



ENVIRONMENTAL MONITORING REPORT, MARCH 2020

PARRAMATTA LIGHT RAIL INFRASTRUCTURE WORKS

25 March 2020

Parramatta
Connect

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1. Introduction

1.1. Background

Parramatta Light Rail Stage 1 ('Stage 1') will connect Westmead to Carlingford via Parramatta Central Business District (CBD) and Camellia. Stage 1 is expected to be operational in 2023.

Stage 1 will create new communities, connect great places and help both local residents and visitors move around and explore what the region has to offer. The route will link Parramatta's CBD and train station to a number of key locations, including the Westmead Precinct, the Parramatta North Growth Centre, the new Western Sydney Stadium, the Camellia Town Centre, the new Powerhouse Museum and Riverside Theatre arts and cultural precinct, the private and social housing redevelopment at Telopea, the Rosehill Gardens Racecourse and the three Western Sydney University campuses.

Key features of Stage 1 include:

- A new dual track light rail network of approximately twelve (12) kilometres in length, including approximately seven (7) kilometres within the existing road corridor and approximately five (5) kilometres within the existing Carlingford Line and Sandown Line, replacing current heavy rail services
- Sixteen (16) stops that are fully accessible and integrated into the urban environment including a terminus stop at each end of Westmead and Carlingford
- High frequency 'turn-up-and-go' services operating seven days a week from 5am to 1am. Weekday services will operate approximately every 7.5 minutes in the peak period between 7am and 7pm
- Modern and comfortable air-conditioned light rail vehicles, nominally 45 metres long and driver-operated, each carrying up to 300 passengers.
- Intermodal interchanges with existing public transport services at Westmead terminus, Parramatta CBD and the Carlingford terminus
- Creation of two light rail and pedestrian zones (no general vehicle access) within the Parramatta CBD along Church Street (generally between Market Street and Macquarie Street) and along Macquarie Street (generally between Horwood Place and Smith Street)
- A Stabling and Maintenance (SaM) Facility located in Camellia for light rail vehicles to be stabled, cleaned and maintained
- New bridge structures along the alignment including over James Ruse Drive and Clay Cliff Creek, Parramatta River (near the Cumberland Hospital), Kissing Point Road and Vineyard Creek, Rydalmere
- Alterations to the existing road network including line marking, additional traffic lanes and turning lanes, new traffic signals, and changes to traffic flows
- Relocation and protection of existing utilities
- Public domain and urban design works along the corridor and at Stop precincts
- Closure of the heavy rail line between Carlingford and Clyde
- Active transport corridors and additional urban design features along sections of the alignment and within Stop precincts
- Integration with the Opal Electronic Ticketing System (ETS)
- Real time information in light rail vehicles and at Stops via visual displays and audio.



1.1.1. Statutory Context

A Construction Environmental Management Plan (CEMP) has been prepared for the Parramatta Light Rail Package 4 – Infrastructure Works (Infrastructure Works). The purpose of the CEMP and associated Sub-plans is to address the requirements of the Minister’s Conditions of Approval (CoA) SSI-8285, the Revised Environmental Mitigation and Management Measures (REMMMs) and Environmental Performance Outcomes (EPO’s) listed in Parramatta Light Rail Stage 1 Westmead to Carlingford via Parramatta CBD and Camellia Environmental Impact Statement (the EIS), as amended by the Parramatta Light Rail (Stage 1) Westmead to Carlingford via Parramatta CBD and Camellia Submissions Report (incorporating Preferred Infrastructure Report) (March 2018) (the SPIR). In addition, the CEMP addresses all applicable legislation and contractual requirements, including the PLR Stage 1 Infrastructure Contract Project Deed (ISD-17-6721). The CEMP and associated Sub-plans were approved the Secretary on the 21 November 2019.

