10 Results

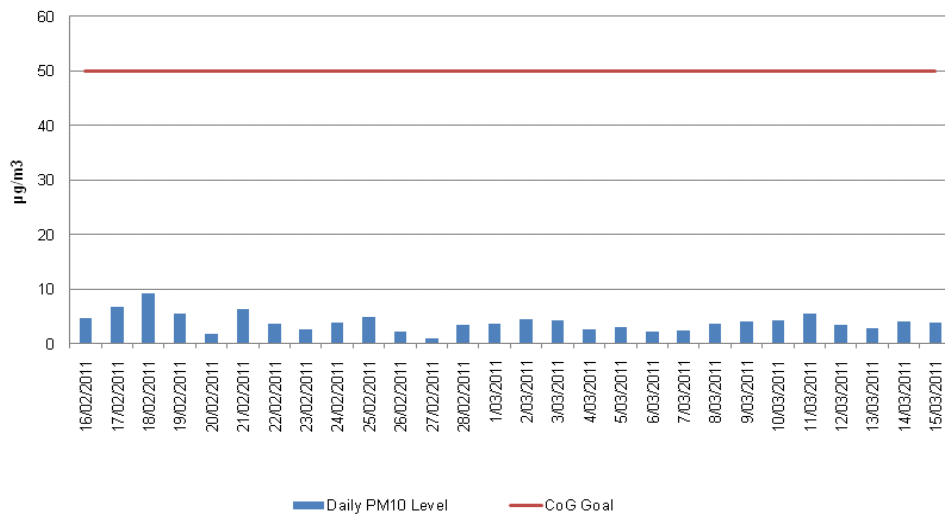


Figure 4.2.2: Northern Busway Site Office, Lutwyche PM10 Results (for location see figure 2.3 – A1)

Erskine Avenue, Kedron, PM10 Results

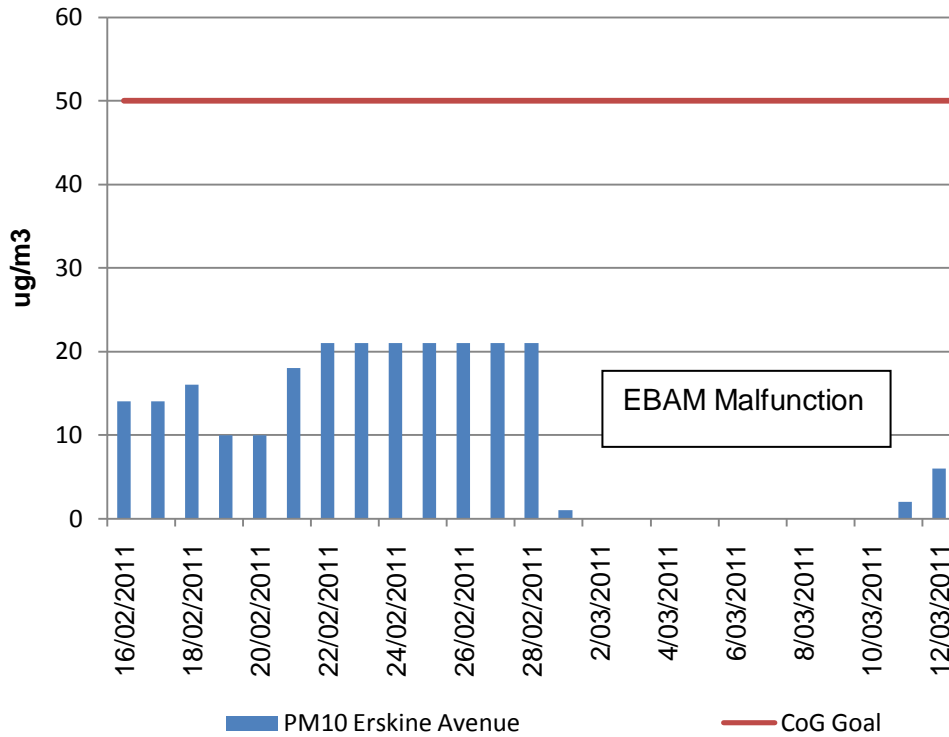


Figure 4.2.3: Erskine Avenue, Kedron PM10 Results (for monitor location see figure 2.4 – A1)

Kedron State High School PM10 Results

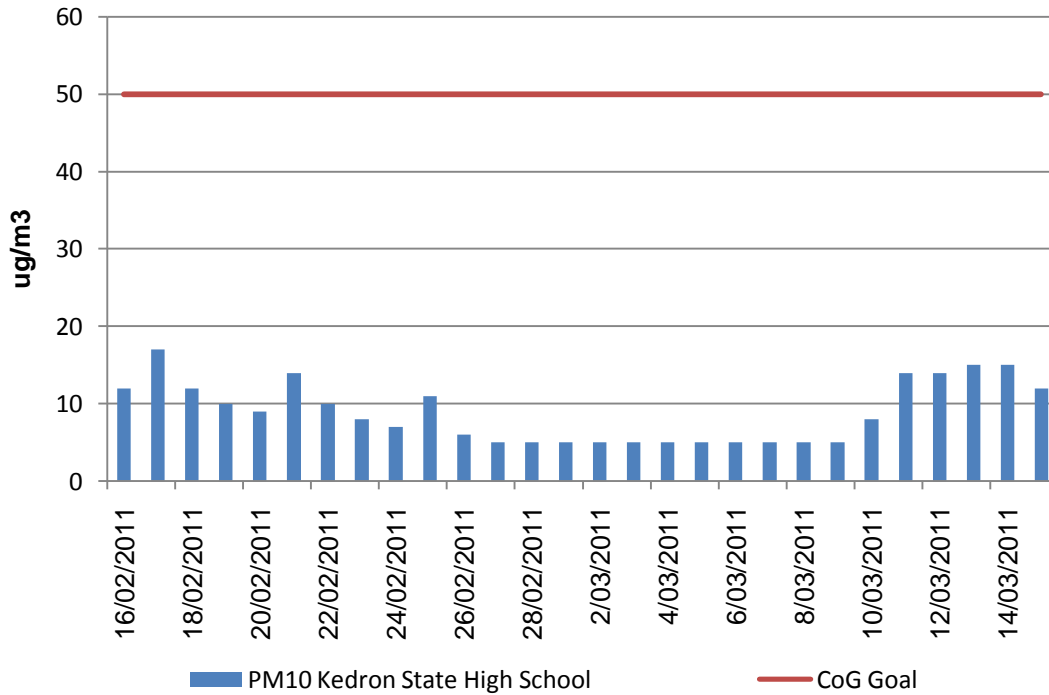


Figure 4.2.4: Kedron State High School (Adj), Kedron PM10 Results (for monitor location see figure 2.4 – A2)

