

ภาคผนวก ง

## ใบรับรองผลการตรวจวิเคราะห์คุณภาพสิ่งแวดล้อม

## ภาคผนวก ง.1

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ใบรับรองผลการตรวจวิเคราะห์  
คุณภาพอากาศจากปล่องระบายอากาศ



บริษัท ซีคอต จำกัด

SECOT CO., LTD.

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239 RJMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND

TEL : +66(0) 2959-3600 FAX : +66(0) 2959-3535 E-mail : envserv@secot.co.th

# STACK EMISSION ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Co., Ltd. REF. NO. : 223007\_Cert-Stack/PM\_Sep 23  
Branch 2, Power Plant  
SAMPLING BY : SECOT Co., Ltd. SAMPLING DATE : 04/09/2023  
RECEIVED DATE : 05/09/2023 ANALYTICAL DATE : 05-06/09/2023  
REPORT DATE : 08/09/2023 SAMPLE CONDITION : Normal  
SOURCE DESCRIPTION : Combustion FUEL TYPE : Natural Gas  
OPERATOR : Mr. Song Hengchwankul STACK LOCATION : H-3701

## STACK DESCRIPTION

Height : 30.0 m Gas Velocity : 10.5 m/s  
Diameter : 4.20 m Flow Rate\* : 5,145 Ncu.m/min  
Temperature : 174.3 °C Excess Oxygen : 15.3 %

PARAMETER	UNITS	RESULTS*			REFERENCE
		15.3%O <sub>2</sub>	7%O <sub>2</sub>	7%O <sub>2</sub>	
					METHODS
Particulate Matter	mg/Ncu.m.	1.22	2.99	60	US. EPA Method 5

Phatchara Samanchan

(Miss Phatchara Samanchan)

Analyst

REG.NO. 2-239-0-0021

Narisa Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO. 2-239-0-0010

Remark : 1. Reported analysis refers to submitted sample only.

2. This report shall not be reproduced, except in full, without official approval.

3. \* At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. <sup>1/</sup> Notification of the Ministry of Industry, B.E.2547.

## The Monitoring Result of Emission Concentration H-3701

PTT Global Chemical Public Co., Ltd.

(Branch 2 : Power Plant I-1)

September 4, 2023


Run Number	Oxygen content (%)		Oxide of Nitrogen (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	15.09	15.24	25.23	25.24	61.99
2	15.05	15.24	25.14	25.15	61.76
3	15.06	15.28	24.86	24.87	61.51
Average	15.07	15.25	25.08	25.09	61.75

Run Number	Oxygen content (%)		Sulfur dioxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	15.09	15.24	0.19	0.13	0.32
2	15.05	15.24	0.14	0.09	0.22
3	15.06	15.28	0.11	0.07	0.17
Average	15.07	15.25	0.15	0.10	0.24

**PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)**  
**EMISSION TEST RESULT**

Date: September 4, 2023 Run # : 1  
 Start time: 11:20 AM Location : H-3701  
 O<sub>2</sub> instrument Model: AMI 70 Finish time : 11:40 AM  
 NO<sub>x</sub> instrument Model: API 200 AH Serial No.: 121121-10  
 SO<sub>2</sub> instrument Model: API 100 AH Serial No.: 314  
 Fuel Type : Natural Gas Serial No.: 132  
 Test Operator : Song H.

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)
11:20 AM	15.21	25.20	0.18
11:21 AM	15.12	23.70	0.19
11:22 AM	15.05	24.80	0.19
11:23 AM	15.08	25.90	0.19
11:24 AM	15.14	24.90	0.19
11:25 AM	15.13	25.15	0.19
11:26 AM	15.06	25.05	0.19
11:27 AM	15.01	25.20	0.20
11:28 AM	14.96	25.35	0.20
11:29 AM	15.11	25.70	0.20
11:30 AM	15.03	26.15	0.20
11:31 AM	15.05	24.90	0.20
11:32 AM	15.04	25.60	0.20
11:33 AM	15.13	27.00	0.20
11:34 AM	15.11	26.25	0.20
11:35 AM	15.22	25.40	0.20
11:36 AM	15.14	24.30	0.19
11:37 AM	15.03	25.20	0.20
11:38 AM	15.13	25.50	0.15
11:39 AM	15.09	24.70	0.15
11:40 AM	15.07	23.90	0.15
Average	15.09	25.23	0.19

Signature   
 ( Miss Katesarin Vorradetwittaya )  
 Environmental Scientist

**PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)**  
**EMISSION TEST RESULT**

Date: September 4, 2023 Run # : 2  
 Start time: 11:41 AM Location : H-3701  
 O<sub>2</sub> instrument Model: AMI 70 Finish time : 12:01 PM  
 NO<sub>x</sub> instrument Model: API 200 AH Serial No.: 121121-10  
 SO<sub>2</sub> instrument Model: API 100 AH Serial No.: 314  
 Fuel Type : Natural Gas Serial No.: 132  
 Test Operator : Song H.

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)
11:41 AM	15.05	25.30	0.15
11:42 AM	15.00	26.30	0.15
11:43 AM	14.97	24.70	0.15
11:44 AM	15.01	24.85	0.15
11:45 AM	15.01	24.45	0.15
11:46 AM	15.10	25.25	0.15
11:47 AM	15.07	25.95	0.15
11:48 AM	14.99	25.10	0.15
11:49 AM	14.94	25.95	0.15
11:50 AM	15.12	25.25	0.15
11:51 AM	14.99	23.60	0.15
11:52 AM	14.94	24.25	0.15
11:53 AM	15.05	25.45	0.15
11:54 AM	15.08	25.60	0.15
11:55 AM	15.08	25.85	0.15
11:56 AM	15.09	24.05	0.15
11:57 AM	15.03	24.25	0.15
11:58 AM	15.04	26.25	0.12
11:59 AM	15.06	26.00	0.11
12:00 PM	15.19	25.25	0.11
12:01 PM	15.22	24.25	0.11
Average	15.05	25.14	0.14

Signature   
 ( Miss Katesarin Vorradetwittaya )  
 Environmental Scientist

# PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)

## EMISSION TEST RESULT

**Run # :** 3  
**Date:** September 4, 2023  
**Start time:** 12:02 PM  
**O<sub>2</sub> instrument Model:** AMI 70  
**NO<sub>x</sub> instrument Model:** API 200 AH  
**SO<sub>2</sub> instrument Model:** API 100 AH  
**Fuel Type :** Natural Gas  
**Location :** H-3701  
**Finish time :** 12:22 PM  
**Serial No.:** 121121-10  
**Serial No.:** 314  
**Serial No.:** 132  
**Test Operator :** Song H.

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)
12:02 PM	15.08	23.80	0.11
12:03 PM	14.98	24.60	0.11
12:04 PM	15.02	25.40	0.11
12:05 PM	15.12	25.70	0.11
12:06 PM	15.03	23.70	0.11
12:07 PM	15.03	24.50	0.11
12:08 PM	15.08	25.60	0.11
12:09 PM	15.02	24.60	0.11
12:10 PM	15.09	24.45	0.11
12:11 PM	15.02	24.40	0.11
12:12 PM	15.02	24.10	0.11
12:13 PM	14.96	24.95	0.11
12:14 PM	14.99	26.55	0.11
12:15 PM	15.13	24.95	0.11
12:16 PM	15.10	24.70	0.11
12:17 PM	15.08	24.95	0.12
12:18 PM	15.08	24.90	0.11
12:19 PM	15.16	25.10	0.11
12:20 PM	15.02	25.10	0.11
12:21 PM	15.10	24.90	0.11
12:22 PM	15.20	25.05	0.11
Average	15.06	24.86	0.11

Signature



(Miss Katesarin Vorradevittaya)

Environmental Scientist



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### STACK EMISSION ANALYSIS REPORT

**CLIENT NAME :** PTT Global Chemical Public Co., Ltd. **REF. NO. :** 223007\_Cert-Stack/PM\_Sep 23  
**Branch 2, Power Plant**  
**SAMPLING BY :** SECOT Co., Ltd. **SAMPLING DATE :** 04/09/2023  
**RECEIVED DATE :** 05/09/2023 **ANALYTICAL DATE :** 05-06/09/2023  
**REPORT DATE :** 08/09/2023 **SAMPLE CONDITION :** Normal  
**SOURCE DESCRIPTION :** Combustion **FUEL TYPE :** Natural Gas  
**OPERATOR :** Mr. Song Hengchwankul **STACK LOCATION :** H-3703  
**STACK DESCRIPTION**

**Height :** 30.0 m **Gas Velocity :** 15.9 m/s  
**Diameter :** 4.20 m **Flow Rate\* :** 8,138 Ncu.m/min  
**Temperature :** 161.0 °C **Excess Oxygen :** 15.6 %

PARAMETER	UNITS	RESULTS*		STANDARDS <sup>1/</sup>		REFERENCE
		15.6%O <sub>2</sub>	7%O <sub>2</sub>	7%O <sub>2</sub>		METHODS
Particulate Matter	mg/Ncu.m.	1.43	3.75	60		US. EPA Method 5

Phatchara Samanchan

(Miss Phatchara Samanchan)

Analyst

REG.NO.7-239-ท-0021



(Miss Narisa Poowasanpet)

Technical Management Team

REG.NO.7-239-ท-0010

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3. \* At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. <sup>1/</sup> Notification of the Ministry of Industry, B.E.2547.

**The Monitoring Result of Emission Concentration  
H-3703**

**PTT Global Chemical Public Co., Ltd.**

**(Branch 2 : Power Plant I-1)**

**September 4, 2023**

Run Number	Oxygen content (%)		Oxide of Nitrogen (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	15.64	15.79	19.26	19.26	52.39
2	15.60	15.60	19.16	19.16	50.25
3	15.59	15.45	22.54	22.55	57.51
<b>Average</b>	<b>15.61</b>	<b>15.61</b>	<b>20.32</b>	<b>20.32</b>	<b>53.44</b>

Run Number	Oxygen content (%)		Sulfur dioxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	15.64	15.79	0.15	0.10	0.27
2	15.60	15.60	0.14	0.10	0.26
3	15.59	15.45	0.13	0.10	0.26
<b>Average</b>	<b>15.61</b>	<b>15.61</b>	<b>0.14</b>	<b>0.10</b>	<b>0.26</b>

**PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)  
EMISSION TEST RESULT**

Date: September 4, 2023

Start time: 11:20 AM

O<sub>2</sub> instrument Model: AMI 70

NO<sub>x</sub> instrument Model: TELEDYNE 200 EM

SO<sub>2</sub> instrument Model: API 100 AH

Fuel Type : Natural Gas

Run # : 1

Location : H-3703

Finish time : 11:40 AM

Serial No.: 161212-14

Serial No.: 435

Serial No.: 058

Test Operator : Song H.

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)
11:20 AM	15.70	18.61	0.17
11:21 AM	15.70	19.16	0.16
11:22 AM	15.67	17.37	0.16
11:23 AM	15.70	19.47	0.16
11:24 AM	15.70	19.43	0.16
11:25 AM	15.70	20.33	0.16
11:26 AM	15.67	19.15	0.16
11:27 AM	15.62	18.15	0.15
11:28 AM	15.67	19.63	0.15
11:29 AM	15.62	17.78	0.15
11:30 AM	15.65	20.11	0.15
11:31 AM	15.65	20.90	0.15
11:32 AM	15.62	19.39	0.15
11:33 AM	15.65	19.63	0.15
11:34 AM	15.60	19.91	0.15
11:35 AM	15.62	19.75	0.15
11:36 AM	15.60	20.94	0.15
11:37 AM	15.60	19.01	0.15
11:38 AM	15.60	19.02	0.14
11:39 AM	15.60	18.98	0.14
11:40 AM	15.60	17.78	0.14
<b>Average</b>	<b>15.64</b>	<b>19.26</b>	<b>0.15</b>

Signature



( Miss Katesarin Vorradetwittaya )

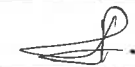
Environmental Scientist

**PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)**  
**EMISSION TEST RESULT**

Date: September 4, 2023 Run # : 2  
 Start time: 11:41 AM Location : H-3703  
 O<sub>2</sub> instrument Model: AMI 70 Finish time : 12:01 PM  
 NO<sub>x</sub> instrument Model: TELEDYNE 200 EM Serial No.: 161212-14  
 SO<sub>2</sub> instrument Model: API 100 AH Serial No.: 435  
 Fuel Type : Natural Gas Serial No.: 058  
 Test Operator : Song H.

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)
11:41 AM	15.60	18.53	0.14
11:42 AM	15.60	18.94	0.14
11:43 AM	15.60	18.91	0.14
11:44 AM	15.60	19.59	0.14
11:45 AM	15.60	18.71	0.14
11:46 AM	15.60	18.31	0.14
11:47 AM	15.60	19.68	0.14
11:48 AM	15.60	18.74	0.14
11:49 AM	15.60	19.72	0.14
11:50 AM	15.60	17.66	0.14
11:51 AM	15.60	19.16	0.14
11:52 AM	15.60	18.48	0.14
11:53 AM	15.60	19.28	0.14
11:54 AM	15.60	18.01	0.14
11:55 AM	15.60	18.31	0.14
11:56 AM	15.60	19.10	0.14
11:57 AM	15.60	18.35	0.14
11:58 AM	15.59	19.16	0.14
11:59 AM	15.59	18.78	0.14
12:00 PM	15.59	21.48	0.14
12:01 PM	15.59	23.54	0.14
Average	15.60	19.16	0.14

Signature



( Miss Katesarin Vorradetwittaya )

Environmental Scientist

**PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)**  
**EMISSION TEST RESULT**

Date: September 4, 2023 Run # : 3  
 Start time: 12:02 PM Location : H-3703  
 O<sub>2</sub> instrument Model: AMI 70 Finish time : 12:22 PM  
 NO<sub>x</sub> instrument Model: TELEDYNE 200 EM Serial No.: 161212-14  
 SO<sub>2</sub> instrument Model: API 100 AH Serial No.: 435  
 Fuel Type : Natural Gas Serial No.: 058  
 Test Operator : Song H.

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)
12:02 PM	15.59	23.11	0.14
12:03 PM	15.59	22.65	0.14
12:04 PM	15.60	22.81	0.14
12:05 PM	15.59	23.11	0.14
12:06 PM	15.59	21.56	0.14
12:07 PM	15.59	22.36	0.14
12:08 PM	15.59	24.03	0.13
12:09 PM	15.59	21.88	0.13
12:10 PM	15.59	23.19	0.13
12:11 PM	15.59	22.90	0.13
12:12 PM	15.59	22.75	0.13
12:13 PM	15.59	23.24	0.13
12:14 PM	15.59	21.26	0.13
12:15 PM	15.59	23.16	0.13
12:16 PM	15.59	22.66	0.13
12:17 PM	15.59	22.67	0.13
12:18 PM	15.59	23.18	0.13
12:19 PM	15.59	22.04	0.13
12:20 PM	15.59	22.54	0.13
12:21 PM	15.60	21.54	0.14
12:22 PM	15.59	20.66	0.14
Average	15.59	22.54	0.13

Signature



( Miss Katesarin Vorradetwittaya )

Environmental Scientist



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# STACK EMISSION ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Co., Ltd. REF. NO. : 223007\_Cert-Stack/PM\_Sep 23  
Branch 2, Power Plant

SAMPLING BY : SECOT Co., Ltd. SAMPLING DATE : 04/09/2023

RECEIVED DATE : 05/09/2023 ANALYTICAL DATE : 05-06/09/2023

REPORT DATE : 08/09/2023 SAMPLE CONDITION : Normal

SOURCE DESCRIPTION : Combustion FUEL TYPE : Natural Gas

OPERATOR : Mr. Song Hengchwankul STACK LOCATION : H-3704

STACK DESCRIPTION

Height : 30.0 m Gas Velocity : 13.9 m/s

Diameter : 3.60 m Flow Rate\* : 5,873 Ncu.m/min

Temperature : 109.3 °C Excess Oxygen : 14.9 %

PARAMETER	UNITS	RESULTS*		STANDARDS <sup>1</sup>	REFERENCE
		14.9%O <sub>2</sub>	7%O <sub>2</sub>	7%O <sub>2</sub>	
Particulate Matter	mg/Ncu.m.	1.40	3.24	60	US. EPA Method 5

Phatchara Samanchan

(Miss Phatchara Samanchan)

Analyst

REG.NO.7-239-8-0021

Narisa Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO.7-239-8-0010

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4. <sup>1</sup> Notification of the Ministry of Industry, B.E.2547.

## The Monitoring Result of Emission Concentration

H-3704

PTT Global Chemical Public Co., Ltd.

(Branch 2 : Power Plant I-1)

September 4, 2023

Run Number	Oxygen content (%)		Oxide of Nitrogen (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O <sub>2</sub>	Corrected Gas Conc @7% O <sub>2</sub>
1	14.74	14.88	3.30	3.26	7.53
2	14.78	14.92	3.37	3.31	7.69
3	14.75	14.89	3.25	3.17	7.33
Average	14.76	14.90	3.31	3.25	7.52

Run Number	Oxygen content (%)		Sulfur dioxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O <sub>2</sub>	Corrected Gas Conc @7% O <sub>2</sub>
1	14.74	14.88	0.21	0.18	0.42
2	14.78	14.92	0.21	0.19	0.44
3	14.75	14.89	0.26	0.24	0.56
Average	14.76	14.90	0.23	0.20	0.47



**PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)**  
**EMISSION TEST RESULT**

**Date:** September 4, 2023  
**Start time:** 2:50 PM  
**O<sub>2</sub> instrument Model:** AMI 70  
**NO<sub>x</sub> instrument Model:** TELEDYNE 200 EM  
**SO<sub>2</sub> instrument Model:** API 100 AH  
**Fuel Type :** Natural Gas

**Run # : 1**  
**Location :** H-3704  
**Finish time :** 3:10 PM  
**Serial No.:** 071023-47  
**Serial No.:** 433  
**Serial No.:** 118  
**Test Operator :** Song H.

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)
2:50 PM	14.70	3.34	0.21
2:51 PM	14.70	3.35	0.21
2:52 PM	14.74	3.31	0.21
2:53 PM	14.72	3.30	0.21
2:54 PM	14.72	3.28	0.21
2:55 PM	14.74	3.29	0.21
2:56 PM	14.73	3.29	0.21
2:57 PM	14.77	3.28	0.21
2:58 PM	14.77	3.29	0.21
2:59 PM	14.74	3.28	0.21
3:00 PM	14.72	3.29	0.21
3:01 PM	14.72	3.24	0.21
3:02 PM	14.74	3.26	0.21
3:03 PM	14.76	3.26	0.21
3:04 PM	14.76	3.28	0.21
3:05 PM	14.76	3.28	0.21
3:06 PM	14.76	3.28	0.21
3:07 PM	14.76	3.33	0.21
3:08 PM	14.76	3.33	0.21
3:09 PM	14.77	3.33	0.21
3:10 PM	14.77	3.33	0.21
Average	14.74	3.30	0.21

Signature



( Miss Katesarin Vorradetwittaya )

Environmental Scientist

**PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)**  
**EMISSION TEST RESULT**

**Date:** September 4, 2023  
**Start time:** 3:11 PM  
**O<sub>2</sub> instrument Model:** AMI 70  
**NO<sub>x</sub> instrument Model:** TELEDYNE 200 EM  
**SO<sub>2</sub> instrument Model:** API 100 AH  
**Fuel Type :** Natural Gas

**Run # : 2**  
**Location :** H-3704  
**Finish time :** 3:31 PM  
**Serial No.:** 071023-47  
**Serial No.:** 433  
**Serial No.:** 118  
**Test Operator :** Song H.

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)
3:11 PM	14.76	3.33	0.21
3:12 PM	14.77	3.33	0.21
3:13 PM	14.77	3.34	0.21
3:14 PM	14.78	3.34	0.21
3:15 PM	14.80	3.38	0.21
3:16 PM	14.78	3.38	0.21
3:17 PM	14.78	3.39	0.22
3:18 PM	14.78	3.38	0.21
3:19 PM	14.79	3.38	0.21
3:20 PM	14.79	3.39	0.21
3:21 PM	14.78	3.38	0.21
3:22 PM	14.80	3.39	0.21
3:23 PM	14.78	3.38	0.21
3:24 PM	14.78	3.39	0.21
3:25 PM	14.78	3.38	0.21
3:26 PM	14.78	3.38	0.21
3:27 PM	14.78	3.39	0.21
3:28 PM	14.78	3.38	0.21
3:29 PM	14.78	3.38	0.22
3:30 PM	14.79	3.36	0.21
3:31 PM	14.78	3.30	0.21
Average	14.78	3.37	0.21

Signature



( Miss Katesarin Vorradetwittaya )

Environmental Scientist

**PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)**  
**EMISSION TEST RESULT**

**Date:** September 4, 2023  
**Start time:** 3:32 PM  
**O<sub>2</sub> instrument Model:** AMI 70  
**NO<sub>x</sub> instrument Model:** TELEDYNE 200 EM  
**SO<sub>2</sub> instrument Model:** API 100 AH  
**Fuel Type :** Natural Gas

**Run # :** 3  
**Location :** H-3704  
**Finish time :** 3:52 PM  
**Serial No.:** 071023-47  
**Serial No.:** 433  
**Serial No.:** 118  
**Test Operator :** Song H.

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)
3:32 PM	14.76	3.28	0.24
3:33 PM	14.76	3.28	0.24
3:34 PM	14.75	3.26	0.26
3:35 PM	14.75	3.28	0.25
3:36 PM	14.72	3.28	0.26
3:37 PM	14.75	3.28	0.23
3:38 PM	14.76	3.28	0.21
3:39 PM	14.75	3.28	0.23
3:40 PM	14.76	3.28	0.24
3:41 PM	14.76	3.24	0.23
3:42 PM	14.76	3.23	0.27
3:43 PM	14.76	3.23	0.27
3:44 PM	14.76	3.28	0.27
3:45 PM	14.76	3.27	0.27
3:46 PM	14.75	3.22	0.27
3:47 PM	14.74	3.22	0.25
3:48 PM	14.75	3.22	0.28
3:49 PM	14.73	3.23	0.28
3:50 PM	14.74	3.22	0.28
3:51 PM	14.71	3.22	0.28
3:52 PM	14.74	3.22	0.28
<b>Average</b>	14.75	3.25	0.26

Signature



( Miss Katesarin Vorradeetwittaya )

Environmental Scientist



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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND

TEL : +66(0) 2959-3600 FAX : +66(0) 2959-3535 E-mail : envserv@secot.co.th

## STACK EMISSION ANALYSIS REPORT

**CLIENT NAME :** PTT Global Chemical Public Co., Ltd. **REF. NO. :** 223007\_Cert-Stack/PM\_Sep 23  
**Branch 2, Power Plant**

**SAMPLING BY :** SECOT Co., Ltd. **SAMPLING DATE :** 04/09/2023

**RECEIVED DATE :** 05/09/2023 **ANALYTICAL DATE :** 05-06/09/2023

**REPORT DATE :** 08/09/2023 **SAMPLE CONDITION :** Normal

**SOURCE DESCRIPTION :** Combustion **FUEL TYPE :** Natural Gas

**OPERATOR :** Mr. Song Hengchwankul **STACK LOCATION :** H-3705

## STACK DESCRIPTION

**Height :** 30.0 m **Gas Velocity :** 14.1 m/s

**Diameter :** 3.60 m **Flow Rate\* :** 5,887 Ncu.m/min

**Temperature :** 114.5 °C **Excess Oxygen :** 15.1 %

PARAMETER	UNITS	RESULTS*		STANDARDS <sup>1/</sup>	REFERENCE
		15.1%O <sub>2</sub>	7%O <sub>2</sub>	7%O <sub>2</sub>	METHODS
Particulate Matter	mg/Ncu.m.	1.28	3.09	60	US. EPA Method 5

Phatchara Samanchan

(Miss Phatchara Samanchan)

Analyst

REG.NO. 2-239-ก-0021



(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO. 2-239-ก-0010

**Remark :** 1. Reported analysis refers to submitted sample only.

2. This report shall not be reproduced, except in full, without official approval.

3. \* At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. <sup>1/</sup> Notification of the Ministry of Industry, B.E.2547.

**The Monitoring Result of Emission Concentration  
H-3705**

**PTT Global Chemical Public Co., Ltd.**

**(Branch 2 : Power Plant I-1)**

**September 4, 2023**

Run Number	Oxygen content (%)		Oxide of Nitrogen (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	14.92	15.04	3.03	2.97	7.04
2	15.02	15.14	3.22	3.15	7.60
3	15.10	15.22	3.30	3.23	7.90
<b>Average</b>	<b>15.01</b>	<b>15.13</b>	<b>3.18</b>	<b>3.12</b>	<b>7.51</b>

Run Number	Oxygen content (%)		Sulfur dioxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	14.92	15.04	0.15	0.12	0.28
2	15.02	15.14	0.14	0.11	0.27
3	15.10	15.22	0.14	0.11	0.27
<b>Average</b>	<b>15.01</b>	<b>15.13</b>	<b>0.14</b>	<b>0.11</b>	<b>0.27</b>

**PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)  
EMISSION TEST RESULT**

Date: September 4, 2023

Start time: 2:50 PM

O<sub>2</sub> instrument Model: AMI 70

NO<sub>x</sub> instrument Model: API 200 AH

SO<sub>2</sub> instrument Model: API 100 AH

Fuel Type : Natural Gas

Run # : 1

Location : H-3705

Finish time : 3:10 PM

Serial No.: 111117-2

Serial No.: 441

Serial No.: 060

Test Operator : Song H.

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)
2:50 PM	14.82	3.26	0.15
2:51 PM	14.79	3.12	0.15
2:52 PM	14.82	3.10	0.15
2:53 PM	14.81	3.00	0.14
2:54 PM	14.81	2.94	0.14
2:55 PM	14.88	3.01	0.15
2:56 PM	14.88	2.88	0.14
2:57 PM	14.93	3.02	0.16
2:58 PM	14.92	2.93	0.15
2:59 PM	14.94	3.00	0.15
3:00 PM	14.96	2.95	0.15
3:01 PM	14.95	2.83	0.15
3:02 PM	14.97	2.96	0.15
3:03 PM	14.96	2.95	0.14
3:04 PM	14.97	2.99	0.14
3:05 PM	14.99	3.04	0.14
3:06 PM	14.98	2.94	0.15
3:07 PM	14.99	3.12	0.15
3:08 PM	14.99	3.17	0.15
3:09 PM	14.98	3.17	0.14
3:10 PM	15.01	3.17	0.14
<b>Average</b>	<b>14.92</b>	<b>3.03</b>	<b>0.15</b>

Signature



( Miss Katesarin Vorradetwittaya )

Environmental Scientist

**PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)**  
**EMISSION TEST RESULT**

Date: September 4, 2023  
 Start time: 3:11 PM  
 O<sub>2</sub> instrument Model: AMI 70  
 NO<sub>x</sub> instrument Model: API 200 AH  
 SO<sub>2</sub> instrument Model: API 100 AH  
 Fuel Type : Natural Gas

Run # : 2  
 Location : H-3705  
 Finish time : 3:31 PM  
 Serial No.: 111117-2  
 Serial No.: 441  
 Serial No.: 060  
 Test Operator : Song H.

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)
3:11 PM	14.99	3.17	0.14
3:12 PM	15.00	3.21	0.14
3:13 PM	15.00	3.20	0.15
3:14 PM	15.01	3.19	0.14
3:15 PM	15.01	3.25	0.14
3:16 PM	15.03	3.23	0.14
3:17 PM	15.02	3.17	0.15
3:18 PM	15.00	3.25	0.13
3:19 PM	15.03	3.29	0.14
3:20 PM	15.02	3.18	0.15
3:21 PM	15.00	3.17	0.15
3:22 PM	15.03	3.34	0.14
3:23 PM	14.99	3.23	0.13
3:24 PM	15.02	3.26	0.15
3:25 PM	15.02	3.25	0.14
3:26 PM	15.00	3.23	0.14
3:27 PM	15.02	3.29	0.14
3:28 PM	15.05	3.21	0.14
3:29 PM	15.05	3.09	0.14
3:30 PM	15.05	3.16	0.14
3:31 PM	15.05	3.22	0.15
Average	15.02	3.22	0.14

Signature   
 ( Miss Katesarin Vorradetwittaya )  
 Environmental Scientist

**PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)**  
**EMISSION TEST RESULT**

Date: September 4, 2023  
 Start time: 3:32 PM  
 O<sub>2</sub> instrument Model: AMI 70  
 NO<sub>x</sub> instrument Model: API 200 AH  
 SO<sub>2</sub> instrument Model: API 100 AH  
 Fuel Type : Natural Gas

Run # : 3  
 Location : H-3705  
 Finish time : 3:52 PM  
 Serial No.: 111117-2  
 Serial No.: 441  
 Serial No.: 060  
 Test Operator : Song H.

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)
3:32 PM	15.05	3.20	0.15
3:33 PM	15.04	3.23	0.14
3:34 PM	15.09	3.33	0.15
3:35 PM	15.06	3.18	0.14
3:36 PM	15.08	3.30	0.14
3:37 PM	15.06	3.30	0.14
3:38 PM	15.09	3.32	0.14
3:39 PM	15.09	3.30	0.15
3:40 PM	15.10	3.30	0.14
3:41 PM	15.10	3.32	0.15
3:42 PM	15.11	3.30	0.15
3:43 PM	15.12	3.21	0.14
3:44 PM	15.13	3.21	0.14
3:45 PM	15.12	3.30	0.14
3:46 PM	15.12	3.33	0.15
3:47 PM	15.12	3.38	0.14
3:48 PM	15.10	3.31	0.15
3:49 PM	15.13	3.33	0.15
3:50 PM	15.10	3.31	0.15
3:51 PM	15.13	3.40	0.15
3:52 PM	15.12	3.34	0.14
Average	15.10	3.30	0.14

Signature   
 ( Miss Katesarin Vorradetwittaya )  
 Environmental Scientist



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TEL : +66(0) 2959-3600 FAX : +66(0) 2959-3535 E-mail : envserv@secot.co.th

# STACK EMISSION ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Co., Ltd. REF. NO. : 223007\_Cert-Stack/PM\_Sep 23  
Branch 2, Power Plant

SAMPLING BY : SECOT Co., Ltd. SAMPLING DATE : 04/09/2023

RECEIVED DATE : 05/09/2023 ANALYTICAL DATE : 05-06/09/2023

REPORT DATE : 08/09/2023 SAMPLE CONDITION : Normal

SOURCE DESCRIPTION : Combustion FUEL TYPE : Natural Gas

OPERATOR : Mr. Song Hengchwankul STACK LOCATION : H-3706

STACK DESCRIPTION

Height : 35.0 m Gas Velocity : 4.7 m/s

Diameter : 1.80 m Flow Rate\* : 456 Ncu.m/min

Temperature : 144.8 °C Excess Oxygen : 5.2 %

PARAMETER	UNITS	RESULTS*		STANDARDS <sup>1/</sup>	REFERENCE
		5.2%O <sub>2</sub>	7%O <sub>2</sub>	7%O <sub>2</sub>	
Particulate Matter	mg/Ncu.m.	1.83	1.63	60	US. EPA Method 5

Phatchara Samanchan

(Miss Phatchara Samanchan)

Analyst

REG.NO. 2-239-0-0021

Narisa Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO. 2-239-0-0010

Remark : 1. Reported analysis refers to submitted sample only.

2. This report shall not be reproduced, except in full, without official approval.

3. \* At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. <sup>1/</sup> Notification of the Ministry of Industry, B.E.2547.

## The Monitoring Result of Emission Concentration

H-3706

PTT Global Chemical Public Co., Ltd.

(Branch 2 : Power Plant I-1)

September 4, 2023

Run Number	Oxygen content (%)		Oxide of Nitrogen (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	5.19	5.20	32.58	32.54	28.81
2	5.19	5.20	32.73	32.70	28.95
3	5.24	5.24	33.01	32.99	29.28
Average	5.21	5.21	32.77	32.74	29.01

Run Number	Oxygen content (%)		Sulfur dioxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	5.19	5.20	0.13	0.12	0.11
2	5.19	5.20	0.15	0.13	0.12
3	5.24	5.24	0.20	0.18	0.16
Average	5.21	5.21	0.16	0.14	0.13

**PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)**  
**EMISSION TEST RESULT**

Date: September 4, 2023  
 Start time: 12:00 PM  
 O<sub>2</sub> instrument Model: AMI 70  
 NO<sub>x</sub> instrument Model: TELEDYNE 200 EM  
 SO<sub>2</sub> instrument Model: API 100 AH  
 Fuel Type : Natural Gas

Run # : 1  
 Location : H-3706  
 Finish time : 12:20 PM  
 Serial No.: 071023-47  
 Serial No.: 433  
 Serial No.: 118  
 Test Operator : Song H.

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)
12:00 PM	5.23	32.04	0.17
12:01 PM	5.25	32.32	0.15
12:02 PM	5.20	32.43	0.13
12:03 PM	5.19	32.33	0.13
12:04 PM	5.15	32.26	0.13
12:05 PM	5.16	32.25	0.13
12:06 PM	5.17	32.28	0.13
12:07 PM	5.17	32.37	0.13
12:08 PM	5.15	32.38	0.13
12:09 PM	5.20	32.43	0.13
12:10 PM	5.20	32.61	0.13
12:11 PM	5.23	32.69	0.13
12:12 PM	5.18	32.81	0.13
12:13 PM	5.18	32.95	0.13
12:14 PM	5.19	32.89	0.12
12:15 PM	5.25	32.78	0.12
12:16 PM	5.24	32.98	0.12
12:17 PM	5.19	33.04	0.13
12:18 PM	5.17	32.78	0.10
12:19 PM	5.16	32.75	0.10
12:20 PM	5.19	32.78	0.12
<b>Average</b>	5.19	32.58	0.13

Signature

( Miss Katesarin Vorradetwittaya )

Environmental Scientist

**PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)**  
**EMISSION TEST RESULT**

Date: September 4, 2023  
 Start time: 12:21 PM  
 O<sub>2</sub> instrument Model: AMI 70  
 NO<sub>x</sub> instrument Model: TELEDYNE 200 EM  
 SO<sub>2</sub> instrument Model: API 200 AH  
 Fuel Type : Natural Gas

Run # : 2  
 Location : H-3706  
 Finish time : 12:41 PM  
 Serial No.: 071023-47  
 Serial No.: 433  
 Serial No.: 118  
 Test Operator : Song H.

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)
12:21 PM	5.15	32.81	0.13
12:22 PM	5.18	32.69	0.13
12:23 PM	5.19	32.65	0.13
12:24 PM	5.14	32.66	0.13
12:25 PM	5.11	32.64	0.13
12:26 PM	5.16	32.72	0.14
12:27 PM	5.21	32.70	0.14
12:28 PM	5.17	32.55	0.14
12:29 PM	5.19	32.44	0.14
12:30 PM	5.25	32.66	0.14
12:31 PM	5.24	32.84	0.14
12:32 PM	5.18	32.81	0.14
12:33 PM	5.19	32.74	0.14
12:34 PM	5.19	32.64	0.14
12:35 PM	5.19	32.65	0.14
12:36 PM	5.22	32.81	0.14
12:37 PM	5.22	32.86	0.19
12:38 PM	5.18	32.85	0.18
12:39 PM	5.18	32.86	0.15
12:40 PM	5.22	32.87	0.19
12:41 PM	5.24	32.89	0.19
<b>Average</b>	5.19	32.73	0.15

Signature

( Miss Katesarin Vorradetwittaya )

Environmental Scientist

# PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)

## EMISSION TEST RESULT

Run # : 3  
 Date: September 4, 2023  
 Start time: 12:42 PM  
 O<sub>2</sub> instrument Model: AMI 70  
 NO<sub>x</sub> instrument Model: TELEDYNE 200 EM  
 SO<sub>2</sub> instrument Model: API 100 AH  
 Fuel Type : Natural Gas

Location : H-3706  
 Finish time : 1:02 PM  
 Serial No.: 071023-47  
 Serial No.: 433  
 Serial No.: 118  
 Test Operator : Song H.

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)
12:42 PM	5.21	32.86	0.19
12:43 PM	5.23	33.04	0.19
12:44 PM	5.23	33.13	0.19
12:45 PM	5.22	33.07	0.19
12:46 PM	5.19	33.11	0.19
12:47 PM	5.26	33.09	0.19
12:48 PM	5.19	33.09	0.20
12:49 PM	5.32	33.12	0.20
12:50 PM	5.18	33.04	0.20
12:51 PM	5.16	32.89	0.20
12:52 PM	5.18	32.82	0.20
12:53 PM	5.21	32.79	0.20
12:54 PM	5.35	32.98	0.20
12:55 PM	5.30	33.21	0.20
12:56 PM	5.28	33.21	0.20
12:57 PM	5.24	33.06	0.21
12:58 PM	5.24	33.01	0.21
12:59 PM	5.19	32.98	0.20
1:00 PM	5.23	32.87	0.24
1:01 PM	5.25	32.81	0.26
1:02 PM	5.28	32.94	0.22
Average	5.24	33.01	0.20

Signature



(Miss Katesarin Vorradetwittaya)

Environmental Scientist



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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND

TEL : +66(0) 2959-3600 FAX : +66(0) 2959-3535 E-mail : envserv@secot.co.th

### STACK EMISSION ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Co., Ltd. REF. NO. : 223007\_Cert-Stack/PM\_Sep 23  
 Branch 2, Power Plant

SAMPLING BY : SECOT Co., Ltd. SAMPLING DATE : 04/09/2023

RECEIVED DATE : 05/09/2023 ANALYTICAL DATE : 05-06/09/2023

REPORT DATE : 08/09/2023 SAMPLE CONDITION : Normal

SOURCE DESCRIPTION : Combustion FUEL TYPE : Natural Gas

OPERATOR : Mr. Song Hengchwankul STACK LOCATION : H-3707

STACK DESCRIPTION

Height : 35.0 m Gas Velocity : 5.8 m/s  
 Diameter : 1.80 m Flow Rate\* : 568 Ncu.m/min  
 Temperature : 150.6 °C Excess Oxygen : 6.3 %


PARAMETER	UNITS	RESULTS*		STANDARDS <sup>1/</sup>		REFERENCE
		6.3%O <sub>2</sub>	7%O <sub>2</sub>	7%O <sub>2</sub>		METHODS
Particulate Matter	mg/Ncu.m.	2.20	2.08	60		US. EPA Method 5

Phatchara Samanchan

(Miss Phatchara Samanchan)

Analyst

REG.NO. 7-239-ก-0021



(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO. 7-239-ก-0010

Remark : 1. Reported analysis refers to submitted sample only.

2. This report shall not be reproduced, except in full, without official approval.

3. \* At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. <sup>1/</sup> Notification of the Ministry of Industry, B.E.2547.

