



# ENVIRONMENTAL MONITORING REPORT, OCTOBER 2021

## PARRAMATTA LIGHT RAIL INFRASTRUCTURE WORKS

5 November 2021

**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

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

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](http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8285).

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
- Revised Environmental Mitigation and Management Measures (REMMMs)
- Environmental Performance Outcomes (EPOs)
- Applicable legislation and contractual requirements, including the PLR Stage 1 Infrastructure Contract Project Deed (ISD-17-6721).

The REMMMs and EPOs are 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). The CEMP and associated Sub-plans were approved the Secretary on the 21 November 2019.

## 1.2. Scope

The scope of this 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 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 Report.



**Table 1-1 Monthly Environmental Monitoring Reporting Requirements**

<b>CEMP or Sub-plan</b>	<b>Monitoring program</b>	<b>Distribution</b>
Noise and Vibration Management Sub-plan	<ul style="list-style-type: none"> <li>- Locations and descriptions of monitoring undertaken</li> <li>- Noise monitoring results</li> <li>- Summary of any exceedance of the nominated criteria</li> <li>- Corrective actions</li> </ul>	<ul style="list-style-type: none"> <li>- City of Paramatta Council</li> <li>- Cumberland Council</li> <li>- EPA</li> <li>- NSW Health</li> <li>- TfNSW</li> <li>- IC</li> <li>- ER</li> <li>- AA</li> <li>- Made publicly available</li> </ul>
Soil and Water Management Sub-plan	<ul style="list-style-type: none"> <li>- Weather forecasts and observations</li> <li>- Water Quality (Turbidity) monitoring</li> <li>- Discharge and dewatering monitoring</li> </ul>	<ul style="list-style-type: none"> <li>- City of Paramatta Council</li> <li>- Cumberland Council</li> <li>- EPA</li> <li>- DOI Water</li> <li>- TfNSW</li> <li>- IC</li> <li>- Made publicly available</li> </ul>
Air Quality and Dust Management Sub-plan	<ul style="list-style-type: none"> <li>- Weather observations</li> <li>- Dust deposition monitoring</li> <li>- Real time aerosol dust monitors</li> <li>- Asbestos fibre air monitoring</li> </ul>	<ul style="list-style-type: none"> <li>- EPA</li> <li>- TfNSW</li> <li>- IC</li> <li>- Made publicly available</li> </ul>
Grey-headed Flying-fox (GHFF) Construction Monitoring Program	<ul style="list-style-type: none"> <li>- Weekly visual checks of GHFF camp during high risk periods (1 September to 31 January)</li> </ul>	<ul style="list-style-type: none"> <li>- TfNSW</li> </ul>



## 2. Site Activities

**Table 2-1** provides a summary of the site activities for this reporting period (26 September 2021 to 25 October 2021).

**Table 2-1 Site Activities During Reporting Period**

Precinct	Site Activities
Westmead and North Parramatta	<b>Westmead</b>
	<ul style="list-style-type: none"><li>– Ongoing utility, property adjustment, drainage, Combined Service Route (CSR), track works</li><li>– Urban design landscaping works commenced</li></ul>
	<b>Cumberland</b>
	<ul style="list-style-type: none"><li>– Ongoing utility, property adjustment, drainage, CSR, track works</li><li>– Urban design landscaping works commenced</li></ul>
Parramatta CBD	<b>North Parramatta</b>
	<ul style="list-style-type: none"><li>– Ongoing utility, property adjustment, drainage, CSR, track works</li><li>– Urban design landscaping works commenced</li></ul>
	<b>Area 2 West (CBD)</b>
	<ul style="list-style-type: none"><li>– Ongoing utility and services installations on Church Street and Macquarie Street</li><li>– Ongoing electrical and lighting works</li><li>– Ongoing Multifunction Pole works</li><li>– Drainage works along North Lennox Bridge, Macquarie Street</li><li>– Landscaping, paving and umbrella installation on Church Street</li><li>– Footpath works along Church St and Macquarie Street</li><li>– Finishing works</li><li>– Intersection works:<ul style="list-style-type: none"><li>▪ Church/Phillip Street Intersection</li><li>▪ Church/George Street Intersection</li></ul></li></ul>
Camellia and Carlingford line	<b>Area 2 East (Smith Street to Arthur Street)</b>
	<ul style="list-style-type: none"><li>– Drainage works on Macquarie Street, Tramway Avenue</li><li>– Ongoing civil works (pavement, CSR, road works) along Macquarie Street, Harris Street, Robin Thomas Reserve, George Street, Tramway Avenue</li><li>– Track works along Macquarie Street, George Street</li><li>– Intersection works:<ul style="list-style-type: none"><li>▪ Macquarie/Harris Street</li><li>▪ George/Alfred Street</li></ul></li></ul>
Camellia and Carlingford line	<b>Camellia</b>
	<ul style="list-style-type: none"><li>– James Ruse Drive Bridge fit out works and track works.</li><li>– Paving at Camellia Platform</li><li>– Landscaping works.</li></ul>
	<b>Carlingford Line</b>

**Precinct****Site Activities**

- Active Transport Link (ATL) in Carlingford and at the stops
  - CSR and track slab works at Rydalmere and Dundas Stops
  - Rail grinding (Camellia to Carlingford).
  - Soft landscaping works from Camellia to Carlingford
  - Telopea & Carlingford Stop works ongoing
  - Footpath connections from Camellia to Carlingford.
-





## 3. Monitoring Results

Section 3 presents a summary of the environmental inspection and monitoring programs completed during the reporting period (26 September 2021 to 25 October 2021). Detailed monitoring results for each activity are presented in the appendices to this report.