Perry Street, Lutwyche, PM10 Results

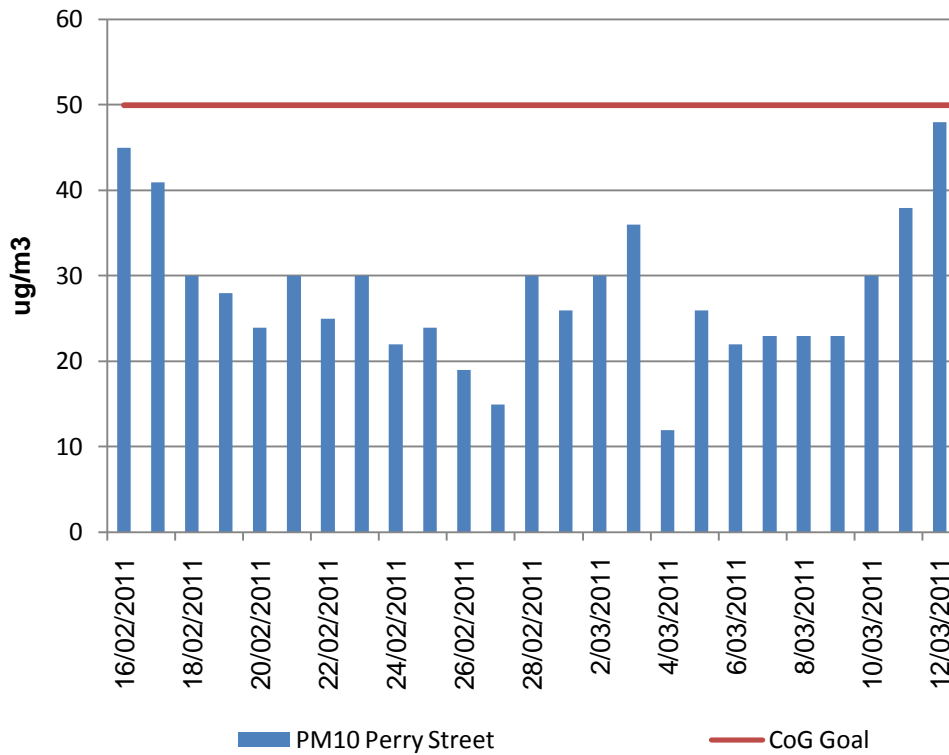


Figure 4.2.5: Perry Street, Lutwyche PM10 Results (for monitor location see figure 2.4 – A3)

Woolloowin State High School PM10 Results

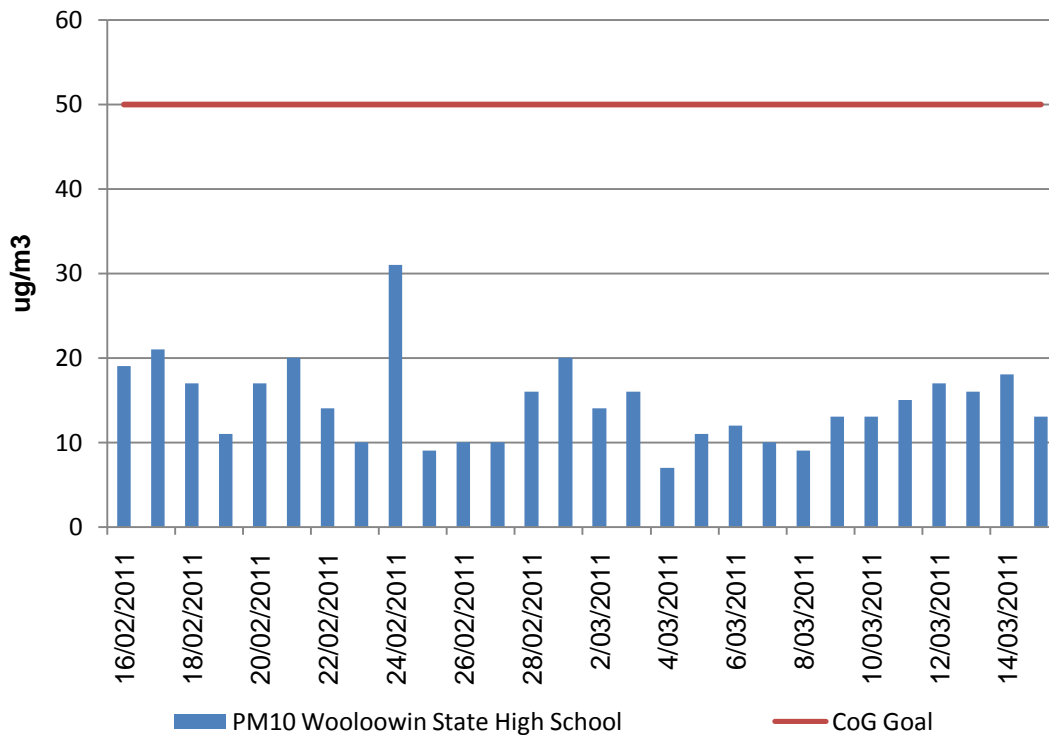


Figure 4.2.6: Woolloowin State School, Lutwyche PM10 Results (for monitor location see figure 2.4 – A4)

71 Park Road, Woolloowin PM10 Results 16/02/2011 to 15/03/2011

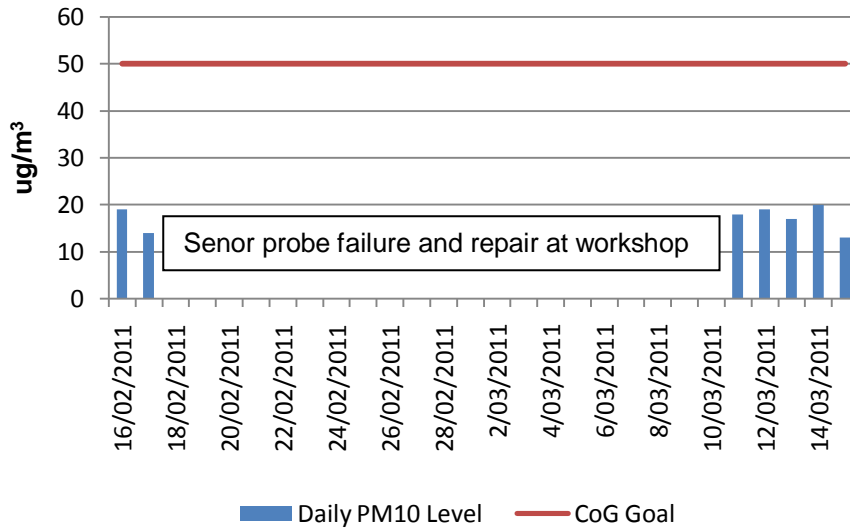


Figure 4.2.7: 71 Park Road, Woolloowin PM10 Results (for monitor location see figure 2.5 – A1)

71 Park Road, Woolloowin PM2.5 Results 16/02/2011 to 15/03/2011

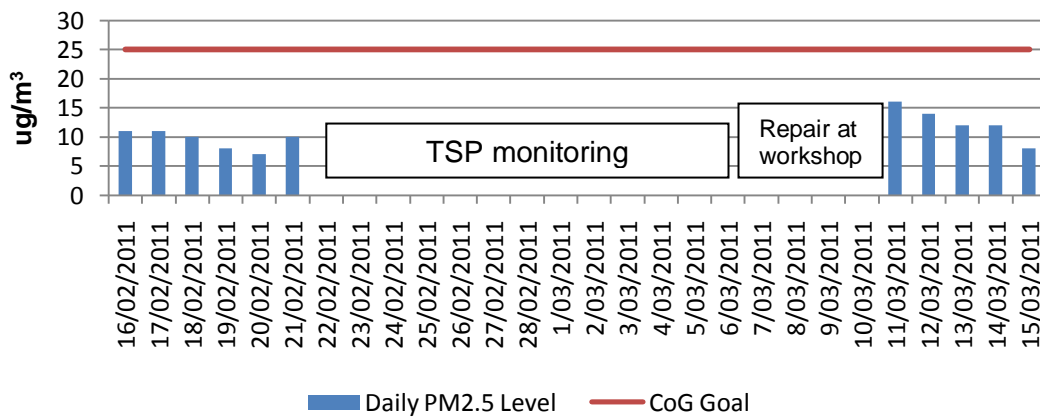


Figure 4.2.8: 71 Park Road, Woolloowin PM2.5 Results (for monitor location see figure 2.5 – A1)

