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CERTIFICATE OF ANALYSIS 351008

Client Details

Client	Martens & Associates Pty Ltd
Attention	Dean Shi
Address	Suite 201, 20 George St, Hornsby, NSW, 2077

Sample Details

Your Reference	**P2007619, Clarence Sand Quarry**
Number of Samples	9 Water
Date samples received	10/05/2024
Date completed instructions received	10/05/2024

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	17/05/2024
Date of Issue	17/05/2024

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Results Approved By
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Authorised By
Nancy Zhang, Laboratory Manager

vTRH in Water (C6-C9) NEPM						
Our Reference		351008-1	351008-2	351008-3	351008-4	351008-5
Your Reference	UNITS	7619 / EPL1	7619 / EPL2	7619 / EPL3	7619 / EPL4	7619 / EPL6
Sample ID		EPL1 / SW01	EPL2 / SW02	EPL3 / SW03	EPL4 / SW04	EPL6 / MW04
Date Sampled		10/05/2024	10/05/2024	10/05/2024	10/05/2024	10/05/2024
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	14/05/2024	14/05/2024	14/05/2024	14/05/2024	14/05/2024
Date analysed	-	15/05/2024	15/05/2024	15/05/2024	15/05/2024	15/05/2024
TRH C_6 - C_9	µg/L	<10	<10	<10	<10	<10
TRH C_6 - C_{10}	µg/L	<10	<10	<10	<10	<10
Surrogate Dibromofluoromethane	%	104	104	112	110	105
Surrogate Toluene-d8	%	93	91	96	92	93
Surrogate 4-Bromofluorobenzene	%	103	103	104	106	103

vTRH in Water (C6-C9) NEPM					
Our Reference		351008-6	351008-7	351008-8	351008-9
Your Reference	UNITS	7619 / EPL7	7619 / EPL8	7619 / EPL9	7619 / EPL10
Sample ID		EPL7 / MW05	EPL8 / MW06	EPL9 / MW07	EPL10 / MW08
Date Sampled		10/05/2024	10/05/2024	10/05/2024	10/05/2024
Type of sample		Water	Water	Water	Water
Date extracted	-	14/05/2024	14/05/2024	14/05/2024	14/05/2024
Date analysed	-	15/05/2024	15/05/2024	15/05/2024	15/05/2024
TRH C_6 - C_9	µg/L	<10	<10	<10	<10
TRH C_6 - C_{10}	µg/L	<10	<10	<10	<10
Surrogate Dibromofluoromethane	%	114	119	106	114
Surrogate Toluene-d8	%	93	98	93	94
Surrogate 4-Bromofluorobenzene	%	106	105	103	105

svTRH (C10-C40) in Water						
Our Reference		351008-1	351008-2	351008-3	351008-4	351008-5
Your Reference	UNITS	7619 / EPL1	7619 / EPL2	7619 / EPL3	7619 / EPL4	7619 / EPL6
Sample ID		EPL1 / SW01	EPL2 / SW02	EPL3 / SW03	EPL4 / SW04	EPL6 / MW04
Date Sampled		10/05/2024	10/05/2024	10/05/2024	10/05/2024	10/05/2024
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	14/05/2024	14/05/2024	14/05/2024	14/05/2024	14/05/2024
Date analysed	-	15/05/2024	15/05/2024	15/05/2024	15/05/2024	15/05/2024
TRH C_{10} - C_{14}	µg/L	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	µg/L	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16}	µg/L	<50	<50	<50	<50	<50
TRH >C_{16} - C_{34}	µg/L	<100	<100	<100	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	89	96	87	88	85

svTRH (C10-C40) in Water					
Our Reference		351008-6	351008-7	351008-8	351008-9
Your Reference	UNITS	7619 / EPL7	7619 / EPL8	7619 / EPL9	7619 / EPL10
Sample ID		EPL7 / MW05	EPL8 / MW06	EPL9 / MW07	EPL10 / MW08
Date Sampled		10/05/2024	10/05/2024	10/05/2024	10/05/2024
Type of sample		Water	Water	Water	Water
Date extracted	-	14/05/2024	14/05/2024	14/05/2024	14/05/2024
Date analysed	-	15/05/2024	15/05/2024	15/05/2024	15/05/2024
TRH C_{10} - C_{14}	µg/L	<50	<50	<50	<50
TRH C_{15} - C_{28}	µg/L	<100	<100	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50	<50	<50
TRH >C_{10} - C_{16}	µg/L	<50	<50	<50	<50
TRH >C_{16} - C_{34}	µg/L	<100	<100	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50	<50	<50
Surrogate o-Terphenyl	%	96	78	99	101