The Parramatta Light Rail was subject to environmental impact assessment under the *Environmental Planning and Assessment Act 1979* (EP&A Act). It is classified as Critical State Significant Infrastructure (CSSI). The EIS assessed impacts for Parramatta Light Rail Stage 1 (Westmead to Carlingford). This covered the light rail and associated works including road enabling work.

Stage 1 received Infrastructure Approval from the Minister for Planning under Section 5.19 of the EP&A Act on 29 May 2018 (Critical State Significant Infrastructure Application SSI-8285), subject to the conditions provided in the Instrument of Approval, specifically Schedule B – Ministerial Conditions of Approval.

The Infrastructure Approval was subsequently modified under Section 5.25 of the EP&A Act on 21 December 2018 and 25 January 2019.

The planning approval, modifications and related environmental assessment documents are located at: http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8285

1.2. Scope

The scope of this report is report is to present monthly results of the inspection and monitoring programs outlined in the Infrastructure Works CEMP and associated Sub-plans, including the results of the construction monitoring programs referred to in Condition C9 of the Planning Infrastructure Approval.

Environmental inspections and monitoring are undertaken to:

- Validate the predicted impacts of the Infrastructure Works
- Measure the effectiveness of environmental controls
- Track progress against targets and objectives of the CEMP.

The monitoring requirements for nominated aspects are included in the relevant environmental management sub plans and summarised in **Table 1-1**.

Where relevant, data will be presented on a progressive basis (i.e. monthly summary) to identify trends.

The data of the monitoring programs will also be reviewed annually in the Annual Environment Reports.

Table 1-1 Monthly Environmental Monitoring Reporting Requirements

CEMP or Sub-plan	Monitoring program	Distribution
CEMP	<ul style="list-style-type: none"> – External Inspections with TfNSW, ER or other interested parties 	<ul style="list-style-type: none"> – TfNSW – IC
Noise and Vibration Management Sub-plan	<ul style="list-style-type: none"> – Locations and descriptions of monitoring undertaken – Noise monitoring results 	<ul style="list-style-type: none"> – Relevant councils EPA – NSW Health – TfNSW – IC



CEMP or Sub-plan	Monitoring program	Distribution
	<ul style="list-style-type: none"> - Summary of any exceedance of the nominated criteria - Corrective actions 	<ul style="list-style-type: none"> - ER - AA - Made publicly
Flora and Fauna Management Sub-plan	<ul style="list-style-type: none"> - Weed survey - Nest boxes - Pre-clearing and clearing supervision - Grey headed flying fox monitoring - Tree removals, relocations and pruning 	<ul style="list-style-type: none"> - TfNSW -
Soil and Water Management Sub-plan	<ul style="list-style-type: none"> - Weather forecasts and observations - Water Quality (Turbidity) monitoring - Discharge and dewatering monitoring 	<ul style="list-style-type: none"> - TfNSW - City of Paramatta Council - IC - Cumberland Council - EPA - DOI Water - Made publicly available
Landscape and Temporary Works Management Sub-plan	<ul style="list-style-type: none"> - Light spill observations - Crime Prevention Through Environmental Design (CPTED) inspections - Graffiti and advertising observations and actions 	<ul style="list-style-type: none"> - TfNSW - IC
Air Quality and Dust Management Sub-plan	<ul style="list-style-type: none"> - Weather observations - Dust Deposition Monitoring - Real time aerosol dust monitors - Asbestos fibre air monitoring 	<ul style="list-style-type: none"> - TfNSW - IC - EPA - Made publicly available



2. Site Activities

Table 2-1 provides a summary of the site activities for March 2020.