71 Park Road, Woolloowin, Daily TSP Results 16/02/2011 to 15/03/2011

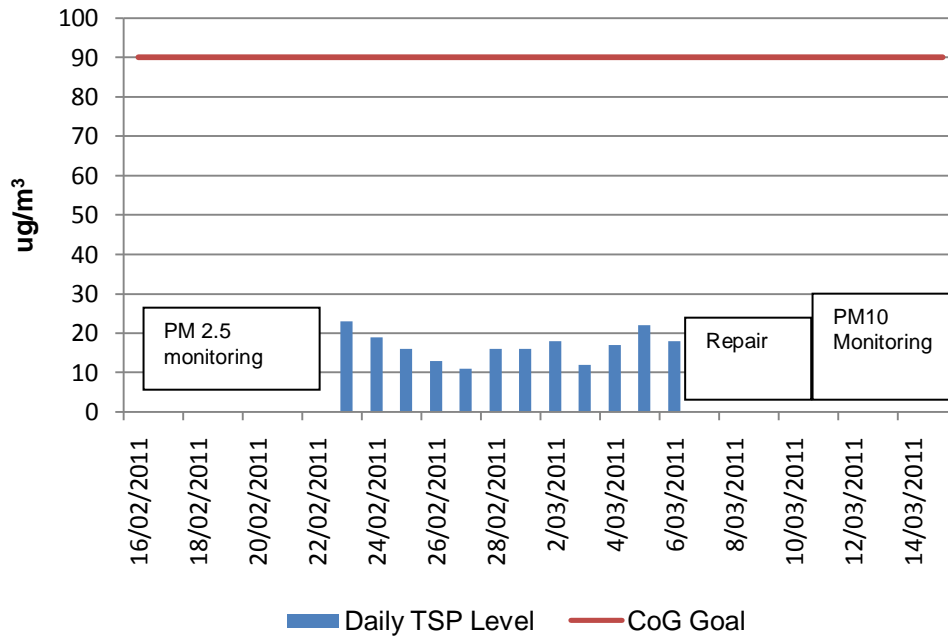


Figure 4.2.9: 71 Park Road, Woolloowin TSP Results (for monitor location see figure 2.5 – A1)

56 Kalinga Street, Clayfield PM10 Results

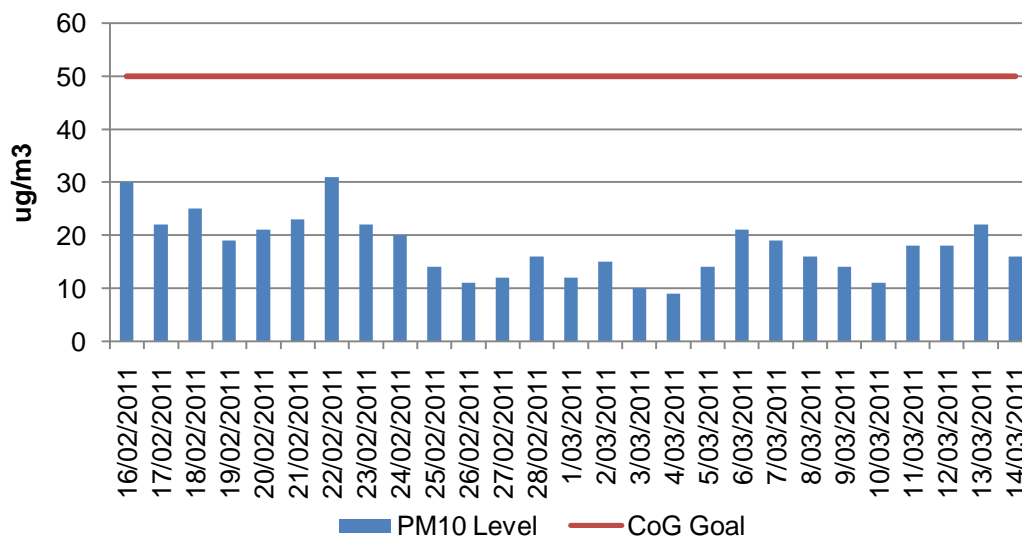


Figure 4.2.10: 56 Kalinga Street, Toombul PM10 Results (for monitor location see figure 2.6 – A1)

5 Mabel Street, Clayfield TSP Results

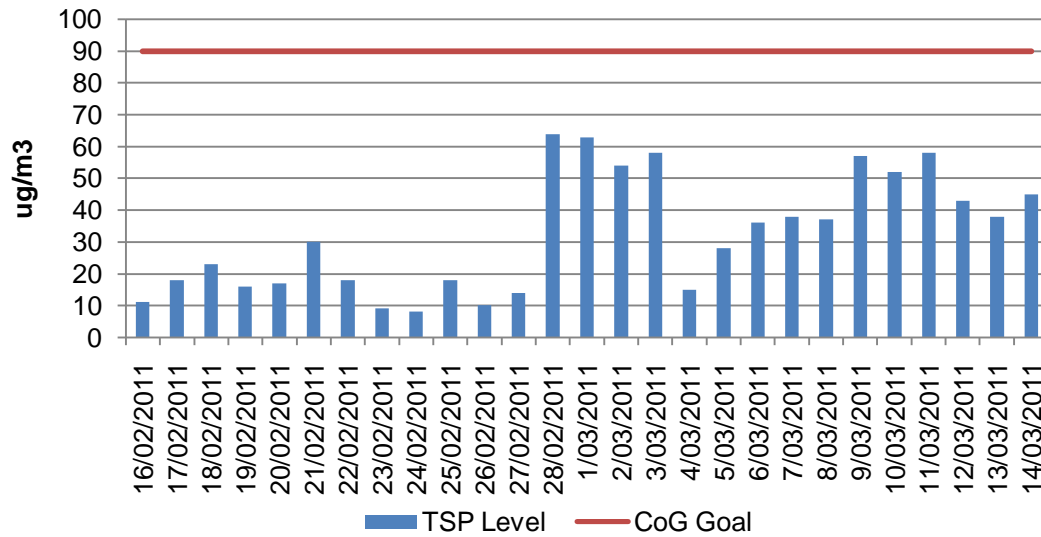


Figure 4.2.11: Kalinga Park Adj Alma Road, Toombul TSP Results (for monitor location see figure 2.6- A2)

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 Sep 2010 - Feb 2011

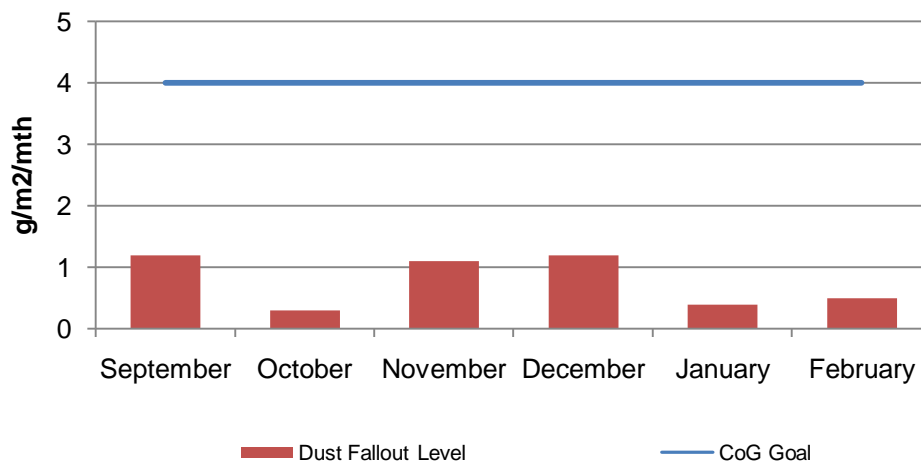


Figure 4.3.1: 5 Morris Street, Bowen Hills Dust Deposition Results (for monitor location refer to figure 2.1 – D1)

