

**NO: SAMM 129** 

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**ERALAB SDN. BHD.** LABORATORY LOCATION:

(PERMANENT LABORATORY) NO. 21, BLOCK C, TAIPAN 2 DAMANSARA

JALAN PJU 1A/3, ARA DAMANSARA

47301 PETALING JAYA,

**SELANGOR** 

**MALAYSIA** 

**FIELDS OF TESTING: CHEMICAL AND MICROBIOLOGY** 

This laboratory has demonstrated its technical competence to operate in accordance with MS ISO/IEC 17025:2017 (ISO/IEC 17025:2017).

This laboratory's fulfillment of the requirements of ISO/IEC 17025 means the laboratory meets both the technical competence requirements and management system requirements that are necessary for it to consistently deliver technically valid test results and calibrations. The management system requirements in ISO/IEC 17025 are written in language relevant to laboratory operations and operate generally in accordance with the principles of ISO 9001 (see Joint ISO-ILAC-IAF Communiqué dated April 2017).

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Environmental Monitoring		
Sewage Water, Industrial	Temperature	APHA 2550B
Wastewater, Effluent & Others (Sea Water)	рН	APHA 4500H+-B
	Dissolved Oxygen	APHA 4500O-G
	Conductivity	APHA 2510B
	Salinity	In-house method Ref ERA/TMPM-I (W009) based on Manufacturer's Method (YSI)
	Residual Chlorine	In-house method Ref ERA/TMPM-I (W004) based on Manufacturer's Method (Lovibond/ Palintest)
	Total Solids	APHA 2540B
	Total Dissolved Solids	APHA 2540C
	Total Suspended Solids	APHA 2540D
	Turbidity	APHA 2130B
	Alkalinity	APHA 2320B



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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Environmental Monitoring (continued)		
Sewage Water, Industrial	Acidity	APHA 2310B
Wastewater, Effluent & Others (Sea Water)	Color	APHA 2120B
	Hardness	APHA 2340C
	Biochemical Oxygen Demand	APHA 5210B
	Chemical Oxygen Demand	APHA 5220C
	Oil and Grease	APHA 5520 B
	Total Kjeldahl Nitrogen	APHA 4500Norg-B, APHA 4500 - NH <sub>3</sub> C
	Ammoniacal Nitrogen	APHA 4500-NH₃C
	Organic Nitrogen	APHA 4500Norg-B
	Phenols	HACH METHOD 8047
	Surfactant, Anionic	HACH METHOD 8028
	Silica	HACH METHOD 8185
	Boron	HACH METHOD 8015
	Chloride	HACH METHOD 8113
	Cyanide	HACH METHOD 8027
	Fluoride	HACH METHOD 8029
	Nitrate	HACH METHOD 8171
	Nitrite	HACH METHOD 8507
	Sulfate	HACH METHOD 8051
	Sulfide	HACH METHOD 8131
	Orthophosphate	HACH METHOD 8048



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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Environmental Monitoring (continued)		
Sewage Water, Industrial Wastewater, Effluent &	Total Phosphorus	HACH METHOD 8190
Others (Sea Water)	Chromium Hexavalent (Cr VI)	HACH METHOD 8023
	Chromium Trivalent (Cr III)	In-house method Ref ERA/TMPM-I(W046)
	Color	APHA 2120F
	Formaldehyde	HACH MTD 8110
	Calcium (Ca) Chromium (Cr) Copper (Cu) Iron (Fe) Magnesium (Mg) Manganese (Mn) Nickel (Ni) Potassium (K) Sodium (Na) Silver (Ag) Zinc (Zn)	APHA 3111B
	Cadmium (Cd) Lead (Pb) Aluminium (Al) Tin (Sn)	APHA 3113B
	Arsenic (As) Selenium (Se)	APHA 3114C
	Mercury (Hg)	APHA 3112B
	Sample Preparation for Metals Analysis	APHA 3030B, APHA 3030E, F, G, H & I

