Monthly Environmental Monitoring Report

October 2009

TABLE OF CONTENTS

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).

The monitoring data covered in this report is for the September 2009 reporting period, from 15th September to 15th October 2009.

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 2009, though do serve a useful purpose in relating the monitoring locations to existing structures and infrastructure.

Figure 1: Bowen Hills

Legend

- Noise (during construction)
- Vibration
- Air (PM_{10})
- Air (Dust Deposition)

Note – these locations are indicative only

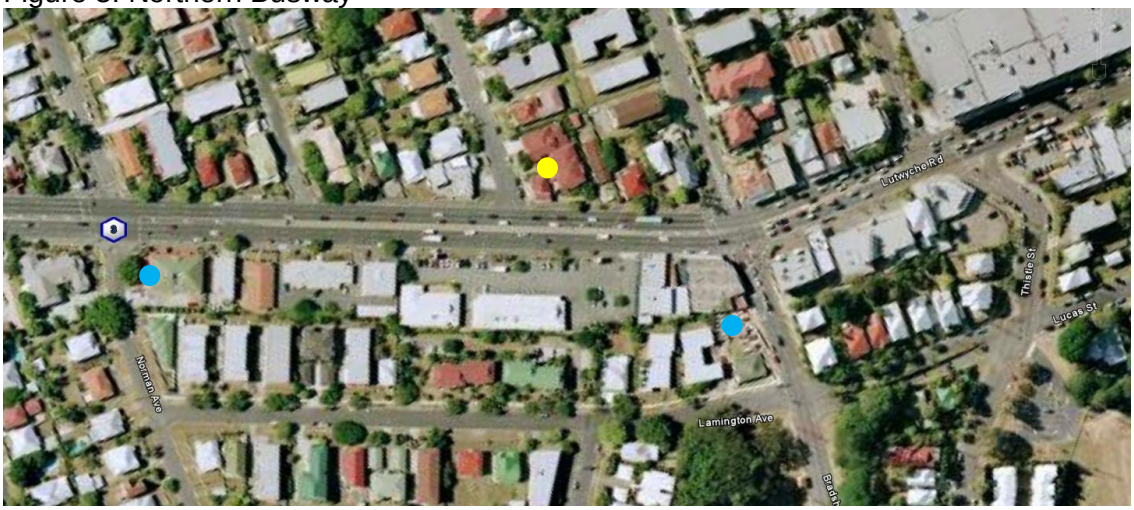
Figure 2: Truro Street

Legend

- Noise (during construction)
- Air (PM_{10})

Note – these locations are indicative only

Figure 3: Northern Busway



Legend

- Noise (during construction)
- Air (PM_{10})

Note – these locations are indicative only

Figure 4: Kedron

Legend

Noise (during construction)

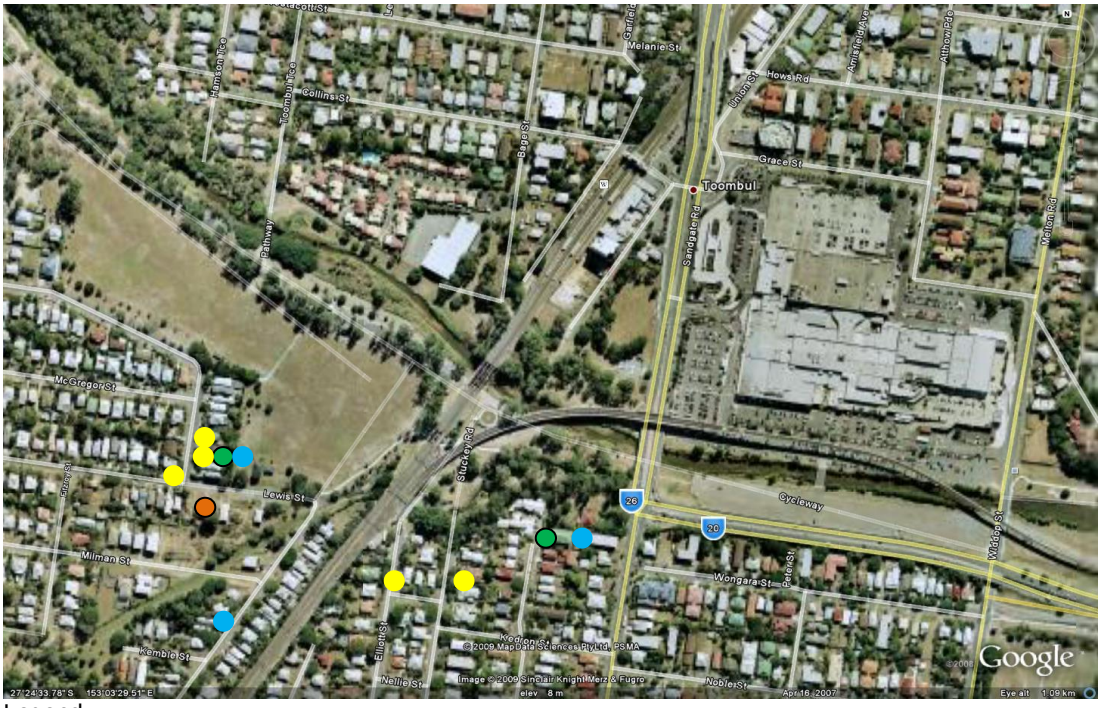
Vibration

Air (PM_{10})

Air (Dust Fallout)

Note – these locations are indicative only

Figure 5: Toombul



Legend

Noise (during construction)

Vibration

Air (PM_{10})

Air (Dust Fallout)

Note – these 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). TJH have also undertaken external monitoring to better understand the pre-construction baseline and acoustic environment during works to assist TJH conduct risk assessments and nominate appropriate mitigation measures.

Monitoring involves 'attended' monitoring (where a member of the TJH environment team is observing noise sources and durations whilst noise measurements are taken) and 'unattended' monitoring (where the sound level meter with a data logger is installed and collected at a later time).

Noise monitoring priorities are mostly influenced by predictive modelling undertaken for construction activities, responses from members of the community, access to resident's properties, availability of existing knowledge of the acoustic environment, and results of impact assessments undertaken by the TJH environment team and consultants.

Results of predictive modelling and monitoring are compared to Noise Goals nominated by the Coordinator General (Change Report July 2008) for the Airport Link and Northern Busway projects.

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. Truro Street on all sides of works
      iii. Federation Street, Morris Street and Gallway St (Bowen Hills)
      iv. Boarding Gympie Rd for CC210 (Kedron)
      v. Stafford Rd (Kedron)
   b. Temporary noise barrier (shipping container with plywood gap fillers, and extended sheet piles) installations:
      i. Park Terrace / Lasseter St (Kedron)
      ii. Perry Street, (Kedron)
      iii. Morris St (Bowen Hills)
      iv. Stafford Road Site (Kedron)
   c. Acoustic sheds:
      i. Truro Street
      ii. Bowen Hills
      iii. Kedron
   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. Investigation of alternative plant and equipment which inherently create less sound during operation.
h. Acoustic shielding of various plant.
i. 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.
j. Use of temporary acoustic treatment (e.g. sound curtains around onsite generators and access/ egress from sites).
k. Installation of directional reversing alarms (eg 'squawkers') on plant (especially those working out of normal working hours).
l. Planning of works to occur wherever possible to normal working hours.
m. Planning one-way construction access roads where possible to minimise the amount of reversing.

3.2 Noise Monitoring Results

The results of TJH monitoring efforts are summarised for each project area in Tables 1a-d.

Table 1a: Noise Monitoring Results – Bowen Hills

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
20 Gallway Street						
Living Room, 2nd Level	29/09/09 9:35am-9:50am	50.1	45	51.78	55	**Monitoring Type** Attended, windows and doors closed. **Noise Sources** Regenerated and airborne noise from Area 2 Hammering and Line Drilling, General Construction. **Discussion** The peak source of noise was rock hammers working on the Gallway Street access road in Area 2 (regenerated and airborne noise), which is a short-duration excavation). The hammers working in the CC101 and Northern Busway excavations in Area 2 were also evident (regenerated and airborne noise). **Mitigation Measures** Noise mitigation measures presently installed includes a 3.5m noise wall along Gallway Lane and Morris St (mitigation for Area 2 Works). A noise wall has also been installed along Federation St to mitigate noise from the Area 1 construction activities. For excavation works in Area 2, the smallest practicable rock hammers are being utilised and work hours are limited to 9am-5pm. A trial has been conducted with a surface profiler to potentially replace the hammers in Area 2 for the remainder of the Gallway St and CC101 excavations, which monitoring indicates would significantly reduce the construction noise in this area. Haulage is now using the new Lutwyche Road site entrance/exit. Gate 1 in Federation has been closed, but may be used as required by construction activities. Haul trucks have been accessing Area 2 via Lutwyche Road and exiting onto the western end of Federation Street. Discussions have been ongoing regarding additional mitigation measures for this property.
Living Room, 2nd Level	29/09/09 9:51am-10:04	48.5	45	49.9	55	
Living Room, 2nd Level	5/10/2009 9:27am - 9:41am	46.1	45	47.6	55	
Living Room, 2nd Level	5/10/2009 9:42am – 9:56am	46.8	45	48.4	55	
14 Gallway Street						

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
Living Room, Ground Level	2/10/09 11:25am – 11:39am	53.4	45	54.7	55	**Monitoring Type** Attended, windows and doors closed. **Noise Sources** Regenerated and airborne noise from Area 2 Hammering and Line Drilling, Road Heading, General Construction. **Discussion** The peak source of noise was rock hammers working on the Gallway Street access road in Area 2 (regenerated and airborne noise), which is a short-duration excavation. Regenerated noise from the road header working in Cross Passage 1 to connect the north- and south-bound tunnels was also a significant component of the noise measured on the 15th. The hammers working in the CC101 and Northern Busway excavations in Area 2 were also evident (regenerated and airborne noise). This property appears to be particularly susceptible to regenerated noise due to its construction and limited depth of cover to rock. **Mitigation Measures** Noise mitigation measures presently installed includes a 3.5m noise wall along Gallway Lane, and Morris Street (mitigation for Area 2 Works). For excavation works in Area 2, the smallest practicable rock hammers are being utilised and work hours are limited to 9am-5pm. A trial has been conducted with a surface profiler to potentially replace the hammers in Area 2 for the remainder of the Gallway Street and CC101 excavations, with monitoring of the trial indicating this would significantly reduce the construction noise on this property. Discussions are ongoing regarding further mitigation measures for this property.
Living Room, Ground Level	15/10/09 3:20pm – 3:34pm	52.5	45	54.2	55	
Living Room, Ground Level	15/10/09 3:35pm – 3:49pm	52.0	45	53.8	55	
15 Bryden Street						
Living Room, 2nd Level	10/10/09 8:30am – 8:44am	50.9	45	52.3	55	**Monitoring Type** Attended, windows and doors closed. **Noise Sources** Road traffic noise and rock hammering in Area 1 (Area 2 hammers not working before 9am).

