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**LABORATORY LOCATION:**  
(PERMANENT LABORATORY)
**ALS TECHNICHEM (M) SDN. BHD. (117964-P)**  
**WISMA ALS**  
**No. 19 & 21, JALAN ASTAKA U8/84**  
**SEKSYEN U8, BUKIT JELUTONG**  
**40150 SHAH ALAM, SELANGOR**  
**MALAYSIA**
**FIELDS OF TESTING:**
**CHEMICAL, GMO & NUCLEIC ACID,**  
**MICROBIOLOGY, BIOLOGICAL AND MECHANICAL**

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).

**SCOPE OF TESTING: CHEMICAL**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<b>Environmental Monitoring</b> Industrial Effluent Waste Water Sewage  <b>Water</b> Drinking Water Ground Water Mineral Water Natural Water Potable Water Raw Water Surface Water	pH	APHA 4500-H <sup>+</sup> B
	BOD5 at 20°C	APHA 5210 B, 4500-O B, C, G
	COD	APHA 5220 B, C, D
	Suspended Solids	APHA 2540 D
	Chromium, Hexavalent	APHA 3500-Cr D 19 <sup>th</sup> Ed (1995) APHA 3500-Cr B 21 <sup>st</sup> Ed (2005)
	Chromium, Trivalent	In-house Method QWI-CH/17-007 based on APHA 3120 B & 3500-Cr D
	Mercury (Hg)	APHA 3112 B USEPA 7470 A

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Water</b> Drinking Water Ground Water Mineral Water Natural Water Potable Water Surface Water Raw Water	<u>Metals</u> Arsenic (As), Aluminium (Al), Barium (Ba), Boron (B), Cadmium (Cd), Copper (Cu), Iron (Fe), Lead (Pb), Manganese (Mn), Nickel (Ni), Selenium (Se), Silver (Ag), Tin (Sn), Zinc (Zn), Beryllium (Be), Calcium (Ca), Magnesium (Mg), Potassium (K), Sodium (Na), Sulfur (S), Thallium (Tl), Vanadium (V), Cobalt (Co), Chromium (Cr), Iron (Fe), Molybdenum (Mo), Phosphorus (P), Antimony (Sb), Strontium (Sr), Tellurium (Te), Titanium (Ti), Bismuth (Bi), Uranium (U)	APHA 3120 B  USEPA 6010 B
	Fluoride	APHA 4500-F C, D
	Formaldehyde	In-house Method QWI-CH/17-033 based on Distillation/UV-Vis Spectrometer
	Cyanide	APHA 4500-CN C
	Weak Acid Dissociable (WAD) Cyanide	APHA 4500-CN I
	Free Cyanide	APHA 4500-CN C
	Phenol	APHA 5530 B, D
	Residual Chlorine (free)	APHA 4500-Cl G
	Sulphide	APHA 4500-S <sup>2-</sup> C, D
	Oil & Grease	APHA 5520 B
	Ammonia Nitrogen	APHA 4500-NH <sup>3</sup> B, C, G
Color ADMI (pH natural) Color ADMI (pH adjusted to 7.6)	APHA 2120 E (UV-Vis Spectrometer) & USEPA 110-1	

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Water</b> Drinking Water Ground Water Mineral Water Potable Water Reverse Osmosis Water	Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulphate	APHA 4110 B
<b>Environmental Monitoring</b> Waste Water	Organochlorine and Organophosphate Pesticides (OCOPs) Refer to Appendix 10	In-house Method QWI-OG/17-052 using GC-MS/MS
<b>Water</b> Drinking Water Ground Water River Water Seawater	Polycyclic Aromatic Hydrocarbons (PAHs) Refer to Appendix 11	In-house Method QWI-OG/17-051 using GC-MS/MS
<b>Environmental Monitoring</b> Waste Water	Mixed Liquor Suspended Solids (MLSS)	In-house Method QWI-CH/17-079 based on APHA 2540 D & 2540 E
<b>Water</b> Ground Water River Water Seawater Surface Water	Mixed Liquor Volatile Suspended Solids (MLVSS)	
<b>Environmental Monitoring</b> Palm Oil Mill Effluent (POME)	BOD3	In-house Method QWI-CH/17-045 based on APHA 5210 B (21 <sup>st</sup> ed)
<b>Water</b> Drinking Water Potable Water Raw Water Surface Water Ground Water Seawater Natural Water Mineral Water	<b>Metals</b> Aluminium (Al), Antimony (Sb), Arsenic (As), Barium (Ba), Bismuth (Bi), Boron (B), Beryllium (Be), Calcium (Ca), Cadmium (Cd), Chromium (Cr), Cobalt (Co), Copper (Cu), Gallium (Ga), Indium (In), Iron (Fe), Lead (Pb), Lithium (Li), Magnesium (Mg), Manganese (Mn), Mercury (Hg), Molybdenum (Mo), Nickel (Ni), Potassium (K), Phosphorus (P), Selenium (Se), Silver (Ag), Sodium (Na), Strontium (Sr), Thallium (Tl), Tin (Sn), Tungsten (W), Vanadium (V), Zinc (Zn), Uranium (U), Titanium (Ti)	APHA 3125 B  USEPA 6020 A

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Water</b> Drinking Water Ground Water Mineral Water Natural Water Potable Water Raw Water Surface Water	Sample Pre-Treatment for Metals Analysis	In-house Method QWI-CH/17-004 based on APHA 3030 B, E, F & USEPA 3005 A
	Dissolved Oxygen	APHA 4500-O B, C, G
	Color	APHA 2120 B
	Organic and Volatile Acids	APHA 5560 C
	Borate (calculated as H <sub>3</sub> BO <sub>3</sub> )	APHA 3120 B
	Phosphorus, Total	APHA 4500-P B, F In-house Method QWI-CH/17-058 based on APHA 4500 P - B, F
	Sulphate	In-house Method QWI-CH/17-011 based on APHA 4500-SO <sub>4</sub> <sup>2-</sup> E
	Chloride	APHA 4500-Cl <sup>-</sup> B, E
	Detergent, Anionic (MBAS)	In-house Method QWI-CH/17-003 based on APHA 5540 B, C
	Turbidity	APHA 2130 B
	Hardness (CaCO <sub>3</sub> )	APHA 2340 B, C
	Mineral Oil	APHA 5520 F
	Selenium (Se)	In-house Method QWI-CH/17-009 based on APHA 3120 B
Alkalinity	APHA 2320 B	
Conductivity	APHA 2510 B	

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Water</b> Drinking Water Potable Water Raw Water Surface Water Ground Water Natural Water Mineral Water	Fixed and Volatile Solids Ignited at 550°C	APHA 2540 E
	Nitrate	APHA 4500-NO <sub>3</sub> <sup>-</sup> E, H
	Nitrite	APHA 4500-NO <sub>2</sub> <sup>-</sup> B
	Total Kjeldahl Nitrogen	APHA 4500-N <sub>org</sub> B
	Total Dissolved Solids	In-house Method QWI-CH/17-012 based on APHA 2540 C
<b>Environmental Monitoring</b> Waste Water  <b>Water</b> Seawater River Water Ground Water Drinking Water Surface Water	Total Hydrocarbon	In-house Method QWI-OG/17-018 based on APHA 5520 E & F
	Dissolved / Dispersed Petroleum Hydrocarbon (DDPH)	In-house Method QWI-OG/17-044 based on IOC (MARPOLMON-P)
	Oil & Grease (Emulsified Oil)	In-house Method QWI-CH/17-048 based on APHA 5520 B & APHA 5520F
	Cyanide, Total	APHA 4500-CN-O
	Cyanide, Weak Acid Dissociable (WAD)	APHA 4500-CN-O
	Cyanide, Free	In-house Method QWI-CH/17-097 based on ISO 14402-2
<b>Environmental Monitoring</b> Waste Water  <b>Water</b> River Water Ground Water Drinking Water Surface Water	Carbon Dioxide	APHA 4500 CO <sub>2</sub> D
	Perchlorate	In-house Method QWI-CH/17-080 based on USEPA 6850

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<b>Water</b> Drinking Water Ground Water River Water Seawater Surface Water	Mercury (Hg)	In-house Method QWI-CH/17-093 based on USEPA 1631 E
<b>Environmental Monitoring</b> Waste Water  <b>Water</b> Drinking Water Ground Water River Water	Acrylonitrile	In-house Method QWI-OG/17-013 based on USEPA 5030B, 8260B
<b>Environmental Monitoring</b> Waste Water Soil Sediment Sludge  <b>Water</b> Drinking Water Ground Water River Water Seawater Surface Water	Carbofuran, Carbaryl	In-house Method QWI-OG/17-036 using LC-MS
	2, 4-D 2, 4, 5-T 2, 4, 5-TP 2, 4, 6-T 2, 4- DP 2, 4- DB Clopyralid Picloram Dicamba Fluroxypyr 4- Chlorophenoxyacetic acid MCPA Triclopyr MCP MCPB	In-house Method QWI-OG/17-038 based on USEPA Method 555
	Glyphosate	In-house Method QWI-OG/17-043 based on USEPA 547
	Paraquat, Diquat	In-house Method QWI-OG/17-040 based on USEPA 549.2

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Environmental Monitoring</b> Waste Water  <b>Water</b> Drinking Water Ground Water Potable Water River Water Seawater Surface Water	Sample Extraction Method	USEPA 5030 B (Purge and Trap Extraction)
	Sample Extraction Method	USEPA 3510 C (Separatory Funnel Extraction)
	Benzene, Toluene, Ethylbenzene, Xylenes (BTEX)	USEPA 8260 B
	Total Petroleum Hydrocarbon	USEPA 8015 B
	Volatile Organic Compound (Refer to Appendix 1)	USEPA 8260 B
	Semivolatile Organic Compound (Refer to Appendix 2)	USEPA 8270 C
<b>Water</b> Drinking Water Ground Water Potable Water Mineral Water Natural Water Raw Water Surface Water	Total Organic Carbon	APHA 5310 B USEPA 9060
	Total Solids	APHA 2540 B
	Settleable Solids	APHA 2540 F
	Ferrous Ion (Fe <sup>2+</sup> )	APHA 3500-Fe B
	Organic and Volatile Acids	APHA 5560 C
<b>Water</b> Surface Water Seawater	Chlorophyll	APHA 10200 H
	Organic and Volatile Acids	APHA 5560 C
	Total Organic Carbon	APHA 5310 B
	Nitrate	APHA 4500-NO <sub>3</sub> - E
	Mercury (Hg)	APHA 3112 B USEPA 7470 A
	Salinity	APHA 2520 B

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Water</b> Marine Water	Tributyltin	In-house Method QWI-OG/17-030 based on USEPA 8323 (LC-MSMS)
Seawater	Nitrate	In-house Method QWI-CH/17-016
Potable Water Lake Water Sea Water Ground Water	Monomethyl Arsenic Acid Arsenobetene DiMethylarsenic Acid Arsenious Acid As (III) Arsenic Acid As (V) Selenite Se (IV) Selenate Se (VI)	In-house Method QWI-CH/17-085 based on Speciation Analyses Handbook by LC-ICPMS
Haemodialysis Water Reverse Osmosis Water	Calcium (Ca), Magnesium (Mg), Potassium (K), Sodium (Na)	APHA 3120 B
	Aluminium (Al), Antimony (Sb) Arsenic (As), Barium (Ba), Beryllium (Be), Cadmium (Cd), Chromium (Cr), Copper (Cu), Lead (Pb), Mercury (Hg), Selenium (Se), Silver (Ag), Thallium (Tl), Zinc (Zn)	APHA 3125 B
	Chloramines, Free Chlorine	APHA 4500 Cl G
	Chloride, Fluoride, Nitrate, Sulphate	APHA 4110 B
	Hardness (CaCO <sub>3</sub> )	APHA 2340 B
	Total Dissolved Solids	In-house Method QWI-CH/17-012 based on APHA 2540 C
	pH	APHA 4500-H*B
	Sampling Protocol	In-house Method QWI-CH/17-020 based on AAMI Guideline

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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>
<b>Water</b> Seawater Reverse Osmosis Water Drinking Water Ground Water Surface Water	Silver (Ag), Aluminium (Al), Arsenic (As), Boron (B), Barium (Ba), Beryllium (Be), Cadmium (Cd), Cobalt (Co), Chromium (Cr), Copper (Cu), Iron (Fe), Mercury (Hg), Manganese (Mn), Molybdenum (Mo), Nickel (Ni), Lead (Pb), Antimony (Sb), Selenium (Se), Tin (Sn), Titanium (Ti), Thallium (Tl), Uranium (U), Vanadium (V), Zinc (Zn)	In-house Method QWI-CH/17-031 using Octopole Reaction Cell ICPMS
	Mercury, Total	USEPA 1631 E
	Methyl Mercury	USEPA 1630
<b>Environmental Monitoring</b> Waste Water  <b>Water</b> River Water Ground Water	Absorbable Organic Halides (AOX)	In-house Method QWI-OG/17-057 based on USEPA 1650C
<b>Environmental Monitoring</b> Soil  <b>Water</b> River Water Ground Water Seawater	Bentazone	In-house Method QWI-OG/17-038 based on USEPA Method 555
<b>Water</b> River Water Ground Water Seawater	Diuron, Metolachlor, Temephos	In-house Method QWI-OG/17-059 based on USEPA Method 507
	2,4-D Methyl Ester	In-house Method QWI-OG/17-048 based on USEPA 8270C
	Chromium Hexavalent Chromium Trivalent	In-house Method QWI-CH/17-151 based on Agilent Application notes: Low Level speciated analysis of Cr(III) and Cr (VI) using LC (IC)-ICP-MS

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Environmental Monitoring</b> Waste Water  <b>Water</b> River Water Ground Water Seawater Drinking Water Raw Water	Total Mercury	In-house Method QWI-CH/17-147 based on USEPA 7473
<b>Environmental Monitoring</b> Waste Water  <b>Water</b> Drinking Water Surface Water	Per- and Polyfluoroalkyl Substances (PFAS) (Refer to Appendix 12)	In-house Method QWI-OG/17-061 based on USEPA 8327
<b>Water</b> Ground Water	Lead	Japanese Industrial Standard Method K0102 (54.4)
	Cadmium	Japanese Industrial Standard Method K0102 (55.4)
	Volatile Organic Compound (Refer to Appendix 4)	Japanese Industrial Standard Method K0125 (5.1)  <b>Sample Preparation Method:</b> Japanese Ministry of Environment: Announcement 18 & 19
<b>Water</b>	Ether Oxygenates (MTBE, TBA, DIPE, TAME and ETBE)	In-house Method QWI-OG/17-027 based on USEPA 5030B, 8260B
	TPH Speciation – Aliphatic Hydrocarbon >C5-C6 fraction >C6-C8 fraction >C8-C10 fraction TPH Speciation - Aromatic Hydrocarbon >C5-C7 fraction >C7-C8 fraction >C8-C10 fraction	In-house Method QWI-OG/17-029 based on TPHCWG

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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>
<b>Water</b>  Drinking water	Ethylenediamine tetraacetic acid (EDTA), Nitritotriacetic acid (NTA)	In-house Method QWI-OG/17-073 Using HPLC-DAD
	Haloacetic acid (Monobromoacetic acid, Dibromoacetic acid, Monochloroacetic acid, Dichloroacetic acid, Trichloroacetic acid)	In-house Method QWI-OG/17-074 using LC/ESI-MSMS
	Oxyhalides (Perchlorate, Chlorate, Bromate)	In-house Method QWI-OG/17-070 using LC/ESI-MSMS
Surface Water, Drinking Water, Waste Water, Sea Water	Total Silica, Reactive Silica	In-house Method QWI-CH/17-177 based on APHA 4500 SiO <sub>2</sub> C, 23 <sup>rd</sup> Ed, 2017
	Pharmaceuticals and Personal Care Products (PPCPs) Refer Appendix 13	In-house Method QWI-OG/17-076 based on EPA Method 1694, 2007
Drinking Water, Sodium Hypochlorite Solution	Oxyhalides (Chlorite, Bromate, Chlorate)	In-house Method QWI-CH/17-173 based on APHA 4110 B, 23 <sup>rd</sup> Ed, 2017
	Oxyhalides (Perchlorate)	In-house Method QWI-CH/17-152 based on APHA 4110 B, 23 <sup>rd</sup> Ed, 2017

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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>
<b>Water</b>	TPH Speciation – Aliphatic Hydrocarbon >C10-C12 fraction >C12-C16 fraction >C16-C35 fraction TPH Speciation - Aromatic Hydrocarbon >C10-C12 fraction >C12-C16 fraction >C16-C21 fraction >C21-C35 fraction	In-house Method QWI-OG/17-028 based on TPHCWG
<b>Environmental Monitoring</b> Soil Sediments Solid Waste	Calorific Value	In-house Method QWI-CH/17-088 based on ASTM D 5468-95
	Chromium Hexavalent	USEPA 3060A, USEPA 7196 In-house Method QWI-CH/17-120 based on USEPA 3060A, USEPA 6020A
Soil Sediments Sludge Solid Waste	Aluminium (Al), Antimony (Sb), Arsenic (As), Barium (Ba), Boron (B), Beryllium (Be), Calcium (Ca), Cadmium (Cd), Chromium (Cr), Cobalt (Co), Copper (Cu), Iron (Fe), Lead (Pb), Lithium (Li), Magnesium (Mg), Manganese (Mn), Molybdenum (Mo), Nickel (Ni), Potassium (K), Phosphorus (P), Selenium (Se), Silver (Ag), Sodium (Na), Strontium (Sr), Thallium (Tl), Tin (Sn), Vanadium (V), Zinc (Zn)	USEPA 3050 B USEPA 6010 B, APHA 3120 B USEPA 200.2, USEPA 6010 B, APHA 3120 B
	Mercury (Hg)	USEPA 3050 B USEPA 7470 A, APHA 3112 B USEPA 200.2 USEPA 7471 A, APHA 3112 B
	Toxicity Characteristic Leaching Procedure (TCLP)	USEPA 1311

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Environmental Monitoring</b>  Soil Sediments Sludge Solid Waste	Aluminium (Al), Antimony (Sb), Arsenic (As), Barium (Ba), Boron (B), Beryllium (Be), Calcium (Ca), Cadmium (Cd), Chromium (Cr), Cobalt (Co), Copper (Cu), Iron (Fe), Lead (Pb), Lithium (Li), Magnesium (Mg), Manganese (Mn), Molybdenum (Mo), Nickel (Ni), Potassium (K), Phosphorus (P), Selenium (Se), Silver (Ag), Sodium (Na), Strontium (Sr), Thallium (Tl), Tin (Sn), Vanadium (V), Zinc (Zn)	APHA 3120 B USEPA 6010 B
	Total Organic Carbon	USEPA 9060
	Total Organic Matter	In-house Method QWI-CH/17-014 based on APHA 2540 B, E
	Total Solids at 103 °C – 105 °C	In-house Method QWI-CH/17-008 based on (Oven Drying)
	Moisture at 103 °C – 105 °C	In-house Method QWI-CH/17-008 based on (Oven Drying)
	Oil & Grease	USEPA 9071 B APHA 5520
	Cyanide	APHA 4500-CN- C, E
	pH	USEPA 1311 APHA 4500-H+ B
	Anions (Chloride, Sulphate, Nitrite, Nitrate, Bromide, Phosphate, Fluoride)	In-house Method QWI-CH/17-006 based on APHA 4110 B
	Hydrocarbon, Total	In-house Method QWI-OG/17-018 based on EPA 418.1, APHA 5520 F

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Environmental Monitoring</b>  Wastewater Soil	Microplastics	In-house Method QWI-OG/17-071 using micro-FTIR
		In-house Method QWI-OG/17-072 using Py-GC-MS
Wastewater and Seawater	Total Silica, Reactive Silica	In-house Method QWI-CH/17-177 based on APHA 4500 SiO <sub>2</sub> C, 23 <sup>rd</sup> Ed, 2017
Environmental Swabs	Allergen of Almond	In-house Method QWI-OF/17-107 based on ELISA Method
	Allergen of Egg	In-house Method QWI-OF/17-108 based on ELISA Method
	Allergen of Hazelnut	In-house Method QWI-OF/17-109 based on ELISA Method
	Allergen of Crustacean	In-house Method QWI-OF/17-110 based on ELISA Method
	Allergen of Sesame	In-house Method QWI-OF/17-111 based on ELISA Method
	Allergen of Mustard	In-house Method QWI-OF/17-112 based on ELISA Method
	Allergen of Walnut	In-house Method QWI-OF/17-113 based on ELISA Method
	Allergen of Pistachio	In-house Method QWI-OF/17-114 based on ELISA Method
	Allergen of Fish	In-house Method QWI-OF/17-106 based on ELISA Method
	Allergen of Cashew	In-house Method QWI-OF/17-146 based on ELISA Method
	Allergen of Soy	In-house Method QWI-OF/17-085 based on ELISA Method
	Allergen of Gluten	In-house Method QWI-OF/17-086 based on ELISA Method
	Allergen of Peanut	In-house Method QWI-OF/17-087 based on ELISA Method
Allergen of Milk	In-house Method QWI-OF/17-088 based on ELISA Method	

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Environmental Monitoring</b>  Soil Sediments Sludge Solid Waste	Microscale Solvent Extraction of Solids	USEPA 3570 (Microscale Solvent Extraction) In-house Method QWI-OG/17-016 based on USEPA 3570
	Polyaromatic Hydrocarbon (PAH) (Refer to Appendix 3 for List of PAHs)	USEPA 8270 C
	Semivolatile Organic Compound (Refer to Appendix 2, 5, 6)	USEPA 8270 C
	Total Petroleum Hydrocarbon	USEPA 8015 B
	Purge and Trap Extraction	USEPA 5030 B
	BTEX (Benzene, Toluene, Ethylbenzene, Xylenes)	USEPA 8260 B
	Volatile Organic Compound (Refer to Appendix 1)	USEPA 8260 B
Soil Sediment Biota	Methyl Mercury	In-house Method QWI-CH/17-034 based on USEPA 1630
Soil Solid Waste	Total Carbon	In-house Method QWI-CH/17-108 based on USEPA 9060
Water & Soil	Total Petroleum Hydrocarbon (TPH C6-C9)	In-house Method QWI-OG/17-011 based on USEPA 8260 B
		In-house Method QWI-OG/17-010 based on USEPA 5030 B
Seawater & Sediment	Tributyltin	In-house Method QWI-OG/17-033 and QWI-OG/17-34

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<b>Environmental Monitoring</b>	Ether Oxygenates (MTBE, TBA, DIPE, TAME and ETBE)	In-house Method QWI-OG/17-027 based on USEPA 5030 B, 8260 B
Soil Sediment	TPH Speciation – Aliphatic Hydrocarbon >C5-C6 fraction >C6-C8 fraction >C8-C10 fraction TPH Speciation – Aromatic Hydrocarbon >C5-C7 fraction >C7-C8 fraction >C8-C10 fraction	In-house Method QWI-OG/17-029 based on TPHCWG
	TPH Speciation – Aliphatic Hydrocarbon >C10-C12 fraction >C12-C16 fraction >C16-C35 fraction TPH Speciation – Aromatic Hydrocarbon >C10-C12 fraction >C12-C16 fraction >C16-C21 fraction >C21-C35 fraction	In-house Method QWI-OG/17-028 based on TPHCWG
	Monomethyl Arsenic Acid Arsenobetene DiMethylarsenic Acid Arsenious Acid, As (III) Arsenic Acid, As (V) Selenite, Se (IV) Selenate, Se (VI)	In-house Method QWI-CH/17-085 based on Speciation Analysis Handbook by LC-ICPMS
Soil	Lead	Japanese Industrial Standard Method K0102 (54.4)
	Cadmium	Japanese Industrial Standard Method K0102 (55.4)
	Volatile Organic Compound (Refer to Appendix 4)	Japanese Industrial Standard Method K0125 (5.1)  <b>Sample Preparation Method:</b> Japanese Ministry of Environment: Announcement 18 & 19

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**SCOPE OF TESTING: CHEMICAL**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Environmental Monitoring</b>  Soil	Organochlorine and Organophosphate Pesticides (OCOPs) Refer to Appendix 10	In-house Method QWI-OG/17-052 using GC-MS/MS
	Polycyclic Aromatic Hydrocarbons (PAHs) Refer to Appendix 11	In-house Method QWI-OG/17-051 using GC-MS/MS
Personal Exposure (Sampling Media)	Benzene, Toluene, Ethylbenzene, Xylenes (BTEX)	In-house Method QWI-OG/17-015 based on 3M Organic Vapor Monitor Sampling and Analysis Guide NIOSH 1501 OSHA 1005
	Mercury (Hg)	NIOSH 6009
	Dust particulates (TSP)	In-house Method QWI-CH/17-083 based on NIOSH 0500
	Dust particulates (PM10, PM2.5)	In-house Method QWI-CH/17-103 based on NIOSH 0600
Ambient Air (Personal Exposure)	Acid Gases (H <sub>2</sub> SO <sub>4</sub> , HNO <sub>3</sub> , HCl)	NIOSH 7903
	Acid Gases (HBr, HCl, HF, HNO <sub>3</sub> , H <sub>3</sub> PO <sub>4</sub> , H <sub>2</sub> SO <sub>4</sub> )	In-house Method QWI-CH/17-135 based on OSHA ID 165 SG
	Aluminium (Al), Antimony (Sb), Arsenic (As), Barium (Ba), Beryllium (Be), Cadmium (Cd), Calcium (Ca), Chromium (Cr), Cobalt (Co), Copper (Cu), Iron (Fe), Lead (Pb), Magnesium (Mg), Manganese (Mn), Molybdenum (Mo), Nickel (Ni), Tin (Sn), Zinc (Zn)	NIOSH 7303
	Volatile Organic Compounds (Refer to Appendix 1)	US EPA TO-17 NIOSH 2549
	Fluorides	NIOSH 7906

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**SCOPE OF TESTING: CHEMICAL**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
Environmental Monitoring  Ambient Air (Sampling Media)	Benzene, Toluene, Ethylbenzene, Xylenes (BTEX)	NIOSH 1501 OSHA 1005
	Mercury (Hg)	NIOSH 6009
	Dust Particulates (TSP, PM10, PM2.5)	USEPA Method IO 3.1 (Section 5)
	Acid Gases (H <sub>2</sub> SO <sub>4</sub> , HNO <sub>3</sub> , HCl)	NIOSH 7903
	Hydrogen Sulfide	In-house Method QWI-CH/17-087 based on NIOSH 6013
	Sulphur Dioxide	In-house Method QWI-CH/17-036 based on J.P. Lodge 704C
	Nitrogen Dioxide	In-house Method QWI-CH/17-035 based on J.P. Lodge 407
	Ozone	In-house Method QWI-CH/17-106 based on J.P. Lodge 819
	Aluminium (Al), Antimony (Sb), Arsenic (As), Barium (Ba), Beryllium (Be), Cadmium (Cd), Calcium (Ca), Chromium (Cr), Cobalt (Co), Copper (Cu), Iron (Fe), Lead (Pb), Magnesium (Mg), Manganese (Mn), Molybdenum (Mo), Nickel (Ni), Tin (Sn), Zinc	NIOSH 7303
	Volatile Organic Compounds (Refer to Appendix 1)	US EPA TO-17 NIOSH 2549
Fluorides	NIOSH 7906	

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Environmental Monitoring</b>  Ambient Air (Passive sampler)	Ammonia (NH <sub>3</sub> )	In-house method QWI-CH/17-129 based on Radiello reference method Ed,01/2006
	Hydrogen Sulfide (H <sub>2</sub> S)	In-house method QWI-CH/17-130 based on Radiello reference method Ed, 01/2006
	Nitrogen Dioxides (NO <sub>2</sub> )	In-house method QWI-CH/17-131 based on Radiello reference method Ed, 01/2006
	Sulfur Dioxides (SO <sub>2</sub> )	In-house method QWI-CH/17-137 based on Radiello reference method Ed, 01/2006
	Ozone (O <sub>3</sub> )	In-house method QWI-CH/17-132 based on Radiello reference method Ed, 01/2006
	Hydrochloric Acid (HCl)	In-house method QWI-CH/17-133 based on Radiello reference method Ed, 01/2006
	Methyl- Ter-Butyl Ether (MTBE), Benzene, Toluene, Ethylbenzene, o-Xylene, m-&p-Xylene	In-house method QWI-CH/17-134 based on Radiello reference method Ed, 01/2006
Ambient Air	<ol style="list-style-type: none"> <li>1. Hydrogen Sulfide</li> <li>2. Carbonyl Sulfide</li> <li>3. Methyl Mercaptan</li> <li>4. Ethyl Mercaptan</li> <li>5. Dimethyl Sulfide</li> <li>6. N-Propyl Mercaptan</li> <li>7. Ethyl Methyl Sulfide</li> <li>8. Isobutyl Mercaptan</li> <li>9. Diethyl Sulfide</li> <li>10. 3-Methylthiophene</li> <li>11. Tetrahydrothiophene</li> <li>12. 2-Ethylthiophene</li> <li>13. Diethyl Disulfide</li> <li>14. Carbon Disulfide</li> <li>15. Thiophene</li> </ol>	In-house Method QWI-OG/17-077 based on ASTM D 5504-12 & VOA- S307M_SCD Rev 17.0 (Analysis of Reduced Sulfur Compound in Gaseous Matrix by GC SCD as per ASTM D 5504 and Modified SCAQMD 307 (QWI ALS Simi Valley)

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Environmental Monitoring</b>		
Stationary Air Emission	Hydrogen Halide and Halogen	USEPA 26A
Crude Oil Condensate Naphtha	Total Mercury	In-house method QWI-CH/17-144 based on UOP 938-10
Soil Sludge Solid Waste	Total Mercury	In-house method QWI-CH/17-146 based on USEPA 7473
Petroleum Oil Waste Oil	Total Chloride	In-house method QWI-CH/17-140 based on ASTM D4929-19 B
Air	Total Organic Matter	In-house Method QWI-CH/17-119 based on USEPA IO-3.1 (Gravimetric)
	Total Polycyclic Aromatic Hydrocarbons (Total PAHs) (Refer to Appendix 9)	In-house Method QWI-OG/17-047 based on USEPA Method TO-13A
	Volatile Organic Compounds (Refer to Appendix 8)	In-house Method QWI-OG/17-049 based on USEPA 325
	Methanol	In-house Method QWI-OG/17-065 based on SKC 575-007
	Aldehydes (Acrolein, Formaldehyde, Acetaldehyde)	In-house Method QWI-OG/17-066 based on Radiello reference method Ed, 01/2006
	n-Hexane. 1,4-Dioxane	USEPA TO-17
	Ethylene Oxide	In-house Method QWI-OG/17-063 based on NIOSH 1614
	Mercury	In-house Method QWI-CH/17-165 based on OSHA ID 140

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Environmental Monitoring</b>  High Volume Sampler (HVS) Filter paper	Silver (Ag), Aluminum (Al), Arsenic (As), Boron (B), Calcium (Ca), Cobalt (Co), Cadmium (Cd), Chromium (Cr), Copper (Cu), Iron (Fe), Silica (SiO <sub>2</sub> ), Silicon (Si), Lead (Pb), Sulfur (S), Antimony (Sb), Selenium (Se), Zinc (Zn), Mercury (Hg)	In-house Method QW I-CH/17-115 based on USEPA IO-3.1 & 3.4
<b>Biological Specimens</b>  Blood Urine	Mercury, Total	In-house Method QWI-CH/17-023 based on NIOSH P&CAM 165 and P&CAM 167
	Aluminium (Al), Antimony (Sb), Arsenic (As), Barium (Ba), Beryllium (Be), Cadmium (Cd), Calcium (Ca), Chromium (Cr), Cobalt (Co), Copper (Cu), Iron (Fe), Lead (Pb), Magnesium (Mg), Manganese (Mn), Molybdenum (Mo), Nickel (Ni), Tin (Sn), Zinc (Zn)	In-house Method QWI-CH/17-078 based on Mutagenesis (2005) vol.20 no.6 pg 425-432
	Methyl Mercury	In-house Method QWI-CH/17-034 based on USEPA 1630
	S-Phenylmercapturic Acid (SPMA)	In-house Method QWI-CH/17-081 based on Carcinogenesis (1999) vol.20 no.4 pg 719-726
	Monomethyl Arsenic Acid Arsenobetaine DiMethylarsenic Acid Arsenious Acid, As (III) Arsenic Acid, As (V) Selenite, Se (IV) Selenate, Se (VI)	In-house Method QWI-CH/17-085 based on Speciation Analysis Handbook by LC-ICPMS

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
Biological Specimens  Urine	2, 5 Hexadione	In-house Method QWI-CH/17-114 using GC-FID
	2-Thioxothiazolidine-4-Carboxylic Acid (TTCA)	In-house Method QWI-CH/17-123 using HPLC
	Methanol Ethanol	In-house Method QWI-CH/17-136 using GC-FID
	Hippuric Acid (HA) Methyl Hippuric Acid (MHA)	In-house Method QWI-CH/17-127 based on NIOSH 8301 using LC-MS
	Trans, trans-muconic acid (TTMA)	In-house Method QWI-CH/17-081 using LC-MS
	Creatinine	In-house Method QWI-CH/17-126 using JAFFE Method
	Total Mercury	In-house Method QWI-CH/17-149 based on USEPA 7473
Serum / Plasma	Cholinesterase	In-house Method QWI-CH/17-125
Whole Blood	Methyl Mercury	In-house Method QWI-CH/17-121
Blood	Total Mercury	In-house Method QWI-CH/17-148 based on USEPA 7473
Hair	Total Mercury	In-house Method QWI-CH/17-145 based on USEPA 7473

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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>
<b>Paper, Paper Board &amp; Wood Pulp</b>  Chemicals Metals Paints Papers Plastics	Lead (Pb) Mercury (Hg) Cadmium (Cd) Chromium (Cr) Hexavalent Chromium (Cr <sup>6+</sup> ) Polybrominated Biphenyl (PBBs) Polybrominated Diphenyl Ether (PBDEs)	In-house Method QWI-CH/17-018 based on Procedures for Determination of Levels of Regulated Substances in Electro Technical Products IEC ACEA Ad Hoc Working Group
Plastic	Cadmium (Cd)	BS EN 1122:2001
	Mercury (Hg)	In-house Method QWI-CH/17-018 based on USEPA 7473
Toy Materials	Soluble Metals (Lead, Barium, Cadmium, Arsenic, Antimony, Chromium, Mercury, Selenium)	In-house Method QWI-CH/17-032 based on BSEN 71 Part 3
Food Packaging Material	Leachable Metals (Antimony, Arsenic, Cadmium, Lead)	In-house Method QWI-OF/17-042 based on Malaysian Food Act 13 <sup>th</sup> Schedule
<b>Agricultural Product and Materials</b>  Plant	Fipronil	In-house Method QWI-OG/17-068 Using LC/ESI - MSMS

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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>
<b>Foods</b> Vegetable Rice Mayonnaise Fish	Total Mercury	In-house Method QWI-OF/17-157 based on USEPA 7473
<b>Foods</b> Cereal Cereal Products Malt Malt Products Milk Milk Products Confection Nut Nut Products Cocoa, Cocoa Products Vegetable Products Fruit Products Sauces Soft Drink Beverages (Tea, Coffee)	Calories (Energy)	In-house Method QWI-OF/ 17-036 based on Methods of Analysis for Nutrition Labeling (1993) Page 5 and 106
	Ash	In-house Method QWI-OF/17-002 based on Method of Analysis for Nutrition Labeling (1993) Chapter 10
	Moisture	In-house Method QWI-OF/17-007 based on Method of Analysis for Nutrition Labeling (1993) Chapter 23
		In-house Method QWI-OF/17-038 Moisture Analyzer
	Water Activity	In-house Method QWI-OF/17-072 based on AOAC 978.18
	pH	In-house Method QWI-OF/17-095 based on AOAC 945.27, 970.21, 943.02 & 981.12
	Carbohydrate, Available	In-house Method QWI-OF/17-037 based on Method of Analysis for Nutritional beling and Malaysian Food Act 1983
	Carbohydrate, Total	In-house Method QWI-OF/17-035 based on Method of Analysis for Nutrition Labeling (1993) Page 106
Washing Water Feed	Formaldehyde	In-house Method QWI-OF/17-043 based on AOAC 931.08

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**SCOPE OF TESTING: CHEMICAL**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Foods</b>  Cereal, Cereal Products Malt, Malt Products Milk, Milk Products Confection Nut, Nut Products Cocoa, Cocoa Products Meat Fish Products Egg Edible Fat Edible Oil	Fat, Total Fat, Crude	In-house Method QWI-OF/17-010 based on Method of Analysis for Nutrition Labeling (1993) Chapter 18 and Pearson's (1991) Page 24
	Fatty Acid Composition: Monounsaturated Fat Polyunsaturated Fat Saturated Fat Trans Fatty Acid EPA (Eicosapentaenoic Acid) DHA (Docosahexaenoic Acid) Omega 3,6,9	In-house Method QWI-OF/17-015 based on AOAC Method 963.22 and AOCS Ce-1-62
	Cholesterol	In-house Method QWI-OF/17-016 based on JAOAC Vol 73, No.5,1990 and GC – FID
Cereal Cereal Products Malt Malt Products Milk Milk Products Confection Nut Nut Products Cocoa Cocoa Products Sauces Beverages, Juices Creamer Honey	Protein/Total Kjeldahl Nitrogen	In-house Method QWI-OF/17-006 based on Method of Analysis for Nutrition Labeling (1993) Chapter 28 and Pearson's (1991) Page 17 & 20
	Fibre, Crude	In-house Method QWI-OF/17-009 based on Pearson's (1991) Page 26-27
	Fibre, Dietary	In-house Method QWI-OF/17-014 based on Methods AOAC 985.29
	Sugar, Total (As Inverted Sugar)	In-house Method QWI-OF/17-001 based on AOAC 923.09 and Pearson's (1991) Page 197
	Sugar, Reducing	In-house Method QWI-OF/17-067 based on AOAC 906.03B and Pearson's (1991) Page 197
	Sucrose	In-house Method QWI-OF/17- 070 based on AOAC 930.36 and Pearson's (1991) Page 197

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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>
<b>Foods</b>  Oil Sweetening Substances Beverages Confection	Phthalates Benzylbutyl phthalate (BBP) Diethyl phthalate (DEP) Di-n-butyl phthalate (DBP) Bis(2-ethylhexyl) phthalate (DEHP) Di-nOctyl phthalate (DNOP) Diisononyl phthalate (DINP) Diisodecyl phthalate (DIDP)	In-house Method QWI-OF/17-063 based on JRC EUR 23682 EN (2009)
Cereal, Cereal Products Confection Nut, Nut Products Malt, Malt Products Milk, Milk Products Cocoa, Cocoa Products Sauces Vegetables Products Fruit Products	Organochlorine Pesticides Organophosphorus Pesticides (Refer to Appendix 5 and 6)	In-house Method QWI-OG/17-021 QuEChERS Method – Multi Residue Method & GC MS based on AOAC 2007.01
Cereal, Cereal Products Soft Drink Beverages Milk, Milk Products Malt, Malt Products Confection Nut, Nut Products Cocoa, Cocoa Products Flavouring Substances Sweetening Substances Honey Sauces Vinegar Vegetable Products Fruit Products Pickles Tomato Pulp Paste Puree Salt & Spices Tea, Tea Dust, Extracts Fish, Fishery Products Meat Egg Edible Fats Edible Oil Edible Gelatin	Minerals (Ca, Cu, Fe, Mg, Mn, P, K, Na, Zn)  Metal Contaminants (As, Pb, Cu, Sn, Zn, Hg, Cd, Sb)	In-house Method QWI-OF/17-041 (Method A) based on AOAC 984.27 and APHA 3120 B by ICP-OES  In-house Method QWI-OF/17-041 (Method B) based on AOAC 999.11, 986.15 and APHA 3125B by ICP- MS  In-house Method QWI-OF/17-041 (Method C) based on AOAC 999.11, 986.15 and APHA 3120 B, APHA 3112 B by ICP-OES & CV-AAS

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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>
<b>Foods</b>  Dairy products Edible oils, fats and their products Eggs and egg products Fish and fish products Flour and confectionery Food additives and supplements Infant foods Meat, poultry and derived products Non-alcoholic beverages Nuts, fruits and vegetable and derived products	Cr, Ni, Be, Ba, Co, Mo	In-house Method QWI-OF/17-041 (Method B) based on AOAC 999.11, 986.15 and APHA 3125B by ICPMS
Dairy products Edible oils, fats and their products Egg and egg products Essential nutrients, including vitamins Fish and fish products Food additives and supplements Infant foods Meat, poultry and derived products Non-alcoholic beverages Nuts, fruits and vegetables and derived products Sauces, herbs, spices and condiments Sugars and sugar products	Al, Cr, Ni, Be, B, Ba, Co, Mo	In-house Method QWI-OF/17-041 (Method C) based on AOAC 999.11, 986.15 and APHA 3120B, APHA 3112B by ICPOES & CVAAS
Edible Oils, Fats and their products Flour and Confectionery	Tert-Butylhydroquinone (TBHQ) Butylated Hydroxyanisole (BHA) Butylated Hydroxytoluene (BHT)	In-house Method QWI-OF/17-156 using GC-MS
Essential nutrients Food additives and supplements	Amino Acids Profiling Refer Appendix 14	In-house Method QWI-OF/17-147 based on AQC derivatization

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Foods</b>  Cereal, Cereal Products Starch Bread Soft Drink Beverages Milk, Milk Products Malt Malt Products Confection Fruit Products	Vitamin A (Retinol)	In-house Method QWI-OF/17-020 based on British Standard BS EN 12823 – 1: 2000
	Vitamin A (Beta Carotene)	In-house Method QWI-OF/17-065 based on AOAC 941.15
	Vitamin B1	In-house Method QWI-OF/17-018 based on AOAC Method 942.23, 970.65
	Vitamin B2	In-house Method QWI-OF/17-018 based on AOAC Method 942.23, 970.65
	Vitamin B3	In-house Method QWI-OF/17-048 based on JAOAC (2002)
	Vitamin B5	In-house Method QWI-OF/17-049 based on Food Chem (2000)
	Vitamin B6	In-house Method QWI-OF/17-018 based on JFAC (1996)
	Vitamin B7	In-house Method QWI-OF/17-053 based on AOAC 960.46
	Vitamin B9	In-house Method QWI-OF/17-046 based on AOAC 960.46
	Vitamin B12	In-house Method QWI-OF/17-047 based on AOAC 960.46
	Vitamin C	In-house Method QWI-OF/17-008 based on AOAC 967.21
	Vitamin E	In-house Method QWI-OF/17-019 based on British Standard BS EN 12822: 2000 and HPLC
	Vitamin D3	In-house Method QWI-OF/17-066 based on AOAC 995.05

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Foods</b> Brine Sauces Salt of spice	Sodium Chloride (Salt)	In-house Method QWI-OF/17-024 based on AOAC 960.29 Pearson's Composition & Analysis of Food 9 <sup>th</sup> Ed. (1991) pg.14
Soft Drink, Beverages Sauces Confection Sweetening Substances	Sorbic Acid and its Salt Benzoic Acid and its Salt	In-house Method QWI-OF/17-013 based on AOAC 979.08 & Pearson's (1991)
Bird Nest Washing Water Milk, Milk Products	Nitrite	In-house Method QWI-OF/17-069 based on AOAC 993.30
Bird Nest	Nitrite	In-house Method QWI-OF/17-069 based on GB 5009.33-2010 Method 1 and AOAC 993.30
	As, Pb, Cd, Hg, Sb, Sn, Cu	In-house Method QWI-OF/17-041 (Method B) based on AOAC 999.11,986.15 and APHA 3125B by ICPMS
Milk, Milk products Confection	Iodine	In-house Method QWI-OF/17-060 based on JAAS (1998)
Coffee, Beverages Tea, Beverages Soft Drink	Caffeine	In-house Method QWI-OF/17-051 based on AOAC 960.25, AOAC 979.08
Sweetening Substances Fruit Products Washing Water	Sulphur Dioxide/ Sulphite	In-house Method QWI-OF/17-023 Iodometric Titration Method Based on Analytical Chemistry of Food 1 Ed. (1991) Pg. 148
Milk & Milk Products	Fat	In-house Method QWI-OF/17-089 based on GB 5413.3
	Protein	In-house Method QWI-OF/17-091 based on GB 5009.5
	Acidity	In-house Method QWI-OF/17-090 based on GB 5413.34

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Foods</b>  Milk Products	Total Milk Solid	In-house Method QWI-OF/17-077 based on Official Journal of the European Communities 79/1067/EEC
	Non Fat Milk Solid	In-house Method QWI-OF/17-078 based on Official Journal of the European Communities 79/1067/EEC
	Nitrofuran groups (Furaladone, Furazolidone, Nitrofurantoin, Nitrofurazone)	In-house Method QWI-OF/17-101 based on AB Sciex Application Note (LC-MSMS)
	Aflatoxin M1	In-house Method QWI-OF/17-092 based on GB 5413.37 (2010, Method 4) ELISA Method
Milk Powder	Melamine/ Cyanuric Acid	In-house Method QWI-OF/17-097 based on USFDA (LC-MSMS)
Milk and milk products	3-MCPD esters 2-MCPD esters Glycidol esters	In-house Method QWI-OF/17-140 based on AOAC First Action 2018.03 using GC-MS/MS
Dairy Products, Oats	Fructan (Inulin)	In-house Method QWI-OF/17-057 based on AOAC 999.03
	Beta Glucan	In-house Method QWI-OF/17-104 based on AOAC 995.16
Coffee, Cocoa	Ochratoxin A	In-house Method QWI-OF/17-081 based on AOAC 2000.09, AOAC 2008.02 HPLC
Shrimp	Ochratoxin A	In-house Method QWI-OF/17-081 Method E based on AOAC 2000.09 using HPLC

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**SCOPE OF TESTING: CHEMICAL**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
Foods  Water	Acrylamide	In-house Method QWI-OF/17-102 based on AB Sciex Application Note (LC-MSMS)
	Tetracycline, Doxycycline, Chlortetracycline & Oxytetracycline	In-house Method QWI-OF/17-099 based on AB Sciex Application Note (LC-MSMS)
	Malachite green, Leuncomalachite green	In-house Method QWI-OF/17-096 based on AB Sciex Application Note (LC-MSMS)
Beverages Pickled Food	Sodium Cyclamate	In-house Method QWI-OF/17-130 based on AOAC 993.3 using HPLC
Beverages Honey Milk Product	Sucrose Lactose Fructose Galactose Maltose Glucose	In-house Method QWI-OF/17-129 based on AOAC 995.13 using HPLC
Honey and honey products	Free Acidity	In-house Method QWI-OF/17-142 based on AOAC 962.19
	Hydroxy Methyl Furfural (HMF)	In-house Method QWI-OF/17-143 based on AOAC 980.23
	Diatase Activity	In-house Method QWI-OF/17-175 based on AOAC 958.09
	Moisture	In-house Method QWI-OF/17-141 based on AOAC 969.38
Beverage (Cordial, Liqueurs)	Acidity, Total	In-house Method QWI-OF/17-059 based on AOAC 940.15
Food / Beverage	Artificial Color (Qualitative)	In-house Method QWI-OF/17-076 based on Modern Food Analysis (1971)

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**SCOPE OF TESTING: CHEMICAL**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
Foods  Flour	Bromide	In-house Method QWI-OF/17- 093 based on AOAC 993.30 Ion Chromatography Method
Bread & Its Products	Propionic Acid & Its Salts	In-house Method QWI-OF/17-044 based on AOAC 950.35
MSG / Iodized Salt	Potassium Iodide	In-house Method QWI-OF/17-039 based on AOAC 925.56
Fruit & Vegetables	Pesticide Screen (Refer to Appendix 7)	In-house Method QWI-OF/17-098 based on Method AB Sciex (LC-MSMS)
	Carbamates Screen	In-house Method QWI-OF/17-100 based on Method AB Sciex (LC-MSMS)
Food (Starch based Products), Powder	Maleic Acid	In-house Method QWI-OF/17-080 based on Method of Test for Total Amount of Maleic Acid and Maleic Anhydride in Foods, Department of Health, Taiwan (2013) by HPLC- DAD
Food (Fish and Fishery Products, Grain, Fruit Juice)	Monomethyl Arsenic Acid Arsenobeteneine DiMethylarsenic Acid Arsenious Acid As (III) Arsenic Acid As (V) Selenite Se (IV) Selenate Se (VI)	In-house Method QWI-CH/17-085 based on Speciation Analysis Handbook by LC-ICPMS
Food and Feed	Protein/ Nitrogen/ Carbon Protein by calculation	In-house Method QWI-OF/17-119 based on AOAC 972.43
Food, Drink and Cosmetic	Ethanol	In-house Method QWI-OF/17-135 based on AOAC 986.12
	Alcohol (Ethanol)	In-house Method QWI-OF/17-071 based on AOAC 973.23

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**SCOPE OF TESTING: CHEMICAL**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Foods</b>  Canned Food Pickled Food	EDTA	In-house Method QWI-OF/17-082 based on Compendium of Method for Food Analysis, 2003 using HPLC
Peanut & Its Products Cereal and Legumes Grain (Feed)	Aflatoxins, Total	In-house Method QWI-OF/17-050 based on Agraquant ELISA Method
	Aflatoxins B1, B2, G1, G2	In-house Method QWI-OF/17-058 based on AOAC 991.31 & 990.33 HPLC
Potato based product	Acrylamide	In-house Method QWI-OF/17-126 using LC-MSMS
Soy Sauce Oyster Sauce	Sodium Chloride (Salt)	In-house Method QWI-OF/17-083 based on AOAC 935.47
	3-MCPD	In-house Method QWI-OF/17-079 based on Food Control 18 (2007) by GC-MS
Spices and Chili Sauce	Sudan Red I, II, III, IV	In-house Method QWI-OF/17-022 based on FSA (UK) (Method 145B)
	Rhodamine B, Methyl Yellow, Para Red	In-house Method QWI-OF/17-022 based on FSA (Food Standard Agencies) Method 145B
Seafood	Tetracycline, Doxycycline, Chlortetracycline, Oxytetracycline	In-house Method QWI-OF/17-099 Method B based on AB Sciex Application Note using LC-MSMS
	Malachite Green, Leucomalachite Green, Crystal Violet, Leucocrystal Violet	In-house Method QWI-OF/17-096 Method B based on AOAC 2012.25 and AB Sciex Application Note using LC-MSMS

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**SCOPE OF TESTING: CHEMICAL**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
Foods  Seafood Products Fish Shrimp Meat	Methyl Mercury	In-house Method QWI-CH/17-034 based on USEPA 1630
	Chloramphenicol	In-house Method QWI-OF/17-028 based on ELISA Method
	Nitrofurans AOZ, AMOZ	In-house Method QWI-OF/17-029 based on ELISA Method
Shrimp & Seafood	Nitrofurans	In house Method QWI-OF/17-101 using LC-MSMS based on ACA 586 (2007) 336-347
Fish Seafood	Histamine	In-house Method QWI-OF/17-132 based on ELISA Method (Aqua Quant)
Fish	Microplastics	In-house Method QWI-OG/17-071 Using micro-FTIR
		In-house Method QWI-OG/17-072 using Py-GC-MS
Seafood, Oil and Fats	Organochlorine and Organophosphate Pesticides (OCOPs) Refer Appendix 10	In-house Method QWI-OF/17-139 using GC-MS/MS
Bird nest	Sialic Acid	In-house Method QWI-OF/17-137 based on GB30636-2014 using IC
Animal Premixes	Vitamin A and E Acetate	In-house Method QWI-OF/17-136 based on DSM Method using HPLC
	25-Hydroxy Vitamin D3	In-house Method QWI-OF/17-152 based on DSM Method using LC-MS
Food Supplements, Sauces & Beverages	Vitamin C	In-house Method QWI-OF/17-174 using HPAEC
Alcoholic Beverages & Liquid Sanitizer	Methanol Isopropanol Ethanol	In-house Method QWI-OF/17-166 using GC-FID based on AOAC 971.03

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**SCOPE OF TESTING: CHEMICAL**

<b>Materials/ Products Tested</b>	<b>Type of Test/ Properties Measured/ Range of Measurement</b>	<b>Standard Test Methods/ Equipment/ Techniques</b>
Foods  Water Food Food Ingredients	Allergen of Almond	In-house Method QWI-OF/17-107 based on ELISA Method
	Allergen of Egg	In-house Method QWI-OF/17-108 based on ELISA Method
	Allergen of Hazelnut	In-house Method QWI-OF/17-109 based on ELISA Method
	Allergen of Crustacean	In-house Method QWI-OF/17-110 based on ELISA Method
	Allergen of Sesame	In-house Method QWI-OF/17-111 based on ELISA Method
	Allergen of Mustard	In-house Method QWI-OF/17-112 based on ELISA Method
	Allergen of Walnut	In-house Method QWI-OF/17-113 based on ELISA Method
	Allergen of Pistachio	In-house Method QWI-OF/17-114 based on ELISA Method
	Allergen of Fish	In-house Method QWI-OF/17-106 based on ELISA Method
Allergen of Cashew	In-house Method QWI-OF/17-146 based on ELISA Method	
Washing Water Allergen Raw Material	Allergen of Soy	In-house Method QWI-OF/17-085 based on ELISA Method
	Allergen of Gluten	In-house Method QWI-OF/17-086 based on ELISA Method
	Allergen of Peanut	In-house Method QWI-OF/17-087 based on ELISA Method
	Allergen of Milk	In-house Method QWI-OF/17-088 based on ELISA Method

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**SCOPE OF TESTING: CHEMICAL**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Drugs and Pharmaceuticals</b>  Food, Nutraceuticals & Pharmaceutical Products	Conditioning of Stability Study	Conditioning of Stability Study
Pharmaceutical products	Uniformity of Weight	Procedure 5.2 Uniformity of Mass based on The International Pharmacopoeia 4 <sup>th</sup> edition
Tablets and Capsules	Disintegration	In-house Method QWI-OF/17-105 based on BP 2010
Health Supplement	Collagen	In-house Method QWI-OF/17-117 using LC-MS
Traditional Medicine	Arsenic Cadmium Lead Mercury Copper	In-house Method QWI-OF/17-041 (Method B) based on AOAC 999.11, 986.15 and APHA 3125B by ICP-MS
Oil	Total Polar Compound	In-house Method QWI-OF/17-073 based on AOCS Cd 20-91 and Pure Appl. Chem., Vol. 72 (2000)
	Aromatic Hydrocarbons (PAHs) Refer to Appendix 11	In-house Method QWI-OF/17-138 using GC-MS/MS
Oil Products	Lipid Composition: Monoglycerides Diglycerides	In-house Method QWI-OF/17-068 based on AOCS Cd 11b-91
Oil and Fat	Free Fatty Acids	In-house Method QWI-OF/17-121 based on AOCS Ca 5a-40
	Anisidine Value	In-house Method QWI-OF/17-122 based on AOCS Cd 18-90

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**SCOPE OF TESTING: CHEMICAL**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
Drugs and Pharmaceuticals  Oil and Fat	Peroxide Value	In-house Method QWI-OF/17-123 based on AOCS Cd 8-53
	2-MCPD esters, 3-MCPD esters and glycidyl esters	In-house Method QWI-OF/17-133 based on AOCS Cd 29a-13  In-house Method QWI-OF/17-134 based on AOCS Cd 29b-13
	3-MCPD esters and glycidyl esters	In-house Method QWI-OF/17-131 based on AOCS Cd 29c-13
Edible Oil	Total Chloride	In-house Method QWI-OF/17-163 based on ASTM D4929-19 B
	Mineral Oil Saturated Hydrocarbons (MOSH) / Mineral Oil Aromatic Hydrocarbons (MOAH)	In-house Method QWI-OF/17-176 based on DIN EN 16995:2017
	3-MCPD esters, 2-MCPD esters and glycidyl esters	In-house Method QWI-OF/17-179 based on ISO 18363-4
Medical Devices	Ethylene Oxide (ETO), Ethylene Chlorohydrin (EC) and Ethylene Glycol (EG)	In-house Method QWI-OF/17-150 based on ISO 10993-7 using GC-FID
Sartan (Active Pharmaceutical Ingredient & Drug Products)	N-Nitrosodimethylamine (NDMA) N-Nitrosomethylethylamine (NMEA) N-Nitrosodiethylamine (NDEA) N-Nitrosodi-n-butylamine (NDBA) N-Nitrosodiisopropylamine (NDIPA)	In-house Method QWI-OG/17-064 using GC-MSMS based on USFDA 04/19/2019
Metformin (Active Pharmaceutical Ingredient & Drug Products)	N-Nitrosodimethylamine (NDMA) N-Nitrosodiethylamine (NDEA)	In-house Method QWI-OG/17-067 using LC-MSMS based on USFDA 06/03/2020
	N-Nitrosodimethylamine (NDMA) N-Nitrosodiethylamine (NDEA)	In-house Method QWI-OG/17-060 using GC-MSMS based on HSA PHARM NDMA EX_GC Ver 002
Cosmetic & Pharmaceutical Products	Total Mercury	In-house Method QWI-OF17-164 based on USEPA 7473

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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>
<b>Petroleum &amp; Petroleum Products</b>  Lubricant Oil Includes Petrol Engine Oil Diesel Engine & Marine Engine Oil Gas Engine Oil Hydraulic/ Transmission Oil Turbine Oil Gear/Gearbox Oil Differential/Final Drive and Transmission Oil Refrigeration Compressor Oil Air Compressor Oil Grease	Metal (ICP) - Al, Cr, Cu, Fe, Pb, Sn, Si, Mg, Mo, B, Na, K, Ca, Zn, P, Ni	In-house Method QWI-WC/17-004 based on ASTM D5185-13 by ICP-AES
Diesel Engine Marine Engine Oil Gas Engine Oil	Kinematic Viscosity @ 40 °C & 100 °C	ASTM D7042-16e <sup>2</sup>
	Total Base Number	ASTM D2896-15 (Method B)
Diesel Engine Marine Engine Oil	Flash Point	ASTM D93-16a (Procedure A)
<b>Petroleum &amp; Petroleum Products</b>  Petrol Engine Oil Gas Engine Oil Hydraulic / Transmission Oil Turbine Oil Differential/Final Drive Transmission Oil Refrigeration Compressor Oil Air Compressor Oil	Kinematic Viscosity @ 40 °C	ASTM D7042-16e <sup>2</sup>
Gas Engine Oil	Viscosity Index	ASTM D2270-10 (Reapproved 2016)
Turbine Oil Air Compressor Oil Gas Engine Oil	Total Acid Number	ASTM D664-17 (Method A)

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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
<b>Environmental Monitoring &amp; Water</b>  Sea Water River Water Ground Water Waste Water Drinking Water Surface Water	pH Measurement (In-Situ)	In-house Method QWI-SP/21- 017 based on APHA 4500- H <sup>+</sup> B, 21 <sup>st</sup> Edition
	Temperature Measurement (In-Situ)	In-house Method QWI-SP/21- 018 based on APHA 2550, 21 <sup>st</sup> Edition
	Dissolved Oxygen Measurement (In-Situ)	In-house Method QWI-SP/21- 019 based on APHA 4500-O G, 21 <sup>st</sup> Edition
	Conductivity Measurement (In-Situ)	In-house Method QWI-SP/21- 020 based on APHA 2510 B, 21 <sup>st</sup> Edition
<b>Environmental Monitoring</b>  Stationary Air Emission	Sample and Velocity Traverses	USEPA 1
	Stack Gas Velocity Volumetric Flow Rate	USEPA 2
	Dry Molecular Weight (Oxygen and Carbon Dioxide)	USEPA 3A
	Moisture Content	USEPA 4
	Particulate Emission	USEPA 5
	Sulfur Dioxide	USEPA 6C
	Nitrogen Oxide	USEPA 7E
	Sulfuric Acid and Sulfur Dioxide	USEPA 8
<b>Environmental Monitoring</b>  Stationary Air Emission	PCDDs and PCDF Dioxin and Furan (Sampling)	USEPA 23A
	Hydrogen Halide and Halogen	USEPA 26A
	Metals Emission	USEPA 29

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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  Stationary Air Emission	Volatile Organic Compounds (Sampling)	In-house Method QWI-SP/21- 027 based on USEPA 30
	Ammonia (NH <sub>3</sub> )	In-house Method QWI-SP/21- 026 based on CTM 0027
Ambient Air	Dust particulates (TSP, PM10, PM2.5)	In-house method QWI-SP/21- 021 based on 40 CFR part 50, Appendix J & L
Soil	Rapid On-Site Total Petroleum Hydrocarbon Measurement (RemScan)	In-house Method QWI-SP/21- 022 based on RemScan Operation Manual and RemScan ISO 14034 Verification Statement
Stationery Stack Emission	Particulate Matter	MS1596:2003

## Note:

APHA - Standard Methods for the Examination of Water and Wastewater, 19<sup>th</sup> Edition (1995), 20<sup>th</sup> Edition (1998) and  
21<sup>st</sup> Edition (2005)FDA - Food and Drugs Administration - Bacteriological Analytical Manual, 8<sup>th</sup> Edition (1995)AOAC - Association of Official Analytical Chemists, 16<sup>th</sup> Edition (1995)

ASTM - American Society for Testing and Material

USEPA - United States Environmental Protection Agency

OSHA - Occupational Safety Health Administration

NIOSH - National Institute of Occupational Safety and Health

**Signatories:**

- |                             |  |
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**SCOPE OF TESTING: GMO & NUCLEIC ACID**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
Food	GMO Screening	In-house Method QWI-NA/17-002 based on Real Time PCR Technology
	Porcine DNA	In-house Method QWI-NA/17-001 based on Real Time PCR Technology
Food and Food Related Product	Porcine DNA	In-house Method QWI-NA/17-011 using Ultra-fast Real-Time PCR
	Salmonella ( <i>Salmonella</i> spp.) DNA	In-house Method QWI-NA/17-012 using Ultra-fast Real-Time PCR
	Listeria ( <i>Listeria Monocytogens</i> ) DNA	In-house Method QWI-NA/17-013 using Ultra-fast Real-Time PCR
Shrimp	White Spot Syndrome Virus (WSSV) DNA	In-house Method QWI-NA/17-007 using Real-Time PCR with IQReal WSSV detection kit
	Taura Syndrome Virus (TSV) RNA	In-house Method QWI-NA/17-008 using Real-Time PCR with IQReal TSV detection kit
	Yellow Head Disease Virus (YHV) RNA	In-house Method QWI-NA/17-009 using Real-Time PCR with IQReal YHV detection kit
	Infectious Myonecrosis Virus (IMNV) RNA	In-house Method QWI-NA/17-010 using Real-Time PCR with IQReal IMNV detection kit
Fish	Spring Viraemia of Carp Virus (SVCV) DNA	In-house Method QWI-NA/17-014 using Real-Time PCR with IQReal SVCV detection kit

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**SCOPE OF TESTING: GMO & NUCLEIC ACID**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
Meat Gelatine Collagen	Bovine DNA	In-house Method QWI-NA/17-018 based on RT-qPCR Method
Meat Milk	Buffalo DNA	In-house Method QWI-NA/17-017 based on RT-qPCR Method
Saliva	Microarray Processing	In-house Method QWI-NA/17-015 based on Illumina Infinium HTS Assay
Hard surfaces Food packaging Food	Nucleic acid of SARS-CoV-2 virus	In-house Method QWI-NA/17-021 based on RT-qPCR Method
Air	Nucleic acid of SARS-CoV-2 virus	In-house Method QWI-NA/17-028 based on RT-qPCR Method
Water Food Food Ingredients	Nucleic acid of Decapod iridescent virus 1	In-house Method QWI-NA/17-030 based on RT-qPCR Method
	Nucleic acid of infectious hypodermal and hematopoietic necrosis virus	In-house Method QWI-NA/17-029 based on RT-qPCR Method
	Nucleic acid of acute hepatopancreatic necrosis disease	In-house Method QWI-NA/17-031 based on RT-qPCR Method
	Nucleic acid of enterocytozoon hepatopenaei	In-house Method QWI-NA/17-032 based on RT-qPCR Method
	Nucleic acid of Salmonella spp.	In-house Method QWI-NA/17-033 based on RT-qPCR Method
	Nucleic acid of Listeria spp.	In-house Method QWI-NA/17-034 based on RT-qPCR Method

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**SCOPE OF TESTING: GMO & NUCLEIC ACID**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
Water	Nucleic acid of adenovirus	In-house Method QWI-NA/17-035 based on RT-qPCR Method
	Nucleic acid of rotavirus	In-house Method QWI-NA/17-036 based on RT-qPCR Method
	Nucleic acid of norovirus	In-house Method QWI-NA/17-037 based on RT-qPCR Method
	Nucleic acid of SARS-CoV-2 virus	In-house Method QWI-NA/17-023 based on RT-qPCR Method
Environmental swabs	Nucleic acid of <i>Salmonella</i> spp.	In-house Method QWI-NA/17-033 based on RT-qPCR Method
	Nucleic acid of <i>Listeria</i> spp.	In-house Method QWI-NA/17-034 based on RT-qPCR Method
Plasticware	Nuclease	In-house Method QWI-NA/17-038 based on Substrate Nuclease Method
Cell culture Pharmaceutical products	Mycoplasma	In-house Method QWI-NA/17-044 based on qPCR Method

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- |                                   |                |                                   |
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| 3. Nurnadira Binti Abdul Rashid   | MJMM No.: 0290 | (Food Microbiology, GMO, Porcine) |
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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>
Sea Water Marine Water & Fresh Water	Zooplankton	In-house Method QWI-BI/17-001 based on APHA 10200 G (23 <sup>rd</sup> Edition, 2017)
Marine Water & Fresh Water	Phytoplankton	In-house Method QWI-BI/17-002 based on APHA 10200 F (23 <sup>rd</sup> Edition, 2017)

**Signatory:**

- Yee Yoke Sim**

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**SCOPE OF TESTING: MICROBIOLOGY**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Microbiological environmental sample</b>  Water	Heterotrophic Plate Count/ Total Plate Count	APHA 9215 B (Pour Plate Technique)
Waste Water Potable Water Drinking Water Industrial Water	Total Coliform Count	APHA 9221 B (Fermentation Technique)  APHA 9222 B (Membrane Filtration Technique)
	Total Faecal Coliform Count	APHA 9221 E (Fermentation Technique)  APHA 9222 D (Membrane Filtration Technique)
	<i>Pseudomonas aeruginosa</i>	In-house Method QWI-MB/17-055 based on APHA 9213 E (Membrane Filtration Technique)
	Fecal Streptococci	In-house Method QWI-MB/17-060 based on APHA 9230 B (Fermentation Technique)
	<i>Legionella</i> spp. <i>Legionella pneumophila</i>	APHA 9260 J
	Total Coliform Count	In-house Method QWI-MB/17-025 based on APHA 9222 B (Membrane Filtration Technique)
	Total <i>Escherichia coli</i> Count	In-house Method QWI-MB/17-022 based on APHA 9222 D (Membrane Filtration Technique)

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**SCOPE OF TESTING: MICROBIOLOGY**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Microbiological environmental sample</b>  Drinking Water	<i>Escherichia coli</i>	In-house Method QWI-MB/17-059 based on APHA 9221 E (Fermentation Technique)
	Faecal Streptococci	In-house Method QWI-MB/17-023 based on APHA 9230 C (Membrane Filtration Technique)
	Sulfite-reducing Anaerobes	ISO 6461-2:1986
	<i>Clostridium perfringens</i>	ISO 14189:2013
Reverse Osmosis Water	Total Plate Count	APHA 9215 D (Membrane Filtration Technique)
	Endotoxin	USP <85> Bacterial Endotoxins Test (Kinetic-Turbidimetric Technique) (2012)
Sea Water Ground Water Waste Water River Water Surface Water Soil, Sludge	Acute Toxicity Screening	In-house Method QWI-MB/17-092 based on Microtox™ System
Marine Water Drinking Water	Total Coliforms	APHA 9223 B (Colilert®, Multi well Procedure)
	<i>Escherichia coli</i>	APHA 9223 B (Colilert®, Multi well Procedure)
	Faecal Coliforms	APHA 9223 B (Colilert-18®, Multi well Procedure)
	<i>Enterococci</i>	APHA 9230 D (Enterolert®, Multi well Procedure)

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**SCOPE OF TESTING: MICROBIOLOGY**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Microbiological environmental sample</b>  Environmental Air Sampling	Bioaerosol Test: Total Plate Count Total Yeast and Mold Count	In-house Method QWI-MB/17-007 based on NIOSH Manual Analytical Method, Method 0800, 4 <sup>th</sup> Ed. (1995)
	Settle Plate Test: Total Plate Count Total Yeast and Mold Count Coliform <i>Escherichia coli</i>	In-house Method QWI-MB/17-080 based on Compendium of Methods for Microbiological Examination of Foods, 5 <sup>th</sup> Edition, 2015, Chapter 3
Environmental Swabs	<i>Salmonella</i> spp.	ISO 6579-1:2017
	<i>Salmonella</i> spp. (Rapid Method)	AOAC 2016.01 (3M™ Molecular Detection Assay 2- <i>Salmonella</i> ) (2019)
	<i>Salmonella</i> spp. (Rapid Method)	In-house Method QWI-MB/17-100 based on ELISA method
	<i>Enterobacteriaceae</i> Detection	ISO 21528-1:2017
	<i>Enterobacteriaceae</i> Count	ISO 21528-2:2017
	<i>Listeria</i> spp. (Rapid Method)	AOAC 2016.07 (3M™ Molecular Detection Assay 2- <i>Listeria</i> ) (2019)
	<i>Cronobacter</i> spp. (Rapid Method)	AOAC 2018.01 (3M™ Molecular Detection Assay 2- <i>Cronobacter</i> ) (2021)
	<i>Cronobacter</i> spp.	ISO 22964: 2017  GB 4789.40- 2016

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**SCOPE OF TESTING: MICROBIOLOGY**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<p><b>Microbiological environmental sample</b>  Surface, Equipment and Personnel Hand</p>	<p>Swab Test: Total Plate Count Total Yeast and Mold Count Coliform Count <i>E. coli</i> Count <i>Staphylococcus aureus</i> <i>Enterobacteriaceae</i> <i>Salmonella</i> spp. <i>Cronobacter</i> spp. (<i>Enterobacter sakazakii</i>) <i>Listeria</i> spp. <i>Listeria monocytogenes</i></p>	<p>In-house Method QWI-MB17-081 based on Compendium of Methods for Microbiological Examination of Foods, 5<sup>th</sup> Edition, 2015, Chapter 3</p>
<p>Surface ATP Swab</p>	<p>ATP</p>	<p>In-house Method QWI-MB/17-109 based on 3M Clean-Trace Surface ATP Swab Technique</p>

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**SCOPE OF TESTING: MICROBIOLOGY**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
Microbiological tests on foods  Food and Food Related Products	<i>Cronobacter</i> spp. ( <i>Enterobacter sakazakii</i> )	In-house Method QWI-MB/17-051 based on ISO/TS 22964 (2005)
	<i>Listeria</i> spp. <i>Listeria monocytogenes</i>	FDA-BAM Online, Chapter 10 (2022)
	Total <i>Enterobacteriaceae</i> Count	AOAC 2003.01 (Petrifilm Method) (2006)
	<i>Staphylococcus aureus</i>	In-house Method QWI-MB/17-073 based on DIN EN ISO 6888-1 and 6888-2 (1999)
	<i>Bacillus cereus</i>	In-house Method QWI-MB/17-074 based on ISO 7932 (1993)
	<i>Clostridium perfringens</i>	In-house Method QWI-MB/17-075 based on CEN 13401(1999)
	<i>Enterobacteriaceae</i>	In-house Method QWI-MB/17-076 based on ISO 8523 (1991)
	Total <i>Escherichia coli</i> Count	In-house Method QWI-MB/17-077 based on ISO 8523 (1991), ISO 4831(1991), ISO 7251 (1993)
	Aerobic Mesophilic Count	ISO 4833-1:2013
	Total Yeast and Mold Count	AOAC 2014.05 (3M™ Petrifilm Rapid Yeast and Mold) (2022)
	<i>Salmonella</i> spp. (Rapid Method)	AOAC 2016.01 (3M™ Molecular Detection Assay 2 - Salmonella) (2019)
Total Yeast and Mould Count	In-house Method QWI-MB/17-155 based on CompactDry YMR	
Food and Food Product	<i>Salmonella</i> spp.	ISO 6579-1:2017
	<i>Enterobacteriaceae</i> Count	ISO 21528-2:2017

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Microbiological tests on foods</b>  Food	<i>Salmonella</i> spp. (Rapid Method)	In-house Method QWI-MB/17-100 based on ELISA Method
	<i>Shigella</i> spp.	Compendium of Methods for The Microbiological Examination of Foods, 5 <sup>th</sup> Edition, 2015, Chapter 37
	<i>Bacillus cereus</i>	FDA-BAM Online, Chapter 14 (2020), (Spread Plate Technique)
	Aerobic Plate Count/ Total Plate Count	AOAC 990.12 (Petrifilm Method) (2002)
	Total <i>Escherichia coli</i> count and Total Total Coliform count	AOAC 991.14 (Petrifilm Method) (2002)
	Total Yeast and Mold count	AOAC 997.02 (Petrifilm Method) (2002)
Milk and Milk Product Special Purpose Food	<i>Cronobacter</i> spp. (Rapid Method)	AOAC 2018.01 (3M™ Molecular Detection Assay 2-Cronobacter) (2021)
	<i>Cronobacter</i> spp.	ISO 22964:2017 GB 4789.40-2016
Confection Milk and Milk Product Special Purpose Food Vegetable and Vegetable Product	<i>Listeria</i> spp. (Rapid Method)	AOAC 2016.07 (3M™ Molecular Detection Assay 2-Listeria) (2019)
Confection Meat and Meat Product Milk and Milk Product Salt and Spice Special Purpose Food Tea, Coffee, Chicory and Related Product	<i>Clostridium perfringens</i>	ISO 7937:2004

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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>
<b>Microbiological tests on foods</b>  Cereal, Cereal Product, Starch and Bread Cocoa and Cocoa Product Meat and Meat Product Poultry and Poultry Product Special Purpose Food	Coagulase-positive <i>Staphylococci</i>	ISO 6888-1:1999/Amd.2:2018
Cereal, Cereal Product, Starch and Bread Cocoa and Cocoa Product Confection Meat and Meat Product Milk and Milk Product Poultry and Poultry Product Special Purpose Food	<i>Enterobacteriaceae</i> Detection	ISO 21528-1:2017
Milk Milk products Sauces Confectionery	Coagulase-positive Staphylococci Detection	ISO 6888-3:2003
Milk Milk products Vitamin premix	Sulphite-reducing Bacteria (Clostridia) Count	ISO 15213:2003
Dairy products, Nutritional supplements, Sauces, Sweetening substance	Aerobic Plate Count  Total Coliform Count  Total Coliform Count  Total Yeast and Mould Count  <i>Salmonella</i> spp.  <i>Staphylococcus aureus</i> Count	GB 4789.2-2016  GB 4789.3-2016 (Method I – MPN)  GB 4789.3-2016 (Method II – Plate Count)  GB 4789.15-2016  GB 4789.4-2016  GB 4789.10-2016 (Method II-Plate Count)

**NO: SAMM 147**(Issue 6, 25 September 2023 replacement  
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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Microbiological tests on pharmaceutical and cosmetics</b>  Pharmaceutical Products/ Traditional Medicines/ Toiletries	Total Aerobic Microbial Count Total Yeast and Mold Count <i>Candida albicans</i> Bile Tolerant Gram Negative Bacteria <i>Escherichia coli</i> <i>Staphylococcus aureus</i> <i>Pseudomonas aeruginosa</i> <i>Salmonella</i> spp.	BP 2021
Pharmaceutical products, Toiletries, Cosmetics	Burkholderia cepacia	USP<60>(USP-NF 2021, Issue 1)
Food and Toiletries	Total Plate Count	FDA-BAM Online, Chapter 3 (2001) (Pour Plate Technique)
	<i>Staphylococcus aureus</i>	FDA-BAM Online, Chapter 12 (2016) (Spread Plate Technique)
	Total Coliform Count	FDA-BAM Online, Chapter 4 (2017) (MPN Technique)
	Total <i>Escherichia coli</i> Count	FDA-BAM Online, Chapter 4 (2017) (MPN Technique)
	Total Yeast and Mold Count	FDA-BAM Online, Chapter 18 (2001) (Spread Plate Technique)
	<i>Salmonella</i> spp.	FDA-BAM Online, Chapter 5 (2022)

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**SCOPE OF TESTING: MICROBIOLOGY**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Medical devices</b>	Biological Indicator Sterility Test	In-house Method QWI-MB/17-070
	Endotoxin	USP <85> Bacterial Endotoxins Test (Kinetic- Turbidimetric Technique) (2012)
	Bioburden Test	ISO 11737-1:2018/Amd 1:2021
	Sterility Test	ISO 11737-2:2019
	Sterility Test	USP <71> (2020)
	Bacteriostasis and Fungistasis Test (Method Suitability Test)	In-house Method QWI-MB/17-005 based on USP <71>, ISO 11737-2
Biological Indicators	Biological Indicator Population Count	In-house Method QWI-MB/17-131 based on USP <55>, ISO 11138- 1:2017

**Notes:**

AOAC - Association of Official Analytical Chemists  
 APHA - American Public Health Association, 23<sup>rd</sup> Edition (2017)  
 BP - British Pharmacopoeia  
 FDA-BAM - Food and Drug Administration – Bacteriological Analytical Manual  
 GB - China GuoBiao Standards  
 ISO - International Organization for Standardization  
 USP - United States Pharmacopoeia

**Signatories:**

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| 1. | <b>Lee Su Ann</b>                   | <b>MJMM No.: 0288</b>  |
| 2. | <b>Siti Aisha Binti Abd. Aziz</b>   | <b>MJMM No.: 0289</b>  |
| 3. | <b>Dr. Ch'ng Ai Ying</b>            | <b>MJMM No.: 0120</b>  |
| 4. | <b>Nurnadira Binti Abdul Rashid</b> | <b>MJMM No.: 0290</b>  |
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**SCOPE OF TESTING: MECHANICAL****SITE: CATEGORY I**

<b>Materials/ Products Tested</b>	<b>Type of Test/ Properties Measured/ Range of Measurement</b>	<b>Standard Test Methods/ Equipment/ Techniques</b>
Vibration	Structural Vibration Monitoring Peak Particle Velocity (PPV): 0.12 mm/s to 10 mm/s Frequency: > 100Hz	In-house Method QWI-SP/21-016 based on DIN 4150-3:2017 Method for Vibration (Minimate Plus Seismograph)
Noise	Noise level measurement (25 – 130dB) L <sub>eq</sub> L <sub>min</sub> L <sub>max</sub> L <sub>10</sub> L <sub>50</sub> L <sub>90</sub>	In-house Method QWI-SP/21-015 based on ISO 1996-1:2016

**Signatories:**

1. Nazirah Binti Ariffin                      **MMIC No.:M/3878/6603/13**
2. Norain Binti Yahya                        **MMIC No.:M/4233/7042/15**



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**SCOPE OF TESTING: ~~CHEMICAL~~**

**SITE: CATEGORY II**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Water</b>  Ground water River water Waste water Sea water	pH	APHA 4500-H <sup>+</sup> B
	Biochemical Oxygen Demand (BOD)	APHA 5210-B
	Chemical Oxygen Demand (COD)	APHA 5220-D
	Total Suspended Solids	APHA 2540-D
	Total Dissolved Solids	APHA 2540-C
	Conductivity	APHA 2510-B
	Nitrite	APHA 4500-NO <sup>2-</sup> B
	Oil & Grease	APHA 5520-B
	Turbidity	APHA 2130-B
	Color	APHA 2120-B
	Free Chlorine	APHA 4500-Cl-G
	Salinity	APHA 2520-B
	Dissolved Oxygen	APHA 4500-O-G
	pH Measurement (In-Situ)	In-house Method QWI-SP/21-017 based on APHA 4500-H <sup>+</sup> B, 21 <sup>st</sup> Edition
	Temperature Measurement (In-Situ)	In-house Method QWI-SP/21-018 based on APHA 2550, 21 <sup>st</sup> Edition
Dissolved Oxygen Measurement (In-Situ)	In-house Method QWI-SP/21-019 based on APHA 4500-O-G, 21 <sup>st</sup> Edition	
Conductivity Measurement (In-Situ)	In-house Method QWI-SP/21-020 based on APHA 2510-B, 21 <sup>st</sup> Edition	

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**SITE: CATEGORY II**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Water</b>  Ground water River water Waste water	Total Solids	APHA 2540-B
Sea water	Chlorophyll - a	APHA 10200-H
<b>Environmental Monitoring</b>  Waste water	Mixed Liquor Suspended Solids (MLSS)	In-house Method QWI-CH/17-79 based on APHA 2540-D & 2540-E
Stationery Air Emission	Sample and Velocity Traverses	USEPA-1
	Stack Gas Velocity Volumetric Flow Rate	USEPA-2
	Dry Molecular Weight (Oxygen and Carbon Dioxide)	USEPA-3A
	Moisture Content	USEPA-4
	Particulate Emission	USEPA-5
	Sulfur Dioxide Nitrogen Oxide Carbon Monoxide	In-house Method QWI-SP/21-029 based on Testo 350 Flue gas analyzer manual

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**Signatories:**

- |    |                              |                                    |
|----|------------------------------|------------------------------------|
| 1. | <b>Dr. Chin Teen Teen</b>    | <b>FMIC No.: F/0126/2772/97/20</b> |
| 2. | <b>Nazirah Binti Ariffin</b> | <b>MMIC No.: M/3878/6603/13</b>    |
| 3. | <b>Norain Binti Yahya</b>    | <b>MMIC No.: M/4233/7042/15</b>    |

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**SCOPE OF TESTING: MICROBIOLOGY**

**SITE: CATEGORY II**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Microbiological environmental sample</b>  Ground water River water Waste water Sea water	Total Coliform Count	In-house Method QWI-MB/17-25 based on APHA 9222-B
	Total <i>Escherichia coli</i> Count	In-house Method QWI-MB/17-22 based on APHA 9222-D
	Total Faecal Coliform Count	APHA 9222-D
	Fecal Streptococci/Enterococci	In-house Method QWI-MB/17-23 based on APHA 9230-C
<b>Microbiological tests on foods</b>  Food and food related products	Aerobic Plate Count	AOAC 990.12 (Petrifilm Method) (2002)
	Total <i>Escherichia coli</i> Count and Total Coliform Count	AOAC 991.14 (Petrifilm Method) (2002)

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**Signatories:**

- |    |                                     |                       |
|----|-------------------------------------|-----------------------|
| 1. | <b>Lee Su Ann</b>                   | <b>MJMM No.: 0288</b> |
| 2. | <b>Siti Aisha Binti Abd. Aziz</b>   | <b>MJMM No.: 0289</b> |
| 3. | <b>Dr. Ch'ng Ai Ying</b>            | <b>MJMM No.: 0120</b> |
| 4. | <b>Nurnadira Binti Abdul Rashid</b> | <b>MJMM No.: 0290</b> |

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**LABORATORY LOCATION:**  
(BRANCH LABORATORY)

**ALS TECHNICHEM (M) SDN. BHD.**  
**NO.12 A, PERSIARAN MUTIARA 1**  
**PUSAT KOMERSIAL BANDAR TASEK MUTIARA**  
**14120 SIMPANG AMPAT**  
**PULAU PINANG**  
**MALAYSIA**

**SCOPE OF TESTING: MICROBIOLOGY**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Microbiological tests on foods</b>  Food and food related products	Aerobic Plate Count	FDA-BAM Online, Chapter 3 (2001) (Pour Plate Technique)
	Total Yeast and Mold Count	FDA-BAM Online, Chapter 18 (2001) (Spread Plate Technique)
	Total Coliform Count	FDA-BAM Online, Chapter 4 (2017) (MPN Technique)
	Total <i>Escherichia coli</i> Count	FDA-BAM Online, Chapter 4 (2017) (MPN Technique)
	<i>Staphylococcus aureus</i> Count	FDA-BAM Online, Chapter 12 (2016) (Spread Plate Technique)
	<i>Salmonella</i> spp.	FDA-BAM Online, Chapter 5 (2022)
	<i>Listeria</i> spp. <i>Listeria monocytogenes</i> Detection	FDA-BAM Online, Chapter 10 (2022)
<b>Microbiological environmental sample</b>  Environmental Swabs	<i>Salmonella</i> spp.	FDA-BAM Online, Chapter 5 (2022)
	<i>Listeria</i> spp. <i>Listeria monocytogenes</i> Detection	FDA-BAM Online, Chapter 10 (2022)

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**SCOPE OF TESTING: MICROBIOLOGY**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Microbiological environmental sample</b>  Natural Water Potable Water Drinking Water	Heterotrophic Plate Count / Total Plate Count	APHA 9215 B (Pour Plate Technique)
	Total Coliform Count	APHA 9221 B (Fermentation Technique)
	Total Coliform Count	In-house Method QWI-MB/17-25 based on APHA 9222 B (Membrane Filtration Technique)
	<i>Escherichia coli</i>	In-house Method QWI-MB/17-59 based on APHA 9221 E (Fermentation Technique)
	<i>Escherichia coli</i>	In-house Method QWI-MB/17-22 based on APHA 9222 D (Membrane Filtration Technique)
	<i>Fecal Enterococci / Streptococci</i>	In-house Method QWI-MB/17-23 based on APHA 9230 C (Membrane Filtration Technique)
	<i>Pseudomonas aeruginosa</i>	In-house Method QWI-MB/17-55 based on APHA 9213 E (Membrane Filtration Technique)

Notes:

APHA - American Public Health Association, 23<sup>rd</sup> Edition (2017)**Signatories:**

- Mathan A/L Kalimuthu**                      **MJMM No.: 1026**
- Lee Su Ann**                                      **MJMM No.: 0288**      **(Non- Resident)**
- Siti Aisha Binti Abd Aziz**                      **MJMM No.: 0289**      **(Non-Resident)**

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**SCOPE OF TESTING: CHEMICAL**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/ Techniques
<b>Environmental Monitoring</b>  Waste water River water Ground water Sea water	Biochemical Oxygen Demand	APHA 5210 B
	pH	APHA 4500-H <sup>+</sup> B
	Conductivity	APHA 2510 B
	Total Dissolved Solids	APHA 2540 C
	Total Suspended Solids	APHA 2540 D
	Oil & Grease	APHA 5520 B

**Signatories:**

- Natasha Ain Binti Jamian** LMIC No.: L/2509/7481/16
- Nazirah Binti Ariffin** MMIC No.: M/3878/6603/13 (Non- Resident)

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**APPENDIX 1****TABLE 1: VOLATILE ORGANIC COMPOUND (VOC)**

1. 1,1,1,2-Tetrachloroethane	36. Chloroethane
2. 1,1,1-Trichloroethane	37. Chloroform
3. 1,1,2,2-Tetrachloroethane	38. Chloromethane
4. 1,1,2-Trichloroethane	39. cis-1,3-Dichloropropylene
5. 1,1-Dichloroethane	40. cis-1,4-Dichloro-2-butene
6. 1,1-Dichloroethene	41. Dibromochloromethene
7. 1,1-Dichloropropylene	42. 1,2 - Dibromomethane
8. 1,2,3-Trichlorobenzene	43. Dichlorodifluoromethane
9. 1,2,3-Trichloropropane	44. Ethylbenzene
10. 1,2,4-Trichlorobenzene	45. Hexachlorobutadiene
11. 1,2,4-Trimethylbenzene	46. Iodomethane
12. 1,2-Dibromo-3-chloropropane	47. Isopropylbenzene
13. 1,2-Dibromoethane	48. meta- & para-Xylene
14. 1,2-Dichlorobenzene	49. Methylene chloride
15. 1,2-Dichloroethane	50. Naphtalene
16. 1,2-Dichloropropane	51. N-Butylbenzene
17. 1,3,5-Trimethylbenzene	52. n-Propylbenzene
18. 1,3-Dichlorobenzene	53. ortho-Xylene
19. 1,3-Dichloropropane	54. Pentachloroethane
20. 1,4-Dichlorobenzene	55. P-Isopropyltoluene
21. 2,2-Dichloropropane	56. sec-Butylbenzene
22. 2-Butanone (MEK)	57. Styrene
23. 2-Chlorotoluene	58. Tert-Butylbenzene
24. 2-Hexanone (MBK)	59. Tetrachloroethene
25. 2-Propanone (Acetone)	60. Toluene
26. 4-Chlorotoluene	61. Trans-1,2-Dichloroethene
27. 4-Methyl-2-pentanone (MIBK)	62. trans-1,3-Dichloropropylene
28. Benzene	63. trans-1,4-Dichloro-2-butene
29. Bromobenzene	64. Trichloroethene
30. Bromodichloromethane	65. Trichlorofluoromethane
31. Bromoform	66. Vinyl acetate
32. Bromomethane	67. Vinyl chloride
33. Carbon disulfide	68. cis-1,2-Dichloroethene
34. Carbon tetrachloride	69. Methyl-t-butyl ether
35. Chlorobenzene	70. n-Hexane
	71. 1,4- Dioxane

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**APPENDIX 2****TABLE 2: SEMIVOLATILE ORGANIC COMPOUND (SVOC)**

1. 1,2-Dichlorobenzene	48. Bis (2-ethylhexyl) phthalate	97. N-Nitrosodibutylamine
2. 1,2,4-Trichlorobenzene	49. Butyl benzyl phthalate	98. N-Nitrosodiethylamine
3. 1,3,5-Trinitrobenzene	50. Carbazole	99. N-Nitrosodi-n-propylamine
4. 1,3-Dichlorobenzene	51. Chlorfenvinphos-E	100. N-Nitrosomethylethylamine
5. 1,4-Dichlorobenzene	52. Chlorfenvinphos-Z	101. N-Nitrosomorpholine
6. 1-Naphthylamine	53. Chlorobenzilate	102. N-Nitrosopiperidine
7. 2,4,5-Trichlorophenol	54. Chlorpyrifos	103. N-Nitrosopyrrolidine
8. 2,4,6-Trichlorophenol	55. Chlorpyrifos methyl	104. p,p'-DDD
9. 2,4-Dichlorophenol	56. Chrysene	105. p,p'-DDE
10. 2,4-Dimethylphenol	57. cis-Isosafrole	106. p,p'-DDT
11. 2,4-Dinitrotoluene	58. delta-BHC	107. Pentachlorobenzene
12. 2,6-Dichlorophenol	59. Diallate	108. Pentachloronitrobenzene
13. 2,6-Dinitrotoluene	60. Diazinon	109. Pentachlorophenol
14. 2-Chloronaphthalene	61. Dibenz (a,h) anthracene	110. Phenacetin
15. 2-Chlorophenol	62. Dibenzofuran	111. Phenanthrene
16. 2-Methylnaphthalene	63. Dichlorvos	112. Phenol
17. 2-Methylphenol	64. Dieldrin	113. Pirimphos ethyl
18. 2-Nitroaniline	65. Diethyl phthalate	114. Pronamide
19. 2-Nitrophenol	66. Dimethoate	115. Prothiofos
20. 2-Picoline	67. Dimethyl phthalate	116. Pyrene
21. 3,3' Dichlorobenzidine	68. Dimethylaminoazobenzene	117. Safrole
22. 3-Methylchloanthrene	69. Di-n-butyl phthalate	118. trans-isosafrole
23. 3-Nitroaniline	70. Di-n-octyl phthalate	119. 2-Chlorobiphenyl
24. 4-Aminobiphenyl	71. Diphenylamine & NNitrosodiphenylamine	120. 3,3'-Dichlorobiphenyl
25. 4-Bromophenyl phenyl ether	72. Endosulfan 1	121. 2,4,5-Trichlorobiphenyl
26. 4-Chloro-3-methylphenol	73. Endosulfan 2	122. 2,2',4,4'-Tetrachlorobiphenyl
27. 4-Chloroaniline	74. Endosulfan sulfate	123. 2,3',4,5',6'-Pentachlorobiphenyl
28. 4-Chlorophenyl phenyl ether	75. Endrin	124. 2,2',3,3',6,6'-Hexachlorobiphenyl
29. 4-Nitroaniline	76. Ethion	125. 2,2',3,4,5,5',6'-Heptachlorobiphenyl
30. 4-Nitroquinoline-N-oxide	77. Fenthion	126. 2,2',3,3',4,4',5,5'-Octachlorobiphenyl
31. 5-Nitro-o-toluidine	78. Fluoranthrene	127. 2,2',3,3',4,4',5,5',6'-Nonachlorobiphenyl
32. 7,12-Dimethyl benz (a) anthracene	79. Fluorene	128. 2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl
33. Acenaphthylene	80. gamma-BHC	129. 3&4 Methylphenol
34. Acenaphthene	81. Heptachlor	130. Chlordane – trans
35. Acetophenone	82. Heptachlor epoxide	131. Chlordane – cis
36. Aldrin	83. Hexachlorobenzene	132. Methoxychlor
37. alpha-BHC	84. Hexachlorobutadiene	
38. Aniline	85. Hexachlorocyclopentadiene	
39. Anthracene	86. Hexachloroethane	
40. Azobenzene	87. Hexachloropropylene	
41. Benz (a) anthracene	88. Indeno (1,2,3-cd) pyrene	
42. Benzo (a) pyrene	89. Isophorone	
43. Benzo (b) & (k) fluoroanthene	90. Malathion	
44. Benzo (g,h,i) perylene	91. Methanesulfonate ethyl	
45. beta BHC	92. Methanesulfonate methyl	
46. Bis (2-chloroethyl) ether	93. Methapyrilene	
47. Bis (2-chloroethoxy) methane	94. N-2-Fluorenylacetamide	
	95. Naphthalene	
	96. Nitrobenzene	

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**APPENDIX 3****TABLE 3: POLYAROMATIC HYDROCARBONS (PAHs)**

- |     |                                      |
|-----|--------------------------------------|
| 1.  | 2 - Chloronaphthalene                |
| 2.  | 2 - Methylnaphthalene                |
| 3.  | 3 - Methylchloanthrene               |
| 4.  | 7, 12 - Dimethyl benz (a) anthracene |
| 5.  | Acenaphthylene                       |
| 6.  | Acenaphthene                         |
| 7.  | Anthracene                           |
| 8.  | Benz (a) anthracene                  |
| 9.  | Benzo (a) pyrene                     |
| 10. | Benzo (b) & (k) fluroanthene         |
| 11. | Benzo (g, h, i) perylene             |
| 12. | Chrysene                             |
| 13. | Dibenz (a,h) anthracene              |
| 14. | Fluoranthrene                        |
| 15. | Fluorene                             |
| 16. | Indeno (1, 2, 3 - cd) pyrene         |
| 17. | N -2 - Fluorenylacetamide            |
| 18. | Naphthalene                          |
| 19. | Phenanthrene                         |
| 20. | Pyrene                               |



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**APPENDIX 4****TABLE 4: VOLATILE ORGANIC COMPOUND (VOC)**

- |     |                                     |
|-----|-------------------------------------|
| 1.  | 1, 1, 1 - Trichloroethane           |
| 2.  | 1, 1, 2 - Trichloroethane           |
| 3.  | Trans - 1, 2 - Dichloroethene       |
| 4.  | cis - 1, 2 - Dichloroethene         |
| 5.  | cis - 1, 3 - Dichloro - 1 - propene |
| 6.  | 1, 1 - Dichloroethane               |
| 7.  | 1, 2 - Dimethylbenzene (o - xylene) |
| 8.  | 1, 2 - Dichloroethane               |
| 9.  | 1, 2 - Dichloropropane              |
| 10. | 1, 3 - Dimethylbenzene (m - xylene) |
| 11. | 1, 4 - Dimethylbenzene (p - xylene) |
| 12. | 1, 4 - Dichlorobenzene              |
| 13. | Benzene                             |
| 14. | Bromodichloromethane                |
| 15. | Bromoform                           |
| 16. | Carbon tetrachloride                |
| 17. | Chloroform                          |
| 18. | Dibromochloromethane                |
| 19. | Dichloromethane                     |
| 20. | Tetrachloroethene                   |
| 21. | Toluene                             |
| 22. | Trichloroethene                     |

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**APPENDIX 5****TABLE 5: ORGANOCHLORINE PESTICIDES**

- |     |                           |
|-----|---------------------------|
| 1.  | a-BHC                     |
| 2.  | HCB                       |
| 3.  | $\beta$ - & $\gamma$ -BHC |
| 4.  | d-BHC                     |
| 5.  | Heptachlor                |
| 6.  | Aldrin                    |
| 7.  | Heptachlor epoxide        |
| 8.  | Chlordane-trans           |
| 9.  | Endosulfan 1              |
| 10. | Chlordane-cis             |
| 11. | Dieldrin                  |
| 12. | DDE                       |
| 13. | Endrin                    |
| 14. | Endosulfan 2              |
| 15. | DDD                       |
| 16. | Endrin aldehyde           |
| 17. | Endosulfan sulfate        |
| 18. | DDT                       |
| 19. | Endrin ketone             |
| 20. | Methoxychlor              |

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**APPENDIX 6****TABLE 6: ORGANOPHOSPHORUS PESTICIDES**

- |     |                     |
|-----|---------------------|
| 1.  | Dichlorvos          |
| 2.  | Demeton-S-methyl    |
| 3.  | Monocrotophos       |
| 4.  | Dimethoate          |
| 5.  | Diazinon            |
| 6.  | Chlorpyrifos-methyl |
| 7.  | Parathion-methyl    |
| 8.  | Malathion           |
| 9.  | Fenthion            |
| 10. | Chlorpyrifos        |
| 11. | Parathion           |
| 12. | Pirimphos-ethyl     |
| 13. | Chlorfenvinphos E   |
| 14. | Chlorfenvinphos Z   |
| 15. | Bromophos-ethyl     |
| 16. | Fenamiphos          |
| 17. | Prothiofos          |
| 18. | Ethion              |
| 19. | Carbofenthion       |
| 20. | Azinphos-methyl     |

**TABLE 7: CYPERMETHRIN**

- |    |               |
|----|---------------|
| 1. | Simazine      |
| 2. | Atrazine      |
| 3. | Cypermethrins |

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**APPENDIX 7****TABLE 8: PESTICIDES LIST**

1. 3-Hydroxycarbofuran	44. Cyproconazole (isomer)	87. Fluquinconazole
2. Acephate	45. Cyprodinil	88. Flusilazole
3. Acetamiprid	46. Desmedipham	89. Flutolanil
4. Acibenzolar-S-methyl	47. Diclobutrazol	90. Flutriafol
5. Alanycarb	48. Dicrotophos	91. Forchlorfenuron
6. Aldicarb	49. Diethofencarb	92. Formetanate
7. Aldicarb-sulfoxide	50. Difenoconazole	93. Fuberidazole
8. Aldoxycarb	51. Difenoconazole (isomer)	94. Furalaxyl
9. Ametryn	52. Diflubenzuron	95. Furathiocarb
10. Aminocarb	53. Dimethoate	96. Halofenozide
11. Amitraz	54. Dimethomorph	97. Hexaconazole
12. Azoxystrobin	55. Dimoxystrobin	98. Hexaflumuron
13. Benalaxyl	56. Diniconazole	99. Hexythiazox
14. Bendiocarb	57. Dinotefuran	100. Hydramethylnon
15. Benfuracarb	58. Dioxacarb	101. Imazalil
16. Benzoximate	59. Diuron	102. Imidacloprid
17. Bifenazate	60. Emamectin B1a	103. Indoxacarb
18. Bitertanol	61. Emamectin B1b	104. Ipconazole
19. Boscalid	62. Epoxiconazole	105. Iprovalicarb
20. Bromuconazole-cis	63. Etaconazole	106. Isoprocarb
21. Bromuconazole-trans	64. Ethiofencarb	107. Isoproturon
22. Bupirimate	65. Ethiprole	108. Isoxaflutole
23. Buprofezin	66. Ethirimol	109. Kresoxim-methyl
24. Butafenacil	67. Ethofumesate	110. Linuron
25. Butoxycarboxim	68. Etoxazole	111. Lufenuron
26. Carbaryl	69. Famoxadone	112. Mandipropamid
27. Carbendazim	70. Fenamidone	113. Mefenacet
28. Carbetamide	71. Fenarimol	114. Mepanipyrim
29. Carbofuran	72. Fenazaquin	115. Mepronil
30. Carboxin	73. Fenbuconazole	116. Mesotrione
31. Carfentrazone-ethyl	74. Fenhexamid	117. Metaflumizone
32. Chlorantraniliprole	75. Fenobucarb	118. Metalaxyl
33. Chlorfluazuron	76. Fenoxycarb	119. Metconazole
34. Chlorotoluron	77. Fenpropimorph	120. Methabenzthiazuron
35. Chloroxuron	78. Fenpyroximate	121. Methamidophos
36. Clethodim E	79. Fenuron	122. Methiocarb
37. Clethodim Z	80. Fipronil	123. Methomyl
38. Clofentezine	81. Flonicamid	124. Methoprotrotryne
39. Clothianidin	82. Fludioxonil	125. Methoxyfenozide
40. Cyazofamid	83. Flufenacet	126. Metobromuron
41. Cycluron	84. Flufenoxuron	127. Metribuzin
42. Cymoxanil	85. Fluometuron	128. Mevinphos E
43. Cyproconazole	86. Fluoxastrobin	129. Mevinphos Z

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**TABLE 8: PESTICIDES LIST (continue)**

130. Mexacarbate	173. Spiromesifen
131. Monocrotophos	174. Spirotetramat
132. Monolinuron	175. Spiroxamine
133. Myclobutanil	176. Spiroxamine (isomer)
134. Neburon	177. Sulfentrazone
135. Nitenpyram	178. Tebuconazole
136. Novaluron	179. Tebufenozide
137. Nuairimol	180. Tebufenpyrad
138. Omethoate	181. Tebuthiuron
139. Oxadixyl	182. Teflubenzuron
140. Oxamyl	183. Temephos
141. Paclobutrazol	184. Terbumeton
142. Penconazole	185. Terbutryn
143. Pencycuron	186. Tetraconazole
144. Phenmedipham	187. Thiabendazole
145. Picoxystrobin	188. Thiacloprid
146. Piperonyl-butoxide	189. Thiamethoxam
147. Pirimicarb	190. Thidiazuron
148. Prochloraz	191. Thiobencarb
149. Promecarb	192. Thiofanox
150. Prometon	193. Thiophanate-methyl
151. Prometryne	194. Triadimefon
152. Propamocarb	195. Triadimenol
153. Propargite	196. Trichlorfon
154. Propham	197. Tricyclazole
155. Propiconazole	198. Trifloxystrobin
156. Propoxur	199. Triflumizole
157. Pymetrozine	200. Triflumuron
158. Pyracarbolid	201. Triticonazole
159. Pyraclostrobin	202. Vamidothion
160. Pyridaben	203. Zoxamide
161. Pyrimethanil	204. Avermectin B1a
162. Pyriproxyfen	205. Avermectin B1b
163. Quinoxifen	206. Doramectin
164. Rotenone	207. Ivermectin B1a
165. Secbumeton	208. Ivermectin B1b
166. Siduron	209. Moxidectin
167. Simetryn	210. Eprinomectin B1a
168. Spinetoram A	211. Eprinomectin B1b
169. Spinetoram B	212. Cyromazine
170. Spinosyn A	
171. Spinosyn D	
172. Spirodiclofen	

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**APPENDIX 8****TABLE 9: VOLATILE ORGANIC COMPOUNDS**

- |     |                          |
|-----|--------------------------|
| 1.  | Benzene                  |
| 2.  | 1, 3-Butadiene           |
| 3.  | 3-Chloropropene          |
| 4.  | Toluene                  |
| 5.  | Ethylbenzene             |
| 6.  | m- & p-Xylene            |
| 7.  | Styrene                  |
| 8.  | o-Xylene                 |
| 9.  | 1, 2-Dichloropropane     |
| 10. | 1, 1-Dichloroethylene    |
| 11. | 1, 1-Dichloroethane      |
| 12. | 1, 1, 1-Trichloroethane  |
| 13. | Carbon Tetrachloride     |
| 14. | 1, 2-Dichloroethane      |
| 15. | Trichloroethylene        |
| 16. | 1, 1, 2- Trichloroethane |
| 17. | Tetrachloroethylene      |
| 18. | Chlorobenzene            |
| 19. | 1,4-Dichlorobenzene      |

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**APPENDIX 9****TABLE 10: TOTAL POLYCYCLIC AROMATIC HYDROCARBON (TOTAL PAHs)**

- |     |                              |
|-----|------------------------------|
| 1.  | Fluoranthene                 |
| 2.  | Chrysene                     |
| 3.  | Dibenzo (a,h) anthracene     |
| 4.  | Acenaphthylene               |
| 5.  | Fluorene                     |
| 6.  | Anthracene                   |
| 7.  | Pyrene                       |
| 8.  | Benzo (a) anthracene         |
| 9.  | Benzo (b) & (K) fluoranthene |
| 10. | Benzo (a) pyrene             |
| 11. | Indeno (1,2,3-cd) pyrene     |
| 12. | Benzo (ghi) perylene         |
| 13. | Naphthalene                  |
| 14. | Acenaphthene                 |
| 15. | Phenanthrene                 |

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**APPENDIX 10****TABLE 11: PESTICIDES LIST**

- |     |                            |
|-----|----------------------------|
| 1.  | Dichlorvos                 |
| 2.  | Dimethon-S-methyl          |
| 3.  | Monocrotophos              |
| 4.  | Phorate                    |
| 5.  | $\alpha$ -BHC              |
| 6.  | HCB                        |
| 7.  | Dimethoate                 |
| 8.  | Simazine                   |
| 9.  | Atrazine                   |
| 10. | $\beta$ -BHC               |
| 11. | $\gamma$ -BHC              |
| 12. | Diazinon                   |
| 13. | $\delta$ -BHC              |
| 14. | Chlorpyrifos-methyl        |
| 15. | Heptachlor                 |
| 16. | Malathion                  |
| 17. | Parathion-methyl           |
| 18. | Fenthion                   |
| 19. | Aldrin                     |
| 20. | Chlorpyrifos               |
| 21. | Parathion                  |
| 22. | Primiphos-ethyl            |
| 23. | Heptachlor epoxide         |
| 24. | Chlorfenvinphos-E          |
| 25. | Chlorfenvinphos-Z          |
| 26. | Bromophos-ethyl            |
| 27. | Chlordane-Cis              |
| 28. | Chlordane-Trans            |
| 29. | Fenamiphos                 |
| 30. | Prothiofos                 |
| 31. | P', p - DDE                |
| 32. | Dieldrin                   |
| 33. | Endosulfan I               |
| 34. | Endrin                     |
| 35. | p',p-DDD                   |
| 36. | Ethion                     |
| 37. | Endrin aldehyde            |
| 38. | Endosulfan II              |
| 39. | Endosulfan sulfate         |
| 40. | Carbofenthion              |
| 41. | p',p'-DDT                  |
| 42. | Endrin Ketone              |
| 43. | Phosmet                    |
| 44. | Methoxychlor               |
| 45. | Azinophos-methyl           |
| 46. | Mirex                      |
| 47. | Cypermethrin (multi-peaks) |
| 48. | Chlordecone (Kepone)       |
| 49. | Deltamethrin               |

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**APPENDIX 11****TABLE 12: TOTAL POLYCYCLIC AROMATIC HYDROCARBON (TOTAL PAHs)**

1.	Trans-Decalin
2.	Cis-Decalin
3.	Isophorone
4.	Naphthalene
5.	2-Metylnaphthalene
6.	2-Chloronaphthalene
7.	Acenaphthylene
8.	Benzo(b)thiophene
9.	1-Methylnaphthalene
10.	Biphenyl
11.	2,6-Dimethylnaphthalene
12.	Acenaphthene
13.	Fluorene
14.	Dibenzofuran
15.	2,3,5-Trimethylnaphthalene
16.	Dibenzothiophene
17.	Carbazole
18.	Phenanthrene
19.	Anthracene
20.	Fluoranthene
21.	Pyrene
22.	Benz(a)anthracene
23.	Chrysene
24.	1-Methylphenanthrene
25.	3,6-Dimethylphenanthrene
26.	Benzo(b)fluoranthene
27.	Benzo(k)fluoranthene
28.	Benzo(b)&(k)fluoranthene
29.	Benzo(a)pyrene
30.	Benzo(e)pyrene
31.	Indeno(1,2,3-cd) pyrene
32.	Dibenz(a,h)anthracene
33.	Benzo(g,h,i) perylene
34.	Perylene

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**APPENDIX 12****TABLE 13: PER- AND POLYFLUORINATED ALKYL SUBSTANCES (PFAS)**

- |     |  |
|-----|--|
| 1.  | Perfluoro-n-butanoic acid (PFBA)             |
| 2.  | Perfluoropentanoic acid (PFPeA)              |
| 3.  | Potassium perfluoro-1-butanefulfonate (PFBS) |
| 4.  | Perfluoro-n-hexanoic acid (PFHxA)            |
| 5.  | Perfluoropentane sulfonic acid (PFPeS)       |
| 6.  | Perfluoro-n-heptanoic acid (PFHpA)           |
| 7.  | Perfluorohexanesulfonic acid (PFHxS)         |
| 8.  | 6:2-Fluorotelomer sulfonate (6:2 FTS)        |
| 9.  | Perfluorooctanoic acid (PFOA)                |
| 10. | Perfluoroheptane sulfonic acid (PFHpS)       |
| 11. | Perfluorooctanesulfonic acid (PFOS)          |
| 12. | Perfluoro-n-nonanoic acid (PFNA)             |
| 13. | Perfluoro-n-decanoic acid (PFDA)             |
| 14. | 8:2 Fluorotelomer sulfonate (8:2 FTS)        |
| 15. | Sodium perfluoro-1-decanesulfonate (PFDS)    |
| 16. | Perfluoro-1-octanesulfonamide (FOSA)         |
| 17. | Perfluoro-n-dodecanoic acid (PFDoDA)         |

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**APPENDIX 13****TABLE 14: PHARMACEUTICAL AND PERSONAL CARE PRODUCTS (PPCP) COMPOUND**

1.	Acetaminophen (Paracetamol)
2.	Atenolol
3.	Caffeine
4.	Carbamazepine
5.	Citalopram
6.	Cyclophosphamide
7.	Diazepam
8.	Diclofenac acid
9.	Enalapril
10.	Fluoxetine
11.	Furosemide
12.	Gabapentin
13.	Hydrochlorothiazide
14.	Ifosfamide
15.	Propranolol
16.	Sulfamethoxazole
17.	Tramadol
18.	Valsartan
19.	Bezafibrate
20.	Chloramphenicol
21.	Clofibric acid
22.	Gemfibrozil
23.	Indomethacin
24.	Ketoprofen
25.	Naproxen
26.	Piroxicam
27.	Sulfamethazine
28.	Trimethoprim
29.	Warfarin
30.	Oxazepam
31.	Albuterol (Salbutamol)
32.	Metoprolol
33.	Sotalol
34.	Anastrozole
35.	Azathioprine
36.	Butorphanol
37.	Capecitabine
38.	Cyclobenzaprine
39.	Flutamide
40.	Lincomycine
41.	Loperamide
42.	Metronidazole
43.	Mycophenolate Mofetil
44.	Paclitaxel
45.	Sertraline
46.	Terbutaline
47.	Zolpidem

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**APPENDIX 14****TABLE 15: AMINO ACIDS PROFILING**

- |     |                      |
|-----|----------------------|
| 1.  | Hydroxyproline (Hyp) |
| 2.  | Aspartic Acid (Asp)  |
| 3.  | Serine (Ser)         |
| 4.  | Glutamic Acid (Glu)  |
| 5.  | Glycine (Gly)        |
| 6.  | Histidine (His)      |
| 7.  | Arginine (Arg)       |
| 8.  | Threonine (Thr)      |
| 9.  | Alanine (Ala)        |
| 10. | Proline (Pro)        |
| 11. | Cystine (Cys)        |
| 12. | Tyrosine (Tyr)       |
| 13. | Valine (Val)         |
| 14. | Methionine (Met)     |
| 15. | Lysine (Lys)         |
| 16. | Isoleucine (Ile)     |
| 17. | Leucine (Leu)        |
| 18. | Phenylalanine (Phe)  |