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Environmental Monitoring		
Ambient Air	Total Suspended Particulates (TSP)	APHA IC (11101-01-70T)(74R)
	PM10	APHA IC (11101-01-70T)(74R)
	Nitrogen Dioxide (NO <sub>2</sub> )	APHA IC (42602-01-68T)(74R)
	Sulfur Dioxide (SO <sub>2</sub> )	APHA IC (424401-01-69T)
	Carbon Monoxide (CO)	APHA IC (42101-07-74T)
	Dust:	
	Particulate Matter as PM2.5 Particulate Matter as PM10 Total Suspended Particulate (TSP)	In-house method TMPM 1-A006 & TMPM II-A005 based on 40 CFR part 50, Appendix J & L
	Gases: Ozone	In-house method TMPM II-A006 based on Manufacturer's Method



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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Industrial Effluent, Leachate & Sewage Water	Metals:  Aluminium (Al) Antimony (Sb) Arsenic (As) Barium (Ba) Beryllium (Be) Boron (B) Calcium (Ca) Cadmium (Cd) Cobalt (Co) Copper (Cu) Iron (Fe) Lead (Pb) Lithium (Li) Magnesium (Mg) Manganese (Mn) Molybdenum (Mo) Nickel (Ni) Silica (Si) Silver (Ag) Selenium (Se) Sodium (Na) Strontium (Tl) Vanadium (V) Zinc (Zn) Chromium (Cr)	APHA 3120B
	Organics: Phenols Total Hydrocarbon	APHA 5530 B & C APHA 5520 F
	Inorganics: Sulfide	APHA 4500 S2- D
	Metals:  Tin (Sn) Potassium (K) Phosphorus (P) Chromium Hexavalent (Cr VI)  Solids:	APHA 3120 B APHA 3120 B APHA 3120 B APHA 3500 Cr B
	Fixed and Volatile Solids Ignited at 550°C	APHA 2540 E

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Environmental Monitoring (continued)		
Industrial Effluent, Leachate & Sewage Water	Inorganics:  Fluoride (F <sup>-</sup> ) Bromide (Br <sup>-</sup> ) Chloride (Cl <sup>-</sup> ) Nitrate (NO <sub>3</sub> <sup>-</sup> ) Nitrite (NO <sub>2</sub> <sup>-</sup> ) Phosphate (PO <sub>4</sub> <sup>2-</sup> ) Sulphate (SO <sub>4</sub> <sup>2-</sup> )	APHA 4110B
	Organics:	
	Total Organic Carbon	APHA 5310B
	Total Petroleum Hydrocarbon	USEPA 8015C
Liquid Sample (Stack Emission)	Inorganic Acids:  Hydrogen Chloride (HCI) Hydrogen Fluoride (HF) Hydrogen Bromide (HBr)	In-house method TMPM I- E001 (inorganics) based on USEPA 26A (analysis only)



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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Water		
Surface Water,	Temperature	APHA 2550B
Groundwater, Mineral Water, Processed Water, Recycled Water, Potable & Domestic	рН	APHA 4500H+-B
Water Water	Dissolved Oxygen	APHA 4500O-G
	Conductivity	APHA 2510B
	Salinity	In-house method Ref ERA/TMPM-I (W009) based on Manufacturer's Method (YSI)
	Turbidity	APHA 2130B
	Residual Chlorine	In-house method Ref ERA/TMPM-I (W004) based on Manufacturer's Method (Lovibond/ Palintest)
	Total Solids	APHA 2540B
	Total Dissolved Solids	APHA 2540C
	Total Suspended Solids	APHA 2540D
	Turbidity	APHA 2130B
	Alkalinity	APHA 2320B
	Acidity	APHA 2310B
	Color	APHA 2120B
	Hardness	APHA 2340C
	Biochemical Oxygen Demand	APHA 5210B
	Chemical Oxygen Demand	APHA 5220C
	Oil and Grease	APHA 5520 B
	Total Kjeldahl Nitrogen	APHA 4500N <sub>org</sub> -B, APHA 4500 - NH <sub>3</sub> C
	Ammoniacal Nitrogen	APHA 4500-NH₃C
	Organic Nitrogen	APHA 4500N <sub>org</sub> -B
	Phenols	HACH METHOD 8047



