



ENVIRONMENTAL MONITORING REPORT, DECEMBER 2020

PARRAMATTA LIGHT RAIL INFRASTRUCTURE WORKS

25 December 2020

Parramatta
Connect

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1. Introduction

1.1. Background

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

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

Key features of Stage 1 include:

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



1.1.1. Statutory Context

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.

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 Reports.



Table 1-1 Monthly Environmental Monitoring Reporting Requirements

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



2. Site Activities

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

Table 2-1 Site Activities During Reporting Period

Precinct	Site Activities
Westmead and North Parramatta	Westmead
	<ul style="list-style-type: none">– Drainage works– Ongoing Combined Service Route and track works
	Cumberland
	<ul style="list-style-type: none">– Ongoing utilities works, drainage and Combined Service Route works
Parramatta CBD	North Parramatta
	<ul style="list-style-type: none">– Property adjustments– Utilities works nearing completion– Commencement of drainage, Combined Service Route and track works
	Area 2 West (CBD)
	<ul style="list-style-type: none">– Ongoing utility, multifunction poles, electrical and lighting works– Microtunnel foreshore works (Pit 6 to Pit 5 drive by manual tunnelling); works through Lennox Bridge now completed– Ongoing tree pits and Combine Service Route works along Church Street and Macquarie Street– Drainage works along North Lennox Bridge, Church Street and Macquarie Street– Track works along Macquarie Street and Church Street
Camellia and Carlingford line	Area 2 East (Smith Street to Arthur Street)
	<ul style="list-style-type: none">– Ongoing utility works along George Street between Harris to Purchase Street, Purchase Street to Arthur Street, Macquarie/Charles Intersection and Macquarie Street– Sewer relocation works along Barrack Lane– Ongoing multifunction pole works– Ongoing Combined Service Route works along Tramway Avenue and Macquarie Street– Drainage works along Tramway Avenue, Robin Thomas Reserve and Macquarie Street– Track works along Macquarie Street
	Camellia
	<ul style="list-style-type: none">– Bridge girder installation for James Ruse Drive Bridge– Ongoing retaining wall works– Ongoing utility works at Grand Avenue– Ongoing stormwater drainage, Combined Service Route and track works along Sandown Line
	Carlingford Line
	<ul style="list-style-type: none">– Kissing Point Road Bridge track works



Precinct	Site Activities
	<ul style="list-style-type: none">- Vineyard Creek Bridge girder installation- Victoria Road and Adderton Road deflection wall works- Combined Service Route and lighting works in Carlingford- Retaining wall and stormwater drainage works from Rydalmere to Carlingford- Leamington Road underpass form retain pour works- Ongoing utility works at Winter Street



3. Monitoring Results

Section 3 presents a summary of the environmental inspection and monitoring programs completed during the reporting period (26 November 2020 to 25 December 2020). Detailed monitoring results for each activity are presented in the appendices to this report.

3.1. Inspections

A total of four ER inspections, two AA inspections and six TfNSW inspections were completed during the reporting period in addition to 22 internal inspections. **Table 3-1** provides a summary of the number of actions raised and closed within the agreed timeframe.

Table 3-1 Inspections for December 2020

Date	Number of Inspections	Type	Actions	Closed in Time
26/11/2020	1	TfNSW Inspection	9	Yes
1/12/2020	1	TfNSW Inspection	5	Yes
1/12/2020	2	Internal Inspection	14	Yes
7/12/2020	7	Internal Inspection	17	Yes
7/12/2020	2	TfNSW Inspection	14	Yes
8/12/2020	1	ER Inspection	7	Yes
09/12/2020	1	TfNSW Inspection	3	Yes
09/12/2020	1	AA Inspection	1	Yes
10/12/2020	1	Internal Inspection	5	Yes
11/12/2020	1	TfNSW Inspection	10	Yes
11/12/2020	1	ER Inspection	7	Yes
11/12/2020	1	Internal Inspection	7	Yes
14/12/2020	1	Internal Inspection	6	Yes
15/12/2020	1	ER Inspection	15	Yes
15/12/2020	2	Internal Inspection	20	Yes
15/12/2020	1	TfNSW Inspection	4	Yes
17/12/2020	2	Internal Inspection	7	Yes
21/12/2020	1	AA Inspection	2	Yes
22/12/2020	1	ER Inspection	2	Yes
23/12/2020	6	Internal Inspection	11	Yes



Total	35	-	166	-
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3.2. Weather

The total rainfall during the reporting period was 77.6mm with ten days with over 1mm of rain. No rain events exceeded the 80th percentile (25.8mm) and the 85th percentile (33.1mm).

During the reporting period, there were 26 days where the maximum wind gust recorded was greater than 25km/hr and 5 days where the maximum wind gust recorded was greater than 50km/hr. There was a total of 24 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 December 2020 are presented in **Appendix A-1**.

Table 3-2 Weather Summary and Trigger Weather Events for December¹ 2020

Weather Event	Forecast	Observation
Minimum temperature	12°C	11.5°C
Maximum temperature	37°C	40.6°C
Total rainfall	84.4mm	77.6mm
Number of days with rain (>1mm)	13 days	10 days
>80 th percentile (25.8mm) rain events	1 day	No days
Flood warning / events	No events	No events
>25km/hr wind ²	23 days	26 days
>50km/hr wind	1 day	5 days

¹Weather summary based on data from the 26 November to 25 December 2020 (30 days).

²Wind 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.

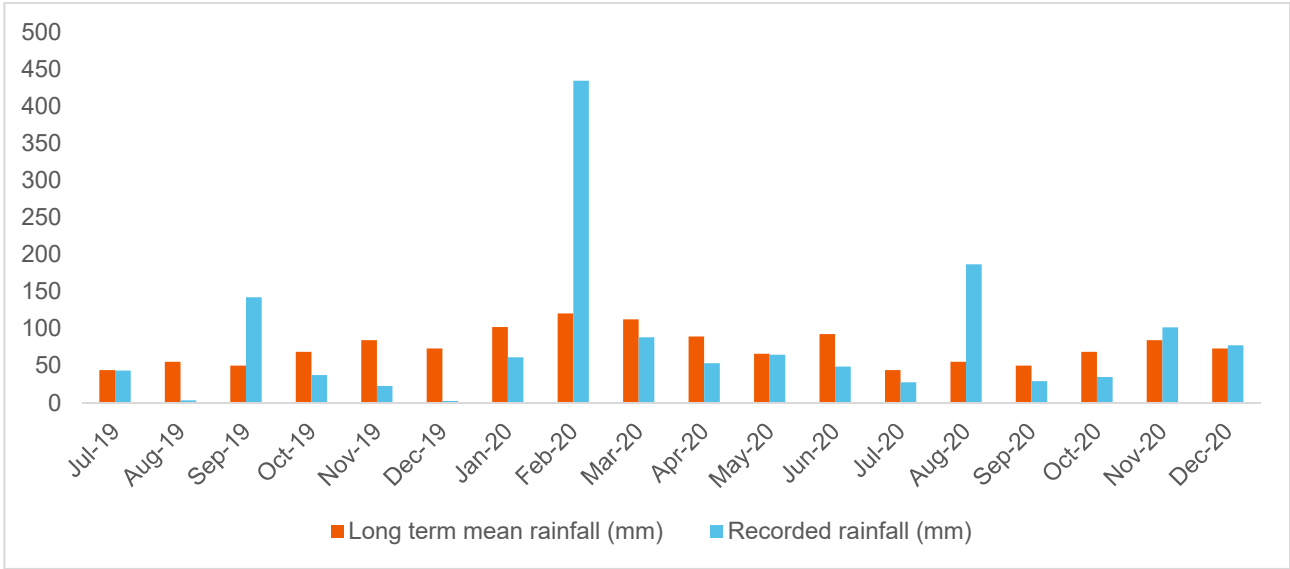


Figure 3-1 Monthly rainfall comparison

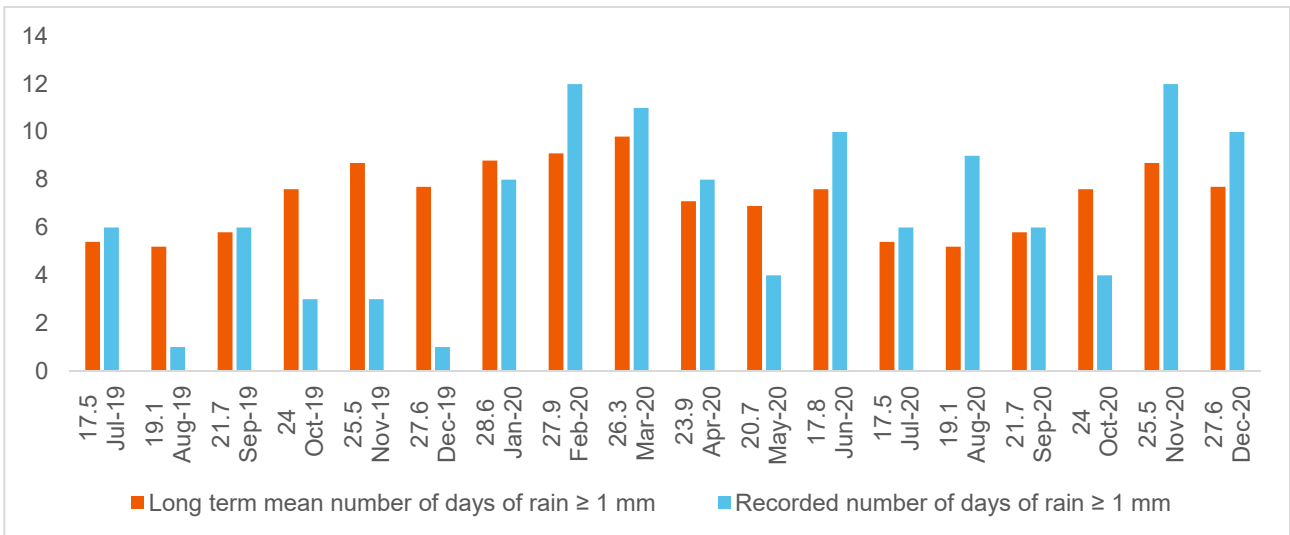


Figure 3-2 Monthly rain days comparison

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**. One noise level ($L_{Aeq15min}$) recorded during the reporting period was above the predicted noise level. However, the noise was attributed to nearby traffic and not associated with construction.

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.

All noise and vibration monitors used during the reporting period, together with current NATA calibration data, is 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 (**Table 3-6**). In consultation with the Health Administration Corporation, monitoring will be ongoing for 12 months.

Table 3-3 Summary of Noise Monitoring December 2020

Date	Monitoring Location	Attended/Continuous	Description
03/12/2020	Corner of Albert/Church St	Attended	General construction
03/12/2020	Church St	Attended	General construction
03/12/2020	Church St	Attended	General construction
03/12/2020	Lennox Bridge	Attended	General construction
04/12/2020	45 Macquarie Street	Attended	General construction
18/12/2020	22 Adderton Road, Telopea	Attended	Monthly ambient monitoring
18/12/2020	89 Marshall Road Telopea	Attended	Monthly ambient monitoring
18/12/2020	Carlingford Station	Attended	Monthly ambient monitoring
18/12/2020	Dundas Station	Attended	Monthly ambient monitoring
18/12/2020	Telopea Station	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 December 2020

Date	Monitoring Location	Attended/Continuous	Description
30/11/2020	15 Grand Ave	Attended	General construction
04/12/2020	459 Church Street	Attended	General construction
04/12/2020	Church St	Attended	General construction
10/12/2020	Robin Thomas Reserve	Attended	General construction



Date	Monitoring Location	Attended/Continuous	Description
10/12/2020	Robin Thomas Reserve	Attended	General construction
16/06/2020	Hawkesbury Road Westmead Institute for Medical Research (HAL incubators)	Continuous	General construction
16/06/2020	Hawkesbury Road Westmead Institute for Medical Research (Microscopy Labs)	Continuous	General construction
16/06/2020	Hawkesbury Road Children's Medical Research Institute (Microscopy Labs)	Continuous	General construction

Table 3-5 Noise and Vibration Monitors and NATA Calibration

Equipment	Serial Number	Calibration Due Date
Noise Level Meter	00973277	18/12/2020 ¹
Noise Level Meter	00661732	19/05/2021
Noise Level Meter	00973275	17/12/2021
Vibration Monitor	BE17441	16/07/2021

1. Noise Level Meter 00973277 was removed from service on 18/12/2020

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
		Brain Dynamics Centre
Children's Medical Research Institute	Vibration Monitor	Microscopy Labs
	Noise Monitor	Labs (Level 1)
Cumberland Hospital	Noise Monitor	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, dry and wet weather monitoring for the quarter was undertaken as summarised in **Table 3-7** and detailed in **Table A-3-1**. It is noted that elevated pH levels were recorded at two upstream locations and therefore not attributed to construction works.

The wet weather monitoring was undertaken during a 58.4mm 10-day rainfall event. Overall the water levels were moderate to high at the time of sampling and overall there were little to no debris or leaf litter present. All results were within the water quality objectives.

Table 3-7 Water Quality in Receiving Waters

Date	Type	Type of Results	Wet / Dry	Locations
09/12/2020	Monitoring during construction	Laboratory	Dry	Parramatta River: PR1; PR3; PR4; PR5; PR6 Domain Creek: DC1 Clay Cliff Creek: CC1, CC2 Vineyard Creek: VY1; VY2 Subiaco Creek: SC1 A'becketts Creek: AC1, AC2
18/12/2020	Monitoring during construction	Field	Wet	Parramatta River: PR1; PR3; PR4; PR5; PR6 Domain Creek: DC1 Clay Cliff Creek: CC1, CC2 Vineyard Creek: VY1; VY2 Subiaco Creek: SC1

Table 3-8 Water Monitor Calibration

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

¹All equipment is calibrated by NATA standards.

3.4.2. Discharge and dewatering

There were three discharge events during the reporting period as presented in **Table A-3-2**.

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/m² 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.

Dust deposition results are summarised in **Table A-4-1** in **Appendix A-4**, noting that data is received one month in arrears.

Results from the previous reporting period show that 13a Grand Avenue and Telopea levels are outside TIM limits. It is noted that during the November reporting period, 30 out of 31 days recorded wind gusts over 25km/hr with two of those 30 days recorded wind gusts over 50km/hr. While the strong wind speeds likely contributed to the results, additional controls have been deployed by the construction team to minimise risk including the increased deployment of water carts. In addition, prior to the December holiday shut-down period, stockpiles were covered and areas of disturbance were sealed.

3.5.2. Asbestos Fibre Monitoring

All 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.

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.

Asbestos Fibre Monitoring results are summarised in **Table A-4-2** in **Appendix A-4**. None of the results in the reporting period exceeded the trigger limits.

3.6. Flora and Fauna

3.6.1. Grey-Headed Flying Fox Monitoring

Under Condition of Approval C9, a Grey-Headed Flying Fox (GHFF) Construction Monitoring Program was developed by TfNSW and the requirements reflected in the Flora and Fauna Management Sub-Plan.

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

Visual observation inspections must be carried out during the 'high risk' months of September to January, inclusive (**Table 3-9**). If distress is observed within the camp, immediate notification must be provided to TfNSW. During the reporting period, no indicators of stress or abnormal behaviour were observed during weekly inspections.

Table 3-9 Observations from Visual Monitoring

Date	Time	Temperature	Works	Notification Triggers ¹	Comments
4/12/2020	13:08	34.5°C	Utility works, truck movement and stockpile management	No	No indicators of stress or abnormal behaviour were observed during the inspection. No construction works can be heard.
11/12/2020	10:00	22.5°C	No PCPLR works, only Donnelley construction demolition	No	No indicators of stress or abnormal behaviour were observed during the inspection.



Date	Time	Temperature	Works	Notification Triggers ¹	Comments
					No construction works can be heard.
17/12/2020	14:00	19.9°C	Utility works	No	No indicators of stress or abnormal behaviour were observed during the inspection. No construction works can be heard.
24/12/2020	10:30	23°C	No PCPLR works	No	No indicators of stress or abnormal behaviour were observed during the inspection. No construction works can be heard.

¹Notification 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).

3.7. Issues/incidents/non-compliance

Table 3-10 provides a summary of environmental compliance during the reporting period.

There was one non-compliance and one environmental incident during the reporting period. Neither the incident or the non-compliance was notifiable to DPIE or the EPA as they were minor in nature. The incidents are summarised as follows:

Table 3-10 Issues/incidents/non-compliances

Date	Location	Description
27/11/2020	Dundas	A community complaint regarding the Dundas footpath diversion was not entered into the complaints register within the allocated timeframe as defined in the Community Communication Strategy. It is noted that the complaint was appropriately managed and recorded in Consultation Manager.
01/12/2020	Cumberland	A sewer bypass pipe was installed above ground to maintain sewer flow within existing sewer network prior to switching over to newly installed sewer. A Sydney Water approval was in place for the works, however, the bypass pipe was placed outside Approved Project boundary footprint prior to completing required Environmental Review (as required by the CEMP). There were no excavation works conducted outside of the Approved Project boundary.
15/12/2020	Church Street	During a rainfall event, an oil slick was identified on the road surface. No plant or equipment were operating in the area and there were no works being undertaken. The spill kit was deployed and erosion and sediment controls were in place around the stormwater pit.



Date	Location	Description
23/12/2020	Westmead	Following a TfNSW review, it was determined that two trees (TN 1045 and an unmarked tree) were removed in April/May 2020 prior to obtaining Independent Arborist approval. In the case of TN 1045, approval for removal was sought from the Independent Arborist, but the tree was not included in the Tree Register. Both TN 1045 and the unmarked tree were fully encroached by the Approved Project works and approval for removal will be sought retrospectively.



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	°C	%			
26/11/2020	16.6	34.3	0	23.5	67	0	NNW	6
27/11/2020	17.5	31.7	0	20.5	75	8	WSW	2
28/11/2020	18.2	40.6	0	31.6	78	5	NNW	6
29/11/2020	26.5	40.5	0	32.8	39	6	NW	15
30/11/2020	18	23.5	0	20.7	65	8	ESE	4
1/12/2020	15	33.6	0	21.2	79	8	NNE	6
2/12/2020	16.7	23	11.8	21.2	76	8	SE	19
3/12/2020	16.6	25	0.2	20	77	8	NE	2
4/12/2020	17.1	34.5	0	25	66	0	W	4
5/12/2020	16.8	25.5	0	20	83	8	W	4
6/12/2020	19	29.8	7.2	24.2	49	1	WNW	15
7/12/2020	15.4	29.7	0	24.5	42	3	NW	11
8/12/2020	14.8	24	0	19	46	1	SW	11
9/12/2020	15.2	27.2	0	19.8	63	1	W	2
10/12/2020	13.6	28.2	0	22.2	66	2	WSW	4
11/12/2020	15.5	22.5	0	19.5	56	6	SE	11
12/12/2020	15.8	24.2	0	21	57	8	E	6
13/12/2020	12.3	23.6	1.6	21	66	6	ESE	6
14/12/2020	16.6	24.5	5	20.8	89	8	SW	4
15/12/2020	18	25	6.6	21.2	98	8	ESE	2
16/12/2020	20	29.5	11	24.2	90	7	NE	6
17/12/2020	19.9	33.3	2.4	26.6	74	6	NNW	6
18/12/2020	20	31.2	0.6	30.7	60	6	W	4
19/12/2020	18.5	19.9	1.6	19.2	81	8	SSE	9
20/12/2020	17.2	23.8	4.8	18.2	98	8	SE	4
21/12/2020	16.8	24	0.4	20.7	93	8	ENE	2
22/12/2020	17	27.7	24.4	20.2	98	8	NNW	4
23/12/2020	11.5	26	0	21.5	58	2	SSW	9
24/12/2020	15.8	28.5	0	21.4	74	6	NW	2
25/12/2020	17.3	*	0	19	83	8	SSW	19



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
26/11/2020	SSE	41	19:42	NW	4	ESE	19
27/11/2020	S	31	23:14	*	Calm	E	15
28/11/2020	NW	46	12:07	*	Calm	NW	19
29/11/2020	WNW	78	13:59	NW	24	WNW	43
30/11/2020	E	31	14:14	SE	11	ESE	20
1/12/2020	SW	50	17:32	N	11	E	17
2/12/2020	SSE	35	2:13	SE	17	ESE	17
3/12/2020	NE	24	13:58	ENE	6	NNE	19
4/12/2020	WSW	35	13:17	NW	4	ESE	19
5/12/2020	N	35	20:43	*	Calm	N	9
6/12/2020	WNW	50	11:53	NW	15	WNW	22
7/12/2020	WNW	48	14:33	NW	17	WNW	20
8/12/2020	SSW	43	23:11	SW	19	ESE	20
9/12/2020	ESE	35	14:39	WNW	11	ENE	13
10/12/2020	SSE	56	12:47	*	Calm	SSE	26
11/12/2020	SE	43	10:29	SSE	19	SE	20
12/12/2020	E	37	11:50	ESE	11	ESE	20
13/12/2020	ESE	33	20:01	ESE	7	ESE	19
14/12/2020	ESE	35	9:43	ESE	7	E	19
15/12/2020	ENE	33	12:53	ESE	11	ENE	13
16/12/2020	ENE	31	15:00	NE	11	ENE	11
17/12/2020	NE	33	16:06	N	9	ENE	9
18/12/2020	SSE	39	16:35	WNW	6	N	15
19/12/2020	S	30	23:53	SSE	15	SSE	7
20/12/2020	ESE	20	15:43	*	Calm	ENE	7
21/12/2020	E	22	12:11	*	Calm	E	7
22/12/2020	W	43	13:34	WNW	9	WNW	19
23/12/2020	SE	37	14:46	SW	13	SE	24
24/12/2020	ESE	28	13:26	NNW	9	E	15
25/12/2020	*	*	*	S	17	SSE	15

Notes:

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

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

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

* 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 (dBA)	Predicted (dBA)	Additional Mitigation Measures	L _{Amax}	Recorded L _{eq, 15min} (dBA)	Exceedance of Predicted (dBA)	Exceedance of Predicted	Comments
03/12/2020	23:20	OOHW Period 2	Utility and pre-track works	Intersection	Corner of Albert/Church St	44	108	PN, V	74.7	70.1	-37.9	No	Construction noise is the dominant noise source. HNIW were undertaken sporadically.
03/12/2020	09:58	Standard Hours	Asphalt milling	Between Phillip Street/Lennox bridge	Church St	70	85	PN, V	89.6	81.1	-3.9	No	Construction noise is the dominant noise source
03/12/2020	09:30	Standard Hours	Asphalt milling	Between Phillip Street/Lennox bridge	Church St	-	92	-	99.3	88	-4	No	Plant spot check
03/12/2020	16:04	Standard Hours	Hand tunnelling	Lennox Bridge	Lennox Bridge	68	75	PN, V	92.9	71	-4	N/A	Construction noise inaudible; noise attributed to members of public
04/12/2020	23:30	OOHW Period 1	Box out	19 Macquarie Street	45 Macquarie Street	61	48	PN, V, RP	79.5	64.2	+16.2	N/A	Construction noise inaudible Exceedance of predicted value due to third party traffic movement
18/12/2020	09:41	Standard Hours	Loading soil	22 Adderton Road, Telopea	22 Adderton Road, Telopea	56	-	-	85.4	66.8	-	N/A	Monthly ambient monitoring
18/12/2020	08:55	Standard Hours	Retaining wall	Telopea	89 Marshall Road Telopea	52	-	-	72.5	65.7	-	N/A	Monthly ambient monitoring
18/12/2020	08:20	Standard Hours	Drainage works	Carlingford	Carlingford Station	62	-	-	84.9	60.6	-	N/A	Monthly ambient monitoring
18/12/2020	10:06	Standard Hours	No works	Dundas	Dundas Station	55	-	-	72.1	55.2	-	N/A	Monthly ambient monitoring
18/12/2020	09:18	Standard Hours	Loading spoil into bogie	Telopea	Telopea Station	53	-	-	82.5	69.9	-	N/A	Monthly ambient monitoring
26/06/2020 - ongoing	Continuous monitoring	Construction works	Hawkesbury Road works	Westmead Institute for Medical Research (Sleep Lab)		40	*	*	*	*	*	No	
26/06/2020 - ongoing	Continuous monitoring	Construction works	Hawkesbury Road works	Westmead Institute for Medical Research (Brain Dynamics Centre)		60	*	*	*	*	*	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	Children's Medical Research Institute (Microscopy Labs)		60	*	*	*	*	*	No	
26/06/2020 - ongoing	Continuous monitoring	Construction works	Cumberland Hospital	Cumberland Hospital (Clinical psychology rooms)		60	*	*	*	*	*	No	

Notes:

Standard hours:

- a) All areas excluding Eat Street and Camellia – Monday to Friday 7:00am to 7:00pm. Saturday 8:00am to 6:00pm
- b) Eat Street (Church Street between Palmer Street and George Street) – Monday to Friday 7:00am to 6:00pm. Saturday 8:00am to 12:00pm)
- 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
- b) 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
30/11/2020	08:30-12:00	Standard work hours	Concrete hammering	15 Grand Ave	15 Grand Ave	25	20.7	No	No	No comment
04/12/2020	08:45-09:00	Standard work hours	Vibratory roller	Between Pennant Hills Road and Harold Street	459 Church Street	25	5.04 (PPV)	No	No	No comment
04/12/2020	09:15-10:35	Standard work hours	Asphalt milling	Church Street between Phillip Street and Lennox Bridge	Church St	7.5	2.415	No	No	No comment
10/12/2020	12:30-12:45	Standard work hours	Vibratory roller - baseline, no works	Robin Thomas Reserve	Robin Thomas Reserve	25	0.319	No	No	No comment
10/12/2020	13:05-13:20	Standard work hours	Vibratory rolling	Robin Thomas Reserve	Robin Thomas Reserve	25	2.814	No	No	No comment
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	
26/06/2020		Continuous monitoring	Hawkesbury Road works	Hawkesbury Road	Children's Medical Research Institute (Microscopy Labs)	0.1 mm/s	*	No	No	

A-3 Water Sampling and Discharge Results

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

Location	Waterway	Upstream/ Downstream of Works ³	Type	Date	Time	pH 5.5-8.5 ²	Elec. Conduct. (µS/cm) LR ¹ : 125-2200 ² E: None	Turbidity (NTU) 6-50 ²	Comments and Observations
PR1	Parramatta River	Upstream	Dry	09/12/2020	9.34	8.11	360	0.0	No Comment
DC1	Domain Creek	N/A	Dry	09/12/2020	10.51	7.71	306	0.0	No Comment
PR3	Parramatta River	Upstream	Dry	09/12/2020	9.05	7.87	351	0.0	No Comment
PR4	Parramatta River	Upstream	Dry	09/12/2020	17.08	9.32	1050	7.2	No Comment
PR5	Parramatta River	Downstream	Dry	09/12/2020	16.43	8.46	39300	0.0	No Comment
CC1	Clay Cliff Creek	Upstream	Dry	09/12/2020	16.27	8.23	26600	6.3	No Comment
CC2	Clay Cliff Creek	Downstream	Dry	09/12/2020	16.14	8.02	35900	0.0	No Comment
VY2	Vineyard Creek	Downstream	Dry	09/12/2020	11.49	8.29	672	13.7	No Comment
VY1	Vineyard Creek	Upstream	Dry	09/12/2020	11.37	7.85	431	0.6	No Comment
PR6	Parramatta River	Downstream	Dry	09/12/2020	12.08	8.15	39100	0.0	No Comment
SC1	Subiaco Creek	N/A	Dry	09/12/2020	12.33	7.69	35400	0.0	No Comment
AC1	A'becketts Creek	Upstream	Dry	09/12/2020	15.48	7.72	19600	6.3	No Comment
AC2	A'becketts Creek	Downstream	Dry	09/12/2020	15.34	7.89	11300	2.9	No Comment
PR1	Parramatta River	Upstream	Wet	21/12/2020	13:38	8.39	305	0.0	No Comment
DC1	Domain Creek	N/A	Wet	21/12/2020	15:58	8.20	216	0.0	No Comment
PR3	Parramatta River	Upstream	Wet	21/12/2020	16:26	7.83	306	0.0	No Comment
PR4	Parramatta River	Upstream	Wet	21/12/2020	18:50	8.35	323	2.7	No Comment
PR5	Parramatta River	Downstream	Wet	21/12/2020	18:34	7.83	22200	1.6	No Comment
CC1	Clay Cliff Creek	Upstream	Wet	21/12/2020	18:15	8.54	76	46.1	No Comment
CC2	Clay Cliff Creek	Downstream	Wet	21/12/2020	18:00	8.37	106	44.4	No Comment
VY2	Vineyard Creek	Downstream	Wet	21/12/2020	17:35	7.91	241	42.4	No Comment
VY1	Vineyard Creek	Upstream	Wet	21/12/2020	17:26	8.15	254	40.5	No Comment
PR6	Parramatta River	Downstream	Wet	21/12/2020	17:03	7.66	32100	0.0	No Comment
SC1	Subiaco Creek	N/A	Wet	21/12/2020	19:10	7.93	642	25.5	No Comment

1. ANZECC Waterway types: Fresh water (PR1, PR2, PR3, PR4, VY1 and VY2); E: Estuarine (CC1, CC2, SC1, 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. Note that there is no electrical conductivity limit for estuarine locations

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
A2.09	Basins and settling containers	Stormwater inlet	8/12/2020	DW-A2_046	Not visible	8.5	39.2	Discharge from Sydney Water main. Lab results indicate pH @ 7.07
A2.10 & A2.11	Basins and settling containers	Stormwater inlet	28/11/2020	DW-A2_048	Not visible	8.39	0	Discharge from Sydney Water main. Lab results indicate pH @ 7.73 and NTU of 0.4
A2.19	Basins and settling containers	Stormwater inlet	3/12/2020	DW-A2_049	Not visible	8.5	0	Discharge from Sydney Water main. Lab results indicate pH @7.16 and NTU of 0.2



A-4 Air Quality Monitoring Results

Table A-4-1 Summary of Dust Deposition Data

Date	Monitoring Location	Total Insoluble Matter g/m ² /month
November	13a Grand Avenue	4.9
November	Rydalmere Station	2
November	Dundas Station	3.5
November	Telopea	6
November	Carlingford	3.1



Table A-4-2 Summary of Asbestos Fibre Monitoring

Report Number	Date	Location	Start time	End time	Result (Fibres/Fields)	Result (Fibres/mL)
AMR094	26-Nov	CAMELLIA, RETAINING WALL 1, BOX OUT, EASTERN BOUNDARY	7:24	16:24	0/100	< 0.01
AMR094	26-Nov	CAMELLIA, RETAINING WALL 1, BOX OUT, SOUTH WEST BOUNDARY	7:25	16:25	0/100	< 0.01
AMR094	26-Nov	CAMELLIA, RETAINING WALL 1, BOX OUT, NORTH WEST BOUNDARY	7:26	16:26	0/100	< 0.01
AMR094	26-Nov	STOCKPILE AREA, EASTERN ACCESS GATE	7:27	16:27	0/100	< 0.01
AMR094	26-Nov	STOCKPILE AREA, WESTERN ACCESS GATE	7:28	16:28	0/100	< 0.01
AMR095	26-Nov	TRAMWAY AVE - SE OF FOOTPATH EXCAVATION	7:40	13:45	0/100	< 0.01
AMR095	26-Nov	TRAMWAY AVE - SW OF FOOTPATH EXCAVATION	7:42	13:47	0/100	< 0.01
AMR095	26-Nov	TRAMWAY AVE - NW OF FOOTPATH EXCAVATION	7:44	13:49	0/100	< 0.01
AMR095	26-Nov	TRAMWAY AVE - NE OF FOOTPATH EXCAVATION	7:46	13:51	0/100	< 0.01
AMR095	26-Nov	CAMELLIA, RETAINING WALL 2, NORTHWESTCORNER	7:12	16:06	0/100	< 0.01
AMR095	26-Nov	CAMELLIA, RETAINING WALL 2, SOUTHWEST CORNER	7:13	16:07	0/100	< 0.01
AMR095	26-Nov	CAMELLIA, RETAINING WALL 2, SOUTHEAST CORNER	7:14	16:08	0/100	< 0.01
AMR096	27-Nov	RETAINING WALL 2, WESTERN BOUNDARY, NORTHERN END	7:06	15:30	0/100	< 0.01
AMR096	27-Nov	RETAINING WALL 2, WESTERN BOUNDARY, EASTERN END	7:07	15:31	0/100	< 0.01
AMR096	27-Nov	JAMES HARDIE BRIDGE, NW CORNER	7:08	15:32	0/100	< 0.01
AMR096	27-Nov	JAMES HARDIE BRIDGE, ADJACENT TO SITE GATE EASTERN BOUNDARY	7:28	15:40	0/100	< 0.01
AMR096	27-Nov	JAMES HARDIE BRIDGE, APPROX 10M NORTH OF GATE, WESTERN BOUNDARY	7:29	15:41	0/100	< 0.01
AMR096	27-Nov	STOCKPILE AREA, EASTERN GATE	7:36	15:47	0/100	< 0.01
AMR096	27-Nov	STOCKPILE AREA, WESTERN GATE	7:37	15:48	0/100	< 0.01
AMR097	28-Nov	RETAINING WALL 2, JAMES HARDIE BRIDGE, NORTH EAST CORNER	6:55	13:30	0/100	< 0.01
AMR097	28-Nov	RETAINING WALL 2, SOUTHERN END, WESTERN BOUNDARY	6:56	13:31	0/100	< 0.01
AMR097	28-Nov	RETAINING WALL 2, NORTHERN END, WESTERN BOUNDARY	6:57	13:32	0/100	< 0.01
AMR098	30-Nov	JAMES HARDIE BRIDGE, NE CORNER	7:16	15:48	0/100	< 0.01
AMR098	30-Nov	RETAINING WALL 2, SOUTHERN END	7:17	15:49	0/100	< 0.01
AMR098	30-Nov	RETAINING WALL 2, NORTHERN END	7:18	15:50	0/100	< 0.01
AMR097	27-Nov	CAMELLIA STOCKPILE AREA, EASTERN ACCESS GATE	21:00	9:05	0/100	< 0.01
AMR097	27-Nov	CAMELLIA STOCKPILE AREA, WESTERN ACCESS GATE	21:00	9:07	0/100	< 0.01

AMR097	27-Nov	VICTORIA ROAD / CHURCH ST INTERSECTION, SE CORNER OF INTERSECTION	21:00	9:08	0/100	< 0.01
AMR097	27-Nov	VICTORIA ROAD / CHURCH ST, SW CORNER OF INTERSECTION	21:00	9:09	0/100	< 0.01
AMR097	27-Nov	VICTORIA ROAD / CHURCH ST, NW CORNER OF INTERSECTION	21:00	9:10	0/100	< 0.01
AMR098	28-Nov	RETAINING WALL 1, ADJACENT TO ACCESS GATE, EASTERN BOUNDARY	7:12	14:35	0/100	< 0.01
AMR098	28-Nov	RETAINING WALL 1, APPROX 20M NORTH OF ACCESS GATE, WESTERN BOUNDARY	7:11	14:36	0/100	< 0.01
AMR098	28-Nov	STOCKPILE AREA, WESTERN GATE	7:13	14:40	0/100	< 0.01
AMR098	28-Nov	STOCKPILE AREA, EASTERN GATE	7:12	14:41	0/100	< 0.01
AMR99	30-Nov	RETAINING WALL 1, NORTHERN END, EASTERN BOUNDARY, ADJACENT TO SITE GATE	7:28	15:56	0/100	< 0.01
AMR99	30-Nov	RETAINING WALL 1, WESTERN END, ADJACENT JAMES HARDIE BRIDGE	7:29	15:57	0/100	< 0.01
AMR99	30-Nov	STOCKPILE, EASTERN GATE	7:37	15:58	0/100	< 0.01
AMR99	30-Nov	STOCKPILE AREA, WESTERN GATE	7:38	15:59	0/100	< 0.01
AMR100	30-Nov	TRAMWAY AVE - SE OF FOOTPATH EXCAVATION	7:50	12:26	0/100	< 0.01
AMR100	30-Nov	TRAMWAY AVE - NE OF FOOTPATH EXCAVATION	7:51	12:27	0/100	< 0.01
AMR100	30-Nov	TRAMWAY AVE - NW OF FOOTPATH EXCAVATION	7:53	12:29	0/100	< 0.01
AMR100	30-Nov	TRAMWAY AVE - SW OF FOOTPATH EXCAVATION	7:54	12:30	0/100	< 0.01
AMR99	1-Dec	JAMES HASDIE BRIDGE - NE CORNER	6:50	15:23	0/100	< 0.01
AMR99	1-Dec	RETAINING WALL 2 - SOUTH END	6:52	15:25	0/100	< 0.01
AMR99	1-Dec	RETAINING WALL 2 - NORTH END	6:54	15:27	0/100	< 0.01
AMR102	1-Dec	RETAINING WALL 1 - WEST BOUNDARY, NORTH END	7:03	15:32	0/100	< 0.01
AMR102	1-Dec	RETAINING WALL 1 - EAST BOUNDARY, NORTH END	7:05	15:34	0/100	< 0.01
AMR102	1-Dec	STOCKPILE AREA - EAST GATE	7:13	15:46	0/100	< 0.01
AMR102	1-Dec	STOCKPILE AREA - WEST GATE	7:14	15:47	0/100	< 0.01
AMR101	1-Dec	NORTH BOUNDARY FENCE	7:01	15:00	0/100	< 0.01
AMR101	1-Dec	SOUTH BOUNDARY FENCE	7:02	15:01	0/100	< 0.01
AMR101	1-Dec	EAST BOUNDARY FENCE	7:03	15:02	0/100	< 0.01
AMR101	1-Dec	WEST BOUNDARY FENCE	7:04	15:03	0/100	< 0.01
AMR104	2-Dec	RETAINING WALL 2, BOX OUT - WEST BOUNDARY, NORTH END	7:53	15:30	0/100	< 0.01

AMR104	2-Dec	RETAINING WALL 2, BOX OUT - WEST BOUNDARY, SOUTH END	7:55	15:32	0/100	< 0.01
AMR104	2-Dec	RETAINING WALL 2, BOX OUT - WEST BOUNDARY, SOUTH BOUNDARY	7:56	15:34	0/100	< 0.01
AMR104	2-Dec	STOCKPILE AREA - EAST GATE	7:14	15:45	0/100	< 0.01
AMR104	2-Dec	STOCKPILE AREA - WEST GATE	7:16	15:47	0/100	< 0.01
AMR100	2-Dec	JAMES HARDIE BRIDGE - NE CORNER	6:58	15:22	0/100	< 0.01
AMR100	2-Dec	RETAINING WALL 2 - SOUTH END	7:00	15:24	0/100	< 0.01
AMR100	2-Dec	RETAINING WALL 2 - NORTH END	7:02	15:26	0/100	< 0.01
AMR103	2-Dec	WEST OF FOOTPATH EXCAVATION (TRAMWAY AVE)	7:15	14:23	0/100	< 0.01
AMR103	2-Dec	NW OF FOOTPATH EXCAVATION (TRAMWAY AVE)	7:16	14:24	0/100	< 0.01
AMR103	2-Dec	NE OF FOOTPATH EXCAVATION (TRAMWAY AVE)	7:18	14:26	0/100	< 0.01
AMR103	2-Dec	EAST OF FOOTPATH EXCAVATION (TRAMWAY AVE)	7:20	14:28	0/100	< 0.01
AMR101	3-Dec	RETAINING WALL 2 - NE CORNER OF JAMES HARDIE BRIDGE	7:00	15:19	0/100	< 0.01
AMR101	3-Dec	RETAINING WALL 2 - WEST BOUNDARY, SOUTH END	7:02	15:21	0/100	< 0.01
AMR101	3-Dec	RETAINING WALL 2 - WEST BOUNDARY, NORTH END	7:04	15:23	0/100	< 0.01
AMR105	3-Dec	WEST OF FOOTPATH EXCAVATION - TRAMWAY AVE	7:38	14:18	0/100	< 0.01
AMR105	3-Dec	NORTH OF FOOTPATH EXCAVATION - TRAMWAY AVE	7:39	14:16	0/100	< 0.01
AMR105	3-Dec	NE FOOTPATH EXCAVATION - TRAMWAY AVE	7:41	14:15	0/100	< 0.01
AMR105	3-Dec	EAST OF FOOTPATH EXCAVATION - TRAMWAY AVE	7:42	14:14	0/100	< 0.01
AMR106	3-Dec	RETAINING WALL 2 - BOX OUT, SOUTH END	7:10	15:33	0/100	< 0.01
AMR106	3-Dec	RETAINING WALL 2 - BOX OUT, NORTH END	7:12	15:35	0/100	< 0.01
AMR106	3-Dec	STOCKPILE AREA - EAST GATE	7:20	15:46	0/100	< 0.01
AMR106	3-Dec	STOCKPILE AREA - WEST GATE	7:22	15:48	0/100	< 0.01
AMR102	4-Dec	RETAINING WALL 2, WESTERN BOUNDARY, APPROX 80M NORTH OF GATE	7:08	15:01	0/100	<0.01
AMR102	4-Dec	RETAINING WALL 2, WESTERN BOUNDARY, APPROX 30M NORTH OF GATE	7:09	15:02	0/100	<0.01
AMR102	4-Dec	JAMES HARDIE BRIDGE, NE CORNER	7:10	15:03	0/100	<0.01
AMR107	4-Dec	RETAINING WALL 2 BOX OUT, BENEATH OLD BRIDGE	7:26	15:58	0/100	<0.01
AMR107	4-Dec	RETAINING WALL 2 BOX OUT, WESTERN BOUNDARY APPROX 100M NORTH OF GATE	7:27	14:59	0/100	<0.01
AMR107	4-Dec	STOCKPILE AREA, EASTERN GATE	7:33	14:53	0/100	<0.01
AMR107	4-Dec	STOCKPILE AREA, WESTERN GATE	7:34	14:54	0/100	<0.01


AMR118	4-Dec	CORNER OF FENNEL AND CHURCH ST, NW CORNER OF WORK AREA	8:03	14:27	0/100	<0.01
AMR118	4-Dec	CORNER OF FENNEL AND CHURCH ST, NE CORNER OF WORK AREA	8:04	14:28	0/100	<0.01
AMR118	4-Dec	CORNER OF FENNEL AND CHURCH ST, SE CORNER OF WORK AREA	8:05	14:29	0/100	<0.01
AMR118	4-Dec	CORNER OF FENNEL AND CHURCH ST, SW CORNER OF WORK AREA	8:06	14:30	0/100	<0.01
AMR103	5-Dec	RETAINING WALL 2, WESTERN BOUNDARY, APPROX 80M NORTH OF JAMES HARDIE BRIDGE	7:18	17:41	0/100	<0.01
AMR103	5-Dec	RETAINING WALL 2, WESTERN BOUNDARY, APPROX 40M NORTH OF BRIDGE	7:19	17:42	0/100	<0.01
AMR103	5-Dec	RETAINING WALL 2, NE CORNER OF JAMES HARDIE BRIDGE	7:20	17:43	0/100	<0.01
AMR108	5-Dec	STOCKPILE AREA, EASTERN GATE	7:30	17:47	0/100	<0.01
AMR108	5-Dec	STOCKPILE AREA, WESTERN GATE	7:31	17:48	0/100	<0.01
AMR108	5-Dec	RETAINING WALL 1, WESTERN BOUNDARY, SOUTHERN GATE	7:35	17:49	0/100	<0.01
AMR108	5-Dec	RETAINING WALL 1, EASTERN BOUNDARY, APPROX 20M NORTH OF SOUTHERN GATE	7:36	17:50	0/100	<0.01
AMR108	5-Dec	RETAINING WALL 1, EASTERN BOUNDARY, APPROX 50M NORTH OF SOUTHERN GATE	7:37	17:51	0/100	<0.01
AMR108	5-Dec	RETAINING WALL 1, EASTERN BOUNDARY APPROX 100M NORTH OF SOUTHERN GATE	7:38	17:52	0/100	<0.01
AMR109	6-Dec	RETAINING WALL 2, WESTERN BOUNDARY ADJACENT TO JAMES HARDIE BRIDGE	6:56	17:00	0/100	<0.01
AMR109	6-Dec	RETAINING WALL 2, WESTERN BOUNDARY APPROX 30M NORTH OF JAMES HARDIE BRIDGE	6:57	16:59	0/100	<0.01
AMR109	6-Dec	RETAINING WALL 2, WESTERN BOUNDARY APPROX 80M NORTH OF BRIDGE	6:58	16:58	0/100	<0.01
AMR109	6-Dec	RETAINING WALL 1, EASTERN BOUNDARY APPROX 20M NORTH OF SOUTHERN GATE	7:13	17:11	0/100	<0.01
AMR109	6-Dec	RETAINING WALL 1, EASTERN BOUNDARY APPROX 50M NORTH OF SOUTHERN GATE	7:14	17:12	0/100	<0.01

AMR109	6-Dec	RETAINING WALL 1, EASTERN BOUNDARY APPROX 100M NORTH OF SOUTHERN GATE	7:16	17:13	0/100	<0.01
AMR104	8-Dec	RETAINING WALL 2, ADJACENT TO JAMES HARDIE BRIDGE	7:07	15:29	0/100	<0.01
AMR104	8-Dec	RETAINING WALL 2, APPROX 50M NORTH OF BRIDGE	7:08	15:28	0/100	<0.01
AMR104	8-Dec	RETAINING WALL 2, APPROX 100M NORTH OF BRIDGE	7:09	15:27	0/100	<0.01
AMR110	8-Dec	EXCAVATOR CAB - WORKING IN RETAINING WALL 2 AREA	8:25	13:31	0/100	<0.01
AMR110	8-Dec	RETAINING WALL 1, APPROX 100M NORTH OF SOUTHERN GATE, EASTERN BOUNDARY	7:25	15:45	0/100	<0.01
AMR110	8-Dec	RETAINING WALL 1, APPROX 50M NORTH OF SOUTHERN GATE, EASTERN BOUNDARY	7:26	15:46	0/100	<0.01
AMR110	8-Dec	RETAINING WALL 1, APPROX 20M NORTH OF SOUTHERN GATE, EASTERN BOUNDARY	7:27	15:47	0/100	<0.01
AMR110	8-Dec	RETAINING WALL 1, SOUTHERN GATE, WESTERN BOUNDARY	7:28	15:48	0/100	<0.01
AMR110	8-Dec	STOCKPILE AREA, EASTERN GATE	7:29	15:49	0/100	<0.01
AMR110	8-Dec	STOCKPILE AREA, WESTERN GATE	7:30	15:50	0/100	<0.01
AMR111	9-Dec	STOCKPILE AREA, EASTERN GATE	7:10	16:10	0/100	<0.01
AMR111	9-Dec	STOCKPILE AREA, WESTERN GATE	7:11	16:11	0/100	<0.01
AMR111	9-Dec	RETAINING WALL 1, EASTERN BOUNDARY, SOUTHERN GATE	7:12	16:12	0/100	<0.01
AMR111	9-Dec	RETAINING WALL 1, WESTERN BOUNDARY, APPROX 30M NORTH OF SOUTHERN GATE	7:13	16:13	0/100	<0.01
AMR111	9-Dec	RETAINING WALL 1, WESTERN BOUNDARY, APPROX 60M NORTH OF SOUTHERN GATE	7:14	16:14	0/100	<0.01
AMR111	9-Dec	RETAINING WALL 1, WESTERN BOUDNARY, APPROX 100M NORTH OF SOUTHERN GATE	7:15	16:15	0/100	<0.01
AMR105	9-Dec	RETAINING WALL 2, WESTERN BOUNDARY, ADJACENT JAMES HARDIE BRIDGE	7:24	16:07	0/100	<0.01
AMR105	9-Dec	RETAINING WALL 1, WESTERN BOUNDARY, APPROX 30M NORTH OF JAMES HARDIE BRIDGE	7:25	16:06	0/100	<0.01
AMR105	9-Dec	RETAINING WALL 1, WESTERN BOUNDARY, APPROX 80M NORTH OF JAMES HARDIE BRIDGE	7:26	16:05	0/100	<0.01
AMR125	9-Dec	CHURCH ST, EASTERN BOUNDARY, APPROX 90M NORTH OF FENNELL ST	8:15	15:25	0/100	<0.01

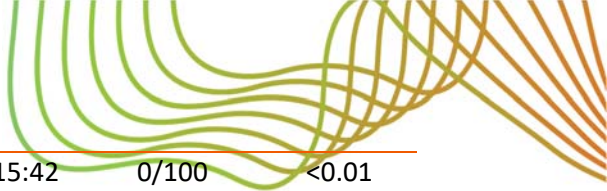
AMR125	9-Dec	CHURCH ST, EASTERN BOUNDARY, APPROX 60M NORTH OF FENNEL ST	8:16	15:26	0/100	<0.01
AMR125	9-Dec	CHURCH STREET, EASTERN BOUNDARY, APPROX 30M NORTH OF FENNEL ST	8:17	15:27	0/100	<0.01
AMR125	9-Dec	CHURCH STREET WORKSITE, EASTERN BOUNDARY AT FENNEL ST INTERSECTION	8:18	15:28	0/100	<0.01
AMR106	10-Dec	RETAINING WALL 2, ADJACENT JAMES HARDIE BRIDGE, WESTERN BOUNDARY	7:04	15:48	0/100	<0.01
AMR106	10-Dec	RW2, APPROX 40M NORTH OF JHB, WESTERN BOUNDARY	7:05	15:49	0/100	<0.01
AMR106	10-Dec	RW2, APPROX 80M NORTH OF JHB, WESTERN BOUNDARY	7:06	15:50	0/100	<0.01
AMR112	10-Dec	RETAINING WALL 1, EASTERN BOUNDARY, APPROX 90M NORTH OF SOUTH GATE	7:11	15:55	0/100	<0.01
AMR112	10-Dec	RETAINING WALL 1, EASTERN BOUNDARY, APPROX 60M NORTH OF SOUTH GATE	7:12	15:56	0/100	<0.01
AMR112	10-Dec	RETAINING WALL 1, EASTERN BOUNDARY, APPROX 30M NORTH OF SOUTH GATE	7:13	15:57	0/100	<0.01
AMR112	10-Dec	RETAINING WALL 1, WESTERN BOUNDARY, AT SOUTH GATE	7:14	15:58	0/100	<0.01
AMR112	10-Dec	STOCKPILE AREA, EASTERN GATE	7:15	15:59	0/100	<0.01
AMR112	10-Dec	STOCKPILE AREA, WESTERN GATE	7:16	16:00	0/100	<0.01
AMR113	10-Dec	TRAMWAY AVE, ROAD BOX OUT - EAST OF EXCAVATION WORKS	7:44	13:33	0/100	<0.01
AMR113	10-Dec	TRAMWAY AVE, ROAD BOX OUT - NORTH OF EXCAVATION WORKS	7:45	13:35	0/100	<0.01
AMR113	10-Dec	TRAMWAY AVE, ROAD BOX OUT - SOUTH OF EXCAVATION WORKS	7:47	13:37	0/100	<0.01
AMR113	10-Dec	TRAMWAY AVE, ROAD BOX OUT - WEST OF EXCAVATION WORKS	7:48	13:38	0/100	<0.01
AMR126	10-Dec	CHURCH ST, EAST BOUNDARY, APPROX 10M NORTH OF FENNEL ST	7:52	14:17	0/100	<0.01
AMR126	10-Dec	CHURCH ST, EAST BOUNDARY, APPROX 40M NORTH OF FENNEL ST	7:53	14:18	0/100	<0.01
AMR126	10-Dec	CHURCH ST, EAST BOUNDARY, APPROX 80M NORTH OF FENNEL ST	7:54	14:19	0/100	<0.01
AMR107	11-Dec	RW2, WESTERN BOUNDARY, APPROX 40M NORTH OF BRIDGE	6:58	15:59	0/100	<0.01
AMR107	11-Dec	RW2, WESTERN BOUNDARY, APPROX 80M NORTH OF BRIDGE	6:59	16:00	0/100	<0.01
AMR113	11-Dec	RETAINING WALL 1, WESTERN BOUNDARY, SOUTHERN GATE	7:08	16:14	0/100	<0.01

AMR113	11-Dec	RW1, EASTERN BOUNDARY, APPROX 20M NORTH OF SOUTHERN GATE	7:09	16:15	0/100	<0.01
AMR113	11-Dec	RW1, EASTERN BOUNDARY, APPROX 50M NORTH OF SOUTHERN GATE	7:10	16:16	0/100	<0.01
AMR113	11-Dec	RW1, EASTERN BOUNDARY, APPROX 80M NORTH OF SOUTHERN GATE	7:11	16:17	0/100	<0.01
AMR113	11-Dec	STOCKPILE AREA, EASTERN GATE	7:12	16:18	0/100	<0.01
AMR113	11-Dec	STOCKPILE AREA, WESTERN GATE	7:13	16:19	0/100	<0.01
AMR115	11-Dec	TRAMWAY AVE ROAD BOX OUT - SE OF EXCAVATION	7:45	15:09	0/100	<0.01
AMR115	11-Dec	TRAMWAY AVE ROAD BOX OUT - NE OF EXCAVATION	7:46	15:08	0/100	<0.01
AMR115	11-Dec	TRAMWAY AVE ROAD BOX OUT - NW OF EXCAVATION	7:48	15:10	0/100	<0.01
AMR115	11-Dec	TRAMWAY AVE ROAD BOX OUT - SW OF EXCAVATION	7:49	15:11	0/100	<0.01
AMR114	11-Dec	RETAINING WALL 1, WESTERN BOUNDARY, SOUTHERN GATE	7:08	16:14	0/100	<0.01
AMR114	11-Dec	RW1, EASTERN BOUNDARY, APPROX 20M NORTH OF SOUTHERN GATE	7:09	16:15	0/100	<0.01
AMR114	11-Dec	RW1, EASTERN BOUNDARY, APPROX 50M NORTH OF SOUTHERN GATE	7:10	16:16	0/100	<0.01
AMR114	11-Dec	RW1, EASTERN BOUNDARY, APPROX 80M NORTH OF SOUTHERN GATE	7:11	16:17	0/100	<0.01
AMR114	11-Dec	STOCKPILE AREA, EASTERN GATE	7:12	16:18	0/100	<0.01
AMR114	11-Dec	STOCKPILE AREA, WESTERN GATE	7:13	16:19	0/100	<0.01
AMR119	11-Dec	CHURCH ST ROAD BOX OUT - EAST BOUNDARY (SOUTH)	7:12	15:26	0/100	<0.01
AMR119	11-Dec	CHURCH ST ROAD BOX OUT - EAST BOUNDARY (MIDDLE)	7:14	15:27	0/100	<0.01
AMR119	11-Dec	CHURCH ST ROAD BOX OUT - EAST BOUNDARY (NORTH)	7:15	15:29	0/100	<0.01
AMR116	12-Dec	RETAINING WALL 1, WESTERN BOUNDARY AT SOUTHERN GATE	7:20	14:27	0/100	<0.01
AMR116	12-Dec	SW1, EASTERN BOUNDARY, APPROX 20M NORTH OF S GATE	7:21	14:28	0/100	<0.01
AMR116	12-Dec	RW1, EASTERN BOUNDARY, APPROX 60M NORTH OF S GATE	7:22	14:29	0/100	<0.01
AMR116	12-Dec	RW, E BOUNDARY, APPROX 100M NORTH OF GATE	7:23	14:30	0/100	<0.01
AMR116	12-Dec	STOCKPILE AREA, EASTERN GATE	7:24	14:31	0/100	<0.01
AMR116	12-Dec	STOCKPILE AREA, WESTERN GATE	7:25	14:32	0/100	<0.01
AMR117	14-Dec	RETAINING WALL 1 BACKFILL - EAST BOUNDARY, NORTH	8:03	15:31	0/100	<0.01
AMR117	14-Dec	RETAINING WALL 1 BACKFILL - EAST BOUNDARY, SOUTH	8:05	15:33	0/100	<0.01
AMR117	14-Dec	RETAINING WALL 1 BACKFILL - EAST BOUNDARY, SE CORNER	8:06	15:35	0/100	<0.01

AMR117	14-Dec	RETAINING WALL 1 BACKFILL - EAST BOUNDARY, ADJACENT GATE	8:10	15:38	0/100	<0.01
AMR117	14-Dec	STOCKPILE AREA - EAST GATE	8:12	15:42	0/100	<0.01
AMR117	14-Dec	STOCKPILE AREA - WEST GATE	8:14	15:43	0/100	<0.01
AMR120	14-Dec	CHURCH ST BOX OUT, EAST BOUNDARY - SOUTH	7:33	15:02	0/100	<0.01
AMR120	14-Dec	CHURCH ST BOX OUT, EAST BOUNDARY - MIDDLE	7:34	15:03	0/100	<0.01
AMR120	14-Dec	CHURCH ST BOX OUT, EAST BOUNDARY - NORTH	7:35	15:04	0/100	<0.01
AMR121	15-Dec	STOCKPILE AREA - EAST GATE	7:52	15:15	0/100	<0.01
AMR121	15-Dec	STOCKPILE AREA - WEST GATE	7:53	15:16	0/100	<0.01
AMR121	15-Dec	RETAINING WALL 1 BACKFILL - SOUTH OF SIDE ACCESS GATE	7:57	15:37	0/100	<0.01
AMR121	15-Dec	RETAINING WALL 1 BACKFILL - NORTH OF SIDE ACCESS GATE	7:58	15:36	0/100	<0.01
AMR121	15-Dec	RETAINING WALL 1 BACKFILL - NORTH BOUNDARY	8:03	15:29	0/100	<0.01
AMR121	15-Dec	RETAINING WALL 1 BACKFILL - DECON UNIT	8:00	15:35	0/100	<0.01
AMR121	15-Dec	RETAINING WALL 2 BOX OUT - NORTH END	8:36	15:23	0/100	<0.01
AMR121	15-Dec	RETAINING WALL 2 BOX OUT - SOUTH END	8:38	15:25	0/100	<0.01
AMR122	16-Dec	RETAINING WALL 2, WESTERN BOUNDARY, ADJACENT TO JAMES HARDIE BRIDGE	7:11	16:18	0/100	<0.01
AMR122	16-Dec	RETAINING WALL 2, WESTERN BOUNDARY, APPROX 40M NORTH OF BRIDGE	7:12	16:19	0/100	<0.01
AMR122	16-Dec	RETAINING WALL 2, WESTERN BOUNDARY, APPROX 80M NORTH OF BRIDGE	7:13	16:20	0/100	<0.01
AMR122	16-Dec	RETAINING WALL 1, EASTERN BOUNDARY APPROX 120M NORTH OF SOUTHERN GATE	7:14	16:21	0/100	<0.01
AMR122	16-Dec	RETAINING WALL 1, EASTERN BOUNDARY, APPROX 60M NORTH OF SOUTH GATE	7:15	16:22	0/100	<0.01
AMR122	16-Dec	RETAINING WALL 1, ESTERN BOUNDARY, APPROX 20M NORTH OF SOUTH GATE	7:16	16:23	0/100	<0.01
AMR122	16-Dec	RETAINING WALL 1, WESTERN BOUNDARY, AT SOUTHERN GATE	7:17	16:24	0/100	<0.01
AMR122	16-Dec	STOCKPILE AREA, EASTERN GATE	7:18	16:25	0/100	<0.01
AMR122	16-Dec	STOCKPILE AREA, WESTERN GATE	7:19	16:26	0/100	<0.01
AMR123	17-Dec	GRAND AVE STOCKPILE AREA - ENTRY GATE	7:05	15:30	0/100	<0.01
AMR123	17-Dec	GRAND AVE STOCKPILE AREA - NTH FENCE LINE	7:07	15:32	0/100	<0.01
AMR123	17-Dec	RETAINING WALL 2 - STH PORTION	7:10	15:39	0/100	<0.01
AMR123	17-Dec	RETAINING WALL 2 - ADJACENT MIDDLE GATE	7:11	15:44	0/100	<0.01



AMR123	17-Dec	RETAINING WALL 2 - NTH OF MIDDLE GATE	7:13	15:47	0/100	<0.01
AMR123	17-Dec	RETAINING WALL 2 - NTH BOUNDARY	7:19	15:49	0/100	<0.01
AMR123	17-Dec	RETAINING WALL 1 - NTH OF STOCKPILE	7:24	15:59	0/100	<0.01
AMR123	17-Dec	RETAINING WALL 1 - STH OF STOCKPILE	7:26	16:03	0/100	<0.01
AMR123	17-Dec	RETAINING WALL 1 - SE OF STOCKPILE	7:29	16:04	0/100	<0.01
AMR124	17-Dec	NORTH	7:30	15:45	0/100	<0.01
AMR124	17-Dec	EAST	7:31	15:46	0/100	<0.01
AMR124	17-Dec	SOUTH	7:32	15:47	0/100	<0.01
AMR124	17-Dec	WEST	7:33	15:48	0/100	<0.01
AMR127	18-Dec	RETAINING WALL 2 BOX OUT - NORTH	6:50	14:15	0/100	<0.01
AMR127	18-Dec	RETAINING WALL 2 BOX OUT - SOUTH	6:52	14:17	0/100	<0.01
AMR127	18-Dec	RETAINING WALL 1 BACKFILL - NORTH	6:56	14:20	0/100	<0.01
AMR127	18-Dec	RETAINING WALL 1 BACKFILL - EAST BOUNDARY NORTH END	7:00	14:23	0/100	<0.01
AMR127	18-Dec	RETAINING WALL 1 BACKFILL - SIDE ACCESS GATE	7:02	14:25	0/100	<0.01
AMR127	18-Dec	RETAINING WALL 1 BACKFILL - EAST BOUNDARY SOUT HEND	7:04	14:27	0/100	<0.01
AMR127	18-Dec	STOCKPILE AREA - EAST GATE	7:10	14:29	0/100	<0.01
AMR127	18-Dec	STOCKPILE AREA - WEST GATE	7:12	14:31	0/100	<0.01
AMR128	18-Dec	TRAMWAY AVE - WEST OF STOCKPILE LOADOUT	9:15	12:45	0/100	<0.01
AMR128	18-Dec	TRAMWAY AVE - NORTH OF STOCKPILE LOADOUT	9:16	12:46	0/100	<0.01
AMR128	18-Dec	TRAMWAY AVE - NE OF STOCKPILE LOADOUT	9:17	12:49	0/100	<0.01
AMR128	18-Dec	TRAMWAY AVE - EAST OF STOCKPILE LOADOUT	9:19	12:53	0/100	<0.01
AMR129	19-Dec	GRAND AVE STOCKPILE AREA - ENTRY GATE	7:24	12:20	0/100	<0.01
AMR129	19-Dec	GRAND AVE STOCKPILE AREA - NORTH FENCELINE	7:26	12:21	0/100	<0.01
AMR129	19-Dec	RETAINING WALL 1 - SE OF FILL AREA	7:45	12:44	0/100	<0.01
AMR129	19-Dec	RETAINING WALL 1 - EAST FENCELINE OF FILL AREA	7:48	12:43	0/100	<0.01
AMR129	19-Dec	RETAINING WALL 1 - MIDDLE GATE ENTRY	7:51	12:42	0/100	<0.01
AMR129	19-Dec	RETAINING WALL 1 - NORTH FENCELINE OF FILL AREA	8:09	12:40	0/100	<0.01
AMR129	19-Dec	RETAINING WALL 2 - NORTH OF STOCKPILE REMOVAL	8:03	12:34	0/100	<0.01
AMR129	19-Dec	RETAINING WALL 2 - SE OF STOCKPILE REMOVAL	8:05	12:36	0/100	<0.01
AMR130	21-Dec	RETAINING WALL 2, WESTERN BOUNDARY, ADJACENT TO JAMES HARDIE BRIDGE	7:05	15:41	0/100	<0.01



AMR130	21-Dec	RETAINING WALL 1, EASTERN BOUNDARY, APPROX. 70M SOUTH OF NORTHERN GATE	7:06	15:42	0/100	<0.01
AMR130	21-Dec	RETAINING WALL 1, EASTERN BOUNDARY, APPROX. 100M SOUTH OF NORTHERN GATE	7:07	15:43	0/100	<0.01
AMR130	21-Dec	RETAINING WALL 1, EASTERN BOUNDARY, APPROX. 150M SOUTH OF NORTHERN GATE	7:08	15:44	0/100	<0.01
AMR130	21-Dec	RETAINING WALL 1, EASTERN BOUNDARY, APPROX. 200M SOUTH OF NORTHERN GATE	7:09	15:45	0/100	<0.01
AMR130	21-Dec	RETAINING WALL 1, WESTERN BOUNDARY, ADJACENT TO SOUTHERN GATE	7:10	15:46	0/100	<0.01
AMR130	21-Dec	STOCKPILE AREA, EASTERN GATE	7:11	15:47	0/100	<0.01
AMR130	21-Dec	STOCKPILE AREA, WESTERN GATE	7:12	15:48	0/100	<0.01
AMR130	21-Dec	RETAINING WALL 1, NORTHERN BOUNDARY, APPROX. 30M SOUTH OF NORTHERN GATE	12:15	15:38	0/100	<0.01