

ภาคผนวก ค

ใบรับรองผลการวิเคราะห์



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 2

Lot ID: 22107209
Date Received : Sep 21, 2022
Date Reported : Sep 27, 2022
Report Number: 2418974-1

Page 1 of 1

Sample Description		Air Quality	
Location	พิกัดตำแหน่ง (GPS 47P 0732309, 1407980)	Nitrogen dioxide (ppm)	
Parameter		Saticha Phitsawaeng	
Measurement Date	Sep 12, 2022 - Sep 19, 2022		
Measurement by	Saticha Phitsawaeng		
Time	22107209-1	22107209-2	22107209-3
10:00 AM - 11:00 AM	0.010	0.009	0.008
11:00 AM - 12:00 PM	0.002	0.008	0.005
12:00 PM - 01:00 PM	0.007	0.010	0.006
01:00 PM - 02:00 PM	0.007	0.009	0.006
02:00 PM - 03:00 PM	0.005	0.009	0.006
03:00 PM - 04:00 PM	0.008	0.009	0.008
04:00 PM - 05:00 PM	0.015	0.010	0.015
05:00 PM - 06:00 PM	0.017	0.018	0.018
06:00 PM - 07:00 PM	0.014	0.016	0.022
07:00 PM - 08:00 PM	0.025	0.026	0.034
08:00 PM - 09:00 PM	0.024	0.017	0.031
09:00 PM - 10:00 PM	0.011	0.011	0.010
10:00 PM - 11:00 PM	0.013	0.012	0.013
11:00 PM - 12:00 AM	0.011	0.009	0.009
12:00 AM - 01:00 AM	0.010	0.009	0.014
01:00 AM - 02:00 AM	0.009	0.009	0.008
02:00 AM - 03:00 AM	0.010	0.009	0.009
03:00 AM - 04:00 AM	0.016	0.009	0.009
04:00 AM - 05:00 AM	0.011	0.012	0.007
05:00 AM - 06:00 AM	0.012	0.010	0.007
06:00 AM - 07:00 AM	0.011	0.011	0.014
07:00 AM - 08:00 AM	0.016	0.012	0.014
08:00 AM - 09:00 AM	0.015	0.018	0.020
09:00 AM - 10:00 AM	0.009	0.013	0.011
Average	0.012	0.012	0.013
1hr - Maximum	0.025	0.026	0.034
Standard 1hr - Average	0.170	0.170	0.170
Standard	: Notification of the National Environment Board No. 33, 2009 (B.E. 2552).		
Reference Method	: US EPA Method Part 50 App. F (Chemiluminescence)		

This above results are valid only for the analyzed/tested sample(s) as indicated in the above table. The results are not valid for other samples without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by

Saemya C.

Saranya Chalermtamrong
Scientist (4)

ADDRESS: 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 Thailand | PHONE +66 0 2760 3000 | FAX +66 0 2760 3197
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

640371/EMAIL

S:\Reports_Air_SON\Ox.rpt (5.48PM)



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 2

Lot ID: 22107209
Date Received : Sep 21, 2022
Date Reported : Sep 27, 2022
Report Number: 2447573-1

Page 1 of 1

Sample Description		Air Quality	
Location	พิกัดตำแหน่ง (GPS 47P 0735044, 1406257)	Nitrogen dioxide (ppm)	
Parameter		Saticha Phitsawaeng	
Measurement Date	Sep 12, 2022 - Sep 19, 2022		
Measurement by	Saticha Phitsawaeng		
Time	22107209-8	22107209-9	22107209-10
11:00 AM - 12:00 PM	0.010	0.009	0.010
12:00 PM - 01:00 PM	0.010	0.004	0.010
01:00 PM - 02:00 PM	0.017	0.006	0.007
02:00 PM - 03:00 PM	0.016	0.009	0.010
03:00 PM - 04:00 PM	0.011	0.009	0.013
04:00 PM - 05:00 PM	0.008	0.008	0.021
05:00 PM - 06:00 PM	0.011	0.012	0.031
06:00 PM - 07:00 PM	0.017	0.020	0.017
07:00 PM - 08:00 PM	0.009	0.016	0.012
08:00 PM - 09:00 PM	0.010	0.009	0.008
09:00 PM - 10:00 PM	0.009	0.009	0.008
10:00 PM - 11:00 PM	0.008	0.009	0.008
11:00 PM - 12:00 AM	0.012	0.011	0.007
12:00 AM - 01:00 AM	0.012	0.005	0.005
01:00 AM - 02:00 AM	0.006	0.011	0.005
02:00 AM - 03:00 AM	0.008	0.010	0.006
03:00 AM - 04:00 AM	0.010	0.009	0.015
04:00 AM - 05:00 AM	0.009	0.009	0.008
05:00 AM - 06:00 AM	0.010	0.008	0.008
06:00 AM - 07:00 AM	0.010	0.016	0.014
07:00 AM - 08:00 AM	0.010	0.008	0.009
08:00 AM - 09:00 AM	0.012	0.009	0.003
09:00 AM - 10:00 AM	0.011	0.010	0.002
10:00 AM - 11:00 AM	0.009	0.009	0.003
Average	0.011	0.010	0.010
1hr - Maximum	0.017	0.020	0.031
Standard 1hr - Average	0.170	0.170	0.170
Standard	: Notification of the National Environment Board No. 33, 2009 (B.E. 2552).		
Reference Method	: US EPA Method Part 50 App. F (Chemiluminescence)		

This above results are valid only for the analyzed/tested sample(s) as indicated in the above table. The results are not valid for other samples without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by

Saemya C.

Saranya Chalermtamrong
Scientist (4)

ADDRESS: 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 Thailand | PHONE +66 0 2760 3000 | FAX +66 0 2760 3197
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

640371/EMAIL

S:\Reports_Air_SON\Ox.rpt (5.48PM)



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 2

Lot ID : 22107219
Date Received : Sep 21, 2022
Date Reported : Sep 27, 2022
Report Number : 2418979-1

Page 1 of 2

Sample Number : 22107219-1 to 7
Parameter : Wind Speed / Wind Direction
Location : ต.บ้านนา อ.บ้านนา จ.ปราจีนบุรี (GPS 47° 07'32.309, 140°79'80")
Sampling Date : Sep 12 - Sep 19, 2022
Sampling by : Sattha Phitsawong

Time	Sep 12 - Sep 13, 2022		Sep 13 - Sep 14, 2022		Sep 14 - Sep 15, 2022		Sep 15 - Sep 16, 2022		Sep 16 - Sep 17, 2022		Sep 17 - Sep 18, 2022		Sep 18 - Sep 19, 2022								
	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	1.2	263.0	W	1.7	266.0	W	1.5	221.0	SW	1.2	318.0	NW	0.9	276.0	W	0.5	230.0	SW	0.4	277.0	W
11:00 AM - 12:00 PM	2.1	349.0	N	1.2	272.0	W	2.3	242.0	WSW	2.4	157.0	SSE	0.9	116.0	ESE	1.1	209.0	SSW	0.6	222.0	SW
12:00 PM - 01:00 PM	2.2	298.0	NNW	1.3	287.0	NNW	1.1	293.0	NNW	1.7	157.0	SSE	0.9	310.0	NW	0.1	-	-	0.5	33.0	NNE
01:00 PM - 02:00 PM	0.4	18.0	NNE	1.6	35.0	NE	2.0	275.0	W	0.7	267.0	W	2.1	258.0	WSW	0.9	201.0	SSW	0.5	277.0	W
02:00 PM - 03:00 PM	1.4	356.0	N	2.1	40.0	NE	2.7	152.0	SSE	2.5	260.0	W	1.0	211.0	SSW	0.5	325.0	NW	0.9	299.0	NNW
03:00 PM - 04:00 PM	2.8	49.0	NE	2.4	8.0	N	3.3	252.0	WSW	2.4	342.0	NNW	2.7	236.0	SW	0.4	243.0	WSW	0.5	284.0	NNW
04:00 PM - 05:00 PM	2.0	54.0	NE	1.6	25.0	NNE	2.3	130.0	SE	1.3	286.0	NNW	0.2	-	-	0.6	236.0	SW	0.9	163.0	SSE
05:00 PM - 06:00 PM	2.0	300.0	NNW	2.5	26.0	NNE	2.8	187.0	S	1.6	186.0	S	0.6	256.0	WSW	0.8	205.0	SSW	1.6	140.0	SE
06:00 PM - 07:00 PM	2.9	0.0	N	1.6	25.0	NNE	1.6	148.0	SSE	1.8	298.0	NNW	1.8	216.0	SW	0.6	329.0	NNW	1.1	262.0	W
07:00 PM - 08:00 PM	3.2	0.0	N	3.2	30.0	NNE	3.3	290.0	NNW	3.0	214.0	SW	1.1	220.0	SW	1.7	236.0	SW	2.8	313.0	NNW
08:00 PM - 09:00 PM	2.6	0.0	N	1.4	35.0	NE	1.6	166.0	SSE	1.6	180.0	S	1.9	50.0	NE	0.8	262.0	W	1.3	8.0	N
09:00 PM - 10:00 PM	2.5	17.0	NNE	0.4	34.0	NE	1.2	279.0	W	2.1	183.0	S	1.2	187.0	S	1.9	285.0	NNW	1.1	279.0	W
10:00 PM - 11:00 PM	0.9	62.0	ENE	2.4	35.0	NE	2.2	237.0	WSW	0.6	329.0	NNW	0.8	142.0	SE	0.9	277.0	W	0.6	258.0	WSW
11:00 PM - 12:00 AM	1.3	343.0	NNW	2.1	195.0	SSW	0.3	262.0	W	1.5	276.0	W	1.5	274.0	W	0.4	265.0	W	0.6	220.0	SW
12:00 AM - 01:00 AM	2.4	343.0	NNW	1.9	259.0	W	1.3	26.0	NNE	1.1	272.0	W	1.1	237.0	WSW	1.9	247.0	WSW	0.4	331.0	NNW
01:00 AM - 02:00 AM	1.2	340.0	NNW	2.5	258.0	WSW	1.5	94.0	E	1.5	273.0	W	1.7	233.0	SW	0.8	248.0	WSW	1.6	332.0	NNW
02:00 AM - 03:00 AM	1.9	9.0	N	0.8	16.0	NNE	1.8	70.0	ENE	1.1	274.0	W	0.8	271.0	W	1.3	243.0	WSW	1.4	300.0	NNW
03:00 AM - 04:00 AM	1.3	11.0	N	2.2	7.0	N	0.5	359.0	N	0.7	276.0	W	0.9	288.0	NNW	1.2	262.0	W	0.2	-	-
04:00 AM - 05:00 AM	1.4	13.0	NNE	1.4	0.0	N	0.6	264.0	W	0.5	271.0	W	0.9	259.0	W	0.3	262.0	W	1.3	13.0	NNE
05:00 AM - 06:00 AM	0.7	340.0	NNW	1.1	142.0	SE	2.0	264.0	W	1.2	303.0	NNW	0.2	-	-	0.6	209.0	SSW	0.5	4.0	N
06:00 AM - 07:00 AM	1.6	347.0	NNW	1.9	284.0	NNW	2.8	258.0	WSW	0.9	290.0	NNW	1.4	257.0	WSW	0.3	271.0	W	0.3	5.0	N
07:00 AM - 08:00 AM	1.0	359.0	N	0.8	16.0	NNE	0.8	247.0	WSW	0.0	-	-	1.0	247.0	WSW	0.3	252.0	WSW	1.2	5.0	N
08:00 AM - 09:00 AM	0.8	282.0	NNW	0.9	341.0	NNW	1.6	244.0	WSW	1.1	228.0	W	0.8	90.0	E	0.4	248.0	WSW	0.8	269.0	W
09:00 AM - 10:00 AM	1.9	325.0	NW	0.9	280.0	W	0.7	228.0	SW	1.1	146.0	SE	0.2	-	-	0.8	219.0	SW	0.9	268.0	W

Reference Method : Cup Anemometer & Anodized Aluminium Vane Method

The above results are valid only for the analyzed 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. A.T. Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by

Sarayuth Uthranont
Assistant General Manager

The above results are valid only for the analyzed 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. A.T. Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

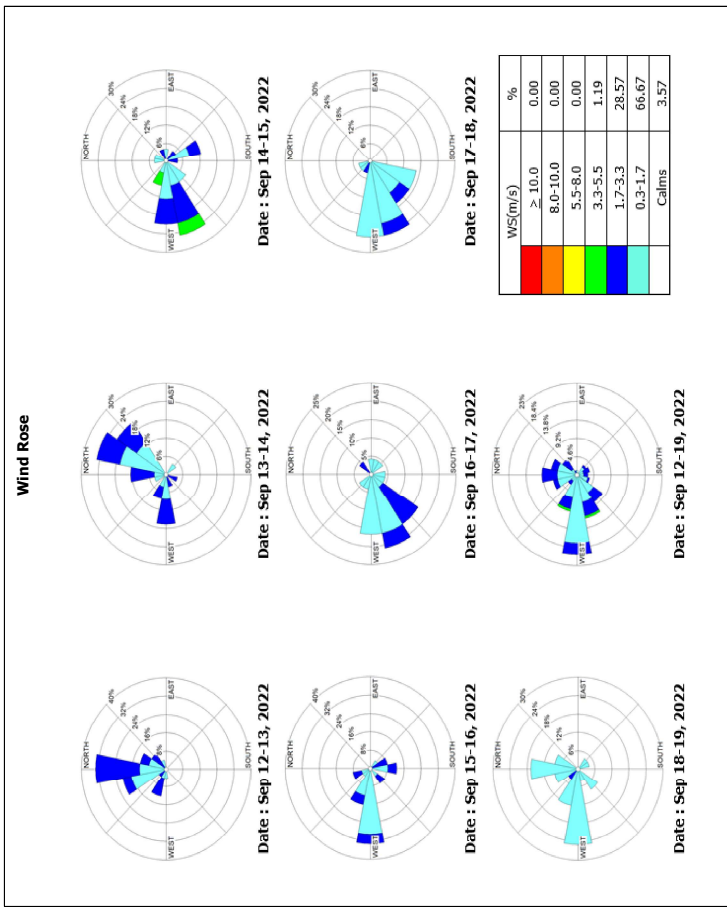
Approved by

Sarayuth Uthranont
Assistant General Manager

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 2

Lot ID : 22107219
Date Received : Sep 21, 2022
Date Reported : Sep 27, 2022
Report Number : 2418979-1

Page 2 of 2



ADDRESS 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 Thailand | PHONE +66 0 2760 3000 | FAX +66 0 2760 3197
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

Life Sciences

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

ADDRESS 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 Thailand | PHONE +66 0 2760 3000 | FAX +66 0 2760 3197
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :

Project Name : Monitoring

Project Location : CUP 2

Lot ID: 22107240

Date Received : Sep 13, 2022

Date Reported : Sep 16, 2022

Report Number : 2419028-1

Page 1 of 1

Sample Number 22107240-1
Sample Description Emission from Stationary Source
Location HRSG#1
Measurement Date Sep 13, 2022

Stack Description

Ambient Temperature	31 °C	Diameter	3.40 m	Oxygen	12.56 %
Ambient Pressure	757 mmHg	Shape	Circle	Carbon dioxide	4.81 %
Type of Process	Combustion	Stack Temperature	141 °C	Gas Velocity	23.17 m/s
Type of Fuel	Natural Gas	Moisture	11.60 %	Flow Rate	480029 Nm3/hr

Run No.	Sampling Time	Oxygen (%)	Carbon Dioxide (%)	Oxides of Nitrogen (ppm)		Sulfur Dioxide (ppm)	
				at Actual O ₂	at 7% O ₂	at Actual O ₂	at 7% O ₂
1	10:05 AM - 10:25 AM	12.56	4.81	14.90	24.85	0.05	0.08
2	10:26 AM - 10:46 AM	12.56	4.81	14.87	24.79	0.05	0.08
3	10:47 AM - 11:07 AM	12.55	4.81	15.26	25.41	0.05	0.08
Average (ppm)		12.56	4.81	15.01	25.02	0.05	0.08
Guideline ^{1/} (ppm)				-	35	-	-
Guideline ^{2/} (ppm)				-	120	-	20
Result (mg/Nm ³)				28.24	47.07	0.12	0.21
Emission Rate at Actual O ₂ (g/s)				3.7660		0.0165	
Guideline ^{1/} (g/s)				6.73		-	
Method				US EPA Method 7E		US EPA Method 6C	

Sampled By : Saksit Phaisanphisut

Guideline : ^{1/} Environmental Impact Assessment Report of Global Power Synergy Public Company Limited (CUP 2)

^{2/} Notification of the Ministry of Industry on determining pollutant contents in air emitted from electric power generation, transmission and distribution plant, 2004 (B.E. 2547), dated September, 2004 (B.E. 2547).

Technical Management

Wichan Choonharat
Manager

ทะเบียนเลขที่ ว-204-ค-6113

Approved by

Sarayuth Jittranont
Assistant General Manager
ทะเบียนเลขที่ ว-204-ค-4702

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.



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :

Project Name : Monitoring

Project Location : CUP 2

Lot ID: 22107241

Date Received : Sep 14, 2022

Date Reported : Sep 20, 2022

Report Number : 2419035-1

Page 1 of 1

Sample Number 22107241-1
Sample Description Emission from Stationary Source
Location HRSG#2
Measurement Date Sep 14, 2022

Stack Description

Ambient Temperature	31 °C	Diameter	3.40 m	Oxygen	13.53 %
Ambient Pressure	757 mmHg	Shape	Circle	Carbon dioxide	4.27 %
Type of Process	Combustion	Stack Temperature	150 °C	Gas Velocity	23.35 m/s
Type of Fuel	Natural Gas	Moisture	12.33 %	Flow Rate	469570 Nm3/hr

Run No.	Sampling Time	Oxygen (%)	Carbon Dioxide (%)	Oxides of Nitrogen (ppm)		Sulfur Dioxide (ppm)	
				at Actual O ₂	at 7% O ₂	at Actual O ₂	at 7% O ₂
1	09:50 AM - 10:10 AM	13.54	4.27	14.56	27.50	0.08	0.15
2	10:11 AM - 10:31 AM	13.53	4.28	12.55	23.65	0.09	0.16
3	10:32 AM - 10:52 AM	13.53	4.28	12.33	23.26	0.08	0.15
Average (ppm)		13.53	4.27	13.15	24.80	0.08	0.15
Guideline ^{1/} (ppm)				-	35	-	-
Guideline ^{2/} (ppm)				-	120	-	20
Result (mg/Nm ³)				24.73	46.66	0.21	0.41
Emission Rate at Actual O ₂ (g/s)				3.2258		0.0280	
Guideline ^{1/} (g/s)				6.73		-	
Method				US EPA Method 7E		US EPA Method 6C	

Sampled By : Saksit Phaisanphisut

Guideline : ^{1/} Environmental Impact Assessment Report of Global Power Synergy Public Company Limited (CUP 2)

^{2/} Notification of the Ministry of Industry on determining pollutant contents in air emitted from electric power generation, transmission and distribution plant, 2004 (B.E. 2547), dated September, 2004 (B.E. 2547).

Technical Management

Wichan Choonharat
Manager

ทะเบียนเลขที่ ว-204-ค-6113

Approved by

Sarayuth Jittranont
Assistant General Manager
ทะเบียนเลขที่ ว-204-ค-4702

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.



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :

Project Name : Monitoring

Project Location : CUP 2

Lot ID: 22107272

Date Received : Sep 14, 2022

Date Reported : Sep 20, 2022

Report Number : 2419060-1

Page 1 of 1

Sample Number 22107272-1
Sample Description Emission from Stationary Source
Location Auxilliary boiler
Measurement Date Sep 14, 2022

Stack Description

Ambient Temperature	31 °C	Diameter	1.50 m	Oxygen	4.96 %
Ambient Pressure	757 mmHg	Shape	Circle	Carbon dioxide	9.24 %
Type of Process	Combustion	Stack Temperature	126 °C	Gas Velocity	5.97 m/s
Type of Fuel	Natural Gas	Moisture	19.75 %	Flow Rate	22658 Nm3/hr

Run No.	Sampling Time	Oxygen (%)	Carbon Dioxide (%)	Oxides of Nitrogen (ppm)		Sulfur Dioxide (ppm)	
				at Actual O ₂	at 7% O ₂	at Actual O ₂	at 7% O ₂
1	12:55 PM - 01:15 PM	5.00	9.22	45.59	39.86	0.20	0.18
2	01:16 PM - 01:36 PM	4.95	9.25	45.21	39.40	0.19	0.16
3	01:37 PM - 01:57 PM	4.93	9.26	44.61	38.83	0.19	0.16
Average (ppm)		4.96	9.24	45.14	39.36	0.19	0.17
Guideline ^{1/} (ppm)				-	50	-	-
Guideline ^{2/} (ppm)				-	120	-	20
Result (mg/Nm ³)				84.92	74.06	0.50	0.44
Emission Rate at Actual O ₂ (g/s)				0.5345		0.0032	
Guideline ^{1/} (g/s)				1.56		-	
Method				US EPA Method 7E		US EPA Method 6C	

Sampled By : Saksit Phaisanphisut

Guideline : ^{1/} Environmental Impact Assessment Report of Global Power Synergy Public Company Limited (CUP 2)

^{2/} Notification of the Ministry of Industry on determining pollutant contents in air emitted from electric power generation, transmission and distribution plant, 2004 (B.E. 2547), dated September, 2004 (B.E. 2547).

Technical Management

Wichan Choonharat
Manager

ทะเบียนเลขที่ ว-204-ค-6113

Approved by

Sarayuth Jittranont
Assistant General Manager
ทะเบียนเลขที่ ว-204-ค-4702

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.



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 2

Lot ID: 22107283

Date Received : Sep 15, 2022
Date Reported : Sep 28, 2022
Report Number : 2419092-1

Page 1 of 8

Sample Number	22107283-1
Sampled Date	Sep 15, 2022
Sample Description	Air Quality
Location	HRSR 1
Date Analysis Commenced	Sep 16, 2022
Condition of Sample	Drawn into one amber plastic bottle, refrigerated
Barometric Pressure	758 mmHg
Atmospheric Temperature	31.0 °C
Analyte	
Air Testing	
Ammonia	09:30 AM - 11:30 AM ppm - 0.10 <0.10 50
	Based on Method of Air Sampling and Analysis, 401

Guideline :
MOL : Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)
Sampled By : Prasannit Kueanpet

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

Approved by

Sararat Mongkonjirawut
Supervisor

The above results are valid only for the analyzed/bested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written permission from ALS. We do not warrant the accuracy of the results and strongly recommend that this report is not reproduced except in full.

ADDRESS 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 Thailand | PHONE +66 0 2760 3000 | FAX +66 0 2760 3197
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

www.alsglobal.com

LIFE SCIENCES RIGHT SOLUTIONS RIGHT PARTNER

6483-71/ EMAIL



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 2

Lot ID: 22107283

Date Received : Sep 15, 2022
Date Reported : Sep 28, 2022
Report Number : 2419092-1

Page 2 of 8

Sample Number	22107283-2
Sampled Date	Sep 15, 2022
Sample Description	Air Quality
Location	HRSR 2
Date Analysis Commenced	Sep 16, 2022
Condition of Sample	Drawn into one amber plastic bottle, refrigerated
Barometric Pressure	758 mmHg
Atmospheric Temperature	31.0 °C
Analyte	
Air Testing	
Ammonia	09:30 AM - 11:30 AM ppm - 0.10 <0.10 50
	Based on Method of Air Sampling and Analysis, 401

Guideline :
MOL : Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)
Sampled By : Prasannit Kueanpet

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

Approved by

Sararat Mongkonjirawut
Supervisor

The above results are valid only for the analyzed/bested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written permission from ALS. We do not warrant the accuracy of the results and strongly recommend that this report is not reproduced except in full.

ADDRESS 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 Thailand | PHONE +66 0 2760 3000 | FAX +66 0 2760 3197
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

www.alsglobal.com

LIFE SCIENCES RIGHT SOLUTIONS RIGHT PARTNER

6483-71/ EMAIL



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 2

Lot ID: 22107283
Date Received : Sep 15, 2022
Date Reported : Sep 28, 2022
Report Number : 2419092-1

Page 3 of 8

Sample Number	22107283-3							
Sampled Date	Sep 15, 2022							
Sample Description	Air Quality							
Location	NH4OH Tank							
Date Analysis Commenced	Sep 16, 2022							
Condition of Sample	Drawn into one amber plastic bottle, refrigerated							
Barometric Pressure	758 mmHg							
Atmospheric Temperature	31.0 °C							
Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline Testing Location
Air Testing								
Ammonia	09:30 AM - 11:30 AM	ppm	-	0.10	<0.10	50	Based on Method of Air Sampling and Analysis, 401.	MOL Rayong

Guideline :
MOL : Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)
Sampled By : Prasannit Kueanpet

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

Approved by

Sararat Mongkonjirawut
Supervisor

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 the written permission of ALS. ALS strongly recommends that this report is not reproduced except in full.

ADDRESS 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 Thailand | PHONE +66 0 2760 3000 | FAX +66 0 2760 3197
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

6483-71/ EMAIL



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 2

Lot ID: 22107283
Date Received : Sep 15, 2022
Date Reported : Sep 28, 2022
Report Number : 2419092-1

Page 4 of 8

Sample Number	22107283-4								
Sampled Date	Sep 15, 2022								
Sample Description	Air Quality								
Location	Cooling Tower								
Date Analysis Commenced	Sep 21, 2022								
Condition of Sample	Drawn into one amber plastic bottle, refrigerated								
Barometric Pressure	758 mmHg								
Atmospheric Temperature	31.0 °C								
Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Chlorine	09:30 AM - 11:30 AM	ppm	-	0.10	<0.10	1(C)	Based on OSHA, ID 101	MOL	Bangkok

Guideline :
MOL : Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)
Sampled By : Prasannit Kueanpet

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

Approved by

Sararat Mongkonjirawut
Supervisor

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 the written permission of ALS. ALS strongly recommends that this report is not reproduced except in full.

ADDRESS 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 Thailand | PHONE +66 0 2760 3000 | FAX +66 0 2760 3197
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

6483-71/ EMAIL



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 2

Lot ID: 22107283
Date Received : Sep 15, 2022
Date Reported : Sep 28, 2022
Report Number : 2419092-1

Page 5 of 8

Sample Number	22107283-5
Sampled Date	Sep 15, 2022
Sample Description	Air Quality
Location	RO Plant
Date Analysis Commenced	Sep 21, 2022
Condition of Sample	Drawn into one amber plastic bottle, refrigerated
Barometric Pressure	758 mmHg
Atmospheric Temperature	31.0 °C
Analyte	
Air Testing	
Chlorine	09:30 AM - 11:30 AM ppm - 0.10 <0.10 1(C) Based on OSHA, ID 101 MOL Bangkok

Guideline :
MOL : Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)
Sampled By : Prasannit Kueanpet

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

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 the written permission of ALS. ALS strongly recommends that this report is not reproduced except in full.

Approved by

Sararat Mongkonjirawut
Supervisor

ADDRESS 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 Thailand | PHONE +66 0 2760 3000 | FAX +66 0 2760 3197
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences

www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

6460-71/ EMAIL



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 2

Lot ID: 22107283
Date Received : Sep 15, 2022
Date Reported : Sep 28, 2022
Report Number : 2419092-1

Page 6 of 8

Sample Number	22107283-6
Sampled Date	Sep 15, 2022
Sample Description	Air Quality
Location	HCI Tank
Date Analysis Commenced	Sep 16, 2022
Condition of Sample	Drawn into one sorbent tube, refrigerated
Barometric Pressure	758 mmHg
Atmospheric Temperature	31.0 °C
Analyte	
Air Testing	
Hydrogen chloride	09:30 AM - 11:30 AM ppm - 0.05 <0.05 5(C) Based on OSHA, ID 174-56 MOL Bangkok

Guideline :
MOL : Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)
Sampled By : Prasannit Kueanpet

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

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 the written permission of ALS. ALS strongly recommends that this report is not reproduced except in full.

Approved by

Sararat Mongkonjirawut
Supervisor

ADDRESS 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 Thailand | PHONE +66 0 2760 3000 | FAX +66 0 2760 3197
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences

www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

6460-71/ EMAIL



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CLP 2

Lot ID: 22107283

Date Received : Sep 15, 2022
Date Reported : Sep 28, 2022
Report Number : 2419092-1

Page 7 of 8

Sample Number	22107283-7																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
---------------	------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Guideline :
MOL : Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)
Sampled By : Prasannit Kueampet

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

Approved by

Sararat Mongkonjirawut
Supervisor

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 permission from ALS. We do not warrant the accuracy of the results and strongly recommend that this report is not reproduced except in full.

ADDRESS 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 Thailand | PHONE +66 0 2760 3000 | FAX +66 0 2760 3197
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences

RIGHT SOLUTIONS RIGHT PARTNER

6460-71/ EMAIL



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CLP 2

Lot ID: 22107283

Date Received : Sep 15, 2022
Date Reported : Sep 28, 2022
Report Number : 2419092-1

Page 8 of 8

Sample Number	22107283-8									
Sampled Date	Sep 15, 2022									
Sample Description	Air Quality									
Location	H2SO4 Tank									
Date Analysis Commenced	Sep 16, 2022									
Condition of Sample	Drawn into one sorbent tube, refrigerated									
Barometric Pressure	758 mmHg									
Atmospheric Temperature	31.0 °C									
Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline Location	Testing Location	
Air Testing	09:30 AM - 11:30 AM	mg/m3	-	0.05	<0.05	1	Based on OSHA, ID-174-SG	MOL	Bangkok	
Sulfuric acid										

Guideline :
MOL : Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)
Sampled By : Prasannit Kueampet

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

Approved by

Sararat Mongkonjirawut
Supervisor

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 permission from ALS. We do not warrant the accuracy of the results and strongly recommend that this report is not reproduced except in full.

ADDRESS 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 Thailand | PHONE +66 0 2760 3000 | FAX +66 0 2760 3197
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences

RIGHT SOLUTIONS RIGHT PARTNER

6460-71/ EMAIL



Analysis / Test Report

TESTING
No.0042

Lot ID: 22107227

Date Received : Sep 20, 2022
Date Reported : Sep 22, 2022
Report Number: 2442125-1



Client: Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :
Project Name : Monitoring
Project Location : CUP 2

Page 1 of 1

Sample Number	22107227-1
Parameter	Noise (Leq 24 hrs.)
Location	บริเวณถนนหน้าโรงงาน (GPS 47P 0734819, 1411045)
Measurement Date	Sep 12 - Sep 13, 2022
Measurement by	Satcha Phetsawaeng
Sound Level meter	Serial No. 296517

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	60.5	79.2	59.8
11:00 AM - 12:00 PM	60.7	66.3	60.0
12:00 PM - 01:00 PM	60.0	67.3	59.3
01:00 PM - 02:00 PM	60.1	70.7	59.5
02:00 PM - 03:00 PM	60.7	72.8	60.0
03:00 PM - 04:00 PM	60.9	65.1	60.2
04:00 PM - 05:00 PM	61.7	70.6	61.1
05:00 PM - 06:00 PM	62.3	68.9	61.8
06:00 PM - 07:00 PM	62.3	66.7	61.8
07:00 PM - 08:00 PM	62.6	65.7	62.1
08:00 PM - 09:00 PM	62.1	65.0	61.6
09:00 PM - 10:00 PM	62.7	71.5	62.1
10:00 PM - 11:00 PM	62.0	69.7	61.6
11:00 PM - 12:00 AM	61.7	66.2	61.6
12:00 AM - 01:00 AM	61.8	69.5	61.3
01:00 AM - 02:00 AM	61.7	63.3	61.4
02:00 AM - 03:00 AM	61.7	63.2	61.3
03:00 AM - 04:00 AM	61.7	64.0	61.3
04:00 AM - 05:00 AM	61.7	67.6	61.3
05:00 AM - 06:00 AM	61.8	68.3	61.2
06:00 AM - 07:00 AM	61.4	67.5	60.8
07:00 AM - 08:00 AM	63.0	74.2	61.3
08:00 AM - 09:00 AM	61.9	84.2	60.7
09:00 AM - 10:00 AM	61.4	72.1	60.5

Leq Average 24 hrs. (dB(A))	61.7
Lmax (dB(A))	84.2
L90 (dB(A))	61.3
Ldn (dB(A))	
Standard (dB(A))	70

Reference Method : ISO1996-1 and 1996-2

Standard : 1. ปริมาณการจราจรและระดับเสียงตามข้อกำหนด 15 (พ.ศ. 2540) ซึ่งกำหนดค่าระดับเสียงตามข้อกำหนดในรูปของค่าเฉลี่ยถ่วงน้ำหนัก
2. ปริมาณการจราจรและระดับเสียงตามข้อกำหนด และระดับเสียงตามข้อกำหนดในการคำนวณค่าระดับเสียงตามข้อกำหนด

Remark :

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

Thairitak

Approved by

Suppt. Salameeh
Section Head

Thairitak
Scientist (4)

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.

ADDRESS 616/110 Moo 5 T. Maenam Khu A. Phakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

LIFE SCIENCES www.alsglobal.com RIGHT SOLUTIONS RIGHT PARTNER

6403-71/ EMAIL

S: Reports_Air Noise.pdf (1:3PM)



Analysis / Test Report

TESTING
No.0042

Lot ID: 22107227

Date Received : Sep 20, 2022
Date Reported : Sep 22, 2022
Report Number: 2442126-1



Client: Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :
Project Name : Monitoring
Project Location : CUP 2

Page 1 of 1

Sample Number	22107227-2
Parameter	Noise (Leq 24 hrs.)
Location	บริเวณถนนหน้าโรงงาน (GPS 47P 0734819, 1411045)
Measurement Date	Sep 13 - Sep 14, 2022
Measurement by	Satcha Phetsawaeng
Sound Level meter	Serial No. 296517

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	62.1	77.2	60.4
11:00 AM - 12:00 PM	61.2	73.1	60.3
12:00 PM - 01:00 PM	61.3	66.8	60.7
01:00 PM - 02:00 PM	61.5	70.0	61.0
02:00 PM - 03:00 PM	61.3	68.9	60.8
03:00 PM - 04:00 PM	61.4	64.2	60.8
04:00 PM - 05:00 PM	61.5	74.0	60.9
05:00 PM - 06:00 PM	61.5	69.3	61.0
06:00 PM - 07:00 PM	61.5	64.9	61.0
07:00 PM - 08:00 PM	61.7	71.1	61.2
08:00 PM - 09:00 PM	61.6	66.9	61.1
09:00 PM - 10:00 PM	61.6	65.9	61.2
10:00 PM - 11:00 PM	61.6	69.0	61.1
11:00 PM - 12:00 AM	62.0	70.9	61.3
12:00 AM - 01:00 AM	61.6	66.1	61.2
01:00 AM - 02:00 AM	61.7	63.7	61.3
02:00 AM - 03:00 AM	61.6	64.1	61.2
03:00 AM - 04:00 AM	61.9	66.4	61.5
04:00 AM - 05:00 AM	62.0	72.1	61.6
05:00 AM - 06:00 AM	62.0	66.8	61.5
06:00 AM - 07:00 AM	61.6	74.9	61.1
07:00 AM - 08:00 AM	61.2	76.7	60.3
08:00 AM - 09:00 AM	61.0	67.7	60.5
09:00 AM - 10:00 AM	61.1	63.9	60.4

Leq Average 24 hrs. (dB(A))	61.6
Lmax (dB(A))	77.2
L90 (dB(A))	61.0
Ldn (dB(A))	
Standard (dB(A))	70

Reference Method : ISO1996-1 and 1996-2

Standard : 1. ปริมาณการจราจรและระดับเสียงตามข้อกำหนด 15 (พ.ศ. 2540) ซึ่งกำหนดค่าระดับเสียงตามข้อกำหนดในรูปของค่าเฉลี่ยถ่วงน้ำหนัก
2. ปริมาณการจราจรและระดับเสียงตามข้อกำหนด และระดับเสียงตามข้อกำหนดในการคำนวณค่าระดับเสียงตามข้อกำหนด

Remark :

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

Thairitak

Approved by

Suppt. Salameeh
Section Head

Thairitak
Scientist (4)

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.

ADDRESS 616/110 Moo 5 T. Maenam Khu A. Phakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

LIFE SCIENCES www.alsglobal.com RIGHT SOLUTIONS RIGHT PARTNER

6403-71/ EMAIL

S: Reports_Air Noise.pdf (1:3PM)



Analysis / Test Report



Client: Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 2

TESTING
No.0042
Lot ID: 22107227
Date Received : Sep 20, 2022
Date Reported : Sep 22, 2022
Report Number: 2442127-1

Page 1 of 1

Sample Number	22107227-3
Parameter	Noise (Leq 24 hrs.)
Location	บริเวณถนนหน้าโรงงาน (GPS 47P 0734819, 1411045)
Measurement Date	Sep 14 - Sep 15, 2022
Measurement by	Satcha Phetsawaeng
Sound Level meter	Serial No. 296517

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	61.1	70.7	60.4
11:00 AM - 12:00 PM	61.0	65.5	60.3
12:00 PM - 01:00 PM	61.2	75.5	60.6
01:00 PM - 02:00 PM	61.5	71.8	60.7
02:00 PM - 03:00 PM	61.3	71.0	60.6
03:00 PM - 04:00 PM	61.4	65.6	60.7
04:00 PM - 05:00 PM	61.4	66.8	60.8
05:00 PM - 06:00 PM	62.0	68.2	61.1
06:00 PM - 07:00 PM	61.5	66.8	61.0
07:00 PM - 08:00 PM	62.1	64.4	61.6
08:00 PM - 09:00 PM	62.0	65.9	61.8
09:00 PM - 10:00 PM	62.5	64.8	62.0
10:00 PM - 11:00 PM	61.8	63.6	61.4
11:00 PM - 12:00 AM	61.6	65.9	61.4
12:00 AM - 01:00 AM	61.7	68.8	61.2
01:00 AM - 02:00 AM	61.5	63.6	61.3
02:00 AM - 03:00 AM	61.5	62.9	61.1
03:00 AM - 04:00 AM	61.6	79.6	61.1
04:00 AM - 05:00 AM	61.8	75.3	61.2
05:00 AM - 06:00 AM	61.6	75.0	61.4
06:00 AM - 07:00 AM	60.8	68.7	61.0
07:00 AM - 08:00 AM	60.5	72.3	60.2
08:00 AM - 09:00 AM	60.2	65.9	59.8
09:00 AM - 10:00 AM	60.2	65.9	59.6
Leq Average 24 hrs. (dB(A))	61.5		
Lmax (dB(A))	79.6		
L90 (dB(A))	61.0		
Ldn (dB(A))	68.0		
Standard (dB(A))	70	115	
Reference Method	: ISO1996-1 and 1996-2		
Standard	: 1. ปริมาณการจราจรและระดับเสียงในย่านอุตสาหกรรม (2540) (พ.ร.บ. 2540) (ปริมาณการจราจรและระดับเสียงในย่านอุตสาหกรรม) 2. ปริมาณการจราจรและระดับเสียงในย่านอุตสาหกรรม (2548) (พ.ร.บ. 2548) (ปริมาณการจราจรและระดับเสียงในย่านอุตสาหกรรม)		
Remark	: 1. ปริมาณการจราจรและระดับเสียงในย่านอุตสาหกรรม (2540) (พ.ร.บ. 2540) (ปริมาณการจราจรและระดับเสียงในย่านอุตสาหกรรม) 2. ปริมาณการจราจรและระดับเสียงในย่านอุตสาหกรรม (2548) (พ.ร.บ. 2548) (ปริมาณการจราจรและระดับเสียงในย่านอุตสาหกรรม)		

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

Suppt S.

Approved by

Tharitat.

Technical Management

Suppt Salameh
Section Head

Thanita Kulurwong
Scientist (4)

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.

ADDRESS 616/110 Moo 5 T. Maenam Khu A. Phakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

6403-71/ EMAIL

S: Reports_Air Noise.pdf (1:3PM)



Analysis / Test Report



Client: Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 2

TESTING
No.0042
Lot ID: 22107227
Date Received : Sep 20, 2022
Date Reported : Sep 22, 2022
Report Number: 2442128-1

Page 1 of 1

Sample Number	22107227-4
Parameter	Noise (Leq 24 hrs.)
Location	บริเวณถนนหน้าโรงงาน (GPS 47P 0734819, 1411045)
Measurement Date	Sep 15 - Sep 16, 2022
Measurement by	Satcha Phetsawaeng
Sound Level meter	Serial No. 296517

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	60.1	67.9	59.4
11:00 AM - 12:00 PM	59.9	67.5	59.2
12:00 PM - 01:00 PM	60.4	69.7	59.7
01:00 PM - 02:00 PM	61.0	77.7	60.2
02:00 PM - 03:00 PM	61.8	66.9	61.3
03:00 PM - 04:00 PM	61.9	63.4	61.5
04:00 PM - 05:00 PM	62.2	66.9	61.8
05:00 PM - 06:00 PM	62.1	65.4	61.6
06:00 PM - 07:00 PM	61.9	64.4	61.5
07:00 PM - 08:00 PM	62.0	73.6	61.5
08:00 PM - 09:00 PM	60.3	67.7	59.7
09:00 PM - 10:00 PM	60.4	66.9	59.8
10:00 PM - 11:00 PM	60.5	66.9	60.0
11:00 PM - 12:00 AM	60.8	72.9	60.0
12:00 AM - 01:00 AM	61.1	79.6	59.9
01:00 AM - 02:00 AM	60.7	65.9	60.1
02:00 AM - 03:00 AM	60.6	64.5	59.9
03:00 AM - 04:00 AM	60.6	68.9	59.9
04:00 AM - 05:00 AM	60.8	65.5	60.3
05:00 AM - 06:00 AM	61.3	64.0	60.9
06:00 AM - 07:00 AM	61.6	63.4	61.2
07:00 AM - 08:00 AM	61.8	79.3	61.3
08:00 AM - 09:00 AM	61.4	62.8	61.0
09:00 AM - 10:00 AM	61.3	64.4	60.9
Leq Average 24 hrs. (dB(A))	61.2		
Lmax (dB(A))	79.6		
L90 (dB(A))	60.2		
Ldn (dB(A))	67.4		
Standard (dB(A))	70	115	
Reference Method	: ISO1996-1 and 1996-2		
Standard	: 1. ปริมาณการจราจรและระดับเสียงในย่านอุตสาหกรรม (2540) (พ.ร.บ. 2540) (ปริมาณการจราจรและระดับเสียงในย่านอุตสาหกรรม) 2. ปริมาณการจราจรและระดับเสียงในย่านอุตสาหกรรม (2548) (พ.ร.บ. 2548) (ปริมาณการจราจรและระดับเสียงในย่านอุตสาหกรรม)		
Remark	: 1. ปริมาณการจราจรและระดับเสียงในย่านอุตสาหกรรม (2540) (พ.ร.บ. 2540) (ปริมาณการจราจรและระดับเสียงในย่านอุตสาหกรรม) 2. ปริมาณการจราจรและระดับเสียงในย่านอุตสาหกรรม (2548) (พ.ร.บ. 2548) (ปริมาณการจราจรและระดับเสียงในย่านอุตสาหกรรม)		

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

Tharitat.

Technical Management

Approved by

Suppt Salameh
Section Head

Thanita Kulurwong
Scientist (4)

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.

ADDRESS 616/110 Moo 5 T. Maenam Khu A. Phakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

6403-71/ EMAIL

S: Reports_Air Noise.pdf (1:4PM)



Analysis / Test Report



Client: Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 2

TESTING
No.0042
Lot ID: 22107227
Date Received : Sep 20, 2022
Date Reported : Sep 22, 2022
Report Number: 2442129-1

Page 1 of 1

Sample Number	22107227-5
Parameter	Noise (Leq 24 hrs.)
Location	บริเวณถนนหน้าโรงงาน (GPS 47P 0734819, 1411045)
Measurement Date	Sep 16 - Sep 17, 2022
Measurement by	Satcha Phetsawaeng
Sound Level meter	Serial No. 296517

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	61.2	70.3	60.7
11:00 AM - 12:00 PM	61.6	66.4	61.1
12:00 PM - 01:00 PM	60.9	70.2	60.4
01:00 PM - 02:00 PM	60.7	71.6	60.1
02:00 PM - 03:00 PM	60.6	69.0	60.0
03:00 PM - 04:00 PM	60.8	66.8	60.1
04:00 PM - 05:00 PM	61.0	73.1	60.3
05:00 PM - 06:00 PM	61.0	67.0	60.3
06:00 PM - 07:00 PM	60.7	64.1	60.1
07:00 PM - 08:00 PM	60.8	70.5	60.1
08:00 PM - 09:00 PM	60.8	65.8	60.3
09:00 PM - 10:00 PM	61.6	75.2	61.1
10:00 PM - 11:00 PM	62.3	69.8	61.7
11:00 PM - 12:00 AM	62.0	80.6	61.6
12:00 AM - 01:00 AM	61.9	64.8	61.5
01:00 AM - 02:00 AM	61.6	64.8	61.4
02:00 AM - 03:00 AM	61.3	63.5	61.1
03:00 AM - 04:00 AM	61.3	63.4	60.8
04:00 AM - 05:00 AM	61.0	65.2	60.8
05:00 AM - 06:00 AM	61.0	65.2	60.5
06:00 AM - 07:00 AM	60.8	63.4	60.3
07:00 AM - 08:00 AM	61.1	70.3	60.5
08:00 AM - 09:00 AM	60.9	73.9	60.3
09:00 AM - 10:00 AM	60.6	65.2	60.1

Leq Average 24 hrs. (dB(A))	61.2
Lmax (dB(A))	80.6
L90 (dB(A))	60.4
Ldn (dB(A))	

Standard (dB(A)) 70
Reference Method : ISO1996-1 and 1996-2
Standard : 1. ใช้มาตรฐานการวัดระดับความดังเสียงตามข้อ 15 (พ.ศ. 2540) ซึ่งกำหนดค่ามาตรฐานระดับเสียงโดยทั่วไป
2. ใช้มาตรฐานการวัดระดับความดังเสียงตามข้อ 15 (พ.ศ. 2540) ซึ่งกำหนดค่ามาตรฐานระดับเสียงโดยทั่วไป

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

Thairitak

Approved by

Suppt. Salameeh
Section Head

Thairitak
Scientist (4)

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.

ADDRESS 616/110 Moo 5 T. Maenam Khu A. Phrakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences **www.alsglobal.com** **RIGHT SOLUTIONS RIGHT PARTNER**

6403-71/ EMAIL

S: Reports_Air Noise.pdf (1:4PM)



Analysis / Test Report



Client: Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 2

TESTING
No.0042
Lot ID: 22107227
Date Received : Sep 20, 2022
Date Reported : Sep 22, 2022
Report Number: 2442130-1

Page 1 of 1

Sample Number	22107227-6
Parameter	Noise (Leq 24 hrs.)
Location	บริเวณถนนหน้าโรงงาน (GPS 47P 0734819, 1411045)
Measurement Date	Sep 17 - Sep 18, 2022
Measurement by	Satcha Phetsawaeng
Sound Level meter	Serial No. 296517

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	60.2	69.6	59.7
11:00 AM - 12:00 PM	61.6	65.4	61.0
12:00 PM - 01:00 PM	62.2	79.5	61.0
01:00 PM - 02:00 PM	62.3	75.2	61.6
02:00 PM - 03:00 PM	62.8	71.8	62.0
03:00 PM - 04:00 PM	62.8	76.7	61.9
04:00 PM - 05:00 PM	61.6	67.2	60.9
05:00 PM - 06:00 PM	61.5	76.8	60.8
06:00 PM - 07:00 PM	61.1	67.9	60.3
07:00 PM - 08:00 PM	60.5	84.3	59.8
08:00 PM - 09:00 PM	61.5	71.2	59.7
09:00 PM - 10:00 PM	60.5	91.6	58.0
10:00 PM - 11:00 PM	60.6	88.3	58.6
11:00 PM - 12:00 AM	60.6	83.3	59.7
12:00 AM - 01:00 AM	62.6	91.3	60.3
01:00 AM - 02:00 AM	60.8	76.0	60.3
02:00 AM - 03:00 AM	61.5	70.9	61.1
03:00 AM - 04:00 AM	60.6	65.6	60.2
04:00 AM - 05:00 AM	59.8	65.8	59.3
05:00 AM - 06:00 AM	59.8	65.4	59.2
06:00 AM - 07:00 AM	61.9	82.1	60.0
07:00 AM - 08:00 AM	61.9	89.4	60.0
08:00 AM - 09:00 AM	61.9	86.9	59.7
09:00 AM - 10:00 AM	61.4	69.9	60.7

Leq Average 24 hrs. (dB(A))	61.4
Lmax (dB(A))	91.6
L90 (dB(A))	60.2
Ldn (dB(A))	

Standard (dB(A)) 70
Reference Method : ISO1996-1 and 1996-2
Standard : 1. ใช้มาตรฐานการวัดระดับความดังเสียงตามข้อ 15 (พ.ศ. 2540) ซึ่งกำหนดค่ามาตรฐานระดับเสียงโดยทั่วไป
2. ใช้มาตรฐานการวัดระดับความดังเสียงตามข้อ 15 (พ.ศ. 2540) ซึ่งกำหนดค่ามาตรฐานระดับเสียงโดยทั่วไป

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

Thairitak

Approved by

Suppt. Salameeh
Section Head

Thairitak
Scientist (4)

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.

ADDRESS 616/110 Moo 5 T. Maenam Khu A. Phrakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences **www.alsglobal.com** **RIGHT SOLUTIONS RIGHT PARTNER**

6403-71/ EMAIL

S: Reports_Air Noise.pdf (1:4PM)



Analysis / Test Report



TESTING
No.0042

Lot ID: 22107227
Date Received : Sep 20, 2022
Date Reported : Sep 22, 2022
Report Number: 2442131-1

Client: Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 2

Page 1 of 1

Sample Number	22107227-7
Parameter	Noise (Leq 24 hrs.)
Location	บริเวณทางเข้าโรงงาน (GPS 477.0734819, 141.1045)
Measurement Date	Sep 18 - Sep 19, 2022
Measurement by	Satcha Phetsawaeng
Sound Level meter	Serial No. 296517

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	60.5	78.8	59.9
11:00 AM - 12:00 PM	61.4	66.1	60.9
12:00 PM - 01:00 PM	60.8	63.0	60.3
01:00 PM - 02:00 PM	60.8	62.2	60.3
02:00 PM - 03:00 PM	61.0	62.7	60.4
03:00 PM - 04:00 PM	61.5	64.1	61.1
04:00 PM - 05:00 PM	62.0	65.3	61.6
05:00 PM - 06:00 PM	62.0	64.3	61.8
06:00 PM - 07:00 PM	62.1	70.3	61.6
07:00 PM - 08:00 PM	61.9	69.5	61.3
08:00 PM - 09:00 PM	61.9	70.0	60.9
09:00 PM - 10:00 PM	61.7	68.6	61.2
10:00 PM - 11:00 PM	61.6	65.3	61.3
11:00 PM - 12:00 AM	61.5	63.5	61.1
12:00 AM - 01:00 AM	61.3	63.2	60.9
01:00 AM - 02:00 AM	60.9	68.2	60.6
02:00 AM - 03:00 AM	61.3	72.6	61.0
03:00 AM - 04:00 AM	60.7	64.7	60.3
04:00 AM - 05:00 AM	61.6	78.7	60.5
05:00 AM - 06:00 AM	61.1	71.4	60.7
06:00 AM - 07:00 AM	62.1	71.2	61.7
07:00 AM - 08:00 AM	62.3	64.0	62.1
08:00 AM - 09:00 AM	62.4	68.5	62.2
09:00 AM - 10:00 AM	62.1	65.1	61.7
Leq Average 24 hrs. (dB(A))	61.6		
Lmax (dB(A))	78.8		61.0
L90 (dB(A))			
Ldn (dB(A))	67.8		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ปริมาณการตรวจวัดต้องไม่น้อยกว่า 15 (พ.ศ. 2540) (การกำหนดค่ามาตรฐานระดับเสียงโดยทั่วไป)
2. ปริมาณการตรวจวัดมาตรฐาน การกำหนดค่าระดับเสียงมาตรฐาน และระดับเสียงที่ค่าการตรวจวัดเกินค่ามาตรฐาน พ.ศ. 2548

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

Technical Management	Approved by	Support
Thanita Kulsunwong Scientist (4)		Suppt Salameh Section Head

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.

ADDRESS 616/110 Moo 5 T. Maenam Khu A. Phakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company



Analysis / Test Report

Client : Global Power Synergy Public Company Limited

P/O : 92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

Project Name : Monitoring

Project Location : CUP 2

Lot ID: 22107307

Date Received : Sep 16, 2022

Date Reported : Sep 21, 2022

Report Number: 2437527-1

Page 1 of 1

Sample Number	22107307-1		
Parameter	Noise (Leq 8 hrs.)		
Location	HRSG #1		
Measurement Date	Sep 15, 2022		
Measurement by	Prasarnit Kueanpet		
Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:49 AM - 09:49 AM	81.9	83.0	81.6
09:49 AM - 10:49 AM	82.0	82.8	81.7
10:49 AM - 11:49 AM	82.1	82.8	82.0
11:49 AM - 12:49 PM	82.3	83.1	82.1
12:49 PM - 01:49 PM	82.2	82.9	82.1
01:49 PM - 02:49 PM	82.1	82.9	81.9
02:49 PM - 03:49 PM	82.1	82.9	81.9
03:49 PM - 04:49 PM	82.3	82.9	82.1

Technical Management

Tharitat.

Thanita Kulsurwong

Scientist (4)

Approved by

Smpt S.

Supot Salameeh

Section Head

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.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

6403-71/ EMAIL

S:\Reports_Air Noise rpt (10.5 AM)



Analysis / Test Report

Client : Global Power Synergy Public Company Limited

P/O : 92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

Project Name : Monitoring

Project Location : CUP 2

Lot ID: 22107307

Date Received : Sep 16, 2022

Date Reported : Sep 21, 2022

Report Number: 2437528-1

Page 1 of 1

Sample Number	22107307-2			
Parameter	Noise (Leq 8 hrs.)			
Location	HRSG #2			
Measurement Date	Sep 15, 2022			
Measurement by	Prasannit Kueanpet			
Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))	
08:43 AM - 09:43 AM	82.5	84.4	81.7	
09:43 AM - 10:43 AM	82.7	83.2	82.6	
10:43 AM - 11:43 AM	82.6	83.8	82.5	
11:43 AM - 12:43 PM	82.9	83.5	82.8	
12:43 PM - 01:43 PM	82.9	83.8	82.8	
01:43 PM - 02:43 PM	82.7	83.8	81.5	
02:43 PM - 03:43 PM	82.6	84.0	81.6	
03:43 PM - 04:43 PM	82.9	83.2	82.8	

Technical Management

Tharitat.

Thanita Kulsurwong

Scientist (4)

Approved by

Smpt S.

Supot Salameeh

Section Head

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.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

6403-71/ EMAIL

S:\Reports_Air Noise rpt (10.5AM)



Analysis / Test Report

Client: Global Power Synergy Public Company Limited

P/O : 92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

Project Name : Monitoring
Project Location : CUP 2

Lot ID: 22107307

Date Received : Sep 16, 2022

Date Reported : Sep 21, 2022

Report Number: 2437529-1

Page 1 of 1

Sample Number	22107307-3			
Parameter	Noise (Leq 8 hrs.)			
Location	GTG #1			
Measurement Date	Sep 15, 2022			
Measurement by	Prasarnit Kuanpet			
	Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
	08:43 AM - 09:43 AM	79.5	81.6	79.2
	09:43 AM - 10:43 AM	79.2	80.4	79.0
	10:43 AM - 11:43 AM	79.6	80.8	79.3
	11:43 AM - 12:43 PM	79.8	81.3	79.6
	12:43 PM - 01:43 PM	79.9	81.2	79.6
	01:43 PM - 02:43 PM	79.8	80.8	79.5
	02:43 PM - 03:43 PM	79.8	80.9	79.5
	03:43 PM - 04:43 PM	80.0	81.3	79.7

Technical Management

Tharitat.

Thanita Kulsurwong

Scientist (4)

Approved by

Smpt S.

Suppt. Salameh

Section Head

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.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

6403-71/ EMAIL

S:\Reports_Air Noise rpt (10.52AM)



Analysis / Test Report

Client: Global Power Synergy Public Company Limited

P/O : 92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

Project Name : Monitoring
Project Location : CUP 2

Lot ID: 22107307

Date Received : Sep 16, 2022

Date Reported : Sep 21, 2022

Report Number: 2437530-1

Page 1 of 1

Sample Number	22107307-4			
Parameter	Noise (Leq 8 hrs.)			
Location	GTG #2			
Measurement Date	Sep 15, 2022			
Measurement by	Prasannit Kuanpet			
Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))	
08:59 AM - 09:59 AM	80.3	84.6	79.9	
09:59 AM - 10:59 AM	80.4	82.3	80.0	
10:59 AM - 11:59 AM	80.4	82.2	80.0	
11:59 AM - 12:59 PM	80.7	82.6	80.4	
12:59 PM - 01:59 PM	80.8	82.6	80.5	
01:59 PM - 02:59 PM	80.6	82.6	80.3	
02:59 PM - 03:59 PM	80.7	83.2	80.3	
03:59 PM - 04:59 PM	80.9	82.8	80.5	

Technical Management

Tharitat.

Thanita Kulsurwong

Scientist (4)

Approved by

Smpt S.

Suppt. Salameh

Section Head

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.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

6403-71/ EMAIL

S:\Reports_Air Noise rpt (10.52AM)



Analysis / Test Report

Client: Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 2

Lot ID: 22107307
Date Received : Sep 16, 2022
Date Reported : Sep 21, 2022
Report Number: 2437531-1

Page 1 of 1

Sample Number	22107307-5		
Parameter	Noise (Leq 8 hrs.)		
Location	STG #1		
Measurement Date	Sep 15, 2022		
Measurement by	Prasannit Kueanpet		
Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:28 AM - 09:28 AM	82.7	83.7	82.5
09:28 AM - 10:28 AM	82.8	83.9	82.5
10:28 AM - 11:28 AM	82.5	83.4	82.3
11:28 AM - 12:28 PM	82.6	83.6	82.5
12:28 PM - 01:28 PM	82.6	83.3	82.4
01:28 PM - 02:28 PM	82.5	83.2	82.4
02:28 PM - 03:28 PM	82.5	83.4	82.3
03:28 PM - 04:28 PM	82.5	83.8	82.3

Tharitat.

Technical Management

Approved by

Smpt S.

Thanita Kulsurwong

Scientist (4)

Suppt. Salameh

Section Head

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.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

6403-71/ EMAIL

S:\Reports_Air Noise rpt (10.52AM)



Analysis / Test Report

Client: Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 2

Lot ID: 22107307
Date Received : Sep 16, 2022
Date Reported : Sep 21, 2022
Report Number: 2437532-1

Page 1 of 1

Sample Number	22107307-6		
Parameter	Noise (Leq 8 hrs.)		
Location	Air Compressor		
Measurement Date	Sep 15, 2022		
Measurement by	Prasannit Kueanpet		
	Time	Leq (dB(A))	Lmax (dB(A))
	08:26 AM - 09:26 AM	75.4	80.5
	09:26 AM - 10:26 AM	75.3	85.2
	10:26 AM - 11:26 AM	75.6	81.1
	11:26 AM - 12:26 PM	75.6	80.6
	12:26 PM - 01:26 PM	75.5	81.1
	01:26 PM - 02:26 PM	75.6	80.8
	02:26 PM - 03:26 PM	75.9	80.8
	03:26 PM - 04:26 PM	75.9	86.2
			L90 (dB(A))
			74.5
			74.1
			74.7
			74.8
			74.6
			74.2
			74.5
			74.6

Tharitat.

Technical Management

Approved by

Smpt S.

Thanita Kulsurwong

Scientist (4)

Suppt. Salameh

Section Head

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.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

6403-71/ EMAIL

S:\Reports_Air Noise rpt (10.52AM)



Analysis / Test Report

Client: Global Power Synergy Public Company Limited
P/O : 92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
Project Name : Monitoring
Project Location : CUP 2

Lot ID: 22107307
Date Received : Sep 16, 2022
Date Reported : Sep 21, 2022
Report Number: 2437533-1

Page 1 of 1

Sample Number	22107307-7		
Parameter	Noise (Leq 8 hrs.)		
Location	Cooling Tower		
Measurement Date	Sep 15, 2022		
Measurement by	Prasannit Kueanpet		
Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:45 AM - 09:45 AM	84.1	84.5	84.0
09:45 AM - 10:45 AM	84.1	84.6	84.0
10:45 AM - 11:45 AM	84.2	84.8	84.1
11:45 AM - 12:45 PM	84.3	84.7	84.2
12:45 PM - 01:45 PM	84.2	84.6	84.2
01:45 PM - 02:45 PM	84.1	84.5	84.0
02:45 PM - 03:45 PM	84.2	84.6	84.1
03:45 PM - 04:45 PM	84.4	84.8	84.2

Technical Management *Tharitat.*

Thanita Kulsurwong
Scientist (4)

Approved by

Suppt S.

Suppt. Salameh
Section Head

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.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

6403-71/ EMAIL

S:\Reports_Air Noise rpt (10.52AM)



Analysis / Test Report

Client: Global Power Synergy Public Company Limited
P/O : 92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
Project Name : Monitoring
Project Location : CUP 2

Lot ID: 22107307
Date Received : Sep 16, 2022
Date Reported : Sep 21, 2022
Report Number: 2437534-1

Page 1 of 1

Sample Number	22107307-8		
Parameter	Noise (Leq 8 hrs.)		
Location	Auxiliary Boiler		
Measurement Date	Sep 15, 2022		
Measurement by	Prasannit Kueanpet		
Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:50 AM - 09:50 AM	81.6	82.8	81.0
09:50 AM - 10:50 AM	80.5	81.1	80.3
10:50 AM - 11:50 AM	80.7	81.3	80.5
11:50 AM - 12:50 PM	80.9	81.5	80.6
12:50 PM - 01:50 PM	81.6	81.6	80.2
01:50 PM - 02:50 PM	80.2	80.8	80.0
02:50 PM - 03:50 PM	80.5	81.0	80.3
03:50 PM - 04:50 PM	80.9	81.7	80.6

Technical Management *Tharitat.*

Thanita Kulsurwong
Scientist (4)

Approved by

Suppt S.

Suppt. Salameh
Section Head

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.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

6403-71/ EMAIL

S:\Reports_Air Noise rpt (10.53AM)



Analysis / Test Report

Client: Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 2

Lot ID: 22131026
Date Received : Nov 11, 2022
Date Reported : Nov 16, 2022
Report Number: 2492927-1

Page 1 of 1

Sample Number	22131026-1		
Parameter	Noise (Leq 8 hrs.)		
Location	HRSG #1		
Measurement Date	Nov 11, 2022		
Measurement by	Mongkon Phalaithip		
Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
02:14 AM - 03:14 AM	79.9	81.1	79.5
03:14 AM - 04:14 AM	79.9	81.1	79.5
04:14 AM - 05:14 AM	79.9	81.1	79.5
05:14 AM - 06:14 AM	80.0	81.2	79.6
06:14 AM - 07:14 AM	79.9	81.3	79.5
07:14 AM - 08:14 AM	79.8	80.9	79.4
08:14 AM - 09:14 AM	79.8	81.1	79.4
09:14 AM - 10:14 AM	79.9	81.5	79.5

Technical Management *Tharitat.* **Approved by** *Smpt S.*
Thanita Kulsurwong Scientist (4) Supot Salameh Section Head

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.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company



Analysis / Test Report

Client: Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 2

Lot ID: 22131026
Date Received : Nov 11, 2022
Date Reported : Nov 16, 2022
Report Number: 2492928-1

Page 1 of 1

Sample Number	22131026-2		
Parameter	Noise (Leq 8 hrs.)		
Location	HRSG #2		
Measurement Date	Nov 11, 2022		
Measurement by	Mongkon Phalaithip		
Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
02:25 AM - 03:25 AM	79.7	82.3	79.1
03:25 AM - 04:25 AM	79.8	82.2	79.1
04:25 AM - 05:25 AM	79.7	82.8	79.1
05:25 AM - 06:25 AM	79.7	82.5	79.0
06:25 AM - 07:25 AM	79.8	82.6	79.1
07:25 AM - 08:25 AM	79.9	83.1	79.0
08:25 AM - 09:25 AM	79.7	82.5	78.9
09:25 AM - 10:25 AM	79.3	82.9	78.6

Technical Management *Tharitat.* **Approved by** *Smpt S.*
Thanita Kulsurwong Scientist (4) Supot Salameh Section Head

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.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company



Analysis / Test Report

Client: Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 2

Lot ID: 22131026
Date Received : Nov 11, 2022
Date Reported : Nov 16, 2022
Report Number: 2492929-1

Page 1 of 1

Sample Number	22131026-3		
Parameter	Noise (Leq 8 hrs.)		
Location	GTG #1		
Measurement Date	Nov 11, 2022		
Measurement by	Mongkon Phalaithip		
Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
02:12 AM - 03:12 AM	81.3	84.3	80.5
03:12 AM - 04:12 AM	81.5	84.4	80.6
04:12 AM - 05:12 AM	81.4	83.6	80.5
05:12 AM - 06:12 AM	81.3	84.3	80.5
06:12 AM - 07:12 AM	81.1	83.3	80.5
07:12 AM - 08:12 AM	81.2	83.2	80.5
08:12 AM - 09:12 AM	81.2	83.6	80.4
09:12 AM - 10:12 AM	80.8	82.7	80.2

Technical Management

Tharitat.

Thanita Kulurwong
Scientist (4)

Approved by

Smpt S.

Supot Salameh
Section Head

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.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

6403-71/ EMAIL

S: Reports_Air Noise.pdf (4.41PM)



Analysis / Test Report

Client: Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 2

Lot ID: 22131026
Date Received : Nov 11, 2022
Date Reported : Nov 16, 2022
Report Number: 2492930-1

Page 1 of 1

Sample Number	22131026-4		
Parameter	Noise (Leq 8 hrs.)		
Location	GTG #2		
Measurement Date	Nov 11, 2022		
Measurement by	Mongkon Phalaithip		
Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
02:23 AM - 03:23 AM	82.2	83.0	81.9
03:23 AM - 04:23 AM	82.2	83.0	81.9
04:23 AM - 05:23 AM	82.2	83.0	81.9
05:23 AM - 06:23 AM	82.2	83.1	81.9
06:23 AM - 07:23 AM	82.2	82.8	81.9
07:23 AM - 08:23 AM	82.0	82.8	81.7
08:23 AM - 09:23 AM	82.0	82.9	81.6
09:23 AM - 10:23 AM	81.8	82.7	81.5

Technical Management

Tharitat.

Thanita Kulurwong
Scientist (4)

Approved by

Smpt S.

Supot Salameh
Section Head

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.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

6403-71/ EMAIL

S: Reports_Air Noise.pdf (4.41PM)



Analysis / Test Report

Client: Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
Lot ID: 22131026
Date Received : Nov 11, 2022
Date Reported : Nov 16, 2022
Report Number: 2492931-1

P/O : DA41002956

Project Name : Monitoring

Project Location : CUP 2

Page 1 of 1

Sample Number	22131026-5		
Parameter	Noise (Leq 8 hrs.)		
Location	STG #1		
Measurement Date	Nov 10, 2022		
Measurement by	Mongkon Phalaithip		
Time			
	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:12 AM - 10:12 AM	83.1	86.2	82.7
10:12 AM - 11:12 AM	83.3	84.8	82.8
11:12 AM - 12:12 PM	83.1	84.4	82.6
12:12 PM - 01:12 PM	82.8	84.0	82.3
01:12 PM - 02:12 PM	82.8	84.6	82.3
02:12 PM - 03:12 PM	83.0	84.6	82.5
03:12 PM - 04:12 PM	83.3	87.8	82.6
04:12 PM - 05:12 PM	83.5	85.3	82.7

Technical Management

Tharitat.

Thanita Kulsurwong

Scientist (4)

Approved by

Smpt S.

Supot Salameh

Section Head

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.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

6403-71/ EMAIL

S: Reports_Air Noise.pdf (4.41PM)



Analysis / Test Report

Client: Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
Lot ID: 22131026
Date Received : Nov 11, 2022
Date Reported : Nov 16, 2022
Report Number: 2492932-1

P/O : DA41002956

Project Name : Monitoring

Project Location : CUP 2

Page 1 of 1

Sample Number	22131026-6			
Parameter	Noise (Leq 8 hrs.)			
Location	Air Compressor			
Measurement Date	Nov 10, 2022			
Measurement by	Mongkon Phalaithip			
Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))	
09:25 AM - 10:25 AM	81.6	87.3	81.2	
10:25 AM - 11:25 AM	81.6	82.6	81.2	
11:25 AM - 12:25 PM	81.2	82.1	80.8	
12:25 PM - 01:25 PM	81.2	82.3	80.7	
01:25 PM - 02:25 PM	81.3	82.4	80.7	
02:25 PM - 03:25 PM	81.6	83.2	81.0	
03:25 PM - 04:25 PM	81.8	82.7	81.4	
04:25 PM - 05:25 PM	81.9	82.7	81.5	

Technical Management

Tharitat.

Thanita Kulsurwong

Scientist (4)

Approved by

Smpt S.

Supot Salameh

Section Head

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.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

6403-71/ EMAIL

S: Reports_Air Noise.pdf (4.29PM)



Analysis / Test Report

Client: Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 2

Lot ID: 22131026
Date Received : Nov 11, 2022
Date Reported : Nov 16, 2022
Report Number: 2492933-1

Page 1 of 1

Sample Number	22131026-7
Parameter	Noise (Leq 8 hrs.)
Location	Cooling Tower
Measurement Date	Nov 10, 2022
Measurement by	Mongkon Phalathip
Time	
09:14 AM - 10:14 AM	83.2
10:14 AM - 11:14 AM	84.1
11:14 AM - 12:14 PM	83.1
12:14 PM - 01:14 PM	84.2
01:14 PM - 02:14 PM	84.1
02:14 PM - 03:14 PM	83.1
03:14 PM - 04:14 PM	84.1
04:14 PM - 05:14 PM	83.2
Leq Average 8 hrs. (dB(A))	83.2
Lmax (dB(A))	86.5
Standard (dB(A))	90
Reference Method : ISO1996-1 and 1996-2	
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง การกำหนดค่าระดับความดังเสียง ตามประเภทการใช้งานที่เกี่ยวกับความดังเสียงในที่ทำงาน พ.ศ.๒๕๔๖	

Technical Management *Tharitat.*

Approved by *Smpt S.*

Suppt. Salameh
Section Head

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.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

6403-71/ EMAIL

S. Reports_Air Noise.pdf (4.42PM)



Analysis / Test Report

Client: Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 2

Lot ID: 22131026
Date Received : Nov 11, 2022
Date Reported : Nov 16, 2022
Report Number: 2492934-1

Page 1 of 1

Sample Number	22131026-8
Parameter	Noise (Leq 8 hrs.)
Location	Auxiliary Boiler
Measurement Date	Nov 10, 2022
Measurement by	Mongkon Phalathip
Time	
09:23 AM - 10:23 AM	74.6
10:23 AM - 11:23 AM	74.6
11:23 AM - 12:23 PM	74.8
12:23 PM - 01:23 PM	74.7
01:23 PM - 02:23 PM	74.7
02:23 PM - 03:23 PM	75.0
03:23 PM - 04:23 PM	75.4
04:23 PM - 05:23 PM	75.6
Leq Average 8 hrs. (dB(A))	74.9
Lmax (dB(A))	84.3
Standard (dB(A))	90
Reference Method : ISO1996-1 and 1996-2	
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง การกำหนดค่าระดับความดังเสียง ตามประเภทการใช้งานที่เกี่ยวกับความดังเสียงในที่ทำงาน พ.ศ.๒๕๔๖	

Technical Management *Tharitat.*

Approved by *Smpt S.*

Suppt. Salameh
Section Head

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.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

6403-71/ EMAIL

S. Reports_Air Noise.pdf (4.42PM)



TESTING
11-0010

Guideline : Effluent standard for factories/industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
Sampled By : Chaisornorn Lertnarathakulchai

Remark :

- LDO : Limit of Detection
- "<" : Lower than LQO (Limit of Quantitation) / LOR (Limit of Reporting)
- Analytical method : N/A not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complies with the ISO/IEC 17025.



analysis / Test Report

Lot ID: 2281451

Remark :

- LOD : Limit of Detection
- "L" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.



Analysis / Test Report

Lot ID: 2281452

- " c " : Lower than LOQ (Limit of Quantisation) / LOR (Limit of Reporting)

94272 ENGL. S3Apex01_R



TESTING
N = 2040

Remark :

- LOD : Limit of Detection
- "c" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.



Analysis / Test Report

Lot ID: 2281451

- "C" : Lower than LOQ (Limit of Quantitation) / LDR (Limit of Reporting)



Analysis / Test Report

Lot ID: 2281453

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

Life Sciences www.alsglobal.com



Lot ID: 2281442

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



Analysis / Test Repo

Lot ID: 2281452

Remark :

- LOD : Limit of Detection
- "L" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.



Analysis / Test Repo

Lot ID: 2281453

* "c" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

8480 TQ ENGEL S:\Report_A



TESTING
No.0042
Lot ID: 2292508
Date Received : Aug 09, 2022
Date Reported : Aug 17, 2022
Report Number : 2387473-1

Guideline: Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
Sampled By: Paramet Sattayakorn

Remark:

- LOQ : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LQR (Limit of Reporting)
- Analysis's method's name not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accredited as an accredited laboratory operating with the ISO/IEC 17025.

RIGHT SOLUTIONS RIGHT PARTNER



Lot ID: 2292445
Date Received : Aug 02, 2022
Date Reported : Aug 05, 2022
Report Number : 2387360-1

Remark :

- LOD : Limit of Detection
- "C" : Lower than LOD (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyst(s) marked "N" are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

RIGHT SOLUTIONS RIGHT PARTNER



Lot ID: 2292446
Date Received : Aug 03, 2022
Date Reported : Aug 05, 2022
Report Number : 2387365-2

- "c" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Life Sciences www.alsglobal.com



TESTING
No.0042
Lot ID: 2292441
Date Received : Aug 01, 2022
Date Reported : Aug 03, 2022
Report Number : 2387344-1

Remark:

- LOD : Limit of Detection
- "L" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked "N" are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

RIGHT SOLUTIONS RIGHT PARTNER



Lot ID: 2292445
Date Received : Aug 02, 2022
Date Reported : Aug 05, 2022
Report Number : 2387360-2

- "c" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

0401-71/04/0000-0000\$05.00/0



Lot ID: 2292447
Date Received : Aug 04, 2022
Date Reported : Aug 08, 2022
Report Number : 2387368-1

Remark :

ADDRESS 616/10 Moo 3 T. Maenam Khu A. Phakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company



Lot ID: 2292441
Date Received : Aug 01, 2022
Date Reported : Aug 03, 2022
Report Number : 2387344-2

- "<" : lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)



Lot ID: 2292446
Date Received : Aug 03, 2022
Date Reported : Aug 05, 2022
Report Number : 2387365-1

Remark :

- LOD : Limit of Detection
- " c " : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

RIGHT SOLUTIONS RIGHT PARTNER



Lot ID: 2292447
Date Received : Aug 04, 2022
Date Reported : Aug 08, 2022
Report Number : 2387368-2

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

Life Sciences www.alsglobal.com



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rongying Highway Road 3191, Map Ta Phut, Muang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CLP 2

Lot ID: 2292461
Date Received : Aug 18, 2022
Date Reported : Aug 24, 2022
Report Number : 2387462-2

Page 1 of 1

Sample Number	2292461-1						
Sampled Date	Aug 18, 2022 9:40 AM						
Sample Description	Wastewater						
Location	sewer/sewerwastewater/sewage (hiding pond)						
Date Analysis Commenced	Aug 19, 2022						
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)						
Analyte	Unit	LOD	LOQ (LOB)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Dissolved Oxygen	mg/L	-	0.1	6.3	No Standard	Based on APHA (2017), 4500-OC1	Rayong
Temperature °	Degree C	-	-	7.5	5.5-6.0	Based on APHA (2017), 4500-H	Rayong
pH at 25 degree C	-	-	-	35.6	<40	Based on APHA (2017), 2550 B	Rayong
Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).							
Sampled By : Nattarat Thanasarn							
Remarks :							
- LOD : Limit of Detection							
- <LOQ : Lower than LOQ (Limit of Quantitation) / LOQ (Limit of Reporting)							



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rongying Highway Road 3191, Map Ta Phut, Muang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CLP 2

TESTING
No.0042
Lot ID: 2292462
Date Received : Aug 18, 2022
Date Reported : Aug 24, 2022
Report Number : 2387462-1

Page 1 of 1

Sample Number	2292462-1						
Sampled Date	Aug 18, 2022 10:00 AM						
Sample Description	Wastewater						
Location	sewer/sewerwastewater/sewage (hiding pond)						
Date Analysis Commenced	Aug 19, 2022						
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)						
Analyte	Unit	LOD	LOQ (LOB)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
pH at 25 degree C	-	-	-	7.5	5.5-6.0	Based on APHA (2017), 4500-H	Rayong
Temperature °	Degree C	-	-	35.6	<40	Based on APHA (2017), 2550 B	Rayong
Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).							
Sampled By : Nattarat Thanasarn							
Remarks :							
- LOD : Limit of Detection							
- <LOQ : Lower than LOQ (Limit of Quantitation) / LOQ (Limit of Reporting)							
- Analyte(s) marked * have not included in scope of Accreditation ISO/IEC 17025.							
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.							



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rongying Highway Road 3191, Map Ta Phut, Muang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CLP 2

Lot ID: 2292463
Date Received : Aug 19, 2022
Date Reported : Aug 24, 2022
Report Number : 2387462-3

Page 1 of 1

Sample Number	2292463-1						
Sampled Date	Aug 19, 2022 10:00 AM						
Sample Description	Wastewater						
Location	sewer/sewerwastewater/sewage (hiding pond)						
Date Analysis Commenced	Aug 19, 2022						
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)						
Analyte	Unit	LOD	LOQ (LOB)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Dissolved Oxygen	mg/L	-	0.1	7.8	No Standard	Based on APHA (2017), 4500-OC1	Rayong
Temperature °	Degree C	-	-	7.8	5.5-6.0	Based on APHA (2017), 4500-H	Rayong
pH at 25 degree C	-	-	-	35.6	<40	Based on APHA (2017), 2550 B	Rayong
Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).							
Sampled By : Nattarat Thanasarn							
Remarks :							
- LOD : Limit of Detection							
- <LOQ : Lower than LOQ (Limit of Quantitation) / LOQ (Limit of Reporting)							

The above results are valid only for the parameters/analytes as indicated in the laboratory accreditation certificate (No. 0042) issued by the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).

Approved by
Nattarat Thanasarn
Supervisor

ADDRESS 616/10 Moo 5, T. Maenam Khwa A, Phukdang Buaing 21140 Thailand | PHONE +66 9 3304 8551 | FAX +66 9 3304 8556
ALS LABORATORY (GROUP) PVT. LTD. (P) 0042
www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

Technical Management
Nattarat Thanasarn
Supervisor

Approved by
D. Chonghan
Senior Manager

ADDRESS 616/10 Moo 5, T. Maenam Khwa A, Phukdang Buaing 21140 Thailand | PHONE +66 9 3304 8551 | FAX +66 9 3304 8556
ALS LABORATORY (GROUP) PVT. LTD. (P) 0042
www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

The above results are valid only for the parameters/analytes as indicated in the laboratory accreditation certificate (No. 0042) issued by the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).

Approved by
Nattarat Thanasarn
Supervisor

ADDRESS 616/10 Moo 5, T. Maenam Khwa A, Phukdang Buaing 21140 Thailand | PHONE +66 9 3304 8551 | FAX +66 9 3304 8556
ALS LABORATORY (GROUP) PVT. LTD. (P) 0042
www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rongying Highway Road 3191, Map Ta Phut, Muang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CLP 2

TESTING
No.0042
Lot ID: 2292463
Date Received : Aug 20, 2022
Date Reported : Aug 24, 2022
Report Number : 2387462-4

Page 1 of 1

Sample Number	2292463-1						
Sampled Date	Aug 20, 2022 9:05 AM						
Sample Description	Wastewater						
Location	sewer/sewerwastewater/sewage (hiding pond)						
Date Analysis Commenced	Aug 20, 2022						
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)						
Analyte	Unit	LOD	LOQ (LOB)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
pH at 25 degree C	-	-	-	7.8	5.5-6.0	Based on APHA (2017), 4500-H	Rayong
Temperature °	Degree C	-	-	35.2	<40	Based on APHA (2017), 2550 B	Rayong
Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).							
Sampled By : Chaitanum Lertthanasakul							
Remarks :							
- LOD : Limit of Detection							
- <LOQ : Lower than LOQ (Limit of Quantitation) / LOQ (Limit of Reporting)							
- Analyte(s) marked * have not included in scope of Accreditation ISO/IEC 17025.							
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.							



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rongying Highway Road 3191, Map Ta Phut, Muang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CLP 2

TESTING
No.0042
Lot ID: 2292463
Date Received : Aug 20, 2022
Date Reported : Aug 24, 2022
Report Number : 2387462-2

Page 1 of 1

Sample Number	2292463-1						
Sampled Date	Aug 20, 2022 9:05 AM						
Sample Description	Wastewater						
Location	sewer/sewerwastewater/sewage (hiding pond)						
Date Analysis Commenced	Aug 23, 2022						
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)						
Analyte	Unit	LOD	LOQ (LOB)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Dissolved Oxygen	mg/L	-	0.1	6.6	No Standard	Based on APHA (2017), 4500-OC1	Rayong
Temperature °	Degree C	-	-	35.2	<40	Based on APHA (2017), 2550 B	Rayong
Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).							
Sampled By : Chaitanum Lertthanasakul							
Remarks :							
- LOD : Limit of Detection							
- <LOQ : Lower than LOQ (Limit of Quantitation) / LOQ (Limit of Reporting)							
- Analyte(s) marked * have not included in scope of Accreditation ISO/IEC 17025.							
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.							



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rongying Highway Road 3191, Map Ta Phut, Muang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CLP 2

TESTING
No.0042
Lot ID: 2292464
Date Received : Aug 20, 2022
Date Reported : Aug 24, 2022
Report Number : 2387462-1

Page 1 of 1

Sample Number	2292464-1						
Sampled Date	Aug 21, 2022 9:00 AM						
Sample Description	Wastewater						
Location	sewer/sewerwastewater/sewage (hiding pond)						
Date Analysis Commenced	Aug 21, 2022						
Condition of Sample	Contained in one BOD bottle and one plastic bottle, sample containers comply to pretreatment - preservation standards (APHA / USEPA)						
Analyte	Unit	LOD	LOQ (LOB)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
pH at 25 degree C	-	-	-	7.8	5.5-6.0	Based on APHA (2017), 4500-H	Rayong
Temperature °	Degree C	-	-	35.4	<40	Based on APHA (2017), 2550 B	Rayong
Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).							
Sampled By : Chaitanum Lertthanasakul							
Remarks :							
- LOD : Limit of Detection							
- <LOQ : Lower than LOQ (Limit of Quantitation) / LOQ (Limit of Reporting)							
- Analyte(s) marked * have not included in scope of Accreditation ISO/IEC 17025.							
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.							



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rongying Highway Road 3191, Map Ta Phut, Muang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CLP 2

Lot ID: 2292464
Date Received : Aug 21, 2022
Date Reported : Aug 24, 2022
Report Number : 2387462-1

Page 1 of 1

Sample Number	2292464-1						
Sampled Date	Aug 21, 2022 9:00 AM						
Sample Description	Wastewater						
Location	sewer/sewerwastewater/sewage (hiding pond)						
Date Analysis Commenced	Aug 23, 2022						
Condition of Sample	Contained in one BOD bottle and one plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOB)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Dissolved Oxygen	mg/L	-	0.1	6.7	No Standard	Based on APHA (2017), 4500-OC1	Rayong
Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).							
Sampled By : Chaitanum Lertthanasakul							
-LOD : Limit of Detection -LOQ : Lower than LOD (Unit of Quantity) (LOQ 50% of LOD)							



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/6, Raying Highway Road 3191, Map Ta Phut, Muang, Raying Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CLP 2

Lot ID: 2297337
Date Received : Sep 05, 2022
Date Reported : Sep 15, 2022
Report Number : 2399090-2

Page 1 of 1

Sample Number	2297337-1						
Sampled Date	Sep 05, 2022 9:05 AM						
Sample Description	Wastewater						
Location	sewer/sewage/wastewater/sewage (hiding pond)						
Date Analysis Commenced	Sep 13, 2022						
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)						
Analyte	Unit	LOD	LOQ	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Dissolved Oxygen	mg/L	-	0.1	6.5	No Standard	Based on APHA (2017), 4500-OC1	Raying
Temperature °	Degree C	-	-	7.2	5.5-6.0	Based on APHA (2017), 4500-H	Raying
pH at 25 degree C		-	-	34.8	<40	Based on APHA (2017), 2550 B	Raying
Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of The Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).							
Sampled By : Chaisorn Lertthanasakulchai							
Remarks :							
- LOD : Limit of Detection							
- <LOQ : Lower than LOQ (Limit of Quantitation) / LOQ (Limit of Reporting)							
- Analytical method * Value not included in scope of Accreditation ISO/IEC 17025.							
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.							



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/6, Raying Highway Road 3191, Map Ta Phut, Muang, Raying Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CLP 2

TESTING
No.0042
Lot ID: 2297338
Date Received : Sep 14, 2022
Date Reported : Sep 14, 2022
Report Number : 2399032-4

Page 1 of 1

Sample Number	2297338-1						
Sampled Date	Sep 14, 2022 9:23 AM						
Sample Description	Wastewater						
Location	sewer/sewage/wastewater/sewage (hiding pond)						
Date Analysis Commenced	Sep 13, 2022						
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)						
Analyte	Unit	LOD	LOQ	Result	Guideline / Specification	Method	Testing Location
Water Testing							
pH at 25 degree C		-	-	7.2	5.5-6.0	Based on APHA (2017), 4500-H	Raying
Temperature °	Degree C	-	-	34.8	<40	Based on APHA (2017), 2550 B	Raying
Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of The Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).							
Sampled By : Chaisorn Lertthanasakulchai							
Remarks :							
- LOD : Limit of Detection							
- <LOQ : Lower than LOQ (Limit of Quantitation) / LOQ (Limit of Reporting)							
- Analytical method * Value not included in scope of Accreditation ISO/IEC 17025.							
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.							



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/6, Raying Highway Road 3191, Map Ta Phut, Muang, Raying Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CLP 2

Lot ID: 2297338
Date Received : Sep 10, 2022
Date Reported : Sep 14, 2022
Report Number : 2399030-2

Page 1 of 1

Sample Number	2297338-1						
Sampled Date	Sep 10, 2022 9:22 AM						
Sample Description	Wastewater						
Location	sewer/sewage/wastewater/sewage (hiding pond)						
Date Analysis Commenced	Sep 13, 2022						
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)						
Analyte	Unit	LOD	LOQ	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Dissolved Oxygen	mg/L	-	0.1	6.4	No Standard	Based on APHA (2017), 4500-OC1	Raying
Temperature °	Degree C	-	-	7.2	5.5-6.0	Based on APHA (2017), 4500-H	Raying
pH at 25 degree C		-	-	34.8	<40	Based on APHA (2017), 2550 B	Raying
Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of The Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).							
Sampled By : Chaisorn Lertthanasakulchai							
Remarks :							
- LOD : Limit of Detection							
- <LOQ : Lower than LOQ (Limit of Quantitation) / LOQ (Limit of Reporting)							
- Analytical method * Value not included in scope of Accreditation ISO/IEC 17025.							
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.							

The above results are valid only for the parameters specified as indicated in the Laboratory Information System (LIS) and are not valid for other parameters not specified in the LIS. The results are not valid for parameters not specified in the LIS.

Approved by
Narumon Banchongkit
Supervisor

ADDRESS 616/10 Moo 5, T. Maenam Khua A, Phakdang Raying 21140 Thailand / PHONE: +66 9 3304 8551 / FAX: +66 9 3304 8556
ALS LABORATORY (PVT) LTD. 616/10 Moo 5, T. Maenam Khua A, Phakdang Raying 21140 Thailand / PHONE: +66 9 3304 8551 / FAX: +66 9 3304 8556
www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

ALS (Pvt) Ltd., 616/10 Moo 5, T. Maenam Khua A, Phakdang Raying 21140 Thailand / PHONE: +66 9 3304 8551 / FAX: +66 9 3304 8556

Technical Management
Narumon Banchongkit
Supervisor

Approved by
Dj Chinghan
Senior Manager

ADDRESS 616/10 Moo 5, T. Maenam Khua A, Phakdang Raying 21140 Thailand / PHONE: +66 9 3304 8551 / FAX: +66 9 3304 8556
ALS LABORATORY (PVT) LTD. 616/10 Moo 5, T. Maenam Khua A, Phakdang Raying 21140 Thailand / PHONE: +66 9 3304 8551 / FAX: +66 9 3304 8556
www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

ALS (Pvt) Ltd., 616/10 Moo 5, T. Maenam Khua A, Phakdang Raying 21140 Thailand / PHONE: +66 9 3304 8551 / FAX: +66 9 3304 8556

The above results are valid only for the parameters specified as indicated in the Laboratory Information System (LIS) and are not valid for other parameters not specified in the LIS. The results are not valid for parameters not specified in the LIS.

Approved by
Narumon Banchongkit
Supervisor

ADDRESS 616/10 Moo 5, T. Maenam Khua A, Phakdang Raying 21140 Thailand / PHONE: +66 9 3304 8551 / FAX: +66 9 3304 8556
ALS LABORATORY (PVT) LTD. 616/10 Moo 5, T. Maenam Khua A, Phakdang Raying 21140 Thailand / PHONE: +66 9 3304 8551 / FAX: +66 9 3304 8556
www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

ALS (Pvt) Ltd., 616/10 Moo 5, T. Maenam Khua A, Phakdang Raying 21140 Thailand / PHONE: +66 9 3304 8551 / FAX: +66 9 3304 8556



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/6, Raying Highway Road 3191, Map Ta Phut, Muang, Raying Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CLP 2

TESTING
No.0042
Lot ID: 2297339
Date Received : Sep 15, 2022
Date Reported : Sep 15, 2022
Report Number : 2399030-4

Page 1 of 1

Sample Number	2297339-1						
Sampled Date	Sep 11, 2022 9:30 AM						
Sample Description	Wastewater						
Location	sewer/sewage/wastewater/sewage (hiding pond)						
Date Analysis Commenced	Sep 13, 2022						
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)						
Analyte	Unit	LOD	LOQ	Result	Guideline / Specification	Method	Testing Location
Water Testing							
pH at 25 degree C		-	-	7.7	5.5-6.0	Based on APHA (2017), 4500-H	Raying
Temperature °	Degree C	-	-	35.4	<40	Based on APHA (2017), 2550 B	Raying
Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of The Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).							
Sampled By : Chaisorn Lertthanasakulchai							
Remarks :							
- LOD : Limit of Detection							
- <LOQ : Lower than LOQ (Limit of Quantitation) / LOQ (Limit of Reporting)							
- Analytical method * Value not included in scope of Accreditation ISO/IEC 17025.							
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.							



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/6, Raying Highway Road 3191, Map Ta Phut, Muang, Raying Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CLP 2

TESTING
No.0042
Lot ID: 2297339
Date Received : Sep 11, 2022
Date Reported : Sep 15, 2022
Report Number : 2399030-2

Page 1 of 1

Sample Number	2297339-1						
Sampled Date	Sep 11, 2022 9:30 AM						
Sample Description	Wastewater						
Location	sewer/sewage/wastewater/sewage (hiding pond)						
Date Analysis Commenced	Sep 13, 2022						
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)						
Analyte	Unit	LOD	LOQ	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Dissolved Oxygen	mg/L	-	0.1	6.3	No Standard	Based on APHA (2017), 4500-OC1	Raying
Temperature °	Degree C	-	-	35.4	<40	Based on APHA (2017), 2550 B	Raying
Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of The Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).							
Sampled By : Chaisorn Lertthanasakulchai							
Remarks :							
- LOD : Limit of Detection							
- <LOQ : Lower than LOQ (Limit of Quantitation) / LOQ (Limit of Reporting)							
- Analytical method * Value not included in scope of Accreditation ISO/IEC 17025.							
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.							



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/6, Raying Highway Road 3191, Map Ta Phut, Muang, Raying Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CLP 2

TESTING
No.0042
Lot ID: 2297340
Date Received : Sep 12, 2022
Date Reported : Sep 15, 2022
Report Number : 2399030-4

Page 1 of 1

Sample Number	2297340-1						
Sampled Date	Sep 12, 2022 9:30 AM						
Sample Description	Wastewater						
Location	sewer/sewage/wastewater/sewage (hiding pond)						
Date Analysis Commenced	Sep 13, 2022						
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)						
Analyte	Unit	LOD	LOQ	Result	Guideline / Specification	Method	Testing Location
Water Testing							
pH at 25 degree C		-	-	7.5	5.5-6.0	Based on APHA (2017), 4500-H	Raying
Temperature °	Degree C	-	-	33.3	<40	Based on APHA (2017), 2550 B	Raying
Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of The Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).							
Sampled By : Chaisorn Lertthanasakulchai							
Remarks :							
- LOD : Limit of Detection							
- <LOQ : Lower than LOQ (Limit of Quantitation) / LOQ (Limit of Reporting)							
- Analytical method * Value not included in scope of Accreditation ISO/IEC 17025.							
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.							



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/6, Raying Highway Road 3191, Map Ta Phut, Muang, Raying Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CLP 2

Lot ID: 2297340
Date Received : Sep 12, 2022
Date Reported : Sep 15, 2022
Report Number : 2399030-4

Page 1 of 1

Sample Number		2297340-1					Page 1 of 1
Sampled Date		Sep 12, 2022 9:30 AM					
Sample Description		Wastewater					
Data Analysis Methodology		Laboratory-based chemical analysis (binding pad)					
Sample Date		Sep 13, 2022					
Sample Location		On-site, near plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / US EPA)					
Analyte	Unit	LOD	LOQ (LOD)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Disinfectant	mg/L		0.1	6.1	No Standard	Based on APHA (2017), 450-0002	Rating
Guidelines: Effluent standard for factories, industrial estate and industrial park set by the Ministry of Natural Resource and Environment and Industries and Industrial park set by Notification of The Ministry of Industry dated June 07, 8.8-2006 (2017).							
Sample By: Chaisorn Lattanasubhachon							
Report ID: LOD of Disinfectant							
Report ID: LOD of Disinfectant							



TESTING
No.0042
Lot ID: 22109965
Date Received : Oct 16, 2022
Date Reported : Oct 19, 2022
Report Number : 2425015-1

Sample Number	22106195-1						
Sample Date	On 01/05/2012 9:20 AM						
Sample Description	Wastewater						
Location	Wastewater Treatment Plant (Ponding pond)						
Location Address Commenced	On 01/05/2012						
Data Analysis Method	Contained in one plastic bottle and one BOD bottle. Sample contains capacity to prebioreactor - preservation standards (APHA / ISO/IEP)						
Analyte	Link	LOD	LOD (LQ)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
pH at 25 degrees C				7.9	5.5-6.0	Based on APHA (2012), ISO:10314 (08)	Running
Temperature		Degree C		35.5	4.0	Based on APHA (2012), ISO:1588	Running
Guideline: Effluent standards for factories, industrial estates and industrial park as per notification of the Ministry of Natural Resources and Environment and the standards for factories and industrial park as per notification of the Ministry of Industry and Commerce (No. 63-EE-2560) (2012).							
Supplied by: Nannorath Nannorath							
LOD: Limit of detection							
LQ: Limit of quantification							
LOD (LQ): Limit of detection (Limit of quantification)							
Analysis method: "none not included" as per accreditation ISO/IEC:17025.							
Uncertainty: has been accepted as an accredited laboratory complying with the ISO/IEC 17025.							

Technical Management <i>N. Bhangait</i> Narumen Bhangait Supervisor vmdwssu@v-323-s-9405	Approved by <i>D. Chhanghan</i> Dej Chhanghan Senior Manager vmdwssu@v-323-s-9402
The above notes and entry are for information only. They are not intended to be used in any way. They are not intended to be used in any way. They are not intended to be used in any way.	
ADDRESS 616/10 Moo 5 T. Maenam Kh. A. Phatungkrong 21403 Thailand PHONE +66 8 334 8555 FAX +66 8 334 8556 SLS Limited Company SLS Limited Company SLS Limited Company	
Life Sciences www.algoblog.com	
RIGHT SOLUTIONS RIGHT PARTNER	

Lot ID: 22109966
Date Received : Oct 17, 2022
Date Reported : Oct 19, 2022
Report Number : 2425061-2

Sample Number	22109664						
Sample Date	Oct 17, 2022 9:30 AM						
Sample Description	Wastewater						
Location	Wastewater Treatment Plant/Inflow/Outflow (Pending pump)						
Date Analysis Commenced	Oct 18, 2022						
Condition of Sample	Contained in two plastic bottles and one BOD bottle. Sample containers comply to prebiomass - preservation standards (APHA / ISO/IEC)						
Analyte	Unit	LOD	LOQ	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Discolored Green	mg/L		0.1	7.4		Based on APHA (2017), ISO-15705	Rayong
Guideline: Effluent standard for factories, industrial estate and industrial park as notification of the Ministry of Natural Resources and Environment and the Pollution Control Department for factories and industrial park as notified by the Notification of the Factory of industry estate issue No. 08-2560 (2017)							
Sample by : Chayavorn Lertnabothai							
LSD	= Limit of Selection						
LOQ	= Lower limit (LOQ Limit of Quantitation) / LOD (Limit of Detection)						

Approved by 

Narumon Banerhighe
Supervisor

Address: 616/10 Moo 5, T. Maennan Klu, Huatungbang 2140 Thailand | PHONE: +66 0 2 304 8551 | FAX: +66 0 3304 8556
ALL LABORATORY GROUP LIMITED AND ITS 100% AS ANS United Company

 www.asglobe.com

 **RIGHT SOLUTIONS** (RIGHT PARTNER)

ASG TO WHOLE © Baughn, ASG and its (2009)



Lot ID: 22109968
Date Received : Oct 19, 2022
Date Reported : Oct 22, 2022
Report Number : 2425063-1

Sample Number	221096818					
Sample Date	On 18, 2022, 9:30 AM					
Sample Description	Wastewater					
Sample Analysis Commenced	On 18, 2022, 9:30 AM					
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample contains copper to prebiorend - pre-oxidation standards (APHA / ISEPA)					
Analyte	Unit	LOD (LOQ)	Result (LOQ)	Guideline / Specification	Method	Testing Location
Water Testing						
pH at 25 degrees C	-	-	8.0	5.5-9.0	Based on APHA (2017), 4500-H-18	Rayong
Temperature	Degree C	-	34.2	4.0-30.0	Based on APHA (2017), 2550-B	Rayong
Guideline: Effluent standards for factories, industrial estate and industrial park set by notification of the Ministry of Natural Resource and Environment and standard for factories and industrial park set by notification of the Ministry of Industry of Thailand (see table 18, 18-256) (2007)						
Supplied by: Nantarat Thammachart						
LOD - Limit of detection LOD = Lower limit LOQ (mg/L or Quantity/L) of Analyte Analyte (mg/L) = value not included in value of Accredited ISO/IEC 17025 The laboratory has been accredited as an accredited laboratory under the ISO/IEC 17025						

Technical Management

N. Bangait
Narumen Banchoatit
Supervisor
vmdw@aei >323-9445

Approved by

D. Chongmanee
Daj Chongman Senior Manager
vmdw@aui >323-9442


The above material will only be used for the purpose stated.

AEE#E616/D Moo T S. Maanani Khia A Phothaklang Rearing 21148 Thailand | PHONE +66 6 334 8555 FAX +66 6 334 8556
216 Vithayalvit Road Bangkok 10110 THAILAND | Email vmdw@aei.com.au www.algoball.com

Life's Satisfaction

RIGHT SOLUTIONS RIGHT PARTNER

0602 76 8888 0602 76 8888 0602 76 8888



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Raying Highway Road 3191, Map Ta Phut, Muang, Raying Thailand 21150

P/O :
Project Name : Monitoring
Project Location : CLP 2

TESTING
No.0042
Lot ID: 22123100
Date Received : Nov 06, 2022
Date Reported : Nov 06, 2022
Report Number : 2455907-2

Page 1 of 1

Sample Number
22123100-1

Sampled Date
Nov 06, 2022 9:00 AM

Sample Description
Wastewater

Location
suanvithasuanvithasuanvithasuan (holding pond)

Date Analysis Commenced
Nov 06, 2022

Condition of Sample
Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ	Result	Guideline / Specification	Method	Testing Location
Water Testing							
pH at 25 degree C	-	-	-	7.7	5.5-9.0 (B)	Based on APHA (2017), 4500-H	Raying
Temperature *	Degree C	-	-	31.8	≤40	Based on APHA (2017), 2550-B	Raying

Guideline: Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).

Sampled By: Pannarat Sattayakorn

Remarks:

- "L" : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOQ (Limit of Reporting)
- Analytical method * Value not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management
N.Bangnit
Narumon Banchongit
Senior Manager
videoweb@v-323-v-9445

Approved by
D.Changthong
Dil Chhangthong
Senior Manager
videoweb@v-323-v-9445

Life Sciences
www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

ALS LABORATORY (PVT) LTD. 110/101, 110/102, 110/103, 110/104, 110/105, 110/106, 110/107, 110/108, 110/109, 110/110, 110/111, 110/112, 110/113, 110/114, 110/115, 110/116, 110/117, 110/118, 110/119, 110/120, 110/121, 110/122, 110/123, 110/124, 110/125, 110/126, 110/127, 110/128, 110/129, 110/130, 110/131, 110/132, 110/133, 110/134, 110/135, 110/136, 110/137, 110/138, 110/139, 110/140, 110/141, 110/142, 110/143, 110/144, 110/145, 110/146, 110/147, 110/148, 110/149, 110/150, 110/151, 110/152, 110/153, 110/154, 110/155, 110/156, 110/157, 110/158, 110/159, 110/160, 110/161, 110/162, 110/163, 110/164, 110/165, 110/166, 110/167, 110/168, 110/169, 110/170, 110/171, 110/172, 110/173, 110/174, 110/175, 110/176, 110/177, 110/178, 110/179, 110/180, 110/181, 110/182, 110/183, 110/184, 110/185, 110/186, 110/187, 110/188, 110/189, 110/190, 110/191, 110/192, 110/193, 110/194, 110/195, 110/196, 110/197, 110/198, 110/199, 110/200, 110/201, 110/202, 110/203, 110/204, 110/205, 110/206, 110/207, 110/208, 110/209, 110/210, 110/211, 110/212, 110/213, 110/214, 110/215, 110/216, 110/217, 110/218, 110/219, 110/220, 110/221, 110/222, 110/223, 110/224, 110/225, 110/226, 110/227, 110/228, 110/229, 110/230, 110/231, 110/232, 110/233, 110/234, 110/235, 110/236, 110/237, 110/238, 110/239, 110/240, 110/241, 110/242, 110/243, 110/244, 110/245, 110/246, 110/247, 110/248, 110/249, 110/250, 110/251, 110/252, 110/253, 110/254, 110/255, 110/256, 110/257, 110/258, 110/259, 110/260, 110/261, 110/262, 110/263, 110/264, 110/265, 110/266, 110/267, 110/268, 110/269, 110/270, 110/271, 110/272, 110/273, 110/274, 110/275, 110/276, 110/277, 110/278, 110/279, 110/280, 110/281, 110/282, 110/283, 110/284, 110/285, 110/286, 110/287, 110/288, 110/289, 110/290, 110/291, 110/292, 110/293, 110/294, 110/295, 110/296, 110/297, 110/298, 110/299, 110/300, 110/301, 110/302, 110/303, 110/304, 110/305, 110/306, 110/307, 110/308, 110/309, 110/310, 110/311, 110/312, 110/313, 110/314, 110/315, 110/316, 110/317, 110/318, 110/319, 110/320, 110/321, 110/322, 110/323, 110/324, 110/325, 110/326, 110/327, 110/328, 110/329, 110/330, 110/331, 110/332, 110/333, 110/334, 110/335, 110/336, 110/337, 110/338, 110/339, 110/340, 110/341, 110/342, 110/343, 110/344, 110/345, 110/346, 110/347, 110/348, 110/349, 110/350, 110/351, 110/352, 110/353, 110/354, 110/355, 110/356, 110/357, 110/358, 110/359, 110/360, 110/361, 110/362, 110/363, 110/364, 110/365, 110/366, 110/367, 110/368, 110/369, 110/370, 110/371, 110/372, 110/373, 110/374, 110/375, 110/376, 110/377, 110/378, 110/379, 110/380, 110/381, 110/382, 110/383, 110/384, 110/385, 110/386, 110/387, 110/388, 110/389, 110/390, 110/391, 110/392, 110/393, 110/394, 110/395, 110/396, 110/397, 110/398, 110/399, 110/400, 110/401, 110/402, 110/403, 110/404, 110/405, 110/406, 110/407, 110/408, 110/409, 110/410, 110/411, 110/412, 110/413, 110/414, 110/415, 110/416, 110/417, 110/418, 110/419, 110/420, 110/421, 110/422, 110/423, 110/424, 110/425, 110/426, 110/427, 110/428, 110/429, 110/430, 110/431, 110/432, 110/433, 110/434, 110/435, 110/436, 110/437, 110/438, 110/439, 110/440, 110/441, 110/442, 110/443, 110/444, 110/445, 110/446, 110/447, 110/448, 110/449, 110/450, 110/451, 110/452, 110/453, 110/454, 110/455, 110/456, 110/457, 110/458, 110/459, 110/460, 110/461, 110/462, 110/463, 110/464, 110/465, 110/466, 110/467, 110/468, 110/469, 110/470, 110/471, 110/472, 110/473, 110/474, 110/475, 110/476, 110/477, 110/478, 110/479, 110/480, 110/481, 110/482, 110/483, 110/484, 110/485, 110/486, 110/487, 110/488, 110/489, 110/490, 110/491, 110/492, 110/493, 110/494, 110/495, 110/496, 110/497, 110/498, 110/499, 110/500, 110/501, 110/502, 110/503, 110/504, 110/505, 110/506, 110/507, 110/508, 110/509, 110/510, 110/511, 110/512, 110/513, 110/514, 110/515, 110/516, 110/517, 110/518, 110/519, 110/520, 110/521, 110/522, 110/523, 110/524, 110/525, 110/526, 110/527, 110/528, 110/529, 110/530, 110/531, 110/532, 110/533, 110/534, 110/535, 110/536, 110/537, 110/538, 110/539, 110/540, 110/541, 110/542, 110/543, 110/544, 110/545, 110/546, 110/547, 110/548, 110/549, 110/550, 110/551, 110/552, 110/553, 110/554, 110/555, 110/556, 110/557, 110/558, 110/559, 110/560, 110/561, 110/562, 110/563, 110/564, 110/565, 110/566, 110/567, 110/568, 110/569, 110/570, 110/571, 110/572, 110/573, 110/574, 110/575, 110/576, 110/577, 110/578, 110/579, 110/580, 110/581, 110/582, 110/583, 110/584, 110/585, 110/586, 110/587, 110/588, 110/589, 110/590, 110/591, 110/592, 110/593, 110/594, 110/595, 110/596, 110/597, 110/598, 110/599, 110/600, 110/601, 110/602, 110/603, 110/604, 110/605, 110/606, 110/607, 110/608, 110/609, 110/610, 110/611, 110/612, 110/613, 110/614, 110/615, 110/616, 110/617, 110/618, 110/619, 110/620, 110/621, 110/622, 110/623, 110/624, 110/625, 110/626, 110/627, 110/628, 110/629, 110/630, 110/631, 110/632, 110/633, 110/634, 110/635, 110/636, 110/637, 110/638, 110/639, 110/640, 110/641, 110/642, 110/643, 110/644, 110/645, 110/646, 110/647, 110/648, 110/649, 110/650, 110/651, 110/652, 110/653, 110/654, 110/655, 110/656, 110/657, 110/658, 110/659, 110/660, 110/661, 110/662, 110/663, 110/664, 110/665, 110/666, 110/667, 110/668, 110/669, 110/670, 110/671, 110/672, 110/673, 110/674, 110/675, 110/676, 110/677, 110/678, 110/679, 110/680, 110/681, 110/682, 110/683, 110/684, 110/685, 110/686, 110/687, 110/688, 110/689, 110/690, 110/691, 110/692, 110/693, 110/694, 110/695, 110/696, 110/697, 110/698, 110/699, 110/700, 110/701, 110/702, 110/703, 110/704, 110/705, 110/706, 110/707, 110/708, 110/709, 110/710, 110/711, 110/712, 110/713, 110/714, 110/715, 110/716, 110/717, 110/718, 110/719, 110/720, 110/721, 110/722, 110/723, 110/724, 110/725, 110/726, 110/727, 110/728, 110/729, 110/730, 110/731, 110/732, 110/733, 110/734, 110/735, 110/736, 110/737, 110/738, 110/739, 110/740, 110/741, 110/742, 110/743, 110/744, 110/745, 110/746, 110/747, 110/748, 110/749, 110/750, 110/751, 110/752, 110/753, 110/754, 110/755, 110/756, 110/757, 110/758, 110/759, 110/760, 110/761, 110/762, 110/763, 110/764, 110/765, 110/766, 110/767, 110/768, 110/769, 110/770, 110/771, 110/772, 110/773, 110/774, 110/775, 110/776, 110/777, 110/778, 110/779, 110/780, 110/781, 110/782, 110/783, 110/784, 110/785, 110/786, 110/787, 110/788, 110/789, 110/790, 110/791, 110/792, 110/793, 110/794, 110/795, 110/796, 110/797, 110/798, 110/799, 110/800, 110/801, 110/802, 110/803, 110/804, 110/805, 110/806, 110/807, 110/808, 110/809, 110/810, 110/811, 110/812, 110/813, 110/814, 110/815, 110/816, 110/817, 110/818, 110/819, 110/820, 110/821, 110/822, 110/823, 110/824, 110/825, 110/826, 110/827, 110/828, 110/829, 110/830, 110/831, 110/832, 110/833, 110/834, 110/835, 110/836, 110/837, 110/838, 110/839, 110/840, 110/841, 110/842, 110/843, 110/844, 110/845, 110/846, 110/847, 110/848, 110/849, 110/850, 110/851, 110/852, 110/853, 110/854, 110/855, 110/856, 110/857, 110/858, 110/859, 110/860, 110/861, 110/862, 110/863, 110/864, 110/865, 110/866, 110/867, 110/868, 110/869, 110/870, 110/871, 110/872, 110/873, 110/874, 110/875, 110/876, 110/877, 110/878, 110/879, 110/880, 110/881, 110/882, 110/883, 110/884, 110/885, 110/886, 110/887, 110/888, 110/889, 110/890, 110/891, 110/892, 110/893, 110/894, 110/895, 110/896, 110/897, 110/898, 110/899, 110/900, 110/901, 110/902, 110/903, 110/904, 110/905, 110/906, 110/907, 110/908, 110/909, 110/910, 110/911, 110/912, 110/913, 110/914, 110/915, 110/916, 110/917, 110/918, 110/919, 110/920, 110/921, 110/922, 110/923, 110/924, 110/925, 110/926, 110/927, 110/928, 110/929, 110/930, 110/931, 110/932, 110/933, 110/934, 110/935, 110/936, 110/937, 110/938, 110/939, 110/940, 110/941, 110/942, 110/943, 110/944, 110/945, 110/946, 110/947, 110/948, 110/949, 110/950, 110/951, 110/952, 110/953, 110/954, 110/955, 110/956, 110/957, 110/958, 110/959, 110/960, 110/961, 110/962, 110/963, 110/964, 110/965, 110/966, 110/967, 110/968, 110/969, 110/970, 110/971, 110/972, 110/973, 110/974, 110/975, 110/976, 110/977, 110/978, 110/979, 110/980, 110/981, 110/982, 110/983, 110/984, 110/985, 110/986, 110/987, 110/988, 110/989, 110/990, 110/991, 110/992, 110/993, 110/994, 110/995, 110/996, 110/997, 110/998, 110/999, 110/1000, 110/1001, 110/1002, 110/1003, 110/1004, 110/1005, 110/1006, 110/1007, 110/1008, 110/1009, 110/1010, 110/1011, 110/1012, 110/1013, 110/1014, 110/1015, 110/1016, 110/1017, 110/1018, 110/1019, 110/1020, 110/1021, 110/1022, 110/1023, 110/1024, 110/1025, 110/1026, 110/1027, 110/1028, 110/1029, 110/1030, 110/1031, 110/1032, 110/1033, 110/1034, 110/1035, 110/1036, 110/1037, 110/1038, 110/1039, 110/1040, 110/1041, 110/1042, 110/1043, 110/1044, 110/1045, 110/1046, 110/1047, 110/1048, 110/1049, 110/1050, 110/1051, 110/1052, 110/1053, 110/1054, 110/1055, 110/1056, 110/1057, 110/1058, 110/1059, 110/1060, 110/1061, 110/1062, 110/1063, 110/1064, 110/1065, 110/1066, 110/1067, 110/1068, 110/1069, 110/1070, 110/1071, 110/1072, 110/1073, 110/1074, 110/1075, 110/1076, 110/1077, 110/1078, 110/1079, 110/1080, 110/1081, 110/1082, 110/1083, 110/1084, 110/1085, 110/1086, 110/1087, 110/1088, 110/1089, 110/1090, 110/1091, 110/1092, 110/1093, 110/1094, 110/1095, 110/1096, 110/1097, 110/1098, 110/1099, 110/1100, 110/1101, 110/1102, 110/1103, 110/1104, 110/1105, 110/1106, 110/1107, 110/1108, 110/1109, 110/1110, 110/1111, 110/1112, 110/1113, 110/1114, 110/1115, 110/1116, 110/1117, 110/1118, 110/1119, 110/1120, 110/1121, 110/1122, 110/1123, 110/1124, 110/1125, 110/1126, 110/1127, 110/1128, 110/1129, 110/1130, 110/1131, 110/1132, 110/1133, 110/1134, 110/1135, 110/1136, 110/1137, 110/1138, 110/1139, 110/1140, 110/1141, 110/1142, 110/1143, 110/1144, 110/1145, 110/1146, 110/1147, 110/1148, 110/1149, 110/1150, 110/1151, 110/1152, 110/1153, 110/1154, 110/1155, 110/1156, 110/1157, 110/1158, 110/1159, 110/1160, 110/1161, 110/1162, 110/1163, 110/1164, 110/1165, 110/1166, 110/1167, 110/1168, 110/1169, 110/1170, 110/1171, 110/1172, 110/1173, 110/1174, 110/1175, 110/1176, 110/1177, 110/1178, 110/1179, 110/1180, 110/1181, 110/1182, 110/1183, 110/1184, 110/1185, 110/1186, 110/1187, 110/1188, 110/1189, 110/1190, 110/1191, 110/1192, 110/1193, 110/1194, 110/1195, 110/1196, 110/1197, 110/1198, 110/1199, 110/1200, 110/1201, 110/1202, 110/1203, 110/1204, 110/1205, 110/1206, 110/1207, 110/1208, 110/1209, 110/1210, 110/1211, 110/1212, 110/1213, 110/1214, 110/1215, 110/1216, 110/1217, 110/1218, 110/1219, 110/1220, 110/1221, 110/1222, 110/1223, 110/1224, 110/1225, 110/1226, 110/1227, 110/1228, 110/1229, 110/1230, 110/1231, 110/1232, 110/1233, 110/1234, 110/1235, 110/1236, 110/1237, 110/1238, 110/1239, 110/1240, 110/1241, 110/1242, 110/1243, 110/1244, 110/1245, 110/1246, 110/1247, 110/1248, 110/1249, 110/1250, 110/1251, 110/1252, 110/1253, 110/1254, 110/1255, 110/1256, 110/1257, 110/1258, 110/1259, 110/1260, 110/1261, 110/1262, 110/1263, 110/1264, 110/1265, 110/1266, 110/1267, 110/1268, 110/1269, 110/1270, 110/1271, 110/1272, 110/1273, 110/1274, 110/1275, 110/1276, 110/1277, 110/1278, 110/1279, 110/1280, 110/1281, 110/1282, 110/1283, 110/1284, 110/1285, 110/1286, 110/1287, 110/1288, 110/1289, 110/1290, 110/1291, 110/1292, 110/1293, 110/1294, 110/1295, 110/1296, 110/1297, 110/1298, 110/1299, 110/1300, 110/1301, 110/1302, 110/1303, 110/1304, 110/1305, 110/1306, 110/1307, 110/1308, 110/1309, 110/1310, 110/1311, 110/1312, 110/1313, 110/1314, 110/1315, 110/1316, 110/1317, 110/1318, 110/1319, 110/1320, 110/1321, 110/1322, 110/1323, 110/1324, 110/1325, 110/1326, 110/1327, 110/1328, 110/1329, 110/1330, 110/1331, 110/1332, 110/13



Lot ID: 22140379
Date Received : Dec 07, 2022
Date Reported : Dec 10, 2022
Report Number : 2496000-1

Guideline: Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
Sampled by: Paramet Sattayakun

Remark:

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

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



Lot ID: 22140380
Date Received : Dec 08, 2022
Date Reported : Dec 10, 2022
Report Number : 2496007-2

Guideline: Effluent standard for factories, industrial estate and industrial park set by Notification of The Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, S.E.2560 (2017).
Sampled By: Chaisorn Lertmanthakundul

Remarks :
 - LOD : Limit of Detection
 - LOD (Limit of Quantitation) : LOD x (bott of Reagent)

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



Lot ID: 22140382
Date Received : Dec 10, 2022
Date Reported : Dec 14, 2022
Report Number : 2496012-1

Guideline: Effluent standard for factories, industrial estate and industrial park set by Notification of The Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, S.E.2560 (2017).
Sampling By: Wanlop Hunchinaeaw wanlop@nre.go.th +323-49457

Remark:
- LOD : Limit of Detection
- LOD (Limit of Quantitation) : LOD x 3 (3x of Detection)

Remark :

- LOD : Limit of Detection
- T_{95} : Less than LOD (Limit of Quantitation) / LOD (Limit of Detection)



Lot ID: 22140379
Date Received : Dec 07, 2022
Date Reported : Dec 10, 2022
Report Number : 2496000-2

Remark :

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



Lot ID: 22140381
Date Received : Dec 09, 2022
Date Reported : Dec 13, 2022
Report Number : 2496006-1

Temperature	Degree C	+	-	33.5	≤40	Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
-------------	----------	---	---	------	-----	---	--------

Guideline: Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2550 (2017).

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of Effluent Discharge.



Lot ID: 22140382
Date Received : Dec 10, 2022
Date Reported : Dec 14, 2022
Report Number : 2496012-2

Remark :

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



Lot ID: 22140380
Date Received : Dec 08, 2022
Date Reported : Dec 10, 2022
Report Number : 2496007-1

Guideline: Effluent standard for factories/ industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
Sampled By: Chainorn Lertnathakunchai

Remark:

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

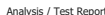
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)



Lot ID: 22140381
Date Received : Dec 09, 2022
Date Reported : Dec 13, 2022
Report Number : 2496006-2

Guideline: Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
Sampled by: Paramet Sattayakun
Remark:
 - LOD : Limit of Detection
 - LOD (link of Quantitation) : LOD (link of Reporting)

- LOD : Limit of Detection
- " $<$ " : lower than LOD (Limit of Quantitation) / LOR (Limit of Reporting)



Lot ID: 22140383
Date Received : Dec 11, 2022
Date Reported : Dec 16, 2022
Report Number : 2496063-1

Guideline: Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
Sampling By: Wanlop Hunchaisaew wlochaesaw@ 3-323-4-9457
Remark:
 - LOD : Limit of Detection
 - LOD (10% of Quantitation) : 100.0 (mg of Benzene)

Remark :

- LOD : Limit of Detection
- T_{95} : lower than (LOD/5) (risk of Contamination) / (LOD/5) (risk of Detection)



Lot ID: 22140383
Date Received : Dec 11, 2022
Date Reported : Dec 16, 2022
Report Number : 2496013-2

Remark :

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



Lot ID: 22140385
Date Received : Dec 13, 2022
Date Reported : Dec 17, 2022
Report Number : 2496017-1

Guideline: Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
Sampling By: Chaiyusorn Lertnarakulchai verisurawit 3-323-4-9461

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

$\text{get_row_id} = \text{get_row_id} + 1$



Lot ID: 22140387
Date Received : Dec 14, 2022
Date Reported : Dec 17, 2022
Report Number : 2496020-2

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

S:\Report6_01_02.cpl (2-0899)



Lot ID: 22140384
Date Received : Dec 12, 2022
Date Reported : Dec 16, 2022
Report Number : 2496014-1

Guideline: Effluent standard for factories, industrial estate and industrial park set by Notification of The Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, S.E.2560 (2017).

Remark :

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

RIGHT SOLUTIONS RIGHT PARTNER



Lot ID: 22140385
Date Received : Dec 13, 2022
Date Reported : Dec 17, 2022
Report Number : 2496017-2

Remark :

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



Lot ID: 22140388
Date Received : Dec 15, 2022
Date Reported : Dec 17, 2022
Report Number : 246023-1

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, BE2560 (2017).

Remark :

- LO D : Limit of Detection
- "<" : Lower than LO Q (Limit of Quantitation)/ LO R (Limit of Reporting)

Life Sciences www.alsglobal.com



Lot ID: 22140384
Date Received : Dec 12, 2022
Date Reported : Dec 16, 2022
Report Number : 2496004-2

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

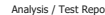


Lot ID: 22140387
Date Received : Dec 14, 2022
Date Reported : Dec 17, 2022
Report Number : 2496020-1

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
Sampling By : Pathompong Kornsawat veclerawit 0-323-4-9468

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

© 2004 Blackwell Publishing Ltd, *Journal of Internal Medicine* 255: 103–110



Lot ID: 22140388
Date Received : Dec 15, 2022
Date Reported : Dec 17, 2022
Report Number : 2496023-2

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

END TQ ENDS S:\Report06_M0_06.rpt (1.03%)



TESTING

Page 1 of 1

Analysis / Test Report

Page 2 of 2



Analysis / Test Report

Lot ID: 22140390
Date Received : Dec 17, 2022
Date Reported : Dec 22, 2022
Report Number : 2496027-1

Page 1 of 1

Guideline : Effluent standard for factories, industrial estate and industrial park set by notification of The Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by notification of The Ministry of Industry dated June 07, B.E.2560 (2017).

Sampling By : Paramet Sattayakun vichonawall 3-323-4-9476

Remark :

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

Techanical Management	N. Bhangit	Approved by	D. Chongthorn
Narumon Banchoangit Supervisor videomail@v-323-a-9445		Dij Chongthorn Senior Manager videomail@v-323-a-9442	
<p>The above details are valid only if the personnel have been interviewed, or otherwise it is stated. If signed off this report or affidavit may be required as a legal document unless written consent has been obtained. All statements herein should clearly represent what the report was representative of.</p> <p>ADDRESS 616/10 Moo 3 T. Maenon Koo A. Phatthanagarn 21140 Thailand PHONE +66 3 204 8555 FAX +66 3 204 8556 MSU International College Ltd. 170-145 United Kingdom</p>			
Life Sciences	www.algobal.com		
RIGHT SOLUTIONS RIGHT PARTNER			



Page 1 of 1



Analysis / Test Report

Page 1 of 1



Analysis / Test Report

Lot ID: 22140391
Date Received : Dec 18, 2022
Date Reported : Dec 22, 2022
Report Number : 2496028-2

Page 1 of 1

Remark :

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

The above results are valid only for the analysed/analysed sample(s) as indicated in the header. The user of the report can only rely on the information as provided in the report and is not responsible for the use of the information. The user of the report is advised to consult the laboratory for any further information. The laboratory is not responsible for the use of the information. The laboratory is not responsible for the use of the information.

Approved by: *N. Bannari*

Narayan Bannari
Supervisor

ADDRESS 616/10 Moo 5, T. Maenan Khu A, Phukphang Road 21140 Thailand / PHONE +66 0 324 8555 / FAX +66 0 3304 8556

ISO 15189 CERTIFIED LABORATORY FOR THE ANALYSIS OF FOODS AND AGRI-FOODS UNITED STATES

www.alsglobal.com

LIFE SOLUTIONS

RIGHT SOLUTIONS RIGHT PARTNER

002/10/2006L

01/September_08_24-26-27-28-29-30/2006



Page 2 of 2



Analysis / Test Report

Page 2 of 2



Analysis / Test Report

Lot ID: 22140393
Date Received : Dec 20, 2022
Date Reported : Dec 23, 2022
Report Number : 2496033-1

Page 1 of 1

Guideline: Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
Sampling by: Chainarom Lertnathakunchai รวบรวมผล 9-323-9-9461

Remark:

- LOD : Limit of Detection
- "c" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * where not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

[illegible]



Lot ID: 22140393
Date Received : Dec 20, 2022
Date Reported : Dec 23, 2022
Report Number : 2496033-2

Remark :
- LOD : Limit of Detection

Approved by

N. Brumby

Neuman Brumby
Supervisor

ADDRESS 616/10 Moss St., Merano Ks A. Plaudinger Baying 211 40 Thailand | PHONE 404 3304 8551 | FAX 404 3304 8551
ALS LABORATORY GROUP (THAILAND) CO., LTD. AN ALS LIMITED COMPANY

Life Sciences **www.alsglobal.com**

NIGHT SOLUTIONS **NIGHT PARTNER**

02/2016 02_2016_02_2016



Lot ID: 22140395
Date Received : Dec 22, 2022
Date Reported : Dec 26, 2022
Report Number : 2496036-1

Guideline: Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07. B.E.2550 (2017).

Sampling By : Paramet Sattayakun veerutairat 3-323-4-9476

Remark :
- LOD : Limit of Detection
- "n" : Lower than LOD (Limit of Quantitation) / LOD (Limit of Quantitation)

Technical Management *N. Banjongkit* **Approved by** *D. Chongchon*

Narumon Banjongkit
Supervisor
webadw@waf-323-a-9445

Dej Chongchon
Senior Manager
webadw@waf-323-a-9442

The above details are only valid for the period of 30 days from the date of signature. After the period of 30 days, the details may be changed without any notice from the laboratory. Do not change the details (Thailand) without the approval of the report in accordance with the ILO.

ADDRESS 61/10 Moo 5 / Mearan Khru A. Phothongjarn Road 21140 Thailand / TEL: +66 8 3204 8511 / FAX: +66 8 3204 8556
AAS LABORATORY GROUP THAILAND CO., LTD. AAS ALLC MEMBER

Life Sciences www.alisglobal.com



Lot ID: 22140396
Date Received : Dec 23, 2022
Date Reported : Dec 27, 2022
Report Number : 2496038-2

Sampling by : Parameter Samplingkan YOGI (KALAM) 3-323-4-94/6

The above results are valid only for the sample(s) tested (sample(s) as indicated in the document). No part of this report is suitable to be reproduced or to be used without written consent from the Laboratory. A-CL Laboratory Group (Thailand) strongly recommends that this report is not accepted except in full.

Narumon Banchongkit
Supervisor

ADDRESS 616/10 Moo 5 T. Maerani Kh.A. Phakdang Baying 21140 Thailand | PHONE +66 0 3104 8555 | FAX +66 0 3104 8556
AS A LABORATORY GROUP THAILAND P.O. BOX 48 AS A LIMITED Company

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER



Lot ID: 22140394
Date Received : Dec 21, 2022
Date Reported : Dec 24, 2022
Report Number : 2496034-1

Guideline: Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07. B.E.2550 (2017).

Sampling By : Paramet Sampayakun vmsuwaru 3-323-4-9476

Remark :

- LOD : Limit of Detection
- $5 \times \text{LOD}$: 5 times than LOD (Limit of Quantitation) / 5 (50 % Limit of Quantitation)

Technical Manager *N. Banerjee* **Approved by** *D. Chongthong*
 Narumon Banerjee
 Supervisor
 wutadisa@alco-323-6945
 Del Chongthong
 Senior Manager
 wutadisa@alco-323-6942

The above results are only valid for the intended application(s) as indicated in this report. No part of this report or certified data can be reproduced or used for any other purpose without written consent from the Laboratory. All customers should be informed that the report is not a contract.

ADDRESS 610/10 Moo 5, T. Mueang Khut, Phakdangkrong 21140 Thailand PHONE +66 6 3304 8551 FAX +66 6 3304 8556
 ALCO LABORATORY GROUP ITALY/ALCO S.p.A. LTD. ALCO PLUMBER COMPANY

Life Sciences www.alcoglobal.com



Lot ID: 22140395
Date Received : Dec 22, 2022
Date Reported : Dec 26, 2022
Report Number : 2496036-2

Sampling by : PARATHAT, Subangjaya, Indonesia, 2013-2014
 Remark :
 - LOD : Limit of Detection

[[Bibliography in words]]
[[Bibliography in words]]

All these details are valid only for the environmental analysis or related to the report. No part of the report or confidential data or information is to be shared without express consent from the company. The company shall be held responsible always regarding the report or any report related to it.

Approved by  Nauman Bhangoo
 Supervisor

ADDRESS: 616/10 Main St. 5, Meridian City A. Puchong Bangs 21140 Thailand | PHONE: +66 2 3304 8551 | FAX: +66 2 3304 8554
 A/S - ALS (INDONESIA) / GEDIP (PRAKASAD) CO., LTD. An ALS Limited Company

Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

HEAD TO HEAD S:\Report_ML_2014\081814



Lot ID: 22140397
Date Received : Dec 24, 2022
Date Reported : Dec 27, 2022
Report Number : 2496039-1

Guideline: Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E. 2550 (2017).

Sampling By : Pathompong Kommasit weidarsaari 9-123-4-9468

Remark :

- LOD : Limit of Detection
- $\bar{x} + s$: Less than LOD (Risk of Contamination) / LOD (Risk of Detection)

Narumon Banchongkit
 Supervisor
 โทรสาร ๐-2324-9445

Approved by 
 Dej Chongthon
 Senior Manager
 โทรสาร ๐-2324-9442

The above results are valid only for the tested sample(s) as indicated in the report. For part of a lot or multiple lots, the results are not representative of the whole lot without written consent from the laboratory. The laboratory strongly recommends that the report is not reproduced without the written consent of the laboratory.

ADDRESS 616/9 Moo 5, T. Wamam Hu, A. Phakdang Rayong 21140 Thailand PHONE +66 6 3304 8551 FAX +66 6 3304 8556
 AIS LABORATORY GROUP (THAILAND) CO., LTD. AN AIS Limited Company

Life Sciences  www.alsglobal.com



Lot ID: 22140394
Date Received : Dec 21, 2022
Date Reported : Dec 24, 2022
Report Number : 2496034-2

Remark :
- LOD : Limit of Detection

The above results are valid only for this uncalibrated instrument as indicated in this report. The user of this report is responsible for any application of these data to other situations. The user of this report is advised to consult with an independent laboratory to determine if the instrument is properly calibrated and to determine if the instrument is properly maintained. The user of this report is advised to consult with an independent laboratory to determine if the instrument is properly calibrated and to determine if the instrument is properly maintained.

Approved by: *N. Baughniff*
 Narumon Baengchit
 Supervisor

ADDRESS 616/1 Moo 5 T. Maetan Eak A. Phatthanasri (Serving 21140) Thailand / PHONE: +66 0 224 8551 / FAX: +66 0 224 8556
 AAS LABORATORY GROUP (THAILAND) CO., LTD. AN AAS Limited Company

www.aasglobal.com

AAS SOLUTIONS RIGHT PARTNER

AAS1070 SERIAL: 51090000101 (2) (2) (2)



Lot ID: 22140396
Date Received : Dec 23, 2022
Date Reported : Dec 27, 2022
Report Number : 2496038-1

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).

Remark :
 - LOD : Limit of Detection
 - "u" : Lower than, LOD (Limit of Quantitation) / LOD (Limit of Reporting)

Technical Management		Approved by	
	Narumon Bangchit		Dj Chongthong
	Supervisor		Senior Manager
	tel:08-616-9323-9495		tel:08-616-9323-9492

The above results are valid only for the purpose of information, it is not intended to be used as a legal document. The results of the test are not intended to be used as a legal document. The results of the test are not intended to be used as a legal document.

ADDRESS 616/0 Moo 5 T. Mueang Kho A. Phatthana Rajang 21140 Thailand / PHON: 081-6 304 8555 FAX: 081-6 3304 8556

ALL LABORATORY GROUP THAILAND CO., LTD. An ASIA United Company



Lot ID: 22140397
Date Received : Dec 24, 2022
Date Reported : Dec 27, 2022
Report Number : 2496039-2

Remark :
- LOD : Limit of Detection

The above materials are only valid for the analysis/evaluation purpose(s) as indicated in this report. No part of this report or its contents may be reproduced in any form without written consent from the Laboratory. AIC Laboratory Group (Thailand) strongly recommends that this report be used in accordance with its full.

Narumon Banchongjit
Supervisor

ADDRESS 616/10 Moo 5, T. Maenam Kh. A. Phukdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
AIC LABORATORY GROUP THAILAND CO., LTD. An AIC United Company

Life Sciences www.aicglobal.com

RIGHT SOLUTIONS. RIGHT PARTNER.

00000173 (ENGL)

01/06/2016, 09:45:19 (UTC+7)



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/6, Rongying Highway Road 3191, Map Ta Phut, Muang, Rayong Thailand 21150
P/O : DA402055
Project Name : Monitoring
Project Location : CLP 2

Lot ID: 22140402
Date Received : Dec 26, 2022
Date Reported : Dec 26, 2022
Report Number : 2495047-2
Page 1 of 1

Sample Number	22140402-1						
Sample Date	Dec 26, 2022 9:00 AM						
Sample Description	Wastewater						
Location	วสวตว/วสวตว/วสวตว/วสวตว (holding pond)						
Date Analysis Commenced	Dec 26, 2022						
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)						
Analysis	Unit	LOD	LOQ (LOB)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Dissolved Oxygen	mg/L	- 0.1	8.0	No	Standard	Standard Methods for the Examination of Water and Wastewater: APHA, 1995 & WEF, 23rd ed., 2017, para 450C-1 (C)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and
Effluent standard for factories and industrial park set by Notification of the Ministry of Industry dated June 07, B.E.2560 (2017).

Sampling By : Narumon thansamran vedasasorn > 323 & 947
Remark :
LOD : Limit of Detection
LOQ : Lower than LOQ (Limit of Quantitation) / LQR (Limit of Reporting)

Approved by
Narumon Banchongkit
Supervisor

ADDRESS 616/10 Moo 5, T. Maenam Kh. A. Phadkang Rongying 21140 Thailand | PHONE: +66 9 3304 8555 | FAX: +66 9 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/6, Rongying Highway Road 3191, Map Ta Phut, Muang, Rayong Thailand 21150
P/O : DA402055
Project Name : Monitoring
Project Location : CLP 2

Lot ID: 22140403
Date Received : Dec 30, 2022
Date Reported : Dec 30, 2022
Report Number : 2495049-1
Page 1 of 1

Sample Number	22140403-1						
Sample Date	Dec 30, 2022 8:57 AM						
Sample Description/Location	Wastewater						
Location	วสวตว/วสวตว/วสวตว/วสวตว (holding pond)						
Date Analysis Commenced	Dec 30, 2022						
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)						
Analysis	Unit	LOD	LOQ (LOD)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
pH at 25 degree C				7.9	5.5-8.0	Standard Methods for the Examination of Water and Wastewater: APHA, 1995 & WEF, 23rd ed., 2017, para 4500-1 (B)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and
Effluent standard for factories and industrial park set by Notification of the Ministry of Industry dated June 07, B.E.2560 (2017).

Sampling By : Chaiyamon Lertthanasakulchai vedasasorn > 323 & 946
Remark :
LOD : Limit of Detection
LOQ : Lower than LOQ (Limit of Quantitation) / LQR (Limit of Reporting)

Technical Manager
Narumon Banchongkit
Supervisor

Approved by
Duj Changhuan
Senior Manager

ADDRESS 616/10 Moo 5, T. Maenam Kh. A. Phadkang Rongying 21140 Thailand | PHONE: +66 9 3304 8555 | FAX: +66 9 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/6, Rongying Highway Road 3191, Map Ta Phut, Muang, Rayong Thailand 21150
P/O : DA402055
Project Name : Monitoring
Project Location : CLP 2

Lot ID: 22140403
Date Received : Dec 30, 2022
Date Reported : Dec 30, 2022
Report Number : 2495049-2
Page 1 of 1

Sample Number	22140403-1						
Sample Date	Dec 30, 2022 8:57 AM						
Sample Description	Wastewater						
Location	วสวตว/วสวตว/วสวตว/วสวตว (holding pond)						
Date Analysis Commenced	Dec 30, 2022						
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)						
Analysis	Unit	LOD	LOQ	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Dissolved Oxygen	mg/L	-	0.1	7.8	No Standard	Standard Methods for the Examination of Water and Wastewater: APHA, 1995 & WEF, 23rd ed., 2017, para 450C-1 (C)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and
Effluent standard for factories and industrial park set by Notification of the Ministry of Industry dated June 07, B.E.2560 (2017).

Sampling By : Chaiyamon Lertthanasakulchai vedasasorn > 323 & 946
Remark :
LOD : Limit of Detection
LOQ : Lower than LOQ (Limit of Quantitation) / LQR (Limit of Reporting)

Approved by
Narumon Banchongkit
Supervisor

ADDRESS 616/10 Moo 5, T. Maenam Kh. A. Phadkang Rongying 21140 Thailand | PHONE: +66 9 3304 8555 | FAX: +66 9 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/6, Rongying Highway Road 3191, Map Ta Phut, Muang, Rayong Thailand 21150
P/O : DA402056
Project Name : Monitoring
Project Location : CLP 2

Lot ID: 22140404
Date Received : Dec 31, 2022
Date Reported : Jan 04, 2023
Report Number : 2495050-1
Page 1 of 1

Sample Number	22140404-1						
Sample Date	Dec 31, 2022 8:55 AM						
Sample Description	Wastewater						
Location	วสวตว/วสวตว/วสวตว/วสวตว (holding pond)						
Date Analysis Commenced	Dec 31, 2022						
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)						
Analysis	Unit	LOD	LOQ	Result	Guideline / Specification	Method	Testing Location
Water Testing							
pH at 25 degree C	-	-	-	7.6	5.5-9.0	Standard Methods for the Examination of Water and Wastewater: APHA, 1995 & WEF, 23rd ed., 2017, para 4500-1 (B)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and
Effluent standard for factories and industrial park set by Notification of the Ministry of Industry dated June 07, B.E.2560 (2017).

Sampling By : Pattanaporn Kormarn vedasasorn > 323 & 948
Remark :
LOD : Limit of Detection
LOQ : Lower than LOQ (Limit of Quantitation) / LQR (Limit of Reporting)

Approved by
Duj Changhuan
Senior Manager

ADDRESS 616/10 Moo 5, T. Maenam Kh. A. Phadkang Rongying 21140 Thailand | PHONE: +66 9 3304 8555 | FAX: +66 9 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/6, Rongying Highway Road 3191, Map Ta Phut, Muang, Rayong Thailand 21150
P/O : DA402056
Project Name : Monitoring
Project Location : CLP 2

Lot ID: 22140404
Date Received : Dec 31, 2022
Date Reported : Jan 04, 2023
Report Number : 2495050-2
Page 1 of 1

Sample Number							22140404-1
Sample Date							Dec 31, 2022 8:55 AM
Sample Description							Wastewater
Location							วสวตว/วสวตว/วสวตว/วสวตว (holding pond)
Date Analysis Commenced							Jan 03, 2023
Condition of Sample							Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)
Analysis	Unit	LOD	LOQ (LOB)	Results	Guideline / Specification	Method	Testing Location
Water Testing							
Dissolved Oxygen	mg/L	-	0.1	7.2	No Standard	Standard Methods for the Examination of Water and Wastewater: APHA, 1995 & WEF, 23rd ed., 2017, para 4500-1 (C)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and
Effluent standard for factories and industrial park set by Notification of the Ministry of Industry dated June 07, B.E.2560 (2017).

Sampling By : Pattanaporn Kormarn vedasasorn > 323 & 948
Remark :
LOD : Limit of Detection
LOQ : Lower than LOQ (Limit of Quantitation) / LQR (Limit of Reporting)

Approved by
Narumon Banchongkit
Supervisor

ADDRESS 616/10 Moo 5, T. Maenam Kh. A. Phadkang Rongying 21140 Thailand | PHONE: +66 9 3304 8555 | FAX: +66 9 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CLP 2



TESTING
No.0042
Lot ID: 2281915
Date Received : Jul 25, 2022
Date Reported : Aug 02, 2022
Report Number : 2363205-1

Page 1 of 4

Sample Number	2281915-1						
Sample Date	Jul 25, 2022 9:30 AM						
Sample Description	Surface water						
Location	คลองห้วยใหญ่/คลองโกลา/พื้นที่ 500 เมตร						
Date Analysis Commenced	Jul 25, 2022						
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOB)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	5.9	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C	-	-	-	6.6	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	29.7	n ⁱ	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	91	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
nⁱ: Change from Natural condition not more than 3 degree C
Sampled By : Tanasit Wongachai

Remark :
- LOD : Limit of Detection
- "nⁱ" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Approved by

N. Bangnit

Narumon Banchoangkit
Supervisor

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phukdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556

ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
www.alsglobal.com
RIGHT SOLUTIONS. RIGHT PARTNERS
6403-7U EN0L S:\Report\AL_GL.rpt (2:40PM)



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CLP 2



TESTING
No.0042
Lot ID: 2281915
Date Received : Jul 25, 2022
Date Reported : Aug 02, 2022
Report Number : 2363205-1

Page 3 of 4

Sample Number	2281915-3						
Sample Date	Jul 25, 2022 9:15 AM						
Sample Description	Surface water						
Location	คลองห้วยใหญ่/คลองโกลา/พื้นที่ 500 เมตร						
Date Analysis Commenced	Jul 25, 2022						
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOB)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	6.4	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C	-	-	-	7.0	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	29.8	n ⁱ	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	250	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
nⁱ: Change from Natural condition not more than 3 degree C
Sampled By : Tanasit Wongachai

Remark :
- LOD : Limit of Detection
- "nⁱ" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Approved by

N. Bangnit

Narumon Banchoangkit
Supervisor

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phukdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556

ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
www.alsglobal.com
RIGHT SOLUTIONS. RIGHT PARTNERS
6403-7U EN0L S:\Report\AL_GL.rpt (2:40PM)



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CLP 2



TESTING
No.0042
Lot ID: 2281915
Date Received : Jul 25, 2022
Date Reported : Aug 02, 2022
Report Number : 2363205-1

Page 2 of 4

Sample Number	2281915-2						
Sample Date	Jul 25, 2022 9:24 AM						
Sample Description	Surface water						
Location	คลองห้วยใหญ่/คลองโกลา/พื้นที่ 500 เมตร						
Date Analysis Commenced	Jul 25, 2022						
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOB)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	8.2	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C	-	-	-	6.9	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	29.7	n ⁱ	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	130	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
nⁱ: Change from Natural condition not more than 3 degree C
Sampled By : Tanasit Wongachai

Remark :
- LOD : Limit of Detection
- "nⁱ" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Approved by

N. Bangnit

Narumon Banchoangkit
Supervisor

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phukdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556

ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
www.alsglobal.com
RIGHT SOLUTIONS. RIGHT PARTNERS
6403-7U EN0L S:\Report\AL_GL.rpt (2:40PM)



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CLP 2



TESTING
No.0042
Lot ID: 2281915
Date Received : Jul 25, 2022
Date Reported : Aug 02, 2022
Report Number : 2363205-1

Page 4 of 4

Sample Number	2281915-4						
Sampled Date	Jul 25, 2022 9:52 AM						
Sample Description	Surface water						
Location	คลองห้วยใหญ่/คลองโกลา/พื้นที่ 2,000 เมตร						
Date Analysis Commenced	Jul 25, 2022						
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOB)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	4	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	6.7	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C	-	-	-	7.5	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	29.8	n ⁱ	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	900	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
nⁱ: Change from Natural condition not more than 3 degree C
Sampled By : Tanasit Wongachai

Remark :
- LOD : Limit of Detection
- "nⁱ" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Approved by

N. Bangnit

Narumon Banchoangkit
Supervisor

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phukdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556

ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
www.alsglobal.com
RIGHT SOLUTIONS. RIGHT PARTNERS
6403-7U EN0L S:\Report\AL_GL.rpt (2:40PM)



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CLP 2



TESTING
No.0042
Lot ID: 2292513
Date Received : Aug 18, 2022
Date Reported : Aug 25, 2022
Report Number : 2387552-1

Page 1 of 4

Sample Number	2292513-1						
Sample Date	Aug 18, 2022 9:50 AM						
Sample Description	Surface water						
Location	คลองห้วยใหญ่/คลองน้ำตื้น 500 เมตร						
Date Analysis Commenced	Aug 18, 2022						
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOB)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	4.5	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C	-	-	-	7.6	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	29.3	n/	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	72	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n/ : Change from Natural condition not more than 3 degree C
Sampled By : Narunat thammassaro

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * /are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Approved by

N. Bangmit

Narumon Banchoangkit
Supervisor

The above results are valid only for the analysed/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.



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CLP 2



TESTING
No.0042
Lot ID: 2292513
Date Received : Aug 18, 2022
Date Reported : Aug 25, 2022
Report Number : 2387552-1

Page 2 of 4

Sample Number	2292513-2						
Sample Date	Aug 18, 2022 9:30 AM						
Sample Description	Surface water						
Location	คลองห้วยใหญ่/คลองน้ำตื้น 500 เมตร						
Date Analysis Commenced	Aug 18, 2022						
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOB)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	5.3	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C	-	-	-	7.3	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	29.1	n/	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	66	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n/ : Change from Natural condition not more than 3 degree C
Sampled By : Narunat thammassaro

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * /are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Approved by

N. Bangmit

Narumon Banchoangkit
Supervisor

The above results are valid only for the analysed/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.



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CLP 2



TESTING
No.0042
Lot ID: 2292513
Date Received : Aug 18, 2022
Date Reported : Aug 25, 2022
Report Number : 2387552-1

Page 3 of 4

Sample Number	2292513-3							Page 2 of 2
Sample Date	Aug 18, 2022 9:20 AM							
Sample Description	Surface water							
Location	คลองห้วยใหญ่/จุดเก็บน้ำที่ 500 เมตร							
Date Analysis Commenced	Aug 18, 2022							
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)							
Analyte	Unit	LOD	LOQ (LOB)	Result	Guideline / Specification	Method	Testing Location	
Water Testing								
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong	
Dissolved Oxygen *	mg/L	-	0.1	5.0	≥2	Based on APHA (2017), 4500-O(C)	Rayong	
pH at 25 degree C	-	-	-	7.8	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong	
Temperature *	Degree C	-	-	29.7	n/	Based on APHA (2017), 2550 B	Rayong	
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	136	No Standard	APHA (2017), 2540 C	Rayong	

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n/ : Change from Natural condition not more than 3 degree C
Sampled By : Narunat thammassaro

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * /are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Approved by

N. Bangmit

Narumon Banchoangkit
Supervisor

The above results are valid only for the analysed/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.



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CLP 2



TESTING
No.0042
Lot ID: 2292513
Date Received : Aug 18, 2022
Date Reported : Aug 25, 2022
Report Number : 2387552-1

Page 4 of 4

Sample Number	2292513-4						
Sample Date	Aug 18, 2022 10:05 AM						
Sample Description	Surface water						
Location	คลองห้วยใหญ่/คลองน้ำตื้น 2,000 เมตร						
Date Analysis Commenced	Aug 18, 2022						
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOB)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	6.6	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C	-	-	-	8.1	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	30.2	n/	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degrees C	mg/L	-	5	712	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n/ : Change from Natural condition not more than 3 degree C
Sampled By : Narunat thammassaro

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * /are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Approved by

N. Bangmit

Narumon Banchoangkit
Supervisor

The above results are valid only for the analysed/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.



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CLP 2

TESTING
No.0042
Lot ID: 2297386
Date Received : Sep 28, 2022
Date Reported : Oct 05, 2022
Report Number : 2398991-1

Page 1 of 4

Sample Number	2297386-1						
Sample Date	Sep 28, 2022 9:30 AM						
Sample Description	Surface water						
Location	คลองห้วยใหญ่/ตำบลนาโพธิ์ 500 เมตร						
Date Analysis Commenced	Sep 28, 2022						
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOB)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	6.8	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C	-	-	-	7.0	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	27.3	n ⁱ	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	106	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
nⁱ: Change from Natural condition not more than 3 degree C
Sampled By : Wanlop Hunchanaow

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

Approved by

N. Bangnit

Narumon Banchoangkit
Supervisor

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phukdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNERS

6403-7U EN0L

S:\Report\AL_GL.rpt (9/27/80)



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CLP 2

TESTING
No.0042
Lot ID: 2297386
Date Received : Sep 28, 2022
Date Reported : Oct 05, 2022
Report Number : 2398991-1

Page 3 of 4

Sample Number	2297386-3						
Sample Date	Sep 28, 2022 9:15 AM						
Sample Description	Surface water						
Location	คลองห้วยใหญ่จุดตรวจน้ำดิบ 500 เมตร						
Date Analysis Commenced	Sep 28, 2022						
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOB)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	6.8	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C	-	-	-	6.8	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	27.3	n ⁱ	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	113	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
nⁱ: Change from Natural condition not more than 3 degree C
Sampled By : Wanlop Hunchanaow

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

Approved by

N. Bangnit

Narumon Banchoangkit
Supervisor

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phukdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNERS

6403-7U EN0L

S:\Report\AL_GL.rpt (9/27/80)



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CLP 2

TESTING
No.0042
Lot ID: 2297386
Date Received : Sep 28, 2022
Date Reported : Oct 05, 2022
Report Number : 2398991-1

Page 2 of 4

Sample Number	2297386-2						
Sample Date	Sep 28, 2022 9:20 AM						
Sample Description	Surface water						
Location	คลองห้วยใหญ่จุดตรวจน้ำดิบ						
Date Analysis Commenced	Sep 28, 2022						
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOB)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	7.0	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C	-	-	-	6.9	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	27.4	n ⁱ	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	111	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
nⁱ: Change from Natural condition not more than 3 degree C
Sampled By : Wanlop Hunchanaow

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

Approved by

N. Bangnit

Narumon Banchoangkit
Supervisor

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phukdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNERS

6403-7U EN0L

S:\Report\AL_GL.rpt (9/27/80)



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CLP 2

TESTING
No.0042
Lot ID: 2297386
Date Received : Sep 28, 2022
Date Reported : Oct 05, 2022
Report Number : 2398991-1

Page 4 of 4

Sample Number	2297386-4							Page 1 of 1
Sample Date	Sep 28, 2022 10:00 AM							
Sample Description	Surface water							
Location	คลองห้วยใหญ่จุดตรวจน้ำดิบ 2,000 เมตร							
Date Analysis Commenced	Sep 28, 2022							
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)							
Analyte	Unit	LOD	LOQ (LOB)	Result	Guideline / Specification	Method	Testing Location	
Water Testing								
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong	
Dissolved Oxygen *	mg/L	-	0.1	7.4	≥2	Based on APHA (2017), 4500-O(C)	Rayong	
pH at 25 degree C	-	-	-	7.0	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong	
Temperature *	Degree C	-	-	28.1	n ⁱ	Based on APHA (2017), 2550 B	Rayong	
Total Dissolved Solids Dried at 180 degrees C	mg/L	-	5	214	No Standard	APHA (2017), 2540 C	Rayong	

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
nⁱ: Change from Natural condition not more than 3 degree C
Sampled By : Wanlop Hunchanaow

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

Approved by

N. Bangnit

Narumon Banchoangkit
Supervisor

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phukdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNERS

6403-7U EN0L

S:\Report\AL_GL.rpt (9/27/80)



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CLP 2

TESTING
No.0042
Lot ID: 22110026
Date Received : Oct 17, 2022
Date Reported : Oct 24, 2022
Report Number : 2425030-1

Page 1 of 4

Sample Number	22110026-1							Page 1 of 2
Sampled Date	Oct 17, 2022 10:00 AM							
Sample Description	Surface water							
Location	คลองห้วยใหญ่/ถนนไทรบุรี 500 เมตร							
Date Analysis Commenced	Oct 17, 2022							
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)							
Analyte	Unit	LOD	LOQ (LOB)	Result	Guideline / Specification	Method	Testing Location	
Water Testing								
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong	
Dissolved Oxygen *	mg/L	-	0.1	7.1	≥2	Based on APHA (2017), 4500-O(C)	Rayong	
pH at 25 degree C	-	-	-	6.7	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong	
Temperature *	Degree C	-	-	26.7	Not Change from natural condition	Based on APHA (2017), 2550 B	Rayong	
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	76	No Standard	APHA (2017), 2540 C	Rayong	

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n: Change from Natural condition not more than 3 degree C
Sampled By : Chainorn Lertnathakunchai

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



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CLP 2

TESTING
No.0042
Lot ID: 22110026
Date Received : Oct 17, 2022
Date Reported : Oct 24, 2022
Report Number : 2425030-1

Page 2 of 4

Sample Number	22110026-2							Page 3 of 3
Sampled Date	Oct 17, 2022 9:55 AM							
Sample Description	Surface water							
Location	คลองห้วยใหญ่/ถนนไทรบุรี 500 เมตร							
Date Analysis Commenced	Oct 17, 2022							
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)							
Analyte	Unit	LOD	LOQ (LOB)	Result	Guideline / Specification	Method	Testing Location	
Water Testing								
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong	
Dissolved Oxygen *	mg/L	-	0.1	7.6	≥2	Based on APHA (2017), 4500-O(C)	Rayong	
pH at 25 degree C	-	-	-	7.0	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong	
Temperature *	Degree C	-	-	27.0	Not Change from natural condition	Based on APHA (2017), 2550 B	Rayong	
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	79	No Standard	APHA (2017), 2540 C	Rayong	

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n: Change from Natural condition not more than 3 degree C
Sampled By : Chainorn Lertnathakunchai

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

The above results are valid only for the analysed/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

N. Bangnit

Narumon Banchoangkit
Supervisor

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phukdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNERS

6403-7U EN0L

S:\Report\AL_LB_01 (1.539M)

The above results are valid only for the analysed/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

N. Bangnit

Narumon Banchoangkit
Supervisor

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phukdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNERS

6403-7U EN0L

S:\Report\AL_LB_01 (1.539M)



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CLP 2

TESTING
No.0042
Lot ID: 22110026
Date Received : Oct 17, 2022
Date Reported : Oct 24, 2022
Report Number : 2425030-1

Page 3 of 4

Sample Number	22110026-3						
Sampled Date	Oct 17, 2022 9:45 AM						
Sample Description	Surface water						
Location	คลองห้วยใหญ่/ถนนไทรบุรี 500 เมตร						
Date Analysis Commenced	Oct 17, 2022						
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOB)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	7.4	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C	-	-	-	7.0	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	26.9	Not Change from natural condition	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 Degree C	mg/L	-	5	108	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n: Change from Natural condition not more than 3 degree C
Sampled By : Chainorn Lertnathakunchai

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



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CLP 2

TESTING
No.0042
Lot ID: 22110026
Date Received : Oct 17, 2022
Date Reported : Oct 24, 2022
Report Number : 2425030-1

Page 4 of 4

Sample Number	22110026-4						
Sampled Date	Oct 17, 2022 10:10 AM						
Sample Description	Surface water						
Location	คลองห้วยใหญ่/ถนนไทรบุรี 2,000 เมตร						
Date Analysis Commenced	Oct 17, 2022						
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOB)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	7.6	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C	-	-	-	7.2	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	27.9	Not Change from natural condition	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	388	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n: Change from Natural condition not more than 3 degree C
Sampled By : Chainorn Lertnathakunchai

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

The above results are valid only for the analysed/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

N. Bangnit

Narumon Banchoangkit
Supervisor

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phukdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNERS

6403-7U EN0L

S:\Report\AL_LB_01 (1.539M)

The above results are valid only for the analysed/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

N. Bangnit

Narumon Banchoangkit
Supervisor

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phukdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNERS

6403-7U EN0L

S:\Report\AL_LB_01 (1.539M)



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CLP 2

TESTING
No.0042
Lot ID: 22123091
Date Received : Nov 08, 2022
Date Reported : Nov 14, 2022
Report Number : 2455866-1

Page 1 of 4

Sample Number	22123091-1
Sample Date	Nov 08, 2022 9:20 AM
Sample Description	Surface water
Location	คลองห้วยใหญ่/ถนนไทรบุรี 500 เมตร
Date Analysis Commenced	Nov 08, 2022
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOB)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	5.4	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C	-	-	-	7.4	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	26.8	Not Change from natural condition	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	76	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n: Change from Natural condition not more than 3 degree C
Sampled By : Chainorn Lertnathakunchai

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

Approved by

N. Bangmit

Narumon Banchoangkit
Supervisor



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CLP 2

TESTING
No.0042
Lot ID: 22123091
Date Received : Nov 08, 2022
Date Reported : Nov 14, 2022
Report Number : 2455866-1

Page 2 of 4

Sample Number	22123091-2
Sample Date	Nov 08, 2022 9:10 AM
Sample Description	Surface water
Location	คลองห้วยใหญ่/ถนนไทรบุรี 500 เมตร
Date Analysis Commenced	Nov 08, 2022
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOB)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	6.5	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C	-	-	-	7.1	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	26.9	Not Change from natural condition	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	84	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n: Change from Natural condition not more than 3 degree C
Sampled By : Chainorn Lertnathakunchai

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

Approved by

N. Bangmit

Narumon Banchoangkit
Supervisor



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CLP 2

TESTING
No.0042
Lot ID: 22123091
Date Received : Nov 08, 2022
Date Reported : Nov 14, 2022
Report Number : 2455866-1

Page 3 of 4

Sample Number	22123091-3
Sample Date	Nov 08, 2022 9:00 AM
Sample Description	Surface water
Location	คลองห้วยใหญ่/ถนนไทรบุรี 500 เมตร
Date Analysis Commenced	Nov 08, 2022
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOB)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	6.0	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C	-	-	-	7.3	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	27.0	Not Change from natural condition	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	120	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n: Change from Natural condition not more than 3 degree C
Sampled By : Chainorn Lertnathakunchai

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

Approved by

N. Bangmit

Narumon Banchoangkit
Supervisor



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CLP 2

TESTING
No.0042
Lot ID: 22123091
Date Received : Nov 08, 2022
Date Reported : Nov 14, 2022
Report Number : 2455866-1

Page 4 of 4

Sample Number	22123091-4
Sample Date	Nov 08, 2022 10:00 AM
Sample Description	Surface water
Location	คลองห้วยใหญ่/ถนนไทรบุรี 2,000 เมตร
Date Analysis Commenced	Nov 08, 2022
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOB)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	7.4	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C	-	-	-	7.6	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	28.4	Not Change from natural condition	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	448	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n: Change from Natural condition not more than 3 degree C
Sampled By : Chainorn Lertnathakunchai

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

Approved by

N. Bangmit

Narumon Banchoangkit
Supervisor



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O : D441002956
Project Name : Monitoring
Project Location : CLP 2

TESTING
No.0042
Lot ID: 22140289
Date Received : Dec 13, 2022
Date Reported : Dec 20, 2022
Report Number : 2495227-1

Page 1 of 4

Sample Number	22140289-1						
Sampled Date	Dec 13, 2022 9:20 AM						
Sample Description	Surface water						
Location	คลองห้วยใหญ่/คลองนาพันห้า 500 เมตร						
Date Analysis Commenced	Dec 13, 2022						
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOB)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	6.2	≥2	Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 23rd ed., 2017, part 4500-O (C)	Rayong
pH at 25 degree C				7.4	5.0-9.0	In-house method : STM 02-005 based on Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	25.8	Not Change from natural condition	Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L		5	75	No Standard	Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n: Change from Natural condition not more than 3 degree C
Sampling By : Chaiusorn Lertmanthakunchai โทร:09-0957323-9461

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

The above results are valid only for the analysed/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

N. Bangmit
Narumon Banchoangkit
Supervisor

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phukdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNERS

64037U EN0L

S:\Report\AL_GL_rpt (6-45PM)



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O : D441002956
Project Name : Monitoring
Project Location : CLP 2

TESTING
No.0042
Lot ID: 22140289
Date Received : Dec 13, 2022
Date Reported : Dec 20, 2022
Report Number : 2495227-1

Page 3 of 4

Sample Number	22140289-3							Page 1 of 1
Sampled Date	Dec 13, 2022 9:00 AM							
Sample Description	Surface water							
Location	คลองห้วยใหญ่/คลองนาพันห้า 500 เมตร							
Date Analysis Commenced	Dec 13, 2022							
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)							
Analyte	Unit	LOD	LOQ (LOB)	Result	Guideline / Specification	Method	Testing Location	
Water Testing								
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B	Rayong	
Dissolved Oxygen *	mg/L	-	0.1	6.3	≥2	Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 23rd ed., 2017, part 4500-O (C)	Rayong	
pH at 25 degree C	-	-	-	7.1	5.0-9.0	In-house method : STM 02-005 based on Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong	
Temperature *	Degree C	-	-	26.2	Not Change from natural condition	Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong	
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	176	No Standard	Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong	

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n: Change from Natural condition not more than 3 degree C
Sampling By : Chaiusorn Lertmanthakunchai โทร:09-0957323-9461

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

The above results are valid only for the analysed/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

N. Bangmit
Narumon Banchoangkit
Supervisor

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phukdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNERS

64037U EN0L

S:\Report\AL_GL_rpt (6-45PM)



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O : D441002956
Project Name : Monitoring
Project Location : CLP 2

TESTING
No.0042
Lot ID: 22140289
Date Received : Dec 13, 2022
Date Reported : Dec 20, 2022
Report Number : 2495227-1

Page 2 of 4

Sample Number	22140289-2						
Sampled Date	Dec 13, 2022 9:10 AM						
Sample Description	Surface water						
Location	คลองห้วยใหญ่/คลองนาพันห้า						
Date Analysis Commenced	Dec 13, 2022						
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOB)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	7.4	≥2	Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 23rd ed., 2017, part 4500-O (C)	Rayong
pH at 25 degree C	-	-	-	7.2	5.0-9.0	In-house method : STM 02-005 based on Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	25.6	Not Change from natural condition	Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	77	No Standard	Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n: Change from Natural condition not more than 3 degree C
Sampling By : Chaiusorn Lertmanthakunchai โทร:09-0957323-9461

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

The above results are valid only for the analysed/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

N. Bangmit
Narumon Banchoangkit
Supervisor

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phukdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNERS

64037U EN0L

S:\Report\AL_GL_rpt (6-45PM)



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O : D441002956
Project Name : Monitoring
Project Location : CLP 2

TESTING
No.0042
Lot ID: 22140289
Date Received : Dec 13, 2022
Date Reported : Dec 20, 2022
Report Number : 2495227-1

Page 4 of 4

Sample Number	22140289-4							page 4 of 4
Sampled Date	Dec 13, 2022 10:20 AM							
Sample Description	Surface water							
Location	คลองนาพันห้า/คลองห้วยใหญ่ประมาณ 2,000 เมตร							
Date Analysis Commenced	Dec 13, 2022							
Condition of Sample	Contained in one BOD bottle and two 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	<2	≤4	Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B	Rayong	
Dissolved Oxygen *	mg/L	-	0.1	7.7	≥2	Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 23rd ed., 2017, part 4500-O (C)	Rayong	
pH at 25 degree C	-	-	-	7.4	5.0-9.0	In-house method : STM 02-005 based on Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong	
Temperature *	Degree C	-	-	27.0	Not Change from natural condition	Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong	
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	1056	No Standard	Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong	

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n: Change from Natural condition not more than 3 degree C
Sampling By : Chaiusorn Lertmanthakunchai โทร:09-0957323-9461

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

The above results are valid only for the analysed/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

N. Bangmit
Narumon Banchoangkit
Supervisor

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phukdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNERS

64037U EN0L

S:\Report\AL_GL_rpt (6-45PM)



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand
21150

P/O :

Project Name : Monitoring

Project Location : CUP 2

Lot ID: 22107321

Date Received : Sep 15, 2022

Date Reported : Sep 19, 2022

Report Number: 2419138-1

Page 1 of 6

Sample Number	22107321-1				
Parameter	Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)				
Measurement Date	Sep 15, 2022				
Measurement by	Natthapon Jitwareewong				
Location	ปฏิบัติงาน 1 ชั่วโมง (ค่ามาตรฐาน ปฏิบัติงาน : - ตาม :-)				

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
Auxiliary Boiler	120	31.5	30.0	35.7	33.8
Average (WBGT)		31.5			
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

Supt S.

Supot Salameh
Section Head

Approved by

Wichan Choonharat

Wichan Choonharat
Assistant Manager

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 with out written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 Thailand | PHONE +66 0 2760 3000 | FAX +66 0 2760 3197
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences

RIGHT SOLUTIONS RIGHT PARTNER

6403-71 / EMAIL

S:Report_Air Heat.pdf (1.459M)



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand
21150

P/O :

Project Name : Monitoring

Project Location : CUP 2

Lot ID: 22107321

Date Received : Sep 15, 2022

Date Reported : Sep 19, 2022

Report Number: 2419138-1

Page 2 of 6

Sample Number	22107321-2				
Parameter	Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)				
Measurement Date	Sep 15, 2022				
Measurement by	Natthapon Jitwareewong				
Location	ปฏิบัติงาน 1 ชั่วโมง (ค่ามาตรฐาน ปฏิบัติงาน : - ตาม :-)				

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
HRS# #1	120	28.6	26.4	33.9	33.7
Average (WBGT)		28.6			
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

Supt S.

Supot Salameh
Section Head

Approved by

Wichan Choonharat

Wichan Choonharat
Assistant Manager

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 with out written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 Thailand | PHONE +66 0 2760 3000 | FAX +66 0 2760 3197
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences

RIGHT SOLUTIONS RIGHT PARTNER

6403-71 / EMAIL

S:Report_Air Heat.pdf (1.459M)



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand
21150

P/O :

Project Name : Monitoring

Project Location : CUP 2

Lot ID: 22107321

Date Received : Sep 15, 2022

Date Reported : Sep 19, 2022

Report Number: 2419138-1

Page 3 of 6

Sample Number	22107321-3				
Parameter	Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)				
Measurement Date	Sep 15, 2022				
Measurement by	Natthapon Jitwareewong				
Location	ปฏิบัติงาน 1 ชั่วโมง (ค่ามาตรฐาน ปฏิบัติงาน : - แดด : -)				

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
HSG #2	120	28.8	26.7	33.8	33.5
Average (WBGT)		28.8			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

- 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)
- 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

Supt S.

Supot Salameh
Section Head

Approved by

Wichan Choonharat

Wichan Choonharat
Assistant Manager

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.

ADDRESS 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 Thailand | PHONE +66 0 2760 3000 | FAX +66 0 2760 3197
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences

RIGHT SOLUTIONS RIGHT PARTNER

6403-71 / EMAIL

S:Report_Air Heat.pdf (1.459M)



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand
21150

P/O :

Project Name : Monitoring

Project Location : CUP 2

Lot ID: 22107321

Date Received : Sep 15, 2022

Date Reported : Sep 19, 2022

Report Number: 2419138-1

Page 4 of 6

Sample Number	22107321-4				
Parameter	Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)				
Measurement Date	Sep 15, 2022				
Measurement by	Natthapon Jitwareewong				
Location	ปฏิบัติงาน 1 ชั่วโมง (ค่ามาตรฐาน ปฏิบัติงาน : - แดด : -)				

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
GTG #1	120	31.1	26.6	45.3	33.9
Average (WBGT)		31.1			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

- 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)
- 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

Supt S.

Supot Salameh
Section Head

Approved by

Wichan Choonharat

Wichan Choonharat
Assistant Manager

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.

ADDRESS 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 Thailand | PHONE +66 0 2760 3000 | FAX +66 0 2760 3197
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences

RIGHT SOLUTIONS RIGHT PARTNER

6403-71 / EMAIL

S:Report_Air Heat.pdf (1.459M)



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand
21150

P/O :

Project Name : Monitoring

Project Location : CUP 2

Lot ID: 22107321

Date Received : Sep 15, 2022

Date Reported : Sep 19, 2022

Report Number: 2419138-1

Page 5 of 6

Sample Number	22107321-5				
Parameter	Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)				
Measurement Date	Sep 15, 2022				
Measurement by	Natthapon Jitwareewong				
Location	ปฏิบัติงาน 1 ชั่วโมง (ค่ามาตรฐาน ปฏิบัติงาน : - แดด : -)				

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
GTG #2	120	30.2	27.1	38.6	35.3
Average (WBGT)		30.2			
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

Supt S.

Supot Salamteh
Section Head

Approved by

Wichan Choonharat

Wichan Choonharat
Assistant Manager

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.

ADDRESS 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 Thailand | PHONE +66 0 2760 3000 | FAX +66 0 2760 3197
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

6403-71 / EMAIL

S:Report_Air Heat.pdf (1.459M)



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand
21150

P/O :

Project Name : Monitoring

Project Location : CUP 2

Lot ID: 22107321

Date Received : Sep 15, 2022

Date Reported : Sep 19, 2022

Report Number: 2419138-1

Page 6 of 6

Sample Number	22107321-6				
Parameter	Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)				
Measurement Date	Sep 15, 2022				
Measurement by	Natthapon Jitwareewong				
Location	ปฏิบัติงาน 1 ชั่วโมง (ค่ามาตรฐาน ปฏิบัติงาน : - แดด : -)				

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
STG #1	120	29.6	26.9	35.8	35.5
Average (WBGT)		29.6			
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

Supt S.

Supot Salamteh
Section Head

Approved by

Wichan Choonharat

Wichan Choonharat
Assistant Manager

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.

ADDRESS 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 Thailand | PHONE +66 0 2760 3000 | FAX +66 0 2760 3197
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

6403-71 / EMAIL

S:Report_Air Heat.pdf (1.459M)

ภาคผนวก ง

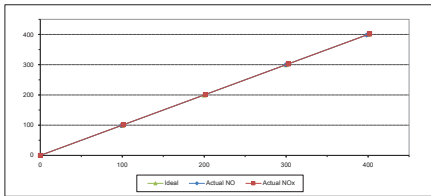
ใบรับรองการสอบเทียบเครื่องมือ



MULTIPOINT CALIBRATION REPORT

Calibration Date	1-Jul-22	Equipment Name	NiCr Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	R080177	Equipment ID	RYG_FS0463
Calibrator/Manufacturer	Teledyne API	Model	700
Serial No.	947	Cylinder No.	GN0227222
Std. Gas Concentration (PPM)	66.68	Certified By	Algas Inc.
Cylinder Pressure (psi)	1800	Expiry Date	9-Feb-30
Certified Date	9-Feb-22		

Point	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	101.10	1.10	1.10
2	200.00	201.80	1.80	0.90	201.50	1.50	0.75
3	300.00	299.40	-0.60	-0.20	302.80	2.80	0.93
4	400.00	398.10	-1.90	-0.47	401.90	1.90	0.47
AVERAGE (%)				-0.18			0.86



Calibrated By

(Mr. Arunod. Saitam)

Field Environmental Scientist (S)

Approved By

(Mr. Saravuth. Jitranont)

Assistant General Manager

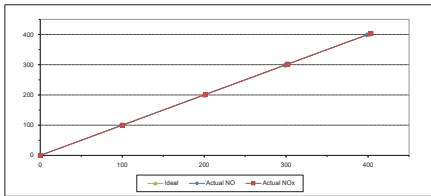
ALS Laboratory Group
FORM NO. F-06-596 REVISION NO. - ISSUE DATE: 02/04/12



MULTIPOINT CALIBRATION REPORT

Calibration Date	1-Jul-22	Equipment Name	NiCr Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	T080177	Equipment ID	RYG_FS0461
Calibrator/Manufacturer	Teledyne API	Model	700
Serial No.	947	Cylinder No.	GN0227222
Std. Gas Concentration (PPM)	66.68	Certified By	Algas Inc.
Cylinder Pressure (psi)	1800	Expiry Date	9-Feb-30
Certified Date	9-Feb-22		

Point	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	98.70	-1.30	-1.30	100.10	0.10	0.10
2	200.00	201.00	1.00	0.50	201.40	1.40	0.70
3	300.00	298.30	-1.70	-0.57	302.10	2.10	0.70
4	400.00	398.40	-1.60	-0.40	403.50	3.50	0.88
AVERAGE (%)				-0.33			0.80



Calibrated By

(Mr. Arunod. Saitam)

Field Environmental Scientist (S)

Approved By

(Mr. Saravuth. Jitranont)

Assistant General Manager

ALS Laboratory Group
FORM NO. F-06-596 REVISION NO. - ISSUE DATE: 02/04/12



63/14-15.67/35-36, Soi Petchkasem 7/71, Petchkasem Rd,
Wattana, Bangkok 10600 Thailand.
Tel: (66) 02-868081213 Fax: (66) 02-8680860 www.jnacrates.com

CERTIFICATE OF CALIBRATION

Certificate No. NIS-13072021
Page 1 of 2 pages

Measurement Date	1-Jul-22	Equipment Name	NiCr Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	R080177	Equipment ID	RYG_FS0463
Calibrator/Manufacturer	Teledyne API	Model	700
Serial No.	947	Cylinder No.	GN0227222
Std. Gas Concentration (PPM)	66.68	Certified By	Algas Inc.
Cylinder Pressure (psi)	1800	Expiry Date	9-Feb-30
Certified Date	9-Feb-22		

Test Results

1. Nitrogen (N2) concentration: 99.99% (v/v)

2. Oxygen (O2) concentration: 20.99% (v/v)

3. Carbon Dioxide (CO2) concentration: 0.05% (v/v)

4. Water Vapor (H2O) concentration: 1.00% (v/v)

5. Sulfur Dioxide (SO2) concentration: 0.01% (v/v)

6. Nitric Oxide (NO) concentration: 0.10 ppm (v/v)

7. Nitrogen Dioxide (NO2) concentration: 0.10 ppm (v/v)

8. Carbon Monoxide (CO) concentration: 0.01 ppm (v/v)

9. Hydrogen Sulfide (H2S) concentration: 0.01 ppm (v/v)

10. Ammonia (NH3) concentration: 0.01 ppm (v/v)

11. Hydrogen Cyanide (HCN) concentration: 0.01 ppm (v/v)

12. Hydrogen Fluoride (HF) concentration: 0.01 ppm (v/v)

13. Hydrogen Chloride (HCl) concentration: 0.01 ppm (v/v)

14. Hydrogen Bromide (HBr) concentration: 0.01 ppm (v/v)

15. Hydrogen Iodide (HI) concentration: 0.01 ppm (v/v)

16. Hydrogen Sulfide (H2S) concentration: 0.01 ppm (v/v)

17. Ammonia (NH3) concentration: 0.01 ppm (v/v)

18. Hydrogen Cyanide (HCN) concentration: 0.01 ppm (v/v)

19. Hydrogen Fluoride (HF) concentration: 0.01 ppm (v/v)

20. Hydrogen Chloride (HCl) concentration: 0.01 ppm (v/v)

21. Hydrogen Bromide (HBr) concentration: 0.01 ppm (v/v)

22. Hydrogen Iodide (HI) concentration: 0.01 ppm (v/v)

23. Hydrogen Sulfide (H2S) concentration: 0.01 ppm (v/v)

24. Ammonia (NH3) concentration: 0.01 ppm (v/v)

25. Hydrogen Cyanide (HCN) concentration: 0.01 ppm (v/v)

26. Hydrogen Fluoride (HF) concentration: 0.01 ppm (v/v)

27. Hydrogen Chloride (HCl) concentration: 0.01 ppm (v/v)

28. Hydrogen Bromide (HBr) concentration: 0.01 ppm (v/v)

29. Hydrogen Iodide (HI) concentration: 0.01 ppm (v/v)

30. Hydrogen Sulfide (H2S) concentration: 0.01 ppm (v/v)

31. Ammonia (NH3) concentration: 0.01 ppm (v/v)

32. Hydrogen Cyanide (HCN) concentration: 0.01 ppm (v/v)

33. Hydrogen Fluoride (HF) concentration: 0.01 ppm (v/v)

34. Hydrogen Chloride (HCl) concentration: 0.01 ppm (v/v)

35. Hydrogen Bromide (HBr) concentration: 0.01 ppm (v/v)

36. Hydrogen Iodide (HI) concentration: 0.01 ppm (v/v)

37. Hydrogen Sulfide (H2S) concentration: 0.01 ppm (v/v)

38. Ammonia (NH3) concentration: 0.01 ppm (v/v)

39. Hydrogen Cyanide (HCN) concentration: 0.01 ppm (v/v)

40. Hydrogen Fluoride (HF) concentration: 0.01 ppm (v/v)

41. Hydrogen Chloride (HCl) concentration: 0.01 ppm (v/v)

42. Hydrogen Bromide (HBr) concentration: 0.01 ppm (v/v)

43. Hydrogen Iodide (HI) concentration: 0.01 ppm (v/v)

44. Hydrogen Sulfide (H2S) concentration: 0.01 ppm (v/v)

45. Ammonia (NH3) concentration: 0.01 ppm (v/v)

46. Hydrogen Cyanide (HCN) concentration: 0.01 ppm (v/v)

47. Hydrogen Fluoride (HF) concentration: 0.01 ppm (v/v)

48. Hydrogen Chloride (HCl) concentration: 0.01 ppm (v/v)

49. Hydrogen Bromide (HBr) concentration: 0.01 ppm (v/v)

50. Hydrogen Iodide (HI) concentration: 0.01 ppm (v/v)

51. Hydrogen Sulfide (H2S) concentration: 0.01 ppm (v/v)

52. Ammonia (NH3) concentration: 0.01 ppm (v/v)

53. Hydrogen Cyanide (HCN) concentration: 0.01 ppm (v/v)

54. Hydrogen Fluoride (HF) concentration: 0.01 ppm (v/v)

55. Hydrogen Chloride (HCl) concentration: 0.01 ppm (v/v)

56. Hydrogen Bromide (HBr) concentration: 0.01 ppm (v/v)

57. Hydrogen Iodide (HI) concentration: 0.01 ppm (v/v)

58. Hydrogen Sulfide (H2S) concentration: 0.01 ppm (v/v)

59. Ammonia (NH3) concentration: 0.01 ppm (v/v)

60. Hydrogen Cyanide (HCN) concentration: 0.01 ppm (v/v)

61. Hydrogen Fluoride (HF) concentration: 0.01 ppm (v/v)

62. Hydrogen Chloride (HCl) concentration: 0.01 ppm (v/v)

63. Hydrogen Bromide (HBr) concentration: 0.01 ppm (v/v)

64. Hydrogen Iodide (HI) concentration: 0.01 ppm (v/v)

65. Hydrogen Sulfide (H2S) concentration: 0.01 ppm (v/v)

66. Ammonia (NH3) concentration: 0.01 ppm (v/v)

67. Hydrogen Cyanide (HCN) concentration: 0.01 ppm (v/v)

68. Hydrogen Fluoride (HF) concentration: 0.01 ppm (v/v)

69. Hydrogen Chloride (HCl) concentration: 0.01 ppm (v/v)

70. Hydrogen Bromide (HBr) concentration: 0.01 ppm (v/v)

71. Hydrogen Iodide (HI) concentration: 0.01 ppm (v/v)

72. Hydrogen Sulfide (H2S) concentration: 0.01 ppm (v/v)

73. Ammonia (NH3) concentration: 0.01 ppm (v/v)

74. Hydrogen Cyanide (HCN) concentration: 0.01 ppm (v/v)

75. Hydrogen Fluoride (HF) concentration: 0.01 ppm (v/v)

76. Hydrogen Chloride (HCl) concentration: 0.01 ppm (v/v)

77. Hydrogen Bromide (HBr) concentration: 0.01 ppm (v/v)

78. Hydrogen Iodide (HI) concentration: 0.01 ppm (v/v)

79. Hydrogen Sulfide (H2S) concentration: 0.01 ppm (v/v)

80. Ammonia (NH3) concentration: 0.01 ppm (v/v)

81. Hydrogen Cyanide (HCN) concentration: 0.01 ppm (v/v)

82. Hydrogen Fluoride (HF) concentration: 0.01 ppm (v/v)

83. Hydrogen Chloride (HCl) concentration: 0.01 ppm (v/v)

84. Hydrogen Bromide (HBr) concentration: 0.01 ppm (v/v)

85. Hydrogen Iodide (HI) concentration: 0.01 ppm (v/v)

86. Hydrogen Sulfide (H2S) concentration: 0.01 ppm (v/v)

87. Ammonia (NH3) concentration: 0.01 ppm (v/v)

88. Hydrogen Cyanide (HCN) concentration: 0.01 ppm (v/v)

89. Hydrogen Fluoride (HF) concentration: 0.01 ppm (v/v)

90. Hydrogen Chloride (HCl) concentration: 0.01 ppm (v/v)

91. Hydrogen Bromide (HBr) concentration: 0.01 ppm (v/v)

92. Hydrogen Iodide (HI) concentration: 0.01 ppm (v/v)

93. Hydrogen Sulfide (H2S) concentration: 0.01 ppm (v/v)

94. Ammonia (NH3) concentration: 0.01 ppm (v/v)

95. Hydrogen Cyanide (HCN) concentration: 0.01 ppm (v/v)

96. Hydrogen Fluoride (HF) concentration: 0.01 ppm (v/v)

97. Hydrogen Chloride (HCl) concentration: 0.01 ppm (v/v)

98. Hydrogen Bromide (HBr) concentration: 0.01 ppm (v/v)

99. Hydrogen Iodide (HI) concentration: 0.01 ppm (v/v)

100. Hydrogen Sulfide (H2S) concentration: 0.01 ppm (v/v)



63/14-15.67/35-36, Soi Petchkasem 7/71, Petchkasem Rd,
Wattana, Bangkok 10600 Thailand.
Tel: (66) 02-868081213 Fax: (66) 02-8680860 www.jnacrates.com

Continuation of Certificate of Calibration Number

Certificate No. NIS-13072021
Page 2 of 2 pages

Result of calibration: ☐ without adjustment ☒ with adjustment
Calibration in the range of 0 - 400 ppm at a correction interval of 100 ppm.
The results of calibration and associated measurement uncertainties are reported in table below.

Point	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	101.10	1.10	1.10
2	200.00	201.80	1.80	0.90	201.50	1.50	0.75
3	300.00	299.40	-0.60	-0.20	302.80	2.80	0.93
4	400.00	398.10	-1.90	-0.47	401.90	1.90	0.47
AVERAGE (%)				-0.18			0.86

Uncertainty of Calibration
The expanded uncertainty is based on standard uncertainty multiplied by a coverage factor (k=2) providing a level of confidence of approximately 95%.

Appendix A: Uncertainty

NO	Source	Manufacturer	Model/Type	Calibration Date	Certificate Number	Range
1	Flow Meter	TEDELCO	TEDELCO	12-Jul-22	TEDELCO	0 - 40 L/min
2	Pressure Transducer	TEDELCO	TEDELCO	12-Jul-22	TEDELCO	0 - 100 kPa
3	Gas Concentration	TEDELCO	TEDELCO	12-Jul-22	TEDELCO	0 - 100 ppm
4	Gas Concentration	TEDELCO	TEDELCO	12-Jul-22	TEDELCO	0 - 100 ppm
5	Gas Concentration	TEDELCO	TEDELCO	12-Jul-22	TEDELCO	0 - 100 ppm
6	Gas Concentration	TEDELCO	TEDELCO	12-Jul-22	TEDELCO	0 - 100 ppm
7	Gas Concentration	TEDELCO	TEDELCO	12-Jul-22	TEDELCO	0 - 100 ppm
8	Gas Concentration	TEDELCO	TEDELCO	12-Jul-22	TEDELCO	0 - 100 ppm
9	Gas Concentration	TEDELCO	TEDELCO	12-Jul-22	TEDELCO	0 - 100 ppm
10	Gas Concentration	TEDELCO	TEDELCO	12-Jul-22	TEDELCO	0 - 100 ppm



63/14-15.67/35-36, Soi Petchkasem 7/71, Petchkasem Rd,
Wattana, Bangkok 10600 Thailand.
Tel: (66) 02-868081213 Fax: (66) 02-8680860 www.jnacrates.com

CERTIFICATE OF CALIBRATION

Certificate No. NIS-13072021
Page 1 of 2 pages

Measurement Date	1-Jul-22	Equipment Name	NiCr Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	R080177	Equipment ID	RYG_FS0463
Calibrator/Manufacturer	Teledyne API	Model	700
Serial No.	947	Cylinder No.	GN0227222
Std. Gas Concentration (PPM)	66.68	Certified By	Algas Inc.
Cylinder Pressure (psi)	1800	Expiry Date	9-Feb-30
Certified Date	9-Feb-22		

Test Results

1. Nitrogen (N2) concentration: 99.99% (v/v)

2. Oxygen (O2) concentration: 20.99% (v/v)

3. Carbon Dioxide (CO2) concentration: 0.05% (v/v)

4. Water Vapor (H2O) concentration: 1.00% (v/v)

5. Sulfur Dioxide (SO2) concentration: 0.01% (v/v)

6. Nitric Oxide (NO) concentration: 0.10 ppm (v/v)

7. Nitrogen Dioxide (NO2) concentration: 0.10 ppm (v/v)

8. Carbon Monoxide (CO) concentration: 0.01 ppm (v/v)

9. Hydrogen Sulfide (H2S) concentration: 0.01 ppm (v/v)

10. Ammonia (NH3) concentration: 0.01 ppm (v/v)

11. Hydrogen Cyanide (HCN) concentration: 0.01 ppm (v/v)

12. Hydrogen Fluoride (HF) concentration: 0.01 ppm (v/v)

13. Hydrogen Chloride (HCl) concentration: 0.01 ppm (v/v)

14. Hydrogen Bromide (HBr) concentration: 0.01 ppm (v/v)

15. Hydrogen Iodide (HI) concentration: 0.01 ppm (v/v)

16. Hydrogen Sulfide (H2S) concentration: 0.01 ppm (v/v)

17. Ammonia (NH3) concentration: 0.01 ppm (v/v)

18. Hydrogen Cyanide (HCN) concentration: 0.01 ppm (v/v)

19. Hydrogen Fluoride (HF) concentration: 0.01 ppm (v/v)

20. Hydrogen Chloride (HCl) concentration: 0.01 ppm (v/v)

21. Hydrogen Bromide (HBr) concentration: 0.01 ppm (v/v)

22. Hydrogen Iodide (HI) concentration: 0.01 ppm (v/v)

23. Hydrogen Sulfide (H2S) concentration: 0.01 ppm (v/v)

24. Ammonia (NH3) concentration: 0.01 ppm (v/v)

25. Hydrogen Cyanide (HCN) concentration: 0.01 ppm (v/v)

26. Hydrogen Fluoride (HF) concentration: 0.01 ppm (v/v)

27. Hydrogen Chloride (HCl) concentration: 0.01 ppm (v/v)

28. Hydrogen Bromide (HBr) concentration: 0.01 ppm (v/v)

29. Hydrogen Iodide (HI) concentration: 0.01 ppm (v/v)

30. Hydrogen Sulfide (H2S) concentration: 0.01 ppm (v/v)

31. Ammonia (NH3) concentration: 0.01 ppm (v/v)

32. Hydrogen Cyanide (HCN) concentration: 0.01 ppm (v/v)

33. Hydrogen Fluoride (HF) concentration: 0.01 ppm (v/v)

34. Hydrogen Chloride (HCl) concentration: 0.01 ppm (v/v)

35. Hydrogen Bromide (HBr) concentration: 0.01 ppm (v/v)

36. Hydrogen Iodide (HI) concentration: 0.01 ppm (v/v)

37. Hydrogen Sulfide (H2S) concentration: 0.01 ppm (v/v)

38. Ammonia (NH3) concentration: 0.01 ppm (v/v)

39. Hydrogen Cyanide (HCN) concentration: 0.01 ppm (v/v)

40. Hydrogen Fluoride (HF) concentration: 0.01 ppm (v/v)

41. Hydrogen Chloride (HCl) concentration: 0.01 ppm (v/v)

42. Hydrogen Bromide (HBr) concentration: 0.01 ppm (v/v)

43. Hydrogen Iodide (HI) concentration: 0.01 ppm (v/v)

44. Hydrogen Sulfide (H2S) concentration: 0.01 ppm (v/v)

45. Ammonia (NH3) concentration: 0.01 ppm (v/v)

46. Hydrogen Cyanide (HCN) concentration: 0.01 ppm (v/v)

47. Hydrogen Fluoride (HF) concentration: 0.01 ppm (v/v)

48. Hydrogen Chloride (HCl) concentration: 0.01 ppm (v/v)

49. Hydrogen Bromide (HBr) concentration: 0.01 ppm (v/v)

50. Hydrogen Iodide (HI) concentration: 0.01 ppm (v/v)

51. Hydrogen Sulfide (H2S) concentration: 0.01 ppm (v/v)

52. Ammonia (NH3) concentration: 0.01 ppm (v/v)

53. Hydrogen Cyanide (HCN) concentration: 0.01 ppm (v/v)

54. Hydrogen Fluoride (HF) concentration: 0.01 ppm (v/v)

55. Hydrogen Chloride (HCl) concentration: 0.01 ppm (v/v)

56. Hydrogen Bromide (HBr) concentration: 0.01 ppm (v/v)

57. Hydrogen Iodide (HI) concentration: 0.01 ppm (v/v)

58. Hydrogen Sulfide (H2S) concentration: 0.01 ppm (v/v)

59. Ammonia (NH3) concentration: 0.01 ppm (v/v)

60. Hydrogen Cyanide (HCN) concentration: 0.01 ppm (v/v)

61. Hydrogen Fluoride (HF) concentration: 0.01 ppm (v/v)

62. Hydrogen Chloride (HCl) concentration: 0.01 ppm (v/v)

63. Hydrogen Bromide (HBr) concentration: 0.01 ppm (v/v)

64. Hydrogen Iodide (HI) concentration: 0.01 ppm (v/v)

65. Hydrogen Sulfide (H2S) concentration: 0.01 ppm (v/v)

66. Ammonia (NH3) concentration: 0.01 ppm (v/v)

67. Hydrogen Cyanide (HCN) concentration: 0.01 ppm (v/v)

68. Hydrogen Fluoride (HF) concentration: 0.01 ppm (v/v)

69. Hydrogen Chloride (HCl) concentration: 0.01 ppm (v/v)

70. Hydrogen Bromide (HBr) concentration: 0.01 ppm (v/v)

71. Hydrogen Iodide (HI) concentration: 0.01 ppm (v/v)

72. Hydrogen Sulfide (H2S) concentration: 0.01 ppm (v/v)

73. Ammonia (NH3) concentration: 0.01 ppm (v/v)

74. Hydrogen Cyanide (HCN) concentration: 0.01 ppm (v/v)

75. Hydrogen Fluoride (HF) concentration: 0.01 ppm (v/v)

76. Hydrogen Chloride (HCl) concentration: 0.01 ppm (v/v)

77. Hydrogen Bromide (HBr) concentration: 0.01 ppm (v/v)

78. Hydrogen Iodide (HI) concentration: 0.01 ppm (v/v)

79. Hydrogen Sulfide (H2S) concentration: 0.01 ppm (v/v)

80. Ammonia (NH3) concentration: 0.01 ppm (v/v)

81. Hydrogen Cyanide (HCN) concentration: 0.01 ppm (v/v)

82. Hydrogen Fluoride (HF) concentration: 0.01 ppm (v/v)

83. Hydrogen Chloride (HCl) concentration: 0.01 ppm (v/v)

84. Hydrogen Bromide (HBr) concentration: 0.01 ppm (v/v)

85. Hydrogen Iodide (HI) concentration: 0.01 ppm (v/v)

86. Hydrogen Sulfide (H2S) concentration: 0.01 ppm (v/v)

87. Ammonia (NH3) concentration: 0.01 ppm (v/v)

88. Hydrogen Cyanide (HCN) concentration: 0.01 ppm (v/v)

89. Hydrogen Fluoride (HF) concentration: 0.01 ppm (v/v)

90. Hydrogen Chloride (HCl) concentration: 0.01 ppm (v/v)

91. Hydrogen Bromide (HBr) concentration: 0.01 ppm (v/v)

92. Hydrogen Iodide (HI) concentration: 0.01 ppm (v/v)

93. Hydrogen Sulfide (H2S) concentration: 0.01 ppm (v/v)

94. Ammonia (NH3) concentration: 0.01 ppm (v/v)

95. Hydrogen Cyanide (HCN) concentration: 0.01 ppm (v/v)

96. Hydrogen Fluoride (HF) concentration: 0.01 ppm (v/v)

97. Hydrogen Chloride (HCl) concentration: 0.01 ppm (v/v)

98. Hydrogen Bromide (HBr) concentration: 0.01 ppm (v/v)

99. Hydrogen Iodide (HI) concentration: 0.01 ppm (v/v)

100. Hydrogen Sulfide (H2S) concentration: 0.01 ppm (v/v)



DRY GAS METER CALIBRATION TEST REPORT

Calibration Date	12-Jul-22	Barometric Pressure (mmHg)	755
Next Calibration Date	12-Jan-23	Relative Humidity (%)	70.0
		Temperature (°C)	30.0
Dry Gas Meter Data		Reference Dry Gas Meter Data	
Calibration sheet No.	C-12072-BKX-FS0563	Serial No.	1607009
Dry Gas Meter No.	BKX-FS0563	Model No.	SKSIXSR-006
Console Serial No.	1606011	Correction Factor (Y)	1.0060
Model No.	XC-62-CV	Next Calibration Date	7-Oct-22

Reference Dry Gas Meter Calibration				Dry Gas Meter				Dry Gas Meter
W (L/min)				Ti				Correction
Final	Initial	Total	(°C)	Final	Initial	Total	Tf (°C)	Factor (Y)
30.00	0.00	30.00	26.0	30.45	0.00	30.40	24.0	0.9855
30.00	0.00	30.00	26.0	30.45	0.00	30.40	26.0	0.9911
60.00	0.00	60.00	26.0	61.56	0.00	61.56	28.0	0.9877
60.00	0.00	60.00	26.0	61.55	0.00	61.55	29.0	0.9872
60.00	0.00	60.00	26.0	62.71	0.00	62.70	29.0	0.9919
60.00	0.00	60.00	26.0	62.23	0.00	62.23	29.0	0.9850
								Aug. 0.9850



Lot No. 22107240.1

ANALYZER CALIBRATION DATA

Client : Global Power Synergy PCL. Location : HRSG #1
Date : 19 Sep 22 Test Operator : Subot P.

O₂ ANALYZER : TELEDYNE API 200SH Serial No. : 774
Model :
Span (%) : 28

	Cylinder Value (%)	Initial Analyzers Calibration Response (%)	Final Analyzers Calibration Response (%)	Difference (Percent of Span)
Zero Gas	0.00	0.00	0.00	0.00
Low-Level Gas	7.93	7.90	7.93	0.00
Span Gas	16.00	16.00	16.00	0.00

NO₂ ANALYZER : TELEDYNE API 200SH Serial No. : 774
Model :
Span (ppm) : 100

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	0.00	0.00	0.00
Low-Level Gas	50.41	50.41	50.41	0.00
Span Gas	80.27	80.29	80.27	0.00

SO₂ ANALYZER : TELEDYNE API 100SH Serial No. : 487
Model :
Span (ppm) : 100

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	0.00	0.00	0.00
Low-Level Gas	51.61	51.63	51.61	0.00
Span Gas	79.00	79.00	79.00	0.00

CO ANALYZER : HORIBA PG-300 Serial No. : T08ANRQP
Model :
Span (ppm) : 100

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	0.00	0.00	0.00
Low-Level Gas	80.31	80.34	80.31	0.00
Span Gas	80.53	80.58	80.53	0.00

Calibrated by

Subot P.

(Mr. Subot Phasongthai)
Environmental Field Scientist (4)

FORM NO. F-06-02 REVISION NO. 2 ISSUE DATE: 2007/9

ALS Laboratory Group



Lot No. 22107240.1

SYSTEM CALIBRATION BIAS AND DRIFT DATA

Client : Global Power Synergy PCL. Location : HRSG #1
Date : 19 Sep 22 Test Operator : Subot P.

O₂ ANALYZER : TELEDYNE API 200SH Serial No. : 774
Model :
Span (%) : 18.00

	O ₂ Analyzer Calibration Response	Initial Values System Calibration Response	Final Values System Calibration Response	Difference (% of Span)
Zero Gas	0.00	0.00	0.00	0.00
Updraft Gas	16.00	16.00	16.00	0.00

NO₂ ANALYZER : TELEDYNE API 200SH Serial No. : 774
Model :
Span (ppm) : 80.27

	NO ₂ Analyzer Calibration Response	Initial Values System Calibration Response	Final Values System Calibration Response	Difference (% of Span)
Zero Gas	0.00	0.00	0.00	0.00
Updraft Gas	80.29	80.29	80.27	0.00

SO₂ ANALYZER : TELEDYNE API 100SH Serial No. : 487
Model :
Span (ppm) : 79.00

	SO ₂ Analyzer Calibration Response	Initial Values System Calibration Response	Final Values System Calibration Response	Difference (% of Span)
Zero Gas	0.00	0.00	0.00	0.00
Updraft Gas	79.00	79.00	79.00	0.00

CO ANALYZER : HORIBA PG-300 Serial No. : T08ANRQP
Model :
Span (ppm) : 80.53

	CO Analyzer Calibration Response	Initial Values System Calibration Response	Final Values System Calibration Response	Difference (% of Span)
Zero Gas	0.00	0.00	0.00	0.00
Updraft Gas	80.58	80.58	80.53	0.00

Calibrated by

Subot P.

(Mr. Subot Phasongthai)
Environmental Field Scientist (4)

FORM NO. F-06-02 REVISION NO. 2 ISSUE DATE: 2007/9

ALS Laboratory Group



EMISSION TEST RESULT

Client : Global Power Synergy PCL. Location : HRSG #1
Date : 19 Sep 22 Test Operator : Subot P.

Start Time : 10:08
End Time : 10:08
Model : TELEDYNE API 200SH
Serial No. : 487

NO₂ Analyzer Model : TELEDYNE API 200SH
CO/CO₂ Analyzer Model : HORIBA PG-300
Serial No. : 774
T08ANRQP

Time (min)	O ₂ (%)	CO ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)	Remark
10:08	12.58	4.81	15.40	0.00	13.20	
10:09	12.58	4.81	15.34	0.00	13.20	
10:10	12.58	4.80	15.23	0.00	13.40	
10:11	12.58	4.80	15.21	0.00	13.50	
10:12	12.57	4.81	15.22	0.00	13.51	
10:13	12.58	4.81	15.07	0.00	13.51	
10:14	12.58	4.81	14.88	0.00	14.88	
10:15	12.58	4.81	14.76	0.00	14.77	
10:16	12.58	4.80	14.80	0.00	14.80	
10:17	12.58	4.80	14.80	0.00	14.80	
10:18	12.57	4.81	14.87	0.00	14.87	
10:19	12.58	4.81	14.84	0.00	14.84	
10:20	12.58	4.80	14.82	0.00	14.82	
10:21	12.57	4.81	14.87	0.00	14.87	
10:22	12.58	4.81	14.84	0.00	14.84	
10:23	12.57	4.81	14.75	0.00	14.75	
10:24	12.57	4.81	14.80	0.00	14.80	
10:25	12.57	4.80	14.80	0.00	14.81	
Average	12.58	4.81	14.80	0.00	14.87	

Subot P.

(Mr. Subot Phasongthai)
Environmental Field Scientist (4)

FORM NO. F-06-02 REVISION NO. 2 ISSUE DATE: 2007/9

ALS Laboratory Group



EMISSION TEST RESULT

Client : Global Power Synergy PCL. Location : HRSG #1
Date : 19 Sep 22 Test Operator : Subot P.

Start Time : 10:08
End Time : 10:08
Model : TELEDYNE API 200SH
Serial No. : 487

NO₂ Analyzer Model : TELEDYNE API 200SH
CO/CO₂ Analyzer Model : HORIBA PG-300
Serial No. : 774
T08ANRQP

Time (min)	O ₂ (%)	CO ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)	Remark
10:08	12.58	4.81	14.80	0.00	14.00	
10:09	12.57	4.81	14.80	0.00	14.00	
10:10	12.57	4.80	15.00	0.00	14.00	
10:11	12.58	4.81	14.81	0.00	14.00	
10:12	12.57	4.80	14.80	0.00	14.00	
10:13	12.57	4.80	14.80	0.00	14.00	
10:14	12.57	4.81	14.72	0.00	14.00	
10:15	12.57	4.81	14.69	0.00	14.00	
10:16	12.58	4.81	14.69	0.00	14.00	
10:17	12.58	4.80	14.68	0.00	14.00	
10:18	12.57	4.81	14.69	0.00	14.00	
10:19	12.57	4.81	14.69	0.00	14.00	
10:20	12.58	4.80	14.68	0.00	14.00	
10:21	12.57	4.81	14.69	0.00	14.00	
10:22	12.57	4.81	14.69	0.00	14.00	
10:23	12.58	4.80	14.68	0.00	14.00	
10:24	12.57	4.81	14.69	0.00	14.00	
10:25	12.58	4.81	14.69	0.00	14.00	
10:26	12.58	4.81	14.69	0.00	14.00	
Average	12.58	4.81	14.69	0.00	14.19	

Subot P.

(Mr. Subot Phasongthai)
Environmental Field Scientist (4)

FORM NO. F-06-02 REVISION NO. 2 ISSUE DATE: 2007/9

ALS Laboratory Group



EMISSION TEST RESULT

Client : Global Power Synergy PCL. Location : HRSG #1
Date : 19 Sep 22 Test Operator : Subot P.

Start Time : 10:07
End Time : 10:07
Model : TELEDYNE API 200SH
Serial No. : 487

NO₂ Analyzer Model : TELEDYNE API 200SH
CO/CO₂ Analyzer Model : HORIBA PG-300
Serial No. : 774
T08ANRQP

Time (min)	O ₂ (%)	CO ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)	Remark
10:07	12.54	4.81	15.00	0.00	13.00	
10:08	12.50	4.81	15.01	0.00	14.20	
10:09	12.54	4.81	14.80	0.00	13.00	
10:10	12.50	4.81	15.01	0.00	14.20	
10:11	12.50	4.81	15.00	0.00	13.00	
10:12	12.50	4.81	15.10	0.00	14.00	
10:13	12.50	4.81	15.00	0.00	14.20	
10:14	12.50	4.81	15.21	0.00	14.20	
10:15	12.50	4.80	15.22	0.00	13.00	
10:16	12.50	4.81	15.20	0.00	13.00	
10:17	12.50	4.81	15.20	0.00	13.00	
10:18	12.50	4.82	15.20	0.00	14.17	
10:19	12.50	4.81	15.20	0.00	14.20	
10:20	12.50	4.81	15.21	0.00	13.00	
10:21	12.50	4.81	15.21	0.00	13.00	
10:22	12.50	4.81	15.21	0.00	13.00	
10:23	12.50	4.82	15.20	0.00	14.44	
10:24	12.50	4.82	15.20	0.00	14.20	
10:25	12.50	4.81	15.20	0.00	14.20	
10:26	12.50	4.81	15.20	0.00	14.20	
10:27	12.50	4.81	15.20	0.00	14.20	
10:28	12.50	4.81	15.20	0.00	14.20	
10:29	12.50	4.81	15.20	0.00	14.20	
10:30	12.50	4.81	15.20	0.00	14.20	
10:31	12.50	4.81	15.20	0.00	14.20	
10:32	12.50	4.81	15.20	0.00	14.20	
10:33	12.50	4.81	15.20	0.00	14.20	
10:34	12.50	4.81	15.20	0.00	14.20	
10:35	12.50	4.81	15.20	0.00	14.20	
10:36	12.50	4.81	15.20	0.00	14.20	
10:37	12.50	4.81	15.20	0.00	14.20	
10:38	12.50	4.81	15.20	0.00	14.20	
10:39	12.50	4.81	15.20	0.00	14.20	
10:40	12.50	4.81	15.20	0.00	14.20	
10:41	12.50	4.81	15.20	0.00	14.20	
10:42	12.50	4.81	15.20	0.00	14.20	
10:43	12.50	4.81	15.20	0.00	14.20	
10:44	12.50	4.81	15.20	0.00	14.20	
10:45	12.50	4.81	15.20	0.00	14.20	
10:46	12.50	4.81	15.20	0.00	14.20	
10:47	12.50	4.81	15.20	0.00	14.20	
10:48	12.50	4.81	15.20	0.00	14.20	
10:49	12.50	4.81	15.20	0.00	14.20	
10:50	12.50	4.81	15.20	0.00	14.20	
10:51	12.50	4.81	15.20	0.00	14.20	
10:52	12.50	4.81	15.20	0.00	14.20	
10:53	12.50	4.81	15.20	0.00	14.20	
10:54	12.50	4.81	15.20	0.00	14.20	
10:55	12.50	4.81	15.20	0.00	14.20	
10:56	12.50	4.81	15.20	0.00	14.20	
10:57	12.50	4.81	15.20	0.00	14.20	
10:58	12.50	4.81	15.20	0.00	14.20	
10:59	12.50	4.81	15.20	0.00	14.20	
11:00	12.50	4.81	15.20	0.00	14.20	
11:01	12.50	4.81	15.20	0.00	14.20	
11:02	12.50	4.81	15.20	0.00	14.20	
11:03	12.50	4.81	15.20	0.00	14.20	
11:04	12.50	4.81	15.20	0.00	14.20	
11:05	12.50	4.81	15.20	0.00	14.20	
11:06	12.50	4.81	15.20	0.00	14.20	
11:07	12.50	4.81	15.20	0.00	14.20	
11:08	12.50	4.81	15.20	0.00	14.20	
11:09	12.50	4.81	15.20	0.00	14.20	
11:10	12.50	4.81	15.20	0.00	14.20	
11:11	12.50	4.81	15.20	0.00	14.20	
11:12	12.50	4.81	15.20	0.00	14.20	
11:13	12.50	4.81	15.20	0.00	14.20	
11:14	12.50	4.81	15.20	0.00	14.20	
11:15	12.50	4.81	15.20	0.00	14.20	
11:16	12.50	4.81	15.20	0.00	14.20	
11:17	12.50	4.81	15.20	0.00	14.20	
11:18	12.50	4.81	15.20	0.00	14.20	
11:19	12.50	4.81	15.20	0.00	14.20	
11:20	12.50	4.81	15.20	0.00	14.20	
11:21	12.50	4.81	15.20	0.00	14.20	
11:22	12.50	4.81	15.20	0.00	14.20	
11:23	12.50	4.81	15.20	0.00	14.20	
11:24	12.50	4.81	15.20	0.00	14.20	
11:25	12.50	4.81	15.20	0.00	14.20	
11:26	12.50	4.81	15.20	0.00	14.20	
11:27	12.50	4.81	15.20	0.00	14.20	
11:28	12.50	4.81	15.20	0.00	14.20	
11:29	12.50	4.81	15.20	0.00	14.20	
11:30	12.50	4.81	15.20	0.00	14.20	
11:31	12.50	4.81	15.20	0.00	14.20	
11:32	12.50	4.81	15.20	0.00	14.20	
11:33	12.50	4.81	15.20	0.00	14.20	
11:34	12.50	4.81	15.20	0.00	14.20	
11:35	12.50	4.81	15.20	0.00	14.20	
11:36	12.50	4.81	15.20	0.00	14.20	
11:37	12.50	4.81	15.20	0.00	14.20	
11:38	12.50	4.81	15.20	0.00	14.20	
11:39	12.50	4.81	15.20	0.00	14.20	
11:40	12.50	4.81	15.20	0.00	14.20	
11:41	12.50	4.81	15.20	0.00	14.20	
11:42	12.50	4.81	15.20	0.00	14.20	
11:43	12.50	4.81	15.20	0.00	14.20	
11:44	12.50	4.81	15.20	0.00	14.20	
11:45	12.50	4.81	15.20	0.00	14.20	
11:46	12.50	4.81	15.20	0.00	14.20	
11:47	12.50	4.81	15.20	0.00	14.20	
11:48	12.50	4.81	15.20	0.00	14.20	
11:49	12.50	4.81	15.20	0.00	14.20	
11:50	12.50	4.81	15.20	0.00	14.20	
11:51	12.50	4.81	15.20	0.00	14.20	
11:52	12.50	4.81	15.20	0.00	14.20	
11:53	12.50	4.81	15.20	0.00	14.20	
11:54	12.50	4.81	15.20	0.00	14.20	
11:55	12.50	4.81	15.20	0.00	14.20	
11:56	12.50	4.81	15.20	0.00	14.20	
11:57	12.50	4.81	15.20	0.00	14.20	
11:58	12.50	4.81	15.20	0.00	14.20	
11:59	12.50	4.81	15.20	0.00	14.20	
12:00	12.50	4.81	15.20	0.00	14.20	



EMISSION TEST RESULT

Client		Global Power Synergy PCL.		Run #		Location	
Start Date		14 Sep 22		1		HONG KONG	
End Date		14 Sep 22		Test Operator		Subul P.	
CO ₂ Analyzer Model		TELESTRYME API 1000H		Serial No.		487	
CO Analyzer Model		TELESTRYME API 1000H		Serial No.		774	
CO/CO ₂ Analyzer Model		HORIBA PG-800		Serial No.		TOMARNSP	

Time (min)	CO ₂ (%)	CO (%)	HCx (%)	HCx (ppm)	CO (ppm)	CO ₂ (ppm)	Remark
10:32	15.34	4.27	12.51	0.08	20.27	0.08	
10:33	15.34	4.27	12.51	0.08	20.27	0.08	
10:34	15.33	4.28	12.50	0.07	20.40	0.08	
10:35	15.33	4.27	12.51	0.08	20.27	0.08	
10:36	15.33	4.27	12.51	0.07	19.95	0.08	
10:37	15.34	4.27	12.53	0.07	19.95	0.08	
10:38	15.34	4.27	12.53	0.09	20.39	0.08	
10:39	15.33	4.28	12.42	0.09	21.46	0.08	
10:40	15.33	4.27	12.44	0.09	21.46	0.08	
10:41	15.31	4.28	12.54	0.09	22.38	0.08	
10:42	15.32	4.28	12.52	0.08	22.46	0.08	
10:43	15.33	4.27	12.50	0.08	21.93	0.08	
10:44	15.32	4.28	11.91	0.07	21.95	0.08	
10:45	15.34	4.28	11.99	0.09	23.14	0.08	
10:46	15.34	4.27	12.05	0.09	22.40	0.08	
10:47	15.34	4.27	12.36	0.07	23.27	0.08	
10:48	15.34	4.28	12.36	0.08	23.39	0.08	
10:49	15.34	4.28	12.52	0.08	23.96	0.08	
10:50	15.32	4.27	12.52	0.08	23.19	0.08	
10:51	15.32	4.27	12.53	0.08	22.29	0.08	
10:52	15.33	4.27	12.58	0.08	22.41	0.08	
Average	15.33	4.28	12.53	0.08	21.72	0.08	

(Mr. Subul P. Phrasphat)

Environmental Field Subunit (E)

FORM NO. F-06-002 REVISION NO. 2 ISSUE DATE: 2007/10/19
ALS Laboratory Group



ANALYZER CALIBRATION DATA

Client		Global Power Synergy PCL.		Location	
Start Date		14 Sep 22		HONG KONG	
End Date		14 Sep 22		Test Operator	
CO ₂ Analyzer Model		TELESTRYME API 1000H		Serial No.	
CO Analyzer Model		TELESTRYME API 1000H		Serial No.	
CO/CO ₂ Analyzer Model		HORIBA PG-800		Serial No.	

Cylinder Value (ppm)	Initial Analyze Calibration Response (ppm)	Final Analyze Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	0.00	0.00
Low Level Gas	7.93	7.99	0.08
Span Gas	16.00	16.00	0.00

Cylinder Value (ppm)	Initial Analyze Calibration Response (ppm)	Final Analyze Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	0.00	0.00
Low Level Gas	50.41	50.46	0.01
Span Gas	80.27	80.32	0.06

Cylinder Value (ppm)	Initial Analyze Calibration Response (ppm)	Final Analyze Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	0.00	0.00
Low Level Gas	51.61	51.61	0.00
Span Gas	79.02	79.02	0.00

(Mr. Subul P. Phrasphat)

Environmental Field Subunit (E)

FORM NO. F-06-002 REVISION NO. 2 ISSUE DATE: 2007/10/19
ALS Laboratory Group



SYSTEM CALIBRATION BIAS AND DRIFT DATA

Client		Global Power Synergy PCL.		Location	
Start Date		14 Sep 22		HONG KONG	
End Date		14 Sep 22		Test Operator	
CO ₂ Analyzer Model		TELESTRYME API 1000H		Serial No.	
CO Analyzer Model		TELESTRYME API 1000H		Serial No.	
CO/CO ₂ Analyzer Model		HORIBA PG-800		Serial No.	

Time (min)	CO ₂ (%)	CO (%)	HCx (%)	HCx (ppm)	CO (ppm)	CO ₂ (ppm)	Remark
10:32	15.34	4.27	12.51	0.08	20.27	0.08	
10:33	15.34	4.27	12.51	0.08	20.27	0.08	
10:34	15.33	4.28	12.50	0.07	20.40	0.08	
10:35	15.33	4.27	12.51	0.08	20.27	0.08	
10:36	15.33	4.27	12.51	0.07	19.95	0.08	
10:37	15.34	4.27	12.53	0.07	19.95	0.08	
10:38	15.34	4.27	12.53	0.09	20.39	0.08	
10:39	15.33	4.28	12.42	0.09	21.46	0.08	
10:40	15.33	4.27	12.44	0.09	21.46	0.08	
10:41	15.31	4.28	12.54	0.09	22.38	0.08	
10:42	15.32	4.28	12.52	0.08	22.46	0.08	
10:43	15.33	4.27	12.50	0.08	21.93	0.08	
10:44	15.32	4.28	11.91	0.07	21.95	0.08	
10:45	15.34	4.28	11.99	0.09	23.14	0.08	
10:46	15.34	4.27	12.05	0.09	22.40	0.08	
10:47	15.34	4.27	12.36	0.07	23.27	0.08	
10:48	15.34	4.28	12.36	0.08	23.39	0.08	
10:49	15.34	4.28	12.52	0.08	23.96	0.08	
10:50	15.32	4.27	12.52	0.08	23.19	0.08	
10:51	15.32	4.27	12.53	0.08	22.29	0.08	
10:52	15.33	4.27	12.58	0.08	22.41	0.08	
Average	15.33	4.28	12.53	0.08	21.72	0.08	

(Mr. Subul P. Phrasphat)

Environmental Field Subunit (E)

FORM NO. F-06-002 REVISION NO. 2 ISSUE DATE: 2007/10/19
ALS Laboratory Group



EMISSION TEST RESULT

Client		Global Power Synergy PCL.		Run #		Location	
Start Date		14 Sep 22		1		HONG KONG	
End Date		14 Sep 22		Test Operator		Subul P.	
CO ₂ Analyzer Model		TELESTRYME API 1000H		Serial No.		487	
CO Analyzer Model		TELESTRYME API 1000H		Serial No.		774	
CO/CO ₂ Analyzer Model		HORIBA PG-800		Serial No.		TOMARNSP	

Time (min)	CO ₂ (%)	CO (%)	HCx (%)	HCx (ppm)	CO (ppm)	CO ₂ (ppm)	Remark
12:05	15.35	4.28	12.51	0.08	20.27	0.08	
12:06	15.35	4.28	12.51	0.08	20.27	0.08	
12:07	15.35	4.28	12.51	0.08	20.27	0.08	
12:08	15.35	4.28	12.51	0.08	20.27	0.08	
12:09	15.35	4.28	12.51	0.08	20.27	0.08	
12:10	15.35	4.28	12.51	0.08	20.27	0.08	
12:11	15.35	4.28	12.51	0.08	20.27	0.08	
12:12	15.35	4.28	12.51	0.08	20.27	0.08	
12:13	15.35	4.28	12.51	0.08	20.27	0.08	
12:14	15.35	4.28	12.51	0.08	20.27	0.08	
12:15	15.35	4.28	12.51	0.08	20.27	0.08	
12:16	15.35	4.28	12.51	0.08	20.27	0.08	
12:17	15.35	4.28	12.51	0.08	20.27	0.08	
12:18	15.35	4.28	12.51	0.08	20.27	0.08	
12:19	15.35	4.28	12.51	0.08	20.27	0.08	
12:20	15.35	4.28	12.51	0.08	20.27	0.08	
12:21	15.35	4.28	12.51	0.08	20.27	0.08	
12:22	15.35	4.28	12.51	0.08	20.27	0.08	
12:23	15.35	4.28	12.51	0.08	20.27	0.08	
12:24	15.35	4.28	12.51	0.08	20.27	0.08	
12:25	15.35	4.28	12.51	0.08	20.27	0.08	
12:26	15.35	4.28	12.51	0.08	20.27	0.08	
12:27	15.35	4.28	12.51	0.08	20.27	0.08	
12:28	15.35	4.28	12.51	0.08	20.27	0.08	
12:29	15.35	4.28	12.51	0.08	20.27	0.08	
12:30	15.35	4.28	12.51	0.08	20.27	0.08	
12:31	15.35	4.28	12.51	0.08	20.27	0.08	
12:32	15.35	4.28	12.51	0.08	20.27	0.08	
12:33	15.35	4.28	12.51	0.08	20.27	0.08	
12:34	15.35	4.28	12.51	0.08	20.27	0.08	
12:35	15.35	4.28	12.51	0.08	20.27	0.08	
12:36	15.35	4.28	12.51	0.08	20.27	0.08	
12:37	15.35	4.28	12.51	0.08	20.27	0.08	
12:38	15.35	4.28	12.51	0.08	20.27	0.08	
12:39	15.35	4.28	12.51	0.08	20.27	0.08	
12:40	15.35	4.28	12.51	0.08	20.27	0.08	
12:41	15.35	4.28	12.51	0.08	20.27	0.08	
12:42	15.35	4.28	12.51	0.08	20.27	0.08	
12:43	15.35	4.28	12.51	0.08	20.27	0.08	
12:44	15.35	4.28	12.51	0.08	20.27	0.08	
12:45	15.35	4.28	12.51	0.08	20.27	0.08	
12:46	15.35	4.28	12.51	0.08	20.27	0.08	
12:47	15.35	4.28	12.51	0.08	20.27	0.08	
12:48	15.35	4.28	12.51	0.08	20.27	0.08	
12:49	15.35	4.28	12.51	0.08	20.27	0.08	
12:50	15.35	4.28	12.51	0.08	20.27	0.08	
12:51	15.35	4.28	12.51	0.08	20.27	0.08	
12:52	15.35	4.28	12.51	0.08	20.27	0.08	
12:53	15.35	4.28	12.51	0.08	20.27	0.08	
12:54	15.35	4.28	12.51	0.08	20.27	0.08	
12:55	15.35	4.28	12.51	0.08	20.27	0.08	
12:56	15.35	4.28	12.51	0.08	20.27	0.08	
12:57	15.35	4.28	12.51	0.08	20.27	0.08	
12:58	15.35	4.28	12.51	0.08	20.27	0.08	
12:59	15.35	4.28	12.51	0.08	20.27	0.08	
13:00	15.35	4.28	12.51	0.08	20.27	0.08	
Average	15.35	4.28	12.51	0.08	20.27	0.08	

(Mr. Subul P. Phrasphat)

Environmental Field Subunit (E)

FORM NO. F-06-002 REVISION NO. 2 ISSUE DATE: 2007/10/19
ALS Laboratory Group



EMISSION TEST RESULT

				Run #	2	
Client	Global Power Synergy PCL.			Location	Auxiliary Boiler	
Date	14 Sep 22			Test Operator	Subul P.	
Start Time	02:56			Serial No.	487	
CO ₂ Analyzer Model	TELESTRYME API 1000H			Serial No.	774	
NO _x /O ₂ Analyzer Model	TELESTRYME API 200H			Serial No.	TD6A90P	
CO/CO ₂ Analyzer Model	HORIBA PD-500					
Time (m)	CO ₂ (ppm)	CO ₂ (%)	NO _x (ppm)	NO _x (ppm)	CO (ppm)	Remark
13:17	5.04	0.22	43.46	0.20	0.87	
13:18	5.17	0.24	43.33	0.17	0.90	
13:18	5.04	0.22	43.46	0.22	0.87	
13:18	5.08	0.24	43.16	0.19	0.92	
13:19	5.18	0.23	43.32	0.21	0.93	
13:20	5.10	0.23	43.32	0.20	0.92	
13:22	5.10	0.23	43.32	0.18	0.94	
13:24	5.19	0.24	43.24	0.20	0.92	
13:24	5.02	0.22	43.03	0.19	0.91	
13:24	5.09	0.18	43.21	0.21	0.91	
13:26	5.11	0.26	43.29	0.21	0.94	
13:27	5.00	0.23	43.18	0.19	0.93	
13:28	5.03	0.26	43.11	0.19	0.92	
13:29	5.05	0.29	43.18	0.19	0.93	
13:30	5.03	0.18	43.16	0.18	0.98	
13:31	5.07	0.29	43.17	0.17	0.98	
13:32	5.04	0.21	43.24	0.18	0.96	
13:33	5.00	0.16	43.07	0.17	1.00	
13:34	5.00	0.32	43.12	0.18	0.97	
13:35	5.09	0.29	43.09	0.17	1.00	
13:36	5.03	0.16	43.14	0.18	0.94	
Average	5.08	0.26	43.21	0.20	0.93	

Summary of Measurement Result:

Parameter	Pass	Fail	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				
Flat 10 Hz to 4 kHz	✓	-	0.3	0.6
Flat - 4 kHz to 10 kHz	✓	-	0.3	0.7
Flat - 10 kHz to 20 kHz	-	-	-	-
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	0.3
11. Overload indication	✓	-	0.2	0.3
12. High level stability	✓	-	0.1	0.1

QP-TS12-04-04-02064

T. Petch

Result of calibration:

1. Absolute sensitivity

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

2. Self-generated noise

2.1 Normal use

Measured Value (dB)
15.4

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

Frequency Weighting	Measured value (dB)
A-weight	11.6
C-weight	17.7
Flat	23.4

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	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	0.6	0.7	0.7	±2.0

QP-TS12-04-04-02064

T. Petch

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
125	0.0	0.1	0.0	±2.0
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	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	94.0	0.0	-
C-weight	94.0	0.0	±0.2
Flat	94.0	0.0	±0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	0.0	-
Slow	94.0	0.0	±0.1
Eq	94.0	0.0	±0.1

6. Long-term stability

Frequency Weighting	S.M Display at initial (dB)	S.M Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	94.0	94.1	0.1	±0.3

QP-TS12-04-04-02064

T. Petch

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
29.0	29.0	0.0	±1.1
24.0	24.0	0.0	±1.1
19.0	19.0	0.0	±1.1
14.0	14.0	0.0	±1.1
9.0	9.0	0.0	±1.1

QP-TS12-04-04-02064

T. Petch

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Auto	94.0	94.0	0.0	±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	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	1.5; ±5.0
	200	800	127.6	127.6	0.0	±7.0
	0.25	1	99.0	99.9	0.9	1.2; ±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

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Leq (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	-
One	136.4	136.3	-0.1	±1.0

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	-
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.1	-0.3	±2.0

QP-TS12-04-04-02064

T. Petch

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.6	89.6	0.0	±1.5

12. High level stability

Frequency Weighting	S.M Display at initial (dB)	S.M 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

QP-TS12-04-04-02064

T. Petch



Cert. No. : ACC22023
Pages : 1 of 3

Calibration Certificate

Equipment : SOUND CALIBRATOR
Manufacturer : RION
Model : NC-54
Serial No. : 34719123
ID No. : RYG-F90215

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATHANAKAN 40, PHATHANAKAN ROAD,
KIWAENG, PHATHANAKAN, KHEE SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location :
Ambient Temperature : (23.0 ± 3) °C
Pressure : (1013 ± 3) hPa
Relative Humidity : (50.0 ± 2.0) %

Received Date : 22 AUGUST 2022
Calibration Date : 31 AUGUST 2022
Date of Issue : 02 SEPTEMBER 2022

Calibrated by : Nattakorn Pongpauw

Approved by : T. Petch
(Thanakul Petchum)

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.

QP-TS12-04-04-02064

Calibration Procedure : CP-AC-03

Calibration Method :

This equipment was calibrated by trace to IEC-60942:2003 Standard.
The sound pressure level, frequency and total duration of the sound calibrator was measured using the reference microphone.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33511B	MY52302742	IF-0008-22	04-Feb-23
Digital Multimeter	33461A	MY53220104	EEL-BP-04/0565	09-Feb-23
Digital Multimeter	33461A	MY53220076	EFL-BP-03/0565	09-Feb-23
Digital Multimeter	33461A	MY60042773	EEL-BP-05/0565	09-Feb-23
Programmable Attenuator	MAAT-1070	6210114	IF-0009-22	07-Feb-23
Condenser Microphone	4189	2977800	AA-1013-22	24-Feb-23
Measuring Amplifier	NA-42KAJ	34560495	AA-1005-22	22-Feb-23
Audio Analyzer	AVR-3360A	V740B0069	IF-0010-22	07-Feb-23

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 :

- National Institute of Metrology (Thailand).
- Thailand Institute of Scientific and Technological Research (TISTR).

Result of calibration :

1. Sound pressure level

Specified sound pressure level (dB)	Measured value (dB)	Deviated value (dB)	Uncertainty (dB)	Tolerance limit (dB)
94	94.04	0.04	0.14	0.40

2. Frequency

Specified Frequency (Hz)	Measured value (Hz)	Deviated value (%)	Uncertainty (%)	Tolerance limit (%)
1000	1001.5	0.1	0.1	1.0

3. Total distortion

Measured value (%)	Uncertainty (%)	Tolerance limit (%)
1.70	0.10	3.0

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

QP-TS12-04-04-02064

T. Petch

Cert. No. : ACL22062
Job No. : VC65AC0043
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NI-42; Microphone UC-52 / Preamplifier NH-24
Serial No. : 0122721 / 14841 / 22770
ID No. : RYG JS0022

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 : 14 JANUARY 2022
Calibration Date : 21-24 JANUARY 2022
Date of Issue : 25 JANUARY 2022

Calibrated by : Nathakorn Petchumai

Approved by : T. Petch.

(Thanakul Petchumai)

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.

QP-TS12-04-04-02064

Continuation of Calibration Certificate

Cert. No. : ACL22062
Job No. : VC65AC0043
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limits (dB)
93.0 (93.06)	93.9	0.9	±0.3

2. Self-generated noise

Measured Value (dB)
14.8

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

Frequency Weighting	Measured value (dB)
A-weight	12.0
C-weight	18.0
Flat	24.1

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)				Acceptance Limits
	Flat	C-weight	A-weight	Limit	
125	0.4	0.4	0.4	0.0	±1.5
200	-0.1	-0.1	-0.1	0.0	±1.0
8000	-0.4	-0.3	-0.3	0.0	±0.0

QP-TS12-04-04-02064

Continuation of Calibration Certificate

Cert. No. : ACL22062
Job No. : VC65AC0043
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by based 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 Acoustic chamber and Reference
Standard Instruments.
For some results of each item 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	TF-0012-21	10-Feb-22
Waveform Generator	33511B	MY52902742	TF-0011-21	10-Feb-22
Digital Multimeter	33401A	MY53220104	EFL-300-050264	10-Feb-22
Digital Multimeter	33401A	MY53220676	EFL-300-050264	10-Feb-22
Digital Multimeter	34401A	MY60024273	1-1510725251-1	15-Sep-22
Programmable Attenuator	MAT-1070	62100134	1500-077748	06-Mar-22
Condenser Microphone	4180	2977900	AA-1008-21	05-Feb-22
Measuring Amplifier	NA-42KA	34504095	AA-3003-21	16-Feb-22

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).

QP-TS12-04-04-02064

Continuation of Calibration Certificate

Cert. No. : ACL22062
Job No. : VC65AC0043
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)				Acceptance Limits
	Flat	C-weight	A-weight	Limit	
63	-0.1	0.0	-0.1	0.0	±2.0
125	0.0	0.0	0.0	0.0	±1.5
250	0.0	0.0	0.0	0.0	±1.5
500	0.0	0.0	0.0	0.0	±1.5
1000	0.0	0.0	0.0	0.0	±1.0
2000	0.0	0.0	0.0	0.0	±2.0
4000	0.0	0.0	0.0	0.0	±3.0
8000	0.0	0.1	0.1	0.0	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	94.0	0.0	±0.2
C-weight	94.0	0.0	±0.2
Flat	94.0	0.0	±0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	0.0	±0.1
Slow	94.0	0.0	±0.1
Log	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

QP-TS12-04-04-02064

Continuation of Calibration Certificate

Cert. No. : ACL22062
Job No. : VC65AC0043
Pages : 6 of 8

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle	0.0	±1.5
80.6	80.6	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

QP-TS12-04-04-02064

Continuation of Calibration Certificate

Cert. No. : ACL22062
Job No. : VC65AC0043
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Pass	Fail	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	✓	✓	0.3	0.6
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	✓	✓	0.3	0.6
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. Time burst response	✓	✓	0.2	0.3
10. Peak C-weight level	✓	✓	0.2	0.35
11. Overload indication	✓	✓	0.2	0.25
12. High-level stability	✓	✓	0.1	0.1

QP-TS12-04-04-02064

Continuation of Calibration Certificate

Cert. No. : ACL22062
Job No. : VC65AC0043
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	±0.1
136.0	136.0	0.0	±0.1
135.0	135.0	0.0	±0.1
134.0	134.0	0.0	±0.1
133.0	133.0	0.0	±0.1
132.0	132.0	0.0	±0.1
131.0	131.0	0.0	±0.1
129.0	129.0	0.0	±0.1
124.0	124.0	0.0	±0.1
119.0	119.0	0.0	±0.1
114.0	114.0	0.0	±0.1
109.0	109.0	0.0	±0.1
104.0	104.0	0.0	±0.1
99.0	99.0	0.0	±0.1
94.0	94.0	0.0	±0.1
89.0	89.0	0.0	±0.1
84.0	84.0	0.0	±0.1
79.0	79.0	0.0	±0.1
74.0	74.0	0.0	±0.1
69.0	69.0	0.0	±0.1
64.0	64.0	0.0	±0.1
59.0	59.0	0.0	±0.1
54.0	54.0	0.0	±0.1
49.0	49.0	0.0	±0.1
44.0	44.0	0.0	±0.1
39.0	39.0	0.0	±0.1
34.0	34.0	0.0	±0.1
29.0	29.0	0.0	±0.1
24.0	24.0	0.0	±0.1
19.0	19.0	0.0	±0.1
14.0	14.0	0.0	±0.1
9.0	9.0	0.0	±0.1
4.0	4.0	0.0	±0.1

QP-TS12-04-04-02064

Continuation of Calibration Certificate

Cert. No. : ACL22062
Job No. : VC65AC0043
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)
Auto	94.0	94.0	0.0	±0.1

9. Time burst response

Time Weighting	Time 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; -0.0)
	2	8	117.0	117.0	0.0	(-1.0; -2.5)
Slow	200	800	134.0	134.0	0.0	(-1.0; -2.5)
	2	8	108.0	108.0	0.0	(-1.5; -0.0)
SEL	0.25	1	99.0	98.9	-0.1	(-1.5; -0.0)
	2	8	108.0	108.0	0.0	(-1.0; -2.5)
	200	800	128.0	128.0	0.0	(-1.0; -2.5)

10. Peak C-weight level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L _{peak} (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±0.1
One	134.4	134.4	0.0	±0.1

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	±0.1
Positive half cycle	135.4	135.2	-0.2	±0.2
Negative half cycle	135.4	135.2	-0.2	±0.2

QP-TS12-04-04-02064

Continuation of Calibration Certificate

451-451/1 Sathorn Rd, Bangkok, Bangkok 10100 THAILAND
Tel: 0-2435-8800 Fax: 0-2435-1629 e-mail: cal@csithiporn.com http://www.sithiporn.comCert. No. : ACL22062
Job No. : VC65AC0043
Pages : 7 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NI-42; Microphone UC-52 / Preamplifier NH-24
Serial No. : 0107421 / 169513 / 75884
ID No. : RYG JS0036

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 : 22 AUGUST 2022
Calibration Date : 26-31 AUGUST 2022
Date of Issue : 02 SEPTEMBER 2022

Calibrated by : Nathakorn Petchumai

Approved by : T. Petch.

(Thanakul Petchumai)

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.

QP-TS12-04-04-02064

Summary of Measurement Result :

Parameter	Pass	Fail	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	-	-	-	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. Time 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

QP-TS12-0404-02064

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
128.0	128.0	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	24.8	-0.2	±1.1

QP-TS12-0404-02064



Cert. No. : ACL22824
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-02 Microphone UC-52 / Preamplifier NH-24
Serial No. : 08709746 / 187332 / 01297
ID No. : RYO, F50491

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATHANAKAN 48, PHATHANAKAN ROAD,
KHUANG PHATHANAKAN, KHIT SUAN LUANG,
RANGKOR, 10250 THAILAND.

Location :
Ambient Temperature : (25.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

Received Date : 05 JANUARY 2022
Calibration Date : 10-12 JANUARY 2022
Date of Issue : 11 JANUARY 2022

Calibrated by : Nithakorn Piumputt

Approved by : T. Petchu

(Thankul Petchu)

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.

QP-TS12-0404-02064

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (0.05)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
15.4

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

Frequency Weighting (dB)	Measured Value (dB)
A-weight	12.6
C-weight	18.6
Flat	24.5

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	0.2	0.2	0.3	± 1.5
1000	0.1	0.1	0.1	± 1.0
8000	1.5	1.5	1.6	±5.0

QP-TS12-0404-02064

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Auto	94.0	94.0	0.0	±1.1

9. Time burst response

Time Weighting	Time burst duration, T _b (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	106.0	106.0	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	0.25	1	106.0	106.0	0.0	1.5; -5.0
	2	8	117.0	117.0	0.0	1.0; -2.5
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	96.0	96.9	+0.9	1.5; -5.0
	2	8	106.0	106.0	0.0	1.0; -2.5
	200	800	128.0	128.1	0.1	±1.0

10. Peak C sound level

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	-
One	136.4	135.8	-0.6	±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	-
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

QP-TS12-0404-02064

Calibration Procedure : CP-AC-01

Calibration Method :

The equipment was calibrated by based on IEC 61673-3 (2013) Standard for sound level meter (SLM). The SLM had been to Acoustical and Electrical signal tests of frequency weighting with Acoustic chamber and Reference Standard Instruments.
For test results of each item were made by observation of each 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	3351RA	MY54017076	TE-0012-21	10-Feb-22
Waveform Generator	3351RB	MY53262742	IE-0011-21	10-Feb-22
Digital Multimeter	33461A	MY53220104	EEL-BP, 03/0264	10-Feb-22
Digital Multimeter	33461A	MY53250076	EEL-BP, 03/0264	08-Feb-22
Digital Multimeter	33461A	MY00024273	I-15180725251-1	13-Sep-22
Programmable Attenuator	MAT-1070	62100114	1500-077748	08-Mar-22
Condenser Microphone	4180	2977000	AA-1008-21	05-Feb-22
Measuring Amplifier	NA-43CAI	3456095	AA-3083-21	16-Feb-22

2. This result of calibration was found accurate as shown on data and place of calibration (for this calibrated item only).

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

- National Institute of Metrology (Thailand).
- Thailand Institute of Scientific and Technological Research (TISTR).

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)			Acceptance Limits
	Flat	C-weight	A-weight	
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	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	94.0	0.0	-
C-weight	94.0	0.0	±0.2
Flat	94.0	0.0	±0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	0.0	-
Slow	94.0	0.0	±0.1
Log	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

QP-TS12-0404-02064

11. Overload indication

Measured value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	-	-
Negative one-half cycle	-0.2	±1.0

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

This 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

QP-TS12-0404-02064

Summary of Measurement Result :

Parameter	Pass	Fail	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	-	-	-	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. Time burst response	✓	-	0.2	0.35
10. Peak C sound level	✓	-	0.2	0.35
11. Overload indication	✓	-	0.2	0.25
12. High level stability	✓	-	0.1	0.1

QP-TS12-0404-02064

Result of calibration:

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (0.36)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
15.1

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

Frequency Weighting	Measured value (dB)
A-weight	13.4
C-weight	19.8
Flat	25.2

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	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	1.1	1.2	1.2	±5.0

QF-TS12-04-04-02064

T. Petch.

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
83	-0.1	0.0	-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	0.1	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	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	94.0	0.0	-
C-weight	94.0	0.0	±0.2
Flat	94.0	0.0	±0.2

5.2 Time-weighting at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	0.0	±0.1
Slow	94.0	0.0	±0.1
Log	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

QF-TS12-04-04-02064

T. Petch.

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limit (dB)
Ann	94.0	94.0	0.0	±1.7

9. Noise burst response

Time Weighting	Time burst duration, T _b (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	106.0	106.0	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	0.25	1	106.0	106.0	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

10. Peak C sound level

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	-
One	136.4	135.5	-0.9	±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	-
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

QF-TS12-04-04-02064

T. Petch.

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.6	89.6	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	136.9	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

QF-TS12-04-04-02064

T. Petch.

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by based on IEC-61672-3 (2013) standard for sound level meter (SLM). The SLM had tests in Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.

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

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	IF-0012-21	10-Feb-22
Waveform Generator	33511B	MY5202742	IF-0011-21	10-Feb-22
Digital Multimeter	33461A	MY5320104	EEL DP, 055064	10-Feb-22
Digital Multimeter	33461A	MY5320679	EEL DP, 030264	08-Feb-22
Digital Multimeter	34461A	MY6004273	1-151072521-1	15-Sep-22
Programmable Attenuator	NAF-1070	62160114	1500-07746	08-Mar-22
Condenser Microphone	4180	2977600	AA-1008-21	09-Feb-22
Measuring Amplifier	NA-42KA1	34560495	AA-3003-21	16-Feb-22

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 suitable 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).

QF-TS12-04-04-02064

T. Petch.

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
29.0	29.0	0.0	±1.1
24.0	24.0	0.0	±1.1
19.0	19.0	0.1	±1.1
14.0	14.0	0.1	±1.1
9.0	9.0	0.1	±1.1
4.0	4.0	0.1	±1.1

QF-TS12-04-04-02064

T. Petch.

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-02 / Microphone UC-52 / Pre-amplifier NH-24
Serial No. : 00000072 / 18465 / 01734
ID No. : RYG, F50493

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATHANAKAN 40, PHATHANAKAN ROAD,
KHWAENG PHATHANAKAN, KHUET 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 2022
Calibration Date : 10-12 JANUARY 2022
Date of Issue : 13 JANUARY 2022

REVIEW BY : [Signature]
APPROVED BY : [Signature]
NEXT CAL. DATE : 10/1/25

Calibrated by : Natsakorn Pimputanon

Approved by : T. Petch.
(Thanakul Petchai)

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.

QF-TS12-04-04-02064

Summary of Measurement Result :

Parameter	Pass	Fail	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	✓	-	0.2	0.6
125 Hz	✓	-	0.2	0.6
1000 Hz	✓	-	0.2	0.6
8000 Hz	✓	-	0.2	0.7
4. Electrical signal tests of frequency weightings	✓	-	0.3	0.6
For 10 Hz to 4 kHz	✓	-	0.3	0.7
For 4 kHz to 10 kHz	✓	-	0.2	0.2
For 10 kHz to 20 kHz	✓	-	0.2	1.0
5. Frequency and time weightings at 1 kHz	✓	-	0.1	0.1
6. Long-term stability	✓	-	0.2	0.3
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. Noise 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

QF-TS12-04-04-02064

T. Petch.

Result of calibration:

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (0.36)	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	Measured value (dB)
A-weight	9.9
C-weight	16.9
Flat	22.6

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
125	0.4	0.4	0.4	±1.5
1000	0.0	0.0	0.0	±1.0
8000	-1.2	-1.3	-1.1	±5.0

QF-TS12-04-04-02064

T. Petch.

Continuation of Calibration Certificate

Cert. No. : ACL22027
Job No. : VC65AC0040
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
63	-0.1	-0.1	-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	0.0	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	94.0	0.0	-
C-weight	94.0	0.0	±0.2
Flat	94.0	0.0	±0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	0.0	-
Slow	94.0	0.0	±0.1
Log	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

QP-TS12-04-04-02064

T. Petch

Continuation of Calibration Certificate

Cert. No. : ACL22027
Job No. : VC65AC0040
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	135.1	0.1	±0.3
134.0	134.1	0.1	±0.3
133.0	133.0	0.0	±1.1
132.0	132.0	0.0	±1.1
131.0	131.0	0.0	±1.1
129.0	129.0	0.0	±1.1
128.0	128.0	0.0	±1.1
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
29.0	29.0	0.0	±1.1
24.0	24.0	0.0	±1.1
19.0	19.0	0.0	±1.1
14.0	14.0	0.0	±1.1
9.0	9.0	0.0	±1.1
4.0	4.0	0.0	±1.1

QP-TS12-04-04-02064

T. Petch

Continuation of Calibration Certificate

Cert. No. : ACL22027
Job No. : VC65AC0040
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)
Auto	94.0	94.0	0.0	±1.1

9. Tone burst response

Time Weighting	Time burst duration, T _b (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	106.9	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	106.9	106.0	0.0	1.5/-5.0
	200	800	127.6	127.6	0.0	±1.0
	0.25	1	99.0	99.6	-0.2	1.5/-5.0
SEL	2	8	106.9	107.9	-0.1	1.0/-2.5
	200	800	128.0	128.0	0.0	±1.0

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	133.0	133.0	0.0	-
Ons	136.4	136.0	-0.4	±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	-
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.1	-0.3	±2.0

QP-TS12-04-04-02064

T. Petch

Continuation of Calibration Certificate

Cert. No. : ACL22027
Job No. : VC65AC0040
Pages : 8 of 8

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.6	89.6	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

QP-TS12-04-04-02064

T. Petch

45/45/19 Sukhumvit Rd., Bangkok, Bangkok 10710 THAILAND
Tel: 2415-8800 Fax: 2415-1629 e-mail: cal@sitiporn.com http://www.sitiporn.com

Calibration Certificate

Equipment : SOUND LEVEL METER
Model : RBN
Serial No. : NI-42 Microphone UC-52; Pre-amplifier NIS-24
Serial No. : 0000077 / 188464 / 01733
ID No. : RYG J50492

Condition As Found : GOOD

Customer : A.S. LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATHANAKAN 90 PHATHANAKAN ROAD,
KHUAEANG PHATHANAKAN, KHUET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location :
Ambient Temperature : (23.0 ± 1) °C
Pressure : (101.3 ± 1) hPa
Relative Humidity : (50.0 ± 20) %
Received Date : 05 JANUARY 2022
Calibration Date : 10-12 JANUARY 2022
Date of Issue : 13 JANUARY 2022

Calibrated by : Nuthakorn Petchairai

Approved by : T. Petch
(Thanakorn Petchairai)

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.

QP-TS12-04-04-02064

Continuation of Calibration Certificate

Cert. No. : ACL22026
Job No. : VC65AC0040
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Pass	Fail	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	-	-	-	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	0.3
11. Overload indication	✓	-	0.2	0.25
12. High level stability	✓	-	0.1	0.1

QP-TS12-04-04-02064

T. Petch

Continuation of Calibration Certificate

Cert. No. : ACL22026
Job No. : VC65AC0040
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limits (dB)
93.9 (93.96)	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	Measured value (dB)
A-weight	11.6
C-weight	17.8
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	-0.2	0.2	0.2	± 1.5
1000	-0.1	-0.1	-0.1	± 1.0
8000	-0.2	0.3	0.3	± 0.6

QP-TS12-04-04-02064

T. Petch

Continuation of Calibration Certificate

Cert. No. : ACL22026
Job No. : VC65AC0040
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	0.0	-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	0.1	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	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	94.0	0.0	-
C-weight	94.0	0.0	±0.2
Flat	94.0	0.0	±0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	0.0	-
Slow	94.0	0.0	±0.1
Log	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

QP-TS12-04-04-02064

T. Petch

Cert. No. : ACL22026
Job No. : VCSAC0840
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	-0.1	±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	26.8	-0.2	±1.1
26.0	25.9	-0.1	±1.1
25.0	24.9	-0.1	±1.1

QF-TS12-04-04-02064

T. Reth.

Cert. No. : ACL22026
Job No. : VCSAC0840
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)
A-weight	94.0	94.0	0.0	±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	104.0	103.9	-0.1	1.5; -5.0
	2	3	117.0	117.0	0.0	1.0; -2.5
	200	800	134.0	134.1	0.1	±1.0
Slow	2	8	106.0	106.0	0.0	1.5; -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	106.0	106.0	0.0	1.0; -2.5
	200	800	128.0	128.0	0.0	±1.0

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	133.0	133.0	0.0	-
One	136.4	136.2	-0.2	±1.0

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	-
Positive half cycle	133.4	135.2	+1.8	±2.0
Negative half cycle	133.4	133.2	-0.2	±2.0

QF-TS12-04-04-02064

T. Reth.

Cert. No. : ACL22026
Job No. : VCSAC0840
Pages : 8 of 8

11. Overload indication

Measured value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	-0.1	±1.5
Negative one-half cycle	-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

QF-TS12-04-04-02064

T. Reth.

SITHIPORN ASSOCIATES CO.,LTD.
CALIBRATION LABORATORY

451-451/1 Silestern Rd, Bangnaeue, Bangkok 10700 THAILAND
Tel:02-2433-8800 Fax:02-2433-8679 e-mail:cal-center@sithiporn.com http://www.sithiporn.com



Cert. No. : ACL22181
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-62 Microphone UC-52 / Preamp/Filter N01-24
Serial No. : 00873057 / 171591 / 73333
ID No. : RYG F80381

Condition As Found : GOOD

Customer : A/S LABORATORY GROUP (THAILAND) CO., LTD.
194 PHATHANAKAN 40, PHATHANAKAN ROAD,
KHUANG PHATHANAKAN, KHUANG SIANG LUANG,
BANGKOK, 10250 THAILAND.

Location : -
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

Received Date : 22 AUGUST 2022
Calibration Date : 26-31 AUGUST 2022
Date of Issue : 02 SEPTEMBER 2022

Calibrated by : Nithakorn Pichumai

Approved by : T. Reth.
(Thanakul Pichumai)

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.

QF-TS12-04-04-02064

T. Reth.

Cert. No. : ACL22181
Job No. : VCSAC0877
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

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

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
15.4

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

Frequency Weighting	Measured value (dB)
A-weight	12.0
C-weight	18.3
Flat	24.0

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	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	0.2	0.2	±5.0

QF-TS12-04-04-02064

T. Reth.

Cert. No. : ACL22181
Job No. : VCSAC0877
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz

Frequency (Hz)	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	0.0	0.0	±5.0

5. Frequency and time weightings at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	94.0	0.0	±0.2
C-weight	94.0	0.0	±0.2
Flat	94.0	0.0	±0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	0.0	±0.1
Slow	94.0	0.0	±0.1
Long	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

QF-TS12-04-04-02064

T. Reth.

Cert. No. : ACL22181
Job No. : VCSAC0877
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	137.1	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	133.0	0.0	±1.1
132.0	132.0	0.0	±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	99.0	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	26.9	-0.1	±1.1
26.0	25.9	-0.1	±1.1
25.0	25.0	0.0	±1.1

QF-TS12-04-04-02064

T. Reth.

Continuation of Calibration Certificate

Cert. No. : ACL22182
Job No. : VCSAC0077
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)
Auto	94.0	94.0	0.0	±1.1

9. Time 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	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.5; -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

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	133.0	133.0	0.0	-
One	136.4	136.1	-0.3	±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	-
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.1	-0.3	±2.0

QH-TS12-04-04-02064

T. Petch.

Continuation of Calibration Certificate

Cert. No. : ACL22181
Job No. : VCSAC0077
Pages : 8 of 8

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limit (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

QH-TS12-04-04-02064

T. Petch.

Continuation of Calibration Certificate

Cert. No. : ACL22182
Job No. : VCSAC0077
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by based on IEC-61672-3 (2013) Standard for sound level meter (SLM). The SLM had tests in Acoustical and Electrical signal term of frequency weighting with Anchoic chamber and Reference Standard Instruments.

For tests results of each item 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	IF-0007-22	04-Feb-23
Waveform Generator	33511B	MY53202742	IF-0008-22	04-Feb-23
Digital Multimeter	34461A	MY5320104	EEL-IP, 04/02/65	09-Feb-23
Digital Multimeter	34461A	MY5320076	FEL-IP, 03/02/65	09-Feb-23
Digital Multimeter	34461A	MY19004273	FEL-IP, 05/02/65	09-Feb-23
Programmable Attenuator	3447-1070	62100114	IF-0009-22	07-Feb-23
Condenser Microphone	4180	2977000	AA-1011-22	24-Feb-23
Measuring Amplifier	NA-42KA	34560495	AA-3005-22	22-Feb-23

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 :

- National Institute of Metrology (Thailand).
- Thailand Institute of Scientific and Technological Research (TISTR).

QH-TS12-04-04-02064

T. Petch.

Continuation of Calibration Certificate

Cert. No. : ACL22182
Job No. : VCSAC0077
Pages : 2 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
63	-0.1	-0.1	-0.1	±2.0
125	0.0	0.0	-0.1	±1.5
250	-0.1	-0.1	-0.1	±1.5
500	-0.1	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	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits
A-weight	94.0	0.0	±0.2
C-weight	94.0	0.0	±0.2
Flat	94.0	0.0	±0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits
Fast	94.0	0.0	±0.1
Slow	94.0	0.0	±0.1
Log	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
A-weight	94.0	94.0	0.0	±0.3

QH-TS12-04-04-02064

T. Petch.

451-451/1 Sathorn Rd.,Bangkok, Bangkok 10120 THAILAND
Tel:02-263-8800 Fax:02-263-1879 e-mail:cal@sinhphorn.com http://www.sithiporn.comCert. No. : ACL22182
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NR-02 Microphone UC-52 / Preamplifier N01-24
Serial No. : 0087106 / 171842 / 73485
ID No. : RYG-FS0384

Condition As Found : GOOD

Customer : A&S LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATHANAKAN 40, PHATHANAKAN ROAD,
KHUANG PHATHANAKAN, KHUANG SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location :
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 2.0) %
Received Date : 22 AUGUST 2022
Calibration Date : 26-31 AUGUST 2022
Date of Issue : 02 SEPTEMBER 2022

Calibrated by : Nattakorn Poompibul

Approved by : T. Petch.
(Thakul Petchum)

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.

QH-TS12-04-04-02064

Continuation of Calibration Certificate

Cert. No. : ACL22182
Job No. : VCSAC0077
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
93.9 (93.9)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
16.5

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

Frequency Weighting	Measured Value (dB)
A-weight	11.2
C-weight	17.6
Flat	23.3

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
125	0.4	0.5	0.5	±1.5
1000	0.0	0.0	0.0	±1.0
3000	-2.4	-2.4	-2.4	±5.0

QH-TS12-04-04-02064

T. Petch.

Continuation of Calibration Certificate

Cert. No. : ACL22182
Job No. : VCSAC0077
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)
Auto	94.0	94.0	0.0	±1.1

9. Time burst response

Time Weighting	Time burst duration, T _b (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	2	1	108.0	107.9	-0.1	1.5; -5.0
		2	117.0	116.9	-0.1	1.0; -2.5
		200	800	134.0	134.0	0.0
Slow	2	1	108.0	108.0	0.0	1.5; -5.0
		2	108.0	127.6	19.6	±1.0
		200	800	127.6	127.6	0.0
SEL	2	1	99.0	98.9	-0.1	1.5; -5.0
		2	108.0	108.0	0.0	1.0; -2.5
		200	800	128.0	128.0	0.0

10. Peak C sound level

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	-
One	136.4	136.3	-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	-
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.1	-0.3	±2.0

QH-TS12-04-04-02064

T. Petch.

Continuation of Calibration Certificate

11. Overall 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	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Weighting				
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

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 Microphone UC-52 / Preamplifier N0-24
Serial No. : 00296516 / H0412 / S0102
ID No. : RYG JS0431

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
106 PHATHANAKAN-40 PHATHANAKAN ROAD,
KHUANG PHATHANAKAN, KHUANG SUAN LIANG,
BANGKOK, 10250 THAILAND.

Location : -
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3.1) kPa
Relative Humidity : (50.0 ± 2.0) %

Received Date : 14 JANUARY 2022
Calibration Date : 21-24 JANUARY 2022
Date of Issue : 25 JANUARY 2022

Calibrated by : Nathakorn Pitsumpan

Approved by : *[Signature]*
(Thankul Petchum)

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.

QP-TS12-04-04-02064

[Signature]

Summary of Measurement Result :

Parameter	Pass	Fail	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	-	-	-	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	0.5
10. Peak C-weight level	✓	-	0.2	0.25
11. Overall indication	✓	-	0.2	0.25
12. High level stability	✓	-	0.1	0.1

QP-TS12-04-04-02064

[Signature]

Continuation of Calibration Certificate

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
29.0	28.9	-0.1	±1.1
24.0	23.9	-0.1	±1.1
19.0	18.9	-0.1	±1.1
14.0	13.9	-0.1	±1.1
9.0	8.9	-0.1	±1.1
4.0	3.9	-0.1	±1.1

QP-TS12-04-04-02064

[Signature]

Continuation of Calibration Certificate

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Auto	94.0	94.0	0.0	±1.1

9. Tone burst response

Time Weighting	Time burst duration, TH (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	117.0	117.0	0.0	1.0 ; -2.5
		200	134.0	134.0	0.0	±1.0
Slow	2	1	108.0	108.0	0.0	1.5 ; -5.0
		200	127.6	127.6	0.0	±1.0
		2	99.0	99.0	-0.1	1.5 ; -5.0
SEL	0.25	1	108.0	108.0	0.0	1.0 ; -2.5
		2	108.0	108.0	0.0	1.0 ; -2.5
		200	128.0	128.0	0.0	±1.0

10. Peak C-weight level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Leqpeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	-
One	136.4	136.3	-0.1	±1.0

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	-
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

QP-TS12-04-04-02064

[Signature]

Continuation of Calibration Certificate

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by based on (IEC 61672-1:2013) Standard for sound level meter (SLM). The SLM had been Acoustical and Electrical signal tests of frequency weighting with Atmospheric chamber and Reference Standard Instruments.

For test results of each item 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	IF-0012-21	10-Feb-22
Waveform Generator	33511B	MY53202742	IF-0011-21	10-Feb-22
Digital Multimeter	33461A	MY53220104	EEL-IP-03-0264	10-Feb-22
Digital Multimeter	33461A	MY53220076	EEL-IP-03-0264	10-Feb-22
Digital Multimeter	34461A	MY60054273	1-1310725251-1	15-Sep-22
Programmable Attenuator	NAT-1070	62100114	1500-07774E	08-Mar-22
Condenser Microphone	4180	2977990	AA-1009-21	05-Feb-22
Measuring Amplifier	NA-42KAI	34560495	AA-3003-21	16-Feb-22

2. This result of calibration was based 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).

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz

Frequency (Hz)	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	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	94.0	0.0	-
C-weight	94.0	0.0	±0.2
Flat	94.0	0.0	±0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	0.0	-
Slow	94.0	0.0	±0.1
Imp	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

QP-TS12-04-04-02064

[Signature]

Continuation of Calibration Certificate

11. Overall indication

Measured value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle	
89.7	89.5	-0.2
		+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

QP-TS12-04-04-02064

[Signature]

SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

433-431/3 Sathitorn Rd., Bangna, Bangkok 10700 THAILAND
Tel: 0-2435-8800 Fax: 0-2435-1679 e-mail: calcenter@sithiporn.com http://www.sithiporn.com



Cert. No. : ACC22001
Pages : 1 of 3

Calibration Certificate

Equipment : SOUND CALIBRATOR
Manufacturer : RION
Model : NC-75
Serial No. : 35002736
ID No. : 154125

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATHANAKAN RD., PHATHANAKAN ROAD,
KHUANG PHATHANAKAN, KHUANG SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location :
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

Received Date : 09 JANUARY 2022
Calibration Date : 10 JANUARY 2022
Date of Issue : 10 JANUARY 2022

REVIEW BY: *Thakul Petchurai*
APPROVED BY: *Thakul Petchurai*
NEXT CAL. DATE: 10/1/23

Calibrated by : Thakul Petchurai

Approved by : *Thakul Petchurai*
(Thakul Petchurai)

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.

QP-TS12-04-04-02064

SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No. : ACC22001
Job No. : VCR5AC0040
Pages : 2 of 3

Calibration Procedure : CP-AC-03

Calibration Method :

This equipment was calibrated by based on IEC-60942-2003 Standard.
The sound pressure level, frequency and total duration of the sound calibrator was measured using the reference microphone.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33511B	MY32302742	EF-0011-21	10-Feb-22
Digital Multimeter	33461A	MY32200104	EEL-RP-04/0264	10-Feb-22
Digital Multimeter	33461A	MY3220076	EEL-RP-03/0264	04-Feb-22
Digital Multimeter	33461A	MY60024273	1-1510725251-1	15-Sep-22
Programmable Attenuator	MAT-1070	62100114	1500-07774E	08-Mar-22
Condenser Microphone	4180	2977900	AA-1006-21	05-Feb-22
Measuring Amplifier	NA-42KAJ	34560495	AA-3003-23	14-Feb-22
Audio Analyzer	AVR-3306A	V7408069	EF-0010-21	10-Feb-22

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 :

- National Institute of Metrology (Thailand).
- Thailand Institute of Scientific and Technological Research (TISTR).

SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No. : ACC22001
Job No. : VCR5AC0040
Pages : 3 of 3

Result of calibration :

1. Sound pressure level

Specified sound pressure level (dB)	Measured value (dB)	Deviated value (dB)	Uncertainty (dB)	Tolerance limit (dB)
94	93.99	-0.01	0.14	0.40

2. Frequency

Specified Frequency (Hz)	Measured value (Hz)	Deviated value (%)	Uncertainty (%)	Tolerance limit (%)
1000	1000.0	0.0	0.1	1.0

3. Total distortion

Measured value (%)	Uncertainty (%)	Tolerance limit (%)
0.28	0.10	3.0

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

QP-TS12-04-04-02064

SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

433-431/3 Sathitorn Rd., Bangna, Bangkok 10700 THAILAND
Tel: 0-2435-8800 Fax: 0-2435-1679 e-mail: calcenter@sithiporn.com http://www.sithiporn.com



Cert. No. : ACL22160
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 Microphone UC-52 / Pre-amplifier NH-24
Serial No. : 60472132 / 160447 / 72466
ID No. : RYUJ 350369

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATHANAKAN RD., PHATHANAKAN ROAD,
KHUANG PHATHANAKAN, KHUANG SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location :
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

Received Date : 06 JULY 2022
Calibration Date : 11-18 JULY 2022
Date of Issue : 19 JULY 2022

REVIEW BY: *Thakul Petchurai*
APPROVED BY: *Thakul Petchurai*
NEXT CAL. DATE: 11/1/23

Calibrated by : Thakul Petchurai

Approved by : *Thakul Petchurai*
(Thakul Petchurai)

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.

QP-TS12-04-04-02064

SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No. : ACL22160
Job No. : VCR5AC0069
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by based on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests by Acoustical and Electrical signal tests of frequency weighting with Acoustic chamber and Reference Standard Instruments.

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

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY40017076	EF-0007-22	04-Feb-23
Waveform Generator	33511B	MY32302742	EF-0008-22	04-Feb-23
Digital Multimeter	33461A	MY32200104	EEL-RP-04/0265	09-Feb-23
Digital Multimeter	33461A	MY3220076	EEL-RP-03/0265	09-Feb-23
Digital Multimeter	33461A	MY60054273	EEL-RP-05/0265	09-Feb-23
Programmable Attenuator	MAT-1070	62100114	EF-0009-22	07-Feb-23
Condenser Microphone	4180	2977900	AA-1013-22	24-Feb-23
Measuring Amplifier	NA-42KAJ	34560495	AA-3005-22	22-Feb-23

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 :

- National Institute of Metrology (Thailand).
- Thailand Institute of Scientific and Technological Research (TISTR).

SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No. : ACL22160
Job No. : VCR5AC0069
Pages : 3 of 8

Summary of Measurement Result :

Parameters	Pass	Fail	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	✓	-	0.3	0.6
125 Hz	✓	-	0.3	0.6
1000 Hz	✓	-	0.3	0.6
4. Electrical signal tests of frequency weightings	✓	-	0.3	0.7
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	-	-	-	-
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. True tone response	✓	-	0.2	0.2
10. Peak C-weight level	✓	-	0.2	0.25
11. Overload indication	✓	-	0.2	0.25
12. High level stability	✓	-	0.1	0.1

QP-TS12-04-04-02064

SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No. : ACL22160
Job No. : VCR5AC0069
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

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

2. Self-generated noise

2.1. Normal test

Measured Value (dB)
14.2

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

Frequency Weighting	Measured Value (dB)
A-weight	6.9
C-weight	16.3
Flat	22.1

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
125	0.2	0.2	0.2	±1.5
1000	-0.1	-0.1	-0.1	±1.0
8000	-1.1	-1.1	-1.1	±5.0

SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No. : ACL22160
Job No. : VCR5AC0069
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	0.0	0.0	±2.0
125	0.1	0.1	0.1	±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	±1.0
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	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	94.0	0.0	-
C-weight	94.0	0.0	±0.2
Flat	94.0	0.0	±0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	0.0	-
Slow	94.0	0.0	±0.1
Long	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

SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No. : ACL22160
Job No. : VCR5AC0069
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	104.1	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	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

QP-TS12-04-04-02064

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Auto	94.0	94.0	0.0	±1.1

9. Time burst response

Time Weighting	Time 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	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.5; -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

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Leqpeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	-
One	136.4	135.3	-1.1	±1.0

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	-
Positive half cycle	135.4	135.1	-0.3	±0.0
Negative half cycle	135.4	135.1	-0.3	±0.0

QP-TS12-04-04-02064

~ R.L.A.

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
39.5	39.6	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

QP-TS12-04-04-02064

~ R.L.A.

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NS-42 Microphone VC-53 / Pre-amplifier NF-24
Serial No. : 0072561 / 170798 / 72999
ID No. : BYO, P90300

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATHANAKAN SA PHATHANAKAN ROAD,
EDUWANG PHATHANAKAN, KHIT SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location :
Ambient Temperature : (23.0 ± 3.1) °C
Pressure : (101.3 ± 3.1) kPa
Relative Humidity : (50.8 ± 2.0) %
Received Date : 06 JULY 2022
Calibration Date : 11-18 JULY 2022
Date of Issue : 19 JULY 2022



Calibrated by : Nattakorn Prapongsom

Approved by : T. R.L.A.
(Thanakul Petchum)

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.

QP-TS12-04-04-02064

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by based on IEC-61672-1 (2013) Standard for sound level meter (SLM). The SLM had been Acoustical and Electrical signal tests of frequency weighting with Acoustic chamber and Reference Standard Instruments.

For test results of each item were made by observation of each 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	MY48017075	EF-0007-22	04-Feb-23
Waveform Generator	33311B	MY52302542	EF-0008-22	04-Feb-23
Digital Multimeter	33461A	MY53201014	EEL-IP, 04/0265	09-Feb-23
Digital Multimeter	33461A	MY5320076	EEL-IP, 05/0265	09-Feb-23
Digital Multimeter	34461A	MY60024273	EEL-IP, 05/0265	09-Feb-23
Programmable Attenuator	MAT-1070	62100114	EF-0009-22	07-Feb-23
Condenser Microphone	4180	2977900	AA-1013-22	24-Feb-23
Measuring Amplifier	NA-42KAI	34504995	AA-3005-22	22-Feb-23

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 :

- National Institute of Metrology (Thailand);
- Thailand Institute of Scientific and Technological Research (TISTR).

QP-TS12-04-04-02064

~ R.L.A.

Summary of Measurement Result :

Parameter	Pass	Fail	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	✓	-	0.2	N/A
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	✓	-	0.2	0.6
For 10 Hz to 4 kHz	✓	-	0.3	0.7
For 4 kHz to 10 kHz	-	-	-	-
For 10 kHz to 20 kHz	-	-	-	-
5. Frequency and time weightings at 1 kHz	✓	-	0.2	0.2
6. Long-term stability	✓	-	0.1	0.1
7. Level linearity on the reference level range	✓	-	0.2	0.3
8. Level linearity including the level range control	✓	-	0.2	0.3
9. Time burst response	✓	-	0.2	0.3
10. Peak C sound level	✓	-	0.2	0.3
11. Overload indication	✓	-	0.2	0.25
12. High level stability	✓	-	0.1	0.1

QP-TS12-04-04-02064

~ R.L.A.

Result of calibration :

1. Absolute sensitivity

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

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
16.2

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

Frequency Weighting	Measured Value (dB)
A-weight	12.0
C-weight	16.3
Flat	24.2

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
125	0.4	0.4	0.4	±1.5
1000	0.0	0.0	0.0	±1.0
8000	0.4	0.5	0.5	±1.0

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	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	0.0	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	±1.0
8000	0.0	0.1	0.1	±1.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	94.0	0.0	-
C-weight	94.0	0.0	±0.2
Flat	94.0	0.0	±0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	0.0	-
Slow	94.0	0.0	±0.1
Leq	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

QP-TS12-04-04-02064

~ R.L.A.

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	39.0	0.0	±1.1
34.0	34.0	0.0	±1.1
29.0	29.0	-0.1	±1.1
24.0	24.0	-0.1	±1.1
19.0	19.0	-0.1	±1.1
14.0	14.0	-0.1	±1.1
9.0	9.0	-0.1	±1.1
4.0	4.0	-0.1	±1.1

QP-TS12-04-04-02064

~ R.L.A.

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Auto	94.0	94.0	0.0	±1.1

9. Time burst response

Time Weighting	Time 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	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.5; -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

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Leqpeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	-
One	136.4	135.0	-1.4	±1.0

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	-
Positive half cycle	135.4	135.2	-0.2	±0.0
Negative half cycle	135.4	135.2	-0.2	±0.0

QP-TS12-04-04-02064

~ R.L.A.

Cert. No. : A-CL32148
Job No. : VCMAC0069
Pages : 8 of 8

11. Overall indication

Measured value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Positive	Negative	
one-half cycle	one-half cycle	
89.7	89.5	+0.2
		+1.5

12. High level stability

Frequency	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Weighting				
A-weight	177.0	177.0	0.0	+0.3

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

End of Calibration Certificate

QC-TS12-04-01-02664

CERTIFICATE OF CALIBRATION

Certificate No. : CL-02145
Page 1 of 2

Equipment Name: Head Stress Monitor with Sensor
Manufacturer: DataDMS
Model: H332.2
Serial No: 18030244
ID No: H332_250245

Received date: 10 JAN 2022
Calibration date: 18 FEB 2022
Issue date: 17 FEB 2022

Customer:
Name: A/S Laboratory group (Thailand) Co.,Ltd.
Address: 104 Phrasimongkol Rd, Phrasimongkol
Rd, Khlong Suan Luang, Khlong Suan Luang, Bangkok
10250 Thailand

Reference Used During Calibration:
1. Standard Temperature Probe Model: STS-100 A500,
Serial No: 607862 09, Due date: 25 Mar 2022
2. Digital Temperature Indicator Model: DT-1000A-MK
II, Serial No: 671402-00591, Due date: 04 June 2022

Calibration Condition:
Temperature: (23.0) °C
Relative Humidity: (55.1) %

Calibration Procedure:
The temperature calibration was done by in-house calibration method as per ISO-17025 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 (NIM) (NMI) Certificate number: TT-0036-21, Certificate number: ER-0032-21

REVIEW BY: *Phanp*
APPROVED BY: *Phanp*
NEXT CAL DATE: 16/12/23

Calibrated by:
1. Mr. Saeed Thachalath
2. Miss Oatthana Thachalath



Approved Signature: *Phanp*
Mr. Phanp Boonchaisarn
Calibration Department Manager

THIS CERTIFICATE REPORT MAY NOT BE REPRODUCED EXCEPT IN FULL, WITHOUT PERMISSION FROM SITHIPORN ASSOCIATES CO., LTD.

CERTIFICATE OF CALIBRATION

Certificate No. : CL-02145
Page 2 of 2

Result of Calibration: 20 - 40 °C

Calibration Range: 20 - 40 °C

Table 1: This equipment was connected with wet bulb probe Model: HPS201.2 S/N: 20020026.
Dimension: Diameter 14 mm, Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
30	20.051	20.1	0.0	0.009
30	20.047	20.1	0.0	0.009
30	20.041	20.1	0.0	0.009
30	20.028	20.1	0.0	0.009
30	20.017	20.1	0.0	0.009

Table 2: This equipment was connected with temperature probe Model: TP3207.2 S/N: 19032223.
Dimension: Diameter 14 mm, Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
70	20.053	20.2	0.0	0.009
70	20.052	20.2	0.0	0.009
70	20.052	20.2	0.0	0.009
70	20.052	20.2	0.0	0.009
70	20.052	20.2	0.0	0.009

Table 3: This equipment was connected with Glue thermometer probe Model: TP3276.2 S/N: 21000884.
Dimension: Diameter 8 mm, Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.054	20.1	0.0	0.009
110	20.047	20.1	0.0	0.009
110	20.041	20.1	0.0	0.009
110	20.028	20.1	0.0	0.009
110	20.017	20.1	0.0	0.009

UUC: Unit Under Calibration

The reported expanded uncertainty is based on standard uncertainty multiplied by a coverage factor $k=2$ providing a level of confidence of approximately 95%.



CERTIFICATE OF CALIBRATION

Certificate No. : CL-02145
Page 1 of 2

Equipment Name: Head Stress Monitor with Sensor
Manufacturer: DataDMS
Model: H332.2
Serial No: 18030244
ID No: H332_250245

Received date: 10 JAN 2022
Calibration date: 18 FEB 2022
Issue date: 25 JAN 2022

Customer:
Name: A/S Laboratory group (Thailand) Co.,Ltd.
Address: 104 Phrasimongkol Rd, Phrasimongkol
Rd, Khlong Suan Luang, Khlong Suan Luang, Bangkok
10250 Thailand

Reference Used During Calibration:
1. Standard Temperature Probe Model: STS-100 A500,
Serial No: 607862 09, Due date: 25 Mar 2022
2. Digital Temperature Indicator Model: DT-1000A-MK
II, Serial No: 671402-00591, Due date: 04 June 2022

Calibration Condition:
Temperature: (23.0) °C
Relative Humidity: (55.1) %

Calibration Procedure:
The temperature calibration was done by in-house calibration method as per ISO-17025 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 (NIM) (NMI) Certificate number: TT-0036-21, Certificate number: ER-0032-21

REVIEW BY: *Phanp*
APPROVED BY: *Phanp*
NEXT CAL DATE: 16/12/23

Calibrated by:
1. Mr. Saeed Thachalath
2. Miss Oatthana Thachalath



Approved Signature: *Phanp*
Mr. Phanp Boonchaisarn
Calibration Department Manager

THIS CERTIFICATE REPORT MAY NOT BE REPRODUCED EXCEPT IN FULL, WITHOUT PERMISSION FROM SITHIPORN ASSOCIATES CO., LTD.

CERTIFICATE OF CALIBRATION

Certificate No. : CL-02145
Page 2 of 2

Result of Calibration: 20 - 40 °C

Calibration Range: 20 - 40 °C

Table 1: This equipment was connected with wet bulb probe Model: HPS201.2 S/N: 18023467.
Dimension: Diameter 14 mm, Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
30	20.048	20.1	0.0	0.009
30	20.050	20.1	0.0	0.009
30	20.036	20.1	0.0	0.009
30	20.027	20.1	0.0	0.009
30	20.024	20.1	0.0	0.009

Table 2: This equipment was connected with temperature probe Model: TP3207.2 S/N: 18021270.
Dimension: Diameter 14 mm, Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
70	20.049	20.0	0.0	0.009
70	24.993	25.1	0.0	0.009
70	25.022	25.0	0.0	0.009
70	24.845	24.8	0.0	0.009
70	25.819	25.8	0.0	0.009

Table 3: This equipment was connected with Glue thermometer probe Model: TP3276.2 S/N: 24020491.
Dimension: Diameter 8 mm, Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.048	20.1	0.0	0.009
110	20.050	20.1	0.0	0.009
110	20.033	20.1	0.0	0.009
110	20.028	20.1	0.0	0.009
110	20.023	20.1	0.0	0.009

UUC: Unit Under Calibration

The reported expanded uncertainty is based on standard uncertainty multiplied by a coverage factor $k=2$ providing a level of confidence of approximately 95%.



CERTIFICATE OF CALIBRATION

Certificate No. : CL-02145
Page 1 of 2

Equipment Name: Head Stress Monitor with Sensor
Manufacturer: DataDMS
Model: H332.2
Serial No: 18030244
ID No: H332_250245

Received date: 10 JAN 2022
Calibration date: 18 FEB 2022
Issue date: 25 JAN 2022

Customer:
Name: A/S Laboratory group (Thailand) Co.,Ltd.
Address: 104 Phrasimongkol Rd, Phrasimongkol
Rd, Khlong Suan Luang, Khlong Suan Luang, Bangkok
10250 Thailand

Reference Used During Calibration:
1. Standard Temperature Probe Model: STS-100 A500,
Serial No: 607862 09, Due date: 25 Mar 2022
2. Digital Temperature Indicator Model: DT-1000A-MK
II, Serial No: 671402-00591, Due date: 04 June 2022

Calibration Condition:
Temperature: (23.0) °C
Relative Humidity: (55.1) %

Calibration Procedure:
The temperature calibration was done by in-house calibration method as per ISO-17025 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 (NIM) (NMI) Certificate number: TT-0036-21, Certificate number: ER-0032-21

REVIEW BY: *Phanp*
APPROVED BY: *Phanp*
NEXT CAL DATE: 16/12/23

Calibrated by:
1. Mr. Saeed Thachalath
2. Miss Oatthana Thachalath



Approved Signature: *Phanp*
Mr. Phanp Boonchaisarn
Calibration Department Manager

THIS CERTIFICATE REPORT MAY NOT BE REPRODUCED EXCEPT IN FULL, WITHOUT PERMISSION FROM SITHIPORN ASSOCIATES CO., LTD.

CERTIFICATE OF CALIBRATION

Certificate No. : CL-02145
Page 2 of 2

Result of Calibration: 20 - 40 °C

Calibration Range: 20 - 40 °C

Table 1: This equipment was connected with wet bulb probe Model: HPS201.2 S/N: 18023467.
Dimension: Diameter 14 mm, Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
30	20.048	20.1	0.0	0.009
30	20.050	20.1	0.0	0.009
30	20.036	20.1	0.0	0.009
30	20.027	20.1	0.0	0.009
30	20.024	20.1	0.0	0.009

Table 2: This equipment was connected with temperature probe Model: TP3207.2 S/N: 18021270.
Dimension: Diameter 14 mm, Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
70	20.049	20.0	0.0	0.009
70	24.993	25.1	0.0	0.009
70	25.022	25.0	0.0	0.009
70	24.845	24.8	0.0	0.009
70	25.819	25.8	0.0	0.009

Table 3: This equipment was connected with Glue thermometer probe Model: TP3276.2 S/N: 24020491.
Dimension: Diameter 8 mm, Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.048	20.1	0.0	0.009
110	20.050	20.1	0.0	0.009
110	20.033	20.1	0.0	0.009
110	20.028	20.1	0.0	0.009
110	20.023	20.1	0.0	0.009

UUC: Unit Under Calibration

The reported expanded uncertainty is based on standard uncertainty multiplied by a coverage factor $k=2$ providing a level of confidence of approximately 95%.



THIS CERTIFICATE REPORT MAY NOT BE REPRODUCED EXCEPT IN FULL, WITHOUT PERMISSION FROM SITHIPORN ASSOCIATES CO., LTD.

CERTIFICATE OF CALIBRATION

Certificate No.: CL-022495
Page 1 of 2

Equipment Name: Heat Stress Monitor with Sensor
Manufacturer: Datascan
Model: H332.2
Serial No.: 18018312
ID No.: RYD_190305

Customer:
Name: A.S. Laboratory group (Thailand) Co., Ltd.
Address: 104 Phrasimamun Rd. Phrasimamun
Rd., Khwaeng San Luang, Khet San Luang Bangkok
10250 Thailand.

Reference Used During Calibration:
1. Standard Temperature Probe Model: STS 100 A000,
Serial No.: 607682-09, Due date: 30 Mar 2022
2. Digital Temperature Indicator Model: DTI-1000A, MK
4, Serial No.: 073407-00094, Due date: 04 Jun 2022

Calibration Condition:
Temperature: (23±3) °C
Relative Humidity: (55±15)%

Calibration Procedure

The temperature calibration was done by the
calibration method as per CL001 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: 71.0006-21, Certificate number: 09.0032-
21.

REVIEW BY: Manon P.
APPROVED BY: [Signature]
NEXT CAL DATE: 1/2/23

Calibrated by:
Mr. Somchai Thairasri
Mr. Somchai Thairasri
Mr. Somchai Thairasri
NAC
NAC ASSOCIATES (THAILAND) CO., LTD.

Certificate No.: CL-022495
Page 2 of 2

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range:
Function: 25 - 40 °C

Table 1: This equipment was connected with wet bulb probe Model: TP3201.2 5/N: 18021471.
Dimension: Diameter 14 mm, Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
30	25.054	25.0	-0.1	0.009
30	25.043	25.0	-0.0	0.009
30	25.038	25.0	-0.0	0.009
30	25.029	25.0	-0.0	0.009
30	25.027	25.0	-0.0	0.009

Table 2: This equipment was connected with temperature probe Model: TP3207.2 5/N: 18021295.
Dimension: Diameter 14 mm, Length 130 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
70	25.049	25.1	0.1	0.009
70	25.033	25.1	0.0	0.009
70	25.026	25.0	-0.1	0.009
70	24.978	24.9	-0.1	0.009
70	24.853	24.8	-0.1	0.009

Table 3: This equipment was connected with Globe thermometer probe Model: TP3276.2 5/N: 18020502.
Dimension: Diameter 8 mm, Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
130	25.047	25.1	0.1	0.009
130	25.042	25.1	0.1	0.009
130	25.038	25.1	0.1	0.009
130	25.030	25.1	0.1	0.009
130	25.027	25.1	0.1	0.009

UUC: Unit Under Calibration
The reported expanded uncertainty is based on standard uncertainty multiplied by a coverage factor k=2 providing a level of confidence of approximately 95%.



CERTIFICATE OF CALIBRATION

Certificate No.: CL-020498
Page 1 of 2

Equipment Name: Heat Stress Monitor with Sensor
Manufacturer: Datascan
Model: H332.2
Serial No.: 18018312
ID No.: RYD_190305

Customer:
Name: A.S. Laboratory group (Thailand) Co., Ltd.
Address: 104 Phrasimamun Rd. Phrasimamun
Rd., Khwaeng San Luang, Khet San Luang Bangkok
10250 Thailand.

Reference Used During Calibration:
1. Standard Temperature Probe Model: STS 100 A000,
Serial No.: 607682-09, Due date: 30 Mar 2022
2. Digital Temperature Indicator Model: DTI-1000A, MK
4, Serial No.: 073407-00094, Due date: 04 Jun 2022

Calibration Condition:
Temperature: (23±3) °C
Relative Humidity: (55±15)%

Calibration Procedure

The temperature calibration was done by the
calibration method as per CL001 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: 71.0006-21, Certificate number: 09.0032-
21.

REVIEW BY: Manon P.
APPROVED BY: [Signature]
NEXT CAL DATE: 1/2/23

Calibrated by:
Mr. Somchai Thairasri
Mr. Somchai Thairasri
Mr. Somchai Thairasri
NAC
NAC ASSOCIATES (THAILAND) CO., LTD.

Certificate No.: CL-020498
Page 2 of 2

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range:
Function: 25 - 40 °C

Table 1: This equipment was connected with wet bulb probe Model: TP3201.2 5/N: 18021471.
Dimension: Diameter 14 mm, Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
30	25.049	25.0	-0.0	0.009
30	25.048	25.0	-0.0	0.009
30	25.033	25.0	-0.0	0.009
30	25.029	25.0	-0.0	0.009
30	25.027	25.0	-0.0	0.009

Table 2: This equipment was connected with temperature probe Model: TP3207.2 5/N: 18021295.
Dimension: Diameter 14 mm, Length 130 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
70	25.049	25.1	0.1	0.009
70	25.043	25.0	-0.0	0.009
70	24.994	24.9	-0.1	0.009
70	24.950	24.9	-0.1	0.009
70	24.853	24.8	-0.1	0.009

Table 3: This equipment was connected with Globe thermometer probe Model: TP3276.2 5/N: 18020502.
Dimension: Diameter 8 mm, Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
130	25.048	25.0	-0.0	0.009
130	25.045	25.0	-0.0	0.009
130	25.038	25.0	-0.0	0.009
130	25.029	25.0	-0.0	0.009
130	25.027	25.0	-0.0	0.009

UUC: Unit Under Calibration

The reported expanded uncertainty is based on standard uncertainty multiplied by a coverage factor k=2 providing a level of confidence of approximately 95%.



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES & EQUIPMENT CALIBRATION AND TESTING SERVICE
394 PATTANAKARN ROAD SOI 18, HUAHONG, HUAHONG, BANGKOK 10250
TEL: 0-2717-0800-7 FAX: 0-2717-0841

Certificate of Calibration

Equipment: pH Meter
Manufacturer: Metro Toledo
Model: Seven Compact 5220
Serial No.: C10409480
ID No.: RYD_190183
Condition As-Received: Used Item
Received Date: 18 March 2022
Calibration Date: 17 March 2022
Reference: 2203-081105C-4
Submitted by: A.S. Laboratory Group (Thailand) Co., Ltd.
Rajabongse Moo 5 T Maenam Khu, A.Puakdang, Rayong 21140, Thailand

Ambient Temperature: (25 ± 2.5) °C
Relative Humidity: (50 ± 10) %
Calibration Procedure:
- CP-CH5 by direct measurement with standard voltage calibrator and direct measurement with certified reference material (CRM)
- CP-CH8 by comparison with standard thermometer

Calibrated by: Warakorn Lemngkhalui
Approved by: [Signature]
Mr. Somchai Thairasri
Mr. Somchai Thairasri
Mr. Somchai Thairasri
NAC
NAC ASSOCIATES (THAILAND) CO., LTD.

Issue Date: 22 March 2022
The Uncertainty 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 the department of Calibration and Testing Service.

REVIEW BY: Manon P.
APPROVED BY: [Signature]
NEXT CAL DATE: 1/2/23

A 0037307

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES & EQUIPMENT CALIBRATION AND TESTING SERVICE
394 PATTANAKARN ROAD SOI 18, HUAHONG, HUAHONG, BANGKOK 10250
TEL: 0-2717-0800-7 FAX: 0-2717-0841

Certificate of Calibration

Equipment: pH Meter
Manufacturer: Metro Toledo
Model: Seven Compact 5220
Serial No.: C10409480
ID No.: RYD_190183
Condition As-Received: Used Item
Received Date: 18 March 2022
Calibration Date: 17 March 2022
Reference: 2203-081105C-4
Submitted by: A.S. Laboratory Group (Thailand) Co., Ltd.
Rajabongse Moo 5 T Maenam Khu, A.Puakdang, Rayong 21140, Thailand

Ambient Temperature: (25 ± 2.5) °C
Relative Humidity: (50 ± 10) %
Calibration Procedure:
- CP-CH5 by direct measurement with standard voltage calibrator and direct measurement with certified reference material (CRM)
- CP-CH8 by comparison with standard thermometer

Calibrated by: Warakorn Lemngkhalui
Approved by: [Signature]
Mr. Somchai Thairasri
Mr. Somchai Thairasri
Mr. Somchai Thairasri
NAC
NAC ASSOCIATES (THAILAND) CO., LTD.

Issue Date: 22 March 2022
The Uncertainty 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 the department of Calibration and Testing Service.

REVIEW BY: Manon P.
APPROVED BY: [Signature]
NEXT CAL DATE: 1/2/23

A 0037307

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES & EQUIPMENT CALIBRATION AND TESTING SERVICE
394 PATTANAKARN ROAD SOI 18, HUAHONG, HUAHONG, BANGKOK 10250
TEL: 0-2717-0800-7 FAX: 0-2717-0841

Certificate of Calibration

Equipment: pH Meter
Manufacturer: Metro Toledo
Model: Seven Compact 5220
Serial No.: C10409480
ID No.: RYD_190183
Condition As-Received: Used Item
Received Date: 18 March 2022
Calibration Date: 17 March 2022
Reference: 2203-081105C-4
Submitted by: A.S. Laboratory Group (Thailand) Co., Ltd.
Rajabongse Moo 5 T Maenam Khu, A.Puakdang, Rayong 21140, Thailand

Ambient Temperature: (25 ± 2.5) °C
Relative Humidity: (50 ± 10) %
Calibration Procedure:
- CP-CH5 by direct measurement with standard voltage calibrator and direct measurement with certified reference material (CRM)
- CP-CH8 by comparison with standard thermometer

Calibrated by: Warakorn Lemngkhalui
Approved by: [Signature]
Mr. Somchai Thairasri
Mr. Somchai Thairasri
Mr. Somchai Thairasri
NAC
NAC ASSOCIATES (THAILAND) CO., LTD.

Issue Date: 22 March 2022
The Uncertainty 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 the department of Calibration and Testing Service.

REVIEW BY: Manon P.
APPROVED BY: [Signature]
NEXT CAL DATE: 1/2/23

A 0037307

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES & EQUIPMENT CALIBRATION AND TESTING SERVICE
394 PATTANAKARN ROAD SOI 18, HUAHONG, HUAHONG, BANGKOK 10250
TEL: 0-2717-0800-7 FAX: 0-2717-0841

Certificate of Calibration

Equipment: pH Meter
Manufacturer: Metro Toledo
Model: Seven Compact 5220
Serial No.: C10409480
ID No.: RYD_190183
Condition As-Received: Used Item
Received Date: 18 March 2022
Calibration Date: 17 March 2022
Reference: 2203-081105C-4
Submitted by: A.S. Laboratory Group (Thailand) Co., Ltd.
Rajabongse Moo 5 T Maenam Khu, A.Puakdang, Rayong 21140, Thailand

Ambient Temperature: (25 ± 2.5) °C
Relative Humidity: (50 ± 10) %
Calibration Procedure:
- CP-CH5 by direct measurement with standard voltage calibrator and direct measurement with certified reference material (CRM)
- CP-CH8 by comparison with standard thermometer

Calibrated by: Warakorn Lemngkhalui
Approved by: [Signature]
Mr. Somchai Thairasri
Mr. Somchai Thairasri
Mr. Somchai Thairasri
NAC
NAC ASSOCIATES (THAILAND) CO., LTD.

Issue Date: 22 March 2022
The Uncertainty 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 the department of Calibration and Testing Service.

REVIEW BY: Manon P.
APPROVED BY: [Signature]
NEXT CAL DATE: 1/2/23

A 0037307

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES & EQUIPMENT CALIBRATION AND TESTING SERVICE
394 PATTANAKARN ROAD SOI 18, HUAHONG, HUAHONG, BANGKOK 10250
TEL: 0-2717-0800-7 FAX: 0-2717-0841

Certificate of Calibration

Equipment: pH Meter
Manufacturer: Metro Toledo
Model: Seven Compact 5220
Serial No.: C10409480
ID No.: RYD_190183
Condition As-Received: Used Item
Received Date: 18 March 2022
Calibration Date: 17 March 2022
Reference: 2203-081105C-4
Submitted by: A.S. Laboratory Group (Thailand) Co., Ltd.
Rajabongse Moo 5 T Maenam Khu, A.Puakdang, Rayong 21140, Thailand

Ambient Temperature: (25 ± 2.5) °C
Relative Humidity: (50 ± 10) %
Calibration Procedure:
- CP-CH5 by direct measurement with standard voltage calibrator and direct measurement with certified reference material (CRM)
- CP-CH8 by comparison with standard thermometer

Calibrated by: Warakorn Lemngkhalui
Approved by: [Signature]
Mr. Somchai Thairasri
Mr. Somchai Thairasri
Mr. Somchai Thairasri
NAC
NAC ASSOCIATES (THAILAND) CO., LTD.

Issue Date: 22 March 2022
The Uncertainty 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 the department of Calibration and Testing Service.

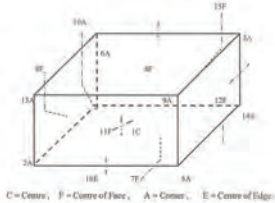
REVIEW BY: Manon P.
APPROVED BY: [Signature]
NEXT CAL DATE: 1/2/23

A 0037307

Certificate No. T22084101

Page 3 of 4

Calibration Report



C = Center, F = Centre of Face, A = Corner, E = Centre of Edge

1C = TN141	12F = TN152
2A = TN142	13A = TN153
3A = TN143	14A = TN154
4F = TN144	15F = TN155
5A = TN145	16E = TN156
6A = TN146	
7F = TN147	
8F = TN148	
9A = TN149	
10A = TN150	
11F = TN151	

Approved By:

PTC0702103

Certificate No. T22084101

Page 4 of 4

Calibration Report

Measurement Results

Calibration Point	Average Standard Reading at each position (°C)							
	TN141	TN142	TN143	TN144	TN145	TN146	TN147	TN148
5.8	3.08	2.98	2.98	2.97	3.16	3.20	3.26	3.14
	3.04	3.19	3.00	3.04	3.21	3.11		

Chamber (Cold Room)			Temperature Distribution				
Setting (°C)	Reading (°C)		Average (°C)	Stability (°C)	Uniformity (°C)	Uncertainty (°C)	Coverage Factor k
	Min, Max	Average					
5.8	3.7, 8.1	3.5	3.11	0.20	0.20	2.60	2.01

The second uncertainty value "uniformity"
The calibration results apply only to the above calibrated item.
The results of test was found accurate as shown on date and place of use 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 %.

Approved By:

PTC0702103

Certificate of Calibration

Represent to Certificate of Calibration: PTC0702103
Certificate No.: PTC0702103
Equipment: Digital Balance
Manufacturer: Sartorius
Model: ME2245-105-DU
Type of Balance: Single internal
Page: 1 of 2
Condition: Normal
Serial No.: 3020108
ID No.: RYG_EN0002

Customer: ALS Laboratory Group (Thailand) Co., Ltd.
816/10 Moo 5 T. Maenam, A. Phukdaeng,
Rayong 21140, Thailand

Environment Condition: Temperature: 23.9 °C ± 0.3 °C
Humidity: 58.1 %RH ± 4.4 %RH
Air density: 1.17 kg/m³

Calibration Place: ALS Laboratory Group (Thailand) Co., Ltd.
816/10 Moo 5 T. Maenam, A. Phukdaeng,
Rayong 21140, Thailand

The Method used: In house method, PTC-W07, based on EN 869-1:1998
Traceability: This certificate is traceable to the SI units through the Calibration Services Co., Ltd., NIST-OMC Accreditation No.: Calibration 0188

Date Received: March 23, 2022
Calibration Date: March 23, 2022
Issued Date: March 23, 2022
Calibration By: Mr. Rungrat Mekul

Approved By:

This certificate is issued to the user of measurement according to the International System of Units (SI). It provides traceability of measurement to international standards as defined in the International System of Units (SI).
The measurement uncertainty is the standard uncertainty, which is derived from the standard uncertainty of the measurement.
This certificate is valid only to the item calibrated on date and place of calibration.
The temperature scale used was based on ITS-90.
The temperature scale used was based on ITS-90.
The temperature scale used was based on ITS-90.
The temperature scale used was based on ITS-90.

Represent to Certificate of Calibration: PTC0702103

Page: 2 of 2

Measurement Results:

Without Adjustment

Function Calibration: Non Adjustment

Estimated Error: Weight to be 1/2, 1/3, or of Maximum capacity

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

Repeatability Test: Weight to be 1/2, 1/3, or of Maximum capacity

Determination of the standard deviation of weighing balance: Repeatability: 0.0001 (g)

The End of Certificate

PTC0702103

RYG_EN0010

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CHANGING SERVICE & EQUIPMENT CALIBRATION AND TESTING SERVICE
104/101 KALAN ROAD FOR 10, KALAN ROAD, KALAN ROAD, KALAN ROAD
TEL: 0-2710-30007 FAX: 0-2710-30008

Cert. No.: 227M1517
Page: 1 of 3

Certificate of Calibration

Equipment: Hot Air Oven
Manufacturer: Memmert
Model: UFE 500
Serial No.: GS11.1572
ID No.: RYG_EN0010
Submitted by: ALS Laboratory Group (Thailand) Co., Ltd. (Rayong Branch)
816/10 Moo 5 T. Maenam Khu, A. Phukdaeng,
Rayong 21140 Thailand
Location: Oven Room
Received Order: 20 October 2022
Calibration Date: 20 October 2022
Ambient Temperature: (26 ± 1) °C
Relative Humidity: (50 ± 3) %
Calibrated by: Man Paitampongpaiboon
Approved by:
() Pongthipong Tanyayakul
() Malek Sukkarn
() Suwit Injai
Issue Date: 2 November 2022
The Uncertainty are for a confidence probability of approximately 95%
This certificate was not issued under the name of the company.
Approval of the Board of Directors: 1. Equipment 2. Calibration and Testing Services

A 0046908

Equipment: Hot Air Oven
Condition As-Received: Used Item
Reference: 2210-03780C-2
Procedure Used: Calibration was conducted using calibration procedure CP-0702 according to direct measurement method with Data Acquisition which connected with Resistance Temperature Detector (RTD) and Thermocouple Type T.
The temperature scale used was based on ITS-90.
Condition of this result of calibration
1. Reference standard instrument-
Instrument Model Serial No. Cert. No. Due Date
1) Data Acquisition 34872A M14023932 22.M17 29 Jul 2023
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 Units.
Result of Calibration: (°C) Without Adjustment
Function of UUC: Temperature Source
Fresh air setting: Close
Environment during calibration
Temp. (°C) Beginning Finished
REL Humid. (%) 25 25
AC Supply (Voh) 223 225
Ref. Std. ID No.: @ Calibration Point
Position: (180) °C (194) °C
1 21-18TC-01 30-18RTD-01
2 21-18TC-02 30-18RTD-02
3 21-18TC-03 30-18RTD-03
4 21-18TC-04 30-18RTD-04
5 21-18TC-05 30-18RTD-05
6 21-18TC-06 30-18RTD-06
7 21-18TC-07 30-18RTD-07
8 21-18TC-08 30-18RTD-08
9 (ref.) 21-18TC-09 30-18RTD-09
Probe Installation Details: Dimension of Chamber:
a = 5.0 cm D = 0.40 m
b = 5.0 cm W = 0.56 m
c = 5.0 cm H = 0.48 m
Capacity = 0.11 m³

a 1132455

RYG_EN0006

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CHANGING SERVICE & EQUIPMENT CALIBRATION AND TESTING SERVICE
104/101 KALAN ROAD FOR 10, KALAN ROAD, KALAN ROAD, KALAN ROAD
TEL: 0-2710-30007 FAX: 0-2710-30008

Cert. No.: 227M1402
Page: 1 of 3

Certificate of Calibration

Equipment: Hot Air Oven
Manufacturer: Memmert
Model: UM 400
Serial No.: b195.0999
ID No.: RYG_EN0006
Submitted by: ALS Laboratory Group (Thailand) Co., Ltd. (Rayong Branch)
816/10 Moo 5 T. Maenam Khu, A. Phukdaeng,
Rayong 21140, Thailand
Location: Oven Room
Received Order: 20 October 2022
Calibration Date: 20 October 2022
Ambient Temperature: (26 ± 1) °C
Relative Humidity: (50 ± 3) %
Calibrated by: Preecha Hahab
Approved by:
() Pongthipong Tanyayakul
() Malek Sukkarn
() Suwit Injai
Issue Date: 2 November 2022
The Uncertainty are for a confidence probability of approximately 95%
This certificate was not issued under the name of the company.
Approval of the Board of Directors: 1. Equipment 2. Calibration and Testing Services

A 0046905

Equipment: Hot Air Oven
Condition As-Received: Used Item
Reference: 2210-03780C-1
Procedure Used: Calibration was conducted using calibration procedure CP-0702 according to direct measurement method with Data Acquisition which connected with Resistance Temperature Detector (RTD) and Thermocouple Type T.
The temperature scale used was based on ITS-90.
Condition of this result of calibration
1. Reference standard instrument-
Instrument Model Serial No. Cert. No. Due Date
1) Data Acquisition 34870A M14023517 21.M130 23 Dec 2022
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 Units.
Result of Calibration: (°C) Without Adjustment
Function of UUC: Temperature Source
Fresh air setting: Close
Environment during calibration
Temp. (°C) Beginning Finished
REL Humid. (%) 26 29
AC Supply (Voh) 220 221
Ref. Std. ID No.: @ Calibration Point
Position: 18-18RTD-01
1 18-18RTD-01
2 18-18RTD-02
3 18-18RTD-03
4 18-18RTD-04
5 18-18RTD-05
6 18-18RTD-06
7 18-18RTD-07
8 18-18RTD-08
9 (ref.) 18-18RTD-09
Probe Installation Details: Dimension of Chamber:
a = 5.0 cm D = 0.33 m
b = 5.0 cm W = 0.40 m
c = 5.0 cm H = 0.40 m
Capacity = 0.053 m³

a 1132473

Equipment: Hot Air Oven
Condition As-Received: Used Item
Reference: 2210-03780C-2
Result of Calibration: (°C) Without Adjustment
Function of UUC: Temperature Source
Fresh air setting: Close
Calibration Point UUC Setting Reading stability (°C) Temperature uniformity (°C) Overall Variation (°C) Uncertainty (°C) Coverage Factor A
104.0 104.0 104.0 0.076 0.52 0.50 0.42 2
180.0 180.0 180.0 0.13 0.68 1.2 1.1 2
Measured Temperature (°C)
Calibration Point Position
1 2 3 4 5 6 7 8 9 (ref.)
104.0 103.788 103.734 103.723 103.800 104.215 104.131 104.132 103.740 103.747
180.0 179.723 179.359 179.439 179.489 180.361 180.114 180.131 180.243 179.695
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 temperature at any sensor and the measured temperature at the reference location, which are observed at the same time or as close as possible 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 included 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 %.

a 1132455

Equipment: Hot Air Oven
Condition As-Received: Used Item
Reference: 2210-03760C-1
Result of Calibration: (*) Without Adjustment
Function of UUC: Temperature Source
Fresh air setting: Close

Cert. No.: 22TM1492
Page: 3 of 3

Calibration Point (°C)	UUC Setting (°C)	UUC Reading (°C)	Temperature Stability (± °C)	Temperature Uniformity (°C)	Overall Variation (°C)	Uncertainty (± °C)	Coverage Factor k
70.0	70.0	70.0	0.079	0.47	0.77	0.42	2

Calibration Point (°C)	Measured Temperature (°C)								
	1	2	3	4	5	6	7	8	9 (ref.)
70.0	70.262	69.995	70.079	70.177	70.664	70.039	70.688	70.149	70.328

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 %.

-00-

a 1132472

Equipment: Water Bath
Condition As-Received: Used Item
Reference: 2210-03760C-4
Procedure Used: Calibration was conducted using in-house calibration procedure CP-0704, according to direct measurement method with Data Acquisition which connected with Industrial Platinum Resistance Thermometer (IPRT).
 The temperature scale used was based on ITS-90.
Condition of this result of calibration:
 1. Reference standard instrument:
 Instrument: 34970A Model: MY4000217
 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.
Result of Calibration: (*) Without Adjustment
Function of UUC: Temperature Source

Cert. No.: 22TM1491
Page: 1 of 3

Equipment: Water Bath
Manufacturer: Memmert
Model: WNB22
Serial No.: L513.0648
ID No.: RYG_EN0061
Submitted by: ALS Laboratory Group (Thailand) Co., Ltd. (Raying Branch)
 616/10 Moo 5, T. Maenam Khu, A. Phukdang, Raying 21140, Thailand
Location: Wet Chemistry Lab
Received Order: 20 October 2022
Calibration Date: 20 October 2022
Ambient Temperature: (28 ± 10) °C
Relative Humidity: (50 ± 30) %
Calibrated by: Preecha Hahab
Approved by: Preecha Hahab
Issue Date: 2 November 2022

The Uncertainties are for a confidence probability of approximately 95 %
This uncertainty may be expanded to provide a level of confidence of approximately 99 %.
Approval of the Head of Department Services: P. Rajapongse, Calibration and Testing Services.

A 0046066

Equipment: Water Bath
Condition As-Received: Used Item
Reference: 2210-03760C-4
Procedure Used: Calibration was conducted using in-house calibration procedure CP-0704, according to direct measurement method with Data Acquisition which connected with Industrial Platinum Resistance Thermometer (IPRT).
 The temperature scale used was based on ITS-90.
Condition of this result of calibration:
 1. Reference standard instrument:
 Instrument: 34970A Model: MY4000217
 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.
Result of Calibration: (*) Without Adjustment
Function of UUC: Temperature Source

Cert. No.: 22TM1491
Page: 2 of 3

Beginning of Calibration (°C)	Environmental (°C)		AC Voltage Supply (V)
	24	50	221
24 <td>24 <td>50 <td>221 </td></td></td>	24 <td>50 <td>221 </td></td>	50 <td>221 </td>	221

Position	Ref. Std. SNL	
	1	2
1	N37P00726	
2	N37P00727	
3	N37P00728	
4	N37P00729	
5 (ref.)	N37P00730	

The Uncertainties are for a confidence probability of approximately 95 %
This uncertainty may be expanded to provide a level of confidence of approximately 99 %.
Approval of the Head of Department Services: P. Rajapongse, Calibration and Testing Services.

a 1132471

Equipment: Water Bath
Condition As-Received: Used Item
Reference: 2210-03760C-4
Result of Calibration: (*) Without Adjustment
Function of UUC: Temperature Source

Cert. No.: 22TM1491
Page: 3 of 3

Calibration point (°C)	UUC Setting (°C)	UUC Reading (°C)	Average Standard Reading (°C)			
			1	2	3	4
85.0	85.0	85.0	84.527	84.563	84.626	84.516

Calibration point (°C)	Uniformity (°C)	Stability (± °C)	Uncertainty (± °C)	Coverage Factor k
85.0	0.12	0.081	0.19	2

Average: The average of 30 values in each position.
Uniformity: The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location, which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.
Stability: One-half of the greatest maximum difference of measured temperature at any one probe.
UUC: Unit Under Calibration
Note: The reported uncertainty of measurement was included stability and excluded uniformity.
 The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k, providing a level of confidence of approximately 95 %.

-00-

a 1132470

Equipment: pH Meter
Condition As-Received: Used Item
Reference: 2205-04050C-2
Procedure Used: Calibration was conducted using in-house calibration procedure CP-0716, according to comparison with Industrial Platinum Resistance Thermometer (IPRT) in Temperature Bath.
 The temperature scale used was based on ITS-90.
Condition of this result of calibration:
 1. Reference standard instrument:
 Instrument: 1232 Model: 3100000
 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.
Result of Calibration: (*) Without Adjustment
Function: Temperature measurement

Cert. No.: 22TM1491
Page: 1 of 3

Equipment: pH Meter
Manufacturer: Metrohm
Model: 1132
Serial No.: 3100000
ID No.: PYS_P02423
Condition As-Received: Used Item
Received Date: 15 March 2022
Calibration Date: 15 March 2022
Reference: 2205-04050C-2
Submitted by: ALS Laboratory Group (Thailand) Co., Ltd. Raying Branch
 616/10 Moo 5 T. Maenam Khu, A. Phukdang, Raying 21140, Thailand
Ambient Temperature: (25 ± 2) °C
Relative Humidity: (50 ± 15) %
Calibration Procedure: In-house method
 • CP-0716 by direct measurement with standard voltage calibration and direct measurement with certified reference material (CRM)
Calibrated by: Wisarut Lomgongso
Approved by: Wisarut Lomgongso
Issue Date: 17 March 2022

The Uncertainties are for a confidence probability of approximately 95 %
This uncertainty may be expanded to provide a level of confidence of approximately 99 %.
Approval of the Head of Department Services: P. Rajapongse, Calibration and Testing Services.

A 0039308

Condition of this calibration result:
 1. Reference Standard Instrument:
 Instrument: 34970A Model: MY4000217
 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.
Result of Calibration: (*) Without Adjustment
Function: pH measurement

Cert. No.: 22TM1491
Page: 2 of 3

Unit Under Calibration	Nominal Value	Measured Value	Actual Reading	Uncertainty of Measurement (mV)	Coverage Factor k
pH Meter	6.00	177.48	177	0.58	2.00
pH 4.00	177.48	177	177	0.58	2.00
pH 7.00	177.48	177	177	0.58	2.00

Unit Under Calibration	Standard Buffer Solution	Reading	Actual pH	Uncertainty of pH measurement (mV)	Coverage Factor k
pH 4.00	4.00	4.01	4.01	0.003	2.00
pH 7.00	7.00	7.00	7.00	0.003	2.00
pH 10.00	10.00	10.01	10.01	0.003	2.00

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 %.
This uncertainty may be expanded to provide a level of confidence of approximately 99 %.
Approval of the Head of Department Services: P. Rajapongse, Calibration and Testing Services.

a 1100595

Equipment: pH Meter with Sensor
Condition As-Received: Used Item
Reference: 2205-04050C-2
Procedure Used: Calibration was conducted using in-house calibration procedure CP-0716, according to comparison with Industrial Platinum Resistance Thermometer (IPRT) in Temperature Bath.
 The temperature scale used was based on ITS-90.
Condition of this result of calibration:
 1. Reference standard instrument:
 Instrument: 1232 Model: 3100000
 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.
Result of Calibration: (*) Without Adjustment
Function: Temperature measurement

Cert. No.: 22TM1491
Page: 1 of 3

Equipment: pH Meter with Sensor
Manufacturer: Metrohm
Model: 1132
Serial No.: 3100000
ID No.: PYS_P02423
Condition As-Received: Used Item
Received Date: 15 March 2022
Calibration Date: 15 March 2022
Reference: 2205-04050C-2
Submitted by: ALS Laboratory Group (Thailand) Co., Ltd. Raying Branch
 616/10 Moo 5 T. Maenam Khu, A. Phukdang, Raying 21140, Thailand
Ambient Temperature: (25 ± 2) °C
Relative Humidity: (50 ± 15) %
Calibration Procedure: In-house method
 • CP-0716 by direct measurement with standard voltage calibration and direct measurement with certified reference material (CRM)
Calibrated by: Wisarut Lomgongso
Approved by: Wisarut Lomgongso
Issue Date: 17 March 2022

The Uncertainties are for a confidence probability of approximately 95 %
This uncertainty may be expanded to provide a level of confidence of approximately 99 %.
Approval of the Head of Department Services: P. Rajapongse, Calibration and Testing Services.

A 0039307

Equipment: pH Meter with Sensor
Condition As-Received: Used Item
Reference: 2205-04050C-2
Procedure Used: Calibration was conducted using in-house calibration procedure CP-0716, according to comparison with Industrial Platinum Resistance Thermometer (IPRT) in Temperature Bath.
 The temperature scale used was based on ITS-90.
Condition of this result of calibration:
 1. Reference standard instrument:
 Instrument: 1232 Model: 3100000
 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.
Result of Calibration: (*) Without Adjustment
Function: Temperature measurement

Cert. No.: 22TM1491
Page: 2 of 3

Calibration Point (°C)	Immersion Depth (mm)	Standard Temperature (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (± °C)	Coverage Factor k
25.0	150	25.000	25.4	0.391	0.19	2.00
30.0	150	30.000	30.5	0.492	0.19	2.00
40.0	150	40.000	40.5	0.503	0.19	2.00
50.0	150	50.000	50.5	0.503	0.19	2.00

UUC: Unit Under Calibration
Note: 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 %.

-00-

A 1100597

ภาคผนวก จ

สำเนาหนังสืออนุญาตขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

ที่ อก ๐๓๑๐(๑)/ ๑๐๖๙



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ เขตราชเทวี
กรุงเทพมหานคร ๑๐๔๐๐

๒๘ มกราคม ๒๕๖๕

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๓๐ กรกฎาคม ๒๕๖๓

- สิ่งที่ส่งมาด้วย ๑. รายชื่อผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑ แผ่น
๒. รายชื่อเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๕ แผ่น
๓. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๑ แผ่น

ตามหนังสือที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ขอต่ออายุ
หนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ว-๒๐๔ สถานที่ตั้งเลขที่ ๑๐๔
ซอยพัฒนาการ ๔๐ ถนนพัฒนาการ แขวงพัฒนาการ เขตสวนหลวง กรุงเทพมหานคร
ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย)
จำกัด ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

- ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๖ ราย ตามสิ่งที่ส่งมาด้วย ๑
ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑๖๒ ราย ตามสิ่งที่ส่งมาด้วย ๒
ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย จำนวน ๕๙ รายการ น้ำใต้ดิน
จำนวน ๑๒๖ รายการ อากาศเสีย ๑๖ รายการ สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน ๓๕ รายการ และดิน
จำนวน ๑๒๕ รายการ รวมทั้งสิ้นจำนวน ๓๖๑ รายการ ตามสิ่งที่ส่งมาด้วย ๓

หนังสือฉบับนี้จะหมดอายุในวันที่ ๒ กันยายน ๒๕๖๖ หากประสงค์จะต่ออายุหนังสือ
รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอ
ต่อกรมโรงงานอุตสาหกรรม ภายใน ๓๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์
เอกชน ซึ่งคำขอต่ออายุดังกล่าวขอรับได้ที่กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายศิริะ จันทรเจต)

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน
ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๒๐๒ ๔๑๔๖ ๐ ๒๒๐๒ ๔๐๐๒

โทรสาร ๐ ๒๓๕๔ ๓๒๐๘ ๐ ๒๓๕๔ ๓๔๑๕

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

เลขทะเบียน ว-๒๐๔

ที่ อก ๐๓๑๐(๑)/

ลงวันที่ ๒๘ มกราคม ๒๕๖๕

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๖ ราย

๑) นางสาวยุพาพร จันทร์เปล่ง

ทะเบียนเลขที่ ว-๒๐๔-ค-๔๗๐๐

๒) นางสาวชัชณีย์ โกมารกุล ณ นคร

ทะเบียนเลขที่ ว-๒๐๔-ค-๔๗๐๑

๓) นายศรายุทธ จิตรานนท์

ทะเบียนเลขที่ ว-๒๐๔-ค-๔๗๐๒

๔) นางสาวกนกกร เอนก

ทะเบียนเลขที่ ว-๒๐๔-ค-๖๑๑๑

๕) นายสุริยา สอนแก้ว

ทะเบียนเลขที่ ว-๒๐๔-ค-๖๑๑๒

๖) นายวิชาญ ชูณหะวัณ

ทะเบียนเลขที่ ว-๒๐๔-ค-๖๑๑๓



(นายศิริระ จันทร์เจิด)

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน

ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

เลขทะเบียน ว-๒๐๔

ที่ ออก ๐๓๑๐(๑)/ ๑๐๖๙

ลงวันที่ ๒๘ มกราคม ๒๕๖๕

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑๖๒ ราย

๑) นางสาวจินดา ไชจุลธรรม	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๐๘
๒) นางสาวสาวิตรี น้อยเสงี่ยม	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๐๙
๓) นางสาวชนัญฎาญจน์ อัมขม	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๑๐
๔) นางสาวนรินทร์ สายเส็ง	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๑๕
๕) นางสาวนันทวดี สมบูรณ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๑๖
๖) นางสาวศรัณยา เฉลิมธำรงค์	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๑๗
๗) นางสาวสรารัศมี มงคลจิรวุฒิ	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๑๙
๘) นางสาวศิริลักษณ์ พึ่งแพง	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๒๐
๙) นายณพพงศ์ จันทรพันธุ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๐๘
๑๐) นายนรเศรษฐ์ โกมลาลัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๑๑
๑๑) นายธันวา จริยา	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๑๔
๑๒) นางสาวเกศรินทร์ แก้วมัน	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๑๖
๑๓) นางสาวสุวิมล ชัยเรืองวุฒิ	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๑๗
๑๔) นางสาวสุชาดา ธรรมถาวร	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๒๑
๑๕) นางสาวเบมิกา ชัยเดชธนกุล	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๒๓
๑๖) นางสาวศศิธร หมูสวัสดิ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๒๔
๑๗) นางสาวเสาวลักษณ์ ภู่นาอำพร	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๒๕
๑๘) นายอภิสิทธิ์ สิงหา	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๒๖
๑๙) นายศักดิ์สิทธิ์ ไพศาลพิสุทธิ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๒๗
๒๐) ว่าที่ร้อยตรีหญิง พรรณีภา ขำเจริญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๒๘
๒๑) นางจิตดา คำภูแก้ว	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๓๑
๒๒) นางสาวอรรวรรณ รักยง	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๑๕
๒๓) นางสาวนพรัตน์ แยมกรานต์	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๑๙
๒๔) นายจุลเดช วารินทร์	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๐
๒๕) นางสาวดาญรัตน์ ร้องคำ	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๑
๒๖) นายนคร สุขเจริญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๒
๒๗) นายบัญชา นามเขตต์	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๓
๒๘) นายพรมมี ศรีปัดเนตร	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๕
๒๙) นายอุทิศ อุ่นสม	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๖
๓๐) ว่าที่ร้อยตรี เฉลิมเกียรติ อมรศรีเสริม	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๘
๓๑) นางสาววริยา สร้างนา	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๙
๓๒) นายอนุพงศ์ รัตนศรีประเสริฐ	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๓๐
๓๓) นางสาวจุฑารัตน์ โอนสันเทียะ	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๔๒
๓๔) นางสาวจรรวรรณ พิมพ์อริกฤติยา	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๗๖

(นายศิระ จันทรเจ็ด)

๓๕) นางสาวปรังค์ทิพย์...

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน

สำนักงานสิ่งแวดล้อมและเฝ้าระวังมลพิษทางอากาศ

๓๕) นางสาวปรางค์ทิพย์ กิจไพศาลศักดิ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๗๙
๓๖) นางสาวเตือนใจ ทางกลาง	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๐
๓๗) นางสาวจิราพร ศิริเวช	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๑
๓๘) นายวรกร ผูกרך	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๓
๓๙) นายทง วิริยะสทกิจ	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๔
๔๐) นายธนิธ เจนจบ	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๕
๔๑) นายคณิศร ขำเพชร	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๖
๔๒) นายอรรคพล นิยมวิทยาพันธ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๗
๔๓) นายภูวิช พรหมสะอาด	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๘
๔๔) นายธนเดช โภคาพิพัฒน์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๙
๔๕) นายชวฤทธิ์ วงษ์จันทร์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๐
๔๖) นายอาทิตย์ ศรีแสน	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๑
๔๗) นายเจษฎินทร คงศักดิ์ไทย	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๒
๔๘) นายจรัส บุญยิ่ง	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๕
๔๙) นายธนาณัติ เอนก	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๖
๕๐) นายอภิวัฒน์ ทุมหนู	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๗
๕๑) นางสาวสุภาขวัญ มาก	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๘
๕๒) นางสาวหัตพร ขวาลสมบูรณ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๐
๕๓) นางสาวธิดิมา บุญเพ็ง	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๑
๕๔) นางสาวกนกอร เข้มเพ็ชร	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๒
๕๕) นางสาวพัชรียา หงษ์สมดี	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๓
๕๖) นางสาวภาวนิดา สุรวงศ์ตระกูล	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๔
๕๗) นางสาวภาณุมาศ นามวัฒน์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๕
๕๘) นางสาวอุไรรัตน์ ทิงสร้างแป้น	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๖
๕๙) นายธีรวัฒน์ ปวงสุข	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๗
๖๐) นายอิทธิพล ยะโส	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๘
๖๑) นายประพจน์ วรรณชูชัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๙
๖๒) นายชยธร พวงทิพย์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๑๐
๖๓) นางสาวกนกวรรณ จันทบาล	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๑๑
๖๔) นางสาวเกษร หลักบุญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๑๒
๖๕) นายสิทธิโชค ธงเงิน	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๑๓
๖๖) นางศิวารณ ใจบุญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๐๕
๖๗) นางสาวพรรณธิดา พุ่มคง	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๐๘
๖๘) นางสาวศรณีย์ ยิ่งดี	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๐๙
๖๙) นายนวกัทร ศรีวิริยะ	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๐
๗๐) นายสุวิชา ทองอ่อน	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๑
๗๑) นายวิญญู บุญตะนัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๓

(นายศิระ จันทรเจ็ด)

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน

บริษัท ปูนซิเมนต์ไทย จำกัด (มหาชน)

๗๒) นายสมบูรณ์...

๑๐๙) นายนนทชัย...

๑๐๙) นายพนนพชัย อุปถัมภ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๕๙๔
๑๑๐) นายนิรุฬพล คุณสุทธิ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๕๙๕
๑๑๑) นายนิพนธ์วัฒน์ สาริน	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๕๙๖
๑๑๒) นายปิยะนัฐ พลมะศรี	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๕๙๗
๑๑๓) นายพงศ์สิริ โสมเขียว	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๕๙๘
๑๑๔) นายพีรพัฒน์ กำคำ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๕๙๙
๑๑๕) นายภาณุพงศ์ มานิตย์	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๐
๑๑๖) นายมงคล ผลาทิพย์	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๑
๑๑๗) นายมนูรินทร์ พูลศิริ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๒
๑๑๘) นายสิรินันท์ ทองอ้น	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๓
๑๑๙) นายอเนชา ทนสมัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๔
๑๒๐) นายอดิศักดิ์ ผมไผ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๕
๑๒๑) นายอนันตชัย วิสม	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๖
๑๒๒) นายณัฐดนัย เจือละออง	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๗
๑๒๓) นายวรวิธ คีนิก	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๘
๑๒๔) นายแสงตะวัน นະตะສັດ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๙
๑๒๕) นายยุทธพงศ์ รัตนะ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๑๐
๑๒๖) นายชัยวัฒน์ ไซยะนิจ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๑๑
๑๒๗) นายวิศรุต ศรีธรรมมา	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๑๒
๑๒๘) นายพนนทกร เผือกผ่อง	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๑๓
๑๒๙) นายกำชัย สุทธะ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๑๔
๑๓๐) นางสาวณัฐภรณ์ รักทะเล	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๑๙
๑๓๑) นางสาวประภาภรณ์ บุตรพรม	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๐
๑๓๒) นางสาวนิลาวัลย์ นามพรม	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๑
๑๓๓) นางสาวพัชรินทร์ แสนสร้อย	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๒
๑๓๔) นายไพโรจน์ เปี่ยมพิมาย	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๓
๑๓๕) นางสาวศุภมาศ ทองมาก	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๔
๑๓๖) นางสาวลลิตา จิตรสว่าง	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๕
๑๓๗) นางสาวชไมพร เสิกภูเขียว	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๖
๑๓๘) นางสาวกฤติมาพร คำมีแก่น	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๗
๑๓๙) นางสาวสกลรัตน์ ภาควุฒิ	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๘
๑๔๐) นางสาวกาญจนา คงคุณ	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๙
๑๔๑) นางสาวไพรินทร์ ศรีรูปี	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๐
๑๔๒) นางสาวทิพนันดา ฝอยปัญญา	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๑
๑๔๓) นางสาวสาธิตา ปานทอง	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๒
๑๔๔) นางสาวอริสา ทองนวล	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๓
๑๔๕) นางสาวอรรษา คำคลอง	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๔

(นายศิริ จันทรเจ็ด)

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน

๑๔๖) นางสาวบุษดาภรณ์...

๑๔๖) นางสาวชุตานภรณ์ สุนทรสนาน	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๕
๑๔๗) นางสาวสุภารัตน์ นนท์ประสาท	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๖
๑๔๘) นางสาวรัชนิกร เนียมกลาง	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๗
๑๔๙) นางสาวกัญญารัตน์ ศรีนิลทา	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๘
๑๕๐) นางสาวอัญชลี คำจันทร์	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๙
๑๕๑) นายบุญฤทธิ์ เอี่ยมเทศ	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๐
๑๕๒) นายศิริวัฒน์ พานิชย์	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๑
๑๕๓) นางสาวศุภรดา ปันมยุรา	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๒
๑๕๔) นางสาวพาฤดี คุณนาน	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๓
๑๕๕) นางสาวจิราเจต พองดา	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๔
๑๕๖) นางสาวกนกภรณ์ อุระ	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๕
๑๕๗) นางสาวอารยา มีชัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๖
๑๕๘) นางสาวจิตสุภา ประเทืองสุข	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๗
๑๕๙) นางสาวอริสา วิริยขันติธรรม	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๘
๑๖๐) นางสาววิษุตา นาคผจญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๙
๑๖๑) นางสาวพนิดา ยอดอินทร์	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๕๐
๑๖๒) นางสาวนันทิยา จันทะสุน	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๕๑



(นายศิริระ จันทรเจต)

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน

ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

เลขทะเบียน ว-๒๐๔

ที่ อก ๐๓๑๐(๑)/ ๑๐๖๕

ลงวันที่ ๒๘ มกราคม ๒๕๖๕

ขอขยายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๖๑ รายการ

น้ำเสีย จำนวน 59 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldicarb	High-Performance Liquid Chromatographic Method ^[4]
2	Aldicarb Sulfone	High-Performance Liquid Chromatographic Method ^[4]
3	Aldicarb Sulfoxide	High-Performance Liquid Chromatographic Method ^[4]
4	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
5	Arsenic	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
6	Barium	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
7	α -BHC	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
8	β -BHC	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
9	δ -BHC	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
10	γ -BHC	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
11	Biochemical Oxygen Demand	1) 5-Day BOD Test, Azide Modification Method ^[4] 2) 5-Day BOD Test, Membrane Electrode Method ^[4]
12	Carbaryl	High-Performance Liquid Chromatographic Method ^[4]
13	Carbofuran	High-Performance Liquid Chromatographic Method ^[4]
14	Cadmium	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
15	Chemical Oxygen Demand	1) Closed Reflux, Colorimetric Method ^[4] 2) Closed Reflux, Titrimetric Method ^[4]
16	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
17	Chromium	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[4]
18	Color	ADMI Weighted-Ordinate Spectrophotometric Method

(นางริกาญจน์ จันทรกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

และทะเบียนห้องปฏิบัติการ

19 Copper...

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

วิมล

44 Methomyl...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

กรมส่งเสริมการค้าระหว่างประเทศ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
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 Suspended Solids	Dried at 103-105 °C ^[4]
57	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
58	Trivalent Chromium	1) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Colorimetric Method; Calculation ^[4]
59	Zinc	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[4]

น้ำใต้ดิน จำนวน 126 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
2	Acetone	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]

วิมล

3 Aldrin...

(นางริภาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ
และทะเบียนห้องปฏิบัติการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
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]

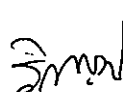
วิธีทาง)

18 Bis(2-ethylhexyl)phthalate...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ
และทะเบียนห้องปฏิบัติการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
18	Bis(2-ethylhexyl)phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
20	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
21	Butanol	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
		Equilibrium Headspace, 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]

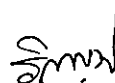


34 Chromium (III)...

(นางริกาญจน์ จิตรสกุลไธ)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
53	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
57	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
58	Diethyl Phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
59	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
60	2,4-Dinitrophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
61	2,4-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
62	2,6-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
63	Di-n-Octyl Phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
64	Endosulfan	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
65	Endrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
67	Fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]



(นางริกาญจน์ นัตถกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ
และทะเบียนห้องปฏิบัติการ

68 Fluorene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
68	Fluorene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
69	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
70	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
71	Hexachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
73	n-Hexane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
74	α -HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
75	β -HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
76	γ -HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
77	Hexachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
78	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
79	Indeno(1,2,3-cd)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
80	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
81	Lead	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
82	Manganese	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
83	Mercury	1) Cold Vapor Atomic Absorption Spectrometric Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]

รศ.ดร.วิมล

84 Methanol...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

และคณะเจ้าหน้าที่ปฏิบัติการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
84	Methanol	1) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4] 2) Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method ^[4]
85	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
86	Methyl Bromide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
87	Methylene Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
88	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
89	2-Methylnaphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
90	Methyl tert-Butyl Ether	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
91	Naphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
92	Nickel	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
93	Nitrobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
94	N-Nitrosodiphenylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
95	N-Nitrosodi-n-Propylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
96	Polychlorinated Biphenyls - PCB 1016 - PCB 1221 - PCB 1232 - PCB 1242 - PCB 1248 - PCB 1254 - PCB 1260	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]

วิมล

97 Pentachlorophenol...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

และทะเบียนห้องปฏิบัติการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
97	Pentachlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
98	pH	Electrometric Method ^[4]
99	Phenanthrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
100	Phenol	1) Distillation, Direct Photometric Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
101	Pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
102	Selenium	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
103	Silver	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
104	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
105	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
106	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
107	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
108	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
109	TPH (C ₅ -C ₈)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,24]
110	TPH (C _{>8} -C ₁₆)	Solvent Extraction, Gas Chromatographic Method ^[9,21]
111	TPH (C _{>16} -C ₃₅)	Solvent Extraction, Gas Chromatographic Method ^[9,21]
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]

วิมล

114 1,1,2-Trichloroethane...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
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]

อากาศเสีย (ปล่อยระบาย) จำนวน 16 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Antimony	Isokinetic, Digestion, Inductively Coupled Plasma Method ^[5]
2	Arsenic	Isokinetic, Digestion, Inductively Coupled Plasma Method ^[5]

วิฑูรย์

3 Carbon Monoxide...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

และศูนย์ปฏิบัติการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
3	Carbon Monoxide	1) Sampling Bag Non-Dispersive Infrared Method ^[5] 2) Non-Dispersive Infrared Method ^[5] 3) Instrumental Analyzer Method ^[5]
4	Chlorine	1) Absorption Sampling, Ion Chromatographic Method ^[5] 2) Isokinetic Sampling, Ion Chromatographic Method ^[5]
5	Copper	Isokinetic, Digestion, Inductively Coupled Plasma Method ^[5]
6	Dioxins	Isokinetic Sampling, Analysis by ISO/IEC 17025 Accredited Laboratory or Analysis by Department of Industrial Works Registered Laboratory (Dioxins/Furans Analysis Approved) ^[5]
7	Hydrogen Chloride	1) Absorption Sampling, Ion Chromatographic Method ^[5] 2) Isokinetic Sampling, Ion Chromatographic Method ^[5]
8	Hydrogen Sulfide	Absorption Sampling, Iodometric Method ^[5]
9	Lead	Isokinetic, Digestion, Inductively Coupled Plasma Method ^[5]
10	Mercury	1) Isokinetic Sampling, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[5] 2) Isokinetic, Digestion, Inductively Coupled Plasma Method ^[5]
11	Opacity	Ringelmann's Method ^[2]
12	Oxides of Nitrogen	1) Absorption Sampling, Phenoldisulfonic Acid Method ^[5] 2) Chemiluminescence Method ^[5] 3) Instrumental Analyzer Method ^[5]
13	Sulfur Dioxide	1) Absorption Sampling, Barium-Thorin Titrimetric Method ^[5] 2) UV Fluorescence Method ^[5] 3) Instrumental Analyzer Method ^[5]
14	Sulfuric Acid	Isokinetic Sampling, Barium-Thorin Titrimetric Method ^[5]
15	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method ^[5]
16	Xylene	Adsorption Sampling, Gas Chromatographic Method ^[5]

วิมล

สิ่งปลูก...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิชาการวิเคราะห์ทดสอบมลพิษ

กรมควบคุมมลพิษ

สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน 35 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31]
2	Antimony	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
3	Arsenic	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
4	Barium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
5	Beryllium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]



6 Cadmium...

(นางริกาญจน์ จิตรสกุลใจ)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ
และทะเบียนห้องปฏิบัติการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
6	Cadmium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
7	Chlordane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,19,25] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31]
8	Chromium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
9	Chromium (III)	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction, Colorimetric Method; Calculation Method ^[1,6,15,17] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Waste Extraction, Colorimetric Method; Calculation Method ^[1,6,16,17] 3) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^[7,8,15,17] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^[7,8, 16,17]
10	Chromium (VI)	1) Waste Extraction, Colorimetric Method ^[1,6,17] 2) Alkaline Digestion, Colorimetric Method ^[8,17]



(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

.....เรียน...../.....

11 Cobalt...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
11	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
12	Copper	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
13	2,4-D	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31]
14	DDD	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31]
15	DDE	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31]
16	DDT	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25]

จิราภรณ์

2) Soxhlet...

(นางริกาญจน์ จัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

และทะเบียนห้องปฏิบัติการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
17	Dieldrin	2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31] 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25]
18	Endrin	2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31] 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25]
19	Heptachlor	2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31] 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25]
20	Lead	2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31] 1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
21	Lindane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31]
22	Mercury	1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[1,6,18]

วิมล

2) Waste Extraction...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
23	Methoxychlor	2) Waste Extraction, Thermal Decomposition Amalgamation and Atomic Absorption Spectrometric Method ^[1,6,19] 3) Waste Extraction, Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ^[1,6,20] 4) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[18] 5) Thermal Decomposition Amalgamation and Atomic Absorption Spectrometric Method ^[19] 6) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ^[20]
24	Mirex	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31]
25	Molybdenum	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31]
26	Nickel	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16] 1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]

วิมล

27 Polychlorinated...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
27	<p>Polychlorinated biphenyls (PCBs)</p> <ul style="list-style-type: none"> - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260 - 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',3,4,4',5',6-Heptachlorobiphenyl - 2,2',3,4',5,5',6-Heptachlorobiphenyl - 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl 	<p>1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method^[1,9,23]</p> <p>2) Soxhlet Extraction, Gas Chromatographic Method^[10,23]</p> <p>3) Automated Soxhlet Extraction, Gas Chromatographic Method^[22,31]</p>

วิมล

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

28 Pentachlorophenol...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
28	Pentachlorophenol	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31]
29	pH	Electrometric Method ^[29,30]
30	Selenium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
31	Silver	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16]
32	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
33	Toxaphene	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31]
34	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15]

วิมล

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิชาการวิเคราะห์ทดสอบมลพิษ

4) Digestion...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
35	Zinc	4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16] 1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]

ดิน จำนวน 125 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
2	Acetone	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
3	Aldrin	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
4	Anthracene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
5	Antimony	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
6	Arsenic	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
7	Atrazine	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
8	Barium	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]

วิมล

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

9 Benz(a)anthracene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
9	Benz(a)anthracene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
10	Benzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
11	Benzo(b)fluoranthene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
12	Benzo(k)fluoranthene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
13	Benzoic acid	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
14	Benzo(a)pyrene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
15	Benzo(g,h,i)perylene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
16	Beryllium	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
17	Bis(2-chloroethyl)ether	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
18	Bis(2-ethylhexyl)phthalate	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
20	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
21	Butanol	Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method ^[12,24]
22	Butyl Benzyl Phthalate	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
23	Cadmium	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
24	Carbazole	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
25	Carbon Disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]

วิกรม

26 Carbon tetrachloride...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
27	Chlordane	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
28	p-Chloroaniline	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
32	2-Chlorophenol	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
33	Chromium	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
34	Chromium (III)	1) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^[7,8,15,17] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^[7,8,16,17]
35	Chromium (VI)	Alkaline Digestion, Colorimetric Method ^[8,17]
36	Chrysene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
37	Cyanide	Extraction, Distillation, Colorimetric Method ^[26,27,28]
38	2,4-D	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
39	DDD	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]

วิฑูรย์

(นางวิภาณูจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

40 DDE...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
40	DDE	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
41	DDT	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
42	Dibenz(a,h)anthracene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
43	Di-n-Butyl Phthalate	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
47	3,3-Dichlorobenzidine	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
48	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
49	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
50	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
53	2,4-Dichlorophenol	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]

วิภาณี

(นางริกาญจน์ ฉัตรสกุลวิไล)

57 Dieldrin...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
57	Dieldrin	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
58	Diethyl Phthalate	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
59	2,4-Dimethylphenol	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
60	2,4-Dinitrophenol	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
61	2,4-Dinitrotoluene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
62	2,6-Dinitrotoluene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
63	Di-n-Octyl Phthalate	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
64	Endosulfan	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
65	Endrin	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
67	Fluoranthene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
68	Fluorene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
69	Heptachlor	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
70	Heptachlor Epoxide	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
71	Hexachlorobenzene	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
73	n-Hexane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
74	α -HCH	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
75	β -HCH	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
76	γ -HCH	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
77	Hexachlorocyclopentadiene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
78	Hexachloroethane	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
79	Indeno(1,2,3-cd)pyrene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
80	Isophorone	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
81	Lead	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
82	Manganese	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
83	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[18]



(นางริกาญจน์ ฉัตรสุกวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

และหน่วยงานห้องปฏิบัติการ

2) Thermal...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
84	Methanol	2) Thermal Decomposition, Amalgamation, and Atomic Absorption Spectrophotometry ^[19] 3) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ^[20] Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^[12,24]
85	Methoxychlor	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
86	Methyl Bromide	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
87	Methylene Chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
88	2-methylphenol	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
89	2-Methylnaphthalene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
90	Methyl tert-Butyl Ether	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
91	Naphthalene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
92	Nickel	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
93	Nitrobenzene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
94	N-Nitrosodiphenylamine	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
95	N-Nitrosodi-n-propylamine	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
96	Polychlorinated biphenyls (PCBs) - Aroclor 1016 - Aroclor 1221 - Aroclor 1232	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,23] 2) Automated Soxhlet Extraction, Gas Chromatographic Method ^[23,32]

วิฑูรย์

(นางริกาญจน์ ฉัตรสกุลวิไล)

- Aroclor 1242...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
	<ul style="list-style-type: none"> - 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',6-Heptachlorobiphenyl - 2,2',3,4',5,5',6-Heptachlorobiphenyl - 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl 	
97	Pentachlorophenol	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
98	Phenanthrene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
99	Phenol	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
100	Pyrene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]

วิกรม

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ
และทะเบียนห้องปฏิบัติการ

101 Selenium...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
101	Selenium	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
102	Silver	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
103	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
104	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
105	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
106	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
107	Toxaphene	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
108	TPH (C ₅ -C ₈)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
109	TPH (C ₈ - C ₁₆)	1) Solvent Extraction, Gas Chromatographic Method ^[11,21] 2) Automated Soxhlet Extraction, Gas Chromatographic Method ^[21,31]
110	TPH (C ₁₆ - C ₃₅)	1) Solvent Extraction, Gas Chromatographic Method ^[11,21] 2) Automated Soxhlet Extraction, Gas Chromatographic Method ^[21,31]
111	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
112	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
113	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
114	Trichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
115	2,4,5-Trichlorophenol	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]

วิมล

116 2,4,6-Trichlorophenol...

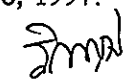
(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
116	2,4,6-Trichlorophenol	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
117	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
118	Vanadium	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
119	Vinyl Acetate	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
120	Vinyl Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
121	m-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
122	o-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
123	p-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
124	Xylene (Total)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
125	Zinc	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]

เอกสารอ้างอิง

- กระทรวงอุตสาหกรรม. ประกาศกระทรวงอุตสาหกรรม, พ.ศ. 2548. เรื่อง การกำจัดสิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว.ราชกิจจานุเบกษา. 25 มกราคม 2549. เล่มที่ 123 ตอนพิเศษ 11ง.
- กระทรวงอุตสาหกรรม. ประกาศกระทรวงอุตสาหกรรม, พ.ศ. 2549. เรื่อง กำหนดค่าปริมาณเขม่าควันที่เจือปนในอากาศที่ระบายออกจากปล่องของหม้อน้ำโรงสีข้าวที่ใช้กลบเป็นเชื้อเพลิง.ราชกิจจานุเบกษา. 4 ธันวาคม 2549. เล่มที่ 123 ตอนพิเศษ 125ง.
- สมาคมวิศวกรรมสิ่งแวดล้อมแห่งประเทศไทย. คู่มือวิเคราะห์น้ำเสีย. พิมพ์ครั้งที่ 4. กรุงเทพฯ: เรือนแก้วการพิมพ์, 2547.
- APHA, AWWA, WEF. Standard Methods for the Examination of Water and Wastewater. 23rd ed. Washington, DC: APHA, 2017.
- United States Environmental Protection Agency. Standards of Performance for New Stationary Sources. 40 CFR 60. Appendix A, 2019.
- United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. SW-846, 1997.


 (นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

7. United States...

20. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. **Mercury in Sediment and Tissue Sample by Atomic Fluorescence Spectrometry. SW-846 Method 7474, 2007.**

21. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. **Nonhalogenated Organics Using GC/FID. SW-846 Method 8015B, 1996.**

22. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. **Organochlorine Pesticides by Gas Chromatography. SW-846 Method 8081B, 2007.**

23. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. **Polychlorinated Biphenyls (PCBs) by Gas Chromatography. SW-846 Method 8082, 1996.**

24. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. **Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS). SW-846 Method 8260D, 2018.**

25. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. **Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS). SW-846 Method 8270E, 2018.**

26. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. **Total and Amenable Cyanide: Distillation SW-846 Method 9010B, 1996.**

27. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. **Cyanide Extraction Procedure for Solids and Oil. SW-846 Method 9013A, 1996.**

28. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. **Cyanide in Waters and Extracts Using Titrimetric and Manual Spectrophotometric Procedures. SW-846 Method 9014, 2014.**

29. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. **pH Electrometric Measurement. SW-846 Method 9040C, 2004.**

30. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. **Soil and Waste pH. SW-846 Method 9045D, 2004.**

31. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. **Automated Soxhlet Extraction. SW-846 Method 3541, 1994.**



(นางริกาญจน์ จิตรสกุลไชย)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ
และทะเบียนห้องปฏิบัติการ



ที่ อก ๐๓๑๐(๓)/ ๖๔๗๐

กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๒๔ มิถุนายน ๒๕๖๕

เรื่อง ขันทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลборาทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๒๙ เมษายน ๒๕๖๔

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แลборาทอรี กรุ๊ป (ประเทศไทย) จำกัด จำนวน ๒ แผ่น

ตามหนังสือที่อ้างถึง บริษัท เอแอลเอส แลборาทอรี กรุ๊ป (ประเทศไทย) จำกัด ขอขึ้นทะเบียน
ห้องปฏิบัติการวิเคราะห์เอกชน พร้อมรายชื่อผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ เจ้าหน้าที่ประจำ
ห้องปฏิบัติการวิเคราะห์ และรายการสารมลพิษที่จะทำการวิเคราะห์ ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอแอลเอส แลборาทอรี กรุ๊ป
(ประเทศไทย) จำกัด ขันทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน มีเลขทะเบียน ว-๓๒๓ สถานที่ตั้งเลขที่
๖๑๖/๑๐ หมู่ที่ ๕ ตำบลแม่น้ำคู้ อำเภอลวกแดง จังหวัดระยอง โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์

- | | | |
|--------------------------|---------------|--------------|
| ๑) นายเดช ช้างชน | ทะเบียนเลขที่ | ว-๓๒๓-ค-๙๔๔๒ |
| ๒) นางวิลาวัลย์ บริรักษ์ | ทะเบียนเลขที่ | ว-๓๒๓-ค-๙๔๔๓ |
| ๓) นายสุพจน์ สลามเต๊ะ | ทะเบียนเลขที่ | ว-๓๒๓-ค-๙๔๔๔ |

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์

- | | | |
|---------------------------------|---------------|--------------|
| ๑) นางสาวณมล บรรจงกิจ | ทะเบียนเลขที่ | ว-๓๒๓-จ-๙๔๔๕ |
| ๒) นางพจนา สีดา | ทะเบียนเลขที่ | ว-๓๒๓-จ-๙๔๔๖ |
| ๓) นางสาวธนิดา กุลสุริวงศ์ | ทะเบียนเลขที่ | ว-๓๒๓-จ-๙๔๔๗ |
| ๔) นายพิทยา ทองแดง | ทะเบียนเลขที่ | ว-๓๒๓-จ-๙๔๔๘ |
| ๕) นางชลธิชา สุนงค | ทะเบียนเลขที่ | ว-๓๒๓-จ-๙๔๔๙ |
| ๖) ว่าที่ ร.ต.รณชัย ม่วงมา | ทะเบียนเลขที่ | ว-๓๒๓-จ-๙๔๕๐ |
| ๗) นายวรารุณ พับพา | ทะเบียนเลขที่ | ว-๓๒๓-จ-๙๔๕๑ |
| ๘) นายศักดิ์รินทร์ จรัสกาย | ทะเบียนเลขที่ | ว-๓๒๓-จ-๙๔๕๒ |
| ๙) นายสุรศักดิ์ สาชิน | ทะเบียนเลขที่ | ว-๓๒๓-จ-๙๔๕๓ |
| ๑๐) นางสาวเพชรคุณ ภาภูตานนท์ | ทะเบียนเลขที่ | ว-๓๒๓-จ-๙๔๕๔ |
| ๑๑) นายสถาพร ถาแก้ว | ทะเบียนเลขที่ | ว-๓๒๓-จ-๙๔๕๕ |
| ๑๒) นายสุทธิดำรงค์ โชคปิตินันท์ | ทะเบียนเลขที่ | ว-๓๒๓-จ-๙๔๕๖ |

๑๓) นายวัลลภ หันไชยเนา	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๕๗
๑๔) นางสาววนาลี เจริญตระกูล	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๕๘
๑๕) นางสาวนิตา ผดุงจิตต์	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๕๙
๑๖) นายธนะสิทธิ์ วงศ์ไชย	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๖๐
๑๗) นายชัยนุสรณ์ เลิศนันทกุลชัย	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๖๑
๑๘) นายสังจา เพ็ชรแสง	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๖๒
๑๙) นายกันตภณ มณีสัมพันธ์	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๖๓
๒๐) นางสาวจันทนีย์ โกเมนชนะ	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๖๔
๒๑) นายธารินทร์ อ็อกจินดา	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๖๕
๒๒) นายศุภณัฐ พิสัยพันธ์	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๖๖
๒๓) นายศุภชัย วงศ์สุริยฉาย	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๖๗
๒๔) นายปฐมพงศ์ กรสวัสดิ์	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๖๘
๒๕) นายไสว ตันโพธิ์	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๖๙
๒๖) นางสาวกิตติยา สัญญาอริยาภรณ์	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๗๐
๒๗) นางสาวเจษฎาพร ศรีบุญเรือง	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๗๑
๒๘) นางสาวมธุรินทร์ สิงห์เงา	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๗๒
๒๙) นางสาวธิดารัตน์ ศิริมั่งคะโร	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๗๓
๓๐) นายพิพัฒน์ นิภัทร์เศรษฐ์	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๗๔
๓๑) นายศิริวิทย์ เรืองสม	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๗๕
๓๒) นายปารามศ สัตยาคุณ	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๗๖
๓๓) นายณนุท ธรรมสโร	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๗๗
๓๔) นางสาวศุภรัตน์ โสจันทร์	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๗๘
๓๕) นายพชรกร อินทรเสนา	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๗๙
๓๖) นายทิวากร เชื้อมาก	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๘๐
๓๗) นายอนุรักษ ทองขจรศักดิ์	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๘๑
๓๘) นายอภิชาติ วิชาส	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๘๒
๓๙) นายจรัสระวี ศรีรักษา	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๘๓
๔๐) นายประสานมิตร เชื้อนเพชร	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๘๔
๔๑) นายภาณุวัฒน์ วังบง	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๘๕
๔๒) นายสันติ ชัยชนะ	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๘๖
๔๓) นายสิทธิชัย แก้วเกตุ	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๘๗
๔๔) นายทินกร กุลชาติ	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๘๘

ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย จำนวน ๑๔ รายการ
 อากาศเสีย (ปล่องระบาย) จำนวน ๗ รายการ และน้ำใต้ดิน จำนวน ๓ รายการ รวมทั้งสิ้นจำนวน ๒๔ รายการ
 ตามสิ่งที่ส่งมาด้วย

หนังสือฉบับนี้มีอายุ ๓ ปี นับจากวันที่กรมโรงงานอุตสาหกรรมออกหนังสือ หากประสงค์
จะต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบ
คำขอต่อกรมโรงงานอุตสาหกรรมภายใน ๓๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการ
วิเคราะห์เอกชน ซึ่งคำขอต่ออายุดังกล่าวขอรับได้ที่กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ



(นางจินดา เตชะศรีนทร์)

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

๒๘ มิ.ย. ๒๕๖๔

กองวิจัยและเตือนภัยมลพิษโรงงาน

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก

โทร. ๐ ๓๘๐๕ ๗๒๖๑-๓

ไปรษณีย์อิเล็กทรอนิกส์ eirw@diw.mail.go.th

เอกสารแนบท้ายหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ว-๓๒๓

ที่ ออก ๐๓๑๐(๓)/

๖๔๗๐

ลงวันที่

๒๘

มิถุนายน

๒๕๖๔

ขอขยาสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๒๔ รายการ
น้ำเสีย จำนวน 14 รายการ

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

อากาศเสีย (ปล่อยระบาย) จำนวน 7 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Carbon Monoxide	1) Sampling Bag, Non-Dispersive Infrared Method ^[5] 2) Instrumental Analyzer Method ^[8]
2	Hydrogen Sulfide	Absorption Sampling, Iodometric Method ^[5]
3	Opacity	Ringelmann's Method ^[3,4]
4	Oxide of Nitrogen	1) Absorption Sampling, Phenoldisulfonic Acid Method ^[6] 2) Instrumental Analyzer Method ^[9]
5	Sulfur Dioxide	1) Absorption Sampling, Barium-Thorin Titrimetric Method ^[5] 2) Instrumental Analyzer Method ^[10]

วิภา สัมฤทธิ์ผล

(นางสาววิชุดา สัมฤทธิ์ผล)

ผู้อำนวยการ

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก

Sulfuric Acid...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
6	Sulfuric Acid	Isokinetic Sampling, Barium – Thorin Titrimetric Method ^[6]
7	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method ^[7]

น้ำใต้ดิน จำนวน 3 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Cyanide	Distillation, Colorimetric Method ^[2]
2	pH	Electrometric Method ^[2]
3	Phenols	Distillation, Direct Photometric Method ^[2]

เอกสารอ้างอิง

1. ธงชัย พรณสวัสดิ์ และวิบูลย์ลักษณ์ วิสุมธิดักดิ์, บรรณาธิการ. (2547) คู่มือวิเคราะห์น้ำเสีย. พิมพ์ครั้งที่ 4. กรุงเทพฯ: สมาคมวิศวกรรมสิ่งแวดล้อมแห่งประเทศไทย.

2. APHA, AWWA, WEF. Standard Methods for the Examination of Water and Wastewater. 23rd ed. Washington, DC : APHA, 2017

3. กระทรวงอุตสาหกรรม. ประกาศกระทรวงอุตสาหกรรม, พ.ศ. 2549. เรื่อง กำหนดค่าปริมาณเขม่าควันที่เจือปนในอากาศที่ระบายออกจากปล่องของหม้อน้ำโรงสีข้าวที่ใช้เกลบเป็นเชื้อเพลิง.

ราชกิจจานุเบกษา. 4 ธันวาคม 2549. เล่มที่ 123 ตอนพิเศษ 125ง.

4. กระทรวงอุตสาหกรรม. ประกาศกระทรวงอุตสาหกรรม, พ.ศ. 2549. เรื่อง กำหนดค่าปริมาณเขม่าควันที่เจือปนในอากาศที่ระบายออกจากปล่องของของหม้อน้ำของโรงงาน.

ราชกิจจานุเบกษา. 4 ธันวาคม 2549. เล่มที่ 123 ตอนพิเศษ 125ง.

5. United States Environmental Protection. Standards of Performance for New Stationary Sources. 40 CFR 60. Appendix A, 2017.

6. United States Environmental Protection. Standards of Performance for New Stationary Sources. 40 CFR 60. Appendix A, 2019.

7. United States Environmental Protection. Standards of Performance for New Stationary Sources. 40 CFR 60. Appendix A, 2020.

8. United States Environmental Protection Agency. Determination of Carbon Monoxide Emissions from Stationary Sources; Instrumental Analyzer Procedure. 40 CFR 60. Appendix A Method 10, 2017.

9. United States Environmental Protection Agency. Determination of Oxide of Nitrogen Emissions from Stationary Sources; Instrumental Analyzer Procedure. 40 CFR 60. Appendix A Method 7E, 2019.

10. United States Environmental Protection Agency. Determination of Sulfur Dioxide Emissions from Stationary Sources; Instrumental Analyzer Procedure. 40 CFR 60. Appendix A Method 6C, 2017.

วิภา สัมฤทธิ์ผล

(นางสาววิชุดา สัมฤทธิ์ผล)

ผู้อำนวยการ

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก



บริษัท เอแอลเอส แลборาทอรี กรุ๊ป (ประเทศไทย) จำกัด

104 ซอยพัฒนาการ 40 ถนนพัฒนาการ แขวงพัฒนาการ เขตสวนหลวง กรุงเทพฯ 10250

โทรศัพท์ 0-2760-3000 โทรสาร 0-2760-3197

www.alsglobal.com