ภาคผนวก ค

ใบรับรองผลการตรวจวิเคราะห์ผลกระทบสิ่งแวดล้อม

Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494220
Date Received :Sep 26, 2024
Date Reported :Oct 07, 2024
Report Number :3084400-1

Sample Number 2494220-1
Sample Description Emission from Stationary Source
Location HRSGs 1 (GPS 47P 0728137, 1405521)
Measurement Date Sep 25, 2024

Stack Description

Ambient Temperature	34.2	°C	Diameter	3.30	m	Oxygen	13.91	%
Ambient Pressure	755.7	mmHg	Shape	Circle		Carbon dioxide	4.04	%
Type of Process	Combustion		Stack Temperature	142	°C	Gas Velocity	20.81	m/s
Type of Fuel	Natural Gas		Moisture	10.10	%	Flow Rate	410646	Nm3/hr

Run No.	Sampling Time	Oxygen (%)	Carbon Dioxide (%)	Oxides of Nitrogen (ppm) at Actual O_2	Oxides of Nitrogen (ppm) at 7% O_2	Sulfur Dioxide (ppm) at Actual O_2	Sulfur Dioxide (ppm) at 7% O_2
1	12:00 PM - 12:20 PM	13.88	4.04	10.86	21.52	0.30	0.60
2	12:21 PM - 12:41 PM	13.93	4.04	11.00	21.92	0.30	0.61
3	12:42 PM - 01:02 PM	13.91	4.04	10.97	21.82	0.31	0.62
Average (ppm)		13.91	4.04	10.94	21.75	0.31	0.61
Guideline[1] (ppm)				-	26.58	-	1.66
Guideline[2] (ppm)				-	120	-	20
Guideline[3] (ppm)				-	120	-	20
Result (mg/Nm^3)				20.59	40.93	0.80	1.59
Emission Rate at Actual O_2 (g/s)				2.3484		0.0912	
Guideline[1] (g/s)				3.000		0.255	
Method				US EPA Method 7E		US EPA Method 6C	

Sampled By : Navaphut Sriviriya

Guideline :
[1]Environmental Impact Assessment Report of Global Power Synergy Public Company Limited (CUP 4)
[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).
[3]Notification of the Ministry of Natural Resources and Environment, 2023 (B.E. 2566) on Emission Standard from Power Plants.

Technical Management
Wichan Choonharat
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Approved by
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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 from without written consent from the Laboratory. ALS Laboratory Group(Thailand) strongly recommends that this report is not reproduced except in full.

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494223
Date Received : Sep 25, 2024
Date Reported : Oct 02, 2024
Report Number: 3084403-1

Sample Number 2494223-1
Sampled Date Sep 25, 2024
Sample Description Emission from Stationary Source
Location HRSGs 1 (GPS 47P 0728137, 1405521)
Date Analysis Commenced Sep 27, 2024
Condition of Sample Extracted into one filter paper placed in plastic petri dish, one plastic bottle and one amber plastic bottle, refrigerated

Stack Description

Ambient Pressure	756	mmHg	Diameter	3.30	m	Oxygen	13.9	%
Ambient Temperature	34.2	°C	Shape	Circle		Carbon Dioxide	4.0	%
Type of Process	Combustion		Stack Temperature	142	°C	Gas Velocity	20.8	m/s
Type of Fuel	Natural Gas		Moisture	9.97	%	Flow Rate (Actual O2)	411619	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result at 7 %O_2	Result at 13.9 %O_2	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing										
Total Suspended Particulate	12:00 PM - 12:36 PM	mg/m3	-	0.5	<0.5	<0.5	40	7,100	United States Environmental Protection Agency, EPA Method 5	Rayong

Guideline :
Guideline (1) : 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).
: Notification of the Ministry of Natural Resources and Environment, 2023 (B.E. 2566) on Emission Standard from Power Plants.
Guideline (2) : Environmental Impact Assessment Report of Global Power Synergy Public Company Limited. (CUP 4)

Technical Management
Thanita Kulsuriwong
Scientist (4)
ทะเบียนเลขที่ ว-323-ง-0029

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ค-0001

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494223
Date Received : Sep 25, 2024
Date Reported : Oct 02, 2024
Report Number: 3084403-1

Sample Number 2494223-1
Sampled Date Sep 25, 2024
Sample Description Emission from Stationary Source
Location HRSGs 1 (GPS 47P 0728137, 1405521)
Date Analysis Commenced Sep 27, 2024
Condition of Sample Extracted into one filter paper placed in plastic petri dish, one plastic bottle and one amber plastic bottle, refrigerated

Stack Description

Ambient Pressure	756	mmHg	Diameter	3.30	m	Oxygen	13.9	%
Ambient Temperature	34.2	°C	Shape	Circle		Carbon Dioxide	4.0	%
Type of Process	Combustion		Stack Temperature	142	°C	Gas Velocity	20.8	m/s
Type of Fuel	Natural Gas		Moisture	9.97	%	Flow Rate (Actual O2)	411619	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result Emission Rate	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Total Suspended Particulate *	12:00 PM - 12:36 PM	g/s	-	-	<0.057	-	0.416	Calculated	Rayong

Guideline :
Guideline (1) : 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).
: Notification of the Ministry of Natural Resources and Environment, 2023 (B.E. 2566) on Emission Standard from Power Plants.
Guideline (2) : Environmental Impact Assessment Report of Global Power Synergy Public Company Limited. (CUP 4)

Sampling By : Waranut Pubpa ทะเบียนเลขที่ ว-323-ง-0033

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.

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494230
Date Received : Oct 03, 2024
Date Reported : Oct 08, 2024
Report Number: 3129611-1

Sample Description Air Quality
Location จุดประชุมสมาชาว
Parameter Nitrogen dioxide (ppm)
Measurement Date Sep 24, 2024 - Oct 01, 2024
Measurement by Nontachai Uppathamp

Time	2494230-1 Sep 24, 2024	2494230-2 Sep 25, 2024	2494230-3 Sep 26, 2024	2494230-4 Sep 27, 2024	2494230-5 Sep 28, 2024	2494230-6 Sep 29, 2024	2494230-7 Sep 30, 2024
11:00 AM - 12:00 PM	0.0176	0.0018	0.0115	0.0139	0.0063	0.0048	0.0042
12:00 PM - 01:00 PM	0.0140	0.0036	0.0094	0.0135	0.0074	0.0132	0.0051
01:00 PM - 02:00 PM	0.0058	0.0037	0.0046	0.0135	0.0161	0.0072	0.0066
02:00 PM - 03:00 PM	0.0044	0.0038	0.0037	0.0096	0.0186	0.0062	0.0045
03:00 PM - 04:00 PM	0.0044	0.0045	0.0031	0.0096	0.0057	0.0070	0.0079
04:00 PM - 05:00 PM	0.0052	0.0053	0.0025	0.0061	0.0046	0.0070	0.0050
05:00 PM - 06:00 PM	0.0049	0.0055	0.0023	0.0044	0.0060	0.0137	0.0043
06:00 PM - 07:00 PM	0.0041	0.0046	0.0022	0.0038	0.0045	0.0048	0.0049
07:00 PM - 08:00 PM	0.0038	0.0049	0.0025	0.0036	0.0042	0.0044	0.0033
08:00 PM - 09:00 PM	0.0038	0.0047	0.0022	0.0041	0.0039	0.0039	0.0031
09:00 PM - 10:00 PM	0.0034	0.0053	0.0023	0.0039	0.0033	0.0021	0.0029
10:00 PM - 11:00 PM	0.0036	0.0040	0.0036	0.0034	0.0031	0.0004	0.0027
11:00 PM - 12:00 AM	0.0034	0.0041	0.0052	0.0033	0.0032	0.0013	0.0015
12:00 AM - 01:00 AM	0.0008	0.0047	0.0032	0.0015	0.0016	0.0007	0.0026
01:00 AM - 02:00 AM	0.0012	0.0046	0.0023	0.0016	0.0017	0.0015	0.0029
02:00 AM - 03:00 AM	0.0013	0.0042	0.0017	0.0033	0.0007	0.0006	0.0030
03:00 AM - 04:00 AM	0.0013	0.0042	0.0020	0.0018	0.0004	0.0012	0.0029
04:00 AM - 05:00 AM	0.0033	0.0052	0.0036	0.0032	0.0034	0.0006	0.0030
05:00 AM - 06:00 AM	0.0052	0.0080	0.0028	0.0033	0.0036	0.0010	0.0030
06:00 AM - 07:00 AM	0.0110	0.0076	0.0026	0.0077	0.0037	0.0012	0.0063
07:00 AM - 08:00 AM	0.0160	0.0078	0.0037	0.0094	0.0052	0.0030	0.0113
08:00 AM - 09:00 AM	0.0113	0.0026	0.0074	0.0101	0.0121	0.0046	0.0035
09:00 AM - 10:00 AM	0.0066	0.0032	0.0095	0.0046	0.0081	0.0087	0.0013
10:00 AM - 11:00 AM	0.0040	0.0132	0.0036	0.0051	0.0167	0.0040	0.0154
Average	0.0058	0.0050	0.0041	0.0060	0.0060	0.0043	0.0046
1hr - Maximum	0.0176	0.0132	0.0115	0.0139	0.0186	0.0137	0.0154
Standard 1hr - Average	0.170	0.170	0.170	0.170	0.170	0.170	0.170

Standard : Notification of the National Environment Board No. 33, 2009 (B.E. 2552).
Reference Method : US EPAMethod Part 60 App. F (Chemiluminescence)

Approved by
Orawan Rakyong
Scientist (3)

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494230
Date Received : Oct 03, 2024
Date Reported : Oct 08, 2024
Report Number: 3132226-1

Sample Description Air Quality
Location มาบตาพุดแม่น้ำ
Parameter Nitrogen dioxide (ppm)
Measurement Date Sep 24, 2024 - Oct 01, 2024
Measurement by Nontachai Uppathamp

Time	2494230-8 Sep 24, 2024	2494230-9 Sep 25, 2024	2494230-10 Sep 26, 2024	2494230-11 Sep 27, 2024	2494230-12 Sep 28, 2024	2494230-13 Sep 29, 2024	2494230-14 Sep 30, 2024
10:00 AM - 11:00 AM	0.0014	0.0011	0.0004	0.0009	0.0004	0.0005	0.0003
11:00 AM - 12:00 PM	0.0012	0.0009	0.0004	0.0004	0.0002	0.0004	0.0004
12:00 PM - 01:00 PM	0.0014	0.0016	0.0004	0.0005	0.0003	0.0005	0.0004
01:00 PM - 02:00 PM	<0.0001	0.0006	0.0005	0.0004	0.0003	0.0005	0.0004
02:00 PM - 03:00 PM	0.0005	0.0003	0.0003	0.0005	0.0004	0.0005	0.0005
03:00 PM - 04:00 PM	0.0008	0.0004	0.0008	0.0006	0.0004	0.0005	0.0004
04:00 PM - 05:00 PM	0.0007	0.0012	0.0008	0.0002	0.0003	0.0005	0.0005
05:00 PM - 06:00 PM	0.0020	0.0018	0.0010	0.0005	0.0004	0.0004	0.0006
06:00 PM - 07:00 PM	0.0025	0.0006	0.0012	0.0005	0.0005	0.0007	0.0017
07:00 PM - 08:00 PM	0.0022	0.0011	0.0039	0.0007	0.0007	0.0005	0.0005
08:00 PM - 09:00 PM	0.0013	0.0015	0.0052	0.0006	0.0004	0.0006	0.0006
09:00 PM - 10:00 PM	0.0013	0.0012	0.0034	0.0008	0.0003	0.0007	0.0005
10:00 PM - 11:00 PM	0.0005	0.0011	0.0020	0.0007	0.0004	0.0005	0.0008
11:00 PM - 12:00 AM	0.0004	0.0007	0.0020	0.0006	0.0005	0.0005	0.0005
12:00 AM - 01:00 AM	0.0011	0.0006	0.0008	0.0009	0.0003	0.0006	0.0007
01:00 AM - 02:00 AM	0.0002	0.0010	0.0014	0.0010	0.0003	0.0006	0.0005
02:00 AM - 03:00 AM	0.0006	0.0012	0.0011	0.0017	0.0003	0.0005	0.0006
03:00 AM - 04:00 AM	0.0008	0.0008	0.0008	0.0025	0.0003	0.0005	0.0006
04:00 AM - 05:00 AM	0.0007	0.0009	0.0007	0.0022	<0.0001	0.0005	0.0006
05:00 AM - 06:00 AM	0.0012	0.0015	0.0008	0.0044	0.0003	0.0009	0.0009
06:00 AM - 07:00 AM	0.0037	0.0026	0.0057	0.0050	0.0003	0.0021	0.0016
07:00 AM - 08:00 AM	0.0062	0.0051	0.0046	0.0046	0.0003	0.0014	0.0017
08:00 AM - 09:00 AM	0.0026	0.0006	0.0025	0.0015	0.0003	0.0006	0.0006
09:00 AM - 10:00 AM	0.0017	0.0012	0.0011	0.0007	0.0005	0.0007	0.0005
Average	0.0015	0.0012	0.0017	0.0014	0.0004	0.0007	0.0007
1hr - Maximum	0.0062	0.0051	0.0057	0.0050	0.0007	0.0021	0.0017
Standard 1hr - Average	0.170	0.170	0.170	0.170	0.170	0.170	0.170

Standard : Notification of the National Environment Board No. 33, 2009 (B.E. 2552).
Reference Method : US EPAMethod Part 50 App. F (Chemiluminescence)

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ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494230
Date Received : Oct 03, 2024
Date Reported : Oct 08, 2024
Report Number: 3132238-1

Sample Description Air Quality
Location วัดบ่ากลุ่มหน้า
Parameter Nitrogen dioxide (ppm)
Measurement Date Sep 24, 2024 - Oct 01, 2024
Measurement by Nontachai Uppathamp

Time	2494230-15 Sep 24, 2024	2494230-16 Sep 25, 2024	2494230-17 Sep 26, 2024	2494230-18 Sep 27, 2024	2494230-19 Sep 28, 2024	2494230-20 Sep 29, 2024	2494230-21 Sep 30, 2024
12:00 PM - 01:00 PM	0.0179	0.0142	0.0061	0.0041	0.0061	0.0123	0.0119
01:00 PM - 02:00 PM	0.0024	0.0066	0.0025	0.0063	0.0102	0.0121	0.0033
02:00 PM - 03:00 PM	0.0063	0.0141	0.0046	0.0036	0.0088	0.0107	0.0029
03:00 PM - 04:00 PM	0.0092	0.0045	0.0022	0.0023	0.0037	0.0060	0.0051
04:00 PM - 05:00 PM	0.0122	0.0031	0.0032	0.0027	0.0089	0.0032	0.0052
05:00 PM - 06:00 PM	0.0076	0.0022	0.0023	0.0075	0.0047	0.0030	0.0036
06:00 PM - 07:00 PM	0.0065	0.0019	0.0029	0.0038	0.0057	0.0037	0.0052
07:00 PM - 08:00 PM	0.0068	0.0025	0.0023	0.0029	0.0103	0.0073	0.0045
08:00 PM - 09:00 PM	0.0070	0.0023	0.0031	0.0048	0.0059	0.0141	0.0058
09:00 PM - 10:00 PM	0.0072	0.0015	0.0044	0.0025	0.0056	0.0047	0.0098
10:00 PM - 11:00 PM	0.0071	0.0034	0.0071	0.0024	0.0061	0.0057	0.0094
11:00 PM - 12:00 AM	0.0068	0.0031	0.0049	0.0028	0.0044	0.0062	0.0129
12:00 AM - 01:00 AM	0.0060	0.0032	0.0105	0.0028	0.0031	0.0070	0.0074
01:00 AM - 02:00 AM	0.0045	0.0072	0.0091	0.0027	0.0028	0.0041	0.0044
02:00 AM - 03:00 AM	0.0044	0.0057	0.0125	0.0027	0.0026	0.0030	0.0066
03:00 AM - 04:00 AM	0.0025	0.0030	0.0057	0.0027	0.0026	0.0033	0.0031
04:00 AM - 05:00 AM	0.0019	0.0066	0.0084	0.0028	0.0042	0.0039	0.0046
05:00 AM - 06:00 AM	0.0022	0.0100	0.0076	0.0044	0.0024	0.0029	0.0112
06:00 AM - 07:00 AM	0.0020	0.0090	0.0040	0.0054	0.0030	0.0042	0.0078
07:00 AM - 08:00 AM	0.0020	0.0076	0.0040	0.0055	0.0038	0.0059	0.0056
08:00 AM - 09:00 AM	0.0025	0.0124	0.0033	0.0045	0.0026	0.0034	0.0026
09:00 AM - 10:00 AM	0.0041	0.0165	0.0048	0.0085	0.0037	0.0036	0.0212
10:00 AM - 11:00 AM	0.0185	0.0175	0.0061	0.0166	0.0062	0.0132	0.0155
11:00 AM - 12:00 PM	0.0158	0.0122	0.0040	0.0134	0.0049	0.0085	0.0165
Average	0.0068	0.0071	0.0052	0.0049	0.0051	0.0063	0.0078
1hr - Maximum	0.0185	0.0175	0.0125	0.0166	0.0103	0.0141	0.0212
Standard 1hr - Average	0.170	0.170	0.170	0.170	0.170	0.170	0.170

Standard : Notification of the National Environment Board No. 33, 2009 (B.E. 2552).
Reference Method : US EPAMethod Part 50 App. F (Chemiluminescence)

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494230
Date Received : Oct 03, 2024
Date Reported : Oct 08, 2024
Report Number: 3132239-1

Sample Description Air Quality
Location วัดนาบอน
Parameter Nitrogen dioxide (ppm)
Measurement Date Sep 24, 2024 - Oct 01, 2024
Measurement by Nontachai Uppathamp

Time	2494230-22 Sep 24, 2024	2494230-23 Sep 25, 2024	2494230-24 Sep 26, 2024	2494230-25 Sep 27, 2024	2494230-26 Sep 28, 2024	2494230-27 Sep 29, 2024	2494230-28 Sep 30, 2024
03:00 PM - 04:00 PM	0.0033	0.0033	0.0036	0.0027	0.0024	0.0014	0.0034
04:00 PM - 05:00 PM	0.0026	0.0024	0.0035	0.0023	0.0026	0.0017	0.0028
05:00 PM - 06:00 PM	0.0024	0.0022	0.0034	0.0018	0.0018	0.0015	0.0031
06:00 PM - 07:00 PM	0.0031	0.0022	0.0030	0.0018	0.0014	0.0014	0.0028
07:00 PM - 08:00 PM	0.0038	0.0021	0.0029	0.0020	0.0012	0.0015	0.0025
08:00 PM - 09:00 PM	0.0038	0.0027	0.0026	0.0019	0.0012	0.0017	0.0025
09:00 PM - 10:00 PM	0.0032	0.0027	0.0026	0.0018	0.0014	0.0021	0.0026
10:00 PM - 11:00 PM	0.0036	0.0030	0.0029	0.0020	0.0016	0.0021	0.0029
11:00 PM - 12:00 AM	0.0042	0.0031	0.0026	0.0026	0.0016	0.0023	0.0034
12:00 AM - 01:00 AM	0.0029	0.0035	0.0024	0.0028	0.0016	0.0022	0.0032
01:00 AM - 02:00 AM	0.0028	0.0028	0.0034	0.0039	0.0021	0.0022	0.0040
02:00 AM - 03:00 AM	0.0029	0.0029	0.0035	0.0037	0.0025	0.0039	0.0068
03:00 AM - 04:00 AM	0.0029	0.0024	0.0020	0.0032	0.0022	0.0052	0.0090
04:00 AM - 05:00 AM	0.0025	0.0027	0.0028	0.0016	0.0010	0.0042	0.0062
05:00 AM - 06:00 AM	0.0026	0.0028	0.0036	0.0019	0.0022	0.0058	0.0047
06:00 AM - 07:00 AM	0.0024	0.0026	0.0037	0.0021	0.0020	0.0062	0.0046
07:00 AM - 08:00 AM	0.0026	0.0025	0.0046	0.0023	0.0024	0.0065	0.0054
08:00 AM - 09:00 AM	0.0021	0.0027	0.0037	0.0024	0.0026	0.0064	0.0048
09:00 AM - 10:00 AM	0.0021	0.0031	0.0040	0.0023	0.0025	0.0052	0.0053
10:00 AM - 11:00 AM	0.0023	0.0031	0.0039	0.0022	0.0023	0.0062	0.0051
11:00 AM - 12:00 PM	0.0026	0.0026	0.0035	0.0018	0.0023	0.0053	0.0049
12:00 PM - 01:00 PM	0.0028	0.0023	0.0033	0.0019	0.0021	0.0044	0.0039
01:00 PM - 02:00 PM	0.0025	0.0032	0.0028	0.0021	0.0020	0.0044	0.0039
02:00 PM - 03:00 PM	0.0028	0.0037	0.0027	0.0026	0.0019	0.0038	0.0037
Average	0.0029	0.0028	0.0032	0.0023	0.0020	0.0036	0.0042
1hr - Maximum	0.0042	0.0037	0.0046	0.0039	0.0026	0.0065	0.0090
Standard 1hr - Average	0.170	0.170	0.170	0.170	0.170	0.170	0.170

Standard : Notification of the National Environment Board No. 33, 2009 (B.E. 2552).
Reference Method : US EPAMethod Part 50 App. F (Chemiluminescence)

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report may be reproduced in any form without written consent from the laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

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ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494232
Date Received : Oct 03, 2024
Date Reported : Oct 08, 2024
Report Number: 3084453-1

Sample Description Air Quality
Location วัดประชุมสิทธาราม
Parameter Sulfur Dioxide (ppm)
Measurement Date Sep 24, 2024 - Oct 01, 2024
Measurement by Nontachai Uppathamp

Time	2494232-1 Sep 24, 2024	2494232-2 Sep 25, 2024	2494232-3 Sep 26, 2024	2494232-4 Sep 27, 2024	2494232-5 Sep 28, 2024	2494232-6 Sep 29, 2024	2494232-7 Sep 30, 2024
11:00 AM - 12:00 PM	0.0037	0.0025	0.0021	0.0023	0.0026	0.0020	0.0026
12:00 PM - 01:00 PM	0.0038	0.0026	0.0021	0.0024	0.0025	0.0021	0.0024
01:00 PM - 02:00 PM	0.0038	0.0024	0.0021	0.0023	0.0024	0.0023	0.0025
02:00 PM - 03:00 PM	0.0036	0.0024	0.0023	0.0023	0.0024	0.0023	0.0026
03:00 PM - 04:00 PM	0.0035	0.0023	0.0022	0.0023	0.0025	0.0024	0.0026
04:00 PM - 05:00 PM	0.0035	0.0023	0.0022	0.0024	0.0024	0.0024	0.0023
05:00 PM - 06:00 PM	0.0033	0.0024	0.0021	0.0025	0.0024	0.0024	0.0024
06:00 PM - 07:00 PM	0.0032	0.0024	0.0022	0.0027	0.0024	0.0025	0.0024
07:00 PM - 08:00 PM	0.0032	0.0024	0.0022	0.0025	0.0026	0.0023	0.0024
08:00 PM - 09:00 PM	0.0031	0.0023	0.0021	0.0022	0.0023	0.0023	0.0024
09:00 PM - 10:00 PM	0.0031	0.0022	0.0023	0.0023	0.0021	0.0023	0.0024
10:00 PM - 11:00 PM	0.0030	0.0021	0.0023	0.0025	0.0020	0.0024	0.0023
11:00 PM - 12:00 AM	0.0029	0.0023	0.0021	0.0023	0.0022	0.0023	0.0023
12:00 AM - 01:00 AM	0.0029	0.0020	0.0022	0.0022	0.0023	0.0025	0.0024
01:00 AM - 02:00 AM	0.0028	0.0021	0.0021	0.0023	0.0024	0.0025	0.0024
02:00 AM - 03:00 AM	0.0027	0.0022	0.0021	0.0023	0.0022	0.0023	0.0025
03:00 AM - 04:00 AM	0.0028	0.0023	0.0021	0.0025	0.0022	0.0023	0.0023
04:00 AM - 05:00 AM	0.0027	0.0024	0.0021	0.0023	0.0024	0.0025	0.0024
05:00 AM - 06:00 AM	0.0026	0.0020	0.0021	0.0023	0.0024	0.0023	0.0022
06:00 AM - 07:00 AM	0.0022	0.0021	0.0021	0.0024	0.0023	0.0024	0.0023
07:00 AM - 08:00 AM	0.0024	0.0021	0.0021	0.0024	0.0020	0.0023	0.0023
08:00 AM - 09:00 AM	0.0024	0.0022	0.0022	0.0023	0.0020	0.0026	0.0023
09:00 AM - 10:00 AM	0.0023	0.0020	0.0022	0.0024	0.0020	0.0025	0.0025
10:00 AM - 11:00 AM	0.0025	0.0021	0.0021	0.0025	0.0021	0.0025	0.0024
Average	0.0030	0.0023	0.0022	0.0024	0.0023	0.0024	0.0024
1hr - Maximum	0.0038	0.0026	0.0023	0.0027	0.0026	0.0026	0.0026
Standard 1hr - Average	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Standard 24 hrs - Average	0.12	0.12	0.12	0.12	0.12	0.12	0.12

Standard : Notification of the National Environment Board No.10, 1995 (B.E.2538), No. 21, 2001 (B.E.2544) and No.24, 2004 (B.E.2547).
Reference Method : US EPA Method Part 53 and 58

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ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494232
Date Received : Oct 03, 2024
Date Reported : Oct 08, 2024
Report Number: 3132242-1

Sample Description Air Quality
Location มาบตาพุดแกมบ่าง
Parameter Sulfur Dioxide (ppm)
Measurement Date Sep 24, 2024 - Oct 01, 2024
Measurement by Nontachai Uppathamp

Time	2494232-8 Sep 24, 2024	2494232-9 Sep 25, 2024	2494232-10 Sep 26, 2024	2494232-11 Sep 27, 2024	2494232-12 Sep 28, 2024	2494232-13 Sep 29, 2024	2494232-14 Sep 30, 2024
10:00 AM - 11:00 AM	0.0019	0.0028	0.0025	0.0024	0.0022	0.0022	0.0022
11:00 AM - 12:00 PM	0.0020	0.0028	0.0024	0.0024	0.0022	0.0022	0.0022
12:00 PM - 01:00 PM	0.0019	0.0027	0.0023	0.0023	0.0022	0.0022	0.0022
01:00 PM - 02:00 PM	0.0021	0.0027	0.0024	0.0023	0.0022	0.0022	0.0021
02:00 PM - 03:00 PM	0.0022	0.0027	0.0023	0.0022	0.0022	0.0022	0.0021
03:00 PM - 04:00 PM	0.0023	0.0025	0.0024	0.0023	0.0022	0.0022	0.0021
04:00 PM - 05:00 PM	0.0026	0.0026	0.0023	0.0022	0.0022	0.0022	0.0021
05:00 PM - 06:00 PM	0.0026	0.0025	0.0023	0.0022	0.0022	0.0021	0.0021
06:00 PM - 07:00 PM	0.0028	0.0025	0.0023	0.0022	0.0021	0.0021	0.0021
07:00 PM - 08:00 PM	0.0028	0.0025	0.0023	0.0022	0.0021	0.0021	0.0021
08:00 PM - 09:00 PM	0.0028	0.0026	0.0023	0.0022	0.0021	0.0021	0.0021
09:00 PM - 10:00 PM	0.0029	0.0025	0.0023	0.0022	0.0021	0.0022	0.0021
10:00 PM - 11:00 PM	0.0030	0.0025	0.0024	0.0022	0.0021	0.0021	0.0021
11:00 PM - 12:00 AM	0.0031	0.0025	0.0023	0.0022	0.0022	0.0021	0.0021
12:00 AM - 01:00 AM	0.0031	0.0025	0.0023	0.0022	0.0022	0.0021	0.0022
01:00 AM - 02:00 AM	0.0030	0.0026	0.0024	0.0023	0.0022	0.0022	0.0022
02:00 AM - 03:00 AM	0.0029	0.0025	0.0024	0.0022	0.0022	0.0022	0.0022
03:00 AM - 04:00 AM	0.0029	0.0024	0.0024	0.0022	0.0022	0.0022	0.0022
04:00 AM - 05:00 AM	0.0029	0.0024	0.0023	0.0023	0.0022	0.0022	0.0022
05:00 AM - 06:00 AM	0.0029	0.0026	0.0023	0.0022	0.0022	0.0022	0.0021
06:00 AM - 07:00 AM	0.0028	0.0024	0.0023	0.0023	0.0021	0.0023	0.0022
07:00 AM - 08:00 AM	0.0029	0.0025	0.0023	0.0022	0.0022	0.0022	0.0023
08:00 AM - 09:00 AM	0.0028	0.0024	0.0024	0.0023	0.0023	0.0023	0.0022
09:00 AM - 10:00 AM	0.0028	0.0024	0.0025	0.0022	0.0022	0.0022	0.0022
Average	0.0027	0.0025	0.0024	0.0022	0.0022	0.0022	0.0022
1hr - Maximum	0.0031	0.0028	0.0025	0.0024	0.0023	0.0023	0.0023
Standard 1hr - Average	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Standard 24 hrs - Average	0.12	0.12	0.12	0.12	0.12	0.12	0.12

Standard : Notification of the National Environment Board No.10, 1995 (B.E.2538), No. 21, 2001 (B.E.2544) and No.24, 2004 (B.E.2547).
Reference Method : US EPA Method Part 53 and 58

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ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494232
Date Received : Oct 03, 2024
Date Reported : Oct 08, 2024
Report Number: 3132243-1

Sample Description Air Quality
Location วัดน้ำตกหุบกะทุ่ม
Parameter Sulfur Dioxide (ppm)
Measurement Date Sep 24, 2024 - Oct 01, 2024
Measurement by Nontachai Uppathamp

Time	2494232-15 Sep 24, 2024	2494232-16 Sep 25, 2024	2494232-17 Sep 26, 2024	2494232-18 Sep 27, 2024	2494232-19 Sep 28, 2024	2494232-20 Sep 29, 2024	2494232-21 Sep 30, 2024
12:00 PM - 01:00 PM	0.0025	0.0024	0.0025	0.0025	0.0025	0.0026	0.0027
01:00 PM - 02:00 PM	0.0024	0.0025	0.0025	0.0025	0.0025	0.0028	0.0026
02:00 PM - 03:00 PM	0.0035	0.0024	0.0025	0.0025	0.0026	0.0028	0.0027
03:00 PM - 04:00 PM	0.0045	0.0024	0.0024	0.0024	0.0029	0.0028	0.0030
04:00 PM - 05:00 PM	0.0036	0.0024	0.0024	0.0027	0.0028	0.0028	0.0028
05:00 PM - 06:00 PM	0.0033	0.0024	0.0026	0.0028	0.0028	0.0028	0.0028
06:00 PM - 07:00 PM	0.0033	0.0026	0.0028	0.0027	0.0028	0.0028	0.0028
07:00 PM - 08:00 PM	0.0028	0.0026	0.0026	0.0029	0.0028	0.0027	0.0028
08:00 PM - 09:00 PM	0.0026	0.0026	0.0026	0.0029	0.0027	0.0026	0.0027
09:00 PM - 10:00 PM	0.0025	0.0023	0.0026	0.0026	0.0026	0.0026	0.0027
10:00 PM - 11:00 PM	0.0025	0.0024	0.0025	0.0027	0.0026	0.0026	0.0027
11:00 PM - 12:00 AM	0.0023	0.0025	0.0025	0.0026	0.0025	0.0025	0.0026
12:00 AM - 01:00 AM	0.0024	0.0025	0.0024	0.0024	0.0025	0.0024	0.0025
01:00 AM - 02:00 AM	0.0025	0.0025	0.0024	0.0025	0.0024	0.0026	0.0025
02:00 AM - 03:00 AM	0.0025	0.0025	0.0025	0.0026	0.0026	0.0026	0.0026
03:00 AM - 04:00 AM	0.0025	0.0025	0.0025	0.0026	0.0026	0.0026	0.0026
04:00 AM - 05:00 AM	0.0025	0.0025	0.0025	0.0026	0.0026	0.0026	0.0026
05:00 AM - 06:00 AM	0.0025	0.0025	0.0025	0.0026	0.0026	0.0027	0.0026
06:00 AM - 07:00 AM	0.0025	0.0025	0.0025	0.0026	0.0026	0.0026	0.0026
07:00 AM - 08:00 AM	0.0025	0.0025	0.0025	0.0026	0.0026	0.0026	0.0026
08:00 AM - 09:00 AM	0.0025	0.0025	0.0025	0.0026	0.0026	0.0027	0.0026
09:00 AM - 10:00 AM	0.0025	0.0025	0.0025	0.0026	0.0026	0.0027	0.0027
10:00 AM - 11:00 AM	0.0025	0.0025	0.0025	0.0026	0.0026	0.0027	0.0027
11:00 AM - 12:00 PM	0.0025	0.0025	0.0025	0.0026	0.0026	0.0027	0.0027
Average	0.0027	0.0025	0.0025	0.0026	0.0026	0.0027	0.0027
1hr - Maximum	0.0045	0.0026	0.0028	0.0029	0.0029	0.0028	0.0030
Standard 1hr - Average	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Standard 24 hrs - Average	0.12	0.12	0.12	0.12	0.12	0.12	0.12

Standard : Notification of the National Environment Board No.10, 1995 (B.E.2538), No. 21, 2001 (B.E.2544) and No.24, 2004 (B.E.2547).
Reference Method : US EPA Method Part 53 and 58

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ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494232
Date Received : Oct 03, 2024
Date Reported : Oct 08, 2024
Report Number: 3132245-1

Sample Description Air Quality
Location วัดนาขอม่วง
Parameter Sulfur Dioxide (ppm)
Measurement Date Sep 24, 2024 - Oct 01, 2024
Measurement by Nontachai Uppathamp

Time	2494232-22 Sep 24, 2024	2494232-23 Sep 25, 2024	2494232-24 Sep 26, 2024	2494232-25 Sep 27, 2024	2494232-26 Sep 28, 2024	2494232-27 Sep 29, 2024	2494232-28 Sep 30, 2024
03:00 PM - 04:00 PM	0.0028	0.0027	0.0026	0.0026	0.0027	0.0027	0.0024
04:00 PM - 05:00 PM	0.0027	0.0027	0.0026	0.0026	0.0028	0.0027	0.0025
05:00 PM - 06:00 PM	0.0027	0.0027	0.0027	0.0026	0.0027	0.0026	0.0025
06:00 PM - 07:00 PM	0.0027	0.0027	0.0026	0.0027	0.0027	0.0026	0.0025
07:00 PM - 08:00 PM	0.0027	0.0028	0.0027	0.0027	0.0027	0.0025	0.0025
08:00 PM - 09:00 PM	0.0027	0.0028	0.0027	0.0026	0.0027	0.0026	0.0025
09:00 PM - 10:00 PM	0.0027	0.0027	0.0027	0.0027	0.0027	0.0026	0.0025
10:00 PM - 11:00 PM	0.0027	0.0028	0.0027	0.0027	0.0028	0.0026	0.0025
11:00 PM - 12:00 AM	0.0027	0.0029	0.0027	0.0027	0.0028	0.0024	0.0025
12:00 AM - 01:00 AM	0.0027	0.0029	0.0026	0.0027	0.0027	0.0024	0.0025
01:00 AM - 02:00 AM	0.0026	0.0027	0.0026	0.0027	0.0026	0.0024	0.0024
02:00 AM - 03:00 AM	0.0026	0.0025	0.0026	0.0026	0.0026	0.0022	0.0024
03:00 AM - 04:00 AM	0.0026	0.0025	0.0026	0.0025	0.0025	0.0021	0.0024
04:00 AM - 05:00 AM	0.0026	0.0025	0.0026	0.0025	0.0025	0.0021	0.0024
05:00 AM - 06:00 AM	0.0026	0.0025	0.0026	0.0024	0.0026	0.0021	0.0023
06:00 AM - 07:00 AM	0.0027	0.0025	0.0026	0.0025	0.0025	0.0022	0.0024
07:00 AM - 08:00 AM	0.0026	0.0025	0.0026	0.0024	0.0026	0.0023	0.0024
08:00 AM - 09:00 AM	0.0027	0.0025	0.0026	0.0025	0.0027	0.0023	0.0024
09:00 AM - 10:00 AM	0.0026	0.0026	0.0027	0.0025	0.0027	0.0024	0.0025
10:00 AM - 11:00 AM	0.0027	0.0025	0.0026	0.0026	0.0026	0.0024	0.0025
11:00 AM - 12:00 PM	0.0027	0.0026	0.0026	0.0026	0.0027	0.0024	0.0025
12:00 PM - 01:00 PM	0.0027	0.0027	0.0026	0.0026	0.0027	0.0025	0.0025
01:00 PM - 02:00 PM	0.0027	0.0027	0.0026	0.0027	0.0027	0.0024	0.0025
02:00 PM - 03:00 PM	0.0027	0.0027	0.0026	0.0027	0.0027	0.0025	0.0025
Average	0.0027	0.0027	0.0026	0.0026	0.0027	0.0024	0.0025
1hr - Maximum	0.0028	0.0029	0.0027	0.0027	0.0028	0.0027	0.0025
Standard 1hr - Average	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Standard 24 hrs - Average	0.12	0.12	0.12	0.12	0.12	0.12	0.12

Standard : Notification of the National Environment Board No.10, 1995 (B.E.2538), No. 21, 2001 (B.E.2544) and No.24, 2004 (B.E.2547).
Reference Method : US EPA Method Part 53 and 58

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report may be reproduced in any form without written consent from the laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

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ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494240
Date Received : Oct 02, 2024
Date Reported : Oct 07, 2024
Report Number: 3084473-1

Sample Description Air Quality
Location วัดน้ำตกหุบตะกุน
Date Analysis Commenced Oct 03, 2024
Condition of Sample Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one quartz filter paper (8x10 inch) placed in plastic bag

Sample Number	Sampled Date	Total Suspended Particulate (mg/m3)	Particulate Matter (PM-10) (mg/m3)	Barometric Pressure (mm Hg)	Atmospheric Temperature (°C)
2494240-1	Sep 24 - Sep 25, 2024	0.023	0.020	759	28
2494240-2	Sep 25 - Sep 26, 2024	0.035	0.024	759	26
2494240-3	Sep 26 - Sep 27, 2024	0.039	0.031	759	32
2494240-4	Sep 27 - Sep 28, 2024	0.030	0.022	759	32
2494240-5	Sep 28 - Sep 29, 2024	0.019	0.016	759	31
2494240-6	Sep 29 - Sep 30, 2024	0.020	0.014	759	36
2494240-7	Sep 30 - Oct 01, 2024	0.023	0.019	759	33
Guideline		0.33	0.12	-	-

Reference Method
Total Suspended Particulate : US EPA 40 CFR Part 50 Appendix B
Particulate Metter (PM-10) : US EPA 40 CFR Part 50 Appendix J

Guideline : Notification of the National Environmental Board. No.24, 2004 (B.E.2547) dated September 22, 2004
Sampled By : Nontachai Uppathamp

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

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report may be reproduced in any form without written consent from the laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

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ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494240
Date Received : Oct 02, 2024
Date Reported : Oct 07, 2024
Report Number: 3084473-2

Sample Description Air Quality
Location บ้านสักหินขาง
Date Analysis Commenced Oct 03, 2024
Condition of Sample Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one quartz filter paper (8x10 inch) placed in plastic bag

Sample Number	Sampled Date	Total Suspended Particulate (mg/m3)	Particulate Matter (PM-10) (mg/m3)	Barometric Pressure (mm Hg)	Atmospheric Temperature (°C)
2494240-8	Sep 24 - Sep 25, 2024	0.029	0.016	759	28
2494240-9	Sep 25 - Sep 26, 2024	0.043	0.028	759	30
2494240-10	Sep 26 - Sep 27, 2024	0.047	0.033	759	33
2494240-11	Sep 27 - Sep 28, 2024	0.035	0.023	759	33
2494240-12	Sep 28 - Sep 29, 2024	0.012	0.011	759	34
2494240-13	Sep 29 - Sep 30, 2024	0.015	0.011	759	35
2494240-14	Sep 30 - Oct 01, 2024	0.029	0.013	759	33
Guideline		0.33	0.12	-	-

Reference Method
Total Suspended Particulate : US EPA 40 CFR Part 50 Appendix B
Particulate Metter (PM-10) : US EPA 40 CFR Part 50 Appendix J

Guideline : Notification of the National Environmental Board. No.24, 2004 (B.E.2547) dated September 22, 2004
Sampled By : Nontachai Uppathamp

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

Approved by
ThanitaK.
Thanita Kulsuriwong
Scientist (4)

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report 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

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494240
Date Received : Oct 02, 2024
Date Reported : Oct 07, 2024
Report Number: 3084473-3

Page 1 of 1

Sample Description Air Quality
Location จังหวัดระยอง
Date Analysis Commenced Oct 03, 2024
Condition of Sample Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one quartz filter paper (8x10 inch) placed in plastic bag

Sample Number	Sampled Date	Total Suspended Particulate (mg/m3)	Particulate Matter (PM-10) (mg/m3)	Barometric Pressure (mm Hg)	Atmospheric Temperature (°C)
2494240-15	Sep 24 - Sep 25, 2024	0.041	0.023	759	28
2494240-16	Sep 25 - Sep 26, 2024	0.048	0.025	759	30
2494240-17	Sep 26 - Sep 27, 2024	0.041	0.027	759	34
2494240-18	Sep 27 - Sep 28, 2024	0.048	0.025	759	34
2494240-19	Sep 28 - Sep 29, 2024	0.035	0.020	759	30
2494240-20	Sep 29 - Sep 30, 2024	0.038	0.019	759	34
2494240-21	Sep 30 - Oct 01, 2024	0.047	0.019	759	35
Guideline		0.33	0.12	-	-

Reference Method
Total Suspended Particulate : US EPA 40 CFR Part 50 Appendix B
Particulate Metter (PM-10) : US EPA 40 CFR Part 50 Appendix J

Guideline : Notification of the National Environmental Board. No.24, 2004 (B.E.2547) dated September 22, 2004
Sampled By : Nontachai Uppathamp

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

Approved by
ThanitaK.
Thanita Kulsuriwong
Scientist (4)

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6403-74 / EMAIL S:\Reports_Air Ambient7Days.rpt (4:32PM)

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494240
Date Received : Oct 02, 2024
Date Reported : Oct 07, 2024
Report Number: 3084473-4

Page 1 of 1

Sample Description Air Quality
Location จังหวัดระยอง
Date Analysis Commenced Oct 03, 2024
Condition of Sample Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one quartz filter paper (8x10 inch) placed in plastic bag

Sample Number	Sampled Date	Total Suspended Particulate (mg/m3)	Particulate Matter (PM-10) (mg/m3)	Barometric Pressure (mm Hg)	Atmospheric Temperature (°C)
2494240-22	Sep 24 - Sep 25, 2024	0.037	0.021	754	28
2494240-23	Sep 25 - Sep 26, 2024	0.057	0.030	759	30
2494240-24	Sep 26 - Sep 27, 2024	0.046	0.033	759	33
2494240-25	Sep 27 - Sep 28, 2024	0.043	0.030	759	31
2494240-26	Sep 28 - Sep 29, 2024	0.026	0.024	759	30
2494240-27	Sep 29 - Sep 30, 2024	0.034	0.017	759	32
2494240-28	Sep 30 - Oct 01, 2024	0.051	0.022	759	34
Guideline		0.33	0.12	-	-

Reference Method
Total Suspended Particulate : US EPA 40 CFR Part 50 Appendix B
Particulate Metter (PM-10) : US EPA 40 CFR Part 50 Appendix J

Guideline : Notification of the National Environmental Board. No.24, 2004 (B.E.2547) dated September 22, 2004
Sampled By : Nontachai Uppathamp

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

Approved by
ThanitaK.
Thanita Kulsuriwong
Scientist (4)

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report may be reproduced in any form without written consent from the laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

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6403-74 / EMAIL S:\Reports_Air Ambient7Days.rpt (4:32PM)

Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494239
Date Received :Oct 02, 2024
Date Reported :Oct 08, 2024
Report Number :3084468-1

Sample Number 2494239-1 to 7
Parameter Wind Speed / Wind Direction
Location จังหวัดระยอง
Sampling Date Sep 24 - Oct 01, 2024
Sampling by Nontachai Uppathamp

Time	Sep 24 - Sep 25, 2024		Sep 25 - Sep 26, 2024		Sep 26 - Sep 27, 2024		Sep 27 - Sep 28, 2024		Sep 28 - Sep 29, 2024		Sep 29 - Sep 30, 2024		Sep 30 - Oct 01, 2024	
	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)
11:00 AM - 12:00 PM	3.1	130.0 SE	1.4	245.0 WSW	1.9	173.0 S	2.4	178.0 S	1.4	189.0 S	0.6	108.0 ESE	1.5	264.0 W
12:00 PM - 01:00 PM	1.3	186.0 S	1.2	236.0 SW	2.5	333.0 NNW	1.4	248.0 WSW	1.2	264.0 W	0.9	246.0 WSW	2.1	336.0 NNW
01:00 PM - 02:00 PM	2.9	237.0 WSW	1.5	214.0 SW	2.9	325.0 NW	1.0	24.0 NNE	2.0	273.0 W	1.5	177.0 S	1.5	356.0 N
02:00 PM - 03:00 PM	1.9	265.0 W	1.7	247.0 WSW	0.8	48.0 NE	0.9	339.0 NNW	1.6	267.0 W	2.1	265.0 W	1.3	158.0 SSE
03:00 PM - 04:00 PM	2.9	226.0 SW	1.5	178.0 S	2.8	14.0 NNE	2.6	256.0 WSW	1.0	199.0 SSW	1.6	214.0 SW	2.5	171.0 S
04:00 PM - 05:00 PM	1.8	268.0 W	1.2	201.0 SSW	1.0	79.0 E	1.6	165.0 SSE	3.8	171.0 S	5.3	219.0 SW	0.8	230.0 SW
05:00 PM - 06:00 PM	2.9	207.0 SSW	0.8	68.0 ENE	1.7	52.0 NE	0.8	59.0 ENE	1.5	210.0 SSW	1.9	177.0 S	1.4	233.0 SW
06:00 PM - 07:00 PM	2.3	200.0 SSW	1.1	85.0 E	0.8	73.0 ENE	1.4	49.0 NE	1.6	232.0 SW	0.0	- -	0.6	159.0 SSE
07:00 PM - 08:00 PM	1.1	261.0 W	0.0	- -	1.0	13.0 N	0.0	- -	1.1	202.0 SSW	1.0	172.0 S	0.0	- -
08:00 PM - 09:00 PM	2.7	202.0 SSW	1.0	66.0 ENE	1.4	22.0 NNE	0.8	31.0 NNE	3.1	191.0 S	0.3	212.0 SSW	0.0	- -
09:00 PM - 10:00 PM	1.2	273.0 W	1.4	63.0 ENE	1.5	60.0 ENE	1.4	60.0 ENE	2.2	281.0 W	0.2	- -	0.3	291.0 WNW
10:00 PM - 11:00 PM	1.5	351.0 N	1.3	55.0 NE	1.0	67.0 ENE	0.0	- -	2.0	0.0 N	0.0	- -	0.4	218.0 SW
11:00 PM - 12:00 AM	0.3	21.0 NNE	1.0	36.0 NE	0.9	17.0 NNE	0.0	- -	0.9	329.0 NNW	0.5	190.0 S	0.0	- -
12:00 AM - 01:00 AM	2.2	55.0 NE	1.0	352.0 N	0.5	342.0 NNW	0.9	359.0 N	1.1	329.0 NNW	0.0	- -	0.0	- -
01:00 AM - 02:00 AM	1.3	55.0 NE	0.0	- -	0.0	- -	0.0	- -	0.4	329.0 NNW	0.0	- -	0.0	- -
02:00 AM - 03:00 AM	0.3	63.0 ENE	1.2	355.0 N	0.0	- -	0.0	- -	0.8	342.0 NNW	0.0	- -	0.0	- -
03:00 AM - 04:00 AM	0.0	- -	0.4	9.0 N	0.0	- -	0.0	- -	0.0	- -	0.0	- -	0.0	- -
04:00 AM - 05:00 AM	0.0	- -	0.0	- -	0.0	- -	0.7	65.0 ENE	0.0	- -	0.0	- -	0.6	11.0 N
05:00 AM - 06:00 AM	0.0	- -	0.0	- -	0.0	- -	0.0	- -	0.0	- -	0.0	- -	0.3	39.0 NE
06:00 AM - 07:00 AM	0.0	- -	0.0	- -	0.8	16.0 NNE	0.0	- -	0.0	- -	0.0	- -	1.9	51.0 NE
07:00 AM - 08:00 AM	1.8	28.0 NNE	0.8	14.0 NNE	1.6	16.0 NNE	0.2	- -	0.0	- -	0.0	- -	0.3	58.0 ENE
08:00 AM - 09:00 AM	2.1	86.0 E	3.1	250.0 WSW	3.1	223.0 SW	1.0	221.0 SW	1.5	166.0 SSE	0.5	358.0 N	0.2	- -
09:00 AM - 10:00 AM	1.7	320.0 NW	1.3	48.0 NE	1.1	238.0 WSW	2.1	70.0 ENE	2.0	152.0 SSE	3.0	297.0 WNW	0.3	173.0 S
10:00 AM - 11:00 AM	0.5	327.0 NNW	2.0	267.0 W	1.3	170.0 S	2.5	202.0 SSW	0.4	231.0 SW	0.1	- -	0.1	- -