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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Water		
Surface Water,	Surfactant, Anionic	HACH METHOD 8028
Groundwater, Mineral Water, Processed Water, Recycled	Silica	HACH METHOD 8185
Water, Potable & Domestic Water	Boron	HACH METHOD 8015
	Chloride	HACH METHOD 8113
	Cyanide	HACH METHOD 8027
	Fluoride	HACH METHOD 8029
	Nitrate	HACH METHOD 8171
	Nitrite	HACH METHOD 8507
	Sulfate	HACH METHOD 8051
	Sulfide	HACH METHOD 8131
	Orthophosphate	HACH METHOD 8048
	Total Phosphorus	HACH METHOD 8190
	Chromium Hexavalent (Cr VI)	HACH METHOD 8023
	Chromium Trivalent (Cr III)	In-house method Ref ERA/TMPM-I(W024a) based on APHA 3111B
	Calcium (Ca) Chromium (Cr) Copper (Cu) Iron (Fe) Magnesium (Mg) Manganese (Mn) Nickel (Ni) Potassium (K) Sodium (Na) Silver (Ag) Zinc (Zn)	APHA 3111B
	Cadmium (Cd) Lead (Pb) Aluminium (Al) Tin (Sn)	APHA 3113B



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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Water (continued)  Surface Water, Groundwater, Mineral Water,	Arsenic (As) Selenium (Se)	APHA 3114C
Processed Water, Recycled Water, Potable & Domestic Water	Mercury (Hg)	APHA 3112B
	Sample Preparation for Metals Analysis	APHA 3030B, APHA 3030E, F, G, H & I
	Organics:	
	Organochlorine Pesticides & Herbicides (List of compounds as in Appendix 1)	USEPA 8081 B GC-ECD USEPA 3510 C Liquid-liquid Extraction
	Volatile Organic Compounds (VOCs) (Benzene, Ethylbenzene, Xylene)	In-House Method ERATTMPM 1- W055 Purge & Trap- GCMS-MS based on USEPA 5030C & USEPA 8260 D
	Phenols	APHA 5530 B & C
	Total Hydrocarbon	APHA 5520 B & F
	Metals:	
	Tin (Sn)	APHA 3120 B
	Potassium (K)	APHA 3120 B
	Phosphorus (P)	APHA 3120 B
	Chromium Hexavalent (Cr VI)	APHA 3500 Cr B
	Inorganics:	
	Sulfide	APHA 4500 S2- D
	Surfactant	APHA 5540 C

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Distilled demineralized, Groundwater, Industrial / Cooling Purposes, Mineral Water, Potable and Domestic, Processes Water, Recycled Water, Reverse Osmosis Water, Saline Water, Steam Raising / Boiler, Surface Water, Swimming Pool Water & Marine Water	Metals:  Aluminium (Al) Antimony (Sb) Arsenic (As) Barium (Ba) Beryllium (Be) Boron (B) Calcium (Ca) Cadmium (Cd) Cobalt (Co) Copper (Cu) Iron (Fe) Lead (Pb) Lithium (Li) Magnesium (Mg) Manganese (Mn) Molybdenum (Mo) Nickel (Ni) Silica (Si) Silver (Ag) Selenium (Se) Sodium (Na) Strontium (Tl) Vanadium (V) Zinc (Zn) Chromium (Cr)	APHA 3120B
	Inorganics:  Fluoride (F <sup>-</sup> ) Bromide (Br <sup>-</sup> ) Chloride (Cl <sup>-</sup> ) Nitrate (NO <sub>3</sub> <sup>-</sup> ) Nitrite (NO <sub>2</sub> <sup>-</sup> ) Phosphate (PO <sub>4</sub> <sup>2-</sup> ) Sulphate (SO <sub>4</sub> <sup>2-</sup> )	APHA 4110B



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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Water (continued)		
Distilled Water, Groundwater, Mineral Water, Potable and Domestic, Processed Water, Surface Water & Marine Water	Organics: Total Organic Carbon Total Petroleum Hydrocarbon	APHA 5310B USEPA 8015C
Distilled Water, Groundwater, Mineral Water, Potable and Domestic & Processed Water	Trihalomethanes - Bromoform - Chloroform - Dibromochloromethane - Dichlorobromomethane	USEPA 8260C
Workplace Environmental & Hazards		
Industrial Hygiene	Metal:  Aluminium (AI) Antimony (Sb) Arsenic (As) Beryllium (Be) Cadmium (Cd) Chromium (Cr) Cobalt (Co) Copper (Cu) Iron (Fe) Magnesium (Mg) Molybdenum (Mo) Nickel (Ni) Vanadium (V) Zinc (Zn)	NMAM 7303
	Lead (Pb)	NMAM 7300 NMAM 7303 NMAM 7082
	Mercury (Hg)  Crystalline Silica	NMAM 6009 NMAM 7602



