



JELLINBAH COAL MINE RECEIVING ENVIRONMENT MONITORING PROGRAM EPML00516813 2026 PROGRESS REPORT

PREPARED FOR
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1 Introduction

AARC Environmental Solutions Pty Ltd (AARC) was commissioned by Jellinbah Mining Pty Ltd (Jellinbah) to prepare the 2026 annual Receiving Environment Monitoring Program (REMP) Progress Report for the Jellinbah Coal Mine (the Project). The Project is managed under the Project's Environmental Authority (EA) EPML00516813 issued¹ on 6 March 2026. The 2026 REMP survey was conducted from 2 to 5 February 2026. In this instance, this progress report remains consistent with the EA in effect at the time of the survey.

As stated in Condition C26 of the Project's EA, for the purposes of the REMP, the receiving environment is the waters of Mackenzie River and connected or surrounding waterways within 5 km downstream of the mine's authorised release points. Connected waterways in this sense includes Blackwater Creek. The REMP encompasses any sensitive receiving waters or environmental values downstream of the authorised mining activity that have the potential to be directly affected by a release of mine affected water.

The activities authorised by this EA are conducted on tenures; ML2418, ML6992, ML70445, ML70446, ML70448, ML70449, ML80018, ML80053, ML80068, ML80108, ML80129, ML80140, ML80165, ML80184, ML700011, ML700012, and ML700013.

The EA aims to prevent any surface water impacts from the Project through its conditions relating to water management. However, some impacts may potentially occur despite the EA conditions. This report assesses whether any impacts have been identified for the monitoring period. The assessment uses multiple lines of evidence including:

- physical and chemical assessment:
 - surface water quality;
 - stream sediment quality; and
- biological assessment:
 - macroinvertebrates as bioindicators of water quality.

¹ Site work was undertaken in February 2026, prior to the issue of this latest EA, and when the previous version of EA (dated 3 March 2025) was current.

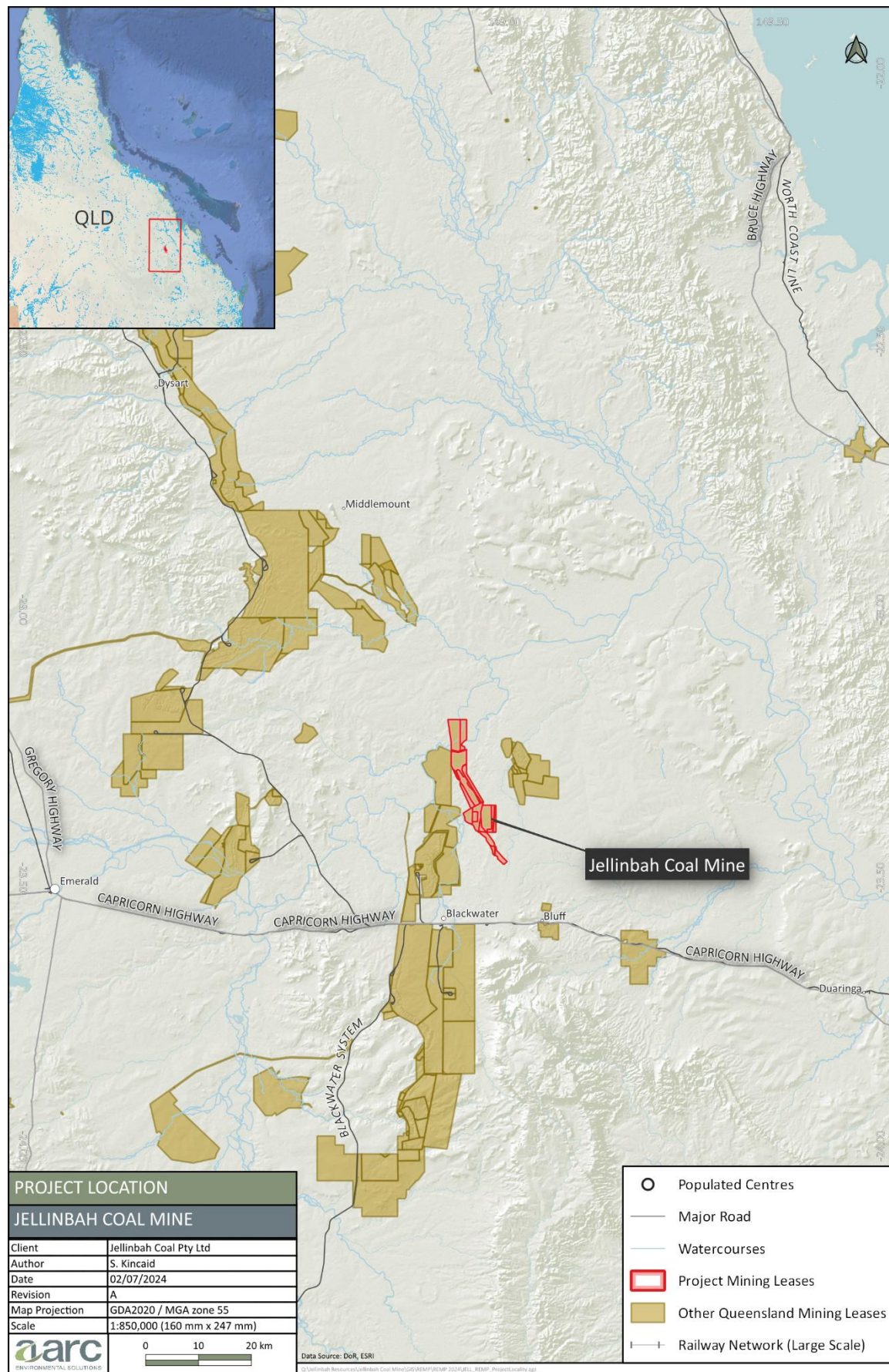


Figure 1-1: Project location

1.1 REMP purpose and scope

The scope of this Progress Report will be to describe the findings of this year's REMP results in accordance with methodologies and objectives outlined in the Project's Design Document (AARC 2017) and the Receiving environment monitoring program guidelines (ESR/2016/2399 v3.01, DESI 2024). Methods used in this document have been designed to assist in monitoring and assessing potential impacts caused by the Project, including controlled or uncontrolled releases of mine affected water and associated contaminants to the receiving environment.

The REMP Progress Report is prepared annually and includes consideration of release characteristics, receiving environment attributes, spatial extent and temporal context of monitoring. Details are provided of assessment of upstream (reference) site data compared with downstream (receiving) site data against multiple lines of evidence, comprising surface water quality, stream sediment quality, macroinvertebrate assemblages, stream flow and hydrological information.

The REMP progress report identifies instances where site data is recorded above water quality objectives (WQOs) or exceeds the trigger levels outlined by the Project's EA. These exceedances are then compared to historical data to determine if water quality exceedances were within background levels.

1.2 Requirements of the Environmental Authority

The purpose of this report is to present the findings of the Receiving Environment Monitoring Program (REMP), including all monitoring results and findings in accordance with condition C28 of the Project's Environmental Authority (EA). This Progress Report adheres to conditions outlined in the EA.

Condition C28 of the Project's EA states:

"A report outlining the findings of the REMP, including all monitoring results and interpretations in accordance with conditions C26 and C27 must be prepared annually and made available on request to the administering authority. This must include an assessment of background reference water quality, the condition of downstream water quality compared against water quality objectives, and the suitability of current discharge limits to protect downstream environmental values".

2 Project setting

The Project site is located (as shown in Figure 4-1) east and north of Blackwater Creek near its junction with the Mackenzie River. The mining leases (MLs) are located on the western slope of a north/south ridge. The average slope angle is 5% but varies from 2% to 10% across the site.

The northernmost portions of the Project (Jellinbah Plains and Mackenzie North) drain into the Mackenzie River, which joins the Fitzroy River approximately 220 km downstream of the mine. The area between the central and northern portions of the Project drains to Three Mile Lagoon to the north-west and Five Mile Lagoon to the north-east of the site. Three Mile Lagoon and Five Mile Lagoon are both located to the east and west of the Plains operating area and were linked by a local drainage feature in the pre-mining landscape.

The lagoons provide shade and watering points for livestock and native fauna habitat. The central portion of the Project (Jellinbah Central) drains westward into the ephemeral Blackwater Creek, before discharging into the Mackenzie River 10 km north-west of Jellinbah Central. The southern portion of the Project (Jellinbah South) drains directly eastward into the ephemeral Twelve Mile Creek, before discharging into the Mackenzie River 60 km downstream of the Jellinbah site (downstream of Bingegang Weir).

2.1 Regional climate

The regional climate at the Project is classified as sub-tropical and sub-humid, characterised by a wet, humid summer and dry winter.

The Bureau of Meteorology records an average annual rainfall of approximately 534.5 mm at the Blackwater Airport station (35134), located near the Project. Rainfall is highly variable and high evaporation rates occur throughout the year. Figure 2-1 indicates the monthly rainfall averages from the Blackwater Airport station (35134) using data from 2013-2026. Most of the rainfall for this region occurs from October to March (i.e. the 'wet season'), with limited rainfall recorded throughout the rest of the year (i.e. the 'dry season')

Figure 2-2 indicates the monthly rainfall data from April 2025 to February 2026 at the Mackenzie River Downstream site (331423) from the SILO Portal at the coordinate (-23.24, 148.93).

Data from the Emerald Airport weather station (35264) from 1992 to 2026 shows that January is the warmest month, with a maximum monthly mean temperature of 38.5°C and a minimum of 19.2°C. The coolest months are June and July, with a maximum mean temperature of 23.5°C and a minimum of 19.2°C (BoM 2026).

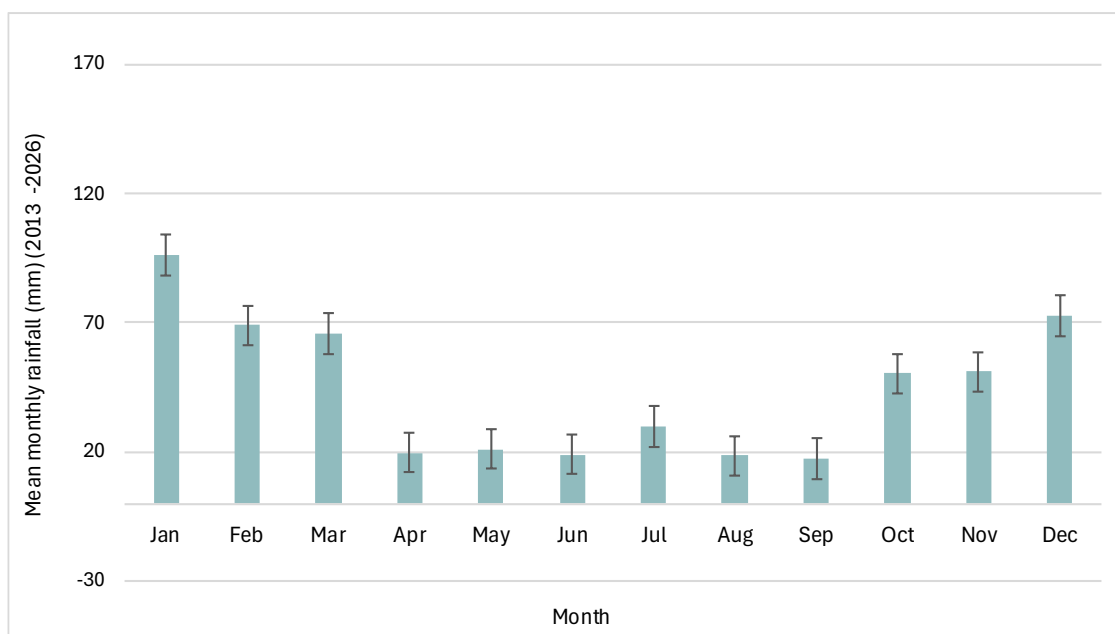


Figure 2-1: Rainfall averages from Blackwater Airport station (BoM 2026)

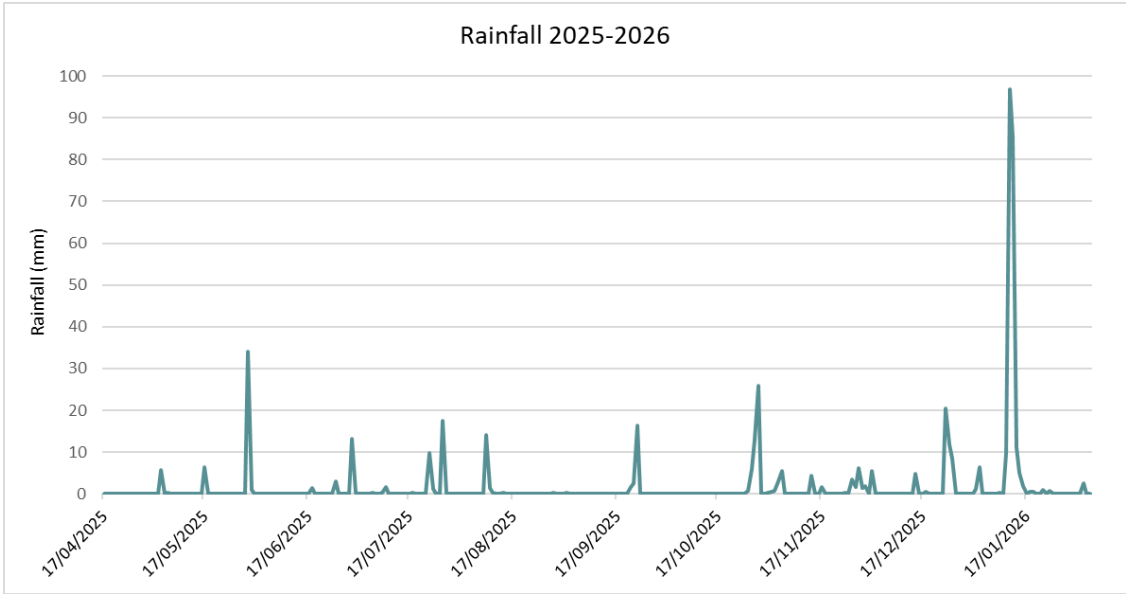


Figure 2-2: Rainfall from April 2025 – February 2026 at the Mackenzie River SILO Portal

2.2 Recent project activities

The Project is made up of three active mining areas and two currently inactive mine areas. The active mine areas consist of Mackenzie North, Jellinbah Central North, and Jellinbah Central. Jellinbah South and Jellinbah Plains, which were previously mined, remain inactive but are expected to resume activity in the future.

Operational mine activities have continued as scheduled during the 2025-2026 reporting period, including:

- stripping and stockpiling of topsoil ahead of mining;
- overburden removal ahead of mining in active voids;
- the production and haulage of coal;
- progressive rehabilitation of inactive spoil dumps and other disturbance areas; and
- general mine maintenance and ancillary activities.

2.3 Mine release event

Schedule C of the EA outlines water conditions for the Project, including conditions for water release. Table C1 of the EA includes 5 release points (RPs), of which two are to the Blackwater Creek (RP1 and RP2) and three are to the Mackenzie River (RP3, RP4 and RP5).

During the 2025-2026 reporting period, there was a controlled release event from 13th to 29th January 2026 from RP5 which releases to the Mackenzie River. The controlled event release into the receiving environment consisted of approximately 827ML of mine affected water (MAW).

Table 2-1 summarises controlled release events that have been reported previously as part of the Jellinbah REMP progress reporting.

Table 2-1: Historic release events at Jellinbah Coal Mine

Year of release	Date	Release point	Release type	Description	Release location
2016	04/02*	RP3	Uncontrolled	24.1 ML – Instantaneous	Mackenzie River
	04/02*	RP2	Controlled	10.8 ML over 7.5 hours	Blackwater Creek
	06/02*	RP2	Controlled	43.2 ML over 10 hours	Blackwater Creek
	08/02*	RP1	Controlled	5.81 ML over 10.75 hours	Blackwater Creek
	13/02*	RP3	Controlled	29.7 ML over 82.5 hours	Mackenzie River
	21/03	RP3	Controlled	45.27 ML over 76.25 hours	Mackenzie River
	16/07	RP3	Controlled	9.09 ML over 50.5 hours	Mackenzie River
2017	05/12	RP3	Controlled	0.18 ML over 1 hour	Mackenzie River
	05/12	RP5	Controlled	45.95 ML over 34.5 hours	Mackenzie River
2018	21/02	RP3	Controlled	147.35 ML over 195 hours	Mackenzie River
	21/02	RP5	Controlled	234.47 ML over 394 hours	Mackenzie River
2019	21/03	RP3 & RP5	Controlled	84.6 ML over 115 hours	Mackenzie River
	05/04	RP3 & RP5	Controlled	359.9 ML over 178 hours	Mackenzie River
2024	30/01	RP5	Controlled	218.6 ML over 150.5 hours	Mackenzie River

Note: *These releases occurred as a result of an extreme rainfall event (1:30-year event) in early February causing the dam wall at the Plains Desilting Water Dam to fail, resulting in an instantaneous uncontrolled release into clean water drains and subsequently the Mackenzie River via RP3

3 Project receiving environment

The Environmental Protection (Water and Wetland Biodiversity) Policy (EPP [Water and Wetland Biodiversity]) is subordinate legislation under the Environmental Protection Act 1994 (Qld) (EP Act) that provides a framework for:

- identifying environmental values (EVs) for Queensland waters, and deciding WQOs to protect or enhance those EVs; and
- including the identified EVs and WQOs under Schedule 1 of the EPP (Water and Wetland Biodiversity).

EPP (Water and Wetland Biodiversity) Fitzroy Basin (WQ1304 – Mackenzie River Sub-basin) identifies several watercourses (rivers/creeks) and lakes/reservoirs on and surrounding the Project site. Of these identified waterbodies, the Project's receiving environment incorporates the Mackenzie River and Anabranche, Blackwater Creek, Three Mile Lagoon and Five Mile Lagoon.

3.1 Environmental values

EVs are defined as the qualities of water that make it suitable for supporting aquatic ecosystems and human water uses (DES 2019).

The EVs and WQOs for waters occurring in the vicinity of the Project site are provided in the Mackenzie Sub-basin Environmental Values and Water Quality Objectives (DEHP 2011). The EVs and WQOs stated within this document have been developed in accordance with the EVs and WQOs in the EPP (Water and Wetland Biodiversity) and relevant supporting documents (AARC 2017). The Project is situated within the Mackenzie River Sub-basin, and as such is subject to the EVs and WQOs outlined in the Mackenzie River Sub-basin Environmental Values and Water Quality Objectives document (DEHP 2011).

The Mackenzie River Sub-Basin EVs include:

- Protection of aquatic ecosystems (aquatic ecosystem EV);
 - Protection or enhancement of aquatic ecosystem values, under four possible levels of ecosystem conditions:
 - high ecological value (effectively unmodified) waters;
 - slightly disturbed water;
 - moderately disturbed waters; and
 - highly disturbed waters.
- EVs other than aquatic ecosystem EV (human use EVs)
 - suitability for drinking water supplies;
 - suitability for primary contact recreation;
 - suitability for secondary contact recreation;
 - suitability for visual (no contact) recreation;
 - suitability for human consumers of wild or stocked fish, shellfish or crustaceans (suitability for oystering has also been specifically identified for some Queensland waters);
 - protection of cultural and spiritual values, including Traditional Owner values of water;
 - suitability for industrial use;
 - suitability for aquaculture (e.g. red claws, barramundi);
 - suitability for crop irrigation;
 - suitability for stock watering; and

- suitability for farm supply use.

Within the immediate vicinity of the Project site, suitability for stock water, irrigation and aquatic ecosystems are considered to be the applicable EVs for surface water. The Mackenzie River at the Project site also supplies the Bingegang Weir which is a drinking water supply located approximately 30 km downstream of the Project. As a result, the potential for impact on drinking water values has not been considered on the basis of distance from the downstream weir.

3.2 Receiving environment objectives

Receiving environment objectives (REOs) refer to thresholds identified to protect water quality to maintain the identified environmental values. These objectives are listed in the Project's EA and include:

- WQOs (for water and macroinvertebrates) from an EPP (2011); and
- Guideline values listed in the EA, including:
 - Default guideline values from ANZG (2018);
 - Site specific Release Contaminant Trigger Investigation Levels; and
 - Receiving Waters Contaminant Trigger Levels specific to Blackwater Creek and the Mackenzie River.

The EPP (Water and Wetland Biodiversity) provides WQOs to support and protect the different EVs identified for waters within the Mackenzie River catchments. WQOs are provided in two main parts:

- a) For the purposes of protecting the aquatic ecosystem EV; and
- b) For EVs other than aquatic ecosystems ('human use EVs').

