

CERTIFICATE OF ANALYSIS

Work Order : KL2002626 Client : SMHB SDN BHD Contact : TANG YY-SAN Address : 38, JALAN 1/76D DESA PANDAN KUALA LUMPUR 55100 E-mail : tangys@smhb.com Telephone : ---- Facsimile : ---- Project : ENVIRONMENTAL MONITORING AT PULAU INDAH, KLANG Order number : ---- C-O-C number : ---- Sampler : CHOO, FADZIL, HUSNI Site : WESTPORT PHASE II DEVELOPMENT Quote number : KL2019SMHB0002	Page : 1 of 9 Laboratory : ALS Technichem (M) Sdn. Bhd. Contact : AbdulQaiyum Musa Address : WISMA ALS, 21, Jalan Astaka U8/84, Bukit Jelutong Shah Alam Selangor Malaysia 40150 E-mail : AbdulQaiyum.Musa@alsglobal.com Telephone : +60175552985 Facsimile : +603 7845 8258 QC Level : ALS Malaysia Standard Quality Schedule Date Samples Received : 02-Mar-2020 17:00 Date Analysis Commenced : 03-Mar-2020 Issue Date : 11-Mar-2020 10:40 No. of samples received : 12 No. of samples analysed : 12
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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
- Surrogate Control Limits



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

Nazirah Ariffin
 Nuramira Abdmalek
 SitiAisha AbdAziz
 YiuLay Lee

Position

Lab Supervisor - Environmental (IKM No: M/3878/6603/13)
 Chemist (IKM No: M/4867/8027/18)
 Lab Supervisor - Microbiology (MJMM No: 0289)
 Lab Manager - Environmental (IKM No: M/2712/4566/04/08)



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

∅ = ALS is not accredited for these tests.

~ = Indicates an estimated value.

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- In Situ measurement results provided by client
- Result < LOR = Not Detected (ND)
- Where moisture determination has been performed, results are reported on a dry weight basis.



Analytical Results

Sub-Matrix: SEAWATER

Compound	Method	LOR	Unit	Client sample ID	W5 HT TOP	W5 HT MIDDLE	W5 HT BOTTOM	W6 HT TOP	W6 HT MIDDLE
				Sampling date/time	02-Mar-2020 09:48	02-Mar-2020 09:53	02-Mar-2020 10:03	02-Mar-2020 09:25	02-Mar-2020 09:30
				KL2002626-001	KL2002626-002	KL2002626-003	KL2002626-004	KL2002626-005	KL2002626-005
Physical and Aggregate Properties									
Salinity	APHA2520B	0.1	parts/1000		28.3	27.6	28.3	27.9	28.2
Total Suspended Solids	APHA2540D	1	mg/L		6	5	7	7	10
Turbidity	APHA2130B	1.0	NTU		5.7	13.9	5.0	6.2	13.7
Aggregate Organics									
Biochemical Oxygen Demand	APHA5210B	1	mg/L		2	3	3	4	4
Chemical Oxygen Demand	APHA5220D	1	mg/L		8	9	11	11	10
Oil & Grease	APHA5520B	1	mg/L		<1	<1	<1	<1	<1
Total Phenols	APHA5530B&D	10	µg/L		<10	<10	<10	<10	<10
Inorganic and Nonmetallic Properties									
Ammonia (Unionized)	APHA4500 NH3	10	µg/L		<10	<10	54	<10	<10
Hexavalent Chromium	APHA3500-Cr-D	10	µg/L		<10	<10	<10	<10	<10
Total Cyanide	APHA4500CN C&E	5	µg/L		<5	<5	<5	<5	<5
Nitrate as NO3	CH17-16	10	µg/L		88	96	130	147	124
Nitrite as NO2	APHA4500-NO2-B	10	µg/L		<10	<10	<10	<10	<10
Phosphate as P	APHA4500-P F	10	µg/L		<10	<10	<10	<10	<10
Metals and Major Cations									
Aluminium	APHA3125B	0.1	µg/L		36.1	32.8	52.0	76.2	65.3
Cadmium	APHA3125B	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Copper	APHA3125B	0.1	µg/L		0.4	0.5	2.0	0.7	0.6
Lead	APHA3125B	0.1	µg/L		0.3	0.2	0.6	0.3	0.5
Mercury	APHA3125B	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Zinc	APHA3125B	0.1	µg/L		5.4	5.6	7.8	6.4	6.9
Metals Speciation									
Arsenious Acid (As (III))	CH17-85	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Polycyclic Aromatics Hydrocarbons (PAHs)									
Polycyclic Aromatic Hydrocarbons (PAHs)	USEPA8270C	5	µg/L		<5	<5	<5	<5	<5
Organotin									
Tributyltin	OG-17-33	2	ngSn/L		<2	<2	<2	<2	<2
In Situ Measurement									
Conductivity	SP-21-020	1	uS/cm		68600	68400	68600	67700	68200
Dissolved Oxygen	SP-21-019	0.01	mg/L		6.19	5.84	5.65	5.74	6.02
pH - Field	SP-21-017	0.1	pH Unit		8.5	8.5	8.5	8.5	8.4
Temperature	SP-21-018	0.1	°C		29.3	29.2	29.2	28.3	28.6
Microbiological Testing									