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
Living Room, 2nd Level	10/10/09 8:45am – 8:59am	47.1	45	49.1	55	**Discussion** Monitoring was undertaken in response to complaint from resident regarding tunnelling noise. Minimal tunnelling noise was evident during this monitoring period (road headers were definitely working in the tunnel throughout this period). The main noise source was Lutwyche Road traffic, though rock hammering noise was also evident. Further monitoring is planned for this property to determine construction impacts. **Mitigation Measures** Noise mitigation measures presently installed includes a 3.5m noise wall along Gallway Lane, and Morris Street (mitigation for Area 2 Works). For excavation works in Area 2, the smallest practicable rock hammers are being utilised and work hours are limited to 9am-5pm. A trial has been conducted with a surface profiler to potentially replace the hammers in Area 2 for the remainder of the Gallway Street and CC101 excavations, with monitoring of the trial indicating this would significantly reduce the construction noise on this property. Further mitigation measures for this property may be considered following additional monitoring, subject to access.

Table 1b: Noise Monitoring Results – Northern Busway

Location	Monitoring Period	Average L_{Aeq} (dBA)	CoG Goal $L_{Aeq\ (15\ min)}$ (dBA)	Average L_{A10} (dBA)	CoG Goal $L_{A10(15\ min)}$ (dBA)	Comments
Unit 5 599 Lutwyche Road, Lutwyche						
Bottom Floor Unit/ Bedroom located at rear of Unit	24/9/09 3.18-3.33pm	45.5	45	46.5	55	**Monitoring Type** Attended, windows and doors closed **Noise Sources** The PUP's team were using an excavator outside the premises and this was causing the majority of the noise that was recorded. **Discussion** Dominant noise source throughout monitoring period was PUP's working directly in front of complex on Felix Street. Unit complex located on corner of Lutwyche Road and Felix Street. An NCR was raised as a result of this exceedance. **Mitigation** Minimal – short term works
Bottom Floor Unit/ Living Room located at rear of Unit	25/9/09 6.34-4.39pm	47.8	45	48.3	55	**Monitoring Type** Unattended, windows and doors closed **Noise Sources** The PUP's team were using an excavator outside the premises and this was causing the majority of the noise that was recorded. **Discussion** The noise logger was setup to record in the living room of bottom floor unit with the sound level recorder activated to record noise sources above 45dB. After collecting the noise logger and converting the noise files the dominant noise source throughout monitoring period was PUP's working directly in front of complex on Felix Street. **Mitigation** Minimal – short term works

Table 1c: 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
Unit 14/40 Swann Street						
Living room	22/09/2009 8:24-8:38am	59.7	45	60.1	55	**Monitoring Type** Attended – windows and doors open. **Noise Source** CC214, CC212, Perry st roundabout, Setlow sewer works and CC210 north and south. Sources include piling, jack hammering, and traffic on Gympie rd. **Discussion** The monitoring session was undertaken with the windows open. With large influence from construction activities and traffic on Gympie Rd. **Mitigation Measures** Individual mitigation has been agreed with this property owner.
Living room	22/09/2009 8:41-8:55am	43.3	45	44.3	55	**Monitoring Type** Attended – windows and doors closed. **Noise Source** CC214, CC212, Perry st roundabout, Setlow sewer works and CC210 north and south. Sources include piling, jack hammering, and traffic on Gympie rd. **Discussion** The monitoring session was undertaken with the windows closed. With large influence from construction activities and traffic on Gympie rd. **Mitigation Measures** Individual mitigation has been agreed with this property owner.
Living area	30/09/2009 7:18-7:32am	57.1	45	57.6	55	**Monitoring Type** Attended – windows and doors open. **Noise Source** CC214, CC212, Perry St roundabout, Setlow sewer works and CC210 north and south. Sources include piling, jack hammering, and traffic on Gympie rd. **Discussion** The monitoring session was undertaken with the windows open. With large influence from construction activities and traffic on Gympie rd. **Mitigation Measures** Individual mitigation has been agreed with this property owner.

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
Living area	30/09/2009 7:35-7:49am	44	45	44.9	55	**Monitoring Type** Attended – windows and doors closed. **Noise Source** CC214, CC212, Perry st roundabout, Setlow sewer works and CC210 north and south. Sources include piling, jack hammering, and traffic on Gympie rd. **Discussion** The monitoring session was undertaken with the windows closed. With large influence from construction activities and traffic on Gympie rd. **Mitigation Measures** Individual mitigation has been agreed with this property owner.
Living area	30/09/2009 14:08-14:22pm	61.8	45	61.4	55	**Monitoring Type** Attended – windows and doors open. **Noise Source** CC214, CC212, Perry st roundabout, Setlow sewer works and CC210 north and south. Sources include piling, jack hammering, and traffic on Gympie rd. **Discussion** The monitoring session was undertaken with the windows open. With large influence from construction activities and traffic on Gympie rd. **Mitigation Measures** Individual mitigation has been agreed with this property owner.
Living area	30/09/2009 14:31-14:35pm	44.7	45	45.6	55	**Monitoring Type** Attended – windows and doors closed. **Noise Source** CC214, CC212, Perry St roundabout, Setlow sewer works and CC210 north and south. Sources include piling, jack hammering, and traffic on Gympie Rd. **Discussion** The monitoring session was undertaken with the windows closed. With large influence from construction activities and traffic on Gympie rd. Note the difference between the session above where the windows and doors were open. **Mitigation Measures** Individual mitigation has been agreed with this property owner.
24 Stafford Road						

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
Living room	24/09/2009 9:07-9:21am	51.5	45	52.0	55	**Monitoring Type** Attended – windows and doors closed. **Noise Source** Trucks, piling, resident, residents dog and background traffic noise (Stafford Rd) **Discussion** The monitoring session was undertaken with the windows closed. Both construction and background noise were recorded during this monitoring session. When the background and construction LAeq and LA10 readings are analysed, variance between the two sources do not vary significantly. **Mitigation Measures** Noise mitigation presently installed includes a 2.1m PCB and ply board fence. Installed mitigation to the south of the CC216 piling alignment (Stafford Rd) is limited due to the close proximity of the construction footprint to the Stafford rd pedestrian foot path and the construction phasing for the southern alignment. Due to the limited area available along the southern piling alignment of CC216 the construction of a noise wall similar to that along Brookfield rd cannot be replicated. However, TJH community representative are working with residents along Stafford rd to implement alternative mitigation measures.
Living room	24/09/2009 922:-9:36am	52.7	45	53.0	55	
40 Stafford Road						
Living Area	25/09/2009 7:13-7:28am	55.6	45	51.5	55	**Monitoring Type** Attended – windows and doors closed. **Noise Source** Trucks, piling, resident and background traffic noise (Stafford rd) **Discussion** The monitoring session was undertaken with the windows closed. Both construction and background noise were recorded during this session. The LAeq and LA10 values recorded do not vary significantly. It should also be noted that the resident has installed double glazing, prior to the commencement of TJH works. **Mitigation Measures** Noise mitigation presently installed includes a 2.1m PCB and ply board fence. Installed mitigation to the south of the CC216 piling alignment (Stafford rd) is limited due to the close proximity of the construction footprint to the Stafford rd pedestrian foot path and the construction phasing for the

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
						southern alignment. Due to the limited area available along the southern piling alignment of CC216 the construction of a noise wall similar to that along Brookfield Rd cannot be replicated. However, TJH community representative are working with residents along Stafford rd to implement alternative mitigation measures.
Living Area	25/09/2009 7:32-7:46am	52.3	45	49.3	55	**Monitoring Type** Attended – windows and doors closed. **Noise Source** Trucks, crane, resident and background traffic noise (Stafford rd). It should be noted that the crane was the only auditable construction noise source during this monitoring session. **Discussion** The monitoring session was undertaken with the windows closed. Both construction and background noise were recorded during this session. The Laeq and LA10 values recorded do not vary significantly. It should also be noted that the resident has installed double glazing, prior to the commencement of TJH works. **Mitigation Measures** Noise mitigation presently installed includes a 2.1m PCB and ply board fence. Installed mitigation to the south of the CC216 piling alignment (Stafford Rd) is limited due to the close proximity of the construction footprint to the Stafford Rd pedestrian footpath and the construction phasing for the southern alignment. Due to the limited area available along the southern piling alignment of CC216 the construction of a noise wall similar to that along Brookfield Rd cannot be replicated. However, TJH community representatives are working with residents along Stafford Rd to implement alternative mitigation measures.
Living Area	25/09/2009 7:54-8:08am	49.1	45	49.9	55	**Monitoring Type** Attended – windows and doors closed. **Noise Source** Trucks, piling, resident and background traffic noise (Stafford Rd) **Discussion** The monitoring session was undertaken with the windows closed. Both