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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Workplace Environmental & Hazards (continued)		
Industrial Hygiene	Inorganic Acids:  Hydroflouric Acid (HF) Hydrochloric Acid (HCI) Phosphoric Acid (H <sub>3</sub> PO <sub>4</sub> ) Hydrobromic Acid (HBr)	In-house method TMPM I-IH005 based on NMAM 7903
	Nitric Acid (HNO <sub>3</sub> ) Sulfuric Acid (H <sub>2</sub> SO <sub>4</sub> )	
	Organics:  Benzene Toluene Ethylbenzene Xylene	NMAM 1501
	Ethylene Dichloride (EDC) Vinyl Chloride (VCM) Oil Mist Total Dust Respirable Dust	NMAM 1003 In-house IH (009) NMAM 5026 NMAM 0500 NMAM 0600
Soil, Sludge, Sediment	Solid:	
	Total, Fixed and Volatile Solids	APHA 2540 G
	Organics:	
	Total Organic Carbon (TOC)	In-House Method ERA/TMPM I-5007 based on Shimadzu SSM-5000 A
	n-Hexane Extractable Material (HEM)	In-House Method ERA/TMPM I-5007 based on Shimadzu SSM-5000 A
	Total Hydrocarbon	APHA 5520 E & F

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Petroleum Product, Lubricant, Additives	Water Content in Liquid Water Content in Gas Density, Relative Density (Specific Gravity), API Gravity Kinematic Viscosity	ASTM D6304-20 ISO 10101-3 ASTM D7777-13(2018)e1 In-House Method TMPM
	Dinamic Viscosity  Yield Stress	In-House Method TMPM WI _1015 based on ISO 3219 In-House Method TMPM WI _ 1015 based on ISO 3219 In-House Method TMPM WI_1015 based on ISO 3219
Gases	Nitrogen Carbon Dioxide Methane Ethane Propane Isobutane N-butane Isopentane N-pentane N-Hexane	GPA 2286

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Note:

APHA : Standard Methods for the Examination of Water and Wastewater

HACH : HACH Spectrophotometer Procedures Manual

APHA IC : Method of Air Sampling and Analysis, APHA Intersociety Committee

NMAM : NIOSH Manual of Analytical Methods

USEPA : United States Environmental Protection Agency

GPA Gas Processors Association

ASTM American Society of Testing and Material ISO International Organization of Standardization

### Signatories:

Noor Azimah Mustafa
 Wan Ezak Shah bin Wan Abdullah
 Nurul Shuhada Zakaria
 Nur Azhani Binti Jamaluddin
 IKM No.: M/2338/4895/06
 IKM No.: M/5126/8417/19
 IKM No.: M/5440/8868/20

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SCOPE OF TESTING: CHEMICAL

**APPENDIX 4** 

### APPENDIX A SCOPE OF ACCREDITATION SOUGHT (TESTING LABORATORY)

Organochlorine P	<u>esticides &amp;</u>	<u> Herbicides</u>
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1. alfa-BHC

2. gamma-BHC (Lindane)

3. beta-BHC

4. delta-BHC

5. Heptachlor

6. Aldrin

7. Heptachlor epoxide (Isomer B)

8. gamma-chlordane

9. alpha-chlordane

10. Endosulfan 1(alpha)

11. 4,4'-DDE

12. Dieldrin

13. Endrin

14. 4,4'-DDD

15. Endosulfan II (beta)

16. Endrin Aldehyde

17. 4,4'-DDT

18. Endosulfan Sulfate

19. Methoxychlor

20. Endrin Ketone

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#### SCOPE OF TESTING: MICROBIOLOGY

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Water		
Dist Distilled Water, Mineral Water, Potable and	Total Coliform	APHA 9222 B
Domestic, Processed Water, Surface Water & Groundwater	Fecal Coliform	APHA 9222 D
	E. Coli	USEPA 1603
	Heterothropic Plate Count	APHA 9215 B
Distilled Water, Mineral Water, Potable and Domestic, Marine Water, Surface Water & Ground Water	Total Coliform	APHA 9221 B (MPN Method)
	Fecal Coliform	APHA 9221 E (MPN Method)
	E. coli	APHA 9221 F (MPN Method)
Distilled Water, Mineral Water, Potable and	Fecal Streptococci/ Enterococci	APHA 9230 C
Domestic	Pseudomonas aeruginosa	APHA 9213 E
	Clostridium perfringens	HPA 2004, NSM W5 (03)
Workplace Environmental & Hazards		
Indoor Air	Total Fungi Total Bacteria	NMAM 0800