HM in water - dissolved						
Our Reference		351008-1	351008-2	351008-3	351008-4	351008-5
Your Reference	UNITS	7619 / EPL1	7619 / EPL2	7619 / EPL3	7619 / EPL4	7619 / EPL6
Sample ID		EPL1 / SW01	EPL2 / SW02	EPL3 / SW03	EPL4 / SW04	EPL6 / MW04
Date Sampled		10/05/2024	10/05/2024	10/05/2024	10/05/2024	10/05/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	15/05/2024	15/05/2024	15/05/2024	15/05/2024	15/05/2024
Date analysed	-	15/05/2024	15/05/2024	15/05/2024	15/05/2024	15/05/2024
Arsenic-Dissolved	µg/L	<1	<1	<1	<1	<1
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1	0.5	<0.1
Chromium-Dissolved	µg/L	<1	<1	<1	<1	<1
Copper-Dissolved	µg/L	<1	<1	<1	<1	6
Lead-Dissolved	µg/L	<1	<1	<1	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05	0.57
Nickel-Dissolved	µg/L	<1	<1	<1	<1	1
Zinc-Dissolved	µg/L	5	5	3	8	110

HM in water - dissolved					
Our Reference		351008-6	351008-7	351008-8	351008-9
Your Reference	UNITS	7619 / EPL7	7619 / EPL8	7619 / EPL9	7619 / EPL10
Sample ID		EPL7 / MW05	EPL8 / MW06	EPL9 / MW07	EPL10 / MW08
Date Sampled		10/05/2024	10/05/2024	10/05/2024	10/05/2024
Type of sample		Water	Water	Water	Water
Date prepared	-	15/05/2024	15/05/2024	15/05/2024	15/05/2024
Date analysed	-	15/05/2024	15/05/2024	15/05/2024	15/05/2024
Arsenic-Dissolved	µg/L	<1	<1	<1	<1
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1	<1	<1
Copper-Dissolved	µg/L	1	2	<1	<1
Lead-Dissolved	µg/L	<1	<1	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	<1	<1	3	<1
Zinc-Dissolved	µg/L	9	14	24	13

Ion Balance						
Our Reference		351008-1	351008-2	351008-3	351008-4	351008-5
Your Reference	UNITS	7619 / EPL1	7619 / EPL2	7619 / EPL3	7619 / EPL4	7619 / EPL6
Sample ID		EPL1 / SW01	EPL2 / SW02	EPL3 / SW03	EPL4 / SW04	EPL6 / MW04
Date Sampled		10/05/2024	10/05/2024	10/05/2024	10/05/2024	10/05/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	14/05/2024	14/05/2024	14/05/2024	14/05/2024	14/05/2024
Date analysed	-	14/05/2024	14/05/2024	14/05/2024	14/05/2024	14/05/2024
Calcium - Dissolved	mg/L	<0.5	<0.5	<0.5	<0.5	0.5
Potassium - Dissolved	mg/L	1	<0.5	<0.5	1	0.9
Sodium - Dissolved	mg/L	3	2	0.8	3	4
Magnesium - Dissolved	mg/L	<0.5	<0.5	<0.5	<0.5	0.5
Hardness (calc) equivalent $CaCO_3$	mg/L	<3	<3	<3	<3	3.6
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	<5	<5	<5	<5	<5
Bicarbonate Alkalinity as $CaCO_3$	mg/L	<5	<5	<5	<5	7
Carbonate Alkalinity as $CaCO_3$	mg/L	<5	<5	<5	<5	<5
Total Alkalinity as $CaCO_3$	mg/L	<5	<5	<5	<5	7
Sulphate, SO4	mg/L	1	<1	<1	<1	<1
Chloride, Cl	mg/L	4	4	4	4	5
Ionic Balance	%	6.0	-24	-51	16	4.0