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
						construction and background noise were recorded during this session. The Laeq and LA10 values recorded do not vary significantly. It should also be noted that the resident has installed double glazing, prior to the commencement of TJH works. **Mitigation Measures** Noise mitigation presently installed includes a 2.1m PCB and ply board fence. Installed mitigation to the south of the CC216 piling alignment (Stafford rd) is limited due to the close proximity of the construction footprint to the Stafford Rd pedestrian foot path and the construction phasing for the southern alignment. Due to the limited area available along the southern piling alignment of CC216 the construction of a noise wall similar to that along Brookfield rd cannot be replicated. However, TJH community representative are working with residents along Stafford Rd to implement alternative mitigation measures.
Living area	1/10/2009 7:33-7:47am	47.1	45	46.8	55	**Monitoring Type** Attended – windows and doors closed. **Noise Source** Trucks, piling, resident and background traffic noise (Stafford Rd) **Discussion** The monitoring session was undertaken with the windows closed. Both construction and background noise were recorded during this session. The LAeq and LA10 values recorded do not vary significantly. It should also be noted that the resident has installed double glazing, prior to the commencement of TJH works. **Mitigation Measures** Noise mitigation presently installed includes a 2.1m PCB and ply board fence. Installed mitigation to the south of the CC216 piling alignment (Stafford rd) is limited due to the close proximity of the construction footprint to the Stafford rd pedestrian foot path and the construction phasing for the southern alignment. Due to the limited area available along the southern piling alignment of CC216 the construction of a noise wall similar to that along Brookfield rd
Front Study	1/10/2009 7:53-8:07am	50.9	45	51.7	55	

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
						cannot be replicated. However, TJH community representative are working with residents along Stafford rd to implement alternative mitigation measures.
6 Erskine Street						
Living room	6/10/2009 14:50-15:04pm	43.9	45	41.5	55	**Monitoring Type** Attended - Windows closed. **Noise Sources** Piling, roof slab construction, excavation and load and haul CC210 north areas 2&3 **Mitigation Measures** Previously installed noise mitigation includes sheet pile wall.
Living room	6/10/2009 15:08-15:22pm	42.4	45	42.1	55	
12 Park Terrace						
Front room	6/10/2009 14:00-14:15pm	55.2	45	55.3	55	**Monitoring Type** Attended - Windows closed. **Noise Sources** Piling and load and haul CC210 north areas 1&2 and services relocation in Park tce **Discussion** Due to excavations and phasing of works, load and haul activities are undertaken 20 metres from monitoring locations within an area not covered by the sheet pile wall, providing minimal mitigation for this specific activity. It should be noted that this house is not occupied. **Mitigation Measures** Previously installed noise mitigation includes sheet pile wall. This property is vacant.
Front room	6/10/2009 14:19-14:33pm	52.8	45	53.9	55	
Front room	15/10/2009 16:22-16:36pm	50.3	45	50.7	55	
Front room	15/10/2009 16:42-16:56pm	49.7	45	49.7	55	
Living room	15/10/2009 16:22-16:36pm	47.6	45	48.0	55	
Living room	15/10/2009 16:42-16:36pm	44	45	47.6	55	

Table 1d: 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
44 Lewis Street						
Front bedroom, 2nd level	08/10/2009 11.35-11.49am	39.5	40	39.1	50	**Monitoring Type** Attended internal monitoring - windows and doors closed **Noise Sources** General construction (Excavator, steel works, trucks being loaded) plus non-TJH sources (Trains, planes, public cars) **Discussion** Excavations, loading and haul activities are undertaken 20 metres from monitoring location as part of PUP sewer relocation works at corner of Lewis street and Kalinga Street. **Mitigation Measures** Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied.
Front bedroom, 2nd level	08/10/2009 11.55-12.09am	44.46	40	40.38	50	**Monitoring Type** Attended internal monitoring - windows and doors closed **Noise Sources** General construction (Excavator, steel dropping, D-walls, trucks being loaded) plus non-TJH sources (Trains, planes, cars) **Discussion** Excavations, loading and haul activities are undertaken 20 metres from monitoring location as part of PUP sewer relocation works at corner of Lewis street and Kalinga Street. **Mitigation Measures** Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied.
Front bedroom, 2nd level	15/10/2009 12:52-1:06pm	38.9	40	39.2	50	**Monitoring Type** Attended internal monitoring - windows and doors closed **Noise Sources** General construction (Electric saw, pile, auger, truck, reverse beeper, revving of machinery) plus non-TJH sources (Trains, planes, voices)

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
						Discussion Monitoring indicates that COG goals are being met. **Mitigation Measures** Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied.
Front bedroom, 2nd level	15/10/2009 1:09 – 1:23pm	44.0	40	45.7	50	**Monitoring Type** Attended internal monitoring - windows and doors closed **Noise Sources** General construction (Excavator, truck, piling, auger, banging, reverse beeper, electric drill, metal on metal) plus non-TJH sources (train). **Discussion** PUP sewer relocation works were being undertaken 20 metres from monitoring location. Also bored piling works was being undertaken at CC 430. **Mitigation Measures** Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied.
1/77 Stuckey						
Second Floor Bedroom - Closest to worksite	25/09/2009 12.36-12.50pm	47.5	45	46.4	55	**Monitoring Type** Attended internal monitoring – windows and doors closed **Noise Sources** General construction (crane) plus non-TJH sources (birds, car, train, residents talking, garage door, non TJH truck idling in street). **Discussion** A computer monitor was running constantly during the monitoring period and was located 1m from monitor. A large influence from the residents was recorded during this monitoring period. **Mitigation Measures** A six metre noise wall and double stack shipping containers have been installed along the perimeter of the worksite.
Second Floor Bedroom - Closest to worksite	25/09/2009 12.51-1.05pm	45.5	45	45.4	55	**Monitoring Type** Attended internal monitoring – windows and doors closed **Noise Sources** General construction (Crane, reversing beeper) plus non-TJH sources

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
						(Residents talking, truck idling, garage door, resident on phone, train **Discussion** A computer monitor was running constantly during the monitoring period and was located 1m from monitor. A large influence from the resident talking on the phone and a non –TJH truck idling in the street was recorded during this monitoring period. **Mitigation Measures** A six metre noise wall and double stack shipping containers have been installed along the perimeter of the worksite.
Second Floor Bedroom - Closest to worksite	25/09/2009 3:06-3:20pm	45.1	45	45.7	55	**Monitoring Type** Attended internal monitoring – windows and doors closed **Noise Sources** General construction (crane, reversing beeper) plus non-TJH sources (Train, resident talking, music) **Discussion** A computer (power pack fan) was running constantly during the monitoring period and was located 1m from monitor. A large influence from the resident was recorded during this monitoring period. **Mitigation Measures** A six metre noise wall and double stack shipping containers have been installed along the perimeter of the worksite.
Second Floor Bedroom - Closest to worksite	25/09/2009 15.21-15.35pm	45.2	45	45.7	55	**Monitoring Type** Attended internal monitoring – windows and doors closed **Noise Sources** General construction (reversing beeper, crane) plus non-TJH sources (Music, car, train). **Discussion** A computer (power pack fan) was running constantly during the monitoring period and was located 1m from monitor. A large influence from the residents was recorded during this monitoring period. **Mitigation Measures** A six metre noise wall and double stack shipping containers have been installed along the perimeter of the worksite.
70 Kalinga Street						
First floor, living area	22/09/2009 7:47-8:01am	37.6	40	38.4	50	**Monitoring Type** Attended internal monitoring – windows and doors closed

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
						Noise Sources General construction (Humming, jack hammering, banging, drilling) and non-TJH sources (train) **Discussion** Monitoring indicates that COG goals are being met. **Mitigation Measures** Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied.
First floor, living area	22/09/2009 10:09-10:23am	32.3	40	33.3	50	**Monitoring Type** Attended internal monitoring – windows and doors closed **Noise Sources** General construction (humming, banging) and non-TJH sources (birds, plane, talking 68 Kalinga, train). **Discussion** Monitoring indicated that COG goals are being met. **Mitigation Measures** Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied.
First floor, living area	22/09/2009 2:00-2:14pm	41.5	40	41.5	50	**Monitoring Type** Attended internal monitoring – windows and doors closed **Noise Sources** General construction (Jack hammering, drilling) and non-TJH sources (garage door banging in wind, train). **Discussion** Exceedences as a result of both TJH and non TJH sources. **Mitigation Measures** Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied.
First floor, living area	22/09/2009 3:25-3:39pm	38.5	40	38.2	50	**Monitoring Type** Attended internal monitoring – windows and doors closed **Noise Sources** General construction (Humming, banging) plus non-TJH sources (plane, crows, train, garage door banging in wind).

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
						Discussion Monitoring indicated that COG goals are being met. **Mitigation Measures** Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied.
First floor, living area	8/10/2009 12:14-12:28pm	40.7	40	40.4	50	**Monitoring Type** Attended internal monitoring – windows and doors closed **Noise Sources** General construction (Excavation for PUP sewer relocation , Jet grouting at western side of CC 410 box, steel fixing & excavation inside CC 410 box. PUP relocation at corner of Kalinga and Lewis Street) and non-TJH sources (birds, plane, talking, train). **Discussion** Excavations, loading and haul activities are undertaken 25 metres from monitoring location as part of PUP sewer relocation works at corner of Lewis street and Kalinga Street. Also jet grouting activities are undertaken 10 metres from monitoring location. The building is unoccupied. **Mitigation Measures** Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied.
First floor, living area	8/10/2009 12:31-12:46pm	43.7	40	42.3	50	**Monitoring Type** Attended internal monitoring – windows and doors closed **Noise Sources** General construction (Excavation for PUP sewer relocation , Jet grouting at western side of CC 410 box, steel fixing & excavation inside CC 410 box. PUP relocation at corner of Kalinga and Lewis Street) and non-TJH sources (birds, plane, talking, train). **Discussion** Excavations, loading and haul activities are undertaken 25 metres from monitoring location as part of PUP sewer relocation works at corner of Lewis street and Kalinga Street. Also jet grouting activities are undertaken 10 metres from monitoring location. The building is unoccupied. **Mitigation Measures** Include a 6m noise wall and double stack containers. The property was

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
						purchased by DMR prior to commencement of the project and is unoccupied.
First floor, living area	15/10/2009 10:03-10:17am	36.8	40	36.3	50	**Monitoring Type** Attended internal monitoring – windows and doors closed **Noise Sources** General construction (excavation at CC 410, steel fixing and haulage. **Discussion** Monitoring indicated that COG goals are being met. **Mitigation Measures** Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied.
68 Kalinga Street						
Second floor, bedroom – closest to site	15/10/2009	38.5	40	39.1	50	**Monitoring Type** Attended internal monitoring – windows and doors closed **Noise Sources** General construction (excavation at CC 410, steel fixing and haulage. **Discussion** Monitoring indicated that COG goals are being met. **Mitigation Measures** Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied.
First floor, living area	15/10/2009 1:32-1:46pm	41.3	40	42.0	50	**Monitoring Type** Attended internal monitoring – windows and doors closed **Noise Sources** General construction (Banging, reverse beeper, truck, piling, auger, squawker) plus non-TJH sources (window shaking in wind, birds, plane)/ **Discussion** Excavations, loading and haul activities are undertaken 20 metres from monitoring location as part of PUP sewer relocation works at corner of Lewis street and Kalinga Street. This property is unoccupied. **Mitigation Measures** Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied.