### Note:

APHA : Standard Methods for the Examination of Water and Wastewater

USEPA : United States Environmental Protection Agency

HPA 2004, : Health Protection Agency (2004), National Standard Method

NSM

NMAM : NIOSH Manual of Analytical Methods

### Signatories:

1. Noraini bt. Shair

2. Nadirah binti Noor Sham MJMM 0422

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SCOPE OF TESTING: MECHANICAL

SITE: CATEGORY I

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Noise	Test parameter:  LAeq  Lmax  Lmin  L10  L50  L90  Measuring range: 0-114 dBA	In-house method ERA/TMPM II- N001 based on Sound Level Meter LXT1 & G4 and ISO 1996-1
Vibration	Test parameter:  Peak Particle Velocity, ppv (mm/s)  Frequency, Hertz (Hz)	In-house method ERA/TMPM II- V001 based on Micromate manufacturer's method;- i) ISO 2631-1 ii) DIN 4150-Part 3

#### Note:

ISO : International Organization for Standardzation

DIN : Deutsches Institut fur Normung (German Standards)

### Signatories:

Noor Azimah Mustafa
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 Wan Ezak Shah bin Wan Abdullah
 IKM No.: M/2338/4895/06



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SCOPE OF TESTING: CHEMICAL

SITE: CATEGORY I

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Water		
Surface Water, Ground Water, Mineral Water, Processed Water,	Temperature	APHA 2550B
	рН	APHA 4500H+-B
Recycled Water, Potable and Domestic Water	Dissolved Oxygen	APHA 4500O-G
r otable and Domestic water	Conductivity	APHA 2510B
	Salinity	In-house method Ref ERA/TMPM-I (W009) based on Manufacturer's Method (YSI)
	Turbidity	APHA 2130B
	Residual Chlorine	In-house method Ref ERA/TMPM-I (W004) based on Manufacturer's Method (Lovibond/ Palintest)
	Color	APHA 2120B
Environmental Monitoring		
Ambient Air	Nitrogen Dioxide (NO <sub>2</sub> )	APHA IC (42602-01-68T)(74R)
	Sulfur Dioxide (SO <sub>2</sub> )	APHA IC (42401-01-69T)
	Carbon Monoxide (CO)	APHA IC (42101-07-74T)
Environmental Monitoring	Temperature	APHA 2550B
Sewage Water, Industrial Wastewater, Others (Sea Water)	рН	APHA 4500H+-B
	Dissolved Oxygen	APHA 4500O-G
	Conductivity	APHA 2510B
	Salinity	In-house method Ref ERA/TMPM-I (W009) based on Manufacturer's Method (YSI)
	Turbidity	APHA 2130B
	Residual Chlorine	In-house method Ref ERA/TMPM-I (W004) based on Manufacturer's Method (Lovibond/ Palintest)

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SCOPE OF TESTING: CHEMICAL

SITE: CATEGORY I

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Environmental Monitoring	Gases:	
Stationary Source Emission	Oxygen (O2) Carbon Monoxide (CO) Carbon Dioxide (CO2) Nitric Oxide (NO) Nitrogen Dioxide (NO2) Sulfur Dioxide (H2S) Hydrogen Sulfide (H2S)	Inhouse Mtd. E-G-001(Flue Gases) Based on Analyzer Kane 975
	Particulate Matter	MS 1596 : 2003 USEPA 5
	Dark Smoke	BS 2742: 2009 (Ringelmann Smoke Chart)

#### Note:

APHA : Standard Methods for the Examination of Water and Wastewater

APHA IC : Method of Air Sampling and Analysis, APHA Intersociety Committee

MS Malaysian Standard BS British Standard

### Signatories:

1. Noor Azimah Mustafa IKM No.: M/1386/2536/1995

Wan Ezak Shah bin Wan Abdullah
 Nurul Shuhada Zakaria
 IKM No.: M/2338/4895/06
 IKM No.: M/5126/8417/19

Environmental Monitoring (Industrial

wastewater, leachate, sewage water & other) &

Water only