

14 May 2024

WDL 247-02 Environmental Monitoring Report

8 August 2023 to 1 April 2024

Rustlers Roost Project Area



Endorsement

Prepared by Sally Horsnell on behalf of Hanking Australia Investment Pty Ltd

MLN1083	Waste Discharge Licence No. 247-02
Sally Horsnell ABN: 22 343 389 310 E: sallyhorsnell@outlook.com M: 0455 669 600	Savannah Roots; Jaime Marr ABN: 11 466 070 796 E: savannahrootsnt@outlook.com M: 0484 785 940
SALLY HORSNELL 	

Photos on front cover: clockwise - monitoring site RRSW9a in flood, *Corymbia ptychocarpa*, photo taken near RRSW23, *Varanus mertensi*, photo taken upper Mount Bunday Creek

Endorsement

Endorsement

	Author	Author	Reviewed by	Approved by
Date DRAFT	13/05/2024	13/05/2024	13/05/2024	13/05/2024
Date FINAL	14/05/2024	14/05/2024	14/05/2024	14/05/2024
Name (s)	Sally Horsnell	Jaime Marr	Charles Hastie	Charles Hastie
Signature				

I Charles Hastie, PGO General Manager- Mining and Permitting, have reviewed this report and I confirm that to the best of my knowledge and ability, all information provided in the report is true and accurate.

SIGNATURE: 

DATE: Monday, 14 May 2024

Environmental Monitoring Report Checklist

Y/N	Page	Requirement	Department's Comment
Y	Front cover, i	Title Page -Does it include report name, reporting period, submission date, version number, Licence number, Report author and business details	
Y	ii	Certification	
Y	1	Executive summary	
Y	9-20	Monitoring Objective	
Y	21-27	Monitoring Method	
NA		Where there is an approved monitoring plan – details of approved plan title, version number, date of submission)	
Y	22	Where there is no approved monitoring plan – details map, sample locations, site layout, description of receiving environment, description of sampling and analysis methods, factors affecting variability in monitoring results	
Y	30-55	Monitoring Results	
y	Appendix A	Has all monitoring data been included?	
y	56	Calculations/exceedance of assessment criteria	
Y	29	QAQC	
Y	30-55	Presentation including graphs against trigger levels/benchmarks.	
Y	41-57	Discussion analysis and data interpretation against trends included?	
Y	59	Conclusions and proposed actions,	
Y	56	Have non-conformances been identified?	
NA	63	Have changes made to monitoring programs been identified and detailed?	
NA	63	Have corrective actions taken and improvements made been detailed?	
Y	65	Incident Reporting: Have environmental incidents been detailed?	
Y	69	Glossary	
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Executive Summary

This Environmental Monitoring Report (EMR) is for the Rustlers Roost Project Area and is the first and final submission under WDL247-02 to address Primary Gold Pty Ltd (PGO) performance monitoring and management activities. The commencement date of this Licence is 08 August 2023 and expiry date is 07 August 2024.

In accordance with sections 40 and 41 of Waste Discharge License 247-02 (the Licence) [WDL 247-02 supersedes WDL 247], this Environmental Monitoring Report (EMR) addresses Primary Gold Pty Ltd (PGO) performance monitoring and management activities at Rustlers Roost Project Area (RRPA) for the 2023/2024 reporting period.

No wastewater discharge occurred during the reporting period at ADP1 or ADP2. A 'Surrender of Licence' was submitted to DEPWS on the 11/03/2024, notifying the Controller of Water Resources that no controlled discharge of water from Rustlers Roost Pit to ADP1 and ADP2 will be occurring during the 2023/24 wet season, and since the Licence expires on 7th August 2024, PGO will not continue with WDL 247-02.

DEPWS has requested an EMR for end of Licence be submitted as soon as possible and before the schedule expiry date of the 7 August 2024. Routine monitoring as per WDL 247-02 conditions has continued for baseline information, pre-operations and is provided in this EMR.

This EMR contains:

- baseline surface water quality information for the 2023/24 wet season as per PGO's assurance to continue with the programme for baseline information pre-operations;
- excludes the biological monitoring information as this is scheduled to commence in May 2024 with a report issued in June 2024 ; and
- excludes any loading calculations and interpretation, due to no discharge data.

There were no changes to the Licence during this reporting period and a communications register is provided in Appendix B.

Surface water monitoring commenced in mid-January 2024 (20/01/2024) when creeks were in full flow and ceased at the end of March (26/03/2024) when creeks were either in slight to no flow and pooling. Water monitoring was conducted in accordance with Schedule 1 of the Licence.

Water quality showed consistent trends to the previous reporting period (2022-23) with two exceedance events of trigger values at Compliance Point RRSW23 only as per section WDL247-02 for Total Phosphorus, and then Cyanide and Chloride. RRSW23 water quality values for pH, dissolved oxygen, electrical conductivity, turbidity, aluminium, chloride, total nitrogen, and total phosphorus fluctuated outside of trigger values on some occasions and mostly during first flush and low rainfall events. Both compliance sites (RRSW23 and RRSW24) short- and long-term water quality trends for dissolved metals were below trigger values.

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While no loading calculations were performed, a review of previous years loading data trends at ADP2 (2020-2021 and 2022-2023) against no active discharge data, showing minimal trend changes to water quality when compared to no active discharge.

It is likely that creek surface water quality in the Mount Bunday catchment area is primarily influenced by a combination of geochemistry and interactions with seasonal flows (first flush from pooled areas in creeks and overland flows with elevated nutrient loads and recessional flows causing pooling), wet season overland flows and seepage from historical mined domains and active cattle grazing, and presence of feral pests (pigs and buffalo) disturbing land surfaces.

During the Licence reporting period with no controlled discharge of water from Rustlers Roost Pit, it is unlikely that contaminant loads from Rustlers Roost pit would have resulted in any adverse impact to sensitive receptors, or contaminant accumulation in the sediments into the receiving Mount Bunday and Marrakai Creek systems. Therefore, it is concluded that there was no harm to or adverse effect on the receiving environment because of these activities.

The final Biological Monitoring Report is due in June 2024 under a separate cover and will conclude findings of any harm caused to the receiving environment.

PGO will apply for a new WDL for pit dewatering once operations at Rustlers Roost Mine Site is approved under the *Mining Management Act* (MMA, 2001).

1 Introduction

In accordance with sections 40 and 41 of Waste Discharge License 247-02 (the Licence) [WDL 247-02 supersedes WDL 247], this Environmental Monitoring Report (EMR) addresses Primary Gold Pty Ltd (PGO) performance monitoring and management activities at Rustlers Roost Project Area (RRPA) for the 2023/2024 from the commencement date of 08 August 2023 and expiry date is 07 August 2024.

No active wastewater discharge occurred during the reporting period at ADP1 or ADP2. Notification by email to environmentalregulation@nt.gov.au was sent on 16/01/2024 and acknowledgement from the Department of Environment, Parks, and Water Security (DEPWS) was received by email on 17/01/2024.

A 'Surrender of Licence' was submitted to DEPWS, by email (Environmentalregualtion@nt.gov.au) on the 11/03/2024 notifying the Controller of Water Resources that no controlled discharge of water from Rustlers Roost Pit to ADP1 and ADP2 will be occurring during the 2023/24 wet season, and since the Licence expires on 7th August 2024, PGO would not continue with WDL 247-02.

DEPWS has requested an EMR for end of Licence be submitted.

This EMR contains:

- all the baseline surface water quality information for the 2023/24 wet season as per PGO's assurance to continue with the programme for baseline information pre-operations;
- excludes the biological monitoring information as this is scheduled to commence in May 2024 with a report issued in June 2024;
- excludes any interpretation of loading calculations as no active discharge occurred.

There were no changes to the Licence during this reporting period and a communications register is provided in Appendix B.

PGO will apply for a new WDL for pit dewatering once operations at Rustlers Roost Mine Site is approved under the *Mining Management Act* (MMA, 2001).

1.1 Monitoring Objectives

WDL 247-02 Conditions 40 and 41, outline the monitoring objectives PGO will address in this EMR during the period from 8 August 2023 to 20 April 2024. The Final EMR will be submitted to DEPWS by 15 May 2024. The Monitoring Report will/will not include:

- Be prepared in accordance with the '*Guideline for Reporting on Environmental Monitoring*,'
- Include a tabulation of all monitoring data (provided electronically in Microsoft Excel format);

Introduction

- Will not Include tabulation of monthly and annual contaminant loads discharged from Authorised Discharge Points for metals, metalloids , nutrients, and other parameters, where available;
- Include long term trend analysis of monitoring data to demonstrate any environmental impact associated with the discharge of water from Rustler Roost Pit over a minimum of three years (where available);
- Include investigations undertaken for WDL 247-02 and in accordance with the Licence for the preceding 12-month period; and
- Include an assessment of environmental impact from the licenced action.

Potential issues associated with the water discharge activity included:

- deterioration of aquatic ecosystem structure and function;
- erosion of natural waterways;
- increased bioavailability of metals due to pH changes; and
- toxicity of salinity, sulphate, acid/alkaline solutions, and metals/metalloids.

1.2 Operator Details

The Project proponent is PGO, a Company formed through the union of the listed entity Hydrotech International and the privately-owned Primary Minerals PGO acquisition of several gold assets, including the RRPA, from Crocodile Gold in early 2013. The Company was delisted on the Australian Stock Exchange (ASX) in 2018 after HGM Resources Pty Ltd bought 100% of the shares in April 2018. PGO is now a privately-owned company. PGO's assets are focused on the Northern Territory, which in addition to RRPA, include Toms Gully Mine, Quest 29 Project Area and ~2,000 km² of exploration tenure.

A Summary of operator details is included in Table 1-1.

Table 1-1 Operator Details

Operator Information			
Business Name	Primary Gold Limited (PGO)		
ACN/ABN	ACN: 122 726 283		
Street and Postal Address	Level 26, 140 St Georges Terrace, Perth WA 6000		
Key Contact(s)	Name:	Dr Mark Qiu	Charles Hastie
	Position:	Managing Director	General Manager- Mining and Permitting

Operator Information			
	Phone number:	0424 288 016	0419 963 250
	Email:	Mark.Qiu@hanking.com.au	Charles.Hastie@hanking.com.au

1.2.1 Organisational Structure and Responsibility

PGO's overall management/organisational structure is illustrated in Figure 1-1. The organisational structure reflects the relatively new nature of the Company. As operations and development of PGO's assets expand, the organisational structure will develop and be updated to reflect this.

Managing Director and Departmental Managers are responsible for:

- Ensuring compliance with all relevant Statutory Acts and Regulations.
- Ensuring compliance with Safety Management and Emergency Response Plans.
- Ensuring regulatory documents (MMP/EMR) are adhered to;
- Establishing and maintaining environmental and safety performance monitoring; and
- Overall environmental management and compliance at RRPA lies with the Managing Director for PGO, the General Manager- Mining and Permitting and delegated personnel.

Managing Director is responsible for:

- Accountable for the overall environmental management and compliance

General Manager and delegated personnel are responsible for:

- Responsible for resourcing and maintaining environmental management as per the Care and Maintenance MMP
- Responsible for defining and communicating relevant environmental responsibilities and accountabilities to employees, consultants, and contractors within their area of responsibility.
- All contractors/consultants contract obligations outline clear environmental and safety performance standards that are regularly assessed by PGO prior to and during their contract work at RRPA.

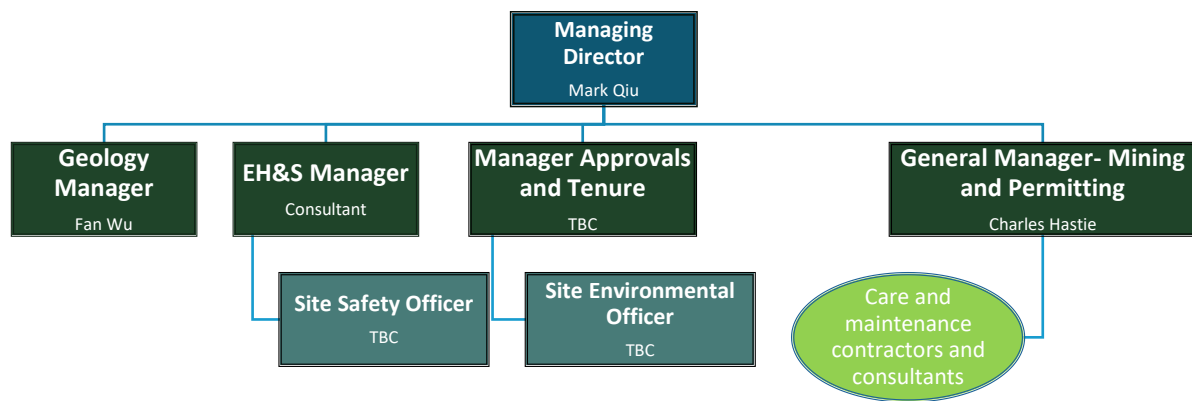


Figure 1-1 RRPA Organisation Structure for Care and Maintenance Activities

1.2.2 Workforce

PGO workforce is summarised in Table 1-2.

Table 1-2 RRPA Workforce and Responsibility

Monitoring and Maintenance Tasks	
Contractor/Consultant	Task
Sally Horsnell/ Savannah Roots	MMP, EMR Reporting
	WDL Management and Monitoring WDL Management and Monitoring
	Inspections: Dam/pit water heights
	Surface and groundwater sampling and data analysis and reporting
	Quarterly Inspection (weeds, erosion and sediment controls, security, access, fire mapping and reporting)
National Pump and Energy (NPE)	Install and maintain electric pumps, generators, and fuel bowser
Poly Fabrications	Install and maintain discharge pipe network
EnviroLab (NATA accredited for analysis category)	Laboratory analysis
Mount Bunday Pastoral Lease Holder	Weed spraying
	Fire mitigation
	Water management/transfer – pipe and pump set-up, maintenance
	Access roads/bund maintenance
	Fencing and gate maintenance
	Tenement access and point of contact for safety and security
Cross Solutions	Survey heights - Pit water levels pick-ups, bore TOC, survey of new crossing (Big Lizard Crossing)

1.3 Title Details

Tenement information has been provided in Table 1-3.

Table 1-3 RRPA Tenement Information

Title Number	Title Holder	%	Grant Date	Area (Ha)	Expiry Date
MLN 1083	Primary Minerals Pty Ltd	100	1st January 2021	755.6	31 December 2045

1.4 Location

RRPA is located approximately 100 kilometres (km) south-east of Darwin in the NT and situated on Old Mount Bunday Station Perpetual Pastoral Lease (PPL 1163). Site access is gained from the Arnhem highway via a 15 km private gravel access road. Access is restricted by locked gates.

1.5 Site Activities

1.5.1 Care and Maintenance

RRPA remained in care and maintenance during 2023-2024 reporting period and has been since PGO's purchase of tenements in 2013. Exploration activities did not occur at site during this reporting period. The EIS for RRPA and Quest 29 Project Areas open cut operation has been formally approved under the NT *Environmental Protection Act 2019*. An Operational Mine Management Plan is currently in preparation and is anticipated to be approved under the NT *Mining Management Act 2001* in mid-2024.

1.5.2 Waste Discharge Licence

WDL 247-02 supersedes WDL 247. There was no change to activities in the approved WDL 247. Some monitoring site locations were altered due to poor access subject to flooding and or dangerous to due buffalo activity in the area.

WDL-02 was issued for one year (2023-2024) for the discharge of water from Rustlers Roost Pit via authorised discharge points ADP1 and ADP2 to Mount Bunday and Marrakai Creeks as per the conditions of the License and whilst the site is in care and maintenance.

PGO obtained the renewed Licence to gain better access to the pit for exploration activities and as a lead up to operations.

As per Licence Condition 4, a sign was displayed at the entrance to the RRPA which included the licence number as issued under the Water Act and a 24-hour emergency contact for public viewing (Photo 1-1).



Photo 1-1 PGO RRPA WDL247-02 Front Entrance Sign

1.5.2.1 Authorised Discharge Points and Compliance Points

As per Condition 24 of The Licence, there are two Authorized Discharge Points (ADPs) for Marrakai and Mount Bunday Creek Systems (Table 1-4 and Figure 1-2). The design and construction of discharge monitoring equipment and pipeline set-up included the installation of Aqua Troll data loggers, situated in a poly pipe sleeve at the discharge end of the 600 mm constructed poly pipeline at each ADP location. Hourly data logging was set for electrical conductivity ($\mu\text{S}/\text{cm}$) and flow (kL/sec) during discharge events.

Table 1-4 WDL 247-02 Authorised Discharge Points and Compliance Points Coordinates

Creek	Site	Type	Latitude	Longitude
			GDA94	
Marrakai Creek	RRSW24	Compliance point/ Telemetry Station	-12.905670	131.469980
	ADP1	Authorised Discharge Point	-12.922603	131.487849
Mt Bunday Creek	RRSW23	Compliance point/ Telemetry Station	-12.930520	131.505500
	ADP2	Authorised Discharge Point	-12.924450	131.495810

Data is captured at the ADPs and downloaded weekly via a VuSitu App by blue tooth. Discharge volumes are recorded via telemetry every half hour (access via Web Supervisor) and data downloaded weekly. An inflow pipe meter is installed near the dewatering pumps for visual reference during field work activities. As the total water volume has lowered, this has started to reveal the separate pits that originally made -up the existing main pit. The Backhoe Pit which is located to the southern end of the original Main Pit requires a staging pump to pump water to the Main Pit prior to extraction (Photo 1-2). Since no active discharge occurred during this reporting period, no pumps were set-up or diesel fuel mobilised to site.

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Rustlers Roost Pit Pump infrastructure- electric pumps, 10,000L diesel tank and generator (Jan 2023)



Staging water pump and generator located on wall between Backhoe Pit and Rustlers Roost Main Pit (Jan 2023)



Overlooking Pump set up in Rustlers Roost Main Pit

Note: All pumps and generators removed, and pipes maintained during the 2023/24 season as no active discharge occurred

Photo 1-2 Installation of Discharge Pipeline for Authorised Discharge Point 2

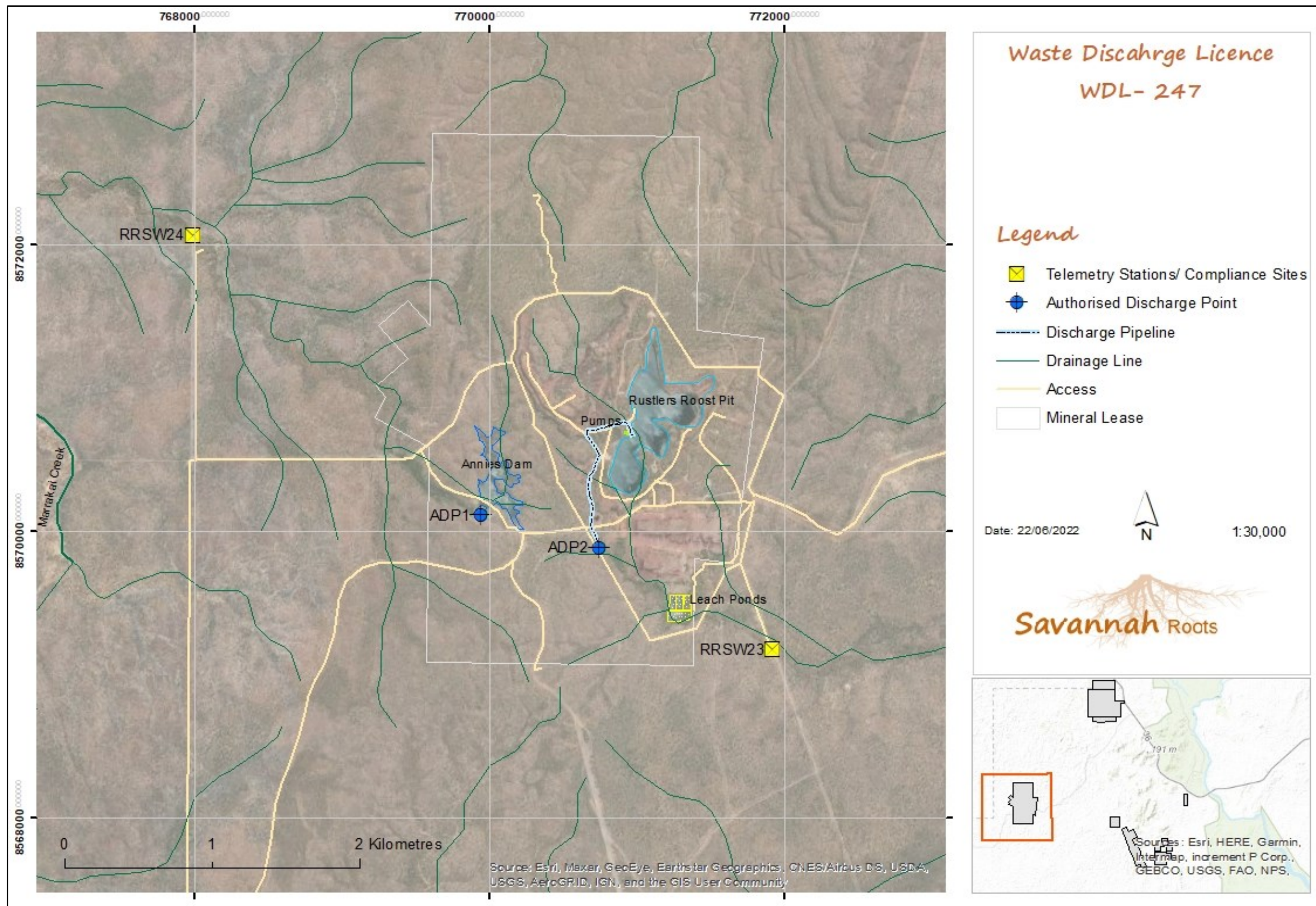


Figure 1-2 WDL247-02 Authorised Discharge points and Compliance Points

Introduction

Two solar powered telemetry stations were installed at each of the Compliance Points (RRSW23 and RRSW24) in October 2021 and located downstream of each of the ADPs to monitor compliance against discharged water during creek flow. RRSW23 compliance point is downstream of ADP2 and located within the upper reaches of Mt Bunday Creek and Mary River sub catchment. A rain gauge was installed with the telemetry at RRSW23 during the 2023/24 period to provide real time rain events to help understand connections to creek heights and water quality fluctuations with dilution. However the rain gauge failed to operate. A review and upgrade of the system will be done in 2024. RRSW24 compliance point is downstream of ADP1 and located in the upper reaches of Marrakai Creek and Adelaide River sub catchment (For the 2023/24 season RRSW24 telemetry was temporarily replaced with an insitu probe in the steel casing). A new telemetry system will be installed for the 2024/25 wet season.

The telemetry stations are powered by solar panels and provide data in real time with hourly recordings of electro- conductivity, pH, turbidity, dissolved oxygen, temperature, and water levels. Data is captured via the Xylem. Eagle internet portal. Weekly water quality sampling is done as per License conditions.

1.5.2.2 Controlled Discharge from Rustlers Roost Pit

In accordance with Conditions 27 and 28 of the Licence, PGO is required to notify DEPWS when water is discharged from the Pit and when discharge ceases. No controlled discharge at discharge points ADP1 (Marrakai Creek) or ADP2 (Mount Bunday Creek) occurred during this reporting period. A Notification sent to DEPWS, by email (Environmentalregualtion@nt.gov.au) on the 16/01/2024; and a 'Surrender of Licence' was submitted to DEPWS, by email (Environmentalregualtion@nt.gov.au) on the 11/03/2024 notifying the Controller of Water Resources that no discharge will be occurring during the 2023/24 wet season, and since the Licence expires on 7th August 2024, PGO saw no need to continue with WDL 247-02. Appendix B

The unforeseen natural surface inflow (150-180 L/sec) into the southern Pit (Backhoe Pit), observed by field officers in February 2023 continued during the 2023/24 wet season. These considerable inflows were not included in the pit dewatering programme model and has compounded the below forecast pit water volume reduction. It is likely these surface inflows have been occurring since mining ceased over 30 years ago which supports the reason why there was a lower than predicted overall pit water reduction during the previous dewatering activities in 2021/2022 and 2022/2023 wet seasons. A photo taken in April 2024 shows the inflows and Rustlers Roost pit water levels have increased to levels around the 55.39RL in (Photo 1-3).

For operational safety, PGO is currently preparing a plan as part of start-up for redirecting these inflows.

Both DEPWS and DITT officers are aware of this inflow and provided with water quality data with results comparable to pit water quality.



Photo 1-3 Surface Water Inflow to Backhoe Pit and current pit levels (April 2024)

2 Monitoring Method

2.1 Receiving Environment

2.1.1 Catchment

The RRPA is positioned over two sub catchments (eastern and western). The eastern sub catchment is part of the Mary River Basin, covering over 2260 km² and the western sub catchment is part of the Adelaide River Basin, covering over 2,790 km² (Figure 2-1).

The western sub catchment covers approximately a third of MLN 1083 and is relatively undisturbed from mining activities. Annie's dam is situated in this sub catchment and water quality is not known to be influenced by the heap leach pad or leach ponds. The dam freely drains northwest into the headwaters of Marrakai Creek which then flows into Adelaide River (DEPWS, 2023). The Dam is monitored under the Licence and has been since 2012 as monitoring site RRSW6.

The eastern sub catchment covers the remainder of MLN 1083 and contains most of the previously mined features including Rustlers Roost Pit, Run of Mine (ROM) pad, Waste Rock Dump (WRD), heap leach pad and ponds. Surface water runoff from these mined features is largely contained onsite draining to the main pit void which acts like a terminal sink for a large portion of the catchment. (CDM Smith, 2019). The northern side of the WRD and heap leach pad and ponds surface drainage enter at different tributaries at the head waters of Mount Bunday finally reporting to the Mary River (DEPWS, 2023).

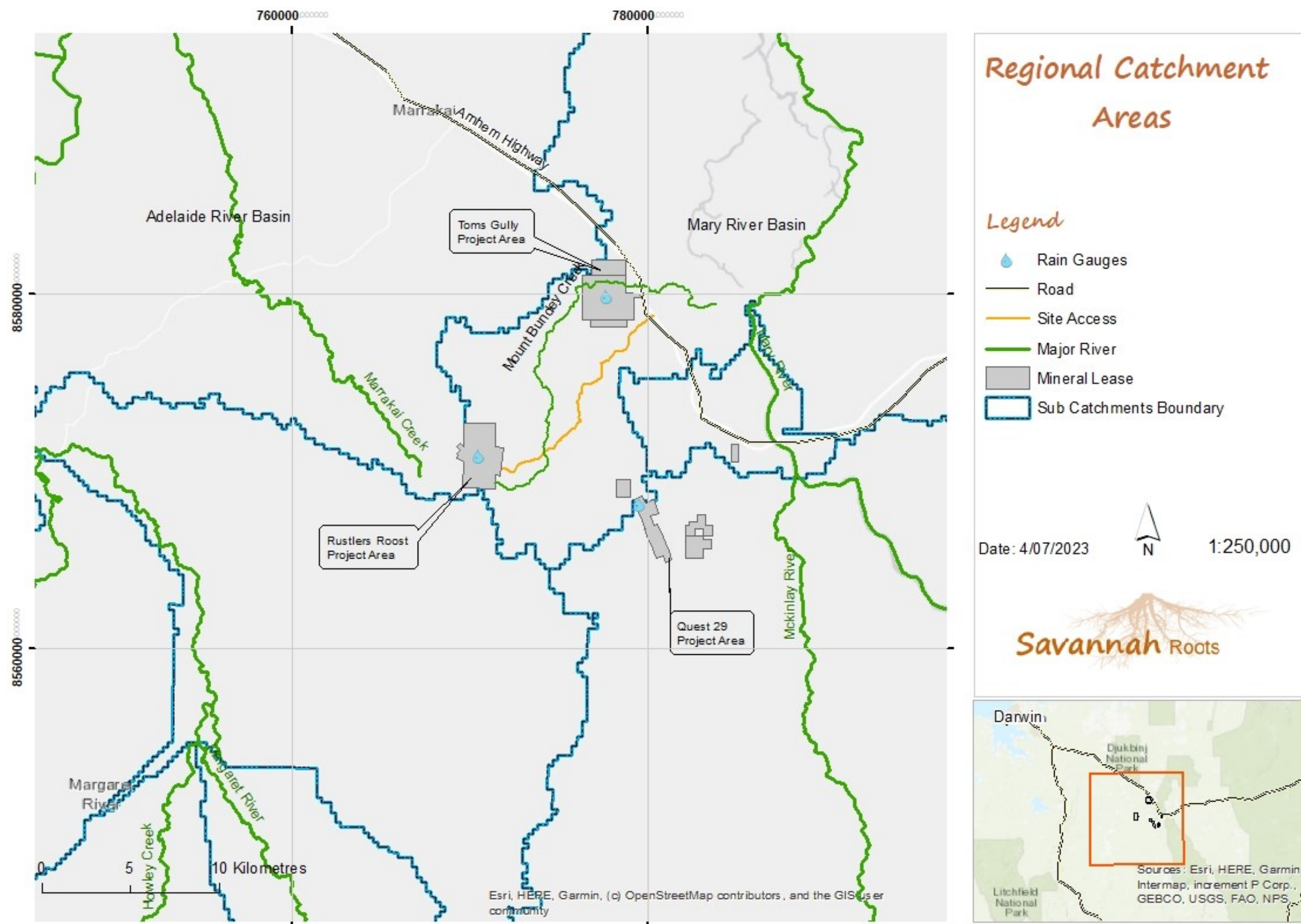


Figure 2-1 Rustlers Roost Project Area Sub Catchments

2.1.2 Sensitive Receptors

RRPA surface water discharge flows into two sub catchments of the Adelaide River Basin and Mary River Basin. The Mary River has beneficial uses for its surface and ground waters. The sub catchment of the Mary River Basin drains through various drains and ephemeral creeks and ultimately enters Mary River system. RRPA is one of many mines situated in Mary River Basin along with quarries, pastoral properties and horticultural activities and recreational areas. Mary River National Park is also situated in its catchment area downstream of RRPA.

The Mary River system includes the Mary River, all its tributaries, lagoons, lakes, swamps, and marshes situated in the catchment of that waterway (Department of Infrastructure, Planning and Environment [DIPE], 2002). The surface waters of the Mary River catchment are declared beneficial use (BUD) for its environmental, riparian, and cultural values. The ground water of the same catchment has environmental, riparian, and agricultural values (DIPE, 2002).

As well as the BUDs, there are several identified conservation areas or national parks in the region or downstream of the site (Figure 2-2), these include:

- Mary River Floodplain System Directory of Important Wetlands (NR Maps, 2024)
- Mar River Coastal Floodplain Sites of Conservations Significance (SoCS 13) located ~10 km north- east (Department of Natural Resources, Environment, The Arts and Sport [DNRETAS], 2009b; Figure 2-2)
- Mary River National Park located 11 km to the east via McKinlay River and Mount Bunday Creek (NR Maps, 2024; Figure 2-2)
- Adelaide River Coastal Floodplain SoCS site 12 located 28 km to the north- west via Marrakai Creek (DNRETAS, 2009a; Figure 2-2)
- Djukdinj National Park located 15 km to the north (NR Maps, 2024); and
- Adelaide River Foreshore Conservation Area located 24 km to the west (NR Maps, 2024).

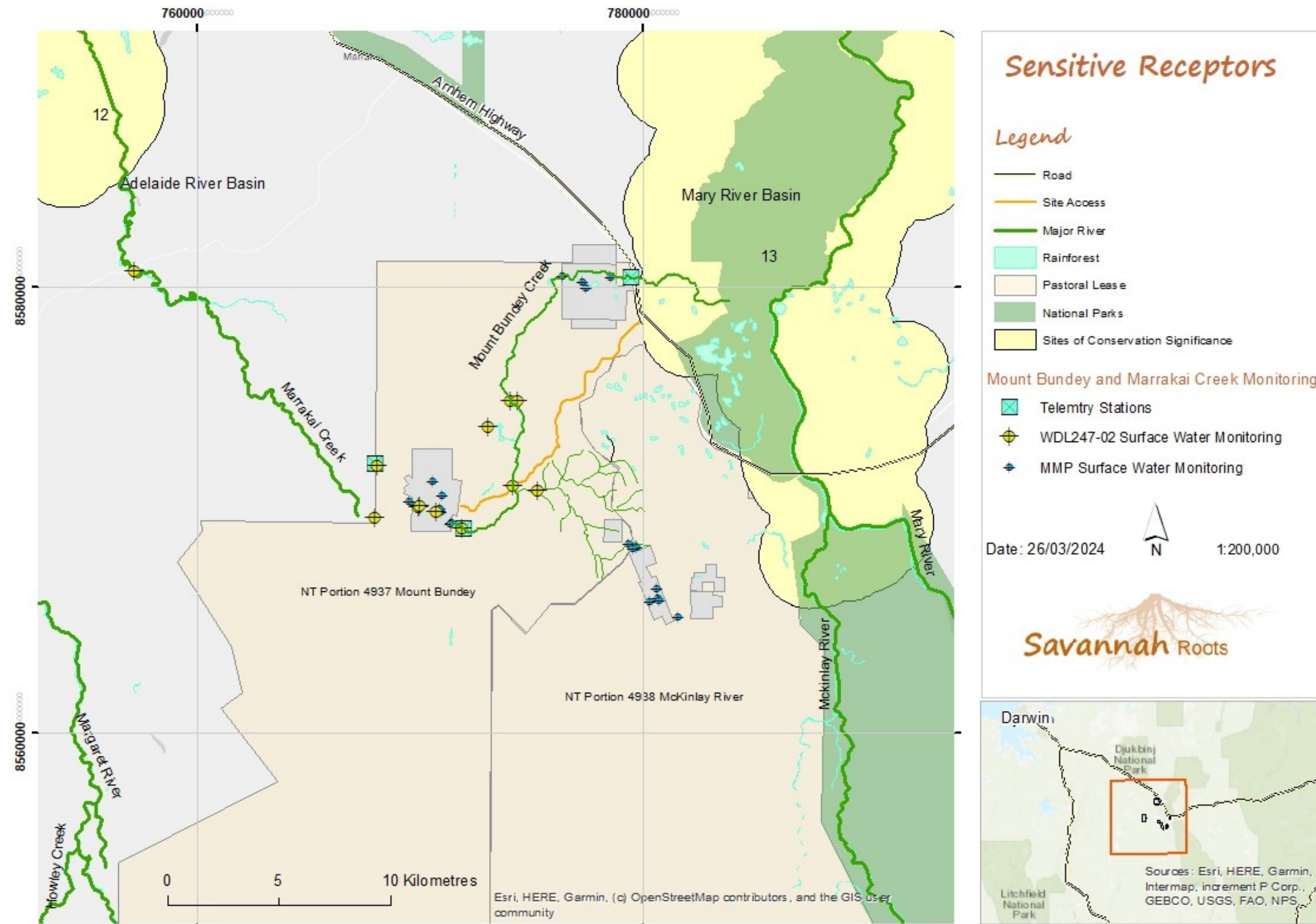


Figure 2-2 Rustlers Roost Sensitive Receptors

2.1.3 Rainfall

Three rain gauges have been installed across the Adelaide River and Mary River catchment areas (Figure 2-1). One is located in a cleared area on top of the Rustlers Roost main WRD and the others are located at Quest 29 and Toms Gully. A rain gauge was installed with the telemetry at RRSW23 during the 2023/24 period to provide real time rain events to help understand connections to creek heights and water quality fluctuations with dilution. However the rain gauge failed to operate. A review and upgrade of the system will be done in 2024.

Locations of rain gauges have been provided in Figure 2-1. With regards to distance, Rustlers Roost rain gauge is located 9.4 km from Quest 29 rain gauge and 11.5 km from Toms Gully rain gauge.

Rain gauges are monitored regularly over the 2023/ 24 wet season. Rain gauges were installed in November which captured first rainfall events in November and December.

The rain gauges will assist to fill knowledge gaps and provide accurate detail in rainfall input in upper or lower catchments of each river system, more so the Mount Bunday Creek. A comparison of monthly regional rainfall has been provided in Figure 2-3. A comparison of seasonal rainfall at Rustlers Roost is provided in Figure 2-4 which shows the 2021/ 22, 2022/ 23, and 2023/ 24 wet season monthly rainfall.

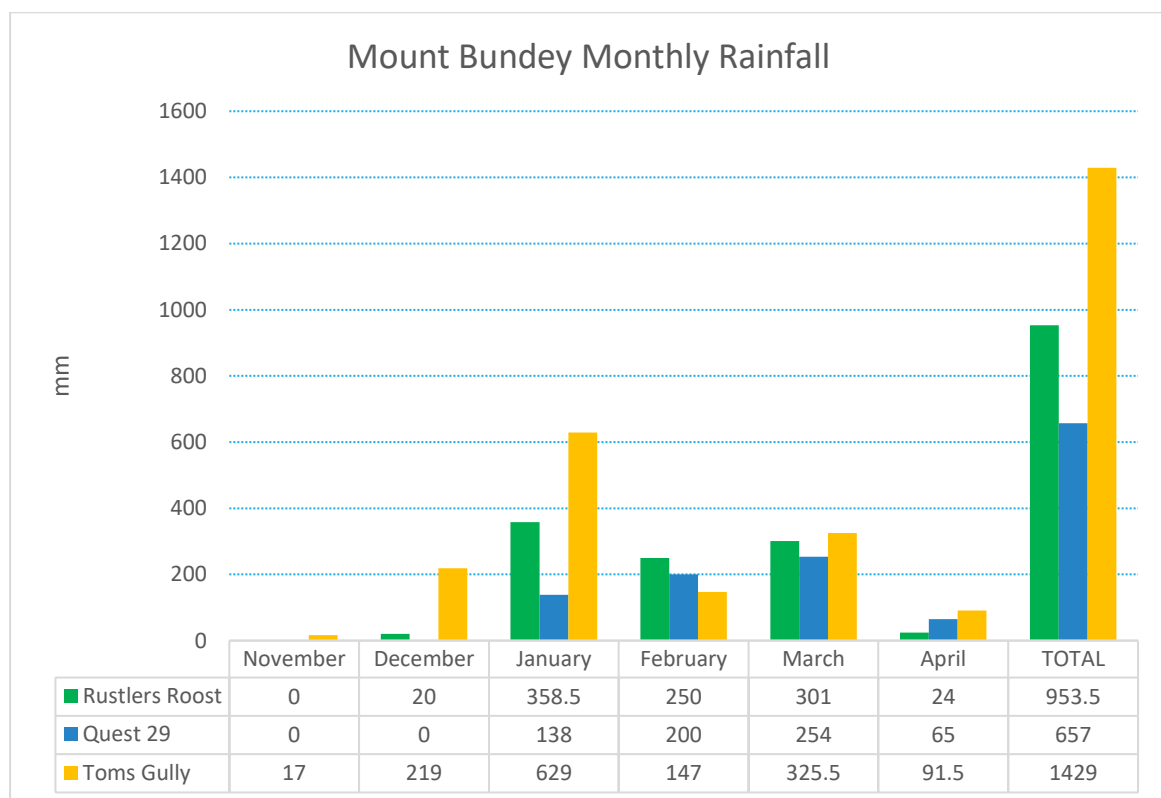


Figure 2-3 Rustlers Roost, Quest 29, Toms Gully Rainfall (mm) for 2023- 24 Wet Season

RRPA total rainfall for the 2023- 24 wet season period thus far is 953.5 mm whilst Q29PA recorded 657 mm and Toms Gully recorded 1429 mm, Quest 29 and Rustlers Roost showed similar total rainfall whilst Toms Gully

Monitoring Method

received greater falls for the 2023/ 24 period. The highest monthly record for the region was at Toms Gully, recording 629 mm in January.

Rustlers Roost did not record rainfall till December of 20mm whereas Toms Gully recorded 219 mm for the month. This may have been a result of delay installing rain gauges whereby previous years were installed in October.

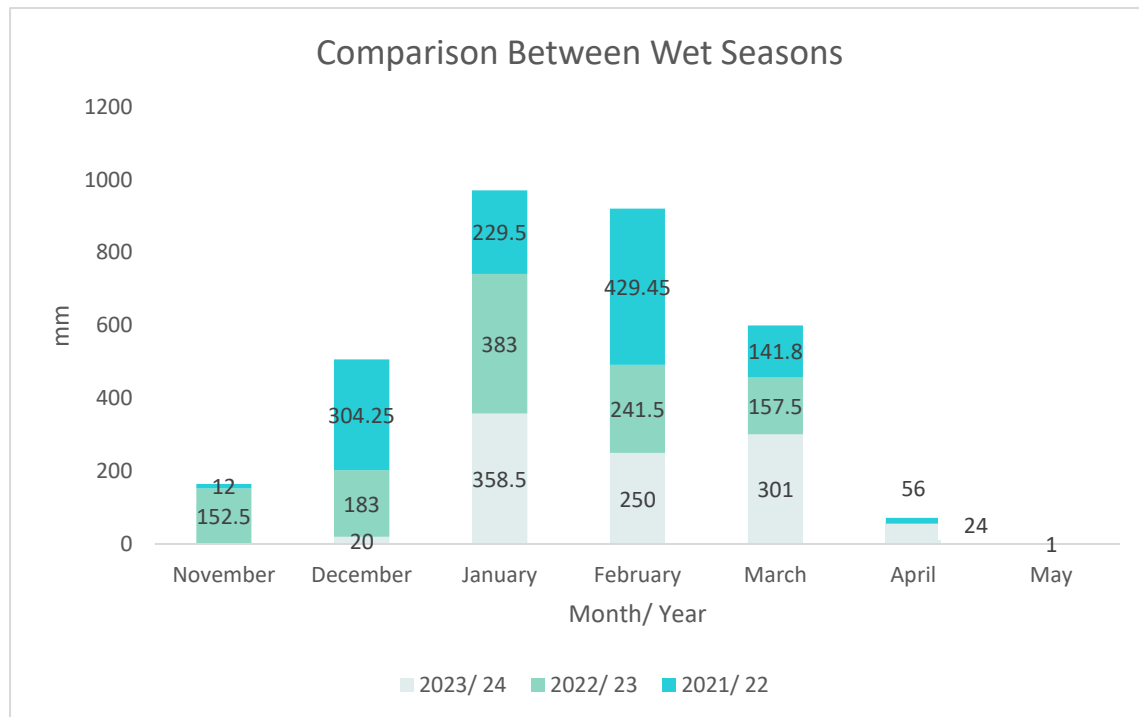


Figure 2-4 Rustlers Roost PA Comparison Between Wet Seasons

As shown in Figure 2-4, January and February show the wettest months for all years with the exception of large rainfall events in December 2021. The 2023/ 24 wet season seen lower monthly rainfall in comparison to the two previous years. The biggest comparison is December with only 20 mm recorded in 2023 when compared to 304 mm in 2021. February 2022 showed the highest rainfall event of all three wet seasons, recording 429 mm. The 2021- 22 wet season recorded a total of 112.5 mm which is slightly less than the 2022/ 23 wet season of 1174.5 mm though greater than totals thus far with only 953.5 mm recorded for this wet season.

2.2 Sampling and Analysis Method

All field sampling was performed as per PGO's water quality monitoring procedure (Appendix C).

No controlled discharge had occurred from ADP1 or ADP2 during the 2023/ 24 wet season thus no data was collected from these points. Previous years used an AquaTROLL located at the outlet pipe (ADP2) to log continuous field data.

Compliance sites RRSW24 and RRSW23 were installed telemetry stations in late December 2024 with real time solar powered data loggers and satellite. RRSW24 telemetry was temporarily replaced with an insitu probe in the steel casing. This still maintained the collection of water quality data over the wet season with monthly checks as per Licence. PGO provided support to another mining company with the use of the telemetry until their equipment arrived. The telemetry system will be installed for the 2024/25 wet season.

Further information is provided in Section 1.5.2.1. Information provided by the loggers are invaluable to gain a clearer understanding of creek flows and water quality fluctuations particularly when site access was limited.

Pit water levels were measured at the beginning and end of wet season using a laser level and staff. The Pit height had previously been surveyed to Relative Level (RL) using Australian Height Datum (AHD) by Contractor Cross Solutions. The RL was recorded on a star picket located close to the water's edge along the western boat access ramp. Standing water levels were routinely measured against the surveyed RL. Levels were not recorded at Annie's Dam.

During each site monitoring event, a record of general observations was maintained in the field handbook and included, fauna siting's, tracks, invasive species presence (i.e. weeds, feral animals), fish, bird life, recent fires, other observed disturbances including anthropological activities (vehicles tracks, rubbish):

All metals/metalloids, general chemistry and nutrients were field sampled as per the routine sampling method in pre labelled and acidified bottles provided by the analytical laboratory (Envirolab NATA accredited for the related analysis). Samples were stored in eskies and kept cool using ice or ice bricks. At the end of each day samples were either moved to a fridge/freezer for overnight holding if field sampling finished after 3pm or delivered to the Darwin Envirolab before 3 pm, repacked with new ice bricks and sent by air to Perth Envirolab laboratory for analysis. To ensure samples were delivered to the lab within the respective holding times and temperature, sampling was performed Monday to Wednesday each week and dispatched same day or next day at the latest.

2.3 Monitoring Locations

PGO has conducted surface water quality monitoring at RRPA since 2016. A water quality database is maintained to store and analyze annual and long- term trends. Monitoring at the site is conducted as per WDL 247-02 (Appendix 4). Reference to WDL247-02 site names and existing names have been included in the Table 2-1.

Monitoring Method

All WDL247-02 surface water sampling locations have been identified in Figure 2-5 which include nine sampling locations, two ADPs and two Compliance Points. The monitoring program as per Appendix 4 of the Licence has been included in Table 2-1 and details of site name, location (Longitude and Latitude), description of the site, analytes, and sample frequency.

Changes were made with the WDL 247-02 with new sites added and inaccessible monitoring sites removed. The following map shows changes made (Figure 2-5)

Monitoring parameters and analytes have been listed in Table 2-2. Monitoring frequency has been further detailed in Table 2-3.

Appendix E shows all surface water monitoring locations that were sampled during the reporting period. A surrender of Licence was submitted to DEPWS on the 11/03/2024 and routine monitoring as per WDL 247-02 conditions continued up until 21 April 2024 where some monitoring sites ceased flow and inconsistent creek flow in the upper Mount Bunday Creek.

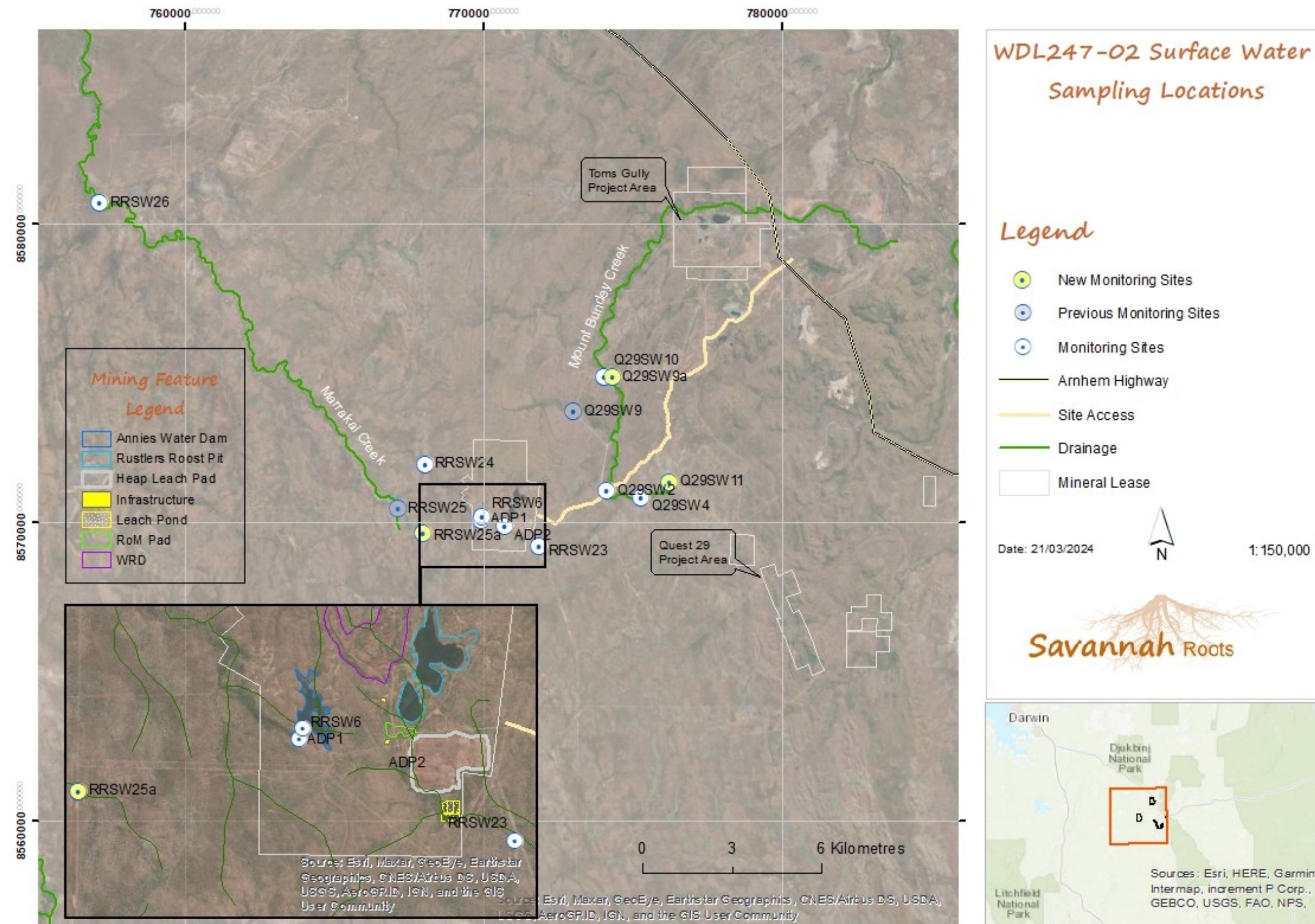


Figure 2-5 WDL247-02 Surface Water Sampling Sites

Table 2-1 Monitoring Program as per WDL 247-02

Catchment	WDL247 -02 Sampling Site	Existing Sampling Site	Latitude	Longitude	Sampling Site Description	Analyte Type						
	Monitoring Sites		°			0	1	2	3	4	5	6
Mount Bundey Creek	ADP2	-	-12.92445	131.49581	Authorised Discharge Point 2 located to the west of the heap leach ponds, discharge basin to Mount Bundey Creek	C	-	-	-	-	-	-
	RRSW22	-	-12.916069	131.497566	Rustlers Roost Pit	-	W	M	M	M	M	M
	RRSW23	RRSW23	-12.930876	131.506169	Headwaters of Mt Bundey Creek, compliance point (WDL 247-02)	-	M	M	M	M	M	M
	Q29SW2	Q29SW2	-12.913378	131.526515	On Mt Bundey Creek downstream of Rustlers Roost and Quest Project Areas (Mertens Bridge)	-	M	M	M	M	M	M
	Q29SW10	-	-12.878930	131.525378	The most downstream monitoring point on the Mount Bundey Creek, located ~8 km downstream of RRSW23.	-	M	M	M	M	M	M
	Q29SW4	Q29SW4	-12.915300	131.536970	Located to the northeast of the Rustlers Roost Project Area on a tributary of Mt Bundey Creek. The site is downstream of Quest 29 PA and upstream of Rustlers Roost site influences.	-	M	M	M	M	M	M
	Q29SW9a	-	-12.87897	131.55927	New information site for the Mount Bundey Creek, located northeast of the Project and east of Q29SW10. Site is located upstream of any mine influences	-	M	M	M	M	M	M
	Q29SW11	-	-12.910530	131.546040	New information site for the Mount Bundey Creek, located east of RRPA, prior to Q29SW4. Site is not influenced by any mining activities and is within the Mary River Catchment	-	M	M	M	M	M	M
Marrakai Creek	ADP1	-	-12.92341	131.49053	Authorised Discharge Point 1 located to the south of Annies Dam, discharge basin to Marrakai Creek	C	-	-	-	-	-	-
	AWD	RRSW6	-12.921821	131.488767	Sampling location changed to dam wall for safety reasons. The changed location is to the northwest of the spillway. Annie’s Water Dam	-	M	M	M	M	M	M
	RRSW24	-	-12.905085	131.469670	Downstream compliance point for Marrakai Creek. Located to the northwest, ~2.5 km downstream of ADP1.	-	M	M	M	M	M	M
	RRSW25a	-	-12.92684	131.46928	New information site for the Marrakai Creek. Located to the west of the tenement boundary and on a tributary of the Marrakai Creek. Upstream of any mine influences	-	M	M	M	M	M	M
	RRSW26	-	-12.827882	131.369258	On the Marrakai Creek, ~16 km downstream of ADP1	-	M	M	M	M	M	M
Previous Monitoring Location												
Marrakai Creek	RRSW25	-	-12.919413	131.462175	Control site for the Marrakai Creek. Located to the west of the tenement boundary ~2 km.	-	M	M	M	M	M	M
Mount Bundey Creek	Q29SW9	-	-12.889617	131.516137	Control Site located northeast of the RRPA. The site is located on a tributary of Mount Bundey Creek prior to any mining influence.	-	M	M	M	M	M	M

Table 2-2 Monitoring Parameters

Type	Analysis	Analysis	Parameter
0	Discharge Monitoring	Data Logger	Flow kilolitres per day, Electrical Conductivity (EC).
1	In field parameters	Field	pH, Electro Conductivity (EC), Dissolved Oxygen (DO), Temperature, Turbidity, Photograph
2	Total and dissolved metals	Total and dissolved	Aluminum (Al), Arsenic (As), Cadmium (Cd), Chromium (Cr), Cobalt (Co), Copper (Cu), Iron (Fe), Lead (Pb), Manganese (Mn), Molybdenum (Mo), Nickel (Ni), Selenium (Se), Tin (Sn), Uranium (U), Zinc (Zn).
3	Dissolved major cations and anions	Dissolved	Calcium (Ca), Manganese (Mg), Potassium (K), Sodium (Na), Sulphate (SO ₄), Chloride (C ⁻)
4	Inorganics	Total and dissolved	Hardness (CaCO ₃), Carbonate (CO ₃), Bicarbonate (HCO ₃), Total Suspended Solids (TSS), Total Dissolved Solids (TDS), Cyanide
5	Nutrients	Total	Total nitrogen (TN), total phosphorus (TP)
6	Cyanide	Total	Cyanide (CN ⁻)

Table 2-3 Monitoring Frequency Descriptions

Key	Frequency	Description
C	Continuous	Continuous during discharge
W	Weekly	Weekly monitoring
M	Monthly	Monthly monitoring
M	Monthly	Weekly during discharge and at least once per discharge event
M	Monthly	During Discharge event

2.4 Variability of Results

Factors that may affect variability in results are based on site activities and the location of the ML, within a pastoral lease. The following table identifies naturally occurring factors and site-based activities that could possibly interact with surface water quality within the RRPA for the 2023- 24 period (Table 2-4). Investigations were conducted for the period following exceedances of analytes against the WDL247-02 Trigger Values.

Table 2-4 Factors That May Affect Variability in Monitoring Results

Contributions	Rationale
First flush events	First flush events are, in particular the upper reaches of the Mount Bunday Creek and its tributaries, are expected to be higher in analyte concentrations than during continuous wet season conditions. First flush events accumulate pooled water from the beginning of the wet season and overland flows which contribute to contaminant loads. This was recorded during the first sampling round at RRSW23.
Animal activity	Notable increase of buffalo number was recorded several times during routine monitoring at the RRPA when compared to previous years. Sightings and evidence of buffalo activity were recorded at RRSW23, RRSW6, Q29SW2 and Q29SW10 on several occasions. Buffalo are known to cause considerable disturbance to the environmental landscape through erosion of riverbanks and wading/ creating wallows. The presence of buffalo is considered to have contributed to nutrient loads during the reporting period.
Influence from onsite mine domains or structures	Existing mined domains including the heap leach pad and ponds, and waste rock dumps are likely to have some influence on surface and groundwater quality.
Care and Maintenance activities	Use of tracks and creek crossings eroding land surface and sedimentation to creeks
Track and creek crossing upgrades	Improvements to tracks and creek crossing access for pastoral and PG eroding land surface and sedimentation of creeks
Pastoral activities	Day to day activities, stock movements over land and through creek lines. Pastoral activities including clearing, and construction of new fence lines and boundaries was done in mid-2022. These activities have affected

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	RRSW10 and RRSW9 WDL 247-02 surface water and biological monitoring sites. DEPWS officers conducted a site visit on the 9/10/22. New sites were not required however sampling for the 2022/23 wet season was done within four metres upstream of the area of disturbance. Trends in water quality has been provided in Section 4.2.
Invasive species	Feral animals i.e. pigs, buffalo wallowing near at sample sites (



Photo 2-1 Presence of buffalo upstream of RRSW23, in the upper catchment of Mount Bunday Creek



Photo 2-2 Presence of Buffalo at RRSW6 Spillway, January 2024

3 QA/QC Evaluation

3.1 Completeness

Monitoring was undertaken during the 2023/ 24 wet season period. Monitoring performance was assessed for completeness of WDL 247-02 and tabulated in Appendix D. It identifies in colour whether sampling events, frequency or analytes were complete.

Performance is assessed when there is an opportunity to sample, such as creek flow. In summary, most monitoring occasions were met.

All monitoring events were met at sites recorded 100% completeness except for RRSW26 which was inaccessible due to track flooding. Access was tried again in March; however, the Marrakai Track was closed for maintenance works.

3.2 Quality Control

Sampling method was consistent for all water sampling events in accordance with the sampling method detailed in Section 2.2. Qualified and experienced environmental consultants undertook the field monitoring since the commencement of the Licence.

All metals/metalloids, general chemistry and nutrients were field sampled as per the routine sampling method in pre labelled and acidified bottles provided by the analytical laboratory (Envirolab NATA accredited for the related analysis).

Calibration of field equipment was undertaken as per the manufacturer's recommendations for telemetry and data loggers. Field handheld equipment was calibrated prior to each monthly sampling event for turbidity, pH, and electrical conductivity (EC) using buffer and quick Cal solutions and dissolved oxygen was undertaken at site.

4 Monitoring Results 2023- 24

4.1 Presentation and Discussion

Water quality results for the WDL247-02 programme are included in the following tables. Water quality data has been divided into four sections - field physical parameters (Table 4-1), general chemistry (Table 4-2), dissolved metals (Table 4-3) and nutrients (Table 4-4). Total loading was not calculated due to no active discharge.

All raw water quality data has been presented in Appendix A.

Each of the following tables includes:

- Current results;
- Unit of measure;
- WDL247-02 Discharge Trigger Value (TV) for Compliance Points;
- Highlighted values that are outside WDL247-02 TV; and
- Minimum, maximum results and median trends for the reporting period.

As per Appendix 2 of the Licence, Compliance Points (RRSW23 and RRSW24) have set trigger values. Each monitoring event was assessed against the TV and highlighted when exceeded. All other data has been included for comparison purposes and to report water quality at each of the monitoring locations listed in the Licence.

For all other monitoring sites, short term (2023- 24) and long term (2012- 24) median values were used, instead of averages, to assess water quality trends across RRPA. Using median values assists in avoiding data outliers which would otherwise skew average values. Median values were calculated using three or more data points. If insufficient data points were available, the median cell was left blank (-). Median values with parameters below LoR have been represented as 'N/A.' Minimum and Maximums were also included for the reporting period (2023- 24) to identify anomalies.

Some sites have been monitored as part of the RRPA MMP and over the last 10 years which has provided long term data trends. New sites introduced with the Licence have been monitored since the commencement of the Licence in 2021 or less in which only three to six monitoring events may have been captured for some sites as a result of creek flows and access. Short term (2023- 24 reporting period) medians and long-term (2012- 2024) medians have been included with date range identifying the temporal length of data captured.

4.1.1 Field Physical Parameters

Field parameter results from 2023-24 monitoring period are shown in Table 4-1.

Table 4-1 Surface Water Field Parameters

Site	Date/ Range	Temp	DO	EC	pH	Turbidity
		°C	%	µS/cm	Units	NTU
RR WDL247-02 TV		-	85-120	20- 250	6.0- 8.0	2- 15
WDL247-02 Compliance Sites						
RRSW23	20/01/2024	28.5	55	61.0	6.6	10
RRSW23	21/02/2024	31.2	82	79.0	6.9	18
RRSW23	05/03/2024	31.1	85	46.5	6.5	27
RRSW23	26/03/2024	-	-	82.5	6.9	15
RRSW23	20/04/2024	26.4	94	102.5	7.3	15
Minimum/Maximum (2020- 24)		25.8/33.2	55/118	22.6/143	5.7/7.4	7/748
Median (2023- 24)		30.9	92	34.5	6.7	13
Long term median (2020- 24)		30.7	90	34	6.4	14
RRSW24	20/01/2024	28.1	65	24.7	6.1	17
RRSW24	10/02/2024	29.9	68	23.8	6.3	18
RRSW24	26/03/2024	-	-	18.0	6.6	15
RRSW24	20/04/2024	27.2	-	35.0	6.6	-
Minimum/Maximum (2022- 24)		27.2/35.4	65/107	14/94	6.1/8.1	9/38
Median (2023- 24)		29.9	105	24.7	6.9	18
Long term median (2022- 24)		29.9	105	24.7	6.8	18
All Other Sampling Locations						
RRSW6	Med (2023- 24)	32	60	14	5.7	5
RRSW6	Long term median (2012- 24)	32	68	14	6.0	8
RRSW22	Med (2023- 24)	32	79	24	7.1	4
RRSW22	Long term median (2012- 24)	32	99	26	7.3	2
Q29SW2	Med (2023- 24)	29	71	34	6.7	29
Q29SW2	Long term median (2016- 24)	29	81	34	6.7	31
Q29SW4	Med (2023- 24)	29	88	34	6.5	20

Site	Date/ Range	Temp	DO	EC	pH	Turbidity
		°C	%	µS/cm	Units	NTU
RR WDL247-02 TV		-	85-120	20- 250	6.0- 8.0	2- 15
Q29SW4	Long term median (2016- 24)	29	92	35	6.6	38
Q29SW9a	Med (2023- 24)	28	109	29	6.7	45
Q29SW10	Med (2023- 24)	29	90	34	6.4	36
Q29SW10	Long term median (2022- 24)	29	95	34	6.4	36
Q29SW11	Med (2023- 24)	29	64	30	6.8	18
Q29SW11	Long term median (2021- 23)	29	64	29	6.7	18
RRSW25a	Med (2023- 24)	30	115	27	6.1	32

There were no exceedances of a trigger value for field parameters at RRSW23 or RRSW24 (Table 4-1) that were considered notifiable incidents (as specified in Condition 26 and 27 of WDL 247-02) during the reporting period.

- RRSW23 and RRSW24 recorded concentrations above trigger values for turbidity over two separate occasions with the overall short- and long-term medians at RRSW24 recording above the trigger value (18 NTU).
- RRSW23 and RRSW24 recorded concentrations below trigger values for low levels of DO over two separate occasions which the overall short- and long-term median trends at both compliance sites recording within trigger values.
- All monitoring sites DO% median values ranges between 60-109% saturation with the highest median value at Q29SW9a (Mount Bunday creek upstream of mine influences) and lowest median value at RRSW6 (Annies Dam).
- All monitoring sites electrical conductivity µS/cm (EC) median value range between 14-35 µS/cm with the highest value at Q29SW9a (Mount Bunday creek upstream of mine influences) and lowest median value at RRSW6 (Annies Dam).
- All monitoring sites pH (units) median values range between 5.7-7.3 units with the highest median pH value at RRSW22 (Rustlers Roost Pit) and lowest pH median value at RRSW6 (Annies Dam).
- All monitoring sites turbidity (NTU) median values range between 2-38 NTU with the highest median turbidity value at Q29SW9a (Mount Bunday creek upstream of mine influences) and lowest turbidity median value at RRSW22 (Rustlers Roost Pit).

4.1.2 General Chemistry

General chemistry results from 2023-24 monitoring period are shown in Table 4-2.

Table 4-2 Surface Water General Chemistry

Site	Date	Unfiltered			Filtered									
		CN	Lab Inorganics		Alkalinity as CaCO3			Total Hardness as CaCO3	Cations				Anions	
			TDS	TSS	Bicarbonate	Carbonate	Total		Ca	Mg	K	Na	Cl ⁻	SO ₄
			µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
RR WDL247-02 TV		7											3	
WDL247-02 Compliance Sites														
RRSW23	20/01/2024	-	68	16	20	25	190	12	3.5	0.75	1.6	7.2	2.9	2.6
RRSW23	21/02/2024	31	49	<5	34	<5	34	12	3.8	0.63	0.55	10	11	5.8
RRSW23 (investigation sample)	05/03/2024	6.9	32	8.5	21	<5	21	24	3.7	3.6	0.8	3.3	2.1	3.8
RRSW23 DUPLICATE	05/03/2024	6.2	33	9	19	<5	19	7.7	2.2	0.52	0.53	7.8	2.3	3.7
RRSW23	26/03/2024	18	46	8	30	<5.0	30	12	4	<0.5	<0.5	11	1.9	6.1
Minimum/Maximum (2022- 24)		N/A/31	15/68	N/A/38	7.8/34	N/A/25	7.8/190	4/24	0.7/4	0.5/3.6	0.53/1.6	0.7/4	N/A/11	N/A/7
Median (2023- 24)		12.5	46	8.8	21	N/A	30	12	3.7	0.7	0.7	3.7	2.3	3.8
Long term median (2022- 24)		N/A	19	10	10	N/A	10	5	1.2	0.6	1	1.2	2.3	1.4
RRSW24	20/01/2024	-	12	8.7	8.5	<5	8.5	3.7	<0.5	0.61	0.58	2.1	2.5	<1
RRSW24	10/02/2024	-	13	9	8.4	<5	8.1	5.1	0.59	0.89	<0.5	2.2	2	<1
RRSW24	26/03/2024	-	11	7.5	8.6	8.6	8.6	3.4	<0.50	0.61	<0.50	1.8	1.7	<1.0
Minimum/Maximum (2022- 24)		-	11/13	6/12	8/26	N/A/N/A	N/A/26	N/A/5.1	N/A/0.6	0.61/0.9	N/A/0.9	1.8/2.6	1.7/3	N/A/N/A
Median (2023- 24)		-	12	9	9	N/A	9	4	1	1	N/A	2	2	N/A
Long term median (2022- 24)		-	12	9	9	N/A	9	5	0.6	1	N/A	2	2	N/A
All Sampling Locations														
RRSW6	Med (2023- 24)	N/A	9.5	12	5.3	N/A	5.3	N/A	N/A	N/A	0.6	1.7	3.2	N/A
RRSW6	Long term median (2012- 24)	N/A	8	12	5.4	N/A	5.4	N/A	N/A	N/A	0.7	1.6	2	N/A
RRSW22	Med (2023- 24)	N/A	18	N/A	9	N/A	10.5	4.8	0.6	0.8	1.5	2.6	2.4	1
RRSW22	Long term median (2012- 24)	N/A	14	9	7.4	N/A	7.7	4.3	0.6	0.7	1.2	1.9	2.5	1.1
Q29SW2	Med (2023- 24)	N/A	20	21	12	N/A	12	5	0.74	0.67	0.9	3.8	2	1.5

Site	Date	Unfiltered			Filtered									
		CN	Lab Inorganics		Alkalinity as CaCO3			Total Hardness as CaCO3	Cations				Anions	
			TDS	TSS	Bicarbonate	Carbonate	Total		Ca	Mg	K	Na	Cl ⁻	SO ₄
			µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
RR WDL247-02 TV		7											3	
Q29SW2	Long term median (2016- 24)	N/A	20	17	11	N/A	11	5	0.72	0.7	1.1	3.7	2	1.5
Q29SW4	Med (2023- 24)	-	20	19	10	N/A	10	5	0.62	0.7	1.3	3.6	2.3	1.7
Q29SW4	Long term median (2016- 24)	N/A	18	21	11	N/A	11	5	0.7	0.8	1.2	3.7	2	1.5
Q29SW9a	Med (2023- 24)	-	15	23	10	N/A	10	4.9	0.6	0.8	1.2	2.2	2.4	N/A
Q29SW10	Med (2023- 24)	-	17	26	13	N/A	13	4.5	0.8	0.6	0.9	3.8	1.8	1.6
Q29SW10	Long term median (2022- 24)	N/A	16	26	9	N/A	9.1	4.7	0.7	0.7	0.9	2.9	2.0	1.6
Q29SW11	Med (2023- 24)	-	17	40	11	N/A	11	4.4	N/A	N/A	1.6	3.1	2.1	N/A
Q29SW11	Long term median (2021- 24)	N/A	15	32	11	N/A	10.5	4.9	N/A	N/A	1.5	3.2	2.1	N/A
Q29SW25a	Med (2023- 24)	-	14	17	9.6	N/A	9.6	4.4	0.55	0.7	0.7	2.6	2.2	N/A

There were no exceedances of a trigger value for general chemistry at RRSW24 that were considered notifiable incidents (as specified in Condition 26 and 27 of WDL 247-02) during the reporting period (Table 4-2). RRSW23 had 1 notifiable incident with an exceedance of the trigger values (3 or more times trigger value) for cyanide and chloride on the 21/02/2024. Refer to Section 7.2 for further details.

- RRSW23 recorded concentrations above trigger values for chloride (11mg/l) during one monitoring event on the 21 February 2024 and recorded concentrations above trigger values for cyanide (31 ug/l and 18 ug/l) during two monitoring events on the 21 February and 26 March 2024.
- RRSW23 short term median for chloride is 2.3 mg/l and short-term median trends for cyanide is 12.5 ug/l recording above the trigger value (7ug/l).
- Cyanide was below laboratory LoR of <4 µg/L at all other monitoring sites.
- RRSW23 short term median bicarbonate alkalinity (as CaCo3) ranges from 8.3mg/L to 34 mg/L, with a median of 21 mg/L and long-term median bicarbonate alkalinity (as CaCo3) ranges from 7.8mg/L to 34 mg/L, with a median of 10 mg/L
- RRSW24 short term median bicarbonate alkalinity (as CaCo3) ranges from 8mg/L to 26 mg/L, with a median of 9 mg/L
- RRSW23 and RRSW24 ionic compositions are a mixed type of sodium bicarbonate water type.
- RRSW23 sulphate ions median and long-term median values were 3.8/1.4 mg/L, and RRSW24 sulphate ions median and long-term median values were recorded below laboratory LoR.
- All monitoring sites ionic compositions are generally a mixed type of sodium bicarbonate water type with Q29SW11 a sodium-potassium bicarbonate water type.
- Sulphate levels at monitoring sites upstream or unaffected by surface discharges from Rustlers Roost (RRSW11, RRSW9a) were below LoR of <1mg/L.

4.1.3 Dissolved Metals

Dissolved metal results from 2023-24 monitoring period are shown in Table 4-3.

Table 4-3 Surface Water Dissolved Metals

Site	Date	Al	As	Cd	Cr	Co	Cu	Fe	Pb	Mn	Mo	Ni	Se	Sn	U	Zn
		µg/L														
RR WDL247-02 TV		55	13	0.2	1.0	1.4	1.4	300	3.4	1900	34	11	11	3	0.5	8
WDL247-02 Compliance Sites																
RRSW23	20/01/2024	66	7	<0.1	<1	2.1	1.1	170	<1	44	2.6	1.3	-	-	0.14	14
RRSW23	21/02/2024	13	27	<0.1	1.3	2.6	<1	170	<1	25	6.5	<1	<1	<1	<0.1	<1
RRSW23 (investigation sample)	05/03/2024	37	18	<0.1	<1	1.8	<1	230	<1	36	3.5	1	<1	<1	<0.1	<1
RRSW23 DUPLICATE	05/03/2024	39	18	<0.1	<1	1.8	<1	230	<1	35	3.5	1.4	<1	<1	<0.1	1.6
RRSW23	26/03/2024	15	14	<0.1	2	3.7	<1	130	<1	25	7.3	<1	<1	<1	<0.1	<1
Minimum (2022- 24)		N/A	2.8	N/A	N/A	N/A	N/A	39	N/A	10	N/A	N/A	N/A	N/A	N/A	N/A
Maximum (2022- 24)		74	27	N/A	2	3.7	1.3	230	N/A	73	7.3	1.4	N/A	N/A	0.14	14
Median (2023- 24)		37	18	N/A	N/A	2.1	N/A	170	N/A	35	3.5	1.3	N/A	N/A	N/A	N/A
Long term median (2022- 24)		22	5	N/A	N/A	N/A	N/A	98	N/A	23	2.6	N/A	N/A	N/A	N/A	1.6
RRSW24	20/01/2024	65	<1	<0.1	<1	<1	<1	200	<1	23	<1	<1	-	-	<0.1	1.6
RRSW24	10/02/2024	52	<1	<0.1	<1	<1	<1	370	<1	17	<1	<1	<1	<1	<0.1	2
RRSW24	26/03/2024	24	<1	<0.1	<1	<1	<1	260	<1	5.9	<1	<1	<1	<1	<0.1	<1
Minimum (2022- 24)		24	N/A	N/A	N/A	N/A	N/A	150	N/A	5.9	N/A	N/A	N/A	N/A	N/A	N/A
Maximum (2022 24)		76	N/A	N/A	N/A	N/A	N/A	440	N/A	37	N/A	N/A	N/A	N/A	N/A	2
Median (2023- 24)		52	N/A	N/A	N/A	N/A	N/A	260	N/A	17	N/A	N/A	N/A	N/A	N/A	2
Long term median (2022- 24)		59	N/A	N/A	N/A	N/A	N/A	250	N/A	19	N/A	N/A	N/A	N/A	N/A	N/A
All Other Sampling Sites																
RRSW6	Med (2023- 24)	N/A	N/A	N/A	N/A	N/A	N/A	300	N/A	18	N/A	N/A	N/A	N/A	N/A	4
RRSW6	Long term median (2012- 24)	N/A	1.2	N/A	N/A	N/A	N/A	240	N/A	21	N/A	N/A	N/A	N/A	N/A	2
RRSW22	Med (2023- 24)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4.4	N/A	N/A	N/A	N/A	N/A	2.9
RRSW22	Long term median (2012- 24)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5.9	N/A	N/A	N/A	N/A	N/A	2.8
Q29SW2	Med (2023- 24)	49	1.7	N/A	N/A	N/A	N/A	230	N/A	14	N/A	N/A	N/A	N/A	N/A	1.6
Q29SW2	Long term median (2016- 24)	110	1.3	N/A	N/A	N/A	N/A	250	N/A	14	N/A	N/A	N/A	N/A	N/A	2.1
Q29SW4	Med (2023- 24)	62	1.1	N/A	N/A	N/A	N/A	200	N/A	13	N/A	N/A	N/A	N/A	0.13	1.9
Q29SW4	Long term median (2016- 24)	80	1.5	N/A	N/A	N/A	N/A	230	N/A	17	N/A	N/A	N/A	N/A	N/A	N/A

Site	Date	Al	As	Cd	Cr	Co	Cu	Fe	Pb	Mn	Mo	Ni	Se	Sn	U	Zn
		µg/L														
RR WDL247-02 TV		55	13	0.2	1.0	1.4	1.4	300	3.4	1900	34	11	11	3	0.5	8
Q29SW9a	Med (2023- 24)	32	N/A	N/A	N/A	N/A	N/A	150	N/A	33	N/A	N/A	N/A	N/A	N/A	2.9
Q29SW10	Med (2023- 24)	90	2.6	N/A	N/A	N/A	N/A	300	N/A	21	N/A	N/A	N/A	N/A	N/A	1.3
Q29SW10	Long term median (2022- 24)	61	2	N/A	N/A	N/A	N/A	260	N/A	18	N/A	N/A	N/A	N/A	N/A	1.2
Q29SW11	Med (2023- 24)	62	N/A	N/A	N/A	N/A	N/A	100	N/A	4	N/A	N/A	N/A	N/A	0.2	3.8
Q29SW11	Long term median (2022- 24)	67	N/A	N/A	N/A	N/A	N/A	130	N/A	4	N/A	N/A	N/A	N/A	0.2	1.8
Q29SW25a	Med (2023- 24)	45	1.1	N/A	N/A	N/A	N/A	250	N/A	20	N/A	N/A	N/A	N/A	0.2	2.9

There were no exceedances of a trigger value for dissolved metals at RRSW24 and RRSW23 that were considered notifiable incidents (as specified in Condition 26 and 27 of WDL 247-02) during the reporting (Table 4-3).

- RRSW24 recorded elevated Aluminum concentrations above trigger values (65ug/L) on one monitoring event (20 January 2024).
- RRSW23 recorded nonconsecutive concentrations above trigger values for Aluminum (1 event), Arsenic (2 events), Chromium (2 events) Cobalt (3 events) and Zinc (1 event) during the reporting period.
- RRSW23 and RRSW24 long term median trends were below trigger values for Aluminum, Arsenic, Chromium, Cobalt, and Zinc (1 event)
- For all monitoring sites short and or long-term median trends for:
 - Aluminum values were above 55 ug/L except for at RRSW6 (Annies Dam) and RRSW22 (Rustlers Roost Pit).
 - Arsenic values were below 13 ug/L.
 - Cadmium, Chromium, Cobalt, Copper, Lead, Molybdenum, Nickel, Selenium, and Tin values were below laboratory LoR.
 - Iron values were below or at 300 ug/L.
 - Manganese values were below 1900 ug/L.
 - Uranium values were below 0.5 ug/L.
 - Zinc values were below 8 ug/L.

4.1.4 Nutrients

Total nutrient results from 2023-24 monitoring period are shown in Table 4-4.

Table 4-4 Surface Water Nutrients

Site	Date	TN	TP
		µg/L	
RR WDL247-02 TV		200-300	10
WDL247-02 Compliance Sites			
RRSW23	20/01/2024	500	44
RRSW23	21/02/2024	410	18
RRSW23 (investigation sample)	05/03/2024	330	11
RRSW23 DUPLICATE	05/03/2024	390	12
RRSW23	26/03/2024	360	16
Minimum (2022- 24)		N/A	N/A
Maximum (2022- 24)		650	44
Median (2023- 24)		390	16
Long term median (2022- 24)		240	N/A
RRSW24	20/01/2024	300	12
RRSW24	10/02/2024	210	21
RRSW24	26/03/2024	150	<10
Minimum (2022- 24)		150	N/A
Maximum (2022- 24)		400	21
Median (2023- 24)		210	17
Long term median (2022- 24)		245	N/A
All Other Sampling Sites			
RRSW6	Med (2023- 24)	485	24
RRSW6	Long term median (2012- 24)	490	N/A
RRSW22	Med (2023- 24)	190	N/A
RRSW22	Long term median (2012- 24)	165	N/A
Q29SW2	Med (2023- 24)	320	16
Q29SW2	Long term median (2016- 24)	380	19
Q29SW4	Med (2023- 24)	310	16.5
Q29SW4	Long term median (2016- 24)	300	15

Site	Date	TN	TP
		µg/L	
RR WDL247-02 TV		200-300	10
Q29SW9a	Med (2023- 24)	620	16.5
Q29SW10	Med (2023- 24)	230	17
Q29SW10	Long term median (2022- 24)	390	17
Q29SW11	Med (2023- 24)	350	13
Q29SW11	Long term median (2022- 24)	160	12
Q29SW25a	Med (2023- 24)	240	26

There were no exceedances of a trigger value for nutrients at RRSW24 that were considered notifiable incidents (as specified in Condition 26 and 27 of WDL 247-02) during the reporting period. RRSW23 had 1 notifiable incident with an exceedance of the trigger value (3 of more times trigger value) for Total Phosphorus on the 20/02/2024 (Table 4-4). Refer to Section 4.3 for further details.

- RRSW23 recorded concentrations above trigger values (10ug/L) for Total Phosphorus over 3 events during the reporting period and short-term median trend of 16 ug/L.
- RRSW24 recorded concentrations above trigger values (10ug/L) for Total Phosphorus over 2 events during the reporting period and short-term median trend of 17ug/L.
- RRSW23 recorded concentrations above trigger values (200-300ug/L) for Total Nitrogen and short-term median trend of 390 ug/L.
- RRSW24 recorded concentrations below trigger values (200-300ug/L) for Total Nitrogen and short-term median trend of 210 ug/L.
- For all monitoring sites Total Nitrogen short and or long-term median values ranged between 160 ug/L at Q29SW11 (upstream of mining influence) and 620 ug/L (upstream of mining influence). Five of the seven monitoring sites long term median values were at or above 300 ug/L.
- All monitoring sites Total Phosphorus short and or long-term median values ranged between below 10 ug/L at RRSW6 (Annies Dam) and RRSW22 (Rustlers Roost Pit), and 19 ug/L at Q29SW2 (Mertens Bridge). Five of the seven monitoring sites long term median values were above 10 ug/L.

4.2 Spatial and Temporal Trends and Analysis

Surface water physical measurements temporal and spatial short term (2023-2024) and long term (2020-2024) trends were generally similar between both compliance points and between monitoring points. Exceptions to this include lower dissolved oxygen (Figure 4-6) and turbidity (Figure 4-8) ranges at Annies Dam and Rustlers Roost pit, marginally higher turbidity ranges (15-120 NTU) at Q29SW4 and Q29SW2 monitoring sites compared to the other monitoring and compliance sites; and electrical conductivity ranges (Figure 4-3 and Figure 4-4) were marginally higher at compliance sites (20-150 μScm^{-1} at RRSW23) compared to the monitoring sites ranges (15-98 μScm^{-1} RRSW22 and Q29SW2).

General chemistry temporal and spatial short term (2023-2024) and long term (2020-2024) trends at both compliance sites and monitoring sites show the ionic compositions are a mixed type of sodium bicarbonate water type with exception at Q29SW11 (reference upstream monitoring sites) with a sodium-potassium bicarbonate water type. Cyanide levels above LoR were only recorded at RRSW23 and below LoR at all other monitoring sites (Figure 4-9 and Figure 4-10). Chloride levels at compliance and monitoring sites were similar with RRSW22 and RRSW6 recording the highest short-term concentrations (Figure 4-11 and Figure 4-12). A spike in cyanide and chloride recorded during the wet season at RRSW23 of 31 $\mu\text{g/L}$ and 11 mg/L respectively, triggered an exceedance 3 times trigger value resulting in a notification to DEPWS and investigation which identified that a combination of low creek flow, and possible data anomaly for the elevated chloride and seepage from existing mined domains were the likely causes of the elevated cyanide.

Sulphate (SO_4) ions short- and long-term trends ranges from 1.5-3.8 mg/L at monitoring sites in the Mount Bunday Creek system with RRSW23 recording the highest reading of 3.8 mg/L . Rustlers Roost Pit recording 1.1 mg/L . All other Monitoring sites and Compliance site RRSW24 sulphate levels were below LoR.

Dissolved metals chemistry temporal and spatial short term (2023-2024) and long term (2020-2024) trends at RRSW23 predominantly consisted of aluminium, arsenic, cobalt, Iron, manganese, molybdenum, nickel, and zinc recording above LoR, but did not exceed trigger values). RRSW24 Compliance site recorded aluminum long term trends above trigger values (Figure 4-13). Dissolved metals short- and long-term trends were generally in higher concentrations at the compliance sites when compared to monitoring sites.

Dissolved metal values across all Monitoring Sites recorded varying short- and long-term median trends for aluminum, arsenic, Iron, manganese and zinc with aluminum exceeding trigger values at upstream (Q29SW11) and downstream monitoring sites (Q29SW2 Q29SW4, Q29SW10) in Mount Bunday Creek and the upstream reference site(RRSW25a) in Marrakai Creek catchment (Figure 4-14). Water quality differed at Rustlers Roost Pit and Annie Dam with dissolved manganese and zinc short- and long-term trends compared to compliance sites and monitoring sites upstream and downstream of mine sites.

Total nitrogen and Total phosphorus temporal and spatial short term (2023-2024) and long term (2020-2024) trends varied across compliance points and monitoring points. RRSW6 (Annies Dam) recorded the highest long term median values for total nitrogen and lowest at Q29SW11 and Rustlers Roost pit of 160-165 $\mu\text{g/L}$ (Figure

4-21 and Figure 4-22). RRSW25a recorded the highest long term median value for total phosphorus of 26 ug/L and lowest recorded at Q29SW11 of 12 ug/L. A spike recorded during the wet season at RRSW23 of 44ug/L triggered an exceedance 3 times trigger value resulting in a notification to DEPWS and investigation which identified that a combination of low creek flow and cattle activity were the likely causes of the elevated Total Phosphorus (Figure 4-23 and Figure 4-24).

4.2.1 Field Parameters

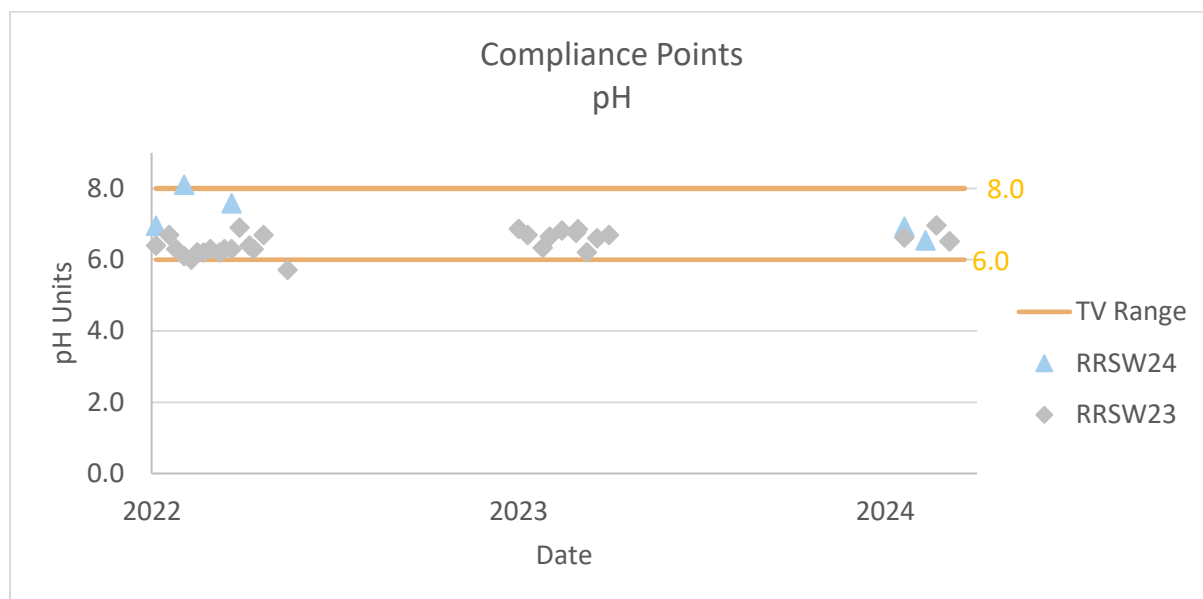


Figure 4-1 Trend analysis for pH at Compliance Points

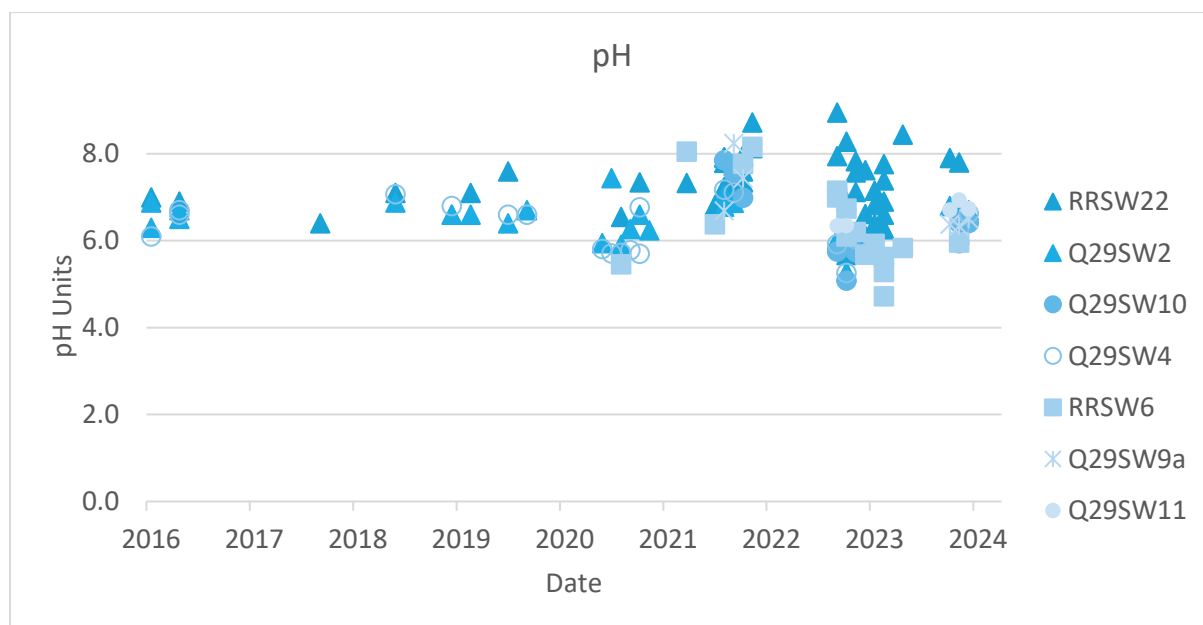


Figure 4-2 Trend analysis for pH at Monitoring Sites

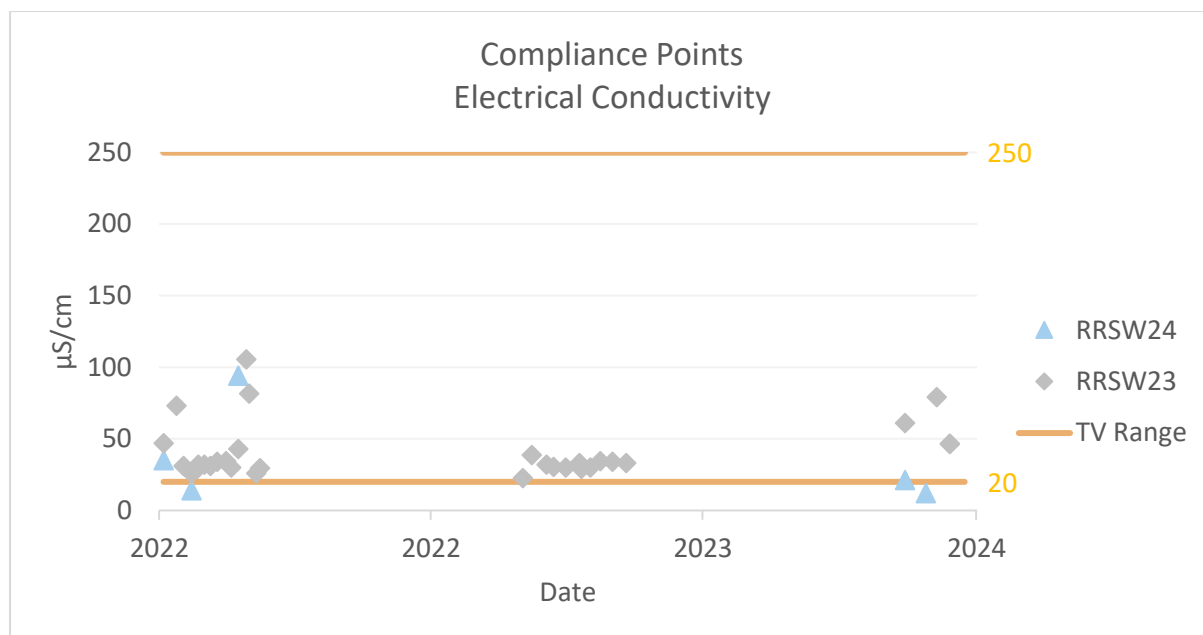


Figure 4-3 Trend analysis for Electrical Conductivity at Compliance Points

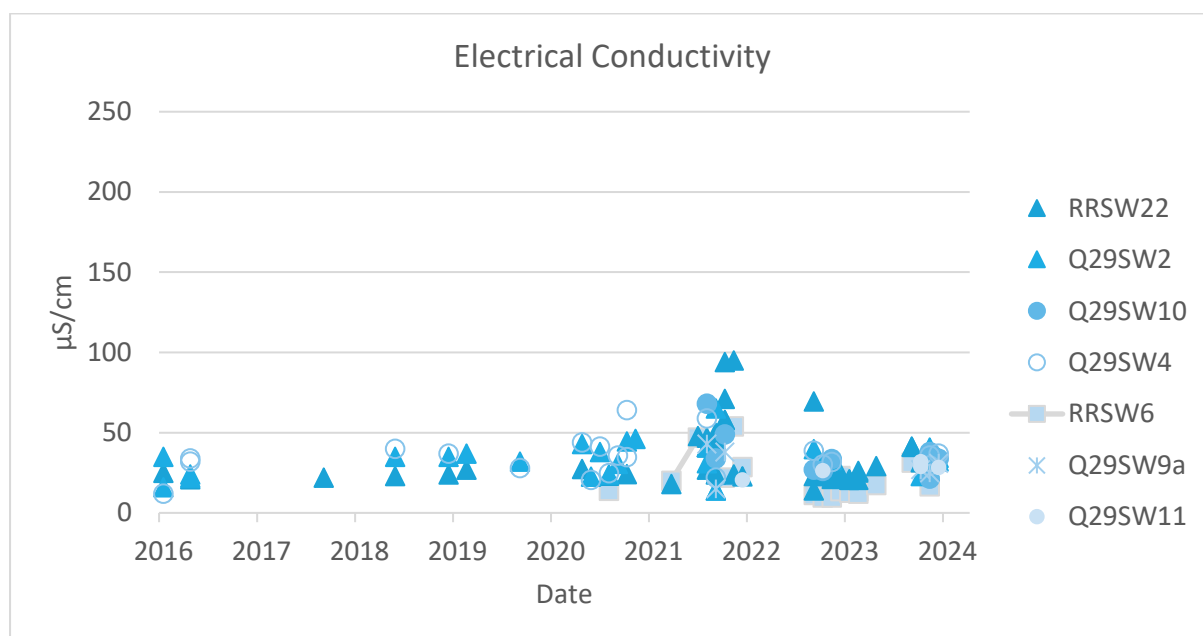


Figure 4-4 Trend analysis for Electrical Conductivity at Monitoring Sites

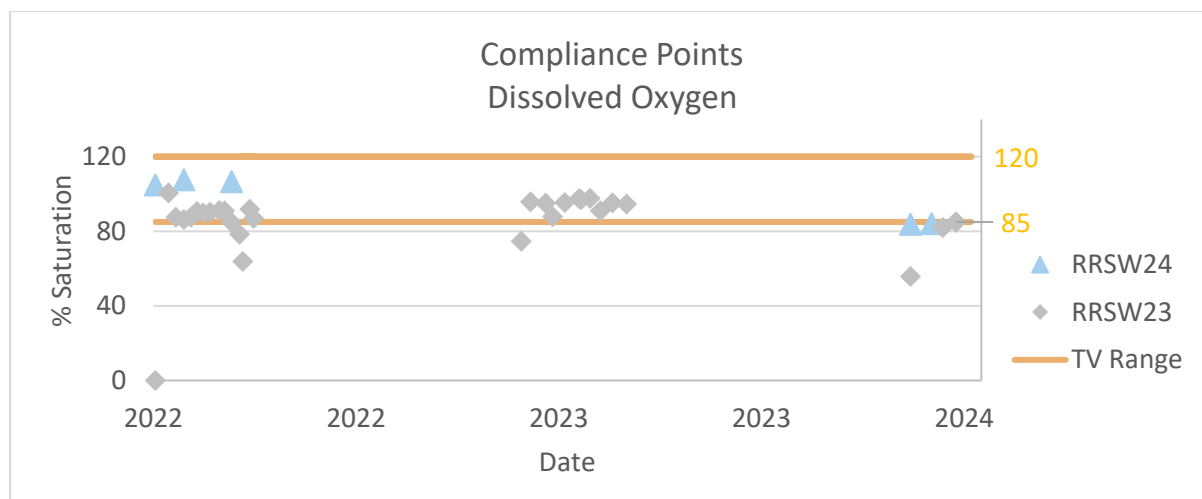


Figure 4-5 Trend analysis for Dissolved Oxygen at Compliance Points

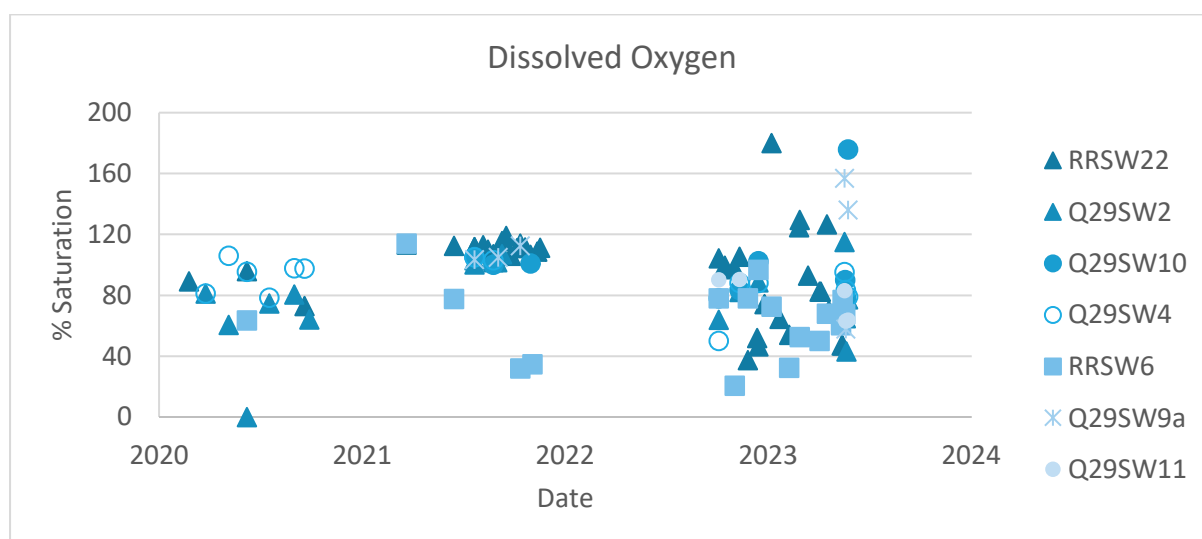


Figure 4-6 Trend analysis for Dissolved Oxygen at Monitoring Sites

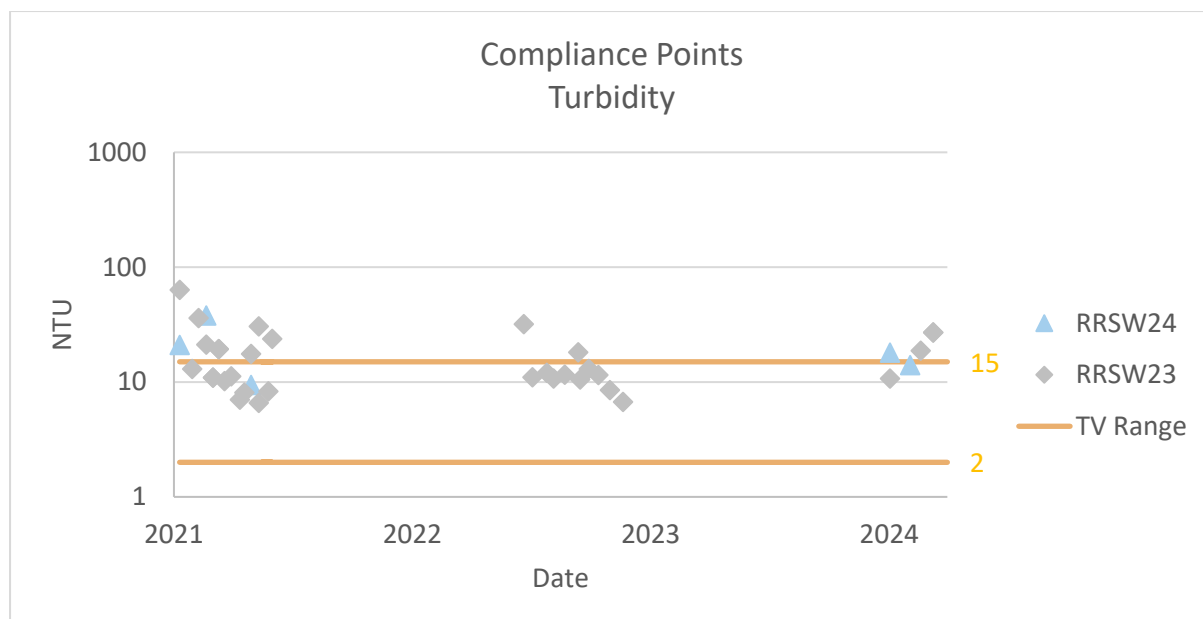


Figure 4-7 Trend analysis for Turbidity at Compliance Points

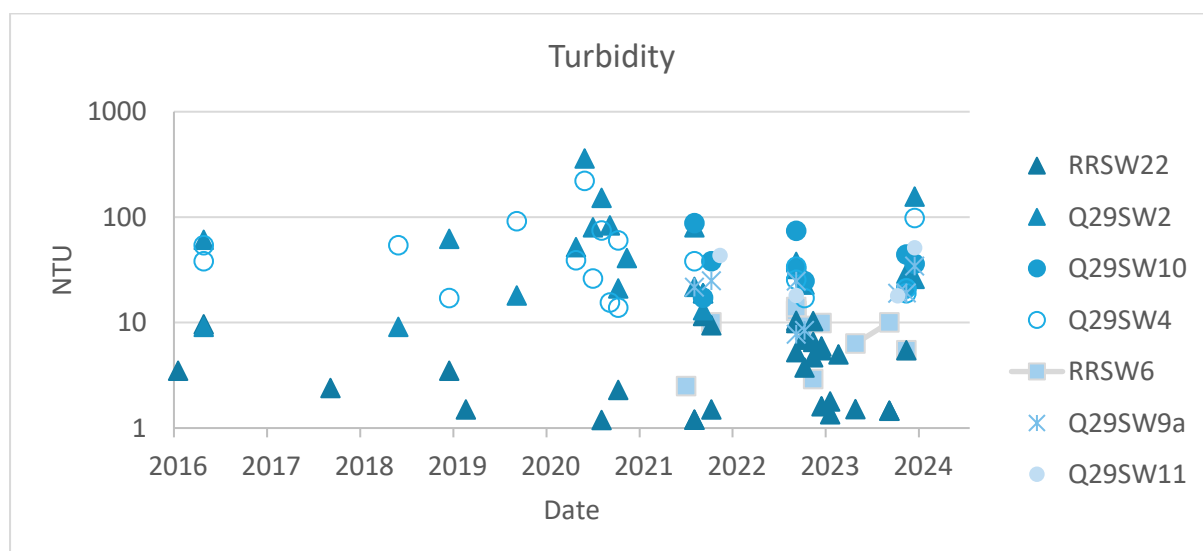


Figure 4-8 Trend analysis for Turbidity at Monitoring Sites

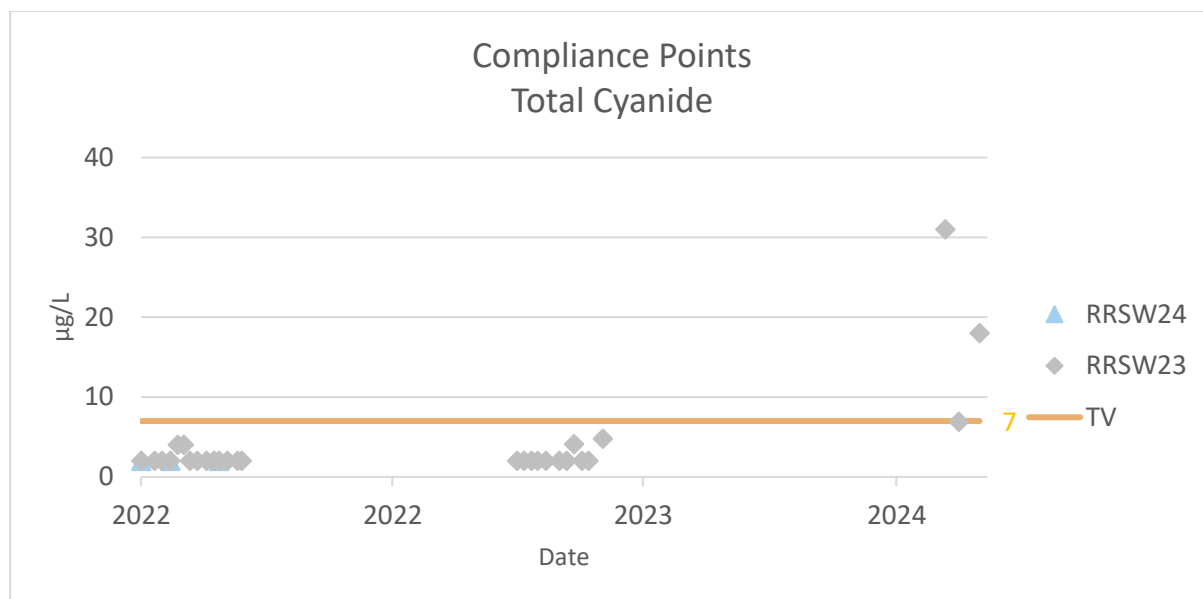


Figure 4-9 Trend analysis for Total Cyanide at Compliance Sites

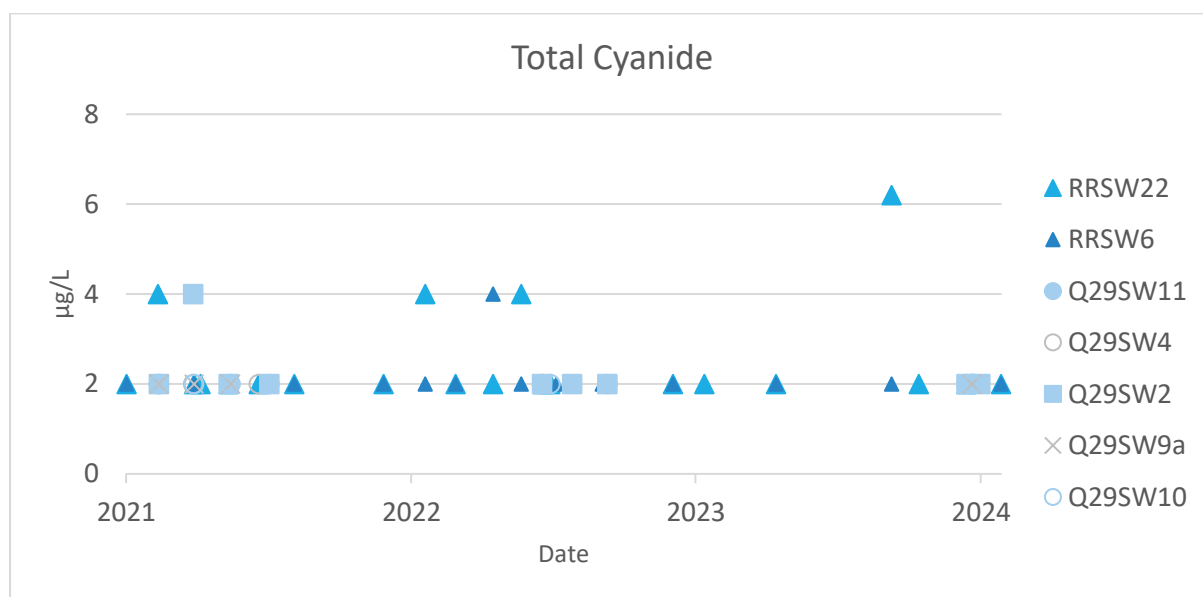
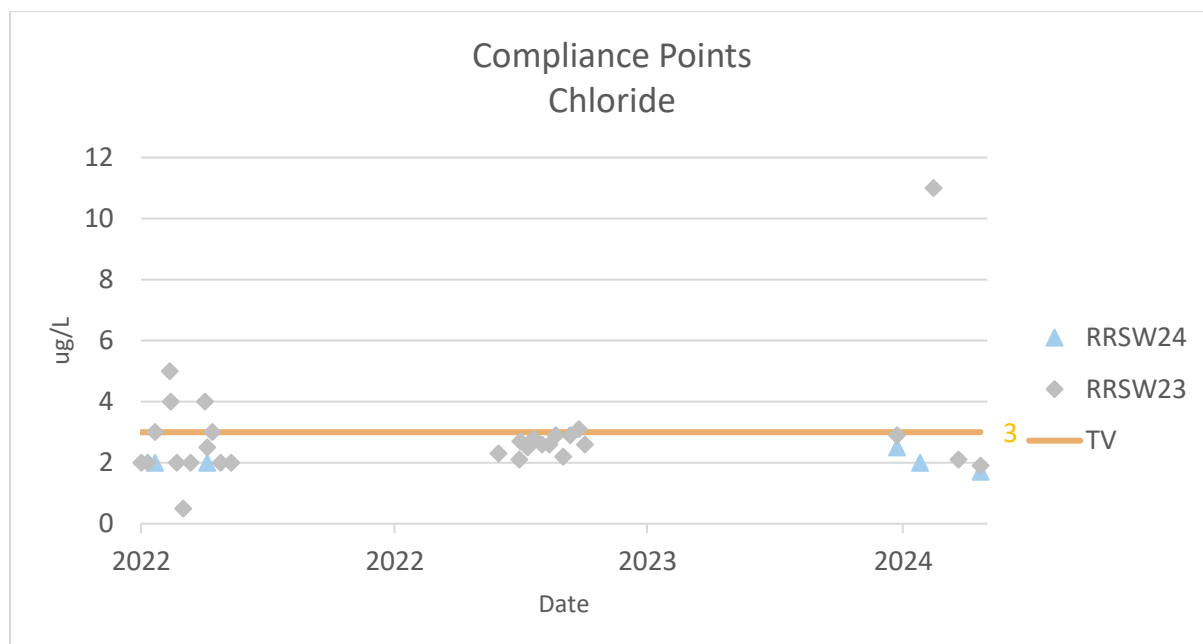


Figure 4-10 Trend analysis for Total Cyanide at Monitoring Sites



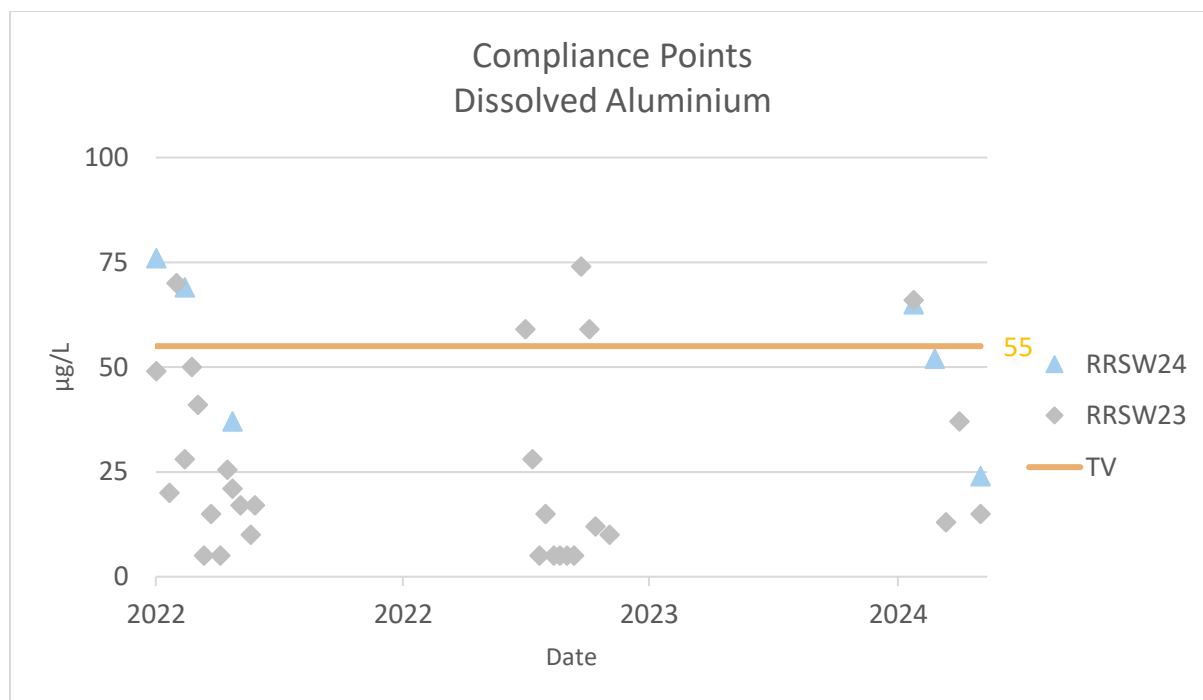


Figure 4-13 Trend analysis for dissolved Aluminium at Compliance Points

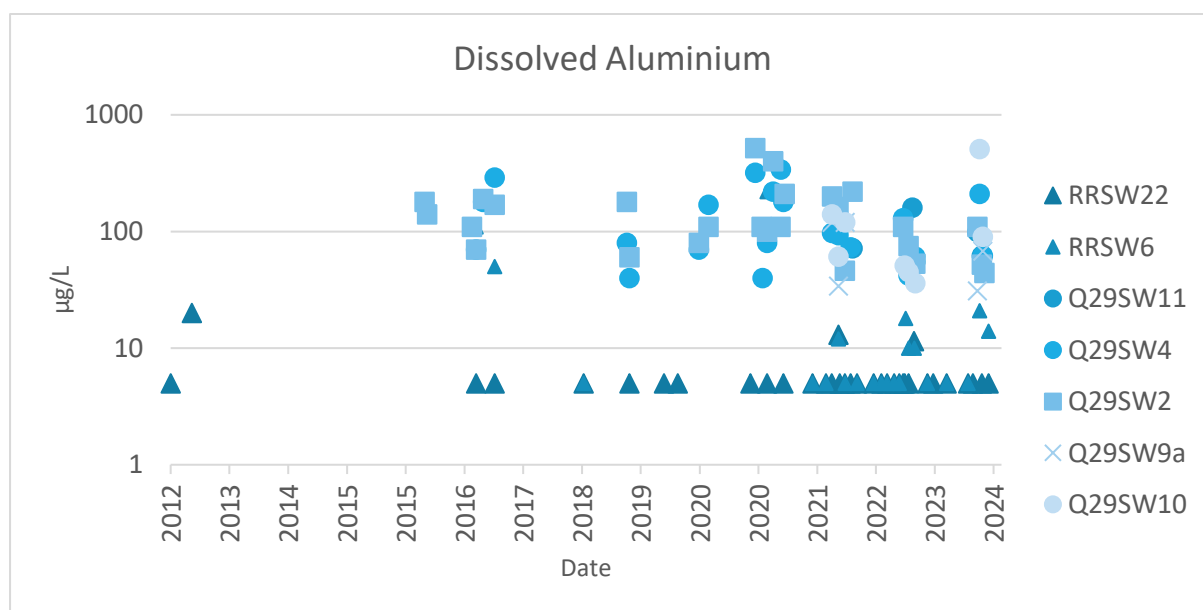


Figure 4-14 Trend analysis for dissolved Aluminium at Monitoring Sites

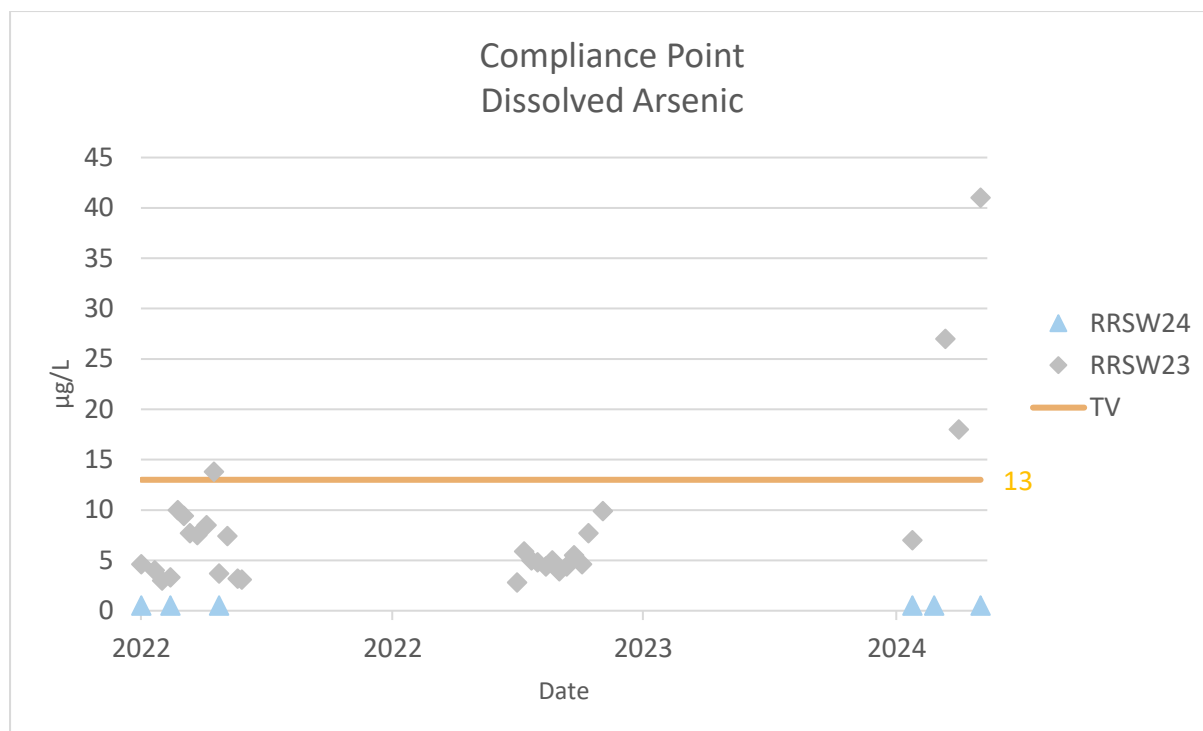


Figure 4-15 Trend analysis for dissolved Arsenic at Compliance Sites

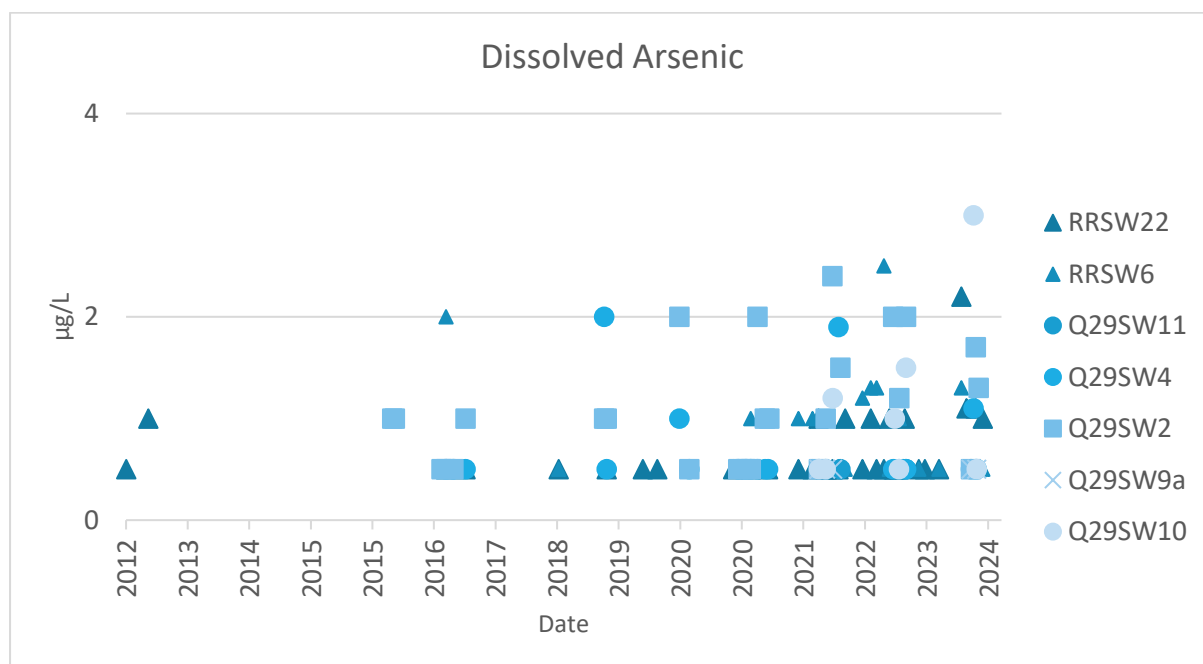


Figure 4-16 Trend analysis for dissolved Arsenic at Monitoring Sites

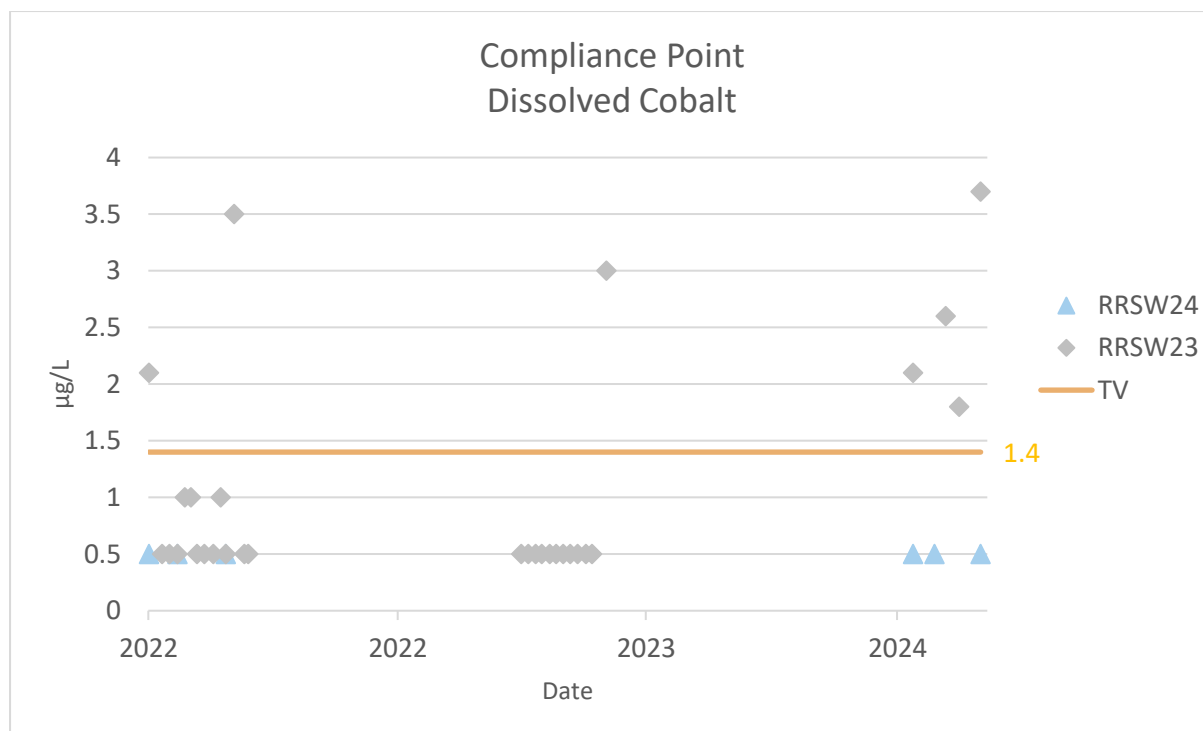


Figure 4-17 trend analysis for dissolved Cobalt at Compliance Sites

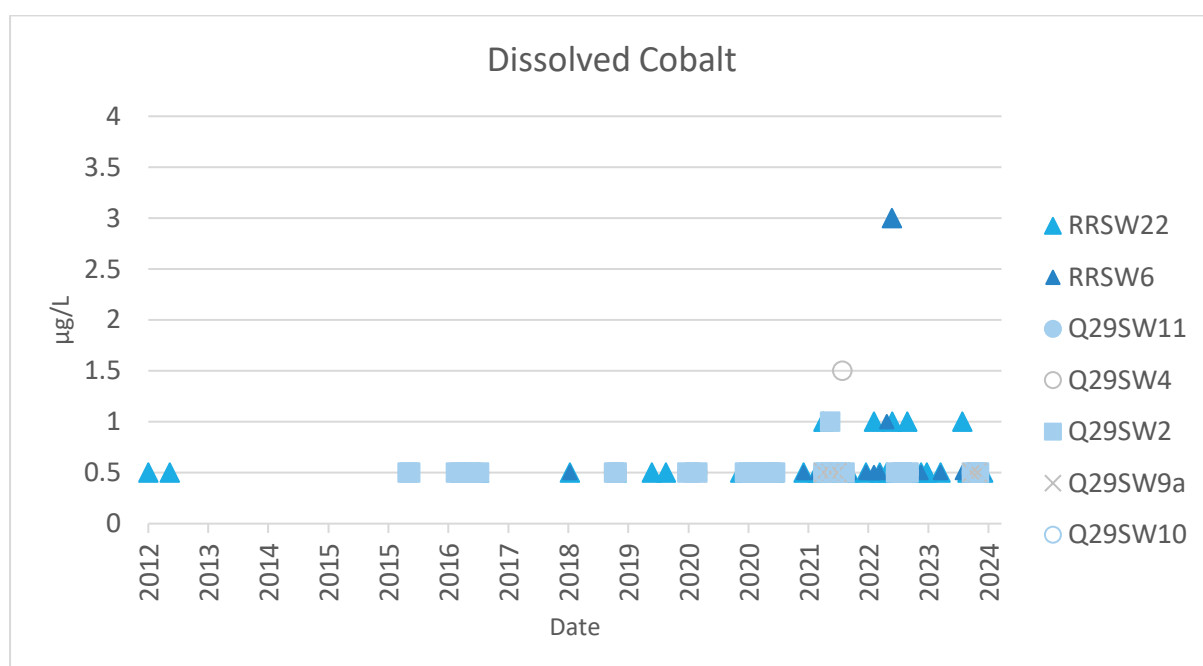


Figure 4-18 Trend analysis for dissolved Cobalt at Monitoring Sites

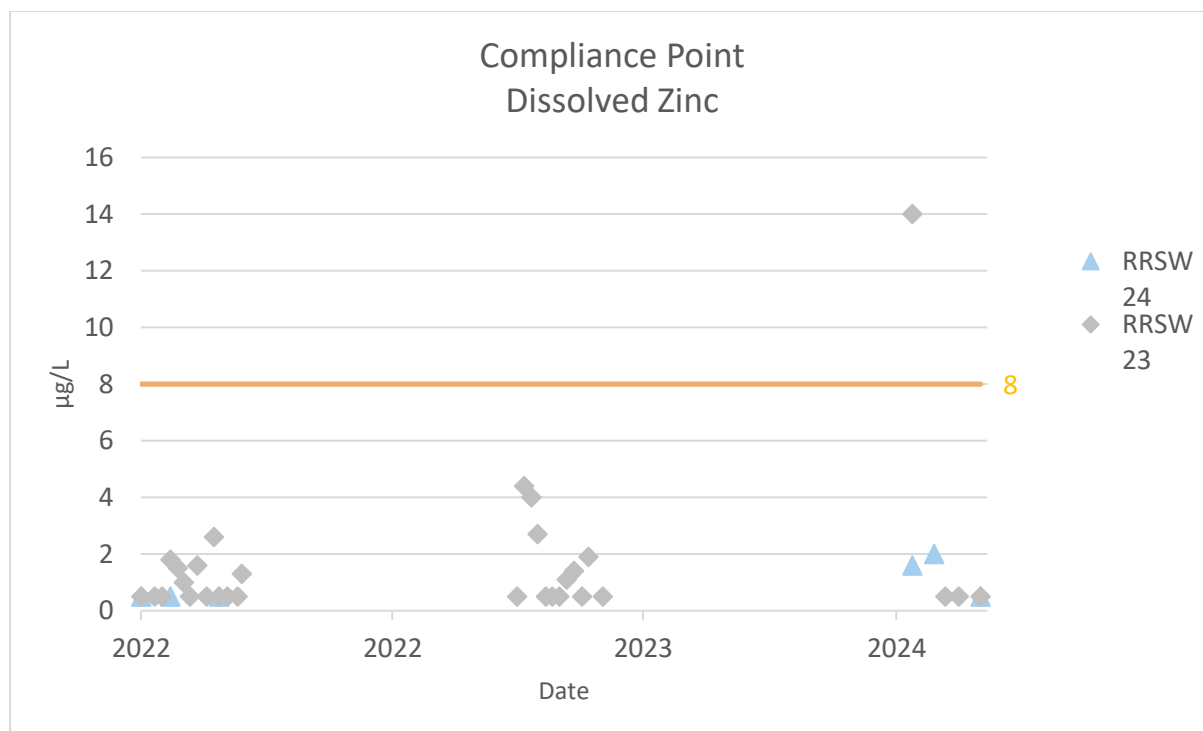


Figure 4-19 Trend analysis for dissolved Zinc at Compliance Sites

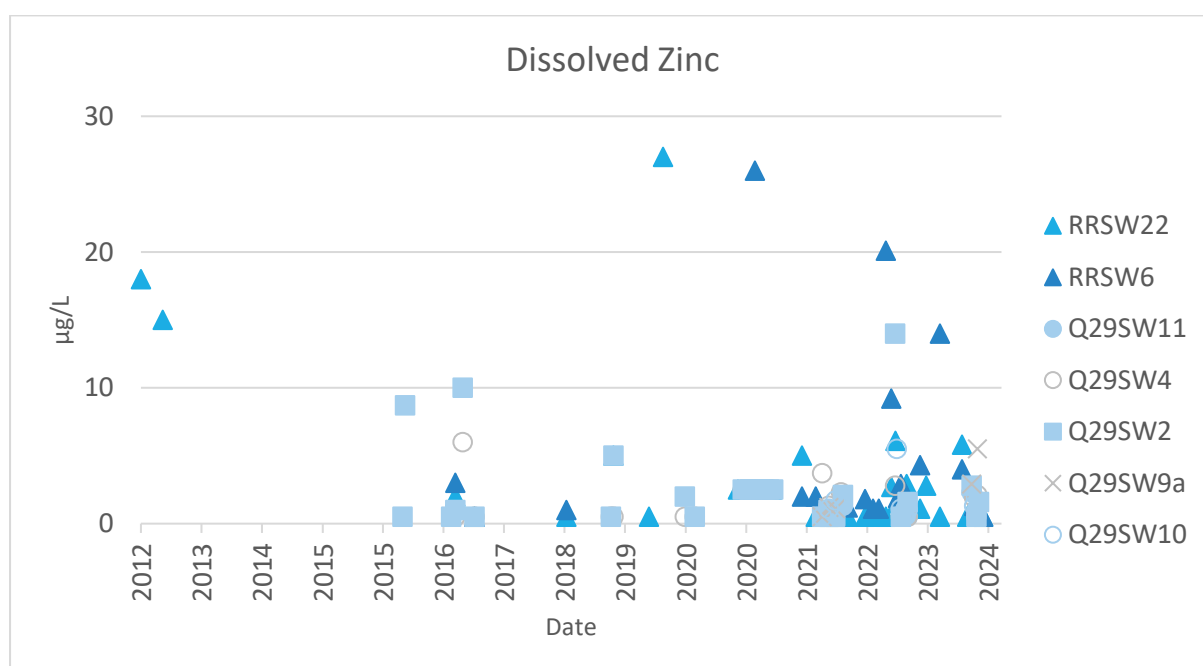


Figure 4-20 Trend analysis for dissolved Zinc at Monitoring Sites

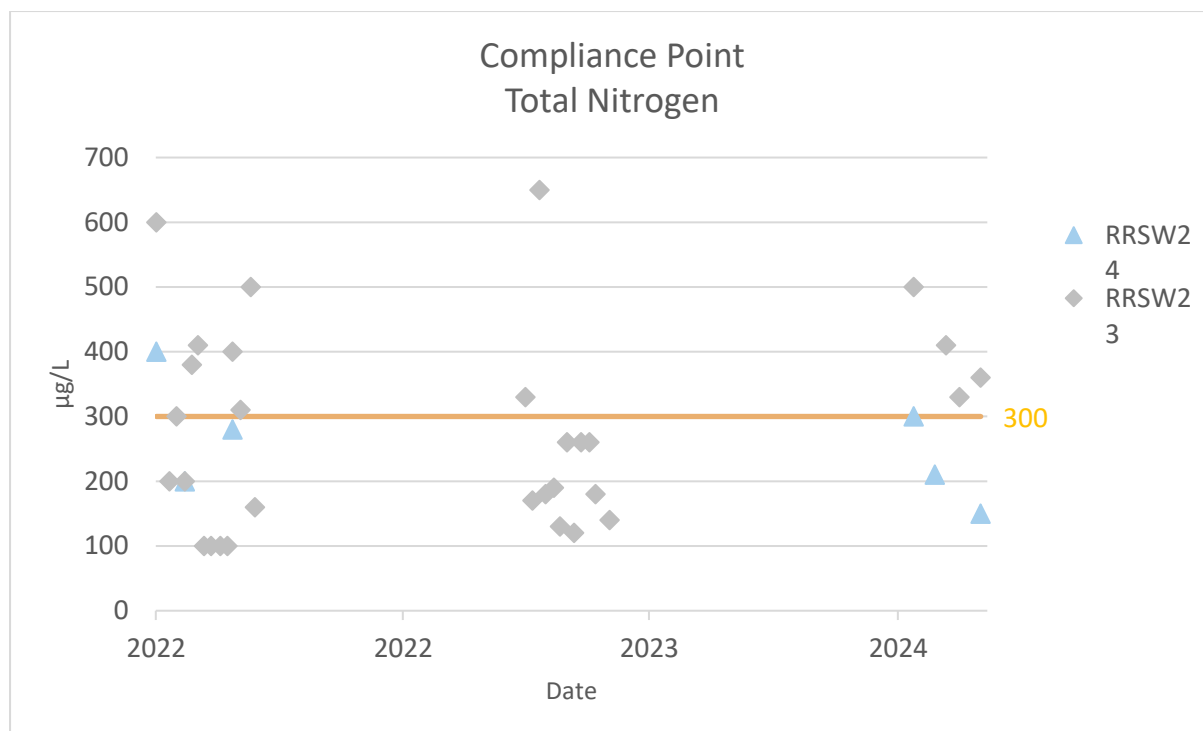


Figure 4-21 Trend analysis for total Nitrogen at Compliance Points

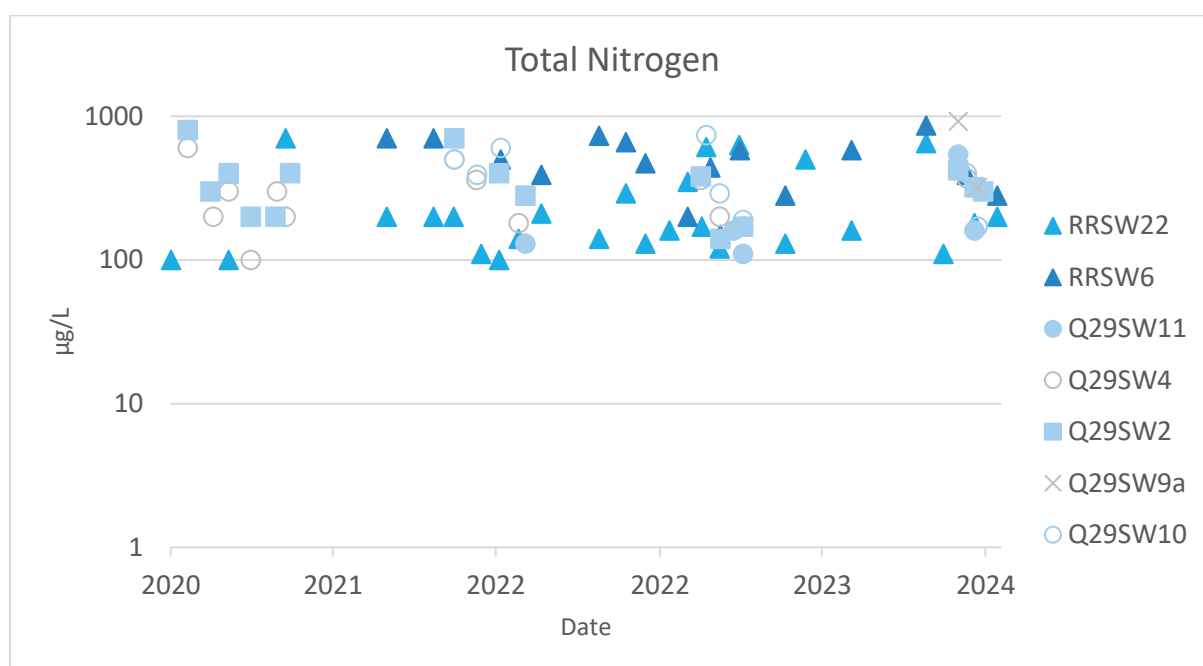


Figure 4-22 Trend analysis for total Nitrogen at Monitoring Sites

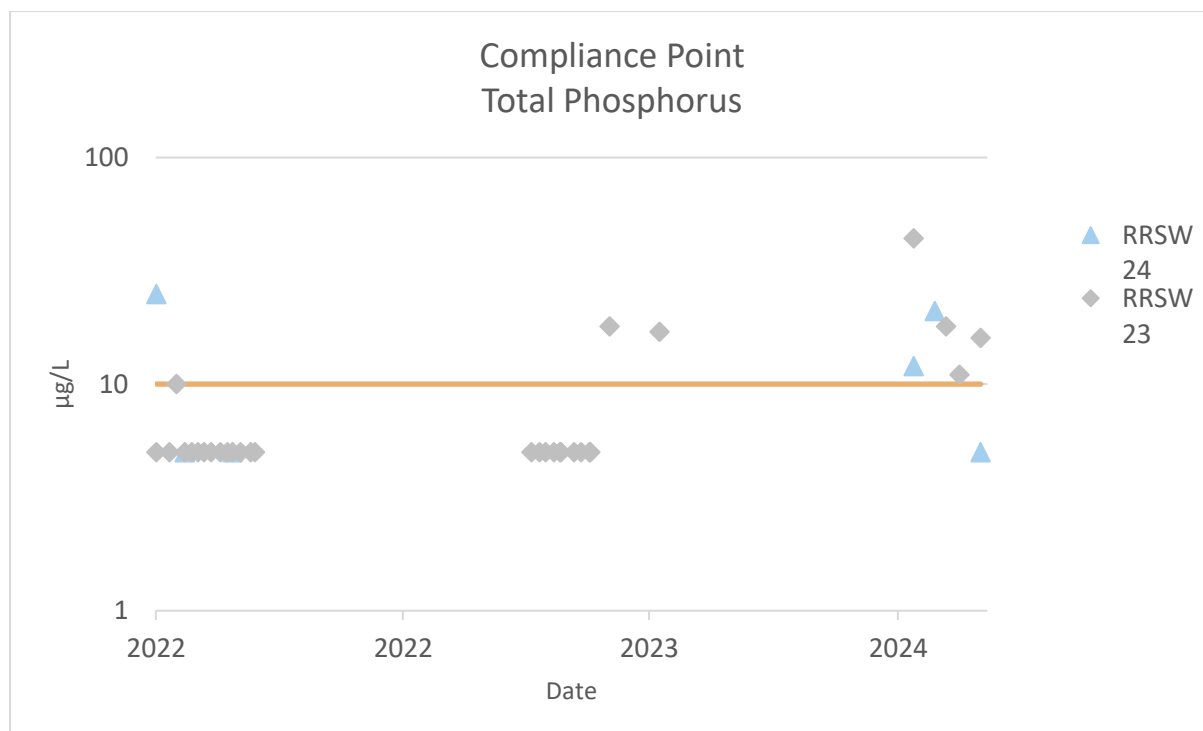


Figure 4-23 Trend analysis for total Phosphorus at Compliance Points

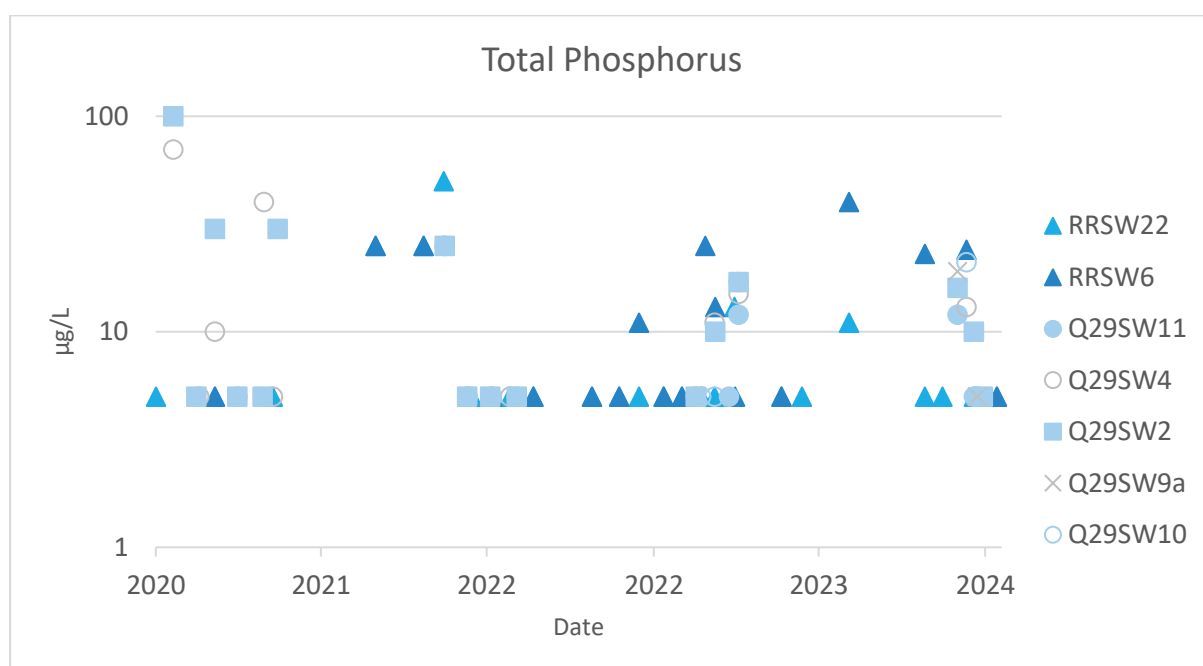


Figure 4-24 Trend analysis for total Phosphorus at Monitoring Sites

4.2.1 Total Loading

No loading calculations were done as there was no active discharge from Rustlers Roost Pit during this reporting period.

4.3 Discussion of Exceedances

There were two exceedance events recorded at Compliance Point RRSW23 for the 2022- 24 reporting period considered notifiable incidents as specified in Condition 26 and 27 of WDL 247-02. Since there was no active discharge to either ADP1 or ADP2 during the reporting period, the likelihood of exceedances as a result of active discharge activities is not applicable. Table 4-5 provides further details of each exceedance of trigger values.

Table 4-5 RRSW23 Compliance Point record of notifiable incidents under WDL 247-02

Sample Date/Time	Analyte	Result	Trigger Value	Detected / Notified	Controlled Discharge	Item
20/01/2024 12.57	Total Phosphorus	44 µg/L	10 µg/L	9/02/2024	No	44.2 exceedance of three times or more a trigger value for parameters specified in Schedule 2 of this Licence for compliance location RRSW23
21/02/2024 11.31	Chloride	11 mg/L	3 mg/L	4/03/2024	No	44.2 exceedance of three times or more a trigger value for parameters specified in Schedule 2 of this Licence for compliance location RRSW23
21/02/2024 11.31	Cyanide	31 µg/L	7 µg/L	4/03/2024	No	44.2 exceedance of three times or more a trigger value for parameters specified in Schedule 2 of this Licence for compliance location RRSW23

4.4 Discussion of Anomalous

Anomalous have been detected in data results at several monitoring sites. Using long term trend graphs, some sites have highlighted anomalies rather than spikes in water quality. RRSW23 in particular shows anomalies in data during the 2020- 21 water monitoring period. Since there have been two other wet seasons captured there is a trend in water quality though the monitoring period shows greater concentrations than the following two wet seasons.

All parameters that were above the RRSW23 TV showed greater variation than long term trends. Electrical conductivity, dissolved oxygen, turbidity, aluminium, total nitrogen, and total phosphorus were the analytes that recorded anomalies.

Q29SW4 and Q29SW2 also recorded anomalies in total phosphorus for the same monitoring period. Continued surface water data collection and analysis together with information gathered from the biological programme will improve understanding long term trends and any potential of risks of environmental harm.

4.5 Discussion of Results and Conclusions

During the reporting period, there was no active discharge from Rustlers Roost Pit. There were two events that triggered reporting to under WDL 247-02 and included exceedances of Total Phosphorus, Cyanide and Chloride at RRSW23. Surface water quality at the compliance and monitoring sites generally remained with the 95% species protection guideline values (ANZG, 2018).

Loading calculations were not performed and are limited to previous years (2020- 2021 and 2022-2023) data trends and total loading calculations from active discharge from ADP2 showing no obvious trend changes to water quality when compared to no active discharge.

Further, in calculation from previous active discharge data active discharge contributed only 9.8% (based on an average flow rate of 165 L/s) of the total water volume flowing through RRSW23, with the remaining 90% from surface runoff, rainfall, and seepage.

It is likely that creek surface water quality in the Mount Bunday catchment area is primarily influenced by a combination of:

- Geochemistry influencing water chemistry.
 - ionic compositions of a mixed type of sodium bicarbonate water type.
 - Dissolved metal values at all monitoring sites short- and long-term median trends for aluminum, arsenic, Iron, manganese, and zinc. The exception at RRSW22 with elevated manganese and zinc long term median trends.
 - Dissolved aluminum long term trends above compliance trigger values at compliance and monitoring sites (upstream and downstream of mine influences).
- Seasonal flows (first flush from pooled areas in creeks and overland flows with elevated nutrient loads and recession flows causing pooling) in the upper Mount Bunday catchment.
- Wet season overland flows and seepage from historical mined domains (Rustlers Roost Heap Leach Pad, Quest 29 northern catchment), with elevated sulphate (So₄) ions short- and long-term trends at RRSW23 and Q29SW4 and below LoR at other monitoring sites. Cyanide levels above LoR at RRSW23, and generally below LoR at all other monitoring sites.
- Active cattle grazing pressures, and presence of feral pests (pigs and buffalo) disturbing land surfaces, (observed grubbing, cattle footprints and scouring at all monitoring sites) affecting physio/chemistry, as shown from long term median for turbidity is above 30 NTU and elevated nutrient loads. RRSW6 (Annie's Dam) recorded the highest long term median values for total nitrogen.

Based on the interpretation of water quality data and site information, the activities under WDL 247/247-02) during 2020-2024 involving the controlled releases/no controlled releases of Rustlers Roost Pit water to Mount Bunday catchment, it is unlikely that contaminant loads from Rustlers Roost pit would have resulted in any adverse impact to aquatic flora or fauna, or contaminant accumulation in the sediments into the receiving

Mount Bundey Creek system. Therefore, it is concluded that there was no harm to or adverse effect on the receiving environment as a result of these activities.

5 Conclusions and Proposed Actions

5.1 Compliance with Assessment Criteria

Compliance with WDL247-02 assessment criteria has been included in Table 5-1. Green coloured dots denote the Condition of the Licence has been met, yellow-coloured dots denote the Condition was partially met and explanatory notes provided., red coloured dots denote the Condition has not been met.

No wastewater discharge occurred at during the reporting period at ADP1 or ADP2. Ccompliance completeness is therefore against the surface waste monitoring sites events, and biological and sediment monitoring programme.

Notification by email to waste@nt.gov.au was provided on 16/01/2023 and acknowledgement from DEPWS was received by email on 17/02/2024. A surrender of Licence was submitted to DEPWS on the 11/03/2024. Routine monitoring as per WDL 247-02 conditions continued up until 21 April 2024 where some monitoring sites ceased flow and inconsistent creek flow in the upper Mount Bunday Creek.

This is the last annual report required under WDL 247-02. Therefore no proposed actions are recommended. PGO will apply for a new WDL for future operational activities.

Table 5-1 Compliance Against Assessment Criteria

WDL 247-02 Monitoring Conditions												
Mount Bunday Creek	Programme sampling locations		C28	C29	C30	C31	C32	C33	C34	C35	C36	C37
	ADP2	Authorised discharge point	-	-	-	-	-	-	-	-	-	-
	RRSW23	Compliance Point	●	●	●	●	●	●	●	●	●	●
	Q29SW2	Information (Monitoring Downstream Point)	●	●	●	●	●	●	●	●	●	●
	Q29SW4	Information (Monitoring Upstream Point)	●	●	●	●	●	●	●	●	●	●
	Q29SW9a	Information (Monitoring Reference Point)	●	●	●	●	●	●	●	●	●	●
	Q29SW10	Information (Monitoring Downstream Point)	●	●	●	●	●	●	●	●	●	●
Marrakai Creek	ADP1	Authorised discharge point	-	-	-	-	-	-	-	-	-	-
	RRSW24	Compliance Point	●	●	●	●	●	●	●	●	●	●
	RRSW25a	Information (Monitoring Reference Point)	●	●	●	●	●	●	●	●	●	●
	RRSW26	Information (Monitoring Downstream Point)	●	●	●	●	-	-	-	-	-	-
Rustlers Roost Pit	RRP (RRSW22)	Information (Monitoring Point)	●	●	●	●	●	●	●	●	●	●
Annies Water Dam	AWD (RRSW6)	Information (Monitoring Point)	●	●	●	●	●	●	●	●	●	●
Explanatory Notes			Insitu probe lost /stolen at RRSW26.	-	Sampling order limited by access track flooding. RRSW6 not able to access due to flooding and track closures	-	-	-	-	-	-	-

5.2 Potential Environmental Harm

Under the *Water Act 1992*, Environmental Harm is defined as:

‘ Any harm to or adverse effect on, or potential harm to or adverse effect on, the environment.’

During the Licence reporting period, there was no controlled discharge of water from Rustlers Roost Pit via ADP1 or ADP2, therefore there was no potential for harm or adverse effect on the environment in the Mount Bunday and Marrakai creek systems. Because water sampling was maintained as per WDL 247-02 Conditions some exceedances of the triggers values at RRSW23 occurred and are detailed in 4.3 of this Report. However overall and comparison to previous water discharge years this decision is based on the following points:

- During the reporting period, exceedances of trigger values at RRSW23 were related to pastoral activities and first flush events.
- Water quality at all monitoring sites were generally with the 95% species protection.
- Few missed monitoring events, and therefore no data gaps, as per schedules 1 and 2.
- Dissolved aluminium median concentrations were elevated across the control and impact creek monitoring sites indicating natural elevations in the catchment soil and mineralogy profiles.
- Elevated turbidity values were consistent across all monitoring sites.

5.3 Major assumptions or uncertainties

5.3.1 Assumptions

In order to meet the WDL 247-02 monitoring objectives the following set of assumptions were followed:

- No wastewater discharge occurred at ADP1 into the Marrakai Creek or ADP2 into Mount Bunday Creek occurred throughout the 2023/24 wet season. Notification by email to environmentalregulation@nt.gov.au was provided on 16/01 2024 and acknowledgement from DEPWS was received by email on 17/01/2024.
- Sample method bias was minimised by having the same consultants conducting the field programme throughout the entire season.
- Field meters and other equipment maintained and calibrated to PGO water sampling programme procedure.
- Field instrumentation (including handheld meters, telemetry equipment and in situ probes) and maintained in accordance with retailers’ instrumentation specification and maintenance documents.

Conclusions and Proposed Actions

- Sampling techniques, as per PGO water sampling programme and guidance with the AS/NZS 5667 and ANZECC/ARMCANZ).
- Sample containers, preservation techniques, holding times compliant with lab specifications.
- The statistical analysis method applied was median values for short- and long-term trend analysis. <LOR readings taken as 0.5 x LoR
- To obtain a representative surface water sample to compare against guideline values and avoid high variability, creek sampling occurred only when creeks at the first flush, in full and recessional flows (not pooled areas), during daylight hours and in the same location where safe to do so.
- No loading calculations were performed as there was no controlled discharge, hence no sample collection, from ADP1 or ADP2.

5.3.2 Uncertainties

Uncertainties regarding the level of direct and indirect impact pastoral activities have on water quality is a critical factor in characterising and measuring the influence mining activities have on sensitive receptors. Difficulties with obtaining measurable comparisons to pre disturbance data availability to compare natural ecological conditions when compared to (ANZG, 2018) 95% trigger value species level of protection for compliance; and choice of suitable background or reference surface water monitoring site (s) not affected by pastoral activities given that active pastoral activities cover the entire area of the Mount Bunday creek sub catchment and most of the Mary River Basin.

Uncertainty using the (ANZG, 2018) default guideline values 95% species protection only to measure ecological protection at all sample sites should be avoided. The use of these parameters as trigger values in ephemeral wastewaters is also not recommended (Smith et al. 2020). Instead a more reliable source of guideline values would include utilising site-specific trigger values (SSTV's) at compliance sites developed where naturally elevated water/sediment chemical and physical properties (beyond natural variation) in the catchment areas such as aluminium and iron concentrations (XXXX); and using median/average values for surface water quality data from (2016-2024).

For monitoring sites, (not intended to assess compliance and depending on type of surface water), applying the ANZG, 2018 livestock drinking water quality guidelines as the upper trigger level (given that the surrounding waterways are routinely used for stock watering) and used as an early warning mechanism to provide insight into potential adverse water quality changes. Then applying a combination of the 80-95% trigger values and SSTV's where water quality sampling indicates on-going values outside of the GV's and/or the long-term site data range.

This would mean that the level of protection of the receiving environment, where minimal change in water/sediment chemical and physical properties beyond current natural variation, is applied for Life of Mine (LOM) and final land use objectives set for ongoing pastoral activity.

5.3.3 Proposed changes and Actions

This is the last EMR required under WDL 247-02. No proposed changes and actions are recommended. PGO will apply for a new WDL for future operational activities and will include any lessons learnt/proposed alternative ideas/samples sites in the new application.

6 Sediment and Macroinvertebrate Monitoring

Aquatic Ecology Services will be conducting the biological monitoring in May 2024 in accordance with Condition 48.2 of the WDL 247-02 involving sediment and macroinvertebrate sampling, analysis and a report will be provided in July 2024 under a separate cover.

7 Incident Reporting

7.1 Incident Response

Under a care and maintenance regime, typical environmental incidents that may occur at RRPA include:

- Waste Discharge Licence noncompliance
- Uncontrolled discharge of wastewater from pipe
- Hydrocarbon spills and leaks from vehicles/machinery/pumps/generators;
- Disturbance/destruction to or contravene the AAPA Certificate, heritage site;
- Destruction to Pastoral Lease holder property (i.e., cattle, fencing, gates, designated access tracks);
- Unauthorised access;
- Wildfires destroying assets (property, pumps, fencing, cattle);
- Breach of leach pond water; and
- Noise and dust complaints.

7.2 Incidents Recorded/ Reported During the Reporting Period

Two exceedances of the trigger values at RRSW23 occurred on the 20/01/2024 and 21/02/2024 during the reporting period that required a notification of the exceedances and submission of investigation reports to DEPWS and DITT. Refer to section 4.3 for full details.

PGO Environment Incident Reporting and Response flowchart is detailed in Table 7-1 and Figure 7-1.

Incident Reporting

Table 7-1 Incident Reporting Contact Details

Cause/incident event	Department	Notification/ Inform	Timeline	Contact
Environmental/ community relations and cultural heritage incidents occurring on and off tenement. An Incident which causes or is threatening or may threaten to cause pollution resulting in material environmental harm or serious harm	NT Department of Industry Tourism and Transport (DITT) Mines Branch- (08) 8999 6528 Emergency outside business hours (8am-7pm ACST)- 0419 036 035	Environmental Incident Report Form (in accordance with Section 29 <i>Mining Management Act</i> 2001) https://nt.gov.au/industry/mining/mining-operations/report-a-mining-environmental-incident	Notification within 24 hours.	e-mail to: mineralinfo.itt@nt.gov.au GPO Box 4550 Darwin NT 0801
Interference, damage, /destruction of a sacred site or unauthorised activity/entry in a restricted work area/ sacred site	Aboriginal Areas Protection Authority- (08) 8999 4365 or 08 8951 5023	Provide the following information (site name, location, type of damage, who discovered damage, who caused damage, witnesses, actions taken to prevent damage, ongoing threats to site) <i>NT Aboriginal Sacred Sites Act</i> 1989 https://www.aapant.org.au/our-services/register-sacred-site#reporting	Notification as soon as possible after first becoming aware of incident.	e-mail to: enquiries.aapa@nt.gov.au GPO Box 1890, Darwin NT 0801

Incident Reporting

Cause/incident event	Department	Notification/ Inform	Timeline	Contact
Interference, damage, removal, destruction, not inform of discovery of Aboriginal or Macassan archaeological objects/places with heritage value.	NT Dept of Territory Families, Housing and Communities (TFHC), Heritage Branch- (08) 8999 5039	Provide the following information to the Heritage Council CEO including the description, location of the Aboriginal or Macassan archaeological object/place, person name and address, owner, or occupier of the place, if known. <i>NT Heritage Act 2011</i> <i>https://tfhc.nt.gov.au/heritage,-libraries-and-archives/heritage-council-members</i>	A report to the CEO within 7 days of discovery of Aboriginal or Macassan archaeological objects/places.	e-mail to: heritagecouncil@nt.gov.au PO Box 4198 Darwin NT 0801
For all mining work- related injury, illness or dangerous incident occurring on and off tenement. Incidents including: - Serious injury or illness; - dangerous incident; - death of a person	NT Work Safe on 1800 019 115 fax (08) 8999 5141 and report a notifiable incident/event. Contact NT police, fire, and emergency services for life-threatening situation on 000 .	Section 35 to 39 Incident Notification form (in accordance the <i>Work Health and Safety (National Uniform Act 2011)</i> of a 'notifiable incident'. <i>https://worksafe.nt.gov.au/forms-and-resources/bulletins/work-health-and-safety-incident-notification</i>	Notification as soon as reasonably practical. And if required by the regulator provide a written notice of the incident within 48 hours of that requirement being made.	e-mail to: NTWorkSafe@nt.gov.au GPO Box 1722 Darwin NT 0801

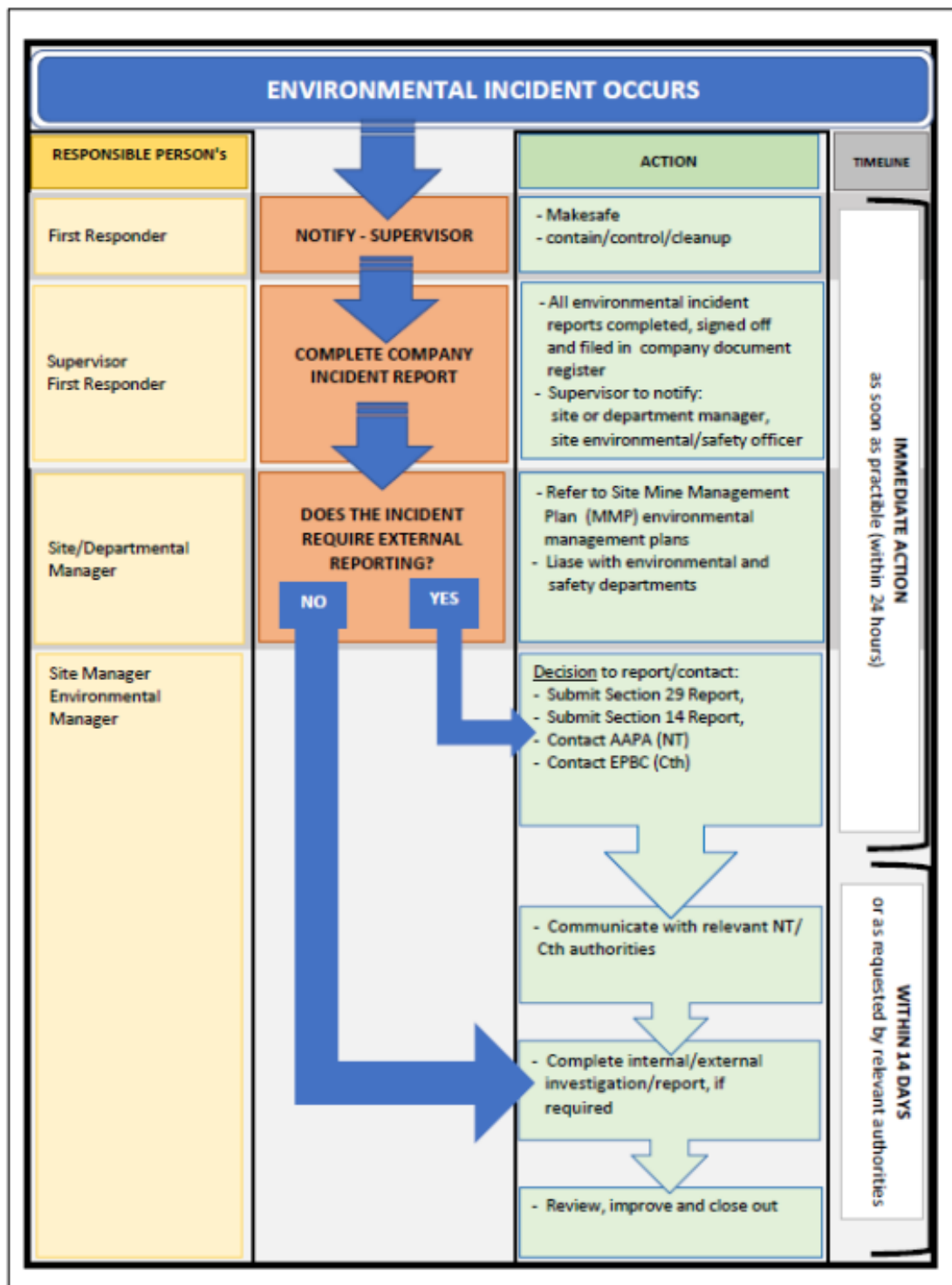


Figure 7-1 Environmental Incident Flowchart

8 Glossary

Abbreviations	Definitions
ADP	Authorised Discharge Point
ANZECC/ ARMCANZ	Australia New Zealand Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand
DEPWS	Department of Environment, Parks, and Water Security
DITT	Department of Industry, Tourism and Trade
EA Act	<i>Environmental Assessment Act 1982 (NT)</i> Please note - This instrument has been Repealed by the Environment Protection Act 2019, NO. 31 which commenced on the 28/06/2020.
EP Act	<i>Environment Protection Act 2019 (NT)</i> In force as of 29/06/2020
EMP	Environmental Management Plan
EMR	Environmental Monitoring Report
GV	Guideline Value
KL	Kilolitre
KL/Sec	Kilolitre per second
Km	Kilometre
LoR	Limits of Reporting
ML	Megalitre
mm	Millimetre
N/A	Not Applicable
NATA	National Association of Testing Authorities
NT EPA	Northern Territory Environment Protection Authority
PL	Pastoral Lease
PGO	Primary Gold Limited
PPL	Perpetual Pastoral Lease
Q29PA	Quest 29 Project Area
RoM	Run of Mine
RRPA	Rustlers Roost Project Area
SoCs	Sites of Conservations Significance
TV	Trigger Values
UTM	Universal Transverse Mercator
WA	<i>Water Act 1999</i>
WRD	Waste Rock Dump

9 References

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10 Appendices

Appendix A. Water Quality Data

Rustlers Roost WDL 247-02 Water Quality data

[illegible]

Rustlers Roost WDL 247-02 Water Quality data

[illegible]

Rustlers Roost WDL 247-02 Water Quality data

[illegible]

Appendix B. Regulatory Communication's Register

Communication Type/Date/ref	Source	Feedback	Action/response and reference in EMR
09/05/2024 (email annual return submission)	PGO to NT EPA	Rustlers Roost PA WDL 247-02 Annual Return submission	Email Ranid May acknowledgment and response 09/05/2024
26/04/2024 (email communications)	PGO to NTEPA	Final monitoring report and annual return. Unable to include the biological information as this will occur in May and report in June. The information will need to be under a separate cover.	Email Ranid May acknowledgment and response 26/04/2024
23/04/2024 (email communications)	PGO to NTEPA	Last discharge date for ADP1 for RR	Email Sally Horsnell acknowledgment and response 23/04/2024
10/04/2024 (email Final Inspection Report)	NTEPA to PGO	NTEPA sent finalised Report	-
21/03/2024 (email Draft Inspection Report)	NTEPA to PGO	Draft submission to PGO for review	Email Sally Horsnell acknowledgment and response 21/03/2024
19/03/2024 (emails Investigation Report)	PGO to NTEPA	Submission of Investigation Report for the trigger values for Chloride and Cyanide three times or more trigger value at RRSW23 on the 21/02/24.	Email received from Ranid May acknowledgement of email received by PGO (20/3/2024)
19/03/2024 (email communications)	NTEPA to PGO	Final report for WDL247-02 requirements. According to Items 12 and 13 in the WDL247-02 'Schedule 1 – Items', the Licensee is required to submit completed 2023 to 2024 Annual Return and Monitoring Report.	Email Sally Horsnell acknowledgment 19/03/2024
11/03/2024 (Email Surrender of WDL)	PGO to NTEPA	PGO surrender of WDL 247-02	Email received from Ranid May acknowledgement of email received by PGO (11/3/2024)
07/03/2024 Email Notification) (environmentalregulation@nt.gov.au)	PGO to NTEPA	Notification for the exceedance of trigger values for chloride and Cyanide on three consecutive occasions at RRSW23	Email received from Ranid May acknowledgement of email received by PGO (05/03/2024)
28/02/2024 Email Communications(Ranid.May@NT.gov.au)	NTEPA to PGO	Sally, as per item 12 on WDL247-02, the Annual Return is due prior the WDL's expiry date i.e. before you surrender the WDL and as per item 13; the Monitoring Report (including a trend analysis and interpretation of all monitoring data required as a condition of the WDL) is due 1 Aug. There are no templates – sorry. Refer to attached NT EPA document/link:	-
15/02/2024 Email Investigation Report (Waste NTEPA)	PGO to NTEPA	Email to Mia Sandgren for the investigation Report for the exceedance of TP more than three times trigger value	Email received from Waste NTEPA acknowledgement of email received by PGO (15/02/2024)
15/02/2024 Email acceptance of meeting	PGO to NTEPA	Primary Gold pre-inspection meet and greet and background brief 19/02/2024	-

Communication Type/Date/ref	Source	Feedback	Action/response and reference in EMR
14/02/2024 Email Investigation Report (environmentalregulation@nt.gov.au)	PGO to NTEPA	Investigation Report for the exceedance of Total Phosphorus more than three times trigger value at RRSW23	Email received from Mia Sandgren acknowledgement of email received by PGO (20/02/2024)
13/02/2024 Email communications (Sally.horsnell@outlook.com)	NTEPA to PGO	Request for date for a Rustlers Roost and Quest 29 inspection 26/02/2024	Email received from S Horsnell acknowledgement of email received by PGO (13/02/2024)
05/02/3034 Email Communications (Ranid.May@nt.gov.au)	PGO to NTEPA	Cancel of the Rustlers Roost WDL 247-02 since there will be no formal discharge this wet season and the fact that the WDL will be ended at the end of this season. How do I go about this process	Email received from Ranid May 'surrender your WDL for Rustlers Roost etc....' (09/02/2024)
05/02/2024 Email Notification (Ranid.May@nt.gov.au)	PGO to NTEPA	Rustlers Roost WDL notification of an exceedance of trigger value reporting even though there is no active discharge	Email received from Ranid May stating that a report is required. (05/02/2024)
16/01/2024 Email Notification (environmentalregulation@nt.gov.au)	PGO to NTEPA	Notification of no wastewater discharge from Rustlers Roost Pit as per WDL247-02	Email received from J. Schult acknowledgement of email received by the Department (17/01/2023)
08/08/2023 Email communications (Jane Orr@nt.gov.au)	PGO to NTEPA	PGO response to Draft Wate Discharge Licence (WDL-02) for Rustlers Roost Mine	-
18/08/2023 Email Notification (Ranid.May@nt.gov.au)	NTEPA to PGO	Rustlers Roost WDL 247-02 – update public register	Email received from S Horsnell acknowledgement of email received by PGO (18/08/2023)
04/08/2023 Email communications (Sallyhorsnell@outlook.com , Charles. Hastie@hanking.com.au)	NTEPA to PGO	Review of Draft Wate Discharge Licence (WDL-02) for Rustlers Roost Mine	Email received from C. Hastie acknowledgement of email received by PGO (04/08/2023)
26/06/2023 meeting	NTEPA to PGO	Compliance assessment for WDL 247 and meeting at NTEPA office	Email received by Sally Horsnell and meeting 26/06/2023.
20/06/2023 Email communications and meeting	NTEPA to PGO	Compliance assessment for WDL 247 and meeting	Email received by Sally Horsnell and meeting 26/06/2023.
14/06/2023 Email communications	NTEPA to PGO	Proposed visit to Rustlers Roost	Email received by Sally Horsnell to confirmed 27 th June for site visit (19/06/2023)
07/06/2023 email communications	NTEPA to PGO	DRAFT Rustlers Roost WDL 247-02 for review	Email received by Sally Horsnell and comments on draft sent (08/06/2023)

PRIMARY GOLD PROJECTS WATER QUALITY PRIMARY GOLD PROJECTS WATER MONITORING PROCEDURE

1.1 Purpose

To ensure all surface water sampling is consistent, representative, undertaken in a safe manner and follows best-practice procedures in accordance with relevant standards.

1.2 Scope

This procedure applies to all surface water sampling undertaken at the Primary Gold mining leases located on the Arnhem Highway, approximately 100 km south-east of Darwin. Primary Gold undertake routine water monitoring of surface water bodies upstream, within and downstream of their mining leases. This procedure applies to all water monitoring including the measurement of water quality parameters in the field, and the collection of water samples for subsequent laboratory analysis.

1.3 Standards and other requirements

To ensure the quality and accuracy of the measurements, sampling procedures have been developed in accordance with the following standards and guidelines:

1. Australian Standard on Water Quality Sampling - *Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples* (AS/NZS 5667.1:1998);
2. Australian Standard on Water Quality Sampling - *Part 4: Guidance on sampling from lakes, natural and man-made* (AS/NZS 5667.4:1998);
3. Australian Standard on Water Quality Sampling - *Part 6: Guidance on sampling of rivers and streams* (AS/NZS 5667.6:1998);
4. Australian Standard on Water Quality Sampling - *Part 10: Guidance on sampling of waste waters* (AN/NZS 5667.10:1998)
5. ANZECC & ARMCANZ 2000, *Australian Guidelines for Water Quality Monitoring and Reporting*, National Water Quality Management Strategy Paper No 7, Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand, Canberra.
6. ANZECC & ARMCANZ 2000, *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, National Water Quality Management Strategy Paper No 4, Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand, Canberra.

1.4 Equipment

The following equipment is required when undertaking surface water sampling at all Primary Gold mine leases:

- **Map** showing monitoring sites
- **GPS** with coordinates uploaded for locating sites
- **Folder/clipboard** and waterproof notebook
- **Stationary:** Pens / pencils, permanent markers for completing sample bottle labelling

- **Sample bottles** obtained from Envirolab, ensuring that specific bottles are obtained for each parameter to be tested and appropriate pre-treatment is undertaken (e.g. preservatives). Remember also to prepare a full set of sample bottles for duplicate samples. Also take some spares, especially the glass bottle types.
- **Eskies** with ice or frozen ice bricks
- **Field meters** (pH, temperature, EC, DO, ORP); calibrated on the day of sampling
- **Calibration solutions** in case of issue with field meters (refer to manufacturers calibration instructions)
- **Camera**
- **Sample pole and Jug**
- **Deionised water** to clean equipment between sample sites
- **Syringes and filters** (for dissolved metals)
- **Powder-free gloves**
- **Spare batteries** for camera, GPS and field test meters
- **Chain of Custody (COC) forms** for Envirolab
- **Plastic sleeves** (snap-lock bags) to protect COC forms inside the eskies
- **Consignment (Con) Notes** for freighting samples to Envirolab
- **Tape and security seal** for eskies; also stickers such as address label, fragile, keep chilled etc.
- **Communications equipment** (e.g. mobile/satellite phone, radio, EPIRB)
- **Personal Protective Equipment (PPE)**
- **Garbage bag** for used filters, syringes, gloves and any other waste generated during sampling.

1.5 Procedure

Preparation

1. Gather all equipment listed in Section 0.
2. Bottles may need to be ordered from Envirolab. Contact the laboratory for advice on what bottles are required (certain analytes require particular bottles and preservatives).
3. Put together a package of sample bottles for each site (i.e. in a large snap-lock bag), including bottles for duplicates.
4. Label each bottle with the site name (or duplicate).
5. For metals, tick the box on the bottle label for either filtered or total, depending on whether samples for metals analysis will be filtered in the field.
6. Calibrate the field test meters (e.g. pH, EC, DO, ORP) according to the manufacturer's instructions.
7. Ensure camera and GPS (if required) are fully charged and have sufficient memory.
8. Depending on the number of sites being sampled, prepare a sufficient volume de-ionised water to use for cleaning sampling equipment in the field.
9. Print out required number of blank Field Data Sheets, COC forms and maps.
10. Ensure that ice bricks have been put in the freezer, or sufficient ice is available to chill samples as they are collected.

Field observations and in-situ parameters

1. Record on field sheets the date, time, site name/number, sampler's name, and field observations such as weather conditions, water colour, clarity, water depth, flow rate, any obvious pollution (e.g. rubbish, odours, surface films etc.), flora/fauna, and any other issues that may affect the samples.
 2. Put on gloves.
-

3. Ideally, in-situ readings (e.g. pH, EC, DO, temperature and ORP) are collected directly from the water body being sampled by immersing the meters in the area to be sampled. However, if safety and/or logistical issues preclude this, field readings may need to be taken from the sampling jug.
4. Record the in-situ parameters just below the water surface (between 0.2 and 0.5 m depth), depending on water depth. Alternatively, if collecting samples from various depths (e.g. depth profiling), ensure the field meter is lowered to the desired depth.
5. If collecting field readings from the sampling jug, collect a representative water sample using the jug mounted on a sampling pole. Ensure that the jug/sampler is fully immersed and rinsed at least three times, tipping the rinse water away from (e.g. on the bank), or downstream of, where the sample is to be collected.
6. If sampling flowing waters, ensure that you are standing downstream of where you are sampling so as not to contaminate the sample.
7. Record all the readings on the Field Data Sheet; one sheet to be filled out per site.

Laboratory sample collection

1. Ensure gloves are on.
2. Take out the snap-lock bag full of sample bottles for the site and fill in any remaining information on the labels with the permanent marker (e.g. time, date, and name of sampler.)
3. Unscrew the cap, making sure not to touch the opening of the bottle with your fingers to avoid contaminating the sample. Put the cap upside-down on a clean surface where it won't pick up any contaminants.
4. If safe to do so (i.e. crocodiles), fill the bottles directly from the water body being sampled; otherwise use the jug on the end of the pole to collect a water sample representative of the site.
5. Fully immerse the sample bottle or jug in the water and rinse at least three times before filling. For sample bottles containing preservatives (e.g. nutrients), do not rinse before filling, use the jug to fill these sample bottles. Bottles should be filled from below the water surface (10-20 cm depending on water depth).
6. Make sure that you are standing downstream of where you are sampling so as not to contaminate the sample.
7. If using the jug, pour the water into each sample bottle.
8. Fill each bottle to the top leaving no headspace and screw on the cap.
9. For samples requiring field filtering (e.g. dissolved metals), draw some water into a syringe, put a filter on the end of the syringe, rinse the filter by pushing a few drops of the sample through onto the ground, then fill the bottle leaving no headspace. Depending on the size of the syringe, it may be necessary to draw several syringes-full of water to fill the sample bottle.
10. Put all the sample bottles back in the snap-lock bag and immediately place them in the esky on ice.

Collection of duplicates

1. For duplicate samples, repeat all the above steps outlined above at the site(s) chosen for these samples (generally at least 1 in 10 sample sites, or one per monitoring event). Label the bottles 'Duplicate' as appropriate. Ensure to note which site these samples were collected at on the Field Data Sheet.

Cleaning of field equipment

1. After sampling each site, rinse all sampling equipment (e.g. jugs) with the deionised water.

2. Dispose of used filters, syringes, and gloves appropriately. Consumables are one use only and fresh gloves, syringes and filters are required at each site.

Sample dispatch

1. Once sampling is completed, pack the samples securely in an esky with ice bricks – note that freight companies generally will not allow ice. Ensure that samples have sufficient contact with the ice bricks to stay as cool as possible.
2. Fill out the COC, put in a plastic sleeve (snap-lock bag) and place inside the esky.
3. Tape up the esky and put on address label and stickers as appropriate (e.g. fragile, keep chilled).
4. Fill out consignment note and stick on esky.
5. Deliver samples direct to freight company or organise pick-up, ensuring that samples will be dispatched in time to meet laboratory holding times (usually by 16:00 on day of sampling for overnight priority service).
6. Note that sample dispatch on Friday and Saturday is not acceptable as samples will not be delivered to labs until Monday morning. Therefore, samples with short holding times (i.e. nutrients) cannot be collected on Friday or Saturday. Other parameters with longer holding times can be kept in fridge until dispatch on Sunday or Monday.

Data management

7. All field sheets should be scanned and saved for future reference, and all photographs are to be saved and labelled according to the relevant site name.
1. Field data and site observations are to be recorded in the Water Quality Database immediately following monitoring.
2. Upon receipt of laboratory results, enter data into the Water Quality Database. All laboratory documents (e.g. results, sample receipt notices, certificate of analysis and QA/QC information) should be grouped and saved in the same folder as the database.
3. Data should be compared to guideline values in the database. Any exceedances of guideline values are to be highlighted in red.
4. Data is analysed annually for reporting in the MMP.

1.6 Monitoring program

All Primary Gold mining leases use the following key for water quality analysis.

Appendix D. Monitoring Performance QA/ QC

- Missed opportunity
- Monitoring event captured

No.	Site	Date	Field Comments	Performance indicator	Event	Frequency	Parameter
1.	ADP1				No discharge	ADP1	
2.	ADP2				No discharge	ADP2	
3.	RRSW22	22/08/2023	Sample /fields	■	No Pump operation	M,W	1,2,3,4,5
4.	RRSW22	09/09/2023	Sample /fields	■	No Pump operation	M,W	1,2,3,4,5
5.	RRSW22	06/10/2023	Sample /fields	■	No Pump operation	M,W	1,2,3,4,5
6.	RRSW22	11/12/2023	Sample /fields	■	No Pump operation	M,W	1,2,3,4,5
7.	RRSW22	06/01/2024	Sample /fields	■	No Pump operation	M,W	1,2,3,4,5
8.	RRSW22	21/02/2024	Sample /fields	■	No Pump operation	M,W	1,2,3,4,5
9.	RRSW22	26/03/2024	Sample /fields	■	No Pump operation	M,W	1,2,3,4,5
10.	RRSW22	20/04/2024	Sample /fields	■	No Pump operation	M,W	1,2,3,4,5
11.	RRSW23	20/01/2024	Sample /fields	■	Flowing	M,W	1,2,3,4,5
12.	RRSW23	21/02/2024	Sample /fields	■	Flowing	M,W	1,2,3,4,5
13.	RRSW23	05/03/2024	Sample /fields	■	Flowing	M,W	1,2,3,4,5
14.	RRSW23	26/03/2024	Sample /fields	■	Flowing	M,W	1,2,3,4,5
15.	RRSW23	20/04/2024	Sample /fields	■	Pooled	M,W	1,2,3,4,5
16.	Q29SW2	28/01/2024	Sample /fields	■	Flowing	M	1,2,3,4,5
17.	Q29SW2	21/02/2024	Sample /fields	■	Flowing	M	1,2,3,4,5
18.	Q29SW2	05/03/2024	Sample /fields	■	Flowing	M	1,2,3,4,5
19.	Q29SW2	20/03/2024	Sample /fields	■	Flowing	M	1,2,3,4,5
20.	Q29SW2	20/04/2024	Sample /fields	■	pooled	M	1,2,3,4,5
21.	Q29SW9a	28/01/2024	Sample /fields	■	Flowing	M	1,2,3,4,5
22.	Q29SW9a	26/02/2024	Sample /fields	■	Flowing	M	1,2,3,4,5
23.	Q29SW9a	20/03/2024	Sample /fields	■	Flowing	M	1,2,3,4,5
24.	Q29SW9a	21/04/2024	No sample	■	pooled	M	1,2,3,4,5
25.	Q29SW10	10/02/2024	Sample /fields	■	Flowing	M	1,2,3,4,5
26.	Q29SW10	26/02/2024	Sample /fields	■	Flowing	M	1,2,3,4,5

No.	Site	Date	Field Comments	Performance indicator	Event	Frequency	Parameter
27.	Q29SW10	20/03/2024	Sample /fields	■	Flowing	M	1,2,3,4,5
28.	Q29SW10	20/04/2024	Sample /fields	■	Flowing	M	1,2,3,4,5
29.	Q29SW11	28/02/2024	Sample /fields	■	Flowing	M	1,2,3,4,5
30.	Q29SW11	21/02/2024	Sample /fields	■	Flowing	M	1,2,3,4,5
31.	Q29SW11	20/03/2024	Sample /fields	■	Flowing	M	1,2,3,4,5
32.	Q29SW11	20/04/2024	Sample /fields	■	Flowing	M	1,2,3,4,5
33.	Q29SW4	10/02/2024	Sample /fields	■	Flowing	M	1,2,3,4,5
34.	Q29SW4	26/02/2024	Sample /fields	■	Flowing	M	1,2,3,4,5
35.	Q29SW4	20/03/2024	Sample /fields	■	Flowing	M	1,2,3,4,5
36.	Q29SW4	20/04/2024	Sample /fields	■	Flowing	M	1,2,3,4,5
37.	RRSW6	07/01/2024	Sample /fields	■	No overflow spillway	M	1,2,3,4,5
38.	RRSW6	10/02/2024	Sample /fields	■	Overflowing spillway	M	1,2,3,4,5
39.	RRSW6	26/03/2024	Sample /fields	■	Overflowing spillway	M	1,2,3,4,5
40.	RRSW6	20/04/2024	Sample /fields	■	Overflowing spillway	M	1,2,3,4,5
41.	RRSW24	20/01/2024	Sample /fields	■	Flowing	M	1,2,3,4,5
42.	RRSW24	10/02/2024	Sample /fields	■	Flowing	M	1,2,3,4,5
43.	RRSW24	26/03/2024	Sample /fields	■	Flowing	M	1,2,3,4,5
44.	RRSW24	20/04/2024	Sample /fields	■	Flowing	M	1,2,3,4,5
45.	RRSW25a	20/01/2024	Sample /fields	■	Flowing	M	1,2,3,4,5
46.	RRSW25a	10/02/2024	Sample /fields	■	Flowing	M	1,2,3,4,5
47.	RRSW25a	26/03/2024	Sample /fields	■	Flowing	M	1,2,3,4,5
48.	RRSW25a	20/04/2024	No sample	■	dry	M	1,2,3,4,5
49.	RRSW26	28/01/2024	Continuous	■	-	M	1,2,3,4,5

Appendix E. WDL247-02 Surface Water Monitoring Locations
2024

Marrakai Creek System 2024			
RRSW25a - Reference			
 RRSW25a – 07 January 2024	 RRSW25a – 10 February 2024	 RRSW25a – 26 March 2024	 RRSW25a – 20 April 2024
RRSW24 - Compliance			
 RRSW24 – 07 January 2024	 RRSW24 – 10 February 2024	 RRSW24 – 26 March 2024	 RRSW24 – 20 April 2024

RRSW6 – Annies Dam



RRSW6 – 7 January 2024



RRSW6 – 10 February 2024



RRSW6 (Annies Dam) – 26 March 2024



RRSW6 – 20 April 2024

Rustlers Roost Pit 2024			
 RRSW22 - 6 January 2024	 RRSW22 – 21 February 2024	 RRSW22 – 26 March 2024	 RRSW22 – 20 April 2024
Mount Bunday Creek System 2024			
RRSW23 - Compliance			
 RRSW23 -20 January 2024	 RRSW23 – 21 February 2024	 RRSW23 – 26 March 2024	 RRSW23 – 20 April 2024

Q29SW11 – Upstream Reference site



Q29SW11-09 January 2024



Q29SW11 –28 January 2024



Q29SW11 -21 February 2024



Q29SW11 – 21 April 2024

Q29SW4 – Upstream Reference

no access to take photo



Q29SW4 – 10 February 2024



Q29SW4 – 20 March 2024



Q29SW4 –21 April 2024

Q29SW2 – (Mertens Bridge) Downstream



Q29SW2 8 January 2024



Q29SW2- 28 January 2024



Q29SW2- 21 February 2024



Q29SW2 – 20 April 2024

Q29SW9a - Reference



Q29SW9a 28 January 2024



Q29SW9a – 10 February 2024



Q29SW9a – 20 March 2024



Q29SW9a – 20 April 2024

Q29SW10 - Downstream

No access to take photo



Q29SW10 – 10 February 2024



Q29SW10 – 20 March 2024



Q29SW10 -20 April 2024