



# ENVIRONMENTAL MONITORING REPORT, MARCH 2021

## PARRAMATTA LIGHT RAIL INFRASTRUCTURE WORKS

9 April 2021

**Parramatta**  
Connect

# Contents

<b>1. Introduction</b>	<b>1</b>
1.1. Background	1
1.1.1. Statutory Context	2
1.2. Scope	2
<b>2. Site Activities</b>	<b>4</b>
<b>3. Monitoring Results</b>	<b>6</b>
3.1. Inspections	6
3.2. Weather	7
3.3. Noise and Vibration	9
3.4. Soil and Water	11
3.4.1. Water quality in receiving waters	11
3.4.2. Discharge and dewatering	12
3.5. Air Quality	12
3.5.1. Dust Deposition Monitoring	12
3.5.2. Asbestos Fibre Monitoring	13
3.6. Flora and Fauna	13
3.6.1. Grey-Headed Flying Fox Monitoring	13
3.7. Issues/incidents/non-compliance	14
<b>Appendices</b>	<b>15</b>
A-1 Weather Observations	15
A-2 Noise and Vibration Monitoring Results	17
A-3 Water Sampling and Discharge Results	19
A-4 Air Quality Monitoring Results	21



<b>Project number</b>	<b>N81080</b>
<b>Document number</b>	PLR1INF-CPBD-ALL-EN-RPT-0000022
<b>Revision date</b>	9 April 2021
<b>Revision</b>	2

<b>Rev.</b>	<b>Date</b>	<b>Prepared By</b>	<b>Reviewed By</b>	<b>Approved By</b>	<b>Remarks</b>
0	29 March 2021	A. Nair	D. Corish	D. Corish	Nil
1	31 March 2021	A. Nair	D. Corish	D. Corish	Nil
2	9 April 2021	A. Nair	D. Corish	D. Corish	Nil



# 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.

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 installations</li><li>– Ongoing drainage and Combined Service Route works</li></ul>
	<b>Cumberland</b>
	<ul style="list-style-type: none"><li>– Ongoing utility installations and track works</li></ul>
Parramatta CBD	<b>North Parramatta</b>
	<ul style="list-style-type: none"><li>– Ongoing track works at North Parramatta</li><li>– Ongoing drainage and Combined Service Route works</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>– Ongoing civil works (tree pits, Combined Service Routes, footpaths) along Church Street and Macquarie</li><li>– Drainage works along Church Street and Macquarie Street</li><li>– Track works along Church Street and Macquarie Street</li><li>– Micro tunnel connection to river, commissioning and reinstatement of foreshore</li></ul>
Camellia and Carlingford line	<b>Area 2 East (Smith Street to Arthur Street)</b>
	<ul style="list-style-type: none"><li>– Utility and services installations on Macquarie Street, Charles Street, Harris Street, George Street, Purchase Street, Alfred Street</li><li>– Ongoing installation of multifunction poles</li><li>– Drainage works on Macquarie Street, Charles Street, Harris Street, George Street, Purchase Street, Alfred Street</li><li>– Ongoing civil works (pavement, Combined Services Route, road works) along Macquarie Street, George Street, Tramway Avenue</li><li>– Track works along Macquarie Street</li><li>– George Street underbore – tunnel boring machine establishment and tunnelling</li></ul>
	<b>Camellia</b>
	<ul style="list-style-type: none"><li>– Arch assembly at Tramway Avenue</li><li>– James Ruse Drive bridge deck works</li><li>– Ongoing retaining wall and bridge works at Grand Avenue North</li><li>– Drainage works at drainage easement into Parramatta River</li><li>– 13a Grand Avenue remediation works</li><li>– Utility works at James Ruse Drive</li></ul>

**Precinct****Site Activities****Carlingford Line**

- Vineyard Creek bridge concrete works and bridge deck installation.
  - Camellia Bridge concrete works and bridge deck works
  - Leamington Road Underpass concrete works
  - Adderton Road overbridge/active transport link works
  - Combined Services Works from Dundas to Carlingford
  - Retaining wall and stormwater drainage works from Rydalmere to Carlingford
  - Active transport link works from Telopea to Carlingford
  - Overhead wire and lighting works from Telopea to Carlingford
  - Utility works at Lloyds Avenue, Adderton Road and Winter Street
  - Lime stabilisation works from Rydalmere to Carlingford
  - Soft landscaping works from Telopea to Carlingford
-





## 3. Monitoring Results

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

### 3.1. Inspections

A total of four ER inspections, one AA inspection and two TfNSW inspections were completed during the reporting period in addition to 39 internal inspections. It is noted that TfNSW also attends 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
26/02/21	1	Internal Inspection	3	Yes
01/03/21	7	Internal Inspection	15	Yes
02/03/21	1	Internal Inspection	1	Yes
02/03/21	1	ER Inspection	5	Yes
03/03/21	1	Internal Inspection	0	N/A
04/03/21	1	Internal Inspection	2	Yes
04/03/21	1	AA Inspection	1	Yes
05/03/21	1	Internal Inspection	6	Yes
08/03/21	8	Internal Inspection	23	Yes
09/03/21	1	ER Inspection	5	Yes
09/03/21	1	TfNSW Inspection	3	Yes
10/03/21	1	Internal Inspection	1	Yes
11/03/21	1	Internal Inspection	9	Yes
12/03/21	1	Internal Inspection	1	Yes
12/03/21	1	AA Inspection	2	Yes
15/03/21	3	Internal Inspection	7	Yes
16/03/21	2	Internal Inspection	10	Yes
16/03/21	1	ER Inspection	5	Yes
16/03/21	1	TfNSW Inspection	5	Yes



17/03/21	1	Internal Inspection	10	Yes
18/03/21	4	Internal Inspection	10	Yes
22/03/21	4	Internal Inspection	7	Yes
23/03/21	1	Internal Inspection	1	Yes
23/03/21	1	ER Inspection	0	-
26/03/21	1	Internal Inspection	2	Yes
<b>Total</b>	<b>46</b>	<b>-</b>	<b>132</b>	<b>-</b>

## 3.2. Weather

The total rainfall recorded during the reporting period was 376.6 mm with 14 days exceeding one millimetre of rain. Five rain events exceeded both the 80<sup>th</sup> percentile (25.8mm) and the 85<sup>th</sup> percentile (33.1mm).

A severe rainfall event occurred between 19 March and 24 March when a total of 302mm of rain was recorded. In response, emergency works were necessitated between 20 March and 24 March 2021 in Section 3 of the alignment. The emergency works were notified to Transport for NSW, the Environmental Representative, the Environment Protection Authority and the Department of Planning, Industry and Environment. The emergency works are summarised as follows:

- The stormwater system between Carlingford and Telopea (which is disconnected from the wider network and operating as a holding tank) reached capacity at approximately 2:00pm on 20 March 2021.
- To prevent overflow and flooding of adjacent properties, a generator and pump was installed within the site stormwater system to divert surplus water and enable the controlled discharge off-site (Adderton Road, Telopea).
- Erosion and sediment controls were installed at the discharge point and gypsum was added to the site stormwater system prior to discharge (it is noted that approximately 80% of the site is landscaped in this section of the alignment and as such, the discharge was not defined as material harm).
- To minimise noise impact, the generator was enclosed on all sides with ATF fencing and noise blankets.

During the reporting period, there were 23 days where the maximum wind gust recorded was greater than 25km/hr and no days where the maximum wind gust recorded was greater than 50km/hr or 60km/hr. There was a total of eight days where wind speeds 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.