Analytical Results

Sub-Matrix: SEAWATER

Compound	Method	LOR	Unit	Client sample ID	W5 HT TOP	W5 HT MIDDLE	W5 HT BOTTOM	W6 HT TOP	W6 HT MIDDLE
				Sampling date/time	02-Mar-2020 09:48	02-Mar-2020 09:53	02-Mar-2020 10:03	02-Mar-2020 09:25	02-Mar-2020 09:30
				KL2002626-001	KL2002626-002	KL2002626-003	KL2002626-004	KL2002626-005	KL2002626-005
Microbiological Testing - Continued									
Enterococci	APHA9230C	1	CFU/100m L	<1	<1	<1	<1	<1	<1
Total Faecal Coliform Count	APHA9222D	1	CFU/100m L	<1	<1	<1	<1	<1	60
Acid Extractable Surrogates									
2-Fluorophenol	USEPA8270C	0.5	%	43.7	45.8	58.4	45.0	48.4	
Phenol-d5	USEPA8270C	0.5	%	45.6	44.5	58.5	42.3	44.0	
2,4,6-Tribromophenol	USEPA8270C	0.5	%	98.7	102	106	95.2	111	
Base/Neutral Extractable Surrogates									
Nitrobenzene -d5	USEPA8270C	0.5	%	100	95.0	95.3	75.4	97.4	
2-Fluorobiphenyl	USEPA8270C	0.5	%	102	109	135	73.2	104	
4-Terphenyl-d14	USEPA8270C	0.5	%	121	114	103	79.9	119	



