

The background of the entire page is a detailed, light blue map of the Cross River area. The map shows a complex network of streets, including major thoroughfares and local roads, as well as the winding course of the Cross River itself. The map is rendered in a monochromatic blue color scheme, providing a geographical context for the project.

Cross River Rail Project

Monthly Environmental Report

May 2022

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Executive Summary

This Monthly Environmental Report (MER) has been produced for Project Works undertaken on site for May 2022 for the Rail, Integration and Systems (RIS), and Tunnel, Stations and Development (TSD) packages. The report addresses the obligations outlined in the Coordinator-General's change report – *Coordinator-General's change report – no. 13 (March 2022)* and the individual contractor's Construction Environmental Management Plans (CEMPs), which have been developed generally in accordance with the Project's Outline Environmental Management Plan (OEMP). The Cross River Rail Delivery Authority (Delivery Authority), as the Proponent of the Cross River Rail Project, is required to submit a monthly report to the Coordinator-General to demonstrate compliance with the imposed conditions.

Section 1 of this report provides a background to the project and the Coordinator-General's conditions. Section 2 provides a review of the contractor's reports contained in **Appendix A** (RIS Monthly Report) and **Appendix B** (TSD Monthly Report).

The Environmental Monitor (EM) has reviewed and endorsed this MER. This endorsement follows ongoing and new document reviews, and surveillance across the relevant project worksites.

The CEMPs prepared by both Unity Alliance (RIS Contractor) and CBUG JV on behalf of Pulse (TSD Contractor) for their Relevant Project Works were endorsed by the EM and submitted to the Coordinator-General in accordance with Condition 4(a) and 4(b) respectively.

The table below presents a summary of compliance status against each condition with a short comment for each:

Imposed Condition	Requirement Summary	Compliance Met (Yes/No/NA)	Comment
1.	General conditions – compliance with the Project Changes relevant to the contractor's scope	Yes	The CEMP and site management plans are in accordance with the Project Changes.
2.	Outline Environmental Management Plan – timely submission to the Coordinator-General including required sub-plans	Yes	OEMP dated June 2020 is effective for the reporting period.
3.	Design – achievement of the Environmental Design Requirements	NA	Ongoing progress with design packages.
4.	Construction Environmental Management Plan – all relating to Relevant Project Works.	Yes	RIS – CEMP Revision 13 covering full scope of RIS works is effective from 14 March 2022. TSD – CEMP Revision 8 covering full scope of TSD works is effective from 9 June 2021.
5.	Compliance and Incident management – Non-compliance events, notifications and reporting.	Yes	There were no non-compliance events (NCEs) in May 2022. Refer to Section 2.5 of this report.

Imposed Condition	Requirement Summary	Compliance Met (Yes/No/NA)	Comment
6.	Reporting – Monthly and Annual reporting.	Yes	This MER, including RIS and TSD Monthly Reports, has been submitted in accordance with the conditioned requirements. Refer to Appendix A and Appendix B .
7.	Environmental Monitor (EM) – engaged and functions resumed.	Yes	Ongoing weekly site inspections and document reviews continue to take place.
8.	Community Relations Monitor (CRM) – engaged and functions resumed	Yes	Ongoing.
9.	Community Engagement Plan – developed and endorsed by Environmental Monitor.	Yes	CEMPs endorsed with Community Engagement Plan.
10.	Hours of work – Project Works undertaken during approved hours.	Yes	Project Works have been undertaken in accordance with project requirements. This has been achieved through Standard Working Hours, Extended work hours and Managed Work.
11.	Noise – Project Works must aim to achieve internal noise goals for human health and well-being.	Yes	Noise monitoring met project noise requirements at Sensitive Places. RIS – Noise monitoring was not triggered based on the predictive noise assessments for the relevant project works during the reporting period. TSD – Noise monitoring was undertaken to validate predicted noise modelling and for stakeholder enquiries. Noise monitoring confirmed project requirements were met. Refer to Appendix B (Table 3 and Section 3.2).
	Vibration – Project Works must aim to achieve vibration goals for cosmetic damage, human comfort and sensitive building contents.	Yes	Vibration monitoring met project vibration requirements at Sensitive Places. RIS –Vibration monitoring was undertaken to validate predicted vibration modelling and confirmed that project requirements were met. Refer to Appendix A (Table 5 and Section 3.1.4). TSD – Vibration monitoring was not required for the reporting period. A monitoring session from late April was included into this report and was undertaken to validate predicted vibration modelling. The TSD contractor confirmed the monitoring result met project goals.

Imposed Condition	Requirement Summary	Compliance Met (Yes/No/NA)	Comment
			Refer to Appendix B (Table 2 and Section 3.1).
12.	Property damage – relating to ground movement.	Yes	<p>RIS – Vibration modelling has been undertaken for Relevant Project Works and Property Damage Sub-plans have been developed and implemented. Pre-condition surveys have been completed at heritage, commercial and residential buildings at RNA, Northern Corridor and Fairfield to Salisbury stations.</p> <p>TSD – Vibration modelling has been prepared and is ongoing. Where required, building condition survey reports are completed for heritage and residential buildings. No enquiries relating to property damage were received during January.</p>
13.	Air quality – Works must aim to achieve air quality goals for human health and nuisance.	Yes	<p>Air quality monitoring met Project air quality goals.</p> <p>RIS – Refer to Appendix A (Tables 7, 8 and 9 and Section 3.2, plus Figures 1, 2 and 3).</p> <p>TSD – Refer to Appendix B (Tables 4 and 5 plus Section 3.3).</p>
14.	Traffic and transport – Works must minimise adverse impacts on road safety and traffic flow.	Yes	Traffic Management Plans are covered in the CEMPs. Sub-plans for all active worksites have been reviewed by the EM.
15.	<p>Water quality – Works must not discharge groundwater from the construction site above the relevant environmental values and water quality objectives.</p> <p>Monitor and report on water quality in accordance with CEMP and Sub-plans.</p>	Yes	<p>Monitoring and reporting on groundwater and surface water quality was undertaken in accordance with RIS and TSD Water Quality Management Plans.</p> <p>RIS – No groundwater discharges occurred during May.</p> <p>Post-rainfall monitoring was undertaken at Mayne Yard and Clapham Yard. This consisted of a combination of visual and in-situ monitoring.</p> <p>There was also active surface water discharges to receiving waters from RNA, Northern Corridor and Clapham Yard worksites. Results met water quality discharge criteria.</p> <p>TSD – Active discharge of groundwater occurred from Roma Street, Albert, Woolloongabba and Boggo Road worksites. Monitoring results of groundwater quality prior to discharge is</p>

Imposed Condition	Requirement Summary	Compliance Met (Yes/No/NA)	Comment
			<p>consistent with the pre-construction water quality levels except for Albert Street which recorded total nitrogen levels above baseline monitoring pre-construction data.</p> <p>Active discharge of surface water occurred at the Northern Portal, Boggo Road and Southern Portal. Results met water quality discharge criteria.</p> <p>Post-rainfall monitoring was undertaken in receiving waters of Albert Street and Woolloongabba worksites.</p> <p>Routine in stream monthly monitoring met project water quality requirements.</p> <p>Refer to Appendix B (Table 6) for ground water monitoring results and refer to Appendix B (Tables 7 and 8) for surface water monitoring results.</p>
16.	Water resources – Evaluate potential impact, plan works, implement controls and monitor inflow of groundwater associated with drawdown.	Yes	<p>RIS – There is no sustained groundwater extraction involved in the RIS scope of works so predictive modelling of groundwater drawdown is not required. Collection of hydrological data to model potential inflow rates into excavations during construction has been undertaken.</p> <p>TSD – Inflow of groundwater into the worksites is being continuously monitored to validate the predictive modelling.</p>
17.	Surface water – Must be designed to avoid inundation from stormwater due to a 2-year (6hr) ARI rainfall event and flood waters due to a 5-year ARI rainfall event and constructed to avoid afflux or cause the redirection of uncontrolled surface water flows, including stormwater flows, outside of worksites.	Yes	Contractors continue to consider this condition in their site planning and design.
18.	Erosion and sediment control – Provisions for erosion and sediment control must be consistent with the Guidelines for Best Practice Erosion and Sediment Control (International Erosion Control Association, 2008) and the Department of Transport and Main Roads' Technical Standard MRTS52.	Yes	Site specific ESC plans for all active work sites have been reviewed by the EM and implemented on site.

Imposed Condition	Requirement Summary	Compliance Met (Yes/No/NA)	Comment
19.	Acid sulfate soils – managed as per the Queensland Acid Sulfate Soil Technical Manual.	Yes	Acid Sulfate Soil Management Plans have been prepared and implemented for all active worksites.
20.	Landscape and open space – general requirement to minimise impacts on landscapes and open space values and specific requirements around Victoria Park.	Yes	The construction of a temporary access road through Victoria Park was undertaken under a Heritage Exemption Certificate approved by the Department of Environment and Science (DES) on 24 June 2021. Consideration has been taken to minimise loss of trees and the area of park impacted during these temporary works.
21.	Worksite rehabilitation – worksites rehabilitated as soon as practicable upon completion of works or commissioning, and in consultation with Brisbane City Council.	NA	N/A

Non-Compliance Events

There were no NCEs raised in May 2022.

Definitions

Acronym	Definition
ARI	Average Recurrence Interval - The average or expected value of the periods between exceedances of a given rainfall total accumulated over a given duration.
CEMP	Construction Environmental Management Plan
CGCR	Coordinator-General's Change Report
CRM	The Community Relations Monitor engaged in accordance with Imposed Condition 8
Contractor	The contractors appointed to design, construct, and commission the Project
Coordinator-General	The corporation sole preserved, continued, and constituted under section 8 of the SDPWO Act.
CRR	Cross River Rail
DES	Department of Environment and Science
EIS	Environmental Impact Statement
EM	The Environmental Monitor engaged in accordance with Imposed Condition 7
ESC	Erosion and sediment control
IECA	International Erosion Control Association
Imposed condition/s	A condition/s imposed by the Coordinator-General under section 54B of the SDPWO Act for the Project
MER	Monthly Environment Report
MRTS52	Transport and Main Roads Specifications MRTS52 Erosion and Sediment Control
NCE	Non-Compliance Event
OEMP	Outline Environmental Management Plan
Project	The Cross River Rail Project
Project Works	As defined in the Imposed Conditions
Proponent	The Cross River Rail Delivery Authority
RfPC	Request for Project Change
RIS	Rail, Integration and Systems
SDPWO Act	<i>State Development and Public Works Organisation Act 1971</i>
Sub-plan	Any sub-plan of the CEMP
The Delivery Authority	The Cross River Rail Delivery Authority
TSD	Tunnel, Stations and Development

1.Introduction

1.1. Background

The Cross River Rail Project (the Project) is a declared coordinated project under the *State Development and Public Works Organisation Act 1971* (SDPWO Act). The CRR Environmental Impact Statement (EIS) was evaluated by the Coordinator-General who recommended the Project proceed, subject to Imposed Conditions and recommendations. Since the evaluation of the EIS, several Requests for Project Change (RfPC) submissions have been evaluated by the Coordinator-General. RfPC 13 was endorsed in March 2022 by the Coordinator-General.

The Coordinator-General has imposed conditions on the Project that apply throughout the design, construction, and commissioning phases. These are referred to as the Imposed Conditions. In addition, the Coordinator-General has approved the Project's OEMP which outlines the environmental management framework for the Project. The OEMP includes environmental outcomes and performance criteria which must be achieved for the Project.

Imposed Conditions 5 and 6 nominate the compliance and reporting requirements for the Project. This monthly report addresses these requirements.

1.2. Project Delivery

The Delivery Authority is responsible for planning and delivering the Project. The Project established environmental management plans and secured some of the secondary environmental approvals in addition to enabling works.

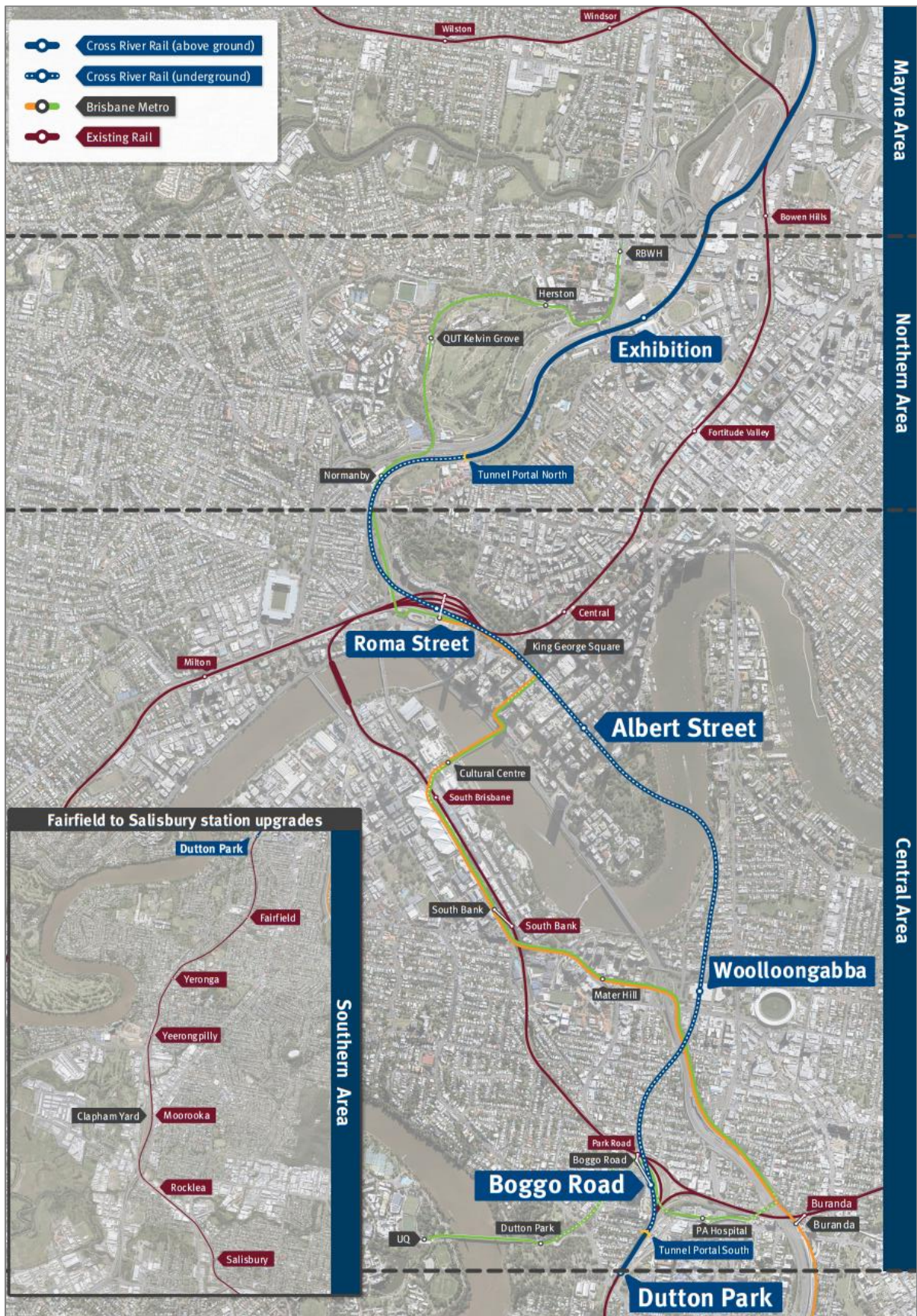
The two main delivery packages which require reporting under the Coordinator-General's imposed conditions are:

- Tunnel, Stations and Development (TSD) being delivered by CBGU JV; and
- Rail, Integration and Systems (RIS) being delivered by Unity Alliance.

The Project is geographically divided into four areas:

- Mayne Area;
- Northern Area;
- Central Area; and
- Southern Area.

These are shown in the figure over.



1.3. Reporting Framework

This MER has been prepared to comply with Imposed Conditions 6 and 7 of the Coordinator-General Change Report (CGCR) and includes:

- monitoring data and associated interpretation of the results required by the imposed conditions and Construction Environmental Management Plan (CEMP);
- details of any NCE's, including incidents, corrective actions, and preventative actions; and
- details of any complaints, including description, responses, and corrective actions.

Reporting on environmental elements captured in each monthly environmental report, including the annual environmental report, will be reviewed, and endorsed by the EM.

1.4. Monthly Environment Report Endorsement

This MER has been endorsed by the EM and the endorsement provided to the Coordinator-General.

2.Compliance Review

This MER has been reviewed and endorsed by the EM as per Imposed Condition 7 of the CGCR.

2.1. Relevant Project Works

The following Project Works were undertaken in May 2022:

Area	Project Works
Mayne Area	Mayne Yard North – <ul style="list-style-type: none">• Graffiti Removal Facility (GRF) – nearing completion with internal service installation continuing;• Crew Change Building - nearing completion with internal fit-out;• Crew Change Car Park and Stabling Yard Access Roads – seal and asphalt works finished and landscaping commenced;• Yard Driver's footpaths and sanding pads nearing completion;• Yard Stabling Yard Fencing nearing completion;• Decanting scope completed with sewer connection at Abbotsford Road currently being finalised;• Tripod Bridge (BR11/13) – all substructure FRP completed;• RSS Walls for tripod bridge have all commenced and RW125 (South) almost complete;• Breakfast Ck Bridge (BR08) permanent piling on Southern bank Pier 2 and 3 completed, commenced piling on northern bank at RW150 and construction of temporary jetty;• CRR Lines – embankment construction including Stage 1 preload placement nearing completion;• RW130 under ICB continues;• BR12 – new QR pedestrian bridge from Bowen Hills, has commenced with preparation works;• Yard – All ballasted track and sleepers installed; and• Yard – OHLE wire being installed currently.
Northern Area	RNA/ Northern Corridor – <ul style="list-style-type: none">• CSR scope for EXT #14 SCAS ongoing;• Grated Channels installation nearing completion;• Victoria Park Feeder Station civil scope ongoing;

Area	Project Works
	<ul style="list-style-type: none"> Watermain underbore complete at Bowen Bridge Road; BR43 (Ekka Station Western viaduct) Structural Steel Structure complete; and Drainage on Western side of viaduct has commenced. <p>Northern Portal –</p> <ul style="list-style-type: none"> Base slab works in the TBM extraction box ongoing; Excavation of portal sump ongoing; Blinding, cavi drain and base slab installation in open trough section ongoing; and Intermediary firewall works commenced.
Central Area	<p>Roma Street –</p> <ul style="list-style-type: none"> Services building Level B3 precast walls at 70%; Station building Escalator pits complete and B4 Base slab at 75% complete; Station building FRP works on back of house and front of house walls; Station cavern Western headwall complete; Station cavern first arch lining pour complete; and Inner Northern Busway (INB) underpinning works 9 of 9 columns complete.
	<p>Albert Street –</p> <ul style="list-style-type: none"> Lot 1 – B10 level base slab FRP works ongoing and perimeter wall steel fixing commenced; Lot 2 – excavation and retention of bench and invert layers nearing completion, invert slab in northern cavern and southern headwall steel fixing and concrete pouring works ongoing; and Lot 3 – excavation (~87% complete) and ongoing ground retention.
	<p>Woolloongabba –</p> <ul style="list-style-type: none"> Station jump form system lift 16 of 17 completed; Level 0 deck reinforcement substantially complete; blockwork ongoing on level B7; Southern cavern back of house internal structure FRP works nearing completion; and Northern cavern back of house construction commenced.
	<p>Tunnels –</p> <ul style="list-style-type: none"> TBM tunnels invert pour works ongoing; Southern mined upline tunnel ongoing permanent lining (~80%); Southern mined downline tunnel ongoing permanent lining (~95%); and Mined tunnel cross passages waterproofing, collar pours and backfilling works.
	<p>Boggo Road –</p> <ul style="list-style-type: none"> Northern cavern Back of House internal structures ongoing; Perimeter walls continuing with some locations now completed to full height; Concrete to in-situ structure at 37% complete; Reinforcement to in-situ structure 50% complete; and Ancillary structure to southern end of station commencing, including new goods lift.
	<p>Southern Portal –</p> <ul style="list-style-type: none"> Detailed excavation and shotcrete within cut and cover trough ongoing; Zone E roof slab works nearing completion; Sewer and stormwater micro tunnelling completed and manhole construction has commenced; Installation of ventilation scrubbers; Boggo Road bridge service investigation and piling pad preparation works commenced; and

Area	Project Works
	<ul style="list-style-type: none"> Completed piling in Zone A adjacent to Boggo Road Station box.
Southern Area	<p>Dutton Park –</p> <ul style="list-style-type: none"> Weekend SCAS on 21 and 22 May included OLE foundation installation throughout the corridor. <p>Fairfield Station –</p> <p>May 21 and 22 SCAS on the Gold Coast line scope:</p> <ul style="list-style-type: none"> Installation of dual gauge rail crossing underway; Rock excavation on platform 1; and, Detailed excavation for overpass foundations. <p>Non-SCAS scope:</p> <ul style="list-style-type: none"> Continuing platform services such as hydraulics, drainage, water, sewer, communications, security, power conduits; and, Detailed excavation and commencement of overpass foundations, lift wells. <p>Yeronga Station –</p> <p>May 21 and 22 SCAS on the Gold Coast line scope:</p> <ul style="list-style-type: none"> Platform 1 and 3 Roofing works; Installation of canopy roofing over PL1 in progress – in progress 50%; Stair 1 and 2 Treads; Station electrical works ongoing; and, UTX Crossing North and South. <p>Non-SCAS scope includes:</p> <ul style="list-style-type: none"> Continuation of building trades fit-out & rough-in throughout the platform facilities; and, Continuation of Fairfield Rd West overpass foundations and piling scope. <p>Clapham Yard –</p> <ul style="list-style-type: none"> Moolabin Creek (BR93) bridge piling complete; SEQ watermain protection works commenced; Pipejacking drainage outlet to Fairfield Road commenced; RW635 (along Mauri Western Mill property) completed; RW620 (along Fair field Road) FRP walls ongoing; Drainage scope (early works) nearing completion; and Bridge BR94 (Chale St) piling ongoing and FRP commenced at Pier 3.

2.2. Key Environmental Elements

2.2.1. Noise

The Coordinator-General's conditions establish a framework for managing the impacts of noise. The Imposed Conditions do not establish noise limits. Compliance with the Imposed Conditions noise requirements involves demonstrating the implementation of the endorsed CEMP and associated Noise and Vibration Management Plan. This establishes the management measures to be applied which aims to achieve the identified noise goals as far as reasonably practicable. The CEMP also includes requirements for the provision of the required community notifications of upcoming work, potential impacts, and how the project team can be contacted in relation to any potential impacts.

For Project Works where potential noise impacts are modelled to be above the noise goal but below the noise goal plus 20dBA, this work is authorised where the endorsed CEMP and associated Noise and Vibration Management Plan is being implemented, including communicating construction activities to potential and actual Directly Affected Persons (DAPs). For Project Works where potential noise

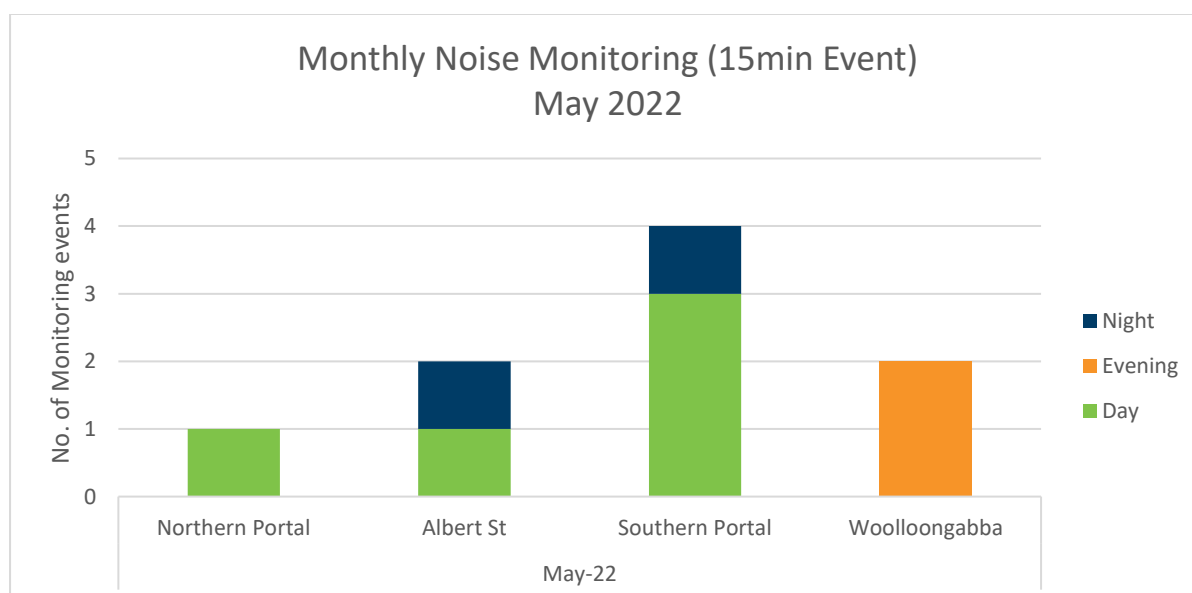
impacts are predicted to be more than 20dBA above the relevant noise goal, specific engagement is required with DAPs for these works.

Where internal monitoring was not possible, contractors have undertaken external monitoring at nominated locations. To determine compliance with the project's noise requirements and to calibrate modelled predictions the project applies recommended façade attenuation corrections, which consider receiver property type.

In the Northern Area, noise monitoring was undertaken to validate predictive modelling for excavation of the sump at the Northern Portal. Monitoring results for the Northern Area are detailed in **Appendix B** (Table 3). The TSD contractors reported that the project noise requirements have been met.

In the Central Area, noise monitoring was undertaken to validate predictive modelling at Sensitive Places close to the project worksites and in response to noise complaints. The TSD contractors reported that the project noise requirements have been met during this reporting month. Monitoring results for the Central Area are detailed in **Appendix B** (Table 3).

A summary of noise monitoring events for the month is provided in the chart below.



2.2.2. Vibration

In the Mayne and Northern Areas, Vibration monitoring took place to validate predictive modelling for piling activities that occurred along the northern bank of Breakfast Creek at Mayne Yard and for rock hammering activities that occurred next to the John MacDonald Stand at RNA. The reported results met project goals and are detailed in **Appendix A** (Table 5).

No vibration monitoring was triggered in the central area during the reporting period, however a late April monitoring result from Albert Street station was included in this month's report. The reported result met project goals and is detailed in **Appendix B** (Table 2).

2.2.3. Air Quality

2.2.3.1. Dust Deposition

Dust deposition monitoring was conducted at Mayne, Northern, Central and Southern Areas. Results met the project air quality goal¹ for all active worksites.

The Mayne Yard depositional dust gauge was left for a reduced period of 20 days from 21 April to 12 May 2022. The depositional dust gauge was replaced early to keep in line with the same replacement cycle for the RNA and Clapham Yard gauges as there was staffing issues with Protection Officers and gauge accessibility as highlighted in last month's reporting. This therefore does not meet the 30±2 days criteria as per AS/NZS 3580.10.1, section 7.3, for routine monitoring programs. Although the Mayne Yard results are not considered a representative sample according to the Australian Standard, per the advice of the Project Certified Air Quality Professional (CAQP), the sample have still been recorded as indicative.

Dust deposition results are detailed in **Appendix A** (Table 8) and **Appendix B** (Table 4.2).

A summary of dust deposition monitoring is provided in the table below.

Air Quality – Dust Deposition Monitoring			
Area	Worksite	Monitoring Location	Comments
Mayne Area	Mayne Yard	Mayne Yard	- Results met air quality goal
Northern Area	RNA / Exhibition	RNA Showgrounds	- Results met air quality goal
	Northern Portal	Northern Portal (near Brisbane Girls Grammar School)	- Results met air quality goal
Central Area	Albert Street	Mary Street	- Results met air quality goal
		Elizabeth Street	- Results met air quality goal
	Boggo Road	Quarry Street (north of the site)	- Results met air quality goal
		Peter Doherty Street/Leukemia Foundation	- Results met air quality goal
	Southern Portal	Dutton Park Station	- Results met air quality goal
		PA Hospital - Central Energy Unit along Kent Street	- Results met air quality goal
	Roma Street	Roma Street Station	- Results met air quality goal
	Woolloongabba	Russian Orthodox Cathedral	- Results met air quality goal
		Woolloongabba Busway	- Results met air quality goal
Southern Area	Clapham Yard	Clapham Yard	- Results met air quality goal

¹ CG air quality goal for dust deposition - 120µg/m² (over an averaging period of 30 days).

2.2.3.2. Particulate Matter and Total Suspended Particulates

Monitoring for particulate matter (PM₁₀) and total suspended particulates (TSP) was conducted at, Northern, Central and Southern Area worksites. Results met the project goals at all active worksites.

The Mayne Yard and RNA air quality monitors were due for their bi-annually factory calibrations resulting in no data being recorded for the month. Upon inspection by the equipment manufacturer, it had been identified that the units had suffered significant water damage which would have impacted its operation and results obtained. The units have been removed from site and sent back to the manufacture in NSW for repair and calibration.

The Boggo Road air quality unit experienced several technical difficulties during the month and stopped functioning on 1-13, 17-21 and 24 May 2022. The review of a nearby DES air quality monitoring station (Woolloongabba) demonstrated PM₁₀ levels on the days when the Boggo Road air quality unit was down, were compliant with project air quality goals.

The Woolloongabba air quality unit experienced two malfunctions on 15 and 21 May 2022 and the issues immediately resolved. The review of a nearby DES air quality monitoring station (South Brisbane) demonstrated PM₁₀ levels on the days when the Woolloongabba air quality unit was down, were compliant with project air quality goals.

The Clapham Yard air quality monitor also experienced a malfunction preventing monitoring data on 11 and 13-31 May 2022. Only partial data was deemed reliable for the purpose of compliance assessment which did not exceed the relevant daily goals for PM₁₀ and TSP. The equipment manufacturer was also contacted in relation to these malfunctions for the Clapham Yard air quality. The manufacturer observed that similar damage to those observed at the Mayne Yard and RNA stations is likely to have caused these malfunctions. The Clapham Yard air quality monitor has also been removed from site and sent to the manufacturer in NSW for inspection.

Particulates results are detailed in **Appendix A** (Figure 2 and Figure 3) and **Appendix B** (Table 5)

A summary of particulate monitoring is provided in the table below.

Air Quality – PM ₁₀ / TSP Monitoring			
Area	Worksite	Monitoring Location	Comments
Mayne Area	Mayne Yard	Mayne Yard North	- Monitoring unit was removed offsite for factory calibration and further investigation into issues.
Northern Area	RNA / Exhibition	RNA showgrounds	- Monitoring unit was removed offsite for factory calibration and further investigation into issues.
	Northern Portal	Brisbane Girls Grammar School	- Results met air quality goals
Central Area	Albert St	iStay River City and Capri (Corner of Mary Street and Albert Street)	- Results met air quality goals
	Boggo Rd / Southern Portal	North-east of Boggo Road worksite	- Results met air quality goals - Monitoring unit experienced several technical faults with no results on 1-13, 17-21 and 24 May 2022.
	Woolloongabba	Place Park, Woolloongabba	- Results met air quality goals. - Monitoring unit experienced two technical faults with no results on 15 and 21 May 2022.

Air Quality – PM ₁₀ / TSP Monitoring			
Area	Worksite	Monitoring Location	Comments
Southern Area	Clapham Yard	Clapham Yard	<ul style="list-style-type: none"> - Results met air quality goals - Monitoring unit experienced a technical fault with no results 11 and 13-31 May 2022. - Subsequently monitoring unit was removed offsite further investigation into issues.

2.2.4. Water Quality

Water quality monitoring and reporting was undertaken in accordance with the contractors CEMP and Water Quality Management Plans.

2.2.4.1. Surface Water

Active surface water discharges occurred from the RNA, Northern Corridor, Northern Portal, Boggo Road, Southern Portal and Clapham Yard worksites through dewatering activities. Post-rainfall water quality monitoring was triggered for Mayne Yard, Albert Street, Woolloongabba and Clapham Yard worksites.

In the Northern Area, water quality monitoring was triggered on 28 occasions from the Northern Portal worksite as water used for construction activities and stormwater run-off was treated and actively discharged to the stormwater network. Water quality monitoring was triggered at the Northern Corridor and RNA worksites due discharging of pooled surface water runoff. Consistent with the CEMP, the water quality was tested to ensure it met the discharge requirements. The contractor confirmed the discharge criteria was met. See **Appendix A** (Table 12) and **Appendix B** (Table 7) for further details.

In the Central Area, there was an active discharge of surface water to the stormwater network at Boggo Rd worksite and there were 5 active discharges from the Southern Portal worksite. Water quality met project water quality discharge criteria across all TSD Sites. See **Appendix B** (Table 7) for further details. In the Southern Area, surface water discharge to receiving waters at Clapham Yard was undertaken and water quality monitoring occurred to ensure it met the discharge requirements. The contractor confirmed the discharge criteria was met. See **Appendix A** (Table 12) for further details.

Post-rainfall monitoring in receiving waters of the TSD worksites was triggered for Albert Street and Woolloongabba worksites. Downstream locations did not exhibit an increase of more than 10% turbidity therefore there was no exceedance of the water quality investigation criteria and no further investigation occurred. See **Appendix B** (Table 8).

Post-rainfall monitoring in the receiving water of Mayne Yard was triggered by the rain event that occurred on 12 May. Visual monitoring carried out at Mayne Yard immediately following the event identified no passive discharge into Breakfast Creek and no supplementary in-situ water quality monitoring was undertaken.

Post-rainfall monitoring in the receiving waters of Clapham Yard was triggered by the rain events that occurred on 6 and 12 May. On 6 May, due to the rise in water levels in Moolabin Creek, the temporary Creek crossing that was set up to support construction activities, overtopped (as intended). This overtopping however caused displacement of the rock scour protection on the downstream side of the crossing resulting in erosion of an estimated 2-3m³ of soil. Corrective actions were swiftly implemented to prevent re-occurrence and the Environmental Monitor, Department of Transport and Main Roads (TMR) and the Office of the Coordinator General were informed of the event when it occurred.

Incident response and further details of the event are in **Appendix A** (section 3.3.6 and 3.3.6.2). Unity with the Delivery Authority is currently finalising the investigation into the event to confirm the potential cause/s and contributing factors. This will ensure appropriate identification and notifications of any potential Non-Compliance Events, if relevant.

On the 12 May, associated with ongoing rain events and as part of the post-rainfall monitoring program implemented by Unity, water quality impacts identified in Moolabin Creek and Rocky Water Holes, to some degree, could be attributed to Project Works. The Unity Team had carried out a significant body of wet weather preparedness on 9 and 10 May 2022, with ongoing ESC maintenance. This included, increasing storage capacity for sediment laden water and active internal aggregation of water, which was observed to minimise off-site releases during 11 and 12 May. Project Works related discharges that entered Moolabin Creek and Rocky Water Holes all passed through ESC measures.

Routine surface water quality monitoring was undertaken in the receiving waters of all TSD worksites in accordance with the Contractor's Water Quality Management Plan. The monitoring results reflect the condition of a broader catchment upstream from the worksites. See **Appendix B** (Table 8) for further details.

Surface water quality monitoring is summarised in the table below:

Surface Water Quality Monitoring					
Area	Worksite	Discharge	Post-Rain Monitoring	Routine Monitoring	Comments
Mayne Area	Mayne Yard North	No	Yes	No	<ul style="list-style-type: none"> - ESC was implemented in accordance with site specific ESC Plan. - Post-rainfall monitoring undertaken
Northern Area	Northern Portal	Yes	No	Yes	<ul style="list-style-type: none"> - Active surface water discharge met water quality investigation criteria. - Routine in-stream monitoring undertaken in accordance with WQMP.
	Northern Corridor	Yes	No	No	<ul style="list-style-type: none"> - Active surface water discharge met water quality investigation criteria. - ESC was implemented in accordance with site specific ESC Plan.
	RNA/Exhibition	Yes	No	N/A	<ul style="list-style-type: none"> - Active surface water discharge met water quality investigation criteria. - ESC was implemented in accordance with site specific ESC Plan.
Central Area	Albert Street	No	Yes	Yes	<ul style="list-style-type: none"> - Post-rainfall monitoring undertaken. - Routine in-stream monitoring undertaken in accordance with WQMP.

Surface Water Quality Monitoring					
Area	Worksite	Discharge	Post-Rain Monitoring	Routine Monitoring	Comments
	Boggo Road	Yes	No	Yes	<ul style="list-style-type: none"> - Active surface water discharge met water quality investigation criteria. - Routine in-stream monitoring undertaken in accordance with WQMP.
	Roma Street	No	No	Yes	<ul style="list-style-type: none"> - Routine in-stream monitoring undertaken in accordance with WQMP.
	Woolloongabba	No	Yes	Yes	<ul style="list-style-type: none"> - Post-rainfall monitoring undertaken. - Routine in-stream monitoring undertaken in accordance with WQMP.
	Southern Portal	Yes	No	Yes	<ul style="list-style-type: none"> - Active surface water discharge met water quality investigation criteria. - Post-rainfall monitoring undertaken - Routine in-stream monitoring undertaken in accordance with WQMP.
Southern Area	Clapham Yard	Yes	Yes	No	<ul style="list-style-type: none"> - ESC was implemented in accordance with site specific ESC Plan. - Post-rainfall monitoring undertaken and investigation into erosion event ongoing.

2.2.4.2. Groundwater

There were no groundwater discharges at Mayne, Northern or Southern Area worksites.

Groundwater discharge occurred in the Central Area at Roma Street, Albert Street, Woolloongabba, and Boggo Road worksites. Groundwater discharge results exceeded relevant water quality objectives (WQO's)² for total nitrogen, ammonia nitrogen, oxidised nitrogen, organic nitrogen and dissolved oxygen. However, these results are consistent with the receiving environment baseline monitoring pre-construction data, except for Albert Street which recorded nitrogen levels above the baseline monitoring pre-construction data. It is not uncommon for high levels of these water quality parameters to be identified in groundwater monitoring. Given the sites are located in highly urbanised inner-city settings, there are many influences on groundwater external to the project. The contractor confirmed no changes

² The Brisbane River Estuary environmental values and water quality objectives (Basin no 143 – mid-estuary) in the Environmental Protection (Water) Policy 2009.

have occurred onsite to the construction methodologies that would have affected the groundwater results.

Groundwater Quality Monitoring			
Area	Worksite	Discharge	Comments
Mayne Area	Mayne Yard North	No	- No groundwater discharges.
Northern Area	RNA/Exhibition	No	- No groundwater discharges.
	Northern Portal	No	- No groundwater discharges.
Central Area	Albert Street	Yes	- Discharge of groundwater did not meet Project WQO's but was generally consistent with pre-construction conditions except for nitrogen parameters. Given the sites are located in highly urbanised inner-city settings, non-project related infrastructure issues (i.e., sewer leaks) can influence the groundwater quality. The contractor confirmed no changes have occurred onsite to the construction methodologies that would have affected the groundwater results.
	Boggo Road / Southern Portal	Yes	- Groundwater discharge (dewatering). - Discharge of groundwater did not meet Project WQO's but was generally consistent with pre-construction conditions.
	Roma Street	Yes	- Groundwater discharge (dewatering). - Discharge of groundwater did not meet Project WQO's but was generally consistent with pre-construction conditions.
	Woolloongabba	Yes	- Groundwater discharge (dewatering). - Discharge of groundwater did not meet Project WQO's but was generally consistent with pre-construction conditions
Southern Area	Clapham Yard	No	- No groundwater discharges.

2.2.5. Erosion and Sediment Control

Site specific Erosion and Sediment Control (ESC) Plans have been prepared, updated, and implemented at Mayne Yard, Northern Portal, RNA Showgrounds, Roma Street, Albert Street, Woolloongabba, Boggo Road, Southern Portal, Yeronga, Fairfield, and Clapham Yard worksites.

2.3. Complaints Management

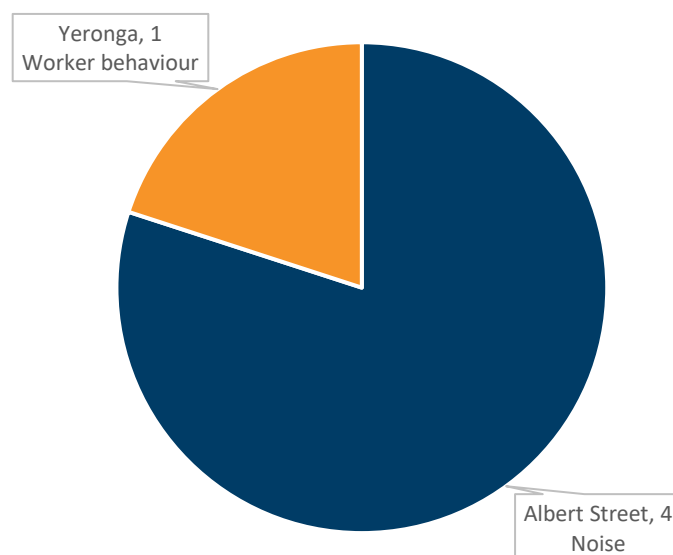
A total of 8 complaints were received during the month of which 3 were non project related.

RIS works received 1 complaint this month related to worker behaviour at Yeronga. For further details refer to **Appendix A** (Table 3).

TSD activities received 4 complaints related to rock hammering works in the station cavern during non-standard hours at Albert Street worksite. For further details refer to **Appendix B** (Table 10).

The Project Works complaints summary for the month is provided in the following chart.

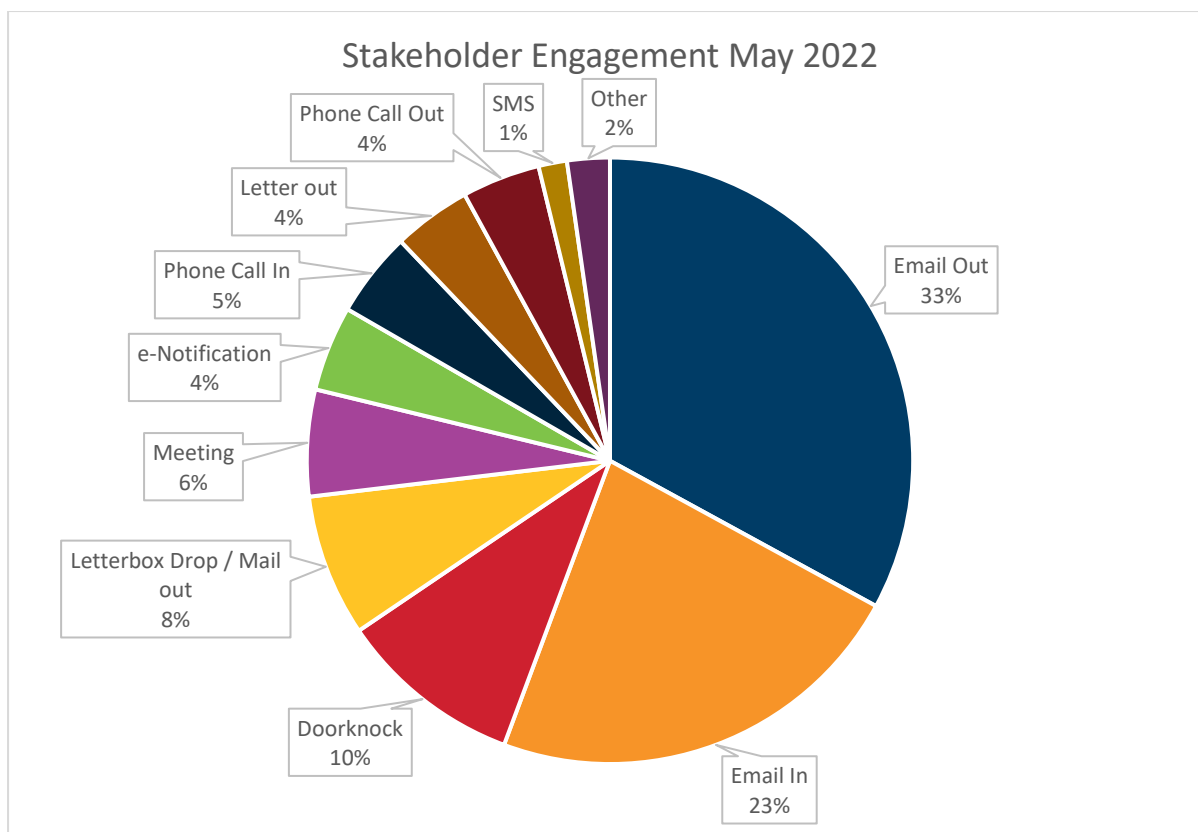
Project Complaints Summary May 2022



Where attended noise monitoring was undertaken in response to a complaint, the contractor confirmed on all occasions that works undertaken at the time of the complaint adhered to project requirements. In some instances, previous attended noise monitoring data, representative of the relevant construction activities was used to confirm the works adhered to the project noise requirements.

To close out a complaint, the monitoring data is reviewed (where applicable) against compliance with the CEMP, site environmental management plans and permits, and checks that required community notification has taken place. Contractors have also confirmed that planned mitigation to reduce the impact was implemented. This is reviewed together to verify if project requirements have been met.

For scheduled out of hours works, community notification was provided, as well as regular project updates. Stakeholder engagement undertaken on the project during the month is summarised in the chart below.



2.4. New Upcoming Project Works

The key new planned Project Works for the coming months include:

Area	New planned works in the coming months
Mayne Area	Mayne Yard North – <ul style="list-style-type: none"> Testing and Commissioning for nearing Mayne Yard Handover; Graffiti Removal Facility completion; Crew Change Building completion including landscaping; RSS walls FRP and barrier scope (RW110 / 125); BR08 (Breakfast Ck Bridge) FRP scope; DLP area clearing incl. service removal and demolition of QR facilities; Yard – Signal Testing and Commissioning; and Yard – SER/PER fit out.
Northern Area	RNA/ Northern Corridor – <ul style="list-style-type: none"> Victoria Park Feeder Station piling and FRP scope; RW260 completion of backfill and edge protection; Commence OHLE foundations through corridor; CSR scope through RNA section and Western viaduct; and Continuing Stage 1 drainage. Northern Portal – <ul style="list-style-type: none"> Installation of remaining deck units in July; Removal and rehabilitation of temporary access track in Victoria Park; and Headwall installation in late June.
Central Area	Roma Street – <ul style="list-style-type: none"> Cavern permanent arch pours;

Area	New planned works in the coming months
	<ul style="list-style-type: none"> Station building remaining cavidrain installation and invert slab works and perimeter wall pours; Services building pre-cast panel installation and concrete pours; and Infill around INB underpinning columns. <p>Albert Street –</p> <ul style="list-style-type: none"> Lot 1 – complete base slab pours, and station structure FRP works; Lot 2 – micro-blasting of service adit works in July and ongoing base slab works; and Lot 3 – Excavation completion in June. <p>Woolloongabba –</p> <ul style="list-style-type: none"> Jump form system lift 17 and 17 in June; Mezzanine unit first delivery and installation in the southern cavern in June; and Northern cavern back of house steel works to continue. <p>Boggo Road –</p> <ul style="list-style-type: none"> Concrete wall steel fixing and concrete pours ongoing; and Tree pruning/removal works in preparation for mezzanine segment delivery in August. <p>Southern Portal –</p> <ul style="list-style-type: none"> Tunnel ventilation fan commissioning in June; Portal dive structure base slab installation to occur in June; Excavation below MC01 roof to commence in June; Shaft 3 and 4 manhole construction works to commence in June; and Upcoming SCAS works in June and July.
Southern Area	<p>Dutton Park –</p> <ul style="list-style-type: none"> Commence clearing and demolition of the Cope Street properties as well as continue preliminary site mobilization activities. <p>Yeronga Station –</p> <ul style="list-style-type: none"> Fairfield Rd West – Foundation, structural column, overpass installation, footpath reinstatement works; Fairfield Overpass – Fit out, lift installation, cladding, finishing, stairs; Station buildings – Fit out, painting, joinery, flooring; and Station entrances – Completion of FRP, landscaping and general tidy up scope. <p>Fairfield Station –</p> <ul style="list-style-type: none"> Continue with the inground services installation (water, stormwater, sewer, electrical, communications, security) and commencement of structural foundations for the overpass and platform structures. <p>Clapham Yard –</p> <ul style="list-style-type: none"> Complete Retaining Walls, remediation outside the LCA and backfill; Commence CSR works; Commence FRP works at Moolabin Creek Bridge (BR93); Complete piling of Chale St Bridge (BR94); and Commence Retaining Wall RW650 in front of Aurizon facility.

2.5 Non-Compliance Events

No new NCEs have been raised this month. The summary of NCEs to date is shown in the table below.

Status	Date of event	Category	Area as on the Report	Conditions affected	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Open									
Closed									
CRRDA-001-RIS-001	11/09/19	Noise	Yeronga Station	4, 10, 11	11/10/19	14/11/19	26/11/19	18/12/19	01/10/20
CRRDA-002-TSD-001	27/03/20	ESC	Woolloongabba	4, 15, 18	30/03/20	31/03/20	22/04/20	06/11/20	31/05/20
CRRDA-003-TSD-002	27/03/20	ESC	Boggo Rd	4, 15, 18	30/03/20	31/03/20	22/04/20	06/11/20	31/05/20
CRRDA-005-TSD-004	27/03/20	Reporting	Albert St, Boggo Rd, Roma St, Woolloongabba	4, 6, 11, 13	30/03/20	31/03/20	22/04/20	06/11/20	31/05/20
CRRDA-006-TSD-005	27/03/20	Air Quality	Albert St, Boggo Rd, Roma St, Woolloongabba	13	30/03/20	31/03/20	22/04/20	06/11/20	31/05/20
CRRDA-004-TSD-003	28/03/20	Traffic	Boggo Rd	4, 10, 14	30/03/20	31/03/20	22/04/20	06/11/20	31/05/20
Withdrawn									
CRRDA-007-RIS-002	04/01/20	Air Quality	Mayne Yard, Victoria Park, Yeronga, Fairfield	13	28/04/20	30/04/20	Withdrawn		
CRRDA-008-TSD-006	04/08/20	Working Hours	Roma Street	4, 10	28/04/20	30/04/20	Withdrawn		
Gate 1 - EM notification to contractor, NCE confirmed Gate 2 - 48 hour NCE notification submitted to CG Gate 3 - 14 day report submitted Gate 4 - 14 day report uploaded to CRR website Gate 5 - Records of mitigation / preventative measures submitted to the CG					Complete				

Throughout construction activities, events and incidents are routinely investigated to verify compliance with the Imposed Conditions and to verify that management and mitigation measures are implemented in accordance with CEMP and sub-plans.

Appendix A RIS Monthly Report

Monthly CGCR Report May 2022

**Cross River Rail – Rail, Integration and Systems
Alliance**

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1 Progress Summary - Relevant Project Works

The following Project Works were undertaken during the reporting period:

Table 1: Summary of Project Works completed during the reporting period

Area	Project Works
Mayne Area	Mayne Yard North <ul style="list-style-type: none"> Graffiti Removal Facility (GRF) – nearing completion with internal service installation continuing. The flood damaged cladding and roofing will be replaced in August requiring an isolation of the GRF building. The replacement panels have been manufactured in Belgium and are currently in transit to Australia. Crew Change Building - nearing completion with internal fit-out, flooring, and tiling ongoing Crew Change Car Park– seal and asphalt work finished, and landscaping commenced Yard Driver's footpaths and sanding pads nearing completion Yard Stabling Yard Fencing nearing completion with razor wire fit-out being completed Decanting scope completed ready for commissioning with sewer connection at Abbotsford Road currently being finalised Tripod Bridge (BR11/13) – All substructure FRP completed RSS Walls for tripod bridge have all commenced and RW125 (South) almost complete and RW110 and RW120 on schedule Breakfast Ck Bridge (BR08) permanent piling southern bank Pier 2 and 3 completed. Commenced piling on northern bank at RW150 and construction of temporary jetty CRR Lines – embankment construction including Stage 1 preload placement nearing completion RW130 under Inner City Bypass continues BR12 – new QR pedestrian bridge from Bowen Hills, has commenced with preparation works at abutment Yard – All ballasted track and sleepers installed Yard – OHLE wire being installed currently Yard – Pneumatics installation has commenced
Northern Area	RNA / Northern Corridor <ul style="list-style-type: none"> BR43 (Ekka Station Western viaduct) Superstructure complete Drainage on Western side of viaduct has commenced CSR scope for EXT #14 SCAS ongoing Grated Channels installation nearing completion Victoria Park Feeder Station civil scope ongoing Watermain underbore complete at Bowen Bridge Road

Area	Project Works
Southern Area	<p>Yeronga Station</p> <p>Scope completed during the two-day May 21 and 22 SCAS on the Gold Coast line was limited due to the ongoing rain, the following activities were however progressed over the weekend:</p> <ul style="list-style-type: none"> Platform 1 and 3 Roofing works Installation of canopy roofing over PL1 in progress – in progress 50% Installation of fascia canopy over PL3 in progress – on hold due to rain Stair 1 Treads Stair 2 Treads Station electrical works ongoing UTX Crossing North UTX Crossing South <p>Non-SCAS scope includes:</p> <ul style="list-style-type: none"> Continuation of building trades fit-out & rough-in throughout the platform facilities Continuation of Fairfield Rd West overpass foundations and piling scope. <p>Fairfield Station</p> <p>Scope completed during the two-day May 21 and 22 SCAS on the Gold Coast line was limited due to the ongoing rain, the following activities were however progressed over the weekend:</p> <ul style="list-style-type: none"> Installation of dual gauge rail crossing underway Rock excavation on platform 1 Detailed excavation for overpass foundations. <p>Non-SCAS scope during the period of May-22 was focused on:</p> <ul style="list-style-type: none"> Continuing platform services such as hydraulics, drainage, water, sewer, communications, security, power conduits Detailed excavation and commencement of overpass foundations, lift wells. <p>Southern Portal / Dutton Park</p> <ul style="list-style-type: none"> No non-SCAS scope planned or undertaken during May 22 Weekend SCAS on 21 and 22 May was focused on OLE foundation installation throughout the corridor, however, rain throughout the weekend limited productivity to four (4) of nine (9) foundations. <p>Clapham Yard</p> <ul style="list-style-type: none"> Moolabin Creek (BR93) Bridge Piling complete RW620 (along Fairfield Road) FRP walls ongoing Drainage scope (early works) nearing completion SEQ Watermain protection works commenced Pipejacking drainage outlet to Fairfield Rd commenced BR94 (Chale St) piling ongoing BR94 (Chale St) FRP commenced at Pier 3.

Acronyms:

CIP – Cast in Situ Piles
 CSR – Combined Services Route
 DL – Drainage Line
 FRP – Form Reo Pour
 HV – High Voltage
 OHLE – Overhead Line Equipment
 OTV – On Track Vehicle
 PUP – Public Utility Plant
 RNA – Royal National Agricultural and Industrial Association of Queensland
 R&R – Remove and Replace
 RSS – Reinforced Soil Slopes
 RW – Retaining Wall
 SCAS – Scheduled Corridor Access Schedule
 UTX – Under Track Crossing

The following table summarises the upcoming Project Works:

Table 2: Summary of upcoming Project Works

Area	Project Works
Mayne Area	Mayne Yard North <ul style="list-style-type: none"> • Testing and Commissioning for nearing Mayne Yard Handover • Graffiti Removal Facility (GRF) completion • Crew Change Building completion including landscaping • RSS walls FRP and barrier scope (RW110 / 125) • BR08 (Breakfast Ck Bridge) FRP scope • BR12 (QR pedestrian bridge) preparation earthworks
Northern Area	RNA / Northern Corridor <ul style="list-style-type: none"> • Sewer and water underbore at Bowen Bridge Road • Victoria Park Feeder Station piling and FRP scope • RW260 completion of backfill and edge protection • Commence OHLE foundations through corridor • CSR scope through RNA section and western viaduct • Continuing Stage 1 drainage.
Southern Area	Yeronga Station <ul style="list-style-type: none"> • Fairfield Rd West – Foundation, structural column, overpass installation, footpath reinstatement works • Fairfield Overpass – Fit out, lift installation, cladding, finishing, stairs • Station buildings – Fit out, painting, joinery, flooring • Station entrances – Completion of FRP, landscaping and general tidy up scope Fairfield Station <ul style="list-style-type: none"> • The focus will be to continue with the inground services installation (water, stormwater, sewer, electrical, communications, security) and commencement of structural foundations for the overpass and platform structures. Southern Portal / Dutton Park <ul style="list-style-type: none"> • Following the Easter SCAS, the teams focus is on the clearing and demolition of the Cope St properties, from late May 22. Clapham Yard <ul style="list-style-type: none"> • Complete retaining walls, remediation outside the LCA and backfill • Complete underbore under Fairfield Rd and complete Early Works drainage as a whole • Complete piling of Moolabin Bridge (BR93, Stage 1) and Chale St Bridge (BR94) • Commence retaining wall RW650 in front of Aurizon facility.

2 Complaints

The below section summarises the complaints relating to the Project Works to be reported in accordance with condition 6(b)(iii) of the CGCR.

Table 3: Summary of Complaints

Date Received	Location	Issue	Project Works / Activity source of the concern	Reporting Period	Complaint Detail	Unity Response	Status
16/05/2022	Yeronga	Worker behaviour	Station Works	May 2022	Stakeholder complained about UNITY Alliance member smoking on Platform 3 at Yeronga Station	Team called stakeholder to thank stakeholder for their feedback and advise that the issue has been raised with the team.	Closed

3 Environmental Monitoring Results

The below section summarises the monitoring results to be reported in accordance with condition 6(b)(i) of the CGCR.

3.1 Acoustics

Condition 11(b) of the CGCR requires that during construction, monitoring and reporting on noise and vibration in accordance with the Noise and Vibration Management Plan, a sub-plan of the Construction Environmental Management Plan (C-EMP) occurs.

3.1.1 Noise Monitoring

Attended noise monitoring was not triggered based on the predictive noise assessments for the Relevant Project Works during the reporting period.

Complaint-based noise monitoring because of Project Works was not triggered during the reporting period.

3.1.2 Noise monitoring Results

Table 4: Summary of Noise Monitoring Data

Location	Receiver Type Details	Type of Monitoring	Work Hours	Monitoring date and time	Noise Type	Purpose of Monitoring	Predictive model (dBA)	Performance Goal 1 (dBA) (Condition 11(a), Table 2, LA _{10/eq} noise goals)	Performance Goal 2 (dBA) – (Condition 11(c), Table 2 LA ₁₀ noise goal + 20dBA))	Measured LA ₁₀ (dBA)	Measured LA _{eq} (dBA)	DAP engagement prior to works	Is performance Goal exceeded?	Comments For interpretation, please refer to (a)(i)(A)i
	N/A – not triggered during monitoring period													

- Note 2 of Imposed Condition 11 Table 2 states *Where internal noise levels are unable to be measured or monitored, the typical noise reductions presented in Guideline Planning for Noise Control, Ecoaccess, DEHP, January 2017 (PFNC) apply.*
- The monitoring was undertaken to validate the model therefore external noise measurements are appropriate to determine the impact of construction noise.
- Note (2) – Façade Attenuation
 - Note 2 of Imposed Condition 11 Table 2 states *Where internal noise levels are unable to be measured or monitored, the typical noise reductions presented in Guideline Planning for Noise Control, Ecoaccess, DEHP, January 2017 (PFNC) apply.*
 - The PFNC guideline can no longer be accessed. The Department of Environment and Science (DES) website still states this guideline is under review and is yet to release an alternative guideline
 - Former revisions of the PFNC table 7 stated the following regarding typical noise reductions through the building façade:
 - 5 dB – Window wide open
 - 10 dB – Partially closed
 - 20 dB – Single glazed, closed
 - 25 dB – Thermal double glazing, closed
 - The RfPC-4 Technical Report considered that all receptors had closed external single glazing for the assessment of construction noise impacts.
 - The Queensland Ombudsman assessed this assumption for the Airport Link Project and recommended that 10dB be adopted for major infrastructure projects in Queensland¹.
 - Additionally, several acoustic studies have shown that 10 dB is a suitable assumption for open windows. Most importantly this requirement only applies to temporary rail works within the project footprint and does not apply to long-term operational rail noise exposure.
 - Accordingly, it is considered appropriate to consider a 10 dB reduction on this basis. This assumption can be used for predictive modelling and for noise measurements, where indoor noise measurements are not practicable.

² All free field measurements are undertaken in accordance with the latest revision of the Noise Measurement Manual from the Department of Environment and Science (DES) reference ESR/2016/2195

3.1.3 Vibration Monitoring

Vibration Monitoring to validate the predictive model was triggered for

- The installation of driven piles (using a piling rig) on the northern bank of Breakfast Creek (Mayne Yard)
- The use of a 2T hammer at the RNA Showgrounds in proximity of the John MacDonald Stand

The results are presented in the below Table.

Complaint-based vibration monitoring was not triggered. No complaints related to vibration occurred during the reporting period.

Vibration monitoring to address property damage was not triggered by the predictive assessment.

3.1.4 Vibration Monitoring Results

Table 5 Summary of Vibration Data

Location	Date (Start and Finish)	Time of day	Closest DAP / Sensitive Place	Receiver Type (table 3 – Imposed Condition 11(e))	Purpose of Monitoring	Vibration intensive equipment	Maximum predicted vibration Level (mm/s)	Shortest distance between Equipment and Sensitive Place (m) @Time of Monitoring"	Maximum recorded vibration level (mm/s)	Vibration goal for receiver (mm/s)	Exceedance of vibration limit?	Comments
Breakfast Creek Northern Bank	27/05/2022 – 31/05/2022	Surface Works Standard Hours	Commercial receiver Human Comfort	Commercial	Construction Monitoring at Sensitive Places – Model Verification	Piling rig (driven piles)	15mm/s - 11m setback	Vibration monitor located at façade of closest receiver, located 10 m away from the works	0.20 mm/s	Transient Vibration 11(e) – 2mm/s (daytime human comfort – vibration goal) 11(g) – 10mm/s (daytime human comfort – vibration goal) – respite or case by case consultation trigger 11(e) – 50mm/s cosmetic damage	No	Continuous 24/7 monitoring
Breakfast Creek Northern Bank	30/05/2022- 07/06/2022	Surface Works Standard Hours	Commercial receiver Human Comfort	Commercial	Construction Monitoring at Sensitive Places – Model Verification	Piling rig (driven piles)	15mm/s - 11m setback 5mm/s – 50m setback	Vibration monitor located 25 m away from the works Closest receiver located 21 m away from the works	0.17 mm/s	Transient Vibration 11(e) – 2mm/s (daytime human comfort – vibration goal) 11(g) – 10mm/s (daytime human comfort – vibration goal) – respite or case by case consultation trigger 11(e) – 50mm/s cosmetic damage	No	Continuous 24/7 monitoring
RNA John MacDonald Stand	01/05/2022 – 31/05/2022	Surface Works Standard and Out of Hours Works	John MacDonald Stand	Heritage	Construction Monitoring at Sensitive Places – Model Verification	2T hammer attachment	1.4 mm/s	32 metres	37.3 mm/s	11(e)- Cosmetic Damage / Heritage Structures Revised Vibration Limit: Group 3 DIN 4150 – 3: 3mm/s – 10mm/s (dependent on frequency)	Yes – but Exceedances of the vibration goal not related to Project Works	Continuous 24/7 monitoring - refer to Section 3.1.5.1.1.2 for details

3.1.5 Interpretation

i. Noise Monitoring²

No noise monitoring was conducted during the reporting period.

The RIS scope of works continues to achieve the outcomes set out by the CGCR and OEMP.

3.1.5.1 Vibration Monitoring

3.1.5.1.1 Model Verification

3.1.5.1.1.1 Breakfast Creek Results

Vibration monitoring on the Northern Bank of Breakfast Creek was a continuation of the Vibration Monitoring carried out in March 2022 on the Southern Bank of the creek for the same activity.

As presented in the March 2022 MER, monitoring of the pile driving rig was carried out in March as the predictive modelling identified there was a potential for the works to trigger the following. Either case-by-case consultation and agreed mitigation measures with the occupants, or the incorporation of respite periods when the pile driving rig was to be used on the Northern Bank of Breakfast Creek.

The monitoring carried out in March identified that the predictive model was presenting a worst-case scenario with the actual vibration levels recorded at a 15m offset distance being four (4) times lower than the predicted levels.

The monitoring results of the driven piling works on the Northern Bank confirmed there were no exceedances of the Project's vibration goals.

Review of the data and site set up identified that the first run of monitoring was in an area of loose fill / granular soils which would have resulted in a higher dissipation of the vibration.

The second run of monitoring therefore saw the relocation of the vibration meter in an area where the ground conditions were more cohesive, to ensure the monitoring on the Northern Bank was not under-representing the vibration emissions.

The second run of monitoring also returned results significantly below the vibration goals. This is because the predictive vibration assessment was highly conservative:

- The modelling assumed a worst-case vibratory piling scenario for start-up / run down, and
- The prediction equation provided by BS5228, was used with the most conservative scaling factor parameter applied, and
- The modelling assumed that all piling activities were driven to refusal at a shallow piling depth.
- Part of the piling works monitored was for Pier 3 which is located in the Creek's bed and therefore under water where higher attenuation is achieved due to the deep profile of the bed and bank soft cohesive soils.

3.1.5.1.1.2 John MacDonald Stand Results

Vibration monitoring during rock breaking works at the RNA Showgrounds was undertaken at the foundation of the State Heritage listed John MacDonald Stand within the Bar Room. This location was selected based on the outcomes of predictive assessments.

Review of the measurement data indicated that there was a total of sixteen (16) exceedances of the revised vibration limits based on building specific vibration goals presented in the latest version of the endorsed Property Damage Sub-Plan (Revision 09). The exceedances were recorded between 27 May 2022 and 28 May 2022. Refer to Table 6 for a summary of the exceedances.

² All free field measurements are undertaken in accordance with the latest revision of the Noise Measurement Manual from the Department of Environment and Science (DES) reference ESR/2016/2195

Table 6 Summary of John MacDonald Stand Exceedances

Date	Time	Peak Vibration Level	Working Hours	UNITY Vibration Intensive Works
Friday 27 May 2022	09:00	33 mm/s	Standard	Nil
Friday 27 May 2022	10:21	19 mm/s	Standard	Nil
Friday 27 May 2022	11:43	22.9 mm/s	Standard	Nil
Friday 27 May 2022	18:03	16.6 mm/s	Standard	Nil
Friday 27 May 2022	18:21	16.5 mm/s	Standard	Nil
Friday 27 May 2022	19:19	23 mm/s	Out of Hours	Nil
Friday 27 May 2022	19:37	32.9 mm/s	Out of Hours	Nil
Friday 27 May 2022	20:46	29.6 mm/s	Out of Hours	Nil
Friday 27 May 2022	21:03	17.5 mm/s	Out of Hours	Nil
Friday 27 May 2022	22:12	29.4 mm/s	Out of Hours	Nil
Saturday 28 May 2022	01:59	37.3 mm/s	Out of Hours	Nil
Saturday 28 May 2022	15:28	26 mm/s	Standard	Nil
Saturday 28 May 2022	16:38	22 mm/s	Standard	Nil
Saturday 28 May 2022	16:55	16.2 mm/s	Standard	Nil
Saturday 28 May 2022	18:40	23.8 mm/s	Out of Hours	Nil
Saturday 28 May 2022	22:09	24.4 mm/s	Out of Hours	Nil

Real-time investigation into the exceedances identified UNITY was not conducting any vibration-intensive works during the period the exceedances were recorded. It was confirmed that the Bar Room was occupied by RNA Showgrounds staff preparing the room for the upcoming Camping and Caravan Show which resulted in a series of accidental contact with the secured located box the vibration meter is located within.

Review of the vibration records at the time Unity Alliance was carrying out rock breaking works confirmed that the highest vibration record was 0.98 mm/s, when the rock breaking was occurring 35 m away from the John MacDonald Stand. The vibration model predicted emissions of 1.2 mm/s when rock breaking was proposed to occur 35m away from the works.

The exceedances cannot be attributed to UNITY Works.

Therefore, RIS scope of works achieved the outcomes set out by the CGCR and OEMP.

3.2 Air Quality

Imposed Condition 13(b) of the CGCR requires that during construction, monitoring, and reporting on air quality in accordance with the Air Quality Management Plan, a sub-plan of the C-EMP occurs.

Visual monitoring was undertaken during routine environmental inspections. A total of 24 inspections were undertaken by the Environment Team across Mayne Yard, RNA Showgrounds, Southern Area, Fairfield Station, Yeronga Station, Clapham Yard, and the Northern Corridor.

UNITY has installed the following air quality monitoring devices, therefore data collected from these devices, when active, is reported on in the monthly report regardless of the Project Works occurring.

Table 7: Summary of Air Quality monitoring devices

Monitoring Device Installed by UNITY	Area	Name	Date Installed	Status for the Reporting Period
Dust Deposition Gauge	RNA Showgrounds	AQ-01	13 December 2019	Active
Dust Deposition Gauge	Mayne Yard (Eastern Air Shed)	AQ-04	13 February 2020	Active
Dust Deposition Gauge	Clapham Yard (Eastern Air Shed)	AQ-06	1 February 2021	Active
Dust Deposition Gauge	Yeronga Station	AQ-07	12 August 2021	Inactive DDG was decommissioned on 10 December 2021 following the completion of earthworks
TSP / PM ₁₀ Monitor	Mayne Yard (Eastern Air Shed)	Mayne Yard	23 April 2020	Partially active DMP was removed 11 May 2022 for bi-annual factory calibration
TSP / PM ₁₀ Monitor	Clapham Yard (Eastern Air Shed)	Clapham Yard	9 August 2021	Active however defective for most of the monitoring period
TSP / PM ₁₀ Monitor	RNA (Western Air Shed)	RNA	25 August 2020	Partially active DMP was removed 11 May 2022 for bi-annual factory calibration

3.2.1 Dust results

As passive dust deposition gauges (DDG) are analysed monthly, results span 12 April 2022 to 12 May 2022 and 13 May to 13 June.

This is excluding Mayne Yard, which spans from 21 April 2022 to 12 May 2022.

The Mayne Yard DDG is located within the active rail corridor and requires a Protection Officer for collection and replacement. During last month's reporting period there was a staffing issue with Protection Officers and the gauge was inaccessible until 21 April 2022, as presented in the April MER.

To prevent a potential reoccurrence of the staffing issue, the DDG was replaced early to keep in line with the same replacement cycle for the RNA and Clapham Yard DDGs. This will aim to ensure sufficient notification is provided to ensure availability of a Protection Officer.

The DDG was therefore left for a reduced period of 20 days. As per AS/NZS 3580.10.1, section 7.3, for routine monitoring programs, the period of exposure is 30±2 days.

The Mayne Yard results are not considered a representative sample according to the Australian Standard, per the advice of the Project Certified Air Quality Professional (CAQP). This is due to the gauge not being active for a period of 30±2 days.

The deposited dust results are detailed below. RNA and Clapham Yard complied with Imposed Condition 13(b) of the CGCR.

Table 8 Dust deposition gauge results for the reporting period

CGCR Goal (mg/m ² /day)	AQ-01 - RNA Showgrounds (mg/m ² /day)	AQ-04 Abbotsford Rd (E Mayne) (mg/m ² /day)	AQ-06– Clapham Yard (mg/m ² /day)
120	23	17*	10
Total Rainfall during Period (mm)	99	88	195

* Results are not a representative sample

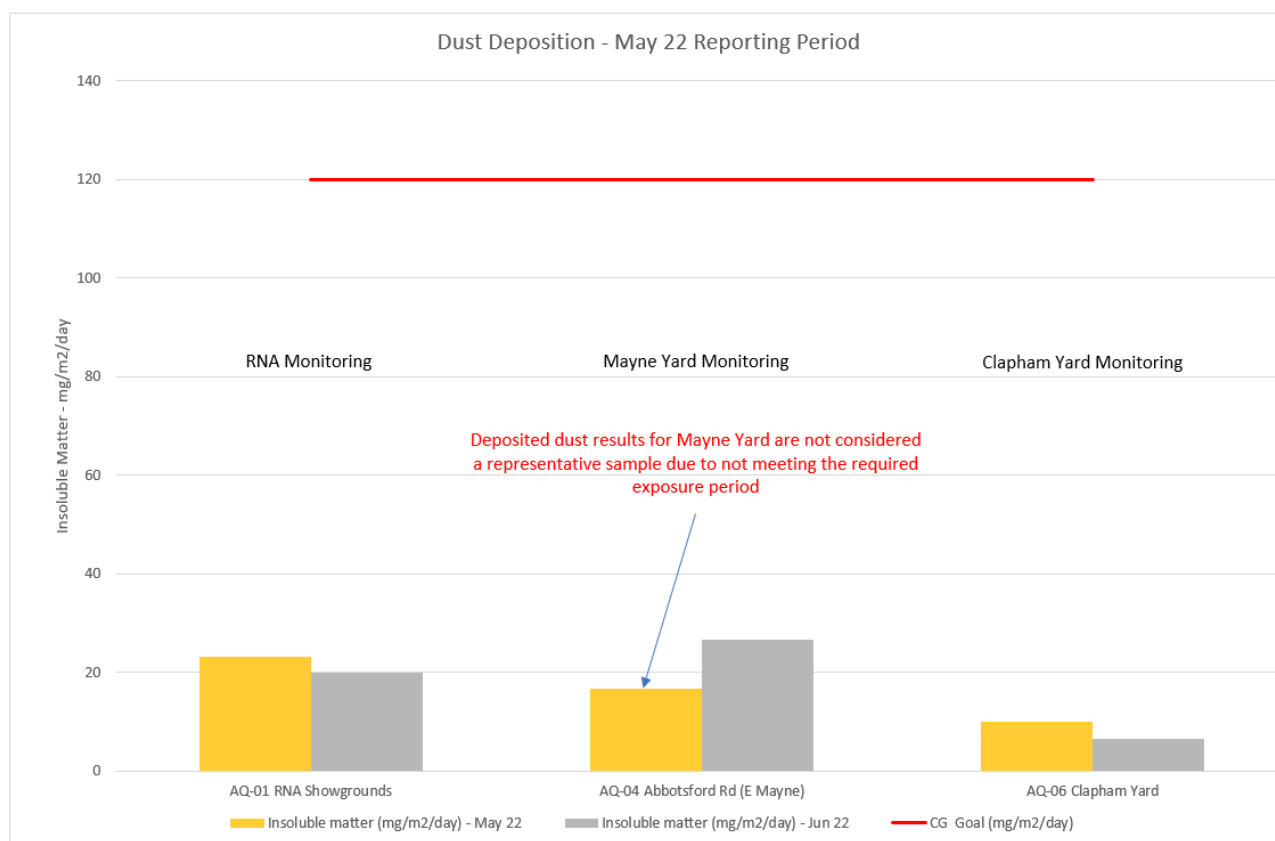


Figure 1 Air Quality Monitoring (Deposited Dust) Results

3.2.2 Particulates results

3.2.2.1 Air Quality Monitoring Stations

UNITY had one (1) active and (2) partially active air quality monitoring stations in place for the reporting period as detailed in Table 7.

As presented in the April MER, the Mayne Yard and RNA DMP were due for their bi-annual factory calibrations.

Both DMPs have now been sent to Sydney and upon inspection by the manufacturer, it was identified that extensive water damage had occurred to both stations requiring significant repairs to be carried out, inclusive of the replacement of a jet holder, heater and heater insulator in addition to the expected replacement of the pumps, batteries and laser diode cable and associated housing.

The findings are consistent with the following malfunctions identified during the reporting period prior to removal on 11 May 2022 for bi-annual factory calibration:

- Mayne Yard DMP
 - no data recorded between 1 May 2022 and 11 May 2022.
- RNA DMP
 - no data recorded between 9 May 2022 and 10 May 2022.
 - Significant spikes between 5 minutes records up to 250 times than average daily records in similar conditions and comparable to readings obtained when carrying smoke testing on the DMP.

Due to extensive damage to both DMPs, the data records for the reporting are deemed invalidated and therefore not reliant. Since they cannot be used for compliance assessment they have not been presented.

The Clapham Yard DMP experienced a serious malfunction preventing recording and logging of data on 11 May 2022 and between 13 – 31 May 2022.

Based on the findings for the RNA and Mayne Yard DMP, Unity contacted the manufacturer. The malfunction was associated to two potential causes:

- heavy rainfall between 11 – 14 May 2022 (186 mm over 72-hour period) which may have caused the battery to trip, or
- as with the other DMPs, water damage caused the malfunction.

The manufacturer requested the DMP be removed from site and sent for inspection to their facility in NSW, noting the DMP was factory calibrated by the manufacturer only six months ago.

Therefore, only partial records that are deemed reliable for the purpose of compliance assessment are presented for the Clapham Yard DMP

3.2.2.2 Monitoring Results – Reporting Period

External ambient air quality data was collected for total suspended particles (TSP), and particulate matter less than 10 μm (PM_{10}).

TSP is one of the indicators for which the Coordinator-General has imposed a goal of 80 $\mu\text{g}/\text{m}^3$ (over an averaging period of 24 hours) the project must aim to achieve under Imposed Condition 13(a).

PM_{10} is one of the indicators for which the Coordinator-General has imposed a goal of 50 $\mu\text{g}/\text{m}^3$ (over an averaging period of 24 hours) the project must aim to achieve under Imposed Condition 13(a).

These stations have been installed on-site as per AS/NZS 3850 1.1 following consultation with UNITY air quality professionals.

As explained in the previous section, the results presented for the reporting period only cover the Clapham Yard records as the Mayne Yard and RNA data records are not reliant.

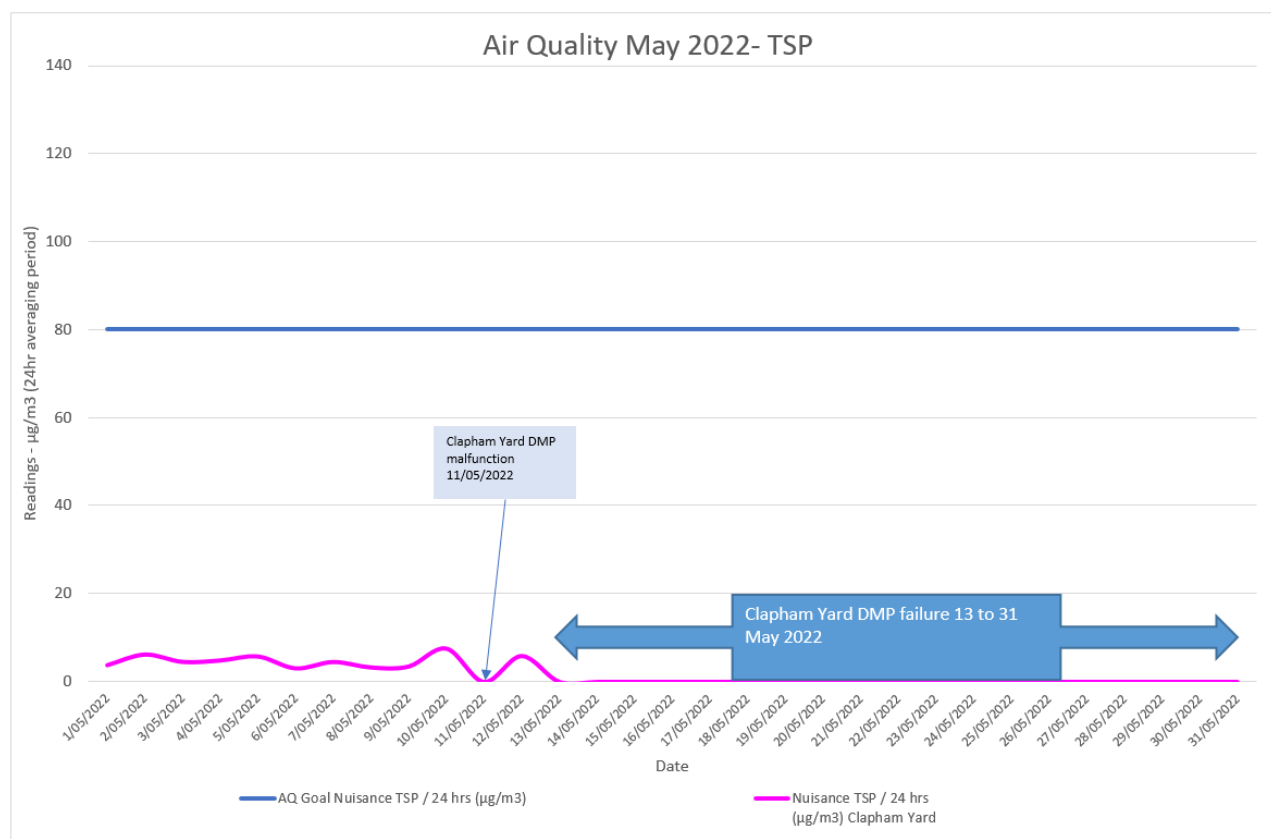


Figure 2 Air Quality Monitoring (TSP) Results

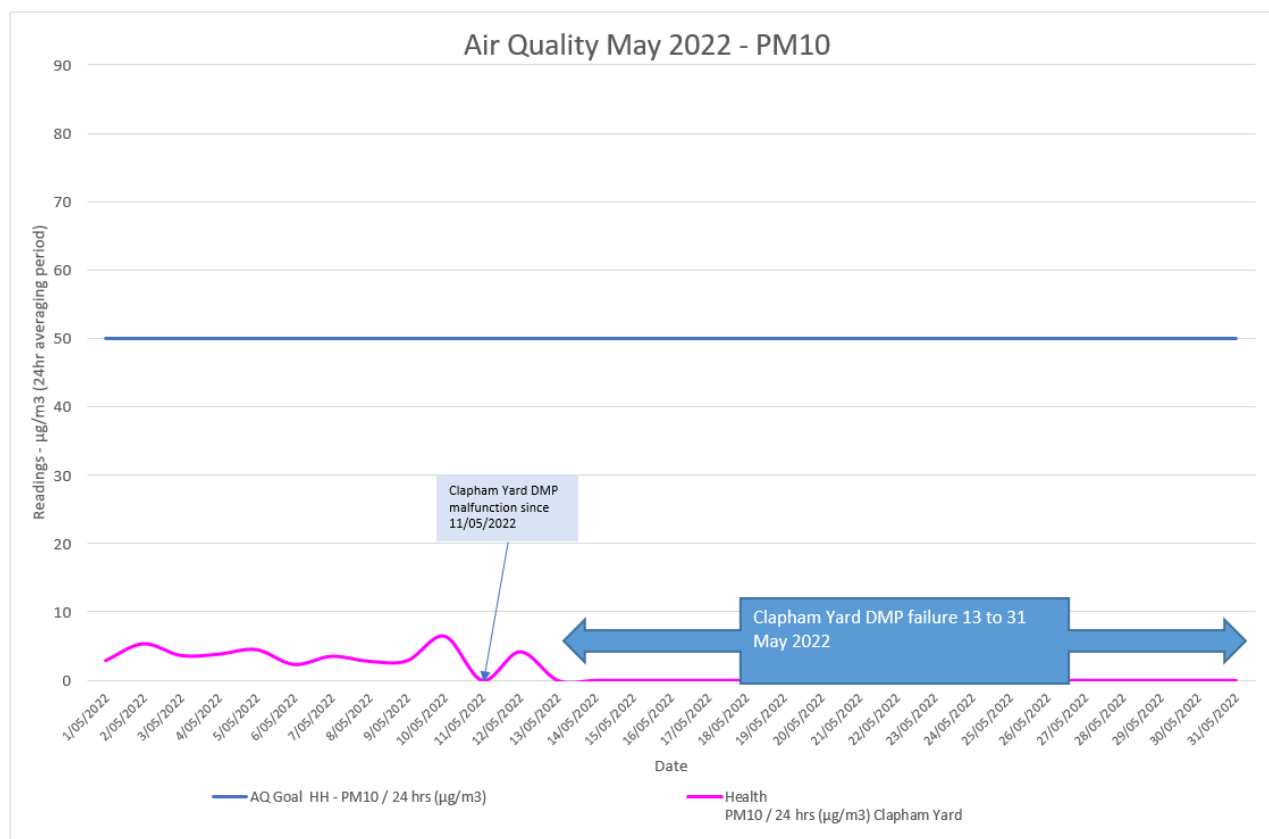


Figure 3 Air Quality Monitoring (PM_{10}) Results

3.2.2.3 Monitoring Results – Annual Averaging

Imposed Condition 13 (a) sets annual average air quality goals for TSP (Human health) and PM_{10} (Human health).

The below table summarises where TSP and PM_{10} monitoring have been carried out over the last 12 months.

The National Environment Protection (Ambient Air Quality) Measure Technical Paper No.5 provides guidance and procedures for uniform data recording and handling.

(<https://www.nepc.gov.au/system/files/resources/9947318f-af8c-0b24-d92804e4d3a4b25c/files/aaqprctp05datacollection200105final.pdf>).

For air quality data to be officially reported, as per section 4.5 of Technical Paper No. 5, the minimum data capture would be 75% of the year or 274 days.

“It is essential that data loss is kept to an absolute minimum. For representative monitoring data and for credible compliance assessment it is desirable to have data capture rates higher than 95%. 75% data availability is specified as an absolute minimum requirement for data completeness”.

In some instances, Relevant Project Works, which triggered TSP and PM_{10} monitoring was carried out for less than 274 days (e.g., at the Northern Corridor). In such instances the annual averages are still reported but are indicative only as data capture did not meet the 75% data capture requirements of *National Environment Protection (Ambient Air Quality) Measure Technical Paper No. 5 – Data Collection and Handling*.

Table 9: Summary of Air Quality monitoring devices over 12 months

Monitoring Device Installed by UNITY	Area	Date Installed	Date Decommissioned	Number of days data was captured over 365 days period	Data capture over an annual period	Annual performance reporting
TSP / PM ₁₀ Monitor	Northern Corridor (Eastern Air Shed)	23 April 2020	13 January 2021	260 over 365 days	71% over 365 days	<i>Indicative only</i> Data capture did not meet the minimum data capture requirements
TSP / PM ₁₀ Monitor	Mayne Yard (Eastern Air Shed)	23 April 2020	Not yet decommissioned	Period 1 (to 23 April 2021) 358 over 365 days Period 2 (24 April 2021 to 25 April 2022) 364 over 365 days Period 3 (starting 26 April 2022)	Period 1 98% over 365 days Period 2 99% Over 365 days Period 3 8% 3 days over 36 days	Applicable for Period 1 Data capture met minimum data capture requirements Applicable for Period 2 Data capture has met minimum data capture requirements Applicable for Period 3 Data capture has not met minimum data capture requirements
TSP / PM ₁₀ Monitor	RNA (Western Air Shed)	11 June 2020	Not yet decommissioned	Period 1 (to 11 June 2021) 314 over 365 days Period 2 (starting 12 June 2021) 319 over 354 days	Period 1 86% over 365 days Period 2 90% Over 354 days	Applicable for Period 1 Data capture met minimum data capture requirements Applicable for Period 2 Data capture met minimum data capture requirements
TSP / PM ₁₀ Monitor	Clapham Yard (Eastern Air Shed)	1 February 2021	Not yet decommissioned	Period 1 (to 31 January 2022) 326 over 364 days Period 2 (starting 01 February 2022) 91 over 120 days	Period 1 90% over 364 days Period 2 76% Over 120 days	Applicable for Period 1 Data capture met minimum data capture requirements Not Applicable for Period 2 Data capture has not yet met the minimum data capture requirements

The below table summarises the applicable and indicative annual data results for TSP and PM₁₀ against the performance goals imposed under Condition 13(a). Results in italic are indicative only.

Table 10 Annual Performance Results

Air Quality Indicator	Goal	Period	Northern Corridor	Mayne Yard	RNA	Clapham Yard
TSP	90 µg/m ³	Period 1	8 µg/m ³	11 µg/m ³	18 µg/m ³	8 µg/m ³
		Period 2	-	10 µg/m ³	15 µg/m ³	Not applicable
		Period 3	-	Not yet applicable	-	-
PM ₁₀	25 µg/m ³	Period 1	5 µg/m ³	7 µg/m ³	11 µg/m ³	5 µg/m ³
		Period 2	-	7 µg/m ³	10 µg/m ³	Not applicable
		Period 3	-	Not yet applicable	-	-

3.2.3 Interpretation

During the reporting period there is limited quantitative data available. However, consistent with Attachment 4 of the C-EMP other qualitative parameters can be used to ascertain compliance with the Air Quality project objectives:

- None of the dust deposition results (when data can be relied upon) exceeded the relevant goal
- The Clapham Yard particulate results for the period of time when data were collected did not exceed their relevant daily goals for PM₁₀ and TSP
- These results also are consistent with an above than average rainfall record for May, as reported by the Bureau of Meteorology (<http://www.bom.gov.au/climate/current/month/qld/brisbane.shtml>)
- May rainfall was very much above average with most sites in Greater Brisbane reporting more than twice the long-term average for the month
- Increased rainfall resulted in higher moisture content within the Project Catchment and therefore associated areas of earthworks, therefore acting as natural dust suppression
- There was no evidence of dust being generated and leaving the site boundaries when carrying out routine inspection
- There were no complaints received associated with air quality concerns during the reporting period for the Mayne Yard, Clapham Yard, and RNA sites.

Therefore, the RIS scope of works has met the project outcomes set out by the CGCR and OEMP.

3.3 Water Quality

Condition 15(b) of the CGCR requires that during construction, monitoring, and reporting on water quality in accordance with the Water Quality Management Plan, a sub-plan of the C-EMP, occurs.

Condition 15(a) requires that discharges of groundwater from Project Works within the Breakfast Creek catchment must comply with the Brisbane River Estuary environmental values and water quality objectives (Basin no.143 – mid-estuary) in the *Environment Protection (Water) Policy 2009*.

Condition 15(a) requires that discharges of groundwater from Project Works within Moolabin Creek, Yeerongpilly – Oxley Creek catchment must comply with the Oxley Creek - Lowland freshwater environmental values and water quality objectives (Basin no.143 (part) – including all tributaries of the Creek) in the *Environment Protection (Water) Policy 2009*.

Water quality monitoring to demonstrate compliance with Condition 15(a) was not triggered during the reporting period.

Water quality monitoring to demonstrate compliance with Condition 15(b) and Condition 18 was triggered during the reporting period for:

- Clapham Yard
 - Friday 6 May 2022
 - 1hr storm (16 mm rainfall with peak intensity of 50 mm/hr)
 - Visual and in situ post rainfall monitoring was carried out within 24 hours of the event
 - Project Works discharges were identified.
- Mayne Yard
 - Wednesday 11 May 2022
 - Series of showers during the day (total of 30mm of rain)
 - Visual post rainfall monitoring was carried around 8am on 12 May 2022, noting that rainfall was ongoing on 12 May
 - Project Works discharges were not identified.
- Clapham Yard
 - Wednesday 11 May 2022
 - Series of showers during the day (total of 51 mm of rain with peak intensity micro-burst of 102 mm/hr)
 - In situ post rainfall monitoring was carried out around 12 pm on Thursday 12 May 2022, noting that rainfall was ongoing at the time of the monitoring (3hr continuous rainfall leading to in situ sampling resulting in 26 mm of rain with peak intensity micro-burst of 106 mm/hr) within 24 hours of the event
 - Project Works discharges were identified.

There were also active surface water discharges (e.g., dewatering through pumping, sediment basin release) to receiving waters.

3.3.1 Rainfall Records

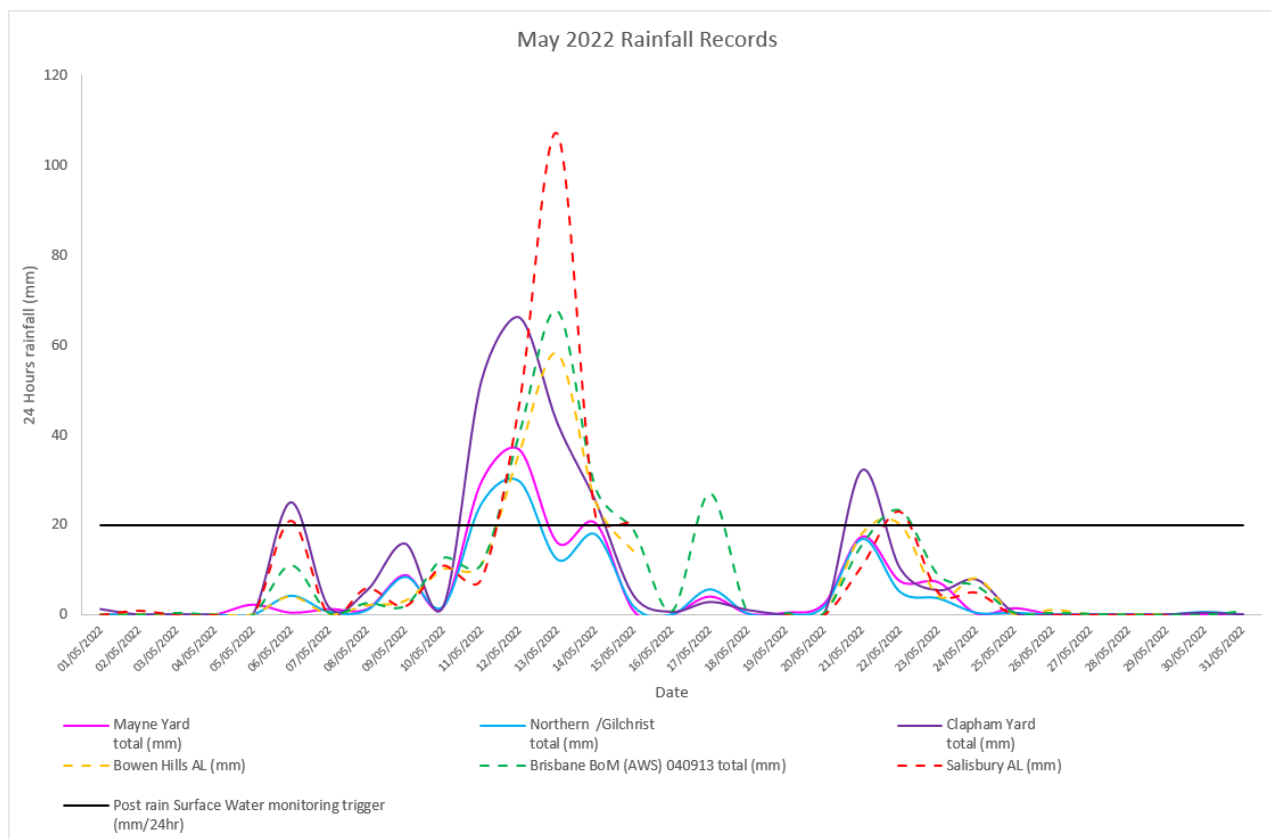


Figure 4: May 2022 Rainfall Records

3.3.2 Post Rainfall Monitoring Results

Post rainfall monitoring is triggered typically following any rainfall event exceeding 20 to 25 mm over 24 hours, however, storm events during the high-risk period of the year (November to March) of lesser amounts but of a higher intensity may cause run-off which would also trigger post-rain monitoring consistent with the C-EMP.

Post rainfall monitoring initially consists of visual monitoring to determine if in-situ water quality monitoring is necessary. If contaminants are observed (e.g., hydrocarbon sheen) or if there is a visible difference in water quality when comparing upstream and downstream monitoring points, water quality sampling will then be undertaken. The visual assessment will assess gross increases in turbidity, litter, hydrocarbons, or the movement of any coarse sediment into the waterway. The assessment will also note any potential offsite impacts that may be adversely affecting water quality within the construction area.

For the reporting period, post rainfall monitoring consisted of a mixture of visual monitoring and in-situ monitoring.

3.3.2.1 Qualitative Monitoring

3.3.2.1.1 Mayne Yard North

On 12 May visual monitoring of Breakfast Creek was carried out from the Mayne Yard North work site immediately following the storm event. The visual monitoring identified that there were no passive discharges into Breakfast Creek.

Therefore, no supplementary in situ water quality monitoring was undertaken.

3.3.2.1.2 Clapham Yard

3.3.2.1.2.1 Moolabin Creek

On 6 May, following a rainfall event commencing at approximately 6am Friday 6 May 2022, Moolabin Creek levels commenced rising.

The temporary Creek crossing (in the process of being completed) to support the construction of the new Dual Gauge Bridge commenced overtopping (as intended) at approximately 7.10 am

The waters concentrated along the southern section of the crossing resulting in:

- The displacement of the rock scour protection on the downstream side of the crossing
- Loss of soils (estimated 2 to 3m³) from the southern bank of the creek downstream of the overtopping.

The rainfall started to reduce to a drizzle by 7.15 am and the overtopping completely stopped by 8am or shortly prior; the creek levels also commenced to recede.

Upon becoming aware of the event, the Environmental Manager inspected the area.

- Due to the potential for further rainfall and flash flooding no in situ water quality monitoring could safely be carried out immediately after the event
- Visual observations could be carried out
- They identified that in stream water quality downstream of the crossing returned to background conditions by 9.30 am
- While the erosion had mobilised the coarse scour protection downstream of the crossing, the material had settled in the watercourse bed within 10-15m from the crossing
- Water quality monitoring could be safely carried out upon completion of the repair works (see below Table 11 for the key parameters).

3.3.2.2 Quantitative Monitoring

The post rainfall monitoring events identified that water quality was visually more turbid throughout the systems at all monitoring locations in the vicinity of Clapham Yard.

In some instances, TSS results at the downstream monitoring locations were more than 10% greater than the upstream results.

In some instances, the TSS results difference between the upstream and downstream results were also greater than 5mg/L.

Table 11: Surface Water Post Rainfall Monitoring Results

Date	Location	Waterway	Tide	Discharge Criteria ³				TSS Delta
				Turbidity (NTU) Nil until Turbidity / TSS correlation achieved ⁴	TSS (mg/L) <50	DO (%) Nil	pH (pH Unit) Stable pH reading; and General sites: 6.5 – 8.5, or Wallum/Acidic Ecosystems: 5.0 – 7.0	change of 5mg/L or 10% increase (whichever is the greatest)
6 May 2022	Moolabin Creek	SW-5 (upstream)	N/A	Field: 16 Lab: 16.5	<5	81	7.3	Immediately after event, visual observation identified coarse sediment mobilisation and likely increase above goal. Post incident response in situ monitoring demonstrated that water quality had returned to ambient conditions
6 May 2022	Moolabin Creek	Immediately downstream of the crossing	N/A	Field: 31 Lab: 27	6	82	7.2	
6 May 2022	Moolabin Creek	SW-6 (downstream)	N/A	Field: 38 Lab: 20	<5	68	6.9	
6 May 2022	Rocky Water Hole	SW-7 (upstream)	N/A	Field: 31 Lab: 29	<5	76	7.1	No
6 May 2022	Rocky Water Hole	SW-8A (downstream)	N/A	Field: 27 Lab: 29	6	64	7.0	
12 May 2022	Moolabin Creek	SW-5 (upstream)	N/A	Field: 56.5 Lab: 61	43	111	7.5	Yes However, increase of turbidity between upstream and downstream locations is also affected by external sources that are not solely project related Refer section 3.3.6 for interpretation
12 May 2022	Moolabin Creek	SW-6 (downstream)	N/A	Field: 94 Lab: 115	142	116	7.2	
12 May 2022	Rocky Water Hole	SW-7 (upstream)	N/A	Field: 72.5 Lab: 81	72	111	7.1	Yes – increase of 39 mg/L or 2% Refer section 3.3.6 for interpretation
12 May 2022	Rocky Water Hole	SW-8 (downstream)	N/A	Field: 88 Lab: 92	110	111	7.25	

3.3.3 Groundwater Discharge Monitoring Results

Groundwater discharge monitoring was not triggered during the reporting period.

3.3.4 Surface Water Discharge Monitoring

Due to the ongoing wet weather in May 2022 surface water run-off entered surface excavations which required dewatering. Consistent with the C-EMP, when water could not be re-used on site (e.g., as dust suppression) or when land release had the potential to reach stormwater system (due to saturated ground conditions) water was proposed to be discharged directly or indirectly to receiving waters (either a creek or stormwater drainage) the water quality was tested to ensure it met the discharge requirements.

³ Refer to the waterways and water quality management plan, a C-EMP sub-plan for details of derivation of the discharge criteria

⁴ Correlations are typically run on the source water (i.e., basins) not the receiving system where there is a dilution component of potentially diffuse sources of sediments from non-Project related areas. Due to the very limited amount of discharges the RIS Scope of Works has experienced, there is no correlation available. Typically, a minimum of 20 data points is used to determine TSS / in field turbidity correlation for site waters.

The below table summarises the off-site water releases to receiving waters that were authorised under a Permit to Dewater as per the Project's requirements.

All key physical water quality parameters were confirmed to meet the Discharge Criteria prior to a first dewatering permit being issued using a combination of in situ readings and laboratory samples. Ongoing dewatering of the same source water was subsequently verified by regular in situ testing and spot laboratory samples.

Table 12: Surface Water Discharge Monitoring Results

Date – Start	Date Finish	Location	Waterway	Discharge Criteria ⁵			
				Turbidity (NTU) Nil until Turbidity / TSS correlation achieved ⁶	TSS (mg/L) <50	DO (%) Nil	pH (pH Unit) Stable pH reading; and General sites: 6.5 – 8.5, or Wallum/Acidic Ecosystems: 5.0 – 7.0
04/05/2022	31/05/2022	Northern Corridor	Multiple campaign discharges to stormwater drain ultimately discharging to Enoggera / Breakfast Creeks	Field: ranging from 12 to 42 NTU Lab: ranging from 15 to 46	Ranging from <5 to 34 mg/L	40 to 137 % pre discharge	6.7 to 8.7
16/05/2022	24/05/22	RNA	Multiple campaign discharges to stormwater drain ultimately discharging to Enoggera / Breakfast Creeks	Field: 9 to 27 NTU Lab: up to 18 NTU	Up to 9 mg/L	46 to 98 % pre discharge	7.0 to 8.2
31/05/22	03/06/22	Clapham Yard	Rock water holes Creek	Field: 0 Lab: 2	<5	86% pre discharge	8.3

3.3.5 Routine Surface Water Monitoring Results

During the reporting period, UNITY did not undertake routine surface water monthly monitoring. A review of the data sample has identified that over 12 months of continuous data collection has occurred with a total of over 18 monitoring events. The frequency of background monitoring has therefore been reduced to bi-annually, with the next sampling round to be undertaken during the dry season (April to September).

Considering the unseasonal precipitation experience at the start of the dry season, dry season monitoring will likely occur in June or July 2022.

This reduction of monitoring frequency is acceptable to continue informing the Dis-1 Credit for the ISC 'Excellent Rating' the Project is pursuing.

⁵ Refer to the waterways and water quality management plan, a C-EMP sub-plan for details of derivation of the discharge criteria

⁶ Correlations are typically run on the source water (i.e., basins) not the receiving system where there is a dilution component of potentially diffuse sources of sediments from non-Project related areas. Due to the very limited amount of discharges the RIS Scope of Works has experienced, there is no correlation available. Typically, a minimum of 20 data points is used to determine TSS / in field turbidity correlation for site waters.

3.3.6 Clapham Yard - Post Rainfall Monitoring Results Interpretation

3.3.6.1 Detailed review criteria

The post rainfall monitoring events identified that water quality was visually more turbid throughout the systems at all monitoring locations.

Where in situ monitoring was carried out, in some instances, downstream water quality data exhibited changes of >5 mg/L or 10% increase for TSS or 10% increase for turbidity.

Consistent with Table 2 of the Waterways and Water Quality Management Sub-plan when TSS results downstream of the Project Works exhibit a change of 5 mg/L or 10% increase (whichever is the greatest), further investigation is required to ascertain whether this change in water quality is related to released water from the Project Works.


Therefore, a detailed review of the data was required to ascertain whether:

- The source of the increased turbidity could be reasonably accredited solely to the Project Works; and
- If so, had the Project implemented all reasonable and practicable measures to minimise environmental impacts.

The assessment included the review of the following factors:

- Rainfall size (below or above the design criteria for the erosion and sediment control measures)
- Existence of an ESC-P designed by suitably qualified person consistent with the Guidelines for Best Practice Erosion and Sediment Control (IECA 2008) as per Imposed Condition 18
- Status of the erosion and sediment control measures, that is
 - ESC measures were installed and maintained as per the ESC-P or the relevant action plan from routine surveillance, and
 - If the rain event was below the design criteria, the ESC measures had not been damaged by the rain event.
- Presence of external sources of sedimentation in the immediate vicinity of the Project Works, and
- Evidence that, where site run-off had been generated by the rainfall, site run-off had entered the surface water bodies without going through an ESC measure, and
- Previous rainfall resulting in increased run-off potential, and
- Flow conditions of the creek (e.g., were flood warnings issued).

The below table details the assessment for each individual monitoring event that identified or presumed impacts to water quality.

Date	Location	Event size	Event above Design Criteria	ESC-P designed and regularly maintained by Suitably Qualified Person	ESC measures were installed and maintained to the appropriate standard	ESC measures damaged by the rain event	Evidence of site run off had entered the surface water bodies	Site run off had entered the surface water bodies without going through ESC measures	Presence of external sources of sedimentation	Previous rainfall resulting in increased run-off potential	Flood alert issued	Discernible downstream impact solely attributable to Project Works releases
06 May 2022	Clapham Yard Moolabin Creek	Between a 12EY ⁷ and 6EY	No	Yes	No	Yes	Yes	No	Yes – hydrocarbon sheen from midstream outlet	Yes	Yes – first alert issued at 6.55 am	Yes – refer 3.3.6.2 for more details
12 May 2022	Clapham Yard Moolabin Creek	Between 4 and 1 EY based on rainfall depth and Between 2- and 5-year ARI ⁸ based on peak intensity microburst	Yes	Yes	Yes	No	Yes – passive discharges through type 2 controls	No	Yes – visible discolouration from two midstream stormwater outlets	Yes – 11 May '22 event	Yes – first alert issued at 9.46 am on 12 May	No
12 May 2022	Clapham Yard Rocky Water Holes Creek	Between 4 and 1 EY based on rainfall depth and Between 2- and 5-year ARI based on peak intensity microburst	Yes	Yes	Yes	No	Yes – passive discharges through type 2 controls	No	Yes – visible dark grey sediment input from Road drainage and unconsolidated sediment throughout the creek channel 	Yes – 11 May '22 events	Yes – first alert issued at 9.46 am on 12 May	No

⁷ Exceedances per year (EY): the number of times an event is likely to occur or be exceeded within any given year.

⁸ average recurrence interval (ARI): The average or expected value of the periods between exceedances of a given rainfall total accumulated over a given duration

3.3.6.2 Findings – 06 May 2022 Event

Unity with the Delivery Authority is currently finalising the investigation into the event to confirm the root cause and contributing factors. This will ensure appropriate identification and notifications of any potential Non-Compliance Events.

The Environmental Monitor, Department of Transport and Main Roads (TMR) and the Office of the Coordinator General were also informed of the event when it occurred.

It is however noted that corrective actions were swiftly implemented to prevent re-occurrence.

Upon becoming aware of the event, Unity enacted their incident response as follows:

- The crossing was shut to all heavy equipment access
- Once the waters receded and the rainfall stopped, the extent of the erosion was assessed
- The Environmental Manager also mobilised to site to inspect the area
- Unity Alliance mobilised plant and equipment to commence repair works at approximately 10am (same day)
- The erosion repair works including extra scour protection above that in place before the event were completed at approximately 3pm on Friday 6 May 2022, and included:
 - repair of the erosion at the crossing
 - extension of Reno mattresses on the overflow section that had eroded
 - placement of large rock in the void of the eroded bank.
- Upon completion of the repair works, water quality monitoring was carried out along Moolabin Creek, Upstream and Downstream of the crossing.

Furthermore, on Monday 9 May 2022:

- The Environmental Manager attended site to assess if further works were required to be carried out considering the worsening weather forecast
- It was agreed that it would be prudent to carry additional precautionary erosion protection works on the approach to the crossing due to further wet weather being predicted

On Tuesday 10 May 2022, the Environmental Manager attended site to inspect the additional erosion protection works. The additional works were deemed satisfactory.

Following the repair works, the crossing experienced additional overtopping events, associated with larger rain events, the effects of which were closely monitored. No new or additional erosion was observed.

Unity Alliance and the Proponent are in the process of finalising their assessment of the event as discussed with the OCG, TMR and the Environmental Monitor. In the event a Non-Compliance event is confirmed, the process detailed as part of Imposed Condition 5 will be implemented.

3.3.6.3 Findings – 12 May 2022 Event

The water quality impacts identified in Moolabin Creek and Rocky Water Holes as part of the post rainfall monitoring program implemented by Unity can be to some degree attributed to Project Works.

The Project Team had carried out a significant body of wet weather preparedness on 9 and 10 May 2022, with ongoing ESC maintenance inclusive of increasing storage capacity for sediment laden water capture and active internal aggregation of water to minimise off-site releases during 11 and 12 May.

Project Works related discharges that entered Moolabin Creek and Rocky Water Holes all passed through ESC measures.

Actions pertaining to the maintenance of ESC measures prior to predicted rain events and following rainfall had been promptly addressed to a suitable degree of execution. The ESC measures did not get damaged during the above design rain events. Compliance with Imposed Conditions 15 and 18 was met.

4 Compliance Review

4.1 Non-Compliance Events

The below section summarises the events to be reported in accordance with Condition 5 and Condition 6(b)(ii) of the CGCR. A non-compliance event (NCE) is defined as Project Works that do not comply with the Imposed Conditions.

4.1.1 Non - Compliance Events Summary

Table 13 Summary of Non-Compliance Events

Event Title	Location, Date, and time of event	Date the Event was Formally Notified to CG/IEM	Conditions Affected	Date the Event Report Formally Sent to CG/IEM	Status of Event
Unity Alliance and the Proponent are working in finalising their assessment of the 6 May 2022 event to confirm whether a Non-Compliance of the Imposed Condition exists					

4.2 C-EMP Compliance

The below table summarises compliance status with the C-EMP and monitoring requirements of relevant sub-plans for the reporting period.

Table 14 C-EMP and relevant Subplans monitoring requirements – Compliance Status for the reporting period

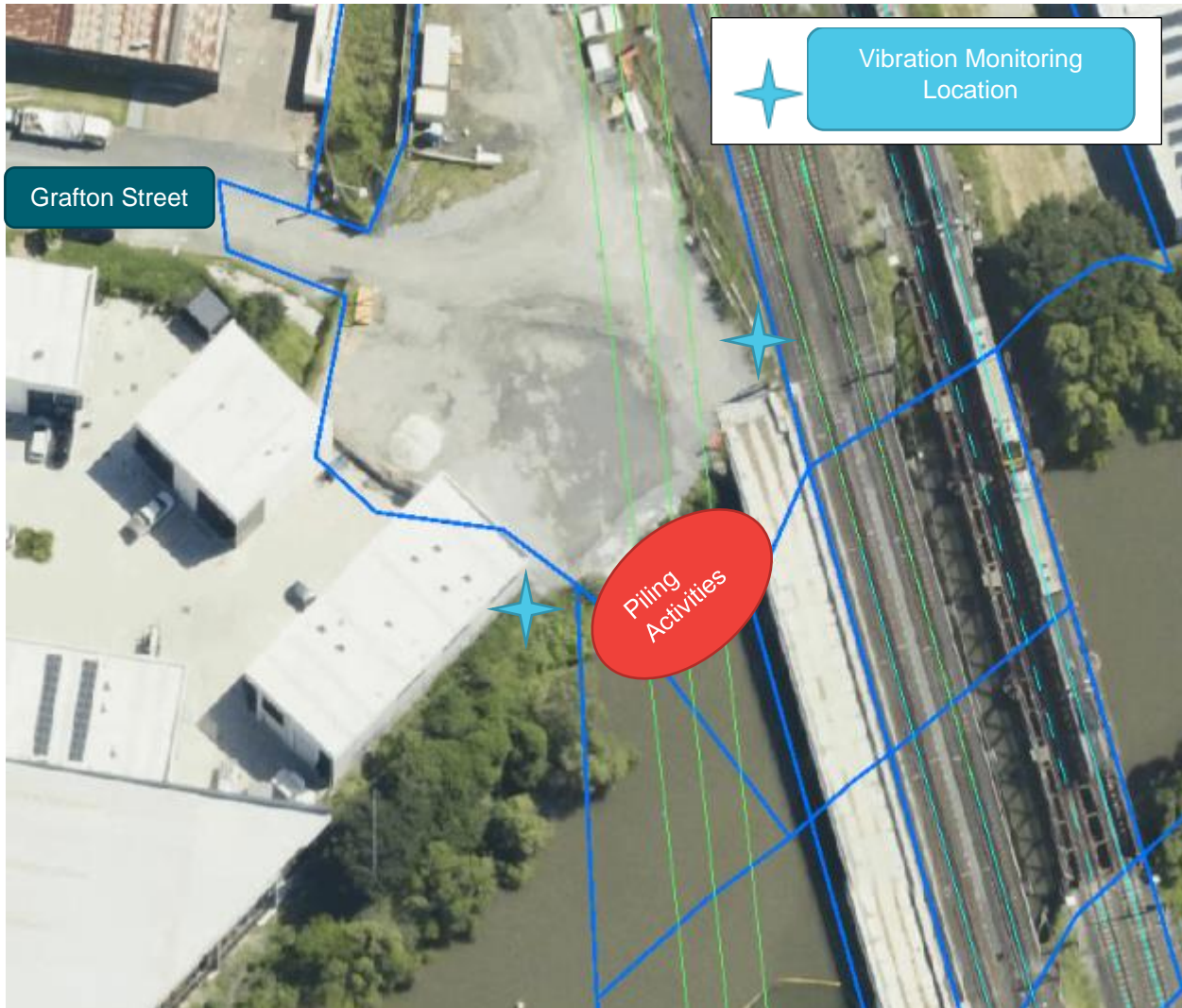
Aspect	Monitoring requirement	Activities risk profile	Monitoring undertaken	Compliance status with C-EMP / Subplan	Effect of the non-compliance
Air Quality	Visual monitoring program + Additional particulate monitoring as required based on the outcomes of the predictive assessment/risk profile	Moderate to High	Yes – visual monitoring is undertaken as part of routine inspections. Monitoring for TSP, PM ₁₀ , and deposited dust was also undertaken albeit in a reduced manner	Compliant	Not Applicable
Air Quality	Complaint's response	Moderate to High	Not triggered No complaints	Compliant	Not Applicable
Noise	Buffer distance tests based on the outcomes of the predictive assessment based / risk profile of activities	Moderate to High	Not triggered	Compliant	Not Applicable
Noise	Plant noise audits for noisy plant to validate models input as required	Moderate to High	No	N/A	Not Applicable
Noise	Complaint's response	Moderate to High	Not triggered	Compliant	Not Applicable
Vibration	Construction Monitoring at Sensitive Places / DAPs - Model verification based on the outcomes of the predictive assessment based / risk profile of activities	Moderate to High	Yes	Compliant	Not Applicable
Vibration	Complaint's response	Moderate to High	Not triggered No complaints	Compliant	Not Applicable
Water Quality	Bi-Annual monitoring	N/A	Wet season monitoring completed in January 2022 Dry Season monitoring likely to be scheduled in June or July 2022	Compliant	Not Applicable

Aspect	Monitoring requirement	Activities risk profile	Monitoring undertaken	Compliance status with C-EMP / Subplan	Effect of the non-compliance
Water Quality	Post Rainfall	Moderate to High	Triggered	Compliant	Not Applicable
Water Quality	Dewatering	Moderate to High	Triggered	N/A	Not Applicable

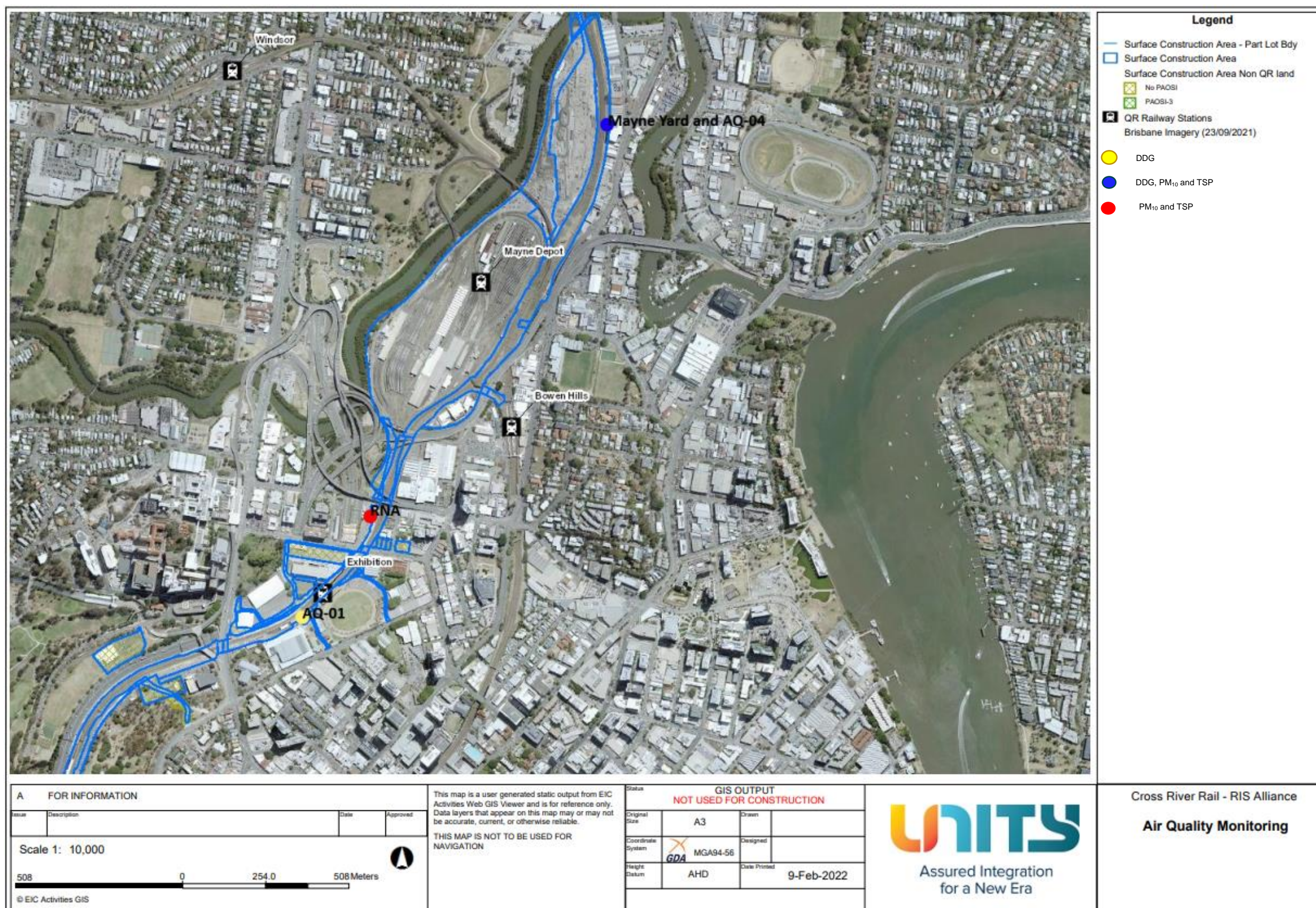
Attachment 1 CGCR Non-Compliance Event Report (if required)

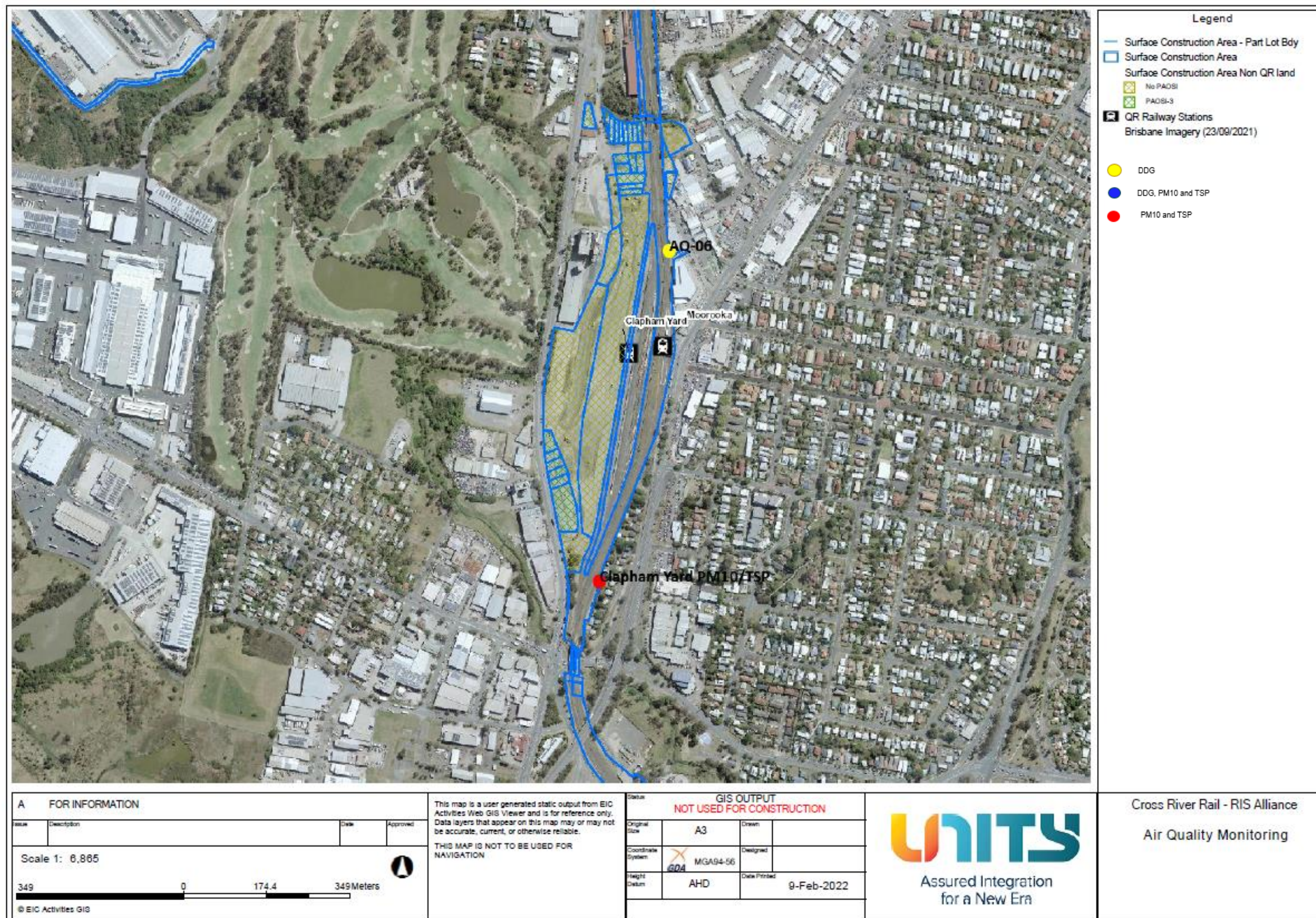
None for this reporting period.

Attachment 2 Monitoring Locations – Noise and Vibration

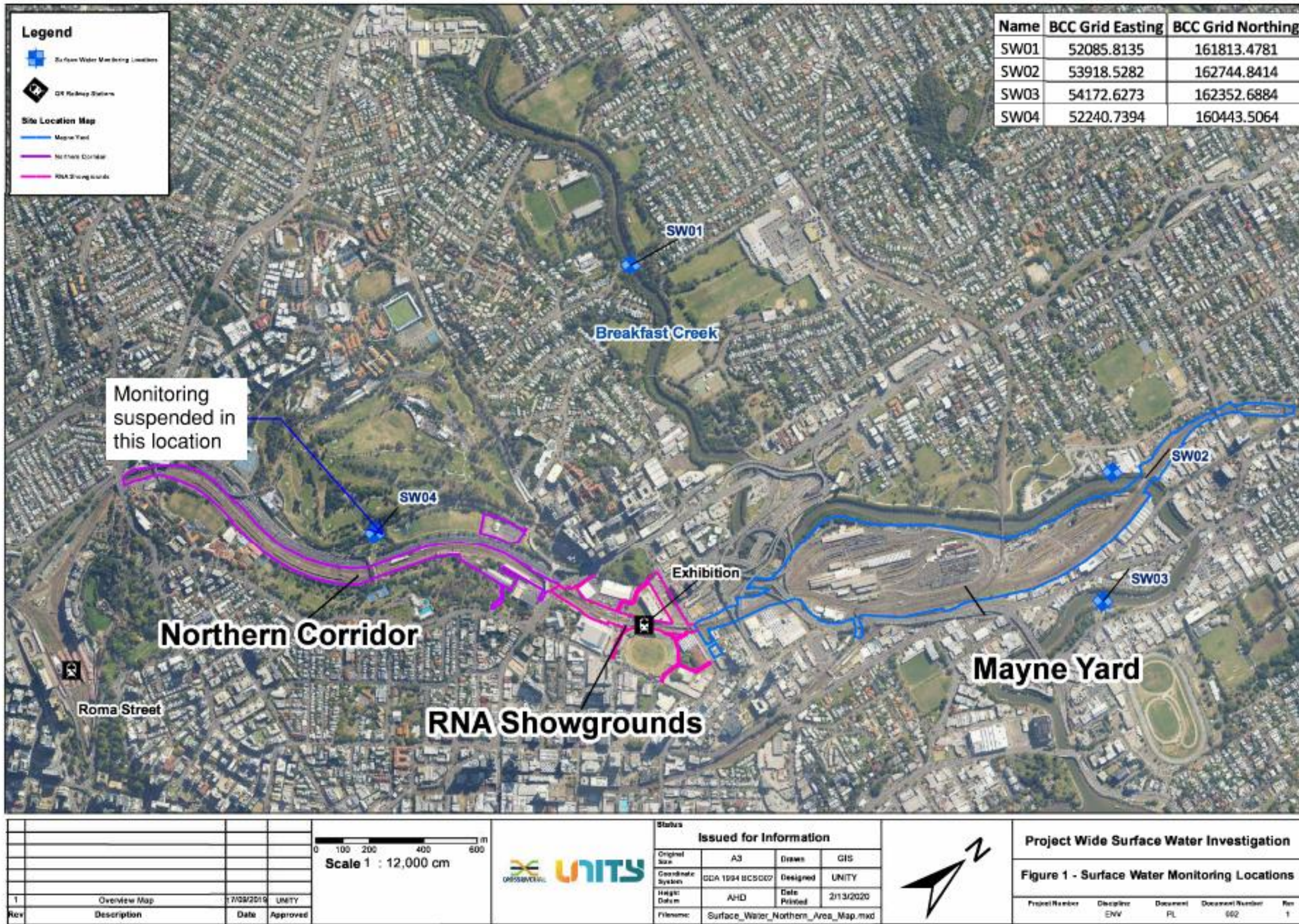


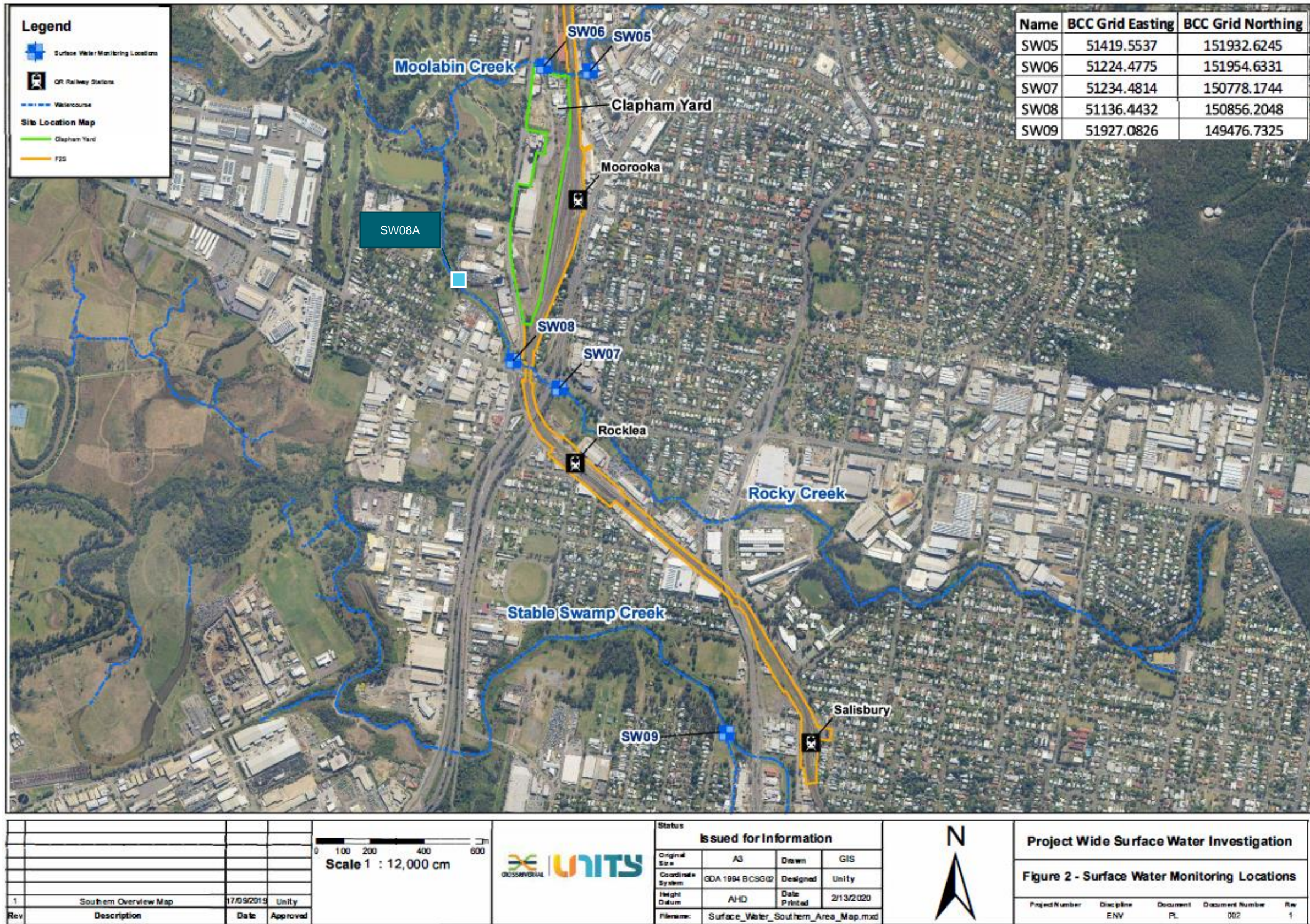
Attachment 3 Monitoring Locations – Air Quality





Attachment 4 Monitoring Locations – Surface Water





Appendix B TSD Monthly Report

COORDINATOR-GENERAL'S MONTHLY REPORT: May 2022

Prepared in accordance with Coordinator-General Imposed Condition 6 - Reporting.

1. Monthly Monitoring Summary

It is CBGU Joint Venture's intent to aim for the Goals and Objectives relevant to vibration, noise, air quality and water monitoring within the practical extent of delivering the Project.

Noise monitoring was conducted on nine (9) occasions during May 2022. No vibration monitoring was required during May 2022. Albeit, noise and vibration data that hadn't yet been finalised at the time of preparation of the previous report (April 2022) has been included within this report. Each vibration and noise monitoring event confirmed works adhered to project requirements.

Ambient air quality monitoring was conducted at Roma Street, Albert Street, Woolloongabba, Boggo Road, Southern Portal and Northern Portal precinct sites during May 2022. Air quality monitoring confirmed works adhered to project requirements.

Water quality monitoring was conducted before the release of water from the site on thirty-four (34) occasions. Each monitoring event confirmed project requirements were adhered to. Two (2) rounds of surface water quality monitoring were conducted; the monitoring events confirmed no impacts were generated by the Project.

2. CG Monthly Report – Compliance Assessment Against Imposed Conditions

Whilst not a requirement of Imposed Condition 6, CBGU offers the below Compliance Status Table as a good-will gesture to demonstrate the Project's ongoing environmental performance.

Table 1: Compliance Status – CG Imposed Conditions

CG Condition	Requirement Summary	Compliance Met (Yes/No/NA)	Comment
1.	General conditions – compliance with the Project Changes relevant to the Contractor's scope.	Yes	CBGU project works have been conducted in compliance with the Imposed Conditions.
2.	Outline Environmental Management Plan – timely submission to the Coordinator-General, including required sub plans.	N/A	The OEMP is not an obligation of the CBGU Joint Venture.
3.	Design – the achievement of the Environmental Design Requirements.	Yes	Design and implementation proceeded in accordance with the Environmental Design Requirements.
4.	Construction Environmental Management Plan – all relating to Relevant Project Works.	Yes	All CBGU works were conducted in accordance with the Construction Environmental Management Plan (CEMP) (Rev 8).
5.	Compliance and Incident management – Non-compliance events, notifications, and reporting.	Yes	Nil non-compliances occurred during the monitoring period (refer to Section 4).
6.	Reporting – Monthly and Annual reporting.	Yes	All reporting requirements are completed in accordance with Imposed Condition 6.
7.	Environmental Monitor – engaged and functions resumed.	Yes	An Environmental Monitor (EM) is appointed to the Project, and CBGU is committed to working collaboratively to aid the EM's functions under Imposed Condition 7.
8.	Community Relations Monitor – engaged and functions resumed.	Yes	A Community Relations Monitor (CRM) is appointed to the Project, and CBGU is committed to working collaboratively to aid the CRM's functions under Imposed Condition 8.
9.	Community engagement plan – developed and endorsed by Environmental Monitor.	Yes	A Community Engagement Plan (CEP) has been developed and implemented in accordance with Imposed Condition 9. The CEMP has been endorsed with the CEP.
10.	Hours of work – works undertaken during approved hours.	Yes	CBGU project works have been conducted in accordance with the approved hours of work.

CG Condition	Requirement Summary	Compliance Met (Yes/No/NA)	Comment
11.	Noise – Work must aim to achieve internal noise goals for human health and well-being.	Yes	CBGU project work has aimed to achieve internal noise goals for human health and well-being. Where internal noise levels have been unable to be measured, suitable noise reductions have been applied in accordance with Imposed Condition 11. Noise monitoring data is provided within Section 3.2.
	Vibration – Works must aim to achieve vibration goals for cosmetic damage, human comfort and sensitive building contents.	Yes	CBGU project work has aimed to achieve vibration goals for cosmetic damage, human comfort and sensitive buildings. Vibration monitoring data is provided within Section 3.1.
12.	Property damage relating to ground movement	Yes	The management of potential impacts relating to property damage has been completed in accordance with Imposed Condition 12.
13.	Air quality – Works must aim to achieve air quality goals for human health and nuisance.	Yes	CBGU project works have aimed to achieve air quality goals. Air quality monitoring data is provided within Section 3.3.
14.	Traffic and transport – Works must minimise adverse impacts on road safety and traffic flow.	Yes	CBGU project works have been conducted in a manner that has minimised adverse impacts on road safety and traffic flow.
15.	Water quality – Works must not discharge surface water and groundwater from the construction site above the relevant environmental values and water quality objectives.	Yes	CBGU has prepared and manages processes to ensure water quality is managed in accordance with Imposed Condition 15.
16.	Water resources – evaluate potential impact, plan works, implement controls and monitor the inflow of groundwater associated with drawdown.	Yes	CBGU project works are managed in accordance with Imposed Condition 16.
17.	Surface water – Must be designed to avoid inundation from stormwater due to a 2-year (6hr) ARI rainfall event and flood waters due to a 5-year ARI rainfall event and constructed to avoid afflux or cause the redirection of uncontrolled surface water flows, including stormwater flows, outside of worksites.	Yes	Design of the CBGU project works considers the requirements of Imposed Condition 17.
18.	Erosion and sediment control – Provisions for erosion and sediment control must be consistent with the Guidelines for Best Practice Erosion and Sediment Control (International Erosion Control Association, 2008) and the Department of Transport and Main Roads' Technical Standard MRTS52.	Yes	CBGU has prepared and manages processes to ensure erosion & sediment control is managed in accordance with Imposed Condition 18.
19.	Acid Sulfate Soils managed as per the <i>Queensland Acid Sulfate Soil Technical Manual</i> .	Yes	CBGU has prepared and manages processes to ensure acid sulphate soils are managed in accordance with Imposed Condition 19.

CG Condition	Requirement Summary	Compliance Met (Yes/No/NA)	Comment
20.	Landscape and open space – general requirement to minimise impacts on landscapes and open space values and specific requirements around Victoria park	Yes	CBGU project works are designed and implemented in accordance with Condition 20.
21.	Worksite rehabilitation – worksites rehabilitated as soon as practicable upon completion of works or commissioning, and in consultation with Brisbane City Council.	Yes	CBGU project works are designed and implemented in accordance with Condition 21.
22.	Flood Water – Temporary emission to allow the release of Flood Waters to high flow receiving waters.	Yes	CBGU project works have been conducted in accordance with the provisions available to manage floodwaters.

3. Environmental Monitoring Results

Monitoring data is provided below in accordance with Imposed Condition 6(b)(i).

3.1 Vibration

Vibration requirements (levels) are defined as goals within Imposed Condition 11. The goals are to be aimed for.

The Coordinator-General Change Report acknowledges instances that exist that these goals may not be achieved.

One (1) vibration monitoring session from April 2022 has been included in this month's report, as the results had not been finalised before the completion of last month's report. Vibration monitoring adhered to project requirements and is detailed in the table below.

During May there were no new construction activities or changes in construction methodologies. As such, no vibration monitoring was performed.

Table 2: Vibration Monitoring Data

No.	Start Date	Time (AM/PM)	Finish Date	Location	Average Vibration level (mm/s)	Max Vibration Level (mm/s)	Vibration Goal (mm/s)	Receiver / Goal Type	Adhered to Project Requirements (Yes / No)
1.	28/04/2022	07:32:00 AM	28/04/2022	Albert Street (Albert Street Precinct)	-	1.1	10	Residential Heritage Structure (Controlled Blast)	Yes

3.2 Noise

Noise requirements (levels) are defined as goals within Imposed Condition 11. The goals are to be aimed for.

The Coordinator-General Change Reports acknowledge instances exist that these goals may not be achieved.

One (1) noise monitoring session from April 2022 has been included in this month's report, as the results had not been finalised before the completion of last month's report. Noise monitoring was conducted on nine (9) occasions during May 2022. All noise monitoring data adhered to project requirements and is provided in the table below.

Table 3: Noise Monitoring Data

No.	Date	Time (AM / PM)	Location (Street Name) (Construction Precinct)	Purpose of Monitoring	Internal or External ^[3] Monitoring	Activity	Dominant Noise Source	Noise Goal LA10 ^[1]	Noise level LA10	Noise Goal LAeq ^[2]	Noise level LAeq	Adhered to Project Requirements (Yes / No)
1.	28/4/2022	7:32:00 AM	Albert Street (Albert Street Precinct)	Construction Monitoring	External	Controlled Blast	Construction	-	-	130 ^[3]	117.5 ^[3]	Yes
2.	04/05/2022	9:09:00 AM	Rawnsley Street (Southern Portal Precinct)	Construction Monitoring at Sensitive Places	External	Sheet Piling	Construction	57	72.6	47	71.5	Yes
3.	10/05/2022	7:00:00 PM	Mark Lane (Woolloongabba Precinct)	Model Verification	External	Hydro Demolition	Construction	62	63.6	52	62	Yes
4.	10/05/2022	8:02:00 PM	Reid Street (Woolloongabba Precinct)	Model Verification	External	Hydro Demolition	Construction	62	59.3	52	58	Yes
5.	15/05/2022	8:17:00 PM	Kent Street (Southern Portal Precinct)	Construction Monitoring at Sensitive Places	External	Vegetation Removal	Construction	62	64.6	52	65.4	Yes

No.	Date	Time (AM / PM)	Location (Street Name) (Construction Precinct)	Purpose of Monitoring	Internal or External ^[3] Monitoring	Activity	Dominant Noise Source	Noise Goal LA10 ^[1]	Noise level LA10	Noise Goal LAeq ^[2]	Noise level LAeq	Adhered to Project Requirements (Yes / No)
6.	17/05/2022	11:00:00 AM	Gregory Terrace (Northern Portal Precinct)	Construction Monitoring at Sensitive Places	External	Excavation	Construction	62	72	52	68.8	Yes
7.	27/05/2022	5:38:00 AM	Albert Street (Albert Street Precinct)	Construction Monitoring at Sensitive Places	Internal	Concrete Pouring	Construction	42	56.9	35	56.7	Yes
8.	27/05/2022	1:48:00 PM	Albert Street (Albert Street Precinct)	Construction Monitoring at Sensitive Places	Internal	Concrete Pouring	Construction	50	38.6	40	37.6	Yes
9.	30/05/2022	10:03:00 AM	Ipswich Road (Southern Portal Precinct)	Construction Monitoring at Sensitive Places	External	Tunnel Ventilation System	Construction	67	61.1	57	59.1	Yes
10.	30/05/2022	9:43:00 AM	Kent Street (Southern Portal Precinct)	Construction Monitoring at Sensitive Places	External	Tunnel Ventilation System	Construction	72	62.5	62	61.2	Yes

- [1] Intermittent noise goal (LA10)

- [2] Continuous noise goal (LAeq)

- [3] Blasting is measured in dB Linear Peak.

- Note: In accordance with Imposed Condition 11, where internal noise levels were unable to be measured, external noise goals were developed by an acoustic specialist using the following standards: ISO 140-5:1998 Acoustics – Measurement of Sound Insulation in Buildings and of Building Elements, Part 5: Field measurements of airborne sound insulation of façade elements and facades and ISO 354:1985 Acoustics – Measurement of sound absorption in a reverberation room.

3.3 Air Quality

3.3.1 Deposited Dust Results

Air quality requirements (levels) are defined as goals within Imposed Condition 13. The goals are to be aimed for. The Coordinator-General Change Report acknowledges instances that exist that these goals may not be achieved. Dust deposition monitoring was performed in May 2022. The dust deposition gauges result for the reporting period are detailed below, and all monitoring data adhered to project requirements.

- Table 4.2: April Air Quality Monitoring – Deposited Dust Data

Location	Project Wide Air Quality Goals ^[1]			Monitoring results (mg/m ² /day)	Comments
	Criterion	Air Quality Indicator	Goal (mg/m ² /day)		
Northern Portal	Nuisance	Deposited dust	120	10.34	Air quality monitoring was performed during the reporting period. All results adhered to project requirements.
Roma Street Precinct				6.90	
Albert Street Precinct (North)				46.43	
Albert Street Precinct (South)				14.29	
Woolloongabba Precinct (North)				15.63	
Woolloongabba Precinct (South)				18.75	
Boggo Road Precinct (North)				3.13	
Boggo Road Precinct (South)				18.75	
Southern Portal (South)				6.25	
Southern Portal (East)				6.25	

3.3.2 Particulates and Ambient Air Quality Results

Total Suspended Particulates (TSP) and particulate matter less than 10µm (PM10) monitoring was conducted during May 2022.

TSP and PM10 are monitored using portable air quality units and nearby Government air quality stations. Targeted monitoring of potential dust-generating activities is conducted by the mobile air quality units and was completed at Albert Street, Woolloongabba, Boggo Road and Northern Portal Precincts during May 2022. Three (3) Government air quality stations near the Construction Precincts are also utilised.

Table 5: Targeted Air Quality Monitoring – Total Suspended Particles and PM10 Data

Date	TSP Project Goal ^[1]	PM10 Project Goal	Woolloongabba		Albert		Boggo Road ^[2]		Northern Portal	
			TSP	PM 10	TSP	PM 10	TSP	PM 10	TSP	PM 10
			(µg/m3/24 hr)							
01-May-22	80	50	6.87	6.85	24.86	24.61	13.77	13.77	11.75	11.64
02-May-22	80	50	4.76	4.75	15.35	15.21	-	-	10.26	10.21
03-May-22	80	50	10.16	10.09	25.22	24.89	-	-	10.16	10.09
04-May-22	80	50	9.40	9.33	29.96	29.71	-	-	9.40	9.33
05-May-22	80	50	11.09	11.01	25.01	24.79	-	-	11.09	11.01
06-May-22	80	50	6.79	6.70	28.85	28.57	-	-	6.79	6.70
07-May-22	80	50	7.48	7.33	32.26	31.87	-	-	7.48	7.33
08-May-22	80	50	8.40	8.35	21.30	21.10	-	-	8.40	8.35
09-May-22	80	50	4.77	4.76	39.32	39.01	-	-	9.69	9.64
10-May-22	80	50	4.86	4.85	38.08	37.75	-	-	11.06	11.00
11-May-22	80	50	6.88	6.88	17.18	17.13	-	-	12.83	12.82
12-May-22	80	50	9.47	9.46	18.23	18.18	-	-	15.65	15.63
13-May-22	80	50	13.25	13.25	23.92	23.87	-	-	22.23	22.19
14-May-22	80	50	4.16	4.16	13.57	13.50	1.88	1.88	4.23	4.23
15-May-22	80	50	-	-	14.70	14.63	4.50	4.50	10.99	10.92
16-May-22	80	50	13.53	13.51	36.57	36.44	11.25	11.24	21.38	21.28
17-May-22	80	50	9.37	9.35	24.98	24.79	-	-	14.39	14.28
18-May-22	80	50	9.00	8.99	24.77	24.63	-	-	16.51	16.37

Date	TSP Project Goal ^[1]	PM10 Project Goal	Woolloongabba		Albert		Boggo Road ^[2]		Northern Portal	
			TSP	PM 10	TSP	PM 10	TSP	PM 10	TSP	PM 10
			(µg/m3/24 hr)							
19-May-22	80	50	7.67	7.66	28.61	28.41	-	-	14.77	14.66
20-May-22	80	50	6.78	6.78	26.93	26.72	-	-	9.81	9.74
21-May-22	80	50	-	-	19.21	19.07	-	-	8.98	8.92
22-May-22	80	50	3.33	3.32	26.23	26.04	3.73	3.73	6.16	6.11
23-May-22	80	50	3.16	3.15	23.40	23.22	4.05	4.03	6.51	6.43
24-May-22	80	50	3.99	3.98	22.48	22.32	-	-	8.62	8.58
25-May-22	80	50	3.91	3.90	21.19	21.00	6.16	6.15	9.23	9.19
26-May-22	80	50	3.89	3.88	21.04	20.65	5.66	5.65	11.39	11.34
27-May-22	80	50	4.70	4.69	25.03	24.66	8.95	8.91	11.85	11.75
28-May-22	80	50	5.20	5.18	22.79	22.52	7.25	7.24	9.28	9.23
29-May-22	80	50	3.54	3.51	33.56	33.11	15.61	15.61	4.04	3.90
30-May-22	80	50	3.85	3.83	16.38	16.17	6.61	6.57	6.08	5.86
31-May-22	80	50	3.37	3.29	13.22	12.81	3.63	3.46	6.42	5.87

- [1] Project works must aim to achieve construction air quality goals. The Coordinator-General Change Report – Whole of Project Refinements 2019 acknowledges instances exist that these goals may not be achieved.
- [2] The Boggo Road air quality unit experienced several technical difficulties during the month of May 2022. CBGU's environmental team attempted to resolve the issue several times. It was not until CBGU received manufacture advice was the issue resolve. A nearby (Woolloongabba) DES Air Quality Station demonstrated compliant air quality during this outage period, these results are provided below. Low levels were also consistently monitored throughout the month when the unit was operating. The monitoring unit is being reviewed to reduce the likelihood of future intermittent lapses.

CBGU also utilises three (3) Government air quality monitoring stations to monitor PM10 near the project sites. The results during this reporting period were as follows:

- Brisbane CBD: PM10 daily Maximum average: **32.4 µg/m3/24 hr** (<https://apps.des.qld.gov.au/air-quality/chart/?station=cbd¶meter=18&date=1/05/2022&timeframe=month>)
- South Brisbane: PM10 daily Maximum average: **38.1 µg/m3/24 hr** (<https://apps.des.qld.gov.au/air-quality/chart/?station=sbr¶meter=18&date=1/05/2022&timeframe=month>)
- Woolloongabba: PM10 daily Maximum average: **34.6 µg/m3/24 hr** (<https://apps.des.qld.gov.au/air-quality/chart/?station=woo¶meter=18&date=1/05/2022&timeframe=month>)

The graphical representation of the Government air quality data is presented in the below charts (refer to Figures 1-3).

Particle PM₁₀ at Brisbane CBD, 1–31 May 2022 [about Particle PM₁₀](#)

[Brisbane CBD station overview](#)

The guideline for Particle PM₁₀ is 100µg/m³ (1hr avg) and 50µg/m³ (24hr avg).

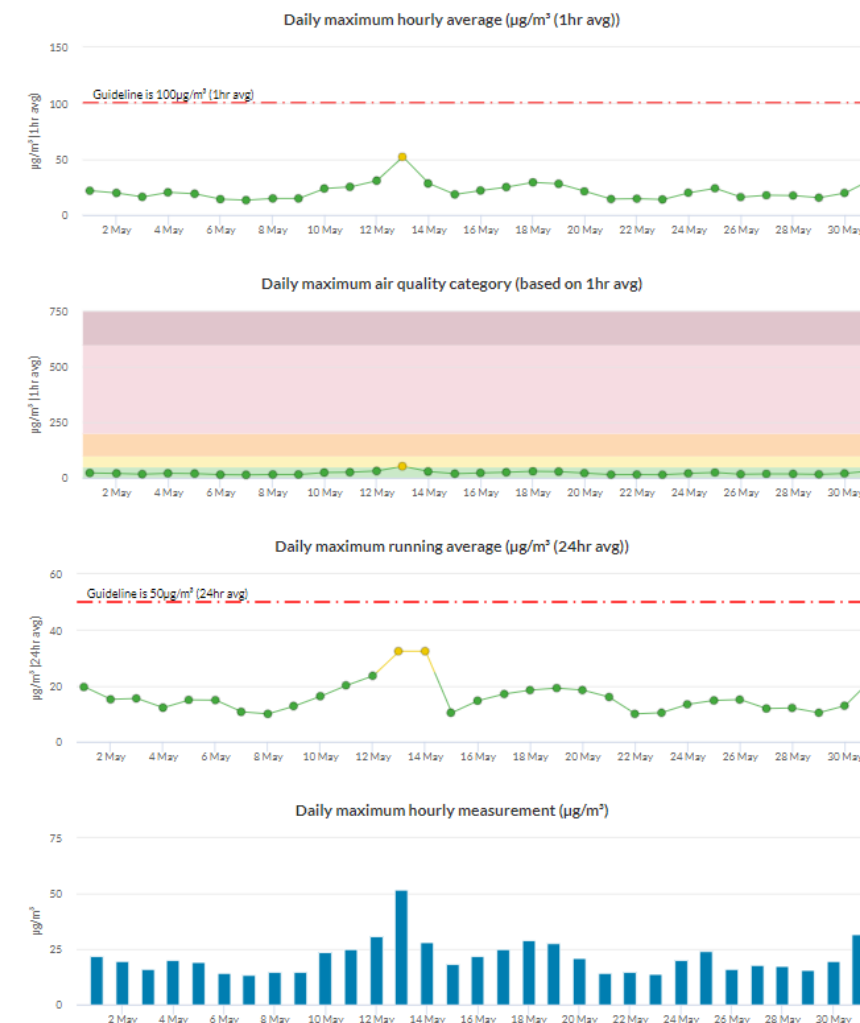


Figure 1: Brisbane CBD – DES Station - PM10 graph for May 2022 (reproduction from the DES website).

Particle PM₁₀ at South Brisbane, 1–31 May 2022 [about Particle PM₁₀](#)

[South Brisbane station overview](#)

The guideline for Particle PM₁₀ is 100µg/m³ (1hr avg) and 50µg/m³ (24hr avg).

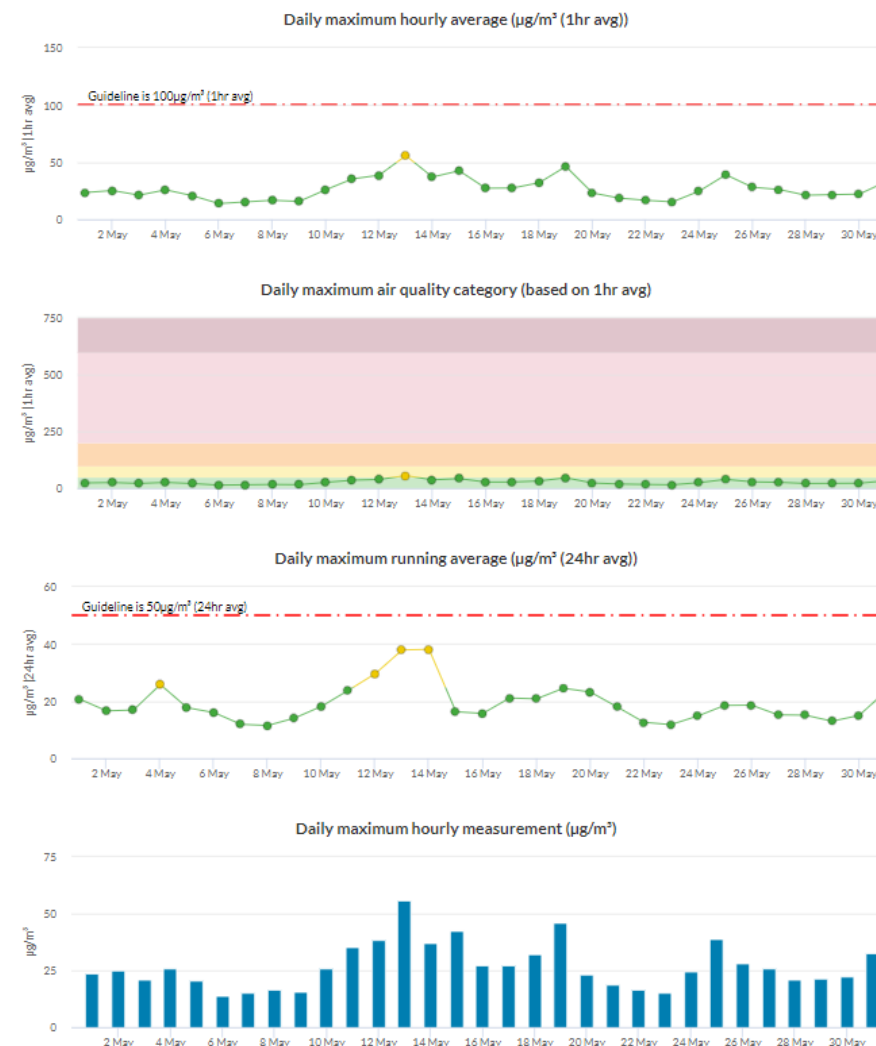


Figure 2: South Brisbane – DES Station - PM10 graph for May 2022 (reproduction from the DES website).

Particle PM₁₀ at Woolloongabba, 1–31 May 2022 [about Particle PM₁₀](#)

[Woolloongabba station overview](#)

The guideline for Particle PM₁₀ is 100µg/m³ (1hr avg) and 50µg/m³ (24hr avg).

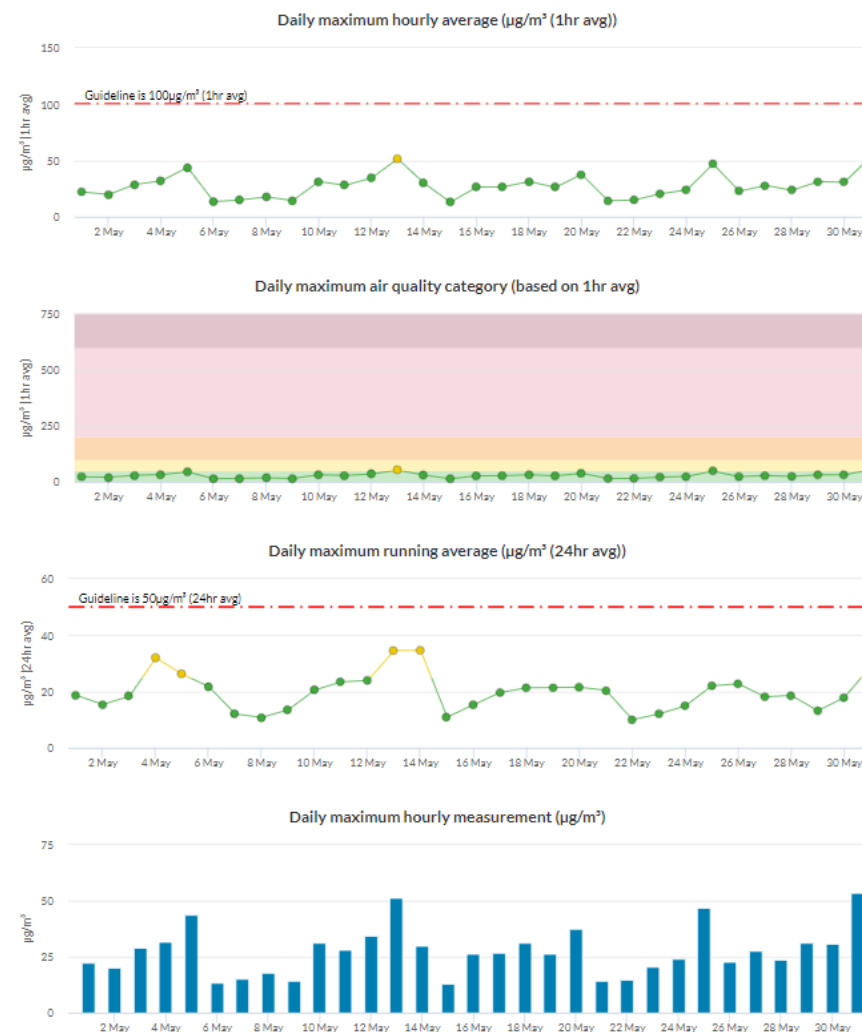


Figure 3: Woolloongabba – DES Station - PM10 graph for May 2022 (reproduction from the DES website).

3.4 Water Quality – Discharge

CBGU undertook five (5) water quality monitoring events prior to the release (groundwater and surface water) from the site.

3.4.1 Groundwater Discharge

Water quality monitoring data is provided in the table below.

Table 6: Groundwater Discharge – Water Quality Monitoring Data

Location	Date	Testing of Water Quality Objectives ^[1]											Adhered to Project Requirements (Yes / No)
		pH	Suspended solids (mg/L)	Turbidity (NTU)	Ammonia N (µg/L) ^[3]	Oxidised N (µg/L) ^[3]	Organic N (µg/L) ^[3]	Total nitrogen (µg/L) ^[4]	Total phosphorus (µg/L)	Filterable Reactive phosphorus (FRP) (µg/L)	Chlorophyll a (µg/L)	Dissolved oxygen (%) ^[2]	
Woolloongabba	12/05/2022	8.01	<5	4.72	180.00	380.00	200.00	800.00	300.00	<10	<1	94.91	Yes
Albert Street	16/05/2022	7.70	8	0.80	1200.00	5780.00	2100.00	9100.00	60.00	<10	<1	78.90	Yes
Roma Street	16/05/2022	7.90	<5	2	280	660	300.00	1300	<10	<10	<1	89.56	Yes
Boggo Road	16/05/2022	7.89	<5	2.14	<10	<10	<10	1100.00	10.00	70.00	<1	101.67	Yes

- [1] The Project's discharge procedure is designed to minimise environmental impact and aim to achieve the water quality objectives. Water quality objectives are defined as goals within the Brisbane River estuary environmental values and water quality objectives document.
- [2] All results adhere to project requirements in that site practices are designed to aim to achieve the water quality objectives. The dissolved oxygen samples were acquired prior to discharge from the site. Pumping of the water will have inadvertently aerated the water, thus influencing the dissolved oxygen level.
- [3] All results adhere to project requirements in that site practices aim to achieve the water quality objectives. These samples identified results generally consistent with pre-construction conditions, and no external influences were introduced by construction activity.
- [4] Total nitrogen levels adhered to project requirements in that site practices are designed to aim to achieve the water quality objectives. The results are mostly below that of the receiving environment. They are also considered abnormal compared to results from previous months, and are influenced by external factors (e.g., high rainfall events, overloaded sewage systems, fertilising natural areas, etc) rather than related to construction activities.
- Note: Testing of EPP (Water) Quality Objectives are analysed at a NATA accredited laboratory each month (results provided above). Field testing (turbidity, pH) is done regularly during ongoing discharge.

3.4.2 Ponded/Surface Water Discharge

Discharged ponded/Surface water quality monitoring data is provided in the table below.

Table 7: Surface Water Discharge - Water Quality Monitoring Data

No.	Location	Date	Testing of Water Quality Objectives ^[1]		Adhered to Project Requirements (Yes / No)
			pH	Turbidity (NTU)	
1.	Northern Portal	1/05/2022	8.33	20.30	Yes
2.	Northern Portal	2/05/2022	8.46	8.72	Yes
3.	Northern Portal	3/05/2022	8.37	1.75	Yes
4.	Southern Portal	3/05/2022	8.14	24.40	Yes
5.	Northern Portal	4/05/2022	8.30	26.30	Yes
6.	Southern Portal	4/05/2022	8.11	10.29	Yes
7.	Northern Portal	5/05/2022	8.38	23.40	Yes
8.	Southern Portal	5/05/2022	7.88	19.09	Yes
9.	Northern Portal	6/05/2022	8.28	25.90	Yes
10.	Northern Portal	7/05/2022	8.13	27.60	Yes
11.	Northern Portal	8/05/2022	8.21	28.80	Yes
12.	Northern Portal	9/05/2022	8.28	24.00	Yes
13.	Southern Portal	9/05/2022	8.04	34.20	Yes
14.	Northern Portal	10/05/2022	8.28	29.80	Yes
15.	Northern Portal	11/05/2022	8.36	31.50	Yes

16.	Northern Portal	12/05/2022	8.43	41.20	Yes
17.	Northern Portal	13/05/2022	8.41	39.70	Yes
18.	Northern Portal	14/05/2022	8.37	28.50	Yes
19.	Northern Portal	16/05/2022	8.03	3.25	Yes
20.	Boggo Road	16/05/2022	7.53	3.41	Yes
21.	Northern Portal	17/05/2022	8.12	12.01	Yes
22.	Northern Portal	18/05/2022	7.94	0.50	Yes
23.	Northern Portal	19/05/2022	8.07	7.93	Yes
24.	Northern Portal	20/05/2022	8.05	1.67	Yes
25.	Southern Portal	20/05/2022	8.23	19.72	Yes
26.	Northern Portal	21/05/2022	8.03	29.80	Yes
27.	Northern Portal	23/05/2022	8.18	12.36	Yes
28.	Northern Portal	24/05/2022	8.28	19.56	Yes
29.	Northern Portal	25/05/2022	8.30	6.24	Yes
30.	Northern Portal	25/05/2022	8.23	18.30	Yes
31.	Northern Portal	25/05/2022	8.42	0.80	Yes
32.	Northern Portal	26/05/2022	8.42	0.50	Yes
33.	Northern Portal	27/05/2022	8.23	18.30	Yes
34.	Northern Portal	28/05/2022	8.42	0.80	Yes

- [1] The Project's discharge procedure is designed to minimise environmental impact and aim to achieve the water quality objectives. All discharges were compliant with *Guidelines for Best Practice Erosion and Sediment Control (IECA, 2008)* and the *Department of Transport and Main Roads' Technical Standard MRTS 52 – Erosion and Sediment Control*.

3.5 Water Quality – Surface Water

During May 2022, CDBGU JV undertook one (1) round of surface water sampling on 16 & 17 May 2022 at five (5) site locations (upstream and downstream). A localised rain-event occurred on 23 May 2022 that resulted in a round of post rainfall sampling being performed at Albert Street and Woolloongabba. The Roma Street and Boggo Road sites did not experience as much rainfall and therefore surface water quality monitor was not necessary in these locations.

Results from the below-monitoring locations reflect the condition of the broader catchment (not just the influence of the Project). Water quality generally appears good, and water discharge from the Project would not have had an impact on the catchment considering the results also provided within section 3.4 above.

Table 8: Offsite Upstream & Downstream Water Quality Data

Location	Upstream / Downstream	Date	Purpose of Monitoring	Turbidity (NTU)	EC (μS/cm)	Dissolved oxygen (%)	pH
Roma Street	Upstream	16/05/2022	Monthly	251	189	89.56	7.57
Roma Street	Downstream	16/05/2022	Monthly	229	196	88.35	7.5
Northern Portal	Downstream	16/05/2022	Monthly	7	438	71.41	7.55
Albert Street	Upstream	16/05/2022	Monthly	235	162	90.77	6.77
Albert Street	Downstream	16/05/2022	Monthly	237	163	90.77	6.53
Woolloongabba	Upstream	17/05/2022	Monthly	100	204	102.88	6.89
Woolloongabba	Downstream	17/05/2022	Monthly	78	267	104.09	7.06
Boggo Road ^[1]	Downstream	17/05/2022	Monthly	14	356	83.51	6.74
Albert Street	Upstream	23/05/2022	Post Rainfall	32	230	98.04	6.93
Albert Street	Downstream	23/05/2022	Post Rainfall	31	230	99.25	6.66
Gabba	Upstream	23/05/2022	Post Rainfall	33	241	98.04	6.85
Gabba	Downstream	23/05/2022	Post Rainfall	29	237	99.25	6.69

- [1] Monitoring at the Boggo Rd site occurs at a pipe outlet at the beginning of the surface catchment. There is no upstream/downstream monitoring point as such. The pipe outlet receives water released from the site, as well as a broader stormwater catchment.

4 Non-Compliances

Details of non-compliances are provided in accordance with Imposed Condition 6(b)(ii).

A Non-Compliance Event is defined as project works that do not comply with the Imposed Conditions. Nil non-compliances occurred during the monitoring period.

Table 9: Non-Compliance Events this Month

Event Title	Location, Date, and time of the event	Date the Event was Formally Notified to CG/IEM	Conditions Affected	Date the Event Report Formally Sent to CG/IEM	Status of Event
Nil					

5 Complaints

Reporting of complaints is provided below in accordance with Imposed Condition 6(b)(iii).

During May 2022, four (4) complaints relating to the Project were received, as detailed in Table 10 below.

Table 10: Summary of Complaints

No.	Date	Location	Description of Issue	Responses	Status of Event
1.	25 May 22	Albert Street (Albert Street Precinct)	Noise	A stakeholder contacted the Project regarding noise generated from the Albert Street Precinct. CBGU provided the stakeholder with an overview of the works occurring and their duration. CBGU also outlined the mitigation measures used to alleviate potential impacts and ensure compliance. CBGU reviewed the circumstances and monitoring confirmed works adhered to the Project's noise requirements, and the works undertaken were consistent with the community notification.	Closed
2.	25 May 22	Albert Street (Albert Street Precinct)	Noise	A stakeholder contacted the Project regarding noise generated from the Albert Street Precinct. CBGU provided the stakeholder with an overview of the works occurring and their duration. CBGU also outlined the mitigation measures used to alleviate potential impacts and ensure compliance.	Closed

No.	Date	Location	Description of Issue	Responses	Status of Event
				CBGU reviewed the circumstances and monitoring confirmed works adhered to the Project's noise requirements, and the works undertaken were consistent with the community notification.	
3.	25 May 22	Albert Street (Albert Street Precinct)	Noise	<p>A stakeholder contacted the Project regarding noise generated from the Albert Street Precinct. CBGU provided the stakeholder with an overview of the works occurring and their duration. CBGU also outlined the mitigation measures used to alleviate potential impacts and ensure compliance.</p> <p>CBGU reviewed the circumstances and monitoring confirmed works adhered to the Project's noise requirements, and the works undertaken were consistent with the community notification.</p>	Closed
4.	27 May 22	Albert Street (Albert Street Precinct)	Noise	<p>A stakeholder contacted the Project regarding noise generated from the Albert Street Precinct. CBGU provided the stakeholder with an overview of the works occurring and their duration. CBGU also outlined the mitigation measures used to alleviate potential impacts and ensure compliance.</p> <p>CBGU reviewed the circumstances and monitoring confirmed works adhered to the Project's noise requirements, and the works undertaken were consistent with the community notification.</p>	Closed