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**.



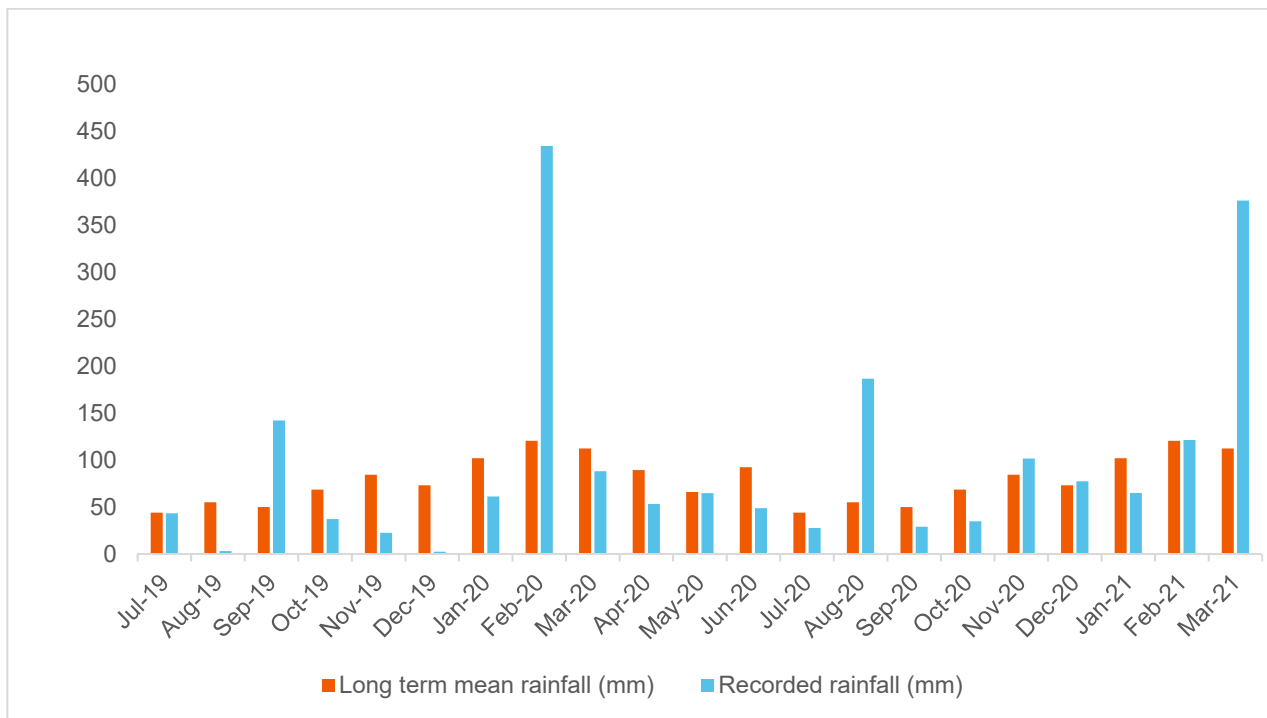
**Table 3-2 Weather Summary and Trigger Weather Events for reporting period<sup>1</sup>**

Weather Event	Forecast	Observation
Minimum temperature	15°C	11.3°C
Maximum temperature	40°C	34.5°C
Total rainfall	359.8 mm	<b>376.6 mm</b>
Number of days with rain (>1mm)	16 days	14 days
>80 <sup>th</sup> percentile (25.8mm) rain events	4 days	<b>5 days</b>
>80 <sup>th</sup> percentile (33.1mm) rain events	4 days	<b>5 days</b>
Flood warning / events	1	1
>25km/hr wind <sup>2</sup>	8 days	<b>23 days</b>
>50km/hr wind	No days	No days
>60km/hr wind	No days	No days

<sup>1</sup>Weather summary based on data from the 26 February 2021 to 25 March 2021 (28 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**

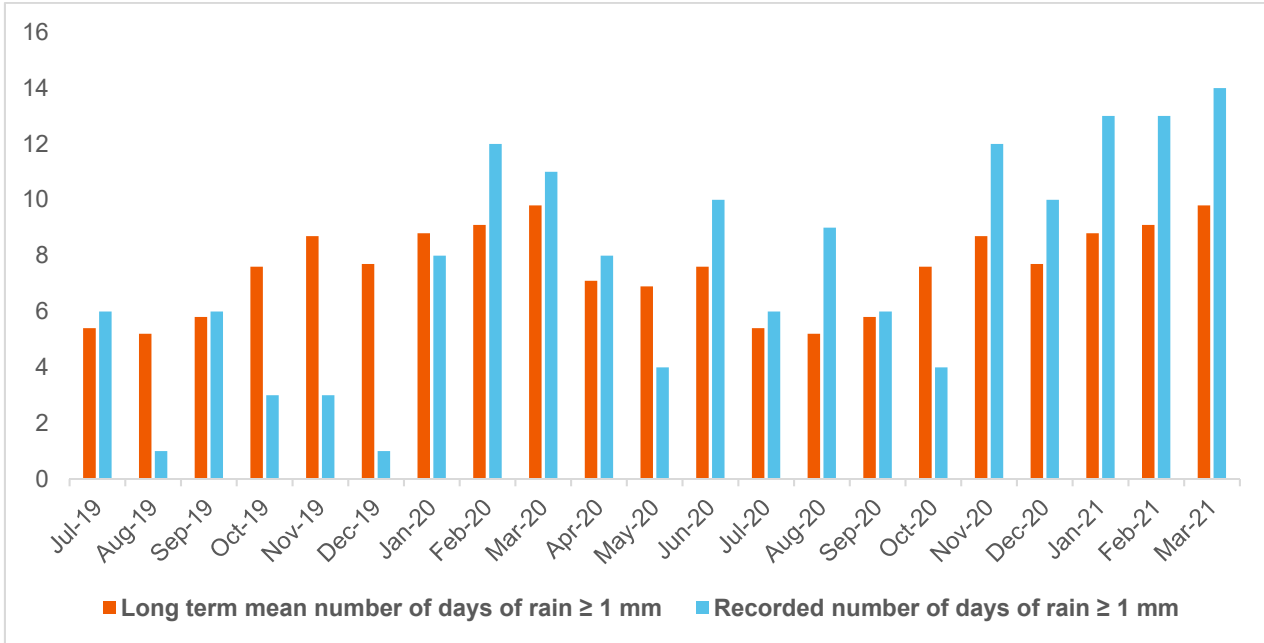


Figure 3-2 Monthly rain days comparison

### 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 were no recorded noise levels ( $L_{Aeq15min}$ ) during the reporting period that exceeded the predicted noise levels.

During the reporting period, additional vibration monitoring was carried out by Renzo Tonin. All results were compliant.

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**. All monitoring events were compliant with vibration targets. Monitoring carried out by Renzo Tonin during the reporting period will be provided in the April 2021 report.