### 3.1. Inspections

A total of four ER inspections and two AA inspections were completed during the reporting period in addition to 16 internal inspections. It is also noted that TfNSW attend all ER inspections.

**Table 3-1** provides a summary of the number of actions raised and closed within the agreed timeframe.

**Table 3-1 Inspections for reporting period**

Date	Number of Inspections	Type	Actions	Closed in Time
28/09/21	1	Internal Inspection	2	Yes
28/09/21	1	ER Inspection	10	Yes
30/09/21	1	Internal Inspection	2	Yes
30/09/21	1	AA Inspection	0	N/A
04/10/21	1	Internal Inspection	2	Yes
05/10/21	1	Internal Inspection	2	Yes
06/10/21	2	Internal Inspection	3	Yes
06/10/21	1	ER Inspection	3	Yes
07/10/21	1	AA Inspection	0	Yes
08/10/21	2	Internal Inspection	2	Yes
11/10/21	1	Internal Inspection	3	Yes
12/10/21	2	Internal Inspection	12	Yes
12/10/21	1	ER Inspection	7	Yes
14/10/21	2	Internal Inspection	7	Yes
15/10/21	1	Internal Inspection	1	Yes
19/10/21	1	Internal Inspection	2	Yes
19/10/21	1	ER Inspection	2	Yes
22/10/21	1	Internal Inspection	2	Yes
<b>Total</b>	<b>22</b>	<b>-</b>	<b>62</b>	<b>-</b>



## 3.2. Weather

The total rainfall recorded during the reporting period was 70.6 mm with 11 days exceeding one millimetre of rain. No events exceeded the 80<sup>th</sup> percentile (25.8mm).

During the reporting period, there were 28 days where the maximum wind gust recorded was greater than 25km/hr and three days where the maximum wind gust recorded was greater than 50km/hr. There was a total of 13 days where wind speeds greater than 25km/hr were forecast. On those days, a notification was issued to the construction team to alert them of the strong winds forecast, including direction for necessary controls to be implemented.

A summary of the weather observations and weather events during the reporting period of relevance to the Soil and Water Management Sub-plan and Air Quality Management Sub-Plan Trigger Action Response Plans (TARPs) are summarised in **Table 7-2**. A comparison between long term monthly means and recorded values can be found in **Figure 3-2**.

Detailed weather observation records for the reporting period are presented in **Appendix A-1**.

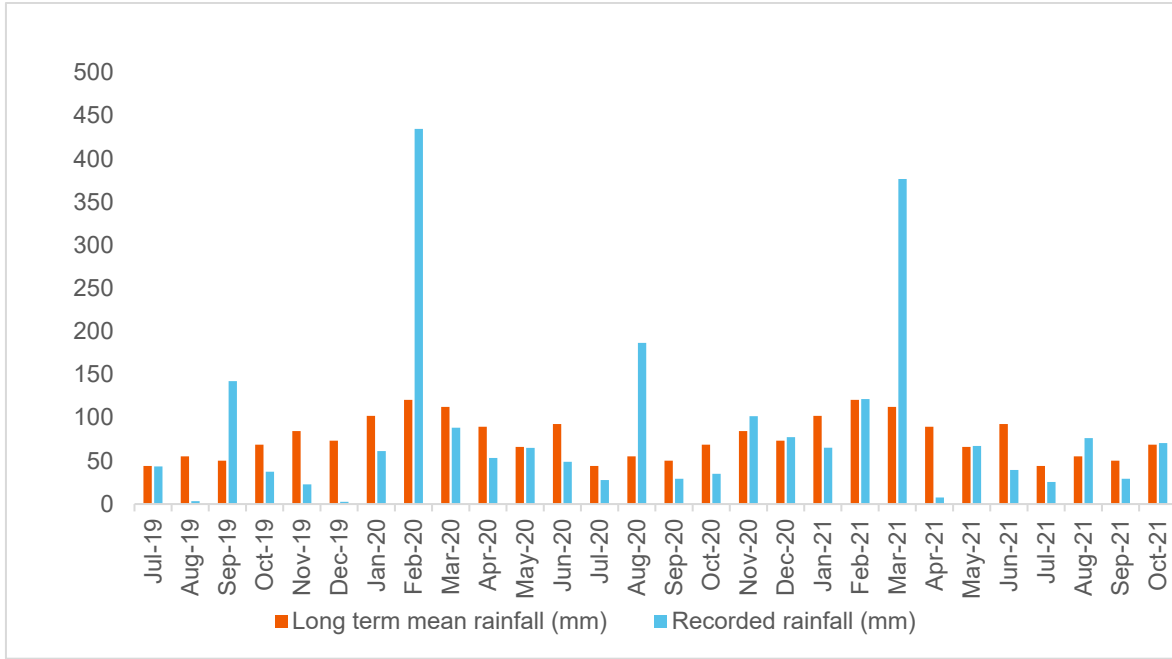
**Table 3-2 Weather Summary and Trigger Weather Events for reporting period<sup>1</sup>**