Reference Method : Cup Anemometer & Anodized Aluminium Vane Method

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

Approved by
Sarayuth Jittranont
Assistant General Manager

Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130

P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494239
Date Received :Oct 02, 2024
Date Reported :Oct 08, 2024
Report Number :3084468-1

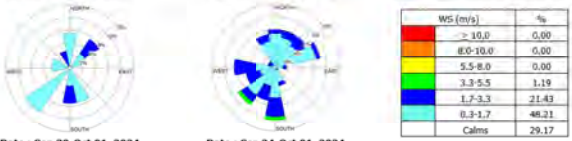
Wind Rose



Date : Sep 24-25, 2024 | Date : Sep 25-26, 2024 | Date : Sep 26-27, 2024



Date : Sep 27-28, 2024 | Date : Sep 28-29, 2024 | Date : Sep 29-30, 2024



Date : Sep 30-Oct 01, 2024 | Date : Sep 24-Oct 01, 2024

WS (m/s)	%
>= 10.0	0.00
8.0-10.0	0.00
5.5-8.0	0.00
3.3-5.5	1.19
1.7-3.3	21.43
0.3-1.7	48.21
Calms	29.17

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Approved by
Serayuth Jittranont
Assistant General Manager

Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130

P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494223
Date Received : Sep 25, 2024
Date Reported : Oct 02, 2024
Report Number: 3084403-2

Sample Number	2494223-1
Sampled Date	Sep 25, 2024
Sample Description	Emission from Stationary Source
Location	HRSGs 1 (GPS 47P 0728137, 1405521)
Date Analysis Commenced	Sep 26, 2024
Condition of Sample	Extracted into one filter paper placed in plastic petri dish, one plastic bottle and one amber plastic bottle, refrigerated

Stack Description

Ambient Pressure	756	mmHg	Diameter	3.30	m	Oxygen	13.9	%
Ambient Temperature	34.2	°C	Shape	Circle		Carbon Dioxide	4.0	%
Type of Process	Combustion		Stack Temperature	142	°C	Gas Velocity	20.8	m/s
Type of Fuel	Natural Gas		Moisture	9.97	%	Flow Rate (Actual O2)	411619	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result at 7 %O2	Result at 13.9 % O2	Method	Testing Location
Air Testing								
Ammonia	12:00 PM - 12:30 PM	ppm	-	0.02	0.48	0.24	In-house method based on Method of Air Sampling and Analysis, 401	Rayong

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report 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
Thanita Kulsuriwong
Scientist (4)

Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130

P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494223
Date Received : Sep 25, 2024
Date Reported : Oct 02, 2024
Report Number: 3084403-2

Sample Number	2494223-1
Sampled Date	Sep 25, 2024
Sample Description	Emission from Stationary Source
Location	HRSGs 1 (GPS 47P 0728137, 1405521)
Date Analysis Commenced	Sep 26, 2024
Condition of Sample	Extracted into one filter paper placed in plastic petri dish, one plastic bottle and one amber plastic bottle, refrigerated

Stack Description

Ambient Pressure	756	mmHg	Diameter	3.30	m	Oxygen	13.9	%
Ambient Temperature	34.2	°C	Shape	Circle		Carbon Dioxide	4.0	%
Type of Process	Combustion		Stack Temperature	142	°C	Gas Velocity	20.8	m/s
Type of Fuel	Natural Gas		Moisture	9.97	%	Flow Rate (Actual O2)	411619	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result Emission Rate	Method	Testing Location
Air Testing							
Ammonia	12:00 PM - 12:30 PM	g/s	-	-	0.02	Calculated	Rayong

Sampling By : Warawut Pubpa

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

Approved by
Thanita Kulsuriwong
Scientist (4)

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130

P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494245
Date Received : Oct 02, 2024
Date Reported : Oct 05, 2024
Report Number: 3110704-1

Sample Number	2494245-1
Parameter	Noise (Leq 24 hrs)
Location	บริเวณริมถั่วโรงงานสำนักงานเช่าโครงการ
Measurement Date	Sep 24 - Sep 25, 2024
Measurement by	Nontachai Uppathamp
Sound Level meter	Serial No. 1122579

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	59.2	80.6	49.9
10:00 AM - 11:00 AM	60.2	83.6	49.5
11:00 AM - 12:00 PM	60.9	89.1	50.0
12:00 PM - 01:00 PM	64.2	94.9	50.3
01:00 PM - 02:00 PM	64.9	89.3	49.4
02:00 PM - 03:00 PM	56.8	78.0	51.1
03:00 PM - 04:00 PM	53.5	81.2	49.5
04:00 PM - 05:00 PM	53.0	78.8	49.5
05:00 PM - 06:00 PM	50.9	60.8	49.7
06:00 PM - 07:00 PM	51.8	72.3	49.5
07:00 PM - 08:00 PM	53.7	71.8	50.3
08:00 PM - 09:00 PM	52.3	83.2	48.5
09:00 PM - 10:00 PM	51.3	76.6	48.1
10:00 PM - 11:00 PM	49.3	64.2	48.1
11:00 PM - 12:00 AM	50.9	62.4	49.3
12:00 AM - 01:00 AM	51.7	66.6	50.4
01:00 AM - 02:00 AM	55.4	77.0	48.5
02:00 AM - 03:00 AM	61.9	91.7	48.8
03:00 AM - 04:00 AM	59.0	81.1	48.3
04:00 AM - 05:00 AM	61.1	87.7	49.5
05:00 AM - 06:00 AM	60.8	80.9	50.9
06:00 AM - 07:00 AM	58.0	87.0	49.0
07:00 AM - 08:00 AM	62.7	86.8	50.3
08:00 AM - 09:00 AM	60.4	87.0	50.4
Leq Average 24 hrs. (dB(A))	59.1		
Lmax (dB(A))		94.9	
L90 (dB(A))			49.5
Ldn (dB(A))	65.0		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management
Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by
Supot Salamteh
Section Head

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494245
Date Received : Oct 02, 2024
Date Reported : Oct 05, 2024
Report Number: 3130705-1

Sample Number 2494245-2
Parameter Noise (Leq 24 hrs)
Location บริเวณริมรั้วโรงงานด้านทางเข้าโครงการ
Measurement Date Sep 25 - Sep 26, 2024
Measurement by Nontachai Uppathamp
Sound Level meter Serial No. 1122579

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	62.2	86.5	51.7
10:00 AM - 11:00 AM	58.0	79.4	48.7
11:00 AM - 12:00 PM	59.0	82.4	48.3
12:00 PM - 01:00 PM	59.7	87.9	48.8
01:00 PM - 02:00 PM	63.0	93.7	49.1
02:00 PM - 03:00 PM	63.7	88.1	48.2
03:00 PM - 04:00 PM	55.6	76.8	49.9
04:00 PM - 05:00 PM	52.3	80.0	48.3
05:00 PM - 06:00 PM	51.8	77.6	48.3
06:00 PM - 07:00 PM	49.7	59.6	48.5
07:00 PM - 08:00 PM	50.6	71.1	48.3
08:00 PM - 09:00 PM	52.5	70.6	49.1
09:00 PM - 10:00 PM	51.1	82.0	47.3
10:00 PM - 11:00 PM	50.1	75.4	46.9
11:00 PM - 12:00 AM	48.1	63.0	46.9
12:00 AM - 01:00 AM	49.7	61.2	48.1
01:00 AM - 02:00 AM	50.5	67.4	49.2
02:00 AM - 03:00 AM	54.2	75.8	47.3
03:00 AM - 04:00 AM	60.7	90.5	47.6
04:00 AM - 05:00 AM	57.8	79.9	47.1
05:00 AM - 06:00 AM	59.9	86.5	48.3
06:00 AM - 07:00 AM	59.6	79.7	49.7
07:00 AM - 08:00 AM	56.8	65.8	47.8
08:00 AM - 09:00 AM	61.5	87.6	49.1
Leq Average 24 hrs. (dB(A))	58.2		
Lmax (dB(A))		93.7	
L90 (dB(A))			48.7
Ldn (dB(A))	63.6		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management Chontichak
Chontticha Subongkoch
Scientist (3)

Approved by Supt S
Supot Salamteh
Section Head

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494245
Date Received : Oct 02, 2024
Date Reported : Oct 05, 2024
Report Number: 3130706-1

Sample Number 2494245-3
Parameter Noise (Leq 24 hrs)
Location บริเวณริมรั้วโรงงานด้านทางเข้าโครงการ
Measurement Date Sep 26 - Sep 27, 2024
Measurement by Nontachai Uppathamp
Sound Level meter Serial No. 1122579

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	59.2	85.8	49.2
10:00 AM - 11:00 AM	61.0	85.3	50.5
11:00 AM - 12:00 PM	59.0	84.1	48.7
12:00 PM - 01:00 PM	58.6	84.1	47.9
01:00 PM - 02:00 PM	60.2	91.6	47.8
02:00 PM - 03:00 PM	56.3	84.0	48.3
03:00 PM - 04:00 PM	55.0	82.1	48.9
04:00 PM - 05:00 PM	58.6	86.8	49.4
05:00 PM - 06:00 PM	52.9	74.0	50.2
06:00 PM - 07:00 PM	51.9	71.3	49.2
07:00 PM - 08:00 PM	52.0	70.9	50.2
08:00 PM - 09:00 PM	50.9	71.7	48.2
09:00 PM - 10:00 PM	49.2	66.5	47.9
10:00 PM - 11:00 PM	52.5	72.7	49.6
11:00 PM - 12:00 AM	52.0	69.6	48.4
12:00 AM - 01:00 AM	48.8	59.5	47.0
01:00 AM - 02:00 AM	49.2	71.3	47.6
02:00 AM - 03:00 AM	53.6	74.4	48.5
03:00 AM - 04:00 AM	56.5	82.7	47.8
04:00 AM - 05:00 AM	59.0	78.7	48.1
05:00 AM - 06:00 AM	57.6	82.0	49.0
06:00 AM - 07:00 AM	58.9	83.1	48.9
07:00 AM - 08:00 AM	53.4	72.1	47.9
08:00 AM - 09:00 AM	56.1	83.4	47.9
Leq Average 24 hrs. (dB(A))	56.5		
Lmax (dB(A))		91.6	
L90 (dB(A))			48.4
Ldn (dB(A))	62.3		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management Chontichak
Chontticha Subongkoch
Scientist (3)

Approved by Supt S
Supot Salamteh
Section Head

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494245
Date Received : Oct 02, 2024
Date Reported : Oct 05, 2024
Report Number: 3130707-1

Sample Number 2494245-4
Parameter Noise (Leq 24 hrs)
Location บริเวณริมรั้วโรงงานด้านทางเข้าโครงการ
Measurement Date Sep 27 - Sep 28, 2024
Measurement by Nontachai Uppathamp
Sound Level meter Serial No. 1122579

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	57.1	80.6	47.3
10:00 AM - 11:00 AM	58.0	85.6	48.2
11:00 AM - 12:00 PM	62.0	88.4	49.4
12:00 PM - 01:00 PM	56.3	83.3	49.0
01:00 PM - 02:00 PM	53.1	73.0	48.6
02:00 PM - 03:00 PM	64.0	92.3	49.0
03:00 PM - 04:00 PM	54.6	73.7	47.2
04:00 PM - 05:00 PM	54.9	83.5	48.1
05:00 PM - 06:00 PM	49.5	67.2	47.9
06:00 PM - 07:00 PM	48.7	70.0	47.0
07:00 PM - 08:00 PM	48.7	71.1	46.8
08:00 PM - 09:00 PM	48.7	68.8	46.8
09:00 PM - 10:00 PM	52.1	72.8	49.6
10:00 PM - 11:00 PM	52.1	63.2	50.4
11:00 PM - 12:00 AM	51.0	66.4	49.6
12:00 AM - 01:00 AM	51.2	71.4	49.4
01:00 AM - 02:00 AM	49.5	57.4	47.6
02:00 AM - 03:00 AM	49.4	74.0	47.5
03:00 AM - 04:00 AM	55.2	76.3	48.2
04:00 AM - 05:00 AM	55.9	76.0	46.5
05:00 AM - 06:00 AM	54.0	83.0	45.7
06:00 AM - 07:00 AM	54.9	77.0	48.3
07:00 AM - 08:00 AM	54.9	78.1	47.1
08:00 AM - 09:00 AM	55.3	82.6	48.2
Leq Average 24 hrs. (dB(A))	56.0		
Lmax (dB(A))		92.3	
L90 (dB(A))			48.1
Ldn (dB(A))	60.4		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management Chontichak
Chontticha Subongkoch
Scientist (3)

Approved by Supt S
Supot Salamteh
Section Head

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494245
Date Received : Oct 02, 2024
Date Reported : Oct 05, 2024
Report Number: 3130708-1

Sample Number 2494245-5
Parameter Noise (Leq 24 hrs)
Location บริเวณริมรั้วโรงงานด้านทางเข้าโครงการ
Measurement Date Sep 28 - Sep 29, 2024
Measurement by Nontachai Uppathamp
Sound Level meter Serial No. 1122579

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	54.3	80.1	47.5
10:00 AM - 11:00 AM	53.5	83.4	46.3
11:00 AM - 12:00 PM	54.0	83.1	47.3
12:00 PM - 01:00 PM	54.5	80.1	47.6
01:00 PM - 02:00 PM	59.2	87.7	47.8
02:00 PM - 03:00 PM	59.2	88.7	47.8
03:00 PM - 04:00 PM	54.8	76.7	48.3
04:00 PM - 05:00 PM	53.9	74.7	49.1
05:00 PM - 06:00 PM	51.6	66.1	49.0
06:00 PM - 07:00 PM	51.6	74.3	49.2
07:00 PM - 08:00 PM	50.5	61.0	49.5
08:00 PM - 09:00 PM	51.0	65.1	49.7
09:00 PM - 10:00 PM	52.3	70.2	50.0
10:00 PM - 11:00 PM	52.9	73.1	50.4
11:00 PM - 12:00 AM	50.8	65.5	49.6
12:00 AM - 01:00 AM	50.5	65.0	49.4
01:00 AM - 02:00 AM	50.2	60.6	48.9
02:00 AM - 03:00 AM	51.1	74.7	48.9
03:00 AM - 04:00 AM	56.1	75.9	49.2
04:00 AM - 05:00 AM	55.1	75.2	47.4
05:00 AM - 06:00 AM	53.9	79.5	45.3
06:00 AM - 07:00 AM	49.9	72.9	45.6
07:00 AM - 08:00 AM	50.6	72.1	45.6
08:00 AM - 09:00 AM	52.9	78.3	47.5
Leq Average 24 hrs. (dB(A))	54.0		
Lmax (dB(A))		88.7	
L90 (dB(A))			48.3
Ldn (dB(A))	59.5		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management Chontichak
Chontticha Subongkoch
Scientist (3)

Approved by Supt S
Supot Salamteh
Section Head

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494245
Date Received : Oct 02, 2024
Date Reported : Oct 05, 2024
Report Number: 3130709-1

Sample Number	2494245-6
Parameter	Noise (Leq 24 hrs)
Location	บริเวณริมรั้วโรงงานด้านทางเข้าโครงการ
Measurement Date	Sep 29 - Sep 30, 2024
Measurement by	Nontachai Uppathamp
Sound Level meter	Serial No. 1122579

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	52.4	74.3	47.6
10:00 AM - 11:00 AM	51.0	74.3	47.3
11:00 AM - 12:00 PM	52.0	76.2	47.0
12:00 PM - 01:00 PM	50.9	72.3	47.1
01:00 PM - 02:00 PM	48.8	66.1	46.7
02:00 PM - 03:00 PM	50.5	75.3	46.9
03:00 PM - 04:00 PM	53.6	75.2	48.1
04:00 PM - 05:00 PM	53.8	79.8	50.0
05:00 PM - 06:00 PM	51.5	75.1	49.4
06:00 PM - 07:00 PM	51.8	72.2	48.8
07:00 PM - 08:00 PM	51.0	73.6	48.8
08:00 PM - 09:00 PM	52.6	74.8	49.8
09:00 PM - 10:00 PM	51.4	67.8	49.9
10:00 PM - 11:00 PM	51.2	71.7	49.6
11:00 PM - 12:00 AM	49.9	62.7	48.7
12:00 AM - 01:00 AM	50.0	67.9	48.7
01:00 AM - 02:00 AM	50.1	73.8	47.8
02:00 AM - 03:00 AM	50.7	73.7	47.4
03:00 AM - 04:00 AM	55.6	75.5	49.8
04:00 AM - 05:00 AM	57.2	80.3	49.5
05:00 AM - 06:00 AM	56.8	88.2	48.4
06:00 AM - 07:00 AM	56.1	78.0	47.5
07:00 AM - 08:00 AM	55.3	78.6	47.3
08:00 AM - 09:00 AM	59.4	87.9	48.2
Leq Average 24 hrs. (dB(A))	53.6		
Lmax (dB(A))		88.2	
L90 (dB(A))			48.2
Ldn (dB(A))	60.4		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management Chontichak
Chontticha Subongkoch
Scientist (3)

Approved by Supt S
Supot Salamteh
Section Head

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494245
Date Received : Oct 02, 2024
Date Reported : Oct 05, 2024
Report Number: 3130710-1

Sample Number	2494245-7
Parameter	Noise (Leq 24 hrs)
Location	บริเวณริมรั้วโรงงานด้านทางเข้าโครงการ
Measurement Date	Sep 30 - Oct 01, 2024
Measurement by	Nontachai Uppathamp
Sound Level meter	Serial No. 1122579

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	57.0	79.4	47.5
10:00 AM - 11:00 AM	54.4	74.9	47.7
11:00 AM - 12:00 PM	55.4	78.3	48.4
12:00 PM - 01:00 PM	57.7	84.7	47.5
01:00 PM - 02:00 PM	57.7	84.9	48.4
02:00 PM - 03:00 PM	60.1	82.9	48.3
03:00 PM - 04:00 PM	55.1	74.5	49.2
04:00 PM - 05:00 PM	54.7	76.9	49.8
05:00 PM - 06:00 PM	51.9	80.0	49.0
06:00 PM - 07:00 PM	51.1	71.1	49.0
07:00 PM - 08:00 PM	51.9	72.4	49.7
08:00 PM - 09:00 PM	50.8	70.2	49.0
09:00 PM - 10:00 PM	61.3	77.5	54.4
10:00 PM - 11:00 PM	58.8	74.5	50.0
11:00 PM - 12:00 AM	49.1	59.3	47.6
12:00 AM - 01:00 AM	50.4	72.0	48.1
01:00 AM - 02:00 AM	49.9	57.4	48.5
02:00 AM - 03:00 AM	50.3	71.2	47.9
03:00 AM - 04:00 AM	56.0	77.8	49.0
04:00 AM - 05:00 AM	57.3	73.9	50.1
05:00 AM - 06:00 AM	54.8	78.4	47.3
06:00 AM - 07:00 AM	53.7	75.2	47.5
07:00 AM - 08:00 AM	54.9	78.8	47.5
08:00 AM - 09:00 AM	56.5	79.8	47.9
Leq Average 24 hrs. (dB(A))	55.9		
Lmax (dB(A))		84.9	
L90 (dB(A))			48.4
Ldn (dB(A))	61.4		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management Chontichak
Chontticha Subongkoch
Scientist (3)

Approved by Supt S
Supot Salamteh
Section Head

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6403-74/ EMAIL S:\Reports_Air Noise.rpt (1.48PM)

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494245
Date Received : Oct 02, 2024
Date Reported : Oct 05, 2024
Report Number: 3130711-1

Sample Number	2494245-8
Parameter	Noise (Leq 24 hrs)
Location	บ้านสำนักแขว่าง
Measurement Date	Sep 24 - Sep 25, 2024
Measurement by	Nontachai Uppathamp
Sound Level meter	Serial No. 597167

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	51.0	75.1	45.1
11:00 AM - 12:00 PM	48.0	70.4	44.7
12:00 PM - 01:00 PM	48.2	78.9	43.1
01:00 PM - 02:00 PM	46.5	65.8	43.4
02:00 PM - 03:00 PM	50.1	69.0	44.4
03:00 PM - 04:00 PM	49.4	80.8	44.5
04:00 PM - 05:00 PM	49.6	73.2	45.2
05:00 PM - 06:00 PM	49.0	70.3	45.1
06:00 PM - 07:00 PM	49.9	77.1	44.5
07:00 PM - 08:00 PM	55.3	64.4	54.1
08:00 PM - 09:00 PM	54.1	63.6	52.2
09:00 PM - 10:00 PM	54.0	81.9	52.4
10:00 PM - 11:00 PM	69.0	85.5	46.0
11:00 PM - 12:00 AM	68.2	81.5	58.0
12:00 AM - 01:00 AM	63.1	71.3	60.8
01:00 AM - 02:00 AM	62.4	70.6	57.7
02:00 AM - 03:00 AM	58.7	68.9	55.7
03:00 AM - 04:00 AM	57.7	70.0	54.9
04:00 AM - 05:00 AM	63.4	77.8	54.0
05:00 AM - 06:00 AM	56.8	78.6	47.0
06:00 AM - 07:00 AM	54.1	69.7	47.5
07:00 AM - 08:00 AM	51.9	72.4	46.0
08:00 AM - 09:00 AM	50.4	68.5	44.5
09:00 AM - 10:00 AM	50.8	78.9	43.0
Leq Average 24 hrs. (dB(A))	60.1		
Lmax (dB(A))		85.5	
L90 (dB(A))			46.0
Ldn (dB(A))	69.8		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management Chontichak
Chontticha Subongkoch
Scientist (3)

Approved by Supt S
Supot Salamteh
Section Head

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6403-74/ EMAIL S:\Reports_Air Noise.rpt (1.48PM)

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494245
Date Received : Oct 02, 2024
Date Reported : Oct 05, 2024
Report Number: 3130712-1

Sample Number	2494245-9
Parameter	Noise (Leq 24 hrs)
Location	บ้านสำนักแขว่าง
Measurement Date	Sep 25 - Sep 26, 2024
Measurement by	Nontachai Uppathamp
Sound Level meter	Serial No. 597167

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	49.8	77.5	44.2
11:00 AM - 12:00 PM	48.2	59.5	46.8
12:00 PM - 01:00 PM	47.9	63.1	46.1
01:00 PM - 02:00 PM	48.3	68.5	46.3
02:00 PM - 03:00 PM	48.3	66.1	46.4
03:00 PM - 04:00 PM	49.6	66.3	46.7
04:00 PM - 05:00 PM	52.0	81.5	46.9
05:00 PM - 06:00 PM	67.1	86.0	49.2
06:00 PM - 07:00 PM	51.5	70.4	48.6
07:00 PM - 08:00 PM	55.8	70.6	53.3
08:00 PM - 09:00 PM	56.4	73.9	55.3
09:00 PM - 10:00 PM	55.3	62.0	54.0
10:00 PM - 11:00 PM	53.0	59.3	51.9
11:00 PM - 12:00 AM	51.2	58.4	49.7
12:00 AM - 01:00 AM	50.6	60.5	49.3
01:00 AM - 02:00 AM	50.9	69.0	49.8
02:00 AM - 03:00 AM	50.0	60.8	47.4
03:00 AM - 04:00 AM	50.8	62.5	49.1
04:00 AM - 05:00 AM	50.9	61.4	49.0
05:00 AM - 06:00 AM	50.2	70.3	45.7
06:00 AM - 07:00 AM	55.2	72.7	48.8
07:00 AM - 08:00 AM	53.6	71.6	48.7
08:00 AM - 09:00 AM	51.8	76.5	48.4
09:00 AM - 10:00 AM	49.6	75.1	46.0
Leq Average 24 hrs. (dB(A))	55.7		
Lmax (dB(A))		86.0	
L90 (dB(A))			46.0
Ldn (dB(A))	59.4		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management Chontichak
Chontticha Subongkoch
Scientist (3)

Approved by Supt S
Supot Salamteh
Section Head

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
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6403-74/ EMAIL S:\Reports_Air Noise.rpt (1.48PM)

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494245
Date Received : Oct 02, 2024
Date Reported : Oct 05, 2024
Report Number: 3130713-1

Sample Number 2494245-10
Parameter Noise (Leq 24 hrs)
Location บ้านสำนักแขว่ง
Measurement Date Sep 26 - Sep 27, 2024
Measurement by Nontachai Uppathamp
Sound Level meter Serial No. 597167

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	50.6	76.3	42.8
11:00 AM - 12:00 PM	56.1	85.1	49.7
12:00 PM - 01:00 PM	51.6	75.9	48.7
01:00 PM - 02:00 PM	52.8	75.0	48.8
02:00 PM - 03:00 PM	54.2	74.3	50.7
03:00 PM - 04:00 PM	52.8	70.6	50.3
04:00 PM - 05:00 PM	52.4	67.8	49.4
05:00 PM - 06:00 PM	51.8	75.7	49.4
06:00 PM - 07:00 PM	52.0	66.0	49.6
07:00 PM - 08:00 PM	53.8	69.8	52.9
08:00 PM - 09:00 PM	52.8	70.7	51.5
09:00 PM - 10:00 PM	51.6	67.0	50.7
10:00 PM - 11:00 PM	49.8	63.6	48.5
11:00 PM - 12:00 AM	49.0	60.7	48.2
12:00 AM - 01:00 AM	48.5	67.3	47.0
01:00 AM - 02:00 AM	49.4	61.2	48.7
02:00 AM - 03:00 AM	50.0	56.7	48.9
03:00 AM - 04:00 AM	47.9	52.8	46.6
04:00 AM - 05:00 AM	48.8	66.4	47.0
05:00 AM - 06:00 AM	50.5	65.5	48.7
06:00 AM - 07:00 AM	57.5	75.3	52.3
07:00 AM - 08:00 AM	55.8	74.9	50.7
08:00 AM - 09:00 AM	52.4	61.5	49.6
09:00 AM - 10:00 AM	51.8	73.4	43.1
Leq Average 24 hrs. (dB(A))	52.6		
Lmax (dB(A))		85.1	
L90 (dB(A))			48.7
Ldn (dB(A))	58.1		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management Chontichak
Chontticha Subongkoch
Scientist (3)

Approved by Supt S
Supot Salamteh
Section Head

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494245
Date Received : Oct 02, 2024
Date Reported : Oct 05, 2024
Report Number: 3130714-1

Sample Number 2494245-11
Parameter Noise (Leq 24 hrs)
Location บ้านสำนักแขว่ง
Measurement Date Sep 27 - Sep 28, 2024
Measurement by Nontachai Uppathamp
Sound Level meter Serial No. 597167

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	54.3	85.9	47.8
11:00 AM - 12:00 PM	49.4	69.3	47.5
12:00 PM - 01:00 PM	49.7	67.3	47.8
01:00 PM - 02:00 PM	50.0	77.3	47.6
02:00 PM - 03:00 PM	49.3	66.4	47.9
03:00 PM - 04:00 PM	50.0	62.7	48.6
04:00 PM - 05:00 PM	51.2	67.0	49.5
05:00 PM - 06:00 PM	51.2	67.7	49.4
06:00 PM - 07:00 PM	50.3	66.5	49.1
07:00 PM - 08:00 PM	53.7	71.6	51.7
08:00 PM - 09:00 PM	53.0	62.7	52.1
09:00 PM - 10:00 PM	51.4	65.8	49.9
10:00 PM - 11:00 PM	49.0	59.2	47.6
11:00 PM - 12:00 AM	49.0	63.2	47.8
12:00 AM - 01:00 AM	48.7	58.2	48.0
01:00 AM - 02:00 AM	47.7	64.0	46.1
02:00 AM - 03:00 AM	47.9	70.4	46.8
03:00 AM - 04:00 AM	47.4	59.2	45.5
04:00 AM - 05:00 AM	46.6	54.9	45.2
05:00 AM - 06:00 AM	47.3	65.4	45.5
06:00 AM - 07:00 AM	51.5	67.0	47.3
07:00 AM - 08:00 AM	55.9	69.0	49.9
08:00 AM - 09:00 AM	51.6	66.8	48.6
09:00 AM - 10:00 AM	51.1	74.7	46.2
Leq Average 24 hrs. (dB(A))	51.0		
Lmax (dB(A))		85.9	
L90 (dB(A))			47.8
Ldn (dB(A))	55.7		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management Chontichak
Chontticha Subongkoch
Scientist (3)

Approved by Supt S
Supot Salamteh
Section Head

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494245
Date Received : Oct 02, 2024
Date Reported : Oct 05, 2024
Report Number: 3130715-1

Sample Number 2494245-12
Parameter Noise (Leq 24 hrs)
Location บ้านสำนักแขว่ง
Measurement Date Sep 28 - Sep 29, 2024
Measurement by Nontachai Uppathamp
Sound Level meter Serial No. 597167

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	47.3	76.0	43.8
11:00 AM - 12:00 PM	51.8	80.9	47.8
12:00 PM - 01:00 PM	48.9	71.4	45.8
01:00 PM - 02:00 PM	48.9	67.1	45.8
02:00 PM - 03:00 PM	50.0	66.9	46.2
03:00 PM - 04:00 PM	50.3	74.8	46.1
04:00 PM - 05:00 PM	49.6	65.4	46.9
05:00 PM - 06:00 PM	51.3	83.9	46.5
06:00 PM - 07:00 PM	48.2	67.0	45.7
07:00 PM - 08:00 PM	52.4	69.4	50.5
08:00 PM - 09:00 PM	53.2	72.2	50.2
09:00 PM - 10:00 PM	51.5	70.8	50.2
10:00 PM - 11:00 PM	50.7	69.5	49.9
11:00 PM - 12:00 AM	49.8	60.7	49.0
12:00 AM - 01:00 AM	48.6	56.5	46.8
01:00 AM - 02:00 AM	46.7	68.6	45.4
02:00 AM - 03:00 AM	48.3	55.9	46.8
03:00 AM - 04:00 AM	48.8	62.0	47.6
04:00 AM - 05:00 AM	48.2	60.8	46.9
05:00 AM - 06:00 AM	48.2	64.9	45.4
06:00 AM - 07:00 AM	50.7	72.6	46.4
07:00 AM - 08:00 AM	52.3	69.0	48.5
08:00 AM - 09:00 AM	50.0	68.8	47.8
09:00 AM - 10:00 AM	49.5	64.3	46.3
Leq Average 24 hrs. (dB(A))	50.1		
Lmax (dB(A))		83.9	
L90 (dB(A))			46.8
Ldn (dB(A))	55.7		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management Chontichak
Chontticha Subongkoch
Scientist (3)

Approved by Supt S
Supot Salamteh
Section Head

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494245
Date Received : Oct 02, 2024
Date Reported : Oct 05, 2024
Report Number: 3130716-1

Sample Number 2494245-13
Parameter Noise (Leq 24 hrs)
Location บ้านสำนักแขว่ง
Measurement Date Sep 29 - Sep 30, 2024
Measurement by Nontachai Uppathamp
Sound Level meter Serial No. 597167

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	49.2	77.9	42.7
11:00 AM - 12:00 PM	48.1	70.0	45.8
12:00 PM - 01:00 PM	47.9	72.0	46.1
01:00 PM - 02:00 PM	49.2	73.6	47.2
02:00 PM - 03:00 PM	49.2	71.3	47.2
03:00 PM - 04:00 PM	50.3	72.7	47.9
04:00 PM - 05:00 PM	50.1	69.3	48.0
05:00 PM - 06:00 PM	50.0	66.0	47.6
06:00 PM - 07:00 PM	50.9	82.3	47.1
07:00 PM - 08:00 PM	52.0	77.1	50.3
08:00 PM - 09:00 PM	51.4	72.1	49.5
09:00 PM - 10:00 PM	49.1	65.2	47.6
10:00 PM - 11:00 PM	47.6	60.2	46.3
11:00 PM - 12:00 AM	47.9	57.5	46.3
12:00 AM - 01:00 AM	48.0	66.0	46.0
01:00 AM - 02:00 AM	51.1	80.4	44.9
02:00 AM - 03:00 AM	45.8	58.8	44.8
03:00 AM - 04:00 AM	46.2	61.1	44.8
04:00 AM - 05:00 AM	48.3	74.9	45.7
05:00 AM - 06:00 AM	47.6	67.8	45.5
06:00 AM - 07:00 AM	52.5	73.0	47.3
07:00 AM - 08:00 AM	51.5	70.4	47.2
08:00 AM - 09:00 AM	49.9	67.5	46.2
09:00 AM - 10:00 AM	47.3	68.0	44.8
Leq Average 24 hrs. (dB(A))	49.6		
Lmax (dB(A))		82.3	
L90 (dB(A))			46.3
Ldn (dB(A))	55.4		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management Chontichak
Chontticha Subongkoch
Scientist (3)

Approved by Supt S
Supot Salamteh
Section Head

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494245
Date Received : Oct 02, 2024
Date Reported : Oct 05, 2024
Report Number: 3130717-1

Sample Number	2494245-14
Parameter	Noise (Leq 24 hrs)
Location	มาบสาหมแก่น
Measurement Date	Sep 30 - Oct 01, 2024
Measurement by	Nontachai Uppathamp
Sound Level meter	Serial No. 597167

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	47.8	75.8	38.9
11:00 AM - 12:00 PM	51.6	79.1	44.3
12:00 PM - 01:00 PM	50.6	74.2	46.0
01:00 PM - 02:00 PM	50.4	69.4	47.6
02:00 PM - 03:00 PM	50.4	71.5	47.9
03:00 PM - 04:00 PM	49.7	66.3	47.3
04:00 PM - 05:00 PM	51.2	73.7	48.6
05:00 PM - 06:00 PM	50.8	66.4	48.4
06:00 PM - 07:00 PM	51.1	76.2	47.1
07:00 PM - 08:00 PM	50.9	70.1	48.7
08:00 PM - 09:00 PM	50.8	76.1	48.5
09:00 PM - 10:00 PM	47.5	61.5	45.7
10:00 PM - 11:00 PM	46.8	58.8	45.3
11:00 PM - 12:00 AM	56.5	90.8	45.4
12:00 AM - 01:00 AM	49.4	69.6	53.4
01:00 AM - 02:00 AM	60.0	79.1	53.5
02:00 AM - 03:00 AM	55.6	64.2	53.3
03:00 AM - 04:00 AM	55.6	65.0	53.2
04:00 AM - 05:00 AM	57.3	65.6	52.8
05:00 AM - 06:00 AM	59.9	66.6	51.4
06:00 AM - 07:00 AM	55.5	70.4	48.9
07:00 AM - 08:00 AM	54.1	73.8	50.1
08:00 AM - 09:00 AM	52.1	76.1	48.6
09:00 AM - 10:00 AM	51.5	72.7	48.1
Leq Average 24 hrs. (dB(A))	57.9		
Lmax (dB(A))		90.8	
L90 (dB(A))			48.4
Ldn (dB(A))	67.3		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดประเภทอันตรายและระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management Chonticha Subongkoch
Chonticha Subongkoch
Scientist (3)

Approved by Supot Salamteh
Supot Salamteh
Section Head

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2466173
Date Received : Jul 09, 2024
Date Reported : Jul 16, 2024
Report Number : 3056793-1

Sample Number	2466173-1
Sampled Date	Jul 09, 2024 2:23 PM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Jul 09, 2024
Condition of Sample	Contained in one BOD bottle, one amber glass bottle, two glass vials and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	11.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	48	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C		-	-	7.9	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Residual Free Chlorine *	mg/L	-	0.1	<0.1	≤1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Cl (F)	Rayong
Temperature *	Degree C	-	-	30.7	≤45	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	294	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	12.4	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	5	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Technical Management Photchana S.
Photchana Seeda
Scientist (4)
ทะเบียนเลขที่ ว-323-ง-9446

Approved by Dej Changchon
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-9442

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report may be reproduced in any form without written consent from the laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2466173
Date Received : Jul 09, 2024
Date Reported : Jul 16, 2024
Report Number : 3056793-1

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Chainusorn Lertnanthakunchai ทะเบียนเลขที่ ว-323-ง-9461 , Nachakorn Hansa ทะเบียนเลขที่ ว-204-ง-0187

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.

Technical Management Photchana S.
Photchana Seeda
Scientist (4)
ทะเบียนเลขที่ ว-323-ง-9446

Approved by Dej Changchon
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-9442

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report may be reproduced in any form without written consent from the laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

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Analysis / Test Report

TESTING
No.0009

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2466173
Date Received : Jul 09, 2024
Date Reported : Jul 17, 2024
Report Number : 3056793-2

Sample Number	2466173-1
Sampled Date	Jul 09, 2024 2:23 PM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Jul 10, 2024
Condition of Sample	Contained in one BOD bottle, one amber glass bottle, two glass vials and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/L	0.0003	0.0005	0.48	≤2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Chainusorn Lertnanthakunchai ทะเบียนเลขที่ ว-323-ง-9461 , Nachakorn Hansa ทะเบียนเลขที่ ว-204-ง-0187

Remark :
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- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management Sawitree N.
Sawitree Noisangiam
Manager
ทะเบียนเลขที่ ว-204-ง-0007

Approved by Kanokkorn Anek
Kanokkorn Anek
Assistant General Manager
ทะเบียนเลขที่ ว-204-ก-0004

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Analysis / Test Report

TESTING
No.0009

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2466173
Date Received : Jul 09, 2024
Date Reported : Jul 17, 2024
Report Number : 3056793-3

Sample Number	2466173-1
Sampled Date	Jul 09, 2024 2:23 PM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Jul 09, 2024
Condition of Sample	Contained in one BOD bottle, one amber glass bottle, two glass vials and six plastic bottles, sample containers comply to pretreatment - preservation standards (AP4A, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Iron	mg/L	0.003	0.005	1.13	≤10.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok
Water Testing							
Calcium Hardness as CaCO3 *	mg/L	-	1	26	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3500-Ca (B)	Bangkok
Coriductivity at 25 Degree C *	micromhos/cm	-	0.5	347	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2510 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	6.4	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-O (C)	Rayong
Flow rate *	m3/s	-	-	0.004	No Standard	Flow meter	Rayong
Nitrate as N *	mg/L	0.015	0.05	1.15	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-NO3 (E)	Rayong
Silica as SiO2 *	mg/L	0.2	0.5	5.5	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SiO2 (C)	Rayong
Total Alkalinity as CaCO3 *	mg/L	1	1	87	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2320 B	Rayong
Total Hardness as CaCO3 *	mg/L	-	1	26	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2340 C	Rayong

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Approved by Sawitree N.
Sawitree Noisangiam
Manager

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ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Analysis / Test Report

TESTING
No.0009

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2466173
Date Received : Jul 09, 2024
Date Reported : Jul 17, 2024
Report Number : 3056793-3

Sample Number	2466173-1
Sampled Date	Jul 09, 2024 2:23 PM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Jul 09, 2024
Condition of Sample	Contained in one BOD bottle, one amber glass bottle, two glass vials and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Turbidity *	NTU	-	0.1	3.0	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2130 B	Rayong

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

Remark :
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Sawitree Noisangiam
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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2478323
Date Received : Aug 13, 2024
Date Reported : Aug 26, 2024
Report Number : 3066717-1

Sample Number	2478323-1
Sampled Date	Aug 13, 2024 2:28 PM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Aug 13, 2024
Condition of Sample	Contained in one amber glass bottle, two BOD bottles and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	<25	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C	-	-	-	8.2	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Residual Free Chlorine *	mg/L	-	0.1	<0.1	≤1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Cl (F)	Rayong
Temperature *	Degree C	-	-	31.9	≤45	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	152	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	1.4	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	6	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Technical Management Photchana S.
Photchana Seeda
Scientist (4)
ทะเบียนเลขที่ ว-323-ง-0028

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-0001

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2478323
Date Received : Aug 13, 2024
Date Reported : Aug 26, 2024
Report Number : 3066717-1

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Chainusorn Lertnanthakunchai ทะเบียนเลขที่ ว-323-ง-0041 , Pattaiapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

Remark :
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- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management Photchana S.
Photchana Seeda
Scientist (4)
ทะเบียนเลขที่ ว-323-ง-0028

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-0001

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Analysis / Test Report

TESTING
No.0009

Lot ID: 2478323

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Aug 13, 2024
Date Reported : Aug 26, 2024
Report Number : 3088717-2

Sample Number	2478323-1
Sampled Date	Aug 13, 2024 2:28 PM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Aug 14, 2024
Condition of Sample	Contained in one amber glass bottle, two BOD bottles and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/L	0.0003	0.0005	0.34	≤2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Chainusorn Lertnanthakunchai ทะเบียนเลขที่ ว-323-ง-0041 , Pattarapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

Remark :
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Technical Management
Sawitree Noisangiam
Manager
ทะเบียนเลขที่ ว-204-ง-0007

Approved by
Kanokkorn Anek
Assistant General Manager
ทะเบียนเลขที่ ว-204-ง-0004

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Analysis / Test Report

TESTING
No.0009

Lot ID: 2478323

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Aug 13, 2024
Date Reported : Aug 26, 2024
Report Number : 3088717-3

Sample Number	2478323-1
Sampled Date	Aug 13, 2024 2:28 PM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Aug 13, 2024
Condition of Sample	Contained in one amber glass bottle, two BOD bottles and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Iron	mg/L	0.003	0.005	0.49	≤10.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok
Water Testing							
Calcium Hardness as CaCO3 *	mg/L	-	1	17	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3500-Ca (B)	Bangkok
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	243	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2510 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	9.3	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-O (C)	Rayong
Flow rate *	m3/s	-	-	No Report	No Standard	Flow meter	Rayong
Nitrate as N *	mg/L	0.015	0.05	0.46	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-NO3 (E)	Rayong
Silica as SiO2 *	mg/L	0.2	0.5	4.0	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SiO2 (C)	Rayong
Total Alkalinity as CaCO3 *	mg/L	1	1	29	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2320 B	Rayong
Total Hardness as CaCO3 *	mg/L	-	1	29	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2340 C	Rayong

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Approved by
Sawitree Noisangiam
Manager

Analysis / Test Report

TESTING
No.0009

Lot ID: 2478323

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Aug 13, 2024
Date Reported : Aug 26, 2024
Report Number : 3088717-3

Sample Number	2478323-1
Sampled Date	Aug 13, 2024 2:28 PM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Aug 13, 2024
Condition of Sample	Contained in one amber glass bottle, two BOD bottles and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Turbidity *	NTU	-	0.1	2.9	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2130 B	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Note : No Report เนื่องจากไม่สามารถวัด Flow rate ได้
Sampling By : Chainusorn Lertnanthakunchai , Pattarapol Sawangjaitam

Remark :
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- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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Approved by
Sawitree Noisangiam
Manager

Analysis / Test Report

TESTING
No.0042

Lot ID: 2494248

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Sep 11, 2024
Date Reported : Sep 19, 2024
Report Number : 3115277-1

Sample Number	2494248-1
Sampled Date	Sep 11, 2024 2:53 PM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Sep 11, 2024
Condition of Sample	Contained in two BOD bottles, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	<25	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C	-	-	-	8.6	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Residual Free Chlorine *	mg/L	-	0.1	<0.1	≤1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Cl (F)	Rayong
Temperature *	Degree C	-	-	31.8	≤45	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	85	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	<1.0	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	6	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Technical Management
Photchana Seeda
Scientist (4)
ทะเบียนเลขที่ ว-323-ง-0028

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-0001

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494248
Date Received : Sep 11, 2024
Date Reported : Sep 19, 2024
Report Number : 3115277-1

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Suphanat Sakulk ทะเบียนเลขที่ ว-323-ง-0021 , Pattarapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

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

Technical Management Photchana S.
Photchana Seeda
Scientist (4)
ทะเบียนเลขที่ ว-323-ง-0028

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-0001

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ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Analysis / Test Report

TESTING
No.0009

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494248
Date Received : Sep 11, 2024
Date Reported : Sep 19, 2024
Report Number : 3115277-2

Sample Number	2494248-1
Sampled Date	Sep 11, 2024 2:53 PM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Sep 12, 2024
Condition of Sample	Contained in two BOD bottles, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/L	0.0003	0.0005	0.23	≤2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Suphanat Sakulk ทะเบียนเลขที่ ว-323-ง-0021 , Pattarapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

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

Technical Management Sawitree N.
Sawitree Noisangiam
Manager
ทะเบียนเลขที่ ว-204-ง-0007

Approved by Kanokkorn Anek
Kanokkorn Anek
Assistant General Manager
ทะเบียนเลขที่ ว-204-ง-0004

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ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Analysis / Test Report

TESTING
No.0009

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494248
Date Received : Sep 11, 2024
Date Reported : Sep 19, 2024
Report Number : 3115277-3

Sample Number	2494248-1
Sampled Date	Sep 11, 2024 2:53 PM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Sep 11, 2024
Condition of Sample	Contained in two BOD bottles, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Iron	mg/L	0.003	0.005	0.59	≤10.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok
Water Testing							
Calcium Hardness as CaCO3 *	mg/L	-	1	18	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3500-Ca (B)	Bangkok
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	134	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2510 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	8.9	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-O (C)	Rayong
Flow rate *	m3/s	-	-	No Velocity	No Standard	Flow meter	Rayong
Nitrate as N *	mg/L	0.015	0.05	0.28	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-NO3 (E)	Rayong
Silica as SiO2 *	mg/L	0.2	0.5	3.8	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SiO2 (C)	Rayong
Total Alkalinity as CaCO3 *	mg/L	1	1	37	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2320 B	Rayong
Total Hardness as CaCO3 *	mg/L	-	1	37	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2340 C	Rayong

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Approved by Sawitree N.
Sawitree Noisangiam
Manager

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

Analysis / Test Report

TESTING
No.0009

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494248
Date Received : Sep 11, 2024
Date Reported : Sep 19, 2024
Report Number : 3115277-3

Sample Number	2494248-1
Sampled Date	Sep 11, 2024 2:53 PM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Sep 11, 2024
Condition of Sample	Contained in two BOD bottles, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Turbidity *	NTU	-	0.1	5.7	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2130 B	Rayong

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

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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Approved by Sawitree N.
Sawitree Noisangiam
Manager

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

Analysis / Test Report

TESTING
No.0042

Lot ID: 24104298

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Oct 09, 2024
Date Reported : Oct 18, 2024
Report Number : 3140783-1

Sample Number	24104298-1
Sampled Date	Oct 09, 2024 11:28 AM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Oct 09, 2024
Condition of Sample	Contained in two BOD bottles, one amber glass bottle and six plastic bottles. Sample containers comply to pretreatment - preservation standards. (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	<25	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH at 25 degree C	-	-	-	7.7	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Residual Free Chlorine *	mg/L	-	0.1	<0.1	≤1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-Cl (F)	Rayong
Temperature *	Degree C	-	-	30.4	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	90	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	1.1	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	3	<3	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Technical Management Photchana S.
Photchana Seeda
Scientist (4)
ทะเบียนเลขที่ ว-323-ง-0028

Approved by Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-0001

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report 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

TESTING
No.0042

Lot ID: 24104298

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Oct 09, 2024
Date Reported : Oct 18, 2024
Report Number : 3140783-1

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Suphanat Sakulk ทะเบียนเลขที่ ว-323-ง-0021 , Pattarapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

Remark :
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- "<" : 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.