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
First floor, living area	15/10/2009	52.8	40	43.53	50	**Monitoring Type** Attended internal monitoring – windows and doors closed **Noise Sources** General construction (Reverse beeper, auger, truck movements, piling works, revving of machinery, machinery), plus non-TJH sources (window shaking in wind, cars, plane, crows). **Discussion** Excavations, loading and haul activities are undertaken 20 metres from monitoring location as part of PUP sewer relocation works at corner of Lewis street and Kalinga Street. This property is unoccupied. **Mitigation Measures** Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied.
5 Mabel Street						
Second Floor, Master Bedroom	9/09/2009 10:57 – 11:12pm	36	35	55	45	**Monitoring Type** Attended internal monitoring – windows and doors open **Discussion** Monitoring undertaken by third party (ANE). Exceedance was due to windows and doors opened during monitoring. **Mitigation** Include a 6m noise wall and double stack containers.
Second Flood, Master Bedroom	9/09/2009 11:17-11:33pm	29	35	40	45	**Monitoring Type** Attended internal monitoring – windows and doors closed **Discussion** Monitoring undertaken by ANE. Monitoring indicates that COG night-time goals are being met when windows and doors are closed. **Mitigation Measures** Include a 6m noise wall and double stack containers.

3.3 Compliance with Noise Goals

Exceedences of the Coordinator General's Noise Goals have been found during this monitoring period at a number of locations, these include:

- Northern Busway
  - Unit 5/ 599 Lutwyche Road
- Bowen Hills
  - 14 Gallway Street
  - 20 Gallway Street
  - 15 Bryden Street
- Kedron
  - 12 Park Terrace
  - Unit 14/40 Swann Street
  - 24 Stafford Road
  - 40 Stafford Road
- Toombul
  - 44 Lewis Street, Clayfield
  - Unit 1 77 Stuckey Road, Clayfield
  - 70 Kalinga Street, Clayfield
  - 68 Kalinga Street, Clayfield
  - 5 Mabel Street, Clayfield

A global NCR is raised to cover all noise exceedences recorded through attended noise monitoring sessions on the Airport Link Project. The NCR is completed for the calendar month and is submitted to Brisconnections, CNI and CoG.

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 at a number of locations nominated by the Coordinator General.

Results of monitoring are compared to Air Quality Goals nominated by the Coordinator General (Change Report October 2008) 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 during the following activities:
   i. Bulk earthworks
   ii. Haul roads
   iii. Car parks and hardstands
   iv. Clearing and grubbing
2. Investigation of appropriate soil binders (Water and Aeolian erosion prevention techniques).
3. Covering of haul vehicles.
4. Stabilisation of cleared areas with hardstand materials such as concrete and crushed rock.
5. Hydro-mulching and laying geofab to batters.
6. Reduction of cleared / exposed soils with concrete paving and geo-fabric installation.
7. Road sweepers.
8. Enclosed spoil handling facilities at portals.

4.2 Air Quality Monitoring Results – Respirable Dust (PM10)

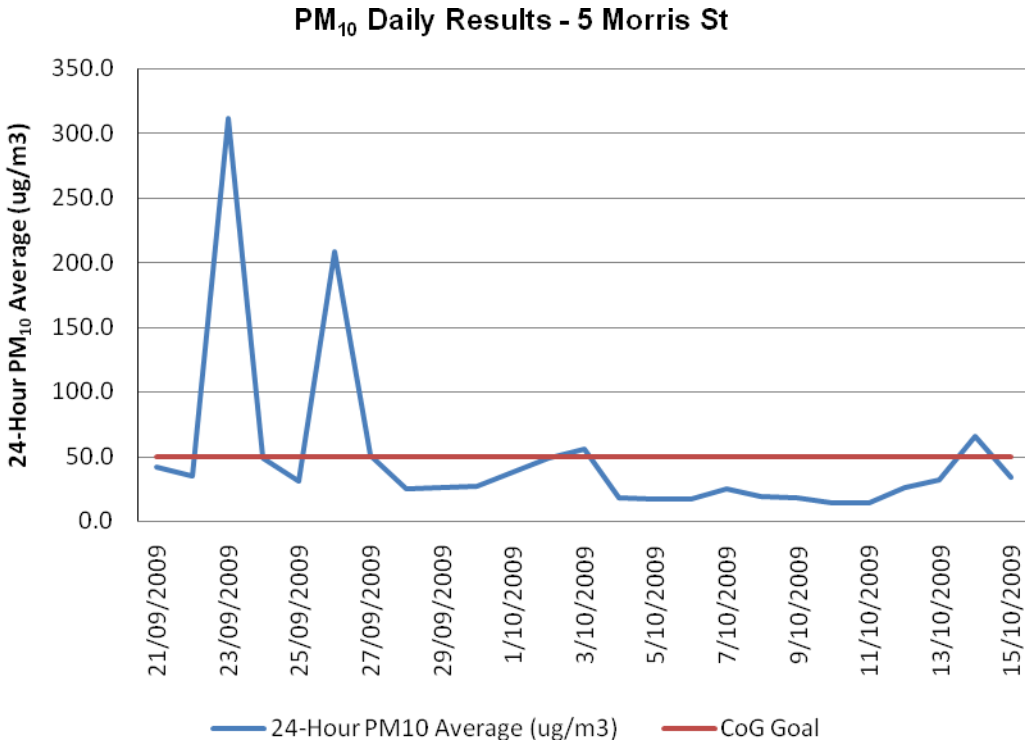
The results of PM10 monitoring is shown in Tables 2a-j and their associated figures.

Table 2a: PM_{10} Results – Bowen Hills

Monitoring Period	Daily PM_{10} ($\mu g/m^3$)	PM_{10} Goal ($\mu g/m^3$/day)	Comments
5 Morris St			
21/09/2009	41.9	50	
22/09/2009	35.3	50	
23/09/2009	311.3	50	Exceedance (Dust Storm)– NCR Raised
24/09/2009	48.9	50	
25/09/2009	31.0	50	
26/09/2009	208.8	50	Exceedance (Dust Storm)– NCR Raised
27/09/2009	51.0	50	
28/09/2009	25.1	50	
29/09/2009	26.0	50	
30/09/2009	27.3	50	
1/10/2009	38.1	50	
2/10/2009	49.3	50	
3/10/2009	56.4	50	Exceedance (Dust Storm)– NCR Raised
4/10/2009	18.2	50	
5/10/2009	17.0	50	
6/10/2009	17.4	50	
7/10/2009	25.7	50	
8/10/2009	19.1	50	
9/10/2009	18.2	50	
10/10/2009	14.4	50	
11/10/2009	14.9	50	
12/10/2009	26.5	50	
13/10/2009	32.2	50	
14/10/2009	66.3	50	Exceedance (Dust Storm)– NCR Raised
15/10/2009	34.1	50	
20 Gallway St			
15/09/2009	13.7	50	
16/09/2009	15.2	50	
17/09/2009	13.7	50	
18/09/2009	19.9	50	
19/09/2009	21.1	50	
20/09/2009	28.6	50	
21/09/2009	28.4	50	
22/09/2009	26.6	50	
23/09/2009	489.6	50	Exceedance (Dust Storm)– NCR Raised
24/09/2009	28.3	50	
25/09/2009	8.1	50	
28/09/2009	10.9	50	
29/09/2009	12.0	50	
30/09/2009	15.9	50	
1/10/2009	10.3	50	
2/10/2009	36.9	50	
3/10/2009	42.3	50	
4/10/2009	9.0	50	
5/10/2009	22.9	50	
6/10/2009	4.8	50	

7/10/2009	14.2	50	
8/10/2009	18.7	50	
9/10/2009	7.1	50	
10/10/2009	6.2	50	
11/10/2009	5.9	50	
12/10/2009	7.8	50	
13/10/2009	14.6	50	
14/10/2009	43.6	50	
15/10/2009	24.0	50	

Note: AS 3580.10.1: 2003 requires a statement to be included with results when all of the siting recommendations are not able to be satisfied. The dust gauge is located such that a 120 degree skyward field is partially obscured by a building or treeline. Full satisfaction of AS recommendations is not possible to satisfy gauge security and access provisions.



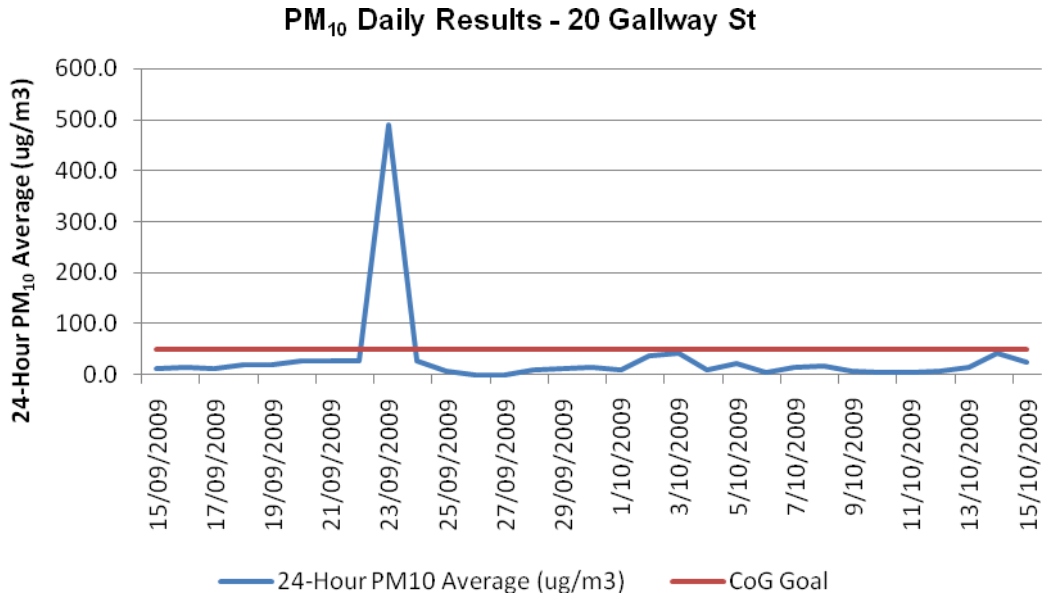


Table 2b: PM_{10} Results – Truro Street

Monitoring Period	Daily PM_{10} ($\mu g/m^3$/day)	CoG PM_{10} Goal ($\mu g/m^3$/day)	Comments
15/09/2009	21	50	
16/09/2009	21.1	50	
17/09/2009	14	50	
18/09/2009	20.6	50	
19/09/2009	31.3	50	
20/09/2009	30.1	50	
21/09/2009	37.9	50	
22/09/2009	35.4	50	
23/09/2009	21.6	50	
24/09/2009	85.6	50	Exceedance (Dust Storm)– NCR Raised
25/09/2009	13.7	50	
26/09/2009	35.9	50	
27/09/2009	64.5	50	Exceedance (Dust Storm)– NCR Raised
28/09/2009	16	50	
29/09/2009	10.3	50	
30/09/2009	22.8	50	
1/10/2009	24.3	50	
2/10/2009	31.4	50	