**The Monitoring Result of Emission Concentration**  
**H-3707**  
**PTT Global Chemical Public Co., Ltd.**  
**(Branch 2 : Power Plant I-1)**  
**September 4, 2023**

Run Number	Oxygen content (%)		Oxide of Nitrogen (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	6.24	6.26	28.08	28.03	26.61
2	6.24	6.26	27.78	27.73	26.33
3	6.23	6.25	27.65	27.60	26.19
<b>Average</b>	<b>6.24</b>	<b>6.26</b>	<b>27.84</b>	<b>27.79</b>	<b>26.38</b>

Run Number	Oxygen content (%)		Sulfur dioxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	6.24	6.26	0.19	0.16	0.15
2	6.24	6.26	0.20	0.17	0.16
3	6.23	6.25	0.18	0.15	0.14
<b>Average</b>	<b>6.24</b>	<b>6.26</b>	<b>0.19</b>	<b>0.16</b>	<b>0.15</b>

**PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)**  
**EMISSION TEST RESULT**

Date: September 4, 2023  
 Start time: 12:00 PM  
 O<sub>2</sub> instrument Model: AMI 70  
 NO<sub>x</sub> instrument Model: API 200 AH  
 SO<sub>2</sub> instrument Model: API 100 AH  
 Fuel Type : Natural Gas

Run # : 1  
 Location : H-3707  
 Finish time : 12:20 PM  
 Serial No.: 111117-2  
 Serial No.: 441  
 Serial No.: 060  
 Test Operator : Song H.

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)
12:00 PM	6.26	27.49	0.12
12:01 PM	6.26	27.76	0.20
12:02 PM	6.24	27.90	0.20
12:03 PM	6.25	27.81	0.20
12:04 PM	6.20	27.78	0.20
12:05 PM	6.23	27.94	0.20
12:06 PM	6.23	28.09	0.20
12:07 PM	6.21	28.15	0.20
12:08 PM	6.23	27.84	0.20
12:09 PM	6.22	27.85	0.20
12:10 PM	6.23	28.21	0.20
12:11 PM	6.22	28.16	0.03
12:12 PM	6.23	28.33	0.20
12:13 PM	6.26	28.34	0.20
12:14 PM	6.27	28.37	0.20
12:15 PM	6.27	28.23	0.20
12:16 PM	6.25	28.43	0.20
12:17 PM	6.25	28.28	0.20
12:18 PM	6.24	28.11	0.20
12:19 PM	6.27	28.21	0.20
12:20 PM	6.25	28.31	0.20
<b>Average</b>	<b>6.24</b>	<b>28.08</b>	<b>0.19</b>

Signature



( Miss Katesarin Vorradetwittaya )

Environmental Scientist



**PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)**  
**EMISSION TEST RESULT**

**Date:** September 4, 2023  
**Start time:** 12:21 PM  
**O<sub>2</sub> instrument Model:** AMI 70  
**NO<sub>x</sub> instrument Model:** API 200 AH  
**SO<sub>2</sub> instrument Model:** API 100 AH  
**Fuel Type :** Natural Gas

**Run # :** 2  
**Location :** H-3707  
**Finish time :** 12:41 PM  
**Serial No.:** 111117-2  
**Serial No.:** 441  
**Serial No.:** 060  
**Test Operator :** Song H.

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)
12:21 PM	6.25	28.19	0.20
12:22 PM	6.26	27.99	0.20
12:23 PM	6.20	27.99	0.20
12:24 PM	6.19	27.92	0.20
12:25 PM	6.20	27.96	0.20
12:26 PM	6.25	27.87	0.20
12:27 PM	6.21	27.81	0.20
12:28 PM	6.22	27.57	0.19
12:29 PM	6.25	27.61	0.19
12:30 PM	6.26	27.66	0.20
12:31 PM	6.23	27.80	0.20
12:32 PM	6.25	27.73	0.20
12:33 PM	6.23	27.68	0.20
12:34 PM	6.22	27.53	0.20
12:35 PM	6.26	27.64	0.20
12:36 PM	6.28	27.70	0.20
12:37 PM	6.25	27.76	0.19
12:38 PM	6.26	27.82	0.19
12:39 PM	6.25	27.86	0.19
12:40 PM	6.25	27.72	0.20
12:41 PM	6.25	27.66	0.20
Average	6.24	27.78	0.20

Signature



( Miss Katesarin Vorradetwittaya )

Environmental Scientist

**PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)**  
**EMISSION TEST RESULT**

**Date:** September 4, 2023  
**Start time:** 12:42 PM  
**O<sub>2</sub> instrument Model:** AMI 70  
**NO<sub>x</sub> instrument Model:** API 200 AH  
**SO<sub>2</sub> instrument Model:** API 100 AH  
**Fuel Type :** Natural Gas

**Run # :** 3  
**Location :** H-3707  
**Finish time :** 1:02 PM  
**Serial No.:** 111117-2  
**Serial No.:** 441  
**Serial No.:** 060  
**Test Operator :** Song H.

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)
12:42 PM	6.24	27.64	0.19
12:43 PM	6.23	27.66	0.19
12:44 PM	6.26	27.66	0.19
12:45 PM	6.23	27.79	0.19
12:46 PM	6.24	27.74	0.18
12:47 PM	6.26	27.68	0.18
12:48 PM	6.24	27.91	0.18
12:49 PM	6.24	27.71	0.18
12:50 PM	6.20	27.58	0.18
12:51 PM	6.23	27.53	0.18
12:52 PM	6.22	27.53	0.17
12:53 PM	6.21	27.64	0.18
12:54 PM	6.22	27.51	0.18
12:55 PM	6.22	27.65	0.18
12:56 PM	6.25	27.60	0.18
12:57 PM	6.25	27.75	0.17
12:58 PM	6.23	27.68	0.18
12:59 PM	6.22	27.73	0.18
1:00 PM	6.20	27.49	0.18
1:01 PM	6.22	27.56	0.18
1:02 PM	6.25	27.59	0.18
Average	6.23	27.65	0.18

Signature



( Miss Katesarin Vorradetwittaya )

Environmental Scientist



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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND

TEL : +66(0) 2959-3600 FAX : +66(0) 2959-3535 E-mail : envserv@secot.co.th

# STACK EMISSION ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Co., Ltd. REF. NO. : 223007\_Cert-Stack/PM\_Sep 23  
Branch 2, Power Plant

SAMPLING BY : SECOT Co., Ltd. SAMPLING DATE : 05/09/2023

RECEIVED DATE : 06/09/2023 ANALYTICAL DATE : 06-07/09/2023

REPORT DATE : 13/09/2023 SAMPLE CONDITION : Normal

SOURCE DESCRIPTION : Combustion FUEL TYPE : Natural Gas

OPERATOR : Mr. Song Hengchwankul STACK LOCATION : H-3708

STACK DESCRIPTION

Height : 35.0 m Gas Velocity : 26.6 m/s

Diameter : 3.26 m Flow Rate\* : 7,757 Ncu.m/min

Temperature : 179.2 °C Excess Oxygen : 14.7 %

PARAMETER	UNITS	RESULTS*		STANDARDS <sup>1/</sup>	REFERENCE METHODS
		14.7%O <sub>2</sub>	7%O <sub>2</sub>	7%O <sub>2</sub>	
Particulate Matter	mg/Ncu.m.	1.27	2.84	60	US. EPA Method 5

Phatchara Samanchan

(Miss Phatchara Samanchan)

Analyst

REG.NO. 2-239-0-0021

Narisa Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO. 2-239-0-0010

Remark : 1. Reported analysis refers to submitted sample only.

2. This report shall not be reproduced, except in full, without official approval.

3. \* At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. <sup>1/</sup> Notification of the Ministry of Industry, B.E.2547.

## The Monitoring Result of Emission Concentration

H-3708

PTT Global Chemical Public Co., Ltd.

(Branch 2 : Power Plant I-1)

September 5, 2023

Run Number	Oxygen content (%)		Oxide of Nitrogen (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	14.72	14.79	5.59	5.54	12.60
2	14.73	14.70	5.76	5.71	12.80
3	14.75	14.61	6.27	6.23	13.77
Average	14.73	14.70	5.87	5.83	13.06

Run Number	Oxygen content (%)		Sulfur dioxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	14.72	14.79	0.14	0.08	0.18
2	14.73	14.70	0.14	0.08	0.18
3	14.75	14.61	0.14	0.07	0.15
Average	14.73	14.70	0.14	0.08	0.17

**PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)**  
**EMISSION TEST RESULT**

Date: September 5, 2023  
 Start time: 11:00 AM  
 O<sub>2</sub> instrument Model: AMI 70  
 NO<sub>x</sub> instrument Model: TELEDYNE 200 EM  
 SO<sub>2</sub> instrument Model: API 100 AH  
 Fuel Type : Natural Gas

Run # : 1  
 Location : H-3708  
 Finish time : 11:20 AM  
 Serial No.: 161212-14  
 Serial No.: 435  
 Serial No.: 058  
 Test Operator : Song H.

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)
11:00 AM	14.71	5.73	0.14
11:01 AM	14.75	5.72	0.14
11:02 AM	14.72	5.58	0.14
11:03 AM	14.73	5.58	0.15
11:04 AM	14.70	5.55	0.14
11:05 AM	14.74	5.63	0.14
11:06 AM	14.75	5.70	0.14
11:07 AM	14.73	5.65	0.14
11:08 AM	14.66	5.57	0.14
11:09 AM	14.75	5.61	0.14
11:10 AM	14.72	5.63	0.14
11:11 AM	14.75	5.54	0.14
11:12 AM	14.75	5.63	0.15
11:13 AM	14.75	5.63	0.14
11:14 AM	14.70	5.54	0.14
11:15 AM	14.68	5.53	0.14
11:16 AM	14.71	5.65	0.14
11:17 AM	14.70	5.51	0.14
11:18 AM	14.75	5.47	0.14
11:19 AM	14.74	5.48	0.14
11:20 AM	14.71	5.46	0.14
Average	14.72	5.59	0.14

Signature



( Miss Katesarin Vorradetwittaya )

Environmental Scientist

**PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)**  
**EMISSION TEST RESULT**

Date: September 5, 2023  
 Start time: 11:21 AM  
 O<sub>2</sub> instrument Model: AMI 70  
 NO<sub>x</sub> instrument Model: TELEDYNE 200 EM  
 SO<sub>2</sub> instrument Model: API 100 AH  
 Fuel Type : Natural Gas

Run # : 2  
 Location : H-3708  
 Finish time : 11:41 AM  
 Serial No.: 161212-14  
 Serial No.: 435  
 Serial No.: 058  
 Test Operator : Song H.

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)
11:21 AM	14.71	5.49	0.14
11:22 AM	14.75	5.44	0.14
11:23 AM	14.66	5.49	0.14
11:24 AM	14.75	5.57	0.14
11:25 AM	14.75	5.78	0.14
11:26 AM	14.66	5.71	0.14
11:27 AM	14.72	5.73	0.14
11:28 AM	14.76	5.75	0.14
11:29 AM	14.72	5.63	0.14
11:30 AM	14.69	5.51	0.14
11:31 AM	14.68	5.49	0.15
11:32 AM	14.69	5.54	0.15
11:33 AM	14.75	5.66	0.14
11:34 AM	14.75	5.84	0.14
11:35 AM	14.75	5.92	0.14
11:36 AM	14.75	6.02	0.14
11:37 AM	14.75	5.96	0.14
11:38 AM	14.75	5.92	0.14
11:39 AM	14.75	6.11	0.14
11:40 AM	14.75	6.18	0.14
11:41 AM	14.75	6.12	0.14
Average	14.73	5.76	0.14

Signature



( Miss Katesarin Vorradetwittaya )

Environmental Scientist

# PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)

## EMISSION TEST RESULT

Date: September 5, 2023

Run # : 3

Location : H-3708

Start time: 11:42 AM

Finish time : 12:02 PM

O<sub>2</sub> instrument Model: AMI 70

Serial No.: 161212-14

NO<sub>x</sub> instrument Model: TELEDYNE 200 EM

Serial No.: 435

SO<sub>2</sub> instrument Model: API 100 AH

Serial No.: 058

Fuel Type : Natural Gas

Test Operator : Song H.

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)
11:42 AM	14.75	5.97	0.14
11:43 AM	14.75	5.96	0.14
11:44 AM	14.75	6.04	0.13
11:45 AM	14.75	6.16	0.14
11:46 AM	14.75	6.07	0.14
11:47 AM	14.75	5.93	0.14
11:48 AM	14.75	5.92	0.15
11:49 AM	14.75	6.05	0.14
11:50 AM	14.75	6.18	0.14
11:51 AM	14.75	6.22	0.14
11:52 AM	14.75	6.25	0.14
11:53 AM	14.75	6.18	0.14
11:54 AM	14.75	6.26	0.14
11:55 AM	14.75	6.28	0.14
11:56 AM	14.75	6.49	0.13
11:57 AM	14.75	6.58	0.13
11:58 AM	14.75	6.48	0.14
11:59 AM	14.75	6.45	0.14
12:00 PM	14.75	6.54	0.14
12:01 PM	14.75	6.76	0.14
12:02 PM	14.75	6.97	0.14
Average	14.75	6.27	0.14

Signature



(Miss Katesarin Vorradevittaya)

Environmental Scientist



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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND

TEL : +66(0) 2959-3600 FAX : +66(0) 2959-3535 E-mail : envserv@secot.co.th

## STACK EMISSION ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical Public Co., Ltd.	REF. NO.	: 223007_Cert-Stack/PM_Sep 23
	Branch 2, Power Plant		
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING DATE	: 05/09/2023
RECEIVED DATE	: 06/09/2023	ANALYTICAL DATE	: 06-07/09/2023
REPORT DATE	: 13/09/2023	SAMPLE CONDITION	: Normal
SOURCE DESCRIPTION	: Combustion	FUEL TYPE	: Natural Gas
OPERATOR	: Mr. Song Hengchwankul	STACK LOCATION	: H-3709
STACK DESCRIPTION			
Height	: 35.0 m	Gas Velocity	: 26.7 m/s
Diameter	: 3.26 m	Flow Rate*	: 8,030 Ncu.m/min
Temperature	: 158.8 °C	Excess Oxygen	: 14.3 %

PARAMETER	UNITS	RESULTS*		STANDARDS <sup>1/</sup>	REFERENCE
		14.3%O <sub>2</sub>	7%O <sub>2</sub>	7%O <sub>2</sub>	METHODS
Particulate Matter	mg/Ncu.m.	2.23	4.73	60	US. EPA Method 5

Phatchara Samanchan

(Miss Phatchara Samanchan)

Analyst

REG.NO. 7-239-ก-0021



(Miss Narisa Poowasanpet)

Technical Management Team

REG.NO. 7-239-ก-0010

Remark : 1. Reported analysis refers to submitted sample only.

2. This report shall not be reproduced, except in full, without official approval.

3. \* At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. <sup>1/</sup> Notification of the Ministry of Industry, B.E.2547.

**The Monitoring Result of Emission Concentration  
H-3709**

**PTT Global Chemical Public Co., Ltd.**

**(Branch 2 : Power Plant I-1)**

**September 5, 2023**

Run Number	Oxygen content (%)		Oxide of Nitrogen (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	14.65	14.36	7.54	7.51	15.96
2	14.65	14.36	7.45	7.43	15.79
3	14.59	14.30	7.31	7.30	15.37
<b>Average</b>	<b>14.63</b>	<b>14.34</b>	<b>7.44</b>	<b>7.41</b>	<b>15.71</b>

Run Number	Oxygen content (%)		Sulfur dioxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	14.65	14.36	0.16	0.09	0.19
2	14.65	14.36	0.15	0.08	0.17
3	14.59	14.30	0.15	0.08	0.17
<b>Average</b>	<b>14.63</b>	<b>14.34</b>	<b>0.15</b>	<b>0.08</b>	<b>0.18</b>

**PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)  
EMISSION TEST RESULT**

Date: September 5, 2023  
 Start time: 11:00 AM  
 O<sub>2</sub> instrument Model: AMI 70  
 NO<sub>x</sub> instrument Model: API 200 AH  
 SO<sub>2</sub> instrument Model: API 100 AH  
 Fuel Type : Natural Gas

Run # : 1  
 Location : H-3709  
 Finish time : 11:20 AM  
 Serial No.: 121121-10  
 Serial No.: 314  
 Serial No.: 132  
 Test Operator : Song H.

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)
11:00 AM	14.63	7.62	0.16
11:01 AM	14.57	7.57	0.16
11:02 AM	14.63	7.55	0.15
11:03 AM	14.62	7.49	0.15
11:04 AM	14.68	7.55	0.15
11:05 AM	14.59	7.51	0.15
11:06 AM	14.57	7.49	0.15
11:07 AM	14.59	7.54	0.16
11:08 AM	14.68	7.56	0.16
11:09 AM	14.61	7.56	0.16
11:10 AM	14.63	7.50	0.16
11:11 AM	14.61	7.58	0.16
11:12 AM	14.62	7.62	0.16
11:13 AM	14.62	7.60	0.16
11:14 AM	14.64	7.52	0.16
11:15 AM	14.59	7.48	0.16
11:16 AM	14.63	7.48	0.16
11:17 AM	14.51	7.54	0.16
11:18 AM	14.90	7.56	0.15
11:19 AM	14.85	7.54	0.15
11:20 AM	14.84	7.57	0.15
<b>Average</b>	<b>14.65</b>	<b>7.54</b>	<b>0.16</b>

Signature \_\_\_\_\_

( Miss Katesarin Vorradetwittaya )

Environmental Scientist

**PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)**  
**EMISSION TEST RESULT**

**Date:** September 5, 2023  
**Start time:** 11:21 AM  
**O<sub>2</sub> instrument Model:** AMI 70  
**NO<sub>x</sub> instrument Model:** API 200 AH  
**SO<sub>2</sub> instrument Model:** API 100 AH  
**Fuel Type :** Natural Gas

**Run # : 2**  
**Location :** H-3709  
**Finish time :** 11:41 AM  
**Serial No.:** 121121-10  
**Serial No.:** 314  
**Serial No.:** 132  
**Test Operator :** Song H.

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)
11:21 AM	14.78	7.67	0.15
11:22 AM	14.79	7.53	0.15
11:23 AM	14.71	7.51	0.15
11:24 AM	14.68	7.52	0.15
11:25 AM	14.66	7.55	0.15
11:26 AM	14.65	7.50	0.15
11:27 AM	14.65	7.50	0.15
11:28 AM	14.65	7.40	0.15
11:29 AM	14.69	7.39	0.15
11:30 AM	14.70	7.42	0.15
11:31 AM	14.69	7.46	0.15
11:32 AM	14.63	7.46	0.15
11:33 AM	14.58	7.43	0.15
11:34 AM	14.55	7.41	0.15
11:35 AM	14.55	7.41	0.15
11:36 AM	14.57	7.43	0.15
11:37 AM	14.59	7.41	0.15
11:38 AM	14.64	7.37	0.15
11:39 AM	14.63	7.34	0.15
11:40 AM	14.60	7.40	0.15
11:41 AM	14.57	7.43	0.15
<b>Average</b>	14.65	7.45	0.15

Signature



( Miss Katesarin Vorradetwittaya )

Environmental Scientist

**PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)**  
**EMISSION TEST RESULT**

**Date:** September 5, 2023  
**Start time:** 11:42 AM  
**O<sub>2</sub> instrument Model:** AMI 70  
**NO<sub>x</sub> instrument Model:** API 200 AH  
**SO<sub>2</sub> instrument Model:** API 100 AH  
**Fuel Type :** Natural Gas

**Run # : 3**  
**Location :** H-3709  
**Finish time :** 12:02 PM  
**Serial No.:** 121121-10  
**Serial No.:** 314  
**Serial No.:** 132  
**Test Operator :** Song H.

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)
11:42 AM	14.57	7.37	0.15
11:43 AM	14.56	7.32	0.15
11:44 AM	14.57	7.29	0.15
11:45 AM	14.57	7.26	0.15
11:46 AM	14.58	7.27	0.15
11:47 AM	14.57	7.32	0.15
11:48 AM	14.52	7.31	0.15
11:49 AM	14.50	7.36	0.15
11:50 AM	14.52	7.37	0.15
11:51 AM	14.57	7.26	0.15
11:52 AM	14.62	7.33	0.15
11:53 AM	14.65	7.42	0.15
11:54 AM	14.66	7.33	0.15
11:55 AM	14.68	7.29	0.15
11:56 AM	14.63	7.25	0.15
11:57 AM	14.59	7.24	0.15
11:58 AM	14.59	7.22	0.15
11:59 AM	14.62	7.31	0.15
12:00 PM	14.62	7.35	0.15
12:01 PM	14.62	7.32	0.15
12:02 PM	14.62	7.26	0.15
<b>Average</b>	14.59	7.31	0.15

Signature



( Miss Katesarin Vorradetwittaya )

Environmental Scientist



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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND

TEL : +66(0) 2959-3600 FAX : +66(0) 2959-3535 E-mail : envserv@secot.co.th

# STACK EMISSION ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical Public Co., Ltd.	REF. NO.	: 223007_Cert-Stack/PM_Nov23
	Branch 2, Power Plant		
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING DATE	: 08/11/2023
RECEIVED DATE	: 09/11/2023	ANALYTICAL DATE	: 09-10/11/2023
REPORT DATE	: 14/11/2023	SAMPLE CONDITION	: Normal
SOURCE DESCRIPTION	: Combustion	FUEL TYPE	: Natural Gas
OPERATOR	: Mr. Song Hengchwankul	STACK LOCATION	: H-3710
STACK DESCRIPTION			
Height	: 35.0 m	Gas Velocity	: 19.2 m/s
Diameter	: 3.26 m	Flow Rate*	: 5,965 Ncu.m/min
Temperature	: 150.7 °C	Excess Oxygen	: 14.3 %

PARAMETER	UNITS	RESULTS*		STANDARDS <sup>1/</sup>	REFERENCE
		14.3%O <sub>2</sub>	7%O <sub>2</sub>	7%O <sub>2</sub>	
Particulate Matter	mg/Ncu.m.	1.73	3.63	60	US. EPA Method 5

Phatchara Samanchan

(Miss Phatchara Samanchan)

Analyst

REG.NO. 2-239-ท-0021

Maing Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO. 2-239-ท-0010

Remark : 1. Reported analysis refers to submitted sample only.

2. This report shall not be reproduced, except in full, without official approval.

3. \* At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. <sup>1/</sup> Notification of the Ministry of Industry, B.E.2547.

## The Monitoring Result of Emission Concentration

H-3710

PTT Global Chemical Public Co., Ltd.

(Branch 2 : Power Plant I-1)

November 8, 2023

Run Number	Oxygen content (%)		Oxide of Nitrogen (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	14.13	14.21	6.89	6.86	14.25
2	14.30	14.31	6.74	6.72	14.17
3	14.32	14.26	6.66	6.64	13.90
Average	14.25	14.26	6.76	6.74	14.11

Run Number	Oxygen content (%)		Sulfur dioxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	14.13	14.21	0.31	0.28	0.58
2	14.30	14.31	0.24	0.21	0.44
3	14.32	14.26	0.33	0.29	0.61
Average	14.25	14.26	0.29	0.26	0.54

**PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)**  
**EMISSION TEST RESULT**

**Date:** November 8, 2023  
**Start time:** 10:40 AM  
**O<sub>2</sub> instrument Model:** AMI 70  
**NO<sub>x</sub> instrument Model:** TELEDYNE 200 EM  
**SO<sub>2</sub> instrument Model:** API 100 AH  
**Fuel Type :** Natural Gas

**Run # : 1**  
**Location :** H-3710  
**Finish time :** 11:00 AM  
**Serial No.:** 161212-14  
**Serial No.:** 435  
**Serial No.:** 058  
**Test Operator :** Song H.

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)
10:40 AM	14.17	6.93	0.31
10:41 AM	14.16	6.39	0.39
10:42 AM	13.99	6.81	0.32
10:43 AM	14.21	6.15	0.35
10:44 AM	14.03	7.21	0.31
10:45 AM	13.95	7.11	0.31
10:46 AM	14.14	6.54	0.34
10:47 AM	14.07	6.88	0.36
10:48 AM	14.10	7.21	0.42
10:49 AM	14.11	6.75	0.38
10:50 AM	14.11	6.87	0.36
10:51 AM	14.11	6.90	0.36
10:52 AM	14.15	6.80	0.29
10:53 AM	14.05	6.99	0.49
10:54 AM	14.11	6.76	0.42
10:55 AM	14.05	6.76	0.36
10:56 AM	14.10	7.10	0.23
10:57 AM	14.19	7.20	0.19
10:58 AM	14.34	7.29	0.12
10:59 AM	14.34	7.04	0.08
11:00 AM	14.25	7.08	0.05
<b>Average</b>	14.13	6.89	0.31

Signature



( Miss Katesarin Vorradetwittaya )

Environmental Scientist

**PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)**  
**EMISSION TEST RESULT**

**Date:** November 8, 2023  
**Start time:** 11:01 AM  
**O<sub>2</sub> instrument Model:** AMI 70  
**NO<sub>x</sub> instrument Model:** TELEDYNE 200 EM  
**SO<sub>2</sub> instrument Model:** API 100 AH  
**Fuel Type :** Natural Gas

**Run # : 2**  
**Location :** H-3710  
**Finish time :** 11:21 AM  
**Serial No.:** 161212-14  
**Serial No.:** 435  
**Serial No.:** 058  
**Test Operator :** Song H.

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)
11:01 AM	14.34	7.11	0.02
11:02 AM	14.31	6.97	0.06
11:03 AM	14.26	6.85	0.07
11:04 AM	14.32	6.75	0.12
11:05 AM	14.35	6.53	0.15
11:06 AM	14.32	6.48	0.15
11:07 AM	14.28	6.56	0.19
11:08 AM	14.34	6.62	0.20
11:09 AM	14.32	6.62	0.24
11:10 AM	14.33	6.74	0.26
11:11 AM	14.34	6.71	0.26
11:12 AM	14.29	6.68	0.27
11:13 AM	14.29	6.67	0.30
11:14 AM	14.16	7.19	0.29
11:15 AM	14.25	6.54	0.33
11:16 AM	14.25	6.60	0.34
11:17 AM	14.25	6.67	0.37
11:18 AM	14.22	7.07	0.33
11:19 AM	14.35	6.58	0.37
11:20 AM	14.33	6.80	0.37
11:21 AM	14.31	6.70	0.33
<b>Average</b>	14.30	6.74	0.24

Signature



( Miss Katesarin Vorradetwittaya )

Environmental Scientist



# PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)

## EMISSION TEST RESULT

Run # : 3  
 Date: November 8, 2023  
 Start time: 11:22 AM  
 O<sub>2</sub> instrument Model: AMI 70  
 NO<sub>x</sub> instrument Model: TELEDYNE 200 EM  
 SO<sub>2</sub> instrument Model: API 100 AH  
 Fuel Type : Natural Gas

Location : H-3710  
 Finish time : 11:42 AM  
 Serial No.: 161212-14  
 Serial No.: 435  
 Serial No.: 058  
 Test Operator : Song H.

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)
11:22 AM	14.40	6.47	0.33
11:23 AM	14.32	6.54	0.33
11:24 AM	14.30	6.68	0.33
11:25 AM	14.29	6.73	0.33
11:26 AM	14.41	6.19	0.33
11:27 AM	14.36	6.82	0.33
11:28 AM	14.30	6.95	0.33
11:29 AM	14.34	6.53	0.33
11:30 AM	14.34	6.44	0.33
11:31 AM	14.37	6.48	0.24
11:32 AM	14.37	6.35	0.25
11:33 AM	14.34	6.95	0.30
11:34 AM	14.40	6.77	0.31
11:35 AM	14.29	6.88	0.31
11:36 AM	14.29	6.75	0.32
11:37 AM	14.34	6.39	0.33
11:38 AM	14.20	7.01	0.34
11:39 AM	14.32	6.74	0.38
11:40 AM	14.21	6.78	0.39
11:41 AM	14.24	6.57	0.44
11:42 AM	14.19	6.79	0.45
Average	14.32	6.66	0.33

Signature



(Miss Katesarin Vorradetwittaya)

Environmental Scientist



บริษัท ซีคอต จำกัด

SECOT CO., LTD.

239 ถนนวิมลทองประชา แขวงบางซื่อ เขตบางซื่อ กรุงเทพฯ 10800

239 RIMKLONGPRA ROAD, BANGSUE, BANGKOK 10800, THAILAND

TEL : +66(0) 2959-3600 FAX : +66(0) 2959-3535 E-mail : envserv@secot.co.th

### STACK EMISSION ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Co., Ltd. REF. NO. : 223007\_Cert-Stack/PM\_Sep 23  
 Branch 2, Power Plant

SAMPLING BY : SECOT Co., Ltd. SAMPLING DATE : 05/09/2023

RECEIVED DATE : 06/09/2023 ANALYTICAL DATE : 06-07/09/2023

REPORT DATE : 13/09/2023 SAMPLE CONDITION : Normal

SOURCE DESCRIPTION : Combustion FUEL TYPE : Natural Gas

OPERATOR : Mr. Song Hengchwankul STACK LOCATION : H-3711

STACK DESCRIPTION

Height	: 35.0	m	Gas Velocity	: 20.3	m/s
Diameter	: 3.26	m	Flow Rate*	: 6,641	Ncu.m/min
Temperature	: 130.0	°C	Excess Oxygen	: 13.2	%

PARAMETER	UNITS	RESULTS*		STANDARDS <sup>1/</sup>		REFERENCE
		13.2%O <sub>2</sub>	7%O <sub>2</sub>	7%O <sub>2</sub>		
Particulate Matter	mg/Ncu.m.	2.10	3.80	60		US. EPA Method 5

Phatchara Samanchan

(Miss Phatchara Samanchan)

Analyst

REG.NO. 2-239-ก-0021



(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO. 2-239-ก-0010

Remark : 1. Reported analysis refers to submitted sample only.

2. This report shall not be reproduced, except in full, without official approval.

3. \* At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. <sup>1/</sup> Notification of the Ministry of Industry, B.E.2547.

**The Monitoring Result of Emission Concentration  
H-3711**

**PTT Global Chemical Public Co., Ltd.**

**(Branch 2 : Power Plant I-1)**

**September 5, 2023**

Run Number	Oxygen content (%)		Oxide of Nitrogen (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	13.38	13.15	4.81	4.80	8.61
2	13.40	13.22	5.12	5.10	9.23
3	13.42	13.30	5.08	5.05	9.24
<b>Average</b>	<b>13.40</b>	<b>13.22</b>	<b>5.00</b>	<b>4.98</b>	<b>9.02</b>

Run Number	Oxygen content (%)		Sulfur dioxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	13.38	13.15	0.14	0.08	0.14
2	13.40	13.22	0.15	0.11	0.20
3	13.42	13.30	0.15	0.12	0.22
<b>Average</b>	<b>13.40</b>	<b>13.22</b>	<b>0.15</b>	<b>0.10</b>	<b>0.19</b>

**PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)  
EMISSION TEST RESULT**

Date: September 5, 2023  
 Start time: 2:10 PM  
 O<sub>2</sub> instrument Model: AMI 70  
 NO<sub>x</sub> instrument Model: API 200 AH  
 SO<sub>2</sub> instrument Model: API 100 AH  
 Fuel Type: Natural Gas

Run # : 1  
 Location : H-3711  
 Finish time : 2:30 PM  
 Serial No.: 121121-10  
 Serial No.: 314  
 Serial No.: 132  
 Test Operator : Song H.

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)
2:10 PM	13.41	4.62	0.13
2:11 PM	13.42	4.70	0.13
2:12 PM	13.38	4.21	0.13
2:13 PM	13.38	4.32	0.13
2:14 PM	13.37	4.46	0.14
2:15 PM	13.37	4.57	0.14
2:16 PM	13.36	4.68	0.14
2:17 PM	13.35	4.89	0.14
2:18 PM	13.35	5.07	0.14
2:19 PM	13.35	5.02	0.14
2:20 PM	13.35	4.90	0.14
2:21 PM	13.37	4.85	0.14
2:22 PM	13.38	4.82	0.14
2:23 PM	13.40	4.85	0.14
2:24 PM	13.39	4.90	0.14
2:25 PM	13.39	4.91	0.14
2:26 PM	13.41	4.97	0.14
2:27 PM	13.39	5.01	0.14
2:28 PM	13.37	5.06	0.14
2:29 PM	13.36	5.09	0.14
2:30 PM	13.39	5.13	0.14
<b>Average</b>	<b>13.38</b>	<b>4.81</b>	<b>0.14</b>

Signature 

( Miss Katesarin Vorradetwittaya )

Environmental Scientist

**PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)**  
**EMISSION TEST RESULT**

Date: September 5, 2023  
 Start time: 2:31 PM  
 O<sub>2</sub> instrument Model: AMI 70  
 NO<sub>x</sub> instrument Model: API 200 AH  
 SO<sub>2</sub> instrument Model: API 100 AH  
 Fuel Type : Natural Gas

Run # : 2  
 Location : H-3711  
 Finish time : 2:51 PM  
 Serial No.: 121121-10  
 Serial No.: 314  
 Serial No.: 132  
 Test Operator : Song H.

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)
2:31 PM	13.41	5.11	0.14
2:32 PM	13.38	5.11	0.15
2:33 PM	13.41	5.13	0.15
2:34 PM	13.39	5.14	0.15
2:35 PM	13.38	5.10	0.15
2:36 PM	13.38	5.10	0.15
2:37 PM	13.39	5.09	0.15
2:38 PM	13.40	5.10	0.15
2:39 PM	13.41	5.11	0.15
2:40 PM	13.38	5.10	0.15
2:41 PM	13.41	5.05	0.15
2:42 PM	13.43	5.06	0.15
2:43 PM	13.43	5.06	0.15
2:44 PM	13.40	5.08	0.15
2:45 PM	13.40	5.11	0.15
2:46 PM	13.42	5.12	0.15
2:47 PM	13.42	5.12	0.15
2:48 PM	13.42	5.17	0.15
2:49 PM	13.40	5.21	0.15
2:50 PM	13.41	5.20	0.15
2:51 PM	13.41	5.19	0.15
Average	13.40	5.12	0.15

Signature



( Miss Katesarin Vorradetwittaya )

Environmental Scientist

**PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)**  
**EMISSION TEST RESULT**

Date: September 5, 2023  
 Start time: 2:52 PM  
 O<sub>2</sub> instrument Model: AMI 70  
 NO<sub>x</sub> instrument Model: API 200 AH  
 SO<sub>2</sub> instrument Model: API 100 AH  
 Fuel Type : Natural Gas

Run # : 3  
 Location : H-3711  
 Finish time : 3:12 PM  
 Serial No.: 121121-10  
 Serial No.: 314  
 Serial No.: 132  
 Test Operator : Song H.

