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**LABORATORY LOCATION:**  
(PERMANENT LABORATORY)**PERMULAB SDN BHD  
38, JALAN SS 22/25  
DAMANSARA JAYA  
47400 PETALING JAYA  
SELANGOR, MALAYSIA**

The standard used for assessment of this laboratory is MS ISO/IEC 17025: 2005

**FIELD OF TESTING: CHEMICAL****SCOPE OF ACCREDITATION:**

<b>Materials/ Products tested</b>	<b>Type of test/ Properties measured/ Range of measurement</b>	<b>Standard test methods/ Equipment/Techniques</b>
<b>Water</b>		
River Water	pH	APHA - 4500-H B
Drinking Water	Colour	APHA - 2120B
Well Water	Turbidity	APHA - 2130B
Ground Water	Conductivity	APHA - 2510B
Effluent	Temperature	APHA - 2550B
Waste Water	Total Dissolved Solids	APHA - 2540C
Swimming Pool Water	Total Suspended Solids	APHA - 2540D
Cooling Tower Water	Total Solids	APHA - 2540B
Boiler Water	Total Alkalinity as CaCO <sub>3</sub>	APHA - 2320B
Mineral Water	Phenolphthalein Alkalinity as CaCO <sub>3</sub>	APHA - 2320B
	Caustic Alkalinity as CaCO <sub>3</sub>	APHA - 2320B
	Carbonate Alkalinity as CaCO <sub>3</sub>	APHA - 2320B
	Bicarbonate Alkalinity as CaCO <sub>3</sub>	APHA - 2320B
	Total Hardness as CaCO <sub>3</sub>	APHA - 2340C
	Carbonate Hardness as CaCO <sub>3</sub>	APHA - 2340A&C & 2320B
	Non Carbonate Hardness as CaCO <sub>3</sub>	APHA - 2340A&C & 2320B
	Biochemical Oxygen Demand @ 20°C for 5 Days	APHA - 5210B & APHA - 4500O-C or G
	Biochemical Oxygen Demand @ 30°C for 3 Days	DOE (Malaysia, 1995) (ALT)
	Chemical Oxygen Demand	APHA - 5220B or APHA - 5220C
	Chloride as Cl	APHA - 4500Cl-B
	Anionic Detergent MBAS	APHA - 5540C
	Ammoniacal Nitrogen as N	APHA - 4500NH <sub>3</sub> -B&C or B&F
	Nitrate Nitrogen as N	APHA - 418E* or APHA - 4500NO <sub>3</sub> <sup>-</sup> D
	Nitrite Nitrogen as N	APHA - 4500NO <sub>2</sub> <sup>-</sup> B
	Nitrogen (Organic) as N	APHA - 4500Norg B
	Total Nitrogen (Kjeldahl) as N	APHA - 4500Norg B
	Total Nitrogen as N	APHA - 4500Norg B & APHA - 418E* or APHA - 4500NO <sub>3</sub> <sup>-</sup> D

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<b>Materials/ Products tested</b>	<b>Type of test/ Properties measured/ Range of measurement</b>	<b>Standard test methods/ Equipment/Techniques</b>
1) River Water	Fluoride as F	APHA - 4500F-B&D
Drinking Water	Mercury as Hg	APHA - 3112B
Well Water	Selenium as Se	APHA - 3114C
Ground Water	Arsenic as As	In-house No W68 (based on APHA - 3114C)
Effluent		
Waste Water	Tin as Sn	In-house No W68 (based on APHA - 3114C)
Swimming Pool Water		
Cooling Tower Water	Antimony as Sb	In-house No W68 (based on APHA - 3114C)
Boiler Water		
Mineral Water (continue)	Cyanide as Cn	APHA - 4500CN-C&D or C&F
	Aluminium as Al	APHA - 3500Al-B
	Dissolved Oxygen	APHA - 4500O-C or G
	Silica as SiO <sub>2</sub>	APHA - 4500Si-D
	Orthophosphorous as P / Total Phosphorous as P	APHA - 4500P-D
	Iron as Fe <sup>2+</sup>	APHA - 3500FeB
	Iron as Fe	APHA - 3111B
	Cadmium as Cd	APHA - 3111B
	Lead as Pb	APHA - 3111B
	Chromium as Cr	APHA - 3111B
	Silver as Ag	APHA - 3111B
	Copper as Cu	APHA - 3111B
	Manganese as Mn	APHA - 3111B
	Magnesium as Mg	APHA - 3111B
	Sodium as Na	APHA - 3111B
	Zinc as Zn	APHA - 3111B
	Potassium as K	APHA - 3111B
	Calcium as Ca	APHA - 3111B
	Cobalt as Co	APHA - 3111B
	Chromium, 6+	APHA - 3500CrB
	Chromium, 3+	In-house No. W 26
	Nickel as Ni	APHA - 3111B
	Sulphate as SO <sub>4</sub>	APHA - 4500SO <sub>4</sub> -E
	Phenol	APHA - 5530D or APHA - 5530B&C
	Boron as B	APHA - 4500B-C
	Free Chlorine as Cl <sub>2</sub>	APHA - 4500Cl-G
	Combined Chlorine as Cl <sub>2</sub> (Monochloroamine and Dichloroamine)	APHA - 4500Cl-G
	Total Chlorine as Cl <sub>2</sub>	APHA - 4500Cl-G

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<b>Materials/ Products tested</b>	<b>Type of test/ Properties measured/ <u>Range of measurement</u></b>	<b>Standard test methods/ <u>Equipment/Techniques</u></b>
River Water	Sulphide	APHA - 4500S-F
Drinking Water	Oil & Grease	APHA - 5520B or APHA - 5520D
Well Water	Barium	APHA - 3111D
Ground Water	Lignin & Tannin	APHA - 5503B
Effluent		
Waste Water	Metals by Inductive Coupled	
Swimming Pool Water	Plasma Emission	
Cooling Tower Water	Spectroscopy	
Boiler Water		
Mineral Water (continue)	Antimony as Sb	USEPA Method 6010B
	Beryllium as Be	APHA - 3030E&F (HNO <sub>3</sub> or HNO <sub>3</sub> <sup>-</sup>
	Cadmium as Cd	HCl Digestion)
	Calcium as Ca	
	Chromium as Cr	
	Cobalt as Co	
	Copper as Cu	
	Iron as Fe	
	Lead as Pb	
	Lithium as Li	
	Magnesium as Mg	
	Manganese as Mn	
	Molybdenum as Mo	
	Nickel as Ni	
	Selenium as Se	
	Strontium as Sr	
	Thalium as Tl	
	Tin as Sn	
	Titanium as Ti	
	Vanadium as V	
	Zinc as Zn	
	Sodium as Na	
	Potassium as K	
	Barium as Ba	
	Scandium as Sc	
	Silver as Ag	
	Boron as B	
	Aluminium as Al	
	Phosphorus as P	

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<b>Materials/ Products tested</b>	<b>Type of test/ Properties measured/ Range of measurement</b>	<b>Standard test methods/ Equipment/Techniques</b>
River Water	Metals by Inductive Coupled Plasma Emission Spectroscopy	
Drinking Water		
Well Water		
Ground Water		
Effluent	Antimony as Sb	APHA - 3120B
Waste Water	Beryllium as Be	APHA - 3030 E & F (HNO <sub>3</sub> or HNO <sub>3</sub> - HCl Digestion)
Swimming Pool Water	Cadmium as Cd	
Cooling Tower Water	Calcium as Ca	
Boiler Water	Chromium as Cr	
Mineral Water (continue)	Cobalt as Co	
	Copper as Cu	
	Iron as Fe	
	Lead as Pb	
	Lithium as Li	
	Magnesium as Mg	
	Manganese as Mn	
	Molybdenum as Mo	
	Nickel as Ni	
	Selenium as Se	
	Strontium as Sr	
	Thalium as Tl	
	Vanadium as V	
	Zinc as Zn	
	Sodium as Na	
	Potassium as K	
	Barium as Ba	
	Silver as Ag	
	Boron as B	
	Aluminium as Al	
	Tin as Sn	In-House No. W86
	Titanium as Ti	(based on APHA - 3120B)
	Phosphorus as P	
	Anions by Ion Chromatography with Chemical Suppression of Eluent Conductivity	
	Fluoride as F	APHA - 4110 B
	Chloride as Cl	
	Nitrite as NO <sub>2</sub>	
	Sulphate as SO <sub>4</sub>	
	Bromide as Br	
	Nitrate as NO <sub>3</sub>	
	Phosphate as PO <sub>4</sub>	

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<b>Materials/ Products tested</b>	<b>Type of test/ Properties measured/ Range of measurement</b>	<b>Standard test methods/ Equipment/Techniques</b>
River Water Drinking Water Well Water Ground Water Effluent Waste Water Swimming Pool Water Cooling Tower Water Boiler Water Mineral Water (continue)	Cations by Ion Chromatography with Chemical Suppression of Eluent Conductivity  Lithium as Li Sodium as Na Ammonia as NH <sub>4</sub> Potassium as K Magnesium as Mg Calcium as Ca	     In-House No. W77 (based on APHA - 4110B) & Dionex Publication 2007
2) Cooling Tower Water	pH Total Alkalinity as CaCO <sub>3</sub> Total Hardness as CaCO <sub>3</sub> Chloride as Cl Total Dissolved Solids Conductivity  Molybdenum	APHA - 4500-H B APHA - 2320B APHA - 2340C APHA - 4500Cl-B APHA - 2540C APHA - 2510B  APHA - 3111D
3) Boiler Water	pH Caustic Alkalinity as CaCO <sub>3</sub> Total Hardness as CaCO <sub>3</sub> Chloride as Cl Total Dissolved Solids	APHA - 4500-H B APHA - 2320B APHA - 2340C APHA - 4500-Cl B APHA - 2540C
4) Mineral Water	pH Potassium as K Calcium as Ca Sodium as Na Magnesium as Mg Silica as SiO <sub>2</sub> Bicarbonate Alkalinity as CaCO <sub>3</sub> Sulfate as SO <sub>4</sub> Chloride as Cl Total Dissolved Solids Nitrite Nitrogen as N	APHA - 4500-H B APHA - 3111B APHA - 3111B APHA - 3111B APHA - 3111B APHA - 4500Si-D APHA - 2320B  APHA - 4500SO <sub>4</sub> E APHA - 4500-Cl B APHA - 2540C APHA - 4500NO <sub>2</sub> <sup>-</sup> B

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<b>Materials/ Products tested</b>	<b>Type of test/ Properties measured/ Range of measurement</b>	<b>Standard test methods/ Equipment/Techniques</b>
5) Swimming Pool Water	pH Turbidity Color Free Chlorine as Cl <sub>2</sub> Total Alkalinity as CaCO <sub>3</sub> Total Dissolved Solids Ammoniacal Nitrogen as N Nitrate Nitrogen as N Aluminium as Al Iron as Fe Copper as Cu Magnesium as Mg	APHA - 4500-H B APHA - 2130B APHA - 2120B APHA - 4500Cl G APHA - 2320B APHA - 2540C APHA - 4500NH <sub>3</sub> -B&C or B&F APHA - 418 E* or APHA - 4500NO <sub>3</sub> <sup>-</sup> D APHA - 3500Al-B APHA - 3111B APHA - 3111B APHA - 3111B
6) For (1) to (5)	<u>Sample Pretreatment</u> 1) Heavy Metals (Ag, Cu, Co, Ca, Cd, Cr, Fe, K, Mn, Mg, Ni, Na, Pb, Zn, As, Hg, Se, Sn)  2) Soluble & Suspended Metals for the Above Elements	APHA - 3030E (HNO <sub>3</sub> Digestion) APHA - 3030F (HNO <sub>3</sub> - HCl Digestion)  APHA - 3030B

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<b>Materials/ Products tested</b>	<b>Type of test/ Properties measured/ Range of measurement</b>	<b>Standard test methods/ Equipment/Techniques</b>
River Water Treated Water Drinking Water Well Water Ground Water	Organochlorine Pesticides  Acenaphthene d10 (Internal Standard) Hexachlorobenzene Alpha Lindane Phenanthrene d10 (Internal Standard) Methoxychlor Chrysene d12 (Internal Standard) Gamma Lindane Beta Lindane Delta Lindane Heptachlor Aldrin Heptachlor Epoxide Chlordane Endosulfan DDE Dieldrin Endosulfan 1 DDD Endosulfan Sulfate DDT Perylene d12 (Surrogate Standard)	EPA 525.2
	Trihalomethanes	
	Chloroform Dichlorobromomethane Dibromochloromethane Bromoform	APHA - 6200 B APHA - 6200 B APHA - 6200 B APHA - 6200 B
	2, 4-D (2,4-Dichlorophenoxy Acetic Acid)	In-House No. FH09 (based on The Publication of Department of Analytical Chemistry, Chemical Faculty, Gdansk University of Technology, Poland)
Effluent, Waste Water	Fixed & Volatile Solids Ignited at 550°C (MLVSS, MLSS)	APHA - 2540E

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**SCOPE OF ACCREDITATION:**

<b>Materials/ Products tested</b>	<b>Type of test/ Properties measured/ Range of measurement</b>	<b>Standard test methods/ Equipment/Techniques</b>
Palm Oil Waste Water & Effluent	Chemical Oxygen Demand Ammoniacal Nitrogen Total Suspended Solids Total Nitrogen Oil & Grease	D.O.E. Reference D.O.E. Reference D.O.E. Reference D.O.E. Reference (Macro-Kjeldahl) D.O.E. Reference
Solid Waste	Toxicity Leaching Characteristic Procedure (TCLP)	
	For Metal Analysis Arsenic as As Barium as Ba Boron as B Cadmium as Cd Chromium as Cr Copper as Cu Lead as Pb Mercury as Hg Nickel as Ni Selenium as Se Tin as Sn Zinc as Zn	EPA 1311
Sludge	Oil & Grease	APHA - 5520E

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<b>Materials/ Products tested Food</b>	<b>Type of test/ Properties measured/ Range of measurement</b>	<b>Standard test methods/ Equipment/Techniques</b>
Milk	Fat	AOAC 989.05 (Modified Mojonnier Ether Extraction Method)
	Total Nitrogen / Protein	AOAC 991.20 (Kjeldahl Method)
Coconut Cream, Beverages, Ice Cream	Fat	In-House No. F12 (based on AOAC 989.05) (Modified Mojonnier Ether Extraction Method)
Petai, Tea, Bread, Sauces, Spices, Meat Products, Ice Cream Confectionery, Coconut Milk, Soybean Milk	Total Nitrogen / Protein	In-House No. F7 (based on AOAC 991.20) (Kjeldahl Method)
Cocoa Products	Moisture	AOAC 931.04
Butter Products	Salt	AOAC 960.29
Beverages, Sauces	Chloride / Salt	In-House No.F8 (based on AOAC 960.29)
Beverages	pH	AOAC 945.10
Meat Products, Cocoa Products, Desiccated Coconut	Total Fat	In-House No.F13 (Modified Soxhlet Extraction Method) (based on AOAC 963.15 and Pearson's Chemical Analysis of Foods, 7 <sup>th</sup> Ed., 1976; pg 14-15)
Sauces and Ketchup	3Chloro 1,2 Propanediol (3MCPD)	Journal of AOAC International VOL.84 No.2, 2001.
Dried Plant	Metal (Ca, Cu, Fe, K, Mn, Mg, and Zn)	AOAC 975.03

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<b>Materials/ Products tested</b>	<b>Type of test/ Properties measured/ Range of measurement</b>	<b>Standard test methods/ Equipment/Techniques</b>
Food Products	Total Dietary Fibre	AOAC 985.29 (Enzymatic-Gravimetric Method)
	Metal (Co, Na, Pb, Ca, Cu, Fe, K, Cd, Mn, Mg and Zn) Sample Preparation	APHA - 3111B AOAC 975.03
	Sample Preparation (Cd)	In-House No. F59 (based on Pearson's Chemical Analysis of Foods; 7 <sup>th</sup> ed.1976; pg 79-80.
	Metal (As, Sb, Sn) Sample Preparation	In-House No. F3 (based on APHA 3114C) AOAC 971.21
	Metal (Mercury-Hg)	AOAC 971.21 (Flameless AAS Method)
	Metal (Pb, Sn, Se, Sb, Cd, Ca, Na, Mg, K, Cu, Zn, Fe) Sample Preparation	USEPA 6010B(1996); by ICP-OES AOAC 975.03, 17th Edition, 2000
	Moisture	In-House No. F5 (based on AOAC 931.04) (Air Oven Method)
	Salt / Sodium Chloride	In-House No.F8 (based on AOAC 960.29)
	Sugar	In-House No. F9 (based on Pearson's Chemical Analysis of Foods; 7 <sup>th</sup> Ed., 1976; pg 121-127)
	Fat	In-House No.F2 (based on Pearson's Chemical Analysis of Foods, 7 <sup>th</sup> Ed., 1976; pg 14-15) Solvent Extraction-Submersion Method (Modified Soxhlet Extraction Method)
	Benzoic Acid & Sorbic Acid	In-House FH 01 (HPLC) (based on Journal of Chromatography, Vol. 173, 1979, pg. 343-348)

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<b>Materials/ Products tested</b>	<b>Type of test/ Properties measured/ <u>Range of measurement</u></b>	<b>Standard test methods/ <u>Equipment/Techniques</u></b>
Food Products (continue)	pH	In-House No.F6 (based on AOAC 945.10)
	Crude Fibre	In-House No. F1 (based on Pearson's Chemical Analysis of Foods, 7 <sup>th</sup> Ed., 1976; pg 16-18)
	Ash	In-House No. F11 (based on Pearson's Chemical Analysis of Foods; 7 <sup>th</sup> Ed., 1976; pg 7-8)
	Energy as Calories	In-House No. F41 (based on Method of Analysis for Nutrition Labeling, AOAC, 1993)
	Energy from Fat as Calories	In-House No. F42 (based on Method of Analysis for Nutrition Labeling, AOAC, 1993)
	Total Carbohydrate	In-House No. F43 (based on Method of Analysis for Nutrition Labeling, AOAC, 1993)
	Carbohydrate	In-House No. F44 (based on Method of Analysis for Nutrition Labeling, AOAC, 1993)
	Sulphur Dioxide	In-House No. F16 (based on Pearson's Chemical Analysis of Food 7 <sup>th</sup> Edition, Pg 29-31)
	Water Activity	In-House No. F53 (based on Decagon Paw Kit Water Activity Meter Manual)

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<b>Materials/ Products tested</b>	<b>Type of test/ Properties measured/ Range of measurement</b>	<b>Standard test methods/ Equipment/Techniques</b>
Food Products (continue)	Fatty Acid Methyl Esters Saturated Fat / Saturated Fatty Acid Monounsaturated Fat / Monounsaturated Fatty Acid Polyunsaturated Fat / Polyunsaturated Fatty Acid Trans Fat / Tran Fatty Acid EPA( Eicosapentaenoic Acid) DHA (Docosahexaenoic Acid) Omega3 Fatty Acid Omega6 Fatty Acid Omega9 Fatty Acid	In-House No. G3 [based on AOCS (Ce 1-62 Reapproved 1997)]
	Cholesterol	In-House No.GH12 (based on JAOAC International Volume 64 ,No 1 ,1981 & Volume 73, No 5.1990)
	Vitamin C as L-ascorbic Acid	In-House No. FH02 (based on Vitamin Analysis For Food & Health Science, Roald R. Eitmeller 7 W.O. Landen, Jr. 1999)
	Vitamin A as all trans-retinol	In-House No. FH03 (based on BS EN 12823-1:2000)
Flour Confectionary, Bread and Cakes	Propionic Acid	In-House No. G15 (based on JAOAC International Volume 64, No 2 1981)
Beverages, Sweets	Colour (Qualitative) Tartrazine, Sunset Yellow, Ponceau 4r, Carmoisine	In-House No F46 (based on Pearson's Chemical Analysis of Food, 7 <sup>th</sup> Edition, Pg 50-60)
Cosmetics	Salicylic Acid	In-House No FH16
Spices, Salted Egg Yolk, Confectionary and Sauces	Sudan I, II, III, IV Para Red	In-House No. FH18 (based on Analysis of Illegal Dyes in Chili Powder by LGC, Oct 2006)

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**FIELD OF TESTING: CHEMICAL (SITE TESTING)****SCOPE OF ACCREDITATION:**

<b>Materials/ Products tested</b>	<b>Type of test/ Properties measured/ Range of measurement</b>	<b>Standard test methods/ Equipment/Techniques</b>
<b>Environmental</b>		
Ambient Atmosphere	Total Suspended Particulate	ASTM D 4096-91
	Nitrogen Dioxide Content of The Atmosphere	ASTM D 1607-91 (Griess-Saltzman Reaction)
	Sulfur Dioxide Content of The Atmosphere	ASTM D 2914-91 (West-Gaeke Method)
	Measuring The Concentration of Carbon Monoxide	ASTM D 4599-90 (using Length-of- Stain Dosimeter)
Work Place Atmosphere	Free Chlorine in Air	APHA Method in Air Sampling and Analysis 1977 (Method No. 209)
	Cyanide in Air	APHA Method in Air Sampling and Analysis 1977 (Method No. P & CAM 116)
Noise Measurement	Outdoor Noise Level Pertinent to Land Use	ISO1996 (Part I, II and III)
River Water, Drinking Water, Well Water, Ground Water, Effluent, Waste Water, Swimming Pool Water, Cooling Tower, Boiler Water.	pH in Water (In situ)	In-House Method E1 based on APHA 4500-H B (In Situ)
	Free Chlorine in Water	In-House Method E2 based on Hach Method for Chlorine (Cl <sub>2</sub> ) (In Situ)
	Turbidity in Water	APHA - 2130 B (In Situ)
	Colour in Water	APHA - 2120 B (In Situ)
	Dissolved Oxygen in Water	APHA - 4500-O G (In Situ)
	Temperature in Water	APHA - 2550 B (In Situ)
	Total Chlorine in Water	In-House Method E3 based on Hach Method for Chlorine (Cl <sub>2</sub> )

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**SCOPE OF ACCREDITATION:**

<b>Materials/ Products tested</b>	<b>Type of test/ Properties measured/ Range of measurement</b>	<b>Standard test methods/ Equipment/Techniques</b>
Air Emission	Sample and Velocity Traverses for Stationary Sources	US EPA Method 1
	Determination of Stack Gas Velocity and Volumetric Flow Rate	US EPA Method 2 (Type S Pitot Tube)
	Determination of Moisture Content in Stack Gases	US EPA Method 4
	Determination of Particulate Matter Emissions from Stationary Sources	US EPA Method 5
	Determination of Sulfuric Acid and Sulfur Dioxide Emissions from Stationary Sources	US EPA Method 8
	Determination of Hydrogen Halide and Halogen Emissions from Stationary Sources Isokinetic Method	US EPA Method 26A (Sampling Part Only)
	Determination of Metals Emissions from Stationary Sources	US EPA Method 29
	Determination of Concentration and Mass Flow of Particulate Matter in Flue Gas for Stationary Sources Emissions	MS 1596: 2003
	Dark Smoke	BS 2742:1969 (Ringelmann Smoke Chart)

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**FIELD OF TESTING: MICROBIOLOGY****SCOPE OF ACCREDITATION:**

<b>Materials/ Products tested Water</b>	<b>Type of test/ Properties measured/ <u>Range of measurement</u></b>	<b>Standard test methods/ <u>Equipment/Techniques</u></b>
River Water	Heterotrophic Plate Count	APHA - 9215B (Pour Plate Method)
Drinking Water	Total Coliform	APHA - 9221B (MPN Method)
Well Water	Fecal Coliform	APHA - 9221E.1 (MPN Method)
Ground Water	<i>Escherichia coli</i>	APHA - 9221F (MPN Method)
Effluent	Total Coliform	APHA - 9222B (Membrane Filtration Procedure)
Waste Water	Fecal Coliform	APHA - 9222D (Membrane Filtration Procedure)
Raw Water	<i>Escherichia coli</i>	APHA - 9222G (Membrane Filtration Partition Procedure)
Sewage	<i>Total Legionella</i>	AS/NZS 3896
Treated Water	<i>Legionella pneumophila</i> Serogroup 1	AS/NZS 3896
Swimming Pool	<i>Legionella pneumophila</i> Serogroup 2-14	AS/NZS 3896
Cooling Tower Water	<i>Legionella spp.</i> (unidentified)	AS/NZS 3896
Mineral Water	<i>Pseudomonas aeruginosa</i>	APHA - 9213E (Membrane Filtration Procedure)
	<i>Staphylococcus aureus</i>	APHA - 9213B.6 (Membrane Filtration Procedure)

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**FIELD OF TESTING: MICROBIOLOGY**

**SCOPE OF ACCREDITATION:**

<b>Materials/ Products tested Food</b>	<b>Type of test/ Properties measured/ Range of measurement</b>	<b>Standard test methods/ Equipment/Techniques</b>
Food, Perishable Food Products, Canned Foods	Aerobic Plate Count	FDA / BAM Chapter 3 (Pour Plate Method)
	Yeasts and Molds	FDA / BAM Chapter 18
	Coliforms	FDA / BAM Chapter 4 (MPN Method)
	Fecal Coliforms	FDA / BAM Chapter 4 (MPN Method)
	<i>Escherichia coli</i>	FDA / BAM Chapter 4 (MPN Method)
	Coliform Counts	AOAC 991.14 (3M Petrifilm)
	<i>Escherichia coli</i> Counts	AOAC 991.14 (3M Petrifilm)
	<i>Salmonella</i>	FDA / BAM Chapter 5
	<i>Staphylococcus aureus</i>	FDA / BAM Chapter 12
	<i>Listeria spp</i>	FDA / BAM Chapter 10
	<i>Listeria monocytogenes</i>	FDA / BAM Chapter 10
	<i>Lactobacillus spp</i>	CLMM Chapter 38
	<i>Bacillus cereus</i>	AOAC 980.31
<b>Pharmaceutical</b>		
Pharmaceutical Product	Total Viable Aerobic Count (Bacteria & Fungi)	BP Appendix XVI B.2
	Enterobacteria & Certain Other Gram Negative Bacteria	BP Appendix XVI B.1
	<i>Escherichia coli</i>	BP Appendix XVI B.1
	<i>Staphylococcus aureus</i>	BP Appendix XVI B.1
	<i>Salmonella</i>	BP Appendix XVI B.1
	<i>Pseudomonas aeruginosa</i>	BP Appendix XVI B.1

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**FIELD OF TESTING: MICROBIOLOGY****SCOPE OF ACCREDITATION:**

<b>Materials/ Products tested</b>	<b>Type of test/ Properties measured/ Range of measurement</b>	<b>Standard test methods/ Equipment/Techniques</b>
Cosmetic Product	Aerobic Plate Count	FDA / BAM Chapter 23
	<i>Staphylococcus aureus</i>	FDA / BAM Chapter 23
	Yeasts and Molds	FDA / BAM Chapter 23
<b>Environmental</b>		
Swab	Aerobic Plate Count	CMMEF Chapter 3 & FDA / BAM; Chapter 3
	Yeasts & Molds	CMMEF Chapter 3 & FDA / BAM; Chapter 18
Swab (Sponge Method)	Aerobic Plate Count	In-House No. M1 (based on ISO 18593: 2004 (E) & FDA/BAM; Chapter 3)
	Yeasts & Molds	In-House No.M2 (based on ISO 18593: 2004 (E) & FDA/BAM; Chapter 18)
Microbial Air Density	Aerobic Plate Count	APHA - 9020 B.2.e & FDA/BAM; Chapter 3 (Open Plate Method)
	Yeasts & Molds	APHA - 9020 B.2.e & FDA/BAM; Chapter 18 (Open Plate Method)
Microbial Air Monitoring	Aerobic Plate Count	In-House No.M3 [based on Merck MAS 100 ECO, FDA/BAM; Chapter 3 & 0800, Issue 1 (NMAM)]
	Yeasts & Molds	In-House No.M4 [based on Merck MAS 100 ECO, FDA/BAM; Chapter 18 & 0800, Issue 1 (NMAM)]
	Total Bacteria Count	In-House No.M5 [based on Merck MAS 100 ECO, USP NF 25 & 0800, Issue 1 (NMAM)]
	Total Fungi Count	In-House No.M6 [based on Merck MAS 100 ECO, USP NF 25 & 0800, Issue 1 (NMAM)]
	Total Microbial Count	In-House No.M7 [based on Merck MAS 100 ECO, USP NF 25 & 0800, Issue 1 (NMAM)]

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### Abbreviation:

APHA	American Public Health Association, 20 <sup>th</sup> Ed., 1998.
APHA *	American Public Health Association, 16 <sup>th</sup> Ed., 1989.
FDA/BAM	Food and Drugs Administration / Bacteriological Analytical Manual (FDA/BAM) Online; January 2001, August 2001, September 2002, January 2003 and June 2006.
AOAC	Official Methods of Analysis of AOAC International, 16 <sup>th</sup> Ed., 1995.
AS/NZS 3896	Standard Method for the Examination of Water for Legionella including Legionella pneumophila 1998 (Australia / New Zealand Standard).
ASTM	Associated Standard Testing Methods.
EPA	Environmental Protection Agency Methods.
AOCS	Official Methods of American Oil of Chemists Society.
BP	British Pharmacopeia 2007
CMMEF	Compendium of Microbiological Method Examination of Food, 3 <sup>rd</sup> Edition
CLMM	Collins and Lyne's Microbiological Methods; 7 <sup>th</sup> Edition 1998.
ISO	International Organisation for Standardisation
JAOAC	Journal of AOAC International
LGC	London Government Chemist
BS EN	British Standard - European Number
BS	British Standard

### Chemical Testing on Water:

- 1) Standard Method for the Examination of Water and Waste Water (2005), 21<sup>st</sup> Ed. APHA, AWWA, WEF.
- 2) Standard Method for the Examination of Water and Waste Water (1998), 20<sup>th</sup> Ed. APHA, AWWA, WEF.
- 3) Standard Method for the Examination of Water and Waste Water (1989), 16<sup>th</sup> Ed. APHA, AWWA, WPCF.
- 4) Environmental Protection Agency Methods. Revision 2, 1995.

### Chemical Testing on Food:

- 1) Official Methods of Analysis of AOAC, 16<sup>th</sup> Edition (1995).
- 2) The Chemical Analysis of Foods, 7<sup>th</sup> Edition, Pearson, D. (1976).
- 3) Standard Method for the Examination of Water and Waste Water (1998) 20<sup>th</sup> Ed. APHA, AWWA, WEF.
- 4) Official Methods of American Oil of Chemists Society, 1989.
- 5) Vitamin Analysis for Food & Health Science Ronald R. Eitenmiller 7 W. O Landen Jr 1999.
- 6) Methods of Analysis For. Nutrition Labeling, AOAC 1993.

### Chemical Testing on Environmental:

- 1) Annual Book of ASTM Standard (1993) Vol. 11.03.
- 2) APHA Method of Air Sampling and Analysis (2<sup>nd</sup> Edition).
- 3) US EPA CFR40 Part 60 Appendix A.
- 4) International Organization for Standardization, ISO 1996-1:2003(E), ISO 1996-2:1987(E) & ISO 1996-3:1987(E)
- 5) British Standard, BS2742:1969

### Microbiological Testing on Water:

- 1) Standard Method for the Examination of Water and Waste Water (1998) 20<sup>th</sup> Ed. APHA, AWWA, WEF.
- 2) Standard Method for the Examination of Water for Legionella including Legionella pneumophila, 1998 (Australian / New Zealand Standard).

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### Microbiological Testing on Food:

- 1) Food and Drugs Administration / Bacteriological Analytical Manual (FDA/BAM)  
Online; January 2001, August 2001, September 2002, January 2003 and June 2006.
- 2) AOAC Standard Methods -16<sup>th</sup> Edition, 1995.
- 3) Collins and Lyne's Microbiological Methods; 7<sup>th</sup> Edition 1998.

### Microbiological Testing on Cosmetic:

- 1) Food and Drugs Administration / Bacteriological Analytical Manual (FDA/BAM)  
Online; January 2001, August 2001, September 2002, January 2003 and June 2006.

### Microbiological Testing on Pharmaceutical:

- 1) British Pharmacopeia 2007

### Microbiological Testing on Environmental:

- 1) Compendium of Method Microbiological Examination of Foods, 3<sup>rd</sup> Edition
- 2) Food and Drug Administration/Bacteriological Analytical Manual (FDA/BAM) Online; January 2001, August 2001, September 2002, January 2003 and June 2006.
- 3) Standard Method for the Examination of Water and Wastewater (1998); 20<sup>th</sup> Edition, APHA, AWWA, WEF
- 4) Merck MAS 100ECO Air Sampler Manual
- 5) 0800, Issue 1: NIOSH Manual of Analytical Methods (NMAM); Fourth Edition (1998)
- 6) US Pharmacopoeia 30- N F25 (2007)
- 7) International Organization for Standardization 18593:2004 (E)

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