Issue date: 03 August 2023
Valid until: 11 April 2028

NO: SAMM 822
(Issue 2, 03 August 2023 replacement of SAMM 822 dated 16 January 2023)

LABORATORY LOCATION:
(PERMANENT LABORATORY)

BIO SYNERGY LABORATORIES SDN. BHD.
NO. 24, JALAN KELISA EMAS
SEBERANG JAYA
13700 PULAU PINANG
MALAYSIA

FIELDS OF TESTING: **CHEMICAL, MECHANICAL & MICROBIOLOGY**

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

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

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Edible Oils, Fats & Their Products	Moisture & Volatile Matter	MPOB p2.1 Part 1 : 2004
	Impurities	MPOB p2.2: 2004
	Peroxide Value	MPOB p2.3: 2004
	Acidity/Free Fatty Acid	MPOB p2.5: 2004
	DOBI	MPOB p2.9: 2004
	Iodine Value	MPOB p3.2: 2004
	Colour Lovibond	MPOB p4.1: 2004
	Slip Melting Point	MPOB p4.2: 2004
	Mineral Oil (Qualitative)	AOAC 945.102

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Food Products: • Dairy Products • Edible oils, fats and their products • Eggs and egg products • Fish and fish products • Flour and confectionery • Meat, poultry and derived products • Nuts, fruits and vegetables and derived products • Sauces, herbs, spices and condiments • Other specified foods	Metals/ Minerals • Lead • Cadmium • Tin • Calcium • Magnesium • Iron • Zinc • Copper • Sodium • Potassium • Antimony • Chromium	In-house Method PCL-HMF-01 Based On AOAC 999.11 (Sample Preparation) and using MP-AES
	• Mercury	In-house Method PCL-HMF-02 Based On AOAC 971.21 (Sample Preparation) and using MP-AES
	• Arsenic	In-house Method PCL-HMF-03 Based On AOAC 986.15 (Sample Preparation) and using MP-AES
	Crude Ash	In-house Method PCL-FCA-01 Based On MS ISO 5984 : 2003
	Moisture	In-house Method PCL-FMC-01 Based On MS ISO 6496 : 2003
	Energy Content as Calories	Method of Analysis for Nutrition Labeling, AOAC (1993)
	Total Carbohydrate	Methods of Analysis for Nutrition Labeling, AOAC (1993)
	Total Fat	In-house Method PCL-FTF-01 Based On Pearson's Chemical Analysis of Food's, Page 22, 8th Edition, 1990
	Protein Content	ISO 1871 : 2009(E)

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Food Products: • Dairy Products • Edible Oil, Fats and their products • Eggs and Egg Products • Fish and Fish Products • Flour and Confectionery • Meat, Poultry an derived products • Nuts, Fruits and Vegetables and derived products • Sauce, Herbs, Spices and Condiments • Sweetening Substances • Beverages • Frozen Food • Cereal Products • Tea, Coffee and related products • Cocoa and Cocoa products • Other specified foods	Total Dietary Fiber Total Sugar (As invert Sugar) Sugar Profile Vitamin D Carbohydrate (Available) Calories from Fat	AOAC Method 985.29 In-house method Based on AOAC 968.28 In House method based on AOAC 980.13 In House method based on AOAC 2002.05 FAO Food and Nutrition Paper 77, Chapter 2 (2003) Methods of analysis for nutrition labeling (1993)
Pharmaceutical Products: • Tablet • Powder • Capsule • Liquid • Oil & Cream	Lead Cadmium Arsenic Mercury	BP 2019, Vol. V, Appendix VII & IID

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Environmental Monitoring • Industrial Effluent • Mineral water • Potable and domestic • Reverse osmosis water • Ultrapure water • Others	**Metals** Aluminium as Al Antimony as Sb Barium as Ba Berylium as Be Boron as B Cadmium as Cd Calcium as Ca Chromium as Cr Copper as Cu Iron as Fe Lead as Pb Magnesium as Mg Manganese as Mn Molybdenum as Mo Nickel as Ni Potassium as K Silver as Ag Sodium as Na Tin as Sn Zinc as Zn Arsenic as As Selenium as Se Mercury as Hg	In-house Method PCL-HMW-01 Based on APHA 3120 B using MP-AES instrument In-house Method PCL-HMW-03 using MP-AES Instrument In-house Method PCL-HMW-02 using MP-AES Instrument
• Industrial Effluent	pH	APHA 4500- H^+B
	BOD	APHA 5210 B & 4500-O G
	COD	APHA 5220 D
	Total Suspended Solid	APHA 2540 D
	Oil & Grease	APHA 5520 B
	Ammoniacal Nitrogen	APHA 4500- NH_3 B & F
	Colour	APHA 2120 F
Water • Ultrapure Water • Drinking Water • Treated Water	Total Organic Carbon	APHA 5310 C

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
• Industrial Effluent • Drinking water • Mineral water • Package drinking water • Surface water	**Metals by ICP** • Aluminium as Al • Antimony as Sb • Arsenic as As • Barium as Ba • Berylillium as Be • Bismuth as Bi • Boron as B • Cadmium as Cd • Calcium as Ca • Chromium as Cr • Cobalt as Co • Copper as Cu • Gold as Au • Iron as Fe • Lead as Pb • Lithium as Li • Magnesium as Mg • Manganese as Mn • Molybdenum as Mo • Nickel as Ni • Platinum as Pt • Potassium as K • Selenium as Se • Silicon as SiO_2 • Silver as Ag • Sodium as Na • Strontium as Sr • Sulphur as S • Thallium as Tl • Tin as Sn • Titanium as Ti • Vanadium as V • Zinc as Zn	APHA 3120 B
	• Mercury as Hg	APHA 3112 B
	Sample Pre-Treatment for Metal Analysis	APHA 3030 E

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Animal Feed	Crude Fat	MS 1416 : 1997
	Protein Content	AOAC Official Method 2001.11
	Moisture Crude Ash Crude Fiber	MS ISO 6496:2003 MS ISO 5984:2003 In-house method PCL-FCF-02 based on AOAC 962.09:1986 (2002)
	Energy content as calories	In-house method PCL-FEC-02 based on Method of Analysis for Nutrition Labeling AOAC (1993)
	Total carbohydrate	In-house method PCL-FTC-02 based on Method of Analysis for Nutrition Labeling AOAC (1993)
Food Products: • Sugar • Dairy products • Fish and fish products • Flour and confectionery • Sauces, spices and condiments • Beverages	pH	In-house method PCL-FPH-01 based on AOAC 981.12 & 970.21
• Coffee and coffee products • Teas and tea products • Beverages	Caffeine	GB 5009.139-2014

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Water: • Industrial Effluent • Mineral Water • Potable and domestic • Reverse osmosis water • Ultrapure water • Others	Temperature	APHA 2550 B
	Chromium Hexavalent	APHA 3500-Cr B
	Chromium Trivalent	In-house Method PCL-CTV-01 Based On APHA 3120 B & 3500 Cr B
	Cyanide	APHA 4500-CN^- C & E
	Fluoride	APHA 4500 F D
	Formaldehyde	US EPA 8315A
	Phenol	APHA 5530 B & C
	Free Chlorine	APHA 4500 Cl G
	Sulphide	APHA 4500 S2-D
Water: • Industrial Effluent	MLSS, MLVSS	In-house Method Based on APHA 2540 D & E
Water: • Mineral Water • Ultrapure water • Potable and domestic water • Surface water	pH	APHA 4500 H+ B
	Color PtCo	APHA 2120 C
	Turbidity	APHA 2130 B
	Ammonia	APHA 4500 NH_3 F
	MBAS	APHA 5540 C

SCOPE OF TESTING: CHEMICAL

SITE TESTING: CATEGORY I & II

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Air Emission from Stationary Sources	Particulate Matter	USEPA 40 CFR60 App A, Method 1, 2, 3, 4, 5
	Sulphuric Acids & Sulphur Dioxide	USEPA 40 CFR60 App A, Method 8
	Hydrogen Halide: HCl, HBr, HF	USEPA 40 CFR60 App A, Method 26 & 26A
	Halogen: Cl_2, Br_2	
	Nitrogen Oxide	USEPA 40 CFR60 App A, Method 7 & 7A
	Metals (Sb, As, Ba, Be, Cd Cr, Co, Cu, Pb, Mn, Hg, Ni, P, Se, Ag, Ti, Zn)	USEPA 40 CFR60 App A, Method 29
	Particulate Matter	MS 1596:2003
Stack Air Emission	VOC See Appendix 1	In-House Method PCL-ENV-025 based on USEPA Method TO-17

APPENDIX 1: LIST OF ORGANIC COMPOUND (VOC)

1. Acrylonitrile (107-13-1)
2. Allyl chloride (3-chloropropene) (107-05-1)
3. Benzene (71-43-2)
4. Bromobenzene (108-86-1)
5. Bromochloromethane (74-97-5)
6. Bromodichloromethane (75-27-4)
7. Bromoform (75-25-2)
8. n-Butylbenzene (104-51-8)
9. sec-Butylbenzene (135-98-8)
10. tert-Butylbenzene (98-06-6)
11. Carbon disulfide (75-15-0)
12. Carbon tetrachloride (56-23-5)
13. Chlorobenzene (108-90-7)
14. 2-Chloroethanol (107-07-3)
15. Chloroform (67-66-3)
16. Chloroprene (2-chloro-1,3-butadiene) (126-99-8)
17. 2-Chlorotoluene (95-49-8)
18. 4-Chlorotoluene (106-43-4)
19. Dibromochloromethane (124-48-1)
20. 1,2-Dibromo-3-chloropropane (DBCP) (96-12-8)
21. 1,2-Dibromoethane (EDB) (106-93-4)
22. Dibromomethane (74-95-3)
23. 1,2-Dichlorobenzene (95-50-1)
24. 1,3-Dichlorobenzene (541-73-1)
25. 1,4-Dichlorobenzene (106-46-7)
26. cis-1,4-Dichloro-2-butene (1476-11-5)
27. trans-1,4-Dichloro-2-butene (110-57-6)
28. 1,1-Dichloroethane (75-34-3)
29. 1,2-Dichloroethane (107-06-2)
30. 1,1-Dichloroethene (75-35-4)
31. cis-1,2-Dichloroethene (156-59-2)
32. trans-1,2-Dichloroethene (156-60-5)
33. 1,2-Dichloropropane (78-87-5)
34. 1,3-Dichloropropane (142-28-9)
35. 2,2-Dichloropropane (594-20-7)
36. 1,1-Dichloropropene (563-58-6)
37. cis-1,3-Dichloropropene (10061-01-5)
38. trans-1,3-Dichloropropene (10061-02-6)
39. Diethyl ether (ethyl ether) (60-29-7)
40. 1,4-Dioxane (123-91-1)
41. Ethylbenzene (100-41-4)
42. Ethyl methacrylate (97-63-2)
43. Hexachloro-1,3-butadiene (87-68-3)
44. Iodomethane (methyl iodide) (74-88-4)
45. Isobutyl alcohol (2-methyl-1-propanol) (78-83-1)
46. Isopropylbenzene (cumene) (98-82-8)
47. 4-Isopropyltoluene (p-Cymene) (99-87-6)
48. Methacrylonitrile (126-98-7)
49. Methyl acrylate (96-33-3)
50. Methyl methacrylate (80-62-6)
51. Naphthalene (91-20-3)
52. Nitrobenzene (98-95-3)
53. 2-Nitropropane (79-46-9)
54. Pentachloroethane (76-01-7)
55. Propionitrile (107-12-0)
56. n-Propylbenzene (103-65-1)
57. Styrene (100-42-5)
58. 1,1,1,2-Tetrachloroethane (630-20-6)
59. 1,1,2,2-Tetrachloroethane (79-34-5)
60. Tetrachloroethene (127-18-4)
61. Tetrahydrofuran (109-99-9) 62.
62. Toluene (108-88-3)
63. 1,2,3-Trichlorobenzene (87-61-6)
64. 1,2,4-Trichlorobenzene (120-82-1)
65. 1,1,1-Trichloroethane (71-55-6)
66. 1,1,2-Trichloroethane (79-00-5)
67. Trichloroethene (79-01-6)
68. 1,2,3-Trichloropropane (96-18-4)
69. 1,2,4-Trimethylbenzene (95-63-6)
70. 1,3,5-Trimethylbenzene (108-67-8)
71. m-Xylene (108-38-3)
72. o-Xylene (95-47-6)
73. p-Xylene (106-42-3)

SCOPE OF TESTING: CHEMICAL

SITE TESTING: CATEGORY I & II

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Chemical Exposure Monitoring Pollutant in Air	Aluminium Arsenic Antimony Barium Beryllium Bismuth Boron Cadmium Calcium Chromium Cobalt Copper Gold Iron Lead Magnesium Manganese Molybdenum Nickel Phosphorus Platinum Potassium Selenium Sodium Strontium Tin Titanium Vanadium Zinc	NIOSH 7303
	Mercury	NIOSH 6009
	Particulates Fluorides & Hydrofluoric Acid	NIOSH 7906
	Volatile Acids (HCl, HBr & HNO3,)	NIOSH 7907
	Non- Volatile Acids (H_2SO_4 & H_3PO_4)	NIOSH 7908
	Group A Benzene Toluene Ethylbenzene o - xylene m - xylene p- xylene	NIOSH 1501
	Group B Cumene Styrene	

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3.	**Zuraidah Ngah Abdullah**	**IKM No.: L/2148/7300/16**
4.	**Rawiah Abdul Razak**	**IKM No.: M/4209/7037/15**
5.	**Ruzaini Aryadiy Sahlan**	**IKM No.: L/2538/7567/16**
6.	**Siti Khadijah Ishak**	**IKM No.: L/2074/7051/15 (Heavy metals related to water, effluent and food testing)**
7.	**Mohd. Rohaimi B. Ab Halim**	**IKM No.: M/4538/7519/16**
8.	***Mohamad Arif b. Abdul Rahman**	**IKM No.: M/5864/8175/18/21**

*indicates non-resident signatory

SCOPE OF TESTING: CHEMICAL

SITE TESTING: CATEGORY II

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Environmental Monitoring		
Stack Air Emission	Dark Smoke	BS 2742:2009
	Measurement of CO_2, CO, O_2, NO, NO_2, SO_2 & H_2S using portable gas analyzer	In-House Method PCL-ENV-018 Flue Gas Analyzer based on manufacturer manual
Ambient Air Monitoring	Particulate matter 2.5 Particulate matter 10 Sulphur Dioxide (SO_2) Nitrogen Oxide (NO_2) Ozone (O_3) Carbon Dioxide (CO_2) Carbon Monoxide (CO)	In House Method PCL-ENV-020 Using Direct Meter (Aeroqual S500)
*Local Exhaust Ventilation (LEV) Fumehood	Face Velocity Capture Velocity Static Pressure Duct Velocity Revolution per minute (RPM)	Malaysia Guidelines on Occupational Safety and Health for Design, Inspection, Testing and examination of Local Exhaust Ventilation System 2008. (DOSH) (Anemometer, Air Velocity Meter & Stroboscope)

Signatories:

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2. ***Mohamad Arif Abdul Rahman** — **DOSH Reg. No: HQ/22/JHI/0060 (IHT1 – CEM)**
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SCOPE OF TESTING: MECHANICAL

SITE TESTING: CATEGORY II

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Environmental Monitoring		
Noise	Boundary Sound Pressure Level	Malaysia Guidelines for Environmental Noise Limits & Control (Third Edition 2019) - (Annex B)
Vibration (Ground & Structural)	Test Parameter: Peak Particle Velocity, ppv Frequency, Hertz (Hz)	Malaysia Guidelines Environmental Vibration Limits & Control (Third Edition 2021) - (Annex B)

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SCOPE OF TESTING: MICROBIOLOGY

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Food Products: • Cereal Products • Dairy products • Meat and meat products • Fish, crustaceans and molluscs • Poultry and poultry products • Vegetable and vegetable products • Fruit, jams and other fruit products • Sugar products, honey and confectionery • Beverages • Mixes foods • Additives to foods • Herbs and spices • Other food products **Animal Feeds**	Aerobic Plate Counts	ISO 4833-1:2013 (Pour Plate Technique) AOAC Official Method 990.12 (3M Petrifilm)
	Yeast & Mould Counts	ISO 21527-1:2008(E) & ISO 21527-2:2008(E) (Spread Plate Technique) AOAC Official Method 2014.05 (3M Petrifilm)
	Coliform Count	ISO 4832:2006 (Pour Plate Technique) ISO 4831:2006 (E) (MPN Technique) AOAC Official Method 998.08 & 991.14 (3M Petrifilm)
	Escherichia coli Count	ISO 16649-2:2001(E) (Pour Plate Technique) ISO 16649-3:2015 (MPN Technique) AOAC Official Method 998.08 & 991.14 (3M Petrifilm)
	Enterobacteriaceae Count	ISO 21528-2:2017 (Pour Plate Technique) ISO 21528-1:2017 (MPN Technique)
	Coagulase-Positive Staphylococci (*Staphylococcus aureus* and other species) Count	ISO 6888-2:2021 (Pour Plate Technique) ISO 6888-3:2003 (MPN Technique) AOAC Official Method 2003.07, 2003.08, 2003.11 (3M Petrifilm)
	Salmonella spp (Detection)	ISO 6579-1: 2017 AOAC Official Method 2014.01 (3M Petrifilm)
	Vibrio parahaemolyticus & *Vibrio cholerae (Detection)*	ISO/TS 21872-1: 2017
	Listeria monocytogenes & *Listeria spp. (Detection)*	ISO 11290-1: 2017

SCOPE OF TESTING: MICROBIOLOGY

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Environmental testing • Enumeration of Microbial Count in the Air Using an Open Plate	• Total Plate Count • Yeast Count • Mould Count	Compendium of Methods for the Microbiological Examination of Foods, Chapter 3, 4th Edition (2001) (Sedimentation method)
• Enumeration/Detection of Microbial count on Surface Area, Equipment and Hand	• Aerobic Plate Count • Yeast Count • Mould Count • Coliform Count • *E. Coli* Count • *Staphylococcus aureus* Count • Salmonella Detection • Bacillus cereus Count • Listeria spp. Detection • Enterobacteriacae Count	Compendium of Methods for the Microbiological Examination of Foods, Chapter 3, 4th Edition (2001) (Swab Contact Method)
Pharmaceutical Products: • Tablet • Powder • Capsule • Liquid • Oil & Cream	Total Microbial Aerobic Count Total Combined Yeast & Mould Count Enterobacteria and Certain Other Gram-Negative Bacteria Bile-tolerant Gram Negative Bacteria Escherichia coli Salmonella Staphylococcus aureus Pseudomonas aeruginosa Clostridia spp Candida albicans	BP 2019, Appendix XVI B BP 2019, Appendix XVI B BP 2019, Appendix XVI B BP 2019, Appendix XVI B BP 2019, Appendix XVI B BP 2019, Appendix XVI B BP 2019, Appendix XVI B BP 2019, Appendix XVI B BP 2019, Appendix XVI B BP 2019, Appendix XVI B

SCOPE OF TESTING: MICROBIOLOGY

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Water • Potable and Domestic water • Industrial water • Distilled Demineralized water • Reverse Osmosis water • Ultrapure water • Swimming Pool water • Cooling Tower water • Boiler water • Surface water • Mineral water • Industrial effluent • Treated water	Heterotropic plate count	APHA 9215 B, 22nd Edition (2012) (Pour Plate Technique) APHA 9215 D, 22nd Edition (2012) (Membrane Filtration Technique)
	Coliform Count	APHA 9222 B, 22nd Edition (2012) (Membrane Filtration Technique) APHA 9221 B, 22nd Edition (2012) (MPN Technique)
	Escherichia coli	APHA 9222 G, 22nd Edition (2012) (Membrane Filtration Technique) APHA 9221 F, 22nd Edition (2012) (MPN Technique)
	Fecal coliform	APHA 9222 D, 22nd Edition (2012) (Membrane Filtration Technique) APHA 9221 E, 22nd Edition (2012) (MPN Technique)
	Fecal Streptococci	APHA 9230 C, 22nd Edition (2012) (Membrane Filtration Technique) APHA 9230 B, 22nd Edition (2012) (MPN Technique)
	Pseudomonas aeruginosa	APHA 9213 E, 22nd Edition (2012) (Membrane Filtration Technique)
	Salmonella (Detection)	APHA 9260 B, 22nd Edition (2012)
	Staphylococcus aureus	APHA 9213 B, 22nd Edition (2012) (Membrane Filtration Technique)
	Vibrio spp (Detection)	APHA 9260 H, 22nd Edition (2012)
	Yeast & Mold Count	APHA 9610 B, 22nd Edition (2012) (Pour Plate Method) APHA 9610 D, 22nd Edition (2012) (Membrane Filtration Technique)
	Sulphite Reducing Anaerobes (Clostridia) including Clostridium perfingens	AS/NZS 4276.17.1:2000 (Membrane Filtration Technique)
	Listeria spp (Detection)	FDA-BAM, Chapter 10

Signatories:

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