Site Office, Bowen Hills Dust Fallout Sep 2010 - Feb 2011

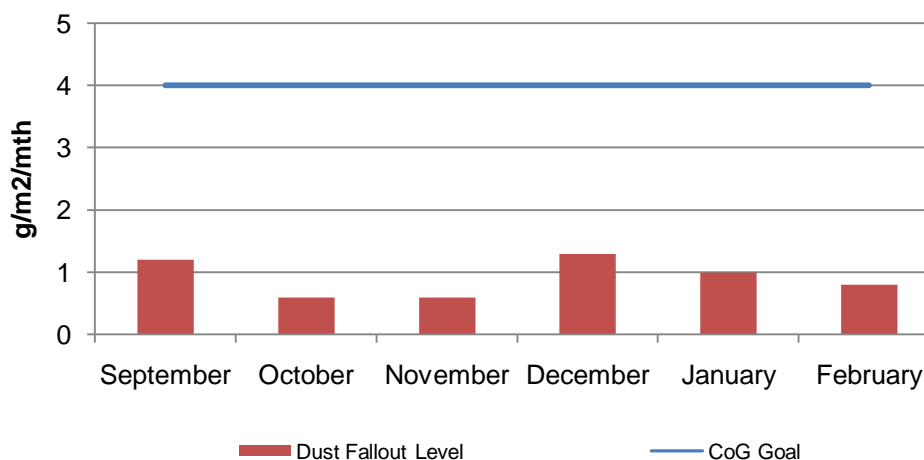


Figure 4.3.2: Site Office, Bowen Hills Dust Deposition Results (for monitor location refer to figure 2.1- D2)

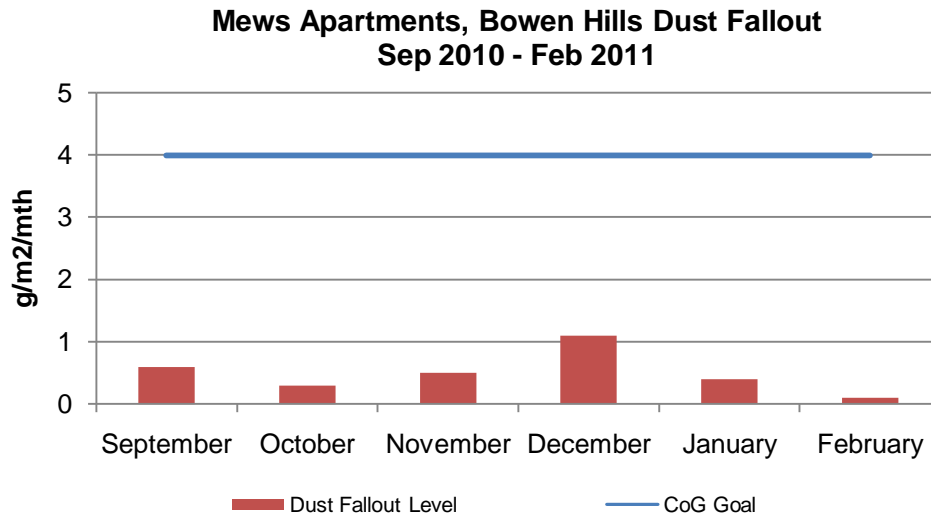


Figure 4.3.3: Mews Apartments, Bowen Hills Dust Deposition Results (for monitor location refer to figure 2.1- D3)

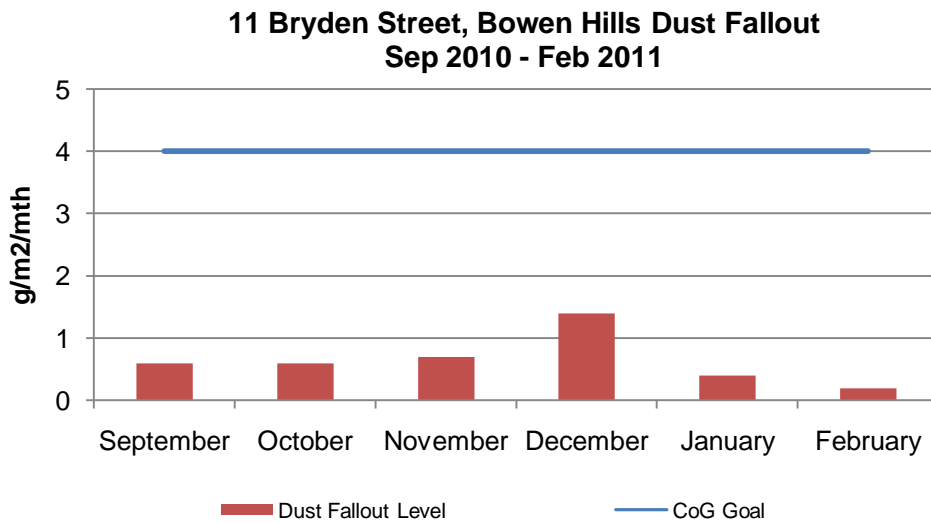


Figure 4.3.4: 11 Bryden Street, Bowen Hills Dust Deposition Results (for monitor location refer to figure 2.1- D4)

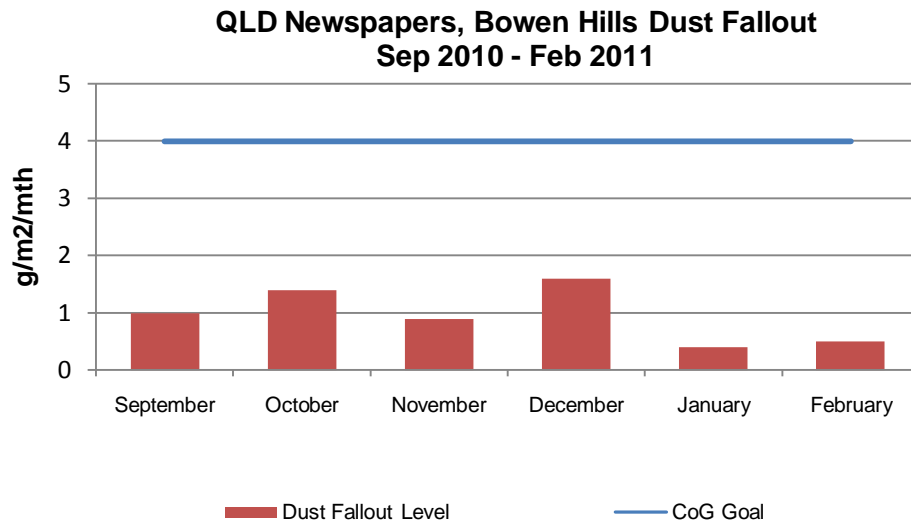


Figure 4.3.5 : Qld Newspapers, Bowen Hills Dust Deposition Results (for monitor location refer to figure 2.1- D5)