Ion Balance					
Our Reference		351008-6	351008-7	351008-8	351008-9
Your Reference	UNITS	7619 / EPL7	7619 / EPL8	7619 / EPL9	7619 / EPL10
Sample ID		EPL7 / MW05	EPL8 / MW06	EPL9 / MW07	EPL10 / MW08
Date Sampled		10/05/2024	10/05/2024	10/05/2024	10/05/2024
Type of sample		Water	Water	Water	Water
Date prepared	-	14/05/2024	14/05/2024	14/05/2024	14/05/2024
Date analysed	-	14/05/2024	14/05/2024	14/05/2024	14/05/2024
Calcium - Dissolved	mg/L	<0.5	<0.5	<0.5	<0.5
Potassium - Dissolved	mg/L	<0.5	<0.5	<0.5	0.5
Sodium - Dissolved	mg/L	0.6	5	6.4	5.6
Magnesium - Dissolved	mg/L	<0.5	<0.5	<0.5	<0.5
Hardness (calc) equivalent $CaCO_3$	mg/L	<3	<3	<3	<3
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	<5	<5	<5	<5
Bicarbonate Alkalinity as $CaCO_3$	mg/L	<5	<5	7	5
Carbonate Alkalinity as $CaCO_3$	mg/L	<5	<5	<5	<5
Total Alkalinity as $CaCO_3$	mg/L	<5	<5	7	5
Sulphate, SO4	mg/L	<1	<1	<1	<1
Chloride, Cl	mg/L	4	8	6	5
Ionic Balance	%	-59	-4.0	-6.0	-1.0

Miscellaneous Inorganics						
Our Reference		351008-1	351008-2	351008-3	351008-4	351008-5
Your Reference	UNITS	7619 / EPL1	7619 / EPL2	7619 / EPL3	7619 / EPL4	7619 / EPL6
Sample ID		EPL1 / SW01	EPL2 / SW02	EPL3 / SW03	EPL4 / SW04	EPL6 / MW04
Date Sampled		10/05/2024	10/05/2024	10/05/2024	10/05/2024	10/05/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	10/05/2024	10/05/2024	10/05/2024	10/05/2024	10/05/2024
Date analysed	-	10/05/2024	10/05/2024	10/05/2024	10/05/2024	10/05/2024
pH	pH Units	6.4	5.8	5.7	5.3	5.0
Electrical Conductivity	µS/cm	40	24	24	24	34
Total Suspended Solids	mg/L	10	27	38	22	[NA]
Turbidity	NTU	320	25	160	94	[NA]
BOD	mg/L	6	<5	<5	<5	<5
Dissolved Oxygen*	mg/L	8.5	8.4	8.4	8.4	[NA]

Miscellaneous Inorganics					
Our Reference		351008-6	351008-7	351008-8	351008-9
Your Reference	UNITS	7619 / EPL7	7619 / EPL8	7619 / EPL9	7619 / EPL10
Sample ID		EPL7 / MW05	EPL8 / MW06	EPL9 / MW07	EPL10 / MW08
Date Sampled		10/05/2024	10/05/2024	10/05/2024	10/05/2024
Type of sample		Water	Water	Water	Water
Date prepared	-	10/05/2024	10/05/2024	10/05/2024	10/05/2024
Date analysed	-	10/05/2024	10/05/2024	10/05/2024	10/05/2024
pH	pH Units	4.8	5.0	5.0	4.7
Electrical Conductivity	µS/cm	25	32	33	35
BOD	mg/L	<5	<5	7	<5