Table 2-1 Monthly Environmental Monitoring Reporting Requirements

Precinct	Site Activities
Westmead and North Parramatta	<ul style="list-style-type: none"> – Site establishment and preparation works related to demolition of 28 Railway Parade, Westmead. This included survey and mark-up of existing utilities, setup of ATF fencing, shade cloth, hoarding, noise blankets and erosion and sediment controls – Commencement of internal strip out at 28 Railway Parade including removal of asbestos and other hazardous materials as per HAZMAT Report – Utility investigation works at 181 Hawkesbury Road to determine exact location of known utilities (exempt development activity) – Deliveries and setup of double storey site offices at Fennel Street site compound – Archaeological salvage works at Cumberland campus East and West – finalisation of historical salvage of site H4-S01 (finished 26th February), historical and Aboriginal salvage of first expansion of AT14 (site adjacent to H4-S01) from 27th Feb – 23rd March, and historical salvage of H4-S02 (started 11th March and currently ongoing)
Parramatta CBD	<ul style="list-style-type: none"> – Heritage investigations on Church Street from 3rd to 13th March. No significant finds and no further archaeological work recommended – Continued investigations of existing in-ground utilities (UTC-005) for Telstra space proofing (such as potholing, slot trenching, locating, surveying) on Church Street (Market Street to Macquarie Street) – Excavation of trenches along Church Street footpaths and installation of new Telstra conduits (UTC-005) on Church Street (Market Street to Macquarie Street) – Continued investigations of existing in-ground utilities for Telstra (UTC-005) space proofing (such as potholing, slot trenching, locating and surveying) at Centenary Square – Excavation of trenches along Church Street footpaths and installation of new Telstra conduits (UTC-005) at Centenary Square – Commenced investigations of existing in-ground utilities (UTC-005) for Telstra space proofing (such as potholing, slot trenching, locating, surveying) on Church Street to Smith Street – Continued investigations of existing in-ground utilities for relocation of Sydney Water watermain (UTC-008b) (such as potholing, slot trenching, locating, surveying) at Phillip Street/Church Street intersection – Commenced investigations of existing in-ground utilities (UTC-008) for relocation of Jemena Gas (such as



Precinct	Site Activities
	potholing, slot trenching, locating, surveying) on Market Street to Lennox Bridge – Commenced relocations of existing in-ground utilities (UTC-008) for relocation of Jemena Gas on Market Street to Lennox Bridge
Camellia and Carlingford line	– Trenching and underboring at Tramway Avenue, Camellia for the Endeavour Energy and Telstra Utility (UTC-03) relocation works – Construction of the Sydney Water Pump Station Retaining Wall at Grand Avenue North, Camellia (UTC-03) – Relocation and installation of water main at Grand Avenue North, Camellia (UTC-03) – Potholing and investigation works for Jemena Gas relocation at Grand Avenue North, Camellia (UTC-03) – Removal and stockpiling of ballast from main line (Camellia to Carlingford) – Removal of Stanchions and concrete footings from main line (Camellia to Carlingford) – Demolition of Rydalmere Station – Removal of redundant rail sign posts at Clyde at Parramatta Road between George Street and Marsh Street



3. Monitoring Results

Section 3 presents summaries of the environmental inspection and monitoring programs completed in March 2020 (reporting period from the 26th of February to the 25th of March). Detailed monitoring results for each program are presented in the Appendices.

3.1. Inspections

Four inspections were completed in March 2020. **Table 3-1** provides a summary of the number of actions raised and closed within the agreed timeframe.

Table 3-1 Inspections for March 2020

Date	Type	Actions	Closed in time
03/03/2020	ER Inspection	0	N/A
10/03/2020	ER Inspection	2	Yes
17/03/2020	ER Inspection	2	Yes
24/03/2020	ER Inspection		
Total	3	4	Yes

3.2. Weather

Weather during March 2020 had less rainfall comparative to February 2020. The total rainfall was 88.4 mm with 11 rain day (days with >1mm of rain). No rain days exceeded the 80th percentile (25.8mm) and the 85th percentile (33.1mm).

During this reporting period there were 21 days (29 days in the reporting period) where the maximum wind gust recorded was greater than 25km/hr, and 2 days where the maximum wind gust recorded was greater than 50km/hr. 6 days of wind greater than 25km/hr were forecast and on each of those days notifications were issued to the construction team to alert them of the strong winds forecast. This month there was minimal ground disturbance works, so risk of dust generation was low. No complaints relating to dust generation were received.