All noise and vibration monitors used 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
08/03/2021	Grey-Headed Flying Fox Camp, Parramatta Park	Attended	Verification Monitoring For Narla Inspection
12/03/2021	86-94 Kissing Point Road	Attended	Road Sowing
17/03/2021	199 Hawkesbury Road	Attended	Monthly Ambient Monitoring
17/03/2021	Factory/O'Connell Corner	Attended	Monthly Ambient Monitoring



Date	Monitoring Location	Attended/Continuous	Description
17/03/2021	8-12 Alexandra Avenue	Attended	Monthly Ambient Monitoring
17/03/2021	Cumberland East Embankment	Attended	Monthly Ambient Monitoring
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
5/03/2021	Camellia Junction	Attended	Roller Compacting new road at Grand Avenue North
6/03/2021	Gasworks Bridge	Attended	Monitored by Renzo Tonin: TBM + Excavation
6/03/2021 – 18/03/2021	Gasworks	Continuous	Monitored by Renzo Tonin: TBM Operation
9/03/2021	Dundas Station	Attended	Padfoot Compacting track alignment
11/03/2021	Horse Building	Attended	Monitored by Renzo Tonin
12/03/2021	Dundas Station	Attended	Pulling out concrete slab with excavator bucket
15/03/2021	Albion Retrieval Pit	Attended	Monitored by Renzo Tonin
18/03/2021	Albion Retrieval Pit	Attended	Monitored by Renzo Tonin
26/03/2021	Albion Hotel	Attended	Monitored by Renzo Tonin: TBM Operation
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	19/05/2021
Noise Level Meter	00973275	17/12/2021
Vibration Monitor	BE14639	10/02/2023
Vibration Monitor	BE17441	16/07/2021

**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.

During the reporting period, wet weather monitoring was undertaken during a 314.6 mm 14-day rainfall event as summarised in **Table 3-7** and detailed in **Table A-3-1**. Water levels were extremely high during the rainfall event and low to medium during the dry sampling. Overall there was a moderate amount of debris or leaf litter present. All results were within the water quality objectives outlined in the ANZECC guidelines.



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

Date	Type	Type of Results	Wet / Dry	Locations
22/03/2021	Monitoring during construction	Field	Wet	Parramatta River: PR4; PR5; PR6 Clay Cliff Creek: CC1; CC2 Vineyard Creek <sup>1</sup> : VY1; VY2 Subiaco Creek: SC1 A'becketts Creek: AC1, AC2  PR1, PR2, PR3, DC1 and VY3 were not accessible due to unsafe water levels at time of testing.
25/03/2021	Monitoring during construction	Laboratory	Dry	Parramatta River: PR1; PR3; PR4; PR5; PR6 Clay Cliff Creek: CC1; CC2 Domain Creek: DC1 Vineyard Creek: VY1; VY2; VY3 Subiaco Creek: SC1 A'becketts Creek: AC1, AC2  PR2 was not accessible due to construction activities at time of testing.

<sup>1</sup>Laboratory samples were taken of upstream and downstream locations at Vineyard Creek. These samples were taken from an area of the creek separate to the normal sampling location to further ensure emergency works had not affected the water body.

**Table 3-8 Water Monitor Calibration**

Equipment <sup>1</sup>	Serial Number	Calibration Date
Water Quality Monitor	DV7F6E7J	21/08/2021

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

### 3.4.2. Discharge and dewatering

There were seven discharge events 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.



From December 2020 onwards, results have been presented as Ash Content rather than TIM. This method 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. With the exception of Carlingford, all results from the previous reporting period had a satisfactory level of ash content. During this period, landscaping works were undertaken near the monitoring location in Carlingford. It is noted that this is the most likely reason for the exceedance in ash content, however as per the Air Quality Management Plan, additional controls have been implemented in response to the result. The batters in Carlingford have been hydro mulched and DGB capping has been installed for placement of ballast. It is expected that this will significantly reduce dust migration risk in this area.

### **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**

The 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 the Bridge Road Bridge, a trained ecologist from Narla Environmental must 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 Conducted by Narla**

Date	Time	Works	Notification Triggers <sup>1</sup>	Comments and Number of Monitoring Events <sup>2</sup>
1/03/2021	7:39am – 2:50pm	Hammering, plant/construction noises, piling works	No	Narla Monitoring: 28 events None to small disturbance identified. Mostly attributed to non-PCPLR works.
8/03/2021	8:23am – 3:04pm	Piling works, construction noises	No	Narla Monitoring: ten events No disturbance attributed to PCPLR works.
15/03/2021	7:42am – 2:50pm	Engines, plant noises, hammering, construction noises, piling works	No	Narla Monitoring: 29 events None to small disturbance identified. Mostly attributed to non-PCPLR works.
22/03/2021	-	-	-	No works on this day due to severe rainfall event. Monitoring was cancelled.

<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 fetuses).

<sup>2</sup> A 'monitoring event' refers to a period of continuous monitoring in response to noise generating activities (irrespective of whether the noise is generated by Parramatta Connect works or third party activities).

### 3.7. Issues/incidents/non-compliance

**Table 3-10** provides a summary of environmental compliance during the reporting period. There were three environmental incidents, all of which were minor in nature, and no non-compliances.

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

Date	Location	Description
3/03/2021	Bunya Building	A piling rig was installing a pile casing on the eastern embankment near Bunya building when the hydraulic fluid hose burst. A spill kit was deployed, and the piling rig was repaired. There was no loss of hydraulic fluid to Parramatta River.
3/03/2021	Church Street (between Phillip and George)	A minor hydraulic oil leak was identified on Church Street between Phillip Street and George Street. The spill kit was deployed and there was no impact to stormwater.
22/03/2021	Leamington Road	Following a major stormwater event (>137mm), a blocked local stormwater pit on Leamington Road (non-PLR related) caused water to enter site and over-topple on-site sediment controls. As a result, sediment laden water impacted the garden of an adjoining property.



# 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				Cld	Dir	Spd
	°C	°C	mm	%	8th			
26/02/2021	15.3	26.8	9.8	19.5	95	0	WSW	2
27/02/2021	17.5	24	0.2	19.2	96	8	WSW	2
28/02/2021	17.4	28.3	1.6	20.5	98	8	NNE	2
1/03/2021	18.5	34.5	0	23.3	84	4	NE	4
2/03/2021	17	24.3	0	22	77	4	SW	6
3/03/2021	15.5	23	0	18.3	70	8	SW	7
4/03/2021	13.5	28.7	0	19.5	68	0	W	2
5/03/2021	13.7	24.2	0	22.5	57	2	SSW	6
6/03/2021	*	24.6	0	19.2	77	4	SW	6
7/03/2021	12.6	26.3	0	19	72	4	SSW	4
8/03/2021	16	30.7	0	20.6	81	6	NW	6
9/03/2021	16.7	30.3	4.6	24	67	4	W	6
10/03/2021	17.5	25.8	0.8	22	74	7	ESE	7
11/03/2021	16.3	25.3	0	22.3	82	7	ENE	2
12/03/2021	18.8	26	3	21.4	93	7	NE	2
13/03/2021	17.2	32.5	0.4	20.5	91	4	NNW	2
14/03/2021	17.5	19	17	19	95	8	SW	15
15/03/2021	11.3	23.1	15	16.8	65	0	SSE	4
16/03/2021	12.3	21.3	0	18	81	8	SW	2
17/03/2021	14.5	23.2	10.4	18.6	86	8	S	4
18/03/2021	16.2	20.6	11.4	20	86	8	E	2
19/03/2021	16.8	24.7	59	19.2	93	8	NE	2
20/03/2021	18.2	20.8	57	19.6	98	8	SE	6
21/03/2021	18.2	19.7	91	18.8	96	8	SE	6
22/03/2021	17	19.8	45	18	96	8	E	6
23/03/2021	17.2	22.8	37	18.7	93	8	NE	11
24/03/2021	17.5	29	13.4	22.8	68	0	NNW	11
25/03/2021	16.6	28	0	21.6	69	5	NW	2



**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
26/02/2021	ESE	35	16:20	NW	2	SE	19
27/02/2021	E	20	23:47	WSW	4	NNE	6
28/02/2021	ESE	26	15:46	S	9	E	13
1/03/2021	*	*	*	WNW	6	ENE	9
2/03/2021	*	*	*	*	*	SE	20
3/03/2021	ESE	33	14:16	S	11	SSE	13
4/03/2021	NNW	28	11:38	WSW	9	W	6
5/03/2021	SSE	41	10:21	SW	7	SSE	20
6/03/2021	SE	28	14:12	WSW	6	ESE	15
7/03/2021	E	31	15:56	NW	7	ENE	11
8/03/2021	WNW	43	15:59	NW	6	NNW	9
9/03/2021	SE	35	12:26	WNW	9	SE	22
10/03/2021	E	33	14:47	SE	13	ESE	20
11/03/2021	E	31	15:30	NE	6	ENE	13
12/03/2021	N	22	16:56	Calm	*	N	9
13/03/2021	E	24	14:32	N	6	E	13
14/03/2021	SW	39	12:36	S	13	S	17
15/03/2021	ESE	28	11:45	WSW	9	ESE	13
16/03/2021	SSE	26	12:41	WNW	4	S	7
17/03/2021	ESE	37	13:13	S	6	ESE	24
18/03/2021	ESE	30	6:51	E	17	ESE	9
19/03/2021	ESE	39	13:31	SE	6	SSE	15
20/03/2021	E	50	1:39	SE	17	E	20
21/03/2021	E	46	7:08	E	20	E	11
22/03/2021	E	26	13:04	ENE	6	ENE	2
23/03/2021	ENE	30	7:38	NE	13	ENE	2
24/03/2021	NW	41	10:17	NW	15	WNW	17
25/03/2021	WSW	31	11:33	WNW	2	SW	11

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
8/03/21	9:40	Standard Hours	Piling	Cumberland Campus	Grey-Headed Flying Fox Camp, Parramatta Park	-	-	-	74.4	62.2	-	-	Construction noise inaudible. Noise monitoring was conducted during Narla ecological monitoring of the encampment. Confirmed with Narla ecologist that noise levels were compliant.
12/03/21	23:17	OOHW Period 2	Road Sowing	Kissing Point Road	86-94 Kissing Point Road	39	82	-	102	79.8	-2.2	No	Construction noise is dominant noise source; impulsive and tonal
17/03/21	8:00	Standard Hours	CSR	Darcy Road	199 Hawkesbury Road	59	100	-	69	57	-43	No	Construction noise clearly audible
17/03/21	10:10	Standard Hours	Track Welding	Factory Street	Factory/O'Connell Corner	52	100	-	78	75.4	-24.6	No	Construction noise clearly audible
17/03/21	8:20	Standard Hours	Material Handling	28 Railway Parade	8-12 Alexandra Avenue	59	58	-	61	50	-8	No	Construction noise clearly audible
17/03/21	9:30	Standard Hours	Piling	Bunya	Cumberland East Embankment	65	118	-	78	72	-46	No	Construction noise clearly audible
26/06/2020 - ongoing	Continuous monitoring	Construction works	Hawkesbury Road 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	Hawkesbury Road works	Westmead Institute for Medical Research (Brain Dynamics Centre)	65	*	*	*	*	*	No	
26/06/2020 - ongoing	Continuous monitoring	Construction works	Hawkesbury Road works	Hawkesbury Road works	Children's Medical Research Institute (Microscopy Labs)	65	*	*	*	*	*	No	
26/06/2020 - ongoing	Continuous monitoring	Construction works	Cumberland Hospital	Cumberland Hospital	Cumberland Hospital (Clinical psychology rooms)	55	*	*	*	*	*	No	

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)	Recorded PVS (mm/s)	Exceedance of Target	Construction Vibration Exceedance	Comments
5/03/2021	15:26 – 17:05	Standard work hours	Roller compacting new road	Camellia Junction	Camellia Junction	20	3 <sup>1</sup>	No	No	Compliant
9/03/2021	7:31 – 7:47	Standard work hours	Padfoot compacting track alignment	Dundas Station	Adjacent to platform at ground level	5	1.286 <sup>1</sup>	No	No	Compliant
12/3/2021	7:23 – 14:36	Standard work hours	Pulling out concrete slab with excavator bucket	Dundas Station	Dundas Station platform	5	3.7 <sup>1</sup>	No	No	Compliant
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.  <b>No exceedances were attributed to PLR construction activities.</b>  <b>Continuous monitoring values are available on request.</b>	
26/06/2020	Continuous monitoring	Hawkesbury Road works	Hawkesbury Road	Westmead Institute for Medical Research (Microscopy Labs)	0.1 mm/s	*	No	No		
26/06/2020	Continuous monitoring	Hawkesbury Road works	Hawkesbury Road	Children's Medical Research Institute (Microscopy Labs)	0.1 mm/s	*	No	No		

<sup>1</sup> The monitors used in these locations do not record PVS values, rather PPV. In this case, the PPV value is compared to the trigger value. It should be noted that PVS values are always equivalent or higher than PPV. The PPV values for this reporting period are 3 mm/s for 5/03/2021, 1.286 mm/s for 9/03/2021 and 3.7 mm/s for 12/03/2021. These values are compliant with CNVIS criteria.

## 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>	
AC1	A'becketts Creek	Upstream	Wet	23/03/2021	10:34	7.64	136	48	Rainy. Moderate Current. No oil or grease visible. Moderate rubbish. Large amount of vegetation. Quite turbid.
AC2	A'becketts Creek	Downstream	Wet	23/03/2021	10:46	7.67	139	48.6	Rainy. Moderate current. No oil or grease visible. Moderate amount of rubbish washed up onto branches. Quite turbid.
CC1	Clay Cliff Creek	Upstream	Wet	23/03/2021	12:23	7.48	152	30.2	Rainy. Some wind. No oil or grease visible. Minimal leaf litter. Slightly turbid.
CC2	Clay Cliff Creek	Downstream	Wet	22/03/2021	13:36	7.67	248	32.5	Rainy. Slightly turbid. Trolley present in water otherwise minimal rubbish. No leaf litter. No oil or grease visible.
DC1	Domain Creek	Upstream	Wet	22/03/2021	-	-	-	-	Site deemed too dangerous to access during sever rainfall event.
PR1	Parramatta River	Upstream	Wet	22/03/2021	-	-	-	-	Site deemed too dangerous to access during sever rainfall event.
PR2	Parramatta River	Downstream	Wet	22/03/2021	-	-	-	-	Site deemed too dangerous to access during sever rainfall event.
PR3	Parramatta River	Upstream	Wet	22/03/2021	-	-	-	-	Site deemed too dangerous to access during sever rainfall event.
PR4	Parramatta River	Downstream	Wet	22/03/2021	13:00	7.66	273	37.2	No leaf litter. Rainy. No oil. No rubbish. Moderately turbid. Slight current.
PR5	Parramatta River	Upstream	Wet	22/03/2021	13:20	7.69	278	41	Rainy. No wind. Normal current. No oil or grease visible. No rubbish. No leaf litter. Water slightly turbid.
PR6	Parramatta River	Downstream	Wet	22/03/2021	9:58	7.75	303	37.1	Rainy. Minimal wind. No visible oil or grease. Moderately turbid. Minimal leaf litter. No visible current.
SC1	Subiaco Creek	Upstream	Wet	23/03/2021	10:17	7.5	240	48.4	Slightly turbid. No oil or grease visible. Moderate vegetation and leaf litter. Rainy. Windy.
VY1	Vineyard Creek	Upstream	Wet	22/03/2021	10:04	8.04	470	56	Rainy. No oil or grease visible. Minimal leaf litter. Strong current. Moderate turbidity.
VY2	Vineyard Creek	Downstream	Wet	22/03/2021	10:08	7.93	468	54.3	Rainy. No oil or grease visible. Minimal leaf litter and vegetation. Strong current. Moderate turbidity.
VY3	Vineyard Creek	Downstream	Wet	22/03/2021	-	-	-	-	Site deemed too dangerous to access during sever rainfall event.
-	Vineyard Creek	Upstream	Wet	22/03/2021	12:37	7.74	314	24.1	Emergency Works Monitoring: Data from laboratory sample.
-	Vineyard Creek	Downstream	Wet	22/03/2021	12:39	7.23	342	28.1	Emergency Works Monitoring: Data from laboratory sample.
AC1	A'becketts Creek	Upstream	Dry	25/03/2021	13:15	7.88	1420	6.8	Clear weather. Moderate leaf litter. Lots of rubbish above water level but minimal in water. No visible oil or grease. Very slightly turbid. Minimal current.
AC2	A'becketts Creek	Downstream	Dry	25/03/2021	13:25	8.03	1410	4.3	Rainy. Large amount of leaf litter and vegetation. Moderate amount of rubbish. No visible oil or grease. Slightly turbid.
CC1	Clay Cliff Creek	Upstream	Dry	25/03/2021	10:44	8.54	1000	3.9	Clear weather, no rain. Small amount of chemical/grease visible. Minimal leaf litter. Minimal rubbish. CC1 is noted to be an upstream location and as such, the trigger value is not applicable.
CC2	Clay Cliff Creek	Downstream	Dry	25/03/2021	11:11	8.37	1000	14.4	Clear weather. Slightly turbid. Trolley present in water otherwise minimal rubbish. No leaf litter. No oil or grease visible.
DC1	Domain Creek	Upstream	Dry	25/03/2021	16:57	8.01	525	0	No leaf litter. Clear weather. No oil. No rubbish. Clear water.
PR1	Parramatta River	Upstream	Dry	25/03/2021	16:31	7.72	522	0.1	Sunny weather. Clear Water. Moderate Leaf Litter. Moderate Rubbish. No oil or grease visible.
PR2	Parramatta River	Downstream	Dry	25/03/2021	-	-	-	-	Site was not accessible during time of sampling due to construction activities.
PR3	Parramatta River	Upstream	Dry	25/03/2021	17:21	7.59	417	9.9	Sunny, clear weather. Minimal leaf litter. No rubbish. Mild current. No oil or grease visible.
PR4	Parramatta River	Downstream	Dry	25/03/2021	17:59	7.92	395	2.8	Clear Water. Clear Weather. No leaf litter. No rubbish. No visible oil or grease.
PR5	Parramatta River	Upstream	Dry	25/03/2021	11:37	7.62	2070	0	Clear Weather. No visible oil or grease. No rubbish but multiple trolleys present in water. No leaf litter. Slight current.
PR6	Parramatta River	Downstream	Dry	25/03/2021	7:14	7.73	2010	0	Clear weather, no rain. No leaf litter or vegetation. No rubbish. No visible oil or grease. No visible current.
SC1	Subiaco Creek	Upstream	Dry	25/03/2021	8:33	7.8	597	0	Clear weather. Moderate leaf litter and vegetation. No visible oil or grease. Clear water. No rubbish.

VY1	Vineyard Creek	Upstream	Dry	25/03/2021	7:44	7.5	573	0	Sunny weather. Clear water. Minimal rubbish. No visible oil or grease. Low current.
VY2	Vineyard Creek	Downstream	Dry	25/03/2021	7:55	7.33	552	0.5	Sunny weather. Clear water. Moderate leaf litter. No visible oil or grease. No rubbish.
VY3	Vineyard Creek	Downstream	Dry	25/03/2021	15:07	7.98	438	0	Sunny weather. Clear water. Large amount of leaf litter and vegetation. No visible oil or grease. No rubbish.

1. ANZECC Waterway types: Fresh water (PR1, PR2, PR3, PR4, VY1 and VY2); E: Estuarine (CC1, CC2, AC1, AC2, PR5 and PR6).
2. Trigger values were established by Parramatta Connect within the Pre-Construction Sampling (Baseline Review) Water Quality Monitoring Report (PLR1INF-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**

Discharge monitoring Point ID	Type of Monitoring Point	Type of Discharge Point	Date	Discharge Permit #	Oil and Grease (Not visible)	pH (6.5 - 8.5)	Turbidity (NTU)	Comments
N/A	Settling Container (Water Treatment Plan)	Re-use	11/03/2021	DW-A1-031	Not visible	8.4	30	Reused for dust suppression
N/A	Settling Container (Water Treatment Plan)	Re-use	15/03/2021	DW-A1-032	Not visible	8.1	0	Reused for dust suppression
N/A	Settling Container (Water Treatment Plan)	Re-use	15/03/2021	DW-A1-033	Not visible	8	0	Reused for dust suppression
A1.42	Basins and settling containers	Stormwater inlet	19/03/2021	DW-A1-034	Not visible	8	35	Discharge from Sydney Water main
A1.14-A1.18	Basins and settling containers	Stormwater inlet, Vac Truck	24/03/2021	DW-A1-035	Not visible	7.52	5	Discharge from Sydney Water main and to water cart
A2.13	Basins and settling containers	Stormwater inlet	1/03/2021	DW-A2-059	Not visible	8.42	0	Discharge from Sydney Water main, dust suppression
A3.3	Basins and settling containers	Creek	25/03/2021	DW-A3-030	Not visible	7.67	9.7	Discharge into watercourse/creek



## 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
February	13a Grand Avenue	0.3
February	Rydalmere Station	1.0
February	Dundas Station	2.2
February	Teloopa	1.9
February	Carlingford	8.2






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

Report Number	Date	Location	Start time	End time	Result (Fibres/Fields)	Result (Fibres/mL)
AMR186	26-Feb	RETAINING WALL 1 - MIDDLE GATE, EAST BOUNDARY	7:22	15:15	0/100	<0.01
AMR186	26-Feb	RETAINING WALL 1 - APPROXIMATE 50M NORTH OF MIDDLE GATE, EAST BOUNDARY	7:24	15:17	0/100	<0.01
AMR186	26-Feb	RETAINING WALL 1 - EAST BOUNDARY ADJ SITE SHEDS	7:26	15:19	0/100	<0.01
AMR186	26-Feb	RETAINING WALL 1 - NORTH GATE	7:28	15:21	0/100	<0.01
AMR187	26-Feb	NW OF EXCAVATION	13:11	15:11	0/100	<0.01
AMR187	26-Feb	NE OF EXCAVATION	13:12	15:12	0/100	<0.01
AMR187	26-Feb	S OF EXCAVATION	13:13	15:13	0/100	<0.01
AMR188	27-Feb	RETAINING WALL 2 - NORTH	7:05	12:50	0/100	<0.01
AMR188	27-Feb	RETAINING WALL 2 - SOUTH	7:06	12:52	0/100	<0.01
AMR188	27-Feb	RETAINING WALL 1 - NORTH	7:09	12:54	0/100	<0.01
AMR188	27-Feb	RETAINING WALL 1 - SOUTH	7:10	12:56	0/100	<0.01
AMR189	1-Mar	RETAINING WALL 2, SOUTHERN END	7:15	16:16	0/100	<0.01
AMR189	1-Mar	RETAINING WALL 2, MIDDLE	7:16	16:17	0/100	<0.01
AMR189	1-Mar	RETAINING WALL 2, NORTHERN END	7:17	16:18	0/100	<0.01
AMR189	1-Mar	RETAINING WALL 1, NORTHERN GATE, EASTERN BOUNDARY	7:20	16:19	0/100	<0.01
AMR189	1-Mar	RETAINING WALL 1, NORTHERN GATE WESTERN BOUNDARY	7:21	16:20	0/100	<0.01
AMR189	1-Mar	OVERPASS STOCKPILE, EASTERN GATE	7:25	16:27	0/100	<0.01
AMR189	1-Mar	RETAINING WALL 1 EASTERN BOUNDARY MIDDLE GATE	7:26	16:22	0/100	<0.01

AMR189	1-Mar	RETAINING WALL 1, WESTERN BOUNDARY, APPROX 30M NORTH OF MIDDLE GATE	7:27	16:23	0/100	<0.01
AMR189	1-Mar	RETAINING WALL 1, EASTERN BOUNDARY APPROX 60M NORTH OF MIDDLE GATE	7:28	16:24	0/100	<0.01
AMR190	2-Mar	OVERPASS STOCKPILE, EASTERN GATE	7:17	15:37	0/100	<0.01
AMR190	2-Mar	RETAINING WALL 1, 40M SOUTH OF MIDDLE GATE	7:18	15:56	0/100	<0.01
AMR190	2-Mar	RETAINING WALL 1, MIDDLE GATE	7:19	15:57	0/100	<0.01
AMR190	2-Mar	RETAINING WALL 1, 40M NORTH OF MIDDLE GATE	7:20	15:58	0/100	<0.01
AMR190	2-Mar	OVERPASS STOCKPILE, NW CORNER	7:29	15:38	0/100	<0.01
AMR190	2-Mar	RETAINING WALL 1, NORTH GATE	7:22	15:54	0/100	<0.01
AMR190	2-Mar	RETAINING WALL 1/2, JAMES HARDIE ABUTMENT	7:23	16:00	0/100	<0.01
AMR190	2-Mar	RETAINING WALL 2, SOUTHERN END	7:24	16:01	0/100	<0.01
AMR190	2-Mar	RETAINING WALL 2, MIDDLE	7:25	16:02	0/100	<0.01
AMR190	2-Mar	RETAINING WALL 2, NORTHERN END	7:26	16:03	0/100	<0.01
AMR190	2-Mar	SANDOWN NE CORNER	11:33	16:04	0/100	<0.01
AMR190	2-Mar	SANDOWN NW CORNER	11:34	16:05	0/100	<0.01
AMR190	2-Mar	SANDOWN SW CORNER	11:35	16:06	0/100	<0.01
AMR190	2-Mar	SANDOWN SE CORNER	11:36	16:07	0/100	<0.01
AMR191	3-Mar	RETAINING WALL 1, MIDDLE GATE	7:27	16:01	0/100	<0.01
AMR191	3-Mar	RETAINING WALL 1, APPROXIMATELY 40M NORTH OF MIDDLE GATE	7:28	16:02	0/100	<0.01
AMR191	3-Mar	RETAINING WALL 1, NORTHERN END, EASTERN BOUNDARY	7:30	16:03	0/100	<0.01
AMR191	3-Mar	RETAINING WALL 1, NORTHERN END, WESTERN BOUNDARY	7:31	16:04	0/100	<0.01
AMR191	3-Mar	RETAINING WALL 2, SOUTHERN END	7:32	16:05	0/100	<0.01



AMR191	3-Mar	RETAINING WALL 2, MIDDLE	7:33	16:06	0/100	<0.01
AMR191	3-Mar	RETAINING WALL 2, NORTHERN END	7:34	16:07	0/100	<0.01
AMR191	3-Mar	OVERPASS STOCKPILE, EASTERN GATE	7:18	15:54	0/100	<0.01
AMR191	3-Mar	OVERPASS STOCKPILE, NW CORNER	7:19	15:55	0/100	<0.01
AMR191	3-Mar	SANDOWN LINE, SE CORNER OF EXCAVATION	7:20	15:56	0/100	<0.01
AMR191	3-Mar	SANDOWN LINE, SW CORNER OF EXCAVATION	7:21	15:57	0/100	<0.01
AMR191	3-Mar	SANDOWN LINE, NW CORNER OF EXCAVATION	7:22	15:58	0/100	<0.01
AMR191	3-Mar	SANDOWN LINE, NE CORNER OF EXCAVATION	7:23	15:59	0/100	<0.01
AMR191	3-Mar	RETAINING WALL 1, APPROXIMATELY 40M SOUTH OF MIDDLE GATE	7:26	16:00	0/100	<0.01
AMR192	4-Mar	OVERPASS STOCKPILE, EASTERN GATE	7:41	15:33	0/100	<0.01
AMR192	4-Mar	OVERPASS STOCKPILE, NW CORNER	7:42	15:34	0/100	<0.01
AMR192	4-Mar	SANDOWN, SE CORNER	7:44	15:35	0/100	<0.01
AMR192	4-Mar	SANDOWN, SW CORNER	7:45	15:36	0/100	<0.01
AMR192	4-Mar	SANDOWN, NW CORNER	7:46	15:37	0/100	<0.01
AMR192	4-Mar	SANDOWN, NE CORNER	7:47	15:38	0/100	<0.01
AMR192	4-Mar	RETAINING WALL 1, 40M SOUTH OF MIDDLE GATE	7:51	15:39	0/100	<0.01
AMR192	4-Mar	RETAINING WALL 1, MIDDLE GATE	7:52	15:40	0/100	<0.01
AMR192	4-Mar	RETAINING WALL 1, 70M NORTH OF MIDDLE GATE	7:53	15:41	0/100	<0.01
AMR192	4-Mar	RETAINING WALL 1, NORTHERN GATE, EASTERN BOUNDARY	7:54	15:42	0/100	<0.01
AMR192	4-Mar	RETAINING WALL 1 NORTHERN GATE, WESTERN BOUNDARY	7:55	15:43	0/100	<0.01
AMR192	4-Mar	RETAINING WALL 2, SOUTHERN END	7:56	15:44	0/100	<0.01
AMR192	4-Mar	RETAINING WALL 2, MIDDLE	7:57	15:45	0/100	<0.01
AMR192	4-Mar	RETAINING WALL 2, NORTH END	7:58	15:46	0/100	<0.01
AMR193	5-Mar	RETAINING WALL 2, NORTHERN END	7:46	16:25	0/100	<0.01
AMR193	5-Mar	RETAINING WALL 2, MIDDLE	7:47	16:26	0/100	<0.01
AMR193	5-Mar	RETAINING WALL 2, SOUTH END	7:48	16:27	0/100	<0.01



AMR193	5-Mar	RETAINING WALL 1, NORTHERN GATE WESTERN BOUNDARY	7:49	16:28	0/100	<0.01
AMR193	5-Mar	RETAINING WALL 1, NORTHERN GATE EASTERN BOUNDARY	7:50	16:29	0/100	<0.01
AMR193	5-Mar	OVERPASS STOCKPILE	7:57	16:20	0/100	<0.01
AMR193	5-Mar	SANDOWN LINE, NE CORNER	7:58	16:21	0/100	<0.01
AMR193	5-Mar	SANDOWN LINE, NW CORNER	7:59	16:22	0/100	<0.01
AMR193	5-Mar	SANDOWN LINE, SW CORNER	8:00	16:23	0/100	<0.01
AMR193	5-Mar	SANDOWN LINE, SE CORNER	8:01	16:24	0/100	<0.01
AMR194	6-Mar	RETAINING WALL 2, NORTHERN END	7:26	14:42	0/100	<0.01
AMR194	6-Mar	RETAINING WALL 2, MIDDLE	7:27	13:43	0/100	<0.01
AMR194	6-Mar	RETAINING WALL 2, SOUTHERN END	7:28	12:44	0/100	<0.01
AMR194	6-Mar	RETAINING WALL 1, WESTERN BOUNDARY NORTHERN END	7:29	11:45	0/100	<0.01
AMR194	6-Mar	RETAINING WALL 1, EASTERN BOUNDARY NORTHERN END	7:30	10:46	0/100	<0.01
AMR195	8-Mar	RETAINING WALL 2 - NORTH	7:25	15:13	0/100	<0.01
AMR195	8-Mar	RETAINING WALL 2 - MIDDLE	7:27	15:15	0/100	<0.01
AMR195	8-Mar	RETAINING WALL 2 - SOUTH	7:29	15:16	0/100	<0.01
AMR195	8-Mar	RETAINING WALL 1 - NORTH GATE, WEST	7:31	15:18	0/100	<0.01
AMR195	8-Mar	RETAINING WALL 1 - NORTH GATE, EAST	7:33	15:20	0/100	<0.01

AMR195	8-Mar	CAMELLIA SOUTH - NW	7:40	15:24	0/100	<0.01
AMR195	8-Mar	CAMELLIA SOUTH - NE	7:42	15:25	0/100	<0.01
AMR195	8-Mar	CAMELLIA SOUTH - SE	7:44	15:27	0/100	<0.01
AMR195	8-Mar	CAMELLIA SOUTH - SW	7:46	15:29	0/100	<0.01
AMR196	9-Mar	S OF EXCAVATIONS	10:14	12:14	0/100	<0.01
AMR196	9-Mar	NW OF EXCAVATIONS	10:15	12:15	0/100	<0.01
AMR196	9-Mar	NE OF EXCAVATIONS	10:16	12:16	0/100	<0.01
AMR197	9-Mar	RETAINING WALL 2, NORTHERN END OF P RIVER BRIDGE	7:37	15:26	0/100	<0.01
AMR197	9-Mar	JAMES HARDIE BRIDGE, WESTERN BOUNDARY	7:38	15:27	0/100	<0.01
AMR197	9-Mar	RETAINING WALL 1/2, AT DECON UNIT ON CONCRETE BLOCKS	7:39	15:28	0/100	<0.01
AMR197	9-Mar	RETAINING WALL 1, EAST BOUNDARY, APPROX 50M NORTH OF MIDDLE GATE	7:40	15:32	0/100	<0.01
AMR197	9-Mar	RETAINING WALL 1, EAST BOUNDARY AT MIDDLE GATE	7:41	15:33	0/100	<0.01
AMR197	9-Mar	RETAINING WALL 1, EAST BOUNDARY APPROX 50M SOUTH OF MIDDLE GATE	7:42	15:34	0/100	<0.01
AMR197	9-Mar	CAMELLIA JUNCTION - EAST BOUNDARY, 50M NORTH OF SE CORNER	7:44	15:41	0/100	<0.01
AMR197	9-Mar	CAMELLIA JUNCTION - EAST BOUNDARY, AT SE CORNER	7:45	15:40	0/100	<0.01
AMR197	9-Mar	CAMELLIA JUNCTION - SOUTH BOUNDARY, APPROX 30M WEST OF SE CORNER	7:46	15:39	0/100	<0.01
AMR197	9-Mar	CAMELLIA JUNCTION - WEST BOUNDARY, APPROX 20M NORTH OF SW CORNER	7:47	15:38	0/100	<0.01
AMR197	9-Mar	CAMELLIA JUNCTION - WEST BOUNDARY, APPROX 50M NORTH OF SW CORN	7:48	15:37	0/100	<0.01

AMR197	9-Mar	CAMELLIA JUNCTION - EAST BOUNDARY, APPROX 100M NORTH OF SE CORNER	7:43	15:36	0/100	<0.01
AMR198	10-Mar	RETAINING WALL 2, NORTH END AT PARRAMATTA RIVER BRIDGE	7:16	16:01	0/100	<0.01
AMR198	10-Mar	JAMES HARDIE BRIDGE, WESTERN SITE BOUNDARY	7:17	16:00	0/100	<0.01
AMR198	10-Mar	GATE 22, ADJACENT DECON UNIT	7:18	15:59	0/100	<0.01
AMR198	10-Mar	RETAINING WALL 1, APPROX 50M NORTH OF MIDDLE GATE, EASTERN BOUNDARY	7:19	15:58	0/100	<0.01
AMR198	10-Mar	RETAINING WALL 1, MIDDLE GATE EASTERN BOUNDARY	7:20	15:57	0/100	<0.01
AMR198	10-Mar	RETAINING WALL 1, APPROX 50M SOUTH OF MIDDLE GATE, EASTERN BOUNDARY	7:21	15:56	0/100	<0.01
AMR198	10-Mar	CAMELLIA JUNCTION, EASTERN BOUNDARY APPROX 50M NORTH OF SE CORNER	7:22	15:55	0/100	<0.01
AMR198	10-Mar	CAMELLIA JUNCTION, EASTERN BOUNDARY APPROX 20M NORTH OF SE CORNER	7:23	15:54	0/100	<0.01
AMR198	10-Mar	CAMELLIA JUNCTION, EASTERN BOUNDARY AT SE CORNER	7:24	15:53	0/100	<0.01
AMR198	10-Mar	CAMELLIA JUNCTION, SOUTHERN BOUNDARY APPROX 30M FROM SW CORNER	7:25	15:52	0/100	<0.01
AMR198	10-Mar	CAMELLIA JUNCTION, WESTERN BOUNDARY APPROX 30M FROM SW CORNER	7:26	15:51	0/100	<0.01
AMR198	10-Mar	OVERPASS STOCKPILE, EASTERN GATE	7:27	15:50	0/100	<0.01
AMR199	11-Mar	E SITE BOUNDARY (13A)	7:39	15:08	0/100	<0.01
AMR199	11-Mar	S SITE BOUNDARY (13A)	7:41	15:09	0/100	<0.01
AMR199	11-Mar	W SITE BOUNDARY (13A)	7:43	15:10	0/100	<0.01
AMR199	11-Mar	N SITE BOUNDARY (13A)	7:45	15:11	0/100	<0.01
AMR200	12-Mar	11B DRAINAGE - NW BOUNDARY OF WORKS	7:50	14:45	0/100	<0.01


AMR200	12-Mar	11B DRAINAGE - NE BOUNDARY OF WORKS	7:51	14:46	0/100	<0.01
AMR200	12-Mar	11B DRAINAGE - SE BOUNDARY OF WORKS	7:53	14:50	0/100	<0.01
AMR200	12-Mar	11B DRAINAGE - SW BOUNDARY OF WORKS	7:55	14:51	0/100	<0.01
AMR201	13-Mar	OVERPASS AREA, EASTERN GATE	7:03	13:36	0/100	<0.01
AMR201	13-Mar	CAMELLIA JUNCTION, WESTERN BOUNDARY APPROX 50M NORTH OF SW CORNER	7:04	13:35	0/100	<0.01
AMR201	13-Mar	CAMELLIA JUNCTION, SOUTHERN BOUNDARY APPROX 30M EAST OF SW BOARDER	7:05	13:34	0/100	<0.01
AMR201	13-Mar	CAMELLIA JUNCTION, SW CORNER	7:06	13:33	0/100	<0.01
AMR201	13-Mar	CAMELLIA JUNCTION, EASTERN BOUNDARY APPROX 30M NORTH OF SW CORNER	7:07	13:32	0/100	<0.01
AMR201	13-Mar	CAMELLIA JUNCTION, EASTERN BOUNDARY APPROX 80M NORTH OF SE CORNER	7:08	13:31	0/100	<0.01
AMR201	13-Mar	RETAINING WALL 1, EASTERN BOUNDARY APPROX 50M SOUTH OF MIDDLE GATE	7:09	13:30	0/100	<0.01
AMR201	13-Mar	RETAINING WALL 1, EASTERN BOUNDARY AT MIDDLE GATE	7:10	13:29	0/100	<0.01
AMR201	13-Mar	RETAINING WALL 1, EASTERN BOUNDARY APPROX 50M NORTH OF MIDDLE GATE	7:11	13:28	0/100	<0.01
AMR201	13-Mar	GATE 22	7:12	13:27	0/100	<0.01
AMR201	13-Mar	JAMES HARDIE BRIDGE, WESTERN BOUNDARY	7:13	13:26	0/100	<0.01
AMR201	13-Mar	RETAINING WALL 2, NORTHERN END	7:14	13:25	0/100	<0.01

AMR202	15-Mar	CAMELIA ALIGNMENT - NTH END OF RETAINING WALL 1	7:40	15:01	0/100	<0.01
AMR202	15-Mar	CAMELIA ALIGNMENT - WTH END OF RETAINING WALL 1	7:42	15:04	0/100	<0.01
AMR202	15-Mar	CAMELIA ALIGNMENT - STH END OF RETAINING WALL 1	7:48	15:07	0/100	<0.01
AMR202	15-Mar	CAMELIA ALIGNMENT - MIDDLE OF RETAINING WALL 1	7:53	15:11	0/100	<0.01
AMR202	15-Mar	CAMELIA ALIGNMENT - STH END OF RETAINING WALL 1, EAST OF WORKS	8:10	15:20	0/100	<0.01
AMR202	15-Mar	CAMELIA ALIGNMENT - STH END OF RETAINING WALL 1, SE OF WORKS	8:12	15:21	0/100	<0.01
AMR202	15-Mar	CAMELIA ALIGNMENT - STH END OF RETAINING WALL 1, SW OF WORKS	8:14	15:24	0/100	<0.01
AMR202	15-Mar	CAMELIA ALIGNMENT - STH END OF RETAINING WALL 1, WEST OF WORKS	8:17	15:27	0/100	<0.01
AMR203	16-Mar	CAMELLIA JUNCTION, WESTERN BOUNDARY APPROX 40M NORTH FROM SW CORNER	7:42	15:40	0/100	<0.01
AMR203	16-Mar	CAMELLIA JUNCTION, SOUTHERN BOUNDARY APPROX 30M EAST OF SW CORNER	7:43	15:41	0/100	<0.01
AMR203	16-Mar	CAMELLIA JUNCTION, SE CORNER	7:44	15:42	0/100	<0.01
AMR203	16-Mar	OVERPASS AREA, EASTERN GATE	7:45	15:43	0/100	<0.01
AMR203	16-Mar	CAMELLIA JUNCTION, EAST BOUNDARY, APPROX 40M NORTH OF SE CORNER	7:46	15:44	0/100	<0.01
AMR203	16-Mar	CAMELLIA JUNCTION, EAST BOUNDARY, APPROX 80M NORTH OF SE CORNER	7:47	15:45	0/100	<0.01
AMR203	16-Mar	RETAINING WALL 1, EAST BOUNDARY, APPROX 50M SOUTH OF MIDDLE GATE	7:48	15:46	0/100	<0.01
AMR203	16-Mar	RETAINING WALL 1, EAST BOUNDARY, APPROX AT MIDDLE GATE	7:49	15:47	0/100	<0.01





AMR203	16-Mar	RETAINING WALL 1, EAST BOUNDARY, APPROX 50M NORTH OF MIDDLE GATE	7:50	15:48	0/100	<0.01
AMR203	16-Mar	JAMES HARDIE BRIDGE AREA, EASTERN BOUNDARY AT CAR PARK FENCE	7:51	15:49	0/100	<0.01
AMR203	16-Mar	JAMES HARDIE BRIDGE AREA, WESTERN BOUNDARY UNDER BRIDGE	7:52	15:50	0/100	<0.01
AMR203	16-Mar	RETAINING WALL 2, NORTHERN END	7:53	15:51	0/100	<0.01
AMR204	17-Mar	OVERPASS AREA, EASTERN GATE	7:16	16:07	0/100	<0.01
AMR204	17-Mar	CAMELLIA JUNCTION WEST BOARDER APPROX 40M NORTH OF SW CORNER	7:17	16:08	0/100	<0.01
AMR204	17-Mar	CAMELLIA JUNCTION SOUTH BOARDER APPROX 20M EAST OF SW CORNER	7:18	16:09	0/100	<0.01
AMR204	17-Mar	CAMELLIA JUNCTION EAST BOARDER APPROX 20M NORTH OF SE CORNER	7:19	16:10	0/100	<0.01
AMR204	17-Mar	JAMES HARDIE BRIDGE, WEST BOUNDARY	7:20	16:11	0/100	<0.01
AMR204	17-Mar	RETAINING WALL 1, EAST BOUNDARY APPROX 50M NORTH OF MIDDLE GATE	7:21	16:12	0/100	<0.01
AMR204	17-Mar	GATE 22	7:22	16:13	0/100	<0.01
AMR203	16-Mar	JAMES HARDIE BRIDGE AREA, EASTERN BOUNDARY AT CAR PARK FENCE	7:51	15:49	0/100	<0.01
AMR203	16-Mar	JAMES HARDIE BRIDGE AREA, WESTERN BOUNDARY UNDER BRIDGE	7:52	15:50	0/100	<0.01
AMR203	16-Mar	RETAINING WALL 2, NORTHERN END	7:53	15:51	0/100	<0.01
AMR204	17-Mar	OVERPASS AREA, EASTERN GATE	7:16	16:07	0/100	<0.01



AMR204	17-Mar	CAMELLIA JUNCTION WEST BOARDER APPROX 40M NORTH OF SW CORNER	7:17	16:08	0/100	<0.01
AMR204	17-Mar	CAMELLIA JUNCTION SOUTH BOARDER APPROX 20M EAST OF SW CORNER	7:18	16:09	0/100	<0.01
AMR204	17-Mar	CAMELLIA JUNCTION EAST BOARDER APPROX 20M NORTH OF SE CORNER	7:19	16:10	0/100	<0.01
AMR204	17-Mar	JAMES HARDIE BRIDGE, WEST BOUNDARY	7:20	16:11	0/100	<0.01
AMR204	17-Mar	RETAINING WALL 1, EAST BOUNDARY APPROX 50M NORTH OF MIDDLE GATE	7:21	16:12	0/100	<0.01
AMR204	17-Mar	GATE 22	7:22	16:13	0/100	<0.01