

# Schedule

Issue date: 09 May 2017  
Valid until: 24 June 2020



MS ISO/IEC 17025

NO: SMM 076

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**LABORATORY LOCATION:** E S LABORATORIES (M) SDN BHD  
(PERMANENT LABORATORY) NO. 18, JALAN TAGO 11  
TAGO INDUSTRIAL PARK  
SRI DAMANSARA  
52200 KUALA LUMPUR  
MALAYSIA

This laboratory accredited under *Skim Akreditasi Makmal Malaysia* (SMM) meets the requirements of MS ISO/IEC 17025:2005 'General requirements for competence of testing and calibration laboratories'. This Malaysian Standards is identical with ISO/IEC 17025:2005 published by the International Organization for Standardization (ISO).

**FIELD OF TESTING:** CHEMICAL

**SCOPE OF ACCREDITATION:**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Environmental Monitoring  Potable Water Ground Water Surface Water Liquid Effluents	Color	APHA 2120 B, 2005
	Acidity	APHA 2310 B, 2005
	Alkalinity	APHA 2320 B, 2005
	Hardness	APHA 2340 B, 2005 APHA 2340 C, 2005
	Conductivity	APHA 2510 B, 2005
	Total Solids	APHA 2540 B, 2005
	Total Dissolved Solids	APHA 2540 C, 2005
	Total Suspended Solids	APHA 2540 D, 2005
	Fix Solids & Volatile Solids	APHA 2540 E, 2005
	Aluminium (as Al)	APHA 3111 D, 2005 APHA 3120 B, 2005
	Antimony (as Sb)	APHA 3120 B, 2005
	Arsenic (as As)	APHA 3114 C, 2005 APHA 3120 B, 2005 In-House Method (ESL/LW-02) based on PE: B3505: As (1994)
	Barium (as Ba)	APHA 3111 D, 2005 APHA 3120 B, 2005
	Boron (as B)	APHA 3120 B, 2005 APHA 4500-B C, 2005 ISO 9390: 1990 E

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SCOPE OF ACCREDITATION:

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<b>Environmental Monitoring</b>  Potable Water Ground Water Surface Water Liquid Effluents	Calcium (as Ca)	APHA 3111 B, 2005 APHA 3120 B, 2005
	Cadmium (as Cd)	APHA 3111 B, 2005 APHA 3120 B, 2005
	Chromium (as Cr)	APHA 3111 B, 2005 APHA 3120 B, 2005
	Chromium, hexa (Cr <sup>6+</sup> )	APHA 3500-Cr B, 2005
	Chromium, tri (Cr <sup>3+</sup> )	In-House Method (ESL/LW-01) based on APHA 3111 B, 2005 / APHA 3120 B, 2005 & APHA 3500- Cr B, 2005 :By Calculation
	Copper (as Cu)	APHA 3111 B, 2005 APHA 3120 B, 2005
	Cobalt (as Co)	APHA 3111 B, 2005 APHA 3120 B, 2005
	Iron (as Fe)	APHA 3111 B, 2005 APHA 3120 B, 2005
	Lead (as Pb)	APHA 3111 B, 2005 APHA 3120 B, 2005
	Mercury (as Hg)	APHA 3112 B, 2005 USEPA 245.1, 1991
	Manganese (as Mn)	APHA 3111 B, 2005 APHA 3120 B, 2005
	Magnesium (as Mg)	APHA 3111 B, 2005 APHA 3120 B, 2005
	Nickel (as Ni)	APHA 3111 B, 2005 APHA 3120 B, 2005
	Potassium (as K)	APHA 3111 B, 2005 APHA 3120 B, 2005
	Sodium (as Na)	APHA 3111 B, 2005 APHA 3120 B, 2005
Selenium (as Se)	APHA 3114 C, 2005 APHA 3120 B, 2005 In-House Method (ESL/LW-03) based on PE: B3505: Se, 1994	

