

28/01/2025

Parkes Shire Council
2 Cecile Street
Parkes NSW 2870

Attention: Sharyn Ware, Waste Management Coordinator
Michael Chambers, Manager Environment & Sustainability

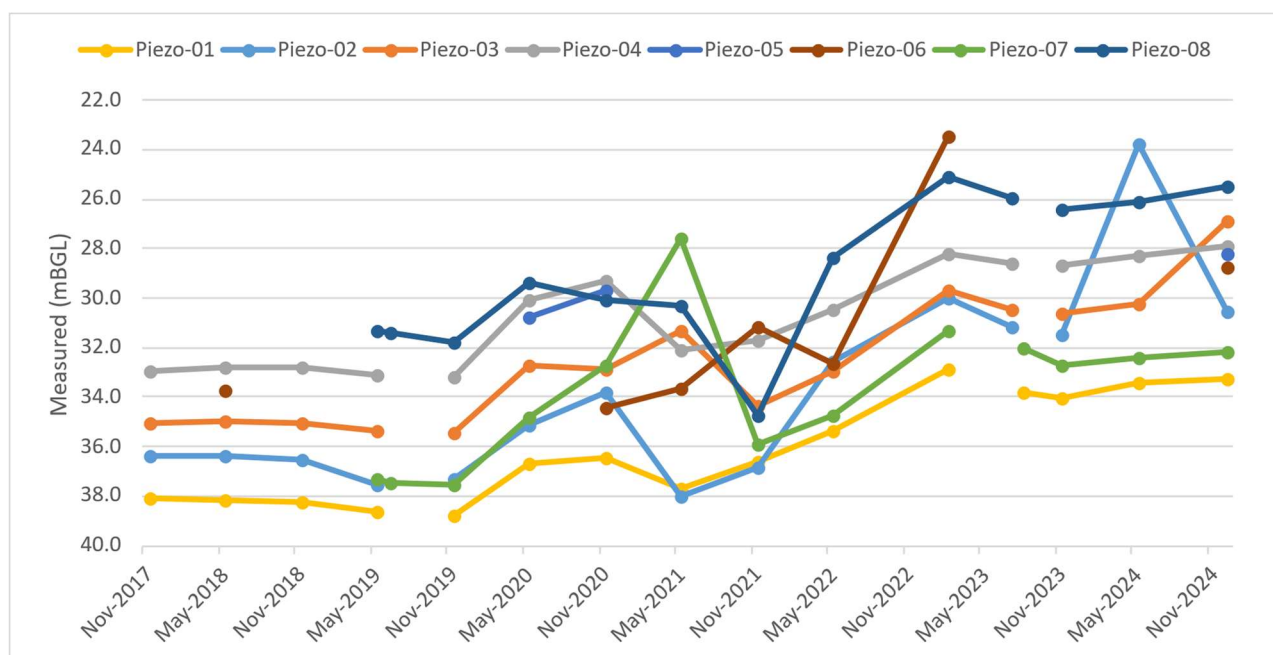
Environmental Monitoring of Parkes Waste Depot, under Environment Protection Licence 6016 – December 2024

Premise has completed scheduled groundwater, leachate and landfill gas monitoring at Parkes Waste Depot, located at 104 Brolgan Road, Parkes on 4 December 2024.

GROUNDWATER LEVELS

Groundwater was gauged at eight (8) groundwater monitoring wells across the site. Groundwater gauging data is included in **Table 1** (attached), and elevations are shown on **Figure 1**.

Figure 1 – Parkes Waste Depot – Groundwater Depths



Groundwater observations were as follows:

- > Groundwater was gauged at all monitoring points, i.e., Piezo-01, Piezo-02, Piezo-03, Piezo-04, Piezo-05, Piezo-06, Piezo-07 and Piezo-08, respectively corresponding to EPL points 1, 2, 3, 4, 16, 15, 17 and 18.
- > Depths to groundwater ranged from 25.47 metres below ground level (mbgl) at Piezo-08, to 33.28 mbgl at Piezo-01.

Groundwater flow direction cannot be inferred as surveyed elevation data for existing monitoring wells is not available. Surrounding topography of the region suggests a landform slope to the west, indicating a possible westerly preferential flow direction for groundwater.

GROUNDWATER QUALITY

Groundwater samples were able to be collected from all groundwater monitoring points. Samples were couriered to SGS Laboratories in Alexandria, NSW, who are NATA accredited to perform the scheduled analysis. Results of analysis are included in **Table 2** (attached), and laboratory certificates have also been appended to this letter.

Groundwater quality has been assessed by comparison to criteria (where available) adopted from Australian and New Zealand Environment and Conservation Council (ANZECC) Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* 2000 – Primary Industries: Water quality for irrigation and general water use.

- > pH of groundwater ranged from 6.8 at Piezo-02 to 7.1 at Piezo-08 and was within the guideline range considered suitable for pumping, irrigation, and stock watering (6.0 to 8.5 pH units).
- > Electrical conductivity (EC) ranged from 3400 µS/cm at Piezo-05 to 8900 µS/cm at Piezo-03.
- > Total dissolved solids (TDS) concentrations were recorded to range from 2100 mg/L at Piezo-05 to 9400 mg/L at Piezo-03, and were above the livestock watering 'loss of production' tolerance limit for the most susceptible livestock category, poultry (3000 mg/L – ANZECC & ARMCANZ, 2000) at all monitoring points with the exception of Piezo-05.
- > Biochemical oxygen demand (BOD) of groundwater was recorded at concentrations below the laboratory limit of reporting (LOR) of 5 mg/L at all monitoring points.
- > Total alkalinity in groundwater ranged from 560 mg/L at Piezo-05 to 1000 mg/L at Piezo-04. All concentrations were higher than the guideline hardness value for potential fouling of waters (350 mg/L).
- > Groundwater chloride concentrations ranged from 890 mg/L at Piezo-05 to 3600 mg/L at Piezo-03. All concentrations were higher than the guideline value for protection of moderately sensitive crops (350 mg/L).
- > Fluoride concentrations in groundwater ranged from 0.38 mg/L at Piezo-03 to 1.1 mg/L at Piezo-08. The fluoride concentration at Piezo-08 exceeded the guideline value of 1 mg/L for long term irrigation use (up to 100 years).
- > Sulfate concentrations in groundwater ranged from 68 mg/L at Piezo-08 to 910 mg/L at Piezo-03.
- > Calcium concentrations ranged from 87 mg/L at Piezo-05 to 780 mg/L at Piezo-03. Calcium concentrations were below the guideline value for livestock drinking water quality (< 1,000 mg/L).
- > Magnesium concentrations ranged from 150 mg/L at Piezo-05 to 600 mg/L at Piezo-03.
- > Potassium concentrations ranged from 4.6 mg/L at Piezo-06 to 26 mg/L at Piezo-03.

- > Concentrations of sodium ranged from 440 mg/L at Piezo-05 to 1100 mg/L at Piezo-02. Sodium concentrations in groundwater were above the guideline level for irrigation to moderately sensitive crops (< 230 mg/L) at all monitoring locations.
- > The concentration of total organic carbon (TOC) ranged from 3.1 mg/L at Piezo-05 to 29 mg/L at Piezo-07.
- > Ammonia concentrations in groundwater ranged from below the laboratory limit of reporting (LOR) of 0.05 mgN/L at Piezo-01, Piezo-06, Piezo-07, and Piezo-08, to 0.19 mgN/L at Piezo-02.
- > Nitrate concentrations in groundwater ranged from 0.048 mgN/L at Piezo-05 to 160 mgN/L at Piezo-08.
- > Total phosphorus (TP) concentrations ranged from 0.04 mg/L at Piezo-01 to 1.1 mg/L at Piezo-08. TP concentrations in groundwater were at or above the guideline value of 0.05 mg/L for long term irrigation use (up to 100 years) at all monitoring locations with the exception of Piezo-01.
- > Iron concentrations ranged from below the laboratory LOR of 0.005 mg/L at multiple locations to 0.013 mg/L at Piezo-01. The iron concentration in groundwater did not exceed the long-term (up to 100 years) irrigation guideline concentration of 0.2 mg/L.
- > Manganese concentrations ranged from 0.01 mg/L at Piezo-08 to 3.0 mg/L at Piezo-05. The manganese concentrations at Piezo-02, Piezo-03, Piezo-04, Piezo-05, and Piezo-07 exceeded the long-term (up to 100 years) irrigation guideline concentration of 0.2 mg/L.
- > Concentrations of other dissolved heavy metals, including aluminium, arsenic, barium, cadmium, hexavalent chromium, copper, lead and zinc were recorded to be below irrigation guideline concentrations.
- > Total phenolics were below the laboratory LOR of 0.05 mg/L in groundwater at all piezometers.
- > Total petroleum hydrocarbons (TPH) and total recoverable hydrocarbons (TRH) were below respective laboratory LORs at all groundwater monitoring points, with the exceptions of:
 - TRH >C₁₀-C₁₆ fraction at Piezo-02 (130 µg/L), Piezo-04 (63 µg/L), Piezo-05 (99 µg/L) and Piezo-07 (180 µg/L).
 - TRH >C₁₆-C₃₄ fraction at Piezo-07 (510 µg/L).
 - TPH C₁₀-C₁₄ fraction at Piezo-02 (83 µg/L), Piezo-05 (60 µg/L) and Piezo-07 (100 µg/L).
 - TPH C₁₅-C₂₈ fraction at Piezo-02 (280 µg/L), Piezo-05 (220 µg/L) and Piezo-07 (550 µg/L).
- > Organochlorine pesticides (OCPs), organophosphorus pesticides (OPPs) and polynuclear aromatic hydrocarbons (PAHs) were below respective laboratory LORs at all groundwater monitoring points.

SURFACE WATER QUALITY

Surface water discharge points are inspected for discharge following rain events and on a monthly basis. No discharge events were recorded or observed to have occurred at the facility in the period from May 2024 to December 2024.

LEACHATE EVAPORATION POND QUALITY

Leachate collection points L1 and L2 are inspected during monitoring events, and samples are collected when water is present. Water was present at leachate collection points during the December 2024 monitoring event, and samples were collected and couriered to SGS Laboratories who are NATA accredited to perform the

scheduled analysis. Results of analysis are included in **Table 3** (attached), and laboratory certificates have also been appended to this letter.

Leachate quality has been assessed by comparison to criteria (where available) adopted from Australian and New Zealand Environment and Conservation Council (ANZECC) Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* 2000 – Primary Industries: Water quality for irrigation and general water use.

- > pH of the leachate samples was recorded to range from 8.7 at L1 to 9.0 at L2. The pH of both the L1 and L2 leachate samples exceeded the upper limit of the guideline range considered suitable for pumping, irrigation, and stock watering (6.0 to 8.5 pH units).
- > Electrical conductivity (EC) was recorded at 1,800 $\mu\text{S}/\text{cm}$ at L1 and 1,700 $\mu\text{S}/\text{cm}$ at L2.
- > Total suspended solids (TSS) concentrations were recorded to range from 18 mg/L at L1 to 270 mg/L at L2.
- > Total alkalinity measured 520 mg/L at L1 and 480 mg/L at L2; L1 and L2 alkalinity was higher than the guideline hardness value for potential fouling of waters (350 mg/L).
- > Leachate chloride concentrations were recorded at 260 mg/L at L1 and 310 mg/L at L2; leachate chloride concentrations at both L1 and L2 were lower than the guideline value for protection of moderately sensitive crops (350 mg/L).
- > Fluoride concentrations in the leachate samples ranged from 0.40 mg/L at L2 to 0.49 mg/L at L1. The leachate samples exhibited fluoride concentrations below the guideline value of 1 mg/L for long term irrigation use (up to 100 years).
- > Sulfate concentrations ranged from 26 mg/L at L2 to 100 mg/L at L1.
- > Calcium concentrations ranged from 14 mg/L at L2 to 22 mg/L at L1, below the guideline value for livestock drinking water quality (< 1,000 mg/L).
- > Magnesium concentrations were recorded at 72 mg/L at L1 and 59 mg/L at L2.
- > Potassium concentrations in the leachate samples were recorded at 93 mg/L at L1 and 79 mg/L at L2.
- > Concentrations of sodium ranged from 230 mg/L at L1 to 240 mg/L at L2. The sodium concentration of leachate at L1 was equal to the guideline level for irrigation to moderately sensitive crops (230 mg/L), while the concentration at L2 exceeded the guideline.
- > The concentration of total organic carbon (TOC) in leachate ranged from 38 mg/L at L1 to 140 mg/L at L2.
- > Ammonia concentrations were recorded at 0.04 mgN/L at L1 and 0.19 mgN/L at L2.
- > Nitrate concentrations in leachate ranged from below the laboratory LOR of 0.005 mgN/L at L2 to 0.009 mgN/L at L1.
- > Aluminium concentrations ranged from below the laboratory LOR of 0.005 mg/L at L1 to 0.019 mg/L at L2. The long-term (up to 100 years) irrigation guideline concentration was not exceeded.
- > Leachate arsenic concentrations ranged from 0.019 mg/L at L2 to 0.038 mg/L at L1. The long-term (up to 100 years) irrigation guideline concentration was not exceeded.
- > Barium concentrations were 0.11 mg/L at L1 and 0.10 mg/L at L2.
- > Copper concentrations in leachate were recorded at a concentration of 0.002 mg/L at L1 and 0.001 mg/L at L2. The long-term (up to 100 years) irrigation guideline concentration was not exceeded.
- > Iron concentrations ranged from 0.006 mg/L at L1 to 0.061 mg/L at L2. The iron concentration in leachate did not exceed the long-term (up to 100 years) irrigation guideline concentration of 0.20 mg/L.

- > Lead concentrations in leachate were recorded below the laboratory LOR of 0.001 mg/L at both L1 and L2. The long-term (up to 100 years) irrigation guideline concentration was not exceeded.
- > Concentrations of manganese in the leachate ranged from below the laboratory LOR of 0.001 mg/L at L1 to 0.11 mg/L at L2. The long-term (up to 100 years) irrigation guideline concentration of 0.2 mg/L was not exceeded.
- > Zinc concentrations in leachate were recorded at less than the laboratory LOR of 0.005 mg/L at both L1 and L2. The long-term (up to 100 years) irrigation guideline concentration was not exceeded.
- > Total phenolics were not recorded at concentrations above the laboratory LOR of 0.05 mg/L at L1 and L2.
- > Total petroleum hydrocarbons (TPH) and total recoverable hydrocarbons (TRH) were recorded in leachate as follows:
 - TRH >C₁₀-C₁₆ fraction at L2 (210 µg/L).
 - TRH >C₁₆-C₃₄ (F3) fraction at L2 (750 µg/L).
 - TPH C₁₀-C₁₄ fraction at L2 (150 µg/L).
 - TPH C₁₅-C₂₈ fraction at L2 (650 µg/L).

ACCUMULATED LANDFILL GAS MONITORING

Accumulated (building) gas methane monitoring is conducted using a zeroed and calibrated methane gas detector. The monitoring frequency is in accordance with EPL requirements.

The following procedure is used to monitor accumulated landfill gas:

1. Before starting, prepare field notebook and check that gas analyser is working. Date, time and person(s) conducting monitoring are all recorded.
2. All enclosed buildings within 250 m of active or capped areas of landfill are monitored. All rooms are investigated, with the gas meter allowed to detect for a period of approximately one minute in each.
3. Starting in the middle of each room, with the instrument probe at head height, the ambient concentration of methane present is recorded. Locations or features such as service ingress points, floor cracks / penetrations, skirting boards and joins between walls and floors are subsequently investigated.
4. Larger spaces also have a perimeter walk conducted as well as investigation of alcoves and pits.
5. The highest concentration of methane found at any location in each structure is recorded.

Gas concentrations in buildings and sheds within the required monitoring distance of 250 metres of filled areas were all below the detection limits (0.05% v/v) during the biannual monitoring round conducted in December 2024.

SURFACE LANDFILL GAS MONITORING

The methane concentration recorded at the surface monitoring point (EPL12) was below the detection threshold concentration of 0.05% (v/v) during the monitoring round conducted in December 2024.

SUMMARY

Results for the environmental monitoring conducted in December 2024 are summarised below:

- > Groundwater levels were gauged at eight monitoring wells, with depths ranging from 25.47 mbgl at Piezo-08, to 33.28 mbgl (Piezo-01); a definitive groundwater flow direction was unable to be determined in the absence of surveyed elevation data.
- > Groundwater quality analysis indicated widespread salinity impacts, with most monitoring locations exceeding irrigation and/or livestock guidelines for total dissolved solids (TDS), total alkalinity, chloride, and sodium. Total phosphorus and manganese were also elevated above guidelines for irrigation at most locations. Nitrate was recorded as elevated at Piezo-08, where an exceedance for fluoride was also noted. pH and other dissolved metals were generally within guideline values. Detections of various petroleum hydrocarbon fractions were recorded at four of the eight wells.
- > No surface water discharge was observed or recorded during the monitoring period, so no samples were collected.
- > Leachate samples collected from L1 and L2 showed concentrations exceeding relevant guidelines for pH, total alkalinity, and sodium. Total suspended solids also exceeded the guideline at L2, and various petroleum hydrocarbon fractions were detected in the L2 sample.
- > Monitoring for accumulated landfill gas in all enclosed buildings within 250 metres of the landfill areas (EPL 13) found methane concentrations were below the detection limit of 0.05% v/v.
- > Surface landfill gas monitoring at the designated point (EPL 12) recorded methane concentrations below the detection threshold.

The next routine monitoring for groundwater, leachate and accumulated landfill gas is scheduled for May 2025. Surface water monitoring is required to take place any calendar month when a surface water discharge is recorded. Please do not hesitate to contact us with any questions or comments you may have regarding this report.

Yours sincerely



BRENDAN STUART
SENIOR ENVIRONMENTAL SCIENTIST

No. of Attachments – 5: Environmental Monitoring Point Locations
 Table 1 – Groundwater Gauging Results
 Table 2 – Results of Laboratory Analyses – Groundwater
 Table 3 – Results of Laboratory Analyses – Leachate
 SGS Laboratories Analytical Reports – December 2024



Important Notice!

This map is not a precise survey document. Accurate locations can only be determined by a survey on the ground. This information has been prepared for Council's internal purposes and for no other purpose. No statement is made about the accuracy or suitability of the information for use for any purpose (whether the purpose has been notified to Council or not). While every care is taken to ensure the accuracy of this data, neither the Parkes Shire Council nor the LPI makes any representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you might incur as a result of the data being inaccurate or incomplete in any way and for any reason.

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Drawn By: Chris Foley

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**PARKES WASTE FACILITY
ENVIRONMENTAL
MONITORING POINTS**

Map Scale: 1:6310 at A4



Table 1: Parkes Waste Depot - Groundwater Gauging Results

Ground Water Levels: 4-Dec-24

Piezometer Details:

	Date	Measured (mBGL)	Well Depth (m)	Water Column (m)
Piezo-01	4/12/2024	33.28	50.00	16.72
Piezo-02	4/12/2024	30.57	40.00	9.43
Piezo-03	4/12/2024	26.87	38.00	11.13
Piezo-04	4/12/2024	27.93	40.00	12.07
Piezo-05	4/12/2024	28.23	40.00	11.77
Piezo-06	4/12/2024	28.79	50.00	21.21
Piezo-07	4/12/2024	32.21	53.00	20.79
Piezo-08	4/12/2024	25.47	56.00	30.53

	Piezo-01	Piezo-02	Piezo-03	Piezo-04	Piezo-05	Piezo-06	Piezo-07	Piezo-08
Date	Measured (mBGL)	Measured (mBGL)	Measured (mBGL)	Measured (mBGL)	Measured (mBGL)	Measured (mBGL)	Measured (mBGL)	Measured (mBGL)
28-Nov-17	38.05	36.37	35.08	32.97				
24-May-18	38.16	36.35	35.01	32.82		33.75		
29-Nov-18	38.25	36.56	35.06	32.82		NMWL		
22-May-19	38.61	37.57	35.33	33.10	NMWL	NMWL	37.34	31.31
25-Jun-19							37.44	31.43
20-Nov-19	38.78	37.29	35.45	33.20	NMWL	NMWL	37.51	31.75
26-May-20	36.68	35.1	32.7	30.05	30.8	NMWL	34.79	29.38
3-Nov-20	36.43	33.81	32.87	29.28	29.65	34.39	32.73	30.05
11-May-21	37.70	38.04	31.3	32.06	NMWL	33.63	27.58	30.32
17-Nov-21	36.62	36.84	34.38	31.67	NMWL	31.14	35.90	34.71
26-May-22	35.38	32.56	32.98	30.5	NMWL	32.62	34.72	28.38
23-Feb-23	32.84	29.96	29.69	28.19	NMWL	23.48	31.29	25.12
25-Jul-23		31.13	30.5	28.61	NMWL	NMWL		25.95
17-Aug-23	33.79				NMWL	NMWL	32.04	
1-Nov-23	34.07	31.44	30.62	28.71	NMWL	NMWL	32.74	26.45
28-May-24	33.41	23.75	30.22	28.29	NMWL	NMWL	32.39	26.14
4-Dec-24	33.28	30.57	26.87	27.93	28.23	28.79	32.21	25.47

Definitions:

Measured: Depth of groundwater measured from reference point
Blank: Water level not measured
NMWL: No measureable water level

GROUNDWATER SAMPLING

					Sample ID	Piezo-01	Piezo-02	Piezo-03	Piezo-04	Piezo-05	Piezo-06	Piezo-07	Piezo-08
	Sample Date					4/12/2024	3/12/2024	4/12/2024	3/12/2024	4/12/2024	3/12/2024	4/12/2024	4/12/2024
Group	Analyte	LOR	Units	Criteria	PS	PS	PS	PS	PS	PS	PS	PS	PS
Physical Parameters	pH (Lab)	0	No unit	6.0 - 8.5	6.9	6.8	6.9	6.9	7	6.9	6.9	6.9	7.1
	Electrical Conductivity (Lab)	2	µS/cm	4478	8100	8800	8900	7500	3400	7000	5000	5200	
	Total Dissolved Solids	10	mg/L	3000	6800	6700	9400	6000	2100	7000	4200	3700	
	Biochemical Oxygen Demand (BOD5)	5	mg/L	-	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	
Alkalinity	Total Alkalinity as CaCO3	5	mg/L	350	730	930	670	1000	560	670	960	910	
Anions	Chloride	1	mg/L	350	3000	3000	3600	2500	890	2700	1200	1100	
	Fluoride	0.1	mg/L	1	0.69	0.61	0.38	0.72	0.5	0.68	0.72	1.1	
	Sulfate (SO4)	1	mg/L	-	490	460	910	480	95	440	290	68	
Cations	Calcium (Ca)	0.1	mg/L	1000	420	310	780	400	87	510	350	120	
	Magnesium (Mg)	0.1	mg/L	-	470	440	600	350	150	480	290	260	
	Potassium (K)	0.2	mg/L	-	10	8.6	26	9.4	17	4.6	8	6.9	
	Sodium (Na)	0.1	mg/L	230	830	1100	660	940	440	490	480	670	
Forms of Carbon	Total Organic Carbon	0.2	mg/L	-	5.3	17	11	10	3.1	4.3	29	5.5	
Nutrients	Ammonia (NH3) as N	0.01	mg/L	-	-	0.19	0.15	0.09	0.07	-	-	-	
	Ammonia (NH3) as N	0.05	mg/L	-	< 0.05	-	-	-	-	< 0.05	< 0.05	< 0.05	
	Nitrate (NO3) as N	0.005	mg/L	-	3.2	3.3	1.9	3.3	0.048	16	80	160	
	Total Phosphorus	0.02	mg/L	0.05	0.04	0.11	0.3	0.18	0.23	0.13	0.1	1.1	
Phenolics	Total Phenols	0.05	mg/L	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Trace Metals	Aluminium (Al)	0.005	mg/L	5	0.018	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	
	Arsenic (As)	0.001	mg/L	0.1	< 0.001	0.007	0.002	0.004	0.001	< 0.001	0.002	< 0.001	
	Barium (Ba)	0.001	mg/L	-	0.055	0.16	0.15	0.079	0.33	0.063	0.065	0.011	
	Cadmium (Cd)	0.0001	mg/L	0.01	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	
	Hexavalent Chromium (Cr-VI)	0.004	mg/L	0.1	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	
	Copper (Cu)	0.001	mg/L	0.2	< 0.001	0.001	< 0.001	0.002	< 0.001	< 0.001	0.003	< 0.001	
	Iron (Fe)	0.005	mg/L	0.2	0.013	0.006	0.009	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	
	Lead (Pb)	0.001	mg/L	2	0.014	< 0.001	0.003	< 0.001	< 0.001	0.001	0.011	0.001	
	Manganese (Mn)	0.001	mg/L	0.2	0.12	0.86	2.3	0.64	3	0.011	0.37	0.01	
	Zinc (Zn)	0.005	mg/L	2	0.019	0.015	0.03	0.012	0.015	0.014	0.017	0.012	
Total Recoverable Hydrocarbons	TRH C6-C10	50	µg/L	-	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	
	TRH C6-C10 - BTEX (F1)	50	µg/L	-	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	
	TRH >C10-C16	60	µg/L	-	< 60	130	< 60	63	99	< 60	180	< 60	
	TRH >C10-C16 - naphthalene (F2)	60	µg/L	-	< 60	130	< 60	63	99	< 60	180	< 60	
	TRH >C16-C34 (F3)	500	µg/L	-	< 500	< 500	< 500	< 500	< 500	< 500	510	< 500	
	TRH >C34-C40 (F4)	500	µg/L	-	< 500	< 500	< 500	< 500	< 500	< 500	< 500	< 500	
Total Petroleum Hydrocarbons	TRH C6-C9	40	µg/L	-	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	
	TRH C10-C14	50	µg/L	-	< 50	83	< 50	< 50	60	< 50	100	< 50	
	TRH C15-C28	200	µg/L	-	< 200	280	< 200	< 200	220	< 200	550	< 200	
	TRH C29-C36	200	µg/L	-	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200	
	TRH C37-C40	200	µg/L	-	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200	
	TRH C10-C40	320	µg/L	-	< 320	410	< 320	< 320	< 320	< 320	720	< 320	
BTEXN Analytes	Benzene (F0)	0.5	µg/L	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	

GROUNDWATER SAMPLING

[illegible]

TABLE 2 PARKES WASTE DEPOT - RESULTS OF LABORATORY ANALYSIS
DECEMBER 2024

GROUNDWATER SAMPLING



				Sample ID Sample Date	Piezo-01 4/12/2024	Piezo-02 3/12/2024	Piezo-03 4/12/2024	Piezo-04 3/12/2024	Piezo-05 4/12/2024	Piezo-06 3/12/2024	Piezo-07 4/12/2024	Piezo-08 4/12/2024
					PS	PS	PS	PS	PS	PS	PS	PS
Group	Analyte	LOR	Units	Criteria								
OC Pesticides	Hexachlorobenzene (HCB)	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Alpha BHC	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Lindane (gamma BHC)	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Heptachlor	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Aldrin	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Beta BHC	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Delta BHC	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Heptachlor epoxide	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	o,p'-DDE	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Alpha Endosulfan	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Gamma Chlordane	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Alpha Chlordane	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	trans-Nonachlor	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	p,p'-DDE	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Dieldrin	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Endrin	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	o,p'-DDD	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	o,p'-DDT	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Beta Endosulfan	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	p,p'-DDD	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	p,p'-DDT	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Endosulfan sulphate	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Endrin aldehyde	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Methoxychlor	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Endrin ketone	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Isodrin	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Mirex	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Total OC Pesticides	1	µg/L	-	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1

mg/L milligrams per litre
µg/L micrograms per litre
µS/cm microsiemens per centimetre
LOR limit of reporting
PS primary sample
Criteria Criteria adopted from *Australian and New Zealand Environment and Conservation Council (ANZECC) Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) Australian and New Zealand Guidelines for Fresh and Marine Water Quality* - 'Primary Industries: Water quality for irrigation and general water use', 2000

within criteria
criteria exceeded

TABLE 3 PARKES WASTE DEPOT - RESULTS OF LABORATORY ANALYSIS
DECEMBER 2024

LEACHATE SAMPLING



				Sample ID Sample Date	L1 3/12/2024	L2 4/12/2024
					PS	PS
Group	Analyte	LOR	Units	Criteria		
Physical Parameters	pH (Lab)	0	No unit	6.0 - 8.5	8.7	9
	Electrical Conductivity (Lab)	2	µS/cm	4478	1800	1700
	Total Suspended Solids	5	mg/L	-	18	270
Alkalinity	Total Alkalinity as CaCO ₃	5	mg/L	350	520	480
Anions	Chloride	1	mg/L	350	260	310
	Fluoride	0.1	mg/L	1	0.49	0.4
	Sulfate (SO ₄)	1	mg/L	-	100	26
Cations	Calcium (Ca)	0.1	mg/L	1000	22	14
	Magnesium (Mg)	0.1	mg/L	-	72	59
	Potassium (K)	0.2	mg/L	-	93	79
	Sodium (Na)	0.1	mg/L	230	230	240
Forms of Carbon	Total Organic Carbon	0.2	mg/L	-	38	140
Nutrients	Ammonia (NH ₃) as N	0.01	mg/L	-	0.04	0.19
	Nitrate (NO ₃) as N	0.005	mg/L	-	0.009	< 0.005
Phenolics	Total Phenols	0.05	mg/L	-	< 0.05	< 0.05
Trace Metals	Aluminium (Al)	0.005	mg/L	5	< 0.005	0.019
	Arsenic (As)	0.001	mg/L	0.1	0.038	0.019
	Barium (Ba)	0.001	mg/L	-	0.11	0.1
	Copper (Cu)	0.001	mg/L	0.2	0.002	0.001
	Iron (Fe)	0.005	mg/L	0.2	0.006	0.061
	Lead (Pb)	0.001	mg/L	2	< 0.001	< 0.001
	Manganese (Mn)	0.001	mg/L	0.2	< 0.001	0.11
	Zinc (Zn)	0.005	mg/L	2	< 0.005	< 0.005
Total Recoverable Hydrocarbons	TRH C6-C10	50	µg/L	-	< 50	< 50
	TRH C6-C10 - BTEX (F1)	50	µg/L	-	< 50	< 50
	TRH >C10-C16	60	µg/L	-	< 60	210
	TRH >C10-C16 - naphthalene (F2)	60	µg/L	-	< 60	210
	TRH >C16-C34 (F3)	500	µg/L	-	< 500	750
	TRH >C34-C40 (F4)	500	µg/L	-	< 500	< 500
Total Petroleum Hydrocarbons	TRH C6-C9	40	µg/L	-	< 40	< 40
	TRH C10-C14	50	µg/L	-	< 50	150
	TRH C15-C28	200	µg/L	-	< 200	650
	TRH C29-C36	200	µg/L	-	< 200	< 200
	TRH C37-C40	200	µg/L	-	< 200	< 200
	TRH C10-C40	320	µg/L	-	< 320	1000
BTEXN Analytes	Benzene (F0)	0.5	µg/L	-	< 0.5	< 0.5

mg/L milligrams per litre
 µg/L micrograms per litre
 µS/cm microsiemens per centimetre
 LOR limit of reporting
 PS primary sample
 Criteria Criteria adopted from Australian and New Zealand Environment and Conservation Council (ANZECC)
 Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) Australian and
 New Zealand Guidelines for Fresh and Marine Water Quality - 'Primary Industries: Water quality for
 irrigation and general water use', 2000

 within criteria
 criteria exceeded

CLIENT DETAILS

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Email **Brendan.stuart@premise.com.au**
Project **217317 - Parkes WD**
Order Number **217317**
Samples **10**

LABORATORY DETAILS

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SGS Reference **SE275366 R0**
Date Received **6/12/2024**
Date Reported **13/12/2024**

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

SIGNATORIES



Dong LIANG
Metals/Inorganics Team Leader



Ly Kim HA
Organic Section Head



Ying Ying ZHANG
Laboratory Technician

Volatile Petroleum Hydrocarbons in Water [AN433] Tested: 11/12/2024

PARAMETER	UOM	LOR	Piezo 1	Piezo 2	Piezo 3	Piezo 4	Piezo 5
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			4/12/2024 SE275366.001	3/12/2024 SE275366.002	4/12/2024 SE275366.003	3/12/2024 SE275366.004	4/12/2024 SE275366.005
Benzene (F0)	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TRH C6-C9	µg/L	40	<40	<40	<40	<40	<40
TRH C6-C10	µg/L	50	<50	<50	<50	<50	<50
TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	<50	<50	<50	<50

PARAMETER	UOM	LOR	Piezo 6	Piezo 7	Piezo 8	L-DAM_1	L-DAM_2
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			3/12/2024 SE275366.006	4/12/2024 SE275366.007	4/12/2024 SE275366.008	3/12/2024 SE275366.009	4/12/2024 SE275366.010
Benzene (F0)	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TRH C6-C9	µg/L	40	<40	<40	<40	<40	<40
TRH C6-C10	µg/L	50	<50	<50	<50	<50	<50
TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	<50	<50	<50	<50

TRH (Total Recoverable Hydrocarbons) in Water [AN403] Tested: 11/12/2024

PARAMETER	UOM	LOR	Piezo 1	Piezo 2	Piezo 3	Piezo 4	Piezo 5
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			4/12/2024 SE275366.001	3/12/2024 SE275366.002	4/12/2024 SE275366.003	3/12/2024 SE275366.004	4/12/2024 SE275366.005
TRH C10-C14	µg/L	50	<50	83	<50	<50	60
TRH C15-C28	µg/L	200	<200	280	<200	<200	220
TRH C29-C36	µg/L	200	<200	<200	<200	<200	<200
TRH C37-C40	µg/L	200	<200	<200	<200	<200	<200
TRH >C10-C16	µg/L	60	<60	130	<60	63	99
TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<60	130	<60	63	99
TRH >C16-C34 (F3)	µg/L	500	<500	<500	<500	<500	<500
TRH >C34-C40 (F4)	µg/L	500	<500	<500	<500	<500	<500
TRH C10-C40	µg/L	320	<320	410	<320	<320	<320

PARAMETER	UOM	LOR	Piezo 6	Piezo 7	Piezo 8	L-DAM_1	L-DAM_2
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			3/12/2024 SE275366.006	4/12/2024 SE275366.007	4/12/2024 SE275366.008	3/12/2024 SE275366.009	4/12/2024 SE275366.010
TRH C10-C14	µg/L	50	<50	100	<50	<50	150
TRH C15-C28	µg/L	200	<200	550	<200	<200	650
TRH C29-C36	µg/L	200	<200	<200	<200	<200	<200
TRH C37-C40	µg/L	200	<200	<200	<200	<200	<200
TRH >C10-C16	µg/L	60	<60	180	<60	<60	210
TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<60	180	<60	<60	210
TRH >C16-C34 (F3)	µg/L	500	<500	510	<500	<500	750
TRH >C34-C40 (F4)	µg/L	500	<500	<500	<500	<500	<500
TRH C10-C40	µg/L	320	<320	720	<320	<320	1000

PAH (Polynuclear Aromatic Hydrocarbons) in Water [AN420] Tested: 11/12/2024

PARAMETER	UOM	LOR	Piezo 1	Piezo 2	Piezo 3	Piezo 4	Piezo 5
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			4/12/2024 SE275366.001	3/12/2024 SE275366.002	4/12/2024 SE275366.003	3/12/2024 SE275366.004	4/12/2024 SE275366.005
Naphthalene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)anthracene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total PAH (18)	µg/L	1	<1	<1	<1	<1	<1

PARAMETER	UOM	LOR	Piezo 6	Piezo 7	Piezo 8
			WATER	WATER	WATER
			-	-	-
			3/12/2024 SE275366.006	4/12/2024 SE275366.007	4/12/2024 SE275366.008
Naphthalene	µg/L	0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	µg/L	0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	µg/L	0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	µg/L	0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1	<0.1	<0.1
Dibenzo(ah)anthracene	µg/L	0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	µg/L	0.1	<0.1	<0.1	<0.1
Total PAH (18)	µg/L	1	<1	<1	<1

OC Pesticides in Water [AN420] Tested: 11/12/2024

PARAMETER	UOM	LOR	Piezo 1	Piezo 2	Piezo 3	Piezo 4	Piezo 5
			WATER	WATER	WATER	WATER	WATER
			4/12/2024 SE275366.001	3/12/2024 SE275366.002	4/12/2024 SE275366.003	3/12/2024 SE275366.004	4/12/2024 SE275366.005
Hexachlorobenzene (HCB)	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane (gamma BHC)	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Gamma Chlordane	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDD	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDD	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin aldehyde	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin ketone	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total OC	µg/L	1	<1	<1	<1	<1	<1
Total OC	µg/L	1	<1	<1	<1	<1	<1

OC Pesticides in Water [AN420] Tested: 11/12/2024 (continued)

PARAMETER	UOM	LOR	Piezo 6	Piezo 7	Piezo 8
			WATER	WATER	WATER
			3/12/2024 SE275366.006	4/12/2024 SE275366.007	4/12/2024 SE275366.008
Hexachlorobenzene (HCB)	µg/L	0.1	<0.1	<0.1	<0.1
Alpha BHC	µg/L	0.1	<0.1	<0.1	<0.1
Lindane (gamma BHC)	µg/L	0.1	<0.1	<0.1	<0.1
Heptachlor	µg/L	0.1	<0.1	<0.1	<0.1
Aldrin	µg/L	0.1	<0.1	<0.1	<0.1
Beta BHC	µg/L	0.1	<0.1	<0.1	<0.1
Delta BHC	µg/L	0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	µg/L	0.1	<0.1	<0.1	<0.1
o,p'-DDE	µg/L	0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	µg/L	0.1	<0.1	<0.1	<0.1
Gamma Chlordane	µg/L	0.1	<0.1	<0.1	<0.1
Alpha Chlordane	µg/L	0.1	<0.1	<0.1	<0.1
trans-Nonachlor	µg/L	0.1	<0.1	<0.1	<0.1
p,p'-DDE	µg/L	0.1	<0.1	<0.1	<0.1
Dieldrin	µg/L	0.1	<0.1	<0.1	<0.1
Endrin	µg/L	0.1	<0.1	<0.1	<0.1
o,p'-DDD	µg/L	0.1	<0.1	<0.1	<0.1
o,p'-DDT	µg/L	0.1	<0.1	<0.1	<0.1
Beta Endosulfan	µg/L	0.1	<0.1	<0.1	<0.1
p,p'-DDD	µg/L	0.1	<0.1	<0.1	<0.1
p,p'-DDT	µg/L	0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	µg/L	0.1	<0.1	<0.1	<0.1
Endrin aldehyde	µg/L	0.1	<0.1	<0.1	<0.1
Methoxychlor	µg/L	0.1	<0.1	<0.1	<0.1
Endrin ketone	µg/L	0.1	<0.1	<0.1	<0.1
Isodrin	µg/L	0.1	<0.1	<0.1	<0.1
Mirex	µg/L	0.1	<0.1	<0.1	<0.1
Total OC	µg/L	1	<1	<1	<1
Total OC	µg/L	1	<1	<1	<1

OP Pesticides in Water [AN420] Tested: 11/12/2024

			Piezo 1	Piezo 2	Piezo 3	Piezo 4	Piezo 5
			WATER - 4/12/2024 SE275366.001	WATER - 3/12/2024 SE275366.002	WATER - 4/12/2024 SE275366.003	WATER - 3/12/2024 SE275366.004	WATER - 4/12/2024 SE275366.005
PARAMETER	UOM	LOR					
Dichlorvos	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	µg/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	µg/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	µg/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	µg/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	µg/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	µg/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl	µg/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2

			Piezo 6	Piezo 7	Piezo 8
			WATER - 3/12/2024 SE275366.006	WATER - 4/12/2024 SE275366.007	WATER - 4/12/2024 SE275366.008
PARAMETER	UOM	LOR			
Dichlorvos	µg/L	0.5	<0.5	<0.5	<0.5
Dimethoate	µg/L	0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	µg/L	0.5	<0.5	<0.5	<0.5
Fenitrothion	µg/L	0.2	<0.2	<0.2	<0.2
Malathion	µg/L	0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	µg/L	0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	µg/L	0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	µg/L	0.2	<0.2	<0.2	<0.2
Methidathion	µg/L	0.5	<0.5	<0.5	<0.5
Ethion	µg/L	0.2	<0.2	<0.2	<0.2
Azinphos-methyl	µg/L	0.2	<0.2	<0.2	<0.2



ANALYTICAL RESULTS

SE275366 R0

Total Phenolics in Water [AN295] Tested: 9/12/2024

			Piezo 1	Piezo 2	Piezo 3	Piezo 4	Piezo 5
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			4/12/2024	3/12/2024	4/12/2024	3/12/2024	4/12/2024
PARAMETER	UOM	LOR	SE275366.001	SE275366.002	SE275366.003	SE275366.004	SE275366.005
Total Phenols	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05

			Piezo 6	Piezo 7	Piezo 8	L-DAM_1	L-DAM_2
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			3/12/2024	4/12/2024	4/12/2024	3/12/2024	4/12/2024
PARAMETER	UOM	LOR	SE275366.006	SE275366.007	SE275366.008	SE275366.009	SE275366.010
Total Phenols	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Anions by Ion Chromatography in Water [AN245] Tested: 11/12/2024

PARAMETER	UOM	LOR	Piezo 1	Piezo 2	Piezo 3	Piezo 4	Piezo 5
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			4/12/2024 SE275366.001	3/12/2024 SE275366.002	4/12/2024 SE275366.003	3/12/2024 SE275366.004	4/12/2024 SE275366.005
Nitrate Nitrogen, NO3-N	mg/L	0.005	3.2	3.3	1.9	3.3	0.048
Chloride	mg/L	1	3000	3000	3600	2500	890
Sulfate, SO4	mg/L	1	490	460	910	480	95
Fluoride	mg/L	0.1	0.69	0.61	0.38	0.72	0.50

PARAMETER	UOM	LOR	Piezo 6	Piezo 7	Piezo 8	L-DAM_1	L-DAM_2
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			3/12/2024 SE275366.006	4/12/2024 SE275366.007	4/12/2024 SE275366.008	3/12/2024 SE275366.009	4/12/2024 SE275366.010
Nitrate Nitrogen, NO3-N	mg/L	0.005	16	80	160	0.009	<0.005
Chloride	mg/L	1	2700	1200	1100	260	310
Sulfate, SO4	mg/L	1	440	290	68	100	26
Fluoride	mg/L	0.1	0.68	0.72	1.1	0.49	0.40



ANALYTICAL RESULTS

SE275366 R0

Ammonia Nitrogen by Discrete Analyser [AN291] Tested: 6/12/2024

			Piezo 1	Piezo 2	Piezo 3	Piezo 4	Piezo 5
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			4/12/2024	3/12/2024	4/12/2024	3/12/2024	4/12/2024
PARAMETER	UOM	LOR	SE275366.001	SE275366.002	SE275366.003	SE275366.004	SE275366.005
Ammonia Nitrogen, NH ₃ as N	mg/L	0.01	<0.05 †	0.19	0.15	0.09	0.07

			Piezo 6	Piezo 7	Piezo 8	L-DAM_1	L-DAM_2
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			3/12/2024	4/12/2024	4/12/2024	3/12/2024	4/12/2024
PARAMETER	UOM	LOR	SE275366.006	SE275366.007	SE275366.008	SE275366.009	SE275366.010
Ammonia Nitrogen, NH ₃ as N	mg/L	0.01	<0.05 †	<0.05 †	<0.05 †	0.04	0.19

Total Phosphorus by Kjeldahl Digestion DA in Water [AN279/AN293(Sydney only)] Tested: 10/12/2024

			Piezo 1	Piezo 2	Piezo 3	Piezo 4	Piezo 5
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			4/12/2024	3/12/2024	4/12/2024	3/12/2024	4/12/2024
PARAMETER	UOM	LOR	SE275366.001	SE275366.002	SE275366.003	SE275366.004	SE275366.005
Total Phosphorus (Kjeldahl Digestion) as P	mg/L	0.02	0.04	0.11	0.30	0.18	0.23

			Piezo 6	Piezo 7	Piezo 8
			WATER	WATER	WATER
			-	-	-
			3/12/2024	4/12/2024	4/12/2024
PARAMETER	UOM	LOR	SE275366.006	SE275366.007	SE275366.008
Total Phosphorus (Kjeldahl Digestion) as P	mg/L	0.02	0.13	0.10	1.1



ANALYTICAL RESULTS

SE275366 R0

pH in water [AN101] Tested: 6/12/2024

			Piezo 1	Piezo 2	Piezo 3	Piezo 4	Piezo 5
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			4/12/2024	3/12/2024	4/12/2024	3/12/2024	4/12/2024
PARAMETER	UOM	LOR	SE275366.001	SE275366.002	SE275366.003	SE275366.004	SE275366.005
pH**	No unit	-	6.9	6.8	6.9	6.9	7.0

			Piezo 6	Piezo 7	Piezo 8	L-DAM_1	L-DAM_2
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			3/12/2024	4/12/2024	4/12/2024	3/12/2024	4/12/2024
PARAMETER	UOM	LOR	SE275366.006	SE275366.007	SE275366.008	SE275366.009	SE275366.010
pH**	No unit	-	6.9	6.9	7.1	8.7	9.0

Conductivity and TDS by Calculation - Water [AN106] Tested: 6/12/2024

			Piezo 1	Piezo 2	Piezo 3	Piezo 4	Piezo 5
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			4/12/2024	3/12/2024	4/12/2024	3/12/2024	4/12/2024
PARAMETER	UOM	LOR	SE275366.001	SE275366.002	SE275366.003	SE275366.004	SE275366.005
Conductivity @ 25 C	µS/cm	2	8100	8800	8900	7500	3400

			Piezo 6	Piezo 7	Piezo 8	L-DAM_1	L-DAM_2
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			3/12/2024	4/12/2024	4/12/2024	3/12/2024	4/12/2024
PARAMETER	UOM	LOR	SE275366.006	SE275366.007	SE275366.008	SE275366.009	SE275366.010
Conductivity @ 25 C	µS/cm	2	7000	5000	5200	1800	1700



ANALYTICAL RESULTS

SE275366 R0

Total Dissolved Solids (TDS) in water [AN113] Tested: 10/12/2024

			Piezo 1	Piezo 2	Piezo 3	Piezo 4	Piezo 5
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			4/12/2024	3/12/2024	4/12/2024	3/12/2024	4/12/2024
PARAMETER	UOM	LOR	SE275366.001	SE275366.002	SE275366.003	SE275366.004	SE275366.005
Total Dissolved Solids Dried at 175-185°C	mg/L	10	6800	6700	9400	6000	2100

			Piezo 6	Piezo 7	Piezo 8
			WATER	WATER	WATER
			-	-	-
			3/12/2024	4/12/2024	4/12/2024
PARAMETER	UOM	LOR	SE275366.006	SE275366.007	SE275366.008
Total Dissolved Solids Dried at 175-185°C	mg/L	10	7000	4200	3700



ANALYTICAL RESULTS

SE275366 R0

Total and Volatile Suspended Solids (TSS / VSS) [AN114] Tested: 6/12/2024

			L-DAM_1	L-DAM_2
			WATER	WATER
			-	-
			3/12/2024	4/12/2024
			SE275366.009	SE275366.010
PARAMETER	UOM	LOR		
Total Suspended Solids Dried at 103-105°C	mg/L	5	18	270



ANALYTICAL RESULTS

SE275366 R0

BOD5 [AN183] Tested: 6/12/2024

			Piezo 1	Piezo 2	Piezo 3	Piezo 4	Piezo 5
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			4/12/2024	3/12/2024	4/12/2024	3/12/2024	4/12/2024
PARAMETER	UOM	LOR	SE275366.001	SE275366.002	SE275366.003	SE275366.004	SE275366.005
Biochemical Oxygen Demand (BOD5)	mg/L	5	<5	<5	<5	<5	<5

			Piezo 6	Piezo 7	Piezo 8
			WATER	WATER	WATER
			-	-	-
			3/12/2024	4/12/2024	4/12/2024
PARAMETER	UOM	LOR	SE275366.006	SE275366.007	SE275366.008
Biochemical Oxygen Demand (BOD5)	mg/L	5	<5	<5	<5



ANALYTICAL RESULTS

SE275366 R0

Alkalinity [AN135] Tested: 10/12/2024

			Piezo 1	Piezo 2	Piezo 3	Piezo 4	Piezo 5
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			4/12/2024	3/12/2024	4/12/2024	3/12/2024	4/12/2024
PARAMETER	UOM	LOR	SE275366.001	SE275366.002	SE275366.003	SE275366.004	SE275366.005
Total Alkalinity as CaCO3	mg/L	5	730	930	670	1000	560

			Piezo 6	Piezo 7	Piezo 8	L-DAM_1	L-DAM_2
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			3/12/2024	4/12/2024	4/12/2024	3/12/2024	4/12/2024
PARAMETER	UOM	LOR	SE275366.006	SE275366.007	SE275366.008	SE275366.009	SE275366.010
Total Alkalinity as CaCO3	mg/L	5	670	960	910	520	480



ANALYTICAL RESULTS

SE275366 R0

Forms of Carbon [AN190] Tested: 10/12/2024

			Piezo 1	Piezo 2	Piezo 3	Piezo 4	Piezo 5
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			4/12/2024	3/12/2024	4/12/2024	3/12/2024	4/12/2024
PARAMETER	UOM	LOR	SE275366.001	SE275366.002	SE275366.003	SE275366.004	SE275366.005
Total Organic Carbon as NPOC	mg/L	0.2	5.3	17	11	10	3.1

			Piezo 6	Piezo 7	Piezo 8	L-DAM_1	L-DAM_2
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			3/12/2024	4/12/2024	4/12/2024	3/12/2024	4/12/2024
PARAMETER	UOM	LOR	SE275366.006	SE275366.007	SE275366.008	SE275366.009	SE275366.010
Total Organic Carbon as NPOC	mg/L	0.2	4.3	29	5.5	38	140



ANALYTICAL RESULTS

SE275366 R0

Hexavalent Chromium in water by Discrete Analyser [AN283] Tested: 6/12/2024

			Piezo 1	Piezo 2	Piezo 3	Piezo 4	Piezo 5
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			4/12/2024	3/12/2024	4/12/2024	3/12/2024	4/12/2024
PARAMETER	UOM	LOR	SE275366.001	SE275366.002	SE275366.003	SE275366.004	SE275366.005
Hexavalent Chromium, Cr6+	mg/L	0.004	<0.004	<0.004	<0.004	<0.004	<0.004

			Piezo 6	Piezo 7	Piezo 8
			WATER	WATER	WATER
			-	-	-
			3/12/2024	4/12/2024	4/12/2024
PARAMETER	UOM	LOR	SE275366.006	SE275366.007	SE275366.008
Hexavalent Chromium, Cr6+	mg/L	0.004	<0.004	<0.004	<0.004

Metals in Water (Dissolved) by ICPOES [AN320] Tested: 11/12/2024

PARAMETER	UOM	LOR	Piezo 1	Piezo 2	Piezo 3	Piezo 4	Piezo 5
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			4/12/2024 SE275366.001	3/12/2024 SE275366.002	4/12/2024 SE275366.003	3/12/2024 SE275366.004	4/12/2024 SE275366.005
Calcium, Ca	mg/L	0.1	420	310	780	400	87
Magnesium, Mg	mg/L	0.1	470	440	600	350	150
Sodium, Na	mg/L	0.1	830	1100	680	940	440
Potassium, K	mg/L	0.2	10	8.6	26	9.4	17

PARAMETER	UOM	LOR	Piezo 6	Piezo 7	Piezo 8	L-DAM_1	L-DAM_2
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			3/12/2024 SE275366.006	4/12/2024 SE275366.007	4/12/2024 SE275366.008	3/12/2024 SE275366.009	4/12/2024 SE275366.010
Calcium, Ca	mg/L	0.1	510	350	120	22	14
Magnesium, Mg	mg/L	0.1	480	290	260	72	59
Sodium, Na	mg/L	0.1	490	480	670	230	240
Potassium, K	mg/L	0.2	4.6	8.0	6.9	93	79

Trace Metals (Dissolved) in Water by ICPMS [AN318] Tested: 11/12/2024

PARAMETER	UOM	LOR	Piezo 1	Piezo 2	Piezo 3	Piezo 4	Piezo 5
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			4/12/2024 SE275366.001	3/12/2024 SE275366.002	4/12/2024 SE275366.003	3/12/2024 SE275366.004	4/12/2024 SE275366.005
Aluminium	µg/L	5	18	<5	<5	<5	<5
Barium	µg/L	1	55	160	150	79	330
Arsenic	µg/L	1	<1	7	2	4	1
Cadmium	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead	µg/L	1	14	<1	3	<1	<1
Manganese	µg/L	1	120	860	2300	640	3000
Zinc	µg/L	5	19	15	30	12	15
Iron	µg/L	5	13	6	9	<5	<5
Copper	µg/L	1	<1	1	<1	2	<1

PARAMETER	UOM	LOR	Piezo 6	Piezo 7	Piezo 8	L-DAM_1	L-DAM_2
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			3/12/2024 SE275366.006	4/12/2024 SE275366.007	4/12/2024 SE275366.008	3/12/2024 SE275366.009	4/12/2024 SE275366.010
Aluminium	µg/L	5	<5	<5	<5	<5	19
Barium	µg/L	1	63	65	11	110	100
Arsenic	µg/L	1	<1	2	<1	38	19
Cadmium	µg/L	0.1	<0.1	<0.1	<0.1	-	-
Lead	µg/L	1	1	11	1	<1	<1
Manganese	µg/L	1	11	370	10	<1	110
Zinc	µg/L	5	14	17	12	<5	<5
Iron	µg/L	5	<5	<5	<5	6	61
Copper	µg/L	1	<1	3	<1	2	1

METHOD

METHODOLOGY SUMMARY

AN020	Unpreserved water sample is filtered through a 0.45µm membrane filter and acidified with nitric acid similar to APHA3030B.
AN101	pH in Soil Sludge Sediment and Water: pH is measured electrometrically using a combination electrode (glass plus reference electrode) and is calibrated against 3 buffers purchased commercially. For soils, an extract with water is made at a ratio of 1:5 and the pH determined and reported on the extract. Reference APHA 4500-H+.
AN106	Conductivity and TDS by Calculation: Conductivity is measured by meter with temperature compensation and is calibrated against a standard solution of potassium chloride. Conductivity is generally reported as µmhos/cm or µS/cm @ 25°C. For soils, an extract with water is made at a ratio of 1:5 and the EC determined and reported on the extract, or calculated back to the as-received sample. Total Dissolved Salts can be estimated from conductivity using a conversion factor, which for natural waters, is in the range 0.55 to 0.75. SGS use 0.6. Reference APHA 2510 B.
AN106	Salinity may be calculated in terms of NaCl from the sample conductivity. This assumes all soluble salts present, measured by the conductivity, are present as NaCl.
AN113	Total Dissolved Solids: A well-mixed filtered sample of known volume is evaporated to dryness at 180°C and the residue weighed. Approximate methods for correlating chemical analysis with dissolved solids are available. Reference APHA 2540 C.
AN113	The Total Dissolved Solids residue may also be ignited at 550 C and volatile TDS (Organic TDS) and non-volatile TDS (Inorganic) can be determined.
AN114	Total Suspended and Volatile Suspended Solids: The sample is homogenised by shaking and a known volume is filtered through a pre-weighed GF/C filter paper and washed well with deionised water. The filter paper is dried and reweighed. The TSS is the residue retained by the filter per unit volume of sample. Reference APHA 2540 D. Internal Reference AN114
AN135	Alkalinity (and forms of) by Titration: The sample is titrated with standard acid to pH 8.3 (P titre) and pH 4.5 (T titre) and permanent and/or total alkalinity calculated. The results are expressed as equivalents of calcium carbonate or recalculated as bicarbonate, carbonate and hydroxide. Reference APHA 2320. Internal Reference AN135
AN183	BOD: Serial dilutions of the sample are firstly combined with various reagents to aid bacterial growth and the sample is incubated for 5 days at 20°C. The difference between the initial and final oxygen contents of the sample is the amount of oxygen consumed by the bacteria. This is related to the organic loading of the sample therefore cBOD is the measure of the digestibility or bioavailability of organic matter in the sample. Reference APHA 5210 B. Internal Reference AN183
AN190	TOC and DOC in Water: A homogenised micro portion of sample is injected into a heated reaction chamber packed with an oxidative catalyst that converts organic carbon to carbon dioxide. The CO2 is measured using a non-dispersive infrared detector. The process is fully automated in a commercially available analyser. If required a sugar value can be calculated from the TOC result. Reference APHA 5310 B.
AN190	Chemical oxygen demand can be calculated/estimated based on the O2/C relation as 2.67*NPOC (TOC). This is an estimate only and the factor will vary with sample matrix so results should be interpreted with caution.
AN245	Anions by Ion Chromatography: A water sample is injected into an eluent stream that passes through the ion chromatographic system where the anions of interest ie Br, Cl, NO2, NO3 and SO4 are separated on their relative affinities for the active sites on the column packing material. Changes to the conductivity and the UV-visible absorbance of the eluent enable identification and quantitation of the anions based on their retention time and peak height or area. APHA 4110 B
AN279/AN293(Sydney)	The sample is digested with Sulphuric acid, K2SO4 and CuSO4. All forms of phosphorus are converted into orthophosphate. The digest is cooled and placed on the discrete analyser for colorimetric analysis.
AN283	Hexavalent Chromium via DA: Soluble hexavalent chromium forms a red/violet colour with diphenylcarbazide in acidic solution. This procedure is very sensitive and nearly specific for Cr6+. If total chromium is also measured the trivalent form of chromium Cr3+ can be calculated from the difference (Total Cr - Cr6+). Reference APHA3500CrB.
AN291	Ammonia in solution reacts with hypochlorite ions from Sodium Dichloroisocyanate, and salicylate in the presence of Sodium Nitroprusside to form indophenol blue and measured at 660 nm by Discrete Analyser.
AN295	The water sample or extract of sample is distilled in a phosphoric acid stream. Phenolic compounds in the distillate react with a reagent stream of potassium hexacyanoferrate(III) and 4-Amino-2,3-dimethyl-3-pyrazolin-5-one in an alkaline medium to form a coloured complex which is analysed spectrophotometrically onboard a continuous flow analyser.

AN318	Determination of elements at trace level in waters by ICP-MS technique,, referenced to USEPA 6020B and USEPA 200.8 (5.4).
AN320	Metals by ICP-OES: Samples are preserved with 10% nitric acid for a wide range of metals and some non-metals. This solution is measured by Inductively Coupled Plasma. Solutions are aspirated into an argon plasma at 8000-10000K and emit characteristic energy or light as a result of electron transitions through unique energy levels. The emitted light is focused onto a diffraction grating where it is separated into components .
AN320	Photomultipliers or CCDs are used to measure the light intensity at specific wavelengths. This intensity is directly proportional to concentration. Corrections are required to compensate for spectral overlap between elements . Reference APHA 3120 B.
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). Where F2 is corrected for Naphthalene, the VOC data for Naphthalene is used.
AN403	Additionally, the volatile C6-C9/C6-C10 fractions may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Recoverable Hydrocarbons - Silica (TRH-Silica) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents.
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken . This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup /fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D). Total PAH calculated from individual analyte detections at or above the limit of reporting .
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC's are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.
Calculation	Free and Total Carbon Dioxide may be calculated using alkalinity forms only when the samples TDS is <500mg/L. If TDS is >500mg/L free or total carbon dioxide cannot be reported . APHA4500CO2 D.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
**	Indicative data, theoretical holding time exceeded.	NVL	Not validated.	LOR	Limit of Reporting.
***	Indicates that both * and ** apply.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the "Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.

Note that in terms of units of radioactivity:

- 1 Bq is equivalent to 27 pCi
- 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety.

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