Where more than one EV applies to receiving waters (e.g. aquatic ecosystem and stock watering), the Project's design document (AARC 2017) deems the most stringent WQO for each water quality indicator is adopted to protect all identified EVs. Aquatic ecosystem WQOs are typically more stringent than objectives for stock watering (AARC 2017), and as such, form the basis for site-specific targets and criteria.

It is considered to apply WQOs for aquatic ecosystems to the dissolved fraction for metals, as this is the fraction that would be available to aquatic organisms. Furthermore, it is considered appropriate to apply WQOs for stock drinking water and irrigation to the total metals fraction for water, as these fractions of metals are more likely to affect these EVs. Where stock drinking water and irrigation WQOs differ, the more stringent WQO has been adopted.

The WQOs outlined in the Mackenzie Sub-basin Environmental Values and Water Quality Objectives (2011) define desirable ranges for physical and chemical parameters for waterways within the Mackenzie River Sub-Basin. These values have been compared to data recorded at Jellinbah Mine to give an indication of river system health.

Monitoring results collected as part of the Jellinbah REMP are compared to site-specific criteria defined in the Project EA. An exceedance at a receiving site is considered significant if it is higher than the EA trigger level as well as the reference sites.

3.2.1 Surface water

Surface water REOs in Table 3-1 show the WQOs and EA trigger levels for water quality characteristics where specific values are outlined in the EPP (Water and Wetland Biodiversity). Table 3-2 indicates the water quality trigger levels for petroleum hydrocarbons from the release contaminant trigger investigation levels in the EA. Table 3-3 indicates the WQOs and EA trigger levels where the EPP (Water and Wetland Biodiversity) WQOs refer to the ANZECC (2000) guidelines.

Table 3-1: WQOs and trigger levels for major ions and physiochemical parameters

Water quality characteristic	EPP (Water and Wetland Biodiversity) WQOs		EA trigger level	
	Moderately disturbed aquatic ecosystems ¹	Freshwater lakes/reservoirs ²	Blackwater Creek	Mackenzie River
Ammonia N	< 20 µg/L	< 10 µg/L	900 µg/L	900 µg/L
Oxidised N	< 60 µg/L	< 10 µg/L	-	-
Organic N	< 420 µg/L	< 330 µg/L	-	-
Total nitrogen	< 775 µg/L	< 350 µg/L	-	-
Filterable reactive phosphorus (FRP)	< 20 µg/L	< 5 µg/L	-	-
Total phosphorus	< 160 µg/L	< 10 µg/L	-	-
Chlorophyll a	< 5 µg/L	< 5 µg/L	-	-
Dissolved oxygen	85% – 110% saturation	90% – 110% saturation	-	-
Turbidity	< 50 NTU	1–20 NTU	Low flow: 1,885 NTU* High Flow: 2,991 NTU*	-
Suspended solids	< 110 mg/L	-	690 mg/L	690 mg/L
pH	6.5–8.5	6.5–8	6.5–9	6.5–8.5
Electrical Conductivity (EC)	< 310 µS/cm (base flow); < 210 µS/cm (high flow)	< 250 µS/cm (no flow/base flow)	1,000 µS/cm	400 µS/cm
Sulphate	< 10 mg/L	-	250 mg/L	250 mg/L
Sodium	-	-	180,000 µg/L	180,000 µg/L
Nitrate	-	-	1,100 µg/L	1,100 µg/L

Note: ¹ Applicable to Blackwater Creek, Mackenzie River, and Mackenzie River Anabranh; ²Applicable to wetland sites.

* For the purpose of measuring turbidity in Blackwater Creek, low flow is defined as <2 m³/s and high flow is defined as >2 m³/s.

Table 3-2: Trigger levels for petroleum hydrocarbons

Petroleum hydrocarbon fraction	Release contaminant trigger investigation level
C6–C9	20 µg/L
C10–C36	100 µg/L

Table 3-3: WQOs and trigger levels for metals, metalloids and ions

Metal, metalloid or ion	ANZECC WQOs			EA trigger level (µg/L) ⁴
	Aquatic ecosystems guideline value (µg/L) ¹	Livestock Guideline Value (low risk) (mg/L) ²	Irrigation STV Guideline Value (mg/L) ³	
Aluminium	55	5	20	55
Arsenic	13	5 ⁵	2	13
Boron	370	5	-	370
Cadmium	0.2	0.01	0.05	0.2
Chromium	1	1	1	1
Cobalt	-	1	0.1	90
Copper	1.4	1 (cattle)	5	2
Fluoride	-	2	2	2,000
Iron	-	not sufficiently toxic	10	Interpretive purposes only
Lead	3.4	0.1	5	4
Manganese	1,900	not sufficiently toxic	2.5	1,900
Mercury	0.6	0.002	0.002	0.2
Molybdenum	-	0.15	0.05	34
Nickel	11	1	2	11
Selenium	-	0.02	0.05	10
Silver	0.05	-	-	1
Uranium	-	0.2	0.1	1
Vanadium	-	-	0.5	10
Zinc	8	20	5	8

Note: ¹ WQOs for aquatic ecosystems are applicable for dissolved metals only;

² WQOs for livestock drinking water are applicable for total metals only;

³ WQOs for Irrigation are applicable for total metals only;

⁴ EA trigger levels are applicable to dissolved metals only;

⁵ The upper guideline values adopted given ANZECC (2000) states it may be tolerated if not provided as a food additive and natural levels in the diet are low.

3.2.2 Stream sediment quality

Table 3-4 indicates the guideline values for stream sediment quality for the Project which have been adopted from the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG) (2018). Sediment guideline values were selected based on the sediment quality guideline values (SQGVs) published in ANZG 2018, and within the 'Revision of the ANZECC/ ARMCANZ Sediment Quality Guidelines' (Simpson et al. 2013) which provides default guideline values and guideline values–high for a range of parameters.

Concentrations below the default guideline have low risk of impact to aquatic ecological values, and concentrations above the SQG – High values have significant risk of impact to aquatic ecological values (Simpson et al. 2013).

It is noted that the Project's design document (AARC 2017) does not include a default guideline value (DGV) for arsenic, however this value is considered relevant for the purposes of this REMP progress report.

Table 3-4: Stream sediment quality guideline values

Toxicant	Default guideline value (mg/kg dry wt) ¹	Guideline value – high (mg/kg dry wt)
Arsenic*	20	70
Cadmium	1.5	10
Chromium	80	370
Copper	65	270
Lead	50	220
Mercury	0.15	1
Nickel	21	52
Silver	1	3.7
Zinc	200	410

Note: ¹The DGV has been used as a conservative sediment quality objective

*The guideline value for arsenic was not included in the REMP design document, however, is considered relevant to the objectives for stream sediment quality

3.2.3 Macroinvertebrate community

The Project's design document does not identify relevant macroinvertebrate WQOs, therefore an adopted value of relevance was used from the Mackenzie Sub-basin's EVs and WQOs (2011). Macroinvertebrate WQOs are defined by desirable ranges for biological parameters within the Mackenzie River Sub-Basin, including taxa richness, PET taxa richness, SIGNAL 2 index scores, and the percentage of tolerant taxa compared with sensitive taxa. These values have been compared to the data collected at Jellinbah Mine to give an indication of river system health. Table 3-5 shows the WQOs for macroinvertebrate edge habitat and composite communities.

Table 3-5: WQOs for macroinvertebrate communities

Indicator	EPP (Water and Wetland Biodiversity) WQOs	
	Composite	Edge Habitat
Taxa richness	12 – 21	23 – 33
PET taxa richness	2 – 5	2 – 5

Indicator	EPP (Water and Wetland Biodiversity) WQOs	
	Composite	Edge Habitat
SIGNAL 2 index	3.33 – 3.85	3.31 – 4.20
% tolerant taxa	25 – 50%	44 – 56%

4 Methodology

Monitoring was conducted in accordance with the REMP design document (AARC 2017), which should be referred to for the detailed methodologies that have been used in collecting data for this report. REMP datasets are collected on an annual basis.

REMP monitoring for the current report period was conducted from 2nd to 5th February 2026. Only one monitoring point (MP1), out of a total of 9 monitoring points, was unable to be surveyed at Blackwater Creek, due to safe site access restrictions associated with wet weather.

The following section summarises the monitoring parameters investigated, monitoring sites and the methodologies used to acquire the data.

4.1 Monitoring sites

The REMP Survey involved undertaking surface water, stream sediment and macroinvertebrate sampling at nine monitoring sites. This included four upstream (reference) sites and five downstream (receiving) sites. The REMP monitoring site locations are described in Table 4-1. The location of each site and potential points of contaminant release (i.e. release points) to each waterbody is displayed in Figure 4-1.

Three Mile Lagoon (US3) and Five Mile Lagoon (DS5), whilst not included within the EA Table C8 monitoring points, are part of the REMP due to their connection to the receiving environment catchments. Additionally, EA Condition C26 requires monitoring of any sensitive receiving waters or environmental values downstream of the authorised mining activity.

Table 4-1: Receiving waters reference monitoring sites and impact monitoring points

Monitoring Points	Location Description	Easting (MGA GDA94 Zone 55)	Northing (MGA GDA94 Zone 55)
Upstream (reference/background) monitoring sites			
MP2	Blackwater Creek 1360 m upstream of RP2	695630	7410000
MP4	Upstream Mackenzie River	694538	7426005
Three Mile Lagoon (US3)	Upstream Three Mile Lagoon	694443	7423876
MP7	Upstream Mackenzie River Anabranh	693814	7426977
Downstream (receiving) monitoring sites			
MP1	Blackwater Creek 1500 m downstream of RP1	694760	7413420
MP3	Downstream Mackenzie River	696930	7425950
Five Mile Lagoon (DS5)	Downstream Five Mile Lagoon	696694	7423071
MP5	Downstream Mackenzie River	697281	7428227
MP6	Downstream Mackenzie River Anabranh	696010	7433270

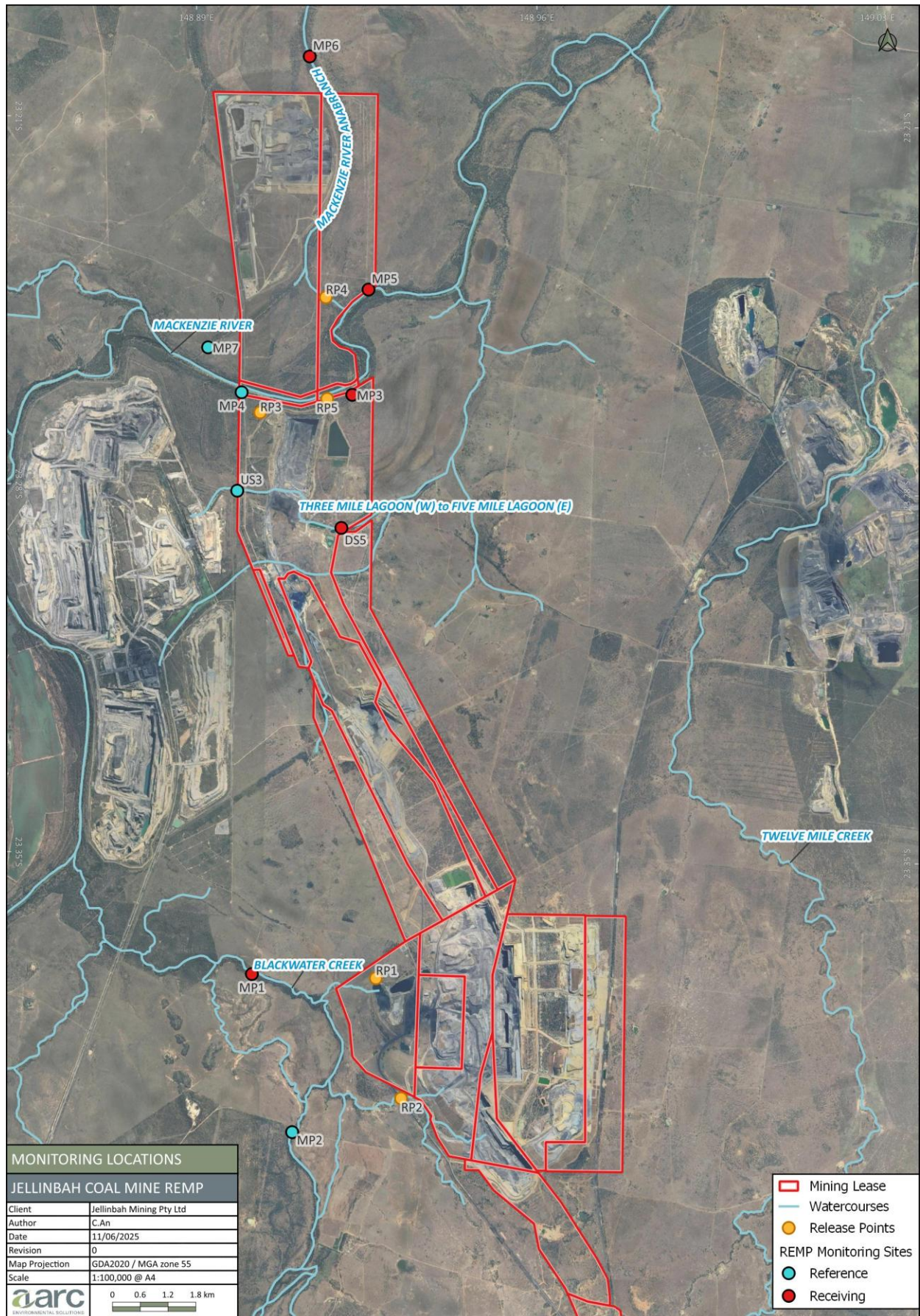


Figure 4-1: Jellinbah REMP monitoring and release points

4.2 Timing and scheduling

The frequency and scheduling of REMP monitoring are based on the Queensland Monitoring and Sampling Manual (DES 2018). REMP monitoring should take place during periods of stream flow, ideally towards the end of the wet season, and when safe access is available. In the event of a major flow event, REMP monitoring should be scheduled to occur approximately 2 – 4 weeks later but before base flows cease. The 2026 REMP survey was conducted from 2nd to the 5th of February 2026, two to three weeks after a rainfall event in the area.

4.3 Sampling methodology

Field sampling of water, sediment, and macroinvertebrates was carried out in accordance with the Queensland DES Monitoring and Sampling Manual (DES 2018), the Australian River Assessment System (AusRivAS) sampling and assessment methodology (Parsons et al. 2002) and the REMP Design Document (AARC 2017) described methodologies.

The following sections summarise the sampling methodology.

4.3.1 Site visual observations

To assist in the interpretation of any temporal variation in an ecosystem, visual observations were recorded for several parameters, including:

- habitat condition and physical description of stream banks;
- rapid assessment of riparian vegetation health (including the presence of necrosis and dieback) and canopy coverage immediately upstream and downstream of the site; and
- disturbance and other general observations of the site.

This information was recorded and stored in an electronic database for the identification of any temporal variation. All visual observations were compiled and associated with reference photographs of the site.

A physical assessment of the environment was conducted for each REMP site using the methods adapted from AusRivAS Physical Assessment Protocol (Parsons et al. 2002); and QLD AusRivAS Sampling and Processing Manual (DNRME 2001).

4.3.2 Photographic monitoring

Photographs provide a record of the receiving environment health and condition. Photographic monitoring at monitoring sites allows visual comparison over time, for riparian vegetation, ground cover, erosion and general appearance of each monitoring site. Photographs were taken with a digital camera and retained on an electronic database to provide a record for each monitoring site. One photograph was taken looking upstream, and one looking downstream, at all reference and impact sites and additional photographs were taken of relevant features. The photographs are used to provide context to the site's visual observations in the results and discussion sections.

4.3.3 Erosion monitoring

Erosion monitoring was undertaken in accordance with the adapted AusRivAS Physical Assessment Protocol (Parsons et al. 2002). This assessment includes a methodology to assess erosion characteristics. The erosion metrics were scored according to the system shown in the site observation record sheets in Appendix B.

4.3.4 Water quality

4.3.4.1 Field collection and laboratory analysis

In-situ water quality sampling was completed in accordance with the methods outlined in the Queensland DES Monitoring and Sampling Manual (DES 2018). Field readings including pH, dissolved oxygen (DO%), turbidity, electrical conductivity (EC) and temperature (°C) were recorded using a multi-parameter water quality meter calibrated to the manufacturer's specifications.

Grab samples were collected at a depth of 10 to 20 cm where sufficient water was available. Water samples including field filtered and unfiltered samples were collected at each site. Water quality samples were analysed under laboratory testing conditions for the parameters listed below:

- fluoride;
- ammonia;
- nitrate;
- petroleum hydrocarbons;
- sulphate;
- sodium; and
- metals (dissolved and total):
 - Al, As, Cd, Cr, Co, Cu, Fe, Pb, Hg, Mo, Ni, Ag, Se, U, V, B, and Zn

Water samples were placed on ice in sample containers and sent to a NATA accredited laboratory, for analysis of the relevant physico-chemical and water quality parameters. Copies of chain of custody forms, laboratory receipts and analytical reports can be found in Appendix C and Appendix D of this report.

4.3.4.2 Data analyses

Analysis results have been compared to upstream water quality (reference sites), and the relevant guideline values (Section 3.2). Where an Environmental Authority trigger value has not been set for a parameter, the approved WQO value was used, if one is applicable (refer Table 3-1). Where water hardness exceeded 30 mg/L (CaCO₃ equivalent), concentrations of cadmium, chromium, nickel, and zinc were compared to hardness modified trigger values according to ANZG (2018).

Where a parameter result at a receiving site was identified to exceed both the trigger value and reference site values, a time series plot using available historic data was created to identify long term trends. Time series plots were also identified for key parameters considered to be the greatest risk to the receiving environment.

4.3.5 Flow monitoring

Flow monitoring incorporates measurements of stream level (height in metres) and stream discharge (volume in cubic metres per second [m³/s]). Flow monitoring is important when dealing with point source releases to freshwater streams, regardless of stream ephemerality. The flow will heavily influence water quality and biological indicators and must be considered in the interpretation of REMP data. Collection of flow information allows for the analysis of the relationship between individual water quality parameters and flow conditions, enabling more accurate characterisation of the receiving environment, while also assisting the derivation of WQOs.

Flow monitoring data recorded at the Mackenzie River Gauging Station (331423) and the Blackwater Creek Gauging Station (331420) were used for flow monitoring in the 2026 REMP report. Historic data for these sites are from 2014 to 2026.

4.3.6 Sediment quality

Sediment quality sampling was undertaken in accordance with the Queensland DES Monitoring and Sampling Manual (DES 2018). A minimum five sub-samples (approximately 500 g each) of the stream bed substrate were taken at each REMP site along an approximate 50 m transect in the streambed. Samples were collected using a clean, non-metallic trowel. The sub-samples were then mixed in a clean plastic bucket to obtain a composite

sample (approximately 1 kg) to be sealed in sterilised plastic sample bags and/or glass jars and sent to a NATA accredited laboratory for analysis of particle size and chemical analysis for the following parameters:

- Aluminium
- Boron
- Beryllium
- Cadmium
- Chromium
- Cobalt
- Copper
- Iron
- Lead
- Magnesium
- Arsenic
- Barium
- Molybdenum
- Nickel
- Selenium
- Silver
- Vanadium
- Zinc
- Uranium
- Mercury

The results of the sediment samples at receiving sites were compared with reference sites and the relevant sediment quality objectives. Where metals concentrations exceeded the relevant guideline value further analysis for the bioavailability of the analyte was considered.

4.3.7 Macroinvertebrates

Macroinvertebrates have been adopted as the standard biological indicators of aquatic ecosystem health and water quality and are therefore frequently used to assess the condition of a waterway. Macroinvertebrates live, for at least some part of their life, in the aquatic system and are usually large enough to be seen with the naked eye. This group includes, among others, dragonflies, caddis flies, biting flies (e.g. midges), mites, snails, mussels, prawns and crayfish (Lloyd and Cook 2002).

Macroinvertebrates are chosen because of their abundance and diversity nationally, their sensitivity to changes in water quality, flow regime and habitat conditions, and relatively good taxonomic knowledge. Impacts on these animals are relatively long lasting and can be detected for some time after the impact. They are also limited in their ability to migrate from an area of the watercourse that is being adversely impacted and only have the ability to recolonise quite slowly after any pollution events. These animals have been utilised worldwide as good indicators of river and stream health and are increasingly used for rapid bio-assessment (Lloyd and Cook 2002).

Macroinvertebrate sampling is common in waterway health assessments for the following reasons:

- they are generally sensitive to the cumulative impacts of a wide range of disturbances and pollutants;
- they are abundant in freshwater systems;
- they are relatively easy to identify; and
- they are easy to collect (Chessman 2003).

Combining macroinvertebrate indices with habitat quality factors provides the most robust method for assessing macroinvertebrate assemblages and stream health. Macroinvertebrate sampling was conducted using a method adapted from the AusRivAS sampling and assessment methodology (Parsons et al. 2002), the Queensland Monitoring and Sampling Manual (DES 2018), and the QLD AusRivAS Sampling and Processing Manual (DNMRE 2001). AusRivAS is a nationally standardised method for undertaking an assessment of the biological health of inland rivers within Australia. The following sections outline the methods used to assess habitat quality and calculate macroinvertebrate indices.

4.3.7.1 Habitat bioassessment

A habitat assessment was performed at selected sites using a modified version of the AusRivAS protocols (DNRME 2001). The assessment has considered morphological characteristics of waterways only, including the broad habitat type, channel pattern, water level and flow, substrate character and cover, bed and bank stability, and riparian cover at each site. Each survey site has been given a score out of 135, with higher numbers indicating favourable habitats normally associated with healthy waterways.

4.3.7.2 Bed and edge habitat sampling

Along a 10 m stretch of the waterbody, a D-frame net (350 mm x 250 mm with 250 µm mesh) was used to sample macroinvertebrates at each monitoring site containing sufficient suitable aquatic habitat. This procedure targets various micro-habitats including riffles, runs, pool beds (which were sampled as 'bed' habitat where present) and edge habitat. The kick-sampling method was employed, where the substrate in the waterbody is disturbed and the net passed through the resulting plume to obtain benthos and water column-dwelling macroinvertebrates. For edge habitat, the methodology of short upward sweeping movements at right angles to the bank along a total 10m bank length, stirring up the bottom while doing so.

One edge habitat sample and one bed habitat sample were collected where habitat was present. When one of the habitat types wasn't present, no representative sample was collected, such instances include:

- site water level was low and the water level was not at typical edge of the creek;
- when the stream is very narrow and the edge and bed habitat are located so close that it is difficult to collect a sample excluding the other habitat type (i.e. streams less than 2 m wide).

Collected macroinvertebrates were placed in a white sorting tub and 'live-picked' using a pipette and tweezers for 60 minutes. Macroinvertebrates were placed in a vial containing 100% ethanol solution and sent to a designated laboratory for identification to the family or sub-family level by a specialist taxonomist. The results of these samples are provided in Appendix E of this report.

4.3.7.3 Data analysis

The data collected was assessed for:

- total abundance;
- taxa richness;
- PET taxa richness;
- SIGNAL2 score (weighted);
- percentage tolerant taxa; and
- community composition.

The community composition was described using a bi-plot of SIGNAL2 scores and species richness according to Chessman (2003). The bi-plot identifies the community compositions typically associated with particular water quality conditions, including:

- Quadrant 1 – Typically favourable habitat or chemically dilute water.
- Quadrant 2 – High salinity or nutrient levels (may be natural).
- Quadrant 3 – Toxic pollution or harsh physical environments.
- Quadrant 4 – Urban, industrial, or agricultural pollution.

The bi-plot provides this characterisation against the macroinvertebrate communities recorded at reference monitoring sites. The boundaries for the water quality quadrant have been set based on the 80th percentile of the Project reference site's historical data.

4.4 Laboratory quality control

Details of the quality control (QC) and quality assurance (QA) procedures employed to ensure the reliability of the monitoring results is provided in Appendix A. The summary of the outcome of these procedures is provided in Sections 4.4.1 and 4.4.2.

4.4.1 NATA laboratory quality control

The laboratory provided a QC report which describes the quality of the data provided. The report included the following statements:

- No method blank value outliers occurred;
- No duplicate outliers occurred;
- No laboratory control outliers occurred; and
- For all regular sample matrices, no surrogate recovery outliers occurred.

The laboratory received the samples within the recommended holding times with the exception of:

- Total suspended solids;
- Nitrite as N; and
- Total petroleum hydrocarbons-silica gel cleanup.

4.4.2 AARC sampling quality control

QCI of laboratory assessment and sampling procedure was conducted from the results of the QA duplicate and field blank samples. Laboratory results were assessed for QA and QC. The assessment identified:

- All dissolved metals concentrations were less than, or within the laboratory defined margin of error for the total analyses;
- Quality assurance duplicate sample results were identical or within the relevant reproducibility thresholds; and
- The quality control field blank sample returned no detectable concentrations for all analyses.

Results are considered valid for the purposes of this REMP assessment.

5 Results

5.1 Site observations

Site visual observations and photographic monitoring were conducted at the monitoring sites. The observations were consistent with previous monitoring and are presented in Appendix B with the following findings documented:

- Five Mile Lagoon (DS5), Three Mile Lagoon (US3) and Mackenzie River (MP7) had standing water at the time of sampling. All other monitoring sites were slow flowing. The water level was considered moderate to high at the Mackenzie River monitoring sites, except Three Mile Lagoon (US3) and Blackwater Creek MP2 had no flow recorded, and Five Mile Lagoon (DS5) was flooding.
- Water condition was generally turbid and opaque at most sites, except for Three Mile Lagoon (US3), and MP3 where the water was only slightly turbid. Additionally, MP2 was observed to have eutrophication.
- Evidence of cattle were consistent across all monitoring sites. Downstream Mackenzie River (MP3) and Downstream Mackenzie River (MP5) had evidence of Rakali due to discarded molluscs, and MP7 showed evidence of Eastern Grey Kangaroo footprints.
- The degree of erosion was considered 'None' to 'Little' at Upstream Mackenzie River (MP4), US3 and DS5, across all erosion types. The degree of erosion downstream in the Mackenzie River showed greater variability with the majority of erosion types considered to be 'None' to 'Little' and areas of weathering and bare ground displaying signs of 'moderate' erosion. The highest degree of erosion was observed at the Upstream Blackwater Creek (MP2) and at the MP7.
- Sediment deposits mainly consist of clay and silt across sites, with sand present at MP3 and US3. DS5 sediment deposits were comprised of sand and clay. Algal deposits were present at MP2, DS5, MP4 and at the Downstream Mackenzie River anabranch MP6.

5.2 Flow monitoring

Continuous site monitoring data provides for the analysis of relationships between flow conditions and individual water quality parameters, which enables more accurate characterisation of the receiving environment and informs the derivation of WQOs. Continuous monitoring data was sourced from receiving environment gauging stations on the Mackenzie River and Blackwater Creek (ALS Environmental 2026). Data was collected from each monitoring location (refer Figure 5-1) from the end of the 2025 survey period to the end of the 2026 survey period.

Physio-chemical parameters (i.e. pH, EC and turbidity) have been graphed against the stream flow rate for each location to identify correlations between the stream flow rate and water quality. Stream flow has the potential to influence water quality and biological indicators and must be considered in the interpretation of REMP data. The Department of Agriculture and Water Resources (Sinclair Knight Merz 2013) highlight that in dryland river systems, when discharge (stream flow) is high, turbidity, acidity, and dissolved oxygen are generally high. When discharge levels are low the result is often low dissolved oxygen, increased salinity, hardness, and alkalinity.

Continuous site monitoring data obtained from the Mackenzie River (receiving site) and Blackwater Creek gauging stations is summarised in sections 5.2.1 and 5.2.2.

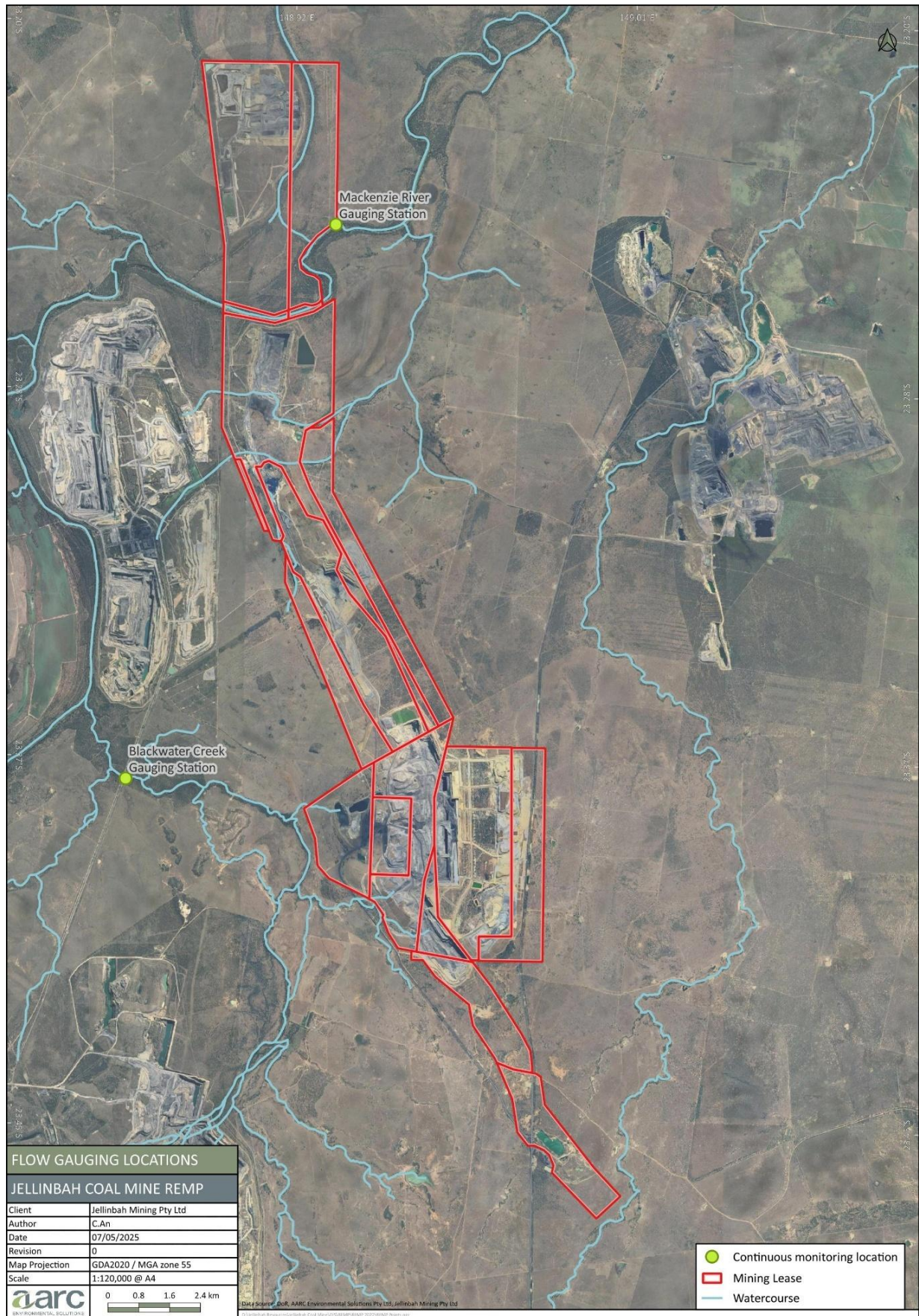


Figure 5-1: Continuous gauging station locations

5.2.1 Mackenzie River – receiving site

Figures have been included to show a comparison of flow rate and rainfall, pH, EC and turbidity (Figure 5-2, Figure 5-3 and Figure 5-4, respectively). Historical continuous monitoring data from Mackenzie River gauging station for these parameters have been included in Figure 5-5 to indicate any long-term trends.

High flow rates appear to be associated with decreased pH at the Mackenzie River receiving site gauging station. From mid-January to the end of January 2026, pH generally decreased, reaching a value of 6.7 when flow rates fluctuated around 1290.3 m³/s. Another relatively low point at 6.9 occurred in mid-January 2026 after a heavy rainfall event, associated with the highest flow rate observed of 1496.5 m³/s. Following this period, pH levels increased back to reach 7 as the flow rate decreased, which corresponds with the heavy rainfall occurring at this time (Figure 2-2). Throughout the monitoring periods, pH remained below the upper trigger level.

Similarly, high flow rates appear to correlate with lower electrical conductivity (EC) at the gauging site. EC steadily increased to its peak with 674 µS/cm in early January 2026, while rainfall was constantly low. EC dropped to approximately 188.3 µS/cm on 17th January 2026 while the flow rate was 1496.5 m³/s, then fluctuated above the EA trigger level. For over half of the period from April 2025 to January 2026, EC was below the EA trigger level. However, during periods of elevated flow rate in January 2026, EC decreased below the EA trigger level and reached its second lowest value during the peak flow event in early January 2026.

Rises in turbidity appear to correlate with high flow rates, as observed in January 2026, during periods of high flow. The high flow trigger level was not exceeded for the monitoring period.

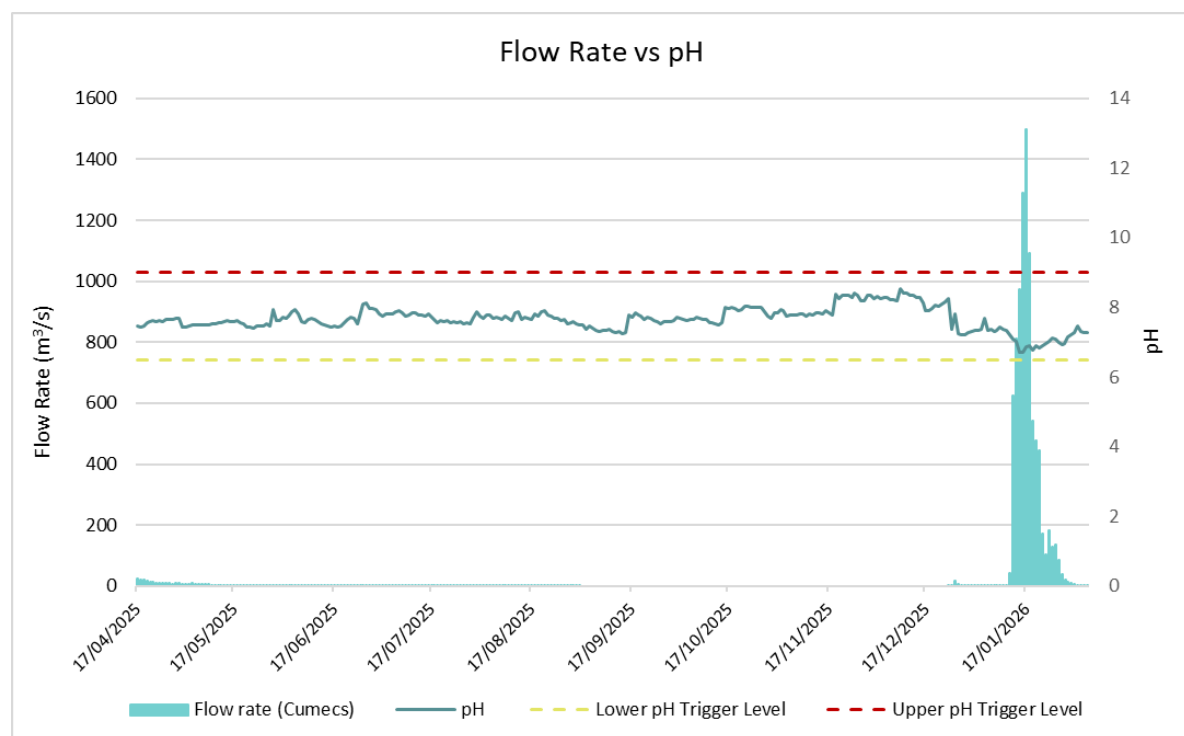


Figure 5-2: Flow rate versus pH at Mackenzie River receiving site gauging station (331423)

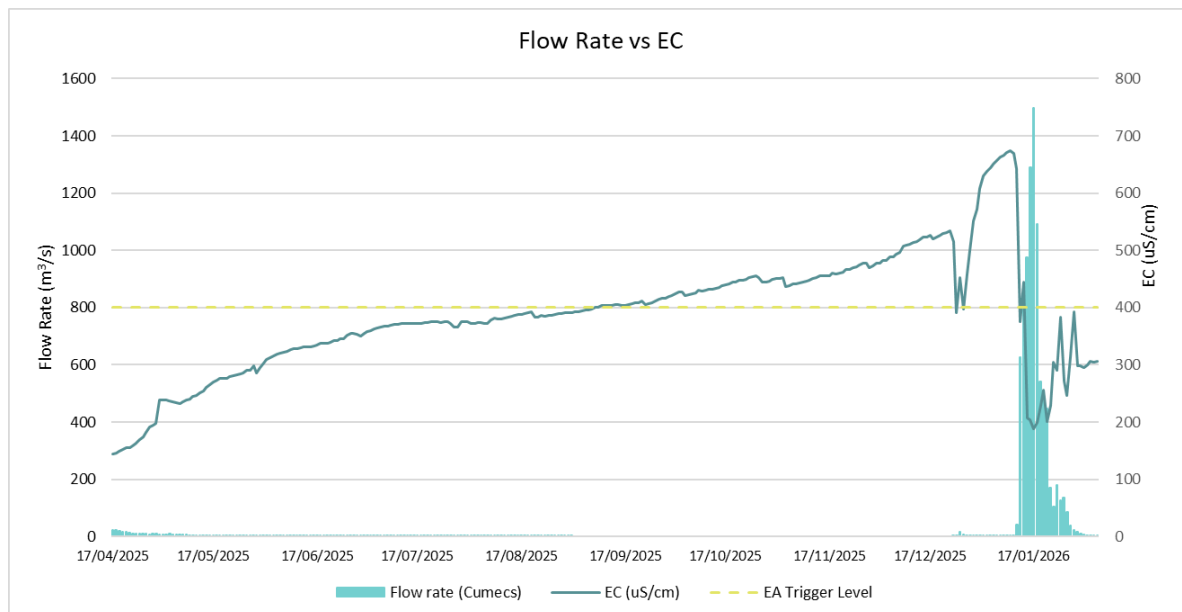


Figure 5-3: Flow rate versus EC at Mackenzie River receiving site gauging station (331423)

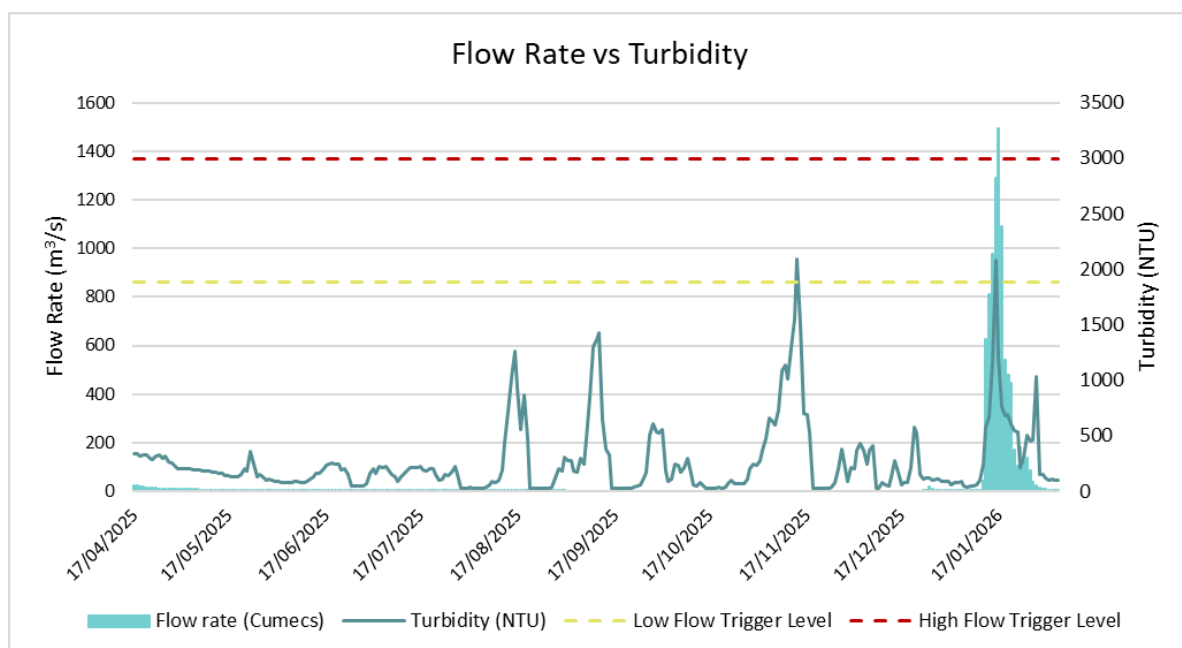


Figure 5-4: Flow rate versus turbidity at Mackenzie River receiving site gauging station (331423)



Figure 5-5: Historical continuous data from Mackenzie River gauging station (331423)

5.2.2 Blackwater Creek – receiving site

Figures have been included to show a comparison of flow rate and pH, EC and turbidity (Figure 5-6, Figure 5-7 and Figure 5-8, respectively). Historically continuous monitoring data from the Blackwater Creek gauging station for these parameters have been included in Figure 5-9 to indicate any long-term trends.

Periods of high flow events appear to generally coincide with lower pH at the Blackwater Creek Gauging station, however pH levels during periods of consistently low flow appear to fluctuate. The pH levels appear to lower during higher flow rates when flow increases steadily in the creek. Whereas during intermittent moderate to heavy rainfall events resulting in escalated high flow rates, from first flush pH tends to rise and then lower as flow reduces but remains elevated. For example, in mid-January 2026, the flow rate increased to its peak of 56.72 m³/s, and the pH levels appeared to be relatively low at 7.26.

Electrical conductivity (EC) is highly variable in Blackwater Creek due to the ephemeral nature of the watercourse. No clear correlation appears to be present between flow rate and EC at the Blackwater Creek gauging station. However, during first flush events EC appears to elevate before lowering as flow continues. EC fluctuates depending on flow rates and conditions. For example, in mid-January 2026, the EC values heightened to approximately 1700 µS/cm before lowering to 159.13 µS/cm, well below the EA trigger level, corresponding with first flush and ongoing flow rates.

Similarly, turbidity appears to fluctuate throughout the monitoring event, with little to no correlation with flow rate. During low flow rate (<2 m³/s) at Blackwater Creek, the turbidity fluctuated significantly above the low flow trigger level. During the high flow rate period since mid-January 2026, the turbidity remained well under the high flow EA trigger level. Furthermore, turbidity has historically fluctuated in both wet and dry seasons at the gauging station.

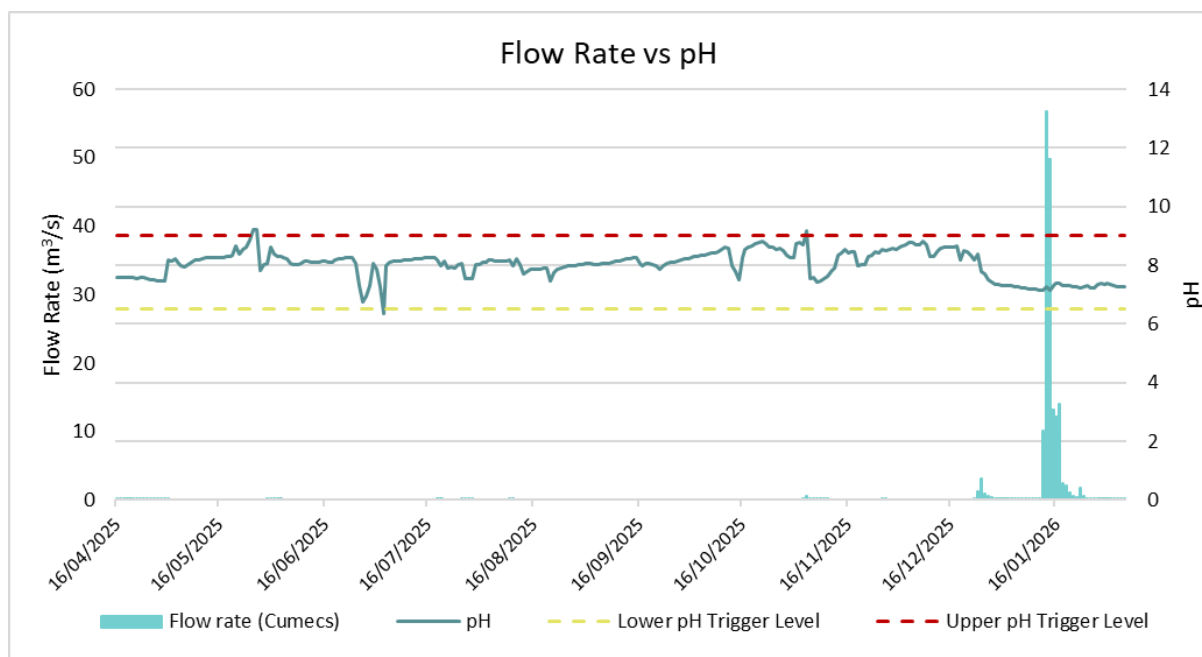


Figure 5-6: Flow rate versus pH at Blackwater Creek gauging station (331420)

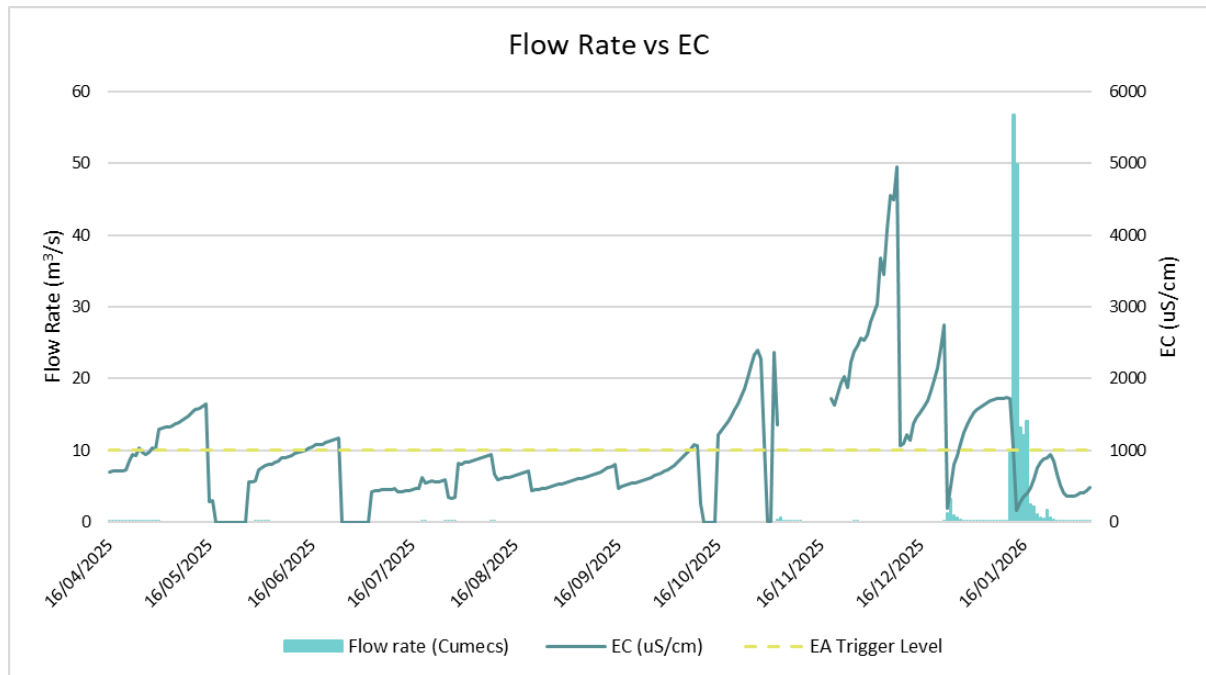


Figure 5-7: Flow rate versus EC at Blackwater Creek gauging station (331420)

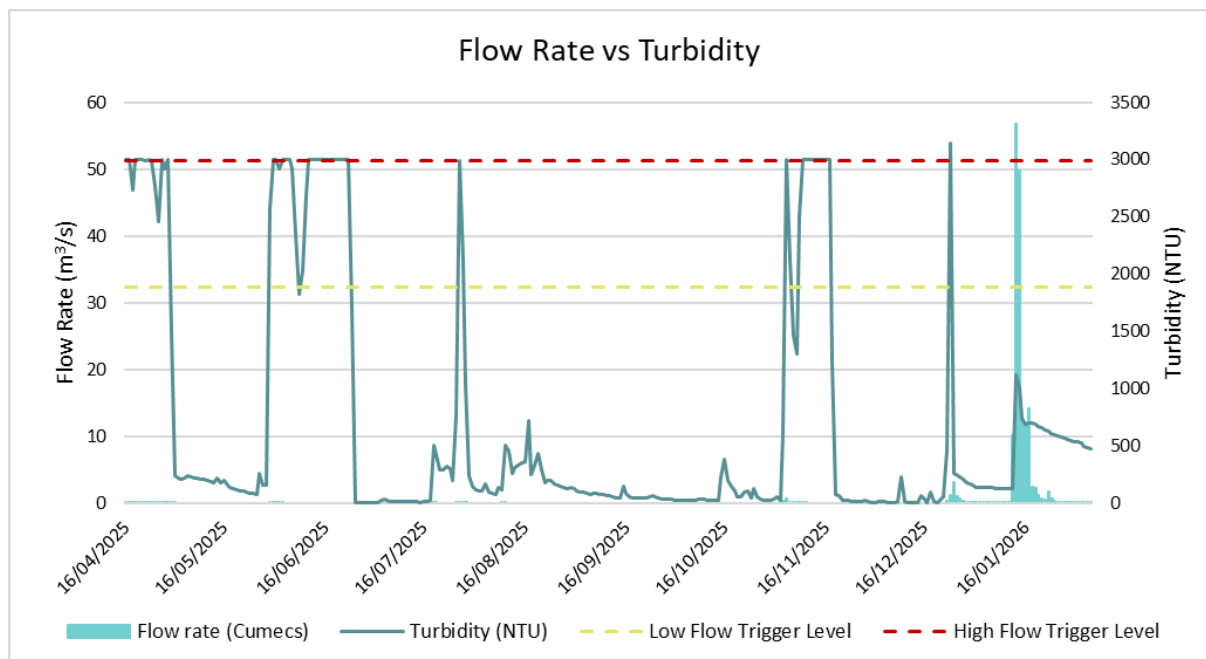


Figure 5-8: Flow rate versus turbidity at Blackwater Creek gauging station (331420)



Figure 5-9: Historical continuous data from Blackwater Creek gauging station (331420)

5.3 Surface water quality

Water quality results from the 2026 monitoring period have been compared to the EPP WQOs for aquatic ecosystems, livestock drinking water, and irrigation and EA trigger levels, as well as data obtained during previous monitoring events, where relevant.

Water quality monitoring results are presented in Table 5-1, Table 5-2, Table 5-3 and Table 5-4 with the following findings documented:

- Dissolved oxygen (DO) levels at receiving sites DS5 and MP5 did not meet the WQO range, however these levels were comparable with the results for the reference sites (US3 and MP4).
- Electrical conductivity (EC) at all sites were within the WQO and below EA trigger level.
- Turbidity levels at all receiving sites were substantially above the WQO thresholds except for MP6 with 30.52 NTU.
- Suspended solids at receiving site MP5 (169 mg/L) was elevated above the WQO of 110 mg/L.
- Dissolved copper concentrations were marginally above the EA trigger level (0.002 mg/L) at receiving sites MP3 (0.004 mg/L) and MP5 (0.003 mg/L). The exceedance at MP5 aligned with background conditions at the reference site MP4 (0.003 mg/L). MP6 (0.002 mg/L) exceeded both the EA trigger level and the WQO, although this was consistent with background concentrations recorded at MP7 (0.002 mg/L). The time series graph for dissolved copper (Appendix F) has been removed this year because, over the past two years, concentrations at the receiving sites have generally met trigger levels or remained comparable to reference sites. Dissolved copper data will continue to be reviewed, and further analysis will be undertaken if further exceedances occur. Dissolved copper has historically been elevated in the receiving sites as well as the reference sites, indicating the catchment naturally contains elevated concentrations of copper.
- No exceedances were recorded for zinc. As per previous recommendations, with the results remaining below the trigger levels, the time series graph has been removed from Appendix F.
- Total aluminium was recorded above the WQO for livestock drinking water (5 mg/L) at receiving site MP5 (6.07 mg/L).

Table 5-1: Water quality monitoring results – Physio-chemical parameters

Parameter	Unit	Blackwater Creek				Mackenzie River					Wetlands				Mackenzie River Anabranh			
		EPP WQO	EA trigger levels	MP1 (Receiving)	MP2 (Reference)	EPP WQO	EA trigger levels	MP3 (Receiving)	MP4 (Reference)	MP5 (Receiving)	EPP WQO	EA trigger levels	DS5 (Receiving)	US3 (Reference)	EPP WQO	EA trigger levels	MP6 (Receiving)	MP7 (Reference)
pH value	pH Unit	6.5-8.5	6.5-9.0	N/A	6.98	6.5-8.5	6.5-8.5	6.74	8.52	7.55	6.0-8.0	-	6.97	6.97	6.5-8.5	6.5-8.5	6.88	7.06
Field temperature	°C	-	-	N/A	27.5	-	-	28.4	35.3	28.7	-	-	29.3	29.3	-	-	28.9	27.7
Dissolved Oxygen	%	85-110	-	N/A	68.6	85-110	-	72.1	169.7	84.3	90 -110	-	69.9	69.8	85-110	-	87.3	73.3
Field EC	µS/cm	310 (base flow); 210 (high flow)	1000	N/A	332.7	310 (base flow); 210 (high flow)	400	280.9	318.6	283.0	250 (no flow/base flow)	-	242.9	224.4	310 (base flow); 210 (high flow)	-	300.8	278.8
Turbidity	NTU	50	1885 (low flow); 2991 (high flow)	N/A	373.59	50	-	92.87	81.50	87.11	1-20	-	34.65	34.46	50	-	30.52	81.39
Suspended Solids (SS)	mg/L	110	690	N/A	190	110	690	82	62	169	-	690	53	28	-	690	38	44

Notes: Values shaded in blue indicate a value outside the range of the WQOs and values shaded in orange indicate a value above the EA Trigger Levels

Table 5-2: Water quality monitoring results – Major ions and total petroleum hydrocarbons

Parameter	WQO	EA trigger level	Unit	Reference sites				Receiving sites				
				MP2	MP4	MP7	US3	MP1	MP3	DS5	MP5	MP6
Major ions												
Sulphate as SO ₄	10	250	mg/L	9	4	7	10	N/A	4	2	4	6
Sodium	-	180	mg/L	41	18	20	75	N/A	18	12	17	19
Fluoride	-	2	mg/L	0.3	0.2	0.2	0.1	N/A	0.2	0.1	0.2	0.2
Nitrate as N	-	1.1	mg/L	0.11	0.05	<0.01	<0.01	N/A	0.33	<0.01	0.34	<0.01
Ammonia as N	0.02 (streams); 0.01 (wetlands)	0.9	mg/L	0.03	0.02	<0.01	<0.01	N/A	0.02	0.02	0.01	<0.01
Total petroleum hydrocarbons												
C6 - C9 Fraction	-	20	µg/L	<20	<20	<20	<20	N/A	<20	<20	<20	<20
C10 - C36 Fraction	-	100	µg/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
C10 - C36 Fraction (Silica gel cleanup)		100	µg/L	<50	<50	<50	<50	N/A	<50	<50	<50	<50

Notes: Values shaded in blue indicate a value outside the range of the WQOs and values shaded in orange indicate a value above the EA Trigger Levels.

Table 5-3: Water quality monitoring results – dissolved metals

Parameter	WQO (Aquatic ecosystems)	EA trigger level	Unit	Reference sites				Receiving sites				
				MP2	MP4	MP7	US3	MP1	MP3	DS5	MP5	MP6
Dissolved metals												
Aluminium	0.055	0.055	mg/L	<0.01	0.01	0.02	<0.01	N/A	<0.01	<0.01	0.02	<0.01
Arsenic	0.013	0.013	mg/L	0.002	0.001	0.002	0.004	N/A	0.001	0.005	0.001	0.002
Boron	0.37	0.37	mg/L	0.07	<0.05	0.05	0.06	N/A	<0.05	<0.05	<0.05	0.05
Cadmium	0.0002	0.0002	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	N/A	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	0.001	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	N/A	<0.001	<0.001	<0.001	<0.001
Cobalt	-	0.09	mg/L	<0.001	<0.001	<0.001	0.001	N/A	<0.001	<0.001	<0.001	<0.001
Copper	0.0014	0.002	mg/L	0.003	0.003	0.002	<0.001	N/A	0.004	0.001	0.003	0.002
Iron	-	0.3	mg/L	<0.05	<0.05	<0.05	0.22	N/A	<0.05	<0.05	<0.05	<0.05
Lead	0.0034	0.004	mg/L	<0.001	<0.001	<0.001	<0.001	N/A	<0.001	<0.001	<0.001	<0.001
Manganese	1.9	1.9	mg/L	0.012	0.002	0.023	0.309	N/A	0.021	<0.001	0.003	0.038
Mercury	0.0006	0.0002	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	N/A	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	-	0.034	mg/L	0.001	<0.001	<0.001	0.001	N/A	<0.001	0.001	<0.001	<0.001
Nickel	0.011	0.011	mg/L	0.002	0.003	0.004	0.002	N/A	0.004	0.003	0.003	0.004
Selenium	-	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01
Silver	0.00005**	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	N/A	<0.001	<0.001	<0.001	<0.001
Uranium	-	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	N/A	<0.001	<0.001	<0.001	<0.001
Vanadium	-	0.01	mg/L	<0.01	0.02	<0.01	<0.01	N/A	0.02	<0.01	0.02	<0.01
Zinc	0.008	0.008	mg/L	<0.005	<0.005	<0.005	<0.005	N/A	<0.005	<0.005	<0.005	<0.005

Notes: Values shaded in blue indicate a value outside the range of the WQOs and values shaded in orange indicate a value above the REO.
*Indicates value is not greater than the hardness modified trigger level
**EPP WQO is lower than the LOR for silver

Table 5-4: Water quality monitoring results - total metals

Parameter	WQO (Livestock drinking water)	WQO (Irrigation)	Unit	Reference sites				Receiving sites				
				MP2	MP4	MP7	US 3	MP1	MP3	DS5	MP5	MP6
Total metals												
Aluminium	5	20	mg/L	11.4	4.04	4.64	0.26	N/A	4.65	1.14	6.07	1.80
Arsenic	5	2	mg/L	0.004	0.002	0.003	0.006	N/A	0.002	0.006	0.002	0.003
Boron	5	n/a	mg/L	0.08	0.06	0.08	0.08	N/A	0.05	<0.05	0.06	0.06
Cadmium	0.01	0.05	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	N/A	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	1	1	mg/L	0.009	0.007	0.008	<0.001	N/A	0.009	<0.001	0.011	0.001
Cobalt	1	0.1	mg/L	0.004	0.002	0.002	0.002	N/A	0.002	0.002	0.003	0.001
Copper	1 (cattle)	5	mg/L	0.01	0.006	0.005	0.001	N/A	0.006	0.002	0.007	0.003
Iron	-	10	mg/L	9.71	3.68	4.19	2.29	N/A	4.43	2.16	5.85	2.09
Lead	0.1	5	mg/L	0.005	<0.001	<0.001	<0.001	N/A	<0.001	<0.001	0.001	<0.001
Manganese	-	2.5	mg/L	0.293	0.058	0.109	0.379	N/A	0.086	0.178	0.089	0.103
Mercury	0.002	0.002	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	N/A	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	0.15	0.05	mg/L	0.001	<0.001	<0.001	0.001	N/A	<0.001	0.001	<0.001	<0.001
Nickel	1	2	mg/L	0.011	0.010	0.011	0.003	N/A	0.011	0.005	0.013	0.007
Selenium	-	0.05	mg/L	<0.01	<0.01	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01
Silver	-	n/a	mg/L	<0.001	<0.001	<0.001	<0.001	N/A	<0.001	<0.001	<0.001	<0.001
Uranium	0.2	0.1	mg/L	<0.001	<0.001	<0.001	<0.001	N/A	<0.001	<0.001	<0.001	<0.001
Vanadium	-	0.5	mg/L	0.02	0.03	0.01	<0.01	N/A	0.03	<0.01	0.03	<0.01
Zinc	20	5	mg/L	0.025	0.007	0.006	<0.005	N/A	0.007	<0.005	0.01	<0.005

Notes: Values shaded in blue indicate a value above the WQOs

5.4 Stream sediment quality

5.4.1 Sediment quality analysis

Stream sediment results are presented in Table 5-5. The results show marginal exceedance in nickel for receiving sites DS5 and MP5. However, the results were consistent with the corresponding reference sites US3 and MP4.

Copper and zinc concentrations were well below the respective DGVs and continued to decline relative to historical trends, indicating an overall reduction of these metals in stream sediment within the local area. Consistent with previous recommendations, and given that both parameters remain below trigger levels, the time series graphs for both parameters have been removed from this year's report (Appendix F). If future concentrations exceed trigger levels, further analysis and comparison against historical trends will be undertaken.

Table 5-5: Stream sediment results – <2000 µg fraction

Parameter	WQO*	LOR	Unit	Reference sites				Receiving sites				
				MP2	MP4	US3	MP7	MP1	MP3	DS5	MP5	MP6
Arsenic	20	5	mg/kg	<5	<5	<5	<5	N/A	<5	<5	<5	<5
Cadmium	1.5	1	mg/kg	<1	<1	<1	<1	N/A	<1	<1	<1	<1
Chromium	80	2	mg/kg	15	21	19	20	N/A	6	20	21	17
Copper	65	5	mg/kg	17	17	25	15	N/A	<5	19	16	12
Lead	50	5	mg/kg	8	8	6	5	N/A	<5	7	7	6
Nickel	21	2	mg/kg	17	24	25	21	N/A	6	24	24	18
Silver	1	2	mg/kg	<2	<2	<2	<2	N/A	<2	<2	<2	<2
Zinc	200	5	mg/kg	27	29	47	28	N/A	5	37	30	23
Mercury	0.15	1.1	mg/kg	<0.1	<0.1	<0.1	<0.1	N/A	<0.1	<0.1	<0.1	<0.1

Notes: Values shaded in blue indicate a value above the WQOs

*ISQG (Low) Trigger Levels were used for a conservative WQO

5.5 Macroinvertebrates

Macroinvertebrate results from the 2026 monitoring event have been summarised by calculating total abundance, taxonomic richness, SIGNAL (Stream Invertebrate Grade Number – Average Level) index, the proportion of tolerant taxa, and the richness of Plecoptera, Ephemeroptera and Trichoptera (PET) taxa across all study sites where samples could be collected. These macroinvertebrate indices have been compared with the EPP WQOs for macroinvertebrate assemblage as well as indices calculated during previous monitoring events (refer Table 5-6).

Table 5-6: Macroinvertebrate results

Sampling Site	Sampling period	Total abundance	Taxa richness	SIGNAL 2 score	PET Taxa	# tolerant taxa	% tolerant taxa	Signal count
EPP WQO (Composite/Bed)		-	12 – 21	3.33 – 3.85	2 – 5	-	25 - 50 %	-
EPP WQO (Edge)		-	23 – 33	3.31 – 4.2	2 – 5	-	44 – 56%	-
MP1 (receiving)	Sep-14	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Mar-15	59	14	3.2	1	7	58.33	12
	Mar-16	32	11	3.12	3	1	11.11	9
	Mar-17	13	3	1.67	0	2	100	2
	Apr-18	50	14	3.13	0	6	50	12
	Apr-19	1415	10	3.14	1	4	57.14	7
	Apr-20	165	14	1.47	0	8	72.72	11
	May-21	325	13	1.64	0	8	80	10
	Jun-22	5	3	2.25	0	0	0	2
	May-23	9	5	1.4	0	3	75	4
	Apr-24 (bed)	84	8	3.38	0	3	37.5	6
	Apr-25 (bed)	6	1	3.38	0	0	0	1
	Apr-25 (edge)	40	9	3.38	1	6	66.67	9
	Feb-26	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MP2 (reference)	Sep-14	8	8	2.9	1	3	42.86	7
	Mar-15	19	12	3.15	0	6	60	10
	Mar-16	9	6	2.83	0	4	66.67	6
	Mar-17	45	13	2.9	0	10	83.33	12
	Apr-18	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Apr-19	4528	14	3.4	2	5	62.5	8
	Apr-20	49	12	1.59	1	7	70	10
	May-21	173	14	1.47	1	7	63.64	11
	Jun-22	19	6	1.35	0	4	66.67	6
	May-23	22	6	1.75	0	2	50	4

Sampling Site	Sampling period	Total abundance	Taxa richness	SIGNAL 2 score	PET Taxa	# tolerant taxa	% tolerant taxa	Signal count
	Apr-24 (bed)	46	10	2.64	0	5	50	8
	Apr-25(bed)	3	2	2.64	1	0	0	2
	Apr-25(edge)	14	7	2.64	1	2	28.57	6
	Feb-26(edge)	144	32	3.09	2	17	53.13	30
MP3 (receiving)	Sep-14	11	11	3.7	2	3	37.5	8
	Mar-15	15	9	2.89	0	4	57.14	7
	Mar-16	23	11	2.71	1	5	50	10
	Mar-17	27	10	1.94	0	8	100	8
	Apr-18	25	12	2.67	0	6	54.55	11
	Apr-19	60	17	3.05	0	9	64.29	14
	Apr-20	95	18	1.82	1	8	50	16
	May-21	58	15	1.94	2	8	66.67	12
	Apr-22	22	6	1.75	1	2	33.33	6
	Apr-24 (bed)	56	17	4.3	5	6	40	16
	Apr-25(bed)	12	7	4.30	1	3	42.86	7
	Apr-25(edge)	29	9	4.30	2	6	66.67	9
	Feb-26(bed)	31	9	4.15	1	3	33.33	8
	Feb-26(edge)	23	8	3.14	1	4	50	8
MP4 (reference)	Sep-14	10	10	2.8	1	4	50	8
	Mar-15	7	6	3	0	3	50	6
	Mar-16	21	8	3.45	1	4	50	8
	Mar-17	28	9	1.57	0	7	100	7
	Apr-18	19	11	3.45	1	4	40	10
	Apr-19	106	18	3.46	2	9	60	15
	Apr-20	215	29	1.57	2	17	65.38	26
	May-21	120	15	1.73	0	17	141.67	12
	Jun-22	6	4	1.8	0	1	25	4
	Apr-24 (edge)	37	14	3.6	3	4	28.57	13
	Apr-25 (composite)	22	9	3.60	1	6	66.67	9
	Feb-26(edge)	88	19	3.17	2	10	52.63	18
MP5 (receiving)	Sep-14	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Mar-15	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Sampling Site	Sampling period	Total abundance	Taxa richness	SIGNAL 2 score	PET Taxa	# tolerant taxa	% tolerant taxa	Signal count
	Mar-16	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Mar-17	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Apr-18	65	19	3.33	1	7	43.75	16
	Apr-19	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Apr-20	87	9	1.93	0	2	28.57	7
	May-21	34	9	1.55	1	2	28.57	7
	Apr-22	20	6	1.83	1	5	50	10
	Apr-24 (edge)	23	15	4.21	3	3	20	13
	Apr-25 (composite)	23	8	4.21	0	5	62.50	7
	Feb-26(edge)	46	19	3.44	3	10	52.63	19
DS5 (receiving)	Sep-14	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Mar-15	86	12	3.09	0	6	66.67	9
	Mar-16	89	13	2.48	1	7	63.64	11
	Mar-17	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Apr-18	64	18	2.57	1	10	66.67	15
	Apr-19	4356	16	2.27	0	9	64.29	14
	Apr-20	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	May-21	2533	23	1.46	1	8	40	20
	Jun-22	52	15	1.19	1	11	78.57	14
	May-23	59	13	1.25	0	8	72.73	11
	Apr-24 (comp)	36	11	2.65	0	8	72.73	11
	Apr-25 (composite)	33	8	2.65	2	6	75	8
	Feb-26(bed)	28	5	3.03	0	2	40	5
	Feb-26(edge)	116	20	3.20	1	10	50	18
US3 (reference)	Sep-14	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Mar-15	137	20	2.34	0	10	58.82	17
	Mar-16	57	9	2.53	1	5	62.5	8
	Mar-17	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Apr-18	245	26	2.6	1		0	23
	Apr-19	111	10	2.16	0	8	100	8
	Apr-20	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Sampling Site	Sampling period	Total abundance	Taxa richness	SIGNAL 2 score	PET Taxa	# tolerant taxa	% tolerant taxa	Signal count
	May-21	153	15	1.34	1	2	15.38	13
	Jun-22	34	8	1.31	1	5	71.43	7
	May-23	25	9	1.54	0	5	55.56	9
	Apr-25(bed)	103	18	2.42	1	11	61.11	15
	Apr-25(edge)	116	19	2.42	2	11	57.89	16
	Feb-26(bed)	50	4	3.29	0	2	50	3
	Feb-26(edge)	240	20	2.51	1	14	70	18
MP6 (receiving)	May-21	58	13	3.23	0	2	18.18	11
	Apr-22	9	7	2.88	0	5	71.43	7
	May-23	79	17	1.66	1	9	64.29	13
	Apr-24 (bed)	88	19	3.52	1	9	47.37	16
	Apr-25(bed)	39	8	3.52	0	4	50	8
	Apr-25(edge)	30	18	3.52	0	11	61.11	16
	Feb-26(bed)	14	7	2.83	0	3	42.86	4
	Feb-26(edge)	81	19	3	1	11	57.89	18
MP7 (reference)	May-21	72	15	2.79	2	2	16.67	12
	Apr-22	9	5	2.25	0	3	75	5
	Apr-24 (bed)	86	16	2.42	1	10	62.5	14
	Apr-25(bed)	95	14	2.42	2	8	57.14	12
	Apr-25(edge)	42	13	2.42	1	8	61.54	11
	Feb-26(bed)	6	3	3.25	0	2	66.67	3
	Feb-26(edge)	42	12	2.76	1	8	66.67	11

Note: Values shaded in blue are outside the WQO and measured in 2026.

5.5.1 Abundance and taxa richness

Total abundance was higher at reference sites compared to receiving sites. For example, Three Mile lagoon (US3) had the highest total abundance, followed by Blackwater Creek (MP2). Reference site US3 (240) had considerably higher abundance than receiving site DS5 (144). However, the Mackenzie River Anabranh receiving site MP6 (95) had higher abundance than reference site MP7 (48).

An overall increase in taxa richness from 2025 was evident, with receiving sites (87) observing almost the same number of taxa as the reference sites (90). Taxa richness at the upstream Mackenzie River site (MP4) was directly comparable to reference site MP5, with 19 taxa recorded at each edge site. An increase in taxa richness in the downstream bed of the Mackenzie River (MP3) was at 9 taxa, unfortunately access to the riverbed upstream was not possible, so no comparable bed sample was collected. This however was an increase from 2025 when with just 1 bed taxa recorded. The receiving site for the Mackenzie River anabranh (MP6) supported a higher number of taxa than its corresponding reference site (MP7), with a bed taxa recorded at 7 and 3, respectively and edge taxa at 19 and 12, respectively. Taxa richness was similar between Three Mile

Lagoon (US3) and its reference site, Five Mile Lagoon (DS5). Bed taxa counts were 4 and 5, respectively, and both sites recorded 20 edge taxa. Overall Blackwater Creek (MP2 (32)) recorded the highest taxa richness.

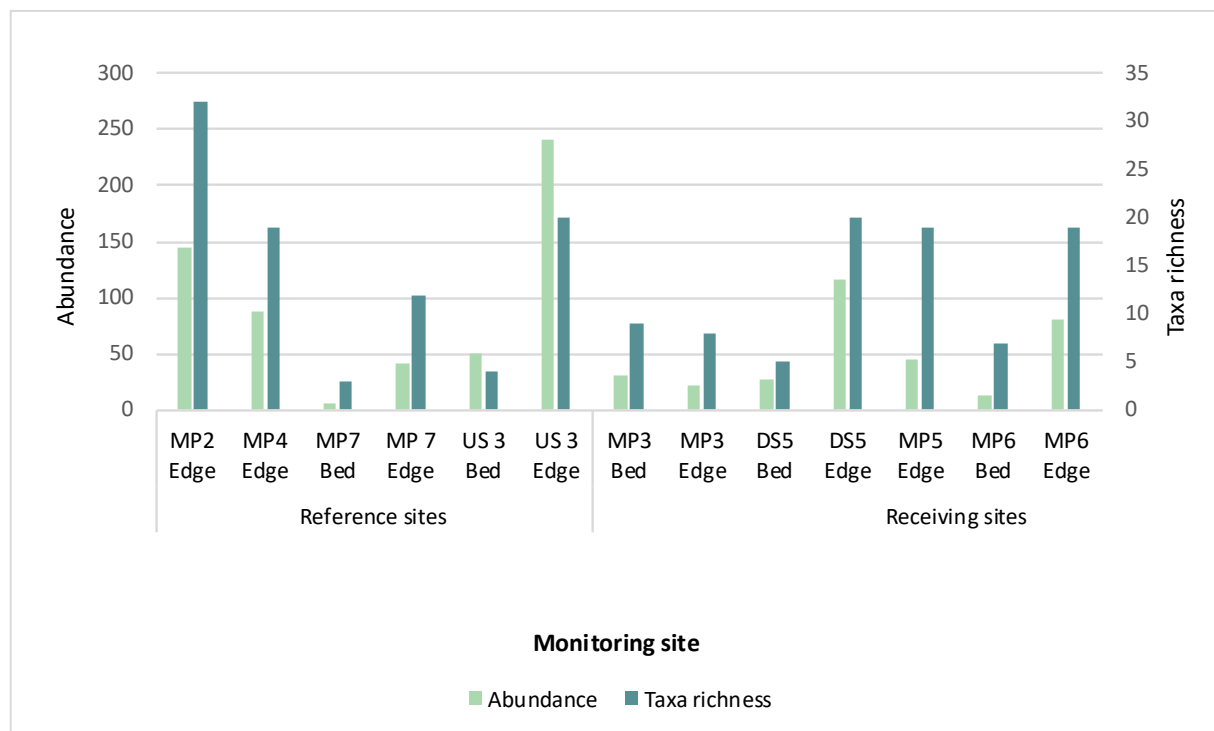


Figure 5-10: Macroinvertebrate total abundance and taxa richness

5.5.2 PET taxa richness and Signal 2 score

PET richness and Signal 2 scores for each site are presented in Figure 5-11. PET taxa richness was highest at Mackenzie River (MP5), followed by reference sites for Blackwater Creek (MP2) and Mackenzie River (MP4). No PET taxa were recorded at two receiving sample sites, including DS5 bed (Five Mile lagoon), and MP6 bed (Mackenzie River Anabranh), and two reference sites, Mackenzie River Anabranh (MP7) and Three Mile lagoon (US3). In general, receiving sites were comparable to reference sites for PET taxa richness.

The SIGNAL 2 scores were higher at receiving sites than at reference sites. The highest SIGNAL 2 score was at the reference site of Mackenzie River, MP3 followed by MP5. The receiving sites of Mackenzie River were considerably higher signal 2 scores than the reference site (MP4) which had a Signal 2 score of 3.17. Three Mile lagoon (US3) received the highest SIGNAL 2 score out of all the reference sites.

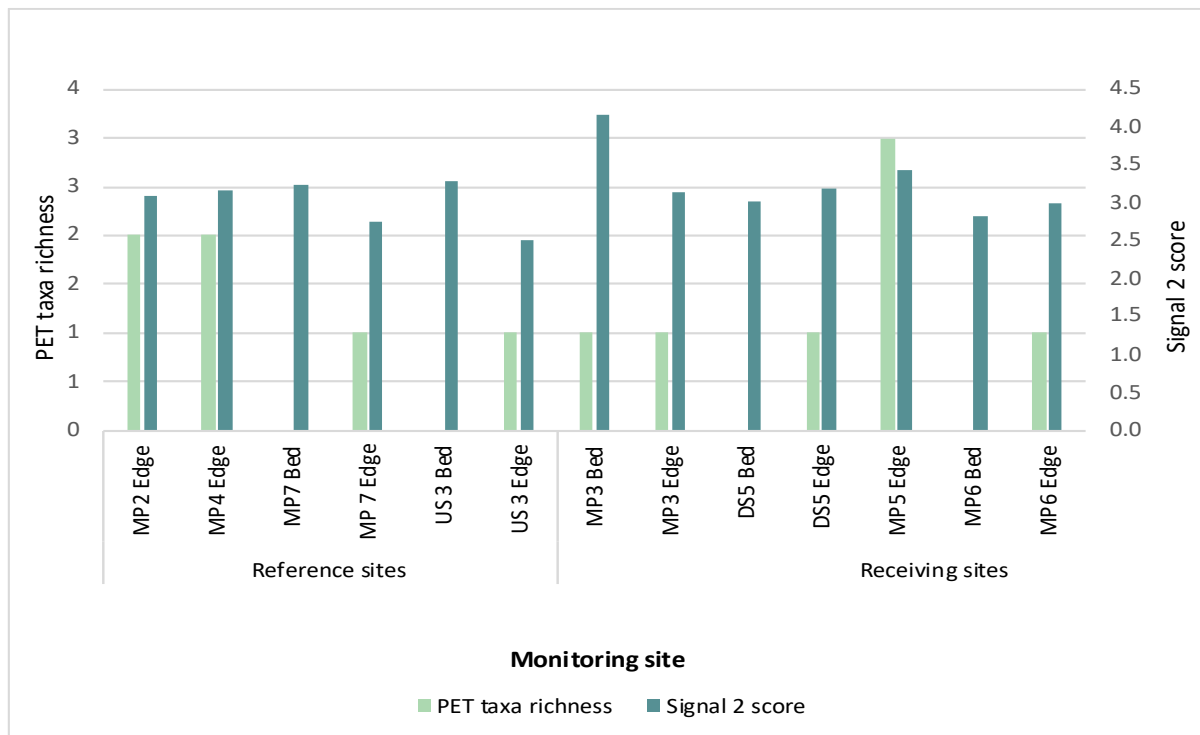


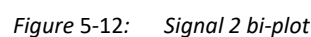
Figure 5-11: Macroinvertebrate PET taxa richness and Signal 2 index score

5.5.3 SIGNAL 2 bi-plot

The SIGNAL 2 bi-plot (refer to Figure 5-12) illustrates all SIGNAL Indices obtained from monitoring within the receiving environment for 2026, and previous years of monitoring. The quadrant boundaries were set using the 80th percentile for all historic reference site data, as recommended in 2024, for conservative suitability for the study region and local sampling methods.

The 80th percentile of up to 12 years of historic reference data for both SIGNAL-2 scores and taxa richness provides a robust threshold representing the upper range of natural variation at the monitored slightly to moderately disturbed waters of the Mackenzie River sub-basin. This benchmark reflects conditions met by the majority of reference sites most of the time, accounting for natural variability while excluding outliers.

For the 2026 survey, the majority of receiving sites are placed in quadrant 4, as compared to the reference sites where the majority are within quadrant 4. MP6 Edge sample was the only monitoring site to be within quadrant 2. Historically, both reference and receiving sites have typically resided within the lower water quality (quadrants 4 and 2). Occasionally both receiving and reference sites have results associated with the 3rd and 1st quadrant; however, this is assumed to reflect variable changes in the natural environment.



Habitats at each macroinvertebrate sampling site were assessed based on specific variables associated with flow velocity, bank structure, water characteristics and vegetation. The sites were given a score out of 135 and categorised into poor, fair, good, and excellent based of their bioassessment score (refer Table 5-7 and Figure 5-13).

Site scores ranged between 95 and 130 out of 135, with either 'Good' or 'Excellent' category placement. This is a noticeable improvement from the 2025 survey. Reference sites MP4 and US3 scored the highest (125 and 130 out of 135, respectively), and the receiving sites scored lower on average compared to the reference sites.

Table 5-7: Macroinvertebrate habitat bioassessment results

Site	Reference sites				Receiving sites				
	MP2	MP4	US3	MP7	MP1	MP3	MP5	MP6	DS5
Habitat bioassessment score	95	125	130	115	N/A	110	120	110	110
Category	Good	Excellent	Excellent	Excellent	N/A	Good	Excellent	Good	Good
Average (Reference/ Receiving)	116.25				112.50				

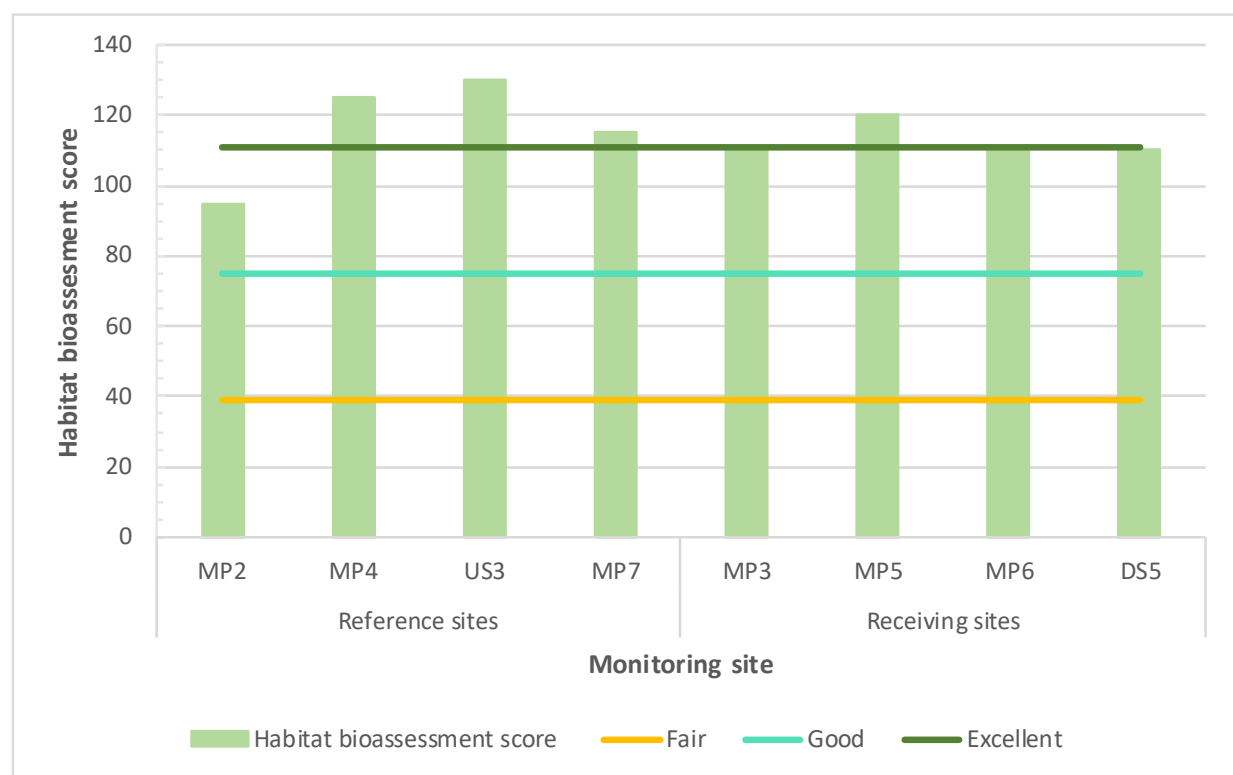


Figure 5-13: Habitat bioassessment scores

6 Summary and conclusions

The receiving environment at Jellinbah Mine has been assessed against multiple lines of evidence. In general, the results showed an improvement in water quality, stream sediment quality, and macroinvertebrate assemblage health from historical monitoring data.

6.1 Recommendations

The following recommendation has been developed to benefit future REMP monitoring:

- Time series graphs for both zinc and copper concentrations in surface water and stream sediment have been removed, as recent data remain at or below trigger values. Updated time-series plots will be reinstated if future concentrations exceed these thresholds in the receiving environment.

7 References

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Appendix A. Quality control and assurance

To ensure the reliability of monitoring results, a number of quality control / quality assurance (QC/QA) procedures were adopted during the collection and analysis of REMP samples. All field testing and sample collection were completed using best practice techniques and in accordance with the instrument manufacturer's instructions (including calibration). Macroinvertebrate samples were sent to an AusRivAS accredited laboratory for ID. Water and sediment samples were sent to NATA accredited laboratories for analysis. Samples were analysed using appropriate methods as per NATA laboratory accreditation requirements. In accordance with those requirements, the analysing laboratory was responsible for undertaking a range of QC/QA checks, (e.g. evaluation of sample preservation and holding times, relative performance differences on duplicate samples, etc). The results of these QC/QA checks were provided with the raw quality data in the report appendices.

The following QC/QA steps were undertaken as part of the water and sediment quality sampling procedure:

- At each monitoring site, water quality measurements and water samples were collected prior to any other sampling, to reduce sample contamination and bias of in-situ turbidity readings. Care was taken to prevent disturbance to the stream bed or banks when undertaking these tasks.
- Water quality meters were calibrated in accordance with the manufacturer's specifications prior to sampling.-
- Water quality probes were rinsed between sampling sites to prevent contamination.
- Persons collecting water samples wore clean, single-use, powder free, sterile, nitrile gloves at each REMP site.
- Where required, unpreserved sample bottles were rinsed in local water before filling.
- Prior to the collection of field-filtered samples, the sampling syringe was rinsed twice, using sampling water collected in a sample container. The entire inside surface of the syringe came in contact with the sample. The syringe would then be refilled, and a filter attached. The first 2 ml of the sample was discarded through the filter as a filter rinse, before filling the sample bottle via the filter. -
- All label information on each sampling bottle was completed while at the REMP site and checked during the completion of the Chain of Custody forms prior to sample dispatch. Sampling bottles containing dissolved water were appropriately demarcated as field filtered.
- Samples were stored in appropriate, laboratory allocated sample bottles and sample collection was conducted according to appropriate methods, as advised by the analysing laboratory.
- Samples collected as part of the monitoring were stored in coolers with ice to keep them chilled and were sent to the NATA accredited laboratory for testing (as soon as practically possible) in order to comply with holding times.
- The COCs for each batch of samples were included in the coolers.
- Cooler lids were taped with the security tape to ensure that any tampering is evident.
- Data received from the laboratories was reviewed immediately following receipt, to identify any anomalies that may require samples to be re-tested.
- The following sampling control procedures were undertaken as part of the macroinvertebrate sampling procedure, to assure sample quality and data reliability:
 - Dip nets and sorting trays were thoroughly rinsed prior to sampling at each REMP site to prevent sample contamination.
 - Each sample was clearly labelled, with sample details recorded on the sample jar in permanent marker. These details were then recorded on the COC forms prior to the samples being dispatched. This process ensures samples can be readily tracked when sent to the laboratory for processing.
- For quality assurance purposes, the following sampling specific activities were undertaken: -
- For water quality sampling, duplicate water samples were collected from one site to confirm the analytical reliability of laboratory results. This sample was collected following the same methodology

described in Section 4.3.4. It is noted that duplicate sample bottles were labelled with 'QA' to ensure that the laboratory did not know which site was used for the quality assurance sample. This was recorded on the field datasheet.

- Laboratory analysis results were assessed for reproducibility using quality assurance duplicate sample.
- A 'field blank' water sample was included in the samples sent for laboratory analysis to identify potential contamination of samples during the collection procedures. A Blank sample was completed using 'blank distilled water' supplied by the Lab. The blank samples were labelled 'QC' and recorded on the COC.
- The field blank sample was assessed against the laboratory limit of reporting.
- For sediment sampling, a duplicate sample was taken at one site to confirm analytical reliability for laboratory analysis. The quality assurance sample was taken in the same manner described in Section 4.3.6, except approximately 1 kg of sediment was collected and mixed. One corner of the bag was cut to pour sediment into a cone shape on clean paper, flattened and divided into quarters with a clean trowel. The top left and bottom right quarters were extracted into a clean sediment bag and labelled with the site name, while the top right and bottom left quarters were extracted into a clean sediment bag labelled 'QA'.

Appendix B. Site profiles

A1.1

A1.2 Monitoring site MP2 (Reference)

Sample date/time:	4.02.2026/15:05	Site coordinates:	695630, 7410000	GDA94 / MGA zone 55
Upstream		Downstream		
				
Water flow:	Slow flowing	Water oils:	None	
Pool dimensions (m):	Continuous, 10	Plume:	Extensive	
Water surface:	Algae scum on the surface	Sediment smothering:	Yes	
Turbidity:	Eutrophied	Sediment oils:	Absent	
Water colour:	Brown	Sediment odour:	None	
Bank shape (left/right):	Concave, Convex	Adjacent land use:	Livestock grazing	
Bank slope (left/right):	Vertical 80-90°, Steep 60-80°	Livestock/animal impacts:	Cattle pugging	
Erosion observations		Habitat assessment: MP2		
Bare ground:	Moderate 50-75%	Bottom substrate:	Poor	5
Exposed tree roots:	Moderate 50-75%	Embeddedness:	Fair	10
Gully erosion:	Some 10-50%	Velocity/depth category:	Fair	10
Bank slumping:	Little 1-10%	Channel alteration:	Good	11
Local catchment erosion:	Little 1-10%	Bottom scouring/deposition:	Fair	7
Notes:		Pool/riffle, run/bend ratio:	Fair	7
Blackwater creek.		Bank stability:	Poor	2
		Bank vegetation stability:	Fair	5
		Streamside dominant cover:	Excellent	10
		Total score:	Fair	67

Monitoring site: MP2			
Macroinvertebrate sample 1		Macroinvertebrate sample 2	
Habitat type:	Edge	Habitat type:	Bed
Collected/picked by:	HS, SS/HS, SS	Collected/picked by:	N/A
Substrate description (%)		Substrate description	
Bedrock:	Clay and silt	Bedrock:	N/A
Boulder:	N/A	Boulder:	N/A
Cobble:	N/A	Cobble:	N/A
Pebble:	N/A	Pebble:	N/A
Gravel:	N/A	Gravel:	N/A
Sand:	5	Sand:	N/A
Silt/clay:	95	Silt/clay:	N/A
Substrate description		Substrate description	
Periphyton:	Some (10% - 50%)	Periphyton:	N/A
Moss:	None	Moss:	N/A
Filamentous algae:	Little (<10%)	Filamentous algae:	N/A
Macrophytes:	None	Macrophytes:	N/A
Bank overhang vegetation:	Moderate (50% - 75%)	Bank overhang vegetation:	N/A
Trailing vegetation:	Little (<10%)	Trailing vegetation:	N/A
Substrate anoxia:	None	Substrate anoxia:	N/A
Blanketing silt:	None	Blanketing silt:	N/A
Large debris		Large debris	
Detritus:	Little (<10%)	Detritus:	N/A
Sticks:	Little (<10%)	Sticks:	N/A
Branches:	Little (<10%)	Branches:	N/A
Logs:	None	Logs:	N/A

A1.3 Monitoring site MP3 (Receiving)

Sample date/time:	4.02.26/7:00	Site coordinates:	696930, 7425950	GDA94 / MGA zone 55
Upstream		Downstream		
				
Water flow:	Slow flowing	Water oils:	None	
Pool dimensions (m):	continuous, 20-10	Plume:	None	
Water surface:	Normal	Sediment smothering:	No	
Turbidity:	Slight	Sediment oils:	Absent	
Water colour:	Tannin	Sediment odour:	None	
Bank shape (left/right):	Concave, Lower bench	Adjacent land use:	grazing and mining	
Bank slope (left/right):	Low 10-30°, Vertical 80-90°	Livestock/animal impacts:	cattle pugging, molluscs, dingo and cat scats	
Erosion observations		Habitat assessment: MP3		
Bare ground:	Some 10-50%	Bottom substrate:	Good	15
Exposed tree roots:	Little 1-10%	Embeddedness:	Fair	10
Gully erosion:	Some 10-50%	Velocity/depth category:	Good	15
Bank slumping:	Little 1-10%	Channel alteration:	Fair	7
Local catchment erosion:	Some 10-50%	Bottom scouring/deposition:	Fair	7
Notes:		Pool/riffle, run/bend ratio:	Good	11
End of track, down to the sampling point along bend downstream of Mackenzie River releases point.		Bank stability:	Poor	2
		Bank vegetation stability:	Fair	5
		Streamside dominant cover:	Excellent	10

Sample date/time:	4.02.26/7:00	Site coordinates:	696930, 7425950	GDA94 / MGA zone 55
		Total score:	Good	82

Monitoring site: MP3			
Macroinvertebrate sample 1		Macroinvertebrate sample 2	
Habitat type:	Edge	Habitat type:	Bed
Collected/picked by:	HS, SS/HS, SS	Collected/picked by:	HS, SS/HS, SS
Substrate description (%)		Substrate description	
Bedrock:	mostly sand and gravel	Bedrock:	mostly sand and gravel
Boulder:	N/A	Boulder:	N/A
Cobble:	N/A	Cobble:	N/A
Pebble:	8	Pebble:	8
Gravel:	32	Gravel:	32
Sand:	50	Sand:	50
Silt/clay:	10	Silt/clay:	10
Substrate description		Substrate description	
Periphyton:	None	Periphyton:	None
Moss:	None	Moss:	None
Filamentous algae:	None	Filamentous algae:	None
Macrophytes:	Little (<10%)	Macrophytes:	Little (<10%)
Bank overhang vegetation:	None	Bank overhang vegetation:	None
Trailing vegetation:	Little (<10%)	Trailing vegetation:	Little (<10%)
Substrate anoxia:	None	Substrate anoxia:	None
Blanketing silt:	None	Blanketing silt:	Some (10% - 50%)
Large debris		Large debris	
Detritus:	Some (10% - 50%)	Detritus:	Little (<10%)
Sticks:	Little (<10%)	Sticks:	Little (<10%)
Branches:	None	Branches:	None
Logs:	None	Logs:	None

A1.4 Monitoring site MP4 (Reference)

Sample date/time:	2.02.26/16:25	Site coordinates:	694538, 7426005	GDA94 / MGA zone 55
Upstream		Downstream		
				
Water flow:	Slow flowing	Water oils:	None	
Pool dimensions (m):	continuous, 40	Plume:	Little	
Water surface:	Normal	Sediment smothering:	No	
Turbidity:	Opaque	Sediment oils:	Absent	
Water colour:	Brown	Sediment odour:	sewage (manure like)	
Bank shape (left/right):	Wide, Wide	Adjacent land use:	gzazing, bridge crossing	
Bank slope (left/right):	Moderate 30-60°, Moderate 30-60°	Livestock/animal impacts:	Cattle evidence	
Erosion observations		Habitat assessment: MP4		
Bare ground:	Some 10-50%	Bottom substrate:	Fair	10
Exposed tree roots:	Some 10-50%	Embeddedness:	Fair	10
Gully erosion:	Little 1-10%	Velocity/depth category:	Fair	10
Bank slumping:	None 0%	Channel alteration:	Excellent	15
Local catchment erosion:	Moderate 50-75%	Bottom scouring/deposition:	Good	11
Notes:		Pool/riffle, run/bend ratio:	Fair	7
Next to Mackenzie River bridge, access tracks.		Bank stability:	Good	8
		Bank vegetation stability:	Good	8
		Streamside dominant cover:	Excellent	10

Sample date/time:	2.02.26/16:25	Site coordinates:	694538, 7426005	GDA94 / MGA zone 55
		Total score:	Good	89

Monitoring site: MP4			
Macroinvertebrate sample 1		Macroinvertebrate sample 2	
Habitat type:	Edge	Habitat type:	Bed
Collected/picked by:	HS, SS/HS, SS	Collected/picked by:	N/A
Substrate description (%)		Substrate description	
Bedrock:	Almost entirely clay and silt	Bedrock:	N/A
Boulder:	N/A	Boulder:	N/A
Cobble:	N/A	Cobble:	N/A
Pebble:	N/A	Pebble:	N/A
Gravel:	N/A	Gravel:	N/A
Sand:	10	Sand:	N/A
Silt/clay:	90	Silt/clay:	N/A
Substrate description		Substrate description	
Periphyton:	Some (10% - 50%)	Periphyton:	N/A
Moss:	Little (<10%)	Moss:	N/A
Filamentous algae:	Some (10% - 50%)	Filamentous algae:	N/A
Macrophytes:	Moderate (50% - 75%)	Macrophytes:	N/A
Bank overhang vegetation:	Little (<10%)	Bank overhang vegetation:	N/A
Trailing vegetation:	Little (<10%)	Trailing vegetation:	N/A
Substrate anoxia:	Little (<10%)	Substrate anoxia:	N/A
Blanketing silt:	Little (<10%)	Blanketing silt:	N/A
Large debris		Large debris	
Detritus:	Little (<10%)	Detritus:	N/A
Sticks:	Little (<10%)	Sticks:	N/A
Branches:	Little (<10%)	Branches:	N/A

Monitoring site: MP4			
Logs:	Some (10% - 50%)	Logs:	N/A

A1.5 Monitoring site MP5 (Receiving)

Sample date/time:	3.02.26/9:45	Site coordinates:	697281, 7428227	GDA94 / MGA zone 55
Upstream		Downstream		
				
Water flow:	Slow flowing	Water oils:	None	
Pool dimensions (m):	Continuous, 30	Plume:	Moderate	
Water surface:	Normal	Sediment smothering:	No	
Turbidity:	Opaque	Sediment oils:	Absent	
Water colour:	Brown	Sediment odour:	None	
Bank shape (left/right):	Wide, Wide	Adjacent land use:	Grazing	
Bank slope (left/right):	Moderate 30-60°, Steep 60-80°	Livestock/animal impacts:	Yes, Potential, water rats(as evidenced by discarded freshwater muscles)	
Erosion observations		Habitat assessment: MP5		
Bare ground:	Some 10-50%	Bottom substrate:	Poor	5
Exposed tree roots:	Some 10-50%	Embeddedness:	Fair	10
Gully erosion:	Little 1-10%	Velocity/depth category:	Fair	10
Bank slumping:	None 0%	Channel alteration:	Excellent	15
Local catchment erosion:	Some 10-50%	Bottom scouring/deposition:	Good	11
Notes:		Pool/riffle, run/bend ratio:	Fair	7
Mackenzie River site.		Bank stability:	Good	8
		Bank vegetation stability:	Good	8

Sample date/time:	3.02.26/9:45	Site coordinates:	697281, 7428227	GDA94 / MGA zone 55
		Streamside dominant cover:	Excellent	10
		Total score:	Good	84

Monitoring site: MP5			
Macroinvertebrate sample 1		Macroinvertebrate sample 2	
Habitat type:	Edge	Habitat type:	Bed
Collected/picked by:	HS, SS/HS, SS	Collected/picked by:	N/A
Substrate description (%)		Substrate description	
Bedrock:	almost entirely clay and silt	Bedrock:	N/A
Boulder:	N/A	Boulder:	N/A
Cobble:	N/A	Cobble:	N/A
Pebble:	N/A	Pebble:	N/A
Gravel:	N/A	Gravel:	N/A
Sand:	10	Sand:	N/A
Silt/clay:	90	Silt/clay:	N/A
Substrate description		Substrate description	
Periphyton:	Some (10% - 50%)	Periphyton:	N/A
Moss:	None	Moss:	N/A
Filamentous algae:	Little (<10%)	Filamentous algae:	N/A
Macrophytes:	Moderate (50% - 75%)	Macrophytes:	N/A
Bank overhang vegetation:	Some (10% - 50%)	Bank overhang vegetation:	N/A
Trailing vegetation:	Little (<10%)	Trailing vegetation:	N/A
Substrate anoxia:	Little (<10%)	Substrate anoxia:	N/A
Blanketing silt:	Little (<10%)	Blanketing silt:	N/A
Large debris		Large debris	
Detritus:	Little (<10%)	Detritus:	N/A
Sticks:	Little (<10%)	Sticks:	N/A
Branches:	Some (10% - 50%)	Branches:	N/A

Monitoring site: MP5			
Logs:	Little (<10%)	Logs:	N/A

A1.6 Monitoring site US3 (Reference)

Sample date/time:	4.02.26/9:50	Site coordinates:	694443, 7423876	GDA94 / MGA zone 55
Upstream		Downstream		
				
Water flow:	Standing	Water oils:	None	
Pool dimensions (m):	200, 20	Plume:	Moderate	
Water surface:	Water surface is clear	Sediment smothering:	Yes	
Turbidity:	Slight	Sediment oils:	Absent	
Water colour:	Clear	Sediment odour:	Subtle petroleum smell	
Bank shape (left/right):	Wide, Wide	Adjacent land use:	Cattle grazing, mining operations in close proximity	
Bank slope (left/right):	Flat <10°, Flat <10°	Livestock/animal impacts:	Minimal cattle evidence	
Erosion observations		Habitat assessment: US3		
Bare ground:	Little 1-10%	Bottom substrate:	Fair	10
Exposed tree roots:	Little 1-10%	Embeddedness:	Good	15
Gully erosion:	None 0%	Velocity/depth category:	Poor	5
Bank slumping:	None 0%	Channel alteration:	Excellent	15
Local catchment erosion:	None 0%	Bottom scouring/deposition:	Good	11
Notes:		Pool/riffle, run/bend ratio:	Poor	3
Billabong patch. Water pooling due to a levee downstream.		Bank stability:	Excellent	10
		Bank vegetation stability:	Excellent	10

Sample date/time:	4.02.26/9:50	Site coordinates:	694443, 7423876	GDA94 / MGA zone 55
		Streamside dominant cover:	Excellent	10
		Total score:	Good	89

Monitoring site: US3			
Macroinvertebrate sample 1		Macroinvertebrate sample 2	
Habitat type:	Edge	Habitat type:	Bed
Collected/picked by:	HS, SS/HS, SS	Collected/picked by:	HS, SS/HS, SS
Substrate description (%)		Substrate description	
Bedrock:	N/A	Bedrock:	N/A
Boulder:	N/A	Boulder:	N/A
Cobble:	N/A	Cobble:	N/A
Pebble:	N/A	Pebble:	N/A
Gravel:	N/A	Gravel:	N/A
Sand:	10	Sand:	10
Silt/clay:	90	Silt/clay:	90
Substrate description		Substrate description	
Periphyton:	Little (<10%)	Periphyton:	Little (<10%)
Moss:	None	Moss:	None
Filamentous algae:	None	Filamentous algae:	None
Macrophytes:	Little (<10%)	Macrophytes:	Little (<10%)
Bank overhang vegetation:	Little (<10%)	Bank overhang vegetation:	Little (<10%)
Trailing vegetation:	None	Trailing vegetation:	None
Substrate anoxia:	None	Substrate anoxia:	None
Blanketing silt:	None	Blanketing silt:	Little (<10%)
Large debris		Large debris	
Detritus:	Moderate (50% - 75%)	Detritus:	Moderate (50% - 75%)
Sticks:	Some (10% - 50%)	Sticks:	Some (10% - 50%)
Branches:	Some (10% - 50%)	Branches:	Some (10% - 50%)

Monitoring site: US3			
Logs:	Some (10% - 50%)	Logs:	Some (10% - 50%)

A1.7 Monitoring site DS5 (Receiving)

Sample date/time:	4.02.26/12:30	Site coordinates:	696694, 7423071	GDA94 / MGA zone 55
Upstream		Downstream		
				
Water flow:	Standing	Water oils:	None	
Pool dimensions (m):	100+m, continuous, 20	Plume:	Some	
Water surface:	scum	Sediment smothering:	Yes	
Turbidity:	Turbid	Sediment oils:	Absent	
Water colour:	Tannin	Sediment odour:	None	
Bank shape (left/right):	Concave, Concave	Adjacent land use:	grazing, mining	
Bank slope (left/right):	Low 10-30°, Low 10-30°,	Livestock/animal impacts:	cattle pugging and tracks	
Erosion observations		Habitat assessment: DS5		
Bare ground:	Some 10-50%	Bottom substrate:	Good	15
Exposed tree roots:	Little 1-10%	Embeddedness:	Fair	10
Gully erosion:	Little 1-10%	Velocity/depth category:	Poor	5
Bank slumping:	Little 1-10%	Channel alteration:	Fair	7
Local catchment erosion:	Little 1-10%	Bottom scouring/deposition:	Fair	7
Notes:		Pool/riffle, run/bend ratio:	Fair	7
Off lease down from operational mine levee.		Bank stability:	Excellent	10

Sample date/time:	4.02.26/12:30	Site coordinates:	696694, 7423071	GDA94 / MGA zone 55
		Bank vegetation stability:	Good	8
		Streamside dominant cover:	Good	8
		Total score:	Good	77

Monitoring site: DS5			
Macroinvertebrate sample 1		Macroinvertebrate sample 2	
Habitat type:	Edge	Habitat type:	Bed
Collected/picked by:	HS, SS/HS, SS	Collected/picked by:	HS, SS/HS, SS
Substrate description (%)		Substrate description	
Bedrock:	clayey	Bedrock:	clayey
Boulder:	N/A	Boulder:	N/A
Cobble:	N/A	Cobble:	N/A
Pebble:	N/A	Pebble:	N/A
Gravel:	10	Gravel:	10
Sand:	15	Sand:	10
Silt/clay:	75	Silt/clay:	80
Substrate description		Substrate description	
Periphyton:	None	Periphyton:	None
Moss:	Little (<10%)	Moss:	Little (<10%)
Filamentous algae:	Moderate (50% - 75%)	Filamentous algae:	Moderate (50% - 75%)
Macrophytes:	Some (10% - 50%)	Macrophytes:	Some (10% - 50%)
Bank overhang vegetation:	Moderate (50% - 75%)	Bank overhang vegetation:	Moderate (50% - 75%)
Trailing vegetation:	Moderate (50% - 75%)	Trailing vegetation:	Moderate (50% - 75%)
Substrate anoxia:	Some (10% - 50%)	Substrate anoxia:	Some (10% - 50%)
Blanketing silt:	Some (10% - 50%)	Blanketing silt:	Little (<10%)
Large debris		Large debris	
Detritus:	Some (10% - 50%)	Detritus:	Little (<10%)

Monitoring site: DS5			
Sticks:	Little (<10%)	Sticks:	Little (<10%)
Branches:	Some (10% - 50%)	Branches:	Some (10% - 50%)
Logs:	Some (10% - 50%)	Logs:	Some (10% - 50%)

A1.8 Monitoring site MP6 (Receiving)

Sample date/time:	3.02.26/12.10	Site coordinates:	696010, 7433270	GDA94 / MGA zone 55
Upstream		Downstream		
				
Water flow:	Slow flowing	Water oils:	None	
Pool dimensions (m):	continuous, 20	Plume:	Little	
Water surface:	scum	Sediment smothering:	Yes	
Turbidity:	Turbid	Sediment oils:	Light	
Water colour:	Tannin	Sediment odour:	None	
Bank shape (left/right):	Lower bench, Lower bench	Adjacent land use:	grazing	
Bank slope (left/right):	Moderate 30-60°, Low 10-30°,	Livestock/animal impacts:	cattle pugging and tracks	
Erosion observations		Habitat assessment: MP6		
Bare ground:	Moderate 50-75%	Bottom substrate:	Good	15
Exposed tree roots:	Moderate 50-75%	Embeddedness:	Fair	10
Gully erosion:	Some 10-50%	Velocity/depth category:	Fair	10
Bank slumping:	None 0%	Channel alteration:	Good	11
Local catchment erosion:	Some 10-50%	Bottom scouring/deposition:	Fair	7

Sample date/time:	3.02.26/12.10	Site coordinates:	696010, 7433270	GDA94 / MGA zone 55
Notes:		Pool/riffle, run/bend ratio:	Fair	7
Lot of tree debris and fence line fallen in the water. North off Mackenzie north ML boundary.		Bank stability:	Fair	5
		Bank vegetation stability:	Fair	5
		Streamside dominant cover:	Excellent	10
		Total score:	Good	80

Monitoring site: MP6			
Macroinvertebrate sample 1		Macroinvertebrate sample 2	
Habitat type:	Edge	Habitat type:	Bed
Collected/picked by:	HS, SS/HS, SS	Collected/picked by:	HS, SS/HS, SS
Substrate description (%)		Substrate description	
Bedrock:	N/A	Bedrock:	N/A
Boulder:	N/A	Boulder:	N/A
Cobble:	N/A	Cobble:	N/A
Pebble:	N/A	Pebble:	N/A
Gravel:	N/A	Gravel:	N/A
Sand:	40	Sand:	40
Silt/clay:	60	Silt/clay:	60
Substrate description		Substrate description	
Periphyton:	Moderate (50% - 75%)	Periphyton:	Moderate (50% - 75%)
Moss:	None	Moss:	None
Filamentous algae:	Some (10% - 50%)	Filamentous algae:	Some (10% - 50%)
Macrophytes:	Some (10% - 50%)	Macrophytes:	Some (10% - 50%)
Bank overhang vegetation:	Some (10% - 50%)	Bank overhang vegetation:	Some (10% - 50%)
Trailing vegetation:	Some (10% - 50%)	Trailing vegetation:	Some (10% - 50%)
Substrate anoxia:	Little (<10%)	Substrate anoxia:	Some (10% - 50%)
Blanketing silt:	Little (<10%)	Blanketing silt:	Little (<10%)

Monitoring site: MP6			
Large debris		Large debris	
Detritus:	Moderate (50% - 75%)	Detritus:	Some (10% - 50%)
Sticks:	Some (10% - 50%)	Sticks:	Some (10% - 50%)
Branches:	Some (10% - 50%)	Branches:	Moderate (50% - 75%)
Logs:	Moderate (50% - 75%)	Logs:	Some (10% - 50%)

A1.9 Monitoring site MP7 (Reference)

Sample date/time:	3.02.26/15:00	Site coordinates:	693814, 7426977	GDA94 / MGA zone 55
Upstream		Downstream		
				
Water flow:	Standing	Water oils:	None	
Pool dimensions (m):	300, 15	Plume:	Moderate	
Water surface:	Clear, wind has caused a lot of disturbance on the surface, preventing easy detection of oils or algae etc	Sediment smothering:	Yes	
Turbidity:	Opaque	Sediment oils:	Absent	
Water colour:	Brown	Sediment odour:	None	
Bank shape (left/right):	Wide	Adjacent land use:	Cattle grazing	
Bank slope (left/right):	Low 10-30°	Livestock/animal impacts:	Eastern grey kangaroo tracks	
Erosion observations		Habitat assessment: MP7		
Bare ground:	Some 10-50%	Bottom substrate:	Poor	5
Exposed tree roots:	N/A	Embeddedness:	Fair	10
Gully erosion:	Some 10-50%	Velocity/depth category:	Fair	10
Bank slumping:	Little 1-10%	Channel alteration:	Excellent	15

Sample date/time:	3.02.26/15:00	Site coordinates:	693814, 7426977	GDA94 / MGA zone 55
Local catchment erosion:	Some 10-50%	Bottom scouring/deposition:	Good	11
Notes:		Pool/riffle, run/bend ratio:	Poor	3
Anabranh of the Mackenzie River, fringed by RE 11.3.3.		Bank stability:	Good	8
		Bank vegetation stability:	Good	8
		Streamside dominant cover:	Excellent	10
		Total score:	Good	80

Monitoring site: MP7			
Macroinvertebrate sample 1		Macroinvertebrate sample 2	
Habitat type:	Edge	Habitat type:	Bed
Collected/picked by:	HS, SS/HS, SS	Collected/picked by:	HS, SS/HS, SS
Substrate description (%)		Substrate description	
Bedrock:	Silt and clay	Bedrock:	N/A
Boulder:	N/A	Boulder:	N/A
Cobble:	N/A	Cobble:	N/A
Pebble:	N/A	Pebble:	N/A
Gravel:	N/A	Gravel:	N/A
Sand:	5	Sand:	5
Silt/clay:	95	Silt/clay:	95
Substrate description		Substrate description	
Periphyton:	None	Periphyton:	None
Moss:	None	Moss:	None
Filamentous algae:	None	Filamentous algae:	None
Macrophytes:	Little (<10%)	Macrophytes:	Little (<10%)
Bank overhang vegetation:	Little (<10%)	Bank overhang vegetation:	Little (<10%)
Trailing vegetation:	Little (<10%)	Trailing vegetation:	Little (<10%)
Substrate anoxia:	None	Substrate anoxia:	None

Monitoring site: MP7			
Blanketing silt:	None	Blanketing silt:	Some (10% - 50%)
Large debris		Large debris	
Detritus:	Little (<10%)	Detritus:	Little (<10%)
Sticks:	Little (<10%)	Sticks:	Little (<10%)
Branches:	Little (<10%)	Branches:	Little (<10%)
Logs:	Little (<10%)	Logs:	Little (<10%)

Appendix C. Chain of custody

Mandatory Fields		CHAIN OF CUSTODY										Page <u>1 of 1</u>			
CLIENT CODE: AUSRESCON		*PROJECT MANAGER: Jacinta Palmer		SAMPLER: Hriday Saxena/ Samuel Scott								CoC #s (if applicable)			
*CLIENT: AARC ENVIRONMENTAL SOLUTIONS PTY LTD		*PM MOBILE: 468397568		SAMPLER MOBILE: 0422091250/ 0407835552											
OFFICE: (Business Office)		ALS QUOTE #: EB26AUSRESCON0002		PURCHASE ORDER NO.:											
PROJECT NO./PROJECT: Jallinbah REMP				SITE:											
*INVOICE TO: (Include default if nil)		apooks@narc.au										CC Invoice to PM ☐			
*EMAIL REPORTS TO: (default to PM if blank)		inalmur@narc.au													
*STORAGE REQUIREMENTS Please check box Standard Storage time from receipt of samples: Waters - 3 weeks Spills - 2 months		☐ Standard Storage ☐ Extended Storage Specify Disposal Date: Note: Extended storage incurs a fee and requires a signed agreement.		*TURNAROUND Please check box (Not all tests can be expedited, contact Client Services for more information)		☐ 5+ days (no surcharge) ☐ 3 day (+15%) ☐ 2 day (+31%) ☐ 1 day (+50%)		*ANALYSIS REQUIRED (Only ALS Quote No. and/or Analysis Suite Codes must be filled to attract sub-sampled price) Where Matrix is required, specify Total (unfiltered bottle required) or Dispersed (bottle filtered bottle required) Mark an X in the boxes below analysis to indicate the parameter listed above to be tested on that sample.							
Comments:				Table 1: Sediment Analysis - Shaved to <2000µm Table 2: Surface Water Analysis		HT						Lab QC (additional bottles req.)		Additional Information (Comment on hazards e.g., asbestos, known high contamination)	
												Dup MS			
ALS Use Only	Sample ID	Depth	Date/Time	No. Bottles	MATRIX: (Soil/Sediment, Water/Water Sediments, ISD), Duct (D), Product (P), Bore (B), Biosolid (BS)							Dup	MS		
Lab ID															
1	MP2	0	15:20, 04/02/26	7	W							☐	☐		
2	MP3	0	0700, 04/02/26	7	W							☐	☐		
3	MP4	0	16:25, 02/02/26	7	W							☐	☐		
4	MP5	0	15:10, 03/02/26	7	W							☐	☐		
5	MP6	0	12:10, 03/02/26	7	W							☐	☐		
6	MP7	0	10:00, 03/02/26	7	W							☐	☐		
7	DSS	0	12:30, 04/02/26	7	W							☐	☐		
8	US3	0	0945, 04/02/26	7	W							☐	☐		
9	BLANK	0	1650, 03/02/26	7	W							☐	☐		
10	DUPLICATE	0		7	W							☐	☐		
Receipt Detail (Lab Use Only)		Chilling Method: Frozen / Melted	Ice: Ice Blocks: Frozen / Thawed	None	Sample Temp at Receipt: °C °C °C	Security Seal Intact (circle)	Yes / No / NA (None)	Carrier Details: Con Note #	☐ Courier/Post	☐ Client	Packaging (Circle): Count	Hard Esly	Foam Esly	Box/Bag/Other	
Relinquished by:		Signature:		Date/Time:		Received by:		Signature:		Date/Time:					
Relinquished by:		Signature:		Date/Time:		Received by:		Signature:		Date/Time:					

Environmental Division
Brisbane
Work Order Reference
EB2604319



Telephone : + 61-7-3552-8686

Mandatory Fields		CHAIN OF CUSTODY										Page <u>1</u> of <u>1</u>																																																																																																																																																																											
CLIENT CODE: AUSRECON		*PROJECT MANAGER: Jacinta Palmer				SAMPLER: Hriday Saxena / Samuel Scott				CoC #: (if applicable)																																																																																																																																																																													
*CLIENT: AARC ENVIRONMENTAL SOLUTIONS PTY LTD		*PM MOBILE: 468397568				MOBILE: 0422091250 / 0407835552																																																																																																																																																																																	
OFFICE: (Invoicing Office)		ALS QUOTE #: EB26AUSRECON0002				PURCHASE ORDER NO.:																																																																																																																																																																																	
PROJECT NO./PROJECT: Jellinbah REMP		SITE:																																																																																																																																																																																					
*INVOICE TO: (Client default if null)		apcooks@aacrc.au				☐ CC Invoice to PM																																																																																																																																																																																	
*EMAIL REPORTS TO: (default to PM if blank)		jpalmer@aacrc.au				*ANALYSIS REQUIRED (N/A: ALS Quote No. and/or Analysis Suite Codes must be listed to attract sub-requested price) Where Multiple are required, specify Total (unfilled bottle required) or Disposed (filled filtered bottle required). Mark an X in the boxes below analysis to indicate the parameter listed above to be tested on that sample.																																																																																																																																																																																	
*STORAGE REQUIREMENTS Please check box ☐ Standard Storage ☐ Extended Storage Standard Storage time from receipt of samples: Waters - 3 weeks Soils - 2 months Specify Disposal Date: Note: Extended storage incurs a fee and requires a signed agreement.		*TURNAROUND Please check box ☐ 5+ days (no surcharge) ☐ 3 day (+15%) ☐ 2 day (+30%) ☐ 1 day (+50%) (Not all tests can be expedited, contact Client Services for more information)		Table 1: Sediment Analysis - Sediment to 4200µm Table 2: Surface Water Analysis																																																																																																																																																																																			
Comments:																																																																																																																																																																																							
ALS Use Only Lab ID <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Sample ID</th> <th>Depth</th> <th>Date/Time</th> <th>No. Bottles</th> <th>MATRIX: Soil/Sediment/Water/Water/Sediment (SD), Dust/DI, Product (PL), Biota (B), Biosolid (BS)</th> <th colspan="10"></th> <th colspan="2"> Lab GC (Additional bottles req.) Dup MS </th> <th rowspan="2"> Additional Information (Comment on hazards - e.g., asbestos, known high contamination) </th> </tr> </thead> <tbody> <tr><td>1</td><td></td><td>04/02 3:20pm</td><td>1</td><td>SD</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>2</td><td></td><td>04/02 1:00pm</td><td>1</td><td>SD</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>3</td><td></td><td>02/02 4:25pm</td><td>1</td><td>SD</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>4</td><td></td><td>03/02 10:00am</td><td>1</td><td>SD</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>5</td><td></td><td>03/02 12:10pm</td><td>1</td><td>SD</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>6</td><td></td><td>03/02 3:10pm</td><td>1</td><td>SD</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>7</td><td></td><td>04/02 12:30pm</td><td>1</td><td>SD</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>8</td><td></td><td>04/02 9:45am</td><td>1</td><td>SD</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>9</td><td></td><td></td><td>1</td><td>SD</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>		Sample ID	Depth	Date/Time	No. Bottles	MATRIX: Soil/Sediment/Water/Water/Sediment (SD), Dust/DI, Product (PL), Biota (B), Biosolid (BS)											Lab GC (Additional bottles req.) Dup MS		Additional Information (Comment on hazards - e.g., asbestos, known high contamination)	1		04/02 3:20pm	1	SD														2		04/02 1:00pm	1	SD														3		02/02 4:25pm	1	SD														4		03/02 10:00am	1	SD														5		03/02 12:10pm	1	SD														6		03/02 3:10pm	1	SD														7		04/02 12:30pm	1	SD														8		04/02 9:45am	1	SD														9			1	SD															
Sample ID	Depth	Date/Time	No. Bottles	MATRIX: Soil/Sediment/Water/Water/Sediment (SD), Dust/DI, Product (PL), Biota (B), Biosolid (BS)											Lab GC (Additional bottles req.) Dup MS		Additional Information (Comment on hazards - e.g., asbestos, known high contamination)																																																																																																																																																																						
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Receipt Detail (Batch ORA)		Chilling Method: ☐ Frozen / Melted Ice Blocks: ☐ Frozen / Thawed None: ☐		Sample Temp at Receipt: ☐ °C ☐ °C ☐ °C		Security Seal Intact (circle): ☐ Yes ☐ No ☐ N/A/None		Carrier Details: ☐ Courier/Post ☐ Client		Packaging (Circle): ☐ Hard Esly ☐ Foam Esly ☐ Box/Bag/Other		Count: # # #																																																																																																																																																																											
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Relinquished by:		Signature:		Date/Time:		Received by:		Signature: EL		Date/Time: 05-03-26 6:22																																																																																																																																																																													

Environmental Division
Brisbane
Work Order Reference
EB2604324



Telephone : +61-7-3552-8885

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Appendix D. Analytical report



CERTIFICATE OF ANALYSIS

Work Order	: EB2604319	Page	: 1 of 11
Amendment	: 1		
Client	: AARC ENVIRONMENTAL SOLUTIONS PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: JACINTA PALMER	Contact	: Customer Services EB
Address	: BRISBANE	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61 7 3243 7222
Project	: Jellinbah REMP	Date Samples Received	: 06-Feb-2026 08:30
Order number	: ----	Date Analysis Commenced	: 06-Feb-2026
C-O-C number	: ----	Issue Date	: 20-Feb-2026 17:31
Sampler	: HRIDAY SAXENA, Samuel Scott		
Site	:		
Quote number	: EB26AUSRESCON0002		
No. of samples received	: 10		
No. of samples analysed	: 10		



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Beatriz Llarinas	Senior Chemist	Brisbane Inorganics, Stafford, QLD
Beatriz Llarinas	Senior Chemist	Brisbane Organics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- Amendment (20/02/2026): This report has been amended and re-released to allow the reporting of additional analytical data, specifically AI under method EG020T and EG020F for all samples
- EG020T (Total Metals by ICP-MS): The high failing laboratory control standard for Beryllium is deemed acceptable as all results are less than the limit of reporting.
- EG020T (Total Metals by ICP-MS): The high failing matrix spikes for Beryllium are deemed acceptable as all results are less than the limit of reporting.
- It is recognised that EG020T (Total Metals by ICP-MS) is less than EG020F (Dissolved Metals by ICP-MS) for some samples. However, the difference is within experimental variation of the methods.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MP2	MP3	MP4	MP5	MP6
Sampling date / time					04-Feb-2026 15:20	04-Feb-2026 07:00	02-Feb-2026 16:25	03-Feb-2026 15:10	03-Feb-2026 12:10
Compound	CAS Number	LOR	Unit		EB2604319-001	EB2604319-002	EB2604319-003	EB2604319-004	EB2604319-005
					Result	Result	Result	Result	Result
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	-----	5	mg/L		190	82	62	169	38
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		9	4	4	5	6
ED093F: Dissolved Major Cations									
Sodium	7440-23-5	1	mg/L		41	18	18	17	19
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		<0.01	<0.01	0.01	0.02	<0.01
Arsenic	7440-38-2	0.001	mg/L		0.002	0.001	0.001	0.001	0.002
Boron	7440-42-8	0.05	mg/L		0.07	<0.05	<0.05	<0.05	0.05
Barium	7440-39-3	0.001	mg/L		0.050	0.025	0.021	0.024	0.023
Beryllium	7440-41-7	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	7440-48-4	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L		0.003	0.004	0.003	0.003	0.002
Manganese	7439-96-5	0.001	mg/L		0.012	0.021	0.002	0.003	0.038
Nickel	7440-02-0	0.001	mg/L		0.002	0.004	0.003	0.003	0.004
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	<0.010
Vanadium	7440-62-2	0.01	mg/L		<0.01	0.02	0.02	0.02	<0.01
Zinc	7440-66-6	0.005	mg/L		<0.005	<0.005	<0.005	<0.005	<0.005
Molybdenum	7439-98-7	0.001	mg/L		0.001	<0.001	<0.001	<0.001	<0.001
Silver	7440-22-4	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Iron	7439-89-6	0.05	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		11.4	4.65	4.04	6.07	1.80

Sub-Matrix: WATER
(Matrix: WATER)

Sampling date / time	
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Compound	CAS Number	LOR	Unit
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EG020T: Total Metals by ICP-MS - Continued

Arsenic	7440-38-2	0.001	mg/L	0.004	0.002	0.002	0.002	0.003
Boron	7440-42-8	0.05	mg/L	0.08	0.05	0.06	0.06	0.06
Barium	7440-39-3	0.001	mg/L	0.173	0.046	0.042	0.050	0.035
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	7440-48-4	0.001	mg/L	0.004	0.002	0.002	0.003	0.001
Chromium	7440-47-3	0.001	mg/L	0.009	0.008	0.007	0.011	0.003
Copper	7440-50-8	0.001	mg/L	0.010	0.006	0.006	0.007	0.003
Manganese	7439-96-5	0.001	mg/L	0.293	0.086	0.058	0.089	0.103
Nickel	7440-02-0	0.001	mg/L	0.011	0.011	0.010	0.013	0.007
Lead	7439-92-1	0.001	mg/L	0.005	<0.001	<0.001	0.001	<0.001
Selenium	7782-49-2	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Vanadium	7440-62-2	0.01	mg/L	0.02	0.03	0.03	0.03	<0.01
Zinc	7440-66-6	0.005	mg/L	0.025	0.007	0.007	0.010	<0.005
Molybdenum	7439-98-7	0.001	mg/L	0.001	<0.001	<0.001	<0.001	<0.001
Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	7439-89-6	0.05	mg/L	9.71	4.43	3.68	5.85	2.09

Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
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Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
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Fluoride	16984-48-8	0.1	mg/L	0.3	0.2	0.2	0.2	0.2
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Ammonia as N	7664-41-7	0.01	mg/L	0.03	0.02	0.01	0.01	<0.01
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EK057G: Nitrite as N by Discrete Analyser

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MP2	MP3	MP4	MP5	MP6
Sampling date / time				04-Feb-2026 15:20	04-Feb-2026 07:00	02-Feb-2026 16:25	03-Feb-2026 15:10	03-Feb-2026 12:10	
Compound	CAS Number	LOR	Unit	EB2604319-001	EB2604319-002	EB2604319-003	EB2604319-004	EB2604319-005	
				Result	Result	Result	Result	Result	
EK057G: Nitrite as N by Discrete Analyser - Continued									
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L	0.11	0.33	0.05	0.34	<0.01	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L	0.11	0.33	0.05	0.34	<0.01	
EK060G:Organic Nitrogen as N (TKN-NH3) By Discrete Analyser									
Organic Nitrogen as N	----	0.1	mg/L	1.1	0.7	0.9	0.7	0.8	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.1	0.7	0.9	0.7	0.8	
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L	1.2	1.0	1.0	1.0	0.8	
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L	0.40	0.17	0.16	0.19	0.15	
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.18	0.12	0.10	0.12	0.06	
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup									
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50	
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50	
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	<50	
EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup									
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	<100	
>C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100	
EP080/071: Total Petroleum Hydrocarbons									



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Sample ID

				MP2	MP3	MP4	MP5	MP6
Sampling date / time				04-Feb-2026 15:20	04-Feb-2026 07:00	02-Feb-2026 16:25	03-Feb-2026 15:10	03-Feb-2026 12:10
Compound	CAS Number	LOR	Unit	EB2604319-001	EB2604319-002	EB2604319-003	EB2604319-004	EB2604319-005
				Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
[^] C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
[^] Total Xylenes	----	2	µg/L	<2	<2	<2	<2	<2
[^] Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	2	%	98.0	99.7	97.1	97.0	99.4
Toluene-D8	2037-26-5	2	%	105	101	104	103	112
4-Bromofluorobenzene	460-00-4	2	%	107	105	99.5	103	100.0



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Sample ID

				MP7	DS5	US3	Blank	Duplicate
Sampling date / time				03-Feb-2026 10:00	04-Feb-2026 12:30	04-Feb-2026 09:45	03-Feb-2026 16:50	[04-Feb-2026]
Compound	CAS Number	LOR	Unit	EB2604319-006	EB2604319-007	EB2604319-008	EB2604319-009	EB2604319-010
				Result	Result	Result	Result	Result
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	-----	5	mg/L	44	53	28	<5	46
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	7	2	10	<1	7
ED093F: Dissolved Major Cations								
Sodium	7440-23-5	1	mg/L	20	12	75	<1	20
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.02	<0.01	<0.01	<0.01	<0.01
Arsenic	7440-38-2	0.001	mg/L	0.002	0.005	0.004	<0.001	0.002
Boron	7440-42-8	0.05	mg/L	0.05	<0.05	0.06	<0.05	0.05
Barium	7440-39-3	0.001	mg/L	0.027	0.014	0.050	<0.001	0.028
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.001	<0.001	<0.001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	0.002	0.001	<0.001	<0.001	0.002
Manganese	7439-96-5	0.001	mg/L	0.023	<0.001	0.309	<0.001	0.022
Nickel	7440-02-0	0.001	mg/L	0.004	0.003	0.002	<0.001	0.004
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Molybdenum	7439-98-7	0.001	mg/L	<0.001	0.001	0.001	<0.001	<0.001
Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.22	<0.05	<0.05
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	4.64	1.14	0.26	<0.01	4.31

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MP7	DS5	US3	Blank	Duplicate
Sampling date / time				03-Feb-2026 10:00	04-Feb-2026 12:30	04-Feb-2026 09:45	03-Feb-2026 16:50	[04-Feb-2026]	
Compound	CAS Number	LOR	Unit	EB2604319-006	EB2604319-007	EB2604319-008	EB2604319-009	EB2604319-010	
				Result	Result	Result	Result	Result	
EG020T: Total Metals by ICP-MS - Continued									
Arsenic	7440-38-2	0.001	mg/L	0.003	0.006	0.006	<0.001	0.003	
Boron	7440-42-8	0.05	mg/L	0.08	<0.05	0.08	<0.05	0.07	
Barium	7440-39-3	0.001	mg/L	0.047	0.033	0.072	<0.001	0.045	
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Cobalt	7440-48-4	0.001	mg/L	0.002	0.002	0.002	<0.001	0.002	
Chromium	7440-47-3	0.001	mg/L	0.008	0.002	<0.001	<0.001	0.007	
Copper	7440-50-8	0.001	mg/L	0.005	0.002	0.001	<0.001	0.005	
Manganese	7439-96-5	0.001	mg/L	0.109	0.178	0.379	<0.001	0.102	
Nickel	7440-02-0	0.001	mg/L	0.011	0.005	0.003	<0.001	0.010	
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Selenium	7782-49-2	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	
Vanadium	7440-62-2	0.01	mg/L	0.01	<0.01	<0.01	<0.01	0.01	
Zinc	7440-66-6	0.005	mg/L	0.006	<0.005	<0.005	<0.005	0.006	
Molybdenum	7439-98-7	0.001	mg/L	<0.001	0.001	0.001	<0.001	<0.001	
Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Iron	7439-89-6	0.05	mg/L	4.19	2.16	2.29	<0.05	3.93	
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L	0.2	0.1	0.1	<0.1	0.2	
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.02	<0.01	<0.01	0.01	
EK057G: Nitrite as N by Discrete Analyser									

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MP7	DS5	US3	Blank	Duplicate
Sampling date / time				03-Feb-2026 10:00	04-Feb-2026 12:30	04-Feb-2026 09:45	03-Feb-2026 16:50	[04-Feb-2026]	
Compound	CAS Number	LOR	Unit	EB2604319-006	EB2604319-007	EB2604319-008	EB2604319-009	EB2604319-010	
				Result	Result	Result	Result	Result	
EK057G: Nitrite as N by Discrete Analyser - Continued									
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
EK060G:Organic Nitrogen as N (TKN-NH3) By Discrete Analyser									
Organic Nitrogen as N	----	0.1	mg/L	0.8	1.1	1.4	<0.1	0.8	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.8	1.1	1.4	<0.1	0.8	
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L	0.8	1.1	1.4	<0.1	0.8	
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L	0.19	0.81	0.54	<0.01	0.19	
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.12	0.52	0.20	<0.01	0.11	
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup									
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50	
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50	
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	<50	
EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup									
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	<100	
>C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100	
EP080/071: Total Petroleum Hydrocarbons									



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Sample ID

				MP7	DS5	US3	Blank	Duplicate
Sampling date / time				03-Feb-2026 10:00	04-Feb-2026 12:30	04-Feb-2026 09:45	03-Feb-2026 16:50	[04-Feb-2026]
Compound	CAS Number	LOR	Unit	EB2604319-006	EB2604319-007	EB2604319-008	EB2604319-009	EB2604319-010
				Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
[^] C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
[^] Total Xylenes	----	2	µg/L	<2	<2	<2	<2	<2
[^] Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	2	%	94.7	96.0	97.2	97.5	97.0
Toluene-D8	2037-26-5	2	%	101	98.3	104	101	113
4-Bromofluorobenzene	460-00-4	2	%	91.1	103	98.6	96.7	89.5



Surrogate Control Limits

Sub-Matrix: **WATER**

		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	66	138
Toluene-D8	2037-26-5	79	120
4-Bromofluorobenzene	460-00-4	74	118



CERTIFICATE OF ANALYSIS

Work Order : **EB2604324**
Client : **AARC ENVIRONMENTAL SOLUTIONS PTY LTD**
Contact : JACINTA PALMER
Address :
BRISBANE
Telephone : ----
Project : Jellinbah REMP
Order number : ----
C-O-C number : ----
Sampler : HRIDAY SAXENA, Samuel Scott
Site :
Quote number : EB26AUSRESCON0002
No. of samples received : 18
No. of samples analysed : 9

Page : 1 of 4
Laboratory : Environmental Division Brisbane
Contact : Customer Services EB
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61 7 3243 7222
Date Samples Received : 06-Feb-2026 08:30
Date Analysis Commenced : 12-Feb-2026
Issue Date : 16-Feb-2026 09:07



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Beatriz Llarinas	Senior Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				MP2 <2000µm fraction	MP3 <2000µm fraction	MP4 <2000µm fraction	MP5 <2000µm fraction	MP6 <2000µm fraction
Sampling date / time				04-Feb-2026 15:20	04-Feb-2026 07:00	02-Feb-2026 04:25	03-Feb-2026 10:00	03-Feb-2026 12:10
Compound	CAS Number	LOR	Unit	EB2604324-010	EB2604324-011	EB2604324-012	EB2604324-013	EB2604324-014
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES								
Antimony	7440-36-0	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	15	6	21	21	17
Copper	7440-50-8	5	mg/kg	17	<5	17	16	12
Lead	7439-92-1	5	mg/kg	8	<5	8	7	6
Nickel	7440-02-0	2	mg/kg	17	6	24	24	18
Silver	7440-22-4	2	mg/kg	<2	<2	<2	<2	<2
Zinc	7440-66-6	5	mg/kg	27	5	29	30	23
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
GEO26: Sieving								
-2000µm	----	0.01	%	97.6	75.3	96.8	97.0	93.0



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				MP7 <2000µm fraction	DS5 <2000µm fraction	US3 <2000µm fraction	Duplicate <2000µm fraction	----
Sampling date / time				03-Feb-2026 15:10	04-Feb-2026 12:30	04-Feb-2026 09:45	[03-Feb-2026]	----
Compound	CAS Number	LOR	Unit	EB2604324-015	EB2604324-016	EB2604324-017	EB2604324-018	-----
				Result	Result	Result	Result	----
EG005(ED093)T: Total Metals by ICP-AES								
Antimony	7440-36-0	5	mg/kg	<5	<5	<5	<5	----
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	----
Chromium	7440-47-3	2	mg/kg	20	20	19	21	----
Copper	7440-50-8	5	mg/kg	15	19	25	15	----
Lead	7439-92-1	5	mg/kg	5	7	8	6	----
Nickel	7440-02-0	2	mg/kg	21	24	25	21	----
Silver	7440-22-4	2	mg/kg	<2	<2	<2	<2	----
Zinc	7440-66-6	5	mg/kg	28	37	47	31	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	----
GEO26: Sieving								
-2000µm	----	0.01	%	93.3	96.5	80.8	97.8	----

Appendix E. Macroinvertebrate data

Table E-1: Macroinvertebrate species data

Taxa Code	Class/Order	Family/Sub-family	SIGNAL 2 Value	MP 2 Edge	MP 4 Edge	MP 7 Bed	MP 7 Edge	US 3 Bed	US 3 Edge	MP 3 Bed	MP 3 Edge	DS 5 Bed	DS 5 Edge	MP 5 Edge	MP 6 Bed	MP 6 Edge
MM99999	Acarina	sp.	6		2					3			5			1
OG99999	Cladocera	sp.	N/A	2			1		55				2		1	
KP02999	Bivalvia	Cyrenidae (formerly Corbiculidae)	4		2				3					1		
QC09999	Coleoptera	Dytiscidae	2	6			2		24		1		6			
QC08999	Coleoptera	Noteridae	4	5										1		
QC11999	Coleoptera	Hydrophilidae	2	4			1		23				2			1
QC11999	Coleoptera	Spercheidae (formerly within Hydrophilidae)	2	1					24							3
QC13999	Coleoptera	Hydraenidae	3	8	4		1		9				1	2		6
QCA0999	Coleoptera	Hydrochidae	4						3				2			5
OJ99999	Copepoda	sp.	N/A					2	12						1	
OT01999	Decapoda	Atyidae	3	12	13											11
OT02999	Decapoda	Palaemonidae	4	13	1							4	8		2	1
QD07999	Diptera	Culicidae	1	5					7							
QD09999	Diptera	Ceratopogonidae	4				1			1		1	1	1		

Taxa Code	Class/Order	Family/Sub-family	SIGNAL 2 Value	MP 2 Edge	MP 4 Edge	MP 7 Bed	MP 7 Edge	US 3 Bed	US 3 Edge	MP 3 Bed	MP 3 Edge	DS 5 Bed	DS 5 Edge	MP 5 Edge	MP 6 Bed	MP 6 Edge
QDAE 9999	<i>Diptera</i>	<i>Tanypodinae</i>	4	4	14	2	2			1		1	15	1		6
QDAJ9 999	<i>Diptera</i>	<i>Chironominae</i>	3	4	8	3	4	46	26	2		17	16	4	4	13
QE029 999	<i>Ephemeroptera</i>	<i>Baetidae</i>	5					6					2	1		
QE089 999	<i>Ephemeroptera</i>	<i>Caenidae</i>	4	2	8		1			18	1			6		6
KG019 999	<i>Gastropoda</i>	<i>Viviparidae</i>	4	9									1			1
KG039 999	<i>Gastropoda</i>	<i>Bithyniidae</i>	3			1	17		15				2			3
KG049 999	<i>Gastropoda</i>	<i>Thiaridae</i>	4	13	7						6			8		
KG059 999	<i>Gastropoda</i>	<i>Lymnaeidae</i>	1	1												
KG069 999	<i>Gastropoda</i>	<i>Ancylidae</i>	4	1	1											
KG079 999	<i>Gastropoda</i>	<i>Planorbidae</i>	2	3	5			2						1		5
KG089 999	<i>Gastropoda</i>	<i>Physidae</i>	1	19	5						1					3
QH52 9999	<i>Hemiptera</i>	<i>Mesoveliidae</i>	2		1											
QH56 9999	<i>Hemiptera</i>	<i>Veliidae</i>	3	2										1		
QH57 9999	<i>Hemiptera</i>	<i>Gerridae</i>	4	1												1
QH62 9999	<i>Hemiptera</i>	<i>Belostomatidae</i>	1		1									1		
QH65 9999	<i>Hemiptera</i>	<i>Corixidae</i>	2						14							1
QH65 9999	<i>Hemiptera</i>	<i>Micronectidae</i> (split from <i>Corixidae</i>)	2	2			9		7	1	7		31	5		8
QH66 9999	<i>Hemiptera</i>	<i>Naucoridae</i>	2		2											2

Taxa Code	Class/Order	Family/Sub-family	SIGNAL 2 Value	MP 2 Edge	MP 4 Edge	MP 7 Bed	MP 7 Edge	US 3 Bed	US 3 Edge	MP 3 Bed	MP 3 Edge	DS 5 Bed	DS 5 Edge	MP 5 Edge	MP 6 Bed	MP 6 Edge
QH67 9999	Hemiptera	Notonectidae	1					1								
QH68 9999	Hemiptera	Pleidae	2	2												
LH019 999	Hirudinea	Glossiphoniidae	1					1								
QO12 9999	Hydrzoa	Hydridae	2	1		1							1			
OR12 9999	Isopoda	Corallanidae (formerly Cirolanidae)	2	1												
II9999 99	Nematoda	sp.	3				1	2				2		1		
QO02 9999	Odonata	Coenagrionidae	2	4								4	4			
QO03 9999	Odonata	Isostictidae	3	1												
QO13 9999	Odonata	Gomphidae	5	5						3	1					
QO16 9999	Odonata	Corduliidae	5	3			1	2								
QO17 9999	Odonata	Libellulidae	4	5				1				4	1			
QO22 9999	Odonata	Lindenidae	3		2					1			1			
LO999 999	Oligochaeta	sp.	2		9	2		6			5	7	1	4		
OH99 9999	Ostracoda	sp.	N/A	3	2					1		6		1	4	
QT259 999	Trichoptera	Leptoceridae	6	1	1								1			
IF499 999	Turbellaria	Temnocephalidae	5	1												

Appendix F. Time series of key parameters

Time series graphs for both zinc and copper concentrations in surface water and stream sediment have been removed, as recent data remain at or below trigger values. Updated time-series plots will be reinstated if future concentrations exceed these thresholds.