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)
2:52 PM	13.40	5.25	0.15
2:53 PM	13.38	5.25	0.15
2:54 PM	13.37	5.19	0.15
2:55 PM	13.41	5.16	0.15
2:56 PM	13.41	5.15	0.15
2:57 PM	13.40	5.11	0.15
2:58 PM	13.41	5.08	0.15
2:59 PM	13.43	5.06	0.15
3:00 PM	13.42	5.05	0.15
3:01 PM	13.42	5.07	0.15
3:02 PM	13.42	5.08	0.15
3:03 PM	13.40	5.05	0.15
3:04 PM	13.42	4.99	0.15
3:05 PM	13.42	4.98	0.15
3:06 PM	13.41	5.02	0.15
3:07 PM	13.42	4.96	0.15
3:08 PM	13.44	4.96	0.15
3:09 PM	13.42	5.02	0.15
3:10 PM	13.43	5.10	0.15
3:11 PM	13.43	5.11	0.15
3:12 PM	13.52	5.05	0.15
Average	13.42	5.08	0.15

Signature



( Miss Katesarin Vorradetwittaya )

Environmental Scientist

## ภาคผนวก ง.2

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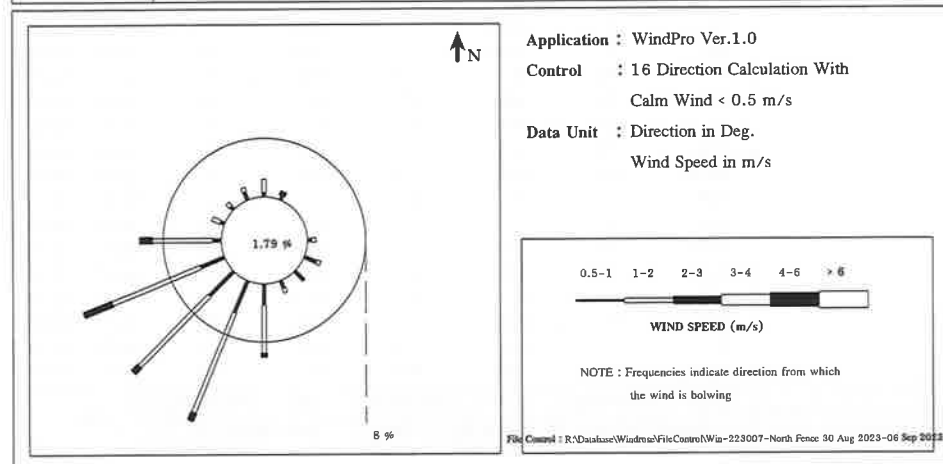
### ใบรับรองผลการตรวจวิเคราะห์คุณภาพอากาศในบรรยากาศ



## Meteorological Monitoring Results : Wind Rose MTR-PTTGC, Branch 2 (Power Plant)

Location : North Fence Monitor period : 30 Aug 2023-06 Sep 2023  
Wind Speed Model : NRG Symphonie Serial No : A5084  
Wind Direction Model : NRG Symphonie Serial No : A5084

Direction	Percentage of Occurrence of Wind Direct Grouped in Various Wind Speed						Total
	0.5-1 m/s	1-2 m/s	2-3 m/s	3-4 m/s	4-6 m/s	More than 6	
N	0.0060	0.0179	0.0000	0.0000	0.0000	0.0000	0.0238
NNE	0.0060	0.0000	0.0060	0.0000	0.0000	0.0000	0.0119
NE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ENE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
E	0.0060	0.0060	0.0000	0.0000	0.0000	0.0000	0.0119
ESE	0.0179	0.0060	0.0000	0.0000	0.0000	0.0000	0.0238
SE	0.0179	0.0000	0.0000	0.0000	0.0000	0.0000	0.0179
SSE	0.0119	0.0060	0.0000	0.0000	0.0000	0.0000	0.0179
S	0.0298	0.0655	0.0060	0.0000	0.0000	0.0000	0.1012
SSW	0.0476	0.1488	0.0119	0.0000	0.0000	0.0000	0.2083
SW	0.0476	0.1369	0.0119	0.0000	0.0000	0.0000	0.1964
WSW	0.0357	0.1310	0.0417	0.0000	0.0000	0.0000	0.2083
W	0.0119	0.0833	0.0179	0.0000	0.0000	0.0000	0.1131
WNW	0.0060	0.0119	0.0000	0.0000	0.0000	0.0000	0.0179
NW	0.0060	0.0060	0.0000	0.0000	0.0000	0.0000	0.0119
NNW	0.0119	0.0060	0.0000	0.0000	0.0000	0.0000	0.0179
CALM	0.0179						



(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

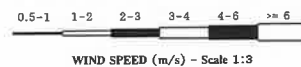
Preeda S.  
(Miss Preeda Somjai)  
Technical Management Team



## Meteorological Monitoring Results : Wind Rose MTR-PTTGC, Branch 2 (Power Plant)

Location : North Fence Monitor period : 30 Aug 2023-06 Sep 2023  
Wind Speed Model : NRG Symphonie Serial No : A5084  
Wind Direction Model : NRG Symphonie Serial No : A5084

Time	30-31 Aug 2023		Aug 31-Sep 01, 2023		01-02 Sep 2023		02-03 Sep 2023	
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD
10:00 - 11:00	2.2	WSW	1.2	SW	1.9	WSW	1.2	S
11:00 - 12:00	2.7	WSW	2.8	W	1.5	SSW	1.7	WSW
12:00 - 13:00	2.2	SSW	2.3	WSW	1.5	SSW	1.8	W
13:00 - 14:00	2.4	WSW	1.6	SW	1.3	NW	1.5	WSW
14:00 - 15:00	2.1	S	1.1	SSW	1.2	WNW	1.3	SW
15:00 - 16:00	2.4	W	0.9	WSW	1.5	W	1.7	SSW
16:00 - 17:00	2.2	SW	1.3	W	1.2	WNW	1.1	W
17:00 - 18:00	1.8	SSW	0.9	SSW	0.9	SW	1.3	S
18:00 - 19:00	1.8	W	1.0	SSW	1.5	SSW	1.2	S
19:00 - 20:00	1.5	S	0.6	SSE	0.9	W	1.0	SW
20:00 - 21:00	1.5	S	0.7	N	0.7	SW	1.3	WSW
21:00 - 22:00	2.2	WSW	2.3	NNE	0.9	SW	0.9	SSW
22:00 - 23:00	1.9	WSW	1.1	N	0.8	SSW	1.1	WSW
23:00 - 24:00	1.6	W	0.5	NNE	0.6	SSW	1.1	W
00:00 - 01:00	1.7	WSW	1.1	N	1.0	SW	1.3	SW
01:00 - 02:00	2.0	WSW	0.7	ESE	0.7	SSW	1.2	WSW
02:00 - 03:00	2.0	W	0.9	SE	1.1	SSW	0.8	SSW
03:00 - 04:00	1.5	WSW	1.1	S	0.6	SSW	1.0	WSW
04:00 - 05:00	2.1	SW	0.5	NNW	0.7	ESE	0.4	S
05:00 - 06:00	1.7	W	0.5	SE	0.8	SE	0.5	NNW
06:00 - 07:00	1.9	WSW	0.4	ESE	1.0	W	0.6	ESE
07:00 - 08:00	1.3	SSW	1.1	SW	1.2	SSW	1.2	SSE
08:00 - 09:00	1.1	NNW	0.9	S	0.9	WNW	1.5	SW
09:00 - 10:00	0.7	NW	1.3	S	1.6	N	1.0	SW



File Control : R:\Database\Windrose\FileControl\Win-223007-North Fence 30 Aug 2023-06 Sep 2023

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

Preeda S.  
(Miss Preeda Somjai)  
Technical Management Team



## Meteorological Monitoring Results : Wind Rose

### MTR-PTTGC, Branch 2 (Power Plant)

Location : North Fence

Monitor period : 30 Aug 2023-06 Sep 2023

Wind Speed Model : NRG Symphonie

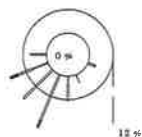
Serial No : A5084

Wind Direction Model : NRG Symphonie

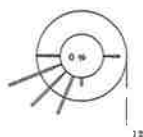
Serial No : A5084

Time	03-04 Sep 2023		04-05 Sep 2023		05-06 Sep 2023	
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD
10:00 - 11:00	1.8	SW	1.8	WSW	1.2	SW
11:00 - 12:00	2.0	SSW	1.5	SW	1.5	S
12:00 - 13:00	1.4	SSW	1.7	SSW	1.3	SSW
13:00 - 14:00	1.6	WSW	1.6	W	1.7	SW
14:00 - 15:00	1.9	SSW	1.9	SSW	1.2	WSW
15:00 - 16:00	2.1	WSW	1.7	WSW	1.5	WSW
16:00 - 17:00	1.6	SSW	1.8	S	1.4	SSW
17:00 - 18:00	1.7	W	1.9	W	1.3	SSW
18:00 - 19:00	1.8	SSW	1.4	WSW	0.9	WSW
19:00 - 20:00	1.7	SW	1.5	SW	0.6	SW
20:00 - 21:00	1.1	S	1.4	WSW	0.7	S
21:00 - 22:00	1.2	SW	1.4	WSW	0.7	W
22:00 - 23:00	1.6	SSW	1.3	W	0.8	S
23:00 - 24:00	1.5	SSW	0.9	WSW	1.0	SW
00:00 - 01:00	0.9	WSW	1.6	WSW	1.0	SW
01:00 - 02:00	1.1	SW	1.4	SW	0.7	S
02:00 - 03:00	1.2	WSW	1.4	SSW	1.0	WSW
03:00 - 04:00	0.8	WSW	1.2	SSW	0.9	WSW
04:00 - 05:00	0.7	S	1.0	SSW	0.6	SW
05:00 - 06:00	0.7	SSE	1.1	SW	0.8	SW
06:00 - 07:00	1.0	ESE	0.9	SW	0.6	SW
07:00 - 08:00	1.4	S	0.6	E	0.4	SW
08:00 - 09:00	1.4	SW	1.2	E	0.7	SSW
09:00 - 10:00	1.4	W	1.7	SW	1.4	SSW

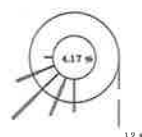
Wind Rose



12 %



12 %



12 %



WIND SPEED (m/s) - Scale 1:3

File Control : R:\Database\Windrose\FireControl\Win-223007-North Fence 30 Aug 2023-06 Sep 2023

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team

SECOT CO., LTD

239 Rinklongrue Rd.

Bangkok, Bangkok 10800

Tel: 66(0)2959-3600 Fax: 66(0)2959-3535



## Meteorological Monitoring Results : Wind Rose

### MTR-PTTGC, Branch 2 (Power Plant)

Location : South Fence

Monitor period : 30 Aug 2023-06 Sep 2023

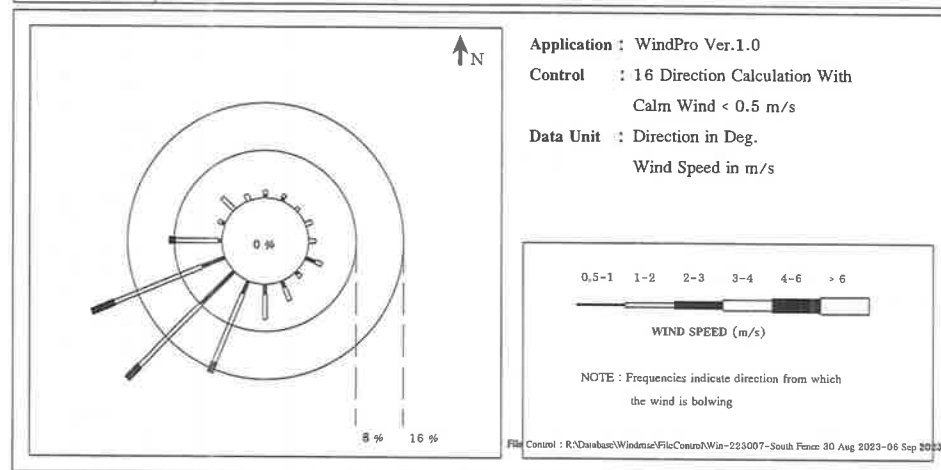
Wind Speed Model : NRG Symphonie

Serial No : A5092

Wind Direction Model : NRG Symphonie

Serial No : A5092

Direction	Percentage of Occurrence of Wind Direct Grouped in Various Wind Speed						
	0.5-1 m/s	1-2 m/s	2-3 m/s	3-4 m/s	4-6 m/s	More than 6	Total
N	0.0060	0.0060	0.0000	0.0000	0.0000	0.0000	0.0119
NNE	0.0060	0.0060	0.0000	0.0000	0.0000	0.0000	0.0119
NE	0.0000	0.0060	0.0000	0.0000	0.0000	0.0000	0.0060
ENE	0.0000	0.0119	0.0000	0.0000	0.0000	0.0000	0.0119
E	0.0000	0.0119	0.0000	0.0000	0.0000	0.0000	0.0119
ESE	0.0179	0.0119	0.0000	0.0000	0.0000	0.0000	0.0298
SE	0.0060	0.0060	0.0000	0.0000	0.0000	0.0000	0.0119
SSE	0.0119	0.0238	0.0000	0.0000	0.0000	0.0000	0.0357
S	0.0179	0.0417	0.0000	0.0000	0.0000	0.0000	0.0595
SSW	0.0238	0.1250	0.0179	0.0000	0.0000	0.0000	0.1667
SW	0.0774	0.1488	0.0298	0.0000	0.0000	0.0000	0.2560
WSW	0.0417	0.1607	0.0417	0.0000	0.0000	0.0000	0.2440
W	0.0060	0.0714	0.0119	0.0000	0.0000	0.0000	0.0893
WNW	0.0060	0.0060	0.0000	0.0000	0.0000	0.0000	0.0119
NW	0.0000	0.0298	0.0000	0.0000	0.0000	0.0000	0.0298
NNW	0.0000	0.0119	0.0000	0.0000	0.0000	0.0000	0.0119
CALM	0.0000						



Application : WindPro Ver.1.0

Control : 16 Direction Calculation With

Calm Wind &lt; 0.5 m/s

Data Unit : Direction in Deg.

Wind Speed in m/s



WIND SPEED (m/s)

NOTE : Frequencies indicate direction from which the wind is blowing

File Control : R:\Database\Windrose\FireControl\Win-223007-South Fence 30 Aug 2023-06 Sep 2023

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team

SECOT CO., LTD

239 Rinklongrue Rd.

Bangkok, Bangkok 10800

Tel: 66(0)2959-3600 Fax: 66(0)2959-3535



## Meteorological Monitoring Results : Wind Rose MTR-PTTGC, Branch 2 (Power Plant)

Location : South Fence

Monitor period : 30 Aug 2023-06 Sep 2023

Wind Speed Model : NRG Symphonie

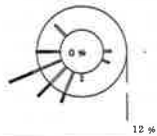
Serial No : A5092

Wind Direction Model : NRG Symphonie

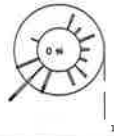
Serial No : A5092

Time	30-31 Aug 2023		Aug 31-Sep 01, 2023		01-02 Sep 2023		02-03 Sep 2023	
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD
11:00 - 12:00	2.9	WSW	2.8	SW	1.8	S	1.7	SW
12:00 - 13:00	2.2	SW	2.5	SSW	1.7	SW	1.8	SSW
13:00 - 14:00	2.3	SW	1.9	SSW	1.5	NNW	1.6	WSW
14:00 - 15:00	2.6	W	1.6	SW	1.7	NNW	2.1	SSW
15:00 - 16:00	2.4	WSW	1.7	WSW	1.4	NW	1.2	S
16:00 - 17:00	1.9	WSW	1.2	WSW	1.0	WNW	1.3	SSW
17:00 - 18:00	1.8	WSW	1.5	WSW	1.2	WSW	1.9	WSW
18:00 - 19:00	2.1	W	1.0	SW	1.0	W	1.8	S
19:00 - 20:00	1.8	E	1.1	SE	0.9	SW	2.0	SW
20:00 - 21:00	1.4	ESE	1.4	ENE	1.3	SW	1.4	SSW
21:00 - 22:00	1.9	WSW	1.8	ENE	1.0	SW	0.7	WSW
22:00 - 23:00	2.3	WSW	1.3	NNE	0.5	WSW	1.0	SW
23:00 - 24:00	1.5	SW	0.8	NNE	0.9	WSW	1.0	WSW
00:00 - 01:00	1.7	WSW	1.3	NE	1.1	WSW	0.9	S
01:00 - 02:00	1.8	W	1.2	SSE	0.6	SSW	1.2	W
02:00 - 03:00	1.9	SSW	1.2	E	0.7	W	1.0	WSW
03:00 - 04:00	1.9	SSW	1.1	ESE	1.0	W	0.5	SSW
04:00 - 05:00	2.1	SSW	0.7	WNW	0.6	ESE	1.2	WSW
05:00 - 06:00	1.8	S	0.5	SE	1.0	SSE	1.2	NW
06:00 - 07:00	1.5	SW	1.2	SSE	0.9	SW	0.6	SSE
07:00 - 08:00	1.7	SSW	0.7	SW	1.3	WSW	0.7	ESE
08:00 - 09:00	1.5	NW	0.9	SW	0.8	N	1.2	S
09:00 - 10:00	1.0	NW	1.0	SW	1.9	N	1.1	SSW
10:00 - 11:00	1.5	SW	1.8	SSW	1.3	NW	1.1	W

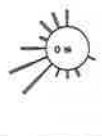
Wind Rose



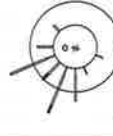
12 %



12 %



12 %



12 %



WIND SPEED (m/s) - Scale 1:3

File Control : R:\Database\Windrose\FileControl\Win-223007-South Fence 30 Aug 2023-06 Sep 2023

Preeda S.

(Miss Preeda Somjai)  
Technical Management Team(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

## Meteorological Monitoring Results : Wind Rose MTR-PTTGC, Branch 2 (Power Plant)

Location : South Fence

Monitor period : 30 Aug 2023-06 Sep 2023

Wind Speed Model : NRG Symphonie

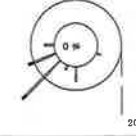
Serial No : A5092

Wind Direction Model : NRG Symphonie

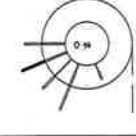
Serial No : A5092

Time	03-04 Sep 2023		04-05 Sep 2023		05-06 Sep 2023	
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD
11:00 - 12:00	1.8	SW	2.0	WSW	1.2	SW
12:00 - 13:00	1.7	W	2.1	WSW	1.8	SSW
13:00 - 14:00	1.5	W	1.9	SSW	1.4	SSW
14:00 - 15:00	2.0	WSW	1.5	W	1.3	SW
15:00 - 16:00	1.5	SW	2.2	WSW	1.6	WSW
16:00 - 17:00	1.9	SSW	1.6	SSW	1.7	SSW
17:00 - 18:00	2.0	SW	1.8	SSW	1.3	SSW
18:00 - 19:00	1.9	SW	1.5	W	1.1	WSW
19:00 - 20:00	1.4	S	1.1	WSW	1.1	WSW
20:00 - 21:00	1.3	SW	1.0	WSW	1.2	SW
21:00 - 22:00	0.8	S	1.2	SW	0.9	SSW
22:00 - 23:00	1.1	SW	1.0	W	1.1	WSW
23:00 - 24:00	1.4	WSW	1.0	SSW	1.1	SW
00:00 - 01:00	0.9	SW	1.3	W	1.2	WSW
01:00 - 02:00	1.0	SW	0.8	SSW	0.5	WSW
02:00 - 03:00	0.8	SW	0.8	SW	1.0	SSW
03:00 - 04:00	0.8	WSW	0.6	SW	0.7	SW
04:00 - 05:00	0.7	SW	1.2	WSW	0.6	WSW
05:00 - 06:00	0.5	ESE	0.7	SW	0.5	SW
06:00 - 07:00	0.5	S	1.1	SSW	0.6	WSW
07:00 - 08:00	1.6	WSW	0.8	SSE	0.5	SW
08:00 - 09:00	1.7	WSW	1.1	SSE	1.3	S
09:00 - 10:00	1.7	SW	1.6	W	1.0	SW
10:00 - 11:00	1.9	WSW	1.6	SW	1.7	SSW

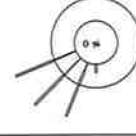
Wind Rose



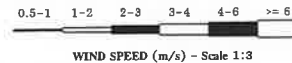
20 %



12 %



12 %



WIND SPEED (m/s) - Scale 1:3

File Control : R:\Database\Windrose\FileControl\Win-223007-South Fence 30 Aug 2023-06 Sep 2023

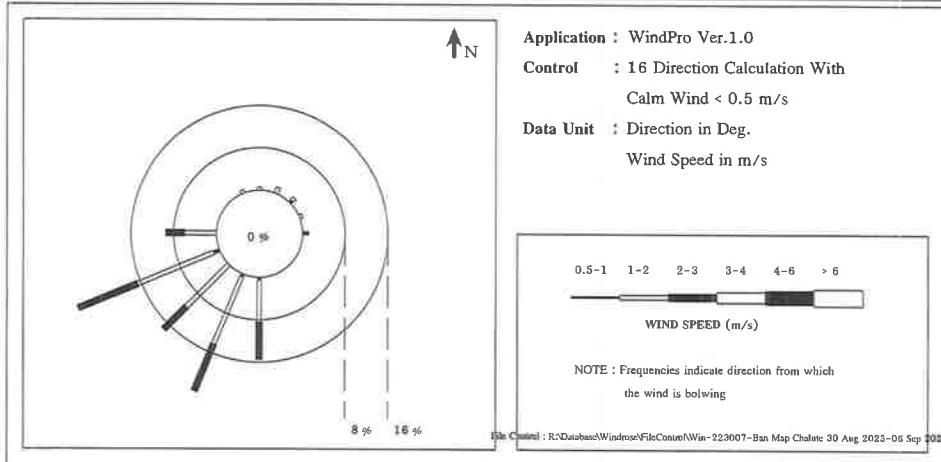
(Miss Katesarin Vorradetwittaya)  
Environmental Scientist(Miss Preeda Somjai)  
Technical Management Team



## Meteorological Monitoring Results : Wind Rose MTR-PTTGC, Branch 2 (Power Plant)

Location : Ban Map Chalute      Monitor period : 30 Aug 2023-06 Sep 2023  
Wind Speed Model : NRG Symphonie      Serial No : 10851  
Wind Direction Model : NRG Symphonie      Serial No : 10851

Direction	Percentage of Occurrence of Wind Direct Grouped in Various Wind Speed						Total
	0.5-1 m/s	1-2 m/s	2-3 m/s	3-4 m/s	4-6 m/s	More than 6	
N	0.0000	0.0060	0.0000	0.0000	0.0000	0.0000	0.0060
NNE	0.0000	0.0119	0.0000	0.0000	0.0000	0.0000	0.0119
NE	0.0060	0.0060	0.0000	0.0000	0.0000	0.0000	0.0119
ENE	0.0000	0.0060	0.0000	0.0000	0.0000	0.0000	0.0060
E	0.0119	0.0000	0.0000	0.0000	0.0000	0.0000	0.0119
ESE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SSE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
S	0.0060	0.0774	0.0714	0.0000	0.0000	0.0000	0.1548
SSW	0.0060	0.1369	0.0952	0.0000	0.0000	0.0000	0.2381
SW	0.0000	0.1131	0.0595	0.0000	0.0000	0.0000	0.1726
WSW	0.0119	0.1548	0.1190	0.0000	0.0000	0.0000	0.2857
W	0.0000	0.0595	0.0357	0.0000	0.0000	0.0000	0.0952
WNW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NNW	0.0000	0.0060	0.0000	0.0000	0.0000	0.0000	0.0060
CALM	0.0000						



(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team



## Meteorological Monitoring Results : Wind Rose MTR-PTTGC, Branch 2 (Power Plant)

Location : Ban Map Chalute      Monitor period : 30 Aug 2023-06 Sep 2023  
Wind Speed Model : NRG Symphonie      Serial No : 10851  
Wind Direction Model : NRG Symphonie      Serial No : 10851

Time	30-31 Aug 2023		Aug 31-Sep 01, 2023		01-02 Sep 2023		02-03 Sep 2023	
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD
12:00 - 13:00	2.6	SW	1.7	SSW	2.8	S	2.9	SSW
13:00 - 14:00	2.6	WSW	1.1	SSW	2.9	WSW	2.8	SSW
14:00 - 15:00	1.8	SSW	1.8	W	2.6	W	2.2	SSW
15:00 - 16:00	1.9	SW	2.1	S	1.9	SW	2.4	SW
16:00 - 17:00	2.0	SSW	2.0	SSW	1.5	SSW	2.0	WSW
17:00 - 18:00	1.9	SSW	1.9	WSW	1.5	SW	1.4	S
18:00 - 19:00	1.5	SW	1.4	SW	1.8	SW	1.4	S
19:00 - 20:00	1.1	SSW	1.8	WSW	1.7	SW	1.9	SSW
20:00 - 21:00	1.2	SSW	1.9	SW	1.6	WSW	2.2	WSW
21:00 - 22:00	1.0	WSW	1.8	W	1.9	SSW	1.7	WSW
22:00 - 23:00	1.4	WSW	1.2	NNW	2.4	W	1.6	WSW
23:00 - 24:00	1.1	S	1.0	N	2.3	WSW	1.8	WSW
00:00 - 01:00	2.0	S	1.2	NNE	2.4	SW	1.8	SW
01:00 - 02:00	1.6	S	0.9	E	2.3	S	1.8	WSW
02:00 - 03:00	2.0	S	1.3	ENE	2.6	SSW	1.8	SW
03:00 - 04:00	1.2	SW	1.1	NNE	2.7	S	1.1	W
04:00 - 05:00	1.8	WSW	1.1	NE	1.8	SW	0.9	S
05:00 - 06:00	1.5	W	0.8	NE	1.0	SW	0.8	SSW
06:00 - 07:00	1.9	SW	0.9	E	1.2	SW	1.5	S
07:00 - 08:00	2.1	W	1.2	S	1.2	SSW	1.8	S
08:00 - 09:00	1.5	WSW	1.0	SSW	1.8	WSW	2.3	S
09:00 - 10:00	1.3	WSW	1.8	SW	1.7	WSW	2.2	SW
10:00 - 11:00	1.7	WSW	2.1	SSW	2.8	W	2.5	SW
11:00 - 12:00	1.8	SSW	2.2	SW	2.8	W	2.2	SW

Wind Rose



File Control : R:\Database\Windrose\FileControl\Win-223007-Ban Map Chalute 30 Aug 2023-06 Sep 2023

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team



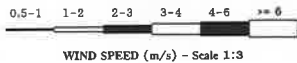
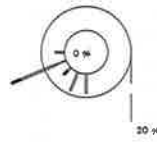
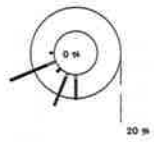
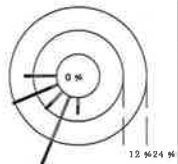


## Meteorological Monitoring Results : Wind Rose MTR-PTTGC, Branch 2 (Power Plant)

Location : Ban Map Chalute Monitor period : 30 Aug 2023-06 Sep 2023  
Wind Speed Model : NRG Symphonie Serial No : 10851  
Wind Direction Model : NRG Symphonie Serial No : 10851

Time	03-04 Sep 2023		04-05 Sep 2023		05-06 Sep 2023	
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD
12:00 - 13:00	2.3	S	2.4	SSW	2.2	WSW
13:00 - 14:00	2.4	WSW	2.4	WSW	2.7	WSW
14:00 - 15:00	2.0	SSW	2.6	S	2.4	SW
15:00 - 16:00	1.7	SW	2.3	S	1.6	SSW
16:00 - 17:00	2.0	WSW	2.2	WSW	1.4	WSW
17:00 - 18:00	1.3	S	2.6	SW	1.4	WSW
18:00 - 19:00	1.5	SSW	2.0	SSW	1.6	S
19:00 - 20:00	2.0	SSW	2.4	WSW	1.7	SSW
20:00 - 21:00	2.2	WSW	2.0	WSW	1.9	S
21:00 - 22:00	2.1	SW	2.1	S	1.7	WSW
22:00 - 23:00	1.8	W	2.3	WSW	1.3	SSW
23:00 - 24:00	2.3	W	2.3	SSW	1.5	SW
00:00 - 01:00	1.8	W	2.2	S	1.7	S
01:00 - 02:00	1.7	SSW	1.9	SSW	1.1	WSW
02:00 - 03:00	1.7	SSW	2.0	WSW	1.1	W
03:00 - 04:00	1.5	W	1.9	WSW	0.8	WSW
04:00 - 05:00	1.3	SSW	1.9	W	0.9	WSW
05:00 - 06:00	1.4	SSW	1.9	WSW	1.0	WSW
06:00 - 07:00	1.5	SW	2.1	SSW	1.0	SSW
07:00 - 08:00	1.7	SSW	2.5	SSW	1.0	WSW
08:00 - 09:00	1.8	WSW	1.8	S	1.0	WSW
09:00 - 10:00	2.6	WSW	2.1	WSW	1.6	W
10:00 - 11:00	2.2	WSW	2.2	SSW	1.9	S
11:00 - 12:00	2.5	SSW	2.3	WSW	1.7	WSW

Wind Rose



File Control : R:\Database\Windrose\FileControl\Win-223007-Ban Map Chalute 30 Aug 2023-06 Sep 2023

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

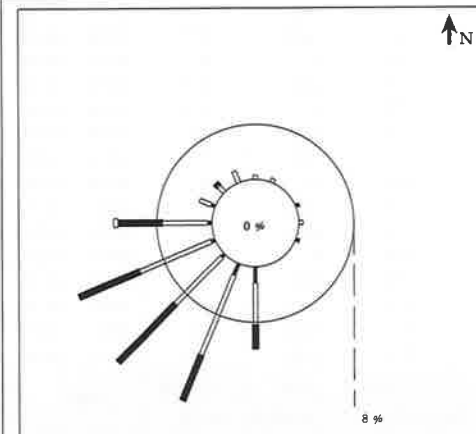
(Miss Preeda Somjai)  
Technical Management Team



## Meteorological Monitoring Results : Wind Rose MTR-PTTGC, Branch 2 (Power Plant)

Location : Nong Feab Monitor period : 30 Aug 2023-06 Sep 2023  
Wind Speed Model : NRG Symphonie Serial No : A4905  
Wind Direction Model : NRG Symphonie Serial No : A4905

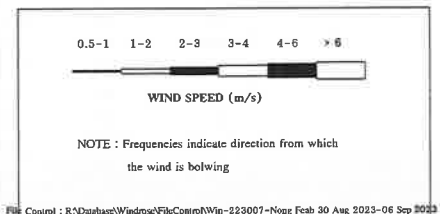
Direction	Percentage of Occurrence of Wind Direct Grouped in Various Wind Speed						Total
	0.5-1 m/s	1-2 m/s	2-3 m/s	3-4 m/s	4-6 m/s	More than 6	
N	0.0000	0.0060	0.0000	0.0000	0.0000	0.0000	0.0060
NNE	0.0000	0.0060	0.0000	0.0000	0.0000	0.0000	0.0060
NE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ENE	0.0060	0.0000	0.0000	0.0000	0.0000	0.0000	0.0060
E	0.0000	0.0060	0.0000	0.0000	0.0000	0.0000	0.0060
ESE	0.0060	0.0000	0.0000	0.0000	0.0000	0.0000	0.0060
SE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SSE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
S	0.0238	0.0595	0.0357	0.0000	0.0000	0.0000	0.1190
SSW	0.0179	0.1250	0.0714	0.0000	0.0000	0.0000	0.2143
SW	0.0060	0.0952	0.1190	0.0000	0.0000	0.0000	0.2202
WSW	0.0060	0.1131	0.0952	0.0000	0.0000	0.0000	0.2143
W	0.0060	0.0655	0.0655	0.0060	0.0000	0.0000	0.1429
WNW	0.0060	0.0179	0.0000	0.0000	0.0000	0.0000	0.0238
NW	0.0000	0.0119	0.0060	0.0000	0.0000	0.0000	0.0179
NNW	0.0000	0.0179	0.0000	0.0000	0.0000	0.0000	0.0179
CALM	0.0000						



Application : WindPro Ver.1.0

Control : 16 Direction Calculation With  
Calm Wind < 0.5 m/s

Data Unit : Direction in Deg.  
Wind Speed in m/s



NOTE : Frequencies indicate direction from which  
the wind is blowing

File Control : R:\Database\Windrose\FileControl\Win-223007-Nong Feab 30 Aug 2023-06 Sep 2023

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team



## Meteorological Monitoring Results : Wind Rose MTR-PTTGC, Branch 2 (Power Plant)

Location : Nong Feab

Monitor period : 30 Aug 2023-06 Sep 2023

Wind Speed Model : NRG Symphonie

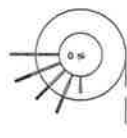
Serial No : A4905

Wind Direction Model : NRG Symphonie

Serial No : A4905

Time	30-31 Aug 2023		Aug 31-Sep 01, 2023		01-02 Sep 2023		02-03 Sep 2023	
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD
12:00 - 13:00	1.9	W	2.0	S	3.0	W	2.5	WSW
13:00 - 14:00	2.2	SW	1.2	SW	2.5	W	2.8	SW
14:00 - 15:00	2.5	SSW	1.6	SSW	2.6	SW	2.8	SSW
15:00 - 16:00	2.5	SSW	1.7	SSW	2.1	SW	2.3	WSW
16:00 - 17:00	1.4	SSW	1.7	SW	1.8	SSW	2.3	SW
17:00 - 18:00	1.2	WSW	1.6	S	1.5	S	2.2	W
18:00 - 19:00	1.1	SW	2.0	W	2.4	WSW	2.1	WSW
19:00 - 20:00	0.5	S	2.1	SW	1.8	S	2.5	SSW
20:00 - 21:00	0.6	SSW	2.4	S	2.5	S	2.3	SSW
21:00 - 22:00	1.5	SW	0.9	W	2.0	W	1.8	SW
22:00 - 23:00	1.4	SSW	1.4	NNW	2.3	SW	2.1	SSW
23:00 - 24:00	1.1	W	1.4	NNW	2.4	SSW	2.3	W
00:00 - 01:00	1.8	WSW	0.9	ENE	2.3	W	2.4	WSW
01:00 - 02:00	2.2	WSW	1.4	WNW	1.9	WSW	2.1	SW
02:00 - 03:00	1.4	WSW	1.1	NNW	2.4	SW	1.7	SW
03:00 - 04:00	1.5	W	1.0	NNE	2.4	SSW	1.8	SSW
04:00 - 05:00	2.0	WSW	1.0	E	1.7	SW	1.2	SSW
05:00 - 06:00	1.7	WSW	1.1	WNW	1.3	WSW	1.8	WSW
06:00 - 07:00	1.3	S	0.9	WNW	1.3	SW	2.1	WSW
07:00 - 08:00	1.5	W	1.1	WSW	1.3	S	1.9	SSW
08:00 - 09:00	1.5	W	1.8	WSW	1.5	W	2.5	WSW
09:00 - 10:00	1.3	SW	2.3	SW	1.7	SSW	1.7	SSW
10:00 - 11:00	1.7	W	2.1	SW	1.6	W	2.2	SW
11:00 - 12:00	2.2	SW	2.8	SSW	2.3	W	2.6	WSW

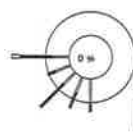
Wind Rose



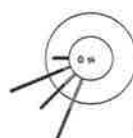
12 %



12 %



12 %



File Control : R:\Database\Windrose\FireControl\Win-223007-Nong Feab 30 Aug 2023-06 Sep 2023

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

Preeda S.  
(Miss Preeda Somjai)  
Technical Management Team



## Meteorological Monitoring Results : Wind Rose MTR-PTTGC, Branch 2 (Power Plant)

Location : Nong Feab

Monitor period : 30 Aug 2023-06 Sep 2023

Wind Speed Model : NRG Symphonie

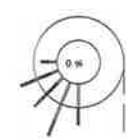
Serial No : A4905

Wind Direction Model : NRG Symphonie

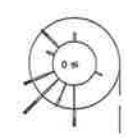
Serial No : A4905

Time	03-04 Sep 2023		04-05 Sep 2023		05-06 Sep 2023	
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD
12:00 - 13:00	1.9	SSW	2.2	NW	2.1	WSW
13:00 - 14:00	2.3	WSW	1.8	WNW	2.2	W
14:00 - 15:00	2.2	SSW	1.5	WSW	2.3	W
15:00 - 16:00	2.6	SW	2.0	S	1.9	W
16:00 - 17:00	2.0	S	2.8	SW	1.6	SSW
17:00 - 18:00	1.9	SSW	2.3	SW	2.2	W
18:00 - 19:00	2.3	WSW	1.7	WSW	2.0	SW
19:00 - 20:00	2.2	SW	0.9	SSW	1.9	WSW
20:00 - 21:00	2.4	SW	1.0	SW	1.5	WSW
21:00 - 22:00	2.4	WSW	0.7	WSW	1.6	SSW
22:00 - 23:00	2.1	S	0.6	S	1.7	WSW
23:00 - 24:00	2.3	SW	0.6	S	1.7	W
00:00 - 01:00	1.8	S	0.8	S	1.5	WSW
01:00 - 02:00	1.8	SSW	1.0	SW	1.5	WSW
02:00 - 03:00	1.9	SSW	1.3	NW	1.6	SSW
03:00 - 04:00	1.6	S	0.8	ESE	1.3	SW
04:00 - 05:00	1.8	SSW	0.8	SSW	1.5	SW
05:00 - 06:00	1.9	WSW	1.2	S	1.7	WSW
06:00 - 07:00	1.3	SW	1.1	SW	1.3	S
07:00 - 08:00	1.6	W	0.8	SW	1.5	SSW
08:00 - 09:00	2.2	SSW	1.4	N	1.3	SSW
09:00 - 10:00	2.2	WSW	1.9	SSW	2.0	SSW
10:00 - 11:00	2.8	W	1.6	NW	1.6	SW
11:00 - 12:00	1.3	S	2.2	WSW	1.7	WSW

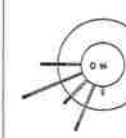
Wind Rose



12 %



12 %



12 %



File Control : R:\Database\Windrose\FireControl\Win-223007-Nong Feab 30 Aug 2023-06 Sep 2023

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

Preeda S.  
(Miss Preeda Somjai)  
Technical Management Team



บริษัท ซีคอต จำกัด

SECOT CO., LTD.

239 ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพฯ 10800

239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND

TEL : +66(0) 2959-3600 FAX : +66(0) 2959-3535 E-mail : envserv@secot.co.th

### AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Co., Ltd. REFERENCE NO. : 223007 Amb (Cert.)/TSP/Aug 2023  
Branch 2, Power Plant SAMPLING DATE : 30/08/2023-06/09/2023  
SAMPLING BY : SECOT Co., Ltd. ANALYTICAL DATE : 11-12/09/2023  
RECEIVED DATE : 11/09/2023 SAMPLE CONDITION : Normal  
REPORT DATE : 15/09/2023 SITE OPERATOR : Mr. Siwanon Kulawong  
LOCATION DESCRIPTIO : 1. Ban Map Chalute  
2. Ban Nong Feab

PARAMETER	SAMPLING DATE	UNITS	RESULTS		STANDARD*	REFERENCE METHODS
			1	2		
TSP (24 hr)	30-31/08/2023	mg/m <sup>3</sup>	0.086	0.046	0.330	High Volume Air
	31/08/2023-01/09-2023	mg/m <sup>3</sup>	0.054	0.029		Sampler/Gravimetric
	01-02/09/2023	mg/m <sup>3</sup>	0.062	0.039		Method
	02-03/09/2024	mg/m <sup>3</sup>	0.067	0.039		
	03-04/09/2025	mg/m <sup>3</sup>	0.060	0.042		
	04-05/09/2026	mg/m <sup>3</sup>	0.107	0.030		
	05-06/09/2027	mg/m <sup>3</sup>	0.086	0.040		

Phatchara Samanchan

(Miss Phatchara Samanchan)

Analyst

Narisa Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

Remark : 1. Reported analysis refers to submitted sample only.

2. This report shall not be reproduced, except in full, without official approval.

3. \* Notification of National Environment Board, No.24, B.E.2547 (2004).



บริษัท ซีคอต จำกัด

SECOT CO., LTD.

239 ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพฯ 10800

239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND

TEL : +66(0) 2959-3600 FAX : +66(0) 2959-3535 E-mail : envserv@secot.co.th

### AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Co., Ltd. REFERENCE NO. : 223007 Amb (Cert.)/PM-10/Aug 2023  
Branch 2, Power Plant SAMPLING DATE : 30/08/2023-06/09/2023  
SAMPLING BY : SECOT Co., Ltd. ANALYTICAL DATE : 11-12/09/2023  
RECEIVED DATE : 11/09/2023 SAMPLE CONDITION : Normal  
REPORT DATE : 15/09/2023 SITE OPERATOR : Mr. Siwanon Kulawong  
LOCATION DESCRIPTIO : 1. Ban Map Chalute  
2. Ban Nong Feab

PARAMETER	SAMPLING DATE	UNITS	RESULTS		STANDARD*	REFERENCE METHODS
			1	2		
PM-10 (24 hr)	30-31/08/2023	mg/m <sup>3</sup>	0.044	0.017	0.120	High Volume Air Sampler
	31/08/2023-01/09-2023	mg/m <sup>3</sup>	0.027	0.011		(Hi-Vol PM-10 Size
	01-02/09/2023	mg/m <sup>3</sup>	0.034	0.009		Selective Inlet/
	02-03/09/2024	mg/m <sup>3</sup>	0.041	0.011		Gravimetric Method
	03-04/09/2025	mg/m <sup>3</sup>	0.018	0.006		
	04-05/09/2026	mg/m <sup>3</sup>	0.054	0.007		
	05-06/09/2027	mg/m <sup>3</sup>	0.052	0.042		

Phatchara Samanchan

(Miss Phatchara Samanchan)

Analyst

Narisa Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

Remark : 1. Reported analysis refers to submitted sample only.

2. This report shall not be reproduced, except in full, without official approval.

3. \* Notification of National Environment Board, No.24, B.E.2547 (2004).