Method ID	Methodology Summary
Inorg-001	pH - Measured using pH meter and electrode. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell.
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA latest edition, 2320-B.
Inorg-019	Suspended Solids - determined gravimetricially by filtration of the sample. The samples are dried at 104+/-5°C.
Inorg-022	Turbidity - measured nephelometrically using a turbidimeter, in accordance with APHA latest edition, 2130-B.
Inorg-040	The concentrations of the major ions (mg/L) are converted to milliequivalents and summed. The ionic balance should be within +/- 15% ie total anions = total cations +/-15%.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
Inorg-091	BOD - Analysed in accordance with APHA latest edition 5210 D and in house INORG-091.
Inorg-112	Dissolved Oxygen using membrane electrode. Note this analysis should ideally be carried out immediately after sampling.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Salt forms (e.g. FeO, PbO, ZnO) are determined stoichiometrically from the base metal concentration.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

QUALITY CONTROL: vTRH in Water (C6-C9) NEPM						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			14/05/2024	1	14/05/2024	15/05/2024		14/05/2024	[NT]
Date analysed	-			15/05/2024	1	15/05/2024	16/05/2024		15/05/2024	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	1	<10	<10	0	87	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	1	<10	<10	0	87	[NT]
Surrogate Dibromofluoromethane	%		Org-023	102	1	104	106	2	98	[NT]
Surrogate Toluene-d8	%		Org-023	93	1	93	94	1	99	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	103	1	103	103	0	97	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			14/05/2024	[NT]	[NT]	[NT]	[NT]	14/05/2024	[NT]
Date analysed	-			15/05/2024	[NT]	[NT]	[NT]	[NT]	15/05/2024	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	119	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	114	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	119	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	114	[NT]
Surrogate o-Terphenyl	%		Org-020	91	[NT]	[NT]	[NT]	[NT]	113	[NT]

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date prepared	-			15/05/2024	1	15/05/2024	15/05/2024		15/05/2024	[NT]
Date analysed	-			15/05/2024	1	15/05/2024	15/05/2024		15/05/2024	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		97	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	1	<0.1	[NT]		99	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		97	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		99	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		103	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	98	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		98	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	1	5	[NT]		104	[NT]

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	2	15/05/2024	15/05/2024		[NT]	[NT]
Date analysed	-			[NT]	2	15/05/2024	15/05/2024		[NT]	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	[NT]	2	<1	<1	0	[NT]	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	[NT]	2	<0.1	<0.1	0	[NT]	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	[NT]	2	<1	<1	0	[NT]	[NT]
Copper-Dissolved	µg/L	1	Metals-022	[NT]	2	<1	<1	0	[NT]	[NT]
Lead-Dissolved	µg/L	1	Metals-022	[NT]	2	<1	<1	0	[NT]	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	[NT]	2	<0.05	[NT]		[NT]	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	[NT]	2	<1	<1	0	[NT]	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	[NT]	2	5	4	22	[NT]	[NT]

QUALITY CONTROL: Ion Balance						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	351008-2
Date prepared	-			14/05/2024	1	14/05/2024	14/05/2024		14/05/2024	14/05/2024
Date analysed	-			14/05/2024	1	14/05/2024	14/05/2024		14/05/2024	14/05/2024
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	<0.5	[NT]		107	[NT]
Potassium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	1	[NT]		100	[NT]
Sodium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	3	[NT]		110	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	<0.5	[NT]		105	[NT]
Hardness (calc) equivalent $CaCO_3$	mg/L	3	Metals-020	[NT]	1	<3	[NT]		[NT]	[NT]
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	5	Inorg-006	<5	1	<5	[NT]		[NT]	[NT]
Bicarbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	1	<5	[NT]		[NT]	[NT]
Carbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	1	<5	[NT]		[NT]	[NT]
Total Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	1	<5	[NT]		104	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	<1	1	1	1	0	109	111
Chloride, Cl	mg/L	1	Inorg-081	<1	1	4	4	0	116	105
Ionic Balance	%		Inorg-040	[NT]	1	6.0	[NT]		[NT]	[NT]

QUALITY CONTROL: Ion Balance						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	2	14/05/2024	14/05/2024		[NT]	[NT]
Date analysed	-			[NT]	2	14/05/2024	14/05/2024		[NT]	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	[NT]	2	<0.5	<0.5	0	[NT]	[NT]
Potassium - Dissolved	mg/L	0.5	Metals-020	[NT]	2	<0.5	<0.5	0	[NT]	[NT]
Sodium - Dissolved	mg/L	0.5	Metals-020	[NT]	2	2	2	0	[NT]	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	[NT]	2	<0.5	<0.5	0	[NT]	[NT]
Hardness (calc) equivalent $CaCO_3$	mg/L	3	Metals-020	[NT]	2	<3	<3	0	[NT]	[NT]
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	5	Inorg-006	[NT]	2	<5	[NT]		[NT]	[NT]
Bicarbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	[NT]	2	<5	[NT]		[NT]	[NT]
Carbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	[NT]	2	<5	[NT]		[NT]	[NT]
Total Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	[NT]	2	<5	[NT]		[NT]	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	[NT]	2	<1	[NT]		[NT]	[NT]
Chloride, Cl	mg/L	1	Inorg-081	[NT]	2	4	[NT]		[NT]	[NT]
Ionic Balance	%		Inorg-040	[NT]	2	-24	[NT]		[NT]	[NT]

QUALITY CONTROL: Ion Balance						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	4	14/05/2024	14/05/2024		[NT]	[NT]
Date analysed	-			[NT]	4	14/05/2024	14/05/2024		[NT]	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	[NT]	4	<0.5	[NT]		[NT]	[NT]
Potassium - Dissolved	mg/L	0.5	Metals-020	[NT]	4	1	[NT]		[NT]	[NT]
Sodium - Dissolved	mg/L	0.5	Metals-020	[NT]	4	3	[NT]		[NT]	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	[NT]	4	<0.5	[NT]		[NT]	[NT]
Hardness (calc) equivalent $CaCO_3$	mg/L	3	Metals-020	[NT]	4	<3	[NT]		[NT]	[NT]
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	5	Inorg-006	[NT]	4	<5	<5	0	[NT]	[NT]
Bicarbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	[NT]	4	<5	<5	0	[NT]	[NT]
Carbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	[NT]	4	<5	<5	0	[NT]	[NT]
Total Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	[NT]	4	<5	<5	0	[NT]	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	[NT]	4	<1	[NT]		[NT]	[NT]
Chloride, Cl	mg/L	1	Inorg-081	[NT]	4	4	[NT]		[NT]	[NT]
Ionic Balance	%		Inorg-040	[NT]	4	16	[NT]		[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			14/05/2024	1	10/05/2024	10/05/2024		14/05/2024	[NT]
Date analysed	-			14/05/2024	1	10/05/2024	10/05/2024		14/05/2024	[NT]
pH	pH Units		Inorg-001	[NT]	1	6.4	[NT]		100	[NT]
Electrical Conductivity	µS/cm	1	Inorg-002	<1	1	40	[NT]		103	[NT]
Total Suspended Solids	mg/L	5	Inorg-019	<5	1	10	[NT]		108	[NT]
Turbidity	NTU	0.1	Inorg-022	<0.1	1	320	310	3	100	[NT]
BOD	mg/L	5	Inorg-091	<5	1	6	[NT]		89	[NT]
Dissolved Oxygen*	mg/L	0.1	Inorg-112	<0.1	1	8.5	8.5	0	[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	4	10/05/2024	10/05/2024		[NT]	[NT]
Date analysed	-			[NT]	4	10/05/2024	10/05/2024		[NT]	[NT]
pH	pH Units		Inorg-001	[NT]	4	5.3	5.2	2	[NT]	[NT]
Electrical Conductivity	µS/cm	1	Inorg-002	[NT]	4	24	24	0	[NT]	[NT]
Total Suspended Solids	mg/L	5	Inorg-019	[NT]	4	22	[NT]		[NT]	[NT]
Turbidity	NTU	0.1	Inorg-022	[NT]	4	94	[NT]		[NT]	[NT]
BOD	mg/L	5	Inorg-091	[NT]	4	<5	<5	0	[NT]	[NT]
Dissolved Oxygen*	mg/L	0.1	Inorg-112	[NT]	4	8.4	[NT]		[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Dissolved Metals: no filtered, preserved sample was received, therefore the unpreserved sample was filtered through 0.45µm filter at the lab.
Note: there is a possibility some elements may be underestimated.