A summary of the month's weather observations and weather events relevant to the Soil and Water Management Sub-plan and Air Quality Management Sub-Plan Trigger Action Response Plans (TARPs) are summarised in **Table 3-2**. A comparison between long term monthly means and recorded values can be found in **Figure 3-1** for rainfall and **Figure 3-2** for rain days >1mm.

Detailed weather observations records for March 2020 are presented in **Appendix A-1**.

Table 3-2 Weather Summary and Trigger Weather Events for March¹ 2020

Weather event	Forecast	Observation
Minimum temperature	12°C	10.4 °C
Maximum temperature	38°C	37.7 °C
Total rainfall	135.8mm	88.4mm



Weather event	Forecast	Observation
Number of days with rain (>1mm)	5 days	11 days
>80 th percentile (25.8mm) rain events	1	0 events
>85 th percentile (33.1mm) rain events	0	0 events
Flood warning / events	-	-
>25km/hr wind ²	6 days	21 days
>50km/hr wind	0 days	2 days

1. Weather summary based on data from the 26 February to 25 March (29 days).
2. Wind data from Sydney Olympic Park AWS (Archery Centre) {station 066212}. Weather data from Parramatta North (Masons Drive) {station 066124}.

Note: Red text in Observation column indicates observation greater than forecast.

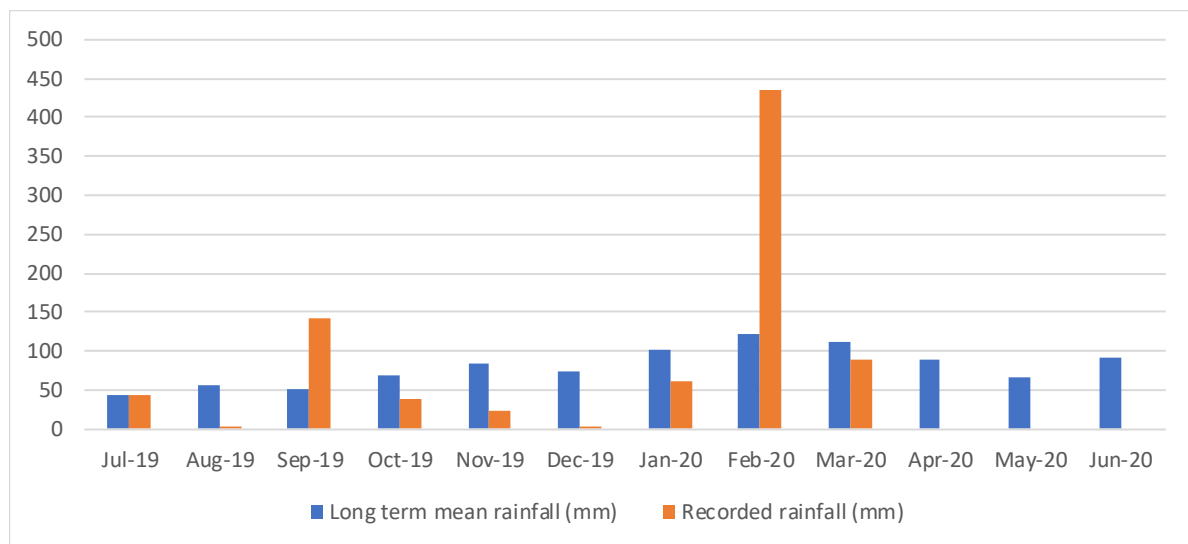


Figure 3-1 Monthly rainfall comparison

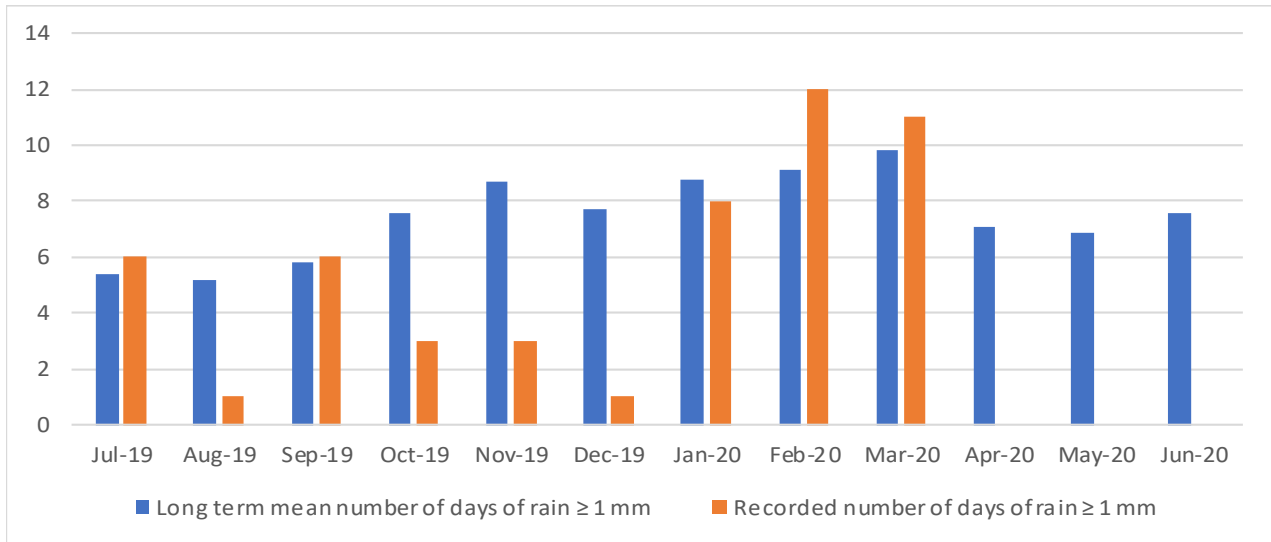


Figure 3-2 Monthly rain days comparison

3.3. Noise and Vibration

Table 3-3 provides a summary of noise monitoring events completed in March 2020. Detailed noise monitoring results and comments are presented in **Appendix A-2**.

Table 3-3 Summary of noise monitoring March 2020

Date	Monitoring Location	Description
09/03/2020	181 Hawkesbury Road Westmead	OOHW Period 2: Pot holing to identify known services.
19/03/2020	Museum Gardens	OOHW Period 2: Non-Destructive Digging
19/03/2020	350 Church Street, Novotel	OOHW Period 2: Non-Destructive Digging
19/03/2020	137 Arthur Street	OOHW Period 2: Trenching

3.4. Flora and Fauna

3.4.1. Tree removals

No tree removals in March 2020.

3.5. Soil and Water

3.5.1. Water quality (turbidity) in receiving waters

Water quality monitoring in the receiving waters was not required in the reporting period.



3.5.2. Discharge and dewatering

There was no discharge or dewatering events in March 2020.

3.6. Air Quality

3.6.1. Dust Deposition Monitoring

A dust deposition gauge has been set up at 13A Grand Avenue in Camellia. This gauge was installed at the end of December 2019 and the monitoring results for the month of March are yet to be received.

Table 3-4 Summary of dust disposition data

Date	Monitoring Location	Total Insoluble Matter g/m2/month
20/01/2020	13 Grand Avenue	3.9



Appendices

A-1 Weather Observations

Table A-1-1 Weather observations: Parramatta North (Masons Drive) {station 066124}.

Date	Temps		Rain mm	Temp °C	RH %	9:00 AM		
	Min	Max				Cld 8th	Dir	Spd km/h
	°C	°C						
26/02/2020	20.4	32	0.0	27.8	63	5	WNW	9
27/02/2020	18.5	25.4	0.6	20.7	73	7	SSW	4
28/02/2020	13.7	25.7	0.0	20.7	47	3	S	6
29/02/2020	18.3	27.2	0.0	20.4	81	3	SE	2
1/03/2020	16.2	31	0.0	23.0	83	3	NW	2
2/03/2020	16.5	37.7	0.0	28.0	45	3	NW	6
3/03/2020	19.4	21.3	0.0	20.4	81	8	SW	4
4/03/2020	17.9	25	19.8	20.4	99	8	E	6
5/03/2020	19.6	24.5	6.4	22.4	95	8	N	7
6/03/2020	20.6	28.3	20.4	24.4	85	2	WNW	6
7/03/2020	18.5	24.4	0.0	20.4	78	7	SSW	9
8/03/2020	15.8	22	10.4	17.2	98	8	S	6
9/03/2020	16.3		4	18.3	89	7	E	6
10/03/2020	13.8	23.5	2.6	17.3	97	6	SW	4
11/03/2020	13	24.8	0.0	19.4	79	0	SE	2
12/03/2020	14	25	0.4	19.0	90	5	NW	2
13/03/2020	12	27	0.0	18.5	78	1	W	2
14/03/2020	14	16.5	1.4	14.6	96	8	SSE	6
15/03/2020	10.4	20.5	12	16.4	72	3	SW	4
16/03/2020	14	22.4	5.8	16.5	99	8	SW	6
17/03/2020	14		2.6	17.8	87	5	SW	6
18/03/2020	11.2	27.5	0.0	18.5	88	0	NW	2
19/03/2020	14	32.7	0.0	20.5	77	4	W	6
20/03/2020	17	34.8	0.0	26.0	55	5	NW	4
21/03/2020	15.2	25.2	0.0	20.6	80	0	W	4
22/03/2020	16.2	29.8	0.0	21.5	75	4	NW	6
23/03/2020	17.3	22.5	0.0	19.3	64	7	SW	6
24/03/2020	13.5	22	2.0	18.0	87	7	NE	4
25/03/2020	15	25.9	0	19.8	79	7	NNW	2



Table A-1-2 Wind observations: Sydney Olympic Park AWS (Archery Centre) {station 066212}.

Date	Max Wind Gust			9:00 AM		3:00 PM	
	Dir	Spd	Time	Dir	Spd	Dir	Spd
		km/h	local		km/h		km/h
26/02/2020	SSE	56	20:07	NNW	7	NW	11
27/02/2020	E	31	17:04	S	6	NNE	11
28/02/2020	SE	37	15:29	S	9	SE	19
29/02/2020	ENE	28	17:16	WSW	6	ENE	11
1/03/2020	NE	30	16:21	WNW	4	E	17
2/03/2020	S	61	15:30		Calm	W	11
3/03/2020	SSE	24	11:24	SSW	7	SSE	11
4/03/2020	ENE	30	13:13		Calm	ENE	13
5/03/2020	NE	24	3:05	NNE	6	NE	6
6/03/2020	SSE	35	16:59	WNW	9	SE	20
7/03/2020	SSE	35	16:06	SSW	11	SSE	19
8/03/2020	SE	28	15:13	S	9	SE	17
9/03/2020	SE	33	13:46	E	4	SSE	17
10/03/2020	E	24	16:58	W	2	SE	15
11/03/2020	SE	31	11:23	WNW	6	ESE	20
12/03/2020	E	30	11:07		Calm	E	19
13/03/2020	NE	37	11:37		Calm	ESE	17
14/03/2020	SSE	43	5:59	SSE	19	W	7
15/03/2020	SE	37	16:27	W	6	ESE	9
16/03/2020	SSE	41	13:10	SW	7	SSE	17
17/03/2020	ESE	20	14:02	SW	6	SE	13
18/03/2020	E	22	15:28	SW	6	SE	13
19/03/2020	NW	19	11:00		Calm	N	4
20/03/2020	NW	44	15:13	WNW	7	E	4
21/03/2020	ESE	31	12:35		Calm	NW	20
22/03/2020	SSE	56	20:07	NNW	7	NW	11
23/03/2020	ESE	35	13:18	S	9	SE	9
24/03/2020	NE	26	16:05		Calm	E	9
25/03/2020	ESE	30	13:31		Calm	SE	15

Notes:

Blue text indicates a rain event greater than 1mm of rain.



Orange text indicates a rain event greater than the 80th percentile of 25.8mm, and a wind speed of greater than 25km/hr

Red text indicates a rain event greater than the 85th percentile of 33.1mm, and a wind speed greater than 50km/hr.



A-2 Noise and Vibration Monitoring Results

Table A-2-1 Noise monitoring results

Date	Time	Out of Hours Works Period	Construction Activity	Activity Location	Monitoring Location	NML (dBA)	Predicted (dBA)	Additional Mitigation Measures	Specified Noise Limit	Recorded Leq, 15min (dBA)	Exceedance of Specified Noise Limit (dBA)	Construction noise exceedance	Comments
09/03/2020	22:00:00	OOHW Period 2	Pot holing	181 Hawkesbury Road Westmead	181/157 Hawkesbury Road Westmead	53	78	PN, V, SN, RP, DR, RO	78	71	-7	No	Construction Moderately Intrusive: Pot holing – Vacuum truck in use Light vehicles parked and switched off Traffic control set up Detour signs in place – Jessie St and Hainsworthy Hawkesbury Rd closed W/E bound
19/03/2020	23:35:00	OOHW Period 2	NDD	350 Church Street, Novotel	Museum Gardens	51	81	PN, V, SN, RP, DR	>76	75.2	-0.8	No	Construction highly intrusive: Pedestrians talking near museum
19/03/2020	23:16:00	OOHW Period 2	NDD	350 Church Street, Novotel	350 Church Street, Novotel	51	80	PN, V, SN, RP, DR	>76	76.9	-3.1	No	Construction highly intrusive: Van truck in operation 7m away Dominant noise of rocks/rubble being sucked up and hitting metal pipe No suction just humming No hammering or suction ~65 dB 6:35, suction of rocks started up ~ 79.80dB
20/03/2020	00:15:00	OOHW Period 2	Trenching	Intersection of and Arthur Street	137 Arthur St Parramatta	46	69	PN, V, SN, RP, DR	>71	63.6	-7.3	No	Construction Moderately Intrusive: Excavator~ 67 dB 9:00 tipper leaving ~69dB 11:40 tipper reversing w/ squawker 68-70 dB Day marker with no other construction noise 10m = 63dB

Notes:

Standard hours: Monday to Friday 7:00 am to 6:00 pm. Saturday 8:00 am to 1:00 pm

OOHW Period 1 is defined as:

- a) 6:00pm to 10:00pm (evenings) Monday to Saturday
- b) 7:00am to 8:00am and 1:00pm to 10:00pm (day & evening) Saturday and
- c) 8:00am to 6:00pm Sunday and public holidays (days).

OOHW Period 2 is defined as:

- a) 10:00pm to 7:00am (nights) Monday to Saturday and
6:00pm to 8:00am (nights) Sundays and public holidays.

Additional Mitigation Measures

- PN = Project Notification
- V = Verification Monitoring
- RP = Respite Period
- AA = Alternate Accommodation
- SN = Specific Notification / individual briefing or phone call
- DR = Duration Reduction
- RO = Project Specific Respite Offer

Table A-2-2 Vibration monitoring results

Date	Time	Out of Hours Works Period	Construction Activity	Activity Location	Monitoring Location	Target	Recorded PPV	Exceedance of Target	Construction vibration exceedance	Comments
17/03/2020	08:55-18:00	Standard Hours	Excavating concrete footings outside Caltex easement	Grand Avenue North	Concrete footing	20 mm/s	Max: 1.60 mm/s	No	No	No construction vibration exceedance

