CERTIFICATE OF ANALYSIS

Work Order	: **KL1906842-AA**	Page	: 1 of 4
Amendment	: **1**		
Client	: **UNIVERSITI KEBANGSAAN MALAYSIA**	Laboratory	: ALS Technichem (M) Sdn. Bhd.
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Project	: GROUNDWATER SAMPLE ANALYSIS	QC Level	: ALS Malaysia Standard Quality Schedule
Order number	:	Date Samples Received	: 09-Jul-2019 19:00
C-O-C number	: 12595	Date Analysis Commenced	: 10-Jul-2019
Sampler	: ----	Issue Date	: 24-Jan-2020 09:37
Site	: ----		
		No. of samples received	: 3
Quote number	: KL2019UKMSCBNGI0005_GW	No. of samples analysed	: 3

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

MS ISO/IEC 17025
TESTING
SAMM NO. 147

Signatories

This laboratory is accredited under STANDARDS MALAYSIA. The tests reported herein have been performed in accordance with laboratory's Terms of Accreditation. This document has been electronically signed by authorized signatories indicated below. Electronic signing has been carried out in compliance with procedure specified in 21 CFR Part 11.

Signatories	*Position*
Nazirah Ariffin	Lab Supervisor - Environmental (IKM No: M/3878/6603/13)
Norain Yahya	Chemist (IKM No: M/4233/7042/15)
SuAnn Lee	Lab Manager - Microbiology (MJMM No: 0288)

*Please direct all technical queries to the laboratory (Reports.KL@alsglobal.com)

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, ASTM, NIOSH and BS EN. In house developed procedures are employed in the absence of documented standards or by client request.

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not accredited for these tests.
~ = Indicates an estimated value.

- ALS TECHNICHEM prepares this Test Report based on the tests requested and on the specific sample(s) submitted for analysis. The significance of this Report is subject to the adequacy and representative character of the sample(s) and to the comprehensiveness of the tests requested or made. ALS TECHNICHEM assumes no responsibility for variations in quality or other characteristic of the product produced or supplied under conditions over which ALS TECHNICHEM has no control.
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- **ND : Recovery not determined, background level>= 4x spike level**
- Result < LOR = Not Detected (ND)
- Where moisture determination has been performed, results are reported on a dry weight basis.

Analytical Results

Sub-Matrix: **WATER**

Compound	Method	LOR	Unit	Client sample ID: THB 02 Sampling date/time: 08-Jul-2019 11:00 KL1906842-002	THB 03 08-Jul-2019 12:00 KL1906842-003	POS DATO 08-Jul-2019 15:00 KL1906842-004	---- ---- --------	---- ---- --------
Physical and Aggregate Properties								
Conductivity	APHA2510B	0.001	mS/cm	0.484	0.504	0.591	----	----
pH Value	APHA4500H+B	0.1	pH Unit	6.5	6.6	6.6	----	----
Salinity	APHA2520B	0.1	parts/1000	0.2	0.2	0.3	----	----
Total Dissolved Solids	APHA2540C	1	mg/L	269	281	331	----	----
Total Hardness as CaCO3	APHA2340B	0.1	mg/L	207	231	157	----	----
Total Suspended Solids	APHA2540D	1	mg/L	1	18	14	----	----
Carbonate Alkalinity as CO3	APHA2320B	1	mg/L	<1	<1	<1	----	----
Bicarbonate Alkalinity as HCO3	APHA2320B	1	mg/L	227	224	244	----	----
Aggregate Organics								
Total Phenols	APHA5530B&D	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Inorganic and Nonmetallic Properties								
Chloride	APHA4500-Cl-E	1	mg/L	<1	<1	2	----	----
Hexavalent Chromium	APHA3500-Cr-D	0.01	mg/L	<0.01	<0.01	<0.01	----	----
Nitrate as NO3	APHA4500-NO3-H	0.01	mg/L	<0.01	<0.01	<0.01	----	----
Phosphorus as P	APHA4500P F	0.01	mg/L	0.01	<0.01	<0.01	----	----
Sulphate	CH17-11	1	mg/L	3	<1	33	----	----
Total Cyanide	APHA4500CN C&E	0.050	mg/L	<0.050	<0.050	<0.050	----	----
Total Nitrogen as N	APHA 4500Norg B NO3H	1	mg/L	<1	<1	<1	----	----
Metals and Major Cations								
Aluminium	APHA3125B	0.0010	mg/L	0.0223	0.116	0.0054	----	----
Arsenic	APHA3125B	0.0010	mg/L	0.0016	0.0020	0.0020	----	----
Cadmium	APHA3125B	0.0005	mg/L	<0.0005	<0.0005	<0.0005	----	----
Calcium	APHA3120B	0.1	mg/L	68.7	87.4	53.6	----	----
Copper	APHA3125B	0.0010	mg/L	<0.0010	0.0016	<0.0010	----	----
Iron	APHA3125B	0.0010	mg/L	6.34	1.46	0.673	----	----
Lead	APHA3125B	0.0010	mg/L	0.0170	0.184	<0.0010	----	----
Magnesium	APHA3120B	0.1	mg/L	8.7	3.1	5.7	----	----
Manganese	APHA3125B	0.0010	mg/L	0.592	0.160	0.545	----	----
Potassium	APHA3120B	0.1	mg/L	2.5	1.7	1.3	----	----
Selenium	APHA3125B	0.0020	mg/L	<0.0020	<0.0020	<0.0020	----	----
Sodium	APHA3120B	0.1	mg/L	2.3	2.2	47.6	----	----
Zinc	APHA3125B	0.0010	mg/L	0.0317	0.0256	0.0202	----	----
Microbiological Testing								

Analytical Results

Sub-Matrix: **WATER**

				Client sample ID	THB 02	THB 03	POS DATO	----	----
				Sampling date/time	08-Jul-2019 11:00	08-Jul-2019 12:00	08-Jul-2019 15:00	----	----
Compound	Method	LOR	Unit		KL1906842-002	KL1906842-003	KL1906842-004	--------	--------
Microbiological Testing - Continued									
Total Escherichia coli Count	MB-17-22	1	CFU/100mL		<1	<1	<1	----	----