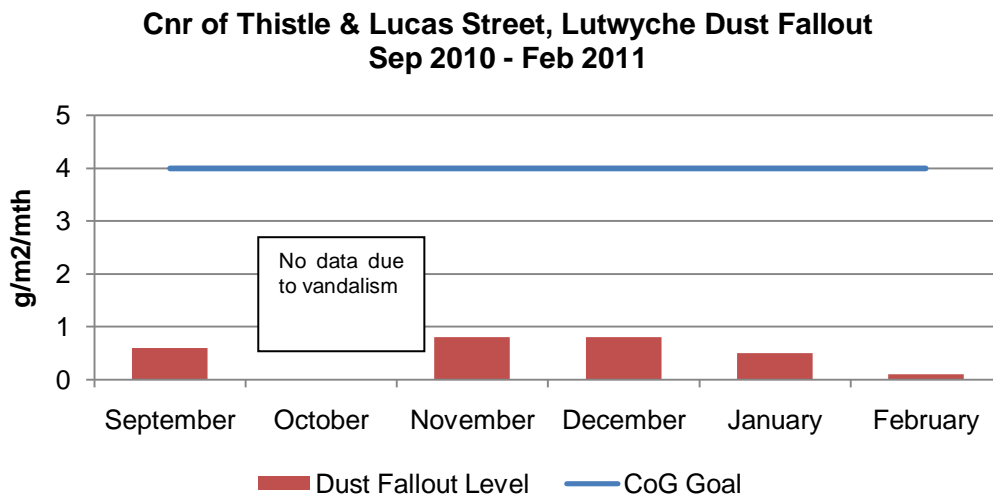


Figure 4.3.6: Cnr of Thistle & Lucas Street, Lutwyche Dust Fallout Results (location refer to figure 2.3 – D2)

Kedron Brook Reserve, Northern Busway Dust Fallout Sep 2010 - Feb 2011

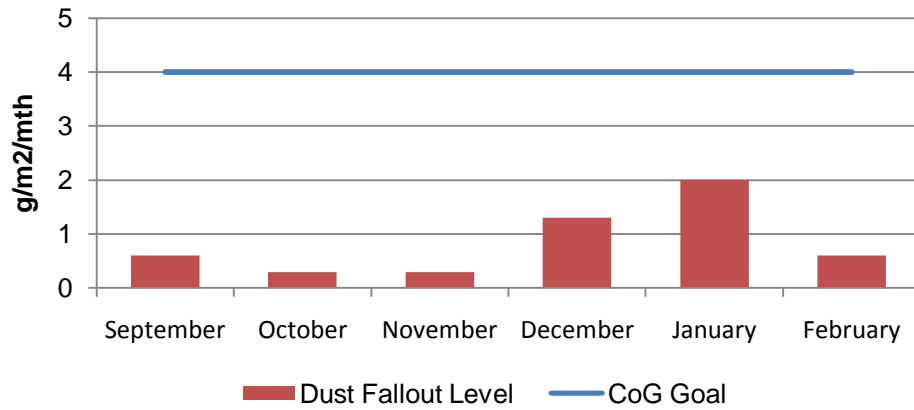


Figure 4.3.7: Kedron Brook Reserve, Northern Busway Dust Fallout Results (location refer to figure 2.3 – D1)

Dust Fallout Erskine Avenue, Kedron, October 2010 - March 2011

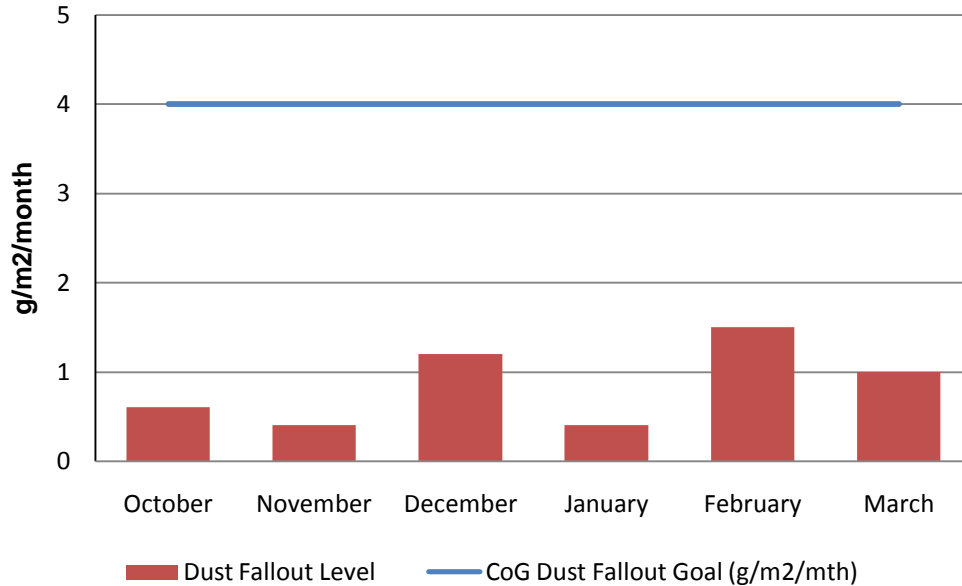


Figure 4.3.8: Erskine Avenue, Kedron Dust Fallout October 2010 – March 2011 (for monitor location see figure 2.4 – A1)

Dust Fallout Kedron State High School, Kedron, October 2010 - March 2011

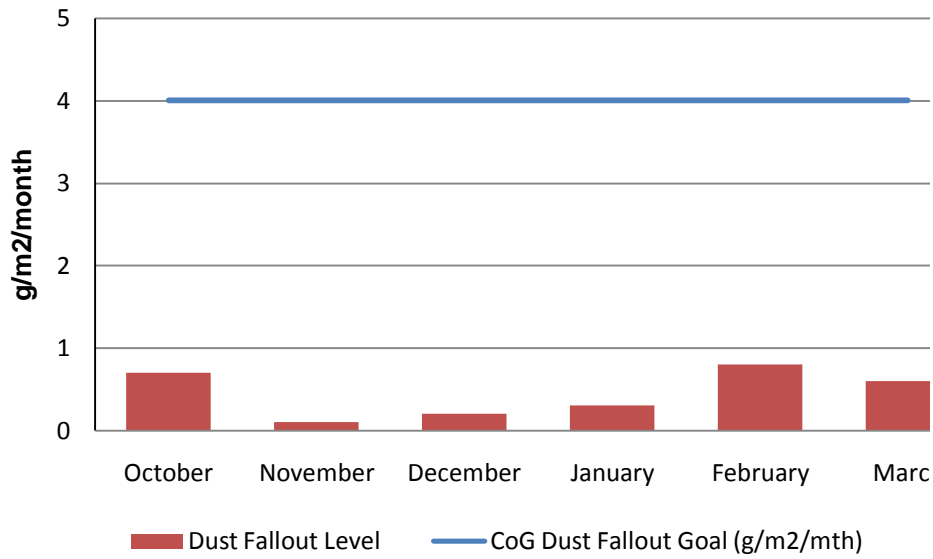


Figure 4.3.9: Kedron State High School, Dust Fallout October 2010 – March 2011 (for monitor location see figure 2.4 A2)

