

ภาคผนวก ง

เอกสารการสอบเทียบเครื่องมือตรวจวิเคราะห์



right solutions.
right partner.

รายการเครื่องมือที่ใช้ในการวิเคราะห์ / ทดสอบ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Ambient	Nitrogen Dioxide	NO ₂ Analyzer	BKK_FS0797	3-Jan-24	3-Jul-24	6
Ambient	Nitrogen Dioxide	NO ₂ Analyzer	RYG_FS0459	4-Jan-24	4-Jul-24	6
Ambient	Nitrogen Dioxide	NO ₂ Analyzer	RYG_FS0252	4-Jan-24	4-Jul-24	6
Ambient	Non-Methane Hydrocarbon	Total Hydrocarbon Analyzer	RYG_EN0038	10-Aug-23	10-Aug-24	12
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	RYG_FS0414	10-Feb-23	10-Aug-24	18
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	RYG_FS0413	10-Feb-23	10-Aug-24	18
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	RYG_FS0531	19-Jan-23	19-Jul-24	18
Workplace	n-Hexane	Field Rotameter	RYG_FS0199	4-Jan-24	4-Apr-24	3
Workplace	n-Hexane	DRYCAL FLOWMETER	BKK_FS1347	18-Aug-23	18-Aug-24	12
Workplace	n-Hexane	GC-FID	BKK_EN0126	21-Apr-23	21-Oct-24	18
Workplace	Total Dust	Field Rotameter	RYG_FS0197	4-Jan-24	4-Apr-24	3
Workplace	Total Dust	DRYCAL FLOWMETER	BKK_FS1347	18-Aug-23	18-Aug-24	12
Workplace	Total Dust	Digital Balance	RYG_EN0004	22-Feb-24	22-Feb-25	12
Noise	Leq 24 hrs	Sound Calibrator	RYG_FS0496	26-Jan-24	25-Jan-25	12
Noise	Leq 24 hrs	Sound Level Meter	RYG_FS0024	25-Jan-24	24-Jan-25	12
Noise	Leq 8 hrs	Sound Calibrator	RYG_FS0215	20-Sep-23	20-Sep-24	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0612	5-Jan-24	4-Jan-25	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0613	5-Jan-24	4-Jan-25	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0614	5-Jan-24	4-Jan-25	12
Noise	Leq 8 hrs	Sound Calibrator	RYG_FS0213	28-Feb-24	27-Feb-25	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0016	1-Sep-23	1-Sep-24	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0018	22-Jan-24	21-Jan-25	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0432	22-Feb-24	21-Feb-25	12
Heat	Heat Stress	Heat Stress Monitor	RYG_FS0218	14-Feb-23	14-Feb-24	12
Heat	Heat Stress	Heat Stress Monitor	RYG_FS0218	15-Feb-24	14-Feb-25	12
Rayong Lab	pH at 25 °C	pH meter	RYG_EN0183	19-Jan-24	19-Jan-25	12
Rayong Lab	Color (at Original pH)	Spectrophotometer	RYG_EN0037	18-Sep-23	18-Mar-25	18
Rayong Lab	Color (at pH 7.0)	Spectrophotometer	RYG_EN0037	18-Sep-23	18-Mar-25	18
Rayong Lab	BOD	DO meter with Sensor	RYG_EN0032	24-Jul-23	24-Jan-25	18
Rayong Lab	BOD	Incubator	RYG_EN0154	29-May-23	29-Nov-24	18
Rayong Lab	BOD	Burette	RYG_EN0162	30-Oct-23	30-Oct-24	12
Rayong Lab	COD	Spectrophotometer	RYG_EN0037	18-Sep-23	18-Mar-25	18
Rayong Lab	Total Suspended Solids	Electronic Balance	RYG_EN0002	22-Feb-24	22-Feb-25	12
Rayong Lab	Total Suspended Solids	Hot Air Oven	RYG_EN0010	21-Mar-24	21-Sep-25	18
Rayong Lab	Total Dissolved Solids 180°C	Electronic Balance	RYG_EN0002	22-Feb-24	22-Feb-25	12
Rayong Lab	Total Dissolved Solids 180°C	Hot Air Oven	RYG_EN0010	21-Mar-24	21-Sep-25	18
Rayong Lab	Oil & Grease	Electronic Balance	RYG_EN0002	22-Feb-24	22-Feb-25	12
Rayong Lab	Oil & Grease	Hot Air Oven	RYG_EN0213	21-Mar-24	21-Mar-25	12
Rayong Lab	Oil & Grease	Water Bath	RYG_EN0061	21-Mar-24	21-Sep-25	18
Rayong Lab	Temperature	pH meter	RYG_FS0607	6-Dec-23	6-Dec-24	12
Rayong Lab	Chloride	pH ISE Meter	RYG_EN0152	14-Dec-23	14-Dec-24	12
Water Lab	n-Hexane	Gas Chromatography (MSD)	BKK_EN0059	13-Dec-23	13-Jun-25	18



88/14 18.5752 3/5, Col. Pichayuan 7/71, Prachinburi 61,
Wattana, Bangkok, Thailand 10600 Thailand
Tel: 662 5258507-7913 Fax: 662 5258507 www.pichayuan.com



Calibration No. 12106-01
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Result of Calibration: 91 Passed Calibration 02 Not Accepted
Calibration Result: 20-40 °C

Function:

This equipment was submitted with temperature control device Model: EM950 5/10/2022

Calibration: 12106-01 12106-01 12106-01

Temperature Point (°C)	Standard Setting (°C)	QC Reading (°C)	Error (°C)	Uncertainty (°C)
20	20.007	19.8	-0.2	0.008
30	30.008	29.8	-0.2	0.008
40	40.009	39.8	-0.2	0.008

(QC) Limit is 0.008 °C

This report is valid only if the equipment is used in accordance with the calibration certificate and the calibration certificate is valid for the equipment.

W 12106-01 12106-01



88/14 18.5752 3/5, Col. Pichayuan 7/71, Prachinburi 61,
Wattana, Bangkok, Thailand 10600 Thailand
Tel: 662 5258507-7913 Fax: 662 5258507 www.pichayuan.com

CERTIFICATE OF CALIBRATION

Calibration No. 12106-01 12106-01
Page 1 of 1 Page

Measurement Item: 1. Temperature control device
Model/Type: 1. EM950 5/10/2022
Serial Number: 1. 12106-01
Calibration: 1. 12106-01 12106-01 12106-01

Measurement Method: 1. The measurement was carried out in accordance with the calibration certificate and the calibration certificate is valid for the equipment.

Uncertainty:

The uncertainty was calculated using the standard uncertainty of the measurement and the standard uncertainty of the measurement.

Measurement Date: 1. Jan 18, 2022
Issue Date: 1. Jan 18, 2022

Measurement Result:

The measurement result was calculated using the standard uncertainty of the measurement and the standard uncertainty of the measurement.

Measurement Item	Measurement Result	Standard Uncertainty	Expanded Uncertainty
Temperature	20.007 °C	0.008 °C	0.008 °C
Temperature	30.008 °C	0.008 °C	0.008 °C
Temperature	40.009 °C	0.008 °C	0.008 °C

Reviewed by: 1. Mr. Pichayuan 7/71
Approved by: 1. Mr. Pichayuan 7/71



Signature: 1. Mr. Pichayuan 7/71
Name: 1. Mr. Pichayuan 7/71

This calibration certificate is valid for the equipment and the calibration certificate is valid for the equipment.



ROTA METER CALIBRATION RESULT JANUARY 2024

Rotameter ID	Calibration Date	Regression Result	Coefficient (R ²)
BKH-F50565	10 Jan 24	$y = 1.0051x + 2.3733$	0.9998
BKH-F50567	10 Jan 24	$y = 1.0186x + 15.06$	0.9997
BKH-F50568	10 Jan 24	$y = 1.0015x + 12.000$	1.0000
BKH-F50569	10 Jan 24	$y = 1.0048x + 4.9782$	1.0000
BKH-F51004	04 Jan 24	$y = 0.9879x + 13.47$	0.9993
BKH-F51005	04 Jan 24	$y = 1.0187x + 1.25$	0.9998
BKH-F51006	04 Jan 24	$y = 1.1566x + 1.6605$	0.9981
BKH-F51007	10 Jan 24	$y = 1.1347x + 1.6007$	0.9985
BKH-F51008	10 Jan 24	$y = 1.1271x + 4.3927$	0.9985
BKH-F51017	04 Jan 24	$y = 1.1653x + 0.0701$	0.9984
BKH-F51018	04 Jan 24	$y = 1.0115x + 1.2887$	0.9995
BKH-F51019	04 Jan 24	$y = 1.0016x + 8.4887$	1.0000
BKH-F51020	19 Jan 24	$y = 0.9616x + 1.8026$	0.9995
BKH-F51021	19 Jan 24	$y = 1.0055x + 4.3786$	1.0000
BKH-F51022	19 Jan 24	$y = 1.0184x + 37.306$	0.9997
BKH-F51023	19 Jan 24	$y = 0.9900x + 2.7925$	0.9977
BKH-F51030	19 Jan 24	$y = 0.990x + 1.3290$	1.0000
BKH-F51031	19 Jan 24	$y = 1.015x + 27.238$	0.9997
BKH-F51036	04 Jan 24	$y = 1.0047x + 8.0287$	0.9997
BKH-F51040	04 Jan 24	$y = 1.0066x + 9.8882$	1.0000
BKH-F51041	04 Jan 24	$y = 1.0077x + 0.0486$	0.9995
BKH-F51042	04 Jan 24	$y = 1.0021x + 11.273$	0.9995
BKH-F51043	04 Jan 24	$y = 1.0023x + 8.3865$	1.0000
BKH-F51044	04 Jan 24	$y = 1.0738x + 1.2527$	0.9997
BKH-F51027	10 Jan 24	$y = 1.1096x + 0.3585$	1.0000
BKH-F51028	10 Jan 24	$y = 1.034x + 2.92$	1.0000
BKH-F51029	10 Jan 24	$y = 1.0017x + 8.0124$	1.0000
RYG-F50187	04 Jan 24	$y = 1.0045x + 10.275$	1.0000
RYG-F50188	04 Jan 24	$y = 1.0024x + 10.1$	1.0000
RYG-F50189	04 Jan 24	$y = 1.004x + 0.3854$	0.9995
RYG-F50584	04 Jan 24	$y = 1.0026x + 0.1885$	0.9998
RYG-F50585	04 Jan 24	$y = 0.992x + 8.9887$	0.9982
RYG-F50586	04 Jan 24	$y = 1.0088x + 2.8428$	1.0000
RYG-F50587	04 Jan 24	$y = 1.0472x + 1.8228$	0.9998
RYG-F50588	04 Jan 24	$y = 0.9975x + 20.283$	0.9995
RYG-F50589	04 Jan 24	$y = 1.0026x + 10.275$	1.0000
SGK-F50135	17 Jan 24	$y = 1.0145x + 2.8273$	1.0000
SGK-F50136	17 Jan 24	$y = 1.0115x + 1.75$	0.9999
SGK-F50138	04 Jan 24	$y = 1.0032x + 1.0284$	0.9999

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ALS Laboratory Group



Calibration Certificate

Certificate No. 551422
Product: 205410M October 510 Medium Flow
Serial No. 258341
Cal. Date: 18 Aug 2023

Sold To:

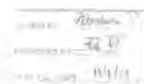
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As Received Calibration Data

Technician	As Received	Lab. Pressure Lab. Temperature	ASD 1 m/sly 73.8 °C
Inconceivable Reading	Lab. Standard Reading	Deviation	Allowable Deviation
4323.89 cm	4318.02 cm	5.86%	1.00%
398.43 cm	398.21 cm	0.01%	1.00%
245.22 cm	245.89 cm	-0.27%	1.00%

Mesa Laboratories Standards Used

Standard	Standard Serial Number	Calibration Date	Calibration Due Date
1A_800_24	202501	25-May-2023	25-May-2024



As Shipped Calibration Data

Calibration No.	Calibration Date	Lab. Pressure Lab. Temperature	ASD 1 m/sly 73.8 °C
Inconceivable Reading	Lab. Standard Reading	Deviation	Allowable Deviation
4318.02 cm	4318.02 cm	0.00%	1.00%
398.21 cm	398.21 cm	0.00%	1.00%
245.89 cm	245.89 cm	0.00%	1.00%

Mesa Laboratories Standards Used

Standard	Standard Serial Number	Calibration Date	Calibration Due Date
1A_800_24	202501	25-May-2023	25-May-2024

Calibration Notes

The expected uncertainty of this test is a coverage factor of 2, which is a confidence interval of approximately 95%. This testing is in accordance with our test method MP-0007, which is an expected uncertainty of 0.27% using high-purity nitrogen of stored laboratory air.

Traceability to the International System of Units (SI) is verified by accreditation to ISO/IEC 17025 by NVLAP under NVLAP Case 202011-0.

Technician Notes

By: 1. Mr. Pichayuan 7/71

Approved by: 1. Mr. Pichayuan 7/71

Signature: 1. Mr. Pichayuan 7/71

Signature: 1. Mr. Pichayuan 7/71

Printed Name: 1. Mr. Pichayuan 7/71

Printed Name: 1. Mr. Pichayuan 7/71

Signature: 1. Mr. Pichayuan 7/71

Signature: 1. Mr. Pichayuan 7/71

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Signature: 1. Mr. Pichayuan 7/71

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Setpoint Status: **Pass**

Test Pressure: 23.0 psi Actual: 23.9 psi

Accuracy: 0.2 psi

Agilent Recommended: 1.2 psi

Overall Inlet Pressure Accuracy Test Status: **Pass**

Detector Flow Accuracy

Name: 7935

Flow Type: FID

Setpoint Status: **Pass**

Flow Type: Fuel

Setpoint: 20.0 mL/min Measured Flow: 20.8 mL/min

Accuracy: 0.1 mL/min

Agilent Recommended: 1.0 mL/min

Limit is percentage of setpoint or 0.5 mL/min, whichever is larger.

Setpoint Status: **Pass**

Flow Type: Oxidant

Setpoint: 400.0 mL/min Measured Flow: 402.0 mL/min

Accuracy: 0.0 mL/min

Agilent Recommended: 10.0 mL/min

Limit is percentage of setpoint or 0.5 mL/min, whichever is larger.

Setpoint Status: **Pass**

Flow Type: Makeup

Setpoint: 25.0 mL/min Measured Flow: 24.8 mL/min

Accuracy: 0.1 mL/min

Agilent Recommended: 10.0 mL/min

Limit is percentage of setpoint or 0.5 mL/min, whichever is larger.

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System ID: CH1141000

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Overall Detector Flow Accuracy Test Status: **Pass**

Detector Flow Accuracy

Name: 7935

Setpoint: FID

Setpoint Status: **Pass**

Flow Type: Fuel

Setpoint: 20.0 mL/min Measured Flow: 20.7 mL/min

Accuracy: 0.2 mL/min

Agilent Recommended: 1.0 mL/min

Limit is percentage of setpoint or 0.5 mL/min, whichever is larger.

Setpoint Status: **Pass**

Flow Type: Oxidant

Setpoint: 400.0 mL/min Measured Flow: 397.0 mL/min

Accuracy: 1.0 mL/min

Agilent Recommended: 10.0 mL/min

Limit is percentage of setpoint or 0.5 mL/min, whichever is larger.

Setpoint Status: **Pass**

Flow Type: Makeup

Setpoint: 25.0 mL/min Measured Flow: 24.6 mL/min

Accuracy: 0.4 mL/min

Agilent Recommended: 10.0 mL/min

Limit is percentage of setpoint or 0.5 mL/min, whichever is larger.

Overall Detector Flow Accuracy Test Status: **Pass**

GC Oven Temperature Accuracy

Name: 7935

Date: April 21, 2023 2:29:38 PM
System ID: CH1141000

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Setpoint Status: **Pass**

Zone: Oven

Temperature: 230.0 230.8 °C

Accuracy: 0.8 °C

Agilent Recommended: 1.0 °C

Limit is percentage of setpoint or 0.5 °C, whichever is larger.

Setpoint Status: **Pass**

Zone: Oven

Temperature: 100.0 100.9 °C

Accuracy: 0.9 °C

Agilent Recommended: 1.0 °C

Limit is percentage of setpoint or 0.5 °C, whichever is larger.

Overall GC Oven Temperature Accuracy Test Status: **Pass**

GC Oven Temperature Stability

Name: 7935

Setpoint Status: **Pass**

Temperature: 100.0 100.8833 °C

Stability: 0.1 °C

Agilent Recommended: 0.5 °C

Overall GC Oven Temperature Stability Test Status: **Pass**

Sealing Run

Tested Combination: Front BSL / Front FID

Name: 7935A

Date: April 21, 2023 2:29:38 PM
System ID: CH1141000

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Setpoint Status: **Completed**

Injection Volume on Column: 1.0 µL

Overall Sealing Run Status: **Completed**

Heads and Drift

Tested Combination: Front BSL / Front FID

Name: 7935

Setpoint Status: **Pass**

Area Signal: 22.7 µA

ASTM Status: DR# 0.06 µA/yr

Agilent Recommended: 0.10 µA/yr

Overall Heads and Drift Test Status: **Pass**

Injection Precision

Tested Combination: Front BSL / Front FID

Name: 7935A

Setpoint Status: **Pass**

Injection Volume on Column: 1.0 µL

Area RSD: 0.33 %

Agilent Recommended: 3.00 %

Retention Time RSD: 0.07 %

Overall Injection Precision Test Status: **Pass**

Signal to Noise

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System ID: CH1141000

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Tested Combination: Front BSL / Front FID

Name: 7935

Setpoint Status: **Pass**

Signal to Noise: 721790

Agilent Recommended: 200000

Overall Signal to Noise Test Status: **Pass**

Sealing Run

Tested Combination: Back BSL / Back FID

Name: 7935A

Setpoint Status: **Completed**

Injection Volume on Column: 1.0 µL

Overall Sealing Run Status: **Completed**

Heads and Drift

Tested Combination: Back BSL / Back FID

Name: 7935

Setpoint Status: **Pass**

Area Signal: 22.9 µA

ASTM Status: DR# 0.07 µA/yr

Agilent Recommended: 0.10 µA/yr

Overall Heads and Drift Test Status: **Pass**

Date: April 21, 2023 2:29:38 PM
System ID: CH1141000

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Overall Heads and Drift Test Status: **Pass**

Injection Precision

Tested Combination: Back BSL / Back FID

Name: 7935A

Setpoint Status: **Pass**

Injection Volume on Column: 1.0 µL

Area RSD: 0.33 %

Agilent Recommended: 3.00 %

Retention Time RSD: 0.07 %

Overall Injection Precision Test Status: **Pass**

Signal to Noise

Tested Combination: Back BSL / Back FID

Name: 7935

Setpoint Status: **Pass**

Signal to Noise: 2104236

Agilent Recommended: 200000

Overall Signal to Noise Test Status: **Pass**

Date: April 21, 2023 2:29:38 PM
System ID: CH1141000

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Task Name	Task ID	Task Description	Task Type	Task Status	Task Date	Task Time	Task Location	Task Notes
Task 1	1001	Task 1 Description	Task 1 Type	Task 1 Status	Task 1 Date	Task 1 Time	Task 1 Location	Task 1 Notes
Task 2	1002	Task 2 Description	Task 2 Type	Task 2 Status	Task 2 Date	Task 2 Time	Task 2 Location	Task 2 Notes
Task 3	1003	Task 3 Description	Task 3 Type	Task 3 Status	Task 3 Date	Task 3 Time	Task 3 Location	Task 3 Notes
Task 4	1004	Task 4 Description	Task 4 Type	Task 4 Status	Task 4 Date	Task 4 Time	Task 4 Location	Task 4 Notes
Task 5	1005	Task 5 Description	Task 5 Type	Task 5 Status	Task 5 Date	Task 5 Time	Task 5 Location	Task 5 Notes
Task 6	1006	Task 6 Description	Task 6 Type	Task 6 Status	Task 6 Date	Task 6 Time	Task 6 Location	Task 6 Notes
Task 7	1007	Task 7 Description	Task 7 Type	Task 7 Status	Task 7 Date	Task 7 Time	Task 7 Location	Task 7 Notes
Task 8	1008	Task 8 Description	Task 8 Type	Task 8 Status	Task 8 Date	Task 8 Time	Task 8 Location	Task 8 Notes
Task 9	1009	Task 9 Description	Task 9 Type	Task 9 Status	Task 9 Date	Task 9 Time	Task 9 Location	Task 9 Notes
Task 10	1010	Task 10 Description	Task 10 Type	Task 10 Status	Task 10 Date	Task 10 Time	Task 10 Location	Task 10 Notes

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1000

Date: April 21, 2019 3:26:50 PM
 System ID: C:\hsad\hsad

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System ID: CIV-1461884

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Certificate of Calibration

Model Number	MSE125R-100-010	Certificate No	73BC10114
Description	Self-Healing Balance	Issued Date	Friday, March 01, 2023
Serial Number	0232190593	Reference No	PG4831
ID No	KYD_P00054		
Manufacturer	Sartorius	Page No	2 of 2

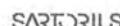
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Energy 48

Book: April 21, 2025 5:05:38 PM
System ID: CRT14C1006

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				SARTORIUS <i>THOMAS</i>	
Sartorius (Thailand) Co., Ltd. 401 Pacha 3 Pacha Building, Naphanong Road, Bangna District Tel: 02-545 5151 Fax: 02-545 5152 E-Mail: sarthai@sartorius-thailand.com					
<h1>Certificate</h1>					
<h2>of Calibration</h2>			REF ID: <i>TH-11</i> APPROVED BY: <i>[Signature]</i> REF ID: 2019 <i>01101016</i>		
Model Number: MSA 1234-100-OU		Confidence: 230C0114		Issue Date: Friday, March 01, 2022	
Description: Semi-micro Balance		ISSUED DATE:		Reference No: 204543	
Serial Number: 0123 056803					
ID No: RYD_722024					
Manufacturer: Sartorius		Page No: 1 of 2			
Customer Name: ALE Laboratory Group (Thailand) Co., Ltd. (Tayang Branch)					
Address: 616/10 Moo 51 Mueang Khua, A Phuak-Dong, Rayong 21140, Thailand.					
Calibration Point: ALE Laboratory Group (Thailand) Co., Ltd. (Balance Room)					
Address: 616/15 Moo 52 Mueang Khua, A Phuak-Dong, Rayong 21143, Thailand.					
Calibrated By: Mr. Chomcharin Inthana		Calibration Procedure No.: This calibration was conducted by using in-house calibration equipment number (WACB). Based on OIMAS 140, 2016.			
Calibration Date: Wednesday, March 01, 2022		Ambient Conditions:			
Measurand:		Temperature: 24.0 °C ± 0.6 °C			
Capacity: 120 g g Repeatability: 0.0001 g		Humidity: 53.0 % RH ± 10.0 % RH			
Pressure:		Pressure:			
Relative for Calibration:		Environmental Condition:			
<input type="checkbox"/> No Impurities <input type="checkbox"/> Solids / Residue <input type="checkbox"/> Not an approved material		<input type="checkbox"/> Fully Compliant <input type="checkbox"/> Limit Status <input type="checkbox"/> RH			
Measurement Method UKAS Publication Ref: Lab 14					
This measurement uncertainty stated is the expanded uncertainty which is associated from the standard uncertainty multiplied by the coverage factor (k=2) to provide a level of confidence of approximately 95%. It is determined in accordance with the Guide to the Expression of Uncertainty in Measurement (GUM). The calibration certificate documents the traceability to National Measurement System, which is related to the measurement according to the International System of Units (SI). Report of Uncertainty comes from List of National Measurement Uncertainties.					
Traceability:					
Model Number:		Traceability:		Certificate No:	
Issue Date:		Traceability:		Due Date:	
YCB211-622-00		SPC-RT		202213580	
MS-6-36280		DR/SH		131220444	
Uncertainty/Resolution: Temp: 1.0001 g/0.001 g		8-Sep-2022			
This certificate needs only one copy and it is required only once. This certificate may not be reproduced in whole or full contents with the prior written approval of the International Calibration Corporation (Thailand) Co., Ltd.					
					
An associate member of Sartorius Manufacturing					
S T A M P					
					



Certificate of Calibration

Model Number	LINE 125P-100-DU	Certificate No.	738C0114
Description	Scintimetric Balance	Initial Date	Friday, March 03, 2006
Serial Number	0037106053	Reference No.	204623
ID No.	RYG_EX0004		
Manufacturer	Scintiscan	Page No.	3 of 3

Calibration Results - 1600hour Adjustment

Repeatability

The repeatability is the ability to re-measure components in different ways without the need for statistical analysis. The repeatability is the same for all components. The repeatability is the same for all components. The repeatability is the same for all components.

Normal Value (Low Level)

Tolerance

0.00015 g

Normal Value (High Level)

100 g

Tolerance

0.00015 g

Standard Deviation

0.00015 g

Eccentricity (Off-center loading error)

The eccentricity is the ability to re-measure components in different ways without the need for statistical analysis. The eccentricity is the same for all components. The eccentricity is the same for all components. The eccentricity is the same for all components.

Normal value: 0.01 g

Tolerance: 0.0015 g

Difference

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Cert. No. : ACL24009
Page : 2 of 5

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : BICO
Model : NL-43 Miniature (C-52) Precision 901-54
Serial No. : 0023183 / 14418 / 121280
ID No. : NYG F90234

Condition As Found : 0000

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
108 PHATTHANAKAN 46, PHATTHANAKAN ROAD,
KORATANG PHATTHANAKAN, KHUET SUAN LUANG,
RANGKOK, (1250 PHATTHANAKAN)

Location :
Ambient Temperature : (23.0 ± 0.5) °C
Pressure : (101.3 ± 1) kPa
Relative Humidity : (50.0 ± 20) %
Received Date : 19 JANUARY 2024
Calibration Date : 25-26 JANUARY 2024
Date of Issue : 28 JANUARY 2024

Calibrated by : *Thaicharn Pichaphan*

Approved by : *T. Pichaphan*
(Thaicharn Pichaphan)

This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard, and can be reproduced
either than in full, except with the prior written approval of the head of Calibration Laboratory.



Cert. No. : ACL24009
Job No. : VCK7ACR008
Page : 3 of 5

Summary of Measurement Result:

Parameter	Tolerance (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	0.6
2. Self-generated noise	0.2	0.6
3. Acoustical signal tone of frequency weightings		
125 Hz	0.3	0.8
1000 Hz	0.3	0.8
8000 Hz	0.3	0.7
4. Electrical signal tone of frequency weightings		
For 10 Hz to 1 kHz	0.3	0.8
For > 1 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	-	1.0
5. Frequency and time weightings at 1 kHz	0.2	0.2
6. Long-term stability	0.1	0.1
7. Level linearity on the reference level range	0.2	0.3
8. Level linearity including the level range tested	0.2	0.3
9. Time burst response	0.2	0.3
10. Peak C-weight level	0.2	0.39
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1



Cert. No. : ACL24009
Job No. : VCK7ACR008
Page : 2 of 5

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow an IEC-61672-2 (2013) Standard for sound level meter (SLM).
The SLM test was in Acoustical and Electrical signal tone of frequency weighting with Acoustic chamber and Reference
Standard Instrument.
For test results of each item, were made by observation of each instrument display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instrument :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY93017070	ET-0009-23	07-FEB-24
Waveform Generator	33511B	MY93202142	ET-0010-23	07-FEB-24
Digital Multimeter	33401A	MY93202104	ETL-007 201006	15-FEB-24
Digital Multimeter	33401A	MY93202078	ETL-007 201006	15-FEB-24
Digital Multimeter	34401A	MY930204271	ETL-007 31-02-24	14-FEB-24
Programmable Attenuator	MA1-10070	42100114	EP-0011-23	08-FEB-24
Condenser Microphone	4190	2077980	AA-0101-23	14-FEB-24
Amplifying Amplifier	NA-42KAI	3450095	AA-0002-23	14-FEB-24

2. This result of calibration was tested accurate as shown on test and phase of calibration for this calibrated item.

3. This certificate is available to the international system of unit maintained at :
3.1 National Institute of Metrology (Thailand)
3.2 Thailand Institute of Scientific and Technological Research (TISTR).



Cert. No. : ACL24009
Job No. : VCK7ACR008
Page : 3 of 5

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.9)	93.9	0.0	±0.3

2. Self-generated noise

Measured Value (dB)
18.2

2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Measured value (dB)
A-weight	14.2
C-weight	20.0
Flat	23.6

3. Acoustical signal tone of frequency weightings

Motor for field acoustic response at a level of 94 dB

Frequency (Hz)	1/3a	C-weight	A-weight	Acceptance Limit
125	0.2	0.2	0.2	±1.0
1000	0.1	0.1	0.1	±1.0
8000	0.3	0.3	0.3	±0.8



Cert. No. : ACL24009
Job No. : VCK7ACR008
Page : 3 of 5

4. Electrical signal tone of frequency weightings

Weighting between frequency with relative to 1 kHz

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limit
63	0.0	0.0	0.0	±2.0
125	0.0	0.0	0.0	±1.2
250	0.0	0.0	0.0	±1.2
500	0.0	0.0	0.0	±1.2
1000	0.0	0.0	0.0	±0.8
2000	0.0	0.0	0.0	±1.0
4000	0.0	0.0	0.0	±1.0
8000	0.0	0.1	0.1	±1.0

5. Frequency and time weightings at 1 kHz

Frequency Weighting	Accepted Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit (dB)
A-weight	94.0	94.0	0.0	±0.2
C-weight	94.0	94.0	0.0	±0.2
Flat	94.0	94.0	0.0	±0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Accepted Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit (dB)
Flat	94.0	94.0	0.0	±0.1
Slow	94.0	94.0	0.0	±0.1
Fast	94.0	94.0	0.0	±0.1

6. Long-term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviation Value (dB)	Acceptance Limit (dB)
A-weight	94.0	94.0	0.0	±0.1



Cert. No. : ACL24009
Job No. : VCK7ACR008
Page : 3 of 5

7. Level linearity on the reference level range

Reference Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit (dB)
137.0	137.0	0.0	±1.1
136.0	136.0	0.0	±1.1
135.0	135.0	0.0	±1.1
134.0	134.0	0.0	±1.1
133.0	133.0	0.0	±1.1
132.0	132.0	0.0	±1.1
131.0	131.0	0.0	±1.1
129.0	129.0	0.0	±1.1
128.0	128.0	0.0	±1.1
127.0	127.0	0.0	±1.1
126.0	126.0	0.0	±1.1
125.0	125.0	0.0	±1.1
124.0	124.0	0.0	±1.1
123.0	123.0	0.0	±1.1
122.0	122.0	0.0	±1.1
121.0	121.0	0.0	±1.1
120.0	120.0	0.0	±1.1
119.0	119.0	0.0	±1.1
118.0	118.0	0.0	±1.1
117.0	117.0	0.0	±1.1
116.0	116.0	0.0	±1.1
115.0	115.0	0.0	±1.1
114.0	114.0	0.0	±1.1
113.0	113.0	0.0	±1.1
112.0	112.0	0.0	±1.1
111.0	111.0	0.0	±1.1
110.0	110.0	0.0	±1.1
109.0	109.0	0.0	±1.1
108.0	108.0	0.0	±1.1
107.0	107.0	0.0	±1.1
106.0	106.0	0.0	±1.1
105.0	105.0	0.0	±1.1
104.0	104.0	0.0	±1.1
103.0	103.0	0.0	±1.1
102.0	102.0	0.0	±1.1
101.0	101.0	0.0	±1.1
100.0	100.0	0.0	±1.1
99.0	99.0	0.0	±1.1
98.0	98.0	0.0	±1.1
97.0	97.0	0.0	±1.1
96.0	96.0	0.0	±1.1
95.0	95.0	0.0	±1.1
94.0	94.0	0.0	±1.1
93.0	93.0	0.0	±1.1
92.0	92.0	0.0	±1.1
91.0	91.0	0.0	±1.1
90.0	90.0	0.0	±1.1
89.0	89.0	0.0	±1.1
88.0	88.0	0.0	±1.1
87.0	87.0	0.0	±1.1
86.0	86.0	0.0	±1.1
85.0	85.0	0.0	±1.1
84.0	84.0	0.0	±1.1
83.0	83.0	0.0	±1.1
82.0	82.0	0.0	±1.1
81.0	81.0	0.0	±1.1
80.0	80.0	0.0	±1.1
79.0	79.0	0.0	±1.1
78.0	78.0	0.0	±1.1
77.0	77.0	0.0	±1.1
76.0	76.0	0.0	±1.1
75.0	75.0	0.0	±1.1

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had been to Acoustical and Electrical signal tests of frequency weighting with Acoustic chamber and Reference Standard Instruments.
For test results of each item were made by observation of each instrument display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	23210A	MY6017076	02-0009-23	07-FEB-24
Waveform Generator	33511B	MY3232742	43-0010-23	07-FEB-24
Digital Multimeter	33801A	MY3230104	123-RP-230206	13-FEB-24
Digital Multimeter	33801A	MY3230078	123-RP-230206	13-FEB-24
Digital Multimeter	34461A	MY60034271	123-RP-314058	14-FEB-24
Programmable Attenuator	MA1-107B	82100114	EF-0011-23	08-FEB-24
Condenser Microphone	4190	2877826	AA-0101-23	14-FEB-24
Measuring Amplifier	NA-425A1	3454085	AA-0002-23	16-FEB-24

2. This result of calibration was found accurate at above date and place of calibration for this calibrated item only.

3. This certificate is traceable to the international system of unit maintained at :

3.1 National Institute of Standards (NIST).

3.2 Thailand Institute of Scientific and Technological Research (TISTR).

Summary of Measurement Result :

Parameter	Uncertainty	
	(dB)	Maximum permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	NA
2. Self-generated noise	0.2	NA
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For 4 kHz to 10 kHz	0.3	0.7
For 10 kHz to 20 kHz	-	1.8
5. Frequency and time weightings at 1 kHz	0.2	0.2
6. Long-term stability	0.1	0.1
7. Level linearity on the reference level range	0.2	0.3
8. Level linearity including the level range control	0.2	0.3
9. Time base response	0.2	0.3
10. Peak C sound level	0.2	0.3
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.9)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal use

Measured Value (dB)
16.0

2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Measured Value (dB)
A-weight	17.6
C-weight	17.6
Flat	23.6

3. Acoustical signal tests of frequency weightings

Mean four third octave response at a level of 94 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)				Acceptance Limit (dB)
	Flat	C-weight	A-weight	Acceptance Limit	
125	0.2	0.2	0.3	±1.5	
1000	0.0	0.0	0.0	±1.0	
5000	0.6	0.7	0.7	±1.0	

4. Electrical signal tests of frequency weightings

Weighting network response with reference to 1 kHz

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)				Acceptance Limit (dB)
	Flat	C-weight	A-weight	Acceptance Limit	
40	-0.1	0.0	0.0	±2.0	
125	0.0	0.1	0.0	±1.5	
250	0.0	0.0	0.0	±1.5	
500	0.0	0.1	0.0	±1.5	
1000	0.0	0.0	0.0	±1.0	
2000	0.0	0.1	0.0	±1.0	
4000	0.0	0.0	0.0	±1.0	
8000	0.0	0.1	0.1	±1.0	

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit (dB)
A-weight	94.0	94.0	0.0	±0.2
C-weight	94.0	94.0	0.0	±0.2
Flat	94.0	94.0	0.0	±0.2

5.2 Time weightings at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit (dB)
Fast	94.0	94.0	0.0	±0.1
Slow	94.0	94.0	0.0	±0.1
Imp	94.0	94.0	0.0	±0.1

6. Long-term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviation Value (dB)	Acceptance Limit (dB)
A-weight	94.0	94.0	0.0	±0.1

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit (dB)
157.0	157.0	0.0	±1.1
136.0	136.0	0.0	±1.1
115.0	115.0	0.0	±1.1
114.0	114.0	0.0	±1.1
113.0	113.0	0.0	±1.1
112.0	112.0	0.0	±1.1
111.0	111.0	0.0	±1.1
110.0	110.0	0.0	±1.1
109.0	109.0	0.0	±1.1
108.0	108.0	0.0	±1.1
107.0	107.0	0.0	±1.1
106.0	106.0	0.0	±1.1
105.0	105.0	0.0	±1.1
104.0	104.0	0.0	±1.1
103.0	103.0	0.0	±1.1
102.0	102.0	0.0	±1.1
101.0	101.0	0.0	±1.1
100.0	100.0	0.0	±1.1
99.0	99.0	0.0	±1.1
98.0	98.0	0.0	±1.1
97.0	97.0	0.0	±1.1
96.0	96.0	0.0	±1.1
95.0	95.0	0.0	±1.1
94.0	94.0	0.0	±1.1
93.0	93.0	0.0	±1.1
92.0	92.0	0.0	±1.1
91.0	91.0	0.0	±1.1
90.0	90.0	0.0	±1.1
89.0	89.0	0.0	±1.1
88.0	88.0	0.0	±1.1
87.0	87.0	0.0	±1.1
86.0	86.0	0.0	±1.1
85.0	85.0	0.0	±1.1
84.0	84.0	0.0	±1.1
83.0	83.0	0.0	±1.1
82.0	82.0	0.0	±1.1
81.0	81.0	0.0	±1.1
80.0	80.0	0.0	±1.1
79.0	79.0	0.0	±1.1
78.0	78.0	0.0	±1.1
77.0	77.0	0.0	±1.1
76.0	76.0	0.0	±1.1
75.0	75.0	0.0	±1.1

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit (dB)
Auto	94.0	94.0	0.0	±1.1

9. Time base response

Time Response	Time base duration, T _b (sec)	Cycle	Anticipated Value (dB)				Acceptance Limit (dB)
			Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit (dB)	
Fast	0.25	1	100.0	100.0	0.0	±1.5	±1.5
	2	3	117.0	117.0	0.0	±1.0	±1.0
	200	800	134.0	134.0	0.0	±1.0	±1.0
Slow	2	3	100.0	100.0	0.0	±1.5	±1.5
	200	800	121.0	121.0	0.0	±1.0	±1.0
	0.25	1	99.0	99.0	0.0	±1.5	±1.5
Imp	2	3	100.0	100.0	0.0	±1.0	±1.0
	200	800	120.0	120.0	0.0	±1.0	±1.0

10. Peak C sound level

Number of cycle test signal	Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit (dB)
Continuous	113.0	113.0	0.0	±1.0
One	110.0	110.0	0.0	±1.0

Number of cycle test signal	Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit (dB)
Continuous	113.0	113.0	0.0	±1.0
Positive half cycle	113.0	113.0	0.0	±1.0
Negative half cycle	113.0	113.0	0.0	±1.0

11. Overall Indication

Measured value (dB)	Deviation Value (dB)	Acceptance Limit (dB)
Positive	Negative	
measured value	measured value	
89.7	89.5	-0.2
		0.3

12. High level stability

Frequency	SLM Display at initial	SLM Display at final	Deviation Value	Acceptance Limit
Weighting	(dB)	(dB)	(dB)	(dB)
A-weight	131.0	131.6	0.6	-0.3

The required uncertainty is based on a standard uncertainty multiplied by coverage factor $k = 2$ or any value following calculation providing a level of confidence of approximately 95 %

End of Calibration Certificate

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42A / Microphone UC-32 / Pre-amplifier NH-54
Serial No. : 280208 / 19643 / 26416
ID No. : RYO / 150613

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
SIRINDHAR PHATTHANAKAN, KURT SUANLUANG,
BANGKOK, 10250 THAILAND

Location :
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %
Received Date : 19 DECEMBER 2021
Calibration Date : 06-JANUARY 2024
Date of Issue : 09 JANUARY 2024

Calibrated by : Natchanon Pongmanee

Approved by : *T. Pongmanee*
(Natchanon Pongmanee)

This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard, any not be reproduced other than in full, except with the prior written approval of the Issuing Calibration Laboratory.

Calibration Procedure : CP-AC-01

Calibration Method :

The equipment was calibrated by follow on IEC 61672-1 Class 1 Standard for sound level meter (SLM).
The SLM had been in Acoustic and Electrical signal tests of frequency weighting with Acoustic chamber and Reference Standard Instruments.
Test results of each item were made by observation of each instrument display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY8017976	17-0009-23	07-12-24
Waveform Generator	33511B	ATV3202742	17-0010-23	07-12-24
Digital Multimeter	3380A	MY1320104	13-10-2020	13-12-24
Digital Multimeter	3380A	MY1320076	13-10-2020	13-12-24
Digital Multimeter	3441A	MY0024273	13-10-2020	13-12-24
Programmable Attenuator	MAT-1070	6210014	17-0011-23	08-12-24
Condenser Microphone	4180	2977001	AS 1800-23	14-12-24
Measuring Amplifier	NA-42CA	3540495	AA 3807-23	14-12-24

2. This result of calibration was found accurate as shown on date and place of calibration for this calibration item only.

3. This certificate is issued in the International system of unit maintained at :

3.1 National Institute of Metrology (Thailand)

3.2 Thailand Institute of Scientific and Technological Research (TISTR)

Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
820 Hz	0.2	0.6
1000 Hz	0.2	0.6
2000 Hz	0.2	0.7
4. Electrical signal tests of frequency weightings		
10 Hz to 4 kHz	0.2	0.6
For < 4 kHz to 10 kHz	0.2	0.7
For > 10 kHz to 20 kHz	—	1.0
5. Frequency and time weightings at 1 kHz	0.2	0.2
6. Long-term stability	0.1	0.1
7. Level linearity on the reference level range	0.2	0.2
8. Level linearity including the level range extend	0.2	0.3
9. Time base response	0.2	0.3
10. Pass C sound level	0.2	0.35
11. Overall indication	0.2	0.29
12. High level stability	0.1	0.1

Result of Calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.9)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Noise test

Measured Value (dB)
13.6

2.2 The acceptance of the sound level meter was replaced by electrical signal input device

Frequency	Measured value (dB)
Weighting	
A-weight	10.8
C-weight	17.1
Flat	23.0

3. Acoustical signal tests of frequency weightings

More free-field accurate response at a level of 94 dB

Frequency (Hz)	Deviation from various frequency weighting response curves (dB)			
	Flat	1/weight	A-weight	Asymptotic Limit
125	0.3	0.3	0.4	± 1.5
1000	0.0	0.0	0.0	± 1.0
8000	1.0	1.1	1.1	± 0.9

4. Electrical signal tests of frequency weightings

Weighting more or less accurate with relative to 1 kHz

Frequency (Hz)	Deviation from vision frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limit
43	-0.1	-0.1	0.0	±0.5
125	0.0	0.0	0.0	±1.3
250	0.0	0.0	0.0	±1.3
500	0.0	0.0	0.0	±1.3
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.0	0.0	±2.0
4000	0.0	0.0	0.0	±2.0
8000	0.0	0.1	0.1	±3.0

5. Frequency and time weightings at 1 kHz

Parameter	Accepted Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit (dB)
Weighting				
A-weight	94.0	94.0	0.0	±0.2
C-weight	94.0	94.0	0.0	±0.2
Flat	94.0	94.0	0.0	±0.2

6. Long-term stability

Frequency	SLM Display at initial	SLM Display at final	Deviation Value	Acceptance Limit
Weighting	(dB)	(dB)	(dB)	(dB)
A-weight	94.0	94.0	0.0	±0.1
C-weight	94.0	94.0	0.0	±0.1
Flat	94.0	94.0	0.0	±0.1

7. High level stability

Frequency	SLM Display at initial	SLM Display at final	Deviation Value	Acceptance Limit
Weighting	(dB)	(dB)	(dB)	(dB)
A-weight	94.0	94.0	0.0	±0.1

7. Level linearity on the reference level range

Assessment Year (dB)	Measured Value (dB)	Deviant Value (dB)	Acceptance Limits (dB)
127.0	127.0	0.0	+1.1
126.0	126.0	0.0	+1.1
125.0	125.0	0.0	+1.1
124.0	124.0	0.0	+1.1
123.0	123.0	0.0	+1.1
122.0	122.0	0.0	+1.1
121.0	121.0	0.0	+1.1
120.0	120.0	0.0	+1.1
119.0	119.0	0.0	+1.1
118.0	118.0	0.0	+1.1
117.0	117.0	0.0	+1.1
116.0	116.0	0.0	+1.1
115.0	115.0	0.0	+1.1
114.0	114.0	0.0	+1.1
113.0	113.0	0.0	+1.1
112.0	112.0	0.0	+1.1
111.0	111.0	0.0	+1.1
110.0	110.0	0.0	+1.1
109.0	109.0	0.0	+1.1
108.0	108.0	0.0	+1.1
107.0	107.0	0.0	+1.1
106.0	106.0	0.0	+1.1
105.0	105.0	0.0	+1.1
104.0	104.0	0.0	+1.1
103.0	103.0	0.0	+1.1
102.0	102.0	0.0	+1.1
101.0	101.0	0.0	+1.1
100.0	100.0	0.0	+1.1
99.0	99.0	0.0	+1.1
98.0	98.0	0.0	+1.1
97.0	97.0	0.0	+1.1
96.0	96.0	0.0	+1.1
95.0	95.0	0.0	+1.1
94.0	94.0	0.0	+1.1
93.0	93.0	0.0	+1.1
92.0	92.0	0.0	+1.1
91.0	91.0	0.0	+1.1
90.0	90.0	0.0	+1.1
89.0	89.0	0.0	+1.1
88.0	88.0	0.0	+1.1
87.0	87.0	0.0	+1.1
86.0	86.0	0.0	+1.1
85.0	85.0	0.0	+1.1
84.0	84.0	0.0	+1.1
83.0	83.0	0.0	+1.1
82.0	82.0	0.0	+1.1
81.0	81.0	0.0	+1.1
80.0	80.0	0.0	+1.1
79.0	79.0	0.0	+1.1
78.0	78.0	0.0	+1.1
77.0	77.0	0.0	+1.1
76.0	76.0	0.0	+1.1
75.0	75.0	0.0	+1.1
74.0	74.0	0.0	+1.1
73.0	73.0	0.0	+1.1
72.0	72.0	0.0	+1.1
71.0	71.0	0.0	+1.1
70.0	70.0	0.0	+1.1
69.0	69.0	0.0	+1.1
68.0	68.0	0.0	+1.1
67.0	67.0	0.0	+1.1
66.0	66.0	0.0	+1.1
65.0	65.0	0.0	+1.1
64.0	64.0	0.0	+1.1
63.0	63.0	0.0	+1.1
62.0	62.0	0.0	+1.1
61.0	61.0	0.0	+1.1
60.0	60.0	0.0	+1.1
59.0	59.0	0.0	+1.1
58.0	58.0	0.0	+1.1
57.0	57.0	0.0	+1.1
56.0	56.0	0.0	+1.1
55.0	55.0	0.0	+1.1
54.0	54.0	0.0	+1.1
53.0	53.0	0.0	+1.1
52.0	52.0	0.0	+1.1
51.0	51.0	0.0	+1.1
50.0	50.0	0.0	+1.1
49.0	49.0	0.0	+1.1
48.0	48.0	0.0	+1.1
47.0	47.0	0.0	+1.1
46.0	46.0	0.0	+1.1
45.0	45.0	0.0	+1.1
44.0	44.0	0.0	+1.1
43.0	43.0	0.0	+1.1
42.0	42.0	0.0	+1.1
41.0	41.0	0.0	+1.1
40.0	40.0	0.0	+1.1
39.0	39.0	0.0	+1.1
38.0	38.0	0.0	+1.1
37.0	37.0	0.0	+1.1
36.0	36.0	0.0	+1.1
35.0	35.0	0.0	+1.1
34.0	34.0	0.0	+1.1
33.0	33.0	0.0	+1.1
32.0	32.0	0.0	+1.1
31.0	31.0	0.0	+1.1
30.0	30.0	0.0	+1.1
29.0	29.0	0.0	+1.1
28.0	28.0	0.0	+1.1
27.0	27.0	0.0	+1.1
26.0	26.0	0.0	+1.1
25.0	25.0	0.0	+1.1
24.0	24.0	0.0	+1.1
23.0	23.0	0.0	+1.1
22.0	22.0	0.0	+1.1
21.0	21.0	0.0	+1.1
20.0	20.0	0.0	+1.1
19.0	19.0	0.0	+1.1
18.0	18.0	0.0	+1.1
17.0	17.0	0.0	+1.1
16.0	16.0	0.0	+1.1
15.0	15.0	0.0	+1.1
14.0	14.0	0.0	+1.1
13.0	13.0	0.0	+1.1
12.0	12.0	0.0	+1.1
11.0	11.0	0.0	+1.1
10.0	10.0	0.0	+1.1
9.0	9.0	0.0	+1.1
8.0	8.0	0.0	+1.1
7.0	7.0	0.0	+1.1
6.0	6.0	0.0	+1.1
5.0	5.0	0.0	+1.1
4.0	4.0	0.0	+1.1
3.0	3.0	0.0	+1.1
2.0	2.0	0.0	+1.1
1.0	1.0	0.0	+1.1
0.0	0.0	0.0	+1.1
-1.0	-1.0	0.0	+1.1
-2.0	-2.0	0.0	+1.1
-3.0	-3.0	0.0	+1.1
-4.0	-4.0	0.0	+1.1
-5.0	-5.0	0.0	+1.1
-6.0	-6.0	0.0	+1.1
-7.0	-7.0	0.0	+1.1
-8.0	-8.0	0.0	+1.1
-9.0	-9.0	0.0	+1.1
-10.0	-10.0	0.0	+1.1
-11.0	-11.0	0.0	+1.1
-12.0	-12.0	0.0	+1.1
-13.0	-13.0	0.0	+1.1
-14.0	-14.0	0.0	+1.1
-15.0	-15.0	0.0	+1.1
-16.0	-16.0	0.0	+1.1
-17.0	-17.0	0.0	+1.1
-18.0	-18.0	0.0	+1.1
-19.0	-19.0	0.0	+1.1
-20.0	-20.0	0.0	+1.1
-21.0	-21.0	0.0	+1.1
-22.0	-22.0	0.0	+1.1
-23.0	-23.0	0.0	+1.1
-24.0	-24.0	0.0	+1.1
-25.0	-25.0	0.0	+1.1
-26.0	-26.0	0.0	+1.1
-27.0	-27.0	0.0	+1.1
-28.0	-28.0	0.0	+1.1
-29.0	-29.0	0.0	+1.1
-30.0	-30.0	0.0	+1.1
-31.0	-31.0	0.0	+1.1
-32.0	-32.0	0.0	+1.1
-33.0	-33.0	0.0	+1.1
-34.0	-34.0	0.0	+1.1
-35.0	-35.0	0.0	+1.1
-36.0	-36.0	0.0	+1.1
-37.0	-37.0	0.0	+1.1
-38.0	-38.0	0.0	+1.1
-39.0	-39.0	0.0	+1.1
-40.0	-40.0	0.0	+1.1
-41.0	-41.0	0.0	+1.1
-42.0	-42.0	0.0	+1.1
-43.0	-43.0	0.0	+1.1
-44.0	-44.0	0.0	+1.1
-45.0	-45.0	0.0	+1.1
-46.0	-46.0	0.0	+1.1
-47.0	-47.0	0.0	+1.1
-48.0	-48.0	0.0	+1.1
-49.0	-49.0	0.0	+1.1
-50.0	-50.0	0.0	+1.1
-51.0	-51.0	0.0	+1.1
-52.0	-52.0	0.0	+1.1
-53.0	-53.0	0.0	+1.1
-54.0	-54.0	0.0	+1.1
-55.0	-55.0	0.0	+1.1
-56.0	-56.0	0.0	+1.1
-57.0	-57.0	0.0	+1.1
-58.0	-58.0	0.0	+1.1
-59.0	-59.0	0.0	+1.1
-60.0	-60.0	0.0	+1.1
-61.0	-61.0	0.0	+1.1
-62.0	-62.0	0.0	+1.1
-63.0	-63.0	0.0	+1.1
-64.0	-64.0	0.0	+1.1
-65.0	-65.0	0.0	+1.1
-66.0	-66.0	0.0	+1.1
-67.0	-67.0	0.0	+1.1
-68.0	-68.0	0.0	+1.1
-69.0	-69.0	0.0	+1.1
-70.0	-70.0	0.0	+1.1
-71.0	-71.0	0.0	+1.1
-72.0	-72.0	0.0	+1.1
-73.0	-73.0	0.0	+1.1
-74.0	-74.0	0.0	+1.1
-75.0	-75.0	0.0	+1.1
-76.0	-76.0	0.0	+1.1
-77.0	-77.0	0.0	+1.1
-78.0	-78.0	0.0	+1.1
-79.0	-79.0	0.0	+1.1
-80.0	-80.0	0.0	+1.1
-81.0	-81.0	0.0	+1.1
-82.0	-82.0	0.0	+1.1
-83.0	-83.0	0.0	+1.1
-84.0	-84.0	0.0	+1.1
-85.0	-85.0	0.0	+1.1
-86.0	-86.0	0.0	+1.1
-87.0	-87.0	0.0	+1.1
-88.0	-88.0	0.0	+1.1
-89.0	-89.0	0.0	+1.1
-90.0	-90.0	0.0	+1.1
-91.0	-91.0	0.0	+1.1
-92.0	-92.0	0.0	+1.1
-93.0	-93.0	0.0	+1.1
-94.0	-94.0	0.0	+1.1
-95.0	-95.0	0.0	+1.1
-96.0	-96.0	0.0	+1.1
-97.0	-97.0	0.0	+1.1
-98.0	-98.0	0.0	+1.1
-99.0	-99.0	0.0	+1.1
-100.0	-100.0	0.0	+1.1

T. Pichai

11. Overload indication

Measured value (dB)	Deviant	Acceptance
Positive	Value	Limits
Negative	Value	Limits
127.0	0.0	+1.1

12. High level stability

Frequency	SLM Display	SLM Display	Deviant	Acceptance
Weighting	at initial	at final	Value	Limits
(dB)	(dB)	(dB)	(dB)	(dB)
A-weighting	127.0	127.0	0.0	+1.1

This report is issued on the basis of a measured uncertainty multiplied by Coverage Factor k = 2
or any other relevant value, depending on the level of confidence of measurement 95 %

End of Calibration Certificate

T. Pichai

Calibration Procedure : CPAC-01

Calibration Method :

This equipment was calibrated by follow on IEC 61010-2 (2015) Standard for sound level meter (SLM).
The SLM had been in Automatic and Electrical signal test of frequency weighting with Acoustic chamber and Reference Standard Instruments.

For test results of each item were made by observation of each instrument display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Certs. No.	Due Date
Wireless Generator	33210A	MY4801076	17-06-23	07-12-24
Wireless Generator	33511B	MY3510252	17-06-23	07-12-24
Digital Multimeter	33401A	MY3320100	17-06-23	07-12-24
Digital Multimeter	33401A	1A1232079	17-06-23	07-12-24
Digital Multimeter	33401A	MY4050271	17-06-23	07-12-24
Programmable Attenuator	44A-1070	8210014	17-06-23	07-12-24
Condenser Microphone	4101	2077901	17-06-23	07-12-24
Shielding Amplifier	NA-42CAF	3404001	17-06-23	07-12-24

2. The result of calibration was found accurate as shown on data and photo of calibration the two calibration certificate

3. The certificate is ready to be issued on the basis of the result of calibration

3.1 National Institute of Standards (NIST)

3.2 National Institute of Standards and Technology (NIST)

T. Pichai

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviant Value (dB)	Acceptance Limits (dB)
Auto	94.0	94.0	0.0	+1.1

9. Time base response

Time	Time base	Cycle	Anticipated	Measured	Deviant	Acceptance
Weighting	duration, T _b		Value (dB)	Value (dB)	Value (dB)	Limits (dB)
Flat	0.25	1	108.0	107.9	-0.1	+1.1
	2	2	117.0	117.0	0.0	+1.1
	200	200	124.0	124.0	0.0	+1.1
Slew	0.25	1	108.0	108.0	0.0	+1.1
	2	2	117.0	117.0	0.0	+1.1
	200	200	124.0	124.0	0.0	+1.1
100%	0.25	1	99.0	99.0	0.0	+1.1
	2	2	108.0	108.0	0.0	+1.1
	200	200	124.0	124.0	0.0	+1.1

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	
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7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limit (dB)
137.0	137.0	0.0	+1.1
136.0	136.0	0.0	+1.1
135.0	135.0	0.0	+1.1
134.0	134.0	0.0	+1.1
133.0	133.0	0.0	+1.1
132.0	132.0	0.0	+1.1
131.0	131.0	0.0	+1.1
129.0	129.0	0.0	+1.1
124.0	124.0	0.0	+1.1
119.0	119.0	0.0	+1.1
114.0	114.0	0.0	+1.1
109.0	109.0	0.0	+1.1
104.0	104.0	0.0	+1.1
99.0	99.0	0.0	+1.1
94.0	94.0	0.0	+1.1
89.0	89.0	0.0	+1.1
84.0	84.0	0.0	+1.1
79.0	79.0	0.0	+1.1
74.0	74.0	0.0	+1.1
69.0	69.0	0.0	+1.1
64.0	64.0	0.0	+1.1
59.0	59.0	0.0	+1.1
54.0	54.0	0.0	+1.1
49.0	49.0	0.0	+1.1
44.0	44.0	0.0	+1.1
39.0	39.0	0.0	+1.1
34.0	34.0	0.0	+1.1
29.0	29.0	0.0	+1.1
24.0	24.0	0.0	+1.1
19.0	19.0	0.0	+1.1
14.0	14.0	0.0	+1.1
9.0	9.0	0.0	+1.1
4.0	4.0	0.0	+1.1

AC: 11/20/2024/00000

R. R. R.

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11. Overload indication

Measured value (dB)	Deviated Value (dB)	Acceptance Limit (dB)
Positive over full scale	0.0	+1.1
Negative over full scale	0.0	+1.1

12. High level stability

Frequency	SLM Display at start (dB)	SLM Display at end (dB)	Deviated Value (dB)	Acceptance Limit (dB)
Weighting	117.0	117.0	0.0	+1.1
A-weight	117.0	117.0	0.0	+1.1

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor $k=2$.
It is any value following calibration provides level of confidence of approximately 95 %

End of Calibration Certificate

AC: 11/20/2024/00000

R. R. R.

101-103/103-105/106/107/108/109/110/111/112/113/114/115/116/117/118/119/120/121/122/123/124/125/126/127/128/129/130/131/132/133/134/135/136/137/138/139/140/141/142/143/144/145/146/147/148/149/150/151/152/153/154/155/156/157/158/159/160/161/162/163/164/165/166/167/168/169/170/171/172/173/174/175/176/177/178/179/180/181/182/183/184/185/186/187/188/189/190/191/192/193/194/195/196/197/198/199/200/201/202/203/204/205/206/207/208/209/210/211/212/213/214/215/216/217/218/219/220/221/222/223/224/225/226/227/228/229/230/231/232/233/234/235/236/237/238/239/240/241/242/243/244/245/246/247/248/249/250/251/252/253/254/255/256/257/258/259/260/261/262/263/264/265/266/267/268/269/270/271/272/273/274/275/276/277/278/279/280/281/282/283/284/285/286/287/288/289/290/291/292/293/294/295/296/297/298/299/300/301/302/303/304/305/306/307/308/309/310/311/312/313/314/315/316/317/318/319/320/321/322/323/324/325/326/327/328/329/330/331/332/333/334/335/336/337/338/339/340/341/342/343/344/345/346/347/348/349/350/351/352/353/354/355/356/357/358/359/360/361/362/363/364/365/366/367/368/369/370/371/372/373/374/375/376/377/378/379/380/381/382/383/384/385/386/387/388/389/390/391/392/393/394/395/396/397/398/399/400/401/402/403/404/405/406/407/408/409/410/411/412/413/414/415/416/417/418/419/420/421/422/423/424/425/426/427/428/429/430/431/432/433/434/435/436/437/438/439/440/441/442/443/444/445/446/447/448/449/450/451/452/453/454/455/456/457/458/459/460/461/462/463/464/465/466/467/468/469/470/471/472/473/474/475/476/477/478/479/480/481/482/483/484/485/486/487/488/489/490/491/492/493/494/495/496/497/498/499/500/501/502/503/504/505/506/507/508/509/510/511/512/513/514/515/516/517/518/519/520/521/522/523/524/525/526/527/528/529/530/531/532/533/534/535/536/537/538/539/540/541/542/543/544/545/546/547/548/549/550/551/552/553/554/555/556/557/558/559/560/561/562/563/564/565/566/567/568/569/570/571/572/573/574/575/576/577/578/579/580/581/582/583/584/585/586/587/588/589/590/591/592/593/594/595/596/597/598/599/600/601/602/603/604/605/606/607/608/609/610/611/612/613/614/615/616/617/618/619/620/621/622/623/624/625/626/627/628/629/630/631/632/633/634/635/636/637/638/639/640/641/642/643/644/645/646/647/648/649/650/651/652/653/654/655/656/657/658/659/660/661/662/663/664/665/666/667/668/669/670/671/672/673/674/675/676/677/678/679/680/681/682/683/684/685/686/687/688/689/690/691/692/693/694/695/696/697/698/699/700/701/702/703/704/705/706/707/708/709/710/711/712/713/714/715/716/717/718/719/720/721/722/723/724/725/726/727/728/729/730/731/732/733/734/735/736/737/738/739/740/741/742/743/744/745/746/747/748/749/750/751/752/753/754/755/756/757/758/759/760/761/762/763/764/765/766/767/768/769/770/771/772/773/774/775/776/777/778/779/780/781/782/783/784/785/786/787/788/789/790/791/792/793/794/795/796/797/798/799/800/801/802/803/804/805/806/807/808/809/810/811/812/813/814/815/816/817/818/819/820/821/822/823/824/825/826/827/828/829/830/831/832/833/834/835/836/837/838/839/840/841/842/843/844/845/846/847/848/849/850/851/852/853/854/855/856/857/858/859/860/861/862/863/864/865/866/867/868/869/870/871/872/873/874/875/876/877/878/879/880/881/882/883/884/885/886/887/888/889/890/891/892/893/894/895/896/897/898/899/900/901/902/903/904/905/906/907/908/909/910/911/912/913/914/915/916/917/918/919/920/921/922/923/924/925/926/927/928/929/930/931/932/933/934/935/936/937/938/939/940/941/942/943/944/945/946/947/948/949/950/951/952/953/954/955/956/957/958/959/960/961/962/963/964/965/966/967/968/969/970/971/972/973/974/975/976/977/978/979/980/981/982/983/984/985/986/987/988/989/990/991/992/993/994/995/996/997/998/999/1000/1001/1002/1003/1004/1005/1006/1007/1008/1009/1010/1011/1012/1013/1014/1015/1016/1017/1018/1019/1020/1021/1022/1023/1024/1025/1026/1027/1028/1029/1030/1031/1032/1033/1034/1035/1036/1037/1038/1039/1040/1041/1042/1043/1044/1045/1046/1047/1048/1049/1050/1051/1052/1053/1054/1055/1056/1057/1058/1059/1060/1061/1062/1063/1064/1065/1066/1067/1068/1069/1070/1071/1072/1073/1074/1075/1076/1077/1078/1079/1080/1081/1082/1083/1084/1085/1086/1087/1088/1089/1090/1091/1092/1093/1094/1095/1096/1097/1098/1099/1100/1101/1102/1103/1104/1105/1106/1107/1108/1109/1110/1111/1112/1113/1114/1115/1116/1117/1118/1119/1120/1121/1122/1123/1124/1125/1126/1127/1128/1129/1130/1131/1132/1133/1134/1135/1136/1137/1138/1139/1140/1141/1142/1143/1144/1145/1146/1147/1148/1149/1150/1151/1152/1153/1154/1155/1156/1157/1158/1159/1160/1161/1162/1163/1164/1165/1166/1167/1168/1169/1170/1171/1172/1173/1174/1175/1176/1177/1178/1179/1180/1181/1182/1183/1184/1185/1186/1187/1188/1189/1190/1191/1192/1193/1194/1195/1196/1197/1198/1199/1200/1201/1202/1203/1204/1205/1206/1207/1208/1209/1210/1211/1212/1213/1214/1215/1216/1217/1218/1219/1220/1221/1222/1223/1224/1225/1226/1227/1228/1229/1230/1231/1232/1233/1234/1235/1236/1237/1238/1239/1240/1241/1242/1243/1244/1245/1246/1247/1248/1249/1250/1251/1252/1253/1254/1255/1256/1257/1258/1259/1260/1261/1262/1263/1264/1265/1266/1267/1268/1269/1270/1271/1272/1273/1274/1275/1276/1277/1278/1279/1280/128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Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.8 (93.8)	93.6	0.2	±0.3

2. Self-generated noise

2.1 Normal use

Measured Value (dB)
18.6

2.2 The microphone of the sound level meter was replaced by electrical signal device:

Frequency Weighting	Measured value (dB)
A-weight	14.3
C-weight	19.2
Flat	23.9

3. Acoustical signal tests of frequency weightings

Mean free-field acoustic response at a level of 94 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	F _{ref}	S-weight	A-weight	Acceptance limits
125	0.2	0.2	0.2	± 1.5
1000	0.1	0.1	0.1	± 1.0
8000	2.3	3.4	3.4	±5.0

T. Pichai

7. Level accuracy in the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limits (dB)
127.0	127.0	0.0	±1.1
130.0	130.0	0.0	±1.1
133.0	133.0	0.0	±1.1
136.0	136.0	0.0	±1.1
139.0	139.0	0.0	±1.1
142.0	142.0	0.0	±1.1
145.0	145.0	0.0	±1.1
148.0	148.0	0.0	±1.1
151.0	151.0	0.0	±1.1
154.0	154.0	0.0	±1.1
157.0	157.0	0.0	±1.1
160.0	160.0	0.0	±1.1
163.0	163.0	0.0	±1.1
166.0	166.0	0.0	±1.1
169.0	169.0	0.0	±1.1
172.0	172.0	0.0	±1.1
175.0	175.0	0.0	±1.1
178.0	178.0	0.0	±1.1
181.0	181.0	0.0	±1.1
184.0	184.0	0.0	±1.1
187.0	187.0	0.0	±1.1
190.0	190.0	0.0	±1.1
193.0	193.0	0.0	±1.1
196.0	196.0	0.0	±1.1
199.0	199.0	0.0	±1.1
202.0	202.0	0.0	±1.1
205.0	205.0	0.0	±1.1
208.0	208.0	0.0	±1.1
211.0	211.0	0.0	±1.1
214.0	214.0	0.0	±1.1
217.0	217.0	0.0	±1.1
220.0	220.0	0.0	±1.1
223.0	223.0	0.0	±1.1
226.0	226.0	0.0	±1.1
229.0	229.0	0.0	±1.1
232.0	232.0	0.0	±1.1
235.0	235.0	0.0	±1.1
238.0	238.0	0.0	±1.1
241.0	241.0	0.0	±1.1
244.0	244.0	0.0	±1.1
247.0	247.0	0.0	±1.1
250.0	250.0	0.0	±1.1
253.0	253.0	0.0	±1.1
256.0	256.0	0.0	±1.1
259.0	259.0	0.0	±1.1
262.0	262.0	0.0	±1.1
265.0	265.0	0.0	±1.1
268.0	268.0	0.0	±1.1
271.0	271.0	0.0	±1.1
274.0	274.0	0.0	±1.1
277.0	277.0	0.0	±1.1
280.0	280.0	0.0	±1.1
283.0	283.0	0.0	±1.1
286.0	286.0	0.0	±1.1
289.0	289.0	0.0	±1.1
292.0	292.0	0.0	±1.1
295.0	295.0	0.0	±1.1
298.0	298.0	0.0	±1.1
301.0	301.0	0.0	±1.1
304.0	304.0	0.0	±1.1
307.0	307.0	0.0	±1.1
310.0	310.0	0.0	±1.1
313.0	313.0	0.0	±1.1
316.0	316.0	0.0	±1.1
319.0	319.0	0.0	±1.1
322.0	322.0	0.0	±1.1
325.0	325.0	0.0	±1.1
328.0	328.0	0.0	±1.1
331.0	331.0	0.0	±1.1
334.0	334.0	0.0	±1.1
337.0	337.0	0.0	±1.1
340.0	340.0	0.0	±1.1
343.0	343.0	0.0	±1.1
346.0	346.0	0.0	±1.1
349.0	349.0	0.0	±1.1
352.0	352.0	0.0	±1.1
355.0	355.0	0.0	±1.1
358.0	358.0	0.0	±1.1
361.0	361.0	0.0	±1.1
364.0	364.0	0.0	±1.1
367.0	367.0	0.0	±1.1
370.0	370.0	0.0	±1.1
373.0	373.0	0.0	±1.1
376.0	376.0	0.0	±1.1
379.0	379.0	0.0	±1.1
382.0	382.0	0.0	±1.1
385.0	385.0	0.0	±1.1
388.0	388.0	0.0	±1.1
391.0	391.0	0.0	±1.1
394.0	394.0	0.0	±1.1
397.0	397.0	0.0	±1.1
400.0	400.0	0.0	±1.1
403.0	403.0	0.0	±1.1
406.0	406.0	0.0	±1.1
409.0	409.0	0.0	±1.1
412.0	412.0	0.0	±1.1
415.0	415.0	0.0	±1.1
418.0	418.0	0.0	±1.1
421.0	421.0	0.0	±1.1
424.0	424.0	0.0	±1.1
427.0	427.0	0.0	±1.1
430.0	430.0	0.0	±1.1
433.0	433.0	0.0	±1.1
436.0	436.0	0.0	±1.1
439.0	439.0	0.0	±1.1
442.0	442.0	0.0	±1.1
445.0	445.0	0.0	±1.1
448.0	448.0	0.0	±1.1
451.0	451.0	0.0	±1.1
454.0	454.0	0.0	±1.1
457.0	457.0	0.0	±1.1
460.0	460.0	0.0	±1.1
463.0	463.0	0.0	±1.1
466.0	466.0	0.0	±1.1
469.0	469.0	0.0	±1.1
472.0	472.0	0.0	±1.1
475.0	475.0	0.0	±1.1
478.0	478.0	0.0	±1.1
481.0	481.0	0.0	±1.1
484.0	484.0	0.0	±1.1
487.0	487.0	0.0	±1.1
490.0	490.0	0.0	±1.1
493.0	493.0	0.0	±1.1
496.0	496.0	0.0	±1.1
499.0	499.0	0.0	±1.1
502.0	502.0	0.0	±1.1
505.0	505.0	0.0	±1.1
508.0	508.0	0.0	±1.1
511.0	511.0	0.0	±1.1
514.0	514.0	0.0	±1.1
517.0	517.0	0.0	±1.1
520.0	520.0	0.0	±1.1
523.0	523.0	0.0	±1.1
526.0	526.0	0.0	±1.1
529.0	529.0	0.0	±1.1
532.0	532.0	0.0	±1.1
535.0	535.0	0.0	±1.1
538.0	538.0	0.0	±1.1
541.0	541.0	0.0	±1.1
544.0	544.0	0.0	±1.1
547.0	547.0	0.0	±1.1
550.0	550.0	0.0	±1.1
553.0	553.0	0.0	±1.1
556.0	556.0	0.0	±1.1
559.0	559.0	0.0	±1.1
562.0	562.0	0.0	±1.1
565.0	565.0	0.0	±1.1
568.0	568.0	0.0	±1.1
571.0	571.0	0.0	±1.1
574.0	574.0	0.0	±1.1
577.0	577.0	0.0	±1.1
580.0	580.0	0.0	±1.1
583.0	583.0	0.0	±1.1
586.0	586.0	0.0	±1.1
589.0	589.0	0.0	±1.1
592.0	592.0	0.0	±1.1
595.0	595.0	0.0	±1.1
598.0	598.0	0.0	±1.1
601.0	601.0	0.0	±1.1
604.0	604.0	0.0	±1.1
607.0	607.0	0.0	±1.1
610.0	610.0	0.0	±1.1
613.0	613.0	0.0	±1.1
616.0	616.0	0.0	±1.1
619.0	619.0	0.0	±1.1
622.0	622.0	0.0	±1.1
625.0	625.0	0.0	±1.1
628.0	628.0	0.0	±1.1
631.0	631.0	0.0	±1.1
634.0	634.0	0.0	±1.1
637.0	637.0	0.0	±1.1
640.0	640.0	0.0	±1.1
643.0	643.0	0.0	±1.1
646.0	646.0	0.0	±1.1
649.0	649.0	0.0	±1.1
652.0	652.0	0.0	±1.1
655.0	655.0	0.0	±1.1
658.0	658.0	0.0	±1.1
661.0	661.0	0.0	±1.1
664.0	664.0	0.0	±1.1
667.0	667.0	0.0	±1.1
670.0	670.0	0.0	±1.1
673.0	673.0	0.0	±1.1
676.0	676.0	0.0	±1.1
679.0	679.0	0.0	±1.1
682.0	682.0	0.0	±1.1
685.0	685.0	0.0	±1.1
688.0	688.0	0.0	±1.1
691.0	691.0	0.0	±1.1
694.0	694.0	0.0	±1.1
697.0	697.0	0.0	±1.1
700.0	700.0	0.0	±1.1
703.0	703.0	0.0	±1.1
706.0	706.0	0.0	±1.1
709.0	709.0	0.0	±1.1
712.0	712.0	0.0	±1.1
715.0	715.0	0.0	±1.1
718.0	718.0	0.0	±1.1
721.0	721.0	0.0	±1.1
724.0	724.0	0.0	±1.1
727.0	727.0	0.0	±1.1
730.0	730.0	0.0	±1.1
733.0	733.0	0.0	±1.1
736.0	736.0	0.0	±1.1
739.0	739.0	0.0	±1.1
742.0	742.0	0.0	±1.1
745.0	745.0	0.0	±1.1
748.0	748.0	0.0	±1.1
751.0	751.0	0.0	±1.1
754.0	754.0	0.0	±1.1
757.0	757.0	0.0	±1.1
760.0	760.0	0.0	±1.1
763.0	763.0	0.0	±1.1
766.0	766.0	0.0	±1.1
769.0	769.0	0.0	±1.1
772.0	772.0	0.0	±1.1
775.0	775.0	0.0	±1.1
778.0	778.0	0.0	±1.1
781.0	781.0	0.0	±1.1
784.0	784.0	0.0	±1.1
787.0	787.0	0.0	±1.1
790.0	790.0	0.0	±1.1
793.0	793.0	0.0	±1.1
796.0	796.0	0.0	±1.1
799.0	799.0	0.0	±1.1
802.0	802.0	0.0	±1.1
805.0	805.0	0.0	±1.1
808.0	808.0	0.0	±1.1
811.0	811.0	0.0	±1.1
814.0	814.0	0.0	±1.1
817.0	817.0	0.0	±1.1
820.0	820.0	0.0	±1.1
823.0	823.0	0.0	±1.1
826.0	826.0	0.0	±1.1
829.0	829.0	0.0	±1.1
832.0	832.0	0.0	±1.1
835.0	835.0	0.0	±1.1
838.0	838.0	0.0	±1.1
841.0	841.0	0.0	±1.1
844.0	844.0	0.0	±1.1
847.0	847.0	0.0	±1.1
850.0	850.0	0.0	±1.1
853.0	853.0	0.0	±1.1
856.0	856.0	0.0	±1.1
859.0	859.0	0.0	±1.1
862.0	862.0	0.0	±1.1
865.0	865.0	0.0	±1.1
868.0	868.0	0.0	±1.1
871.0	871.0	0.0	±1.1
874.0	874.0	0.0	±1.1
877.0	877.0	0.0	±1.1
880.0	880.0	0.0	±1.1
883.0	883.0	0.0	±1.1
886.0	886.0	0.0	±1.1
889.0	889.0	0.0	±1.1
892.0	892.0	0.0	±1.1
895.0	895.0	0.0	±1.1
898.0	898.0	0.0	±1.1
901.0	901.0	0.0	±1.1
904.0	904.0	0.0	±1.1
907.0	907.0	0.0	±1.1
910.			

THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)
Request No. 21-67-0232 MTC No. E.L. BP. 172-0167

9. Power Amplifier BruckKarr 2700 S/N 1517406
10. Speaker Tannoy Limited, Great Britain Patent No. 215506
11. Digital Multimeter Agilent 34401A S/N MY400540
12. Programmable Automatic Tannoyers TPA300A S/N 2212.

Calibration Procedure :
This instrument was calibrated by using calibration procedure on CP-102-02 and CP-102-03, which were based on IEC 61672-3 Electromechanical - Sound Level Meters - Part 3: Periodic tests (2013). These calibration procedures were related to the electrical and acoustic signal tests. The electrical signal test was carried out with the direct measurement method. The acoustic signal test was performed in an anechoic room with the comparison measurement method.
This instrument has been calibrated against standards maintained at the Electrical and Electronic Standards Laboratory (EELS), which are traceable to the International System of Units through the National Institute of Standards (NIST) (USA).
The information on actual reading is attached herewith and the uncertainty limits quoted refer to the measured value only.
The reported expanded uncertainty is based upon a standard uncertainty multiplied by a coverage factor $k=2$, providing a level of confidence of approximately 95%.

Date of Calibration 22-25 Feb 2024

Head Office: 119 Moo 1, Chomphu-ong, Bang Khen District, Bangkok 10150, Thailand
Tel: 02-579 2111
Fax: 02-579 2111
E-mail: tistr@tistr.go.th

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Tel: 02-579 2111
Fax: 02-579 2111
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1. Absolute Sensitivity

Reference Acoustic Signal (dB)	Measured value (dB)	Deviation (dB)	Acceptance limit (dB)	Uncertainty (dB)	Maximum permitted uncertainty (dB)
113.96	114.1	0.1	-0.1	0.30	N/A

Note: The external calibration adjustment was finally performed. The internal calibration adjustment was then completed at the display of 121.6 dB.

2. Self-generated noise

2.1 Normal test

Measured value (dB)	Uncertainty (dB)	Maximum permitted uncertainty of measurement (dB)
19.1	0.10	N/A

2.2 The microphone at the sound level meter was replaced by electrical signal input device

Frequency (kHz)	Measured value (dB)	Uncertainty (dB)	Maximum permitted uncertainty of measurement (dB)
Weighting			
A-weight	11.8	0.10	N/A
C-weight	11.8	0.10	N/A
Flat	23.2	0.10	N/A

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3. Acoustical signal test of frequency weightings

Frequency (Hz)	A-weight	C-weight	Flat	Measured value (dB)	Deviation (dB)	Acceptance limit (dB)	Uncertainty (dB)	Maximum permitted uncertainty (dB)
125	-0.1	-0.2	-0.2	1.5	0.45	0.6		
1000	-0.1	-0.1	-0.1	1.0	0.45	0.6		
5000	0.0	0.0	0.0	5.0	0.45	0.7		

4. Electrical signal test of frequency weightings

Frequency (Hz)	A-weight	C-weight	Flat	Measured value (dB)	Deviation (dB)	Acceptance limit (dB)	Uncertainty (dB)	Maximum permitted uncertainty (dB)
63	-0.1	0.0	0.0	2.0	0.20	0.6		
125	-0.1	0.0	0.0	1.5	0.20	0.6		
250	-0.1	0.0	0.0	1.5	0.20	0.6		
500	0.0	0.0	0.0	1.5	0.20	0.6		
1000	0.0	0.0	0.0	1.0	0.20	0.6		
2000	0.0	0.0	0.0	2.0	0.20	0.6		
4000	0.0	0.0	0.0	3.0	0.20	0.6		
8000	0.0	0.0	0.0	5.0	0.20	0.7		

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5. Long-term stability

Date	Measured Value (dB)	Deviation (dB)	Acceptance limit (dB)	Uncertainty (dB)	Maximum permitted uncertainty (dB)
Begin	91.0	0.0	0.3	0.10	0.1
End	91.0	0.0	0.3	0.10	0.1

6. Frequency and time weightings at 1 kHz

6.1 Frequency weightings at 1 kHz

Frequency (kHz)	Measured value (dB)	Deviation (dB)	Acceptance limit (dB)	Uncertainty (dB)	Maximum permitted uncertainty (dB)
A-weight	91.0	0.0	0.3	0.20	0.2
C-weight	91.0	0.0	0.3	0.20	0.3
Flat	91.1	0.1	0.2	0.20	0.3

6.2 Time weightings at 1 kHz

Frequency (kHz)	Measured Value (dB)	Deviation (dB)	Acceptance limit (dB)	Uncertainty (dB)	Maximum permitted uncertainty (dB)
Fast	91.0	0.0	0.1	0.20	0.2
Slow	91.0	0.0	0.1	0.20	0.2
Imp	91.0	0.0	0.1	0.20	0.2

Date of Calibration 22-25 Feb 2024

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Tel: 02-579 2111
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Fax: 02-579 2111
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7. Level linearity on the reference level range

Assigned value (dB)	Measured value (dB)	Deviation (dB)	Acceptance limit (dB)	Uncertainty (dB)	Maximum permitted uncertainty (dB)
127	127.1	0.1	1.1	0.30	0.3
126	126.1	0.1	1.1	0.30	0.3
125	125.1	0.1	1.1	0.30	0.3
124	124.1	0.1	1.1	0.30	0.3
123	123.1	0.1	1.1	0.30	0.3
122	122.1	0.1	1.1	0.30	0.3
121	121.1	0.1	1.1	0.30	0.3
120	120.1	0.1	1.1	0.30	0.3
119	119.1	0.1	1.1	0.30	0.3
118	118.1	0.1	1.1	0.30	0.3
117	117.1	0.1	1.1	0.30	0.3
116	116.1	0.1	1.1	0.30	0.3
115	115.1	0.1	1.1	0.30	0.3
114	114.1	0.1	1.1	0.30	0.3
113	113.1	0.1	1.1	0.30	0.3
112	112.1	0.1	1.1	0.30	0.3
111	111.1	0.1	1.1	0.30	0.3
110	110.1	0.1	1.1	0.30	0.3
109	109.1	0.1	1.1	0.30	0.3
108	108.1	0.1	1.1	0.30	0.3
107	107.1	0.1	1.1	0.30	0.3
106	106.1	0.1	1.1	0.30	0.3
105	105.1	0.1	1.1	0.30	0.3
104	104.1	0.1	1.1	0.30	0.3
103	103.1	0.1	1.1	0.30	0.3
102	102.1	0.1	1.1	0.30	0.3
101	101.1	0.1	1.1	0.30	0.3
100	100.1	0.1	1.1	0.30	0.3
99	99.1	0.1	1.1	0.30	0.3
98	98.1	0.1	1.1	0.30	0.3
97	97.1	0.1	1.1	0.30	0.3
96	96.1	0.1	1.1	0.30	0.3
95	95.1	0.1	1.1	0.30	0.3
94	94.1	0.1	1.1	0.30	0.3
93	93.1	0.1	1.1	0.30	0.3
92	92.1	0.1	1.1	0.30	0.3
91	91.1	0.1	1.1	0.30	0.3
90	90.1	0.1	1.1	0.30	0.3
89	89.1	0.1	1.1	0.30	0.3
88	88.1	0.1	1.1	0.30	0.3
87	87.1	0.1	1.1	0.30	0.3
86	86.1	0.1	1.1	0.30	0.3
85	85.1	0.1	1.1	0.30	0.3
84	84.1	0.1	1.1	0.30	0.3
83	83.1	0.1	1.1	0.30	0.3
82	82.1	0.1	1.1	0.30	0.3
81	81.1	0.1	1.1	0.30	0.3
80	80.1	0.1	1.1	0.30	0.3
79	79.1	0.1	1.1	0.30	0.3
78	78.1	0.1	1.1	0.30	0.3
77	77.1	0.1	1.1	0.30	0.3
76	76.1	0.1	1.1	0.30	0.3
75	75.1	0.1	1.1	0.30	0.3
74	74.1	0.1	1.1	0.30	0.3
73	73.1	0.1	1.1	0.30	0.3
72	72.1	0.1	1.1	0.30	0.3
71	71.1	0.1	1.1	0.30	0.3
70	70.1	0.1	1.1	0.30	0.3
69	69.1	0.1	1.1	0.30	0.3
68	68.1	0.1	1.1	0.30	0.3
67	67.1	0.1	1.1	0.30	0.3
66	66.1	0.1	1.1	0.30	0.3
65	65.1	0.1	1.1	0.30	0.3
64	64.1	0.1	1.1	0.30	0.3
63	63.1	0.1	1.1	0.30	0.3
62	62.1	0.1	1.1	0.30	0.3
61	61.1	0.1	1.1	0.30	0.3
60	60.1	0.1	1.1	0.30	0.3
59	59.1	0.1	1.1	0.30	0.3
58	58.1	0.1	1.1	0.30	0.3
57	57.1	0.1	1.1	0.30	0.3
56	56.1	0.1	1.1	0.30	0.3
55	55.1	0.1	1.1	0.30	0.3
54	54.1	0.1	1.1	0.30	0.3
53	53.1	0.1	1.1	0.30	0.3
52	52.1	0.1	1.1	0.30	0.3
51	51.1	0.1	1.1	0.30	0.3
50	50.1	0.1	1.1	0.30	0.3
49	49.1	0.1	1.1	0.30	0.3
48	48.1	0.1	1.1	0.30	0.3
47	47.1	0.1	1.1	0.30	0.3
46	46.1	0.1	1.1	0.30	0.3
45	45.1	0.1	1.1	0.30	0.3
44	44.1	0.1	1.1	0.30	0.3
43	43.1	0.1	1.1	0.30	0.3
42	42.1	0.1	1.1	0.30	0.3
41	41.1	0.1	1.1	0.30	0.3
40	40.1	0.1	1.1	0.30	0.3
39	39.1	0.1	1.1	0.30	0.3
38	38.1	0.1	1.1	0.30	0.3
37	37.1	0.1	1.1	0.30	0.3
36	36.1	0.1	1.1	0.30	0.3
35	35.1	0.1	1.1	0.30	0.3
34	34.1	0.1	1.1	0.30	0.3
33	33.1	0.1	1.1	0.30	0.3
32	32.1	0.1	1.1	0.30	0.3
31	31.1	0.1	1.1	0.30	0.3
30	30.1	0.1	1.1	0.30	0.3
29	29.1	0.1	1.1	0.30	0.3
28	28.1	0.1	1.1	0.30	0.3
27	27.1	0.1	1.1	0.30	0.3
26	26.1	0.1	1.1	0.30	0.3
25	25.1	0.1	1.1	0.30	0.3
24	24.1	0.1	1.1	0.30	0.3
23	23.1	0.1	1.1	0.30	0.3
22	22.1	0.1	1.1	0.30	0.3
21	21.1	0.1	1.1	0.30	0.3
20	20.1	0.1	1.1	0.30	0.3
19	19.1	0.1	1.1	0.30	0.3
18	18.1	0.1	1.1	0.30	0.3
17	17.1	0.1	1.1	0.30	0.3
16	16.1	0.1	1.1	0.30	0.3
15	15.1	0.1	1.1	0.30	0.3
14	14.1	0.1	1.1	0.30	0.3
13	13.1	0.1	1.1	0.30	0.3
12	12.1	0.1	1.1	0.30	0.3
11	11.1	0.1	1.1	0.30	0.3
10	10.1	0.1	1.1	0.30	0.3
9	9.1	0.1	1.1	0.30	0.3
8	8.1	0.1	1.1	0.30	0.3
7	7.1	0.1	1.1	0.30	0.3
6	6.1	0.1	1.1	0.30	0.3
5	5.1	0.1	1.1	0.30	0.3
4	4.1	0.1	1.1	0.30	0.3
3	3.1	0.1	1.1	0.30	0.3
2	2.1	0.1	1.1	0.30	0.3
1	1.1				

Calibration Results:
Without Adjustment

Wavelength Accuracy (nm), The spread (standard deviation) of 20 at 2 nm and CUV 2 nm				
Standard Wavelength	Unit Under Calibration	Correction	Uncertainty	
418.81	418.2	0.31	0.13	
526.36	526.6	-0.36	0.13	
637.36	636.3	-0.22	0.13	
749.48	748.7	-0.22	0.13	
827.55	827.4	-0.17	0.13	
Photometric Accuracy (Absorbance)				
Wavelength	Standard Absorbance	Unit Under Calibration	Correction	Uncertainty
	0.0002	0.001	0.0009	0.0004
	0.1000	0.286	0.0346	0.0048
	0.2161	0.610	-0.0022	0.0048
	0.2208	1.088	0.0064	0.0048
	0.6000	0.608	0.0020	0.0048
	0.7867	0.832	0.0237	0.0048
	0.8375	0.508	-0.2917	0.0048
	1.0000	1.097	0.0013	0.0048
	0.0006	0.006	0.0000	0.0048
	0.2818	0.255	0.0116	0.0048
	0.4916	0.432	-0.0283	0.0048
	0.7024	0.283	-0.0054	0.0048
	0.9002	0.876	0.0009	0.0048
	0.2481	0.516	0.2611	0.0048
	0.4802	0.466	-0.0020	0.0048
	0.9468	0.946	0.0005	0.0048
	0.0008	0.003	0.0000	0.0048
	0.2384	0.289	0.0054	0.0048
	0.3040	0.560	-0.0610	0.0048
	0.6002	1.062	0.0012	0.0048
	0.0006	0.008	0.0000	0.0048
	0.2579	0.257	0.0001	0.0048
	0.4871	0.487	0.0001	0.0048
	0.8722	0.871	0.0001	0.0048

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DOI:10.1002/anie.202113821



ใบตรวจสอบสภาพเครื่องวัดสิ่งแวดล้อม

ผลิตภัณฑ์ (Product)		SPECTRAHYDROMETER		รุ่น (Model)		วันที่ออกใบ (Issue Date)		หมายเลขใบ (Serial Number)	
18 Sep 2023						18 Sep 2023			
วันที่ (Date)	เวลา (Time)	ข้อมูลการทดสอบ (Test Data)				วันที่ (Date)	เวลา (Time)	ผลการทดสอบ (Test Result)	
วันที่ (Date)	เวลา (Time)					วันที่ (Date)	เวลา (Time)		
General									
<input type="checkbox"/>	<input type="checkbox"/>	1. การทำงานของเครื่อง (Machine Operation)				<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	<input type="checkbox"/>	2. การเชื่อมต่อ (Connection Status, On/Off Switch)				<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	<input type="checkbox"/>	3. อัตราการไหล (Flow Rate)				<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	<input type="checkbox"/>	4. อุณหภูมิ (Temperature)				<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	<input type="checkbox"/>	5. เวลา (Display, Screen Control)				<input type="checkbox"/>	<input type="checkbox"/>		
Spectrophotometer									
<input type="checkbox"/>	<input type="checkbox"/>	6. แหล่งจ่ายไฟ (Battery Backup) ≥ 3.5 VDC				<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	<input type="checkbox"/>	7. ความยาวคลื่นการวัด (Wavelength Control)				<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	<input type="checkbox"/>	8. ความยาวคลื่น (Wavelength Check)				<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	<input type="checkbox"/>	9. ความละเอียด (Resolution) $\geq 3,000$ nm				<input type="checkbox"/>	<input type="checkbox"/>	8.2 Hours	
<input type="checkbox"/>	<input type="checkbox"/>	10. ความละเอียด (Resolution) $\geq 5,000$ nm				<input type="checkbox"/>	<input type="checkbox"/>	741.5 Hours	
<input type="checkbox"/>	<input type="checkbox"/>	11. เซนเซอร์การวัด (Sensor Module)				<input type="checkbox"/>	<input type="checkbox"/>		
pH Meter and Conductivity Meter									
<input type="checkbox"/>	<input type="checkbox"/>	12. เวลา (Electrode and Connection Cable)				<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	<input type="checkbox"/>	13. เซนเซอร์วัดค่า pH (pH Electrode)				<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	<input type="checkbox"/>	14. เซนเซอร์วัดค่า Conductivity (Conductivity Electrode)				<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	<input type="checkbox"/>	15. เซนเซอร์วัดค่า pH (pH Electrode)				<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	<input type="checkbox"/>	16. เซนเซอร์วัดค่า Conductivity (Conductivity Electrode)				<input type="checkbox"/>	<input type="checkbox"/>		
Test Results									
<input type="checkbox"/>	<input type="checkbox"/>	17. การทำงานของเครื่อง (Machine Operation)				<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	<input type="checkbox"/>	18. การเชื่อมต่อ (Connection Status) ≥ 2.5 VDC				<input type="checkbox"/>	<input type="checkbox"/>		
Automatic Meter									
<input type="checkbox"/>	<input type="checkbox"/>	19. Screen Plotting System				<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	<input type="checkbox"/>	20. Function Plotting and Saving				<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	<input type="checkbox"/>	21. การเชื่อมต่อ (Connection Status)				<input type="checkbox"/>	<input type="checkbox"/>		

if (a < b) {
 a = b;
}

Mr. Mallapat Rungtong
Service Engineer

[illegible]

DALYD 874-88 20 Jun 2001



CaseNo: ZSTW100
Page: 2 of 2

Condition of the roads at galleries

⁸ Reference Standards Instruments
This certification is traceable to the international System of Unit through the reference standards laboratory of Industrial Calibration Center, Technology Promotion Association (Tosoni-Japan).

<u>Instrument</u>	<u>Serial No.</u>	<u>SI No.</u>	<u>Certificate No.</u>	<u>Exp. Date</u>
1) <u>Bond</u>		1368/10	2903/172	22 Mar 2021
2) <u>Bond</u>	1126143761	1406C04	208850	01 Sep 2020

2. Blending Methods

Material	Manufacturer	Lot No.	Assay
Sodium Thiosulfate pentahydrate	Merck	AM702218	100.2%

Stand : Dissolved Oxygen Meter Adjustment W/In Air 122.1
Dissolved Oxygen Probe No. 1FD100464

Titration Method (Acid Modification Method) (mg/L)	CO Meter Reading (mg/L)	Standard Deviation (mg/L)
8.14	8.17	0.0250

This report was certified only for the instrument and cannot be extended to use for study of the system software. This environmental impact study had passed to completion if any concerned issues in use for subleasing and related purpose is prohibited. The report may not be reproduced without prior written permission of the sponsor.

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- ● **STRENGTH**

Calibration Results:
YOffset Adjustment:

Photometric Accuracy (Absorbance)				
Wavelength	Standard Absorbance	Unit Under Calibration	Correction	Uncertainty
228 nm	0.0090	0.0060	0.0030	0.0020
	0.7261	0.737	-0.0108	0.0026
287 nm	0.0090	0.0060	0.0030	0.0020
	0.8474	0.857	-0.0094	0.0026
313 nm	0.0090	0.0060	0.0030	0.0020
	0.3884	0.210	-0.0028	0.0026
332 nm	0.0090	0.0060	0.0030	0.0020
	0.8374	0.897	-0.0594	0.0026
Sensitivity *				
	UVG Wavelength (nm)	UVC Transmittance (%)	Absorbance (A)	
250.00 ± 0.11 nm	293.6	1.2	1.00	
281.66 ± 0.11 nm	261.8	1.3	1.00	
Spectral Resolution *				
Interval: Constant 0.02 % UV	Peak	Trough	Ratio	99%
Standard Wavelength (nm)	258.68	259.68	1.01	2.05
UVC Wavelength (nm)	266.1	266.1		
99% Absorbance (A)	0.0402	0.2750		
Absorbance (A)	0.012	0.0001		

* Cellulose Market * Not TDI Approved * In this Certificate have been included for simplification

The End of Certificate

[illegible]

PHYSICS 2004-16, 17 Sep 2005



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 2 : EQUIPMENT CALIBRATION AND TESTING SERVICES
334-4 PATTANAKARN ROAD BOX 10, SUKOLU AND SUKUNGLANG, BANGKOK 10250
TEL. 0-2717-5480 FAX. 0-2719-9436

Case No.: 23TW188
Page: 1 of 2

Certificate of Testing

Equipment: DO Meter

Manufacturer: YSI

Model: 500-115V

Serial No.: 192 02796

ID No.: HYG_R02020

Received From: (To be filled in)

Test Date: 24 July 2023

Reference: Z007-071300-1

Submitted by: ALS Laboratory Group (Thailand) Co., Ltd.
Relying Branch
818/23 Nua 5, T. Maenam Phu, A. Phumthong,
Rayong 21140, Thailand

Laboratory Conditions:
Temperature: (20 ± 1) °C
Humidity: (50 ± 20) %
By Completed Technique with Azide Modification (optional)

Test Preparator: (To be filled in)

Tested by: Visakha Sathyan

Approved by: *Sathya*
Approved Signature

() Mobile Butyrate
() Sulfide, Manganite
() Wastewater Microbiology

Issue Date: 26 July 2023

Issue Date: 26 July 2021



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Fax: 312 936 7089 or 312 936 7088



Cont. No.: JGLM176
Page: 1 of 8

Certificate of Calibration

Equipment:	Q2 Mobile with Detector
Manufacturer:	YBI
Model:	5200-115V
Serial No.:	1561C2799
Q2 No.:	HYG_Eval032
Refurnished by:	A-3 Laboratory Group (Thailand) Co., Ltd. Rajaporn Street #1610 Main St 7, Mueang Nua, Chiang Mueang 51142 Thailand
Location:	TPA On Site Calibration Laboratory
Received/Order:	29 July 2023
Calibration Code:	29 July 2023
Additional Temperature:	28 ± 0.5 °C
Relative Humidity:	50 ± 5 %
AC Line Voltage:	220 ± 2 V
Calibrated by:	Procedur 1/0101
Approved by:	 Approved Signature
1. Photographic Transmittance 2. Volatile Matter 3. Total Solids	
Issue Date:	31 July 2023

The 1 test statistics are for a confidence probability of approximately 90%.



Equipment : Hot Air Oven
Condition As-Received : Used Item
Reference : 2403-056300-3
Page : 2 of 3

Procedure Used : Calibration were conducted using calibration procedure CP-OT02 according to direct measurement method with Data Acquisition which connected with Resistance Temperature Detector (RTD) and Thermocouple Type T.

The temperature scale used was based on ITS-90.

Condition of this result of calibration

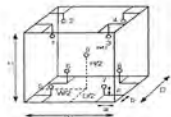
1) Reference standard instrument:
Instrument : MVS7013711
Serial No. : 23LM115
Traceable : TPA
Due Date : 11 Jul 2024

2) This certificate is valid only to the item calibrated on date and place of calibration.

3) This certificate is traceable to the International System of Unit.

Remark : TPA, Technology Promotion Association (Thailand - Japan)

Result of Calibration : (*) Without Adjustment
Function of UUC : Temperature Source
Fresh air setting : Close



Probe installation detail : Dimension of Chamber :
A = 7.0 dm
B = 3.0 dm
C = 3.0 dm
D = 0.40 m
E = 0.56 m
F = 0.48 m
Capacity = 0.11 m³

Environment during calibration	
Beginning	Finished
Temp (°C)	27 27
Rel. Humid. (%)	59 56
AC Supply (Voh)	224 223

Ref. Std. ID No. @ Calibration Point	
Position : (180) °C	(104) °C
1 18-18TC01 18-18RTD-01	
2 18-18TC02 18-18RTD-02	
3 18-18TC03 18-18RTD-03	
4 18-18TC04 18-18RTD-04	
5 18-18TC05 18-18RTD-05	
6 18-18TC06 25-18RTD-06	
7 18-18TC07 18-18RTD-07	
8 18-18TC08 23-18RTD-08	
9 (ref) 18-18TC09 18-18RTD-09	



Equipment : Hot Air Oven
Condition As-Received : Used Item
Reference : 2403-056300-3
Page : 3 of 3

Procedure Used : Calibration were conducted using in-house calibration procedure CP-OT04 Based on ASTM E715 according to direct measurement method with Data Acquisition which connected with Industrial Platinum Resistance Thermometer (PRT).

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1) Reference standard instrument:
Instrument : MVS7013711
Serial No. : 23LM115
Traceable : TPA
Due Date : 11 Jul 2024

2) This certificate is valid only to the item calibrated on date and place of calibration.

3) This certificate is traceable to the International System of Unit.

Remark : TPA, Technology Promotion Association (Thailand - Japan)

Result of Calibration : (*) Without Adjustment
Function of UUC : Temperature Source
Heat transfer medium used : Water

Calibration		UUC	UUC	Temperature	Temperature	Overall	Coverage
Point	Setting	Reading	Stability	Uniformity	Variance	Factor	
(°C)	(°C)	(°C)	(°C)	(°C)	(°C)		
104.0	104.0	104.0	0.005	0.02	0.00	2	
180.0	180.0	180.0	0.20	1.2	0.0	2	

Calibration		Measured Temperature (°C)									Uncertainty
Point	Position	1	2	3	4	5	6	7	8	9 (ref)	(± °C)
(°C)											
104.0	104 109	103 530	103 694	103 712	103 772	103 780	104 289	103 855	103 796		0.42
180.0	180 201	179 230	179 888	179 965	180 127	180 158	180 895	179 313	180 211		1.1

Average : The average of 30 values in each position.

Temperature stability : One-half of the greatest maximum difference of measured temperature at any one sensor.

Temperature uniformity : The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location, which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.

Overall Variance : The difference of the maximum and minimum measured temperatures throughout observation.

UUC : Unit Under Calibration

Note : The reported uncertainty of measurement was included stability and excluded uniformity.

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k, providing a level of confidence of approximately 95 %.

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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
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254/1 PATTANAPONG ROAD, 3RD FLOOR, SUKUMVIT, SUKUMVIT 103/8
TEL: 0-2717-3032-29 FAX: 0-2719-9484



Certificate of Calibration

Cert. No. : 24TMM03
Page : 1 of 3

Equipment : Water Bath
Manufacturer : Memmert
Model : WAB22
Serial No. : LS13 0048
ID No. : RYD-EN0001
Submitted by : ALS Laboratory Group (Thailand) Co., Ltd. (Pattana Pong Road)
Location : Wet Chemistry Lab
Received Order : 21 March 2024
Calibration Date : 21 March 2024
Ambient Temperature : (20 ± 10) °C
Relative Humidity : (50 ± 30) %
Calibrated by : Man Pattanapongkoon
Approved by : (Signature)
Approved Signature : (Signature)
Issue Date : 23 March 2024

REVIEW BY : Thairat
APPROVED BY : Dhanu
NEXT CAL DATE : 21/09/25

The Uncertainty are for a confidence probability of approximately 95%
This certificate may not be reproduced after date is full, except with the prior written
Agreement of the head of Department 3. Equipment Calibration and Testing Services



Equipment : Water Bath
Condition As-Received : Used Item
Reference : 2403-056300-4
Page : 2 of 3

Procedure Used : Calibration were conducted using in-house calibration procedure CP-OT04 Based on ASTM E715 according to direct measurement method with Data Acquisition which connected with Industrial Platinum Resistance Thermometer (PRT).

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1) Reference standard instrument:
Instrument : MVS7013711
Serial No. : 23LM115
Traceable : TPA
Due Date : 11 Jul 2024

2) This certificate is valid only to the item calibrated on date and place of calibration.

3) This certificate is traceable to the International System of Unit.

Remark : TPA, Technology Promotion Association (Thailand - Japan)

Result of Calibration : (*) Without Adjustment
Function of UUC : Temperature Source
Heat transfer medium used : Water

Environmental		AC Voltage Supply
Beginning of Calibration	Finished of Calibration	
25 25	25 27	222 223

Position		Ref. Std. ID No.
1	4003095-001	
2	4003095-002	
3	4003095-003	
4	4003095-004	
5 (ref)	4003095-005	

Fixed



Equipment : Water Bath
Condition As-Received : Used Item
Reference : 2403-056300-4
Page : 3 of 3

Procedure Used : Calibration were conducted using in-house calibration procedure CP-OT04 Based on ASTM E715 according to direct measurement method with Data Acquisition which connected with Industrial Platinum Resistance Thermometer (PRT).

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1) Reference standard instrument:
Instrument : MVS7013711
Serial No. : 23LM115
Traceable : TPA
Due Date : 11 Jul 2024

2) This certificate is valid only to the item calibrated on date and place of calibration.

3) This certificate is traceable to the International System of Unit.

Remark : TPA, Technology Promotion Association (Thailand - Japan)

Result of Calibration : (*) Without Adjustment
Function of UUC : Temperature Source
Heat transfer medium used : Water

Calibration point		UUC	UUC	Average Standard Reading (°C)	Uncertainty
(°C)	(°C)	(°C)	(°C)	1 2 3 4 5 (ref)	(± °C)
85.0	85.0	85.0	84.426	84.426 84.469 84.507 84.477	0.18

Calibration point	Uniformity	Stability	Coverage Factor
(°C)	(°C)	(± °C)	k
85.0	0.19	0.11	2

Average : The average of 30 values in each position.

Uniformity : The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location, which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.

Stability : One-half of the greatest maximum difference of measured temperature at any one probe.

UUC : Unit Under Calibration

Note : The reported uncertainty of measurement was included stability and excluded uniformity.

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k, providing a level of confidence of approximately 95 %.

-60-



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Cert. No. : 25CH1540
Page : 1 of 2

Certificate of Calibration

Equipment : pH Meter
Manufacturer : Mettler Toledo
Model : SevenGo S2
Serial No. : C23258842
ID No. : RYD-F30017
Condition As-Received : Used Item
Received Date : 08 December 2023
Calibration Date : 08 December 2023
Reference : JIS S 0102:2001
Submitted by : ALS Laboratory Group (Thailand) Co., Ltd. (Pattana Pong Road)
Location : Wet Chemistry Lab
Received Order : 21 March 2024
Calibration Date : 21 March 2024
Ambient Temperature : (20 ± 10) °C
Relative Humidity : (50 ± 30) %
Calibrated by : Man Pattanapongkoon
Approved by : (Signature)
Approved Signature : (Signature)
Issue Date : 8 December 2023

REVIEW BY : Thairat
APPROVED BY : Dhanu
NEXT CAL DATE : 21/09/25

The Uncertainty are for a confidence probability of approximately 95%
This certificate may not be reproduced after date is full, except with the prior written
Agreement of the head of Department 3. Equipment Calibration and Testing Services

[illegible]

User: Admin Language: english (en)				System 6.0001	
Report Generated By: Veronique.BRISARD@INRA.fr				Print date: December 01, 2010 at 17:27 PM	
GSP-2009 Vaccination list					
Date	Vaccination date	Activity	Parvovirus	Type of Interventions	Additional Interventions
December 17, 2009 12:27:00 PM	Auto	None		Injecte Vaccins B1 - Lymph Injection Point: B10, B12 Reason: B1 - Lymphatic system Fluorimex 1, 1 = 100%	Injecte Vaccin B1/Injection Point: B10, B12 Reason: B1 - Lymphatic system Fluorimex 1, 1 = 100%
December 17, 2009 12:28:00 PM	Auto	Continu		Injecte Vaccins B2 - Lymph Injection Point: B10, B12 Reason: B2 - Lymphatic system Fluorimex 1, 1 = 100%	Injecte Vaccin 1
December 17, 2009 12:30:00 PM	Auto	Parvovirus		Injecte Vaccin B1 - Lymph Injection Point: B10, B12 Reason: B1 - Lymphatic system Fluorimex 1, 1 = 100%	Injecte Vaccin B1 Injection Point: B10, B12 Reason: B1 - Lymphatic system Fluorimex 1, 1 = 100%
December 17, 2009 12:31:00 PM	Auto	Continu		Injecte Vaccins B1 - Lymph Injection Point: B10, B12 Reason: B1 - Lymphatic system Fluorimex 1, 1 = 100%	None
December 17, 2009 12:32:00 PM	Auto	None		Injecte Vaccins B1 - Lymph Injection Point: B10, B12 Reason: B1 - Lymphatic system Fluorimex 1, 1 = 100%	Injecte Vaccin 1 Injection Point: B10, B12 Reason: B1 - Lymphatic system Fluorimex 1, 1 = 100%
December 17, 2009 12:33:00 PM	Auto	None		Injecte Vaccins B1 - Lymph Injection Point: B10, B12 Reason: B1 - Lymphatic system Fluorimex 1, 1 = 100%	Injecte Vaccin 1 Injection Point: B10, B12 Reason: B1 - Lymphatic system Fluorimex 1, 1 = 100%
December 17, 2009 12:34:00 PM	Auto	Continu		Injecte Vaccins B1 - Lymph Injection Point: B10, B12 Reason: B1 - Lymphatic system Fluorimex 1, 1 = 100%	Injecte Vaccin 1 Injection Point: B10, B12 Reason: B1 - Lymphatic system Fluorimex 1, 1 = 100%
December 17, 2009 12:35:00 PM	Auto	Continu		Injecte Vaccins B1 - Lymph Injection Point: B10, B12 Reason: B1 - Lymphatic system Fluorimex 1, 1 = 100%	Injecte Vaccin 1 Injection Point: B10, B12 Reason: B1 - Lymphatic system Fluorimex 1, 1 = 100%
December 17, 2009 12:36:00 PM	Auto	Continu		Injecte Vaccins B1 - Lymph Injection Point: B10, B12 Reason: B1 - Lymphatic system Fluorimex 1, 1 = 100%	Injecte Vaccin 1 Injection Point: B10, B12 Reason: B1 - Lymphatic system Fluorimex 1, 1 = 100%
December 17, 2009 12:37:00 PM	Auto	Continu		Injecte Vaccins B1 - Lymph Injection Point: B10, B12 Reason: B1 - Lymphatic system Fluorimex 1, 1 = 100%	Injecte Vaccin 1 Injection Point: B10, B12 Reason: B1 - Lymphatic system Fluorimex 1, 1 = 100%

Erik Meijer: <i>Generative programming</i> (with contributions by: www.haskell.org/ghc/doc/ghc-7.0.4/html/GenProg.html)				October 06, 2009
SBS-30005 Translation log				Printed Date: 10/06/2009 12:18 PM
File	Accession Date	Activity Performed	Type of Intervention	Revision Information
Translation 01 (001) 1/14/07 to 1/14/07	001	Entered	Original <Meijer 01> (1) Original: 01 (001) History: 01 (001) Entered: 01 (001) Entered 1 (001) = 001	Accession 01 (001)
Translation 02 (002) 1/14/07 to 1/14/07	002	Translated	Original <Meijer 02> (1) Original: 02 (002) History: 02 (002) Entered 1 (001) = 002	Accession 02 (002), 01 (001)
Translation 03 (003) 1/14/07 to 1/14/07	003	Entered	Original <Meijer 03> (1) Original: 03 (003) History: 03 (003) Entered 1 (001) = 003	None
Translation 04 (004) 1/14/07 to 1/14/07	004	Test	Original <Meijer 04> (1) Original: 04 (004) History: 04 (004) Entered 1 (001) = 004	None Accession 04 (004), 03 (003)
Translation 05 (005) 1/14/07 to 1/14/07	005	Entered	Original <Meijer 05> (1) Original: 05 (005) History: 05 (005) Entered 1 (001) = 005	Accession 05 (005)
Translation 06 (006) 1/14/07 to 1/14/07	006	Translated	Original <Meijer 06> (1) Original: 06 (006) History: 06 (006) Entered 1 (001) = 006	Accession 06 (006), 05 (005)
Translation 07 (007) 1/14/07 to 1/14/07	007	Entered	Original <Meijer 07> (1) Original: 07 (007) History: 07 (007) Entered 1 (001) = 007	Accession 07 (007)
Translation 08 (008) 1/14/07 to 1/14/07	008	Entered	Original <Meijer 08> (1) Original: 08 (008) History: 08 (008) Entered 1 (001) = 008	Accession 08 (008)
Translation 09 (009) 1/14/07 to 1/14/07	009	Entered	Original <Meijer 09> (1) Original: 09 (009) History: 09 (009) Entered 1 (001) = 009	Accession 09 (009)

[illegible][illegible]

Year	Transaction Date	Activity Description	Type of Transaction	Referral Information
December 31, 2002	12/31/2002	Auto	Auto Credit	None
November 15, 2002	11/15/2002	Auto	Auto Payment	None
November 15, 2002	11/15/2002	Auto	Auto Payment	None
January 15, 2003	1/15/2003	Tax	Quarterly	IRS
September 15, 2002	9/15/2002	Auto	Monthly	Supermarket Grocery
December 31, 2002	12/31/2002	Auto	Monthly	High Credit Card - None

ภาคผนวก จ

สำเนาหนังสืออนุญาตขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
19	Copper	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
20	Cyanide	Distillation, Colorimetric Method ⁽⁴⁾
21	2,4'-DDD	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
22	4,4'-DDD	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
23	2,4'-DDE	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
24	4,4'-DDE	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
25	2,4'-DDT	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
26	4,4'-DDT	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
27	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
28	Endosulfan Sulfate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
29	Endosulfan I	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
30	Endosulfan II	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
31	Endrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
32	Endrin Aldehyde	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
33	Formaldehyde	Distillation, Colorimetric Method ⁽⁴⁾
34	Free Chlorine	1) DPD Ferrous Titrimetric Method ⁽⁴⁾ 2) DPD Colorimetric Method ⁽⁴⁾
35	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
36	Heptachlor Epoxide	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
37	Hexavalent Chromium	Colorimetric Method ⁽⁴⁾
38	3-Hydroxycarbofuran	High-Performance Liquid Chromatographic Method ⁽⁴⁾
39	Lead	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾

40 Manganese...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
40	Manganese	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
41	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
42	Methiocarb	High-Performance Liquid Chromatographic Method ⁽⁴⁾
43	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
44	Methomyl	High-Performance Liquid Chromatographic Method ⁽⁴⁾
45	Nickel	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
46	Oil & Grease	1) Liquid-Liquid, Partition-Gravimetric Method ⁽⁴⁾ 2) Soxhlet Extraction Method ⁽⁴⁾
47	Oxamyl	High-Performance Liquid Chromatographic Method ⁽⁴⁾
48	Propoxur	High-Performance Liquid Chromatographic Method ⁽⁴⁾
49	pH	Electrometric Method ⁽⁴⁾
50	Phenols	1) Distillation, Chloroform Extraction Method ⁽⁴⁾ 2) Distillation, Direct Photometric Method ⁽⁴⁾
51	Selenium	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
52	Sulfide	Iodometric Method ⁽⁴⁾
53	Temperature	Laboratory and Field Methods ⁽⁴⁾
54	Total Dissolved Solids	Dried at 180 °C ⁽⁴⁾
55	Total Kjeldahl Nitrogen	Semi-Micro Kjeldahl Method ⁽⁴⁾
56	Total Phosphorous	Digestion, Colorimetric Method ⁽⁴⁾
57	Total Suspended Solids	Dried from 103-105 °C ⁽⁴⁾
58	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
59	Trivalent Chromium	1) Digestion, Inductively Coupled Plasma Method/ Colorimetric Method; Calculation ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Colorimetric Method; Calculation ⁽⁴⁾
60	Zinc	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾

61 Chlorine...

น้ำดื่ม จำนวน 126 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
2	Acetone	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
3	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
4	Anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
5	Antimony	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
6	Arsenic	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
7	Atrazine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
8	Barium	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
9	Benz(a)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
10	Benzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
11	Benzo(b)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
12	Benzo(k)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
13	Benzoic Acid	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
14	Benzo(a)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
15	Benzo(g,h,i)perylene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
16	Beryllium	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
17	Bis(2-chloroethyl)ether	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾

18 Bis(2-ethylhexyl)phthalate...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
18	Bis(2-ethylhexyl)phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
20	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
21	Butanol	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
22	Butyl benzyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
23	Cadmium	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
24	Carbazole	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
25	Carbon disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
27	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
28	p-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
32	2-Chlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
33	Chromium	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
34	Chromium (III)	1) Digestion, Inductively Coupled Plasma Method/ Colorimetric Method; Calculation ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Colorimetric Method; Calculation ⁽⁴⁾
35	Chromium (VI)	Colorimetric Method ⁽⁴⁾

36 Chrysene...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
36	Chrysene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
37	Cyanide	Distillation, Colorimetric Method ⁽⁴⁾
38	2,4-D	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
39	DDO	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
40	DDE	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
41	DDT	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
42	Dibenz(a,h)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
43	Di-n-Butyl Phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
47	3,3-Dichlorobenzidine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
48	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
49	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
50	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
53	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾

56 1,3-Dichloropropene...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
57	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
58	Diethyl Phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
59	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
60	2,4-Dinitrophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
61	2,4-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
62	2,6-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
63	Di-n-octyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
64	Endosulfan	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
65	Endrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
67	Fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
68	Fluorene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
69	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
70	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
71	Hexachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
73	n-Hexane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
74	α-HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
75	β-HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾

76 γ-HCH...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
76	γ-HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
77	Hexachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
78	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
79	Indeno(1,2,3-cd)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
80	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
81	Lead	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
82	Manganese	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
83	Mercury	1) Digestion, Cold Vapor Atomic Absorption Spectrometric Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
84	Methanol	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
85	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
86	Methyl bromide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
87	Methylene chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
88	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
89	2-Methylnaphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
90	Methyl tert-butyl Ether	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
91	Naphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
92	Nickel	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
93	Nitrobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾

94 N-Nitrosodiphenylamine...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
94	N-Nitrosodiphenylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
95	N-Nitrosodi-n-Propylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
96	Polychlorinated Biphenyls - PCB 1016 - PCB 1221 - PCB 1232 - PCB 1242 - PCB 1248 - PCB 1254 - PCB 1260	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
97	Pentachlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
98	pH	Electrometric Method ⁽⁴⁾
99	Phenanthrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
100	Phenol	1) Distillation, Chloroform Extraction Method ⁽⁴⁾ 2) Distillation, Direct Photometric Method ⁽⁴⁾ 3) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
101	Pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
102	Selenium	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
103	Silver	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
104	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
105	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
106	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
107	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
108	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
109	TPH (C ₆ -C ₈)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(4,28)

110 TPH (C₆-C₁₀)...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
110	TPH (C ₉ -C ₁₆)	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(9,22)
111	TPH (C ₉ -C ₃₅)	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(9,22)
112	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
113	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
114	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
115	Trichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
116	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
117	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
118	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
119	Vanadium	1) Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁴⁾
120	Vinyl acetate	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
121	Vinyl chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
122	m-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
123	o-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
124	p-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
125	Xylene (Total)	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
126	Zinc	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁴⁾

ธาตุเคมี...

ธาตุเคมี (ไม่สมบูรณ์) จำนวน 28 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Arsimony	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
2	Arsenic	2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾ 1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
3	Beryllium	2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾ 1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
4	Cadmium	2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾ 1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
5	Carbon Monoxide	2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾ 1) Instrumental Analyzer Method ⁽⁵⁾
6	Chlorine	2) Sampling Bag Non-Dispersive Infrared Method ⁽⁵⁾ 1) Absorption Sampling, Ion Chromatographic Method ⁽⁵⁾
7	Chromium	1) Isokinetic Sampling, Ion Chromatographic Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
8	Cobalt	2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾ 1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
9	Copper	2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾ 1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
10	Cresol	2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾ Adsorption Sampling, Gas Chromatographic Method ⁽⁵⁾
11	Dioxins	Isokinetic Sampling ⁽⁵⁾
12	Hydrogen Chloride	1) Absorption Sampling, Ion Chromatographic Method ⁽⁵⁾ 2) Isokinetic Sampling, Ion Chromatographic Method ⁽⁵⁾
13	Hydrogen Fluoride	1) Absorption Sampling, Ion Chromatographic Method ⁽⁵⁾ 2) Isokinetic Sampling, Ion Chromatographic Method ⁽⁵⁾
14	Hydrogen Sulfide	Absorption Sampling, Iodometric Method ⁽⁵⁾

15 Lead...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
15	Lead	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾
16	Manganese	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾
17	Mercury	1) Isokinetic Sampling, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ⁽⁵⁾
18	Nickel	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾
19	Opacity	Ringelmann's Method ⁽⁷⁾
20	Oxides of Nitrogen	1) Absorption Sampling, Phenoldisulfonic Acid Method ⁽⁵⁾ 2) Absorption Sampling, Alkaline Permanganate/Colorimetric Method ⁽⁵⁾
21	Selenium	3) Instrumental Analyzer Method ⁽⁵⁾ 1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾
22	Sulfur Dioxide	1) Absorption Sampling, Barium-Thoron Titrimetric Method ⁽⁵⁾ 2) Instrumental Analyzer Method ⁽⁵⁾
23	Sulfuric Acid	Isokinetic Sampling, Barium-Thoron Titrimetric Method ⁽⁵⁾
24	Tellurium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾
25	Tin	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾
26	Total Suspended Particulate	1) Isokinetic Sampling, Gravimetric Method ⁽⁵⁾ 2) Paired Train, Isokinetic Sampling, Gravimetric Method ⁽⁵⁾

27 Vanadium...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
27	Vanadium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾
28	Xylene	Adsorption Sampling, Gas Chromatographic Method ⁽⁵⁾

สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน 35 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,8,20) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,8,21)
2	Antimony	3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,8,21) 1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,8,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,8,17) 3) Digestion, Inductively Coupled Plasma Method ^(1,8,16) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,17)
3	Arsenic	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,8,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,8,17) 3) Digestion, Inductively Coupled Plasma Method ^(1,16) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,17)
4	Barium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,8,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,8,17) 3) Digestion, Inductively Coupled Plasma Method ^(1,16) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,17)

5 Beryllium...

ลำดับที่	สารพิษ	วิธีวิเคราะห์
5	Beryllium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,4,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,4,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,14) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
6	Cadmium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,4,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,4,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,14) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
7	Chlordane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,28) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(9,26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,120)
8	Chromium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,4,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,4,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,14) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
9	Chromium (III)	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction, Colorimetric Method; Calculation Method ^(1,4,14,19) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Waste Extraction, Colorimetric Method; Calculation Method ^(1,4,17,19) 3) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(7,14,19) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(7,17,19)

10 Chromium (VI)...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
10	Chromium (VI)	1) Waste Extraction, Colorimetric Method ^(1,6,9) 2) Alkaline Digestion, Colorimetric Method ^(6,10)
11	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,16) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
12	Copper	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,16) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
13	2,4-D	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,26) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
14	DDT	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,26) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
15	DDE	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,26) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
16	DDT	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,26)

2) Soxhlet...

ลำดับที่	สารพิษ	วิธีวิเคราะห์
17	Dieldrin	2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
18	Endrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,26) 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
19	Heptachlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,26) 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
20	Lead	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,8,14) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,8,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,14) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)
21	Lindane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,26) 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)

22 Mercury...

ลำดับที่	สารพิษ	วิธีการหา
22	Mercury	1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^(1,4,20) 2) Waste Extraction, Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ^(1,6,32) 3) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽²⁰⁾ 4) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ⁽²⁰⁾ 5) Thermal Decomposition Amalgamation and Atomic Absorption Spectrometric Method ⁽²¹⁾
23	Methoxychlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(19,26) 2) Soxhlet Extraction, Gas Chromatographic / Mass Spectrometric Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic / Mass Spectrometric Method ^(11,26)
24	Mirex	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(19,26) 2) Soxhlet Extraction, Gas Chromatographic / Mass Spectrometric Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic / Mass Spectrometric Method ^(11,26)
25	Molybdenum	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,14) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(16,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,14) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)
26	Nickel	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,14) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)
27	Polychlorinated biphenyls (PCBs) - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,7,28) 2) Soxhlet Extraction, Gas Chromatographic Method ^(10,24) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(11,26)

- 2-Chlorobiphenyl...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
28	<ul style="list-style-type: none"> - 2-Chlorobiphenyl - 2,3-Dichlorobiphenyl - 2,2',5-Trichlorobiphenyl - 2,4',5-Trichlorobiphenyl - 2,2',3,5-Tetrachlorobiphenyl - 2,2',5,5'-Tetrachlorobiphenyl - 2,3',4,4'-Tetrachlorobiphenyl - 2,2',3,4,5-Pentachlorobiphenyl - 2,2',4,5,5'-Pentachlorobiphenyl - 2,3',4',6-Pentachlorobiphenyl - 2,2',3,4,4',5'-Hexachlorobiphenyl - 2,2',3,4,5,5'-Hexachlorobiphenyl - 2,2',3,5,5',6-Hexachlorobiphenyl - 2,2',4,4',5,5'-Hexachlorobiphenyl - 2,2',3,3',4,4',5-Heptachlorobiphenyl - 2,2',3,4,4',5,5'-Heptachlorobiphenyl - 2,2',3,4,4',5,6-Heptachlorobiphenyl - 2,2',3,4',5,5',6-Heptachlorobiphenyl - 2,2',3,3',4,4',5,6-Nonachlorobiphenyl 	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,3,24) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(16,24) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,124) Electrometric Method ^(23,24)
29	pH	
30	Selenium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,4,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,4,17) 3) Digestion, Inductively Coupled Plasma Method ^(3,14) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)

31 Silver...

กิม...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
31	Silver	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,4,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,4,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,14) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
32	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,4,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,4,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,14) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
33	Toxaphene	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(3,6,24) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(16,24) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,24)
34	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,4,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,4,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,14) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
35	Zinc	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,4,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,4,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,14) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)

23 Cadmium...

ดิน จำนวน 125 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(16,24) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,24)
2	Acetone	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(16,23) 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ⁽¹³⁾
3	Aldrin	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(16,24) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,24)
4	Anthracene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(16,24) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,24)
5	Antimony	1) Digestion, Inductively Coupled Plasma Method ^(7,14) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
6	Arsenic	1) Digestion, Inductively Coupled Plasma Method ^(7,14) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
7	Atrazine	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(16,24) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,24)
8	Barium	1) Digestion, Inductively Coupled Plasma Method ^(7,14) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
9	Benz(a)anthracene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(16,24) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,24)
10	Benzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(16,25)

11 Benzo(b)fluoranthene

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
11	Benzo(b)fluoranthene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(16,24) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,24)
12	Benzo(k)fluoranthene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(16,24) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,24)
13	Benzoic acid	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(16,24) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,24)
14	Benzo(a)pyrene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(16,24) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,24)
15	Benzo(g,h,i)perylene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(16,24) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,24)
16	Beryllium	1) Digestion, Inductively Coupled Plasma Method ^(7,14) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
17	Bis(2-chloroethyl)ether	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(16,24) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,24)
18	Bis(2-ethylhexyl)phthalate	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(16,24) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,24)
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(16,25)
20	Bromoform	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(16,25)
21	Butanol	Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(13,23)
22	Butyl Benzyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(16,24) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,24)

ลำดับที่	สารเคมี	วิธีวิเคราะห์
23	Cadmium	1) Digestion, Inductively Coupled Plasma Method ^(7,16) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)
24	Carbazole	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
25	Carbon Disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
27	Chlordane	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
28	p-Chloroaniline	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
32	2-Chlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
33	Chromium	1) Digestion, Inductively Coupled Plasma Method ^(7,16) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)
34	Chromium (III)	1) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(7,8,16,19) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(7,8,17,19)
35	Chromium (VI)	Alkaline Digestion, Colorimetric Method ^(8,19)

36 Chrysene...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
36	Chrysene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
37	Cyanide	Extraction, Distillation, Colorimetric Method ^(7,28,29)
38	2,4-D	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
39	DDD	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
40	DDE	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
41	DDT	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
42	Dibenz(a,h)anthracene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
43	Di-n-Butyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
47	3,3-Dichlorobenzidine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
48	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)

49 1,2-Dichloroethane...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
49	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
50	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
53	2,4-Dichlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
57	Dieldrin	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
58	Diethyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
59	2,4-Dimethylphenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
60	2,4-Dinitrophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
61	2,4-Dinitrotoluene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
62	2,6-Dinitrotoluene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)

63 Di-n-Octyl Phthalate...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
63	Di-n-Octyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
64	Endosulfan	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
65	Endrin	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
67	Fluoranthene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
68	Fluorene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
69	Heptachlor	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
70	Heptachlor epoxide	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
71	Hexachlorobenzene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
73	n-Hexane	1) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25) 2) Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method ⁽¹³⁾

73 n-Hexane...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
74	α -HCH	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
75	β -HCH	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
76	γ -HCH	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
77	Hexachlorocyclopentadiene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
78	Hexachloroethane	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
79	Indeno(1,2,3-cd)pyrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
80	Isophorone	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
81	Lead	1) Digestion, Inductively Coupled Plasma Method ⁽⁷⁾⁽¹⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁷⁾⁽¹⁷⁾
82	Manganese	1) Digestion, Inductively Coupled Plasma Method ⁽⁷⁾⁽¹⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁷⁾⁽¹⁷⁾
83	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽⁸⁾⁽⁹⁾ 2) Thermal Decomposition, Amalgamation, and Atomic Absorption Spectrophotometry ⁽¹³⁾ 3) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ⁽⁸⁾⁽⁹⁾

84 Methanol...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
84	Methanol	1) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽³⁾⁽⁵⁾ 2) Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽³⁾⁽⁵⁾
85	Methoxychlor	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
86	Methyl Bromide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽³⁾⁽⁵⁾
87	Methylene Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽³⁾⁽⁵⁾
88	2-methylphenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
89	2-Methylnaphthalene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
90	Methyl tert-Butyl Ether	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽³⁾⁽⁵⁾
91	Naphthalene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
92	Nickel	1) Digestion, Inductively Coupled Plasma Method ⁽⁷⁾⁽¹⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁷⁾⁽¹⁷⁾
93	Nitrobenzene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
94	N-Nitrosodiphenylamine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
95	N-Nitrosodi-n-propylamine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾

96 Polychlorinated biphenyls (PCBs)

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
96	Polychlorinated biphenyls (PCBs) - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260 - 2-Chlorobiphenyl - 2,2',3,5'-Tetrachlorobiphenyl - 2,2',5,5'-Tetrachlorobiphenyl - 2,3',4,4'-Tetrachlorobiphenyl - 2,2',3,4,5'-Pentachlorobiphenyl - 2,2',4,5,5'-Pentachlorobiphenyl - 2,3,3',4,6'-Pentachlorobiphenyl - 2,2',3,4,4',5'-Hexachlorobiphenyl - 2,2',3,5,5',6'-Hexachlorobiphenyl - 2,2',4,4',5,5'-Hexachlorobiphenyl - 2,2',3,3',4,4',5'-Heptachlorobiphenyl - 2,2',3,4,4',5,5'-Heptachlorobiphenyl - 2,2',3,4,4',5,6'-Heptachlorobiphenyl - 2,2',3,4',5,5',6'-Heptachlorobiphenyl - 2,2',3,3',4,4',5,5',6'-Nonachlorobiphenyl	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
97	Pentachlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
98	Phenanthrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾

99 Phenol...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
99	Phenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
100	Pyrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
101	Selenium	1) Digestion, Inductively Coupled Plasma Method ⁽⁷⁾⁽¹⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁷⁾⁽¹⁷⁾
102	Silver	1) Digestion, Inductively Coupled Plasma Method ⁽⁷⁾⁽¹⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁷⁾⁽¹⁷⁾
103	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽³⁾⁽⁵⁾
104	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽³⁾⁽⁵⁾
105	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽³⁾⁽⁵⁾
106	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽³⁾⁽⁵⁾
107	Toxaphene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
108	TPH (C ₈ -C ₆)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽³⁾⁽⁵⁾
109	TPH (C ₁₀ -C ₁₆)	1) Automated Extraction, Gas Chromatographic Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Solvent Extraction, Gas Chromatographic Method ⁽¹⁾⁽²⁾⁽³⁾ 3) Ultrasonic Extraction, Gas Chromatographic Method ⁽¹⁾⁽²⁾⁽³⁾
110	TPH (C ₁₈ -C ₃₅)	1) Automated Extraction, Gas Chromatographic Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Solvent Extraction, Gas Chromatographic Method ⁽¹⁾⁽²⁾⁽³⁾ 3) Ultrasonic Extraction, Gas Chromatographic Method ⁽¹⁾⁽²⁾⁽³⁾
111	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽³⁾⁽⁵⁾
112	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽³⁾⁽⁵⁾
113	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽³⁾⁽⁵⁾
114	Trichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽³⁾⁽⁵⁾

115 2,4,5-Trichlorophenol...

ลำดับที่	สารพิษ	วิธีวิเคราะห์
115	2,4,5-Trichlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
116	2,4,6-Trichlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
117	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
118	Vanadium	1) Digestion, Inductively Coupled Plasma Method ^(7,14) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)
119	Vinyl Acetate	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
120	Vinyl Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
121	m-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
122	o-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
123	p-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
124	Xylene (Total)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
125	Zinc	1) Digestion, Inductively Coupled Plasma Method ^(7,14) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)

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พ.ศ. ๒๕๖๖ (๒๕๖๖) ๕๑ ๒๖



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๒ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพมหานคร ๑๐๖๐๐

๒๕ มีนาคม ๒๕๖๖

เรื่อง เปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรมการอุตสาหกรรม บริษัท เอนเดอร์ส แลนดพอร์ กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง: คำขอเสนอเปลี่ยน/เปลี่ยนแปลงบุคลากร แล่นดพอร์ กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการวิเคราะห์

วันที่ ๒๒ มีนาคม ๒๕๖๖

ตามคำขอที่ส่งถึง บริษัท เอนเดอร์ส แลนดพอร์ กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการวิเคราะห์ เมื่อวันที่ ๖ กุมภาพันธ์ ๒๕๖๖ สืบเนื่องจาก ๑๐๘ ขอยกพนักงาน ๕๐ คนที่พัฒนาการ แล่นดพอร์ กรุ๊ป (ประเทศไทย) จำกัด

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้

๑. ให้ยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๓๖ ราย

๑) นายสมชาย วัฒนศิริ	ทะเบียนเลขที่ ๖-๒๐๑๘-๖-๐๐๐๐๐๐
๒) นายวิชัย สุขทอง	ทะเบียนเลขที่ ๖-๒๐๑๘-๖-๐๐๐๐๐๐
๓) นายสมชาย วัฒนศิริ	ทะเบียนเลขที่ ๖-๒๐๑๘-๖-๐๐๐๐๐๐
๔) ให้เพิ่มเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์อีก ๕๐ ราย	
๑) นายสมชาย วัฒนศิริ	ทะเบียนเลขที่ ๖-๒๐๑๘-๖-๐๐๐๐๐๐
๒) นายสมชาย วัฒนศิริ	ทะเบียนเลขที่ ๖-๒๐๑๘-๖-๐๐๐๐๐๐
๓) นายสมชาย วัฒนศิริ	ทะเบียนเลขที่ ๖-๒๐๑๘-๖-๐๐๐๐๐๐
๔) นายสมชาย วัฒนศิริ	ทะเบียนเลขที่ ๖-๒๐๑๘-๖-๐๐๐๐๐๐
๕) นายสมชาย วัฒนศิริ	ทะเบียนเลขที่ ๖-๒๐๑๘-๖-๐๐๐๐๐๐
๖) นายสมชาย วัฒนศิริ	ทะเบียนเลขที่ ๖-๒๐๑๘-๖-๐๐๐๐๐๐
๗) นายสมชาย วัฒนศิริ	ทะเบียนเลขที่ ๖-๒๐๑๘-๖-๐๐๐๐๐๐
๘) นายสมชาย วัฒนศิริ	ทะเบียนเลขที่ ๖-๒๐๑๘-๖-๐๐๐๐๐๐
๙) นายสมชาย วัฒนศิริ	ทะเบียนเลขที่ ๖-๒๐๑๘-๖-๐๐๐๐๐๐
๑๐) นายสมชาย วัฒนศิริ	ทะเบียนเลขที่ ๖-๒๐๑๘-๖-๐๐๐๐๐๐
๑๑) นายสมชาย วัฒนศิริ	ทะเบียนเลขที่ ๖-๒๐๑๘-๖-๐๐๐๐๐๐
๑๒) นายสมชาย วัฒนศิริ	ทะเบียนเลขที่ ๖-๒๐๑๘-๖-๐๐๐๐๐๐

อนึ่ง เสนอให้

เอกสารแนบท้ายหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แล็บอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน 7-๒๒๓

ที่ เอก ๐๓๑๐(๙)/ ๖๔๗๐ ลงวันที่ ๒๕ มิถุนายน ๒๕๖๕

ขอขยายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๒๔ รายการ

แนบท้าย จำนวน 14 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Biochemical Oxygen Demand	1) 5-Day BOD Test, Membrane Electrode Method ⁽²⁾ 2) 5-Day BOD Test, Azide Modification Method ⁽²⁾
2	Chemical Oxygen Demand	1) Open Reflux, Titrimetric Method ⁽²⁾ 2) Closed Reflux, Colorimetric Method ⁽²⁾ 3) Closed Reflux, Titrimetric Method ⁽²⁾
3	Color	ADMI Weighted - Ordinate Spectrophotometric Method ⁽²⁾
4	Cyanide	Distillation, Colorimetric Method ⁽²⁾
5	Formaldehyde	Distillation, Colorimetric Method ⁽²⁾
6	Free Chlorine	DPD-Ferrous Titrimetric Method ⁽²⁾
7	Oil and Grease	Liquid-Liquid Partition-Gravimetric Method ⁽¹⁾
8	pH	Electrometric Method ⁽²⁾
9	Phenols	1) Distillation, Chloroform Extraction Method ⁽²⁾ 2) Distillation, Direct Photometric Method ⁽²⁾
10	Sulfide	ZnS Precipitation, Iodometric Method ⁽²⁾
11	Temperature	Laboratory and Field Method ⁽²⁾
12	Total Dissolved Solids	Dried at 180 °C ⁽²⁾
13	Total Kjeldahl Nitrogen	Semi-Micro Kjeldahl Method ⁽²⁾
14	Total Suspended Solids	Dried at 103-105 °C ⁽²⁾

เอกสารแนบ (ปลั๊กอะแดปเตอร์) จำนวน 7 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Carbon Monoxide	1) Sampling Bag, Non-Dispersive Infrared Method ⁽¹⁾ 2) Instrumental Analyzer Method ⁽⁶⁾
2	Hydrogen Sulfide	Absorption Sampling, Iodometric Method ⁽¹⁾
3	Opacity	Ringelmann's Method ⁽¹⁾⁽⁴⁾
4	Oxide of Nitrogen	1) Absorption Sampling, Phenoldisulfonic Acid Method ⁽⁴⁾ 2) Instrumental Analyzer Method ⁽⁹⁾
5	Sulfur Dioxide	1) Absorption Sampling, Barium-Thorin Titrimetric Method ⁽¹⁾ 2) Instrumental Analyzer Method ⁽¹⁰⁾

วิรัตน์ สิมสุต
(นางสาววิชุดา สิมสุต)

ผู้อำนวยการ

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก

Sulfuric Acid...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
6	Sulfuric Acid	Isokinetic Sampling, Barium - Thorin Titrimetric Method ⁽⁶⁾
7	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method ⁽¹⁾

แนบท้าย จำนวน 3 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Cyanide	Distillation, Colorimetric Method ⁽²⁾
2	pH	Electrometric Method ⁽²⁾
3	Phenols	Distillation, Direct Photometric Method ⁽²⁾

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วิรัตน์ สิมสุต

(นางสาววิชุดา สิมสุต)

ผู้อำนวยการ

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก ถนนวิชัยและเตือนภัยมลพิษโรงงาน กรมโรงงานอุตสาหกรรม โทร ๐ ๓๐๐๕ ๕๒๒๓๓๓

สำเนา

ที่ เอก ๐๓๑๐(๙)/ ๖๐๕๐๓

กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๒๕ มิ.ย. ๒๕๖๕

เรื่อง เปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แล็บอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอเปลี่ยนแปลงบุคลากร ของห้องปฏิบัติการวิเคราะห์เอกชน ลงวันที่ ๑๔ มีนาคม ๒๕๖๕

ตามที่หนังสือที่อ้างถึง บริษัท เอแอลเอส แล็บอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน 7-๒๒๓ สถานที่ตั้งเลขที่ ๖๓๖/๑๐ หมู่ที่ ๕ ตำบลแม่ไม้ ต.บ้านหลวง อ.เวียงพางคำ จ.แม่ฮ่องสอน ขอเปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์ ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้

ก. ให้ยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๕ ราย

- ๑) นางสาวเจษฎาพร ศรีบุญเรือง ทะเบียนเลขที่ 7-๒๒๓-๖-๑๔๔๗๓
- ๒) นางสาวสุวิมล สิงห์เวา ทะเบียนเลขที่ 7-๒๒๓-๖-๑๔๔๗๔
- ๓) นางสาววันดา ผดุงจิตต์ ทะเบียนเลขที่ 7-๒๒๓-๖-๑๔๔๗๕
- ๔) นายศุภณัฐ พิสมัยพันธ์ ทะเบียนเลขที่ 7-๒๒๓-๖-๑๔๔๗๖
- ๕) นายสิทธิชัย แก้วเกตุ ทะเบียนเลขที่ 7-๒๒๓-๖-๑๔๔๗๗

ข. ให้เพิ่มเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑๒ ราย

- ๑) นายณัฐพงษ์ เพ็งขาวมา ทะเบียนเลขที่ 7-๒๒๓-๖-๑๐๐๐๓
- ๒) นางสาวกัญญารัตน์ วิฑิตี ทะเบียนเลขที่ 7-๒๒๓-๖-๑๐๐๐๔
- ๓) นางสาวจุฑารัตน์ สีทองหลวง ทะเบียนเลขที่ 7-๒๒๓-๖-๑๐๐๐๕
- ๔) นางสาวจิตติภา ประเทืองสุข ทะเบียนเลขที่ 7-๒๒๓-๖-๑๐๐๐๖
- ๕) นายสรวิชัย คูยกสุย ทะเบียนเลขที่ 7-๒๒๓-๖-๑๐๐๐๗
- ๖) นายณัฐพงษ์ ออมพรราช ทะเบียนเลขที่ 7-๒๒๓-๖-๑๐๐๐๘
- ๗) นายจักรกร สีระสา ทะเบียนเลขที่ 7-๒๒๓-๖-๑๐๐๐๙
- ๘) นายสิทธิพงษ์ สุวรรณรัตน์ ทะเบียนเลขที่ 7-๒๒๓-๖-๑๐๐๑๐
- ๙) นายสิทธิพงษ์ เสนาพิลา ทะเบียนเลขที่ 7-๒๒๓-๖-๑๐๐๑๑
- ๑๐) นายอนุวัฒน์ เสงี่ยม ทะเบียนเลขที่ 7-๒๒๓-๖-๑๐๐๑๒
- ๑๑) นายสุวิทย์ นราพงษ์ ทะเบียนเลขที่ 7-๒๒๓-๖-๑๐๐๑๓
- ๑๒) นายอดิศักดิ์ ตะริณีย์ ทะเบียนเลขที่ 7-๒๒๓-๖-๑๐๐๑๔

อนึ่ง หนังสือฉบับนี้จะหมดอายุพร้อมหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ที่ เอก ๐๓๑๐(๙)/๖๐๕๐๓ ลงวันที่ ๒๕ มิถุนายน ๒๕๖๕ คือในวันที่ ๒๕ มิถุนายน ๒๕๖๗ ทั้งนี้ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ที่หน้าเว็บไซต์กรมโรงงานอุตสาหกรรมตาม QR Code ท้ายหนังสือนี้

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(ลายเซ็น)

(นายทวี ธีรพาทย์)

ผู้อำนวยการศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก
โทร. ๐ ๓๐๐๕ ๕๒๒๓๓๓ ต่อ ๕๐๐๑๓-๑
ไปรษณีย์อิเล็กทรอนิกส์: elw@ddiw.mail.go.th



ยื่นคำขอผ่านระบบอิเล็กทรอนิกส์





ที่ ๒/ ๐๑๒๐/๒๕๖๕

กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๑๐ พ.ย. ๒๕๖๕

เรื่อง เปลี่ยนแปลงสารมลพิษของห้องปฏิบัติการวิเคราะห์
เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด
อ้างถึง คำขอเปลี่ยนแปลงสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน ลงวันที่ ๒๕ ตุลาคม ๒๕๖๔
สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือเปลี่ยนแปลงสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำนวน ๓ แผ่น
ตามหนังสือที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการ
วิเคราะห์เอกชน เลขทะเบียน ๖-๑๒๓ สถานที่ตั้งเลขที่ ๖๑๖/๑๐ หมู่ที่ ๕ ตำบลแม่ไม้คู อำเภอลำปางหลวง
จังหวัดพะเยา ขอเปลี่ยนแปลงสารมลพิษของห้องปฏิบัติการวิเคราะห์ ความละเอียดดังนี้
กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย)
จำกัด เพิ่มขอบข่ายสารมลพิษที่วิเคราะห์ในน้ำเสีย จำนวน ๑๓ รายการ และน้ำใต้ดิน ๓ รายการ ตามสิ่งที่ส่ง
มาด้วย

อนึ่ง หนังสือฉบับนี้จะสิ้นสุดอายุพร้อมหนังสือต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์
เอกชนที่ ๒/ ๐๓๑๐(๑)/๒๕๗๐ ในวันที่ ๒๘ มิถุนายน ๒๕๖๕ คือในวันที่ ๒๘ มิถุนายน ๒๕๖๗ ทั้งนี้ สามารถ
ยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ทั้งน้ำเสียและน้ำใต้ดินที่กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายพร อัมพพันธุ์)

ผู้อำนวยการศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก
ปฏิบัติการทางเทคโนโลยีการตรวจวัดมลพิษทางอากาศ

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก
โทร. ๐ ๓๓๑๓ ๖๐๕๙ ต่อ ๕๐๐๑-๒
โทรสาร ๐๓๓๑๖๐๕๙-๒
อีเมล: ew@dw.m.go.th



"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า รวมกันพัฒนา อุตสาหกรรมสีเขียว"



ที่ ๒/ ๐๑๒๐/ ๔๖๐๑

กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๑๘ พฤษภาคม ๒๕๖๕

เรื่อง เปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์
เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด
อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๒๐ มีนาคม ๒๕๖๕

ตามคำขอที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการ
วิเคราะห์เอกชน เลขทะเบียน ๖-๑๒๓ สถานที่ตั้งเลขที่ ๖๑๖/๑๐ หมู่ที่ ๕ ตำบลแม่ไม้คู อำเภอลำปางหลวง
จังหวัดพะเยา ขอเปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์ ความละเอียดดังนี้

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้

๑. ให้อยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๓ ราย

นางสาวเพชรคุณ ภวภูตานนท์ ทะเบียนเลขที่ ๖-๑๒๓-๖-๑๔๕๔

๒. ให้เพิ่มเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน จำนวน ๑๕ ราย

๑) นายณัฐพล เชื้อวังวิเศษ ทะเบียนเลขที่ ๖-๑๒๓-๖-๐๖๓๓

๒) นายชานนท์ บุญชื่น ทะเบียนเลขที่ ๖-๑๒๓-๖-๐๖๓๔

๓) นายณัฐกานต์ วงศ์อินทร์อยู่ ทะเบียนเลขที่ ๖-๑๒๓-๖-๐๖๓๕

๔) นายอานนท์ โพธิ์พระทอง ทะเบียนเลขที่ ๖-๑๒๓-๖-๐๖๓๖

๕) นายณัฐพล อังคณา ทะเบียนเลขที่ ๖-๑๒๓-๖-๐๖๓๗

๖) นายศุภณัฐ พิทยพันธ์ ทะเบียนเลขที่ ๖-๑๒๓-๖-๐๖๓๘

๗) นายสันติ คิณันติ ทะเบียนเลขที่ ๖-๑๒๓-๖-๐๖๓๙

๘) นายวิญญู มีพาสี ทะเบียนเลขที่ ๖-๑๒๓-๖-๐๖๔๐

๙) นายศุภณัฐ สกฤตดิสมศักดิ์ ทะเบียนเลขที่ ๖-๑๒๓-๖-๐๖๔๑

๑๐) นายเอกชัย นิยมทอง ทะเบียนเลขที่ ๖-๑๒๓-๖-๐๖๔๒

๑๑) นายพงษ์เทพ สิทธิเลาชะ ทะเบียนเลขที่ ๖-๑๒๓-๖-๐๖๔๓

๑๒) นายทินกร กุณาธิ ทะเบียนเลขที่ ๖-๑๒๓-๖-๐๖๔๔

๑๓) นางสาวนันทิยา บุญจันต์ ทะเบียนเลขที่ ๖-๑๒๓-๖-๐๖๔๕

๑๔) นายสิทธิชัย ยืนพิมาย ทะเบียนเลขที่ ๖-๑๒๓-๖-๐๖๔๖

๑๕) นางสาวปณณิศา พลอดพุด ทะเบียนเลขที่ ๖-๑๒๓-๖-๐๖๔๗

อนึ่ง...



"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า รวมกันพัฒนา อุตสาหกรรมสีเขียว"



เอกสารแนบท้ายหนังสือเปลี่ยนแปลงสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ๖-๑๒๓
ที่ ๒/ ๐๑๒๐/๒๕๖๕ ลงวันที่ ๑๐ พ.ย. ๒๕๖๕

ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๑๖ รายการ
น้ำเสีย จำนวน 13 รายการ

ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
1	Biochemical Oxygen Demand	1) 5-Day BOD Test, Membrane Electrode Method
2	Chemical Oxygen Demand	2) 5-Day BOD Test, Azide Modification Method
		1) Open Reflux, Titrimetric Method
		2) Closed Reflux, Colorimetric Method
		3) Closed Reflux, Titrimetric Method
3	Color	ADMI Weighted-Ordinate Spectrophotometric Method
4	Cyanide	Distillation, Colorimetric Method
5	Free Chlorine	DPD Ferrous Titrimetric Method
6	Oil and Grease	Extraction, Gravimetric Method
7	pH	Electrometric Method
8	Phenols	1) Distillation, Chloroform Extraction Method
		2) Distillation, Direct Photometric Method
9	Sulfide	ZnS Precipitation, Iodometric Method
10	Temperature	Field Method
11	Total Dissolved Solids	Dried at 180 °C
12	Total Kjeldahl Nitrogen	Semi-Macro Kjeldahl Method
13	Total Suspended Solids	Dried at 103-105 °C

น้ำใต้ดิน จำนวน 3 รายการ

ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
1	Cyanide	Distillation, Colorimetric Method
2	pH	Electrometric Method
3	Phenols	Distillation, Direct Photometric Method

เอกสารอ้างอิง

APHA, AWWA, WEF, Standard Methods for the Examination of Water and
Wastewater, 24th ed. Washington, DC: APHA, 2023

(นายพร อัมพพันธุ์)

อนึ่ง หนังสือฉบับนี้จะสิ้นสุดอายุพร้อมหนังสือต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
ในวันที่ ๒๘ มิถุนายน ๒๕๖๕

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายพร อัมพพันธุ์)

ผู้อำนวยการศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก
ปฏิบัติการทางเทคโนโลยีการตรวจวัดมลพิษทางอากาศ

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก
โทร. ๐ ๓๓๑๓ ๖๐๕๙ ต่อ ๕๐๐๑-๒
โทรสาร ๐๓๓๑๖๐๕๙-๒
อีเมล: ew@dw.m.go.th

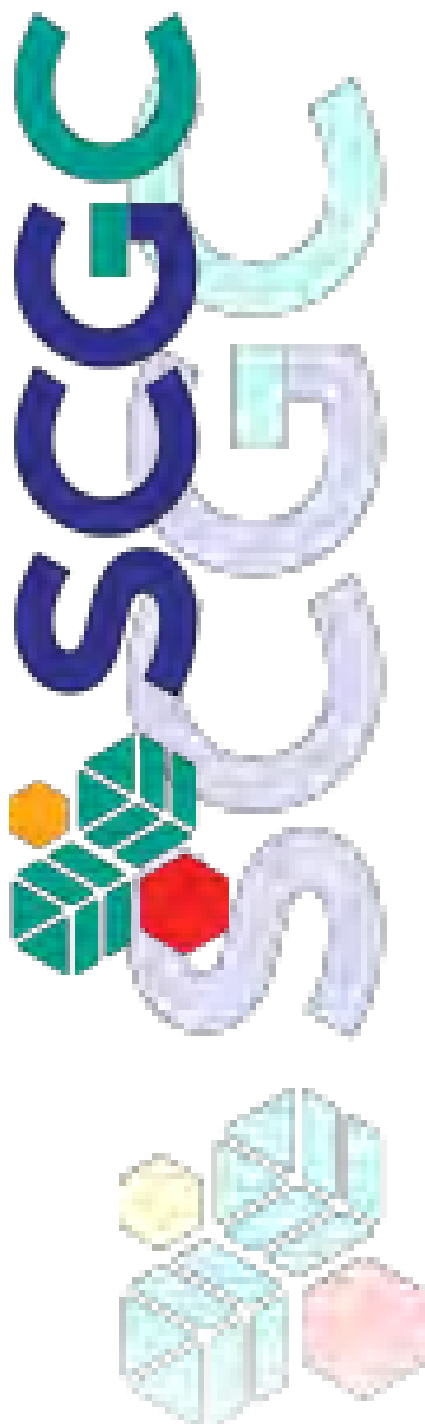


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✉ bangkok@alsglobal.com



ALS Line Official
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right partner.