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<b>Environmental Monitoring</b>  Potable Water Ground Water Surface Water Liquid Effluents	Silver (as Ag)	APHA 3111 B, 2005 APHA 3120 B, 2005
	Tin (as Sn)	In-House Method (ESL/L/W-04) based on PE: B3505: Sn, 1994 In-House Method (ESL/L/W-07) based on APHA 3114C, 2005 In-House Method (ESL/L/W-08) based on APHA 3120B, 2005
	Vanadium (as V)	APHA 3120 B, 2005
	Zinc (as Zn)	APHA 3111 B, 2005 APHA 3120 B, 2005
	pH	APHA 4500-H <sup>+</sup> B, 2005
	Cyanide	APHA 4500-CN C & F, 2005
	Chloride	APHA 4500-Cl <sup>-</sup> B, 2005
	Chlorine	APHA 4500-Cl B, 2005 APHA 4500-Cl G, 2005 Free Chlorine, In-House Method (ESL/L/W-06) based on BS 1427:1962
	Fluoride	APHA 4500-F-D, 2005
	Nitrogen (Ammonia)	APHA 4500-NH <sub>3</sub> B&C, 2005 APHA 4500-NH <sub>3</sub> B&C, 1992
	Nitrogen (Nitrate)	APHA 4500-NO <sub>3</sub> <sup>-</sup> B, 2005
	Nitrogen (Nitrite)	APHA 4500-NO <sub>2</sub> <sup>-</sup> B, 2005
	Oxygen (Dissolved)	APHA 4500-O G, 2005
	Phosphorus (Total)	APHA 4500-P B & D, 2005
	Phosphorus (Dissolved)	APHA 4500-P D, 2005
	Silica (Dissolved)	APHA 4500-SiO <sub>2</sub> C, 2005
	Sulphide	APHA 4500-S <sup>2-</sup> F, 2005
	Sulphate	APHA 4500-SO <sub>4</sub> <sup>2-</sup> E, 2005
	BOD <sub>5</sub>	APHA 5210 B, 2005 APHA 4500-O G, 2005

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Environmental Monitoring  Potable Water Ground Water Surface Water Liquid Effluents	COD	APHA 5220 B, 2005
	Oil & Grease	APHA 5520 B, 2005
	Phenol	APHA 5530 B & D, 2005 APHA 5530 C, 2005
	Color (ADMI)	APHA 2120 F, 2005
	Formaldehyde	USEPA 8315 A, 1996 HACH Method 8110 (03/2014, 8ed)
Environmental Monitoring  Marine Water	Conductivity	APHA 2510 B, 2005
	Total Solids	APHA 2540 B, 2005
	Total Dissolved Solids	APHA 2540 C, 2005
	Total Suspended Solids	APHA 2540 D, 2005
	pH	APHA 4500-H <sup>+</sup> B, 2005
	Chromium hexa (Cr <sup>6+</sup> )	APHA 3500- Cr B, 2005
	Cyanide	HACH Method 8027 (01/2014, 9ed)
	Ammonia	APHA 4500-NH <sub>3</sub> B&C, 1992
	Nitrate	APHA 4500-NO <sub>3</sub> <sup>-</sup> B, 2005
	Nitrite	APHA 4500-NO <sub>2</sub> <sup>-</sup> B, 2005
	Oxygen (Dissolved)	APHA 4500-O G, 2005
	Phosphorus (Dissolved)	APHA 4500-P D, 2005
	Mercury (Hg)	APHA 3112 B, 2005
	Phenol	APHA 5530 B&D, 2005 APHA 5530 C, 2005

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SCOPE OF ACCREDITATION:

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Environmental Monitoring  Potable Water Ground Water Surface Water Liquid Effluents Marine Water	Turbidity (NTU)	APHA 2130 B, 2005
	Salinity (ppt)	APHA 2520 B, 2005
	Total Organic Carbon	APHA 5310 B, 2005
	Oil and Grease	APHA 5520 G, 2005
	<b>Pre-treatment of sample for metal analysis:</b>	
	Nitric acid Digestion	APHA 3030 E, 2005
	Nitric acid – Hydrochloric acid Digestion	APHA 3030 F, 2005
	Nitric acid – Sulfuric acid Digestion	APHA 3030 G, 2005

## Signatories:

- |                         |                                |
|-------------------------|--------------------------------|
| 1. Ong Poh Cheng        | IKM No.: MMIC M/1429/2600/1995 |
| 2. Choo Bon Lian        | IKM No.: MMIC M/1836/4194/2001 |
| 3. Kok Yin Yean         | IKM No.: MMIC M/3299/6133/2011 |
| 4. Zulaikha binti Suhai | IKM No.: LMIC L/2028/6813/2014 |