Dust Fallout Perry Street Lutwyche, October 2010 - March 2011

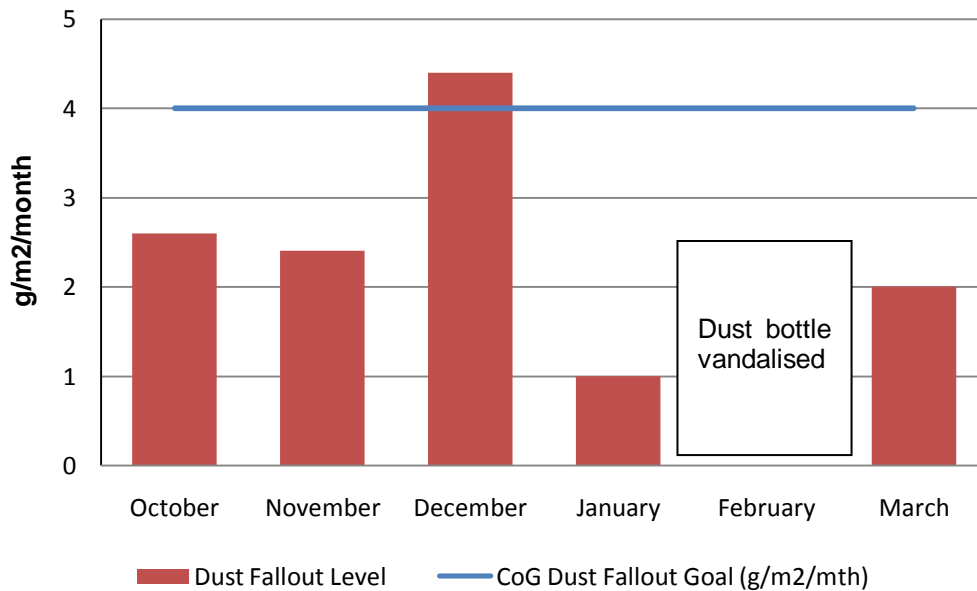


Figure 4.3.10: Perry Street, Lutwyche Dust Fallout October 2010 – March 2011 (for monitor location see figure 2.4 – A3)

Dust Fallout Woolloowin State School, Woolloowin, October 2010 - March 2011

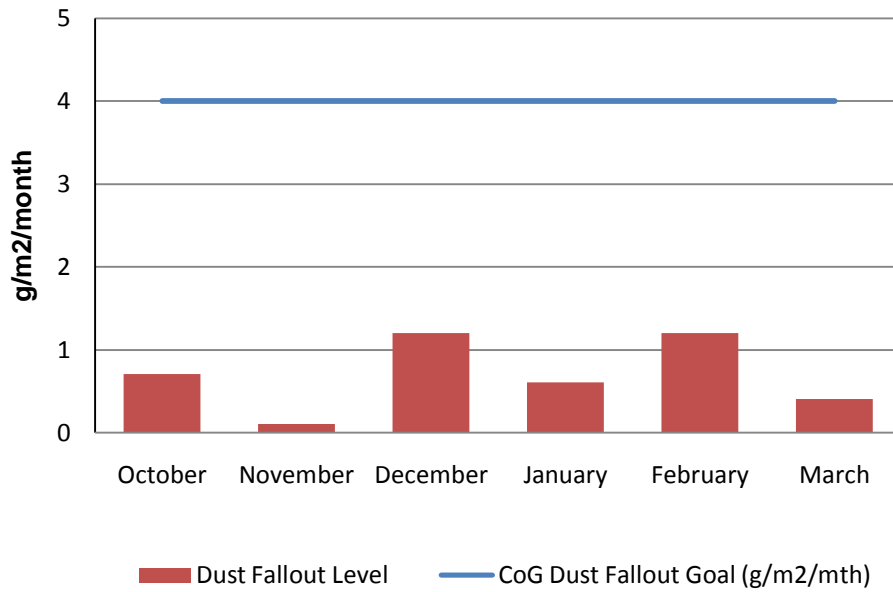


Figure 4.3.11: Woolloowin State School, Dust Fallout October 2010 – March 2011 (for monitor location see figure 2.4 – A4)

Dust Fallout 228 Gympie Road, Kedron, November 2010 - March 2011

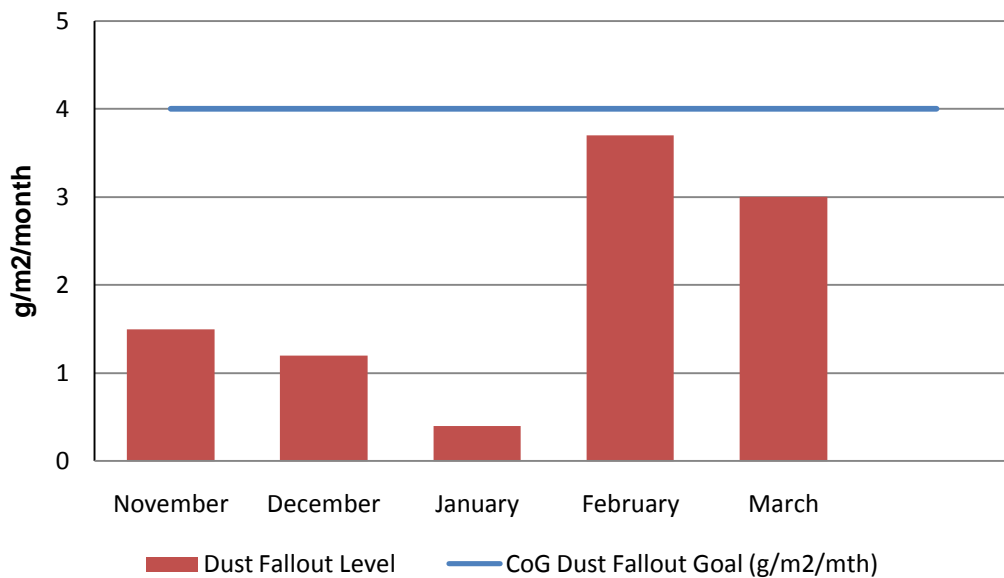


Figure 4.3.12: 228 Gympie Road, Kedron Dust Fallout November 2010 – March 2011 (for monitor location see figure 2.4)

68 Park Road, Woolloowin Dust Fallout October 2010 to March 2011

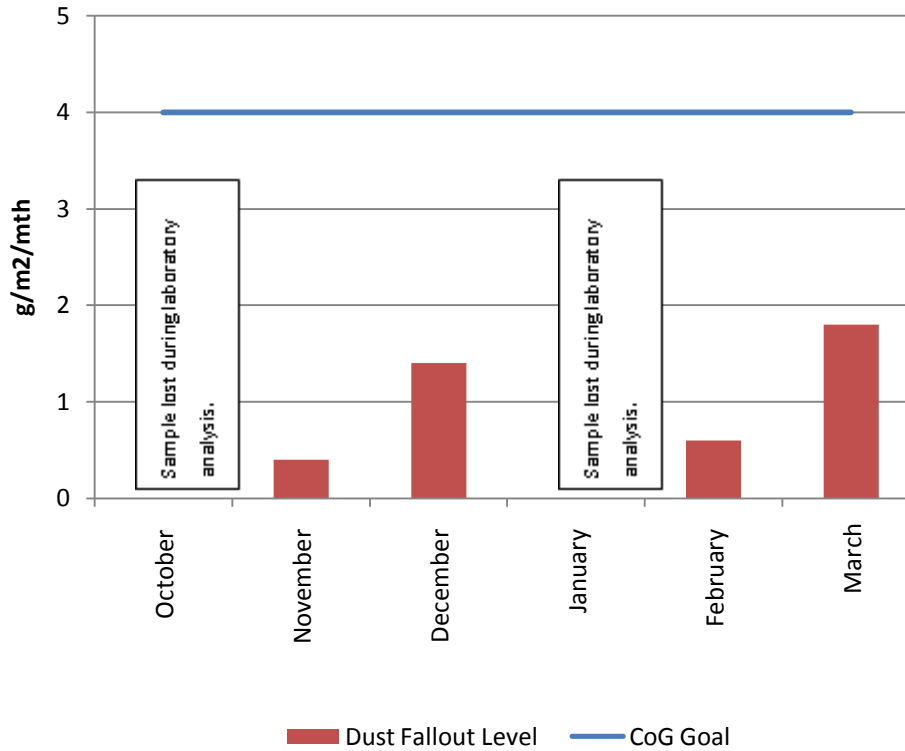


Figure 4.3.13: 68 Park Road, Woolloowin Dust Deposition Results (for monitor location refer to figure 2.5)