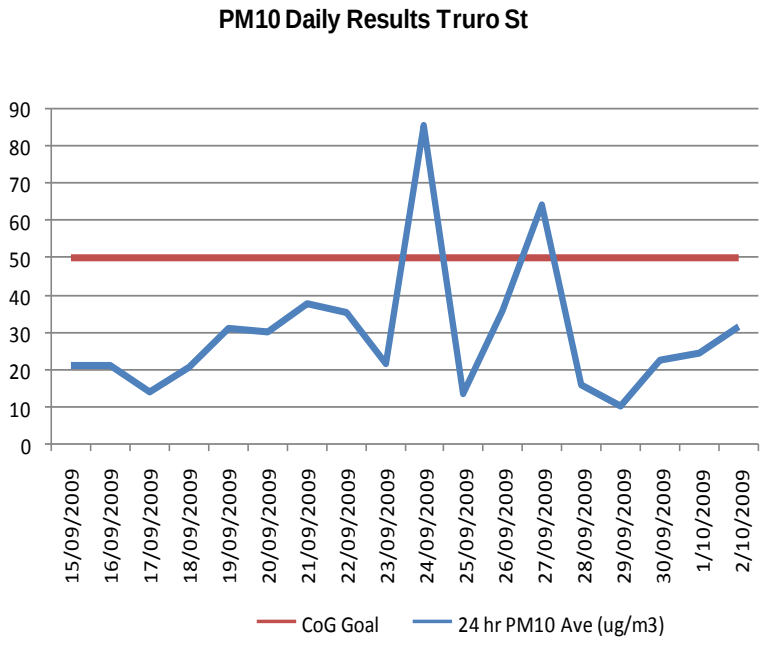
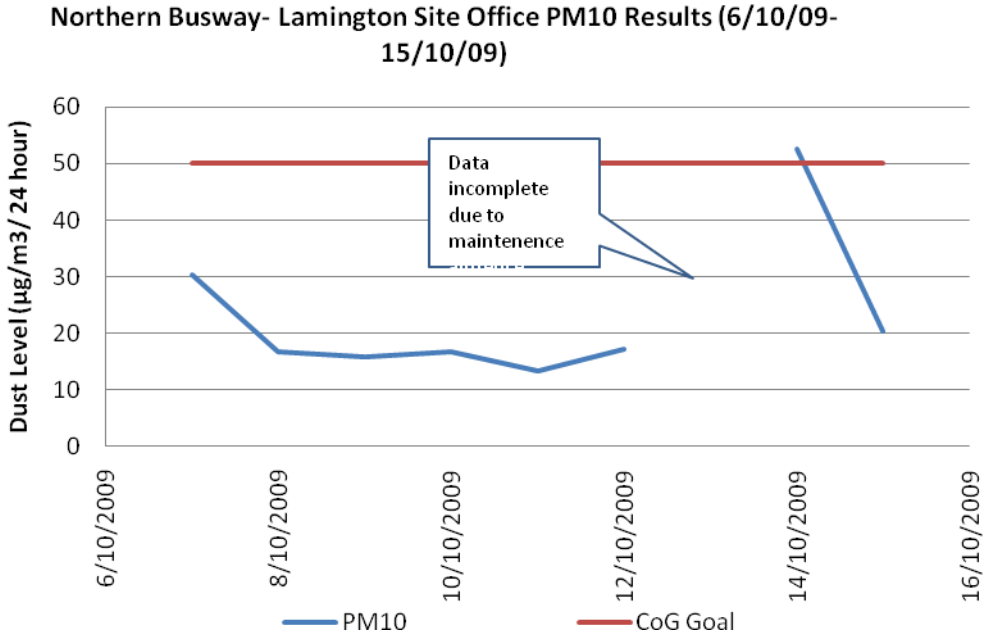


Table 2c: PM_{10} Results – Lutwyche Site Office, CC701, Chalk St Site

Monitoring Period	Daily PM_{10} ($\mu g/m^3$)	CoG PM_{10} Goal ($\mu g/m^3$/day)	Comments
Lutwyche Site Office			
16/09/2009	12	50	Exceedences were recorded on 23/9/09, 24/9/09, 26/9/09, and 27/9/09. Dust storms occurred on the 23/9 and 26/9 with higher levels on subsequent days resulting from these storms. High levels (including exceedences) measured at the DERM Brisbane CBD Air Quality Monitoring Station over these 24hr periods. Data incomplete 21/9/09- 22/9/09 due to maintenance
17/09/2009	16	50	
18/09/2009	20	50	
19/09/2009	28	50	
20/09/2009	35	50	
21/09/2009	-	-	
22/09/2009	-	-	
23/09/2009	419	50	
24/09/2009	63	50	
25/09/2009	32	50	
26/09/2009	167	50	
27/09/2009	76	50	
28/09/2009	14	50	
29/09/2009	18	50	
30/09/2009	23	50	
CC701			
1/10/2009	33	50	One exceedance was recorded on 14/10/09. A considerable level of dust was present in the atmosphere throughout this day. High levels (including exceedences) measured at the DERM Brisbane CBD Air Quality Monitoring Station over these 24hr periods. Data incomplete 3/9/09-6/9/09 due to maintenance
2/10/2009	33	50	
3/10/2009	-		
4/10/2009	-		
5/10/2009	-		
6/10/2009	-		
7/10/2009	30	50	
8/10/2009	17	50	
9/10/2009	16	50	
10/10/2009	17	50	
11/10/2009	13	50	
12/10/2009	17	50	
13/10/2009	-		
14/10/2009	53	50	
15/10/2009	20	50	


Northern Busway- Lamington Site Office PM10 Results (6/10/09-15/10/09)
Dust Level (µg/m3/ 24 hour)
60
50
40
30
20
10
0
Data incomplete due to maintenence
6/10/2009
8/10/2009
10/10/2009
12/10/2009
14/10/2009
16/10/2009
PM10
CoG Goal

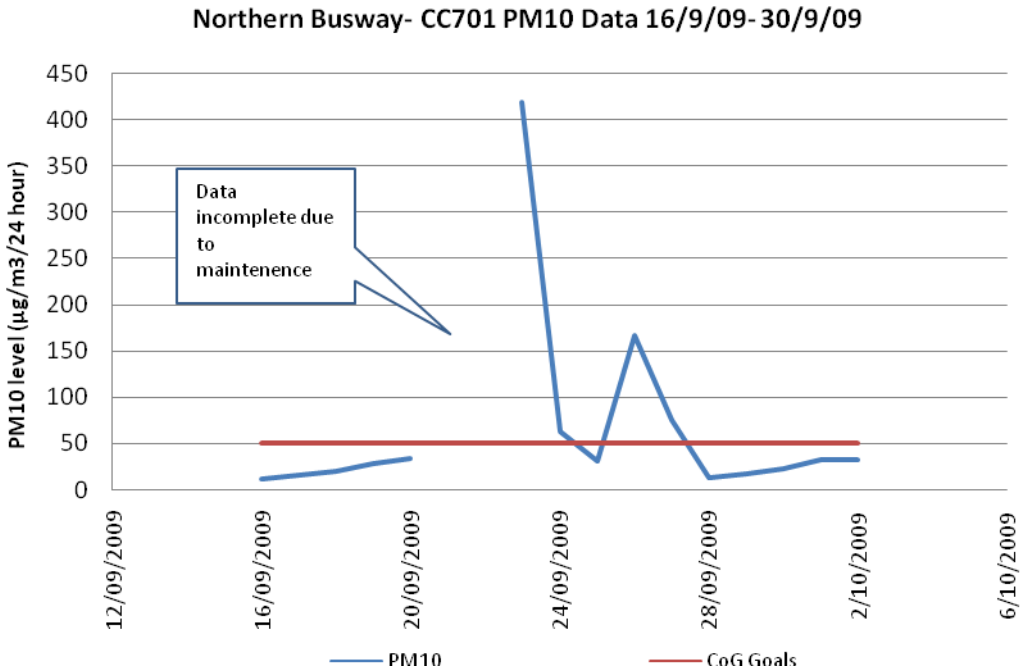

Northern Busway- CC701 PM10 Data 16/9/09- 30/9/09
PM10 level (µg/m3/24 hour)
450
400
350
300
250
200
150
100
50
0
Data incomplete due to maintenence
12/09/2009
16/09/2009
20/09/2009
24/09/2009
28/09/2009
2/10/2009
6/10/2009
PM10
CoG Goals