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<b>Environmental Monitoring</b>  Potable Water Ground Water Surface Water Liquid Effluents	<u>Phenolic Compound in Water</u> for: Phenol 3-methylphenol 2-nitrophenol 2,4-dichlorophenol 4-chloro-3-methylphenol 2,4,6-trichlorophenol 4-nitrophenol 2-methyl-4,6-dinitrophenol Pentachlorophenol 2-chlorophenol 2-methylphenol 4-methylphenol 2,4-dimethylphenol 2,4-dinitrophenol 2,6-dichlorophenol 2,4,5-trichlorophenol 2,3,4,6-tetrachlorophenol 2-sec-butyl-4,6-dinitrophenol	APHA 6420 B, 2005
	<u>Polynuclear Aromatic Hydrocarbons (PAHs) In Water</u> for: Acenaphthene Acenaphthylene Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(ghi)perylene Benzo(k)fluoranthene Chrysene Dibenzo(a,h)anthracene Fluoranthene Fluorene Indeno(1,2,3-cd)pyrene Naphthalene Phenanthrene Pyrene	APHA 6440 B, 2005
	<u>Organochlorine Pesticides in Water for:</u> Aldrin Alpha-BHC Beta-BHC Delta-BHC Dieldrin Endosulfan I (alpha) Endosulfan II (beta) Endosulfan sulphate	APHA 6630 B, 2005 APHA 6630 C, 2005

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<b>Environmental Monitoring</b>  Potable Water Ground Water Surface Water Liquid Effluents	<u>Organochlorine Pesticides in Water for:</u> Endrin Endrin aldehyde Endrin ketone Gamma-BHC Heptachlor Heptachlor Epoxide Isomer B Methoxychlor 4,4'-DDE 4,4'-DDD 4,4'-DDT	APHA 6630 B, 2005 APHA 6630 C, 2005
	<u>Aromatics Volatile Organic Compounds in Water for:</u> Benzene Chlorobenzene Ethylbenzene Isopropylbenzene n-propylbenzene sec-butylbenzene Toluene tert-butylbenzene Xylene (o, m, p) 2-chlorotoulene 4-chlorotoluene 1,2-dichlorobenzene 1,3-dichlorobenzene 1,4-dichlorobenzene	DIN 38407, part 9, 1991
<b>Environmental Monitoring</b>  Marine Water	<u>Polynuclear Aromatic Hydrocarbons (PAHs):</u> Acenaphthene Acenaphthylene Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoroanthene Benzo(ghi)perylene Benzo(k)fluoroanthene Chrysene Dibenzo(a,h)anthracene Fluoranthene Fluorene Indeno(1,2,3-cd)pyrene Naphthalene Phenanthrene Pyrene	APHA 6440 B, 2005

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SCOPE OF ACCREDITATION:

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<b>Environmental Monitoring</b>  Potable Water Ground Water Surface Water Liquid Effluent Marine Water	Anionic surfactant (as MBAS)	APHA 5540 C, 2005
	Anionic surfactant (calculated as LAS)	HACH8028 (1/2014, 9ed)
	Uranium (U)	In-House Method (ESL/L-W-12) based on APHA 3120 B, 2005
<b>Workplace Environment and Hazard</b>  Personal Exposure / Work Place Atmosphere	Dust (total)	NIOSH 0500 (issue 2: 15 Aug 1994) Excluding Sampling
	Dust (respirable)	NIOSH 0600 (Issue 3:15 Jan 1998) Excluding Sampling
	<b>Hydrocarbon Aromatic:</b> Benzene Toluene Ethylbenzene Xylenes	NIOSH 1501 (Issue 3: 15 Mar 2003) Excluding Sampling
	<b>Metals on Air Filter</b> Aluminium (Al) Barium (Ba) Cadmium (Cd) Chromium (Cr) Cobalt (Co) Copper (Cu) Iron (Fe) Lead (Pb) Manganese (Mn) Nickel (Ni) Zinc (Zn)	NIOSH 7303 (Issue 1: 15 Mar 2003) Excluding Sampling

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FIELD OF TESTING: CHEMICAL

SITE TESTING: CATEGORY I

SCOPE OF ACCREDITATION:

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<b>Environmental Monitoring Ambient Air</b>	Sampling and Analysis of Total Suspended Particulates in the Atmosphere Using High Volume Sampler	ASTM D 4096, 1993
	Sampling and Analysis of PM 10 (particulates 10 micron) in the Atmosphere Using PM 10 High Volume Sampler	ASTM D 4096, 1993
	Treatment of Silica Fibre Media for Analysis of Heavy Metals (Cd, Cr, Cu, Fe, Mn, Ni, Zn, Al, Pb) in the Total Suspended Particulates Collected Using High Volume Sampler	ISO 9855, 1993
	<b>Analysis of Heavy Metals in the Collected Total Suspended Particulates in the Atmosphere for:</b>	
	Cadmium Chromium Copper Iron Lead Manganese Nickel Zinc	APHA 3111 B, 2005
	Aluminium	APHA 3111 D, 2005
	Arsenic	In-House Method (ESL/L/A-01) based on PE: B3505: As, 1994
	Selenium	In-House Method (ESL/L/A-03) based on PE: B3505: Se 1994
	Mercury	In-House Method (ESL/L/A-02) based on USEPA 245.1, 1991
	Sampling and Analysis of Sulphur Dioxide in the Atmosphere Using Trigas Sampler and Colorimetric Analysis	ASTM D 2914, 1993