Technical Management Photchana S.
Photchana Seeda
Scientist (4)
ทะเบียนเลขที่ ว-323-ง-0028

Approved by Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-0001

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Life Sciences www.alsglobal.com
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Analysis / Test Report

TESTING
No.0009

Lot ID: 24104298

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Oct 09, 2024
Date Reported : Oct 18, 2024
Report Number : 3140783-2

Sample Number	24104298-1
Sampled Date	Oct 09, 2024 11:28 AM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Oct 10, 2024
Condition of Sample	Contained in two BOD bottles, one amber glass bottle and six plastic bottles. Sample containers comply to pretreatment - preservation standards. (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/L	0.0003	0.0005	0.81	≤2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Suphanat Sakulk ทะเบียนเลขที่ ว-323-ง-0021 , Pattarapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

Remark :
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- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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Technical Management Sawitree N.
Sawitree Noisangjam
Manager
ทะเบียนเลขที่ ว-204-ง-0007

Approved by Kanokkorn Anek
Kanokkorn Anek
Assistant General Manager
ทะเบียนเลขที่ ว-204-ก-0004

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Analysis / Test Report

TESTING
No.0009

Lot ID: 24104298

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Oct 09, 2024
Date Reported : Oct 18, 2024
Report Number : 3140783-3

Sample Number	24104298-1
Sampled Date	Oct 09, 2024 11:28 AM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Oct 09, 2024
Condition of Sample	Contained in two BOD bottles, one amber glass bottle and six plastic bottles. Sample containers comply to pretreatment - preservation standards. (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Iron	mg/L	0.003	0.005	1.28	≤10.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok
Water Testing							
Calcium Hardness as CaCO3 *	mg/L	-	1	25	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3500-Ca (B)	Bangkok
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	160	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2510 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	7.2	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-O (C)	Rayong
Flow rate *	m3/s	-	-	0.007	No Standard	Flow meter	Rayong
Nitrate as N *	mg/L	0.015	0.05	0.40	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-NO3 (E)	Rayong
Silica as SiO2 *	mg/L	0.2	0.5	3.7	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-SiO2 (C)	Rayong
Total Alkalinity as CaCO3 *	mg/L	1	1	41	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2320 B	Rayong
Total Hardness as CaCO3 *	mg/L	-	1	45	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2340 C	Rayong

Approved by Sawitree N.
Sawitree Noisangjam
Manager

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Analysis / Test Report

TESTING
No.0009

Lot ID: 24104298

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Oct 09, 2024
Date Reported : Oct 18, 2024
Report Number : 3140783-3

Sample Number	24104298-1
Sampled Date	Oct 09, 2024 11:28 AM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Oct 09, 2024
Condition of Sample	Contained in two BOD bottles, one amber glass bottle and six plastic bottles. Sample containers comply to pretreatment - preservation standards. (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Turbidity *	NTU	-	0.1	5.8	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2130 B	Rayong

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

Remark :
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Approved by Sawitree N.
Sawitree Noisangiam
Manager

Analysis / Test Report

TESTING
No.0042

Lot ID: 24114973

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Nov 13, 2024
Date Reported : Nov 21, 2024
Report Number : 3172731-1

Sample Number	24114973-1
Sampled Date	Nov 13, 2024 10:33 AM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Nov 13, 2024
Condition of Sample	Contained in two BOD bottles, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	5.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	52	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH at 25 degree C	-	-	-	7.2	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Residual Free Chlorine *	mg/L	-	0.1	<0.1	≤1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-Cl (F)	Rayong
Temperature *	Degree C	-	-	30.3	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	304	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	10.7	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Technical Management Photchana S.
Photchana Seeda
Scientist (4)
ทะเบียนเลขที่ ว-323-ง-0028

Approved by D Jumnow
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-0001

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Analysis / Test Report

TESTING
No.0042

Lot ID: 24114973

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Nov 13, 2024
Date Reported : Nov 21, 2024
Report Number : 3172731-1

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Wanlop Hunchainaow ทะเบียนเลขที่ ว-323-ง-0038 , Pattarapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

Remark :
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Technical Management Photchana S.
Photchana Seeda
Scientist (4)
ทะเบียนเลขที่ ว-323-ง-0028

Approved by D Jumnow
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-0001

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Analysis / Test Report

TESTING
No.0009

Lot ID: 24114973

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Nov 13, 2024
Date Reported : Nov 21, 2024
Report Number : 3172731-2

Sample Number	24114973-1
Sampled Date	Nov 13, 2024 10:33 AM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Nov 14, 2024
Condition of Sample	Contained in two BOD bottles, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/L	0.0003	0.0005	1.34	≤2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Wanlop Hunchainaow ทะเบียนเลขที่ ว-323-ง-0038 , Pattarapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

Remark :
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Technical Management Sawitree N.
Sawitree Noisangiam
Manager
ทะเบียนเลขที่ ว-204-ง-0007

Approved by Kanokkorn Anek
Kanokkorn Anek
Assistant General Manager
ทะเบียนเลขที่ ว-204-ง-0004

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report 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

TESTING
No.0009

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 24114973
Date Received : Nov 13, 2024
Date Reported : Nov 21, 2024
Report Number : 3172731-3

Sample Number	24114973-1
Sampled Date	Nov 13, 2024 10:33 AM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Nov 13, 2024
Condition of Sample	Contained in two BOD bottles, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Iron	mg/L	0.003	0.005	1.32	≤10.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok
Water Testing							
Calcium Hardness as CaCO3 *	mg/L	-	1	33	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3500-Ca (B)	Bangkok
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	376	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2510 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	4.8	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-O (C)	Rayong
Flow rate *	m3/s	-	-	0.004	No Standard	Flow meter	Rayong
Nitrate as N *	mg/L	0.015	0.05	0.16	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-NO3 (E)	Rayong
Silica as SiO2 *	mg/L	0.2	0.5	6.2	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-SiO2 (C)	Rayong
Total Alkalinity as CaCO3 *	mg/L	1	1	52	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2320 B	Rayong
Total Hardness as CaCO3 *	mg/L	-	1	13	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2340 C	Rayong

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Approved by Sawitree N.
Sawitree Noisangiam
Manager

Analysis / Test Report

TESTING
No.0009

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 24114973
Date Received : Nov 13, 2024
Date Reported : Nov 21, 2024
Report Number : 3172731-3

Sample Number	24114973-1
Sampled Date	Nov 13, 2024 10:33 AM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Nov 13, 2024
Condition of Sample	Contained in two BOD bottles, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Turbidity *	NTU	-	0.1	1.5	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2130 B	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Wanlop Hunchainaow , Pattarapol Sawangjaitam

Remark :
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- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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Approved by Sawitree N.
Sawitree Noisangiam
Manager

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 24128019
Date Received : Dec 11, 2024
Date Reported : Dec 19, 2024
Report Number : 3197421-1

Sample Number	24128019-1
Sampled Date	Dec 11, 2024 11:45 AM
Sample Description	Wastewater
Location	Holding pond 320 m3
Date Analysis Commenced	Dec 11, 2024
Condition of Sample	Contained in two BOD bottles, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	<25	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH at 25 degree C	-	-	-	7.8	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Residual Free Chlorine *	mg/L	-	0.1	<0.1	≤1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-Cl (F)	Rayong
Temperature *	Degree C	-	-	29.8	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	106	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	1.6	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	7	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Technical Management Photchana S.
Photchana Seeda
Scientist (4)
ทะเบียนเลขที่ ว-323-ง-0028

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-0001

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 24128019
Date Received : Dec 11, 2024
Date Reported : Dec 19, 2024
Report Number : 3197421-1

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Surawit Narapong ทะเบียนเลขที่ ว-323-ง-0011 , Pattarapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

Remark :
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- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management Photchana S.
Photchana Seeda
Scientist (4)
ทะเบียนเลขที่ ว-323-ง-0028

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-0001

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Analysis / Test Report

TESTING
No.0009

Lot ID: 24128019

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Dec 11, 2024
Date Reported : Dec 19, 2024
Report Number : 3197421-2

Sample Number 24128019-1
Sampled Date Dec 11, 2024 11:45 AM
Sample Description Wastewater
Location Holding pond 320 m3
Date Analysis Commenced Dec 12, 2024
Condition of Sample Contained in two BOD bottles, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/L	0.0003	0.0005	0.51	≤2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Surawit Narapong ทะเบียนเลขที่ ว-323-ง-0011 , Pattarapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

Remark :
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- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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Technical Management
Sawitree Noisangiam
Manager
ทะเบียนเลขที่ ว-204-ง-0007

Approved by
Kanokkorn Anek
Assistant General Manager
ทะเบียนเลขที่ ว-204-ง-0004

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Analysis / Test Report

TESTING
No.0009

Lot ID: 24128019

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Dec 11, 2024
Date Reported : Dec 19, 2024
Report Number : 3197421-3

Sample Number 24128019-1
Sampled Date Dec 11, 2024 11:45 AM
Sample Description Wastewater
Location Holding pond 320 m3
Date Analysis Commenced Dec 11, 2024
Condition of Sample Contained in two BOD bottles, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Iron	mg/L	0.003	0.005	0.67	≤10.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok
Water Testing							
Calcium Hardness as CaCO3 *	mg/L	-	1	27	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3500-Ca (B)	Bangkok
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	179	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2510 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	10.2	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-O (C)	Rayong
Flow rate *	m3/s	-	-	0.004	No Standard	Flow meter	Rayong
Nitrate as N *	mg/L	0.015	0.05	0.47	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-NO3 (E)	Rayong
Silica as SiO2 *	mg/L	0.2	0.5	4.3	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-SiO2 (C)	Rayong
Total Alkalinity as CaCO3 *	mg/L	1	1	32	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2320 B	Rayong
Total Hardness as CaCO3 *	mg/L	-	1	10	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2340 C	Rayong

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Sawitree Noisangiam
Manager

Analysis / Test Report

TESTING
No.0009

Lot ID: 24128019

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Dec 11, 2024
Date Reported : Dec 19, 2024
Report Number : 3197421-3

Sample Number 24128019-1
Sampled Date Dec 11, 2024 11:45 AM
Sample Description Wastewater
Location Holding pond 320 m3
Date Analysis Commenced Dec 11, 2024
Condition of Sample Contained in two BOD bottles, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Turbidity *	NTU	-	0.1	6.5	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2130 B	Rayong

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

Remark :
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Sawitree Noisangiam
Manager

Analysis / Test Report

TESTING
No.0042

Lot ID: 2466173

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Jul 09, 2024
Date Reported : Jul 16, 2024
Report Number : 3056794-1

Sample Number 2466173-2
Sampled Date Jul 09, 2024 2:11 PM
Sample Description Wastewater
Location Holding pond 1800 m3
Date Analysis Commenced Jul 09, 2024
Condition of Sample Contained in one BOD bottle, one amber glass bottle, two glass vials and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	28	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C		-	-	8.4	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	30.5	≤45	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	552	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	1.3	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Chainusorn Lertnanthakunchai ทะเบียนเลขที่ ว-323-ง-9461 , Nachakorn Hansa ทะเบียนเลขที่ ว-204-ง-0187

Technical Management
Photchana Seeda
Scientist (4)
ทะเบียนเลขที่ ว-323-ง-9446

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-9442

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Lot ID: 2466173
Date Received : Jul 09, 2024
Date Reported : Jul 16, 2024
Report Number : 3056794-1

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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Technical Management Photchana S.
Photchana Seeda
Scientist (4)
ทะเบียนเลขที่ ว-323-ง-9446

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-9442

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Analysis / Test Report

TESTING
No.0009

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Lot ID: 2466173
Date Received : Jul 09, 2024
Date Reported : Jul 17, 2024
Report Number : 3056794-2

Sample Number 2466173-2
Sampled Date Jul 09, 2024 2:11 PM
Sample Description Wastewater
Location Holding pond 1800 m3
Date Analysis Commenced Jul 10, 2024
Condition of Sample Contained in one BOD bottle, one amber glass bottle, two glass vials and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/L	0.0003	0.0005	0.008	≤2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Chainusorn Lertnanthakunchai ทะเบียนเลขที่ ว-323-ง-9461 , Nachakorn Hansa ทะเบียนเลขที่ ว-204-ง-0187

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Technical Management Sawitree N.
Sawitree Noisangiam
Manager
ทะเบียนเลขที่ ว-204-ง-0007

Approved by
Kanokkorn Anek
Assistant General Manager
ทะเบียนเลขที่ ว-204-ก-0004

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Analysis / Test Report

TESTING
No.0009

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Lot ID: 2466173
Date Received : Jul 09, 2024
Date Reported : Jul 17, 2024
Report Number : 3056794-3

Sample Number 2466173-2
Sampled Date Jul 09, 2024 2:11 PM
Sample Description Wastewater
Location Holding pond 1800 m3
Date Analysis Commenced Jul 09, 2024
Condition of Sample Contained in one BOD bottle, one amber glass bottle, two glass vials and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Iron	mg/L	0.003	0.005	0.03	≤10.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok
Volatile Organics Compounds							
Bromodichloromethane *	ug/L	0.2	0.5	Not Detected	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Bromoform *	ug/L	0.2	0.5	Not Detected	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Chloroform *	ug/L	0.2	0.5	3.6	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Dibromochloromethane *	ug/L	0.2	0.5	Not Detected	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Total Trihalomethanes *	ug/L	0.2	1	3.6	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Water Testing							
Calcium Hardness as CaCO3 *	mg/L	-	1	147	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3500-Ca (B)	Bangkok
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	860	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2510 B	Rayong

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Approved by
Sawitree Noisangiam
Manager

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Analysis / Test Report

TESTING
No.0009

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Lot ID: 2466173
Date Received : Jul 09, 2024
Date Reported : Jul 17, 2024
Report Number : 3056794-3

Sample Number 2466173-2
Sampled Date Jul 09, 2024 2:11 PM
Sample Description Wastewater
Location Holding pond 1800 m3
Date Analysis Commenced Jul 09, 2024
Condition of Sample Contained in one BOD bottle, one amber glass bottle, two glass vials and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Nitrate as N *	mg/L	0.015	0.05	1.56	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-NO3 (E)	Rayong
Silica as SiO2 *	mg/L	0.2	0.5	33.3	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SiO2 (C)	Rayong
Total Alkalinity as CaCO3 *	mg/L	1	1	224	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2320 B	Rayong
Total Hardness as CaCO3 *	mg/L	-	1	232	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2340 C	Rayong
Turbidity *	NTU	-	0.1	0.8	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2130 B	Rayong

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

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

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Lot ID: 2478323
Date Received : Aug 13, 2024
Date Reported : Aug 26, 2024
Report Number : 3088718-1

Sample Number	2478323-2
Sampled Date	Aug 13, 2024 2:14 PM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Aug 13, 2024
Condition of Sample	Contained in two glass vials, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	<25	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C	-	-	-	8.4	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	32.7	≤45	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	556	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	1.6	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Chainusorn Lertnanthakunchai ทะเบียนเลขที่ ว-323-ง-0041 , Pattarapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

Technical Management Photchana S.
Photchana Seeda
Scientist (4)
ทะเบียนเลขที่ ว-323-ง-0028

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-0001

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Lot ID: 2478323
Date Received : Aug 13, 2024
Date Reported : Aug 26, 2024
Report Number : 3088718-1

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.

Technical Management Photchana S.
Photchana Seeda
Scientist (4)
ทะเบียนเลขที่ ว-323-ง-0028

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-0001

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Analysis / Test Report

TESTING
No.0009

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Lot ID: 2478323
Date Received : Aug 13, 2024
Date Reported : Aug 26, 2024
Report Number : 3088718-2

Sample Number	2478323-2
Sampled Date	Aug 13, 2024 2:14 PM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Aug 14, 2024
Condition of Sample	Contained in two glass vials, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/L	0.0003	0.0005	0.003	≤2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Chainusorn Lertnanthakunchai ทะเบียนเลขที่ ว-323-ง-0041 , Pattarapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

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

Technical Management Sawitree N.
Sawitree Noisangjam
Manager
ทะเบียนเลขที่ ว-204-ง-0007

Approved by
Kanokkorn Anek
Assistant General Manager
ทะเบียนเลขที่ ว-204-ง-0004

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ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Analysis / Test Report

TESTING
No.0009

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Lot ID: 2478323
Date Received : Aug 13, 2024
Date Reported : Aug 26, 2024
Report Number : 3068716-3

Sample Number	2478323-2
Sampled Date	Aug 13, 2024 2:14 PM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Aug 14, 2024
Condition of Sample	Contained in two glass vials, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Iron	mg/L	0.003	0.005	0.03	≤10.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok
Volatile Organics Compounds							
Bromodichloromethane *	ug/L	0.2	0.5	6.3	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Bromoform *	ug/L	0.2	0.5	Not Detected	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Chloroform *	ug/L	0.2	0.5	6.2	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Dibromochloromethane *	ug/L	0.2	0.5	4.9	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Total Trihalomethanes *	ug/L	0.2	1	17.3	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Water Testing							
Calcium Hardness as CaCO3 *	mg/L	-	1	147	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3500-Ca (B)	Bangkok
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	796	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2510 B	Rayong

Approved by Sawitree N.
Sawitree Noisangjam
Manager

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Analysis / Test Report

TESTING
No.0009

Lot ID: 2478323

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Aug 13, 2024
Date Reported : Aug 26, 2024
Report Number : 3088718-3

Sample Number	2478323-2
Sampled Date	Aug 13, 2024 2:14 PM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Aug 14, 2024
Condition of Sample	Contained in two glass vials, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Nitrate as N *	mg/L	0.015	0.05	1.87	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-NO3 (E)	Rayong
Silica as SiO2 *	mg/L	0.2	0.5	36.6	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SiO2 (C)	Rayong
Total Alkalinity as CaCO3 *	mg/L	1	1	188	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2320 B	Rayong
Total Hardness as CaCO3 *	mg/L	-	1	232	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2340 C	Rayong
Turbidity *	NTU	-	0.1	1.1	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2130 B	Rayong

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

Remark :
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Approved by Sawitree N.
Sawitree Noisangjam
Manager

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Analysis / Test Report

TESTING
No.0042

Lot ID: 2494248

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Sep 11, 2024
Date Reported : Sep 19, 2024
Report Number : 3115278-1

Sample Number	2494248-2
Sampled Date	Sep 11, 2024 2:38 PM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Sep 11, 2024
Condition of Sample	Contained in two BOD bottles, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	30	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C	-	-	-	8.4	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	31.5	≤45	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	540	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	1.1	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Suphanat Sakulk ทะเบียนเลขที่ ว-323-ง-0021 , Pattarapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

Technical Management Photchana S.
Photchana Seeda
Scientist (4)
ทะเบียนเลขที่ ว-323-ง-0028

Approved by Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-0001

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Analysis / Test Report

TESTING
No.0042

Lot ID: 2494248

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Sep 11, 2024
Date Reported : Sep 19, 2024
Report Number : 3115278-1

Remark :
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- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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Technical Management Photchana S.
Photchana Seeda
Scientist (4)
ทะเบียนเลขที่ ว-323-ง-0028

Approved by Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-0001

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Analysis / Test Report

TESTING
No.0009

Lot ID: 2494248

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Sep 11, 2024
Date Reported : Sep 19, 2024
Report Number : 3115278-2

Sample Number	2494248-2
Sampled Date	Sep 11, 2024 2:38 PM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Sep 12, 2024
Condition of Sample	Contained in two BOD bottles, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/L	0.0003	0.0005	0.003	≤2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Suphanat Sakulk ทะเบียนเลขที่ ว-323-ง-0021 , Pattarapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

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

Technical Management Sawitree N.
Sawitree Noisangjam
Manager
ทะเบียนเลขที่ ว-204-ง-0007

Approved by Kanokkorn Anek
Kanokkorn Anek
Assistant General Manager
ทะเบียนเลขที่ ว-204-ง-0004

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Analysis / Test Report

TESTING
No.0009

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494248
Date Received : Sep 11, 2024
Date Reported : Sep 19, 2024
Report Number : 3115278-3

Sample Number	2494248-2
Sampled Date	Sep 11, 2024 2:38 PM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Sep 11, 2024
Condition of Sample	Contained in two BOD bottles, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Iron	mg/L	0.003	0.005	0.01	≤10.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok
Volatile Organics Compounds							
Bromodichloromethane *	ug/L	0.2	0.5	Not Detected	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Bromoform *	ug/L	0.2	0.5	Not Detected	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Chloroform *	ug/L	0.2	0.5	1.8	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Dibromochloromethane *	ug/L	0.2	0.5	Not Detected	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Total Trihalomethanes *	ug/L	0.2	1	1.8	No Standard	In-house method based on United States Environmental Protection Agency, EPA Method 5030 B and 8260 D	Bangkok
Water Testing							
Calcium Hardness as CaCO3 *	mg/L	-	1	166	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 3500-Ca (B)	Bangkok
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	849	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2510 B	Rayong

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Approved by
Sawitree Noisangiam
Manager

Analysis / Test Report

TESTING
No.0009

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494248
Date Received : Sep 11, 2024
Date Reported : Sep 19, 2024
Report Number : 3115278-3

Sample Number	2494248-2
Sampled Date	Sep 11, 2024 2:38 PM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Sep 11, 2024
Condition of Sample	Contained in two BOD bottles, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Nitrate as N *	mg/L	0.015	0.05	1.72	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-NO3 (E)	Rayong
Silica as SiO2 *	mg/L	0.2	0.5	30.8	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SiO2 (C)	Rayong
Total Alkalinity as CaCO3 *	mg/L	1	1	176	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2320 B	Rayong
Total Hardness as CaCO3 *	mg/L	-	1	228	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2340 C	Rayong
Turbidity *	NTU	-	0.1	1.6	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2130 B	Rayong

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

Remark :
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Approved by
Sawitree Noisangiam
Manager

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 24104298
Date Received : Oct 09, 2024
Date Reported : Oct 18, 2024
Report Number : 3140784-1

Sample Number	24104298-2
Sampled Date	Oct 09, 2024 11:14 AM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Oct 09, 2024
Condition of Sample	Contained in two BOD bottles, one amber glass bottle and six plastic bottles. Sample containers comply to pretreatment - preservation standards. (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	28	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH at 25 degree C	-	-	-	8.2	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	31.1	≤45	Standard Methods for the examination of water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	536	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	2.1	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Suphanat Sakulk ทะเบียนเลขที่ ว-323-ง-0021 , Pattarapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

Technical Management
Photchana Seeda
Scientist (4)
ทะเบียนเลขที่ ว-323-ง-0028

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-0001

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 24104298
Date Received : Oct 09, 2024
Date Reported : Oct 18, 2024
Report Number : 3140784-1

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.

Technical Management
Photchana Seeda
Scientist (4)
ทะเบียนเลขที่ ว-323-ง-0028

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-0001

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6403-74/ EMAIL S:\Reports\Khaf...All_GL.rpt (11:02AM)

Analysis / Test Report

TESTING
No.0009

Lot ID: 24104298

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Oct 09, 2024
Date Reported : Oct 18, 2024
Report Number : 3140784-2

Sample Number	24104298-2
Sampled Date	Oct 09, 2024 11:14 AM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Oct 10, 2024
Condition of Sample	Contained in two BOD bottles, one amber glass bottle and six plastic bottles. Sample containers comply to pretreatment - preservation standards. (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/L	0.0003	0.0005	0.002	≤2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Suphanat Sakulk ทะเบียนเลขที่ ว-323-ง-0021 , Pattarapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

Remark :
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- "<" : 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.

Technical Management
Sawitree Noisangiam
Manager
ทะเบียนเลขที่ ว-204-ง-0007

Approved by
Kanokkorn Anek
Assistant General Manager
ทะเบียนเลขที่ ว-204-ง-0004

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report 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

TESTING
No.0009

Lot ID: 24104298

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Oct 09, 2024
Date Reported : Oct 18, 2024
Report Number : 3140784-3

Sample Number	24104298-2
Sampled Date	Oct 09, 2024 11:14 AM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Oct 09, 2024
Condition of Sample	Contained in two BOD bottles, one amber glass bottle and six plastic bottles. Sample containers comply to pretreatment - preservation standards. (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Iron	mg/L	0.003	0.005	0.01	≤10.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok
Volatile Organics Compounds							
Bromodichloromethane *	ug/L	0.2	0.5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Bromoform *	ug/L	0.2	0.5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Chloroform *	ug/L	0.2	0.5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Dibromochloromethane *	ug/L	0.2	0.5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Total Trihalomethanes *	ug/L	0.2	1	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Water Testing							
Calcium Hardness as CaCO3 *	mg/L	-	1	146	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3500-Ca (B)	Bangkok
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	830	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2510 B	Rayong

Approved by
Sawitree Noisangiam
Manager

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Analysis / Test Report

TESTING
No.0009

Lot ID: 24104298

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Oct 09, 2024
Date Reported : Oct 18, 2024
Report Number : 3140784-3

Sample Number	24104298-2
Sampled Date	Oct 09, 2024 11:14 AM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Oct 09, 2024
Condition of Sample	Contained in two BOD bottles, one amber glass bottle and six plastic bottles. Sample containers comply to pretreatment - preservation standards. (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Nitrate as N *	mg/L	0.015	0.05	1.30	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-NO3 (E)	Rayong
Silica as SiO2 *	mg/L	0.2	0.5	31.7	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-SiO2 (C)	Rayong
Total Alkalinity as CaCO3 *	mg/L	1	1	193	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2320 B	Rayong
Total Hardness as CaCO3 *	mg/L	-	1	194	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2340 C	Rayong
Turbidity *	NTU	-	0.1	0.6	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2130 B	Rayong

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

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

Approved by
Sawitree Noisangiam
Manager

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Analysis / Test Report

TESTING
No.0042

Lot ID: 24114973

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location: CUP 4

Date Received : Nov 13, 2024
Date Reported : Nov 21, 2024
Report Number : 3172732-2

Sample Number	24114973-2
Sampled Date	Nov 13, 2024 10:15 AM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Nov 13, 2024
Condition of Sample	Contained in two BOD bottles, one amber glass bottle and six plastic bottles. sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	3.7	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	46	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH at 25 degree C	-	-	-	8.4	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	25.4	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	644	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	3.1	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Wanlop Hunchainaow ทะเบียนเลขที่ ว-323-ง-0038 , Pattarapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

Technical Management
Photchana Seeda
Scientist (4)
ทะเบียนเลขที่ ว-323-ง-0028

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-0001

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Analysis / Test Report

TESTING
No.0042

Lot ID: 24114973

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Date Received : Nov 13, 2024
Date Reported : Nov 21, 2024
Report Number : 3172732-1

Remark :
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- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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Technical Management Photchana S.
Photchana Seeda
Scientist (4)
ทะเบียนเลขที่ ว-323-ง-0028

Approved by D Changchon
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-0001

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Analysis / Test Report

TESTING
No.0009

Lot ID: 24114973

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Date Received : Nov 13, 2024
Date Reported : Nov 21, 2024
Report Number : 3172732-2

Sample Number 24114973-2
Sampled Date Nov 13, 2024 10:15 AM
Sample Description Wastewater
Location Holding pond 1800 m3
Date Analysis Commenced Nov 14, 2024
Condition of Sample Contained in two BOD bottles, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/L	0.0003	0.0005	0.004	≤2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Wanlop Hunchainaow ทะเบียนเลขที่ ว-323-ง-0038 , Pattarapol Sawangjaitam ทะเบียนเลขที่ ว-204-ง-0002

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

Technical Management Sawitree N.
Sawitree Noisangjam
Manager
ทะเบียนเลขที่ ว-204-ง-0007

Approved by Kanokkorn Anek
Kanokkorn Anek
Assistant General Manager
ทะเบียนเลขที่ ว-204-ง-0004

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Analysis / Test Report

TESTING
No.0009

Lot ID: 24114973

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Date Received : Nov 13, 2024
Date Reported : Nov 21, 2024
Report Number : 3172732-3

Sample Number 24114973-2
Sampled Date Nov 13, 2024 10:15 AM
Sample Description Wastewater
Location Holding pond 1800 m3
Date Analysis Commenced Nov 13, 2024
Condition of Sample Contained in two BOD bottles, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Iron	mg/L	0.003	0.005	0.03	≤10.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok
Volatile Organics Compounds							
Bromodichloromethane *	ug/L	0.2	0.5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Bromoform *	ug/L	0.2	0.5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Chloroform *	ug/L	0.2	0.5	2.6	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Dibromochloromethane *	ug/L	0.2	0.5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Total Trihalomethanes *	ug/L	0.2	1	2.6	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Water Testing							
Calcium Hardness as CaCO3 *	mg/L	-	1	211	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3500-Ca (B)	Bangkok
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	970	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2510 B	Rayong

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Approved by Sawitree N.
Sawitree Noisangjam
Manager

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Analysis / Test Report

TESTING
No.0009

Lot ID: 24114973

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Date Received : Nov 13, 2024
Date Reported : Nov 21, 2024
Report Number : 3172732-3

Sample Number 24114973-2
Sampled Date Nov 13, 2024 10:15 AM
Sample Description Wastewater
Location Holding pond 1800 m3
Date Analysis Commenced Nov 13, 2024
Condition of Sample Contained in two BOD bottles, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Nitrate as N *	mg/L	0.015	0.05	0.78	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-NO3 (E)	Rayong
Silica as SiO2 *	mg/L	0.2	0.5	47.6	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-SiO2 (C)	Rayong
Total Alkalinity as CaCO3 *	mg/L	1	1	218	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2320 B	Rayong
Total Hardness as CaCO3 *	mg/L	-	1	301	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2340 C	Rayong
Turbidity *	NTU	-	0.1	0.7	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2130 B	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant
Sampling By : Wanlop Hunchainaow , Pattarapol Sawangjaitam

Remark :
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- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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Approved by Sawitree N.
Sawitree Noisangjam
Manager

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 24128019
Date Received : Dec 11, 2024
Date Reported : Dec 19, 2024
Report Number : 3197422-1

Sample Number	24128019-2
Sampled Date	Dec 11, 2024 11:25 AM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Dec 11, 2024
Condition of Sample	Contained in two glass vials, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	36	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH at 25 degree C	-	-		8.3	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	30.0	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	656	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	2.1	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Surawit Narapong หมายเลขที่ ว-323-ง-0011 , Pattarapol Sawangjaitam หมายเลขที่ ว-204-ง-0002

Technical Management Photchana S.
Photchana Seeda
Scientist (4)
หมายเลขที่ ว-323-ง-0028

Approved by Dej Changchon
Senior Manager
หมายเลขที่ ว-323-ง-0001

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ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 24128019
Date Received : Dec 11, 2024
Date Reported : Dec 19, 2024
Report Number : 3197422-1

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.

Technical Management Photchana S.
Photchana Seeda
Scientist (4)
หมายเลขที่ ว-323-ง-0028

Approved by Dej Changchon
Senior Manager
หมายเลขที่ ว-323-ง-0001

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report may be reproduced in any form without written consent from the laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

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Analysis / Test Report

TESTING
No.0009

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 24128019
Date Received : Dec 11, 2024
Date Reported : Dec 19, 2024
Report Number : 3197422-2

Sample Number	24128019-2
Sampled Date	Dec 11, 2024 11:25 AM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Dec 12, 2024
Condition of Sample	Contained in two glass vials, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/L	0.0003	0.0005	0.002	≤2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Surawit Narapong หมายเลขที่ ว-323-ง-0011 , Pattarapol Sawangjaitam หมายเลขที่ ว-204-ง-0002

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.

Technical Management Sawitree N.
Sawitree Noisangjam
Manager
หมายเลขที่ ว-204-ง-0007

Approved by Kanokkorn Anek
Kanokkorn Anek
Assistant General Manager
หมายเลขที่ ว-204-ง-0004

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ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Analysis / Test Report

TESTING
No.0009

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 24128019
Date Received : Dec 11, 2024
Date Reported : Dec 19, 2024
Report Number : 3197422-3

Sample Number	24128019-2
Sampled Date	Dec 11, 2024 11:25 AM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Dec 11, 2024
Condition of Sample	Contained in two glass vials, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Iron	mg/L	0.003	0.005	0.02	≤10.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok
Volatile Organics Compounds							
Bromodichloromethane *	ug/L	0.2	0.5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Bromoform *	ug/L	0.2	0.5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Chloroform *	ug/L	0.2	0.5	2.2	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Dibromochloromethane *	ug/L	0.2	0.5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Total Trihalomethanes *	ug/L	0.2	1	2.2	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Water Testing							
Calcium Hardness as CaCO3 *	mg/L	-	1	214	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3500-Ca (B)	Bangkok
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	1005	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2510 B	Rayong

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Approved by Sawitree N.
Sawitree Noisangjam
Manager

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ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Analysis / Test Report

TESTING
No.0009

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 24128019
Date Received : Dec 11, 2024
Date Reported : Dec 19, 2024
Report Number : 3197422-3

Sample Number	24128019-2
Sampled Date	Dec 11, 2024 11:25 AM
Sample Description	Wastewater
Location	Holding pond 1800 m3
Date Analysis Commenced	Dec 11, 2024
Condition of Sample	Contained in two glass vials, one amber glass bottle and six plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Nitrate as N *	mg/L	0.015	0.05	1.28	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-NO3 (E)	Rayong
Silica as SiO2 *	mg/L	0.2	0.5	51.6	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-SiO2 (C)	Rayong
Total Alkalinity as CaCO3 *	mg/L	1	1	222	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2320 B	Rayong
Total Hardness as CaCO3 *	mg/L	-	1	249	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2340 C	Rayong
Turbidity *	NTU	-	0.1	1.0	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2130 B	Rayong

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

Remark :
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Approved by
Sawitree Noisangiam
Manager

Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494254
Date Received : Sep 25, 2024
Date Reported : Sep 27, 2024
Report Number: 3121166-1

Sample Number	2494254-1
Parameter	Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)
Measurement Date	Sep 24, 2024
Measurement by	Norranon Tathongkham
Location	ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
GTG	120	29.2	27.3	33.9	32.9
Average (WBGT)		29.2			
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 Environmentin relation to Heat,Light and Noise, B.E.2559

Technical Management
Supot Salamteh
Section Head

Approved by
Wichan Choonharat
Assistant Manager

Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494254
Date Received : Sep 25, 2024
Date Reported : Sep 27, 2024
Report Number: 3121166-1

Sample Number	2494254-2
Parameter	Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)
Measurement Date	Sep 24, 2024
Measurement by	Norranon Tathongkham
Location	ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
HRSG	120	28.7	26.9	33.0	32.8
Average (WBGT)		28.7			
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 Environmentin relation to Heat,Light and Noise, B.E.2559

Technical Management
Supot Salamteh
Section Head

Approved by
Wichan Choonharat
Assistant Manager

Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494255
Date Received : Sep 25, 2024
Date Reported : Sep 27, 2024
Report Number : 3084487-1

Sample Number	2494255-1
Sampled Date	Sep 24, 2024
Sample Description	Noise dose
Location	FO#1 (Day)
Personal Sampling	คนสกาทัต แซ่แต้
Date Analysis Commenced	Sep 27, 2024

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Noise Dose (12 hrs.) (Calculated from Lavg)	07:30 AM - 07:30 PM	%	-	1	5.8	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
Noise Dose (8 hrs.)	07:30 AM - 07:30 PM	%	-	1	5.4	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (12 hrs.) (Calculated from Lavg)	07:30 AM - 07:30 PM	dB(A)	-	--	70.6	83*	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (8 hrs.)	07:30 AM - 07:30 PM	dB(A)	-	--	72.3	85	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong

Guideline :
MOL : 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. Notification of Department of Labour Protection and Welfare on the Stancard of Time Weighted Average (TWA) Noise Level (B.E. 2561)
* MOL: Recommended guideline limit for 12 working hours should not be over 83 dB(A)
Sampled By : Norranon Tathongkham

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

Approved by
Supot Salamteh
Section Head

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494255
Date Received : Sep 25, 2024
Date Reported : Sep 27, 2024
Report Number : 3084487-1

Sample Number 2494255-2
Sampled Date Sep 24, 2024
Sample Description Noise dose
Location FO#1 (Night)
Personal Sampling คณกฤษดา หลั่งพโล
Date Analysis Commenced Sep 27, 2024

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Noise Dose (12 hrs.) (Calculated from Lavg)	07:30 PM - 07:30 AM	%	-	:	3.6	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
Noise Dose (8 hrs.)	07:30 PM - 07:30 AM	%	-	:	3.4	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (12 hrs.) (Calculated from Lavg)	07:30 PM - 07:30 AM	dB(A)	-	-	68.6	83*	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (8 hrs.)	07:30 PM - 07:30 AM	dB(A)	-	-	70.3	85	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong

Guideline :
MOL : 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. Notification of Department of Labour Protection and Welfare on the Standard of Time Weighted Average (TWA) Noise Level (B.E. 2561)
* MOL: Recommended guideline limit for 12 working hours should not be over 83 dB(A)
Sampled By : Norranon Tathongkham

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

Approved by
Supot Salamteh
Section Head

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494255
Date Received : Sep 25, 2024
Date Reported : Sep 27, 2024
Report Number : 3084487-1

Sample Number 2494255-3
Sampled Date Sep 24, 2024
Sample Description Noise dose
Location FO#2 (Day)
Personal Sampling คุณรุ่งนิ เลยดีรัม
Date Analysis Commenced Sep 27, 2024

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Noise Dose (12 hrs.) (Calculated from Lavg)	07:30 AM - 07:30 PM	%	-	1	13.5	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
Noise Dose (8 hrs.)	07:30 AM - 07:30 PM	%	-	1	12.6	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (12 hrs.) (Calculated from Lavg)	07:30 AM - 07:30 PM	dB(A)	-	-	74.3	83*	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (8 hrs.)	07:30 AM - 07:30 PM	dB(A)	-	-	76.0	85	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong

Guideline :
MOL : 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. Notification of Department of Labour Protection and Welfare on the Standard of Time Weighted Average (TWA) Noise Level (B.E. 2561)
* MOL: Recommended guideline limit for 12 working hours should not be over 83 dB(A)
Sampled By : Norranon Tathongkham

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

Approved by
Supot Salamteh
Section Head

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494255
Date Received : Sep 25, 2024
Date Reported : Sep 27, 2024
Report Number : 3084487-1

Sample Number 2494255-4
Sampled Date Sep 24, 2024
Sample Description Noise dose
Location FO#2 (Night)
Personal Sampling คุณวันดิลล์ เอกศิริพนิชกร
Date Analysis Commenced Sep 27, 2024

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Noise Dose (12 hrs.) (Calculated from Lavg)	07:30 PM - 07:30 AM	%	-	:	4.9	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
Noise Dose (8 hrs.)	07:30 PM - 07:30 AM	%	-	:	4.7	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (12 hrs.) (Calculated from Lavg)	07:30 PM - 07:30 AM	dB(A)	-	-	69.9	83*	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (8 hrs.)	07:30 PM - 07:30 AM	dB(A)	-	-	71.7	85	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong

Guideline :
MOL : 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. Notification of Department of Labour Protection and Welfare on the Standard of Time Weighted Average (TWA) Noise Level (B.E. 2561)
* MOL: Recommended guideline limit for 12 working hours should not be over 83 dB(A)
Sampled By : Norranon Tathongkham

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

Approved by
Supot Salamteh
Section Head

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Banchang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494255
Date Received : Sep 25, 2024
Date Reported : Sep 27, 2024
Report Number : 3084487-1

Sample Number 2494255-5
Sampled Date Sep 24, 2024
Sample Description Noise dose
Location CO#1 (Day)
Personal Sampling คณวิฆเนศ เหรอีง
Date Analysis Commenced Sep 27, 2024

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Noise Dose (12 hrs.) (Calculated from Lavg)	07:30 AM - 07:30 PM	%	-	1	<1	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
Noise Dose (8 hrs.)	07:30 AM - 07:30 PM	%	-	1	<1	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (12 hrs.) (Calculated from Lavg)	07:30 AM - 07:30 PM	dB(A)	-	-	61.6	83*	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (8 hrs.)	07:30 AM - 07:30 PM	dB(A)	-	-	63.3	85	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong

Guideline :
MOL : 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. Notification of Department of Labour Protection and Welfare on the Standard of Time Weighted Average (TWA) Noise Level (B.E. 2561)
* MOL: Recommended guideline limit for 12 working hours should not be over 83 dB(A)
Sampled By : Norranon Tathongkham

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

Approved by
Supot Salamteh
Section Head

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
1/2 Moo 2, Banchang, Barichang, Rayong 21130
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 4

Lot ID: 2494255
Date Received : Sep 25, 2024
Date Reported : Sep 27, 2024
Report Number : 3084487-1

Sample Number 2494255-6
Sampled Date Sep 24, 2024
Sample Description Noise dose
Location CO#1 (Night)
Personal Sampling คณะวิทยุศักดิ์ บัณฑนา
Date Analysis Commenced Sep 27, 2024

Analyte	Sampled Date/time	Unit	LOD	LOQ '(LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Noise Dose (12 hrs.) (Calculated from Lavg)	07:30 PM - 07:30 AM	%	-	:	<1	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
Noise Dose (8 hrs.)	07:30 PM - 07:30 AM	%	-	:	<1	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (12 hrs.) (Calculated from Lavg)	07:30 PM - 07:30 AM	dB(A)	-	-	48.2	83*	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (8 hrs.)	07:30 PM - 07:30 AM	dB(A)	-	-	46.9	85	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong

Guideline :
MOL : 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. Notification of Department of Labour Protection and Welfare on the Standard of Time Weighted Average (TWA) Noise Level (B.E. 2561)
* MOL: Recommended guideline limit for 12 working hours should not be over 83 dB(A)
Sampled By : Norranon Tathongkham

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

Approved by
Supot Salamteh
Section Head

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report 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.

ภาคผนวก ง

ใบรับรองการสอบเทียบเครื่องมือ

right solutions
right partner.

รายการเครื่องมือที่ใช้ในการวิเคราะห์ / ตรวจสอบ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal.	Freq. Calibrate (Months)
Stack (CEMs)	Oxides of Nitrogen	Analyzer , System calibration, Stand	-	-	-	
Stack (CEMs)	Sulfur Dioxide	Analyzer , System calibration, Stand	-	-	-	
Stack	Total Suspended Particulate	Console Control Unit	RYG_FS0315	10-Jul-24	10-Jan-25	6
Stack	Total Suspended Particulate	Pitot Tube	RYG_FS0321	10-Jul-24	10-Jan-25	6
Stack	Total Suspended Particulate	Flue gas Analyzer	RYG_FS0464	8-Mar-24	7-Mar-25	12
Stack	Total Suspended Particulate	Digital Balance	RYG_EN0003	22-Feb-24	22-Feb-25	12
Stack	Ammonia	Console Control Unit	RYG_FS0315	10-Jul-24	10-Jan-25	6
Stack	Ammonia	Pitot Tube	RYG_FS0321	10-Jul-24	10-Jan-25	6
Stack	Ammonia	Flue gas Analyzer	RYG_FS0464	8-Mar-24	7-Mar-25	12
Stack	Ammonia	Dry Gas	RYG_FS0317	10-Jul-24	10-Jan-25	6
Stack	Ammonia	SPECTROPHOTOMETER	RYG_EN0037	18-Sep-23	18-Mar-25	18
Ambient	Nitrogen Dioxide	NO_2 Analyzer	RYG_FS0252	2-Jul-24	2-Jan-25	6
Ambient	Nitrogen Dioxide	NO_2 Analyzer	BKK_FS1094	2-Jul-24	2-Jan-25	6
Ambient	Nitrogen Dioxide	NO_2 Analyzer	RYG_FS0264	2-Jul-24	2-Jan-25	6
Ambient	Nitrogen Dioxide	NO_2 Analyzer	RYG_FS0459	3-Jul-24	3-Jan-25	6
Ambient	Sulfur Dioxide	SO_2 Analyzer	RYG_FS0251	4-Jul-24	4-Jan-25	6
Ambient	Sulfur Dioxide	SO_2 Analyzer	RYG_FS0265	4-Jul-24	4-Jan-25	6
Ambient	Sulfur Dioxide	SO_2 Analyzer	RYG_FS0263	4-Jul-24	4-Jan-25	6
Ambient	Sulfur Dioxide	SO_2 Analyzer	RYG_FS0458	5-Jul-24	5-Jan-25	6
Ambient	Particulate Matter (PM-10)	High Volume	RYG_FS0187	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	High Volume	RYG_FS0186	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	High Volume	RYG_FS0188	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	High Volume	RYG_FS0400	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	Digital Balance	RYG_EN0001	22-Feb-24	22-Feb-25	12
Ambient	Total Suspended Particulate	High Volume	RYG_FS0177	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	RYG_FS0178	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	RYG_FS0176	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	RYG_FS0662	-	-	On site Calibration
Ambient	Total Suspended Particulate	Digital Balance	RYG_EN0001	22-Feb-24	22-Feb-25	12
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	RYG_FS0530	21-Aug-24	21-Feb-26	18
Noise	Leq 24 hrs	Sound Calibrator	RYG_FS0213	28-Feb-24	27-Feb-25	12
Noise	Leq 24 hrs	Sound Level Meter	RYG_FS0018	22-Jan-24	21-Jan-25	12
Noise	Leq 24 hrs	Sound Level Meter	RYG_FS0437	19-Oct-23	19-Oct-24	12
Noise	Noise Dose, TWA	Dose Badge Reader	RYG_FS0210	29-Jan-24	28-Jan-25	12
Heat	Heat Stress	Heat Stress Monitor	RYG_FS0228	16-Feb-24	15-Feb-25	12
Heat	Heat Stress	Heat Stress Monitor	RYG_FS0226	16-Feb-24	15-Feb-25	12
Workplace	Ammonia	DRYCAL FLOWMETER	BKK_FS1346	29-Jan-24	28-Jan-25	12
Workplace	Ammonia	SPECTROPHOTOMETER	RYG_EN0037	18-Sep-23	18-Mar-25	18
Rayong Lab	pH at 25 °C	pH meter	RYG_EN0183	19-Jan-24	19-Jul-25	18
Rayong Lab	BOD	DO meter with Sensor	RYG_EN0032	24-Jul-23	28-Jan-25	18
Rayong Lab	BOD	Incubator	RYG_EN0154	1-Nov-24	1-May-26	18
Rayong Lab	BOD	Burette	RYG_EN0216	24-Sep-24	24-Sep-25	12
Rayong Lab	Total Dissolved Solids 180°C	Electronic Balance	RYG_EN0002	22-Feb-24	22-Feb-25	12
Rayong Lab	Total Dissolved Solids 180°C	Hot Air Oven	RYG_EN0010	21-Mar-24	21-Sep-25	18
Rayong Lab	Oil & Grease	Electronic Balance	RYG_EN0002	22-Feb-24	22-Feb-25	12
Rayong Lab	Oil & Grease	Hot Air Oven	RYG_EN0213	21-Mar-24	21-Mar-25	12
Rayong Lab	Oil & Grease	Water Bath	RYG_EN0061	21-Mar-24	21-Sep-25	18
Rayong Lab	Temperature	pH meter	RYG_FS0596	1-Jul-24	1-Jul-25	12
Rayong Lab	Dissolved Oxygen	Chamber (Cold Room)	RYG_EN0184	11-Jun-24	11-Dec-25	18
Water Lab	Chloroform	Gas Chromatography (MSD)	BKK_EN0059	13-Dec-23	13-Jun-25	18
Water Lab	Bromoform	Gas Chromatography (MSD)	BKK_EN0059	13-Dec-23	13-Jun-25	18
Water Lab	Dibromochloromethane	Gas Chromatography (MSD)	BKK_EN0059	13-Dec-23	13-Jun-25	18
Water Lab	Total Trihalomethanes	Gas Chromatography (MSD)	BKK_EN0059	13-Dec-23	13-Jun-25	18
Water Lab	Bromodichloromethane	Gas Chromatography (MSD)	BKK_EN0059	13-Dec-23	13-Jun-25	18

Lot No. 2494220-1

ANALYZER CALIBRATION DATA

Client : Global Power Synergy PCL
Date : 25 Sep 24
Location : HRSGs 1
Test Operator : Navaphut S.

O_2 ANALYZER
Model : HORIBA PG-350
Span (%) : 25
Serial No. : TD8ARGKP

	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	8.00	8.00	7.90	0.40
Span Gas	16.04	16.00	16.00	0.00

NO_x ANALYZER
Model : HORIBA PG-350
Span (ppm) : 200
Serial No. : TD8ARGKP

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	0.00	0.50	0.25
Low-Level Gas	82.39	82.40	82.00	0.20
Span Gas	160.20	160.00	159.30	0.35

SO2 ANALYZER
Model : TELEDYNE API 100EH
Span (ppm) : 200
Serial No. : 437

	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	78.75	78.80	78.50	0.15
Span Gas	159.30	159.30	158.60	0.35

Calibrated by

Navaphut S

(Mr.Navaphut Sriviriya)

Environmental Field Scientist (2)

Lot No. : 2494220-1

SYSTEM CALIBRATION BIAS AND DRIFT DATA

Client : Global Power Synergy PCL
Date : 25 Sep 24
Location : HRSGs 1
Test Operator : Navaphut S.

O_2 ANALYZER
Cylinder Conc. (%) : 16.04
Span (%) : 25

	O_2 Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	0.00	0.10	0.40	0.00	0.00	0.40
Upscale Gas	16.00	15.90	0.40	16.00	0.00	0.40

NO_x ANALYZER
Cylinder Conc. (ppm) : 160.20
Span (ppm) : 200

	NO_x Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	0.00	0.80	0.40	0.50	0.25	0.15
Upscale Gas	160.00	159.00	0.50	159.30	0.35	0.15

SO_2 ANALYZER
Cylinder Conc. (ppm) : 159.30
Span (ppm) : 200

	SO_2 Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	0.00	0.00	0.00	0.00	0.00	0.00
Upscale Gas	159.30	159.00	0.15	158.60	0.35	0.20

Calibrated by

Navaphut S

(Mr.Navaphut Sriviriya)

Environmental Field Scientist (2)

EMISSION TEST RESULT

Client : Global Power Synergy PCL
Date : 25 Sep 24
Start Time : 12:00
SO_2 Analyzer Model : TELEDYNE API 100EH
NO_x/O_2 Analyzer Model : HORIBA PG-350
CO/CO_2 Analyzer Model : -

Run # : 1
Location : HRSGs 1
Test Operator : Navaphut S.
Finish Time : 12:20
Serial No. : 437
Serial No. : TD8ARGKP
Serial No. : -

Time (min)	O_2 (%)	CO_2 (%)	NO_x (ppm)	SO_2 (ppm)	CO (ppm)	Remark
12:00	13.86	4.05	13.93	0.27	-	
12:01	13.86	4.05	13.96	0.32	-	
12:02	13.88	4.05	13.78	0.31	-	
12:03	13.91	4.05	13.84	0.31	-	
12:04	13.91	4.05	13.71	0.31	-	
12:05	13.91	4.03	13.88	0.31	-	
12:06	13.93	4.04	13.82	0.31	-	
12:07	13.96	4.04	13.69	0.30	-	
12:08	13.55	4.04	13.86	0.31	-	
12:09	13.87	4.04	13.86	0.30	-	
12:10	13.88	4.04	13.87	0.30	-	
12:11	13.89	4.04	13.70	0.31	-	
12:12	13.90	4.04	13.96	0.30	-	
12:13	13.91	4.04	13.93	0.30	-	
12:14	13.91	4.05	13.82	0.30	-	
12:15	13.93	4.06	13.94	0.31	-	
12:16	13.96	4.05	13.89	0.29	-	
12:17	13.96	4.04	13.85	0.28	-	
12:18	13.81	4.04	11.08	0.31	-	
12:19	13.86	4.04	13.91	0.30	-	
12:20	13.87	4.05	13.93	0.30	-	
Average	**13.88**	**4.04**	**13.86**	**0.30**	-	

Navaphut S

(Mr.Navaphut Sriviriya)

Environmental Field Scientist (2)

EMISSION TEST RESULT

Client	Global Power Synergy PCL	Run #	2
Date	25 Sep 24	Location	HRSGs 1
Start Time	12:21	Test Operator	Navaphut S.
SO_2 Analyzer Model	TELEDYNE API 100EH	Finish Time	12:41
NO_x/O_2 Analyzer Model	HORIBA PG-350	Serial No.	437
CO/CO_2 Analyzer Model	-	Serial No.	TD8ARGKP
		Serial No.	-

Time (min)	O_2 (%)	CO_2 (%)	NOx (ppm)	SO_2 (ppm)	CO (ppm)	Remark
12:21	13.88	4.06	10.80	0.29	-	
12:22	13.91	4.06	10.77	0.30	-	
12:23	13.91	4.05	10.93	0.28	-	
12:24	13.93	4.04	11.00	0.28	-	
12:25	13.94	4.04	11.12	0.29	-	
12:26	13.95	4.03	11.16	0.28	-	
12:27	13.96	4.03	11.26	0.29	-	
12:28	13.96	4.03	11.07	0.30	-	
12:29	13.89	4.03	11.07	0.28	-	
12:30	13.91	4.04	10.88	0.29	-	
12:31	13.94	4.04	10.88	0.31	-	
12:32	13.93	4.04	11.12	0.32	-	
12:33	13.93	4.04	11.10	0.32	-	
12:34	13.94	4.04	10.99	0.32	-	
12:35	13.95	4.03	10.99	0.31	-	
12:36	13.96	4.04	10.94	0.32	-	
12:37	13.91	4.05	10.74	0.31	-	
12:38	13.92	4.05	10.97	0.32	-	
12:39	13.92	4.04	11.04	0.33	-	
12:40	13.91	4.04	11.12	0.31	-	
12:41	13.92	4.04	10.99	0.31	-	
Average	13.93	4.04	11.00	0.30	-	

Navaphut S.

(Mr.Navaphut Sriviriya)

Environmental Field Scientist (2)

FORM NO.: F 06-060 REVISION NO.: 1 ISSUE DATE: 18/01/24

ALS Laboratory Group

EMISSION TEST RESULT

Client	Global Power Synergy PCL	Run #	3
Date	25 Sep 24	Location	HRSGs 1
Start Time	12:42	Test Operator	Navaphut S.
SO_2 Analyzer Model	TELEDYNE API 100EH	Finish Time	13:02
NO_x/O_2 Analyzer Model	HORIBA PG-350	Serial No.	437
CO/CO_2 Analyzer Model	-	Serial No.	TD8ARGKP
		Serial No.	-

Time (min)	O_2 (%)	CO_2 (%)	NOx (ppm)	SO_2 (ppm)	CO (ppm)	Remark
12:42	13.93	4.05	10.91	0.30	-	
12:43	13.95	4.06	10.85	0.30	-	
12:44	13.95	4.05	10.93	0.30	-	
12:45	13.84	4.05	10.90	0.31	-	
12:46	13.87	4.05	10.78	0.30	-	
12:47	13.88	4.04	10.69	0.31	-	
12:48	13.90	4.04	10.71	0.30	-	
12:49	13.89	4.05	10.92	0.30	-	
12:50	13.89	4.05	10.89	0.31	-	
12:51	13.92	4.05	10.84	0.30	-	
12:52	13.93	4.05	11.04	0.30	-	
12:53	13.93	4.04	11.10	0.31	-	
12:54	13.95	4.05	11.07	0.31	-	
12:55	13.83	4.05	10.85	0.29	-	
12:56	13.93	4.04	11.07	0.31	-	
12:57	13.91	4.03	11.34	0.31	-	
12:58	13.92	4.04	11.21	0.30	-	
12:59	13.94	4.04	11.10	0.32	-	
13:00	13.95	4.04	10.97	0.32	-	
13:01	13.95	4.04	11.01	0.33	-	
13:02	13.96	4.03	11.03	0.34	-	
Average	13.91	4.04	10.97	0.31	-	

Navaphut S.

(Mr.Navaphut Sriviriya)

Environmental Field Scientist (2)

FORM NO.: F 06-060 REVISION NO.: 1 ISSUE DATE: 18/01/24

ALS Laboratory Group

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA LLC
6141 Easton Road
Plumsteadville, PA 18949
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA PROTOCOL STANDARD

Customer:	AIR LIQUIDE (THAILAND) LTD		
Part Number:	E04NI99E3HA0002	Reference Number:	160-402340013-1
Cylinder Number:	GN0027210	Cylinder Volume:	247.2 CF
Laboratory:	124 - Plumsteadville - PA	Cylinder Pressure:	2215 PSIG
PGVP Number:	A12022	Valve Outlet:	660
Gas Code:	CO,NO,NOX,SO2,BALN	Certification Date:	Feb 11, 2022

Expiration Date: Feb 11, 2030

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a molemole basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
NOX	80.00 PPM	82.39 PPM	G1	+/- 1.0% NIST Traceable	02/04/2022, 02/11/
CARBON MONOXIDE	80.00 PPM	79.48 PPM	G1	+/- 0.6% NIST Traceable	02/04/2022
NITRIC OXIDE	80.00 PPM	82.38 PPM	G1	+/- 1.0% NIST Traceable	02/04/2022, 02/11/
SULFUR DIOXIDE	80.00 PPM	78.75 PPM	G1	+/- 0.9% NIST Traceable	02/04/2022, 02/11/
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Dat
NTRM	09010212	KAL004777	98.48 PPM CARBON MONOXIDE/NITROGEN	+/- 0.5%	Oct 16, 2024
NTRM	200610-15	CC733106	98.61 PPM NITRIC OXIDE/NITROGEN	+/- 0.9%	Oct 06, 2026
NTRM	200610-04	CC708044	98.61 PPM NITRIC OXIDE/NITROGEN	+/- 0.9%	Oct 06, 2026
GMIS	124206889139	CC323707	4.097 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%	Sep 03, 2024
NTRM	11010419	KAL004813	99.6 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.8%	Jul 28, 2023

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet iS50 FTIR AUP2010245 CO	FTIR	Feb 03, 2022
Nicolet iS50 FTIR AUP2010245 NO	FTIR	Feb 10, 2022
Nicolet iS50 FTIR AUP2010245 NO2	FTIR	Jan 27, 2022
Nicolet iS50 FTIR AUP2010245 SO2	FTIR	Jan 20, 2022

Triad Data Available Upon Request

NOTES: Gross Weight: 48.5 Kg
Net Weight: 8.1 Kg

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
6141 Easton Road
Bldg 3
Plumsteadville, PA 18949
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E04NI99E15A0617	Reference Number:	160-401907848-1
Cylinder Number:	EB0137461	Cylinder Volume:	144.4 Cubic Feet
Laboratory:	124 - Plumsteadville - PA	Cylinder Pressure:	2015 PSIG
PGVP Number:	A12020	Valve Outlet:	660
Gas Code:	CO,NO,NOX,SO2,BALN	Certification Date:	Oct 07, 2020

Expiration Date: Oct 07, 2028

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a molemole basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
NOX	160.0 PPM	160.2 PPM	G1	+/- 0.8% NIST Traceable	09/29/2020, 10/07/2020
CARBON MONOXIDE	160.0 PPM	161.0 PPM	G1	+/- 0.8% NIST Traceable	09/29/2020
NITRIC OXIDE	160.0 PPM	160.2 PPM	G1	+/- 0.8% NIST Traceable	09/29/2020, 10/07/2020
SULFUR DIOXIDE	160.0 PPM	159.3 PPM	G1	+/- 1.0% NIST Traceable	09/29/2020, 10/07/2020
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	139102	KAL004829	246.9 PPM CARBON MONOXIDE/NITROGEN	+/- 0.5%	Oct 16, 2024
PRM	12386	D685025	9.91 PPM AIR/NITROGEN DIOXIDE	2.0%	Feb 20, 2020
NTRM	03161238	KAL004402	243.4 PPM NITRIC OXIDE/NITROGEN	+/- 0.5%	May 26, 2026
GMIS	124206889	CC323707	4.028 PPM NITROGEN DIOXIDE/NITROGEN	2.1%	Aug 15, 2021
NTRM	10010212	AAL072873	255.3 PPM SULFUR DIOXIDE/NITROGEN	+/-0.8%	Apr 25, 2022

The SRM, PRM or RGM noted above is only in reference to the GMIS used in the assay and not part of the analysis.

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet iS50 FTIR AUP2010245 CO	FTIR	Sep 21, 2020
Nicolet 6700 APW1100391 NO	FTIR	Sep 21, 2020
Nicolet 6700 APW1100391 NO2	FTIR	Sep 24, 2020
Nicolet 6700 APW1100391 SO2	FTIR	Sep 23, 2020

Triad Data Available Upon Request

NOTES:
Gross Weight: 27.8 Kg
Net Weight: 4.6 Kg

Approved for Release

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
600 Union Landing Road
Cinnaminson, NJ 08077-0000
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E02NI92E3HA0000	Reference Number:	82-401018725-1
Cylinder Number:	ND60018	Cylinder Volume:	248.4 CF
Laboratory:	124 - Riverton (SAP) - NJ	Cylinder Pressure:	2214 PSIG
PGVP Number:	B52017	Valve Outlet:	590
Gas Code:	O2,BALN	Certification Date:	Oct 23, 2017

Expiration Date: Oct 23, 2025

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does nd require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
OXYGEN	8.000 %	8.003 %	G1	+/- 0.4% NIST Traceable	10/23/2017
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRMplus	09060208	CC262337	9.961 % OXYGEN/NITROGEN	+/- 0.3%	Nov 08, 2018

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba MPA 510-O2-7TWMJ041	Paramagnetic	Sep 28, 2017

Triad Data Available Upon Request

NOTES:
This calibration std. has been certified in accordance with the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531. All testing processes and measurements conform to the requirements of ISO/IEC 17025 and to Airgas ISO 9001:2000 and relate only to items identified on this certificate. All values are certified to be NIST Traceable with total uncertainty as detailed under Analytical Uncertainty. This document shall not be reproduced in full without written approval of the issuer.

ACCREDITED
TESTING CERT No. 2000.02

Approved for Release

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA LLC
6141 Easton Road
Plumsteadville, PA 18949
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA PROTOCOL STANDARD

Customer:	AIR LIQUIDE (THAILAND) LTD		
Part Number:	E02NI84E3HA0001	Reference Number:	160-402340010-1
Cylinder Number:	GN0027201	Cylinder Volume:	249.8 CF
Laboratory:	124 - Plumsteadville - PA	Cylinder Pressure:	2214 PSIG
PGVP Number:	A12022	Valve Outlet:	590
Gas Code:	O2,BALN	Certification Date:	Feb 02, 2022

Expiration Date: Feb 02, 2030

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted.
Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
OXYGEN	16.00 %	16.04 %	G1	+/- 0.4% NIST Traceable	02/02/2022
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	08010230	K005228	23.20 % OXYGEN/NITROGEN	+/- 0.4%	Jun 01, 2022

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
SIEMENS OXYMAT 6 - N1JUE-951 - 02	PARAMAGNETIC	Jan 27, 2022

Triad Data Available Upon Request

NOTES: Gross Weight: 48.8 Kg
Net Weight: 8.2 Kg

Approved for Release

CONSOLE CONTROL UNIT CALIBRATION TEST REPORT

Calibration of Date	10-Jul-24	Barometric Pressure (mmHg)	752.4
Next Cal. Date	10-Jan-25	Relative Humidity (%)	64.0
		Temperature (°C)	29.2
Console Control Meter Data		*Reference Dry Gas Meter Data*	
Calibration No.	C-100724-RYG_FS0315	Reference Dry Gas Meter ID.	BKK_FS1122
Dry Gas Meter ID	RYG_FS0315	Serial No.	A2003240
Serial No.	1706091	Correction Factor (Y)	0.9824
Model No.	XC-572-V	Next Calibration Date	7-Nov-24

ΔH (mm H2O)	Θ (Minute)	Reference Dry Gas Meter Calibration: Vr (Litres) Final	Initial	Total	Tr (°C)	Console Control : Dry gas Meter: Vm (Litres) Final	Initial	Total	Ti (°C)	To (°C)	Avg Tm (°C)	Dry Gas Meter Correction Factor (Y)	Orifice Calibration Factor ΔH@
10	12.60	150.00	0.00	150.00	26.0	2011497.2	2011345.0	152.00	29.0	29.0	29.0	0.9778	47.9329
20	9.01	150.00	0.00	150.00	26.0	2011657.2	2011505.0	152.00	29.0	29.0	29.0	0.9769	48.4230
50	5.86	150.00	0.00	150.00	26.0	2011816.2	2011665.0	151.00	29.0	29.0	29.0	0.9899	47.7881
90	3.40	150.00	0.00	150.00	26.0	2011981.3	2011830.0	151.00	29.0	29.0	29.0	0.9780	48.9520
120	2.93	150.00	0.00	150.00	26.0	2012141.3	2011990.0	151.00	29.0	29.0	29.0	0.9761	49.1080
											Avg. :	0.9787	47.8188

Y : Ratio of reading of reference to dry gas meter - tolerance for individual values ± 0.02 from average.
ΔH@ : Orifice pressure differential that equates to 21.24 lm of air @ 25 C and 760 mm of mercury , mmH2O , tolerance for individual values ± 5.08 from average.
Procedure: 40 CFR 60,APP A,METH.5/IC 5.3 & 7

Calibrated by: Saksit Phaisanphisul
(Mr. Saksit Phaisanphisul)
RYG Field Service Scientist(4)

Approved by: Natthapol Jiengwareewong
(Mr.Natthapol Jiengwareewong)
RYG Field Service Specialist(1)

FORM NO. : F-08-09 ISSUED DATE: 30-Jan-12

Stopwatch Calibration Test Report

Calibration Date :	10 Jul 24	Next Cal. Date :	10 Jan 25
Barometric Pressure (mmHg) :	752.4	Temperature (°C) :	29.2
Relative Humidity (%) :	64.0		

Reference Stopwatch Data		Console Control Meter Data	
Stopwatch ID No.	RYG_FS0540	Dry Gas Meter No. :	RYG_FS0315
Model :	F808	Model :	XC-572-V
Serial No. :	E18061	Serial No. :	1706091
Calibration Date :	9 Dec 22		
Certificate No. :	E-2009018		

Run No.	Time Actual (m:ss:ms)	Time Reading (m:ss)	Diff. (ms)	Diff. (min)
1	5:00:03	5:00	3	0.00005
2	5:00:08	5:00	8	0.00013
3	5:00:07	5:00	7	0.00012
4	5:00:08	5:00	8	0.00013
5	5:00:05	5:00	5	0.00008
6	5:00:06	5:00	6	0.00010
7	5:00:06	5:00	6	0.00010
8	5:00:07	5:00	7	0.00012
9	5:00:08	5:00	8	0.00013
10	5:00:07	5:00	7	0.00012
			Average	0.00011
			SD	0.00003

Calibrate by : Saksit Phaisanphisul
Mr. Saksit Phaisanphisul
RYG Field Service Scientist (4)

Approved by : Natthapol Jiengwareewong
Mr.Natthapol Jiengwareewong
RYG Field Service Specialist (1)

DIGITAL TEMPERATURE CALIBRATION DATA SHEET

Calibration Date :	10 Jul 24	Ambient Temperature (°C)	29.2
Calibration sheet No. :	C-100724-RYG_FS0315	Relative Humidity (%) :	64
Digital Temperature ID	RYG_FS0315	Reference Temperature ID	RYG_FS0681
Serial No. :	1706091	Serial No. :	201090014818
Model :	XC-572-V	Model :	Digicon-CC-VT-MS
		Next Calibrate :	13 Nov 24

Location	Reference Temperature °C	Digital Temperature °C	Error °C	MPE	Pass / Fail
Stack	0	0	0	±3	Pass
	25	25	0	±3	Pass
	50	50	0	±3	Pass
	100	101	1	±3	Pass
	150	151	1	±3	Pass
	200	200	0	±3	Pass
	250	250	0	±3	Pass
	300	301	1	±3	Pass
	500	501	1	±3	Pass
Probe	100	102	2	±3	Pass
	120	121	1	±3	Pass
	140	141	1	±3	Pass
Oven	100	101	1	±3	Pass
	120	120	0	±3	Pass
	140	141	1	±3	Pass
Filter	100	101	1	±3	Pass
	120	121	1	±3	Pass
	140	140	0	±3	Pass
Exit	0	0	0	±3	Pass
	10	10	0	±3	Pass
	20	20	0	±3	Pass
Meter	0	-1	-1	±3	Pass
	25	24	-1	±3	Pass
	50	49	-1	±3	Pass
AUX	0	0	0	±3	Pass
	25	25	0	±3	Pass
	50	50	0	±3	Pass

MPE : (Maximum permissible error of measurement) ค่าความผิดพลาดสูงสุดของการวัดที่ยอมได้

Calibrated by : Saksit Phaisanphisut
(Mr. Saksit Phaisanphisut)
RYG Field Service Scientist (4)

Approved By : Natthapol Jiengwareewong
(Mr.Natthapol Jiengwareewong)
RYG Field Service Specialist (1)

FORM NO.: F 06-027 REVISION NO.: 2 ISSUE DATE: 16/2/23

PROBE NOZZLE DIAMETER CALIBRATION DATA SHEET

Calibration Date :	10 Jul 24	Nozzle Set ID. :	RYG_FS0319
Calibration Sheet No. :	C-100724-RYG_FS0319	Vernier Caliper ID.:	BKK_FS1123

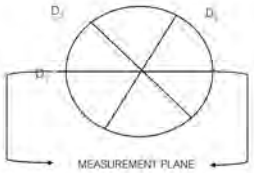
Nozzle ID #	Nozzle Diameter (cm.)			Hi - Lo	$(D_1 + D_2 + D_3) / 3$
	D_1	D_2	D_3	ΔD	D_{avg}
1	0.298	0.300	0.305	0.007	0.301
2	0.465	0.475	0.465	0.010	0.468
3	0.605	0.605	0.605	0.000	0.605
4	0.770	0.760	0.765	0.010	0.765
5	0.930	0.928	0.930	0.002	0.929
6	1.082	1.080	1.085	0.005	1.082
7	1.240	1.230	1.235	0.010	1.235
8	1.594	1.558	1.551	0.043	1.568

Where :

D_1, D_2, D_3 = There different nozzle diameters at 60 degree to each other, each measured the nearest 0.025 mm.

ΔD = Maximum distance between any two diameter must be $\leq$ 0.100 mm.

$D_{avg} = (D_1 + D_2 + D_3) / 3$

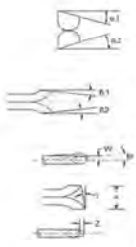


Calibrated by : Saksit Phaisanphisut
(Mr. Saksit Phaisanphisut)
RYG Field Service Scientist (4)

Approved By : Natthapol Jiengwareewong
(Mr.Natthapol Jiengwareewong)
RYG Field Service Specialist (1)

Type S Pitot Tube Calibration

Date Calibration	10 Jul 24	**Due Date**	10-Jan-25
Pitot ID	RYG_FS0321	**Inclinometer ID**	BKK_FS1131
Pitot SN	-	**Vernier ID**	RYG_FS0539



Parameter	Value	Allowable Range	Check
α1	-1.4	-10° < α1 < +10°	OK
α2	-0.2	-10° < α2 < +10°	OK
β1	0.3	-5° < β1 < +5°	OK
β2	-0.4	-5° < β2 < +5°	OK
γ	0.3	-	-
θ	0.5	-	-
Z = A tan γ	0.013	Z ≤ 0.125"	OK
W = A tan θ	0.008	W ≤ 0.031"	OK
Dt	0.310	0.188" to 0.375"	OK
A/2Dt	1.434	1.05 ≤ PA/Dt ≤ 1.5	OK
A	0.92	2.1Dt ≤ A ≤ 3Dt	OK

Certify that pitot tube/porbe meets or exceeds all specifications, crieria and/or applicable design features and is hereby assigned a pitot tube certification fact of 0.84 . See 40 CFR Pt. 60, App. A,EPA Method 2.

Calibrated by : Saksit Phaisanphisut
(Mr. Saksit Phaisanphisut)
RYG Field Services Scientist (4)

Approved By : Natthapol Jiengwareewong
(Mr.Natthapol Jiengwareewong)
RYG Field Services Specialist (1)

FORM NO.: F 06-124 REVISION NO.: 0 ISSUE DATE: 25/12/23

ENTECH Where Solutions Begin

Calibration Certificate

Certificate No: G 670176
Date of issue : 08-Mar-24

Instrument description	:	Flue Gas Analyser
Instrument model	:	Testo 350 New
Control unit serial no.	:	03401649/1119
Instrument serial no.	:	62087344/1119
ID no. or control no.	:	RYG_FS0464
Manufacturer	:	Testo SE & Co. KGaA
Probe description	:	-
Probe model	:	-
Probe serial no.	:	-
Customer name	:	ALS LABORATORY GROUP (THAILAND) CO.,LTD.
Customer address	:	104 Phatthanakan 46, Phatthakekan Road, Khwaeng Phatthanakan, Khet Suan Luang, Bangkok, 10250 Thailand
Total pages of certificate	:	3 Pages
Receiving no.	:	L-240885
Receiving date.	:	04-Mar-24
Parameter of calibration	:	Gas Calibration(Oxygen 2.50,10.04,21.02 %vol, Carbon Monoxide 80.14,302,1003 ppm, Nitrogen Dioxide 30.34,81.32, 201.9 ppm, Nitric Oxide 30.01, 151.5, 322.5 ppm, Sulphur Dioxide 50.36, 100.8, 500.8 ppm)
Condition of UUC.	:	Used
Ambient condition	:	All of the Measurment ware caried out the stabilized laboratory Temperature : 23 ±5 °C Humidity : 55 ± 15 %RH
Calibration place	:	17/121 Soi Ngamwongwan 47 Yaek 48, Toongsonghong, Laksi, Bangkok 10210
Calibration procedure no. :		This instrument was calibrated by comparison with Standard gas mixture according to calibration Work Instruction no. W1-CL-28-C

REVIEW BY Mayakan. P
APPROVED BY
NEXT CAL. DATE 7/3/25

The calibration certificate expanded uncertainty of measurement is stated at the standard uncertainty of measurement Multiplied by coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

This certificate is applied only to item under test Environmental condition.

This Calibration Certificate may not be reproduced other than in full except with the permission of the issuing laboratory. Calibration certificates without signature and seal not valid and The results relate only to the items tested/calibrated.

This calibration certificate documents are traceability to national standards, which realize measurement according to the International System of Units (SI).

Date of calibration : 08-Mar-24

Mr. Kwanchai Khandoung
Calibration Technician

Mrs. Nongluck Wongsettee
Technical Manager

FM-CL-09-C Rev.6 Page 1 of 4 Issued Date 26/07/16

ENTECH

Calibration Certificate

Certificate No.: G 670176

Standard References (Table 1)

Standard	Certificate No.	Vendor	Due date
Oxygen (O2) 2.50 % Vol	2412/23	Linde	27-Aug-27
Oxygen (O2) 10.04 % Vol	CG-0153-21	Nimt	18-Nov-26
Oxygen (O2) 21.02 % Vol	CG-0041-22	Nimt	10-Feb-27
Carbon monoxide (CO) 80.14 ppm	CG-0040-22	Nimt	14-Feb-27
Carbon monoxide (CO) 302 ppm	1915/23	Linde	16-Jun-25
Carbon monoxide (CO) 1003 ppm	2564/23	Linde	10-Sep-25
Nitrogen Dioxide (NO2) 30.34 ppm	2703/22	Linde	22-Aug-24
Nitrogen Dioxide (NO2) 81.32 ppm	3546/23	Linde	14-Jan-26
Nitrogen Dioxide (NO2) 201.9 ppm	1973/23	Linde	17-Jul-25
Nitric Oxide (NO) 30.01 ppm	CG-0014-23	Nimt	19-Feb-25
Nitric Oxide (NO) 151.5 ppm	0161/23	Linde	22-Jan-25
Nitric Oxide (NO) 322.5 ppm	1974/23	Linde	17-Jul-25
Sulphur Dioxide (SO2) 50.36 ppm	3004/23	Linde	17-Jul-25
Sulphur Dioxide (SO2) 100.8 ppm	3507/22	Linde	09-Nov-24
Sulphur Dioxide (SO2) 600.8 ppm	2003/23	Linde	17-Jul-25

Measured room conditions

Temperature : 23.6 °C Humidity : 65.2 %RH Pressure : 1011.2 mbar

Calibration conditions

Gas Temperature : 23 °C Flow rate : 1,300 ml/min Gas pressure : 1017.1 mbar

Calibration Results (Befor adjustment) (Table 2)

Parameter of Standard	Standard Values	Mean of UUC	Error	Uncertainty (±)
O2 (%Vol)	2.50	2.45	-0.05	0.15
O2 (%Vol)	10.04	9.93	-0.11	0.20
O2 (%Vol)	21.02	21.10	0.08	0.30
CO (ppm)	80.14	81	0.86	3.0
CO (ppm)	302	305	3	6.0
CO (ppm)	1003	1009	6	12
NO2 (ppm)	30.34	24.2	-6.14	8.0
NO2 (ppm)	81.32	76.9	-4.42	8.0
NO2 (ppm)	201.9	188.7	-13.2	12
NO (ppm)	30.01	27	-3.01	8.0
NO (ppm)	151.5	144	-7.5	8.0
NO (ppm)	322.5	304	-18.5	12
SO2 (ppm)	50.36	50	-0.36	6.0
SO2 (ppm)	100.8	98	-2.8	6.0
SO2 (ppm)	600.8	597	-3.8	13

Entech Industrial Solution Co.,Ltd.
17/121 Soi Nampuangwan 47 Yaek 48, Toongsonghong, Laksi, Bangkok 10210 THAILAND Tel 0-2779-8888 Calibration@entechcorp.com
Tax ID : 0105536035591 www.entechcorp.com

ENTECH

Calibration Certificate

Certificate No.: G 670176

Calibration Results (After adjustment) (Table 3)

Parameter of Standard	Standard Values	Mean of UUC	Error	Uncertainty (±)
O2 (%Vol)	2.500	2.45	-0.05	0.15
O2 (%Vol)	10.04	9.93	-0.11	0.20
O2 (%Vol)	21.02	21.10	0.08	0.30
CO (ppm)	80.14	81	0.86	3.0
CO (ppm)	302	305	3	6.0
CO (ppm)	1003	1009	6	12
NO2 (ppm)	30.34	29.5	-0.84	8.0
NO2 (ppm)	81.32	82.4	1.08	8.0
NO2 (ppm)	201.9	202.4	0.5	12
NO (ppm)	30.01	29	-1.01	8.0
NO (ppm)	151.5	152	0.5	8.0
NO (ppm)	322.5	321	-1.5	12
SO2 (ppm)	50.36	50	-0.36	6.0
SO2 (ppm)	100.8	98	-2.8	6.0
SO2 (ppm)	600.8	597	-3.8	13

Remark : 1 cmol/mol = 1 %vol. 1 µmol/mol = 1 ppm.

End of Report

Entech Industrial Solution Co.,Ltd.
17/121 Soi Nampuangwan 47 Yaek 48, Toongsonghong, Laksi, Bangkok 10210 THAILAND Tel 0-2779-8888 Calibration@entechcorp.com
Tax ID : 0105536035591 www.entechcorp.com

Sartorius (Thailand) Co., Ltd.
129 Rama 9 Road, Huaykwang, Huaykwang, Bangkok 10310
Tel: +66 2643 8361-6 , e-mail: service.thailand@sartorius.com

NSC-TISI-TIS 17025
CALIBRATION 0426

SARTORIUS

Certificate of Calibration

REVIEW BY Thanitat
APPROVED BY
NEXT CAL. DATE 22/02/2025

Model Number : MSU224S-100-DU
Description : Analytical Balance
Serial Number : 0031709552
ID No. : RYG_EN0003
Manufacturer : Sartorius

Certificate No. : 24BCI0073
Issued Date : Friday, February 23, 2024
Reference No. : 229196
Page No. : 1 Of 2

Customer Name : ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
616/10 Moo 5 T.Maenam Khu, A.Pluak Daeng, Rayong 21140, Thailand.

Calibrated Place : ALS Laboratory Group (Thailand) Co., Ltd.(Balance Room)
616/10 Moo 5 T.Maenam Khu, A.Pluak Daeng, Rayong 21140, Thailand.

Calibrated By : Mr.Chonchai Inthana
Calibration Date : Thursday, February 22, 2024

Calibration Procedure No. : This calibration was conducted by Using in-house calibration procedure number (WI-003) Based on UKAS LAB 14 : 2019

Metrological data :
Capacity : 220 g Readability : 0.0001 g

Ambients Conditions:
Temperature : 23.7 °C ± 5.0 °C
Humidity : 62.0 % RH ± 10.0 % RH
Pressure ± —

Reasons for calibration
☐ New Installation ☐ Service / Repaired ☑ Re-calibration/ Maintenance

Equipment Condition: ☑ Good Operate ☐ Fair

Measurement Method UKAS Publication Ref :Lab 14

The measurement uncertainty stated is the expended uncertainty which is obtained from the standard uncertainty multiplied by the coverage factor (k=2) to provide a level of confidence of approximately 95%. It is determined in accordance with the Guide to Expression of Uncertainty in Measurement (GUM). The calibration certificate documents the traceability to National Standards, which realise the unit of measurement according to the International Standard System of Units (SI). Report of Tolerance came form list of Sartorius Metrological Specifications.

Traceability:

Model Number	Description	Traceability	Cetificate No.	Due Date
YCS011-522-00	Sartorius weight set 1mg - 5000g E2,YCS011-522-00	TCS	M2308197S	23-Aug-2025
MHB-382SD	Humidity/Barometer/Temp Lutron MHB-382SD	DKSH	C19231845	23-Aug-2024

This certificate relate and apply this equipment only.
This certificate may not be reproduced other than in full except with the prior written approval of the Verification Operation Division Sartorius (Thailand) Co., Ltd.

Mr.chonchai Intrhana(Technical Manager)

STAMP

Sartorius (Thailand) Co., Ltd.
129 Rama 9 Road, Huaykwang, Huaykwang, Bangkok 10310
Tel: +66 2643 8361-6 Fax: +66 2643-8367, e-mail: service.thailand@sartorius.com

SARTORIUS

Certificate of Calibration

Model Number : MSU224S-100-DU
Description : Analytical Balance
Serial Number : 0031709552
ID No. : RYG_EN0003
Manufacturer : Sartorius

Certificate No. : 24BCI0073
Issued Date : Friday, February 23, 2024
Reference No. : 229196
Page No. : 2 of 2

Calibration Results : Without Adjustment

Repeatability

The reproducibility is the ability of a weighing instrument to display nearly identical reaouts under constant test conditions when the same load within a measurement series is placed repeatedly on the weighing pan in the same manner. The standard deviation is used to express reproducibility quantitatively.

Nominal Value : (Low Load) 20 g	20.0000	200.0001
	20.0000	200.0000
Tolerance 0.0001 g	20.0001	200.0001
	20.0000	200.0001
	20.0000	200.0001
Nominal Value : (High Load) 200 g	20.0000	200.0001
	19.9999	200.0001
Tolerance 0.0001 g	20.0000	200.0000
	20.0000	200.0000
	20.0000	200.0001
Standard Deviation	0.00005	0.00005

Eccentricity (Off-center loading error)

The off-center loading error is yielded by the difference between the readout of the load, i.e. 1/3 or 1/4 of maximim capacity, placed in the middle of the weighing pan and between each of four additional measurement points (positions defined according to OIML R76).

Nominal value : 100 g
Tolerance 0.0004 g



	Difference
1	—
2	0.0000
3	-0.0001
4	0.0000
5	0.0001
6	-

Linearity

The linearity, also called linearity error. Describes the deviation of the characteristic curve of a weighing instrument from the linear slope.

Tolerance 0.0002 g

Nominal Value (g)	Conventional Mass Value (g)	Displayed Value (g)	Deviation (g)	Uncertainty (g)
0.01	0.0100	0.0100	0.0000	0.00013
0.1	0.1000	0.1000	0.0000	0.00013
0.5	0.5000	0.5000	0.0000	0.00013
1	1.0000	1.0000	0.0000	0.00013
5	5.0000	5.0000	0.0000	0.00013
10	10.0000	10.0000	0.0000	0.00013
20	20.0000	20.0000	0.0000	0.00013
50	50.0000	50.0000	0.0000	0.00024
100	100.0000	99.9999	-0.0001	0.00018
200	200.0000	199.9999	-0.0001	0.00029

End of Report.

DRY GAS METER CALIBRATION TEST REPORT

Calibration of Date 10-Jul-24
Next Calibration Date 10-Jan-25

Barometric Pressure (mm.Hg) : 756.2
Relative Humidity (%) 56.2
Temperature (°C) 26.7

Dry Gas Meter Data
Calibration sheet No. : C-090124-RYG_FS0317
Dry Gas Meter ID RYG_FS0317
Serial No. 1706003
Model No. XC-62-CV

Reference Dry Gas Meter Data
Reference Dry Gas Meter ID : BKK_FS1122
Serial No. : A2003240
Correction Factor (Y) : 0.9824
Next Calibration Date : 7-Nov-24

Reference Dry Gas Meter Calibration				Dry Gas Meter						Dry Gas Meter Correction
Vr (Liters)			Tr	Vm (Liters)			Ti	To	Avg. Tm	Factor
Final	Initial	Total	(°C)	Final	Initial	Total	(°C)	(°C)	(°C)	(Y)
30.00	0.00	30.00	26.0	30.01	0.00	30.01	26.0	27.0	26.5	0.9837
30.00	0.00	30.00	26.0	30.01	0.00	30.01	26.0	27.0	26.5	0.9837
60.00	0.00	60.00	26.0	60.05	0.00	60.05	26.0	27.0	26.5	0.9832
60.00	0.00	60.00	26.0	60.05	0.00	60.05	26.0	27.0	26.5	0.9832
90.00	0.00	90.00	26.0	90.02	0.00	90.02	26.0	27.0	26.5	0.9838
90.00	0.00	90.00	26.0	90.02	0.00	90.02	26.0	27.0	26.5	0.9838
									Avg.	0.9836

Y = Ratio of reading of reference dry gas meter to dry gas meter ; tolerance for individual ± 0.05 from average.

Calibrate by : Mr. (jittakorn.sriwasa)
RYG Field ServiceScientist (2)

Approved by : Mr.Natthapol Jiengwareewong
RYG Field ServiceSpecialist (1)

FORM NO.: F 06-023 REVISION NO.: 1 ISSUE DATE: 30/6/22

DIGITAL TEMPERATURE CALIBRATION DATA SHEET

Calibration Date : 10 Jul 24
Calibration sheet No. : C-100724-RYG_FS0317
Ambient Temperature (°C) 26.7
Relative Humidity (%) : 56.2

Digital Temperature ID RYG_FS0317
Serial No. : 1706003
Model : XC-62-CV
Reference Temperature ID RYG_FS0681
Serial No. : 201090014918
Model : Digicon-CC-VT-MS
Next Calibrate : 13 Nov 24

Location	Reference Temperature °C	Digital Temperature °C	Error °C	MPE	Pass / Fail
Stack	0	0	0	±3	Pass
	25	25	0	±3	Pass
	50	50	0	±3	Pass
	100	100	0	±3	Pass
	150	150	0	±3	Pass
	200	200	0	±3	Pass
	250	251	1	±3	Pass
	300	301	1	±3	Pass
	500	501	1	±3	Pass
Probe	100	101	1	±3	Pass
	120	121	1	±3	Pass
	140	141	1	±3	Pass
Oven	-	-	-	-	-
	-	-	-	-	-
Filter	100	101	1	±3	Pass
	120	121	1	±3	Pass
	140	141	1	±3	Pass
Exit	0	0	0	±3	Pass
	10	10	0	±3	Pass
	20	20	0	±3	Pass
Meter	0	0	0	±3	Pass
	25	25	0	±3	Pass
	50	50	0	±3	Pass
AUX	0	1	1	±3	Pass
	25	26	1	±3	Pass
	50	51	1	±3	Pass

MPE : (Maximum permissible error of measurement) ค่าความผิดพลาดสูงสุดของการวัดเที่ยงยอมได้

Calibrated by : (Mr.Jittakorn.Sriwasa)
RYG Field Services Scientist (2)

Approved by : Mr.Natthapol Jiengwareewong
RYG Field Services Specialist (1)

FORM NO.: F 06-027 REVISION NO.: 2 ISSUE DATE: 16/2/23

DKSH

Certificate of Calibration

Equipment: SPECTROPHOTOMETER
Model: DR6000
Serial No. (or ID.): 1627845 (RYG_EN0037)
Manufacturer: HACH
Condition: In Condition

Certificate No.: C06230441
Issued Date: 19 September 2023
Job No.: WO-00005382
Page: 1 of 3

Customer: ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
616/10 Moo 5 T.Maenam Khu,
A.Pluakdaeng, Rayong 21140, Thailand.

REVIEW BY N. Bamrungsuk
APPROVED BY D.
NEXT CAL. DATE 18/3/25

Environment Condition: Temperature 23.9 °C ± 0.2
Humidity 65.3 %RH ± 1.4

Calibration Place: ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch) (Wet Chemistry)
616/10 Moo 5 T.Maenam Khu,
A.Pluakdaeng, Rayong 21140, Thailand.

Calibration By: Mr.Nattapat Rungrueang
Calibration Date: 18 September 2023
The Method used: In house method, CAL-WI-24, base on ASTM E 275-08 and ASTM E 387-04
Traceability: This certificate is traceable to the CRM maintained by National Institute of Standards and Technology (NIST) through Starna Scientific Limited.

The standard for Wavelength Certificate No. 111583 and 111584
The standard for Photometric Certificate No. 9114984 and 111588
The standard for Stray light Certificate No. 111586 and 111585
The standard for Spectral resolution Certificate No. 111587

(Mr. Nattapat Rungrueang)
Person in charge

(Mr. Nitinun Srihawan)
Authorized signatory

This certificate is issued the units of measurement according to the International System of Units (SI). It provides traceability of measurement to international or national standard or other recognized national standard laboratories.
The measurement uncertainty stated is the expanded uncertainty which is obtained from the standard uncertainty multiplied by the coverage factor (k=2) to provide a level of confidence of approximately 95%. It is determined in accordance with the Guide to Expression of Uncertainty in Measurement (GUM).
These results may be affected by deviations from specified conditions. The results relate only to the items tested, calibrated or sampled. The report shall not be reproduced except in full without approval of DKSH Technology Limited.

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DKSH Technology Limited
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2833 Sukhumvit Road, Bangchak, Phrakhanong, Bangkok 10260
Phone: +66 2639 7000 Email: info.calibration@dksh.com Website: www.dksh.com/scientific-thailand

Calibration Results:
Without Adjustment

Wavelength Accuracy (nm), The spectral bandwidth of Std at 2 nm and UUC at 2 nm

Standard Wavelength	Unit Under Calibration	Correction	Uncertainty
418.61	418.3	0.31	0.13
536.66	536.6	0.06	0.13
637.98	638.3	-0.32	0.13
748.48	748.7	-0.22	0.13
807.03	807.4	-0.37	0.13

Photometric Accuracy (Absorbance)

Wavelength	Standard absorbance	Unit Under Calibration	Correction	Uncertainty
420 nm	0.0000	0.000	0.0000	0.0045
	0.2930	0.289	0.0040	0.0045
	0.5168	0.519	-0.0022	0.0045
	1.0298	1.029	0.0008	0.0045
440 nm	0.0000	0.000	0.0000	0.0045
	0.2867	0.283	0.0037	0.0045
	0.5073	0.509	-0.0017	0.0045
	1.0083	1.007	0.0013	0.0045
465 nm	0.0000	0.000	0.0000	0.0045
	0.2516	0.250	0.0016	0.0045
	0.4595	0.462	-0.0025	0.0045
	0.9334	0.933	0.0004	0.0045
546.1 nm	0.0000	0.000	0.0000	0.0045
	0.2461	0.245	0.0011	0.0045
	0.4652	0.466	-0.0008	0.0045
	0.9468	0.946	0.0008	0.0045
590 nm	0.0000	0.000	0.0000	0.0045
	0.2594	0.259	0.0004	0.0045
	0.5040	0.505	-0.0010	0.0045
	1.0032	1.002	0.0012	0.0045
635 nm	0.0000	0.000	0.0000	0.0045
	0.2579	0.257	0.0009	0.0045
	0.4971	0.497	0.0001	0.0045
	0.9720	0.971	0.0010	0.0045

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CAL-FM-C06-15: 12 Sep 2022

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Calibration Results:

Without Adjustment

Photometric Accuracy (Absorbance)

Wavelength	Standard absorbance	Unit Under Calibration	Correction	Uncertainty
235 nm	0.0000	0.000	0.0000	0.0080
	0.7355	0.737	-0.0015	0.0080
257 nm	0.0000	0.000	0.0000	0.0080
	0.8574	0.857	0.0004	0.0080
313 nm	0.0000	0.000	0.0000	0.0080
	0.2864	0.290	-0.0036	0.0080
350 nm	0.0000	0.000	0.0000	0.0080
	0.6374	0.637	0.0004	0.0080

Stray light *

Standard: cut-off	UUC: Wavelength (nm)	UUC: Transmission (%T)	Absorbance (A)
260.62 +/- 0.11 nm	260.8	1.3	1.886
391.44 +/- 0.11 nm	391.4	1.3	1.886

Spectral Resolution *

Nominal Concentration 0.02 % v/v	Peak	Trough	Ratio	SBW
Standard Wavelength (nm)	268.66	268.89	1.38	2.00
UUC: Wavelength (nm)	268.2	268.1		
Std Absorbance (A)	0.4566	0.2780		
Absorbance (A)	0.413	0.300		

* Calibration Marked " Not TISI Accredited " in this Certificate have been included for completeness.