## Ambient Air Monitoring Results : Sulfur dioxide MTR-PTTGC, Branch 2 (Power Plant)

Location : Ban Map Chalute  
Analyzer Model : API 100A  
Serial No : 1715

Monitor Period : 30 Aug 2023-06 Sep 2023  
Station No : SS2-20  
Site Operator : Mr. Siwanon Kulawong

Calibrator Model : Teledyne 700E  
Calibration Gas Cylinder I.D.: EB0108319  
Certified Date : 09 Jan 2023  
Expire Date : 08 Jan 2024

Serial No : 587  
Cal Concentration (ppb) : 0,100,200,400

Time	SO2 Concentration (ppm)						
	30-31 Aug 2023	31-01 Sep 2023	01-02 Sep 2023	02-03 Sep 2023	03-04 Sep 2023	04-05 Sep 2023	05-06 Sep 2023
12:00 - 13:00	0.0148	0.0007	0.0084	0.0060	0.0170	0.0075	0.0070
13:00 - 14:00	0.0087	0.0061	0.0065	0.0026	0.0075	0.0082	0.0066
14:00 - 15:00	0.0110	0.0018	0.0127	0.0096	0.0200	0.0061	0.0079
15:00 - 16:00	0.0059	0.0119	0.0036	0.0041	0.0080	0.0027	0.0100
16:00 - 17:00	0.0042	0.0071	0.0028	0.0040	0.0030	0.0099	0.0149
17:00 - 18:00	0.0041	0.0102	0.0048	0.0096	0.0060	0.0033	0.0087
18:00 - 19:00	0.0089	0.0063	0.0050	0.0079	0.0095	0.0064	0.0101
19:00 - 20:00	0.0028	0.0040	0.0056	0.0069	0.0015	0.0033	0.0057
20:00 - 21:00	0.0026	0.0096	0.0033	0.0072	0.0170	0.0027	0.0063
21:00 - 22:00	0.0100	0.0163	0.0080	0.0094	0.0170	0.0056	0.0054
22:00 - 23:00	0.0028	0.0074	0.0060	0.0017	0.0065	0.0020	0.0057
23:00 - 00:00	0.0122	0.0085	0.0031	0.0109	0.0150	0.0009	0.0168
00:00 - 01:00	0.0090	0.0067	0.0036	0.0020	0.0115	0.0036	0.0189
01:00 - 02:00	0.0029	0.0068	0.0053	0.0078	0.0100	0.0007	0.0125
02:00 - 03:00	0.0207	0.0025	0.0057	0.0056	0.0216	0.0056	0.0121
03:00 - 04:00	0.0126	0.0011	0.0034	0.0072	0.0001	0.0035	0.0102
04:00 - 05:00	0.0059	0.0032	0.0063	0.0088	0.0056	0.0084	0.0118
05:00 - 06:00	0.0133	0.0029	0.0020	0.0068	0.0061	0.0050	0.0067
06:00 - 07:00	0.0126	0.0110	0.0059	0.0050	0.0086	0.0104	0.0008
07:00 - 08:00	0.0170	0.0032	0.0071	0.0059	0.0221	0.0036	0.0071
08:00 - 09:00	0.0053	0.0133	0.0018	0.0045	0.0086	0.0102	0.0060
09:00 - 10:00	0.0082	0.0055	0.0037	0.0075	0.0036	0.0089	0.0108
10:00 - 11:00	0.0085	0.0076	0.0028	0.0035	0.0181	0.0058	0.0097
11:00 - 12:00	0.0024	0.0037	0.0065	0.0082	0.0104	0.0079	0.0063

Average-24Hr*	0.0085	0.0066	0.0052	0.0064	0.0106	0.0055	0.0092
Max-1Hr	0.0207	0.0163	0.0127	0.0109	0.0221	0.0104	0.0189
Min-1Hr	0.0024	0.0007	0.0018	0.0017	0.0001	0.0007	0.0008

Standard-1Hr	0.30 ppm(780 ug/cu.m)						
Standard-24Hr	0.12 ppm(300 ug/cu.m)						

Remark : \* Average time between 12:00-12:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

Preeda S.  
(Miss Preeda Somjai)  
Technical Management Team



## Ambient Air Monitoring Results : Sulfur dioxide MTR-PTTGC, Branch 2 (Power Plant)

Location : Nong Feab  
Analyzer Model : Thermo 43C  
Serial No : 60771-328-2

Monitor Period : 30 Aug 2023-06 Sep 2023  
Station No : SCT-15  
Site Operator : Mr. Siwanon Kulawong

Calibrator Model : Teledyne 700E  
Calibration Gas Cylinder I.D.: EB0108319  
Certified Date : 09 Jan 2023  
Expire Date : 08 Jan 2024

Serial No : 587  
Cal Concentration (ppb) : 0,100,200,400

Time	SO2 Concentration (ppm)						
	30-31 Aug 2023	31-01 Sep 2023	01-02 Sep 2023	02-03 Sep 2023	03-04 Sep 2023	04-05 Sep 2023	05-06 Sep 2023
12:00 - 13:00	0.0090	0.0030	0.0107	0.0048	0.0018	0.0088	0.0046
13:00 - 14:00	0.0039	0.0077	0.0044	0.0025	0.0056	0.0046	0.0050
14:00 - 15:00	0.0029	0.0049	0.0057	0.0097	0.0184	0.0048	0.0030
15:00 - 16:00	0.0133	0.0091	0.0023	0.0106	0.0117	0.0044	0.0154
16:00 - 17:00	0.0068	0.0028	0.0077	0.0068	0.0079	0.0084	0.0071
17:00 - 18:00	0.0017	0.0100	0.0062	0.0026	0.0097	0.0039	0.0018
18:00 - 19:00	0.0047	0.0082	0.0017	0.0030	0.0040	0.0117	0.0062
19:00 - 20:00	0.0032	0.0004	0.0031	0.0030	0.0143	0.0062	0.0019
20:00 - 21:00	0.0061	0.0066	0.0066	0.0097	0.0116	0.0075	0.0081
21:00 - 22:00	0.0076	0.0097	0.0034	0.0104	0.0069	0.0107	0.0080
22:00 - 23:00	0.0050	0.0139	0.0074	0.0076	0.0187	0.0055	0.0042
23:00 - 00:00	0.0080	0.0086	0.0029	0.0088	0.0180	0.0045	0.0136
00:00 - 01:00	0.0060	0.0073	0.0040	0.0025	0.0183	0.0038	0.0158
01:00 - 02:00	0.0109	0.0100	0.0068	0.0061	0.0061	0.0058	0.0090
02:00 - 03:00	0.0194	0.0002	0.0031	0.0100	0.0123	0.0098	0.0154
03:00 - 04:00	0.0078	0.0104	0.0052	0.0019	0.0096	0.0111	0.0036
04:00 - 05:00	0.0023	0.0026	0.0054	0.0027	0.0154	0.0059	0.0008
05:00 - 06:00	0.0072	0.0028	0.0039	0.0057	0.0092	0.0067	0.0010
06:00 - 07:00	0.0137	0.0065	0.0038	0.0033	0.0040	0.0057	0.0072
07:00 - 08:00	0.0137	0.0092	0.0042	0.0019	0.0123	0.0040	0.0038
08:00 - 09:00	0.0081	0.0104	0.0026	0.0098	0.0151	0.0015	0.0043
09:00 - 10:00	0.0046	0.0046	0.0078	0.0053	0.0014	0.0083	0.0089
10:00 - 11:00	0.0015	0.0098	0.0052	0.0091	0.0072	0.0085	0.0021
11:00 - 12:00	0.0020	0.0045	0.0066	0.0080	0.0053	0.0004	0.0053

Average-24Hr*	0.0071	0.0068	0.0050	0.0061	0.0102	0.0064	0.0065
Max-1Hr	0.0194	0.0139	0.0107	0.0106	0.0187	0.0117	0.0158
Min-1Hr	0.0015	0.0002	0.0017	0.0019	0.0014	0.0004	0.0008

Standard-1Hr	0.30 ppm(780 ug/cu.m)						
Standard-24Hr	0.12 ppm(300 ug/cu.m)						

Remark : \* Average time between 12:00-12:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

Preeda S.  
(Miss Preeda Somjai)  
Technical Management Team



## Ambient Air Monitoring Results : Nitrogen dioxide MTR-PTTGC, Branch 2 (Power Plant)

Location : North Fence Monitor Period : 30 Aug 2023-06 Sep 2023  
Analyzer Model : API 200A Station No : Mobile 18  
Serial No : 1645 Site Operator : Mr. Siwanon Kulawong

Calibrator Model : Teledyne 700E Serial No : 587  
Calibration Gas Cylinder I.D.: EB0108319  
Certified Date : 09 Jan 2023 Cal Concentration (ppb) : 0,100,200,400  
Expire Date : 08 Jan 2024

Time	NO2 Concentration (ppm)						
	30-31 Aug 2023	31-01 Sep 2023	01-02 Sep 2023	02-03 Sep 2023	03-04 Sep 2023	04-05 Sep 2023	05-06 Sep 2023
10:00 - 11:00	0.0019	0.0103	0.0079	0.0085	0.0085	0.0070	0.0012
11:00 - 12:00	0.0063	0.0062	0.0074	0.0061	0.0074	0.0049	0.0018
12:00 - 13:00	0.0097	0.0092	0.0034	0.0041	0.0069	0.0074	0.0135
13:00 - 14:00	0.0082	0.0061	0.0066	0.0071	0.0029	0.0083	0.0137
14:00 - 15:00	0.0046	0.0040	0.0056	0.0022	0.0094	0.0138	0.0143
15:00 - 16:00	0.0065	0.0065	0.0107	0.0042	0.0093	0.0122	0.0155
16:00 - 17:00	0.0154	0.0090	0.0137	0.0118	0.0093	0.0112	0.0132
17:00 - 18:00	0.0138	0.0145	0.0083	0.0138	0.0083	0.0086	0.0163
18:00 - 19:00	0.0087	0.0120	0.0093	0.0048	0.0102	0.0091	0.0170
19:00 - 20:00	0.0101	0.0100	0.0064	0.0134	0.0107	0.0085	0.0016
20:00 - 21:00	0.0075	0.0070	0.0059	0.0054	0.0057	0.0015	0.0088
21:00 - 22:00	0.0070	0.0055	0.0080	0.0064	0.0061	0.0054	0.0095
22:00 - 23:00	0.0069	0.0025	0.0045	0.0045	0.0081	0.0099	0.0106
23:00 - 00:00	0.0058	0.0065	0.0051	0.0055	0.0041	0.0063	0.0078
00:00 - 01:00	0.0037	0.0040	0.0066	0.0050	0.0061	0.0053	0.0020
01:00 - 02:00	0.0086	0.0035	0.0037	0.0096	0.0085	0.0087	0.0091
02:00 - 03:00	0.0090	0.0059	0.0072	0.0091	0.0030	0.0072	0.0073
03:00 - 04:00	0.0069	0.0059	0.0013	0.0016	0.0050	0.0047	0.0080
04:00 - 05:00	0.0079	0.0089	0.0078	0.0092	0.0059	0.0056	0.0101
05:00 - 06:00	0.0078	0.0079	0.0109	0.0092	0.0109	0.0111	0.0083
06:00 - 07:00	0.0147	0.0119	0.0084	0.0098	0.0094	0.0105	0.0070
07:00 - 08:00	0.0091	0.0119	0.0110	0.0083	0.0103	0.0155	0.0101
08:00 - 09:00	0.0035	0.0109	0.0115	0.0033	0.0078	0.0059	0.0133
09:00 - 10:00	0.0049	0.0079	0.0061	0.0054	0.0078	0.0069	0.0080
Average-24Hr*	0.0079	0.0078	0.0074	0.0070	0.0075	0.0081	0.0095
Max-1Hr	0.0154	0.0145	0.0137	0.0138	0.0109	0.0155	0.0170
Min-1Hr	0.0019	0.0025	0.0013	0.0016	0.0029	0.0015	0.0012
Standard-1Hr	0.17 ppm(320 ug/cu.m)						
Standard-24Hr	-						

Remark : \* Average time between 10:00-10:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team



## Ambient Air Monitoring Results : Nitrogen dioxide MTR-PTTGC, Branch 2 (Power Plant)

Location : South Fence Monitor Period : 30 Aug 2023-06 Sep 2023  
Analyzer Model : API 200A Station No : Shelter 16  
Serial No : 2386 Site Operator : Mr. Siwanon Kulawong

Calibrator Model : Teledyne 700E Serial No : 587  
Calibration Gas Cylinder I.D.: EB0108319  
Certified Date : 09 Jan 2023 Cal Concentration (ppb) : 0,100,200,400  
Expire Date : 08 Jan 2024

Time	NO2 Concentration (ppm)						
	30-31 Aug 2023	31-01 Sep 2023	01-02 Sep 2023	02-03 Sep 2023	03-04 Sep 2023	04-05 Sep 2023	05-06 Sep 2023
11:00 - 12:00	0.0073	0.0057	0.0055	0.0055	0.0081	0.0047	0.0027
12:00 - 13:00	0.0046	0.0070	0.0060	0.0036	0.0021	0.0078	0.0064
13:00 - 14:00	0.0029	0.0045	0.0074	0.0026	0.0067	0.0060	0.0111
14:00 - 15:00	0.0017	0.0050	0.0052	0.0097	0.0082	0.0017	0.0078
15:00 - 16:00	0.0055	0.0069	0.0105	0.0082	0.0098	0.0088	0.0140
16:00 - 17:00	0.0094	0.0104	0.0137	0.0072	0.0083	0.0140	0.0162
17:00 - 18:00	0.0087	0.0159	0.0065	0.0093	0.0124	0.0067	0.0094
18:00 - 19:00	0.0080	0.0129	0.0087	0.0053	0.0094	0.0083	0.0171
19:00 - 20:00	0.0098	0.0088	0.0104	0.0078	0.0115	0.0055	0.0073
20:00 - 21:00	0.0106	0.0058	0.0072	0.0119	0.0060	0.0067	0.0125
21:00 - 22:00	0.0044	0.0073	0.0069	0.0059	0.0026	0.0048	0.0072
22:00 - 23:00	0.0027	0.0023	0.0037	0.0025	0.0071	0.0060	0.0079
23:00 - 00:00	0.0015	0.0053	0.0069	0.0125	0.0082	0.0027	0.0026
00:00 - 01:00	0.0048	0.0042	0.0056	0.0035	0.0047	0.0033	0.0018
01:00 - 02:00	0.0036	0.0022	0.0064	0.0051	0.0058	0.0080	0.0075
02:00 - 03:00	0.0019	0.0032	0.0066	0.0021	0.0053	0.0072	0.0047
03:00 - 04:00	0.0058	0.0102	0.0013	0.0076	0.0024	0.0093	0.0109
04:00 - 05:00	0.0076	0.0066	0.0026	0.0042	0.0074	0.0030	0.0120
05:00 - 06:00	0.0094	0.0096	0.0133	0.0042	0.0085	0.0087	0.0082
06:00 - 07:00	0.0097	0.0061	0.0121	0.0113	0.0075	0.0094	0.0084
07:00 - 08:00	0.0110	0.0101	0.0073	0.0108	0.0066	0.0080	0.0106
08:00 - 09:00	0.0028	0.0121	0.0055	0.0068	0.0081	0.0057	0.0123
09:00 - 10:00	0.0041	0.0090	0.0118	0.0059	0.0102	0.0049	0.0090
10:00 - 11:00	0.0024	0.0080	0.0095	0.0034	0.0087	0.0065	0.0092
Average-24Hr*	0.0058	0.0075	0.0075	0.0085	0.0073	0.0066	0.0090
Max-1Hr	0.0110	0.0159	0.0137	0.0125	0.0124	0.0140	0.0171
Min-1Hr	0.0015	0.0022	0.0013	0.0021	0.0021	0.0017	0.0018
Standard-1Hr	0.17 ppm(320 ug/cu.m)						
Standard-24Hr	-						

Remark : \* Average time between 11:00-11:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team



## Ambient Air Monitoring Results : Nitrogen dioxide MTR-PTTGC, Branch 2 (Power Plant)

Location : Ban Map Chalute      Monitor Period : 30 Aug 2023-06 Sep 2023  
Analyzer Model : API 200A      Station No : SS2-20  
Serial No : 1528      Site Operator : Mr. Siwanon Kulawong

Calibrator Model : Teledyne 700E      Serial No : 587  
Calibration Gas Cylinder I.D.: EB0108319  
Certified Date : 09 Jan 2023      Cal Concentration (ppb) : 0,100,200,400  
Expire Date : 08 Jan 2024

Time	NO2 Concentration (ppm)						
	30-31 Aug 2023	31-01 Sep 2023	01-02 Sep 2023	02-03 Sep 2023	03-04 Sep 2023	04-05 Sep 2023	05-06 Sep 2023
12:00 - 13:00	0.0049	0.0102	0.0100	0.0042	0.0040	0.0071	0.0056
13:00 - 14:00	0.0088	0.0084	0.0059	0.0068	0.0021	0.0071	0.0036
14:00 - 15:00	0.0097	0.0068	0.0043	0.0060	0.0056	0.0062	0.0051
15:00 - 16:00	0.0071	0.0062	0.0060	0.0046	0.0031	0.0062	0.0047
16:00 - 17:00	0.0129	0.0097	0.0096	0.0063	0.0097	0.0083	0.0027
17:00 - 18:00	0.0098	0.0106	0.0056	0.0059	0.0087	0.0057	
18:00 - 19:00	0.0072	0.0080	0.0041	0.0051	0.0087	0.0079	0.0048
19:00 - 20:00	0.0076	0.0084	0.0056	0.0097	0.0053	0.0084	0.0058
20:00 - 21:00	0.0095	0.0078	0.0037	0.0074	0.0058	0.0095	0.0038
21:00 - 22:00	0.0054	0.0092	0.0012	0.0040	0.0073	0.0085	0.0059
22:00 - 23:00	0.0108	0.0097	0.0067	0.0042	0.0094	0.0091	0.0044
23:00 - 00:00	0.0072	0.0021	0.0057	0.0023	0.0074	0.0091	0.0054
00:00 - 01:00	0.0016	0.0070	0.0053	0.0040	0.0064	0.0042	0.0055
01:00 - 02:00	0.0014	0.0079	0.0058	0.0046	0.0080	0.0037	0.0030
02:00 - 03:00	0.0068	0.0053	0.0033	0.0063	0.0075	0.0088	0.0055
03:00 - 04:00	0.0037	0.0062	0.0019	0.0024	0.0035	0.0098	0.0056
04:00 - 05:00	0.0066	0.0061	0.0029	0.0071	0.0046	0.0019	0.0041
05:00 - 06:00	0.0055	0.0076	0.0024	0.0062	0.0066	0.0074	0.0036
06:00 - 07:00	0.0089	0.0100	0.0054	0.0044	0.0036	0.0070	0.0072
07:00 - 08:00	0.0103	0.0079	0.0045	0.0055	0.0042	0.0115	0.0067
08:00 - 09:00	0.0127	0.0088	0.0070	0.0072	0.0067	0.0066	0.0042
09:00 - 10:00	0.0071	0.0107	0.0035	0.0083	0.0068	0.0061	0.0043
10:00 - 11:00	0.0089	0.0096	0.0090	0.0050	0.0053	0.0082	0.0053
11:00 - 12:00	0.0063	0.0101	0.0076	0.0046	0.0060	0.0055	0.0033
Average-24Hr*	0.0075	0.0081	0.0053	0.0055	0.0061	0.0074	0.0048
Max-1Hr	0.0129	0.0107	0.0100	0.0097	0.0097	0.0115	0.0072
Min-1Hr	0.0014	0.0021	0.0012	0.0023	0.0021	0.0019	0.0027
Standard-1Hr	0.17 ppm(320 ug/cu.m)						
Standard-24Hr							

Remark : \* Average time between 12:00-12:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team



## Ambient Air Monitoring Results : Nitrogen dioxide MTR-PTTGC, Branch 2 (Power Plant)

Location : Nong Feab      Monitor Period : 30 Aug 2023-06 Sep 2023  
Analyzer Model : API 200A      Station No : SCT-15  
Serial No : 2387      Site Operator : Mr. Siwanon Kulawong

Calibrator Model : Teledyne 700E      Serial No : 587  
Calibration Gas Cylinder I.D.: EB0108319  
Certified Date : 09 Jan 2023      Cal Concentration (ppb) : 0,100,200,400  
Expire Date : 08 Jan 2024

Time	NO2 Concentration (ppm)						
	30-31 Aug 2023	31-01 Sep 2023	01-02 Sep 2023	02-03 Sep 2023	03-04 Sep 2023	04-05 Sep 2023	05-06 Sep 2023
12:00 - 13:00	0.0050	0.0096	0.0076	0.0048	0.0070	0.0085	0.0093
13:00 - 14:00	0.0109	0.0074	0.0071	0.0039	0.0070	0.0055	0.0069
14:00 - 15:00	0.0059	0.0084	0.0055	0.0061	0.0050	0.0055	0.0066
15:00 - 16:00	0.0084	0.0078	0.0011	0.0062	0.0065	0.0085	0.0102
16:00 - 17:00	0.0063	0.0083	0.0061	0.0049	0.0060	0.0045	0.0128
17:00 - 18:00	0.0123	0.0062	0.0086	0.0085	0.0060	0.0099	0.0090
18:00 - 19:00	0.0063	0.0072	0.0052	0.0047	0.0045	0.0039	0.0016
19:00 - 20:00	0.0097	0.0101	0.0067	0.0103	0.0080	0.0019	0.0067
20:00 - 21:00	0.0077	0.0085	0.0067	0.0085	0.0025	0.0064	0.0099
21:00 - 22:00	0.0087	0.0050	0.0038	0.0031	0.0050	0.0074	0.0085
22:00 - 23:00	0.0101	0.0069	0.0058	0.0033	0.0045	0.0074	0.0052
23:00 - 00:00	0.0061	0.0019	0.0043	0.0054	0.0050	0.0029	0.0058
00:00 - 01:00	0.0041	0.0033	0.0089	0.0066	0.0050	0.0044	0.0034
01:00 - 02:00	0.0040	0.0053	0.0049	0.0052	0.0030	0.0034	0.0096
02:00 - 03:00	0.0035	0.0062	0.0069	0.0024	0.0040	0.0044	0.0072
03:00 - 04:00	0.0084	0.0062	0.0020	0.0025	0.0050	0.0034	0.0108
04:00 - 05:00	0.0044	0.0081	0.0040	0.0062	0.0085	0.0074	0.0045
05:00 - 06:00	0.0019	0.0050	0.0070	0.0043	0.0050	0.0058	0.0111
06:00 - 07:00	0.0133	0.0085	0.0021	0.0030	0.0075	0.0093	0.0143
07:00 - 08:00	0.0043	0.0104	0.0016	0.0056	0.0055	0.0078	0.0099
08:00 - 09:00	0.0108	0.0089	0.0076	0.0058	0.0074	0.0088	0.0075
09:00 - 10:00	0.0062	0.0088	0.0057	0.0059	0.0049	0.0033	0.0082
10:00 - 11:00	0.0107	0.0038	0.0082	0.0076	0.0064	0.0058	0.0063
11:00 - 12:00	0.0087	0.0082	0.0041	0.0067	0.0050	0.0071	0.0044
Average-24Hr*	0.0076	0.0071	0.0055	0.0055	0.0056	0.0060	0.0079
Max-1Hr	0.0133	0.0104	0.0089	0.0103	0.0085	0.0099	0.0143
Min-1Hr	0.0019	0.0019	0.0011	0.0024	0.0025	0.0019	0.0016
Standard-1Hr	0.17 ppm(320 ug/cu.m)						
Standard-24Hr							

Remark : \* Average time between 12:00-12:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team

### ภาคผนวก ง.3

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## ใบรับรองผลการตรวจวัดระดับเสียงทั่วไป



## Noise Monitoring Result : Community Noise MTR-PTTGC, Branch 2 (Power Plant)

Location : The North of Fence  
SLM Model : RION NL-21  
Site Operator : Mr. Siwanon Kulawong

Monitor Period : 30 Aug 2023-06 Sep 2023

Serial No : 00487734

Calibrator Model : RION NC-74

Serial No : 34283648

Calibration Ref dB(A) : 94.0

Certified Date : 13 Jan 2023

SLM Reading / Adjust dB(A) : 93.8/0.2

Expire Date : 12 Jan 2024

Cal Sheet No.: NC-74-2023-040

Time	Equivalent Sound Pressure Level (dB(A))						
	30-31 Aug 2023	31-01 Sep 2023	01-02 Sep 2023	02-03 Sep 2023	03-04 Sep 2023	04-05 Sep 2023	05-06 Sep 2023
11:00 - 12:00	69.9	69.3	66.6	65.8	65.8	66.2	66.3
12:00 - 13:00	69.4	69.1	66.2	66.1	65.6	66.3	66.2
13:00 - 14:00	69.9	69.3	66.0	66.1	65.7	66.4	66.2
14:00 - 15:00	69.3	67.0	66.2	66.1	65.8	66.3	66.3
15:00 - 16:00	69.2	66.5	66.2	65.9	65.6	66.0	65.9
16:00 - 17:00	70.1	66.7	66.4	66.0	65.5	66.2	66.1
17:00 - 18:00	69.8	67.5	67.0	66.5	66.0	66.5	66.2
18:00 - 19:00	69.6	67.1	67.5	66.4	66.2	66.9	67.0
19:00 - 20:00	69.7	66.9	67.2	66.8	66.1	67.2	67.1
20:00 - 21:00	69.1	66.5	66.6	66.3	66.0	66.5	66.9
21:00 - 22:00	68.9	66.1	66.5	65.9	65.9	66.3	66.6
22:00 - 23:00	68.6	65.8	65.8	65.6	65.2	65.5	65.9
23:00 - 00:00	68.7	65.3	65.4	66.1	65.2	65.7	66.0
00:00 - 01:00	68.5	65.3	65.3	65.2	65.2	65.5	66.0
01:00 - 02:00	68.5	65.1	65.1	65.5	65.2	65.4	65.5
02:00 - 03:00	68.5	65.6	65.1	65.3	65.0	65.2	65.2
03:00 - 04:00	68.5	65.9	65.2	65.4	64.9	65.3	65.2
04:00 - 05:00	68.6	65.9	65.2	65.1	64.9	65.0	65.2
05:00 - 06:00	68.8	65.4	65.3	65.1	65.0	65.2	65.1
06:00 - 07:00	70.6	66.6	65.6	65.2	65.3	65.5	65.4
07:00 - 08:00	70.1	68.2	67.6	66.5	66.5	66.2	65.8
08:00 - 09:00	69.3	66.9	67.6	67.0	68.0	68.1	67.4
09:00 - 10:00	69.1	66.2	66.3	66.1	66.8	67.3	68.2
10:00 - 11:00	69.0	65.9	65.8	65.7	66.5	66.6	66.6
Leq(24)*	69.3	66.9	66.2	65.9	65.8	66.2	66.2
Ldn	75.4	72.4	72.0	71.9	71.7	72.0	72.1
Lmax **	103.4	88.5	88.6	87.1	89.0	90.0	85.9
Standard-24Hr	70 dB(A)						
Standard-Max	115 dB(A)						

Remark : \* Average time between 11:00-11:00

\*\* Maximum Sound Pressure Level between 11:00-11:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

Preeda S.  
(Miss Preeda Somjai)  
Technical Management Team



## Noise Monitoring Result : Background Noise MTR-PTTGC, Branch 2 (Power Plant)

Location : The North of Fence  
SLM Model : RION NL-21  
Site Operator : Mr. Siwanon Kulawong

Monitor Period : 30 Aug 2023-06 Sep 2023

Serial No : 00487734

Calibrator Model : RION NC-74

Serial No : 34283648

Calibration Ref dB(A) : 94.0

Certified Date : 13 Jan 2023

SLM Reading / Adjust dB(A) : 93.8/0.2

Expire Date : 12 Jan 2024

Cal Sheet No.: NC-74-2023-040

Time	L90 (dB(A))						
	30-31 Aug 2023	31-01 Sep 2023	01-02 Sep 2023	02-03 Sep 2023	03-04 Sep 2023	04-05 Sep 2023	05-06 Sep 2023
11:00 - 12:00	67.7	68.1	64.5	64.5	64.6	64.7	64.7
12:00 - 13:00	67.6	68.0	64.5	64.2	64.5	64.8	64.4
13:00 - 14:00	68.0	68.2	64.5	64.4	64.4	64.7	64.5
14:00 - 15:00	68.2	65.0	64.6	64.6	64.5	64.7	64.5
15:00 - 16:00	68.2	64.9	64.7	64.6	64.5	64.7	64.6
16:00 - 17:00	68.5	65.0	64.8	64.6	64.5	64.8	64.5
17:00 - 18:00	68.6	65.5	65.1	64.7	64.6	64.9	64.6
18:00 - 19:00	68.4	65.5	65.5	64.7	64.7	65.4	65.2
19:00 - 20:00	68.4	65.3	65.5	64.9	64.8	65.0	65.2
20:00 - 21:00	68.3	65.1	65.2	64.8	64.8	65.0	65.1
21:00 - 22:00	68.2	64.8	65.0	64.8	64.9	64.7	65.0
22:00 - 23:00	68.1	64.5	64.8	64.7	64.6	64.6	64.8
23:00 - 00:00	68.2	64.5	64.6	64.7	64.6	64.8	64.7
00:00 - 01:00	68.1	64.5	64.6	64.6	64.5	64.9	64.7
01:00 - 02:00	68.1	64.5	64.5	64.9	64.6	64.7	64.6
02:00 - 03:00	68.1	64.7	64.6	64.7	64.5	64.7	64.6
03:00 - 04:00	68.1	65.2	64.7	64.8	64.4	64.7	64.6
04:00 - 05:00	68.1	65.4	64.7	64.6	64.4	64.5	64.6
05:00 - 06:00	68.2	64.5	64.6	64.5	64.4	64.6	64.6
06:00 - 07:00	68.6	64.7	64.6	64.6	64.4	64.7	64.7
07:00 - 08:00	68.5	65.3	65.1	64.8	64.6	64.8	64.8
08:00 - 09:00	68.0	64.8	65.0	65.0	65.4	65.6	65.4
09:00 - 10:00	67.9	64.5	64.6	64.6	64.8	65.1	66.2
10:00 - 11:00	67.8	64.4	64.3	64.6	64.8	65.0	65.0
L90(avg)*	68.2	65.5	64.8	64.7	64.6	64.8	64.8

Remark : \* Average time between 11:00-11:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

Preeda S.  
(Miss Preeda Somjai)  
Technical Management Team





## Noise Monitoring Result : Community Noise MTR-PTTGC, Branch 2 (Power Plant)

Location : The South of Fence      Monitor Period : 30 Aug 2023-06 Sep 2023  
SLM Model : RION NL-21      Serial No : 00487723  
Site Operator : Mr. Siwanon Kulawong

Calibrator Model : RION NC-74      Serial No : 34283648  
Calibration Ref dB(A) : 94.0      Certified Date : 13 Jan 2023  
SLM Reading / Adjust dB(A) : 94.1/-0.1      Expire Date : 12 Jan 2024  
Cal Sheet No.: NC-74-2023-040

Time	Equivalent Sound Pressure Level (dB(A))						
	30-31 Aug 2023	31-01 Sep 2023	01-02 Sep 2023	02-03 Sep 2023	03-04 Sep 2023	04-05 Sep 2023	05-06 Sep 2023
12:00 - 13:00	60.0	59.1	59.6	59.3	58.9	60.8	61.2
13:00 - 14:00	62.0	60.4	59.4	59.2	58.3	58.7	60.1
14:00 - 15:00	60.7	59.0	61.1	58.9	58.0	58.9	59.5
15:00 - 16:00	61.3	59.5	60.4	60.3	59.7	60.3	60.3
16:00 - 17:00	60.9	59.3	59.3	60.1	61.6	60.0	59.8
17:00 - 18:00	60.3	60.7	62.9	59.9	59.1	59.7	60.0
18:00 - 19:00	59.3	59.6	61.6	59.3	58.6	60.2	60.1
19:00 - 20:00	59.2	59.0	60.1	58.4	59.0	59.6	60.3
20:00 - 21:00	58.4	58.3	58.7	58.6	58.4	58.9	59.3
21:00 - 22:00	58.2	58.6	58.6	58.3	58.0	58.1	58.4
22:00 - 23:00	58.3	58.4	58.4	58.4	58.0	58.0	58.3
23:00 - 00:00	58.7	58.1	58.3	57.9	58.1	57.8	58.5
00:00 - 01:00	58.3	58.1	58.5	57.7	58.0	58.0	58.3
01:00 - 02:00	58.6	58.1	58.6	58.0	57.3	57.8	57.2
02:00 - 03:00	58.6	57.8	59.0	58.1	57.4	57.4	57.5
03:00 - 04:00	58.4	57.9	58.8	57.9	57.8	57.5	57.3
04:00 - 05:00	58.8	57.6	58.6	57.8	57.4	57.7	57.3
05:00 - 06:00	58.9	57.8	58.5	57.8	57.3	57.2	57.2
06:00 - 07:00	59.5	57.9	58.4	56.9	57.1	56.9	59.0
07:00 - 08:00	60.3	59.3	58.3	57.5	57.7	57.0	59.4
08:00 - 09:00	61.1	60.2	58.9	58.0	58.5	58.4	59.1
09:00 - 10:00	60.0	60.5	59.8	58.5	59.9	59.9	59.5
10:00 - 11:00	59.7	60.4	60.8	59.2	61.2	60.3	60.0
11:00 - 12:00	59.5	60.8	59.1	58.5	61.2	61.2	60.6

Leq(24)*	59.7	59.1	59.6	58.6	58.8	59.0	59.3
Ldn	65.3	64.7	65.2	64.4	64.3	64.4	64.7
Lmax **	77.8	79.0	83.5	74.8	85.9	85.4	79.0

Standard-24Hr      70 dB(A)  
Standard-Max      115 dB(A)

Remark : \* Average time between 12:00-12:00

\*\* Maximum Sound Pressure Level between 12:00-12:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

Preeda S.  
(Miss Preeda Somjai)  
Technical Management Team



## Noise Monitoring Result : Background Noise MTR-PTTGC, Branch 2 (Power Plant)

Location : The South of Fence      Monitor Period : 30 Aug 2023-06 Sep 2023  
SLM Model : RION NL-21      Serial No : 00487723  
Site Operator : Mr. Siwanon Kulawong

Calibrator Model : RION NC-74      Serial No : 34283648  
Calibration Ref dB(A) : 94.0      Certified Date : 13 Jan 2023  
SLM Reading / Adjust dB(A) : 94.1/-0.1      Expire Date : 12 Jan 2024  
Cal Sheet No.: NC-74-2023-040

Time	L90 (dB(A))						
	30-31 Aug 2023	31-01 Sep 2023	01-02 Sep 2023	02-03 Sep 2023	03-04 Sep 2023	04-05 Sep 2023	05-06 Sep 2023
12:00 - 13:00	59.0	58.3	58.1	57.2	57.0	57.9	58.5
13:00 - 14:00	59.2	58.6	58.2	57.5	57.0	57.5	57.8
14:00 - 15:00	59.1	58.3	58.3	57.5	57.1	57.6	58.0
15:00 - 16:00	59.1	58.1	58.5	58.4	57.0	58.1	58.4
16:00 - 17:00	58.6	58.0	57.9	58.3	57.5	57.9	57.8
17:00 - 18:00	58.1	58.3	58.0	58.0	57.3	57.6	58.0
18:00 - 19:00	58.0	57.7	57.8	57.9	57.5	58.0	58.1
19:00 - 20:00	57.8	57.8	57.5	57.1	57.1	57.5	57.8
20:00 - 21:00	57.8	57.6	57.6	57.3	57.5	57.4	57.5
21:00 - 22:00	57.5	57.9	57.6	57.4	57.1	57.0	57.4
22:00 - 23:00	57.5	57.8	57.7	57.5	57.3	57.1	57.5
23:00 - 00:00	56.0	57.5	57.4	57.1	57.0	56.9	57.6
00:00 - 01:00	57.7	57.4	57.7	56.9	57.2	56.9	56.9
01:00 - 02:00	57.9	57.5	57.8	57.3	56.6	57.1	56.5
02:00 - 03:00	57.9	57.0	57.8	57.3	56.7	56.7	56.7
03:00 - 04:00	57.8	57.1	57.9	57.2	57.0	56.8	56.9
04:00 - 05:00	58.1	57.1	57.6	57.1	56.8	56.9	56.5
05:00 - 06:00	58.2	57.2	57.6	57.0	56.6	56.5	56.6
06:00 - 07:00	58.1	57.4	57.6	56.1	56.5	56.2	57.8
07:00 - 08:00	58.0	57.8	57.4	56.6	56.5	56.3	58.0
08:00 - 09:00	58.6	58.3	57.6	56.7	56.7	56.9	57.6
09:00 - 10:00	58.4	58.1	58.0	57.2	56.9	57.6	57.8
10:00 - 11:00	58.0	57.9	58.2	57.4	57.8	57.7	58.1
11:00 - 12:00	58.4	58.6	57.5	57.0	58.0	58.9	58.0

L90(avg)\*      58.2      57.8      57.8      57.3      57.1      57.3      57.6

Remark : \* Average time between 12:00-12:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

Preeda S.  
(Miss Preeda Somjai)  
Technical Management Team

## ภาคผนวก ง.4

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### ใบรับรองผลการตรวจวิเคราะห์คุณภาพน้ำ



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**WATER AND WASTEWATER ANALYSIS REPORT**

**CLIENT NAME** : PTT Global Chemical Public Company Limited , **REQUEST SERVICE No.** : 1183/66  
**Branch 2 (Power Plant)** **SAMPLING METHOD** : Grab  
**SAMPLING BY** : SECOT Co., Ltd. **SAMPLING TIME** : 09:16  
**SAMPLING DATE** : 13/07/2023 **ANALYTICAL DATE** : 14-20/07/2023  
**RECEIVED DATE** : 14/07/2023 **SITE OPERATOR** : Mr. Watcharakan Pramakhate  
**REPORT DATE** : 20/07/2023 **FILE CODE** : 223007\_WW\_July  
**SAMPLE CONDITION** : Normal  
**LOCATION DESCRIPTION** : 1 = ก่อนปล่อยลงสู่คลองระบายน้ำทิ้งของนิคมฯ (Final Check Basin)

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION 1	STANDARD <sup>1/</sup>
Temperature	°C	2550 B	< 0.5	34.7	≤ 40
pH		4500-H <sup>+</sup> B	< 0.10	7.91	5.5-9.0
Total Dissolved Solids	mg/l	2540 C	< 50	3,358	36,980 <sup>2/</sup>
Total Suspended Solids	mg/l	2540 D	< 5	< 5	≤ 50
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	≤ 5
Phenols	mg/l	5530 B,C	< 0.001	ND	≤ 1
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	< 1.0	≤ 20
COD	mg/l	5220 C	< 15.00	35.28	≤ 120

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED. 2017 (AWWA.APHA.WEF)

*Khemchuda Insorn*

(Miss Khemchuda Insorn)

Analyst

REG. NO. 2-239-ก-5976

*(Mrs. Araya Tipparuk)*

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-ก-5863

**Remark :** 1. Reported analysis refers to submitted sample only.

2. This report shall not be reproduced, except in full, without official approval.

3. <sup>1/</sup> Notification of the Ministry of Industry, B.E.2560 (2017).

4. <sup>2/</sup> In case of discharging effluent into water resources containing TDS of more than 3,000 mg/l, TDS in the effluent to be discharged must exceed TDS in the water resources by not more than 5,000 mg/l (Measurement Results of Coastal Water on July 13, 2023 found to be 31,980 mg/l therefore the Standard of TDS found to be 36,980 mg/l).

5. - Not available.