Kalinga Street, Toombul Dust Fallout Level October 2010 - March 2011

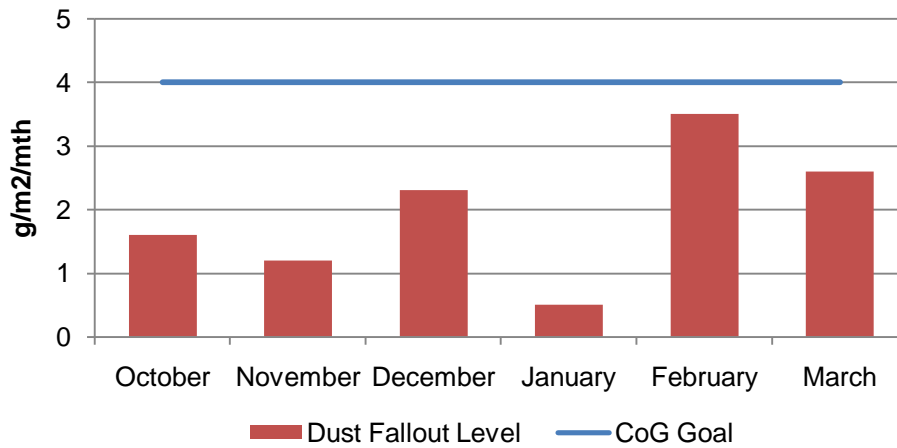


Figure 4.3.14: 56 Kalinga Street Toombul, Dust Fallout (location refer to figure 2.6 – D1)

Mabel Street, Toombul Dust Fallout Level October 2010 - March 2011

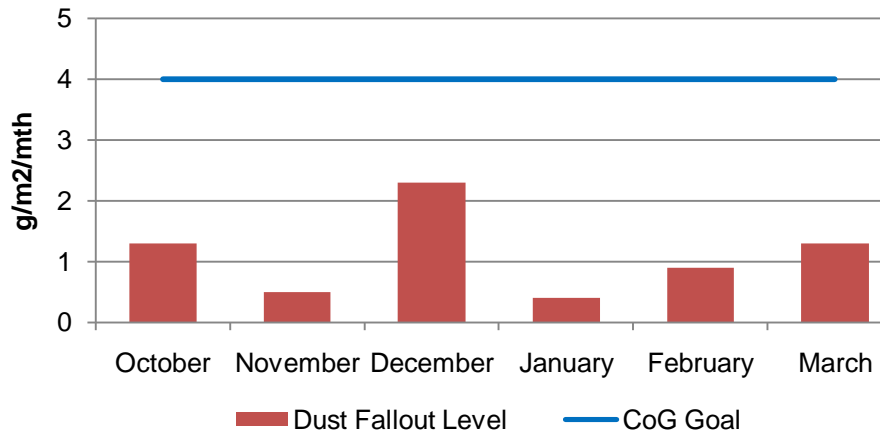


Figure 4.3.15: Mabel Street Toombul, Dust Fallout (location refer to figure 2.6 – D2)

Bage Street, Toombul Dust Fallout Level October 2010 - March 2011

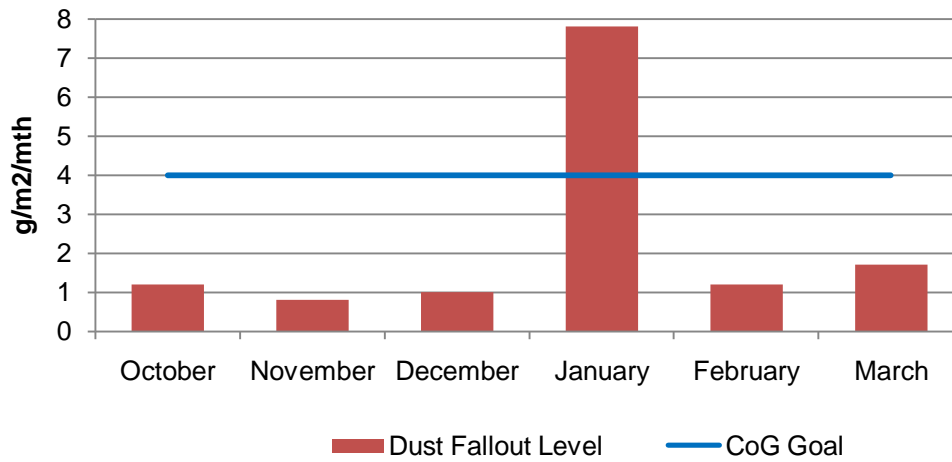


Figure 4.3.16: Bage Street Toombul, Dust Fallout (location refer to figure 2.6 – D3)

4.4 CO/NO₂ Monitoring – Woolloowin Worksite

TJH undertakes regular monitoring of CO/NO₂ in the vicinity of the Woolloowin Worksite. Monitoring involves real-time sampling and results of monitoring are compared to Air Quality Goals nominated by the Coordinator General in the Woolloowin Worksite Modification Change Report - October 2009.

Gas Monitor at 71 Park Road, Woolloowin					
Date	Peak Date and Time	CO (mg/m ³) Peak	CoG CO Limit (mg/m ³)	NO ₂ (mg/m ³) Peak	CoG NO ₂ Limit (mg/m ³)
16/02/2011 to 15/03/2011	12:40pm, 4/03/2011	0.9	11	-	
	8:00pm, 21/02/2011	-	-	51.45	250

Note:

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

For Nitrogen dioxide (NO₂) a 1 hour averaging period is used

4.5 Compliance with Air Quality Goals

There were no exceedances of the Coordinator Generals Air Quality Conditions this reporting period. Dust fallout results for some locations at Bowen Hills and Northern Busway have not been received from the lab. The March 2011 dust fallout results will be published in next month's report.