Weather Event	Forecast	Observation
Minimum temperature	9.0°C	8.6°C
Maximum temperature	28.0°C	31.0°C
Total rainfall	68.0 mm	70.6 mm
Number of days with rain (>1mm)	11 days	11 days
>80 <sup>th</sup> percentile (25.8mm) rain events	No days	No days
>80 <sup>th</sup> percentile (33.1mm) rain events	No days	No days
Flood warning / events	No events	No events
>25km/hr wind <sup>2</sup>	13 days	28 days
>50km/hr wind	No days	3 days
>60km/hr wind	No days	No days

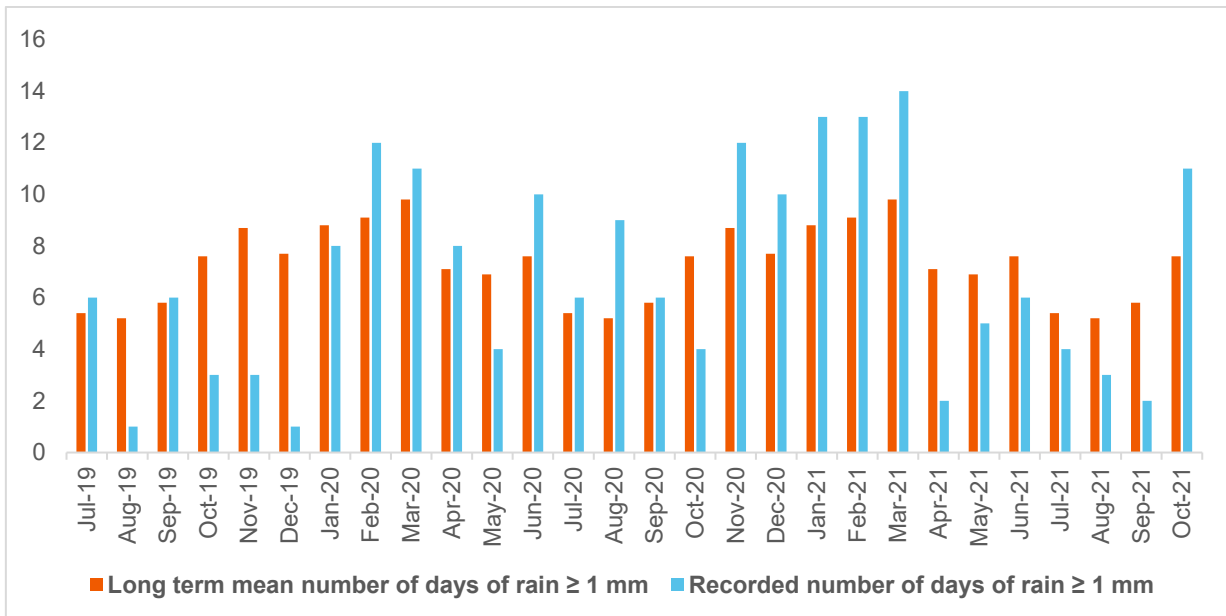
<sup>1</sup>Weather summary based on data from the 26 September 2021 to 25 October 2021 (30 days).

<sup>2</sup>Wind data from Sydney Olympic Park AWS (Archery Centre) {station 066212}. Weather data from Parramatta North (Masons Drive) {station 066124}.

Note: Red text 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 conducted during the reporting period. Detailed noise monitoring results and comments are presented in **Appendix A-2**. There was one exceedance of the predicted noise level ( $L_{Aeq15min}$ ) during the reporting period. In this case, the monitoring activity documented the noise could not be attributable to PLR activities.

Additional information on the hours of works, respite requirements and alternative accommodation is provided in the Noise and Vibration Management Sub-plan (Section 11.3).



Vibration monitoring events completed during the reporting period are summarised in **Table 3-4** and detailed results and comments are presented in **Appendix A-2**. During the reporting period, no attended vibration monitoring was undertaken.

All noise and vibration monitors available during the reporting period, together with current NATA calibration data, are provided in **Table 3-5**.

Continuous noise and vibration monitoring was undertaken during the reporting period at medical facilities in Westmead that have been identified as sensitive receivers. In consultation with the Health Administration Corporation, monitoring will be ongoing for 12 months. Locations of the noise and vibration monitors are provided in **Table 3-6**.

**Table 3-3 Summary of Noise Monitoring for reporting period**

Date	Monitoring Location	Attended/Continuous	Description
08/10/21	Meriton, Church Street	Attended	Rail Grinding (outside standard hours)
08/10/21	306 Church Street	Attended	Rail Grinding (outside standard hours)
19/10/21	8-12 Alexandra Avenue	Attended	Concrete works
19/10/21	157 Hawkesbury Rd, Westmead	Attended	Trackworks
19/10/21	199 Hawkesbury Rd, Westmead	Attended	Excavation and Non-Destructive Digging
19/10/21	Cumberland Hospital East	Attended	Trackworks and Roller Operation
19/10/21	55 O'Connell St, North Parramatta	Attended	Excavation and Trackworks
19/10/21	St Patricks Cemetery, North Parramatta	Attended	Trackworks and Roller Operation
19/10/21	20 Victoria Rd, Parramatta	Attended	Trackworks
22/10/21	Arthur Phillip High School, Parramatta	Attended	Trackworks and Concrete Works
22/10/21	9 Noller Pde, Parramatta	Attended	Concrete pour and Sawing
21/10/21	14 Dudley St, Rydalmere	Attended	Earthworks
21/10/21	Dundas Station	Attended	Concrete pour and Sawing
21/10/21	Telopea Station	Attended	Excavation
21/10/21	Carlingford Station	Attended	Finishing Works
26/06/2020 -ongoing	Westmead Institute for Medical Research (Sleep Lab)	Continuous	General construction
26/06/2020 -ongoing	Westmead Institute for Medical Research (Brain Dynamics Centre)	Continuous	General construction
26/06/2020 -ongoing	Children's Medical Research Institute (Microscopy Labs)	Continuous	General construction
26/06/2020 -ongoing	Cumberland Hospital (Clinical psychology rooms)	Continuous	General construction



**Table 3-4 Summary of Vibration Monitoring for reporting period**

Date	Monitoring Location	Attended/Continuous	Description
26/06/2020	Westmead Institute for Medical Research (HAL incubators)	Continuous	General construction
26/06/2020	Westmead Institute for Medical Research (Microscopy Labs)	Continuous	General construction
26/06/2020	Children’s Medical Research Institute (Microscopy Labs)	Continuous	General construction

**Table 3-5 Noise and Vibration Monitors and NATA Calibration**

Equipment	Serial Number	Calibration Date
Noise Level Meter	00973277	2/12/2021
Noise Level Meter	00661732	01/06/2022
Noise Level Meter	00973275	17/12/2021
Vibration Monitor	BE14639	10/02/2023
Vibration Monitor	BE17441	14/07/2022

**Table 3-6 HAC Noise and Vibration Monitor Locations**

Organisation	Monitor Type	Location
Westmead Institute for Medical Reach	Vibration Monitor	HAL incubators
		Microscopy Labs
	Noise Monitor	Sleep Lab
Children’s Medical Research Institute	Vibration Monitor	Brain Dynamics Centre
	Noise Monitor	Microscopy Labs
Cumberland Hospital	Noise Monitor	Labs (Level 1)
		Clinical psychology rooms

**Note:** The calibration of the monitoring equipment is checked in the field before and after the noise measurement period per Standards Australia AS/IEC 60942:2004/IEC 60942:2003–Electroacoustic – Sound Calibrators.

## 3.4. Soil and Water

### 3.4.1. Water quality in receiving waters

A pre-construction investigation to establish water quality objectives for the project is included within the EIS Technical Paper 6 – Water Quality Assessment.

Water monitoring results are summarised in **Table 3-7** and detailed in **Table A-3-1**. There were no triggers for water sampling during the reporting period and as such no monitoring was undertaken.

**Table 3-7 Water Quality in Receiving Waters**

Date	Type	Type of Results	Wet / Dry	Locations
-	-	-	-	-



**Table 3-8 Water Monitor Calibration**

Equipment <sup>1</sup>	Serial Number	Calibration Date
Water Quality Monitor	DV7F6E7J	23/07/2022

<sup>1</sup>All equipment is calibrated by NATA standards.

### 3.4.2. Discharge and dewatering

There was one discharge event during the reporting period as presented in **Table A-3-2**. All events were compliant with discharge criteria.

## 3.5. Air Quality

### 3.5.1. Dust Deposition Monitoring

A dust deposition gauge was installed at 13A Grand Avenue in Camellia in December 2019 in advance of works which commenced at the beginning of February 2020. Baseline data indicated that the value of Total Insoluble Matter (TIM) was 3.9 g/m<sup>2</sup> before the commencement of construction activities at 13A Grand Avenue.

Additional dust gauges were progressively installed at Rydalmere Station, Dundas Station, Carlingford and Telopea in advance of large-scale earthworks. As of September 2021, the gauge at Carlingford has been removed following conclusion of large-scale earthworks.

From December 2020 onwards, results have been presented as both TIM and Ash Content. The Ash Content method of analysis involves burning the TIM in a furnace to rid the sample of combustible materials such as vegetative matter, coal and insects. The remaining non-combustible material is then weighed to provide a more accurate dust monitoring result.

Dust deposition results are summarised in **Table A-4-1** in **Appendix A-4**, noting that data is received one month in arrears. All results from the previous reporting period had a satisfactory level of TIM and Ash Content except for 13A Grand Ave which was recorded at 7.2 g/m<sup>2</sup> and 6.2 g/m<sup>2</sup> respectively. Works for this location included placement of topsoil, with no earthworks or other dust producing activities undertaken during the reporting period. Dust management controls were reviewed at the site and the use of the water cart was subsequently increased.