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TEL. (662) 959-3600 FAX (662) 959-3535 Website : secot.co.th E-mail : envserv@secot.co.th

**WATER AND WASTEWATER ANALYSIS REPORT**

**CLIENT NAME** : PTT Global Chemical Public Company Limited , **REQUEST SERVICE No.** : 1182/66  
**Branch 2 (Power Plant)** **SAMPLING METHOD** : Grab  
**SAMPLING BY** : SECOT Co., Ltd. **SAMPLING TIME** : 10:02  
**SAMPLING DATE** : 13/07/2023 **ANALYTICAL DATE** : 14-20/07/2023  
**RECEIVED DATE** : 14/07/2023 **SITE OPERATOR** : Mr. Watcharakan Pramakhate  
**REPORT DATE** : 20/07/2023 **FILE CODE** : 223007\_SW\_July  
**SAMPLE CONDITION** : Normal  
**LOCATION DESCRIPTION** : 1 = คลองระบายน้ำทิ้งของนิคมฯ ก่อนจุดปล่อยน้ำของโรงโหล่ฟีนส์

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION 1	STANDARD <sup>1/</sup>
Temperature	°C	2550 B	< 0.5	32.7	<sup>2/</sup>
pH		4500-H <sup>+</sup> B	< 0.10	8.57	<sup>2/</sup>
Total Dissolved Solids	mg/l	2540 C	< 50	4,640	<sup>2/</sup>
Total Suspended Solids	mg/l	2540 D	< 5	22	<sup>2/</sup>
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	<sup>2/</sup>
Phenols	mg/l	5530 B,C	< 0.001	ND	<sup>2/</sup>
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	< 1.0	<sup>2/</sup>
COD	mg/l	5220 C	< 15.00	66.33	<sup>2/</sup>

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED. 2017 (AWWA.APHA.WEF)

*Khemchuda Insorn*

(Miss Khemchuda Insorn)

Analyst

*(Mrs. Araya Tipparuk)*

(Mrs. Araya Tipparuk)

Technical Management Team

**Remark :** 1. Reported analysis refers to submitted sample only.

2. This report shall not be reproduced, except in full, without official approval.

3. <sup>1/</sup> Notification of the National Environment Board No.8 B.E.2537 (1994).

Subject Determining water quality standards in Surface Water Sources for Surface Water Class 5.

4. <sup>2/</sup> No standard.

5. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Company Limited , REQUEST SERVICE No. : 1182/66  
Branch 2 (Power Plant) SAMPLING METHOD : Grab  
SAMPLING BY : SECOT Co., Ltd. SAMPLING TIME : 10:09  
SAMPLING DATE : 13/07/2023 ANALYTICAL DATE : 14-20/07/2023  
RECEIVED DATE : 14/07/2023 SITE OPERATOR : Mr. Watcharakan Pramakhate  
REPORT DATE : 20/07/2023 FILE CODE : 223007\_SW\_July  
SAMPLE CONDITION : Normal  
LOCATION DESCRIPTION : 2 = คลองระบายน้ำทิ้งของนิคมฯ หลังจุดปล่อยน้ำของโรงโหลยฟอส

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION 2	STANDARD <sup>1/</sup>
Temperature	°C	2550 B	< 0.5	32.1	2/
pH		4500-H <sup>+</sup> B	< 0.10	7.68	2/
Total Dissolved Solids	mg/l	2540 C	< 50	1,428	2/
Total Suspended Solids	mg/l	2540 D	< 5	6	2/
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	2/
Phenols	mg/l	5530 B,C	< 0.001	ND	2/
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	1.0	2/
COD	mg/l	5220 C	< 15.00	28.22	2/

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED. 2017 (AWWA APHA WEF)

*Khemchuda Insorn*

(Miss Khemchuda Insorn)

Analyst

*Mrs. Araya Tipparuk*

(Mrs. Araya Tipparuk)

Technical Management Team

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Subject Determining water quality standards in Surface Water Sources for Surface Water Class 5.  
4. <sup>2/</sup> No standard.  
5. - Not available.



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TEL. (662) 959-3600 FAX (662) 959-3535 Website: secot.co.th E-mail: envserv@secot.co.th

WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Company Limited , REQUEST SERVICE No. : 1336/66  
Branch 2 (Power Plant) SAMPLING METHOD : Grab  
SAMPLING BY : SECOT Co., Ltd. SAMPLING TIME : 10:38  
SAMPLING DATE : 10/08/2023 ANALYTICAL DATE : 11-18/08/2023  
RECEIVED DATE : 11/08/2023 SITE OPERATOR : Mr.Nathachai Chaiyakhot  
REPORT DATE : 21/08/2023 FILE CODE : 223007\_WW\_August  
SAMPLE CONDITION : Normal  
LOCATION DESCRIPTION : 1 = ก่อนปล่อยลงสู่คลองระบายน้ำทิ้งของนิคมฯ (Final Check Basin)

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION 1	STANDARD <sup>1/</sup>
Temperature	°C	2550 B	< 0.5	36.0	≤ 40
pH		4500-H <sup>+</sup> B	< 0.10	8.02	5.5-9.0
Total Dissolved Solids	mg/l	2540 C	< 50	3,352	38,060 <sup>2/</sup>
Total Suspended Solids	mg/l	2540 D	< 5	< 5	≤ 50
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	≤ 5
Phenols	mg/l	5530 B,C	< 0.001	ND	≤ 1
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	2.6	≤ 20
COD	mg/l	5220 C	< 15.00	62.69	≤ 120

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED. 2017 (AWWA APHA WEF)

*Khemchuda Insorn*

(Miss Khemchuda Insorn)

Analyst

REG. NO. 2-239-ท-0005

*Mrs. Araya Tipparuk*

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-ท-0004

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3. <sup>1/</sup> Notification of the Ministry of Industry, B.E.2560 (2017).  
4. <sup>2/</sup> In case of discharging effluent into water resources containing TDS of more than 3,000 mg/l, TDS in the effluent to be discharged must exceed TDS in the water resources by not more than 5,000 mg/l (Measurement Results of Coastal Water on August 10, 2023 found to be 33,060 mg/l therefore the Standard of TDS found to be 38,060 mg/l).  
5. - Not available.



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TEL. (662) 959-3600 FAX (662) 959-3535 Website : secot.co.th E-mail : envserv@secot.co.th

WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical Public Company Limited ,	REQUEST SERVICE No. :	1335/66
	Branch 2 (Power Plant)	SAMPLING METHOD	: Grab
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING TIME	: 15:05
SAMPLING DATE	: 10/08/2023	ANALYTICAL DATE	: 11-18/08/2023
RECEIVED DATE	: 11/08/2023	SITE OPERATOR	: Mr.Natthachai Chaiyakhrot
REPORT DATE	: 21/08/2023	FILE CODE	: 223007_SW_August
SAMPLE CONDITION	: Normal		
LOCATION DESCRIPTION	: 1 = คลองระบายน้ำทิ้งของนิคมฯ ก่อนจุดปล่อยน้ำของโรงโม่หิน		

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION 1	STANDARD <sup>1/</sup>
Temperature	°C	2550 B	< 0.5	36.3	<sup>2/</sup>
pH		4500-H <sup>+</sup> B	< 0.10	9.29	<sup>2/</sup>
Total Dissolved Solids	mg/l	2540 C	< 50	8,920	<sup>2/</sup>
Total Suspended Solids	mg/l	2540 D	< 5	85	<sup>2/</sup>
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	<sup>2/</sup>
Phenols	mg/l	5530 B,C	< 0.001	ND	<sup>2/</sup>
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	2.1	<sup>2/</sup>
COD	mg/l	5220 C	< 15.00	35.71	<sup>2/</sup>

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 21<sup>st</sup> ED. 2017 (AWWA APHA WEF)

*Khemchuda Insorn*

(Miss Khemchuda Insorn)  
Analyst

*Araya Tipparuk*

(Mrs. Araya Tipparuk )  
Technical Management Team

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3. <sup>1/</sup> Notification of the National Environment Board No.8 B.E.2537 (1994).  
Subject Determining water quality standards in Surface Water Sources for Surface Water Class 5.  
4. <sup>2/</sup> No standard.  
5. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical Public Company Limited ,	REQUEST SERVICE No. :	1335/66
	Branch 2 (Power Plant)	SAMPLING METHOD	: Grab
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING TIME	: 15:11
SAMPLING DATE	: 10/08/2023	ANALYTICAL DATE	: 11-18/08/2023
RECEIVED DATE	: 11/08/2023	SITE OPERATOR	: Mr.Natthachai Chaiyakhrot
REPORT DATE	: 21/08/2023	FILE CODE	: 223007_SW_August
SAMPLE CONDITION	: Normal		
LOCATION DESCRIPTION	: 2 = คลองระบายน้ำทิ้งของนิคมฯ หลังจุดปล่อยน้ำของโรงโม่หิน		

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION 2	STANDARD <sup>1/</sup>
Temperature	°C	2550 B	< 0.5	36.1	<sup>2/</sup>
pH		4500-H <sup>+</sup> B	< 0.10	8.88	<sup>2/</sup>
Total Dissolved Solids	mg/l	2540 C	< 50	2,576	<sup>2/</sup>
Total Suspended Solids	mg/l	2540 D	< 5	18	<sup>2/</sup>
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	<sup>2/</sup>
Phenols	mg/l	5530 B,C	< 0.001	ND	<sup>2/</sup>
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	4.0	<sup>2/</sup>
COD	mg/l	5220 C	< 15.00	43.65	<sup>2/</sup>

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 21<sup>st</sup> ED. 2017 (AWWA APHA WEF)

*Khemchuda Insorn*

(Miss Khemchuda Insorn)  
Analyst

*Araya Tipparuk*

(Mrs. Araya Tipparuk )  
Technical Management Team

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Subject Determining water quality standards in Surface Water Sources for Surface Water Class 5.  
4. <sup>2/</sup> No standard.  
5. - Not available.



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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND  
TEL. (662) 959-3600 FAX (662) 959-3535 Website: secot.co.th E-mail: envserv@secot.co.th

WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Company Limited , REQUEST SERVICE No. : 1605/66  
Branch 2 (Power Plant) SAMPLING METHOD : Grab  
SAMPLING BY : SECOT Co., Ltd. SAMPLING TIME : 15:14  
SAMPLING DATE : 14/09/2023 ANALYTICAL DATE : 15-21/09/2023  
RECEIVED DATE : 15/09/2023 SITE OPERATOR : Mr. Watcharakon Pramakhate  
REPORT DATE : 22/09/2023 FILE CODE : 223007\_WW\_September  
SAMPLE CONDITION : Normal  
LOCATION DESCRIPTION : 1 = ก่อนปล่อยลงสู่คลองระบายน้ำทิ้งของนิคมฯ (Final Check Basin)

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION 1	STANDARD <sup>1/</sup>
Temperature	°C	2550 B	< 0.5	37.0	≤ 40
pH	-	4500-H <sup>+</sup> B	< 0.10	8.08	5.5-9.0
Total Dissolved Solids	mg/l	2540 C	< 50	3,680	34,380 <sup>2/</sup>
Total Suspended Solids	mg/l	2540 D	< 5	6	≤ 50
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	≤ 5
Phenols	mg/l	5530 B,C	< 0.001	ND	≤ 1
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	< 1.0	≤ 20
COD	mg/l	5220 C	< 15.00	32.20	≤ 120

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 21<sup>st</sup> ED, 2017 (AWWA, APHA, WEF)

*Khemchuda Insorn*

(Miss Khemchuda Insorn)

Analyst

REG. NO. 7-239-R-0005

*(Mrs. Araya Tipparuk)*

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-R-0004

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3. <sup>1/</sup> Notification of the Ministry of Industry, B.E.2560 (2017).  
4. <sup>2/</sup> In case of discharging effluent into water resources containing TDS of more than 3,000 mg/l, TDS in the effluent to be discharged must exceed TDS in the water resources by not more than 5,000 mg/l (Measurement Results of Coastal Water on September 14, 2023 found to be 29,380 mg/l therefore the Standard of TDS found to be 34,380 mg/l).  
5. - Not available.



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TEL. (662) 959-3600 FAX (662) 959-3535 Website: secot.co.th E-mail: envserv@secot.co.th

WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Company Limited , REQUEST SERVICE No. : 1606/66  
Branch 2 (Power Plant) SAMPLING METHOD : Grab  
SAMPLING BY : SECOT Co., Ltd. SAMPLING TIME : 15:46  
SAMPLING DATE : 14/09/2023 ANALYTICAL DATE : 15-21/09/2023  
RECEIVED DATE : 15/09/2023 SITE OPERATOR : Mr.Chanapon Oakkharapion  
REPORT DATE : 22/09/2023 FILE CODE : 223007\_SW\_September  
SAMPLE CONDITION : Normal  
LOCATION DESCRIPTION : 1 = คลองระบายน้ำทิ้งของนิคมฯ ก่อนจุดปล่อยน้ำของโรงโม่หิน

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION 1	STANDARD <sup>1/</sup>
Temperature	°C	2550 B	< 0.5	34.4	<sup>2/</sup>
pH	-	4500-H <sup>+</sup> B	< 0.10	8.82	<sup>2/</sup>
Total Dissolved Solids	mg/l	2540 C	< 50	7,544	<sup>2/</sup>
Total Suspended Solids	mg/l	2540 D	< 5	28	<sup>2/</sup>
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	<sup>2/</sup>
Phenols	mg/l	5530 B,C	< 0.001	ND	<sup>2/</sup>
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	2.4	<sup>2/</sup>
COD	mg/l	5220 C	< 15.00	24.71	<sup>2/</sup>

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 21<sup>st</sup> ED, 2017 (AWWA, APHA, WEF)

*Khemchuda Insorn*

(Miss Khemchuda Insorn)

Analyst

*(Mrs. Araya Tipparuk)*

(Mrs. Araya Tipparuk)

Technical Management Team

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3. <sup>1/</sup> Notification of the National Environment Board No.8 B.E.2537 (1994).  
Subject: Determining water quality standards in Surface Water Sources for Surface Water Class 5.  
4. <sup>2/</sup> No standard.  
5. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Company Limited , REQUEST SERVICE No. : 1606/66  
Branch 2 (Power Plant) SAMPLING METHOD : Grab  
SAMPLING BY : SECOT Co., Ltd. SAMPLING TIME : 15:53  
SAMPLING DATE : 14/09/2023 ANALYTICAL DATE : 15-21/09/2023  
RECEIVED DATE : 15/09/2023 SITE OPERATOR : Mr.Chanapon Oakkharaplon  
REPORT DATE : 22/09/2023 FILE CODE : 223007\_SW\_September  
SAMPLE CONDITION : Normal  
LOCATION DESCRIPTION : 2 = คลองระบายน้ำทิ้งของนิคมฯ หลังจุดปล่อยน้ำของโรงไอลิพีนส์

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION 2	STANDARD <sup>1/</sup>
Temperature	°C	2550 B	< 0.5	32.9	<sup>2/</sup>
pH	-	4500-H <sup>+</sup> B	< 0.10	8.03	<sup>2/</sup>
Total Dissolved Solids	mg/l	2540 C	< 50	832	<sup>2/</sup>
Total Suspended Solids	mg/l	2540 D	< 5	23	<sup>2/</sup>
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	<sup>2/</sup>
Phenols	mg/l	5530 B,C	< 0.001	ND	<sup>2/</sup>
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	1.3	<sup>2/</sup>
COD	mg/l	5220 C	< 15.00	20.97	<sup>2/</sup>

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 21<sup>st</sup> ED. 2017 (AWWA, APHA, WEF)

*Khemchuda Insorn*

(Miss Khemchuda Insorn)

Analyst

*MR*

(Mrs. Araya Tipparuk)

Technical Management Team

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3. <sup>1/</sup> Notification of the National Environment Board No.8 B.E.2537 (1994).

Subject Determining water quality standards in Surface Water Sources for Surface Water Class 5.

4. <sup>2/</sup> No standard.

5. - Not available.



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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND  
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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Company Limited , REQUEST SERVICE No. : 1791/66  
Branch 2 (Power Plant) SAMPLING METHOD : Grab  
SAMPLING BY : SECOT Co., Ltd. SAMPLING TIME : 12:38  
SAMPLING DATE : 12/10/2023 ANALYTICAL DATE : 13-20/10/2023  
RECEIVED DATE : 13/10/2023 SITE OPERATOR : Miss Mareeyanee Hawae  
REPORT DATE : 21/10/2023 FILE CODE : 223007\_WW\_October  
SAMPLE CONDITION : Normal  
LOCATION DESCRIPTION : 1 = ก่อนปล่อยลงสู่คลองระบายน้ำทิ้งของนิคมฯ (Final Check Basin)

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION 1	STANDARD <sup>1/</sup>
Temperature	°C	2550 B	< 0.5	32.6	≤ 40
pH	-	4500-H <sup>+</sup> B	< 0.10	7.92	5.5-9.0
Total Dissolved Solids	mg/l	2540 C	< 50	2,028	15,240 <sup>2/</sup>
Total Suspended Solids	mg/l	2540 D	< 5	7	≤ 50
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	≤ 5
Phenols	mg/l	5530 B,C	< 0.001	ND	≤ 1
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	< 1.0	≤ 20
COD	mg/l	5220 C	< 15.00	38.23	≤ 120
Free Cl <sub>2</sub>	mg/l	4500-Cl G	< 0.01	ND	≤ 1
Nitrate	mg/l	4500-NO <sub>3</sub> -E	< 0.02	ND	≤ 10
TKN	mg/l	4500-Norg B	< 0.20	1.8	≤ 100
Copper (Cu)	mg/l	3120 B	< 0.001	< 0.02	≤ 2
Iron (Fe)	mg/l	3500-Fe B	< 0.05	0.14	≤ 1
Zinc (Zn)	mg/l	3120 B	< 0.003	0.67	≤ 5

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 21<sup>st</sup> ED. 2017 (AWWA, APHA, WEF)

*Khemchuda Insorn*

(Miss Khemchuda Insorn)

Analyst

REG. NO. 7-239-ท-0005

*MR*

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-ท-0004

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3. <sup>1/</sup> Notification of the Ministry of Natural Resources and Environment B.E.2565 (2022).

4. <sup>2/</sup> In case of discharging effluent into water resources containing TDS of more than 3,000 mg/l, TDS in the effluent to be discharged must exceed TDS in the water resources by not more than 5,000 mg/l (Measurement Results of Coastal Water on October 12, 2023 found to be 10,240 mg/l therefore the Standard of TDS found to be 15,240 mg/l).

5. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Company Limited , REQUEST SERVICE No. : 1790/66  
Branch 2 (Power Plant) SAMPLING METHOD : Grab  
SAMPLING BY : SECOT Co., Ltd. SAMPLING TIME : 13:20  
SAMPLING DATE : 12/10/2023 ANALYTICAL DATE : 13-20/10/2023  
RECEIVED DATE : 13/10/2023 SITE OPERATOR : Miss Mareeyanee Hawae  
REPORT DATE : 21/10/2023 FILE CODE : 223007\_SW\_October  
SAMPLE CONDITION : Normal  
LOCATION DESCRIPTION : 1 = คลองระบายน้ำทิ้งของนิคมฯ ก่อนจุดปล่อยน้ำของโรงโม่หินสี

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION 1	STANDARD <sup>1/</sup>
Temperature	°C	2550 B	< 0.5	28.3	2/
pH		4500-H <sup>+</sup> B	< 0.10	7.46	2/
Total Dissolved Solids	mg/l	2540 C	< 50	920	2/
Total Suspended Solids	mg/l	2540 D	< 5	174	2/
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	2/
Phenols	mg/l	5530 B,C	< 0.001	ND	2/
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	2.7	2/
COD	mg/l	5220 C	< 15.00	49.26	2/

REFERENCE: STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 21<sup>st</sup> ED. 2017 (AWWA APHA WEF)

*Khemchuda Insorn*

(Miss Khemchuda Insorn)  
Analyst

*Araya Tipparuk*

(Mrs. Araya Tipparuk)  
Technical Management Team

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Subject Determining water quality standards in Surface Water Sources for Surface Water Class 5.  
4. <sup>2/</sup> No standard.  
5. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Company Limited , REQUEST SERVICE No. : 1790/66  
Branch 2 (Power Plant) SAMPLING METHOD : Grab  
SAMPLING BY : SECOT Co., Ltd. SAMPLING TIME : 13:29  
SAMPLING DATE : 12/10/2023 ANALYTICAL DATE : 13-20/10/2023  
RECEIVED DATE : 13/10/2023 SITE OPERATOR : Miss Mareeyanee Hawae  
REPORT DATE : 21/10/2023 FILE CODE : 223007\_SW\_October  
SAMPLE CONDITION : Normal  
LOCATION DESCRIPTION : 2 = คลองระบายน้ำทิ้งของนิคมฯ หลังจุดปล่อยน้ำของโรงโม่หินสี

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION 2	STANDARD <sup>1/</sup>
Temperature	°C	2550 B	< 0.5	28.9	2/
pH		4500-H <sup>+</sup> B	< 0.10	7.39	2/
Total Dissolved Solids	mg/l	2540 C	< 50	876	2/
Total Suspended Solids	mg/l	2540 D	< 5	310	2/
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	2/
Phenols	mg/l	5530 B,C	< 0.001	ND	2/
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	1.9	2/
COD	mg/l	5220 C	< 15.00	56.61	2/

REFERENCE: STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 21<sup>st</sup> ED. 2017 (AWWA APHA WEF)

*Khemchuda Insorn*

(Miss Khemchuda Insorn)  
Analyst

*Araya Tipparuk*

(Mrs. Araya Tipparuk)  
Technical Management Team

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4. <sup>2/</sup> No standard.  
5. - Not available.





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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical Public Company Limited ,	REQUEST SERVICE No.	: 1966/66
	Branch 2 (Power Plant)	SAMPLING METHOD	: Grab
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING TIME	: 10:14
SAMPLING DATE	: 09/11/2023	ANALYTICAL DATE	: 10-16/11/2023
RECEIVED DATE	: 10/11/2023	SITE OPERATOR	: Miss Wiraya Patchimboon
REPORT DATE	: 17/11/2023	FILE CODE	: 223007_WW_November
SAMPLE CONDITION	: Normal		
LOCATION DESCRIPTION	: 1 = ก่อนปล่อยลงสู่คลองระบายน้ำทิ้งของนิคมฯ (Final Check Basin)		

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION I	STANDARD <sup>1/</sup>
Temperature	°C	2550 B	< 0.5	31.7	≤ 40
pH	-	4500-H <sup>+</sup> B	< 0.10	7.95	5.5-9.0
Total Dissolved Solids	mg/l	2540 C	< 50	1,360	37,260 <sup>2/</sup>
Total Suspended Solids	mg/l	2540 D	< 5	< 5	≤ 50
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	≤ 5
Phenols	mg/l	5530 B,C	< 0.001	ND	≤ 1
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	1.4	≤ 20
COD	mg/l	5220 C	< 15.00	42.47	≤ 120
Free Cl <sub>2</sub>	mg/l	4500-Cl G	< 0.01	ND	≤ 1
Nitrate	mg/l	4500-NO <sub>3</sub> <sup>-</sup> E	< 0.02	1.1	≤ 10
TKN	mg/l	4500-Norg B	< 0.20	1.2	≤ 100
Copper (Cu)	mg/l	3120 B	< 0.001	< 0.02	≤ 2
Iron (Fe)	mg/l	3500-Fe B	< 0.05	0.25	≤ 1
Zinc (Zn)	mg/l	3120 B	< 0.003	0.57	≤ 5

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED. 2017 (AWWA,APHA, WEF)

(Miss Pornnapa Budthum)

Analyst

REG. NO. 7-239-9-0018

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-9-0004

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  4. <sup>2/</sup> In case of discharging effluent into water resources containing TDS of more than 3,000 mg/l, TDS in the effluent to be discharged must exceed TDS in the water resources by not more than 5,000 mg/l (Measurement Results of Coastal Water on November 09, 2023 found to be 32,260 mg/l therefore the Standard of TDS found to be 37,260 mg/l).
  5. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical Public Company Limited ,	REQUEST SERVICE No.	: 1963/66
	Branch 2 (Power Plant)	SAMPLING METHOD	: Grab
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING TIME	: 11:10
SAMPLING DATE	: 09/11/2023	ANALYTICAL DATE	: 10-15/11/2023
RECEIVED DATE	: 10/11/2023	SITE OPERATOR	: Miss Wiraya Patchimboon
REPORT DATE	: 16/11/2023	FILE CODE	: 223007_SW_November
SAMPLE CONDITION	: Normal		
LOCATION DESCRIPTION	: 1 = คลองระบายน้ำทิ้งของนิคมฯ ก่อนจุดปล่อยน้ำของโรงโม่หิน		

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION I	STANDARD <sup>1/</sup>
Temperature	°C	2550 B	< 0.5	31.5	2/
pH	-	4500-H <sup>+</sup> B	< 0.10	8.51	2/
Total Dissolved Solids	mg/l	2540 C	< 50	2,568	2/
Total Suspended Solids	mg/l	2540 D	< 5	44	2/
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	2/
Phenols	mg/l	5530 B,C	< 0.001	ND	2/
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	1.1	2/
COD	mg/l	5220 C	< 15.00	18.20	2/

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED. 2017 (AWWA,APHA, WEF)

(Miss Khemchuda Insorn)

Analyst

(Mrs. Araya Tipparuk)

Technical Management Team

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Subject Determining water quality standards in Surface Water Sources for Surface Water Class 5.
  4. <sup>2/</sup> No standard.
  5. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	PTT Global Chemical Public Company Limited	REQUEST SERVICE No.	1963/66
	Branch 2 (Power Plant)	SAMPLING METHOD	Grab
SAMPLING BY	SECOT Co., Ltd.	SAMPLING TIME	10:18
SAMPLING DATE	09/11/2023	ANALYTICAL DATE	10-15/11/2023
RECEIVED DATE	10/11/2023	SITE OPERATOR	Miss Wiraya Patchimboon
REPORT DATE	16/11/2023	FILE CODE	223007_SW_November
SAMPLE CONDITION	Normal		
LOCATION DESCRIPTION	2 = คลองระบายน้ำทิ้งของนิคมฯ หลังชุดปล่อยน้ำของโรงโม่หิน		

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION 2	STANDARD <sup>1/</sup>
Temperature	°C	2550 B	< 0.5	30.4	2 <sup>1/</sup>
pH	-	4500-H <sup>+</sup> B	< 0.10	6.29	2 <sup>1/</sup>
Total Dissolved Solids	mg/l	2540 C	< 50	1,228	2 <sup>1/</sup>
Total Suspended Solids	mg/l	2540 D	< 5	9	2 <sup>1/</sup>
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	2 <sup>1/</sup>
Phenols	mg/l	5530 B,C	< 0.001	ND	2 <sup>1/</sup>
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	1.7	2 <sup>1/</sup>
COD	mg/l	5220 C	< 15.00	28.82	2 <sup>1/</sup>

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 21<sup>st</sup> ED. 2017 (AWWA, APHA, WEF)

*Khemchuda Insorn*

(Miss Khemchuda Insorn)

Analyst

*Araya Tipparuk*

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Technical Management Team

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Subject Determining water quality standards in Surface Water Sources for Surface Water Class 5.

4. <sup>2/</sup> No standard.

5. - Not available.



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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND  
TEL. (662) 959-3600 FAX (662) 959-3535 Website : secot.co.th E-mail : envserv@secot.co.th

WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	PTT Global Chemical Public Company Limited	REQUEST SERVICE No.	2173/66
	Branch 2 (Power Plant)	SAMPLING METHOD	Grab
SAMPLING BY	SECOT Co., Ltd.	SAMPLING TIME	11:30
SAMPLING DATE	07/12/2023	ANALYTICAL DATE	08-15/12/2023
RECEIVED DATE	08/12/2023	SITE OPERATOR	Mr. Aniwat Pimwanna
REPORT DATE	15/12/2023	FILE CODE	223007_WW_December
SAMPLE CONDITION	Normal		
LOCATION DESCRIPTION	1 = ก่อนปล่อยลงสู่คลองระบายน้ำทิ้งของนิคมฯ (Final Check Basin)		

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION 1	STANDARD <sup>1/</sup>
Temperature	°C	2550 B	< 0.5	36.8	≤ 40
pH	-	4500-H <sup>+</sup> B	< 0.10	8.55	5.5-9.0
Total Dissolved Solids	mg/l	2540 C	< 50	1,950	31,060 <sup>2/</sup>
Total Suspended Solids	mg/l	2540 D	< 5	8	≤ 50
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	≤ 5
Phenols	mg/l	5530 B,C	< 0.001	ND	≤ 1
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	2.8	≤ 20
COD	mg/l	5220 C	< 15.00	32.56	≤ 120
Free Cl <sub>2</sub>	mg/l	4500-Cl G	< 0.01	0.07	≤ 1
Nitrate	mg/l	4500-NO <sub>3</sub> -E	< 0.02	0.68	≤ 10
TKN	mg/l	4500-Norg B	< 0.20	5.3	≤ 100
Copper (Cu)	mg/l	3120 B	< 0.001	< 0.02	≤ 2
Iron (Fe)	mg/l	3500-Fe B	< 0.05	0.36	≤ 1
Zinc (Zn)	mg/l	3120 B	< 0.003	0.84	≤ 5

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 21<sup>st</sup> ED. 2017 (AWWA, APHA, WEF)

*Khemchuda Insorn*

(Miss Khemchuda Insorn)

Analyst

REG. NO. 2-239-R-0005

*Araya Tipparuk*

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-R-0004

Remark : 1. Reported analysis refers to submitted sample only.

2. This report shall not be reproduced, except in full, without official approval.

3. <sup>1/</sup> Notification of the Ministry of Natural Resources and Environment B.E.2565 (2022).

4. <sup>2/</sup> In case of discharging effluent into water resources containing TDS of more than 3,000 mg/l, TDS in the effluent to be discharged must exceed TDS in the water resources by not more than 5,000 mg/l (Measurement Results of Coastal Water on December 07, 2023 found to be 26,060 mg/l therefore the Standard of TDS found to be 31,060 mg/l).

5. - Not available.



บริษัท ซีคอต จำกัด  
SECOT CO., LTD.

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Company Limited , REQUEST SERVICE No. : 2172/66  
Branch 2 (Power Plant) SAMPLING METHOD : Grab  
SAMPLING BY : SECOT Co., Ltd. SAMPLING TIME : 12:10  
SAMPLING DATE : 07/12/2023 ANALYTICAL DATE : 08-15/12/2023  
RECEIVED DATE : 08/12/2023 SITE OPERATOR : Mr. Aniwat Pimwanna  
REPORT DATE : 15/12/2023 FILE CODE : 223007\_SW\_December  
SAMPLE CONDITION : Normal  
LOCATION DESCRIPTION : 1 = คลองระบายน้ำทิ้งของนิคมฯ ก่อนจุดปล่อยน้ำของโรงโหล่หินส์

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION 1	STANDARD <sup>1/</sup>
Temperature	°C	2550 B	< 0.5	34.4	2/
pH		4500-H <sup>+</sup> B	< 0.10	9.35	2/
Total Dissolved Solids	mg/l	2540 C	< 50	6,008	2/
Total Suspended Solids	mg/l	2540 D	< 5	72	2/
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	2/
Phenols	mg/l	5530 B,C	< 0.001	ND	2/
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	1.0	2/
COD	mg/l	5220 C	< 15.00	< 15.00	2/

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 21<sup>st</sup> ED. 2017 (AWWA, APHA, WEF)

(Miss Khemchuda Insorn)

Analyst

(Mrs. Araya Tipparuk)

Technical Management Team

- Remark : 1. Reported analysis refers to submitted sample only.  
2. This report shall not be reproduced, except in full, without official approval.  
3. <sup>1/</sup> Notification of the National Environment Board No.8 B.E.2537 (1994).  
Subject Determining water quality standards in Surface Water Sources for Surface Water Class 5.  
4. <sup>2/</sup> No standard.  
5. - Not available.



บริษัท ซีคอต จำกัด  
SECOT CO., LTD.

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Company Limited , REQUEST SERVICE No. : 2172/66  
Branch 2 (Power Plant) SAMPLING METHOD : Grab  
SAMPLING BY : SECOT Co., Ltd. SAMPLING TIME : 12:20  
SAMPLING DATE : 07/12/2023 ANALYTICAL DATE : 08-15/12/2023  
RECEIVED DATE : 08/12/2023 SITE OPERATOR : Mr. Aniwat Pimwanna  
REPORT DATE : 15/12/2023 FILE CODE : 223007\_SW\_December  
SAMPLE CONDITION : Normal  
LOCATION DESCRIPTION : 2 = คลองระบายน้ำทิ้งของนิคมฯ หลังจุดปล่อยน้ำของโรงโหล่หินส์

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION 2	STANDARD <sup>1/</sup>
Temperature	°C	2550 B	< 0.5	32.7	2/
pH		4500-H <sup>+</sup> B	< 0.10	8.22	2/
Total Dissolved Solids	mg/l	2540 C	< 50	1,454	2/
Total Suspended Solids	mg/l	2540 D	< 5	6	2/
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	2/
Phenols	mg/l	5530 B,C	< 0.001	ND	2/
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	2.0	2/
COD	mg/l	5220 C	< 15.00	27.02	2/

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 21<sup>st</sup> ED. 2017 (AWWA, APHA, WEF)

(Miss Khemchuda Insorn)

Analyst

(Mrs. Araya Tipparuk)

Technical Management Team

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3. <sup>1/</sup> Notification of the National Environment Board No.8 B.E.2537 (1994).  
Subject Determining water quality standards in Surface Water Sources for Surface Water Class 5.  
4. <sup>2/</sup> No standard.  
5. - Not available.

## ภาคผนวก ง.5

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### ใบรับรองผลการตรวจวัดระดับเสียงในพื้นที่ทำงาน



## Noise Monitoring Result : Working Noise MTR-PTTGC, Branch 2 (Power Plant)


Location : Air Intake                      Monitor Period : Aug 25, 2023  
SLM Model : SCARLET ST-21D                      Serial No : 820727  
Site Operator : Miss Mareeyanee Hawae


Calibrator Model : Cirrus CR:515                      Serial No : 94296  
Calibration Ref dB(A) : 94.0                      Certified Date : Dec 20, 2022  
SLM Reading / Adjust dB(A) : 93.8/0.0                      Expire Date : Dec 19, 2023  
Cal Sheet No. : CR-515-2023-127

Time	Equivalent Sound Pressure Level (dB(A))	
	Aug 25, 2023	
00:00 - 01:00		
01:00 - 02:00		
02:00 - 03:00		
03:00 - 04:00		
04:00 - 05:00		
05:00 - 06:00		
06:00 - 07:00		
07:00 - 08:00		
08:00 - 09:00	83.1	
09:00 - 10:00	83.1	
10:00 - 11:00	83.2	
11:00 - 12:00	83.1	
12:00 - 13:00	83.1	
13:00 - 14:00	83.2	
14:00 - 15:00	83.3	
15:00 - 16:00	83.2	
16:00 - 17:00	83.2	
17:00 - 18:00	83.2	
18:00 - 19:00	83.1	
19:00 - 20:00	83.2	
20:00 - 21:00		
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		
Leq(12)*	83.2	
Lmax **	93.9	
Standard-12Hr	87 dB(A)	
Standard-Max	140 dB(A)	

Remark : \* Average time between 08:00-20:00

\*\* Maximum Sound Pressure Level between 08:00-20:00

  
(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

  
(Miss Sununta Sirawuttinanon)  
Technical Management Team



## Noise Monitoring Result : Working Noise MTR-PTTGC, Branch 2 (Power Plant)


Location : Turbine                      Monitor Period : Aug 25, 2023  
SLM Model : SCARLET ST-21D                      Serial No : 820725  
Site Operator : Miss Mareeyanee Hawae

Calibrator Model : Cirrus CR:515                      Serial No : 94296  
Calibration Ref dB(A) : 94.0                      Certified Date : Dec 20, 2022  
SLM Reading / Adjust dB(A) : 93.8/0.0                      Expire Date : Dec 19, 2023  
Cal Sheet No. : CR-515-2023-127

Time	Equivalent Sound Pressure Level (dB(A))	
	Aug 25, 2023	
00:00 - 01:00		
01:00 - 02:00		
02:00 - 03:00		
03:00 - 04:00		
04:00 - 05:00		
05:00 - 06:00		
06:00 - 07:00		
07:00 - 08:00		
08:00 - 09:00	78.3	
09:00 - 10:00	77.8	
10:00 - 11:00	77.8	
11:00 - 12:00	77.8	
12:00 - 13:00	77.4	
13:00 - 14:00	77.3	
14:00 - 15:00	53.1	
15:00 - 16:00	77.3	
16:00 - 17:00	77.5	
17:00 - 18:00	77.5	
18:00 - 19:00	77.7	
19:00 - 20:00	75.1	
20:00 - 21:00		
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		
Leq(12)*	77.1	
Lmax **	103.8	
Standard-12Hr	87 dB(A)	
Standard-Max	140 dB(A)	

Remark : \* Average time between 08:00-20:00

\*\* Maximum Sound Pressure Level between 08:00-20:00

  
(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

  
(Miss Sununta Sirawuttinanon)  
Technical Management Team



## Noise Monitoring Result : Working Noise MTR-PTTGC, Branch 2 (Power Plant)

Location : Air Intake  
SLM Model : SCARLET ST-21D  
Site Operator : Miss Wiraya Patchimboon

Monitor Period : Nov 03, 2023

Serial No : 820729

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : Sep 11, 2023

SLM Reading / Adjust dB(A) : 93.8/0.0

Expire Date : Sep 10, 2024

Cal Sheet No.: CR-515-2023-193

Time	Equivalent Sound Pressure Level (dB(A))	
	Nov 03, 2023	
00:00 - 01:00		
01:00 - 02:00		
02:00 - 03:00		
03:00 - 04:00		
04:00 - 05:00		
05:00 - 06:00		
06:00 - 07:00		
07:00 - 08:00		
08:00 - 09:00	83.9	
09:00 - 10:00	82.5	
10:00 - 11:00	82.7	
11:00 - 12:00	82.8	
12:00 - 13:00	82.7	
13:00 - 14:00	82.8	
14:00 - 15:00	82.4	
15:00 - 16:00	82.2	
16:00 - 17:00	82.6	
17:00 - 18:00	83.3	
18:00 - 19:00	83.1	
19:00 - 20:00	83.2	
20:00 - 21:00		
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		
Leq(12)*	82.9	
Lmax **	94.8	
Standard-12Hr	87 dB(A)	
Standard-Max	140 dB(A)	

Remark : \* Average time between 08:00-20:00

\*\* Maximum Sound Pressure Level between 08:00-20:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Sununta Sirawuttinanon)  
Technical Management Team



## Noise Monitoring Result : Working Noise MTR-PTTGC, Branch 2 (Power Plant)

Location : Turbine  
SLM Model : SCARLET ST-21D  
Site Operator : Miss Wiraya Patchimboon

Monitor Period : Nov 03, 2023

Serial No : 820726

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : Sep 11, 2023

SLM Reading / Adjust dB(A) : 93.8/0.0

Expire Date : Sep 10, 2024

Cal Sheet No.: CR-515-2023-193

Time	Equivalent Sound Pressure Level (dB(A))	
	Nov 03, 2023	
00:00 - 01:00		
01:00 - 02:00		
02:00 - 03:00		
03:00 - 04:00		
04:00 - 05:00		
05:00 - 06:00		
06:00 - 07:00		
07:00 - 08:00		
08:00 - 09:00	76.2	
09:00 - 10:00	75.8	
10:00 - 11:00	75.7	
11:00 - 12:00	75.8	
12:00 - 13:00	75.8	
13:00 - 14:00	75.9	
14:00 - 15:00	76.0	
15:00 - 16:00	75.9	
16:00 - 17:00	76.0	
17:00 - 18:00	76.0	
18:00 - 19:00	76.1	
19:00 - 20:00	76.3	
20:00 - 21:00		
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		
Leq(12)*	76.0	
Lmax **	91.9	
Standard-12Hr	87 dB(A)	
Standard-Max	140 dB(A)	

Remark : \* Average time between 08:00-20:00

\*\* Maximum Sound Pressure Level between 08:00-20:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Sununta Sirawuttinanon)  
Technical Management Team

ภาคผนวก จ

## ใบแสดงการตรวจเทียบเครื่องมือ



## CONTROL UNIT CALIBRATION

(Metric units, mm)

Date 16 Jan 23

Barometric press, Pb

Initial	Final	Average
759	759	759

 mmHg

## Dry Gas Meter Data

Console No. M50-09

Metering System ID

DGM Number 972135

DGM Model ES-110

Calibrated by : Montri P.