Analytical Results

Sub-Matrix: SEAWATER

Compound	Method	LOR	Unit	Client sample ID	W6 HT BOTTOM	W7 HT TOP	W7 HT MIDDLE	W7 HT BOTTOM	W8 HT TOP
				Sampling date/time	02-Mar-2020 09:41	02-Mar-2020 08:57	02-Mar-2020 09:03	02-Mar-2020 09:09	02-Mar-2020 08:30
				KL2002626-006	KL2002626-007	KL2002626-008	KL2002626-009	KL2002626-010	
Physical and Aggregate Properties									
Salinity	APHA2520B	0.1	parts/1000		27.9	28.3	27.6	28.4	27.6
Total Suspended Solids	APHA2540D	1	mg/L		6	4	10	9	7
Turbidity	APHA2130B	1.0	NTU		8.3	4.3	10.1	13.2	7.2
Aggregate Organics									
Biochemical Oxygen Demand	APHA5210B	1	mg/L		3	2	4	3	4
Chemical Oxygen Demand	APHA5220D	1	mg/L		11	9	12	10	11
Oil & Grease	APHA5520B	1	mg/L		<1	<1	<1	<1	<1
Total Phenols	APHA5530B&D	10	µg/L		<10	<10	<10	<10	<10
Inorganic and Nonmetallic Properties									
Ammonia (Unionized)	APHA4500 NH3	10	µg/L		<10	<10	<10	<10	<10
Hexavalent Chromium	APHA3500-Cr-D	10	µg/L		<10	<10	<10	<10	<10
Total Cyanide	APHA4500CN C&E	5	µg/L		<5	<5	<5	<5	<5
Nitrate as NO3	CH17-16	10	µg/L		138	158	244	1370	100
Nitrite as NO2	APHA4500-NO2-B	10	µg/L		<10	51	39	34	55
Phosphate as P	APHA4500-P F	10	µg/L		<10	303	<10	<10	<10
Metals and Major Cations									
Aluminium	APHA3125B	0.1	µg/L		84.2	87.9	113	101	86.1
Cadmium	APHA3125B	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Copper	APHA3125B	0.1	µg/L		0.7	0.6	2.4	0.8	0.8
Lead	APHA3125B	0.1	µg/L		0.4	0.5	1.6	0.8	0.7
Mercury	APHA3125B	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Zinc	APHA3125B	0.1	µg/L		6.8	6.1	16.4	7.7	7.1
Metals Speciation									
Arsenious Acid (As (III))	CH17-85	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Polycyclic Aromatics Hydrocarbons (PAHs)									
Polycyclic Aromatic Hydrocarbons (PAHs)	USEPA8270C	5	µg/L		<5	<5	<5	<5	<5
Organotin									
Tributyltin	OG-17-33	2	ngSn/L		<2	<2	<2	<2	<2
In Situ Measurement									
Conductivity	SP-21-020	1	uS/cm		68200	68300	68200	68000	68200
Dissolved Oxygen	SP-21-019	0.01	mg/L		5.49	5.89	5.85	5.42	5.93
pH - Field	SP-21-017	0.1	pH Unit		8.5	8.4	8.4	8.4	7.9
Temperature	SP-21-018	0.1	°C		28.5	29.3	29.3	28.7	29.2
Microbiological Testing									



Analytical Results

Sub-Matrix: SEAWATER

Compound	Method	LOR	Unit	Client sample ID	W6 HT BOTTOM	W7 HT TOP	W7 HT MIDDLE	W7 HT BOTTOM	W8 HT TOP
				Sampling date/time	02-Mar-2020 09:41	02-Mar-2020 08:57	02-Mar-2020 09:03	02-Mar-2020 09:09	02-Mar-2020 08:30
				KL2002626-006	KL2002626-007	KL2002626-008	KL2002626-009	KL2002626-010	
Microbiological Testing - Continued									
Enterococci	APHA9230C	1	CFU/100m L		<1	<1	<1	<1	<1
Total Faecal Coliform Count	APHA9222D	1	CFU/100m L		72	72	84	92	200
Acid Extractable Surrogates									
2-Fluorophenol	USEPA8270C	0.5	%		40.6	41.2	54.6	42.2	42.8
Phenol-d5	USEPA8270C	0.5	%		43.9	44.9	59.2	47.8	44.6
2,4,6-Tribromophenol	USEPA8270C	0.5	%		130	88.9	104	106	102
Base/Neutral Extractable Surrogates									
Nitrobenzene -d5	USEPA8270C	0.5	%		106	92.4	91.0	94.0	97.4
2-Fluorobiphenyl	USEPA8270C	0.5	%		83.6	91.2	138	85.7	108
4-Terphenyl-d14	USEPA8270C	0.5	%		96.4	86.8	112	102	98.2



