



Certificate of Analysis

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Client:	4SIGHT Consulting Limited	Lab No:	2392587	SPV1
Contact:	C Oakey C/- 4SIGHT Consulting Limited PO Box 911310 Victoria Street West Auckland 1142	Date Received:	27-Jun-2020	
		Date Reported:	08-Jul-2020	
		Quote No:	66824	
		Order No:	AA1146	
		Client Reference:	AA1146 Eastland Port-Dunstan Rd Surface Water	
		Submitted By:	Shanna Hickling	

Sample Type: Aqueous

Sample Name:	MLYSW Site 1 26-Jun-2020 12:10 pm	MLWSW Site 2 26-Jun-2020 12:25 pm	MLYSW Site 3 26-Jun-2020 12:35 pm		
Lab Number:	2392587.1	2392587.2	2392587.3		

Individual Tests

Volatile Suspended Solids	g/m ³	52	83	6	-	-
Total Suspended Solids	g/m ³	220	310	21	-	-
Dissolved Copper	g/m ³	0.0040	0.0036	0.0022	-	-
Dissolved Lead	g/m ³	0.0042	0.0029	< 0.00010	-	-
Dissolved Zinc	g/m ³	0.021	0.0159	< 0.002	-	-
Dissolved Inorganic Nitrogen*	g/m ³	< 0.011	< 0.011	0.77	-	-
Total Nitrogen	g/m ³	5.6	0.94	2.0	-	-
Total Ammoniacal-N	g/m ³	< 0.010	< 0.010	0.22	-	-
Nitrate-N + Nitrite-N	g/m ³	< 0.002	0.002	0.55	-	-
Total Kjeldahl Nitrogen (TKN)	g/m ³	5.6	0.94	1.49	-	-
Dissolved Reactive Phosphorus	g/m ³	0.029	0.21	0.76	-	-
Carbonaceous Biochemical Oxygen Demand (cBOD ₅)	g O ₂ /m ³	62	30	3	-	-
Total Phenols	g/m ³	0.03	0.02	< 0.02	-	-
Tannin	g/m ³	17.4	6.8	1.6 #1	-	-
Absorbance at 440 nm	AU cm ⁻¹	0.048	0.042	0.037	-	-
Transmittance at 440 nm*	%T, 1 cm cell	89.5	90.7	91.8	-	-
Total Petroleum Hydrocarbons in Water						
C7 - C9	g/m ³	< 0.10	< 0.10	< 0.10	-	-
C10 - C14	g/m ³	< 0.2	< 0.2	< 0.2	-	-
C15 - C36	g/m ³	< 0.4	< 0.4	< 0.4	-	-
Total hydrocarbons (C7 - C36)	g/m ³	< 0.7	< 0.7	< 0.7	-	-

Analyst's Comments

#1 Severe matrix interferences required that a dilution be performed prior to analysis, resulting in a detection limit higher than that normally achieved for the Tannin analysis.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Aqueous

Test	Method Description	Default Detection Limit	Sample No
Individual Tests			
Filtration, Glass Fibre	Sample filtration through glass fibre filter.	-	1-3
Filtration, Unpreserved	Sample filtration through 0.45µm membrane filter.	-	1-3