Table 2d: PM_{10} Results – 20 Erskine Street, Kedron

Monitoring Period	Daily PM_{10} ($\mu g/m^3$/day)	CoG PM_{10} Goal ($\mu g/m^3$/day)	Comments
Wed 16/09/2009	21	50	
Thu 17/09/2009	13.4	50	
Fri 18/09/2009	20.8	50	
Sat 19/09/2009	32.9	50	
Sun 20/09/2009	38.9	50	
Mon 21/09/2009	45	50	
Tue 22/09/2009	29.2	50	
Wed 23/09/2009	67.1	50	Exceedance (Dust Storm)– NCR Raised
Thu 24/09/2009	40.1	50	
Fri 25/09/2009	24.6	50	
Sat 26/09/2009	65.2	50	Exceedance (Dust Storm)– NCR Raised
Sun 27/09/2009	48.3	50	
Mon 28/09/2009	14.4	50	
Tue 29/09/2009	17.9	50	
Wed 30/09/2009	21.8	50	
Thu 1/10/2009	33.9	50	
Fri 2/10/2009	48.3	50	
Sat 3/10/2009	52	50	Exceedance (Dust Storm)– NCR Raised
Sun 4/10/2009	13.5	50	
Mon 5/10/2009	11.4	50	
Tue 6/10/2009	12.6	50	
Wed 7/10/2009	21.6	50	
Thu 8/10/2009	11.5	50	
Fri 9/10/2009	12.2	50	
Sat 10/10/2009	8.6	50	
Sun 11/10/2009	7.6	50	
Mon 12/10/2009	23.2	50	
Tue 13/10/2009	23.2	50	
Wed 14/10/2009	53.5	50	Exceedance (Dust Storm)– NCR Raised
Thu 15/10/2009	25.2	50	

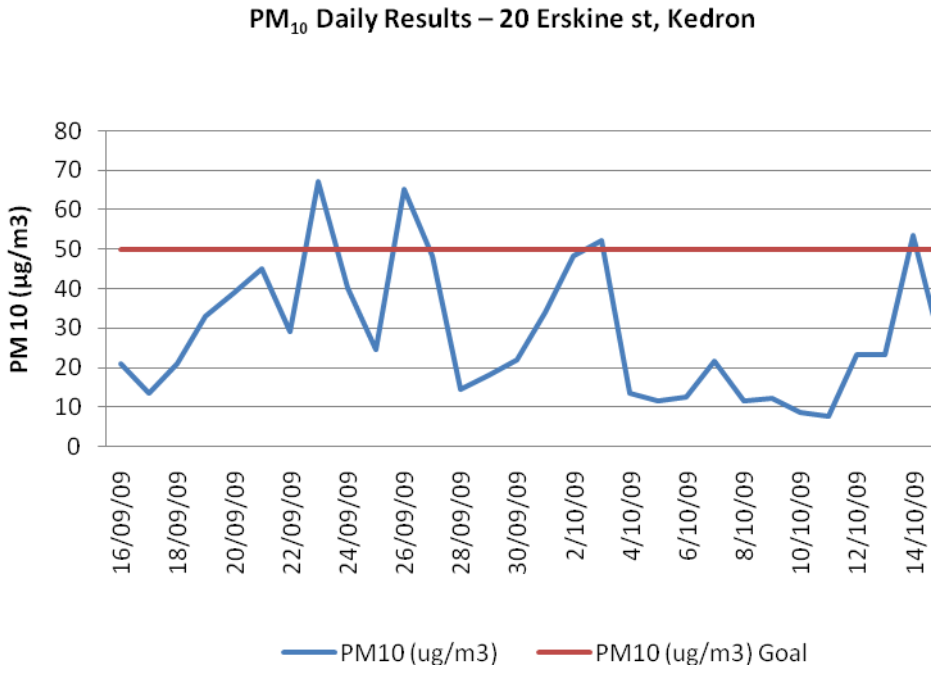


Table 2e: PM_{10} Results – Kedron State High School Oval

Monitoring Period	Daily PM_{10} ($\mu g/m^3$/day)	CoG PM_{10} Goal ($\mu g/m^3$/day)	Comments
Wed 16/09/2009	13.8	50	
Thu 17/09/2009	11.9	50	
Fri 18/09/2009	9.7	50	
Sat 19/09/2009	21.3	50	
Sun 20/09/2009	20	50	
Mon 21/09/2009	27.4	50	
Tue 22/09/2009	18.1	50	
Wed 23/09/2009	16	50	
Thu 24/09/2009	221.2	50	Exceedance (Dust Storm)– NCR Raised
Fri 25/09/2009	9.8	50	
Sat 26/09/2009	28.1	50	
Sun 27/09/2009	174.2	50	Exceedance (Dust Storm)– NCR Raised
Mon 28/09/2009	14.5	50	
Tue 29/09/2009	8.8	50	
Wed 30/09/2009	11.9	50	
Thu 1/10/2009	19.7	50	
Fri 2/10/2009	19.5	50	
Sat 3/10/2009	35.2	50	
Sun 4/10/2009	26.9	50	
Mon 5/10/2009	6.1	50	
Tue 6/10/2009	8	50	
Wed 7/10/2009	6.9	50	
Thu 8/10/2009	14.8	50	
Fri 9/10/2009	17.2	50	
Sat 10/10/2009	18.7	50	
Sun 11/10/2009	18.7	50	
Mon 12/10/2009	18.9	50	
Tue 13/10/2009	18.8	50	
Wed 14/10/2009	19	50	
Thu 15/10/2009	19.3	50	

Note: AS 3580.10.1: 2003 requires a statement to be included with results when all of the siting recommendations are not able to be satisfied. The dust gauge is located such that a 120 degree skyward field is partially obscured by a building or treeline. Full satisfaction of AS recommendations is not possible to satisfy gauge security and access provisions.

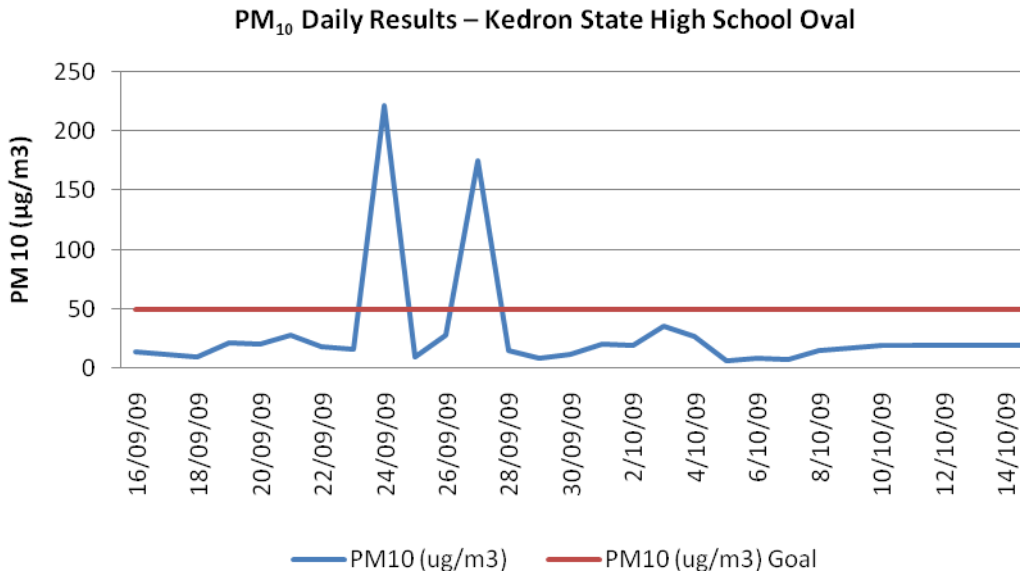


Table 2f: PM_{10} Results – Wooloowin State School, Front Office

Monitoring Period	Daily PM_{10} ($\mu g/m^3$/day)	CoG PM_{10} Goal ($\mu g/m^3$/day)	Comments
Tue 15/09/2009	18.5	50	
Wed 16/09/2009	19.4	50	
Thu 17/09/2009	18.9	50	
Fri 18/09/2009	19.8	50	
Sat 19/09/2009	19.5	50	
Sun 20/09/2009	21.1	50	
Mon 21/09/2009	21.6	50	
Tue 22/09/2009	20.5	50	
Wed 23/09/2009	53.2	50	Exceedance (Dust Storm)– NCR Raised
Thu 24/09/2009	21.4	50	
Fri 25/09/2009	19.4	50	
Sat 26/09/2009	39.4	50	
Sun 27/09/2009	23.2	50	
Mon 28/09/2009	18.4	50	
Tue 29/09/2009	18.5	50	
Wed 30/09/2009	19.4	50	
Thu 1/10/2009	21	50	
Fri 2/10/2009	22.7	50	
Sat 3/10/2009	22.3	50	
Sun 4/10/2009	18.3	50	
Mon 5/10/2009	18.2	50	
Tue 6/10/2009	18.3	50	
Wed 7/10/2009	19.6	50	
Thu 8/10/2009	21.6	50	
Fri 9/10/2009	26.6	50	
Sat 10/10/2009	24.3	50	

Note: AS 3580.10.1: 2003 requires a statement to be included with results when all of the siting recommendations are not able to be satisfied. The dust gauge is located such that a 120 degree skyward field is partially obscured by a building or treeline. Full satisfaction of AS recommendations is not possible to satisfy gauge security and access provisions.