Analytical Results

Sub-Matrix: SEAWATER

				Client sample ID	W8 HT MIDDLE	W8 HT BOTTOM	----	----	----
				Sampling date/time	02-Mar-2020 08:35	02-Mar-2020 08:45	----	----	----
Compound	Method	LOR	Unit	KL2002626-011	KL2002626-012	-----	-----	-----	
Physical and Aggregate Properties									
Salinity	APHA2520B	0.1	parts/1000	28.4	27.8	----	----	----	
Total Suspended Solids	APHA2540D	1	mg/L	16	15	----	----	----	
Turbidity	APHA2130B	1.0	NTU	14.5	19.2	----	----	----	
Aggregate Organics									
Biochemical Oxygen Demand	APHA5210B	1	mg/L	5	2	----	----	----	
Chemical Oxygen Demand	APHA5220D	1	mg/L	11	9	----	----	----	
Oil & Grease	APHA5520B	1	mg/L	<1	<1	----	----	----	
Total Phenols	APHA5530B&D	10	µg/L	<10	<10	----	----	----	
Inorganic and Nonmetallic Properties									
Ammonia (Unionized)	APHA4500 NH3	10	µg/L	<10	<10	----	----	----	
Hexavalent Chromium	APHA3500-Cr-D	10	µg/L	<10	<10	----	----	----	
Total Cyanide	APHA4500CN C&E	5	µg/L	<5	<5	----	----	----	
Nitrate as NO3	CH17-16	10	µg/L	194	808	----	----	----	
Nitrite as NO2	APHA4500-NO2-B	10	µg/L	<10	<10	----	----	----	
Phosphate as P	APHA4500-P F	10	µg/L	<10	<10	----	----	----	
Metals and Major Cations									
Aluminium	APHA3125B	0.1	µg/L	299	167	----	----	----	
Cadmium	APHA3125B	0.1	µg/L	<0.1	<0.1	----	----	----	
Copper	APHA3125B	0.1	µg/L	0.8	1.0	----	----	----	
Lead	APHA3125B	0.1	µg/L	1.6	0.9	----	----	----	
Mercury	APHA3125B	0.1	µg/L	<0.1	<0.1	----	----	----	
Zinc	APHA3125B	0.1	µg/L	11.1	9.0	----	----	----	
Metals Speciation									
Arsenious Acid (As (III))	CH17-85	0.5	µg/L	<0.5	<0.5	----	----	----	
Polycyclic Aromatics Hydrocarbons (PAHs)									
Polycyclic Aromatic Hydrocarbons (PAHs)	USEPA8270C	5	µg/L	<5	<5	----	----	----	
Organotin									
Tributyltin	OG-17-33	2	ngSn/L	<2	<2	----	----	----	
In Situ Measurement									
Conductivity	SP-21-020	1	uS/cm	68000	68000	----	----	----	
Dissolved Oxygen	SP-21-019	0.01	mg/L	5.72	5.83	----	----	----	
pH - Field	SP-21-017	0.1	pH Unit	8.1	8.2	----	----	----	
Temperature	SP-21-018	0.1	°C	28.8	28.9	----	----	----	
Microbiological Testing									



Analytical Results

Sub-Matrix: SEAWATER

				Client sample ID	W8 HT MIDDLE	W8 HT BOTTOM	----	----	----
				Sampling date/time	02-Mar-2020 08:35	02-Mar-2020 08:45	----	----	----
Compound	Method	LOR	Unit	KL2002626-011	KL2002626-012	-----	-----	-----	
Microbiological Testing - Continued									
<i>Enterococci</i>	APHA9230C	1	CFU/100m L	<1	<1	----	----	----	
Total Faecal Coliform Count	APHA9222D	1	CFU/100m L	80	<1	----	----	----	
Acid Extractable Surrogates									
2-Fluorophenol	USEPA8270C	0.5	%	43.4	40.5	----	----	----	
Phenol-d5	USEPA8270C	0.5	%	49.1	48.7	----	----	----	
2,4,6-Tribromophenol	USEPA8270C	0.5	%	101	94.7	----	----	----	
Base/Neutral Extractable Surrogates									
Nitrobenzene -d5	USEPA8270C	0.5	%	99.1	99.6	----	----	----	
2-Fluorobiphenyl	USEPA8270C	0.5	%	103	98.2	----	----	----	
4-Terphenyl-d14	USEPA8270C	0.5	%	140	129	----	----	----	



Surrogate Control Limits

Sub-Matrix: SEAWATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	20	60
Phenol-d5	----	20	60
2,4,6-Tribromophenol	118-79-6	50	140
Base/Neutral Extractable Surrogates			
Nitrobenzene -d5	4165-60-0	50	140
2-Fluorobiphenyl	321-60-8	50	140
4-Terphenyl-d14	1718-51-0	50	140