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 & Woolloowin 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 Civils

Location	Monitoring Period	Peak Particle Velocity (mm/s)	CoG Vibration Goal (mm/s)	Comments
Queensland Newspapers	24/02/11-15/03/11	2.83	10.0	Results are within CoG goals

Table 5b: Blast Monitoring Results Summary – Truro Street Mid Tunnel

Location	Monitoring Period	Peak Particle Velocity (mm/s)	CoG Vibration Goal (mm/s)	Comments
7 Felix Street (TBM Shaft – South Bound)	18/02/11 30 Seconds	4.70	25.0	Results are within CoG goals
26 Bradshaw Street (TBM Shaft – South Bound)	18/02/11 30 Seconds	8.38	25.0	Results are within CoG goals
7 Felix Street (TBM Shaft – South Bound)	19/02/11 30 Seconds	5.21	25.0	Results are within CoG goals
26 Bradshaw Street (TBM Shaft – South Bound)	19/02/11 30 Seconds	6.86	25.0	Results are within CoG goals
7 Felix Street (Ramp B)	24/02/11 30 Seconds	<1.5	25.0	Results are within CoG goals
26 Bradshaw Street (Ramp B)	24/02/11 30 Seconds	4.57	25.0	Results are within CoG goals
7 Felix Street (Ramp B - Misfire)	24/02/11 30 Seconds	2.03	25.0	Results are within CoG goals
26 Bradshaw Street (Ramp B- Misfire)	24/02/11 30 Seconds	7.91	25.0	Results are within CoG goals
133 Chalk Street (TBM Shaft – South Bound)	25/02/11 30 Seconds	17.1	25.0	Results are within CoG goals
26 Bradshaw Street (TBM Shaft – South Bound)	25/02/11 30 Seconds	31.8	25.0	A NCR was raised for this exceedance.
7 Felix Street (Ramp B)	25/02/11 30 Seconds	3.94	25.0	Results are within CoG goals

26 Bradshaw Street (Ramp B)	25/02/11 30 Seconds	9.03	25.0	Results are within CoG goals
7 Felix Street (Ramp B)	26/02/11 30 Seconds	4.06	25.0	Results are within CoG goals
26 Bradshaw Street (Ramp B)	26/02/11 30 Seconds	8.00	25.0	Results are within CoG goals
7 Felix Street (Ramp B)	28/02/11 30 Seconds	3.68	25.0	Results are within CoG goals
26 Bradshaw Street (Ramp B)	28/02/11 30 Seconds	7.49	25.0	Results are within CoG goals
7 Felix Street (Ramp B)	01/03/11 30 Seconds	5.08	25.0	Results are within CoG goals
26 Bradshaw Street (Ramp B)	01/03/11 30 Seconds	7.24	25.0	Results are within CoG goals
7 Felix Street (Ramp B)	02/03/11 30 Seconds	3.81	25.0	Results are within CoG goals
26 Bradshaw Street (Ramp B)	02/03/11 30 Seconds	5.46	25.0	Results are within CoG goals
7 Felix Street (Ramp B)	03/03/11 30 Seconds	3.30	25.0	Results are within CoG goals
26 Bradshaw Street (Ramp B)	03/03/11 30 Seconds	5.21	25.0	Results are within CoG goals
7 Felix Street (Ramp B)	04/03/11 30 Seconds	4.83	25.0	Results are within CoG goals
26 Bradshaw Street (Ramp B)	04/03/11 30 Seconds	4.44	25.0	Results are within CoG goals
7 Felix Street Ramp B)	05/03/11 30 Seconds	<2.0	25.0	Results are within CoG goals
26 Bradshaw Street (Ramp B)	05/03/11 30 Seconds	3.81	25.0	Results are within CoG goals
7 Felix Street (Ramp B)	07/03/11 30 Seconds	6.35	25.0	Results are within CoG goals

26 Bradshaw Street (Ramp B)	07/03/11 30 Seconds	5.46	25.0	Results are within CoG goals
7 Felix Street (Ramp B)	08/03/11 30 Seconds	4.57	25.0	Results are within CoG goals
26 Bradshaw Street (Ramp B)	08/03/11 30 Seconds	4.57	25.0	Results are within CoG goals
7 Felix Street (Ramp B)	09/03/11 30 Seconds	3.43	25.0	Results are within CoG goals
26 Bradshaw Street (Ramp B)	09/03/11 30 Seconds	4.32	25.0	Results are within CoG goals
7 Felix Street (Ramp B)	10/03/11 30 Seconds	4.57	25.0	Results are within CoG goals
26 Bradshaw Street (Ramp B)	10/03/11 30 Seconds	4.19	25.0	Results are within CoG goals
18 Felix Street (Ramp B)	11/03/11 30 Seconds	7.24	25.0	Results are within CoG goals
7 Felix Street (Ramp B)	14/03/11 30 Seconds	5.59	25.0	Results are within CoG goals
18 Felix Street (Ramp B)	14/03/11 30 Seconds	10.9	25.0	Results are within CoG goals
18 Felix Street (Ramp B)	15/03/11 30 Seconds	10.4	25.0	Results are within CoG goals
26 Bradshaw Street (TBM Shaft – South Bound)	15/03/11 30 Seconds	5.46	25.0	Results are within CoG goals

Table 5c: Vibration Monitoring Results Summary – Kedron 07/03/2011

Location	Property Type	Monitoring Period	Monitoring Type	Peak Particle Velocity (mm/s)	CoG Vibration Goal (mm/s)
40 Brookfield Road	Residential	07/03/2011	Histogram (8 Hrs)	3.43	5.00

Table 5d: Vibration Monitoring Results Summary – Kedron

Location	Property Type	Monitoring Period	Monitoring Type	Peak Particle Velocity (mm/s)	CoG Vibration Goal (mm/s)
40 Stafford Road	Residential	07/03/2011	Histogram (8 Hrs)	3.43	5.00

Table 5e: Vibration Monitoring Results Summary – Kedron

Location	Property Type	Monitoring Period	Monitoring Type	Peak Particle Velocity (mm/s)	CoG Vibration Goal (mm/s)
72 Gympie Road	Commercial	09/03/2011	Continuous	20.6	25

Table 5g: Vibration Monitoring Results Summary – Wooloowin

Location	Monitoring Period	Peak Particle Velocity (mm/s)	CoG Vibration Goal (mm/s)	Comments
71 Park Road, Wooloowin	12:17pm 23/02/2011 to 8:55am 3/03/2011	4.19	5	Results are within CoG goals
71 Park Road, Wooloowin	9:55am 11/03/2011 to 9:28am 16/03/2011	1.05	5	Results are within CoG goals

Table 5h: Vibration Monitoring Results Summary – Toombul

Location	Monitoring Period	Peak Particle Velocity (mm/s)	CoG Goal (Continuous) (mm/s)	Comments
32 Roseleigh Street, Wooloowin	16/02/2011 – 25/02/2011	0.48	5	Monitoring indicates that CoG goals are being met
105 Kent Road, Wooloowin	16/02/2011 – 10/03/2011	1.27	5	Monitoring indicates that CoG goals are being met
56 Park Road, Wooloowin	25/02/2011 – 10/03/2011	0.11	5	Monitoring indicates that CoG goals are being met

5.3 Compliance with Vibration Goals

As a result of vibration monitoring across the project, there was one vibration

exceedences identified at:

- 26 Bradshaw Street, Lutwyche

6.0 Community enquiries and complaints

A total of 207 community complaints were reported to the project between 16 February and 15 March 2011. 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 February to 15 March 2011		
Issues	No.	No. of stakeholders
Site noise out-of-hours	44	27
Construction vehicle movements	33	17
Parking	23	20
Truck noise	18	14
Traffic Management	16	15
General Construction	12	9
Site noise	10	10
Water/Flooding	10	10
Driver Behaviour	10	9
Worker Behaviour	10	10
PUPs noise out-of-hours	9	6
Consultation	8	7
Mitigation	8	7
Pedestrian/Cyclists	8	7
Road condition	7	7
Site dust	6	5
Site lighting	6	4
Site un-notified work	5	5
PUPs reinstatement	4	4
Lane closure	4	4
Other	57	51
Total complaints	206	138

6.1 Top 10 issues raised:

