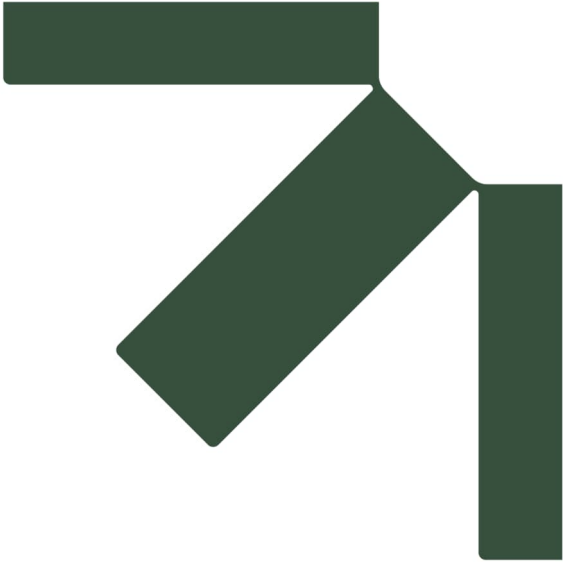




Attachment 9 Casuarina Groundwater Monitoring, October 2022 to October 2024 (SLR, 2025)

**Casuarina South Precinct Residential Development - Lots
110, 111, 108 and 114 Lugg Place**

EPBC Act Referral Form

316 Property Developments Pty Ltd and 316 Property Group Pty Ltd

SLR Project No.: 675.073556.00001



Casuarina Groundwater Monitoring October 2022 to October 2024

Casuarina 6167, WA

Various Landowners (Casuarina LSP Area)

Casuarina Local Structure Plan Area

Prepared by:

SLR Consulting Australia

SLR Project No.: 675.0729597.00001

Client Reference No.: XXXX

13 May 2025

Revision: 1

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
1	17 December 2024	D. Jarvis	S. Hyde	S. Hyde
1	13 May 2025	D. Jarvis	S. Hyde	S. Hyde

Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Various Landowners (Casuarina LSP Area) (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work



Table of Contents

Basis of Report	i
1.0 Introduction	1
1.1 Objectives	1
1.2 Scope of Works	1
2.0 Site Environmental Setting	3
2.1 Climate	3
2.2 Rainfall (Oct 2022 to Oct 2024)	4
2.3 Surrounding Land Uses.....	4
2.3.1 Current Land Use	4
2.3.2 Historical Land Uses	4
2.3.3 Surrounding Land Uses.....	4
2.4 Topography.....	4
2.5 Regional Geology and Soils	5
2.5.1 Soil Landscape and Land Systems	5
2.5.2 Acid Sulfate Soils	5
2.5.3 Hydrogeology	5
2.6 Site Location and Monitoring Locations	6
3.0 Sampling and Analysis	7
3.1 Groundwater Monitoring Locations.....	7
3.2 Surface Water Locations	7
3.3 Sampling Methods.....	7
3.4 Laboratory Analysis.....	8
3.5 Assessment Criteria	8
4.0 Groundwater Quality Data Usability and Validity.....	9
4.1 Field QA/QC Compliance	9
4.2 Elevated RPDs	10
4.3 Laboratory QA/QC.....	10
4.4 Data Usability Evaluation.....	10
5.0 Groundwater and Surface Water Level Results	11
5.1 Groundwater Levels (Oct 2022 to Oct 2024)	11
5.2 Surface Water Levels (Oct 2023 to Oct 2024)	13
5.3 Controlled Groundwater Levels (Oct 2022 to Oct 2024)	13
6.0 Groundwater Level Contours	14
6.1 Maximum GWL Contours (2022-2024)	14



6.2	Depth to Maximum GWL Contours (2022-2024).....	15
6.3	Minimum GWLs Contours (2022-2024)	16
7.0	Groundwater Quality	17
7.1	Groundwater Quality – Field Measured Parameters	17
7.2	Groundwater Quality – Laboratory Analytical Results	18
8.0	Key Findings.....	19
8.1	Groundwater Levels	19
8.2	Surface Water Levels	19
8.3	Controlled Groundwater Levels	19
8.4	Groundwater Quality	20
9.0	Bibliography	21

Tables in Text

Table 1	Summary groundwater monitoring program.....	1
Table 2:	Jandakot Aero (Station 9172) Monthly Rainfall (2021 to 2024).....	4
Table 3:	Groundwater Monitoring Bore Survey Data.	7
Table 4:	Surface Water Location Survey Data	7
Table 5	Field QA/QC Compliance	9
Table 6	Field QA/QC Sample Compliance	9
Table 7	Laboratory QA/QC Summary Table.....	10
Table 8:	Groundwater Levels - Results Summary	11
Table 9:	Surface Water Levels - Results Summary	13
Table 10:	GWQ Field Measured Parameters	17

Figures in Text

Figure 1:	Long term and Monthly Total Rainfall, Maximum and Minimum Temperatures for Jandakot Aero (Station 9172).	3
Figure 2:	Site Location and Monitoring Locations.....	6
Figure 3:	Groundwater Levels (2022-2024) in mAHD.....	12
Figure 4:	Maximum GWL Contours in mAHD (2022-2024).....	14
Figure 5:	Depth to Maximum GWL Contours in mbgl (2022-2024)	15
Figure 6:	Minimum GWL Contours in mAHD (2022-2024).....	16



Appendices

Appendix A	Field Documentation
Appendix B	Laboratory Documentation
Appendix C	Groundwater & Surface Water Levels, Physico-Chemical Tables
Appendix D	Groundwater Quality and QA/QC Tables



1.0 Introduction

SLR Consulting Australia Pty Ltd conducted monthly groundwater monitoring events (GMEs) at the Casuarina South area, northeast of the Kwinana Freeway and Mortimer Road, Western Australia referred to herein as the 'site'. This report compiles data from all three phases of GMEs conducted on site since October 2022 to support the preparation of a Structure Plan developed by Burgess Design Group (BDG). The groundwater monitoring results will inform the Local Structure Plan (LSP) and the Local Water Management Strategy (LWMS).

The groundwater monitoring was conducted in three different phases:

- Phase 1 October 2022 to March 2023
- Phase 2 July 2023 to October 2023
- Phase 3 May 2024 to October 2024

1.1 Objectives

The objectives of the GMEs were to provide groundwater level and water quality data to inform the development of the Local Structure Plan and the LWMS as required.

1.2 Scope of Works

The following scope of work was undertaken during the phase three (3) of GME:

- Present the results of two years of groundwater monitoring events (GMEs) of six bores at the site and two surface water locations.
 - Monthly measurement of groundwater water levels (GWLs) and surface water levels (SWLs),
 - monthly monitoring field physicochemical parameters [temperature, pH, electrical conductivity (EC), oxidation/reduction potential (ORP) and dissolved oxygen (DO)].
 - Periodic monitoring of groundwater quality with sample collection by low flow pumping methods, and submission of groundwater samples to a NATA accredited laboratory for analysis of a range of parameters as presented in **Table 1**.
- Preparation of this groundwater monitoring report for provision to the Burgess Design Group.

Table 1 Summary groundwater monitoring program

Bore ID	Parameter	Unit	Frequency
MC4, MB5, MB6, MB7, MB20 and MB21	Standing Water Level (SWL)	mAHD	Monthly
	Water temperature	°C	Oct 2022 (MC4, MB5, MB6 and MB7 only), Jul 2023, Aug 2023,
	Dissolved Oxygen	mg/L	
	Specific Conductivity	(µS/cm)	
	pH	pH Unit	



Bore ID	Parameter	Unit	Frequency
	Oxidation Reduction Potential (ORP)	mV	Sep 2023, Jun 2024, Sep 2024.
	Field Observation	---	
	Total suspended Solids (TSS)	mg/L	
	Nutrient (Ammonia as N, Nitrate as N, Nitrite as N, NOx-N, total Kjeldahl nitrogen, total nitrogen)	mg/L	
	Nutrient (total phosphorus, filterable reactive phosphorus)	mg/L	
	Alkalinity (bicarbonate, carbonate, hydroxide, total alkalinity)	Mg CaCO3/L	
	Major ions (Aluminium, Iron, calcium, magnesium, potassium, sodium, bromide, chloride, sulfate)	mg/L	



2.0 Site Environmental Setting

2.1 Climate

The Site is located within a warm Mediterranean climate with warm summers and cool winters. The nearest long-term Bureau of Meteorology (BoM) weather station with a complete dataset is Jandakot Aero (Station 9172), located approximately 17 km northeast of the Site.

The temperature statistics use data from 1989 to 2024, and the rainfall statistics use data from 1972 to 2024 (BoM, 2024).

The mean annual maximum and minimum temperatures are 24.7°C and 11.7°C, respectively (**Figure 1**). The long-term mean maximum temperature ranges from 18.1°C (July) to 31.7°C (February). The long-term mean minimum temperature ranges from 7.2°C (July) to 17.2°C (February).

The long-term average annual rainfall in the area is 812.1 mm and the average annual rain days for the station is 108.5 days per year (BoM, 2024).

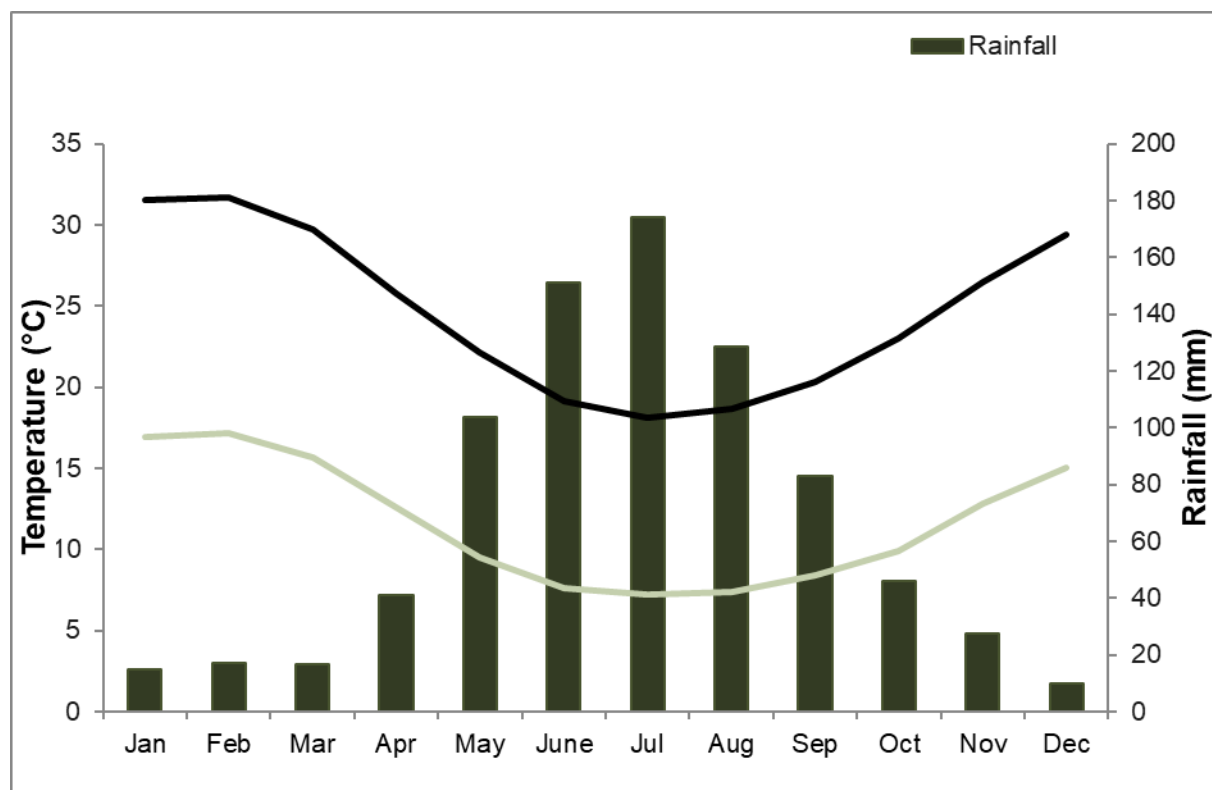


Figure 1: Long term and Monthly Total Rainfall, Maximum and Minimum Temperatures for Jandakot Aero (Station 9172).



2.2 Rainfall (Oct 2022 to Oct 2024)

Table 2 presents the monthly rainfall and long term average monthly rainfall for Jandakot Aero (Station 9172) from 2021 to 2024. Key points are as follows:

- Annual rainfall for period preceding monitoring (January 2021 to September 2022) was above average.
- Rainfall during the monitoring period (October 2022 – October 2024) was below average.
- Groundwater and Surface water levels are estimated to be close to the long term average controlled groundwater levels (CGLs) since the site has drains intersecting the northwest and southwest corners of the site.

Table 2: Jandakot Aero (Station 9172) Monthly Rainfall (2021 to 2024)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2021	0	47.4	41.6	51.8	110.6	95.2	315	79.8	47.2	125.8	5.6	2.6	922.6
2022	0	2.8	5.6	50.4	101.8	102.4	159	197.6	79	35.6	22.8	0	757
2023	0	0	40.4	43.2	56	189.2	126.6	59.6	67	6.8	6	0.6	595.4
2024	1.4	0.8	0.4	9.2	88.8	158.2	200.6	175.8	44.2				744.4
Long-term Mean	14.9	17.1	16.8	40.9	103.9	151.1	174	128.4	82.1	46.3	26.9	9.9	812.1

2.3 Surrounding Land Uses

2.3.1 Current Land Use

The Site is currently used for rural activities and rural residential development.

2.3.2 Historical Land Uses

A historical aerial photograph assessment identifies that the Site has predominantly been used for broad acre grazing and associated rural activities.

Land uses have subsequently changed for the creation of land parcels for rural residential properties and the development of the Kwinana Freeway adjacent to the Site.

2.3.3 Surrounding Land Uses

The Site is surrounded by the following land uses:

- Zoned 'Development' under LSP2 and Casuarina Nature Reserve to the east
- Residential development (Bertram) to the west
- Residential development to the south
- Rural residential development to the north
- Zoned 'Parks and Recreation' under LPS 2 to the northeast of the Site.

2.4 Topography

The topography of the Site ranges between 13m Australian Height Datum (AHD) and 23 mAHd across the Site. The site elevation is on a downward slope from north to south (Google Earth Pro, 2018).



2.5 Regional Geology and Soils

2.5.1 Soil Landscape and Land Systems

Soil landscapes and land system mapping of Western Australia describes broad soil and landscape characteristics from regional to local scales and has been captured at a scales ranging from 1:20,000 to 1:250,000 (DPIRD, 2022a).

The Site is within the Bassendean soil landscape land quality zone, which is described as Mid Pleistocene Bassendean sand. Fixed dunes inland from coastal dune zone. Non-calcareous sands, podsolised soils with low-lying wet areas (DPIRD, 2022b).

The Site occurs in the Bassendean Land System (212Bs), which is described as the Swan Coastal Plain (SCP) from Busselton to Jurien. Sand dunes and sandplains with pale deep sand, semi-wet and wet soil. Banksia-paperbark woodlands and mixed heaths (DPIRD, 2022a).

The Site occurs within three (3) soil landscape subsystems:

- Bassendean B3 Phase (212Bs_B3)- Closed depressions and poorly defined stream channels with moderately deep, poorly to very poorly drained bleached sands with an iron-organic pan, or clay subsoil. Surfaces are dark grey sand or sandy loam.
- Bassendean B1 Phase (212Bs_B1)- Extremely low to very low relief dunes, undulating sandplain and discrete sand rises with deep bleached grey sands sometimes with a pale-yellow B horizon or a weak iron-organic hardpan at depths generally greater than 2 m; banksia dominant.
- Bassendean B6 Phase (212Bs_B6)- Sandplain and broad extremely low rises with imperfectly drained deep or very deep grey siliceous sands.

2.5.2 Acid Sulfate Soils

Acid Sulfate Soil (ASS) risk mapping identifies the wetlands within the Site as having 'High to Moderate' risk of ASS occurring within the first 3 m of natural soil surface (DWER, 2017). The remainder of the Site is mapped as having 'Moderate to Low' risk of ASS occurring within the first 3 m of natural soil surface (DWER, 2017).

2.5.3 Hydrogeology

2.5.3.1 Groundwater

The Site is not located within a Public Drinking Water Source Area (PDWSA). The nearest PDWSA is a P1 located approximately 0.6 km northeast of the Site. The PDWSA, P1 area is under the Jandakot Underground Water Pollution Control Area and connects with the P2 area (DWER, 2023a).

The Site is located within the Serpentine Groundwater Area and Jandakot Mount 2 Groundwater Subarea (DWER, 2018a; 2023b). The groundwater salinity in the Site region ranges between 500-1000 mg/l (DWER, 2018b).

2.5.3.2 Surface Water

There are no streams, or creeks, within the Site. The only surface water feature mapped within the Site include three wetlands (DBCA, 2023) The wetlands at the northwest and southwest corners are connected to the larger drainage network managed by WaterCorp.



2.6 Site Location and Monitoring Locations

The site location and monitoring locations are provided in **Figure 2**.



Figure 2: Site Location and Monitoring Locations.



3.0 Sampling and Analysis

3.1 Groundwater Monitoring Locations

Groundwater monitoring bores sampled as part of the current sampling program are presented in **Appendix A**. A summary of the survey data is presented in **Table 3**.

Table 3. Groundwater Monitoring Bore Survey Data.

Bore ID	Description	Easting (GDA94)	Northing (GDA94)	Top of Casing (ToC, mAHD)	Ground Level (GL, mAHD)	Depth to Base (DTB, mbTOC)
MC4	Two existing bores to the east of the site	392218.689	6431300.085	13.859	13.375	2.23
MB6		391999.759	6431331.303	13.970	13.473	3.76
MB5	Existing bore to the west of the site	392225.481	6431157.863	13.878	13.344	4.34
MB7	Existing bore to the southeast of the site	392032.154	6430945.604	16.017	15.616	5.35
MB20	New bores installed in 2024 to the north of the site	392064.128	6431619.423	15.130	14.406	3.40
MB21		391974.927	6431514.364	11.963	11.320	3.34

The groundwater monitoring event in September 2022 indicated that the monitoring bores, MC4, MB5, MB6 and MB7 were functional and suitable for monitoring. Two additional bores, MB20 and MB21, were installed and surveyed in August 2023.

3.2 Surface Water Locations

Two surface water locations, one for each of the two drains that intersect the site were introduced in October 2023 and surveyed at the top of concrete (mAHD) and at the zero point of the staff gauge (mAHD) to allow measurement of the controlled groundwater levels (CGL) at these locations (**Table 4**).

Table 4: Surface Water Location Survey Data

SW Location	Easting (GDA94)	Northing (GDA94)	Top of Concrete (mAHD)	RL Staff Gauge (mAHD)
Gauge1	392158.081	6430746.033	11.557	10.929
Gauge2	392086.095	6431219.798	17.785	12.007

3.3 Sampling Methods

Groundwater sampling methodology implemented at the site were based on the following standard guidelines:

- Australian/ New Zealand Standard AS/NZS 5667.1:1998 Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples



- Australian/ New Zealand Standard AS/NZS 5667.11 Part 11: Guidance on sampling of Groundwater
- DWER (2021) Assessment and Management of Contaminated Sites Guidelines
- National Environment Protection Council (NEPC, 2013) National Environmental Protection Measure - Assessment of Site Contamination, as amended 2013.
- Samples were collected in accordance with the SLR method statements
 - Instrument Calibration
 - Purging and Sampling (Peri Pump).

3.4 Laboratory Analysis

All groundwater samples were analysed by Eurofins ARL, a National Association of Testing Authorities (NATA) accredited laboratory. Chain of Custody, Laboratory Analysis report and calibration certificates are compiled in **Appendix B**.

The groundwater quality was tested for following laboratory analytes:

- Nutrient (Ammonia as N, Nitrate as N, Nitrite as N, NOx-N, total Kjeldahl nitrogen (TKN), total nitrogen (TN), total phosphorus (TP) and filterable reactive phosphorus (FRP)
- Alkalinity (bicarbonate, carbonate, hydroxide, total alkalinity)
- Major ions (Aluminium, Iron, calcium, magnesium, potassium, sodium, bromide, chloride, sulphate)

The field water quality parameters were collected using multiparameter YSI probe measuring the following parameters:

- Water temperature in °C
- Dissolved oxygen (DO) in mg/L
- Specific conductivity (µS/cm)
- pH in pH units
- Oxidation reduction potential (ORP in mV)

3.5 Assessment Criteria

The following relevant assessment criteria have been provided for reference:

- Australian and New Zealand Governments (ANZG), Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, 2019) – Fresh Water 95% (FWG)
- Western Australia Department of Health (2021), Contaminated sites ground and surface water chemical screening guidelines Non-Potable Groundwater Use (NPUG)
- Australian Drinking Water Guidelines (ADWG) Aesthetic (Updated September 2022, Version 3.8).



4.0 Groundwater Quality Data Usability and Validity

4.1 Field QA/QC Compliance

Table 5 summarises the compliance with the field QA/QC procedures.

Table 5 Field QA/QC Compliance

Field QA/QC	Component	Compliant	Comment
Calibration	Field equipment requiring calibration was calibrated prior to sampling and complied with calibration checks.	Y	All equipment were calibrated by the Suppliers.
Water sample collection	Targeted water samples were collected.	Y	None
	Standardised field documentation used to record field activities.	Y	None
	Laboratory prepared sample jars used for sample collection	Y	None
	Decontamination of sample equipment undertaken between samples	Y	Reusable equipment was decontaminated in line with the Method Statement presented in the SAQP (360 Environmental, 2020)
Sample handling and transit	Samples kept chilled at all times following sample collection	Y	Laboratory analysis reports identifying that samples were received appropriately chilled are provided in Appendix B
	Samples appropriately handled between field and laboratory	Y	None
	Samples transported under chain of custody	Y	Copies of the chain of custody is provided in Appendix B
	Samples received in good condition at the laboratory	Y	Laboratory analysis reports identifying that samples were received in good condition are provided in Appendix B

Table 6 summarises the number and frequency of field QC samples and compliance with the DQI evaluation criteria.

Table 6 Field QA/QC Sample Compliance

Date	QC Sample Type	Primary Sample	QC Sample	% of Primary Samples	Sufficient QC Samples Collected?	DQI non-compliances (RPD <30%)
Oct 2022	Duplicate	MB7	QC01	25%	Yes (>5%)	Phosphorous (43%)
Mar 2023	Duplicate	MB6	QC01	50%	Yes (>5%)	Aluminium (34%), Iron (31%)



Date	QC Sample Type	Primary Sample	QC Sample	% of Primary Samples	Sufficient QC Samples Collected?	DQI non-compliances (RPD <30%)
Jul 2023	Duplicate	MB7	QC01	20%	Yes (>5%)	Aluminium (138%), Iron (53%), Calcium (75%), Total Nitrogen (137%), Phosphorous (196%), TSS (199%)
Jun 2024	Duplicate	MB6	QC01	20%	Yes (>5%)	Total Nitrogen (84%), Kjeldahl Nitrogen total (84%) Phosphorous (133%)
Sep 2024	Duplicate	MB6	QC01	16.67%	Yes (>5%)	Phosphorous (100%)
Sep 2024	Triplicate	MB6	QC02	16.67%	Yes (>5%)	Sulphate (61%), Nox as N (56%), Nitrate as N (56%), Phosphorous (91%)

4.2 Elevated RPDs

An elevated relative percent difference (RPD) between a primary sample and its replicate sample was reported above the applicable level (50%) for 17 out of 123 primary/replicate sample sets (14%). Six of these exceedances were for metals and major ions (5%). Eleven of these exceedances were for nutrient species (9%).

4.3 Laboratory QA/QC

Outcomes of the laboratory QA/QC data validation assessment are summarised below in Table 7.

Table 7 Laboratory QA/QC Summary Table

QA/QC	Compliant?	QC non-compliances
Analytes Holding Times	Yes	None
Limits of Reporting (LOR)	Yes	None
Laboratory Duplicates	Yes	None
Laboratory Control Samples	Yes	None
Laboratory Matrix Spikes	Yes	None
Laboratory Surrogate Spikes	Yes	None
Laboratory Method Blanks	Yes	None
Laboratory QC Frequency	Yes	None

4.4 Data Usability Evaluation

In evaluating the data quality, it was identified that there were field and laboratory QA/QC DQI non-compliances associated with the analytical results as noted above. In consideration of the outcomes of the QA/QC evaluation above, the majority of reported non-compliances for RPDs are not considered to materially impact on the interpretation and use of the data.



5.0 Groundwater and Surface Water Level Results

The key findings of the groundwater monitoring program are summarised below. Field documentation is provided in **Appendix A** and laboratory documentation including analytical results are provided in **Appendix B**.

The following limitations to the data should apply:

- Rainfall for the monitoring period was
- The data are representative of the maximum and minimum groundwater conditions for the monitoring period (2022-2024) and are likely to be less than the historical maxima and minima for the site.
- The maximum and minimum values are not intended for design purposes, but rather, to inform the LSP, LWMS and other planning documents.

5.1 Groundwater Levels (Oct 2022 to Oct 2024)

Table 8 provides a summary of the groundwater levels and includes the following measured data and calculations:

- Top of Collar (ToC) – Surveyed, in mAHD.
- Ground Level (GL) – Surveyed, in mAHD.
- Maximum/Minimum Depth to Water (Max/MinDTW) – Measured, in metres below top of collar (mbToC).
- Maximum/Minimum Depth to Water (Max/MinDTW) – Calculated, in metres below ground level (mbgl).
- Minimum/Maximum Groundwater Levels (Min/MaxGWL) – Calculated, in mAHD.

Table 8: Groundwater Levels - Results Summary

GW Location	ToC (mAHD)	GL (mAHD)	MaxDTW (mbToC)	MaxDTW (mbgl)	MinGWL (mAHD)	MinDTW (mbToC)	MinDTW (mbgl)	MaxGWL (mAHD)	Max-Min (m)
MC4	13.859	13.375	2.220	1.736	11.639	0.550	0.295	13.080	1.441
MB5	13.970	13.473	3.330	2.833	10.640	1.500	1.003	12.470	1.830
MB6	13.878	13.344	2.200	1.666	11.678	0.735	0.204	13.140	1.462
MB7	16.017	15.616	Dry	4.439	11.177	4.100	3.696	11.920	0.743
MB20	15.130	14.406	3.300	2.576	11.830	2.850	2.126	12.280	0.450
MB21	11.963	11.320	2.820	2.177	9.143	0.900	0.260	11.060	1.917
Average		13.589		2.571	11.018		1.264	12.325	1.307



The depth to groundwater (DTW) level in metres below top of collar (mbToC) were recorded from September 2022 to October 2024 for MC4, MB5, MB6 and MB7. For the two additional bores installed in 2023 (MB20 and MB21), data is only recorded from August 2023 to October 2024. Key observations for the groundwater levels are as follows:

- The highest groundwater levels were recorded between August and October, with the majority of maxima occurring in September.
- The bores MC4 and MB7 were, on occasion, recorded as 'dry' during the late summer/early autumn months.
- The maximum groundwater levels ranged from 11.060 mAHD at MB21 to 13.140 mAHD at MB6. This is a difference of 2.08 m.
- The minimum groundwater levels ranged from 9.143 mAHD at MB21 to 11.830 at MB20. This is a difference of 2.687 m.
- Three bores MC4, MB6 and MB21 recorded shallow ground water (less than 0.3 mbgl) while MB5, MB6 and MB20 were within 2 mbgl. MB7 recorded the highest depth to the maximum watertable at 3.696 mbgl.
- **Figure 3** presents all groundwater levels (in mAHD) for 2022 to 2024 as a graph. Bores were recorded as 'dry' where data is missing.
- The complete groundwater level results table is presented in **Appendix D**.

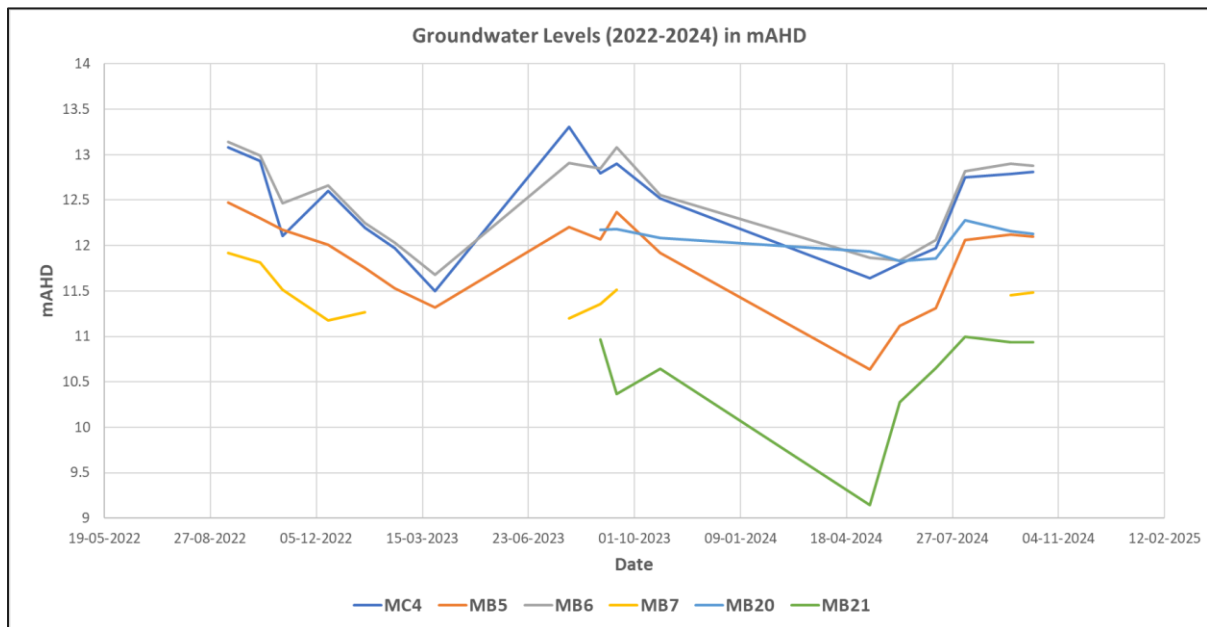


Figure 3: Groundwater Levels (2022-2024) in mAHD.



5.2 Surface Water Levels (Oct 2023 to Oct 2024)

Surface water monitoring station were established in October 2023. Data was collected from October 2023 to October 2024.

Table 9 provides a summary of the surface water levels and includes the following measured data and calculations:

- Top of Concrete – Surveyed, in mAHD.
- Reduced level (RL) of Staff Gauge – Surveyed, in mAHD.
- Maximum Staff Gauge (Max Staff Gauge) – Measured, in metres.
- Maximum Surface Water Levels (MaxSWL) – Calculated, in mAHD.
- Minimum surface water levels are not included since surveyed locations are dry during the low groundwater period.

Table 9: Surface Water Levels - Results Summary

SW Location	Top Concrete (mAHD)	RL Staff Gauge (mAHD)	Max Staff Gauge (m)	MaxSWL (mAHD)
Gauge1	11.557	10.929	0.200	11.129
Gauge2	17.785	12.007	0.300	12.307

A summary of the results is as follows:

- The southern drain location at Gauge 1 had the lowest MaxSWL for the monitoring period at 11.129 mAHD. The wetland location (Gauge 2) had a MaxSWL of 12.307 mAHD.
- The drains at the northwest and southwest corners of the site are likely to maintain controlled groundwater levels (CGLs) during the high groundwater period. The MaxSWL at Gauge 1 (11.129 mAHD) represents the CGL at this location.
- Surface water levels were included in the dataset for the interpolated contours.
- The complete surface water level results table is presented in **Appendix D**.

5.3 Controlled Groundwater Levels (Oct 2022 to Oct 2024)

- When rainfall from the period leading up to and including the GME program is taken into account, GWLs and SWLs are estimated to be close to the long-term average maximum CGLs since the site has drains intersecting the northwest and southwest corners of the site.
- Historical maximum CGLs are likely to be marginally higher along the west of the site where the drains are located and higher toward the centre and east of the site.



6.0 Groundwater Level Contours

6.1 Maximum GWL Contours (2022-2024)

The Maximum GWL contours for the monitoring periods are provided in **Figure 4**. The lowest MaxGWLs were at the northwest and southwest corners of the site. These locations have groundwater controlling infrastructure in the form of drains.

Groundwater flow is to the west and ranges from 13 mAHd at the centre of the site to around 11 mAHd at the drain locations near the western boundary of the site. There were no bores in the eastern half of the site, however MaxGWLs are known to be greater than 13 mAHd.

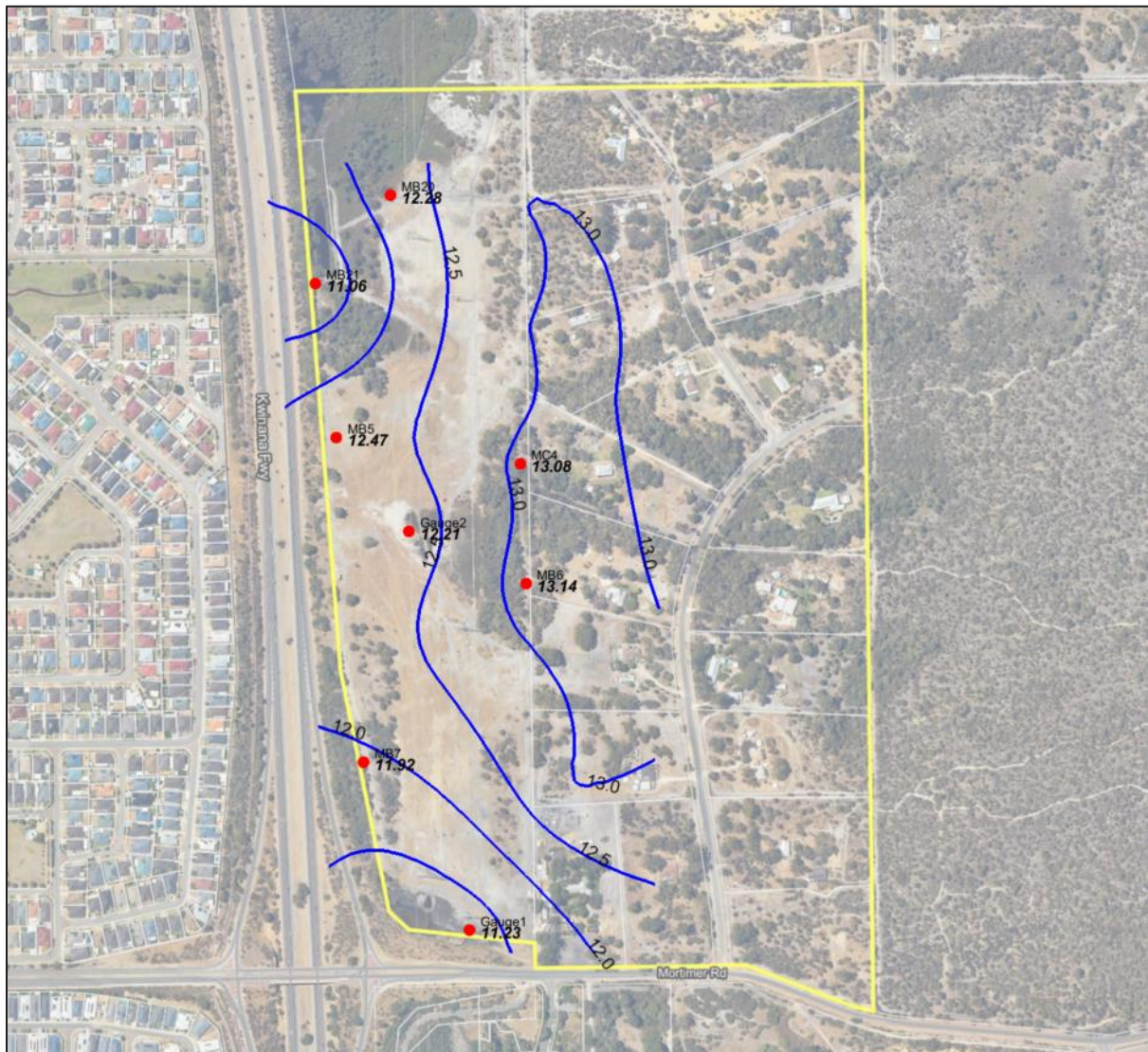


Figure 4: Maximum GWL Contours in mAHd (2022-2024)



6.2 Depth to Maximum GWL Contours (2022-2024)

The depth to Maximum GWL (thickness of the unsaturated zone in mbgl) was estimated by subtracting the contoured data for Maximum GWLs from the inferred topography contours (source: Online groundwater map at <https://maps.water.wa.gov.au/Groundwater/>).

The depth to Maximum GWLs (**Figure 5**) was less than 2.5 mbgl in the central and western areas of the site. In the central western area of the site, the inferred depth to Maximum GWLs was less than 1.5 mbgl. Recorded data confirms that the depth to Maximum GWLs is less than 0.3 mbgl at MC4 and MB6, as well as at MB21 near the northwest corner of the site near the drain.

To the eastern half of the site, the topography rises to about 20 mAHd. It is likely that clearance above the watertable is more 5m along much of the eastern boundary.

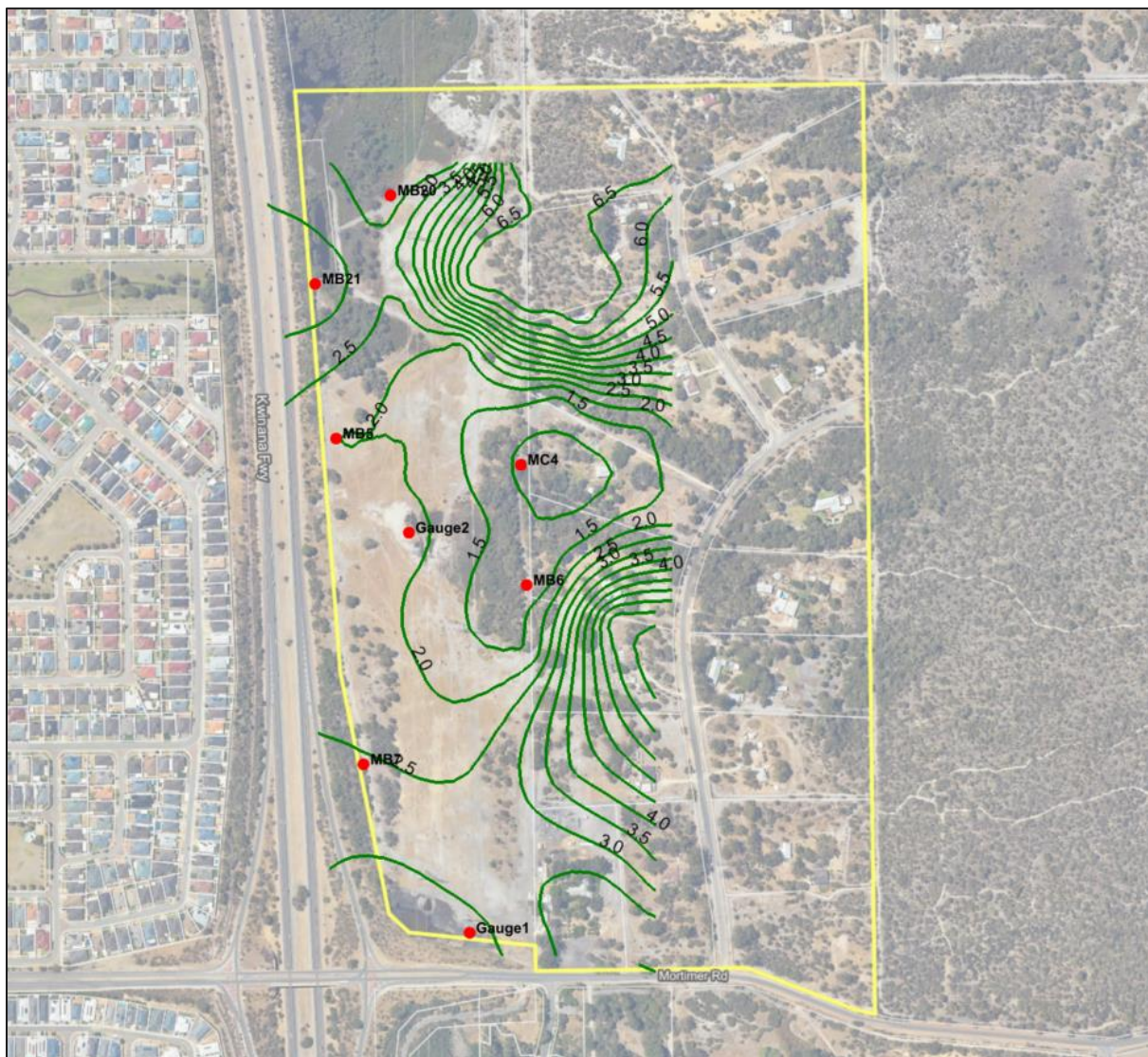


Figure 5: Depth to Maximum GWL Contours in mbgl (2022-2024)



6.3 Minimum GWLs Contours (2022-2024)

The Minimum GWL contours for the monitoring periods are provided in **Figure 6**. The lowest MinGWLs were at the north-western and south-western corners of the site.

Groundwater flow is generally to the west and ranges from approximately 12.5 mAHd at the central north of the site to less than 10 mAHd at the drain locations near the north-western boundary of the site.

There were no bores in the eastern half of the site, however MinGWLs are known to be greater than 12.5 mAHd.

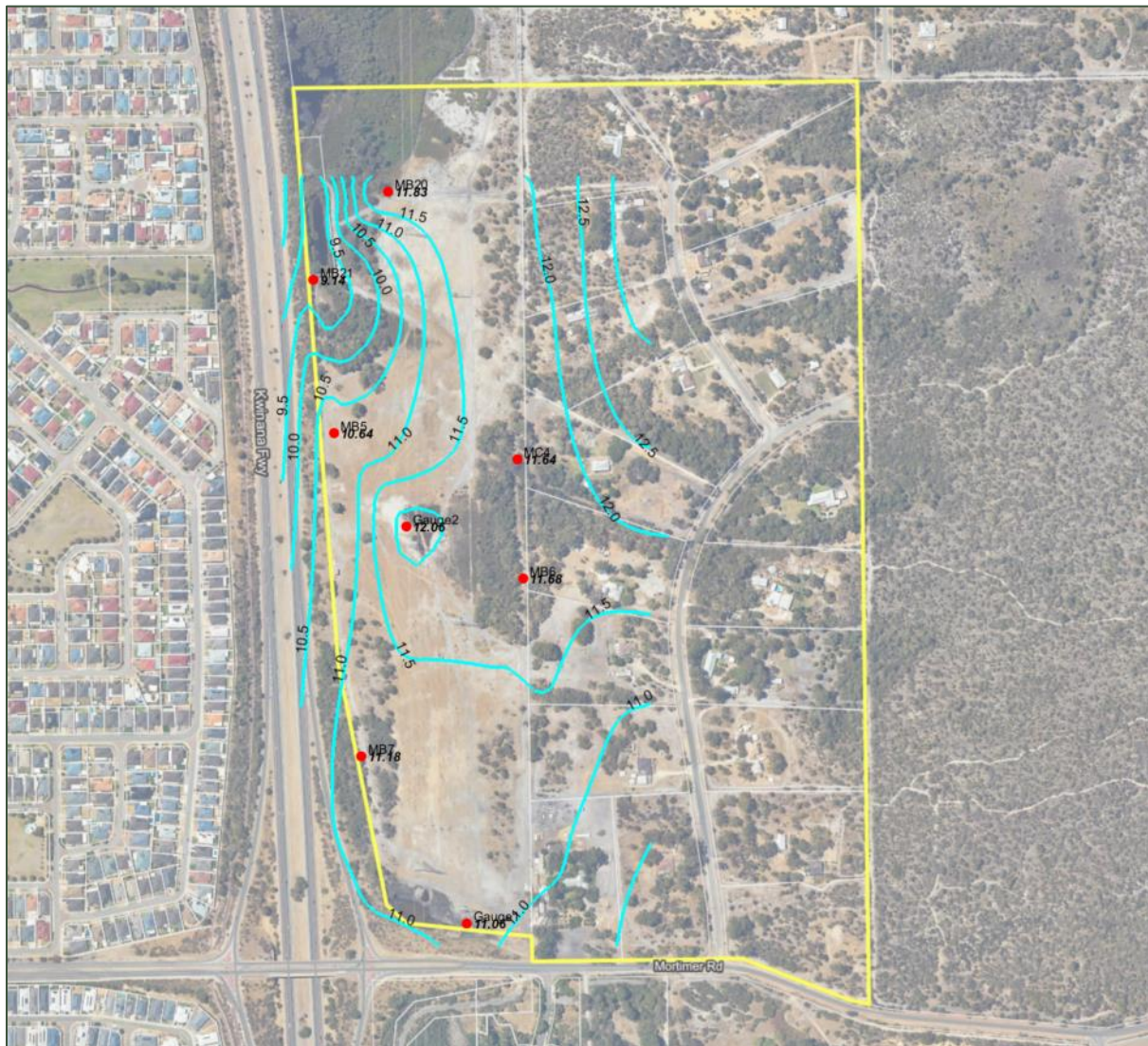


Figure 6: Minimum GWL Contours in mAHd (2022-2024)



7.0 Groundwater Quality

7.1 Groundwater Quality – Field Measured Parameters

The summary of field measured physico-chemical groundwater quality (GWQ) parameters is below and presented in **Table 10**:

- The groundwater at all locations was generally described as colourless, odourless and low turbidity. Occasionally, groundwater with a pale brown colour and higher turbidity was recorded at MB5.
- Dissolved oxygen (DO) ranged from 0.06 mg/L (MB6) to 7.37 mg/L (MB6). Mean DO values ranged from 0.16 mg/L (MC4) to 1.83 mg/L (MB5) indicating moderate aerobic conditions.
- Bore MC4 recorded higher electrical conductivity (EC) compared to the other bores. The brackish conditions at MC4 (2432 to 3,468 $\mu\text{S/cm}$, mean EC 2,916.54 $\mu\text{S/cm}$) could be attributed to its location within silty, organic soils near the central wetland. Bore MB21, located near the northern drain and wetland, recorded the second highest EC (max EC 1397 $\mu\text{S/cm}$, mean EC 598.28 $\mu\text{S/cm}$). The mean EC for all bores except MC4 was less than 1000 $\mu\text{S/cm}$ indicating generally fresh water beneath the site.
- The pH of groundwater ranged from 4.14 to 5.77 pH units indicating moderate acidic conditions. MC4 and MB5 recorded the lowest pH with all recordings less than pH 5.
- The oxidation-reduction potential (ORP) ranged from -241.4 mV (MB6) to 218.5 mV (MC4) indicating both reductive conditions and oxidizing conditions. Mean ORP values ranged from -102.85 mV (MB6) to 57.18 mV (MB5), with four of the six bores having negative ORP values, indicating generally reductive conditions.
- All groundwater physico-chemical field results are presented in **Appendix D**.

Table 10: GWQ Field Measured Parameters

Monitoring Well	Statistic	DO (mg/L)	EC ($\mu\text{S/cm}$)	pH (pH unit)	ORP (mV)
MC4	Min	0.08	2432.00	4.22	-165.40
	Mean	0.16	2956.14	4.41	1.67
	Max	0.27	3468.00	4.60	218.50
MB5	Min	0.10	98.90	4.14	-85.70
	Mean	1.83	129.75	4.37	57.18
	Max	3.76	156.20	4.99	210.60
MB6	Min	0.06	366.60	5.09	-241.40
	Mean	1.29	496.34	5.33	-102.85
	Max	7.37	683.00	5.52	-38.60
MB7	Min	0.86	171.30	5.32	-157.70
	Mean	1.07	324.70	5.53	-86.30
	Max	1.37	520.40	5.77	42.70
MB20	Min	0.14	7.70	5.12	-152.80



Monitoring Well	Statistic	DO (mg/L)	EC (µS/cm)	pH (pH unit)	ORP (mV)
MB21	Mean	0.37	254.40	5.33	-58.58
	Max	0.56	354.90	5.49	11.10
	Min	0.34	60.40	5.03	-145.10
	Mean	1.27	598.28	5.47	-41.28
	Max	4.09	1397.00	5.64	27.40

7.2 Groundwater Quality – Laboratory Analytical Results

All groundwater quality analytical results and QAQC results are presented in Table A and Table B in **Appendix C**. The key findings from the water quality analysis are presented below:

- The concentration of aluminium and iron exceeded the NPUG guidelines (0.2 mg/L) at all locations during the monitoring period except at MB7 from July to September 2023.
- Other analytes that exceeded the assessment criteria were sulfate, sodium, chloride and ammonia as nitrogen. Bore MC4 is the only bore reporting exceedance of ADW Aesthetic guidelines for sulfate and sodium. Bore MC4 is also the only bore that reported exceedances of NPUG guidelines for chloride. Bore MC4 also reported the exceedance of ammonia-N for ADWG Aesthetic values (0.41 mg/L).
- All GWQ results including exceedances were considered typical of the pre-development groundwater quality for the area.
- The GWQ field and laboratory results represent pre-development baseline results for the site.



8.0 Key Findings

8.1 Groundwater Levels

The key findings for GWLs are as follows:

- The highest groundwater levels were recorded between August and October, with the majority of maxima occurring in September.
- The bores MC4 and MB7 were, on occasion, recorded as 'dry' during the late summer/early autumn months.
- The maximum groundwater levels ranged from 11.060 mAHD at MB21 to 13.140 mAHD at MB6. This is a difference of 2.08 m.
- The minimum groundwater levels ranged from 9.143 mAHD at MB21 to 11.830 at MB20. This is a difference of 2.687 m.
- Three bores MC4, MB6 and MB21 recorded shallow ground water (less than 0.3 mbgl) while MB5, MB6 and MB20 were within 2 mbgl. MB7 recorded the highest depth to the maximum watertable at 3.696 mbgl.
- The data are representative of the maximum and minimum groundwater conditions for the monitoring period (2022-2024) and are likely to be less than the historical maxima and minima for the site.
- The lowest MaxGWLs were at the northwestern and southwestern corners of the site. These locations have groundwater controlling infrastructure in the form of drains.
- In the central western area of the site, the inferred depth to Maximum GWLs was less than 1.5 mbgl.
- Recorded data confirms that the depth to Maximum GWLs is less than 0.3 mbgl at MC4 and MB6, as well as at MB21 near the northwest corner of the site near the drain.
- The interpolated contours and inferred topography are not intended for design purposes, but rather, to inform the LSP, LWMS and other planning documents.

8.2 Surface Water Levels

The key findings for SWLs are as follows:

- The southern drain location at Gauge 1 had a MaxSWL for the monitoring period of 11.129 mAHD. The wetland location (Gauge 2) had a MaxSWL of 12.307 mAHD.
- The WaterCorp drains at the northwest and southwest corners of the site are likely to maintain controlled groundwater levels (CGLs) during the high groundwater period. The MaxSWL at Gauge 1 (11.129 mAHD) represents the CGL at this location.
- Surface water levels were included in the dataset for the interpolated contours.

8.3 Controlled Groundwater Levels

- When rainfall from the period leading up to and including the GME program is taken into account, GWLs and SWLs are estimated to be close to the long-term average maximum CGLs since the site has drains intersecting the northwest and southwest corners of the site.



- Historical maximum CGLs are likely to be marginally higher along the west of the site where the drains are located and higher toward the centre and east of the site.

8.4 Groundwater Quality

The key findings for GWQ are as follows:

- The pH of groundwater ranged from 4.14 to 5.77 pH units indicating moderate acidic conditions. MC4 and MB5 recorded the lowest pH with all recordings less than pH 5.
- Bore MC4 recorded higher electrical conductivity (EC) compared to the other bores (2432 to 3,468 $\mu\text{S/cm}$, mean EC 2916.54 $\mu\text{S/cm}$). The mean EC for all bores except MC4 was less than 1000 $\mu\text{S/cm}$ indicating generally fresh water beneath the site.
- The concentration of aluminium and iron exceeded the NPUG guidelines (0.2 mg/L) at all locations at some time during the monitoring period. Other analytes that exceeded the assessment criteria were sulfate, sodium, chloride and ammonia-N with MC4 recording the most exceedances.
- All GWQ results including exceedances were considered typical of the pre-development groundwater quality for the area.
- The GWQ field and laboratory results represent pre-development baseline results for the site.



9.0 Bibliography

Bureau of Meteorology (BoM). (2023). Climate statistics for Australian locations – Summary statistics JANDAKOT (9172). Available at: [Climate statistics for Australian locations \(bom.gov.au\)](https://www.bom.gov.au)

Beard, J. S. (1976). Vegetation survey of Western Australia. Western Australia 1: 1 000 000 vegetation series. Design and cartography by Dept. of Geography, University of W.A.

Department of Biodiversity Conservation and Attractions [DBCA]. (2017a). A methodology for the evaluation of specific wetland types on the Swan Coastal Plain, Western Australia. www.dpaw.wa.gov.au/management/wetlands.

Department of Biodiversity Conservation and Attractions [DBCA]. (2017b). A methodology for the evaluation of wetlands on the Swan Coastal Plain, Western Australia.

Department of Biodiversity, Conservation and Attractions [DBCA]. (2023). Geomorphic Wetlands, Swan Coastal Plain – GIS Dataset (DBCA-019). Available at: <https://www.data.wa.gov.au/>

Department of Primary Industries and Regional Development [DPIRD]. (2022a). Soil Landscape Mapping – Systems – GIS Dataset (DPIRD-064). Available at: <https://www.data.wa.gov.au/>

Department of Primary Industries and Regional Development [DPIRD]. (2022b). Soil Landscape Land Quality – Zones – GIS Dataset (DPIRD-017). Available at <https://www.data.wa.gov.au/>

Department of Planning, Lands and Heritage [DPLH]. (2019). Bush Forever Areas (DPLH-019) – GIS Dataset. Available at: <https://www.data.wa.gov.au/>

Department of Planning, Lands and Heritage [DPLH]. (2023). Aboriginal Heritage Places – GIS Dataset (DPLH-001). Available at: <https://www.data.wa.gov.au/>

Department of Water and Environmental Regulation [DWER]. (2017). Acid Sulfate Soil Risk Map, Swan Coastal Plain – GIS Dataset (DWER-055). Available at <https://www.data.wa.gov.au/>

Department of Water and Environmental Regulation [DWER]. (2018a). RIWI Act, Groundwater Areas – GIS Dataset (DWER-034). Available at: <https://www.data.wa.gov.au/>

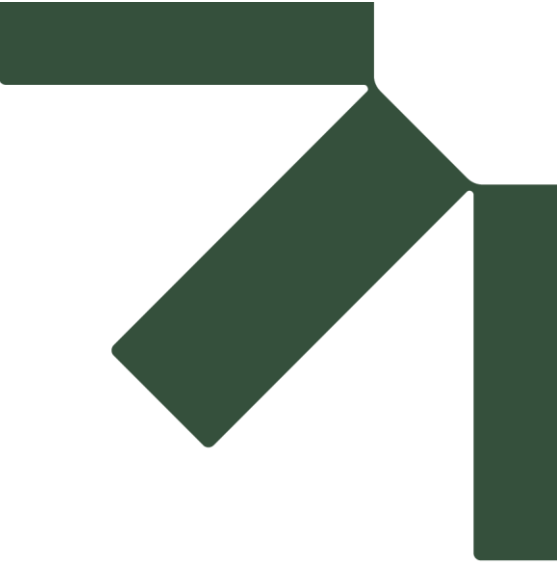
Department of Water and Environmental Regulation [DWER]. (2018b). Groundwater Salinity Statewide – GIS Dataset (DWER-026). Available at: <https://www.data.wa.gov.au/>

Department of Water and Environmental Regulation [DWER]. (2023a). Public Drinking Water Source Areas – GIS Dataset (DWER-033). Available at: <https://www.data.wa.gov.au/>

Hill, A.L., Semeniuk C.A., Semeniuk, V. & Del Marco, A. (1996). Wetlands of the Swan Coastal Plain: volume 2 B: wetland mapping, classification and evaluation, wetland atlas, Government of Western Australia.

State Heritage Office (SHO). 2021. State Register of Heritage Places – GIS Dataset, Government of Western Australia. Available at: <http://inherit.stateheritage.wa.gov.au/Public/>





Appendix A Field Documentation

Casuarina Groundwater Monitoring October 2022 to October 2024

Casuarina 6167, WA

Various Landowners (Casuarina LSP Area)

SLR Project No.: 675.0729597.00001

13 May 2025

PROJECT FIELD LOG (DAILY)

Date: 13/10 Project Number: 4763 Project Name: Casuarina SH

Arrived: 800 Departed: 1150 Weather: Clear

PM: AP

Field Personnel: Declan

Contractors: -

Client Contact: - Site Contact: Phil Bailey

Purpose of Visit (Tick Appropriate Box):

☒ Site Inspection ☒ Well Integrity Assessment

☐ Soil Bore Advancement (Drill Rig) ☐ Hand Augering ☐ Test Pits ☐ Soil Sampling

☐ Monitoring Well Installation (Drill Rig) ☒ Groundwater Monitoring ☐ Sediment Sampling

☐ Sub-slab Vapour Probe Installation ☐ Landfill Gas Well Installation ☐ Gas/ Vapour Sampling

☐ Remediation Works Oversight ☐ Other (Specify):

Equipment Used:

Peri, Dipper, YSI

☒ Calibration Certificate Received : _____ ☐ Calibration Undertaken: _____

Sampling:

Sampling Conducted: ☒ Y ☐ N Matrix: ☐ Soil ☒ Water ☐ Air

CoC Completed: ☒ Y ☐ N

Primary Lab: Eurofins Secondary Lab: _____

Quality Control Details:

QC	Type	Date and time	Primary	Media
QC 01		13/10	MB7	water
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				

QC	Collection Point	Collection Location	Date and time	Rinsate water batch #
RS				
RS				
RS				
RS				
RS				

QC	Date and time	Trip blank batch #
TB		
TB		
TB		
TB		
TB		

QC	Date and time	Collection Location	Blank water batch #
FB			
FB			
FB			
FB			
FB			

Description of Activities:

800 - Arrive to site

830 - Dip round and well inspection

940 - Sample MB7, MB6, MB5
MC4

1150 - Depart site

360
environment

Monitoring Well ID:	MC4
Inner Diameter:	50mm
Depth to Water (mbTOC):	0.93
Depth of Well (mbTOC):	1.99
Top of Well Screen (mbTOC):	
Bottom of Well Screen (mbTOC):	
Height of Riser*(m above/below ground)	
Presence & thickness of LNAPL:	

[illegible]

¹ Readings to be collected every five minutes or greater.
² Drawdown should not exceed 9 cm ONCE first set of readings obtained. This allows for natural drawdown stabilisation to occur.
³ Must be such that the drawdown doesn't exceed 9 cm, or if it does exceed, remains stable.
⁴ 10% for values greater than 0.5 mg/L; if three DO values are less than 0.5 mg/L, consider these values as stabilised.
 The depth to groundwater measurement must be recorded before SAMPLING
 VOC samples must be collected first
 Pump intake should be located within the screen interval & at the mid point of the saturated screen length
 * Gatic cover riser height should be a negative value
 In the event that the recharge is very slow and the well runs dry, the readings may be collected at intervals of less than 5 minutes or for every litres purged
 If a well runs dry, it is assumed that stabilisation will have occurred once the it has recharged and that samples can be collected straight after
 A minimum of 4 readings are required, unless the well runs dry
 To calculate % difference, use the following equation: $((R2-R1)/((R2+R1)/2))*100$

mbTOC = metres below top of casing
DO = dissolved oxygen
ORP = oxygen reduction potential

Monitoring Well ID: 1155

Inner Diameter: 50mm

Depth to Water (mbTOC): 1.670

Depth of Well (mbTOC): 4.320

Top of Well Screen (mbTOC):

Bottom of Well Screen (mbTOC):

Height of Riser*(m above/below ground)

Presence & thickness of LNAPL:

Pump Intake (mbTOC):

[illegible]

To calculate % difference, use the following equation: $((R2-R1)/((R2+R1)/2))*100$

ORP = oxygen reduction potential

360
environment

Monitoring Well ID:	M156
Inner Diameter:	50mm
Depth to Water (mbTOC):	0.890
Depth of Well (mbTOC):	3.74
Top of Well Screen (mbTOC):	
Bottom of Well Screen (mbTOC):	
Height of Riser* (m above/below ground)	
Presence & thickness of LNAPL:	

[illegible]

To calculate % difference, use the following equation: $((R2-R1)/((R2+R1)/2))*100$

ORP = oxygen reduction potential

Monitoring Well ID:	MD 7
Inner Diameter:	50mm
Depth to Water (mbTOC):	4.205
Depth of Well (mbTOC):	5.08
Top of Well Screen (mbTOC):	
Bottom of Well Screen (mbTOC):	
Height of Riser*(m above/below ground)	
Presence & thickness of LNAPL:	

[illegible]

¹ Readings to be collected every five minutes or greater.

² Drawdown should not exceed 9 cm ONCE first set of readings obtained. This allows for natural drawdown stabilisation to occur.

³ Must be such that the drawdown doesn't exceed 9 cm, or if it does exceed, remains stable.

⁴ 10% for values greater than 0.5 mg/L; if three DO values are less than 0.5 mg/L, consider these values as stabilised.

The depth to groundwater measurement must be recorded before SAMPLING

VOC samples must be collected first

Pump intake should be located within the screen interval & at the mid point of the saturated screen length

* Gatic cover riser height should be a negative value

In the event that the recharge is very slow and the well runs dry, the readings may be collected at intervals of less than 5 minutes or for every litres purged

If a well runs dry, it is assumed that stabilisation will have occurred once the it has recharged and that samples can be collected straight after

A minimum of 4 readings are required, unless the well runs dry

To calculate % difference, use the following equation: $((R2-R1)/((R2+R1)/2))*100$

mbTOC = metres below top of casing
DO = dissolved oxygen
ORP = oxygen reduction potential

Quality Control Details:

QC	Type	Date and time	Primary	Media
QC 1	<i>Duplicate</i>	<i>27/3/23</i>	<i>msc</i>	<i>Water</i>
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				

QC	Collection Point	Collection Location	Date and time	Rinsate water batch #
RS				
RS				
RS				
RS				
RS				

QC	Date and time	Trip blank batch #
TB		
TB		
TB		
TB		
TB		

QC	Date and time	Collection Location	Blank water batch #
FB			
FB			
FB			
FB			
FB			

Description of Activities:

8:30 Am - Arrived at the site.

8:35 Am - Commenced Sampling. Sampled four following wells.

MB3, MC4, MB5, MB6, MB7. However, MB3, MC4 and MB7 were found dry. One sample taken from MB6.

Issue

Vehicle could not ply to MB3 due to huge piles of sand. Also took time due to vehicle bogged down into sand. Spent around 1/2 hrs. to get out.

2:00pm dropped samples at Enviroplus.

2:13pm - Back to office.

360
environment

Project:

360 Job No.:

Location:

360 Field Representative:

Date:

Pump Type:

Total Volume purged:

Pump Intake (mbTOC):

Monitoring Well ID:

Inner Diameter:

Depth to Water (mbTOC):

Depth of Well (mbTOC):

Top of Well Screen (mbTOC):

Bottom of Well Screen (mbTOC):

Height of Riser*(m above/below ground)

Presence & thickness of LNAPL:

[illegible]

Legend:

mbTOC= metres below top of casing

DO = dissolved oxygen

ORP = oxygen reduction potential

¹ Readings to be collected every five minutes or greater.

² Drawdown should not exceed 9 cm ONCE first set of readings obtained. This allows for natural drawdown stabilisation to occur.

³ Must be such that the drawdown doesn't exceed 9 cm, or if it does exceed, remains stable.

⁴ 10% for values greater than 0.5 mg/L; if three DO values are less than 0.5 mg/L, consider these values as stabilised.

The depth to groundwater measurement must be recorded before SAMPLING

VOC samples must be collected first.

Pump intake should be located within the screen interval & at the mid point of the saturated screen length

* Gatic cover riser height should be a negative value

In the event that the recharge is very slow and the well runs dry, the readings may be collected at intervals of less than 5 minutes or for every litres purged

If a well runs dry, it is assumed that stabilisation will have occurred once the it has recharged and that samples can be collected straight after

A minimum of 4 readings are required, unless the well runs dry

To calculate % difference, use the following equation: $((R2-R1)/((R2+R1)/2))*100$

360
environment

Monitoring Well ID:	MC4
Inner Diameter:	80mm
Depth to Water (mbTOC):	Dry
Depth of Well (mbTOC):	2-23m
Top of Well Screen (mbTOC):	-
Bottom of Well Screen (mbTOC):	-
Height of Riser*(m above/below ground)	-
Presence & thickness of LNAPL:	-

[illegible]

Legend:

mbTOC= metres below top of casing

DO = dissolved oxygen

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

360
environment
360

Monitoring Well ID:	mg5
Inner Diameter:	50mm
Depth to Water (mbTOC):	2.65m
Depth of Well (mbTOC):	4.33m
Top of Well Screen (mbTOC):	—
Bottom of Well Screen (mbTOC):	—
Height of Riser*(m above/below ground)	—
Presence & thickness of LNAPL:	✓

			Temp (°C)	3%	D.O ⁴ (mg/L)	10%	Spec. Cond. (µS/cm)	3%	pH (unit)	± 0.1	ORP (mV)	±10	Comments
Time ¹	Depth to groundwater (mbTOC) ²	Purge rate (mL/min) ³	Reading	% between readings	Reading	% between readings	Reading	% between readings	Reading	± between readings	Reading	± between readings	
Start:	Start:												
9:35	2.66	—	26.4		1.17		136.5		4.28		266.0		Brownish colour, odourless and low probability.
9:40	2.66	—	26.3		0.72		137.9		4.30		228.5		
9:45	2.66	—	26.7		0.58		138.9		4.32		201.8		
9:50	2.66	—	26.8		0.56		139.4		4.33		188.9		
SAMPLING:													

To calculate % difference, use the following equation: $((R2-R1)/((R2+R1)/2))*100$

ORP = oxygen reduction potential

360
LETTER TO THE EDITOR

Monitoring Well ID:	M36
Inner Diameter:	86mm
Depth to Water (mbTOC):	2.2m
Depth of Well (mbTOC):	3.745m
Top of Well Screen (mbTOC):	—
Bottom of Well Screen (mbTOC):	—
Height of Riser*(m above/below ground)	—
Presence & thickness of LNAPL:	—

Notes:

To calculate % difference, use the following equation: $((R2-R1)/((R2+R1)/2))*100$

ORP = oxygen reduction potential

360
environment

Monitoring Well ID: M37

Inner Diameter: 50 mm

Depth to Water (mbTOC): Dry

Depth of Well (mbTOC): 5.74 m

Top of Well Screen (mbTOC): _____

Bottom of Well Screen (mbTOC): _____

Height of Riser*(m above/below ground) _____

Presence & thickness of LNAPL: _____

[illegible]

Legend:

mbTOC= metres below top of casing

DO = dissolved oxygen

ORP = oxygen reduction potential

ORP = oxygen reduction potential

PROJECT FIELD LOG (DAILY)

Date: 3/10/23 Project Number: 4863 Project Name: Cassagne Lane

Arrived: 5:24am Departed: 1:15pm Weather: Sunny

PM: JH/KT

Field Personnel: P.D

Contractors: /

Client Contact: / Site Contact: /

Purpose of Visit (Tick Appropriate Box):

☐ Site Inspection ☐ Well Integrity Assessment

☐ Soil Bore Advancement (Drill Rig) ☐ Hand Augering ☐ Test Pits ☐ Soil Sampling

☐ Monitoring Well Installation (Drill Rig) ☒ Groundwater Monitoring ☐ Sediment Sampling

☐ Sub-slab Vapour Probe Installation ☐ Landfill Gas Well Installation ☐ Gas/ Vapour Sampling

☐ Remediation Works Oversight ☐ Other (Specify):

Equipment Used:

Pentap, 7SL, Dipper

☐ Calibration Certificate Received : / ☒ Calibration Undertaken: /

Sampling:

Sampling Conducted: ☒ Y ☐ N Matrix: ☐ Soil ☒ Water ☐ Air

CoC Completed: ☒ Y ☐ N

Primary Lab: Europeus Secondary Lab: /

Quality Control Details:

QC	Type	Date and time	Primary	Media
QC01	Duplicate	3/1/07/20	msz	water ✓
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				

QC	Collection Point	Collection Location	Date and time	Rinsate water batch #
RS				
RS				
RS				
RS				
RS				

QC	Date and time	Trip blank batch #
TB		
TB		
TB		
TB		
TB		

QC	Date and time	Collection Location	Blank water batch #
FB			
FB			
FB			
FB			
FB			

Description of Activities:

9:24 AM - Arrived at site
- Sampled from following wells
MS2, MS5, MS6, MC4, MS3.

- Dropped sample at rooftop.
- Back to office. completed paper work.
- Departed for site at 1:15 pm.

Groundwater Monitoring (Synoptic Water Level Measurements)

Time Started: _____ Time Finished: _____

[illegible]

* Gatic cover (also referred to as flush mount) riser height should be a negative value

NAPL Detected: _____

Location: _____

Thickness: _____

Groundwater Low Flow Purging: Water Quality Measurement Form

Client: Cameron Creek
 Project: Cameron Creek
 360 Job No.: 4763
 Location: Cameron
 360 Field Representative: PP
 Date: 31/05/23
 Pump Type: Per Pump Total Volume purged: 1
 Pump Intake (mbTOC): 1

Monitoring Well ID: M37
 Inner Diameter: 1
 Depth to Water (mbTOC): 4.82
 Depth of Well (mbTOC): 5.12
 Top of Well Screen (mbTOC): 1
 Bottom of Well Screen (mbTOC): 1
 Height of Riser*(m above/below ground): 1
 Presence & thickness of LNAPL: 1

Time ¹	Depth to groundwater (mbTOC) ²	Purge rate (mL/min) ³	Temp (°C)	3%	D.O ⁴ (mg/L)	10%	Spec. Cond. (µS/cm)	3%	pH (unit)	± 0.1	ORP (mV)	± 10	Comments
Reading				% between readings	Reading	% between readings	Reading	% between readings	Reading	± between readings	Reading	± between readings	
Start:	Start:												
9:52	4.86	250/h	17.8		2.21		546.3		5.77		-151.8		Column, odules, medium/high & rising
9:57	4.85		17.6		1.24		519.2		5.72		-142.4		
10:02	4.85		17.6		1.15		514.8		5.70		-135.5		
10:07	4.85		17.7		1.22		520.7		5.69		-132.1		
													Good place for here.
SAMPLING:													

Notes:

- ¹ Readings to be collected every five minutes or greater.
² Drawdown should not exceed 9 cm ONCE first set of readings obtained. This allows for natural drawdown stabilisation to occur.
³ Must be such that the drawdown doesn't exceed 9 cm, or if it does exceed, remains stable.
⁴ 10% for values greater than 0.5 mg/L; if three DO values are less than 0.5 mg/L, consider these values as stabilised.
 The depth to groundwater measurement must be recorded before SAMPLING
 VOC samples must be collected first
 Pump intake should be located within the screen interval & at the mid point of the saturated screen length
 * Gatic cover riser height should be a negative value
 In the event that the recharge is very slow and the well runs dry, the readings may be collected at intervals of less than 5 minutes or for every litres purged
 If a well runs dry, it is assumed that stabilisation will have occurred once the it has recharged and that samples can be collected straight after
 A minimum of 4 readings are required, unless the well runs dry
 To calculate % difference, use the following equation: $((R2-R1)/((R2+R1)/2))*100$

Legend:

mbTOC= metres below top of casing
 DO = dissolved oxygen
 ORP = oxygen reduction potential

360

mass

1.22m

4.70g

ORP = oxygen reduction potential

360
environmental
360

Monitoring Well ID:	me 4
Inner Diameter:	-
Depth to Water (mbTOC):	0.55
Depth of Well (mbTOC):	2.21
Top of Well Screen (mbTOC):	-
Bottom of Well Screen (mbTOC):	-
Height of Riser*(m above/below ground)	-
Presence & thickness of LNAPL:	-

Notes:

¹ Readings to be collected every five minutes or greater.

² Drawdown should not exceed 9 cm ONCE first set of readings obtained. This allows for natural drawdown stabilisation to occur.

³ Must be such that the drawdown doesn't exceed 9 cm, or if it does exceed, remains stable.

⁴ 10% for values greater than 0.5 mg/L; if three DO values are less than 0.5 mg/L, consider these values as stabilised.

The depth to groundwater measurement must be recorded before SAMPLING

VOC samples must be collected first.

Pump intake should be located within the screen interval & at the mid point of the saturated screen length

* Gatic cover riser height should be a negative value

In the event that the recharge is very slow and the well runs dry, the readings may be collected at intervals of less than 5 minutes or for every litres purged

If a well runs dry, it is assumed that stabilisation will have occurred once the it has recharged and that samples can be collected straight after

A minimum of 4 readings are required, unless the well runs dry.

To calculate % difference, use the following equation: $((R2-R1)/((R2+R1)/2))*100$

Legend:

mbTOC= metres below top of casing

DO = dissolved oxygen

ORP = oxygen reduction potential

360
environmental

Monitoring Well ID:	MS-3
Inner Diameter:	—
Depth to Water (mbTOC):	1.63
Depth of Well (mbTOC):	2.63
Top of Well Screen (mbTOC):	—
Bottom of Well Screen (mbTOC):	—
Height of Riser*(m above/below ground)	—
Presence & thickness of LNAPL:	—

Notes:

¹ Readings to be collected every five minutes or greater.

² Drawdown should not exceed 9 cm ONCE first set of readings obtained. This allows for natural drawdown stabilisation to occur.

³ Must be such that the drawdown doesn't exceed 9 cm, or if it does exceed, remains stable.

⁴ 10% for values greater than 0.5 mg/L; if three DO values are less than 0.5 mg/L, consider these values as stabilised.

The depth to groundwater measurement must be recorded before SAMPLING

VOC samples must be collected first

Pump intake should be located within the screen interval & at the mid point of the saturated screen length

* Gatic cover riser height should be a negative value

In the event that the recharge is very slow and the well runs dry, the readings may be collected at intervals of less than 5 minutes or for every litres purged

If a well runs dry, it is assumed that stabilisation will have occurred once the it has recharged and that samples can be collected straight after

A minimum of 4 readings are required, unless the well runs dry

To calculate % difference, use the following equation: $((R2-R1)/((R2+R1)/2))*100$

Legend:

mbTOC= metres below top of casing

DO = dissolved oxygen

ORP = oxygen reduction potential

PROJECT FIELD LOG (DAILY)

Date: 30-08-2023 Project Number: 4739 Project Name: Casuarina South LSP - GME

Arrived: 930 Departed: 1230 Weather: Clear

PM: KT

Field Personnel: DB / OS

Contractors: —

Client Contact: — Site Contact: —

Purpose of Visit (Tick Appropriate Box):

☐ Site Inspection ☐ Well Integrity Assessment

☐ Soil Bore Advancement (Drill Rig) ☐ Hand Augering ☐ Test Pits ☐ Soil Sampling

☐ Monitoring Well Installation (Drill Rig) ☒ Groundwater Monitoring ☐ Sediment Sampling

☐ Sub-slab Vapour Probe Installation ☐ Landfill Gas Well Installation ☐ Gas/ Vapour Sampling

☐ Remediation Works Oversight ☐ Other (Specify):

Equipment Used:

YSI, Peri pump, dipper, tube cutters

☐ Calibration Certificate Received : — ☒ Calibration Undertaken: —

Sampling:

Sampling Conducted: ☒ Y ☐ N Matrix: ☐ Soil ☒ Water ☐ Air

CoC Completed: ☒ Y ☐ N

Primary Lab: ARL Secondary Lab: —

Description of Activities:

930 arrive to site

945 - Sample wells MB6, MC4

- Install tube and sample MB20, MB21

- Sample MB5, MB7

1230 - Depart site

Groundwater Low Flow Purging: Water Quality Measurement Form

Client: _____
Project: Casuarina South LSP - GME
360 Job No.: 4739
Location: _____
360 Field Representative: DB / OS
Date: 30-08-2023

Monitoring Well ID: MC4
Inner Diameter: _____
Depth to Water (mbTOC): 1.06
Depth of Well (mbTOC): _____
Top of Well Screen (mbTOC): _____
Bottom of Well Screen (mbTOC): _____
Height of Riser*(m above/below ground) _____
Presence & thickness of LNAPL: _____

Pump Type: _____ Total Volume purged: _____

Pump Intake (mbTOC): _____

			Temp (°C)	3%	D.O* (mg/L)	10%	Spec. Cond. (µS/cm)	3%	pH (unit)	± 0.1	ORP (mV)	±10	
Time ¹	Depth to groundwater (mbTOC) ²	Purge rate (mL/min) ³	Reading	% between readings	Reading	% between readings	Reading	% between readings	Reading	± between readings	Reading	± between readings	Comments
Start:	Start:												
10.00	1.06		15.0		6.33		2973		4.26		-139.0		0, c, low turb
10.05	1.10		15.5		0.38		3044		4.25		-163.5		
10.10	1.10		15.6		0.29		3048		4.29		-163.9		
10.15			15.7		0.20		3057		4.30		-165.4		
SAMPLING:													

Notes:

¹ Readings to be collected every five minutes or greater.

² Drawdown should not exceed 9 cm ONCE first set of readings obtained. This allows for natural drawdown stabilisation to occur.

³ Must be such that the drawdown doesn't exceed 9 cm, or if it does exceed, remains stable.

⁴ 10% for values greater than 0.5 mg/L; if three DO values are less than 0.5 mg/L, consider these values as stabilised.

The depth to groundwater measurement must be recorded before SAMPLING

VOC samples must be collected first

Pump intake should be located within the screen interval & at the mid point of the saturated screen length

* Gatic cover riser height should be a negative value

In the event that the recharge is very slow and the well runs dry, the readings may be collected at intervals of less than 5 minutes or for every litres purged

If a well runs dry, it is assumed that stabilisation will have occurred once the it has recharged and that samples can be collected straight after

A minimum of 4 readings are required, unless the well runs dry

To calculate % difference, use the following equation: $((R2-R1)/((R2+R1)/2))*100$

Legend:

mbTOC= metres below top of casing

DO = dissolved oxygen

ORP = oxygen reduction potential

360
environment

Monitoring Well ID:	MB5
Inner Diameter:	
Depth to Water (mbTOC):	1.90
Depth of Well (mbTOC):	
Top of Well Screen (mbTOC):	
Bottom of Well Screen (mbTOC):	
Height of Riser*(m above/below ground)	
Presence & thickness of LNAPL:	

Pump Intake (mbTOC):

[illegible]¹ Readings to be collected every five minutes or greater.

² Drawdown should not exceed 9 cm ONCE first set of readings obtained. This allows for natural drawdown stabilisation to occur.

³ Must be such that the drawdown doesn't exceed 9 cm, or if it does exceed, remains stable.

⁴ 10% for values greater than 0.5 mg/L; if three DO values are less than 0.5 mg/L, consider these values as stabilised.

The depth to groundwater measurement must be recorded before SAMPLING

VOC samples must be collected first.

Pump intake should be located within the screen interval & at the mid point of the saturated screen length

* Gatic cover riser height should be a negative value

In the event that the recharge is very slow and the well runs dry, the readings may be collected at intervals of less than 5 minutes or for every litres purged

If a well runs dry, it is assumed that stabilisation will have occurred once the it has recharged and that samples can be collected straight after

A minimum of 4 readings are required, unless the well runs dry

To calculate % difference, use the following equation: $((R2-R1)/((R2+R1)/2))*100$

mbTQC= metres below top of casing

DO = dissolved oxygen

ORP = oxygen reduction potential

360
environment

Monitoring Well ID: MS6

Inner Diameter:

Depth to Water (mbTOC): 1.03

Depth of Well (mbTOC):

Top of Well Screen (mbTOC):

Bottom of Well Screen (mbTOC):

Height of Riser*(m above/below ground)

Presence & thickness of LNAPL:

Pump Intake (mbTOC):

[illegible]

To calculate % difference, use the following equation: $((R2-R1)/((R2+R1)/2))*100$

ORP = oxygen reduction potential

360
environment

Monitoring Well ID: _____

Inner Diameter: _____

Depth to Water (mbTOC): 2.66

Depth of Well (mbTOC): _____

Top of Well Screen (mbTOC): _____

Bottom of Well Screen (mbTOC): _____

Height of Riser*(m above/below ground) _____

Presence & thickness of LNAPL: _____

Pump Intake (mbTOC):

			Temp (°C)	3%	D.O ⁴ (mg/L)	10%	Spec. Cond. (µS/cm)	3%	pH (unit)	± 0.1	ORP (mV)	±10	Comments
Time¹	Depth to groundwater (mbTOC)²	Purge rate (mL/min)³	Reading	% between readings	Reading	% between readings	Reading	% between readings	Reading	± between readings	Reading	± between readings	
Start:	Start:												
12-01	4.66		18.9		6.42		402.8		4.95		21.5		O₂ < , low furth
12-06	4.66		18.5		0.62		337.6		5.24		-166.7		
12-11	--		18.5		0.76		319.1		5.24		-160.7		
12-16	--		18.5		0.91		316.6		5.32		-157.7		
SAMPLING:													

To calculate % difference, use the following equation: $((R2-R1)/((R2+R1)/2))*100$

ORP = oxygen reduction potential

360
environmental

Monitoring Well ID: M320

Inner Diameter:

Depth to Water (mbTOC): 2.96

Depth of Well (mbTOC): 6.10

Top of Well Screen (mbTOC):

Bottom of Well Screen (mbTOC):

Height of Riser*(m above/below ground)

Presence & thickness of LNAPL:

Pump Intake (mbTOC):

[illegible]

Legend:

mbTOC= metres below top of casing

DO = dissolved oxygen

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

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ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

Groundwater Low Flow Purging: Water Quality Measurement Form

Client: _____
Project: Casuarina South LSP - GME
360 Job No.: 4739
Location: _____
360 Field Representative: DB / OS
Date: 30-08-2023

Monitoring Well ID: MB 21
Inner Diameter: _____
Depth to Water (mbTOC): 1.0
Depth of Well (mbTOC): 3.37
Top of Well Screen (mbTOC): _____
Bottom of Well Screen (mbTOC): _____
Height of Riser*(m above/below ground) _____
Presence & thickness of LNAPL: _____

Pump Type: _____ Total Volume purged: _____

Pump Intake (mbTOC): _____

			Temp (°C)	3%	D.O ⁴ (mg/L)	10%	Spec. Cond. (µS/cm)	3%	pH (unit)	± 0.1	ORP (mV)	± 10	
Time ¹	Depth to groundwater (mbTOC) ²	Purge rate (mL/min) ³	Reading	% between readings	Reading	% between readings	Reading	% between readings	Reading	± between readings	Reading	± between readings	Comments
Start:	Start:												
11.05	1.0		15.6		0.54		604		5.98		-105.2		Brown, murky turbid
11.10	1.10		14.5		0.19		577		5.45		-153.6		clearer
11.15	1.16		14.3		0.31		572		5.48		-157.5		
11.20	1.17		14.2		0.57		567		5.54		-150.0		could? filter
11.25	1.18		14.1		0.90		560		5.57		-145.1		
SAMPLING:													

Notes:

- ¹ Readings to be collected every five minutes or greater.
² Drawdown should not exceed 9 cm ONCE first set of readings obtained. This allows for natural drawdown stabilisation to occur.
³ Must be such that the drawdown doesn't exceed 9 cm, or if it does exceed, remains stable.
⁴ 10% for values greater than 0.5 mg/L; if three DO values are less than 0.5 mg/L, consider these values as stabilised.

The depth to groundwater measurement must be recorded before SAMPLING

VOC samples must be collected first

Pump intake should be located within the screen interval & at the mid point of the saturated screen length

* Gatic cover riser height should be a negative value

In the event that the recharge is very slow and the well runs dry, the readings may be collected at intervals of less than 5 minutes or for every litres purged

If a well runs dry, it is assumed that stabilisation will have occurred once the it has recharged and that samples can be collected straight after

A minimum of 4 readings are required, unless the well runs dry

To calculate % difference, use the following equation: $((R2-R1)/((R2+R1)/2))*100$

Legend:

mbTOC= metres below top of casing
DO = dissolved oxygen
ORP = oxygen reduction potential

PROJECT FIELD LOG (DAILY)

Date: 26/10/23 Project Number: 4762 Project Name: Casuarina South LSP - GME

Arrived: 10:30 Departed: _____ Weather: Sunny

PM: KT

Field Personnel: OS

Contractors: _____

Client Contact: _____ Site Contact: _____

Purpose of Visit (Tick Appropriate Box):

☐ Site Inspection ☐ Well Integrity Assessment

☐ Soil Bore Advancement (Drill Rig) ☐ Hand Augering ☐ Test Pits ☐ Soil Sampling

☐ Monitoring Well Installation (Drill Rig) ☐ Groundwater Monitoring ☐ Sediment Sampling

☐ Sub-slab Vapour Probe Installation ☐ Landfill Gas Well Installation ☐ Gas/ Vapour Sampling

☐ Remediation Works Oversight ☐ Other (Specify): _____

Equipment Used:

YSI, Peni, dipper

☐ Calibration Certificate Received: _____ ☐ Calibration Undertaken: _____

Sampling:

Sampling Conducted: ☐ Y ☐ N Matrix: ☐ Soil ☐ Water ☐ Air

CoC Completed: ☐ Y ☐ N

Primary Lab: _____ Secondary Lab: _____

Description of Activities:

10.30 Arrive at site

Start sampling MB6, MC4, MBW, MBZ,

MB5

MB7 - Dry

13.00 Leave site

360
environmental
50 25 10

Monitoring Well ID: MB6

Inner Diameter:

Depth to Water (mbTOC): 1.32

Depth of Well (mbTOC):

Top of Well Screen (mbTOC):

Bottom of Well Screen (mbTOC):

Height of Riser*(m above/below ground)

Presence & thickness of LNAPL:

			Temp (°C)	3%	D.O ⁴ (mg/L)	10%	Spec. Cond. (µS/cm)	3%	pH (unit)	± 0.1	ORP (mV)	± 10	Comments
Time ¹	Depth to groundwater (mbTOC) ²	Purge rate (mL/min) ³	Reading	% between readings	Reading	% between readings	Reading	% between readings	Reading	± between readings	Reading	± between readings	
Start:	Start:												
10-43	1.32		19.3		4.73		494.4		5.33		-41.0		O, C, yellow
10-48	1.32		18.4		0.17		500.0		5.33		-42.1		
10-53	↓		18.4		0.10		509.7		5.37		-43.2		
10-58			18.3		0.06		513.2		5.37		-38.6		
SAMPLING:													

Legend:

mbTOC= metres below top of casing

DO = dissolved oxygen

ORP = oxygen reduction potential

VOC samples must be collected first

Pump intake should be located within the screen interval & at the mid point of the saturated screen length

* Gatic cover riser height should be a negative value

If a well runs dry, it is assumed that stabilisation will have occurred once the it has recharged and that samples can be collected straight after

A minimum of 4 readings are required, unless the well runs dry

To calculate % difference, use the following equation: $((R2-R1)/((R2+R1)/2))*100$

360
driveline magazine
S E A

Monitoring Well ID: MC4

Inner Diameter: 1.34

Depth to Water (mbTOC):

Depth of Well (mbTOC):

Top of Well Screen (mbTOC):

Bottom of Well Screen (mbTOC):

Height of Riser*(m above/below ground)

Presence & thickness of LNAPL:

[illegible]

Legend:

mbTOC= metres below top of casing

DO = dissolved oxygen

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

360
environment

Casuarina South LSP- GME

4763

Casuarina, WA

Casuarina, WA

05

19 Oct 2023

25

MBro

3-05

ORP = oxygen reduction potential

360
environment

MB2

47 63

1.32

Casuarina, WA

Depth of Well (mbTOC):

50

Top of Well Screen (mbTOC):

360 Field Representative:

14 Oct 2023

Bottom of Well Screen (mbTOC):

25

Total Volume purged:

Height of Riser*(m above/below ground)

Presence & thickness of LNAPL:

ORP = oxygen reduction potential

360
environmental
energy

Monitoring Well ID: _____

Inner Diameter: _____

Depth to Water (mbTOC): _____

Depth of Well (mbTOC): _____

Top of Well Screen (mbTOC): _____

Bottom of Well Screen (mbTOC): _____

Height of Riser*(m above/below ground) _____

Presence & thickness of LNAPL: _____

yellow, low T, adanless

Legend:

mbTOC= metres below top of casing

DO = dissolved oxygen

ORP = oxygen reduction potential

2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 2681, 2682, 2683, 2684, 2685, 2686, 2687, 2688, 26

VOC samples must be collected first

Pump intake should be located within the screen interval & at the mid point of the saturated screen length

* Gatic cover riser height should be a negative value

In the event that the recharge is very slow and the well runs dry, the readings may be collected at intervals of less than 5 minutes or for every litres purged

If a well runs dry, it is assumed that stabilisation will have occurred once the it has recharged and that samples can be collected straight after

A minimum of 4 readings are required, unless the well runs dry.

To calculate % difference, use the following equation: $((R2-R1)/((R2+R1)/2))*100$

360
BRUNO DI NITTO

ORP = oxygen reduction potential



PROJECT FIELD LOG (DAILY)

Date: 10/5/24 Project Number: 72155 Project Name: Casuarina

Arrived: _____ Departed: _____ Weather: Sunny

PM: K1

Field Personnel: OS + KS

Contractors: BE surveyors

Client Contact: _____ Site Contact: _____

Purpose of Visit (Tick Appropriate Box):

- ☐ Site Inspection ☐ Well Integrity Assessment
- ☐ Soil Bore Advancement (Drill Rig) ☐ Hand Augering ☐ Test Pits ☐ Soil Sampling
- ☐ Monitoring Well Installation (Drill Rig) ☐ Groundwater Monitoring ☐ Sediment Sampling
- ☐ Sub-slab Vapour Probe Installation ☐ Landfill Gas Well Installation ☐ Gas/ Vapour Sampling
- ☐ Remediation Works Oversight ☐ Other (Specify): _____

Equipment Used:

Dipper

☐ Calibration Certificate Received : _____ ☐ Calibration Undertaken: _____

Sampling:

Sampling Conducted: ☐ Y ☐ N Matrix: ☐ Soil ☐ Water ☐ Air

CoC Completed: ☐ Y ☐ N

Primary Lab: _____ Secondary Lab: _____

Description of Activities:

9.45 Arrive @ site & meet Surveyor

Start dipping & survey

Well	SWL	DTB
Mb6	blocked @ 2.01 (roots)	
Mb4	roots @ 2.22	
Mb5	3.33	4.33
Mb7	Dry @ 4.96	
Mb20	Dry @ 3.19	
Mb21	2.82	3.30

12.30 Depart site

PROJECT FIELD LOG (DAILY)

Date: <u>07/06/2024</u> Project Number: <u>072155</u> Project Name: <u>Casuarina LSP - Byford West</u>	
Arrived: <u>10 am</u>	Departed: _____ Weather: <u>Cloudy</u>
PM: <u>Kuenzang Tshering</u>	
Field Personnel: <u>Kavindi Sahabandu</u>	
Contractors: _____	
Client Contact: _____	Site Contact: _____
Purpose of Visit (Tick Appropriate Box):	
☐ Site Inspection ☐ Well Integrity Assessment ☐ Soil Bore Advancement (Drill Rig) ☐ Hand Augering ☐ Test Pits ☐ Soil Sampling ☐ Monitoring Well Installation (Drill Rig) ☒ Groundwater Monitoring ☐ Sediment Sampling ☐ Sub-slab Vapour Probe Installation ☐ Landfill Gas Well Installation ☐ Gas/ Vapour Sampling ☐ Remediation Works Oversight ☐ Other (Specify): _____	
Equipment Used:	
<u>YSI , Peri , Dipper</u>	

☒ Calibration Certificate Received : _____ ☐ Calibration Undertaken: _____	

Sampling:	
Sampling Conducted: ☒ Y ☐ N	Matrix: ☐ Soil ☒ Water ☐ Air
CoC Completed: ☒ Y ☐ N	
Primary Lab: <u>Eurofins</u>	Secondary Lab: _____

Description of Activities:

Arrived at site by 10 am

MB20 - purged

MB21 - slow recharging rate, purged with a slower rate

MB5 - purged

MB7 - dry

MB6 - roots, dtw may not be accurate, purged (QCI)

MC4 - purged, roots, n, changed the tubing

Left site by 3.45 pm

Monitoring Well ID:	MC4
Inner Diameter:	
Depth to Water (mbTOC):	2.06 m
Depth of Well (mbTOC):	
Top of Well Screen (mbTOC):	
Bottom of Well Screen (mbTOC):	
Height of Riser* (m above/below ground)	
Presence & thickness of LNAPL:	

* well is kinda blocked with roots, depth to water may not be accurate

[illegible]

Readings to be collected every five minutes or greater.

² Drawdown should not exceed 9 cm ONCE first set of readings obtained. This allows for natural drawdown stabilisation to occur.

³ Must be such that the drawdown doesn't exceed 9 cm, or if it does exceed, remains stable.

⁴ 10% for values greater than 0.5 mg/L; if three DO values are less than 0.5 mg/L, consider these values as stabilised.

The depth to groundwater measurement must be recorded before SAMPLING

VOC samples must be collected first

Pump intake should be located within the screen interval & at the mid point of the saturated screen length

* Gatic cover riser height should be a negative value

In the event that the recharge is very slow and the well runs dry, the readings may be collected at intervals of less than 5 minutes

If a well runs dry, it is assumed that stabilisation will have occurred once the it has recharged and that samples can be collected st

A minimum of 4 readings are required, unless the well runs dry

To calculate % difference, use the following equation: $((R2-R1)/((R2+R1)/2))*100$

mbTOC = metres below top of casing
DO = dissolved oxygen
ORP = oxygen reduction potential

Monitoring Well ID:	<u>MB5</u>
Inner Diameter:	<u></u>
Depth to Water (mbTOC):	<u>2.85m</u>
Depth of Well (mbTOC):	<u></u>
Top of Well Screen (mbTOC):	<u></u>
Bottom of Well Screen (mbTOC):	<u></u>
Height of Riser*(m above/below ground)	<u></u>
Presence & thickness of LNAPL:	<u></u>

			Temp (°C)	3%	D.O ⁴ (mg/L)	10%	Spec. Cond. (µS/cm)	3%	pH (unit)	± 0.1	ORP (mV)	±10	Comments
Time ¹	Depth to groundwater (mbTOC) ²	Purge rate (mL/min) ³	Reading	% between readings	Reading	% between readings	Reading	% between readings	Reading	± between readings	Reading	± between readings	
Start:	Start:												
12.41 pm	2.85	25	23.4		0.29		159.6		5.07	-	80.3		} no odour clear pale yellow
12.46 pm	2.85		23.3		0.3		150.8		5.05	-	81.8		
12.51 pm	2.85		23.4		0.23		152.2		5.03	-	87.4		
12.56 pm	2.85		23.6		0.10		156.2		4.99	-	85.7		
SAMPLING:													

Legend:
mbTOC= metres below top of casing
DO = dissolved oxygen
ORP = oxygen reduction potential

Monitoring Well ID:	MB6
Inner Diameter:	
Depth to Water (mbTOC):	2.04
Depth of Well (mbTOC):	
Top of Well Screen (mbTOC):	
Bottom of Well Screen (mbTOC):	
Height of Riser*(m above/below ground)	
Presence & thickness of LNAPL:	

* Well is kinda blocked by roots,
Depth to water may not be accurate.

[illegible]

Legend:
mbTOC = metres below top of casing
DO = dissolved oxygen
ORP = oxygen reduction potential

Monitoring Well ID:	M B20
Inner Diameter:	
Depth to Water (mbTOC):	3.30 m
Depth of Well (mbTOC):	
Top of Well Screen (mbTOC):	
Bottom of Well Screen (mbTOC):	
Height of Riser*(m above/below ground)	
Presence & thickness of LNAPL:	

Pump Intake (mbTOC):

[illegible]

ORP = oxygen reduction potential

Monitoring Well ID:	M821
Inner Diameter:	
Depth to Water (mbTOC):	1.69
Depth of Well (mbTOC):	
Top of Well Screen (mbTOC):	
Bottom of Well Screen (mbTOC):	
Height of Riser*(m above/below ground)	
Presence & thickness of LNAPL:	

- * Very slow recharging rate
- nence slower purge rate.

[illegible]

To calculate % difference, use the following equation: $((R2-R1)/((R2+R1)/2))*100$

ORP = oxygen reduction potential



PROJECT FIELD LOG (DAILY)

Date: <u>11/07</u>	Project Number: <u>72155/72597</u>	Project Name: <u>Casuarina LSP/ Casuarina GME</u>
Arrived: <u>10 am</u>	Departed: _____	Weather: <u>Sunny</u>
PM: <u>KT</u>	_____	
Field Personnel: <u>KS</u>	_____	
Contractors: <u>-</u>	_____	
Client Contact: _____	Site Contact: <u>-</u>	_____
Purpose of Visit (Tick Appropriate Box):		
☐ Site Inspection ☐ Well Integrity Assessment		
☐ Soil Bore Advancement (Drill Rig) ☐ Hand Augering ☐ Test Pits ☐ Soil Sampling		
☐ Monitoring Well Installation (Drill Rig) ☒ Groundwater Monitoring ☐ Sediment Sampling		
☐ Sub-slab Vapour Probe Installation ☐ Landfill Gas Well Installation ☐ Gas/ Vapour Sampling		
☐ Remediation Works Oversight ☐ Surface Water Sampling ☐ Other (Specify): _____		
Equipment Used:		
<u>Dipper</u>		

☐ Calibration Certificate Received : _____ ☐ Calibration Undertaken: _____		
Sampling:		
Sampling Conducted:	☐ Y ☒ N	Matrix: ☐ Soil ☐ Water ☐ Air
CoC Completed:	☐ Y ☒ N	
Primary Lab: _____	Secondary Lab: _____	

Description of Activities:

10 am arrived on site

MB 6 - 1.82 m (blocked by roots?)

MC 4 - 1.89 m blocked at 2.17 m

MB 20 - blocked at 3.27 m

MB 21 - 1.31 m

MB 5 - 2.66 m

MB 7 - ~~dry~~ dry/blocked at 5.1 m

11.30 am - left the site

Quality Control Details:

QC	Type	Date and time	Primary	Media
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				

QC	Collection Point	Collection Location	Date and time	Rinsate water batch #
RS				
RS				
RS				
RS				
RS				

QC	Date and time	Trip blank batch #
TB		
TB		
TB		
TB		
TB		

QC	Date and time	Collection Location	Blank water batch #
FB			
FB			
FB			
FB			
FB			

PROJECT FIELD LOG (DAILY)

Date: 08/08/24 Project Number: 072597/ Project Name: Casuarina GME

Arrived: 09:50 Departed: 10:30 ⁰⁷²¹⁵⁵ Weather: Sunny

PM: KT

Field Personnel: KS + PD

Contractors:

Client Contact: Site Contact:

Purpose of Visit (Tick Appropriate Box):

- ☐ Site Inspection ☐ Well Integrity Assessment
☐ Soil Bore Advancement (Drill Rig) ☐ Hand Augering ☐ Test Pits ☐ Soil Sampling
☐ Monitoring Well Installation (Drill Rig) ☒ Groundwater Monitoring ☐ Sediment Sampling
☐ Sub-slab Vapour Probe Installation ☐ Landfill Gas Well Installation ☐ Gas/ Vapour Sampling
☐ Remediation Works Oversight ☐ Surface Water Sampling ☐ Other (Specify):

Equipment Used:

Dipper

☐ Calibration Certificate Received : ☐ Calibration Undertaken:

Sampling:

Sampling Conducted: ☐ Y ☒ N Matrix: ☐ Soil ☐ Water ☐ Air

CoC Completed: ☐ Y ☐ N

Primary Lab: Secondary Lab:

Description of Activities:

09.50 - Arrived on site

MB7 - Dry at 5m

MB5 - dtw 1.91 dtb 4.31

MB6 - dtw 1.06 dtb/break 2.21 (check historical data)

MC4 - dtw 1.11 " 2.17 "

MB20 - dtw 2.85 dtb 3.27

MB21 - dtw 0.97 dtb 3.37

10.30 - Left site

Quality Control Details:

QC	Type	Date and time	Primary	Media
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				

QC	Collection Point	Collection Location	Date and time	Rinsate water batch #
RS				
RS				
RS				
RS				
RS				

QC	Date and time	Trip blank batch #
TB		
TB		
TB		
TB		
TB		

QC	Date and time	Collection Location	Blank water batch #
FB			
FB			
FB			
FB			
FB			

PROJECT FIELD LOG (DAILY)

Date: 20/09/24 Project Number: 72597 Project Name: Casuarina GME

Arrived: 09.30am Departed: 1.15pm Weather: Sunny

PM: KT

Field Personnel: KS

Contractors: -

Client Contact: - Site Contact: -

Purpose of Visit (Tick Appropriate Box):

- ☐ Site Inspection ☐ Well Integrity Assessment
☐ Soil Bore Advancement (Drill Rig) ☐ Hand Augering ☐ Test Pits ☐ Soil Sampling
☐ Monitoring Well Installation (Drill Rig) ☒ Groundwater Monitoring ☐ Sediment Sampling
☐ Sub-slab Vapour Probe Installation ☐ Landfill Gas Well Installation ☐ Gas/ Vapour Sampling
☐ Remediation Works Oversight ☐ Surface Water Sampling ☐ Other (Specify):

Equipment Used:

Dipper, YSI, Peripump

☒ Calibration Certificate Received : _____ ☐ Calibration Undertaken: _____

Sampling:

Sampling Conducted: ☒ Y ☐ N Matrix: ☐ Soil ☒ Water ☐ Air

CoC Completed: ☒ Y ☐ N

Primary Lab: Burofin Secondary Lab: ALS

Description of Activities:

9.30 am - arrived on site

conducted GW monitoring

MB5, MB21, MB20, MCH, MB 16 ($\phi_{c1} + \phi_{c2}$)
 2 MB7

1.15 pm - left site

Quality Control Details:

QC	Type	Date and time	Primary	Media
QC 01	Duplicate	20/09/24	MB6	W.
QC 02	Triplicate			
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				

QC	Collection Point	Collection Location	Date and time	Rinsate water batch #
RS				
RS				
RS				
RS				
RS				

QC	Date and time	Trip blank batch #
TB		
TB		
TB		
TB		
TB		

QC	Date and time	Collection Location	Blank water batch #
FB			
FB			
FB			
FB			
FB			

360
environment
7-12-03

Monitoring Well ID:	M4
Inner Diameter:	-
Depth to Water (mbTOC):	1.03
Depth of Well (mbTOC):	2.18
Top of Well Screen (mbTOC):	-
Bottom of Well Screen (mbTOC):	-
Height of Riser* (m above/below ground)	-
Presence & thickness of LNAPL:	-

Pump Intake (mbTOC):

[illegible]

To calculate % difference, use the following equation: $((R2-R1)/((R2+R1)/2))*100$

ORP = oxygen reduction potential

Monitoring Well ID:	MDS
Inner Diameter:	-
Depth to Water (mbTOC):	1.85 m
Depth of Well (mbTOC):	4.31 m
Top of Well Screen (mbTOC):	-
Bottom of Well Screen (mbTOC):	-
Height of Riser*(m above/below ground)	-
Presence & thickness of LNAPL:	-

Pump Intake (mbTOC):

[illegible]

Legend:

mbTOC= metres below top of casing

DO = dissolved oxygen

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

360
environment

Monitoring Well ID:	MB6
Inner Diameter:	—
Depth to Water (mbTOC):	0.97
Depth of Well (mbTOC):	2.13
Top of Well Screen (mbTOC):	—
Bottom of Well Screen (mbTOC):	—
Height of Riser*(m above/below ground)	—
Presence & thickness of LNAPL:	—

Pump Intake (mbTOC):

[illegible]

¹ Readings to be collected every five minutes or greater.

² Drawdown should not exceed 9 cm ONCE first set of readings obtained. This allows for natural drawdown stabilisation to occur.

³ Must be such that the drawdown doesn't exceed 9 cm, or if it does exceed, remains stable.

⁴ 10% for values greater than 0.5 mg/l; if three DO values are less than 0.5 mg/L, consider these values as stabilised.

The depth to groundwater measurement must be recorded before SAMPLING

VOC samples must be collected first.

Pump intake should be located within the screen interval & at the mid point of the saturated screen length

* Gatic cover riser height should be a negative value

In the event that the recharge is very slow and the well runs dry, the readings may be collected at intervals of less than 5 minutes or for every litres purged

If a well runs dry, it is assumed that stabilisation will have occurred once the it has recharged and that samples can be collected straight after

A minimum of 4 readings are required, unless the well runs dry.

To calculate % difference, use the following equation: $((R2-R1)/((R2+R1)/2))*100$

mbTOC= metres below top of casing

DO = dissolved oxygen

ORP = oxygen reduction potential

Monitoring Well ID:	MB7
Inner Diameter:	
Depth to Water (mbTOC):	4.57
Depth of Well (mbTOC):	4.97
Top of Well Screen (mbTOC):	
Bottom of Well Screen (mbTOC):	
Height of Riser*(m above/below ground)	
Presence & thickness of LNAPL:	

Pump Intake (mbTOC):

			Temp (°C)	3%	D.O ⁴ (mg/L)	10%	Spec. Cond. (µS/cm)	3%	pH (unit)	± 0.1	ORP (mV)	±10	Comments
Time ¹	Depth to groundwater (mbTOC) ²	Purge rate (mL/min) ³	Reading	% between readings	Reading	% between readings	Reading	% between readings	Reading	± between readings	Reading	± between readings	
Start:	Start:												
12.47	4.57		19.9		2.01		188.5		5.51		46.5		0 / 0 / 0
12.52	4.57		19.7		1.10		173.9		5.37		50.3		
12.57	↓		19.6		1.15		174.2		5.49		45.7		
13.02	↓		19.5		1.37		171.3		5.51		42.7		
SAMPLING:													

Legend:

mbTOC= metres below top of casing

DO = dissolved oxygen

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

ORP = oxygen reduction potential

Monitoring Well ID:	MB20
Inner Diameter:	
Depth to Water (mbTOC):	2.97
Depth of Well (mbTOC):	3.20 Concrete/Gravelled Bottom?
Top of Well Screen (mbTOC):	
Bottom of Well Screen (mbTOC):	
Height of Riser*(m above/below ground)	
Presence & thickness of LNAPL:	

Pump Intake (mbTOC):

[illegible]

ORP = oxygen reduction potential

Monitoring Well ID:	M B21
Inner Diameter:	
Depth to Water (mbTOC):	1.00
Depth of Well (mbTOC):	3.37
Top of Well Screen (mbTOC):	
Bottom of Well Screen (mbTOC):	
Height of Riser*(m above/below ground)	
Presence & thickness of LNAPL:	

[illegible]

Readings to be collected every five minutes or greater.

² Drawdown should not exceed 9 cm ONCE first set of readings obtained. This allows for natural drawdown stabilisation to occur.

³ Must be such that the drawdown doesn't exceed 9 cm, or if it does exceed, remains stable.

⁴ 10% for values greater than 0.5 mg/L; if three DO values are less than 0.5 mg/L, consider these values as stabilised.

The depth to groundwater measurement must be recorded before SAMPLING

VOC samples must be collected first

Pump intake should be located within the screen interval & at the mid point of the saturated screen length

* Gatic cover riser height should be a negative value

In the event that the recharge is very slow and the well runs dry, the readings may be collected at intervals of less than 5 minutes

If a well runs dry, it is assumed that stabilisation will have occurred once the the well has recharged and that samples can be collected

A minimum of 4 readings are required, unless the well runs dry

To calculate % difference, use the following equation: $((R2-R1)/((R2+R1)/2))^*100$

mbTOC= metres below top of casing
DO = dissolved oxygen
ORP = oxygen reduction potential

PROJECT FIELD LOG (DAILY)

Date: 11/10/24 Project Number: 72597 Project Name: Casuarina GME

Arrived: 10.30 Departed: 11-30 Weather: Sunny

PM: KT

Field Personnel: KS + PD

Contractors: _____

Client Contact: _____ Site Contact: _____

Purpose of Visit (Tick Appropriate Box):

- ☐ Site Inspection ☐ Well Integrity Assessment
☐ Soil Bore Advancement (Drill Rig) ☐ Hand Augering ☐ Test Pits ☐ Soil Sampling
☐ Monitoring Well Installation (Drill Rig) ☒ Groundwater Monitoring ☐ Sediment Sampling
☐ Sub-slab Vapour Probe Installation ☐ Landfill Gas Well Installation ☐ Gas/ Vapour Sampling
☐ Remediation Works Oversight ☐ Surface Water Sampling ☐ Other (Specify): _____

Equipment Used:

Dipper

☒ Calibration Certificate Received : _____ ☐ Calibration Undertaken: _____

Sampling:

Sampling Conducted: ☐ Y ☒ N Matrix: ☐ Soil ☐ Water ☐ Air

CoC Completed: ☐ Y ☐ N

Primary Lab: _____ Secondary Lab: _____

Description of Activities:

10.30am - Arrived on site

	dt w	dtb
MB7	4.53	4.98
MB5	1.87	4.35
MC4	1.05	2.20
MB20	3.00	3.40
MB21	1.03	3.34
MB6	1.00	2.20 2.14

11.30 am - left the site

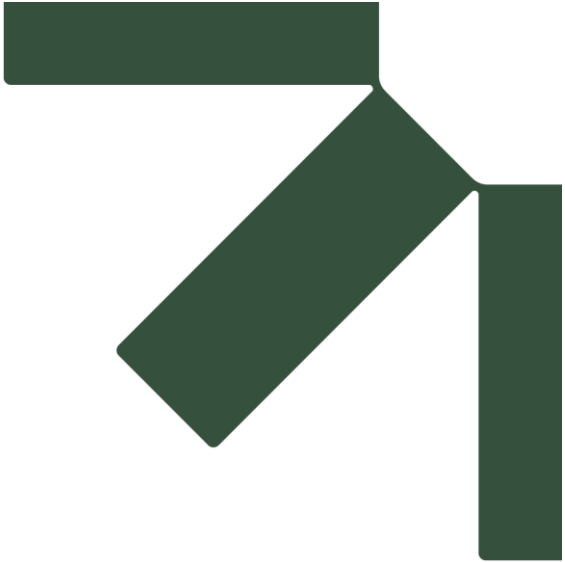
Quality Control Details:

QC	Type	Date and time	Primary	Media
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				
QC				

QC	Collection Point	Collection Location	Date and time	Rinsate water batch #
RS				
RS				
RS				
RS				
RS				

QC	Date and time	Trip blank batch #
TB		
TB		
TB		
TB		
TB		

QC	Date and time	Collection Location	Blank water batch #
FB			
FB			
FB			
FB			
FB			



Appendix B Laboratory Documentation

**Casuarina Groundwater Monitoring October 2022 to
October 2024**

Casuarina 6167, WA

Various Landowners (Casuarina LSP Area)

SLR Project No.: 675.0729597.00001

13 May 2025

CHAIN OF CUSTODY RECORD

Eurofins | mgf ABN 50 005 085 521

☐ Sydney Laboratory

Unit F3 Bld.F 16 Mars Road Lane Cove West NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

☐ Brisbane Laboratory

Unit 121 Smallwood Place Murarie QLD 4172
07 3902 4600 EnviroSampleQLD@eurofina.com

☒ Perth Laboratory

Unit 2 91 Leach Highway Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ Melbourne Laboratory

6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

[illegible]

360 Environmental
10 Bermondsey St
West Leederville
WA 6007



NATA Accredited
Accreditation Number 2377
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition
Arrangement for the mutual recognition of the
equivalence of testing, medical testing, calibration,
inspection, proficiency testing scheme providers and
reference materials producers reports and certificates.

Attention: Alison Prior

Report **931547-W**
Project name **CASUARINA SOUTH GROUNDWATER MONITORING**
Project ID **4763**
Received Date **Oct 13, 2022**

Client Sample ID			MC4	MC5	MC6	MC7
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22- Oc0025564	L22- Oc0025565	L22- Oc0025566	L22- Oc0025567
Date Sampled			Oct 13, 2022	Oct 13, 2022	Oct 13, 2022	Oct 13, 2022
Test/Reference	LOR	Unit				
Alkalinity	5	mg CaCO ₃ /L	< 5	< 5	16	13
Ammonia-N	0.02	mg/L	0.48	0.05	0.25	0.03
Bicarbonate	5	mg CaCO ₃ /L	< 5	< 5	16	13
Carbonate	5	mg CaCO ₃ /L	< 5	< 5	< 5	< 5
Chloride	5	mg/L	590	21	130	28
Filterable Reactive Phosphorus	0.01	mg/L	0.03	0.15	0.02	< 0.01
Hydroxide	5	mg CaCO ₃ /L	< 5	< 5	< 5	< 5
Nitrate-N	0.01	mg/L	< 0.01	1.9	< 0.01	5.0
Nitrite-N	0.01	mg/L	< 0.01	< 0.01	< 0.01	0.03
NOx-N	0.01	mg/L	< 0.01	1.9	< 0.01	5.0
Sulfate	1	mg/L	400	< 1	38	23
Total Kjeldahl Nitrogen	0.2	mg/L	0.8	1.8	0.9	< 0.2
Total Nitrogen	0.2	mg/L	0.8	3.7	0.9	5.0
Total Phosphorus	0.01	mg/L	0.29	0.18	0.14	0.14
Total Suspended Solids	5	mg/L	< 5	8.0	< 5	< 5
Total Titratable Acidity	5	mg CaCO ₃ /L	130	33	38	22
Bromide	0.1	mg/L	1.3	0.3	0.5	0.2
Heavy Metals						
Aluminium	0.05	mg/L	7.0	1.4	0.67	1.4
Iron	0.01	mg/L	21	0.20	0.91	0.18
Eurofins Suite B11C: Na/K/Ca/Mg						
Calcium	0.5	mg/L	71	7.3	6.4	4.2
Magnesium	0.5	mg/L	89	3.2	12	6.5
Potassium	0.5	mg/L	14	0.6	5.8	5.6
Sodium	0.5	mg/L	430	10.0	84	30

Client Sample ID			QC01	Trip Blank
Sample Matrix			Water	Water
Eurofins Sample No.			L22- Oc0025568	L22- Oc0025569
Date Sampled			Oct 13, 2022	Oct 13, 2022
Test/Reference	LOR	Unit		
Alkalinity	5	mg CaCO ₃ /L	15	-
Ammonia-N	0.02	mg/L	0.03	-
Bicarbonate	5	mg CaCO ₃ /L	15	-
Carbonate	5	mg CaCO ₃ /L	< 5	-
Chloride	5	mg/L	31	-
Filterable Reactive Phosphorus	0.01	mg/L	< 0.01	-
Hydroxide	5	mg CaCO ₃ /L	< 5	-
Nitrate-N	0.01	mg/L	4.4	-
Nitrite-N	0.01	mg/L	0.03	-
NO _x -N	0.01	mg/L	4.4	-
Sulfate	1	mg/L	23	-
Total Kjeldahl Nitrogen	0.2	mg/L	< 0.2	-
Total Nitrogen	0.2	mg/L	4.4	-
Total Phosphorus	0.01	mg/L	0.09	-
Total Suspended Solids	5	mg/L	< 5	-
Total Titratable Acidity	5	mg CaCO ₃ /L	9.4	-
Bromide	0.1	mg/L	0.2	-
Naphthalene ^{NO2}	0.01	mg/L	-	< 0.01
Heavy Metals				
Aluminium	0.05	mg/L	1.5	-
Iron	0.01	mg/L	0.18	-
Eurofins Suite B11C: Na/K/Ca/Mg				
Calcium	0.5	mg/L	4.3	-
Magnesium	0.5	mg/L	6.4	-
Potassium	0.5	mg/L	5.2	-
Sodium	0.5	mg/L	32	-
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	0.02	mg/L	-	< 0.02
BTEX				
Benzene	0.001	mg/L	-	< 0.001
Toluene	0.001	mg/L	-	< 0.001
Ethylbenzene	0.001	mg/L	-	< 0.001
m&p-Xylenes	0.002	mg/L	-	< 0.002
o-Xylene	0.001	mg/L	-	< 0.001
Xylenes - Total*	0.003	mg/L	-	< 0.003
Total Recoverable Hydrocarbons				
TRH C6-C10	0.02	mg/L	-	< 0.02
TRH C6-C10 less BTEX (F1) ^{NO4}	0.02	mg/L	-	< 0.02

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Alkalinity	Welshpool	Oct 14, 2022	14 Days
- Method: ARL037 - Alkalinity in Water			
Bicarbonate	Welshpool	Oct 14, 2022	14 Days
- Method: ARL037 - Alkalinity in Water			
Carbonate	Welshpool	Oct 14, 2022	14 Days
- Method: ARL037 - Alkalinity in Water			
Hydroxide	Welshpool	Oct 14, 2022	14 Day
- Method: ARL037 - Alkalinity in Water			
Ammonia-N	Welshpool	Oct 14, 2022	28 Days
- Method: ARL303 - Ammonia in Water by Discrete Analyser			
Chloride	Welshpool	Oct 14, 2022	28 Days
- Method: ARL305 - Chloride in Water by Discrete Analyser			
Filterable Reactive Phosphorus	Welshpool	Oct 14, 2022	28 Days
- Method: ARL309 - Filterable Reactive Phosphorus in Water by Discrete Analyser			
Nitrate-N	Welshpool	Oct 14, 2022	28 Days
- Method: ARL313/319 - NOx in Water by Discrete Analyser			
Nitrite-N	Welshpool	Oct 14, 2022	2 Days
- Method: ARL311 - Nitrite in Water by Discrete Analyser			
Sulfate	Welshpool	Oct 14, 2022	28 Days
- Method: ARL301 - Sulfate in Water by Discrete Analyser			
Total Phosphorus	Welshpool	Oct 14, 2022	28 Days
- Method: ARL308 - Total Phosphorus in Water by Discrete Analyser			
Total Suspended Solids	Welshpool	Oct 14, 2022	7 Days
- Method: ARL No. 016 - Total Suspended Solids			
Bromide	Welshpool	Oct 14, 2022	28 Days
- Method: ARL323 - Bromide in Water by Discrete Analyser			
Heavy Metals	Welshpool	Oct 14, 2022	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Eurofins Suite B11C: Na/K/Ca/Mg	Welshpool	Oct 14, 2022	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
NOx-N	Welshpool	Oct 14, 2022	28 Days
- Method: ARL313/319 - NOx in Water by Discrete Analyser			
Total Kjeldahl Nitrogen	Welshpool	Oct 14, 2022	28 Days
- Method: ARL No. 330 - Persulfate Method for Simultaneous Determination of TN & TP			
Total Nitrogen	Welshpool	Oct 14, 2022	28 Days
- Method: ARL No. 330 - Persulfate Method for Simultaneous Determination of TN & TP			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Oct 14, 2022	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Melbourne	Oct 14, 2022	14 Days
- Method: LTM-ORG-2010 BTEX and Volatile TRH			
Total Recoverable Hydrocarbons	Melbourne	Oct 14, 2022	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			

Company Name: 360 Environmental
Address: 10 Bermondsey St
West Leederville
WA 6007

Order No.:
Report #: 931547
Phone: 08 9388 8360
Fax: 08 9381 2360

Received: Oct 13, 2022 12:00 AM
Due: Oct 24, 2022
Priority: 7 Day
Contact Name: Alison Prior

Project Name: CASUARINA SOUTH GROUNDWATER MONITORING
Project ID: 4763

Eurofins Analytical Services Manager : Natalie Hill

Sample Detail						Aluminium	Ammonia-N	Bromide	Chloride	Filterable Reactive Phosphorus	Iron	Nitrate-N	Nitrite-N	Sulfate	Total Phosphorus	Total Suspended Solids	Total Titratable Acidity	Eurofins Suite B1	Eurofins Suite B11C: Na/K/Ca/Mg	Total Nitrogen	Alkalinity
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
External Laboratory																					
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID																
1	MC4	Oct 13, 2022		Water	L22-Oc0025564	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
2	MC5	Oct 13, 2022		Water	L22-Oc0025565	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
3	MC6	Oct 13, 2022		Water	L22-Oc0025566	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
4	MC7	Oct 13, 2022		Water	L22-Oc0025567	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
5	QC01	Oct 13, 2022		Water	L22-Oc0025568	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
6	Trip Blank	Oct 13, 2022		Water	L22-Oc0025569													X			
Test Counts						5	5	5	5	5	5	5	5	5	5	5	5	1	5	5	5

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	µg/L: micrograms per litre
ppm: parts per million	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test			Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Method Blank								
Alkalinity			mg CaCO ₃ /L	< 5		5	Pass	
Ammonia-N			mg/L	< 0.02		0.02	Pass	
Bicarbonate			mg CaCO ₃ /L	< 5		5	Pass	
Carbonate			mg CaCO ₃ /L	< 5		5	Pass	
Chloride			mg/L	< 5		5	Pass	
Filterable Reactive Phosphorus			mg/L	< 0.01		0.01	Pass	
Hydroxide			mg CaCO ₃ /L	< 5		5	Pass	
Nitrate-N			mg/L	< 0.01		0.01	Pass	
Nitrite-N			mg/L	< 0.01		0.01	Pass	
NOx-N			mg/L	< 0.01		0.01	Pass	
Sulfate			mg/L	< 1		1	Pass	
Total Titratable Acidity			mg CaCO ₃ /L	< 5		5	Pass	
Bromide			mg/L	< 0.1		0.1	Pass	
Method Blank								
Heavy Metals								
Aluminium			mg/L	< 0.05		0.05	Pass	
Iron			mg/L	< 0.01		0.01	Pass	
Method Blank								
Eurofins Suite B11C: Na/K/Ca/Mg								
Calcium			mg/L	< 0.5		0.5	Pass	
Magnesium			mg/L	< 0.5		0.5	Pass	
Potassium			mg/L	< 0.5		0.5	Pass	
LCS - % Recovery								
Heavy Metals								
Aluminium			%	101		80-120	Pass	
Iron			%	98		80-120	Pass	
LCS - % Recovery								
Eurofins Suite B11C: Na/K/Ca/Mg								
Calcium			%	103		80-120	Pass	
Magnesium			%	109		80-120	Pass	
Potassium			%	108		80-120	Pass	
Sodium			%	106		80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery								
				Result 1				
Chloride	L22-Oc0025213	NCP	%	96		70-130	Pass	
NOx-N	L22-Oc0025544	NCP	%	117		80-120	Pass	
Sulfate	L22-Oc0025213	NCP	%	82		70-130	Pass	
Total Phosphorus	L22-Oc0025564	CP	%	96		80-120	Pass	
Spike - % Recovery								
				Result 1				
Aluminium	L22-Oc0025563	NCP	%	103		75-125	Pass	
Iron	L22-Oc0025563	NCP	%	101		75-125	Pass	
Spike - % Recovery								
				Result 1				
Calcium	L22-Oc0025563	NCP	%	91		75-125	Pass	
Magnesium	L22-Oc0025563	NCP	%	82		75-125	Pass	
Potassium	L22-Oc0025563	NCP	%	102		75-125	Pass	
Sodium	L22-Oc0025563	NCP	%	Q05		75-125	Fail	Q05
Spike - % Recovery								

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
				Result 1					
Ammonia-N	L22-Oc0025568	CP	%	120			80-120	Pass	
Filterable Reactive Phosphorus	L22-Oc0025568	CP	%	109			80-120	Pass	
Nitrite-N	L22-Oc0025568	CP	%	113			80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Chloride	L22-Oc0026264	NCP	mg/L	160	170	5.6	30%	Pass	
Sulfate	L22-Oc0026264	NCP	mg/L	130	130	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Heavy Metals									
Aluminium	L22-Oc0025108	NCP	mg/L	5.2	5.3	1.5	30%	Pass	
Iron	L22-Oc0025108	NCP	mg/L	0.30	0.29	1.9	30%	Pass	
Duplicate									
Eurofins Suite B11C: Na/K/Ca/Mg				Result 1	Result 2	RPD			
Calcium	L22-Oc0025108	NCP	mg/L	5.0	5.1	1.6	30%	Pass	
Magnesium	L22-Oc0025108	NCP	mg/L	5.8	5.9	1.6	30%	Pass	
Potassium	L22-Oc0025108	NCP	mg/L	1.8	1.8	1.6	30%	Pass	
Sodium	L22-Oc0025108	NCP	mg/L	16	16	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Total Phosphorus	L22-Oc0025565	CP	mg/L	0.18	0.18	3.4	20%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Ammonia-N	L22-Oc0025567	CP	mg/L	0.03	0.02	8.0	20%	Pass	
Filterable Reactive Phosphorus	L22-Oc0025567	CP	mg/L	< 0.01	< 0.01	<1	20%	Pass	
Nitrate-N	L22-Oc0025567	CP	mg/L	5.0	5.1	2.4	30%	Pass	
Nitrite-N	L22-Oc0025567	CP	mg/L	0.03	0.03	7.1	20%	Pass	
NOx-N	L22-Oc0025567	CP	mg/L	5.0	5.2	2.4	20%	Pass	
Total Phosphorus	L22-Oc0025567	CP	mg/L	0.14	0.12	11	20%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Alkalinity	L22-Oc0025055	NCP	mg CaCO ₃ /L	< 5	< 5	<1	30%	Pass	
Bicarbonate	L22-Oc0025055	NCP	mg CaCO ₃ /L	< 5	< 5	<1	20%	Pass	
Carbonate	L22-Oc0025055	NCP	mg CaCO ₃ /L	< 5	< 5	<1	20%	Pass	
Hydroxide	L22-Oc0025055	NCP	mg CaCO ₃ /L	< 5	< 5	<1	20%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
Q05	The matrix spike concentration is less than five times the background concentration in the sample - therefore the spike recovery cannot be determined

Authorised by:

Natalie Hill	Analytical Services Manager
Kim Rodgers	Senior Analyst-Metal
Lauren Killin	Senior Analyst-Inorganic
Sam Becker	Senior Analyst-Inorganic
Sean Sangster	Senior Analyst-Metal



Kim Rodgers

Business Unit Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

CHAIN OF CUSTODY RECORD

Eurofins I mat ABN 50 005 085 521

☐ Sydney Laboratory

Unit F3 Bld F 16 Mars Road Lane Cove West NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

Brisbane Laboratory

Unit 1 21 Smallwood Place Marano QLD 4172
07 3902 4600 EnviroSampleQLD@neurofins.com

☒ Perth Laboratory

Unit 2 91 Leach Highway Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ Melbourne Laboratory

6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company		360 Environmental part of SLR		Project No		4763		Project Manager		Kuenzang		Sampler(s)		Pema																													
Address		500 Hay Street, Subiaco		Project Name		Casuarina South LSP LWMS		EDD Format ESdat, EQuls etc		EsDat		Handed over by		Pema																													
Contact Name		Kuenzang Tshering		Analyses Where results are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.		Total Suspended Solids		Total Nitrogen		Ammonia as Nitrogen		Nitrate as Nitrogen		Nitrite as Nitrogen		Total Phosphorus		Reactive Phosphorus		Total titratable acidity and total alkalinity		Major anions (Chloride, bromide and sulfate)		Major cations (Calcium, magnesium, sodium and Potassium)		Iron and Aluminium		500mL Plastic		250mL Plastic		125mL Plastic		200mL Amber Glass		40mL VOA vial		500mL PFAS Bottle		Jar (Glass or HDPE)		Other (Abertox AS4964, WA Guidelines) ☐ Overnight (reporting by 9am) ♦ ☐ Same day ♦ ☐ 1 day ♦ ☐ 2 days ♦ ☐ 3 days ♦ ☒ 5 days (Standard) ☐ Other ()	
Phone No		426036143																																									
Special Directions																																											
Purchase Order																																											
Quote ID No		360 Blanket Quote																																									
No	Client Sample ID		Sampled Date/Time dd/mm/yy hh:mm		Matrix Solid (S) Water (W)																																Sample Comments / Dangerous Goods Hazard Warning						
1	MC4		27-03-23																														Dry										
2	MB3		27-03-23																														Dry										
3	MB5		27-03-23		W		X		X		X		X		X		X		X		X		X		X																		
4	MB6		27-03-23		W		X		X		X		X		X		X		X		X		X		X																		
5	MB7		27-03-23																														Dry										
6	QC01		27-03-23		W		X		X		X		X		X		X		X		X		X		X																		
7																																											
8																																											
9																																											
Total Counts													3		3		3		3		3		3																				
Method of Shipment		☐ Courier (#) ☒ Hand Delivered ☐ Postal		Name				Signature				Date				Time				Temperature				Report No																			
Eurofins mgt Laboratory Use Only		Received By		Hayley		SYD BNE MEL PER ADL NTL DRW		Signature		H		Date		27/3/23		Time		14:00		Temperature		25.2		Report No		97572																	
		Received By				SYD BNE MEL PER ADL NTL DRW		Signature				Date				Time																											

Eurofins ARL Pty Ltd

Eurofins Environment Testing Australia Pty Ltd

ABN: 91 05 0159 898

ABN: 50 005 085 521

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Tel: +61 8 6253 4444
NATA# 2377 Site# 2370

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Mayfield West NSW 2304
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NATA# 1261
Site# 25079 & 25289

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

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Tel: +64 9 526 45 51
IANZ# 1327

Christchurch
43 Detroit Drive
Rolleston,
Christchurch 7675
Tel: 0800 856 450
IANZ# 1290

Sample Receipt Advice

Company name: SLR Consulting Australia Pty Ltd
Contact name: Kuenzang Tshering
Project name: CASUARINA SOUTH LSP LWMS
Project ID: 4763
Turnaround time: 7 Day
Date/Time received: Mar 27, 2023 2:00 PM
Eurofins reference: 975729

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 25.2 degrees Celsius.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- ✓ Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- ✓ Sample containers for volatile analysis received with zero headspace.
- ✗ Split sample sent to requested external lab.
- ✗ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Natalie Hill on phone : or by email: NatalieHill@eurofins.com

Results will be delivered electronically via email to Kuenzang Tshering - ktshering@slrconsulting.com.

Note: A copy of these results will also be delivered to the general SLR Consulting Australia Pty Ltd email address.



web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins ARL Pty Ltd

ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
Tel: +61 8 6253 4444
NATA# 2377 Site# 2370

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

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NATA# 1261 Site# 1254

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Grovedale
VIC 3216
Tel: +61 3 8564 5000
NATA# 1261 Site# 25403

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Tel: +61 2 9900 8400
NATA# 1261 Site# 18217

Canberra
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Mitchell
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NATA# 1261 Site# 25466

Brisbane
1/21 Smallwood Place
Murarrie
QLD 4172
Tel: +61 7 3902 4600
NATA# 1261 Site# 20794

Newcastle
1/2 Frost Drive
Mayfield West NSW 2304
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NATA# 1261
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Eurofins Environment Testing NZ Ltd

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Auckland 1061
Tel: +64 9 526 45 51
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Christchurch
43 Detroit Drive
Rolleston,
Christchurch 7675
Tel: 0800 856 450
IANZ# 1290

Company Name: SLR Consulting Australia Pty Ltd
Address: Level 1, 500 Hay Street
Subiaco
WA 6008

Project Name: CASUARINA SOUTH LSP LWMS
Project ID: 4763

Order No.:
Report #: 975729
Phone: 08 9388 8360
Fax: 08 9381 2360

Received: Mar 27, 2023 2:00 PM
Due: Apr 5, 2023
Priority: 7 Day
Contact Name: Kuenzang Tshering

Eurofins Analytical Services Manager : Natalie Hill

Sample Detail						Aluminium	Bromide	Iron	Total Suspended Solids	Total Titratable Acidity	Eurofins Suite B11E: Cl/SO4/Alkalinity	Eurofins Suite B11C: Na/K/Ca/Mg	Nutrients in water
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X	X	X	X	X	X
External Laboratory													
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID								
1	MB5	Mar 27, 2023		Water	L23-Ma0063846	X	X	X	X	X	X	X	X
2	MB6	Mar 27, 2023		Water	L23-Ma0063847	X	X	X	X	X	X	X	X
3	QC01	Mar 27, 2023		Water	L23-Ma0063848	X	X	X	X	X	X	X	X
Test Counts						3	3	3	3	3	3	3	3



CHAIN OF CUSTODY RECORD

Eurofins | mgt ABN 50 005 085 521

☐ Sydney Laboratory
Unit F3 Bld F 16 Mars Road Lane Cove West NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

☐ Brisbane Laboratory
Unit 1 21 Smallerwood Place Murarie QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

☒ Perth Laboratory
Unit 2 91 Leach Highway Keerdele WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ Melbourne Laboratory
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	360 Environmental part of SLR	Project No	4763	Project Manager	Kuenzang Tshering	Sampler(s)	Pema Dorji																		
Address	500 Hay Street, Subiaco	Project Name	Casuarina South LSP LWMS	EDD Format ESdat, EduS etc	EsDat	Handed over by	Pema Dorji																		
Contact Name	Kuenzang Tshering	Analyses Where inserts are requested, please specify "Total" or "Filtered". S.UITE code must be used to amend S.UITE pricing.	Total Suspended Solids	Total Nitrogen	Ammonia as Nitrogen	Nitrate as Nitrogen	Nitrite as Nitrogen	Total Phosphorus	Reactive Phosphorus	Total titratable acidity and total alkalinity	Major anions (Chloride, bromide and sulfate)	Major cations (Calcium, magnesium, sodium and Potassium)	Iron and Aluminium	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4864, WA Guidelines)	Email for Invoice	AccountsPayableAU@slrconsulting.com		
Phone No	426036143																					Email for Results	labresults@360environmental.com.au, ktshering@slrconsulting.com		
Special Directions																						Containers Change container type & size if necessary.		Required Turnaround Time (TAT) Default will be 5 days if not ticked.	
Purchase Order																						☐ Overnight (reporting by 9am)* ☐ Same day* ☐ 2 days* ☒ 5 days (Standard) ☐ Other()			
Quote ID No	360 Blanket Quote																								
No	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)																			Sample Comments / Dangerous Goods Hazard Warning			
1	MC4	31/07/23	W	X	X	X	X	X	X	X	X	X	X	1	1							Lab filter			
2	MB3	31/07/23	W	X	X	X	X	X	X	X	X	X	X	1	1							Lab filter			
3	MB5	31/07/23	W	X	X	X	X	X	X	X	X	X	X	1	1							Lab filter			
4	MB6	31/07/23	W	X	X	X	X	X	X	X	X	X	X	1	1							Lab filter			
5	MB7	31/07/23	W	X	X	X	X	X	X	X	X	X	X	1	1							Lab filter			
6	QC01	31/07/23	W	X	X	X	X	X	X	X	X	X	X	1	1							Lab filter			
7																									
8																									
9																									
Total Counts														6	6										
Method of Shipment				☐ Courier (#) ☒ Hand Delivered ☐ Postal		Name		Signature		Date		Time													
Eurofins mgt Laboratory Use Only		Received By	Maylen	SYD BNE MEL PER ADL NTL DRW		Signature		Date		31/7/23		Time		16:34		Temperature		18.7		Report No		1012541			
		Received By		SYD BNE MEL PER ADL NTL DRW		Signature		Date				Time													

Eurofins ARL Pty Ltd

Eurofins Environment Testing Australia Pty Ltd

Eurofins Environment Testing NZ Ltd

ABN: 91 05 0159 898

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Perth	Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
46-48 Banksia Road Welshpool WA 6106 Tel: +61 8 6253 4444 NATA# 2377 Site# 2370	6 Monterey Road Dandenong South VIC 3175 Tel: +61 3 8564 5000 NATA# 1261 Site# 1254	19/8 Lewalan Street Grovedale VIC 3216 Tel: +61 3 8564 5000 NATA# 1261 Site# 25403	179 Magowar Road Girraween NSW 2145 Tel: +61 2 9900 8400 NATA# 1261 Site# 18217	Unit 1,2 Dacre Street Mitchell ACT 2911 Tel: +61 2 6113 8091 NATA# 1261 Site# 25466	1/21 Smallwood Place Murarrie QLD 4172 Tel: +61 7 3902 4600 NATA# 1261 Site# 20794	1/2 Frost Drive Mayfield West NSW 2304 Tel: +61 2 4968 8448 NATA# 1261 Site# 25079 & 25289

Auckland	Christchurch
35 O'Rourke Road Penrose, Auckland 1061 Tel: +64 9 526 4551 IANZ# 1327	43 Detroit Drive Rolleston, Christchurch 7675 Tel: +64 3 343 5201 IANZ# 1290

Sample Receipt Advice

Company name:	SLR Consulting Australia Pty Ltd
Contact name:	Kuenzang Tshering
Project name:	CASUARINA SOUTH LSP LWMS
Project ID:	4763
Turnaround time:	5 Day
Date/Time received	Jul 31, 2023 4:34 PM
Eurofins reference	1012541

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 18.9 degrees Celsius.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- ✓ Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- ✓ Sample containers for volatile analysis received with zero headspace.
- ✗ Split sample sent to requested external lab.
- ✗ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Natalie Hill on phone : or by email: NatalieHill@eurofins.com

Results will be delivered electronically via email to Kuenzang Tshering - ktshering@slrconsulting.com.

Note: A copy of these results will also be delivered to the general SLR Consulting Australia Pty Ltd email address.

SLR Consulting Australia Pty Ltd
Level 1, 500 Hay Street
Subiaco
WA 6008



NATA Accredited
Accreditation Number 2377
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition
Arrangement for the mutual recognition of the
equivalence of testing, medical testing, calibration,
inspection, proficiency testing scheme providers and
reference materials producers reports and certificates.

Attention: Kuenzang Tshering

Report 1012541-W
Project name CASUARINA SOUTH LSP LWMS
Project ID 4763
Received Date Jul 31, 2023

Client Sample ID			MC4	MB3	MB5	MB6
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L23- Au0000428	L23- Au0000429	L23- Au0000430	L23- Au0000431
Date Sampled			Jul 31, 2023	Jul 31, 2023	Jul 31, 2023	Jul 31, 2023
Test/Reference	LOR	Unit				
Alkalinity	5	mg CaCO ₃ /L	< 5	18	< 5	16
Ammonia-N	0.02	mg/L	0.59	0.08	0.08	0.03
Bicarbonate	5	mg CaCO ₃ /L	< 5	18	< 5	16
Bromide	0.5	mg/L	< 2	< 0.5	< 0.5	< 0.5
Carbonate	5	mg CaCO ₃ /L	< 5	< 5	< 5	< 5
Chloride	5	mg/L	540	34	19	74
Filterable Reactive Phosphorus	0.01	mg/L	0.45	0.13	0.21	0.20
Hydroxide	5	mg CaCO ₃ /L	< 5	< 5	< 5	< 5
Nitrate-N	0.01	mg/L	< 0.01	< 0.01	3.8	< 0.01
Nitrite-N	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
NOx-N	0.01	mg/L	< 0.01	< 0.01	3.8	< 0.01
Sulfate	1	mg/L	470	24	< 1	49
Total Kjeldahl Nitrogen	0.2	mg/L	0.9	0.7	0.6	1.6
Total Nitrogen	0.2	mg/L	0.9	0.7	4.4	1.6
Total Phosphorus	0.01	mg/L	0.45	0.13	7.0	0.20
Total Suspended Solids	5	mg/L	5.0	45	6.0	5.0
Total Titratable Acidity	5	mg CaCO ₃ /L	130	20	29	39
Heavy Metals						
Aluminium (filtered)	0.05	mg/L	5.6	0.35	0.83	1.4
Iron (filtered)	0.01	mg/L	22	0.11	0.09	0.17
Eurofins Suite B11C: Na/K/Ca/Mg						
Calcium	0.5	mg/L	40	2.8	4.7	8.2
Magnesium	0.5	mg/L	69	5.2	2.7	9.8
Potassium	0.5	mg/L	12	1.7	1.0	2.9
Sodium	0.5	mg/L	360	24	10.0	52

Client Sample ID			MB7	QC01
Sample Matrix			Water	Water
Eurofins Sample No.			L23- Au0000432	L23- Au0000433
Date Sampled			Jul 31, 2023	Jul 31, 2023
Test/Reference	LOR	Unit		
Alkalinity	5	mg CaCO ₃ /L	27	25
Ammonia-N	0.02	mg/L	< 0.02	< 0.02
Bicarbonate	5	mg CaCO ₃ /L	27	25
Bromide	0.5	mg/L	< 0.5	< 0.5
Carbonate	5	mg CaCO ₃ /L	< 5	< 5
Chloride	5	mg/L	140	140
Filterable Reactive Phosphorus	0.01	mg/L	0.12	0.12
Hydroxide	5	mg CaCO ₃ /L	< 5	< 5
Nitrate-N	0.01	mg/L	1.3	1.4
Nitrite-N	0.01	mg/L	< 0.01	0.01
NOx-N	0.01	mg/L	1.3	1.4
Sulfate	1	mg/L	34	40
Total Kjeldahl Nitrogen	0.2	mg/L	< 0.2	5.6
Total Nitrogen	0.2	mg/L	1.3	7.0
Total Phosphorus	0.01	mg/L	0.12	12
Total Suspended Solids	5	mg/L	8.0	2700
Total Titratable Acidity	5	mg CaCO ₃ /L	21	17
Heavy Metals				
Aluminium (filtered)	0.05	mg/L	0.12	0.66
Iron (filtered)	0.01	mg/L	0.24	0.14
Eurofins Suite B11C: Na/K/Ca/Mg				
Calcium	0.5	mg/L	2.6	5.7
Magnesium	0.5	mg/L	7.4	8.9
Potassium	0.5	mg/L	5.0	6.2
Sodium	0.5	mg/L	89	83

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Alkalinity - Method: ARL037 - Alkalinity in Water	Welshpool	Aug 03, 2023	14 Days
Bicarbonate - Method: ARL037 - Alkalinity in Water	Welshpool	Aug 03, 2023	14 Days
Carbonate - Method: ARL037 - Alkalinity in Water	Welshpool	Aug 03, 2023	14 Days
Hydroxide - Method: ARL037 - Alkalinity in Water	Welshpool	Aug 03, 2023	14 Day
Ammonia-N - Method: ARL303 - Ammonia in Water by Discrete Analyser	Welshpool	Aug 03, 2023	28 Days
Filterable Reactive Phosphorus - Method: ARL309 - Filterable Reactive Phosphorus in Water by Discrete Analyser	Welshpool	Aug 03, 2023	28 Days
Nitrate-N - Method: ARL313/319 - NOx in Water by Discrete Analyser	Welshpool	Aug 03, 2023	28 Days
Nitrite-N - Method: ARL311 - Nitrite in Water by Discrete Analyser	Welshpool	Aug 03, 2023	2 Days
NOx-N - Method: ARL313/319 - NOx in Water by Discrete Analyser	Welshpool	Aug 03, 2023	28 Days
Total Kjeldahl Nitrogen - Method: ARL No. 330 - Persulfate Method for Simultaneous Determination of TN & TP	Welshpool	Aug 01, 2023	28 Day
Total Nitrogen - Method: ARL No. 330 - Persulfate Method for Simultaneous Determination of TN & TP	Welshpool	Aug 03, 2023	28 Days
Total Phosphorus - Method: ARL308 - Total Phosphorus in Water by Discrete Analyser	Welshpool	Aug 03, 2023	28 Days
Bromide - Method: In-house method LTM-INO-4270 Anions by Ion Chromatography	Sydney	Aug 02, 2023	28 Days
Total Suspended Solids - Method: ARL No. 016 - Total Suspended Solids	Welshpool	Aug 03, 2023	7 Days
Heavy Metals (filtered) - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Welshpool	Aug 03, 2023	28 Days
Eurofins Suite B11C: Na/K/Ca/Mg - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Welshpool	Aug 03, 2023	180 Days
Chloride - Method: ARL305 - Chloride in Water by Discrete Analyser	Welshpool	Aug 03, 2023	28 Days
Sulfate - Method: ARL301 - Sulfate in Water by Discrete Analyser	Welshpool	Aug 03, 2023	28 Days



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Company Name: SLR Consulting Australia Pty Ltd
Address: Level 1, 500 Hay Street
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WA 6008

Project Name: CASUARINA SOUTH LSP LWMS
Project ID: 4763

Order No.:
Report #: 1012541
Phone: 08 9388 8360
Fax: 08 9381 2360

Received: Jul 31, 2023 4:34 PM
Due: Aug 7, 2023
Priority: 5 Day
Contact Name: Kuenzang Tshering

Eurofins Analytical Services Manager : Natalie Hill

Sample Detail						Aluminium (filtered)	Bromide	Chloride	Iron (filtered)	Sulfate	Total Suspended Solids	Total Titratable Acidity	Eurofins Suite B11C: Na/K/Ca/Mg	Alkalinity	Eurofins Suite B19E
Perth Laboratory - NATA # 2377 Site # 2370						X		X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217							X								
External Laboratory															
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID										
1	MC4	Jul 31, 2023		Water	L23-Au0000428	X	X	X	X	X	X	X	X	X	X
2	MB3	Jul 31, 2023		Water	L23-Au0000429	X	X	X	X	X	X	X	X	X	X
3	MB5	Jul 31, 2023		Water	L23-Au0000430	X	X	X	X	X	X	X	X	X	X
4	MB6	Jul 31, 2023		Water	L23-Au0000431	X	X	X	X	X	X	X	X	X	X
5	MB7	Jul 31, 2023		Water	L23-Au0000432	X	X	X	X	X	X	X	X	X	X
6	QC01	Jul 31, 2023		Water	L23-Au0000433	X	X	X	X	X	X	X	X	X	X
Test Counts						6	6	6	6	6	6	6	6	6	6

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	µg/L: micrograms per litre
ppm: parts per million	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit		

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Alkalinity	mg CaCO ₃ /L	< 5			5	Pass	
Ammonia-N	mg/L	< 0.02			0.02	Pass	
Bicarbonate	mg CaCO ₃ /L	< 5			5	Pass	
Bromide	mg/L	< 0.5			0.5	Pass	
Carbonate	mg CaCO ₃ /L	< 5			5	Pass	
Chloride	mg/L	< 5			5	Pass	
Filterable Reactive Phosphorus	mg/L	< 0.01			0.01	Pass	
Hydroxide	mg CaCO ₃ /L	< 5			5	Pass	
Nitrate-N	mg/L	< 0.01			0.01	Pass	
Nitrite-N	mg/L	< 0.01			0.01	Pass	
NOx-N	mg/L	< 0.01			0.01	Pass	
Sulfate	mg/L	< 1			1	Pass	
Total Nitrogen	mg/L	< 0.2			0.2	Pass	
Total Phosphorus	mg/L	< 0.01			0.01	Pass	
Total Suspended Solids	mg/L	< 5			5	Pass	
Total Titratable Acidity	mg CaCO ₃ /L	< 5			5	Pass	
Method Blank							
Heavy Metals							
Aluminium (filtered)	mg/L	< 0.05			0.05	Pass	
Iron (filtered)	mg/L	< 0.01			0.01	Pass	
Method Blank							
Eurofins Suite B11C: Na/K/Ca/Mg							
Calcium	mg/L	< 0.5			0.5	Pass	
Magnesium	mg/L	< 0.5			0.5	Pass	
Potassium	mg/L	< 0.5			0.5	Pass	
Sodium	mg/L	< 0.5			0.5	Pass	
LCS - % Recovery							
Bromide	%	101			70-130	Pass	
Total Phosphorus	%	80			80-120	Pass	
LCS - % Recovery							
Heavy Metals							
Aluminium (filtered)	%	89			80-120	Pass	
Iron (filtered)	%	83			80-120	Pass	
LCS - % Recovery							
Eurofins Suite B11C: Na/K/Ca/Mg							
Calcium	%	82			80-120	Pass	
Magnesium	%	100			80-120	Pass	
Potassium	%	87			80-120	Pass	
Sodium	%	100			80-120	Pass	
CRM - % Recovery							
Ammonia-N	%	102			80-120	Pass	
Chloride	%	101			80-120	Pass	
Filterable Reactive Phosphorus	%	101			80-120	Pass	
Nitrate-N	%	111			80-120	Pass	
NOx-N	%	112			80-120	Pass	
Sulfate	%	107			80-120	Pass	
Total Nitrogen	%	84			80-120	Pass	
Total Suspended Solids	%	100			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
				Result 1					
Bromide	S23-Au0002471	NCP	%	81			70-130	Pass	
Total Phosphorus	L23-Jl0064032	NCP	%	88			80-120	Pass	
Spike - % Recovery									
Heavy Metals									
				Result 1					
Aluminium (filtered)	L23-Jl0065379	NCP	%	93			75-125	Pass	
Iron (filtered)	L23-Jl0065379	NCP	%	81			75-125	Pass	
Spike - % Recovery									
Eurofins Suite B11C: Na/K/Ca/Mg									
				Result 1					
Calcium	L23-Jl0068483	NCP	%	71			75-125	Fail	Q08
Magnesium	L23-Jl0068483	NCP	%	99			75-125	Pass	
Potassium	L23-Jl0068483	NCP	%	85			75-125	Pass	
Sodium	L23-Jl0068483	NCP	%	Q05			75-125	Fail	Q05
Spike - % Recovery									
				Result 1					
Total Nitrogen	L23-Au0000429	CP	%	108			70-130	Pass	
Spike - % Recovery									
				Result 1					
Ammonia-N	L23-Au0000433	CP	%	99			80-120	Pass	
Chloride	L23-Au0000433	CP	%	87			70-130	Pass	
Filterable Reactive Phosphorus	L23-Au0000433	CP	%	90			80-120	Pass	
Nitrate-N	L23-Au0000433	CP	%	103			70-130	Pass	
Nitrite-N	L23-Au0000433	CP	%	102			80-120	Pass	
NOx-N	L23-Au0000433	CP	%	103			80-120	Pass	
Sulfate	L23-Au0000433	CP	%	115			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Bromide	L23-Au0000428	CP	mg/L	< 2	< 2	<1	30%	Pass	
Total Nitrogen	L23-Au0000428	CP	mg/L	0.9	0.9	<1	30%	Pass	
Duplicate									
Heavy Metals									
				Result 1	Result 2	RPD			
Aluminium (filtered)	L23-Jl0065378	NCP	mg/L	0.07	0.07	<1	30%	Pass	
Iron (filtered)	L23-Jl0065378	NCP	mg/L	0.32	0.32	1.2	30%	Pass	
Duplicate									
Eurofins Suite B11C: Na/K/Ca/Mg									
				Result 1	Result 2	RPD			
Calcium	L23-Jl0068482	NCP	mg/L	< 0.5	< 0.5	<1	30%	Pass	
Magnesium	L23-Jl0068482	NCP	mg/L	< 0.5	< 0.5	<1	30%	Pass	
Potassium	L23-Jl0068482	NCP	mg/L	6.0	6.0	1.3	30%	Pass	
Sodium	L23-Jl0068482	NCP	mg/L	150	150	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Ammonia-N	L23-Au0000432	CP	mg/L	< 0.02	< 0.02	<1	20%	Pass	
Chloride	L23-Au0000432	CP	mg/L	140	140	1.1	30%	Pass	
Filterable Reactive Phosphorus	L23-Au0000432	CP	mg/L	0.12	0.11	7.0	20%	Pass	
Nitrate-N	L23-Au0000432	CP	mg/L	1.3	1.3	2.4	30%	Pass	
Nitrite-N	L23-Au0000432	CP	mg/L	< 0.01	< 0.01	<1	20%	Pass	
NOx-N	L23-Au0000432	CP	mg/L	1.3	1.3	2.4	20%	Pass	
Sulfate	L23-Au0000432	CP	mg/L	34	34	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Total Suspended Solids	L23-Au0000433	CP	mg/L	2700	2900	7.1	20%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
Q05	The matrix spike concentration is less than five times the background concentration in the sample - therefore the spike recovery cannot be determined
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.

Authorised by:

Natalie Hill	Analytical Services Manager
Douglas Todd	Senior Analyst-Metal
Ryan Phillips	Senior Analyst-Inorganic
Sam Becker	Senior Analyst-Inorganic



Kim Rodgers
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.



CHAIN OF CUSTODY RECORD

Eurofins | mgt ABN 50 005 085 521

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☐ Melbourne Laboratory

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03 8564 5000 EnviroSampleVic@eurofins.com

Company				SLR Consulting Australia Pty Ltd				Project No				4739				Project Manager				Kuenzang				Sampler(s)		Olivia																							
Address				Level 1, 500 Hay Street, Subiaco, Australia, WA 6008				Project Name				Casuarina South LSP				EDD Format				ESdat, ESuLS etc				Handed over by		Olivia																							
Contact Name				Kuenzang Tshering				Analyses Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.				Total Suspended Solids		Total Nitrogen		Ammonia as Nitrogen		Nitrate as Nitrogen		Nitrite as Nitrogen		Total Phosphorus		Reactive Phosphorus		Total titratable acidity and total alkalinity		Major anions (Chloride, bromide and sulfate)		Major cations (Calcium, magnesium, sodium and Potassium)		Iron and Aluminium		Containers				Required Turnaround Time (TAT)											
Phone No				0426036143																														Email for Invoice				AccountsPayableAU@slrconsulting.com				Email for Results				labresults@360environmental.com.au, ktshering@slrconsulting.com			
Special Directions																																		Change container type & size if necessary.				500mL Plastic 250mL Plastic 125mL Plastic 200mL Amber Glass 40mL VOA vial 500mL PFAS Bottle Jar (Glass or HDPE) Other (Asbestos AS4964, WA Guidelines)				Default will be 5 days if not ticked. ☐ Overnight (reporting by 9am) ♦ ☐ Same day ♦ ☐ 1 day ♦ ☐ 2 days ♦ ☐ 3 days ♦ ☒ 5 days (Standard) ☐ Other ()							
Purchase Order																																																	
Quote ID No				SLR Blanket Quote																																													
No	Client Sample ID			Sampled Date/Time dshmdvdy hctmm			Matrix Solid (S) Water (W)																																										
1	MC4			30-08-23			W			X		X		X		X		X		X		X		X		X		X																					
2	MB5			30-08-23			W			X		X		X		X		X		X		X		X		X		X																					
3	MB6			30-08-23			W			X		X		X		X		X		X		X		X		X		X																					
4	MB7			30-08-23			W			X		X		X		X		X		X		X		X		X		X																					
5	MB20			30-08-23			W			X		X		X		X		X		X		X		X		X		X																					
6	MB21			30-08-23			W			X		X		X		X		X		X		X		X		X		X																					
7																																																	
8																																																	
9																																																	
Total Counts																		6		6		6		6		6		6																					
Method of Shipment				☐ Courier (#) ☒ Hand Delivered ☐ Postal				Name								Signature								Date								Time																	
Eurofins mgt Laboratory Use Only				Received By				SYD BNE MEL PER ADL NTL DRW				Signature				M. B				Date				30/8/23				Time				16:30				Temperature		16.4											
				Received By				SYD BNE MEL PER ADL NTL DRW				Signature								Date								Time								Report No													

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

1021623

Eurofins ARL Pty Ltd

Eurofins Environment Testing Australia Pty Ltd

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Sample Receipt Advice

Company name: SLR Consulting Australia Pty Ltd
Contact name: Kuenzang Tshering
Project name: CASUARINA SOUTH LSP
Project ID: 4739
Turnaround time: 5 Day
Date/Time received: Aug 30, 2023 4:30 PM
Eurofins reference: 1021623

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 16.4 degrees Celsius.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- ✓ Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- N/A Sample containers for volatile analysis received with zero headspace.
- ✗ Split sample sent to requested external lab.
- ✗ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

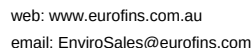
Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Natalie Hill on phone : or by email: NatalieHill@eurofins.com

Results will be delivered electronically via email to Kuenzang Tshering - ktshering@slrconsulting.com.

Note: A copy of these results will also be delivered to the general SLR Consulting Australia Pty Ltd email address.



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ABN: 50 005 085 521

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NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217

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IANZ# 1327	IANZ# 1290	IANZ# 1402

Order No.:
Report #: 1021623
Phone: 08 9388 8360
Fax: 08 9381 2360

Received: Aug 30, 2023 4:30 PM
Due: Sep 6, 2023
Priority: 5 Day
Contact Name: Kuenzang Tshering

Eurofins Analytical Services Manager : Natalie Hill

[illegible]

SLR Consulting Australia Pty Ltd
Level 1, 500 Hay Street
Subiaco
WA 6008



NATA Accredited
Accreditation Number 2377
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition
Arrangement for the mutual recognition of the
equivalence of testing, medical testing, calibration,
inspection, proficiency testing scheme providers and
reference materials producers reports and certificates.

Attention: Kuenzang Tshering

Report 1021623-W
Project name CASUARINA SOUTH LSP
Project ID 4739
Received Date Aug 30, 2023

Client Sample ID			MC4	MB5	MB6	MB7
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L23- Au0077795	L23- Au0077796	L23- Au0077797	L23- Au0077798
Date Sampled			Aug 30, 2023	Aug 30, 2023	Aug 30, 2023	Aug 30, 2023
Test/Reference	LOR	Unit				
Alkalinity	5	mg CaCO ₃ /L	< 5	< 5	20	25
Ammonia-N	0.02	mg/L	0.38	0.09	0.23	0.05
Bicarbonate	5	mg CaCO ₃ /L	< 5	< 5	20	25
Bromide	0.5	mg/L	< 5	< 5	< 5	< 5
Carbonate	5	mg CaCO ₃ /L	< 5	< 5	< 5	< 5
Chloride	5	mg/L	680	19	170	46
Filterable Reactive Phosphorus	0.01	mg/L	0.02	0.21	< 0.01	< 0.01
Hydroxide	5	mg CaCO ₃ /L	< 5	< 5	< 5	< 5
Nitrate-N	0.01	mg/L	< 0.01	4.0	< 0.01	3.6
Nitrite-N	0.01	mg/L	< 0.01	< 0.01	< 0.01	0.02
NOx-N	0.01	mg/L	< 0.01	4.0	< 0.01	3.6
Sulfate	1	mg/L	490	< 1	66	29
Total Kjeldahl Nitrogen	0.2	mg/L	0.9	1.0	1.6	< 0.2
Total Nitrogen	0.2	mg/L	0.9	5.0	1.6	3.6
Total Phosphorus	0.01	mg/L	0.02	0.21	0.05	0.04
Total Suspended Solids	5	mg/L	< 5	< 5	< 5	6.0
Total Titratable Acidity	5	mg CaCO ₃ /L	160	35	51	30
Heavy Metals						
Aluminium (filtered)	0.05	mg/L	7.5	0.77	0.58	0.06
Iron (filtered)	0.01	mg/L	25	0.07	1.2	0.07
Eurofins Suite B11C: Na/K/Ca/Mg						
Calcium	0.5	mg/L	72	7.5	17	2.5
Magnesium	0.5	mg/L	93	3.2	19	4.9
Potassium	0.5	mg/L	16	0.9	6.9	4.8
Sodium	0.5	mg/L	440	9.6	100	56

Client Sample ID			MB20	MB21
Sample Matrix			Water	Water
Eurofins Sample No.			L23- Au0077799	L23- Au0077800
Date Sampled			Aug 30, 2023	Aug 30, 2023
Test/Reference	LOR	Unit		
Alkalinity	5	mg CaCO ₃ /L	19	42
Ammonia-N	0.02	mg/L	0.15	0.11
Bicarbonate	5	mg CaCO ₃ /L	19	42
Bromide	0.5	mg/L	< 5	< 5
Carbonate	5	mg CaCO ₃ /L	< 5	< 5
Chloride	5	mg/L	75	140
Filterable Reactive Phosphorus	0.01	mg/L	0.07	0.02
Hydroxide	5	mg CaCO ₃ /L	< 5	< 5
Nitrate-N	0.01	mg/L	3.8	< 0.01
Nitrite-N	0.01	mg/L	< 0.01	< 0.01
NOx-N	0.01	mg/L	3.8	< 0.01
Sulfate	1	mg/L	29	46
Total Kjeldahl Nitrogen	0.2	mg/L	< 0.2	4.7
Total Nitrogen	0.2	mg/L	3.9	4.7
Total Phosphorus	0.01	mg/L	0.06	0.51
Total Suspended Solids	5	mg/L	20	520
Total Titratable Acidity	5	mg CaCO ₃ /L	33	26
Heavy Metals				
Aluminium (filtered)	0.05	mg/L	0.82	0.64
Iron (filtered)	0.01	mg/L	0.82	0.88
Eurofins Suite B11C: Na/K/Ca/Mg				
Calcium	0.5	mg/L	6.4	30
Magnesium	0.5	mg/L	8.0	24
Potassium	0.5	mg/L	2.1	3.3
Sodium	0.5	mg/L	56	87

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Alkalinity - Method: ARL037 - Alkalinity in Water	Welshpool	Aug 31, 2023	14 Days
Bicarbonate - Method: ARL037 - Alkalinity in Water	Welshpool	Aug 31, 2023	14 Days
Carbonate - Method: ARL037 - Alkalinity in Water	Welshpool	Aug 31, 2023	14 Days
Hydroxide - Method: ARL037 - Alkalinity in Water	Welshpool	Aug 31, 2023	14 Day
Ammonia-N - Method: ARL303 - Ammonia in Water by Discrete Analyser	Welshpool	Aug 31, 2023	28 Days
Filterable Reactive Phosphorus - Method: ARL309 - Filterable Reactive Phosphorus in Water by Discrete Analyser	Welshpool	Aug 31, 2023	28 Days
Nitrate-N - Method: ARL313/319 - NOx in Water by Discrete Analyser	Welshpool	Aug 31, 2023	28 Days
Nitrite-N - Method: ARL311 - Nitrite in Water by Discrete Analyser	Welshpool	Aug 31, 2023	2 Days
NOx-N - Method: ARL313/319 - NOx in Water by Discrete Analyser	Welshpool	Aug 31, 2023	28 Days
Total Kjeldahl Nitrogen - Method: ARL No. 330 - Persulfate Method for Simultaneous Determination of TN & TP	Welshpool	Aug 31, 2023	28 Day
Total Nitrogen - Method: ARL No. 330 - Persulfate Method for Simultaneous Determination of TN & TP	Welshpool	Aug 31, 2023	28 Days
Total Phosphorus - Method: ARL308 - Total Phosphorus in Water by Discrete Analyser	Welshpool	Aug 31, 2023	28 Days
Bromide - Method: In-house method LTM-INO-4270 Anions by Ion Chromatography	Sydney	Sep 01, 2023	28 Days
Total Suspended Solids - Method: ARL No. 016 - Total Suspended Solids	Welshpool	Aug 31, 2023	7 Days
Heavy Metals (filtered) - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Welshpool	Aug 31, 2023	28 Days
Eurofins Suite B11C: Na/K/Ca/Mg - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Welshpool	Aug 31, 2023	180 Days
Chloride - Method: ARL305 - Chloride in Water by Discrete Analyser	Welshpool	Aug 31, 2023	28 Days
Sulfate - Method: ARL301 - Sulfate in Water by Discrete Analyser	Welshpool	Aug 31, 2023	28 Days



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email: EnviroSales@eurofins.com

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Project Name: CASUARINA SOUTH LSP
Project ID: 4739

Order No.:
Report #: 1021623
Phone: 08 9388 8360
Fax: 08 9381 2360

Received: Aug 30, 2023 4:30 PM
Due: Sep 6, 2023
Priority: 5 Day
Contact Name: Kuenzang Tshering

Eurofins Analytical Services Manager : Natalie Hill

Sample Detail						Aluminium	Bromide	Chloride	Iron	Sulfate	Total Titratable Acidity	Eurofins Suite B11.C: Na/K/Ca/Mg	Alkalinity	Nutrients in water	Total Dissolved Solids (TDS)
Perth Laboratory - NATA # 2377 Site # 2370						X		X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217							X								
External Laboratory															
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID										
1	MC4	Aug 30, 2023		Water	L23-Au0077795	X	X	X	X	X	X	X	X	X	X
2	MB5	Aug 30, 2023		Water	L23-Au0077796	X	X	X	X	X	X	X	X	X	X
3	MB6	Aug 30, 2023		Water	L23-Au0077797	X	X	X	X	X	X	X	X	X	X
4	MB7	Aug 30, 2023		Water	L23-Au0077798	X	X	X	X	X	X	X	X	X	X
5	MB20	Aug 30, 2023		Water	L23-Au0077799	X	X	X	X	X	X	X	X	X	X
6	MB21	Aug 30, 2023		Water	L23-Au0077800	X	X	X	X	X	X	X	X	X	X
Test Counts						6	6	6	6	6	6	6	6	6	6

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with **blue** colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	µg/L: micrograms per litre
ppm: parts per million	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit		

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Alkalinity	mg CaCO ₃ /L	< 5			5	Pass	
Ammonia-N	mg/L	< 0.02			0.02	Pass	
Bicarbonate	mg CaCO ₃ /L	< 5			5	Pass	
Bromide	mg/L	< 0.5			0.5	Pass	
Carbonate	mg CaCO ₃ /L	< 5			5	Pass	
Chloride	mg/L	< 5			5	Pass	
Filterable Reactive Phosphorus	mg/L	< 0.01			0.01	Pass	
Hydroxide	mg CaCO ₃ /L	< 5			5	Pass	
Nitrate-N	mg/L	< 0.01			0.01	Pass	
Nitrite-N	mg/L	< 0.01			0.01	Pass	
NO _x -N	mg/L	< 0.01			0.01	Pass	
Sulfate	mg/L	< 1			1	Pass	
Total Nitrogen	mg/L	< 0.2			0.2	Pass	
Total Phosphorus	mg/L	< 0.01			0.01	Pass	
Total Suspended Solids	mg/L	< 5			5	Pass	
Method Blank							
Heavy Metals							
Aluminium (filtered)	mg/L	< 0.05			0.05	Pass	
Iron (filtered)	mg/L	< 0.01			0.01	Pass	
Method Blank							
Eurofins Suite B11C: Na/K/Ca/Mg							
Calcium	mg/L	< 0.5			0.5	Pass	
Magnesium	mg/L	< 0.5			0.5	Pass	
Potassium	mg/L	< 0.5			0.5	Pass	
Sodium	mg/L	< 0.5			0.5	Pass	
LCS - % Recovery							
Bromide	%	85			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Aluminium (filtered)	%	99			80-120	Pass	
Iron (filtered)	%	98			80-120	Pass	
LCS - % Recovery							
Eurofins Suite B11C: Na/K/Ca/Mg							
Calcium	%	95			80-120	Pass	
Magnesium	%	98			80-120	Pass	
Potassium	%	88			80-120	Pass	
Sodium	%	96			80-120	Pass	
CRM - % Recovery							
Ammonia-N	%	106			80-120	Pass	
Chloride	%	110			80-120	Pass	
Filterable Reactive Phosphorus	%	101			80-120	Pass	
Nitrate-N	%	103			80-120	Pass	
Nitrite-N	%	112			80-120	Pass	
NO _x -N	%	101			80-120	Pass	
Sulfate	%	105			80-120	Pass	
Total Suspended Solids	%	104			80-120	Pass	
CRM - % Recovery							
Heavy Metals							
Aluminium (filtered)	%	100			90-110	Pass	
Iron (filtered)	%	93			90-110	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
				Result 1					
Ammonia-N	L23-Au0077186	NCP	%	113			80-120	Pass	
Bromide	S23-Au0072121	NCP	%	97			70-130	Pass	
Chloride	L23-Au0076893	NCP	%	106			70-130	Pass	
Filterable Reactive Phosphorus	L23-Au0076893	NCP	%	108			80-120	Pass	
Nitrate-N	L23-Au0077186	NCP	%	113			70-130	Pass	
Nitrite-N	L23-Au0077186	NCP	%	106			80-120	Pass	
NOx-N	L23-Au0077186	NCP	%	110			80-120	Pass	
Sulfate	L23-Au0076893	NCP	%	114			70-130	Pass	
Total Nitrogen	L23-Au0075686	NCP	%	103			70-130	Pass	
Total Phosphorus	L23-Au0075330	NCP	%	93			80-120	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Aluminium (filtered)	L23-Au0077796	CP	%	90			75-125	Pass	
Iron (filtered)	L23-Au0077796	CP	%	95			75-125	Pass	
Spike - % Recovery									
Eurofins Suite B11C: Na/K/Ca/Mg				Result 1					
Calcium	L23-Au0077799	CP	%	121			75-125	Pass	
Magnesium	L23-Au0077799	CP	%	120			75-125	Pass	
Potassium	L23-Au0077799	CP	%	111			75-125	Pass	
Sodium	L23-Au0077799	CP	%	105			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Ammonia-N	L23-Au0077795	CP	mg/L	0.38	0.38	1.3	20%	Pass	
Bromide	L23-Au0077795	CP	mg/L	< 5	< 5	<1	30%	Pass	
Chloride	L23-Au0077795	CP	mg/L	680	700	2.4	30%	Pass	
Filterable Reactive Phosphorus	L23-Au0077795	CP	mg/L	0.02	0.02	11	20%	Pass	
Nitrate-N	L23-Au0077795	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Nitrite-N	L23-Au0077795	CP	mg/L	< 0.01	< 0.01	<1	20%	Pass	
NOx-N	L23-Au0077795	CP	mg/L	< 0.01	< 0.01	<1	20%	Pass	
Sulfate	L23-Au0077795	CP	mg/L	490	490	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Aluminium (filtered)	L23-Au0077795	CP	mg/L	7.5	7.5	<1	30%	Pass	
Iron (filtered)	L23-Au0077795	CP	mg/L	25	25	1.2	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Total Nitrogen	L23-Au0077798	CP	mg/L	3.6	3.9	9.7	30%	Pass	
Total Phosphorus	L23-Au0077798	CP	mg/L	0.04	0.05	8.6	20%	Pass	
Duplicate									
Eurofins Suite B11C: Na/K/Ca/Mg				Result 1	Result 2	RPD			
Calcium	L23-Au0077798	CP	mg/L	2.5	2.4	2.9	30%	Pass	
Magnesium	L23-Au0077798	CP	mg/L	4.9	4.9	<1	30%	Pass	
Potassium	L23-Au0077798	CP	mg/L	4.8	4.8	<1	30%	Pass	
Sodium	L23-Au0077798	CP	mg/L	56	56	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Total Suspended Solids	L23-Au0077800	CP	mg/L	520	500	3.9	20%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised by:

Natalie Hill	Analytical Services Manager
Douglas Todd	Senior Analyst-Metal
Ryan Phillips	Senior Analyst-Inorganic
Sam Becker	Senior Analyst-Inorganic



Kim Rodgers
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Eurofins ARL Pty Ltd

Eurofins Environment Testing Australia Pty Ltd

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ABN: 50 005 085 521

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Sample Receipt Advice

Company name:	SLR Consulting Australia Pty Ltd
Contact name:	*ALL RESULTS/SRA/COC"S
Project name:	CASUARINA SOUTH LSP
Project ID:	4739
Turnaround time:	5 Day
Date/Time received	Sep 15, 2023 1:20 PM
Eurofins reference	1026581

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 3.6 degrees Celsius.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- ✓ Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- N/A Sample containers for volatile analysis received with zero headspace.
- ✗ Split sample sent to requested external lab.
- ✗ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

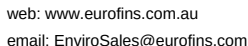
Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Natalie Hill on phone : or by email: NatalieHill@eurofins.com

Results will be delivered electronically via email to *ALL RESULTS/SRA/COC"S - labresults@slrconsulting.com.

Note: A copy of these results will also be delivered to the general SLR Consulting Australia Pty Ltd email address.



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Tel: +64 9 525 0568
IANZ# 1402

Order No.:
Report #: 1026581
Phone: 08 9388 8360
Fax: 08 9381 2360

Received: Sep 15, 2023 1:20 PM
Due: Sep 22, 2023
Priority: 5 Day
Contact Name: *ALL RESULTS/SRA/COC"S

Eurofins Analytical Services Manager : Natalie Hill

[illegible]

SLR Consulting Australia Pty Ltd
Level 1, 500 Hay Street
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WA 6008



NATA Accredited
Accreditation Number 2377
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition
Arrangement for the mutual recognition of the
equivalence of testing, medical testing, calibration,
inspection, proficiency testing scheme providers and
reference materials producers reports and certificates.

Attention: Kuenzang Tshering

Report 1026581-W
Project name CASUARINA SOUTH LSP
Project ID 4739
Received Date Sep 15, 2023

Client Sample ID			MC4	MB5	MB6	MB7
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L23-Se0036148	L23-Se0036149	L23-Se0036150	L23-Se0036151
Date Sampled			Sep 14, 2023	Sep 14, 2023	Sep 14, 2023	Sep 14, 2023
Test/Reference	LOR	Unit				
Alkalinity	5	mg CaCO ₃ /L	< 5	< 5	15	29
Ammonia-N	0.02	mg/L	0.76	0.12	0.12	0.03
Bicarbonate	5	mg CaCO ₃ /L	< 5	< 5	15	29
Bromide	0.5	mg/L	0.9	17	< 0.5	17
Carbonate	5	mg CaCO ₃ /L	< 5	< 5	< 5	< 5
Chloride	5	mg/L	590	18	120	41
Filterable Reactive Phosphorus	0.01	mg/L	0.22	0.15	0.01	< 0.01
Hydroxide	5	mg CaCO ₃ /L	< 5	< 5	< 5	< 5
Nitrate-N	0.01	mg/L	0.76	3.9	< 0.01	4.0
Nitrite-N	0.01	mg/L	< 0.01	< 0.01	< 0.01	0.03
NOx-N	0.01	mg/L	0.76	3.9	< 0.01	4.1
Sulfate	1	mg/L	520	< 1	67	28
Total Kjeldahl Nitrogen	0.2	mg/L	4.0	7.1	16	4.7
Total Nitrogen	0.2	mg/L	4.8	11	16	8.8
Total Phosphorus	0.01	mg/L	0.22	0.22	0.45	0.62
Total Suspended Solids	5	mg/L	96	27	33	840
Total Titratable Acidity	5	mg CaCO ₃ /L	130	24	32	14
Heavy Metals						
Aluminium (filtered)	0.05	mg/L	7.3	0.66	0.94	< 0.05
Iron (filtered)	0.01	mg/L	24	0.05	0.29	0.02
Eurofins Suite B11C: Na/K/Ca/Mg						
Calcium	0.5	mg/L	60	5.9	14	3.5
Magnesium	0.5	mg/L	88	2.6	11	5.4
Potassium	0.5	mg/L	14	0.8	8.3	4.7
Sodium	0.5	mg/L	400	9.4	75	48

Client Sample ID			MB20	MB21
Sample Matrix			Water	Water
Eurofins Sample No.			L23-Se0036152	L23-Se0036153
Date Sampled			Sep 14, 2023	Sep 14, 2023
Test/Reference	LOR	Unit		
Alkalinity	5	mg CaCO ₃ /L	6.5	49
Ammonia-N	0.02	mg/L	0.03	0.08
Bicarbonate	5	mg CaCO ₃ /L	6.5	49
Bromide	0.5	mg/L	19	0.6
Carbonate	5	mg CaCO ₃ /L	< 5	< 5
Chloride	5	mg/L	27	110
Filterable Reactive Phosphorus	0.01	mg/L	< 0.01	0.02
Hydroxide	5	mg CaCO ₃ /L	< 5	< 5
Nitrate-N	0.01	mg/L	4.5	< 0.01
Nitrite-N	0.01	mg/L	< 0.01	< 0.01
NOx-N	0.01	mg/L	4.5	< 0.01
Sulfate	1	mg/L	14	38
Total Kjeldahl Nitrogen	0.2	mg/L	1.7	6.3
Total Nitrogen	0.2	mg/L	6.2	6.3
Total Phosphorus	0.01	mg/L	0.44	0.76
Total Suspended Solids	5	mg/L	240	1000
Total Titratable Acidity	5	mg CaCO ₃ /L	18	24
Heavy Metals				
Aluminium (filtered)	0.05	mg/L	0.69	5.2
Iron (filtered)	0.01	mg/L	0.09	4.1
Eurofins Suite B11C: Na/K/Ca/Mg				
Calcium	0.5	mg/L	4.2	20
Magnesium	0.5	mg/L	3.0	21
Potassium	0.5	mg/L	1.1	4.0
Sodium	0.5	mg/L	19	87

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Alkalinity - Method: ARL037 - Alkalinity in Water	Welshpool	Sep 19, 2023	14 Days
Bicarbonate - Method: ARL037 - Alkalinity in Water	Welshpool	Sep 19, 2023	14 Days
Carbonate - Method: ARL037 - Alkalinity in Water	Welshpool	Sep 19, 2023	14 Days
Hydroxide - Method: ARL037 - Alkalinity in Water	Welshpool	Sep 19, 2023	14 Day
Ammonia-N - Method: ARL303 - Ammonia in Water by Discrete Analyser	Welshpool	Sep 19, 2023	28 Days
Filterable Reactive Phosphorus - Method: ARL309 - Filterable Reactive Phosphorus in Water by Discrete Analyser	Welshpool	Sep 19, 2023	28 Days
Nitrate-N - Method: ARL313/319 - NOx in Water by Discrete Analyser	Welshpool	Sep 19, 2023	28 Days
Nitrite-N - Method: ARL311 - Nitrite in Water by Discrete Analyser	Welshpool	Sep 19, 2023	2 Days
NOx-N - Method: ARL313/319 - NOx in Water by Discrete Analyser	Welshpool	Sep 19, 2023	28 Days
Total Kjeldahl Nitrogen - Method: ARL No. 330 - Persulfate Method for Simultaneous Determination of TN & TP	Welshpool	Sep 15, 2023	28 Day
Total Nitrogen - Method: ARL No. 330 - Persulfate Method for Simultaneous Determination of TN & TP	Welshpool	Sep 19, 2023	28 Days
Total Phosphorus - Method: ARL308 - Total Phosphorus in Water by Discrete Analyser	Welshpool	Sep 19, 2023	28 Days
Bromide - Method: In-house method LTM-INO-4270 Anions by Ion Chromatography	Sydney	Sep 20, 2023	28 Days
Total Suspended Solids - Method: ARL No. 016 - Total Suspended Solids	Welshpool	Sep 19, 2023	7 Days
Heavy Metals (filtered) - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Welshpool	Sep 19, 2023	28 Days
Eurofins Suite B11C: Na/K/Ca/Mg - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Welshpool	Sep 19, 2023	180 Days
Chloride - Method: ARL305 - Chloride in Water by Discrete Analyser	Welshpool	Sep 19, 2023	28 Days
Sulfate - Method: ARL301 - Sulfate in Water by Discrete Analyser	Welshpool	Sep 19, 2023	28 Days



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Company Name: SLR Consulting Australia Pty Ltd
Address: Level 1, 500 Hay Street
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Project Name: CASUARINA SOUTH LSP
Project ID: 4739

Order No.:
Report #: 1026581
Phone: 08 9388 8360
Fax: 08 9381 2360

Received: Sep 15, 2023 1:20 PM
Due: Sep 22, 2023
Priority: 5 Day
Contact Name: *ALL RESULTS/SRA/COC"S

Eurofins Analytical Services Manager : Natalie Hill

Sample Detail						Aluminium	Ammonia-N	Bromide	Chloride	Filterable Reactive Phosphorus	Iron	Nitrate-N	Nitrite-N	Sulfate	Total Phosphorus	Total Suspended Solids	Total Titratable Acidity	Eurofins Suite B11C: Na/K/Ca/Mg	Total Nitrogen	Alkalinity
Perth Laboratory - NATA # 2377 Site # 2370						X	X		X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217								X												
External Laboratory																				
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID															
1	MC4	Sep 14, 2023		Water	L23-Se0036148	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2	MB5	Sep 14, 2023		Water	L23-Se0036149	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3	MB6	Sep 14, 2023		Water	L23-Se0036150	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4	MB7	Sep 14, 2023		Water	L23-Se0036151	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	MB20	Sep 14, 2023		Water	L23-Se0036152	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	MB21	Sep 14, 2023		Water	L23-Se0036153	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Test Counts						6	6	6	6	6	6	6	6	6	6	6	6	6	6	6

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	µg/L: micrograms per litre
ppm: parts per million	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit		

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test			Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Method Blank								
Alkalinity			mg CaCO ₃ /L	< 5		5	Pass	
Ammonia-N			mg/L	< 0.02		0.02	Pass	
Bicarbonate			mg CaCO ₃ /L	< 5		5	Pass	
Bromide			mg/L	< 0.5		0.5	Pass	
Carbonate			mg CaCO ₃ /L	< 5		5	Pass	
Chloride			mg/L	< 5		5	Pass	
Filterable Reactive Phosphorus			mg/L	< 0.01		0.01	Pass	
Hydroxide			mg CaCO ₃ /L	< 5		5	Pass	
Nitrate-N			mg/L	< 0.01		0.01	Pass	
Nitrite-N			mg/L	< 0.01		0.01	Pass	
NOx-N			mg/L	< 0.01		0.01	Pass	
Sulfate			mg/L	< 1		1	Pass	
Total Nitrogen			mg/L	< 0.2		0.2	Pass	
Total Phosphorus			mg/L	< 0.01		0.01	Pass	
Total Suspended Solids			mg/L	< 5		5	Pass	
Method Blank								
Heavy Metals								
Aluminium (filtered)			mg/L	< 0.05		0.05	Pass	
Iron (filtered)			mg/L	< 0.01		0.01	Pass	
Method Blank								
Eurofins Suite B11C: Na/K/Ca/Mg								
Calcium			mg/L	< 0.5		0.5	Pass	
Magnesium			mg/L	< 0.5		0.5	Pass	
Potassium			mg/L	< 0.5		0.5	Pass	
Sodium			mg/L	< 0.5		0.5	Pass	
LCS - % Recovery								
Bromide			%	99		70-130	Pass	
LCS - % Recovery								
Heavy Metals								
Aluminium (filtered)			%	95		80-120	Pass	
Iron (filtered)			%	98		80-120	Pass	
LCS - % Recovery								
Eurofins Suite B11C: Na/K/Ca/Mg								
Calcium			%	113		80-120	Pass	
Magnesium			%	111		80-120	Pass	
Potassium			%	113		80-120	Pass	
Sodium			%	108		80-120	Pass	
CRM - % Recovery								
Chloride			%	106		80-120	Pass	
Sulfate			%	108		80-120	Pass	
Total Phosphorus			%	90		80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery								
Heavy Metals				Result 1				
Aluminium (filtered)	L23-Se0040647	NCP	%	89		75-125	Pass	
Iron (filtered)	L23-Se0040647	NCP	%	88		75-125	Pass	
Spike - % Recovery								
				Result 1				
Bromide	L23-Se0036149	CP	%	74		70-130	Pass	
Spike - % Recovery								

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Eurofins Suite B11C: Na/K/Ca/Mg				Result 1					
Calcium	L23-Se0036149	CP	%	90			75-125	Pass	
Magnesium	L23-Se0036149	CP	%	101			75-125	Pass	
Potassium	L23-Se0036149	CP	%	94			75-125	Pass	
Sodium	L23-Se0036149	CP	%	95			75-125	Pass	
Spike - % Recovery									
				Result 1					
Ammonia-N	L23-Se0036152	CP	%	118			80-120	Pass	
Chloride	L23-Se0036152	CP	%	98			70-130	Pass	
Filterable Reactive Phosphorus	L23-Se0036152	CP	%	107			80-120	Pass	
Nitrate-N	L23-Se0036152	CP	%	108			70-130	Pass	
Nitrite-N	L23-Se0036152	CP	%	107			80-120	Pass	
NOx-N	L23-Se0036152	CP	%	108			80-120	Pass	
Sulfate	L23-Se0036152	CP	%	117			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Ammonia-N	L23-Se0036076	NCP	mg/L	0.11	0.11	<1	20%	Pass	
Bromide	L23-Se0036148	CP	mg/L	0.9	1.0	<1	30%	Pass	
Total Nitrogen	L23-Se0036058	NCP	mg/L	< 0.2	< 0.2	<1	30%	Pass	
Total Phosphorus	L23-Se0036058	NCP	mg/L	0.05	0.05	<1	20%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Aluminium (filtered)	L23-Se0040646	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Iron (filtered)	L23-Se0040646	NCP	mg/L	0.20	0.21	4.0	30%	Pass	
Duplicate									
Eurofins Suite B11C: Na/K/Ca/Mg				Result 1	Result 2	RPD			
Calcium	L23-Se0036148	CP	mg/L	60	74	20	30%	Pass	
Magnesium	L23-Se0036148	CP	mg/L	88	89	1.1	30%	Pass	
Potassium	L23-Se0036148	CP	mg/L	14	14	1.1	30%	Pass	
Sodium	L23-Se0036148	CP	mg/L	400	410	1.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chloride	L23-Se0036151	CP	mg/L	41	41	<1	30%	Pass	
Filterable Reactive Phosphorus	L23-Se0036151	CP	mg/L	< 0.01	< 0.01	<1	20%	Pass	
Nitrate-N	L23-Se0036151	CP	mg/L	4.0	4.0	<1	30%	Pass	
Nitrite-N	L23-Se0036151	CP	mg/L	0.03	0.04	2.9	20%	Pass	
NOx-N	L23-Se0036151	CP	mg/L	4.1	4.1	<1	20%	Pass	
Sulfate	L23-Se0036151	CP	mg/L	28	29	2.5	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Total Suspended Solids	L23-Se0036153	CP	mg/L	1000	1000	<1	20%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.

Authorised by:

Natalie Hill	Analytical Services Manager
Douglas Todd	Senior Analyst-Metal
Lauren Killin	Senior Analyst-Inorganic
Ryan Phillips	Senior Analyst-Inorganic



Kim Rodgers
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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CHAIN OF CUSTODY RECORD

Eurofins | mgt ABN 50 005 085 521

☐ Sydney Laboratory

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02 9900 8400 EnviroSampleNSW@eurofins.com

☐ Brisbane Laboratory

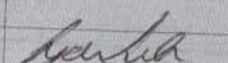
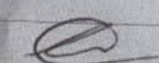
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☐ Melbourne Laboratory

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03 8564 5000 EnviroSampleVic@eurofins.com

Company SLR Consulting Australia Pty Ltd			Project No 675.V64739.00000	Project Manager Kuenzang	Sampler(s) Olivia Susanto								
Address Level 1, 500 Hay Street, Subiaco WA Australia 6008			Project Name Casuarina South LSP LWMS	EDD Format EsDat	Handed over by Olivia Susanto								
Contact Name Kuenzang Tshering			Analyses Where results are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.		Email for Invoice AccountsPayableAU@slrconsulting.com								
Phone No 0426036143					Email for Results labresults@360environmental.com.au , ktshering@slrconsulting.com								
Special Directions					Containers Change container type & size if necessary.	Required Turnaround Time (TAT) Default will be 5 days if not ticked.							
Purchase Order					☐ Overnight (reporting by 9am)* ☐ Same day* ☐ 2 days* ☒ 5 days (Standard) ☐ Other()	*Surcharge will apply							
Quote ID No SLR Blanket Quote					☐ 1 day* ☐ 3 days*								
No	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Total Suspended Solids	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4664, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	MC4	25/10/23	W	X	X	X	X	X	X	X	X	X	
2	MB5	25/10/23	W	X	X	X	X	X	X	X	X	X	
3	MB6	25/10/23	W	X	X	X	X	X	X	X	X	X	
4	MB20	25/10/23	W	X	X	X	X	X	X	X	X	X	
5	MB21	25/10/23	W	X	X	X	X	X	X	X	X	X	
6													
7													
8													
9													
Total Counts				5	5	5	5	5	5				
Method of Shipment ☐ Courier (#) ☒ Hand Delivered ☐ Postal				Name		Signature		Date		Time		Temperature	
Eurofins mgt Laboratory Use Only				Received By 		Signature 		Date 25/10/23		Time 15:50		Report No 1038180	
				SYD BNE MEL PER ADL NTL DRW									
				SYD BNE MEL PER ADL NTL DRW									

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

Eurofins ARL Pty Ltd

Eurofins Environment Testing Australia Pty Ltd

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Sample Receipt Advice

Company name: SLR Consulting Australia Pty Ltd - ENV
Contact name: *ALL RESULTS/SRA/COC"S
Project name: CASUARINA SOUTH LSP LWMS
Project ID: 675.V64739.00000
Turnaround time: 5 Day
Date/Time received Oct 25, 2023 3:50 PM
Eurofins reference 1038181

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 2.7 degrees Celsius.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- ✓ Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- N/A Sample containers for volatile analysis received with zero headspace.
- ✗ Split sample sent to requested external lab.
- ✗ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

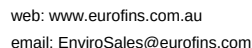
Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Natalie Hill on phone : or by email: NatalieHill@eurofins.com

Results will be delivered electronically via email to *ALL RESULTS/SRA/COC"S - labresults@slrconsulting.com.

Note: A copy of these results will also be delivered to the general SLR Consulting Australia Pty Ltd - ENV email address.



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ABN: 50 005 085 521

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IANZ# 1402

Received: Oct 25, 2023 3:50 PM
Due: Nov 1, 2023
Priority: 5 Day
Contact Name: *ALL RESULTS/SRA/COC"S

Eurofins Analytical Services Manager : Natalie Hill

[illegible]

SLR Consulting Australia Pty Ltd
Level 1, 500 Hay Street
Subiaco
WA 6008



NATA Accredited
Accreditation Number 2377
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition
Arrangement for the mutual recognition of the
equivalence of testing, medical testing, calibration,
inspection, proficiency testing scheme providers and
reference materials producers reports and certificates.

Attention: **Kuenzang Tshering**

Report **1038181-W**
Project name **CASUARINA SOUTH LSP LWMS**
Project ID **675.V64739.00000**
Received Date **Oct 25, 2023**

Client Sample ID			MC4	MB5	MB6	MB20
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L23- Oc0060209	L23- Oc0060210	L23- Oc0060211	L23- Oc0060212
Date Sampled			Oct 25, 2023	Oct 25, 2023	Oct 25, 2023	Oct 25, 2023
Test/Reference	LOR	Unit				
Alkalinity	5	mg CaCO ₃ /L	< 5	< 5	24	22
Ammonia-N	0.02	mg/L	0.64	0.14	0.43	0.22
Bicarbonate	5	mg CaCO ₃ /L	< 5	< 5	24	22
Bromide	0.5	mg/L	< 5	< 0.5	< 0.5	< 0.5
Carbonate	5	mg CaCO ₃ /L	< 5	< 5	< 5	< 5
Chloride	5	mg/L	670	17	120	47
Filterable Reactive Phosphorus	0.01	mg/L	0.03	0.14	0.01	< 0.01
Hydroxide	5	mg CaCO ₃ /L	< 5	< 5	< 5	< 5
Nitrate-N	0.01	mg/L	< 0.01	2.3	0.03	2.4
Nitrite-N	0.01	mg/L	< 0.01	0.01	< 0.01	< 0.01
NOx-N	0.01	mg/L	< 0.01	2.3	0.03	2.4
Sulfate	1	mg/L	600	< 1	39	27
Total Kjeldahl Nitrogen	0.2	mg/L	0.7	< 0.2	0.8	0.2
Total Nitrogen	0.2	mg/L	0.7	2.4	0.8	2.6
Total Phosphorus	0.01	mg/L	0.03	0.16	0.01	< 0.01
Total Suspended Solids	5	mg/L	< 5	< 5	< 5	15
Total Titratable Acidity	5	mg CaCO ₃ /L	230	22	19	13
Heavy Metals						
Aluminium	0.05	mg/L	9.9	1.2	0.65	1.00
Iron	0.01	mg/L	46	0.10	0.92	0.16
Eurofins Suite B11C: Na/K/Ca/Mg						
Calcium	0.5	mg/L	83	6.2	3.6	6.4
Magnesium	0.5	mg/L	110	2.4	11	6.9
Potassium	0.5	mg/L	16	0.8	2.9	1.8
Sodium	0.5	mg/L	510	9.5	85	40

Client Sample ID			MB21
Sample Matrix			Water
Eurofins Sample No.			L23- Oc0060213
Date Sampled			Oct 25, 2023
Test/Reference	LOR	Unit	
Alkalinity	5	mg CaCO ₃ /L	59
Ammonia-N	0.02	mg/L	0.39
Bicarbonate	5	mg CaCO ₃ /L	59
Bromide	0.5	mg/L	1.0
Carbonate	5	mg CaCO ₃ /L	< 5
Chloride	5	mg/L	120
Filterable Reactive Phosphorus	0.01	mg/L	0.03
Hydroxide	5	mg CaCO ₃ /L	< 5
Nitrate-N	0.01	mg/L	< 0.01
Nitrite-N	0.01	mg/L	< 0.01
NOx-N	0.01	mg/L	< 0.01
Sulfate	1	mg/L	4.1
Total Kjeldahl Nitrogen	0.2	mg/L	1.3
Total Nitrogen	0.2	mg/L	1.3
Total Phosphorus	0.01	mg/L	0.07
Total Suspended Solids	5	mg/L	50
Total Titratable Acidity	5	mg CaCO ₃ /L	27
Heavy Metals			
Aluminium	0.05	mg/L	2.8
Iron	0.01	mg/L	8.0
Eurofins Suite B11C: Na/K/Ca/Mg			
Calcium	0.5	mg/L	12
Magnesium	0.5	mg/L	17
Potassium	0.5	mg/L	3.2
Sodium	0.5	mg/L	82

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Alkalinity	Welshpool	Oct 28, 2023	14 Days
- Method: ARL037 - Alkalinity in Water			
Bicarbonate	Welshpool	Oct 28, 2023	14 Days
- Method: ARL037 - Alkalinity in Water			
Carbonate	Welshpool	Oct 28, 2023	14 Days
- Method: ARL037 - Alkalinity in Water			
Hydroxide	Welshpool	Oct 28, 2023	14 Day
- Method: ARL037 - Alkalinity in Water			
Ammonia-N	Welshpool	Oct 28, 2023	28 Days
- Method: ARL303 - Ammonia in Water by Discrete Analyser			
Filterable Reactive Phosphorus	Welshpool	Oct 28, 2023	28 Days
- Method: ARL309 - Filterable Reactive Phosphorus in Water by Discrete Analyser			
Nitrate-N	Welshpool	Oct 28, 2023	28 Days
- Method: ARL313/319 - NOx in Water by Discrete Analyser			
Nitrite-N	Welshpool	Oct 28, 2023	2 Days
- Method: ARL311 - Nitrite in Water by Discrete Analyser			
NOx-N	Welshpool	Oct 28, 2023	28 Days
- Method: ARL313/319 - NOx in Water by Discrete Analyser			
Total Kjeldahl Nitrogen	Welshpool	Oct 26, 2023	28 Day
- Method: ARL No. 330 - Persulfate Method for Simultaneous Determination of TN & TP			
Total Nitrogen	Welshpool	Oct 28, 2023	28 Days
- Method: ARL No. 330 - Persulfate Method for Simultaneous Determination of TN & TP			
Total Phosphorus	Welshpool	Oct 28, 2023	28 Days
- Method: ARL308 - Total Phosphorus in Water by Discrete Analyser			
Bromide	Sydney	Oct 30, 2023	28 Days
- Method: In-house method LTM-INO-4270 Anions by Ion Chromatography			
Total Suspended Solids	Welshpool	Oct 28, 2023	7 Days
- Method: ARL No. 016 - Total Suspended Solids			
Heavy Metals	Welshpool	Oct 28, 2023	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Eurofins Suite B11C: Na/K/Ca/Mg	Welshpool	Oct 28, 2023	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Chloride	Welshpool	Oct 28, 2023	28 Days
- Method: ARL305 - Chloride in Water by Discrete Analyser			
Sulfate	Welshpool	Oct 28, 2023	28 Days
- Method: ARL301 - Sulfate in Water by Discrete Analyser			



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Order No.:
Report #: 1038181
Phone: 08 9388 8360
Fax: 08 9381 2360

Received: Oct 25, 2023 3:50 PM
Due: Nov 1, 2023
Priority: 5 Day
Contact Name: *ALL RESULTS/SRA/COC"S

Project Name: CASUARINA SOUTH LSP LWMS
Project ID: 675.V64739.00000

Eurofins Analytical Services Manager : Natalie Hill

Sample Detail						Acidity	Aluminium	Ammonia-N	Bromide	Filterable Reactive Phosphorus	Iron	Nitrate-N	Nitrite-N	Sulfate	Total Phosphorus	Total Suspended Solids	Total Titratable Acidity	Eurofins Suite B11C: Na/K/Ca/Mg	Total Nitrogen
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X		X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217									X										
External Laboratory																			
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID														
1	MC4	Oct 25, 2023		Water	L23-Oc0060209	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2	MB5	Oct 25, 2023		Water	L23-Oc0060210	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3	MB6	Oct 25, 2023		Water	L23-Oc0060211	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4	MB20	Oct 25, 2023		Water	L23-Oc0060212	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	MB21	Oct 25, 2023		Water	L23-Oc0060213	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Test Counts						5	5	5	5	5	5	5	5	5	5	5	5	5	5

Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry weight basis unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion unless otherwise stated.
- For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
- Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified in this report with **blue** colour indicates data provided by customers that may have an impact on the results.
- This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is 7 days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	µg/L: micrograms per litre
ppm: parts per million	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit		

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30%; however the following acceptance guidelines are equally

applicable: Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries above the QC limit designated in QSM 5.4, where no positive PFAS results have been reported, have been reviewed, and no data was affected.

QC Data General Comments

- Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
- pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
- For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test			Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Method Blank								
Alkalinity			mg CaCO ₃ /L	< 5		5	Pass	
Ammonia-N			mg/L	< 0.02		0.02	Pass	
Bicarbonate			mg CaCO ₃ /L	< 5		5	Pass	
Carbonate			mg CaCO ₃ /L	< 5		5	Pass	
Chloride			mg/L	< 5		5	Pass	
Filterable Reactive Phosphorus			mg/L	< 0.01		0.01	Pass	
Hydroxide			mg CaCO ₃ /L	< 5		5	Pass	
Nitrate-N			mg/L	< 0.01		0.01	Pass	
Nitrite-N			mg/L	< 0.01		0.01	Pass	
NO _x -N			mg/L	< 0.01		0.01	Pass	
Sulfate			mg/L	< 1		1	Pass	
Total Nitrogen			mg/L	< 0.2		0.2	Pass	
Total Phosphorus			mg/L	< 0.01		0.01	Pass	
Total Suspended Solids			mg/L	< 5		5	Pass	
Method Blank								
Heavy Metals								
Aluminium			mg/L	< 0.05		0.05	Pass	
Iron			mg/L	< 0.01		0.01	Pass	
Method Blank								
Eurofins Suite B11C: Na/K/Ca/Mg								
Calcium			mg/L	< 0.5		0.5	Pass	
Magnesium			mg/L	< 0.5		0.5	Pass	
Potassium			mg/L	< 0.5		0.5	Pass	
Sodium			mg/L	< 0.5		0.5	Pass	
LCS - % Recovery								
Heavy Metals								
Aluminium			%	101		80-120	Pass	
Iron			%	99		80-120	Pass	
LCS - % Recovery								
Eurofins Suite B11C: Na/K/Ca/Mg								
Calcium			%	99		80-120	Pass	
Magnesium			%	100		80-120	Pass	
Potassium			%	100		80-120	Pass	
Sodium			%	101		80-120	Pass	
CRM - % Recovery								
Chloride			%	93		80-120	Pass	
Nitrite-N			%	108		80-120	Pass	
Sulfate			%	94		80-120	Pass	
Total Suspended Solids			%	98		80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery								
				Result 1				
Ammonia-N	L23-Oc0060057	NCP	%	111		80-120	Pass	
Chloride	L23-Oc0060057	NCP	%	100		70-130	Pass	
Filterable Reactive Phosphorus	L23-Oc0060057	NCP	%	109		80-120	Pass	
Nitrate-N	L23-Oc0060057	NCP	%	110		70-130	Pass	
Nitrite-N	L23-Oc0060057	NCP	%	104		80-120	Pass	
NO _x -N	L23-Oc0060057	NCP	%	107		80-120	Pass	
Sulfate	L23-Oc0060057	NCP	%	104		70-130	Pass	
Total Nitrogen	L23-Oc0060030	NCP	%	94		70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total Phosphorus	L23-Oc0060030	NCP	%	89			80-120	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Aluminium	L23-Oc0061551	NCP	%	101			75-125	Pass	
Iron	L23-Oc0061551	NCP	%	101			75-125	Pass	
Spike - % Recovery									
Eurofins Suite B11C: Na/K/Ca/Mg				Result 1					
Calcium	L23-Oc0061551	NCP	%	93			75-125	Pass	
Magnesium	L23-Oc0061551	NCP	%	95			75-125	Pass	
Potassium	L23-Oc0061551	NCP	%	102			75-125	Pass	
Sodium	L23-Oc0061551	NCP	%	75			75-125	Pass	
Spike - % Recovery									
				Result 1					
Bromide	L23-Oc0060210	CP	%	97			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Alkalinity	L23-Oc0060020	NCP	mg CaCO ₃ /L	< 5	< 5	<1	30%	Pass	
Ammonia-N	L23-Oc0060056	NCP	mg/L	0.04	0.03	12	20%	Pass	
Bicarbonate	L23-Oc0060020	NCP	mg CaCO ₃ /L	< 5	< 5	<1	20%	Pass	
Bromide	L23-Oc0060209	CP	mg/L	< 5	< 5	<1	30%	Pass	
Carbonate	L23-Oc0060020	NCP	mg CaCO ₃ /L	< 5	< 5	<1	20%	Pass	
Chloride	L23-Oc0060056	NCP	mg/L	< 5	< 5	<1	30%	Pass	
Filterable Reactive Phosphorus	L23-Oc0060056	NCP	mg/L	< 0.01	< 0.01	<1	20%	Pass	
Hydroxide	L23-Oc0060020	NCP	mg CaCO ₃ /L	< 5	< 5	<1	20%	Pass	
Nitrate-N	L23-Oc0060056	NCP	mg/L	0.05	0.04	11	30%	Pass	
Nitrite-N	L23-Oc0060056	NCP	mg/L	< 0.01	< 0.01	<1	20%	Pass	
NO _x -N	L23-Oc0060056	NCP	mg/L	0.05	0.04	11	20%	Pass	
Sulfate	L23-Oc0060056	NCP	mg/L	< 1	< 1	<1	30%	Pass	
Total Nitrogen	L23-Oc0060029	NCP	mg/L	6.3	3.9	5.5	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Aluminium	L23-Oc0061578	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Eurofins Suite B11C: Na/K/Ca/Mg				Result 1	Result 2	RPD			
Calcium	L23-Oc0061578	NCP	mg/L	67	69	2.5	30%	Pass	
Magnesium	L23-Oc0061578	NCP	mg/L	17	16	2.5	30%	Pass	
Potassium	L23-Oc0061578	NCP	mg/L	3.5	3.5	1.1	30%	Pass	
Sodium	L23-Oc0061578	NCP	mg/L	55	50	9.2	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Total Phosphorus	L23-Oc0060213	CP	mg/L	0.07	0.07	8.9	20%	Pass	
Total Suspended Solids	L23-Oc0060213	CP	mg/L	50	42	17	20%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised by:

Natalie Hill	Analytical Services Manager
Douglas Todd	Senior Analyst-Metal
Lauren Killin	Senior Analyst-Inorganic
Ryan Phillips	Senior Analyst-Inorganic
Sam Becker	Senior Analyst-Inorganic



Kim Rodgers
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.



CHAIN OF CUSTODY RECORD

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Company		SLR Consulting Australia Pty Ltd		Project No		72155.00004		Project Manager		Kuenzang		Sampler(s)		Kavindi Sahabandu			
Address		Level 1, 500 Hay Street, Subiaco, Australia, WA 6008		Project Name		Casuarina GME 2024		EDD Format		EsDat		Handed over by		Kavindi Sahabandu			
Contact Name		Kavindi Sahabandu		Analysis Where metals are requested, please specify "Total" or "Filtered". SATE code must be used to detect SATE pricing.		Ammonia as N		Nitrate as N		Nitrite as N		Nex-N		Total Kjeldahl nitrogen			
Phone No		0406245350				Total nitrogen		Total phosphorus		Filterable reactive phosphorus		bicarbonate		Carbonate		Hydrous	
Special Directions						Major ions (Aluminum, Iron, calcium, magnesium, potassium, sodium, bromide, chloride, nitrate, sulfate)		Total alkalinity		500mL Plastic		250mL Plastic		125mL Plastic		200mL Amber Glass	
Purchase Order						40mL VOA vial		500mL PFAS Bottle		Jar (Glass or HDPE)		Other (Asbestos AS4004, WA Guidelines)		Required Turnaround Time (TAT) (Default: will be 5 days if not ticked)		☐ Overnight (reporting by 9am) ☐ Same day ☐ 1 day ☐ 2 days ☒ 5 days (Standard) ☐ Other ()	
Quote ID No		SLR Blanket Quote															
No	Client Sample ID	Sampled Date/Time	Matrix														
1	MC4	7-06-24	W	X	X	X	X	X	X	X	X	X	X	X	X		
2	MB5	7-06-24	W	X	X	X	X	X	X	X	X	X	X	X	X		
3	MB6	7-06-24	W	X	X	X	X	X	X	X	X	X	X	X	X		
4	MB7	7-06-24	W	X	X	X	X	X	X	X	X	X	X	X	X		
5	MB20	7-06-24	W	X	X	X	X	X	X	X	X	X	X	X	X		
6	MB21	7-06-24	W	X	X	X	X	X	X	X	X	X	X	X	X		
7	QC01	7-06-24	W	X	X	X	X	X	X	X	X	X	X	X	X		
8																	
9																	
Total Counts				7	7	7	7	7	7	7	7	7	7	7	7		
Method of Shipment				☐ Courier (#) ☒ Hand Delivered		☐ Postal		Name		Signature		Date		Time			
Eurofins mgt Laboratory Use Only				Received By		SYD BNE MEL PER ADL NTL DRW		Signature		Date		Time		Temperature			
				Received By		SYD BNE MEL PER ADL NTL DRW		Signature		Date		Time		Report No			

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

* No sample was filtered.

SLR Consulting Australia Pty Ltd
Level 1, 500 Hay Street
Subiaco
WA 6008



NATA Accredited
Accreditation Number 2377
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition
Arrangement for the mutual recognition of the
equivalence of testing, medical testing, calibration,
inspection, proficiency testing scheme providers and
reference materials producers reports and certificates.

Attention: **Kuenzang Tshering**

Report **1105981-W**
Project name **CASUARINA GME 2024**
Received Date **Jun 07, 2024**

Client Sample ID			MC4	MB5	MB6	MB20
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L24-Jn0019913	L24-Jn0019914	L24-Jn0019915	L24-Jn0019916
Date Sampled			Jun 07, 2024	Jun 07, 2024	Jun 07, 2024	Jun 07, 2024
Test/Reference	LOR	Unit				
Ammonia-N	0.02	mg/L	1.2	0.95	0.21	0.22
Bromide	0.5	mg/L	< 0.5	< 0.5	< 0.5	< 0.5
Chloride	5	mg/L	550	38	140	120
Filterable Reactive Phosphorus	0.01	mg/L	0.05	0.02	0.04	0.03
Nitrate-N	0.01	mg/L	< 0.01	< 0.01	< 0.01	0.02
Nitrite-N	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
NOx-N	0.01	mg/L	< 0.01	< 0.01	< 0.01	0.02
Sulfate	1	mg/L	420	13	40	44
Total Kjeldahl Nitrogen	0.2	mg/L	1.2	3.9	1.6	1.6
Total Nitrogen	0.2	mg/L	1.2	3.9	1.6	1.6
Total Phosphorus	0.01	mg/L	0.03	0.15	< 0.01	0.03
Alkalinity (speciated)						
Bicarbonate Alkalinity (as CaCO ₃)	5	mg/L	< 5	7.2	9.3	19
Carbonate Alkalinity (as CaCO ₃)	5	mg/L	< 5	< 5	< 5	< 5
Hydroxide Alkalinity (as CaCO ₃)	5	mg/L	< 5	< 5	< 5	< 5
Total Alkalinity (as CaCO ₃)	5	mg/L	< 5	7.2	9.3	19
Heavy Metals						
Aluminium	0.05	mg/L	3.4	2.1	0.96	0.74
Iron	0.01	mg/L	22	2.1	1.4	0.18
Eurofins Suite B11C: Na/K/Ca/Mg						
Calcium	0.5	mg/L	57	3.7	2.4	7.9
Magnesium	0.5	mg/L	64	5.1	10	10
Potassium	0.5	mg/L	14	1.8	2.7	2.2
Sodium	0.5	mg/L	330	16	88	61

Client Sample ID			MB21	QC01
Sample Matrix			Water	Water
Eurofins Sample No.			L24-Jn0019917	L24-Jn0019918
Date Sampled			Jun 07, 2024	Jun 07, 2024
Test/Reference	LOR	Unit		
Ammonia-N	0.02	mg/L	0.17	0.19
Bromide	0.5	mg/L	< 0.5	< 0.5
Chloride	5	mg/L	310	110
Filterable Reactive Phosphorus	0.01	mg/L	0.03	0.03
Nitrate-N	0.01	mg/L	0.15	< 0.01
Nitrite-N	0.01	mg/L	< 0.01	< 0.01
NOx-N	0.01	mg/L	0.16	< 0.01
Sulfate	1	mg/L	280	40
Total Kjeldahl Nitrogen	0.2	mg/L	2.3	3.9
Total Nitrogen	0.2	mg/L	2.5	3.9
Total Phosphorus	0.01	mg/L	0.17	0.05
Alkalinity (speciated)				
Bicarbonate Alkalinity (as CaCO ₃)	5	mg/L	6.9	9.0
Carbonate Alkalinity (as CaCO ₃)	5	mg/L	< 5	< 5
Hydroxide Alkalinity (as CaCO ₃)	5	mg/L	< 5	< 5
Total Alkalinity (as CaCO ₃)	5	mg/L	6.9	9.0
Heavy Metals				
Aluminium	0.05	mg/L	2.5	1.3
Iron	0.01	mg/L	0.98	1.6
Eurofins Suite B11C: Na/K/Ca/Mg				
Calcium	0.5	mg/L	29	2.4
Magnesium	0.5	mg/L	61	9.9
Potassium	0.5	mg/L	2.9	2.5
Sodium	0.5	mg/L	170	86

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Ammonia-N	Welshpool	Jun 14, 2024	28 Days
- Method: ARL303 - Ammonia in Water by Discrete Analyser			
Filterable Reactive Phosphorus	Welshpool	Jun 14, 2024	28 Days
- Method: ARL309 - Filterable Reactive Phosphorus in Water by Discrete Analyser			
Nitrate-N	Welshpool	Jun 14, 2024	28 Days
- Method: ARL313/319 - NOx in Water by Discrete Analyser			
Nitrite-N	Welshpool	Jun 14, 2024	2 Days
- Method: ARL311 - Nitrite in Water by Discrete Analyser			
NOx-N	Welshpool	Jun 14, 2024	28 Days
- Method: ARL313/319 - NOx in Water by Discrete Analyser			
Total Kjeldahl Nitrogen	Welshpool	Jun 10, 2024	28 Day
- Method: ARL No. 330 - Persulfate Method for Simultaneous Determination of TN & TP			
Total Nitrogen	Welshpool	Jun 14, 2024	28 Days
- Method: ARL No. 330 - Persulfate Method for Simultaneous Determination of TN & TP			
Total Phosphorus	Welshpool	Jun 14, 2024	28 Days
- Method: ARL308 - Total Phosphorus in Water by Discrete Analyser			
Bromide	Sydney	Jun 14, 2024	28 Days
- Method: In-house method LTM-INO-4270 Anions by Ion Chromatography			
Heavy Metals	Welshpool	Jun 14, 2024	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Eurofins Suite B11C: Na/K/Ca/Mg	Welshpool	Jun 14, 2024	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Chloride	Welshpool	Jun 14, 2024	28 Days
- Method: ARL305 - Chloride in Water by Discrete Analyser			
Sulfate	Welshpool	Jun 14, 2024	28 Days
- Method: ARL301 - Sulfate in Water by Discrete Analyser			
Alkalinity (speciated)	Welshpool	Jun 14, 2024	14 Days
- Method: LTM-INO-4250 Alkalinity by Electrometric Titration			



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Company Name: SLR Consulting Australia Pty Ltd - ENV
Address: Level 1, 500 Hay Street
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WA 6008
Project Name: CASUARINA GME 2024

Order No.:
Report #: 1105981
Phone: 08 9388 8360
Fax: 08 9381 2360

Received: Jun 7, 2024 5:05 PM
Due: Jun 14, 2024
Priority: 5 Day
Contact Name: Kuenzang Tshering

Eurofins Analytical Services Manager : Natalie Hill

Sample Detail						Aluminium	Bromide	Iron	Eurofins Suite B11C: Na/K/Ca/Mg	Eurofins Suite B19E	Eurofins Suite B11E
Perth Laboratory - NATA # 2377 Site # 2370						X		X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217							X				
External Laboratory											
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID						
1	MC4	Jun 07, 2024		Water	L24-Jn0019913	X	X	X	X	X	X
2	MB5	Jun 07, 2024		Water	L24-Jn0019914	X	X	X	X	X	X
3	MB6	Jun 07, 2024		Water	L24-Jn0019915	X	X	X	X	X	X
4	MB20	Jun 07, 2024		Water	L24-Jn0019916	X	X	X	X	X	X
5	MB21	Jun 07, 2024		Water	L24-Jn0019917	X	X	X	X	X	X
6	QC01	Jun 07, 2024		Water	L24-Jn0019918	X	X	X	X	X	X
Test Counts						6	6	6	6	6	6

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. Unless otherwise stated, all soil/sediment/solid results are reported on a dry weight basis.
3. Unless otherwise stated, all biota/food results are reported on a wet weight basis on the edible portion.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds where annotated.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with **blue** colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the sampling date; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is seven days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	ppm: parts per million
µg/L: micrograms per litre	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony Forming Unit	Colour: Pt-Co Units (CU)	

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 6.0
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is ≤30%; however, the following acceptance guidelines are equally applicable:

Results <10 times the LOR:	No Limit
Results between 10-20 times the LOR:	RPD must lie between 0-50%
Results >20 times the LOR:	RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%, VOC recoveries 50 – 150%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 6.0, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test			Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Method Blank								
Ammonia-N			mg/L	< 0.02		0.02	Pass	
Chloride			mg/L	< 5		5	Pass	
Filterable Reactive Phosphorus			mg/L	< 0.01		0.01	Pass	
Nitrate-N			mg/L	< 0.01		0.01	Pass	
Nitrite-N			mg/L	< 0.01		0.01	Pass	
NOx-N			mg/L	< 0.01		0.01	Pass	
Sulfate			mg/L	< 1		1	Pass	
Total Nitrogen			mg/L	< 0.2		0.2	Pass	
Total Phosphorus			mg/L	< 0.01		0.01	Pass	
Method Blank								
Alkalinity (speciated)								
Bicarbonate Alkalinity (as CaCO3)			mg/L	< 5		5	Pass	
Hydroxide Alkalinity (as CaCO3)			mg/L	< 5		5	Pass	
Method Blank								
Bromide			mg/L	< 0.5		0.5	Pass	
Method Blank								
Heavy Metals								
Aluminium			mg/L	< 0.05		0.05	Pass	
Iron			mg/L	< 0.01		0.01	Pass	
Method Blank								
Eurofins Suite B11C: Na/K/Ca/Mg								
Calcium			mg/L	< 0.5		0.5	Pass	
Magnesium			mg/L	< 0.5		0.5	Pass	
Potassium			mg/L	< 0.5		0.5	Pass	
Sodium			mg/L	< 0.5		0.5	Pass	
LCS - % Recovery								
Bromide			%	101		70-130	Pass	
LCS - % Recovery								
Heavy Metals								
Aluminium			%	107		80-120	Pass	
Iron			%	102		80-120	Pass	
LCS - % Recovery								
Eurofins Suite B11C: Na/K/Ca/Mg								
Calcium			%	105		80-120	Pass	
Magnesium			%	109		80-120	Pass	
Potassium			%	100		80-120	Pass	
Sodium			%	104		80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery								
				Result 1				
Ammonia-N	L24-Jn0019914	CP	%	111		80-120	Pass	
Bromide	S24-Jn0013363	NCP	%	96		70-130	Pass	
Chloride	L24-Jn0019914	CP	%	118		70-130	Pass	
Filterable Reactive Phosphorus	L24-Jn0019914	CP	%	118		80-120	Pass	
Nitrate-N	L24-Jn0019914	CP	%	110		70-130	Pass	
Nitrite-N	L24-Jn0019914	CP	%	101		80-120	Pass	
NOx-N	L24-Jn0019914	CP	%	106		80-120	Pass	
Sulfate	L24-Jn0019914	CP	%	103		70-130	Pass	
Spike - % Recovery								
Heavy Metals				Result 1				

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Aluminium	L24-Jn0019916	CP	%	106			75-125	Pass	
Iron	L24-Jn0019916	CP	%	100			75-125	Pass	
Spike - % Recovery									
Eurofins Suite B11C: Na/K/Ca/Mg				Result 1					
Calcium	L24-Jn0019916	CP	%	100			75-125	Pass	
Magnesium	L24-Jn0019916	CP	%	105			75-125	Pass	
Potassium	L24-Jn0019916	CP	%	98			75-125	Pass	
Sodium	L24-Jn0019916	CP	%	88			75-125	Pass	
Spike - % Recovery									
				Result 1					
Total Nitrogen	L24-Jn0019918	CP	%	95			70-130	Pass	
Total Phosphorus	L24-Jn0019918	CP	%	91			80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Ammonia-N	L24-Jn0019913	CP	mg/L	1.2	1.2	3.6	20%	Pass	
Chloride	L24-Jn0019913	CP	mg/L	550	560	1.0	30%	Pass	
Filterable Reactive Phosphorus	L24-Jn0019913	CP	mg/L	0.05	0.05	<1	20%	Pass	
Nitrate-N	L24-Jn0020325	NCP	mg/L	2.8	2.9	3.3	30%	Pass	
Nitrite-N	L24-Jn0019913	CP	mg/L	< 0.01	< 0.01	<1	20%	Pass	
NOx-N	L24-Jn0019692	NCP	mg/L	0.25	0.26	4.8	20%	Pass	
Sulfate	L24-Jn0019913	CP	mg/L	420	420	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Bromide	N24-Jn0015476	NCP	mg/L	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Aluminium	L24-Jn0019915	CP	mg/L	0.96	0.94	2.3	30%	Pass	
Iron	L24-Jn0019915	CP	mg/L	1.4	1.4	<1	30%	Pass	
Duplicate									
Eurofins Suite B11C: Na/K/Ca/Mg				Result 1	Result 2	RPD			
Calcium	L24-Jn0019915	CP	mg/L	2.4	2.4	2.6	30%	Pass	
Magnesium	L24-Jn0019915	CP	mg/L	10	10	2.4	30%	Pass	
Potassium	L24-Jn0019915	CP	mg/L	2.7	2.6	1.9	30%	Pass	
Sodium	L24-Jn0019915	CP	mg/L	88	86	2.4	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Total Nitrogen	L24-Jn0019917	CP	mg/L	2.5	2.2	11	30%	Pass	
Total Phosphorus	L24-Jn0019917	CP	mg/L	0.17	0.16	9.5	20%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised by:

Natalie Hill	Analytical Services Manager
Douglas Todd	Senior Analyst-Metal
Ryan Phillips	Senior Analyst-Inorganic
Sam Becker	Senior Analyst-Inorganic



Kim Rodgers
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.



CHAIN OF CUSTODY RECORD

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Company	SLR Consulting Australia Pty Ltd			Project No	72597			Project Manager	Kuenzang			Sampler(s)	Kavindi Sahabandu					
Address	Level 1, 500 Hay Street, Subiaco, Australia, WA 6008			Project Name	Casuarina GME 2024			EDD Format	EsDat			Handed over by	Kavindi Sahabandu					
Contact Name	Kavindi Sahabandu			Analyses Where results are requested, please specify 'Total' or 'Filtered'. SUITE code must be used to attract SUITE pricing.	Nutrient (Ammonia as N, Nitrate as N, Nitrite as N, NOx-N, total Kjeldahl nitrogen, total nitrogen)	Nutrient (total phosphorus filterable reactive phosphorus)	Alkalinity (bicarbonate, carbonate, hydroxide, total alkalinity)	Major ions (Aluminium, Iron, calcium, magnesium, potassium, sodium, bromide, chloride, sulfate)				Email for Invoice	AccountsPayableAU@slrconsulting.com					
Phone No	0406245350											Email for Results	ktshering@slrconsulting.com, ksahabandu@slrconsulting.com					
Special Directions	Please forward QC02 to the ALS Lab											Containers Change container type & size if necessary.			Required Turnaround Time (TAT) Default will be 5 days if not ticked.			
Purchase Order												500mL Plastic			• Surcharge will apply ☐ Overnight (reporting by 9am) ♦ ☐ Same day ♦ ☐ 1 day ♦ ☐ 2 days ♦ ☐ 3 days ♦ ☒ 5 days (Standard) ☐ Other ()			
Quote ID No	SLR Blanket Quote												Jar (Glass or HDPE)			Other (Asbestos AS3664 WA Guidelines)		
No	Client Sample ID	Sampled Date/Time dd/mm/yyyy hh:mm	Matrix Solid (S) Water (W)														Sample Comments / Dangerous Goods Hazard Warning	
1	MC4	20-09-24	W	X	X	X	X											
2	MB5	20-09-24	W	X	X	X	X											
3	MB6	20-09-24	W	X	X	X	X											
4	MB7	20-09-24	W	X	X	X	X											
5	MB20	20-09-24	W	X	X	X	X											
6	MB21	20-09-24	W	X	X	X	X											
7	QC01	20-09-24	W	X	X	X	X											
8																		
9																		
Total Counts				7	7	7	7											
Method of Shipment				☐ Courier (#) ☒ Hand Delivered ☐ Postal				Name		Signature		Date		Time		Temperature		
Eurofins mgt Laboratory				Received By				SYD BNE MEL PER ADL NTL DRW		Signature		Date 20/9/24		Time 1620		Temperature 6°C		
Use Only				Received By				SYD BNE MEL PER ADL NTL DRW		Signature		Date		Time		Report No 1142175		

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

SLR Consulting Australia Pty Ltd
Level 1, 500 Hay Street
Subiaco
WA 6008



NATA Accredited
Accreditation Number 2377
Site Number 2370 & 2554

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition
Arrangement for the mutual recognition of the
equivalence of testing, medical testing, calibration,
inspection, proficiency testing scheme providers and
reference materials producers reports and certificates.

Attention: Kuenzang Tshering

Report 1142175-W
Project name CASUARINA GME 2024
Project ID 72597
Received Date Sep 20, 2024

Client Sample ID			MC4	MB5	MB6	MB7
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L24-Se0059836	L24-Se0059837	L24-Se0059838	L24-Se0059839
Date Sampled			Sep 20, 2024	Sep 20, 2024	Sep 20, 2024	Sep 20, 2024
Test/Reference	LOR	Unit				
Ammonia (as N)	0.02	mg/L	0.44	< 0.02	< 0.02	< 0.02
Bromide	0.5	mg/L	< 2.5	< 0.5	< 0.5	< 0.5
Chloride	5	mg/L	590	14	81	20
Filterable Reactive Phosphorus	0.01	mg/L	0.03	0.12	0.01	< 0.01
Nitrate (as N)	0.01	mg/L	< 0.01	3.1	0.09	3.1
Nitrite (as N)	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
NOx (as N)	0.01	mg/L	< 0.01	3.1	0.09	3.1
Sulfate (as SO4)	1	mg/L	580	< 1	62	20
Total Kjeldahl Nitrogen	0.2	mg/L	0.7	0.6	1.7	0.5
Total Nitrogen	0.2	mg/L	0.7	3.7	1.8	3.6
Total Phosphorus	0.01	mg/L	0.03	0.18	0.03	0.02
Alkalinity (speciated)						
Bicarbonate Alkalinity (as CaCO3)	5	mg/L	< 5	< 5	11	15
Carbonate Alkalinity (as CaCO3)	5	mg/L	< 5	< 5	< 5	< 5
Hydroxide Alkalinity (as CaCO3)	5	mg/L	< 5	< 5	< 5	< 5
Total Alkalinity (as CaCO3)	5	mg/L	< 5	< 5	11	15
Heavy Metals						
Aluminium	0.05	mg/L	8.6	1.1	1.4	1.3
Iron	0.01	mg/L	26	0.13	0.16	0.16
Eurofins Suite B11C: Na/K/Ca/Mg						
Calcium	0.5	mg/L	70	4.9	16	1.9
Magnesium	0.5	mg/L	98	2.2	9.9	4.1
Potassium	0.5	mg/L	13	< 0.5	12	3.8
Sodium	0.5	mg/L	500	8.1	71	25

Client Sample ID			MB20	MB21	QC01
Sample Matrix			Water	Water	Water
Eurofins Sample No.			L24-Se0059840	L24-Se0059841	L24-Se0059842
Date Sampled			Sep 20, 2024	Sep 20, 2024	Sep 20, 2024
Test/Reference	LOR	Unit			
Ammonia (as N)	0.02	mg/L	0.10	0.05	< 0.02
Bromide	0.5	mg/L	< 0.5	0.5	< 0.5
Chloride	5	mg/L	45	120	85
Filterable Reactive Phosphorus	0.01	mg/L	< 0.01	0.02	0.01
Nitrate (as N)	0.01	mg/L	1.8	< 0.01	0.08
Nitrite (as N)	0.01	mg/L	< 0.01	< 0.01	< 0.01
NOx (as N)	0.01	mg/L	1.8	< 0.01	0.08
Sulfate (as SO4)	1	mg/L	26	110	61
Total Kjeldahl Nitrogen	0.2	mg/L	0.7	1.2	1.7
Total Nitrogen	0.2	mg/L	2.5	1.2	1.8
Total Phosphorus	0.01	mg/L	0.02	0.05	0.01
Alkalinity (speciated)					
Bicarbonate Alkalinity (as CaCO3)	5	mg/L	12	16	12
Carbonate Alkalinity (as CaCO3)	5	mg/L	< 5	< 5	< 5
Hydroxide Alkalinity (as CaCO3)	5	mg/L	< 5	< 5	< 5
Total Alkalinity (as CaCO3)	5	mg/L	12	16	12
Heavy Metals					
Aluminium	0.05	mg/L	0.80	1.7	1.3
Iron	0.01	mg/L	0.12	5.5	0.16
Eurofins Suite B11C: Na/K/Ca/Mg					
Calcium	0.5	mg/L	5.4	17	16
Magnesium	0.5	mg/L	6.7	27	9.6
Potassium	0.5	mg/L	1.3	3.1	11
Sodium	0.5	mg/L	36	96	69

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Ammonia (as N) - Method: ARL303 - Ammonia in Water by Discrete Analyser	Welshpool	Sep 26, 2024	28 Days
Filterable Reactive Phosphorus - Method: ARL309 - Filterable Reactive Phosphorus in Water by Discrete Analyser	Welshpool	Sep 26, 2024	28 Days
Nitrate (as N) - Method: ARL313/319 - NOx in Water by Discrete Analyser	Welshpool	Sep 26, 2024	28 Days
Nitrite (as N) - Method: ARL311 - Nitrite in Water by Discrete Analyser	Welshpool	Sep 26, 2024	2 Days
NOx (as N) - Method: ARL313/319 - NOx in Water by Discrete Analyser	Welshpool	Sep 26, 2024	28 Days
Total Kjeldahl Nitrogen - Method: ARL No. 330 - Persulfate Method for Simultaneous Determination of TN & TP	Welshpool	Sep 24, 2024	28 Day
Total Nitrogen - Method: ARL No. 330 - Persulfate Method for Simultaneous Determination of TN & TP	Welshpool	Sep 26, 2024	28 Days
Total Phosphorus - Method: ARL308 - Total Phosphorus in Water by Discrete Analyser	Welshpool	Sep 26, 2024	28 Days
Bromide - Method: In-house method LTM-INO-4270 Anions by Ion Chromatography	Sydney	Sep 25, 2024	28 Days
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Welshpool	Sep 26, 2024	28 Days
Eurofins Suite B11C: Na/K/Ca/Mg - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Welshpool	Sep 26, 2024	180 Days
Chloride - Method: ARL305 - Chloride in Water by Discrete Analyser	Welshpool	Sep 26, 2024	28 Days
Sulfate (as SO ₄) - Method: ARL301 - Sulfate in Water by Discrete Analyser	Welshpool	Sep 26, 2024	28 Days
Alkalinity (speciated) - Method: LTM-INO-4250 Alkalinity by Electrometric Titration	Welshpool	Sep 26, 2024	14 Days



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Address: Level 1, 500 Hay Street
Subiaco
WA 6008

Project Name: CASUARINA GME 2024
Project ID: 72597

Order No.:
Report #: 1142175
Phone: 08 9388 8360
Fax: 08 9381 2360

Received: Sep 20, 2024 4:20 PM
Due: Sep 30, 2024
Priority: 5 Day
Contact Name: Kuenzang Tshering

Eurofins Analytical Services Manager : Natalie Hill

Sample Detail						Aluminium	Bromide	Iron	Eurofins Suite B11C: Na/K/Ca/Mg	Eurofins Suite B19E	Eurofins Suite B11E
Perth Laboratory - NATA # 2377 Site # 2370						X		X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217							X				
External Laboratory											
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID						
1	MC4	Sep 20, 2024		Water	L24-Se0059836	X	X	X	X	X	X
2	MB5	Sep 20, 2024		Water	L24-Se0059837	X	X	X	X	X	X
3	MB6	Sep 20, 2024		Water	L24-Se0059838	X	X	X	X	X	X
4	MB7	Sep 20, 2024		Water	L24-Se0059839	X	X	X	X	X	X
5	MB20	Sep 20, 2024		Water	L24-Se0059840	X	X	X	X	X	X
6	MB21	Sep 20, 2024		Water	L24-Se0059841	X	X	X	X	X	X
7	QC01	Sep 20, 2024		Water	L24-Se0059842	X	X	X	X	X	X
Test Counts						7	7	7	7	7	7

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. Unless otherwise stated, all soil/sediment/solid results are reported on a dry weight basis.
3. Unless otherwise stated, all biota/food results are reported on a wet weight basis on the edible portion.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds where annotated.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with **blue** colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the sampling date; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is seven days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	ppm: parts per million
µg/L: micrograms per litre	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony Forming Unit	Colour: Pt-Co Units (CU)	

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 6.0
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is ≤30%; however, the following acceptance guidelines are equally applicable:

Results <10 times the LOR:	No Limit
Results between 10-20 times the LOR:	RPD must lie between 0-50%
Results >20 times the LOR:	RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%, VOC recoveries 50 – 150%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 6.0, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Nitrate (as N)	mg/L	< 0.01			0.01	Pass	
Nitrite (as N)	mg/L	< 0.01			0.01	Pass	
NOx (as N)	mg/L	< 0.01			0.01	Pass	
Sulfate (as SO4)	mg/L	< 1			1	Pass	
Total Nitrogen	mg/L	< 0.2			0.2	Pass	
Total Phosphorus	mg/L	< 0.01			0.01	Pass	
Method Blank							
Alkalinity (speciated)							
Bicarbonate Alkalinity (as CaCO3)	mg/L	< 5			5	Pass	
Hydroxide Alkalinity (as CaCO3)	mg/L	< 5			5	Pass	
Method Blank							
Heavy Metals							
Aluminium	mg/L	< 0.05			0.05	Pass	
Iron	mg/L	< 0.01			0.01	Pass	
Method Blank							
Eurofins Suite B11C: Na/K/Ca/Mg							
Calcium	mg/L	< 0.5			0.5	Pass	
Magnesium	mg/L	< 0.5			0.5	Pass	
Potassium	mg/L	< 0.5			0.5	Pass	
Sodium	mg/L	< 0.5			0.5	Pass	
Method Blank							
Ammonia (as N)	mg/L	< 0.02			0.02	Pass	
Method Blank							
Filterable Reactive Phosphorus	mg/L	< 0.01			0.01	Pass	
Method Blank							
Chloride	mg/L	< 5			5	Pass	
Method Blank							
Bromide	mg/L	< 0.5			0.5	Pass	
LCS - % Recovery							
Heavy Metals							
Aluminium	%	99			80-120	Pass	
Iron	%	99			80-120	Pass	
LCS - % Recovery							
Eurofins Suite B11C: Na/K/Ca/Mg							
Calcium	%	100			80-120	Pass	
Magnesium	%	106			80-120	Pass	
Potassium	%	102			80-120	Pass	
Sodium	%	103			80-120	Pass	
LCS - % Recovery							
Bromide	%	98			70-130	Pass	
CRM - % Recovery							
Sulfate (as SO4)	%	101			80-120	Pass	
CRM - % Recovery							
Chloride	%	93			80-120	Pass	
CRM - % Recovery							
Alkalinity (speciated)							
Bicarbonate Alkalinity (as CaCO3)	%	110			70-130	Pass	
Hydroxide Alkalinity (as CaCO3)	%	110			70-130	Pass	
Total Alkalinity (as CaCO3)	%	110			70-130	Pass	
CRM - % Recovery							
Sulfate (as SO4)	%	111			80-120	Pass	
CRM - % Recovery							

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Chloride			%	95			80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
				Result 1					
Ammonia (as N)	L24-Se0054700	NCP	%	101			80-120	Pass	
Chloride	L24-Se0054700	NCP	%	111			70-130	Pass	
Filterable Reactive Phosphorus	L24-Se0064807	NCP	%	109			80-120	Pass	
Nitrate (as N)	L24-Se0054700	NCP	%	105			70-130	Pass	
Nitrite (as N)	L24-Se0054700	NCP	%	110			80-120	Pass	
NOx (as N)	L24-Se0054700	NCP	%	107			80-120	Pass	
Sulfate (as SO4)	L24-Se0054700	NCP	%	114			70-130	Pass	
Total Nitrogen	L24-Se0059705	NCP	%	102			70-130	Pass	
Total Phosphorus	L24-Se0059705	NCP	%	101			80-120	Pass	
Spike - % Recovery									
Eurofins Suite B11C: Na/K/Ca/Mg				Result 1					
Calcium	L24-Se0064171	NCP	%	92			75-125	Pass	
Magnesium	L24-Se0064171	NCP	%	102			75-125	Pass	
Potassium	L24-Se0064171	NCP	%	102			75-125	Pass	
Sodium	L24-Se0064171	NCP	%	96			75-125	Pass	
Spike - % Recovery									
				Result 1					
Bromide	L24-Se0059842	CP	%	103			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Ammonia (as N)	L24-Se0061182	NCP	mg/L	< 0.02	< 0.02	<1	20%	Pass	
Bromide	L24-Se0059836	CP	mg/L	< 2.5	< 2.5	<1	30%	Pass	
Chloride	L24-Se0061182	NCP	mg/L	29	29	<1	30%	Pass	
Filterable Reactive Phosphorus	L24-Se0064806	NCP	mg/L	< 0.01	< 0.01	<1	20%	Pass	
Nitrate (as N)	L24-Se0061279	NCP	mg/L	0.84	0.85	2.0	30%	Pass	
Nitrite (as N)	L24-Se0061182	NCP	mg/L	< 0.01	< 0.01	<1	20%	Pass	
NOx (as N)	L24-Se0061279	NCP	mg/L		0.85	2.0	20%	Pass	
Sulfate (as SO4)	L24-Se0061182	NCP	mg/L	16	16	1.0	30%	Pass	
Total Nitrogen	L24-Se0059704	NCP	mg/L	1.7	1.6	10	30%	Pass	
Total Phosphorus	L24-Se0059704	NCP	mg/L	0.03	0.03	10	20%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Aluminium	L24-Oc0002769	NCP	mg/L	1.3	**	2.0	30%	Pass	
Iron	L24-Oc0002769	NCP	mg/L	16	**	1.0	30%	Pass	
Duplicate									
Eurofins Suite B11C: Na/K/Ca/Mg				Result 1	Result 2	RPD			
Calcium	L24-Oc0002769	NCP	mg/L	260	**	6.0	30%	Pass	
Magnesium	L24-Oc0002769	NCP	mg/L	19	**	1.0	30%	Pass	
Potassium	L24-Oc0002769	NCP	mg/L	16	**	1.0	30%	Pass	
Sodium	L24-Oc0002769	NCP	mg/L	73	**	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
Q05	The matrix spike concentration is less than five times the background concentration in the sample - therefore the spike recovery cannot be determined
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.

Authorised by:

Natalie Hill	Analytical Services Manager
Douglas Todd	Senior Analyst-Metal
Ryan Phillips	Senior Analyst-Inorganic
Sam Becker	Senior Analyst-Inorganic



Kim Rodgers
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

[illegible]



CERTIFICATE OF ANALYSIS

Work Order : EP2413874
Client : SLR CONSULTING AUSTRALIA PTY LTD
Contact : KUENZANG TSHERING
Address : 503 MURRAY STREET
PERTH 6000
Telephone : ----
Project : Casuarina GME 2024
Order number : 675.072597.00001
C-O-C number : ----
Sampler : Kavindi Sahabandu
Site : ----
Quote number : EN-000
No. of samples received : 1
No. of samples analysed : 1

Page : 1 of 4
Laboratory : Environmental Division Perth
Contact : Georgina Nearygrant
Address : 26 Rigali Way Wangara WA Australia 6065
Telephone : +61-8-9406 1301
Date Samples Received : 25-Sep-2024 11:15
Date Analysis Commenced : 26-Sep-2024
Issue Date : 03-Oct-2024 16:58



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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	Position	Accreditation Category
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Chris Lemaitre	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
Efua Wilson	Metals Chemist	Perth Inorganics, Wangara, WA



General Comments

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

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

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

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

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

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

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

LOR = Limit of reporting

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

ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- Bromide conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	QC02	----	----	----	----
Sampling date / time					20-Sep-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2413874-001	-----	-----	-----	-----
				Result	----	----	----	----	----
ED009: Anions									
Bromide	24959-67-9	0.010	mg/L		0.186	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		8	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		8	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		33	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		116	----	----	----	----
ED093T: Total Major Cations									
Calcium	7440-70-2	1	mg/L		13	----	----	----	----
Magnesium	7439-95-4	1	mg/L		9	----	----	----	----
Sodium	7440-23-5	1	mg/L		58	----	----	----	----
Potassium	7440-09-7	1	mg/L		11	----	----	----	----
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		1.15	----	----	----	----
Iron	7439-89-6	0.05	mg/L		0.13	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		<0.01	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		0.16	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		0.16	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		1.5	----	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	QC02	----	----	----	----
				Sampling date / time	20-Sep-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2413874-001	-----	-----	-----	-----
					Result	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N		----	0.1	mg/L	1.7	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P		----	0.01	mg/L	0.08	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P		14265-44-2	0.01	mg/L	<0.01	----	----	----	----

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry / Biology).
(WATER) ED009: Anions



QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EP2413874	Page	: 1 of 8
Client	: SLR CONSULTING AUSTRALIA PTY LTD	Laboratory	: Environmental Division Perth
Contact	: KUENZANG TSHERING	Telephone	: +61-8-9406 1301
Project	: Casuarina GME 2024	Date Samples Received	: 25-Sep-2024
Site	: ----	Issue Date	: 03-Oct-2024
Sampler	: Kavindi Sahabandu	No. of samples received	: 1
Order number	: 675.072597.00001	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- Matrix Spike outliers exist - please see following pages for full details.
- For all regular sample matrices, where applicable to the methodology, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers exist - please see following pages for full details.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: WATER

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED009: Anions	EM2416394--001	Anonymous	Bromide	24959-67-9	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Ar	EP2413818--001	Anonymous	Nitrite + Nitrate as N	----	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

Outliers : Analysis Holding Time Compliance

Matrix: WATER

Method	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EK055G: Ammonia as N by Discrete Analyser						
Clear Plastic Bottle - Natural QC02	----	----	----	26-Sep-2024	21-Sep-2024	5
EK057G: Nitrite as N by Discrete Analyser						
Clear Plastic Bottle - Natural QC02	----	----	----	26-Sep-2024	22-Sep-2024	4
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser						
Clear Plastic Bottle - Natural QC02	----	----	----	27-Sep-2024	22-Sep-2024	5
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser						
Clear Plastic Bottle - Natural QC02	28-Sep-2024	21-Sep-2024	7	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser						
Clear Plastic Bottle - Natural QC02	28-Sep-2024	22-Sep-2024	6	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser						
Clear Plastic Bottle - Natural QC02	----	----	----	26-Sep-2024	22-Sep-2024	4

Outliers : Frequency of Quality Control Samples

Matrix: WATER

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	
Matrix Spikes (MS)						
Total Metals by ICP-MS - Suite A	EG020A-T	0	11	0.00	5.00	NEPM 2013 B3 & ALS QC Standard



Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED009: Anions							
Clear Plastic Bottle - Natural (ED009-X) QC02	20-Sep-2024	----	----	----	01-Oct-2024	18-Oct-2024	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) QC02	20-Sep-2024	----	----	----	03-Oct-2024	04-Oct-2024	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) QC02	20-Sep-2024	----	----	----	03-Oct-2024	18-Oct-2024	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G) QC02	20-Sep-2024	----	----	----	03-Oct-2024	18-Oct-2024	✓
ED093T: Total Major Cations							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (ED093T) QC02	20-Sep-2024	01-Oct-2024	18-Oct-2024	✓	01-Oct-2024	18-Oct-2024	✓
EG020T: Total Metals by ICP-MS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG020A-T) QC02	20-Sep-2024	01-Oct-2024	19-Mar-2025	✓	01-Oct-2024	19-Mar-2025	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK055G) QC02	20-Sep-2024	----	----	----	26-Sep-2024	21-Sep-2024	✗
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) QC02	20-Sep-2024	----	----	----	26-Sep-2024	22-Sep-2024	✗
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Natural (EK059G) QC02	20-Sep-2024	----	----	----	27-Sep-2024	22-Sep-2024	✗
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Natural (EK061G) QC02	20-Sep-2024	28-Sep-2024	21-Sep-2024	✗	02-Oct-2024	26-Oct-2024	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Natural (EK067G) QC02	20-Sep-2024	28-Sep-2024	22-Sep-2024	✗	02-Oct-2024	26-Oct-2024	✓



Matrix: WATER

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G) QC02	20-Sep-2024	----	----	----	26-Sep-2024	22-Sep-2024	✖



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	2	17	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Total	ED093T	1	1	100.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Standard Anions -by IC (Extended Method)	ED009-X	2	6	33.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	11	18.18	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Total	ED093T	1	1	100.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Standard Anions -by IC (Extended Method)	ED009-X	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Total	ED093T	1	1	100.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Standard Anions -by IC (Extended Method)	ED009-X	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification .

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Method Blanks (MB) - Continued							
Total Metals by ICP-MS - Suite A	EG020A-T	1	11	9.09	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	17	5.88	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	15	6.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Standard Anions -by IC (Extended Method)	ED009-X	1	6	16.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	0	11	0.00	5.00	✖	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Standard Anions -by IC (Extended Method)	ED009-X	WATER	In house: Referenced to APHA 4110B. This method is compliant with NEPM Schedule B(3)
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO ₄ 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO ₄ . Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO ₄ suspension is measured by a photometer and the SO ₄ -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm.
Major Cations - Total	ED093T	WATER	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Samples are digested by USEPA 3005 prior to analysis. The ICPAES technique ionises the sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM Schedule B(3)
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH ₃ G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO ₂ - B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO ₃ - F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NO _x) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO ₃ - F. Combined oxidised Nitrogen (NO ₂ +NO ₃) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO ₃ -. This method is compliant with NEPM Schedule B(3)



<i>Analytical Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al, Zhang et al. This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with orthophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM Schedule B(3)
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)



QUALITY CONTROL REPORT

Work Order	: EP2413874	Page	: 1 of 5
Client	: SLR CONSULTING AUSTRALIA PTY LTD	Laboratory	: Environmental Division Perth
Contact	: KUENZANG TSHERING	Contact	: Georgina Nearygrant
Address	: 503 MURRAY STREET PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: Casuarina GME 2024	Date Samples Received	: 25-Sep-2024
Order number	: 675.072597.00001	Date Analysis Commenced	: 26-Sep-2024
C-O-C number	: ----	Issue Date	: 03-Oct-2024
Sampler	: Kavindi Sahabandu		
Site	: ----		
Quote number	: EN-000		
No. of samples received	: 1		
No. of samples analysed	: 1		



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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

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

Signatories	Position	Accreditation Category
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Chris Lemaitre	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
Efua Wilson	Metals Chemist	Perth Inorganics, Wangara, WA



General Comments

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

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

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
= Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED009: Anions (QC Lot: 6090574)									
EM2416394-001	Anonymous	ED009-X: Bromide	24959-67-9	0.01	mg/L	1.47	1.42	3.7	0% - 20%
EP2413853-006	Anonymous	ED009-X: Bromide	24959-67-9	0.01	mg/L	0.496	0.452	9.3	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 6093416)									
EP2413774-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	190	187	1.9	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	190	187	1.9	0% - 20%
EP2413782-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	343	341	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	343	341	0.6	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 6082703)									
EP2413900-006	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	466	466	0.0	0% - 20%
EP2413864-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	18	18	0.0	0% - 50%
ED045G: Chloride by Discrete Analyser (QC Lot: 6082704)									
EP2413900-006	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1680	1670	1.0	0% - 20%
EP2413864-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	128	129	0.0	0% - 20%
ED093T: Total Major Cations (QC Lot: 6087045)									
EP2413874-001	QC02	ED093T: Calcium	7440-70-2	1	mg/L	13	13	0.0	0% - 50%
		ED093T: Magnesium	7439-95-4	1	mg/L	9	10	0.0	No Limit
		ED093T: Sodium	7440-23-5	1	mg/L	58	62	6.2	0% - 20%
		ED093T: Potassium	7440-09-7	1	mg/L	11	11	0.0	0% - 50%

Page : 3 of 5
 Work Order : EP2413874
 Client : SLR CONSULTING AUSTRALIA PTY LTD
 Project : Casuarina GME 2024



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020T: Total Metals by ICP-MS (QC Lot: 6087044)									
EP2413834-004	Anonymous	EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.03	0.05	34.7	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.16	0.18	13.3	No Limit
EP2413932-003	Anonymous	EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 6082979)									
EP2413864-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP2413892-005	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 6082701)									
EP2413900-006	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP2413864-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 6082980)									
EP2413864-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.02	0.0	No Limit
EP2413892-005	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 6084280)									
EP2413664-004	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.5	0.6	27.8	No Limit
EP2413806-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	102	101	0.8	0% - 20%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 6084279)									
EP2413664-004	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.02	0.06	113	No Limit
EP2413806-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.04	0.03	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 6082702)									
EP2413900-006	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP2413864-002	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.02	0.0	No Limit

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
	Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) LowHigh	
Result				
<0.010	2 mg/L	101	93.0	109
<1	----	----	----	----
<1	----	----	----	----
<1	----	----	----	----
<1	20 mg/L	91.4	85.1	126
<1	200 mg/L	94.4	90.5	111
<1	25 mg/L	99.1	89.9	112
<1	500 mg/L	97.2	89.9	112
<1	10 mg/L	97.9	88.6	113
<1	1000 mg/L	97.4	88.6	113
<1	50 mg/L	114	85.0	115
<1	50 mg/L	114	85.0	115
<1	50 mg/L	110	85.0	115
<1	50 mg/L	106	85.0	115
<0.01	0.5 mg/L	103	91.6	114
<0.05	0.5 mg/L	100	95.0	132
<0.01	1 mg/L	102	86.2	111
<0.01	0.5 mg/L	100	88.7	113
<0.01	0.5 mg/L	102	90.5	110
<0.1	10 mg/L	95.6	80.0	115

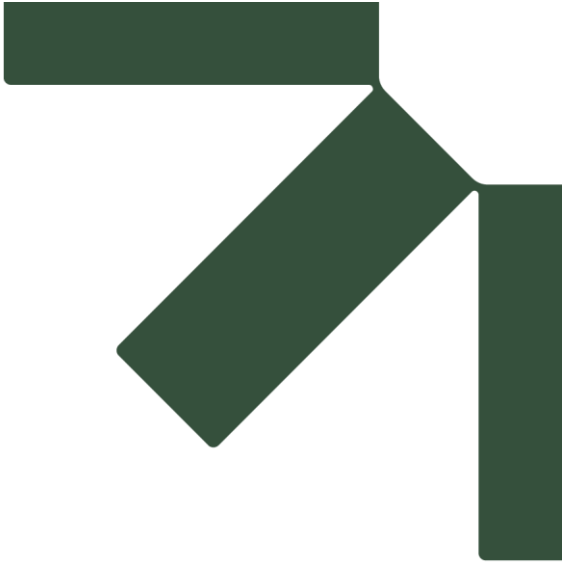


Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
Method: Compound	CAS Number	LOR	Unit	Result				
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 6084279) - continued								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	93.8	70.0	110
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 6082702)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	104	89.4	109

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%) MS	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number			Low	High
ED009: Anions (QCLot: 6090574)							
EM2416394-001	Anonymous	ED009-X: Bromide	24959-67-9	0.2 mg/L	# Not Determined	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 6082703)							
EP2413864-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	98.5	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 6082704)							
EP2413864-001	Anonymous	ED045G: Chloride	16887-00-6	200 mg/L	126	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 6082979)							
EP2413818-001	Anonymous	EK055G: Ammonia as N	7664-41-7	1 mg/L	96.5	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6082701)							
EP2413864-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	104	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 6082980)							
EP2413818-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	# Not Determined	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 6084280)							
EP2413664-005	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	85.0	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 6084279)							
EP2413664-005	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	82.6	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 6082702)							
EP2413864-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	111	70.0	130



Appendix C Groundwater & Surface Water Levels, Physico-Chemical Tables

**Casuarina Groundwater Monitoring October 2022 to
October 2024**

Casuarina 6167, WA

Various Landowners (Casuarina LSP Area)

SLR Project No.: 675.0729597.00001

13 May 2025



Groundwater Levels

Monitoring Well	Sampling date	Easting	Northing	ToC (mAHD)	GL (mAHD)	DTW (mbTOC)	DTW (mbgl)	GWL (mAHD)	Water Temperature (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (pH unit)	ORP (mV)	Field observation
MC4	13-Sep-22	392218.689	6431300.085	13.859	13.375	---	---	---	---	---	---	---	---	---
MC4	13-Oct-22	392218.689	6431300.085	13.859	13.375	0.93	0.45	12.93	16.50	0.08	2959.00	4.59	-71.10	Odourless, colourless, low turbidity
MC4	03-Nov-22	392218.689	6431300.085	13.859	13.375	1.75	1.27	12.11	---	---	---	---	---	---
MC4	16-Dec-22	392218.689	6431300.085	13.859	13.375	1.26	0.78	12.60	---	---	---	---	---	---
MC4	20-Jan-23	392218.689	6431300.085	13.859	13.375	1.66	1.18	12.20	---	---	---	---	---	---
MC4	17-Feb-23	392218.689	6431300.085	13.859	13.375	1.89	1.41	11.97	---	---	---	---	---	---
MC4	27-Mar-23	392218.689	6431300.085	13.859	13.375	Dry	---	---	---	---	---	---	---	---
MC4	31-Jul-23	392218.689	6431300.085	13.859	13.375	0.55	0.07	13.31	14.90	0.22	2649.00	4.51	-89.20	Colourless, odourless, low turbidity
MC4	30-Aug-23	392218.689	6431300.085	13.859	13.375	1.06	0.58	12.80	15.70	0.20	3097.00	4.30	-165.40	Colourless, odourless, low turbidity
MC4	14-Sep-23	392218.689	6431300.085	13.859	13.375	0.96	0.48	12.90	16.50	0.09	2980.00	4.60	199.00	Colourless, odourless, low turbidity
MC4	25-Oct-23	392218.689	6431300.085	13.859	13.375	1.34	0.86	12.52	16.20	0.13	3468.00	4.38	218.50	Colourless, odourless, no turbidity
MC4	10-May-24	392218.689	6431300.085	13.859	13.375	2.22	1.74	11.64	---	---	---	---	---	---
MC4	07-Jun-24	392218.689	6431300.085	13.859	13.375	2.06	1.58	11.80	19.80	0.27	2432.00	4.22	-55.40	Odourless, Colourless, clear
MC4	11-Jul-24	392218.689	6431300.085	13.859	13.375	1.89	1.41	11.97	---	---	---	---	---	---
MC4	08-Aug-24	392218.689	6431300.085	13.859	13.375	1.11	0.63	12.75	---	---	---	---	---	---
MC4	20-Sep-24	392218.689	6431300.085	13.859	13.375	1.07	0.59	12.79	16.80	0.14	3108.00	4.27	-24.70	Colourless, odourless, no turbidity
MC4	11-Oct-24	392218.689	6431300.085	13.859	13.375	1.05	0.57	12.81	---	---	---	---	---	---
MB5	13-Sep-22	391999.759	6431331.303	13.97	13.473	1.50	1.00	12.47	---	---	---	---	---	---
MB5	13-Oct-22	391999.759	6431331.303	13.97	13.473	1.67	1.17	12.30	19.70	3.40	124.80	4.14	-30.70	Odourless, pale brown, low turbidity
MB5	03-Nov-22	391999.759	6431331.303	13.97	13.473	1.80	1.30	12.17	---	---	---	---	---	---
MB5	16-Dec-22	391999.759	6431331.303	13.97	13.473	1.96	1.46	12.01	---	---	---	---	---	---
MB5	20-Jan-23	391999.759	6431331.303	13.97	13.473	2.22	1.72	11.75	---	---	---	---	---	---
MB5	17-Feb-23	391999.759	6431331.303	13.97	13.473	2.44	1.94	11.53	---	---	---	---	---	---
MB5	27-Mar-23	391999.759	6431331.303	13.97	13.473	2.65	2.15	11.32	26.80	0.56	139.40	4.33	188.90	Brownish colour, odourless, low turbidity
MB5	31-Jul-23	391999.759	6431331.303	13.97	13.473	1.77	1.27	12.20	18.00	3.40	128.50	4.34	140.90	Light brown, odourless, low turbidity
MB5	30-Aug-23	391999.759	6431331.303	13.97	13.473	1.90	1.40	12.07	10.90	1.67	142.00	4.16	17.50	Light brown, odourless, medium turbidity
MB5	14-Sep-23	391999.759	6431331.303	13.97	13.473	1.60	1.10	12.37	17.00	1.20	131.20	4.30	15.00	Light brown, odourless, medium turbidity
MB5	25-Oct-23	391999.759	6431331.303	13.97	13.473	2.05	1.55	11.92	21.90	0.57	117.00	4.32	0.90	Pale yellow colour, odourless, low turbidity
MB5	10-May-24	391999.759	6431331.303	13.97	13.473	3.33	2.83	10.64	---	---	---	---	---	---
MB5	07-Jun-24	391999.759	6431331.303	13.97	13.473	2.85	2.35	11.12	23.60	0.10	156.20	4.99	-85.70	Odourless, Pale yellow, low turbidity
MB5	11-Jul-24	391999.759	6431331.303	13.97	13.473	2.66	2.16	11.31	---	---	---	---	---	---
MB5	08-Aug-24	391999.759	6431331.303	13.97	13.473	1.91	1.41	12.06	---	---	---	---	---	---
MB5	20-Sep-24	391999.759	6431331.303	13.97	13.473	1.85	1.35	12.12	19.80	3.76	98.90	4.36	210.60	Odourless, Pale yellow, low turbidity
MB5	11-Oct-24	391999.759	6431331.303	13.97	13.473	1.87	1.37	12.10	---	---	---	---	---	---
MB6	13-Sep-22	392225.481	6431157.863	13.878	13.344	0.74	0.20	13.14	---	---	---	---	---	---
MB6	13-Oct-22	392225.481	6431157.863	13.878	13.344	0.89	0.36	12.99	17.60	0.10	503.30	5.48	-91.00	Slight organic odour, pale yellow colour, low turbidity
MB6	03-Nov-22	392225.481	6431157.863	13.878	13.344	1.41	0.88	12.47	---	---	---	---	---	---
MB6	16-Dec-22	392225.481	6431157.863	13.878	13.344	1.22	0.69	12.66	---	---	---	---	---	---
MB6	20-Jan-23	392225.481	6431157.863	13.878	13.344	1.63	1.10	12.25	---	---	---	---	---	---
MB6	17-Feb-23	392225.481	6431157.863	13.878	13.344	1.85	1.32	12.03	---	---	---	---	---	---
MB6	27-Mar-23	392225.481	6431157.863	13.878	13.344	2.20	1.67	11.68	22.30	0.34	486.50	5.46	-133.90	Colourless, rotten egg smell, low turbidity
MB6	31-Jul-23	392225.481	6431157.863	13.878	13.344	0.97	0.44	12.91	14.90	1.35	366.60	5.30	-44.60	Colourless, odourless, low turbidity
MB6	30-Aug-23	392225.481	6431157.863	13.878	13.344	1.03	0.50	12.85	15.80	0.27	683.00	5.15	-241.40	Colourless, odourless, low turbidity
MB6	14-Sep-23	392225.481	6431157.863	13.878	13.344	0.80	0.27	13.08	16.21	0.50	450.00	5.30	-85.00	Colourless, odourless, low turbidity
MB6	25-Oct-23	392225.481	6431157.863	13.878	13.344	1.32	0.79	12.56	18.30	0.06	513.20	5.37	-38.60	Colourless, odourless, low turbidity
MB6	10-May-24	392225.481	6431157.863	13.878	13.344	2.01	1.48	11.87	---	---	---	---	---	Roots blockage at 2.01 mbgl
MB6	07-Jun-24	392225.481	6431157.863	13.878	13.344	2.04	1.51	11.84	20.10	7.37	498.00	5.52	-126.30	Sulfur odour, Pale yellow, low turbidity
MB6	11-Jul-24	392225.481	6431157.863	13.878	13.344	1.82	1.29	12.06	---	---	---	---	---	---
MB6	08-Aug-24	392225.481	6431157.863	13.878	13.344	1.06	0.53	12.82	---	---	---	---	---	---
MB6	20-Sep-24	392225.481	6431157.863	13.878	13.344	0.98	0.45	12.90	17.90	0.36	470.10	5.09	-62.00	Sulfur odour, Pale yellow, low turbidity
MB6	11-Oct-24	392225.481	6431157.863	13.878	13.344	1.00	0.47	12.88	---	---	---	---	---	---



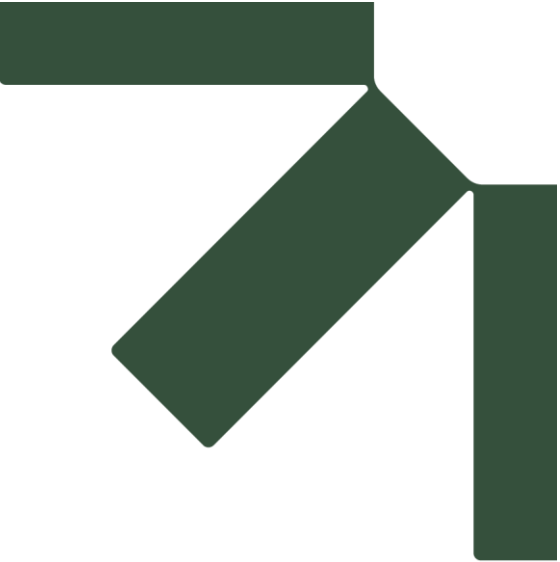
Groundwater Levels

Monitoring Well	Sampling date	Easting	Northing	ToC (mAHD)	GL (mAHD)	DTW (mbTOC)	DTW (mbgl)	GWL (mAHD)	Water Temperature (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (pH unit)	ORP (mV)	Field observation
MB7	13-Sep-22	392032.154	6430945.604	16.017	15.616	4.10	3.70	11.92	---	---	---	---	---	---
MB7	13-Oct-22	392032.154	6430945.604	16.017	15.616	4.20	3.80	11.81	18.30	0.86	201.20	5.77	-41.20	Odourless, colourless, low turbidity
MB7	03-Nov-22	392032.154	6430945.604	16.017	15.616	4.50	4.10	11.52	---	---	---	---	---	---
MB7	16-Dec-22	392032.154	6430945.604	16.017	15.616	4.84	4.44	11.18	---	---	---	---	---	---
MB7	20-Jan-23	392032.154	6430945.604	16.017	15.616	4.75	4.35	11.27	---	---	---	---	---	---
MB7	17-Feb-23	392032.154	6430945.604	16.017	15.616	Dry	---	---	---	---	---	---	---	---
MB7	27-Mar-23	392032.154	6430945.604	16.017	15.616	Dry	---	---	---	---	---	---	---	---
MB7	31-Jul-23	392032.154	6430945.604	16.017	15.616	4.82	4.42	11.20	17.70	1.22	520.40	5.69	-132.10	Colourless, odourless, medium turbidity
MB7	30-Aug-23	392032.154	6430945.604	16.017	15.616	4.66	4.26	11.36	18.50	0.91	318.60	5.32	-157.70	Colourless, odourless, low turbidity
MB7	14-Sep-23	392032.154	6430945.604	16.017	15.616	4.50	4.10	11.52	19.60	1.00	412.00	5.36	-143.20	Colourless, odourless, low turbidity
MB7	25-Oct-23	392032.154	6430945.604	16.017	15.616	Dry	---	---	---	---	---	---	---	Bore was dry
MB7	10-May-24	392032.154	6430945.604	16.017	15.616	Dry	---	---	---	---	---	---	---	Bore was dry
MB7	07-Jun-24	392032.154	6430945.604	16.017	15.616	Dry	---	---	---	---	---	---	---	Bore was dry
MB7	11-Jul-24	392032.154	6430945.604	16.017	15.616	Dry	---	---	---	---	---	---	---	Bore was dry
MB7	08-Aug-24	392032.154	6430945.604	16.017	15.616	Dry	---	---	---	---	---	---	---	Bore was dry
MB7	20-Sep-24	392032.154	6430945.604	16.017	15.616	4.57	4.17	11.45	19.50	1.37	171.30	5.51	42.70	Colourless, odourless, low turbidity
MB7	11-Oct-24	392032.154	6430945.604	16.017	15.616	4.53	4.13	11.49	---	---	---	---	---	---
MB20	13-Sep-22	392064.128	6431619.423	15.13	14.406	---	---	---	---	---	---	---	---	Bores were installed in Aug. 2023
MB20	13-Oct-22	392064.128	6431619.423	15.13	14.406	---	---	---	---	---	---	---	---	Bores were installed in Aug. 2023
MB20	03-Nov-22	392064.128	6431619.423	15.13	14.406	---	---	---	---	---	---	---	---	Bores were installed in Aug. 2023
MB20	16-Dec-22	392064.128	6431619.423	15.13	14.406	---	---	---	---	---	---	---	---	Bores were installed in Aug. 2023
MB20	20-Jan-23	392064.128	6431619.423	15.13	14.406	---	---	---	---	---	---	---	---	Bores were installed in Aug. 2023
MB20	17-Feb-23	392064.128	6431619.423	15.13	14.406	---	---	---	---	---	---	---	---	Bores were installed in Aug. 2023
MB20	27-Mar-23	392064.128	6431619.423	15.13	14.406	---	---	---	---	---	---	---	---	Bores were installed in Aug. 2023
MB20	31-Jul-23	392064.128	6431619.423	15.13	14.406	---	---	---	---	---	---	---	---	Bores were installed in Aug. 2023
MB20	30-Aug-23	392064.128	6431619.423	15.13	14.406	2.96	2.24	12.17	19.20	0.37	354.90	5.37	-152.80	Pale yellow colour, odourless, medium turbidity
MB20	14-Sep-23	392064.128	6431619.423	15.13	14.406	2.95	2.23	12.18	18.90	0.24	345.00	5.24	-14.30	Pale yellow colour, odourless, less turbidity
MB20	25-Oct-23	392064.128	6431619.423	15.13	14.406	3.05	2.33	12.08	18.90	0.14	304.00	5.12	11.10	Pale yellow colour, odourless, less turbidity
MB20	10-May-24	392064.128	6431619.423	15.13	14.406	3.20	2.48	11.93	---	---	---	---	---	---
MB20	07-Jun-24	392064.128	6431619.423	15.13	14.406	3.30	2.58	11.83	22.80	0.54	7.70	5.49	-92.90	Odourless, Pale yellow, low turbidity
MB20	11-Jul-24	392064.128	6431619.423	15.13	14.406	3.27	2.55	11.86	---	---	---	---	---	---
MB20	08-Aug-24	392064.128	6431619.423	15.13	14.406	2.85	2.13	12.28	---	---	---	---	---	---
MB20	20-Sep-24	392064.128	6431619.423	15.13	14.406	2.97	2.25	12.16	19.80	0.56	260.40	5.45	-44.00	Odourless, Pale yellow, low turbidity
MB20	11-Oct-24	392064.128	6431619.423	15.13	14.406	3.00	2.28	12.13	---	---	---	---	---	---
MB21	13-Sep-22	391974.927	6431514.364	11.963	11.32	---	---	---	---	---	---	---	---	Bores were installed in Aug. 2023
MB21	13-Oct-22	391974.927	6431514.364	11.963	11.32	---	---	---	---	---	---	---	---	Bores were installed in Aug. 2023
MB21	03-Nov-22	391974.927	6431514.364	11.963	11.32	---	---	---	---	---	---	---	---	Bores were installed in Aug. 2023
MB21	16-Dec-22	391974.927	6431514.364	11.963	11.32	---	---	---	---	---	---	---	---	Bores were installed in Aug. 2023
MB21	20-Jan-23	391974.927	6431514.364	11.963	11.32	---	---	---	---	---	---	---	---	Bores were installed in Aug. 2023
MB21	17-Feb-23	391974.927	6431514.364	11.963	11.32	---	---	---	---	---	---	---	---	Bores were installed in Aug. 2023
MB21	27-Mar-23	391974.927	6431514.364	11.963	11.32	---	---	---	---	---	---	---	---	Bores were installed in Aug. 2023
MB21	31-Jul-23	391974.927	6431514.364	11.963	11.32	---	---	---	---	---	---	---	---	Bores were installed in Aug. 2023
MB21	30-Aug-23	391974.927	6431514.364	11.963	11.32	1.00	0.36	10.96	14.10	0.90	560.00	5.57	-145.10	Brown, odourless, high turbidity
MB21	14-Sep-23	391974.927	6431514.364	11.963	11.32	1.60	0.96	10.36	16.30	0.65	263.00	5.64	-50.60	Brown, odourless, high turbidity
MB21	25-Oct-23	391974.927	6431514.364	11.963	11.32	1.32	0.68	10.64	17.30	0.37	60.40	5.60	-14.60	Brown, odourless, medium turbidity
MB21	10-May-24	391974.927	6431514.364	11.963	11.32	2.82	2.18	9.14	---	---	---	---	---	---
MB21	07-Jun-24	391974.927	6431514.364	11.963	11.32	1.69	1.05	10.27	18.20	4.09	1397.00	5.03	27.40	Odourless, Pale yellow, low turbidity
MB21	11-Jul-24	391974.927	6431514.364	11.963	11.32	1.31	0.67	10.65	---	---	---	---	---	---
MB21	08-Aug-24	391974.927	6431514.364	11.963	11.32	0.97	0.33	10.99	---	---	---	---	---	---
MB21	20-Sep-24	391974.927	6431514.364	11.963	11.32	1.03	0.39	10.93	17.00	0.34	711.00	5.52	-23.50	Colourless, odourless, low turbidity
MB21	11-Oct-24	391974.927	6431514.364	11.963	11.32	1.03	0.39	10.93	---	---	---	---	---	---

*Standing water level for bores MB20 and MB21 are in mAHD while rest of the bores are in mbgl

Surface water Levels

Location	Easting	Northing	Date	RL Top of concrete (mAHD)	RL Staff zero (mAHD)	Staff Reading (m)	Surface Water Level (mAHD)	Observation
Gauge 1	392158.081	6430746.033	10-Oct-23	11.557	10.929	0.10	11.029	Installation of gauges
Gauge 1	392158.081	6430746.033	23-Oct-23	11.557	10.929	0.06	10.989	
Gauge 1	392158.081	6430746.033	10-May-24	11.557	10.929			Dry
Gauge 1	392158.081	6430746.033	11-Jul-24	11.557	10.929			Dry
Gauge 1	392158.081	6430746.033	08-Aug-24	11.557	10.929			No water on the gauge but there is water to the western part of the wetland
Gauge 1	392158.081	6430746.033	20-Sep-24	11.557	10.929	0.15	11.079	
Gauge 1	392158.081	6430746.033	11-Oct-24	11.557	10.929	0.2	11.129	
Gauge 2	392086.095	6431219.798	10-Oct-23	17.785	12.007	0.075	12.082	Installation of gauges
Gauge 2	392086.095	6431219.798	23-Oct-23	17.785	12.007	0.04	12.047	
Gauge 2	392086.095	6431219.798	10-May-24	17.785	12.007	0		Dry
Gauge 2	392086.095	6431219.798	11-Jul-24	17.785	12.007	0		Dry
Gauge 2	392086.095	6431219.798	08-Aug-24	17.785	12.007	0.26	12.267	
Gauge 2	392086.095	6431219.798	20-Sep-24	17.785	12.007	0.3	12.307	
Gauge 2	392086.095	6431219.798	11-Oct-24	17.785	12.007	0.3	12.307	



Appendix D Groundwater Quality and QA/QC Tables

**Casuarina Groundwater Monitoring October 2022 to
October 2024**

Casuarina 6167, WA

Various Landowners (Casuarina LSP Area)

SLR Project No.: 675.0729597.00001

13 May 2025

Metals				Major/minor ions						Inorganics													
Aluminium	Aluminium (filtered)	Iron	Iron (filtered)	Calcium	Magnesium	Potassium	Sulphate (filtered)	Sodium	Chloride (filtered)	Alkalinity (total) as CaCO3	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Carbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Bromide	TSS	Ammonia as N	Nitrogen (Total)	Kjeldahl Nitrogen Total	Nitrite + Nitrate as N	Nitrate (as N)	Nitrite (as N)	Phosphorus	Phosphorous filterable reactive (P)
mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
0.05	0.05	0.01	0.01	0.5	0.5	0.5	1	0.5	5	5	5	5	5	0.1	5	0.02	0.2	0.2	0.01	0.01	0.01	0.01	0.01
		0.3	0.3				250	180	250							0.4118 ^{#1}							
0.2	0.2	0.3	0.3				1,000		250														
0.055 ^{#2}	0.055 ^{#2}															0.9 ^{#3}							

	Number of Results	22	17	22	17	39	39	39	39	39	39	39	11	11	11	39	28	39	39	39	39	39	39	32	
	Minimum Concentration	0.65	<0.05	0.1	0.02	1.9	2.2	<0.5	<1	8.1	14	<5	<5	<5	<5	0.2	5	<0.02	0.7	0.2	<0.01	<0.01	0.01	0.01	0.01
	Maximum Concentration	9.9	7.5	46	25	83	110	16	600	510	680	59	19	<5	<5	19	1,000	1.2	16	16	5	5	0.03	7	0.22
	Average Concentration *	2.4	2	6.4	4.7	19	24	5.2	120	121	174	14	9.4	2.5	2.5	2.1	106	0.25	3.3	2	1.3	1.3	0.0068	0.35	0.048

Environmental Standards
ANZG, 2018, ANZG (2018) Freshwater 95% toxicant DGVs

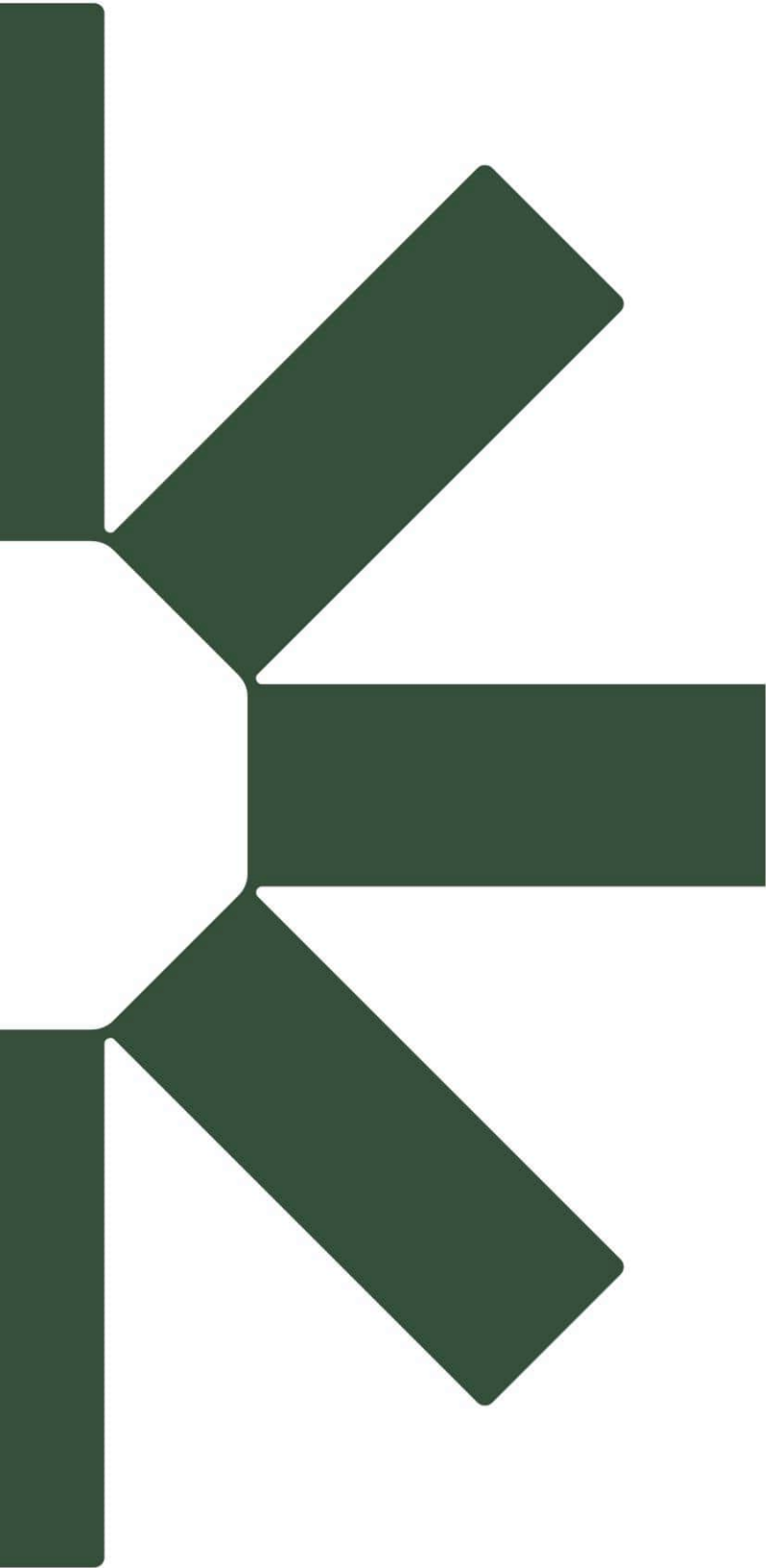
Table B - Historical QA/QC Results

Lab Report Number	Unit	EQL	Date	13-10-2022	13-10-2022	RPD	27-03-2023	27-03-2023	RPD	31-07-2023	31-07-2023	RPD	07 Jun 2024	07 Jun 2024	RPD	20 Sep 2024	20 Sep 2024	RPD	20 Sep 2024	20 Sep 2024	RPD
			Sample Type	Normal	Field_D		Normal	Field_D		Normal	Field_D		Normal	Field_D		Normal	Field_D		Normal	Interlab_D	
			Field ID	MC7	QC01		MB6	QC01		MB7	QC01		MB6	QC01		MB6	QC01		MB6	QC02	
				L22-Oc0025567	L22-Oc0025568		L23-Ma0063847	L23-Ma0063848		1012541	1012541		1105981	1105981		1142175	1142175		1142175	EP2413874	
				Eurofins	Eurofins		Eurofins	Eurofins		Eurofins	Eurofins		Eurofins ARL	Eurofins ARL		Eurofins ARL	Eurofins ARL		Eurofins ARL	ALS	
Metals																					
Aluminium	mg/L	0.01		1.4	1.5	7%	1.1	0.78	34%	0.12	0.66	138%	0.96	1.3	30	1.4	1.3	7	1.4	1.15	20
Iron	mg/L	0.01		0.18	0.18	0%	3.4	2.5	31%	0.24	0.14	53%	1.4	1.6	13	0.16	0.16	0	0.16	0.13	21
Major/minor ions																					
Calcium	mg/L	0.5		4.2	4.3	2%	2.6	2.3	12%	2.6	5.70	75%	2.4	2.4	0	16	16	0	16	13	21
Magnesium	mg/L	0.5		6.5	6.4	2%	10	9.6	4%	7.4	8.90	18%	10	9.9	1	9.9	9.6	3	9.9	9	10
Potassium	mg/L	0.5		5.6	5.2	7%	2.9	2.7	7%	5	6.20	21%	2.7	2.5	8	12	11	9	12	11	9
Sulphate (filtered)	mg/L	1		23	23	0%	29	27	7%	34	40.00	16%	40	40	0	62	61	2	62	33	61
Sodium	mg/L	0.5		30	32	6%	110	90	20%	89	83.00	7%	88	86	2	71	69	3	71	58	20
Chloride (filtered)	mg/L	1		28	31	10%	140	140	0%	140	140.00	0%	140	110	24	81	85	5	81	116	-
Inorganics																					
Alkalinity (total) as CaCO3	mg/L	1		13	15	14%	11	13	NC	27	25.00	8%	9.3	9	3	11	12	9	11	8	32
Alkalinity (Bicarbonate as CaCO3)	mg/L	1		13	15	14%	11	13	17%	27	25.00	8%	9.3	9	3	11	12	9	11	8	32
Alkalinity (Carbonate as CaCO3)	mg/L	1		<5	<5	NC	<5	<5	NC	<5	<5	NC	<5	<5	0	<5	<5	0	<5	<1	0
Alkalinity (Hydroxide) as CaCO3	mg/L	1		<5	<5	NC	<5	<5	NC	<5	<5	NC	<5	<5	0	<5	<5	0	<5	<1	0
Bromide	mg/L	0.01		0.2	0.2	0%	<0.5	<0.5	NC	<5	<5	NC	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	0.186	0
Ammonia as N	mg/L	0.01		0.03	0.03	0%	0.31	0.34	9%	<0.02	0.02	NC	0.21	0.19	10	<0.02	<0.02	0	<0.02	<0.01	0
Nitrogen (Total)	mg/L	0.1		5	4.4	13%	0.7	0.7	0%	1.3	7.00	137%	1.6	3.9	84	1.8	1.8	0	1.8	1.7	6
Kjeldahl Nitrogen Total	mg/L	0.1		<0.2	<0.2	NC	0.7	0.7	0%	<0.2	5.60	NC	1.6	3.9	84	1.7	1.7	0	1.7	1.5	12
Nitrite + Nitrate as N	mg/L	0.01		5	4.4	13%	<0.01	<0.01	NC	1.3	1.40	7%	<0.01	<0.01	0	0.09	0.08	12	0.09	0.16	56
Nitrate (as N)	mg/L	0.01		5	4.4	13%	<0.01	<0.01	NC	1.3	1.40	7%	<0.01	<0.01	0	0.09	0.08	12	0.09	0.16	56
Nitrite (as N)	mg/L	0.01		0.03	0.03	0%	<0.01	<0.01	NC	<0.01	<0.02	NC	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Phosphorus	mg/L	0.01		0.14	0.09	43%	0.09	0.08	12%	0.12	12.00	196%	<0.01	0.05	133	0.03	0.01	100	0.03	0.08	91
Phosphorous filterable reactive	mg/L	0.01		<0.01	<0.01	NC	<0.01	<0.01	NC	0.12	0.12	NC	0.04	0.03	29	0.01	0.01	0	0.01	<0.01	-
Total Suspended Solids	mg/L	5.00		<5	<5	NC	14	9	43%	8	2700	199%	-	-	-	-	-	-	-	-	-

*RPDs have only been considered where a concentration is greater than 1 times the EQL.

**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 30 (1 - 10 x EQL); 30 (10 - 30 x EQL); 30 (> 30 x EQL))

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory



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