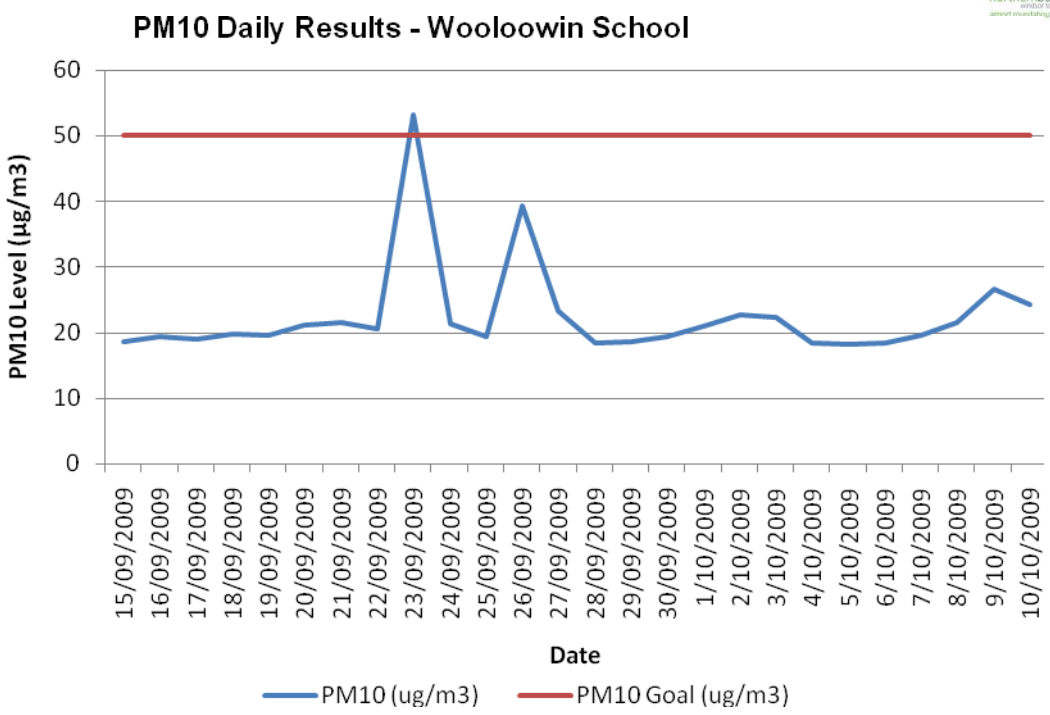


Table 2g: PM_{10} Results – 8 Perry St

Monitoring Period	Daily PM_{10} ($\mu g/m^3$/day)	CoG PM_{10} Goal ($\mu g/m^3$/day)	Comments
Wed 16/09/2009	-		Power outage
Thu 17/09/2009	-		
Fri 18/09/2009	-		
Sat 19/09/2009	-		
Sun 20/09/2009	-		
Mon 21/09/2009	-		
Tue 22/09/2009	33.2	50	
Wed 23/09/2009	383.7	50	Exceedance (Dust Storm)– NCR Raised
Thu 24/09/2009	48.4	50	
Fri 25/09/2009	26.9	50	
Sat 26/09/2009	199.0	50	Exceedance (Dust Storm)– NCR Raised
Sun 27/09/2009	71.5	50	Exceedance (Dust Storm)– NCR Raised
Mon 28/09/2009	9.5	50	
Tue 29/09/2009	17.1	50	
Wed 30/09/2009	26.1	50	
Thu 1/10/2009	37.8	50	
Fri 2/10/2009	51.6	50	Exceedance (Dust Storm)– NCR Raised
Sat 3/10/2009	51.2	50	Exceedance (Dust Storm)– NCR Raised
Sun 4/10/2009	13.4	50	
Mon 5/10/2009	11.7	50	
Tue 6/10/2009	16.6	50	
Wed 7/10/2009	21.7	50	
Thu 8/10/2009	-	50	Power outage
Fri 9/10/2009	42.5	50	
Sat 10/10/2009	-	50	Power outage
Sun 11/10/2009	-	50	

Mon 12/10/2009	-	50	
Tue 13/10/2009	-	50	
Wed 14/10/2009	92.51	50	Exceedance (Dust Storm)– NCR Raised

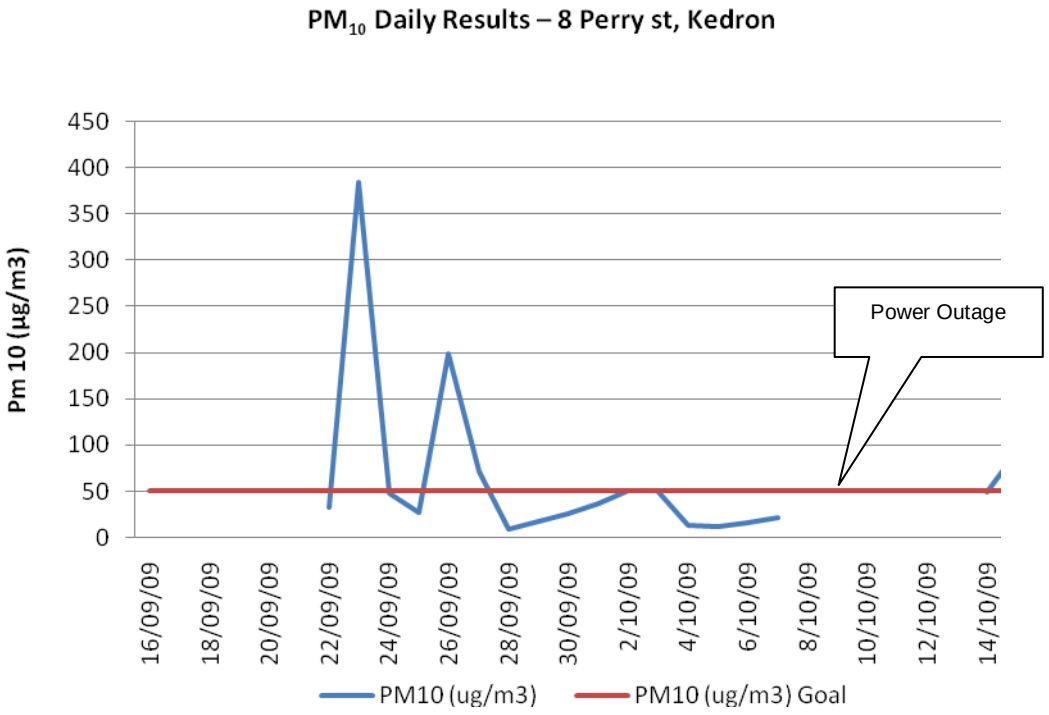


Table 2h: PM_{10} Results 35 Brookfield Rd and 35 Brook Rd, Kedron

Monitoring Period	Daily PM_{10} ($\mu g/m^3$)	CoG PM_{10} Goal ($\mu g/m^3$/day)	Comments
35 Brookfield Rd			
28/09/2009-29/09/2009 (7:43-7:33am)	6.0	50	
29/09/2009-30/09/2009 (7:43:7:33am)	15.9	50	
35 Brook Rd			
6/10/2009 (10:56-10:46am)	7.4	50	
7/10/2009 (10:56-10:46am)	16.2	50	
8/10/2009 (10:56-1046am)	6.4	50	

Note: AS 3580.10.1: 2003 requires a statement to be included with results when all of the siting recommendations are not able to be satisfied. The dust gauge is located such that a 120 degree skyward field is partially obscured by a building or treeline. Full satisfaction of AS recommendations is not possible to satisfy gauge security and access provisions.

Table 2i: PM_{10} Results – Kalinga St, Toombul

Monitoring Period (midnight-midnight)	Daily PM_{10} ($\mu g/m^3$/day)	CoG PM_{10} Goal ($\mu g/m^3$/day)	Comments
3/10/2009	10.5	50	
4/10/2009	30.7	50	
5/10/2009	8	50	
6/10/2009	11.8	50	
7/10/2009	10	50	
8/10/2009	16.7	50	
9/10/2009	8.7	50	
10/10/2009	13.4	50	
11/10/2009	9.5	50	
12/10/2009	13.3	50	
13/10/2009	11.5	50	
14/10/2009	23.3	50	
15/10/2009	36.2	50	

Note: AS 3580.10.1: 2003 requires a statement to be included with results when all of the siting recommendations are not able to be satisfied. The dust gauge is located such that a 120 degree skyward field is partially obscured by a building or treeline. Full satisfaction of AS recommendations is not possible to satisfy gauge security and access provisions.

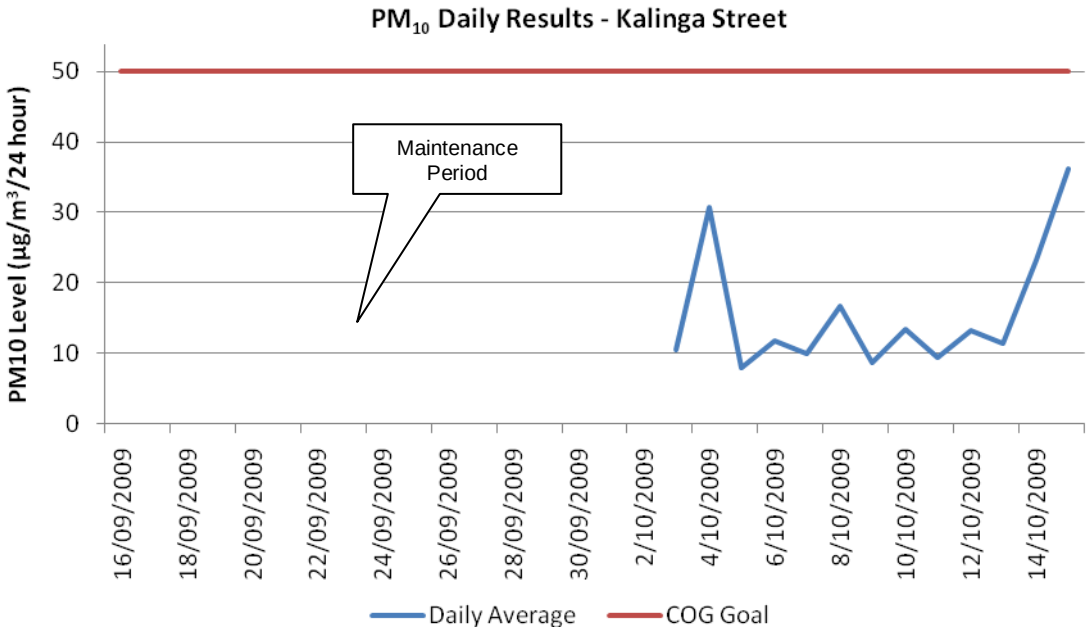


Table 2j: PM_{10} Results for Alma Rd (Kalinga Park), 5 Mabel St, 1/77 Stuckey Road, Toombul

Monitoring Period (midnight-midnight)	Daily PM_{10} ($\mu g/m^3$/day)	CoG PM_{10} Goal ($\mu g/m^3$/day)	Comments
Alma Road (Kalinga Park), Toombul			
19/09/2009	24.3	50	
20/09/2009	32.3	50	
21/09/2009	33.7	50	
22/09/2009	29.9	50	
23/09/2009	323.7	50	Exceedance (Dust Storm)– NCR Raised
24/09/2009	21.0	50	
25/09/2009	23.0	50	

26/09/2009	179.1	50	Exceedance (Dust Storm)– NCR Raised
27/09/2009	47.4	50	Exceedance (Dust Storm)– NCR Raised
8/10/2009	12.9	50	
9/10/2009	21.5	50	
10/10/2009	5.4	50	
11/10/2009			Not Operating
12/10/2009	49.3	50	
13/10/2009	33.7	50	
14/10/2009	55.9	50	Stockpiling of material within 5m of dust monitor.
15/10/2009	33.1	50	
58 Jackson Street, Toombul			
28/09/2009	2.9	50	
29/09/2009	6.1	50	
30/09/2009	4.5	50	
1/10/2009	8.1	50	
2/10/2009	10.8	50	

4.3 Air Quality Monitoring Results – Dust Deposition

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 and at locations nominated by the Coordinator General. Results are displayed in table's 3a-c.

Table 3a: Dust Deposition Results – Bowen Hills

Location and Monitoring Period (midnight-midnight)	Dust Fallout ($g/m^2/mth$)	CoG Dust Fallout Goal ($g/m^2/mth$)	Comments
5 Morris St 07-09-09 – 08-10-09	2.4	4	
Bowen Hills Site Office 07-09-09 – 08-10-09	2.5	4	
100 Campbell St 08-09-09 – 09-10-09	4.7	4	Exceedance – NCR Raised

Note: - All samples assessed at a NATA accredited laboratory.
- AS 3580.10.1: 2003 requires a statement to be included with results when all of the siting recommendations are not able to be satisfied. The 5 Morris St and 100 Campbell St dust gauges are located such that a 120 degree skyward field is partially obscured by a building or treeline. Full satisfaction of AS recommendations is not possible to satisfy gauge security and access provisions.

Table 3b: Dust Deposition Results – Kedron

Location and Monitoring Period (midnight-midnight)	Dust Fallout ($g/m^2/mth$)	CoG Dust Fallout Goal ($g/m^2/mth$)	Comments
Wooloowin State School 10/09/09 - 09/10/09	2.4	4	
Kedron DES Site 10/09/09 - 09/10/09	2.7	4	
Erskine St, Kedron 10/09/09 - 09/10/09	3.3	4	
Perry st, Kedron 10/09/09 - 09/10/09	5.3	4	Exceedance - NCR Raised

Note: - All samples assessed at a NATA accredited laboratory.
- AS 3580.10.1: 2003 requires a statement to be included with results when all of the siting recommendations are not able to be satisfied. The Wooloowin, Perry and DES dust gauges are located such that a 120 degree skyward field is partially obscured by a building or treeline. Full satisfaction of AS recommendations is not possible to satisfy gauge security and access provisions.

Table 3c: Dust Deposition Results – Toombul

Location and Monitoring Period (midnight-midnight)	Dust Fallout ($g/m^2/mth$)	CoG Dust Fallout Goal ($g/m^2/mth$)	Comments
68 Kalinga St 21/08/09 – 21/09/09	2.4	4	
Kalinga Park Adj Alma Rd 21/08/09 – 21/09/09	3.7	4	
Toombul Indoor Sports Complex – Bage Street 21/08/09 – 21/09/09	1.2	4	

Note: - All samples assessed at a NATA accredited laboratory.
- AS 3580.10.1: 2003 requires a statement to be included with results when all of the siting recommendations are not able to be satisfied. All dust gauges are located such that a 120 degree skyward field is partially obscured by a building or treeline. Full satisfaction of AS recommendations is not possible to satisfy gauge security and access provisions.

4.4 Compliance with Air Quality Goals

The following exceedences of air quality goals were recorded this month:

Bowen Hills

Dustfall Limits:

100 Campbell St – The dust fallout gauge recorded a level of 4.7g/m2/m against the goal of 4g/m2/m. This Dust Deposition Gauge is adjacent to the NSBT worksite and main gate. While TJH haulage trucks use Campbell St, it is expected that sources other than TJH construction activities were the main contributor to this exceedance. Investigation into this exceedance is ongoing.

PM10 Levels:

5 Morris St – On the 23/9/09, 26/9/09, 3/10/09 and 14/10/09 the air quality monitor recorded 24hr average PM10 levels of 311.3ug/m3, 208.8ug/m3, 56.4ug/m3 and 66.3ug/m3 respectively. These are exceedences of the CoG Goal. (see below for explanation)

20 Gallway St – On the 23/9/09 the air quality monitor recorded 24hr average PM10 level of 489.6ug/m3. This is an exceedance of the CoG Goal. (see below for explanation)

Truro St:

PM10 Levels: Truro St Office - On the 24/9/09 and 27/9/09 the air quality monitor recorded 24hr average PM10 levels of 85.6ug/m3 and 64.5ug/m3 respectively. These are exceedences of the CoG Goal. (see below for explanation)

Northern Busway:

PM10 Levels: Lamington Site Office - On the 23/9/09, 24/9/09, 26/9/09, and 27/9/09 the air quality monitor recorded 24hr average PM10 levels of 419ug/m3, 63ug/m3, 167ug/m3 and 76ug/m3 respectively. These are exceedences of the CoG Goal. (see below for explanation)

CC701 - On the 14th October the air quality monitor recorded a 24hr average PM10 level above the CoG goal of 50ug/m3. These are exceedences of the CoG Goal. (see below for explanation)

Kedron:

Dustfall Limits:

Perry St - The dust fallout gauge recorded a level of 5.3g/m2/m against the goal of 4g/m2/m. Initial investigations have found that that the gauge is placed within a residents premises which has an unsealed driveway frequently used to store a number of vehicles throughout the day. TJH is further investigating the exceedance and implementing dust mitigation measures.

PM10 Levels:

Erskine Ave – The air quality monitor recorded 24hr averages of PM10 levels of 67.1ug/m3, 65.2ug/m3, 52ug/m3 on 23/9/09, 26/9/09, 3/10/09 respectively. These are exceedences of the CoG Goal. (see below for explanation)

Perry St – The air quality monitor recorded 24hr averages of PM10 levels of 383.7ug/m3, 199ug/m3, 51.6ug/m3, 51.2ug/m3, 92.5ug/m3 on 23/09/09, 26/09/09, 2/10/09, 3/10/09, 14/10/09 respectively. These are exceedences of the CoG Goal. (see below for explanation)

Wooloowin SS – The air quality monitor recorded 24hr averages of PM10 levels of 53.2ug/m3 on 23/09/09. This is an exceedance of the CoG Goal. (see below for explanation)

Kedron SHS - The air quality monitor recorded 24hr averages of PM10 levels of 221.2ug/m3, 174ug/m3 on 24/9/09 and 27/9/09 respectively. These are exceedences of the CoG Goal. (see below for explanation)

Toombul:

Dustfall Limits:

Dustfall limits are within COG goals at each of the three monitoring sites.

PM10 Levels:

Alma Road – The air quality monitor recorded 24hr averages of PM10 levels of 323.7ug/m3, 179.1ug/m3 and 55.8ug/m3 on 23/9/09, 26/9/09 and 14/10/09 respectively. These are exceedences of the CoG Goal. (see below for explanation)

Initial investigations indicate that dust levels in the wider Brisbane area were elevated (refer DERM AQ Data) due to dust storm and hazy conditions, hence having influence on the averages recorded at all the above mentioned PM10 Air Quality Monitors on the above mentioned dates. NCRs have been raised against the exceedences identified above and forwarded to Brisconnections, CNI and CoG.

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 nominated by the Coordinator General (Change Report October 2008) 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 and checking the robustness of the predictive modelling.
5. Consideration when purchasing or hiring equipment to minimise vibration impact where practicable

5.2 Vibration Monitoring Results

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

Table 5a: Vibration Monitoring Results Summary – Kedron

Location	Monitoring Period	Peak Particle Velocity (mm/s)	CoG Vibration Goal (mm/s)	Comments
134 Kedron Park rd - Tramway Sub-Station No8	15/09/2009-15/10/2009	0.49	2	Monitoring the Road header (day and night)

Table 5b: Vibration Monitoring Results Summary – Bowen Hills

Location	Monitoring Period	Peak Particle Velocity* (mm/s)	CoG Vibration Goal (mm/s)	Comments
14 Gallway St	15/09/2009 – 15/10/2009	2.46	5 (continuous)	Monitoring for rock hammering (day-time) and tunnelling (day and night-time)
11 Bryden St	15/09/2009 – 15/10/2009	0.37	5 (continuous)	Monitoring for rock hammering (day-time) and tunnelling (day and night-time)

15 Bryden St	15/09/2009 – 15/10/2009	0.67	5 (continuous)	Monitoring for rock hammering (day-time) and tunnelling (day and night-time)
16 Bryden St	15/09/2009 – 15/10/2009	0.08	2 (continuous)	Monitoring for rock hammering (day-time) and tunnelling (day and night-time)

Table 5c: Vibration Monitoring Results Summary – Toombul

Location	Monitoring Period	Peak Particle Velocity (mm/s)	CoG Vibration Goal (mm/s)	Comments
35 Lewis Street	9/10/2009 11:44am – 2:40pm	0.254	10	Complies with goals

Red font = result greater than CoG Goal/other imposed limits
*Reported as 99th percentile to remove non-construction related peaks.

5.3 Compliance with Vibration Goals

The values shown in the tables above do not identify any exceedences with Vibration Goals.

6.0 Community Enquiries and Complaints

231 community complaints were reported to the project between 15 September and 15 October 2009. 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.

Complaints Raised: 15 Sep 2009 - 15 Oct 2009		
Category	**No.**	**No. of stakeholders**
Site noise	52	27
Site dust	34	21
Site out-of-hours	27	19
PUPs noise	26	19
PUPs out-of-hours	23	18
Parking	20	18
Construction vehicle movements	11	6
Truck dust	11	11
Driver Behaviour	10	9
Piling noise	10	6
PUPs reinstatement	8	6
Traffic Management	8	6
General Construction	7	7
Worker Behaviour	7	7
Truck noise	5	3
Site lighting	5	4
PUPs worker behaviour	5	5

Complaints Raised: 15 Sep 2009 - 15 Oct 2009		
Category	**No.**	**No. of stakeholders**
Tunnelling	4	3
Site vibration	4	3
Piling out-of-hours	4	3
PUPs dust	4	4
Spoil haulage driver behaviour	4	4
Building Damage	3	3
Consultation	3	3
Spoil haulage dust	3	3
Total complaints	**231**	**138**

Top 5 issues raised: