

ANNUAL ENVIRONMENTAL REPORT 2023–2024 URALLA LANDFILL, URALLA Prepared for URALLA SHIRE COUNCIL

Prepared by RCA Australia RCA ref 15579a-409/1 DECEMBER 2024





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	DOCUMENT STATUS							
Rev	Commont	Author	Poviowor	Approved for Issue (Project Manager)				
No	Comment	Additor	IVENIEMEI	Name	Signature	Date		
/0	Draft with highlighted text for client confirmation / confirmation	S Hendriksen	F Brooker	F Brooker		16.12.24		
/1	Final	S Hendriksen	F Brooker	F Brooker	PETB	18.12.24		

	DOCUMENT DISTRIBUTION					
Rev No	Copies	Format	Issued to	Date		
/0	1	Electronic (email)	Uralla Shire Council Isaac Arah – <u>IArah@uralla.nsw.gov.au</u>	16.12.24		
/0	1	Electronic report	RCA – job archive	16.12.24		
/1	1	Electronic (email)	Uralla Shire Council Isaac Arah – <u>IArah@uralla.nsw.gov.au</u>	18.12.24		
/1	1	Electronic report	RCA – job archive	18.12.24		



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RCA ref 15579a-409/1 Client ref PO30039

18 December 2024

Uralla Shire Council PO Box 106 URALLA NSW 2358

Attention: Isaac Arah (Manager Environment and Waste)



Geotechnical Engineering Engineering Geology Environmental Engineering Hydrogeology Construction Materials Testing Environmental Monitoring Noise & Vibration Occupational Hygiene

ANNUAL ENVIRONMENTAL REPORT 2023–2024 URALLA LANDFILL, URALLA

1 INTRODUCTION

This annual environmental report (AER) has been prepared in accordance with the EPL 5899 (Ref [1]) for Uralla Landfill, which requires Uralla Shire Council (USC) to provide an assessment of the environmental performance relevant to the Environment Protection Licence (EPL) conditions for the annual reporting period.

The objective of this AER is to provide a holistic assessment of the Uralla Landfill environmental monitoring within the current reporting period and to provide discussion and recommend potential response actions to improve the environmental performance of the landfill.

2 SITE IDENTIFICATION AND DESCRIPTION

The Uralla Landfill (the site) is located on Rowan Avenue, off the New England Highway Uralla, NSW approximately 1.5 kilometres to the south west of the main town of Uralla. The site is identified as Lot 172 in DP 755846, Uralla NSW 2358.

Additional site details are shown in Table 1.

Table 1 Site Details IN1 RU2 **Current zoning** (Ref [2]) RU4 RU2 – Rural Landscape (site as per red outline). **Current use** Landfill and community recycling centre. Size of site Approximately 16 hectares. Land use to the: North IN1 – General Industrial Land and industrial structure. South RU2 - Rural Landscape. RU2 – Rural Landscape and RU4 – Primary Production East Small Lots. RU2 – Rural Landscape. West Community recycling centre and computer store located onsite. Nearest sensitive receptor Industrial building located approximately 150m to the north (human health) and a residential property approximately 500m to the north. Further residential properties are situated within Uralla located approximately 1km northeast of the site. A small creek located directly adjacent to the western boundary which is a tributary creek to the larger Kentucky Nearest sensitive receptor Creek and Rocky River located approximately 1km to the (environmental) north west of the site. Surface water from the site drains to the west via an established channel.

Drawing 1, Appendix A shows the locality and the layout of the site.



2.1 SITE HISTORY

The site was originally a 4ha landfill operated by Gostwyck Shire Council until the formation of USC in 1947 at which time it undertook operations. An application was approved by the Health Commission of NSW in 1975 for the operation of a landfill over the entire (current) Lot 172 site. The location of the original 4ha landfill is unknown.

The site was originally utilised for the disposal of nightsoil and refuse until the discontinuing of the disposal of nightsoil in the mid 1980's. Septic tank effluent was intermittently disposed of at the site until the construction of the Armidale City Council's sewage treatment works disposal system in late 1997 / early 1998 at which time disposal ceased.

Between the initial operation of the site and the completion of the landfill environmental management plan in December 1997 (Ref [3]), several different waste streams had been noted as being brought into the landfill site. These included:

- Inert waste.
- Putrescible waste.
- Green waste.
- Contaminated waste including, but not limited to, asbestos, material from a pole plant include timber railway sleepers and concrete blocks. This material was disposed into two (2) specifically surveyed sites within the landfill.
- Nightsoil (septic tank effluent).

Other existing uses on the site included:

- Recycling centre (shed, recycling wall, compound and bays for crushed glass).
- General recycling.
- Dog pound.

3 CURRENT LANDFILL OPERATIONS

During the reporting period the site comprised an active landfilling area within the northern portion of the site, a leachate pond located in the down gradient central western, two (2) large structures in the northeastern portion (including a recycling facility, office space, sorting facility, a community computer servicing facility), and a shipping storage container which is approximately 80m northwest of the computer servicing facility.

3.1 TOTAL WASTE RECEIVED

USC has advised RCA that during the 2023–2024 reporting period a total of 4,678¹ tonnes of waste was accepted to the site. The predominant waste received was municipal waste which includes mixed (commercial & construction) waste, vegetation or garden waste, commingle recycling, paper & cardboard, metals (of all kinds) and E-waste (electronic & electrical). A breakdown of the waste type is shown below in **Figure 1**.

¹The Uralla Shire Council Waste Facilities has no weighbridge and hence weights are estimations depending on capacities of vehicles or storage containers used to drop off waste.





Figure 1 Inbound Waste 2023–2024

A total of approximately 733.05 tonnes of material was exported from the Uralla Landfill site during the 2023–2024 reporting year (October 2023–October 2024) as presented in **Table 2** below. The predominant waste exported were metals (of all kinds) and cardboard. It is noted that tin cans were sold together with the metals (of all kinds) and there were no exported batteries in the reporting year.

Material	Tonne
Cardboard	148
Plastics	36
Metals (of all kinds)	543
Car Bodies	0.75
Car Batteries	5.3
Batteries	0
Tin cans	Included in metals

Table 2	Exported Materials	s during t	he reporting	period
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3.2 MONITORING EVENTS

The monitoring schedule as per the EPL is presented in **Table 3** below; a total of two (2) quarterly and two (2) biannual (six-monthly) rounds are required. Timing of the rounds is not specified however it is understood that the purpose of the sampling is to provide for seasonal variation over the twelve (12) month period and as such sampling rounds would be expected to occur once within every three (3) month period.

Monitoring Item	Quarterly	Biannual			
Surface Gas	\checkmark	\checkmark			
Accumulated Gas	✓ ✓				
Leachate (UL1)	Water gauging	Alkalinity, Metals (As, B, Cr, Fe, Pb, Mn, Zn), Cl, NO _x , OCP, OPP, P, TKN, TOC, VOC)			
Leachate (EPL2)	Sample durir Metals (As, B, Cu, Cr, Fe, Mn, Zn), B NO _x , Cations (Ca, Mg, Na, K), Anio TOC,	ng discharge. TEX, Conductivity, Dissolved Oxygen, ns (Cl, SO4, Alkalinity), pH, P, TKN, TSS.			
Surface Water	Depth gauging.	Alkalinity, Metals (As, Cr, Cu, Fe, Mn, Zn), BTEX, Cl, NO _x , Cations (Ca, Mg, Na, K), P, SO ₄ , TKN, TOC, TSS).			
(US1)	Sample during discharge. Metals (As, B, Cu, Cr, Fe, Mn, Zn), BTEX, Conductivity, Dissolved Oxygen, NO _x , Cations (Ca, Mg, Na, K), Anions (Cl, SO ₄ , Alkalinity), pH, P, TKN, TOC, TSS.				
Surface Water (US2)	Sample during discharge. Metals (As, B, Cu, Cr, Fe, Mn, Zn), BTEX, Conductivity, Dissolved Oxygen NO _x , Cations (Ca, Mg, Na, K), Anions (Cl, SO ₄ , Alkalinity), pH, P, TKN, TOC. TSS.				
Surface Water (US3)	Sample during discharge. Surface Water (US3) Metals (As, B, Cu, Cr, Fe, Mn, Zn), BTEX, Conductivity, Dissolved Oxy NO _x , Cations (Ca, Mg, Na, K), Anions (Cl, SO ₄ , Alkalinity), pH, P, TK TOC, TSS.				
Groundwater (UW1) Depth gauging.		Field readings.			
Groundwater (UW2)	Depth gauging.	Alkalinity, Metals (As, Fe, Mn), CO ₂ , Cl, Dissolved oxygen, NO _x , TKN, TOC.			
Groundwater (UW3)	Depth gauging. Alkalinity, Metals (As, Fe, Mn), CO ₂ , Cl, NO _x , TKN, TOC.	Alkalinity, Metals (As, Fe, Mn), CO ₂ , Cl, Dissolved oxygen, NO _x , TKN, TOC.			

Table 3	EPL	Schedule	of	Fieldwork	and	Analysis	for	Quarterly	and	Biannual
	Monit	toring Rour	nds							

See glossary for explanation of acronyms.



A total of four (4) monitoring events have been undertaken by RCA in the reporting period:

- December 2023 biannual round. Comprised surface gas, leachate, surface water and groundwater sampling.
- April 2024 quarterly round. Comprised surface gas and groundwater sampling along with field readings of surface water and leachate.
- July 2024 biannual round. Comprised surface gas, leachate, surface water and groundwater sampling.
- October 2024 quarterly round. Comprised surface gas and groundwater sampling along with field readings of surface water and leachate.

This sample schedule is in compliance with the EPL which requires four (4) sampling rounds with each round in a different season.

4 WEATHER

Meteorological monitoring data has been collected from the Uralla Bureau of Meteorology (BOM) weather station located at Dumaresq Street Uralla (056034), the Armidale Tree Group Nursery site located at Mann Street (056037) and the Armidale Airport BOM weather station (056238). The Uralla BOM does not supply current evaporation or temperature readings. Therefore, evaporation² and temperature readings were obtained from the Armidale BOM stations³, located approximately 25km from the site.

4.1 RAINFALL AND EVAPORATION²

The Uralla BOM station (056034) recorded 726mm of rain during the reporting period, slightly less than the 732.2mm recorded during the previous reporting period however generally consistent with the historical average (791.5mm).

Total evaporation for the reporting period was 1128.5mm.

Rainfall and evaporation data are shown in **Figure 2**. It is noted that the data shown for October 2023 and October 2024 is representative of approximately half of the month each as it is based on the site EPL anniversary date (Ref [1]) whereas the averages are for the whole month.



² Evaporation measured with Class 'A' pan which is considered a conservative estimate of actual surface evaporation.

³ Most observations from the Armidale Tree Group Nursery site (056037) in Mann Street, but some from Armidale Airport.



Figure 2 Total Monthly Rainfall and Evaporation¹ during the 2023-2024 reporting period

During the 2023–2024 reporting period the following observations were noted:

- The monthly rainfall exceeded the monthly average of 55.85mm six (6) times throughout the reporting period (November 2023 to December 2023 and April 2024 to July 2024) and comprised approximately 70% of the annual rainfall. The monthly rainfall also exceeded the historical average for that specific month five (5) times throughout the reporting period (December 2023 and April 2024 to July 2024).
- The highest monthly rainfall in the 2023–2024 period was recorded in April 2024 at 126mm, while the lowest was in February 2024 at 26mm.
- The monthly evaporation in six (6) months (five (5) continuous month from November 2023 to March 2024, and September 2024) was above the average evaporation in the reporting period.
- The monthly evaporation was greater than the monthly rainfall events recorded throughout the reporting period except for the period from April 2024 to July 2024.
- The average of the monthly rainfall was less than the average of the monthly evaporation.

Large rainfall events defined as greater than 25mm in a 24hour period occurred on five (5) occasions:

- Approximately 42% of December 2023 was a rainfall event of 44.8mm from 9am 19/12/2023 9am 20/12/2023
- Approximately 53% of April 2024 was in two (2) rainfall events:
 - 40.2mm of rainfall in the period 9am 4/4/2024 9am 5/4/2024



- 26.8mm of rainfall in the period 9am 17/4/2024 9am 18/4/2024
- Approximately 62% of May 2024 was in a rainfall event of 48.2mm from 9am 4/5/2024
 9am 5/5/2024.
- Approximately 66% of September 2024 was in a rainfall event of 32.4mm from 9am 9/11/2024 9am 12/9/2024.

4.2 TEMPERATURE

The average monthly maximum and minimum temperature recorded at the Armidale BOM station compared to the historical monthly averages for the period 1994 - 2024 are shown in **Figure 3**.



Figure 3 Average Monthly Minimum and Maximum Temperatures 2023–2024

The maximum monthly temperatures during the reporting period were more than the historical monthly averages. The annual average deviation of the maximum temperature (average of monthly difference between historical and 2023–2024 maximum temperature) was 7.4°C. The October 2023 and August 2024 maximum monthly average showed the greatest deviation from the maximum historical average (10.1°C).

The minimum monthly temperatures for the reporting period were less than the historical monthly averages. The annual average deviation of the minimum temperature (average of monthly difference between historical and 2023–2024 minimum temperature) was -5.7°C. The September 2024 minimum monthly average showed the greatest deviation from the minimum historical average (-10.2°C).



5 LEACHATE MANAGEMENT

Leachate is formed as a result of the percolation of rainfall and moisture through waste. Leachate is mainly generated from the current and existing tipping areas located within the northern and north western portions of the site. The leachate pond is considered to intercept most overland flows with the exception of large rainfall events (Ref [4]).

The chemical composition of leachate is dependent on the type of waste and the quantity generated is largely dependent on rainfall.

Leachate within the onsite leachate pond is pumped through to an irrigation / sprinkler system which applies the leachate to the existing landfilling area up-gradient of the leachate pond (refer **Drawing 1**, **Appendix A**).

The leachate dam has been desilted and dam perimeter expanded in July 2024 to increase holding capacity. Dam leachate level stood at about 20% of dam's capacity as of 2nd November 2024. Pumping of leachate (irrigation) is still ongoing.

Council has also constructed another pond to contain (divert) surface run-off from the waste facility which used to fill up the leachate dam even though the run-off is not leachate.

Leachate within the onsite leachate pond can also be removed via a tanker truck to the nearest sewer manhole. This is generally undertaken when the leachate pond is near capacity and the current irrigation system cannot reduce the required volume prior to large rainfall events. The tanker truck service was not used within current reporting year.

At the time of writing, a USC project to allow for the disposal of leachate to sewer is yet to be completed.

6 FIELDWORK

6.1 GROUNDWATER MONITORING AND SAMPLING METHODOLOGY

The current groundwater monitoring programme has been established at the site to assist in comparing the groundwater monitoring results with leachate indicator parameters to determine any potential leachate impacts.

The groundwater monitoring network consists of one (1) bore located upgradient of the site (UW1) and two (2) bores (UW2 and UW3) located downgradient of the landfill. Bore UW3 is the downgradient well and is located adjacent to the leachate dam wall. This location is monitored on a quarterly basis to assess any potential breaches from the leachate pond. It is considered, based on the elevated nature of the landfill site, that groundwater would flow in a west to north westerly direction towards lower lying lands and the Kentucky Creek. Historical data of the three (3) wells since approximately 2001 supports that understanding.

Groundwater monitoring locations are shown on **Drawing 2**, **Appendix A**.

RCA's groundwater sampling methodology comprised:

- Monitoring of methane gas at each well by carefully removing the well cap and placing the gas monitor into the monitoring well. It is noted that this reading has been considered indicative only as there would likely be loss of volatile gasses, should these be present, once the cap was removed.
- Measurement of standing water level.
- Removal of at least one bore volume with a hand bailer prior to the commencement of water quality measurements by a calibrated water quality meter.
- Collection of samples into appropriately preserved sample containers following the stabilisation of pH and electrical conductivity readings. Samples to be analysed for dissolved metals were filtered in the field using syringes and 0.45µm filters. Samples were placed into an insulated container on ice.

A photographic record of the water columns was taken in the field and all samples were transferred to a NATA accredited laboratory for the required EPL (Ref [1]) parameters: refer **Section 7.2** for results.

Field sheets and calibration certificates for the monitoring period are attached in **Appendix B**.

6.2 SURFACE WATER MONITORING AND SAMPLING METHODOLOGY

The surface water monitoring programme is implemented to characterise the site surface water located near the western boundary, to detect if surface water is being contaminated with leachate or other wastewater and to determine if any potential offsite pollution is occurring.

Surface water quality at the site can be impacted by a number of variables including:

- Type of waste emplaced in landfill.
- Presence and location of historically contaminated soils.
- Contamination with leachate or other wastewater.
- Stockpile cover.
- Maintenance of vegetation.



- Rainfall events.
- Weed and pest control measures.
- Chemical, fuel and oil storage. Including environmental incidents.
- Sewage spills.
- Maintenance of the leachate pond and onsite roads.

The surface water monitoring network consists of US1 situated downgradient (west) of the leachate pond and two (2) offsite locations (US2 and US3) within the unnamed creek that is the tributary to Kentucky Creek. Surface water monitoring locations are shown on **Drawing 2**, **Appendix A**.

Surface water sampling of US1 was undertaken by submerging a clean unpreserved sampling container into the water body or syringing the water directly from the shallow flow and decanting into the appropriately preserved sampling receptacles. Field measurements (pH, conductivity, salinity, dissolved oxygen, redox and temperature), sampling technique and sample appearance were recorded on the field sheets. A photographic record of the water column was taken in the field. All samples were transferred into suitably prepared laboratory supplied bottles and analysed by a NATA accredited laboratory for the required EPL (Ref [1]) parameters; refer **Section 7.3** for results.

Field sheets and calibration certificates for the monitoring period are attached in **Appendix B**.

6.3 LEACHATE MONITORING AND SAMPLING METHODOLOGY

USC implements a leachate monitoring programme to:

- Characterise the quality of leachate generated.
- Monitor evolution of the landfill leachate and composition with time.
- Compare key leachate indicator parameters with surface and groundwater monitoring results.

Leachate sampling was undertaken at one (1) location (UL1) on a biannual basis, **Drawing 2**, **Appendix A**, in conjunction with the surface water and groundwater sampling. Field measurements (pH, conductivity, salinity, dissolved oxygen, redox and temperature), sampling technique and sample appearance were recorded on field sheets. Leachate samples were transferred into suitably prepared laboratory supplied bottles and analysed by a NATA accredited laboratory for the required EPL (Ref [1]) parameters. A photographic record of the water column was taken in the field.

Field sheets and calibration certificates for the monitoring period are attached in **Appendix B**.

6.4 LEACHATE POND OVERFLOW EVENTS

Leachate pond overflow events are required to be monitored from the onsite leachate pond. EPL2 is located at the spillway and is only sampled during a discharge event.

No leachate pond overflow events occurred during the 2023–2024 reporting period.



6.5 SURFACE GAS MONITORING AND SAMPLING METHODOLOGY

Surface gas monitoring is undertaken on a quarterly basis at the site to determine the effectiveness and integrity of landfill cover / capping material in containing landfill gas. Surface gas monitoring is undertaken in general accordance with the NSW EPA Solid Waste Landfill Guidelines (Ref [5]).

Surface gas monitoring was undertaken by collecting readings on an approximate 25m grid across accessible areas of the landfill with intermediate or final cover using a calibrated Huberg *Laser One* gas analyser for methane: calibration certificates are included in **Appendix B**. Measurements were taken approximately five (5) centimetres above the surface of the capping in a general criss-cross pattern over the central area of the site. Depressions in cover material, surface fissures and dying vegetation were also investigated as these were encountered in sections within the leachate application area. Monitoring was undertaken, where possible, on days of calm winds however monitoring did have to be undertaken in non-ideal conditions on occasion during the 2023–2024 reporting period due to logistical issues with availability of equipment and personnel. It is noted the Huberg *Laser One* gas analyser telescopic rod utilised during the sampling events had a suction cup attached around the sensor to reduce any potential impact of wind.

Where readings exceeded 500ppm of methane in surface gas at a sampling point on the site additional readings were taken in the immediate vicinity of the hot spot in an attempt to delineate the extent of impact.

GPS locations were logged by the Huberg *Laser One* gas analyser in small intervals to allow tracking of the path during the 2023–2024 monitoring period and imported into RCA's GIS for inclusion on the drawings consistent with previous methodology.

Monitoring of the northern landfill cell methane vent (**Drawing 1**, **Appendix A**) was undertaken by placing the monitor inside the large PVC piped vent, at the ground level and at its top, situated approximately 2m above the ground level.

6.6 ACCUMULATED GAS MONITORING AND SAMPLING METHODOLOGY

The site's accumulated gas monitoring programme is undertaken on a quarterly basis (Ref [1]) to assess the potential for methane gas accumulation in enclosed spaces near the landfill in accordance with the guidelines (Ref [5]). Landfill gas readings were undertaken within three (3) enclosed structures located within 250m of the landfilling area during the 2023–2024 monitoring period. The locations where accumulated gas surveys were undertaken during this period were:

- Onsite recycling and service building (AMP1).
- Open aired recycling sorting building (Community Recycling Centre).
- Large storage shipping container. The primary purpose of the container is for storage of computer parts and no personnel utilise the area on a regular basis. Entry to this container is dependent on there being volunteers present at the time of the monitoring.

The locations of the structures monitored for accumulated gas are shown on **Drawing 4**, **Appendix A**.



7 SUMMARY OF RESULTS

Analytical results from the groundwater, surface water and leachate samples collected throughout the current reporting period are compared to the relevant criteria in **Appendix C**, field readings are also included. RCA utilised the specific heath, ecological, trade waste, irrigation, livestock criteria and trigger levels to allow comparison to identifiable environmental onsite and offsite risks and to ensure consistency to what has historically been utilised at the site. Results were also compared to historical data collected from previous rounds of monitoring as summarised below.

Laboratory report sheets for the monitoring period are provided in Appendix D.

Results for surface and accumulated gas monitoring for the current period have been compared with historical data collected from previous rounds of monitoring as summarised below.

7.1 **GROUNDWATER LEVELS**

Standing water level (SWL) measurements taken prior to sampling for each monitoring event and converted to relative datum are shown in **Figure 4** below.



Figure 4 Groundwater Monitoring Bore Standing Water Levels

Groundwater levels at UW1 and UW2 increased slightly from 5 March 2015 to 5 January 2023 before stabilising. Groundwater levels at UW3 fluctuated slightly from 5 March 2015 to 16 February 2021, then rose to a peak of 85.89m on January 5, 2023, before beginning to decline. UW3 shows the most variation during the monitoring period.



7.2 **GROUNDWATER MONITORING**

Results of groundwater sample analysis indicate:

- The pH at the three (3) groundwater locations was generally neutral during the reporting period, with UW1 and UW3 showing slightly acidic conditions, while UW2 was slightly alkaline.
 - All results were within the relevant guideline range (Ref [6]) except for the December 2023 (pH 6.3) and October 2024 (pH 6.21) results at UW3. The pH results at UW1 and UW2 were within their respective historical ranges, however, the pH at UW3 in October 2024 was the lowest in the historical range available to RCA.
- Electrical conductivity concentrations at the three (3) groundwater locations indicated more brackish to saline conditions within the groundwater across the site.
 - All reported conductivity concentrations exceeded the relevant ecological guideline (Ref [6]). All electrical conductivity results at UW1 and UW2 were within their respective historical ranges however the April 2024 result at UW3 was the highest in the historical range available to RCA.
- Methane gas concentrations recorded at the three (3) groundwater locations were found to be below 5ppm except at UW3 in April 2024 which was 17.3ppm. The result is well below the criterion (Ref [5]) for enclosed spaces and within the historical range available to RCA.
- Redox potential at the three (3) groundwater locations was positive throughout the reporting period and were within their respective historical ranges available to RCA.
- The recorded temperatures at the three (3) groundwater locations varied from 15.59°C at UW2 in April 2024 to 17.98°C at UW1 in December 2024.
 - All recorded temperatures at the three (3) wells were within their respective historical ranges available to RCA.
 - It is noted that there may be some impact on groundwater temperature from the average atmospheric temperature over a period of time.
- The field measurement of dissolved oxygen concentration at the three (3) groundwater locations varied from 0.64mg/L (UW3) to 4.37mg/L (UW1).
 - All concentrations, field and laboratory, were within their respective historical ranges.
- Total organic carbon concentrations at UW2 and UW3 were generally consistent throughout the reporting period and within their respective historical ranges.
- The free carbon dioxide concentrations at UW2 varied over the time period; the recorded amount in December 2023 was approximately five (5) times greater than the amount recorded in July 2024. The concentrations also varied at UW3 from 14mg/L in July 2024 to 378mg/L in October 2024.
 - The UW2 and UW3 results for July 2024 were the lowest recorded within their respective historical ranges.
- The total Kjeldahl nitrogen concentrations at UW2 and UW3 were consistent and within their respective historical ranges.



- Total oxidised nitrogen concentrations at UW2 and UW3 were over the ecological guideline (Ref [6]) with the results of UW3 also in excess of the long-term irrigation guideline (Ref [7]). The UW3 results were two (2) levels of magnitude higher than the UW2 results.
 - All results were within their respective historical ranges, except for UW3 in October 2024, which recorded the lowest value in its range.
- Bicarbonate concentrations were generally consistent at UW2 and UW3, and similar between wells, however, higher concentrations were recorded at UW3 on average.
 - The UW2 result in July 2024 was the lowest recorded within its historical range, whereas the UW3 result for the same period marked the highest value in its historical range
- Chloride concentrations were generally consistent at UW2 and UW3; the UW3 results were higher than the UW2 results. The UW2 results were within the historical range whereas the UW3 July 2024 result was the highest of the historical range.
- Metals concentrations at UW2 were either not detected or were detected at low concentrations below the ecological guideline values (Ref [6]); all results were within the historical ranges.

The UW3 arsenic results for December 2023, April 2024 and October 2024 were consistent and in excess of the ecological value (Ref [6]) and the relevant human health guidelines (Ref [8]), iron was not detected, and manganese was detected at low concentrations below the guidelines.

The results at UW3 for July 2024 were the lowest for arsenic and the highest for manganese within the historical ranges.

7.3 SURFACE WATER MONITORING

Field readings at US1 were conducted during four (4) monitoring rounds throughout the monitoring period, with samples collected during two (2) of those rounds (December 2023 and July 2024).

No flow was observed at US1 during any of the four (4) monitoring rounds. Water was sampled from a slight trickle beneath the surface of the grass within the channel, with the use of the syringe.

Results of surface water sample analysis indicate:

- The pH at US1 was slightly alkaline across all four (4) monitoring rounds, remaining within the relevant guideline range (Ref [6]) and the historical range of results.
- The conductivity concentrations recorded exceeded the relevant ecological guideline (Ref [6]) except July 2024 however were within the historical range.
- Redox potential was positive except for the December 2023 monitoring event and all results were within the historical range.
- The recorded temperatures varied between 11.7°C (April 2024) and 16.43°C (December 2024); all were within the historical range.
 - It is noted that there would be impact on surface water temperature due to air temperature at, and preceding, the time of sampling.



- The dissolved oxygen concentration ranged from 3.16mg/L in December 2023 to 5.95mg/L in October 2024; all results were within the historical range.
- The total suspended solids concentration varied by approximately 25% between the two (2) monitoring events, however, both results were within the historical range.
- The total organic carbon was higher in the December 2023, while the July 2024 concentration was the lowest within the historical range of results.
- The total Kjeldahl nitrogen concentrations varied slightly in the two (2) monitoring events; the July 2024 concentration was the lowest within the historical range of results.
- The total oxidised nitrogen concentration exceeded the ecological guideline (Ref [6]) only in July 2024; while the concentration recorded in December was the lowest in the historical range of results.
- The total phosphorus concentrations exceeded the ecological guideline (Ref [6]) and the long-term irrigation guideline (Ref [7]) in both monitoring rounds; both results were within the historical range of results.
- Dissolved major cations varied across the two (2) monitoring events but remained within the historical range of results, except for sodium in December 2023, which was the highest recorded in the historical range.
- The alkalinity concentrations recorded in December 2023 were more than double those in July 2024; all concentrations were within the historical range of results.
- The chloride concentrations recorded in December 2023 were more than double those in July 2024; all concentrations were within the historical range of results.
- The sulphate concentration recorded in July 2024 was an order of magnitude higher than in December 2023; the December 2024 non-detected concentration was the lowest recorded within the historical range of results.
- Iron and manganese concentrations exceeded the applicable ecological guideline (Ref [6]) in December 2023, whilst in July 2024 only iron concentrations exceeded the applicable ecological guideline (Ref [6]).

Iron and manganese exceeded the long-term irrigation guideline (Ref [7]) during both monitoring rounds.

Manganese exceeded the human health guidelines (Ref [8]) during both the monitoring rounds.

All metal concentrations were within the historical ranges of results.

• Benzene, toluene, ethylbenzene, xylene and naphthalene (BTEXN) were not detected at US1, consistent with the historical data set, and were therefore considered below the relevant human health guidelines (Ref [8]).

7.4 LEACHATE MONITORING

Field readings at UL1 were conducted during four (4) monitoring rounds throughout the monitoring period, with samples collected during two (2) of those rounds (December 2023 and July 2024).



Results of leachate sample analysis indicate:

- The pH of the leachate at UL1 was moderately alkaline in December 2023 and April 2024, while it was slightly alkaline in July 2024 and October 2024. All monitoring events exceeded the guideline range (Ref [6]) except for October 2024; however, all results were within the historical range.
- The conductivity concentrations recorded exceeded the relevant ecological guideline (Ref [6]), with the December 2023 result being the lowest within the historical range.
- Redox potential was negative in December 2023 and positive for the following rounds: July 2024 was the highest recorded value in the historical range.
- The temperature was highest in December 2023, with all recorded temperatures falling within the historical range for this location.
 - It is noted that there would be impact on surface water temperature due to air temperature at, and preceding, the time of sampling.
- The dissolved oxygen concentrations varied between 11.01mg/L in December 2023 to 5.0mg/L in October 2024; all recorded values were within the historical range.
- The total organic carbon concentration in December 2023 was almost double the July 2024 concentration; both were within the historical range.
- The total Kjeldahl nitrogen concentrations were generally consistent in both monitoring rounds and within the historical range.
- The total oxidised nitrogen concentration in July 2024 was approximately seven (7) times higher than that in December 2023, both were above the ecological guideline (Ref [6]) and within the historical range.
- The total phosphorus concentration in December 2023 was approximately five (5) times higher than that in July 2024, both were above the ecological and irrigation guidelines (Ref [6], Ref [7]) and within the historical range.
- The total alkalinity concentrations were generally consistent in both monitoring rounds; the December 2023 result was the lowest recorded within the historical range.
- The chloride concentrations were generally consistent in both monitoring rounds and were within the historical range.
- Chromium and iron concentrations exceeded the ecological guideline (Ref [6]) in both monitoring rounds, whilst zinc exceeded the guideline in December 2023 and manganese in July 2024.
 - Iron concentrations exceeded the long-term irrigation guideline (Ref [7]) in both monitoring rounds, while manganese exceeded the guideline in July 2024.
 - All the metal concentrations were within the historical range of results with the exception of the July 2024 result for boron which was the lowest in the historical range.
- Pesticides were not detected and considered below the human health guidelines (Ref [8]), consistent with the historical range.
- Volatile organic compounds were not detected and considered below the human health guidelines (Ref [8]), consistent with the historical range.



7.5 ADDITIONAL SAMPLES

No additional samples were collected in the reporting period.

7.6 WATER QUALITY ASSURANCE

A total of two (2) water duplicate samples, two (2) trip blanks and spikes were submitted blind to the laboratory for analysis with the biannual sampling rounds in December 2023 and July 2024, noting that no volatile analysis is undertaken in the April or October 2024 monitoring rounds and a total of ten (10) samples were submitted for analysis in the reporting period. Results are included in **Appendix D**.

RCA has reviewed the analytical results of these quality assurance samples as well as the laboratory's internal quality assurance and control (refer laboratory report sheets in **Appendix D**) in each of the quarterly reports and notes the following:

- The laboratory control spike relating to the UL1 result in December 2024 for monocrotophos was not considered reliable as the recovery was 24.4%. This is considered to indicate uncertainty in the analysis however it is noted that no OPP was detected in the analysed sample and that there is no criterion for monocrotophos. Therefore, the uncertainty is not considered significant.
- The relative percentage difference (RPD) for iron at UL1 in July 2024 was 61%. The sample was described as clear with green floaties (possible aquatic fauna) and as such the cause of the high RPD is unknown. The duplicate had the higher result and as the concentration is greater than twice the criterion, that value was used for the monitoring result.
- laboratory control spike was run on each of the requested analytes with the exception of carbon dioxide and dissolved oxygen. All recoveries were within the acceptance criteria of 70-130% with the exception of pesticide azinphos methyl.
 - The recovery of azinphos methyl was 66.5% and is considered a minor non-compliance only. It is noted that no azinphos methyl was detected in the analysed sample.

RCA therefore considers that the data obtained from this testing is accurate and reliable in as far as it can be ascertained.

7.7 SURFACE AND ACCUMULATED GAS MONITORING

Wind readings were collected onsite during monitoring in addition to consideration of the data provided by the nearest capable BOM station. In general, there were occasions when the wind speed was greater than the recommended 10km/hr (Ref [5]) value. The methodology for monitoring minimises the potential for wind impact to the surface methane results based on the height above ground level and the protective cup around the probe such that, when the probe is touched to the ground as it was during monitoring, it is protected from wind influence. As such it is considered that the readings are generally representative of the methane gas emissions at the site.



Atmospheric pressure readings, recorded from the nearest capable BOM station, were generally slightly to moderately above the preferable range of less than 101.3 kPa and stable (Ref [5]), except for the April 2024 event, which was within the preferred range. There were logistical restrictions to the days of fieldwork associated with equipment hire and personnel establishment to site such that alternative monitoring was not undertaken due to higher than preferred pressure. The discrepancy between the actual pressure and the preferable pressure was not considered significant such that the readings are considered generally representative of the methane gas emissions at the site.

Results higher than the 500ppm NSW EPA criterion (Ref [5]) for surface gas identified during the 2023–2024 reporting period are presented **Table 4** below and **Drawing 3**, **Appendix A**.

Grid Reference of location	Monitored	Description	Peak Methane reading (ppm)*
	December 2023	Near drainage ditch north of active tipping area	1,784
H3		Additional hole in grass area to north of tipping area.	1,612
	July 2024	Dirt pile northwestern corner	2,100
		5cm hole in northwestern corner	6,990
		Disturbed area to the west of tipping area	600
H4	July 2024	Grassed area to the west of tipping area, in front of emergency assembly area.	700
	December 2023	Bare patch, north of the active tipping area.	2,871
		Grassed area to north of active tipping area	720
13	July 2024	Grassed area to north of active tipping area.	1,710
		Hole in grassed area to the north of active tipping area.	1,985
	October 2024	Grassed area to north of active tipping area	986
	December 2023	Near pile of rubbish, south of the active tipping area.	1,939
H6	huby 2024	Dirt pile to the south of tipping area	600
	July 2024	1m north of dirt pile to the south of tipping area	2,188
16	December 2023	Fully vegetated drainage ditch, south of irrigation area	1,817

Table 4Concentration Recorded Above 500ppm



Most of the areas with elevated surface methane are to the north, northwest and west of the area of active tipping with two (2) locations to the south of the active tipping area. The area to the north of the active tipping area routinely has readings above background, generally in the order of 25-100ppm and / or 100-500ppm however multiple readings >500ppm were detected over the monitoring period and two (2) readings >2,500ppm were detected in December 2023 and July 2024. These have been reported in each of the associated monitoring reports and the details in relation to the detected methane have been extracted into **Figure 5** below.



 Figure 5
 Repeated Above Background Concentrations North of Active Tipping (noting grey / rust colour represents 25-100ppm and orange represents 100-500ppm)

An area near the *Drum Muster* collection point which had indicated repeat elevated concentrations in the previous reporting period did not exhibit concentrations >500ppm in this reporting period, although the readings were above background in April and July 2024.

Methane concentrations at the northern vent generally exceeded the acceptance criterion of 500ppm, except in October 2024. Readings from April, July, and October 2024 were below the threshold for methane in enclosed spaces (10,000ppm) and did not exceed the lower explosive limit (LEL, 50,000ppm). However, the December 2023 reading reached a maximum of 15% (150,100ppm) at the base of the vent, where the pipe is broken. This result falls within the explosive range for methane (5–17%, 50,000–170,000ppm) and exceeds the threshold for methane in enclosed spaces (10%, 10,000ppm). It is noted that the area in the immediate vicinity of the northern vent had been excavated at the time of the July and October 2024 monitoring and it is considered that this would have contributed to the significantly lower concentrations detected.

There were no methane concentrations that exceeded the 1% (volume/volume) or 10,000ppm NSW EPA criterion (Ref [5]) for enclosed structures identified within any of the structures at the site during the reporting period, refer **Drawing 4**, **Appendix A**. It is noted that readings regarding the shipping container, which is used for storage and only occasionally accessed by personnel, were only taken in December 2023 due to lack of access during the monitoring period. Readings from around the outside of the container did not exceed 10ppm.

RCA identified some minor erosion (<0.3m) within the northern west portion of the site identified on **Drawing 3**, **Appendix A** consistent with the previous 2022–2023 monitoring, noting that the area appeared generally stable and revegetated in parts during the monitoring period. Gas readings taken within the erosion were comparable with the remainder of the covered landfill areas; elevated readings to the north of the active landfilling did not necessarily correlate with eroded / bare earth areas. No noticeable leachate seepages were observed across the landfill beyond that associated with runoff from the irrigation being undertaken.



8 CONCLUSION AND DISSCUSSION

This report has presented the findings of water, leachate and gas monitoring undertaken at the Uralla Landfill located on Rowan Avenue, Uralla during the annual 2023–2024 reporting period.

Two (2) rounds of biannual monitoring (December 2023 and July 2024) and two (2) rounds of quarterly monitoring (April and October 2024) were undertaken within the current reporting period in compliance with the requirements of the site's EPL (Ref [1]).

The current analytical programme undertaken during the reporting period was generally conducted in accordance with the site EPL (Ref [1]) and recommended methodologies (Ref [5]). Sampling was not conducted by RCA or site personnel for the reporting period at offsite locations US2 and US3 and at the onsite spillway (EPL2) due to no discharge being observed from the onsite leachate pond. The leachate dam level stood at about 20% of dam's capacity as of 2nd November 2024.

Rainfall data obtained from the Uralla BOM station (056034) recorded a total of 726mm of rain during the 2023–2024 reporting period, this was slightly less than the previous reporting period, however, is generally consistent with the historical average. Approximately 80% of the annual rainfall fell within two (2) periods (November 2023 to December 2023 and April 2024 to July 2024) throughout the reporting period, where the monthly rainfall exceeded the monthly average. The total monthly rainfall also exceeded the historical annual average five (5) times throughout the reporting period (December 2023 and April 2024 to July 2024) and comprised 75% of the annual rainfall. The largest amount of rainfall was received in April 2024. There were five (5) large rainfall events recorded throughout the reporting period (>25mm within a 24hr period) which contributed approximately 27% of the annual rainfall.

The total pan evaporation for the 2023–2024 reporting period was 1128.5mm and was largely found to be greater than the total monthly rainfall events recorded throughout the year except for the period from April 2024 to July 2024. Council's re-building of the leachate irrigation network in mid-2022 with more sprinklers mounted on higher riser pipes to increase the volume of leachate disposed through evaporation appears to have been successful in the absence of overflow events in the reporting period (noting the slightly decreased rainfall). Council has further desilted the leachate dam and expanded the dam perimeter to increase holding capacity. Pumping of leachate (irrigation) is still ongoing.

The maximum monthly temperatures during the 2023–2024 reporting period were generally higher than the historical monthly averages whereas the minimum temperatures were generally less than the historical monthly averages.

Standing water levels at groundwater wells UW1 and UW2 have been increasing slightly since monitoring has been undertaken; the results of this monitoring period indicate stabilisation is occurring. The water level in UW3 has indicated the most significant variation (~3.4m) since monitoring commenced; the results of the monitoring period indicate stabilisation / decrease in water level. None of the chemical results are considered to indicate signs of leachate impact.

Sampling of surface water point US1 was undertaken at each monitoring event however flow was not present or minimal such that samples were not collected from free water. The concentrations of metals in the 2023–2024 reporting period were generally lower than that in the previous reporting period (2022–2023) except for manganese. The total phosphorus and nitrogen concentrations are also lower in the current reporting period. There is no obvious correlation of the data with the leachate (UL1) sample results.



The field readings and laboratory results of the leachate UL1 appear to be consistent with the historical range of results collected at this location. No pesticides or VOC were detected within the material sampled during the current reporting period.

Surface methane was detected above the relevant thresholds (Ref [5]) during the reporting period, primarily in proximity to the active landfilling area and the northern vent. The area along the northern face of the active filling area is considered to represent a continual source of methane as it is consistently indicating higher than background levels although not >500ppm except in localised positions. RCA notes that due to the localised extent of elevated gas readings identified during the monitoring period and the variable nature of the surveys' traverse route, there may be some methane emissions that were not picked up even with deliberate attempt to find previously detected areas of concern.

Significant concentrations of methane, detected at the northern vent, were greater than the acceptance criterion (>500ppm) except for October 2024. Readings for April and July 2024 remained below the 10,000ppm threshold for enclosed spaces and the lower explosive limit (LEL, 50,000ppm) except for December 2023 where it peaked at 15% (150,100ppm), falling within the explosive range (5–17%, 50,000–170,000ppm) and exceeding the threshold for enclosed spaces.

The levels of methane varied throughout the reporting period, however, the reason for the variation is unknown and may be related to underground conditions (level of leachate), atmospheric conditions or combination of both.

No building methane was detected above the relevant thresholds (Ref [5]) during the reporting period and RCA do not consider the current gas concentrations to pose a risk to personnel working at the site. RCA has previously made recommendations to relevant personnel for air exchange prior to entering the shipping container as it is rarely accessed and has the potential to allow accumulation of methane.

Based on the majority of results and comparison of these results to historical data collected at the site, RCA does not consider that any specific environmental response actions are needed. RCA also considers that monitoring undertaken within the current reporting period has been done in general compliance with Section B2 of the site EPL (Ref [1]) and has demonstrated that all monitoring results were evaluated correctly. RCA notes that nutrient concentrations (total nitrogen and NOx) remain the best indicator of potential leachate impact on groundwater and surface water at the site however recommend Council consider adding ammonia, BOD, COD and per- and polyfluoroalkyl substances to the analysis suites for future landfill sampling events. These contaminants are considered appropriate indicators for leachate contamination within surface water and groundwater and will provide a more detailed interpretation of the obtained results.

9 LIMITATIONS

This report has been prepared for Uralla Shire Council in accordance with an agreement with RCA Australia (RCA). The services performed by RCA have been conducted in a manner consistent with that generally exercised by members of its profession and consulting practice.

This report has been prepared for the sole use of Uralla Shire Council. The report may not contain sufficient information for purposes of other uses or for parties other than Uralla Shire Council. This report shall only be presented in full and may not be used to support objectives other than those stated in the report without written permission from RCA Australia.



The information in this report is considered accurate at the date of issue with regard to the current conditions of the site. Conditions can vary across any site that cannot be explicitly defined by investigation.

Environmental conditions including contaminant concentrations can change in a limited period of time. This should be considered if the report is used following a significant period of time after the date of issue.

Yours faithfully

RCA AUSTRALIA

Stephen Hendriksen Environmental Engineer BEng (Env)

REFERENCES

- [1] NSW EPA, *Environment Protection Licence No. 5899, 30 July 2002*, Licence Version Dated 30 June 2021.
- [2] *Uralla Local Environment Plan 2012* under the Environmental Planning and Assessment Act 1979 published 23 March 2012.
- [3] Uralla Shire Council, *Landfill Environmental Management Plan, Uralla Landfill Rowan Avenue, Uralla.* 22 December 1997.
- [4] Uralla Shire Council, *Pollution Incident Response Management Plan (PIRMP), Uralla Landfill and Recycling Facility.* Rev 3.0 30 November 2020.
- [5] EPL NSW EPA, *Environmental Guidelines Solid Waste Landfills*, Second Edition 2016.
- [6] ANZG, Australian and New Zealand Guidelines for Fresh and Marine Water Quality Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia., August 2018. Available at www.waterquality.gov.au/anz-guidelines.
- [7] ANZECC, Australian and New Zealand Guidelines for Fresh and Marine Water Quality, October 2000.
- [8] National Health and Medical Research Council, *Australian Drinking Water Guidelines*, 2011.

GLOSSARY

AER	Annual Environment Report
AHD	Australian height datum, based on a mean sea level.
ANZECC	Australian and New Zealand Environmental Conservation Council.
ANZG	Australian and New Zealand Guidelines for the Fresh and Marine Water Quality.



DPIE	Department of Planning, Industry and Environment.
EPL	Environment Protection Licence
ESL	Ecological screening level. Relates to vapour risk from petroleum hydrocarbons which may pose a risk to ecological health.
HIL	Health investigation level. Relates to soil concentrations which may pose a risk to human health in soil.
Interlaboratory	A sample sent to two different laboratories for comparative analysis.
Intralaboratory	A sample split into two and sent blind to the sample laboratory for comparative analysis.
Leachate	Fluid that has passed through a soil stratum, possibly collects contaminants.
LEP	Local environment plan. A planning tool for the Local Government.
NHMRC	National Health and Medical Research Council.
NSW EPA	NSW Environment Protection Authority – formerly a component of DECC, DECCW, OEH but made a separate entity in 2011 to regulates the contaminated land industry.
PQL	Practical Quantitation Limit.
QA	Quality Assurance.
QC	Quality Control.
RPD	Relative Percentage Difference.

Chemical Compounds

BOD	Biochemical oxygen demand, the requirement for molecular oxygen by microbes during oxidation of biological substances in sewage. The BOD test measures the oxygen consumed (in mg/L) over five days at 20°C.
BTEX	Benzene, toluene, ethylbenzene, xylene.
COD	Chemical oxygen demand, the amount of oxygen (in mg/L) to oxidise both organic and oxidisable inorganic compounds.
OCP	Organochlorin pesticides.
TDS	Total dissolved solids. Also known as non filterable residue (NFR).
TSS	Total suspended solids.



Appendix A

Drawings







Approximate leachate irrigation area

• Northern vent





RCA Ref 15579a-409/1 1:2,500 (A3) DRAWING No 1 SH SCALE REV 0 FB DATE 18/12/2024 OFFICE NEWCASTLE





WATER MONITORING LOCATIONS ANNUAL ENVIRONMENTAL REPORT 2023-2024 URALLA LANDFILL, URALLA

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<u>LEGEND</u>

Approximate site boundary

Methane within normal background (<5ppm)

Methane above normal background

December 2023 April 2024 **July 2024** October 2024

Aerial image taken from Nearmap, 26 January 2024 (used in accordance with commercial licence)







ACCUMULATED GAS MONITORING ANNUAL ENVIRONMENTAL MONITORING REPORT 2023-2024 URALLA LANDFILL, URALLA

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Appendix B

Field Sheets and Calibration Certificates



URALLA LANDFILL

SURFACE GAS MONITORING FIELD SHEET

Sampler:	FB		Temperatu	re (° C): 2	5.8 Ananomete
When I have been at					
wind Speed (n	n/s): _20	3.3	wind Direc	tion (bearing	g) 515000
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	11.33 5	start -	Laver	SAYS	10.40
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Date:	Page	


Project: En	vironmental M	onitoring	Client: Uralla Shire Council				
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Time:	8.00		Surface Wat	er Location ID:			
Sampler (s)	: FR		Sample met	hod: Direct who syringe			
Weather:	Sunn	3 esteu					
Sample app	earance: C	lear					
Additional of moder product	comments:	No frée Sample en synge -	water stracte pudelle	a Cron tong recharged stouly			
Duplicate sample	□⁄ YES -	Sample ID: LLS (Laboratory analysis:	VES – Lab No:			
collected:				□ NO			
FIELD MEAS	SUREMENTS	- after coll of usuf	ection .	of samples in case with			
TEN	/IP (C)	16.43					
	рН	7.58					
ORF	P (mV)	-56/108					
COND (mS/cm)		1.79					
DO (mg/L) 3.1		3.16					
Salinity (%)		0.09.					
Turi	bidity	194					
Total Disso	olved Solids	l					



Project: Environmental Monitoring	Client: Uralla Shire Council						
Project number: 15579a	Date: 5	112					
Time: 9.50	Surface Wat	er Location ID: ULI					
Sampler (s):	Sample method: Direct						
Weather: Surry & still							
Sample appearance: Cleas, Shight green tinge							
Additional comments: Water level 100. No pumping a time of sampling but was 4/12							
Duplicate YES - Sample ID: THE	Laboratory	YES - Lab No: UL					
collected: 🛱 NO	analysis:	□ NO					

FIELD MEASUREMENTS

TEMP (C)	24.40
рН	9.61
ORP (mV)	-163/114
COND (mS/cm)	1.08
DO (mg/L)	(1.0)
Salinity (%)	0.053
Turbidity	202
Total Dissolved Solids	0.690

SAMPLE NO	SAMPLE BOTTLE NO	PRESERVATIVES



WATER SAMPLING RECORD

X NO

collected:

Project: Environme	ental Monitoring	Client: Uralla	Shire Council	Site: Uralla I	Landfill			
Project number: 1	5579a	Date: 4	12/23	Time:	Time: $2 \leq 2 \leq 40$			
Sampler (s):		Bore ID: UW1						
Bore depth (m): 2	50.45	Depth to aquif	er (m): 18.86	Height above ground level (m): 07				
Sample method: B	ailer	Sample time:	3.35 pm	Methane reading (ppm): 🖉 🕖				
Sample appearanc	e / additional comments:							
Depth	SURFACE LEVEL	Duplicate	YES - Sample ID:		VES - Lab No:			
measurement	TOP OF CASING	sample		Laboratory				

analysis:

NO NO

VOLUME (L)	TEMP (C)	рН	ORP (mV)	CONDUCTIVITY (mS/cm)	Turbidity	DO (mg/L)	Salinity (%)	SWL (m TOC)	Comment
25	20.13	6.91	-21/179	(.74	1	4.04	0.058		111 705
+22	18.98	6.86	-18/184	1.71	-	4.02	0.086		INT POL
+24		6.78	-14/172	1.71	(3.82	0.086		201 201
-122	18.77	6.62	-6/207	1.65	71000	3:03	0.885		1.08 TDS
-22	1798	6.57	-3/220	1.70	860	3.23	0.085		1.08 TDS

location:

(TOC)



Project: Er	nvironmenta	al Monitoring	9	Client: Ura	Client: Uralla Shire Council Site: Uralla Landfill						
Project nu	mber: 15579	9a		Date: D	rige 41	12		Tir	ne: pn	54eg1.50-2.00	
Sampler (s	s):			Bore ID: L	Bore ID: UW2						
Bore depth	h (m): 12	.76 Sot	ft base.	Depth to a	Depth to aquifer (m): 8.60 (8.615 $5/11$) Height above ground level (m): 0.8						
Sample me	ethod: Baile	r		Sample tin	Sample time: 5/12 8.30-8.45				thane re	ading (ppm):	
Sample ap	pearance / a	additional co	omments:							- / P -	
Depth			ACE LEVEL	Duplicate		YES - Sample ID:		Labo		YES – Lab No:	
measurement□TOP OF CASINGlocation:(TOC)		sample collected:		NO a		analy	atory sis:				
VOLUME (L)	TEMP (C)	pH	ORP (mV)	CONDUCTIVITY (mS/cm)	Turbidity	DO (mg/L)	Salinity (%)	SWL (m TC	C)	Comment	
9+2	17.51	7.30	-41/162	1.75	367	3.53	0.089		1	205 21.	

(-/			3.0	(mo/cm)	and the second second	1.		
9+2	17.51	7.30	-41/162	1.75	367	3.53	0.089	205 51.1
+2	16.91	7.24	-35/195	1.78	570	340	D.DQU	1.14
+2	17.01	7.17	-35 1202	1.77	582	2.26	0.089	1.13
12	12.02	7.17	-34/163	1.78	560	2.64	0.090	1.14



Project: Environme	ental Monitoring	Client: Uralla	Shire Council	Site: Uralla	Landfill		
Project number: 15	5579a	Date: Pur	Ge 4/12	Time: Au	SAK 2.05-72P		
Sampler (s): Bore ID: UW3					8		
Bore depth (m):	21.64	Depth to aquif	er (m): 5.37 (5.41 \$11)	2 Height abov	Height above ground level (m):		
Sample method: B	ailer	Sample time:	9.30- 9.40	Methane rea	ading (ppm): 2.5 AD		
Sample appearanc	e / additional comments:	leal, no	odow		μγ		
Depth	SURFACE LEVEL	Duplicate	YES - Sample ID: UWR		VFS-Lat No:		
measurement location:	TOP OF CASING (TOC)	sample collected:		Laboratory analysis:			

VOLUME (L)	TEMP (C)	рН	ORP (mV)	CONDUCTIVITY (mS/cm)	Turbidity	DO (mg/L)	Salinity (%)	SWL (m TOC)	Comment
33+2		6:64	-7/209	3.04	95.8	1.56	0.158		TOS LAS
+34	16.35	6.59	-5/169	3.06	105	1.87	0.159		79.1.200
43L	16.46	6.37	7/171	304	78.9	0.44	O.ISK		77.1.207
- 3L	16.90	6.30	10/181	3.03	79.8	0.64	0.158		TDS 1.94

CERTIFICATION OF CALIBRATION





Issued by: QED Environmental Systems Ltd.

Calibration certificate number

41650 H-09784

Instrument Laser One

Serial Number

41650

Description of the calibration procedure:

The calibration is verified with certified gas bottle. The maximum error of the instrument as specified in the datasheet.

Gas verification from	0-1000ppm	CH4

Full scale (ppm)	Gas concentration (ppm)	Response 1 (ppm)	Response 2 (ppm)	Response 3 (ppm)	Average response (ppm)	Maximum error (ppm)	Maximum error (% F.s.)	Maximum error %
1000	0.0	0	0	0	0.00	0.00	0.00	0.00
1000	2.91	3.1	3.1	3.1	3.10	0.19	0.02	0.02
1000	10.3	10.4	10.4	10.4	10.40	0.10	0.01	0.01
1000	101.0	102	102	102	102.00	1.00	0.10	0.10
1000	1011	1005	1005	1005	1005.00	6.00	0.60	0.60
						Uncertainty	0.60	%
						Max % error	0.60	% FS

Gas verification from 0-100% vol CH4

Full scale (%vol)	Gas concentration (%vol)	Response 1 (%vol)	Response 2 (%vol)	Response 3 (%vol)	Average response (%vol)	Maximum error (%vol)	Maximum error (% F.s.)	Maximum error %
100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	2.20	2.20	2.20	2.20	2.20	0.00	0.00	0.00
100.00	5.00	5.00	5.00	5.00	5.00	0.00	0.00	0.00
100.00	15.00	15.00	15.00	15.00	15.00	0.00	0.00	0.00
100.00	50.00	50.00	50.00	50.00	50.00	0.00	0.00	0.00
100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00
						Uncertainty	0.00	%
						Max % error	0.00	% FS

Gas verification from 0-100% CH4 LEL (0-4.4% VOL)

Average Maximum Maximum Full scale Gas concentration **Response 1 Response 2 Response 3** Maximum error response error error (%vol) (LEL%) (LEL%) (LEL%) (LEL%) % (%vol) (LEL%) (% F.s.) 100.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 100.00 2.00 2.01 2.01 2.01 2.01 0.01 0.01 0.01 100.00 50.00 50.00 50.00 50.00 50.00 0.00 0.00 0.00

Uncertainty	0.01	%
Max % error	0.01	% FS

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QED Environmental Systems Ltd. Cyan Park - Unit 3, Jimmy Hill Way, Coventry, CV2 4QP, UNITED KINGDOM

Registered in England and Wales 1898734







Issued by: QED Environmental Systems Ltd.

Environmental conditions during calibration

Temp.	23.4	с
Pressure	1004	mBar

Gas bottles used for calibration

Gas	Cylinder number	Expiry date	Gas
N2	110241	03/11/2025	N2
3 ppm	292675	17/08/2027	CH4
10 ppm	119779SG	11/04/2024	CH4
100ppm	\$1035778	08/03/2028	CH4
1000 ppm	S1500109Y	02/03/2028	CH4
1.0% Vol	S1198415S	10/04/2024	CH4
2.2% vol	S1204209S	27/02/2028	CH4
5.0% vol	244842	08/08/2025	CH4
15% vol	268737	08/08/2025	CH4
50% vol	267652	09/05/2025	CH4
100% vol	1262313	09/08/2027	CH4

Calibration results: Pass

Next scheduled calibration: 21/06/2024

Calibration date: 21/06/2023

Issued by: Keeley Knight

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QED Environmental Systems Ltd. Cyan Park - Unit 3, Jimmy Hill Way, Coventry, CV2 4QP, UNITED KINGDOM Registered in England and Wales 1898734 Page 2 of 2

SERVICE & CALIBRATION REPORT Water Quality Meter

Customer details:

RCA Australia 92 Hill Street Carrington NSW Attn: Fiona Brooker

Instrument model:

HORIBA U-52/10m

<u>Job no.</u> 230810 <u>Date:</u> 3 August 2023

Instrument serial number:

1PH7HSWB 2019

Multi-parameter water quality meter

Fault report:

Requires service/calibration.

Repairs carried out:

Replaced DO membrane and replaced pH liquid junction cap on reference electrode. Refilled reference electrode. Cleaned all sensors (dirty). Re-calibrated all sensors as follows:

<u>Calibration: (in accordance with manufacturer's specifications)</u>

Parameter - unit	Before Calibration	Calibration value	After calibration	Comment
рН (рН)	7.08	7.01	7.01	Pass
рН (рН)	4.31	4.00	4.00	Pass
ORP (mV)	211	225	225	Pass
Conductivity (mS/cm	0.000	0.000	0.000	Pass
Conductivity (mS/cm)	0.712	0.718	0.718	Pass
Conductivity (mS/cm)	6.60	6.67	6.67	Pass
Conductivity (mS/cm)	56.9	58.6	58.6	Pass
Turbidity (NTU)	0.0	0.0	0.0	Pass
Turbidity (NTU)	6.3	8.0	8.0	Pass
Turbidity (NTU)	84.9	80	80	Pass
Turbidity (NTU)	407	400	400	Pass
D.O. zero (mg/L)	0.00	0.00	0.00	Pass
D.O span (mg/L)	11.02mg/L@22ºC	8.96mg/L@22ºC	8.96mg/L@22ºC	Pass
Temperature (⁰ C)	22.89ºC	23.1ºC	23.1ºC	Pass

Comments:

MAKE SURE pH reference electrode is refilled with soln #330 regularly. If the #330 soln solidifies inside the pH reference electrode, remove the liquid junction cap and rinse out the old soln with distilled water. Then refill with fresh HORIBA soln # 330 and refit the liquid junction cap.

Calibration carried out by:

Tony Fincher

AUSTRALIAN SCIENTIFIC PTY LTD 11 McDougall Street, Kotara NSW 2289 TEL: 1800 021 083 E-mail: sales<u>@austscientific.com.au</u>

www.austscientific.com.au



URALLA LANDFILL

SURFACE GAS MONITORING FIELD SHEET

Date: 10/4/24	Time: 7.21	Page
Sampler: FB	Temperature (° C):	15 Anenumeter
Wind Speed (m/s): 25mls Crun Sumth west to	Wind Direction (bearing	ng) South West
Other observations: Ammidale Arront Oran 70K WSW 17km/h 1013.9 hPa 9NH 1010.6 hPa MSL	suce	

MONITORING POINT	TIME	CH ₄ (PPM)	CH4 (%)	COMMENTS
	7.27	- Mon	ctor se	243 8.48
Depression	news	vert	~ 7ppi	
BASZ C	of ve	<i>t</i> ~	14000	
TUP of	vert	~ ~	27ppm	~
Just before	start of	berl, dur	t smrthe	, half way up hull 7500
North f	face ge	worally	lower	
No CH4	a sh	corne.	r wher	e normaliy
Down r	histor	portion	much	loner
Base of	Vert	~ 10p	on Q	9.20 - end of work.
A .				

Page

1

Date:



Project: Env	vironmental Monitoring	Client: Uralla	Shire Council		
Project num	ber: 15579a	Date: 16	14/24		
Time: 9.40		Surface Wate	Surface Water Location ID: US		
Sampler (s): FB Sample method: Direct					
Weather:	Suny, some c	louds, br	Ce 24		
Sample app	earance:				
Clean	-, no odour, nu	o sheer			
Additional c	omments: Vory 10	N, Shark	ile syringed		
Duplicate	□ YES - Sample ID:	Laboratory	□ YES – Lab No:		
collected:	Ŋ NO	analysis:	NO NO		

FIELD MEASUREMENTS

TEMP (C)	11.70
рН	7.9
ORP (mV)	76
COND (mS/cm)	1.70
DO (mg/L)	5.40
Salinity (%)	0.085
Turbidity	76.9
Total Dissolved Solids	1.69

SAMPLE NO	SAMPLE BOTTLE NO	PRESERVATIVES

Star 14 Th



Project: Env	vironmental Monitoring	Client: Uralla	Shire Council		
Project num	nber: 15579a	Date: 10	>14124		
Time: (D. D) Surface Water Location ID: UL(
Sampler (s)	Sampler (s): FB Sample method: Direct				
Weather:	Sunny, sume.	clouds, bre	e 2 y		
Sample app	earance: ear, no sheen	, no odo	w		
Additional c	omments: water brel, l n western edu	ob of ve	ystation growth		
Duplicate	□ YES - Sample ID:	Laboratory	□ YES – Lab No:		
collected:	ĭ⊊ NO	analysis:	₩ NO		

FIELD MEASUREMENTS

TEMP (C)	16.84
рН	8.98
ORP (mV)	127
COND (mS/cm)	1.33
DO (mg/L)	9.76
Salinity (%)	0.066
Turbidity	27.6
Total Dissolved Solids	0.854

SAMPLE NO	SAMPLE BOTTLE NO	PRESERVATIVES



Project: E	Environmental Monitoring Client: Uralla Shire Council						Site	Site: Uralla Landfill			
Project nu	mber: 1557	9a		Date:	10/4/	24		Time	: 11	.15	
Sampler (s	s): PA	2		Bore ID: L	JW1						
Bore dept	h (m):			Depth to a	quifer (m):	18.9	80	Heig	Height above ground level (m):		
Sample m	ethod: Baile	ər		Sample tin	Sample time: ().40 Me					ading (ppm): 7 4	
Sample ap	opearance /	additional co	omments:								
Depth			Duplicate	6	YES - Sam	ple ID:	Laborat		□ YES – Lab No:		
location: TOP OF CASING (TOC)		sample collected:					ory s:				
VOLUME (L)	TEMP (C)	рН	ORP (mV)	CONDUCTIVITY (mS/cm)	Turbidity	DO (mg/L)	Salinity (%)	SWL (m TOC)	Comment	
23L	17.60	6.95	173	1.66	637	4.37	0.084		1.0	DG TOS	
	No.										
			·								
									_		
							1				



roject: Environmental Monitoring			Shire Council	Site: Uralla Landfill		
:: 15579a		Date: 0	4124	Time: G	C-1007	
er (s): FA Bore ID: UW2					5 10 22	
re depth (m): Depth to aquifer (m): S, 6 3 Height above ground level (m):					e ground level (m):	
Sample method: Bailer				Methane rea	ding (ppm): 2.4 aram	
ance / additional c	omments: C	lear to s Silver t	shightly hurbed	. Level .	03	
	SURFACE LEVEL TOP OF CASING (TOC)		Duplicate Image: YES - Sample ID: sample sample collected: Image: NO		VES – Lab No:	
TOP (TOC					₩ NO	
	r: 15579a F J :	r: 15579a FB :	Image: Provide state Date: Provide state Image: Provide state Depth to aquif Depth to aquif Depth to aquif Sample time: Sample time: Image: Provide state Support Image: Provide state Supplicate Image:	Image: Prescription Date: 10/4/24 FA Bore ID: UW2 Bore ID: UW2 Depth to aquifer (m): 8,63 d: Bailer Sample time: rance / additional comments: Clear to shafty hod bod silver particles in wicks Image: Depth to aquifer (m): 8,63 Support Top of CASING (TOC) Duplicate sample collected: Image: NO	Time: $10/4/24$ Time: $14/4$ FA Bore ID: UW2 E Depth to aquifer (m): $8,63$ Height above d: Bailer Sample time: Methane read rance / additional comments: Clear to shall by the bid in which is the formation of the state in which is the formation of the state in the sta	

(L)	TEMP (C)	рН	ORP (mV)	CONDUCTIVITY (mS/cm)	Turbidity	DO (mg/L)	Salinity (%)	SWL (m TOC)		Comment
92	15:59	7.21	150	1.79	116	235	0091	9:03	1.15705	1
										4
				1	in a second second second					



WATER SAMPLING RECORD

GEOTECHNICAL . ENVIRONMENTAL

Project: Environmental Monitoring Client: Uralla Shire Council Site: Uralla Landfill			_andfill						
Project number: 15	579a	Date: 101	4(24	Time: 10.15 -			Time: 10.15 -		
Sampler (s): 두	ß	Bore ID: UW3							
Bore depth (m):	(Depth to aquif	er (m): 5.64	Height above	Height above ground level (m):				
Sample method: Ba	ailer	Sample time:	11-05	Methane rea	Methane reading (ppm): 17.3				
Sample appearance	e / additional comments:	lear, bu	65hs , no odon	no shees					
Depth	SURFACE LEVEL	Duplicate	YES - Sample ID:	Loboratory	□ YES – Lab No:				
measurement location:	TOP OF CASING (TOC)	sample collected:		analysis:					

VOLUME (L)	TEMP (C)	рН	ORP (mV)	CONDUCTIVITY (mS/cm)	Turbidity	DO (mg/L)	Salinity (%)	SWL (m TOC)	Comment
332	16-40	6.56	150	4.06	11.7	2.03	0.157		1.96705
-14L	16.50	6.55	(63	3.12	62	1.46	0.162		2 00 TDS
+4L	16.56	6.53	169	3.11	6.7	1.71	0.162	5.77	1.99 TDS
				·				F	
						1		· · · · · · · · · · · · · · · · · · ·	
			1						

SERVICE & CALIBRATION REPORT Water Quality Meter

Customer Details:Job NumberDateRCA24032619/03/202492 Hill Street24032619/03/2024Carrington4ttn: Kenny Yan4ttn: Kenny Yan

Instrument Model:

Instrument Serial Number: 1PH7HSWB 2019

HORIBA U-52/10m 🛛 Multi-Parameter Water Quality Meter

Fault Report

Requires service/calibration.

Repairs Carried Out

Replaced DO membrane. Replaced pH glass electrode (slow response). Refilled pH reference electrode (solidified). Cleaned all sensors (dirty). Re-calibrated all sensors as follows:

<u>Calibration</u> (in accordance with manufacturer's specifications):

Parameter - unit	Before Calibration	Calibration Value	After calibration	Comment
рН (рН)	6.63	7.01	7.01	Pass
рН (рН)	4.51	4.00	4.00	Pass
ORP (mV)	238	225	225	Pass
Conductivity (mS/cm)	0.000	0.000	0.000	Pass
Conductivity (mS/cm)	0.702	0.718	0.718	Pass
Conductivity (mS/cm)	6.52	6.67	6.67	Pass
Conductivity (mS/cm)	58.1	58.6	58.6	Pass
Turbidity (NTU)	12.8	0.0	0.0	Pass
Turbidity (NTU)	35.1	8.0	8.0	Pass
Turbidity (NTU)	91.2	80.0	80.0	Pass
Turbidity (NTU)	409	400	400	Pass
D.O. zero (mg/L)	0.00	0.00	0.00	Pass
D.O. zero (mg/L)	7.71mg/L @ 23°C	8.81mg/L @23°C	8.81mg/L @23°C	Pass
Temperature (°C)	24.83°C	24.9°C	24.9°C	Pass
Sensors:				
pH Glass Electrode	pH Ref Electrode	ORP Ele	ectrode	DO Electrode
211143	WGTAD2NV	NHOO	\$3C6	X3H6CF5A

Comments:

MAKE SURE the pH reference electrode is refilled with soln #330 regularly. If the #330 soln solidifies inside the pH reference electrode, remove the liquid junction cap (flat black rubber cap with wick in the middle) and rinse out the old solution with distilled water. Then refill with fresh HORIBA soln # 330 and refit the liquid junction cap. Please read the notes on pH maintenance.

Calibration carried out by:

Tony Fincher

AUSTRALIAN SCIENTIFIC PTY LTD

11 McDougall Street, Kotara, NSW, 2289 TEL: 1800 021 083 E-mail: sales@austscientific.com.au

www.austscientific.com.au

CERTIFICATION OF CALIBRATION





Issued by: QED Environmental Systems Inc.

Calibration certificate number	24RA-59238 H-L100	100EN-H	
Instrument	Laser One	Serial Number	41521

Description of the calibration procedure:

The calibration is verified with certified gas bottle. The maximum error of the instrument as specified in the datasheet.

Gas verification from 0-1000ppm CH4

Full scale (ppm)	Gas concentration (ppm)	Response 1 (ppm)	Response 2 (ppm)	Response 3 (ppm)	Average response (ppm)	Maximum error (ppm)	Maximum error (% F.s.)	Maximum error %
1000	0.0	0	0	0	0.00	0.00	0.00	0.00
1000	3.02	3.1	3.1	3.1	3.10	0.08	0.01	0.01
1000	9.97	10.4	10.4	10.4	10.40	0.43	0.04	0.04
1000	102.0	101	101	101	101.00	1.00	0.10	0.10
1000	1006	1040	1040	1040	1040.00	34.00	3.40	3.40

Uncertainty 3.40 Max % error 3.40

0-100% vol CH4

Full scale (%vol)	Gas concentration (%vol)	Response 1 (%vol)	Response 2 (%vol)	Response 3 (%vol)	Average response (%vol)	Maximum error (%vol)	Maximum error (% F.s.)	Maximum error %
100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	2.17	2.30	2.30	2.30	2.30	0.13	0.13	0.13
100.00	5.10	5.30	5.30	5.30	5.30	0.20	0.20	0.20
100.00	15.00	15.30	15.30	15.30	15.30	0.30	0.30	0.30
100.00	50.00	51.20	51.20	51.20	51.20	1.20	1.20	1.20
100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00
						Uncertainty	1.20	%

Gas verification from

0-100% CH4 LEL (0-4.4% VOL)

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QED Environmental Systems Inc. 2355 Bishop Circle West, Dexter, MI 48130

%

%FS

Gas verification from







Issued by: QED Environmental Systems Inc.

Full scale (%vol)	Gas concentration (LEL%)	Response 1 (LEL%)	Response 2 (LEL%)	Response 3 (LEL%)	Average response (%vol)	Maximum error (LEL%)	Maximum error (% F.s.)	Maximum error %
100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	2.17	2.10	2.10	2.10	2.10	0.07	0.07	0.07
100.00	50.00	50.00	50.00	50.00	50.00	0.00	0.00	0.00

Uncertainty 0.07 % Max % error 0.07 % FS

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Issued by: QED Environmental Systems Inc.

Environmental conditions during calibration

Temp.	24	С
Pressure	978	mBar

Gas bottles used for calibration

Gas	Cylinder number	Expiry date	Gas
Synthetic Air	173442043	10/18/2028	Synthetic Air
3 ppm	4405001	2/29/2027	CH4
10 ppm	CC303924	11/30/2031	CH4
100ppm	CC109096	12/1/2028	CH4
1000 ppm	CC64714	9/27/2028	CH4
1.0% Vol	CC122022	11/15/2028	CH4
2.2% vol	DT0022538	11/17/2028	CH4
5.0% vol	425925	9/7/2027	CH4
15% vol	6103974Y	9/7/2027	CH4
50% vol	4275373Y	3/14/2028	CH4
100% vol	1347010	11/11/2027	CH4

Calibration results: Pass

Calibration date: 13/3/2024

Issued by: Christopher Fleenor

Next scheduled calibration: 13/3/2025

Mit

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QED Environmental Systems Inc. 2355 Bishop Circle West, Dexter, MI 48130



URALLA LANDFILL

SURFACE GAS MONITORING FIELD SHEET

Date: 10/7/24	Time: 10.00	Page
Sampler: FB	Temperature (° C):	13.2
Wind Speed (m/s): <1 2-2-0 Wind Direction		ring) West South West
Other observations: Sunny - Site closed to public, Sc	very few cloud	s. Ground met
Armidale Airport 9 30an Temp 7.9 Wine WSW ISKALLY Cons Ran	+ 19/2014 Press	5000 1023.9 6000 hF 1024.2 MSL hP.

MONITORING POINT	TIME	CH ₄ (PPM)	CH4 (%)	COMMENTS
Vent	10.10 (10.46)	~ 131		At base - has been soil excavated from
				wind vent - an
Vent	1.1	~ 12		At top
North Face	(1047)	-245	Photo	Andom grasser hilloch on north Bace south of draw
		-360		+ mother - 300 a matre to south No others
North Fare	(11.03)	~4500	Photo	of previow
North Face	(1109)	~720	Photo	Grassed and no sign of hole, is IS in mest of previous
North Free	(11.16)	~1710	Photo	hole non way of preven
North Face	(11.19)	~ 1985	pholo	downhill (north) I wast of previou
North Fra	(11.24)	~1612	Photo	Mob inside grassed area - 10m west of procows
) I		Additional "SUDAPT OF hillock of dust "Be word
				mother - sooppon on growing hillochy ust at benet - 3rd west
North Face	(11.35)	-2100	Photo *2	Bulloch of dust just at

Date:	Page
	5

MONITORING POINT	TIME	CH₄ (PPM)	CH4 (%)	COMMENTS
Worth Wost	641-41	~6990	photo x	Som hole in grassen area at bend
West	(11.45)	~600	photo	Dusturbed Area
WestFree	(1153)	~700	Photo	Grassed area half way
Sonth West Phile	(1211)	~600	Pholo	purt pile (historic)
	(12.12)	-2185		In north of pile
CRC	Mar 49	2.4-2.	60 gr	ound, head
Binling	(12.53)	2.3-25	e grou	noi s haad
Shipping'	C12.54)	2.3 E,	stenur (1	ntenar not Accessiste
	12.0.5			
Vert	(13:00)	~1000		Et base
				ŝe ,
	(<u>.</u>	1		
			-	
ſ				

Date:	Page
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Project: En	vironmental Monitoring	Client: Uralla	Shire Council
Project nun	nber: 15579a	Date: 101	7124
Time: 12	2.45 - 1.05	Surface Wate	r Location ID: US i
Sampler (s)	: FB	Sample meth	od: Direct by Syringe
Weather:	Sunny, very fe	~ clouds, l	ight sporsidic breeze
Sample app Clew	, no oclour		
Additional c	comments:	Dier Sami	1 and a frame
No 05 Water	Flowing down L	nul (pathwa	y tron uwes to
No 05 Water Duplicate	Flowing down L VES - Sample ID:	Laboratory	y trun uw25 to creek VES-Lab No:

FIELD MEASUREMENTS

TEMP (C)	13.86	
рН	7.83	
ORP (mV)	63	
COND (mS/cm)	0.849	
DO (mg/L)	5.43	
Salinity (%)	0.042	
Turbidity	126	
Total Dissolved Solids	0.546	

SAMPLE NO	SAMPLE BOTTLE NO	PRESERVATIVES
		*



Project: Env	vironmental Monitoring	Client: Uralla	Shire Council		
Project num	ber: 15579a	Date: 0	17/24		
Time:	5-30	Surface Wate	er Location ID: ULI		
Sampler (s)	FB	Sample meth	od: Direct ~ 12 m Grunge		
Weather: Sunny					
Sample app Proch	Sample appearance: Clear, no adour. Some green Ploaties in pord (& neighe sample) which				
Additional comments: Level low - no return from Imagehan sighted.					
Duplicate	D YES - Sample ID:	Laboratory	🕅 YES – Lab No:		
collected:	□ NO	analysis:	□ NO		

FIELD MEASUREMENTS

TEMP (C)	12.48
рН	8.16
ORP (mV)	169
COND (mS/cm)	1.35
DO (mg/L)	4.69
Salinity (%)	0.067
Turbidity	333
Total Dissolved Solids	0-863

SAMPLE NO	SAMPLE BOTTLE NO	PRESERVATIVES	



WATER SAMPLING RECORD

GEOTECHNICAL . ENVIRONMENTAL

Project: Environmer	tal Monitoring	Client: Uralla Sl	hire Council	5	Site: Uralla Landfill			
Project number: 155	79a	Date: 101-	7/2.4	٦	Time: 1 15 pm			
Sampler (s):	FB	Bore ID: UW2						
Bore depth (m): 12.9		Depth to aquife	er (m): 8:605 (8)	150me)	Height above	ground level (m): 0.85		
Sample method: Bai	ler	Sample time:	1.50	r	Methane reading (ppm): 2.0			
Sample appearance	/ additional comments:	ar to s	inghty hirsd, no	o ade	on.			
Depth	□ SURFACE LEVEL	Duplicate	YES - Sample ID:	Lab	oratory	YES – Lab No:		
location:	(TOC) monument	sample collected:	NO NO	ana	lysis:	□ NO		

VOLUME (L)	TEMP (C)	рН	ORP (mV)	CONDUCTIVITY (mS/cm)	Turbidity	DO (mg/L)	Salinity (%)	SWL (m TOC)	Comment
24	15.82	7.18	150	1.92	216	2.13	0.097		1-23 JOS
+ 3	15.73	7.22	155	1.92	432	2.12	0.097		1.22
+3	1600	7.26	163	190	492	3.35	0.096	8.92	1.21
									5



16

Project: E	nvironment	al Monitoring		Client: Ura	alla Shire Co	uncil		Site: Ura	alla Landfill
Project nu	mber: 1557	'9a		Date: (2	017124	<i>t</i>		Time:	00
Sampler (s	s): [-]	3		Bore ID:	UW3				
Bore dept	h (m): 21.64	į.		Depth to a	aquifer (m):	1.64 5.8	3. (312	Height a	bove ground level (m): 0.83
Sample m	ethod: Bail	er		Sample ti	Sample time: 3.20 -				e reading (ppm): 40
Sample ap	opearance /	additional co	omments:						
Depth			ACE LEVEL	Duplicate		YES - Sam	ple ID:	Laboratory	YES – Lab No:
measurem location:	nent	⊠ TOP ((TOC)	Monum	collected:	R	NO		analysis:	□ NO
VOLUME (L)	TEMP (C)	рН	ORP (mV)	CONDUCTIVITY (mS/cm)	Turbidity	DO (mg/L)	Salinity (%)	SWL (m TOC)	Comment
93	15.80	6.62	187	3.25	46.5	1.60	0170		2.08
-13	15-77	6.65	193	3.26	34.9	1.90	0.170		2.09
+3	15.85	6.67	195	3.25	30.9	1.65	0 169	6.08.	2.08.
			1						



Project: Environmer	ntal Monitoring	Client: Uralla Sl	hire Council	Site: Uralla L	andfill			
Project number: 155	i79a	Date:	17	Time: 3	Time: 3.55			
Sampler (s):	FB.	Bore ID: UW1						
Bore depth (m):		Depth to aquife	r (m): 18, 7 222 1500	- Height above	e ground level (m): 0.76			
Sample method: Bai	iler	Sample time:	4.30	Methane reading (ppm): 2.3				
Sample appearance	/ additional comments:	rightly .	cloudy, no odinr					
Depth	SURFACE LEVEL	Duplicate	□ YES - Sample ID:	Laboratory	YES – Lab No:			
location:		sample collected:	D NO	analysis:	D NO			

VOLUME (L)	TEMP (C)	рН	ORP (mV)	CONDUCTIVITY (mS/cm)	Turbidity	DO (mg/L)	Salinity (%)	SWL (m TOC)	Comment
22	15.82	7.12	177	1.68	460	4.26	0.085		I.UE TOS
+3	16.09	7.01	193	1.70	475	3.83	0.086		109
+25	16.32	7.02	202	1.70	427	3.88	0.085	~1957	1.08
								0	

Gas Verification Certificate

Instrument Serial No. Sensors Huber Laser 19254.18 Laser



Item Test Pass Comments Battery Charge Condition 1 Fuses 1 Capacity 1 Recharge OK? 1 Switch/keypad Operation 1 Display Intensity 1 Operation (segments) 1 Grill Filter Condition 1 Seal 1 Pump Operation Filter Flow Valves, Diaphragm PCB Condition 1 Connectors Condition 1 Low High TWA STEL Sensor Laser 1 40ppm 1 1 1 1 Alarms Beeper 1 Settings 1 Software Version Datalogger Operation Download Operation Other tests:

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Diffusion mode	Aspirated mode				
Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No	Instrument Reading
Laser	1-11	500ppm CH4	NIST	BE85775	501.00 ppm

Bump Test by:

Trent Chase

Date:

2/5/23

Instrument Service Report

Unit Type: Laser One Part Number: Date: Serial Number: 19254 01-Mar 2	Next S	Service Due:	Customer Name:
Actions/Investigation Description	Recult	0-2025	Thermo Fisher Scientific Australia Pty
Serial Number Check	Yes	Sec. Sec. Sec. Sec. Sec. Sec. Sec. Sec.	Comments
Battery Requires Replacing	No	No battery wit	th unit
Service history of instrument reviewed	Yes		
Instrument turns on	Pass		4
Backlight operates correctly	Yes		
External visual inspection performed	Pass		
Internal visual inspection performed	Pass		
Case assembly closed and screws tightened to correct torque	Yes		
Check instrument for visible damages /defects	Pass		
Inwards assessment stage reviewed	Yes		
Buzzer working correctly	Pass		
Software version correct	Pass	Had update	
Functionality check e.g. LEDs, , Keypad, Display and Buzzer test	Pass		
Flow is > 0.6 L/min	Pass		
Flow fail test	· Pass		
Rattle Test	Pass		
Change external anti-water filter	Complete		



Instrument Service Report

Page 2 of 3

Unit Type: Laser One Part Number: Serial Number: 19254 Part Number:	<u>Date:</u> 01-Mar-2022	<u>Next S</u> 28-Feb	ervice Due: -2025	Customer Name: Thermo Fisher Scientific Australia Pty
Actions/Investigation Description	R	lesult		Comments
Bluetooth		Pass	and an an an air an	
Flow is > 0.6 L/min		Pass		THE REPORT OF
Instrument turns on	mute and a second	Pass		
As Received Gas Check Performed		Pass	synth air = 2.5 3ppm=2.8 10ppm=9.9 100ppm=105 5%=4.8 15%=14.4 50%=49.9 100=98.3	
Keypad/dial test		Pass		
Cable Comms test		Pass	No battery with	unit
LEDs checked		Pass		
Laser Bench Realignment & Optimization	Rete	st Passed	Instrument doe on 2.2 % calibring instrument read	esn't read high gases from 5% due to extra Zero ration table. This has been corected and the ds the full range from 0-100%
Full Calibration		Pass	Instrument pas	sed calibration. Next calibration date 25/2/2023
Verification of Instrument		Pass	PASS	

Customer Comments

Annual calibration



Page 3 of 3

Service Details: Service Scheme	Service Engineer:	Calibration Engineer:	Approved By:	Signature:
Standard Service 🖌	Gary Sharma	Sabin Neagu	In man 1	1-11
			Latera MBrido	ATM-



Unit Type: Laser One Serial Number: 19254

Part Number: Date: 01-Mar-2022

Next Service Due: 28-Feb-2025

<u>Customer Name:</u> Thermo Fisher Scientific Australia Pty



URALLA LANDFILL

SURFACE GAS MONITORING FIELD SHEET

Date: 10/10/2024	Time: 715-9.21 Page
Sampler: Frana B	Temperature (° C): 8.5 & Tam
Wind Speed (m/s): 1 20 hanller Armichie @ Tan	Wind Direction (bearing)
Other observations: What speed on site up the Armidele pressure 1019.0 1022.8	5 2.3mls Cron east 6 NULLAPA Sobra ran 5 GNRIMPA Since gan

MONITORING	TIME	CH₄ (PPM)	CH4 (%)	COMMENTS
				Start 7.30 6.57.
Vert	700	210		Area around vert sm
				below base of vert Except for large boulder
A few	nolat	ed all	xppm.	on north face,
must	ty on	bare of	rond	Abotos taken
	7.23	986	photo	grassy hylloch just at
Wind	picking	up n	speed 2	Erequercy ~3.4m/s el.
- 3401	370ppm	near b	ochpile	a sw comer
Variat	shu.	10 Mor	e Man	background
Q	end of	nonhi	ng	
14			J	

Date: 10 (10 24

Page of I



Project: En	Project: Environmental Monitoring Client: Uralla Shire Council										
Project nun	ject number: 15579a Date: 010124										
Time:	9.45 Surface Water Location ID: USI										
Sampler (s)	Sampler (s): FA Sample method: Direct										
Weather:	Sung, isolated	clouds o	ccassional breeze								
Sample app	earance: ear, no odow										
Additional of No	comments: observable Alon ssion put nto n	, Sample vet area	taken from a ferceline & syringe								
Duplicate	□ YES - Sample ID:	Laboratory	□ YES – Lab No:								
collected:	DC NO	analysis:	X NO								

FIELD MEASUREMENTS

TEMP (C)	13-38 13.55
рН	7.72
ORP (mV)	30
COND (mS/cm)	1.88
DO (mg/L)	87. S.95
Salinity (%)	0.095
Turbidity	960
Total Dissolved Solids	LE C

LABORATORY DETIAILS

SAMPLE NO	SAMPLE BOTTLE NO	PRESERVATIVES
and the second		

Date:



Project: Env	rironmental Monitoring	Client: Uralla	Shire Council
Project num	ber: 15579a	Date: 16	10124
Time:) (5.32	Surface Wate	r Location ID: UL
Sampler (s):	FB	Sample metho	od: Direct
Weather:	Sumy, Scattere	ed cloud, s	FLU
Additional c	omments: 1) etc	no odou	no return
tra	m vorgation (started &	0 ~ 9,30)
			and the second
Duplicate	□ YES - Sample ID:	Laboratory	□ YES – Lab No:

FIELD MEASUREMENTS

TEMP (C)	17.76
рН	7.91
ORP (mV)	113
COND (mS/cm)	1.87
DO (mg/L)	5.00
Salinity (%)	0.094
Turbidity	6.9
Total Dissolved Solids	1.19

SAMPLE NO	SAMPLE BOTTLE NO	PRESERVATIVES



Project: E	nvironment	al Monitoring	3	Client: Ur	Client: Uralla Shire Council				Site: Uralla Landfill		
Project number: 15579a				Date:	Date: 10/10				Time: 12000		
Sampler (s): Fic	ona A	Noohe	Bore ID:	UW1				1 4	7	
Bore depth (m): 30.45				Depth to a	Depth to aquifer (m):					ove ground level (m): 0.676	
Sample m	ethod: Baile	er		Sample ti	Sample time: 12.30				Methane reading (ppm): 2		
Sample a	opearance /	additional co	omments:	cloudy.	hally,	becam	e stigt	ning		i bare volume 352.222	
Depth measurement location: USURFACE LEVEL TOP OF CASING (TOC)		Duplicate sample collected:	Duplicate Image: YES - Sample ID: sample Image: YES - Sample ID: collected: Image: NO			Labor analy	Laboratory analysis:				
VOLUME (L)	TEMP (C)	рН	ORP (mV)	CONDUCTIVITY (mS/cm)	Turbidity	DO (mg/L)	Salinity (%)	SWL (m TC)C)	Comment	
22	17.42	6.62	178	1.70	257	3.42	0.086	>19~	1	DAJL IDS	
										0	

(L)	TEMP (C)	рН	ORP (mV)	CONDUCTIVITY (mS/cm)	Turbidity	DO (mg/L)	Salinity (%)	SWL (m TOC)	Comment
22	17.42	6.62	178	1.70	257	3.42	0.086	YERM	1 Darle JDS
									3
							1		



Project: Environme	ental Monitoring	Client: Uralla S	Shire Council	Site: Uralla	Landfill		
Project number: 15	579a	Date:	10124	Time: 🧠 🤇	Time: G C C		
Sampler (s):	27						
Bore depth (m): 12	.00	Depth to aquif	er (m):	Height abov	Height above ground level (m): $(S \)$		
Sample method: Ba	ailer	Sample time:	10.23.	Methane rea	Methane reading (ppm): 7, 5		
Sample appearanc	e / additional comments:	ear nuhal	by becoming slight	Hy sles. No odo	1 bore Jahrma 15.22.		
Donth	SURFACE LEVEL	Duplicate	□ YES - Sample ID:	1.000.007	VES - Lab No:		
Deptil				a haratami			

(L)	TEMP (C)	рН	ORP (mV)	CONDUCTIVITY (mS/cm)	Turbidity	DO (mg/L)	Salinity (%)	SWL (m TOC)	Comment
15.5	16.49	6.88	72	1-89	36.0	1.50	0.076		1.21 TAS
+2.5	16,30	6.90	90	1.87	150	1.98	0.025		1.20
130	16.33	6.90	108	1.86	174	2.05	0.094	9.05	1.19
_									
								1. a	
				· · · · · · · · · · · · · · · · · · ·				· · · · · · · · · · · · · · · · · · ·	





Project: Environme	ntal Monitoring	Client: Uralla	Shire Council	Site: Uralla L	andfill			
Project number: 155	579a	Date: (🔿	10124	Time:	Time: 10.40			
Sampler (s):	FB	Bore ID: UW3	Bore ID: UW3					
Bore depth (m): 21	54	Depth to aquit	fer (m): \$7.90	Height above	Height above ground level (m):			
Sample method: Ba	iler	Sample time:	11.35	Methane rea	ding (ppm): 2.4			
Sample appearance	/ additional comments:	lear, no Was so	orbur one bubbles geo	sated lbore	ng backy			
Depth		Duplicate	□ YES - Sample ID:	Laboratory	YES - Lab No:			
location:	TOP OF CASING (TOC)	sample collected:	⊠C NO	analysis:				

VOLUME (L)	TEMP (C)	рН	ORP (mV)	CONDUCTIVITY (mS/cm)	Turbidity	DO (mg/L)	Salinity (%)	SWL (m TOC)	Comment
33	16.61	6.24	165	3-23	0.8	0.91	0.168		2.07a/L TDS
+3	16.48	6.21	172	3.24	1.8	0.88	0.169		2.07616
+3	16.37	6.21	160	3.23	0.88	0.88	0-168	602	2.070
					2.5				
								1	
1						L			
	-								

SERVICE & CALIBRATION REPORT Water Quality Meter

Customer Details:	Job Number	Date
RCA	240944	30/09/2024
92 Hill Street		
Carrington		

Carrington Attn: Kenny Yan

Instrument Model:

HORIBA U-52/10m 🛛 Multi-Parameter Water Quality Meter

Fault Report

Requires service/calibration.

Repairs Carried Out

Replaced DO membrane. Refilled pH reference electrode.

Cleaned all sensors. Re-calibrated all sensors as follows:

<u>Calibration</u> (in accordance with manufacturer's specifications):

Parameter - unit	Before Calibration	Calibration Value	After calibration	Comment
рН (рН)	7.25	7.01	7.01	Pass
рН (рН)	3.99	4.00	4.00	Pass
ORP (mV)	227	225	225	Pass
Conductivity (mS/cm)	0.000	0.000	0.000	Pass
Conductivity (mS/cm)	0.727	0.718	0.718	Pass
Conductivity (mS/cm)	6.74	6.67	6.67	Pass
Conductivity (mS/cm)	59.1	58.6	58.6	Pass
Turbidity (NTU)	0.0	0.0	0.0	Pass
Turbidity (NTU)	2.1	8.0	8.0	Pass
Turbidity (NTU)	82.7	80.0	80.0	Pass
Turbidity (NTU)	455	400	400	Pass
D.O. zero (mg/L)	0.00	0.00	0.00	Pass
D.O. zero (mg/L)	10.14mg/L @ 21°C	9.12mg/L @21°C	9.12mg/L @21°C	Pass
Temperature (°C)	20.01°C	19.8°C	19.8°C	Pass
Sensors:				
pH Glass Electrode	pH Ref Electrode	ORP Ele	ectrode	DO Electrode
345078	WGTAD2NV	NHOO	0\$3C6	X3H6CF5A

Comments:

MAKE SURE the pH reference electrode is refilled with soln #330 regularly. If the #330 soln solidifies inside the pH reference electrode, remove the liquid junction cap (flat black rubber cap with wick in the middle) and rinse out the old solution with distilled water. Then refill with fresh HORIBA soln # 330 and refit the liquid junction cap. Please read the notes on pH maintenance.

Calibration carried out by:

Tony Fincher

AUSTRALIAN SCIENTIFIC PTY LTD 11 McDougall Street, Kotara, NSW, 2289 TEL: 1800 021 083

E-mail: sales@austscientific.com.au

www.austscientific.com.au

Instrument Serial Number: 1PH7HSWB 2019
CERTIFICATION OF CALIBRATION





Issued by: QED Environmental Systems Inc.

Calibration	certificate number	24RA-60222

Instrument

Laser One

Serial Number

41299

Description of the calibration procedure:

The calibration is verified with certified gas bottle. The maximum error of the instrument as specified in the datasheet.

Gas verification from 0-1000ppm CH4

uli scale (ppm)	Gas concentration (ppm)	Response 1 (ppm)	Response 2 (ppm)	Response 3 (ppm)	Average response (ppm)	Maximum error (ppm)	Maximum error (%F.s.)	Maximum error %
1000	0.0	0	0	0	0.00	0.00	0.00	0.00
1000	3.02	3.1	3.1	3.1	3.10	0.08	0.01	0.01
1000	11	10	10	10	10.00	1.00	0.10	0.10
1000	102.0	102	102	102	102.00	0.00	0.00	0.00
1000	1000	994	994	994	994.00	6.00	0.60	0.60
						Uncertainty	0.00	0/

Uncertainty 0.60 Max % error 0.60

% FS

Gas	verification from	0-100% vol CH4

Full scale (%vol)	Gas concentration (%vol)	Response 1 (%vol)	Response 2 (%vol)	Response 3 (%vol)	Average response (%vol)	Maximum error (%vol)	Maximum error (% F.s.)	Maximum erroi %
100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	2.20	2.20	2.20	2.20	2.20	0.00	0.00	0.00
100.00	5.10	5.10	5.10	5.10	5.10	0.00	0.00	0.00
100.00	15.00	15.30	15.30	15.30	15.30	0.30	0.30	0.30
100.00	50.00	51.00	51.00	51.00	51.00	1.00	1.00	1.00
100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00
						Uncertainty	1.00	%
						Max % error	1.00	% ES

Gas verification from 0-100% CH4 LEL (0-4.4% VOL)

www.qedenv.com (800) 624-2026 info@qedenv.com

QED Environmental Systems Inc. 2355 Bishop Circle West, Dexter, MI 48130







Issued by: QED Environmental Systems Inc.

Full scale (%vol)	Gas concentration (LEL%)	Response 1 (LEL%)	Response 2 (LEL%)	Response 3 (LEL%)	Average response (%vol)	Maximum error (LEL%)	Maximum error (% F.s.)	Maximum error %
100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	2.17	2.20	2.20	2.20	2.20	0.03	0.03	0.03
100.00	50.00	50.40	50.40	50.40	50.40	0.40	0.40	0.40
						Uncertainty	0.40	%

Max % error 0.40

% FS

www.qedenv.com (800) 624-2026 info@qedenv.com QED Environmental Systems Inc. 2355 Bishop Circle West, Dexter, MI 48130







Issued by: QED Environmental Systems Inc.

Environmental conditions during calibration

Temp.	28.8	С
Pressure	975	mBar

Gas bottles used for calibration

Gas	Cylinder number	Expiry date	Gas
Synthetic Air	4405104	2/1/2027	Synthetic Air
3 ppm	4405001	2/1/2027	CH4
10 ppm	4225861	9/1/2025	CH4
100ppm	4228613	10/1/2025	CH4
1000 ppm	4228610	10/1/2025	CH4
1.0% Vol	CC122022	11/15/2028	CH4
2.2% vol	4228611	10/1/2025	CH4
5.0% vol	425925	9/7/2027	CH4
15% vol	5879637Y	6/28/2028	CH4
50% vol	4275373Y	3/14/2028	CH4
100% vol	1347010	11/11/2027	CH4

Calibration results: Pass

Next scheduled calibration: 5/9/2025

Calibration date: 5/9/2024

Issued by: Christopher Fleenor

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Appendix C

Summary of Results

Groundwa

																	1
Sample Identification	Laboratory	Aquatic	Human Health	Solid Waste	Irrigation	UW1	UW1	UW1	UW1	UW2	UW2	UW2	UW2	UW3	UW3	UW3	UW3
Date		Ecosystem	(Indestion)	Landfill	Guidalina ^D	05-Dec-23	10-Apr-24	10-Jul-24	10-Oct-24	05-Dec-23	10-Apr-24	10-Jul-24	10-Oct-24	5-Dec-23	10-Apr-24	10-Jul-24	10-Oct-24
Groundwater Level (m AHD)	I QL	Guideline ^A	Guideline ^B	Guideline ^c	Guideime	84.25	84.31	84.32	84.27	79.21	79.23	79.28	79.24	85.89	85.70	85.61	85.42
Depth (m top of water surface)			Guideline			18.86	18.8	18.79	18.84	8.65	8.63	8.585	8.62	4.74	4.93	5.015	5.21
Sample Description					Turbid, light brown, no odour	Turbid, brown, no odour.	Slightly cloudy , no odour	Clear to slightly cloudy, no odour	Clear before purging, then slightly turbid	Clear / slightly turbid, no odour.	Clear to slightly turbid, no odour	Clear / slightly brown, no odour	Clear, no odour	Clear, bubbles, no odour	Clear, no odour	Clear, no odour	
Sample collected by					RCA-FB	RCA-FB	RCA-FB	RCA-FB	RCA-FB	RCA-FB	RCA-FB	RCA-FB	RCA-FB	RCA-FB	RCA-FB	RCA-FB	
Field Readings												-	-				-
Temperature (°C)						17.98	17.60	16.08	17.42	17.02	15.59	16.00	16.33	16.90	16.51	15.85	16.37
pH (pH UNIT)		6.5 - 8.0			<6 ^E	6.57	6.95	7.05	6.62	7.17	7.21	7.26	6.9	6.30	6.55	6.67	6.21
ORP (mV)						220	173	190	178	163	150	163	108	181	161	195	160
Conductivity (µS/cm)		1000				1700	1660	1693	1700	1780	1790	1900	1860	3030	3430	3250	3230
Turbidity (NTU)						860	637	453	267	560	116	492	174	798	8.2	30.9	2.5
Dissolved Oxygen						3.23	4.37	3.99	3.42	2.64	2.35	3.35	2.05	0.64	1.73	1.65	0.88
Salinity (%)				10000		0.085	0.066	0.085	0.086	0.09	0.091	0.096	0.094	0.158	0.161	0.169	0.168
Methane Gas (ppm)				10000		0	2.4	2.3	Z. I	0	2.4	2.0	2.50	2.5	17.3	4.0	2.4
Total Organic Carbon	1									12		10		27	28	21	19
	0.1									9.6		84		21	20	21	10
Free Carbon Dioxide as CO ₂	1									26		5		114	134	14	378
Total Carbon Dioxide as CO ₂	1									618		473		838	879	536	1100
Nutrients	-			l	1		1						I				
TKN	0.1									1		1.2		3	2.3	3.7	2.5
Nitrite	0.01									0.005		0.005		0.5	0.55	0.56	0.51
Nitrate	0.01									0.12		0.05		11.2	8.64	8.26	7.58
Total Oxidisable Nitrogen as N	0.01	0.015			5					0.12		0.05		11.7	9.19	8.82	8.09
Total Nitrogen as N*	0.1									1.12		1.25		14.7	11.49	12.52	10.59
Major Anions				-	-		-	_					-				-
Hydroxide Alkalinity as CaCO ₃	1									<1		<1		<1	<1	<1	<1
Carbonate Alkalinity as CaCO ₃	1									<1		12		<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO ₃	1									673		526		823	846	593	825
Total Alkalinity as CaCO ₃	1									673		538		823	846	593	825
Chloride	1									214		278		486	477	584	489
Metals (dissolved)																	
Arsenic	0.001	0.013	0.01		0.1					0.003		0.005		<u>0.045</u>	<u>0.051</u>	0.003	<u>0.05</u>
Iron	0.05	0.3			0.2					< 0.05		< 0.05		<0.05	<0.05	<0.05	< 0.05
Manganese	0.001	1.9	0.5		0.2					0.012		0.034		0.023	0.028	0.03	0.02

All results are in units of mg/L unless otherwise stated

Blank Cell indicates no criterion available

* Total nitrogen calculated from TKN and total oxidisable nitrogen as N

PQL = Practical Quantitation Limit. Where PQL is for a summation, PQL of all components is summed and may be different from that presented by laboratory. ANZG 2018 95% Protection Level for Fresh Waters and Default trigger values for aquatic ecosystems in upland rivers of south-east Australia that are slightly-moderately disturbed

_в NHMRC Australian Drinking Water Guidelines, 2011.

EPA Solid Waste Landfill Guidelines, methane in enclosed spaces

, Guidelines presented based on ANZECC Long term irrigation water trigger value for use up to 100 years

E Causes corrosion of pipes

ANZG guidelines in *italics* are low level reliability guidelines

NHMRC arsenic guidelines are based on total arsenic

Results shown in BOLD are in excess of the 95% aquatic ecosystems guidelines

Results shown in <u>underline</u> are in excess of the human health (ingestion) guideline

Results shown in *italics* are in excess of the solid waste guideline

Results shown in patterned cells are in excess of the long term irrigation guidelines

Uralla Shire Council AER 2023–2024 Uralla Landfill, Uralla RCA ref 15579a-409/1, December 2024 Client ref PO30039

Prepared by: SH Checked by: FB

RCA Australia.

Surface Water Results 2023-2024 Annual Reporting Period

Sample Identification			Human			US1	US1	US1	US1	
Date	Laboratory	Aquatic	Health	Irrigation	Livestock	5-Dec-23	10-Apr-24	10-Jul-24	10-Oct-24	
Depth (m top of water surface)	PQL	Ecosystem	(Indestion)	Guideline ^C	Guideline ^D	0	0	0	0	
Volumetric Flow Rate (kl./day)		Guideline ^A	Guideline ^B	Guidenne		Nil Observed	Nil Observed	Nil Observed	Nil Observed	
Volumetrie How Rate (RE/day)			Guideinie			Nii Observed				
			ole Description	Clear, no free water present, water under grass, sample extracted using a syringe	Clear, no odour, sample extracted using syringe from connected pool	Clear, no odour, no obvious flow, sample point recharging	Clear, no odour, no observable flow, extracted using syringe			
Sample collected by RCA-FB RCA-FB RCA										
Field Poadings										
Temperature (°C)	1	1		1		16.43	11 7	13.86	13 55	
nH (nH UNIT)		65-80		<6 ^E		7 58	79	7.83	7 72	
ORP (mV)		0.0 0.0		<0		-56	76	63	30	
Conductivity (uS/cm)		1000			>3582	1790	1700	849	1880	
Turbidity (NTU)		1000			0002	194	76.9	126	96	
Dissolved Oxygen						3.16	5.4	5.43	5.95	
Salinity (%)						0.09	0.085	0.042	0.095	
General Water Quality										
Total Suspended Solids	1					98		74		
Non Metallic Inorganics		•				•				
Total Organic Carbon	1					31		19		
Nutrients		-		-						
TKN	0.1					2.3		1.7		
Nitrite	0.01					<0.01		<0.01		
Nitrate	0.01					<0.01		0.03		
Total Oxidisable Nitrogen as N	0.01	0.015		5	90	<0.01		0.03		
Total Nitrogen as N [^]	0.1					2.305		1.73		
Total Phosphorus as P	0.01	0.02		0.05		0.32		0.14		
Dissolved Major Cations										
Calcium	1					48		41		
Magnesium	1					84		37		
Sodium	1					194		91		
Potassium	1					5		9		
Major Anions			-		-					
Hydroxide Alkalinity as CaCO ₃	1					<1		<1		
Carbonate Alkalinity as CaCO ₃	1					<1		22		
Bicarbonate Alkalinity as CaCO ₃	1					694		259		
Total Alkalinity as CaCO ₃	1					694		282		
Chloride	1					219		108		
Sulphate	1					<1		16		
Metals (total)		•		•						
Arsenic	0.001	0.013	0.01	0.1	0.5	0.002		0.002		
Cadmium	0.0001	0.0002	0.002	0.01	0.01					
Chromium	0.001	0.001	0.05	0.1	1	0.001		0.001		
Copper	0.001	0.0014	2	0.2	(0.4, 1, 5 & 5) ^F	<0.001		0.002		
Iron	0.05	0.3		0.2		5.48		4.18		
Lead	0.001	0.0034	0.01	2	0.1					
Manganese	0.005	1.9	0.5	0.2		3.38		<u>1.16</u>		
Zinc	0.001	0.008		2	20	<0.001		<0.001		
Benzene, Toluene, Ethylbenzer	ne, Xylene (E	BTEX)								
Naphthalene	0.005					<0.005		<0.005		
Benzene	0.001	0.95	0.001		5	<0.001		<0.001		
Toluene	0.002	0.18	0.8			<0.002		<0.002		
Ethylbenzene	0.002	0.08	0.3			<0.002		<0.002		
meta- and para-Xylene	0.002	0.275				<0.002		<0.002		
ortho-Xylene	0.002	0.35				<0.002		<0.002		

All results are in units of mg/L unless otherwise stated

Blank Cell indicates no criterion available

^ Total nitrogen calculated from TKN and total oxidisable nitrogen as N

PQL = Practical Quantitation Limit. Where PQL is for a summation, PQL of all components is summed and may be different from that presented by laboratory

^A ANZG 2018 95% Protection Level for Fresh Waters and Default trigger values for aquatic ecosystems in upland rivers of south-east Australia that are slightly-moderately disturbed

^B NHMRC Australian Drinking Water Guidelines, 2011.

^C Guidelines presented based on ANZECC Long term irrigation water trigger value for use up to 100 years

 $^{\rm D}$ Based on low risk trigger values for livestock drinking water

 $^{\rm E}$ Causes corrosion of pipes

^F Trigger values for sheep, cattle, pigs and poultry

ANZG guidelines in *italics* are low level reliability guidelines

NHMRC arsenic guidelines are based on total arsenic

ANZG and NHMRC guidelines for chromium are based on Cr (VI)

Results shown in **BOLD** are in excess of the 95% aquatic ecosystems guidelines Results shown in <u>underline</u> are in excess of the human health (ingestion) guideline Results shown in patterned cells are in excess of the long term irrigation guidelines Results shown in red text are in excess of the livestock guidelines

Uralla Shire Council AER 2023–2024 Uralla Landfill, Uralla RCA ref 15579a-409/1, December 2024 Client ref PO30039 Prepared by: SH Checked by: FB

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RCA Australia

Leachate Results Annual 2023-2024 Reporting Period

Sample Identification Date Sampled	Laboratory PQL	Aquatic Ecosystem Guideline ^A	Human Health (Ingestion) Guideline ^B	Irrigation Guideline ^c	UL1 05-Dec-23	UL1 10-Apr-24	UL1 10-Jul-24	UL1 10-Oct-24			
Depth in pond (m top of water surface)*					<0	<0	<0	<0			
			Sa	mple Description	Clear with green hue	Clear, no sheen, no odour	Clear, no odour	Clear, no odour			
			Sa	mple collected by	RCA-FB	RCA-FB	RCA-FB	RCA-FB			
Tield Readings											
Temperature (°C)					24.1	16.84	13.48	17.76			
pH (pI HIN)		6.5 - 8.0		<6 ^D	9.61	8.98	8.16	7.91			
ORP (mV)					-163	127	169	113			
Conductivity (µS/cm)		1000			1080	1330	1350	1870			
Turbidity (NTU)					202	27.6	33.3	6.9			
Dissolved Oxygen					11.01	9.76	4.69	5			
Salinity (%)					0.053	0.066	0.067	0.094			
Non Metallic Inorganics	1				11		24	-			
Nutrients					41		24				
TKN	0.1				7		9.8				
Nitrite	0.01				0.13		0.19				
Nitrate	0.01				0.02		0.89				
Total Oxidisable Nitrogen as N	0.01	0.015		5	0.15		1.08				
Total Nitrogen as N^					7.15		10.88				
Total Phosphorus as P	0.01	0.02		0.05	0.37		0.07				
Major Anions											
Hydroxide Alkalinity as CaCO ₃	1				<1		<1				
Carbonate Alkalinity as CaCO ₃	1				78.0		23.0				
Bicarbonate Alkalinity as CaCO ₃	1				281		381				
Total Alkalinity as CaCO ₃	1				359		404				
Chloride	1				142		165				
Metals (total)	.										
Arsenic	0.001	0.013	0.01	0.1	0.004		0.002				
Boron	0.05	0.94	4	0.5	0.46		0.35				
Chromium	0.001	0.001		0.1	0.002		0.002				
Lead	0.001	0.0034	0.01	2	< 0.001		< 0.001				
Manganese	0.005	1.9	0.5	0.2	0.19		0.554				
	0.005	0.000		<u> </u>	0.011		<0.005				
Benzene, Toluene, Ethylbenzene, Xylene (BTE)	x)	0.0	1	0.2	0.07		0.00				
Benzene	0.001	0.18	0.8		<0.001		<0.001				
Toluene	0.002	0.08	0.3		< 0.002		<0.002				
Ethylbenzene	0.002	0.275			<0.002		<0.002				
meta- and para-Xylene	0.002	0.35			<0.002		<0.002				
ortho-Xylene	0.002				<0.002		<0.002				
Organochlorine Pesticides (OCP)											
Heptachlor	0.0005	0.00009			<0.0005		<0.0005				
Aldrin	0.0005	0.000001	0.0003		< 0.0005		<0.0005				
Heptachlor epoxide	0.0005	0.00001	0.0003		< 0.0005		< 0.0005				
	0.0005	0.00001			<0.0005 <0.0005						
Endrin	0.0005	0.00002			<0.0005		<0.0005				
DDD	0.0005		0.03		< 0.0005		<0.0005				
DDT	0.002	0.00001	0.009		<0.002		<0.002				
Methoxychlor	0.002	0.000005			<0.002		<0.002				
Chlordane	0.0005	0.00008	0.002		<0.0005		<0.0005				
Endosulfan	0.0005	0.0002	0.02		<0.0005		<0.0005				
Organophosphorous Pesticides (OPP)	0.0005		0.005		-0.0005		-0.0005	1			
Dichlorvos Demeton S methyl	0.0005	0.004	0.005		< 0.0005		< 0.0005				
Dimethoate	0.0005	0.004	0.007		<0.0005		<0.0005				
Diazinon	0.0005	0.00001	0.004		<0.0005		< 0.0005				
Parathion-methyl	0.002		0.0007		<0.002		<0.002				
Malathion	0.0005	0.00005			< 0.0005		< 0.0005				
Fenthion	0.0005	0.0002			<0.0005		<0.0005				
Chlorpyrifos ^E	0.0005	0.00001			< 0.0005		< 0.0005				
Parathion	0.002	0.000004			<0.002		<0.002				
Fenamiphos	0.0005		0.5		<0.0005		<0.0005				
	0.0005	0.00000	4		< 0.0005		< 0.0005				
Azinphos-methyi	0.0005	0.00002	0.03		<0.0005		<0.0005				
Volatile Organic Compounds (VOC)	0.0005		0.002		~0.0000		~0.0005				
VOC (67 Compounds)	varies				<0.750		<0.750				
All regults are in units of mg/L unloss otherwise stated	-		-			-	-	-			

are in units of mg/L unles

Blank Cell indicates no criterion available

* Depth reading taken from within leachate dam.

^ Total nitrogen calculated from TKN and total oxidisable nitrogen as N

PQL = Practical Quantitation Limit. Where PQL is for a summation, PQL of all components is summed and may be different from that presented by laboratory

^A ANZG 2018 95% Protection Level for Fresh Waters and Default trigger values for aquatic ecosystems in upland rivers of south-east Australia that are slightly-moderately disturbed

^B NHMRC Australian Drinking Water Guidelines, 2011.

^C Guidelines presented based on ANZECC Long term irrigation water trigger value for use up to 100 years

^D Causes corrosion of pipes

^E Bioaccummulative Compounds

ANZG guidelines in *italics* are low level reliability guidelines

NHMRC arsenic guidelines are based on total arsenic

ANZG and NHMRC guidelines for chromium are based on Cr (VI)

Results shown in shading are in excess of the 99% aquatic ecosystems guidelines

Results shown in **BOLD** are in excess of the 95% aquatic ecosystems guidelines Results shown in $\underline{\text{underline}}$ are in excess of the human health (ingestion) guideline Results shown in patterned cells are in excess of the long term irrigation guidelines " Duplicate iron result due to poor RPD

Uralla Shire Council AER 2023-2024 Uralla Landfill, Uralla RCA ref 15579a-409/1, December 2024 Client ref PO30039

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Prepared by: SH Checked by: FB

RCA Australia.

Appendix D

Quality Assurance and Laboratory Report Sheets

External Quality Assurance Annual 2023-2024 Reporting Period

Quality Assurance Type		Intralaborato	ory Duplicate		Trip Blank	Trip Spike					
Sample Identification	Primary PQL	UW2	Dup		Trip Blank	Trip Spike 23NE0011T					
Date		5-De	ec-23		24-Nov-23	24-Nov-23					
Sample Descrip	tion	Clear n	o odour	RPD %	Water	Water					
Sample Purp	ose	Quality A	ssurance		Quality Assurance	Quality Assurance					
Sample Collected	d by	RCA	- FB		Laboratory	Laboratory					
Benzene, Toluene, Ethylbenzene, X	ylene (BTE	X)									
Benzene	0.001				<0.001	80%					
Toluene	0.002				<0.002	80%					
Ethylbenzene	0.002				<0.002	85%					
meta- and para-Xylene	0.002				<0.002	85%					
ortho-Xylene	0.002				<0.002	95%					
Polycyclic Aromatic Hydrocarbons (PAH)											
Naphthalene	0.005				<0.005	85%					
Total Recoverable Hydrocarbons (T	RH)										
TRH C ₆ -C ₁₀	0.02				<0.02						
Metals											
Arsenic	0.001	0.003	0.003	0.0							
Manganese	0.001	0.012	0.012	0.0							
Iron	0.05	<u>0.025</u>	<u>0.025</u>	0.0							
Non Metallic Inorganics											
Total Organic Carbon	1	12	10	18.2							
Nutrients											
TKN	0.1	1	1.1	9.5							
Nitrite	0.01	<u>0.005</u>	<u>0.005</u>	0.0							
Nitrate	0.01	0.12	0.1	18.2							
Total Oxidisable Nitrogen as N	0.01	0.12	0.1	18.2							
Major Anions											
Hydroxide Alkalinity as CaCO ₃	1	<u>0.5</u>	<u>0.5</u>	0.0							
Carbonate Alkalinity as CaCO ₃	1	0.5	0.5	0.0							
Bicarbonate Alkalinity as CaCO ₃	1	673	675	0.3							
Total Alkalinity as CaCO ₃	1	673	675	0.3							
Chloride	1	214	188	12.9							

Note all units in mg/L

PQL = Practical Quantitation Limit.

Results <u>underlined</u> were not detected and are reported as half the detection limit for statistical purpose.

BOLD identifies where RPD results >30%

BOLD identifies where trip blank results >PQL

BOLD identifies where trip spike results <70% and / or >130%

External Quality Assurance Annual 2023-2024 Reporting Period

Quality Assurance Type		Intralaborato	ory Duplicate		Trip Blank	Trip Spike
Sample Identification	Primary PQL	UL1	Dup		Trip Blank	Trip Spike 23NE0011T
Date		10-Jul-24			10-Jul-24	10-Jul-24
Sample Descrip	tion	Clear n	o odour	RPD %	Water	Water
Sample Purp	ose	Quality A	ssurance		Quality Assurance	Quality Assurance
Sample Collected	d by	RCA	- FB		Laboratory	Laboratory
Benzene, Toluene, Ethylbenzene, X	ylene (BTE	>				
Benzene	0.001				<0.001	90%
Toluene	0.002				<0.002	90%
Ethylbenzene	0.002				<0.002	90%
meta- and para-Xylene	0.002				<0.002	85%
ortho-Xylene	0.002				<0.002	90%
Polycyclic Aromatic Hydrocarbons	(PAH)	•	•	•		
Naphthalene	0.005				<0.005	100%
Total Recoverable Hydrocarbons (T	RH)					
TRH C ₆ -C ₁₀	0.02				<0.02	
Metals		•				
Arsenic	0.001	0.002	0.002	0.0		
Manganese	0.001	0.554	0.649	15.8		
Iron	0.05	0.35	0.66	61.4		
Non Metallic Inorganics						
Total Organic Carbon	1	24	26	8.0		
Nutrients		-				
TKN	0.1	9.8	8.4	15.4		
Nitrite	0.01	0.19	0.19	0.0		
Nitrate	0.01	0.89	0.89	0.0		
Total Oxidisable Nitrogen as N	0.01	1.08	1.08	0.0		
Major Anions						
Hydroxide Alkalinity as CaCO ₃	1	<u>0.5</u>	<u>0.5</u>	0.0		
Carbonate Alkalinity as CaCO ₃	1	23	27	16.0		
Bicarbonate Alkalinity as CaCO ₃	1	381	392	2.8		
Total Alkalinity as CaCO ₃	1	404	419	3.6		
Chloride	1	165	169	2.4		

Note all units in mg/L

PQL = Practical Quantitation Limit.

Results <u>underlined</u> were not detected and are reported as half the detection limit for statistical purpose.

BOLD identifies where RPD results >30%

BOLD identifies where trip blank results >PQL

BOLD identifies where trip spike results <70% and / or >130%



CERTIFICATE OF ANALYSIS Page Work Order : ES2342102 : 1 of 12 Amendment :1 Client : ROBERT CARR & ASSOCIATES P/L Laboratory : Environmental Division Sydney Contact : MS FIONA BROOKER Contact : Customer Services ES Address Address : 277-289 Woodpark Road Smithfield NSW Australia 2164 : 92 HILL STREET **CARRINGTON NSW 2294** Telephone : +61 02 4902 9200 Telephone : +61-2-8784 8555 Project **Date Samples Received** : 15579 - Quarterly Monitoring : 05-Dec-2023 15:06 Order number Date Analysis Commenced : -----: 06-Dec-2023 C-O-C number Issue Date : 23-Jan-2024 18:39 · ____ Sampler · ____ Site · ____ : SYBQ/400/21 Quote number hulalow Accreditation No. 825

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.

Accredited for compliance with ISO/IEC 17025 - Testing

This Certificate of Analysis contains the following information:

: 7

: 7

General Comments

No. of samples received

No. of samples analysed

- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	Position	Accreditation Category
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW



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.

- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP074: Where reported, Total Trihalomethanes is the sum of the reported concentrations of all Trihalomethanes at or above the LOR.
- EP074: Where reported, Total Trimethylbenzenes is the sum of the reported concentrations of 1.2.3-Trimethylbenzene, 1.2.4-Trimethylbenzene and 1.3.5-Trimethylbenzene at or above the LOR.
- As per QWI EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions Chloride, Alkalinity and Sulfate; and Major Cations Calcium, Magnesium, Potassium and Sodium.
 Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Amendment 23/01/2024): This report has been amended and re-released to allow the reporting of additional analytical data, specifically method EA165-PH for samples 002, and 003.
- EP080: Sample TRIP SPIKE contains volatile compounds spiked into the sample containers prior to dispatch from the laboratory. BTEXN compounds spiked at 20 ug/L.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.



Sub-Matrix: WATER (Matrix: WATER)	Sample ID		US1	UW2	UW3	UL1	DUP	
		Sampli	ng date / time	05-Dec-2023 08:00				
Compound	CAS Number	LOR	Unit	ES2342102-001	ES2342102-002	ES2342102-003	ES2342102-004	ES2342102-005
				Result	Result	Result	Result	Result
EA025: Total Suspended Solids dried	at 104 ± 2°C							
Suspended Solids (SS)		5	mg/L	98				
EA165: CO2 - Free and Total								
Free Carbon Dioxide as CO2	85540-96-1	1	mg/L		26	114		23
Total Carbon Dioxide as CO2	85540-96-1	1	mg/L		618	838		
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	78	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	694	673	823	281	675
Total Alkalinity as CaCO3		1	mg/L	694	673	823	359	675
ED041G: Sulfate (Turbidimetric) as SO	4 2- by DA							
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1				
ED045G: Chloride by Discrete Analyse	r							
Chloride	16887-00-6	1	mg/L	219	214	486	142	188
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	48				
Magnesium	7439-95-4	1	mg/L	84				
Sodium	7440-23-5	1	mg/L	194				
Potassium	7440-09-7	1	mg/L	5				
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L		0.003	0.045		0.003
Manganese	7439-96-5	0.001	mg/L		0.012	0.023		0.012
Iron	7439-89-6	0.05	mg/L		<0.05	<0.05		<0.05
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	0.002			0.004	
Chromium	7440-47-3	0.001	mg/L	0.001			0.002	
Copper	7440-50-8	0.001	mg/L	<0.001				
Lead	7439-92-1	0.001	mg/L				<0.001	



Sub-Matrix: WATER (Matrix: WATER)			Sample ID	US1	UW2	UW3	UL1	DUP
		Sampli	ng date / time	05-Dec-2023 08:00				
Compound	CAS Number	LOR	Unit	ES2342102-001	ES2342102-002	ES2342102-003	ES2342102-004	ES2342102-005
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS - Continued	l i							
Manganese	7439-96-5	0.001	mg/L	3.38			0.191	
Zinc	7440-66-6	0.005	mg/L	<0.005			0.011	
Boron	7440-42-8	0.05	mg/L				0.46	
Iron	7439-89-6	0.05	mg/L	5.48			0.87	
EG049T: Total Trivalent Chromium								
Trivalent Chromium	16065-83-1	0.01	mg/L	<0.01			<0.01	
EG050T: Total Hexavalent Chromium								
Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01			<0.01	
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.50	0.13	<0.01
EK058G: Nitrate as N by Discrete Analyser	r i i i i							
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	0.12	11.2	0.02	0.10
EK059G: Nitrite plus Nitrate as N (NOx) by	/ Discrete Ana	lyser						
Nitrite + Nitrate as N		0.01	mg/L	<0.01	0.12	11.7	0.15	0.10
EK061G: Total Kjeldahl Nitrogen By Discre	te Analyser							
Total Kjeldahl Nitrogen as N		0.1	mg/L	2.3	1.0	3.0	7.0	1.1
EK067G: Total Phosphorus as P by Discret	e Analyser							
Total Phosphorus as P		0.01	mg/L	0.32			0.37	
EN055: Ionic Balance								
ø Total Anions		0.01	meq/L	20.0				
ø Total Cations		0.01	meq/L	17.9				
ø lonic Balance		0.01	%	5.72				
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon		1	mg/L	31	12	27	41	10
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen		0.1	mg/L		9.6			10.4
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.5	µg/L				<0.5	



Sub-Matrix: WATER (Matrix: WATER)	Sample ID		US1	UW2	UW3	UL1	DUP	
		Sampli	ng date / time	05-Dec-2023 08:00				
Compound	CAS Number	LOR	Unit	ES2342102-001	ES2342102-002	ES2342102-003	ES2342102-004	ES2342102-005
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides	s (OC) - Continued							
Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L				<0.5	
beta-BHC	319-85-7	0.5	µg/L				<0.5	
gamma-BHC	58-89-9	0.5	µg/L				<0.5	
delta-BHC	319-86-8	0.5	µg/L				<0.5	
Heptachlor	76-44-8	0.5	µg/L				<0.5	
Aldrin	309-00-2	0.5	µg/L				<0.5	
Heptachlor epoxide	1024-57-3	0.5	µg/L				<0.5	
trans-Chlordane	5103-74-2	0.5	µg/L				<0.5	
alpha-Endosulfan	959-98-8	0.5	µg/L				<0.5	
cis-Chlordane	5103-71-9	0.5	µg/L				<0.5	
Dieldrin	60-57-1	0.5	µg/L				<0.5	
4.4`-DDE	72-55-9	0.5	µg/L				<0.5	
Endrin	72-20-8	0.5	µg/L				<0.5	
beta-Endosulfan	33213-65-9	0.5	µg/L				<0.5	
4.4`-DDD	72-54-8	0.5	µg/L				<0.5	
Endrin aldehyde	7421-93-4	0.5	µg/L				<0.5	
Endosulfan sulfate	1031-07-8	0.5	µg/L				<0.5	
4.4`-DDT	50-29-3	2.0	µg/L				<2.0	
Endrin ketone	53494-70-5	0.5	µg/L				<0.5	
Methoxychlor	72-43-5	2.0	µg/L				<2.0	
^ Total Chlordane (sum)		0.5	µg/L				<0.5	
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5	0.5	µg/L				<0.5	
^ Sum of Aldrin + Dieldrin	0-2 309-00-2/60-57-1	0.5	ua/L				<0.5	
ED068B: Organophosphorus Pectic			r u					
Dichlorvos	62-73-7	0.5	μg/L				<0.5	
Demeton-S-methyl	919-86-8	0.5	μg/L				<0.5	
·	0.000							



Sub-Matrix: WATER			Sample ID	US1	UW2	UW3	UL1	DUP
		Samplii	ng date / time	05-Dec-2023 08:00				
Compound	CAS Number	LOR	Unit	ES2342102-001	ES2342102-002	ES2342102-003	ES2342102-004	ES2342102-005
				Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesti	cides (OP) - Continued							
Monocrotophos	6923-22-4	2.0	µg/L				<2.0	
Dimethoate	60-51-5	0.5	μg/L				<0.5	
Diazinon	333-41-5	0.5	µg/L				<0.5	
Chlorpyrifos-methyl	5598-13-0	0.5	µg/L				<0.5	
Parathion-methyl	298-00-0	2.0	µg/L				<2.0	
Malathion	121-75-5	0.5	µg/L				<0.5	
Fenthion	55-38-9	0.5	µg/L				<0.5	
Chlorpyrifos	2921-88-2	0.5	µg/L				<0.5	
Parathion	56-38-2	2.0	µg/L				<2.0	
Pirimphos-ethyl	23505-41-1	0.5	µg/L				<0.5	
Chlorfenvinphos	470-90-6	0.5	µg/L				<0.5	
Bromophos-ethyl	4824-78-6	0.5	µg/L				<0.5	
Fenamiphos	22224-92-6	0.5	µg/L				<0.5	
Prothiofos	34643-46-4	0.5	µg/L				<0.5	
Ethion	563-12-2	0.5	µg/L				<0.5	
Carbophenothion	786-19-6	0.5	µg/L				<0.5	
Azinphos Methyl	86-50-0	0.5	μg/L				<0.5	
EP074A: Monocyclic Aromatic Hyd	drocarbons							
Benzene	71-43-2	1	µg/L				<1	
Toluene	108-88-3	2	µg/L				<2	
Ethylbenzene	100-41-4	2	µg/L				<2	
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L				<2	
Styrene	100-42-5	5	µg/L				<5	
ortho-Xylene	95-47-6	2	µg/L				<2	
lsopropylbenzene	98-82-8	5	µg/L				<5	
n-Propylbenzene	103-65-1	5	µg/L				<5	
1.3.5-Trimethylbenzene	108-67-8	5	µg/L				<5	



Sub-Matrix: WATER (Matrix: WATER)	Sample ID		US1	UW2	UW3	UL1	DUP	
		Samplii	ng date / time	05-Dec-2023 08:00				
Compound	CAS Number	LOR	Unit	ES2342102-001	ES2342102-002	ES2342102-003	ES2342102-004	ES2342102-005
				Result	Result	Result	Result	Result
EP074A: Monocyclic Aromatic Hydrocar	bons - Continued							
sec-Butylbenzene	135-98-8	5	µg/L				<5	
1.2.4-Trimethylbenzene	95-63-6	5	µg/L				<5	
tert-Butylbenzene	98-06-6	5	µg/L				<5	
p-lsopropyltoluene	99-87-6	5	µg/L				<5	
n-Butylbenzene	104-51-8	5	µg/L				<5	
EP074B: Oxygenated Compounds								
Vinyl Acetate	108-05-4	50	µg/L				<50	
2-Butanone (MEK)	78-93-3	50	µg/L				<50	
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L				<50	
2-Hexanone (MBK)	591-78-6	50	µg/L				<50	
EP074C: Sulfonated Compounds								
Carbon disulfide	75-15-0	5	µg/L				<5	
EP074D: Fumigants								
2.2-Dichloropropane	594-20-7	5	µg/L				<5	
1.2-Dichloropropane	78-87-5	5	µg/L				<5	
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L				<5	
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L				<5	
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L				<5	
EP074E: Halogenated Aliphatic Compou	nds							
Dichlorodifluoromethane	75-71-8	50	µg/L				<50	
Chloromethane	74-87-3	50	µg/L				<50	
Vinyl chloride	75-01-4	50	µg/L				<50	
Bromomethane	74-83-9	50	µg/L				<50	
Chloroethane	75-00-3	50	µg/L				<50	
Trichlorofluoromethane	75-69-4	50	µg/L				<50	
1.1-Dichloroethene	75-35-4	5	µg/L				<5	
lodomethane	74-88-4	5	µg/L				<5	



Sub-Matrix: WATER (Matrix: WATER)	Sample ID			US1	UW2	UW3	UL1	DUP
		Samplii	ng date / time	05-Dec-2023 08:00				
Compound	CAS Number	LOR	Unit	ES2342102-001	ES2342102-002	ES2342102-003	ES2342102-004	ES2342102-005
				Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compo	ounds - Continued							
trans-1.2-Dichloroethene	156-60-5	5	µg/L				<5	
1.1-Dichloroethane	75-34-3	5	µg/L				<5	
cis-1.2-Dichloroethene	156-59-2	5	µg/L				<5	
1.1.1-Trichloroethane	71-55-6	5	µg/L				<5	
1.1-Dichloropropylene	563-58-6	5	µg/L				<5	
Carbon Tetrachloride	56-23-5	5	µg/L				<5	
1.2-Dichloroethane	107-06-2	5	µg/L				<5	
Trichloroethene	79-01-6	5	µg/L				<5	
Dibromomethane	74-95-3	5	µg/L				<5	
1.1.2-Trichloroethane	79-00-5	5	µg/L				<5	
1.3-Dichloropropane	142-28-9	5	µg/L				<5	
Tetrachloroethene	127-18-4	5	µg/L				<5	
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L				<5	
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L				<5	
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L				<5	
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L				<5	
1.2.3-Trichloropropane	96-18-4	5	µg/L				<5	
Pentachloroethane	76-01-7	5	µg/L				<5	
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L				<5	
Hexachlorobutadiene	87-68-3	5	µg/L				<5	
EP074F: Halogenated Aromatic Compo	ounds							
Chlorobenzene	108-90-7	5	µg/L				<5	
Bromobenzene	108-86-1	5	µg/L				<5	
2-Chlorotoluene	95-49-8	5	µg/L				<5	
4-Chlorotoluene	106-43-4	5	µg/L				<5	
1.3-Dichlorobenzene	541-73-1	5	µg/L				<5	
1.4-Dichlorobenzene	106-46-7	5	µg/L				<5	



Sub-Matrix: WATER (Matrix: WATER)	Sample ID		US1	UW2	UW3	UL1	DUP	
		Sampli	ng date / time	05-Dec-2023 08:00				
Compound	CAS Number	LOR	Unit	ES2342102-001	ES2342102-002	ES2342102-003	ES2342102-004	ES2342102-005
				Result	Result	Result	Result	Result
EP074F: Halogenated Aromatic Con	pounds - Continued							
1.2-Dichlorobenzene	95-50-1	5	µg/L				<5	
1.2.4-Trichlorobenzene	120-82-1	5	µg/L				<5	
1.2.3-Trichlorobenzene	87-61-6	5	µg/L				<5	
EP074G: Trihalomethanes								
Chloroform	67-66-3	5	µg/L				<5	
Bromodichloromethane	75-27-4	5	µg/L				<5	
Dibromochloromethane	124-48-1	5	µg/L				<5	
Bromoform	75-25-2	5	µg/L				<5	
EP074H: Naphthalene								
Naphthalene	91-20-3	5	µg/L				<5	
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1				
Toluene	108-88-3	2	µg/L	<2				
Ethylbenzene	100-41-4	2	µg/L	<2				
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2				
ortho-Xylene	95-47-6	2	µg/L	<2				
[^] Total Xylenes		2	µg/L	<2				
^ Sum of BTEX		1	µg/L	<1				
Naphthalene	91-20-3	5	µg/L	<5				
EP068S: Organochlorine Pesticide S	Surrogate							
Dibromo-DDE	21655-73-2	0.5	%				135	
EP068T: Organophosphorus Pestici	de Surrogate							
DEF	78-48-8	0.5	%				140	
EP074S: VOC Surrogates								
1.2-Dichloroethane-D4	17060-07-0	5	%				108	
Toluene-D8	2037-26-5	5	%				119	
4-Bromofluorobenzene	460-00-4	5	%				105	



Sub-Matrix: WATER (Matrix: WATER)			Sample ID	US1	UW2	UW3	UL1	DUP
		Sampli	ing date / time	05-Dec-2023 08:00				
Compound	CAS Number	LOR	Unit	ES2342102-001	ES2342102-002	ES2342102-003	ES2342102-004	ES2342102-005
				Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	104				
Toluene-D8	2037-26-5	2	%	100				
4-Bromofluorobenzene	460-00-4	2	%	108				



Sub-Matrix: WATER (Matrix: WATER)			Sample ID	TRIP BLANK	TRIP SPIKE 5	 	
		Sampli	ng date / time	24-Nov-2023 00:00	24-Nov-2023 00:00	 	
Compound	CAS Number	LOR	Unit	ES2342102-006	ES2342102-007	 	
				Result	Result	 	
EP080/071: Total Petroleum Hydroc	arbons						
C6 - C9 Fraction		20	µg/L	<20		 	
EP080/071: Total Recoverable Hydro	ocarbons - NEPM 201	3 Fractio	ns				
C6 - C10 Fraction	C6_C10	20	µg/L	<20		 	
C6 - C10 Fraction minus BTEX (E1)	C6_C10-BTEX	20	µg/L	<20		 	
EP080: BTEXN							
Benzene	71-43-2	1	µg/L	<1	16	 	
Toluene	108-88-3	2	µg/L	<2	16	 	
Ethylbenzene	100-41-4	2	µg/L	<2	17	 	
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	17	 	
ortho-Xylene	95-47-6	2	µg/L	<2	19	 	
^ Total Xylenes		2	µg/L	<2	36	 	
^ Sum of BTEX		1	µg/L	<1	85	 	
Naphthalene	91-20-3	5	µg/L	<5	17	 	
EP080S: TPH(V)/BTEX Surrogates							
1.2-Dichloroethane-D4	17060-07-0	2	%	107	109	 	
Toluene-D8	2037-26-5	2	%	112	108	 	
4-Bromofluorobenzene	460-00-4	2	%	119	117	 	



Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)		
Compound	CAS Number	Low	High	
EP068S: Organochlorine Pesticide Surrogate				
Dibromo-DDE	21655-73-2	50	150	
EP068T: Organophosphorus Pesticide Surrog	gate			
DEF	78-48-8	50	150	
EP074S: VOC Surrogates				
1.2-Dichloroethane-D4	17060-07-0	78	133	
Toluene-D8	2037-26-5	79	129	
4-Bromofluorobenzene	460-00-4	81	124	
EP080S: TPH(V)/BTEX Surrogates				
1.2-Dichloroethane-D4	17060-07-0	72	143	
Toluene-D8	2037-26-5	75	131	
4-Bromofluorobenzene	460-00-4	73	137	



QUALITY CONTROL REPORT					
Work Order	: ES2342102	Page	: 1 of 19		
Amendment	: 1				
Client	: ROBERT CARR & ASSOCIATES P/L	Laboratory	: Environmental Division	Sydney	
Contact	: MS FIONA BROOKER	Contact	: Customer Services ES		
Address	: 92 HILL STREET CARRINGTON NSW 2294	Address	: 277-289 Woodpark Roa	d Smithfield NSW Australia 2164	
Telephone	: +61 02 4902 9200	Telephone	: +61-2-8784 8555		
Project	: 15579 - Quarterly Monitoring	Date Samples Received	: 05-Dec-2023	and the second s	
Order number	:	Date Analysis Commenced	: 06-Dec-2023	Julie A	
C-O-C number	:	Issue Date	: 23-Jan-2024	NATA	
Sampler				Hac-MRA NATA	
Site	:				
Quote number	: SYBQ/400/21			Accreditation No. 825	

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.

Accredited for compliance with ISO/IEC 17025 - Testing

This Quality Control Report contains the following information:

: 7

: 7

- 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

No. of samples received

No. of samples analysed

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
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW



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

* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

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 (%)
EA025: Total Suspe	nded Solids dried at 104 ± 2°	C (QC Lot: 5481696)							
ES2342096-001	Anonymous	EA025H: Suspended Solids (SS)		5	mg/L	46	42	7.9	No Limit
ES2342381-003	Anonymous	EA025H: Suspended Solids (SS)		5	mg/L	26	28	7.4	No Limit
ES2342478-003	Anonymous	EA025H: Suspended Solids (SS)		5	mg/L	<5	<5	0.0	No Limit
ES2342750-001	Anonymous	EA025H: Suspended Solids (SS)		5	mg/L	14	16	10.0	No Limit
ED037P: Alkalinity b	oy PC Titrator (QC Lot: 54728	393)							
ES2342018-001	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	78	81	2.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3		1	mg/L	78	81	2.7	0% - 20%
ES2341956-001	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	2940	2950	0.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3		1	mg/L	2940	2950	0.5	0% - 20%
ED037P: Alkalinity b	oy PC Titrator (QC Lot: 54796	\$81)							
ES2341869-001	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	270	270	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3		1	mg/L	270	270	0.0	0% - 20%
ES2341995-001	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

Page	: 3 of 19
Work Order	: ES2342102 Amendment 1
Client	: ROBERT CARR & ASSOCIATES P/L
Project	: 15579 - Quarterly Monitoring



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 (%)
ED037P: Alkalinity I	by PC Titrator (QC Lot: 54	79681) - continued				·			
ES2341995-001	Anonymous	ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	32	29	10.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3		1	mg/L	32	29	10.1	0% - 20%
ED037P: Alkalinity I	by PC Titrator (QC Lot: 54	81215)				·			
ES2341986-001	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	472	476	0.9	0% - 20%
		ED037-P: Total Alkalinity as CaCO3		1	mg/L	472	476	0.9	0% - 20%
ED041G: Sulfate (Tu	urbidimetric) as SO4 2- by	DA (QC Lot: 5474192)							
EW2305324-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	186	186	0.0	0% - 20%
ES2342020-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	44	44	0.0	0% - 20%
ED045G: Chloride b	y Discrete Analyser (QC I	Lot: 5474195)				' '	· · · · · · · · · · · · · · · · · · ·		
ES2342102-003	UW3	ED045G: Chloride	16887-00-6	1	mg/L	486	476	2.1	0% - 20%
ES2342020-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	50	50	0.0	0% - 20%
ED093F: Dissolved	Major Cations (QC Lot: 54	480920)				·	1 1		1
ES2341783-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	12	12	0.0	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	6	6	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	16	16	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
ES2342345-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	29	29	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	30	30	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	51	52	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	6	6	0.0	No Limit
EG020F: Dissolved	Metals by ICP-MS (QC Lo	t: 5477767)							
ES2342205-002	Anonymous	EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.010	0.010	0.0	0% - 50%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.18	0.19	0.0	No Limit
ES2342191-002	Anonymous	EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EG020T: Total Meta	Is by ICP-MS (QC Lot: 547	77706)							
ES2342092-003	Anonymous	EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.002	0.003	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.015	0.016	8.0	0% - 50%
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.329	0.350	6.1	0% - 20%
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.179	0.183	1.9	0% - 20%
		EG020A-T: Boron	7440-42-8	0.05	mg/L	1.43	1.55	8.0	0% - 20%

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Sub-Matrix: WATER			Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Sample ID	Method: Compound CAS	S Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020T: Total Metals	by ICP-MS (QC Lot: 54777)6) - continued							
ES2342092-003	Anonymous	EG020A-T: Iron 74	439-89-6	0.05	mg/L	2.58	2.73	5.3	0% - 20%
ES2342017-001	Anonymous	EG020A-T: Arsenic 74	440-38-2	0.001	mg/L	0.002	0.001	0.0	No Limit
		EG020A-T: Chromium 74	440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper 74	440-50-8	0.001	mg/L	0.008	0.008	0.0	No Limit
		EG020A-T: Lead 74	439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Manganese 74	439-96-5	0.001	mg/L	0.170	0.177	3.5	0% - 20%
		EG020A-T: Zinc 74	440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-T: Boron 74	440-42-8	0.05	mg/L	<0.05	<0.05	0.0	No Limit
		EG020A-T: Iron 74	439-89-6	0.05	mg/L	0.10	0.10	0.0	No Limit
EG020T: Total Metals	by ICP-MS (QC Lot: 54809	57)							
ES2342065-001	Anonymous	EG020A-T: Arsenic 74	440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium 74	440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper 74	440-50-8	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-T: Lead 74	439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Manganese 74	439-96-5	0.001	mg/L	0.026	0.030	16.3	0% - 20%
		EG020A-T: Zinc 74	440-66-6	0.005	mg/L	0.175	0.181	3.7	0% - 20%
		EG020A-T: Boron 74	440-42-8	0.05	mg/L	<0.05	<0.05	0.0	No Limit
		EG020A-T: Iron 74	439-89-6	0.05	mg/L	0.17	0.19	11.0	No Limit
ES2341869-002	Anonymous	EG020A-T: Arsenic 74	440-38-2	0.001 (0.010)	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-T: Chromium 74	440-47-3	0.001 (0.010)	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-T: Copper 74	440-50-8	0.001 (0.010)	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-T: Lead 74	439-92-1	0.001 (0.010)	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-T: Manganese 74	439-96-5	0.001 (0.010)	mg/L	0.031	0.027	11.7	No Limit
		EG020A-T: Zinc 74	440-66-6	0.005 (0.050)	mg/L	<0.050	<0.050	0.0	No Limit
		EG020A-T: Boron 74	440-42-8	0.05 (0.50)*	mg/L	<0.50	<0.50	0.0	No Limit
		EG020A-T: Iron 74	439-89-6	0.05 (0.50)*	mg/L	0.64	0.59	8.3	No Limit
EG050T: Total Hexav	alent Chromium (QC Lot: 54	173085)							
ES2341942-001	Anonymous	EG050G-T: Hexavalent Chromium 185	540-29-9	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES2342092-004	Anonymous	EG050G-T: Hexavalent Chromium 185	540-29-9	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N	by Discrete Analyser (QC L	.ot: 5474194)							
ES2342102-003	UW3	EK057G: Nitrite as N 147	797-65-0	0.01	mg/L	0.50	0.50	0.0	0% - 20%
ES2342020-001	Anonymous	EK057C: Nitrite as N 147	797-65-0	0.01	ma/l	<0.01	<0.01	0.0	No Limit

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Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EK059G: Nitrite plus	Nitrate as N (NOx) by Discr	ete Analyser (QC Lot: 5477564)							
ES2342084-001	Anonymous	EK059G: Nitrite + Nitrate as N		0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES2342092-005	Anonymous	EK059G: Nitrite + Nitrate as N		0.01	mg/L	0.07	0.07	0.0	No Limit
EK059G: Nitrite plus	Nitrate as N (NOx) by Discr	ete Analyser (QC Lot: 5477565)							
ES2342102-005	DUP	EK059G: Nitrite + Nitrate as N		0.01	mg/L	0.10	0.10	0.0	0% - 50%
ES2342131-007	Anonymous	EK059G: Nitrite + Nitrate as N		0.01	mg/L	0.02	0.02	0.0	No Limit
EK061G: Total Kjelda	hl Nitrogen By Discrete Ana	Iyser (QC Lot: 5477560)							
ES2342084-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N		0.1	mg/L	0.4	0.4	0.0	No Limit
ES2342092-006	Anonymous	EK061G: Total Kjeldahl Nitrogen as N		0.1 (2.0)*	mg/L	4.0	4.3	6.9	No Limit
EK061G: Total Kjelda	hl Nitrogen By Discrete Ana	Iyser (QC Lot: 5477561)							
ES2342131-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N		0.1	mg/L	0.7	0.6	0.0	No Limit
ES2342132-003	Anonymous	EK061G: Total Kjeldahl Nitrogen as N		0.1 (2.0)*	mg/L	42.3	41.4	2.2	0% - 20%
EK067G: Total Phosp	horus as P by Discrete Ana	lyser (QC Lot: 5477559)							
ES2342084-001	Anonymous	EK067G: Total Phosphorus as P		0.01	mg/L	0.19	0.14	30.5	0% - 50%
ES2342092-006	Anonymous	EK067G: Total Phosphorus as P		0.01 (0.20)*	mg/L	<0.20	<0.20	0.0	No Limit
EP005: Total Organic	Carbon (TOC) (QC Lot: 547	(4170)							
ES2341984-001	Anonymous	EP005: Total Organic Carbon		1	mg/L	352	351	0.0	0% - 20%
ES2342329-004	Anonymous	EP005: Total Organic Carbon		1	mg/L	2	2	0.0	No Limit
EP005: Total Organic	Carbon (TOC) (QC Lot: 547	(4184)							
ES2342075-030	Anonymous	EP005: Total Organic Carbon		1	mg/L	42	42	0.0	0% - 20%
ES2342220-002	Anonymous	EP005: Total Organic Carbon		1	mg/L	3	3	0.0	No Limit
EP074A: Monocyclic	Aromatic Hydrocarbons (Q	C Lot: 5473350)							
ES2342083-001	Anonymous	EP074: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP074: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP074: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP074: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit
			106-42-3						
		EP074: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EPU/4: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5 <5	0.0	
ES23/2163 007	Δροηγρομε		71 /2 2	ບ 1	µy/L	<	>3 <1	0.0	No Limit
L32342103-001	Anonymous	EPU/4: Benzene	11-43-2	1	µy/∟	1	N	0.0	NU LIITIIL

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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 (%)
EP074A: Monocycli	ic Aromatic Hydrocarbor	ns (QC Lot: 5473350) - continued							
ES2342163-007	Anonymous	EP074: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP074: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP074: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit
			106-42-3						
		EP074: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-lsopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
EP074B: Oxygenate	ed Compounds (QC Lot:	5473350)							
ES2342083-001	Anonymous	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
ES2342163-007	Anonymous	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
EP074C: Sulfonated	d Compounds (QC Lot:	5473350)							
ES2342083-001	Anonymous	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
ES2342163-007	Anonymous	EP074: Carbon disulfide	75-15-0	5	ua/L	<5	<5	0.0	No Limit
EP074D: Eumigants	(QC ot: 5473350)				10				
ES2342083-001	Anonymous	EP074: 2.2-Dichloropropage	594-20-7	5	ug/l	<5	<5	0.0	No Limit
	, alonginous	EP074: 1.2 Dichloropropane	78-87-5	5	µg/_	<5	<5	0.0	No Limit
		EP074: cis-1 3-Dichloropropylene	10061-01-5	5	µg/_	<5	<5	0.0	No Limit
		EP074: trans 1.3 Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1 2 Dibromoethano (EDP)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
ES23/2163-007	Δησηγραμε		594-20-7	5	µg/L	<5	<5	0.0	No Limit
202072100-001	, monymous		78_87 5	5	µ9/⊏ µ0/I	-5	<5	0.0	No Limit
			10061_01_5	5	µ9/⊏ µ∩/I	<5	<5	0.0	No Limit
		EP074: dis-1.3-Dichloropropylene	10061-01-5	5	ру/с uo/l	<5	<5	0.0	No Limit
			106-03-4	5	µ9/⊏ µa/l	<5	<5	0.0	No Limit
		EFU14. 1.2-DIDIOIIIOEIIIAIIE (EDD)	100-30-4	5	P9/L	-0	-U	0.0	

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0.0

No Limit

<5

Sub-Matrix: WATER						Laboratory L	Duplicate (DUP) Report	Duplicate (DUP) Report RPD (%) Acceptable RF <5 0.0 No Limit <5		
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)	
EP074E: Halogenated	Aliphatic Compounds (C	QC Lot: 5473350)								
ES2342083-001	Anonymous	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit	
		EP074: lodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit	
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit	
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit	
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit	
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit	
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit	
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit	
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit	
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit	
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit	
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit	
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit	
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit	
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit	
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit	
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit	
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit	
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit	
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit	
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit	
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit	
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit	
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit	
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit	
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit	
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit	
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit	
ES2342163-007	Anonymous	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit	
		EP074: lodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit	
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit	
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit	
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit	
		EP074: 1.1.1-Trichloroethane	71-55-6	5	μg/L	<5	<5	0.0	No Limit	
		EP074: 1.1-Dichloropropylene	563-58-6	5	μg/L	<5	<5	0.0	No Limit	
		EP074: Carbon Tetrachloride	56-23-5	5	μg/L	<5	<5	0.0	No Limit	
		EP074: 1.2-Dichloroethane	107-06-2	5	μg/L	<5	<5	0.0	No Limit	

79-01-6

EP074: Trichloroethene

5

µg/L

<5

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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 (%)
EP074E: Halogenated	Aliphatic Compounds (QC	CLot: 5473350) - continued							
ES2342163-007	Anonymous	EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit
EP074F: Halogenated	Aromatic Compounds (QC	C Lot: 5473350)							
ES2342083-001	Anonymous	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
ES2342163-007	Anonymous	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	5	μg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit

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Sub-Matrix: WATER					Laboratory Duplicate (DUP) Report LOR Unit Original Result Duplicate Result RPD (%) Activity				
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP074G: Trihalometh	anes (QC Lot: 5473350)								
ES2342083-001	Anonymous	EP074: Chloroform	67-66-3	5	μg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	μg/L	<5	<5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5	μg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
ES2342163-007	Anonymous	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
EP074H: Naphthalene	e (QC Lot: 5473350)								
ES2342083-001	Anonymous	EP074: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES2342163-007	Anonymous	EP074: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
EP080/071: Total Petr	oleum Hydrocarbons (QC I	.ot: 5473333)	l de la desideración de						
CA2307614-001	Anonymous	EP080: C6 - C9 Fraction		20	µg/L	<20	<20	0.0	No Limit
WN2314256-001	Anonymous	EP080: C6 - C9 Fraction		20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Petr	oleum Hydrocarbons (QC L	_ot: 5473349)	l de la composición d						
ES2342083-001	Anonymous	EP080: C6 - C9 Fraction		20	µg/L	<20	<20	0.0	No Limit
ES2342163-007	Anonymous	EP080: C6 - C9 Fraction		20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Rec	overable Hydrocarbons - NE	EPM 2013 Fractions (QC Lot: 5473333)							
CA2307614-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
WN2314256-001	Anonymous	EP080: C6 - C10 Fraction	 C6_C10	20	μg/L	<20	<20	0.0	No Limit
EP080/071: Total Rec	overable Hydrocarbons - NE	EPM 2013 Fractions (QC Lot: 5473349)							
ES2342083-001	Anonymous	EP080: C6 - C10 Fraction	C6 C10	20	µg/L	<20	<20	0.0	No Limit
ES2342163-007	Anonymous	EP080: C6 - C10 Fraction	 C6_C10	20	μg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC L	.ot: 5473333)								
CA2307614-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	μg/L	<5	<5	0.0	No Limit
WN2314256-001	Anonymous	EP080: Benzene	71-43-2	1	μg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	μg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	μg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	μg/L	<2	<2	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit

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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 (%)	
EP080: BTEXN (QC L	ot: 5473333) - continued									
WN2314256-001	Anonymous	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit	
EP080: BTEXN (QC L	ot: 5473349)									
ES2342083-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit	
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit	
ES2342163-007	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit	
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Naphthalene	91-20-3	5	μg/L	<5	<5	0.0	No Limit	



Method Blank (MB) and Laboratory Control Sample (LCS) Report

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.

Sub-Matrix: WATER				Method Blank (MB)	Laboratory Control Spike (LCS) Report			
				Report	Spike	ike Spike Recovery (%) Acceptable		e Limits (%)
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot:	5481696)							
EA025H: Suspended Solids (SS)		5	mg/L	<5	150 mg/L	110	83.0	129
				<5	1000 mg/L	102	82.0	110
				<5	841 mg/L	100	83.0	118
ED037P: Alkalinity by PC Titrator (QCLot: 5472893)								
ED037-P: Total Alkalinity as CaCO3			mg/L		200 mg/L	99.0	81.0	115
					50 mg/L	103	80.0	120
ED037P: Alkalinity by PC Titrator (QCLot: 5479681)								
ED037-P: Total Alkalinity as CaCO3			mg/L		200 mg/L	99.0	81.0	115
					50 mg/L	104	80.0	120
ED037P: Alkalinity by PC Titrator (QCLot: 5481215)								
ED037-P: Total Alkalinity as CaCO3			mg/L		200 mg/L	94.8	81.0	115
					50 mg/L	102	80.0	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot:	5474192)							
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	107	82.0	122
				<1	500 mg/L	96.2	82.0	122
ED045G: Chloride by Discrete Analyser (QCLot: 5474195)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	50 mg/L	100	80.9	127
				<1	1000 mg/L	96.0	80.9	127
ED093F: Dissolved Major Cations (QCLot: 5480920)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	98.2	80.0	114
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	103	90.0	116
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	101	82.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	99.8	85.0	113
EG020F: Dissolved Metals by ICP-MS (QCLot: 5477767)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	92.3	85.0	114
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	90.9	82.0	110
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	94.9	82.0	112
EG020T: Total Metals by ICP-MS (QCLot: 5477706)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	97.7	82.0	114
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	95.3	86.0	116
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	94.2	83.0	118

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Sub-Matrix: WATER				Method Blank (MB)	Laboratory Control Spike (LCS) Report			
				Report	Spike	Spike Recovery (%)	Acceptable	Limits (%)
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 5477706) - c	continued							
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	92.4	85.0	115
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	96.2	85.0	113
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	94.8	79.0	117
EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	107	75.0	129
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	98.9	85.0	117
EG020T: Total Metals by ICP-MS (QCLot: 5480957)						- 1		
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	96.4	82.0	114
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	96.1	86.0	116
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	93.7	83.0	118
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	98.9	85.0	115
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	97.0	85.0	113
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	96.1	79.0	117
EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	97.7	75.0	129
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	95.9	85.0	117
EG050T: Total Hexavalent Chromium (QCLot: 5473085	5)							
EG050G-T: Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	0.05 mg/L	98.0	87.0	113
EK057G: Nitrite as N by Discrete Analyser (QCLot: 54	74194)							
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	99.8	82.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete A	nalvser (QCLot: 54	77564)				-		
EK059G: Nitrite + Nitrate as N		0.01	mg/L	<0.01	0.5 mg/L	106	91.0	113
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete A	nalvser (QCLot: 54	77565)						
EK059G: Nitrite + Nitrate as N		0.01	mg/L	<0.01	0.5 mg/L	108	91.0	113
EK061G: Total Kieldahl Nitrogen By Discrete Analyser	(QCLot: 5477560)							
EK061G: Total Kjeldahl Nitrogen as N		0.1	mg/L	<0.1	10 mg/L	99.3	69.0	101
				<0.1	1 mg/L	92.2	70.0	118
				<0.1	5 mg/L	83.5	70.0	130
EK061G: Total Kieldahl Nitrogen By Discrete Analyser	(QCLot: 5477561)							
EK061G: Total Kjeldahl Nitrogen as N		0.1	mg/L	<0.1	10 mg/L	99.4	69.0	101
				<0.1	1 mg/L	90.6	70.0	118
				<0.1	5 mg/L	102	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser	(QCLot: 5477559)				·			
EK067G: Total Phosphorus as P		0.01	mg/L	<0.01	4.42 mg/L	91.9	71.3	126
				<0.01	0.442 mg/L	87.4	71.3	126
				<0.01	1 mg/L	104	70.0	130

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Sub-Matrix: WATER				Method Blank (MB)	Laboratory Control Spike (LCS) Report				
				Report	Spike	Spike Recovery (%)	Acceptable	Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High	
EP005: Total Organic Carbon (TOC) (QCLot: 5474170)									
EP005: Total Organic Carbon		1	mg/L	<1	10 mg/L	106	72.0	120	
EP005: Total Organic Carbon (TOC) (QCLot: 5474184)									
EP005: Total Organic Carbon		1	mg/L	<1	10 mg/L	90.5	72.0	120	
EP068A: Organochlorine Pesticides (OC) (QCLot: 5473	066)								
EP068: alpha-BHC	319-84-6	0.5	µg/L	<0.5	5 µg/L	80.7	64.9	107	
EP068: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	5 µg/L	96.0	58.3	111	
EP068: beta-BHC	319-85-7	0.5	µg/L	<0.5	5 µg/L	82.2	69.0	117	
EP068: gamma-BHC	58-89-9	0.5	µg/L	<0.5	5 µg/L	79.4	70.0	112	
EP068: delta-BHC	319-86-8	0.5	µg/L	<0.5	5 µg/L	82.7	68.9	110	
EP068: Heptachlor	76-44-8	0.5	µg/L	<0.5	5 µg/L	85.3	65.2	108	
EP068: Aldrin	309-00-2	0.5	µg/L	<0.5	5 µg/L	88.2	65.8	109	
EP068: Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	5 µg/L	89.0	67.1	107	
EP068: trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	5 µg/L	87.8	64.1	110	
EP068: alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	5 µg/L	91.4	66.7	112	
EP068: cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	5 µg/L	88.6	63.2	111	
EP068: Dieldrin	60-57-1	0.5	µg/L	<0.5	5 µg/L	92.2	65.2	113	
EP068: 4.4`-DDE	72-55-9	0.5	µg/L	<0.5	5 µg/L	90.8	66.0	112	
EP068: Endrin	72-20-8	0.5	µg/L	<0.5	5 µg/L	97.3	65.2	113	
EP068: beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	5 µg/L	89.8	67.3	114	
EP068: 4.4`-DDD	72-54-8	0.5	µg/L	<0.5	5 µg/L	94.3	72.0	122	
EP068: Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	5 µg/L	84.6	66.9	109	
EP068: Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	5 µg/L	87.7	65.2	112	
EP068: 4.4`-DDT	50-29-3	2	µg/L	<2.0	5 µg/L	85.7	65.2	112	
EP068: Endrin ketone	53494-70-5	0.5	µg/L	<0.5	5 µg/L	81.1	63.8	110	
EP068: Methoxychlor	72-43-5	2	µg/L	<2.0	5 µg/L	88.6	61.1	114	
EP068B: Organophosphorus Pesticides (OP) (QCLot: 5	5473066)								
EP068: Dichlorvos	62-73-7	0.5	µg/L	<0.5	5 μg/L	88.5	65.6	114	
EP068: Demeton-S-methyl	919-86-8	0.5	µg/L	<0.5	5 μg/L	82.6	63.7	113	
EP068: Monocrotophos	6923-22-4	2	µg/L	<2.0	5 µg/L	24.4	19.7	48.0	
EP068: Dimethoate	60-51-5	0.5	µg/L	<0.5	5 µg/L	82.3	69.5	110	
EP068: Diazinon	333-41-5	0.5	µg/L	<0.5	5 µg/L	92.8	71.1	110	
EP068: Chlorpyrifos-methyl	5598-13-0	0.5	µg/L	<0.5	5 µg/L	88.6	77.0	119	
EP068: Parathion-methyl	298-00-0	2	µg/L	<2.0	5 µg/L	81.7	70.0	124	
EP068: Malathion	121-75-5	0.5	µg/L	<0.5	5 µg/L	91.6	68.4	116	

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Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report					
			Spike		Spike Spike Recovery (%) Acceptable Limits (%)					
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High		
EP068B: Organophosphorus Pesticides (OP) (QCLot: 5473066) - continued										
EP068: Fenthion	55-38-9	0.5	µg/L	<0.5	5 µg/L	86.0	68.6	112		
EP068: Chlorpyrifos	2921-88-2	0.5	µg/L	<0.5	5 µg/L	90.3	75.0	119		
EP068: Parathion	56-38-2	2	µg/L	<2.0	5 µg/L	80.8	67.0	121		
EP068: Pirimphos-ethyl	23505-41-1	0.5	µg/L	<0.5	5 µg/L	90.0	69.0	121		
EP068: Chlorfenvinphos	470-90-6	0.5	µg/L	<0.5	5 µg/L	86.4	71.8	110		
EP068: Bromophos-ethyl	4824-78-6	0.5	µg/L	<0.5	5 μg/L	90.4	67.5	112		
EP068: Fenamiphos	22224-92-6	0.5	µg/L	<0.5	5 μg/L	85.5	64.1	116		
EP068: Prothiofos	34643-46-4	0.5	µg/L	<0.5	5 μg/L	89.9	67.8	114		
EP068: Ethion	563-12-2	0.5	µg/L	<0.5	5 μg/L	91.6	74.0	120		
EP068: Carbophenothion	786-19-6	0.5	µg/L	<0.5	5 µg/L	95.8	66.2	114		
EP068: Azinphos Methyl	86-50-0	0.5	µg/L	<0.5	5 µg/L	70.9	51.6	128		
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 5473350)										
EP074: Benzene	71-43-2	1	µg/L	<1	10 µg/L	101	77.0	119		
EP074: Toluene	108-88-3	2	µg/L	<2	10 µg/L	102	69.0	129		
EP074: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	101	76.0	118		
EP074: meta- & para-Xylene	108-38-3	2	µg/L	<2	20 µg/L	100	77.0	119		
	106-42-3									
EP074: Styrene	100-42-5	5	µg/L	<5	10 µg/L	100	73.0	119		
EP074: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	101	79.0	117		
EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	10 µg/L	101	76.0	118		
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	10 µg/L	101	69.0	119		
EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	10 µg/L	101	74.0	116		
EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	10 µg/L	101	73.0	119		
EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	10 µg/L	102	74.0	116		
EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	10 µg/L	102	72.0	116		
EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	10 µg/L	99.7	71.0	119		
EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	10 µg/L	101	65.0	123		
EP074B: Oxygenated Compounds (QCLot: 547335	50)									
EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	100 µg/L	87.9	61.4	134		
EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	100 µg/L	90.4	73.6	130		
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	100 µg/L	104	66.0	132		
EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	100 µg/L	87.4	65.0	137		
EP074C: Sulfonated Compounds (QCLot: 5473350))									
EP074: Carbon disulfide	75-15-0	5	µg/L	<5	10 µg/L	96.2	72.8	127		
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Client	: ROBERT CARR & ASSOCIATES P/L									
Project	: 15579 - Quarterly Monitoring									



Sub-Matrix: WATER			Method Blank (MB)	Laboratory Control Spike (LCS) Report				
				Report	Spike	Spike Recovery (%)	Acceptable	e Limits (%)
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP074D: Fumigants (QCLot: 5473350)								
EP074: 2.2-Dichloropropane	594-20-7	5	μg/L	<5	10 µg/L	88.7	68.0	122
EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	10 µg/L	103	76.0	118
EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	10 µg/L	103	62.0	120
EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	10 µg/L	103	60.0	114
EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	10 µg/L	104	69.0	117
EP074E: Halogenated Aliphatic Compounds (C	QCLot: 5473350)					-	L.	•
EP074: Dichlorodifluoromethane	75-71-8	50	μg/L	<50	100 µg/L	92.1	60.6	138
EP074: Chloromethane	74-87-3	50	μg/L	<50	100 µg/L	97.1	67.4	130
EP074: Vinyl chloride	75-01-4	50	μg/L	<50	100 µg/L	93.9	69.4	129
EP074: Bromomethane	74-83-9	50	µg/L	<50	100 µg/L	98.8	56.0	140
EP074: Chloroethane	75-00-3	50	µg/L	<50	100 µg/L	97.9	61.0	139
EP074: Trichlorofluoromethane	75-69-4	50	μg/L	<50	100 µg/L	98.0	69.0	131
EP074: 1.1-Dichloroethene	75-35-4	5	μg/L	<5	10 µg/L	98.8	70.0	124
EP074: Iodomethane	74-88-4	5	µg/L	<5	10 µg/L	114	70.2	128
EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	10 µg/L	94.7	74.0	118
EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	10 µg/L	87.2	74.0	120
EP074: cis-1.2-Dichloroethene	156-59-2	5	μg/L	<5	10 µg/L	89.4	77.0	119
EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	10 µg/L	95.6	67.0	119
EP074: 1.1-Dichloropropylene	563-58-6	5	μg/L	<5	10 µg/L	100	73.0	119
EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	10 µg/L	97.3	62.0	120
EP074: 1.2-Dichloroethane	107-06-2	5	μg/L	<5	10 µg/L	98.7	73.0	123
EP074: Trichloroethene	79-01-6	5	μg/L	<5	10 µg/L	101	76.0	118
EP074: Dibromomethane	74-95-3	5	μg/L	<5	10 µg/L	104	73.0	119
EP074: 1.1.2-Trichloroethane	79-00-5	5	μg/L	<5	10 µg/L	105	72.0	126
EP074: 1.3-Dichloropropane	142-28-9	5	μg/L	<5	10 µg/L	104	71.0	129
EP074: Tetrachloroethene	127-18-4	5	μg/L	<5	10 µg/L	102	72.0	124
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	μg/L	<5	10 µg/L	101	66.0	114
EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	μg/L	<5	10 µg/L	104	60.0	120
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	μg/L	<5	10 µg/L	104	70.6	128
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	μg/L	<5	10 µg/L	106	70.0	124
EP074: 1.2.3-Trichloropropane	96-18-4	5	μg/L	<5	10 µg/L	105	74.0	126
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	10 µg/L	100.0	71.8	126
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	10 µg/L	103	66.4	136
EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	10 µg/L	105	58.0	130

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Sub-Matrix: WATER				Method Blank (MB)	Laboratory Control Spike (LCS) Report				
				Report	Spike	Spike Recovery (%)	Acceptable	Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High	
EP074F: Halogenated Aromatic Compounds (QCLot:	5473350)								
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	10 µg/L	103	79.0	117	
EP074: Bromobenzene	108-86-1	5	µg/L	<5	10 µg/L	103	76.0	116	
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	10 µg/L	102	73.0	119	
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	10 µg/L	102	73.0	119	
EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	10 µg/L	102	75.0	117	
EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	10 µg/L	103	74.0	118	
EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	10 µg/L	104	75.0	117	
EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	10 µg/L	105	61.0	125	
EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	10 µg/L	110	67.0	123	
EP074G: Trihalomethanes (QCLot: 5473350)									
EP074: Chloroform	67-66-3	5	µg/L	<5	10 µg/L	93.3	72.0	120	
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	10 µg/L	102	64.0	118	
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	10 µg/L	102	65.0	115	
EP074: Bromoform	75-25-2	5	µg/L	<5	10 µg/L	99.9	73.5	126	
EP074H: Naphthalene (QCLot: 5473350)									
EP074: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	110	72.0	122	
EP080/071: Total Petroleum Hvdrocarbons (QCLot: 5	473333)								
EP080: C6 - C9 Fraction		20	µg/L	<20	260 µg/L	107	75.0	127	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5	473349)								
EP080: C6 - C9 Fraction		20	µg/L	<20	260 µg/L	85.4	75.0	127	
EP080/071: Total Recoverable Hydrocarbons - NEPM	2013 Fractions (QC	Lot: 5473333)					1		
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	103	75.0	127	
EP080/071: Total Recoverable Hydrocarbons - NEPM	2013 Fractions (QC	l of: 5473349)							
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	83.2	75.0	127	
EP080: BTEXN (OCL of: 5473333)									
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	96.7	68.3	119	
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	102	73.5	120	
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	106	73.8	122	
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	106	73.0	122	
	106-42-3								
EP080: ortho-Xylene	95-47-6	2	μg/L	<2	10 µg/L	111	76.4	123	
EP080: Naphthalene	91-20-3	5	μg/L	<5	10 µg/L	99.1	75.5	124	
EP080: BTEXN (QCLot: 5473349)									
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	96.3	68.3	119	



Sub-Matrix: WATER				Method Blank (MB)	Laboratory Control Spike (LCS) Report				
			Report	Spike	Spike Recovery (%)	Acceptable Limits (%)			
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High	
EP080: BTEXN (QCLot: 5473349) - continued									
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	97.0	73.5	120	
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	94.5	73.8	122	
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	93.6	73.0	122	
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	95.6	76.4	123	
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	89.2	75.5	124	

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	SpikeRecovery(%)	Acceptable L	imits (%)	
Laboratory sample ID	Sample ID	Method: Compound CAS	Concentration	MS	Low	High		
ED041G: Sulfate (T	urbidimetric) as SO4 2- by DA (QCLot: 5474192)							
ES2342020-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric 148	808-79-8	10 mg/L	# Not	70.0	130	
					Determined			
ED045G: Chloride	by Discrete Analyser (QCLot: 5474195)							
ES2342020-001	Anonymous	ED045G: Chloride 168	887-00-6	250 mg/L	81.9	70.0	130	
EG020F: Dissolved	Metals by ICP-MS (QCLot: 5477767)							
ES2342102-003	UW3	EG020A-F: Arsenic 744	40-38-2	1 mg/L	104	70.0	130	
		EG020A-F: Manganese 743	39-96-5	1 mg/L	99.6	70.0	130	
EG020T: Total Meta	als by ICP-MS (QCLot: 5477706)							
ES2341301-012	Anonymous	EG020A-T: Arsenic 744	40-38-2	2 mg/L	108	70.0	130	
		EG020A-T: Chromium 744	40-47-3	2 mg/L	103	70.0	130	
		EG020A-T: Copper 744	40-50-8	2 mg/L	104	70.0	130	
		EG020A-T: Lead 743	39-92-1	2 mg/L	108	70.0	130	
		EG020A-T: Manganese 743	39-96-5	2 mg/L	106	70.0	130	
		EG020A-T: Zinc 744	40-66-6	2 mg/L	106	70.0	130	
EG020T: Total Meta	als by ICP-MS (QCLot: 5480957)							
ES2341869-001	Anonymous	EG020A-T: Arsenic 744	40-38-2	1 mg/L	103	70.0	130	
		EG020A-T: Chromium 744	40-47-3	1 mg/L	105	70.0	130	
		EG020A-T: Copper 744	40-50-8	1 mg/L	102	70.0	130	
		EG020A-T: Lead 743	39-92-1	1 mg/L	103	70.0	130	
		EG020A-T: Manganese 743	39-96-5	1 mg/L	105	70.0	130	
		EG020A-T: Zinc 744	40-66-6	1 mg/L	101	70.0	130	
EG050T: Total Hex	avalent Chromium (QCLot: 5473085)							

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Matrix Spike (MS) Report Sub-Matrix: WATER Spike SpikeRecovery(%) Acceptable Limits (%) Laboratory sample ID Sample ID CAS Number Concentration MS Method: Compound Low High EG050T: Total Hexavalent Chromium (QCLot: 5473085) - continued 18540-29-9 ES2341942-001 Anonymous 0.05 mg/L 80.8 70.0 130 EG050G-T: Hexavalent Chromium EK057G: Nitrite as N by Discrete Analyser (QCLot: 5474194) ES2342020-001 14797-65-0 130 Anonymous 0.5 mg/L 101 70.0 EK057G: Nitrite as N EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5477564) ES2342084-001 Anonymous 0.5 mg/L 96.5 70.0 130 EK059G: Nitrite + Nitrate as N ____ EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5477565) ES2342102-005 DUP 0.5 mg/L 114 70.0 130 EK059G: Nitrite + Nitrate as N -----EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5477560) ES2342084-002 Anonymous 100 mg/L 87.5 70.0 130 EK061G: Total Kjeldahl Nitrogen as N ----EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5477561) ES2342131-002 Anonymous EK061G: Total Kjeldahl Nitrogen as N ____ 100 mg/L 99.1 70.0 130 EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5477559) ES2342084-002 Anonymous 20 mg/L 102 70.0 130 EK067G: Total Phosphorus as P -----EP005: Total Organic Carbon (TOC) (QCLot: 5474170) ES2341984-004 Anonymous 1000 mg/L 108 70.0 130 EP005: Total Organic Carbon ----EP005: Total Organic Carbon (TOC) (QCLot: 5474184) ES2342075-035 Anonymous 200 mg/L 111 70.0 130 EP005: Total Organic Carbon ----EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 5473350) ES2342083-001 71-43-2 Anonymous 25 µg/L 104 70.0 130 EP074: Benzene 108-88-3 25 µg/L 105 70.0 130 EP074: Toluene EP074E: Halogenated Aliphatic Compounds (QCLot: 5473350) ES2342083-001 75-35-4 25 µg/L 88.7 70.0 130 Anonymous EP074: 1.1-Dichloroethene 79-01-6 97.7 70.0 130 EP074: Trichloroethene 25 µg/L EP074F: Halogenated Aromatic Compounds (QCLot: 5473350) ES2342083-001 Anonymous EP074: Chlorobenzene 108-90-7 25 µg/L 108 70.0 130 EP080/071: Total Petroleum Hydrocarbons (QCLot: 5473333) CA2307614-001 325 µg/L 121 70.0 130 Anonymous EP080: C6 - C9 Fraction ----EP080/071: Total Petroleum Hydrocarbons (QCLot: 5473349) ES2342083-001 Anonymous 325 µg/L 79.9 70.0 130 EP080: C6 - C9 Fraction ----EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5473333) CA2307614-001 C6 C10 375 µg/L 117 70.0 130 Anonymous EP080: C6 - C10 Fraction EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5473349) ES2342083-001 C6 C10 375 µg/L 79.7 70.0 130 Anonymous EP080: C6 - C10 Fraction



Sub-Matrix: WATER					Matrix Spike (MS) Report				
				Spike	SpikeRecovery(%)	Acceptable I	.imits (%)		
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High		
EP080: BTEXN (Q	CLot: 5473333)								
CA2307614-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	114	70.0	130		
		EP080: Toluene	108-88-3	25 µg/L	117	70.0	130		
		EP080: Ethylbenzene	100-41-4	25 µg/L	115	70.0	130		
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	126	70.0	130		
			106-42-3						
		EP080: ortho-Xylene	95-47-6	25 µg/L	125	70.0	130		
		EP080: Naphthalene	91-20-3	25 µg/L	97.0	70.0	130		
EP080: BTEXN (Q	CLot: 5473349)								
ES2342083-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	99.2	70.0	130		
		EP080: Toluene	108-88-3	25 µg/L	94.3	70.0	130		
		EP080: Ethylbenzene	100-41-4	25 µg/L	95.2	70.0	130		
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	96.4	70.0	130		
			106-42-3						
		EP080: ortho-Xylene	95-47-6	25 µg/L	95.1	70.0	130		
		EP080: Naphthalene	91-20-3	25 µg/L	98.5	70.0	130		



QA/QC Compliance Assessment to assist with Quality Review								
Work Order	ES2342102	Page	: 1 of 9					
Amendment	: 1							
Client	: ROBERT CARR & ASSOCIATES P/L	Laboratory	: Environmental Division Sydney					
Contact	: MS FIONA BROOKER	Telephone	: +61-2-8784 8555					
Project	: 15579 - Quarterly Monitoring	Date Samples Received	: 05-Dec-2023					
Site	:	Issue Date	: 23-Jan-2024					
Sampler	:	No. of samples received	: 7					
Order number	:	No. of samples analysed	: 7					

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.
- <u>NO</u> Duplicate outliers occur.
- <u>NO</u> Laboratory Control outliers occur.
- Matrix Spike outliers exist please see following pages for full details.
- For all regular sample matrices, 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							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	ES2342020001	Anonymous	Sulfate as SO4 -	14808-79-8	Not		MS recovery not determined,
			Turbidimetric		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 Date analysed Due for analysis Days Days overdue overdue EP005: Total Organic Carbon (TOC) Clear Plastic Bottle - Natural UW2. UW3. 07-Dec-2023 06-Dec-2023 1 DUP EP025: Oxygen - Dissolved (DO) Clear Plastic Bottle - Natural DUP UW2. 06-Dec-2023 05-Dec-2023 1

Outliers : Frequency of Quality Control Samples

Quality Control Sample Type			Count		(%)	Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)						
Pesticides by GCMS	EP068	0	2	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
Pesticides by GCMS	EP068	0	2	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.

		Evaluation:	x =	Holding	time	breach ;	√ =	Within	holding	time
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Matrix: WATER				Evaluation	: × = Holding time	breach ; 🗸 = Within	n holding time.
Method	Sample Date	Ex	traction / Preparation				
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H)							
US1	05-Dec-2023				10-Dec-2023	12-Dec-2023	✓



Evaluation: \star = Holding time breach ; \checkmark = Within holding time.

Analysis

Matrix: WATER Method Sample Date Extraction / Preparation Container / Client Sample ID(s) Due for

Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P) UW2, DUP	UW3,	05-Dec-2023				07-Dec-2023	19-Dec-2023	~
Clear Plastic Bottle - Natural (ED037-P) US1		05-Dec-2023				08-Dec-2023	19-Dec-2023	~
Clear Plastic Bottle - Natural (ED037-P) UL1		05-Dec-2023				10-Dec-2023	19-Dec-2023	~
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G) US1		05-Dec-2023				07-Dec-2023	02-Jan-2024	1
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G) US1, UW3, DUP	UW2, UL1,	05-Dec-2023				07-Dec-2023	02-Jan-2024	~
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F) US1		05-Dec-2023				09-Dec-2023	12-Dec-2023	~
EG020F: Dissolved Metals by ICP-MS								
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) UW2, DUP	UW3,	05-Dec-2023				08-Dec-2023	02-Jun-2024	~
EG020T: Total Metals by ICP-MS								
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T) UL1		05-Dec-2023	08-Dec-2023	02-Jun-2024	1	08-Dec-2023	02-Jun-2024	~
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T) US1		05-Dec-2023	09-Dec-2023	02-Jun-2024	1	09-Dec-2023	02-Jun-2024	~
EG050T: Total Hexavalent Chromium								
Clear Plastic Bottle - NaOH (EG050G-T) US1		05-Dec-2023				06-Dec-2023	02-Jan-2024	~
Clear Plastic Bottle - Natural (EG050G-T) UL1		05-Dec-2023				06-Dec-2023	06-Dec-2023	~
EK057G: Nitrite as N by Discrete Analyser								
Clear Plastic Bottle - Natural (EK057G) US1, UW3, DUP	UW2, UL1,	05-Dec-2023				07-Dec-2023	07-Dec-2023	~



Matrix: WATER Evaluation: * = Holding time breach ; \checkmark = Within holding time. Method Sample Date Extraction / Preparation Analysis Container / Client Sample ID(s) Due for extraction Evaluation Due for analysis Evaluation Date extracted Date analysed EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser Clear Plastic Bottle - Sulfuric Acid (EK059G) 02-Jan-2024 \checkmark US1. UW2. 05-Dec-2023 ----08-Dec-2023 ____ UW3 UL1. DUP EK061G: Total Kjeldahl Nitrogen By Discrete Analyser Clear Plastic Bottle - Sulfuric Acid (EK061G) UW2. 05-Dec-2023 08-Dec-2023 02-Jan-2024 08-Dec-2023 02-Jan-2024 US1. 1 \checkmark UW3. UL1. DUP EK067G: Total Phosphorus as P by Discrete Analyser Clear Plastic Bottle - Sulfuric Acid (EK067G) 02-Jan-2024 08-Dec-2023 02-Jan-2024 05-Dec-2023 08-Dec-2023 US1. UL1 1 1 EP005: Total Organic Carbon (TOC) Amber TOC Vial - Sulfuric Acid (EP005) US1 UL1 05-Dec-2023 ----08-Dec-2023 02-Jan-2024 ✓ --------Clear Plastic Bottle - Natural (EP005) 06-Dec-2023 05-Dec-2023 07-Dec-2023 UW2. UW3. -------x DUP EP025: Oxygen - Dissolved (DO) Clear Plastic Bottle - Natural (EP025) 05-Dec-2023 06-Dec-2023 05-Dec-2023 UW2. DUP ------------12 EP068A: Organochlorine Pesticides (OC) Amber Glass Bottle - Unpreserved (EP068) 12-Dec-2023 15-Jan-2024 05-Dec-2023 07-Dec-2023 UL1 06-Dec-2023 1 1 EP068B: Organophosphorus Pesticides (OP) Amber Glass Bottle - Unpreserved (EP068) UL1 05-Dec-2023 06-Dec-2023 12-Dec-2023 1 07-Dec-2023 15-Jan-2024 ✓ EP074A: Monocyclic Aromatic Hydrocarbons Amber VOC Vial - Sulfuric Acid (EP074) 19-Dec-2023 19-Dec-2023 05-Dec-2023 08-Dec-2023 1 08-Dec-2023 UL1 \checkmark EP074B: Oxygenated Compounds Amber VOC Vial - Sulfuric Acid (EP074) 05-Dec-2023 08-Dec-2023 19-Dec-2023 08-Dec-2023 19-Dec-2023 UL1 1 \checkmark EP074C: Sulfonated Compounds Amber VOC Vial - Sulfuric Acid (EP074) UL1 05-Dec-2023 08-Dec-2023 19-Dec-2023 08-Dec-2023 19-Dec-2023 \checkmark \checkmark **EP074D: Fumigants** Amber VOC Vial - Sulfuric Acid (EP074) 05-Dec-2023 08-Dec-2023 19-Dec-2023 08-Dec-2023 19-Dec-2023 UL1 \checkmark \checkmark



Matrix: WATER					Evaluation	: × = Holding time	breach ; ✓ = Withi	in holding time
Method		Sample Date	Ex	traction / Preparation			Analysis	
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP074E: Halogenated Aliphatic Compounds								
Amber VOC Vial - Sulfuric Acid (EP074) UL1		05-Dec-2023	08-Dec-2023	19-Dec-2023	1	08-Dec-2023	19-Dec-2023	1
EP074F: Halogenated Aromatic Compounds								
Amber VOC Vial - Sulfuric Acid (EP074) UL1		05-Dec-2023	08-Dec-2023	19-Dec-2023	1	08-Dec-2023	19-Dec-2023	1
EP074G: Trihalomethanes								
Amber VOC Vial - Sulfuric Acid (EP074) UL1		05-Dec-2023	08-Dec-2023	19-Dec-2023	1	08-Dec-2023	19-Dec-2023	1
EP074H: Naphthalene								
Amber VOC Vial - Sulfuric Acid (EP074) UL1		05-Dec-2023	08-Dec-2023	19-Dec-2023	1	08-Dec-2023	19-Dec-2023	✓
EP080/071: Total Petroleum Hydrocarbons								
Amber VOC Vial - Sulfuric Acid (EP080) TRIP BLANK		24-Nov-2023	07-Dec-2023	08-Dec-2023	1	07-Dec-2023	08-Dec-2023	1
EP080/071: Total Recoverable Hydrocarbons - N	IEPM 2013 Fractions							
Amber VOC Vial - Sulfuric Acid (EP080) TRIP BLANK		24-Nov-2023	07-Dec-2023	08-Dec-2023	1	07-Dec-2023	08-Dec-2023	1
EP080: BTEXN								
Amber VOC Vial - Sulfuric Acid (EP080) US1		05-Dec-2023	08-Dec-2023	19-Dec-2023	4	08-Dec-2023	19-Dec-2023	✓
Amber VOC Vial - Sulfuric Acid (EP080) TRIP BLANK,	TRIP SPIKE 5	24-Nov-2023	07-Dec-2023	08-Dec-2023	1	07-Dec-2023	08-Dec-2023	✓



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		C	ount		Rate (%)		Quality Control Specification					
Analytical Methods	Method	QC	Reaular	Actual	Expected	Evaluation						
Laboratory Duplicates (DUP)												
Alkalinity by Auto Titrator	ED037-P	5	46	10.87	10.00	✓	NEPM 2013 B3 & ALS QC Standard					
Chloride by Discrete Analyser	ED045G	2	19	10.53	10.00	~	NEPM 2013 B3 & ALS QC Standard					
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard					
Hexavalent Chromium by Discrete Analyser - Total	EG050G-T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard					
Major Cations - Dissolved	ED093F	2	6	33.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard					
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	4	40	10.00	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					
Pesticides by GCMS	EP068	0	2	0.00	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					
Suspended Solids (High Level)	EA025H	4	38	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard					
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	4	40	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard					
Total Metals by ICP-MS - Suite A	EG020A-T	4	40	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard					
Total Organic Carbon	EP005	4	34	11.76	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					
TRH Volatiles/BTEX	EP080	4	31	12.90	10.00	✓	NEPM 2013 B3 & ALS QC Standard					
Volatile Organic Compounds	EP074	2	17	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard					
Laboratory Control Samples (LCS)												
Alkalinity by Auto Titrator	ED037-P	6	46	13.04	10.00	✓	NEPM 2013 B3 & ALS QC Standard					
Chloride by Discrete Analyser	ED045G	2	19	10.53	10.00	~	NEPM 2013 B3 & ALS QC Standard					
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard					
Hexavalent Chromium by Discrete Analyser - Total	EG050G-T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard					
Major Cations - Dissolved	ED093F	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard					
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	40	5.00	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					
Pesticides by GCMS	EP068	1	2	50.00	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					
Suspended Solids (High Level)	EA025H	5	38	13.16	12.50	✓	NEPM 2013 B3 & ALS QC Standard					
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	6	40	15.00	15.00	✓	NEPM 2013 B3 & ALS QC Standard					
Total Metals by ICP-MS - Suite A	EG020A-T	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard					
Total Organic Carbon	EP005	2	34	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard					
Total Phosphorus as P By Discrete Analyser	EK067G	3	20	15.00	15.00	✓	NEPM 2013 B3 & ALS QC Standard					
TRH Volatiles/BTEX	EP080	2	31	6.45	5.00	✓	NEPM 2013 B3 & ALS QC Standard					
Volatile Organic Compounds	EP074	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard					
Method Blanks (MB)												
Chloride by Discrete Analyser	ED045G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard					
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	~	NEPM 2013 B3 & ALS QC Standard					

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Work Order	ES2342102 Amendment 1
Client	: ROBERT CARR & ASSOCIATES P/L
Project	: 15579 - Quarterly Monitoring



Matrix: WATER				Evaluatio	n: 🗴 = Quality Co	ontrol frequency i	not within specification ; 🗸 = Quality Control frequency within specification.
Quality Control Sample Type		С	ount		Rate (%)	•	Quality Control Specification
Analytical Methods	Method	QC	Reaular	Actual	Expected	Evaluation	
Method Blanks (MB) - Continued							
Hexavalent Chromium by Discrete Analyser - Total	EG050G-T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	6	16.67	5.00	1	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	40	5.00	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
Pesticides by GCMS	EP068	1	2	50.00	5.00	1	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
Suspended Solids (High Level)	EA025H	2	38	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	40	5.00	5.00	1	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	2	34	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	1	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	31	6.45	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	17	5.88	5.00	1	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	1	NEPM 2013 B3 & ALS QC Standard
Hexavalent Chromium by Discrete Analyser - Total	EG050G-T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	19	5.26	5.00	1	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	0	2	0.00	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	2	40	5.00	5.00	1	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	2	34	5.88	5.00	1	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	1	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	31	6.45	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	17	5.88	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
Suspended Solids (High Level)	EA025H	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of
			`non-filterable` residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water,
			oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um).
			The residue on the filter paper is dried at 104+/-2C . This method is compliant with NEPM Schedule B(3)
Free and Total CO2	EA165-P	WATER	In house: Referenced to APHA 4500-CO2 D. 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 SO4 2- by	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate
Discrete Analyser			ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light
			absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 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 CI - 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 thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by
			either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption
			Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This
			method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B.
			This method is compliant with NEPM Schedule B(3)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered
			prior to analysis. 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.
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.
Trivalent Chromium - Total	EG049G-T	WATER	In house: Referenced to APHA 3500 Cr-B & 3120/3125. Trivalent Chromium is the difference between total
			dissolved and dissolved hexavalent chromium.
Hexavalent Chromium by Discrete	EG050G-T	WATER	In house: Referenced to APHA 3500 Cr-A & B. Hexavalent chromium is determined directly on water sample by
Analyser - Total			Descrete Analyser as received by pH adjustment and colour development using dephenylcarbazide. Each run of
			samples is measured against a five-point calibration curve. This method is compliant with NEPM Schedule B(3).
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser.
			This method is compliant with NEPM Schedule B(3)



Analytical Methods	Method	Matrix	Method Descriptions
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- 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 (NOx) by Discrete	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by
Analyser			Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM
			Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high
Analyser			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 Phosphorus as P By Discrete	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al, Zhang et al. This procedure involves sulphuric acid
Analyser			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)
Ionic Balance by PCT DA and Turbi SO4	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
DA			
Total Organic Carbon	EP005	WATER	In house: Referenced to APHA 5310 B, The automated TOC analyzer determines Total and Inorganic Carbon by
			IR cell. TOC is calculated as the difference. This method is compliant with NEPM Schedule B(3)
Oxygen - Dissolved	EP025	WATER	In house: Referenced to APHA 4500-O G. Dissolved Oxygen Probe. This method is compliant with NEPM
			Schedule B(3)
Pesticides by GCMS	EP068	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS and
			quantification is by comparison against an established 5 point calibration curve. This method is compliant with
			NEPM Schedule B(3)
Volatile Organic Compounds	EP074	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary
			GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is
			compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary
			GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a
			sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This
			method is compliant with the QC requirements of NEPM Schedule B(3)
Preparation Methods	Method	Matrix	Method Descriptions
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
, and the second s			

		B(3)
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)
ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel
		and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated
		and concentrated for analysis. This method is compliant with NEPM Schedule B(3). ALS default excludes
		sediment which may be resident in the container.
ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.
	EN25 ORG14 ORG16-W	EN25 WATER ORG14 WATER ORG16-W WATER

(ALS)	ALS Laboratory: please tic	k →	1	Ph 02 8784 8665 E D Newcastle: 5 Ro Ph 02 4968 9433 E	samplea ægum R tamplas	sydney d, Wara newcast	galsen brook N le@ats	aro.com SVV 230- anvico.co	er D n Pl	Town 107 324 107 475	13 722 Isvilla 95 960	2 E.samp : 14-15 () 0 E: Iowie	ies brisb asma Ct. otticenie	aneiga Bohle writeita	senviro QLD 48 N@nhims	18 18 419 cont	Ph D Ph	03 8549 Adelai 08 835	9 9600 E Ide: 2-1 59 0850	: samples.n Burma Rd I E.adelaide	nelbourne Pooraka 5 gjalsenviro	@atsten A 5095 .com	WID COIL	n P D f	h 08 9. I Laun W 03 c	209 76 cestor 1331 2	85 E 1 1: 27 W 158 E	samples.perth@at Vellington St. Laun Tauncestort@atse	senviro.co iceston TA inviro.com	01 18:7250			
CLIENT:	RCA Australia (ROBCAR)	TURNA	AROUND REQUIREMENTS :	JND REQUIREMENTS: Standard TAT: 13/12/23													Yes	No	(NA													
PCA Pet No:	15579 - Quartely Monitor	ing	ALSO	UOTE NO : SYBO 40	0 18			T				COC	SEQUE	ICE NI	IMBER	(Cire	(al:			-		Free		zen ice	bricks	prese	int upo	on receipt?			(Aes)	X	N/A
NCA KEI NO.	15579 - Quartery monitor		ALUG				coc: 1											Rendom Sample Temperature on Receipt:							C.								
PROJECT MANA	GER: Fiona Brooker	CONTACT F	H: 02 49	02 9225 / 0408 687 529					DF:	1												Othe	e comm	ient					-	- 0-	5		
SAMPLER:		SAMPLER N	OBILE:	RE	LINQU	ISHED	BY:	R	ECEIV	ED B	í :			7			_	1		RELINQ	UISHED	BY:								RE	NEIVED BY	1	
COC Emailed to	ALS?	EDD FORM	AT (or de	efault):	FO	ba	00	re	7	N					5.	12	.2	>				IN	1		,	2 4					UL	j L	
Email Reports to	: administrator@rca.com.a	au + enviro@rca.com.au		D/	TE/TIN	IE:	>	D	ATE/T	IME:						1	50	0		DATE/TI	ME:	0-	2	14		4)			DAT	E/TIME:	07	1931
Email Invoice to:	as above			3	511	2	20	m.							-			č				_		-		8	_				2119	es	112
COMMENTS/SPE	CIAL HANDLING/STORAG	E OR DISPOSAL:			_								_																			_	
ALS USE ONLY	SAI MATRI)	MPLE DETAILS (: Solid(S) Water(W)		CONTAINER INFORMATION					A	When	BIS R	EQUIR Is are requ	ED incl	uding	SUIT	ES (NE	. Suite	Codes	s must b	e listed to a field filtered b	attract sui	te price ed).)			-					Addition	al Informati	ion
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	(working the second structure second structure second seco						Lead	Luteuu Manganese NT01 - Cations: Major (Ca, NT01 - Cations: Major (Ca, Na, K) Suite 12; OCP/OPP Suite 12; OCP/OPP Suite 12; OCP/OPP Total Suspended Solids Volatite Organic Carbon Total Suspended Solids Volatite Organic Compoun								Comments samples re	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.												
)	US1	5/12/2023 8.00	Vt			x	x		x		x	x	x		x		x	x	z x		x	x	x	x	x		×	(Total metals on US1 and UL1. Filtered meta			
2	UW2	5/12/2023 8.30				x	x			x	x			x	x		x	x					x	x									
3	UW3	5/12/2023 9.30				x	x			x	x	~			x		x	x					x	x							on UW	2 and UW3.	
- 6	UL1	5/12/2023 4.50				x	x	x			x	x			x	x	x	x		x	x		x	x		x	x	(1
	DUP	5/12/2023			1	x	x				×	Y	1	X	x		x	x				1	x	×	-		1						
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				TOTAL				-																				-					

Telephone : + 61-2-8784 8555

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SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: ES2342102		
Client Contact Address	: ROBERT CARR & ASSOCIATES P/L : MS FIONA BROOKER : 92 HILL STREET CARRINGTON NSW 2294	Laboratory:Contact:Address:	Environmental Division Sydney Customer Services ES 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail Telephone Facsimile	: fionab@rca.com.au : +61 02 4902 9200 : +61 02 4902 9299	E-mail : Telephone : Facsimile :	ALSEnviro.Sydney@ALSGlobal.com +61-2-8784 8555 +61-2-8784 8500
Project Order number C-O-C number Site Sampler	: 15579 - Quarterly Monitoring : : :	Page : Quote number : QC Level :	1 of 3 ES2017ROBCAR0004 (SYBQ/400/21) NEPM 2013 B3 & ALS QC Standard
Dates Date Samples Receive Client Requested Due Date	d : 05-Dec-2023 15:06 : 12-Dec-2023	Issue Date Scheduled Reporting Dat	: 06-Dec-2023 e : 12-Dec-2023
Delivery Details Mode of Delivery No. of coolers/boxes Receipt Detail	: Undefined : 1 :	Security Seal Temperature No. of samples received	: Not Available : -0.5'C - Ice present / analysed : 7 / 7

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.
- Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical
 analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this
 temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS
 recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

• No sample container / preservation non-compliance exists.

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

as the determin tasks, that are incl If no sampling default 00:00 on is provided, the laboratory and component Matrix: WATER Laboratory sample ID	ation of moisture uded in the package. time is provided, the date of samplin sampling date wi displayed in bra Sampling date / time	content and preparation the sampling time will ig. If no sampling date II be assumed by the ckets without a time Sample ID	WATER - EG020T Total Metals by ICP/MS (including digestion)	NATER - EG049G-T Trivalent Chromium - Total	NATER - EP005 Total Organic Carbon (TOC)	NATER - EP080 3TEXN	NATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity	NATER - NT-04 Nitrite and Nitrate	NATER - NT-09 TKN, Total Phosphorus
ES2342102-001	05-Dec-2023 08:00	US1	1	✓	✓	✓	✓	✓	✓
ES2342102-002	05-Dec-2023 08:00	UW2			✓			✓	
ES2342102-003	05-Dec-2023 08:00	UW3			✓			✓	
ES2342102-004	05-Dec-2023 08:00	UL1	✓	✓	✓			✓	✓
ES2342102-005	05-Dec-2023 08:00	DUP			✓			✓	
ES2342102-007	24-Nov-2023 00:00	TRIP SPIKE 5				✓			
Matrix: WATER Laboratory sample	Sampling date / time	Sample ID	WATER - EA025H Suspended Solids - Standard Level	WATER - EA165-PH CO2 - Free and Total (Default)	WATER - ED037-P Alkalinity as CaCO3 (Auto Titrator)	WATER - ED045G Chloride by Discrete Analyser	WATER - EG020F Dissolved Metals by ICP/MS	WATER - EG050G-T Total Hexavalent Chromium	WATER - EK061G Total Kjeldahl Nitrogen as N (TKN) By Discrete
ES2342102-001	05-Dec-2023 08:00	US1	1					✓	
ES2342102-002	05-Dec-2023 08:00	UW2		✓	✓	✓	✓		✓
ES2342102-003	05-Dec-2023 08:00	UW3		✓	✓	✓	✓		✓
ES2342102-004	05-Dec-2023 08:00	UL1			✓	✓		✓	
ES2342102-005	05-Dec-2023 08:00	DUP		1	1	1	1		1



Matrix: WATER Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP025 Dissolved Oxygen (DO)	WATER - EP074 (water) Volatile Organic Compounds	WATER - W-12 OC/OP Pesticides	WATER - W-18 TRH(C6 - C9)/BTEXN
ES2342102-002	05-Dec-2023 08:00	UW2	✓			
ES2342102-004	05-Dec-2023 08:00	UL1		1	✓	
ES2342102-005	05-Dec-2023 08:00	DUP	1			
ES2342102-006	24-Nov-2023 00:00	TRIP BLANK				✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ADMINISTRATOR

 *AU Certificate of Analysis - NATA (COA) 	Email	administrator@rca.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	administrator@rca.com.au
 *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) 	Email	administrator@rca.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	administrator@rca.com.au
- A4 - AU Tax Invoice (INV)	Email	administrator@rca.com.au
- Chain of Custody (CoC) (COC)	Email	administrator@rca.com.au
- EDI Format - ENMRG (ENMRG)	Email	administrator@rca.com.au
- EDI Format - ESDAT (ESDAT)	Email	administrator@rca.com.au
- EDI Format - XTab (XTAB)	Email	administrator@rca.com.au
ALL INVOICES		
- A4 - AU Tax Invoice (INV)	Email	administrator@rca.com.au
ENVIRO		
 *AU Certificate of Analysis - NATA (COA) 	Email	enviro@rca.com.au
 *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) 	Email	enviro@rca.com.au
 *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) 	Email	enviro@rca.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	enviro@rca.com.au
- A4 - AU Tax Invoice (INV)	Email	enviro@rca.com.au
- Chain of Custody (CoC) (COC)	Email	enviro@rca.com.au
- EDI Format - ENMRG (ENMRG)	Email	enviro@rca.com.au
- EDI Format - ESDAT (ESDAT)	Email	enviro@rca.com.au
- EDI Format - XTab (XTAB)	Email	enviro@rca.com.au
FIONA BROOKER		
 *AU Certificate of Analysis - NATA (COA) 	Email	fionab@rca.com.au
 *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) 	Email	fionab@rca.com.au
 *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) 	Email	fionab@rca.com.au
 A4 - AU Sample Receipt Notification - Environmental HT (SRN) 	Email	fionab@rca.com.au
- Chain of Custody (CoC) (COC)	Email	fionab@rca.com.au
- EDI Format - ENMRG (ENMRG)	Email	fionab@rca.com.au
- EDI Format - ESDAT (ESDAT)	Email	fionab@rca.com.au
- EDI Format - XTab (XTAB)	Email	fionab@rca.com.au



CERTIFICATE OF ANALYSIS Page Work Order : ES2411525 : 1 of 3 Amendment :1 Client Laboratory : ROBERT CARR & ASSOCIATES P/L : Environmental Division Sydney Contact : MS FIONA BROOKER Contact : Danae Hambly Address Address : 277-289 Woodpark Road Smithfield NSW Australia 2164 : 92 HILL STREET **CARRINGTON NSW 2294** Telephone : +61 02 4902 9200 Telephone : +61-2-8784 8555 Project **Date Samples Received** : 15579a - Quarterly Monitoring : 10-Apr-2024 16:02 Order number : -----Date Analysis Commenced : 10-Apr-2024 C-O-C number Issue Date · ____ : 09-May-2024 19:06 Sampler : Fiona B Site : -----; EN/222 Quote number "ululov Accreditation No. 825

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.

Accredited for compliance with ISO/IEC 17025 - Testing

This Certificate of Analysis contains the following information:

: 1

: 1

- General Comments
- Analytical Results

No. of samples received

No. of samples analysed

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



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.

 \sim = Indicates an estimated value.

- Amendment (09/05/2024): This report has been amended and re-released to allow the reporting of additional analytical data, Total CO2 for sample 001.
- 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	UW3	 	
		Sampli	ng date / time	10-Apr-2024 11:00	 	
Compound	CAS Number	LOR	Unit	ES2411525-001	 	
				Result	 	
EA165: CO2 - Free and Total						
Free Carbon Dioxide as CO2	85540-96-1	1	mg/L	134	 	
Total Carbon Dioxide as CO2	85540-96-1	1	mg/L	879	 	
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	846	 	
Total Alkalinity as CaCO3		1	mg/L	846	 	
ED045G: Chloride by Discrete Analyser						
Chloride	16887-00-6	1	mg/L	477	 	
EG020F: Dissolved Metals by ICP-MS						
Arsenic	7440-38-2	0.001	mg/L	0.051	 	
Manganese	7439-96-5	0.001	mg/L	0.028	 	
Iron	7439-89-6	0.05	mg/L	<0.05	 	
EK057G: Nitrite as N by Discrete Analys	ser					
Nitrite as N	14797-65-0	0.01	mg/L	0.55	 	
EK058G: Nitrate as N by Discrete Analy	ser					
Nitrate as N	14797-55-8	0.01	mg/L	8.64	 	
EK059G: Nitrite plus Nitrate as N (NOx)	by Discrete Ana	lyser				
Nitrite + Nitrate as N		0.01	mg/L	9.19	 	
EK061G: Total Kjeldahl Nitrogen By Disc	crete Analyser					
Total Kjeldahl Nitrogen as N		0.1	mg/L	2.3	 	
EP005: Total Organic Carbon (TOC)					·	
Total Organic Carbon		1	mg/L	28	 	



	QUALITY CONTROL REPORT									
Work Order	: ES2411525	Page	: 1 of 5							
Amendment	: 1									
Client	: ROBERT CARR & ASSOCIATES P/L	Laboratory	: Environmental Division S	Sydney						
Contact	: MS FIONA BROOKER	Contact	: Danae Hambly							
Address	: 92 HILL STREET CARRINGTON NSW 2294	Address	: 277-289 Woodpark Road	d Smithfield NSW Australia	2164					
Telephone	: +61 02 4902 9200	Telephone	: +61-2-8784 8555							
Project	: 15579a - Quarterly Monitoring	Date Samples Received	: 10-Apr-2024	authra						
Order number	:	Date Analysis Commenced	10-Apr-2024	Mult Mile						
C-O-C number	:	Issue Date	: 09-May-2024		NATA					
Sampler	: Fiona B			Hac-MRA	NAIA					
Site	:			in the second second						
Quote number	: EN/222			"Information	Accorditation No. 975					
No. of samples received	: 1			Accredit	ed for compliance with					

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.

ISO/IEC 17025 - Testing

This Quality Control Report contains the following information:

: 1

- 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

No. of samples analysed

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



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

* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

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 (%)
ED037P: Alkalinity b	y PC Titrator (QC Lot: 5	5717994)							
ES2411448-001	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	10	10	0.0	0% - 50%
		ED037-P: Total Alkalinity as CaCO3		1	mg/L	10	10	0.0	0% - 50%
ES2411527-001	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	10	15	40.0	0% - 50%
		ED037-P: Total Alkalinity as CaCO3		1	mg/L	10	15	40.0	0% - 50%
ED045G: Chloride by	/ Discrete Analyser (QC	: Lot: 5718274)							
EW2401633-003	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	35	36	0.0	0% - 20%
ES2411516-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	38	38	0.0	0% - 20%
EG020F: Dissolved I	Metals by ICP-MS (QC L	ot: 5721185)							
WN2404312-003	Anonymous	EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	1.07	1.01	5.4	0% - 20%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.31	0.30	3.4	No Limit
ES2411398-011	Anonymous	EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EK057G: Nitrite as N	by Discrete Analyser	(QC Lot: 5718271)							
ES2411567-003	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit

Page	: 3 of 5
Work Order	ES2411525 Amendment 1
Client	: ROBERT CARR & ASSOCIATES P/L
Project	: 15579a - Quarterly Monitoring



Sub-Matrix: WATER	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 (%)		
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5718271) - continued											
ES2411516-001	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 Discr	ete Analyser (QC Lot: 5724161)									
ES2411416-001	Anonymous	EK059G: Nitrite + Nitrate as N		0.01 (0.05)*	mg/L	0.22	0.24	8.5	No Limit		
ES2411473-001	Anonymous	EK059G: Nitrite + Nitrate as N		0.01 (0.10)*	mg/L	0.15	<0.10	38.5	No Limit		
EK061G: Total Kjeldal	hl Nitrogen By Discrete Ana	lyser (QC Lot: 5724158)									
ES2411222-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N		0.1	mg/L	0.1	0.1	0.0	No Limit		
ES2411481-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N		0.1	mg/L	150	152	1.2	0% - 20%		
EP005: Total Organic	Carbon (TOC) (QC Lot: 571	8052)									
ES2411516-001	Anonymous	EP005: Total Organic Carbon		1	mg/L	2	2	0.0	No Limit		
ES2411558-001	Anonymous	EP005: Total Organic Carbon		1	mg/L	14	14	0.0	0% - 50%		



Method Blank (MB) and Laboratory Control Sample (LCS) Report

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.

Sub-Matrix: WATER	ub-Matrix: WATER		Method Blank (MB)	Laboratory Control Spike (LCS) Report				
				Report	Spike	Spike Recovery (%)	Acceptable	e Limits (%)
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5717994)								
ED037-P: Total Alkalinity as CaCO3			mg/L		200 mg/L	104	81.0	115
					50 mg/L	108	80.0	120
ED045G: Chloride by Discrete Analyser (QCLot: 57	18274)							
ED045G: Chloride	16887-00-6	1	mg/L	<1	50 mg/L	103	80.9	127
				<1	1000 mg/L	95.3	80.9	127
EG020F: Dissolved Metals by ICP-MS (QCLot: 5721	185)							
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	99.7	85.0	114
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	93.5	82.0	110
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	98.5	82.0	112
EK057G: Nitrite as N by Discrete Analyser (QCLot:	5718271)							
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	104	82.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete	Analyser (QCLot: 57	(24161)						
EK059G: Nitrite + Nitrate as N		0.01	mg/L	<0.01	0.5 mg/L	99.1	91.0	113
EK061G: Total Kjeldahl Nitrogen By Discrete Analys	ser (QCLot: 5724158)							
EK061G: Total Kjeldahl Nitrogen as N		0.1	mg/L	<0.1	10 mg/L	86.2	69.0	123
				<0.1	1 mg/L	90.8	70.0	123
				<0.1	5 mg/L	92.2	70.0	123
EP005: Total Organic Carbon (TOC) (QCLot: 57180	52)							
EP005: Total Organic Carbon		1	mg/L	<1	10 mg/L	107	72.0	120

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	o-Matrix: WATER					Matrix Spike (MS) Report				
				Spike	SpikeRecovery(%)	Acceptable L	.imits (%)			
Laboratory sample ID	Sample ID	Method: Compound CA	AS Number	Concentration	MS	Low	High			
ED045G: Chloride b	by Discrete Analyser (QCLot: 5718274)									
ES2411516-001	Anonymous	ED045G: Chloride 16	6887-00-6	250 mg/L	82.4	70.0	130			
EG020F: Dissolved	G020F: Dissolved Metals by ICP-MS (QCLot: 5721185)									
ES2411476-001	Anonymous	EG020A-F: Arsenic 74	140-38-2	1 mg/L	93.8	70.0	130			

Page	5 of 5
Work Order	ES2411525 Amendment 1
Client	: ROBERT CARR & ASSOCIATES P/L
Project	15579a - Quarterly Monitoring



Sub-Matrix: WATER			Γ	Ма	trix Spike (MS) Report	•	
				Spike	SpikeRecovery(%)	Acceptable L	imits (%)
Laboratory sample ID	Sample ID	Method: Compound CA	AS Number	Concentration	MS	Low	High
EG020F: Dissolved	Metals by ICP-MS (QCLot: 5721185) - continued						
ES2411476-001	Anonymous	EG020A-F: Manganese 74	439-96-5	1 mg/L	89.4	70.0	130
EK057G: Nitrite as	N by Discrete Analyser (QCLot: 5718271)						
ES2411516-001	Anonymous	EK057G: Nitrite as N 14	4797-65-0	0.5 mg/L	105	70.0	130
EK059G: Nitrite plu	s Nitrate as N (NOx) by Discrete Analyser (QCLot: 572	4161)					
ES2411416-001	Anonymous	EK059G: Nitrite + Nitrate as N		2.5 mg/L	96.5	70.0	130
EK061G: Total Kjelo	dahl Nitrogen By Discrete Analyser (QCLot: 5724158)						
ES2411223-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N		5 mg/L	80.2	70.0	130
EP005: Total Organ	ic Carbon (TOC) (QCLot: 5718052)						
ES2411516-002	Anonymous	EP005: Total Organic Carbon		100 mg/L	114	70.0	130



QA/QC Compliance Assessment to assist with Quality Review							
Work Order	ES2411525	Page	: 1 of 4				
Amendment	: 1						
Client	: ROBERT CARR & ASSOCIATES P/L	Laboratory	: Environmental Division Sydney				
Contact	: MS FIONA BROOKER	Telephone	: +61-2-8784 8555				
Project	: 15579a - Quarterly Monitoring	Date Samples Received	: 10-Apr-2024				
Site	:	Issue Date	: 09-May-2024				
Sampler	: Fiona B	No. of samples received	:1				
Order number	:	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.

- <u>NO</u> Method Blank value outliers occur.
- <u>NO</u> Duplicate outliers occur.
- <u>NO</u> Laboratory Control outliers occur.
- <u>NO</u> Matrix Spike outliers occur.
- For all regular sample matrices, <u>NO</u> 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

• NO Quality Control Sample Frequency Outliers exist.



Outliers : Analysis Holding Time Compliance

Matrix	WATER	

Method	Ex	ktraction / Preparation		Analysis			
Container / Client Sample ID(s)	Date extracted	Due for extraction	Days	Date analysed	Due for analysis	Days	
			overdue			overdue	
EP005: Total Organic Carbon (TOC)							
Clear Plastic Bottle - Natural							
UW3				12-Apr-2024	11-Apr-2024	1	

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 ; 🗸 = Withi	n holding time.
Method	Sample Date	Ex	traction / Preparation			Analysis	
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) UW3	10-Apr-2024				10-Apr-2024	24-Apr-2024	1
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G) UW3	10-Apr-2024				11-Apr-2024	08-May-2024	~
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) UW3	10-Apr-2024				12-Apr-2024	07-Oct-2024	√
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) UW3	10-Apr-2024				11-Apr-2024	12-Apr-2024	√
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) UW3	10-Apr-2024				15-Apr-2024	08-May-2024	1
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G) UW3	10-Apr-2024	14-Apr-2024	08-May-2024	1	14-Apr-2024	08-May-2024	1
EP005: Total Organic Carbon (TOC)							
Clear Plastic Bottle - Natural (EP005) UW3	10-Apr-2024				12-Apr-2024	11-Apr-2024	x



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 specific										
Quality Control Sample Type		Co	ount		Rate (%)		Quality Control Specification					
Analytical Methods	Method	QC	Reaular	Actual	Expected	Evaluation						
Laboratory Duplicates (DUP)												
Alkalinity by Auto Titrator	ED037-P	2	11	18.18	10.00	✓	NEPM 2013 B3 & ALS QC Standard					
Chloride by Discrete Analyser	ED045G	2	10	20.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard					
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard					
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	20	10.00	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					
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard					
Total Organic Carbon	EP005	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard					
Laboratory Control Samples (LCS)												
Alkalinity by Auto Titrator	ED037-P	2	11	18.18	10.00	✓	NEPM 2013 B3 & ALS QC Standard					
Chloride by Discrete Analyser	ED045G	2	10	20.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard					
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard					
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	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					
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	3	20	15.00	15.00	✓	NEPM 2013 B3 & ALS QC Standard					
Total Organic Carbon	EP005	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard					
Method Blanks (MB)												
Chloride by Discrete Analyser	ED045G	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard					
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard					
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	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					
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard					
Total Organic Carbon	EP005	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard					
Matrix Spikes (MS)												
Chloride by Discrete Analyser	ED045G	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard					
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard					
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	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					
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	1	NEPM 2013 B3 & ALS QC Standard					
Total Organic Carbon	EP005	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
Free and Total CO2	EA165-P	WATER	In house: Referenced to APHA 4500-CO2 D. 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)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 CI - 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 thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered
			prior to analysis. 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.
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- 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-NO3- 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 (NOx) by Discrete	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by
Analyser			Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM
			Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high
Analyser			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 Organic Carbon	EP005	WATER	In house: Referenced to APHA 5310 B, The automated TOC analyzer determines Total and Inorganic Carbon by
			IR cell. TOC is calculated as the difference. This method is compliant with NEPM Schedule B(3)
Preparation Methods	Method	Matrix	Method Descriptions
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)

LIENT: I	RCA Australia (ROBCAR)		TURNA	ROUND REQUIREMENTS :			□ s	Standard	TAT :	17/4/2	24									FOR LABOR	ATORY US	SE ONLY	(Circle)		Yes No
CA Ref No:	5579a - Quarterly Monitor	ing	ALS Q	UOTE NO.: EN/2	22/23			1			c	OC SE	QUENC	E NUMBER	(Circle)	5				Free icentroze	n ige bricks p	xesent upo	n receipt?		Tes No
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OMMENTS/SPECI	AL HANDLING/STORAGE	OR DISPOSAL:			1															16	-				
ALS-USE ONLY	SAMF MATRIX:	LE DETAILS Solid(S) Water(W)		CONTAINER INFORMATIO	DN				AN	IALYSI Where	S REQ Metals ar	UIRED e required	inclu	ding SUITI Total (unfilter	E S (NB. Su ed bottle requ	uite Codes ulred) or Dis	must be	listed to a	ttract suit	e price) d).					Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	Alkalinity.	Arsenic	Carbon Dioxide	Chloride 4	Manganese	Nitrate + Nitrite	TKN >	Total Organic Carbon												Commants on likely contaminant levels, dilutio samples requiring specific QC analysis etc.
1	UW3	10/4 11.00	W	l green 250mL plastic, 1 60ml purple plas 1 60ml red plastic	^{tic,} 3	x	x	x	x >	< x	x	x	x												Filtered metal analysis
	L																			A					
		-												-				311	24						
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14



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: ES2411525		
Client Contact Address	: ROBERT CARR & ASSOCIATES P/L : MS FIONA BROOKER : 92 HILL STREET CARRINGTON NSW 2294	Laboratory:Contact:Address:	Environmental Division Sydney Danae Hambly 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail Telephone Facsimile	: fionab@rca.com.au : +61 02 4902 9200 : +61 02 4902 9299	E-mail : Telephone : Facsimile :	danae.hambly@alsglobal.com +61-2-8784 8555 +61-2-8784 8500
Project Order number C-O-C number Site Sampler	: 15579a - Quarterly Monitoring : : : Fiona B	Page : Quote number : QC Level :	1 of 3 EN2023ROBCAR0002 (EN/222) NEPM 2013 B3 & ALS QC Standard
Dates Date Samples Receiver Client Requested Due Date	2 : 10-Apr-2024 16:02 : 17-Apr-2024	Issue Date Scheduled Reporting Dat	te : 10-Apr-2024 17-Apr-2024
Delivery Details Mode of Delivery No. of coolers/boxes Receipt Detail	: Undefined : 1 :	Security Seal Temperature No. of samples received	: Not Available : 0.0'C - Ice present / analysed : 1 / 1

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical
 analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this
 temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS
 recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



In Nitrogen as N (TKN) By Discrete

ic Carbon (TOC)

P005

T-04 litrate

Titrator)

CaCO3 (Auto

D037-P D045G **Discrete Analyser**

letals by ICP/MS

G020F

K061G

and Total (Default)

A165-PH

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

• No sample container / preservation non-compliance exists.

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: WATER

Laboratory sample	Sampling date / time	Sample ID	WATER - E CO2 - Free	WATER - E Alkalinity a:	WATER - E Chloride by	WATER - E Dissolved N	WATER - E Total Kjelda	WATER - E Total Orgar	WATER - N Nitrite and I
ES2411525-001	10-Apr-2024 11:00	UW3	1	1	✓	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ADMINISTRATOR

 *AU Certificate of Analysis - NATA (COA) 	Email	administrator@rca.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	administrator@rca.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	administrator@rca.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	administrator@rca.com.au
- A4 - AU Tax Invoice (INV)	Email	administrator@rca.com.au
- Chain of Custody (CoC) (COC)	Email	administrator@rca.com.au
- EDI Format - ENMRG (ENMRG)	Email	administrator@rca.com.au
- EDI Format - ESDAT (ESDAT)	Email	administrator@rca.com.au
- EDI Format - XTab (XTAB)	Email	administrator@rca.com.au
ALL INVOICES		
- A4 - AU Tax Invoice (INV)	Email	administrator@rca.com.au
ENVIRO		
 *AU Certificate of Analysis - NATA (COA) 	Email	enviro@rca.com.au
 *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) 	Email	enviro@rca.com.au
 *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) 	Email	enviro@rca.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	enviro@rca.com.au
- A4 - AU Tax Invoice (INV)	Email	enviro@rca.com.au
- Chain of Custody (CoC) (COC)	Email	enviro@rca.com.au
- EDI Format - ENMRG (ENMRG)	Email	enviro@rca.com.au
- EDI Format - ESDAT (ESDAT)	Email	enviro@rca.com.au
- EDI Format - XTab (XTAB)	Email	enviro@rca.com.au
FIONA BROOKER		
 *AU Certificate of Analysis - NATA (COA) 	Email	fionab@rca.com.au
 *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) 	Email	fionab@rca.com.au
 *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) 	Email	fionab@rca.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	fionab@rca.com.au
- Chain of Custody (CoC) (COC)	Email	fionab@rca.com.au
- EDI Format - ENMRG (ENMRG)	Email	fionab@rca.com.au
- EDI Format - ESDAT (ESDAT)	Email	fionab@rca.com.au
- EDI Format - XTab (XTAB)	Email	fionab@rca.com.au

Issue Date	: 10-Apr-2024
Page	: 3 of 3
Work Order	ES2411525 Amendment 0
Client	: ROBERT CARR & ASSOCIATES P/L





CERTIFICATE OF ANALYSIS

Work Order	ES2422797	Page	: 1 of 11
Client	ROBERT CARR & ASSOCIATES P/L	Laboratory	Environmental Division Sydney
Contact	: MS FIONA BROOKER	Contact	: Danae Hambly
Address	: 92 HILL STREET	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
	CARRINGTON NSW 2294		
Telephone	: +61 02 4902 9200	Telephone	: +61-2-8784 8555
Project	: 15579a - 6 Monthly Monitoring	Date Samples Received	: 11-Jul-2024 09:59
Order number	:	Date Analysis Commenced	: 12-Jul-2024
C-O-C number	:	Issue Date	: 18-Jul-2024 20:30
Sampler	:		Hac-MRA NATA
Site	:		
Quote number	: EN/222		Accordition No. 825
No. of samples received	: 7		Accredited for compliance with
No. of samples analysed	: 7		ISO/IEC 17025 - Testing

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	Position	Accreditation Category
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW



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.

- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP074: Where reported, Total Trihalomethanes is the sum of the reported concentrations of all Trihalomethanes at or above the LOR.
- EP074: Where reported, Total Trimethylbenzenes is the sum of the reported concentrations of 1.2.3-Trimethylbenzene, 1.2.4-Trimethylbenzene and 1.3.5-Trimethylbenzene at or above the LOR.
- As per QWI EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions Chloride, Alkalinity and Sulfate; and Major Cations Calcium, Magnesium, Potassium and Sodium.
 Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Unless otherwise stated, analytical work for this work order will be conducted at ALS Sydney.
- EP080: Sample TRIP SPIKE contains volatile compounds spiked into the sample containers prior to dispatch from the laboratory. BTEXN compounds spiked at 20 ug/L.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
Page : 3 of 11 Work Order : ES2422797 Client : ROBERT CARR & ASSOCIATES P/L Project : 15579a - 6 Monthly Monitoring



Sub-Matrix: WATER (Matrix: WATER)			Sample ID	US1	UW2	UW3	UL1	QA
		Sampli	ng date / time	10-Jul-2024 13:00	10-Jul-2024 13:50	10-Jul-2024 15:00	10-Jul-2024 15:30	10-Jul-2024 00:00
Compound	CAS Number	LOR	Unit	ES2422797-001	ES2422797-002	ES2422797-003	ES2422797-004	ES2422797-005
				Result	Result	Result	Result	Result
EA025: Total Suspended Solids dried	at 104 ± 2°C							
Suspended Solids (SS)		5	mg/L	74				
EA165: CO2 - Free and Total								
Free Carbon Dioxide as CO2	85540-96-1	1	mg/L		5	14		
Total Carbon Dioxide as CO2	85540-96-1	1	mg/L		473	536		
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	22	12	<1	23	27
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	259	526	593	381	392
Total Alkalinity as CaCO3		1	mg/L	282	538	593	404	419
ED041G: Sulfate (Turbidimetric) as SC	04 2- by DA							
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	16				
ED045G: Chloride by Discrete Analyse	ər							
Chloride	16887-00-6	1	mg/L	108	278	584	165	169
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	41				
Magnesium	7439-95-4	1	mg/L	37				
Sodium	7440-23-5	1	mg/L	91				
Potassium	7440-09-7	1	mg/L	9				
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L		0.005	0.003		
Manganese	7439-96-5	0.001	mg/L		0.034	0.030		
Iron	7439-89-6	0.05	mg/L		<0.05	<0.05		
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	0.002			0.002	0.002
Chromium	7440-47-3	0.001	mg/L	0.001			0.002	
Copper	7440-50-8	0.001	mg/L	0.002				
Lead	7439-92-1	0.001	mg/L				<0.001	

Page : 4 of 11 Work Order : ES2422797 Client : ROBERT CARR & ASSOCIATES P/L Project : 15579a - 6 Monthly Monitoring



Sub-Matrix: WATER (Matrix: WATER)			Sample ID	US1	UW2	UW3	UL1	QA
		Sampli	ng date / time	10-Jul-2024 13:00	10-Jul-2024 13:50	10-Jul-2024 15:00	10-Jul-2024 15:30	10-Jul-2024 00:00
Compound	CAS Number	LOR	Unit	ES2422797-001	ES2422797-002	ES2422797-003	ES2422797-004	ES2422797-005
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS - Contin	ued							
Manganese	7439-96-5	0.001	mg/L	1.16			0.554	0.649
Zinc	7440-66-6	0.005	mg/L	<0.005			<0.005	
Boron	7440-42-8	0.05	mg/L				0.35	
Iron	7439-89-6	0.05	mg/L	4.18			0.35	0.66
EG049T: Total Trivalent Chromium								
Trivalent Chromium	16065-83-1	0.01	mg/L	<0.01			<0.01	
EG050T: Total Hexavalent Chromium								
Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01			<0.01	
EK057G: Nitrite as N by Discrete Analys	ser							
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.56	0.19	0.19
EK058G: Nitrate as N by Discrete Analy	ser							
Nitrate as N	14797-55-8	0.01	mg/L	0.03	0.05	8.26	0.89	0.89
EK059G: Nitrite plus Nitrate as N (NOx)	by Discrete Ana	lyser						
Nitrite + Nitrate as N		0.01	mg/L	0.03	0.05	8.82	1.08	1.08
EK061G: Total Kjeldahl Nitrogen By Dise	crete Analyser							
Total Kjeldahl Nitrogen as N		0.1	mg/L	1.7	1.2	3.7	9.8	8.4
EK067G: Total Phosphorus as P by Disc	rete Analyser							
Total Phosphorus as P		0.01	mg/L	0.14			0.07	
EN055: Ionic Balance								
ø Total Anions		0.01	meq/L	9.01				
ø Total Cations		0.01	meq/L	9.28				
ø lonic Balance		0.01	%	1.45				
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon		1	mg/L	19	19	21	24	26
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen		0.1	mg/L		8.4			
EP068A: Organochlorine Pesticides (OC	;)							
alpha-BHC	319-84-6	0.5	µg/L				<0.5	

Page : 5 of 11 Work Order : ES2422797 Client : ROBERT CARR & ASSOCIATES P/L Project : 15579a - 6 Monthly Monitoring



Sub-Matrix: WATER (Matrix: WATER)			Sample ID	US1	UW2	UW3	UL1	QA
		Sampli	ng date / time	10-Jul-2024 13:00	10-Jul-2024 13:50	10-Jul-2024 15:00	10-Jul-2024 15:30	10-Jul-2024 00:00
Compound	CAS Number	LOR	Unit	ES2422797-001	ES2422797-002	ES2422797-003	ES2422797-004	ES2422797-005
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides	(OC) - Continued							
Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L				<0.5	
beta-BHC	319-85-7	0.5	µg/L				<0.5	
gamma-BHC	58-89-9	0.5	µg/L				<0.5	
delta-BHC	319-86-8	0.5	µg/L				<0.5	
Heptachlor	76-44-8	0.5	µg/L				<0.5	
Aldrin	309-00-2	0.5	µg/L				<0.5	
Heptachlor epoxide	1024-57-3	0.5	µg/L				<0.5	
trans-Chlordane	5103-74-2	0.5	µg/L				<0.5	
alpha-Endosulfan	959-98-8	0.5	µg/L				<0.5	
cis-Chlordane	5103-71-9	0.5	µg/L				<0.5	
Dieldrin	60-57-1	0.5	µg/L				<0.5	
4.4`-DDE	72-55-9	0.5	µg/L				<0.5	
Endrin	72-20-8	0.5	µg/L				<0.5	
beta-Endosulfan	33213-65-9	0.5	µg/L				<0.5	
4.4`-DDD	72-54-8	0.5	µg/L				<0.5	
Endrin aldehyde	7421-93-4	0.5	µg/L				<0.5	
Endosulfan sulfate	1031-07-8	0.5	µg/L				<0.5	
4.4`-DDT	50-29-3	2.0	µg/L				<2.0	
Endrin ketone	53494-70-5	0.5	µg/L				<0.5	
Methoxychlor	72-43-5	2.0	µg/L				<2.0	
^ Total Chlordane (sum)		0.5	µg/L				<0.5	
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5	0.5	µg/L				<0.5	
^ Sum of Aldrin + Dieldrin	0-2 309-00-2/60-57-1	0.5	μg/L				<0.5	
EP068B: Organophosphorus Postic	ides (OP)				 			
Dichlorvos	62-73-7	0.5	µg/L				<0.5	
Demeton-S-methyl	919-86-8	0.5	μg/L				<0.5	

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Sub-Matrix: WATER			Sample ID	US1	UW2	UW3	UL1	QA
		Samplii	ng date / time	10-Jul-2024 13:00	10-Jul-2024 13:50	10-Jul-2024 15:00	10-Jul-2024 15:30	10-Jul-2024 00:00
Compound C	AS Number	LOR	Unit	ES2422797-001	ES2422797-002	ES2422797-003	ES2422797-004	ES2422797-005
				Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP)	- Continued							
Monocrotophos	6923-22-4	2.0	µg/L				<2.0	
Dimethoate	60-51-5	0.5	µg/L				<0.5	
Diazinon	333-41-5	0.5	µg/L				<0.5	
Chlorpyrifos-methyl	5598-13-0	0.5	µg/L				<0.5	
Parathion-methyl	298-00-0	2.0	µg/L				<2.0	
Malathion	121-75-5	0.5	µg/L				<0.5	
Fenthion	55-38-9	0.5	µg/L				<0.5	
Chlorpyrifos	2921-88-2	0.5	µg/L				<0.5	
Parathion	56-38-2	2.0	µg/L				<2.0	
Pirimphos-ethyl	23505-41-1	0.5	µg/L				<0.5	
Chlorfenvinphos	470-90-6	0.5	µg/L				<0.5	
Bromophos-ethyl	4824-78-6	0.5	μg/L				<0.5	
Fenamiphos	22224-92-6	0.5	µg/L				<0.5	
Prothiofos	34643-46-4	0.5	µg/L				<0.5	
Ethion	563-12-2	0.5	µg/L				<0.5	
Carbophenothion	786-19-6	0.5	µg/L				<0.5	
Azinphos Methyl	86-50-0	0.5	µg/L				<0.5	
EP074D: Fumigants								
2.2-Dichloropropane	594-20-7	5	µg/L				<5	
1.2-Dichloropropane	78-87-5	5	µg/L				<5	
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L				<5	
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L				<5	
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L				<5	
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	75-71-8	50	µg/L				<50	
Chloromethane	74-87-3	50	μg/L				<50	
Vinyl chloride	75-01-4	50	µg/L				<50	

Page : 7 of 11 Work Order : ES2422797 Client : ROBERT CARR & ASSOCIATES P/L Project : 15579a - 6 Monthly Monitoring



Sub-Matrix: WATER (Matrix: WATER)			Sample ID	US1	UW2	UW3	UL1	QA
		Samplii	ng date / time	10-Jul-2024 13:00	10-Jul-2024 13:50	10-Jul-2024 15:00	10-Jul-2024 15:30	10-Jul-2024 00:00
Compound	CAS Number	LOR	Unit	ES2422797-001	ES2422797-002	ES2422797-003	ES2422797-004	ES2422797-005
				Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compou	unds - Continued							
Bromomethane	74-83-9	50	µg/L				<50	
Chloroethane	75-00-3	50	µg/L				<50	
Trichlorofluoromethane	75-69-4	50	µg/L				<50	
1.1-Dichloroethene	75-35-4	5	µg/L				<5	
lodomethane	74-88-4	5	µg/L				<5	
trans-1.2-Dichloroethene	156-60-5	5	μg/L				<5	
1.1-Dichloroethane	75-34-3	5	µg/L				<5	
cis-1.2-Dichloroethene	156-59-2	5	µg/L				<5	
1.1.1-Trichloroethane	71-55-6	5	µg/L				<5	
1.1-Dichloropropylene	563-58-6	5	µg/L				<5	
Carbon Tetrachloride	56-23-5	5	µg/L				<5	
1.2-Dichloroethane	107-06-2	5	µg/L				<5	
Trichloroethene	79-01-6	5	µg/L				<5	
Dibromomethane	74-95-3	5	µg/L				<5	
1.1.2-Trichloroethane	79-00-5	5	µg/L				<5	
1.3-Dichloropropane	142-28-9	5	µg/L				<5	
Tetrachloroethene	127-18-4	5	µg/L				<5	
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L				<5	
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L				<5	
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L				<5	
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L				<5	
1.2.3-Trichloropropane	96-18-4	5	µg/L				<5	
Pentachloroethane	76-01-7	5	µg/L				<5	
1.2-Dibromo-3-chloropropane	96-12-8	5	μg/L				<5	
Hexachlorobutadiene	87-68-3	5	µg/L				<5	
EP074F: Halogenated Aromatic Compo	unds							
Chlorobenzene	108-90-7	5	µg/L				<5	

Page : 8 of 11 Work Order : ES2422797 Client : ROBERT CARR & ASSOCIATES P/L Project : 15579a - 6 Monthly Monitoring



Sub-Matrix: WATER (Matrix: WATER)	Sample ID		US1	UW2	UW3	UL1	QA	
		Sampli	ng date / time	10-Jul-2024 13:00	10-Jul-2024 13:50	10-Jul-2024 15:00	10-Jul-2024 15:30	10-Jul-2024 00:00
Compound	CAS Number	LOR	Unit	ES2422797-001	ES2422797-002	ES2422797-003	ES2422797-004	ES2422797-005
				Result	Result	Result	Result	Result
EP074F: Halogenated Aromatic Co	mpounds - Continued							
Bromobenzene	108-86-1	5	µg/L				<5	
2-Chlorotoluene	95-49-8	5	µg/L				<5	
4-Chlorotoluene	106-43-4	5	µg/L				<5	
1.3-Dichlorobenzene	541-73-1	5	µg/L				<5	
1.4-Dichlorobenzene	106-46-7	5	µg/L				<5	
1.2-Dichlorobenzene	95-50-1	5	µg/L				<5	
1.2.4-Trichlorobenzene	120-82-1	5	µg/L				<5	
1.2.3-Trichlorobenzene	87-61-6	5	µg/L				<5	
EP074G: Trihalomethanes								
Chloroform	67-66-3	5	µg/L				<5	
Bromodichloromethane	75-27-4	5	µg/L				<5	
Dibromochloromethane	124-48-1	5	µg/L				<5	
Bromoform	75-25-2	5	µg/L				<5	
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1				
Toluene	108-88-3	2	µg/L	<2				
Ethylbenzene	100-41-4	2	µg/L	<2				
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2				
ortho-Xylene	95-47-6	2	µg/L	<2				
^ Total Xylenes		2	µg/L	<2				
^ Sum of BTEX		1	µg/L	<1				
Naphthalene	91-20-3	5	µg/L	<5				
EP068S: Organochlorine Pesticide	Surrogate							
Dibromo-DDE	21655-73-2	0.5	%				118	
EP068T: Organophosphorus Pestic	cide Surrogate							
DEF	78-48-8	0.5	%				97.1	
EP074S: VOC Surrogates								



Sub-Matrix: WATER (Matrix: WATER)			Sample ID	US1	UW2	UW3	UL1	QA
		Sampli	ng date / time	10-Jul-2024 13:00	10-Jul-2024 13:50	10-Jul-2024 15:00	10-Jul-2024 15:30	10-Jul-2024 00:00
Compound	CAS Number	LOR	Unit	ES2422797-001	ES2422797-002	ES2422797-003	ES2422797-004	ES2422797-005
				Result	Result	Result	Result	Result
EP074S: VOC Surrogates - Continued								
1.2-Dichloroethane-D4	17060-07-0	5	%				107	
Toluene-D8	2037-26-5	5	%				108	
4-Bromofluorobenzene	460-00-4	5	%				110	
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	117				
Toluene-D8	2037-26-5	2	%	120				
4-Bromofluorobenzene	460-00-4	2	%	112				



Sub-Matrix: WATER (Matrix: WATER)	ix: WATER Sample ID NATER)		TRIP BLANK	TRIP SPIKE	 		
		Sampli	ng date / time	10-Jul-2024 00:00	10-Jul-2024 00:00	 	
Compound	CAS Number	LOR	Unit	ES2422797-006	ES2422797-007	 	
				Result	Result	 	
EP080/071: Total Petroleum Hydroca	arbons						
C6 - C9 Fraction		20	µg/L	<20		 	
EP080/071: Total Recoverable Hydro	ocarbons - NEPM 201	3 Fractio	ns				
C6 - C10 Fraction	C6_C10	20	µg/L	<20		 	
[^] C6 - C10 Fraction minus BTEX	C6_C10-BTEX	20	µg/L	<20		 	
(F1)							
EP080: BTEXN							
Benzene	71-43-2	1	µg/L	<1	18	 	
Toluene	108-88-3	2	µg/L	<2	18	 	
Ethylbenzene	100-41-4	2	µg/L	<2	18	 	
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	17	 	
ortho-Xylene	95-47-6	2	µg/L	<2	18	 	
^ Total Xylenes		2	µg/L	<2	35	 	
^ Sum of BTEX		1	µg/L	<1	89	 	
Naphthalene	91-20-3	5	µg/L	<5	20	 	
EP080S: TPH(V)/BTEX Surrogates							
1.2-Dichloroethane-D4	17060-07-0	2	%	105	106	 	
Toluene-D8	2037-26-5	2	%	108	111	 	
4-Bromofluorobenzene	460-00-4	2	%	103	105	 	



Surrogate Control Limits

Sub-Matrix: WATER		Recovery	Limits (%)
Compound	CAS Number	Low	High
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	50	150
EP068T: Organophosphorus Pesticide Surrogat	e		
DEF	78-48-8	50	150
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	78	133
Toluene-D8	2037-26-5	79	129
4-Bromofluorobenzene	460-00-4	81	124
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72	143
Toluene-D8	2037-26-5	75	131
4-Bromofluorobenzene	460-00-4	73	137



QUALITY CONTROL REPORT

Work Order	: ES2422797	Page	: 1 of 13
Client	: ROBERT CARR & ASSOCIATES P/L	Laboratory	: Environmental Division Sydney
Contact	: MS FIONA BROOKER	Contact	: Danae Hambly
Address	: 92 HILL STREET CARRINGTON NSW 2294	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 4902 9200	Telephone	: +61-2-8784 8555
Project	: 15579a - 6 Monthly Monitoring	Date Samples Received	: 11-Jul-2024
Order number	:	Date Analysis Commenced	: 12-Jul-2024
C-O-C number	:	Issue Date	: 18-Jul-2024
Sampler	:		Hac-MRA NATA
Site	:		
Quote number	: EN/222		Accreditation No. 825
No. of samples received	: 7		Accredited for compliance with
No. of samples analysed	: 7		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 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
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW



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

* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

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 (%)
EA025: Total Suspen	ded Solids dried at 104 ± 2°	C (QC Lot: 5928066)							
ES2422656-001	Anonymous	EA025H: Suspended Solids (SS)		5	mg/L	<5	<5	0.0	No Limit
ES2422803-001	Anonymous	EA025H: Suspended Solids (SS)		5	mg/L	6	<5	22.2	No Limit
ES2422835-005	Anonymous	EA025H: Suspended Solids (SS)		5	mg/L	7	8	19.4	No Limit
EW2403205-008	Anonymous	EA025H: Suspended Solids (SS)		5	mg/L	<5	<5	0.0	No Limit
ED037P: Alkalinity b	PC Titrator (QC Lot: 5919	990)							
ES2422812-001	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	232	228	1.5	0% - 20%
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	1500	1480	1.4	0% - 20%
		ED037-P: Total Alkalinity as CaCO3		1	mg/L	1730	1710	1.4	0% - 20%
ED041G: Sulfate (Tu	bidimetric) as SO4 2- by DA	(QC Lot: 5921349)							
ES2422789-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1650	1790	8.3	0% - 20%
ED045G: Chloride by	Discrete Analyser (QC Lot	: 5921350)							
ES2422789-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	226	230	1.3	0% - 20%
ED093F: Dissolved N	lajor Cations (QC Lot: 5925	376)							
ES2422651-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	22	22	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	15	12	28.3	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	6	5	24.6	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
ES2422783-004	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	21	20	0.0	0% - 20%

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Work Order	ES2422797
Client	: ROBERT CARR & ASSOCIATES P/L
Project	: 15579a - 6 Monthly Monitoring



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 (%)
ED093F: Dissolved M	ajor Cations (QC Lot: 5925	376) - continued							
ES2422783-004	Anonymous	ED093F: Sodium	7440-23-5	1	mg/L	235	226	4.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	1	1	0.0	No Limit
EG020F: Dissolved M	letals by ICP-MS (QC Lot: §	5925388)							
ES2422868-001	Anonymous	EG020A-F: Arsenic	7440-38-2	0.001	mg/L	1.22	1.29	6.3	0% - 20%
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	4.96	4.93	0.5	0% - 20%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	324	323	0.5	0% - 20%
EN2406627-021	Anonymous	EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EG020T: Total Metals	by ICP-MS (QC Lot: 59192	89)							
ES2422797-004	UL1	EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.554	0.559	0.9	0% - 20%
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	0.35	0.34	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.35	0.36	0.0	No Limit
EN2406729-001	Anonymous	EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.008	0.008	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.011	0.010	0.0	0% - 50%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.002	0.001	0.0	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	7.58	7.66	1.1	0% - 20%
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	1.22	1.21	0.8	0% - 20%
		EG020A-T: Boron	7440-42-8	0.05	mg/L	0.08	0.08	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	7.34	7.36	0.4	0% - 20%
EG020T: Total Metals	by ICP-MS (QC Lot: 59244	29)							
ES2422802-001	Anonymous	EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.007	0.006	19.9	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
ES2422788-001	Anonymous	EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit

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Client	: ROBERT CARR & ASSOCIATES P/L
Project	: 15579a - 6 Monthly Monitoring



Sub-Matrix: WATER						Laboratory D	uplicate (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: 592442	9) - continued							
ES2422788-001	Anonymous	EG020A-T: Copper	7440-50-8	0.001	mg/L	0.055	0.056	0.0	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.006	0.008	28.2	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EG050T: Total Hexava	alent Chromium (QC Lot: 59	28126)							
EN2406807-001	Anonymous	EG050G-T: Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES2422894-003	Anonymous	EG050G-T: Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N	by Discrete Analyser (QC L	ot: 5921348)		i de la companya de l					
ES2422789-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES2422870-003	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: 5922175)									
ES2422656-001	Anonymous	EK059G: Nitrite + Nitrate as N		0.01 (0.50)*	mg/L	25.2	23.7	6.4	0% - 20%
ME2401123-001	Anonymous	EK059G: Nitrite + Nitrate as N		0.01	mg/L	2.04	2.00	2.0	0% - 20%
EK061G: Total Kieldahl Nitrogen By Discrete Analyser (QC Lot: 5922172)									
EW2403229-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N		0.1 (1.0)*	mg/L	36.6	41.2	11.7	0% - 20%
ES2422656-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N		0.1 (0.5)*	mg/L	3.4	3.8	12.5	No Limit
EK067G: Total Phosp	horus as P by Discrete Anal	yser (QC Lot: 5922171)							
EW2403229-001	Anonymous	EK067G: Total Phosphorus as P		0.01 (0.10)*	mg/L	4.55	4.88	7.0	0% - 20%
ES2422656-001	Anonymous	EK067G: Total Phosphorus as P		0.01	mg/L	0.02	0.03	0.0	No Limit
EP005: Total Organic	Carbon (TOC) (QC Lot: 591	8952)							
ES2422797-001	US1	EP005: Total Organic Carbon		1	mg/L	19	20	0.0	0% - 50%
ES2422870-004	Anonymous	EP005: Total Organic Carbon		1	mg/L	<1	<1	0.0	No Limit
EP074D: Fumigants	QC Lot: 5919609)							, i i i i i i i i i i i i i i i i i i i	
ES2422797-004	UL1	EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
EP074E: Halogenated	Aliphatic Compounds (QC	Lot: 5919609)							
ES2422797-004	UL1	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: lodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit

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Work Order	: ES2422797
Client	: ROBERT CARR & ASSOCIATES P/L
Project	: 15579a - 6 Monthly Monitoring



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 (%)
EP074E: Halogenated	Aliphatic Compounds (QC	Lot: 5919609) - continued							
ES2422797-004	UL1	EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit
EP074F: Halogenated	Aromatic Compounds (QC	Lot: 5919609)							
ES2422797-004	UL1	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
EP074G: Trihalometh	anes (QC Lot: 5919609)					·	·		
ES2422797-004	UL1	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit

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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 (%)
EP074G: Trihalometh	anes (QC Lot: 5919609) - c	ontinued							
ES2422797-004	UL1	EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
EP080/071: Total Petr	oleum Hydrocarbons (QC L	_ot: 5919608)							
ES2422675-001	Anonymous	EP080: C6 - C9 Fraction		20	µg/L	<20	<20	0.0	No Limit
ES2422797-001	US1	EP080: C6 - C9 Fraction		20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Rec	overable Hydrocarbons - NE	EPM 2013 Fractions (QC Lot: 5919608)							
ES2422675-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES2422797-001	US1	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC L	.ot: 5919608)								
ES2422675-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES2422797-001	US1	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit



Method Blank (MB) and Laboratory Control Sample (LCS) Report

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.

Mathem Control Spine Spine Spine Spine Addet True (P) Addet Control	Sub-Matrix: WATER				Method Blank (MB)	Laboratory Control Spike (LCS) Report				
Nathor: Consention Consention Concentration				Report	Spike	Spike Recovery (%)	Acceptable	Limits (%)		
EAU25: Total Suspended Solids dried at 104 ± 2°C (QCLot: \$928096) EAU25H: Suspended Solids (SS) 5 mgl. <-5	Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High	
EA025H: Suggended Solids (S)	EA025: Total Suspended Solids dried at 104 \pm 2°C (C	QCLot: 5928066)								
Image: Problem in the second	EA025H: Suspended Solids (SS)		5	mg/L	<5	150 mg/L	95.7	83.0	129	
Image: Book of the set of the se					<5	1000 mg/L	96.4	82.0	110	
ED037:P: Alkalinity by PC Titrator (QCLot: 591990)					<5	928 mg/L	104	83.0	118	
ED037.P: Total Akadinity as CaCO3 mg/L 200 mg/L 88.8 81.0 115 ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (OCLot: 5921349) 50 mg/L 50 mg/L 60 mg/L	ED037P: Alkalinity by PC Titrator (QCLot: 5919990)									
Image: Constraint of the second sec	ED037-P: Total Alkalinity as CaCO3			mg/L		200 mg/L	88.8	81.0	115	
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5921349) 1 mg/L <1 25 mg/L 107 82.0 122 ED045G: Chloride by Discrete Analyser (QCLot: 5921350) 1 1 mg/L <1						50 mg/L	97.5	80.0	120	
ED041G: Sulfate as SQ4 - Turbidimetric 14808-79-8 1 mg/L <1 25 mg/L (1) 107 82.0 122 82.0 ED045G: Chloride by Discrete Analyser (QCLot: 5921350) 50 mg/L 50 mg/L 88.7 82.0 122 ED045G: Chloride by Discrete Analyser (QCLot: 5921360) 100 90.7 82.0 127 ED03F: Dissolved Major Cations (QCLot: 5925376) mg/L <1	ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (Q	CLot: 5921349)								
Lend Image: Problem Pr	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	107	82.0	122	
ED04SG: Chloride by Discrete Analyser (QCLot: 5921350) ED04SG: Chloride 16887-00-6 1 mg/L <1					<1	500 mg/L	98.7	82.0	122	
ED045G: Chloride 16887-00-6 1 mg/L <1 50 mg/L 103 80.9 127 ED03F: Classify Cla	ED045G: Chloride by Discrete Analyser (QCLot: 592	1350)								
Lend	ED045G: Chloride	16887-00-6	1	mg/L	<1	50 mg/L	103	80.9	127	
ED033F: Dissolved Major Cations (QCLot: 5925376) mg/L <1 mg/L <1 50 mg/L 107 80.0 114 ED033F: Calcium 7440-70-2 1 mg/L <1					<1	1000 mg/L	81.8	80.9	127	
ED039F: Calcium 7440-70-2 1 mg/L <1 50 mg/L 107 80.0 114 ED039F: Magnesium 7439-95-4 1 mg/L <1	ED093F: Dissolved Major Cations (QCLot: 5925376)						1			
ED093F: Magnesium 7439-95-4 1 mg/L <1 50 mg/L 100 90.0 116 ED093F: Sodium 7440-23-5 1 mg/L <1	ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	107	80.0	114	
ED093F: Sodium 7440-23-5 1 mg/L <1 50 mg/L 108 82.0 120 ED093F: Potassium 7440-09-7 1 mg/L <1	ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	100	90.0	116	
ED093F: Potassium 7440-09-7 1 mg/L <1 50 mg/L 103 85.0 113 EG020F: Dissolved Metals by ICP-MS (QCLot: 5925388) EG020A-F: Arsenic 7440-38-2 0.001 mg/L <0.001 0.1 mg/L 92.6 85.0 114 EG020A-F: Arsenic 7439-86-5 0.001 mg/L <0.001 0.1 mg/L 97.0 82.0 110 EG020A-F: Iron 7439-89-6 0.05 mg/L <0.05 0.5 mg/L 99.0 82.0 112 EG020A-F: Iron 7439-89-6 0.05 mg/L <0.05 0.5 mg/L 99.0 82.0 114 EG020A-T: Cotal Metals by ICP-MS (QCLot: 5919289) E <th< td=""><td>ED093F: Sodium</td><td>7440-23-5</td><td>1</td><td>mg/L</td><td><1</td><td>50 mg/L</td><td>108</td><td>82.0</td><td>120</td></th<>	ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	108	82.0	120	
EG020F: Dissolved Metals by ICP-MS (QCLot: 5925388) EG020A-F: Arsenic 7440-38-2 0.001 mg/L <0.001	ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	103	85.0	113	
EG020A-F: Arsenic7440-38-20.001mg/L<0.0010.1 mg/L92.685.0114EG020A-F: Manganese7439-96-50.001mg/L<0.001	EG020F: Dissolved Metals by ICP-MS (QCLot: 59253	88)								
EG020A-F: Manganese 7439-96-5 0.001 mg/L <0.001 0.1 mg/L 97.0 82.0 110 EG020A-F: Iron 7439-89-6 0.05 mg/L <0.05	EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	92.6	85.0	114	
EG020A-F: Iron7439-89-60.05mg/L<0.050.5 mg/L99.082.0112EG020A-F: Arsenic7440-38-20.001mg/L<0.0010.1 mg/L10482.0114EG020A-T: Arsenic7440-47-30.001mg/L<0.001	EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	97.0	82.0	110	
EG020T: Total Metals by ICP-MS (QCLot: 5919289) EG020A-T: Arsenic 7440-38-2 0.001 mg/L <0.001	EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	99.0	82.0	112	
EG020A-T: Arsenic7440-38-20.001mg/L<0.0010.1 mg/L10482.0114EG020A-T: Chromium7440-47-30.001mg/L<0.001	EG020T: Total Metals by ICP-MS (QCLot: 5919289)									
EG020A-T: Chromium7440-47-30.001mg/L<0.0010.1 mg/L10286.0116EG020A-T: Copper7440-50-80.001mg/L<0.001	EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	104	82.0	114	
EG020A-T: Copper7440-50-80.001mg/L<0.0010.1 mg/L10183.0118EG020A-T: Lead7439-92-10.001mg/L<0.001	EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	102	86.0	116	
EG020A-T: Lead 7439-92-1 0.001 mg/L <0.001 0.1 mg/L 90.4 85.0 115 EG020A-T: Manganese 7439-96-5 0.001 mg/L <0.001	EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	101	83.0	118	
EG020A-T: Manganese 7439-96-5 0.001 mg/L <0.001 0.1 mg/L 102 85.0 113 EG020A-T: Zinc 7440-66-6 0.005 mg/L <0.005	EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	90.4	85.0	115	
EG020A-T: Zinc 7440-66-6 0.005 mg/L <0.005 0.1 mg/L 99.2 79.0 117 EG020A-T: Boron 7440-42-8 0.05 mg/L <0.05	EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	102	85.0	113	
EG020A-T: Boron 7440-42-8 0.05 mg/L <0.05 0.5 mg/L 104 75.0 129 EG020A-T: Iron 7439-89-6 0.05 mg/L <0.05	EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	99.2	79.0	117	
EG020A-T: Iron 7439-89-6 0.05 mg/L <0.05 0.5 mg/L 102 85.0 117	EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	104	75.0	129	
	EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	102	85.0	117	

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Project	: 15579a - 6 Monthly Monitoring



Sub-Matrix: WATER				Method Blank (MB)	Laboratory Control Spike (LCS) Report			
				Report	Spike	Spike Recovery (%)	Acceptable	Limits (%)
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 5924429)							
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	97.6	82.0	114
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	98.0	86.0	116
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	97.0	83.0	118
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	93.0	85.0	115
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	96.7	85.0	113
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	96.8	79.0	117
EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	91.1	75.0	129
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	105	85.0	117
EG050T: Total Hexavalent Chromium (QCLot: 592	8126)						• •	-
EG050G-T: Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	0.05 mg/L	92.0	87.0	113
EK057G: Nitrite as N by Discrete Analyser (QCLo	t: 5921348)							
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	101	82.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discre	te Analyser (QCLot: 59	922175)						
EK059G: Nitrite + Nitrate as N		0.01	mg/L	<0.01	0.5 mg/L	103	91.0	113
EK061G: Total Kjeldahl Nitrogen By Discrete Analy	yser (QCLot: 5922172)							
EK061G: Total Kjeldahl Nitrogen as N		0.1	mg/L	<0.1	10 mg/L	84.7	69.0	123
				<0.1	1 mg/L	108	70.0	123
				<0.1	5 mg/L	99.8	70.0	123
EK067G: Total Phosphorus as P by Discrete Analy	vser (QCLot: 5922171)							
EK067G: Total Phosphorus as P		0.01	mg/L	<0.01	4.42 mg/L	89.7	71.3	126
				<0.01	0.442 mg/L	100	71.3	126
				<0.01	1 mg/L	102	70.0	130
EP005: Total Organic Carbon (TOC) (QCLot: 5918	952)							
EP005: Total Organic Carbon		1	mg/L	<1	10 mg/L	91.6	72.0	120
EP068A: Organochlorine Pesticides (OC) (QCLot:	5919409)							
EP068: alpha-BHC	319-84-6	0.5	μg/L	<0.5	5 µg/L	84.2	64.9	107
EP068: Hexachlorobenzene (HCB)	118-74-1	0.5	μg/L	<0.5	5 µg/L	91.6	58.3	111
EP068: beta-BHC	319-85-7	0.5	μg/L	<0.5	5 µg/L	95.0	69.0	117
EP068: gamma-BHC	58-89-9	0.5	μg/L	<0.5	5 µg/L	96.0	70.0	112
EP068: delta-BHC	319-86-8	0.5	μg/L	<0.5	5 µg/L	93.7	68.9	110
EP068: Heptachlor	76-44-8	0.5	μg/L	<0.5	5 µg/L	86.7	65.2	108
EP068: Aldrin	309-00-2	0.5	µg/L	<0.5	5 µg/L	92.1	65.8	109
EP068: Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	5 µg/L	99.0	67.1	107
EP068: trans-Chlordane	5103-74-2	0.5	μg/L	<0.5	5 µg/L	97.7	64.1	110

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Project	: 15579a - 6 Monthly Monitoring



Sub-Matrix: WATER			Method Blank (MB)	Laboratory Control Spike (LCS) Report				
			Report	Spike	Spike Recovery (%)	Acceptable	Limits (%)	
Method: Compound CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High	
EP068A: Organochlorine Pesticides (OC) (QCLot: 5919409) - continued								
EP068: alpha-Endosulfan 959-98-8	0.5	µg/L	<0.5	5 µg/L	90.2	66.7	112	
EP068: cis-Chlordane 5103-71-9	0.5	µg/L	<0.5	5 µg/L	97.1	63.2	111	
EP068: Dieldrin 60-57-1	0.5	µg/L	<0.5	5 µg/L	103	65.2	113	
EP068: 4.4`-DDE 72-55-9	0.5	µg/L	<0.5	5 µg/L	106	66.0	112	
EP068: Endrin 72-20-8	0.5	µg/L	<0.5	5 µg/L	81.9	65.2	113	
EP068: beta-Endosulfan 33213-65-9	0.5	µg/L	<0.5	5 µg/L	95.6	67.3	114	
EP068: 4.4`-DDD 72-54-8	0.5	µg/L	<0.5	5 µg/L	98.6	72.0	122	
EP068: Endrin aldehyde 7421-93-4	0.5	µg/L	<0.5	5 µg/L	100.0	66.9	109	
EP068: Endosulfan sulfate 1031-07-8	0.5	µg/L	<0.5	5 µg/L	88.0	65.2	112	
EP068: 4.4`-DDT 50-29-3	2	µg/L	<2.0	5 µg/L	90.2	65.2	112	
EP068: Endrin ketone 53494-70-5	0.5	µg/L	<0.5	5 µg/L	104	63.8	110	
EP068: Methoxychlor 72-43-5	2	µg/L	<2.0	5 µg/L	90.6	61.1	114	
EP068B: Organophosphorus Pesticides (OP) (QCLot: 5919409)								
EP068: Dichlorvos 62-73-7	0.5	µg/L	<0.5	5 µg/L	91.4	65.6	114	
EP068: Demeton-S-methyl 919-86-8	0.5	µg/L	<0.5	5 µg/L	74.5	63.7	113	
EP068: Monocrotophos 6923-22-4	2	µg/L	<2.0	5 µg/L	24.3	19.7	48.0	
EP068: Dimethoate 60-51-5	0.5	µg/L	<0.5	5 µg/L	80.0	69.5	110	
EP068: Diazinon 333-41-5	0.5	µg/L	<0.5	5 µg/L	104	71.1	110	
EP068: Chlorpyrifos-methyl 5598-13-0	0.5	µg/L	<0.5	5 µg/L	98.4	77.0	119	
EP068: Parathion-methyl 298-00-0	2	µg/L	<2.0	5 µg/L	87.6	70.0	124	
EP068: Malathion 121-75-5	0.5	µg/L	<0.5	5 µg/L	96.7	68.4	116	
EP068: Fenthion 55-38-9	0.5	µg/L	<0.5	5 µg/L	100	68.6	112	
EP068: Chlorpyrifos 2921-88-2	0.5	µg/L	<0.5	5 µg/L	96.4	75.0	119	
EP068: Parathion 56-38-2	2	µg/L	<2.0	5 µg/L	93.5	67.0	121	
EP068: Pirimphos-ethyl 23505-41-1	0.5	µg/L	<0.5	5 µg/L	103	69.0	121	
EP068: Chlorfenvinphos 470-90-6	0.5	µg/L	<0.5	5 µg/L	107	71.8	110	
EP068: Bromophos-ethyl 4824-78-6	0.5	µg/L	<0.5	5 µg/L	101	67.5	112	
EP068: Fenamiphos 22224-92-6	0.5	µg/L	<0.5	5 µg/L	88.6	64.1	116	
EP068: Prothiofos 34643-46-4	0.5	μg/L	<0.5	5 μg/L	103	67.8	114	
EP068: Ethion 563-12-2	0.5	µg/L	<0.5	5 µg/L	92.0	74.0	120	
EP068: Carbophenothion 786-19-6	0.5	µg/L	<0.5	5 μg/L	96.6	66.2	114	
EP068: Azinphos Methyl 86-50-0	0.5	µg/L	<0.5	5 µg/L	66.5	51.6	128	
EP074D: Fumigants (QCLot: 5919609)								
EP074: 2.2-Dichloropropane 594-20-7	5	µg/L	<5	10 µg/L	101	68.0	122	

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Sub-Matrix: WATER	1		Method Blank (MB)	Laboratory Control Spike (LCS) Report				
			Report	Spike	Spike Recovery (%)	Acceptable	Limits (%)	
Method: Compound CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High	
EP074D: Fumigants (QCLot: 5919609) - continued								
EP074: 1.2-Dichloropropane 78-87-5	5	µg/L	<5	10 µg/L	99.0	76.0	118	
EP074: cis-1.3-Dichloropropylene 10061-01-5	5	µg/L	<5	10 µg/L	101	62.0	120	
EP074: trans-1.3-Dichloropropylene 10061-02-6	5	µg/L	<5	10 µg/L	95.4	60.0	114	
EP074: 1.2-Dibromoethane (EDB) 106-93-4	5	µg/L	<5	10 µg/L	99.5	69.0	117	
EP074E: Halogenated Aliphatic Compounds (QCLot: 5919609)								
EP074: Dichlorodifluoromethane 75-71-8	50	µg/L	<50	100 µg/L	98.4	60.6	138	
EP074: Chloromethane 74-87-3	50	µg/L	<50	100 µg/L	98.9	67.4	130	
EP074: Vinyl chloride 75-01-4	50	µg/L	<50	100 µg/L	98.0	69.4	129	
EP074: Bromomethane 74-83-9	50	µg/L	<50	100 µg/L	93.8	56.0	140	
EP074: Chloroethane 75-00-3	50	µg/L	<50	100 µg/L	95.2	61.0	139	
EP074: Trichlorofluoromethane 75-69-4	50	µg/L	<50	100 µg/L	96.0	69.0	131	
EP074: 1.1-Dichloroethene 75-35-4	5	µg/L	<5	10 µg/L	93.8	70.0	124	
EP074: lodomethane 74-88-4	5	µg/L	<5	10 µg/L	88.5	70.2	128	
EP074: trans-1.2-Dichloroethene 156-60-5	5	µg/L	<5	10 µg/L	98.4	74.0	118	
EP074: 1.1-Dichloroethane 75-34-3	5	µg/L	<5	10 µg/L	100	74.0	120	
EP074: cis-1.2-Dichloroethene 156-59-2	5	µg/L	<5	10 µg/L	101	77.0	119	
EP074: 1.1.1-Trichloroethane 71-55-6	5	µg/L	<5	10 µg/L	100	67.0	119	
EP074: 1.1-Dichloropropylene 563-58-6	5	µg/L	<5	10 µg/L	97.7	73.0	119	
EP074: Carbon Tetrachloride 56-23-5	5	µg/L	<5	10 µg/L	97.2	62.0	120	
EP074: 1.2-Dichloroethane 107-06-2	5	µg/L	<5	10 µg/L	98.4	73.0	123	
EP074: Trichloroethene 79-01-6	5	µg/L	<5	10 µg/L	93.8	76.0	118	
EP074: Dibromomethane 74-95-3	5	µg/L	<5	10 µg/L	94.8	73.0	119	
EP074: 1.1.2-Trichloroethane 79-00-5	5	µg/L	<5	10 µg/L	98.3	72.0	126	
EP074: 1.3-Dichloropropane 142-28-9	5	µg/L	<5	10 µg/L	100	71.0	129	
EP074: Tetrachloroethene 127-18-4	5	µg/L	<5	10 µg/L	98.0	72.0	124	
EP074: 1.1.1.2-Tetrachloroethane 630-20-6	5	µg/L	<5	10 µg/L	99.3	66.0	114	
EP074: trans-1.4-Dichloro-2-butene 110-57-6	5	µg/L	<5	10 µg/L	86.8	60.0	120	
EP074: cis-1.4-Dichloro-2-butene 1476-11-5	5	µg/L	<5	10 µg/L	88.2	70.6	128	
EP074: 1.1.2.2-Tetrachloroethane 79-34-5	5	µg/L	<5	10 µg/L	99.8	70.0	124	
EP074: 1.2.3-Trichloropropane 96-18-4	5	μg/L	<5	10 µg/L	89.5	74.0	126	
EP074: Pentachloroethane 76-01-7	5	µg/L	<5	10 µg/L	96.1	71.8	126	
EP074: 1.2-Dibromo-3-chloropropane 96-12-8	5	μg/L	<5	10 µg/L	89.1	66.4	136	
EP074: Hexachlorobutadiene 87-68-3	5	µg/L	<5	10 µg/L	101	58.0	130	

EP074F: Halogenated Aromatic Compounds (QCLot: 5919609)

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Sub-Matrix: WATER				Method Blank (MB)	Laboratory Control Spike (LCS) Report				
				Report	Spike	Spike Recovery (%)	Acceptable	e Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High	
EP074F: Halogenated Aromatic Compounds ((QCLot: 5919609) - continu	ed							
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	10 µg/L	96.5	79.0	117	
EP074: Bromobenzene	108-86-1	5	µg/L	<5	10 µg/L	98.3	76.0	116	
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	10 µg/L	100	73.0	119	
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	10 µg/L	99.6	73.0	119	
EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	10 µg/L	98.8	75.0	117	
EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	10 µg/L	96.9	74.0	118	
EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	10 µg/L	96.2	75.0	117	
EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	10 µg/L	100	61.0	125	
EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	10 µg/L	91.3	67.0	123	
EP074G: Trihalomethanes (QCLot: 5919609)							-		
EP074: Chloroform	67-66-3	5	µg/L	<5	10 µg/L	98.0	72.0	120	
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	10 µg/L	98.2	64.0	118	
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	10 µg/L	92.9	65.0	115	
EP074: Bromoform	75-25-2	5	µg/L	<5	10 µg/L	101	73.5	126	
EP080/071: Total Petroleum Hydrocarbons (Q	CLot: 5919608)								
EP080: C6 - C9 Fraction		20	µg/L	<20	260 µg/L	77.6	75.0	127	
EP080/071: Total Recoverable Hydrocarbons -	NEPM 2013 Fractions (QC	Lot: 5919608)							
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	81.1	75.0	127	
EP080: BTEXN (QCLot: 5919608)							-		
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	101	68.3	119	
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	107	73.5	120	
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	108	73.8	122	
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	105	73.0	122	
	106-42-3								
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	105	76.4	123	
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	104	75.5	124	

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	SpikeRecovery(%)	Acceptable L	imits (%)		
Laboratory sample ID	Sample ID	Method: Compound CAS Nut	umber	Concentration	MS	Low	High		
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5921349)									

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Sub-Matrix: WATER				Matrix Spike (MS) Report				
				Spike	SpikeRecovery(%)	Acceptable L	imits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
ED041G: Sulfate (T	urbidimetric) as SO4 2- by DA(QCLot: 5921349)- cont	inued						
ES2422789-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not	70.0	130	
					Determined			
ED045G: Chloride b	by Discrete Analyser (QCLot: 5921350)							
ES2422789-001	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	94.8	70.0	130	
EG020F: Dissolved	Metals by ICP-MS (QCLot: 5925388)				, i i i i i i i i i i i i i i i i i i i			
ES2422797-002	UW2	EG020A-E ⁻ Arsenic	7440-38-2	1 mg/L	100	70.0	130	
		EG020A-F: Manganese	7439-96-5	1 mg/L	110	70.0	130	
EG020T: Total Meta	ls by ICP-MS (QCLot: 5919289)					·		
EN2406729-002	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	106	70.0	130	
		EG020A-T: Chromium	7440-47-3	1 mg/L	109	70.0	130	
		EG020A-T: Copper	7440-50-8	1 mg/L	97.2	70.0	130	
		EG020A-T: Lead	7439-92-1	1 mg/L	93.3	70.0	130	
		EG020A-T: Manganese	7439-96-5	1 mg/L	# Not	70.0	130	
					Determined			
		EG020A-T: Zinc	7440-66-6	1 mg/L	106	70.0	130	
EG020T: Total Meta	ils by ICP-MS (QCLot: 5924429)							
ES2422788-002	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	98.9	70.0	130	
		EG020A-T: Chromium	7440-47-3	1 mg/L	106	70.0	130	
		EG020A-T: Copper	7440-50-8	1 mg/L	102	70.0	130	
		EG020A-T: Lead	7439-92-1	1 mg/L	102	70.0	130	
		EG020A-T: Manganese	7439-96-5	1 mg/L	100	70.0	130	
		EG020A-T: Zinc	7440-66-6	1 mg/L	99.4	70.0	130	
EG050T: Total Hexa	avalent Chromium (QCLot: 5928126)							
EN2406807-001	Anonymous	EG050G-T: Hexavalent Chromium	18540-29-9	0.05 mg/L	89.2	70.0	130	
EK057G: Nitrite as	N by Discrete Analyser (QCLot: 5921348)							
ES2422789-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	104	70.0	130	
EK059G: Nitrite plu	us Nitrate as N (NOx) by Discrete Analyser (QCLot: 59	22175)				i de la companya de l		
ES2422656-001	Anonymous	EK059G: Nitrite + Nitrate as N		0.5 mg/L	# Not	70.0	130	
					Determined			
EK061G: Total Kjel	dahl Nitrogen By Discrete Analyser (QCLot: 5922172)							
ES2422744-001	Anonymous	EK061G [,] Total Kieldahl Nitrogen as N		5 mg/L	# Not	70.0	130	
				0	Determined			
EK067G: Total Pho	sphorus as P by Discrete Analyser (QCLot: 5922171)							
ES2422744-001	Anonymous	EK067G: Total Phosphorus as P		1 mg/L	# Not	70.0	130	
				·····	Determined			
EP005: Total Organ	ic Carbon (TOC) (QCLot: 5918952)				· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		

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Sub-Matrix: WATER			Ма	trix Spike (MS) Report	•		
				Spike	SpikeRecovery(%)	Acceptable L	_imits (%)
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP005: Total Organ	ic Carbon (TOC) (QCLot: 5918952) - continued						
ES2422797-002	UW2	EP005: Total Organic Carbon		100 mg/L	97.4	70.0	130
EP074E: Halogenat	ed Aliphatic Compounds (QCLot: 5919609)						
ES2422797-004	UL1	EP074: 1.1-Dichloroethene	75-35-4	25 µg/L	89.1	70.0	130
		EP074: Trichloroethene	79-01-6	25 µg/L	105	70.0	130
EP074F: Halogenat	ed Aromatic Compounds (QCLot: 5919609)						
ES2422797-004	UL1	EP074: Chlorobenzene	108-90-7	25 µg/L	117	70.0	130
EP080/071: Total Pe	etroleum Hydrocarbons (QCLot: 5919608)						
ES2422675-001	Anonymous	EP080: C6 - C9 Fraction		325 µg/L	71.4	70.0	130
EP080/071: Total R	ecoverable Hydrocarbons - NEPM 2013 Fractions(QCL	ot: 5919608)					
ES2422675-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 μg/L	73.6	70.0	130
EP080: BTEXN (QC	:Lot: 5919608)						
ES2422675-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	89.2	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	94.2	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	96.2	70.0	130
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	94.3	70.0	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	25 µg/L	92.6	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	96.1	70.0	130



QA/QC Compliance Assessment to assist with Quality Review							
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Client	: ROBERT CARR & ASSOCIATES P/L	Laboratory	: Environmental Division Sydney				
Contact	: MS FIONA BROOKER	Telephone	: +61-2-8784 8555				
Project	: 15579a - 6 Monthly Monitoring	Date Samples Received	: 11-Jul-2024				
Site	:	Issue Date	: 18-Jul-2024				
Sampler	:	No. of samples received	: 7				
Order number	:	No. of samples analysed	: 7				

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.
- <u>NO</u> Duplicate outliers occur.
- <u>NO</u> 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, <u>NO</u> 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									
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	ES2422789001	Anonymous	Sulfate as SO4 -	14808-79-8	Not		MS recovery not determined,		
			Turbidimetric		Determined		background level greater than or		
							equal to 4x spike level.		
EG020T: Total Metals by ICP-MS	EN2406729002	Anonymous	Manganese	7439-96-5	Not		MS recovery not determined,		
					Determined		background level greater than or		
							equal to 4x spike level.		
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete A	ES2422656001	Anonymous	Nitrite + Nitrate as N		Not		MS recovery not determined,		
					Determined		background level greater than or		
							equal to 4x spike level.		
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser	ES2422744001	Anonymous	Total Kjeldahl Nitrogen		Not		MS recovery not determined,		
			as N		Determined		background level greater than or		
							equal to 4x spike level.		
EK067G: Total Phosphorus as P by Discrete Analyser	ES2422744001	Anonymous	Total Phosphorus as P		Not		MS recovery not determined,		
					Determined		background level greater than or		
							equal to 4x spike level.		

Outliers : Analysis Holding Time Compliance

Matrix: WATER

Method	Ex	traction / Preparation		Analysis					
Container / Client Sample ID(s)	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue			
EK057G: Nitrite as N by Discrete Analyser									
Clear Plastic Bottle - Natural UW3, UL1, QA				13-Jul-2024	12-Jul-2024	1			
EP025: Oxygen - Dissolved (DO)									
Clear Plastic Bottle - Natural UW2				12-Jul-2024	10-Jul-2024	2			

Outliers : Frequency of Quality Control Samples

Matrix: WATER Quality Control Sample Type **Quality Control Specification** Count Rate (%) Analytical Methods Method QC Regular Actual Expected Laboratory Duplicates (DUP) Pesticides by GCMS NEPM 2013 B3 & ALS QC Standard EP068 0 4 0.00 10.00 Matrix Spikes (MS) Pesticides by GCMS 0.00 5.00 NEPM 2013 B3 & ALS QC Standard EP068 0 4



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 <u>VOC in soils</u> 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 <u>or</u> Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: WATER					Evaluation	: × = Holding time	breach ; 🗸 = Withi	n holding time.			
Method		Sample Date	Ex	traction / Preparation		Analysis					
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation			
EA025: Total Suspended Solids dried at 104 ± 2°C											
Clear Plastic Bottle - Natural (EA025H)											
US1		10-Jul-2024				16-Jul-2024	17-Jul-2024	✓			
ED037P: Alkalinity by PC Titrator											
Clear Plastic Bottle - Natural (ED037-P)											
US1,	UW2,	10-Jul-2024				12-Jul-2024	24-Jul-2024	✓			
UW3,	UL1,										
QA											
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA											
Clear Plastic Bottle - Natural (ED041G)											
US1		10-Jul-2024				13-Jul-2024	07-Aug-2024	✓			
ED045G: Chloride by Discrete Analyser											
Clear Plastic Bottle - Natural (ED045G)											
US1,	UW2,	10-Jul-2024				13-Jul-2024	07-Aug-2024	✓			
UW3,	UL1,										
QA											
ED093F: Dissolved Major Cations											
Clear Plastic Bottle - Natural (ED093F)							17 1 1 000 1				
US1		10-Jul-2024				16-Jul-2024	17-Jul-2024	✓			
EG020F: Dissolved Metals by ICP-MS			1			1					
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)		40.1.1.0004				40.1.10004	00 100 0005				
UW2,	UW3	10-Jul-2024				16-Jul-2024	06-Jan-2025	✓			
EG020T: Total Metals by ICP-MS			1								
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T)				00 100 0005			00 100 0005				
US1,	UL1	10-Jul-2024	12-Jul-2024	06-Jan-2025	~	12-Jul-2024	06-Jan-2025	✓			
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T)		10 101 2024	15 Jul 2024	06- Jan-2025		15 Jul 2024	06- Jan-2025				
		10-301-2024	13-301-2024	00-0011-2020	~	15-501-2024	00-0011-2020	✓			
EG050T: Total Hexavalent Chromium											
Clear Plastic Bottle - NaOH (EG050G-T)	111.1	10- Jul-2024				17- Jul-2024	07-Aug-2024				
001,	ULI	10-001-2024				17-501-2024	57 Aug 2024	V			

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Matrix: WATER					Evaluation	: × = Holding time	breach ; 🗸 = Withi	n holding time
Method		Sample Date	Ex	traction / Preparation			Analysis	
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK057G: Nitrite as N by Discrete Analyser								
Clear Plastic Bottle - Natural (EK057G)								
US1,	UW2	10-Jul-2024				12-Jul-2024	12-Jul-2024	✓
Clear Plastic Bottle - Natural (EK057G)	111.4	10 101 2024				12 101 2024	12- lul-2024	
	UEI,	10-501-2024				13-301-2024	12-301-2024	*
EKOEOCI Nitwite plue Nitwete ee N (NOv) by Discrete A								
Clear Plastic Bottle - Sulfuric Acid (EK059G)	naiysei							
UW3		10-Jul-2024				13-Jul-2024	07-Aug-2024	 ✓
Clear Plastic Bottle - Sulfuric Acid (EK059G)								
US1,	UW2,	10-Jul-2024				15-Jul-2024	07-Aug-2024	 ✓
UL1,	QA							
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser		-		1	1	1	1	
Clear Plastic Bottle - Sulfuric Acid (EK061G)		40.1.10004	40.1.10004	07 4.17 2024		40.1.1.000.4	07 Aug 0004	
US1,	UW2,	10-Jul-2024	13-Jui-2024	07-Aug-2024	~	13-Jul-2024	07-Aug-2024	✓
UW3,	UL1,							
QA								
EK067G: Total Phosphorus as P by Discrete Analyser								
LIS1	111.1	10-Jul-2024	13-Jul-2024	07-Aug-2024		13-Jul-2024	07-Aua-2024	
ED005: Total Ormania Carbon (TOC)		10 001 2024	10 001 2024	017 Kag 2021	•	10 001 2024	01 7 Kdg 202 1	•
Amber TOC Vial Sulfuric Acid (EB005)								
US1.	UW2.	10-Jul-2024				15-Jul-2024	07-Aug-2024	1
UW3,	UL1						-	
Amber VOC Vial - Sulfuric Acid (EP005)								
QA		10-Jul-2024				15-Jul-2024	07-Aug-2024	✓
EP025: Oxygen - Dissolved (DO)								
Clear Plastic Bottle - Natural (EP025)							40.1.1.0004	
UW2		10-Jul-2024				12-Jul-2024	10-Jul-2024	×
EP068A: Organochlorine Pesticides (OC)								1
Amber Glass Bottle - Unpreserved (EP068)		10 101 2024	12 101 2024	17 101 2024	,	12 101 2024	21 Aug 2024	
		10-501-2024	12-301-2024	17-301-2024	✓	13-301-2024	21-Aug-2024	✓
EP068B: Organophosphorus Pesticides (OP)		1				1		1
Amber Glass Bottle - Unpreserved (EP068)		10-Jul-2024	12-Jul-2024	17-Jul-2024		13-Jul-2024	21-Aug-2024	
ER074D: Eumiconto								₩
Amber VOC Vial - Sulfuric Acid (EP074)			l					
		10-Jul-2024	12-Jul-2024	24-Jul-2024	1	12-Jul-2024	24-Jul-2024	1
EP074E: Halogenated Alinhatic Compounds								
Amber VOC Vial - Sulfuric Acid (EP074)								
UL1		10-Jul-2024	12-Jul-2024	24-Jul-2024	1	12-Jul-2024	24-Jul-2024	✓



Matrix: WATER Evaluation: * = Holding time breach ; \checkmark = Within holding time. Method Sample Date Extraction / Preparation Analysis Container / Client Sample ID(s) Due for extraction Evaluation Due for analysis Evaluation Date extracted Date analysed EP074F: Halogenated Aromatic Compounds Amber VOC Vial - Sulfuric Acid (EP074) 24-Jul-2024 24-Jul-2024 10-Jul-2024 12-Jul-2024 12-Jul-2024 UL1 1 \checkmark EP074G: Trihalomethanes Amber VOC Vial - Sulfuric Acid (EP074) 10-Jul-2024 UL1 12-Jul-2024 24-Jul-2024 1 12-Jul-2024 24-Jul-2024 \checkmark EP080/071: Total Petroleum Hydrocarbons Amber VOC Vial - Sulfuric Acid (EP080) TRIP BLANK 10-Jul-2024 12-Jul-2024 24-Jul-2024 1 12-Jul-2024 24-Jul-2024 1 EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions Amber VOC Vial - Sulfuric Acid (EP080) 24-Jul-2024 24-Jul-2024 10-Jul-2024 12-Jul-2024 12-Jul-2024 TRIP BLANK 1 \checkmark EP080: BTEXN Amber VOC Vial - Sulfuric Acid (EP080) 10-Jul-2024 24-Jul-2024 US1, TRIP BLANK, 12-Jul-2024 ✓ 12-Jul-2024 24-Jul-2024 \checkmark TRIP SPIKE



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 n										
Quality Control Sample Type		С	ount		Rate (%)		Quality Control Specification				
Analytical Methods	Method	QC	Reaular	Actual	Expected	Evaluation					
Laboratory Duplicates (DUP)											
Alkalinity by Auto Titrator	ED037-P	1	8	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard				
Chloride by Discrete Analyser	ED045G	1	8	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard				
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard				
Hexavalent Chromium by Discrete Analyser - Total	EG050G-T	2	13	15.38	10.00	✓	NEPM 2013 B3 & ALS QC Standard				
Major Cations - Dissolved	ED093F	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard				
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	17	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard				
Nitrite as N by Discrete Analyser	EK057G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard				
Pesticides by GCMS	EP068	0	4	0.00	10.00	×	NEPM 2013 B3 & ALS QC Standard				
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard				
Suspended Solids (High Level)	EA025H	4	40	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard				
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard				
Total Metals by ICP-MS - Suite A	EG020A-T	4	31	12.90	10.00	✓	NEPM 2013 B3 & ALS QC Standard				
Total Organic Carbon	EP005	2	13	15.38	10.00	✓	NEPM 2013 B3 & ALS QC Standard				
Total Phosphorus as P By Discrete Analyser	EK067G	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard				
TRH Volatiles/BTEX	EP080	2	12	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard				
Volatile Organic Compounds	EP074	1	6	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard				
Laboratory Control Samples (LCS)											
Alkalinity by Auto Titrator	ED037-P	2	8	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard				
Chloride by Discrete Analyser	ED045G	2	8	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard				
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard				
Hexavalent Chromium by Discrete Analyser - Total	EG050G-T	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard				
Major Cations - Dissolved	ED093F	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard				
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard				
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard				
Pesticides by GCMS	EP068	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard				
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	4	50.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard				
Suspended Solids (High Level)	EA025H	5	40	12.50	12.50	✓	NEPM 2013 B3 & ALS QC Standard				
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	3	18	16.67	15.00	✓	NEPM 2013 B3 & ALS QC Standard				
Total Metals by ICP-MS - Suite A	EG020A-T	2	31	6.45	5.00	✓	NEPM 2013 B3 & ALS QC Standard				
Total Organic Carbon	EP005	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard				
Total Phosphorus as P By Discrete Analyser	EK067G	3	16	18.75	15.00	✓	NEPM 2013 B3 & ALS QC Standard				
TRH Volatiles/BTEX	EP080	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard				
Volatile Organic Compounds	EP074	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard				
Method Blanks (MB)											
Chloride by Discrete Analyser	ED045G	1	8	12.50	5.00	\checkmark	NEPM 2013 B3 & ALS QC Standard				
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard				

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Client	: ROBERT CARR & ASSOCIATES P/L
Project	: 15579a - 6 Monthly Monitoring



Matrix: WATER				Evaluatio	on: × = Quality Co	ontrol frequency	not within specification ; ✓ = Quality Control frequency within specification
Quality Control Sample Type		(Count		Rate (%)	•	Quality Control Specification
Analytical Methods	Method	QC	Reaular	Actual	Expected	Evaluation	
Method Blanks (MB) - Continued							
Hexavalent Chromium by Discrete Analyser - Total	EG050G-T	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	16	6.25	5.00	1	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	4	25.00	5.00	1	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	18	5.56	5.00	1	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	31	6.45	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	1	13	7.69	5.00	1	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	1	NEPM 2013 B3 & ALS QC Standard
Hexavalent Chromium by Discrete Analyser - Total	EG050G-T	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	1	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	0	4	0.00	5.00	x	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	18	5.56	5.00	1	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	31	6.45	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	1	13	7.69	5.00	1	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	16	6.25	5.00	1	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	6	16.67	5.00	1	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
Suspended Solids (High Level)	EA025H	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of
			`non-filterable` residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water,
			oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um).
			The residue on the filter paper is dried at 104+/-2C . This method is compliant with NEPM Schedule B(3)
Free and Total CO2	EA165-P	WATER	In house: Referenced to APHA 4500-CO2 D. 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 SO4 2- by	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate
Discrete Analyser			ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light
			absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 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 CI - 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 thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by
			either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption
			Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This
			method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B.
			This method is compliant with NEPM Schedule B(3)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered
			prior to analysis. 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.
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.
Trivalent Chromium - Total	EG049G-T	WATER	In house: Referenced to APHA 3500 Cr-B & 3120/3125. Trivalent Chromium is the difference between total
			dissolved and dissolved hexavalent chromium.
Hexavalent Chromium by Discrete	EG050G-T	WATER	In house: Referenced to APHA 3500 Cr-A & B. Hexavalent chromium is determined directly on water sample by
Analyser - Total			Descrete Analyser as received by pH adjustment and colour development using dephenylcarbazide. Each run of
			samples is measured against a five-point calibration curve. This method is compliant with NEPM Schedule B(3).
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser.
			This method is compliant with NEPM Schedule B(3)



Analytical Methods	Method	Matrix	Method Descriptions
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- 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 (NOx) by Discrete	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by
Analyser			Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM
			Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high
Analyser			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 Phosphorus as P By Discrete	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al, Zhang et al. This procedure involves sulphuric acid
Analyser			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)
Ionic Balance by PCT DA and Turbi SO4	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
DA			
Total Organic Carbon	EP005	WATER	In house: Referenced to APHA 5310 B, The automated TOC analyzer determines Total and Inorganic Carbon by
			IR cell. TOC is calculated as the difference. This method is compliant with NEPM Schedule B(3)
Oxygen - Dissolved	EP025	WATER	In house: Referenced to APHA 4500-O G. Dissolved Oxygen Probe. This method is compliant with NEPM
			Schedule B(3)
Pesticides by GCMS	EP068	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS and
			quantification is by comparison against an established 5 point calibration curve. This method is compliant with
			NEPM Schedule B(3)
Volatile Organic Compounds	EP074	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary
			GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is
			compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary
			GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a
			sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This
			method is compliant with the QC requirements of NEPM Schedule B(3)
Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	WATER	In house: Poterspeed to APHA 4500 Norg D: APHA 4500 P. H. This method is compliant with NEDM Schedule

r reparation methous	Method	Wallix	Method Descriptions
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)
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel
			and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated
			and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes
			sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.

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LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to cades below)	TOTAL BOTTLES	Alkalinity	Arsenic	Boron	BTEX	Carbon Dioxide	Chloride	Chromium (III + VI)		Copper	Dissolved Oxygen	Lead	Manganese	Nitrate + Nitrite	VT01 - Cations: Major (Ca, Mg, Na K)	Suite 12; OCP/OPP		Phosphorous (total)	Sulfate	TKN	Total Organic Carbon	Total Suspended Solids	Volatile Organic Compounds	Zinc			Comments on samples requir	likely contam	ninant levels, dilutions, QC analysis etc.
1	US1	10/7 hm	W		S	x	x		x		x	x		x		(x	x	x			x	x	x	x	x	1	x					
1	UW2	10/7 150	61		20	x	x			x	x				x	(x	x						x	x						Tetal sectors		JULA Filtered meth
1	UW3	10/7 307	6		5	x	x			x	x		-			(x	x			1		1	x	x		1				Total metals	on UW2 a	and UW3.
2	UL1	10/7 230	W		g	x	x	x			x	x			;	x	x	x		x		x		x	x		x	x			-		
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SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: ES2422797		
Client Contact Address	: ROBERT CARR & ASSOCIATES P/L : MS FIONA BROOKER : 92 HILL STREET CARRINGTON NSW 2294	Laboratory : Er Contact : D Address : 27 N	nvironmental Division Sydney anae Hambly 77-289 Woodpark Road Smithfield SW Australia 2164
E-mail Telephone Facsimile	: fionab@rca.com.au : +61 02 4902 9200 : +61 02 4902 9299	E-mail : da Telephone : +(Facsimile : +(anae.hambly@alsglobal.com 61-2-8784 8555 61-2-8784 8500
Project Order number C-O-C number Site Sampler	: 15579a - 6 Monthly Monitoring : : :	Page : 1 Quote number : El QC Level : N	of 3 N2023ROBCAR0002 (EN/222) EPM 2013 B3 & ALS QC Standard
Dates Date Samples Receive Client Requested Due Date	d : 11-Jul-2024 09:59 : 18-Jul-2024	Issue Date Scheduled Reporting Date	: 11-Jul-2024 : 18-Jul-2024
Delivery Details Mode of Delivery No. of coolers/boxes Receipt Detail	: Undefined : 1 :	Security Seal Temperature No. of samples received / a	: Not Available : 1.7 - Ice present analysed : 7 / 7

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.
- Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Unless otherwise stated, analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

• No sample container / preservation non-compliance exists.

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

laboratory and component Matrix: WATER	displayed in bra	sample ID	a time	'ER - EA025H bended Solids - Stand	'ER - EG049G-T tlent Chromium - Tota	'ER - EP005 I Organic Carbon (TO	'ER - EP080 XN	TER - NT-01 & 02 Mg, Na, K, CI, SO4, AI	'ER - NT-04 e and Nitrate	'ER - NT-09 , Total Phosphorus
ID	time			WAT Susp	WAT Triva	WAT Total	WAT BTE)	WAT Ca, h	WAT Nitrit	WAT TKN,
ES2422797-001	10-Jul-2024 13:00	US1		1	✓	✓	✓	✓	✓	✓
ES2422797-002	10-Jul-2024 13:50	UW2				✓			✓	
ES2422797-003	10-Jul-2024 15:00	UW3				✓			✓	
ES2422797-004	10-Jul-2024 15:30	UL1			✓	✓			✓	✓
ES2422797-005	10-Jul-2024 00:00	QA				✓			 ✓ 	
ES2422797-007	10-Jul-2024 00:00	TRIP SPIKE					✓			
Matrix: WATER Laboratory sample ID	Sampling date / time	sample ID		WATER - EA165-PH CO2 - Free and Total (Default)	WATER - ED037-P Alkalinity as CaCO3 (Auto Titrator)	WATER - ED045G Chloride by Discrete Analyser	WATER - EG020T Total Metals by ICP/MS (including digestion)	WATER - EG050G-T Total Hexavalent Chromium	WATER - EK061G Total Kjeldahl Nitrogen as N (TKN) By Discrete	WATER - EP025 Dissolved Oxygen (DO)
ES2422797-001	10-Jul-2024 13:00	US1					✓	✓		
ES2422797-002	10-Jul-2024 13:50	UW2		✓	✓	✓			✓	✓
ES2422797-003	10-Jul-2024 15:00	UW3		1	✓	✓			✓	
ES2422797-004	10-Jul-2024 15:30	UL1			✓	✓	✓	✓		
ES2422797-005	10-Jul-2024 00:00	QA			\checkmark	\checkmark	\checkmark		\checkmark	

Standard Level

arbon (TOC)

nium - Total

Alkalinity



Matrix: WATER Laboratory sample ID	Sampling date / time	Sample ID	WATER - EG020F Dissolved Metals by ICP/MS	WATER - EP074DEFG VOC - Fumigants, Hal Aliphatics, Hal Aromatics,	WATER - W-12 OC/OP Pesticides	WATER - W-18 TRH(C6 - C9)/BTEXN
ES2422797-002	10-Jul-2024 13:50	UW2	1			
ES2422797-003	10-Jul-2024 15:00	UW3	1			
ES2422797-004	10-Jul-2024 15:30	UL1		1	1	
ES2422797-006	10-Jul-2024 00:00	TRIP BLANK				✓

Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Matrix: WATER Evaluation: × = Holding time breach ; ✓ = Within holding time						olding time.	
Method		Due for	Due for	Samples Received		Instructions Received	
Client Sample ID(s)	Container	extraction	analysis	Date	Evaluation	Date	Evaluation
EP025: Oxygen - Dissolved							
UW2	Clear Plastic Bottle - Natural		10-Jul-2024	11-Jul-2024	×	11-Jul-2024	×

Requested Deliverables

ADMINIOTICATOR

 *AU Certificate of Analysis - NATA (COA) 	Email	administrator@rca.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	administrator@rca.com.au
 *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) 	Email	administrator@rca.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	administrator@rca.com.au
- A4 - AU Tax Invoice (INV)	Email	administrator@rca.com.au
- Chain of Custody (CoC) (COC)	Email	administrator@rca.com.au
- EDI Format - ENMRG (ENMRG)	Email	administrator@rca.com.au
- EDI Format - ESDAT (ESDAT)	Email	administrator@rca.com.au
ALL INVOICES		
- A4 - AU Tax Invoice (INV)	Email	administrator@rca.com.au
ENVIRO		
 *AU Certificate of Analysis - NATA (COA) 	Email	enviro@rca.com.au
 *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) 	Email	enviro@rca.com.au
 *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) 	Email	enviro@rca.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	enviro@rca.com.au
- A4 - AU Tax Invoice (INV)	Email	enviro@rca.com.au
- Chain of Custody (CoC) (COC)	Email	enviro@rca.com.au
- EDI Format - ENMRG (ENMRG)	Email	enviro@rca.com.au
- EDI Format - ESDAT (ESDAT)	Email	enviro@rca.com.au
FIONA BROOKER		
 *AU Certificate of Analysis - NATA (COA) 	Email	fionab@rca.com.au
 *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) 	Email	fionab@rca.com.au
 *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) 	Email	fionab@rca.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	fionab@rca.com.au
- Chain of Custody (CoC) (COC)	Email	fionab@rca.com.au
- EDI Format - ENMRG (ENMRG)	Email	fionab@rca.com.au
- EDI Format - ESDAT (ESDAT)	Email	fionab@rca.com.au



CERTIFICATE OF ANALYSIS

Work Order	ES2433134	Page	: 1 of 3
Client	ROBERT CARR & ASSOCIATES P/L	Laboratory	Environmental Division Sydney
Contact	: MS FIONA BROOKER	Contact	: Danae Hambly
Address	: 92 HILL STREET	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
	CARRINGTON NSW 2294		
Telephone	: +61 02 4902 9200	Telephone	: +61-2-8784 8555
Project	: 15579a - Quarterly Monitoring	Date Samples Received	: 10-Oct-2024 16:54
Order number	:	Date Analysis Commenced	: 10-Oct-2024
C-O-C number		Issue Date	: 17-Oct-2024 11:07
Sampler	: FIONA BROOKER		Hac-MRA NATA
Site	:		
Quote number	: NSW Custom BQ 2024		Accreditation No. 825
No. of samples received	: 1		Accredited for compliance with
No. of samples analysed	: 1		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
Dian Dao	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW


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.

 \sim = Indicates an estimated value.

• 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	UW3	 	
		Sampli	ng date / time	10-Oct-2024 11:35	 	
Compound	CAS Number	LOR	Unit	ES2433134-001	 	
				Result	 	
EA165: CO2 - Free and Total						
Free Carbon Dioxide as CO2	85540-96-1	1	mg/L	378	 	
Total Carbon Dioxide as CO2	85540-96-1	1	mg/L	1100	 	
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	825	 	
Total Alkalinity as CaCO3		1	mg/L	825	 	
ED045G: Chloride by Discrete Analyser						
Chloride	16887-00-6	1	mg/L	489	 	
EG020F: Dissolved Metals by ICP-MS						
Arsenic	7440-38-2	0.001	mg/L	0.050	 	
Manganese	7439-96-5	0.001	mg/L	0.020	 	
Iron	7439-89-6	0.05	mg/L	<0.05	 	
EK057G: Nitrite as N by Discrete Analys	ser					
Nitrite as N	14797-65-0	0.01	mg/L	0.51	 	
EK058G: Nitrate as N by Discrete Analy	/ser					
Nitrate as N	14797-55-8	0.01	mg/L	7.58	 	
EK059G: Nitrite plus Nitrate as N (NOx)	by Discrete Ana	lyser				
Nitrite + Nitrate as N		0.01	mg/L	8.09	 	
EK061G: Total Kjeldahl Nitrogen By Dis	crete Analyser					
Total Kjeldahl Nitrogen as N		0.1	mg/L	2.5	 	
EP005: Total Organic Carbon (TOC)						
Total Organic Carbon		1	mg/L	18	 	



QUALITY CONTROL REPORT

Work Order	: ES2433134	Page	: 1 of 5	
Client	: ROBERT CARR & ASSOCIATES P/L	Laboratory	: Environmental Division Sy	dney
Contact	: MS FIONA BROOKER	Contact	: Danae Hambly	
Address	: 92 HILL STREET CARRINGTON NSW 2294	Address	: 277-289 Woodpark Road	Smithfield NSW Australia 2164
Telephone	: +61 02 4902 9200	Telephone	: +61-2-8784 8555	
Project	: 15579a - Quarterly Monitoring	Date Samples Received	: 10-Oct-2024	awillin.
Order number	:	Date Analysis Commenced	: 10-Oct-2024	
C-O-C number	:	Issue Date	: 17-Oct-2024	NATA
Sampler	: FIONA BROOKER			Hac-MRA NATA
Site	:			
Quote number	: NSW Custom BQ 2024			Accreditation No. 825
No. of samples received	: 1			Accredited for compliance with
No. of samples analysed	: 1			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 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

Dian Dao

Senior Chemist - Inorganics

Sydney Inorganics, Smithfield, NSW



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 (%)
ED037P: Alkalinity b	y PC Titrator (QC Lot: 6112)	/15)							
ES2433083-001 Anonymous	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	8	<1	157	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	142	151	5.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3		1	mg/L	151	151	0.0	0% - 20%
ED045G: Chloride by	Discrete Analyser (QC Lot	: 6115740)							
EN2412652-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	74	74	0.0	0% - 20%
EN2412662-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	627	630	0.4	0% - 20%
EG020F: Dissolved	letals by ICP-MS(QC Lot: 6	119161)							
EN2412645-002	Anonymous	EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.009	0.008	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.12	0.12	0.0	No Limit
EW2404671-005	Anonymous	EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.014	0.014	0.0	0% - 50%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.07	0.07	0.0	No Limit
EK057G: Nitrite as N	by Discrete Analyser (QC	Lot: 6115742)							
EN2412652-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EN2412662-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.07	0.07	0.0	No Limit
EK059G: Nitrite plus	Nitrate as N (NOx) by Disc	rete Analyser (QC Lot: 6121025)							
ES2433129-001	Anonymous	EK059G: Nitrite + Nitrate as N		0.01	mg/L	3.13	3.13	0.0	0% - 20%
ES2433360-001	Anonymous	EK059G: Nitrite + Nitrate as N		0.01	mg/L	1.67	1.66	0.6	0% - 20%
EK061G: Total Kjeld	ahl Nitrogen By Discrete Ana	alyser (QC Lot: 6121032)							
ES2433032-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N		0.1	mg/L	0.4	0.3	0.0	No Limit

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Work Order	: ES2433134
Client	: ROBERT CARR & ASSOCIATES P/L
Project	: 15579a - Quarterly Monitoring



Sub-Matrix: WATER						Laboratory D	Duplicate (DUP) Report	t	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP005: Total Organic	Carbon (TOC) (QC Lot: 611	12777)							
ES2433110-008	Anonymous	EP005: Total Organic Carbon		1	mg/L	<1	6	139	No Limit



Method Blank (MB) and Laboratory Control Sample (LCS) Report

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.

Sub-Matrix: WATER				Method Blank (MB)	Laboratory Control Spike (LCS) Report			
				Report	Spike	Spike Recovery (%)	Acceptable	e Limits (%)
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 6112715)								
ED037-P: Total Alkalinity as CaCO3			mg/L		200 mg/L	95.3	81.0	115
					50 mg/L	100	80.0	128
ED045G: Chloride by Discrete Analyser (QCLot: 611	5740)							
ED045G: Chloride	16887-00-6	1	mg/L	<1	50 mg/L	102	80.9	127
				<1	1000 mg/L	93.9	80.9	127
EG020F: Dissolved Metals by ICP-MS (QCLot: 61191	61)							
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	100	85.0	114
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	97.6	82.0	110
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	106	82.0	112
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6	6115742)							
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	97.7	82.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete	Analyser (QCLot: 6 [/]	121025)						
EK059G: Nitrite + Nitrate as N		0.01	mg/L	<0.01	0.5 mg/L	97.5	91.0	113
EK061G: Total Kjeldahl Nitrogen By Discrete Analyse	er (QCLot: 6121032)							
EK061G: Total Kjeldahl Nitrogen as N		0.1	mg/L	<0.1	10 mg/L	88.0	69.0	123
				<0.1	1 mg/L	92.3	70.0	123
				<0.1	5 mg/L	89.9	70.0	123
EP005: Total Organic Carbon (TOC) (QCLot: 611277)	7)							
EP005: Total Organic Carbon		1	mg/L	<1	10 mg/L	97.1	72.0	120

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.

ub-Matrix: WATER					
		Spike	SpikeRecovery(%)	Acceptable I	_imits (%)
Method: Compound	CAS Number	Concentration	MS	Low	High
ED045G: Chloride	16887-00-6	250 mg/L	95.0	70.0	130
EG020A-F: Arsenic	7440-38-2	1 mg/L	97.7	70.0	130
	Method: Compound ED045G: Chloride EG020A-F: Arsenic	Method: Compound CAS Number ED045G: Chloride 16887-00-6 EG020A-F: Arsenic 7440-38-2	Mathematical Spike Method: Compound CAS Number Concentration ED045G: Chloride 16887-00-6 250 mg/L EG020A-F: Arsenic 7440-38-2 1 mg/L	Matrix Spike (MS) Report Spike SpikeRecovery(%) Method: Compound CAS Number Concentration MS ED045G: Chloride 16887-00-6 250 mg/L 95.0 EG020A-F: Arsenic 7440-38-2 1 mg/L 97.7	Matrix Spike (MS) Report Spike Spike (MS) Report Spike Spike (MS) Report Acceptable I Method: Compound CAS Number Concentration MS Low ED045G: Chloride 16887-00-6 250 mg/L 95.0 70.0 EG020A-F: Arsenic 7440-38-2 1 mg/L 97.7 70.0

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Project	15579a - Quarterly Monitoring



Sub-Matrix: WATER	ıb-Matrix: WATER						
				Spike	SpikeRecovery(%)	Acceptable L	imits (%)
Laboratory sample ID	Sample ID	Method: Compound C.	AS Number	Concentration	MS	Low	High
EG020F: Dissolved	Metals by ICP-MS (QCLot: 6119161) - continued						
ES2433117-007	Anonymous	EG020A-F: Manganese 74	439-96-5	1 mg/L	101	70.0	130
EK057G: Nitrite as	N by Discrete Analyser (QCLot: 6115742)						
EN2412652-001	Anonymous	EK057G: Nitrite as N 14	4797-65-0	0.5 mg/L	107	70.0	130
EK059G: Nitrite plu	us Nitrate as N (NOx) by Discrete Analyser (QCLot: 612	1025)					
ES2433129-001	Anonymous	EK059G: Nitrite + Nitrate as N		0.5 mg/L	# Not	70.0	130
					Determined		
EK061G: Total Kjel	dahl Nitrogen By Discrete Analyser (QCLot: 6121032)						
ES2433032-003	Anonymous	EK061G: Total Kjeldahl Nitrogen as N		5 mg/L	88.7	70.0	130
EP005: Total Organ	ic Carbon (TOC) (QCLot: 6112777)						
ES2433110-009	Anonymous	EP005: Total Organic Carbon		100 mg/L	124	70.0	130



	QA/QC Compliance Assessment to assist with Quality Review							
Work Order	: ES2433134	Page	: 1 of 5					
Client	: ROBERT CARR & ASSOCIATES P/L	Laboratory	: Environmental Division Sydney					
Contact	: MS FIONA BROOKER	Telephone	: +61-2-8784 8555					
Project	: 15579a - Quarterly Monitoring	Date Samples Received	: 10-Oct-2024					
Site	:	Issue Date	: 17-Oct-2024					
Sampler	: FIONA BROOKER	No. of samples received	: 1					
Order number	:	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.

- <u>NO</u> 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							
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete A	r ES2433129001	Anonymous	Nitrite + Nitrate as N		Not		MS recovery not determined,
					Determined		background level greater than or
							equal to 4x spike level.

Outliers : Analysis Holding Time Compliance

Matrix: WATER

Ex	traction / Preparation			Analysis	
Date extracted	Due for extraction	Days	Date analysed	Due for analysis	Days
		overdue			overdue
			14-Oct-2024	12-Oct-2024	2
	Ex Date extracted	Extraction / Preparation Date extracted Due for extraction	Extraction / Preparation Date extracted Due for extraction Days overdue	Extraction / Preparation Dates Date extracted Due for extraction Days overdue Date extracted Due for extraction Days overdue	Extraction / Preparation Datescale Date extracted Due for extraction Days overdue Date extracted Due for extraction Days overdue Date extracted Due for extraction Date analysed Due for extraction Days overdue Date analysed Due for extraction Days overdue Date analysed Due for extraction Due for extraction Due for extraction Due for extraction Due for extraction Due for extraction

Outliers : Frequency of Quality Control Samples

Matrix: WATER

Quality Control Sample Type	Co	unt	Rate	e (%)	Quality Control Specification	
Analytical Methods	Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)						
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	17	5.88	10.00	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 ; ✓ = Withi	n holding time.
Method	Sample Date	Ex	traction / Preparation			Analysis	
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) UW3	10-Oct-2024				10-Oct-2024	24-Oct-2024	~
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G) UW3	10-Oct-2024				14-Oct-2024	07-Nov-2024	~
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Natural (EG020A-F) UW3	10-Oct-2024				15-Oct-2024	08-Apr-2025	1

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Work Order	: ES2433134
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Project	: 15579a - Quarterly Monitoring



Matrix: WATER Evaluation: * = Holding time breach ; \checkmark = 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 EK057G: Nitrite as N by Discrete Analyser Clear Plastic Bottle - Natural (EK057G) 12-Oct-2024 UW3 10-Oct-2024 14-Oct-2024 ----50 ____ EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser Clear Plastic Bottle - Sulfuric Acid (EK059G) 10-Oct-2024 16-Oct-2024 07-Nov-2024 UW3 -------- \checkmark ----EK061G: Total Kjeldahl Nitrogen By Discrete Analyser Clear Plastic Bottle - Sulfuric Acid (EK061G) UW3 10-Oct-2024 15-Oct-2024 07-Nov-2024 1 15-Oct-2024 07-Nov-2024 1 EP005: Total Organic Carbon (TOC) Amber TOC Vial - Sulfuric Acid (EP005) 07-Nov-2024 10-Oct-2024 14-Oct-2024 UW3 ------------- \checkmark



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 with								
Quality Control Sample Type		Co	ount		Rate (%)		Quality Control Specification			
Analytical Methods	Method	QC	Reaular	Actual	Expected	Evaluation				
Laboratory Duplicates (DUP)										
Alkalinity by Auto Titrator	ED037-P	1	6	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard			
Chloride by Discrete Analyser	ED045G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard			
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard			
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	14	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard			
Nitrite as N by Discrete Analyser	EK057G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard			
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	17	5.88	10.00	×	NEPM 2013 B3 & ALS QC Standard			
Total Organic Carbon	EP005	1	10	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard			
Laboratory Control Samples (LCS)										
Alkalinity by Auto Titrator	ED037-P	2	6	33.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard			
Chloride by Discrete Analyser	ED045G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard			
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard			
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard			
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard			
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	3	17	17.65	15.00	✓	NEPM 2013 B3 & ALS QC Standard			
Total Organic Carbon	EP005	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard			
, Method Blanks (MB)										
Chloride by Discrete Analyser	ED045G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard			
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard			
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard			
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard			
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard			
Total Organic Carbon	EP005	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard			
Matrix Spikes (MS)										
Chloride by Discrete Analyser	ED045G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard			
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard			
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	14	7.14	5.00	1	NEPM 2013 B3 & ALS QC Standard			
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard			
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	17	5.88	5.00	1	NEPM 2013 B3 & ALS QC Standard			
Total Organic Carbon	EP005	1	10	10.00	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
Free and Total CO2	EA165-P	WATER	In house: Referenced to APHA 4500-CO2 D. 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)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 CI - 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 thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered
			prior to analysis. 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.
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- 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-NO3- 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 (NOx) by Discrete	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by
Analyser			Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM
			Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high
Analyser			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 Organic Carbon	EP005	WATER	In house: Referenced to APHA 5310 B, The automated TOC analyzer determines Total and Inorganic Carbon by
			IR cell. TOC is calculated as the difference. This method is compliant with NEPM Schedule B(3)
Preparation Methods	Method	Matrix	Method Descriptions
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)

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LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	Alkalinity	Arseníc	Carbon Dioxide	Chloride	kton	Nitrata + Nitrita	TKN	Total Organic Carbon						~				75								Comme samples	nts on like requiring	aiy conta 7 specific	rinant le QC anely	wels, dilut ysis etc.	tions, or
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V = VOA Vial HCI P	reserved; VB = VOA Vial Sodium	Bisulphate Preserved; VS = VOA ¹ ed Bottles: ST = Sterile Bottle: AS	vial Sulfur S = Plasti	IC Preserved; AV = Airfreight Unprese c Bag for Acid Sulphate Soils; B = Ur	erved Viai hpreserved	ଞ⊌≭S IBao.	uiturić P	reserved	Ambe	n (51855)	H = H	or breaely	veu Me	aano; me	- 1101	vieserv€	ou opeci	onon botte	u, ur – a	anony PD	¥															

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SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: ES2433134								
Client Contact Address	: ROBERT CARR & ASSOCIATES P/L : MS FIONA BROOKER : 92 HILL STREET CARRINGTON NSW 2294	Laboratory Contact Address	: Environme : Danae Har : 277-289 W NSW Austr	ental Division Sydney mbly Voodpark Road Smithfield tralia 2164					
E-mail Telephone Facsimile	: fionab@rca.com.au : +61 02 4902 9200 : +61 02 4902 9299	E-mail : danae.hambly@alsglobal.com Telephone : +61-2-8784 8555 Facsimile : +61-2-8784 8500							
Project Order number	: 15579a - Quarterly Monitoring :	Page Quote number	DBCAR0002 (NSW Custom						
C-O-C number	:	QC Level	: NEPM 201	13 B3 & ALS QC Standard					
Site Sampler	: : FIONA BROOKER								
Dates Date Samples Receiver Client Requested Due Date	2 : 10-Oct-2024 16:54 : 17-Oct-2024	Issue Date Scheduled Reporting I	Date	: 10-Oct-2024 • 17-Oct-2024					
Delivery Details Mode of Delivery No. of coolers/boxes Receipt Detail	: Undefined : 1 :	Security Seal Temperature No. of samples receive	ed / analysed	: Not Available : 1.1 - Ice present : 1 / 1					

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Unless otherwise stated, analytical work for this work order will be conducted at ALS Sydney, NATA accreditation no. 825, site no. 10911.
- Sample Disposal Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

Method Sample ID	Sample Container Received	Preferred Sample Container for Analysis
Dissolved Metals by ICP-MS - Sui	te A : EG020A-F	
UW3	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - Nitric Acid; Filtered
0113		

CaCO3 (Auto Titrator)

ED037-P

Discrete Analyser

ED045G

Metals by ICP/MS

EG020F

EK061G

and Total (Default)

EA165-PH

ahl Nitrogen as N (TKN) By Discrete

nic Carbon (TOC)

EP005

Nitrate

NT-04

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: WATER

Laboratory sample	Sampling date / time	Sample ID	WATER - CO2 - Fre	WATER - Alkalinity	WATER - Chloride t	WATER - Dissolved	WATER - Total Kjel	WATER - Total Org:	WATER - Nitrite and
ES2433134-001	10-Oct-2024 11:35	UW3	✓	✓	✓	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ADMINISTRATOR

 *AU Certificate of Analysis - NATA (COA) 	Email	administrator@rca.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	administrator@rca.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	administrator@rca.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	administrator@rca.com.au
- A4 - AU Tax Invoice (INV)	Email	administrator@rca.com.au
- Chain of Custody (CoC) (COC)	Email	administrator@rca.com.au
- EDI Format - ENMRG (ENMRG)	Email	administrator@rca.com.au
- EDI Format - ESDAT (ESDAT)	Email	administrator@rca.com.au
ALL INVOICES		
- A4 - AU Tax Invoice (INV)	Email	administrator@rca.com.au
ENVIRO		
 *AU Certificate of Analysis - NATA (COA) 	Email	enviro@rca.com.au
 *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) 	Email	enviro@rca.com.au
 *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) 	Email	enviro@rca.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	enviro@rca.com.au
- A4 - AU Tax Invoice (INV)	Email	enviro@rca.com.au
- Chain of Custody (CoC) (COC)	Email	enviro@rca.com.au
- EDI Format - ENMRG (ENMRG)	Email	enviro@rca.com.au
- EDI Format - ESDAT (ESDAT)	Email	enviro@rca.com.au
FIONA BROOKER		
 *AU Certificate of Analysis - NATA (COA) 	Email	fionab@rca.com.au
 *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) 	Email	fionab@rca.com.au
 *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) 	Email	fionab@rca.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	fionab@rca.com.au
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- EDI Format - ENMRG (ENMRG)	Email	fionab@rca.com.au
- EDI Format - ESDAT (ESDAT)	Email	fionab@rca.com.au

Issue Date	: 10-Oct-2024
Page	: 3 of 3
Work Order	ES2433134 Amendment 0
Client	: ROBERT CARR & ASSOCIATES P/L