### 3.5.2. Asbestos Fibre Monitoring

Asbestos air monitoring is completed in accordance with the Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003(2005)], with NATA certification applying to all sample collection, handling and analytical procedures.

Asbestos Fibre Monitoring results are summarised in **Table A-4-2** in **Appendix A-4**. All reported results were satisfactory and conform with the minimum action level of <0.01 fibres /mL for control monitoring as outlined in Work, Health and Safety (2017) Regulation; and SafeWork NSW (2019) Code of Practice – How to Safely Remove Asbestos.



## 3.6. Flora and Fauna

### 3.6.1. Grey-Headed Flying Fox Monitoring

A Grey-Headed Flying Fox (GHFF) camp is located in Parramatta Park which lies approximately 150m from the project boundary at the nearest point.

Under Condition of Approval C9, a GHFF Construction Monitoring Program has been developed by TfNSW. The requirements of this Program have been reflected in the Flora and Fauna Management Sub-plan and include visual inspections on a weekly basis during the 'high risk' months of September to January. If distress is observed within the camp, immediate notification must be provided to TfNSW.

In addition, as required by the Environmental Work Method Statement for Bridge Road Bridge, a trained ecologist from Narla Environmental is required to undertake additional inspections of the camp during bridge piling works (**Table 3-9**).

During the reporting period, no indicators of stress or abnormal behaviour were observed during inspections.

**Table 3-9 Observations from Visual Monitoring of Grey Headed Flying Fox Camp**

Date	Time	Weather Conditions	Works	Notification Triggers <sup>1</sup>	Comments
27/09/21	6:30	Fine	Vibrating tool at compound	No	No disturbance identified.
1/10/21	6:45	Overcast	Jetty removal	No	No disturbance identified.
7/10/21	13:45	Sunny	Jetty removal	No	No disturbance identified.
11/10/21	12:25	Rain at times	Embankment Works	No	No disturbance identified.
18/10/21	10:30	Fair	Embankment Works	No	No disturbance identified.

<sup>1</sup>Notification triggers include: >50% of the roost takes flight for over 20 minutes, GHFF leaving the roost in daylight hours, unusual vocalisations, located on or 2m from the ground, panting, saliva spreading, adults moving away from young, GHFF injured or killed on site (including aborted foetuses).

## 3.7. Issues/incidents/non-compliance

**Table 3-10** provides a summary of environmental compliance during the reporting period. There were three environmental incidents and no non-compliances identified during the reporting period.

**Table 3-10** Issues/incidents/non-compliances

Date	Location	Description
20/09/21	Palmer Street, Parramatta	During root investigation works, one tree appeared to have encountered minor bark damage. The Project Arborist was present during the time of incident and noted that the damage was considered to be minor impact and the tree will self-repair.
21/09/21	Trott Street, North Parramatta	Unapproved use of the street by Heavy Vehicles associated with the Parramatta Light Rail Infrastructure works.



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15/10/21	Church/Victoria Road Intersection, Parramatta	A water main strike occurred following the breaking and removal of the temporary asphalt. The water main was identified 0.5 metres below the surface directly underneath the temporary asphalt and was shallower than anticipated. No trenches or any other open excavations were present during the incident, meaning the water remained without sediment and mobilised off-site as clean water.
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# Appendices

## A-1 Weather Observations

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

Date	Temperatures		Rain	Temp	RH	9:00 AM		
	Min	Max				RH	Cld	Dir
	°C	°C	mm	°C	%	8th	km/h	
26/09/2021	9.4	15.8	0.4	13.4	62	8	SSE	11
27/09/2021	8.6	18.6	0.4	15.4	65	4	NE	2
28/09/2021	8.8	23.5	0	16	67	3	W	2
29/09/2021	10.4	21.8	1.6	16.4	90	8	NE	9
30/09/2021	12.6	23	4	19.5	68	5	NW	4
1/10/2021	13.2	25.6	3.2	18.5	73	8	NW	2
2/10/2021	11.2	23.8	12	19.7	61	2	SW	2
3/10/2021	10.4	25.2	3	16.2	85	0	W	2
4/10/2021	12.2	27.2	0	20.7	63	0	W	2
5/10/2021	10.8	22.2	0	18	45	2	W	6
6/10/2021	9.4	25.6	0	16.2	49	0	W	11
7/10/2021	10.2	30.2	0	19	35	6	NW	9
8/10/2021	10.8	21.6	0	17.7	66	6	W	6
9/10/2021	11.5	28.6	0	16.5	79	6	NW	4
10/10/2021	15	28	0	22.4	57	5	NW	2
11/10/2021	10.2	14	19	10.7	91	8	SW	6
12/10/2021	9.5	17.2	4.2	13.8	78	8	E	4
13/10/2021	10.5	18.2	6	14.4	96	8	E	4
14/10/2021	12.8	24.7	5.4	18.1	77	6	N	2
15/10/2021	11.5	21.2	8.2	15.8	66	7	WSW	4
16/10/2021	11.3	22.6	0	17.8	48	4	W	11
17/10/2021	11	23	0	17	56	0	WSW	13
18/10/2021	10.6	27.1	0	17	40	0	NW	6
19/10/2021	13.6	24.4	0	20	57	2	W	2
20/10/2021	11.8	22.6	1	14.8	78	5	SW	7
21/10/2021	11	23.2	0.2	18.5	74	3	SW	2
22/10/2021	12.2	24	0	18.4	73	6	S	4
23/10/2021	13.5	31	0	21.2	73	0	NNE	6
24/10/2021	14	22.8	1.2	19	61	5	SW	9
25/10/2021	12.5		0.8	17.2	81	1	SW	7



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

Date	Maximum Wind Gusts			9:00 AM		3:00 PM	
	Direction	Speed	Time	Direction	Speed	Direction	Speed
		km/h	local		km/h		km/h
26/09/2021	SSE	37	14:42	SSW	15	SE	19
27/09/2021	NE	26	15:19	NE	2	NE	11
28/09/2021	NE	31	17:24	NNW	4	ENE	9
29/09/2021	N	17	8:30	N	6	Calm	
30/09/2021	ENE	28	16:12	NW	13	E	13
1/10/2021	WNW	52	16:57	Calm		E	19
2/10/2021	SW	31	14:56	NW	7	SW	19
3/10/2021	WNW	33	12:19	Calm		WSW	13
4/10/2021	WNW	48	18:52	W	2	WSW	13
5/10/2021	NW	50	12:27	SW	9	W	20
6/10/2021	E	28	14:24	W	9	NW	2
7/10/2021	SSE	56	17:35	Calm		NW	20
8/10/2021	E	35	15:00	NNW	6	E	15
9/10/2021	ESE	30	15:45	WNW	7	E	15
10/10/2021	SSE	41	13:22	Calm		S	15
11/10/2021	SSW	30	0:41	W	7	SSW	7
12/10/2021	SE	28	8:11	ESE	6	ESE	19
13/10/2021	ESE	30	9:00	ESE	15	E	9
14/10/2021	NW	35	15:35	N	2	ENE	13
15/10/2021	NW	59	12:09	WNW	11	NW	15
16/10/2021	WNW	50	14:44	WNW	26	SW	20
17/10/2021	N	35	12:38	W	15	E	19
18/10/2021	ESE	26	15:44	WNW	9	W	13
19/10/2021	S	43	14:50	NW	7	SSE	22
20/10/2021	SSE	30	12:52	WSW	6	SSE	15
21/10/2021	ESE	35	16:21	WNW	2	ESE	19
22/10/2021	ESE	30	15:55	Calm		E	17
23/10/2021	SSW	31	21:08	N	2	ESE	17
24/10/2021	S	33	6:16	SSE	13	ESE	20
25/10/2021				WNW	11	SSE	20

Notes:

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

The orange text indicates a rain event greater than the 80<sup>th</sup> percentile of 25.8mm, and a wind speed of greater than 25km/hr

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

\* Data was unavailable.

# A-2 Noise and Vibration Monitoring Results

Table A-2-1 Noise Monitoring Results

Date	Time	Works Period	Construction Activity	Activity Location	Monitoring Location	NML Predicted (dBA)	Predicted (dBA)	Additional Mitigation Measures	L <sub>Amax</sub>	Recorded L <sub>eq, 15min</sub> (dBA)	Exceedance of Predicted (dBA)	Exceedance of Predicted	Comments
8/10/21	20:37	OOHW Period 1	Rail Grinding	Phillip Street Intersection	Meriton, Church Street	48	77	PN	80.4	71.3	-5.7	No	Construction noise is dominant noise source.
8/10/21	21:36	OOHW Period 1	Rail Grinding	Phillip Street Intersection	306 Church Street	48	91	PN	88.5	78	-13	No	Construction noise is dominant noise source.
19/10/21	8:49	Standard Hours	Concrete Works	28 Railway Parade	8-12 Alexandra Avenue	59	52	-	81.2	67.9	+15.9	Yes	Monthly verification noise monitoring. Construction noise inaudible. Traffic is dominant noise source including bus and train.
19/10/21	9:15	Standard Hours	Trackworks	Hawkesbury Road	157 Hawkesbury Rd, Westmead	61	72	-	77.9	63.3	-8.7	No	Monthly verification noise monitoring. Construction noise audible at most times.
19/10/21	9:42	Standard Hours	Excavation and NDD	Hawkesbury Road	199 Hawkesbury Rd, Westmead	59	79	-	80.8	70	-9	No	Monthly verification noise monitoring. Construction noise is dominant noise source.
19/10/21	10:08	Standard Hours	Trackworks, Roller	Bunya East	Cumberland Hospital East	59	72	-	69.8	56	-16	No	Monthly verification noise monitoring. Construction noise audible at most times.
19/10/21	12:28	Standard Hours	Excavation and Trackworks	Factory/O'Connell	55 O'Connell St, North Parramatta	52	72	-	79.5	64.4	-7.6	No	Monthly verification noise monitoring. Construction noise audible at most times.
19/10/21	12:57	Standard Hours	Roller, Trackworks	Church/Pennant Hills Road	St Patricks Cemetery, North Parramatta	61	71	-	72.9	58.1	-12.9	No	Monthly verification noise monitoring. Construction noise clearly audible.
19/10/21	13:29	Standard Hours	Trackworks	Church Street	20 Victoria Rd, Parramatta	69	72	-	85.7	69.1	-2.8	No	Monthly verification noise monitoring. Construction noise is dominant noise source.
22/10/21	12:27	Standard Hours	Trackworks and Concrete Works	Macquarie Street	Arthur Phillip High School, Parramatta	68	78	-	84.6	66.9	-11.1	No	Monthly verification noise monitoring. Construction noise clearly audible.
22/10/21	9:25	Standard Hours	Concrete Pour and Sawing	George Street	9 Noller Pde, Parramatta	53	75	-	76.5	60.4	-14.6	No	Monthly verification noise monitoring. Construction noise sometimes audible.
21/10/21	12:44	Standard Hours	Earthworks	Dudley Street	14 Dudley St, Rydalmere	55	65	-	84.2	60.6	-4.4	No	Monthly verification noise monitoring. Construction noise sometimes audible. Traffic is dominant noise source.
21/10/21	13:08	Standard Hours	Concrete Pour and Rail saw	Dundas	Dundas Station	55	78	-	84.2	70.7	-7.3	No	Monthly verification noise monitoring. Construction noise is dominant noise source.
21/10/21	14:02	Standard Hours	Excavation	Telopea	Telopea Station	53	79	-	80.3	63.8	-15.2	No	Monthly verification noise monitoring. Construction noise is dominant noise source.
21/10/21	14:50	Standard Hours	Finishing Works	Carlingford	Carlingford Station	62	72	-	66.2	50.2	-21.8	No	Monthly verification noise monitoring. Construction noise sometimes audible.
26/06/2020 - ongoing	Continuous monitoring	Construction works	Hawkesbury Road works	Westmead Institute for Medical Research (Sleep Lab)		65	*	*	*	*	*	No	Activities are reviewed in response to exceedance alerts. Where the exceedance is attributed to construction, a review is undertaken of works and plant/equipment or methodology is modified where necessary.
26/06/2020 - ongoing	Continuous monitoring	Construction works	Hawkesbury Road works	Westmead Institute for Medical Research (Brain Dynamics Centre)		65	*	*	*	*	*	No	

Date	Time	Works Period	Construction Activity	Activity Location	Monitoring Location	NML Predicted (dBA)	Predicted (dBA)	Additional Mitigation Measures	L <sub>Amax</sub>	Recorded L <sub>eq, 15min</sub> (dBA)	Exceedance of Predicted (dBA)	Exceedance of Predicted	Comments
26/06/2020 - ongoing	Continuous monitoring	Construction works	Hawkesbury Road works	Children's Medical Research Institute (Microscopy Labs)	65	*	*	*	*	*	*	No	No exceedances were attributed to Parramatta Connect construction activities.
26/06/2020 - ongoing	Continuous monitoring	Construction works	Cumberland Hospital	Cumberland Hospital (Clinical psychology rooms)	55	*	*	*	*	*	*	No	Continuous monitoring values are available on request.

<sup>1</sup>Sound Pressure Level (SPL) used instead of NML

Notes:

**Standard hours:**

- a) All areas excluding Eat Street and Camellia – Monday to Friday 7:00 am to 7:00 pm. Saturday 8:00 am to 6:00 pm
- b) Eat Street (Church Street between Palmer Street and George Street) – Monday to Friday 7:00 am to 6:00 pm. Saturday 8:00 am to 12:00 pm
- c) Camellia, Rosehill and Rydalmere (east of James Ruse Drive to Victoria Road) – 24 hours a day and seven days a week provided that sensitive receivers are not affected by noise levels of greater than 5 dBA above the rating background level at any residence

**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	Works Period	Construction Activity	Activity Location	Monitoring Location	Trigger Value (mm/s)	95 <sup>th</sup> Percentile PPV (mm/s)	Maximum PPV (mm/s)	Exceedance of Target	Construction Vibration Exceedance	Comments
26/06/2020	Continuous monitoring	Hawkesbury Road works	Hawkesbury Road	Westmead Institute for Medical Research (HAL incubators)	0.1 mm/s	*	No	No	Activities are reviewed in response to exceedance alerts. Where the exceedance is attributed to construction, a review is undertaken of works and plant/equipment or methodology is modified where necessary.		
26/06/2020	Continuous monitoring	Hawkesbury Road works	Hawkesbury Road	Westmead Institute for Medical Research (Microscopy Labs)	0.1 mm/s	*	No	No	No exceedances were attributed to PLR construction activities.		
26/06/2020	Continuous monitoring	Hawkesbury Road works	Hawkesbury Road	Children's Medical Research Institute (Microscopy Labs)	0.1 mm/s	*	No	No	Continuous monitoring values are available on request.		



## A-3 Water Sampling and Discharge Results

Table A-3-1 Water Quality Monitoring - Comments and observations

Location	Waterway	Upstream/ Downstream of Works	Type <sup>3</sup>	Date	Time	pH	Elec. Conduct. (µS/cm)	Turbidity (NTU)	Comments and Observations
-	-	-	-	-	-	5.5-8.5 <sup>2</sup>	LR <sup>1</sup> : 125–2200 <sup>2</sup> E: None	6-50 <sup>2</sup>	-

1. ANZECC Waterway types: Fresh water (PR1, PR2, PR3, PR4, VY1 and VY2); E: Estuarine (CC1, CC2, AC1, AC2, PR5, PR6 and SC1).
2. Trigger values were established by Parramatta Connect within the Pre-Construction Sampling (Baseline Review) Water Quality Monitoring Report (PLR11NF-CPBD-ALL-WA-RPT-000003). **Red text** indicates values outside of the baseline trigger values.
3. Charles Street Weir separates Parramatta River from up and downstream.



**Table A-3-2 Discharge Water Quality**

<b>Discharge monitoring Point ID</b>	<b>Type of Monitoring Point</b>	<b>Type of Discharge Point</b>	<b>Date</b>	<b>Discharge Permit #</b>	<b>Oil and Grease (Not visible)</b>	<b>pH (6.5 - 8.5)</b>	<b>Turbidity (NTU)</b>	<b>Comments</b>
A1.10	Basins and settling containers	Stormwater inlet	6/10/2021	DW-A1-059	Not visible	7.79	30.3	Discharge to stormwater A1.10

## A-4 Air Quality Monitoring Results

Table A-4-1 Summary of Dust Deposition Data (Ash Content)

Date	Monitoring Location	Ash Content g/m <sup>2</sup> /month	Total Insoluble Matter (g/m <sup>2</sup> /month)
September	13a Grand Avenue	7.4	6.2
September	Rydalmere Station	0.3	0.2
September	Dundas Station	1.3	0.9
September	Telopea	0.6	0.2

Red text indicates exceedance of the ash content trigger value 4.0 g/m<sup>2</sup>/month.





**Table A-4-2 Summary of Asbestos Fibre Monitoring**

<b>Report Number</b>	<b>Date</b>	<b>Location</b>	<b>Start time</b>	<b>End time</b>	<b>Result (Fibres/Fields)</b>	<b>Result (Fibres/mL)</b>
AMR340	25-Sep	CAMELLIA SOUTH, OVERPASS AREA, NW CORNER	6:48	12:37	0/100	<0.01
AMR340	25-Sep	CAMELLIA SOUTH, OVERPASS AREA, NORTH BOUNDARY	6:49	12:38	0/100	<0.01
AMR340	25-Sep	CAMELLIA SOUTH, OVERPASS, NE CORNER	6:50	12:39	0/100	<0.01
AMR340	25-Sep	GATE 22, WEST BOUNDARY, BENEATH JAMES HARDIE BRIDGE	6:55	12:44	0/100	<0.01
AMR340	25-Sep	GATE 22, WEST SIDE OF CARPARK NEAR GATE	6:56	12:45	0/100	<0.01
AMR340	25-Sep	GATE 22, EAST SIDE OF CARPARK NEAR GATE	6:57	12:46	0/100	<0.01
AMR341	27-Sep	OVERPASS AREA, NW CORNER	7:20	16:15	0/100	<0.01
AMR341	27-Sep	OVERPASS AREA, WEST BOUNDARY, 20 M SOUTH OF NW CORNER	7:21	16:14	0/100	<0.01
AMR341	27-Sep	OVERPASS AREA, NORTH BOUNDARY, MIDDLE GATE	7:22	16:13	0/100	<0.01
AMR341	27-Sep	CAMELLIA ALIGNMENT, EAST BOUNDARY APPROX 100M SOUTH OF JAMES HARDIE BRIDGE	7:29	16:07	0/100	<0.01
AMR341	27-Sep	CAMELLIA ALIGNMENT, EAST BOUNDARY APPROX	7:30	16:06	0/100	<0.01



70 MK SOUTH OF JAMES HARDIE BRIDGE						
AMR341	27-Sep	CAMELLIA ALIGNMENT, EAST BOUNDARY APPROX 30 M SOUTH OF JAMES HARDIE BRIDGE	7:31	16:05	0/100	<0.01
AMR341	27-Sep	CAMELLIA ALIGNMENT, EAST BOUNDARY AT JAMES HARDIE BRIDGE	7:32	16:04	0/100	<0.01
AMR342	28-Sep	OVERPASS AREA, NW CORNER	6:58	16:06	0/100	<0.01
AMR342	28-Sep	OVERPASS AREA, NE CORNER	6:59	16:05	0/100	<0.01
AMR342	28-Sep	OVERPASS AREA, EAST BOUNDARY ADJACENT TO OVERPASS WALL	7:00	16:04	0/100	<0.01
AMR342	28-Sep	OVERPASS AREA, WEST BOUNDARY APPROX 20 M SOUTH OF NW CORNER	7:01	16:03	0/100	<0.01
AMR342	28-Sep	GATE 22, EAST BOUNDARY APPROX 15 M NORTH OF CARPARK	9:12	15:51	0/100	<0.01
AMR342	28-Sep	GATE 22, NW CORNER OF CARPARK	9:13	15:52	0/100	<0.01
AMR342	28-Sep	GATE 22, WEST BOUNDARY, UNDER JAMES HARDIE BRIDGE	9:14	15:53	0/100	<0.01