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FIELD OF TESTING: CHEMICAL

SITE TESTING: CATEGORY I

SCOPE OF ACCREDITATION:

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<b>Environmental Monitoring</b> Ambient Air	Sampling and Analysis of Nitrogen Dioxide in the Atmosphere Using Trigas Sampler and Colorimetric Analysis	ASTM D 1607, 1991
	Sampling and analysis of total suspended particulates, PM 10 & PM 2.5 in atmosphere using small volume sampler	In-House Method (ESL/F/A-06) based on Manufacturer's Measurement Procedures (MiniVol™ TAS)
	Carbon Monoxide (CO)	ASTM D4599-14 (Length-of-stain dosimeter)
	Wind Speed and Direction	In-House Method (ESL/F/A-08) based on manufacturer's manual
Chimney Stack Emission	Sampling and Analysis of Dust Concentration in the Stack Flue Gas Using Isokinetic Sampling Technique	MS 1596: 2003 JIS Z 8808, 1992 Isokinetic Sampler, Type 1
	Treatment of Silica Fiber Thimble for Analysis of Heavy Metals (Cd, Cr, Cu, Fe, Pb, Mn, Ni, Zn, Al) in the Dust Particles Collected Using Isokinetic Sampling Technique	JIS K 0097, 1992
	<b>Analysis of Heavy Metals in the Collected Dust Particulates in Stack Flue Gas for:</b>	
	Cadmium Chromium Copper Iron Lead Manganese Nickel Zinc	APHA 3111 B, 2005
	Aluminium	APHA 3111 D, 2005
	Arsenic	In-House Method (ESL/L/F-01) based on PE: B3505: As, 1994
	Selenium	In-House Method (ESL/L/F-03) based on PE: B3505: Se, 1994

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SITE TESTING: CATEGORY I

SCOPE OF ACCREDITATION:

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Chimney Stack Emission	Mercury	In-House Method (ESL/L/F-02) based on USEPA 245.1,1991
	Measurement of SO <sub>2</sub> , NO, NO <sub>2</sub> , CO and H <sub>2</sub> S Using Portable Flue Gas Analyser based on Electrochemical Sensor Principal	In-House Method (ESL/F/F-01) based on Manufacturer's Measurement Procedures (MRU & Kane Quintox)
Acoustic / Noise Measurement	Description and Measurement of Environmental Noise Level (Intensity and Frequency) - Basic Quantities and Procedures	ISO 1996 Sound Level Meter & Octave Filter (1982)
Ground Vibration	Measurement of Ground Vibration using vibrometer	In-House Method (ESL/F/V-01) based on Manufacturer's Measurement Procedures (InstanTel Minimate Plus™ Vibrometer)

Note:

APHA-Standard Method for the Examination of Water & Wastewater, American Public Health Association  
ISO-International Organization for Standardisation  
DIN-German Standard Methods for the Examination of Water, Wastewater and Sludge  
JIS-Japanese Industrial Standard  
ASTM-American Society for Testing and Materials  
USEPA-Environmental and Protection Agency, United States

Signatories:

1. Ong Poh Cheng IKM No.: MMIC M/1429/2600/1995
2. Choo Bon Lian IKM No.: MMIC M/1836/4194/2001
3. Kok Yin Yean IKM No.: MMIC M/3299/6133/2011

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FIELD OF TESTING: MICROBIOLOGY

SCOPE OF ACCREDITATION:

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<b>Environmental Sample</b>  Potable Water Ground Water Surface Water Liquid Effluents Marine Water Drinking Water	Heterotrophic Plate Count	APHA 9215 D, 2005 (MF Method)
	Total Coliform	APHA 9221 B, 2005 (MPN Method) APHA 9222 B, 2005 (MF Method)
	Fecal Coliform	APHA 9221 E, 2005 (MPN Method) APHA 9222 D, 2005 (MF Method)
	<i>Escherichia Coli</i>	APHA 9221 F, 2005 (MPN Method) APHA 9222 G, 2005 (MF Method)

Signatory:

1. Haziqah binti Mohd Saleh

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