

ภาคผนวก ค

ผลการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม

ภาคผนวก ค-1

คุณภาพอากาศจากปล่อง



Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :



TESTING
No.0009

Lot ID: 2615901
Date Received : Mar 18, 2026
Date Reported : Apr 02, 2026
Report Number: 3540436-1

Page 1 of 2

Sample Number 2615901-1
Sampled Date Mar 16, 2026
Sample Description Emission from Stationary Source
Location ปล่องพลาสม่าไฟฟ้า (HRSG) #11 (GPS 47P 0729672, 1434585)
Date Analysis Commenced Mar 19, 2026
Condition of Sample Extracted into one 10-L air sampling bag, one filter paper placed in plastic petri dish, two 2-L collection flask and one amber plastic bottle, refrigerated

Stack Description

Ambient Pressure	752	mmHg	Diameter	2.90	m	Oxygen	14.3	%
Ambient Temperature	35.1	°C	Shape	Circle		Carbon Dioxide	3.3	%
Type of Process	Combustion		Stack Temperature	96.9	°C	Gas Velocity	16.0	m/s
Type of Fuel	Natural Gas		Moisture	7.93	%	Flow Rate (Actual O2)	278823	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result at 7 % O ₂	Result at 14.3 % O ₂	Guideline Limit	Method	Testing Location
Air Testing									
Carbon Monoxide *	10:30 AM - 10:40 AM	ppm	-	1.0	<1.00	<1.00	No Standard	U.S. Environmental Protection Agency, EPA Method 10	Bangkok
Oxides of Nitrogen *	10:10 AM - 10:20 AM	ppm	-	1.06	29.3	13.91	120	U.S. Environmental Protection Agency, EPA Method 7	Bangkok
Sulfur dioxide *	10:00 AM - 12:00 PM	ppm	-	0.5	<0.5	<0.5	20	U.S. Environmental Protection Agency, EPA Method 6	Bangkok
Total Suspended Particulate	11:00 AM - 11:48 AM	mg/m3	-	0.5	<0.5	<0.5	60	U.S. Environmental Protection Agency 40 CFR method 1-5, Appendix A, 2020 (Include sampling)	Bangkok

Guideline :

Notification of the Ministry of Industry on determining pollution contents in air emissions from power plants, 2024 (B.E. 2567)

Technical Management

Saranya C.
Saranya Chalermthamrong
Scientist (4)
หมายเลข 7-204-3-0011

Approved by

Kanokkarn Anek
Kanokkarn Anek
Assistant General Manager
หมายเลข 7-204-3-0004

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S:\Reports_Air Stack_O2_GL.rpt (1.58PB)



Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :



TESTING
No.0009

Lot ID: 2615901
Date Received : Mar 18, 2026
Date Reported : Apr 02, 2026
Report Number: 3540436-1

Page 2 of 2

Sample Number 2615901-1
Sampled Date Mar 16, 2026
Sample Description Emission from Stationary Source
Location ปล่องพลาสม่าไฟฟ้า (HRSG) #11 (GPS 47P 0729672, 1434585)
Date Analysis Commenced Mar 19, 2026
Condition of Sample Extracted into one 10-L air sampling bag, one filter paper placed in plastic petri dish, two 2-L collection flask and one amber plastic bottle, refrigerated

Stack Description

Ambient Pressure	752	mmHg	Diameter	2.90	m	Oxygen	14.3	%
Ambient Temperature	35.1	°C	Shape	Circle		Carbon Dioxide	3.3	%
Type of Process	Combustion		Stack Temperature	96.9	°C	Gas Velocity	16.0	m/s
Type of Fuel	Natural Gas		Moisture	7.93	%	Flow Rate (Actual O2)	278823	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result Emission Rate	Guideline Limit	Method	Testing Location
Air Testing								
Carbon Monoxide *	10:30 AM - 10:40 AM	g/s	-	-	<0.080	No Standard	Calculated	Bangkok
Carbon Monoxide *	10:30 AM - 10:40 AM	kg/day	-	-	<6.69	No Standard	Calculated	Bangkok
Oxides of Nitrogen *	10:10 AM - 10:20 AM	g/s	-	-	2.016	No Standard	Calculated	Bangkok
Oxides of Nitrogen *	10:10 AM - 10:20 AM	kg/day	-	-	174	No Standard	Calculated	Bangkok
Sulfur dioxide *	10:00 AM - 12:00 PM	g/s	-	-	<0.10	No Standard	Calculated	Bangkok
Sulfur dioxide *	10:00 AM - 12:00 PM	kg/day	-	-	<8.70	No Standard	Calculated	Bangkok
Total Suspended Particulate *	11:00 AM - 11:48 AM	g/s	-	-	<0.04	No Standard	Calculated	Bangkok
Total Suspended Particulate *	11:00 AM - 11:48 AM	kg/day	-	-	<3.35	No Standard	Calculated	Bangkok

Note:

This Analysis test report is issued to supersede report No. 3511690-1, Date Reported : Mar 26, 2026 due to the revision of guideline by 3511690-1

Sampled By : Sangtawan Natasat

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.

Technical Management

Saranya C.
Saranya Chalermthamrong
Scientist (4)
หมายเลข 7-204-3-0011

Approved by

Kanokkarn Anek
Kanokkarn Anek
Assistant General Manager
หมายเลข 7-204-3-0004

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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :



TESTING
No.0009

Lot ID: 2615903
Date Received : Mar 18, 2026
Date Reported : Apr 02, 2026
Report Number: 3540435-1

Page 1 of 2

Sample Number 2615903-1
Sampled Date Mar 16, 2026
Sample Description Emission from Stationary Source
Location ปล่องพลาสม่า (HRSG) #12 (GPS 47P 0729694, 1434594)
Date Analysis Commenced Mar 19, 2026
Condition of Sample Extracted into one 10-L air sampling bag, one filter paper placed in plastic petri dish, two 2-L collection flask and one amber plastic bottle, refrigerated

Stack Description

Ambient Pressure	752	mmHg	Diameter	2.90	m	Oxygen	14.0	%
Ambient Temperature	35.1	°C	Shape	Circle		Carbon Dioxide	3.9	%
Type of Process	Combustion		Stack Temperature	95.4	°C	Gas Velocity	18.7	m/s
Type of Fuel	Natural Gas		Moisture	8.53	%	Flow Rate (Actual O2)	324921	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result		Guideline Limit	Method	Testing Location
					at 7 %O ₂	at 14.0 % O ₂			
Air Testing									
Carbon Monoxide *	03:00 PM - 03:10 PM	ppm	-	1.0	1.45	0.72	No Standard	U.S. Environmental Protection Agency, EPA Method 10	Bangkok
Oxides of Nitrogen *	02:40 PM - 02:50 PM	ppm	-	1.06	13.0	6.45	120	U.S. Environmental Protection Agency, EPA Method 7	Bangkok
Sulfur dioxide *	02:30 PM - 04:30 PM	ppm	-	0.5	<0.5	<0.5	20	U.S. Environmental Protection Agency, EPA Method 6	Bangkok
Total Suspended Particulate	02:30 PM - 03:34 PM	mg/m3	-	0.5	4.5	2.23	60	U.S. Environmental Protection Agency 40 CFR method 1-5, Appendix A, 2020 (Include sampling)	Bangkok

Guideline :

Notification of the Ministry of Industry on determining pollution contents in air emissions from power plants, 2024 (B.E. 2567)

Technical Management

Saranya C.
Saranya Chalerthamrong
Scientist (4)
หมายเลข 7-204-3-0011

Approved by

Kanokkarn Anek
Kanokkarn Anek
Assistant General Manager
หมายเลข 7-204-3-0004

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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :



TESTING
No.0009

Lot ID: 2615903
Date Received : Mar 18, 2026
Date Reported : Apr 02, 2026
Report Number: 3540435-1

Page 2 of 2

Sample Number 2615903-1
Sampled Date Mar 16, 2026
Sample Description Emission from Stationary Source
Location ปล่องพลาสม่า (HRSG) #12 (GPS 47P 0729694, 1434594)
Date Analysis Commenced Mar 19, 2026
Condition of Sample Extracted into one 10-L air sampling bag, one filter paper placed in plastic petri dish, two 2-L collection flask and one amber plastic bottle, refrigerated

Stack Description

Ambient Pressure	752	mmHg	Diameter	2.90	m	Oxygen	14.0	%
Ambient Temperature	35.1	°C	Shape	Circle		Carbon Dioxide	3.9	%
Type of Process	Combustion		Stack Temperature	95.4	°C	Gas Velocity	18.7	m/s
Type of Fuel	Natural Gas		Moisture	8.53	%	Flow Rate (Actual O2)	324921	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result Emission Rate	Guideline Limit	Method	Testing Location
Air Testing								
Carbon Monoxide *	03:00 PM - 03:10 PM	g/s	-	-	0.070	No Standard	Calculated	Bangkok
Carbon Monoxide *	03:00 PM - 03:10 PM	kg/day	-	-	6.40	No Standard	Calculated	Bangkok
Oxides of Nitrogen *	02:40 PM - 02:50 PM	g/s	-	-	1.089	No Standard	Calculated	Bangkok
Oxides of Nitrogen *	02:40 PM - 02:50 PM	kg/day	-	-	94.1	No Standard	Calculated	Bangkok
Sulfur dioxide *	02:30 PM - 04:30 PM	g/s	-	-	<0.12	No Standard	Calculated	Bangkok
Sulfur dioxide *	02:30 PM - 04:30 PM	kg/day	-	-	<10.14	No Standard	Calculated	Bangkok
Total Suspended Particulate *	02:30 PM - 03:34 PM	g/s	-	-	0.20	No Standard	Calculated	Bangkok
Total Suspended Particulate *	02:30 PM - 03:34 PM	kg/day	-	-	17.4	No Standard	Calculated	Bangkok

Note:

This Analysis test report is issued to supersede report No. 3511693-1, Date Reported : Mar 26, 2026 due to the revision of guideline by 3511693-1

Sampled By : Sangtawan Natasat

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.

Technical Management

Saranya C.
Saranya Chalerthamrong
Scientist (4)
หมายเลข 7-204-3-0011

Approved by

Kanokkarn Anek
Kanokkarn Anek
Assistant General Manager
หมายเลข 7-204-3-0004

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ภาคผนวก ค-2

คุณภาพอากาศในบรรยากาศ



Analysis / Test Report



TESTING
No.0042

Lot ID: 2615815

Date Received : Mar 25, 2026

Date Reported : Mar 30, 2026

Report Number: 3511571-1

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140

P/O : 2601110101

Project Name : ABPR 1

Project Location :

Sample Description Air Quality
Location โรงพจนานตส่งเสริมสุขภาพผ่านมณางพร (GPS 47P 0731399, 1436972)
Date Analysis Commenced Mar 26, 2026
Condition of Sample Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one quartz filter paper (8x10 inch) placed in plastic bag

Sample Number	Sampled Date	Sampling Condition		Total Suspended Particulate (ug/m3)	Particulate Matter (PM-10) (ug/m3)
		Pressure (mm Hg)	Temperature (°C)		
2615815-1	Mar 15 - Mar 16, 2026	752	31.2	131	42.7
2615815-2	Mar 16 - Mar 17, 2026	757	30.1	109	40.2
2615815-3	Mar 17 - Mar 18, 2026	757	30.3	132	39.4
2615815-4	Mar 18 - Mar 19, 2026	757	30.0	95.9	37.8
2615815-5	Mar 19 - Mar 20, 2026	757	30.2	128	35.4
2615815-6	Mar 20 - Mar 21, 2026	757	30.3	132	41.3
2615815-7	Mar 21 - Mar 22, 2026	757	30.1	96.2	38.7
Guideline	-	-	-	200	100

Reference Method

Total Suspended Particulate : United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008
Particulate Matter (PM-10) : United States Environmental Protection Agency 40 CFR, method 50, Appendix J, revised as of July 1, 2008

Guideline : Notification of the National Environmental Board., 2026 (B.E.2569) dated January 21, 2026.

Sampled By : Satcha Phetsawaeng

Approved by

Thanita K.

Thanita Kulsuriwong
Scientist (4)

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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140

P/O : 2601110101

Project Name : ABPR 1

Project Location :

Lot ID: 2615814

Date Received : Mar 24, 2026

Date Reported : Mar 28, 2026

Report Number: 3511563-1

Page 1 of 1

Sample Description Air Quality
Location โรงพจนานตส่งเสริมสุขภาพผ่านมณางพร (GPS 47P 0731399, 1436972)
Parameter Sulfur Dioxide (ppb)
Measurement Date Mar 15, 2026 - Mar 22, 2026
Measurement by Satcha Phetsawaeng

Time	2615814-1	2615814-2	2615814-3	2615814-4	2615814-5	2615814-6	2615814-7
	Mar 15, 2026	Mar 16, 2026	Mar 17, 2026	Mar 18, 2026	Mar 19, 2026	Mar 20, 2026	Mar 21, 2026
11:00 AM - 12:00 PM	4.2	4.4	4.9	0.4	3.9	4.9	4.5
12:00 PM - 01:00 PM	3.8	4.4	5.0	2.5	4.7	4.8	4.5
01:00 PM - 02:00 PM	4.1	4.4	4.9	4.1	3.0	4.9	4.4
02:00 PM - 03:00 PM	4.3	4.4	3.0	4.4	4.3	5.0	3.6
03:00 PM - 04:00 PM	4.3	4.5	3.4	4.8	4.5	4.9	4.0
04:00 PM - 05:00 PM	4.3	4.5	4.9	3.8	4.7	4.8	4.7
05:00 PM - 06:00 PM	3.7	4.4	4.9	4.8	4.7	4.8	3.3
06:00 PM - 07:00 PM	4.0	4.4	4.9	0.6	4.7	4.8	2.9
07:00 PM - 08:00 PM	4.3	4.4	4.3	4.8	4.8	4.9	3.0
08:00 PM - 09:00 PM	4.6	4.6	4.4	4.3	4.8	3.2	5.0
09:00 PM - 10:00 PM	4.6	0.9	3.6	4.8	4.9	2.4	4.5
10:00 PM - 11:00 PM	4.6	2.3	3.8	4.8	4.2	1.1	3.8
11:00 PM - 12:00 AM	4.6	5.0	4.4	4.8	4.8	2.1	4.7
12:00 AM - 01:00 AM	4.2	4.5	4.4	4.7	4.9	2.5	4.8
01:00 AM - 02:00 AM	4.2	4.1	4.3	4.7	4.5	3.6	4.8
02:00 AM - 03:00 AM	4.2	4.4	4.3	4.8	0.9	4.5	4.8
03:00 AM - 04:00 AM	4.2	4.5	4.3	4.7	1.3	4.5	4.8
04:00 AM - 05:00 AM	4.2	4.5	4.3	4.8	2.2	4.4	4.8
05:00 AM - 06:00 AM	4.2	4.5	4.3	4.8	3.8	4.4	4.5
06:00 AM - 07:00 AM	4.6	4.4	4.3	4.1	3.5	4.5	4.5
07:00 AM - 08:00 AM	4.6	4.9	4.3	4.8	3.9	4.5	4.5
08:00 AM - 09:00 AM	4.6	4.9	4.3	4.7	4.4	4.3	4.4
09:00 AM - 10:00 AM	4.6	4.9	4.3	2.6	4.9	4.5	4.5
10:00 AM - 11:00 AM	4.6	4.8	4.3	3.8	4.8	4.5	4.5
Average	4.3	4.3	4.3	4.1	4.0	4.1	4.3
1hr - Maximum	4.6	5.0	5.0	4.8	4.9	5.0	5.0
Standard 1hr - Average	100	100	100	100	100	100	100
Standard 24 hrs - Average	50	50	50	50	50	50	50

Standard : Notification of the National Environment Board B.E. 2569.

Reference Method : U.S. Environmental Protection Agency, EPA Method Part 53 and 58

Approved by

Orawan R.

Orawan Rak Yong
Scientist (3)

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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2615813
Date Received : Mar 24, 2026
Date Reported : Mar 28, 2026
Report Number: 3511561-1

Page 1 of 1

Sample Description Air Quality
Location โรงพลาสม่าสเต็มเซลล์ขนาดเล็กแบบถาวร (GPS 47P 0731399, 1436972)
Parameter Nitrogen dioxide (ppb)
Measurement Date Mar 15, 2026 - Mar 22, 2026
Measurement by Satcha Phetsawaeng

Time	2615813-1 Mar 15, 2026	2615813-2 Mar 16, 2026	2615813-3 Mar 17, 2026	2615813-4 Mar 18, 2026	2615813-5 Mar 19, 2026	2615813-6 Mar 20, 2026	2615813-7 Mar 21, 2026
11:00 AM - 12:00 PM	5.9	5.3	6.3	1.9	5.1	2.3	8.3
12:00 PM - 01:00 PM	7.7	4.3	6.0	8.0	4.9	2.4	7.2
01:00 PM - 02:00 PM	7.9	5.4	6.2	5.3	5.2	3.4	8.4
02:00 PM - 03:00 PM	4.4	5.9	5.3	6.2	5.0	3.6	6.3
03:00 PM - 04:00 PM	1.6	6.5	5.1	6.0	5.3	6.0	5.1
04:00 PM - 05:00 PM	5.6	5.4	3.6	5.2	6.3	7.2	3.6
05:00 PM - 06:00 PM	7.2	7.7	9.2	5.0	5.1	5.0	4.3
06:00 PM - 07:00 PM	2.7	8.5	8.2	6.3	4.0	2.0	5.0
07:00 PM - 08:00 PM	3.0	9.3	8.0	7.0	5.6	3.3	6.0
08:00 PM - 09:00 PM	6.0	4.6	7.3	7.2	7.9	6.3	5.2
09:00 PM - 10:00 PM	6.1	5.6	8.3	5.5	5.2	1.2	4.9
10:00 PM - 11:00 PM	8.3	6.2	9.3	5.0	8.6	7.0	5.0
11:00 PM - 12:00 AM	7.9	5.9	6.3	6.3	7.5	11.0	6.5
12:00 AM - 01:00 AM	9.9	7.3	6.4	6.5	6.0	5.2	3.7
01:00 AM - 02:00 AM	7.5	11.1	5.8	6.0	6.2	4.4	3.3
02:00 AM - 03:00 AM	2.8	7.4	5.0	6.2	6.0	5.0	1.3
03:00 AM - 04:00 AM	1.8	4.9	5.1	7.0	5.3	5.0	0.8
04:00 AM - 05:00 AM	4.9	7.0	3.2	6.3	5.0	6.1	1.3
05:00 AM - 06:00 AM	9.1	6.5	1.5	6.0	5.3	5.9	3.2
06:00 AM - 07:00 AM	9.8	7.2	2.9	5.3	6.9	6.1	2.2
07:00 AM - 08:00 AM	9.4	8.3	7.3	7.2	3.9	4.3	3.0
08:00 AM - 09:00 AM	7.8	8.0	6.9	3.7	5.6	3.9	2.9
09:00 AM - 10:00 AM	10.0	9.3	8.3	5.0	6.0	5.2	8.0
10:00 AM - 11:00 AM	8.5	7.2	7.0	4.3	3.8	5.6	3.1
Average	6.5	6.9	6.2	5.8	5.7	4.9	4.5
1hr - Maximum	10.0	11.1	9.3	8.0	8.6	11.0	8.4
Standard 1hr - Average	120	120	120	120	120	120	120

Standard : Notification of the National Environment Board B.E. 2569.
Reference Method : U.S. Environmental Protection Agency Method Part 50 App. F (Chemiluminescence)

Approved by

Orawan R.
Orawan Rakyong
Scientist (3)

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

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S:\Reports_Air_SCh4C1x.rpt (9:29AM)



Analysis / Test Report



TESTING
No. 0042

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2615854
Date Received : Mar 25, 2026
Date Reported : Mar 30, 2026
Report Number: 3511632-1

Page 1 of 1

Sample Description Air Quality
Location โรงพลาสม่าสเต็มเซลล์ขนาดเล็ก (GPS 47P 0724074, 1439002)
Date Analysis Commenced Mar 26, 2026
Condition of Sample Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one quartz filter paper (8x10 inch) placed in plastic bag

Sample Number	Sampled Date	Sampling Condition		Total Suspended Particulate (ug/m3)	Particulate Matter (PM-10) (ug/m3)
		Pressure (mm Hg)	Temperature (°C)		
2615854-1	Mar 15 - Mar 16, 2026	752	31.2	66.8	38.9
2615854-2	Mar 16 - Mar 17, 2026	752	30.5	69.2	29.9
2615854-3	Mar 17 - Mar 18, 2026	752	30.1	64.7	27.8
2615854-4	Mar 18 - Mar 19, 2026	752	30.2	62.0	31.1
2615854-5	Mar 19 - Mar 20, 2026	752	30.1	54.9	33.7
2615854-6	Mar 20 - Mar 21, 2026	752	31.5	54.8	37.9
2615854-7	Mar 21 - Mar 22, 2026	752	31.8	49.4	30.7
Guideline		-	-	200	100

Reference Method

Total Suspended Particulate : United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008
Particulate Matter (PM-10) : United States Environmental Protection Agency 40 CFR, method 50, Appendix J, revised as of July 1, 2008

Guideline : Notification of the National Environmental Board., 2026 (B.E.2569) dated January 21, 2026.

Sampled By : Satcha Phetsawaeng

Approved by

Thanita K.
Thanita Kulsuriwong
Scientist (4)

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

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S:\Reports_Air_Ambient\Days.rpt (11:18AM)



Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2615853
Date Received : Mar 24, 2026
Date Reported : Mar 28, 2026
Report Number: 3511631-1

Page 1 of 1

Sample Description Air Quality
Location ชุมชนบ้านโป่งตะกั่ว (GPS 47P 0724074, 1439002)
Parameter Sulfur Dioxide (ppb)
Measurement Date Mar 15, 2026 - Mar 22, 2026
Measurement by Satcha Phetsawaeng

Time	2615853-1 Mar 15, 2026	2615853-2 Mar 16, 2026	2615853-3 Mar 17, 2026	2615853-4 Mar 18, 2026	2615853-5 Mar 19, 2026	2615853-6 Mar 20, 2026	2615853-7 Mar 21, 2026
09:00 AM - 10:00 AM	7.7	6.6	6.5	5.9	8.1	8.9	8.6
10:00 AM - 11:00 AM	7.8	7.7	5.9	5.8	8.8	8.7	8.5
11:00 AM - 12:00 PM	7.8	6.4	5.8	5.8	7.5	8.5	7.2
12:00 PM - 01:00 PM	7.2	6.7	6.2	5.8	6.5	8.7	6.8
01:00 PM - 02:00 PM	7.9	6.6	7.2	5.8	6.7	8.9	8.4
02:00 PM - 03:00 PM	7.0	6.5	6.7	5.8	7.7	9.8	7.2
03:00 PM - 04:00 PM	6.4	8.4	5.8	7.6	7.8	8.9	7.3
04:00 PM - 05:00 PM	6.9	8.6	5.8	7.1	9.2	8.6	8.8
05:00 PM - 06:00 PM	8.0	7.6	5.9	6.0	8.3	10.1	8.5
06:00 PM - 07:00 PM	7.9	7.6	6.2	6.3	7.9	8.0	6.1
07:00 PM - 08:00 PM	5.9	8.9	7.1	9.1	7.8	5.8	7.8
08:00 PM - 09:00 PM	5.8	8.4	7.5	7.2	6.5	5.9	6.9
09:00 PM - 10:00 PM	6.8	7.8	7.5	6.1	6.0	7.1	7.2
10:00 PM - 11:00 PM	6.5	7.3	6.0	6.0	8.1	6.5	8.5
11:00 PM - 12:00 AM	6.2	5.8	5.7	6.5	7.5	5.8	7.5
12:00 AM - 01:00 AM	8.8	5.8	6.2	6.3	8.9	6.4	9.1
01:00 AM - 02:00 AM	8.5	5.8	5.8	5.8	8.2	6.2	9.2
02:00 AM - 03:00 AM	8.7	5.8	7.7	6.6	7.5	6.4	10.1
03:00 AM - 04:00 AM	7.0	5.7	7.3	6.6	8.8	6.8	10.1
04:00 AM - 05:00 AM	7.3	5.7	5.9	7.5	9.2	8.6	10.3
05:00 AM - 06:00 AM	6.7	6.0	5.9	6.1	7.7	6.1	10.0
06:00 AM - 07:00 AM	6.3	5.9	6.5	6.5	9.7	9.2	9.6
07:00 AM - 08:00 AM	6.9	6.2	6.4	6.5	7.8	7.1	9.6
08:00 AM - 09:00 AM	6.9	6.2	6.4	7.2	9.0	7.5	9.8
Average	7.2	6.8	6.4	6.5	8.0	7.7	8.5
1hr - Maximum	8.8	8.9	7.7	9.1	9.7	10.1	10.3
Standard 1hr - Average	100	100	100	100	100	100	100
Standard 24 hrs - Average	50	50	50	50	50	50	50

Standard : Notification of the National Environment Board B.E. 2569.
Reference Method : U.S. Environmental Protection Agency, EPA Method Part 53 and 58

Approved by

Orawan R.

Orawan Rakyong
Scientist (3)

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

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S:\Reports_Air\SOxNOx.rpt (10:06AM)



Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2615851
Date Received : Mar 24, 2026
Date Reported : Mar 28, 2026
Report Number: 3511629-1

Page 1 of 1

Sample Description Air Quality
Location ชุมชนบ้านโป่งตะกั่ว (GPS 47P 0724074, 1439002)
Parameter Nitrogen dioxide (ppb)
Measurement Date Mar 15, 2026 - Mar 22, 2026
Measurement by Satcha Phetsawaeng

Time	2615851-1 Mar 15, 2026	2615851-2 Mar 16, 2026	2615851-3 Mar 17, 2026	2615851-4 Mar 18, 2026	2615851-5 Mar 19, 2026	2615851-6 Mar 20, 2026	2615851-7 Mar 21, 2026
09:00 AM - 10:00 AM	3.4	11.6	13.7	5.7	5.3	14.2	8.8
10:00 AM - 11:00 AM	4.1	5.5	13.8	5.6	4.9	8.1	9.8
11:00 AM - 12:00 PM	3.1	10.0	6.2	6.8	3.9	4.4	6.2
12:00 PM - 01:00 PM	2.1	10.9	16.4	3.1	8.7	2.1	4.5
01:00 PM - 02:00 PM	4.3	15.4	14.0	2.7	11.0	2.5	2.0
02:00 PM - 03:00 PM	4.2	18.3	14.3	12.8	2.2	2.2	5.2
03:00 PM - 04:00 PM	2.8	18.9	14.9	4.8	3.5	3.5	3.7
04:00 PM - 05:00 PM	9.0	18.5	8.7	7.8	3.9	7.4	3.4
05:00 PM - 06:00 PM	8.7	17.1	5.2	9.1	6.5	5.1	5.7
06:00 PM - 07:00 PM	7.9	6.2	6.4	5.5	12.7	10.9	3.7
07:00 PM - 08:00 PM	4.3	3.1	12.7	11.9	14.4	9.8	9.7
08:00 PM - 09:00 PM	6.9	2.5	13.4	12.1	18.8	14.7	9.6
09:00 PM - 10:00 PM	11.9	2.4	12.2	15.9	10.0	12.2	13.8
10:00 PM - 11:00 PM	19.6	2.5	7.4	8.9	12.4	11.2	16.1
11:00 PM - 12:00 AM	10.7	3.2	7.5	5.1	10.1	15.4	13.4
12:00 AM - 01:00 AM	10.9	3.5	5.0	5.4	7.9	15.8	12.1
01:00 AM - 02:00 AM	9.2	3.0	4.0	2.9	5.3	17.5	15.0
02:00 AM - 03:00 AM	5.6	2.1	4.0	5.4	5.7	13.7	12.5
03:00 AM - 04:00 AM	8.8	2.7	3.9	3.6	5.5	16.1	15.3
04:00 AM - 05:00 AM	2.7	2.8	3.2	3.8	7.7	16.7	13.2
05:00 AM - 06:00 AM	3.3	3.0	2.6	5.8	5.6	8.1	9.1
06:00 AM - 07:00 AM	9.1	3.0	13.5	4.5	15.8	14.8	9.5
07:00 AM - 08:00 AM	3.1	5.2	2.1	10.9	13.6	8.2	10.2
08:00 AM - 09:00 AM	4.7	7.4	3.3	13.8	12.4	15.7	9.1
Average	6.7	7.5	8.7	7.2	8.7	10.4	9.2
1hr - Maximum	19.6	18.9	16.4	15.9	18.8	17.5	16.1
Standard 1hr - Average	120	120	120	120	120	120	120

Standard : Notification of the National Environment Board B.E. 2569.
Reference Method : U.S. Environmental Protection Agency Method Part 50 App. F (Chemiluminescence)

Approved by

Orawan R.

Orawan Rakyong
Scientist (3)

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S:\Reports_Air\SOxNOx.rpt (10:04AM)



Analysis / Test Report



TESTING
No.0042

Lot ID: 2615858

Date Received : Mar 25, 2026

Date Reported : Mar 30, 2026

Report Number: 3511637-1

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140

P/O : 2601110101

Project Name : ABPR 1

Project Location :

Sample Description Air Quality
Location โรงงานอุตสาหกรรม (GPS 47P 0725669, 1440184)
Date Analysis Commenced Mar 26, 2026
Condition of Sample Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one quartz filter paper (8x10 inch) placed in plastic bag

Sample Number	Sampled Date	Sampling Condition		Total Suspended Particulate (ug/m3)	Particulate Matter (PM-10) (ug/m3)
		Pressure (mm Hg)	Temperature (°C)		
2615858-1	Mar 15 - Mar 16, 2026	752	31.2	104	50.3
2615858-2	Mar 16 - Mar 17, 2026	752	30.5	86.5	44.6
2615858-3	Mar 17 - Mar 18, 2026	752	30.1	72.8	41.7
2615858-4	Mar 18 - Mar 19, 2026	752	30.2	82.5	41.8
2615858-5	Mar 19 - Mar 20, 2026	752	30.1	94.7	50.3
2615858-6	Mar 20 - Mar 21, 2026	752	31.5	70.3	52.5
2615858-7	Mar 21 - Mar 22, 2026	752	31.8	69.7	42.7
Guideline	-	-	-	200	100

Reference Method

Total Suspended Particulate : United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008
Particulate Matter (PM-10) : United States Environmental Protection Agency 40 CFR, method 50, Appendix J, revised as of July 1, 2008

Guideline : Notification of the National Environmental Board., 2026 (B.E.2569) dated January 21, 2026.

Sampled By : Satcha Phetsawaeng

Approved by

Thanita K.

Thanita Kulsuriwong
Scientist (4)

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140

P/O : 2601110101

Project Name : ABPR 1

Project Location :

Lot ID: 2615857

Date Received : Mar 24, 2026

Date Reported : Mar 28, 2026

Report Number: 3511636-1

Page 1 of 1

Sample Description Air Quality
Location โรงงานอุตสาหกรรม (GPS 47P 0725669, 1440184)
Parameter Sulfur Dioxide (ppb)
Measurement Date Mar 15, 2026 - Mar 22, 2026
Measurement by Satcha Phetsawaeng

Time	2615857-1	2615857-2	2615857-3	2615857-4	2615857-5	2615857-6	2615857-7
	Mar 15, 2026	Mar 16, 2026	Mar 17, 2026	Mar 18, 2026	Mar 19, 2026	Mar 20, 2026	Mar 21, 2026
10:00 AM - 11:00 AM	6.2	6.1	6.2	6.2	6.2	6.1	6.9
11:00 AM - 12:00 PM	6.2	6.1	6.2	6.2	6.2	6.2	6.9
12:00 PM - 01:00 PM	6.1	6.2	6.2	6.2	6.2	6.2	6.9
01:00 PM - 02:00 PM	6.1	6.3	6.2	6.3	6.2	6.2	6.9
02:00 PM - 03:00 PM	5.6	6.2	6.3	6.2	6.2	6.2	7.0
03:00 PM - 04:00 PM	6.1	6.2	6.3	6.2	6.2	6.2	6.8
04:00 PM - 05:00 PM	6.2	6.3	6.3	6.2	6.2	6.3	6.9
05:00 PM - 06:00 PM	6.2	5.0	6.4	6.3	6.2	6.2	6.9
06:00 PM - 07:00 PM	6.1	6.2	6.3	6.4	6.4	6.2	6.9
07:00 PM - 08:00 PM	6.2	5.1	6.3	6.4	6.4	6.2	6.9
08:00 PM - 09:00 PM	6.1	5.3	6.2	6.6	6.5	6.2	6.9
09:00 PM - 10:00 PM	6.2	6.2	6.2	6.5	6.4	6.2	6.9
10:00 PM - 11:00 PM	6.3	6.3	6.2	6.4	6.5	6.2	6.9
11:00 PM - 12:00 AM	6.1	6.2	6.3	6.3	6.5	6.2	6.9
12:00 AM - 01:00 AM	6.2	6.3	6.3	6.4	6.4	6.3	6.9
01:00 AM - 02:00 AM	6.2	6.3	6.3	6.3	6.4	6.2	6.9
02:00 AM - 03:00 AM	6.1	6.4	6.4	6.4	6.4	6.2	6.9
03:00 AM - 04:00 AM	6.0	6.5	6.3	6.3	6.4	6.3	6.9
04:00 AM - 05:00 AM	6.2	6.4	6.3	6.3	6.3	6.3	6.8
05:00 AM - 06:00 AM	6.2	6.2	6.1	6.2	6.2	6.2	6.8
06:00 AM - 07:00 AM	6.2	6.5	6.1	6.1	6.2	6.2	6.3
07:00 AM - 08:00 AM	6.3	6.3	6.1	6.0	6.0	6.2	6.6
08:00 AM - 09:00 AM	6.1	6.3	6.1	6.1	6.1	6.6	7.0
09:00 AM - 10:00 AM	6.2	6.2	6.1	6.1	6.1	6.7	6.9
Average	6.1	6.1	6.2	6.3	6.3	6.3	6.9
1hr - Maximum	6.3	6.5	6.4	6.6	6.5	6.7	7.0
Standard 1hr - Average	100	100	100	100	100	100	100
Standard 24 hrs - Average	50	50	50	50	50	50	50

Standard : Notification of the National Environment Board B.E. 2569.

Reference Method : U.S. Environmental Protection Agency, EPA Method Part 53 and 58

Approved by

Orawan R.

Orawan Rakyong
Scientist (3)

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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2615856
Date Received : Mar 24, 2026
Date Reported : Mar 28, 2026
Report Number: 3511634-1

Page 1 of 1

Sample Description Air Quality
Location โรงงานผลิตพลาสติก (GPS 47P 0725669, 1440184)
Parameter Nitrogen dioxide (ppb)
Measurement Date Mar 15, 2026 - Mar 22, 2026
Measurement by Satcha Phetsawaeng

Time	2615856-1 Mar 15, 2026	2615856-2 Mar 16, 2026	2615856-3 Mar 17, 2026	2615856-4 Mar 18, 2026	2615856-5 Mar 19, 2026	2615856-6 Mar 20, 2026	2615856-7 Mar 21, 2026
10:00 AM - 11:00 AM	6.3	9.1	35.8	30.3	31.5	34.0	15.2
11:00 AM - 12:00 PM	4.4	5.5	28.4	53.1	30.5	37.7	25.8
12:00 PM - 01:00 PM	7.1	27.4	42.2	41.1	35.3	31.8	36.3
01:00 PM - 02:00 PM	8.4	47.1	34.2	47.8	39.5	37.7	32.1
02:00 PM - 03:00 PM	24.8	53.6	32.2	29.8	40.5	38.1	40.6
03:00 PM - 04:00 PM	37.4	52.4	15.6	31.2	45.5	44.5	35.4
04:00 PM - 05:00 PM	41.4	65.7	29.1	36.3	41.1	48.3	41.3
05:00 PM - 06:00 PM	59.8	61.9	14.1	40.6	36.2	42.4	38.9
06:00 PM - 07:00 PM	68.1	59.7	45.3	46.0	37.5	45.6	36.5
07:00 PM - 08:00 PM	58.9	51.7	47.1	46.2	37.5	45.1	37.0
08:00 PM - 09:00 PM	57.8	49.4	41.4	42.6	34.7	39.5	30.4
09:00 PM - 10:00 PM	51.7	46.2	34.6	36.5	32.7	21.3	29.5
10:00 PM - 11:00 PM	35.7	38.8	34.5	31.1	31.9	34.4	22.2
11:00 PM - 12:00 AM	34.1	22.8	26.8	30.4	29.0	33.2	21.6
12:00 AM - 01:00 AM	29.1	19.6	23.5	23.2	30.5	28.9	24.3
01:00 AM - 02:00 AM	18.4	21.9	20.3	24.9	24.7	24.6	22.3
02:00 AM - 03:00 AM	24.7	24.0	17.1	27.9	28.8	22.9	19.9
03:00 AM - 04:00 AM	28.7	22.7	19.2	21.0	30.7	19.4	15.6
04:00 AM - 05:00 AM	35.7	32.1	21.5	26.8	24.3	19.9	18.2
05:00 AM - 06:00 AM	19.5	35.3	25.5	30.3	32.0	15.8	23.6
06:00 AM - 07:00 AM	29.0	38.0	22.5	27.4	37.6	21.5	16.3
07:00 AM - 08:00 AM	35.2	22.2	27.7	27.5	36.4	25.0	24.7
08:00 AM - 09:00 AM	30.8	22.3	19.0	23.3	36.1	18.3	26.3
09:00 AM - 10:00 AM	20.1	25.2	11.2	32.7	37.1	27.9	13.3
Average	32.0	35.6	27.9	33.7	34.2	31.6	27.0
1hr - Maximum	68.1	65.7	47.1	53.1	45.5	48.3	41.3
Standard 1hr - Average	120	120	120	120	120	120	120

Standard : Notification of the National Environment Board B.E. 2569.

Reference Method : U.S. Environmental Protection Agency Method Part 50 App. F (Chemiluminescence)

Approved by

Orawan R.
Orawan Rakyong
Scientist (3)

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S:\Reports\Air_SoixNdx.rpt (10:20AM)



Analysis / Test Report



TESTING
No. 0042

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2615866
Date Received : Mar 25, 2026
Date Reported : Mar 30, 2026
Report Number: 3511647-1

Page 1 of 1

Sample Description Air Quality
Location โรงงานผลิตพลาสติก (GPS 47P 0729262, 1440292)
Date Analysis Commenced Mar 26, 2026
Condition of Sample Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one quartz filter paper (8x10 inch) placed in plastic bag

Sample Number	Sampled Date	Sampling Condition		Total Suspended Particulate (ug/m3)	Particulate Matter (PM-10) (ug/m3)
		Pressure (mm Hg)	Temperature (°C)		
2615866-1	Mar 15 - Mar 16, 2026	752	31.2	79.9	42.3
2615866-2	Mar 16 - Mar 17, 2026	752	30.5	52.1	24.9
2615866-3	Mar 17 - Mar 18, 2026	752	30.1	50.8	26.5
2615866-4	Mar 18 - Mar 19, 2026	752	30.2	47.0	25.1
2615866-5	Mar 19 - Mar 20, 2026	752	30.1	51.1	34.0
2615866-6	Mar 20 - Mar 21, 2026	752	31.5	61.1	30.1
2615866-7	Mar 21 - Mar 22, 2026	752	31.8	44.7	29.4
Guideline		-	-	200	100

Reference Method

Total Suspended Particulate : United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008
Particulate Matter (PM-10) : United States Environmental Protection Agency 40 CFR, method 50, Appendix J, revised as of July 1, 2008

Guideline : Notification of the National Environmental Board., 2026 (B.E.2569) dated January 21, 2026.

Sampled By : Satcha Phetsawaeng

Approved by

Thanita K.
Thanita Kulsuriwong
Scientist (4)

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

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S:\Reports\Air_Ambient7Days.rpt (11:22AM)



Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporm, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2615865
Date Received : Mar 24, 2026
Date Reported : Mar 28, 2026
Report Number: 3511646-1

Page 1 of 1

Sample Description Air Quality
Location บ้านห้วยทราย (ห้วยทราย) (GPS 47P 0729262, 1440292)
Parameter Sulfur Dioxide (ppb)
Measurement Date Mar 15, 2026 - Mar 22, 2026
Measurement by Satcha Phetsawaeng

Time	2615865-1 Mar 15, 2026	2615865-2 Mar 16, 2026	2615865-3 Mar 17, 2026	2615865-4 Mar 18, 2026	2615865-5 Mar 19, 2026	2615865-6 Mar 20, 2026	2615865-7 Mar 21, 2026
10:00 AM - 11:00 AM	4.7	4.2	3.6	6.5	4.7	2.3	2.4
11:00 AM - 12:00 PM	4.4	2.2	8.7	7.3	3.6	5.6	2.3
12:00 PM - 01:00 PM	6.0	6.0	7.8	4.5	3.2	1.9	2.8
01:00 PM - 02:00 PM	8.2	4.7	8.2	5.0	3.6	8.6	5.8
02:00 PM - 03:00 PM	7.2	3.8	3.5	2.7	2.6	2.6	5.5
03:00 PM - 04:00 PM	4.3	3.8	6.8	3.1	2.6	1.8	6.9
04:00 PM - 05:00 PM	4.8	8.1	2.5	4.0	3.5	4.0	9.1
05:00 PM - 06:00 PM	4.7	8.0	2.9	6.6	4.9	3.9	2.4
06:00 PM - 07:00 PM	3.8	3.2	2.6	8.2	6.3	7.1	2.9
07:00 PM - 08:00 PM	5.9	8.2	3.5	7.3	3.7	2.8	2.5
08:00 PM - 09:00 PM	3.3	7.3	4.9	7.3	5.7	4.4	2.3
09:00 PM - 10:00 PM	3.6	6.2	5.4	5.8	4.6	3.1	8.1
10:00 PM - 11:00 PM	3.7	6.0	5.0	3.8	3.0	8.8	5.7
11:00 PM - 12:00 AM	2.3	6.2	3.9	3.7	2.7	9.2	6.2
12:00 AM - 01:00 AM	3.2	6.4	2.9	5.1	3.1	7.1	4.1
01:00 AM - 02:00 AM	4.0	6.3	2.6	3.4	6.0	4.6	1.6
02:00 AM - 03:00 AM	5.4	8.0	4.0	4.1	5.7	1.6	2.5
03:00 AM - 04:00 AM	1.7	9.7	3.6	6.8	2.9	1.9	2.7
04:00 AM - 05:00 AM	3.1	7.5	3.4	4.1	4.4	3.2	2.8
05:00 AM - 06:00 AM	3.2	8.2	3.3	1.9	1.5	3.2	2.0
06:00 AM - 07:00 AM	3.4	6.5	5.1	7.7	2.6	2.7	7.7
07:00 AM - 08:00 AM	4.9	7.9	3.4	5.9	6.4	4.5	5.3
08:00 AM - 09:00 AM	2.8	7.8	7.3	3.8	8.1	5.7	6.5
09:00 AM - 10:00 AM	3.5	3.8	4.0	3.8	9.1	3.6	5.9
Average	4.3	6.3	4.5	5.1	4.4	4.3	4.4
1hr - Maximum	8.2	9.7	8.7	8.2	9.1	9.2	9.1
Standard 1hr - Average	100	100	100	100	100	100	100
Standard 24 hrs - Average	50	50	50	50	50	50	50

Standard : Notification of the National Environment Board B.E. 2569.
Reference Method : U.S. Environmental Protection Agency, EPA Method Part 53 and 58

Approved by

Orawan R.
Orawan Rakyong
Scientist (3)

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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporm, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2615863
Date Received : Mar 24, 2026
Date Reported : Mar 28, 2026
Report Number: 3511645-1

Page 1 of 1

Sample Description Air Quality
Location บ้านห้วยทราย (ห้วยทราย) (GPS 47P 0729262, 1440292)
Parameter Nitrogen dioxide (ppb)
Measurement Date Mar 15, 2026 - Mar 22, 2026
Measurement by Satcha Phetsawaeng

Time	2615863-1 Mar 15, 2026	2615863-2 Mar 16, 2026	2615863-3 Mar 17, 2026	2615863-4 Mar 18, 2026	2615863-5 Mar 19, 2026	2615863-6 Mar 20, 2026	2615863-7 Mar 21, 2026
10:00 AM - 11:00 AM	3.8	8.7	10.4	3.3	11.1	3.3	8.8
11:00 AM - 12:00 PM	2.6	12.6	5.3	13.3	10.1	3.6	7.2
12:00 PM - 01:00 PM	4.9	11.9	7.3	7.9	7.4	4.8	4.6
01:00 PM - 02:00 PM	4.5	9.2	6.3	12.8	5.3	6.3	5.7
02:00 PM - 03:00 PM	4.8	8.6	5.7	16.0	5.1	5.4	3.7
03:00 PM - 04:00 PM	5.8	7.1	5.4	18.9	6.5	5.0	4.5
04:00 PM - 05:00 PM	4.5	7.1	9.6	17.6	6.0	5.5	4.8
05:00 PM - 06:00 PM	5.2	7.6	7.1	8.8	6.0	6.0	6.8
06:00 PM - 07:00 PM	7.8	6.5	9.7	8.8	7.6	7.3	5.8
07:00 PM - 08:00 PM	5.6	7.0	10.5	15.3	10.6	10.3	8.2
08:00 PM - 09:00 PM	7.8	9.1	9.4	8.9	14.1	11.5	8.6
09:00 PM - 10:00 PM	9.3	11.5	8.3	11.7	11.0	13.4	10.0
10:00 PM - 11:00 PM	13.9	19.3	13.9	16.5	8.3	17.9	10.0
11:00 PM - 12:00 AM	19.7	11.4	10.1	15.6	7.5	14.1	7.8
12:00 AM - 01:00 AM	11.9	6.5	8.0	16.2	7.3	11.4	6.3
01:00 AM - 02:00 AM	11.6	4.7	7.2	16.3	5.8	13.2	5.9
02:00 AM - 03:00 AM	12.2	4.7	12.4	16.2	6.8	16.2	5.0
03:00 AM - 04:00 AM	13.9	4.5	13.6	16.8	10.6	15.1	4.4
04:00 AM - 05:00 AM	15.3	4.4	12.7	16.2	8.5	17.4	5.6
05:00 AM - 06:00 AM	14.5	2.8	10.8	21.5	11.9	20.1	14.5
06:00 AM - 07:00 AM	14.8	4.6	11.8	15.8	9.4	11.6	5.8
07:00 AM - 08:00 AM	16.9	4.4	22.6	9.3	4.5	6.5	1.9
08:00 AM - 09:00 AM	21.9	10.9	13.3	9.0	5.5	4.6	2.2
09:00 AM - 10:00 AM	12.3	11.0	9.0	10.2	2.4	7.5	2.5
Average	10.2	8.2	10.0	13.5	7.9	9.9	6.3
1hr - Maximum	21.9	19.3	22.6	21.5	14.1	20.1	14.5
Standard 1hr - Average	120	120	120	120	120	120	120

Standard : Notification of the National Environment Board B.E. 2569.
Reference Method : U.S. Environmental Protection Agency Method Part 50 App. F (Chemiluminescence)

Approved by

Orawan R.
Orawan Rakyong
Scientist (3)

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

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Analysis / Test Report



TESTING
No.0042

Lot ID: 2615838

Date Received : Mar 25, 2026

Date Reported : Mar 30, 2026

Report Number: 3511624-1

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140

P/O : 2601110101

Project Name : ABPR 1

Project Location :

Sample Description Air Quality
Location โรงเจิมบ่วงโพธิ์ (GPS 47P 0725746, 1434294)
Date Analysis Commenced Mar 26, 2026
Condition of Sample Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one quartz filter paper (8x10 inch) placed in plastic bag

Sample Number	Sampled Date	Sampling Condition		Total Suspended Particulate (ug/m3)	Particulate Matter (PM-10) (ug/m3)
		Pressure (mm Hg)	Temperature (°C)		
2615838-1	Mar 15 - Mar 16, 2026	752	31.2	105	29.7
2615838-2	Mar 16 - Mar 17, 2026	752	30.5	92.1	28.5
2615838-3	Mar 17 - Mar 18, 2026	752	30.1	99.1	27.7
2615838-4	Mar 18 - Mar 19, 2026	752	30.2	93.2	30.3
2615838-5	Mar 19 - Mar 20, 2026	752	30.1	94.3	32.2
2615838-6	Mar 20 - Mar 21, 2026	752	31.5	86.7	32.9
2615838-7	Mar 21 - Mar 22, 2026	752	31.8	73.5	28.5
Guideline	-	-	-	200	100

Reference Method

Total Suspended Particulate : United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008
Particulate Matter (PM-10) : United States Environmental Protection Agency 40 CFR, method 50, Appendix J, revised as of July 1, 2008

Guideline : Notification of the National Environmental Board., 2026 (B.E.2569) dated January 21, 2026.

Sampled By : Satcha Phetsawaeng

Approved by

Thanita K.

Thanita Kulsuriwong
Scientist (4)

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140

P/O : 2601110101

Project Name : ABPR 1

Project Location :

Lot ID: 2615839

Date Received : Mar 24, 2026

Date Reported : Mar 28, 2026

Report Number: 3511622-1

Page 1 of 1

Sample Description Air Quality
Location โรงเจิมบ่วงโพธิ์ (GPS 47P 0725746, 1434294)
Parameter Sulfur Dioxide (ppb)
Measurement Date Mar 15, 2026 - Mar 22, 2026
Measurement by Satcha Phetsawaeng

Time	2615839-1	2615839-2	2615839-3	2615839-4	2615839-5	2615839-6	2615839-7
	Mar 15, 2026	Mar 16, 2026	Mar 17, 2026	Mar 18, 2026	Mar 19, 2026	Mar 20, 2026	Mar 21, 2026
10:00 AM - 11:00 AM	3.2	3.9	4.1	4.0	3.6	3.6	2.7
11:00 AM - 12:00 PM	3.8	4.0	4.1	3.9	3.6	3.7	3.2
12:00 PM - 01:00 PM	3.8	4.2	4.0	4.0	3.6	3.6	3.6
01:00 PM - 02:00 PM	3.8	4.0	4.1	3.9	3.6	3.6	3.5
02:00 PM - 03:00 PM	3.8	4.0	4.1	4.0	3.6	3.6	3.1
03:00 PM - 04:00 PM	3.8	3.9	4.0	4.0	3.6	3.6	3.5
04:00 PM - 05:00 PM	3.6	3.9	4.0	4.0	3.6	3.3	3.1
05:00 PM - 06:00 PM	3.7	4.0	4.0	4.0	3.8	3.8	3.4
06:00 PM - 07:00 PM	3.7	3.9	4.0	3.7	3.6	3.7	3.5
07:00 PM - 08:00 PM	3.8	3.9	4.0	3.7	3.7	3.0	3.7
08:00 PM - 09:00 PM	3.9	3.9	3.9	3.5	3.6	2.8	3.8
09:00 PM - 10:00 PM	4.0	4.0	4.0	3.6	3.6	3.2	3.8
10:00 PM - 11:00 PM	4.1	4.1	4.0	3.8	3.7	3.1	3.8
11:00 PM - 12:00 AM	3.9	3.9	4.0	4.0	3.8	2.9	3.7
12:00 AM - 01:00 AM	3.9	4.1	4.0	4.1	3.7	3.5	3.6
01:00 AM - 02:00 AM	3.8	4.3	4.1	4.1	3.9	3.3	3.6
02:00 AM - 03:00 AM	3.9	4.3	4.0	4.2	3.7	3.4	3.7
03:00 AM - 04:00 AM	3.9	4.1	3.9	3.9	3.0	3.7	3.7
04:00 AM - 05:00 AM	4.0	4.0	4.0	3.0	3.0	3.7	3.9
05:00 AM - 06:00 AM	4.0	4.0	3.9	3.5	3.4	3.7	3.9
06:00 AM - 07:00 AM	4.0	4.0	3.9	3.1	3.6	3.7	3.8
07:00 AM - 08:00 AM	4.0	4.1	3.8	2.9	3.6	3.7	3.7
08:00 AM - 09:00 AM	3.9	4.0	4.0	3.4	3.7	3.7	3.3
09:00 AM - 10:00 AM	3.9	4.0	3.9	3.5	3.7	4.0	3.9
Average	3.8	4.0	4.0	3.7	3.6	3.5	3.6
1hr - Maximum	4.1	4.3	4.1	4.2	3.9	4.0	3.9
Standard 1hr - Average	100	100	100	100	100	100	100
Standard 24 hrs - Average	50	50	50	50	50	50	50

Standard : Notification of the National Environment Board B.E. 2569.

Reference Method : U.S. Environmental Protection Agency, EPA Method Part 53 and 58

Approved by

Orawan R.

Orawan Rakyong
Scientist (3)

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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2615835
Date Received : Mar 24, 2026
Date Reported : Mar 28, 2026
Report Number: 3511620-1

Page 1 of 1

Sample Description Air Quality
Location โรงเจียมบ้านทุ่งโพธิ์ (GPS 47P 0725746, 1434294)
Parameter Nitrogen dioxide (ppb)
Measurement Date Mar 15, 2026 - Mar 22, 2026
Measurement by Satcha Phetsawaeng

Time	2615835-1 Mar 15, 2026	2615835-2 Mar 16, 2026	2615835-3 Mar 17, 2026	2615835-4 Mar 18, 2026	2615835-5 Mar 19, 2026	2615835-6 Mar 20, 2026	2615835-7 Mar 21, 2026
10:00 AM - 11:00 AM	7.3	10.8	6.1	7.1	5.8	17.8	7.8
11:00 AM - 12:00 PM	6.8	5.1	7.0	10.8	5.3	8.1	6.8
12:00 PM - 01:00 PM	1.3	3.5	5.8	10.7	7.0	15.0	6.0
01:00 PM - 02:00 PM	4.2	3.1	8.9	10.1	6.1	12.1	5.3
02:00 PM - 03:00 PM	7.4	2.1	12.7	9.3	5.8	8.2	5.7
03:00 PM - 04:00 PM	5.0	2.8	13.8	8.7	4.5	4.4	5.6
04:00 PM - 05:00 PM	5.2	2.6	6.6	4.8	4.9	5.6	7.2
05:00 PM - 06:00 PM	5.1	2.9	11.7	4.4	6.5	3.6	6.0
06:00 PM - 07:00 PM	4.7	4.7	12.8	3.2	3.5	4.8	8.5
07:00 PM - 08:00 PM	4.9	8.1	11.8	4.1	9.5	5.5	11.2
08:00 PM - 09:00 PM	3.7	6.8	11.5	3.6	9.2	14.0	3.6
09:00 PM - 10:00 PM	3.2	11.9	9.7	3.5	2.3	8.1	6.2
10:00 PM - 11:00 PM	2.7	10.7	4.8	3.0	2.9	9.7	8.1
11:00 PM - 12:00 AM	4.4	8.7	5.4	4.7	3.5	9.0	7.5
12:00 AM - 01:00 AM	6.1	9.8	4.7	6.3	3.0	13.9	7.3
01:00 AM - 02:00 AM	6.7	7.5	3.9	9.7	2.5	11.9	8.0
02:00 AM - 03:00 AM	5.3	14.9	4.6	4.7	2.0	8.6	7.9
03:00 AM - 04:00 AM	6.7	4.3	4.3	8.2	2.0	10.8	8.0
04:00 AM - 05:00 AM	7.7	4.9	4.6	8.9	4.0	11.6	7.1
05:00 AM - 06:00 AM	7.1	4.5	4.4	9.8	4.6	12.6	6.5
06:00 AM - 07:00 AM	6.6	4.5	5.2	9.9	6.1	10.9	7.0
07:00 AM - 08:00 AM	9.6	3.9	7.8	7.5	5.8	8.4	7.7
08:00 AM - 09:00 AM	11.9	3.3	4.2	8.3	17.4	8.6	9.8
09:00 AM - 10:00 AM	6.1	4.4	8.0	3.3	17.2	1.9	9.9
Average	5.8	6.1	7.5	6.9	5.9	9.4	7.3
1hr - Maximum	11.9	14.9	13.8	10.8	17.4	17.8	11.2
Standard 1hr - Average	120	120	120	120	120	120	120

Standard : Notification of the National Environment Board B.E. 2569.

Reference Method : U.S. Environmental Protection Agency Method Part 50 App. F (Chemiluminescence)

Approved by

Orawan R.

Orawan Rakyong
Scientist (3)

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

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ภาคผนวก ค-3

ความเร็วลมและทิศทางลม



Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Phuaakdaeng, Rayong Thailand 21140

P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2615816
Date Received : Mar 25, 2026
Date Reported : Mar 30, 2026
Report Number : 3511586-1

Page 1 of 2

Sample Number : 2615816-1 to 7
Parameter : Wind Speed / Wind Direction
Location : โรงพนาตลิ่งเลนสุภาพดาณมาพร (GPS 47P 0731399, 1436972)
Sampling Date : Mar 15 - Mar 22, 2026
Sampling by : Satcha Phetsawaeng

Time	Mar 15 - Mar 16, 2026			Mar 16 - Mar 17, 2026			Mar 17 - Mar 18, 2026			Mar 18 - Mar 19, 2026			Mar 19 - Mar 20, 2026			Mar 20 - Mar 21, 2026			Mar 21 - Mar 22, 2026		
	WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)	
11:00 AM - 12:00 PM	4.3	161.0	SSE	2.2	327.0	NNW	1.6	131.0	SE	5.9	126.0	SE	6.2	119.0	ESE	0.8	127.0	SE	0.1	-	-
12:00 PM - 01:00 PM	4.0	142.0	SE	6.6	306.0	NW	1.3	123.0	ESE	5.8	124.0	SE	6.0	24.0	NNE	2.7	113.0	ESE	1.9	119.0	ESE
01:00 PM - 02:00 PM	3.4	312.0	NW	4.7	127.0	SE	3.0	129.0	SE	6.4	121.0	ESE	5.6	143.0	SE	2.5	127.0	SE	1.0	273.0	W
02:00 PM - 03:00 PM	4.7	292.0	WNW	4.0	105.0	ESE	0.4	317.0	NW	5.1	258.0	WSW	7.0	138.0	SE	1.7	140.0	SE	0.4	110.0	ESE
03:00 PM - 04:00 PM	4.1	123.0	ESE	3.7	117.0	ESE	1.5	118.0	ESE	3.8	125.0	SE	6.6	143.0	SE	0.8	61.0	ENE	0.6	137.0	SE
04:00 PM - 05:00 PM	5.4	243.0	WSW	3.0	265.0	W	1.1	103.0	ESE	2.4	131.0	SE	5.5	163.0	SSE	1.5	131.0	SE	2.0	144.0	SE
05:00 PM - 06:00 PM	3.6	131.0	SE	3.1	130.0	SE	3.8	125.0	SE	4.5	136.0	SE	4.1	151.0	SSE	4.7	136.0	SE	4.6	141.0	SE
06:00 PM - 07:00 PM	1.2	119.0	ESE	2.0	123.0	ESE	2.3	135.0	SE	3.5	131.0	SE	3.8	126.0	SE	3.7	130.0	SE	2.9	124.0	SE
07:00 PM - 08:00 PM	1.6	128.0	SE	2.4	131.0	SE	2.3	120.0	ESE	2.4	123.0	ESE	3.0	122.0	ESE	2.6	122.0	ESE	2.1	130.0	SE
08:00 PM - 09:00 PM	1.2	124.0	SE	2.3	128.0	SE	2.0	120.0	ESE	1.8	124.0	SE	2.1	127.0	SE	1.9	125.0	SE	2.6	125.0	SE
09:00 PM - 10:00 PM	1.3	125.0	SE	1.4	125.0	SE	1.7	242.0	WSW	2.0	259.0	W	1.7	171.0	S	1.1	125.0	SE	1.4	127.0	SE
10:00 PM - 11:00 PM	1.5	123.0	ESE	2.0	138.0	SE	1.2	250.0	WSW	2.1	279.0	W	1.5	113.0	ESE	0.7	125.0	SE	1.1	125.0	SE
11:00 PM - 12:00 AM	1.4	125.0	SE	2.1	124.0	SE	1.0	255.0	WSW	0.5	279.0	W	1.1	152.0	SSE	1.4	123.0	ESE	0.7	221.0	SW
12:00 AM - 01:00 AM	0.2	-	-	1.7	128.0	SE	1.7	124.0	SE	2.0	280.0	W	0.6	279.0	W	1.4	123.0	ESE	1.3	278.0	W
01:00 AM - 02:00 AM	0.3	124.0	SE	0.9	288.0	WNW	0.0	-	-	0.6	282.0	WNW	0.5	275.0	W	0.3	123.0	ESE	1.4	266.0	W
02:00 AM - 03:00 AM	0.5	322.0	NW	1.3	256.0	WSW	1.9	131.0	SE	2.8	282.0	WNW	0.4	271.0	W	0.5	118.0	ESE	1.0	275.0	W
03:00 AM - 04:00 AM	1.1	322.0	NW	1.7	289.0	WNW	1.9	278.0	W	0.4	282.0	WNW	1.1	129.0	SE	0.8	118.0	ESE	0.0	-	-
04:00 AM - 05:00 AM	1.1	322.0	NW	1.9	125.0	SE	1.4	268.0	W	1.2	282.0	WNW	0.3	181.0	S	1.1	119.0	ESE	0.0	-	-
05:00 AM - 06:00 AM	0.7	322.0	NW	4.8	136.0	SE	0.0	-	-	2.9	283.0	WNW	0.2	-	-	0.7	318.0	NW	1.0	134.0	SE
06:00 AM - 07:00 AM	0.4	322.0	NW	2.6	121.0	ESE	0.0	-	-	2.3	282.0	WNW	1.1	126.0	SE	0.6	318.0	NW	0.0	-	-
07:00 AM - 08:00 AM	0.4	273.0	W	3.0	123.0	ESE	0.3	346.0	NNW	1.1	132.0	SE	3.7	121.0	ESE	0.4	318.0	NW	1.6	125.0	SE
08:00 AM - 09:00 AM	0.1	-	-	0.3	129.0	SE	2.6	125.0	SE	3.5	130.0	SE	3.1	116.0	ESE	3.1	120.0	ESE	1.3	140.0	SE
09:00 AM - 10:00 AM	0.9	255.0	WSW	1.3	123.0	ESE	3.4	139.0	SE	3.5	118.0	ESE	3.8	145.0	SE	2.5	214.0	SW	1.5	145.0	SE
10:00 AM - 11:00 AM	4.3	133.0	SE	1.7	118.0	ESE	4.9	93.0	E	4.5	129.0	SE	2.0	137.0	SE	3.1	141.0	SE	1.2	136.0	SE

Reference Method : Cup Anemometer & Anodized Aluminium Vane Method

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Sarayuth Jitranont
Assistant General Manager

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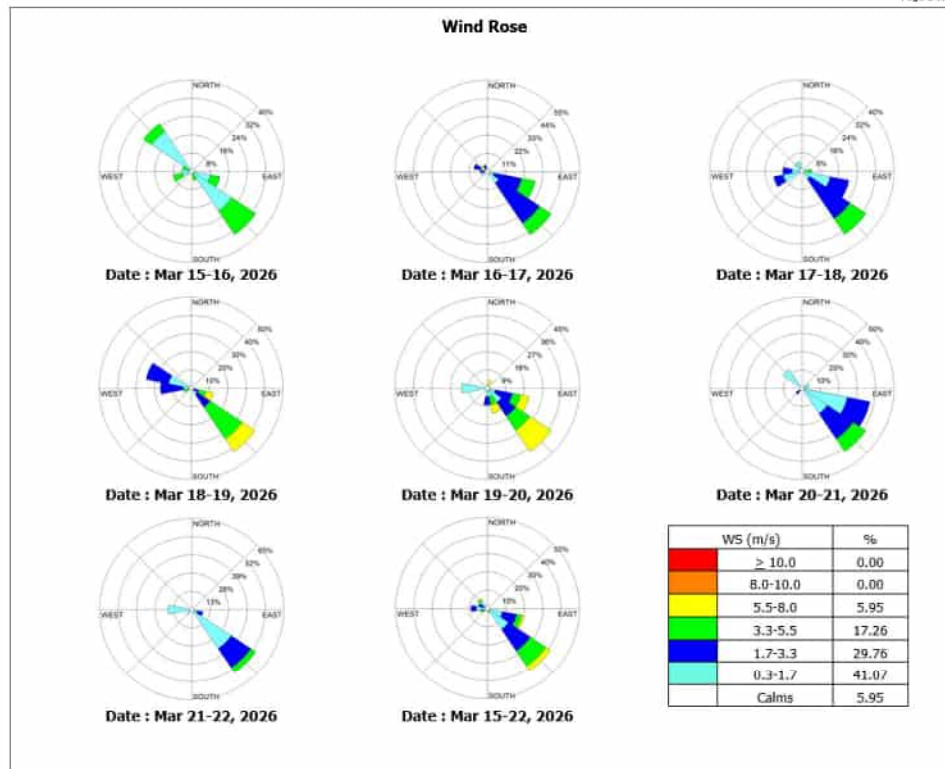
Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Phuaakdaeng, Rayong Thailand 21140

P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2615816
Date Received : Mar 25, 2026
Date Reported : Mar 30, 2026
Report Number : 3511586-1

Page 2 of 2



Location : โรงพนาตลิ่งเลนสุภาพดาณมาพร (GPS 47P 0731399, 1436972)

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Sarayuth Jitranont
Assistant General Manager

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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Phuaakdaeng, Rayong Thailand 21140

Lot ID: 2615855
Date Received : Mar 25, 2026
Date Reported : Mar 30, 2026
Report Number : 3511633-1

P/O : 260110101
Project Name : ABPR 1
Project Location :

Page 1 of 2

Sample Number 2615855-1 to 7
Parameter Wind Speed / Wind Direction
Location ชุมชนบ้านโป่งตะกั่ว (GPS 47P 0724074, 1439002)
Sampling Date Mar 15 - Mar 22, 2026
Sampling by Satcha Phetsawaeng

Time	Mar 15 - Mar 16, 2026		Mar 16 - Mar 17, 2026		Mar 17 - Mar 18, 2026		Mar 18 - Mar 19, 2026		Mar 19 - Mar 20, 2026		Mar 20 - Mar 21, 2026		Mar 21 - Mar 22, 2026	
	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)
09:00 AM - 10:00 AM	2.0	42.0	NE	2.4	96.0	E	0.6	163.0	SSE	4.5	214.0	SW	0.7	211.0
10:00 AM - 11:00 AM	0.9	56.0	NE	3.5	113.0	ESE	2.0	205.0	SSW	0.7	144.0	SE	0.0	-
11:00 AM - 12:00 PM	0.9	226.0	SW	2.9	23.0	NNE	1.4	200.0	SSW	3.3	250.0	WSW	1.2	143.0
12:00 PM - 01:00 PM	1.0	127.0	SE	2.8	130.0	SE	1.4	201.0	SSW	1.7	153.0	SSE	0.9	249.0
01:00 PM - 02:00 PM	0.0	-	-	3.6	256.0	WSW	3.2	221.0	SW	1.5	264.0	W	0.3	301.0
02:00 PM - 03:00 PM	2.9	274.0	W	2.9	241.0	WSW	0.0	-	-	1.8	345.0	NNW	2.1	225.0
03:00 PM - 04:00 PM	3.2	350.0	N	3.8	201.0	SSW	2.6	242.0	WSW	1.0	232.0	SW	2.6	200.0
04:00 PM - 05:00 PM	0.9	216.0	SW	2.6	241.0	WSW	1.6	131.0	SE	1.6	222.0	SW	1.1	230.0
05:00 PM - 06:00 PM	1.0	270.0	W	2.4	216.0	SW	0.7	203.0	SSW	1.4	229.0	SW	3.7	197.0
06:00 PM - 07:00 PM	0.9	204.0	SSW	3.7	203.0	SSW	1.2	216.0	SW	1.6	191.0	S	2.6	189.0
07:00 PM - 08:00 PM	2.4	216.0	SW	2.0	212.0	SSW	3.1	218.0	SW	2.1	236.0	SW	2.6	225.0
08:00 PM - 09:00 PM	1.6	359.0	N	1.9	222.0	SW	3.8	203.0	SSW	2.0	241.0	WSW	3.9	227.0
09:00 PM - 10:00 PM	0.9	220.0	SW	1.7	249.0	WSW	2.6	274.0	W	2.1	249.0	WSW	3.0	209.0
10:00 PM - 11:00 PM	0.5	228.0	SW	2.6	231.0	SW	1.3	219.0	SW	0.9	244.0	WSW	3.3	231.0
11:00 PM - 12:00 AM	2.0	214.0	SW	4.9	211.0	SSW	2.5	234.0	SW	1.4	229.0	SW	3.3	227.0
12:00 AM - 01:00 AM	1.1	183.0	S	2.6	212.0	SSW	1.4	210.0	SSW	1.7	235.0	SW	1.2	243.0
01:00 AM - 02:00 AM	0.5	165.0	SSE	3.5	264.0	W	1.7	136.0	SE	0.4	233.0	SW	1.6	234.0
02:00 AM - 03:00 AM	0.8	160.0	SSE	3.2	248.0	WSW	0.0	-	-	0.9	230.0	SW	1.0	225.0
03:00 AM - 04:00 AM	0.9	163.0	SSE	2.4	224.0	SW	2.5	207.0	SSW	0.7	229.0	SW	1.3	222.0
04:00 AM - 05:00 AM	0.4	157.0	SSE	1.3	204.0	SSW	0.5	236.0	SW	0.6	169.0	S	0.9	229.0
05:00 AM - 06:00 AM	1.9	154.0	SSE	1.9	153.0	SSE	0.8	202.0	SSW	0.2	-	-	0.9	235.0
06:00 AM - 07:00 AM	2.1	231.0	SW	2.7	191.0	S	1.2	215.0	SW	0.0	-	-	1.4	220.0
07:00 AM - 08:00 AM	1.9	214.0	SW	2.3	216.0	SW	1.1	122.0	ESE	1.2	113.0	ESE	0.6	171.0
08:00 AM - 09:00 AM	1.9	212.0	SSW	3.2	141.0	SE	2.5	157.0	SSE	1.8	207.0	SSW	1.6	232.0

Reference Method : Cup Anemometer & Anodized Aluminium Vane Method

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Sarayuth Jitranont
Assistant General Manager

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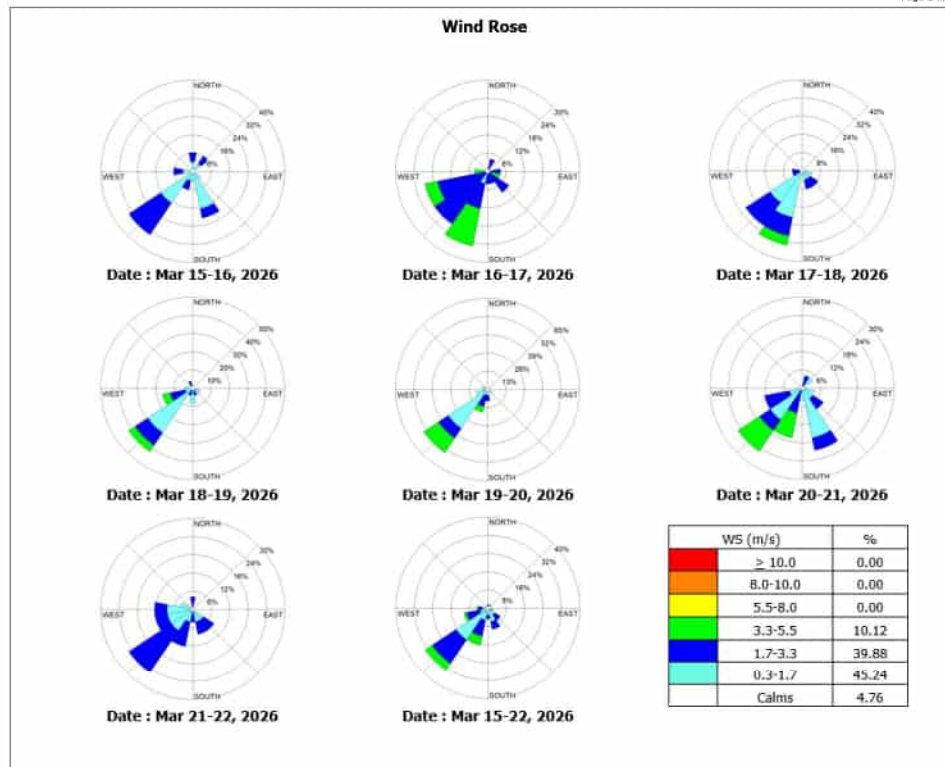
Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Phuaakdaeng, Rayong Thailand 21140

Lot ID: 2615855
Date Received : Mar 25, 2026
Date Reported : Mar 30, 2026
Report Number : 3511633-1

P/O : 260110101
Project Name : ABPR 1
Project Location :

Page 2 of 2



Location : ชุมชนบ้านโป่งตะกั่ว (GPS 47P 0724074, 1439002)

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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Phuaakdaeng, Rayong Thailand 21140

P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2615859
Date Received : Mar 25, 2026
Date Reported : Mar 30, 2026
Report Number : 3511639-1

Page 1 of 2

Sample Number 2615859-1 to 7
Parameter Wind Speed / Wind Direction
Location โรงเขื่อนสวนกุหลาบ (GPS 47P 0725669, 1440184)
Sampling Date Mar 15 - Mar 22, 2026
Sampling by Satcha Phetsawaeng

Time	Mar 15 - Mar 16, 2026			Mar 16 - Mar 17, 2026			Mar 17 - Mar 18, 2026			Mar 18 - Mar 19, 2026			Mar 19 - Mar 20, 2026			Mar 20 - Mar 21, 2026			Mar 21 - Mar 22, 2026		
	WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)	
10:00 AM - 11:00 AM	1.5	132.0	SE	4.1	21.0	NNE	0.5	198.0	SSW	2.4	179.0	S	0.5	132.0	SE	1.0	323.0	NW	2.2	133.0	SE
11:00 AM - 12:00 PM	0.4	109.0	ESE	4.5	34.0	NE	1.5	278.0	W	0.8	225.0	SW	0.8	143.0	SE	0.0	-	-	2.7	291.0	WNW
12:00 PM - 01:00 PM	1.8	60.0	ENE	4.8	306.0	NW	1.6	144.0	SE	0.9	81.0	E	0.7	274.0	W	3.6	267.0	W	3.3	272.0	W
01:00 PM - 02:00 PM	1.5	70.0	ENE	2.6	236.0	SW	2.6	205.0	SSW	1.3	246.0	WSW	1.5	314.0	NW	2.1	253.0	WSW	4.7	300.0	WNW
02:00 PM - 03:00 PM	1.0	293.0	WNW	3.5	275.0	W	1.4	303.0	WNW	1.4	30.0	NNE	1.0	323.0	NW	0.5	299.0	WNW	4.7	287.0	WNW
03:00 PM - 04:00 PM	1.6	286.0	WNW	4.2	316.0	NW	0.5	37.0	NE	0.0	-	-	1.0	194.0	SSW	1.0	241.0	WSW	3.3	277.0	W
04:00 PM - 05:00 PM	1.3	286.0	WNW	3.2	297.0	WNW	1.2	209.0	SSW	0.0	-	-	0.8	230.0	SW	0.0	-	-	3.8	255.0	WSW
05:00 PM - 06:00 PM	2.5	158.0	SSE	2.7	265.0	W	1.7	101.0	E	2.4	286.0	WNW	0.5	248.0	WSW	0.5	241.0	WSW	3.9	266.0	SSW
06:00 PM - 07:00 PM	2.6	280.0	W	1.8	233.0	SW	1.5	147.0	SSE	3.5	242.0	WSW	0.2	-	-	3.9	220.0	SW	3.8	273.0	W
07:00 PM - 08:00 PM	1.2	228.0	SW	1.8	252.0	WSW	3.6	240.0	WSW	3.4	182.0	S	3.7	212.0	SSW	3.2	216.0	SW	2.6	220.0	SW
08:00 PM - 09:00 PM	0.7	234.0	SW	1.6	226.0	SW	3.7	287.0	WNW	1.5	277.0	W	3.2	223.0	SW	1.3	222.0	SW	2.2	191.0	S
09:00 PM - 10:00 PM	0.6	226.0	SW	1.7	232.0	SW	2.1	275.0	W	1.7	233.0	SW	1.8	271.0	W	2.1	216.0	SW	2.6	232.0	SW
10:00 PM - 11:00 PM	1.3	182.0	S	3.3	227.0	SW	0.2	-	-	0.9	264.0	W	1.7	204.0	SSW	0.2	-	-	1.9	225.0	SW
11:00 PM - 12:00 AM	1.3	180.0	S	3.9	219.0	SW	0.9	258.0	WSW	0.7	264.0	W	1.3	258.0	WSW	0.0	-	-	0.7	219.0	SW
12:00 AM - 01:00 AM	0.0	-	-	2.9	205.0	SSW	1.4	254.0	WSW	0.8	264.0	W	0.6	257.0	WSW	0.9	197.0	SSW	0.0	-	-
01:00 AM - 02:00 AM	0.5	179.0	S	2.0	215.0	SW	1.4	170.0	S	0.8	264.0	W	0.7	258.0	WSW	1.7	209.0	SSW	0.6	219.0	SW
02:00 AM - 03:00 AM	0.7	179.0	S	1.1	220.0	SW	0.8	169.0	S	0.0	-	-	0.7	258.0	WSW	0.4	204.0	SSW	0.6	219.0	SW
03:00 AM - 04:00 AM	0.6	179.0	S	1.3	259.0	W	1.1	218.0	SW	0.0	-	-	0.0	-	-	0.6	190.0	S	0.0	-	-
04:00 AM - 05:00 AM	0.0	-	-	1.1	252.0	WSW	1.9	265.0	W	0.3	264.0	W	0.6	259.0	W	0.7	210.0	SSW	0.0	-	-
05:00 AM - 06:00 AM	0.0	-	-	2.3	155.0	SSE	1.0	191.0	S	0.0	-	-	0.0	-	-	1.1	123.0	ESE	0.6	219.0	SW
06:00 AM - 07:00 AM	0.5	177.0	S	2.8	259.0	W	0.5	190.0	S	0.0	-	-	1.2	263.0	W	1.1	81.0	E	1.1	196.0	SSW
07:00 AM - 08:00 AM	0.9	199.0	SSW	1.2	107.0	ESE	1.1	83.0	E	0.0	-	-	2.2	254.0	WSW	1.1	44.0	NE	0.9	271.0	W
08:00 AM - 09:00 AM	1.6	223.0	SW	3.1	177.0	S	1.5	165.0	SSE	1.3	185.0	S	3.6	180.0	S	0.7	129.0	SE	1.5	270.0	W
09:00 AM - 10:00 AM	3.0	52.0	NE	3.4	203.0	SSW	2.2	171.0	S	1.5	208.0	SSW	3.5	185.0	S	2.6	129.0	SE	1.2	205.0	SSW

Reference Method : Cup Anemometer & Anodized Aluminium Vane Method

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Sarayuth Jitranont
Assistant General Manager

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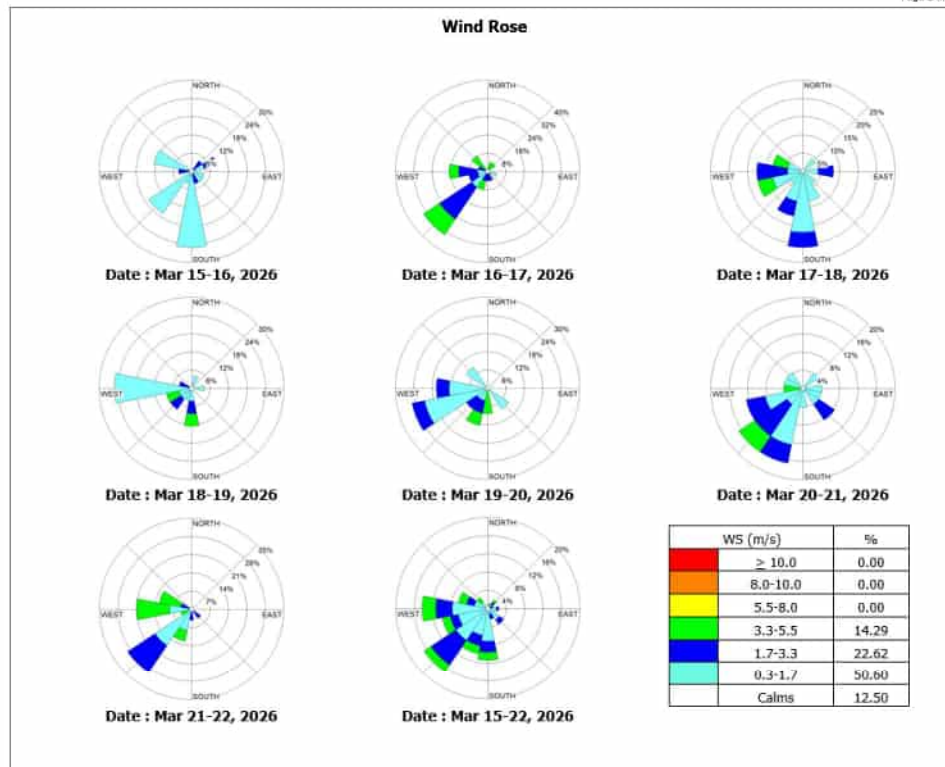
Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Phuaakdaeng, Rayong Thailand 21140

P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2615859
Date Received : Mar 25, 2026
Date Reported : Mar 30, 2026
Report Number : 3511639-1

Page 2 of 2



Location : โรงเขื่อนสวนกุหลาบ (GPS 47P 0725669, 1440184)

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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Phukdaeng, Rayong Thailand 21140

P/O : 260110101
Project Name : ABPR 1
Project Location :

Lot ID: 2615867
Date Received : Mar 25, 2026
Date Reported : Mar 30, 2026
Report Number : 3511679-1

Page 1 of 2

Sample Number 2615867-1 to 7
Parameter Wind Speed / Wind Direction
Location บ้านโคกบวร (หนองหัววัว) (GPS 47P 0729262, 1440292)
Sampling Date Mar 15 - Mar 22, 2026
Sampling by Satcha Phetsawaeng

Time	Mar 15 - Mar 16, 2026			Mar 16 - Mar 17, 2026			Mar 17 - Mar 18, 2026			Mar 18 - Mar 19, 2026			Mar 19 - Mar 20, 2026			Mar 20 - Mar 21, 2026			Mar 21 - Mar 22, 2026		
	WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)	
10:00 AM - 11:00 AM	1.7	100.0	E	2.6	58.0	ENE	2.0	202.0	SSW	0.2	-	-	2.3	130.0	SE	1.1	217.0	SW	4.8	200.0	SSW
11:00 AM - 12:00 PM	2.1	115.0	ESE	4.2	79.0	E	1.4	82.0	E	2.0	210.0	SSW	2.9	240.0	WSW	1.4	221.0	SW	4.3	203.0	SSW
12:00 PM - 01:00 PM	0.9	230.0	SW	4.0	209.0	SSW	1.9	218.0	SW	1.0	204.0	SSW	1.5	262.0	W	1.5	213.0	SSW	1.8	270.0	W
01:00 PM - 02:00 PM	1.4	69.0	ENE	3.6	219.0	SW	2.4	188.0	S	0.7	9.0	N	0.7	231.0	SW	3.4	217.0	SW	0.6	256.0	WSW
02:00 PM - 03:00 PM	0.7	268.0	W	4.8	251.0	WSW	1.4	167.0	SSE	2.2	347.0	NNW	1.8	220.0	SW	4.3	206.0	SSW	1.8	245.0	WSW
03:00 PM - 04:00 PM	0.3	248.0	WSW	3.5	204.0	SSW	2.3	86.0	E	2.9	312.0	NW	2.5	190.0	S	2.1	221.0	SW	2.2	194.0	SSW
04:00 PM - 05:00 PM	3.0	161.0	SSE	3.6	189.0	S	1.1	85.0	E	2.0	292.0	WNW	2.5	209.0	SSW	1.6	198.0	SSW	4.2	142.0	SE
05:00 PM - 06:00 PM	2.3	227.0	SW	4.0	184.0	S	0.5	165.0	SSE	4.9	193.0	SSW	2.6	217.0	SW	2.2	192.0	SSW	1.9	191.0	S
06:00 PM - 07:00 PM	1.1	216.0	SW	3.2	211.0	SSW	1.5	175.0	S	4.5	184.0	S	0.7	215.0	SW	1.1	200.0	SSW	1.5	210.0	SSW
07:00 PM - 08:00 PM	0.0	-	-	1.9	193.0	SSW	4.3	204.0	SSW	4.3	200.0	SSW	3.1	194.0	SSW	1.7	130.0	SE	1.0	201.0	SSW
08:00 PM - 09:00 PM	0.0	-	-	1.3	191.0	S	3.1	194.0	SSW	3.6	214.0	SW	3.9	215.0	SW	3.2	139.0	SE	0.9	204.0	SSW
09:00 PM - 10:00 PM	0.3	211.0	SSW	1.8	218.0	SW	3.2	255.0	WSW	2.3	227.0	SW	2.1	228.0	SW	1.4	148.0	SSE	4.2	193.0	SSW
10:00 PM - 11:00 PM	0.0	-	-	4.0	210.0	SSW	1.3	230.0	SW	0.9	225.0	SW	2.0	210.0	SSW	0.8	145.0	SE	2.0	214.0	SW
11:00 PM - 12:00 AM	0.6	203.0	SSW	4.1	200.0	SSW	2.2	210.0	SSW	1.2	224.0	SW	2.3	221.0	SW	1.5	142.0	SE	1.3	213.0	SSW
12:00 AM - 01:00 AM	0.8	203.0	SSW	3.1	223.0	SW	1.6	179.0	S	0.9	225.0	SW	1.3	221.0	SW	1.5	117.0	ESE	0.7	213.0	SSW
01:00 AM - 02:00 AM	0.8	208.0	SSW	1.5	225.0	SW	1.2	175.0	S	0.7	227.0	SW	0.7	221.0	SW	0.8	117.0	ESE	1.2	215.0	SW
02:00 AM - 03:00 AM	1.2	198.0	SSW	1.0	225.0	SW	0.5	177.0	S	0.9	228.0	SW	1.1	221.0	SW	0.5	116.0	ESE	1.2	211.0	SSW
03:00 AM - 04:00 AM	0.1	-	-	2.2	225.0	SW	1.6	196.0	SSW	0.6	230.0	SW	1.1	223.0	SW	0.8	116.0	ESE	0.0	-	-
04:00 AM - 05:00 AM	1.1	202.0	SSW	2.3	189.0	S	0.7	197.0	SSW	0.7	228.0	SW	0.7	222.0	SW	1.2	124.0	SE	1.0	214.0	SSW
05:00 AM - 06:00 AM	0.8	206.0	SSW	3.5	135.0	SE	1.1	195.0	SSW	0.4	227.0	SW	1.0	220.0	SW	1.3	40.0	NE	0.6	213.0	SSW
06:00 AM - 07:00 AM	0.6	202.0	SSW	3.6	150.0	SSE	0.7	196.0	SSW	1.0	255.0	WSW	1.1	221.0	SW	1.1	40.0	NE	0.9	213.0	SSW
07:00 AM - 08:00 AM	1.0	202.0	SSW	1.6	120.0	ESE	2.0	42.0	NE	1.3	149.0	SSE	1.9	187.0	S	1.7	99.0	E	2.8	219.0	SW
08:00 AM - 09:00 AM	2.2	96.0	E	0.7	188.0	S	1.8	219.0	SW	1.2	142.0	SE	1.3	168.0	SSE	3.7	151.0	SSE	4.6	219.0	SW
09:00 AM - 10:00 AM	4.4	98.0	E	1.2	200.0	SSW	1.9	101.0	E	0.4	229.0	SW	0.7	131.0	SE	4.7	147.0	SSE	4.2	116.0	ESE

Reference Method : Cup Anemometer & Anodized Aluminium Vane Method

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Approved by

Sarayuth Jitranont
Assistant General Manager

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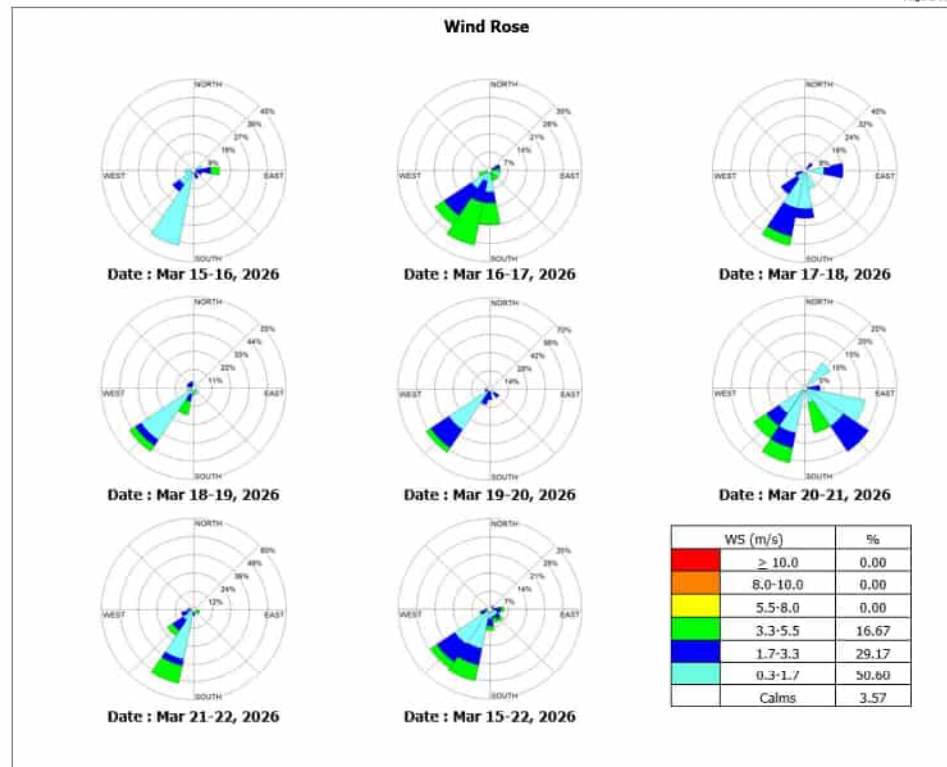
Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Phukdaeng, Rayong Thailand 21140

P/O : 260110101
Project Name : ABPR 1
Project Location :

Lot ID: 2615867
Date Received : Mar 25, 2026
Date Reported : Mar 30, 2026
Report Number : 3511679-1

Page 2 of 2



Location : บ้านโคกบวร (หนองหัววัว) (GPS 47P 0729262, 1440292)

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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Phuaakdaeng, Rayong Thailand 21140

P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2615841
Date Received : Mar 25, 2026
Date Reported : Mar 30, 2026
Report Number : 3511625-1

Page 1 of 2

Sample Number 2615841-1 to 7
Parameter Wind Speed / Wind Direction
Location โรงเรือนกล้วยไม้ออร์แกนิก (GPS 47P 0725746, 1434294)
Sampling Date Mar 15 - Mar 22, 2026
Sampling by Satcha Phetsawaeng

Time	Mar 15 - Mar 16, 2026		Mar 16 - Mar 17, 2026		Mar 17 - Mar 18, 2026		Mar 18 - Mar 19, 2026		Mar 19 - Mar 20, 2026		Mar 20 - Mar 21, 2026		Mar 21 - Mar 22, 2026	
	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)
10:00 AM - 11:00 AM	0.4	130.0	SE	5.5	152.0	SSE	1.2	181.0	S	4.6	281.0	W	4.2	237.0
11:00 AM - 12:00 PM	1.3	129.0	SE	5.9	326.0	NW	0.1	-	-	4.9	237.0	WSW	4.8	192.0
12:00 PM - 01:00 PM	1.7	173.0	S	7.2	281.0	W	3.9	253.0	WSW	6.3	220.0	SW	5.5	276.0
01:00 PM - 02:00 PM	1.5	68.0	ENE	7.6	260.0	W	3.5	228.0	SW	5.2	107.0	ESE	4.6	241.0
02:00 PM - 03:00 PM	3.7	227.0	SW	4.3	271.0	W	1.1	20.0	NNE	2.6	320.0	NW	3.2	271.0
03:00 PM - 04:00 PM	1.6	278.0	W	4.8	243.0	WSW	1.9	183.0	S	5.3	129.0	SE	2.3	200.0
04:00 PM - 05:00 PM	1.0	243.0	WSW	4.3	236.0	SW	2.2	165.0	SSE	2.9	188.0	S	2.6	225.0
05:00 PM - 06:00 PM	3.0	311.0	NW	2.6	243.0	WSW	4.7	215.0	SW	5.5	216.0	SW	5.2	250.0
06:00 PM - 07:00 PM	2.3	247.0	WSW	1.0	271.0	W	3.0	269.0	W	2.7	244.0	WSW	3.3	271.0
07:00 PM - 08:00 PM	1.6	236.0	SW	0.7	212.0	SSW	2.0	261.0	W	1.7	263.0	W	2.4	233.0
08:00 PM - 09:00 PM	0.8	236.0	SW	1.1	301.0	WNW	1.9	260.0	W	1.5	211.0	SSW	2.3	301.0
09:00 PM - 10:00 PM	0.7	303.0	WNW	1.3	243.0	WSW	1.6	346.0	NNW	1.5	303.0	WNW	1.5	219.0
10:00 PM - 11:00 PM	0.9	306.0	NW	2.6	222.0	SW	0.8	252.0	WSW	1.3	316.0	NW	1.4	245.0
11:00 PM - 12:00 AM	1.2	332.0	NNW	1.9	240.0	WSW	0.9	208.0	SSW	1.3	265.0	W	1.0	334.0
12:00 AM - 01:00 AM	1.2	334.0	NNW	1.1	241.0	WSW	0.9	227.0	SW	1.1	313.0	NW	1.0	276.0
01:00 AM - 02:00 AM	0.9	332.0	NNW	0.5	235.0	SW	1.5	262.0	W	0.7	298.0	WNW	0.9	272.0
02:00 AM - 03:00 AM	1.0	2.0	N	0.7	304.0	NW	1.5	307.0	NW	1.0	359.0	N	1.0	6.0
03:00 AM - 04:00 AM	0.4	359.0	N	0.5	297.0	WNW	1.2	305.0	NW	0.8	326.0	NW	1.4	307.0
04:00 AM - 05:00 AM	0.3	359.0	N	2.2	235.0	SW	0.8	298.0	WNW	0.5	295.0	WNW	1.4	355.0
05:00 AM - 06:00 AM	1.0	288.0	WNW	3.3	236.0	SW	1.0	263.0	W	0.6	297.0	WNW	1.2	248.0
06:00 AM - 07:00 AM	0.6	317.0	NW	1.6	34.0	NE	1.1	242.0	WSW	1.5	284.0	WNW	1.5	258.0
07:00 AM - 08:00 AM	2.0	174.0	S	2.9	106.0	ESE	1.4	167.0	SSE	1.3	232.0	SW	3.8	225.0
08:00 AM - 09:00 AM	3.0	150.0	SSE	3.0	193.0	SSW	3.2	232.0	SW	4.3	188.0	S	3.9	196.0
09:00 AM - 10:00 AM	4.9	150.0	SSE	1.5	151.0	SSE	4.7	209.0	SSW	4.4	179.0	S	1.3	288.0

Reference Method : Cup Anemometer & Anodized Aluminium Vane Method

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by

Sarayuth Jitranont
Assistant General Manager

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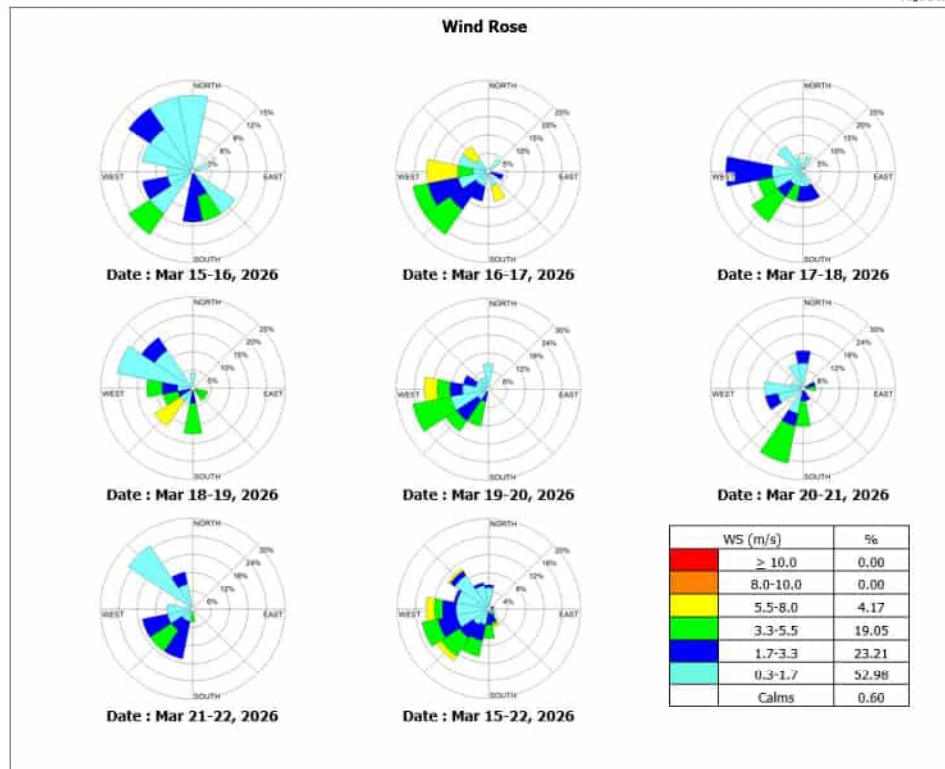
Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Phuaakdaeng, Rayong Thailand 21140

P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2615841
Date Received : Mar 25, 2026
Date Reported : Mar 30, 2026
Report Number : 3511625-1

Page 2 of 2



Location : โรงเรือนกล้วยไม้ออร์แกนิก (GPS 47P 0725746, 1434294)

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by

Sarayuth Jitranont
Assistant General Manager

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ภาคผนวก ค-4

คุณภาพน้ำทิ้ง



Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporm, Pluakdaeng, Rayong Thailand 21140

P/O :
Project Name : ABPR 1
Project Location :



TESTING
No.0042

Lot ID: 264608
Date Received : Jan 19, 2026
Date Reported : Jan 29, 2026
Report Number : 3498313-1

Page 1 of 2

Sample Number 264608-1
Sampled Date Jan 19, 2026 9:55 AM
Sample Description Wastewater
Location มลพิษน้ำทิ้งของโครงการ ABPR1
Date Analysis Commenced Jan 19, 2026
Condition of Sample Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	35	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH (on site) *		-	-	7.6	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
pH at 25 degree C		-	-	7.7	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Residual Free Chlorine *	mg/L	-	0.1	<0.1	≤1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-Cl (F)	Rayong
Temperature *	Degree C	-	-	29.9	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	2580	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Technical Management

Photchana S

Photchana Seeda
Scientist (4)
หมายเลขประจำตัว 3-323-3-0028

Approved by

D. Chuan

Dej Changchon
Senior Manager
หมายเลขประจำตัว 3-323-3-0001

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

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5/Reports/ALSL/pt (5:41PM)



Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporm, Pluakdaeng, Rayong Thailand 21140

P/O :
Project Name : ABPR 1
Project Location :



TESTING
No.0042

Lot ID: 264608
Date Received : Jan 19, 2026
Date Reported : Jan 29, 2026
Report Number : 3498313-1

Page 2 of 2

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.

Note : This Analysis test Report is issued to supersede Report No. 3489028-1, Date Reported : Jan 26, 2026 due to the additional of parameter.

Sampling By : Wanlop Hunchanaow หมายเลขประจำตัว 3-323-3-0038

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- Sampling is not included in scope of accreditation ISO/IEC 17025

Technical Management

Photchana S

Photchana Seeda
Scientist (4)
หมายเลขประจำตัว 3-323-3-0028

Approved by

D. Chuan

Dej Changchon
Senior Manager
หมายเลขประจำตัว 3-323-3-0001

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

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5773-41/ EMAIL

5/Reports/ALSL/pt (5:41PM)



Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporm, Pluakdaeng, Rayong Thailand 21140

P/O :
Project Name : ABPR 1
Project Location :

Lot ID: 264608
Date Received : Jan 19, 2026
Date Reported : Jan 29, 2026
Report Number : 3498313-2

Page 1 of 1

Sample Number 264608-1
Sampled Date Jan 19, 2026 9:55 AM
Sample Description Wastewater
Location มลพิษน้ำทิ้งของโครงการ ABPR1
Date Analysis Commenced Jan 19, 2026
Condition of Sample Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/s	-	-	0.0244	No Standard	Flow meter	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.

Note : This Analysis test Report is reissued to supersede Report No. 3489028-1, Date Reported : Jan 26, 2026 due to the additional of parameter.

Sampling By : Wanlop Hunchainaow

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LDR (Limit of Reporting)

Approved by

Photchana S

Photchana Seeda
Scientist (4)

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9773-412 EMAIL

\\Reports\AL\GL\prj (S:\ZPH)



Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporm, Pluakdaeng, Rayong Thailand 21140

P/O :
Project Name : ABPR 1
Project Location :

TESTING
No.0042
Lot ID: 2612632
Date Received : Feb 16, 2026
Date Reported : Feb 23, 2026
Report Number : 3504405-1

Page 1 of 2

Sample Number 2612632-1
Sampled Date Feb 16, 2026 10:00 AM
Sample Description Wastewater
Location มลพิษน้ำทิ้งของโครงการ ABPR1
Date Analysis Commenced Feb 16, 2026
Condition of Sample Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	54	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH (on site) *		-	-	7.8	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Residual Free Chlorine *	mg/L	-	0.1	<0.1	≤1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-Cl (F)	Rayong
Temperature *	Degree C	-	-	31.1	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	2680	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.

Sampling By : Wanlop Hunchainaow โทรแจ้งเลขที่ ๖-323-๖-0038

Remark :

Technical Management

Photchana S

Photchana Seeda
Scientist (4)
โทรแจ้งเลขที่ ๖-323-๖-0028

Approved by

D. Chuan

Dej Changchon
Senior Manager
โทรแจ้งเลขที่ ๖-323-๖-0001

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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140
P/O :
Project Name : ABPR 1
Project Location :



TESTING
No.0042
Lot ID: 2612632
Date Received : Feb 16, 2026
Date Reported : Feb 23, 2026
Report Number : 3504405-1

Page 2 of 2

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LDR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- Sampling is not included in scope of accreditation ISO/IEC 17025



Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140
P/O :
Project Name : ABPR 1
Project Location :

Lot ID: 2612632
Date Received : Feb 16, 2026
Date Reported : Feb 23, 2026
Report Number : 3504405-2

Page 1 of 1

Sample Number 2612632-1
Sampled Date Feb 16, 2026 10:00 AM
Sample Description Wastewater
Location มลพิษน้ำทิ้งของโครงการ ABPR1
Date Analysis Commenced Feb 16, 2026
Condition of Sample Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/s	-	-	0.0250	No Standard	Flow meter, Analyzed by Client	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Wanlop Hunchainaow

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LDR (Limit of Reporting)

Technical Management

Photchana S

Photchana Seeda
Scientist (4)
โทรศัพท์มือถือ ร-323-ร-0028

Approved by

D. Chuan

Dej Changchon
Senior Manager
โทรศัพท์มือถือ ร-323-ร-0001

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Approved by

Photchana S

Photchana Seeda
Scientist (4)

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\\Reports\AL\GL\pt (2.03PM)



Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporm, Pluakdaeng, Rayong Thailand 21140

P/O :
Project Name : ABPR 1
Project Location :



TESTING
No.0042

Lot ID: 2612653
Date Received : Mar 09, 2026
Date Reported : Mar 16, 2026
Report Number : 3504423-1

Page 1 of 2

Sample Number 2612653-1
Sampled Date Mar 09, 2026 10:20 AM
Sample Description Wastewater
Location มลพิษน้ำทิ้งของโครงการ ABPR1
Date Analysis Commenced Mar 09, 2026
Condition of Sample Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	41	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH (on site) *		-	-	7.3	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Residual Free Chlorine *	mg/L	-	0.1	0.1	≤1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-Cl (F)	Rayong
Temperature *	Degree C	-	-	31.7	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	1500	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried from 103-105 degree C	mg/L	-	5	<5	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.

Sampling By : Wanlop Hunchainaw ทนวัฒน์ หุ่นชัย ๖-323-๖-0038

Remark :

Technical Management

Photchana S

Photchana Seeda
Scientist (4)
โทรศัพท์ ๖-323-๖-0028

Approved by

D. Chuan

Dej Changchon
Senior Manager
โทรศัพท์ ๖-323-๖-0001

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P/O :
Project Name : ABPR 1
Project Location :



TESTING
No.0042

Lot ID: 2612653
Date Received : Mar 09, 2026
Date Reported : Mar 16, 2026
Report Number : 3504423-1

Page 2 of 2

- LOD : Limit of Detection
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- Sampling is not included in scope of accreditation ISO/IEC 17025

Technical Management

Photchana S

Photchana Seeda
Scientist (4)
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Approved by

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Dej Changchon
Senior Manager
โทรศัพท์ ๖-323-๖-0001

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P/O :
Project Name : ABPR 1
Project Location :

Lot ID: 2612653
Date Received : Mar 09, 2026
Date Reported : Mar 16, 2026
Report Number : 3504423-2

Page 1 of 1

Sample Number 2612653-1
Sampled Date Mar 09, 2026 10:20 AM
Sample Description Wastewater
Location มลพิษน้ำทิ้งของโครงการ ABPR1
Date Analysis Commenced Mar 09, 2026
Condition of Sample Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/s	-	-	0.025	No Standard	Flow meter, Analyzed by Client	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.

Sampling By : Wanlop Hunchainaow

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Approved by

Photchana S

Photchana Seeda
Scientist (4)

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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
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P/O : 2601110101
Project Name : ABPR 1
Project Location :



TESTING
No.0042

Lot ID: 2626766
Date Received : Apr 06, 2026
Date Reported : Apr 15, 2026
Report Number : 3537054-1

Page 1 of 2

Sample Number 2626766-1
Sampled Date Apr 06, 2026 10:36 AM
Sample Description Wastewater
Location มลพิษน้ำทิ้งของโครงการ ABPR1
Date Analysis Commenced Apr 06, 2026
Condition of Sample Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	41	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH (on site) *		-	-	7.4	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Residual Free Chlorine *	mg/L	-	0.1	<0.1	≤1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-Cl (F)	Rayong
Temperature *	Degree C	-	-	33.9	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	1360	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried from 103-105 degree C	mg/L	-	5	5	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.

Sampling By : Wanlop Hunchainaow โทร.09-0000000000 3-323-3-0038

Remark :

Technical Management

Photchana S

Photchana Seeda
Scientist (4)
โทร.09-0000000000 3-323-3-0028

Approved by

D. Chuan

Dej Changchon
Senior Manager
โทร.09-0000000000 3-323-3-0001

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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporm, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :



TESTING
No.0042
Lot ID: 2626766
Date Received : Apr 06, 2026
Date Reported : Apr 15, 2026
Report Number : 3537054-1

Page 2 of 2

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LDR (Limit of Reporting)
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- Sampling is not included in scope of accreditation ISO/IEC 17025



Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporm, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2626766
Date Received : Apr 06, 2026
Date Reported : Apr 15, 2026
Report Number : 3537054-2

Page 1 of 1

Sample Number 2626766-1
Sampled Date Apr 06, 2026 10:36 AM
Sample Description Wastewater
Location มอพักบ้านวังทองโครงการ ABPR1
Date Analysis Commenced Apr 06, 2026
Condition of Sample Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/s	-	-	0.0250	No Standard	Flow meter, Analyzed by Client	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Wanlop Hunchainaow

- Remark :**
- LOD : Limit of Detection
 - "<" : Lower than LOQ (Limit of Quantitation) / LDR (Limit of Reporting)

Technical Management

Photchana S

Photchana Seeda
Scientist (4)
โทรศัพท์ ๖-323-๖-0028

Approved by

D. Chuan

Dej Changchon
Senior Manager
โทรศัพท์ ๖-323-๖-0001

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Approved by

Photchana S

Photchana Seeda
Scientist (4)

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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporm, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :



TESTING
No.0042

Lot ID: 2634078
Date Received : May 11, 2026
Date Reported : May 18, 2026
Report Number : 3555934-1

Page 1 of 2

Sample Number 2634078-1
Sample Date May 11, 2026 11:00 AM
Sample Description Wastewater
Location มลพิษน้ำทิ้งของโครงการ ABPR1
Date Analysis Commenced May 11, 2026
Condition of Sample Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	41	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH (on site) *		-	-	7.5	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Residual Free Chlorine *	mg/L	-	0.1	0.1	≤1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-Cl (F)	Rayong
Temperature *	Degree C	-	-	32.7	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	1480	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried from 103-105 degree C	mg/L	-	5	<5	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.

Sampling By : Wanlop Hunchainaox โทรศัทพ์ ๖-323-๖-0038

Remark :

Technical Management

Photchana S

Photchana Seeda
Scientist (4)
โทรศัพท์ ๖-323-๖-0028

Approved by

D. Chuan

Dej Changchon
Senior Manager
โทรศัพท์ ๖-323-๖-0001

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5/Reports/ALSLRpt (4.33PM)



Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporm, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :



TESTING
No.0042

Lot ID: 2634078
Date Received : May 11, 2026
Date Reported : May 18, 2026
Report Number : 3555934-1

Page 2 of 2

- LOD : Limit of Detection
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- Sampling is not included in scope of accreditation ISO/IEC 17025

Technical Management

Photchana S

Photchana Seeda
Scientist (4)
โทรศัพท์ ๖-323-๖-0028

Approved by

D. Chuan

Dej Changchon
Senior Manager
โทรศัพท์ ๖-323-๖-0001

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5/Reports/ALSLRpt (4.33PM)



Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporm, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2634078
Date Received : May 11, 2026
Date Reported : May 21, 2026
Report Number : 3555934-2

Page 1 of 1

Sample Number 2634078-1
Sampled Date May 11, 2026 11:00 AM
Sample Description Wastewater
Location มลพิษน้ำทิ้งของโครงการ ABPR1
Date Analysis Commenced May 11, 2026
Condition of Sample Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/s	-	-	0.02458	No Standard	Flow meter	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Wanlop Hunchainaow

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Approved by

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Photchana Seeda
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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporm, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :



TESTING
No.0042

Lot ID: 2639417
Date Received : Jun 12, 2026
Date Reported : Jun 19, 2026
Report Number : 3568135-1

Page 1 of 2

Sample Number 2639417-1
Sampled Date Jun 12, 2026 10:25 AM
Sample Description Wastewater
Location มลพิษน้ำทิ้งของโครงการ ABPR1
Date Analysis Commenced Jun 12, 2026
Condition of Sample Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	40	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH (on site) *		-	-	7.6	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Residual Free Chlorine *	mg/L	-	0.1	<0.1	≤1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-Cl (F)	Rayong
Temperature *	Degree C	-	-	31.8	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	2420	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried from 103-105 degree C	mg/L	-	5	<5	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.

Sampling By : Wasan Kinunt วัฒนวิมลกุลศิริ 3-323-3-0019

Remark :

Technical Management

Photchana S

Photchana Seeda
Scientist (4)
หมายเลขโทรศัพท์ 3-323-3-0028

Approved by

D. Chanchon

Dej Chanchon
Senior Manager
หมายเลขโทรศัพท์ 3-323-3-0001

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

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9773-412 EMAIL

S:\Reports\ALS\SL\pt (113004)



Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :



TESTING
No.0042
Lot ID: 2639417
Date Received : Jun 12, 2026
Date Reported : Jun 19, 2026
Report Number : 3568135-1

Page 2 of 2

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LDR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- Sampling is not included in scope of accreditation ISO/IEC 17025



Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2639417
Date Received : Jun 12, 2026
Date Reported : Jun 19, 2026
Report Number : 3568135-2

Page 1 of 1

Sample Number 2639417-1
Sampled Date Jun 12, 2026 10:25 AM
Sample Description Wastewater
Location มลพิษน้ำทิ้งของโครงการ ABPR1
Date Analysis Commenced Jun 12, 2026
Condition of Sample Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/s	-	-	0.0242	No Standard	Flow meter, Analyzed by Client	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Wasan Kinunti

- Remark :**
- LOD : Limit of Detection
 - "<" : Lower than LOQ (Limit of Quantitation) / LDR (Limit of Reporting)

Technical Management

Photchana S

Photchana Seeda
Scientist (4)
หมายเลขโทรศัพท์ 323-3-0028

Approved by

D. Chanchon

Dej Chanchon
Senior Manager
หมายเลขโทรศัพท์ 323-3-0001

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

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5/Reports/ALGLRpt (5:18PM)

Approved by

Photchana S

Photchana Seeda
Scientist (4)

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

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5/Reports/ALGLRpt (5:18PM)

ภาคผนวก ค-5

ระดับเสียงในบรรยากาศ



Analysis / Test Report

Client: Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :



TESTING
No.0042

Lot ID: 2615887
Date Received : Mar 26, 2026
Date Reported : Mar 31, 2026
Report Number: 3540281-1

Page 1 of 1

Sample Number 2615887-1
Parameter Noise (Leq 24 hrs.)
Location วนังโครงการ ทางด้านทิศตะวันออก (GPS 47P 0730009, 1434537)
Measurement Date Mar 17 - Mar 18, 2026
Measurement by Satcha Phetsawaeng
Sound Level meter Serial No. 623390

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	58.4	82.0	55.4
11:00 AM - 12:00 PM	57.9	81.1	55.2
12:00 PM - 01:00 PM	57.2	77.0	54.8
01:00 PM - 02:00 PM	60.8	87.5	55.9
02:00 PM - 03:00 PM	59.0	87.8	55.9
03:00 PM - 04:00 PM	61.8	83.3	55.6
04:00 PM - 05:00 PM	58.3	82.0	55.2
05:00 PM - 06:00 PM	59.1	76.6	54.0
06:00 PM - 07:00 PM	59.1	79.1	55.6
07:00 PM - 08:00 PM	55.6	73.5	53.9
08:00 PM - 09:00 PM	56.6	83.3	53.9
09:00 PM - 10:00 PM	55.4	70.6	54.0
10:00 PM - 11:00 PM	55.3	69.0	53.8
11:00 PM - 12:00 AM	55.1	69.0	53.9
12:00 AM - 01:00 AM	55.1	69.1	53.7
01:00 AM - 02:00 AM	54.8	68.1	53.4
02:00 AM - 03:00 AM	54.4	68.6	53.1
03:00 AM - 04:00 AM	55.2	71.3	53.3
04:00 AM - 05:00 AM	59.2	88.2	53.8
05:00 AM - 06:00 AM	56.4	72.4	54.3
06:00 AM - 07:00 AM	56.8	82.4	53.2
07:00 AM - 08:00 AM	63.8	96.9	55.0
08:00 AM - 09:00 AM	58.9	86.3	55.2
09:00 AM - 10:00 AM	77.1	108.3	55.8

Leq Average 24 hrs. (dB(A)) 64.5
Lmax (dB(A)) 108.3
L90 (dB(A)) 54.0
Ldn (dB(A)) 66.2
Standard (dB(A)) 70 115

Reference Method : ISO 1996-1 : 2016

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak
Chonticha Subongkroh
Scientist (3)

Approved by

Supot S
Supot Salamteh
Section Head

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S:\Report\Air Noise\pt (4.32PM)



Analysis / Test Report

Client: Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :



TESTING
No.0042

Lot ID: 2615887
Date Received : Mar 26, 2026
Date Reported : Mar 31, 2026
Report Number: 3540282-1

Page 1 of 1

Sample Number 2615887-2
Parameter Noise (Leq 24 hrs.)
Location วนังโครงการ ทางด้านทิศตะวันออก (GPS 47P 0730009, 1434537)
Measurement Date Mar 18 - Mar 19, 2026
Measurement by Satcha Phetsawaeng
Sound Level meter Serial No. 623390

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	59.1	83.6	55.6
11:00 AM - 12:00 PM	58.6	78.2	55.6
12:00 PM - 01:00 PM	58.7	82.3	55.3
01:00 PM - 02:00 PM	60.0	84.6	55.2
02:00 PM - 03:00 PM	59.3	82.7	56.0
03:00 PM - 04:00 PM	65.5	89.9	56.4
04:00 PM - 05:00 PM	59.6	79.2	55.9
05:00 PM - 06:00 PM	58.9	79.0	55.2
06:00 PM - 07:00 PM	63.2	93.6	56.6
07:00 PM - 08:00 PM	56.2	76.2	54.6
08:00 PM - 09:00 PM	55.9	71.6	54.4
09:00 PM - 10:00 PM	55.8	69.1	54.4
10:00 PM - 11:00 PM	55.4	68.5	54.4
11:00 PM - 12:00 AM	56.0	69.5	54.4
12:00 AM - 01:00 AM	55.3	68.2	54.2
01:00 AM - 02:00 AM	55.7	68.2	54.3
02:00 AM - 03:00 AM	55.4	68.7	54.4
03:00 AM - 04:00 AM	55.5	74.7	54.3
04:00 AM - 05:00 AM	57.4	81.3	54.5
05:00 AM - 06:00 AM	60.6	90.2	55.3
06:00 AM - 07:00 AM	58.9	87.0	55.6
07:00 AM - 08:00 AM	60.3	94.2	55.6
08:00 AM - 09:00 AM	58.4	84.0	55.6
09:00 AM - 10:00 AM	59.2	86.7	56.0

Leq Average 24 hrs. (dB(A)) 59.2
Lmax (dB(A)) 94.2
L90 (dB(A)) 55.2
Ldn (dB(A)) 64.1
Standard (dB(A)) 70 115

Reference Method : ISO 1996-1 : 2016

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak
Chonticha Subongkroh
Scientist (3)

Approved by

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Supot Salamteh
Section Head

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S:\Report\Air Noise\pt (4.32PM)



Analysis / Test Report

Client: Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :



TESTING
No.0042

Lot ID: 2615887
Date Received : Mar 26, 2026
Date Reported : Mar 31, 2026
Report Number: 3540283-1

Page 1 of 1

Sample Number 2615887-3
Parameter Noise (Leq 24 hrs.)
Location รั้วโครงการ ทางด้านทิศตะวันออก (GPS 47P 0730009, 1434537)
Measurement Date Mar 19 - Mar 20, 2026
Measurement by Satcha Phetsawaeng
Sound Level meter Serial No. 623390

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	58.9	83.0	56.1
11:00 AM - 12:00 PM	59.1	86.3	55.9
12:00 PM - 01:00 PM	59.0	84.0	55.8
01:00 PM - 02:00 PM	60.4	86.4	56.0
02:00 PM - 03:00 PM	58.8	74.5	56.3
03:00 PM - 04:00 PM	60.3	79.9	56.8
04:00 PM - 05:00 PM	59.3	83.6	55.4
05:00 PM - 06:00 PM	57.8	84.5	54.7
06:00 PM - 07:00 PM	58.4	78.0	56.0
07:00 PM - 08:00 PM	56.0	73.3	54.2
08:00 PM - 09:00 PM	56.4	81.1	54.1
09:00 PM - 10:00 PM	56.4	84.3	54.3
10:00 PM - 11:00 PM	55.7	69.1	54.4
11:00 PM - 12:00 AM	55.4	69.1	54.4
12:00 AM - 01:00 AM	55.6	68.8	54.3
01:00 AM - 02:00 AM	55.5	68.8	54.4
02:00 AM - 03:00 AM	55.5	68.3	54.2
03:00 AM - 04:00 AM	55.4	68.8	54.3
04:00 AM - 05:00 AM	56.7	83.4	54.7
05:00 AM - 06:00 AM	57.6	78.7	55.4
06:00 AM - 07:00 AM	59.3	87.7	54.8
07:00 AM - 08:00 AM	57.8	84.8	55.3
08:00 AM - 09:00 AM	61.5	96.1	55.9
09:00 AM - 10:00 AM	59.0	89.7	56.2

Leq Average 24 hrs. (dB(A)) 58.1
Lmax (dB(A)) 96.1
L90 (dB(A)) 54.8
Ldn (dB(A)) 63.3
Standard (dB(A)) 70 115
Reference Method : ISO 1996-1 : 2016

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการ
โรงงาน พ.ศ. 2548

Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

Supot S
Supot Salamteah
Section Head

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S:\Report\Air Noise rpt (4.33PM)



Analysis / Test Report

Client: Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :



TESTING
No.0042

Lot ID: 2615887
Date Received : Mar 26, 2026
Date Reported : Mar 31, 2026
Report Number: 3540284-1

Page 1 of 1

Sample Number 2615887-4
Parameter Noise (Leq 24 hrs.)
Location รั้วโครงการ ทางด้านทิศตะวันออก (GPS 47P 0730009, 1434537)
Measurement Date Mar 20 - Mar 21, 2026
Measurement by Satcha Phetsawaeng
Sound Level meter Serial No. 623390

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	59.9	87.3	56.0
11:00 AM - 12:00 PM	60.1	85.9	56.1
12:00 PM - 01:00 PM	58.9	82.1	55.9
01:00 PM - 02:00 PM	60.1	86.6	56.0
02:00 PM - 03:00 PM	59.8	83.2	56.5
03:00 PM - 04:00 PM	66.0	90.4	56.9
04:00 PM - 05:00 PM	60.1	79.7	56.4
05:00 PM - 06:00 PM	59.4	79.5	55.7
06:00 PM - 07:00 PM	63.7	94.1	57.1
07:00 PM - 08:00 PM	56.7	69.9	55.1
08:00 PM - 09:00 PM	56.4	72.1	54.9
09:00 PM - 10:00 PM	55.6	69.2	54.2
10:00 PM - 11:00 PM	55.7	70.6	54.2
11:00 PM - 12:00 AM	55.3	70.1	54.2
12:00 AM - 01:00 AM	55.5	69.9	54.0
01:00 AM - 02:00 AM	55.3	69.7	54.0
02:00 AM - 03:00 AM	55.0	70.1	53.7
03:00 AM - 04:00 AM	55.3	69.5	53.8
04:00 AM - 05:00 AM	56.3	73.3	54.5
05:00 AM - 06:00 AM	57.0	76.8	54.0
06:00 AM - 07:00 AM	59.0	83.6	53.6
07:00 AM - 08:00 AM	56.4	72.3	54.0
08:00 AM - 09:00 AM	57.7	77.5	54.7
09:00 AM - 10:00 AM	56.9	74.7	54.3

Leq Average 24 hrs. (dB(A)) 59.1
Lmax (dB(A)) 94.1
L90 (dB(A)) 54.5
Ldn (dB(A)) 63.5
Standard (dB(A)) 70 115
Reference Method : ISO 1996-1 : 2016

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการ
โรงงาน พ.ศ. 2548

Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

Supot S
Supot Salamteah
Section Head

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S:\Report\Air Noise rpt (4.34PM)



Analysis / Test Report

Client: Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :



TESTING
No.0042

Lot ID: 2615887
Date Received : Mar 26, 2026
Date Reported : Mar 31, 2026
Report Number: 3540285-1

Page 1 of 1

Sample Number 2615887-5
Parameter Noise (Leq 24 hrs.)
Location บริเวณโครงการ ทางด้านทิศตะวันออก (GPS 47P 0730009, 1434537)
Measurement Date Mar 21 - Mar 22, 2026
Measurement by Satcha Phetsawaeng
Sound Level meter Serial No. 623390

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	57.5	81.5	55.4
11:00 AM - 12:00 PM	58.8	88.1	55.7
12:00 PM - 01:00 PM	62.7	94.8	55.3
01:00 PM - 02:00 PM	63.7	87.0	55.5
02:00 PM - 03:00 PM	61.7	76.7	56.0
03:00 PM - 04:00 PM	61.9	79.7	55.5
04:00 PM - 05:00 PM	58.3	75.6	54.3
05:00 PM - 06:00 PM	57.1	82.4	53.9
06:00 PM - 07:00 PM	58.4	74.2	55.0
07:00 PM - 08:00 PM	55.5	73.5	53.9
08:00 PM - 09:00 PM	55.9	73.1	53.7
09:00 PM - 10:00 PM	55.2	68.8	53.8
10:00 PM - 11:00 PM	55.3	70.2	53.8
11:00 PM - 12:00 AM	54.9	69.7	53.8
12:00 AM - 01:00 AM	55.1	69.5	53.6
01:00 AM - 02:00 AM	54.9	69.3	53.6
02:00 AM - 03:00 AM	54.6	69.7	53.3
03:00 AM - 04:00 AM	54.9	69.1	53.4
04:00 AM - 05:00 AM	55.9	72.9	54.1
05:00 AM - 06:00 AM	57.7	77.5	54.7
06:00 AM - 07:00 AM	59.7	87.9	54.3
07:00 AM - 08:00 AM	57.1	73.0	54.7
08:00 AM - 09:00 AM	58.4	78.2	55.4
09:00 AM - 10:00 AM	57.6	75.4	55.0

Leq Average 24 hrs. (dB(A)) 58.5
Lmax (dB(A)) 94.8
L90 (dB(A)) 54.3
Ldn (dB(A)) 63.3
Standard (dB(A)) 70 115

Reference Method : ISO 1996-1 : 2016

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak
Chonticha Subongkroh
Scientist (3)

Approved by

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Supot Salamteh
Section Head

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S:\Report\Air Noise rpt (4.36PM)



Analysis / Test Report

Client: Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :



TESTING
No.0042

Lot ID: 2615889
Date Received : Mar 26, 2026
Date Reported : Mar 31, 2026
Report Number: 3540314-1

Page 1 of 1

Sample Number 2615889-1
Parameter Noise (Leq 24 hrs.)
Location บริเวณสถานีขนถ่ายน้ำมันจากพร (GPS 47P 0731378, 1436959)
Measurement Date Mar 17 - Mar 18, 2026
Measurement by Satcha Phetsawaeng
Sound Level meter Serial No. 623389

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:00 AM - 09:00 AM	54.9	78.3	51.0
09:00 AM - 10:00 AM	53.5	71.1	49.6
10:00 AM - 11:00 AM	54.2	74.9	49.2
11:00 AM - 12:00 PM	51.7	68.0	47.7
12:00 PM - 01:00 PM	52.5	77.6	47.9
01:00 PM - 02:00 PM	52.5	84.5	48.1
02:00 PM - 03:00 PM	54.9	87.1	48.8
03:00 PM - 04:00 PM	53.3	84.5	47.6
04:00 PM - 05:00 PM	53.9	75.5	49.9
05:00 PM - 06:00 PM	56.2	84.9	51.4
06:00 PM - 07:00 PM	54.2	73.6	50.9
07:00 PM - 08:00 PM	54.4	73.5	50.9
08:00 PM - 09:00 PM	54.5	75.9	51.0
09:00 PM - 10:00 PM	52.3	69.8	49.0
10:00 PM - 11:00 PM	51.0	66.6	47.7
11:00 PM - 12:00 AM	51.2	71.1	47.9
12:00 AM - 01:00 AM	49.4	65.7	46.4
01:00 AM - 02:00 AM	48.6	65.5	45.6
02:00 AM - 03:00 AM	50.1	76.7	45.8
03:00 AM - 04:00 AM	48.9	68.7	45.1
04:00 AM - 05:00 AM	48.5	63.9	45.2
05:00 AM - 06:00 AM	50.4	67.0	47.1
06:00 AM - 07:00 AM	54.9	69.9	50.4
07:00 AM - 08:00 AM	55.5	75.1	51.3

Leq Average 24 hrs. (dB(A)) 53.1
Lmax (dB(A)) 87.1
L90 (dB(A)) 48.1
Ldn (dB(A)) 57.9
Standard (dB(A)) 70 115

Reference Method : ISO 1996-1 : 2016

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

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Approved by

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Supot Salamteh
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S:\Report\Air Noise rpt (4.38PM)



Analysis / Test Report

Client: Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :



TESTING
No.0042

Lot ID: 2615889
Date Received : Mar 26, 2026
Date Reported : Mar 31, 2026
Report Number: 3540315-1

Page 1 of 1

Sample Number 2615889-2
Parameter Noise (Leq 24 hrs.)
Location บริเวณสถานีวิทยุคมนาคมฯ (GPS 47P 0731378, 1436959)
Measurement Date Mar 18 - Mar 19, 2026
Measurement by Satcha Phetsawaeng
Sound Level meter Serial No. 623389

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:00 AM - 09:00 AM	54.9	75.3	49.6
09:00 AM - 10:00 AM	52.3	74.3	47.7
10:00 AM - 11:00 AM	51.4	74.8	47.6
11:00 AM - 12:00 PM	51.6	72.6	47.1
12:00 PM - 01:00 PM	51.0	69.4	47.1
01:00 PM - 02:00 PM	50.7	70.5	47.2
02:00 PM - 03:00 PM	64.9	98.7	48.4
03:00 PM - 04:00 PM	55.5	81.9	47.9
04:00 PM - 05:00 PM	52.8	74.7	48.9
05:00 PM - 06:00 PM	53.8	72.4	51.2
06:00 PM - 07:00 PM	54.4	75.8	50.9
07:00 PM - 08:00 PM	54.5	76.3	51.1
08:00 PM - 09:00 PM	54.5	71.9	51.2
09:00 PM - 10:00 PM	52.4	66.3	49.1
10:00 PM - 11:00 PM	51.1	65.4	48.3
11:00 PM - 12:00 AM	51.8	67.4	49.7
12:00 AM - 01:00 AM	51.1	79.8	47.6
01:00 AM - 02:00 AM	49.1	73.6	45.8
02:00 AM - 03:00 AM	48.7	65.8	45.9
03:00 AM - 04:00 AM	48.2	64.5	45.2
04:00 AM - 05:00 AM	49.1	67.4	46.4
05:00 AM - 06:00 AM	51.4	68.6	48.6
06:00 AM - 07:00 AM	55.0	70.4	50.6
07:00 AM - 08:00 AM	55.4	73.5	51.0

Leq Average 24 hrs. (dB(A)) 54.9
Lmax (dB(A)) 98.7
L90 (dB(A)) 48.3
Ldn (dB(A)) 58.7
Standard (dB(A)) 70 115

Reference Method : ISO 1996-1 : 2016

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak
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S:\Report\Air Noise rpt (4-40PM)



Analysis / Test Report

Client: Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :



TESTING
No.0042

Lot ID: 2615889
Date Received : Mar 26, 2026
Date Reported : Mar 31, 2026
Report Number: 3540316-1

Page 1 of 1

Sample Number 2615889-3
Parameter Noise (Leq 24 hrs.)
Location บริเวณสถานีวิทยุคมนาคมฯ (GPS 47P 0731378, 1436959)
Measurement Date Mar 19 - Mar 20, 2026
Measurement by Satcha Phetsawaeng
Sound Level meter Serial No. 623389

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:00 AM - 09:00 AM	54.5	71.9	50.1
09:00 AM - 10:00 AM	53.1	84.9	48.5
10:00 AM - 11:00 AM	53.1	73.3	47.9
11:00 AM - 12:00 PM	53.3	77.1	48.2
12:00 PM - 01:00 PM	53.2	84.3	47.6
01:00 PM - 02:00 PM	60.2	86.5	48.8
02:00 PM - 03:00 PM	59.9	95.1	48.4
03:00 PM - 04:00 PM	57.4	75.9	49.0
04:00 PM - 05:00 PM	55.5	76.8	50.1
05:00 PM - 06:00 PM	54.5	74.0	51.3
06:00 PM - 07:00 PM	54.7	71.5	51.1
07:00 PM - 08:00 PM	55.1	69.5	52.6
08:00 PM - 09:00 PM	55.3	78.3	52.1
09:00 PM - 10:00 PM	53.2	69.2	49.6
10:00 PM - 11:00 PM	52.2	65.7	49.5
11:00 PM - 12:00 AM	50.9	66.2	47.4
12:00 AM - 01:00 AM	50.3	69.9	47.1
01:00 AM - 02:00 AM	49.1	72.4	45.4
02:00 AM - 03:00 AM	48.4	67.0	45.0
03:00 AM - 04:00 AM	47.6	70.7	44.6
04:00 AM - 05:00 AM	48.7	70.4	45.3
05:00 AM - 06:00 AM	50.8	71.7	47.1
06:00 AM - 07:00 AM	55.0	72.9	50.5
07:00 AM - 08:00 AM	55.7	74.2	51.4

Leq Average 24 hrs. (dB(A)) 54.6
Lmax (dB(A)) 95.1
L90 (dB(A)) 48.5
Ldn (dB(A)) 58.5
Standard (dB(A)) 70 115

Reference Method : ISO 1996-1 : 2016

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

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S:\Report\Air Noise rpt (4-39PM)



Analysis / Test Report

Client: Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :



TESTING
No.0042

Lot ID: 2615889
Date Received : Mar 26, 2026
Date Reported : Mar 31, 2026
Report Number: 3540317-1

Page 1 of 1

Sample Number 2615889-4
Parameter Noise (Leq 24 hrs.)
Location บริเวณสถานีวิทยุคมนาคมฯ (GPS 47P 0731378, 1436959)
Measurement Date Mar 20 - Mar 21, 2026
Measurement by Satcha Phetsawaeng
Sound Level meter Serial No. 623389

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:00 AM - 09:00 AM	54.1	75.9	49.8
09:00 AM - 10:00 AM	69.3	99.7	59.4
10:00 AM - 11:00 AM	57.3	86.1	48.8
11:00 AM - 12:00 PM	53.2	75.9	48.5
12:00 PM - 01:00 PM	52.9	79.3	48.1
01:00 PM - 02:00 PM	51.1	67.5	47.2
02:00 PM - 03:00 PM	53.2	80.0	47.9
03:00 PM - 04:00 PM	52.4	69.8	47.5
04:00 PM - 05:00 PM	54.9	79.2	49.7
05:00 PM - 06:00 PM	55.3	79.0	50.7
06:00 PM - 07:00 PM	53.5	80.3	50.0
07:00 PM - 08:00 PM	53.7	72.3	50.6
08:00 PM - 09:00 PM	54.1	73.2	51.0
09:00 PM - 10:00 PM	52.1	70.0	49.1
10:00 PM - 11:00 PM	51.1	67.9	47.6
11:00 PM - 12:00 AM	52.0	73.2	47.9
12:00 AM - 01:00 AM	51.4	67.9	47.8
01:00 AM - 02:00 AM	50.1	72.1	46.3
02:00 AM - 03:00 AM	49.4	76.2	45.9
03:00 AM - 04:00 AM	49.7	77.5	46.2
04:00 AM - 05:00 AM	49.5	62.3	47.3
05:00 AM - 06:00 AM	51.3	78.9	48.1
06:00 AM - 07:00 AM	54.5	72.6	49.6
07:00 AM - 08:00 AM	54.4	68.5	50.7

Leq Average 24 hrs. (dB(A)) 57.4
Lmax (dB(A)) 99.7
L90 (dB(A)) 48.1
Ldn (dB(A)) 60.0
Standard (dB(A)) 70 115

Reference Method : ISO 1996-1 : 2016

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

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S:\Report\Air Noise rpt (4.39PM)



Analysis / Test Report

Client: Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :



TESTING
No.0042

Lot ID: 2615889
Date Received : Mar 26, 2026
Date Reported : Mar 31, 2026
Report Number: 3540318-1

Page 1 of 1

Sample Number 2615889-5
Parameter Noise (Leq 24 hrs.)
Location บริเวณสถานีวิทยุคมนาคมฯ (GPS 47P 0731378, 1436959)
Measurement Date Mar 21 - Mar 22, 2026
Measurement by Satcha Phetsawaeng
Sound Level meter Serial No. 623389

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:00 AM - 09:00 AM	54.8	74.2	50.0
09:00 AM - 10:00 AM	53.3	72.1	49.0
10:00 AM - 11:00 AM	59.6	89.7	48.6
11:00 AM - 12:00 PM	51.9	70.6	48.2
12:00 PM - 01:00 PM	52.2	69.5	47.9
01:00 PM - 02:00 PM	53.2	75.5	48.0
02:00 PM - 03:00 PM	52.2	70.5	47.8
03:00 PM - 04:00 PM	53.5	74.8	48.8
04:00 PM - 05:00 PM	54.4	78.3	49.9
05:00 PM - 06:00 PM	55.5	71.2	51.4
06:00 PM - 07:00 PM	54.0	68.7	50.3
07:00 PM - 08:00 PM	53.6	73.2	50.1
08:00 PM - 09:00 PM	54.2	85.7	50.4
09:00 PM - 10:00 PM	52.0	67.1	48.5
10:00 PM - 11:00 PM	52.6	71.2	48.2
11:00 PM - 12:00 AM	51.2	75.0	46.6
12:00 AM - 01:00 AM	50.3	71.8	45.6
01:00 AM - 02:00 AM	49.2	65.0	44.6
02:00 AM - 03:00 AM	49.4	70.2	44.9
03:00 AM - 04:00 AM	49.4	68.9	45.4
04:00 AM - 05:00 AM	49.0	63.6	45.1
05:00 AM - 06:00 AM	50.2	69.2	46.5
06:00 AM - 07:00 AM	55.6	77.7	49.3
07:00 AM - 08:00 AM	55.6	73.5	49.5

Leq Average 24 hrs. (dB(A)) 53.6
Lmax (dB(A)) 89.7
L90 (dB(A)) 48.2
Ldn (dB(A)) 58.4
Standard (dB(A)) 70 115

Reference Method : ISO 1996-1 : 2016

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

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ภาคผนวก ค-6

ระดับเสียงรบกวน



Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporm, Pluakdaeng, Rayong Thailand 21140

P/O : 2601110101
Project Name : ABPR 1
Project Location :

Sample No. 2615893-1
Parameter เสียงรบกวน
Location บริเวณสถานีน้ำมันยาพร (GPS 47P 0731378, 1436959)
Measurement Date Mar 17 - 18, 2026
Measurement by Satcha Phetsawaeng
Sound Level Meter 623389

Lot ID: 2615893
Date Received : Mar 26, 2026
Date Reported : Apr 02, 2026
Report Number : 3542007-1

Page 1 of 3

ระดับเสียง (dB(A))					
เวลา	เสียงจากแหล่งกำเนิด	เสียงขณะไม่มีการรบกวน	เสียงขณะมีการรบกวน		ค่าระดับการรบกวน
			กลางวัน	กลางคืน	
08:00 AM - 09:00 AM	54.9	56.5	n/a	-	52.2
09:00 AM - 10:00 AM	53.5	56.5	n/a	-	52.2
10:00 AM - 11:00 AM	54.2	56.5	n/a	-	52.2
11:00 AM - 12:00 PM	51.7	56.5	n/a	-	52.2
12:00 PM - 01:00 PM	52.5	56.5	n/a	-	52.2
01:00 PM - 02:00 PM	52.5	56.5	n/a	-	52.2
02:00 PM - 03:00 PM	54.9	56.5	n/a	-	52.2
03:00 PM - 04:00 PM	53.3	56.5	n/a	-	52.2
04:00 PM - 05:00 PM	53.9	56.5	n/a	-	52.2
05:00 PM - 06:00 PM	56.2	56.5	n/a	-	52.2
06:00 PM - 07:00 PM	54.2	56.5	n/a	-	52.2
07:00 PM - 08:00 PM	54.4	56.5	n/a	-	52.2
08:00 PM - 09:00 PM	54.5	56.5	n/a	-	52.2
09:00 PM - 10:00 PM	52.3	56.5	n/a	-	52.2
10:00 PM - 10:05 PM	51.9	53.5	-	n/a	45.6
10:05 PM - 10:10 PM	53.3	53.5	-	n/a	45.6
10:10 PM - 10:15 PM	50.8	53.5	-	n/a	45.6
10:15 PM - 10:20 PM	51.0	53.5	-	n/a	45.6
10:20 PM - 10:25 PM	50.2	53.5	-	n/a	45.6
10:25 PM - 10:30 PM	51.0	53.5	-	n/a	45.6
10:30 PM - 10:35 PM	51.1	53.5	-	n/a	45.6
10:35 PM - 10:40 PM	50.3	53.5	-	n/a	45.6
10:40 PM - 10:45 PM	49.7	53.5	-	n/a	45.6
10:45 PM - 10:50 PM	49.8	53.5	-	n/a	45.6
10:50 PM - 10:55 PM	50.6	53.5	-	n/a	45.6
10:55 PM - 11:00 PM	51.2	53.5	-	n/a	45.6
11:00 PM - 11:05 PM	52.1	53.5	-	n/a	45.6
11:05 PM - 11:10 PM	50.7	53.5	-	n/a	45.6
11:10 PM - 11:15 PM	50.6	53.5	-	n/a	45.6
11:15 PM - 11:20 PM	50.6	53.5	-	n/a	45.6
11:20 PM - 11:25 PM	47.2	53.5	-	n/a	45.6
11:25 PM - 11:30 PM	50.4	53.5	-	n/a	45.6
11:30 PM - 11:35 PM	50.6	53.5	-	n/a	45.6
11:35 PM - 11:40 PM	51.5	53.5	-	n/a	45.6
11:40 PM - 11:45 PM	52.8	53.5	-	n/a	45.6
11:45 PM - 11:50 PM	50.6	53.5	-	n/a	45.6
11:50 PM - 11:55 PM	51.4	53.5	-	n/a	45.6
11:55 PM - 12:00 AM	50.0	53.5	-	n/a	45.6
12:00 AM - 12:05 AM	51.2	53.5	-	n/a	45.6
12:05 AM - 12:10 AM	50.7	53.5	-	n/a	45.6

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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporm, Pluakdaeng, Rayong Thailand 21140

P/O : 2601110101
Project Name : ABPR 1
Project Location :

Sample No. 2615893-1
Parameter เสียงรบกวน
Location บริเวณสถานีน้ำมันยาพร (GPS 47P 0731378, 1436959)
Measurement Date Mar 17 - 18, 2026
Measurement by Satcha Phetsawaeng
Sound Level Meter 623389

Lot ID: 2615893
Date Received : Mar 26, 2026
Date Reported : Apr 02, 2026
Report Number : 3542007-1

Page 2 of 3

ระดับเสียง (dB(A))					
เวลา	เสียงจากแหล่งกำเนิด	เสียงขณะไม่มีการรบกวน	เสียงขณะมีการรบกวน		ค่าระดับการรบกวน
			กลางวัน	กลางคืน	
12:10 AM - 12:15 AM	50.1	53.5	-	n/a	45.6
12:15 AM - 12:20 AM	50.1	53.5	-	n/a	45.6
12:20 AM - 12:25 AM	48.1	53.5	-	n/a	45.6
12:25 AM - 12:30 AM	49.6	53.5	-	n/a	45.6
12:30 AM - 12:35 AM	48.7	53.5	-	n/a	45.6
12:35 AM - 12:40 AM	48.6	53.5	-	n/a	45.6
12:40 AM - 12:45 AM	49.1	53.5	-	n/a	45.6
12:45 AM - 12:50 AM	49.8	53.5	-	n/a	45.6
12:50 AM - 12:55 AM	47.9	53.5	-	n/a	45.6
12:55 AM - 01:00 AM	46.9	53.5	-	n/a	45.6
01:00 AM - 01:05 AM	49.0	53.5	-	n/a	45.6
01:05 AM - 01:10 AM	48.7	53.5	-	n/a	45.6
01:10 AM - 01:15 AM	48.6	53.5	-	n/a	45.6
01:15 AM - 01:20 AM	48.4	53.5	-	n/a	45.6
01:20 AM - 01:25 AM	50.7	53.5	-	n/a	45.6
01:25 AM - 01:30 AM	48.6	53.5	-	n/a	45.6
01:30 AM - 01:35 AM	48.6	53.5	-	n/a	45.6
01:35 AM - 01:40 AM	47.9	53.5	-	n/a	45.6
01:40 AM - 01:45 AM	49.0	53.5	-	n/a	45.6
01:45 AM - 01:50 AM	47.3	53.5	-	n/a	45.6
01:50 AM - 01:55 AM	47.6	53.5	-	n/a	45.6
01:55 AM - 02:00 AM	47.7	53.5	-	n/a	45.6
02:00 AM - 02:05 AM	46.9	53.5	-	n/a	45.6
02:05 AM - 02:10 AM	46.5	53.5	-	n/a	45.6
02:10 AM - 02:15 AM	47.4	53.5	-	n/a	45.6
02:15 AM - 02:20 AM	47.6	53.5	-	n/a	45.6
02:20 AM - 02:25 AM	48.4	53.5	-	n/a	45.6
02:25 AM - 02:30 AM	47.6	53.5	-	n/a	45.6
02:30 AM - 02:35 AM	52.3	53.5	-	n/a	45.6
02:35 AM - 02:40 AM	52.6	53.5	-	n/a	45.6
02:40 AM - 02:45 AM	48.4	53.5	-	n/a	45.6
02:45 AM - 02:50 AM	49.6	53.5	-	n/a	45.6
02:50 AM - 02:55 AM	48.1	53.5	-	n/a	45.6
02:55 AM - 03:00 AM	55.0	53.5	-	52.7	45.6
03:00 AM - 03:05 AM	46.4	53.5	-	n/a	45.6
03:05 AM - 03:10 AM	47.6	53.5	-	n/a	45.6
03:10 AM - 03:15 AM	49.6	53.5	-	n/a	45.6
03:15 AM - 03:20 AM	50.2	53.5	-	n/a	45.6
03:20 AM - 03:25 AM	48.5	53.5	-	n/a	45.6
03:25 AM - 03:30 AM	50.6	53.5	-	n/a	45.6

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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporm, Pluakdaeng, Rayong Thailand 21140

P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2615893
Date Received : Mar 26, 2026
Date Reported : Apr 02, 2026
Report Number : 3542007-1

Page 3 of 3

Sample No. 2615893-1
Parameter เสียงรบกวน
Location บริเวณสถานีขนถ่ายน้ำมัน (GPS 47P 0731378, 1436959)
Measurement Date Mar 17 - 18, 2026
Measurement by Satcha Phetsawaeng
Sound Level Meter 623389

ระดับเสียง (dB(A))					
เวลา	เสียงจากแหล่งกำเนิด	เสียงขณะไม่มีการรบกวน	เสียงขณะมีการรบกวน		ค่าระดับการรบกวน
			กลางวัน	กลางคืน	
03:30 AM - 03:35 AM	48.6	53.5	-	n/a	45.6
03:35 AM - 03:40 AM	47.1	53.5	-	n/a	45.6
03:40 AM - 03:45 AM	47.3	53.5	-	n/a	45.6
03:45 AM - 03:50 AM	48.6	53.5	-	n/a	45.6
03:50 AM - 03:55 AM	50.8	53.5	-	n/a	45.6
03:55 AM - 04:00 AM	49.1	53.5	-	n/a	45.6
04:00 AM - 04:05 AM	49.3	53.5	-	n/a	45.6
04:05 AM - 04:10 AM	47.4	53.5	-	n/a	45.6
04:10 AM - 04:15 AM	48.5	53.5	-	n/a	45.6
04:15 AM - 04:20 AM	48.5	53.5	-	n/a	45.6
04:20 AM - 04:25 AM	48.2	53.5	-	n/a	45.6
04:25 AM - 04:30 AM	48.5	53.5	-	n/a	45.6
04:30 AM - 04:35 AM	48.0	53.5	-	n/a	45.6
04:35 AM - 04:40 AM	48.4	53.5	-	n/a	45.6
04:40 AM - 04:45 AM	49.2	53.5	-	n/a	45.6
04:45 AM - 04:50 AM	48.9	53.5	-	n/a	45.6
04:50 AM - 04:55 AM	49.1	53.5	-	n/a	45.6
04:55 AM - 05:00 AM	47.5	53.5	-	n/a	45.6
05:00 AM - 05:05 AM	46.8	53.5	-	n/a	45.6
05:05 AM - 05:10 AM	50.3	53.5	-	n/a	45.6
05:10 AM - 05:15 AM	50.0	53.5	-	n/a	45.6
05:15 AM - 05:20 AM	50.2	53.5	-	n/a	45.6
05:20 AM - 05:25 AM	49.3	53.5	-	n/a	45.6
05:25 AM - 05:30 AM	49.0	53.5	-	n/a	45.6
05:30 AM - 05:35 AM	50.7	53.5	-	n/a	45.6
05:35 AM - 05:40 AM	48.4	53.5	-	n/a	45.6
05:40 AM - 05:45 AM	49.5	53.5	-	n/a	45.6
05:45 AM - 05:50 AM	51.9	53.5	-	n/a	45.6
05:50 AM - 05:55 AM	52.7	53.5	-	n/a	45.6
05:55 AM - 06:00 AM	52.4	53.5	-	n/a	45.6
06:00 AM - 07:00 AM	51.9	56.5	n/a	-	52.2
07:00 AM - 08:00 AM	55.5	56.5	n/a	-	52.2

ค่ามาตรฐาน

≤ 10

Reference Method :

- ISO 1996-1
- ประกาศกรมโรงงานอุตสาหกรรม เรื่อง วิธีการตรวจระดับเสียงการรบกวน ระดับเสียงเฉลี่ย 24 ชั่วโมง และระดับเสียงสูงสุดที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2567

มาตรฐาน

- ประกาศกระทรวงอุตสาหกรรม เรื่อง กำหนดค่าระดับเสียงการรบกวนและระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
- ประกาศกระทรวงสาธารณสุข เรื่อง กำหนดค่ามาตรฐานคพพิฆาตเสียงอันเกิดจากการประกอบกิจการที่เป็นอันตรายต่อสุขภาพ พ.ศ. 2561

Remark:

- ระดับเสียงจากแหล่งกำเนิด หากการตรวจวัด วันที่ 17-18 มีนาคม 2569
- ระดับเสียงพื้นฐานและระดับเสียงขณะไม่มีการรบกวน วันที่ตรวจวัด 5-6 มีนาคม 2556
- n/a: ไม่สามารถคำนวณระดับเสียงขณะมีการรบกวนเนื่องจากระดับเสียงจากแหล่งกำเนิดน้อยกว่าระดับเสียงขณะไม่มีการรบกวน

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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporm, Pluakdaeng, Rayong Thailand 21140

P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2615893
Date Received : Mar 26, 2026
Date Reported : Apr 02, 2026
Report Number : 3542008-1

Page 1 of 3

Sample No. 2615893-2
Parameter เสียงรบกวน
Location บริเวณสถานีขนถ่ายน้ำมัน (GPS 47P 0731378, 1436959)
Measurement Date Mar 18 - 19, 2026
Measurement by Satcha Phetsawaeng
Sound Level Meter 623389

ระดับเสียง (dB(A))					
เวลา	เสียงจากแหล่งกำเนิด	เสียงขณะไม่มีการรบกวน	เสียงขณะมีการรบกวน		ค่าระดับการรบกวน
			กลางวัน	กลางคืน	
08:00 AM - 09:00 AM	54.9	56.5	n/a	-	52.2
09:00 AM - 10:00 AM	52.3	56.5	n/a	-	52.2
10:00 AM - 11:00 AM	51.4	56.5	n/a	-	52.2
11:00 AM - 12:00 PM	51.6	56.5	n/a	-	52.2
12:00 PM - 01:00 PM	51.0	56.5	n/a	-	52.2
01:00 PM - 02:00 PM	50.7	56.5	n/a	-	52.2
02:00 PM - 03:00 PM	64.9	56.5	64.2	-	52.2
03:00 PM - 04:00 PM	55.5	56.5	n/a	-	52.2
04:00 PM - 05:00 PM	52.8	56.5	n/a	-	52.2
05:00 PM - 06:00 PM	53.8	56.5	n/a	-	52.2
06:00 PM - 07:00 PM	54.4	56.5	n/a	-	52.2
07:00 PM - 08:00 PM	54.5	56.5	n/a	-	52.2
08:00 PM - 09:00 PM	54.5	56.5	n/a	-	52.2
09:00 PM - 10:00 PM	52.4	56.5	n/a	-	52.2
10:00 PM - 10:05 PM	51.5	53.5	-	n/a	45.6
10:05 PM - 10:10 PM	51.8	53.5	-	n/a	45.6
10:10 PM - 10:15 PM	51.7	53.5	-	n/a	45.6
10:15 PM - 10:20 PM	50.7	53.5	-	n/a	45.6
10:20 PM - 10:25 PM	50.7	53.5	-	n/a	45.6
10:25 PM - 10:30 PM	51.5	53.5	-	n/a	45.6
10:30 PM - 10:35 PM	51.2	53.5	-	n/a	45.6
10:35 PM - 10:40 PM	50.8	53.5	-	n/a	45.6
10:40 PM - 10:45 PM	50.7	53.5	-	n/a	45.6
10:45 PM - 10:50 PM	50.7	53.5	-	n/a	45.6
10:50 PM - 10:55 PM	51.6	53.5	-	n/a	45.6
10:55 PM - 11:00 PM	50.6	53.5	-	n/a	45.6
11:00 PM - 11:05 PM	51.1	53.5	-	n/a	45.6
11:05 PM - 11:10 PM	50.7	53.5	-	n/a	45.6
11:10 PM - 11:15 PM	52.2	53.5	-	n/a	45.6
11:15 PM - 11:20 PM	52.9	53.5	-	n/a	45.6
11:20 PM - 11:25 PM	51.8	53.5	-	n/a	45.6
11:25 PM - 11:30 PM	51.0	53.5	-	n/a	45.6
11:30 PM - 11:35 PM	52.4	53.5	-	n/a	45.6
11:35 PM - 11:40 PM	51.4	53.5	-	n/a	45.6
11:40 PM - 11:45 PM	52.6	53.5	-	n/a	45.6
11:45 PM - 11:50 PM	52.6	53.5	-	n/a	45.6
11:50 PM - 11:55 PM	50.7	53.5	-	n/a	45.6
11:55 PM - 12:00 AM	51.4	53.5	-	n/a	45.6
12:00 AM - 12:05 AM	51.8	53.5	-	n/a	45.6
12:05 AM - 12:10 AM	53.4	53.5	-	n/a	45.6

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Analysis / Test Report

Client : Anata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporm, Pluakdaeng, Rayong Thailand 21140

P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2615893
Date Received : Mar 26, 2026
Date Reported : Apr 02, 2026
Report Number : 3542008-1

Page 2 of 3

Sample No. 2615893-2
Parameter เสียงรบกวน
Location บริเวณสถานีอนามัยนาผาพร (GPS 47P 0731378, 1436959)
Measurement Date Mar 18 - 19, 2026
Measurement by Satcha Phetsawaeng
Sound Level Meter 623389

ระดับเสียง (dB(A))					
เวลา	เสียงจากแหล่งกำเนิด	เสียงขณะไม่มีกิจกรรม	เสียงขณะมีการรบกวน		เสียงพื้นฐาน
			กลางวัน	กลางคืน	
12:10 AM - 12:15 AM	51.8	53.5	-	n/a	45.6
12:15 AM - 12:20 AM	51.1	53.5	-	n/a	45.6
12:20 AM - 12:25 AM	52.0	53.5	-	n/a	45.6
12:25 AM - 12:30 AM	52.6	53.5	-	n/a	45.6
12:30 AM - 12:35 AM	50.7	53.5	-	n/a	45.6
12:35 AM - 12:40 AM	49.5	53.5	-	n/a	45.6
12:40 AM - 12:45 AM	50.1	53.5	-	n/a	45.6
12:45 AM - 12:50 AM	48.6	53.5	-	n/a	45.6
12:50 AM - 12:55 AM	49.7	53.5	-	n/a	45.6
12:55 AM - 01:00 AM	49.9	53.5	-	n/a	45.6
01:00 AM - 01:05 AM	49.7	53.5	-	n/a	45.6
01:05 AM - 01:10 AM	49.5	53.5	-	n/a	45.6
01:10 AM - 01:15 AM	49.7	53.5	-	n/a	45.6
01:15 AM - 01:20 AM	47.9	53.5	-	n/a	45.6
01:20 AM - 01:25 AM	48.3	53.5	-	n/a	45.6
01:25 AM - 01:30 AM	51.8	53.5	-	n/a	45.6
01:30 AM - 01:35 AM	49.3	53.5	-	n/a	45.6
01:35 AM - 01:40 AM	47.3	53.5	-	n/a	45.6
01:40 AM - 01:45 AM	48.7	53.5	-	n/a	45.6
01:45 AM - 01:50 AM	48.2	53.5	-	n/a	45.6
01:50 AM - 01:55 AM	47.7	53.5	-	n/a	45.6
01:55 AM - 02:00 AM	49.1	53.5	-	n/a	45.6
02:00 AM - 02:05 AM	47.8	53.5	-	n/a	45.6
02:05 AM - 02:10 AM	47.5	53.5	-	n/a	45.6
02:10 AM - 02:15 AM	49.4	53.5	-	n/a	45.6
02:15 AM - 02:20 AM	48.7	53.5	-	n/a	45.6
02:20 AM - 02:25 AM	48.6	53.5	-	n/a	45.6
02:25 AM - 02:30 AM	47.8	53.5	-	n/a	45.6
02:30 AM - 02:35 AM	49.2	53.5	-	n/a	45.6
02:35 AM - 02:40 AM	48.1	53.5	-	n/a	45.6
02:40 AM - 02:45 AM	49.2	53.5	-	n/a	45.6
02:45 AM - 02:50 AM	49.2	53.5	-	n/a	45.6
02:50 AM - 02:55 AM	48.9	53.5	-	n/a	45.6
02:55 AM - 03:00 AM	49.7	53.5	-	n/a	45.6
03:00 AM - 03:05 AM	48.8	53.5	-	n/a	45.6
03:05 AM - 03:10 AM	47.3	53.5	-	n/a	45.6
03:10 AM - 03:15 AM	48.0	53.5	-	n/a	45.6
03:15 AM - 03:20 AM	49.6	53.5	-	n/a	45.6
03:20 AM - 03:25 AM	48.2	53.5	-	n/a	45.6
03:25 AM - 03:30 AM	47.7	53.5	-	n/a	45.6

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Analysis / Test Report

Client : Anata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporm, Pluakdaeng, Rayong Thailand 21140

P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2615893
Date Received : Mar 26, 2026
Date Reported : Apr 02, 2026
Report Number : 3542008-1

Page 3 of 3

Sample No. 2615893-2
Parameter เสียงรบกวน
Location บริเวณสถานีอนามัยนาผาพร (GPS 47P 0731378, 1436959)
Measurement Date Mar 18 - 19, 2026
Measurement by Satcha Phetsawaeng
Sound Level Meter 623389

ระดับเสียง (dB(A))					
เวลา	เสียงจากแหล่งกำเนิด	เสียงขณะไม่มีกิจกรรม	เสียงขณะมีการรบกวน		เสียงพื้นฐาน
			กลางวัน	กลางคืน	
03:30 AM - 03:35 AM	48.4	53.5	-	n/a	45.6
03:35 AM - 03:40 AM	47.3	53.5	-	n/a	45.6
03:40 AM - 03:45 AM	47.6	53.5	-	n/a	45.6
03:45 AM - 03:50 AM	48.0	53.5	-	n/a	45.6
03:50 AM - 03:55 AM	48.3	53.5	-	n/a	45.6
03:55 AM - 04:00 AM	48.7	53.5	-	n/a	45.6
04:00 AM - 04:05 AM	48.1	53.5	-	n/a	45.6
04:05 AM - 04:10 AM	48.3	53.5	-	n/a	45.6
04:10 AM - 04:15 AM	47.8	53.5	-	n/a	45.6
04:15 AM - 04:20 AM	50.0	53.5	-	n/a	45.6
04:20 AM - 04:25 AM	48.8	53.5	-	n/a	45.6
04:25 AM - 04:30 AM	49.6	53.5	-	n/a	45.6
04:30 AM - 04:35 AM	49.1	53.5	-	n/a	45.6
04:35 AM - 04:40 AM	49.9	53.5	-	n/a	45.6
04:40 AM - 04:45 AM	49.2	53.5	-	n/a	45.6
04:45 AM - 04:50 AM	49.9	53.5	-	n/a	45.6
04:50 AM - 04:55 AM	49.6	53.5	-	n/a	45.6
04:55 AM - 05:00 AM	48.7	53.5	-	n/a	45.6
05:00 AM - 05:05 AM	50.6	53.5	-	n/a	45.6
05:05 AM - 05:10 AM	51.0	53.5	-	n/a	45.6
05:10 AM - 05:15 AM	50.2	53.5	-	n/a	45.6
05:15 AM - 05:20 AM	51.6	53.5	-	n/a	45.6
05:20 AM - 05:25 AM	51.8	53.5	-	n/a	45.6
05:25 AM - 05:30 AM	50.6	53.5	-	n/a	45.6
05:30 AM - 05:35 AM	50.5	53.5	-	n/a	45.6
05:35 AM - 05:40 AM	50.1	53.5	-	n/a	45.6
05:40 AM - 05:45 AM	51.7	53.5	-	n/a	45.6
05:45 AM - 05:50 AM	51.2	53.5	-	n/a	45.6
05:50 AM - 05:55 AM	53.5	53.5	-	n/a	45.6
05:55 AM - 06:00 AM	53.0	53.5	-	n/a	45.6
06:00 AM - 07:00 AM	55.0	56.5	n/a	-	52.2
07:00 AM - 08:00 AM	55.4	56.5	n/a	-	52.2

ตามมาตรฐาน

≤ 10

Reference Method :

- ISO 1996-1
- ประกาศกรมโรงงานอุตสาหกรรม เรื่อง วิธีการตรวจวัดระดับเสียงการรบกวน ระดับเสียงเฉลี่ย 24 ชั่วโมง และระดับเสียงสูงสุดที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2567

มาตรฐาน

- ประกาศกระทรวงอุตสาหกรรม เรื่อง กำหนดค่าระดับเสียงการรบกวนและระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
- ประกาศกระทรวงสาธารณสุข เรื่อง กำหนดค่ามาตรฐานเพศทางเสียงอันเกิดจากการประกอบกิจการเป็นอันตรายต่อสุขภาพ พ.ศ. 2561

Remark:

- ระดับเสียงจากแหล่งกำเนิด ทำการตรวจวัด วันที่ 17-18 มีนาคม 2569
- ระดับเสียงพื้นฐานและระดับเสียงขณะไม่มีกิจกรรม ตรวจวัดในวันที่ 5-6 มีนาคม 2556
- n/a: ไม่สามารถคำนวณระดับเสียงขณะมีการรบกวนเนื่องจากระดับเสียงจากแหล่งกำเนิดน้อยกว่าระดับเสียงขณะไม่มีกิจกรรม

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Approved by

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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporm, Pluakdaeng, Rayong Thailand 21140

P/O : 2601110101
Project Name : ABPR 1
Project Location :

Sample No. 2615893-3
Parameter เสียงรบกวน
Location บริเวณสถานีอนามัยนวมฤาพร (GPS 47P 0731378, 1436959)
Measurement Date Mar 19 - 20, 2026
Measurement by Satcha Phetsawaeng
Sound Level Meter 623389

Lot ID: 2615893
Date Received : Mar 26, 2026
Date Reported : Apr 02, 2026
Report Number : 3542009-1

Page 1 of 3

ระดับเสียง (dB(A))						
เวลา	เสียงจากแหล่งกำเนิด	เสียงขณะไม่มีกิจกรรม	เสียงขณะมีการรบกวน		เสียงพื้นฐาน	ค่าระดับการรบกวน
			กลางวัน	กลางคืน		
08:00 AM - 09:00 AM	54.5	56.5	n/a	-	52.2	-
09:00 AM - 10:00 AM	53.1	56.5	n/a	-	52.2	-
10:00 AM - 11:00 AM	53.1	56.5	n/a	-	52.2	-
11:00 AM - 12:00 PM	53.3	56.5	n/a	-	52.2	-
12:00 PM - 01:00 PM	53.2	56.5	n/a	-	52.2	-
01:00 PM - 02:00 PM	60.2	56.5	57.8	-	52.2	5.6
02:00 PM - 03:00 PM	59.9	56.5	57.2	-	52.2	5.0
03:00 PM - 04:00 PM	57.4	56.5	50.1	-	52.2	-2.1
04:00 PM - 05:00 PM	55.5	56.5	n/a	-	52.2	-
05:00 PM - 06:00 PM	54.5	56.5	n/a	-	52.2	-
06:00 PM - 07:00 PM	54.7	56.5	n/a	-	52.2	-
07:00 PM - 08:00 PM	55.1	56.5	n/a	-	52.2	-
08:00 PM - 09:00 PM	55.3	56.5	n/a	-	52.2	-
09:00 PM - 10:00 PM	53.2	56.5	n/a	-	52.2	-
10:00 PM - 10:05 PM	52.6	53.5	-	n/a	45.6	-
10:05 PM - 10:10 PM	51.6	53.5	-	n/a	45.6	-
10:10 PM - 10:15 PM	52.7	53.5	-	n/a	45.6	-
10:15 PM - 10:20 PM	51.4	53.5	-	n/a	45.6	-
10:20 PM - 10:25 PM	52.2	53.5	-	n/a	45.6	-
10:25 PM - 10:30 PM	52.3	53.5	-	n/a	45.6	-
10:30 PM - 10:35 PM	53.2	53.5	-	n/a	45.6	-
10:35 PM - 10:40 PM	52.1	53.5	-	n/a	45.6	-
10:40 PM - 10:45 PM	52.3	53.5	-	n/a	45.6	-
10:45 PM - 10:50 PM	52.4	53.5	-	n/a	45.6	-
10:50 PM - 10:55 PM	51.9	53.5	-	n/a	45.6	-
10:55 PM - 11:00 PM	51.4	53.5	-	n/a	45.6	-
11:00 PM - 11:05 PM	50.3	53.5	-	n/a	45.6	-
11:05 PM - 11:10 PM	50.0	53.5	-	n/a	45.6	-
11:10 PM - 11:15 PM	51.4	53.5	-	n/a	45.6	-
11:15 PM - 11:20 PM	52.2	53.5	-	n/a	45.6	-
11:20 PM - 11:25 PM	50.7	53.5	-	n/a	45.6	-
11:25 PM - 11:30 PM	51.3	53.5	-	n/a	45.6	-
11:30 PM - 11:35 PM	51.6	53.5	-	n/a	45.6	-
11:35 PM - 11:40 PM	51.8	53.5	-	n/a	45.6	-
11:40 PM - 11:45 PM	49.9	53.5	-	n/a	45.6	-
11:45 PM - 11:50 PM	50.2	53.5	-	n/a	45.6	-
11:50 PM - 11:55 PM	51.5	53.5	-	n/a	45.6	-
11:55 PM - 12:00 AM	48.8	53.5	-	n/a	45.6	-
12:00 AM - 12:05 AM	50.4	53.5	-	n/a	45.6	-
12:05 AM - 12:10 AM	51.6	53.5	-	n/a	45.6	-

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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporm, Pluakdaeng, Rayong Thailand 21140

P/O : 2601110101
Project Name : ABPR 1
Project Location :

Sample No. 2615893-3
Parameter เสียงรบกวน
Location บริเวณสถานีอนามัยนวมฤาพร (GPS 47P 0731378, 1436959)
Measurement Date Mar 19 - 20, 2026
Measurement by Satcha Phetsawaeng
Sound Level Meter 623389

Lot ID: 2615893
Date Received : Mar 26, 2026
Date Reported : Apr 02, 2026
Report Number : 3542009-1

Page 2 of 3

ระดับเสียง (dB(A))						
เวลา	เสียงจากแหล่งกำเนิด	เสียงขณะไม่มีกิจกรรม	เสียงขณะมีการรบกวน		เสียงพื้นฐาน	ค่าระดับการรบกวน
			กลางวัน	กลางคืน		
12:10 AM - 12:15 AM	52.0	53.5	-	n/a	45.6	-
12:15 AM - 12:20 AM	50.3	53.5	-	n/a	45.6	-
12:20 AM - 12:25 AM	49.9	53.5	-	n/a	45.6	-
12:25 AM - 12:30 AM	48.8	53.5	-	n/a	45.6	-
12:30 AM - 12:35 AM	49.9	53.5	-	n/a	45.6	-
12:35 AM - 12:40 AM	48.4	53.5	-	n/a	45.6	-
12:40 AM - 12:45 AM	47.9	53.5	-	n/a	45.6	-
12:45 AM - 12:50 AM	50.6	53.5	-	n/a	45.6	-
12:50 AM - 12:55 AM	51.1	53.5	-	n/a	45.6	-
12:55 AM - 01:00 AM	50.5	53.5	-	n/a	45.6	-
01:00 AM - 01:05 AM	49.6	53.5	-	n/a	45.6	-
01:05 AM - 01:10 AM	51.2	53.5	-	n/a	45.6	-
01:10 AM - 01:15 AM	48.9	53.5	-	n/a	45.6	-
01:15 AM - 01:20 AM	49.8	53.5	-	n/a	45.6	-
01:20 AM - 01:25 AM	49.7	53.5	-	n/a	45.6	-
01:25 AM - 01:30 AM	49.1	53.5	-	n/a	45.6	-
01:30 AM - 01:35 AM	49.6	53.5	-	n/a	45.6	-
01:35 AM - 01:40 AM	48.8	53.5	-	n/a	45.6	-
01:40 AM - 01:45 AM	48.3	53.5	-	n/a	45.6	-
01:45 AM - 01:50 AM	47.3	53.5	-	n/a	45.6	-
01:50 AM - 01:55 AM	46.5	53.5	-	n/a	45.6	-
01:55 AM - 02:00 AM	48.0	53.5	-	n/a	45.6	-
02:00 AM - 02:05 AM	46.4	53.5	-	n/a	45.6	-
02:05 AM - 02:10 AM	47.2	53.5	-	n/a	45.6	-
02:10 AM - 02:15 AM	48.1	53.5	-	n/a	45.6	-
02:15 AM - 02:20 AM	47.5	53.5	-	n/a	45.6	-
02:20 AM - 02:25 AM	48.4	53.5	-	n/a	45.6	-
02:25 AM - 02:30 AM	48.0	53.5	-	n/a	45.6	-
02:30 AM - 02:35 AM	48.3	53.5	-	n/a	45.6	-
02:35 AM - 02:40 AM	52.5	53.5	-	n/a	45.6	-
02:40 AM - 02:45 AM	46.3	53.5	-	n/a	45.6	-
02:45 AM - 02:50 AM	48.0	53.5	-	n/a	45.6	-
02:50 AM - 02:55 AM	48.1	53.5	-	n/a	45.6	-
02:55 AM - 03:00 AM	45.9	53.5	-	n/a	45.6	-
03:00 AM - 03:05 AM	46.6	53.5	-	n/a	45.6	-
03:05 AM - 03:10 AM	47.7	53.5	-	n/a	45.6	-
03:10 AM - 03:15 AM	46.9	53.5	-	n/a	45.6	-
03:15 AM - 03:20 AM	47.2	53.5	-	n/a	45.6	-
03:20 AM - 03:25 AM	47.4	53.5	-	n/a	45.6	-
03:25 AM - 03:30 AM	47.4	53.5	-	n/a	45.6	-

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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporm, Pluakdaeng, Rayong Thailand 21140

P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2615893
Date Received :Mar 26, 2026
Date Reported :Apr 02, 2026
Report Number : 3542009-1

Page 3 of 3

Sample No. 2615893-3
Parameter เสียงรบกวน
Location บริเวณสถานีน้ำมันยานพาหนะ (GPS 47P 0731378, 1436959)
Measurement Date Mar 19 - 20, 2026
Measurement by Satcha Phetsawaeng
Sound Level Meter 623389

ระดับเสียง (dB(A))					
เวลา	เสียงจากแหล่งกำเนิด	เสียงขณะไม่มีกิจกรรม	เสียงขณะมีกิจกรรม		ค่าระดับการรบกวน
			กลางวัน	กลางคืน	
03:30 AM - 03:35 AM	46.7	53.5	-	n/a	45.6
03:35 AM - 03:40 AM	46.7	53.5	-	n/a	45.6
03:40 AM - 03:45 AM	46.8	53.5	-	n/a	45.6
03:45 AM - 03:50 AM	47.4	53.5	-	n/a	45.6
03:50 AM - 03:55 AM	50.9	53.5	-	n/a	45.6
03:55 AM - 04:00 AM	47.4	53.5	-	n/a	45.6
04:00 AM - 04:05 AM	48.0	53.5	-	n/a	45.6
04:05 AM - 04:10 AM	48.3	53.5	-	n/a	45.6
04:10 AM - 04:15 AM	47.5	53.5	-	n/a	45.6
04:15 AM - 04:20 AM	48.5	53.5	-	n/a	45.6
04:20 AM - 04:25 AM	50.4	53.5	-	n/a	45.6
04:25 AM - 04:30 AM	49.9	53.5	-	n/a	45.6
04:30 AM - 04:35 AM	48.2	53.5	-	n/a	45.6
04:35 AM - 04:40 AM	48.7	53.5	-	n/a	45.6
04:40 AM - 04:45 AM	47.8	53.5	-	n/a	45.6
04:45 AM - 04:50 AM	49.2	53.5	-	n/a	45.6
04:50 AM - 04:55 AM	48.3	53.5	-	n/a	45.6
04:55 AM - 05:00 AM	49.2	53.5	-	n/a	45.6
05:00 AM - 05:05 AM	49.3	53.5	-	n/a	45.6
05:05 AM - 05:10 AM	49.9	53.5	-	n/a	45.6
05:10 AM - 05:15 AM	50.4	53.5	-	n/a	45.6
05:15 AM - 05:20 AM	52.9	53.5	-	n/a	45.6
05:20 AM - 05:25 AM	48.7	53.5	-	n/a	45.6
05:25 AM - 05:30 AM	49.4	53.5	-	n/a	45.6
05:30 AM - 05:35 AM	50.4	53.5	-	n/a	45.6
05:35 AM - 05:40 AM	50.5	53.5	-	n/a	45.6
05:40 AM - 05:45 AM	50.2	53.5	-	n/a	45.6
05:45 AM - 05:50 AM	50.6	53.5	-	n/a	45.6
05:50 AM - 05:55 AM	50.2	53.5	-	n/a	45.6
05:55 AM - 06:00 AM	53.8	53.5	-	45.0	-0.6
06:00 AM - 07:00 AM	55.0	56.5	n/a	-	52.2
07:00 AM - 08:00 AM	55.7	56.5	n/a	-	52.2
ค่ามาตรฐาน					≤ 10

Reference Method :
1. ISO 1996-1
2. ประกาศกรมโรงงานอุตสาหกรรม เรื่อง มาตรการบรรเทาผลกระทบสิ่งแวดล้อมจากโรงงาน ระดับเสียงเฉลี่ย 24 ชั่วโมง และระดับเสียงสูงสุดที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2567

มาตรฐาน
1. ประกาศกระทรวงอุตสาหกรรม เรื่อง กำหนดค่าระดับเสียงการรบกวนและระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
2. ประกาศกระทรวงสาธารณสุข เรื่อง กำหนดค่ามาตรฐานพิษทางเสียงอันเกิดจากการประกอบกิจการที่เป็นอันตรายต่อสุขภาพ พ.ศ. 2561

Remark :
1. ระดับเสียงจากแหล่งกำเนิด ทำการตรวจวัด วันที่ 17-18 มีนาคม 2569
2. ระดับเสียงพื้นฐานและระดับเสียงขณะไม่มีกิจกรรมการ รบกวนตรวจวัด 5-6 มีนาคม 2566
3. n/a: ไม่สามารถคำนวณระดับเสียงขณะมีกิจกรรมเนื่องจากแหล่งกำเนิดน้อยการรบกวนเสียงขณะไม่มีกิจกรรม

The above results are valid only for the analysed/tested service(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporm, Pluakdaeng, Rayong Thailand 21140

P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2615893
Date Received :Mar 26, 2026
Date Reported :Apr 02, 2026
Report Number : 3542010-1

Page 1 of 3

Sample No. 2615893-4
Parameter เสียงรบกวน
Location บริเวณสถานีน้ำมันยานพาหนะ (GPS 47P 0731378, 1436959)
Measurement Date Mar 20 - 21, 2026
Measurement by Satcha Phetsawaeng
Sound Level Meter 623389

ระดับเสียง (dB(A))					
เวลา	เสียงจากแหล่งกำเนิด	เสียงขณะไม่มีกิจกรรม	เสียงขณะมีกิจกรรม		ค่าระดับการรบกวน
			กลางวัน	กลางคืน	
08:00 AM - 09:00 AM	54.1	56.5	n/a	-	52.2
09:00 AM - 10:00 AM	69.3	56.5	69.1	-	52.2
10:00 AM - 11:00 AM	57.3	56.5	49.6	-	52.2
11:00 AM - 12:00 PM	53.2	56.5	n/a	-	52.2
12:00 PM - 01:00 PM	52.9	56.5	n/a	-	52.2
01:00 PM - 02:00 PM	51.1	56.5	n/a	-	52.2
02:00 PM - 03:00 PM	53.2	56.5	n/a	-	52.2
03:00 PM - 04:00 PM	52.4	56.5	n/a	-	52.2
04:00 PM - 05:00 PM	54.9	56.5	n/a	-	52.2
05:00 PM - 06:00 PM	55.3	56.5	n/a	-	52.2
06:00 PM - 07:00 PM	53.5	56.5	n/a	-	52.2
07:00 PM - 08:00 PM	53.7	56.5	n/a	-	52.2
08:00 PM - 09:00 PM	54.1	56.5	n/a	-	52.2
09:00 PM - 10:00 PM	52.1	56.5	n/a	-	52.2
10:00 PM - 10:05 PM	50.7	53.5	-	n/a	45.6
10:05 PM - 10:10 PM	51.7	53.5	-	n/a	45.6
10:10 PM - 10:15 PM	52.2	53.5	-	n/a	45.6
10:15 PM - 10:20 PM	51.5	53.5	-	n/a	45.6
10:20 PM - 10:25 PM	52.2	53.5	-	n/a	45.6
10:25 PM - 10:30 PM	50.6	53.5	-	n/a	45.6
10:30 PM - 10:35 PM	50.1	53.5	-	n/a	45.6
10:35 PM - 10:40 PM	50.1	53.5	-	n/a	45.6
10:40 PM - 10:45 PM	51.6	53.5	-	n/a	45.6
10:45 PM - 10:50 PM	50.3	53.5	-	n/a	45.6
10:50 PM - 10:55 PM	49.8	53.5	-	n/a	45.6
10:55 PM - 11:00 PM	51.8	53.5	-	n/a	45.6
11:00 PM - 11:05 PM	51.2	53.5	-	n/a	45.6
11:05 PM - 11:10 PM	52.7	53.5	-	n/a	45.6
11:10 PM - 11:15 PM	52.4	53.5	-	n/a	45.6
11:15 PM - 11:20 PM	51.1	53.5	-	n/a	45.6
11:20 PM - 11:25 PM	51.0	53.5	-	n/a	45.6
11:25 PM - 11:30 PM	52.7	53.5	-	n/a	45.6
11:30 PM - 11:35 PM	52.6	53.5	-	n/a	45.6
11:35 PM - 11:40 PM	51.4	53.5	-	n/a	45.6
11:40 PM - 11:45 PM	54.4	53.5	-	50.1	45.6
11:45 PM - 11:50 PM	50.6	53.5	-	n/a	45.6
11:50 PM - 11:55 PM	51.8	53.5	-	n/a	45.6
11:55 PM - 12:00 AM	51.1	53.5	-	n/a	45.6
12:00 AM - 12:05 AM	51.3	53.5	-	n/a	45.6
12:05 AM - 12:10 AM	51.7	53.5	-	n/a	45.6

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Wilawan Borirak
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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporm, Pluakdaeng, Rayong Thailand 21140

P/O : 2601110101
Project Name : ABPR 1
Project Location :

Sample No. 2615893-4
Parameter เสียงรบกวน
Location บริเวณสถานีอนามัยนวมฤาพร (GPS 47P 0731378, 1436959)
Measurement Date Mar 20 - 21, 2026
Measurement by Satcha Phetsawaeng
Sound Level Meter 623389

Lot ID: 2615893
Date Received : Mar 26, 2026
Date Reported : Apr 02, 2026
Report Number : 3542010-1

Page 2 of 3

ระดับเสียง (dB(A))					
เวลา	เสียงจากแหล่งกำเนิด	เสียงขณะไม่มีกิจกรรม	เสียงขณะมีการรบกวน		เสียงพื้นฐาน
			กลางวัน	กลางคืน	
12:10 AM - 12:15 AM	51.7	53.5	-	n/a	45.6
12:15 AM - 12:20 AM	52.9	53.5	-	n/a	45.6
12:20 AM - 12:25 AM	50.7	53.5	-	n/a	45.6
12:25 AM - 12:30 AM	51.1	53.5	-	n/a	45.6
12:30 AM - 12:35 AM	50.0	53.5	-	n/a	45.6
12:35 AM - 12:40 AM	50.8	53.5	-	n/a	45.6
12:40 AM - 12:45 AM	51.6	53.5	-	n/a	45.6
12:45 AM - 12:50 AM	52.6	53.5	-	n/a	45.6
12:50 AM - 12:55 AM	51.6	53.5	-	n/a	45.6
12:55 AM - 01:00 AM	50.4	53.5	-	n/a	45.6
01:00 AM - 01:05 AM	49.7	53.5	-	n/a	45.6
01:05 AM - 01:10 AM	49.7	53.5	-	n/a	45.6
01:10 AM - 01:15 AM	52.6	53.5	-	n/a	45.6
01:15 AM - 01:20 AM	51.2	53.5	-	n/a	45.6
01:20 AM - 01:25 AM	50.5	53.5	-	n/a	45.6
01:25 AM - 01:30 AM	49.9	53.5	-	n/a	45.6
01:30 AM - 01:35 AM	48.2	53.5	-	n/a	45.6
01:35 AM - 01:40 AM	50.5	53.5	-	n/a	45.6
01:40 AM - 01:45 AM	47.3	53.5	-	n/a	45.6
01:45 AM - 01:50 AM	51.4	53.5	-	n/a	45.6
01:50 AM - 01:55 AM	49.3	53.5	-	n/a	45.6
01:55 AM - 02:00 AM	47.4	53.5	-	n/a	45.6
02:00 AM - 02:05 AM	46.8	53.5	-	n/a	45.6
02:05 AM - 02:10 AM	52.2	53.5	-	n/a	45.6
02:10 AM - 02:15 AM	49.0	53.5	-	n/a	45.6
02:15 AM - 02:20 AM	49.5	53.5	-	n/a	45.6
02:20 AM - 02:25 AM	49.6	53.5	-	n/a	45.6
02:25 AM - 02:30 AM	48.0	53.5	-	n/a	45.6
02:30 AM - 02:35 AM	48.0	53.5	-	n/a	45.6
02:35 AM - 02:40 AM	48.4	53.5	-	n/a	45.6
02:40 AM - 02:45 AM	47.9	53.5	-	n/a	45.6
02:45 AM - 02:50 AM	49.5	53.5	-	n/a	45.6
02:50 AM - 02:55 AM	50.5	53.5	-	n/a	45.6
02:55 AM - 03:00 AM	49.2	53.5	-	n/a	45.6
03:00 AM - 03:05 AM	54.4	53.5	50.1	n/a	45.6
03:05 AM - 03:10 AM	49.9	53.5	-	n/a	45.6
03:10 AM - 03:15 AM	48.7	53.5	-	n/a	45.6
03:15 AM - 03:20 AM	48.7	53.5	-	n/a	45.6
03:20 AM - 03:25 AM	47.6	53.5	-	n/a	45.6
03:25 AM - 03:30 AM	48.2	53.5	-	n/a	45.6

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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporm, Pluakdaeng, Rayong Thailand 21140

P/O : 2601110101
Project Name : ABPR 1
Project Location :

Sample No. 2615893-4
Parameter เสียงรบกวน
Location บริเวณสถานีอนามัยนวมฤาพร (GPS 47P 0731378, 1436959)
Measurement Date Mar 20 - 21, 2026
Measurement by Satcha Phetsawaeng
Sound Level Meter 623389

Lot ID: 2615893
Date Received : Mar 26, 2026
Date Reported : Apr 02, 2026
Report Number : 3542010-1

Page 3 of 3

ระดับเสียง (dB(A))					
เวลา	เสียงจากแหล่งกำเนิด	เสียงขณะไม่มีกิจกรรม	เสียงขณะมีการรบกวน		เสียงพื้นฐาน
			กลางวัน	กลางคืน	
03:30 AM - 03:35 AM	48.9	53.5	-	n/a	45.6
03:35 AM - 03:40 AM	49.0	53.5	-	n/a	45.6
03:40 AM - 03:45 AM	48.7	53.5	-	n/a	45.6
03:45 AM - 03:50 AM	48.9	53.5	-	n/a	45.6
03:50 AM - 03:55 AM	49.4	53.5	-	n/a	45.6
03:55 AM - 04:00 AM	49.2	53.5	-	n/a	45.6
04:00 AM - 04:05 AM	48.3	53.5	-	n/a	45.6
04:05 AM - 04:10 AM	49.7	53.5	-	n/a	45.6
04:10 AM - 04:15 AM	48.9	53.5	-	n/a	45.6
04:15 AM - 04:20 AM	48.6	53.5	-	n/a	45.6
04:20 AM - 04:25 AM	49.1	53.5	-	n/a	45.6
04:25 AM - 04:30 AM	50.1	53.5	-	n/a	45.6
04:30 AM - 04:35 AM	50.1	53.5	-	n/a	45.6
04:35 AM - 04:40 AM	49.6	53.5	-	n/a	45.6
04:40 AM - 04:45 AM	50.0	53.5	-	n/a	45.6
04:45 AM - 04:50 AM	50.3	53.5	-	n/a	45.6
04:50 AM - 04:55 AM	49.5	53.5	-	n/a	45.6
04:55 AM - 05:00 AM	49.2	53.5	-	n/a	45.6
05:00 AM - 05:05 AM	50.2	53.5	-	n/a	45.6
05:05 AM - 05:10 AM	50.5	53.5	-	n/a	45.6
05:10 AM - 05:15 AM	52.6	53.5	-	n/a	45.6
05:15 AM - 05:20 AM	51.6	53.5	-	n/a	45.6
05:20 AM - 05:25 AM	50.9	53.5	-	n/a	45.6
05:25 AM - 05:30 AM	50.5	53.5	-	n/a	45.6
05:30 AM - 05:35 AM	50.6	53.5	-	n/a	45.6
05:35 AM - 05:40 AM	50.6	53.5	-	n/a	45.6
05:40 AM - 05:45 AM	50.7	53.5	-	n/a	45.6
05:45 AM - 05:50 AM	52.3	53.5	-	n/a	45.6
05:50 AM - 05:55 AM	51.8	53.5	-	n/a	45.6
05:55 AM - 06:00 AM	52.2	53.5	-	n/a	45.6
06:00 AM - 07:00 AM	51.5	56.5	n/a	-	52.2
07:00 AM - 08:00 AM	54.4	56.5	n/a	-	52.2

ตามมาตรฐาน

≤ 10

Reference Method :

- ISO 1996-1
- ประกาศกรมโรงงานอุตสาหกรรม เรื่อง วิธีการตรวจวัดระดับเสียงการรบกวน ระดับเสียงเฉลี่ย 24 ชั่วโมง และระดับเสียงสูงสุดที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2567

มาตรฐาน

- ประกาศกระทรวงอุตสาหกรรม เรื่อง กำหนดค่าระดับเสียงการรบกวนและระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
- ประกาศกระทรวงสาธารณสุข เรื่อง กำหนดค่ามาตรฐานเสียงทางเสียงอันเกิดจากการประกอบกิจการที่เป็นอันตรายต่อสุขภาพ พ.ศ. 2561

Remark:

- ระดับเสียงจากแหล่งกำเนิด ทำการตรวจวัด วันที่ 17-18 มีนาคม 2569
- ระดับเสียงพื้นฐานและระดับเสียงขณะไม่มีกิจกรรม ตรวจวัดวันที่ 5-6 มีนาคม 2556
- n/a: ไม่สามารถคำนวณระดับเสียงขณะมีการรบกวนเนื่องจากระดับเสียงจากแหล่งกำเนิดน้อยกว่าระดับเสียงขณะไม่มีกิจกรรม

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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporm, Pluakdaeng, Rayong Thailand 21140

P/O : 260110101
Project Name : ABPR 1
Project Location :

Sample No. 2615893-5
Parameter เสียงรบกวน
Location บริเวณสถานีอนามัยนวมฤาพร (GPS 47P 0731378, 1436959)
Measurement Date Mar 21 - 22, 2026
Measurement by Satcha Phetsawaeng
Sound Level Meter 623389

Lot ID: 2615893
Date Received : Mar 26, 2026
Date Reported : Apr 02, 2026
Report Number : 35420111-1

Page 1 of 3

ระดับเสียง (dB(A))						
เวลา	เสียงจากแหล่งกำเนิด	เสียงขณะไม่มีกิจกรรม	เสียงขณะมีการรบกวน		เสียงพื้นฐาน	ค่าระดับการรบกวน
			กลางวัน	กลางคืน		
08:00 AM - 09:00 AM	54.8	56.5	n/a	-	52.2	-
09:00 AM - 10:00 AM	53.3	56.5	n/a	-	52.2	-
10:00 AM - 11:00 AM	59.6	56.5	56.7	-	52.2	4.5
11:00 AM - 12:00 PM	51.9	56.5	n/a	-	52.2	-
12:00 PM - 01:00 PM	52.2	56.5	n/a	-	52.2	-
01:00 PM - 02:00 PM	53.2	56.5	n/a	-	52.2	-
02:00 PM - 03:00 PM	52.2	56.5	n/a	-	52.2	-
03:00 PM - 04:00 PM	53.5	56.5	n/a	-	52.2	-
04:00 PM - 05:00 PM	54.4	56.5	n/a	-	52.2	-
05:00 PM - 06:00 PM	55.5	56.5	n/a	-	52.2	-
06:00 PM - 07:00 PM	54.0	56.5	n/a	-	52.2	-
07:00 PM - 08:00 PM	53.6	56.5	n/a	-	52.2	-
08:00 PM - 09:00 PM	54.2	56.5	n/a	-	52.2	-
09:00 PM - 10:00 PM	52.0	56.5	n/a	-	52.2	-
10:00 PM - 10:05 PM	52.4	53.5	-	n/a	45.6	-
10:05 PM - 10:10 PM	51.7	53.5	-	n/a	45.6	-
10:10 PM - 10:15 PM	53.2	53.5	-	n/a	45.6	-
10:15 PM - 10:20 PM	51.7	53.5	-	n/a	45.6	-
10:20 PM - 10:25 PM	50.9	53.5	-	n/a	45.6	-
10:25 PM - 10:30 PM	54.7	53.5	-	51.5	45.6	5.9
10:30 PM - 10:35 PM	52.8	53.5	-	n/a	45.6	-
10:35 PM - 10:40 PM	50.0	53.5	-	n/a	45.6	-
10:40 PM - 10:45 PM	53.0	53.5	-	n/a	45.6	-
10:45 PM - 10:50 PM	53.2	53.5	-	n/a	45.6	-
10:50 PM - 10:55 PM	54.4	53.5	-	50.1	45.6	4.5
10:55 PM - 11:00 PM	51.0	53.5	-	n/a	45.6	-
11:00 PM - 11:05 PM	50.1	53.5	-	n/a	45.6	-
11:05 PM - 11:10 PM	54.3	53.5	-	49.6	45.6	4.0
11:10 PM - 11:15 PM	52.5	53.5	-	n/a	45.6	-
11:15 PM - 11:20 PM	49.8	53.5	-	n/a	45.6	-
11:20 PM - 11:25 PM	51.5	53.5	-	n/a	45.6	-
11:25 PM - 11:30 PM	50.1	53.5	-	n/a	45.6	-
11:30 PM - 11:35 PM	52.2	53.5	-	n/a	45.6	-
11:35 PM - 11:40 PM	50.4	53.5	-	n/a	45.6	-
11:40 PM - 11:45 PM	50.2	53.5	-	n/a	45.6	-
11:45 PM - 11:50 PM	50.8	53.5	-	n/a	45.6	-
11:50 PM - 11:55 PM	48.3	53.5	-	n/a	45.6	-
11:55 PM - 12:00 AM	51.0	53.5	-	n/a	45.6	-
12:00 AM - 12:05 AM	50.6	53.5	-	n/a	45.6	-
12:05 AM - 12:10 AM	49.4	53.5	-	n/a	45.6	-

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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
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P/O : 260110101
Project Name : ABPR 1
Project Location :

Sample No. 2615893-5
Parameter เสียงรบกวน
Location บริเวณสถานีอนามัยนวมฤาพร (GPS 47P 0731378, 1436959)
Measurement Date Mar 21 - 22, 2026
Measurement by Satcha Phetsawaeng
Sound Level Meter 623389

Lot ID: 2615893
Date Received : Mar 26, 2026
Date Reported : Apr 02, 2026
Report Number : 35420111-1

Page 2 of 3

ระดับเสียง (dB(A))						
เวลา	เสียงจากแหล่งกำเนิด	เสียงขณะไม่มีกิจกรรม	เสียงขณะมีการรบกวน		เสียงพื้นฐาน	ค่าระดับการรบกวน
			กลางวัน	กลางคืน		
12:10 AM - 12:15 AM	49.6	53.5	-	n/a	45.6	-
12:15 AM - 12:20 AM	51.6	53.5	-	n/a	45.6	-
12:20 AM - 12:25 AM	50.2	53.5	-	n/a	45.6	-
12:25 AM - 12:30 AM	50.6	53.5	-	n/a	45.6	-
12:30 AM - 12:35 AM	50.0	53.5	-	n/a	45.6	-
12:35 AM - 12:40 AM	48.9	53.5	-	n/a	45.6	-
12:40 AM - 12:45 AM	49.8	53.5	-	n/a	45.6	-
12:45 AM - 12:50 AM	49.0	53.5	-	n/a	45.6	-
12:50 AM - 12:55 AM	49.6	53.5	-	n/a	45.6	-
12:55 AM - 01:00 AM	52.6	53.5	-	n/a	45.6	-
01:00 AM - 01:05 AM	51.1	53.5	-	n/a	45.6	-
01:05 AM - 01:10 AM	47.8	53.5	-	n/a	45.6	-
01:10 AM - 01:15 AM	47.8	53.5	-	n/a	45.6	-
01:15 AM - 01:20 AM	50.1	53.5	-	n/a	45.6	-
01:20 AM - 01:25 AM	48.3	53.5	-	n/a	45.6	-
01:25 AM - 01:30 AM	48.3	53.5	-	n/a	45.6	-
01:30 AM - 01:35 AM	48.9	53.5	-	n/a	45.6	-
01:35 AM - 01:40 AM	49.9	53.5	-	n/a	45.6	-
01:40 AM - 01:45 AM	48.8	53.5	-	n/a	45.6	-
01:45 AM - 01:50 AM	48.0	53.5	-	n/a	45.6	-
01:50 AM - 01:55 AM	49.8	53.5	-	n/a	45.6	-
01:55 AM - 02:00 AM	49.7	53.5	-	n/a	45.6	-
02:00 AM - 02:05 AM	47.3	53.5	-	n/a	45.6	-
02:05 AM - 02:10 AM	50.0	53.5	-	n/a	45.6	-
02:10 AM - 02:15 AM	49.3	53.5	-	n/a	45.6	-
02:15 AM - 02:20 AM	48.5	53.5	-	n/a	45.6	-
02:20 AM - 02:25 AM	48.1	53.5	-	n/a	45.6	-
02:25 AM - 02:30 AM	49.1	53.5	-	n/a	45.6	-
02:30 AM - 02:35 AM	51.5	53.5	-	n/a	45.6	-
02:35 AM - 02:40 AM	50.2	53.5	-	n/a	45.6	-
02:40 AM - 02:45 AM	47.9	53.5	-	n/a	45.6	-
02:45 AM - 02:50 AM	49.9	53.5	-	n/a	45.6	-
02:50 AM - 02:55 AM	48.6	53.5	-	n/a	45.6	-
02:55 AM - 03:00 AM	50.5	53.5	-	n/a	45.6	-
03:00 AM - 03:05 AM	50.5	53.5	-	n/a	45.6	-
03:05 AM - 03:10 AM	48.9	53.5	-	n/a	45.6	-
03:10 AM - 03:15 AM	47.8	53.5	-	n/a	45.6	-
03:15 AM - 03:20 AM	47.5	53.5	-	n/a	45.6	-
03:20 AM - 03:25 AM	49.0	53.5	-	n/a	45.6	-
03:25 AM - 03:30 AM	48.7	53.5	-	n/a	45.6	-

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Wilawan Borirak

Wilawan Borirak
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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporm, Pluakdaeng, Rayong Thailand 21140

Lot ID: 2615893
Date Received : Mar 26, 2026
Date Reported : Apr 02, 2026
Report Number : 3542011-1

P/O : 2601110101
Project Name : ABPR 1
Project Location :

Page 3 of 3

Sample No. 2615893-5
Parameter เสียงรบกวน
Location บริเวณสถานีน้ำมันยานพาหนะ (GPS 47P 0731378, 1436959)
Measurement Date Mar 21 - 22, 2026
Measurement by Satcha Phetsawaeng
Sound Level Meter 623389

ระดับเสียง (dB(A))						
เวลา	เสียงจากแหล่งกำเนิด	เสียงขณะไม่มีการรบกวน	เสียงขณะมีการรบกวน		เสียงพื้นฐาน	ค่าระดับการรบกวน
			กลางวัน	กลางคืน		
03:30 AM - 03:35 AM	50.0	53.5	-	n/a	45.6	-
03:35 AM - 03:40 AM	50.1	53.5	-	n/a	45.6	-
03:40 AM - 03:45 AM	50.2	53.5	-	n/a	45.6	-
03:45 AM - 03:50 AM	50.0	53.5	-	n/a	45.6	-
03:50 AM - 03:55 AM	46.9	53.5	-	n/a	45.6	-
03:55 AM - 04:00 AM	51.5	53.5	-	n/a	45.6	-
04:00 AM - 04:05 AM	50.6	53.5	-	n/a	45.6	-
04:05 AM - 04:10 AM	47.6	53.5	-	n/a	45.6	-
04:10 AM - 04:15 AM	48.7	53.5	-	n/a	45.6	-
04:15 AM - 04:20 AM	49.7	53.5	-	n/a	45.6	-
04:20 AM - 04:25 AM	47.7	53.5	-	n/a	45.6	-
04:25 AM - 04:30 AM	49.2	53.5	-	n/a	45.6	-
04:30 AM - 04:35 AM	48.4	53.5	-	n/a	45.6	-
04:35 AM - 04:40 AM	48.6	53.5	-	n/a	45.6	-
04:40 AM - 04:45 AM	49.3	53.5	-	n/a	45.6	-
04:45 AM - 04:50 AM	50.2	53.5	-	n/a	45.6	-
04:50 AM - 04:55 AM	48.4	53.5	-	n/a	45.6	-
04:55 AM - 05:00 AM	47.8	53.5	-	n/a	45.6	-
05:00 AM - 05:05 AM	47.8	53.5	-	n/a	45.6	-
05:05 AM - 05:10 AM	49.6	53.5	-	n/a	45.6	-
05:10 AM - 05:15 AM	49.8	53.5	-	n/a	45.6	-
05:15 AM - 05:20 AM	50.7	53.5	-	n/a	45.6	-
05:20 AM - 05:25 AM	49.6	53.5	-	n/a	45.6	-
05:25 AM - 05:30 AM	49.0	53.5	-	n/a	45.6	-
05:30 AM - 05:35 AM	48.1	53.5	-	n/a	45.6	-
05:35 AM - 05:40 AM	49.2	53.5	-	n/a	45.6	-
05:40 AM - 05:45 AM	50.9	53.5	-	n/a	45.6	-
05:45 AM - 05:50 AM	50.1	53.5	-	n/a	45.6	-
05:50 AM - 05:55 AM	52.8	53.5	-	n/a	45.6	-
05:55 AM - 06:00 AM	52.1	53.5	-	n/a	45.6	-
06:00 AM - 07:00 AM	55.6	56.5	n/a	-	52.2	-
07:00 AM - 08:00 AM	55.6	56.5	n/a	-	52.2	-
ค่ามาตรฐาน						≤ 10

Reference Method :
1. ISO 1996-1
2. ประกาศกรมโรงงานอุตสาหกรรม เรื่อง วิธีการตรวจวัดระดับเสียงการรบกวน ระดับเสียงเฉลี่ย 24 ชั่วโมง และระดับเสียงสูงสุดที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2567

มาตรฐาน
1. ประกาศกระทรวงอุตสาหกรรม เรื่อง กำหนดค่าระดับเสียงการรบกวนและระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
2. ประกาศกระทรวงสาธารณสุข เรื่อง กำหนดค่ามาตรฐานมลพิษทางเสียงอันเกิดจากการประกอบกิจการที่เป็นอันตรายต่อสุขภาพ พ.ศ. 2561

Remark:
1. ระดับเสียงจากแหล่งกำเนิด ทำการตรวจวัด วันที่ 17-18 มีนาคม 2569
2. ระดับเสียงพื้นฐานและระดับเสียงขณะไม่มีการรบกวน วันที่ตรวจวัด 5-6 มีนาคม 2556
3. n/a: ไม่สามารถคำนวณระดับเสียงขณะมีการรบกวนเนื่องจากระดับเสียงจากแหล่งกำเนิดน้อยกว่าระดับเสียงขณะไม่มีการรบกวน

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ภาคผนวก ค-7

ระดับเสียงในสถานที่ทำงาน



Analysis / Test Report

Client: Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2613291
Date Received : Mar 16, 2026
Date Reported : Mar 20, 2026
Report Number: 3532773-1

Page 1 of 1

Sample Number 2613291-1
Parameter Noise (Leq 8 hrs.)
Location เครื่องผลิตไฟฟ้ากังหันไอน้ำ (Steam Turbine 10)
Measurement Date Mar 16, 2026
Measurement by Nattakarn Vonginyoo

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:40 AM - 10:40 AM	74.5	77.4	73.8
10:40 AM - 11:40 AM	74.4	77.0	73.7
11:40 AM - 12:40 PM	74.3	77.9	73.8
12:40 PM - 01:40 PM	74.8	78.3	74.0
01:40 PM - 02:40 PM	74.5	77.4	73.8
02:40 PM - 03:40 PM	74.4	77.1	73.6
03:40 PM - 04:40 PM	74.5	77.3	73.7
04:40 PM - 05:40 PM	74.6	78.1	73.8

Leq Average 8 hrs. (dB(A)) 74.5
Lmax (dB(A)) 78.3
Standard (dB(A)) 90
Reference Method : ISO 1996-1 : 2016
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการควบคุมการปล่อยเสียง
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Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

Supot S
Supot Salamteh
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S:\Reports_Air Noise\ rpt (10.36AM)



Analysis / Test Report

Client: Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2613291
Date Received : Mar 16, 2026
Date Reported : Mar 20, 2026
Report Number: 3532774-1

Page 1 of 1

Sample Number 2613291-2
Parameter Noise (Leq 8 hrs.)
Location เครื่องผลิตไฟฟ้ากังหันก๊าซ 11 (Gas Turbine Generator 11)
Measurement Date Mar 16, 2026
Measurement by Nattakarn Vonginyoo

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:45 AM - 10:45 AM	74.6	78.5	73.8
10:45 AM - 11:45 AM	74.4	77.3	73.8
11:45 AM - 12:45 PM	73.2	77.7	72.2
12:45 PM - 01:45 PM	75.5	80.0	73.0
01:45 PM - 02:45 PM	75.1	78.7	74.0
02:45 PM - 03:45 PM	74.7	78.1	73.8
03:45 PM - 04:45 PM	74.8	79.4	73.8
04:45 PM - 05:45 PM	75.2	79.8	74.2

Leq Average 8 hrs. (dB(A)) 74.7
Lmax (dB(A)) 80.0
Standard (dB(A)) 90
Reference Method : ISO 1996-1 : 2016
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการควบคุมการปล่อยเสียง
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Analysis / Test Report

Client: Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2613291
Date Received : Mar 16, 2026
Date Reported : Mar 20, 2026
Report Number: 3532775-1

Page 1 of 1

Sample Number 2613291-3
Parameter Noise (Leq 8 hrs.)
Location เครื่องผลิตไฟฟ้ากังหันก๊าซ 12 (Gas Turbine Generator 12)
Measurement Date Mar 16, 2026
Measurement by Nattakarn Vonginyoo

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:42 AM - 10:42 AM	80.1	83.1	79.5
10:42 AM - 11:42 AM	79.5	81.7	79.0
11:42 AM - 12:42 PM	78.3	82.0	76.9
12:42 PM - 01:42 PM	79.2	82.8	77.5
01:42 PM - 02:42 PM	79.8	81.9	79.3
02:42 PM - 03:42 PM	79.8	82.5	79.3
03:42 PM - 04:42 PM	79.9	82.4	79.4
04:42 PM - 05:42 PM	79.7	82.4	79.2

Leq Average 8 hrs. (dB(A)) 79.6
Lmax (dB(A)) 83.1
Standard (dB(A)) 90
Reference Method : ISO 1996-1 : 2016
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการควบคุมการปล่อยเสียง
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Analysis / Test Report

Client: Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2613291
Date Received : Mar 16, 2026
Date Reported : Mar 20, 2026
Report Number: 3532776-1

Page 1 of 1

Sample Number 2613291-4
Parameter Noise (Leq 8 hrs.)
Location เครื่องอัดอากาศ (Air Compressor ABPR1)
Measurement Date Mar 16, 2026
Measurement by Nattakarn Vonginyoo

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:19 AM - 10:19 AM	80.9	96.8	78.4
10:19 AM - 11:19 AM	80.8	97.0	78.2
11:19 AM - 12:19 PM	80.5	97.0	78.2
12:19 PM - 01:19 PM	80.0	96.9	77.6
01:19 PM - 02:19 PM	80.2	97.3	77.6
02:19 PM - 03:19 PM	80.2	97.5	77.6
03:19 PM - 04:19 PM	80.2	97.3	77.6
04:19 PM - 05:19 PM	80.1	97.4	77.5

Leq Average 8 hrs. (dB(A)) 80.4
Lmax (dB(A)) 97.5
Standard (dB(A)) 90
Reference Method : ISO 1996-1 : 2016
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการควบคุมการปล่อยเสียง
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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporm, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2647240
Date Received : Jun 18, 2026
Date Reported : Jun 23, 2026
Report Number: 3603977-1

Page 1 of 1

Sample Number 2647240-1
Parameter Noise (Leq 8 hrs.)
Location เครื่องผลิตไฟฟ้ากังหันไอน้ำ (Steam Turbine 10)
Measurement Date Jun 17, 2026
Measurement by Saksit Phaisanphisit

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:41 AM - 09:41 AM	76.6	80.1	75.7
09:41 AM - 10:41 AM	75.9	79.3	75.1
10:41 AM - 11:41 AM	76.2	81.4	75.1
11:41 AM - 12:41 PM	76.2	79.4	75.3
12:41 PM - 01:41 PM	76.4	80.2	75.5
01:41 PM - 02:41 PM	75.9	84.3	75.1
02:41 PM - 03:41 PM	76.3	78.9	75.6
03:41 PM - 04:41 PM	76.4	84.9	75.7

Leq Average 8 hrs. (dB(A)) 76.2
Lmax (dB(A)) 84.9
Standard (dB(A)) 90
Reference Method : ISO 1996-1 : 2016
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการวัดการปล่อยเสียง
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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporm, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2647240
Date Received : Jun 18, 2026
Date Reported : Jun 23, 2026
Report Number: 3603978-1

Page 1 of 1

Sample Number 2647240-2
Parameter Noise (Leq 8 hrs.)
Location เครื่องผลิตไฟฟ้ากังหันก๊าซ 11 (Gas Turbine Generator 11)
Measurement Date Jun 17, 2026
Measurement by Saksit Phaisanphisit

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:53 AM - 09:53 AM	74.3	78.7	72.7
09:53 AM - 10:53 AM	76.4	80.6	74.2
10:53 AM - 11:53 AM	76.9	80.0	74.2
11:53 AM - 12:53 PM	73.1	77.5	71.5
12:53 PM - 01:53 PM	74.1	77.5	72.5
01:53 PM - 02:53 PM	74.1	84.1	73.1
02:53 PM - 03:53 PM	74.7	78.2	74.1
03:53 PM - 04:53 PM	75.3	78.7	73.7

Leq Average 8 hrs. (dB(A)) 75.0
Lmax (dB(A)) 84.1
Standard (dB(A)) 90
Reference Method : ISO 1996-1 : 2016
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการวัดการปล่อยเสียง
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S:\Report\Air Noise rpt (3-24PM)



Analysis / Test Report

Client: Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporm, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2647240
Date Received : Jun 18, 2026
Date Reported : Jun 23, 2026
Report Number: 3603979-1

Page 1 of 1

Sample Number 2647240-3
Parameter Noise (Leq 8 hrs.)
Location เครื่องผลิตไฟฟ้ากังหันก๊าซ 12 (Gas Turbine Generator 12)
Measurement Date Jun 17, 2026
Measurement by Saksit Phaisanphisit

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:53 AM - 09:53 AM	77.1	80.9	76.0
09:53 AM - 10:53 AM	76.9	80.8	75.8
10:53 AM - 11:53 AM	76.8	80.6	75.7
11:53 AM - 12:53 PM	75.8	80.1	74.6
12:53 PM - 01:53 PM	77.3	80.9	75.7
01:53 PM - 02:53 PM	78.4	80.6	77.5
02:53 PM - 03:53 PM	77.3	80.9	76.7
03:53 PM - 04:53 PM	76.9	80.2	76.2

Leq Average 8 hrs. (dB(A)) 77.1
Lmax (dB(A)) 80.9
Standard (dB(A)) 90
Reference Method : ISO 1996-1 : 2016
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการควบคุมการปล่อยเสียง
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S:\Report\Air Noise rpt (3.25PM)



Analysis / Test Report

Client: Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporm, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2647240
Date Received : Jun 18, 2026
Date Reported : Jun 23, 2026
Report Number: 3603980-1

Page 1 of 1

Sample Number 2647240-4
Parameter Noise (Leq 8 hrs.)
Location เครื่องอัดอากาศ (Air Compressor ABPR1)
Measurement Date Jun 17, 2026
Measurement by Saksit Phaisanphisit

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:38 AM - 09:38 AM	79.2	83.6	77.4
09:38 AM - 10:38 AM	79.0	84.3	77.4
10:38 AM - 11:38 AM	79.2	83.8	77.5
11:38 AM - 12:38 PM	79.0	83.8	77.2
12:38 PM - 01:38 PM	79.4	90.5	77.7
01:38 PM - 02:38 PM	82.4	96.8	78.0
02:38 PM - 03:38 PM	79.4	83.7	77.5
03:38 PM - 04:38 PM	79.2	84.5	77.6

Leq Average 8 hrs. (dB(A)) 79.8
Lmax (dB(A)) 96.8
Standard (dB(A)) 90
Reference Method : ISO 1996-1 : 2016
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการควบคุมการปล่อยเสียง
ในการประกอบกิจการโรงงานเกี่ยวกับผลการวัดเสียงในการทำงาน พ.ศ.๒๕๕๖

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

Supot S
Supot Salamteh
Section Head

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
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9773-41/ EMAIL

S:\Report\Air Noise rpt (3.25PM)

ภาคผนวก ค-8

ระดับความร้อนในสถานประกอบการ



Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2627787

Date Received : Apr 01, 2026

Date Reported : Apr 04, 2026

Report Number: 3539602-1

Page 1 of 2

Sample Number 2627787-1
Parameter Heat Stress (Sampling Time : 11.00 AM - 01.00 PM)
Measurement Date Apr 01, 2026
Measurement by Natthapon Jiengwareewong
Location ปฏิบัติงาน - พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
หม้อไอน้ำ	120	30.1	26.8	38.6	35.7
Average (WBGT)		30.1			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
2. Ministerial Regulation on Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environment in relation to Heat, Light and Noise, B.E.2559

Technical Management


Supot Salamteh
Section Head

Approved by


Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Amata B. Grimm Power (Rayong) 1 Limited
7/316 Moo 6, Mabyangporn, Pluakdaeng, Rayong Thailand 21140
P/O : 2601110101
Project Name : ABPR 1
Project Location :

Lot ID: 2627787

Date Received : Apr 01, 2026

Date Reported : Apr 04, 2026

Report Number: 3539602-1

Page 2 of 2

Sample Number 2627787-2
Parameter Heat Stress (Sampling Time : 11.00 AM - 01.00 PM)
Measurement Date Apr 01, 2026
Measurement by Natthapon Jiengwareewong
Location ปฏิบัติงาน - พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
เครื่องกำเนิดไฟฟ้า	120	31.4	27.3	42.4	37.9
Average (WBGT)		31.4			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
2. Ministerial Regulation on Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environment in relation to Heat, Light and Noise, B.E.2559

Technical Management


Supot Salamteh
Section Head

Approved by


Wichan Choonharat
Assistant Manager

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ใบรับรองการสอบเทียบเครื่องมือ



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รายการเครื่องมือที่ใช้ในการวิเคราะห์ / ทดสอบ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Stack	Carbon Monoxide	Console Control Unit	NKH_FS0170	13-May-25	13-May-26	12
Stack	Carbon Monoxide	Probe	RYG_FS0749	6-Jan-26	6-Jul-26	6
Stack	Carbon Monoxide	Fuel Gas Analyzer	NKH_FS0168	28-Apr-25	28-Apr-26	12
Stack	Carbon Monoxide	CO Analyzer	BKK_EN0375	4-Aug-25	3-Aug-26	12
Stack	Oxides of Nitrogen	Console Control Unit	NKH_FS0170	13-May-25	13-May-26	12
Stack	Oxides of Nitrogen	Probe	RYG_FS0749	6-Jan-26	6-Jul-26	6
Stack	Oxides of Nitrogen	Fuel Gas Analyzer	NKH_FS0168	28-Apr-25	28-Apr-26	12
Stack	Oxides of Nitrogen	Vacuum Gauge	NKH_FS0169	22-Jul-25	22-Jan-27	18
Stack	Oxides of Nitrogen	Spectrophotometer	BKK_EN0356	8-Oct-25	8-Oct-26	12
Stack	Sulfur Dioxide	Console Control Unit	NKH_FS0170	13-May-25	13-May-26	12
Stack	Sulfur Dioxide	Probe	RYG_FS0749	6-Jan-26	6-Jul-26	6
Stack	Sulfur Dioxide	Fuel Gas Analyzer	NKH_FS0168	28-Apr-25	28-Apr-26	12
Stack	Sulfur Dioxide	Dry Gas	NKH_FS0171	27-May-25	27-May-26	12
Stack	Total Suspended Particulate	Console Control Unit	NKH_FS0170	13-May-25	13-May-26	12
Stack	Total Suspended Particulate	Probe	RYG_FS0749	6-Jan-26	6-Jul-26	6
Stack	Total Suspended Particulate	Fuel Gas Analyzer	NKH_FS0168	28-Apr-25	28-Apr-26	12
Stack	Total Suspended Particulate	Digital Balance	BKK_EN0309	29-Oct-25	29-Oct-26	12
Ambient	Nitrogen Dioxide	NO ₂ Analyzer	NKH_FS0082	5-Jan-26	5-Jul-26	6
Ambient	Nitrogen Dioxide	NO ₂ Analyzer	NKH_FS0078	5-Jan-26	5-Jul-26	6
Ambient	Nitrogen Dioxide	NO ₂ Analyzer	RYG_FS0261	5-Jan-26	5-Jul-26	6
Ambient	Nitrogen Dioxide	NO ₂ Analyzer	RYG_FS0264	5-Jan-26	5-Jul-26	6
Ambient	Nitrogen Dioxide	NO ₂ Analyzer	RYG_FS0272	5-Jan-26	5-Jul-26	6
Ambient	Sulfur Dioxide	SO ₂ Analyzer	NKH_FS0083	5-Jan-26	5-Jul-26	6
Ambient	Sulfur Dioxide	SO ₂ Analyzer	NKH_FS0079	5-Jan-26	5-Jul-26	6
Ambient	Sulfur Dioxide	SO ₂ Analyzer	BKK_FS0775	5-Jan-26	5-Jul-26	6
Ambient	Sulfur Dioxide	SO ₂ Analyzer	BKK_FS0740	5-Jan-26	5-Jul-26	6
Ambient	Sulfur Dioxide	SO ₂ Analyzer	BKK_FS0772	5-Jan-26	5-Jul-26	6
Ambient	Particulate Matter (PM-10)	High Volume	NKH_FS0047	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	High Volume	NKH_FS0045	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	High Volume	RYG_FS0667	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	High Volume	RYG_FS0295	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	High Volume	RYG_FS0188	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	Digital Balance	RYG_EN0001	3-Feb-26	3-Feb-27	12
Ambient	Total Suspended Particulate	High Volume	NKH_FS0051	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	NKH_FS0052	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	BKK_FS0371	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	BKK_FS0359	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	BKK_FS0362	-	-	On site Calibration
Ambient	Total Suspended Particulate	Digital Balance	RYG_EN0001	3-Feb-26	3-Feb-27	12
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	RYG_FS0609	21-Jan-26	20-Jul-27	18
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	RYG_FS0649	17-Jan-25	16-Jul-26	18
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	RYG_FS0413	29-Oct-24	29-Apr-26	18
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	RYG_FS0611	6-Jan-26	5-Jul-27	18
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	BKK_FS0143	23-Feb-26	22-Aug-27	18
Noise	Leq 24 hrs	Sound Calibrator	RYG_FS0213	9-Jan-26	8-Jan-27	12
Noise	Leq 24 hrs	Sound Level Meter	RYG_FS0615	22-Dec-25	21-Dec-26	12
Noise	Leq 24 hrs	Sound Level Meter	RYG_FS0614	24-Dec-25	23-Dec-26	12
Noise	Noise Annoyance	Sound Calibrator	RYG_FS0213	9-Jan-26	8-Jan-27	12
Noise	Noise Annoyance	Sound Level Meter	RYG_FS0614	24-Dec-25	23-Dec-26	12
Noise	Leq 8 hrs	Sound Calibrator	RYG_FS0213	9-Jan-26	8-Jan-27	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0384	29-Oct-25	28-Oct-26	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0304	18-Aug-25	17-Aug-26	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0381	29-Oct-25	29-Oct-26	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0434	21-Jan-26	20-Jan-27	12
Noise	Leq 8 hrs	Sound Calibrator	RYG_FS0213	9-Jan-26	8-Jan-27	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0437	18-Dec-25	17-Dec-26	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0438	29-Oct-25	28-Oct-26	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0432	21-Jan-26	20-Jan-27	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0030	21-Jan-26	20-Jan-27	12



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รายการเครื่องมือที่ใช้ในการวิเคราะห์ / ทดสอบ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Heat	Heat Stress	Heat Stress Monitor	RYG_FS0356	6-Jan-26	5-Jan-27	12
Heat	Heat Stress	Heat Stress Monitor	RYG_FS0231	20-Feb-26	19-Feb-27	12
Rayong Lab	pH on site	pH meter	RYG_FS0596	25-Jun-25	25-Jun-26	12
Rayong Lab	Temperature	pH meter	RYG_FS0596	25-Jun-25	25-Jun-26	12
Rayong Lab	BOD	DO meter with Sensor	RYG_EN0032	20-Jan-25	20-Jul-26	18
Rayong Lab	BOD	Incubator	RYG_EN0154	18-Mar-26	18-Sep-27	18
Rayong Lab	BOD	Burette	RYG_EN0216	18-Sep-25	18-Sep-26	12
Rayong Lab	COD	Spectrophotometer	RYG_EN0037	18-Mar-25	18-Sep-26	18
Rayong Lab	Total Suspended Solids	Electronic Balance	RYG_EN0163	3-Feb-26	3-Feb-27	12
Rayong Lab	Total Suspended Solids	Chamber (Oven)	RYG_EN0012	10-Sep-25	10-Mar-27	18
Rayong Lab	Total Dissolved Solids 180°C	Electronic Balance	RYG_EN0163	3-Feb-26	3-Feb-27	12
Rayong Lab	Total Dissolved Solids 180°C	Chamber (Oven)	RYG_EN0012	10-Sep-25	10-Mar-27	18
Rayong Lab	Oil & Grease	Electronic Balance	RYG_EN0003	3-Feb-26	3-Feb-27	12
Rayong Lab	Oil & Grease	Liquid Bath (Water)	RYG_EN0220	27-Nov-25	27-Nov-26	12

Calibration certificate Kalibrier-Zertifikat

6354299

Object Gegenstand: Controlunit T350 Measuring Box testo 350

Manufacturer Hersteller: TESTO SE & Co. KGaA TESTO SE & Co. KGaA

Type description Typ: D632 3511 D632 3510

Serial no. Serien Nr.: 55436222 85147886

Inventory no. Inventar Nr.: --- ---

Test equipment no. Prüfmittel Nr.: --- ---

Equipment no. Equipment Nr.: 16238245 16238451

Location Standort: --- ---

Customer Auftraggeber: ALS Laboratory Group (Thailand) Co., Ltd.
104 Phatthanakan 40,
Phatthanakan Road Khwaeng Phatthanakan
TH-10250 Khet Suan Luang Bangkok

Customer ID no. Kunden Nr.: 1031984

Order no. Auftrags Nr.: 13028654 / 0520 0055

Date of calibration Datum der Kalibrierung: 28.04.2025

Date of the recommended re-calibration Datum der empfohlenen Rekalibrierung: 28.04.2026

Conformity statement Konformitätsaussage: Pass

The reported uncertainty of measurement was calculated according to EA-4/02 M:2022 with a coverage probability of about 95% and contains the uncertainty of the reference, the uncertainty of the method and the uncertainty of the test specimen. The conformity statement is made according to the decision rule "confidence level 90".
Die erweiterte Messunsicherheit wurde nach EA-4/02 M:2022 mit einer Überdeckungs Wahrscheinlichkeit von etwa 95% berechnet und enthält die Unsicherheit der Referenz, die Unsicherheit der Methode sowie die Unsicherheit des Prüflings. Die Konformitätsaussage erfolgt nach der Entscheidungsregel "Vertrauensniveau 90".
This calibration certificate may not be reproduced other than in full, except with the permission of the issuing laboratory. Calibration certificates without signature and seal are not valid.
Dieses Kalibrierzertifikat darf nur vollständig wiedergegeben werden. Auszüge oder Änderungen bedürfen der Genehmigung des ausstellenden Kalibrierlaboratoriums. Ohne Kalibrierstempel und Unterschrift haben keine Gültigkeit.

REVIEW BY: *Martina P.*
APPROVED BY: *Martina P.*
NEXT CAL DATE: 28/04/26



Supervisor Fachgruppenleiter

Martin Förderer

Technician Dienstleister

Johannes Wiegler

Testo Industrial Services GmbH

Gewerbestraße 3
72198 KirchheimTel: +49 7141 93001-8000 www.testo.de
Fax: +49 7141 93001-8000

Calibration certificate Kalibrier-Zertifikat

6354299

Measuring equipment Messmeßgeräte

Traceability	Next cal.	Certificate no.	Eq. no.
1. Test gas medium 1 (Propan Medium 1)	2025-04	6242999	1309085
2. Test gas medium 2 (Propan Medium 2)	2025-04	6242999	1309085
3. Test gas medium 3 (Propan Medium 3)	2025-04	6242999	1309085
4. Test gas medium 4 (Propan Medium 4)	2025-04	6242999	1309085
5. Test gas medium 5 (Propan Medium 5)	2025-04	6242999	1309085
6. Test gas medium 6 (Propan Medium 6)	2025-04	6242999	1309085
7. Test gas medium 7 (Propan Medium 7)	2025-04	6242999	1309085
8. Test gas medium 8 (Propan Medium 8)	2025-04	6242999	1309085
9. Test gas medium 9 (Propan Medium 9)	2025-04	6242999	1309085
10. Test gas medium 10 (Propan Medium 10)	2025-04	6242999	1309085
11. Test gas medium 11 (Propan Medium 11)	2025-04	6242999	1309085

Reference certificates are available at: www.primaonline.com Referenzzertifikate sind auf: www.primaonline.com abrufbar

Ambient conditions Umgebungsbedingungen

Temperature Temperatur: (20...26) °C Humidity Feuchte: (20...60) % RH % RH

Measuring procedure Messverfahren

The calibration was carried out by comparison measurement with calibrated test gases. Die Kalibrierung erfolgte durch Vergleichsmessung mit kalibrierten Prüfgasen.

Measuring results Messergebnisse

Reference value (Bezugswert)	Indicated measured value (Angezeigter Messwert)	Deviation (Abweichung)	Allowed deviation ¹⁾ (Zulässige Abweichung ²⁾)	Measurement uncertainty (k=2) (Messunsicherheit (k=2))	Confirmation (Freigabe)
ppm Vol.-%	ppm Vol.-%	ppm Vol.-%	ppm Vol.-%	ppm Vol.-%	
CO					
100.3 ³⁾	98	-2.3	± 11	3.3	pass
401.0 ³⁾	408	7.0	± 21	9.4	pass
706.0 ³⁾	712	6.0	± 36	14.4	pass
NO					
150.3 ³⁾	151	0.7	± 9	4.0	pass
300 ³⁾	305	5.0	± 16	6.9	pass
NO2					
97.3 ³⁾	100.9	3.6	± 5.1	3.00	pass
SO2					
100.0 ³⁾	98	-2.0	± 6	3.0	pass
O2					
0.00 ³⁾	0.07	0.07	± 0.21	0.037	pass
2.50 ³⁾	2.58	0.08	± 0.21	0.055	pass
5.00 ³⁾	5.07	0.07	± 0.21	0.102	pass

³⁾ in accordance with the manufacturer's data Hersteller

Remarks Bemerkungen

Testo Industrial Services GmbH

Gewerbestraße 3
72198 KirchheimTel: +49 7141 93001-8000 www.testo.de
Fax: +49 7141 93001-8000

MULTI POINT CALIBRATION REPORT

CUSTOMER NAME : ALS Laboratory Group (Thailand) Co. Ltd.

EQUIPMENT NAME : CO Analyzer

MANUFACTURER : Teledyne - API MODEL : T300 SERIAL NO : 5947

STANDARD GAS CONCENTRATION (PPM) : 808.9 CERTIFIED DATE : OCT39972

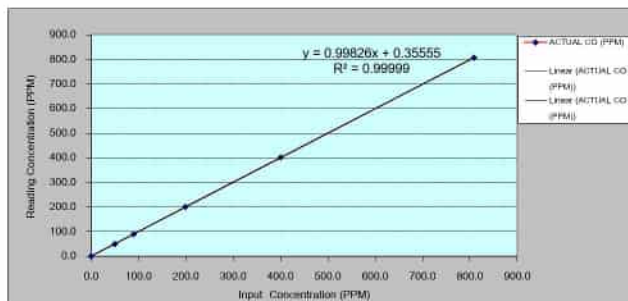
CYLINDER PRESSURE (psig) : 900 CERTIFIED DATE : Nov. 05, 2020

CERTIFIED BY : AIRGAS SPECIALTY GASES EXPIRED DATE : Nov. 05, 2028

CALIBRATION RESULTS

POINT NO	CALIBRATION RESULTS			
	IDEAL (PPM)	ACTUAL CO (PPM)	ERROR CO (PPM)	% ERROR CO
ZERO	0.00	0.010	0.010	-
1	50.00	49.541	-0.459	-0.915
2	90.00	89.472	-0.528	-0.587
3	199.20	200.522	1.322	0.664
4	400.30	401.311	1.011	0.253
5	808.90	806.978	-1.922	-0.238
AVERAGE (%)				0.523

REVIEW BY: *Martina P.*
APPROVED BY: *Martina P.*
CERTIFY DATE: 03/08/26



CALIBRATED BY : คุณสมชาย นพวิทย์

DATE : 4 สิงหาคม 2568

ต้องการข้อมูลทางด้านเทคนิคเพิ่มเติม : คุณสมชาย นพวิทย์ โทรศัพท์: 02-515-8867

เลขที่ 388 ถนนประชาภิรม แขวงจันทนาภิรม เขตจตุจักร กรุงเทพฯ 10000 โทรศัพท์: 0-2515-8888 โทรสาร: 0-2515-8888 E-Mail: info@nmetra.co.th



CALIBRATION LABORATORY Co., LTD.

2/10-11, 14, 55 Soi Praset Manulit 29 Yank 4, Praset Manulit Rd., Ladphras, Bangkok 10230
Tel: 02-576-0333-4 Fax: 02-576-2672 www.cal-lab.com E-mail: sales@cal-lab.com

CERTIFICATE OF CALIBRATION

FOR

NOMENCLATURE : DIGITAL PRESSURE GAUGE
MANUFACTURER : DWYER
MODEL / TYPE : DPGA-00
SERIAL NO. : DVG17[NKH_FS0169]
CLID. NO. : 212501437
JOB CONTROL NO. : 250719085187
CALIBRATION SERVICE : ☒ IN-LABORATORY ☐ ON-SITE

CUSTOMER : ALS LABORATORY GROUP (THAILAND) CO., LTD.

104 PHATTHANAKAN 40, PHATTHANAKAN RD.,

KHWAENG PHATTHANAKAN, KHET SUAN LUANG, BANGKOK 10250, THAILAND

DATE OF RECEIVED : 19 July 2025

DATE OF ISSUED : 23 July 2025

The report of calibration shall not be reproduced except in full without approval of the Calibration Laboratory Co., Ltd.

Calibrated By : Sitipong Pimdee
Calibration Engineer

Approved By : Mongkol Yotsontorn
Authorized Signatory
23 July 2025



This Calibration Certificate documents the traceability to national standards, which realize the units of measurement according to the International System of Units (SI)

Certificate No. Q25085187

F3-011-05/12-23

page 1 of 3





REPORT OF CALIBRATION

FOR

NOMENCLATURE : DIGITAL PRESSURE GAUGE
MANUFACTURER : DWYER
MODEL / TYPE : DPGA-00
SERIAL NO. : DVG17[NKH_FS0169]
DATE OF CALIBRATION : 22 July 2025

ENVIRONMENT CONDITIONS :

Temperature : (23 ± 2) °C

Relative Humidity : (55 ± 10) %RH

PROCEDURE USED :

This instrument was calibrated under procedure No. CLC-CPPP-05 according to DKD-R 6-1 as calibration guidelines.

The calibration was performed by direct measurement with Document Process Calibrator and Pressure Module which maintained by the Calibration Laboratory Co., Ltd.

REFERENCE STANDARD USED :

Document Process Calibrator, Fluke Model 741B S/N: 8295020 with Pressure Module Model 700PV4 S/N: 19298401.

TRACEABILITY :

The measurements are traceable to International System of Units (SI), through National Institute of Metrology (Thailand).
Certificate No. MP-0110-24, Due Date 05 August 2025.

UNCERTAINTY :

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor of $k=2$. It has been evaluated according to the "Calibration of Pressure Gauges (DKD-R 6-1)" which provides a level of confidence approximately 95%.

Certificate No. Q25085187

F3-011-05/12-23

page 2 of 3



www.calibration.com



CONDITION OF CALIBRATION ITEM : RECEIVED IN GOOD OPERATIONAL CONDITION

MEASUREMENT RESULTS : (X) without adjustment () adjustment

The DUC was exercised by applying a known pressure from its zero to full scale 1 times. Then 2 series of known gauge pressure were applied. The STD reading were recorded and the means value were reported in the table below.

CALIBRATION DATA

CORRECTION OF PRESSURE

DUC Test point		STD Reading (kPa)		Conversion to inHg		Correction (inHg)	
(inHg)	(kPa)	Up	Down	Up	Down	Up	Down
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-10.00	-33.86	-34.00	-34.00	-10.04	-10.04	-0.04	-0.04
-20.00	-67.73	-67.73	-67.76	-20.00	-20.01	0.00	-0.01
-25.00	-84.66	-84.58	-84.63	-24.98	-24.99	+0.02	+0.01
-26.00	-88.05	-87.94	-87.98	-25.97	-25.98	+0.03	+0.02
-27.00	-91.43	-91.33	-91.33	-26.97	-26.97	+0.03	+0.03

Uncertainty of measurement : 0.04 inHg

Technical Note: Transmitting fluid : Air.

Conversion factor 1 kPa : 0.2953003 inHg

Note: The Scope of Accredited ANAB Certificate No. ACDM-2814 Version 015 Page 43 of 68

This report is valid for the above stated instrument/s only.

End of Certificate

Certificate No. Q25085187

F3-011-05/12-23

page 3 of 3



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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL.0-2717-3000-29 FAX.0-2719-9484



Certificate of Calibration

Cert.No.: 25CHO537
Page.: 1 of 3

Equipment : Spectrophotometer
Manufacturer : HACH
Model : DR3900
Serial No. : 2021559
ID No. : BKQ_EH0356
Condition As-Received: Used Item
Received Date : 08 October 2025
Calibration Date : 08 October 2025
Reference : 2510-00420C-11
Submitted by : ALS Laboratory Group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd.,
Khwaeng Phatthanakan, Khet Suan Luang,
Bangkok 10250 Thailand
Calibration Place : Wet Chemistry Lab 2
Ambient Temperature : (21.9 to 21.9) °C (On-Site)
Relative Humidity : (62 to 65) % (On-Site)
Calibration Procedure : In-house method ;
CP-0CH4 based on ASTM E 275-08

Calibrated by : Uthen Kankawit

Approved by :

() Chakrit Waeewangjisa
() Porpan Paipim
(✓) Saitthip Meangmai

Issue Date :

01 October 2025

REVIEW BY: Jinda K
APPROVED BY: Saitthip P
NEXT CAL DATE: 08/10/26

Approved Signatory

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full, except with the prior written approval of the head of Corporate Services 3: Equipment Calibration and Testing Services.



Cert. No.: 25CHO537
Page: 2 of 3

Condition of calibration result

1. Reference Standard Material :

Material	Serial No.	Certificate No.	Due date
1. Absorbance Standard set	44487	122584	31 May 2026
2. Wavelength Standard set	36730	118120	15 Jan 2026
3. Wavelength Standard set	36730	118121	15 Jan 2026

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 maintained through :
- Stama Scientific Ltd.
4. Spectral BandWidth : 5 nm
Scan Speed : - nm/min

Calibration Results : without adjustment

Wavelength Accuracy

Certified Values of Reference Material (nm)	UUC Reading (nm)	Uncertainty of Measurement (± nm)	Coverage Factor k
418.40	418	0.59	2.00
479.66	480	0.59	2.00
513.75	513	0.59	2.00
537.00	536	0.59	2.00
638.00	638	0.59	2.00
747.61	748	0.59	2.00
807.04	807	0.59	2.00



Cert. No.: 25CHO537

Page: 3 of 3

Calibration Results : without adjustment

Photometric Accuracy

Wavelength (nm)	Certified Values of Reference Material (Abs)	UUC Reading (Abs)	Uncertainty of Measurement (±Abs)	Coverage Factor k
420.0	Zero 0.5750 0.7156 1.0176	0.000 0.573 0.713 1.014	0.0028 0.0028 0.0028 0.0028	2.00 2.00 2.00 2.00
440.0	Zero 0.5508 0.7037 1.0013	0.000 0.557 0.700 0.997	0.0028 0.0028 0.0028 0.0028	2.00 2.00 2.00 2.00
465.0	Zero 0.5222 0.6646 0.9444	0.000 0.522 0.664 0.945	0.0028 0.0028 0.0028 0.0028	2.00 2.00 2.00 2.00
546.1	Zero 0.5234 0.7007 0.9802	0.000 0.523 0.700 0.990	0.0028 0.0028 0.0028 0.0028	2.00 2.00 2.00 2.00
590.0	Zero 0.5573 0.7760 1.1104	0.000 0.556 0.773 1.108	0.0028 0.0028 0.0028 0.0028	2.00 2.00 2.00 2.00
635.0	Zero 0.5648 0.7654 1.0961	0.000 0.565 0.765 1.096	0.0028 0.0028 0.0028 0.0028	2.00 2.00 2.00 2.00

Remark

- Each individual filter is measured against the empty filter holder (blank) used to zero the spectrophotometer

- UUC = Unit Under Calibration

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%.

-000-

Page 2 of 2

Certificate of Calibration - Supplemental

Method 588 Pre-Test Console Pulse Calibration - Lines 6, 7

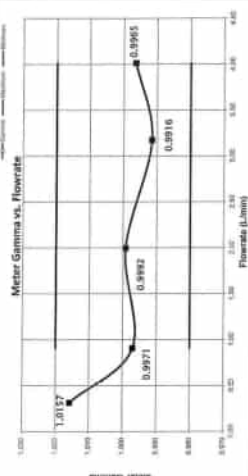
Calibration Tools



Equations

$$V_{\text{ref}}(t) = V_{\text{ref}} + \left(\frac{V_{\text{ref}} - V_{\text{ref}}}{T_{\text{ref}}} \right) \cdot T_{\text{ref}}$$
$$V_{\text{ref}}(t) = \text{Constant} + Y_{\text{ref}}(t)$$
$$\text{Constant} = R_{\text{ref}} \cdot C_{\text{ref}} + \left(\frac{V_{\text{ref}} - V_{\text{ref}}}{T_{\text{ref}}} \right) \cdot T_{\text{ref}}$$
$$R_{\text{ref}} = \frac{V_{\text{ref}}}{C_{\text{ref}}}$$
$$Y_{\text{ref}}(t) = \frac{V_{\text{ref}} - V_{\text{ref}}}{T_{\text{ref}}} \cdot (T_{\text{ref}} - t)$$
$$\text{Atmospheric Pressure} = P_{\text{ref}} + 0.00101325 \cdot \left(\frac{P_{\text{ref}} - P_{\text{ref}}}{T_{\text{ref}}} \right) \cdot (T_{\text{ref}} - t)$$

Calibration Graphs



Temperature Display Calibration Data Sheet

Model #: XC-623B-CMV
Serial #: A2505261
Units: Metric

Calibration Conditions
Pbar (mm. Hg): 30.25
Humidity (%): 56
Amb. Temp. (°F): 74.3

Reference Device Information
TC Simulator Model: PIE 520-K
Reference #: 112893
Technician: NJ

Temperature Sensors Calibration

Reference Point	Ref. Thermometer Temperature °C	Thermocouple Display Temperature °C	Temperature Difference °C
1	-18.0	-18.0	0.0
2	38.0	38.0	0.0
3	93.0	93.0	0.0
4	149.0	149.0	0.0
5	260.0	260.0	0.0
6	371.0	371.0	0.0
7	482.0	482.0	0.0
8	593.0	593.0	0.0
9	816.0	816.0	0.0
10	1036.0	1036.0	0.0

NIST Reference Thermocouple ID: 230424261

Ice Bath Temperature °C	Thermocouple Sensor Reading °C	Abs. Temperature Difference °C
0.2	0.0	0.07%

Notes

- 1 For valid test results, the maximum difference between temperature readings should be $\pm 1.0^\circ\text{C}$ (EPA Method 5, Section 6.1.1.1)
2 For valid test results, the maximum % difference between temperature readings should be less than 1.5% (EPA Method 2, Section 6.3)

Reviewed By: Nathan Johnson Date: May 27, 2025

I certify that the above Thermocouple Display was calibrated in accordance with the EPA Methods, CFR 40 Part 61.



Notes:
1. Check for any loose connections.
2. Check for any loose connections.
3. Check for any loose connections.
4. Check for any loose connections.
5. Check for any loose connections.
6. Check for any loose connections.
7. Check for any loose connections.
8. Check for any loose connections.
9. Check for any loose connections.
10. Check for any loose connections.

UUT Digital Pressure Transducer Audit					
Range	Reference Point	Target Pressure	Actual Ref. Pressure	Positive (+) Reading	Reference Point Status ¹
mm H ₂ O	#	mm H ₂ O	mm H ₂ O	mm H ₂ O	Pass/Fail
127.000	0%	0.000	0.000	0.000	PASS
± 0.4	30%	35.000	35.000	35.100	PASS
Tolerance (0.0% F.S.)	60%	75.000	75.000	75.200	PASS
	90%	115.000	115.000	115.000	PASS

Reviewed By: Mathan Johnson Date: May 27, 2025
I certify that the above Thermoplastic Display was calibrated in accordance with ISO 9194 Methods, GPR 42 Part B2.



Accredited by

NSC-TISI-TIS 17025

Calibration 0426

NSC-TISI-TIS 17025
CALIBRATION 0426

Calibration certificate

Calibration Certificate No. 25BCI0423

Object	Electronic non-automatic weighing instrument	This calibration certificate documents the traceability to national standards. Uncertainties of measurements are taken into account when only statements of compliance are made. This certificate was prepared by Sartorius Corporation in accordance to the current ISO/IEC 17025:2017 standard and Sartorius Work Instruction (Method) SOP WI 08. This certificate relate and apply this equipment only.
Manufacturer	Sartorius	
Type	SECURA224-1S	
Serial QM Ident. no.	38304165 BKK_EN0309	
Customer	ALS Laboratory Group (Thailand)Co., Ltd.	
	104 Phatthanakarn 40,Phatthanakarn Rd.,Khwaeng Phatthanakarn, Khet Suan Luang,Bangkok 10250	
Order no.	272173	REVIEW BY: <u>Jinda K</u>
Number of pages	4	APPROVED BY: <u>Sinluk P</u>
Date of calibration	29 Oct 2025	NEXT CAL DATE: 29/10/26

This calibration certificate may not be reproduced other than in full except with the permission of NSC-TISI-TIS-17025 and the issuing laboratory. Calibration certificates without signature are not valid.

The user is obliged to have the object recalibrated at appropriate intervals.

Date of issue	29 Oct 2025	Approval of the Calibration Certificate	Person in charge
		Mr. Chonchai Inthana	Chonchai Inthana

Sartorius (Thailand) Co., Ltd.
129 Rama 9 Road, Huaykwang
10310 Bangkok

Verical®
Version 6.5

Page 1 | 4

Calibration certificate No.: 25BCI0423

Calibration Certificate

Calibration object

Single range instrument

Model	SECURA224-1S
Serial Number	38304165
QM Ident. no Inventory no.	BKK_EN0309 ---
Maximum capacity (Max. load)	220.0000 g
Measured up to	220.0000 g
Scale interval	0.0001 g

Place of calibration

Address	According to page 1
Department Cost center	Laboratory Department. ---
Building Floor	--- 1st Floor.
Room	Laboratory Room.
Maximum temperature variation at place of calibration	5 K

Calibration procedure

EURAMET Calibration Guide No. 18, Version 4.0 (11/2015) - Guidelines on the Calibration of Non-Automatic Weighing Instruments

Test equipment

Test equipment type	Test equipment ID	Valid until
Thermometer	Teslo 174(Traceable to Si unit through ENTECH)	11 Nov 2025
Test weight set OIML R111 E2	Certificate No.M2508149S_E2(Traceable to Si unit through TCS)	19 Aug 2027

Calibration certificate No.: 25BCI0423

Calibration Certificate

Adjustment Status

The measuring device was internally adjusted before the calibration.

Environmental and measuring conditions

Date of calibration	29 Oct 2025
Temperature at place of calibration Temp. diff.	20 °C 0.5 K
Weights - T _{place}	
Measuring conditions	The installation site is suitable. The device is level. Balance was loaded up to Max before test.
Comments	Humidity 62.0 %RH.

Measurement results | Measurement uncertainties

Repeatability		Eccentricity	
Test load (nominal): 10 g 100 g		Test load (nominal): 100 g	
10 g	100 g	Center	99.9999 g
1 10.0000 g	100.0000 g	Front left	99.9999 g
2 10.0001 g	100.0000 g	Back left	99.9999 g
3 10.0000 g	100.0001 g	Back right	99.9998 g
4 10.0000 g	100.0000 g	Front right	99.9999 g
5 10.0000 g	100.0000 g	Maximum deviation from centric loading indication	
6 10.0000 g	100.0001 g	ΔM _{cent} max = 0.0001 g	
7 10.0001 g	100.0000 g		
8 10.0000 g	100.0000 g		
9 10.0000 g	99.9999 g		
10 10.0000 g	100.0000 g		
s = 0.00004 g	s = 0.00006 g		

Error of indication

Testload	Indication	Error	Expansion factor	Uncertainty	Uncertainty relative
L	I	E	k	U(E)	U _{rel} (E)
0.0100 g	0.0100 g	0.0000 g	2.00	0.00012 g	1.2 %
0.0500 g	0.0500 g	0.0000 g	2.00	0.00014 g	0.28 %
0.1000 g	0.1000 g	0.0000 g	2.00	0.00014 g	0.14 %
0.5000 g	0.5000 g	0.0000 g	2.00	0.00014 g	0.028 %
1.0000 g	1.0000 g	0.0000 g	2.00	0.00014 g	0.014 %
2.0000 g	2.0000 g	0.0000 g	2.00	0.00014 g	0.0071 %
5.0000 g	5.0000 g	0.0000 g	2.00	0.00014 g	0.0028 %
10.0000 g	10.0000 g	0.0000 g	2.00	0.00015 g	0.0015 %
20.0000 g	20.0000 g	0.0000 g	2.00	0.00015 g	0.00075 %
200.0000 g	199.9999 g	-0.0001 g	2.00	0.00028 g	0.00014 %
210.0000 g	209.9999 g	-0.0001 g	2.00	0.00032 g	0.00015 %
Maximum error of indication		E _{max} = 0.0001 g			

U_{rel}(E) is the quotient of U(E) and test load L. The uncertainty of measurement U(E) is valid only if error E is considered. You will find reference notes on the uncertainty of measurement in our under: Appendix to the calibration certificate | Interpretation of measurement results.
Reference note: The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the documented Expansion Factor, determined in accordance with the European Calibration Guideline EURAMET CG-16, V4.0. There is a 95 % probability that the value of the measurand will be in the assigned value range.

End of calibration certificate

Uncertainty of measurement in use

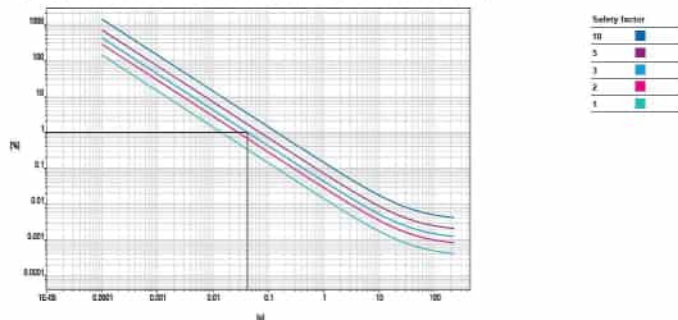
Device adjusted before measurement Yes
 Temperature deviation considered 1 K (isoCAL active)
 Temperature coefficient considered $2 \cdot 10^{-4} \text{K}$

Uncertainty of the weighing result $U_9(W)$ $U_9(W) = 0.00014 \text{ g} + 3.58 \cdot 10^{-4} \cdot R$

Reference note: The current uncertainty of measurement is calculated by entering of the reading R into this formula. In relation to this, there is no need for a correction of the indication error. The reported expanded uncertainty of measurement is stated as the standard uncertainty multiplied with an Expansion factor of 2, determined in accordance with the European Calibration Guideline EURAMET cg-18, V4.0. There is a 95 % probability that the value of the measurand will lie in the assigned value range.

Indication in % from max load	Net indication R	Uncertainty $U_9(W)$	Uncertainty relative $U_9(W)_{\text{rel}}$
1 %	2.2000 g	0.00015 g	0.0067 %
25 %	55.0000 g	0.00034 g	0.00061 %
50 %	110.0000 g	0.00053 g	0.00049 %
75 %	165.0000 g	0.00073 g	0.00044 %
100 %	220.0000 g	0.00093 g	0.00042 %

Graphic realization of the relative uncertainty of measurement | process accuracy



Displayed example

Process accuracy 1.00 %
 Safety factor 3
 Minimum sample weight 0.0420 g

Sartorius (Thailand) Co., Ltd.
 129 Rama 9 Road, Huaykwang
 10310 Bangkok

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 Version 6.6

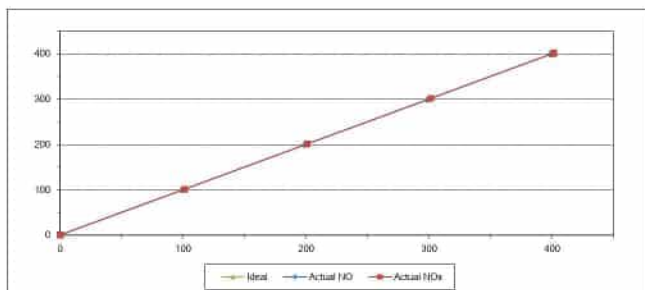
Page 4 | 4



MULTIPOINT CALIBRATION REPORT

Calibration Date	5-Jan-26	Equipment Name	NOx Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	MB03MPX3	Equipment ID	NKH_FS0062
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	55.88	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10	0.10
1	100.00	99.10	-0.90	-0.90	101.30	1.30	1.30
2	200.00	198.50	-1.50	-0.75	201.10	1.10	0.55
3	300.00	298.70	-1.30	-0.43	301.40	1.40	0.47
4	400.00	398.50	-1.50	-0.38	401.30	1.30	0.33
AVERAGE (%)				-0.47			0.55



Calibrated By

(Mr. Jirawut Sakarn)
 Field Environmental Scientist (3)

Approved By

(Mr. Sarayuth Jittrantont)
 Assistant General Manager

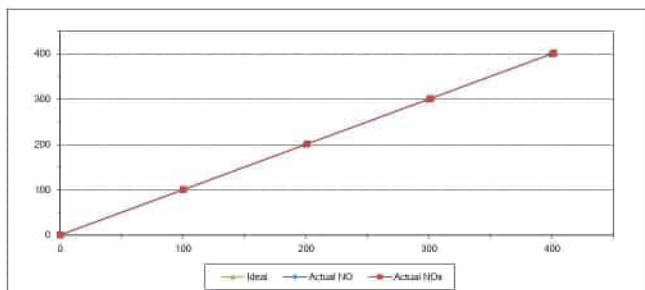
ALS Laboratory Group
 FORM NO.: F-08-056 REVISION NO.: - ISSUE DATE: 02/04/12



MULTIPOINT CALIBRATION REPORT

Calibration Date	5-Jan-26	Equipment Name	NOx Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	SEEAW53E	Equipment ID	RYG_FS0261
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	55.88	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10	0.10
1	100.00	98.80	-1.20	-1.20	100.20	0.20	0.20
2	200.00	198.70	-1.30	-0.65	201.10	1.10	0.55
3	300.00	298.30	-1.70	-0.57	301.10	1.10	0.37
4	400.00	398.60	-1.40	-0.35	401.20	1.20	0.30
AVERAGE (%)				-0.53			0.30



Calibrated By

(Mr. Jirawut Sakarn)
 Field Environmental Scientist (3)

Approved By

(Mr. Sarayuth Jittrantont)
 Assistant General Manager

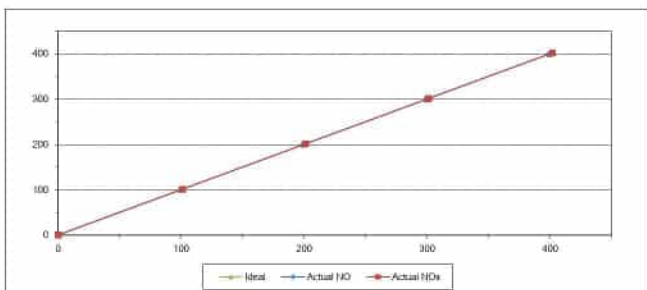
ALS Laboratory Group
 FORM NO.: F-08-056 REVISION NO.: - ISSUE DATE: 02/04/12



MULTIPOINT CALIBRATION REPORT

Calibration Date	5-Jan-26	Equipment Name	NOx Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	RZTBH6XTY	Equipment ID	NKH_FS0076
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	55.88	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10	0.10
1	100.00	99.20	-0.80	-0.80	101.20	1.20	1.20
2	200.00	198.60	-1.40	-0.70	201.20	1.20	0.60
3	300.00	298.80	-1.20	-0.40	301.10	1.10	0.37
4	400.00	398.80	-1.20	-0.30	402.00	2.00	0.50
AVERAGE (%)				-0.42			0.55



Calibrated By

(Mr. Jirawut Sakarn)
 Field Environmental Scientist (3)

Approved By

(Mr. Sarayuth Jittrantont)
 Assistant General Manager

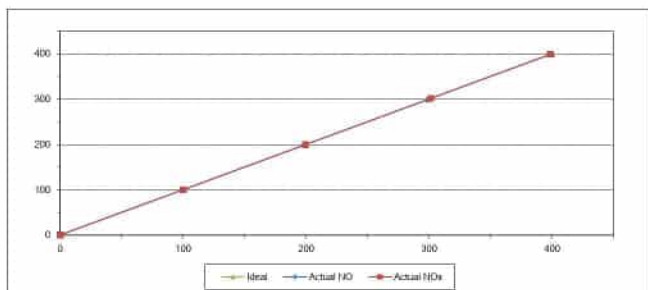
ALS Laboratory Group
 FORM NO.: F-08-056 REVISION NO.: - ISSUE DATE: 02/04/12



MULTIPOINT CALIBRATION REPORT

Calibration Date	5-Jan-26	Equipment Name	NOx Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	8G314J3K	Equipment ID	RYG_FS0264
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	55.88	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx	%Error NOx
ZERO	0.00	0.05	0.05	0.05	0.10	0.10	0.10
1	100.00	99.10	-0.90	-0.90	100.10	0.10	0.10
2	200.00	198.70	-1.30	-0.65	199.40	-0.60	-0.30
3	300.00	298.70	-1.30	-0.43	301.40	1.40	0.47
4	400.00	398.60	-1.40	-0.35	398.70	-1.30	-0.33
AVERAGE (%)				-0.46			0.01



Calibrated By

Approved By

(Mr. Jirawut Sakarn)
Field Environmental Scientist (3)

(Mr. Sarayuth Jittranont)
Assistant General Manager

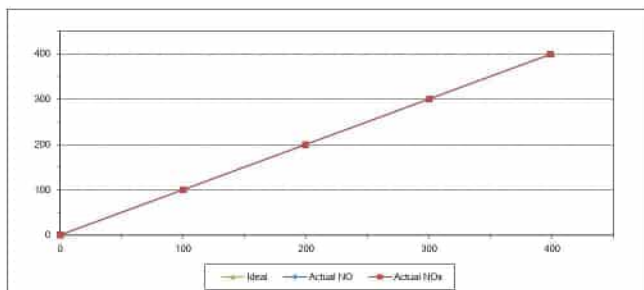
ALS Laboratory Group
FORM NO.: F 08-056 REVISION NO.: - ISSUE DATE: 02/04/12



MULTIPOINT CALIBRATION REPORT

Calibration Date	5-Jan-26	Equipment Name	NOx Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	7AVB9544	Equipment ID	RYG_FS0272
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	55.88	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx	%Error NOx
ZERO	0.00	0.05	0.05	0.05	0.10	0.10	0.10
1	100.00	99.10	-0.90	-0.90	100.10	0.10	0.10
2	200.00	198.70	-1.30	-0.65	199.50	-0.50	-0.25
3	300.00	298.60	-1.40	-0.47	300.30	0.30	0.10
4	400.00	398.90	-1.10	-0.28	398.70	-1.30	-0.33
AVERAGE (%)				-0.45			-0.06



Calibrated By

Approved By

(Mr. Jirawut Sakarn)
Field Environmental Scientist (3)

(Mr. Sarayuth Jittranont)
Assistant General Manager

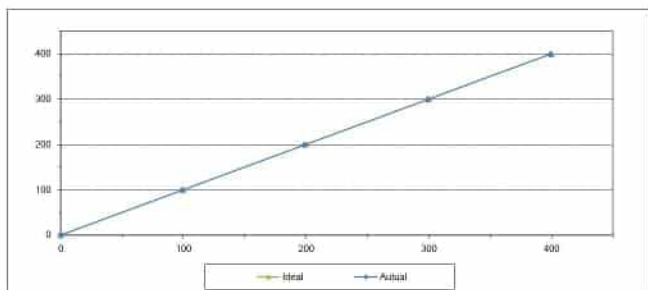
ALS Laboratory Group
FORM NO.: F 08-056 REVISION NO.: - ISSUE DATE: 02/04/12



MULTIPOINT CALIBRATION REPORT

Calibration Date	5-Jan-26	Equipment Name	SO2 Analyzer
Manufacturer	HORIBA	Model	APSA-370
Serial No.	SMWOLFJB	Equipment ID	NKH_FS0083
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	56.3	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS			
	Ideal	Actual	Error	%Error
ZERO	0.00	0.10	0.10	0.10
1	100.00	98.80	-1.20	-1.20
2	200.00	198.50	-1.50	-0.75
3	300.00	298.90	-1.10	-0.37
4	400.00	398.90	-1.10	-0.28
AVERAGE (%)				-0.50



Calibrated By

Approved By

(Mr. Jirawut Sakarn)
Field Environmental Scientist (3)

(Mr. Sarayuth Jittranont)
Assistant General Manager

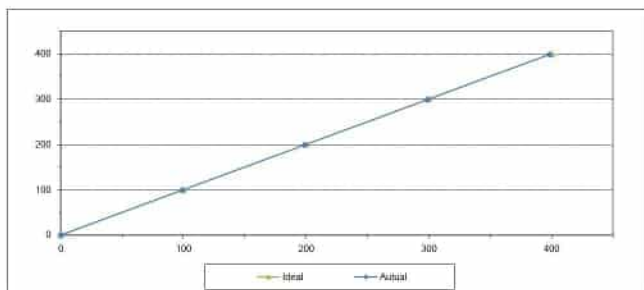
ALS Laboratory Group
FORM NO.: F 08-056 REVISION NO.: - ISSUE DATE: 02/04/12



MULTIPOINT CALIBRATION REPORT

Calibration Date	5-Jan-26	Equipment Name	SO2 Analyzer
Manufacturer	HORIBA	Model	APSA-370
Serial No.	C6GMRU6P	Equipment ID	NKH_FS0079
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	56.3	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS			
	Ideal	Actual	Error	%Error
ZERO	0.00	0.10	0.10	0.10
1	100.00	98.90	-1.10	-1.10
2	200.00	198.70	-1.30	-0.65
3	300.00	298.50	-1.50	-0.50
4	400.00	398.20	-1.80	-0.45
AVERAGE (%)				-0.52



Calibrated By

Approved By

(Mr. Jirawut Sakarn)
Field Environmental Scientist (3)

(Mr. Sarayuth Jittranont)
Assistant General Manager

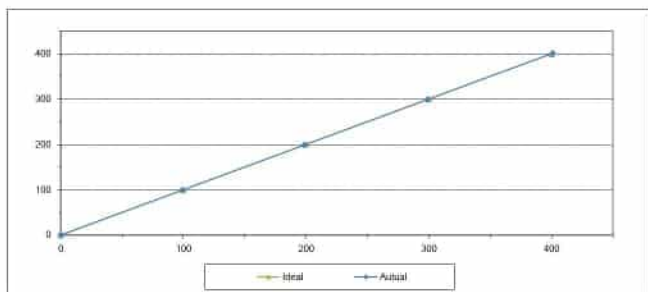
ALS Laboratory Group
FORM NO.: F 08-056 REVISION NO.: - ISSUE DATE: 02/04/12



MULTIPOINT CALIBRATION REPORT

Calibration Date	5-Jan-26	Equipment Name	SO2 Analyzer
Manufacturer	Teledyne API	Model	100E
Serial No.	3469	Equipment ID	BKK_FS0775
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	56.3	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS			
	Ideal	Actual	Error	%Error
ZERO	0.00	0.10	0.10	0.10
1	100.00	99.00	-1.00	-1.00
2	200.00	198.50	-1.50	-0.75
3	300.00	298.80	-1.20	-0.40
4	400.00	401.00	1.00	0.25
AVERAGE (%)				-0.36



Calibrated By

(Mr. Jirawut Sakam)
Field Environmental Scientist (3)

Approved By

(Mr. Sarayuth Jitranont)
Assistant General Manager

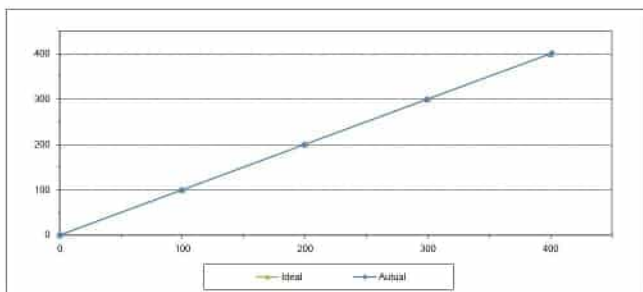
ALS Laboratory Group
FORM NO.: F-06-556 REVISION NO.: - ISSUE DATE: 02/04/12



MULTIPOINT CALIBRATION REPORT

Calibration Date	5-Jan-26	Equipment Name	SO2 Analyzer
Manufacturer	Teledyne API	Model	T100
Serial No.	060	Equipment ID	BKK_FS0740
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	56.3	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS			
	Ideal	Actual	Error	%Error
ZERO	0.00	0.10	0.10	0.10
1	100.00	99.10	-0.90	-0.90
2	200.00	199.10	-0.90	-0.45
3	300.00	298.80	-1.20	-0.40
4	400.00	401.10	1.10	0.28
AVERAGE (%)				-0.28



Calibrated By

(Mr. Jirawut Sakam)
Field Environmental Scientist (3)

Approved By

(Mr. Sarayuth Jitranont)
Assistant General Manager

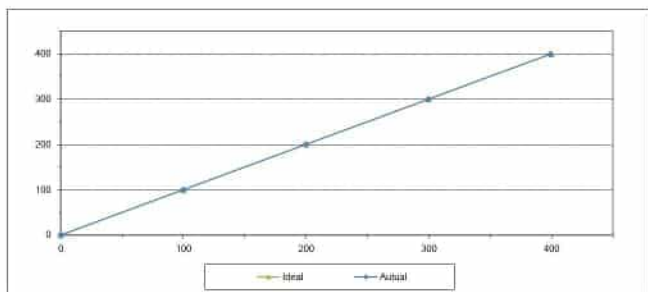
ALS Laboratory Group
FORM NO.: F-06-556 REVISION NO.: - ISSUE DATE: 02/04/12



MULTIPOINT CALIBRATION REPORT

Calibration Date	5-Jan-26	Equipment Name	SO2 Analyzer
Manufacturer	Teledyne API	Model	100E
Serial No.	3468	Equipment ID	BKK_FS0772
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	56.3	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS			
	Ideal	Actual	Error	%Error
ZERO	0.00	0.10	0.10	0.10
1	100.00	99.80	-0.20	-0.20
2	200.00	199.80	-0.20	-0.10
3	300.00	299.40	-0.60	-0.20
4	400.00	398.80	-1.20	-0.30
AVERAGE (%)				-0.14



Calibrated By

(Mr. Jirawut Sakam)
Field Environmental Scientist (3)

Approved By

(Mr. Sarayuth Jitranont)
Assistant General Manager

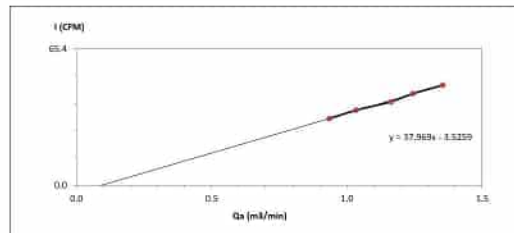
ALS Laboratory Group
FORM NO.: F-06-556 REVISION NO.: - ISSUE DATE: 02/04/12



High Volume Air Sampler Calibration Worksheet

Project Site:	Amata Rattana Power (Rayong) 1 Limited	Barometric Pressure (mm Hg):	752.2
Calibrate Location:	1538/171/1035/1036/1037/1038/1039	Temperature (°C):	31.2
Calibrate Date:	15-Mar-16	High Volume ID:	MEH-FS0047
Calibration Sheet No.:	C-150326-NKH-FS0047	High Volume Model:	TE-500PS
Calibrator ID:	DYG-FS0706	High Volume S/N:	5848
Calibrator Model:	TE-5028A	Calibrator Slope:	0.9219
Calibrator S/N:	1543	Calibrator Intercept:	-0.01004

Test No.	Delta H ₂ O (inch)	Q _a (m ³ /min)	I - Chart (CFM)	Linear Regression
1	1.8	0.936	32	Slope: 37.9691 Intercept: -3.5259 Correlation Coefficient: 0.9988
2	2.2	1.033	36	
3	2.8	1.164	40	
4	3.2	1.244	44	
5	3.8	1.355	48	



Calibrated by: Satcha P.
(Mr. Satcha Phattanasong)
RYG Field Services Scientist (3)

Approved by: Satcha P.
(Mr. Satcha Phattanasong)
Field Services Section Head

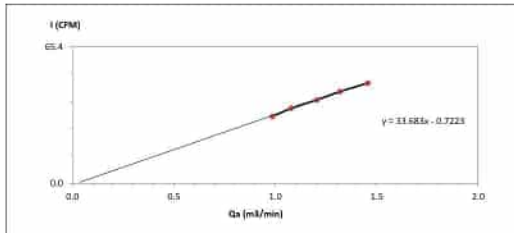
FORM NO.: F-06-674 REVISION NO.: 2 ISSUE DATE: 29/11/23



High Volume Air Sampler Calibration Worksheet

Project Site : Amata Rattana Power (Rayong) 1 Limited
Calibrate Location : โรงไฟฟ้าถ่านหิน
Calibrate Date : 15-Mar-18
Calibration Sheet No. : C-150326-NKH-F30045
Calibrator ID : RYG-P50206
Calibrator Model : TE-50098
Calibrator S/N : 1543
Barometric Pressure (mm Hg) : 752.2
Temperature (°C) : 31.2
High Volume ID : MEH-P50045
High Volume Model : TE-50098
High Volume S/N : 5044
Calibrator Slope : 0.9219
Calibrator Intercept : -0.01004

Test No.	Delta H ₂ O (inch)	Q _s (m ³ /min)	I : Chart (CFM)	Linear Regression
1	2.0	0.906	32	Slope : 33.6039 Intercept : -0.7223 Correlation Coefficient : 0.9991
2	2.4	1.079	36	
3	3.0	1.205	40	
4	3.0	1.319	44	
5	4.4	1.457	48	



Calibrated by : Satcha P.
(Mr. Satcha Phatzaewang)
RYG Field Services Scientist (3)

Approved by : Supt S.
(Mr. Supot Lalantak)
Field Services Section Head

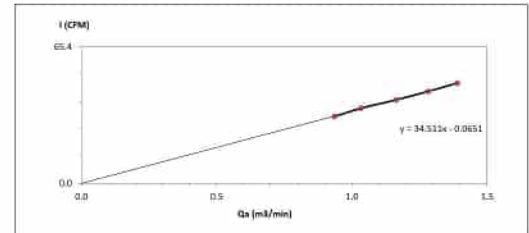
FORM NO. P 06-074 REVISION NO.2 ISSUE DATE 29/11/23



High Volume Air Sampler Calibration Worksheet

Project Site : Amata Rattana Power (Rayong) 1 Limited
Calibrate Location : โรงไฟฟ้าถ่านหิน
Calibrate Date : 15-Mar-18
Calibration Sheet No. : C-150326-RYG-F30067
Calibrator ID : RYG-P50206
Calibrator Model : TE-50098
Calibrator S/N : 1543
Barometric Pressure (mm Hg) : 752.2
Temperature (°C) : 31.2
High Volume ID : RYG-P50067
High Volume Model : TE-50098
High Volume S/N : 6266
Calibrator Slope : 0.9219
Calibrator Intercept : -0.01004

Test No.	Delta H ₂ O (inch)	Q _s (m ³ /min)	I : Chart (CFM)	Linear Regression
1	1.0	0.936	32	Slope : 34.5111 Intercept : -0.0651 Correlation Coefficient : 0.9991
2	2.2	1.033	36	
3	2.8	1.164	40	
4	3.4	1.262	44	
5	4.0	1.390	48	



Calibrated by : Satcha P.
(Mr. Satcha Phatzaewang)
RYG Field Services Scientist (3)

Approved by : Supt S.
(Mr. Supot Lalantak)
Field Services Section Head

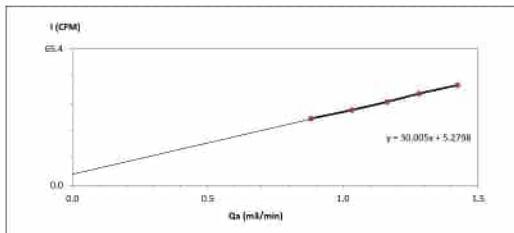
FORM NO. P 06-074 REVISION NO.2 ISSUE DATE 29/11/23



High Volume Air Sampler Calibration Worksheet

Project Site : Amata Rattana Power (Rayong) 1 Limited
Calibrate Location : โรงไฟฟ้าถ่านหิน
Calibrate Date : 15-Mar-18
Calibration Sheet No. : C-150326-RYG-F30295
Calibrator ID : RYG-P50206
Calibrator Model : TE-50098
Calibrator S/N : 1543
Barometric Pressure (mm Hg) : 752.2
Temperature (°C) : 31.2
High Volume ID : RYG-P50185
High Volume Model : TE-50098
High Volume S/N : 5502
Calibrator Slope : 0.9219
Calibrator Intercept : -0.01004

Test No.	Delta H ₂ O (inch)	Q _s (m ³ /min)	I : Chart (CFM)	Linear Regression
1	1.6	0.803	32	Slope : 30.0046 Intercept : 5.2798 Correlation Coefficient : 0.9992
2	2.2	1.033	36	
3	2.8	1.164	40	
4	3.4	1.262	44	
5	4.2	1.424	48	



Calibrated by : Satcha P.
(Mr. Satcha Phatzaewang)
RYG Field Services Scientist (3)

Approved by : Supt S.
(Mr. Supot Lalantak)
Field Services Section Head

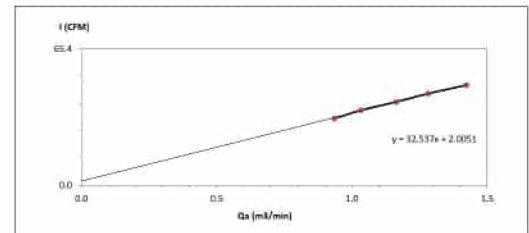
FORM NO. P 06-074 REVISION NO.2 ISSUE DATE 29/11/23



High Volume Air Sampler Calibration Worksheet

Project Site : Amata Rattana Power (Rayong) 1 Limited
Calibrate Location : โรงไฟฟ้าถ่านหิน
Calibrate Date : 15-Mar-18
Calibration Sheet No. : C-150326-RYG-F30188
Calibrator ID : RYG-P50206
Calibrator Model : TE-50098
Calibrator S/N : 1543
Barometric Pressure (mm Hg) : 752.2
Temperature (°C) : 31.2
High Volume ID : RYG-P50188
High Volume Model : TE-50098
High Volume S/N : 4796
Calibrator Slope : 0.9219
Calibrator Intercept : -0.01004

Test No.	Delta H ₂ O (inch)	Q _s (m ³ /min)	I : Chart (CFM)	Linear Regression
1	1.0	0.936	32	Slope : 32.5369 Intercept : 3.0051 Correlation Coefficient : 0.9993
2	2.2	1.033	36	
3	2.8	1.164	40	
4	3.4	1.262	44	
5	4.2	1.424	48	



Calibrated by : Satcha P.
(Mr. Satcha Phatzaewang)
RYG Field Services Scientist (3)

Approved by : Supt S.
(Mr. Supot Lalantak)
Field Services Section Head

FORM NO. P 06-074 REVISION NO.2 ISSUE DATE 29/11/23



Accredited by

NSC-TIS-TIS 17025
Calibration 0426

Calibration certificate

Calibration Certificate No. 26BCI0067

Object	Electronic non-automatic weighing instrument	This calibration certificate documents the traceability to national standards.
Manufacturer	Sartorius	Uncertainties of measurements are taken into account when only statements of compliance are made.
Type	LA130S-F	This certificate was prepared by Sartorius Corporation in accordance to the current ISO/IEC 17025:2017 standard and Sartorius Work Instruction (Method) SOP WI 08.
Serial QM ident. no.	25409664 RYG_EN0001	This certificate relate and apply this equipment only.
Customer	ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)	
	616/10 Moo 5 T.Maenamkoo, A.Pluak Daeng, Rayong 21140, Thailand.	
Order no.	278579	
Number of pages	4	
Date of calibration	03 Feb 2026	

This calibration certificate may not be reproduced other than in full except with the permission of NSC-TIS-TIS-17025 and the issuing laboratory. Calibration certificates without signature are not valid.

The user is obliged to have the object recalibrated at appropriate intervals.

Date of issue	03 Feb 2026	Approval of the Calibration Certificate	Person in charge
		Mr. Chonchai Inthana	Chonchai Inthana

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10310 BangkokVerical®
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Calibration object

Single range instrument

Model	LA130S-F
Serial Number	25409664
QM Ident. no Inventory no.	RYG_EN0001 —

Maximum capacity (Max. load)	150.0000 g
Measured up to	150.0000 g
Scale interval	0.0001 g

Place of calibration

Address	According to page 1
Department Cost center	Laboratory Department. —
Building Floor	— 1st Floor.
Room	Balance Room.
Maximum temperature variation at place of calibration	5 K

Calibration procedure

EURAMET Calibration Guide No. 18, Version 4.0 (11/2015) - Guidelines on the Calibration of Non-Automatic Weighing Instruments

Test equipment

Test equipment type	Test equipment ID	Valid until
Thermometer	Teslo 174H H/T250743 (Traceable to SI unit through ENTECH)	18 Nov 2026
Test weight set OIML R111 E2	Certificate No.M2508149S_E2(Traceable to SI unit through TCS)	19 Aug 2027

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10310 BangkokVerical®
Version 6.7

Page 2 | 4

Calibration certificate No.: 26BCI0067

Calibration Certificate

Adjustment Status

The measuring device was internally adjusted before the calibration.

Environmental and measuring conditions

Date of calibration	03 Feb 2026
Temperature at place of calibration Temp. diff.	24.5 °C 0.5 K
Tweights - Tplace	
Measuring conditions	The installation site is suitable. The device is level. Balance was loaded up to Max before test.
Comments	Humidity 52.0 %RH.

Measurement results | Measurement uncertainties

Repeatability		Eccentricity	
Test load (nominal): 10 g 100 g		Test load (nominal):	50 g
10 g	100 g	Center	50.0000 g
1	10.0000 g	Front left	50.0001 g
2	10.0000 g	Back left	50.0001 g
3	9.9999 g	Back right	50.0000 g
4	10.0001 g	Front right	50.0001 g
5	10.0000 g	Maximum deviation from centric loading indication	
6	9.9999 g	$ \Delta_{\text{Max}} _{\text{max}} = 0.0001 \text{ g}$	
7	9.9999 g		
8	9.9999 g		
9	9.9999 g		
10	9.9999 g		
$s = 0.00007 \text{ g}$ $s = 0.00007 \text{ g}$			

Error of indication

Testload	Indication	Error	Expansion factor	Uncertainty	Uncertainty relative
L	I	E	k	U(E)	U _{rel} (E)
0.0100 g	0.0100 g	0.0000 g	2.00	0.00016 g	1.6 %
0.0500 g	0.0500 g	0.0000 g	2.00	0.00016 g	0.33 %
0.1000 g	0.1000 g	0.0000 g	2.00	0.00016 g	0.16 %
0.5000 g	0.5000 g	0.0000 g	2.00	0.00016 g	0.033 %
1.0000 g	1.0000 g	0.0000 g	2.00	0.00016 g	0.016 %
2.0000 g	2.0000 g	0.0000 g	2.00	0.00017 g	0.0083 %
5.0000 g	5.0001 g	0.0001 g	2.00	0.00017 g	0.0033 %
10.0000 g	10.0001 g	0.0001 g	2.00	0.00017 g	0.0017 %
20.0000 g	20.0000 g	0.0000 g	2.00	0.00017 g	0.0008 %
100.0000 g	100.0001 g	0.0001 g	2.00	0.00023 g	0.0023 %
150.0000 g	150.0001 g	0.0001 g	2.00	0.00030 g	0.0020 %
Maximum error of indication		$E_{\text{max}} = 0.0001 \text{ g}$			

$U_{\text{rel}}(E)$ is the quotient of $U(E)$ and test load L . The uncertainty of measurement $U(E)$ is valid only if error E is considered. You will find reference notes on the uncertainty of measurement in our under: Appendix to the calibration certificate | Interpretation of measurement results.
Reference note: The reported expanded uncertainty of measurement is stated as the standard uncertainty multiplied by the documented Expansion Factor, determined in accordance with the European Calibration Guidelines EURAMET cg-18, v4.0. There is a 95 % probability that the value of the measurand will be in the assigned value range.

End of calibration certificate

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Interpretation of measurement results | Appendix to the calibration certificate

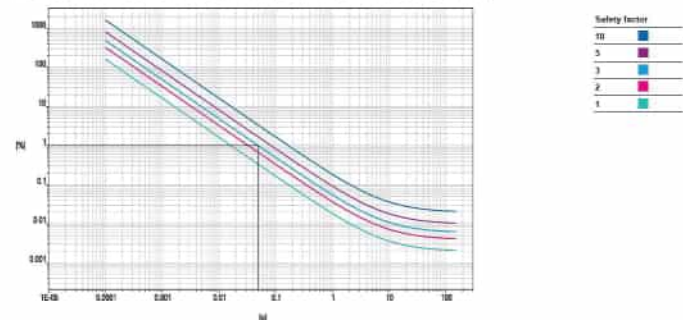
Uncertainty of measurement in use

Device adjusted before measurement	Yes
Temperature deviation considered	1.5 K (isoCAL active)
Temperature coefficient considered	1 · 10 ⁻⁴ /K
Uncertainty of the weighing result $U_{\text{g}}(W)$	$U_{\text{g}}(W) = 0.00016 \text{ g} + 1.95 \cdot 10^{-4} \cdot R$

Reference note: The current uncertainty of measurement is calculated by entering of the reading R into this formula. In relation to this, there is no need for a correction of the indication error. The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied with an Expansion factor of 2, determined in accordance with the European Calibration Guidelines EURAMET cg-18, v4.0. There is a 95 % probability that the value of the measurand will be in the assigned value range.

Indication in % from max load	Net indication R	Uncertainty $U_{\text{g}}(W)$	Uncertainty relative $U_{\text{g}}(W)_{\text{rel}}$
1 %	1.5000 g	0.00019 g	0.013 %
25 %	37.5000 g	0.00069 g	0.0024 %
50 %	75.0000 g	0.0016 g	0.0022 %
75 %	112.5000 g	0.0024 g	0.0021 %
100 %	150.0000 g	0.0031 g	0.0021 %

Graphic realization of the relative uncertainty of measurement | process accuracy



Displayed example

Process accuracy	1.00 %
Safety factor	3
Minimum sample weight	0.0493 g

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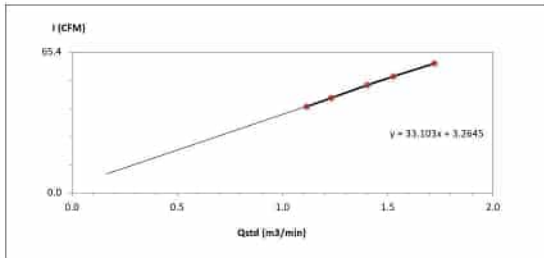


High Volume Air Sampler Calibration Worksheet

Project Site: Amata B.Grimm Power (Rayong) 1 Limited
 Calibrate Location: โรงผลิตไฟฟ้าพลังความร้อน
 Calibrate Date: 15-Mar-26
 Calibration Sheet No.: C-150326-NKH.F50051
 Calibrator ID: RYG_F50296
 Calibrator Model: TE-5028A
 Calibrator S/N: 1543

Barometric Pressure (mm Hg): 752.2
 Temperature (°C): 31.2
 High Volume ID: NKH.F50051
 High Volume Model: TE-5170D
 High Volume S/N: 5854
 Calibrator Slope: 1.4719
 Calibrator Intercept: -0.01014

Test No.	Delta H ₂ O (inch)	Q _{std} (m ³ /min)	I: Chart (CFM)	Linear Regression
1	2.7	1.1154	40	Slope: 33.1030 Intercept: 3.2645 Correlation Coefficient: 0.9996
2	3.3	1.2314	44	
3	4.3	1.4833	50	
4	5.1	1.5269	54	
5	6.5	1.7217	60	



Calibrated by: Satcha P.
 (Mr. Satcha Phetsawaeng)
 RYG Field Services Scientist (3)

Approved by: Spt S
 (Mr. Supot Salanteh)
 Field Services Section Head

FORM NO.: F-06-073 REVISION NO.:2 ISSUE DATE: 20/11/23

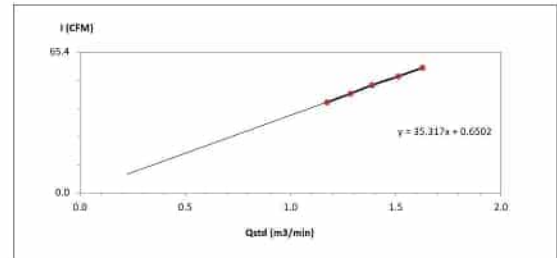


High Volume Air Sampler Calibration Worksheet

Project Site: Amata B.Grimm Power (Rayong) 1 Limited
 Calibrate Location: โรงผลิตไฟฟ้าพลังความร้อน
 Calibrate Date: 15-Mar-26
 Calibration Sheet No.: C-150326-NKH.F50052
 Calibrator ID: RYG_F50296
 Calibrator Model: TE-5028A
 Calibrator S/N: 1543

Barometric Pressure (mm Hg): 752.2
 Temperature (°C): 31.2
 High Volume ID: NKH.F50052
 High Volume Model: TE-5170D
 High Volume S/N: 5855
 Calibrator Slope: 1.4719
 Calibrator Intercept: -0.01014

Test No.	Delta H ₂ O (inch)	Q _{std} (m ³ /min)	I: Chart (CFM)	Linear Regression
1	3.0	1.1748	42	Slope: 35.3174 Intercept: 0.6502 Correlation Coefficient: 0.9995
2	3.6	1.2854	46	
3	4.2	1.3871	50	
4	5.0	1.5120	54	
5	5.8	1.6272	58	



Calibrated by: Satcha P.
 (Mr. Satcha Phetsawaeng)
 RYG Field Services Scientist (3)

Approved by: Spt S
 (Mr. Supot Salanteh)
 Field Services Section Head

FORM NO.: F-06-073 REVISION NO.:2 ISSUE DATE: 20/11/23

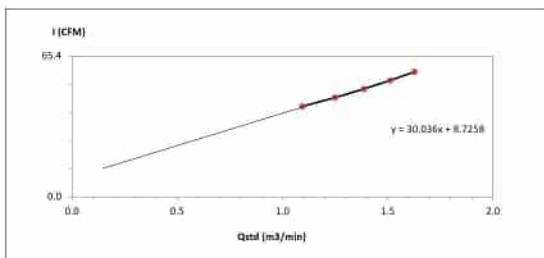


High Volume Air Sampler Calibration Worksheet

Project Site: Amata B.Grimm Power (Rayong) 1 Limited
 Calibrate Location: โรงผลิตไฟฟ้าพลังความร้อน
 Calibrate Date: 15-Mar-26
 Calibration Sheet No.: C-150326-BKK.F50371
 Calibrator ID: RYG_F50296
 Calibrator Model: TE-5028A
 Calibrator S/N: 1543

Barometric Pressure (mm Hg): 752.2
 Temperature (°C): 31.2
 High Volume ID: BKK.F50371
 High Volume Model: G1051
 High Volume S/N: 1324
 Calibrator Slope: 1.4719
 Calibrator Intercept: -0.01014

Test No.	Delta H ₂ O (inch)	Q _{std} (m ³ /min)	I: Chart (CFM)	Linear Regression
1	2.6	1.0948	42	Slope: 30.0357 Intercept: 8.7258 Correlation Coefficient: 0.9983
2	3.4	1.2497	46	
3	4.2	1.3871	50	
4	5.0	1.5120	54	
5	5.8	1.6272	58	



Calibrated by: Satcha P.
 (Mr. Satcha Phetsawaeng)
 RYG Field Services Scientist (3)

Approved by: Spt S
 (Mr. Supot Salanteh)
 Field Services Section Head

FORM NO.: F-06-073 REVISION NO.:2 ISSUE DATE: 20/11/23

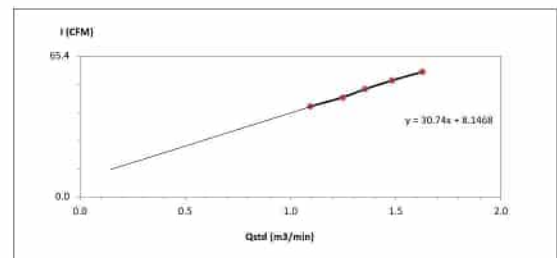


High Volume Air Sampler Calibration Worksheet

Project Site: Amata B.Grimm Power (Rayong) 1 Limited
 Calibrate Location: โรงผลิตไฟฟ้าพลังความร้อน
 Calibrate Date: 15-Mar-26
 Calibration Sheet No.: C-150326-BKK.F50359
 Calibrator ID: RYG_F50296
 Calibrator Model: TE-5009X
 Calibrator S/N: 1543

Barometric Pressure (mm Hg): 752.2
 Temperature (°C): 31.2
 High Volume ID: BKK.F50359
 High Volume Model: TE-5009X
 High Volume S/N: 5194
 Calibrator Slope: 1.4719
 Calibrator Intercept: -0.01014

Test No.	Delta H ₂ O (inch)	Q _{std} (m ³ /min)	I: Chart (CFM)	Linear Regression
1	2.6	1.0948	42	Slope: 30.7401 Intercept: 8.1468 Correlation Coefficient: 0.9984
2	3.4	1.2497	46	
3	4.0	1.3541	50	
4	4.8	1.4810	54	
5	5.8	1.6272	58	



Calibrated by: Satcha P.
 (Mr. Satcha Phetsawaeng)
 RYG Field Services Scientist (3)

Approved by: Spt S
 (Mr. Supot Salanteh)
 Field Services Section Head

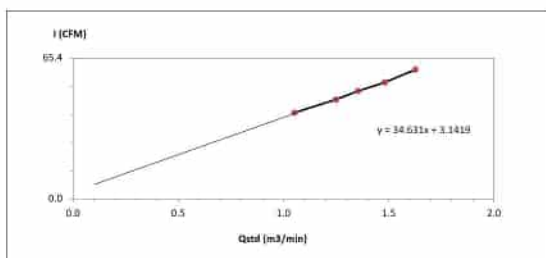
FORM NO.: F-06-073 REVISION NO.:2 ISSUE DATE: 20/11/23



High Volume Air Sampler Calibration Worksheet

Project Site:	Amata B.Grimm Power (Rayong) 1 Limited	Barometric Pressure (mm Hg):	752.2
Calibrate Location:	บ้านพักนาบอน (บ่อนักนาบอน)	Temperature (°C):	31.2
Calibrate Date:	15-Mar-26	High Volume ID:	BKK_P50362
Calibration Sheet No.:	C-150226-BKK_P50362	High Volume Model:	G1051
Calibrator ID:	RYG_P50296	High Volume S/N:	1452
Calibrator Model:	TE-5028A	Calibrator Slope:	1.4710
Calibrator S/N:	1543	Calibrator Intercept:	-0.01014

Test No.	Delta H ₂ O (inch)	Q _{std} (m ³ /min)	1: Chart (CFM)	Linear Regression
1	2.4	1.6325	40	Slope: 34.6314
2	3.4	1.2497	46	Intercept: 3.1419
3	4.0	1.3541	50	Correlation Coefficient: 0.9983
4	4.8	1.4810	54	
5	5.8	1.6272	60	



Calibrated by: **Satcha P.**

(Mr. Satcha Phetsawang)
RYG Field Services Scientist (3)

Approved by: **Spt S**

(Mr. Supot Salauteh)
Field Services Section Head

FORM NO.: F-06-073 REVISION NO.: 2 ISSUE DATE: 28/11/23



Iranattee Associates Co., Ltd.
12/14-15, 12/15-16,
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Mobile: +662-0099451
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Web site: www.jnac.com

Accredited calibration laboratory
ISO/IEC 17025:2017
MSC-TS-15 17025
CALIBRATION 0367

Air speed measurement laboratory
Calibration services department



MSC-TS-15 - TIS 17025
CALIBRATION 0367

Certificate Number

CWS-010-69

CERTIFICATE OF CALIBRATION

Page 1 of 2 Pages

MEASUREMENT ITEM
MANUFACTURER
MODEL/TYPE

: Cup anemometer
: Naisys
: Sensor: WS-027
: Data logger: 110-WS-250L-0
: Sensor: WSD-A5010
: Data logger: AS910
: RYG_P50609

SERIAL NUMBER

ID NUMBER
CONDITION AS-RECEIVED
CUSTOMER

: Used item
: ALS laboratory group (Thailand) Co., Ltd.
104 Phattanasak 40, Phattanasak Rd,
Khwaeng Soan Luang, Khet Soan Luang,
Bangkok 10250 Thailand.

RECEIVED DATE
MEASUREMENT DATE
ISSUE DATE

: 09 Jan 2026
: 21 Jan 2026
: 21 Jan 2026

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:
Temperature
Relative Humidity
Atmospheric Pressure

: 23.0 ± 3.0 °C
: 55.0 ± 15.0 %RH
: 1010 ± 10 hPa

PLACE OF CALIBRATION

: Effel-type wind tunnel of Iranattee Associates Co., Ltd.

CALIBRATION CONDITIONS

: Wind tunnel cross-section area¹ 900 cm²
: Cup anemometer frontal area² 100 cm²
: Diameter of mounting pipe³ - mm
: Blockage ratio of test object⁴ 0.111 [-]

Preconditioning

: 24 hours at ambient conditions.
: The average values during measurement are (23.4) °C, (55.1) %RH and (1013.3) hPa.

TABULATION OF RESULTS:

The table on next page give the measured values.

Calibrated by:

: 21 Mr. Sorapet Thiradipol
: Miss Jitrasri Lerttongphol



Approved signatory:

Mr. Panyay Booncharoen
Calibration Department Manager

Remark:

¹ Result given section area of the wind tunnel
² Projected cross-section area of the tested object include mounting pipe
³ Diameter of mounting pipe
⁴ Ratio "a/b"

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY



Iranattee Associates Co., Ltd.
12/14-15, 12/15-16,
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Bangkok 10000 (Thailand)
Tel: +662-0080812
Mobile: +662-0099451
E-mail: jnac@iranattee.com
Web site: www.jnac.com

Accredited calibration laboratory
ISO/IEC 17025:2017
MSC-TS-15 17025
CALIBRATION 0367

Wind direction measurement laboratory
Calibration services department



MSC-TS-15 - TIS 17025
CALIBRATION 0367

Certificate Number

CWD-010-69

CERTIFICATE OF CALIBRATION

Page 1 of 2 Pages

MEASUREMENT ITEM
MANUFACTURER
MODEL/TYPE

: Wind direction sensor
: Naisys
: Sensor: WS-027
: Data logger: 110-WS-250L-0
: Sensor: WSD-A5010
: Data logger: AS910
: RYG_P50609

SERIAL NUMBER

ID NUMBER
CONDITION AS-RECEIVED
CUSTOMER

: Used item
: ALS laboratory group (Thailand) Co., Ltd.
104 Phattanasak 40, Phattanasak Rd,
Khwaeng Soan Luang, Khet Soan Luang,
Bangkok 10250 Thailand.

RECEIVED DATE
MEASUREMENT DATE
ISSUE DATE

: 09 Jan 2026
: 21 Jan 2026
: 21 Jan 2026

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:
Temperature
Relative Humidity
Atmospheric Pressure

: 23.0 ± 3.0 °C
: 55.0 ± 15.0 %RH
: 1010 ± 10 hPa

PLACE OF CALIBRATION

: Effel-type wind tunnel of Iranattee Associates Co., Ltd.

CALIBRATION CONDITION

: Wind tunnel cross-section area¹ 900 cm²
: Wind direction frontal area² 129 cm²
: Diameter of mounting pipe³ - mm
: Blockage ratio of test object⁴ 0.143 [-]

Preconditioning

: 24 hours at ambient conditions.
: The average values during measurement are (23.57) °C, (55.9) %RH and (1012.4) hPa.

TABULATION OF RESULTS:

The table on next page give the measured values.

Calibrated by:

: 21 Mr. Sorapet Thiradipol
: Miss Jitrasri Lerttongphol



Approved signatory:

Mr. Panyay Booncharoen
Calibration Department Manager

Remark:

¹ Result given section area of the wind tunnel
² Projected cross-section area of the tested object include mounting pipe
³ Diameter of mounting pipe
⁴ Ratio "a/b"

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

Page 2 of 2 Pages

MEASUREMENT RESULTS^a

The Cup anemometer, Unit Under Calibration (UUC) was exercised at 30 m/s for 5 minutes prior to calibration being performed. The standard air velocity 0.5 m/s to 5 m/s was calculated by a standard air velocity transducer which was installed 50 mm away from wind tunnel nozzle and installed 40 mm away from top of the test section and the standard air velocity 5 m/s to 30 m/s was calculated by a pitot tube with precision differential pressure meter which was installed 50 mm away from wind tunnel nozzle and installed 40 mm away from top of the test section. UUC was mounted on a round vertical tube of the lower plate at center of test section. The calibration was carried out under both rising and falling air velocity in the range of 1 m/s to 16 m/s at calibration interval of 1 m/s. The results of calibration and associated measurement uncertainties are reported in the table below.

U _{std} (m/s)	Temp. wind tunnel (°C)	Temp. room (°C)	U _{std} (m/s)	Error (m/s)	U (k=2) (m/s)
0.582	23.40	23.40	0.8	-0.2	0.31
2.123	23.30	23.40	1.9	-0.2	0.31
5.013	23.28	23.40	2.9	-0.1	0.31
4.219	23.30	23.40	3.9	-0.3	0.31
4.56	23.15	23.40	4.9	-0.1	0.31
6.02	23.42	23.40	5.9	-0.1	0.31
6.96	23.38	23.40	7.0	0.0	0.31
7.97	23.42	23.40	8.0	0.0	0.31
8.96	23.42	23.40	9.0	0.0	0.31
9.96	23.36	23.40	10.0	0.1	0.31
10.96	23.38	23.40	11.1	0.1	0.31
12.01	23.40	23.40	12.2	0.2	0.31
13.01	23.00	23.40	13.4	0.4	0.32
14.01	23.30	23.40	14.4	0.4	0.31
15.00	23.10	23.40	15.4	0.4	0.31
15.99	23.28	23.40	16.5	0.5	0.32

Remark:

^a Calibration results only count for the tested circumstances and environmental conditions during which calibration took place
^b Velocity of standard
^c Velocity of Unit Under Calibration

PHOTO OF CALIBRATION SET-UP



Calibration set-up of the Cup anemometer calibration in the wind tunnel of Iranattee Associates Co., Ltd. The Cup anemometer shown may differ from the calibrated one. Remark: The proportion of the set-up is not true to scale due to imaging geometry.



Certificate Number
CWD-030-69

Page 2 of 2 Pages

MEASUREMENT RESULTS¹

The wind direction sensor was calibrated against standard rotary encoder by comparison method. During calibration, the measurement was carried out at 45° intervals in clockwise and counterclockwise directions after offset adjustment has been made. The flow speed of wind tunnel (usually 5 m/s) is kept constant while the sensor is rotated around its vertical axis. The results of calibration and associated measurement uncertainties are reported in the table below.

Air speed m/s	D _{me} Degree (°)	D _{acc} Degree (°)	Error Degree (°)	U (p=2) Degree (°)
	0.000	0	0	0.60
	45.000	43	-2	0.60
	90.000	86	-4	0.60
	135.000	130	-5	0.93
	180.000	174	-6	0.60
	225.000	220	-5	0.82
	270.000	271	1	0.60
	315.000	321	6	0.60

Remarks:

¹ Calibration results only valid for the tested circumstances and environmental conditions during which calibration took place.

² Direction of standard.

³ Direction of Unit Under Calibration.

End of Certificate of Calibration



J NAC
JIRANATEE ASSOCIATES CO., LTD.
Jiranatee Associates Co., Ltd.
63/14-15, 63/15-16
Petchakum 1/12, Rd. Wattana 4, Bangkok, Thailand 10110 (Thailand)
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Mobile: +662-0508013
E-mail: jnac@jiranatee.com
Web site: www.jiranatee.com

Accredited calibration laboratory
ISO/IEC 17025:2017
NSC-TIS 17025
CALIBRATION 0367



Temperature measurement laboratory
Calibration services department.

CERTIFICATE OF CALIBRATION

Certificate No. : CDT-030-69

Page 1 of 2 Pages

MEASUREMENT ITEM

: Data Logger with Temperature sensor

MANUFACTURER

: Novolyte

MODEL/TYPE

: 110-WS-250L-D

SERIAL NUMBER

: A5910

ID NUMBER

: RYG_F50609

CONDITION AS RECEIVED

: Used item

CUSTOMER

: ALS laboratory group (Thailand) Co., Ltd.
104 Phatthanakan Rd.,
Khuasong Suan Luang, Khet Suan Luang,
Bangkok 10250 Thailand.

RECEIVED DATE

: 09 Jan 2026

MEASUREMENT DATE

: 21 Jan 2026

ISSUE DATE

: 21 Jan 2026

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:

Temperature : 23.0 ± 3.0 °C

Relative Humidity : 55.0 ± 15.0 %RH

NOTED: The certificate is valid only to the item calibrated on date and place of calibration.

TABULATION OF RESULTS:

The table on next page give the measured values.

Calibration procedure:

The temperature calibration was done by in-house calibration method on WCI-001 according to comparison method with standard digital temperature indicator and standard temperature probe. The temperature scale was based on ITS-90.

Traceability:

The measurement results are traceable to the international system of units (SI) through National Institute of Metrology (NIMT) Certificate number: IT-1013-25, Certificate number: FR-0561-25.

Reference Used During Calibration:

1. Standard Temperature Probe
Model: STS-100-A100, Serial No.: 667682-09,
Due date: 9 Apr 2026
2. Digital Temperature Indicator
Model: DTI-1000-A MK II, Serial No.: 671407-00591 Due date: 22 Apr 2026

Uncertainty of Measurement:

The reported uncertainty of measurement is based on the standard uncertainty multiplied by a coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty has been determined in accordance with the GUM Evaluation of measurement data - Guide to the expression of uncertainty in measurement.

Calibrated by:

- ☐ Mr. Sorwatt Thachalad
- ☒ Miss Jitraporn Lertsomphol
- ☐ Miss Ruangsungpai Phoommit



Approved signature:

Mr. Parinya Booncharoen
Calibration Department Manager

THIS CERTIFICATE MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

J NAC
JIRANATEE ASSOCIATES CO., LTD.

Continuation of Certificate of Calibration Number CDT-030-69

Page 2 of 2 Pages

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 20 °C to 40 °C

Function:

Table 1: This equipment was connected with temperature sensor Model: HMP60 S/N: U3641223.
Dimension: Diameter 12 mm, Length 80 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.046	19.7	-0.3	0.099
80	25.031	24.6	-0.4	0.099
80	30.027	29.7	-0.3	0.099
80	35.031	34.7	-0.3	0.099
80	40.001	39.7	-0.3	0.099

UUC*: Unit Under Calibration

End of Certificate of Calibration



J NAC
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Web site: www.jiranatee.com

Accredited calibration laboratory
ISO/IEC 17025:2017
NSC-TIS 17025
CALIBRATION 0367



Relative humidity and Air Temperature measurement laboratory
Calibration services department.

CERTIFICATE OF CALIBRATION

Certificate No. : CRT-006-69

Page 1 of 2 Pages

MEASUREMENT ITEM

: Relative humidity with data logger

MANUFACTURER

: Novolyte

MODEL/TYPE

: Data Logger: 110-WS-250L-D

SERIAL NUMBER

: Data Logger: A5910

ID NUMBER

: Sensor: U3641223

CONDITION AS RECEIVED

: Used item

CUSTOMER

: ALS laboratory group (Thailand) Co., Ltd.
104 Phatthanakan Rd., Khuasong Suan Luang,
Khet Suan Luang, Bangkok 10250 Thailand.

RECEIVED DATE

: 09 Jan 2026

MEASUREMENT DATE

: 21 Jan 2026

ISSUE DATE

: 21 Jan 2026

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:

Temperature : 23.0 ± 3.0 °C

Relative Humidity : 55.0 ± 15.0 %RH

NOTED: The certificate is valid only to the item calibrated on date and place of calibration.

TABULATION OF RESULTS:

The table on next page give the measured values.

Calibration procedure:

The Relative Humidity and Air Temperature calibration was done by in-house calibration method as WCI-009 and WCI-020 according to comparison method with Standard Chilled Mixer Hygrometer with Temperature sensor and standard humidity generator chamber.

Traceability:

The measurements are traceable to the international system of units (SI) through National Institute of Metrology (NIMT) Certificate number: TH-0146-24 and Jiranatee Associates Co., Ltd. Certificate number: CDT-009-68.

Uncertainty of Measurement:

The reported uncertainty of measurement is based on the standard uncertainty multiplied by a coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty has been determined in accordance with the GUM Evaluation of measurement data - Guide to the expression of uncertainty in measurement.

Calibrated by:

- ☐ Mr. Sorwatt Thachalad
- ☒ Miss Jitraporn Lertsomphol
- ☐ Miss Ruangsungpai Phoommit



Approved signature:

Mr. Parinya Booncharoen
Calibration Department Manager

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

Measurement Results:

The results of calibration and associated measurement uncertainties are reported in the table below.

Result of Calibration: ☐ Without Adjustment ☒ With Adjustment

Table 1: The results of calibration of relative humidity at 30 °C are reported in table below.
Calibration Range: 20%RH to 80%RH

Air Temperature (°C)	Standard Reading (%RH)	UUC Reading (%RH)	Error (%RH)	Uncertainty (%RH)
30.09	29.94	21.0	1.1	0.74
30.11	49.96	50.9	0.9	1.1
30.11	79.96	79.9	-0.1	2.1

UUC: Unit Under Calibration

End of Certificate of Calibration



Certificate Number

CMS-006-68

CERTIFICATE OF CALIBRATION

Page 1 of 2 Pages

MEASUREMENT ITEM	Cup anemometer
MANUFACTURER	Novelma
MODEL/TYPE	Sensor: WS-02FA Data logger: 110 WS-250L-D
SERIAL NUMBER	Sensor: WSD-A5980 Data logger: A5980
ID NUMBER	RVC, F50049
CONDITION AS RECEIVED	Used item
CUSTOMER	AL5 laboratory group (Thailand) Co., Ltd. 104 Phatthanakan 40, Phatthanakan Rd, Khwaeng Siem Luang, Khet Siem Luang, Bangkok 10250 Thailand.
RECEIVED DATE	10 Jan 2025
MEASUREMENT DATE	17 Jan 2025
ISSUE DATE	20 Jan 2025
ENVIRONMENTAL CONDITIONS:	Ambient condition in the laboratory are as follow: Temperature: 23.0 ± 3.0 °C Relative Humidity: 55.0 ± 15.0 %RH Atmospheric Pressure: 1010 ± 10 hPa
PLACE OF CALIBRATION	(Effel) type wind tunnel of Jiranatee Associates Co., Ltd.
CALIBRATION CONDITIONS	Wind tunnel cross-section area ¹ : 900 cm ² Wind direction (azimuth) angle ² : 100 ° Diameter of mounting pipe ³ : mm Blockage ratio of test object ⁴ : 0.111 [-]
Preconditioning	24 hours at ambient conditions.
Measurement Condition	The average values during measurement are (24.8) °C, (61.5) %RH and (1012.5) hPa.
TABULATION OF RESULTS:	The table on next page give the measured values.

Calibrated by:
[1] Mr. Somsak Thongkham
[2] Mrs. Jiraporn Jirapornkham



Approved signature:
Mr. Pongpoo Boonchom
Calibration Department Manager

REVIEW BY: S/S

APPROVED BY: S/S

NEXT CAL DATE: 16/07/26

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

Page 2 of 2 Pages

MEASUREMENT RESULTS¹

The Cup anemometer, Unit Under Calibration (UUC) was exercised at 30 m/s for 5 minutes prior to calibration being performed. The standard air velocity 8.5 m/s to 5 m/s was calculated by a standard air velocity transducer which was installed 50 mm away from wind tunnel nozzle and installed 40 mm away from top of the test section and the standard air velocity 5 m/s to 30 m/s was calculated by a pitot tube with precision differential pressure meter which was installed 50 mm away from wind tunnel nozzle and installed 40 mm away from top of the test section. UUC was mounted on a round vertical tube of the lower plate at center of test section. The calibration was carried out under both rising and falling air velocity in the range of 1 m/s to 30 m/s at calibration interval of 1 m/s. The results of calibration and associated measurement uncertainties are reported in the table below.

V_{std} (m/s)	Temp. wind tunnel (°C)	Temp. room (°C)	V_{UUC} (m/s)	Error (m/s)	$(V_{UUC}-V_{std})$ (m/s)
1.023	24.68	24.75	0.9	-0.1	0.11
2.246	24.88	24.75	2.0	-0.2	0.31
3.076	24.44	24.75	3.0	-0.1	0.31
4.204	24.50	24.75	4.0	-0.2	0.31
4.96	24.30	24.75	4.9	0.0	0.31
5.97	24.70	24.75	5.9	0.0	0.31
7.03	24.30	24.75	7.0	0.0	0.31
7.97	24.62	24.75	8.1	0.1	0.31
9.03	24.20	24.75	9.1	0.1	0.31
9.98	24.30	24.75	10.1	0.1	0.31
11.09	24.16	24.75	11.2	0.1	0.31
12.00	24.10	24.75	12.3	0.2	0.31
13.05	24.20	24.75	13.4	0.3	0.31
12.98	24.22	24.75	14.5	0.3	0.31
15.03	24.36	24.75	15.3	0.2	0.31
15.93	24.32	24.75	16.3	0.3	0.31

Remark:

¹ Calibration results only valid for the tested characteristics and environmental conditions during which calibration took place

² Velocity of standard

³ Velocity of Unit Under Calibration

PHOTO OF CALIBRATION SET-UP



Calibration set up of the Cup anemometer calibration in the wind tunnel of Jiranatee Associates Co., Ltd. The Cup anemometer shown may differ from the calibrated one. However, this guarantee all the set-up is in accordance with the calibration certificate.



Certificate Number

CMS-006-68

CERTIFICATE OF CALIBRATION

Page 1 of 2 Pages

MEASUREMENT ITEM	Wind Direction Sensor
MANUFACTURER	Novelma
MODEL/TYPE	Sensor: WS-02FA Data logger: 110 WS-250L-D
SERIAL NUMBER	Sensor: WSD-A5980 Data logger: A5980
ID NUMBER	RVC, F50049
CONDITION AS RECEIVED	Used item
CUSTOMER	AL5 laboratory group (Thailand) Co., Ltd. 104 Phatthanakan 40, Phatthanakan Rd, Khwaeng Siem Luang, Khet Siem Luang, Bangkok 10250 Thailand.
RECEIVED DATE	10 Jan 2025
MEASUREMENT DATE	17 Jan 2025
ISSUE DATE	20 Jan 2025
ENVIRONMENTAL CONDITIONS:	Ambient condition in the laboratory are as follow: Temperature: 23.0 ± 3.0 °C Relative Humidity: 55.0 ± 15.0 %RH Atmospheric Pressure: 1010 ± 10 hPa
PLACE OF CALIBRATION	(Effel) type wind tunnel of Jiranatee Associates Co., Ltd.
CALIBRATION CONDITION	Wind tunnel cross-section area ¹ : 900 cm ² Wind direction (azimuth) angle ² : 129 ° Diameter of mounting pipe ³ : mm Blockage ratio of test object ⁴ : 0.143 [-]
Preconditioning	24 hours at ambient conditions.
Measurement Condition	The average values during measurement are (24.4) °C, (52.4) %RH and (1017.3) hPa.
TABULATION OF RESULTS:	The table on next page give the measured values.

Calibrated by:
[1] Mr. Somsak Thongkham
[2] Mrs. Jiraporn Jirapornkham



Approved signature:
Mr. Pongpoo Boonchom
Calibration Department Manager

Remark:
¹ Wind tunnel cross-section area of the wind tunnel
² Proposed cross-section area of the tested object include mounting pipe
³ Diameter of mounting pipe
⁴ Ratio "a/b"

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

Certificate Number
CWD-036-68

MEASUREMENT RESULTS¹

The wind direction sensor was calibrated against standard rotary encoder by comparison method. During calibration, the measurement was carried out at 45° intervals in clockwise and counter-clockwise directions after effort adjustment has been made. The flow speed of wind tunnel (usually 5 m/s) is kept constant while the sensor is rotated around its vertical axis. The results of calibration and associated measurement uncertainty are reported in the table below.

Air speed m/s	D ⁺ _{ref} Degree (°)	D ⁻ _{ref} Degree (°)	Error Degree (°)	U (k=2) Degree (°)
	0.000	0	0	0.80
	45.000	-41	-4	0.80
	90.000	87	-3	0.80
5.02	135.000	133	-2	0.80
	180.000	182	2	0.80
	225.000	226	1	0.80
	270.000	274	4	0.80
	315.000	320	5	0.80

Remarks:

¹ Calibration results only valid for the tested circumstances and measurement conditions during which calibration took place.

² Direction of standard.

³ Direction of Unit Under Calibration.

End of Certificate of Calibration



Jirantee Associates Co., Ltd.
84/24 ST. 27/28-38
Puchitkarn 1771, Rd. Wuthayua, Bangkok,
Bangkok 10250 (Thailand)
Tel: +662-0584112
Mobile: +662-0584113
E-mail: jnao-calibration@jiranatee.com
Web site: www.jiranatee.com

Accredited calibration laboratory
ISO/IEC 17025:2017
NSC-TIS-TIS 17025
CALIBRATION 0367

Temperature measurement laboratory
Calibration services department.



CERTIFICATE OF CALIBRATION

Certificate No. : CDT-030-68

Page 1 of 2 Pages

MEASUREMENT ITEM

MANUFACTURER

MODEL/TYPE

SERIAL NUMBER

ID NUMBER

CONDITION AS-RECEIVED

CUSTOMER

Data Logger with Temperature sensor

Novolyne

110-WS-250L-D

AS980

RYG-F50649

Used item

ALS laboratory group (Thailand) Co., Ltd.
104 Phattanakarn 40, Phattanakarn Rd.,
Khuang Suan Luang, Khet Suan Luang,
Bangkok 10250 Thailand.

RECEIVED DATE

MEASUREMENT DATE

ISSUE DATE

10 Jan 2025

17 Jan 2025

20 Jan 2025

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:

Temperature : 23.0 ± 3.0 °C

Relative Humidity : 55.0 ± 15.0 %RH

NOTED: The certificate is valid only to the item calibrated on date and place of calibration.

TABULATION OF RESULTS:

The table on next page give the measured values.

Calibration procedure:

The temperature calibration was done by In-House calibration method as HP-CL-001 according to comparison method with standard digital temperature indicator and standard temperature probe. The temperature scale use was based on ITS-90.

Traceability:

The measurement results are traceable to the International System of Units (SI) through National Institute of Metrology Thailand (NIMT).
Certificate number: TT-0047-24, Certificate number: EN-0113-24

Reference Used During Calibration:

1. Standard Temperature Probe
Model: 175-100 AS03, Serial No.: 667662-09,
Due date: 26 Mar 2025
2. Digital Temperature Indicator
Model: DTI-2000 A MK II, Serial No.: 671407-00591 Due date: 21 Oct 2025

Uncertainty of Measurement:

The reported uncertainty of measurement is based on the standard uncertainty multiplied by a coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty has been determined in accordance with the GUM Evaluation of measurement data - Guide to the expression of uncertainty in measurement²



Calibrated by:

- ☒ Mr. Sorawit Thachalad
☒ Mr. Jittaporn Lerthongphol
☐ Mr. Ruangsam Poonmit

Approved signature:

Mr. Pannya Booncharoen
Calibration Department Manager

THIS CERTIFICATE MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

Continuation of Certificate of Calibration Number CDT-030-68

Page 2 of 2 Pages

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 20 °C to 40 °C

Function:

Table 1: This equipment was connected with temperature sensor Model: HMP60 S/N: V1920214.
Dimension: Diameter 12 mm, Length 80 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.078	19.8	-0.3	0.099
80	25.067	24.8	-0.3	0.099
80	30.054	29.7	-0.4	0.099
80	35.035	34.7	-0.3	0.099
80	40.019	39.7	-0.3	0.099

UUC*: Unit Under Calibration

End of Certificate of Calibration



Jirantee Associates Co., Ltd.
84/24 ST. 27/28-38
Puchitkarn 1771, Rd. Wuthayua, Bangkok,
Bangkok 10250 (Thailand)
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Web site: www.jiranatee.com

Accredited calibration laboratory
ISO/IEC 17025:2017
NSC-TIS-TIS 17025
CALIBRATION 0367

Relative humidity and Air Temperature measurement laboratory
Calibration services department.



CERTIFICATE OF CALIBRATION

Certificate No. : CRT-004-68

Page 1 of 2 Pages

MEASUREMENT ITEM

MANUFACTURER

MODEL/TYPE

SERIAL NUMBER

ID NUMBER

CONDITION AS-RECEIVED

CUSTOMER

Relative Humidity with data logger

Novolyne

Data Logger: 110-WS-250L-D

Sensor: HMP60

Data Logger: AS980

Sensor: V1920214

RYG-F50649

Used item

ALS laboratory group (Thailand) Co., Ltd.
104 Phattanakarn 40, Phattanakarn Rd., Khuang Suan Luang,
Khet Suan Luang, Bangkok 10250 Thailand.

RECEIVED DATE

MEASUREMENT DATE

ISSUE DATE

10 Jan 2025

17 Jan 2025

20 Jan 2025

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:

Temperature : 23.0 ± 3.0 °C

Relative Humidity : 55.0 ± 15.0 %RH

NOTED: The certificate is valid only to the item calibrated on date and place of calibration.

TABULATION OF RESULTS:

The table on next page give the measured values.

Calibration procedure:

The Relative humidity and Air Temperature calibration was done by In-House calibration method as WH-CL-005 and WH-CL-030 according to comparison method with Standard, Chilled Mirror Hygrometer with Temperature sensor and standard Humidity generator chamber.

Traceability:

The measurement results are traceable to the International System of Units (SI) through National Institute of Metrology Thailand (NIMT).
Certificate number: WH-CL-24 and Jiranatee Associates Co., Ltd. Certificate number: CDT-026-68

Uncertainty of Measurement:

The reported uncertainty of measurement is based on the standard uncertainty multiplied by a coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty has been determined in accordance with the GUM Evaluation of measurement data - Guide to the expression of uncertainty in measurement²



Calibrated by:

- ☒ Mr. Sorawit Thachalad
☒ Mr. Jittaporn Lerthongphol
☐ Mr. Ruangsam Poonmit

Approved signature:

Mr. Pannya Booncharoen
Calibration Department Manager

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

Measurement Results:

The results of calibration and associated measurement uncertainties are reported in the table below.

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Table 1: The results of calibration of relative humidity at 30 °C are reported in table below

Calibration Range: 20%RH to 80%RH

Air Temperature (°C)	Standard Reading (%RH)	UUC Reading (%RH)	Error (%RH)	Uncertainty ± (%RH)
29.71	59.85	59.9	0.0	0.28
29.74	51.27	51.7	0.4	1.1
29.75	82.85	83.3	0.4	2.1

UUC* Unit Under Calibration

End of Certificate of Calibration



CERTIFICATE OF CALIBRATION

Certificate No.: CPB-001-68

Page 1 of 2 Pages

MEASUREMENT ITEM

Digital barometer

MANUFACTURER

Novatyna

MODEL/TYPE

Sensor: 110-W5-25BP

SERIAL NUMBER

Data logger: 110-W5-2501-D

CONDITION AS-RECEIVED

Sensor: BP-A5980

ID NUMBER

Data logger: A5980

CONDITION AS-RECEIVED

Used item

CUSTOMER

ALS laboratory group (Thailand) Co., Ltd.
104 Phatthanasukan Rd, Phatthanasukan Rd,
Khwang Suan Luang, Khet Suan Luang,
Bangkok 10250 Thailand.

RECEIVED DATE

10 Jan 2025

MEASUREMENT DATE

17 Jan 2025

ISSUE DATE

20 Jan 2025

Calibration procedure:

The Digital barometer was calibrated against Digital pressure calibration, the W C 0301 was used as a calibration guideline.

Traceability:

The measurement results are traceable to the international system of units (SI) through the NMVT (National Metrology Institute of Thailand) and Certificate number: MP-0009-24

Reference Used during Calibration:

1. Absolute Pressure Transducer Model: GP22003, Serial No.: 4183126P

Uncertainty of Measurement:

The reported uncertainty of measurement is based on the standard uncertainty multiplied by a coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty has been determined in accordance with the GUM Evaluation of measurement data - Guide to the expression of uncertainty in measurement

CONDITION OF THIS RESULT OF CALIBRATION:

1. Calibration effect for calibration sequence C

2. The UUC* was installed in vertical orientation above reference standard instrument and center of UUC* was used as the reference level.

3. Calibration conditions:

4. Condition

☒ Normal ☐ Abnormal

Pressure transmitting medium

Air

Pressure (20°C, 1 bar)

1.19 kPa

Humidity

54.2 (6-7) %

Temperature

22.9 (0.1) °C

Pressure

1013.4 (1.7) mbar

5. The certificate is valid only to the item calibrated on date and place of calibration



Calibrated by:
Dr. Mitthaporn Thachalad
Mr. Mitthaporn Thachalad

Approved signature: Mr. Panyapa Rattanasorn
Calibration Department Manager

THIS CERTIFICATE REPORT MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

CERTIFICATE OF CALIBRATION

Certificate No.: CPB-004-68

Page 2 of 2 Pages

MEASUREMENT RESULTS

☐ Without adjustment ☒ With adjustment

CALIBRATION IN THE RANGE OF : 950 mbar to 1050 mbar

The results of calibration and associated measurement uncertainties are reported in the table below.

STD (mbar)	UUC* (mbar)	Error (mbar)	Uncertainty (k=2) (mbar)
950.06	951.4	1.3	0.37
970.07	970.9	0.8	0.38
990.10	990.6	0.5	0.38
1010.05	1010.1	0.0	0.38
1030.07	1029.5	-0.5	0.37
1050.05	1049.0	-1.1	0.37

Note: UUC* Unit Under Calibration

To convert the result in report unit to Pa should be multiply by 100

End of certificate



CERTIFICATE OF CALIBRATION

Page 1 of 2 Pages

MEASUREMENT ITEM

Cup anemometer

MANUFACTURER

Novatyna

MODEL/TYPE

Sensor: W5-029

SERIAL NUMBER

Data logger: 200-W5-2501

CONDITION AS-RECEIVED

Data logger: W50-A5375

ID NUMBER

RYL-F50413

CONDITION AS-RECEIVED

Used item

CUSTOMER

ALS laboratory group (Thailand) Co., Ltd.
104 Phatthanasukan Rd, Phatthanasukan Rd,
Khwang Suan Luang, Khet Suan Luang,
Bangkok 10250 Thailand.

RECEIVED DATE

18 Oct 2024

MEASUREMENT DATE

29 Oct 2024

ISSUE DATE

29 Oct 2024

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:

23.0 ± 0.3 °C

Relative Humidity

55.0 ± 15.9 %RH

Atmospheric Pressure

1010.10 hPa

PLACE OF CALIBRATION

Effort-type wind tunnel of Jiranatee Associates Co., Ltd.

CALIBRATION CONDITIONS

Wind tunnel cross-section area¹ 900 cm²
Wind direction frontal area² 300 cm²
Diameter of mounting pipe³ - mm
Blockage ratio of test object⁴ 0.111 %

Preconditioning

24 hours at ambient conditions.

Measurement Condition

The average values during measurement are (22.9 °C, (41.4) °RH and (1004.2) hPa.

TABULATION OF RESULTS:

The table on next page give the measured values.

Calibrated by:
Dr. Mitthaporn Thachalad
Mr. Mitthaporn Thachalad



Approved signature: Mr. Panyapa Rattanasorn
Calibration Department Manager

Remarks:

¹ Inside cross section area of the wind tunnel
² Projected cross section area of the tested object include mounting plate
³ Diameter of mounting pipe
⁴ Ratio "b/a"

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

MEASUREMENT RESULTS¹

The Cup anemometer, Unit Under Calibration (UUC) was exercised at 10 m/s for 5 minutes prior to calibration being performed. The standard air velocity 0.5 m/s to 5 m/s was calculated by a standard air velocity transducer which was installed 50 mm away from wind tunnel nozzle and installed 40 mm away from top of the test section and the standard air velocity 5 m/s to 30 m/s was calculated by a pitot tube with precision differential pressure meter which was installed 50 mm away from wind tunnel nozzle and installed 40 mm away from top of the test section. UUC was mounted on a round vertical tube of the lower plate at center of test section. The calibration was carried out under both rising and falling air velocity in the range of 1 m/s to 16 m/s at calibration interval of 1 m/s. The results of calibration and associated measurement uncertainties are reported in the table below.

V_{ref} (m/s)	Temp. wind tunnel (°C)	Temp. room (°C)	V_{UUC} (m/s)	Error (m/s)	$U(k=2)$ (m/s)
1.004	23.00	22.90	0.9	-0.1	0.31
2.178	22.80	22.90	2.0	-0.2	0.31
3.006	22.90	22.90	2.9	-0.1	0.31
4.000	22.92	22.90	4.0	-0.2	0.31
4.93	22.70	22.90	4.9	0.0	0.31
5.95	22.72	22.90	5.9	-0.1	0.31
7.00	22.78	22.90	7.0	0.0	0.31
7.95	22.64	22.90	7.9	-0.1	0.31
8.94	22.88	22.90	9.0	0.0	0.31
9.94	22.94	22.90	10.1	0.1	0.31
11.07	22.54	22.90	11.1	0.0	0.31
12.00	22.90	22.90	12.0	0.0	0.31
12.93	22.64	22.90	13.0	0.1	0.31
13.92	22.84	22.90	14.1	0.1	0.31
14.96	22.70	22.90	15.1	0.2	0.31
15.94	22.70	22.90	16.3	0.3	0.32

Remarks:

¹ Calibration results only valid for the tested circumstances and environmental conditions during which calibration took place

² Velocity of standard

³ Velocity of Unit Under Calibration

PHOTO OF CALIBRATION SET-UP



Calibration set-up of the Cup anemometer calibration in the wind tunnel of Jiranatee Associates Co., Ltd. The Cup anemometer shown may differ from the calibrated one. Remark: The proportion of the set-up is not true to scale due to imaging geometry.



End of Certificate of Calibration

JIRANATEE ASSOCIATES CO., LTD.

MEASUREMENT RESULTS¹

The Cup anemometer, Unit Under Calibration (UUC) was exercised at 10 m/s for 5 minutes prior to calibration being performed. The standard air velocity 0.5 m/s to 5 m/s was calculated by a standard air velocity transducer which was installed 50 mm away from wind tunnel nozzle and installed 40 mm away from top of the test section and the standard air velocity 5 m/s to 30 m/s was calculated by a pitot tube with precision differential pressure meter which was installed 50 mm away from wind tunnel nozzle and installed 40 mm away from top of the test section. UUC was mounted on a round vertical tube of the lower plate at center of test section. The calibration was carried out under both rising and falling air velocity in the range of 1 m/s to 16 m/s at calibration interval of 1 m/s. The results of calibration and associated measurement uncertainties are reported in the table below.

V_{ref} (m/s)	Temp. wind tunnel (°C)	Temp. room (°C)	V_{UUC} (m/s)	Error (m/s)	$U(k=2)$ (m/s)
1.015	24.33	24.35	0.8	-0.2	0.31
2.349	24.30	24.35	2.0	-0.2	0.31
3.011	24.50	24.35	2.8	-0.2	0.32
4.232	24.46	24.35	3.9	-0.3	0.32
4.96	24.30	24.35	4.8	-0.1	0.31
6.03	24.88	24.35	5.9	-0.1	0.31
6.97	24.30	24.35	6.9	-0.1	0.32
7.97	24.70	24.35	8.0	0.0	0.31
8.97	24.40	24.35	9.0	0.0	0.31
9.97	24.50	24.35	10.0	0.0	0.31
11.03	24.30	24.35	11.1	0.1	0.31
12.03	24.34	24.35	12.1	0.1	0.31
13.01	24.18	24.35	13.2	0.2	0.31
14.01	24.12	24.35	14.2	0.2	0.31
15.00	24.04	24.35	15.3	0.3	0.35
16.01	24.00	24.35	16.3	0.3	0.32

Remarks:

¹ Calibration results only valid for the tested circumstances and environmental conditions during which calibration took place

² Velocity of standard

³ Velocity of Unit Under Calibration

PHOTO OF CALIBRATION SET-UP



Calibration set-up of the Cup anemometer calibration in the wind tunnel of Jiranatee Associates Co., Ltd. The Cup anemometer shown may differ from the calibrated one. Remark: The proportion of the set-up is not true to scale due to imaging geometry.



End of Certificate of Calibration

JIRANATEE ASSOCIATES CO., LTD.

CERTIFICATE OF CALIBRATION

MEASUREMENT ITEM MANUFACTURER MODEL/TYPE SERIAL NUMBER ID NUMBER CONDITION AS-RECEIVED CUSTOMER	: Cup anemometer : Novalyne : Sensor: WS-02F : Data logger: L10 WS-25DL-D : Sensor: WSO-A5912 : Data logger: A5912 : RYD, F50611 : Used item : ALS laboratory group (Thailand) Co., Ltd. : 104 Phatthanasak 40, Phatthanasak Rd. : Khwaeng Suan Luang, Khut Suan Luang, : Bangkok 10250 Thailand.	Calibration procedure: The Cup anemometer was calibrated against Standard air velocity transducer against B&S-02 and pitot tube with precision differential pressure meter model: DPM2500 in velocity calibration of Effel-type wind tunnel with 300 cm ² cross test section area. The WI-CL-001 based on IEC 61400-12-1, Wind energy generation systems - Part 12-1: Power performance measurement of electricity producing wind turbines, March 2017 was used as a calibration guideline. Traceability: This certificate provides a traceability of the measurement to recognition of the national standards and to realization of the international system of units (SI) through the NMPT (National Metrology Institute of Thailand) via Certificate number: MW-0019-23 and MW-0059-23. Uncertainty of Measurement: The reported uncertainty of measurement is based on the standard uncertainty multiplied by a coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty has been determined in accordance with the GUM "Evaluation of measurement data - Guide to the expression of uncertainty in measurement".
RECEIVED DATE MEASUREMENT DATE ISSUE DATE	: 19 Dec 2025 : 06 Jan 2026 : 06 Jan 2026	ENVIRONMENTAL CONDITIONS: Ambient condition in the laboratory are as follows: Temperature : 23.0 ± 3.0 °C Relative Humidity : 55.0 ± 15.0 %RH Atmospheric Pressure : 1010.0 ± 10 hPa
PLACE OF CALIBRATION : Effel-type wind tunnel of Jiranatee Associates Co., Ltd.		
CALIBRATION CONDITIONS : Wind tunnel cross-section area ¹ : 300 cm ² : Cup anemometer frontal area ² : 100 cm ² : Diameter of mounting pipe ³ : - mm : Blockage ratio of test object ⁴ : 0.111 [-]		
Preconditioning Measurement Condition : 24 hours at ambient conditions. (The average values during measurement are 24.4 °C, 63.6 %RH and 1007.9 hPa.		
TABULATION OF RESULTS: The table on next page give the measured values.		
Calibrated by: ☒ Mr. Sorawit Thakphad ☐ Miss Jiraporn Lertthongphol  JIRANATEE ASSOCIATES CO., LTD. Approved signature:  Mr. Parinya Booncharon Calibration Department Manager		
Remark: ¹ Available cross-section area of the wind tunnel ² Projected cross-section area of the tested object include mounting pipe ³ Diameter of mounting pipe ⁴ Ratio "a/b"		

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

CERTIFICATE OF CALIBRATION

MEASUREMENT ITEM MANUFACTURER MODEL/TYPE SERIAL NUMBER ID NUMBER CONDITION AS-RECEIVED CUSTOMER	: Wind Direction Sensor : Novalyne : Sensor: WS-02F : Data logger: L10 WS-25DL-D : Sensor: WSO-A5912 : Data logger: A5912 : RYD, F50611 : Used item : ALS laboratory group (Thailand) Co., Ltd. : 104 Phatthanasak 40, Phatthanasak Rd. : Khwaeng Suan Luang, Khut Suan Luang, : Bangkok 10250 Thailand.	Calibration procedure: The wind direction sensor was calibrated against Standard Rotary Encoder model: K4480075-DNA-P2-S-10 in on clear reflection of Effel-type wind tunnel with 300 cm ² cross test section area. The WI-CL-001 based on IEC 61400-12-1, Wind energy generation systems - Part 12-1: Power performance measurement of electricity producing wind turbines, March 2017 was used as a calibration guideline. Traceability: This certificate provides a traceability of the measurement to recognition of the national standards and to realization of the international system of units (SI) through the NMPT (National Metrology Institute of Thailand) via Certificate number: DA-0027-24. Uncertainty of Measurement: The reported uncertainty of measurement is based on the standard uncertainty multiplied by a coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty has been determined in accordance with the GUM "Evaluation of measurement data - Guide to the expression of uncertainty in measurement".
RECEIVED DATE MEASUREMENT DATE ISSUE DATE	: 19 Dec 2025 : 06 Jan 2026 : 06 Jan 2026	ENVIRONMENTAL CONDITIONS: Ambient condition in the laboratory are as follows: Temperature : 23.0 ± 3.0 °C Relative Humidity : 55.0 ± 15.0 %RH Atmospheric Pressure : 1010.0 ± 10 hPa
PLACE OF CALIBRATION : Effel-type wind tunnel of Jiranatee Associates Co., Ltd.		
CALIBRATION CONDITION : Wind tunnel cross-section area ¹ : 300 cm ² : Wind direction frontal area ² : 129 cm ² : Diameter of mounting pipe ³ : - mm : Blockage ratio of test object ⁴ : 0.143 [-]		
Preconditioning Measurement Condition : 24 hours at ambient conditions. (The average values during measurement are 24.7 °C, 63.6 %RH and 1007.9 hPa.		
TABULATION OF RESULTS: The table on next page give the measured values.		
Calibrated by: ☒ Mr. Sorawit Thakphad ☐ Miss Jiraporn Lertthongphol  JIRANATEE ASSOCIATES CO., LTD. Approved signature:  Mr. Parinya Booncharon Calibration Department Manager		
Remark: ¹ Available cross-section area of the wind tunnel ² Projected cross-section area of the tested object include mounting pipe ³ Diameter of mounting pipe ⁴ Ratio "a/b"		

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

Certificate Number
CVD-003-69

Page 2 of 2 Pages

MEASUREMENT RESULTS¹

The wind direction sensor was calibrated against standard rotary encoder by comparison method. During calibration, the measurement was carried out at 45° intervals in clockwise and counterclockwise directions after offset adjustment has been made. The flow speed of wind tunnel (usually 5 m/s) is kept constant while the sensor is rotated around its vertical axis. The results of calibration and associated measurement uncertainties are reported in the table below.

Air speed m/s	D ₁₀₀ Degree (°)	D ₁₀₀ Degree (°)	Error Degree (°)	U (k=2) Degree (°)
0.000	0	0	0	0.80
4.99	45.000	43	-3	0.82
	90.000	87	-3	0.81
	135.000	132	-3	0.95
	180.000	177	-3	0.82
	225.000	224	-1	0.82
	270.000	271	1	0.82
	315.000	318	3	0.82

Remark:

¹ Calibration results only valid for the tested circumstances and environmental conditions during which calibration took place.

² Direction of standard.

³ Direction of Unit Under Calibration.

End of Certificate of Calibration



CERTIFICATE OF CALIBRATION

Certificate No. : CDT-002-69

Page 1 of 2 Pages

MEASUREMENT ITEM
MANUFACTURER
MODEL/TYPE
SERIAL NUMBER
ID NUMBER
CONDITION AS-RECEIVED
CUSTOMER

- Data Logger with Temperature sensor
- Novolyns
- 110-W5-25DL-D
- AS912
- RYG_F50611
- Used item
- ALS laboratory group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd.,
Khwang Suan Luang, Khet Suan Luang,
Bangkok 10250 Thailand.

Calibration procedure:
The temperature calibration was done by In-House calibration method as WS-CL-003 according to comparison method with standard digital temperature indicator and standard temperature probe. The temperature scale was based on ITS-90.

Traceability:
The measurement results are traceable to the international system of units (SI) through National Institute of Metrology Thailand (NIMT).
Certificate number: TT-1218-25, Certificate number: TA-0061-25.

Reference Used During Calibration:

1. Standard Temperature Probe
Model: STS-100 AS00, Serial No.: 667682-09,
Due date: 9 Apr 2026
2. Digital Temperature Indicator
Model: DTI-1000-A MK II, Serial No.: 671407,
00591 Due date: 21 Apr 2026

Uncertainty of Measurement:
The reported uncertainty of measurement is based on the standard uncertainty multiplied by a coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty has been determined in accordance with the GUM Evaluation of measurement data - Guide to the expression of uncertainty in measurement.

RECEIVED DATE : 19 Dec 2025
MEASUREMENT DATE : 06 Jan 2026
ISSUE DATE : 06 Jan 2026

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:
Temperature : 23.0 ± 3.0 °C
Relative Humidity : 55.0 ± 15.0 %RH

NOTED: The certificate is valid only to the item calibrated on date and place of calibration.

TABULATION OF RESULTS:

The table on next page give the measured values.

Calibrated by:
☒ Mr. Sorawit Thachalad
☒ Miss Jitraporn Lertsomphol
☒ Miss Ruangsirumai Phoommit



Approved signature:
Mr. Parinyi Booncharoen
Calibration Department Manager

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Continuation of Certificate of Calibration Number CDT-002-69

Page 2 of 2 Pages

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 20 °C to 40 °C

Function:

Table 1: This equipment was connected with temperature sensor Model: HMP60 S/N: U3911247.
Dimension: Diameter 12 mm, Length 80 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.059	19.7	-0.4	0.019
80	25.043	24.6	-0.4	0.019
80	30.035	29.7	-0.3	0.019
80	35.022	34.6	-0.4	0.019
80	39.998	39.5	-0.5	0.019

UUC*: Unit Under Calibration

End of Certificate of Calibration



CERTIFICATE OF CALIBRATION

Certificate No. : CRT-002-60

Page 1 of 2 Pages

MEASUREMENT ITEM
MANUFACTURER
MODEL/TYPE
SERIAL NUMBER
ID NUMBER
CONDITION AS-RECEIVED
CUSTOMER

- Relative humidity with data logger
- Novolyns
- Data Logger: 110-W5-25DL-D
Sensor: HMP60
Data Logger: AS912
Sensor: USB1247
- RYG_F50611
- Used item
- ALS laboratory group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd, Khwang Suan Luang,
Khet Suan Luang, Bangkok 10250 Thailand.

Calibration procedure:
The Relative Humidity and Air Temperature calibration was done by In-House calibration method as WS-CL-029 and WS-CL-028 according to comparison method with Standard Chamber Hygrometer with Temperature sensor and standard Humidity generator chamber.

Traceability:
The measurements are traceable to the international system of units (SI) through National Institute of Metrology Thailand (NIMT).
Certificate number: TH0346-24 and Jirantee Associates Co., Ltd. Certificate number: CDT-026-68.

Uncertainty of Measurement:
The reported uncertainty of measurement is based on the standard uncertainty multiplied by a coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty has been determined in accordance with the GUM Evaluation of measurement data - Guide to the expression of uncertainty in measurement.

RECEIVED DATE : 19 Dec 2025
MEASUREMENT DATE : 06 Jan 2026
ISSUE DATE : 06 Jan 2026

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:
Temperature : 23.0 ± 3.0 °C
Relative Humidity : 55.0 ± 15.0 %RH

NOTED: The certificate is valid only to the item calibrated on date and place of calibration.

TABULATION OF RESULTS:

The table on next page give the measured values.

Calibrated by:
☒ Mr. Sorawit Thachalad
☒ Miss Jitraporn Lertsomphol
☒ Miss Ruangsirumai Phoommit



Approved signature:
Mr. Parinyi Booncharoen
Calibration Department Manager

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Measurement Results:

The results of calibration and associated measurement uncertainties are reported in the table below.

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Table 1: The results of calibration of relative humidity at 30 °C are reported in table below.
Calibration Range: 30%RH to 80%RH

Air Temperature [°C]	Standard Reading [NRH]	UUC Reading [NRH]	Error [NRH]	Uncertainty ± [NRH]
30.03	20.03	19.0	-1.0	0.79
30.06	50.03	48.5	-1.5	1.3
30.03	80.04	77.3	-2.7	2.3

UUC*: Unit Under Calibration

End of Certificate of Calibration



CERTIFICATE OF CALIBRATION

Certificate No. : CPH-002-69

Page 1 of 2 Pages

MEASUREMENT ITEM : Digital barometer
MANUFACTURER : Novaya
MODEL/TYPE : Sensor: 110-W5-25BP
Data logger: 110-W5-25D1-0
SERIAL NUMBER : Sensor: BP-A5912
Data logger: A5912
ID NUMBER : RYG_F50611
CONDITION AS-RECEIVED : Used item
CUSTOMER : ALS laboratory group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd,
Khwang Suan Luang, Khet Suan Luang,
Bangkok 10250 Thailand.

Calibration procedure:
The Digital barometer was calibrated against
Digital pressure calibration, The W-CL-003
was used as a calibration guideline.

Traceability:
The measurement results are traceable to
the international system of units (SI) through
the NIMT (National Metrology Institute of
Thailand) via Certificate number: MP-0017-25

Reference Used During Calibration:
1. Absolute Pressure Transducer
Model: KP2500, Serial No.: 4100126P

Uncertainty of Measurement:
The reported uncertainty of measurement is
based on the standard uncertainty multiplied
by a coverage factor $k=2$, which for a normal
distribution corresponds to a coverage
probability of approximately 95%. The
standard uncertainty has been determined in
accordance with the GUM "Evaluation of
measurement data - Guide to the expression
of uncertainty in measurement"

RECEIVED DATE : 19 Dec 2025
MEASUREMENT DATE : 06 Jan 2026
ISSUE DATE : 06 Jan 2026

CONDITION OF THIS RESULT OF CALIBRATION:

- Calibration effort for calibration sequence C.
- The UUC* was installed in vertical orientation above reference standard instrument and center of UUC* was used as the reference level.
- Calibration conditions:
- Condition : ☒ Normal ☐ Abnormal
Pressure transmitting medium : Air
 p_h (20°C, 1 bar) : 1.19 kg/m³
 p_{ref} : (53.1±5.2) %
 t_{amb} : (23.2±0.2) °C
 p_{ref} : (1012.5±0.6) mbar
- The certificate is valid only to the item calibrated on date and place of calibration

Calibrated by:
☒ Mr. Soradet Thacholad
☐ Miss Siraporn Lertsomphol



Approved signature: Mr. Panyya Booncharoen
Calibration Department Manager

THIS CERTIFICATE REPORT MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED
IN WRITING FROM THE LABORATORY

CERTIFICATE OF CALIBRATION

Certificate No. : CPH-002-69

Page 2 of 2 Pages

MEASUREMENT RESULTS : ☐ Without adjustment ☒ With adjustment

CALIBRATION IN THE RANGE OF : 950 mbar to 1050 mbar

The results of calibration and associated measurement uncertainties are reported in the table below.

STD (mbar)	UUC* (mbar)	Error (mbar)	Uncertainty (k=2) (mbar)
950.03	951.3	1.3	0.37
970.01	970.9	0.9	0.40
990.02	990.5	0.5	0.37
1010.00	1010.2	0.2	0.37
1029.99	1029.7	-0.3	0.41
1049.99	1049.3	-0.7	0.37

Note: UUC* Unit Under Calibration

* To convert the result in report unit to Pa should be multiply by 100



CERTIFICATE OF CALIBRATION

Page 1 of 2 Pages

MEASUREMENT ITEM : Cup anemometer
MANUFACTURER : Novaya
MODEL/TYPE : Sensor: W5-02F
Data logger: W5-25DL
Sensor: W50-A45G2
Data logger: A45G2
BXX_F50143
ID NUMBER : Used item
CONDITION AS-RECEIVED : ALS laboratory group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd,
Khwang Suan Luang, Khet Suan Luang,
Bangkok 10250 Thailand.

Calibration procedure:
The Cup anemometer was calibrated against
Standard air velocity transducer against B-05-23
and pilot tube with precision differential pressure
meter model: DPM2500 in an exhaust-section of
tunnel type wind tunnel with 300 cm² cross
section area, The W-CL-002 based on IEC 61400-3
12-1, Wind energy generation systems - Part 12-1:
Power performance measurements of
electricity producing wind turbines, March 2017
was used as a calibration guideline.

Traceability:
This certificate provides a traceability of the
measurement to recognized the national
standards, and to realization of the international
system of units (SI) through the NIMT (National
Metrology Institute of Thailand) via Certificate
number: MP-0019-25 and MW-0759-25

Uncertainty of Measurement:
The reported uncertainty of measurement is
based on the standard uncertainty multiplied by a
coverage factor $k=2$, which for a normal
distribution corresponds to a coverage probability
of approximately 95%. The standard uncertainty
has been determined in accordance with the GUM
"Evaluation of measurement data - Guide to the
expression of uncertainty in measurement"

RECEIVED DATE : 10-Feb-2026
MEASUREMENT DATE : 23-Feb-2026
ISSUE DATE : 23-Feb-2026

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follows:
Temperature : 23.0 ± 0.3 °C
Relative Humidity : 55.0 ± 15.0 %RH
Atmospheric Pressure : 1010.0 ± 10 hPa

PLACE OF CALIBRATION

: Exhaust type wind tunnel of Jirantee Associates Co., Ltd.

CALIBRATION CONDITIONS

: Wind tunnel cross-section area¹ : 500 cm²
Cup anemometer frontal area² : 100 cm²
Diameter of mounting pipe³ : - mm
Blockage ratio of test object⁴ : 0.111 %

Preconditioning

: 24 hours at ambient conditions.
Measurement Condition : The average values during measurement are (24.0) °C, (51.9) %RH and (1011.3) hPa.

TABULATION OF RESULTS:
The table on next page give the measured values.

Calibrated by:
☒ Mr. Soradet Thacholad
☐ Miss Siraporn Lertsomphol



Approved signature: Mr. Panyya Booncharoen
Calibration Department Manager

Remarks:
¹ Inside cross-section area of the wind tunnel
² Projected cross-section area of the tested object include mounting pipe
³ Diameter of mounting pipe
⁴ Ratio $\frac{A_o}{A_t}$

REVIEW BY: S.T.S.
APPROVED BY: [Signature]
NEXT CAL DATE: 22 Nov 2027

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED
IN WRITING FROM THE LABORATORY

Certificate Number
CWS-021-01

Page 2 of 2 Pages

MEASUREMENT RESULTS¹

The Cup anemometer, Unit Under Calibration (UUC) was exercised at 10 m/s for 5 minutes prior to calibration being performed. The standard air velocity 0.5 m/s to 5 m/s was calculated by a standard air velocity transducer which was installed 50 mm away from wind tunnel nozzle and installed 40 mm away from top of the test section and the standard air velocity 5 m/s to 30 m/s was calculated by a pitot tube with precision differential pressure meter which was installed 50 mm away from wind tunnel nozzle and installed 40 mm away from top of the test section. UUC was mounted on a round vertical table of the lower plate at center of test section. The calibration was carried out under both rising and falling air velocity in the range of 1 m/s to 30 m/s at calibration interval of 1 m/s. The results of calibration and associated measurement uncertainties are reported in the table below.

u_{ref} (m/s)	Temp. wind tunnel (°C)	Temp. room (°C)	u_{meas} (m/s)	Error (m/s)	$U/(k=2)$ (m/s)
1.043	23.70	23.95	0.9	-0.1	0.31
2.232	24.20	23.95	2.0	-0.2	0.31
3.031	23.60	23.95	2.9	-0.1	0.31
4.272	23.62	23.95	4.0	-0.3	0.31
5.03	23.80	23.95	5.0	0.0	0.31
6.03	24.10	23.95	5.8	-0.1	0.31
7.08	23.56	23.95	6.9	-0.1	0.31
8.02	23.82	23.95	7.9	-0.1	0.31
9.02	23.26	23.95	9.1	-0.1	0.31
10.01	23.50	23.95	10.1	0.1	0.40
11.01	23.44	23.95	11.1	0.1	0.31
12.01	23.50	23.95	12.2	0.2	0.37
12.99	23.50	23.95	13.2	0.2	0.45
13.98	23.46	23.95	14.2	0.2	0.35
14.97	23.50	23.95	15.3	0.3	0.53
16.03	23.40	23.95	16.3	0.3	0.42

Remark:

¹ Calibration results only valid for the tested circumstances and environmental conditions during which calibration took place

² Velocity of standard

³ Velocity of Unit Under Calibration

PHOTO OF CALIBRATION SET-UP



Calibration set-up of the Cup anemometer calibration in the wind tunnel of Jiranatee Associates Co., Ltd. The Cup anemometer shown may differ from the calibrated one. Remark: The proportion of the set-up is not true to scale due to imaging geometry.



Certificate Number
CWD-021-01

CERTIFICATE OF CALIBRATION

Page 1 of 2 Pages

MEASUREMENT ITEM

Wind Direction Sensor

MANUFACTURER

Nonaflex

MODEL/TYPE

Sensor: WS-029

SERIAL NUMBER

Data logger: WS-250L

ID NUMBER

Sensor: WSD-A4562

CONDITION AS RECEIVED

Data logger: A4562

CUSTOMER

ALC Laboratory Group (Thailand) Co., Ltd.
104 Phatthanasak Road,
Klong Luang, Klong Luang,
Bangkok 10150 Thailand.

RECEIVED DATE

10 Feb 2026

MEASUREMENT DATE

23 Feb 2026

ISSUE DATE

23 Feb 2026

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follows:

Temperature

(23.0 ± 3.0) °C

Relative Humidity

(55.0 ± 15.0) %RH

Atmospheric Pressure

(1010 ± 10) hPa

PLACE OF CALIBRATION

Effel-type wind tunnel of Jiranatee Associates Co., Ltd.

CALIBRATION CONDITION

Wind tunnel cross section area¹ 900 cm²
Wind direction frontal area² 129 cm²
Diameter of mounting pipe³ 10 mm
Blockage ratio of test object⁴ 0.143 [-]

Preconditioning

24 hours at ambient conditions.

Measurement Condition

The average values during measurement are (23.0°C, (54.0) %RH and (1006.3) hPa.

TABULATION OF RESULTS:

The table on next page give the measured values.



Approved signature:

Mr. Pichai Boonchamont
Calibration Department Manager

Remark:

¹ Nozzle cross section area of the wind tunnel

² Projected cross section area of the tested object include mounting pipe

³ Diameter of mounting pipe

⁴ Ratio S_o/S_n

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Certificate Number
CWD-021-01

Page 2 of 2 Pages

MEASUREMENT RESULTS¹

The wind direction sensor was calibrated against standard rotary encoder by comparison method. During calibration, the measurement was carried out at 45° intervals in clockwise and counterclockwise directions after offset adjustment has been made. The flow speed of wind tunnel (usually 5 m/s) is kept constant while the sensor is rotated around its vertical axis. The results of calibration and associated measurement uncertainties are reported in the table below.

Air speed m/s	θ'_{meas} Degree (°)	θ'_{ref} Degree (°)	Error Degree (°)	$U/(k=2)$ Degree (°)
5.00	45.000	44	-1	0.60
	90.000	88	-1	0.60
	135.000	134	-1	0.60
	180.000	181	1	0.82
	225.000	228	3	0.82
	270.000	273	3	0.82
	315.000	317	2	0.82
	360.000	359	-1	0.60

Remark:

¹ Calibration results only valid for the tested circumstances and environmental conditions during which calibration took place

² Direction of standard

³ Direction of Unit Under Calibration



Page 1 of 2

Certificate of Calibration

Customer

Name : ALC Laboratory Group Thailand Co., Ltd.

Certificate No : 26-ACT-007

Address : 104 Soi Phatthanasak 40, Phatthanasak Road, Sam Luang,
Bangkok 10250

Request No : Req-2026-0043

Unit Under Calibration Details

Measurement item : Acoustic Calibrator

Class : 1

Manufacturer : RION

Range : 94 dB / 1000 Hz

Model : NC-74

Instrument Status : Used

Serial Number : 34178121

ID : RYG_FS0213

Calibration Environment and Details

Temperature : (23 ± 2) °C

Humidity : (50 ± 20 %RH)

Barometric Pressure : (1013 ± 10.0 hPa)

Received Date : 7 January 2026

Calibration Date : 9 January 2026

Location of Calibration : LAB 1 Acoustic

Calibration Procedure : In-house method CP-ACT-02 based on IEC 60942:2017 Electroacoustics - Sound calibrators

Reference Standard	Model	Serial Number	Traceable	Due Calibration
Sound Calibrator	SV 35A	58079	EEL	20 June 2026
THD Multimeter	2015	1047765	NIMT	4 February 2026

Traceability : This certificate provides traceability of measurement to recognized national standard, and to the realization of the International System of Units (SI).

Note

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor $k=2$, providing a level of confidence approximately 95 %.

Calibrated By :

Mr. Noppakorn Luangrat
Service Calibration Engineer

Approved By :

Mr. Pichai Boonchamont
Calibration Engineer Supervisor

Issue Date : 9 January 2026

Certificate No : 26-ACI-007
Request No : Req-2026-0043

Sound pressure level

Calibration Results : Without Adjustment

Calibration Range (dB)	Without Adjustment (dB)		Adjustment (dB)		Uncertainty (+ dB)
	Measured	Deviated value	Measured	Deviated value	
94 dB / 1000 Hz	94.08	0.08	-	-	0.12

Frequency of Sound pressure level

Calibration Range (Hz)	Without Adjustment		Adjustment		Uncertainty (+ %)
	Measured (Hz)	Deviated value (%)	Measured (Hz)	Deviated value (%)	
94 dB / 1000 Hz	1000.00	0.000	-	-	0.010

Total Harmonic Distortion plus Noise of Sound pressure level (THD+N %)

Calibration Range (Hz)	Without Adjustment	Adjustment	Uncertainty (+ %)
	Measured (%)	Measured (%)	
94 dB / 1000 Hz	1.84	-	0.17

Note :

- The calibration results exclude the calibration process correction
- The calibration results exclude the microphone volume correction

End of Calibration

The results are valid only in the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

INA-708-ACT-02 Rev.54 Issue date 12/02/25

SITHIPORN ASSOCIATES CO., LTD.
CALIBRATION LABORATORY

451-454/ Siemthorn Road, Bangthumru, Bangkok, 10700 Thailand
Tel : +66 2433 8331 Email : calibration@sithiporn.com

SITHIPORN
associates



Cert. No. : ACL25500
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42A / Microphone UC-52 / Preamplifier NH-24
Serial No.: 00623890 / 198637 / 26418
ID No.: RYG_FS0615

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location : -
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

Received Date : 11 DECEMBER 2025
Calibration Date : 22 DECEMBER 2025
Date of Issue : 24 DECEMBER 2025



Calibrated by : Nathakorn Pisutpaisan

Approved by : Nitinun Srihawan
(Nitinun Srihawan)

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

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CALIBRATION LABORATORY

Cert. No. : ACL25500
Job No. : VC69AC0045
Pages : 2 of 8

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 tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.

For tests results of each items were made by observation of each Instruments 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	MY48017076	EP-0011-25	11-FEB-26
Waveform Generator	33511B	MY52302742	EP-0012-25	11-FEB-26
Digital Multimeter	33461A	MY53220104	EEL_BP 24/0268	22-APR-26
Digital Multimeter	33461A	MY53220076	EEL_BP 23/0268	22-APR-26
Digital Multimeter	34461A	MY60024273	CA2025120EA	18-MAR-26
Programmable Attenuator	MAT-1070	62100114	EP-0006-25	11-FEB-26
Condenser Microphone	4180	2977900	AA-1002-25	19-FEB-26
Measuring Amplifier	NA-42KA1	34560495	AA-3002-25	19-FEB-26

2. This result of calibration was found accurate as shown on 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 Metrology (Thailand).
- 3.2 Thailand Institute of Scientific and Technological Research (TISTR).
- 3.3 Electrical And Electronics Institute (EEI).

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CALIBRATION LABORATORY

Cert. No. : ACL25500
Job No. : VC69AC0045
Pages : 3 of 8

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		
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	0.3	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 control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

Cert. No. : ACL25500
Job No. : VC69AC0045
Page : 4 of 8

Result of calibration :**1. Absolute sensitivity**

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

2. Self-generated noise**2.1 Normal test**

Measured Value (dB)
18.6

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

Frequency Weighting	Weighting (dB)
A - weight	11.6
C - weight	18.1
Flat	23.6

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 84 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.3	0.3	0.3	± 1.5
1000	0.1	0.1	0.1	± 1.0
8000	1.6	1.6	1.6	±5.0

PCL25500-5

Cert. No. : ACL25500
Job No. : VC69AC0045
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	-0.1	-0.1	-0.1	±2.0
125	0.0	0.0	0.0	±1.5
250	-0.1	0.0	-0.1	±1.5
500	0.0	0.0	-0.1	±1.5
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	±3.0
8000	0.0	0.0	0.0	±5.0

5. Frequency and time weightings at 1 kHz**5.1 Frequency weightings at 1 kHz**

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (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	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	94.0	0.0	± 0.1
Slow	94.0	94.0	0.0	± 0.1
Leq	94.0	94.0	0.0	± 0.1

6. Long - term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.1	0.1	± 0.3

TCL25500-6

Cert. No. : ACL25500
Job No. : VC69AC0045
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (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	134.1	0.1	± 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	119.1	0.1	± 1.1
114.0	114.1	0.1	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.1	0.1	± 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
30.0	29.9	-0.1	± 1.1
29.0	28.9	-0.1	± 1.1
28.0	27.9	-0.1	± 1.1
27.0	26.9	-0.1	± 1.1
26.0	26.0	0.0	± 1.1
25.0	24.9	-0.1	± 1.1

PCL25500-5

Cert. No. : ACL25500
Job No. : VC69AC0045
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	28.9	-0.1	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	116.9	-0.1	1.0 ; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.0 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.8	-0.2	1.5 ; -5.0
	2	8	108.0	107.9	-0.1	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

PCL25500-6

Cert. No. : ACL25500
Job No. : VC69AC0045
Pages : 8 of 8

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L _{peak} (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	±3.0
One	133.4	133.4	0.0	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.1	-0.3	±2.0

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.6	89.5	-0.1	±1.5

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	137.0	137.0	0.0	±0.3

The reported 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

END OF CERTIFICATE

Cert. No. : ACL25504
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42A / Microphone UC-52 / Preamplifier NH-24
Serial No. : 00623389 / 198636 / 26417
ID No. : RYG_FS0614

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location : -
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

Received Date : 15 DECEMBER 2025
Calibration Date : 24 DECEMBER 2025
Date of Issue : 26 DECEMBER 2025

Calibrated by : Nathakorn Pinutpaisan

Approved by : 
(Nitinun Srihawan)

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

Cert. No. : ACL25504
Job No. : VC69AC0047
Pages : 2 of 8

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 tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference
Standard Instruments.

For tests results of each items were made by observation of each Instruments 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	MY48017076	EF-0011-25	11-FEB-26
Waveform Generator	33511B	MY52302742	EF-0012-25	11-FEB-26
Digital Multimeter	33461A	MY53220104	EEL_BP 24/0268	22-APR-26
Digital Multimeter	33461A	MY53220076	EEL_BP 23/0268	22-APR-26
Digital Multimeter	34461A	MY60024273	CA2025120EA	18-MAR-26
Programmable Attenuator	MAT-1070	62100114	EF-0006-25	11-FEB-26
Condenser Microphone	4180	2977900	AA-1002-25	19-FEB-26
Measuring Amplifier	NA-42KA1	34560495	AA-3002-25	19-FEB-26

2. This result of calibration was found accurate as shown on 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 Metrology (Thailand).
- 3.2 Thailand Institute of Scientific and Technological Research (TISTR).
- 3.3 Electrical And Electronics Institute (EEI).

END OF CERTIFICATE

Cert. No. : ACL25504
Job No. : VC69AC0047
Pages : 3 of 8

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		
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	0.3	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 control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

END OF CERTIFICATE

Cert. No. : ACL25504
Job No. : VC69AC0047
Page : 4 of 8

Result of calibration :**1. Absolute sensitivity**

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

2. Self-generated noise**2.1 Normal test**

Measured Value (dB)
13.8

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

Frequency Weighting	Weighting (dB)
A - weight	10.8
C - weight	17.1
Flat	22.9

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 84 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.1	0.1	0.2	± 1.5
1000	0.0	0.0	0.0	± 1.0
8000	1.0	1.1	1.1	±5.0

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Cert. No. : ACL25504
Job No. : VC69AC0047
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	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	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz**5.1 Frequency weightings at 1 kHz**

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (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	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	94.0	0.0	± 0.1
Slow	94.0	94.0	0.0	± 0.1
Leq	94.0	94.0	0.0	± 0.1

6. Long - term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.3

EN 12510-1:2010

Cert. No. : ACL25504
Job No. : VC69AC0047
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (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
30.0	30.0	0.0	± 1.1
29.0	28.9	-0.1	± 1.1
28.0	27.9	-0.1	± 1.1
27.0	26.9	-0.1	± 1.1
26.0	25.9	-0.1	± 1.1
25.0	24.9	-0.1	± 1.1

EN 12510-1:2010

Cert. No. : ACL25504
Job No. : VC69AC0047
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	28.8	-0.2	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.1	0.1	±1.0
Slow	2	8	108.0	108.0	0.0	1.0 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.1	0.1	±1.0

EN 12510-1:2010

Cert. No. : ACL25504
Job No. : VC69AC0047
Pages : 8 of 8

Calibration Certificate

Cert. No. : ACL25411
Pages : 1 of 8

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Lepeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	±3.0
One	133.4	133.4	0.0	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.1	0.1	±2.0
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.6	89.5	-0.1	±1.5

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	137.0	137.0	0.0	±0.3

The reported 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

ENCLOSURE

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No. : 00873109 / 171842 / 73485
ID No. : RYG_FS0384

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.Location : -
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %
Received Date : 20 OCTOBER 2025
Calibration Date : 29 - 30 OCTOBER 2025
Date of Issue : 31 OCTOBER 2025

Calibrated by : Nathakorn Pinotpaisan

Approved by : Nitinun Srihawan
(Nitinun Srihawan)

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other than in full, except with the prior written approval of the head of Calibration Laboratory.

Cert. No. : ACL25411
Job No. : VC69AC0014
Pages : 2 of 8Cert. No. : ACL25411
Job No. : VC69AC0014
Pages : 3 of 8

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 tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference
Standard Instruments.

For tests results of each items were made by observation of each Instruments 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	MY48017076	EF-0011-25	11-FEB-26
Waveform Generator	33511B	MY52302742	EF-0012-25	11-FEB-26
Digital Multimeter	33461A	MY53220104	EEL_BP 24/0268	22-APR-26
Digital Multimeter	33461A	MY53220076	EEL_BP 23/0268	22-APR-26
Digital Multimeter	34461A	MY60024273	CA2025120EA	18-MAR-26
Programmable Attenuator	MAT-1070	62100114	EF-0006-25	11-FEB-26
Condenser Microphone	4180	2977900	AA-1002-25	19-FEB-26
Measuring Amplifier	NA-42KAI	34560495	AA-3002-25	19-FEB-26

2. This result of calibration was found accurate as shown on 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 Metrology (Thailand).
- 3.2 Thailand Institute of Scientific and Technological Research (TISTR).
- 3.3 Electrical And Electronics Institute (EEI).

ENCLOSURE

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		
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	0.3	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 control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

ENCLOSURE

Cert. No. : ACL25411
Job No. : VC69AC0014
Page : 4 of 8

Result of calibration :**1. Absolute sensitivity**

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

2. Self-generated noise**2.1 Normal test**

Measured Value (dB)
16.2

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

Frequency Weighting	Weighting (dB)
A - weight	12.0
C - weight	18.4
Flat	23.8

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 84 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.3	0.3	0.3	± 1.5
1000	0.0	0.0	0.0	± 1.0
8000	-0.5	-0.5	-0.5	±5.0

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Cert. No. : ACL25411
Job No. : VC69AC0014
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	-0.1	-0.1	-0.1	±2.0
125	-0.1	0.0	-0.1	±1.5
250	0.0	0.0	-0.1	±1.5
500	0.0	0.0	-0.1	±1.5
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	±3.0
8000	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz**5.1 Frequency weightings at 1 kHz**

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (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	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	94.0	0.0	± 0.1
Slow	94.0	94.0	0.0	± 0.1
Leq	94.0	94.0	0.0	± 0.1

6. Long - term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.3

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Cert. No. : ACL25411
Job No. : VC69AC0014
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (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	131.9	-0.1	± 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
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

D:\Sithiporn S.

Cert. No. : ACL25411
Job No. : VC69AC0014
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	28.9	-0.1	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.0 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

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Cert. No. : ACL25411
Job No. : VC69AC0014
Pages : 8 of 8

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Lepeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	±3.0
One	133.4	133.4	0.0	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.6	89.5	-0.1	±1.5

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	137.0	137.0	0.0	±0.3

The reported 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

Sithiporn S.

Cert. No. : ACL25317
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No. : 00472132 / 169445 / 72446
ID No. : RYG_FS0304

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location : -
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %
Received Date : 04 AUGUST 2025
Calibration Date : 18-19 AUGUST 2025
Date of Issue : 20 AUGUST 2025

Calibrated by :

Nathakorn Pisutpaisan

Approved by :

Wichok B.
(Wichok Ekpongpradit)

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Cert. No. : ACL25317
Job No. : VC68AC0162
Pages : 2 of 8

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 tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference
Standard Instruments.

For tests results of each items were made by observation of each Instruments 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	MY48017076	EF-0011-25	11-FEB-26
Waveform Generator	33511B	MY52302742	EF-0012-25	11-FEB-26
Digital Multimeter	33461A	MY53220104	EEL_BP_24/0268	22-APR-26
Digital Multimeter	33461A	MY53220076	EEL_BP_23/0268	22-APR-26
Digital Multimeter	34461A	MY60024273	CA2025120EA	18-MAR-26
Programmable Attenuator	MAT-1070	62100114	EF-0006-25	11-FEB-26
Condenser Microphone	4180	2977900	AA-1002-25	19-FEB-26
Measuring Amplifier	NA-42KA1	34560495	AA-3002-25	19-FEB-26

2. This result of calibration was found accurate as shown on 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 Metrology (Thailand),
- 3.2 Thailand Institute of Scientific and Technological Research (TISTR),
- 3.3 Electrical And Electronics Institute (EEI).

Sithiporn S.

Cert. No. : ACL25317
Job No. : VC68AC0162
Pages : 3 of 8

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		
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	0.3	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 control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

Sithiporn S.

Cert. No. : ACL25317
Job No. : VC68AC0162
Page : 4 of 8

Result of calibration :**1. Absolute sensitivity**

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

2. Self-generated noise**2.1 Normal test**

Measured Value (dB)
17.9

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

Frequency Weighting	Weighting (dB)
A - weight	8.7
C - weight	15.9
Flat	21.6

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 84 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits (dB)
125	0.3	0.3	0.3	± 1.5
1000	0.0	0.0	0.0	± 1.0
8000	-0.8	-0.7	-0.7	±5.0

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Cert. No. : ACL25317
Job No. : VC68AC0162
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	0.0	0.0	±2.0
125	0.0	0.0	0.0	±1.5
250	0.0	0.0	0.0	±1.5
500	0.0	0.0	0.0	±1.5
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	±3.0
8000	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz**5.1 Frequency weightings at 1 kHz**

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (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	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	94.0	0.0	± 0.1
Slow	94.0	94.0	0.0	± 0.1
Leq	94.0	94.0	0.0	± 0.1

6. Long - term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.3

version 6

Cert. No. : ACL25317
Job No. : VC68AC0162
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (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	53.9	-0.1	± 1.1
49.0	49.0	0.0	± 1.1
44.0	43.9	-0.1	± 1.1
39.0	38.9	-0.1	± 1.1
34.0	33.9	-0.1	± 1.1
30.0	29.9	-0.1	± 1.1
29.0	28.9	-0.1	± 1.1
28.0	27.9	-0.1	± 1.1
27.0	26.9	-0.1	± 1.1
26.0	25.9	-0.1	± 1.1
25.0	24.9	-0.1	± 1.1

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Cert. No. : ACL25317
Job No. : VC68AC0162
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	28.9	-0.1	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.0 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

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Cert. No. : ACL25317
Job No. : VC68AC0162
Pages : 8 of 8

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L _{peak} (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	±3.0
One	133.4	133.3	-0.1	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

11. Overload indication

Measured value (dB)		Deviated Value	Acceptance Limits
Positive one-half cycle	Negative one-half cycle	(dB)	(dB)
89.5	89.5	0.0	±1.5

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	137.0	137.0	0.0	±0.3

The reported 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

Cert. No. : ACL25410
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No. : 00873057 / 143840 / 73333
ID No. : RYG_FS0381

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.,
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHUWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location : -
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %
Received Date : 20 OCTOBER 2025
Calibration Date : 29 - 30 OCTOBER 2025
Date of Issue : 31 OCTOBER 2025



Calibrated by : Nathakorn Pinutpaisan

Approved by : Nititamon S.
(Nititamon S.)

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

Cert. No. : ACL25410
Job No. : VC69AC0014
Pages : 2 of 8

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 tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference
Standard Instruments.

For tests results of each items were made by observation of each Instruments 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	MY48017076	EF-0011-25	11-FEB-26
Waveform Generator	33511B	MY52302742	EF-0012-25	11-FEB-26
Digital Multimeter	33461A	MY53220104	EEL-BP 24/0268	22-APR-26
Digital Multimeter	33461A	MY53220076	EEL-BP 23/0268	22-APR-26
Digital Multimeter	34461A	MY60024273	CA2025120EA	18-MAR-26
Programmable Attenuator	MAT-1070	62100114	EF-0006-25	11-FEB-26
Condenser Microphone	4180	2977900	AA-1002-25	19-FEB-26
Measuring Amplifier	NA-42KAJ	34560495	AA-3002-25	19-FEB-26

2. This result of calibration was found accurate as shown on 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 Metrology (Thailand),
- 3.2 Thailand Institute of Scientific and Technological Research (TISTR),
- 3.3 Electrical And Electronics Institute (EEI).

Cert. No. : ACL25410
Job No. : VC69AC0014
Pages : 3 of 8

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		
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	0.3	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 control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

Cert. No. : ACL25410
Job No. : VC69AC0014
Page : 4 of 8

Result of calibration :**1. Absolute sensitivity**

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

2. Self-generated noise**2.1 Normal test**

Measured Value (dB)
15.9

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

Frequency Weighting	Weighting (dB)
A - weight	11.3
C - weight	17.2
Flat	22.9

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 84 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.3	0.3	0.3	± 1.5
1000	0.1	0.1	0.1	± 1.0
8000	-1.0	-0.9	-0.8	±5.0

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Cert. No. : ACL25410
Job No. : VC69AC0014
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	0.0	0.0	±2.0
125	0.0	0.0	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	±2.0
4000	0.0	0.1	0.0	±3.0
8000	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz**5.1 Frequency weightings at 1 kHz**

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (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	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	94.0	0.0	± 0.1
Slow	94.0	94.0	0.0	± 0.1
Leq	94.0	94.0	0.0	± 0.1

6. Long - term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.1	0.1	± 0.3

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Cert. No. : ACL25410
Job No. : VC69AC0014
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (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
30.0	29.9	-0.1	± 1.1
29.0	28.9	-0.1	± 1.1
28.0	28.0	0.0	± 1.1
27.0	27.0	0.0	± 1.1
26.0	25.9	-0.1	± 1.1
25.0	24.9	-0.1	± 1.1

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Cert. No. : ACL25410
Job No. : VC69AC0014
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	29.0	0.0	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	108.0	0.0	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.1	0.1	±1.0
Slow	2	8	108.0	108.0	0.0	1.0 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.1	0.1	±1.0

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Cert. No. : ACL25410
Job No. : VC69AC0014
Pages : 8 of 8

Cert. No. : ACL26082
Pages : 1 of 8

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Lepeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	±3.0
Cnc	133.4	133.3	-0.1	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	132.9	-0.1	±2.0
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.1	-0.3	±2.0

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.5	89.6	0.1	±1.5

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	136.9	137.0	-0.1	±0.3

The reported 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

01/01/2026

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No.: 00296517 / 135230 / 87527
ID No.: RYG_FS0434

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location : -
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

Received Date : 05 JANUARY 2026
Calibration Date : 21 - 23 JANUARY 2026
Date of Issue : 26 JANUARY 2026

REVIEW BY: *Spt S*
APPROVED BY: *Spt S*
NEXT CAL DATE: 20/ 01/ 2027

Calibrated by : Nathakorn Pinutpaisan

Approved by : *Nitinun S.*
(Nitinun Srihawan)

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other than in full, except with the prior written approval of the head of Calibration Laboratory.

01/01/2026

Cert. No. : ACL26082
Job No. : VC69AC0053
Pages : 2 of 8

Cert. No. : ACL26082
Job No. : VC69AC0053
Pages : 3 of 8

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 tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference
Standard Instruments.

For tests results of each items were made by observation of each Instruments 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	MY48017076	EF-0011-25	11-FEB-26
Waveform Generator	33511B	MY52302742	EF-0012-25	11-FEB-26
Digital Multimeter	33461A	MY53220104	EEL_BP 24/0268	22-APR-26
Digital Multimeter	33461A	MY53220076	EEL_BP 23/0268	22-APR-26
Digital Multimeter	34461A	MY60024273	CA2025120EA	18-MAR-26
Programmable Attenuator	MAT-1070	62100114	EF-0006-25	11-FEB-26
Condenser Microphone	4180	2977900	AA-1002-25	19-FEB-26
Measuring Amplifier	NA-42KA1	34560495	AA-3002-25	19-FEB-26

2. This result of calibration was found accurate as shown on 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 Metrology (Thailand),
- 3.2 Thailand Institute of Scientific and Technological Research (TISTR),
- 3.3 Electrical And Electronics Institute (EEI).

01/01/2026

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		
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	0.3	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 control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

01/01/2026

Cert. No. : ACL26082
Job No. : VC69AC0053
Page : 4 of 8

Result of calibration :**1. Absolute sensitivity**

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

2. Self-generated noise**2.1 Normal test**

Measured Value (dB)
19

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

Frequency Weighting	Weighting (dB)
A - weight	15.8
C - weight	21.5
Flat	27.3

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 84 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	-0.3	-0.3	-0.2	± 1.5
1000	0.1	0.1	0.1	± 1.0
8000	2.2	2.3	2.3	±5.0

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Cert. No. : ACL26082
Job No. : VC69AC0053
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	-0.2	-0.1	±2.0
125	0.0	0.0	-0.1	±1.5
250	0.0	0.0	-0.1	±1.5
500	0.0	0.0	-0.1	±1.5
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	±3.0
8000	0.0	0.0	0.1	±5.0

5. Frequency and time weightings at 1 kHz**5.1 Frequency weightings at 1 kHz**

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (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	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	94.0	0.0	± 0.1
Slow	94.0	94.0	0.0	± 0.1
Leq	94.0	94.0	0.0	± 0.1

6. Long - term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.3

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Cert. No. : ACL26082
Job No. : VC69AC0053
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7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.1	0.1	± 1.1
136.0	136.1	0.1	± 1.1
135.0	135.1	0.1	± 1.1
134.0	134.1	0.1	± 1.1
133.0	133.1	0.1	± 1.1
132.0	132.1	0.1	± 1.1
131.0	131.0	0.0	± 1.1
129.0	129.1	0.1	± 1.1
124.0	124.1	0.1	± 1.1
119.0	119.1	0.1	± 1.1
114.0	114.1	0.1	± 1.1
109.0	109.1	0.1	± 1.1
104.0	104.1	0.1	± 1.1
99.0	99.1	0.1	± 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
30.0	29.9	-0.1	± 1.1
29.0	29.0	0.0	± 1.1
28.0	28.0	0.0	± 1.1
27.0	26.9	-0.1	± 1.1
26.0	25.9	-0.1	± 1.1
25.0	24.9	-0.1	± 1.1

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8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	28.9	-0.1	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.0 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
SEL	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

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10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L _{peak} (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	±3.0
One	133.4	133.4	0.0	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.1	-0.3	±2.0

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.5	89.5	0.0	±1.5

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	137.0	137.0	0.0	±0.3

The reported 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

CP/02599/6

Cert. No. : ACL25495
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Calibration Certificate

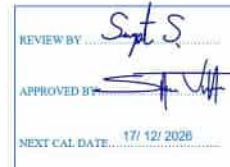
Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No.: 00597167 / 179118 / 87525
ID No.: RYG_FS0437

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location : -
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

Received Date : 08 DECEMBER 2025
Calibration Date : 18-19 DECEMBER 2025
Date of Issue : 22 DECEMBER 2025



Calibrated by : Nathakorn Pinutpaisan

Approved by : Nitinun Srihawan
(Nitinun Srihawan)

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

Cert. No. : ACL25495
Job No. : VC69AC0043
Pages : 2 of 8

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 tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference
Standard Instruments.

For tests results of each items were made by observation of each Instruments 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	MY48017076	EF-0011-25	11-FEB-26
Waveform Generator	33511B	MY52302742	EF-0012-25	11-FEB-26
Digital Multimeter	33461A	MY53220104	EEL_BP 24/0268	22-APR-26
Digital Multimeter	33461A	MY53220076	EEL_BP 23/0268	22-APR-26
Digital Multimeter	34461A	MY60024273	CA2025120EA	18-MAR-26
Programmable Attenuator	MAT-1070	62100114	EF-0006-25	11-FEB-26
Condenser Microphone	4180	2977900	AA-1002-25	19-FEB-26
Measuring Amplifier	NA-42KA1	34560495	AA-3002-25	19-FEB-26

2. This result of calibration was found accurate as shown on 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 Metrology (Thailand).
- 3.2 Thailand Institute of Scientific and Technological Research (TISTR).
- 3.3 Electrical And Electronics Institute (EEI).

DTS/02599/6

Cert. No. : ACL25495
Job No. : VC69AC0043
Pages : 3 of 8

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		
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	0.3	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 control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

DTS/02599/6

Cert. No. : ACL25495
Job No. : VC69AC0043
Page : 4 of 8

Result of calibration :**1. Absolute sensitivity**

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

2. Self-generated noise**2.1 Normal test**

Measured Value (dB)
14.8

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

Frequency Weighting	Weighting (dB)
A - weight	11.6
C - weight	17.7
Flat	23.2

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 84 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.1	0.2	0.2	± 1.5
1000	-0.1	-0.1	-0.1	± 1.0
8000	1.0	1.1	1.1	±5.0

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Cert. No. : ACL25495
Job No. : VC69AC0043
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	-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	0.1	±2.0
4000	0.0	0.1	0.1	±3.0
8000	0.1	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz**5.1 Frequency weightings at 1 kHz**

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (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	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	94.0	0.0	± 0.1
Slow	94.0	94.0	0.0	± 0.1
Leq	94.0	94.0	0.0	± 0.1

6. Long - term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.1	0.1	± 0.3

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Cert. No. : ACL25495
Job No. : VC69AC0043
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (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	119.1	0.1	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.1	0.1	± 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
30.0	30.0	0.0	± 1.1
29.0	29.0	0.0	± 1.1
28.0	27.9	-0.1	± 1.1
27.0	27.0	0.0	± 1.1
26.0	26.0	0.0	± 1.1
25.0	24.9	-0.1	± 1.1

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Cert. No. : ACL25495
Job No. : VC69AC0043
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	29.0	0.0	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	108.0	0.0	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.1	0.1	±1.0
Slow	2	8	108.0	108.0	0.0	1.0 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.1	0.1	±1.0

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Cert. No. : ACL25495
Job No. : VC69AC0043
Pages : 8 of 8

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L _{peak} (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	±3.0
One	133.4	133.4	0.0	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.1	-0.3	±2.0

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.5	89.6	0.1	±1.5

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	137.0	137.0	0.0	±0.3

The reported 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

PNS Version 5

Cert. No. : ACL25413
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No.: 00597168 / 180411 / 88181
ID No.: RYG_FS0438

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location : -
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

Received Date : 20 OCTOBER 2025
Calibration Date : 29 - 30 OCTOBER 2025
Date of Issue : 31 OCTOBER 2025

Calibrated by : Nathakorn Pinutpaisan

Approved by : Nitinun Srihawan

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other than in full, except with the prior written approval of the head of Calibration Laboratory.

Cert. No. : ACL25413
Job No. : VC69AC0014
Pages : 2 of 8

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 tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference
Standard Instruments.

For tests results of each items were made by observation of each Instruments 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	MY48017076	EF-0011-25	11-FEB-26
Waveform Generator	33511B	MY52302742	EF-0012-25	11-FEB-26
Digital Multimeter	33461A	MY53220104	EEL_BP 24/0268	22-APR-26
Digital Multimeter	33461A	MY53220076	EEL_BP 23/0268	22-APR-26
Digital Multimeter	34461A	MY60024273	CA2025120EA	18-MAR-26
Programmable Attenuator	MAT-1070	62100114	EF-0006-25	11-FEB-26
Condenser Microphone	4180	2977900	AA-1002-25	19-FEB-26
Measuring Amplifier	NA-42KA1	34560495	AA-3002-25	19-FEB-26

2. This result of calibration was found accurate as shown on 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 Metrology (Thailand).
- 3.2 Thailand Institute of Scientific and Technological Research (TISTR).
- 3.3 Electrical And Electronics Institute (EEI).

PNS Version 5

Cert. No. : ACL25413
Job No. : VC69AC0014
Pages : 3 of 8

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		
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	0.3	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 control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

PNS Version 5

Cert. No. : ACL25413
Job No. : VC69AC0014
Page : 4 of 8

Result of calibration :**1. Absolute sensitivity**

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

2. Self-generated noise**2.1 Normal test**

Measured Value (dB)
14.8

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

Frequency Weighting	Weighting (dB)
A - weight	11.6
C - weight	18.0
Flat	23.5

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 84 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.1	0.1	0.1	± 1.5
1000	0.0	0.0	0.0	± 1.0
8000	1.3	1.4	1.4	±5.0

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Cert. No. : ACL25413
Job No. : VC69AC0014
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4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	-0.1	-0.1	±2.0
125	0.0	0.0	0.0	±1.5
250	0.0	0.0	0.0	±1.5
500	0.0	0.0	-0.1	±1.5
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	±3.0
8000	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz**5.1 Frequency weightings at 1 kHz**

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (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	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	94.0	0.0	± 0.1
Slow	94.0	94.0	0.0	± 0.1
Leq	94.0	94.0	0.0	± 0.1

6. Long - term stability

Frequency Weighting	SIM Display at initial (dB)	SIM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.3

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Cert. No. : ACL25413
Job No. : VC69AC0014
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (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	89.1	0.1	± 1.1
84.0	84.1	0.1	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.1	0.1	± 1.1
69.0	69.1	0.1	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.1	0.1	± 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	34.1	0.1	± 1.1
30.0	30.1	0.1	± 1.1
29.0	29.1	0.1	± 1.1
28.0	28.1	0.1	± 1.1
27.0	27.1	0.1	± 1.1
26.0	26.2	0.2	± 1.1
25.0	25.1	0.1	± 1.1

C:\S\25413

Cert. No. : ACL25413
Job No. : VC69AC0014
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	28.9	-0.1	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.0 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

C:\S\25413

Cert. No. : ACL25413
Job No. : VC69AC0014
Pages : 8 of 8

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Lepeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	±3.0
One	133.4	133.3	-0.1	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.5	89.5	0.0	±1.5

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	137.0	137.0	0.0	±0.3

The reported 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

C/Sithiporn S.

Cert. No. : ACL26081
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No. : 00296515 / 179119 / 87526
ID No. : RYG_PS0432

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location : -
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

Received Date : 05 JANUARY 2026
Calibration Date : 21 - 23 JANUARY 2026
Date of Issue : 26 JANUARY 2026



Calibrated by : Nathakorn Pisutpaisan

Approved by : Nitinun Srihawan
(Nitinun Srihawan)

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

Cert. No. : ACL26081
Job No. : VC69AC0053
Pages : 3 of 8

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 tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference
Standard Instruments.

For tests results of each items were made by observation of each Instruments 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	MY48017076	EF-0011-25	11-FEB-26
Waveform Generator	33511B	MY52302742	EF-0012-25	11-FEB-26
Digital Multimeter	33461A	MY53220104	EEL_HP 24/0268	22-APR-26
Digital Multimeter	33461A	MY53220076	EEL_HP 23/0268	22-APR-26
Digital Multimeter	34461A	MY60024273	CA2025120EA	18-MAR-26
Programmable Attenuator	MAT-1070	62100114	EF-0006-25	11-FEB-26
Condenser Microphone	4180	2977900	AA-1002-25	19-FEB-26
Measuring Amplifier	NA-42KA1	34560495	AA-3002-25	19-FEB-26

2. This result of calibration was found accurate as shown on 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 Metrology (Thailand).
- 3.2 Thailand Institute of Scientific and Technological Research (TISTR).
- 3.3 Electrical And Electronics Institute (EEI).

C/Sithiporn S.

Cert. No. : ACL26081
Job No. : VC69AC0053
Pages : 3 of 8

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		
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	0.3	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 control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

Nititorn S.

Cert. No. : ACL26081
Job No. : VC69AC0053
Page : 4 of 8

Result of calibration :**1. Absolute sensitivity**

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

2. Self-generated noise**2.1 Normal test**

Measured Value (dB)
14.2

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

Frequency Weighting	Weighting (dB)
A - weight	10.4
C - weight	17.2
Flat	22.9

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 84 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.3	0.3	0.3	± 1.5
1000	0.1	0.1	0.2	± 1.0
8000	-0.1	0.0	0.0	±5.0

SITHIPORN

Cert. No. : ACL26081
Job No. : VC69AC0053
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	-0.1	0.0	±2.0
125	0.0	0.0	0.0	±1.5
250	0.0	0.0	0.0	±1.5
500	0.0	0.0	0.0	±1.5
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	±3.0
8000	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz**5.1 Frequency weightings at 1 kHz**

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (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	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	94.0	0.0	± 0.1
Slow	94.0	94.0	0.0	± 0.1
Leq	94.0	94.0	0.0	± 0.1

6. Long - term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.3

SITHIPORN

Cert. No. : ACL26081
Job No. : VC69AC0053
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (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	53.9	-0.1	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	38.9	-0.1	± 1.1
34.0	34.0	0.0	± 1.1
30.0	29.9	-0.1	± 1.1
29.0	28.9	-0.1	± 1.1
28.0	28.0	0.0	± 1.1
27.0	27.0	0.0	± 1.1
26.0	25.9	-0.1	± 1.1
25.0	24.9	-0.1	± 1.1

SITHIPORN

Cert. No. : ACL26081
Job No. : VC69AC0053
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	28.9	-0.1	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.0 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

SITHIPORN

Cert. No. : ACL26081
Job No. : VC69AC0053
Pages : 8 of 8

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Lepeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	± 3.0
One	133.4	133.3	-0.1	± 3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	± 2.0
Positive half cycle	135.4	135.2	-0.2	± 2.0
Negative half cycle	135.4	135.2	-0.2	± 2.0

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.5	89.6	0.1	± 1.5

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	137.0	137.0	0.0	± 0.3

The reported 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

EXTENSION 6

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No.: 00734225 / 179117 / 87524
ID No.: RYG_FS0030

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.Location : -
Ambient Temperature : (23.0 $\pm$ 3) °C
Pressure : (101.3 $\pm$ 3) kPa
Relative Humidity : (50.0 $\pm$ 20) %
Received Date : 05 JANUARY 2026
Calibration Date : 21 - 23 JANUARY 2026
Date of Issue : 26 JANUARY 2026

REVIEW BY	Sut S
APPROVED BY	[Signature]
NEXT CAL DATE	20/ 01/ 2027

Calibrated by : Nathakorn Pisutpaisan

Approved by : Nitinun Srihawan
(Nitinun Srihawan)

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

Cert. No. : ACL26079
Job No. : VC69AC0053
Pages : 2 of 8

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 tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference
Standard Instruments.

For tests results of each items were made by observation of each Instruments 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	MY48017076	EF-0011-25	11-FEB-26
Waveform Generator	33511B	MY52302742	EF-0012-25	11-FEB-26
Digital Multimeter	33461A	MY53220104	EEL-BP 24/0268	22-APR-26
Digital Multimeter	33461A	MY53220076	EEL-BP 23/0268	22-APR-26
Digital Multimeter	34461A	MY60024273	CA2025120EA	18-MAR-26
Programmable Attenuator	MAT-1070	62100114	EF-0006-25	11-FEB-26
Condenser Microphone	4180	2977900	AA-1002-25	19-FEB-26
Measuring Amplifier	NA-42KA1	34560495	AA-3002-25	19-FEB-26

2. This result of calibration was found accurate as shown on 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 Metrology (Thailand).
- 3.2 Thailand Institute of Scientific and Technological Research (TISTR).
- 3.3 Electrical And Electronics Institute (EEI).

EXTENSION 5

Cert. No. : ACL26079
Job No. : VC69AC0053
Pages : 3 of 8

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		
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	0.3	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 control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

EXTENSION 6

Cert. No. : ACL26079
Job No. : VC69AC0053
Page : 4 of 8

Result of calibration :**1. Absolute sensitivity**

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

2. Self-generated noise**2.1 Normal test**

Measured Value (dB)
14.8

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

Frequency Weighting	Weighting (dB)
A - weight	11.9
C - weight	18.1
Flat	23.8

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 84 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.2	0.2	0.2	± 1.5
1000	0.0	0.0	0.0	± 1.0
8000	-0.2	1.9	1.9	±5.0

DTS/Amir A.

Cert. No. : ACL26079
Job No. : VC69AC0053
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	-0.1	0.0	0.0	±2.0
125	0.0	0.0	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	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz**5.1 Frequency weightings at 1 kHz**

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (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	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	94.0	0.0	± 0.1
Slow	94.0	94.0	0.0	± 0.1
Leq	94.0	94.0	0.0	± 0.1

6. Long - term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.1	0.1	± 0.3

DTS/Amir A.

Cert. No. : ACL26079
Job No. : VC69AC0053
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (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	38.9	-0.1	± 1.1
34.0	34.0	0.0	± 1.1
30.0	30.0	0.0	± 1.1
29.0	28.9	-0.1	± 1.1
28.0	27.9	-0.1	± 1.1
27.0	26.9	-0.1	± 1.1
26.0	25.9	-0.1	± 1.1
25.0	24.8	-0.2	± 1.1

DTS/Amir A.

Cert. No. : ACL26079
Job No. : VC69AC0053
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	28.9	-0.1	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, T _b (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.1	0.1	±1.0
Slow	2	8	108.0	108.0	0.0	1.0 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
SEL	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.1	0.1	±1.0

DTS/Amir A.

Cert. No. : ACL26079
Job No. : VC69AC0053
Pages : 8 of 8

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L _{peak} (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	±3.0
One	133.4	133.4	0.0	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

11. Overload Indication

Measured value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle	
89.5	89.5	0.0
		±1.5

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	137.0	137.0	0.0	±0.3

The reported 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

P2730005

CERTIFICATE OF CALIBRATION

Page 1 of 2 Pages

Certificate No. : CDT-003-69

MEASUREMENT ITEM : Heat Stress Monitor
MANUFACTURER : Delta OHM
MODEL/TYPE : HD32.2
SERIAL NUMBER : LR028311
ID NUMBER : RYG_F50356
CONDITION AS-RECEIVED : Used item
CUSTOMER : ALS laboratory group (Thailand) Co., Ltd.
104 Phatthanasak 40, Phatthanasak Rd.,
Khwaeng Suan Luang, Khet Suan Luang,
Bangkok 10250 Thailand.

RECEIVED DATE : 19 Dec 2025
MEASUREMENT DATE : 06 Jan 2026
ISSUE DATE : 07 Jan 2026

ENVIRONMENTAL CONDITIONS:
Ambient condition in the laboratory are as follow:
Temperature : 23.0 ± 3.0 °C
Relative Humidity : 55.0 ± 15.0 %RH

NOTE: The certificate is valid only to the item calibrated on date and place of calibration.

TABULATION OF RESULTS:
The table on next page give the measured values.

Calibration procedure:
The temperature calibration was done by
in-house calibration method as WP-CL-003
according to comparison method with standard
digital temperature indicator and standard
temperature probe. The temperature scale use
was based on ITS-90.

Traceability:
The measurement results are traceable to the
international system of units (SI) through
National Institute of Metrology Thailand (NIMT)
Certificate number: IT-1013-25, Certificate
number: ER-0061-25.

Reference Used During Calibration:
1. Standard Temperature Probe
Model: ITS-100-A300, Serial No.: 667582-09,
Due date: 9 Apr 2026
2. Digital Temperature Indicator
Model: DTI-1000-A MX II, Serial No.: 671407-
00591 Due date: 21 Apr 2026

Uncertainty of Measurement:
The reported uncertainty of measurement is
based on the standard uncertainty multiplied by
a coverage factor $k=2$, which for a normal
distribution corresponds to a coverage
probability of approximately 95%. The standard
uncertainty has been determined in accordance
with the GUM Evaluation of measurement data
- Guide to the expression of uncertainty in
measurement

REVIEW BY: 
APPROVED BY: 
NEXT CAL DATE: 09/01/2027



Calibrated by:
☐ Mr. Sorawit Thachalad
☐ Miss Jittaporn Lertsamphol
☐ Miss Ruangsri Phoommit

Approved signature: 
Mr. Parinya Booncharoen
Calibration Department Manager

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION HAS BEEN OBTAINED
IN WRITING FROM THE LABORATORY

Continuation of Certificate of Calibration Number CDT-003-69

Page 2 of 2 Pages

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 10 °C to 45 °C

Functions:

Table 1: This equipment was connected with wet bulb probe Model: HP3201.2, S/N: 18021466.
Dimension: Diameter 3.3 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	WUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	10.062	10.1	0.0	0.099
80	20.062	20.1	0.0	0.099
80	25.049	25.0	0.0	0.099
80	30.039	30.0	0.0	0.099
80	35.026	35.0	0.0	0.099
80	45.016	44.9	-0.1	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TP3275.2, S/N: 18020493.
Dimension: Diameter 3.3 mm. Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	WUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	10.062	10.2	0.1	0.099
110	20.062	20.2	0.1	0.099
110	25.049	25.1	0.1	0.099
110	30.039	30.1	0.1	0.099
110	35.026	35.1	0.1	0.099
110	45.016	45.1	0.1	0.099

Table 3: This equipment was connected with temperature probe Model: TP3207.2, S/N: 18021258
Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	WUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	10.063	10.4	0.3	0.099
75	20.062	20.2	0.1	0.099
75	25.049	25.1	0.1	0.099
75	30.039	30.1	0.1	0.099
75	35.026	35.0	0.0	0.099
75	45.016	44.9	-0.1	0.099

WUC*: Unit Under Calibration

End of Certificate of Calibration



CERTIFICATE OF CALIBRATION

Page 1 of 2 Pages

Certificate No. : CDT-067-69

MEASUREMENT ITEM : Heat Stress Monitor
MANUFACTURER : Delta OHM
MODEL/TYPE : HD32.2
SERIAL NUMBER : 15020735
ID NUMBER : RYG_F50231
CONDITION AS-RECEIVED : Used item
CUSTOMER : ALS laboratory group (Thailand) Co., Ltd.
104 Phatthanasak 40, Phatthanasak Rd.,
Khwaeng Suan Luang, Khet Suan Luang,
Bangkok 10250 Thailand.

RECEIVED DATE : 19 Feb 2026
MEASUREMENT DATE : 20 Feb 2026
ISSUE DATE : 20 Feb 2026

ENVIRONMENTAL CONDITIONS:
Ambient condition in the laboratory are as follow:
Temperature : 23.0 ± 3.0 °C
Relative Humidity : 55.0 ± 15.0 %RH

NOTE: The certificate is valid only to the item calibrated on date and place of calibration.

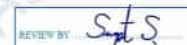
TABULATION OF RESULTS:
The table on next page give the measured values.

Calibration procedure:
The temperature calibration was done by
in-house calibration method as WP-CL-003
according to comparison method with standard
digital temperature indicator and standard
temperature probe. The temperature scale use
was based on ITS-90.

Traceability:
The measurement results are traceable to the
international system of units (SI) through
National Institute of Metrology Thailand (NIMT)
Certificate number: IT-1013-25, Certificate
number: ER-0061-25.

Reference Used During Calibration:
1. Standard Temperature Probe
Model: ITS-100-A300, Serial No.: 667582-09,
Due date: 9 Apr 2027
2. Digital Temperature Indicator
Model: DTI-1000-A MX II, Serial No.: 671407-
00591 Due date: 22 Apr 2027

Uncertainty of Measurement:
The reported uncertainty of measurement is
based on the standard uncertainty multiplied by
a coverage factor $k=2$, which for a normal
distribution corresponds to a coverage
probability of approximately 95%. The standard
uncertainty has been determined in accordance
with the GUM Evaluation of measurement data
- Guide to the expression of uncertainty in
measurement

REVIEW BY: 
APPROVED BY: 
NEXT CAL DATE: 19/02/2027



Calibrated by:
☐ Mr. Sorawit Thachalad
☐ Miss Jittaporn Lertsamphol
☐ Miss Ruangsri Phoommit

Approved signature: 
Mr. Parinya Booncharoen
Calibration Department Manager

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION HAS BEEN OBTAINED
IN WRITING FROM THE LABORATORY

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 10 °C to 45 °C

Function:

Table 1: This equipment was connected with wet built probe Model: HP3201-2, S/N: 15035050.
Dimension: Diameter 3.3 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	10.041	10.1	0.1	0.099
80	20.029	20.1	0.1	0.099
80	25.012	25.0	0.0	0.099
80	30.004	30.0	0.0	0.099
80	35.000	35.0	0.0	0.099
80	45.000	45.0	0.0	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TP3276-2, S/N: 17023218.
Dimension: Diameter 3.3 mm. Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	10.044	10.1	0.1	0.099
110	20.024	20.1	0.1	0.099
110	25.011	25.1	0.1	0.099
110	30.004	30.1	0.1	0.099
110	35.000	35.1	0.1	0.099
110	45.000	45.1	0.1	0.099

Table 3: This equipment was connected with temperature probe Model: TP3207-2, S/N: 15033321.
Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	10.041	10.1	0.1	0.099
75	20.029	20.1	0.1	0.099
75	25.011	24.9	-0.1	0.099
75	30.004	29.8	-0.2	0.099
75	35.000	34.7	-0.3	0.099
75	44.999	44.5	-0.4	0.099

UUC*: Unit Under Calibration



Certificate of Calibration

Cert.No.: 25CH458
Page.: 1 of 3

Equipment :

Manufacturer :

Model :

Serial No. :

ID No. :

Condition As-Received:

Received Date :

Calibration Date :

Reference :

Submitted by :

pH Meter

Mettler Toledo

SevenGo S2

C221115514

RYG_FS0596

Used Item

24 June 2025

25 June 2025

2506-0782DSC-4

ALS Laboratory Group (Thailand) Co.,Ltd. Rayong Branch
616/10 Moo 5, T.Maesiam Khui, A.Pluakdaeng,
Rayong 21140, Thailand

Ambient Temperature :

Relative Humidity :

Calibration Procedure :

(25 ± 2.5) °C

(50 ± 15) %

In - house - method :

- CP-CH5 by direct measurement with DC voltage
standard and direct measurement with
certified reference material (CRM)

- CP-CH8 by comparison with temperature - standard

Calibrated by :

Waladek Sirithuan

Approved by :

Sathip

Approved Signatory

() Chakrit Wanwanjua

() Ponpan Paipim

(✓) Sathip Meangmai

Issue Date :

26 June 2025

The Uncertainties are for a confidence probability of approximately 95%

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Approval of the head of Corporate Services 3 : Equipment Calibration and Testing Services.



Cert.No.: 25CH458
Page.: 2 of 3

Condition of this calibration result

1. Reference Standard Instrument

Instrument

Serial No.	ID No.	Cert. No.	Due Date
54030049	130RC116	24E2759	25 Aug 2025
4982054	110RC044	24I757	14 July 2025

- This measurement result is traceable to SI through Technology Promotion Association (Thailand - Japan)

2. Certified Reference Materials

: The measurement results are traceable to SI through CPA chem Ltd.,
ANSI-ASQ National Accreditation Board, Accredited No. AR-1835

Buffer Solution	Manufacturer	Lot No.	Exp. date
pH 4.007	CPA chem	1066665	18 Jan 2027
pH 6.965	CPA chem	1066667	18 Jan 2026
pH 10.010	CPA chem	1114385	08 June 2026

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

Calibration Results

Function : mV Measurement

Performing standard curve by Document Process Calibrator at pH (4,7,10)

Unit Under Calibration	Nominal Value	Standard Voltage Input	Actual Reading		Uncertainty of Measurement (mV)	Coverage factor k
	pH	mV	mV	pH		
pH Meter	4.00	177.48	178	4.00	0.58	2.00
S/N: C221115514	7.00	0.00	0	7.00	0.58	2.00
	10.00	-177.48	-178	10.00	0.58	2.00



Cert.No.: 25CH458
Page.: 3 of 3

Calibration Results

Function : pH Measurement

Performing three buffers standard curve by using buffer nominal pH (4,7,10)

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH Measurement (t)	Coverage factor k
pH Electrode S/N: 3293232	4.007	4.01	163	0.0079	2.00
	6.965	6.99	-10	0.011	2.00
	10.010	10.00	-185	0.0092	2.00

Function : Temperature Measurement

(*) Without adjustment

This equipment was connected with Temperature Probe;

- Model : InLabExpert Go-ISM

- Serial No. : 3293232

Dimension of probe

- Length : 120 mm.

- Diameter : 12 mm.

- Immersion Depth : 100 mm.

Calibration Point (°C)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty of measurement (± °C)	Coverage factor k
25.0	25.002	25.1	0.098	0.13	2.00
45.0	45.001	45.2	0.199	0.13	2.00

Remark - UUC* = Unit Under Calibration

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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Certificate of Calibration

Cert. No.: 25LM10
Page.: 1 of 2

Equipment : DO Meter with Sensor
Manufacturer : YSI
Model : 5000-115V
Serial No. : 15E102796
ID No. : RYG_EN0032
Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd.
(Rayong Branch)
616/10 Moo 5 T. Maenam Khu, A. Phukdaeng,
Rayong 21140 Thailand
Location : TPA On Site Calibration Laboratory
Received Order : 17 January 2025
Calibrated Date : 20 January 2025
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %
AC Line Voltage : (220 ± 22) V

Calibrated by : Warakorn Lemgagtrakul

Approved by :

() Chakrit Wanwanjua
(✓) Sowit Imjai
() Kunchat Promprat

Issue Date : 23 January 2025

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full, except with the prior written
Approval of the head of Corporate Services 3 : Equipment Calibration and Testing Services.

REVIEW BY: Photchanas
APPROVED BY: [Signature]
NEXT CAL DATE: 20/07/26



Equipment : DO Meter with Sensor
Condition As-Received : Used Item
Reference : 2501-0600DSC-2
Procedure Used :-

Cert. No.: 25LM10
Page.: 2 of 2

Calibration were conducted using in-house calibration procedure CP-OT01 according to comparison with Industrial Platinum Resistance Thermometer (IPRT) into Temperature Bath.
The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Digital Thermometer	2188080	2411022	TPA	17 Sep 2025

2. This certificate is valid only to the item calibrated on date and place of calibration.
3. This certification is traceable to the International System of Unit.

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

Result of Calibration :- (*) Without Adjustment
Function : Temperature measurement.

This instrument was connected with temperature sensor, S/N: 15E100464

Calibration Point (°C)	Immersion Depth (mm)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty (± °C)	Coverage Factor k
20.00	60	20.002	19.81	-0.192	0.15	2.00

UUC* : Unit Under Calibration

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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Certificate of Testing

Cert.No.: 25TW15
Page.: 1 of 2

Equipment : DO Meter
Manufacturer : YSI
Model : 5000-115V
Serial No. : 15E102796
ID No. : RYG_EN0032
Received Date : 17 January 2025
Test Date : 20 January 2025
Reference : 2501-0600DSC-1
Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd.
(Rayong Branch)
616/10 Moo 5, T.Maenam Khu, A.Phoakdaeng,
Rayong 21140, Thailand
Laboratory Condition : Temperature (25 ± 5) °C
Humidity (50 ± 20) %
Test Procedure : In - house method : CP-CH9
by Comparison Technique with Azide Modification Method

Tested by : Walalak Sirithesat

Approved by :

() Pongthippa Tameyakul
() Ponpan Palpin
(✓) Sathip Meangmai

Issue Date : 21 January 2025

[Signature]
Approved Signatory



Cert.No.: 25TW15
Page.: 2 of 2

Condition of this result of calibration

1. Reference Standard Instruments :

This certification is traceable to the International System of Unit through the reference standards laboratory of Industrial Calibration Center, Technology Promotion Association (Thailand-Japan).

Instruments	Serial No.	ID No.	Certificate No.	Due Date
1. Burette	-	130BU10	23CG1172	22 Mar 2025
2. Balance	14233821	110RC001	24MM1131	04 July 2025

2. Standard Material :-

Material	Manufacturer	Lot.No.	Assay
Sodium Thiosulfate 5-Hydrate AR	KEMAUS	2203162447	99.6%

Result : Dissolved Oxygen Meter Adjustment With Air 100 %
Dissolved Oxygen Probe No.: 15E100464

Titration Method (Azide Modification Method) (mg/L)	DO Meter Reading (mg/L)	Standard Deviation (mg/L)
8.20	8.20	0.0084

This report was certified only for the instrument we tested. It is allowable to use for study
Intend to use for advertising and referral purpose is prohibited. This report may not be reproduced
other in full, without written approval of the laboratory

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Certificate of Calibration

Cert. No.: 26TM461
Page : 1 of 3

Equipment : Low Temp. Incubator
Manufacturer : Meimert
Model : IPP750
Serial No. : VB18.0084
ID No. : RYG_EN0154
Submitted by : ALS Laboratory Group (Thailand) Co., Ltd. Rayong Branch
616/10 Moo 5, T. Maenankoo, A. Phukdaeng,
Rayong 21140, Thailand
Location : BOD Room
Received Order : 18 March 2026
Calibration Date : 18 March 2026
Ambient Temperature : $(20 \pm 10) ^\circ\text{C}$
Relative Humidity : $(50 \pm 30) \%$
AC Line Voltage : $(220 \pm 22) \text{ V}$
Calibrated by : Preecha Hlaib
Approved by : Kunchit
() Chakrit Wanwanjua
() Siret Inpal
(✓) Kunchit Promprai
Issue Date : 31 March 2026

The Uncertainties are for a confidence probability of approximately 95%

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Approval of the head of Corporate Services 3 : Equipment Calibration and Testing Services.



Equipment : Low Temp. Incubator
Condition As-Received : New Item
Reference : 2603-0502OC-2
Procedure Used :-

Cert. No.: 26TM461
Page : 2 of 3

Calibration were conducted using calibration procedure CP-OT02 based on TLAS G-20 according to direct measurement method with Data Acquisition which connected with Resistance Temperature Detector (RTD).
The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument	Serial No.	Cert. No.	Traceable	Due Date
1.) Data Acquisition	MY49023932	25LM121	TPA,	27 Jul 2026

2. This certificate is valid only to the item calibrated on date and place of calibration.
3. This measurement result is traceable to the International System of Unit maintained through :

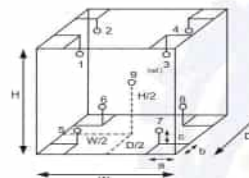
Remark : TPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Fresh air setting : Not Available

Environment during calibration		
	Beginning	Finished
Temp. (°C)	23	21
REL.Humid. (%)	37	33
AC Supply (Volt)	220	221



Probe Installation Details :

a = 10 cm
b = 10 cm
c = 10 cm

Dimension of Chamber :

D = 0.60 m
W = 1.0 m
H = 1.2 m
Capacity = 0.72 m³

Position :	Ref. Std. ID No.:
1	19-16RTD-01
2	19-16RTD-02
3	19-16RTD-03
4	23-16RTD-04
5	19-16RTD-05
6	19-14RTD-06
7	21-16RTD-07
8	19-16RTD-08
9 (ref.)	19-16RTD-09



Equipment : Low Temp. Incubator
Condition As-Received : New Item
Reference : 2603-0502OC-2
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source
Fresh air setting : Not Available

Cert. No.: 26TM461
Page : 3 of 3

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Coverage Factor k
20.0	20.0	20.0	0.019	0.19	0.34	2

Calibration Point (°C)	Measured Temperature (°C)								Uncertainty (±°C)	
	Position									
	1	2	3	4	5	6	7	8		9 (ref.)
20.0	20.185	20.132	20.303	20.160	20.001	20.054	19.983	20.060	20.163	0.30

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 Variation : 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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Certificate of Calibration

Cert.No.: 25CG3608
Page: 1 of 2

Equipment : Burette
Capacity : 50 mL
Serial No. :
ID. No. : RYG_EN0216
Manufacturer : Wiliig
Made in : Germany
Submitted by : ALS Laboratory Group (Thailand) Co., Ltd.
Rayong Branch
616/10 Moo 5 T. Maenankoo, A. Phukdaeng
Rayong 21140, Thailand

Ambient Temperature : $(20 \pm 2.5) ^\circ\text{C}$
Relative Humidity : $(50 \pm 10) \%$
Barometric Pressure : 753 mmHg
Calibration Procedure : ASTM E 542 - 01

Calibrated by : Srisuda Khanitha

Approved by :
() Panpan Paipim
(✓) Chakrit Wanwanjua

Issue Date : 19 September 2025

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full, except with the prior written
Approval of the head of Corporate Services 3 : Equipment Calibration and Testing Services.



Equipment : Burette
Received Date : 16 September 2025
Condition As-Received : Used Item
Calibration Date : 18 September 2025
Reference : 2509-0564DSC-3

Cert.No.: 25CG3668
Page: 2 of 2

Condition of this result of calibration

1. Reference Standard Instruments :

Instruments	Model	Serial No.	ID No.	Certificate No.	Traceability	Due date
1) Balance	XP205	B134206712	140RC007	25MM296	TPA	16 July 2026
2) Humidity/Baro/Temp	MHB-382SD	AM.42259	140EC016	25H1616	TPA	14 Aug 2026
3) Digital Thermometer	HH376	230806555	140EC013	25H1740	TPA	17 Jan 2026

This measurement result is traceable to SI Unit

2. The certificate is valid only to the item calibrated on date and place of calibration.
3. True value is converted to true volume at the standard temperature of 20 °C

Calibration result :

Nominal capacity (mL)	Reading (mL)	Uncertainty (± mL)	k Factor
10	10.0264	0.0082	2.00
25	25.0141	0.0087	2.00
50	49.9952	0.010	2.00

Remark mL = cm³

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 %.

-o0o-



Certificate of Calibration

Equipment: SPECTROPHOTOMETER
Model: DR9000
Serial No. (or ID.): 1627845 (RYG_EN0037)
Manufacturer: HACH
Condition: In Condition

Certificate No.: C06250108
Issued Date: 18 March 2025
Job No.: WO-D0064379
Page: 1 of 3

Customer: ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
616/10 Moo 5 T.Maenam Khu,
A.Pluakdaeng, Rayong 21140, Thailand.



Environment Condition: Temperature 24.4 °C ± 0.3 °C
Humidity 60.8 %RH ± 3.5 %RH

Calibration Place: ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
(Wet Chemistry Lab)
616/10 Moo 5 T.Maenam Khu, A.Pluakdaeng, Rayong 21140, Thailand.

Calibration By: Mr.Preecha Phooarsai
Calibration Date: 18 March 2025
The Method used: In house method, CAL-WI-24, base on ASTM E 275-08 and ASTM E 387-04
Traceability: This certificate is traceable to the CRM maintained by National Institute of Standards and Technology (NIST) through Stama Scientific Limited.

The standard for Wavelength Certificate No. 111583 and 111584
The standard for Photometric Certificate No. 9114964 and 111588
The standard for Stray light Certificate No. 111586 and 111585
The standard for Spectral resolution Certificate No. 111587

(Mr. Preecha Phooarsai)

(Miss Kaewkan Suradech)
Authorized signatory

This certificate is issued for the units of measurement according to the International System of Units (SI). It provides traceability of measurement to international or national standard or other recognized national laboratories.
The measurement uncertainty stated is the expanded uncertainty which is obtained 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 Expression of Uncertainty in Measurement (GUM).
These results may be affected by deviations from specified conditions. The results relate only to the items tested, calibrated or sampled. The report shall not be reproduced except in full without approval of DKSH Technology Limited.
DKSH Technology Limited
2533 Sukhumvit Road, Bangkok, Phraekhlong, Bangkok 10260
Phone: +66 2638 1500 Email: info.calibration@dksh.com Website: www.dksh.com/calibration-thailand

Delivering Growth - In Asia and Beyond.

CAL-FM-C06-16: 11 Mar 2024



Certificate No.: C06250108 Page 2 of 3

Calibration Results: Without Adjustment

Wavelength Accuracy (nm), The spectral bandwidth of Std at 2 nm and UUC at 2 nm

Standard Wavelength	Unit Under Calibration	Correction	Uncertainty
418.61	418.5	0.11	0.13
536.66	536.7	-0.04	0.13
637.96	638.3	-0.32	0.13
748.48	748.8	-0.32	0.13
807.03	807.5	-0.47	0.13

Photometric Accuracy (Absorbance)

Wavelength	Standard absorbance	Unit Under Calibration	Correction	Uncertainty
420 nm	0.0000	0.000	0.0000	0.0045
	0.2930	0.291	0.0020	0.0045
	0.5168	0.518	-0.0012	0.0045
	1.0298	1.031	-0.0012	0.0045
440 nm	0.0000	0.000	0.0000	0.0045
	0.2867	0.285	0.0017	0.0045
	0.5073	0.508	-0.0007	0.0045
	1.0083	1.009	-0.0007	0.0045
465 nm	0.0000	0.000	0.0000	0.0045
	0.2516	0.250	0.0016	0.0045
	0.4595	0.461	-0.0015	0.0045
	0.9334	0.935	-0.0016	0.0045
546.1 nm	0.0000	0.000	0.0000	0.0045
	0.2461	0.246	0.0001	0.0045
	0.4652	0.466	-0.0008	0.0045
	0.9468	0.948	-0.0012	0.0045
590 nm	0.0000	0.000	0.0000	0.0045
	0.2594	0.259	0.0004	0.0045
	0.5040	0.505	-0.0010	0.0045
	1.0032	1.004	-0.0008	0.0045
635 nm	0.0000	0.000	0.0000	0.0045
	0.2579	0.258	-0.0001	0.0045
	0.4971	0.497	0.0001	0.0045
	0.9720	0.973	-0.0010	0.0045

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Phone: +66 2638 1500 Email: info.calibration@dksh.com Website: www.dksh.com/calibration-thailand

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CAL-FM-C06-16: 11 Mar 2024



Certificate No.: C06250108 Page 3 of 3

Calibration Results: Without Adjustment

Photometric Accuracy (Absorbance)

Wavelength	Standard absorbance	Unit Under Calibration	Correction	Uncertainty
235 nm	0.0000	0.000	0.0000	0.0080
	0.7355	0.738	-0.0025	0.0080
257 nm	0.0000	0.000	0.0000	0.0080
	0.8574	0.857	0.0004	0.0080
313 nm	0.0000	0.000	0.0000	0.0080
	0.2864	0.290	-0.0036	0.0080
350 nm	0.0000	0.000	0.0000	0.0080
	0.6374	0.637	0.0004	0.0080

Stray light *

Standard: cut-off	UUC: Wavelength (nm)	UUC: Transmission (%T)	Absorbance (A)
260.62 ± 0.11 nm	260.6	1.7	1.770
391.44 ± 0.11 nm	391.4	1.4	1.854

Spectral Resolution *

Nominal Concentration 0.02 % w/v	Peak	Trough	Ratio	SBW
Standard Wavelength (nm)	268.66	266.89	1.38	2.00
UUC: Wavelength (nm)	268.2	266.2		
Std Absorbance (A)	0.4566	0.2780		
UUC: Absorbance (A)	0.413	0.299		

* Calibration Marked * Not TISI Accredited * in this Certificate have been included for completeness.

The End of Certificate

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CAL-FM-C06-16: 11 Mar 2024

ใบตรวจสอบสภาพเครื่องวัดสิ่งแวดล้อม

เลขที่ใบงาน: WO-00064379

ชนิดเครื่องมือ: SPECTROPHOTOMETER

รุ่น: DR8000

หมายเลขเครื่อง: 1627845

ตรวจสอบ (วัน)	ผลการตรวจเช็ค	ตรวจสอบ (ถึง)		หมายเหตุ
		ปกติ	ไม่ปกติ	
18 Mar 2025				
ปกติ	ไม่ปกติ			
General				
☒	☐	1. ความสมบูรณ์เครื่อง	☒	
☒	☐	2. ความสะอาด (ช่องใส่ตัวอย่าง, ภายใน-นอกเครื่อง)	☒	
☒	☐	3. สวิตช์ เปิด - ปิด เครื่อง (On-Off Switch)	☒	
☒	☐	4. ปุ่มกด (Keypad)	☒	
☒	☐	5. หน้าจอ (Display, Screen Contrast)	☒	
Spectrophotometer				
☒	☐	6. แรงดันไฟฟ้า (Battery Backup) ≥ 2.5 VDC	☒	
☒	☐	7. ตัวกรองเลือกความยาวคลื่น (Wavelength Control)	☒	
☒	☐	8. ความยาวคลื่น (Wavelength Check)	☒	*
☒	☐	9. แหล่งกำเนิดแสง (UV $< 3,000$ hour)	☒	13.5 Hours
☒	☐	10. แหล่งกำเนิดแสง (Visible $< 5,000$ hour)	☒	893.0 Hours
☒	☐	11. ขั้ววัดหลายตัว (Carousel Module)	☒	
pH Meter and Conductivity Meter				
☒	☐	12. อิเล็กโทรด (Electrode and Connection Cable)	☒	
☒	☐	13. ระดับสารละลายใน Electrode (Level KCl)	☒	
☒	☐	14. ฝาปิดกันฝุ่น Electrode (Dust Protection Hood)	☒	
☒	☐	15. ขาตั้งอิเล็กโทรด (Stand)	☒	
Turbidimeter				
☒	☐	16. ค่าความขุ่นที่สุด (No Sample)	☒	
☒	☐	17. ระดับการส่องสว่างของแสง (≥ 2.5 ไม่นเกิน 3.0)	☒	
Automatic titrator				
☒	☐	18. สภาพ Piston Burettes	☒	
☒	☐	19. Function Rinsing and Dosing	☒	
☒	☐	20. ระบบท่อสายยางและอุปกรณ์ประกอบ	☒	

เงื่อนไขข้อแนะนำ: * 656 nm = 656.1 nm

* 486.0 nm = 485.7 nm

Mr.Preecha Phooarsai
Service EngineerDKSH Technology Limited
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CAL-FM-R31-05: 20 Jul 2022



Accredited by

NSC-TIS-TIS 17025

Calibration 0426

Calibration certificate

Calibration Certificate No. 26BCI0064

Object	Electronic non-automatic weighing instrument	This calibration certificate documents the traceability to national standards.
Manufacturer	Sartorius	Uncertainties of measurements are taken into account when only statements of compliance are made.
Type	MCE224S-2S00-UJ	This certificate was prepared by Sartorius Corporation in accordance to the current ISO/IEC 17025:2017 standard and Sartorius Work Instruction (Method) SOP WI 08.
Serial QM ident. no.	38101399 RYG_EN0163	This certificate relate and apply this equipment only
Customer	ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)	
	616/10 Moo 5 T.Maenamkoo, A.Pluak Daeng, Rayong 21140, Thailand.	
Order no.	278579	
Number of pages	4	
Date of calibration	03 Feb 2026	

This calibration certificate may not be reproduced other than in full except with the permission of NSC-TIS-TIS-17025 and the issuing laboratory. Calibration certificates without signature are not valid.

The user is obliged to have the object recalibrated at appropriate intervals.

Date of issue	03 Feb 2026	Approval of the Calibration Certificate	Person in charge
		Mr. Chonchai Inthana	Chonchai Inthana

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129 Rama 9 Road, Huaykwang
10310 BangkokVerical®
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Calibration certificate No.: 26BCI0064

Calibration Certificate

Calibration object

Single range instrument

Model	MCE224S-2S00-UJ
Serial Number	38101399
QM Ident. no Inventory no.	RYG_EN0163 --
Maximum capacity (Max. load)	220.0000 g
Measured up to	220.0000 g
Scale interval	0.0001 g

Place of calibration

Address	According to page 1
Department Cost center	Laboratory Department. --
Building Floor	-- 1st Floor.
Room	Balance Room.
Maximum temperature variation at place of calibration	5 K

Calibration procedure

EURAMET Calibration Guide No. 18, Version 4.0 (11/2015) - Guidelines on the Calibration of Non-Automatic Weighing Instruments

Test equipment

Test equipment type	Test equipment ID	Valid until
Thermometer	Teslo 174H H/T250743 (Traceable to SI unit through ENTECH)	18 Nov 2026
Test weight set OIML R111 E2	Certificate No.M2508149S_E2(Traceable to SI unit through TCS)	19 Aug 2027

Calibration certificate No.: 26BCI0064

Calibration Certificate

Adjustment Status

The measuring device was internally adjusted before the calibration.

Environmental and measuring conditions

Date of calibration	03 Feb 2026
Temperature at place of calibration Temp. diff.	25 °C 0.5 K
Weights - T place	
Measuring conditions	The installation site is suitable. The device is level. Balance was loaded up to Max before test.
Comments	Humidity 49.0 %RH.

Measurement results | Measurement uncertainties

Repeatability		Eccentricity	
Test load (nominal): 10 g 200 g		Test load (nominal): 100 g	
10 g	200 g	Center	100.0001 g
1	10.0000 g	Front left	100.0002 g
2	10.0000 g	Back left	100.0002 g
3	10.0000 g	Back right	100.0000 g
4	10.0000 g	Front right	100.0000 g
5	9.9999 g		
6	10.0000 g		
7	10.0000 g		
8	10.0000 g		
9	9.9999 g		
10	10.0000 g		
s = 0.00004 g s = 0.00007 g		Maximum deviation from centric loading indication ΔAcc max = 0.0001 g	

Error of indication

Testload	Indication	Error	Expansion factor	Uncertainty	Uncertainty relative
L	I	E	k	U(E)	Urel(E)
0.0100 g	0.0100 g	0.0000 g	2.00	0.00012 g	1.2 %
0.1000 g	0.1000 g	0.0000 g	2.00	0.00017 g	0.17 %
0.5000 g	0.5000 g	0.0000 g	2.00	0.00017 g	0.034 %
1.0000 g	1.0000 g	0.0000 g	2.00	0.00017 g	0.017 %
5.0000 g	5.0000 g	0.0000 g	2.00	0.00017 g	0.0034 %
10.0000 g	10.0000 g	0.0000 g	2.00	0.00017 g	0.0017 %
20.0000 g	20.0000 g	0.0000 g	2.00	0.00018 g	0.0008 %
50.0000 g	50.0000 g	0.0000 g	2.00	0.00018 g	0.00037 %
100.0000 g	100.0001 g	0.0001 g	2.00	0.00021 g	0.00021 %
200.0000 g	200.0000 g	0.0000 g	2.00	0.00030 g	0.00015 %
220.0000 g	220.0001 g	0.0001 g	2.00	0.00034 g	0.00015 %
Maximum error of indication		E _{max} = 0.0001 g			

G_{rel}(E) is the quotient of U(E) and test load L. The uncertainty of measurement U(E) is valid only if error E is considered. You will find reference notes on the uncertainty of measurement in use under: Appendix to the calibration certificate | Interpretation of measurement results.
Reference note: The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the documented Expansion Factor, determined in accordance with the European Calibration Guidelines EURAMET-19-16, V4.0. There is a 95 % probability that the value of the measurand will be in the assigned value range.

End of calibration certificate

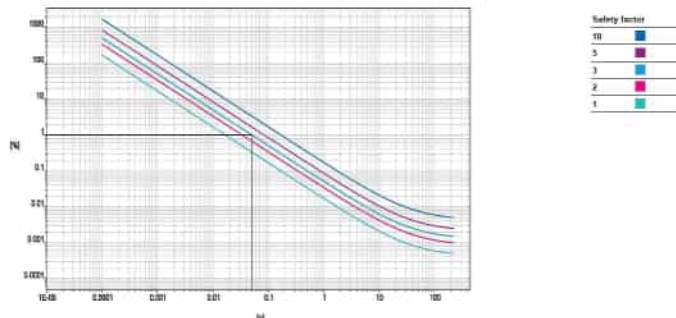
Uncertainty of measurement in use

Device adjusted before measurement	Yes
Temperature deviation considered	1.5 K (isoCAL active)
Temperature coefficient considered	1 · 10 ⁻⁴ /K
Uncertainty of the weighing result $U_0(W)$	$U_0(W) = 0.00017 \text{ g} + 4.25 \cdot 10^{-4} \cdot R$

Reference note: The current uncertainty of measurement is calculated by entering of the reading R into this formula. In relation to this, there is no need for a correction of the indication error. The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied with an Expansion factor of 2, determined in accordance with the European Calibration Guideline EURAMET-cg-18, V4.0. There is a 95 % probability that the value of the measured will lie in the assigned value range.

Indication in % from max load	Net indication R	Uncertainty $U_0(W)$	Uncertainty relative $U_0(W)/R$
1 %	2.2000 g	0.00016 g	0.0062 %
25 %	55.0000 g	0.00040 g	0.00073 %
50 %	110.0000 g	0.00064 g	0.00058 %
75 %	165.0000 g	0.00087 g	0.00053 %
100 %	220.0000 g	0.0011 g	0.00050 %

Graphic realization of the relative uncertainty of measurement | process accuracy



Displayed example

Process accuracy	1.00 %
Safety factor	3
Minimum sample weight	0.0507 g

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Page 4 | 4



Metrology Center
SCI ECO Services Company Limited

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Saraburi Tel : +669 8247 2360

Website : www.scieco.co.th E-Mail : calibrate@scg.co.th



Certificate No. T251530

Certificate of Calibration

Page 1 of 3

Equipment : Chamber (Oven)

Manufacturer : MEMMERT

Model : UF 110

Serial No. : B416.2420

Customer Code : RYG_EN0012

ID No. : T6444A5

Customer : ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)

616/10 Moo 5 T.Maenamkoo,

A.Pluakdaeng, Rayong 21140

Customer Location : ENVIRONMENT LABORATORY

Date of Receipt : 3 September 2025

Calibrated By : Sujjar Naknakred (Site Calibration Manager)

Approved By : Boonchai Suriyawong (Site Calibration Manager)

Date of Issue : 17 SEP 2025

The uncertainties are for a confidence probability of approximately 95%.

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation Scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standard laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the Metrological Center.

FM-TL06 J02/27-03-68



Metrology Center
SCI ECO Services Company Limited

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Certificate No. T251530

Page 2 of 3

Calibration Report

Equipment : Chamber (Oven)
Date of Calibration : 10 September 2025
Environment : Temperature : 35.7-36.6 °C
Line Voltage : 226.8-233.7 V
Relative Humidity : 55 - 65 %RH

Condition of this results of calibration :

- This equipment was calibrated by insert nine resistance thermometer detectors into its chamber , the other one resistance thermometer detector use for ambient temperature measurement . The calibration was done in according to WI-T20 (based on ASTM E145-94 (Reapproved 2019) and AS2853-1986). All data show below were final values and the initial data from customer request . The temperature scale used was based on ITS - 90 .

2. Reference Standard Instrument :

Instrument	Model	Instrument No.	Certificate No.	Due Date
RTD	100 ohm	30-(CH)-10	T242203	9 November 2025
DATA LOGGER	34970A	T47	T242203	9 November 2025

3. This certificate is traceable to :

National Institute of Metrology (Thailand) through Metrological Center (NSC-TISI-TIS 17025 CALIBRATION 0244.

4. Condition of calibrated item : good

Equipment Description :

Time Constant 3 Hour 29 Minute At 104 °C
Fresh Air Dumper ☒ Open ☒ Min ☐ Medium ☐ Max
☐ Close
☐ Not Available

5. Adjustment :

() without adjustment (X) after adjustment

Approved By.

FM-TL07 J02/27-03-68



Metrology Center
SCI ECO Services Company Limited

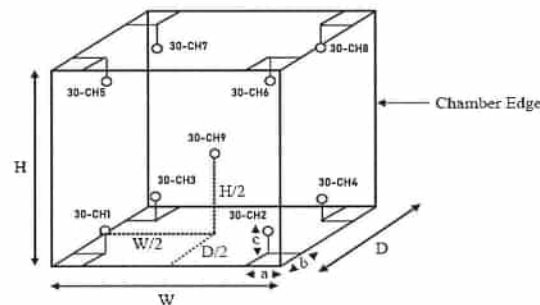
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Certificate No. T251530

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Calibration Report



Remark : Internal Dimensions of Chamber : W (Width) = 58 cm. , H (Height) = 48 cm. and D (Depth) = 40 cm.
Size of Installed Standard sensor number 30-CH3 to number 30-CH8 : a = 5 cm. , b = 5 cm. and c = 5 cm.
Size of Installed Standard sensor number 30-CH9 : W/2 = 56 cm./2 , H/2 = 48 cm./2 and D/2 = 40cm./2

Measurement Results

Average Standard Reading at each position (°C)									
Calibration Point	30-CH1	30-CH2	30-CH3	30-CH4	30-CH5	30-CH6	30-CH7	30-CH8	30-CH9
104	104.02	103.70	104.01	104.16	104.11	104.06	104.01	104.33	103.61
180	180.67	178.78	180.38	178.85	179.16	180.27	180.98	181.04	179.49

Chamber (Oven)			Temperature Distribution				
Setting °C	Reading (°C)		Average (°C)	Stability (± °C)	Uniformity (°C)	Uncertainty (± °C)	Coverage Factor k
	Min	Max					
104.0	103.9	104.1	104.0	0.08	0.61	0.42	2.05
180.0	179.9	180.1	180.0	0.21	1.51	0.52	2.00

* The quoted uncertainty include "uniformity"

The calibration result apply only the above calibrated item.

The result of test was found accurate as shown on date and place of test only.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k which for a t-distribution, providing a level of confidence of approximately 95 %.

End of Certificate.

Approved By.

FM-TL07 J02/27-03-68



Accredited by

NSC-TISI-TIS 17025
Calibration 0426

Calibration certificate

Calibration Certificate No. 26BCI0066

Object	Electronic non-automatic weighing instrument	This calibration certificate documents the traceability to national standards.
Manufacturer	Sartorius	Uncertainties of measurements are taken into account when only statements of compliance are made.
Type	MSU224S-100-DU	This certificate was prepared by Sartorius Corporation in accordance to the current ISO/IEC 17025:2017 standard and Sartorius Work Instruction (Method) SOP WI 08.
Serial QM ident. no.	31709552 RYG_EN0003	This certificate relate and apply this equipment only.
Customer	ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)	
	616/10 Moo 5 T.Maenamkoo, A.Pluak Daeng, Rayong 21140, Thailand.	
Order no.	278579	
Number of pages	4	
Date of calibration	03 Feb 2026	

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The user is obliged to have the object recalibrated at appropriate intervals.

Date of issue	03 Feb 2026	Approval of the Calibration Certificate	Person in charge
		Mr. Chonchai Inthana	Chonchai Inthana

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Calibration certificate No.: 26BCI0066

Calibration Certificate

Adjustment Status

The measuring device was internally adjusted before the calibration.

Environmental and measuring conditions

Date of calibration	03 Feb 2026
Temperature at place of calibration Temp. diff.	24.5 °C 0.5 K
Tweights - Tplace	
Measuring conditions	The installation site is suitable. The device is level. Balance was loaded up to Max before test.
Comments	Humidity 52.0 %RH.

Measurement results | Measurement uncertainties

Repeatability		Eccentricity	
Test load (nominal): 10 g 200 g		Test load (nominal):	100 g
10 g	200 g	Center	100.0000 g
1	10.0000 g	Front left	100.0000 g
2	10.0000 g	Back left	99.9999 g
3	10.0000 g	Back right	100.0000 g
4	10.0001 g	Front right	100.0000 g
5	10.0000 g	Maximum deviation from centric loading indication	
6	10.0000 g	ΔMax = 0.0001 g	
7	10.0000 g		
8	10.0000 g		
9	10.0000 g		
10	10.0000 g		
s = 0.00003 g	s = 0.00005 g		

Error of indication

Test load	Indication	Error	Expansion factor	Uncertainty	Uncertainty relative
L	I	E	k	U(E)	Urel(E)
0.0100 g	0.0100 g	0.0000 g	2.00	0.00010 g	1.0 %
0.1000 g	0.1000 g	0.0000 g	2.00	0.00013 g	0.13 %
0.5000 g	0.5000 g	0.0000 g	2.00	0.00013 g	0.027 %
1.0000 g	1.0000 g	0.0000 g	2.00	0.00013 g	0.013 %
5.0000 g	5.0000 g	0.0000 g	2.00	0.00014 g	0.0027 %
10.0000 g	10.0000 g	0.0000 g	2.00	0.00014 g	0.0014 %
20.0000 g	20.0000 g	0.0000 g	2.00	0.00014 g	0.00071 %
50.0000 g	50.0001 g	0.0001 g	2.00	0.00015 g	0.00030 %
100.0000 g	100.0000 g	0.0000 g	2.00	0.00018 g	0.00018 %
200.0000 g	200.0000 g	0.0000 g	2.00	0.00028 g	0.00014 %
220.0000 g	220.0000 g	0.0000 g	2.00	0.00032 g	0.00015 %
Maximum error of indication		E _{max} = 0.0001 g			

U_{rel}(E) is the quotient of U(E) and test load L. The uncertainty of measurement U(E) is valid only if error E is considered. You will find reference notes on the uncertainty of measurement in our under: Appendix to the calibration certificate | Interpretation of measurement results.

Reference note: The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the documented Expansion Factor, determined in accordance with the European Calibration Guideline EURAMET cg-18, v4.0. There is a 95 % probability that the value of the measurand will be in the assigned value range.

End of calibration certificate

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Calibration Certificate No.: 26BCI0066

Calibration Certificate

Calibration object

Single range instrument

Model	MSU224S-100-DU
Serial Number	31709552
QM Ident. no Inventory no.	RYG_EN0003 —

Maximum capacity (Max. load)	220.0000 g
Measured up to	220.0000 g
Scale interval	0.0001 g

Place of calibration

Address	According to page 1
Department Cost center	Laboratory Department. —
Building Floor	— 1st Floor.
Room	Balance Room.
Maximum temperature variation at place of calibration	5 K

Calibration procedure

EURAMET Calibration Guide No. 18, Version 4.0 (11/2015) - Guidelines on the Calibration of Non-Automatic Weighing Instruments

Test equipment

Test equipment type	Test equipment ID	Valid until
Thermometer	Teslo 174H H/T250743 (Traceable to SI unit through ENTECH)	18 Nov 2026
Test weight set OIML R111 E2	Certificate No.M2508149S_E2(Traceable to SI unit through TCS)	19 Aug 2027

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Interpretation of measurement results | Appendix to the calibration certificate

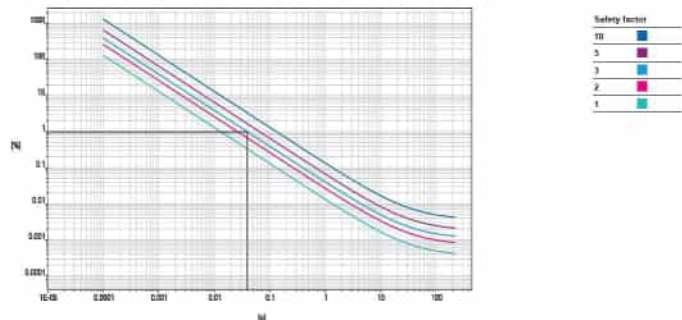
Uncertainty of measurement in use

Device adjusted before measurement	Yes
Temperature deviation considered	1.5 K (isoCAL active)
Temperature coefficient considered	1 · 10 ⁻⁴ K
Uncertainty of the weighing result U ₉₅ (W)	U ₉₅ (W) = 0.00013 g + 3.65 · 10 ⁻⁴ · R

Reference note: The current uncertainty of measurement is calculated by entering of the reading R into this formula. In relation to this, there is no need for a correction of the indication error. The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied with an Expansion factor of 2, determined in accordance with the European Calibration Guideline EURAMET cg-18, v4.0. There is a 95 % probability that the value of the measurand will be in the assigned value range.

Indication in % from max load	Net indication R	Uncertainty U ₉₅ (W)	Uncertainty relative U ₉₅ (W) _{rel}
1 %	2.2000 g	0.00014 g	0.0063 %
25 %	55.0000 g	0.00033 g	0.00060 %
50 %	110.0000 g	0.00053 g	0.00048 %
75 %	165.0000 g	0.00073 g	0.00044 %
100 %	220.0000 g	0.00093 g	0.00042 %

Graphic realization of the relative uncertainty of measurement | process accuracy



Displayed example

Process accuracy	1.00 %
Safety factor	3
Minimum sample weight	0.0395 g

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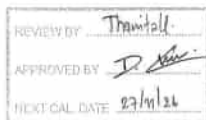
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Certificate No. T252169

Certificate of Calibration

Page 1 of 3

Equipment : Liquid Bath (Water)
Manufacturer : Memmert
Model : WNE29
Serial No. : L623.0105
Customer Code : RYG_EN0220
ID No. : T5650A5
Customer : ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
616/10 Moo 5 T.Maenamkoo,
A.Pluakdaeng, Rayong 21140
Customer Location : Wet Chemistry Lab
Date of Receipt : 19 November 2025
Calibrated By : Sujjar Nakkakred (Site Calibration Manager)
Approved By : Dr. Zee / Boonchai Suriyawong (Site Calibration Manager)
Date of Issue : 01 DEC 2025



The uncertainties are for a confidence probability of approximately 95%.

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation Scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standard laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the Metrological Center.

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Certificate No. T252169

Calibration Report

Page 2 of 3

Equipment : Liquid Bath (Water)
Date of Calibration : 27 November 2025
Environment : Temperature : 25.5-25.7 °C
Line Voltage : 221.8-225.5 V
Relative Humidity : 55 - 65 %RH

Condition of this results of calibration :

- This equipment was calibrated by insert five resistance thermometer detectors into its water bath , the other one thermocouple type T use for ambient temperature measurement . The calibration was done in according to WI-T36 (based on ASTM E715-80 (Reapproved 2022)).
All data show below were final values and the initial data from customer request . The temperature scale used was based on ITS - 90 .
- Reference Standard Instrument :

Instrument	Model	Instrument No.	Certificate No.	Due Date
RTD	100 OHM	M18 (CH1-CH5)	T251758	17 October 2026
DATA LOGGER	34970A	T261	T251758	17 October 2026
- This certificate is traceable to :
National Institute of Metrology (Thailand) through Metrological Center (NSC-TISI-TIS 17025 CALIBRATION 0244)
- Condition of calibrated item : good
Equipment Description :
Time Constant 1 Hour 3 Minute At 63 °C
- Adjustment :
(X) without adjustment () after adjustment

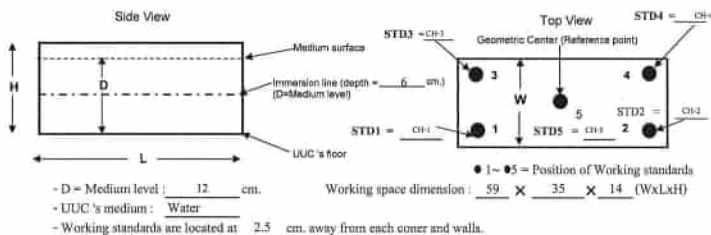
Approved By. Dr. Zee

FM-TL07 J02/27-03-68

Certificate No. T252169

Calibration Report

Page 3 of 3



Measurement Results:

Average Standard Reading at each position (°C)					
Calibration Point	CH-1	CH-2	CH-3	CH-4	CH-5
63	62.93	63.13	62.94	63.10	63.09
85	85.15	85.33	85.21	85.43	85.20

Liquid Bath (Water)			Temperature Distribution				
Setting (°C)	Reading (°C)		Average (°C)	Stability (±°C)	Uniformity (±°C)	Uncertainty (±°C)	Coverage Factor k
	Min , Max	Average					
63.0	62.9 , 63.1	63.0	63.04	0.08	0.17	0.27	2.06
85.0	84.8 , 85.2	85.0	85.26	0.13	0.24	0.43	2.23

* The quoted uncertainty exclude "uniformity"

The calibration result apply only the above calibrated item.

The result of test was found accurate as shown on date and place of test only.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k which for a t-distribution, providing a level of confidence of approximately 95 % .

End of Certificate.

Approved By. Dr. Zee

FM-TL07 J02/27-03-68

ภาคผนวก จ

สำเนาหนังสือใบอนุญาตขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

ที่ ถก ๐๑๑๐(๑)/ ๑๖ ๑๖ ๑๖



กรมโรงงานอุตสาหกรรม
ถนนพหลโยธินที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๒๐ พฤศจิกายน ๒๕๖๖

เรื่อง คัดสรรผู้สมัครรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้ตรวจการ บริษัท เอนเนอจีส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และขอขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
เมื่อวันที่ ๔ สิงหาคม ๒๕๖๖

สิ่งที่ส่งมาด้วย ๑. รายชื่อผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑ ฉบับ

๒. รายชื่อเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๕ ฉบับ

๓. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๑๑ ฉบับ

ตามหนังสือที่อ้างถึง บริษัท เอนเนอจีส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ขอต่ออายุหนังสือ
รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๒๐๔ สถานที่ตั้งเลขที่ ๑๐๔ ซอยพัฒนาการ ๔๐
ถนนพัฒนาการ แขวงพัฒนาการ เขตสวนหลวง กรุงเทพมหานคร ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ได้บริษัท เอนเนอจีส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด
ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๖ ราย ตามสิ่งที่ส่งมาด้วย ๑

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ ๑๑๔ ราย ตามสิ่งที่ส่งมาด้วย ๒

ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนในห้องวิเคราะห์ในน้ำเสีย น้ำใต้ดิน อากาศเสีย สิ่งปฏิกูล
หรือวัสดุที่ไม่ใช้แล้ว และดิน ตามสิ่งที่ส่งมาด้วย ๓

หนังสือฉบับนี้จะหมดอายุในวันที่ ๒ กันยายน ๒๕๖๘ หากประสงค์จะต่ออายุหนังสือ
รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อ
กรมโรงงานอุตสาหกรรม ภายใน ๓๐ วัน ก่อนวันสิ้นอายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
ทั้งนี้ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ที่หน้าเว็บไซต์กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายธีระ จันทน์นิล)
ผู้อำนวยการศูนย์วิจัยและพัฒนา
การตรวจวิเคราะห์สิ่งแวดล้อมและมลพิษ
กรมโรงงานอุตสาหกรรม

กองวิจัยและพัฒนาระบบการตรวจวิเคราะห์
กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบและทะเบียนห้องปฏิบัติการ
โทร. ๐ ๒๕๓๖ ๖๓๒๒ ต่อ ๒๑๐๓-๕
โทรสาร ๐ ๒๕๓๖ ๖๓๒๒ ต่อ ๒๑๐๔

ไปรษณีย์อิเล็กทรอนิกส์ sarabak@div.mail.go.th



"อุตสาหกรรมสีเขียว ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เอนเนอจีส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ๖-๒๐๔
ที่ ถก ๐๑๑๐(๑)/ ๑๖ ๑๖ ๑๖ ลงวันที่ ๒๐ พฤศจิกายน ๒๕๖๖

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๖ ราย

- ๑) นางสาวสุพัตรา จันทร์ปลั่ง
- ๒) นางสาวจิราภรณ์ โภษะกุล ณ นคร
- ๓) นายศราวุธ จิตธรรมานนท์
- ๔) นางสาวกนกกร เสนา
- ๕) นายสุริยา สอนแก้ว
- ๖) นายวิชาญ ชุนทร

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๐๑
ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๐๒
ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๐๓
ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๐๔
ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๐๕
ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๐๖

3/11/

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เอนเนอจีส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ๖-๒๐๔
ที่ ถก ๐๑๑๐(๑)/ ๑๖ ๑๖ ๑๖ ลงวันที่ ๒๐ พฤศจิกายน ๒๕๖๖

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑๑๔ ราย

๑) นายภาณุวัฒน์ กิตติคุณวัฒน์

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๐๑

๒) นายภัทรพล สว่างใจธรรม

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๐๒

๓) นายธนธิ์ เพ็ญศรีคำ

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๐๓

๔) นายศิริโชค พงษ์ประสม

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๐๔

๕) นายณัฐวุฒิ ศิวะพร

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๐๕

๖) นางสาวจินดา จิตธรรม

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๐๖

๗) นางสาวลลิตา น้อยเสียม

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๐๗

๘) นางสาวณัฐกานดา ธีระน

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๐๘

๙) นางสาววันวิสา สายเส

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๐๙

๑๐) นางสาวนันทิยา สมบูรณ์

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๑๐

๑๑) นางสาวศรัณยา เจริญธรรม

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๑๑

๑๒) นางสาวอริยพร มงคลจิรวิ

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๑๒

๑๓) นางสาวศิริลักษณ์ ปุณ

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๑๓

๑๔) นายเทพศักดิ์ จันทร์

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๑๔

๑๕) นายณเศรษฐ์ โภษะ

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๑๕

๑๖) นายชินวรา จิรา

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๑๖

๑๗) นางสาวนันทิยา แก้ว

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๑๗

๑๘) นางสาวสุวิมล ชัยเรือง

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๑๘

๑๙) นางสาวสุชาดา อรร

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๑๙

๒๐) นางสาวเนกมา ชัยเดช

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๒๐

๒๑) นางสาวศศิธร พุฒ

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๒๑

๒๒) นางสาวเสาวลักษณ์ ภู

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๒๒

๒๓) นายอภิสิทธิ์ สิง

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๒๓

๒๔) นายศักดิ์สิทธิ์ ใจ

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๒๔

๒๕) ว่าที่ร้อยตรีหญิง พ

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๒๕

๒๖) นางจิตตา คำ

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๒๖

๒๗) นางสาวอรพรรณ วั

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๒๗

๒๘) นางสาวนันทิน แ

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๒๘

๒๙) นายสุเดช วา

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๒๙

๓๐) นางสาวศุภาวิ

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๓๐

๓๑) นายพนมมี ศรี

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๓๑

๓๒) นายสุศักดิ์ ภู

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๓๒

๓๓) ว่าที่ร้อยตรี เ

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๓๓

๓๔) นางสาววิภา ส

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๓๔

๓๕) นายอนุพงษ์ รัตน

ทะเบียนเลขที่ ๖-๒๐๔-๑-๐๐๓๕

3/11/

๓๖) นางสาวสุภาวดี...

- ๓๖) นางสาวสุภาวดี โอนสิน
- ๓๗) นางสาวจุฑารัตน์ พิมพ์
- ๓๘) นางสาวปราณีทิพย์ กิจ
- ๓๙) นางสาวเดือนใจ ทาง
- ๔๐) นางสาวจิราพร ศิ
- ๔๑) นายวรากร ภู
- ๔๒) นายพนม วั
- ๔๓) นายณิธิ เ
- ๔๔) นายณิธิ เ
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๑๐๑) นายประเสริฐ...

ลำดับที่	สารเคมี	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	สารเคมี	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⁾

น้ำดื่ม...

น้ำดื่ม จำนวน 126 รายการ

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

56 1,3-Dichloropropene...

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

76 γ-HCH...

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

94 N-Nitrosodiphenylamine...

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

110 TPH (C₁₀-C₁₄)...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
110	TPH (C ₁₀ -C ₁₄)	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^{3,22}
111	TPH (C ₁₆ -C ₂₀)	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^{3,22}
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 ⁴ 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

จากเคมี

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

15 Lead...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
15	Lead	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁴ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁴
16	Manganese	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁴ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁴
17	Mercury	1) Isokinetic Sampling, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁴ 2) Isokinetic Sampling, Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ⁴
18	Nickel	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁴ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁴
19	Opacity	Ringelmann's Method ⁴
20	Oxides of Nitrogen	1) Absorption Sampling, Phenoldisulfonic Acid Method ⁴ 2) Absorption Sampling, Alkaline Permanganate/Colorimetric Method ⁴ 3) Instrumental Analyzer Method ⁴
21	Selenium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁴ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁴
22	Sulfur Dioxide	1) Absorption Sampling, Barium-Thorin Titrimetric Method ⁴ 2) Instrumental Analyzer Method ⁴
23	Sulfuric Acid	Isokinetic Sampling, Barium-Thorin Titrimetric Method ⁴
24	Tellurium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁴ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁴
25	Tin	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁴ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁴
26	Total Suspended Particulate	1) Isokinetic Sampling, Gravimetric Method ⁴ 2) Paired Train, Isokinetic Sampling, Gravimetric Method ⁴

27 Vanadium...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
27	Vanadium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁴ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁴
28	Xylene	Absorption Sampling, Gas Chromatographic Method ⁴

สารกำจัดศัตรูพืชที่ใช้แล้ว จำนวน 35 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^{1,2,4} 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^{1,2,4} 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^{1,2,4}
2	Antimony	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^{1,4,14} 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^{1,4,17} 3) Digestion, Inductively Coupled Plasma Method ^{1,4,14} 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^{1,17}
3	Arsenic	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^{1,4,14} 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^{1,4,17} 3) Digestion, Inductively Coupled Plasma Method ^{1,4,14} 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^{1,17}
4	Barium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^{1,4,14} 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^{1,4,17} 3) Digestion, Inductively Coupled Plasma Method ^{1,4,14} 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^{1,17}

5 Beryllium...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
5	Beryllium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.4.14) 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 ^(1.4.14) 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 ^(1.9.24) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.1.26)
8	Chromium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.4.14) 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, 1.17, 1.19) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Waste Extraction, Colorimetric Method; Calculation Method ^(1.4.17, 1.19) 3) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(7.14, 1.17, 1.19) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(7.14, 1.17, 1.19)

10 Chromium (VI)...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
10	Chromium (VI)	1) Waste Extraction, Colorimetric Method ^(1.4.19) 2) Alkaline Digestion, Colorimetric Method ^(1.4.19)
11	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.4.14) 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)
12	Copper	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.4.14) 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)
13	2,4-D	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.24) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.1.26)
14	DDD	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.24) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.1.26)
15	DDE	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.24) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.1.26)
16	DDT	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.24)

2) Soxhlet...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
17	Dieldrin	2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.1.26)
18	Endrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.24) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.1.26)
19	Heptachlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.24) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.1.26)
20	Lead	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.4.14) 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)
21	Lindane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.24) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.1.26)

22 Mercury...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
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 ^(1.4.21) 3) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^(7.14) 4) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ^(7.17) 5) Thermal Decomposition Amalgamation and Atomic Absorption Spectrometric Method ^(7.17)
23	Methoxychlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.24) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.1.26)
24	Mirex	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.24) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.1.26)
25	Molybdenum	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.4.14) 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)
26	Nickel	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.4.14) 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)
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 ^(1.9.24) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.1.26)

- 2-Chlorobiphenyl...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
28	- 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 - 2,3,3',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',5,5',6-Heptachlorobiphenyl - 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl Pentachlorophenol	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9,24) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(2.9,24) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.1,24) Electrometric Method ^(2.3,24) 4) Digestion, Inductively Coupled Plasma Method ^(1.1,14) 5) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.1,17) 6) Digestion, Inductively Coupled Plasma Method ^(7.1,14) 7) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.1,17)
29	pH	
30	Selenium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.1,14) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.1,17) 3) Digestion, Inductively Coupled Plasma Method ^(7.1,14) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.1,17)

31 Silver...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
31	Silver	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.1,14) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.1,17) 3) Digestion, Inductively Coupled Plasma Method ^(7.1,14) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.1,17)
32	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.1,14) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.1,17) 3) Digestion, Inductively Coupled Plasma Method ^(7.1,14) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.1,17)
33	Toxaphene	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9,24) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(2.9,24) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.1,24)
34	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.1,14) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.1,17) 3) Digestion, Inductively Coupled Plasma Method ^(7.1,14) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.1,17)
35	Zinc	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.1,14) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.1,17) 3) Digestion, Inductively Coupled Plasma Method ^(7.1,14) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.1,17)

ดิน...

ดิน จำนวน 125 กรัม/กิโล

ลำดับที่	สารเคมี	วิธีวิเคราะห์
1	Acenaphthene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(2.9,24) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.1,24)
2	Acetone	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(1.1,24) 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(1.1)
3	Aldrin	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(2.9,24) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.1,24)
4	Anthracene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(2.9,24) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.1,24)
5	Antimony	1) Digestion, Inductively Coupled Plasma Method ^(7.1,14) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.1,17)
6	Arsenic	1) Digestion, Inductively Coupled Plasma Method ^(7.1,14) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.1,17)
7	Atrazine	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(2.9,24) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.1,24)
8	Barium	1) Digestion, Inductively Coupled Plasma Method ^(7.1,14) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.1,17)
9	Benz(a)anthracene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(2.9,24) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.1,24)
10	Benzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(1.1,24)

11 Benzo(b)fluoranthene

ลำดับที่	สารเคมี	วิธีวิเคราะห์
11	Benzo(b)fluoranthene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(2.9,24) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.1,24)
12	Benzo(k)fluoranthene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(2.9,24) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.1,24)
13	Benzoic acid	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(2.9,24) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.1,24)
14	Benzo(a)pyrene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(2.9,24) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.1,24)
15	Benzo(g,h,i)perylene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(2.9,24) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.1,24)
16	Beryllium	1) Digestion, Inductively Coupled Plasma Method ^(7.1,14) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.1,17)
17	Bis(2-chloroethyl)ether	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(2.9,24) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.1,24)
18	Bis(2-ethylhexyl)phthalate	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(2.9,24) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.1,24)
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(1.1,24)
20	Bromoform	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(1.1,24)
21	Butanol	Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(1.1,24)
22	Butyl Benzyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(2.9,24) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.1,24)

23 Cadmium...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
23	Cadmium	1) Digestion, Inductively Coupled Plasma Method ^(7,14) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)
24	Carbazole	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,20) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,24)
25	Carbon Disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,23)
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,23)
27	Chlordane	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,20) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,24)
28	p-Chloroaniline	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,20) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,24)
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,23)
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,23)
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,23)
32	2-Chlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,20) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,24)
33	Chromium	1) Digestion, Inductively Coupled Plasma Method ^(7,14) 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 ^(7,8,14,18) 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 ^(8,18)

36 Chrysene...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
36	Chrysene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,20) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,24)
37	Cyanide	Extraction, Distillation, Colorimetric Method ^(27,28,29)
38	2,4-D	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,20) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,24)
39	DDE	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,20) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,24)
40	DDE	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,20) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,24)
41	DDT	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,20) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,24)
42	Dibenz(a,h)anthracene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,20) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,24)
43	Di-n-Butyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,20) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,24)
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,23)
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,23)
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,23)
47	3,3-Dichlorobenzidine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,20) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,24)
48	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,23)

49 1,2-Dichloroethane...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
49	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,23)
50	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,23)
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,23)
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,23)
53	2,4-Dichlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,20) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,24)
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,23)
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,23)
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,23)
57	Dieldrin	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,20) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,24)
58	Diethyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,20) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,24)
59	2,4-Dimethylphenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,20) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,24)
60	2,4-Dinitrophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,20) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,24)
61	2,4-Dinitrotoluene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,20) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,24)
62	2,6-Dinitrotoluene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,20) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,24)

63 Di-n-Octyl Phthalate...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
63	Di-n-Octyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,20) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,24)
64	Endosulfan	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,20) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,24)
65	Endrin	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,20) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,24)
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,23)
67	Fluoranthene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,20) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,24)
68	Fluorene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,20) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,24)
69	Heptachlor	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,20) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,24)
70	Heptachlor epoxide	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,20) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,24)
71	Hexachlorobenzene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,20) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,24)
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,23)
73	n-Hexane	1) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,23) 2) Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method ⁽¹¹⁾

73 n-Hexane...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
74	α -HCH	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
75	β -HCH	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
76	γ -HCH	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
77	Hexachlorocyclopentadiene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
78	Hexachloroethane	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
79	Indeno(1,2,3-cd)pyrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
80	Isophorone	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
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 ⁽²⁰⁾ 2) Thermal Decomposition, Amalgamation, and Atomic Absorption Spectrophotometry ⁽²¹⁾ 3) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ⁽²²⁾

84 Methanol...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
84	Methanol	1) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,23) 2) Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method ^(13,23)
85	Methoxychlor	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
86	Methyl Bromide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,23)
87	Methylene Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,23)
88	2-methylphenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
89	2-Methylnaphthalene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
90	Methyl tert-Butyl Ether	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,23)
91	Naphthalene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
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 ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
94	N-Nitrosodiphenylamine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
95	N-Nitrosodi-n-propylamine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)

96 Polychlorinated biphenyls (PCBs)

ลำดับที่	สารเคมี	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',3,4,5,5'-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',5,5',6'-Heptachlorobiphenyl - 2,2',3,3',4,4',5,5',6'-Heptachlorobiphenyl - 2,2',3,3',4,4',5,5',6'-Nonachlorobiphenyl	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
97	Pentachlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
98	Phenanthrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)

99 Phenol...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
99	Phenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
100	Pyrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
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 ^(13,23)
104	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,23)
105	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,23)
106	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,23)
107	Toxaphene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
108	TPH (C ₅ -C ₆)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,23)
109	TPH (C ₁₀ -C ₁₄)	1) Automated Extraction, Gas Chromatographic Method ^(11,26) 2) Solvent Extraction, Gas Chromatographic Method ^(11,26) 3) Ultrasonic Extraction, Gas Chromatographic Method ^(11,26)
110	TPH (C ₁₅ -C ₁₉)	1) Automated Extraction, Gas Chromatographic Method ^(11,26) 2) Solvent Extraction, Gas Chromatographic Method ^(11,26) 3) Ultrasonic Extraction, Gas Chromatographic Method ^(11,26)
111	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,23)
112	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,23)
113	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,23)
114	Trichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,23)

115 2,4,5-Trichlorophenol...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
115	2,4,5-Trichlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,20) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,20)
116	2,4,6-Trichlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,20) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,20)
117	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,21)
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 ^(13,21)
120	Vinyl Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,21)
121	m-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,21)
122	o-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,21)
123	p-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,21)
124	Xylene (Total)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,21)
125	Zinc	1) Digestion, Inductively Coupled Plasma Method ^(7,14) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)

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ที่ ยก ๐๙๐๑๒/ ๔๔ ๒๒

กรมโรงงานอุตสาหกรรม
ถนนพหลโยธิน
เขตราชเทวี กรุงเทพมหานคร ๑๐๖๐๐

๒๕ เมษายน ๒๕๖๕

เรื่อง เปลี่ยนแปลงเอกสารของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอลเอส แลบริทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอเสนอ/ต่ออายุ/เปลี่ยนแปลงเอกสาร และขออนุญาตของห้องปฏิบัติการวิเคราะห์เอกสาร
ฉบับที่ ๒๔ มีนาคม ๒๕๖๔

ตามที่ขอให้อ้างอิง บริษัท เอลเอส แลบริทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการ
วิเคราะห์เอกสาร เลขทะเบียน ๖-๒๐๔ สถานที่ตั้งเลขที่ ๓๐๔ ซอยพัฒนาการ ๔๐ ถนนพัฒนาการ
เขตคลองหลวง กรุงเทพมหานคร ขอเปลี่ยนแปลงเอกสาร ความละเอียดดังนี้

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้

๑. ให้ยกเลิกเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์ จำนวน ๓ ราย

๑) นางสาวพรณิศา ชุมคง ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๐๒๕

๒) นายเกียรติ สุขทอง ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๐๒๕

๓) นางสาวศุภาดา ปิ่นมูรา ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๐๒๕

๒. ให้เพิ่มเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกสาร จำนวน ๑๒ ราย

๑) นางสาวฐาปนา ก้อนเขียว ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๐๒๕

๒) นางสาวกัญญ์กมล สายคำ ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๐๒๕

๓) นางสาวณัฐนิชา กิ่งหวาด ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๐๒๕

๔) นายอำนาจ วัฒนายน ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๐๒๕

๕) นายฤทธิเดช ปัญญาวัฒน์ ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๐๒๕

๖) นายณชากร พรรษา ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๐๒๕

๗) นายวิศิษฐ์ มอัสลามัน ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๐๒๕

๘) นายณัฐพงศ์ โสภะ ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๐๒๕

๙) นายศุภวัฒน์ ปานเพ็ญ ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๐๒๕

๑๐) นายณัฐเดช ชุมชื่น ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๐๒๕

๑๑) นายสนา สุภาพินธุ์ ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๐๒๕

๑๒) นายบรรณ นพพรชัย ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๐๒๕

อนึ่ง ทนั้ขอตอบนี้

อนึ่ง หนังสือฉบับนี้จะส่งมอบให้ผู้รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
ในวันที่ ๒ กันยายน ๒๕๖๕

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายพรศ กสิณกรอง)
รองอธิบดี ปฏิบัติราชการแทน
อธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและพัฒนายุทธศาสตร์โรงงาน
กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบผลิตภัณฑ์และทะเบียนห้องปฏิบัติการ
โทร. ๐ ๒๕๓๐ ๖๓๓๒ ต่อ ๒๑๐๓-๕
โทรสาร ๐ ๒๕๓๐ ๖๓๓๒ ต่อ ๒๑๑๖๕
ไปรษณีย์อิเล็กทรอนิกส์ sarabangodiv@mail.go.th



"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวไกล ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



ที่ กก.๐๑๓๐(๑)/ ๑๒๖๖ ๘ ๑

กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๑๘ ธันวาคม ๒๕๖๗

เรื่อง ยกเลิกบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แล็บราทอรี่ กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และขอคืนสถานะของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๒ ธันวาคม ๒๕๖๗

ตามคำขอที่อ้างถึง บริษัท เอแอลเอส แล็บราทอรี่ กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการ
วิเคราะห์เอกชน เลขทะเบียน ๖-๒๐๔-๙-๐๑๐๔ ขอคืนพัฒนาการ ๕๐ ถนนพัฒนาการ แขวงพัฒนาการ
เขตสวนหลวง กรุงเทพมหานคร ขอยกเลิกบุคลากร ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้ยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์
จำนวน ๘ ราย ได้แก่

๑) นายประพนธ์ วรณัฐชัย	ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๐๐
๒) นายจิรภูมิ งามธรรมา	ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๐๒
๓) นายพิรพัฒน์ คำคำ	ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๐๘
๔) นางสาวอรุณ คำคำ	ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๑๔
๕) นายกิตติพงศ์ แซ่สี	ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๑๔
๖) นายจิรเมธ ประเสริฐศิริพงศ์	ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๒๐
๗) นายภัทรพงษ์ ธนพาทพงษ์	ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๒๗
๘) นางสาวจตุรพรณ กระจำพันธ์	ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๔๑

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายธีรศักดิ์ อิศรางกูร ณ อยุธยา)
รองอธิบดี ปฏิบัติราชการแทน
อธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและพัฒนายุทธศาสตร์โรงงาน
กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบผลิตภัณฑ์และทะเบียนห้องปฏิบัติการ
โทร. ๐ ๒๕๓๐ ๖๓๓๒ ต่อ ๒๑๐๓-๕
โทรสาร ๐ ๒๕๓๐ ๖๓๓๒ ต่อ ๒๑๑๖๕
ไปรษณีย์อิเล็กทรอนิกส์ sarabangodiv@mail.go.th



"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวไกล ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



ที่ กก.๐๑๓๐(๑)/ ๑๑๔๐

กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๑๐ เมษายน ๒๕๖๘

เรื่อง ยกเลิกบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แล็บราทอรี่ กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และขอคืนสถานะของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๒ เมษายน ๒๕๖๘

ตามคำขอที่อ้างถึง บริษัท เอแอลเอส แล็บราทอรี่ กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการ
วิเคราะห์เอกชน เลขทะเบียน ๖-๒๐๔-๙-๐๑๐๔ ขอคืนพัฒนาการ ๕๐ ถนนพัฒนาการ แขวงพัฒนาการ
เขตสวนหลวง กรุงเทพมหานคร ขอเปลี่ยนแปลงบุคลากร ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้ยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์
จำนวน ๒ ราย ได้แก่

๑) นายอิทธิพงศ์ บัวเมธ	ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๐๒
๒) นายนพต ผลาทิพย์	ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๑๐

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายธีรศักดิ์ อิศรางกูร ณ อยุธยา)
รองอธิบดี ปฏิบัติราชการแทน
อธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและพัฒนายุทธศาสตร์โรงงาน
กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบผลิตภัณฑ์และทะเบียนห้องปฏิบัติการ
โทร. ๐ ๒๕๓๐ ๖๓๓๒ ต่อ ๒๑๐๓-๕
โทรสาร ๐ ๒๕๓๐ ๖๓๓๒ ต่อ ๒๑๑๖๕
ไปรษณีย์อิเล็กทรอนิกส์ sarabangodiv@mail.go.th



"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวไกล ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



ที่ กก.๐๑๓๐(๑)/ ๔๖ ๗ ๑

กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๐๕ มิถุนายน ๒๕๖๘

เรื่อง เปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แล็บราทอรี่ กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และขอคืนสถานะของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๙ พฤษภาคม ๒๕๖๘

ตามคำขอที่อ้างถึง บริษัท เอแอลเอส แล็บราทอรี่ กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการ
วิเคราะห์เอกชน เลขทะเบียน ๖-๒๐๔-๙-๐๑๐๔ ขอคืนพัฒนาการ ๕๐ ถนนพัฒนาการ แขวงพัฒนาการ
เขตสวนหลวง กรุงเทพมหานคร ขอเปลี่ยนแปลงบุคลากร ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้เพิ่มเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน
จำนวน ๑๑ ราย ได้แก่

๑) นายศุภณกร มั่นชื่น	ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๑๔
๒) นายพิษณุพล แสนมาตร	ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๑๕
๓) นายเอกรินทร์ บุตสีทิ	ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๑๖
๔) นายพิชิตานนท์ อินธิกร	ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๑๗
๕) นายศุภวรรณ แก้วกัณหา	ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๑๘
๖) นายภิรมย์ มีศิริ	ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๑๙
๗) นายภคินันท์ คำจันทร์	ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๒๐
๘) นายธีรวิทย์ มีโพธิ์	ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๒๑
๙) นายธีรพงษ์ ศรีคำแหง	ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๒๒
๑๐) นายอภิสิทธิ์ ศรีคมแก้ว	ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๒๓
๑๑) วาที่รียะตรี ภาณุพงศ์ แสนศิริ	ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๒๔

อนึ่ง หนังสือฉบับนี้จะส่งมอบให้ผู้รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
ในวันที่ ๒ กันยายน ๒๕๖๘

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายธีรศักดิ์ อิศรางกูร ณ อยุธยา)
รองอธิบดี ปฏิบัติราชการแทน
อธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและพัฒนายุทธศาสตร์โรงงาน
กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบผลิตภัณฑ์และทะเบียนห้องปฏิบัติการ
โทร. ๐ ๒๕๓๐ ๖๓๓๒ ต่อ ๒๑๐๓-๕
โทรสาร ๐ ๒๕๓๐ ๖๓๓๒ ต่อ ๒๑๑๖๕
ไปรษณีย์อิเล็กทรอนิกส์ sarabangodiv@mail.go.th



"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวไกล ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"





ที่อก ๐๓๑๐(๑)/ ๒๕ ๐ ๘

กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๒๑ สิงหาคม ๒๕๖๔

เรื่อง เปลี่ยนแปลงสารมลพิษที่วิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอนแอล เอส แลบริวอรี่ กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงใบอนุญาต และชนิดสารมลพิษขอห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๒๗ มิถุนายน ๒๕๖๔

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือเปลี่ยนแปลงสารมลพิษที่วิเคราะห์

บริษัท เอนแอล เอส แลบริวอรี่ กรุ๊ป (ประเทศไทย) จำกัด จำนวน ๖ แผ่น

ตามคำขอที่อ้างถึง บริษัท เอนแอล เอส แลบริวอรี่ กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการ
วิเคราะห์เอกชน เลขทะเบียน ๖-๒๐๔ สถานที่ตั้งเลขที่ ๑๐๔ ซอยพัฒนาการ ๔๐ ถนนพัฒนาการ แขวงพัฒนาการ
เขตสวนหลวง กรุงเทพมหานคร ขอเปลี่ยนแปลงสารมลพิษที่วิเคราะห์ ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้อำนาจให้บริษัท เอนแอล เอส แลบริวอรี่ กรุ๊ป (ประเทศไทย) จำกัด
เพิ่มขอบข่ายชนิดสารมลพิษที่วิเคราะห์ในน้ำได้ดิน สิ่งปลูกสร้างและวัสดุที่ไม่ได้ดิน และดิน ตามสิ่งที่ส่งมาด้วย

อนึ่ง หนังสือฉบับนี้จะสิ้นสุดอายุพร้อมหนังสือต่ออายุรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
ในวันที่ ๒ กันยายน ๒๕๖๕

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นางสาวปัทมวรรณ คุณประเสริฐ)
ผู้อำนวยการกองทะเบียนและใบอนุญาต
ปฏิบัติงานกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๕๓๐ ๖๓๒๒ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๕๓๐ ๖๓๒๒ ต่อ ๒๑๑๕

ไปรษณีย์อิเล็กทรอนิกส์ saraban@dlw.mail.go.th



"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวทัน ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



เอกสารแนบท้ายหนังสือเปลี่ยนแปลงสารมลพิษที่วิเคราะห์

บริษัท เอนแอล เอส แลบริวอรี่ กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ๖-๒๐๔

ที่อก ๐๓๑๐(๑)/ ๒๕ ๐ ๘

ลงวันที่ ๒๑ สิงหาคม ๒๕๖๔

ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๕๐ รายการ

น้ำได้ดิน จำนวน ๔ รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aluminum	Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽²⁾
2	Copper	Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽²⁾
3	Iron	Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽²⁾
4	Molybdenum	Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽²⁾

สิ่งปลูกสร้างหรือวัสดุที่ไม่ได้ดิน จำนวน 17 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Antimony	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,4) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)
2	Arsenic	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,4) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)
3	Barium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,4) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)

เบริลเลียม

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
4	Beryllium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,4) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)
5	Cadmium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,4) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)
6	Chromium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,4) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)
7	Chromium (III)	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction, Colorimetric Method; Calculation Method ^(1,3,4,8) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Waste Extraction, Colorimetric Method; Calculation Method ^(1,3,7,8) 3) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(4,5,8,9) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(4,5,7,8)
8	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,4) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7)

3) Digestion...

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
9	Copper	3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7) 1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,4) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)
10	Lead	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,4) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)
11	Molybdenum	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,4) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)
12	Nickel	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,4) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)
13	Selenium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,4) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)

14 Silver...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
14	Silver	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,6) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
15	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,6) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
16	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,6) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
17	Zinc	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,6) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)

ดิน จำนวน 19 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aluminum	1) Digestion, Inductively Coupled Plasma Method ^(4,6) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
2	Antimony	1) Digestion, Inductively Coupled Plasma Method ^(4,6) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)

3 Arsenic...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
3	Arsenic	1) Digestion, Inductively Coupled Plasma Method ^(4,6) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
4	Barium	1) Digestion, Inductively Coupled Plasma Method ^(4,6) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
5	Beryllium	1) Digestion, Inductively Coupled Plasma Method ^(4,6) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
6	Cadmium	1) Digestion, Inductively Coupled Plasma Method ^(4,6) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
7	Chromium	1) Digestion, Inductively Coupled Plasma Method ^(4,6) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
8	Chromium (III)	1) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(4,5,6,8) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(4,5,7,8)
9	Copper	1) Digestion, Inductively Coupled Plasma Method ^(4,6) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
10	Iron	1) Digestion, Inductively Coupled Plasma Method ^(4,6) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
11	Lead	1) Digestion, Inductively Coupled Plasma Method ^(4,6) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
12	Manganese	1) Digestion, Inductively Coupled Plasma Method ^(4,6) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
13	Molybdenum	1) Digestion, Inductively Coupled Plasma Method ^(4,6) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
14	Nickel	1) Digestion, Inductively Coupled Plasma Method ^(4,6) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)

15 pH...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
15	pH	Electrometric Method ⁽⁹⁾
16	Selenium	1) Digestion, Inductively Coupled Plasma Method ^(4,6) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
17	Silver	1) Digestion, Inductively Coupled Plasma Method ^(4,6) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
18	Vanadium	1) Digestion, Inductively Coupled Plasma Method ^(4,6) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
19	Zinc	1) Digestion, Inductively Coupled Plasma Method ^(4,6) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)

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กรม



ที่ อบ ๐๓๐๐(๑)๕๐ ๑๑

กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๒๖ กันยายน ๒๕๖๘

เรื่อง เปลี่ยนแปลงบุคลากร ชื่อตัวและชื่อสกุลของบุคลากร

เรียน กรรมการผู้จัดการ บริษัท เอนเอเอส แลบริเอทอรี่ กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และขอคืนสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ในวันที่ ๒๑ สิงหาคม ๒๕๖๘

ตามคำขอที่อ้างถึง บริษัท เอนเอเอส แลบริเอทอรี่ กรุ๊ป (ประเทศไทย) จำกัดห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๒๐๔ สถานที่ตั้งเลขที่ ๓๐๔ ซอยพัฒนาการ ๕๐ ถนนพัฒนาการ แขวงพัฒนาการ เขตสวนหลวง กรุงเทพมหานคร ขอเปลี่ยนแปลงบุคลากร ชื่อตัวและชื่อสกุลของบุคลากร
ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้

๑. โยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๒ ราย

๑) นางสาวพาศิตี คุณนามา ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๓๙๙

๒) นางสาวอรณิชา เทียนคำ ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๓๙๙

๒. ให้เปลี่ยนชื่อตัวและชื่อสกุลของเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จากเดิม

นายอาทิตย์ ศรีสน เป็น นายรัฐวิทย์ หักจิรพรจน์ ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๐๔๘๘

อนึ่ง หนังสือฉบับนี้จะสิ้นสุดอายุพร้อมหนังสือต่ออายุวันขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

ในวันที่ ๒ กันยายน ๒๕๖๙

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นางสาวปัทมาวรรณ คุณประเสริฐ)

ผู้อำนวยการกองวิเคราะห์และควบคุมมลพิษ

ปฎิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและพัฒนาพิษวิทยาโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๕๖๐ ๖๓๒๒ ต่อ ๒๐๔๓-๕

โทรสาร ๐ ๒๕๖๐ ๖๓๒๒ ต่อ ๒๐๔๙

ไปรษณีย์อิเล็กทรอนิกส์ sarabang@diw.mail.go.th



"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



รายการสืบ (ปล่อยระบาย) จำนวน 7 รายการ

ลำดับ ที่	สารเคมี	วิธีวิเคราะห์
1	Carbon Monoxide	1) Sampling Bag, Non-Dispersive Infrared Method ^[1] 2) Instrumental Analyzer Method ^[2]
2	Hydrogen Sulfide	Absorption Sampling, Iodometric Method ^[3]
3	Opacity	Ringelmanns Method ^[4]
4	Oxide of Nitrogen	1) Absorption Sampling, Phenoldisulfonic Acid Method ^[5] 2) Instrumental Analyzer Method ^[6]
5	Sulfur Dioxide	1) Absorption Sampling, Barium-Thorin Titrimetric Acid Method ^[7] 2) Instrumental Analyzer Method ^[11]
6	Sulfuric Acid	Isokinetic Sampling, Barium - Titrimetric Method ^[8]
7	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method ^[9]

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11. United States Environmental Protection Agency, Determination of Sulfur dioxide Emission from Stationary Sources; Instrumental Analyzer Procedure. 40 CFR 60, Appendix A Method 6C, 2017.

OK

ที่ อก.๐๑๐๐/ ๑๐๐๔๔



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๑๔ ตุลาคม ๒๕๖๕

เรื่อง แก้ไขรายชื่อเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบริทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง หนังสือ บริษัท เอแอลเอส แลบริทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขที่ Env 2024/005

ลงวันที่ ๑๐ สิงหาคม ๒๕๖๕

ตามที่หนังสือที่อ้างถึง บริษัท เอแอลเอส แลบริทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๑๒๓ สถานที่ตั้งเลขที่ ๖๑๖/๑๐ หมู่ที่ ๕ ตำบลแม่ไม้คู้ อำเภอปลวกแดง จังหวัดระยอง ขอแก้ไขรายชื่อเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน เนื่องจากมีความคลาดเคลื่อน ความละเอียด

ดังนี้

กรมโรงงานอุตสาหกรรม ได้รับทราบและดำเนินการแก้ไขรายชื่อเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน จำนวน ๕ ราย ตามที่แจ้งเรียบร้อยแล้ว เป็นดังนี้

ลำดับที่ ๒๙ นางพจนา สีลา

ลำดับที่ ๒๘ นางสาวนิลา กุลสุริวงศ์

ลำดับที่ ๓๐ นางชลธิชา สุภกษ

ลำดับที่ ๓๖ นายสุทธิศักดิ์ ใจคปิตินันท์

ลำดับที่ ๔๒ นายกันตณณ มณีนิรันดร์

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายพรพงศ์ ภัสกรพงษ์)
อธิบดีกรมโรงงานอุตสาหกรรม

ศูนย์วิจัยและพัฒนาระบบนิเวศโรงงานภาคตะวันออก
โทร. ๐ ๓๓๓๓ ๖๐๕๕ ต่อ ๕๐๐๑-๒
ไปรษณีย์อิเล็กทรอนิกส์: einwgdw@mail.go.th

Green Industry "อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



ที่ อก.๐๑๐๐(๓)/ ๕๒๔๖



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๒๐ พฤษภาคม ๒๕๖๕

เรื่อง ยกเลิกบุคลากรห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบริทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียนต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารเคมีของห้องปฏิบัติการวิเคราะห์เอกชน ลงวันที่ ๑๐ เมษายน ๒๕๖๔

ตามคำขอที่อ้างถึง บริษัท เอแอลเอส แลบริทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๑๒๓ สถานที่ตั้งเลขที่ ๖๑๖/๑๐ หมู่ที่ ๕ ตำบลแม่ไม้คู้ อำเภอปลวกแดง จังหวัดระยอง ขอยกเลิกบุคลากร ความละเอียดแจ้งแล้ว

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้ยกเลิกเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน จำนวน ๓ ราย ได้แก่ นายปารามศ สัตยาคุณ ทะเบียนเลขที่ ๖-๑๒๓-๖-๐๐๕๓

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายประพนธ์ คำรณพร)
ผู้อำนวยการศูนย์พัฒนาระบบนิเวศโรงงาน
ปฏิบัติการตามแผนปฏิบัติการกรมโรงงานอุตสาหกรรม

ศูนย์วิจัยและพัฒนาระบบนิเวศโรงงานภาคตะวันออก
โทร. ๐ ๓๓๓๓ ๖๐๕๕ ต่อ ๕๐๐๑-๒
ไปรษณีย์อิเล็กทรอนิกส์: einwgdw@mail.go.th



"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



ที่ อก ๐๓๓๐(๓)/ ๕๕๐๘



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๒๗ พฤษภาคม ๒๕๖๔

เรื่อง เปลี่ยนแปลงชื่อ-สกุลบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารเคมีของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๑๕ พฤษภาคม ๒๕๖๔

ตามคำขอที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการ
วิเคราะห์เอกชน เลขทะเบียน ๖-๓๒๓ สถานที่ตั้งเลขที่ ๖๑๖/๑๐ หมู่ที่ ๕ ตำบลแม่ไม้คู อำเภอลำลูกนาง
จังหวัดระยอง ขอเปลี่ยนแปลงชื่อ-สกุลบุคลากร ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้เปลี่ยนแปลงชื่อ-สกุลบุคลากร จำนวน ๑ ราย
จากนายธนสิทธิ์ วงศ์ไชย เป็น นายธนสิทธิ์ วงศ์ไชย

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายประพนธ์ คำรงผล)

ผู้อำนวยการกองวิจัยและพัฒนาสิ่งแวดล้อมพิษโรงงาน
ปฏิบัติการตามแผนปฏิบัติการโรงงานอุตสาหกรรม

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก
โทร. ๐ ๓๓๓๓ ๖๐๕๔ ต่อ ๕๐๐๑-๒
ไปรษณีย์อิเล็กทรอนิกส์ eirw@dlw.mail.go.th



"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



ที่ อก ๐๓๓๐(๓)/ ๕๗๖๔



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๐๒ ธันวาคม ๒๕๖๔

เรื่อง เปลี่ยนแปลงสารเคมีที่วิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารเคมีของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๑๑ ตุลาคม ๒๕๖๔

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือเปลี่ยนแปลงสารเคมีที่วิเคราะห์

บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด จำนวน ๒ แผ่น

ตามคำขอที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการ
วิเคราะห์เอกชน เลขทะเบียน ๖-๓๒๓ สถานที่ตั้งเลขที่ ๖๑๖/๑๐ หมู่ที่ ๕ ตำบลแม่ไม้คู อำเภอลำลูกนาง
จังหวัดระยอง ขอเปลี่ยนแปลงสารเคมีที่วิเคราะห์ ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด
เพิ่มขอบข่ายชนิดสารเคมีที่วิเคราะห์ที่ในน้ำเสีย และน้ำใต้ดิน ตามสิ่งที่ส่งมาด้วย

อนึ่ง หนังสือฉบับนี้จะเป็นอายุพร้อมหนังสือต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
ในวันที่ ๒๘ มิถุนายน ๒๕๖๕

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นางสาวปัทมวรรณ คุณประเสริฐ)
ผู้อำนวยการกองวิจัยและพัฒนาสิ่งแวดล้อมพิษโรงงาน
ปฏิบัติการตามแผนปฏิบัติการโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน
ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก
โทร. ๐ ๓๓๓๓ ๖๐๕๔ ต่อ ๕๐๐๑-๒
ไปรษณีย์อิเล็กทรอนิกส์ eirw@dlw.mail.go.th



"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



เอกสารแนบท้ายหนังสือเปลี่ยนแปลงสารเคมีที่วิเคราะห์

บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ๖-๓๒๓

ที่ อก ๐๓๓๐(๓)/ ๕๗๖๔ ลงวันที่ ๐๒ ธันวาคม ๒๕๖๔

ขอขยายสารเคมีที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๒๓ รายการ

น้ำเสีย จำนวน 13 รายการ

ลำดับที่	สารเคมี	วิธีวิเคราะห์
1	Arsenic	Digestion, Inductively Coupled Plasma Method
2	Barium	Digestion, Inductively Coupled Plasma Method
3	Cadmium	Digestion, Inductively Coupled Plasma Method
4	Chromium	Digestion, Inductively Coupled Plasma Method
5	Copper	Digestion, Inductively Coupled Plasma Method
6	Hexavalent Chromium	Colorimetric Method
7	Lead	Digestion, Inductively Coupled Plasma Method
8	Manganese	Digestion, Inductively Coupled Plasma Method
9	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method
10	Nickel	Digestion, Inductively Coupled Plasma Method
11	Selenium	Digestion, Inductively Coupled Plasma Method
12	Trivalent Chromium	Calculation
13	Zinc	Digestion, Inductively Coupled Plasma Method

น้ำใต้ดิน จำนวน 20 รายการ

ลำดับที่	สารเคมี	วิธีวิเคราะห์
1	Aluminum	Digestion, Inductively Coupled Plasma Method
2	Antimony	Digestion, Inductively Coupled Plasma Method
3	Arsenic	Digestion, Inductively Coupled Plasma Method
4	Barium	Digestion, Inductively Coupled Plasma Method
5	Beryllium	Digestion, Inductively Coupled Plasma Method
6	Cadmium	Digestion, Inductively Coupled Plasma Method
7	Chromium	Digestion, Inductively Coupled Plasma Method
8	Chromium (III)	Calculation
9	Chromium (VI)	Colorimetric Method
10	Copper	Digestion, Inductively Coupled Plasma Method

-๒-

ลำดับที่	สารเคมี	วิธีวิเคราะห์
11	Iron	Digestion, Inductively Coupled Plasma Method
12	Lead	Digestion, Inductively Coupled Plasma Method
13	Manganese	Digestion, Inductively Coupled Plasma Method
14	Mercury	Digestion Cold-Vapor Atomic Absorption Spectrometric Method
15	Molybdenum	Digestion, Inductively Coupled Plasma Method
16	Nickel	Digestion, Inductively Coupled Plasma Method
17	Selenium	Digestion, Inductively Coupled Plasma Method
18	Silver	Digestion, Inductively Coupled Plasma Method
19	Vanadium	Digestion, Inductively Coupled Plasma Method
20	Zinc	Digestion, Inductively Coupled Plasma Method

เอกสารอ้างอิง

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๐๖ มีนาคม ๒๕๖๕

เรื่อง เปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบลอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และขอปิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๖ กุมภาพันธ์ ๒๕๖๔ตามคำขอที่อ้างถึง บริษัท เอแอลเอส แลบลอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการ
วิเคราะห์เอกชน เลขทะเบียน ๖-๓๒๓ สถานที่ตั้งเลขที่ ๖๑๖/๑๐ หมู่ที่ ๕ ตำบลแม่น้ำคู่ อำเภอปลวกแดง
จังหวัดระยอง ขอเปลี่ยนแปลงบุคลากร ความละเอียดแจ้งแล้ว นั้นกรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้เพิ่มเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน
จำนวน ๘ ราย ได้แก่

๑) นายอนวัช คงปลีก	ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๖๓
๒) นายอนาธิป อธิพิศดา	ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๖๔
๓) นายเฉลิมชัย บุญทุบ	ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๖๕
๔) นางสาววิจิตรา งามเสียม	ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๖๖
๕) นางสาวอลิศา คำสมัย	ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๖๗
๖) นางสาวปัทมา ชูดีนทร์	ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๖๘
๗) นายปฏิญญา ปามทองทา	ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๖๙

อนึ่ง หนังสือฉบับนี้จะสิ้นสุดอายุพร้อมหนังสือต่ออายุวันขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

ในวันที่ ๒๔ มิถุนายน ๒๕๖๕

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายศิวัช จันทร์นิล)

ผู้อำนวยการศูนย์วิจัยและพัฒนา
ผู้อำนวยการกองวิจัยและพัฒนาระบบโรงงาน
ปฏิบัติการและสนับสนุนโรงงานอุตสาหกรรมกองวิจัยและพัฒนาระบบโรงงาน
ศูนย์วิจัยและพัฒนาระบบโรงงานภาคตะวันออก
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