

NO: SAMM 307

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LABORATORY LOCATION:
(PERMANENT LABORATORY)

JOHOR PLANTATIONS BERHAD
CENTRAL ANALYTICAL LABORATORY
 LOT 2135 BATU 23½
 JALAN JOHOR BAHRU – KOTA TINGGI
 81900 KOTA TINGGI, JOHOR
 MALAYSIA

FIELD(S) OF TESTING:

CHEMICAL

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

This laboratory's fulfilment 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
Environmental Monitoring Palm Oil Mill and Rubber Factory Effluent	Biochemical Oxygen Demand (BOD ₃)	DOE Method, 4 th Edition 2019, REF
		DOE Method, 4 th Edition 2019, ALT
	Chemical Oxygen Demand (COD)	DOE Method, 4 th Edition 2019, ALT
	Suspended Solids (SS)	DOE Method, 4 th Edition 2019, REF
	Oil & Grease (O & G)	In-House Method, TP-EFF-06 Based on DOE Method, 4 th Edition 2019 REF
	Ammoniacal Nitrogen (AN)	In-House Method, TP-EFF-03 Based on DOE Method, 4 th Edition 2019 REF
	Total Kjeldahl Nitrogen	DOE Method, 4 th Edition 2019, ALT
	Total Solids	APHA 2540B, 23 rd Edition 2017
	pH	APHA 4500-H ⁺ B, 23 rd Edition 2017

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<u>Environmental Monitoring</u>	pH	APHA 4500-H+B, 23 rd Edition 2017
<u>Sewage Water</u>	Biochemical Oxygen Demand (BOD ₅)	In-house Method, TP-WAT-03, Based on APHA 5210 B, 23 rd Edition 2017
<u>Water</u>	Dissolved Oxygen	APHA 4500-O H, 23 rd Edition 2017
<u>Processed Water</u>	Chemical Oxygen Demand	In-house Method, TP-WAT-05, Based on APHA 5220 B, 23 rd Edition 2017
<u>Surface Water</u>	Ammoniacal Nitrogen	APHA 4500-NH ₃ C, 23 rd Edition 2017
	Chloride	APHA 4500-Cl- B, 23 rd Edition 2017
	Nitrate Nitrogen	APHA 4500-NO ₃ ⁻ B, 23 rd Edition 2017
	Phosphorous	APHA 4500-P C, 23 rd Edition 2017
	Total Solids	APHA 2540 B, 23 rd Edition 2017
	Total Suspended Solids	APHA 2540 D, 23 rd Edition 2017
	Total Dissolved Solids	In-house Method, TP-WAT-12, Based on APHA 2540 C, 23 rd Edition 2017
	Conductivity	APHA 2510 B, 23 rd Edition 2017
	Hardness	APHA 2340 B, 23 rd Edition 2017

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<u>Environmental Monitoring</u> Sewage Water <u>Water</u> Processed Water Surface Water	Potassium Magnesium Calcium Zinc Manganese Iron Copper Aluminium Sodium Selenium Lead Cadmium Chromium Silver	APHA 3120 B, 3030E, 23 rd Edition 2017
<u>Water</u> Processed Water	Turbidity	In-house Method, TP-WAT-16, Water & Environmental Analysis According to US EPA Regulations, 1995
<u>Foods</u> Palm Oil & Palm Oil Products	Moisture & Volatile Matter	MPOB Test Method p2.9:2004
	Impurities	MPOB Test Method p2.2:2004
	Peroxide Value	PORIM Test Method p2.3:2004
	Acidity	MPOB Test Method p2.5:2004
	Iodine Value	MPOB Test Method p3.2:2004
	DOBI	MPOB Test Method p2.9:2004
<u>Agriculture Products and Materials</u> Compost	Total Nitrogen	In-house Method, TP-FER-03, Based on LECO TruMac CN Nitrogen in Fertilizer Application Notes 203-821-399:2011
	Total Carbon, Total Organic Carbon, Organic Matter and CN Ratio	In-house Method, TP-FER-08, Based on LECO TruMac CN Nitrogen in Soil and Plant Tissue Application Notes 203-831-394:2010
	Moisture	In-house Method, TP-FER-02, Based on MS 417:Part2:1994

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Agriculture Products and Materials (continued) Compost	Phosphorus	In-house Method, TP-FOL-02, Based on MS 677:Pt.I & II:1980 / ICP-OES
	Potassium	In-house Method, TP-FOL-03, Based on MS 677:Pt.I & II:1980 / ICP-OES
	Magnesium	
	Calcium	
Foliar, Leaf and Rachis	Total Nitrogen	In-house Method, TP-FOL-06, Based on LECO TruMac CN Nitrogen in Soil and Plant Tissue Application Notes 203-821-394:2010
	Phosphorus	In-house Method, TP-FOL-02, Based on MS 677:Pt.I, II & IV:1980, Method A: UV Method B: ICP-OES
	Potassium	In-house Method, TP-FOL-03, Based on MS 677:Pt. I, II & IV:1980; Method A: AAS Method B, ICP-OES
	Magnesium	In-house Method, TP-FOL-03, Based on MS 677: Pt. I, II & VII:1980, Method A: AAS Method B: ICP-OES
	Calcium	In-house Method, TP-FOL-03, Based on MS 677: Pt. I, II & VII:1980, Method A: AAS Method B: ICP-OES
	Boron	In-house Method, TP-FOL-05, Based on MS 677:Pt.I & II:1980 and Method 9.3 Official Journal of the E.U, 2003, Method A: UV Method B: ICP-OES
	Zinc Ferum Copper Manganese	In-house Method, TP-FOL-04, Based on MS 677:Pt. I & II:1980, Method A: AAS Method B: ICP-OES

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<u>Agriculture Products and Materials</u> Fertilizers and liming materials	Moisture	MS 417: Part 2: 1994 Method A: Desiccator Method B: Oven
	Total Nitrogen	MS 417: Part 3: 2020 (Second Revision)
	Total Phosphorus (as P ₂ O ₅)	In-house Method, TP-FER-04, Based on MS 417:Part 4:2020 (Second Revision) Method A: UV Method B: ICP-OES
	Total Potassium (as K ₂ O)	In-house Method, TP-FER-05, Based on MS 417:Part 5:2020 (Second Revision) Method A: AAS Method B: ICP-OES
	Total Magnesium (as MgO)	In-house Method, TP-FER-06, Based on MS 417:Part 6:2020 (Second Revision) Method A: AAS Method B: ICP-OES
	Total Calcium (as CaO)	In-house Method, TP-FER-07, Based on MS 417:Part 6:2020 (Second Revision) Method A: AAS Method B: ICP-OES
	Boron (as B ₂ O ₃)	In-house Method, TP-FER-09, Based on MS 417:Part 7:2020 (Third Revision) Method A: UV Method B: ICP-OES
	Citric Acid Soluble Phosphorus (P ₂ O ₅)	In-house Method, TP-FER-16, Based on MS 417: Part 4: 2020 Second Revision / UV
	Water Soluble Magnesium (MgO)	In-house Method, TP-FER-17, Based on MS 417: Part 6:2020 (Second Revision) Method A: AAS Method B: ICP-OES

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<u>Agriculture Products and Materials</u>	pH	MS 2457:2012
Soils	Conductivity	MS 2458:2012
	Total Nitrogen	In-House Method, TP-SOIL-04, Based on MS ISO 13878:2014
	Total Organic Carbon	In-House Method, TP-SOIL-05, Based on MS ISO 10694: 2016 and Soil Sampling and Analysis 1996 pg. 225
	Available Phosphorus	In-House Method, TP-SOIL-06, Based on Buku Panduan Analisis Tanah & Tumb, Jab Sains Tanah UPM 1988 pg. 23-25, MS 678:Part VIII:1980, Method A: UV Method B: ICP-OES
	Total Phosphorus	MS 678:Part VII:1980 / UV
	Exchangeable Cation Potassium Exchangeable Cation Magnesium Exchangeable Cation Calcium	MS 678:Part IV:1980 / ICP-EOS
	Cation Exchangeable Capacity	MS 678:Part V:1980
<u>Rubber</u> Field Latex	Dry Rubber Content	MS 466:1987

Signatories:

1. Mohd Kamaruddin bin Jaffar

IKM No.: M/2952/5304/08/2010

2. Nur Syafiqah binti Mohamad Sa'adan

IKM No.: L/2792/8264/18