Sample Type: Aqueous			
Test	Method Description	Default Detection Limit	Sample No
Volatile Suspended Solids	Filtration (GF/C, 1.2 µm). Ashing 550°C, 30 min. Gravimetric. APHA 2540 E (modified) 23 rd ed. 2017.	3 g/m ³	1-3
Total Suspended Solids	Filtration using Whatman 934 AH, Advantec GC-50 or equivalent filters (nominal pore size 1.2 - 1.5µm), gravimetric determination. APHA 2540 D (modified) 23 rd ed. 2017.	3 g/m ³	1-3
Filtration for dissolved metals analysis	Sample filtration through 0.45µm membrane filter and preservation with nitric acid. APHA 3030 B 23 rd ed. 2017.	-	1-3
Dissolved Copper	Filtered sample, ICP-MS, trace level. APHA 3125 B 23 rd ed. 2017.	0.0005 g/m ³	1
Dissolved Copper	Filtered sample, ICP-MS, ultratrace level. APHA 3125 B 23 rd ed. 2017.	0.0002 g/m ³	2-3
Dissolved Lead	Filtered sample, ICP-MS, trace level. APHA 3125 B 23 rd ed. 2017.	0.00010 g/m ³	1
Dissolved Lead	Filtered sample, ICP-MS, ultratrace level. APHA 3125 B 23 rd ed. 2017.	0.00005 g/m ³	2-3
Dissolved Zinc	Filtered sample, ICP-MS, trace level. APHA 3125 B 23 rd ed. 2017.	0.0010 g/m ³	1-3
Dissolved Inorganic Nitrogen*	Calculation: NH ₄ -N + NO ₃ -N + NO ₂ -N. In-House.	0.010 g/m ³	1-3
Total Nitrogen	Calculation: TKN + Nitrate-N + Nitrite-N. Please note: The Default Detection Limit of 0.05 g/m ³ is only attainable when the TKN has been determined using a trace method utilising duplicate analyses. In cases where the Detection Limit for TKN is 0.10 g/m ³ , the Default Detection Limit for Total Nitrogen will be 0.11 g/m ³ .	0.05 g/m ³	1-3
Total Ammoniacal-N	Phenol/hypochlorite colourimetry. Flow injection analyser. (NH ₄ -N = NH ₄ ⁺ -N + NH ₃ -N). APHA 4500-NH ₃ H (modified) 23 rd ed. 2017.	0.010 g/m ³	1-3
Nitrate-N + Nitrite-N	Total oxidised nitrogen. Automated cadmium reduction, flow injection analyser. APHA 4500-NO ₃ -I (modified) 23 rd ed. 2017.	0.002 g/m ³	1-3
Total Kjeldahl Nitrogen (TKN)	Total Kjeldahl digestion, phenol/hypochlorite colorimetry. Discrete Analyser. APHA 4500-N _{org} D (modified) 4500 NH ₃ F (modified) 23 rd ed. 2017.	0.10 g/m ³	1-3
Dissolved Reactive Phosphorus	Filtered sample. Molybdenum blue colourimetry. Flow injection analyser. APHA 4500-P G (modified) 23 rd ed. 2017.	0.004 g/m ³	1-3
Carbonaceous Biochemical Oxygen Demand (cBOD ₅)	Incubation 5 days, DO meter, nitrification inhibitor added, seeded. APHA 5210 B (modified) 23 rd ed. 2017.	2 g O ₂ /m ³	1-3
Total Phenols	In-line distillation, segmented flow colorimetry. NB: Does not detect 4-methylphenol. APHA 5530 B & D (modified) 23 rd ed. 2017 & Skalar Method I497-001 (modified).	0.02 g/m ³	1-3
Tannin	Colorimetric with Folin phenol reagent, tannic acid used for calibration. APHA 5550 B (modified) 23 rd ed. 2017.	0.10 g/m ³	1-3
Absorbance at 440 nm	Filtered sample. Spectrophotometry, 1cm cell. APHA 5910 B 23 rd ed. 2017.	0.002 AU cm ⁻¹	1-3
Transmittance at 440 nm*	Calculation from Absorbance at the specified wavelength.	0.5 %T, 1 cm cell	1-3
Total Petroleum Hydrocarbons in Water			
C7 - C9	Solvent extraction, GC-FID analysis. In-house based on US EPA 8015.	0.10 g/m ³	1-3
C10 - C14	Solvent extraction, GC-FID analysis. In-house based on US EPA 8015.	0.2 g/m ³	1-3
C15 - C36	Solvent extraction, GC-FID analysis. In-house based on US EPA 8015.	0.4 g/m ³	1-3
Total hydrocarbons (C7 - C36)	Calculation: Sum of carbon bands from C7 to C36. In-house based on US EPA 8015.	0.7 g/m ³	1-3

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Dates of testing are available on request. Please contact the laboratory for more information.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

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Kim Harrison MSc
Client Services Manager - Environmental



Certificate of Analysis

Client:	4SIGHT Consulting Limited	Lab No:	2392586	SPV1
Contact:	C Oakey C/- 4SIGHT Consulting Limited PO Box 911310 Victoria Street West Auckland 1142	Date Received:	27-Jun-2020	
		Date Reported:	06-Jul-2020	
		Quote No:	83367	
		Order No:	AA1146	
		Client Reference:	AA1146 - Matawhero Logyard [Dunstan Rd]	
		Submitted By:	Shanna Hickling	

Sample Type: Aqueous

Sample Name:	MLYGW01 26-Jun-2020 1:00 pm	MLYGW02 26-Jun-2020 1:30 pm	MLY STD01 26-Jun-2020 12:50 pm		
Lab Number:	2392586.1	2392586.2	2392586.3		
Individual Tests					
pH	pH Units	-	-	7.5	-
Electrical Conductivity (EC)	mS/m	-	-	59.3	-
Total Nitrogen	g/m ³	0.36	0.20	1.16	-
Nitrate-N + Nitrite-N	g/m ³	0.005	0.048	0.003	-
Total Kjeldahl Nitrogen (TKN)	g/m ³	0.35	0.15	1.16	-
Total Petroleum Hydrocarbons in Water					
C7 - C9	g/m ³	< 0.10	< 0.10	< 0.10	-
C10 - C14	g/m ³	< 0.2	< 0.2	< 0.2	-
C15 - C36	g/m ³	< 0.4	< 0.4	< 0.4	-
Total hydrocarbons (C7 - C36)	g/m ³	< 0.7	< 0.7	< 0.7	-

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Aqueous

Test	Method Description	Default Detection Limit	Sample No
Individual Tests			
Filtration, Unpreserved	Sample filtration through 0.45µm membrane filter.	-	1-3
pH	pH meter. APHA 4500-H+ B 23 rd ed. 2017. Note: It is not possible to achieve the APHA Maximum Storage Recommendation for this test (15 min) when samples are analysed upon receipt at the laboratory, and not in the field. Samples and Standards are analysed at an equivalent laboratory temperature (typically 18 to 22 °C). Temperature compensation is used.	0.1 pH Units	3
Electrical Conductivity (EC)	Conductivity meter, 25°C. APHA 2510 B 23 rd ed. 2017.	0.1 mS/m	3
Total Nitrogen	Calculation: TKN + Nitrate-N + Nitrite-N. Please note: The Default Detection Limit of 0.05 g/m ³ is only attainable when the TKN has been determined using a trace method utilising duplicate analyses. In cases where the Detection Limit for TKN is 0.10 g/m ³ , the Default Detection Limit for Total Nitrogen will be 0.11 g/m ³ .	0.05 g/m ³	1-3
Nitrate-N + Nitrite-N	Total oxidised nitrogen. Automated cadmium reduction, flow injection analyser. APHA 4500-NO ₃ -I (modified) 23 rd ed. 2017.	0.002 g/m ³	1-3
Total Kjeldahl Nitrogen (TKN)	Total Kjeldahl digestion, phenol/hypochlorite colorimetry. Discrete Analyser. APHA 4500-N _{org} D (modified) 4500 NH ₃ F (modified) 23 rd ed. 2017.	0.10 g/m ³	1-3
Total Petroleum Hydrocarbons in Water			
C7 - C9	Solvent extraction, GC-FID analysis. In-house based on US EPA 8015.	0.10 g/m ³	1-3



Sample Type: Aqueous			
Test	Method Description	Default Detection Limit	Sample No
C10 - C14	Solvent extraction, GC-FID analysis. In-house based on US EPA 8015.	0.2 g/m ³	1-3
C15 - C36	Solvent extraction, GC-FID analysis. In-house based on US EPA 8015.	0.4 g/m ³	1-3
Total hydrocarbons (C7 - C36)	Calculation: Sum of carbon bands from C7 to C36. In-house based on US EPA 8015.	0.7 g/m ³	1-3

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Ara Heron BSc (Tech)
Client Services Manager - Environmental



Surface Water (Fresh) Sampling Form

Job Information		Equipment	
Date: 26/6/20	Time Arrive: 10am	Depart: 1345	Water quality equipment description: Good
Project Name: EPL Outsourced Compliance Programme	Project Number: AAL146	Interface Probe Number: 139	Calibration Records Filed? <input checked="" type="checkbox"/> X
Site Location: ML1	Operator: DL	Sampling Equipment Type: Grants Pump	Calibration Records Filed? <input checked="" type="checkbox"/> X
Weather: Rain	Rainfall event start time/date:	Event Rainfall Depth:	Number of dry days before sampling:
Reason for sampling: Standard Compliance Programme (Circle frequency: Monthly/2 Monthly/Quarterly/6 Monthly) or Additional Monitoring (describe):			

EPL Site Number	Lab Sample ID	Sample Time	Sample Details			Water Quality Parameters				Observations				Photos Reference
			Approx Depth (m)	Approx Stream Flow Rate	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	pH	Debris Present (Y/N; type)	Foams/Scums (Y/N)	Clarity (Clear/Lightly Turbid/Turbid/Very Turbid)		
ML1 GW01		1300	1.17	20L	13.9	9.4	0.91	918	7.1	N	N	Clear		1m+
ML1 GW02		1330	0.89	6L	14.2	16.6	1.70	923	6.9	N	N	Clear		30cm
ML1 SID01		1250	-	-	13.5	40.0	4.17	590	7.2	N	N	Turbid		5cm
ML1 Site 1		1210	-	Low	13.4	17.4	1.81	672	7.1	N	Y	Very Turbid		3cm
ML1 Site 2		1225	-	Low	13.5	43.0	4.49	1590	7.3	N	N	Turbid		7cm
ML1 Site 3		1255	-	Low	13.6	82.7	8.60	2730	7.7	N	N	Light turbid		26cm

Additional Comments: Anapini Drain wide and full
 GW1 20L Pumped 1hr-sampled Full nights Rain before Sampling. Collection Pond started flowing.
 GW2 6L Pumped 1hr-sampled Full nights Rain before Sampling. Collection Pond started flowing.

Field Quality-Control Checks	
Was pre-cleaning sampling equipment used for these samples?	<input checked="" type="checkbox"/> X
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> X
Sampling has been undertaken in accordance with the Site Specific Sampling Protocol and SOPs?	<input checked="" type="checkbox"/> X
Consistent with COC form?	N
COC Filled out?	N
Signed:	<i>[Signature]</i>