The End of Certificate

บริษัท ดีเคเอสเอช เทคโนโลยี จำกัด
DKSH Technology Limited
2533 ถนนสุขุมวิท แขวงพระโขนง เขตพระโขนง กรุงเทพมหานคร 10260
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Phone: +66 2639 7000 Email: info.calibration@dksh.com Website: www.dksh.com/scientific-thailand

DKSH

ใบตรวจสอบสภาพเครื่องวัดสิ่งแวดล้อม

เลขที่ใบงาน: WO-00005382

ชนิดเครื่องมือ: SPECTROPHOTOMETER รุ่น: DR6000 หมายเลขเครื่อง: 1627845

ตรวจสอบ (รับ) 18 Sep 2023 ปกติ	ตรวจสอบ (รับ) 18 Sep 2023 ไม่ปกติ	รายการตรวจเช็ค	ตรวจสอบ (ส่ง) 18 Sep 2023 ปกติ	ตรวจสอบ (ส่ง) 18 Sep 2023 ไม่ปกติ	หมายเหตุ
		General			
☑	☐	1. ความสมบูรณ์เครื่อง	☑	☐	
☑	☐	2. ความสะอาด (ช่องใส่ตัวอย่าง, ภายใน-นอกเครื่อง)	☑	☐	
☑	☐	3. สวิทช์ ปิด – เปิด เครื่อง (On-Off Swicth)	☑	☐	
☑	☐	4. ปุ่มกด (Keypad)	☑	☐	
☑	☐	5. หน้าจอ (Display, Screen Contrast)	☑	☐	
		Spectrophotometer			
☐	☐	6. แรงดันไฟฟ้า (Battery Backup) >= 2.5 VDC	☐	☐	
☐	☐	7. ตัวหมุนเลือกความยาวคลื่น (Wavelength Control)	☐	☐	
☑	☐	8. ความยาวคลื่น (Wavelength Check)	☑	☐	*
☑	☐	9. แหล่งกำเนิดแสง (UV < 3,000 hour)	☑	☐	9.2 Hours
☑	☐	10. แหล่งกำเนิดแสง (Visible < 5,000 hour)	☑	☐	741.5 Hours
☑	☐	11. ช่องวัดหลายตัวอย่าง (Carousel Module)	☑	☐	
		pH Meter and Conductivity Meter			
☐	☐	12. อิเล็คโทรด (Electrode and Connection Cable)	☐	☐	
☐	☐	13. ระดับสารละลายใน Electrode (Level KCl)	☐	☐	
☐	☐	14. ฝาปิดกันปลาย Electrode (Dust Protection Hood)	☐	☐	
☐	☐	15. ขาจับอิเล็คโทรด (Stand)	☐	☐	
		Turbidimeter			
☐	☐	16. ค่าความขุ่นที่ต่ำสุด (No Sample)	☐	☐	
☐	☐	17. ระดับการส่องสว่างของแสง (>= 2.5 ไม่เกิน 3.0)	☐	☐	
		Automatic titrator			
☐	☐	18. สภาพ Piston Burettes	☐	☐	
☐	☐	19. Function Rinsing and Dosing	☐	☐	
☐	☐	20. ระบบท่อสายยางและอุปกรณ์ประกอบ	☐	☐	

เพิ่มเติม/ข้อแนะนำ : *656.1nm=656.1nm

*486.0nm=485.5nm

Mr.Nattapat Rungrueang

Service Engineer

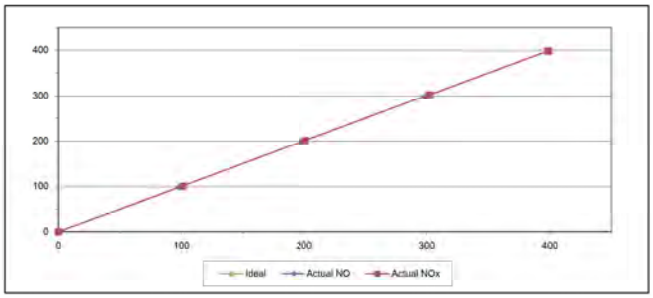
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DKSH Technology Limited
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ALS

MULTIPOINT CALIBRATION REPORT

Calibration Date	2-Jul-24	Equipment Name	NOx Analyzer
Manufacturer	Teledyne API	Model	T200
Serial No.	2198	Equipment ID	RYG_FS0252
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	55.88	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10	0.10
1	100.00	98.70	-1.30	-1.30	101.00	1.00	1.00
2	200.00	198.00	-2.00	-1.00	201.30	1.30	0.65
3	300.00	298.50	-1.50	-0.50	302.30	2.30	0.77
4	400.00	398.20	-1.80	-0.45	398.60	-1.40	-0.35
AVERAGE (%)				-0.63			0.43



Calibrated By

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

Approved By

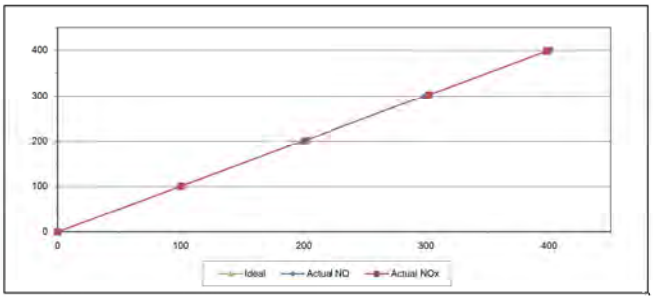
(Mr.Sarayuth Jittranont)
Assistant General Manager

ALS

MULTIPOINT CALIBRATION REPORT

Calibration Date	2-Jul-24	Equipment Name	NOx Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	148EH0E0	Equipment ID	BKK_FS1064
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	55.88	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10	0.10
1	100.00	99.10	-0.90	-0.90	100.70	0.70	0.70
2	200.00	199.30	-0.70	-0.35	201.40	1.40	0.70
3	300.00	298.50	-1.50	-0.50	302.30	2.30	0.77
4	400.00	401.40	1.40	0.35	398.30	-1.70	-0.42
AVERAGE (%)				-0.26			0.37



Calibrated By

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

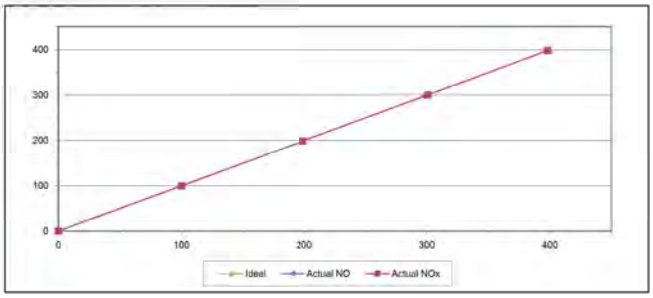
Approved By

(Mr.Sarayuth Jittranont)
Assistant General Manager

MULTIPOINT CALIBRATION REPORT

Calibration Date	2-Jul-24	Equipment Name	NOx Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	8G314J3K	Equipment ID	RYG_FS0264
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	55.88	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx	%Error NOx
ZERO	0.00	0.05	0.05	0.05	0.10	0.10	0.10
1	100.00	99.20	-0.80	-0.80	100.10	0.10	0.10
2	200.00	198.50	-1.50	-0.75	199.30	-0.70	-0.35
3	300.00	298.60	-1.40	-0.47	301.40	1.40	0.47
4	400.00	398.20	-1.80	-0.45	398.00	-2.00	-0.50
AVERAGE (%)				-0.48			-0.04



Calibrated By

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

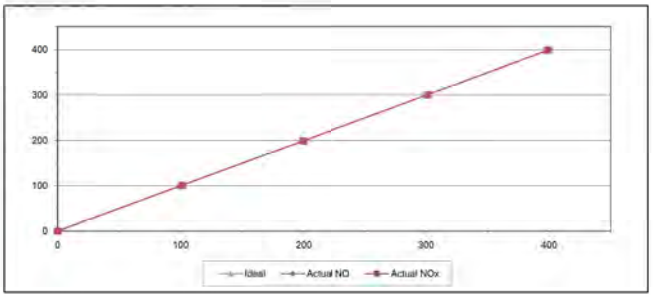
Approved By

(Mr.Sarayuth Jittranont)
Assistant General Manager

MULTIPOINT CALIBRATION REPORT

Calibration Date	3-Jul-24	Equipment Name	NOx Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	NV0ER3YH	Equipment ID	RYG_FS0459
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	55.88	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx	%Error NOx
ZERO	0.00	0.05	0.05	0.05	0.10	0.10	0.10
1	100.00	99.50	-0.50	-0.50	101.20	1.20	1.20
2	200.00	198.70	-1.30	-0.65	199.70	-0.30	-0.15
3	300.00	301.10	1.10	0.37	301.40	1.40	0.47
4	400.00	400.30	0.30	0.08	398.80	-1.20	-0.30
AVERAGE (%)				-0.13			0.26



Calibrated By

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

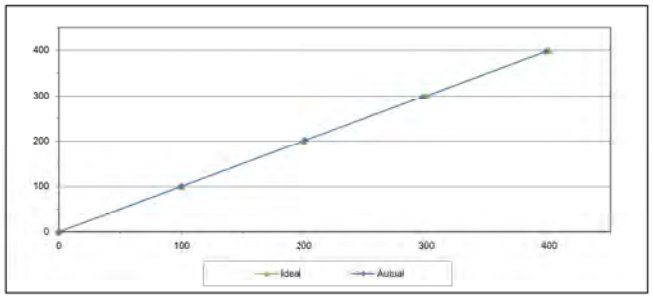
Approved By

(Mr.Sarayuth Jittranont)
Assistant General Manager

MULTIPOINT CALIBRATION REPORT

Calibration Date	4-Jul-24	Equipment Name	SO2 Analyzer
Manufacturer	Teledyne API	Model	T100
Serial No.	1773	Equipment ID	RYG_FS0251
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	56.3	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS			
	Ideal	Autua	Error	%Error
ZERO	0.00	0.10	0.10	0.10
1	100.00	99.60	-0.40	-0.40
2	200.00	201.20	1.20	0.60
3	300.00	297.30	-2.70	-0.90
4	400.00	397.60	-2.40	-0.60
AVERAGE (%)				-0.24



Calibrated By

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

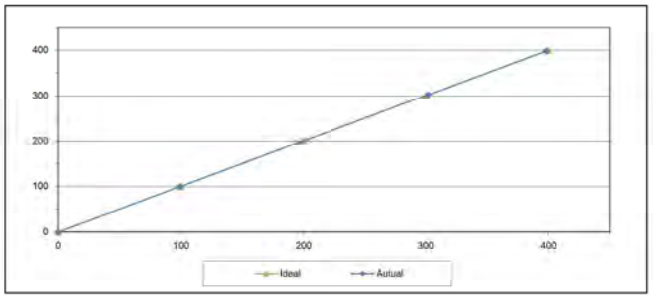
Approved By

(Mr.Sarayuth Jittranont)
Assistant General Manager

MULTIPOINT CALIBRATION REPORT

Calibration Date	4-Jul-24	Equipment Name	SO2 Analyzer
Manufacturer	HORIBA	Model	APSA-370
Serial No.	NM3M2D5M	Equipment ID	RYG_FS0266
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	56.3	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS			
	Ideal	Autual	Error	%Error
ZERO	0.00	0.10	0.10	0.10
1	100.00	98.70	-1.30	-1.30
2	200.00	201.40	1.40	0.70
3	300.00	302.30	2.30	0.77
4	400.00	398.30	-1.70	-0.42
AVERAGE (%)				-0.03



Calibrated By

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

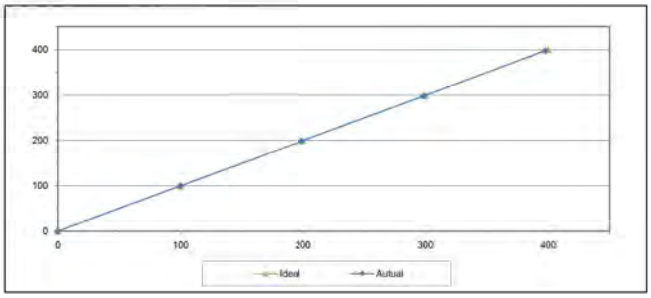
Approved By

(Mr.Sarayuth Jittranont)
Assistant General Manager

MULTIPOINT CALIBRATION REPORT

Calibration Date	4-Jul-24	Equipment Name	SO2 Analyzer
Manufacturer	HORIBA	Model	APSA-370
Serial No.	YPRXJJ20	Equipment ID	RYG_FS0263
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	56.3	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS			
	Ideal	Autua	Error	%Error
ZERO	0.00	0.10	0.10	0.10
1	100.00	99.80	-0.20	-0.20
2	200.00	199.40	-0.60	-0.30
3	300.00	298.20	-1.80	-0.60
4	400.00	398.00	-2.00	-0.50
AVERAGE (%)				-0.30



Calibrated By

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

Approved By

(Mr.Sarayuth Jittranont)
Assistant General Manager

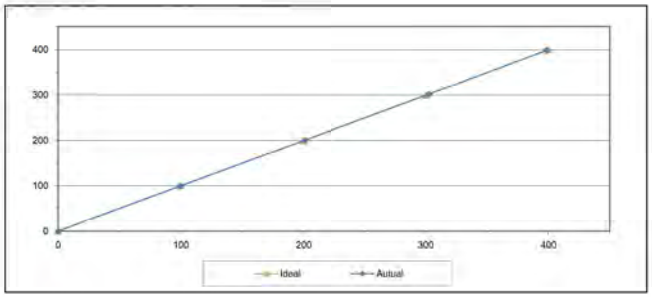
ALS Laboratory Group

FORM NO.: F 06-056 REVISION NO.: - ISSUE DATE: 02/04/12

MULTIPOINT CALIBRATION REPORT

Calibration Date	5-Jul-24	Equipment Name	SO2 Analyzer
Manufacturer	HORIBA	Model	APSA-370
Serial No.	PAUY0T7A	Equipment ID	RYG_FS0458
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	56.3	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS			
	Ideal	Autual	Error	%Error
ZERO	0.00	0.10	0.10	0.10
1	100.00	98.90	-1.10	-1.10
2	200.00	201.00	1.00	0.50
3	300.00	302.30	2.30	0.77
4	400.00	398.50	-1.50	-0.38
AVERAGE (%)				-0.02



Calibrated By

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

Approved By

(Mr.Sarayuth Jittranont)
Assistant General Manager

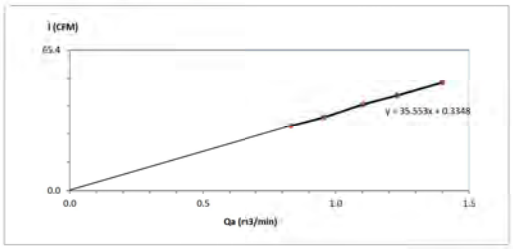
ALS Laboratory Group

FORM NO.: F 06-056 REVISION NO.: - ISSUE DATE: 02/04/12

High Volume Air Sampler Calibration Worksheet

Project Site :	Global Power Synergy Public Company Limited	Barometric Pressure (mm Hg) :	759.2
Calibrate Location :	ห้องประชุมอัครพาร	Temperature (°C) :	28.2
Calibrate Date :	24-Sep-24	High Volume ID :	RYG_FS0187
CalibrationSheet No.:	C-240924-RYG_FS0187	High Volume Model :	TE-5009X
Calibrator ID:	RYG_FS0415	High Volume S/N :	4795
Calibrator Model :	TE-5028A	Calibrator Slope :	1.04247
Calibrator S/N :	3494	Calibrator Intercept :	-0.02107

Test No.	Delta H_2O (inch)	Qa (m^3/min)	I : Chart (CFM)	Linear Regression
1	1.8	0.832	30	Slope : 35.5530
2	2.4	0.958	34	Intercept : 0.3348
3	3.2	1.103	40	Correlation Coefficient : 0.9992
4	4.0	1.230	44	
5	5.2	1.399	50	



Calibrated by

(Mr.Nontachai Uppathamp)
Field Scientist(2)

Approved by :

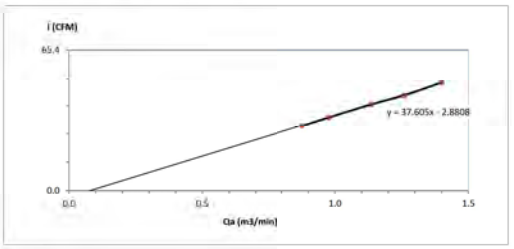
(Mr. Noppong Juntarupan)
Enviro Field Coordinator Scientist (3)

FORM NO.: F 06-074 REVISION NO.:2 ISSUE DATE: 20/11/23

High Volume Air Sampler Calibration Worksheet

Project Site :	Global Power Synergy Public Company Limited	Barometric Pressure (mm Hg) :	759.2
Calibrate Location :	ห้องประชุมอัครพาร	Temperature (°C) :	28.2
Calibrate Date :	24-Sep-24	High Volume ID :	RYG_FS0186
CalibrationSheet No.:	C-240924-RYG_FS0186	High Volume Model :	TE-5009X
Calibrator ID:	RYG_FS0415	High Volume S/N :	4794
Calibrator Model :	TE-5028A	Calibrator Slope :	1.04247
Calibrator S/N :	3494	Calibrator Intercept :	-0.02107

Test No.	Delta H_2O (inch)	Qa (m^3/min)	I : Chart (CFM)	Linear Regression
1	2.0	0.878	30	Slope : 37.6048
2	2.5	0.977	34	Intercept : -2.8808
3	3.4	1.136	40	Correlation Coefficient : 0.9993
4	4.2	1.260	44	
5	5.2	1.399	50	



Calibrated by

(Mr.Nontachai Uppathamp)
Field Scientist(2)

Approved by :

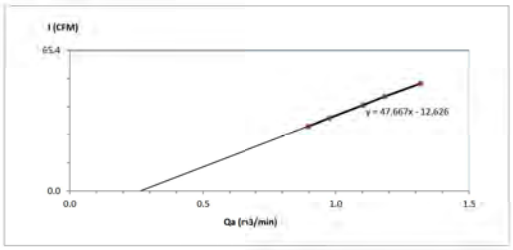
(Mr. Noppong Juntarupan)
Enviro Field Coordinator Scientist (3)

FORM NO.: F 06-074 REVISION NO.:2 ISSUE DATE: 20/11/23

High Volume Air Sampler Calibration Worksheet

Project Site :	Global Power Synergy Public Company Limited	**Barometric Pressure (mm Hg) :**	759.2
Calibrate Location :	วัดยางสูงหนุ่ม	**Temperature (°C) :**	28.2
Calibrate Date :	24-Sep-24	**High Volume ID :**	RYG_FS0188
CalibrationSheet No.:	C-240924-RYG_FS0188	**High Volume Model :**	TE-5009X
Calibrator ID:	RYG_FS0415	**High Volume S/N :**	4796
Calibrator Model :	TE-5028A	**Calibrator Slope :**	1.04247
Calibrator S/N :	3494	**Calibrator Intercept :**	-0.02167

Test No.	Delta H_2O (inch)	Qa (m^3/min)	I : Chart (CFM)	Linear Regression
1	2.1	0.897	30	Slope : 47.6674
2	2.5	0.977	34	Intercept : -12.6263
3	3.2	1.103	40	Correlation Coefficient : 0.9998
4	3.7	1.184	44	
5	4.6	1.318	50	



Calibrated by: _____ Approved by: _____

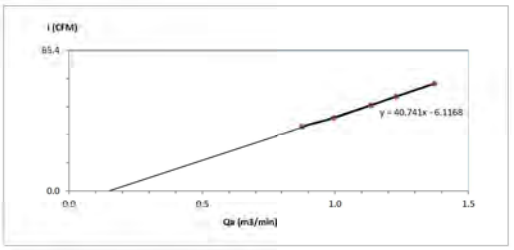
(Mr.Nontachai Uppathamp)
Field Scientist(2)

(Mr. Noppong Juntarupan)
Enviro Field Coordinator Scientist (3)

High Volume Air Sampler Calibration Worksheet

Project Site :	Global Power Synergy Public Company Limited	**Barometric Pressure (mm Hg) :**	759.2
Calibrate Location :	วัดนาบอล	**Temperature (°C) :**	28.2
Calibrate Date :	24-Sep-24	**High Volume ID :**	RYG_FS0400
CalibrationSheet No.:	C-240924-RYG_FS0400	**High Volume Model :**	TE-5009X
Calibrator ID:	RYG_FS0415	**High Volume S/N :**	5691
Calibrator Model :	TE-5028A	**Calibrator Slope :**	1.04247
Calibrator S/N :	3494	**Calibrator Intercept :**	-0.02167

Test No.	Delta H_2O (inch)	Qa (m^3/min)	I : Chart (CFM)	Linear Regression
1	2.0	0.876	30	Slope : 40.7411
2	2.6	0.996	34	Intercept : -6.1168
3	3.4	1.136	40	Correlation Coefficient : 0.9991
4	4.0	1.230	44	
5	5.0	1.373	50	



Calibrated by: _____ Approved by: _____

(Mr.Nontachai Uppathamp)
Field Scientist(2)

(Mr. Noppong Juntarupan)
Enviro Field Coordinator Scientist (3)

Sartorius (Thailand) Co., Ltd.
129 Rama 9 Road, Huaykwang, Huaykwang, Bangkok 10310
Tel: +66 2643 8361-6 , e-mail: service.thailand@sartorius.com

NSC-TISI-TIS 17025
CALIBRATION 0426

SARTORIUS

Certificate of Calibration

Model Number :	LA130S-F	Certificate No. :	24BCI0068
Description :	Analytical Balance	Issued Date :	Friday, February 23, 2024
Serial Number :	25409664	Reference No. :	229196
ID No. :	RYG_EN0001		
Manufacturer :	Sartorius	Page No. :	1 Of 2

REVIEW BY Thanitat
APPROVED BY
NEXT CAL. DATE 22/02/2025

Customer Name : ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
616/10 Moo 5 T.Maenam Khu, A.Pluak Daeng, Rayong 21140, Thailand.

Calibrated Place : ALS Laboratory Group (Thailand) Co., Ltd.(Balance Room)
616/10 Moo 5 T.Maenam Khu, A.Pluak Daeng, Rayong 21140, Thailand.

Calibrated By : Mr.Chonchai Inthana
Calibration Date : Thursday, February 22, 2024

Calibration Procedure No. : This calibration was conducted by
Using in-house calibration procedure number (WI-003)
Based on UKAS LAB 14 : 2019

Metrological data :
Capacity : 150 g Readability : 0.0001 g

Ambients Conditions:
Temperature : 23.6 °C ± 5.0 °C
Humidity : 54.0 % RH ± 10.0 % RH
Pressure ± _____

Reasons for calibration
☐ New Installation ☐ Service / Repaired ☑ Re-calibration/ Maintenance

Equipment Condition: ☑ Good Operate ☐ Fair

Measurement Method UKAS Publication Ref :Lab 14

The measurement uncertainty stated is the expended uncertainty which is obtained from the standard uncertainty multiplied by the coverage factor (k=2) to provide a level of confidence of approximately 95%. It is determined in accordance with the Guide to Expression of Uncertainty in Measurement (GUM). The calibration certificate documents the traceability to National Standards, which realise the unit of measurement according to the International Standard System of Units (SI). Report of Tolerance came form list of Sartorius Metrological Specifications.

Traceability:

Model Number	Description	Traceability	Cetificate No.	Due Date
YCS011-522-00	Sartorius weight set 1mg - 5000g E2,YCS011-522-00	TCS	M2308197S	23-Aug-2025
MHB-382SD	Humidity/Barometer/Temp Lutron MHB-382SD	DKSH	C19231845	23-Aug-2024

This certificate relate and apply this equipment only.
This certificate may not be reproduced other than in full except with the prior written approval of the Verification Operation Division Sartorius (Thailand) Co., Ltd.

Mr.chonchai Intrhana(Technical Manager)

STAMP SARTORIUS ISO/IEC 17025:2017

Sartorius (Thailand) Co., Ltd.
129 Rama 9 Road, Huaykwang, Huaykwang, Bangkok 10310
Tel: +66 2643 8361-6 Fax: +66 2643-8367, e-mail: service.thailand@sartorius.com

SARTORIUS

Certificate of Calibration

Model Number :	LA130S-F	Certificate No. :	24BCI0068
Description :	Analytical Balance	Issued Date :	Friday, February 23, 2024
Serial Number :	25409664	Reference No. :	229196
ID No. :	RYG_EN0001		
Manufacturer :	Sartorius	Page No. :	2 of 2

Calibration Results : Without Adjustment

Repeatability

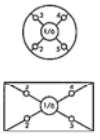
The reproducibility is the ability of a weighing instrument to display nearly identical reaouts under constant test conditions when the same load within a measurement series is placed repeatedly on the weighing pan in the same manner. The standard deviation is used to express reproducibility quantitatively.

Nominal Value : (Low Load)	10.0000	99.9999
10 g	10.0000	100.0000
Tolerance	10.0000	100.0001
0.0001 g	10.0000	100.0001
	9.9999	100.0000
Nominal Value : (High Load)	10.0000	100.0001
100 g	10.0000	100.0000
Tolerance	10.0000	100.0001
0.0001 g	9.9999	100.0002
	9.9999	100.0001
Standard Deviation	0.00005	0.00008

Eccentricity (Off-center loading error)

The off-center loading error is yielded by the difference between the readout of the load, i.e. 1/3 or 1/4 of maximim capacity, placed in the middle of the weighing pan and between each of four additional measurement points (positions defined according to OIML R76).

Nominal value : 50 g
Tolerance *0.0004* g



	Difference
1	--
2	-0.0001
3	0.0001
4	0.0002
5	0.0000
6	-

Linearity

The linearity, also called linearity error. Describes the deviation of the characteristic curve of a weighing instrument from the linear slope.

Tolerance *0.0002* g

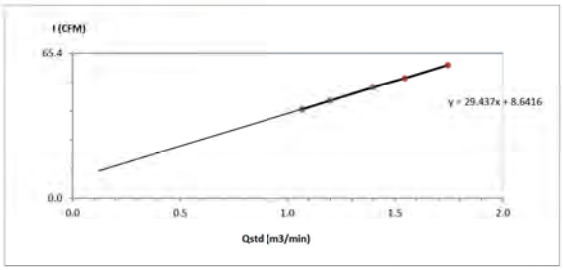
Nominal Value (g)	Conventional Mass Value (g)	Displayed Value (g)	Deviation (g)	Uncertainty (g)
0.01	0.0100	0.0100	0.0000	0.00020
0.05	0.0500	0.0500	0.0000	0.00021
0.1	0.1000	0.1000	0.0000	0.00021
0.5	0.5000	0.5000	0.0000	0.00021
1	1.0000	1.0000	0.0000	0.00021
2	2.0000	2.0000	0.0000	0.00021
5	5.0000	5.0000	0.0000	0.00021
10	10.0000	10.0001	0.0001	0.00024
20	20.0000	20.0001	0.0001	0.00021
100	100.0000	99.9999	-0.0001	0.00024

End of Report.

High Volume Air Sampler Calibration Worksheet

Project Site :	Global Power Synergy Public Company Limited	**Barometric Pressure (mm Hg) :**	759.2
Calibrate Location :	วัดประชุมมิตรปารุง	**Temperature (°C) :**	28.2
Calibrate Date :	24-Sep-24	**High Volume ID :**	RYG_FS0177
CalibrationSheet No.:	C-240924-RYG_FS0177	**High Volume Model :**	TE-5170D
Calibrator ID:	RYG_FS0415	**High Volume S/N :**	4803
Calibrator Model :	TE-5028A	**Calibrator Slope :**	1.66431
Calibrator S/N :	3494	**Calibrator Intercept :**	-0.03482

Test No.	Delta H_2O (inch)	Q_{std} (m^3/min)	I : Chart (CFM)	Linear Regression	
1	3.0	1.0694	40	Slope :	29.4374
2	3.8	1.1992	44	Intercept :	8.6416
3	5.2	1.3969	50	Correlation Coefficient :	0.9998
4	6.4	1.5460	54		
5	8.2	1.7453	60		



Calibrated by _____ Approved by : _____

(Mr.Nontachai Uppathamp)
Field Scientist(2)

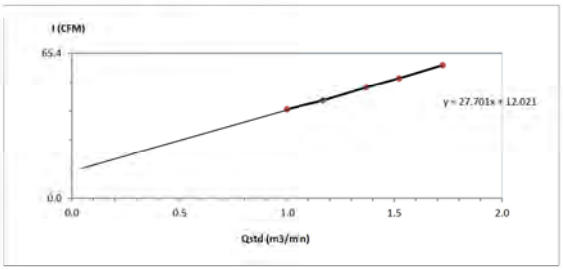
(Mr. Noppong Juntarupan)
Enviro Field Coordinator Scientist (3)

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

High Volume Air Sampler Calibration Worksheet

Project Site :	Global Power Synergy Public Company Limited	**Barometric Pressure (mm Hg) :**	759.2
Calibrate Location :	บ้านสำนักมะม่วง	**Temperature (°C) :**	28.2
Calibrate Date :	24-Sep-24	**High Volume ID :**	RYG_FS0178
CalibrationSheet No.:	C-240924-RYG_FS0178	**High Volume Model :**	TE-5170D
Calibrator ID:	RYG_FS0415	**High Volume S/N :**	4804
Calibrator Model :	TE-5028A	**Calibrator Slope :**	1.66431
Calibrator S/N :	3494	**Calibrator Intercept :**	-0.03482

Test No.	Delta H_2O (inch)	Q_{std} (m^3/min)	I : Chart (CFM)	Linear Regression	
1	2.6	0.9980	40	Slope :	27.7006
2	3.6	1.1682	44	Intercept :	12.0206
3	5.0	1.3705	50	Correlation Coefficient :	0.9993
4	6.2	1.5222	54		
5	8.0	1.7243	60		



Calibrated by _____ Approved by : _____

(Mr.Nontachai Uppathamp)
Field Scientist(2)

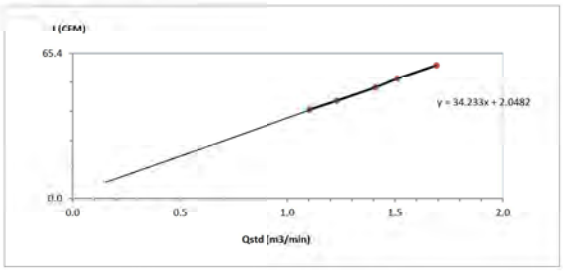
(Mr. Noppong Juntarupan)
Enviro Field Coordinator Scientist (3)

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

High Volume Air Sampler Calibration Worksheet

Project Site :	Global Power Synergy Public Company Limited	**Barometric Pressure (mm Hg) :**	759.2
Calibrate Location :	วัดป่ากลุกหญ้า	**Temperature (°C) :**	28.2
Calibrate Date :	24-Sep-24	**High Volume ID :**	RYG_FS0176
CalibrationSheet No.:	C-240924-RYG_FS0176	**High Volume Model :**	TE-5170D
Calibrator ID:	RYG_FS0415	**High Volume S/N :**	4802
Calibrator Model :	TE-5028A	**Calibrator Slope :**	1.66431
Calibrator S/N :	3494	**Calibrator Intercept :**	-0.03482

Test No.	Delta H_2O (inch)	Q_{std} (m^3/min)	I : Chart (CFM)	Linear Regression	
1	3.2	1.1034	40	Slope :	34.2332
2	4.0	1.2295	44	Intercept :	2.0482
3	5.3	1.4100	50	Correlation Coefficient :	0.9996
4	6.1	1.5101	54		
5	7.7	1.6923	60		



Calibrated by _____ Approved by : _____

(Mr.Nontachai Uppathamp)
Field Scientist(2)

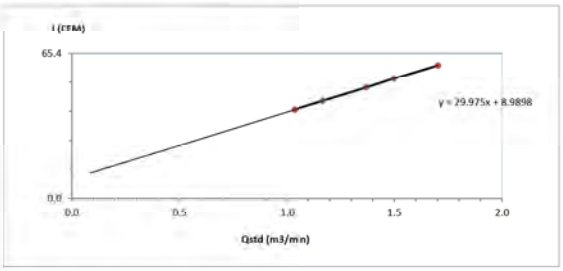
(Mr. Noppong Juntarupan)
Enviro Field Coordinator Scientist (3)

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

High Volume Air Sampler Calibration Worksheet

Project Site :	Global Power Synergy Public Company Limited	**Barometric Pressure (mm Hg) :**	759.2
Calibrate Location :	วัดมาบชลุด	**Temperature (°C) :**	28.2
Calibrate Date :	24-Sep-24	**High Volume ID :**	RYG_FS0662
CalibrationSheet No.:	C-240924-RYG_FS0662	**High Volume Model :**	TE-5009X
Calibrator ID:	RYG_FS0415	**High Volume S/N :**	6259
Calibrator Model :	TE-5028A	**Calibrator Slope :**	1.66431
Calibrator S/N :	3494	**Calibrator Intercept :**	-0.03482

Test No.	Delta H_2O (inch)	Q_{std} (m^3/min)	I : Chart (CFM)	Linear Regression	
1	2.8	1.0343	40	Slope :	29.9748
2	3.6	1.1682	44	Intercept :	8.9898
3	5.0	1.3705	50	Correlation Coefficient :	1.0000
4	6.0	1.4980	54		
5	7.8	1.7031	60		



Calibrated by _____ Approved by : _____

(Mr.Nontachai Uppathamp)
Field Scientist(2)

(Mr. Noppong Juntarupan)
Enviro Field Coordinator Scientist (3)

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

JIRANATEE ASSOCIATES CO.,LTD.
Jiranatee Associates Co.,Ltd.
63/14-15, 67/35-36
Petchkasem 7,7/1, Rd. Wutthajira, Bangkokyai,
Bangkok 10600(Thailand)
Tel: +66(0)868808812
Mobile: +66(0)899899453
E-mail: jnac-calibration@jiranatee.com
Web site: www.jiranatee.com

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

Air speed measurement laboratory
Calibration services department.

NSC – TISI – TIS 17025
CALIBRATION 0367

Certificate Number
CWS-031-67

CERTIFICATE OF CALIBRATION

MEASUREMENT ITEM : Cup anemometer
MANUFACTURER : Novalynx
MODEL/TYPE : Sensor: WS-02F
Data logger: 110-WS-2SDL-D
SERIAL NUMBER : Sensor: WSD-A5660
Data logger: A5660
ID NUMBER : RYG_FS0530
CONDITION AS-RECEIVED : Used item
CUSTOMER : ALS laboratory group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd, Khwaeng Suan Luang, Khet Suan Luang, Bangkok 10250 Thailand.

RECEIVED DATE : 08 Aug 2024
MEASUREMENT DATE : 21 Aug 2024
ISSUE DATE : 21 Aug 2024

ENVIRONMENTAL CONDITIONS:
Ambient condition in the laboratory are as follow:

Temperature	: 23.0 ± 3.0	°C
Relative Humidity	: 55.0 ± 15.0	%RH
Atmospheric Pressure	: 1010± 10	hPa

PLACE OF CALIBRATION : Eiffel-type wind tunnel of Jiranatee Associates Co., Ltd.

CALIBRATION CONDITIONS

: Wind tunnel cross-section area[1]	900	cm^2
Wind direction frontal area[2]	100	cm^2
Diameter of mounting pipe[3]	-	mm
Blockage ratio of test object[4]	0.111	( )

Preconditioning : 24 hours at ambient conditions.
Measurement Condition : The average values during measurement are (23.6) °C, (41.8) %RH and (1002.8) hPa.

TABULATION OF RESULTS:
The table on next page give the measured values.

Calibrated by:
☑ Mr. Sorawit Thuchalad
☐ Miss Jittraporn Lertsomphol

Approved signatory:
Mr. Parinya Booncharoen
Calibration Department Manager

REVIEW BY
APPROVED BY
NEXT CAL. DATE 21/2/26

Remark:
[1] Nozzle cross-section area of the wind tunnel
[2] Projected cross-section area of the tested object include mounting pipe
[3] Diameter of mounting pipe
[4] Ratio [2] to [1]

Calibration procedure:
The Cup anemometer was calibrated against Standard air velocity transducer model: 8455IAS and pitot tube with precision differential pressure meter model: DPM2500 in an close test-section of Eiffel-type wind tunnel with 900 cm^2 cross test section area. The WI-CL-002 based on IEC 61400-12-1, Wind energy generation systems – Part 12-1: Power performance measurements of electricity producing wind turbines, March 2017 was used as a calibration guideline.

Traceability:
This certificate provides a traceability of The measurement to recognized the national standards, and to realization of the international system of units (SI) through the NIMT (National Metrology Institute of Thailand) via Certificate number: MW-0007-24 and MW-0053-23

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

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

Certificate Number
CWS-031-67

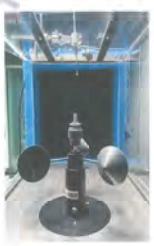
MEASUREMENT RESULTS[5]

The Cup anemometer, Unit Under Calibration (UUC) was exercise at 10 m/s for 5 minutes prior to calibration being performed. The standard air velocity 0.5 m/s to 5 m/s was calculated by a standard air velocity transducer which was installed 50 mm away from wind tunnel nozzle and installed 40 mm away from top of the test section and the standard air velocity 5 m/s to 30 m/s was calculated by a pitot tube with precision differential pressure meter which was installed 50 mm away from wind tunnel nozzle and installed 40 mm away from top of the test section, UUC was mounted on a round vertical tube of the lower plate at center of test section. The calibration was carried out under both rising and falling air velocity in the range of 1 m/s to 16 m/s at calibration interval of 1 m/s. The results of calibration and associated measurement uncertainties are reported in the table below.

v_{std}[2] (m/s)	Temp. wind tunnel (°C)	Temp. room (°C)	v_{uuc}[3] (m/s)	Error (m/s)	U (k=2) (m/s)
0.995	23.70	23.55	0.8	-0.2	0.31
2.010	23.46	23.55	1.8	-0.2	0.31
2.957	23.64	23.55	2.9	-0.1	0.31
4.037	23.66	23.55	3.8	-0.2	0.31
4.99	23.44	23.55	4.9	-0.1	0.31
5.96	23.10	23.55	6.0	0.0	0.31
7.04	23.50	23.55	7.0	0.0	0.31
7.97	22.94	23.55	8.0	0.0	0.31
8.99	23.24	23.55	9.1	0.1	0.31
9.97	22.92	23.55	10.2	0.2	0.31
10.96	23.40	23.55	11.1	0.1	0.31
12.09	23.08	23.55	12.4	0.3	0.31
12.95	23.40	23.55	13.3	0.3	0.31
14.09	23.20	23.55	14.3	0.2	0.31
15.02	23.40	23.55	15.3	0.3	0.31
15.97	23.30	23.55	16.4	0.4	0.31

Remark:
[1] Calibration results only count for the tested circumstances and environmental conditions during which calibration took place
[2] Velocity of standard
[3] Velocity of Unit Under Calibration

PHOTO OF CALIBRATION SET-UP



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

End of Certificate of Calibration

JIRANATEE ASSOCIATES CO.,LTD.
Jiranatee Associates Co.,Ltd.
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Web site: www.jiranatee.com

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

Wind direction measurement laboratory
Calibration services department.

NSC – TISI – TIS 17025
CALIBRATION 0367

Certificate Number
CWD-031-67

CERTIFICATE OF CALIBRATION

MEASUREMENT ITEM : Wind Direction Sensor
MANUFACTURER : Novalynx
MODEL/TYPE : Sensor: WS-02F
Data logger: 110-WS-2SDL-D
SERIAL NUMBER : Sensor: WSD-A5660
Data logger: A5660
ID NUMBER : RYG_FS0530
CONDITION AS-RECEIVED : Used item
CUSTOMER : ALS laboratory group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd, Khwaeng Suan Luang, Khet Suan Luang, Bangkok 10250 Thailand.

RECEIVED DATE : 08 Aug 2024
MEASUREMENT DATE : 21 Aug 2024
ISSUE DATE : 21 Aug 2024

ENVIRONMENTAL CONDITIONS:
Ambient condition in the laboratory are as follow:

Temperature	: 23.0 ± 3.0	°C
Relative Humidity	: 55.0 ± 15.0	%RH
Atmospheric Pressure	: 1010± 10	hPa

PLACE OF CALIBRATION : Eiffel-type wind tunnel of Jiranatee Associates Co., Ltd.

CALIBRATION CONDITION

: Wind tunnel cross-section area[1]	900	cm^2
Wind direction frontal area[2]	129	cm^2
Diameter of mounting pipe[3]	-	mm
Blockage ratio of test object[4]	0.143	( )

Preconditioning : 24 hours at ambient conditions.
Measurement Condition : The average values during measurement are (23.7)°C, (46.3) %RH and (1007.5) hPa.

TABULATION OF RESULTS:
The table on next page give the measured values.

Calibrated by:
☑ Mr. Sorawit Thuchalad
☐ Miss Jittraporn Lertsomphol

Approved signatory:
Mr. Parinya Booncharoen
Calibration Department Manager

Remark:
[1] Nozzle cross-section area of the wind tunnel
[2] Projected cross-section area of the tested object include mounting pipe
[3] Diameter of mounting pipe
[4] Ratio [2] to [1]

Calibration procedure:
The wind direction sensor was calibrated against Standard Rotary Encoder model: AX40H/S-DMDM-F3-S-UD in an close test-section of Eiffel-type wind tunnel with 900 cm^2 cross test section area. The WI-CI-008 based on IEC 61400-12-1, Wind energy generation systems – Part 12-1: Power performance measurements of electricity producing wind turbines, March 2017 was used as a calibration guideline.

Traceability:
This certificate provides a traceability of The measurement to recognized the national standards, and to realization of the international system of units (SI) through the NIMT (National Metrology Institute of Thailand) via Certificate number: DA-0036-23.

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

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

Certificate Number
CWD-031-67

MEASUREMENT RESULTS[5]

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

Air speed m/s	D'_{std} Degree (°)	D'_{uuc} Degree (°)	Error Degree (°)	U (k=2) Degree (°)
	0.000	0	0	0.80
	45.000	42	-3	0.80
	90.000	88	-2	0.80
	135.000	133	-2	0.80
5.0	180.000	181	1	0.80
	225.000	229	4	0.80
	270.000	273	3	0.80
	315.000	318	3	0.80

Remark:
[1] Calibration results only count for the tested circumstances and environmental conditions during which calibration took place
[2] Direction of standard
[3] Direction of Unit Under Calibration

End of Certificate of Calibration

Jiranatee Associates Co., Ltd.

JIRANATEE ASSOCIATES CO.,LTD.

Jiranatee Associates Co.,Ltd
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Accredited calibration laboratory
ISO/IEC 17025:2017
NSC-TISI-TIS 17025
CALIBRATION 0367

Temperature measurement laboratory
Calibration services department.

NSC – TISI – TIS 17025
CALIBRATION 0367

CERTIFICATE OF CALIBRATION

Certificate No. : CDT-156-67

MEASUREMENT ITEM	: Data Logger with Temperature sensor
MANUFACTURER	: Novalynx
MODEL/TYPE	: 110-WS-25DL-D
SERIAL NUMBER	: A5660
ID NUMBER	: RYG_T50530
CONDITION AS-RECEIVED	: Used item
CUSTOMER	: ALS laboratory group (Thailand) Co., Ltd. 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Suan Luang, Khet Suan Luang, Bangkok 10250 Thailand.
RECEIVED DATE	: 08 Aug 2024
MEASUREMENT DATE	: 21 Aug 2024
ISSUE DATE	: 21 Aug 2024

ENVIRONMENTAL CONDITIONS:
Ambient condition in the laboratory are as follow:

Temperature	: 23.0 ± 3.0	°C
Relative Humidity	: 55.0 ± 15.0	%RH

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

TABULATION OF RESULTS:
The table on next page give the measured values.

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

Traceability:
The measurement results are traceable to the international system of units (SI) through National Institute of Metrology Thailand (NIMT) Certificate number: TT-0047-24, Certificate number: ER-0101-23

Reference Used During Calibration:
1. Standard Temperature Probe
Model: STS 100 A500, Serial No.: 667682-05, Due date: 26 Mar 2025
2. Digital Temperature Indicator
Model: DTI-1000-A MK II, Serial No.: 671407-00591 Due date: 14 Sep 2024

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

Calibrated by:
☐ Mr. Sorawit Thachalad
☑ Miss Jittraporn Lertsomphol
☐ Miss Ruangrumpai Phoommit

Approved signatory: .....
Mr. Parinya Booncharoen
Calibration Department Manager

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

Jiranatee Associates Co.,Ltd.

JIRANATEE ASSOCIATES CO.,LTD.

Continuation of Certificate of Calibration Number CDT-156-67

Result of Calibration: ☑ Without Adjustment ☐ With Adjustment

Calibration Range: 20 °C to 40 °C

Function:
Table 3: This equipment was connected with temperature sensor Model: HMP60 S/N: S4620631. Dimension: Diameter 12 mm. Length 80 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.050	19.6	-0.4	0.099
80	25.053	24.6	-0.5	0.099
80	30.045	29.7	-0.3	0.099
80	35.026	34.5	-0.5	0.099
80	40.018	39.4	-0.6	0.099

UUC*: Unit Under Calibration

End of Certificate of Calibration

JIRANATEE ASSOCIATES CO.,LTD.

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

Relative humidity and Air Temperature measurement laboratory
Calibration services department.

CERTIFICATE OF CALIBRATION

Certificate No. : CRT-032-67

MEASUREMENT ITEM	: Relative humidity with data logger
MANUFACTURER	: Novalynx
MODEL/TYPE	: Data Logger: 110-WS-25DL-D Sensor: HMP60
SERIAL NUMBER	: Data Logger: A5660 Sensor: S4620631
ID NUMBER	: RYG_T50530
CONDITION AS-RECEIVED	: Used item
CUSTOMER	: ALS laboratory group (Thailand) Co., Ltd. 104 Phatthanakan 40, Phatthanakan Rd, Khwaeng Suan Luang, Khet Suan Luang, Bangkok, 10250 Thailand.
RECEIVED DATE	: 08 Aug 2024
MEASUREMENT DATE	: 21 Aug 2024
ISSUE DATE	: 21 Aug 2024

ENVIRONMENTAL CONDITIONS:
Ambient condition in the laboratory are as follow:

Temperature	: 23.0 ± 3.0	°C
Relative Humidity	: 55.0 ± 15.0	%RH

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

TABULATION OF RESULTS:
The table on next page give the measured values.

Calibration procedure:
The Relative humidity and Air Temperature calibration was done by In-house calibration method as WI-CL-009 and WI-CL-010 according to comparison method with Standard Chilled Mirror hygrometer with Temperature sensor and standard Humidity generator chamber.

Traceability:
The measurements are traceable to the international system of units (SI) through National Institute of Metrology Thailand (NIMT). Certificate number: TH-0079-23 and through Jiranatee Associates Co., Ltd. Certificate number: CDT-001-67.

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

Calibrated by:
☐ Mr. Sorawit Thachalad
☑ Miss Jittraporn Lertsomphol
☐ Miss Ruangrumpai Phoommit

Approved signatory: .....
Mr. Parinya Booncharoen
Calibration Department Manager

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

Jiranatee Associates Co.,Ltd.

JIRANATEE ASSOCIATES CO.,LTD.

Continuation of Certificate of Calibration Number: CRT-032-67

Measurement Results:

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

Result of Calibration: ☑ Without Adjustment ☐ With Adjustment

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

Air Temperature (°C)	Standard Reading (%RH)	UUC Reading (%RH)	Error (%RH)	Uncertainty ± (%RH)
29.82	19.61	17.8	-1.8	0.83
29.89	50.72	48.0	-2.7	1.3
29.87	82.34	78.5	-3.9	2.3

UUC*: Unit Under Calibration

End of Certificate of Calibration

Jiranatee Associates Co.,Ltd.

THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-67/0292 **MTC No.** EEL. BP. 83/0267

CALIBRATION CERTIFICATE

Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd.
Address : 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok, 10250.
Calibrated at : Electrical and Electronic Standards Laboratory, Industrial Metrology and Testing Service Centre.
Soi 1C, Bangpoo Industrial Estate, Sukhumvit Rd., Muang, Samutprakan 10280.

Instrument Calibrated :
Description : Sound Calibrator
Manufacturer : Rion
Model : NC-74
Serial No. : 34178121 (ID:RYG_FS0213)

Ambient Environment
Temperature : (23 ± 3) °C
Relative Humidity : (50 ± 15) %
Ambient Pressure : (101.325 ± 1.500) kPa

Standards used :
1. Digital Function Synthesizer NF Electronic DF-193A S/N 122037.
2. Measuring Amplifier Bruel&Kjaer 2636 S/N 1537484.
3. Programmable Attenuator Tamagawa TPA-303A S/N OF 2214.
4. Digital Multimeter Agilent 34401A S/N MY44005560.
5. Pressure Transmitter Vaisala PTB202AD S/N T0650001.
6. Audio Analyzer Keithley 2015-P S/N4106495.
7. Condenser Microphone B&K 4180 S/N 2889871.

REVIEW BY Mandarin P
APPROVED BY
NEXT CAL. DATE 29/2/25

Calibration Procedure: CP-102-04 based on IEC 60942-2003; The sound pressure level generated by sound calibrator under test shall be measured by standard microphone using an insert voltage technique.

This instrument has been calibrated against standards maintained at Electrical and Electronic Standards Laboratory (EEL), which are traceable to the International System of Units through the National Institute of Metrology (Thailand).

The information on actual reading is attached herewith and the uncertainty limits quoted refer to the measured values only.

Date of Receipt : 19 Feb. 2024
Date of Calibration : 28 Feb. 2024

The results relate only to the items tested/calibrated or value assigned.
Advertising the Report/Certificate and publicity of the results except in full are prohibited unless written permission is obtained from the governor of TISTR.

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THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-67/0292 **MTC No.** EEL. BP. 83/0267

The reported expanded uncertainty is based upon a standard uncertainty multiplied by a coverage factor k = 2, providing a level of confidence of approximately 95%.

Nominal Output of Unit Under Test = 94 dB re 20μPa at 1000 Hz

Acoustic Output in dB re 20μPa, Corrected to Reference Conditions: 101.325 kPa, 23.0 °C and 50 %RH.

1. Sound Pressure Level

Standard Microphone Type	Measured Sound Pressure Level (dB)	Deviated value (dB)	Uncertainty (dB)	Tolerance limit IEC60942:2003 Class 1
1/2 inch Bruel&Kjaer 4180	94.01	0.01	±0.10	±0.40 dB

2. Frequency

Standard Microphone Type	Measured Frequency (Hz)	Deviated value (Hz)	Uncertainty (Hz)	Tolerance limit IEC60942:2003 Class 1
1/2 inch Bruel&Kjaer 4180	1003.1	3.1	±1.5	±1.0%

3. Total Distortion

Standard Microphone Type	Measured Total Distortion (%)	Uncertainty (%)	Tolerance limit IEC60942:2003 Class 1
1/2 inch Bruel&Kjaer 4180	1.80	±0.50	±3.0%

Note : 1. No adjustment.
2. The calibrator pressure correction was not included.
3. The microphone volume correction was included a level of 0.16 dB from manual.

Calibrated by : (Mr.Weerachai Deechaiyae)

Approved by : (Mr.Prawate Kluaypa)
Director
Electrical and Electronic Standards Laboratory
Industrial Metrology and Testing Service Centre

Date of Calibration : 28 Feb. 2024
Date of Issue : 29 Feb. 2024
Ref : 2011267021900719001

End of Certificate

The results relate only to the items tested/calibrated or value assigned.
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Fax. (66) 0 2579 8592
E-mail : sumalee@tistr.or.th

SITHIPORN ASSOCIATES CO., LTD.
CALIBRATION LABORATORY

451-451/1 Sirinthorn Road, Bangbumru, Bangplud, Bangkok, 10700 Thailand
Tel. +66 2433 8331 Email : calibration@sithiphorn.com

Cert. No. : ACL24073
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No.: 01122579 / 172172 / 74022
ID No.: RYG_FS0018

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) %

REVIEW BY Thanakorn P
APPROVED BY
NEXT CAL. DATE 21/1/25

Received Date : 11 JANUARY 2024
Calibration Date : 22-24 JANUARY 2024
Date of Issue : 24 JANUARY 2024

Calibrated by : Nathakorn Pisutpaisan

Approved by : (Thanakul 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.

SITHIPORN ASSOCIATES CO., LTD.
CALIBRATION LABORATORY

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Tel. +66 2433 8331 Email : calibration@sithiphorn.com

Cert. No. : ACL24073
Job No. : VC67AC0054
Pages : 2 of 8

Calibration Procedure : CP-AC-01

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

Condition of this result of calibration :
1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-23	07-FEB-24
Waveform Generator	33511B	MY52302742	EF-0010-23	07-FEB-24
Digital Multimeter	34461A	MY53220104	EEL.BP 30/0266	13-FEB-24
Digital Multimeter	34461A	MY53220076	EEL.BP 29/0266	13-FEB-24
Digital Multimeter	34461A	MY60024273	EEL.BP 31/0266	14-FEB-24
Programmable Attenuator	MAT-1070	62100114	EF-0011-23	08-FEB-24
Condenser Microphone	4180	2977900	AA-1001-23	14-FEB-24
Measuring Amplifier	NA-42KAI	34560495	AA-3002-23	14-FEB-24

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).

SITHIPORN ASSOCIATES CO., LTD.
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451-451/1 Sirinthorn Road, Bangbumru, Bangplud, Bangkok, 10700 Thailand
Tel. +66 2433 8331 Email : calibration@sithiphorn.com

Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	-	1.0
5. Frequency and time weightings at 1 kHz	0.2	0.2
6. Long - term stability	0.1	0.1
7. Level linearity on the reference level range	0.2	0.3
8. Level linearity including the level range control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

SITHIPORN ASSOCIATES CO., LTD.
CALIBRATION LABORATORY
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Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.98)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
16.6

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

Frequency Weighting	Measured value (dB)
A - weight	14.2
C - weight	19.2
Flat	25.9

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 84 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.2	0.2	0.2	± 1.5
1000	0.1	0.1	0.1	± 1.0
8000	3.3	3.4	3.4	±5.0

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4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	-0.1	0.0	±2.0
125	0.0	0.0	0.0	±1.5
250	0.0	0.0	-0.1	±1.5
500	0.0	0.0	-0.1	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.0	0.0	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	94.0	0.0	± 0.1
Slow	94.0	94.0	0.0	± 0.1
Leq	94.0	94.0	0.0	± 0.1

6. Long - term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.3

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CALIBRATION LABORATORY
451-451/1 Sirinthorn Road, Bangbumru, Bangplud, Bangkok, 10700 Thailand
Tel. +66 2433 8331 Email : calibration@sithiphorn.com

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	± 1.1
136.0	136.0	0.0	± 1.1
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	133.0	0.0	± 1.1
132.0	132.0	0.0	± 1.1
131.0	131.0	0.0	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.0	0.0	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.1	0.1	± 1.1
84.0	84.1	0.1	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.1	0.1	± 1.1
69.0	69.1	0.1	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.1	0.1	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	39.0	0.0	± 1.1
34.0	34.0	0.0	± 1.1
30.0	30.0	0.0	± 1.1
29.0	29.0	0.0	± 1.1
28.0	27.9	-0.1	± 1.1
27.0	27.0	0.0	± 1.1
26.0	25.9	-0.1	± 1.1
25.0	24.9	-0.1	± 1.1

Cert. No. : ACL24073
Job No. : VC67AC0054
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	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Lcpeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.1	0.1	±3.0
One	136.4	136.4	0.0	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.1	0.1	±2.0
Positive half cycle	135.4	135.3	-0.1	±2.0
Negative half cycle	135.4	135.3	-0.1	±2.0

Cert. No. : ACL24073
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11. Overload indication

Measured value (dB)		Devizted Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.5	89.5	0.0	±1.5

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	137.0	137.0	0.0	±0.3

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

End of Calibration Certificate

SITHIPORN ASSOCIATES CO.,LTD.
CALIBRATION LABORATORY
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NSC-TISI-TIS 17025 CALIBRATION 0394

Cert. No. : ACL23320
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42/ Microphone UC-52 / Preamplifier NH-24
Serial No.: 00597167 / 179118 / 87525
ID No.: RYG_FS0437

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location : -
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

REVIEW BY
APPROVED BY
NEXT CAL. DATE 19/10/24

Received Date : 11 OCTOBER 2023
Calibration Date : 19-20 OCTOBER 2023
Date of Issue : 24 OCTOBER 2023

Calibrated by : Nathakorn Pisutpaisan

Approved by :
(Thanakul 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.

Continuation of Calibration Certificate

Cert. No. : ACL23320
Job No. : VC67AC0011
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 Anechoic chamber and Reference Standard Instruments.
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :
1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-23	07-FEB-24
Waveform Generator	33511B	MY52302742	EF-0010-23	07-FEB-24
Digital Multimeter	33461A	MY53220104	EEL.BP 30/0266	13-FEB-24
Digital Multimeter	33461A	MY53220076	EEL.BP 29/0266	13-FEB-24
Digital Multimeter	34461A	MY60024273	EEL.BP 31/0266	14-FEB-24
Programmable Attenuator	MAT-1070	62100114	EF-0011-23	08-FEB-24
Condenser Microphone	4180	2977900	AA-1001-23	14-FEB-24
Measuring Amplifier	NA-42KAI	34560495	AA-3002-23	14-FEB-24

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).

Continuation of Calibration Certificate

Cert. No. : ACL23320
Job No. : VC67AC0011
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	0.35
11. Overload indication	✓	-	0.2	0.25
12. High level stability	✓	-	0.1	0.1

Note : Pass/Fail evaluation for each parameter,
will be considered together from the acceptance limit and the Maximum-permitted uncertainty of measurement.

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Continuation of Calibration Certificate

Cert. No. : ACL23320
Job No. : VC67AC0011
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.98)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
14.6

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	17.5
Flat	23.1

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-weigh	A-weight	Acceptance Limits
125	0.2	0.2	0.2	± 1.5
1000	0.0	0.0	0.0	± 1.0
8000	1.3	1.4	1.4	±5.0

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Continuation of Calibration Certificate

Cert. No. : ACL23320
Job No. : VC67AC0011
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	-0.1	-0.1	-0.1	±2.0
125	0.0	0.0	-0.1	±1.5
250	0.0	0.0	-0.1	±1.5
500	0.0	0.0	0.0	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.0	0.0	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	94.0	0.0	± 0.1
Slow	94.0	94.0	0.0	± 0.1
Leq	94.0	94.0	0.0	± 0.1

6. Long - term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.3

QF-TS12-04-04-020664

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Continuation of Calibration Certificate

Cert. No. : ACL23320
Job No. : VC67AC0011
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	63.9	-0.1	± 1.1
59.0	59.0	0.0	± 1.1
54.0	53.9	-0.1	± 1.1
49.0	48.9	-0.1	± 1.1
44.0	43.9	-0.1	± 1.1
39.0	38.9	-0.1	± 1.1
34.0	34.0	0.0	± 1.1
30.0	29.9	-0.1	± 1.1
29.0	28.9	-0.1	± 1.1
28.0	27.9	-0.1	± 1.1
27.0	26.9	-0.1	± 1.1
26.0	25.9	-0.1	± 1.1
25.0	24.9	-0.1	± 1.1

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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, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Lcpeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.1	0.1	±3.0
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	133.1	0.1	±2.0
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.5	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 lavel of confidence of approximately 95 %

End of Calibration Certificate

CERTIFICATE OF CALIBRATION

REVIEW BY Nanaboon P.
APPROVED BY
NEXT CAL DATE 28/1/26

ISSUED BY **Cirrus Research plc**

DATE OF ISSUE **29 January 2024** CERTIFICATE NUMBER **207437**

Cirrus Research plc
Acoustic House
Bridlington Road
Hunmanby
North Yorkshire
YO14 0PH
United Kingdom

Approved signatory
N.Smith
Electronically signed:

doseBadge Reader : IEC 60942:2003

Instrument information

Manufacturer: Cirrus Research plc **Notes:**
Model: RC:110A
Serial number: 73729
Class: 2

Test summary

Date of calibration: 29 January 2024

The doseBadge reader detailed above has been calibrated to the published data as described in the operating manual and in the half-inch configuration. The procedures and techniques used are as described in IEC60942_2003 Annex B – Periodic Tests and three determinations of the sound pressure level. frequency and total distortion were made.

The sound pressure level was measured using a WS2F condenser microphone type MK:224 manufactured by Cirrus Research plc.

The results have been corrected to the reference pressure of 101.33 kPa using the manufacturer's data.

The doseBadge Reader has been shown to conform to the Class 2 requirements for periodic testing, described in Annex B of IEC 60942:2003 for the sound pressure level(s) anc frequency(ies) stated, for the environmental conditions under which the tests were performed.

However, as public evidence was not available, from a testing organisation responsible for pattern approval, to demonstrate that the model of doseBadge Reader conforrned to the requirements for pattern evaluation described in Annex A of IEC 60942:2003, no general statement or conclusion can be made about conformance of the doseBadge Reader to the requirements of IEC 60942:2003

Notes:

This certificate provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory. The results within this certificate relate only to the items calibrated. The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%.

CERTIFICATE OF CALIBRATION

Certificate Number: **207437**

Environmental conditions

The following conditions were recorded at the time of the test:

Before Pressure: 101.44 kPa Temperature: 21.3 °C Humidity: 35.8 %
After Pressure: 101.44 kPa Temperature: 21.3 °C Humidity: 35.9 %

Test equipment

Equipment	Manufacturer	Model	Serial number
Distortion Meter	Keithley	2015	0994818
Acoustic Calibrator	Bruel and Kjaer	4231	2610257
Environmental Monitor	Comet	T7510	21962628

Initial Acoustic Results

	Expected	Sample 1	Sample 2	Sample 3	Average	Deviation	Tolerance	Uncertainty
Level (dB)	114.00	114.31	114.31	114.29	**114.30**	0.30	±0.75	0.11 dB
Distortion (%)	< 4.00	0.32	0.26	0.40	**0.33**	0.33	+4.00	0.13 %
Frequency (Hz)	1000.0	998.2	998.3	998.3	**998.3**	-1.7	±20.0	0.1 Hz

The measured quantities or deviations (as applicable), extended by the expanded combined uncertainty of measurement, must not exceed the corresponding tolerance.

Adjusted Acoustic Results

	Expected	Sample 1	Sample 2	Sample 3	Average	Deviation	Tolerance	Uncertainty
Level (dB)	114.00	114.01	114.01	114.02	**114.01**	0.01	±0.75	0.11 dB
Distortion (%)	< 4.00	0.30	0.34	0.34	**0.33**	0.33	+4.00	0.13 %
Frequency (Hz)	1000.0	998.1	998.3	998.3	**998.2**	-1.8	±20.0	0.1 Hz

Functionality Results

Function	Result
Keypad	Pass
Battery Power	Pass
Display	Pass
Communication	Pass
2 way IR link	Pass
Clock	Pass

End of results

JIRANATEE ASSOCIATES CO.,LTD.

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

Temperature measurement laboratory
Calibration services department.

NSC – TISI – TIS 17025
CALIBRATION 0367

CERTIFICATE OF CALIBRATION

Certificate No. : CDT-056-67

MEASUREMENT ITEM	: Heat Stress Monitor
MANUFACTURER	: Delta OHM
MODEL/TYPE	: HD32.2
SERIAL NUMBER	: 15006720
ID NUMBER	: RYG_FS0224
CONDITION AS-RECEIVED	: Used item
CUSTOMER	: ALS laboratory group (thailand) Co., Ltd. 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Suan Luang, Khet Suan Luang, Bangkok 10250 Thailand.
RECEIVED DATE	: 12 Feb 2024
MEASUREMENT DATE	: 16 Feb 2024
ISSUE DATE	: 20 Feb 2024

ENVIRONMENTAL CONDITIONS:
Ambient condition in the laboratory are as follow:

Temperature	: 23.0 ± 3.0	°C
Relative Humidity	: 55.0 ± 15.0	%RH

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

TABULATION OF RESULTS:
The table on next page give the measured values.

CHECKED BY Nanakorn P.
APPROVED BY
NEXT CAL. DATE 19/2/25

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

Traceability:
The measurement results are traceable to the International system of units (SI) through National Institute of Metrology Thailand (NIMT) Certificate number: TT-0038-23, Certificate number: ER-0101-23

Reference Used During Calibration:
1. Standard Temperature Probe
Model: STS-100 A500, Serial No.: 667682-09
Due date: 28 Mar 2024
2. Digital Temperature Indicator
Model: DTI-1000-A MK II, Serial No.: 671407-00591 Due date: 14 Sep 2024

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

Calibrated by:
☐ Mr. Sorawit Thachalad
☐ Miss Jittraporn Lertsomphol
☑ Miss Ruangrumpai Phoommit

Approved signatory:
Mr. Parinya Booncharoen
Calibration Department Manager

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

Continuation of Certificate of Calibration Number CDT-056-67

Result of Calibration: ☑ Without Adjustment ☐ With Adjustment

Calibration Range: 20 – 40 °C

Function:

Table 1: This equipment was connected with wet bulb probe Model: HP3201.2 S/N: 15015854. Dimension: Diameter 3.3 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.054	19.7	-0.4	0.099
80	25.054	24.7	-0.4	0.099
80	30.041	29.7	-0.3	0.099
80	35.032	34.7	-0.3	0.099
80	40.020	39.6	-0.4	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TP3276.2 S/N: 20008279. Dimension: Diameter 3.3 mm. Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.054	20.1	0.0	0.099
110	25.055	25.1	0.0	0.099
110	30.041	30.1	0.1	0.099
110	35.032	35.1	0.1	0.099
110	40.020	40.2	0.2	0.099

Table 3: This equipment was connected with temperature probe Model: TP3207.2 S/N: 15015498. Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.054	20.3	0.2	0.099
75	25.054	25.2	0.1	0.099
75	30.041	30.1	0.1	0.099
75	35.032	35.0	0.0	0.099
75	40.019	39.9	-0.1	0.099

UUC*: Unit Under Calibration

End of Certificate of Calibration

JIRANATEE ASSOCIATES CO.,LTD.

Jiranatee Associates Co.,Ltd.
63/14-15, 67/35-36
Petchkasem 7,7/1, Rd. Watthapra, Bangkokyai,
Bangkok 10600 (Thailand)
Tel: +6628808812
Mobile: +66863999453
E-mail: jnac-calibration@jiranatee.com
Web site: www.jiranatee.com

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

Temperature measurement laboratory
Calibration services department.

NSC – TISI – TIS 17025
CALIBRATION 0367

CERTIFICATE OF CALIBRATION

Certificate No. : CDT-057-67

MEASUREMENT ITEM	: Heat Stress Monitor
MANUFACTURER	: Delta OHM
MODEL/TYPE	: HD32.2
SERIAL NUMBER	: 15006726
ID NUMBER	: RYG_FS0226
CONDITION AS-RECEIVED	: Used item
CUSTOMER	: ALS laboratory group (thailand) Co., Ltd. 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Suan Luang, Khet Suan Luang, Bangkok 10250 Thailand.
RECEIVED DATE	: 12 Feb 2024
MEASUREMENT DATE	: 16 Feb 2024
ISSUE DATE	: 20 Feb 2024

ENVIRONMENTAL CONDITIONS:
Ambient condition in the laboratory are as follow:

Temperature	: 23.0 ± 3.0	°C
Relative Humidity	: 55.0 ± 15.0	%RH

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

TABULATION OF RESULTS:
The table on next page give the measured values.

CHECKED BY Nanakorn P.
APPROVED BY
NEXT CAL. DATE 16/2/26

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

Traceability:
The measurement results are traceable to the International system of units (SI) through National Institute of Metrology Thailand (NIMT) Certificate number: TT-0038-23, Certificate number: ER-0101-23

Reference Used During Calibration:
1. Standard Temperature Probe
Model: STS-100 A500, Serial No.: 667682-09
Due date: 28 Mar 2024
2. Digital Temperature Indicator
Model: DTI-1000-A MK II, Serial No.: 671407-00591 Due date: 14 Sep 2024

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

Calibrated by:
☐ Mr. Sorawit Thachalad
☐ Miss Jittraporn Lertsomphol
☑ Miss Ruangrumpai Phoommit

Approved signatory:
Mr. Parinya Booncharoen
Calibration Department Manager

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

Continuation of Certificate of Calibration Number CDT-057-67

Result of Calibration: ☑ Without Adjustment ☐ With Adjustment

Calibration Range: 20 – 40 °C

Functinn:

Table 1: This equipment was connected with wet bulb probe Model: HP3201.2 S/N: 15015841. Dimension: Diameter 3.3 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.054	20.0	-0.1	0.099
80	25.055	25.0	-0.1	0.099
80	30.041	30.0	0.0	0.099
80	35.032	35.0	0.0	0.099
80	40.018	40.0	0.0	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TP3276.2 S/N: 20008282. Dimension: Diameter 3.3 mm. Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.054	20.0	-0.1	0.099
110	25.055	25.1	0.0	0.099
110	30.041	30.1	0.1	0.099
110	35.032	35.1	0.1	0.099
110	40.018	40.1	0.1	0.099

Table 3: This equipment was connected with temperature probe Model: TP3207.2 S/N: 15015494.. Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.054	20.2	0.1	0.099
75	25.054	25.0	-0.1	0.099
75	30.041	29.9	-0.1	0.099
75	35.032	34.8	-0.2	0.099
75	40.018	39.7	-0.3	0.099

UUC*: Unit Under Calibration

End of Certificate of Calibration

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TEL: (669)-2116-5860-1 FAX: (669)-2116-7140

Certificate of Calibration

Customer

Certificate No : 24-AFM-018 Rev.1

Name : ALS Laboratory Group Thailand Co., Ltd

Request No : Req-2024-0043

Address : 104 Soi Phatthanakan 40, Phatthanakan Road, Suan Luang, Bangkok 10250

Unit Under Calibration Details

Measurement Item : Air Flow Meter

Manufacturer : Bios

Model : Defender 510-L — Sensor Model : -

Serial Number : 286895 — Sensor Serial Number : -

ID : BKK_FS1346

Location of Calibration : LAB 4 AIR VELOCITY METER

REVIEW BY Narakorn P.
APPROVED BY
NEXT CAL. DATE 28/1/25

Calibration Environment and Details

Temperature : 23 °C ± 3 °C

Humidity : 55 %RH ± 20 %RH

Barometric Pressure : 1013 hPa ± 10 hPa

Received Date : 3 January 2024

Calibration Date : 29 January 2024

Calibration Procedure : In-house method CP-AFM-01 by Comparison technique with Standard Primary Flow Calibrator

Reference Standard	Model	Serial Number	Traceble	Due Calibration
Air Flow Meter	Gilibrator 3 Low flow	18501010006	Sensidyne	12 July 2024
Air Flow Meter	Gilibrator 3 Standard flow	19031011003	Sensidyne	12 July 2024
Temperature meter	GT 11	08000057	Qreborn	27 February 2024
Pressure meter	CPG2400	41000KDU/651882	TPA	9 November 2024

Traceability :

This Certificate is traceable to SI Unit through Sensidyne A2LA Accreditation No. 3943.01

Note :

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor $k = 2$, providing a level of confidence approximately 95 %.

This Certificate was issued to replace to Calibration Certificate No. 24-AFM-018

Calibration By : Mr. Noppadon Luangart — Service Calibration Engineer

Approved By : Mr. Pacit Mathavom — Calibration Engineer Supervisor

Issue Date : 1 February 2024

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

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TEL: (669)-2116-5860-1 FAX: (669)-2116-7140

Certificate No : 24-AFM-018 Rev.1

Request No : Req-2024-0043

Result of Calibration : Without Adjustment

Temperature (°C)	Pressure (kPa)	STD (ml/min)	UUC (ml/min)	Error (ml/min)	Uncertainty (ml/min)
25.00	101.66	20	20.148	0.1	1.3
25.00	101.67	100	99.409	-0.6	2.8
24.90	101.63	199	197.46	-1.5	5.6
25.00	101.61	300	298.15	-1.8	8.4
24.90	101.60	399	400.13	1	11
24.90	101.59	480	478.02	-2.0	6.8

Note STD : Standard UUC : Unit Under Calibration

- UUC Reference Condition : At atmospheric pressure and room temperature condition
- Flow Rate was corrected for non-standard operating condition by using equation :

$$Q_{meas} = Q_{ref} \times \frac{P_{ref}}{P_{ref}} \times \frac{T_{meas}}{T_{ref}}$$

where Q = Flow Rate P = Absolute Pressure T = Absolute Temperature
Meas = Measurement Condition ref = Standard Condition

* Indicates non accredited

End of Certificate

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

FM-708-AFM-01 Rev.01 Issue date 25/01/24

BKK_FS0614

MesaLabs

NVLAP Lab Code 200661-0 Calibration

Calibration Certificate

CertificateNo. 610563 **Sold To:**
Product 200-510M Defender 510 Medium Flow
Serial No. 151114
Cal. Date 21-May-2024

All calibrations are performedin accordance with ISO 17025 at Mesa Laboratories, Inc., 12100 W. 6th Ave, Lakewood, CO 80228, an ISO 17025:2017 accredited laboratory through NVLAP. This report shall not be reproduced except in full without the written approval of the laboratory. Results only relate to the items calibrated. This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

As Received Calibration Data

Technician Derek Dellape

Lab. Pressure 614.2 mmHg
Lab. Temperature 24.3 °C

Instrument Reading	Lab Standard Reading	Deviation	Allowable Deviation	As Received
0 ccm	4504.81 ccm	-100.0%	1.00%	Out of Tolerance
0 ccm	1000.88 ccm	-100.0%	1.00%	Out of Tolerance
0 ccm	249.55 ccm	-100.0%	1.00%	Out of Tolerance

Mesa Laboratories Standards Used

Description	Standard Serial Number	Calibration Date	Calibration Due Date
ML-800-24	117991	13-Nov-2023	13-Nov-2024

REVIEW BY Narakorn P.
APPROVED BY
NEXT CAL. DATE 21/5/25

MesaLabs

NVLAP Lab Code 200661-0 Calibration

As Shipped Calibration Data

Certificate No 610563 **Lab. Pressure** 617 mmHg
Technician Derek Dellape **Lab. Temperature** 24.6 °C

Instrument Reading	Lab Standard Reading	Deviation	Allowable Deviation	As Shipped
4482.47 ccm	4493.49 ccm	-0.25%	1.00%	In Tolerance
997.25 ccm	996.63 ccm	0.04%	1.00%	In Tolerance
248.51 ccm	248.67 ccm	-0.06%	1.00%	In Tolerance

Mesa Laboratories Standards Used

Description	Standard Serial Number	Calibration Date	Calibration Due Date
ML-800-24	211063	04-Oct-2023	04-Oct-2024

Calibration Notes

The expanded uncertainty of flow has a coverage factor of k = 2 for a confidence interval of approximately 95%.

Flow testing is in accordance with our test number MP-00672 with an expanded uncertainty of 0.27% using high-purity nitrogen or filtered laboratory air.

Traceability to the International System of Units (SI) is verified by accreditation to ISO/IEC 17025 by NVLAP under NVLAP Code 200661-0.

Technician Notes:

By: Derek Dellape, Production Assembler II

Approved By: Troy Thacker, Quality Engineer

Mesa Laboratories, Inc. certifies that the above instrument meets or exceeds published specifications, and that the calibration results in this certificate were obtained using equipment capable of producing results that are traceable through NIST to the International System of Units (SI). Calibration results are in compliance with ISO/IEC 17025:2017. Calibrations process has a Test Uncertainty Ration (TUR) of 4:1 or greater. Any Pass/Fail determination is made without taking measurement uncertainty into account and is based on UUT performance against required tolerance only.

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Certificate of Calibration

Customer

Certificate No : 24-AFM-033

Name : ALS Laboratory Group Thailand Co., Ltd.

Request No : Req-2024-0241

Address : 104 Soi Phatthanakan 40, Phatthanakan Road, Suan Luang, Bangkok 10250

Unit Under Calibration Details

Measurement Item : Primary Flow Calibrator

Manufacturer : Bios

Model : Defender 510-L — Sensor Model : -

Serial Number : 130027 — Sensor Serial Number : -

ID : RYG_FS0208

Location of Calibration : LAB 4 AIR VELOCITY METER

Calibration Environment and Details

REVIEW BY Nipadorn P
APPROVED BY
NEXT CAL. DATE 13/8/25

Temperature : 23 °C ± 3 °C

Humidity : 55 %RH ± 20 %RH

Barometric Pressure : 1013 hPa ± 10 hPa

Received Date : 31 January 2024

Calibration Date : 13 February 2024

Calibration Procedure : In-house method CP-AFM-01 by Comparison technique with Standard Primary Flow Calibrator

Reference Standard	Model	Serial Number	Traceble	Due Calibration
Air Flow Meter	Gilibrator 3 Low flow	18501010006	Sensidyne	12 July 2024
Air Flow Meter	Gilibrator 3 Standard flow	19031011003	Sensidyne	12 July 2024
Temperature meter	GT 11	08000057	Qreborn	27 February 2024
Pressure meter	CPG2400	41000KDU/651882	TPA	9 November 2024

Traceability :

This Certificate is traceable to SI Unit through Sensidyne A2LA Accreditation No. 3943.01

Note :

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor $k = 2$, providing a level of confidence approximately 95 %.

Calibration By : Mr. Noppadon Luangart — Service Calibration Engineer

Approved By : Mr. Pacit Mathavorn — Calibration Engineer Supervisor

Issue Date : 13 February 2024

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

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TEL: 16610-2116-5860-1 FAX: 16610-2116-7140

Certificate No : 24-AFM-033

Request No : Req-2024-0241

Result of Calibration : Without Adjustment

Temperature (°C)	Pressure (kPa)	STD (cc/min)	UUC (cc/min)	Error (cc/min)	Uncertainty (cc/min)
24.50	101.26	20	19.965	0.0	1.3
24.20	101.25	101	100.50	-0.5	2.8
24.00	101.31	200	199.13	-0.9	5.6
23.90	101.42	301	303.56	2.6	8.4
24.10	101.41	401	404.57	4	11
24.10	101.49	480	483.81	3.8	7.0

Note STD : Standard UUC : Unit Under Calibration

- UUC Reference Condition : At atmospheric pressure and room temperature condition
- Flow Rate was corrected for non-standard operating condition by using equation :

$$Q_{meas} = Q_{ref} \times \frac{P_{ref}}{P_{ref}} \times \frac{T_{meas}}{T_{ref}}$$

where Q = Flow Rate P = Absolute Pressure T = Absolute Temperature
Meas = Measurement Condition ref = Standard Condition

* Indicates non accredited

End of Certificate

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

FM-708-AFM-01 Rev.01 Issue date 25/01/24

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Certificate of Calibration

Customer

Certificate No : 24-AFM-032

Name : ALS Laboratory Group Thailand Co., Ltd.

Request No : Req-2024-0240

Address : 104 Soi Phatthanakan 40, Phatthanakan Road, Suan Luang, Bangkok 10250

Unit Under Calibration Details

Measurement Item : Primary Flow Calibrator

Manufacturer : Bios

Model : Defender 510-M — Sensor Model : -

Serial Number : 129958 — Sensor Serial Number : -

ID : RYG_FS0209

Location of Calibration : LAB 4 AIR VELOCITY METER

Calibration Environment and Details

REVIEW BY Nipadorn P
APPROVED BY
NEXT CAL. DATE 13/8/25

Temperature : 23 °C ± 3 °C

Humidity : 55 %RH ± 20 %RH

Barometric Pressure : 1013 hPa ± 10 hPa

Received Date : 31 January 2024

Calibration Date : 13 February 2024

Calibration Procedure : In-house method CP-AFM-01 by Comparison technique with Standard Primary Flow Calibrator

Reference Standard	Model	Serial Number	Traceble	Due Calibration
Air Flow Meter	Gilibrator 3 Low flow	18501010006	Sensidyne	12 July 2024
Air Flow Meter	Gilibrator 3 Standard flow	19031011003	Sensidyne	12 July 2024
Temperature meter	GT 11	08000057	Qreborn	27 February 2024
Pressure meter	CPG2400	41000KDU/651882	TPA	9 November 2024

Traceability :

This Certificate is traceable to SI Unit through Sensidyne A2LA Accreditation No. 3943.01

Note :

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor $k = 2$, providing a level of confidence approximately 95 %.

Calibration By : Mr. Noppadon Luangart — Service Calibration Engineer

Approved By : Mr. Pacit Mathavorn — Calibration Engineer Supervisor

Issue Date : 13 February 2024

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

FM-708-AFM-01 Rev.01 Issue date 25/01/24

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TEL: 16610-2116-5860-1 FAX: 16610-2116-7140

Certificate No : 24-AFM-032

Request No : Req-2024-0240

Result of Calibration : Without Adjustment

Temperature (°C)	Pressure (kPa)	STD (cc/min)	UUC (cc/min)	Error (cc/min)	Uncertainty (cc/min)
23.80	101.89	95	100.13	5.1	2.8
23.90	101.71	501	513.93	12.9	7.2
24.18	101.62	1006	1019.3	13	14
24.00	101.81	1997	2023.0	26	29
24.10	101.87	2999	3035.5	37	45
24.60	102.00	3944	3991.8	48	59
24.60	102.08	4739	4790.5	52	72

Note STD : Standard UUC : Unit Under Calibration

- UUC Reference Condition : At atmospheric pressure and room temperature condition
- Flow Rate was corrected for non-standard operating condition by using equation :

$$Q_{meas} = Q_{ref} \times \frac{P_{ref}}{P_{ref}} \times \frac{T_{meas}}{T_{ref}}$$

where Q = Flow Rate P = Absolute Pressure T = Absolute Temperature
Meas = Measurement Condition ref = Standard Condition

* Indicates non accredited

End of Certificate

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

FM-708-AFM-01 Rev.01 Issue date 25/01/24

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TEL: 66(0)-2116-5860-1 FAX: 66(0)-2116-7140

Certificate of Calibration

Customer

Name : ALS Laboratory Group Thailand Co., Ltd.
Address : 104 Soi Phatthanakan 40, Phatthanakan Road, Suan Luang,
Bangkok 10250

Certificate No : 24-AFM-174
Request No : Req-2024-1861

Unit Under Calibration Details

Measurement Item : Air Flow Meter
Manufacturer : MesaLabs — Accuracy : 1% of Reading
Model : 510-M — Sensor Model : -
Serial Number : 208345 — Sensor Serial Number : -
ID : BKK_FS1347 — Instrument Status : Used
Location of Calibration : LAB 4 AIR VELOCITY METER

Calibration Environment and Details

Temperature : 23 °C ± 3 °C
Humidity : 55 %RH ± 20 %RH
Barometric Pressure : 1013 hPa ± 10 hPa
Received Date : 22 August 2024
Calibration Date : 28 August 2024
Calibration Procedure : In-house method CP-AFM-01 by Comparison technique with Standard Primary Flow Calibrator

REVIEW BY Marakoon P.
APPROVED BY
NEXT CAL. DATE 28/8/25

Reference Standard	Model	Serial Number	Traceble	Due Calibration
Air Flow Meter	Gilibrator 3 Low flow	18501010006	Sensidyne	6 August 2025
Air Flow Meter	Gilibrator 3 Standard flow	19031011003	Sensidyne	2 August 2025
Temperature meter	GT 11	08000057	Qreborn	1 March 2025
Pressure meter	CPG2400	41000KDU/651882	TPA	9 November 2024

Traceability :

This Certificate is traceable to SI Unit through Sensidyne A2LA Accreditation No. 3943.01

Note :

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor $k = 2$, providing a level of confidence approximately 95 %.

Calibration By : Mr. Noppadon Luangart — Service Calibration Engineer

Approved By : Mr. Pacit Mathavorn — Calibration Engineer Supervisor

Issue Date : 28 August 2024

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

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TEL: 66(0)-2116-5860-1 FAX: 66(0)-2116-7140

Certificate No : 24-AFM-174
Request No : Req-2024-1861

Result of Calibration : Without Adjustment

Temperature (°C)	Pressure (kPa)	STD (cc/min)	UUC (cc/min)	Error (cc/min)	Uncertainty (cc/min)	MPE (cc/min)	Result
22.30	100.57	100	99.526	-0.5	2.8	1	N/A
22.40	100.61	499	500.48	1.5	7.8	5	N/A
22.50	100.56	1004	1004.8	1	15	10	N/A
22.60	100.54	2008	2003.3	-5	29	20	N/A
22.80	100.62	3034	3032.1	-2	45	30	N/A
23.20	100.71	4032	4022.4	-10	60	40	N/A
23.40	100.73	5060	5056.4	-4	79	51	N/A

Note STD : Standard UUC : Unit Under Calibration
- UUC Reference Condition : At atmospheric pressure and room temperature condition
- Flow Rate was corrected for non-standard operating condition by using equation :

$$Q_{meas} = Q_{ref} \times \frac{P_{ref}}{P_{ref}} \times \frac{T_{meas}}{T_{ref}}$$

where Q = Flow Rate P = Absolute Pressure T = Absolute Temperature
Meas = Measurement Condition ref = Standard Condition

* Indicates non accredited
MPE = Maximum Permissible Error (Specified in Manufacturer's Specifications)
N/A = Not Aavailable, Customer does not require a statement of conformity.

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

FM-708-AFM-01 Rev.04 Issue date 17/6/24

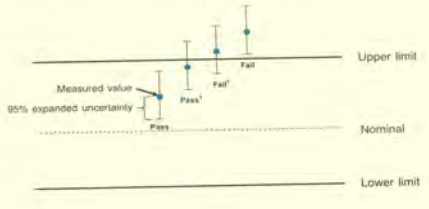
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TEL: 66(0)-2116-5860-1 FAX: 66(0)-2116-7140

Certificate No : 24-AFM-174
Request No : Req-2024-1861

Decision Rule for Statements of Conformity

The standard decision rule employed for the statements of conformity to each calibration result will be applied using ILAC-G8:09/2019, Guidelines on the Reporting of Compliance with Specification as following Fig. and statements

Pass = The measurement result plus the expanded uncertainty with a 95% coverage probability were within the limit.
Pass[1] = The measurement result was within the limit. However, a portion of the expanded uncertainty of measurement at 95% exceeds the limit.
Fail[1] = The measurement result was out of the limit. However, a portion of the expanded uncertainty of measurement at 95% is within the limit.
Fail = The measurement result plus the expanded uncertainty with a 95% coverage probability were outside the limit.



End of Certificate

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

FM-708-AFM-01 Rev.04 Issue date 17/6/24

INNOVATIVE INSTRUMENT CALIBRATION LAB
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AMPHOE BANG PHLI SAMUT PRAKAN PROVINCE 10540 THAILAND
TEL: 66(0)-2116-5860-1 FAX: 66(0)-2116-7140

Certificate of Calibration

Customer

Name : ALS Laboratory Group Thailand Co., Ltd.
Address : 104 Soi Phatthanakan 40, Phatthanakan Road, Suan Luang,
Bangkok 10250

Certificate No : 24-AFM-177
Request No : Req-2024-1862

Unit Under Calibration Details

Measurement Item : Air Flow Meter
Manufacturer : Bios — Accuracy : 1% of Reading
Model : Defender 510-L — Sensor Model : -
Serial Number : 130026 — Sensor Serial Number : -
ID : BKK_FS0619 — Instrument Status : Used
Location of Calibration : LAB 4 AIR VELOCITY METER

Calibration Environment and Details

Temperature : 23 °C ± 3 °C
Humidity : 55 %RH ± 20 %RH
Barometric Pressure : 1013 hPa ± 10 hPa
Received Date : 22 August 2024
Calibration Date : 9 September 2024
Calibration Procedure : In-house method CP-AFM-01 by Comparison technique with Standard Primary Flow Calibrator

REVIEW BY Marakoon P.
APPROVED BY
NEXT CAL. DATE 9/9/26

Reference Standard	Model	Serial Number	Traceble	Due Calibration
Air Flow Meter	Gilibrator 3 Low flow	18501010006	Sensidyne	6 August 2025
Air Flow Meter	Gilibrator 3 Standard flow	19031011003	Sensidyne	2 August 2025
Temperature meter	GT 11	08000057	Qreborn	1 March 2025
Pressure meter	CPG2400	41000KDU/651882	TPA	9 November 2024

Traceability :

This Certificate is traceable to SI Unit through Sensidyne A2LA Accreditation No. 3943.01

Note :

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor $k = 2$, providing a level of confidence approximately 95 %.

Calibration By : Mr. Noppadon Luangart — Service Calibration Engineer

Approved By : Mr. Pacit Mathavorn — Calibration Engineer Supervisor

Issue Date : 9 September 2024

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

FM-708-AFM-01 Rev.04 Issue date 17/6/24

INNOVATIVE INSTRUMENT CALIBRATION LAB
INNOVATIVE INSTRUMENT CO., LTD. HEAD OFFICE
7 139 MOO 13, SOI SUNTINAKORN 11 TAMBON BANG KAEO,
AMPHOE BANG PHLI SAMUT PRAKAN PROVINCE 10540 THAILAND
TEL: (6640-2116-5860-1 FAX: (6640-2116-7140

Certificate No : 24-AFM-177

Request No : Req-2024-1862

Result of Calibration : Without Adjustment

Temperature (°C)	Pressure (kPa)	STD (cc/min)	UUC (cc/min)	Error (cc/min)	Uncertainty (cc/min)	MPE (cc/min)	Result
24.70	100.92	20	20.192	0.2	1.3	0.2	N/A
24.70	100.90	100	99.923	-0.1	2.8	1.0	N/A
24.70	100.94	201	200.7	-0.3	5.6	2.0	N/A
24.70	100.97	298	300.1	2.1	8.4	3.0	N/A
24.70	100.99	403	399.1	-4	11	4.0	N/A
24.80	101.05	482	477.6	-4.4	6.9	4.8	N/A

Note STD : Standard UUC : Unit Under Calibration

- UUC Reference Condition : At atmospheric pressure and room temperature condition
- Flow Rate was corrected for non-standard operating condition by using equation :

$$Q_{meas} = Q_{ref} \chi \frac{P_{ref}}{P_{ref}} \chi \frac{T_{meas}}{T_{ref}}$$

where Q = Flow Rate P = Absolute Pressure T = Absolute Temperature
Meas = Measurement Condition ref = Standard Condition

* Indicates non accredited

MPE = Maximum Permissible Error (Specified in Manufacturer's Specifications)

N/A = Not Aavailable, Customer does not require a statement of conformity.

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TEL: (6640-2116-5860-1 FAX: (6640-2116-7140

Certificate No : 24-AFM-177

Request No : Req-2024-1862

Decision Rule for Statements of Conformity

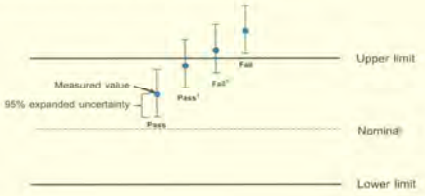
The standard decision rule employed for the statements of conformity to each calibration result will be applied using ILAC-G8:09/2019: Guidelines on the Reporting of Compliance with Specification as following Fig. and statements

Pass = The measurement result plus the expanded uncertainty with a 95% coverage probability were within the limit.

Pass[1] = The measurement result was within the limit. However, a portion of the expanded uncertainty of measurement at 95% exceeds the limit.

Fail[1] = The measurement result was out of the limit. However, a portion of the expanded uncertainty of measurement at 95% is within the limit.

Fail = The measurement result plus the expanded uncertainty with a 95% coverage probability were outside the limit.



End of Certificate

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

FM-708-AFM-01 Rev.04 issue date 17/6/24

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NSC-TISI-TIS17025 CALIBRATION 0008

Cert.No.: 24CH96
Page.: 1 of 3

Certificate of Calibration

Equipment :	pH Meter
Manufacturer :	Mettler Toledo
Model :	SevenCompact S220
Serial No. :	C104059460
ID No. :	RYG_EN0183
Condition As-Received:	Used Item
Received Date :	18 January 2024
Calibration Date :	19 January 2024
Reference :	2401-0579DSC-2
Submitted by :	ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch) 616/10 Moo 5, T.Maenam Khu, A.Pluakdaeng, Rayong 21140, Thailand
Ambient Temperature :	(25 ± 2.5) °C
Relative Humidity :	(50 ± 15) %
Calibration Procedure :	In - house method : - CP-CH5 by direct measurement with standard voltage calibrator and direct measurement with certified reference material (CRM) - CP-CH8 by comparison with themperature standard

REVIEW BY N.Barut
APPROVED BY
NEXT CAL. DATE 19/04/25

Calibrated by : Warakorn Lerngagtrakul

Approved by :

Approved Signatory

(√) Saithip Meangmai
( ) Warakorn Lerngagtrakul
( ) Ponpan Paipim

Issue Date : 24 January 2024

The Uncertainties are for a confidence probability of approximately 95%

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

A 0062854

Cert.No.: 24CH96
Page.: 2 of 3

Condition of this calibration result

1. Reference Standard Instrument

Instrument	Serial No.	ID No.	Cert. No.	Due Date
1) Document Process Calibrator	54030049	130RC116	23E2802	27 Aug 2024
2) Ref. Standard Thermometer	4982054	110RC044	23I908	26 July 2024

This certification is traceable to the International System of Unit maintained through:-
- Technology Promotion Association (Thailand-Japan)

2. Certified Reference Materials : The measurement results are traceable to SI through CPA chem Ltd., ANSI-ASQ National Accreditation Board, Accredited No. AR-1835

Buffer Solution	Manufacturer	Lot No.	Exp. date
pH 4.008	CPA chem	940102	27 Nov 2025
pH 6.986	CPA chem	940104	02 Nov 2024
pH 9.997	CPA chem	940106	02 Nov 2024

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

Calibration Results

Function : mV Measurement

Performing standard curve by Fluke at pH (4,7,10)

Unit Under Calibration	Nominal Value	Standard Voltage Input	Actual Reading		Uncertainty of Measurement	Coverage factor
	pH	mV	mV	pH	(±mV)	*k*
pH Meter	4.000	177.48	177.4	4.000	0.058	2.00
S/N.: C104059460	7.000	0.00	0.0	7.000	0.058	2.00
	10.000	-177.48	-177.5	10.000	0.058	2.00

Saithip

a 1198287

Cert.No.: 24CH96
Page.: 3 of 3

Calibration Results

Function : pH Measurement

Performing three buffers standard curve by using buffer nominal pH (4.01,7.00,10.01)

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH Measurement (±)	Coverage factor *k*
pH Electrode	4.008	4.013	176.0	0.0054	2.07
S/N.: 3225367	6.986	6.983	2.2	0.0084	2.00
	9.997	9.996	-174.1	0.0065	2.00

Function : Temperature Measurement

(*) Without adjustment

This equipment was connected with Temperature Probe;

- Model : InLab®Expert Pro-ISM
- Serial No. : 3225367

Dimension of probe

- Length : 120 mm.
- Diameter : 12 mm.
- Immersion Depth : 100 mm.

Calibration Point (°C)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty of measurement (± °C)	Coverage factor *k*
25.0	25.001	25.2	0.199	0.13	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 %.

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Saithip

a 1198288

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ilac-MRA
NSC-TISI-TIS17025 CALIBRATION 0008

Certificate of Calibration

Certificate No. : 24E289
Page : 1 of 2

Equipment : pH Meter
Manufacturer: Mettler Toledo
Model : SevenCompact S220
Serial No.: C104059460
ID No.: RYG_EN0183
Condition As-Received: Used Item
Received Date: 18 January 2024
Calibration Date: 23 January 2024
Reference: 2401-0579DSC
Ambient Temperature: (23 ± 2) °C
Relative Humidity: (50 ± 10) %

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

Submitted by: ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
616/10 Moo 5, T.Maenam Khu, A.Pluakdaeng, Rayong 21140, Thailand

Procedure used: Calibration were conducted using calibration procedure No. CP-E17 According to EURAMET cg-15.

Condition of this result of calibration

1.Reference standards instruments :

Instrument	Model	Serial No.	Certificate No.	Due Date
1) Multi-Product Calibrator	5500A	6315011	E2U2300035	29 May 2024

2.This result of calibration was made on requested at the point specified by customer.
3.The certificate is valid only to the item calibrated on date and place of calibration.
4.This Certification is traceable to the International System of Unit maintained through:-
-NA Caltechnologies Co.,Ltd., ANAB Accredited No. Calibration AC-2658

Calibrated by : Wutchareeporn Wongchutikrane
Issue Date : 24 January 2024
Approved Signatory :
[ ] Phalinee Prabpaipal
[✓] Nuntawat Khamchai
[ ] Pongsagorn Boonyaporn

B 0333296

Cert. No.: 24E289
Page.: 2 of 2

Result of calibration :- (*) Without adjustment ( ) After adjustment

Function: DC voltage measurement **Range:** 2000 mV

Standard Value (mV)	UUC* Reading (mV)	Error (mV)	Uncertainty (± µV)
-200.0000	-200.0	0.0	68
-150.0000	-150.0	0.0	65
-100.0000	-100.0	0.0	63
-50.0000	-50.0	0.0	61
0.0000	0.0	0.0	58
50.0000	50.0	0.0	61
100.0000	99.9	-0.1	63
150.0000	149.9	-0.1	65
200.0000	199.9	-0.1	68

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor *k*=2, providing a level of confidence of approximately 95 %

UUC* = Unit Under Calibration.

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a 1198963

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Cert.No.: 23TW168
Page.: 1 of 2

Certificate of Testing

Equipment : DO Meter
Manufacturer : YSI
Model : 5000-115V
Serial No. : 15E102796
ID No. : RYS_EN0032
Received Date : 21 July 2023
Test Date : 24 July 2023
Reference : 2307-0713DSC-1
Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd.
Rayong Branch
616/10 Moo 5, T.Maenam Khu, A.Pluakdaeng,
Rayong 21140, Thailand
Laboratory Condition : Temperature (25 ± 5) °C
Humidity (50 ± 20) %
Test Procedure : In - house method : CP-CH9
by Comparison Technique with Azide Modification Method
Tested by : Walalak Sirithean
Approved by : Saithip
Approved Signatory

( ) Malee Butkruea
(✓) Saithip Meangmai
( ) Warakorn Lerngagtrakul

REVIEW BY N.Bamrat
APPROVED BY
NEXT CAL DATE 24/07/25

Issue Date : 26 July 2023

B 0320211

Cert.No.: 23TW168
Page.: 2 of 2

Condition of this result of calibration

1. Reference Standard Instruments :
   This certification is traceable to the International System of Unit through the reference standards laboratory of Industrial Calibration Center,Technology Promotion Association (Thailand-Japan).

Instruments	Serial No.	ID No.	Certificate No.	Due Date
1) Burette	-	130BU10	23CG1172	22 Mar 2025
2) Balance	1126143764	140RC004	22MM50	20 Sep 2023

2. Standard Material :-

Material	Manufacturer	Lot.No.	Assay
Sodium Thiosulfate pentahydrate	Merck	AM1763316	100.2%

Result : **Dissolved Oxygen Meter Adjustment With Air 100 %**

Dissolved Oxygen Probe No.: 15E100464

Titration Method (Azide Modification Method) (mg/L)	DO Meter Reading (mg/L)	Standard Deviation (mg/L)
8.18	8.17	0.0055

This report was certified only for the instrument we tested.It is allowable to use for study the system efficiency,The environmental impact control and present to organization it may concerned Intend to use for advertising and referral purpose is prohibited.This report may not be reproduced other in full,without written approval of the laboratory

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a 1172155

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Cert. No.: 23LM125
Page.: 1 of 2

Certificate of Calibration

Equipment : DO Meter with Sensor
Manufacturer : YSI
Model : 5000-115V
Serial No. : 15E102796
ID No. : RYG_EN0032
Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd. Rayong Branch 616/10 Moo 5 T. Maenam Khu, A. Pluakdaeng, Rayong 21140 Thailand
Location : TPA On Site Calibration Laboratory

Received Order : 25 July 2023
Calibrated Date : 27 July 2023
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %
AC Line Voltage : (220 ± 22) V

Calibrated by : Preecha Hlahib

Approved by :
Approved Signatory

( ) Pornthippa Tameyakul
( ) Malee Butkruea
(✓) Suwit Imjai

Issue Date : 31 July 2023

The Uncertainties are for a confidence probability of approximately 95%

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A 0053616

Equipment : DO Meter with Sensor
Condition As-Received : Used Item
Reference : 2307-0713DSC-2

Cert. No.: 23LM125
Page.: 2 of 2

Procedure Used :-
Calibration were conducted using in-house calibration procedure CP-OT01 according to comparison with Industrial Platinum Resistance Thermometer (IPRT) in\o Temperature Bath.
The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Digital Thermometer	2188080	22I1285	TPA	21 Oct 2023

2. This certificate is valid only to the item calibrated on date and place of calibration.
3. This certification is traceable to the International Systam of Unit.

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

Result of Calibration :- (*) Without Adjustment

Function : Temperature measurement.
This instrument was connected with temperature sensor, S/N.: 1228475367

Calibration Point (°C)	Immersion Depth (mm)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty (±°C)	Coverage Factor k
20.00	100	20.011	19.91	-0.101	0.15	2.00

UUC* : Unit Under Calibration

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

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a 1159515

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
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Certificate of Calibration

Cert. No.: 24TM1663
Page : 1 of 3

REVIEW BY Tharitak.
APPROVED BY
NEXT CAL DATE 01/05/26

Equipment : Low Temp Incubator
Manufacturer : Memmert
Model : IPP750
Serial No. : V818.0084
ID No. : RYG_EN0154
Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd. Rayong Branch 616/10 Moo 5, T.Maenam Khu, A.Pluakdaeng, Rayong 21140, Thailand
Location : BOD Room

Received Order : 01 November 2024
Calibration Date : 01 November 2024
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %
AC Line Voltage : (220 ± 22) V

Calibrated by : Krisda Malee

Approved by :
Approved Signatory

( ) Ponpan Paipim
( ) Suwit Imjai
(✓) Kunchit Promprat

Issue Date : 07 November 2024

The Uncertainties are for a confidence probability of approximately 95%

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

Equipment : Low Temp. Incubator
Condition As-Received : Used Item
Reference : 2411-0002OC-1
Cert. No.: 24TM1663
Page : 2 of 3

Procedure Used :-

Calibration were conducted using calibration procedure CP-OT02 based on TLAS G-20 according to direct measurement method with Data Acquisition which connected with Resistance Temperature Detector (RTD).

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

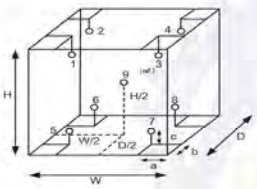
Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Data Acquisition	MY44073381	24LM73	TPA	18 May 2025

2. This certificate is valid only to the item calibrated on date and place of calibration.
3. This certification is traceable to the International System of Unit.

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

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

Environment during calibration	Beginning	Finished
Temp. (°C)	24	25
REL.Humid. (%)	55	53
AC Supply (Volt)	220	221



Position :	Ref. Std. ID No.:
1	1RTD-2/1
2	1RTD-2/2
3	22-01RTD-03
4	1RTD-2/4
5	1RTD-2/5
6	1RTD-2/6
7	23-01RTD-07
8	1RTD-2/8
9 (ref.)	23-01RTD-09

Probe Installation Details :

a =	10	cm
b =	10	cm
c =	10	cm

Dimension of Chamber :

D =	0.60	m
W =	1.0	m
H =	1.2	m
Capacity =	0.72	m³

Equipment : Low Temp. Incubator
Condition As-Received : Used Item
Reference : 2411-0002OC-1
Cert. No.: 24TM1663
Page : 3 of 3

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

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Coverage Factor *k*
20.0	20.0	20.0	0.026	0.26	0.53	2

Calibration Point	Measured Temperature (°C) Position								Uncertainty
(°C)	1	2	3	4	5	6	7	8	9 (ref.)	(±°C)
20.0	20.071	19.915	20.273	20.179	19.977	19.782	20.056	20.026	20.033	0.30

Average* : The average of 30 values in each position.
Temperature stability : One-half of the greatest maximum difference of measured temperature at any one sensor.
Temperature uniformity : The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.
Overall Variation : The Difference of the maximum and minimum measured temperatures throughout observation.
UUC* : Unit Under Calibration
Note : The reported uncertainty of measurement was incluced stability and excluded uniformity .

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

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NSC-TISI-TISI1925
CALIBRATION 0058

Cert.No.: 23CG3704
Page.: 1 of 2

Certificate of Calibration

Equipment : Burette
Capacity : 50 mL
Serial No. : -
ID. No. : RYG_EN0216
Manufacturer : Witeg
Made in : Germany
Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd.
Rayong Branch
616/10 Moo 5, T.Maenam Khu
A.Pluakdaeng, Rayong 21140 Thailand

REVIEW BY N.Bamjit
APPROVED BY
NEXT CAL. DATE 19/09/24

Ambient Temperature : (20 ± 2.5) °C
Relative Humidity : (50 ± 10) %
Barometric Pressure : 756 mmHg
Calibration Procedure : ASTM E 542 - 01
Calibrated by : Srisuda Khamtha
Approved by :
Approved Signatory

( ) Ponpan Paipim
(√) Srisuda Khamtha
( ) Sa-ngeunkam Wongsa

Issue Date : 28 September 2023

The Uncertainties are for a confidence probability of approximately 95%

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Approval of the head of Corporate Services 3 : Equipment Calibration and Testing Services.

A 0058881

Equipment : Burette
Received Date : 19 September 2023
Condition As-Received : Used Item
Calibration Date : 25 September 2023
Reference : 2309-0635DSC-31
Cert.No.: 23CG3704
Page.: 2 of 2

Condition of this result of calibration

1. Reference Standard Instruments :

Instruments	Model	Serial No.	ID. No.	Certificate No.	Traceability	Due date
1) Balance	MS204TS	C226356983	140RC010	TH2068-012	METTLER	29 Sep 2023
2) Thermo-Hygrograph	THDX-CE	00016540	140EC001	23H1275	TPA	09 June 2024
3) Thermometer	-	1594592	140EC010	23I158	TPA	12 Feb 2024

This certification is traceable to SI Unit
2. The certificate is valid only to the item calibrated on date and place of calibration.
3. True value is converted to true volume at the standard temperature of 20 °C

Calibration result :

Nominal capacity (mL)	Reading (mL)	Uncertainty (± mL)	*k* Factor
10	10.0224	0.0082	2.00
20	20.0064	0.0085	2.00
30	29.9931	0.0089	2.00
40	39.9910	0.0094	2.00
50	49.9806	0.010	2.00

Remark mL = cm^3

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

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a 1182477

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
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NSC-TISI-TIS17025
CALIBRATION 0009

Certificate of Calibration

Cert.No.: 24CG3711
Page.: 1 of 2

Equipment :	Burette
Capacity :	50 mL
Serial No. :	-
ID. No. :	RYG_EN0216
Manufacturer :	Witeg
Made in :	Germany
Submitted by :	ALS Laboratory Group (Thailand) Co.,Ltd. Rayong Branch 616/10 Moo 5, T.Maenam Khu. A.Pluakdaeng Rayong 21140, Thailand
Ambient Temperature :	(20 ± 2.5) °C
Relative Humidity :	(50 ± 10) %
Barometric Pressure :	756 mmHg
Calibration Procedure :	ASTM E 542 - 01
Calibrated by :	Sa-ngeunkam Wongsa
Approved by :	Approved Signatory

REVIEW BY Thanitak.
APPROVED BY
NEXT CAL DATE 24/09/25

(✓) Srisuda Khamtha
( ) Ponpan Paipim
( ) Unnopphol Harachai

Issue Date : 24 September 2024

The Uncertainties are for a confidence probability of approximately 95%

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

Equipment :	Burette
Received Date :	19 September 2024
Condition As-Received :	Used Item
Calibration Date :	24 September 2024
Reference :	2409-0756DSC-3

Condition of this result of calibration

1. Reference Standard Instruments :

Instruments	Model	Serial No.	ID. No.	Certificate No.	Traceability	Due date
1) Balance	XP205	B134206712	146RC007	24MM316	TPA	15 July 2025
2) Data Logger	HL-20D	20683159	146EC012	23H2174	TPA	10 Oct 2024
3) Thermometer	-	1594592	146EC010	24I175	TPA	20 Feb 2025

This certification is traceable to SI Unit
2. The certificate is valid only to the item calibrated on date and place of calibration.
3. True value is converted to true volume at the standard temperature of 20 °C

Calibration result :

Nominal capacity (mL)	Reading (mL)	Uncertainty (± mL)	*k* Factor
10	10.0259	0.0082	2.00
20	20.0214	0.0085	2.00
30	30.0006	0.0089	2.00
40	40.0003	0.0094	2.00
50	49.9988	0.011	2.00

Remark mL = cm^3

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

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Sartorius (Thailand) Co., Ltd.
129 Rama 9 Road, Huaykwang, Huaykwang, Bangkok 10310
Tel: +66 2643 8361-6 , e-mail: service.thailand@sartorius.com

NSC-TISI-TIS 17025
CALIBRATION 0436

SARTORIUS

Certificate of Calibration

REVIEW BY Thanitak
APPROVED BY
NEXT CAL DATE 02/02/2025

Model Number :	MSE224S-100-DU	Certificate No. :	24BCI0069
Description :	Analytical Balance	Issued Date :	Friday, February 23, 2024
Serial Number :	0026207038	Reference No. :	229196
ID No. :	RYG_EN0002		
Manufacturer :	Sartorius	Page No. :	1 Of 2

Customer Name : ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
616/10 Moo 5 T.Maenam Khu, A.Pluak Daeng, Rayong 21140, Thailand.

Calibrated Place : ALS Laboratory Group (Thailand) Co., Ltd.(Balance Room)
616/10 Moo 5 T.Maenam Khu, A.Pluakdaeng, Rayong.21140, Thailand.

Calibrated By : Mr.Chonchai Inthana
Calibration Date : Thursday, February 22, 2024

Calibration Procedure No. : This calibration was conducted by Using in-house calibration procedure number (WI-003) Based on UKAS LAB 14 : 2019

Metrological data :
Capacity : 220 g Readability : 0.0001 g

Ambients Conditions:
Temperature : 24.2 °C ± 5.0 °C
Humidity : 57.0 % RH ± 10.0 % RH
Pressure ± -

Reasons for calibration
☐ New Installation ☐ Service / Repaired ☑ Re-calibration/ Maintenance

Equipment Condition: ☑ Good Operate ☐ Fair

Measurement Method UKAS Publication Ref :Lab 14

The measurement uncertainty stated is the expanded uncertainty which is obtained from the standard uncertainty multiplied by the coverage factor (k=2) to provide a level of confidence of aproximately 95%. It is determined in accordance with the Guide to Expression of Uncertainty in Measurement (GUM). The calibration certificate documents the traceability to National Standards, which realise the unit of measurement according to the International Standard System of Units (SI). Report of Tolerance came form list of Sartorius Metrological Specifications.

Traceability:

Model Number	Description	Traceability	Cetificate No.	Due Date
YCS011-522-00	Sartorius weight set 1mg - 5000g E2,YCS011-522-00	TCS	M23081975	23-Aug-2025
MHB-382SD	Humidity/Barometer/Temp Lutron MHB-382SD	DKSH	C19231845	23-Aug-2024

This certificate relate and apply this equipment only.
This certificate may not be reproduced other than in full except with the prior written approval of the Verification Operation Division Sartorius (Thailand) Co., Ltd.

Mr.chonchai Intrhana(Technical Manager)

STAMP

Sartorius (Thailand) Co., Ltd.
129 Rama 9 Road, Huaykwang, Huaykwang, Bangkok 10310
Tel: +66 2643 8361-6 Fax: +66 2643-8367, e-mail: service.thailand@sartorius.com

SARTORIUS

Certificate of Calibration

Model Number :	MSE224S-100-DU	Certificate No. :	24BCI0069
Description :	Analytical Balance	Issued Date :	Friday, February 23, 2024
Serial Number :	0026207038	Reference No. :	229196
ID No. :	RYG_EN0002		
Manufacturer :	Sartorius	Page No. :	2 of 2

Calibration Results : Without Adjustment

Repeatability

The reproducibility is the ability of a weighing instrument to display nearly identical readouts under constant test conditions when the same load within a measurement series is placed repeatedly on the weighing pan in the same manner. The standard deviation is used to express reproducibility quantitatively.

Nominal Value : (Low Load)	20.0000	199.9999
20 g	20.0000	200.0000
Tolerance	20.0001	200.0000
0.0001 g	20.0000	199.9999
	20.0001	200.0000
Nominal Value : (High Load)	19.9999	200.0000
200 g	20.0000	200.0000
Tolerance	20.0000	199.9999
0.0001 g	19.9999	200.0001
	19.9999	200.0000
Standard Deviation	0.00007	0.00006

Eccentricity (Off-center loading error)

The off-center loading error is yielded by the difference between the readout of the load, i.e. 1/3 or 1/4 of maximum capacity, placed in the middle of the weighing pan and between each of four additional measurement points (positions defined according to OIML R76).

Nominal value : 100 g
Tolerance *0.0004* g





	Difference
1	-
2	-0.0001
3	-0.0001
4	0.0000
5	-0.0001
6	-

Linearity

The linearity, also called linearity error. Describes the deviation of the characteristic curve of a weighing instrument from the linear slope.

Tolerance *0.0002* g

Nominal Value (g)	Conventional Mass Value (g)	Displayed Value (g)	Deviation (g)	Uncertainty (g)
0.01	0.0100	0.0100	0.0000	0.00018
0.05	0.0500	0.0500	0.0000	0.00018
0.1	0.1000	0.1000	0.0000	0.00018
0.5	0.5000	0.5000	0.0000	0.00018
1	1.0000	1.0000	0.0000	0.00018
5	5.0000	5.0000	0.0000	0.00018
10	10.0000	10.0000	0.0000	0.00018
20	20.0000	20.0000	0.0000	0.00024
50	50.0000	49.9999	-0.0001	0.00019
100	100.0000	100.0000	0.0000	0.00023
200	200.0000	199.9999	-0.0001	0.00032

End of Report.

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
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TEL.0-2717-3000-29 FAX.0-2719-9484

Certificate of Calibration

Cert. No.: 24TM632
Page : 1 of 3

Equipment :	Hot Air Oven
Manufacturer :	Memmert
Model :	UFE 500
Serial No. :	G511.1572
ID No. :	RYG_EN0010

REVIEW BY ThanitaK.
APPROVED BY
NEXT CAL DATE 21/09/25

Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
616/10 Moo 5 T. Maenam Khu,
A. Pluakdaeng,
Rayong 21140 Thailand

Location : Oven Room

Received Order : 21 March 2024
Calibration Date : 21 March 2024
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %

Calibrated by : Man Pattanapongpaiboon

Approved by :
Approved Signatory

( ) Pornthippa Tameyakul
( ) Unnopphol Harachai
(✓) Suwit Imjai

Issue Date : 22 March 2024

The Uncertainties are for a confidence probability of approximately 95%

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

Procedure Used :-

Calibration were conducted using calibration procedure CP-0102 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:-

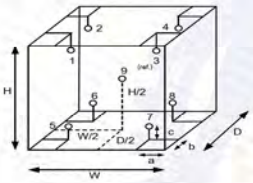
Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Data Acquisition	MY57013711	23LM115	TPA	11 Jul 2024

2. This certificate is valid only to the item calibrated on date and place of calibration.
3. This certification is traceable to the International System of Unit.

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

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

Environment during calibration	Beginning	Finished
Temp. (°C)	27	27
REL.Humid. (%)	57	59
AC Supply (Volt)	222	224



Probe Installation Details :

a =	5.0	cm
b =	5.0	cm
c =	5.0	cm

Dimension of Chamber :

D =	0.40	m
W =	0.56	m
H =	0.48	m
Capacity =	0.11	m³

Position :	Ref. Std. ID No.: @ Calibration Point (180) °C	(104) °C
1	18-18TC-01	18-18RTD-01
2	18-18TC-02	18-18RTD-02
3	18-18TC-03	18-18RTD-03
4	18-18TC-04	18-18RTD-04
5	18-18TC-05	18-18RTD-05
6	18-18TC-06	23-18RTD-06
7	18-18TC-07	18-18RTD-07
8	18-18TC-08	22-18RTD-08
9 (ref.)	18-18TC-09	18-18RTD-09

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Coverage Factor *k*
104.0	104.0	104.0	0.051	0.59	0.62	2
180.0	180.0	180.0	0.15	1.3	1.7	2

Calibration Point	Measured Temperature (°C)									Uncertainty
	Position									
(°C)	1	2	3	4	5	6	7	8	9 (ref.)	(±°C)
104.0	103.921	103.786	103.757	103.759	103.950	103.817	104.213	103.672	103.673	0.42
180.0	179.614	179.270	179.145	179.599	180.001	180.423	180.293	180.629	179.429	1.1

Average* : The average of 30 values in each position.
Temperature stability : One-half of the greatest maximum difference of measured temperature at any one sensor.
Temperature uniformity : The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.
Overall 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 approximatey 95 %.

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Certificate of Calibration

Cert. No.: 24TM634
Page : 1 of 3

Equipment :	Hot Air Oven
Manufacturer :	Memmert
Model :	UF 110
Serial No. :	B423.0853
ID No. :	RYG_EN0213

REVIEW BY ThanitaK.
APPROVED BY
NEXT CAL DATE 21/03/25

Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
616/10 Moo 5 T. Maenam Khu,
A. Pluakdaeng,
Rayong 21140 Thailand

Location : Oven Room

Received Order : 21 March 2024
Calibration Date : 21 - 22 March 2024
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %

Calibrated by : Man Pattanapongpaiboon

Approved by :
Approved Signatory

( ) Pornthippa Tameyakul
( ) Unnopphol Harachai
(✓) Suwit Imjai

Issue Date : 23 March 2024

The Uncertainties are for a confidence probability of approximately 95%

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

Equipment : Hot Air Oven
Condition As-Received : Used Item
Reference : 2403-0563OC-3

Cert. No.: 24TM634
Page : 2 of 3

Procedure Used :-

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

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

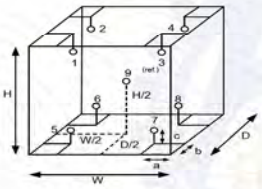
Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Data Acquisition	MY57013711	23LM115	TPA	11 Jul 2024

2. This certificate is valid only to the item calibrated on date and place of calibration.
3. This certification is traceable to the International System of Unit.

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

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

Environment during calibration	Beginning	Finished
Temp. (°C)	27	27
REL.Humid. (%)	59	59
AC Supply (Volt)	224	223



Probe Installation Details :

a =	5.0	cm	
b =	5.0	cm	
c =	5.0	cm	

Dimension of Chamber :

D =	0.40	m
W =	0.56	m
H =	0.48	m
Capacity =	0.11	m³

Position :	Ref. Std. ID No.: @ Calibration Point (180) °C	(104) °C
1	18-18TC-01	18-18RTD-01
2	18-18TC-02	18-18RTD-02
3	18-18TC-03	18-18RTD-03
4	18-18TC-04	18-18RTD-04
5	18-18TC-05	18-18RTD-05
6	18-18TC-06	23-18RTD-06
7	18-18TC-07	18-18RTD-07
8	18-18TC-08	22-18RTD-08
9 (ref.)	18-18TC-09	18-18RTD-09

Equipment : Hot Air Oven
Condition As-Received : Used Item
Reference : 2403-0563OC-3

Cert. No.: 24TM634
Page : 3 of 3

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

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Coverage Factor *k*
104.0	104.0	104.0	0.065	0.52	0.90	2
180.0	180.0	180.0	0.20	1.2	2.0	2

Calibration Point (°C)	Measured Temperature (°C) Position 1	2	3	4	5	6	7	8	9 (ref.)	Uncertainty (±°C)
104.0	104.169	103.506	103.898	103.712	103.772	103.730	104.289	103.805	103.798	0.42
180.0	180.701	179.239	179.935	179.999	180.127	180.138	180.895	179.313	180.211	1.1

Average* : The average of 30 values in each position.

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

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

Overall Variation : The Difference of the maximum and minimum measured temperatures throughout observation.

UUC* : Unit Under Calibration

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

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

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ilac-MRA

ISO/IEC 17025 CALIBRATION 0108

Certificate of Calibration

Cert. No.: 24TM635
Page : 1 of 3

Equipment : Water Bath
Manufacturer : Memmert
Model : WNB22
Serial No. : L513.0648
ID No. : RYG_EN0061

REVIEW BY ThanitaK.
APPROVED BY
NEXT CAL DATE 21/09/25

Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
616/10 Moo 5, T. Maenam Khu,
A. Pluakdaeng,
Rayong 21140, Thailand

Location : Wet Chemistry Lab

Received Order : 21 March 2024
Calibration Date : 21 March 2024
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %

Calibrated by : Man Pattanapongpaiboon

Approved by :
Approved Signatory

( ) Pornthippa Tameyakul
( ) Unnopphol Harachai
(✓) Suwit Imjai

Issue Date : 23 March 2024

The Uncertainties are for a confidence probability of approximately 95%

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

Equipment : Water Bath
Condition As-Received : Used Item
Reference : 2403-0563OC-4

Cert. No.: 24TM635
Page : 2 of 3

Procedure Used :-

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

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

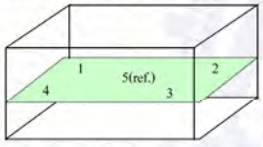
Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Data Acquisition	MY57013711	23LM115	TPA	11 Jul 2024

2. This certificate is valid only to the item calibrated on date and place of calibration.
3. This certification is traceable to the International System of Unit.

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

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

	Environmental (°C)	(%R.H.)	AC Voltage Supply (Volt)
Beginning of Calibration	25	55	222
Finished of Calibration	25	57	223



Front

Position :	Ref. Std. ID No.:
1	4803988-001
2	4803988-002
3	4803988-003
4	4803988-004
5(ref.)	4803988-005

Equipment : Water Bath
Condition As-Received : Used Item
Reference : 2403-0563OC-4
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source

Cert. No.: 24TM635

Calibration point	UUC* Setting	UUC* Reading	Average* Standard Reading (°C) Position					Uncertainty
(°C)	(°C)	(°C)	1	2	3	4	5 (ref.)	(± °C)
85.0	85.0	85.0	84.428	84.424	84.489	84.507	84.477	0.18

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

Average* : The average of 30 values in each position.
Uniformity : The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.
Stability : One-half of the greatest maximum difference of measured temperature at any one probe.
UUC* : Unit Under Calibration
Note : The reported uncertainty of measurement was included stability and excluded uniformity.

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

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TEL.0-2717-3000-29 FAX.0-2719-9484

Certificate of Calibration

Cert.No.: 24CH774

Equipment : pH Meter
Manufacturer : Mettler Toledo
Model : Seven2Go S2
Serial No. : C221115514
ID No. : RYG_FS0596
Condition As-Received: Used Item
Received Date : 28 June 2024
Calibration Date : 01 July 2024
Reference : 2406-0969DSC-6

REVIEW BY Pitthaya T.
APPROVED BY Saithip S.
NEXT CAL DATE 01/07/25

Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd. Rayong Branch
616/10 Moo 5, T.Maenam Khu,
A.Pluakdaeng, Rayong 21140, Thailand

Ambient Temperature : (25 ± 2.5) °C
Relative Humidity : (50 ± 15) %
Calibration Procedure : In - house method :
- CP-CH5 by direct measurement with DC voltage standard and direct measurement with certified reference material (CRM)

Calibrated by : Warakorn Lemgagtrakul

Approved by : Saithip
Approved Signatory

( ) Unnopphol Harachai
( ) Ponpan Paipim
(✓) Saithip Meangmai

Issue Date : 03 July 2024

The Uncertainties are for a confidence probability of approximately 95%

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

Condition of this calibration result

1. Reference Standard Instrument

Instrument	Serial No.	ID No.	Cert. No.	Due Date
1) Document Process Calibrator	54030049	130RC116	23E2802	27 Aug 2024

- This Certification is traceable to SI Throught Technology Promotion Association (Thailand - Japan)

2. Certified Reference Materials : The measurement results are traceable to SI through CPA chem Ltd., ANSI-ASQ National Accreditation Board, Accredited No. AR-1835

Buffer Solution	Manufacturer	Lot No.	Exp. date
pH 4.008	CPA chem	970851	25 Apr 2026
pH 6.986	CPA chem	970852	25 Apr 2025
pH 9.997	CPA chem	970853	25 Apr 2025

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

Calibration Results

Function : mV Measurement
Performing standard curve by Document Process Calibrator at pH (4,7,10)

Unit Under Calibration	Nominal Value	Standard Voltage Input	Actual Reading		Uncertainty of Measurement	Coverage factor
	pH	mV	mV	pH	(±mV)	*k*
pH Meter	4.00	177.48	178	4.00	0.58	2.00
S/N.: C221115514	7.00	0.00	0	7.00	0.58	2.00
	10.00	-177.48	-178	10.00	0.58	2.00

Function : pH Measurement
Performing three buffers standard curve by using buffer nominal pH (4,7,10)

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH Measurement (±)	Coverage factor *k*
pH Electrode	4.008	4.01	180	0.0079	2.00
S/N.: 3293232	6.986	6.99	5	0.011	2.00
	9.997	10.00	-172	0.0092	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 %.

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Certificate of Calibration

Cert. No.: 24LM108

Equipment : pH Meter with Sensor
Manufacturer : Mettler Toledo
Model : Seven2Go S2
Serial No. : C221115514
ID No. : RYG_FS0596
Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
616/10 Moo 5 T. Maenam Khu, A. Pluakdaeng, Rayong 21140 Thailand
Location : TPA On Site Calibration Laboratory

Received Order : 28 June 2024
Calibrated Date : 01 July 2024
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %
AC Line Voltage : (220 ± 22) V

Calibrated by : Warakorn Lemgagtrakul

Approved by : Suwit
Approved Signatory

( ) Ponpan Paipim
(✓) Suwit Imjai
( ) Kunchit Promprat

Issue Date : 03 July 2024

The Uncertainties are for a confidence probability of approximately 95%

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

Equipment : pH Meter with Sensor **Cert. No.:** 24LM108
Condition As-Received : Used Item **Page.:** 2 of 2
Reference : 2406-0969DSC-7

Procedure Used :-

Calibration were conducted using in-house calibration procedure CP-OT01 according to comparison with Industrial Platinum Resistance Thermometer (IPRT) into Temperature Bath.

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Digital Thermometer	2188080	2311216	TPA	11 Oct 2024

2. This certificate is valid only to the item calibrated on date and place of calibration.
3. This certification is traceable to the International System of Unit.

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

Result of Calibration :- (*) Without Adjustment

Function : Temperature measurement.

This instrument was connected with temperature sensor, S/N.: 3293232

Calibration Point (°C)	Immersion Depth (mm)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty (± °C)	Coverage Factor k
25.0	100	25.003	25.1	0.097	0.16	2.00
30.0	100	30.002	30.2	0.198	0.16	2.00
40.0	100	40.003	40.2	0.197	0.16	2.00
50.0	100	50.002	50.2	0.198	0.16	2.00

UUC* : Unit Under Calibration

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

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SCG

Metrology

SCI ECO Services Company Limited

33/2 Moo 3, T.Banpa, A.Kaengkhoi, Saraburi 18110, Thailand.

Saraburi Tel : +66 3627 3095 Fax : +66 3627 3100

Bangkok Tel : +668 9205 6851 , +669 8247 2360

Website : www.scieco.co.th E-Mail : calibrate@scg.com

NSC-TISI-TIS 17025 CALIBRATION 0244

Certificate No. T241120 **Page 1 of 4**

Certificate of Calibration

Equipment : Chamber (Cold Room)

Manufacturer : MODULAR

Model : IREVCOHCOO

Serial No. : C00351459

Customer Code : RYG_EN0184

ID No. : T1939A5

Customer : ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
616/10 Moo 5 T.Maenam Khu,
A.Pluakdaeng, Rayong 21140

Customer Location : Laboratory

Date of Receipt : 5 June 2024

Calibrated By : Sujjar Naknakred (Site Calibration Manager)

Approved By : Preecha Phisassutthikul (Temperature Calibration Manager)

Date of Issue : 12 JUN 2024

REVIEW BY Thanitall.
APPROVED BY D.
NEXT CAL. DATE 11/12/25

The uncertainties are for a confidence probability of approximately 95%.

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation Scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standard laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the Metrology.

FM-L14 I19/18-08-66

SCG

Metrology

SCI ECO Services Company Limited

33/2 Moo 3, T.Banpa, A.Kaengkhoi, Saraburi 18110, Thailand.

NSC-TISI-TIS 17025 CALIBRATION 0244

Certificate No. T241120 **Page 2 of 4**

Calibration Report

Equipment : Chamber (Cold Room)
Date of Calibration : 11 June 2024
Environment : Temperature : 23.1-24.1 °C
Line Voltage : 222.3-226.3 V
Relative Humidity : 55 - 65 %RH

Condition of this results of calibration :

1. This equipment was calibrated by insert nine standard thermocouples type T into its chamber , the other one standard thermocouples type T use for ambient temperature measurement . The calibration was done in according to WI-T20 (based on ASTM E145-94 (Reapproved 2001) and AS2853-1986).
All data show below were final values and the initial data from customer request . The temperature scale used was based on ITS - 90 .
2. Reference Standard Instrument :

Instrument	Model	Instrument No.	Certificate No.	Due Date
TC	TYPE T	TN161-TN170	T240713	19 April 2025
TC	TYPE T	TN171-TN180	T240713	19 April 2025
DATA LOGGER	34970A	T149	T240713	19 April 2025

3. This certificate is traceable to :
National Institute of Metrology (Thailand) through Metrological Center (NSC-TISI-TIS 17025 CALIBRATION 0244.)
4. Condition of calibrated item : good
Equipment Description :
Time Constant 3 Hour 30 Minute At 3 °C
Fresh Air Damper ☐ Open ☐ Min ☐ Medium ☐ Max
☐ Close
☒ Not Available
5. Adjustment :
( ) without adjustment (X) after adjustment

Approved By

FM-L15 I18/18-08-66

SCG

Metrology

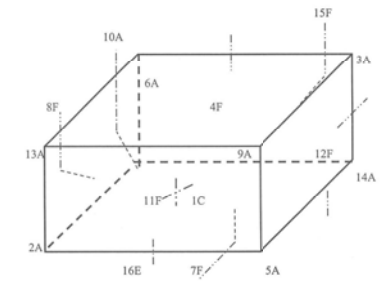
SCI ECO Services Company Limited

33/2 Moo 3, T.Banpa, A.Kaengkhoi, Saraburi 18110, Thailand.

NSC-TISI-TIS 17025 CALIBRATION 0244

Certificate No. T241120 **Page 3 of 4**

Calibration Report



C = Centre , F = Centre of Face , A = Corner , E = Centre of Edge

1C	TN161	11F	TN171
2A	TN162	12F	TN172
3A	TN163	13A	TN173
4F	TN164	14A	TN174
5A	TN165	15F	TN175
6A	TN166	16E	TN176
7F	TN167		
8F	TN168		
9A	TN169		
10A	TN170		

Approved By

FM-L15 I18/18-08-66

SCG

Metrology

SCI ECO Services Company Limited

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NSC-TISI-TIS 17025 CALIBRATION 0244

Certificate No. T241120

Calibration Report

Measurement Results:

	Average Standard Reading at each position (°C)									
Calibration Point	**TN161**	**TN162**	**TN163**	**TN164**	**TN165**	**TN166**	**TN167**	**TN168**	**TN169**	**TN170**
3	2.73	2.70	2.77	2.78	2.99	2.35	3.09	3.21	3.08	2.90
	TN171	**TN172**	**TN173**	**TN174**	**TN175**	**TN176**				
	3.39	3.01	2.92	2.81	3.42	3.42				

Chamber (Cold Room)			Temperature Distribution				
Setting (°C)	Reading (°C)		Average (°C)	Stability (±°C)	Uniformity (°C)	Uncertainty (±°C)	Coverage Factor *k*
	Min , Max	Average					
3.0	2.9 , 4.4	3.7	2.97	1.32	1.13	2.02	2.00

* The quoted uncertainty exclude " uniformity "

The calibration result apply only the above calibrated item.

The result of test was found accurate as shown on date and place of test only.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor *k* which for a t-distribution, providing a level of confidence of approximately 95 % .

Approved By.

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REVIEW BY Nant Sank

APPROVED BY

NEXT CAL. DATE 13-Jun-25

Certificate of System Qualification

GC-OQ + GCMS-OQ

System ID: GM-7
Organization Name: ALS Laboratory Group (Thailand) Co., Ltd.
Organization Location: 104 Pathanakarn 40, Pathanakarn Rd., Khwang Suan Luang, Khet Suan Luang, Bangkok.

Date: December 13, 2023 3:32:46 PM
EQP Name: AgilentRecommended , AgilentRecommended
EQP Revision: GC.02.50, GCMS.02.50
Overall Qualification Status: Pass

System Inspection and Basic Safety and Operation

Name: 7890

Setpoint Status: **Pass**

Overall System Inspection and Basic Safety and Operation Test Status

Pass

Inlet Pressure Accuracy

Name: 7890
Front SSL

Setpoint Status: **Pass**

	Setpoint		Actual	
Inlet Pressure:	25.0	psi	25.0	psi

Accuracy: 0.0 psi
Agilent Recommended: <= 1.2

Overall Inlet Pressure Accuracy Test Status

Pass

GC Oven Temperature Accuracy

Name: 7890

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Setpoint Status: **Pass**
Zone: Oven
Setpoint/Actual
Temperature: 230.0 232.3 °C
Accuracy: 2.3 °C
Agilent Recommended: >= -1.0 % setpoint in K (-5.0 °C)
<= 1.0 % setpoint in K (5.0 °C)

Setpoint Status: **Pass**
Zone: Oven
Setpoint/Actual
Temperature: 100.0 100.7 °C
Accuracy: 0.7 °C
Agilent Recommended: >= -1.0 % setpoint in K (-3.7 °C)
<= 1.0 % setpoint in K (3.7 °C)

Overall GC Oven Temperature Accuracy Test Status

Pass

GC Oven Temperature Stability

Name: 7890

Setpoint Status: **Pass**

	Setpoint	Average	
Temperature:	100.0	100.4	°C

Stability: 0.0 °C
Agilent Recommended: <= 0.5

Overall GC Oven Temperature Stability Test Status

Pass

Log Amp

Tested Combination1 Front SSL / External SQ
Name: 5977A

Setpoint Status: **Pass**

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Overall Log Amp Test Status

Pass

RFPA

Tested Combination1 Front SSL / External SQ
Name: 5977A

Setpoint Status: **Pass**

Amu:	1050	m/z	Drift After Five Minutes:			RFPA Voltage:	
			z	mV		504	mV
Agilent Recommended:			>= -100	and	<= 100	<= 1100	

Overall RFPA Test Status

Pass

Tune EI

Tested Combination1 Front SSL / External SQ
Name: 5977A

Setpoint Status: **Pass**

Filament: 1

Setpoint Status: **Pass**

Filament: 2

Overall Tune EI Test Status

Pass

Signal to Noise EI

Tested Combination1 Front SSL / External SQ
Name: 5977A

Source: EI - Extractor Filament: 1

Setpoint Status: Pass

Signal to Noise: 11316

Agilent Recommended: >= 1200

Source: EI - Extractor Filament: 2

Setpoint Status: Pass

Signal to Noise: 16588

Agilent Recommended: >= 1200

Overall Signal to Noise EI Test Status

Pass

NOTE: This test's 0 comment(s) and 6 deviation(s) are available in the Attachments section.

Instrument Details

Purpose

This section describes the as found system configuration.

Details

System	
System ID	GM-7
Manufacturer	Agilent Technologies
Name	7890
Tested Combination	
Injection Technique	Manual Injection
Inlet	Front
Detector	External
LTM Included?	No
Sampler 1	
Manufacturer	Agilent Technologies
Type	Manual Injection
Usage	Sample Injection
Syringe Volume (µL)	10
Mainframe 1	
Manufacturer	Agilent Technologies
Name	7890
Model Number	G3442B
Serial Number	CN14133161
Firmware Revision	B.02.03
Oven Type	Standard

Inlet 1	
Manufacturer	Agilent Technologies
Name	7890
Type	SSL
Location	Front
Carrier Gas	Helium
Control Type	Electronic Pressure Control (EPC)
Purged Inlet	Yes
Detector 1	
Manufacturer	Agilent Technologies
Name	Mass Spectrometer
Type	Mass Spectrometer
Location	External
Mass Spectrometer 1	
Manufacturer	Agilent Technologies
Type	SQ
Name	5977A
Serial Number	US1416M209
Firmware Revision	5977 6.00.21
High Vacuum System	Turbo Pump
Scooting Rod Standard	OFN Std
MS EI Source 1	
Manufacturer	Agilent Technologies
Source Type	EI - Extractor
Number of filaments	2

Electronic Signature

Purpose

This signature page was created and published because the ACE sign-off action was executed, which is valid for the entire document, including attachments. The ACE sign-off is an electronic signature that requires two distinct identification components: unique username and personal password. The Agilent representative who has delivered this service understands the meaning and legal status of an electronic signature. As a trained official operator, the Agilent representative has a unique password and logon to access ACE and electronically sign this document. (Other e-signatures can be applied to this document using a Document Content Management or other suitable method defined in your data access and control procedures.)

Details

Full Name of Signer:	Supasak Nimsongtham
Logged On User Name:	supasak.nimsongtham@agilent.com
Signature Creation Date:	December 13, 2023
Reason for Signature:	Executed protocol and published this original version of document

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User Name: supasak.nimsongtham System Id: GM-7
Report Generated by Hostname: ASBKKWX492 Print Date: December 13, 2023 3:32:47 PM

GM-7-2023 Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
December 13, 2023 10:22:24 AM	Audit	SessionCreated	Session	None
December 13, 2023 10:22:24 AM	Start	Configuration	Session	None
December 13, 2023 10:22:24 AM	Audit	Entitlement	Licensing	User is FieldEngineer and does not require an unlock code
December 13, 2023 10:23:53 AM	Audit	ConfigLoaded	Session	EQP details for primary technique [GC] - File path: [Protocol\Packs\GC\Configuration\02.50\Gc.02.50.eqp], EQP File Name: [Gc.02.50.eqp], EQP Name: [AgilentRecommended], Protocol Revision: [Gc.02.50] EQP details for hyphenated technique [GcMs] - File path: [Protocol\Packs\GcMs\Configurations\02.50\GcMs.02.50.eqp], EQP File Name: [GcMs.02.50.eqp], EQP Name: [AgilentRecommended]
December 13, 2023 10:23:56 AM	End	Configuration	Session	None
December 13, 2023 10:23:58 AM	Start	Qualification	Session	OQ
December 13, 2023 10:23:59 AM	Start	Execution	System Inspection and Basic Safety and Operation - 7890 : - Qualitative Test - No setpoints associated	None

User Name: supasak.nimsongtham System Id: GM-7
Report Generated by Hostname: ASBKKWX492 Print Date: December 13, 2023 3:32:47 PM

GM-7-2023 Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
December 13, 2023 10:24:10 AM	End	Execution	System Inspection and Basic Safety and Operation - 7890 : - Qualitative Test - No setpoints associated	Run Count : 1
December 13, 2023 10:24:11 AM	Start	Execution	Inlet Pressure Accuracy - Front SSL: - Pressure Controlled Inlet - S: 25.0 psi - L: <= 1.2 psi	None
December 13, 2023 10:24:15 AM	End	Execution	Inlet Pressure Accuracy - Front SSL: - Pressure Controlled Inlet - S: 25.0 psi - L: <= 1.2 psi	Run Count : 1
December 13, 2023 10:24:17 AM	Start	Execution	GC Oven Temperature Accuracy - 7890 : - Temperature : Oven - S: 230.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	None
December 13, 2023 10:32:09 AM	Audit	Load	GC Oven Temperature Accuracy - 7890 : - Temperature : Oven - S: 230.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	Manual Data Entry
December 13, 2023 10:32:11 AM	End	Execution	GC Oven Temperature Accuracy - 7890 : - Temperature : Oven - S: 230.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	Run Count : 1
December 13, 2023 10:32:12 AM	Start	Execution	GC Oven Temperature Accuracy - 7890 : - Temperature : Oven - S: 100.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	None
December 13, 2023 10:34:58 AM	Audit	Data	GC Oven Temperature Accuracy - 7890 : - Temperature : Oven - S: 100.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	Manual Data Entry
December 13, 2023 10:34:59 AM	End	Execution	GC Oven Temperature Accuracy - 7890 : - Temperature : Oven - S: 100.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	Run Count : 1

User Name: supasak.nimsongtham System Id: GM-7
Report Generated by Hostname: ASBKKWX492 Print Date: December 13, 2023 3:32:47 PM

GM-7-2023 Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
December 13, 2023 10:36:00 AM	Start	Execution	GC Oven Temperature Stability - 7890 : - Temperature : Oven - S: 100.0°C - L: <= 0.5°C	None
December 13, 2023 10:36:27 AM	Start	Execution	Signal to Noise EI - Liquid Injection, Front SSL, SQ: - Source: EI - Extractor using Filament 1 - L: >= 1200	None
December 13, 2023 10:36:39 AM	Start	Execution	GC Oven Temperature Stability - 7890 : - Temperature : Oven - S: 100.0°C - L: <= 0.5°C	None
December 13, 2023 10:55:10 AM	Audit	Data	GC Oven Temperature Stability - 7890 : - Temperature : Oven - S: 100.0°C - L: <= 0.5°C	Manual Data Entry
December 13, 2023 10:55:12 AM	End	Execution	GC Oven Temperature Stability - 7890 : - Temperature : Oven - S: 100.0°C - L: <= 0.5°C	Run Count : 1
December 13, 2023 10:55:13 AM	Start	Execution	Log Amp - 5977A SQ: - Source: EI - Extractor	None
December 13, 2023 10:56:42 AM	End	Execution	Log Amp - 5977A SQ: - Source: EI - Extractor	Run Count : 1
December 13, 2023 10:56:43 AM	Start	Execution	RFPA - 5977A SQ: - Source: EI - Extractor	None
December 13, 2023 11:04:34 AM	End	Execution	RFPA - 5977A SQ: - Source: EI - Extractor	Run Count : 1
December 13, 2023 11:04:46 AM	Start	Execution	Tune EI - 5977A SQ: - Source: EI - Extractor Filament 1 (Qualitative - No setpoints associated)	None
December 13, 2023 11:32:36 AM	End	Execution	Tune EI - 5977A SQ: - Source: EI - Extractor Filament 1 (Qualitative - No setpoints associated)	Run Count : 1

User Name: supasak.nimsongtham System Id: GM-7
Report Generated by Hostname: ASBKKWX492 Print Date: December 13, 2023 3:32:47 PM

GM-7-2023 Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
December 13, 2023 11:32:38 AM	Start	Execution	Tune EI - 5977A SQ: - Source: EI - Extractor Filament 2 (Qualitative - No setpoints associated)	None
December 13, 2023 11:33:06 AM	Start	Execution	Signal to Noise EI - Liquid Injection, Front SSL, SQ: - Source: EI - Extractor using Filament 1 - L: >= 1200	None
December 13, 2023 11:49:38 AM	Start	Execution	Tune EI - 5977A SQ: - Source: EI - Extractor Filament 2 (Qualitative - No setpoints associated)	None
December 13, 2023 11:49:42 AM	End	Execution	Tune EI - 5977A SQ: - Source: EI - Extractor Filament 2 (Qualitative - No setpoints associated)	Run Count : 1
December 13, 2023 11:49:43 AM	Start	Execution	Signal to Noise EI - Liquid Injection, Front SSL, SQ: - Source: EI - Extractor using Filament 1 - L: >= 1200	None
December 13, 2023 11:59:58 AM	Audit	AceClosed	Session	None
December 13, 2023 12:36:39 PM	Audit	AceRestarted	Session	None
December 13, 2023 12:36:40 PM	Audit	SessionTimeout	Session	None
December 13, 2023 12:36:42 PM	Start	Qualification	Session	OQ
December 13, 2023 12:36:43 PM	Start	Execution	Signal to Noise EI - Liquid Injection, Front SSL, SQ: - Source: EI - Extractor using Filament 1 - L: >= 1200	None

User Name: supasak.nimsongthon
Report Generated by Hostname: ASBKKWX492
System Id: GM-7
Print Date: December 13, 2023 3:32:47 PM

GM-7-2023 Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
December 13, 2023 12:37:53 PM	Audit	Data	Signal to Noise EI - Liquid Injection, Front SSL_SQ: - Source: EI - Extractor using Filament 1 - L: >= 1200	Data files Path : D:\MassHunter\GCMS\1\data \OQ2023\SZN_F1.D
December 13, 2023 12:38:16 PM	End	Execution	Signal to Noise EI - Liquid Injection, Front SSL_SQ: - Source: EI - Extractor using Filament 1 - L: >= 1200	Run Count : 1
December 13, 2023 12:39:51 PM	Audit	TestUnlocked	Signal to Noise EI - Liquid Injection, Front SSL_SQ: - Source: EI - Extractor using Filament 1 - L: >= 1200	Deviation filed for Run Count : 1
December 13, 2023 12:39:51 PM	Start	Execution	Signal to Noise EI - Liquid Injection, Front SSL_SQ: - Source: EI - Extractor using Filament 1 - L: >= 1200	None
December 13, 2023 12:40:15 PM	Audit	Data	Signal to Noise EI - Liquid Injection, Front SSL_SQ: - Source: EI - Extractor using Filament 1 - L: >= 1200	Data files Path : D:\MassHunter\GCMS\1\data \OQ2023\SZN_F1.D
December 13, 2023 12:42:00 PM	End	Execution	Signal to Noise EI - Liquid Injection, Front SSL_SQ: - Source: EI - Extractor using Filament 1 - L: >= 1200	Run Count : 2
December 13, 2023 12:42:06 PM	Start	Execution	Signal to Noise EI - Liquid Injection, Front SSL_SQ: - Source: EI - Extractor using Filament 2 - L: >= 1200	None
December 13, 2023 12:42:47 PM	Audit	Data	Signal to Noise EI - Liquid Injection, Front SSL_SQ: - Source: EI - Extractor using Filament 2 - L: >= 1200	Data files Path : D:\MassHunter\GCMS\1\data \OQ2023\SZN_F2.D

Date: December 13, 2023 3:32:46 PM
System ID: GM-7

User Name: supasak.nimsongthon
Report Generated by Hostname: ASBKKWX492
System Id: GM-7
Print Date: December 13, 2023 3:32:47 PM

GM-7-2023 Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
December 13, 2023 12:42:59 PM	End	Execution	Signal to Noise EI - Liquid Injection, Front SSL_SQ: - Source: EI - Extractor using Filament 2 - L: >= 1200	Run Count : 1
December 13, 2023 1:54:41 PM	Audit	TestUnlocked	Signal to Noise EI - Liquid Injection, Front SSL_SQ: - Source: EI - Extractor using Filament 1 - L: >= 1200	Deviation filed for Run Count : 2
December 13, 2023 1:54:41 PM	Start	Execution	Signal to Noise EI - Liquid Injection, Front SSL_SQ: - Source: EI - Extractor using Filament 1 - L: >= 1200	None
December 13, 2023 1:54:50 PM	Audit	Data	Signal to Noise EI - Liquid Injection, Front SSL_SQ: - Source: EI - Extractor using Filament 1 - L: >= 1200	Data files Path : D:\MassHunter\GCMS\1\data \OQ2023\SZN_F1.D
December 13, 2023 1:55:23 PM	End	Execution	Signal to Noise EI - Liquid Injection, Front SSL_SQ: - Source: EI - Extractor using Filament 1 - L: >= 1200	Run Count : 3
December 13, 2023 1:56:50 PM	Audit	TestUnlocked	Signal to Noise EI - Liquid Injection, Front SSL_SQ: - Source: EI - Extractor using Filament 1 - L: >= 1200	Deviation filed for Run Count : 3
December 13, 2023 1:56:50 PM	Start	Execution	Signal to Noise EI - Liquid Injection, Front SSL_SQ: - Source: EI - Extractor using Filament 1 - L: >= 1200	None
December 13, 2023 2:14:32 PM	Audit	Data	Signal to Noise EI - Liquid Injection, Front SSL_SQ: - Source: EI - Extractor using Filament 1 - L: >= 1200	Data files Path : D:\MassHunter\GCMS\1\data \OQ2023\SZN_F1.D

Date: December 13, 2023 3:32:46 PM
System ID: GM-7

User Name: supasak.nimsongthon
Report Generated by Hostname: ASBKKWX492
System Id: GM-7
Print Date: December 13, 2023 3:32:47 PM

GM-7-2023 Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
December 13, 2023 2:15:03 PM	End	Execution	Signal to Noise EI - Liquid Injection, Front SSL_SQ: - Source: EI - Extractor using Filament 1 - L: >= 1200	Run Count : 4
December 13, 2023 2:25:07 PM	Audit	TestUnlocked	Signal to Noise EI - Liquid Injection, Front SSL_SQ: - Source: EI - Extractor using Filament 2 - L: >= 1200	Deviation filed for Run Count : 1
December 13, 2023 2:25:07 PM	Start	Execution	Signal to Noise EI - Liquid Injection, Front SSL_SQ: - Source: EI - Extractor using Filament 2 - L: >= 1200	None
December 13, 2023 2:25:20 PM	Audit	Data	Signal to Noise EI - Liquid Injection, Front SSL_SQ: - Source: EI - Extractor using Filament 2 - L: >= 1200	Data files Path : D:\MassHunter\GCMS\1\data \OQ2023\SZN_F2.D
December 13, 2023 2:25:41 PM	End	Execution	Signal to Noise EI - Liquid Injection, Front SSL_SQ: - Source: EI - Extractor using Filament 2 - L: >= 1200	Run Count : 2
December 13, 2023 2:26:51 PM	Audit	TestUnlocked	Signal to Noise EI - Liquid Injection, Front SSL_SQ: - Source: EI - Extractor using Filament 2 - L: >= 1200	Deviation filed for Run Count : 2
December 13, 2023 2:26:51 PM	Start	Execution	Signal to Noise EI - Liquid Injection, Front SSL_SQ: - Source: EI - Extractor using Filament 2 - L: >= 1200	None
December 13, 2023 2:27:01 PM	Audit	Data	Signal to Noise EI - Liquid Injection, Front SSL_SQ: - Source: EI - Extractor using Filament 2 - L: >= 1200	Data files Path : D:\MassHunter\GCMS\1\data \OQ2023\SZN_F2.D

Date: December 13, 2023 3:32:46 PM
System ID: GM-7

User Name: supasak.nimsongthon
Report Generated by Hostname: ASBKKWX492
System Id: GM-7
Print Date: December 13, 2023 3:32:47 PM

GM-7-2023 Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
December 13, 2023 2:27:41 PM	End	Execution	Signal to Noise EI - Liquid Injection, Front SSL_SQ: - Source: EI - Extractor using Filament 2 - L: >= 1200	Run Count : 2
December 13, 2023 2:29:14 PM	Audit	TestUnlocked	Signal to Noise EI - Liquid Injection, Front SSL_SQ: - Source: EI - Extractor using Filament 2 - L: >= 1200	Deviation filed for Run Count : 3
December 13, 2023 2:29:14 PM	Start	Execution	Signal to Noise EI - Liquid Injection, Front SSL_SQ: - Source: EI - Extractor using Filament 2 - L: >= 1200	None
December 13, 2023 2:34:02 PM	Start	Execution	Signal to Noise EI - Liquid Injection, Front SSL_SQ: - Source: EI - Extractor using Filament 2 - L: >= 1200	None
December 13, 2023 2:41:26 PM	Start	Execution	Signal to Noise EI - Liquid Injection, Front SSL_SQ: - Source: EI - Extractor using Filament 2 - L: >= 1200	None
December 13, 2023 2:42:43 PM	Audit	Data	Signal to Noise EI - Liquid Injection, Front SSL_SQ: - Source: EI - Extractor using Filament 2 - L: >= 1200	Data files Path : D:\MassHunter\GCMS\1\data \OQ2023\SZN_F2_001.D
December 13, 2023 2:44:33 PM	End	Execution	Signal to Noise EI - Liquid Injection, Front SSL_SQ: - Source: EI - Extractor using Filament 2 - L: >= 1200	Run Count : 4
December 13, 2023 2:44:56 PM	End	Qualification	Session	OQ
December 13, 2023 2:44:56 PM	Start	Reporting	Session	None

Date: December 13, 2023 3:32:46 PM
System ID: GM-7

User Name: supasak.nimsongthien System Id: GM-7
Report Generated by Hostname: ASRKKWX462 Print Date: December 13, 2023 3:32:47 PM

GM-7-2023 Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
December 13, 2023 3:01:22 PM	Audit	AceClosed	Session	None
December 13, 2023 3:29:10 PM	Audit	AceRestarted	Session	None
December 13, 2023 3:29:10 PM	Audit	SessionReleased	Session	None
December 13, 2023 3:29:13 PM	Start	Qualification	Session	OQ
December 13, 2023 3:31:33 PM	Audit	Processing	Session	Report Generated : Certificate
December 13, 2023 3:32:15 PM	Audit	Processing	Session	Report Generated : Report

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ภาคผนวก จ

สำเนาหนังสืออนุญาตขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

ที่ อก ๐๓๑๐(๑)/ ๑๖๑๖๘ กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๒๐ พฤศจิกายน ๒๕๖๖

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอเอลเอล แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน ลงวันที่ ๕ สิงหาคม ๒๕๖๖

สิ่งที่ส่งมาด้วย ๑. รายชื่อผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑ แผ่น
๒. รายชื่อเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๕ แผ่น
๓. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๑ แผ่น

ตามหนังสือที่อ้างถึง บริษัท เอเอลเอล แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ขอต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ว-๒๐๔ สถานที่ตั้งเลขที่ ๑๐๔ ซอยพัฒนาการ ๔๐ ถนนพัฒนาการ แขวงพัฒนาการ เขตสวนหลวง กรุงเทพมหานคร ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอเอลเอล แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๖ ราย ตามสิ่งที่ส่งมาด้วย ๑
ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ ๑๘๑ ราย ตามสิ่งที่ส่งมาด้วย ๒
ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย น้ำใต้ดิน อากาศเสีย สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว และดิน ตามสิ่งที่ส่งมาด้วย ๓

หนังสือฉบับนี้จะหมดอายุในวันที่ ๒ กันยายน ๒๕๖๙ หากประสงค์จะต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อกรมโรงงานอุตสาหกรรม ภายใน ๓๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ทั้งนี้ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ที่หน้าเว็บไซต์กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายสิระ จันทร์เจิด)
นักวิทยาศาสตร์เชี่ยวชาญ รักษาราชการแทน
ผู้อำนวยการกองวิจัยและเฝ้าระวังมลพิษโรงงาน
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเฝ้าระวังมลพิษโรงงาน
กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ
โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕
โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๙
ไปรษณีย์อิเล็กทรอนิกส์ saraban@diw.mail.go.th

"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"

สิ่งที่ส่งมาด้วย ๑

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เอเอลเอล แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ว-๒๐๔
ที่ อก ๐๓๑๐(๑)/ ๑๖๑๖๘ ลงวันที่ ๒๐ พฤศจิกายน ๒๕๖๖

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๖ ราย

๑) นางสาวยุพาพร จันทร์เปล่ง	ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๑
๒) นางสาวชิชนัย ไกมารกุล ณ นคร	ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๒
๓) นายศรายุทธ จิตรานนท์	ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๓
๔) นางสาวกนกกร เอนก	ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๔
๕) นายสุรีรา สอนแก้ว	ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๕
๖) นายวิชาญ ขุณหรัด	ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๖

สิ่งที่ส่งมาด้วย ๒

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เอเอลเอล แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ว-๒๐๔
ที่ อก ๐๓๑๐(๑)/ ๑๖๑๖๘ ลงวันที่ ๒๐ พฤศจิกายน ๒๕๖๖

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑๘๑ ราย

๑) นายกาจบัณฑิต กิตติศุภวณิชย์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๑
๒) นายภัทรพล สว่างใจธรรม์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๒
๓) นายนราธิป เพ็ชรขัยคำ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๓
๔) นายศิริโชค พงษ์ประสม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๔
๕) นายณัฐวุฒิ ด้วงแพง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๕
๖) นางสาวจินตา ไชยุลธรรม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๖
๗) นางสาวสาวิตรี น้อยเสี้ยม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๗
๘) นางสาวชณัฐกาญจน์ อิ่มชม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๘
๙) นางสาวนรินทร์ สายเสิง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๙
๑๐) นางสาวนันทวดี สมบูรณ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๐
๑๑) นางสาวศรัณยา เฉลิมอำรงค์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๑
๑๒) นางสาวชัญญธร มงคลจิรวุฒิ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๒
๑๓) นางสาวศิริลักษณ์ บุนนาค	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๓
๑๔) นายนพพงศ์ จันทรุพันธุ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๔
๑๕) นายนรเศรษฐ์ ไกมาลย์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๕
๑๖) นายอับวา จริยา	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๖
๑๗) นางสาวเกศรินทร์ แก้วมั่น	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๗
๑๘) นางสาวสุวิมล ชัยเรืองวุฒิ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๘
๑๙) นางสาวสุชาดา ธรรมสาวร	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๙
๒๐) นางสาวเปมิกา ชัยเดชชนกุล	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๐
๒๑) นางสาวศศิกร หมุสวัสดิ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๑
๒๒) นางสาวเสาวลักษณ์ สูนภาอำพร	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๒
๒๓) นายอภิสิทธิ์ สิงหา	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๓
๒๔) นายศักดิ์สิทธิ์ ไพศาลพิสุทธิ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๔
๒๕) ว่าที่ร้อยตรีหญิง พรรณิภา ชำเจริญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๕
๒๖) นางจิลดา คำภูแก้ว	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๖
๒๗) นางสาวอรวรรณ รักยง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๗
๒๘) นางสาวนพรัตน์ แย้มกรานต์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๘
๒๙) นายจุลเดช วารินทร์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๙
๓๐) นางสาวลาษรัตน์ ร้องคำ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๐
๓๑) นายพรมมี ศรีปัดเนตร	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๑
๓๒) นายอุทิศ อุ่นสิม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๒
๓๓) ว่าที่ร้อยตรี เฉลิมเกียรติ อมรศรีเสริม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๓
๓๔) นางสาววรินยา สร้างงาม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๔
๓๕) นายอนุพงศ์ วัดนศรีประเสริฐ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๕

๓๖) นางสาวจุฑารัตน์...

๓๖) นางสาวจุฑารัตน์ โอนสันเทียะ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๖
๓๗) นางสาวจารุวรรณ พิมพ์อภิกฤติยา	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๗
๓๘) นางสาวปรางค์ทิพย์ กิจไพศาลศักดิ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๘
๓๙) นางสาวเดือนใจ ทางกลาง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๙
๔๐) นางสาวจิราพร ศิริเวช	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๐
๔๑) นายวรากร ผูกรักษ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๑
๔๒) นายทนง วิริยะสหกิจ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๒
๔๓) นายธนิต เจนจบ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๓
๔๔) นายคณิศร ชำเพชร	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๔
๔๕) นายภูวิช พรหมสะอาด	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๕
๔๖) นายธนเดช โภคาพิพัฒน์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๖
๔๗) นายชวฤทธิ์ วงษ์จันทร์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๗
๔๘) นายอาทิตย์ ศรีเสน	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๘
๔๙) นายเจษดินทร์ คงศักดิไทย	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๙
๕๐) นายจรัส บุญยิ่ง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๐
๕๑) นายธนาณัติ เอนก	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๑
๕๒) นายอภิวัฒน์ หุมหนู	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๒
๕๓) นางสาวสุภาชวัญ มาก	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๓
๕๔) นางสาวทัตพร ชวาลสมบูรณ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๔
๕๕) นางสาวธิติมา บุญเพ็ง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๕
๕๖) นางสาวภามุมาศ นามวัฒน์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๖
๕๗) นางสาวอุไรรัตน์ ทีงสร้างแป้น	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๗
๕๘) นายธีรวัฒน์ ปวงสุข	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๘
๕๙) นายอิทธิพล ยะโส	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๙
๖๐) นายประพจน์ วรรณชูชัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๐
๖๑) นายชยธร พวงทิพย์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๑
๖๒) นางสาวกนกวรรณ จันทบาล	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๒
๖๓) นายสิทธิโชค ธงเงิน	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๓
๖๔) นางศิลาวรรณ ใจบุญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๔
๖๕) นางสาวพรรณธิดา พุ่มคง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๕
๖๖) นายนวภัทร ศรีวิริยะ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๖
๖๗) นายสุวิชา ทองอ่อน	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๗
๖๘) นายวิญญู บุญตะนัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๘
๖๙) นายสมบูรณ์ บุตรจันทร์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๙
๗๐) นายวิรัตน์ ไชยนะรา	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๐
๗๑) นายนฤเบศน์ เพิ่มพูน	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๑
๗๒) นายจิรณัฐ ขาวละออ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๒
๗๓) นายอัสรี นามบุรี	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๓
๗๔) นายอัศวเรศ จ่อสาว	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๔

๗๕) นายประเสริฐ...

๗๕) นายประเสริฐ สุระชัน์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๗๕
๗๖) นายนุกูล จันทร์เนียม ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๗๖
๗๗) นายพีรพงษ์ ทองคูณปรีดา ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๗๗
๗๘) นายนฤพล ทองบุช ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๗๘
๗๙) นายอนุวัฒน์ ม่วงแพร ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๗๙
๘๐) นายเจตสราวุฒิ ปัดตะมะ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๘๐
๘๑) นายกฤษณะ สายวรรณ์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๘๑
๘๒) นายพิชัย บุญยงค์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๘๒
๘๓) นายภานุพงศ์ โฮมวงศ์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๘๓
๘๔) นายสามารถ คุ้มปลี ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๘๔
๘๕) นายสัญชัย โกศรีนาม ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๘๕
๘๖) นายณัฐวุฒิ ศรีประเสริฐ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๘๖
๘๗) นายชวัลธัช นาคพนม ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๘๗
๘๘) นายพงศธร ชัยทิพย์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๘๘
๘๙) นายสิทธิโชค ทาสีดา ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๘๙
๙๐) นายธนากร อินสุดา ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๙๐
๙๑) นางสาววรรณิชชา ชาติวันชัย ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๙๑
๙๒) นางสาวพิมพ์ตะวัน มินากูล ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๙๒
๙๓) นางสาวเพชรัตน์ สิงห์สมบุญ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๙๓
๙๔) นางสาวชญานิน พรหมจันทร์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๙๔
๙๕) นายกีรติ ทวีราช ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๙๕
๙๖) นายจักริน หมั่นวิชา ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๙๖
๙๗) นายฉัตรชัย สุขเปีย ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๙๗
๙๘) นายณรนนท์ ตีะทองคำ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๙๘
๙๙) นายคุลยพล สนนอก ทะเบียนเลขที่ ว-๒๐๔-๑-๐๐๙๙
๑๐๐) นายทักษ์ดนัย อุบลศรี ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๐๐
๑๐๑) นายธนศวร นามะกุฌณา ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๐๑
๑๐๒) นายธิติพงศ์ บัวแดง ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๐๒
๑๐๓) นายนนทชัย อุปถัมภ์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๐๓
๑๐๔) นายนัฐพล คุณสุทธิ์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๐๔
๑๐๕) นายนันทวัฒน์ สาริน ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๐๕
๑๐๖) นายปิยะนัฐ พลมะศรี ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๐๖
๑๐๗) นายพงศ์สิริ โสมเขียว ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๐๗
๑๐๘) นายพีรพัฒน์ กำคำ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๐๘
๑๐๙) นายภาณุพงศ์ มานิตย์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๐๙
๑๑๐) นายมงคล ผลาทิพย์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๑๐
๑๑๑) นายสิรินนท์ ทองอ้น ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๑๑
๑๑๒) นายอเนชา หันสมัย ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๑๒
๑๑๓) นายอดิศักดิ์ ผมไผ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๑๓

๑๑๔) นายอนันตชัย...

๑๑๔) นายอนันตชัย วีสม ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๑๔
๑๑๕) นายวรวุธ ดีนัก ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๑๕
๑๑๖) นายแสงตะวัน นะตะสัต ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๑๖
๑๑๗) นายยุทธพงศ์ รัตนะ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๑๗
๑๑๘) นายชยัณวุฒิ ไชยอะนิจ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๑๘
๑๑๙) นายวิศรุต ศรีธรรมมา ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๑๙
๑๒๐) นายนนทกร เผือกผ่อง ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๒๐
๑๒๑) นายกำชัย สุทธะ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๒๑
๑๒๒) นางสาวณัฐกรณ์ บุญตะนัย ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๒๒
๑๒๓) นางสาวพัชรินทร์ แสนสร้อย ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๒๓
๑๒๔) นายไพรวัลย์ เปรี่ยมพิมาย ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๒๔
๑๒๕) นางสาวศุภมาศ ทองมาก ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๒๕
๑๒๖) นางสาวลลิตา จิตรสว่าง ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๒๖
๑๒๗) นางสาวชไมพร เสิกภู่เงิย: ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๒๗
๑๒๘) นางสาวกฤติมาพร คำมีแก่น ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๒๘
๑๒๙) นางสาวสกุลรัตน์ ภาคภูมิ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๒๙
๑๓๐) นางสาวไพรินทร์ ศรีรูปิ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๓๐
๑๓๑) นางสาวทิพเนตร ผุยปัญญา ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๓๑
๑๓๒) นางสาวสาธิตา ปานทอง ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๓๒
๑๓๓) นางสาวอริสา ทองนวล ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๓๓
๑๓๔) นางสาวอรยา ค้าคล่อง ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๓๔
๑๓๕) นางสาวชุดาภรณ์ สุนทรสนาน ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๓๕
๑๓๖) นางสาวอัญชลี คำจันทร์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๓๖
๑๓๗) นายบุญฤทธิ์ เอี่ยมเทศ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๓๗
๑๓๘) นางสาวศุภรดา ปั้นมยุรา ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๓๘
๑๓๙) นางสาวพาฤดี คุณนาน ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๓๙
๑๔๐) นางสาวจิราเจต พ่องดา ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๔๐
๑๔๑) นางสาวอารยา มีชัย ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๔๑
๑๔๒) นางสาววิชชุตา นาคผจญ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๔๒
๑๔๓) นางสาวนันทิยา จันทะลุน ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๔๓
๑๔๔) นายกิตติพงศ์ แซ่ลี้ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๔๔
๑๔๕) นายอนุวัติ ภูถวิล ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๔๕
๑๔๖) นายธีรพล แสงทอง ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๔๖
๑๔๗) นายศักดิ์พิพัฒน์ บุญมั่น ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๔๗
๑๔๘) นายธิติวัลค์ เอมอุไร ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๔๘
๑๔๙) นายชัยณรงค์ ศรีบุรินทร์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๔๙
๑๕๐) นางสาวอัจฉราวรรณ สวนสนอง ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๕๐
๑๕๑) นางสาวณัฐฐาพร สิงหา ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๕๑
๑๕๒) นายภีมเรศ แหยมโต ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๕๒

๑๕๓) นางสาวอุบล...

๑๕๓) นางสาวอุบล เศิกศิริ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๕๓
๑๕๔) นางสาวมโนรัตน์ ทองบุตร ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๕๔
๑๕๕) นายภาคภูมิ แทนไทย ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๕๕
๑๕๖) นางสาวสุภาณัฐ เมล์พ่วง ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๕๖
๑๕๗) นางสาวพรทิวา สาตาชนม์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๕๗
๑๕๘) นายเอกวิทย์ วันทะนา ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๕๘
๑๕๙) นายไตรมณฑล ทิพย์วรรณ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๕๙
๑๖๐) นายจิรเมธ ประเสริฐสิริพงศ์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๖๐
๑๖๑) นายจิรายุส เกษมสุข ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๖๑
๑๖๒) นายจีรศักดิ์ ศรีวิชัย ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๖๒
๑๖๓) นายณัฐกฤษฎ์ สะพานแก้ว ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๖๓
๑๖๔) นายบูรณศักดิ์ ปะทิ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๖๔
๑๖๕) นายปัณณวิชญ์ เสมอทรัพย์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๖๕
๑๖๖) นายพิชญพงษ์ ไชย ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๖๖
๑๖๗) นายภัทรพงษ์ มณฑาทอง ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๖๗
๑๖๘) นายวสันต์ ตรีนกุล ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๖๘
๑๖๙) นายภาณุเดช เพชรลุด ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๖๙
๑๗๐) นายอนุกูล วิละแสง ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๗๐
๑๗๑) นายภัทรพงษ์ มีสุข ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๗๑
๑๗๒) นางสาวนุชรี ลีละพืป ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๗๒
๑๗๓) นางสาวสุภาวดี โกศรีนาม ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๗๓
๑๗๔) นางสาวอรณิช เทียนดำ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๗๔
๑๗๕) นางสาวพรเพ็ญ ขอบสอน ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๗๕
๑๗๖) นางสาววันวิสา ขอบพิกุล ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๗๖
๑๗๗) นางสาวอรวรรณ เถาร์ทอง ทะเบียนเลขที่ ว ๒๐๔ ๑ ๐๑๗๗
๑๗๘) นางสาวอัยย์ลิณ เมอร์วิณณ์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๗๘
๑๗๙) นางสาววิสรา คุ่ยครอง ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๗๙
๑๘๐) นายวุฒิกร ศิริวรรณ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๘๐
๑๘๑) นางสาวจารุวรรณ กระจ่างพันธุ์ ทะเบียนเลขที่ ว-๒๐๔-๑-๐๑๘๑

สิ่งที่ส่งมาด้วย ๓

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เอแอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ว-๒๐๔
ที่ อก ๐๓๑๐(๑)/ ๑๖๑๘ ลงวันที่ ๒๐ พฤศจิกายน ๒๕๖๖

ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๗๔ รายการ

น้ำเสีย จำนวน 60 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldicarb	High-Performance Liquid Chromatographic Method[6]
2	Aldicarb Sulfone	High-Performance Liquid Chromatographic Method[6]
3	Aldicarb Sulfoxide	High-Performance Liquid Chromatographic Method[6]
4	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
5	Arsenic	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[5]
6	Barium	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[5]
7	α-BHC	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
8	β-BHC	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
9	δ-BHC	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
10	γ-BHC	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric 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[6]
13	Carbofuran	High-Performance Liquid Chromatographic Method[6]
14	Cadmium	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[5]
15	Chemical Oxygen Demand	1) Closed Reflux, Colorimetric Method[4] 2) Closed Reflux, Titrimetric Method[4]
16	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
17	Chromium	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[5]
18	Color	ADMI Weighted-Ordinate Spectrophotometric Method[4]

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

40 Manganese...

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

น้ำใต้ดิน...

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

18 Bis(2-ethylhexyl)phthalate...

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

36 Chrysene...

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

56 1,3-Dichloropropene...

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

76 γ-HCH...

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

94 N-Nitrosodiphenylamine...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
94	N-Nitrosodiphenylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
95	N-Nitrosodi-n-Propylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
96	Polychlorinated Biphenyls - PCB 1016 - PCB 1221 - PCB 1232 - PCB 1242 - PCB 1248 - PCB 1254 - PCB 1260	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
97	Pentachlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
98	pH	Electrometric Method[4]
99	Phenanthrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
100	Phenol	1) Distillation, Chloroform Extraction Method[4] 2) Distillation, Direct Photometric Method[4] 3) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
101	Pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
102	Selenium	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[4]
103	Silver	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[4]
104	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
105	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
106	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
107	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
108	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
109	TPH (C_5-C_8)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[14,25]

110 TPH ($C_{>8}$-C_{16})...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
110	TPH ($C_{>8}$-C_{16})	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[9,22]
111	TPH ($C_{>16}$-C_{35})	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[9,22]
112	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
113	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
114	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
115	Trichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
116	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
117	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
118	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
119	Vanadium	1) Digestion, Inductively Coupled Plasma Method[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...

อากาศเสีย (ปล่องระบาย) จำนวน 28 รายการ

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

15 Lead...

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

27 Vanadium...

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

สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน 35 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[1,9,26] 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
2	Antimony	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
3	Arsenic	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
4	Barium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]

5 Beryllium...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
5	Beryllium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
6	Cadmium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
7	Chlordane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[1,9,26] 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
8	Chromium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
9	Chromium (III)	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction, Colorimetric Method; Calculation Method[1,6,16,19] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Waste Extraction, Colorimetric Method; Calculation Method[1,6,17,19] 3) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method[7,8,16,19] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method[7,8, 17,19]

10 Chromium (VI)...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
10	Chromium (VI)	1) Waste Extraction, Colorimetric Method[1,6,19] 2) Alkaline Digestion, Colorimetric Method[8,19]
11	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
12	Copper	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
13	2,4-D	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[1,9,26] 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
14	DDD	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[1,9,26] 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
15	DDE	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[1,9,26] 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
16	DDT	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[1,9,26]

2) Soxhlet...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
		2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
17	Dieldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[1,9,26] 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
18	Endrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[1,9,26] 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
19	Heptachlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[1,9,26] 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
20	Lead	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
21	Lindane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[1,9,26] 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]

22 Mercury...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
22	Mercury	1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method[1,6,20] 2) Waste Extraction, Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method[1,6,30] 3) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method[20] 4) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method[30] 5) Thermal Decomposition Amalgamation and Atomic Absorption Spectrometric Method[21]
23	Methoxychlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[1,9,26] 2) Soxhlet Extraction, Gas Chromatographic / Mass Spectrometric Method[10,26] 3) Automated Soxhlet Extraction, Gas Chromatographic /Mass Spectrometric Method[11,26]
24	Mirex	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[1,9,26] 2) Soxhlet Extraction, Gas Chromatographic / Mass Spectrometric Method[10,26] 3) Automated Soxhlet Extraction, Gas Chromatographic /Mass Spectrometric Method[11,26]
25	Molybdenum	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
26	Nickel	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
27	Polychlorinated biphenyls (PCBs) - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[1,9,26] 2) Soxhlet Extraction, Gas Chromatographic Method[10,26] 3) Automated Soxhlet Extraction, Gas Chromatographic Method[11,26]

- 2-Chlorobiphenyl...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
	- 2-Chlorobiphenyl - 2,3-Dichlorobiphenyl - 2,2',5-Trichlorobiphenyl - 2,4',5-Trichlorobiphenyl - 2,2',3,5'-Tetrachlorobipheny. - 2,2',5,5'-Tetrachlorobipheny. - 2,3',4,4'-Tetrachlorobipheny. - 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	
28	Pentachlorophenol	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[1,9,26] 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
29	pH	Electrometric Method[23,26]
30	Selenium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]

31 Silver...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
31	Silver	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
32	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
33	Toxaphene	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[1,9,26] 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
34	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
35	Zinc	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[1,6,17] 3) Digestion, Inductively Coupled Plasma Method[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]

ดิน...

ดิน จำนวน 125 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
2	Acetone	1)Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25] 2) Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method[13]
3	Aldrin	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
4	Anthracene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
5	Antimony	1) Digestion, Inductively Coupled Plasma Method[7,16] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
6	Arsenic	1) Digestion, Inductively Coupled Plasma Method[7,16] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
7	Atrazine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
8	Barium	1) Digestion, Inductively Coupled Plasma Method[7,16] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
9	Benz(a)anthracene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
10	Benzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]

11 Benzo(b)fluoranthene

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
11	Benzo(b)fluoranthene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
12	Benzo(k)fluoranthene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
13	Benzoic acid	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
14	Benzo(a)pyrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
15	Benzo(g,h,i)perylene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
16	Beryllium	1) Digestion, Inductively Coupled Plasma Method[7,16] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
17	Bis(2-chloroethyl)ether	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
18	Bis(2-ethylhexyl)phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
20	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
21	Butanol	Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method[13,25]
22	Butyl Benzyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]

23 Cadmium...

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

36 Chrysene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
36	Chrysene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
37	Cyanide	Extraction, Distillation, Colorimetric Method[27,28,29]
38	2,4-D	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
39	DDD	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
40	DDE	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
41	DDT	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
42	Dibenz(a,h)anthracene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
43	Di-n-Butyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
47	3,3-Dichlorobenzidine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
48	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]

49 1,2-Dichloroethane...

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

63 Di-n-Octyl Phthalate...

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

73 n-Hexane...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
74	α-HCH	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
75	β-HCH	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
76	γ-HCH	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
77	Hexachlorocyclopentadiene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
78	Hexachloroethane	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
79	Indeno(1,2,3-cd)pyrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
80	Isophorone	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
81	Lead	1) Digestion, Inductively Coupled Plasma Method[7,16] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
82	Manganese	1) Digestion, Inductively Coupled Plasma Method[7,16] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
83	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method[20] 2) Thermal Decomposition, Amalgamation, and Atomic Absorption Spectrophotometry[21] 3) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method[30]

84 Methanol...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
84	Methanol	1) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25] 2) Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method[13,25]
85	Methoxychlor	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
86	Methyl Bromide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
87	Methylene Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
88	2-methylphenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
89	2-Methylnaphthalene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
90	Methyl tert-Butyl Ether	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
91	Naphthalene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
92	Nickel	1) Digestion, Inductively Coupled Plasma Method[7,16] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
93	Nitrobenzene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26
94	N-Nitrosodiphenylamine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
95	N-Nitrosodi-n-propylamine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[30,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]

96 Polychlorinated biphenyls (PCBs)

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
96	Polychlorinated biphenyls (PCBs) - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260 - 2-Chlorobiphenyl - 2,2',3,5'-Tetrachlorobipheny. - 2,2',5,5'-Tetrachlorobipheny. - 2,3',4,4'-Tetrachlorobipheny. - 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	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
97	Pentachlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
98	Phenanthrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]

99 Phenol...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
99	Phenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
100	Pyrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
101	Selenium	1) Digestion, Inductively Coupled Plasma Method[7,16] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
102	Silver	1) Digestion, Inductively Coupled Plasma Method[7,16] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
103	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
104	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
105	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
106	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
107	Toxaphene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[30,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
108	TPH (C_5–C_8)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
109	TPH ($C_{>8}$– C_{16})	1) Automate Extraction, Gas Chromatographic Method[11,22] 2) Solvent Extraction, Gas Chromatographic Method[12,22] 3) Ultrasonic Extraction, Gas Chromatographic Method[22,31]
110	TPH ($C_{>16}$ – C_{35})	1) Automate Extraction, Gas Chromatographic Method[11,22] 2) Solvent Extraction, Gas Chromatographic Method[12,22] 3) Ultrasonic Extraction, Gas Chromatographic Method[22,31]
111	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
112	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
113	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
114	Trichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]

115 2,4,5-Trichlorophenol...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
115	2,4,5-Trichlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
116	2,4,6-Trichlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
117	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
118	Vanadium	1) Digestion, Inductively Coupled Plasma Method[7,16] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
119	Vinyl Acetate	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
120	Vinyl Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
121	m-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
122	o-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
123	p-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
124	Xylene (Total)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
125	Zinc	1) Digestion, Inductively Coupled Plasma Method[7,16] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]

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ที่ อก ๐๓๐๐(๗)/ ๕๑๒๓

กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๒๕ เมษายน ๒๕๖๗

เรื่อง เปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอเอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และขนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน ลงวันที่ ๒๙ มีนาคม ๒๕๖๗

ตามคำขอที่อ้างถึง บริษัท เอเอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ว-๒๐๔ สถานที่ตั้งเลขที่ ๓๐๔ ซอยพัฒนาการ ๔๐ ถนนพัฒนาการ แขวงพัฒนาการ เขตสวนหลวง กรุงเทพมหานคร ขอเปลี่ยนแปลงบุคลากร ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้

๑. ให้ยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๓ ราย

๑) นางสาวพรรณธิดา พุ่มดง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๕
๒) นายกำชัย สุทธะ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๓๒๓
๓) นางสาวศุภรดา ปิ่นมยุรา	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๓๓๘

๒. ให้เพิ่มเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน จำนวน ๑๒ ราย

๑) นางสาวฐานิดา กลิ่นเขียว	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๓๔๒
๒) นางสาวกัญญ์ภัสสร สายคำ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๓๔๓
๓) นางสาวณัฐนันท์ กันทะวงค์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๓๔๔
๔) นายอำนาจ วงษาเคน	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๓๔๕
๕) นายกฤษณพล ปัญญาวงค์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๓๔๖
๖) นายณชากร หรรษา	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๓๔๗
๗) นายวัชรินทร์ ผ่องสามสวน	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๓๔๘
๘) นายณัฐพงศ์ ไสยา	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๓๔๙
๙) นายศักรินทร์ ปานเพ็ง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๓๕๐
๑๐) นายณัฐพล ชุ่มชื่น	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๓๕๑
๑๑) นายธนา สุพาพันธุ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๓๕๒
๑๒) นายนราธร แก้วพรพัษา	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๓๕๓

๒หน้า หน้าสุดท้ายนี้...

อนึ่ง หนังสือฉบับนี้จะหมดอายุพร้อมหนังสือต่ออายุรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ในวันที่ ๒ กันยายน ๒๕๖๘

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายพรยศ กลั่นกรอง)
รองอธิบดี ปฏิบัติราชการแทน
อธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน
กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ
โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕
โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๙
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ที่ อก ๐๓๑๐(๑)/ ๑๒๓๖๘ /

กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๑๘ ธันวาคม ๒๕๖๗

เรื่อง ยกเลิกบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอเอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน ลงวันที่ ๒ ธันวาคม ๒๕๖๗

ตามคำขอที่อ้างถึง บริษัท เอเอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ว-๒๐๔ สถานที่ตั้งเลขที่ ๑๐๔ ซอยพัฒนาการ ๕๐ ถนนพัฒนาการ แขวงพัฒนาการ เขตสวนหลวง กรุงเทพมหานคร ขอยกเลิกบุคลากร ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้ยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๘ ราย ได้แก่

๑) นายประพจน์ วรรณชูชัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๐
๒) นายจิรณัฐ ขาวละออ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๒
๓) นายพีรพัฒน์ กำคำ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๐๘
๔) นางสาวอรยา ค้ำคล่อง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๓๔
๕) นายกิตติพงศ์ แซ่ลี้	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๔๔
๖) นายจิรเมธ ประเสริฐสิริพงศ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๖๐
๗) นายภัทรพงษ์ มณฑาทอง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๖๗
๘) นางสาวจารุวรรณ กระจ่างพันธุ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๑

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายธีรทัศน์ อิศรางกูร ณ อยุธยา)
รองอธิบดี ปฏิบัติราชการแทน
อธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน
กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ
โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕
โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๙
ไปรษณีย์อิเล็กทรอนิกส์ saraban@diw.mail.go.th

ที่ กก ๐๓๒๐/ ๗๙๓๘

กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๐๘ สิงหาคม ๒๕๖๗

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอเอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน ลงวันที่ ๒๗ พฤษภาคม ๒๕๖๗

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือต่ออายุรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน บริษัท เอเอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด จำนวน ๓ แผ่น

ตามคำขอที่อ้างถึง บริษัท เอเอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ขอต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ว-๓๒๓ สถานที่ตั้งเลขที่ ๖๒๒/๓๐ หมู่ที่ ๕ ตำบลแม่น้ำคู้ อำเภอปลวกแดง จังหวัดระยอง ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอเอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมห้องปฏิบัติการวิเคราะห์เอกชน

๑) นายเดช ช้างขน	ทะเบียนเลขที่ ว-๓๒๓-ก-๐๐๐๑
๒) นางวิลาวัณย์ บริรักษ์	ทะเบียนเลขที่ ว-๓๒๓-ก-๐๐๐๒
๓) นายสุพจน์ สลามเด๊ะ	ทะเบียนเลขที่ ว-๓๒๓-ก-๐๐๐๓

ข. เจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน

๑) นายณัฐพงษ์ เพ็งจารนา	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๐๑
๒) นางสาวกัลยรรพนี รักดี	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๐๒
๓) นางสาวจุฑารัตน์ ลีพงษ์หลาง	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๐๓
๔) นางสาวจิตสุภา ประเทืองสุข	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๐๔
๕) นายสรวงเสวิญ คุ้ยอกสุย	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๐๕
๖) นายณัฐวุฒิ ยอมพรมวาช	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๐๖
๗) นายจิตกร สีวะสา	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๐๗
๘) นายสิทปวิชญ์ สุวรรณรัตน์	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๐๘
๙) นายสิทธิพันธ์ เสนาพิว	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๐๙
๑๐) นายอนุเวศน์ เหมา	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๑๐
๑๑) นายสุรวิทย์ นราพงษ์	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๑๑
๑๒) นายณัฐพล เจียงวิวังค์	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๑๒
๑๓) นายชานนท์ บุญชื่น	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๑๔
๑๔) นายณัฐกานต์ วงศ์สินทรัพย์	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๑๕
๑๕) นายอานนท์ โพธิ์พระทอง	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๑๖

๑๖) นายณัชพล...

๑๖) นายณัชพล ถ้ำกลาง	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๑๗
๑๗) นายศุภณัฐ พิสัยพันธ์	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๑๘
๑๘) นายวสันต์ คินันติ	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๑๙
๑๙) นายวรัญญู ฉิมพาลี	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๒๐
๒๐) นายศุภณัฐ สกุลกิตติมศักดิ์	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๒๑
๒๑) นายเอกชัย ถันทอง	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๒๒
๒๒) นายพงษ์เทพ สิทธิเลาะ	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๒๓
๒๓) นายทินกร กุมภาษี	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๒๔
๒๔) นางสาวนันทิยา เบญจขันธ์	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๒๕
๒๕) นายสิทธิชัย ยันพิมาย	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๒๖
๒๖) นางสาวปภาณัน หลอดทอง	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๒๗
๒๗) นางสาวพจนา สีดา	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๒๘
๒๘) นางสาวธนิดา กุลศิริวงศ์	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๒๙
๒๙) นายพิทยา ทองแดง	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๓๐
๓๐) นางสาวชลธิชา สุบงกช	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๓๑
๓๑) ว่าที่ร้อยตรี รณชัย ม่วงมา	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๓๒
๓๒) นายวรวุฒิ พับพา	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๓๓
๓๓) นายศักดิ์นรินทร์ จรัสกาย	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๓๔
๓๔) นายสุรศักดิ์ สาจิน	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๓๕
๓๕) นายสถาพร ถาแก้ว	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๓๖
๓๖) นายสุทธิ์ดำรง โชคปิดินันท์	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๓๗
๓๗) นายวัลลภ หันไชยเนาว์	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๓๘
๓๘) นางสาววนาลี เหรียญตระกูล	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๓๙
๓๙) นายธนะสิทธิ์ วงศ์ษาไชย	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๔๐
๔๐) นายชัยนุสรณ์ เลิศนันทกุลชัย	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๔๑
๔๑) นายสัจจา เพ็ชรแสวง	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๔๒
๔๒) นายกัณตภณ มณีสัมพันธ์	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๔๓
๔๓) นายธารินทร์ อ๊อกจินดา	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๔๔
๔๔) นายศุภชัย วงศ์สุริย์ฉาย	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๔๕
๔๕) นายโสว ต้นไพรี	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๔๖
๔๖) นางสาวกิตติยา สัญญาอริยะภรณ์	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๔๗
๔๗) นางสาวอิดารัตน์ ศิริมังคะโร	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๔๘
๔๘) นายพิพัฒน์ นิภัทร์เศรษฐ์	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๔๙
๔๙) นายศิริวิทย์ เรืองสม	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๕๐
๕๐) นายปาราเมศ สัตยาคุณ	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๕๑
๕๑) นายนฤนาท ธรรมสะโร	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๕๒
๕๒) นางสาวศุภรัตน์ โสจันทร์	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๕๓

๕๒) นายพชรกร...

๕๒) นายพชรกร เจิ้งเจริญ ทะเบียนเลขที่ ว-๐๒๓๓-๙-๐๐๕๔
๕๓) นายทิวากร เชื้อมาก ทะเบียนเลขที่ ว-๐๒๓๓-๙-๐๐๕๕
๕๔) นายอนุรักษ์ ทองจรรักษา ทะเบียนเลขที่ ว-๐๒๓๓-๙-๐๐๕๖
๕๕) นายเกียรติ วิลาศ ทะเบียนเลขที่ ว-๐๒๓๓-๙-๐๐๕๗
๕๖) นายจรัสระวี ศรีรักษา ทะเบียนเลขที่ ว-๐๒๓๓-๙-๐๐๕๘
๕๗) นายประสาทชัย เที่ยงเพชร ทะเบียนเลขที่ ว-๐๒๓๓-๙-๐๐๕๙
๕๘) นายภานุวัฒน์ วังบง ทะเบียนเลขที่ ว-๐๒๓๓-๙-๐๐๖๐
๖๐) นายสันติ ชัยชนะ ทะเบียนเลขที่ ว-๐๒๓๓-๙-๐๐๖๑
๖๑) นายพีนกร ทุสชาติ ทะเบียนเลขที่ ว-๐๒๓๓-๙-๐๐๖๒

ค. ขอบข่ายชนิดสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย น้ำใต้ดิน อากาศเสีย ตามสิ่งที่ส่งมาด้วย

หนังสือฉบับนี้จะหมดอายุในวันที่ ๒๘ มิถุนายน ๒๕๗๑ หากประสงค์จะต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อกรมโรงงานอุตสาหกรรมภายใน ๖๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายพรยศ กลั่นกรอง)
รองอธิบดี ปฏิบัติราชการแทน
อธิบดีกรมโรงงานอุตสาหกรรม

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก
โทร. ๐ ๓๓๓๓ ๖๐๕๙ ต่อ ๕๐๐๑-๒
ไปรษณีย์อิเล็กทรอนิกส์ eirw@diw.mail.go.th

เอกสารแนบท้ายหนังสือเปลี่ยนแปลงสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เอนอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ว-๐๒๓๓
ที่ อก ๐๓๒๐/ ๗ ๔๓ ๘ ลงวันที่ ๐๘ สิงหาคม ๒๕๖๗

ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม 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[4]
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	Field Method[3]
12	Total Dissolved Solids	Dried at 180 °C[2]
13	Total Kjeldahl Nitrogen	Semi-Macro Kjeldahl Method[2]
14	Total Suspended Solids	Dried at 103-105 °C[2]

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]

อากาศเสีย

อากาศเสีย (ปล่องระบาย) จำนวน 7 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Carbon Monoxide	1) Sampling Bag, Non-Dispersive Infrared Method[5] 2) Instrumental Analyzer Method[9]
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[8] 2) Instrumental Analyzer Method[10]
5	Sulfur Dioxide	1) Absorption Sampling, Barium-Thorin Titrimetric Acid Method[5] 2) Instrumental Analyzer Method[11]
6	Sulfuric Acid	Isokinetic Sampling, Barium – Titrimetric Method[6]
7	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method[7]

เอกสารอ้างอิง

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ที่ อก ๐๓๒๐/ ๓๐๐๙๙

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