## Reference Dry Gas Meter Data

Serial No. 358794

Model S110

Correction factor (Yr) 1.0079

Last Calibration Date 9 Dec 22

Orifice manometer setting, ΔH mm H2O	Ref. DGM Volume V <sub>r</sub> Liters	DGM Volume V <sub>m</sub> Liters	Temperature (°C)				Time Θ min	DGM Correction factor (Y)	ΔH@ mm
			Ref DGM T <sub>r</sub>	Dry Gas Meter					
				Inlet T <sub>i</sub>	Outlet T <sub>o</sub>	Avg T <sub>m</sub>			
12.5	100.3	101.9	25	25	24	24.5	9.72	0.9891	53.2869
25.0	100.0	101.6	25	25	24	24.5	6.50	0.9882	47.9400
50.0	100.1	100.5	25	25	24	24.5	4.80	0.9973	52.2127
76.0	100.1	99.3	25	25	24	24.5	3.72	1.0070	47.5062
100.0	100.3	99.0	25	25	24	24.5	3.72	1.0089	47.2038
150.0	100.3	99.0	25	25	24	24.5	2.58	1.0050	45.1359
Average								0.9992	48.8809

Approved by : Ladanah W.



## PITOT TUBE CALIBRATION

Calibration Location: SECOT

Calibration Date : 06-01-2023

Calibrated duct No. : 1

Calibration Standard Pitot tube data

Pitot No. : Std-01

Coefficient (Cp) : 1

Type S Pitot No. : PS20-02

Calibrated by : Mr. Montri P.

## A Side Calibration

Run No.	ΔPstd (mm H <sub>2</sub> O)	ΔPs (mm H <sub>2</sub> O)	Cp(s)	Deviation, δ Cp(s) - Cp(A)
1	7.50	10.75	0.8353	0.0032
2	7.50	11.00	0.8257	-0.0064
3	7.50	10.75	0.8353	0.0032

C<sub>P(A),avg</sub> 0.8321

## B Side Calibration

Run No.	ΔPstd (mm H <sub>2</sub> O)	ΔPs (mm H <sub>2</sub> O)	Cp(s)	Deviation, δ Cp(s) - Cp(B)
1	7.50	10.75	0.8353	-0.0033
2	7.50	10.50	0.8452	0.0066
3	7.50	10.75	0.8353	-0.0033

C<sub>P(B),avg</sub> 0.8386

|CP(A)-CP(B)| = 0.0065

C<sub>P(Avg)</sub> = 0.8353

Approved by : Ladanah W.

\*\*\* δ must be ≤ 0.01 for the test to be acceptable \*\*\*  
 \*\*\* |Cp(A)-Cp(B)| must also be < 0.01 if average of Cp(A) and Cp(B) is to be used \*\*\*





# CONTROL UNIT CALIBRATION (Metric units, mm)

Date 16 Jan 23

Initial Final Average  
Barometric press, Pb 759 759 759 mmHg

## Dry Gas Meter Data

Console No. M50-06

Serial No. 358794

Metering System ID

Model S110

DGM Number 333249

Correction factor (Yr) 1.0079

DGM Model MST-C2-1

Last Calibration Date 9 Dec 22

Calibrated by : Montri P.

## Reference Dry Gas Meter Data

Orifice manometer setting, ΔH mm H2O	Ref. DGM Volume V <sub>r</sub> , Liters	DGM Volume V <sub>m</sub> Liters	Temperature (°C)				Time Θ min	DGM Correction factor (Y)	ΔH@ mm
			Ref DGM T <sub>r</sub>	Dry Gas Meter					
				Inlet T <sub>i</sub>	Outlet T <sub>o</sub>	Avg T <sub>m</sub>			
12.5	100.1	100.9	25	25	24	24.5	8.60	0.9968	41.8649
25.0	100.0	100.4	25	25	24	24.5	6.13	0.9998	42.6722
50.0	100.1	100.6	25	25	24	24.5	4.53	0.9963	46.5503
76.0	99.9	100.4	25	25	24	24.5	3.75	0.9949	48.5425
100.0	100.0	99.3	25	25	24	24.5	3.75	1.0031	45.5096
150.0	100.2	98.7	25	25	24	24.5	2.58	1.0070	45.2316
Average								0.9997	45.0618

Approved by : Ladawan W.



# PITOT TUBE CALIBRATION

Calibration Location: SECOT

Calibration Date : 06-01-2023

Calibrated duct No.: 1

Calibration Standard Pitot tube data

Pitot No. : Std-01

Coefficient (Cp) : 1

Type S Pitot No. : PS20-01

Calibrated by : Mr. Montri P.

## A Side Calibration

Run No.	ΔPstd (mm H <sub>2</sub> O)	ΔPs (mm H <sub>2</sub> O)	Cp(s)	Deviation, δ Cp(s) - Cp(A)
1	7.50	10.75	0.8353	-0.0033
2	7.50	10.50	0.8452	0.0066
3	7.50	10.75	0.8353	-0.0033

C<sub>P(A),avg</sub> 0.8386

## B Side Calibration

Run No.	ΔPstd (mm H <sub>2</sub> O)	ΔPs (mm H <sub>2</sub> O)	Cp(s)	Deviation, δ Cp(s) - Cp(B)
1	7.50	10.50	0.8452	0.0033
2	7.50	10.75	0.8353	-0.0066
3	7.50	10.50	0.8452	0.0033

C<sub>P(B),avg</sub> 0.8419

| CP(A) - CP(B) | = 0.0033

C<sub>P(Avg)</sub> = 0.8402

Approved by : Ladawan W.

\*\*\* δ must be ≤ 0.01 for the test to be acceptable \*\*\*  
\*\*\* | Cp(A) - Cp(B) | must also be < 0.01 if average of Cp(A) and Cp(B) is to be used \*\*\*



## High Volume TSP & PM-10 Calibration Data Sheet

Calibration Location : SECOT Co.,Ltd. Calibration Date : Jan 9, 2023  
 Hi-Vol Pump No. : BH-026 Indicator No. : CM-01  
 Amb. Temp (°C) : 26 Press (mmHg) : 760  
 Calibration by : Mr.Punkawin K.

Plate	Indicate (X) ( cm. )	True H <sub>2</sub> O ( in. )	Actual Flow (Y) (cfm)	XY	X <sup>2</sup>	Remark
18	18.50	13.90	61.98	1,146.63	342.25	
13	15.20	10.50	54.21	823.99	231.04	
10	12.20	8.40	48.63	593.29	148.84	
7	7.60	5.30	38.84	295.18	57.76	
5	4.60	3.20	30.50	140.30	21.16	
Sum	58.10	41.30	234.16	2,999.39	801.05	

Calibrated by : Punkawin K. Approved by : Wattaya K.



## High Volume TSP & PM-10 Calibration Data Sheet

Calibration Location : SECOT Co.,Ltd. Calibration Date : Jan 11, 2023  
 Hi-Vol Pump No. : BH-013 Indicator No. : CM-01  
 Amb. Temp (°C) : 27 Press (mmHg) : 760  
 Calibration by : Mr.Nattachai C.

Plate	Indicate (X) ( cm. )	True H <sub>2</sub> O ( in. )	Actual Flow (Y) (cfm)	XY	X <sup>2</sup>	Remark
18	16.80	12.20	58.15	976.92	282.24	
13	14.20	9.40	51.36	729.31	201.64	
	11.20	7.40	45.72	512.06	125.44	
7	7.40	4.70	36.70	271.58	54.76	
5	4.20	2.80	28.62	120.20	17.64	
Sum	53.80	36.50	220.55	2,610.08	681.72	

Calibrated by : Nattachai C. Approved by : Wattaya K.



## High Volume TSP & PM-10 Calibration Data Sheet

Calibration Location : SECOT Co.,Ltd. Calibration Date : Jan 9, 2023  
 Hi-Vol Pump No. : BH-010 Indicator No. : CM-01  
 Amb. Temp (°C) : 26 Press (mmHg) : 760  
 Calibration by : Mr.Punkawin K.

Plate	Indicate (X) ( cm. )	True H <sub>2</sub> O ( in. )	Actual Flow (Y) (cfm)	XY	X <sup>2</sup>	Remark
18	17.80	12.60	59.07	1,051.45	316.84	
13	14.00	10.20	53.45	748.30	196.00	
10	11.00	7.70	46.61	512.71	121.00	
7	7.40	5.20	38.53	285.12	54.76	
5	4.60	3.10	30.04	138.18	21.16	
Sum	54.80	38.80	227.70	2,735.76	709.76	

Calibrated by : Punkawin K. Approved by : Wattaya K.



## High Volume TSP & PM-10 Calibration Data Sheet

Calibration Location : SECOT Co.,Ltd. Calibration Date : Jan 12, 2023  
 Hi-Vol Pump No. : BH-035 Indicator No. : CM-01  
 Amb. Temp (°C) : 27 Press (mmHg) : 760  
 Calibration by : Mr.Nattachai C.

Plate	Indicate (X) ( cm. )	True H <sub>2</sub> O ( in. )	Actual Flow (Y) (cfm)	XY	X <sup>2</sup>	Remark
18	20.40	14.00	62.20	1,268.88	416.16	
13	16.20	10.10	53.20	861.84	262.44	
10	13.20	8.10	47.77	630.56	174.24	
7	8.20	5.30	38.89	318.90	67.24	
5	5.40	3.10	30.44	164.38	29.16	
Sum	63.40	40.60	232.50	3,244.56	949.24	

Calibrated by : Nattachai C. Approved by : Wattaya K.

SHEET No.: 1715\_0123



## SO2 Analyzer Performance Test

Date : 9 Jan 23

Temp: (°C) 25

Barometric Pressure: Pb (mmHg) 760

Analyzer Type :	SO2
Brand :	API
Model :	100A
S/N :	1715

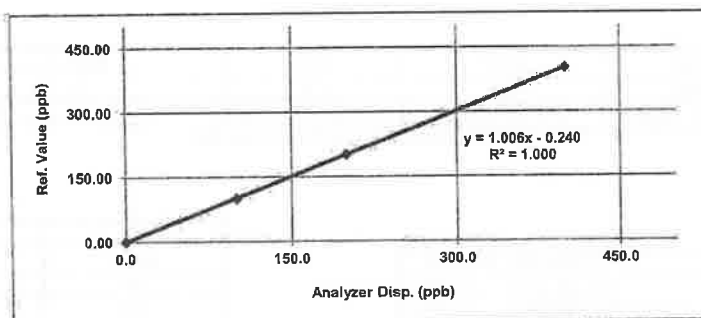
Dilutor :	Teledyne T 700 1367
Zero Air :	M701 S/N 1039
STD GAS :	EB0108319

### Single Point Calibration

Supply Gas	Ref Value	Analyzer Disp.	Zero-Span Error %	Slope - Offset
Zero	0.00	0.20	-	-
Span	450.00	449.90	-	1.006

### MultiPoint Calibration

Ref Value	Analyzer Disp.	Output Difference		
		Diff	Percent Diff	Percent Diff abs.
0.0	0.20	0.20	-	-
100.0	99.50	-0.50	-0.50	0.50
200.0	201.30	1.30	0.65	0.65
400.0	402.10	2.10	0.53	0.53
			Average Diff (%)	0.56

Calibrated by: RunkwinApproved by: W. Haya

SHEET No.: 60771-328/2\_0123



## SO2 Analyzer Performance Test

Date : 9 Jan 23

Temp: (°C) 25

Barometric Pressure: Pb (mmHg) 760

Analyzer Type :	SO2
Brand :	Thermo
Model :	43C
S/N :	60771-328/2

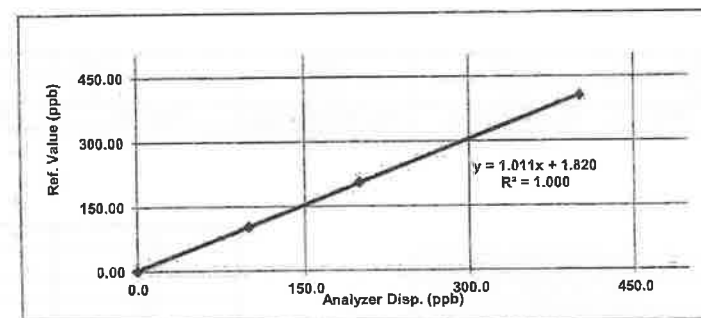
Dilutor :	Teledyne T 700 1367
Zero Air :	M701 S/N 1039
STD GAS :	EB0108319

### Single Point Calibration

Supply Gas	Ref Value	Analyzer Disp.	Zero-Span Error %	Slope - Offset
Zero	0.00	0.70	-	-
Span	450.00	456.70	-	1.011

### MultiPoint Calibration

Ref Value	Analyzer Disp.	Output Difference		
		Diff	Percent Diff	Percent Diff abs.
0.0	0.70	0.70	-	-
100.0	103.30	3.30	3.30	3.30
200.0	205.70	5.70	2.85	2.85
400.0	405.30	5.30	1.33	1.33
			Average Diff (%)	2.49

Calibrated by: RunkwinApproved by: W. Haya



# NOX-NO Analyzer Performance Test

Date: 9 Jan 23

Temp: (°C) 25

Barometric Pressure: Pb (mmHg) 760

Analyzer Type :	Nox
Brand :	API
Model :	200A
S/N :	1528

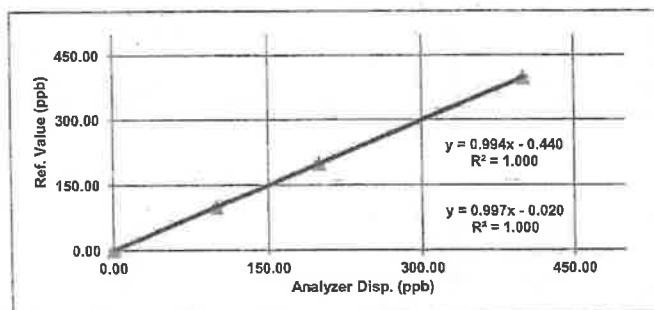
Dilutor :	Teledyne 700E 587
Zero Air :	M701 S/N 1044
STD GAS :	EB0108319

## NOX-NO Single Point Calibration

Supply Gas	Ref Value	NOX Analyzer Disp.	NO Analyzer Disp.	Slope - Offset
Zero	0.0	0.9	0.5	0.994
Span	450.0	444.4	444.30	0.997

## NOX-NO MultiPoint Calibration

Ref Value	NOX Analyzer Disp.	NO Analyzer Disp.	Output Difference	
			NOx Percent Diff abs.	NO Percent Diff abs.
0.00	0.90	0.5	-	-
100.00	98.20	97.7	1.8	2.3
200.00	199.60	198.3	0.2	0.8
400.00	398.80	397.4	0.3	0.7
		Average Diff (%)	0.8	1.3

Calibrated by: RunkunApproved by: Witaya K.

# NOX-NO Analyzer Performance Test

Date: 9 Jan 23

Temp: (°C) 25

Barometric Pressure: Pb (mmHg) 760

Analyzer Type :	Nox
Brand :	API
Model :	200A
S/N :	2387

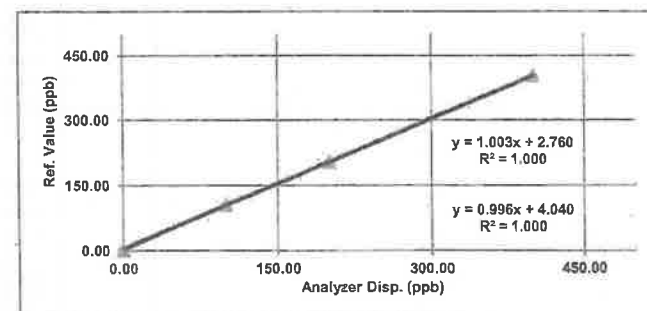
Dilutor :	Teledyne 700E 587
Zero Air :	M701 S/N 1044
STD GAS :	EB0108319

## NOX-NO Single Point Calibration

Supply Gas	Ref Value	NOX Analyzer Disp.	NO Analyzer Disp.	Slope - Offset
Zero	0.0	2.5	1.1	1.003
Span	450.0	453.5	452.20	0.996

## NOX-NO MultiPoint Calibration

Ref Value	NOX Analyzer Disp.	NO Analyzer Disp.	Output Difference	
			NOx Percent Diff abs.	NO Percent Diff abs.
0.00	2.50	1.10	-	-
100.00	105.30	104.90	5.3	4.9
200.00	204.00	203.90	2.0	2.0
400.00	401.90	403.20	0.5	0.8
		Average Diff (%)	2.6	2.6

Calibrated by: RunkunApproved by: Witaya K.



# NOX-NO Analyzer Performance Test

Date : 9 Jan 23

Temp (°C) 25

Barometric Pressure: Pb (mmHg) 760

Analyzer Type :	Nox
Brand :	API
Model :	200A
S/N :	1645

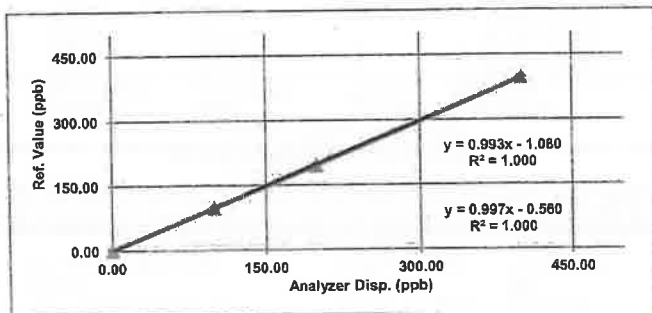
Dilutor :	Teledyne 700E 587
Zero Air :	M701 S/N 1044
STD GAS :	EB0108319

## NOX-NO Single Point Calibration

Supply Gas	Ref Value	NOX Analyzer Disp.	NO Analyzer Disp.	Slope - Offset
Zero	0.0	0.9	0.6	0.993
Span	450.0	450.1	449.20	0.997

## NOX-NO MultiPoint Calibration

Ref Value	NOX Analyzer Disp.	NO Analyzer Disp.	Output Difference	
			NOx Percent Diff abs.	NO Percent Diff abs.
0.00	0.90	0.60	-	-
100.00	98.10	97.60	1.9	2.4
200.00	197.40	195.20	1.3	2.4
400.00	399.10	397.60	0.2	0.6
Average Diff (%)			1.1	1.8

Calibrated by : BanbunApproved by : Wattaya K.

# NOX-NO Analyzer Performance Test

Date : 9 Jan 23

Temp (°C) 25

Barometric Pressure: Pb (mmHg) 760

Analyzer Type :	Nox
Brand :	API
Model :	200A
S/N :	2386

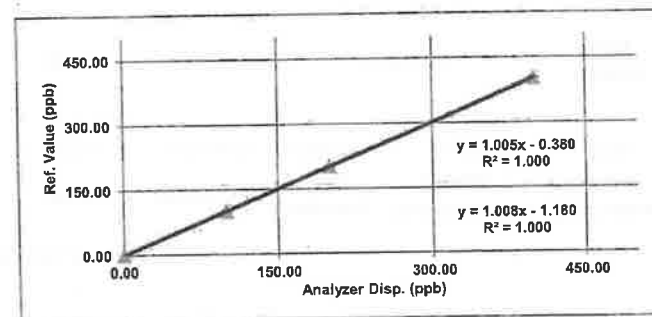
Dilutor :	Teledyne 700E 587
Zero Air :	M701 S/N 1044
STD GAS :	EB0108319

## NOX-NO Single Point Calibration

Supply Gas	Ref Value	NOX Analyzer Disp.	NO Analyzer Disp.	Slope - Offset
Zero	0.0	-0.4	0.0	1.005
Span	450.0	447.6	447.10	1.008

## NOX-NO MultiPoint Calibration

Ref Value	NOX Analyzer Disp.	NO Analyzer Disp.	Output Difference	
			NOx Percent Diff abs.	NO Percent Diff abs.
0.00	-0.40	0.00	-	-
100.00	98.60	99.10	1.4	0.9
200.00	200.40	201.30	0.2	0.7
400.00	402.30	401.40	0.6	0.3
Average Diff (%)			0.7	0.6

Calibrated by : BanbunApproved by : Wattaya K.

## CERTIFICATE OF ANALYSIS

### Grade of Product: EPA Protocol

Part Number: E04NI99E15AC084 Reference Number: 82-401409170-1  
Cylinder Number: EB0102326 Cylinder Volume: 144.4 CF  
Laboratory: 124 - Riverton (SAP) - NJ Cylinder Pressure: 2015 PSIG  
PGVP Number: B52019 Valve Outlet: 660  
Gas Code: CO,NO,NOX,SO2,BALN Certification Date: Feb 05, 2019

Expiration Date: Feb 05, 2027

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 volume/volume basis unless otherwise noted.

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

#### ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
NOX	50.00 PPM	51.01 PPM	G1	+/- 0.9% NIST Traceable	01/28/2019, 02/05/2019
NITRIC OXIDE	50.00 PPM	50.86 PPM	G1	+/- 0.9% NIST Traceable	01/28/2019, 02/05/2019
SULFUR DIOXIDE	50.00 PPM	50.87 PPM	G1	+/- 1.0% NIST Traceable	01/28/2019, 02/05/2019
CARBON MONOXIDE	0.5000 %	0.5050 %	G1	+/- 0.7% NIST Traceable	01/31/2019
NITROGEN	Balance				

#### CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	13080206	CC401947	4950 PPM CARBON MONOXIDE/NITROGEN	+/- 0.4%	Feb 15, 2019
PRM	12367	APEX1098237	9.82 PPM NITROGEN DIOXIDE/AIR	+/- 2.0%	Jun 02, 2017
NTRM	12010724	KAL004497	50.03 PPM NITRIC OXIDE/NITROGEN	+/- 0.8%	Mar 12, 2024
GMIS	1114201601	CC506710	4.971 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%	Nov 14, 2019
NTRM	14010327	KAL004376	49.08 PPM SULFUR DIOXIDE/NITROGEN	+/- 1.0%	Apr 17, 2024

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
Siemens Ultramat 6 J3-599 CO/HIGH	NDIR	Jan 18, 2019
Nicolet 6700 APW1100391 NO	FTIR	Jan 10, 2019
Nicolet 6700 APW1100391 NO2	FTIR	Jan 10, 2019
Nicolet 6700 APW1100391 SO2	FTIR	Jan 10, 2019

Triad Data Available Upon Request

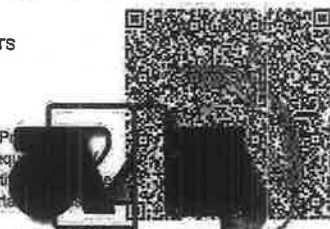
PERMANENT NOTES: PRODUCED IN ACCORDANCE WITH ISO17025 REQUIREMENTS

#### NOTES:

Gross Weight: 27806.3 grams

Net Weight: 4733.2 grams

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 9001:2008 and relate only to items identified on this certificate. All items 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. 3082.05

Approved for Release

Page 1 of 82-401409170-1



## SOUND LEVEL METER CALIBRATION

Calibration Location: SECOT

Calibration Date: Aug 30, 23

### ACOUSTIC CALIBRATOR

Brand	Model	Serial No.	Frequency (Hz)	Ref. Calibrated (dB)	Eff. Calibrated (dB)
RION	NC-74	34283648	1000.00	94.0	94.0
No.	Brand	Model	Serial No.	Reading (dB)	dB Adjust
66	RION	NL-21	00487723	94.1	-0.1
77	RION	NL-21	00487734	93.8	0.2

Calibrated by :

Approved by :

Presda S.



ELECTRICAL AND ELECTRONICS INSTITUTE  
FOUNDATION FOR INDUSTRIAL DEVELOPMENT

975 Moo 4, Bangpoo Industrial Estate, Soi 8, Sukhumvit Road km 37,

Phraek Sa, Mueang Samut Prakan, Samut Prakan 10280

Tel: +66 2709 4860 Fax: +66 2324 0917



Certificate No.: CP20230033EA  
Operation No.: CP2023010024

## Certificate of Calibration

Equipment: Sound Calibrator  
Manufacturer: RION  
Model/Type: NC-74  
Serial No.: 34283648  
ID No.:  
Customer: SECOT Co.,Ltd.  
Address: 239 Rimklongprapa Rd., Bangsue,  
Bangkok 10800 Thailand  
Received Date: 10 January 2023  
Calibrated Date: 13 January 2023  
Issued Date: 16 January 2023  
Calibrated by: Ms. Juntaporn Kunhakom

Approved by:

( Mr. Sittichai Swaksuriyawong )  
Group Manager

This report was prepared electronically using applicable electronic signature. Printing or copy of file are considered as a copy of the document.

The reported uncertainty of measurement was based on standard uncertainty multiplied by a coverage factor ( $k$ ) providing a level of confidence of approximately 95%. This certificate may not be reproduced other than in full except with the prior written approval of the Electrical and Electronics Institute, Foundation for Industrial Development.



ELECTRICAL AND ELECTRONICS INSTITUTE  
FOUNDATION FOR INDUSTRIAL DEVELOPMENT

Certificate No.: CP20230033EA

## Calibration Report

Equipment: Sound Calibrator  
Manufacturer: RION  
Model/Type: NC-74  
Serial No.: 34283648  
ID No.:  
Ambient Temperature:  $(23 \pm 2) ^\circ\text{C}$   
Relative Humidity:  $(50 \pm 15) \%$   
Pressure:  $(101.3 \pm 1.5) \text{ kPa}$

Method of Calibration :-  
IEC 60942:2017

### Condition of this result of calibration

#### 1. Reference standards instrument :-

Instrument	Model	Serial No.	Cert. No.	Due Date
1) Standard microphone	4180	2661000	AA-1020-22	14 June 2023
2) Waveform Generator	33511B	MY52302264	CK20220058EA	19 June 2023
3) Audio Analyzing DMM	2015-P	4079144	E1U221042	16 March 2023
4) Pressure humidity and Temperature Transmitter	PTU301	F0640002	CL1-P220024 CD20220165EA	17 March 2023 24 July 2023

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

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

Reference standards instrument for Acoustic function

- National Institute of Metrology (Thailand)

Reference standards instrument for Electrical function

- Electrical and Electronics Institute; NSC Accredited Calibration No.0119

### Result of Calibration:-

#### 1. Function : Sound pressure level

Norminal Frequency (Hz)	Specified Sound Pressure level (dB)	Measured value (dB)	Deviated value <sup>[1]</sup> (dB)	Acceptance limit <sup>[3]</sup> (dB)
1000	94	94.24	0.24	$\pm 0.25$

#### 2. Function : Frequency

Norminal Sound Pressure level (dB)	Specified Frequency (Hz)	Measured value (Hz)	Deviated value <sup>[2]</sup> (%)	Acceptance limit <sup>[3]</sup> (%)
94	1000	1003.0	0.3	$\pm 0.7$





ELECTRICAL AND ELECTRONICS INSTITUTE  
FOUNDATION FOR INDUSTRIAL DEVELOPMENT

Certificate No.: CP20230033EA

Calibration Report

3. Function : Total distortion + noise

Normal Sound Pressure Level (dB)	Normal Frequency (Hz)	Measured value <sup>[4]</sup> (%)	Acceptance limit <sup>[5]</sup> (%)
94	1000	1.3	2.5

Uncertainty of measurement

Function	Uncertainty	Maximum-permitted uncertainty of measurement
Sound pressure level	0.10 dB	0.15 dB
Frequency	0.10 %	0.20 %
Total distortion + noise	0.40 %	0.50 %

- Note: [1] The deviated value is the absolute value of the difference between the measured value and the corresponding specified sound pressure level.  
 [2] The deviated value is the absolute value of the difference in percent between the measured value and the corresponding specified frequency.  
 [3] The acceptance limit is for the deviated value.  
 [4] The measured value is the total distortion + noise, measured over the frequency range from 20 Hz to 20 kHz.  
 [5] The acceptance limit is for the Measured value.
- Remarks: 1. Using the 1/2-inch microphone adaptor NC-74-002.  
 2. Acceptance limit was IEC 60942:2017 Class 1.  
 3. The coverage factor  $k = 2.00$

-- End of Report --



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)  
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES  
53/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250  
TEL. 0-2717-3000-27 FAX. 0-2719-9484



Cert.No.: 23CH4  
Page.: 1 of 3

## Certificate of Calibration

Equipment : pH Meter  
 Manufacturer : Hanna  
 Model : HI98190  
 Serial No. : 06470022101  
 ID No. : pH No.19  
 Condition As-Received: Used Item  
 Received Date : 03 January 2023  
 Calibration Date : 04 January 2023  
 Reference : 2301-0006DN-1  
 Submitted by : Secot Co.,Ltd.  
 239 Rimkongprapa Road,  
 Bangsue, Bangkok 10800

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 standard thermometer

Calibrated by : Warakorn Lernagatrakul

Approved by :   
 Approved Signatory

- ( / ) Malee Butkruea  
 ( ) Sathip Meangmai  
 ( ) Warakorn Lernagatrakul

Issue Date : 10 January 2023

The Uncertainties are for a confidence probability of approximately 95%

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



Cert.No.: 23CH4

Page.: 2 of 3

**Condition of this calibration result**

## 1. Reference Standard Instrument :-

Instrument	Serial No.	ID No.	Cert. No.	Due Date
1) Ref. Standard Thermometer	4982054	110RC044	2211306	27 Oct 2023

This certification is traceable to the International System of Unit maintained at:-

- Traceable to National Institute of Metrology (Thailand), NIMT

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	826588	09 July 2024
pH 6.987	CPA chem	823322	20 June 2023
pH 10.008	CPA chem	826590	09 July 2023

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

**Calibration Results****Function : pH Measurement**

Performing three buffers standard curve by using buffer nominal pH (4,7,10)

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading ( mV )	Uncertainty of pH measurement (±)	Coverage factor k
pH Electrode	4.008	4.010	157.9	0.0044	2.00
S/N.: 0920044N	6.987	6.990	-1.6	0.0086	2.00
	10.008	10.007	-163.7	0.0065	2.00

**Remark** - Can not connect the BNC because the plug does not match with the socket.

Malu

a 1142465



Cert.No.: 23CH4

Page.: 3 of 3

**Calibration Results****Function : Temperature Measurement**

(\*) Without adjustment

This equipment was connected with Temperature Probe;

- Model :	HI12963
- Serial No. :	0920044N
Dimension of probe;	
- Length :	105 mm.
- Diameter :	14 mm.
- Immersion Depth :	100 mm.

Calibration Point ( °C )	Standard Temperature ( °C )	UUC* Reading ( °C )	Error ( °C )	Uncertainty of measurement ( ± °C )	Coverage factor k
20.0	20.002	20.0	-0.002	0.13	2.00
25.0	25.003	25.0	-0.003	0.13	2.00
30.0	30.005	30.0	-0.005	0.13	2.00
35.0	35.002	35.0	-0.002	0.13	2.00

**Remark** : - UUC\* = Unit Under CalibrationThe reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor  $k$ , providing a level of confidence of approximately 95 %.

-o0o-

Malu

a 1142464


## Calibration Certificate

**Certificate No.:** 2304081-002-01  
**Client name:** SECOT CO., LTD.  
**Address:** 239 Rimklongprapa Road,  
Bangsue, Bangsue, Bangkok 10800

Page 1 of 3

**Equipment:** Water Bath  
**Manufacturer:** MEMMERT  
**Model:** WB 29  
**Serial No.:** I698.0051  
**ID No.:** N/A  
**Order No.:** 2304081  
**Operation No.:** 2304081-002  
**Date of Receipt:** 27 July 2023  
**Date of Calibration:** 27 July 2023

**Calibrated by** Mr.Worapob Sooktong  
Scientist

**Approved by**   
(Mr.Pheraphat Tuanjit)  
Manager, Division of Calibration Laboratory  
Responsible for the Technical Management Team

**Date of Issue:** 7 August 2023

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 standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the National Food Institute.

F-CS-009 Revision: 01 Date: 20-04-65



## Calibration Report

**Certificate No.:** 2304081-002-01  
**Equipment:** Water Bath  
Model: WB 29 Serial No.: I698.0051  
Resolution: 0.1 °C ID No.: N/A  
Manufacturer: MEMMERT

**Date of Calibration:** 27 July 2023

Page 2 of 3

**Location:** Laboratory, SECOT CO., LTD.  
**Environment Condition:** Ambient Temperature ( 24 ± 1 ) °C  
Relative Humidity ( 58 ± 2 ) %  
Line Voltage ( 229 ± 1 ) Volt

### Condition of this results of Calibration:

- This instrument was calibrated by insert 5 standard thermometer into its liquid bath and calibration according to W-TE-011 based on ASTM E715-80 (2016): Standard Specification for Gravity-Convection and Forced-Circulation Water Baths.  
- The temperature scale used is ITS - 90.  
- All data show below were final values and the initial data may be obtained upon request.

### 2. Reference Standard Instrument :

Instrument	Model	Serial No./ID No.	Certificate No.	Due Date	Through
Digital Thermometer with sensor	34972A	MY49016894	TE 660380-01	22 April 2024	NATIONAL FOOD INSTITUTE
	RTD	RTD#201-205 / CH#201-205			

- This certificate is traceable to International System of Units (SI Units).
- This certificate was certified only for the instrument we calibrated.
- This result of calibration was found accurate as shown on date and place of calibration only.
- Condition of Calibrated item : Good

### UUC Description:

Time of Record 1 Hour 9 Minute At 95.0 °C

7. Result of Calibration : ☒ Without adjustment  
☐ After adjustment



F-CS-012 Revision: 01 Date: 20-04-65



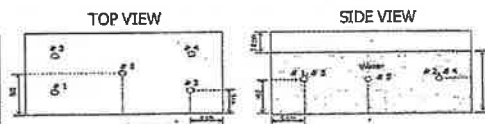
## Calibration Report

**Certificate No.:** 2304081-002-01  
**Equipment:** Water Bath  
 Model: WB 29 Serial No.: I698.0051  
 Resolution: 0.1 °C ID No.: N/A  
 Manufacturer: MEMMERT  
**Date of Calibration:** 27 July 2023

Page 3 of 3

**Calibration point:** 95.0 °C  
**Calibration result:**

Calibration Condition	Temperature (°C)	Relative Humidity (%)	Line Voltage (Volt)
Min	23.0	56.3	227.5
Max	25.0	60.2	229.6



Sensor Installation Location

Table 1 : Reporting of Temperature

Calibration Point (°C)	Measured Temperature (°C) @ Sensor No. (Sensor No.5 is REF)					Uncertainty ± (°C)
	# 1	# 2	# 3	# 4	# 5	
95.0	95.03	94.96	95.10	94.97	95.02	0.28

Table 2 : Reporting of Characterization Result

UUC* Setting (°C)	UUC* reading (°C)			Stability ± (°C)	Uniformity (°C)	Overall Variation (°C)
	MIN	MAX	Average			
95.0	94.9	95.1	95.0	0.18	0.080	0.47

**Note** The quoted uncertainty include " Stability " and " Loading effect (20% of Temp Uniformity)".  
 UUC\* = Unit Under Calibration  
 Stability = One-half of the greatest maximum difference of measured temperatures at any one sensors, for at least half an hour after reaching steady state.  
 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.  
 Overall Variation = The difference of the maximum and minimum measured temperatures throughout observation time.  
 The report uncertainty of measurement was based on standard uncertainty multiplied by coverage factor k= 2, providing a level of confidence of approximately 95 %.

End



Request Service No. 098/66

Page 1 of 3

## Calibration Certificate

**Nomenclature :** Brand : Mettler Toledo Type : Top-Loading Electronic Balance  
 Model : AG245 Serial No. : 1117293916 (198129-0)

Submitted by : Laboratory of SECOT CO., LTD.

Location of Calibration : BAL Room , 6<sup>th</sup> Floor, Secot Co., Ltd.

Calibration range : 0 – 200 g Scale division : 0.00001 g (41g)/ 0.0001 g (210g)

Calibration date : May 25, 2023

Reference Standard No. M220177, M2302167S, M2303005N

Traceable to : Metrological Center SCI ECO Services Company Limited.

Thai Calibration Services CO., LTD.

Ambient Condition : Temperature 25.70 - 25.90 °C  
 Humidity 50.70 - 51.20 % RH

Calibrated By : Sasipa Jaidee Approved By : Nanna Poowasanpetch

(Miss Sasipa Jaidee)

(Miss Narisa Poowasanpetch)

Testing Officer

Chief of Technical Management

Date : 25/05/2023

Date : 25/05/2023

Issued Date : May 26, 2023

## Measurement Report

Request Service No. 098/66

Page 2 of 3

Description : Brand : Mettler Toledo

Type : Top-Loading Electronic Balance

Model : AG245

Serial No. : 1117293916 (198129-0)

Calibration range : 0 – 200 g

Scale division : 0.00001 g (41g)/ 0.0001 g (210g)

Calibration date : May 25, 2023

Ambient Condition : Temperature 25.70-25.90 °C Relative humidity 50.70-51.20 % RH

Measurement data :

### 1. Repeatability of Reading :

Load (g)	Standard Deviation of Reading (g)	Maximum Difference between Successive Reading (g)
50	0.000052	0.0001
100	0.000071	0.0002
150	0.000067	0.0002
200	0.000071	0.0002

### 2. Off-Center Loading :

A Mass of 50.0000 g was placed and moved to various position on the pan.

Unit : g

Center	Front	Left	Back	Right	Center	Maximum Difference
50.00040	50.00062	50.00078	50.00000	50.00010	50.00040	0.00038

Issued Date : May 26, 2023

Request Service No. 098/66

Page 3 of 3

### 3. Departure from Nominal Value :

Reading (g)	Correction (g)	Uncertainty (+/- g)
0	0.000000	± 0.000008
0.5	-0.000017	± 0.000014
1	-0.000026	± 0.000018
10	-0.000099	± 0.000033
20	-0.000168	± 0.000046
40	-0.000339	± 0.000072
60	-0.00058	± 0.00011
80	-0.00059	± 0.00014
100	-0.00070	± 0.00016
120	-0.00069	± 0.00018
140	-0.00096	± 0.00020
160	-0.00082	± 0.00023
180	-0.00089	± 0.00024
200	-0.00118	± 0.00027

Calibrated by : ..... Sasipa Jaidee .....

(Miss Sasipa Jaidee)

Testing Officer

Date : ..... 25/05/2023 .....

Approved By : ..... Narisa Poowasanpetch .....

(Miss Narisa Poowasanpetch)

Chief of Technical Management

Date : ..... 25/05/2023 .....

Issued Date : May 26, 2023


## Calibration Certificate

**Certificate No.:** 2304081-001-01  
**Client name:** SECOT CO., LTD.  
**Address:** 239 Rimkongprapa Road,  
 Bangsue, Bangsue, Bangkok 10800

Page 1 of 3

**Equipment:** CHAMBER (Incubator)  
**Manufacturer:** MEMMERT  
**Model:** ICP 400  
**Serial No.:** K406.0004  
**ID No.:** N/A  
**Order No.:** 2304081  
**Operation No.:** 2304081-001  
**Date of Receipt:** 27 July 2023  
**Date of Calibration:** 27 July 2023

**Calibrated by** Mr. Worapob Sooktoong  
 Scientist

**Approved by**   
 (Mr. Pheraphat Tuanjit)  
 Manager, Division of Calibration Laboratory  
 Responsible for the Technical Management Team

**Date of Issue:** 7 August 2023

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 standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the National Food Institute.

F-CS-009 Revision: 01 Date: 20-04-65



## Calibration Report

**Certificate No.:** 2304081-001-01  
**Equipment:** CHAMBER (Incubator)  
 Model: ICP 400 Serial No.: K406.0004  
 Resolution: 0.1 °C ID No.: N/A  
 Manufacturer: MEMMERT

**Date of Calibration:** 27 July 2023

Page 2 of 3

**Location:** Laboratory, SECOT CO., LTD.  
**Environment Condition:** Ambient Temperature ( 30 ± 1 ) °C  
 Relative Humidity ( 54 ± 1 ) %  
 Line Voltage ( 228 ± 0 ) Volt

### Condition of this results of Calibration:

- This instrument was calibrated by Insert 9 standard thermometer into its chamber and calibration according to W-TE-014 Based on TLAS G-20-1/02-08 (E): Guidelines for Calibration and Checks of Temperature Controlled Enclosures.
  - The temperature scale used was based on ITS - 90.
  - All data show below were final values and the initial data may be obtained upon request.
- Reference Standard Instrument :

Instrument	Model	Serial No./ID No.	Certificate No.	Due Date	Through
Digital Thermometer with sensor	34972A	MY49016894	TE 660380-01	22 April 2024	NATIONAL FOOD INSTITUTE
	RTD	CH#301-309/ RTD#301-309			

- This certificate is traceable to International System of Units (SI Units).
- This certificate was certified only for the instrument we calibrated.
- This result of calibration was found accurate as shown on date and place of calibration only.
- Condition of Calibrated item : Good

### UUC Description :

Time of Record 1 Hour 9 Minute At 20.0 °C  
 Fresh air Damper ☒ Open Position ☒  
☒ Close  
☒ Not Available

- Result of Calibration : ☒ Without adjustment ☐ After adjustment

F-CS-012 Revision: 01 Date: 20-04-65



## Calibration Report

**Certificate No.:** 2304081-001-01  
**Equipment:** CHAMBER (Incubator)  
Model: ICP 400 Serial No.: K406.0004  
Resolution: 0.1 °C ID No.: N/A  
Manufacturer: MEMMERT

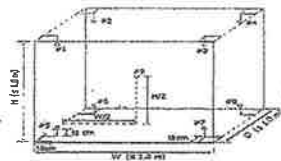
**Date of Calibration:** 27 July 2023

Page 3 of 3

**Calibration point:** 20.0 °C

**Calibration result:**

Calibration Condition	Temperature (°C)	Relative Humidity (%)	Line Voltage (Volt)
MIN	28.6	53.0	227.3
MAX	31.4	54.1	228.1



**Table 1 : Reporting of Temperature**

Calibration point (°C)	Measured Temperature (°C) @ Sensor No. (Sensor No.9 is REF)									Uncertainty ± (°C)
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	
20.0	20.42	20.39	20.40	20.43	20.47	20.49	20.42	20.41	20.43	0.27

**Table 2 : Reporting of Characterization Result**

UUC* Setting (°C)	UUC* reading (°C)			Stability ± (°C)	Uniformity (°C)	Overall Variation (°C)
	MIN	MAX	Average			
20.0	20.0	20.1	20.0	0.065	0.053	0.220

**Note** The quoted uncertainty include " Stability " and " Loading effect (20% of Temp Uniformity) "

UUC\* = Unit Under Calibration

Stability = One-half of the greatest maximum difference of measured temperatures at any one sensors, for at least half an hour after reaching steady state.

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.

Overall Variation = The difference of the maximum and minimum measured temperatures throughout observation time.

The report uncertainty of measurement was based on standard uncertainty multiplied by coverage factor  $k=2$ , providing a level of confidence of approximately 95 %.

----- End -----



## Calibration Certificate

**Certificate No.:** 2303092-002-01  
**Client name:** SECOT CO., LTD.  
**Address:** 239 Rimklongprapa Road, Bangsue, Bangsue, Bangkok 10800

Page 1 of 3

**Equipment:** CHAMBER (Hot Air Oven)

**Manufacturer:** MEMMERT

**Model:** UM 400

**Serial No.:** B419.1400

**ID No.:** N/A

**Order No.:** 2303092

**Operation No.:** 2303092-002

**Date of Receipt:** 26 May 2023

**Date of Calibration:** 26 May 2023

**Calibrated by** Mr.Jerawut Prapawuttipong  
Scientist

**Approved by** ( Mr.Pheraphat Tuanjit )  
Manager, Division of Calibration Laboratory

**Date of Issue:** 30 May 2023

Responsible for the Technical Management Team

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 standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the National Food Institute.



## Calibration Report

**Certificate No.:** 2303092-002-01  
**Equipment:** CHAMBER (Hot Air Oven)  
Model: UM 400 Serial No.: B419.1400  
Resolution: 1 °C ID No.: N/A  
Manufacturer: MEMMERT  
**Date of Calibration:** 26 May 2023

Page 2 of 3

**Location:** Walkway Laboratory, SECOT CO., LTD.  
**Environment Condition:** Ambient Temperature ( 30.5 ± 1 ) °C  
Relative Humidity ( 60 ± 5 ) %  
Line Voltage ( 220 ± 5 ) Volt

### Condition of this results of Calibration:

- This instrument was calibrated by insert 9 standard thermometer into its chamber and calibration according to W-TE-014 Based on TLAS G-20-1/02-08 (E): Guidelines for Calibration and Checks of Temperature Controlled Enclosures.  
- The temperature scale used was based on ITS - 90.  
- All data show below were final values and the initial data may be obtained upon request.

### 2. Reference Standard Instrument :

Instrument	Model	Serial No./ID No.	Certificate No.	Due Date	Through
Digital Thermometer with sensor	34972A	MY49016851	TE 560495-01	7 May 2024	NATIONAL FOOD INSTITUTE
	RTD	CH#101-109/ RTD#101-109			

- This certificate is traceable to International System of Units (SI Units).
- This certificate was certified only for the instrument we calibrated.
- This result of calibration was found accurate as shown on date and place of calibration only.
- Condition of Calibrated item : Good

### UUC Description :

Time of Record 1 Hour 9 Minute At 150 °C  
Fresh air Damper - Open Position +  
X Close Fan -  
- Not Available

7. Result of Calibration : ☒ Without adjustment ☐ After adjustment



## Calibration Report

**Certificate No.:** 2303092-002-01  
**Equipment:** CHAMBER (Hot Air Oven)  
Model: UM 400 Serial No.: B419.1400  
Resolution: 1 °C ID No.: N/A  
Manufacturer: MEMMERT  
**Date of Calibration:** 26 May 2023

Page 3 of 3

**Calibration point:** 150 °C

### Calibration result:

Calibration Condition	Temperature (°C)	Relative Humidity (%)	Line Voltage (Volt)
MIN	30.0	55	215.0
MAX	31.0	65	225.0



Table1 : Reporting of Temperature

Calibration point (°C)	Measured Temperature (°C) @ Sensor No. (Sensor No.9 is REF)									Uncertainty ± (°C)
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	
150	150.84	151.35	150.78	151.22	149.63	151.51	150.53	151.02	150.13	0.89

Table 2 : Reporting of Characterization Result

UUC* Setting (°C)	UUC* Reading (°C)			Stability ± (°C)	Uniformity (°C)	Overall Variation (°C)
	MIN	MAX	Average			
As Mark 150	174	174	174	0.42	1.4	2.5

**Note** The quoted uncertainty include " Stability " and " Loading effect (20% of Temp Uniformity) "

UUC\* = Unit Under Calibration

Stability = One-half of the greatest maximum difference of measured temperatures at any one sensors, for at least half an hour after reaching steady state.

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.

Overall Variation = The difference of the maximum and minimum measured temperatures throughout observation time.

The report uncertainty of measurement was based on standard uncertainty multiplied by coverage factor k= 2, providing a level of confidence of approximately 95 %.

----- End -----







Request Service No.100/66

Page 1 of 3

### Calibration Certificate

Nomenclature : Brand : Sartorius Type : Top-Loading Electronic Balance

Model : BSA224S-CW Serial No. : 32191636

Submitted by : Laboratory of SECOT CO., LTD.

Location of Calibration : BAL Room , 6<sup>th</sup> Floor, Secot Co., Ltd.

Calibration range : 0 – 200 g Scale division : 0.0001 g (220 g)

Calibration date : May 23, 2023

Reference Standard No. M220177, M2302167S, M2303005N

Traceable to : Metrological Center SCI ECO Services Co., Ltd., Thai Calibration services Co., Ltd

Ambient Condition : Temperature 24.60-24.80 °C

Humidity 50.6-51.4 % RH

Calibrated By : *Khemchuda Insorn*

(Miss Khemchuda Insorn)

Approved By : *Narisa Poowasanpetch*

(Miss Narisa Poowasanpetch)

Testing Officer

Chief of Technical Management

Date : *24/05/2023*

Date : *24/05/2023*

Issued Date : May 24, 2023

### Measurement Report

Request Service No.100/66

Page 2 of 3

Description : Brand : Sartorius

Type : Top-Loading Electronic Balance

Model : BSA224S-CW

Serial No. : 32191636

Calibration range : 0 – 200 g

Scale division : 0.0001 g (220 g)

Calibration date : May 23, 2023

Ambient Condition : Temperature 24.60-24.80 °C Relative humidity 50.6-51.4 % RH

Measurement data :

#### 1. Repeatability of Reading :

Load (g)	Standard Deviation of Reading (g)	Maximum Difference between Successive Reading (g)
50	0.00007	0.0002
100	0.00005	0.0001
150	0.00006	0.0002
200	0.00006	0.0002

#### 2. Off-Center Loading :

A Mass of 50.0000 g was placed and moved to various position on the pan.

Unit : g

Center	Front	Left	Back	Right	Center	Maximum Difference
49.99976	49.99988	49.99984	49.99984	49.99990	49.99976	0.00012

Issued Date : May 24, 2023

Request Service No. 100/66

Page 3 of 3

## 3. Departure from Nominal Value :

Reading (g)	Correction (g)	Uncertainty (+/- g)
0	0.00000	$\pm 0.00008$
1	+ 0.00004	$\pm 0.00008$
5	- 0.00005	$\pm 0.00008$
10	+ 0.00020	$\pm 0.00008$
20	+ 0.00027	$\pm 0.00008$
40	+ 0.00022	$\pm 0.00010$
60	+ 0.00018	$\pm 0.00012$
80	+ 0.00019	$\pm 0.00014$
100	+ 0.00028	$\pm 0.00016$
120	+ 0.00027	$\pm 0.00018$
140	+ 0.00036	$\pm 0.00020$
160	+ 0.00040	$\pm 0.00022$
180	+ 0.00058	$\pm 0.00024$
200	+ 0.00052	$\pm 0.00027$

Calibrated by :

(Miss Khemchuda Insorn)

Approved By :

(Miss Narisa Poowasanpetch)

Testing Officer

Chief of Technical Management

Date :

Date :

Issued Date : May 24, 2023



# MAINTENANCE REPORT ATOMIC ABSORPTION SPECTROPHOTOMETER MODEL 3110 + HGA600 + FIAS100 + AMALGAM

Customer : บริษัท ชีคอต จำกัด

Date Tested: June 15, 2566

Address : 239 ถนนริมคลองประปา

Recommendation Recertification

แขวงบางซื่อ เขตบางซื่อ

Period 6 Months

กรุงเทพฯ 10800

Recertification Due: December 15, 2566

User Name: คุณ อารยา

Date Last Certified: December 16, 2565

Phone: 02-9593600 ext. 507

Visit Number: 1 OF 2

E-mail: labmail@secot.co.th

TH Onesource Phone: 081-7316733

E-mail: thonesource@gmail.com

## CONFIGURATION TESTED

MODEL

SERIAL NUMBER

SOFTWARE

AA-3110

311N6062102

AAWINLAB 3.2

HGA 600

2698

AS 60

2124

FIAS 100

1114

AMALGAM

160S2110102

TEST STANDARD USED

PART NUMBER

Copper

N9300183

GFAAS Mixed STD

N9300244

PE standard of Mercury

N9300174

Page 1 of 5



**MAINTENANCE REPORT**  
**ATOMIC ABSORPTION SPECTROPHOTOMETER MODEL**  
**3110 + HGA600 + FIAS100 + AMALGAM**

SERIAL NUMBER <u>311N6062102</u>	DATE TESTED <u>June 15, 2566</u>	
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**1. OPTIC CHECKS**

A. Optical alignment condition (if necessary) ☐ OK

B. Condition of Mirrors, Lenses etc. ☐ OK

C. D2 and HCL beam adjust (if necessary) ☐ OK

**2. ELECTRONICS CHECKS**

A. Power Supplies

+ 5.00 Vdc $\pm$ 0.2 Vdc	+ 5.0	Vdc
+ 11.50 Vdc $\pm$ 0.2 Vdc	+ 11.4	Vdc
+ 15.00 Vdc $\pm$ 1.0 Vdc	+ 15.2	Vdc
- 15.00 Vdc $\pm$ 1.0 Vdc	- 14.9	Vdc

B. D2 Power supplies

+150 Vdc	NA	Vdc
+ 450 Vdc	NA	Vdc

C. PMT Power supply

- 250 Vdc	-249.2	Vdc
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**3. GAS SYSTEM CHECKS**

A. Leak test all internal and external gas box joints ☐ OK

B. All gas box safety features ☐ OK

C. Burner system including nebulizer and all o-ring and gasket ☐ OK

D. Drain system ☐ OK

**4. FIAS CHECK**

A. Output power supplies

+5 VDC $\pm$ 0.25 VDC.	5.01	VDC.		+40 VDC. $\pm$ 0.5 VDC.	40.01	VDC.
------------------------	------	------	--	-------------------------	-------	------

B. Valve and pump clean ☐ OK



**MAINTENANCE REPORT**  
**ATOMIC ABSORPTION SPECTROPHOTOMETER MODEL**  
**3110 + HGA600 + FIAS100 + AMALGAM**

SERIAL NUMBER <u>311N6062102</u>	DATE TESTED <u>June 15, 2566</u>	
----------------------------------	----------------------------------	--

**5. PERFORMANCE TEST FOR FLAME**

A. Performance Tests with **PE** standard.

A1. Run Std. Of Cu and Cr at 324.8 ; 357.9 nm, Concentration 4, 4 ppm respectively

Results = 0.228, 0.244 Abs, with flow spoiler. respectively

Characteristic Concentration 0.077 ; 0.072 mg/L respectively

A2. Run Std. of Pb at 283.3 nm; Concentration 20 ppm

Results = 0.205 Abs, with flow spoiler.

Characteristic Concentration 0.429 mg/L

B. Performance Tests (For C2H2 + N2O Flame)

Run Std. Of Al at 309.3 nm; Concentration 50 ppm

Results = 0.217 Abs, with flow spoiler.

Characteristic Concentration 1.014 mg/L

**6. PERFORMANCE TEST FOR FIAS**

	ACTUAL VALUE
A. Characteristic mass for Mercury ( 500 ul of 10 ug/l Hg for 0.07 Abs. )	<u>0.074</u> Abs.
Characteristic Mass 314 pg / 0.0044 Abs.	<u>297.3</u> pg/0.0044 Abs.
RSD $\leq$ 2%	<u>1.24</u> %
B. Characteristic mass for Arsenic ( 500 ul of 10 ug/l As for 0.45 Abs. )	<u>0.482</u> Abs.
Characteristic Mass 48 pg / 0.0044 Abs.	<u>45.6</u> pg/0.0044 Abs.
RSD $\leq$ 2%	<u>1.54</u> %
C. Characteristic mass for Mercury Amalgamation ( 1000 ul of 1.0 ug/l Hg for 0.03 Abs. )	<u>0.032</u> Abs.
Characteristic Mass 147 pg / 0.0044 Abs.	<u>137.5</u> pg/0.0044 Abs.
RSD $\leq$ 2%	<u>1.76</u> %



**MAINTENANCE REPORT**  
**ATOMIC ABSORPTION SPECTROPHOTOMETER MODEL**  
**3110 + HGA600 + FIAS100 + AMALGAM**

SERIAL NUMBER 311N6062102DATE TESTED June 15, 2566**7. PERFORMANCE CHECK FOR FURNACE**

- A. Internal & External gas flow
- B. Contract Cylinder ( replace if necessary )
- C. Quartz Windows
- D. Gas Tubing and Joins
- E. Cooling System

☐ OK☐ OK☐ OK☐ OK☐ OK**8. AUTOSAMPLER CHECK**

- A. Arm and gears
- B. Sample and Rinse Pump
- C. Tray and Sensors

☐ OK☐ OK☐ OK**9. PERFORMANCE TEST FOR FURNACE****ACTUAL VALUE****Test run using Chromium**

- |  |              |                 |
|--|--------------|-----------------|
| 1. Standard Deviation after 5 replicates of blank $\leq 0.005$ | <u>0.004</u> |                 |
| 2. Characteristic mass ( 5 ug / L for Cr, 3 pg/0.0044 A-s )    | <u>3.0</u>   | pg / 0.0044 A-s |
| Peak Area  | <u>0.148</u> | A-s             |
| Relative Standard Deviation $\leq 2.0$ %                       | <u>0.24</u>  | %               |

**Test run using Lead**

- |  |              |                 |
|--|--------------|-----------------|
| Characteristic mass ( 20 ug / L for Pb, 10 pg/0.0044 A-s ) | <u>9.3</u>   | pg / 0.0044 A-s |
| Peak Area  | <u>0.188</u> | A-s             |
| Relative Standard Deviation $\leq 2.0$ %                   | <u>0.64</u>  | %               |



**MAINTENANCE REPORT**  
**ATOMIC ABSORPTION SPECTROPHOTOMETER MODEL**  
**3110 + HGA600 + FIAS100 + AMALGAM**

SERIAL NUMBER 311N6062102DATE TESTED June 15, 2566

Remarks :

NA Mean no applicant

This is to certify that the above tests have been performed and the configuration tested



meets



does not meet

the PerkinElmer Specifications listed on this certificate.

This certificate does not modify PerkinElmer's standard terms and condition of sale,  
 including warranty terms.

**TH ONE SOURCE CO., LTD.***Krungchai T.*( **Krungchai Treevichien** )**Customer Support Engineer**



## SOUND LEVEL METER CALIBRATION

Calibration Location: SECOT

Calibration Date: Aug 25, 23

## ACOUSTIC CALIBRATOR

Brand	Model	Serial No.	Frequency (Hz)	Ref.Calibrated (dB)	Eff.Calibrated (dB)
Cirrus	CR:515	94296	1000.00	94.0	93.8

No.	Brand	Model	Serial No.	Reading (dB)	dB Adjust
4	SCARLET	ST-21D	820725	93.8	0.0
6	SCARLET	ST-21D	820727	93.8	0.0

Calibrated by :

Approved by :



## SOUND LEVEL METER CALIBRATION

Calibration Location: SECOT

Calibration Date: Nov 3, 23

## ACOUSTIC CALIBRATOR

Brand	Model	Serial No.	Frequency (Hz)	Ref.Calibrated (dB)	Eff.Calibrated (dB)
Cirrus	CR:515	94296	1000.00	94.0	93.8

No.	Brand	Model	Serial No.	Reading (dB)	dB Adjust
5	SCARLET	ST-21D	820726	93.8	0.0
8	SCARLET	ST-21D	820729	93.8	0.0

Calibrated by :

Approved by :



ELECTRICAL AND ELECTRONICS INSTITUTE  
FOUNDATION FOR INDUSTRIAL DEVELOPMENT

975 Moo 4, Bangpoo Industrial Estate, Soi 8, Sukhumvit Road km 37,

Phraek Sa, Mueang Samut Prakan, Samut Prakan 10280

Tel: +66 2709 4860 Fax: +66 2324 0917



NSC-TISI-TIS 17025  
CALIBRATION 0119

Certificate No.: CP20220368EA  
Operation No.: CP2022120011

## Certificate of Calibration

Equipment: Sound Calibrator  
Manufacturer: Cirrus Research Plc  
Model/Type: CR:515  
Serial No.: 94296  
ID No.:  
Customer: SECOT Co.,Ltd.  
Address: 239 Rimklongprapa Rd., Bangsue,  
Bangkok 10800 Thailand  
Received Date: 14 December 2022  
Calibrated Date: 20 December 2022  
Issued Date: 23 December 2022  
Calibrated by: Ms. Juntaporn Kunhakom

Approved by:

( Mr. Sittichai Swaksuriyawong )  
Group Manager

This report was prepared electronically using applicable electronic signature. Printing or copy of file are considered as a copy of the document.

The reported uncertainty of measurement was based on standard uncertainty multiplied by a coverage factor ( $k$ ) providing a level of confidence of approximately 95%. This certificate may not be reproduced other than in full except with the prior written approval of the Electrical and Electronics Institute, Foundation for Industrial Development.



ELECTRICAL AND ELECTRONICS INSTITUTE  
FOUNDATION FOR INDUSTRIAL DEVELOPMENT

Certificate No.: CP20220368EA

## Calibration Report

Equipment: Sound Calibrator  
Manufacturer: Cirrus Research Plc  
Model/Type: CR:515  
Serial No.: 94296  
ID No.:  
Ambient Temperature: ( 23 ± 2 ) °C  
Relative Humidity: ( 50 ± 15 ) %  
Pressure: (101.3 ± 1.5) kPa

Method of Calibration :-  
IEC 60942:2017

### Condition of this result of calibration

#### 1. Reference standards instrument :-

Instrument	Model	Serial No.	Cert. No.	Due Date
1) Standard microphone	4180	2661000	AA-1020-22	14 June 2023
2) Waveform Generator	33511B	MY52302264	CK20220058EA	19 June 2023
3) Audio Analyzing DMM	2015-P	4079144	E1U221042	16 March 2023
4) Pressure humidity and Temperature Transmitter	PTU301	F0640002	CL1-P220024 CD20220165EA	17 March 2023 24 July 2023

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

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

- Reference standards instrument for Acoustic function
- National Institute of Metrology (Thailand)
- Reference standards instrument for Electrical function
- Electrical and Electronics Institute; NSC Accredited Calibration No.0119

### Result of Calibration:-

#### 1. Function : Sound pressure level

Normalinal Frequency (Hz)	Specified Sound Pressure level (dB)	Measured value (dB)	Deviated value <sup>[1]</sup> (dB)	Acceptance limit <sup>[3]</sup> (dB)
1000	94	93.90	-0.10	±0.25

#### 2. Function : Frequency

Normalinal Sound Pressure Level (dB)	Specified Frequency (Hz)	Measured value (Hz)	Deviated value <sup>[2]</sup> (%)	Acceptance limit <sup>[5]</sup> (%)
94	1000	1000.3	0.0	±0.7

Certificate No.: CP20220368EA

### Calibration Report

#### 3. Function : Total distortion + noise

Normal	Normal	Measured value <sup>[4]</sup>	Acceptance limit <sup>[5]</sup>
Sound Pressure level (dB)	Frequency (Hz)	(%)	(%)
94	1000	0.9	2.5

#### Uncertainty of measurement

Function	Uncertainty	Maximum-permitted uncertainty of measurement
Sound pressure level	0.10 dB	0.15 dB
Frequency	0.10 %	0.20 %
Total distortion + noise	0.40 %	0.50 %

- Note:
- [1] The deviated value is the absolute value of the difference between the measured value and the corresponding specified sound pressure level.
  - [2] The deviated value is the absolute value of the difference in percent between the measured value and the corresponding specified frequency.
  - [3] The acceptance limit is for the deviated value.
  - [4] The measured value is the total distortion + noise, measured over the frequency range from 20 Hz to 20 kHz.
  - [5] The acceptance limit is for the Measured value.
- Remarks:
- 1. Acceptance limit was IEC 60942:2017 Class 1.
  - 2. The coverage factor  $k = 2.00$

-- End of Report --

ภาคผนวก จ

หนังสืออนุญาตขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
จากกรมโรงงานอุตสาหกรรม





ที่ อก ๐๓๑๐(๑)/ ๑๑ ๐๑ ๖

กรมโรงงานอุตสาหกรรม  
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท  
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๒๐ กรกฎาคม ๒๕๖๖

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท ซีคอฟ จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน

ลงวันที่ ๗ เมษายน ๒๕๖๖

สิ่งที่ส่งมาด้วย ๑. รายชื่อผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑ แผ่น

๒. รายชื่อเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑ แผ่น

๓. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๙ แผ่น

ตามหนังสือที่อ้างถึง บริษัท ซีคอฟ จำกัด ขอต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ว-๒๓๙ สถานที่ ตั้งเลขที่ ๒๓๙ ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพมหานคร ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท ซีคอฟ จำกัด ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑๐ ราย ตามสิ่งที่ส่งมาด้วย ๑

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๓๘ ราย ตามสิ่งที่ส่งมาด้วย ๒

ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย น้ำใต้ดิน อากาศเสีย สิ่งปฏิกูล หรือวัสดุที่ไม่ใช้แล้ว และดิน ตามสิ่งที่ส่งมาด้วย ๓

หนังสือฉบับนี้จะหมดอายุในวันที่ ๒ พฤษภาคม ๒๕๖๙ หากประสงค์จะต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อกรมโรงงานอุตสาหกรรมภายใน ๓๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ซึ่งคำขอต่ออายุดังกล่าวขอรับได้ที่กรมโรงงานอุตสาหกรรม ทั้งนี้ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ที่หน้าเว็บไซต์กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายประสม ดำรงพงษ์)

กองวิจัยและเตือนภัยมลพิษโรงงาน

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

โทร. ๐ ๒๕๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๕๓๐ ๖๓๑๒ ต่อ ๒๑๙๙

ไปรษณีย์อิเล็กทรอนิกส์ saraban@diw.mail.go.th



"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



ส่งที่ส่งมาด้วย ๑

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท ซีคอฟ จำกัด

เลขทะเบียน ว-๒๓๙

ที่ อก ๐๓๑๐(๑)/ ๑๑ ๐๑ ๖

ลงวันที่ ๒๐ กรกฎาคม ๒๕๖๖

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑๐ ราย

๑) นายขรรชัย เกรียงไกรอุดม

ทะเบียนเลขที่ ว-๒๓๙-ค-๐๐๐๒

๒) นางสมฤดี เกรียงไกรอุดม

ทะเบียนเลขที่ ว-๒๓๙-ค-๐๐๐๓

๓) นางอารยา ทิพย์รักษ์

ทะเบียนเลขที่ ว-๒๓๙-ค-๐๐๐๔

๔) นางสาวเข็มชดา อินทร์ศรี

ทะเบียนเลขที่ ว-๒๓๙-ค-๐๐๐๕

๕) นางสาวปรีดา สมใจ

ทะเบียนเลขที่ ว-๒๓๙-ค-๐๐๐๖

๖) นางสาวอรัญญา มาตา

ทะเบียนเลขที่ ว-๒๓๙-ค-๐๐๐๗

๗) นางสาวลดาวัลย์ วงศ์เจริญ

ทะเบียนเลขที่ ว-๒๓๙-ค-๐๐๐๘

๘) นางสาวณิรารณ เกตุวันดี

ทะเบียนเลขที่ ว-๒๓๙-ค-๐๐๐๙

๙) นางสาวนริสา ภูวสรเพ็ชญ์

ทะเบียนเลขที่ ว-๒๓๙-ค-๐๐๑๐

๑๐) นางสาวศิริวรรณ ฉิมสง่า

ทะเบียนเลขที่ ว-๒๓๙-ค-๐๐๑๑

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท ชีคอฟ จำกัด

ที่ อก ๐๓๑๐(๑)/ ๑๑ ๐ ๑ ๖

เลขทะเบียน ว-๒๓๙

ลงวันที่ ๒๐ กรกฎาคม ๒๕๖๖

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๓๘ ราย

- ๑) นางสาวสุตาพร สุนทร
- ๒) นางสาวสุรชาติ เทียนเตี้ย
- ๓) นางสาวสุนันหา ศิริวัฒนานนท์
- ๔) นายบวร ศิขัยยะ
- ๕) นางสาวเกศรินทร์ วรเดโชวิทยา
- ๖) นายอนันต์ วัฒนานา
- ๗) นายชิตพล สมประสงค์
- ๘) นางสาวศศิธร พรหมประเสริฐ
- ๙) นายศิวะนนท์ กุลวงษ์
- ๑๐) นางสาวอลิษา คณิธรานนท์
- ๑๑) นางสาวสิริวรรณ แก้วชิงดวง
- ๑๒) นางสาวปัทมวรรณ สุวรรณวิโรจน์
- ๑๓) นางสาวกนิษฐา เจริญเชื้อ
- ๑๔) นายวัชรกานต์ ประมาคเต
- ๑๕) นายชอง เสงฆ์กุล
- ๑๖) นางสาวกฤษณา จันทุม
- ๑๗) นางสาวพรนภา บุตรธรรม
- ๑๘) นางสาวธาริณี อาจปลิว
- ๑๙) นายธนโชติ ช่างล้อ
- ๒๐) นางสาวพัชรา สมานฉันท
- ๒๑) นางสาวจุฑารัตน์ แจ่มเรือน
- ๒๒) นางสาวณิศา กุ้ยอ่อน
- ๒๓) นายกิตติพงศ์ ณะเกิงสุข
- ๒๔) นายจิรวัฒน์ โคตรคำหาญ
- ๒๕) นายชนะพล อัครผล
- ๒๖) นางสาวทิพย์สุดา วรรณการ
- ๒๗) นายสิทธิชัย สว่างวงศ์ไชย
- ๒๘) นายพิษณุ สีนามเพ็ง
- ๒๙) นายรัตนชัย ขอบทำกิจ
- ๓๐) นายธนาวุฒิ ด่วนแสง
- ๓๑) นายณัฐชัย ไชยโคตร
- ๓๒) นายณัฐดนัย กฤษณะโสม
- ๓๓) นายศุภชัย สุขใหม่
- ๓๔) นายรอมฎอน เหลี่ยมพาด
- ๓๕) นางสาวสุภาวดี บัวแก้ว
- ๓๖) นางสาวมาเรียณี ฮาแว
- ๓๗) นางสาววิระยา ปังนิมบุรณ์
- ๓๘) นางสาวศลิษา อินริย์

- ทะเบียนเลขที่
- ว-๒๓๙-จ-๐๐๐๑
- ว-๒๓๙-จ-๐๐๐๓
- ว-๒๓๙-จ-๐๐๐๔
- ว-๒๓๙-จ-๐๐๐๕
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- ว-๒๓๙-จ-๐๐๐๙
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- ว-๒๓๙-จ-๐๐๓๙

3/11/16

สิ่งที่ส่งมาด้วย ๒

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท ชีคอฟ จำกัด

ที่ อก ๐๓๑๐(๑)/ ๑๑ ๐ ๑ ๖

เลขทะเบียน ว-๒๓๙

ลงวันที่ ๒๐ กรกฎาคม ๒๕๖๖

ขอขยายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๕๕ รายการ

น้ำเสีย จำนวน 45 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
2	Arsenic	2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
3	Barium	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[4]</sup>
4	α-BHC	2) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
5	β-BHC	1) Digestion, Direct Nitrous Oxide-Acetylene Flame Method <sup>[4]</sup>
6	δ-BHC	2) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
7	γ-BHC	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
		2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>

3/11/16

สิ่งที่ส่งมาด้วย ๓

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
8	Biochemical Oxygen Demand	1) 5-Day BOD Test, Azide Modification Method <sup>[4]</sup> 2) 5-Day BOD Test, Membrane Electrode Method <sup>[4]</sup>
9	Cadmium	1) Digestion, Direct Air-Acetylene Flame Method <sup>[4]</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>[4]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
10	Chemical Oxygen Demand	1) Open Reflux, Titrimetric method <sup>[4]</sup> 2) Closed Reflux, Colorimetric method <sup>[4]</sup> 3) Closed Reflux, Titrimetric Method <sup>[4]</sup>
11	Chlordane	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
12	Chromium	1) Digestion, Direct Air-Acetylene Flame Method <sup>[4]</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>[4]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
13	Color	ADMI Weighted-Ordinate Spectrophotometric Method <sup>[4]</sup>
14	Copper	1) Digestion, Direct Air-Acetylene Flame Method <sup>[4]</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>[4]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
15	Cyanide	Distillation, Colorimetric method <sup>[4]</sup>
16	4,4'-DDD	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup> <i>สมช</i>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
17	4,4'-DDE	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
18	4,4'-DDT	2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup> 1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
19	Dieldrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
20	Endosulfan I	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
21	Endosulfan II	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
22	Endosulfan Sulfate	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
23	Endrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
24	Endrin Aldehyde	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup> <i>สมช</i>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
25	Formaldehyde	Distillation, Colorimetric Method <sup>[3]</sup>
26	Free Chlorine	1) Iodometric Method <sup>[4]</sup>
27	Heptachlor	2) DPD Colorimetric Method <sup>[4]</sup>
28	Heptachlor epoxide	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
29	Hexavalent Chromium	2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass-Spectrometric Method <sup>[4]</sup>
30	Lead	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
31	Manganese	2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
32	Mercury	1) Colorimetric Method <sup>[4]</sup>
33	Methoxychlor	2) Extraction, Air-Acetylene Flame Method <sup>[4]</sup>
34	Nickel	1) Digestion, Direct Air-Acetylene Flame Method <sup>[4]</sup>
		2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>[4]</sup>
		3) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		4) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		5) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		6) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		7) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		8) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		9) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		10) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		11) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		12) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		13) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		14) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		15) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		16) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		17) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		18) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		19) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		20) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		21) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		22) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		23) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		24) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		25) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		26) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		27) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		28) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		29) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		30) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		31) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		32) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		33) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		34) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		35) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		36) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		37) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		38) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		39) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		40) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		41) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		42) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		43) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		44) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		45) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>

3) Digestion...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
35	Oil & Grease	3) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
36	pH	1) Liquid-Liquid, Partition-Gravimetric Method <sup>[4]</sup>
37	Phenols	2) Soxhlet Extraction Method <sup>[4]</sup>
38	Selenium	Electrometric Method <sup>[4]</sup>
39	Sulfide	1) Distillation, Chloroform Extraction Method <sup>[4]</sup>
40	Temperature	2) Distillation, Direct Photometric Method <sup>[4]</sup>
41	Total Dissolved Solids	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[4]</sup>
42	Total Kjeldahl Nitrogen	2) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
43	Total Suspended Solids	1) Iodometric method <sup>[4]</sup>
44	Trivalent Chromium	2) Methylene blue method <sup>[4]</sup>
45	Zinc	Laboratory and Field Methods <sup>[4]</sup>
		Dried at 180 °C <sup>[4]</sup>
		1) Macro Kjeldahl Method <sup>[4]</sup>
		2) Semi-Micro Kjeldahl Method <sup>[4]</sup>
		Dried at 103-105 °C <sup>[4]</sup>
		1) Digestion, Direct Air-Acetylene Flame Method;
		Colorimetric Method; Calculation <sup>[4]</sup>
		2) Digestion, Electrothermal Atomic Absorption Spectrometric Method; Colorimetric Method; Calculation <sup>[4]</sup>
		3) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation <sup>[4]</sup>
		1) Digestion, Direct Air-Acetylene Flame Method <sup>[4]</sup>
		2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>[4]</sup>
		3) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
		Method <sup>[4]</sup>

น้ำใต้ดิน...

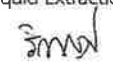
น้ำใต้ดิน จำนวน 125 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
2	Acetone	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
3	Aldrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
4	Anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
5	Antimony	Digestion, Inductively Coupled Plasma Spectrometric Method <sup>[4]</sup>
6	Arsenic	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
7	Atrazine	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
8	Barium	1) Digestion, Direct Nitrous Oxide-Acetylene Flame Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma Spectrometric Method <sup>[4]</sup>
9	Benz(a)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
10	Benzene	Purge and Trap Gas Chromatographic/Mass spectrometric Method <sup>[4]</sup>
11	Benzo(b)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
12	Benzo(k)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup> 3mg/l


ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
13	Benzoic acid	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
14	Benzo(a)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
15	Benzo(g,h,i)perylene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
16	Beryllium	Digestion, Inductively Coupled Plasma Spectrometric Method <sup>[4]</sup>
17	Bis(2-chloroethyl)ether	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
18	Bis(2-ethylhexyl)phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
19	Bromodichloromethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
20	Bromoform	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
21	Butanol	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
22	Butyl benzyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
23	Cadmium	1) Digestion, Direct Air-Acetylene Flame Method <sup>[4]</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>[4]</sup> 3) Digestion, Inductively Coupled Plasma Spectrometric Method <sup>[4]</sup>
24	Carbazole	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
25	Carbon disulfide	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
26	Carbon tetrachloride	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup> 3mg/l

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
27	Chlordane	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
28	p-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
29	Chlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
30	Chlorodibromomethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
31	Chloroform	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
32	2-Chlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
33	Chromium	1) Digestion, Direct Air-Acetylene Flame Method <sup>[4]</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>[4]</sup> 3) Digestion, Inductively Coupled Plasma Spectrometric Method <sup>[4]</sup>
34	Chromium (III)	1) Digestion, Direct Air-Acetylene Flame Method; Colorimetric Method; Calculation <sup>[4]</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method; Colorimetric Method; Calculation <sup>[4]</sup> 3) Digestion, Inductively Coupled Plasma Spectrometric Method; Colorimetric Method; Calculation <sup>[4]</sup>
35	Chromium (VI)	1) Colorimetric Method <sup>[4]</sup> 2) Extraction, Air-Acetylene Flame Method <sup>[4]</sup>
36	Chrysene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup> <i>สม)</i>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
37	Cyanide	1) Distillation, Titrimetric Method <sup>[4]</sup> 2) Distillation, Colorimetric Method <sup>[4]</sup>
38	2,4-D	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
39	DDD	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
40	DDE	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
41	DDT	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
42	Dibenz(a,h)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
43	Di-n-butyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
44	1,2-Dichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
45	1,3-Dichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
46	1,4-Dichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
47	3,3'-Dichlorobenzidine	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
48	1,1-Dichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
49	1,2-Dichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup> <i>สม)</i>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
50	1,1-Dichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
51	cis-1,2-Dichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
52	trans-1,2-Dichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
53	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
54	1,2-Dichloropropane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
55	1,3-Dichloropropane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
56	1,3-Dichloropropene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
57	Dieldrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
58	Diethyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
59	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
60	2,4-Dinitrophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
61	2,4-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
62	2,6-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
63	Di-n-Octyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
64	Endosulfan	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 

2) Liquid-Liquid...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
65	Endrin	2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup> 1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
66	Ethylbenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
67	Fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
68	Fluorene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
69	Heptachlor	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
70	Heptachlor epoxide	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
71	Hexachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
72	Hexachloro-1,3-butadiene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
73	n-Hexane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
74	$\alpha$ -HCH	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
75	$\beta$ -HCH	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 

2) Liquid-Liquid...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
76	γ-HCH	2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup> 1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
77	Hexachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
78	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
79	Indeno(1,2,3-cd)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
80	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
81	Lead	1) Digestion, Direct Air-Acetylene Flame Method <sup>[4]</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>[4]</sup> 3) Digestion, Inductively Coupled Plasma Spectrometric Method <sup>[4]</sup>
82	Manganese	1) Digestion, Direct Air-Acetylene Flame Method <sup>[4]</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>[4]</sup> 3) Digestion, Inductively Coupled Plasma Spectrometric Method <sup>[4]</sup>
83	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>[4]</sup>
84	Methanol	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
85	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
86	Methyl bromide	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>

87 Methylene chloride...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
87	Methylene chloride	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
88	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
89	2-Methylnaphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
90	Methyl tert-butyl ether	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
91	Naphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
92	Nickel	1) Digestion, Direct Air-Acetylene Flame Method <sup>[4]</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>[4]</sup> 3) Digestion, Inductively Coupled Plasma Spectrometric Method <sup>[4]</sup>
93	Nitrobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
94	N-Nitrosodiphenylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
95	N-Nitrosodi-n-propylamine	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
96	Polychlorinated Biphenyls - PCB-1016 - PCB-1221 - PCB-1232 - PCB-1242 - PCB-1248 - PCB-1254 - PCB-1260	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
97	Pentachlorophenol	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
98	pH	Electrometric method <sup>[4]</sup>

99 Phenanthrene...



ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
99	Phenanthrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
100	Phenol	1) Distillation, Chloroform Extraction Method <sup>[4]</sup> 2) Distillation, Direct Photometric Method <sup>[4]</sup> 3) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
101	Pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
102	Selenium	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
103	Silver	1) Digestion, Direct Air-Acetylene Flame Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
104	Styrene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
105	1,1,2,2-Tetrachloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
106	Tetrachloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
107	Toluene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
108	TPH (C <sub>5</sub> -C <sub>8</sub> )	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[12,25]</sup>
109	TPH (C <sub>8</sub> -C <sub>16</sub> )	1) Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[9,21]</sup> 2) Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass spectrometric Method <sup>[9,25]</sup>
110	TPH (C <sub>16</sub> -C <sub>35</sub> )	1) Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[9,21]</sup> <i>Simple</i>

2) Separatory...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
		2) Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass spectrometric Method <sup>[9,25]</sup>
111	1,2,4-Trichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
112	1,1,1-Trichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
113	1,1,2-Trichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
114	Trichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
115	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
116	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
117	1,3,5-Trimethylbenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
118	Vanadium	Digestion, Inductively Coupled Plasma Spectrometric Method <sup>[4]</sup>
119	Vinyl acetate	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
120	Vinyl chloride	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
121	m-Xylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
122	o-Xylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
123	p-Xylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
124	Xylene (Total)	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup> <i>Simple</i>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
125	Zinc	1) Digestion, Direct Air-Acetylene Flame Method <sup>[4]</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>[4]</sup> 3) Digestion, Inductively Coupled Plasma Spectrometric Method <sup>[4]</sup>

อากาศเสีย (ปล่อยระบาย) จำนวน 27 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Antimony	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
2	Arsenic	1) Isokinetic Sampling, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
3	Beryllium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
4	Cadmium	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
5	Carbon monoxide	Instrumental Analyzer Method <sup>[5]</sup>
6	Chlorine	1) Absorption Sampling, Ion Chromatographic Method <sup>[5]</sup> 2) Isokinetic Sampling, Ion Chromatographic Method <sup>[5]</sup>
7	Chromium	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup> <i>วิธีใหม่</i>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
8	Cobalt	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
9	Copper	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
10	Cresol	Adsorption Sampling, Gas Chromatographic Method <sup>[5]</sup>
11	Dioxin/Furans	Isokinetic Sampling <sup>[5]</sup>
12	Hydrogen chloride	1) Absorption Sampling, Ion Chromatographic Method <sup>[5]</sup> 2) Isokinetic Sampling, Ion Chromatographic Method <sup>[5]</sup>
13	Hydrogen Fluoride	1) Absorption Sampling, Ion Chromatographic Method <sup>[5]</sup> 2) Isokinetic Sampling, Ion Chromatographic Method <sup>[5]</sup>
14	Hydrogen Sulfide	Absorption Sampling, Iodometric Method <sup>[5]</sup>
15	Lead	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
16	Manganese	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
17	Mercury	Isokinetic Sampling, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>[5]</sup>
18	Nickel	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup> <i>วิธีใหม่</i>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
19	Opacity	Ringelmann's Method <sup>[2]</sup>
20	Oxides of Nitrogen	1) Absorption Sampling, Phenoldisulfonic acid Method <sup>[5]</sup> 2) Absorption Sampling, Ion Chromatographic Method <sup>[5]</sup> 3) Instrumental Analyzer Method <sup>[5]</sup>
21	Selenium	1) Isokinetic Sampling, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
22	Sulfur dioxide	1) Isokinetic Sampling, Barium-Thorin Titrimetric Method <sup>[5]</sup> 2) Absorption Sampling, Barium-Thorin Titrimetric Method <sup>[5]</sup> 3) Instrumental Analyzer Method <sup>[5]</sup>
23	Sulfuric acid	Isokinetic Sampling, Barium-Thorin Titrimetric Method <sup>[5]</sup>
24	Tin	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
25	Total Suspended Particulate	1) Isokinetic Sampling, Gravimetric Method <sup>[5]</sup> 2) Paired Train, Isokinetic Sampling, Gravimetric Method <sup>[5]</sup>
26	Vanadium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
27	Xylene	1) Adsorption Sampling, Gas Chromatographic Method <sup>[5]</sup> 2) Adsorption Sampling, Gas Chromatographic/Mass Spectrometric Method <sup>[5]</sup>

สิ่งปฏิกูล...

สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน 34 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[1,6,9,22]</sup> 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,6,9,27]</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,27]</sup>
2	Antimony	1) Waste Extraction, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[1,6,16]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 3) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[7,16]</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
3	Arsenic	1) Waste Extraction, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[1,6,16]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 3) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[7,16]</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
4	Barium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>[1,6,15]</sup>

2) Waste Extraction...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
5	Beryllium	2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 3) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,15]</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
6	Cadmium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
7	Chlordane	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>[1,6,15]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 3) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,15]</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
8	Chromium	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[1,9,22]</sup> 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[1,9,27]</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 4) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,27]</sup> 1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>[1,6,15]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> <i>3) Digestion...</i>

3) Digestion...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
9	Chromium (III)	3) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,15]</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup> 1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method; Waste Extraction, Colorimetric Method; Calculation <sup>[1,6,15,17]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction, Colorimetric Method; Calculation <sup>[1,6,14,17]</sup> 3) Digestion, Flame Atomic Absorption Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation <sup>[7,8,15,17]</sup> 4) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation <sup>[7,8,14,17]</sup>
10	Chromium (VI)	1) Waste Extraction, Colorimetric Method <sup>[1,17]</sup> 2) Alkaline Digestion, Colorimetric Method <sup>[8,17]</sup>
11	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
12	Copper	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>[1,6,15]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 3) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,15]</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup> <i>3) Digestion...</i>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
13	2,4-D	1) Waste Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,25]</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25]</sup>
14	DDD	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[1,9,22]</sup> 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,27]</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,27]</sup>
15	DDE	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[1,9,22]</sup> 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,27]</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,27]</sup>
16	DDT	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[1,9,22]</sup> 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,27]</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,27]</sup>

17 Dieldrin...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
17	Dieldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[1,9,22]</sup> 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,27]</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,27]</sup>
18	Endrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[1,9,22]</sup> 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,27]</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,27]</sup>
19	Heptachlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[1,9,22]</sup> 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,27]</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,27]</sup>
20	Lead	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>[1,6,15]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup>

3) Digestion...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
21	Lindane	3) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,15]</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup> 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[1,9,22]</sup> 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,27]</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,27]</sup>
22	Mercury	1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>[1,18]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 3) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>[19]</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
23	Methoxychlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[1,9,22]</sup> 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,27]</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,27]</sup>


24 Molybdenum...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
24	Molybdenum	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
25	Nickel	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>[1,6,15]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 3) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,15]</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
26	Polychlorinated Biphenyls - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[1,9,23]</sup> 2) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,23]</sup>
27	Pentachlorophenol	1) Waste Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,25]</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25]</sup>
28	pH	Electrometric Method <sup>[3,1,32]</sup>
29	Selenium	1) Waste Extraction, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[1,6,20]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 3) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[7,20]</sup>


4) Digestion...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
30	Silver	4) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup> 1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
31	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
32	Trichloroethylene	1) Waste Extraction, Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[1,12,26]</sup> 2) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[12,26]</sup>
33	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
34	Zinc	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>[1,6,15]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 3) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,15]</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>

ดิน จำนวน 124 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,27]</sup> 

2 Acetone...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
2	Acetone	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[13,26]</sup>
3	Aldrin	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>[11,22]</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[11,27]</sup>
4	Anthracene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,27]</sup>
5	Antimony	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[7,16]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
6	Arsenic	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[7,16]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
7	Atrazine	Ultrasonic Extraction, Gas Chromatographic Method <sup>[11,24]</sup>
8	Barium	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,15]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
9	Benz(a)anthracene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,27]</sup>
10	Benzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[13,26]</sup>
11	Benzo(b)fluoranthene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,27]</sup>
12	Benzo(k)fluoranthene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,27]</sup>
13	Benzoic acid	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[11,27]</sup> 

14 Benzo(a)pyrene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
14	Benzo(a)pyrene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,27]</sup>
15	Benzo(g,h,i)perylene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,27]</sup>
16	Beryllium	Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
17	Bis(2-chloroethyl)ether	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,27]</sup>
18	Bis(2-ethylhexyl)phthalate	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,27]</sup>
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[13,26]</sup>
20	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[13,26]</sup>
21	Butanol	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[13,26]</sup>
22	Butyl benzyl phthalate	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,27]</sup>
23	Cadmium	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,15]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
24	Carbazole	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,27]</sup>
25	Carbon disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[13,26]</sup>
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[13,26]</sup>
27	Chlordane	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>[11,22]</sup> 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,27]</sup>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
28	p-Chloroaniline	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,27]</sup>
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[13,26]</sup>
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[13,26]</sup>
31	Chloroform	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[13,26]</sup>
32	2-Chlorophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[11,27]</sup>
33	Chromium	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,15]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
34	Chromium (III)	1) Digestion, Flame Atomic Absorption Spectrometric Method; Colorimetric Method; Calculation <sup>[7,8,15,17]</sup> 2) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation <sup>[7,8,14,17]</sup>
35	Chromium (VI)	Alkaline Digestion, Colorimetric Method <sup>[8,17]</sup>
36	Chrysene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,27]</sup>
37	Cyanide	1) Extraction, Distillation, Titrimetric Method <sup>[28,29,30]</sup> 2) Extraction, Distillation, Colorimetric Method <sup>[28,29,30]</sup>
38	2,4-D	Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[24]</sup>
39	DDD	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>[11,22]</sup> 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,27]</sup>



ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
40	DDE	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>(11,22)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,27)</sup>
41	DDT	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>(11,22)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,27)</sup>
42	Dibenz(a,h)anthracene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>
43	Di-n-butyl phthalate	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,26)</sup>
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,26)</sup>
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,26)</sup>
47	3,3'-Dichlorobenzidine	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>
48	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,26)</sup>
49	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,26)</sup>
50	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,26)</sup>
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,26)</sup>
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,26)</sup>
53	2,4-Dichlorophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,27)</sup>

54 1,2-Dichloropropane...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,26)</sup>
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,26)</sup>
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,26)</sup>
57	Dieldrin	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>(11,22)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,27)</sup>
58	Diethyl phthalate	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>
59	2,4-Dimethylphenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,27)</sup>
60	2,4-Dinitrophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,27)</sup>
61	2,4-Dinitrotoluene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>
62	2,6-Dinitrotoluene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>
63	Di-n-Octyl phthalate	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>
64	Endosulfan	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>(11,22)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,27)</sup>
65	Endrin	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>(11,22)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,27)</sup>
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,26)</sup>

67 Fluoranthene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
67	Fluoranthene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,27]</sup>
68	Fluorene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,27]</sup>
69	Heptachlor	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>[11,22]</sup> 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,27]</sup>
70	Heptachlor epoxide	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>[11,22]</sup> 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,27]</sup>
71	Hexachlorobenzene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[11,27]</sup>
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[13,26]</sup>
73	n-Hexane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[13,26]</sup>
74	α-HCH	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>[11,22]</sup> 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,27]</sup>
75	β-HCH	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>[11,22]</sup> 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,27]</sup>
76	γ-HCH	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>[11,22]</sup> 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,27]</sup>
77	Hexachlorocyclopentadiene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,27]</sup>

78 Hexachloroethane...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
78	Hexachloroethane	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,27]</sup>
79	Indeno(1,2,3-cd)pyrene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,27]</sup>
80	Isophorone	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,27]</sup>
81	Lead	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,15]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
82	Manganese	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,15]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
83	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>[19]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
84	Methanol	Ultrasonic Extraction, Direct Aqueous Injection, Gas Chromatographic Method <sup>[11,21]</sup>
85	Methoxychlor	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>[11,22]</sup> 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,27]</sup>
86	Methyl bromide	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[13,26]</sup>
87	Methylene chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[13,26]</sup>
88	2-Methylphenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[11,27]</sup>
89	2-Methylnaphthalene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[11,27]</sup>

90 Methyl tert-butyl ether...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
90	Methyl tert-butyl ether	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[13,26]</sup>
91	Naphthalene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,27]</sup>
92	Nickel	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,15]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
93	Nitrobenzene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,27]</sup>
94	N-Nitrosodiphenylamine	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,27]</sup>
95	N-Nitrosodi-n-propylamine	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,27]</sup>
96	Polychlorinated Biphenyls - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260	Soxhlet Extraction, Gas Chromatographic Method <sup>[10,23]</sup>
97	Pentachlorophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[26]</sup>
98	Phenanthrene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,27]</sup>
99	Phenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[11,27]</sup>
100	Pyrene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,27]</sup>
101	Selenium	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[7,20]</sup>

2) Digestion...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
		2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
102	Silver	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,15]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
103	Styrene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[13,26]</sup>
104	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[13,26]</sup>
105	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[13,26]</sup>
106	Toluene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[13,26]</sup>
107	TPH (C <sub>5</sub> -C <sub>8</sub> )	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[13,26]</sup>
108	TPH (C <sub>8</sub> -C <sub>16</sub> )	1) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,21]</sup> 2) Soxhlet Extraction, Gas Chromatographic/Mass spectrometric Method <sup>[10,26]</sup>
109	TPH (C <sub>16</sub> -C <sub>35</sub> )	1) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,21]</sup> 2) Soxhlet Extraction, Gas Chromatographic/Mass spectrometric Method <sup>[10,26]</sup>
110	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[13,26]</sup>
111	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[13,26]</sup>
112	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[13,26]</sup>
113	Trichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[13,26]</sup>

114 2,4,5-Trichlorophenol...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
114	2,4,5-Trichlorophenol	Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,27]</sup>
115	2,4,6-Trichlorophenol	Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,27]</sup>
116	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[13,26]</sup>
117	Vanadium	Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
118	Vinyl acetate	Purge and Trap, Gas Chromatographic/Mass spectrometric Method <sup>[13,26]</sup>
119	Vinyl chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[13,26]</sup>
120	m-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[13,26]</sup>
121	o-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[13,26]</sup>
122	p-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[13,26]</sup>
123	Xylene (Total)	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[13,26]</sup>
124	Zinc	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,15]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>

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ภาคผนวก ข

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ใบรับรองความสามารถห้องปฏิบัติการและขอข่ายการรับรอง  
ห้องปฏิบัติการทดสอบ ตามมาตรฐาน ISO/IEC 17025  
จากสำนักงานมาตรฐานอุตสาหกรรม (สมอ.)



แบบ กว.ช./สมอ.๒  
Form NSC/TISI 2

ใบรับรองเลขที่ 24-LB0026  
(Certificate No.)

## ใบรับรองระบบงาน

(Certificate of Accreditation)

อาศัยอำนาจตามความในพระราชบัญญัติการมาตรฐานแห่งชาติ พ.ศ. ๒๕๕๑  
(By Virtue of National Standardization Act B.E. 2551 (2008))

เลขาธิการสำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม  
(Secretary-General, Thai Industrial Standards Institute)

ออกใบรับรองฉบับนี้ให้  
(Issues this certificate to)

บริษัท ซีคोट จำกัด ฝ่ายห้องปฏิบัติการทดสอบด้านสิ่งแวดล้อม  
(Secot Company Limited, Environmental Laboratory Division)

ตั้งอยู่เลขที่  
(Address)

๒๓๙ ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพมหานคร  
(239 Rimklongprapa Road, Bangsue, Bangsue, Bangkok)

ได้รับการรับรองความสามารถ  
(Certificate of competence)

ตามมาตรฐานเลขที่ มอก. ๑๗๐๒๕ - ๒๕๖๑  
(Standard No. TIS 17025-2561 (2018) (ISO/IEC 17025: 2017))

ข้อกำหนดทั่วไปว่าด้วยความสามารถของ ห้องปฏิบัติการทดสอบและห้องปฏิบัติการสอบเทียบ  
(General requirements for the competence of testing and calibration laboratories)

หมายเลขการรับรองที่ ทดสอบ ๐๓๙๔  
(Accreditation No. Testing 0394)

โดยมีรายละเอียดสาขาและขอบข่ายที่ได้ใบรับรอง แสดงไว้ใน QR CODE และ www.tisi.go.th  
(Details of the scheme and scope of the certificate are shown in QR CODE and www.tisi.go.th)

ออกให้ ณ วันที่ ๖ ธันวาคม พ.ศ. ๒๕๖๖  
(Issue date : 6 December B.E. 2566 (2023))

  
(นายวีระศักดิ์ เพ็งหล่ง)  
ผู้อำนวยการสำนักงานคณะกรรมการการมาตรฐานแห่งชาติ  
ปฏิบัติราชการแทน  
เลขาธิการสำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม



Signed by สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม (สมอ.)  
Thai Industrial Standards Institute (TISI)  
Date: 2023-12-06T08:49:04.676+07:00  
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กระทรวงอุตสาหกรรม สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม  
(Ministry of Industry Thailand, Thai Industrial Standards Institute)



รายละเอียดสาขาและขอบข่ายใบรับรองห้องปฏิบัติการ  
(Scope of Accreditation for Testing)  
ใบรับรองเลขที่ 24-LB0026  
(Certification No. 24-LB0026)



ชื่อห้องปฏิบัติการ  
(Laboratory Name)

หมายเลขการรับรองที่  
(Accreditation No.)

ฉบับที่ 02  
(Issue No.02)

สถานภาพห้องปฏิบัติการ  
(Laboratory status)

บริษัท ซีคोट จำกัด ฝ่ายห้องปฏิบัติการทดสอบด้านสิ่งแวดล้อม  
(Secot Company Limited, Environmental Laboratory Division)

ทดสอบ 0394  
(Testing 0394)

ออกให้ตั้งแต่วันที่ 30 ตุลาคม พ.ศ. 2566  
(Valid from) (30 October B.E.2566 (2023))

☒ ถาวร (Permanent) ☐ นอกสถานที่ (Site) ☐ชั่วคราว (Temporary)

ถึงวันที่ 8 กันยายน พ.ศ. 2571  
(Until) (8 September B.E.2571 (2028))

☐เคลื่อนที่ (Mobile) ☐หลายสถานที่ (Multisite)

สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
สาขาสังแวดล้อม (environmental field) 1. น้ำและน้ำเสีย (water and wastewater)	- โลหะหนัก (heavy metals) • สารหนู (Arsenic, As) 0.000 5 mg/L ถึง 0.090 0 mg/L  • สารหนู (Arsenic, As) 0.05 mg/L ถึง 4.50 mg/L  • แบเรียม (Barium, Ba) 0.02 mg/L ถึง 4.50 mg/L  • แคดเมียม (Cadmium, Cd) 0.01 mg/L ถึง 4.50 mg/L  • โครเมียม (Chromium, Cr) 0.01 mg/L ถึง 4.50 mg/L	- Standard Methods for the Examination of Water and Wastewater, APHA , AWWA, WEF, 23 <sup>rd</sup> edition , 2017, Part 3030 F and Part 3114 C  - Standard Methods for the Examination of Water and Wastewater, APHA , AWWA, WEF, 23 <sup>rd</sup> edition , 2017, Part 3030 E and Part 3120 B

กระทรวงอุตสาหกรรมสำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม  
(Ministry of Industry, Thai Industrial Standards Institute)

หน้าที่ 1/9

รายละเอียดสาขาและขอบข่ายใบรับรองห้องปฏิบัติการ

(Scope of Accreditation for Testing)

ใบรับรองเลขที่ 24-LB0026

(Certification No. 24-LB0026)



ฉบับที่ 02

(Issue No.02)

ออกให้ตั้งแต่วันที่ 30 ตุลาคม พ.ศ. 2566

(Valid from)

(30 October B.E.2566 (2023))

ถึงวันที่ 8 กันยายน พ.ศ. 2571

(Until) (8 September B.E.2571 (2028))

สถานภาพห้องปฏิบัติการ  
(Laboratory status)

☒ ถาวร  
(Permanent)

☐ นอกสถานที่  
(Site)

☐ชั่วคราว  
(Temporary)

☐เคลื่อนที่  
(Mobile)

☐หลายสถานที่  
(Multisite)

สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
<p>สาขาสิ่งแวดล้อม (environmental field)</p> <p>1. น้ำและน้ำเสีย (ต่อ) (water and wastewater) (cont.)</p>	<p>- โลหะหนัก (heavy metals)</p> <ul style="list-style-type: none"> <li>ทองแดง (Copper, Cu) 0.02 mg/L ถึง 4.50 mg/L</li> <li>เหล็ก (Iron, Fe) 0.05 mg/L ถึง 9.00 mg/L</li> <li>ตะกั่ว (Lead, Pb) 0.03 mg/L ถึง 4.50 mg/L</li> <li>แมงกานีส (Manganese, Mn) 0.01 mg/L ถึง 9.00 mg/L</li> <li>นิกเกิล (Nickel, Ni) 0.01 mg/L ถึง 4.50 mg/L</li> <li>สังกะสี (Zinc, Zn) 0.02 mg/L ถึง 9.00 mg/L</li> </ul>	<p>- Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WEF, 23<sup>rd</sup> edition, 2017, Part 3030 E and Part 3120 B</p>

กระทรวงอุตสาหกรรมสำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม

(Ministry of Industry, Thai Industrial Standards Institute)

หน้าที่ 2/9

รายละเอียดสาขาและขอบข่ายใบรับรองห้องปฏิบัติการ

(Scope of Accreditation for Testing)

ใบรับรองเลขที่ 24-LB0026

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ฉบับที่ 02

(Issue No.02)

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(30 October B.E.2566 (2023))

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(Until) (8 September B.E.2571 (2028))

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สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
<p>สาขาสิ่งแวดล้อม (environmental field)</p> <p>1. น้ำและน้ำเสีย (ต่อ) (water and wastewater) (cont.)</p>	<p>- ซีโอดี (Chemical oxygen demand, COD) 100 mg/L ถึง 4 000 mg/L</p>	<p>- Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WEF, 23<sup>rd</sup> edition, 2017, Part 5220 D</p>
<p>2. บริเวณทำงาน (workplace)</p>	<p>- ฝุ่นละอองรวม (Total dust) 0.10 mg/filter ถึง 2.00 mg/filter</p> <p>- ฝุ่นละอองขนาดเล็ก (Respirable dust) 0.10 mg/filter ถึง 2.00 mg/filter</p>	<p>- NIOSH Manual of Analytical Methods (NMAM), method 0500, 4<sup>th</sup> edition, 15<sup>th</sup> August 1994 (Exclude Sampling)</p> <p>- NIOSH Manual of Analytical Methods (NMAM), method 0600, 4<sup>th</sup> edition, 15<sup>th</sup> January 1998 (Exclude Sampling)</p>

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หน้าที่ 3/9



รายละเอียดสาขาและขอบข่ายใบรับรองห้องปฏิบัติการ

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สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
<p>สาขาส่งแวดล้อม (environmental field)</p> <p>2. บริเวณทำงาน (ต่อ) (workplace) (cont.)</p>	<ul style="list-style-type: none"> <li>เบนซีน (Benzene) 1.10 µg/tube ถึง 420 µg/tube</li> <li>โทลูอีน (Toluene) 1.10 µg/tube ถึง 420 µg/tube</li> <li>โทโทไซลีน (Total xylenes) 2.20 µg/tube ถึง 840 µg/tube</li> <li>เมตา, พารา-ไซลีน (m, p- Xylene) 1.10 µg/tube ถึง 420 µg/tube</li> <li>ออร์โธ-ไซลีน (o- Xylene) 1.10 µg/tube ถึง 420 µg/tube</li> </ul>	<ul style="list-style-type: none"> <li>NIOSH Manual of Analytical Methods (NMAM), method 1501, 4<sup>th</sup> edition, 15<sup>th</sup> March 2003 (Exclude Sampling)</li> </ul>
<p>3. ปล่องระบายอากาศ (stack)</p>	<ul style="list-style-type: none"> <li>ซัลเฟอร์ไดออกไซด์ (Sulfur dioxide) 1.00 mg/L ถึง 16 000 mg/L (solution)</li> </ul>	<ul style="list-style-type: none"> <li>US.EPA, Code of Federal Regulations, 40 CFR 60 appendix A, method 6, July 2019 (Exclude Sampling)</li> </ul>

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สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
<p>สาขาส่งแวดล้อม (environmental field)</p> <p>3. ปล่องระบายอากาศ (ต่อ) (stack) (cont.)</p>	<ul style="list-style-type: none"> <li>ไฮโดรเจนฟลูออไรด์ (Hydrogen fluoride) 5 µg/sample ถึง 400 µg/sample</li> <li>ไฮโดรเจนคลอไรด์ (Hydrogen chloride) 5 µg/sample ถึง 400 µg/sample</li> </ul>	<ul style="list-style-type: none"> <li>WI-7.2-1-22 based on US.EPA, Code of Federal Regulations, 40 CFR 60 appendix A, method 26, 2019 (Exclude Sampling)</li> </ul>

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สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
<p>สาขาสิ่งแวดล้อม (environmental field)</p> <p>4. บรรยากาศทั่วไป (ambient air)</p>	<p>- สารอินทรีย์ระเหยง่าย (Volatile organic compounds, VOCs)</p> <ul style="list-style-type: none"> <li>คลอโรอีเทน (Chloroethene) 0.05 <math>\mu\text{g}/\text{m}^3</math> ถึง 51.00 <math>\mu\text{g}/\text{m}^3</math> (0.02 ppbv ถึง 20.00 ppbv)</li> <li>1,3-บิวทาไดเอน (1,3-butadiene) 0.04 <math>\mu\text{g}/\text{m}^3</math> ถึง 44.00 <math>\mu\text{g}/\text{m}^3</math> (0.02 ppbv ถึง 20.00 ppbv)</li> <li>โบรมอมีเทน (Bromomethane) 0.08 <math>\mu\text{g}/\text{m}^3</math> ถึง 77.00 <math>\mu\text{g}/\text{m}^3</math> (0.02 ppbv ถึง 20.00 ppbv)</li> <li>อะครอลีน (Acrolein) 0.05 <math>\mu\text{g}/\text{m}^3</math> ถึง 45.00 <math>\mu\text{g}/\text{m}^3</math> (0.02 ppbv ถึง 20.00 ppbv)</li> </ul>	<p>- WI-7.2-1-24 based on US EPA , Compendium Method TO-15 , EPA/625/R-96/010b, Second edition, January 1999</p>

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สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
<p>สาขาสิ่งแวดล้อม (environmental field)</p> <p>4. บรรยากาศทั่วไป (ต่อ) (ambient air) (cont.)</p>	<p>- สารอินทรีย์ระเหยง่าย (Volatile organic compounds, VOCs)</p> <ul style="list-style-type: none"> <li>อะคริโลไนไตรล์ (Acrylonitrile) 0.04 <math>\mu\text{g}/\text{m}^3</math> ถึง 43.00 <math>\mu\text{g}/\text{m}^3</math> (0.02 ppbv ถึง 20.00 ppbv)</li> <li>ไดคลอโรมีเทน (Dichloromethane) 0.14 <math>\mu\text{g}/\text{m}^3</math> to 69.00 <math>\mu\text{g}/\text{m}^3</math> (0.04 ppbv ถึง 20.00 ppbv)</li> <li>คาร์บอนไดซัลไฟด์ (Carbon disulfide) 0.06 <math>\mu\text{g}/\text{m}^3</math> ถึง 62.00 <math>\mu\text{g}/\text{m}^3</math> (0.02 ppbv ถึง 20.00 ppbv)</li> <li>ไตรคลอโรมีเทน (Trichloromethane) 0.20 <math>\mu\text{g}/\text{m}^3</math> ถึง 97.00 <math>\mu\text{g}/\text{m}^3</math> (0.04 ppbv ถึง 20.00 ppbv)</li> <li>1,2-ไดคลอโรอีเทน (1,2-dichloroethane) 0.08 <math>\mu\text{g}/\text{m}^3</math> ถึง 80.00 <math>\mu\text{g}/\text{m}^3</math> (0.02 ppbv ถึง 20.00 ppbv)</li> </ul>	<p>- WI-7.2-1-24 based on US EPA , Compendium Method TO-15 , EPA/625/R-96/010b, Second edition, January 1999</p>

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ฉบับที่ 02  
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สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
<p>สาขาส่งแวดล้อม (environmental field)</p> <p>4. บรรยากาศทั่วไป (ต่อ) (ambient air) (cont.)</p>	<p>- สารอินทรีย์ระเหยง่าย (Volatile organic compounds, VOCs)</p> <ul style="list-style-type: none"> <li>เบนซีน (Benzene) 0.06 <math>\mu\text{g}/\text{m}^3</math> ถึง 63.00 <math>\mu\text{g}/\text{m}^3</math> (0.02 ppbv ถึง 20.00 ppbv)</li> <li>คาร์บอนเตตระคลอไรด์ (Carbon tetrachloride) 0.25 <math>\mu\text{g}/\text{m}^3</math> ถึง 125 <math>\mu\text{g}/\text{m}^3</math> (0.04 ppbv ถึง 20.00 ppbv)</li> <li>ไตรคลอโรเอทิลีน (Trichloroethylene) 0.21 <math>\mu\text{g}/\text{m}^3</math> ถึง 107 <math>\mu\text{g}/\text{m}^3</math> (0.04 ppbv ถึง 20.00 ppbv)</li> <li>1,2-ไดคลอโรโพรเพน (1,2-dichloropropane) 0.18 <math>\mu\text{g}/\text{m}^3</math> ถึง 92.00 <math>\mu\text{g}/\text{m}^3</math> (0.04 ppbv ถึง 20.00 ppbv)</li> <li>เตตระคลอโรเอทิลีน (Tetrachloroethylene) 0.27 <math>\mu\text{g}/\text{m}^3</math> ถึง 135 <math>\mu\text{g}/\text{m}^3</math> (0.04 ppbv ถึง 20.00 ppbv)</li> </ul>	<p>- WI-7.2-1-24 based on US EPA , Compendium Method TO-15 , EPA/625/R-96/010b, Second edition, January 1999</p>

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สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
<p>สาขาส่งแวดล้อม (environmental field)</p> <p>4. บรรยากาศทั่วไป (ต่อ) (ambient air) (cont.)</p>	<p>- สารอินทรีย์ระเหยง่าย (Volatile organic compounds ,VOCs)</p> <ul style="list-style-type: none"> <li>1,2-ไดโบรมออีเทน (1,2-dibromoethane) 0.31 <math>\mu\text{g}/\text{m}^3</math> ถึง 153 <math>\mu\text{g}/\text{m}^3</math> (0.04 ppbv ถึง 20.00 ppbv)</li> <li>1,1,2,2-เตตระคลอโรอีเทน (1,1,2,2-tetrachloroethane) 0.69 <math>\mu\text{g}/\text{m}^3</math> ถึง 137 <math>\mu\text{g}/\text{m}^3</math> (0.10 ppbv ถึง 20.00 ppbv)</li> <li>เบนซิลคลอไรด์ (Benzyl chloride) 0.52 <math>\mu\text{g}/\text{m}^3</math> ถึง 103 <math>\mu\text{g}/\text{m}^3</math> (0.10 ppbv ถึง 20.00 ppbv)</li> <li>1,4-ไดคลอโรเบนซีน (1,4-dichlorobenzene) 0.24 <math>\mu\text{g}/\text{m}^3</math> ถึง 120 <math>\mu\text{g}/\text{m}^3</math> (0.04 ppbv ถึง 20.00 ppbv)</li> </ul>	<p>- WI-7.2-1-24 based on US EPA , Compendium Method TO-15 , EPA/625/R-96/010b, Second edition, January 1999</p>

ภาคผนวก ข

ใบอนุญาตเป็นนิติบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์การทำงาน  
จากกรมสวัสดิการและคุ้มครองแรงงาน



แบบ กก.บุญ  
นิติบุคคล

กรมสวัสดิการและคุ้มครองแรงงาน  
ใบอนุญาต  
เป็นนิติบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์สภาพการทำงานเกี่ยวกับระดับเสียง

ใบอนุญาตเลขที่ ๑๙๑๓-๑๓-๒๕๖๕-๑๑๙๘

อนุญาตให้.....บริษัท ซีแอล จำกัด.....

เลขทะเบียนนิติบุคคล ๑๑๑๕๕๖๖๐๐๐๗๖.....

ตั้งอยู่เลขที่ ๒๗๙ ถนนวิมลจันทน์ แขวงบางซื่อ เขตบางซื่อ กรุงเทพมหานคร.....

เป็นนิติบุคคลผู้ให้บริการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน ตามกฎกระทรวงกำหนดมาตรฐานในการบริหาร จัดการ และดำเนินการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงานเกี่ยวกับความร้อน แสงสว่าง และเสียง พ.ศ. ๒๕๕๙ ในการตรวจวัดและวิเคราะห์สภาพการทำงานเกี่ยวกับระดับเสียง ประกอบกับกฎกระทรวงการขึ้นทะเบียนและการอนุญาตให้บริการเพื่อส่งเสริม ความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน พ.ศ. ๒๕๖๔ แห่งพระราชบัญญัติความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน พ.ศ. ๒๕๕๔ โดยมีบุคลากร จำนวน ๕ ราย ดังรายชื่อแนบท้ายใบอนุญาตนี้

ทั้งนี้ ตั้งแต่วันที่ ๑๗ มิถุนายน พ.ศ. ๒๕๖๕ ถึงวันที่ ๑๖ มิถุนายน พ.ศ. ๒๕๖๘

ให้ไว้ ณ วันที่ ๑๗ มิถุนายน พ.ศ. ๒๕๖๕

(นายสมพจน์ กวางแก้ว)  
รองอธิบดี ปฏิบัติราชการแทน  
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

เลขทะเบียนควบคุม

๒-๑๓-๑๙๐๓-๑๙๘-๑๓-๒๕

(ลงนาม)..... (นายทะเบียน)

(นายศักดิ์ศิลป์ คุณาธร)

ตำแหน่ง ผู้อำนวยการกองความปลอดภัยแรงงาน

รายชื่อบุคลากรแนบท้ายใบอนุญาต  
เป็นนิติบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์สภาวะการทำงานเกี่ยวกับระดับเสียง  
ของบริษัท ซีคอท จำกัด

ใบอนุญาตเลขที่ ๐๙/๐๓-๐๓-๒๕๖๕-๐๐๔๘

- |                   |               |
|-------------------|---------------|
| ๑. นางสาวสุนันทา  | ศิริวัฒนานนท์ |
| ๒. นางสาวกนิษฐา   | เจริญเชื้อ    |
| ๓. นางสาวปัทมวรรณ | สุวรรณวิโรจน์ |
| ๔. นางสาวอลิษา    | คณิธรานนท์    |
| ๕. นางสาวชนิตา    | หล้าสาย       |

ทั้งนี้ ตั้งแต่วันที่ ๑๗ มิถุนายน พ.ศ. ๒๕๖๕ ถึงวันที่ ๑๖ มิถุนายน พ.ศ. ๒๕๖๘

ให้ไว้ ณ วันที่ ๑๗ มิถุนายน พ.ศ. ๒๕๖๕



(นายสมพนธ์ กวางแก้ว)

รองอธิบดี ปฏิบัติราชการแทน  
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

รายชื่อบุคลากร (เพิ่มเติม)  
แนบท้ายใบอนุญาตเป็นนิติบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์สภาวะการทำงานเกี่ยวกับระดับเสียง  
ของบริษัท ซีคอท จำกัด

ใบอนุญาตเลขที่ ๐๙/๐๓-๐๓-๒๕๖๕-๐๐๔๘

- |                   |             |
|-------------------|-------------|
| ๑. นางสาวศลิษา    | อินริย์     |
| ๒. นางสาวมาริยาณี | ฮานว        |
| ๓. นางสาววิระยา   | ปัจฉิมบุรณ์ |

ทั้งนี้ ตั้งแต่วันที่ ๑๙ มกราคม พ.ศ. ๒๕๖๖ ถึงวันที่ ๑๖ มิถุนายน พ.ศ. ๒๕๖๘

ให้ไว้ ณ วันที่ ๑๙ มกราคม พ.ศ. ๒๕๖๖



(นายสมพนธ์ กวางแก้ว)

รองอธิบดี ปฏิบัติราชการแทน  
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน