



บริษัท ซีเอ็นพีซีเอชเค (ไทยแลนด์) จำกัด

รายงานผลการปฏิบัติตามมาตรการป้องกันและแก้ไขผลกระทบสิ่งแวดล้อม และมาตรการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม
โครงการผลิตปิโตรเลียม แปลงสัมปทานปิโตรเลียมบนบกหมายเลข L21/43
ตั้งอยู่ที่อำเภอศรีราชา จังหวัดชลบุรี และอำเภอลานกระบือ จังหวัดกำแพงเพชร
ฉบับเดือนมกราคม - ธันวาคม พ.ศ.2567

ภาคผนวก ง

ผลการตรวจวัดคุณภาพสิ่งแวดล้อม



บริษัท ซีเอ็นพีซีเอชเค (ไทยแลนด์) จำกัด

รายงานผลการปฏิบัติตามมาตรการป้องกันและแก้ไขผลกระทบสิ่งแวดล้อม และมาตรการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม
โครงการผลิตปิโตรเลียม แพลงสัมปทานปิโตรเลียมบนบกหมายเลข L21/43
ตั้งอยู่ที่อำเภอศรีราชา จังหวัดชลบุรี และอำเภอสาทรบุรี จังหวัดกำแพงเพชร
ฉบับเดือนมกราคม – ธันวาคม พ.ศ.2567

ภาคผนวก ง.1

ระดับเสียง

ฤดูแล้ง

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตบิโตรเคียว แป้งสาลีพื๋านบิโตรเคียวแบบกมหมายเลข L21/43 ตั้งอยู่สำเภอศิรมาศ จังหวัสุโขทัย และสำเภอลานกระบือ จังหวัค้ำแพงเพชร
Project Location : จังหวัสุโขทัย และจังหวัค้ำแพงเพชร
Measured Source : Ambient Noise
Measured Point : สถานีผลิต BY-AIR1 : โรงเรียนบ้านบึงนกั (บึงที่ 8 ตำบลหนองจัก สำเภอศิรมาศ จังหวัสุโขทัย)
GPS. Coordinate : UTM (WGS84) 47Q 0584805 E, 1846929 N
Measured Date : March 31-April 1, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : Integrating Sound Level Meter Scarlet Tech Model ST-11D Serial Number 820938

Quotation No. : AR2024-00461
Analysis No. : 2024-AB573-014
Report No. : 2024-RAAH099
Report Date : April 24, 2024

Interval Time	Noise Level, dB(A)					
	Leq	Lmax	L5	L10	L50	L90
13:00-14:00	48.2	75.4	49.1	48.6	40.3	37.3
14:00-15:00	43.1	69.5	45.0	44.3	38.7	35.8
15:00-16:00	47.7	73.3	52.7	50.0	39.9	36.3
16:00-17:00	47.8	75.0	53.3	49.5	40.2	36.7
17:00-18:00	50.6	74.0	54.9	51.2	43.3	38.9
18:00-19:00	45.8	65.5	49.4	48.4	44.7	40.3
19:00-20:00	56.5	65.4	58.3	58.1	56.3	53.2
20:00-21:00	57.0	65.5	58.5	58.3	56.8	53.4
21:00-22:00	56.1	60.4	58.2	57.9	56.0	52.4
22:00-23:00	54.3	59.4	57.4	56.9	53.6	51.1
23:00-00:00	52.4	59.1	54.9	54.1	52.3	49.5
00:00-01:00	48.8	57.9	51.8	51.5	47.5	45.3
01:00-02:00	50.1	61.7	52.7	52.1	50.0	46.1
02:00-03:00	52.8	58.8	55.4	54.8	52.4	50.0
03:00-04:00	52.2	62.9	54.5	54.1	51.7	50.1
04:00-05:00	51.0	62.7	53.8	53.3	50.9	46.0
05:00-06:00	51.0	64.6	54.8	54.3	50.1	44.1
06:00-07:00	51.6	75.0	56.3	53.1	46.4	42.6
07:00-08:00	49.5	77.9	54.5	51.5	44.9	41.4
08:00-09:00	50.6	80.8	55.3	51.8	45.0	41.4
09:00-10:00	52.2	73.6	58.3	54.3	45.0	41.0
10:00-11:00	53.8	78.3	56.8	54.7	46.0	41.4
11:00-12:00	47.8	72.3	52.4	50.4	45.0	40.1
12:00-13:00	46.9	68.1	51.9	49.8	43.1	37.7
24 Hours Measurement	52.0	80.8	55.1	53.8	50.6	47.3
Standard ¹⁾	70	115	-	-	-	-
Ldn	58.3	-	-	-	-	-

Remark : ¹⁾ Notification of National Environmental Board, No.15, B.E.2540 (1997) under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.114 Part 270 dated April 3, B.E.2540 (1997).

(Ms.Supawan Suwannapa)
Laboratory Reviewer

(Ms.Thanida Bunrungrueang)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตบิโตรเคียว แป้งสาลีพื๋านบิโตรเคียวแบบกมหมายเลข L21/43 ตั้งอยู่สำเภอศิรมาศ จังหวัสุโขทัย และสำเภอลานกระบือ จังหวัค้ำแพงเพชร
Project Location : จังหวัสุโขทัย และจังหวัค้ำแพงเพชร
Measured Source : Ambient Noise
Measured Point : สถานีผลิต BY-AIR1 : โรงเรียนบ้านบึงนกั (บึงที่ 8 ตำบลหนองจัก สำเภอศิรมาศ จังหวัสุโขทัย)
GPS. Coordinate : UTM (WGS84) 47Q 0584805 E, 1846929 N
Measured Date : April 1-2, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : Integrating Sound Level Meter Scarlet Tech Model ST-11D Serial Number 820938

Quotation No. : AR2024-00461
Analysis No. : 2024-AB573-014
Report No. : 2024-RAAH099
Report Date : April 24, 2024

Interval Time	Noise Level, dB(A)					
	Leq	Lmax	L5	L10	L50	L90
13:00-14:00	46.4	70.1	51.0	48.0	42.2	38.4
14:00-15:00	47.0	74.5	50.5	47.7	42.1	37.6
15:00-16:00	47.2	69.9	52.0	48.2	40.8	36.5
16:00-17:00	46.0	68.2	50.4	47.4	41.2	37.6
17:00-18:00	50.6	75.6	59.4	55.3	42.3	38.1
18:00-19:00	45.1	73.9	49.1	45.9	43.1	39.6
19:00-20:00	57.7	62.0	59.9	59.7	57.6	49.7
20:00-21:00	58.3	62.0	60.3	60.0	58.2	55.1
21:00-22:00	56.4	59.6	58.1	57.9	56.0	54.2
22:00-23:00	55.1	59.1	56.9	55.5	55.0	53.3
23:00-00:00	56.1	68.7	58.6	58.1	55.9	53.0
00:00-01:00	54.0	58.7	56.6	55.2	53.8	47.5
01:00-02:00	52.2	69.3	55.5	54.7	51.9	47.5
02:00-03:00	51.6	57.2	54.1	53.4	51.4	48.3
03:00-04:00	48.7	70.5	52.2	51.5	46.3	45.0
04:00-05:00	50.9	58.9	54.3	53.3	50.7	44.8
05:00-06:00	51.2	67.7	55.0	54.3	50.0	42.3
06:00-07:00	50.3	75.3	54.9	52.1	45.3	41.6
07:00-08:00	50.7	73.0	56.1	53.7	45.5	41.2
08:00-09:00	52.1	75.1	58.6	55.7	45.9	40.9
09:00-10:00	50.2	71.5	56.0	53.4	44.4	40.1
10:00-11:00	46.0	70.0	52.0	48.4	41.2	37.8
11:00-12:00	48.2	67.8	53.8	51.9	43.4	38.7
12:00-13:00	44.5	68.6	49.7	47.1	40.4	36.9
24 Hours Measurement	52.5	75.6	56.0	54.8	51.5	47.8
Standard ¹⁾	70	115	-	-	-	-
Ldn	59.2	-	-	-	-	-

Remark : ¹⁾ Notification of National Environmental Board, No.15, B.E.2540 (1997) under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.114 Part 270 dated April 3, B.E.2540 (1997).

(Ms.Supawan Suwannapa)
Laboratory Reviewer

(Ms.Thanida Bunrungrueang)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Sol 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการพัฒนาศูนย์ฝึกอบรมและส่งเสริมอาชีพเกษตรกรและผู้นำชุมชน จังหวัดสุโขทัย
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Noise
Measured Point : สถานีผลิต BY-AIR1 : โรงเรือนบ้านวังนกหว้า (หมู่ที่ 8 ตำบลหนองจิก อำเภอศรีนคร จังหวัดสุโขทัย)
GPS. Coordinate : UTM (WGS84) 47Q 0584805 E, 1846929 N
Measured Date : April 2-3, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : Integrating Sound Level Meter Scarlet Tech Model ST-11D Serial Number 820938

Quotation No. : AR2024-00461
Analysis No. : 2024-AB573-014
Report No. : 2024-RAAH099
Report Date : April 24, 2024

Interval Time	Noise Level, dB(A)					
	Leq	Lmax	L5	L10	L50	L90
13:00-14:00	46.1	71.2	49.3	47.2	39.9	36.5
14:00-15:00	47.6	68.3	53.1	51.0	42.4	37.2
15:00-16:00	50.1	71.9	55.3	51.2	44.5	40.7
16:00-17:00	47.5	75.2	51.4	49.1	42.9	39.2
17:00-18:00	48.3	73.6	54.1	52.1	43.5	38.7
18:00-19:00	53.0	76.8	53.9	53.6	46.1	42.8
19:00-20:00	56.4	60.5	58.7	58.5	56.3	49.3
20:00-21:00	57.0	72.3	58.2	58.0	56.8	54.7
21:00-22:00	56.3	65.4	57.3	57.1	56.0	55.0
22:00-23:00	56.2	60.7	57.5	57.2	56.1	54.7
23:00-00:00	56.0	60.2	57.5	57.1	55.8	54.2
00:00-01:00	52.8	71.2	56.4	54.4	49.8	47.4
01:00-02:00	53.7	69.5	56.3	55.5	53.0	49.8
02:00-03:00	53.7	59.5	56.2	55.7	53.4	50.7
03:00-04:00	52.5	70.9	54.1	53.6	51.4	47.3
04:00-05:00	53.1	71.3	55.2	54.4	50.7	42.8
05:00-06:00	54.6	71.5	58.3	55.9	50.8	42.7
06:00-07:00	50.8	73.7	56.2	53.7	46.5	42.7
07:00-08:00	51.5	79.3	56.7	54.1	47.3	42.7
08:00-09:00	56.9	79.2	51.6	60.0	46.5	41.5
09:00-10:00	49.9	71.4	55.1	52.4	44.5	40.5
10:00-11:00	46.6	70.2	51.2	48.4	42.0	38.3
11:00-12:00	48.3	68.7	53.4	49.3	41.4	37.6
12:00-13:00	47.4	68.0	52.8	48.8	40.8	36.6
24 Hours Measurement	53.2	79.3	56.2	54.9	51.4	48.6
Standard 1 ¹	70	115	-	-	-	-
Ldn	60.3	-	-	-	-	-

Remark : ¹ Notification of National Environmental Board, No.15, B.E.2540 (1997) under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.114 Part 27D dated April 3, B.E.2540 (1997).

(Ms.Supawan Suwannapa)
Laboratory Reviewer

(Ms.Thanida Bunrungruang)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Sol 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการพัฒนาศูนย์ฝึกอบรมและส่งเสริมอาชีพเกษตรกรและผู้นำชุมชน จังหวัดสุโขทัย
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Noise
Measured Point : สถานีผลิต BY-AIR2 : บ้านเลขที่ 189 หมู่บ้านนิคมพัฒนา (หมู่ที่ 8 ตำบลหนองจิก อำเภอศรีนคร จังหวัดสุโขทัย)
GPS. Coordinate : UTM (WGS84) 47Q 0583262 E, 1846488 N
Measured Date : March 31-April 1, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : Integrating Sound Level Meter Scarlet Tech Model ST-11D Serial Number 820802

Quotation No. : AR2024-00461
Analysis No. : 2024-AB573-015
Report No. : 2024-RAAH100
Report Date : April 24, 2024

Interval Time	Noise Level, dB(A)					
	Leq	Lmax	L5	L10	L50	L90
09:00-10:00	55.5	79.9	62.0	55.9	50.2	50.0
10:00-11:00	55.2	77.2	58.1	56.3	47.4	46.3
11:00-12:00	54.8	78.5	56.2	55.1	50.3	49.3
12:00-13:00	53.6	77.0	56.2	54.3	44.8	44.0
13:00-14:00	54.4	77.8	57.2	56.0	45.3	44.6
14:00-15:00	52.3	77.8	55.1	52.7	45.0	43.6
15:00-16:00	56.8	80.9	58.5	57.2	49.2	49.0
16:00-17:00	56.7	82.0	60.6	58.2	47.6	47.0
17:00-18:00	55.9	79.8	59.2	56.6	47.4	46.0
18:00-19:00	49.4	71.9	53.6	52.7	44.9	42.9
19:00-20:00	52.1	67.5	54.4	54.1	52.0	45.4
20:00-21:00	48.3	64.0	53.4	52.8	45.9	44.2
21:00-22:00	44.3	59.4	46.9	45.7	43.5	42.7
22:00-23:00	47.8	64.4	51.7	51.0	46.0	44.1
23:00-00:00	48.3	64.1	51.1	49.2	47.2	45.2
00:00-01:00	47.4	60.7	50.0	49.6	46.5	45.4
01:00-02:00	44.3	65.5	46.5	44.7	42.7	41.1
02:00-03:00	47.8	70.1	50.6	49.4	44.9	41.7
03:00-04:00	46.6	74.4	50.1	47.0	43.5	41.0
04:00-05:00	52.8	77.2	53.6	53.0	46.3	45.0
05:00-06:00	63.9	82.3	72.1	67.6	55.3	54.2
06:00-07:00	63.4	82.7	71.3	64.4	56.1	55.6
07:00-08:00	59.3	79.2	65.5	63.3	56.6	55.1
08:00-09:00	58.2	78.0	64.0	61.2	58.0	42.0
24 Hours Measurement	56.2	82.7	62.6	59.2	50.8	48.5
Standard 1 ¹	70	115	-	-	-	-
Ldn	63.7	-	-	-	-	-

Remark : ¹ Notification of National Environmental Board, No.15, B.E.2540 (1997) under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.114 Part 27D dated April 3, B.E.2540 (1997).

(Ms.Supawan Suwannapa)
Laboratory Reviewer

(Ms.Thanida Bunrungruang)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตบิโตรเลียณ แปลงสัมปทานบิโตรเลียณบกหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย และอำเภอลานกระบือ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Noise
Measured Point : สถานีผลิต BY-AIR2 : บ้านเลขที่ 189 หมู่บ้านนิคมพัฒนา (หมู่ที่ 8 ตำบลหนองจิก อำเภอศรีนคร จังหวัดสุโขทัย)
GPS. Coordinate : UTM (WGS84) 47Q 0583262 E, 1846488 N
Measured Date : April 1-2, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : Integrating Sound Level Meter Scarlet Tech Model ST-11D Serial Number 820802

Quotation No. : AR2024-00461
Analysis No. : 2024-AB573-015
Report No. : 2024-RAAH100
Report Date : April 24, 2024

Interval Time	Noise Level, dB(A)					
	Leq	Lmax	L5	L10	L50	L90
09:00-10:00	58.8	79.0	64.8	59.6	55.6	54.0
10:00-11:00	58.6	82.6	62.5	60.3	57.0	56.0
11:00-12:00	61.4	82.4	69.1	62.3	56.3	56.1
12:00-13:00	54.8	78.0	56.6	55.3	52.3	52.0
13:00-14:00	57.2	79.9	61.6	58.2	57.0	56.6
14:00-15:00	52.5	77.2	55.3	54.1	45.7	43.4
15:00-16:00	56.6	80.2	58.5	57.2	55.3	54.0
16:00-17:00	60.5	83.0	64.6	61.5	56.3	55.0
17:00-18:00	61.4	83.0	67.3	62.3	55.2	55.0
18:00-19:00	53.7	77.7	56.8	55.3	45.8	44.0
19:00-20:00	48.1	61.4	49.9	49.2	48.0	45.4
20:00-21:00	50.9	64.9	53.9	53.0	50.3	47.5
21:00-22:00	52.9	65.7	56.8	56.2	52.2	48.6
22:00-23:00	55.5	59.2	57.3	57.1	55.4	49.5
23:00-00:00	45.4	63.3	48.0	47.4	44.3	41.9
00:00-01:00	50.0	64.8	51.8	51.4	49.7	48.1
01:00-02:00	50.9	62.8	52.9	52.3	50.8	48.1
02:00-03:00	48.8	74.8	50.1	49.3	47.0	42.2
03:00-04:00	49.4	76.1	52.3	51.2	45.7	40.2
04:00-05:00	54.5	79.2	55.0	54.6	50.3	50.0
05:00-06:00	64.0	81.1	72.2	67.4	55.3	55.0
06:00-07:00	63.9	81.3	71.8	67.6	60.3	59.6
07:00-08:00	59.4	79.2	55.9	60.5	58.2	58.0
08:00-09:00	67.3	84.6	74.8	71.1	60.5	59.0
24 Hours Measurement	59.1	84.6	65.9	61.8	54.9	53.8
Standard ¹⁾	70	115	-	-	-	-
Ldn	64.9	-	-	-	-	-

Remark : ¹⁾ Notification of National Environmental Board, No.15, B.E.2540 (1997) under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.114 Part 27D dated April 3, B.E.2540 (1997).



(Ms. Supawan Suwannapa)
Laboratory Reviewer



(Ms. Thanida Bunrungrueang)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตบิโตรเลียณ แปลงสัมปทานบิโตรเลียณบกหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย และอำเภอลานกระบือ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Noise
Measured Point : สถานีผลิต BY-AIR2 : บ้านเลขที่ 189 หมู่บ้านนิคมพัฒนา (หมู่ที่ 8 ตำบลหนองจิก อำเภอศรีนคร จังหวัดสุโขทัย)
GPS. Coordinate : UTM (WGS84) 47Q 0583262 E, 1846488 N
Measured Date : April 2-3, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : Integrating Sound Level Meter Scarlet Tech Model ST-11D Serial Number 820802

Quotation No. : AR2024-00461
Analysis No. : 2024-AB573-015
Report No. : 2024-RAAH100
Report Date : April 24, 2024

Interval Time	Noise Level, dB(A)					
	Leq	Lmax	L5	L10	L50	L90
09:00-10:00	60.3	81.5	66.7	62.3	52.3	51.0
10:00-11:00	58.1	79.3	60.3	59.0	55.3	55.0
11:00-12:00	53.5	76.5	54.3	53.6	45.6	44.3
12:00-13:00	48.5	74.5	51.2	49.0	42.3	38.7
13:00-14:00	51.4	78.2	53.2	52.0	42.6	42.0
14:00-15:00	53.9	77.9	55.6	54.0	52.3	50.0
15:00-16:00	52.6	78.1	55.2	53.0	44.3	43.0
16:00-17:00	59.3	81.6	61.8	60.0	50.6	50.0
17:00-18:00	54.1	79.1	57.9	54.3	48.4	45.5
18:00-19:00	54.4	72.0	60.8	59.2	47.7	45.0
19:00-20:00	49.7	70.9	53.9	52.2	46.0	43.8
20:00-21:00	51.1	64.0	53.4	53.0	50.7	44.0
21:00-22:00	50.6	59.3	53.4	53.1	50.3	43.9
22:00-23:00	51.1	63.7	53.9	53.5	50.2	45.3
23:00-00:00	46.1	61.6	50.7	49.8	44.0	41.4
00:00-01:00	46.6	65.5	48.8	47.8	46.0	42.1
01:00-02:00	45.3	60.6	47.7	47.3	43.2	42.1
02:00-03:00	45.3	59.0	47.8	47.5	44.5	41.8
03:00-04:00	46.8	71.6	50.4	48.2	41.2	40.4
04:00-05:00	54.1	77.4	56.6	55.3	50.3	46.6
05:00-06:00	60.3	80.4	63.2	61.0	53.2	53.0
06:00-07:00	61.2	80.3	69.4	63.1	53.0	52.0
07:00-08:00	59.4	77.6	66.7	61.7	50.3	50.0
08:00-09:00	58.1	79.0	63.5	59.0	52.3	50.1
24 Hours Measurement	55.6	81.6	61.0	57.2	49.8	48.1
Standard ¹⁾	70	115	-	-	-	-
Ldn	61.7	-	-	-	-	-

Remark : ¹⁾ Notification of National Environmental Board, No.15, B.E.2540 (1997) under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.114 Part 27D dated April 3, B.E.2540 (1997).



(Ms. Supawan Suwannapa)
Laboratory Reviewer



(Ms. Thanida Bunrungrueang)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปิโตรเลียม แปลงสัมปทานปิโตรเลียมแบบกมหายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย
Project Location : และอำเภอสามกระบือ จังหวัดกำแพงเพชร
Measured Source : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Point : Ambient Noise
Measured Point : ฐานหลุมผลิต NS-AIR1 : บ้านประจักษ์เจริญ (บ้านเลขที่ 28 หมู่บ้านประจักษ์เจริญ หมู่ที่ 8 ตำบลหนองหลวง อำเภอสามกระบือ จังหวัดกำแพงเพชร)
GPS. Coordinate : UTM (WGS84) 47Q 0584195 E, 1839432 N
Measured Date : March 31-April 1, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : Integrating Sound Level Meter Scarlet Tech Model ST-11D Serial Number 820863

Quotation No. : AR2024-00461
Analysis No. : 2024-AB573-016
Report No. : 2024-RAAH101
Report Date : April 24, 2024

Interval Time	Noise Level, dB(A)					
	Leq	Lmax	L5	L10	L50	L90
12:00-13:00	70.6	99.2	83.2	81.0	61.5	54.2
13:00-14:00	68.6	98.0	73.6	70.9	59.6	52.4
14:00-15:00	67.6	89.0	74.3	72.1	60.5	52.6
15:00-16:00	67.4	95.3	72.5	70.3	58.4	52.1
16:00-17:00	69.5	96.8	74.4	71.9	61.9	54.8
17:00-18:00	71.2	99.4	75.4	73.2	64.8	58.2
18:00-19:00	70.8	90.2	76.9	74.5	65.3	57.2
19:00-20:00	68.9	89.9	75.0	72.7	63.5	57.4
20:00-21:00	68.4	92.3	74.1	71.5	63.1	60.1
21:00-22:00	66.7	83.0	73.0	69.5	62.2	60.7
22:00-23:00	66.0	82.6	70.9	67.9	63.4	62.4
23:00-00:00	67.0	90.5	69.9	68.0	62.2	60.4
00:00-01:00	63.0	86.8	64.0	63.3	59.1	57.5
01:00-02:00	62.0	85.4	65.4	62.3	57.7	55.9
02:00-03:00	63.9	79.9	65.8	65.0	63.0	59.4
03:00-04:00	64.6	82.2	66.2	65.3	63.3	61.3
04:00-05:00	62.5	82.8	66.8	62.6	59.0	56.0
05:00-06:00	65.1	85.3	72.5	68.2	55.1	52.5
06:00-07:00	70.5	91.4	76.5	74.3	65.0	58.5
07:00-08:00	72.1	91.3	78.3	76.0	65.3	57.4
08:00-09:00	70.5	93.9	76.1	74.3	66.5	62.1
09:00-10:00	68.9	90.6	74.5	72.3	63.9	56.5
10:00-11:00	69.1	85.9	75.4	73.1	63.5	57.1
11:00-12:00	69.4	91.1	75.1	73.1	63.2	56.7
24 Hours Measurement	68.5	99.4	75.1	72.8	62.9	58.2
Standard ¹⁾	70	115	-	-	-	-
Ldn	73.0	-	-	-	-	-

Remark : ¹⁾ Notification of National Environmental Board, No.15, B.E.2540 (1997) under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.114 Part 27D dated April 3, B.E.2540 (1997).

(Ms.Supawan Suwannapa)
Laboratory Reviewer

(Ms.Thanida Bunrungrueang)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปิโตรเลียม แปลงสัมปทานปิโตรเลียมแบบกมหายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย
Project Location : และอำเภอสามกระบือ จังหวัดกำแพงเพชร
Measured Source : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Point : Ambient Noise
Measured Point : ฐานหลุมผลิต NS-AIR1 : บ้านประจักษ์เจริญ (บ้านเลขที่ 28 หมู่บ้านประจักษ์เจริญ หมู่ที่ 8 ตำบลหนองหลวง อำเภอสามกระบือ จังหวัดกำแพงเพชร)
GPS. Coordinate : UTM (WGS84) 47Q 0584195 E, 1839432 N
Measured Date : April 1-2, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : Integrating Sound Level Meter Scarlet Tech Model ST-11D Serial Number 820863

Quotation No. : AR2024-00461
Analysis No. : 2024-AB573-016
Report No. : 2024-RAAH101
Report Date : April 24, 2024

Interval Time	Noise Level, dB(A)					
	Leq	Lmax	L5	L10	L50	L90
12:00-13:00	68.5	87.2	74.8	72.5	62.4	56.8
13:00-14:00	69.2	96.3	74.6	72.6	61.5	54.2
14:00-15:00	67.4	83.2	74.0	71.7	61.1	54.5
15:00-16:00	67.0	88.8	73.2	70.8	58.5	53.2
16:00-17:00	67.1	93.6	73.6	71.4	60.0	52.6
17:00-18:00	68.8	87.2	74.8	73.0	64.5	55.7
18:00-19:00	70.5	91.6	76.0	73.9	64.5	55.9
19:00-20:00	69.3	93.1	75.6	72.9	61.9	55.2
20:00-21:00	67.6	89.4	73.4	70.8	61.1	58.1
21:00-22:00	66.8	91.8	72.3	69.0	61.7	60.3
22:00-23:00	68.9	95.3	71.5	70.0	62.1	61.2
23:00-00:00	64.9	87.5	68.9	65.3	61.2	59.9
00:00-01:00	66.3	96.1	68.2	67.0	58.8	57.3
01:00-02:00	63.1	89.5	66.3	64.3	58.3	57.3
02:00-03:00	62.8	81.7	63.8	63.0	61.4	60.1
03:00-04:00	61.0	84.2	63.1	62.3	57.8	56.3
04:00-05:00	62.4	81.8	68.4	65.3	56.3	54.4
05:00-06:00	63.1	87.9	69.9	64.8	54.7	53.2
06:00-07:00	69.9	91.1	76.4	73.9	63.2	56.4
07:00-08:00	71.7	90.6	78.0	75.7	65.6	57.2
08:00-09:00	68.3	87.5	73.7	71.9	64.9	57.8
09:00-10:00	69.4	94.0	74.3	72.0	64.5	57.3
10:00-11:00	67.5	90.0	73.8	71.4	61.2	55.5
11:00-12:00	69.0	94.1	74.8	72.1	61.8	56.4
24 Hours Measurement	67.9	96.3	73.5	71.2	62.0	57.1
Standard ¹⁾	70	115	-	-	-	-
Ldn	72.7	-	-	-	-	-

Remark : ¹⁾ Notification of National Environmental Board, No.15, B.E.2540 (1997) under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.114 Part 27D dated April 3, B.E.2540 (1997).

(Ms.Supawan Suwannapa)
Laboratory Reviewer

(Ms.Thanida Bunrungrueang)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตซีเมนต์ แอลูมิเนียมไฮดรอกไซด์แบบบดหมายเลข L21/43 ตั้งอยู่ที่ท่าอากาศยาน จังหวัดสุโขทัย
Project Location : และท่าอากาศยานกระบี่ จังหวัดกระบี่ และจังหวัดกำแพงเพชร
Measured Source : Ambient Noise
Measured Point : ฐานหลุมหลุม NS-AIR1 : บ้านประจักษ์เจริญ (บ้านเลขที่ 28 หมู่บ้านประจักษ์เจริญ หมู่ที่ 8 ตำบลหนองหลวง อำเภอลานกระบี่ จังหวัดกำแพงเพชร)
GPS. Coordinate : UTM (WGS84) 47Q 0584195 E, 1839432 N
Measured Date : April 2-3, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : Integrating Sound Level Meter Scarlet Tech Model ST-11D Serial Number 820863

Interval Time	Noise Level, dB(A)					
	Leq	Lmax	L5	L10	L50	L90
12:00-13:00	66.8	92.3	72.9	70.8	60.5	54.8
13:00-14:00	67.3	90.9	73.6	71.1	59.8	53.6
14:00-15:00	67.8	90.0	73.3	71.0	60.3	54.3
15:00-16:00	67.7	91.7	73.8	70.8	60.1	54.0
16:00-17:00	66.5	90.6	72.1	69.7	59.2	53.5
17:00-18:00	71.0	92.3	76.9	74.8	65.5	56.4
18:00-19:00	69.1	88.7	75.1	73.4	63.6	56.3
19:00-20:00	67.0	90.0	73.1	70.7	61.1	54.9
20:00-21:00	65.4	85.5	71.8	68.9	58.6	56.3
21:00-22:00	65.5	85.0	71.8	68.6	60.2	59.1
22:00-23:00	63.7	79.4	69.1	66.3	60.6	59.5
23:00-00:00	63.3	81.5	68.0	64.6	60.4	59.1
00:00-01:00	62.9	82.1	66.2	65.3	59.3	58.2
01:00-02:00	62.9	83.3	66.0	63.2	59.9	58.2
02:00-03:00	65.5	89.0	66.3	66.0	63.3	61.5
03:00-04:00	61.8	80.5	63.5	62.6	60.5	58.5
04:00-05:00	60.9	81.0	65.3	63.1	55.0	51.9
05:00-06:00	63.4	83.0	70.7	66.7	52.5	50.3
06:00-07:00	69.2	89.1	75.8	73.4	62.7	55.5
07:00-08:00	70.4	96.4	75.4	73.4	64.0	57.2
08:00-09:00	68.0	85.6	74.1	72.1	62.7	53.8
09:00-10:00	66.6	84.9	72.8	70.5	61.1	53.8
10:00-11:00	67.1	88.5	73.4	71.1	61.0	53.4
11:00-12:00	74.0	96.1	76.8	75.3	62.5	55.5
24 Hours Measurement	67.6	96.4	72.9	70.7	61.3	56.6
Standard ^{1*}	70	115	-	-	-	-
Ldn	71.8	-	-	-	-	-

Remark : ^{1*} Notification of National Environmental Board, No.15, B.E.2540 (1997) under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.114 Part 27D dated April 3, B.E.2540 (1997).



(Ms. Supawan Suwannapa)
Laboratory Reviewer



(Ms. Thanida Bunrungrueang)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตซีเมนต์ แอลูมิเนียมไฮดรอกไซด์แบบบดหมายเลข L21/43 ตั้งอยู่ที่ท่าอากาศยาน จังหวัดสุโขทัย
Project Location : และท่าอากาศยานกระบี่ จังหวัดกระบี่ และจังหวัดกำแพงเพชร
Measured Source : Ambient Noise
Measured Point : ฐานหลุมหลุม NS-AIR2 : บ้านหนองไผ่แดง (บ้านเลขที่ 74/1 หมู่ที่ 7 ตำบลหนองหลวง อำเภอลานกระบี่ จังหวัดกำแพงเพชร)
GPS. Coordinate : UTM (WGS84) 47Q 0582515 E, 1839432 N
Measured Date : March 31-April 1, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : Integrating Sound Level Meter Scarlet Tech Model ST-11D Serial Number 820864

Interval Time	Noise Level, dB(A)					
	Leq	Lmax	L5	L10	L50	L90
13:00-14:00	58.2	84.9	65.0	61.2	48.0	45.3
14:00-15:00	52.4	79.6	55.5	53.0	46.8	44.6
15:00-16:00	52.5	80.4	55.7	53.3	46.9	44.1
16:00-17:00	49.0	68.1	53.5	51.5	46.8	44.5
17:00-18:00	51.5	82.0	55.4	53.0	48.2	46.1
18:00-19:00	52.2	73.3	56.0	53.5	49.0	46.9
19:00-20:00	52.9	76.3	54.5	53.7	51.0	47.3
20:00-21:00	52.7	59.9	53.8	53.5	52.6	51.8
21:00-22:00	51.9	66.6	52.7	52.5	51.8	51.3
22:00-23:00	52.1	64.6	52.9	52.6	51.9	51.4
23:00-00:00	51.6	57.6	52.4	52.2	51.5	50.9
00:00-01:00	51.5	60.3	52.3	52.0	51.4	50.8
01:00-02:00	51.3	59.5	52.4	52.2	51.2	50.5
02:00-03:00	51.4	60.3	52.2	52.0	51.3	50.6
03:00-04:00	51.0	60.7	51.9	51.6	50.9	50.3
04:00-05:00	50.9	62.1	51.9	51.4	50.6	49.9
05:00-06:00	51.0	63.6	54.3	52.1	50.0	48.4
06:00-07:00	57.7	82.8	62.0	59.0	50.8	47.5
07:00-08:00	55.2	83.9	60.0	57.8	51.3	48.3
08:00-09:00	58.2	86.2	60.2	59.0	51.1	48.1
09:00-10:00	54.0	81.3	58.7	56.2	49.2	46.6
10:00-11:00	51.4	70.4	55.8	53.9	48.8	45.9
11:00-12:00	51.7	78.5	55.3	53.6	49.3	46.3
12:00-13:00	54.0	80.7	57.6	55.2	50.5	47.4
24 Hours Measurement	53.5	86.2	57.2	55.0	50.3	48.7
Standard ^{1*}	70	115	-	-	-	-
Ldn	59.3	-	-	-	-	-

Remark : ^{1*} Notification of National Environmental Board, No.15, B.E.2540 (1997) under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.114 Part 27D dated April 3, B.E.2540 (1997).



(Ms. Supawan Suwannapa)
Laboratory Reviewer



(Ms. Thanida Bunrungrueang)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปิโตรเลียม แปลงสัมปทานปิโตรเลียมแบบกมหายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย
และอำเภอละหานทราย จังหวัดบุรีรัมย์
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Noise
Measured Point : ฐานหลุมผลิต NS-AIR2 : บ้านหนองไม้แดง
(บ้านเลขที่ 74/1 หมู่ที่ 7 ตำบลหนองหลวง อำเภอละหานทราย จังหวัดกำแพงเพชร)
GPS. Coordinate : UTM (WGS84) 47Q 0582515 E, 1839432 N
Measured Date : April 1-2, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : Integrating Sound Level Meter Scarlet Tech Model ST-11D Serial Number 820864

Quotation No. : AR2024-00461
Analysis No. : 2024-AB573-017
Report No. : 2024-RAAH102
Report Date : April 24, 2024

Interval Time	Noise Level, dB(A)					
	Leq	Lmax	L5	L10	L50	L90
13:00-14:00	50.6	76.0	54.9	53.3	48.7	45.6
14:00-15:00	48.9	73.2	52.6	51.0	47.0	44.9
15:00-16:00	50.3	84.7	53.4	50.9	46.2	44.1
16:00-17:00	52.4	75.5	56.7	53.5	47.8	45.6
17:00-18:00	56.4	89.0	60.9	57.0	49.5	46.9
18:00-19:00	51.8	76.4	56.2	53.4	49.2	47.4
19:00-20:00	54.0	89.4	55.1	54.3	51.1	47.6
20:00-21:00	53.8	73.0	57.3	55.4	52.1	51.1
21:00-22:00	52.5	65.6	55.1	53.8	51.7	51.1
22:00-23:00	51.7	66.0	52.7	52.2	51.4	50.8
23:00-00:00	51.6	55.2	52.6	52.3	51.5	50.7
00:00-01:00	50.9	57.7	52.0	51.7	50.7	49.8
01:00-02:00	50.0	61.6	51.2	50.8	49.7	48.7
02:00-03:00	49.9	62.2	50.8	50.5	49.6	48.9
03:00-04:00	50.1	56.5	51.5	51.1	50.0	49.1
04:00-05:00	49.8	62.4	51.1	50.4	49.4	48.5
05:00-06:00	50.3	63.9	55.5	53.3	48.0	46.4
06:00-07:00	58.1	80.5	60.2	59.0	50.9	46.6
07:00-08:00	55.9	75.3	61.9	59.0	51.1	47.6
08:00-09:00	54.5	73.2	59.3	57.2	50.8	47.0
09:00-10:00	56.2	82.3	59.4	56.4	48.7	45.4
10:00-11:00	51.7	75.1	56.8	54.4	48.0	45.3
11:00-12:00	58.4	89.1	60.4	59.0	49.1	45.8
12:00-13:00	56.9	80.2	62.3	59.7	51.1	45.9
24 Hours Measurement	53.8	89.4	57.3	55.2	50.0	48.0
Standard ¹⁾	70	115	-	-	-	-
Ldn	59.2	-	-	-	-	-

Remark : ¹⁾ Notification of National Environmental Board, No.15, B.E.2540 (1997) under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.114 Part 27D dated April 3, B.E.2540 (1997).



(Ms. Supawan Suwannapa)

Laboratory Reviewer



(Ms. Thanida Bunrungrueang)

Laboratory Supervisor

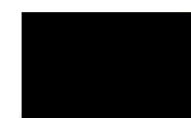
ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปิโตรเลียม แปลงสัมปทานปิโตรเลียมแบบกมหายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย
และอำเภอละหานทราย จังหวัดบุรีรัมย์
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Noise
Measured Point : ฐานหลุมผลิต NS-AIR2 : บ้านหนองไม้แดง
(บ้านเลขที่ 74/1 หมู่ที่ 7 ตำบลหนองหลวง อำเภอละหานทราย จังหวัดกำแพงเพชร)
GPS. Coordinate : UTM (WGS84) 47Q 0582515 E, 1839432 N
Measured Date : April 2-3, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : Integrating Sound Level Meter Scarlet Tech Model ST-11D Serial Number 820864

Quotation No. : AR2024-00461
Analysis No. : 2024-AB573-017
Report No. : 2024-RAAH102
Report Date : April 24, 2024

Interval Time	Noise Level, dB(A)					
	Leq	Lmax	L5	L10	L50	L90
13:00-14:00	54.8	76.4	60.8	57.9	49.2	44.9
14:00-15:00	48.8	70.0	53.3	53.9	45.7	44.4
15:00-16:00	50.5	74.2	55.1	52.4	46.3	44.8
16:00-17:00	55.0	80.5	60.3	57.2	49.1	45.5
17:00-18:00	52.6	72.3	57.7	54.9	49.5	47.2
18:00-19:00	53.1	72.7	57.6	55.5	50.2	47.6
19:00-20:00	57.1	83.2	62.2	59.9	53.4	48.9
20:00-21:00	58.5	77.0	64.2	61.6	54.2	51.8
21:00-22:00	54.9	75.9	59.2	55.3	52.3	51.6
22:00-23:00	51.7	67.5	52.4	52.3	51.6	51.0
23:00-00:00	51.8	63.3	52.7	52.4	51.5	51.0
00:00-01:00	51.5	58.3	52.4	52.2	51.4	50.6
01:00-02:00	51.9	62.4	52.8	52.6	51.8	51.1
02:00-03:00	51.0	61.6	52.0	51.7	50.9	50.0
03:00-04:00	51.1	59.0	52.0	51.8	51.0	50.2
04:00-05:00	50.8	62.7	51.7	51.3	50.4	49.5
05:00-06:00	50.5	63.9	55.2	52.9	48.3	46.7
06:00-07:00	56.4	80.9	60.5	58.4	50.2	47.1
07:00-08:00	54.8	77.2	59.5	57.5	50.9	47.6
08:00-09:00	55.3	80.0	59.2	56.6	49.9	47.3
09:00-10:00	52.8	73.5	57.5	55.5	49.5	46.2
10:00-11:00	52.3	70.8	58.4	55.3	46.1	40.6
11:00-12:00	50.1	68.1	55.8	53.2	45.5	39.5
12:00-13:00	63.9	83.1	68.3	65.3	55.6	40.5
24 Hours Measurement	55.1	83.2	59.6	57.1	50.9	48.4
Standard ¹⁾	70	115	-	-	-	-
Ldn	59.5	-	-	-	-	-

Remark : ¹⁾ Notification of National Environmental Board, No.15, B.E.2540 (1997) under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.114 Part 27D dated April 3, B.E.2540 (1997).



(Ms. Supawan Suwannapa)

Laboratory Reviewer



(Ms. Thanida Bunrungrueang)

Laboratory Supervisor

ฤดูฝน

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปิโตรเลียม แปลงสัมปทานปิโตรเลียมแบบหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีราชา จังหวัดชลบุรี และอำเภอฉะเชิงเทรา
Project Location : จังหวัดชลบุรี และจังหวัดฉะเชิงเทรา
Measured Source : Ambient Noise
Measured Point : สถานีผลิต BY-AIR1 : โรงเรือนบ้านฉาง (จุดที่ 8 ด้านนอกของถังอำเภอศรีราชา จังหวัดชลบุรี)
GPS. Coordinate : UTM (WGS84) 47Q 0584805 E, 1846929 N
Measured Date : August 25-26, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : Integrating Sound Level Meter Scarlet Tech Model ST-11D Serial Number 820934

Quotation No. : AR2024-00461
Analysis No. : 2024-AE295-013
Report No. : 2024-RAAS533
Report Date : September 18, 2024

Interval Time	Noise Level, dB(A)					
	Leq	Lmax	L5	L10	L50	L90
13:00-14:00	43.4	57.1	46.8	44.5	36.9	33.9
14:00-15:00	45.0	65.4	51.3	48.8	39.4	35.0
15:00-16:00	51.3	75.3	56.4	56.6	43.9	40.0
16:00-17:00	49.0	81.0	53.4	49.6	41.0	37.9
17:00-18:00	48.7	80.2	51.7	49.9	41.6	38.6
18:00-19:00	47.2	81.9	51.9	48.6	42.5	39.9
19:00-20:00	47.0	67.9	47.8	47.6	46.9	46.2
20:00-21:00	46.2	64.2	47.4	47.2	45.9	44.9
21:00-22:00	45.1	65.7	46.1	45.9	44.1	43.9
22:00-23:00	45.7	64.1	47.7	47.4	45.2	43.9
23:00-00:00	47.7	62.4	48.9	48.6	47.2	46.7
00:00-01:00	45.4	59.1	47.2	46.8	44.4	43.1
01:00-02:00	42.1	57.7	41.4	43.0	41.8	40.8
02:00-03:00	42.7	56.9	41.7	43.5	42.2	41.8
03:00-04:00	44.6	58.4	46.1	45.7	44.5	42.9
04:00-05:00	44.7	62.9	45.9	45.6	44.5	43.3
05:00-06:00	50.2	80.1	51.0	51.7	42.6	41.3
06:00-07:00	50.1	75.7	54.5	52.2	46.8	41.7
07:00-08:00	56.5	88.8	61.7	58.2	50.0	42.4
08:00-09:00	56.1	80.3	61.4	59.4	52.3	45.2
09:00-10:00	53.5	83.4	57.1	55.0	48.5	43.6
10:00-11:00	59.8	88.6	63.8	60.7	51.6	45.6
11:00-12:00	54.7	78.9	58.8	57.3	50.1	44.6
12:00-13:00	53.7	82.1	57.2	54.1	47.2	42.9
24 Hours Measurement	51.7	88.8	55.0	53.5	46.6	43.0
Standard ¹⁾	70	115	-	-	-	-
Ldn	54.9	-	-	-	-	-

Remark : ¹⁾ Notification of National Environmental Board, No.15, B.E.2540 (1997) under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.114 Part 270 dated April 3, B.E.2540 (1997).

(Ms.Supawan Suwannapa)
Laboratory Reviewer

(Ms.Thanida Bunrungrueang)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปิโตรเลียม แปลงสัมปทานปิโตรเลียมแบบหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีราชา จังหวัดชลบุรี และอำเภอฉะเชิงเทรา
Project Location : จังหวัดชลบุรี และจังหวัดฉะเชิงเทรา
Measured Source : Ambient Noise
Measured Point : สถานีผลิต BY-AIR1 : โรงเรือนบ้านฉาง (จุดที่ 8 ด้านนอกของถังอำเภอศรีราชา จังหวัดชลบุรี)
GPS. Coordinate : UTM (WGS84) 47Q 0584805 E, 1846929 N
Measured Date : August 26-27, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : Integrating Sound Level Meter Scarlet Tech Model ST-11D Serial Number 820934

Quotation No. : AR2024-00461
Analysis No. : 2024-AE295-013
Report No. : 2024-RAAS533
Report Date : September 18, 2024

Interval Time	Noise Level, dB(A)					
	Leq	Lmax	L5	L10	L50	L90
13:00-14:00	61.4	87.0	66.2	62.7	53.8	46.1
14:00-15:00	61.9	90.5	67.3	64.7	53.5	45.8
15:00-16:00	60.5	79.8	66.8	64.3	55.4	47.4
16:00-17:00	59.2	79.7	65.7	63.5	50.4	42.8
17:00-18:00	50.0	65.3	54.4	52.7	47.9	44.3
18:00-19:00	45.2	63.6	48.0	47.5	43.5	41.4
19:00-20:00	47.6	60.7	48.4	48.2	47.5	46.9
20:00-21:00	47.8	58.2	48.5	48.3	47.7	47.0
21:00-22:00	47.3	65.8	47.8	47.6	47.1	46.6
22:00-23:00	46.3	58.2	47.0	46.8	45.8	45.7
23:00-00:00	46.6	57.5	47.3	47.1	46.5	45.9
00:00-01:00	46.7	58.4	51.0	47.5	45.8	44.9
01:00-02:00	50.2	58.5	52.5	52.3	49.7	44.5
02:00-03:00	47.5	61.2	52.0	51.5	44.7	43.9
03:00-04:00	45.7	66.6	46.3	45.9	45.0	44.2
04:00-05:00	45.3	56.6	46.3	46.1	45.2	44.0
05:00-06:00	49.9	79.4	55.4	52.2	42.6	39.9
06:00-07:00	49.3	75.2	54.2	51.7	43.7	39.7
07:00-08:00	59.2	82.9	64.5	61.3	50.7	42.1
08:00-09:00	61.5	81.4	67.5	65.1	57.4	51.6
09:00-10:00	62.9	79.5	68.8	66.8	59.4	52.5
10:00-11:00	59.3	77.4	66.2	63.6	52.0	43.6
11:00-12:00	55.0	78.5	61.1	58.4	49.0	43.0
12:00-13:00	61.0	84.2	67.0	62.4	49.3	41.8
24 Hours Measurement	57.1	90.5	62.9	60.2	51.5	46.0
Standard ¹⁾	70	115	-	-	-	-
Ldn	58.6	-	-	-	-	-

Remark : ¹⁾ Notification of National Environmental Board, No.15, B.E.2540 (1997) under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.114 Part 270 dated April 3, B.E.2540 (1997).

(Ms.Supawan Suwannapa)
Laboratory Reviewer

(Ms.Thanida Bunrungrueang)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการพัฒนาศูนย์ฝึกอบรมและศูนย์บริการลูกค้า บริษัท อี.เอส.ซี. จำกัด
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Noise
Measured Point : สถานีผลิต BY-AIR1 : โรงเรือนบ้านบึงนกยูง (หมู่ที่ 8 ตำบลหนองจิก อำเภอศรีมัท จังหวัดสุโขทัย)
GPS. Coordinate : UTM (WGS84) 47Q 0584805 E, 1846929 N
Measured Date : August 27-28, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : Integrating Sound Level Meter Scarlet Tech Model ST-11D Serial Number 820934

Quotation No. : AR2024-00461
Analysis No. : 2024-AE295-013
Report No. : 2024-RAAS533
Report Date : September 18, 2024

Interval Time	Noise Level, dB(A)					
	Leq	Lmax	L5	L10	L50	L90
13:00-14:00	53.8	75.2	55.3	56.9	49.0	42.8
14:00-15:00	56.3	76.9	61.8	59.1	52.1	46.8
15:00-16:00	56.5	81.9	61.9	59.0	49.5	45.1
16:00-17:00	45.2	66.5	50.0	48.5	41.3	36.9
17:00-18:00	59.1	85.4	65.9	61.0	45.4	36.7
18:00-19:00	51.9	81.3	55.2	52.9	45.9	42.9
19:00-20:00	45.7	71.0	46.2	45.8	44.9	44.0
20:00-21:00	46.4	59.4	47.7	47.2	46.1	45.2
21:00-22:00	47.4	74.2	50.1	48.9	47.2	46.0
22:00-23:00	48.8	61.5	50.7	49.6	48.2	46.4
23:00-00:00	50.5	69.3	54.0	51.4	49.4	48.7
00:00-01:00	55.1	76.0	57.7	56.6	55.0	51.5
01:00-02:00	54.7	66.3	57.2	55.9	54.3	51.8
02:00-03:00	54.9	67.2	61.6	60.2	49.1	46.0
03:00-04:00	67.1	75.5	72.0	70.7	65.3	61.7
04:00-05:00	68.4	76.9	75.0	74.7	66.4	61.2
05:00-06:00	66.8	78.1	71.9	70.5	65.2	62.3
06:00-07:00	50.3	73.6	55.7	52.6	44.3	41.0
07:00-08:00	55.2	83.5	60.3	58.3	51.1	42.9
08:00-09:00	55.1	75.8	60.4	58.3	50.9	44.0
09:00-10:00	52.0	68.9	57.4	55.5	48.7	43.3
10:00-11:00	52.6	75.4	57.5	55.4	49.1	43.3
11:00-12:00	57.1	85.2	62.2	59.5	50.0	44.5
12:00-13:00	56.0	79.1	63.5	58.0	51.3	45.5
24 Hours Measurement	59.7	85.4	65.7	64.1	57.4	53.5
Standard A'	70	115	-	-	-	-
Ldn	68.9	-	-	-	-	-

Remark : 1' Notification of National Environmental Board, No.15, B.E.2540 (1997) under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.114 Part 270 dated April 3, B.E.2540 (1997).

(Ms.Supawan Suwannapa)
Laboratory Reviewer

(Ms.Thanida Bunrungrueang)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการพัฒนาศูนย์ฝึกอบรมและศูนย์บริการลูกค้า บริษัท อี.เอส.ซี. จำกัด
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Noise
Measured Point : สถานีผลิต BY-AIR2 : บ้านเลขที่ 189 หมู่บ้านนิคมพัฒนา (หมู่ที่ 8 ตำบลหนองจิก อำเภอศรีมัท จังหวัดสุโขทัย)
GPS. Coordinate : UTM (WGS84) 47Q 05E3262 E, 1846488 N
Measured Date : August 25-26, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : Integrating Sound Level Meter Scarlet Tech Model ST-11D Serial Number 820801

Quotation No. : AR2024-00461
Analysis No. : 2024-AE295-014
Report No. : 2024-RAAS534
Report Date : September 18, 2024

Interval Time	Noise Level, dB(A)					
	Leq	Lmax	L5	L10	L50	L90
12:00-13:00	53.8	76.7	58.6	55.4	45.6	42.6
13:00-14:00	54.3	78.0	57.6	56.0	46.3	42.8
14:00-15:00	49.4	71.7	53.9	51.9	46.5	43.1
15:00-16:00	54.6	78.8	58.5	55.6	47.4	42.6
16:00-17:00	60.2	73.8	67.5	65.2	50.6	43.0
17:00-18:00	54.2	82.1	56.9	55.0	46.6	44.1
18:00-19:00	51.8	73.3	56.9	53.5	47.9	44.5
19:00-20:00	49.8	64.2	54.4	52.2	48.6	43.9
20:00-21:00	53.2	67.2	55.4	55.0	52.6	50.7
21:00-22:00	54.1	69.8	56.2	55.8	53.8	52.0
22:00-23:00	53.5	72.3	55.8	55.2	52.7	51.7
23:00-00:00	51.3	64.5	52.7	52.4	51.1	49.8
00:00-01:00	51.6	70.1	55.6	53.4	50.0	48.2
01:00-02:00	49.8	69.0	52.9	51.5	48.0	45.5
02:00-03:00	46.7	67.6	49.8	48.1	45.2	43.6
03:00-04:00	47.3	66.7	49.6	48.6	44.9	42.7
04:00-05:00	48.7	71.7	49.3	48.9	47.4	45.6
05:00-06:00	53.3	73.6	57.5	56.8	50.0	48.1
06:00-07:00	59.4	78.1	66.6	60.7	51.8	49.7
07:00-08:00	56.0	77.1	60.3	56.4	49.8	46.5
08:00-09:00	55.4	77.8	60.0	56.9	49.5	44.7
09:00-10:00	54.7	77.8	59.4	56.6	46.5	42.6
10:00-11:00	52.8	75.8	56.8	54.5	47.3	43.5
11:00-12:00	54.0	76.3	58.6	55.3	47.0	43.0
24 Hours Measurement	54.2	82.1	59.3	56.5	49.4	46.9
Standard A'	70	115	-	-	-	-
Ldn	59.8	-	-	-	-	-

Remark : 1' Notification of National Environmental Board, No.15, B.E.2540 (1997) under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.114 Part 270 dated April 3, B.E.2540 (1997).

(Ms.Supawan Suwannapa)
Laboratory Reviewer

(Ms.Thanida Bunrungrueang)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปิโตรเลียม แปลงสัมปทานปิโตรเลียมฉบับหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย และอำเภอตากบกรบือ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Noise
Measured Point : สถานีผลิต BY-AIR2 : บ้านเลขที่ 189 หมู่บ้านนิคมพัฒนา (หมู่ที่ 8 ตำบลหนองจิก อำเภอศรีนคร จังหวัดสุโขทัย)
GPS. Coordinate : UTM (WGS84) 47Q 0583262 E, 1846488 N
Measured Date : August 26-27, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : Integrating Sound Level Meter Scarlet Tech Model ST-11D Serial Number 820801

Quotation No. : AR2024-00461
Analysis No. : 2024-AE295-014
Report No. : 2024-RAA5534
Report Date : September 18, 2024

Interval Time	Noise Level, dB(A)					
	Leq	Lmax	L5	L10	L50	L90
12:00-13:00	53.4	76.4	57.5	55.2	45.3	42.1
13:00-14:00	53.0	76.5	58.6	54.6	46.0	42.8
14:00-15:00	54.4	77.5	59.1	56.3	45.1	42.1
15:00-16:00	52.4	76.3	56.3	53.1	45.2	42.4
16:00-17:00	54.4	81.7	58.1	55.9	46.1	43.1
17:00-18:00	52.6	74.1	57.7	56.1	48.3	44.4
18:00-19:00	54.8	59.4	56.9	57.8	54.1	44.1
19:00-20:00	54.4	80.6	57.4	56.6	49.3	44.3
20:00-21:00	54.3	76.6	57.3	56.9	52.9	51.7
21:00-22:00	51.6	63.9	53.2	52.8	51.5	50.0
22:00-23:00	51.7	71.7	53.7	52.9	50.9	48.4
23:00-00:00	49.4	67.6	56.6	49.9	48.1	46.3
00:00-01:00	47.9	62.1	49.9	49.4	47.6	45.8
01:00-02:00	48.6	65.9	50.6	49.6	47.7	46.0
02:00-03:00	47.7	68.6	50.9	48.7	46.0	44.6
03:00-04:00	49.2	68.6	51.8	50.1	47.7	45.9
04:00-05:00	50.7	72.2	52.5	50.9	48.8	46.8
05:00-06:00	53.8	75.1	56.8	55.7	50.9	49.4
06:00-07:00	59.4	77.0	66.0	63.0	53.7	51.2
07:00-08:00	56.2	77.0	59.2	56.8	51.7	47.8
08:00-09:00	58.5	77.6	64.1	62.0	53.9	47.7
09:00-10:00	54.2	76.3	59.4	54.8	46.1	42.6
10:00-11:00	55.6	78.5	66.6	57.0	48.6	43.2
11:00-12:00	54.2	76.6	58.3	55.4	48.1	42.4
24 Hours Measurement	54.0	81.7	58.6	56.3	49.9	46.7
Standard ¹⁾	70	115	-	-	-	-
Ldn	59.6	-	-	-	-	-

Remark : ¹⁾ Notification of National Environmental Board, No.15, B.E.2540 (1997) under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.114 Part 270 dated April 3, B.E.2540 (1997).



(Ms. Supawan Suwannapa)
Laboratory Reviewer



(Ms. Thanida Bunrungrueang)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปิโตรเลียม แปลงสัมปทานปิโตรเลียมฉบับหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย และอำเภอตากบกรบือ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Noise
Measured Point : สถานีผลิต BY-AIR2 : บ้านเลขที่ 189 หมู่บ้านนิคมพัฒนา (หมู่ที่ 8 ตำบลหนองจิก อำเภอศรีนคร จังหวัดสุโขทัย)
GPS. Coordinate : UTM (WGS84) 47Q 0583262 E, 1846488 N
Measured Date : August 27-28, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : Integrating Sound Level Meter Scarlet Tech Model ST-11D Serial Number 820801

Quotation No. : AR2024-00461
Analysis No. : 2024-AE295-014
Report No. : 2024-RAA5534
Report Date : September 18, 2024

Interval Time	Noise Level, dB(A)					
	Leq	Lmax	L5	L10	L50	L90
12:00-13:00	52.1	75.1	57.2	54.6	47.1	41.4
13:00-14:00	53.2	77.8	56.2	54.8	45.4	41.0
14:00-15:00	57.9	81.3	62.3	59.7	46.2	40.9
15:00-16:00	53.0	75.8	56.2	53.5	44.6	40.5
16:00-17:00	58.6	86.2	61.8	59.4	47.2	42.6
17:00-18:00	52.4	76.3	56.5	53.8	47.1	42.5
18:00-19:00	61.2	88.5	65.8	64.6	55.9	43.7
19:00-20:00	55.4	72.4	61.2	60.0	51.9	47.9
20:00-21:00	50.4	71.3	53.2	52.2	48.9	46.6
21:00-22:00	51.2	62.9	53.7	53.2	50.9	48.0
22:00-23:00	51.4	61.1	53.6	53.1	51.1	48.4
23:00-00:00	50.5	62.2	52.5	52.1	50.2	48.2
00:00-01:00	52.5	66.5	56.9	55.2	51.0	48.1
01:00-02:00	60.4	70.4	62.8	62.0	55.4	52.4
02:00-03:00	57.1	67.1	59.9	59.5	56.7	51.9
03:00-04:00	50.3	68.4	53.4	52.1	49.3	47.2
04:00-05:00	50.6	70.7	54.3	52.8	48.7	46.9
05:00-06:00	56.0	74.9	58.7	58.0	55.0	52.1
06:00-07:00	59.6	77.7	65.3	60.0	55.2	50.2
07:00-08:00	56.8	78.1	61.7	56.9	48.8	45.5
08:00-09:00	55.4	77.7	60.1	56.7	48.9	44.5
09:00-10:00	53.9	74.6	58.5	55.3	48.0	43.9
10:00-11:00	56.8	84.5	60.8	58.3	47.9	42.9
11:00-12:00	55.9	78.5	60.6	57.2	49.5	43.1
24 Hours Measurement	56.0	88.5	60.1	57.9	51.5	47.4
Standard ¹⁾	70	115	-	-	-	-
Ldn	62.4	-	-	-	-	-

Remark : ¹⁾ Notification of National Environmental Board, No.15, B.E.2540 (1997) under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.114 Part 270 dated April 3, B.E.2540 (1997).



(Ms. Supawan Suwannapa)
Laboratory Reviewer



(Ms. Thanida Bunrungrueang)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปิโตรเลียม แปลงสัมปทานปิโตรเลียมชนบทหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย และอำเภอละลานกระบือ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Noise
Measured Point : ฐานหลุมผลิต NS-AIR1 : บานประตาดิจิทัล (แบบเลขที่ 28 หมายเลขประจำเครื่อง หมายเลข 8 ตัวเลขของเลข อำเภอละลานกระบือ จังหวัดกำแพงเพชร)
GPS. Coordinate : UTM (WGS84) 47Q 0584195 E, 1839432 N
Measured Date : August 25-26, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : Integrating Sound Level Meter Scarlet Tech Model ST-11D Serial Number 820870

Interval Time	Noise Level, dB(A)					
	Leq	Lmax	L5	L10	L50	L90
10:00-11:00	58.8	85.2	63.8	61.1	52.3	44.1
11:00-12:00	58.4	79.2	63.7	60.9	53.9	47.7
12:00-13:00	57.8	85.6	61.5	58.9	51.4	45.4
13:00-14:00	56.8	74.2	62.9	59.8	51.2	45.5
14:00-15:00	59.1	82.8	64.0	61.3	53.0	45.3
15:00-16:00	60.4	77.9	65.5	63.4	57.2	49.6
16:00-17:00	58.4	80.2	63.6	61.8	53.7	46.2
17:00-18:00	58.0	76.1	63.2	61.1	52.3	47.2
18:00-19:00	58.3	78.3	63.4	60.9	52.9	47.2
19:00-20:00	60.8	80.5	62.8	61.7	60.0	57.8
20:00-21:00	60.4	70.9	62.1	61.5	60.0	59.1
21:00-22:00	63.9	74.2	67.7	67.1	62.5	58.6
22:00-23:00	65.7	72.6	66.0	68.4	65.0	61.3
23:00-00:00	59.6	67.7	63.7	62.9	58.4	52.6
00:00-01:00	55.8	66.1	66.5	59.3	54.1	50.1
01:00-02:00	52.1	67.0	54.8	54.0	50.8	49.0
02:00-03:00	53.3	70.1	54.8	54.2	52.3	50.3
03:00-04:00	55.7	72.4	58.8	57.2	53.5	51.8
04:00-05:00	55.2	74.8	59.5	55.5	51.1	50.4
05:00-06:00	59.4	78.4	65.3	61.3	50.3	42.1
06:00-07:00	59.3	78.3	64.4	62.2	54.4	47.3
07:00-08:00	59.4	81.9	65.1	62.8	54.6	46.5
08:00-09:00	59.7	83.1	65.1	62.3	52.8	44.4
09:00-10:00	61.0	85.3	65.3	61.7	50.9	43.6
24 Hours Measurement	59.6	85.6	64.0	62.1	56.8	53.0
Standard A ¹	70	115	-	-	-	-
Ldn	65.9	-	-	-	-	-

Remark : ¹ Notification of National Environmental Board, No.15, B.E.2540 (1997) under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.114 Part 27D dated April 3, B.E.2540 (1997).



(Ms. Supawan Suwannapa)
Laboratory Reviewer



(Ms. Thanida Bunrungrueang)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปิโตรเลียม แปลงสัมปทานปิโตรเลียมชนบทหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย และอำเภอละลานกระบือ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Noise
Measured Point : ฐานหลุมผลิต NS-AIR1 : บานประตาดิจิทัล (แบบเลขที่ 28 หมายเลขประจำเครื่อง หมายเลข 8 ตัวเลขของเลข อำเภอละลานกระบือ จังหวัดกำแพงเพชร)
GPS. Coordinate : UTM (WGS84) 47Q 0584195 E, 1839432 N
Measured Date : August 26-27, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : Integrating Sound Level Meter Scarlet Tech Model ST-11D Serial Number 820870

Interval Time	Noise Level, dB(A)					
	Leq	Lmax	L5	L10	L50	L90
10:00-11:00	59.6	80.8	65.1	61.8	51.5	43.2
11:00-12:00	56.3	76.3	62.4	60.0	49.9	43.2
12:00-13:00	57.3	85.6	63.1	60.2	50.3	43.1
13:00-14:00	56.4	82.7	62.9	60.2	48.5	42.5
14:00-15:00	57.4	76.7	63.4	60.7	51.5	43.6
15:00-16:00	56.1	77.1	61.9	59.2	50.3	42.6
16:00-17:00	59.9	84.8	65.0	62.4	54.3	46.6
17:00-18:00	60.0	79.5	65.4	63.0	54.5	47.3
18:00-19:00	57.9	78.6	63.3	60.6	51.9	47.1
19:00-20:00	59.6	82.1	62.5	60.3	57.6	50.5
20:00-21:00	60.1	82.9	62.2	61.0	57.8	56.9
21:00-22:00	56.5	74.2	59.2	57.8	55.6	52.9
22:00-23:00	54.9	76.7	58.5	57.1	53.3	48.5
23:00-00:00	56.4	68.5	60.9	59.9	54.8	47.5
00:00-01:00	57.3	70.1	61.2	60.1	56.4	49.8
01:00-02:00	54.9	68.2	59.3	57.9	53.0	49.1
02:00-03:00	54.3	72.4	57.4	55.8	51.1	49.3
03:00-04:00	53.1	74.3	57.2	54.9	49.1	46.8
04:00-05:00	57.5	79.6	65.2	60.7	47.5	43.4
05:00-06:00	58.8	79.7	65.9	61.6	47.2	42.0
06:00-07:00	58.8	77.9	63.9	61.5	53.4	46.7
07:00-08:00	59.9	85.9	64.1	62.3	54.5	47.5
08:00-09:00	57.9	79.7	63.8	61.6	53.0	45.3
09:00-10:00	59.6	87.4	63.4	60.3	51.0	43.7
24 Hours Measurement	57.9	87.4	63.0	60.4	53.4	48.5
Standard A ¹	70	115	-	-	-	-
Ldn	63.4	-	-	-	-	-

Remark : ¹ Notification of National Environmental Board, No.15, B.E.2540 (1997) under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.114 Part 27D dated April 3, B.E.2540 (1997).



(Ms. Supawan Suwannapa)
Laboratory Reviewer



(Ms. Thanida Bunrungrueang)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Muang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตยี่โถเรียน แปลงสัมปทานยี่โถเรียนขนาดหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีราชา จังหวัดสุโขทัย
และอำเภอละหานทราย จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Noise
Measured Point : ฐานหลุมผลิต NS-AIR1 : บ้านประดาศรี (จุดที่ 8) ตำบลหนองหลวง อำเภอละหานทราย จังหวัดกำแพงเพชร
(บ้านเลขที่ 28 หมู่บ้านประดาศรี หมู่ที่ 8 ตำบลหนองหลวง อำเภอละหานทราย จังหวัดกำแพงเพชร)
GPS. Coordinate : UTM (WGS84) 47Q 0584195 E, 1839432 N
Measured Date : August 27-28, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : Integrating Sound Level Meter Scarlet Tech Model ST-11D Serial Number 820870

Interval Time	Noise Level, dB(A)					
	Leq	Lmax	L5	L10	L50	L90
10:00-11:00	56.0	74.5	62.2	59.7	48.4	42.0
11:00-12:00	56.9	76.6	62.8	60.5	50.3	42.8
12:00-13:00	55.6	73.3	62.0	59.4	49.0	41.7
13:00-14:00	56.9	78.5	62.6	59.9	50.9	43.5
14:00-15:00	56.2	74.2	62.4	59.8	49.8	42.4
15:00-16:00	56.3	76.2	62.3	59.8	51.2	42.8
16:00-17:00	59.3	82.4	63.3	61.1	53.1	44.9
17:00-18:00	62.3	90.7	66.7	65.9	59.4	53.5
18:00-19:00	61.7	86.2	66.7	64.5	57.8	53.2
19:00-20:00	58.6	83.4	62.7	61.0	54.3	50.5
20:00-21:00	62.6	81.3	64.8	64.2	58.0	55.0
21:00-22:00	65.9	71.7	68.3	67.4	65.5	64.1
22:00-23:00	69.1	73.5	71.2	70.8	67.1	65.6
23:00-00:00	68.9	73.1	71.1	70.8	68.7	66.0
00:00-01:00	62.7	68.9	66.5	65.8	61.6	57.0
01:00-02:00	61.5	71.1	64.6	63.7	60.7	59.2
02:00-03:00	57.0	69.6	62.1	60.9	53.0	50.8
03:00-04:00	58.1	74.4	63.9	62.4	53.1	51.3
04:00-05:00	65.8	77.9	71.4	70.0	63.3	59.0
05:00-06:00	63.1	81.6	68.6	65.4	58.0	44.9
06:00-07:00	60.1	81.7	65.8	63.1	54.0	45.9
07:00-08:00	59.9	80.8	65.1	62.9	55.0	47.4
08:00-09:00	57.9	75.3	63.7	61.4	52.5	45.0
09:00-10:00	57.5	75.3	63.0	60.8	53.3	48.1
24 Hours Measurement	62.5	90.7	66.3	65.0	60.4	57.6
Standard ¹	70	115	-	-	-	-
Ldn	70.8	-	-	-	-	-

Remark : ¹ Notification of National Environmental Board, No.15, B.E.2540 (1997) under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.114 Part 27D dated April 3, B.E.2540 (1997).



(Ms. Supawan Suwannapa)
Laboratory Reviewer



(Ms. Thanida Bunrungrueang)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Muang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตยี่โถเรียน แปลงสัมปทานยี่โถเรียนขนาดหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีราชา จังหวัดสุโขทัย
และอำเภอละหานทราย จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Noise
Measured Point : ฐานหลุมผลิต NS-AIR2 : บ้านหนองไม้แดง (จุดที่ 7) ตำบลหนองหลวง อำเภอละหานทราย จังหวัดกำแพงเพชร
(บ้านเลขที่ 74/1 หมู่ที่ 7 ตำบลหนองหลวง อำเภอละหานทราย จังหวัดกำแพงเพชร)
GPS. Coordinate : UTM (WGS84) 47Q 0582515 E, 1839032 N
Measured Date : August 25-26, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : Integrating Sound Level Meter Scarlet Tech Model ST-11D Serial Number 820966

Interval Time	Noise Level, dB(A)					
	Leq	Lmax	L5	L10	L50	L90
14:00-15:00	51.6	84.7	55.0	52.5	46.7	44.9
15:00-16:00	50.9	75.4	53.8	52.1	47.4	45.1
16:00-17:00	56.0	82.0	61.2	59.3	52.2	48.4
17:00-18:00	61.4	86.0	65.2	64.7	59.2	52.2
18:00-19:00	58.4	80.4	64.5	64.1	48.5	46.0
19:00-20:00	50.5	74.2	54.5	51.7	47.8	44.3
20:00-21:00	51.2	60.7	52.1	51.9	50.7	50.4
21:00-22:00	50.9	59.7	52.0	51.7	50.4	49.8
22:00-23:00	49.8	55.1	51.6	51.2	49.3	47.8
23:00-00:00	48.6	59.3	50.4	50.1	48.3	46.7
00:00-01:00	49.5	55.5	50.9	50.6	49.4	48.0
01:00-02:00	49.4	54.7	50.6	50.3	48.9	48.0
02:00-03:00	48.7	55.3	49.8	49.6	48.6	47.5
03:00-04:00	49.0	58.4	50.4	50.1	48.5	47.3
04:00-05:00	48.9	60.9	50.6	50.2	48.8	46.3
05:00-06:00	48.2	62.3	50.4	49.5	46.9	45.1
06:00-07:00	50.1	66.5	55.8	52.1	46.6	44.0
07:00-08:00	54.0	74.1	58.9	56.6	49.7	46.2
08:00-09:00	52.7	76.1	58.0	55.5	48.9	45.3
09:00-10:00	52.9	80.3	57.4	54.2	47.3	44.3
10:00-11:00	53.2	76.4	57.2	55.6	51.1	46.2
11:00-12:00	52.3	67.6	56.8	55.1	50.3	46.4
12:00-13:00	54.1	71.1	58.9	57.3	52.3	46.1
13:00-14:00	51.3	69.8	56.0	53.5	47.9	43.1
24 Hours Measurement	53.4	86.0	57.7	56.5	50.6	47.2
Standard ¹	70	115	-	-	-	-
Ldn	57.0	-	-	-	-	-

Remark : ¹ Notification of National Environmental Board, No.15, B.E.2540 (1997) under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.114 Part 27D dated April 3, B.E.2540 (1997).



(Ms. Supawan Suwannapa)
Laboratory Reviewer



(Ms. Thanida Bunrungrueang)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปิโตรเลียม แปลงสัมปทานปิโตรเลียมแบบกมหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย และอำเภอลานกระบือ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Noise
Measured Point : ฐานหลุมผลิต NS-AIR2 : บ้านหนองไม้แดง (บ้านเลขที่ 74/1 หมู่ที่ 7 ตำบลหนองหลวง อำเภอลานกระบือ จังหวัดกำแพงเพชร)
GPS. Coordinate : UTM (WGS84) 47Q 0582515 E, 1839032 N
Measured Date : August 26-27, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : Integrating Sound Level Meter Scarlet Tech Model ST-11D Serial Number 820966

Interval Time	Noise Level, dB(A)					
	Leq	Lmax	L5	L10	L50	L90
14:00-15:00	50.3	74.0	55.0	53.3	47.6	45.0
15:00-16:00	53.7	74.5	57.8	56.0	50.6	46.0
16:00-17:00	49.9	72.8	52.4	50.6	46.3	44.8
17:00-18:00	50.8	72.6	55.8	52.6	47.5	45.4
18:00-19:00	54.9	77.1	59.5	57.3	49.3	45.1
19:00-20:00	49.3	68.0	51.9	51.4	47.6	43.9
20:00-21:00	50.5	67.3	51.7	51.4	50.3	49.3
21:00-22:00	49.8	57.7	51.1	50.6	49.6	48.7
22:00-23:00	49.1	58.5	50.5	50.0	48.8	48.1
23:00-00:00	48.9	57.7	50.3	50.0	48.6	47.8
00:00-01:00	47.9	59.2	49.4	48.8	47.8	46.7
01:00-02:00	47.5	59.5	48.7	48.3	47.4	46.5
02:00-03:00	47.3	59.4	48.6	48.2	47.0	46.2
03:00-04:00	47.6	61.6	49.4	49.0	47.2	46.0
04:00-05:00	48.2	63.1	49.6	49.1	47.4	46.5
05:00-06:00	59.4	81.0	64.3	64.0	54.8	46.8
06:00-07:00	50.7	74.9	56.6	51.9	46.5	44.5
07:00-08:00	57.7	75.6	65.4	58.1	47.3	44.0
08:00-09:00	57.6	88.5	59.0	58.3	50.3	46.5
09:00-10:00	60.5	89.9	62.1	60.9	49.0	46.1
10:00-11:00	52.6	74.9	56.5	53.9	48.5	45.7
11:00-12:00	51.9	71.3	56.8	54.9	49.6	45.9
12:00-13:00	54.6	76.7	62.5	54.9	46.9	44.3
13:00-14:00	50.8	72.5	55.0	52.7	47.5	44.8
24 Hours Measurement	53.7	89.9	58.1	55.6	49.0	46.3
Standard ¹⁾	70	115	-	-	-	-
Ldn	58.9	-	-	-	-	-

Remark : ¹⁾ Notification of National Environmental Board, No.15, B.E.2540 (1997) under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.114 Part 270 dated April 3, B.E.2540 (1997).



(Ms. Supawan Suwannapa)
Laboratory Reviewer



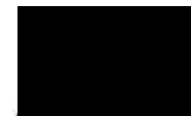
(Ms. Thanida Bunrungrueang)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปิโตรเลียม แปลงสัมปทานปิโตรเลียมแบบกมหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย และอำเภอลานกระบือ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Noise
Measured Point : ฐานหลุมผลิต NS-AIR2 : บ้านหนองไม้แดง (บ้านเลขที่ 74/1 หมู่ที่ 7 ตำบลหนองหลวง อำเภอลานกระบือ จังหวัดกำแพงเพชร)
GPS. Coordinate : UTM (WGS84) 47Q 0582515 E, 1839032 N
Measured Date : August 27-28, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : Integrating Sound Level Meter Scarlet Tech Model ST-11D Serial Number 820966

Interval Time	Noise Level, dB(A)					
	Leq	Lmax	L5	L10	L50	L90
14:00-15:00	49.5	71.3	53.9	51.3	46.5	43.9
15:00-16:00	49.7	73.7	53.7	52.1	47.2	44.4
16:00-17:00	51.2	69.2	55.8	53.1	48.1	46.0
17:00-18:00	49.9	67.6	53.7	51.9	48.0	45.7
18:00-19:00	63.1	91.7	68.7	67.8	58.9	51.6
19:00-20:00	57.2	75.0	63.7	59.9	49.0	47.6
20:00-21:00	49.6	60.7	54.7	51.5	48.1	47.4
21:00-22:00	52.6	72.0	57.1	56.2	51.2	49.1
22:00-23:00	49.4	56.9	50.4	50.0	49.3	48.7
23:00-00:00	49.6	59.3	52.4	50.3	49.0	48.5
00:00-01:00	49.4	59.7	50.0	49.5	48.8	48.3
01:00-02:00	56.2	63.9	59.6	58.6	55.5	49.3
02:00-03:00	51.5	61.4	54.1	53.6	51.0	48.6
03:00-04:00	50.7	62.7	56.1	51.1	48.9	47.9
04:00-05:00	54.0	65.3	60.9	58.8	49.8	48.9
05:00-06:00	62.6	72.9	66.2	65.8	62.5	51.0
06:00-07:00	61.0	68.2	65.9	65.5	54.3	46.3
07:00-08:00	51.5	70.5	56.3	54.4	48.4	45.5
08:00-09:00	53.6	79.0	57.8	55.1	48.1	45.0
09:00-10:00	53.7	77.0	58.9	56.9	49.7	45.7
10:00-11:00	62.3	89.1	65.6	64.7	51.9	47.3
11:00-12:00	54.7	77.5	57.3	54.8	47.6	43.6
12:00-13:00	56.4	88.2	62.6	59.6	53.7	46.9
13:00-14:00	51.3	73.8	56.8	54.2	47.3	42.8
24 Hours Measurement	56.5	91.7	61.1	59.9	53.1	47.6
Standard ¹⁾	70	115	-	-	-	-
Ldn	63.1	-	-	-	-	-

Remark : ¹⁾ Notification of National Environmental Board, No.15, B.E.2540 (1997) under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.114 Part 270 dated April 3, B.E.2540 (1997).



(Ms. Supawan Suwannapa)
Laboratory Reviewer



(Ms. Thanida Bunrungrueang)
Laboratory Supervisor



บริษัท ซีเอ็นพีซีเอชเค (ไทยแลนด์) จำกัด

รายงานผลการปฏิบัติตามมาตรการป้องกันและแก้ไขผลกระทบสิ่งแวดล้อม และมาตรการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม
โครงการผลิตปิโตรเลียม แพลงสัมปทานปิโตรเลียมบนบกหมายเลข L21/43
ตั้งอยู่ที่อำเภอศรีราชา จังหวัดสุโขทัย และอำเภอสามโคก จังหวัดกำแพงเพชร
ฉบับเดือนมกราคม – ธันวาคม พ.ศ.2567

ภาคผนวก ง.2

คุณภาพอากาศ

ฤดูแล้ง

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Sol 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตโพลีโพรพิลีน แป้งสปีนพานิชย์โพลีเอทิลีนแบบขนานหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย และอำเภอลานกระบือ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Sampling Source : Ambient Air Quality
Sampling Point : สถานีผลิต BY1 : A1 : โรงเรือนม้วนมิงท์ (หมู่ที่ 8 ตำบลหนองจิก อำเภอศรีนคร จังหวัดสุโขทัย)
GPS. Coordinate : UTM (WGS84) 47Q 0584805 E, 1846929 N
Sampling Date : March 31-April 3, 2024
Sampling Time : 13:00
Sampling Method : U.S. EPA 40 CFR Part 50
Sampling By : Mr.Sittiporn Wongkham
Analyzed By : Environment Research & Technology Co., Ltd.

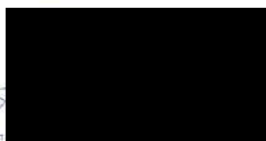
Quotation No. : AR2024-00461
Analysis No. : 2024-AB573
Received Date : April 08, 2024
Analytical Date : April 9-18, 2024
Report No. : 2024-RAAH035
Report Date : April 23, 2024

Parameter	Unit	Method of Analysis	Result			Standard ^{1'}
			Mar 31-Apr 1, 24	Apr 1-2, 24	Apr 2-3, 24	
Total Suspended Particulate (TSP) 24 Hours Average	mg/m ³	High-Volume, Gravimetric	0.145	0.187	0.154	0.330
Particulate Size Less Than 10 Micron (PM10) 24 Hours Average	mg/m ³	PM10 Size Selective, High-Volume, Gravimetric	0.089	0.108	0.093	0.120

Remark : ^{1'} Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995) and Notification No.24, B.E.2547 (2004), published in the Royal Government Gazette No.121 Special Part 1040 dated September 22, B.E.2547 (2004), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).



(Ms.Natricha Sermmatiwong)
Laboratory Reviewer



(Ms.Ramita Taengthai)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Sol 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตโพลีโพรพิลีน แป้งสปีนพานิชย์โพลีเอทิลีนแบบขนานหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย และอำเภอลานกระบือ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Sampling Source : Ambient Air Quality
Sampling Point : สถานีผลิต BY-AIR2 : บ้านเดิมพัฒนา (หมู่ที่ 8 ตำบลหนองจิก อำเภอศรีนคร จังหวัดสุโขทัย)
GPS. Coordinate : UTM (WGS84) 47Q 0583262 E, 1846488 N
Sampling Date : March 31-April 3, 2024
Sampling Time : 09:50
Sampling Method : U.S. EPA 40 CFR Part 50
Sampling By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.

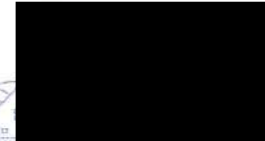
Quotation No. : AR2024-00461
Analysis No. : 2024-AB573
Received Date : April 9, 2024
Analytical Date : April 9-22, 2024
Report No. : 2024-RAAH036
Report Date : April 23, 2024

Parameter	Unit	Method of Analysis	Result			Standard ^{1'}
			Mar 31-Apr 1, 24	Apr 1-2, 24	Apr 2-3, 24	
Total Suspended Particulate (TSP) 24 Hours Average	mg/m ³	High-Volume, Gravimetric	0.204	0.196	0.188	0.330
Particulate Size Less Than 10 Micron (PM10) 24 Hours Average	mg/m ³	PM10 Size Selective, High-Volume, Gravimetric	0.117	0.116	0.109	0.120

Remark : ^{1'} Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995) and Notification No.24, B.E.2547 (2004), published in the Royal Government Gazette No.121 Special Part 1040 dated September 22, B.E.2547 (2004), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).



(Ms.Natricha Sermmatiwong)
Laboratory Reviewer



(Ms.Ramita Taengthai)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปิโตรเลียม แปลงสัมปทานปิโตรเลียมบนบกหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย และอำเภอลานกระบือ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Sampling Source : Ambient Air Quality
Sampling Point : ฐานหลุมผลิต NS-AIR1 : บ้านประจักษ์เจริญ (บ้านเลขที่ 28 หมู่ที่ 8 ตำบลหนองหลวง อำเภอลานกระบือ จังหวัดกำแพงเพชร)
GPS. Coordinate : UTM (WGS84) 47Q 0584195 E, 1839432 N
Sampling Date : March 31-April 3, 2024
Sampling Time : 11:50
Sampling Method : U.S. EPA 40 CFR Part 50
Sampling By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.

Quotation No. : AR2024-00461
Analysis No. : 2024-AB573
Received Date : April 9, 2024
Analytical Date : April 9-22, 2024
Report No. : 2024-RAAH037
Report Date : April 23, 2024

Parameter	Unit	Method of Analysis	Result			Standard ¹⁾
			Mar 31-Apr 1, 24	Apr 1-2, 24	Apr 2-3, 24	
Total Suspended Particulate (TSP) 24 Hours Average	mg/m ³	High-Volume, Gravimetric	0.140	0.145	0.137	0.330
Particulate Size Less Than 10 Micron (PM10) 24 Hours Average	mg/m ³	PM10 Size Selective, High-Volume, Gravimetric	0.079	0.078	0.080	0.120

Remark : ¹⁾ Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995) and Notification No.24, B.E.2547 (2004), published in the Royal Government Gazette No.121 Special Part 1040 dated September 22, B.E.2547 (2004), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปิโตรเลียม แปลงสัมปทานปิโตรเลียมบนบกหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย และอำเภอลานกระบือ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Sampling Source : Ambient Air Quality
Sampling Point : ฐานหลุมผลิต NS-AIR2 : บ้านหนองไม้แดง บ้านเลขที่ 74/1 หมู่ที่ 7 ตำบลหนองหลวง อำเภอลานกระบือ จังหวัดกำแพงเพชร
GPS. Coordinate : UTM (WGS84) 47Q 0582515 E, 1839023 N
Sampling Date : March 31-April 3, 2024
Sampling Time : 12:30
Sampling Method : U.S. EPA 40 CFR Part 50
Sampling By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.

Quotation No. : AR2024-00461
Analysis No. : 2024-AB573
Received Date : April 9, 2024
Analytical Date : April 9-22, 2024
Report No. : 2024-RAAH038
Report Date : April 23, 2024

Parameter	Unit	Method of Analysis	Result			Standard ¹⁾
			Mar 31-Apr 1, 24	Apr 1-2, 24	Apr 2-3, 24	
Total Suspended Particulate (TSP) 24 Hours Average	mg/m ³	High-Volume, Gravimetric	0.242	0.218	0.210	0.330
Particulate Size Less Than 10 Micron (PM10) 24 Hours Average	mg/m ³	PM10 Size Selective, High-Volume, Gravimetric	0.109	0.105	0.094	0.120

Remark : ¹⁾ Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995) and Notification No.24, B.E.2547 (2004), published in the Royal Government Gazette No.121 Special Part 1040 dated September 22, B.E.2547 (2004), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).



(Ms.Natnicha Sermmatiwong)
Laboratory Reviewer



(Ms.Ramita Taengthai)
Laboratory Supervisor



(Ms.Natnicha Sermmatiwong)
Laboratory Reviewer



(Ms.Ramita Taengthai)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Sol 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตไฟฟ้าโดยแสงอาทิตย์แปลงสัมปทานปิโตรเลียมแบบกึ่งพาณิชย์ L21/43 ตั้งอยู่ที่อำเภอศรีราชา จังหวัดชลบุรี
Project Location : และอำเภอสามพระยี่ จังหวัดกาฬงเทศ
Measured Source : จังหวัดสุโขทัย และจังหวัดกาฬงเทศ
Measured Point : สถานีผลิต BY-AIR1 : โรงเรือนบ้านเมืองเก่า
(หมู่ที่ 8 ตำบลเมืองเก่า อำเภอศรีราชา จังหวัดสุโขทัย)
GPS. Coordinate : UTM (WGS84) 47Q 0584805 E, 1846929 N
Measured Date : March 31-April 3, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : NOx Chemiluminescence Analyzer Horiba Model APNA-370 Serial Number NKDVFYRX


Quotation No. : AR2024-00461
Analysis No. : 2024-AB526-001,
2024-AB573-002
Report No. : 2024-RAAH111
Report Date : April 24, 2024

Interval Time	Result NO ₂ (ppm)			Standard ¹⁾
	Mar 31-Apr 1, 24	Apr 1-2, 24	Apr 2-3, 24	
13:00-14:00	0.0076	0.0078	0.0078	
14:00-15:00	0.0072	0.0074	0.0075	
15:00-16:00	0.0074	0.0074	0.0073	
16:00-17:00	0.0077	0.0077	0.0072	
17:00-18:00	0.0098	0.0095	0.0095	
18:00-19:00	0.0098	0.0124	0.0138	
19:00-20:00	0.0121	0.0115	0.0104	
20:00-21:00	0.0107	0.0106	0.0113	
21:00-22:00	0.0104	0.0112	0.0126	
22:00-23:00	0.0106	0.0112	0.0124	
23:00-00:00	0.0086	0.0107	0.0103	
00:00-01:00	0.0088	0.0109	0.0100	
01:00-02:00	0.0088	0.0103	0.0095	
02:00-03:00	0.0085	0.0098	0.0094	
03:00-04:00	0.0090	0.0080	0.0098	
04:00-05:00	0.0090	0.0093	0.0092	
05:00-06:00	0.0089	0.0109	0.0103	
06:00-07:00	0.0095	0.0093	0.0111	
07:00-08:00	0.0120	0.0093	0.0097	
08:00-09:00	0.0110	0.0104	0.0104	
09:00-10:00	0.0108	0.0114	0.0084	
10:00-11:00	0.0114	0.0089	0.0079	
11:00-12:00	0.0112	0.0082	0.0075	
12:00-13:00	0.0085	0.0079	0.0073	
24 Hours Average	0.0096	0.0097	0.0096	-
1 Hour Maximum	0.0121	0.0124	0.0138	0.17

Remark : ¹⁾ Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995), Notification No.28, B.E.2550 (2007), published in the Royal Government Gazette No.124 Special Part 580 dated May 14, B.E.2550 (2007) and Notification No.33, B.E.2552 (2009), published in the Royal Government Gazette No.126 Special Part 1140 dated August 14, B.E.2552 (2009), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).



(Ms.Piyatida Pradangkho)
Laboratory Reviewer



(Ms.Panicha Promchai)
Laboratory Supervisor

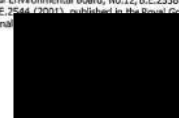
ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Sol 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตไฟฟ้าโดยแสงอาทิตย์แปลงสัมปทานปิโตรเลียมแบบกึ่งพาณิชย์ L21/43 ตั้งอยู่ที่อำเภอศรีราชา จังหวัดชลบุรี
Project Location : และอำเภอสามพระยี่ จังหวัดกาฬงเทศ
Measured Source : จังหวัดสุโขทัย และจังหวัดกาฬงเทศ
Measured Point : สถานีผลิต BY-AIR1 : โรงเรือนบ้านเมืองเก่า
(หมู่ที่ 8 ตำบลเมืองเก่า อำเภอศรีราชา จังหวัดสุโขทัย)
GPS. Coordinate : UTM (WGS84) 47Q 0584805 E, 1846929 N
Measured Date : March 31-April 3, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : SO₂ UV-Fluorescence Analyzer Thermo Model 43C Serial Number 0335804022

Quotation No. : AR2024-00461
Analysis No. : 2024-AB526-001,
2024-AB573-002
Report No. : 2024-RAAH109
Report Date : April 24, 2024

Interval Time	Result SO ₂ (ppm)			Standard
	Mar 31-Apr 1, 24	Apr 1-2, 24	Apr 2-3, 24	
13:00-14:00	0.0019	0.0019	0.0023	
14:00-15:00	0.0018	0.0021	0.0024	
15:00-16:00	0.0018	0.0023	0.0025	
16:00-17:00	0.0019	0.0024	0.0025	
17:00-18:00	0.0023	0.0025	0.0027	
18:00-19:00	0.0023	0.0025	0.0032	
19:00-20:00	0.0022	0.0029	0.0036	
20:00-21:00	0.0023	0.0023	0.0028	
21:00-22:00	0.0024	0.0023	0.0033	
22:00-23:00	0.0024	0.0023	0.0028	
23:00-00:00	0.0021	0.0022	0.0025	
00:00-01:00	0.0019	0.0021	0.0025	
01:00-02:00	0.0018	0.0019	0.0023	
02:00-03:00	0.0017	0.0020	0.0021	
03:00-04:00	0.0017	0.0019	0.0022	
04:00-05:00	0.0017	0.0018	0.0019	
05:00-06:00	0.0018	0.0019	0.0018	
06:00-07:00	0.0020	0.0019	0.0017	
07:00-08:00	0.0019	0.0021	0.0017	
08:00-09:00	0.0019	0.0019	0.0015	
09:00-10:00	0.0014	0.0020	0.0014	
10:00-11:00	0.0013	0.0018	0.0015	
11:00-12:00	0.0014	0.0018	0.0017	
12:00-13:00	0.0016	0.0020	0.0019	
24 Hours Average	0.0018	0.0021	0.0023	0.12 ¹⁾
1 Hour Maximum	0.0024	0.0029	0.0036	0.30 ²⁾

Remark : ¹⁾ Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995) and Notification No.24, B.E.2547 (2004), published in the Royal Government Gazette No.121 Special Part 1040 dated September 22, B.E.2547 (2004), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).
²⁾ Notification of National Environmental Board, No.12, B.E.2538 (1995), published in the Royal Government Gazette No.112 Special Part 770 dated July 13, B.E.2538 (1995) and Notification No.21, B.E.2544 (2001), published in the Royal Government Gazette No.118 Conservation of National



(Ms.Piyatida Pradangkho)
Laboratory Reviewer



(Ms.Panicha Promchai)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตไบโอดีเซล แปลงสัมปทานปิโตรเลียมแบบกบหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย
และอำเภอสามกระบือ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Air Quality
Measured Point : สถานีผลิต BY-AIR1 : โรงเรือนบำบัดน้ำเสีย
(หมู่ที่ 8 ตำบลหนองจิก อำเภอศรีนคร จังหวัดสุโขทัย)
GPS. Coordinate : UTM (WGS84) 47Q 0584805 E, 1846929 N
Measured Date : March 31-April 3, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : CO NDIR Analyzer Thermo Model 48C Serial Number 0415406564

Quotation No. : AR2024-00461
Analysis No. : 2024-AB573-001
Report No. : 2024-RAAH107
Report Date : April 24, 2024

Interval Time	Result CO (ppm)						Standard ¹¹
	Mar 31-Apr 1, 24		Apr 1-2, 24		Apr 2-3, 24		
	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	
13:00-14:00	0.6	-	0.5	0.6	0.6	0.7	
14:00-15:00	0.6	-	0.6	0.6	0.6	0.7	
15:00-16:00	0.7	-	0.6	0.6	0.5	0.6	
16:00-17:00	0.7	-	0.6	0.6	0.5	0.6	
17:00-18:00	0.7	-	0.6	0.6	0.5	0.5	
18:00-19:00	0.7	-	0.7	0.6	0.7	0.6	
19:00-20:00	0.7	-	0.9	0.6	0.6	0.6	
20:00-21:00	0.9	0.7	0.7	0.6	0.7	0.6	
21:00-22:00	1.0	0.8	0.9	0.7	0.8	0.6	
22:00-23:00	1.0	0.8	0.9	0.7	0.9	0.6	
23:00-00:00	0.8	0.8	0.9	0.8	0.8	0.7	
00:00-01:00	0.8	0.8	0.9	0.8	0.8	0.7	
01:00-02:00	0.8	0.8	0.9	0.8	0.8	0.8	
02:00-03:00	0.7	0.8	0.9	0.9	0.8	0.8	
03:00-04:00	0.8	0.8	0.8	0.9	0.9	0.8	
04:00-05:00	0.8	0.8	0.8	0.9	0.8	0.8	
05:00-06:00	0.8	0.8	0.9	0.9	0.8	0.8	
06:00-07:00	0.9	0.8	0.9	0.9	0.8	0.8	
07:00-08:00	0.8	0.8	0.9	0.9	0.7	0.8	
08:00-09:00	0.7	0.8	0.8	0.9	0.6	0.8	
09:00-10:00	0.6	0.8	0.9	0.9	0.6	0.8	
10:00-11:00	0.5	0.7	0.6	0.8	0.6	0.7	
11:00-12:00	0.5	0.7	0.5	0.8	0.5	0.7	
12:00-13:00	0.5	0.7	0.5	0.8	0.5	0.6	
24 Hours Average	0.7	-	0.8	-	0.7	-	-
1 Hour Maximum	1.0	-	0.9	-	0.9	-	30
8 Hours Maximum	-	0.8	-	0.9	-	0.8	9

Remark : ¹¹ Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995), Notification No.28, B.E.2550 (2007), published in the Royal Government Gazette No.124 Special Part 580 dated May 14, B.E.2550 (2007) and Notification No.33, B.E.2552 (2009), published in the Royal Government Gazette No.126 Special Part 1140 dated August 14, B.E.2552 (2009), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).



(Ms.Piyatida Pradangkho)
Laboratory Reviewer



(Ms.Panicha Promchai)
Laboratory Supervisor

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REPORT ANALYSIS REFERS TO SUBMITTED SAMPLE (S) ONLY

Page 1/1

F-RP-053 Rev.03, November 22, 2018

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตไบโอดีเซล แปลงสัมปทานปิโตรเลียมแบบกบหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย
และอำเภอสามกระบือ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Air Quality
Measured Point : สถานีผลิต NS-AIR1 : บ้านประจักษ์เจริญ
(บ้านเลขที่ 28 หมู่บ้านประจักษ์เจริญ หมู่ที่ 8 ตำบลหนองหลวง อำเภอสามกระบือ จังหวัดกำแพงเพชร)
GPS. Coordinate : UTM (WGS84) 47Q 0584195 E, 1839432 N
Measured Date : March 31-April 3, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : NOx Chemiluminescence Analyzer Horiba Model APNA-370 Serial Number PA6WVAJ9

Quotation No. : AR2024-00461
Analysis No. : 2024-AB573-008
Report No. : 2024-RAAH145
Report Date : April 24, 2024

Interval Time	Result NO _x (ppm)			Standard ¹¹
	Mar 31-Apr 1, 24		Apr 2-3, 24	
	1 hr Avg	8 hr Avg	1 hr Avg	
12:00-13:00	0.0108	0.0104	0.0096	
13:00-14:00	0.0142	0.0070	0.0085	
14:00-15:00	0.0075	0.0068	0.0102	
15:00-16:00	0.0075	0.0062	0.0062	
16:00-17:00	0.0061	0.0067	0.0066	
17:00-18:00	0.0072	0.0064	0.0058	
18:00-19:00	0.0080	0.0082	0.0077	
19:00-20:00	0.0160	0.0107	0.0173	
20:00-21:00	0.0215	0.0143	0.0123	
21:00-22:00	0.0175	0.0117	0.0123	
22:00-23:00	0.0154	0.0149	0.0203	
23:00-00:00	0.0145	0.0173	0.0134	
00:00-01:00	0.0107	0.0126	0.0105	
01:00-02:00	0.0089	0.0128	0.0095	
02:00-03:00	0.0098	0.0113	0.0094	
03:00-04:00	0.0101	0.0078	0.0082	
04:00-05:00	0.0089	0.0074	0.0083	
05:00-06:00	0.0096	0.0083	0.0069	
06:00-07:00	0.0090	0.0083	0.0062	
07:00-08:00	0.0136	0.0084	0.0064	
08:00-09:00	0.0123	0.0081	0.0063	
09:00-10:00	0.0103	0.0077	0.0063	
10:00-11:00	0.0087	0.0067	0.0058	
11:00-12:00	0.0127	0.0080	0.0061	
24 Hours Average	0.0113	0.0095	0.0092	-
1 Hour Maximum	0.0215	0.0173	0.0203	0.17

Remark : ¹¹ Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995), Notification No.28, B.E.2550 (2007), published in the Royal Government Gazette No.124 Special Part 580 dated May 14, B.E.2550 (2007) and Notification No.33, B.E.2552 (2009), published in the Royal Government Gazette No.126 Special Part 1140 dated August 14, B.E.2552 (2009), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).



(Ms.Piyatida Pradangkho)
Laboratory Reviewer



(Ms.Panicha Promchai)
Laboratory Supervisor

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REPORT ANALYSIS REFERS TO SUBMITTED SAMPLE (S) ONLY

Page 1/1

F-RP-004 Rev. 02, January 18, 2021

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตไบโอดีเซล แปลงสัมปทานปิโตรเลียมแบบหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีราชา จังหวัดชลบุรี
และอำเภอสามกระบัง จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Air Quality
Measured Point : สถานีผลิต BY-AIR2 : บ้านเลขที่ 189 บ้านฉิมพัตนา
(หมู่ที่ 8 ตำบลหนองจอก อำเภอศรีราชา จังหวัดสุโขทัย)
GPS. Coordinate : UTM (WGS84) 47Q 0583262 E, 1846488 N
Measured Date : March 31-April 3, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : NOx Chemiluminescence Analyzer Horiba Model APNA-370 Serial Number U9LS50WU

Quotation No. : AR2024-00461
Analysis No. : 2024-ABS73-005
Report No. : 2024-RAAH142
Report Date : April 24, 2024

Interval Time	Result NO ₂ (ppm)			Standard ^{1*}
	Mar 31-Apr 1, 24	Apr 1-2, 24	Apr 2-3, 24	
10:00-11:00	0.0095	0.0134	0.0091	
11:00-12:00	0.0097	0.0126	0.0107	
12:00-13:00	0.0086	0.0103	0.0094	
13:00-14:00	0.0104	0.0096	0.0088	
14:00-15:00	0.0095	0.0087	0.0087	
15:00-16:00	0.0100	0.0086	0.0083	
16:00-17:00	0.0093	0.0088	0.0083	
17:00-18:00	0.0102	0.0103	0.0103	
18:00-19:00	0.0121	0.0115	0.0109	
19:00-20:00	0.0126	0.0118	0.0114	
20:00-21:00	0.0177	0.0111	0.0122	
21:00-22:00	0.0145	0.0124	0.0130	
22:00-23:00	0.0117	0.0114	0.0122	
23:00-00:00	0.0109	0.0113	0.0116	
00:00-01:00	0.0103	0.0117	0.0102	
01:00-02:00	0.0101	0.0104	0.0102	
02:00-03:00	0.0102	0.0097	0.0105	
03:00-04:00	0.0102	0.0088	0.0099	
04:00-05:00	0.0102	0.0134	0.0092	
05:00-06:00	0.0104	0.0097	0.0086	
06:00-07:00	0.0134	0.0100	0.0088	
07:00-08:00	0.0146	0.0099	0.0094	
08:00-09:00	0.0137	0.0096	0.0097	
09:00-10:00	0.0149	0.0094	0.0083	
24 Hours Average	0.0114	0.0106	0.0100	-
1 Hour Maximum	0.0177	0.0134	0.0130	0.17

Remark : ^{1*} Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995), Notification No.28, B.E.2550 (2007), published in the Royal Government Gazette No.124 Special Part 580 dated May 14, B.E.2550 (2007) and Notification No.33, B.E.2552 (2009), published in the Royal Government Gazette No.126 Special Part 1140 dated August 14, B.E.2552 (2009), under the Enhancement and Conservation of National Environmental Quality Act, B.E.2535 (1992).



(Ms.Piyatida Pradangkho)
Laboratory Reviewer



(Ms.Panicha Promchai)
Laboratory Supervisor

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REPORT ANALYSIS REFERS TO SUBMITTED SAMPLE (S) ONLY

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F-RP-004 Rev. 02, January 18, 2021

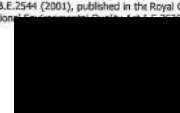
ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตไบโอดีเซล แปลงสัมปทานปิโตรเลียมแบบหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีราชา จังหวัดชลบุรี
และอำเภอสามกระบัง จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Air Quality
Measured Point : สถานีผลิต BY-AIR2 : บ้านเลขที่ 189 บ้านฉิมพัตนา
(หมู่ที่ 8 ตำบลหนองจอก อำเภอศรีราชา จังหวัดสุโขทัย)
GPS. Coordinate : UTM (WGS84) 47Q 0583262 E, 1846488 N
Measured Date : March 31-April 3, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : SO₂ UV-Fluorescence Analyzer Thermo Model 43C Serial Number 57469-317

Quotation No. : AR2024-00461
Analysis No. : 2024-ABS73-005
Report No. : 2024-RAAH141
Report Date : April 24, 2024

Interval Time	Result SO ₂ (ppm)			Standard
	Mar 31-Apr 1, 24	Apr 1-2, 24	Apr 2-3, 24	
10:00-11:00	0.0014	0.0015	0.0014	
11:00-12:00	0.0013	0.0013	0.0015	
12:00-13:00	0.0014	0.0013	0.0016	
13:00-14:00	0.0014	0.0012	0.0014	
14:00-15:00	0.0014	0.0015	0.0017	
15:00-16:00	0.0015	0.0014	0.0016	
16:00-17:00	0.0015	0.0017	0.0017	
17:00-18:00	0.0016	0.0019	0.0017	
18:00-19:00	0.0017	0.0016	0.0016	
19:00-20:00	0.0016	0.0015	0.0016	
20:00-21:00	0.0013	0.0015	0.0015	
21:00-22:00	0.0017	0.0013	0.0018	
22:00-23:00	0.0012	0.0015	0.0013	
23:00-00:00	0.0012	0.0013	0.0015	
00:00-01:00	0.0013	0.0015	0.0014	
01:00-02:00	0.0012	0.0014	0.0012	
02:00-03:00	0.0013	0.0012	0.0013	
03:00-04:00	0.0013	0.0013	0.0013	
04:00-05:00	0.0012	0.0013	0.0013	
05:00-06:00	0.0015	0.0014	0.0013	
06:00-07:00	0.0014	0.0014	0.0013	
07:00-08:00	0.0017	0.0012	0.0016	
08:00-09:00	0.0021	0.0014	0.0018	
09:00-10:00	0.0014	0.0014	0.0014	
24 Hours Average	0.0014	0.0014	0.0015	0.12 ^{1*}
1 Hour Maximum	0.0021	0.0019	0.0018	0.30 ^{1*}

Remark : ^{1*} Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995) and Notification No.24, B.E.2547 (2004), published in the Royal Government Gazette No.121 Special Part 1040 dated September 22, B.E.2547 (2004), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).
^{2*} Notification of National Environmental Board, No.12, B.E.2538 (1995), published in the Royal Government Gazette No.112 Special Part 270 dated July 13, B.E.2538 (1995) and Notification No.21, B.E.2544 (2001), published in the Royal Government Gazette No.110 Special Part 300 dated April 30, B.E.2544 (2001), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).



(Ms.Piyatida Pradangkho)
Laboratory Reviewer



(Ms.Panicha Promchai)
Laboratory Supervisor

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F-RP-004 Rev. 02, January 18, 2021

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Sol 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตบีโตรเลียม แปลงสัมปทานบีโตรเลียมแบบหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย
และอำเภอลานกระบือ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Air Quality
Measured Point : สถานีผลิต BY-AIR2 : บ้านเลขที่ 189 บ้านนิคมพัฒนา
(หมู่ที่ 8 ตำบลหนองจิก อำเภอศรีนคร จังหวัดสุโขทัย)
GPS. Coordinate : UTM (WGS84) 47Q 0533262 E, 1846488 N
Measured Date : March 31-April 3, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : CO NDIR Analyzer Horiba Model APMA-370 Serial Number 4N02XP27

Quotation No. : AR2024-00461
Analysis No. : 2024-AB573-005
Report No. : 2024-RAAH139
Report Date : April 24, 2024

Interval Time	Result CO (ppm)						Standard ¹
	Mar 31-Apr 1, 24		Apr 1-2, 24		Apr 2-3, 24		
	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	
10:00-11:00	0.5	-	0.6	0.8	0.5	0.7	
11:00-12:00	0.5	-	0.5	0.7	0.5	0.7	
12:00-13:00	0.5	-	0.5	0.7	0.5	0.6	
13:00-14:00	0.5	-	0.5	0.7	0.5	0.6	
14:00-15:00	0.5	-	0.5	0.6	0.5	0.6	
15:00-16:00	0.5	-	0.6	0.6	0.5	0.5	
16:00-17:00	0.5	-	0.6	0.6	0.5	0.5	
17:00-18:00	0.5	0.5	0.6	0.6	0.5	0.5	
18:00-19:00	0.6	0.5	0.7	0.6	0.5	0.5	
19:00-20:00	0.6	0.5	0.7	0.6	0.6	0.5	
20:00-21:00	1.2	0.6	0.7	0.6	0.8	0.6	
21:00-22:00	1.3	0.7	0.8	0.6	1.0	0.6	
22:00-23:00	0.9	0.8	0.8	0.7	0.9	0.7	
23:00-00:00	0.8	0.8	0.8	0.7	0.8	0.7	
00:00-01:00	0.8	0.8	0.8	0.7	0.8	0.7	
01:00-02:00	0.7	0.9	0.8	0.8	0.8	0.8	
02:00-03:00	0.7	0.9	0.7	0.8	0.8	0.8	
03:00-04:00	0.7	0.9	0.7	0.8	0.8	0.8	
04:00-05:00	0.7	0.8	0.7	0.8	0.8	0.8	
05:00-06:00	0.8	0.8	0.7	0.8	0.7	0.8	
06:00-07:00	0.9	0.8	0.8	0.8	0.6	0.8	
07:00-08:00	1.0	0.8	0.8	0.8	0.6	0.7	
08:00-09:00	0.8	0.8	0.7	0.7	0.5	0.7	
09:00-10:00	0.6	0.8	0.6	0.7	0.4	0.6	
24 Hours Average	0.7	-	0.7	-	0.6	-	-
1 Hour Maximum	1.3	-	0.8	-	1.0	-	30
8 Hours Maximum	-	0.9	-	0.8	-	0.8	9

Remark : ¹ Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995) and Notification of National Environmental Board, No.12, B.E.2538 (1995), published in the Royal Government Gazette No.112 Special Part 1040 dated September 22, B.E.2547 (2004), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).



(Ms.Piyatida Pradangkho)
Laboratory Reviewer



(Ms.Panicha Promchai)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Sol 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตบีโตรเลียม แปลงสัมปทานบีโตรเลียมแบบหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย
และอำเภอลานกระบือ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Air Quality
Measured Point : สถานีผลิต NS-AIR1 : บ้านประจักษ์เจริญ
(หมู่ที่ 28 หมู่บ้านประจักษ์เจริญ หมู่ที่ 8 ตำบลหนองหลวง อำเภอลานกระบือ จังหวัดกำแพงเพชร)
GPS. Coordinate : UTM (WGS84) 47Q 0584195 E, 1839432 N
Measured Date : March 31-April 3, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : SO₂ UV-Fluorescence Analyzer Horiba Model APSA-370 Serial Number X7L602W6

Quotation No. : AR2024-00461
Analysis No. : 2024-AB573-008
Report No. : 2024-RAAH144
Report Date : April 24, 2024

Interval Time	Result SO ₂ (ppm)			Standard
	Mar 31-Apr 1, 24	Apr 1-2, 24	Apr 2-3, 24	
	1 hr Avg	1 hr Avg	1 hr Avg	
12:00-13:00	0.0014	0.0015	0.0015	
13:00-14:00	0.0014	0.0015	0.0016	
14:00-15:00	0.0013	0.0017	0.0017	
15:00-16:00	0.0012	0.0018	0.0020	
16:00-17:00	0.0014	0.0019	0.0020	
17:00-18:00	0.0015	0.0020	0.0022	
18:00-19:00	0.0016	0.0019	0.0021	
19:00-20:00	0.0016	0.0015	0.0016	
20:00-21:00	0.0015	0.0014	0.0013	
21:00-22:00	0.0016	0.0014	0.0013	
22:00-23:00	0.0016	0.0014	0.0013	
23:00-00:00	0.0018	0.0014	0.0014	
00:00-01:00	0.0018	0.0014	0.0013	
01:00-02:00	0.0016	0.0014	0.0013	
02:00-03:00	0.0016	0.0014	0.0013	
03:00-04:00	0.0016	0.0013	0.0013	
04:00-05:00	0.0015	0.0014	0.0013	
05:00-06:00	0.0014	0.0014	0.0013	
06:00-07:00	0.0014	0.0013	0.0013	
07:00-08:00	0.0014	0.0013	0.0013	
08:00-09:00	0.0015	0.0014	0.0014	
09:00-10:00	0.0014	0.0013	0.0012	
10:00-11:00	0.0014	0.0013	0.0014	
11:00-12:00	0.0015	0.0014	0.0014	
24 Hours Average	0.0015	0.0015	0.0015	0.12 ¹
1 Hour Maximum	0.0018	0.0020	0.0022	0.30 ²

Remark : ¹ Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995) and Notification of National Environmental Board, No.12, B.E.2538 (1995), published in the Royal Government Gazette No.112 Special Part 1040 dated September 22, B.E.2547 (2004), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).
² Notification of National Environmental Board, No.12, B.E.2538 (1995), published in the Royal Government Gazette No.112 Special Part 270 dated July 13, B.E.2538 (1995) and Notification No.21, B.E.2544 (2001), published in the Royal Government Gazette No.118 Special Part 200 dated April 20, B.E.2544 (2001), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).



(Ms.Piyatida Pradangkho)
Laboratory Reviewer



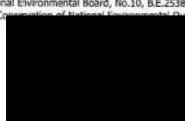
(Ms.Panicha Promchai)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปุ๋ยอินทรีย์ แปลงสัมปทานปิโตรเลียมแบบหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย
และอำเภอลานกระบือ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Air Quality
Measured Point : ฐานหลุมหลุม NS-AIR1 : ปานประดาเจ็ตรัง
(บ้านเลขที่ 28 หมู่บ้านประดาเจ็ตรัง หมู่ที่ 8 ตำบลหนองหลวง อำเภอลานกระบือ จังหวัดกำแพงเพชร)
GPS. Coordinate : UTM (WGS84) 47Q 0534195 E, 1839432 N
Measured Date : March 31-April 3, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : CO NDIR Analyzer Horba Model APMA-370 Serial Number WNTLD9N8

Interval Time	Result CO (ppm)						Standard ¹⁾
	Mar 31-Apr 1, 24		Apr 1-2, 24		Apr 2-3, 24		
	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	
12:00-13:00	0.8	-	0.8	0.7	0.7	0.6	
13:00-14:00	0.9	-	0.9	0.7	0.8	0.6	
14:00-15:00	0.8	-	0.8	0.7	0.8	0.6	
15:00-16:00	0.7	-	0.7	0.7	0.7	0.7	
16:00-17:00	0.5	-	0.8	0.7	0.6	0.7	
17:00-18:00	0.5	-	0.6	0.8	0.6	0.7	
18:00-19:00	0.6	-	0.6	0.8	0.6	0.7	
19:00-20:00	0.6	0.7	0.5	0.7	0.5	0.7	
20:00-21:00	0.5	0.6	0.6	0.7	0.5	0.6	
21:00-22:00	0.5	0.6	0.5	0.6	0.5	0.6	
22:00-23:00	0.5	0.6	0.6	0.6	0.5	0.6	
23:00-00:00	0.6	0.5	0.6	0.6	0.4	0.5	
00:00-01:00	0.6	0.6	0.6	0.6	0.5	0.5	
01:00-02:00	0.5	0.6	0.6	0.6	0.5	0.5	
02:00-03:00	0.6	0.6	0.5	0.6	0.4	0.5	
03:00-04:00	0.6	0.6	0.5	0.6	0.4	0.5	
04:00-05:00	0.7	0.6	0.5	0.6	0.5	0.5	
05:00-06:00	0.7	0.6	0.5	0.6	0.5	0.5	
06:00-07:00	0.6	0.6	0.5	0.5	0.4	0.4	
07:00-08:00	0.7	0.6	0.5	0.5	0.4	0.4	
08:00-09:00	0.6	0.6	0.6	0.5	0.6	0.5	
09:00-10:00	0.5	0.6	0.5	0.5	0.6	0.5	
10:00-11:00	0.6	0.6	0.6	0.5	0.5	0.5	
11:00-12:00	0.8	0.6	0.7	0.6	0.6	0.5	
24 Hours Average	0.6	-	0.6	-	0.5	-	-
1 Hour Maximum	0.9	-	0.9	-	0.8	-	30
8 Hours Maximum	-	0.7	-	0.8	-	0.7	9

Remark : ¹⁾ Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992)



(Ms.Piyatida Pradangkho)
Laboratory Reviewer



(Ms.Panicha Promchai)
Laboratory Supervisor

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F-RP-053 Rev.03, November 22, 2018

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปุ๋ยอินทรีย์ แปลงสัมปทานปิโตรเลียมแบบหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย
และอำเภอลานกระบือ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Air Quality
Measured Point : ฐานหลุมหลุม NS-AIR2 : ปานหนองโม้นแดง
(บ้านเลขที่ 74/1 หมู่ที่ 7 ตำบลหนองหลวง อำเภอลานกระบือ จังหวัดกำแพงเพชร)
GPS. Coordinate : UTM (WGS84) 47Q 0582515 E, 1839023 N
Measured Date : March 31-April 3, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : NOx Chemiluminescence Analyzer Horiba Model APNA-370 Serial Number NT2CRTL2

Interval Time	Result NO _x (ppm)			Standard ¹⁾
	Mar 31-Apr 1, 24	Apr 1-2, 24	Apr 2-3, 24	
13:00-14:00	0.0060	0.0073	0.0073	
14:00-15:00	0.0105	0.0075	0.0073	
15:00-16:00	0.0092	0.0074	0.0071	
16:00-17:00	0.0070	0.0076	0.0071	
17:00-18:00	0.0078	0.0093	0.0080	
18:00-19:00	0.0084	0.0100	0.0101	
19:00-20:00	0.0131	0.0105	0.0123	
20:00-21:00	0.0183	0.0131	0.0127	
21:00-22:00	0.0148	0.0136	0.0140	
22:00-23:00	0.0163	0.0156	0.0122	
23:00-00:00	0.0169	0.0131	0.0142	
00:00-01:00	0.0109	0.0109	0.0141	
01:00-02:00	0.0094	0.0103	0.0099	
02:00-03:00	0.0103	0.0142	0.0094	
03:00-04:00	0.0102	0.0095	0.0094	
04:00-05:00	0.0098	0.0087	0.0086	
05:00-06:00	0.0088	0.0092	0.0079	
06:00-07:00	0.0086	0.0090	0.0079	
07:00-08:00	0.0091	0.0095	0.0084	
08:00-09:00	0.0098	0.0112	0.0088	
09:00-10:00	0.0093	0.0088	0.0084	
10:00-11:00	0.0085	0.0084	0.0074	
11:00-12:00	0.0082	0.0076	0.0072	
12:00-13:00	0.0082	0.0073	0.0073	
24 Hours Average	0.0104	0.0100	0.0095	-
1 Hour Maximum	0.0183	0.0156	0.0142	0.17

Remark : ¹⁾ Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995), Notification No.28, B.E.2550 (2007), published in the Royal Government Gazette No.124 Special Part 580 dated May 14, B.E.2550 (2007) and Notification No.33, B.E.2552 (2009), published in the Royal Government Gazette No.126 Special Part 1140 dated August 14, B.E.2552 (2009), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).



(Ms.Piyatida Pradangkho)
Laboratory Reviewer



(Ms.Panicha Promchai)
Laboratory Supervisor

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REPORT ANALYSIS REFERS TO SUBMITTED SAMPLE (S) ONLY

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F-RP-004 Rev.02, January 18, 2021

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปุ๋ยอินทรีย์ แปลงสัมปทานปิโตรเลียมหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีราชา จังหวัดชลบุรี และอำเภอฉะเชิงเทรา จังหวัดกำแพงเพชร
Project Location : จังหวัดชลบุรี และจังหวัดกำแพงเพชร
Measured Source : Ambient Air Quality
Measured Point : ฐานหลุมผลิต NS-AIR2 : บ้านหนองไผ่แดง (บ้านเลขที่ 74/1 หมู่ที่ 7 ตำบลหนองหลวง อำเภอฉะเชิงเทรา จังหวัดกำแพงเพชร)
GPS. Coordinate : UTM (WGS84) 47Q 0582515 E, 1839023 N
Measured Date : March 31-April 3, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : SO₂ UV-Fluorescence Analyzer Horiba Model APSA-370 Serial Number ESKWB08

Quotation No. : AR2024-00461
Analysis No. : 2024-AB573-011
Report No. : 2024-RAAH147
Report Date : April 24, 2024

Interval Time	Result SO ₂ (ppm)			Standard
	Mar 31-Apr 1, 24	Apr 1-2, 24	Apr 2-3, 24	
13:00-14:00	0.0013	0.0013	0.0018	
14:00-15:00	0.0013	0.0013	0.0016	
15:00-16:00	0.0014	0.0014	0.0016	
16:00-17:00	0.0014	0.0015	0.0016	
17:00-18:00	0.0014	0.0015	0.0015	
18:00-19:00	0.0015	0.0015	0.0014	
19:00-20:00	0.0014	0.0014	0.0014	
20:00-21:00	0.0014	0.0014	0.0013	
21:00-22:00	0.0012	0.0015	0.0013	
22:00-23:00	0.0014	0.0017	0.0013	
23:00-00:00	0.0012	0.0015	0.0012	
00:00-01:00	0.0014	0.0016	0.0012	
01:00-02:00	0.0015	0.0015	0.0012	
02:00-03:00	0.0014	0.0015	0.0012	
03:00-04:00	0.0014	0.0014	0.0012	
04:00-05:00	0.0013	0.0014	0.0012	
05:00-06:00	0.0013	0.0014	0.0012	
06:00-07:00	0.0012	0.0013	0.0012	
07:00-08:00	0.0012	0.0014	0.0012	
08:00-09:00	0.0012	0.0014	0.0012	
09:00-10:00	0.0014	0.0014	0.0013	
10:00-11:00	0.0014	0.0015	0.0016	
11:00-12:00	0.0014	0.0015	0.0017	
12:00-13:00	0.0013	0.0014	0.0016	
24 Hours Average	0.0013	0.0014	0.0014	0.12 ¹
1 Hour Maximum	0.0015	0.0017	0.0018	0.30 ²

Remark : ¹ Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995) and Notification No.24, B.E.2547 (2004), published in the Royal Government Gazette No.121 Special Part 1040 dated September 22, B.E.2547 (2004), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).
² Notification of National Environmental Board, No.12, B.E.2538 (1995), published in the Royal Government Gazette No.112 Special Part 270 dated July 13, B.E.2538 (1995) and Notification No.21, B.E.2544 (2001), published in the Royal Government Gazette No.118 Special Part 380 dated April 30, B.E.2544 (2001), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).



(Ms.Piyatida Pradangkho)
Laboratory Reviewer



(Ms.Panicha Promchai)
Laboratory Supervisor

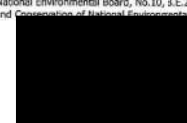
ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปุ๋ยอินทรีย์ แปลงสัมปทานปิโตรเลียมหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีราชา จังหวัดชลบุรี และอำเภอฉะเชิงเทรา จังหวัดกำแพงเพชร
Project Location : จังหวัดชลบุรี และจังหวัดกำแพงเพชร
Measured Source : Ambient Air Quality
Measured Point : ฐานหลุมผลิต NS-AIR2 : บ้านหนองไผ่แดง (บ้านเลขที่ 74/1 หมู่ที่ 7 ตำบลหนองหลวง อำเภอฉะเชิงเทรา จังหวัดกำแพงเพชร)
GPS. Coordinate : UTM (WGS84) 47Q 0582515 E, 1839023 N
Measured Date : March 31-April 3, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : CO NDIR Analyzer Horiba Model APMA-370 Serial Number GFB08INC

Quotation No. : AR2024-00461
Analysis No. : 2024-AB573-011
Report No. : 2024-RAAH146
Report Date : April 24, 2024

Interval Time	Result CO (ppm)						Standard ¹
	Mar 31-Apr 1, 24		Apr 1-2, 24		Apr 2-3, 24		
	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	
13:00-14:00	0.4	-	0.5	0.6	0.5	0.5	
14:00-15:00	0.5	-	0.5	0.5	0.5	0.5	
15:00-16:00	0.4	-	0.5	0.5	0.5	0.5	
16:00-17:00	0.4	-	0.5	0.5	0.5	0.5	
17:00-18:00	0.5	-	0.5	0.5	0.5	0.5	
18:00-19:00	0.5	-	0.5	0.5	0.5	0.5	
19:00-20:00	0.6	-	0.5	0.5	0.5	0.5	
20:00-21:00	0.6	0.5	0.5	0.5	0.6	0.5	
21:00-22:00	0.7	0.5	0.7	0.5	0.7	0.5	
22:00-23:00	0.7	0.6	0.7	0.6	0.7	0.6	
23:00-00:00	0.7	0.6	0.6	0.6	0.7	0.6	
00:00-01:00	0.6	0.6	0.6	0.6	0.6	0.6	
01:00-02:00	0.6	0.6	0.6	0.6	0.6	0.6	
02:00-03:00	0.7	0.6	0.6	0.6	0.6	0.6	
03:00-04:00	0.7	0.7	0.6	0.6	0.6	0.6	
04:00-05:00	0.7	0.7	0.6	0.6	0.6	0.6	
05:00-06:00	0.7	0.7	0.6	0.6	0.6	0.6	
06:00-07:00	0.7	0.7	0.6	0.6	0.6	0.6	
07:00-08:00	0.7	0.7	0.6	0.6	0.5	0.6	
08:00-09:00	0.6	0.7	0.6	0.6	0.4	0.6	
09:00-10:00	0.5	0.7	0.5	0.6	0.4	0.5	
10:00-11:00	0.5	0.6	0.5	0.6	0.4	0.5	
11:00-12:00	0.5	0.6	0.5	0.6	0.5	0.5	
12:00-13:00	0.5	0.6	0.5	0.6	0.4	0.5	
24 Hours Average	0.6	-	0.6	-	0.5	-	-
1 Hour Maximum	0.7	-	0.7	-	0.7	-	30
8 Hours Maximum	-	0.7	-	0.6	-	0.6	9

Remark : ¹ Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).



(Ms.Piyatida Pradangkho)
Laboratory Reviewer



(Ms.Panicha Promchai)
Laboratory Supervisor



TEST REPORT

Analysis No. : R24-1861

Received Date: 08/04/24

Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด

Address : 25/114 หมู่ 6 ซอยจินเขต 1 ถนนงามวงศ์วาน แขวงทุ่งสองห้อง
เขตหลักสี่ กรุงเทพฯ 10210

Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747

Report Date : 29/05/24

Analysis Date : 30/04-01/05/24

Job No. : M/240060

Sampling Date : 31/03-03/04/24

Sampling By : Customer

Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(A)
			BYN 3				
			2404-AA0432	2404-AA0440	2404-AA0448		
			31/03-01/04/24	01-02/04/24	02-03/04/24		
VOCs							
1	Vinyl chloride	µg/m ³	< 0.13	< 0.13	< 0.13	0.03	20
2	1,3-Butadiene	µg/m ³	< 0.11	< 0.11	< 0.11	0.02	5.3
3	Acetaldehyde	µg/m ³	12.66	7.12	9.83	0.03	860
4	Bromomethane	µg/m ³	< 0.19	< 0.19	< 0.19	0.04	190
5	Acrolein	µg/m ³	< 0.11	< 0.11	< 0.11	0.02	0.55
6	Dichloromethane	µg/m ³	5.85	0.62	2.83	0.04	210
7	Acrylonitrile	µg/m ³	< 0.11	< 0.11	< 0.11	0.03	10
8	Chloroform	µg/m ³	< 0.24	< 0.24	< 0.24	0.03	57
9	Carbon tetrachloride	µg/m ³	< 0.31	< 0.31	< 0.31	0.04	150
10	Benzene	µg/m ³	2.20	3.13	2.40	0.02	7.6
11	1,2-Dichloroethane	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	48
12	Trichloroethylene	µg/m ³	< 0.27	< 0.27	< 0.27	0.03	130
13	1,2-Dichloropropane	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	82
14	1,4-Dioxane	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	860
15	Tetrachloroethylene	µg/m ³	< 0.34	< 0.34	< 0.34	0.04	400
16	1,2-Dibromoethane	µg/m ³	< 0.38	< 0.38	< 0.38	0.09	370
17	1,1,2,2-Tetrachloroethane	µg/m ³	< 0.34	< 0.34	< 0.34	0.06	83
18	1,4-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.11	1,100
19	Benzyl chloride	µg/m ³	< 0.26	< 0.26	< 0.26	0.11	12
20	Carbon disulfide	µg/m ³	7.23	< 0.16	4.83	0.03	100 ^(B)
21	Propene	µg/m ³	40.55	95.85	66.07	0.02	-
22	Dichlorodifluoromethane	µg/m ³	1.33	1.38	1.31	0.04	-
23	Difluorochloromethane	µg/m ³	5.79	0.72	4.71	0.04	-
24	1,2-Dichloro-1,1,2,2-tetrafluoroethane	µg/m ³	< 0.35	< 0.35	< 0.35	0.06	-
25	Chloromethane	µg/m ³	1.74	1.93	2.26	0.02	-
26	Isobutene	µg/m ³	< 0.11	< 0.11	< 0.11	0.03	-
27	Methanol	µg/m ³	8.75	6.12	8.09	0.02	-
28	Vinyl bromide	µg/m ³	< 0.22	< 0.22	< 0.22	0.05	-
29	Chloroethane	µg/m ³	< 0.13	< 0.13	< 0.13	0.02	-
30	Trichlorofluoromethane	µg/m ³	0.82	0.85	1.04	0.04	-
31	Pentane	µg/m ³	47.25	120.36	84.79	0.03	-
32	Ethanol	µg/m ³	88.65	7.29	16.62	0.02	-

continue

"Refer to Analysis No. R24-1311 and follow to QF-10-02 No. 022/24 in order to add parameters ; m,p-Xylene and o-Xylene on page 3, 6, 9, 12, 15, 18, 21 and 24"

- REPORTED RESULTS REFER TO SUBMITTED SAMPLE(S) ONLY
- DO NOT COPY PARTIAL OF THIS ANALYSIS REPORT WITHOUT OFFICIAL APPROVAL



TEST REPORT

Analysis No. : R24-1861

Received Date: 08/04/24

Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด

Address : 25/114 หมู่ 6 ซอยจินเขต 1 ถนนงามวงศ์วาน แขวงทุ่งสองห้อง
เขตหลักสี่ กรุงเทพฯ 10210

Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747

Report Date : 29/05/24

Analysis Date : 30/04-01/05/24

Job No. : M/240060

Sampling Date : 31/03-03/04/24

Sampling By : Customer

Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(a)
			BYN 3				
			2404-AA0432	2404-AA0440	2404-AA0448		
			31/03-01/04/24	01-02/04/24	02-03/04/24		
33	Isoprene	µg/m ³	< 0.14	< 0.14	< 0.14	0.02	-
34	Propanal	µg/m ³	< 0.12	< 0.12	< 0.12	0.02	-
35	1,1-Dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
36	1,1,2-Trichloro-1,2,2-trifluoroethane	µg/m ³	< 0.38	< 0.38	< 0.38	0.04	-
37	Acetone	µg/m ³	41.43	12.63	35.77	0.02	-
38	Iodomethane	µg/m ³	< 0.29	< 0.29	< 0.29	0.03	-
39	Isopropyl Alcohol	µg/m ³	9.90	0.60	2.91	0.02	-
40	Acetonitrile	µg/m ³	< 0.08	< 0.08	< 0.08	0.02	-
41	Allyl chloride	µg/m ³	< 0.16	< 0.16	< 0.16	0.02	-
42	Cyclopentane	µg/m ³	3.27	8.61	5.50	0.02	-
43	trans-1,2-dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.03	-
44	2-Methoxy-2-methylpropane	µg/m ³	< 0.18	< 0.18	< 0.18	0.03	-
45	Hexane	µg/m ³	35.96	78.24	56.84	0.03	-
46	Methacrolein	µg/m ³	< 0.14	< 0.14	< 0.14	0.03	-
47	1,1-Dichloroethane	µg/m ³	< 0.20	< 0.20	< 0.20	0.03	-
48	Vinyl acetate	µg/m ³	< 0.18	< 0.18	< 0.18	0.05	-
49	Propanol	µg/m ³	< 0.12	< 0.12	< 0.12	0.02	-
50	Butanal	µg/m ³	< 0.15	< 0.15	< 0.15	0.04	-
51	Methyl vinyl ketone	µg/m ³	30.02	72.12	49.26	0.02	-
52	cis-1,2-Dichloroethene	µg/m ³	< 0.20	< 0.20	0.45	0.02	-
53	Methyl ethyl ketone	µg/m ³	2.05	1.30	1.75	0.02	-
54	Ethyl acetate	µg/m ³	0.69	0.84	1.33	0.03	-
55	Tetrahydrofuran	µg/m ³	< 0.15	< 0.15	< 0.15	0.02	-
56	1,1,1-Trichloroethane	µg/m ³	< 0.27	< 0.27	< 0.27	0.02	-
57	Cyclohexane	µg/m ³	9.84	34.34	18.67	0.01	-
58	2,2,4-Trimethylpentane	µg/m ³	< 0.23	< 0.23	< 0.23	0.03	-
59	Heptane	µg/m ³	12.42	49.22	25.10	0.03	-
60	1-Butanol	µg/m ³	5.82	< 0.15	2.28	0.02	-
61	2-Pentanone	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	-
62	Pentanal	µg/m ³	< 0.18	< 0.18	< 0.18	0.04	-
63	3-Pentanone	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	-
64	Bromodichloromethane	µg/m ³	< 0.34	< 0.34	< 0.34	0.03	-
65	cis-1,3-Dichloropropene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
66	Methyl Isobutyl Ketone	µg/m ³	2.57	0.99	1.46	0.04	-

continue

"Refer to Analysis No. R24-1311 and follow to QF-10-02 No. 022/24 in order to add parameters ; m,p-Xylene and o-Xylene on page 3, 6, 9, 12, 15, 18, 21 and 24"

- REPORTED RESULTS REFER TO SUBMITTED SAMPLE(S) ONLY
- DO NOT COPY PARTIAL OF THIS ANALYSIS REPORT WITHOUT OFFICIAL APPROVAL



Thai Environmental Technic Limited
บริษัท เทคนิคสิ่งแวดล้อมไทย จำกัด

ORIGINAL
ต้นฉบับ

1/6 Soi Ramkhamhaeng 145, Khwaeng / Khet Saphansung, Bangkok 10240
1/6 ซอยรามคำแหง 145 แขวงสะพานสูง เขตสะพานสูง กรุงเทพมหานคร 10240

E-mail : admin@tet1995.com

Tel : 0-2373-7799 (Auto) Fax : 0-2373-7979

Page 9 of 24

TEST REPORT

Analysis No. : R24-1861

Received Date: 08/04/24

Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด

Address : 25/114 หมู่ 6 ซอยจินเขต 1 ถนนงามวงศ์วาน แขวงทุ่งสองห้อง
เขตหลักสี่ กรุงเทพฯ 10210

Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747

Report Date : 29/05/24

Analysis Date : 30/04-01/05/24

Job No. : M/240060

Sampling Date : 31/03-03/04/24

Sampling By : Customer

Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(A)
			BYN 3				
			2404-AA0432	2404-AA0440	2404-AA0448		
			31/03-01/04/24	01-02/04/24	02-03/04/24		
67	Toluene	µg/m ³	3.50	5.82	4.64	0.03	-
68	trans-1,3-Dichloropropene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
69	1,1,2-Trichloroethane	µg/m ³	< 0.27	< 0.27	< 0.27	0.03	-
70	3-Hexanone	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
71	2-Hexanone	µg/m ³	< 0.20	< 0.20	< 0.20	0.05	-
72	Dibromochloromethane	µg/m ³	< 0.42	< 0.42	< 0.42	0.07	-
73	Hexanal	µg/m ³	< 0.20	< 0.20	< 0.20	0.07	-
74	Chlorobenzene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
75	Ethylbenzene	µg/m ³	1.35	0.81	0.47	0.02	-
76	<i>m,p</i> -Xylene	µg/m ³	2.03	0.90	0.53	0.05	-
77	<i>o</i> -Xylene	µg/m ³	2.15	0.66	0.41	0.05	-
78	Total Xylene	µg/m ³	4.18	1.56	0.94	0.05	-
79	Styrene	µg/m ³	2.39	< 0.21	< 0.21	0.03	-
80	Bromoform	µg/m ³	< 0.52	< 0.52	< 0.52	0.11	-
81	4-Ethyl toluene	µg/m ³	0.33	< 0.25	< 0.25	0.06	-
82	1,3,5-Trimethylbenzene	µg/m ³	0.29	< 0.25	< 0.25	0.02	-
83	1,2,4-Trimethylbenzene	µg/m ³	1.55	< 0.25	< 0.25	0.04	-
84	1,3-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.26	-
85	1,2,3-Trimethylbenzene	µg/m ³	< 0.25	< 0.25	< 0.25	0.05	-
86	1,2-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.10	-
87	1,2,4-Trichlorobenzene	µg/m ³	< 0.37	< 0.37	< 0.37	0.08	-
88	Hexachloro-1,3-Butadiene	µg/m ³	< 0.53	< 0.53	< 0.53	0.06	-
89	Naphthalene	µg/m ³	< 0.26	< 0.26	< 0.26	0.06	-

Remarks : Concentration of each gas is Ambient is based on 1 atm and 25 °C

MDL = Method Detection Limit

Method : VOCs - Canister, GC/MS (US EPA Method TO-15)

Standard (A) Notification of Pollution Control Department (2009) (B.E. 2552) : 24 hours

(B) Notification of the National Environment Board (2017) (B.E. 2560) : 24 hours

Reviewed by

Mx. Warerat Prachumdaeng
Chief of Laboratory

Approved by

Mx. Pornpip Pethphoe
Laboratory Manager

"Refer to Analysis No. R24-1311 and follow to QF-10-02 No. 022/24 in order to add parameters m,p-Xylene and o-Xylene on page 3, 6, 9, 12, 15, 18, 21 and 24"

- REPORTED RESULTS REFER TO SUBMITTED SAMPLE(S) ONLY
- DO NOT COPY PARTIAL OF THIS ANALYSIS REPORT WITHOUT OFFICIAL APPROVAL



Thai Environmental Technic Limited
บริษัท เทคนิคสิ่งแวดล้อมไทย จำกัด

ORIGINAL
ต้นฉบับ

1/6 Soi Ramkhamhaeng 145, Khwaeng / Khet Saphansung, Bangkok 10240
1/6 ซอยรามคำแหง 145 แขวงสะพานสูง เขตสะพานสูง กรุงเทพมหานคร 10240

E-mail : admin@tet1995.com

Tel : 0-2373-7799 (Auto) Fax : 0-2373-7979

Page 10 of 24

TEST REPORT

Analysis No. : R24-1861

Received Date: 08/04/24

Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด

Address : 25/114 หมู่ 6 ซอยจินเขต 1 ถนนงามวงศ์วาน แขวงทุ่งสองห้อง
เขตหลักสี่ กรุงเทพฯ 10210

Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747

Report Date : 29/05/24

Analysis Date : 30/04-01/05/24

Job No. : M/240060

Sampling Date : 31/03-03/04/24

Sampling By : Customer

Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(A)
			BYW 1				
			2404-AA0433	2404-AA0441	2404-AA0449		
			31/03-01/04/24	01-02/04/24	02-03/04/24		
VOCs							
1	Vinyl chloride	µg/m ³	< 0.13	< 0.13	< 0.13	0.03	20
2	1,3-Butadiene	µg/m ³	< 0.11	< 0.11	< 0.11	0.02	5.3
3	Acetaldehyde	µg/m ³	17.08	10.31	7.26	0.03	860
4	Bromomethane	µg/m ³	< 0.19	< 0.19	< 0.19	0.04	190
5	Acrolein	µg/m ³	< 0.11	< 0.11	< 0.11	0.02	0.55
6	Dichloromethane	µg/m ³	0.45	64.36	0.52	0.04	210
7	Acrylonitrile	µg/m ³	< 0.11	< 0.11	< 0.11	0.03	10
8	Chloroform	µg/m ³	< 0.24	1.07	0.25	0.03	57
9	Carbon tetrachloride	µg/m ³	< 0.31	< 0.31	< 0.31	0.04	150
10	Benzene	µg/m ³	1.75	1.49	1.70	0.02	7.6
11	1,2-Dichloroethane	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	48
12	Trichloroethylene	µg/m ³	< 0.27	< 0.27	< 0.27	0.03	130
13	1,2-Dichloropropane	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	82
14	1,4-Dioxane	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	860
15	Tetrachloroethylene	µg/m ³	< 0.34	< 0.34	< 0.34	0.04	400
16	1,2-Dibromoethane	µg/m ³	< 0.38	< 0.38	< 0.38	0.09	370
17	1,1,2,2-Tetrachloroethane	µg/m ³	< 0.34	< 0.34	< 0.34	0.06	83
18	1,4-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.11	1,100
19	Benzyl chloride	µg/m ³	< 0.26	< 0.26	< 0.26	0.11	12
20	Carbon disulfide	µg/m ³	< 0.16	13.69	< 0.16	0.03	100 ^(B)
21	Propene	µg/m ³	5.96	3.02	3.41	0.02	-
22	Dichlorodifluoromethane	µg/m ³	1.45	1.63	1.40	0.04	-
23	Difluorochloromethane	µg/m ³	0.60	11.44	0.59	0.04	-
24	1,2-Dichloro-1,1,2,2-tetrafluoroethane	µg/m ³	< 0.35	< 0.35	< 0.35	0.06	-
25	Chloromethane	µg/m ³	1.91	1.60	1.84	0.02	-
26	Isobutene	µg/m ³	1.82	3.16	1.23	0.03	-
27	Methanol	µg/m ³	7.37	8.92	7.36	0.02	-
28	Vinyl bromide	µg/m ³	< 0.22	< 0.22	< 0.22	0.05	-
29	Chloroethane	µg/m ³	< 0.13	< 0.13	< 0.13	0.02	-
30	Trichlorofluoromethane	µg/m ³	0.89	0.94	0.91	0.04	-
31	Pentane	µg/m ³	2.55	1.89	1.57	0.03	-
32	Ethanol	µg/m ³	8.51	81.30	6.57	0.02	-

continue

"Refer to Analysis No. R24-1311 and follow to QF-10-02 No. 022/24 in order to add parameters m,p-Xylene and o-Xylene on page 3, 6, 9, 12, 15, 18, 21 and 24"

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Thai Environmental Technic Limited
บริษัท เทคนิคสิ่งแวดล้อมไทย จำกัด

ORIGINAL
ต้นฉบับ

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E-mail : admin@et1995.com

Tel : 0-2373-7799 (Auto) Fax : 0-2373-7979

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TEST REPORT

Analysis No. : R24-1861

Received Date: 08/04/24

Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด

Address : 25/114 หมู่ 6 ซอยอินเขต 1 ถนนงามวงศ์วาน แขวงทุ่งสองห้อง
เขตหลักสี่ กรุงเทพฯ 10210

Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747

Report Date : 29/05/24

Analysis Date : 30/04-01/05/24

Job No. : M/240060

Sampling Date : 31/03-03/04/24

Sampling By : Customer

Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(A)
			BYW 1				
			2404-AA0433	2404-AA0441	2404-AA0449		
			31/03-01/04/24	01-02/04/24	02-03/04/24		
33	Isoprene	µg/m ³	< 0.14	< 0.14	< 0.14	0.02	-
34	Propanal	µg/m ³	< 0.12	< 0.12	< 0.12	0.02	-
35	1,1-Dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
36	1,1,2-Trichloro-1,2,2-trifluoroethane	µg/m ³	< 0.38	< 0.38	< 0.38	0.04	-
37	Acetone	µg/m ³	15.04	48.63	12.98	0.02	-
38	Iodomethane	µg/m ³	< 0.29	< 0.29	< 0.29	0.03	-
39	Isopropyl Alcohol	µg/m ³	0.53	7.56	0.40	0.02	-
40	Acetonitrile	µg/m ³	< 0.08	< 0.08	< 0.08	0.02	-
41	Allyl chloride	µg/m ³	< 0.16	< 0.16	< 0.16	0.02	-
42	Cyclopentane	µg/m ³	< 0.14	< 0.14	< 0.14	0.02	-
43	trans-1,2-dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.03	-
44	2-Methoxy-2-methylpropane	µg/m ³	< 0.18	< 0.18	< 0.18	0.03	-
45	Hexane	µg/m ³	1.53	18.68	0.80	0.03	-
46	Methacrolein	µg/m ³	< 0.14	< 0.14	< 0.14	0.03	-
47	1,1-Dichloroethane	µg/m ³	< 0.20	< 0.20	< 0.20	0.03	-
48	Vinyl acetate	µg/m ³	< 0.18	< 0.18	< 0.18	0.05	-
49	Propanol	µg/m ³	< 0.12	< 0.12	< 0.12	0.02	-
50	Butanal	µg/m ³	< 0.15	< 0.15	< 0.15	0.04	-
51	Methyl vinyl ketone	µg/m ³	3.58	20.88	2.62	0.02	-
52	cis-1,2-Dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
53	Methyl ethyl ketone	µg/m ³	1.01	1.68	1.15	0.02	-
54	Ethyl acetate	µg/m ³	0.35	0.65	0.63	0.03	-
55	Tetrahydrofuran	µg/m ³	< 0.15	< 0.15	< 0.15	0.02	-
56	1,1,1-Trichloroethane	µg/m ³	< 0.27	< 0.27	< 0.27	0.02	-
57	Cyclohexane	µg/m ³	0.68	0.84	0.48	0.01	-
58	2,2,4-Trimethylpentane	µg/m ³	< 0.23	< 0.23	< 0.23	0.03	-
59	Heptane	µg/m ³	0.69	0.38	0.42	0.03	-
60	1-Butanol	µg/m ³	11.81	15.66	12.02	0.02	-
61	2-Pentanone	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	-
62	Pentanal	µg/m ³	< 0.18	< 0.18	< 0.18	0.04	-
63	3-Pentanone	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	-
64	Bromodichloromethane	µg/m ³	< 0.34	< 0.34	< 0.34	0.03	-
65	cis-1,3-Dichloropropene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
66	Methyl Isobutyl Ketone	µg/m ³	1.07	2.45	0.43	0.04	-

continue

"Refer to Analysis No. R24-1311 and follow to QF-10-02 No. 022/24 in order to add parameters ; m,p-Xylene and o-Xylene on page 3, 6, 9, 12, 15, 18, 21 and 24"

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E-mail : admin@et1995.com

Tel : 0-2373-7799 (Auto) Fax : 0-2373-7979

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TEST REPORT

Analysis No. : R24-1861

Received Date: 08/04/24

Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด

Address : 25/114 หมู่ 6 ซอยอินเขต 1 ถนนงามวงศ์วาน แขวงทุ่งสองห้อง
เขตหลักสี่ กรุงเทพฯ 10210

Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747

Report Date : 29/05/24

Analysis Date : 30/04-01/05/24

Job No. : M/240060

Sampling Date : 31/03-03/04/24

Sampling By : Customer

Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(A)
			BYW 1				
			2404-AA0433	2404-AA0441	2404-AA0449		
			31/03-01/04/24	01-02/04/24	02-03/04/24		
67	Toluene	µg/m ³	1.18	1.90	1.04	0.03	-
68	trans-1,3-Dichloropropene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
69	1,1,2-Trichloroethane	µg/m ³	< 0.27	< 0.27	< 0.27	0.03	-
70	3-Hexanone	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
71	2-Hexanone	µg/m ³	< 0.20	< 0.20	< 0.20	0.05	-
72	Dibromochloromethane	µg/m ³	< 0.42	< 0.42	< 0.42	0.07	-
73	Hexanal	µg/m ³	< 0.20	< 0.20	< 0.20	0.07	-
74	Chlorobenzene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
75	Ethylbenzene	µg/m ³	0.46	1.00	0.28	0.02	-
76	<i>m,p</i> -Xylene	µg/m ³	0.53	0.70	< 0.22	0.05	-
77	<i>o</i> -Xylene	µg/m ³	0.66	0.74	< 0.22	0.05	-
78	Total Xylene	µg/m ³	1.20	1.44	< 0.22	0.05	-
79	Styrene	µg/m ³	0.75	1.50	< 0.21	0.03	-
80	Bromoform	µg/m ³	< 0.52	< 0.52	< 0.52	0.11	-
81	4-Ethyl toluene	µg/m ³	< 0.25	< 0.25	< 0.25	0.06	-
82	1,3,5-Trimethylbenzene	µg/m ³	< 0.25	< 0.25	< 0.25	0.02	-
83	1,2,4-Trimethylbenzene	µg/m ³	< 0.25	< 0.25	< 0.25	0.04	-
84	1,3-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.26	-
85	1,2,3-Trimethylbenzene	µg/m ³	< 0.25	< 0.25	< 0.25	0.05	-
86	1,2-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.10	-
87	1,2,4-Trichlorobenzene	µg/m ³	< 0.37	< 0.37	< 0.37	0.08	-
88	Hexachloro-1,3-Butadiene	µg/m ³	< 0.53	< 0.53	< 0.53	0.06	-
89	Naphthalene	µg/m ³	< 0.26	< 0.26	< 0.26	0.06	-

Remarks : Concentration of each gas in Ambient is based on 1 atm and 25 °C

MDL = Method Detection Limit

Method : VOCs = Canister, GC/MS (US EPA Method TO-15)

Standard : (A) Notification of Pollution Control Departmental (2009 (B.E. 2552) : 24 hours

(B) Notification of the National Environment Board (2017) (B.E. 2560) : 24 hours

Reviewed by

Mrs. Warunat Prachumdaeng
Chief of Laboratory

Approved by

Mrs. Ponnip Petchasat
Laboratory Manager

"Refer to Analysis No. R24-1311 and follow to QF-10-02 No. 022/24 in order to add parameters ; m,p-Xylene and o-Xylene on page 3, 6, 9, 12, 15, 18, 21 and 24"

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Tel : 0-2373-7799 (Auto) Fax : 0-2373-7979

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TEST REPORT

Analysis No. : R24-1861

Received Date: 08/04/24

Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด

Address : 25/114 หมู่ 6 ซอยชินเขต 1 ถนนจันทวงศ์วาน แขวงทุ่งสองห้อง
เขตหลักสี่ กรุงเทพฯ 10210

Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747

Report Date : 29/05/24

Analysis Date : 30/04-01/05/24

Job No. : M/240060

Sampling Date : 31/03-03/04/24

Sampling By : Customer

Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(A)
			BYN 2				
			2404-AA0434	2404-AA0442	2404-AA0450		
			31/03-01/04/24	01-02/04/24	02-03/04/24		
VOCs							
1	Vinyl chloride	µg/m ³	< 0.13	< 0.13	< 0.13	0.03	20
2	1,3-Butadiene	µg/m ³	< 0.11	< 0.11	< 0.11	0.02	5.3
3	Acetaldehyde	µg/m ³	6.00	7.89	15.08	0.03	860
4	Bromomethane	µg/m ³	< 0.19	< 0.19	< 0.19	0.04	190
5	Acrolein	µg/m ³	< 0.11	< 0.11	< 0.11	0.02	0.55
6	Dichloromethane	µg/m ³	< 0.17	< 0.17	41.54	0.04	210
7	Acrylonitrile	µg/m ³	< 0.11	< 0.11	< 0.11	0.03	10
8	Chloroform	µg/m ³	< 0.24	< 0.24	0.75	0.03	57
9	Carbon tetrachloride	µg/m ³	< 0.31	< 0.31	< 0.31	0.04	150
10	Benzene	µg/m ³	1.23	1.47	2.06	0.02	7.6
11	1,2-Dichloroethane	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	48
12	Trichloroethylene	µg/m ³	< 0.27	< 0.27	< 0.27	0.03	130
13	1,2-Dichloropropane	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	82
14	1,4-Dioxane	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	860
15	Tetrachloroethylene	µg/m ³	< 0.34	< 0.34	< 0.34	0.04	400
16	1,2-Dibromoethane	µg/m ³	< 0.38	< 0.38	< 0.38	0.09	370
17	1,1,2,2-Tetrachloroethane	µg/m ³	< 0.34	< 0.34	< 0.34	0.06	83
18	1,4-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.11	1,100
19	Benzyl chloride	µg/m ³	< 0.26	< 0.26	< 0.26	0.11	12
20	Carbon disulfide	µg/m ³	< 0.16	< 0.16	21.44	0.03	100 ^(B)
21	Propene	µg/m ³	1.94	2.36	4.96	0.02	-
22	Dichlorodifluoromethane	µg/m ³	1.32	1.46	1.31	0.04	-
23	Difluorochloromethane	µg/m ³	0.56	0.60	10.70	0.04	-
24	1,2-Dichloro-1,1,2,2-tetrafluoroethane	µg/m ³	< 0.35	< 0.35	< 0.35	0.06	-
25	Chloromethane	µg/m ³	1.46	1.48	1.90	0.02	-
26	Isobutene	µg/m ³	0.97	0.82	19.63	0.03	-
27	Methanol	µg/m ³	5.49	6.13	21.63	0.02	-
28	Vinyl bromide	µg/m ³	< 0.22	< 0.22	< 0.22	0.05	-
29	Chloroethane	µg/m ³	< 0.13	< 0.13	< 0.13	0.02	-
30	Trichlorofluoromethane	µg/m ³	0.82	0.94	1.01	0.04	-
31	Pentane	µg/m ³	1.51	1.20	3.80	0.03	-
32	Ethanol	µg/m ³	5.43	4.62	166.80	0.02	-

continue

"Refer to Analysis No. R24-1311 and follow to QF-10-02 No. 022/24 in order to add parameters : m,p-Xylene and o-Xylene on page 3, 6, 9, 12, 15, 18, 21 and 24"

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Tel : 0-2373-7799 (Auto) Fax : 0-2373-7979

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TEST REPORT

Analysis No. : R24-1861

Received Date: 08/04/24

Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด

Address : 25/114 หมู่ 6 ซอยชินเขต 1 ถนนจันทวงศ์วาน แขวงทุ่งสองห้อง
เขตหลักสี่ กรุงเทพฯ 10210

Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747

Report Date : 29/05/24

Analysis Date : 30/04-01/05/24

Job No. : M/240060

Sampling Date : 31/03-03/04/24

Sampling By : Customer

Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(A)
			BYN 2				
			2404-AA0434	2404-AA0442	2404-AA0450		
			31/03-01/04/24	01-02/04/24	02-03/04/24		
33	Isoprene	µg/m ³	< 0.14	< 0.14	< 0.14	0.02	-
34	Propanal	µg/m ³	< 0.12	< 0.12	< 0.12	0.02	-
35	1,1-Dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
36	1,1,2-Trichloro-1,2,2-trifluoroethane	µg/m ³	< 0.38	< 0.38	< 0.38	0.04	-
37	Acetone	µg/m ³	11.07	11.12	100.82	0.02	-
38	Iodomethane	µg/m ³	< 0.29	< 0.29	< 0.29	0.03	-
39	Isopropyl Alcohol	µg/m ³	0.38	0.23	18.63	0.02	-
40	Acetonitrile	µg/m ³	< 0.08	< 0.08	< 0.08	0.02	-
41	Allyl chloride	µg/m ³	< 0.16	< 0.16	< 0.16	0.02	-
42	Cyclopentane	µg/m ³	< 0.14	< 0.14	0.27	0.02	-
43	trans-1,2-dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.03	-
44	2-Methoxy-2-methylpropane	µg/m ³	< 0.18	< 0.18	< 0.18	0.03	-
45	Hexane	µg/m ³	0.47	0.60	24.08	0.03	-
46	Methacrolein	µg/m ³	< 0.14	< 0.14	< 0.14	0.03	-
47	1,1-Dichloroethane	µg/m ³	< 0.20	< 0.20	< 0.20	0.03	-
48	Vinyl acetate	µg/m ³	< 0.18	< 0.18	< 0.18	0.05	-
49	Propanol	µg/m ³	< 0.12	< 0.12	< 0.12	0.02	-
50	Butanal	µg/m ³	< 0.15	< 0.15	< 0.15	0.04	-
51	Methyl vinyl ketone	µg/m ³	2.11	2.92	14.55	0.02	-
52	cis-1,2-Dichloroethene	µg/m ³	< 0.20	< 0.20	0.52	0.02	-
53	Methyl ethyl ketone	µg/m ³	0.68	0.90	2.60	0.02	-
54	Ethyl acetate	µg/m ³	< 0.18	< 0.18	1.57	0.03	-
55	Tetrahydrofuran	µg/m ³	< 0.15	< 0.15	< 0.15	0.02	-
56	1,1,1-Trichloroethane	µg/m ³	< 0.27	< 0.27	< 0.27	0.02	-
57	Cyclohexane	µg/m ³	0.28	0.42	1.58	0.01	-
58	2,2,4-Trimethylpentane	µg/m ³	< 0.23	< 0.23	< 0.23	0.03	-
59	Heptane	µg/m ³	0.22	0.30	0.93	0.03	-
60	1-Butanol	µg/m ³	9.57	10.33	58.54	0.02	-
61	2-Pentanone	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	-
62	Pentanal	µg/m ³	< 0.18	< 0.18	< 0.18	0.04	-
63	3-Pentanone	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	-
64	Bromodichloromethane	µg/m ³	< 0.34	< 0.34	< 0.34	0.03	-
65	cis-1,3-Dichloropropene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
66	Methyl Isobutyl Ketone	µg/m ³	0.75	< 0.20	1.81	0.04	-

continue

"Refer to Analysis No. R24-1311 and follow to QF-10-02 No. 022/24 in order to add parameters : m,p-Xylene and o-Xylene on page 3, 6, 9, 12, 15, 18, 21 and 24"

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Thai Environmental Technic Limited
บริษัท เทคนิคสิ่งแวดล้อมไทย จำกัด

ORIGINAL
ต้นฉบับ

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E-mail : admin@tet1995.com

Tel : 0-2373-7799 (Auto) Fax : 0-2373-7979

Page 15 of 24

TEST REPORT

Analysis No. : R24-1861

Received Date: 08/04/24

Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด

Address : 25/114 หมู่ 6 ซอยชินเขต 1 ถนนงามวงศ์วาน แขวงทุ่งสองห้อง
เขตหลักสี่ กรุงเทพฯ 10210

Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747

Report Date : 29/05/24

Analysis Date : 30/04-01/05/24

Job No. : M/240060

Sampling Date : 31/03-03/04/24

Sampling By : Customer

Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(A)
			BYN 2				
			2404-AA0434	2404-AA0442	2404-AA0450		
			31/03-01/04/24	01-02/04/24	02-03/04/24		
67	Toluene	µg/m ³	0.64	0.71	5.55	0.03	-
68	trans-1,3-Dichloropropene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
69	1,1,2-Trichloroethane	µg/m ³	< 0.27	< 0.27	< 0.27	0.03	-
70	3-Hexanone	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
71	2-Hexanone	µg/m ³	< 0.20	< 0.20	< 0.20	0.05	-
72	Dibromochloromethane	µg/m ³	< 0.42	< 0.42	< 0.42	0.07	-
73	Hexanal	µg/m ³	< 0.20	< 0.20	< 0.20	0.07	-
74	Chlorobenzene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
75	Ethylbenzene	µg/m ³	0.40	< 0.22	1.17	0.02	-
76	<i>m,p</i> -Xylene	µg/m ³	0.45	< 0.22	2.15	0.05	-
77	<i>o</i> -Xylene	µg/m ³	0.66	< 0.22	1.54	0.05	-
78	Total Xylene	µg/m ³	1.11	< 0.22	3.69	0.05	-
79	Styrene	µg/m ³	0.80	0.25	2.72	0.03	-
80	Bromoform	µg/m ³	< 0.52	< 0.52	< 0.52	0.11	-
81	4-Ethyl toluene	µg/m ³	< 0.25	< 0.25	1.46	0.06	-
82	1,3,5-Trimethylbenzene	µg/m ³	< 0.25	< 0.25	2.15	0.02	-
83	1,2,4-Trimethylbenzene	µg/m ³	< 0.25	< 0.25	17.29	0.04	-
84	1,3-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.26	-
85	1,2,3-Trimethylbenzene	µg/m ³	< 0.25	< 0.25	4.00	0.05	-
86	1,2-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.10	-
87	1,2,4-Trichlorobenzene	µg/m ³	< 0.37	< 0.37	< 0.37	0.08	-
88	Hexachloro-1,3-Butadiene	µg/m ³	< 0.53	< 0.53	< 0.53	0.06	-
89	Naphthalene	µg/m ³	< 0.26	< 0.26	< 0.26	0.06	-

Remarks : Concentration of each gas is Ambient is based on 1 atm and 25 °C

MDL = Method Detection Limit

Method : VOCs = Canister, GC/MS (US EPA Method TO-15)

Standard (A) Notification of Pollution Control Department (2009) (B.E. 2552) 24 hours

(B) Notification of the National Environment Board (2017) (B.E. 2560) 24 hours

Reviewed by

Ms. Watana Prachumdaeng

Chief of Laboratory

Approved by

Ms. Porntip Potholue

Laboratory Manager

"Refer to Analysis No. R24-1311 and follow to QF-10-02 No. 022/24 in order to add parameters : m,p-Xylene and o-Xylene on page 3, 6, 9, 12, 15, 18, 21 and 24"

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E-mail : admin@tet1995.com

Tel : 0-2373-7799 (Auto) Fax : 0-2373-7979

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TEST REPORT

Analysis No. : R24-1861

Received Date: 08/04/24

Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด

Address : 25/114 หมู่ 6 ซอยชินเขต 1 ถนนงามวงศ์วาน แขวงทุ่งสองห้อง
เขตหลักสี่ กรุงเทพฯ 10210

Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747

Report Date : 29/05/24

Analysis Date : 30/04-01/05/24

Job No. : M/240060

Sampling Date : 31/03-03/04/24

Sampling By : Customer

Type of Sample : Ambient Air

Item	Farameter	Unit	Result			MDL	Standard ^(A)
			NS 1				
			2404-AA0435	2404-AA0443	2404-AA0451		
			31/03-01/04/24	01-02/04/24	02-03/04/24		
VOCs							
1	Vinyl chloride	µg/m ³	< 0.13	< 0.13	< 0.13	0.03	20
2	1,3-Butadiene	µg/m ³	< 0.11	< 0.11	< 0.11	0.02	5.3
3	Acetaldehyde	µg/m ³	7.73	10.29	9.95	0.03	860
4	Bromomethane	µg/m ³	< 0.19	< 0.19	< 0.19	0.04	190
5	Acrolein	µg/m ³	< 0.11	< 0.11	< 0.11	0.02	0.55
6	Dichloromethane	µg/m ³	7.28	57.12	13.29	0.04	210
7	Acrylonitrile	µg/m ³	< 0.11	< 0.11	< 0.11	0.03	10
8	Chloroform	µg/m ³	< 0.24	< 0.24	< 0.24	0.03	57
9	Carbon tetrachlbride	µg/m ³	< 0.31	< 0.31	< 0.31	0.04	150
10	Benzene	µg/m ³	1.54	2.11	1.43	0.02	7.6
11	1,2-Dichloroethane	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	48
12	Trichloroethylene	µg/m ³	< 0.27	< 0.27	< 0.27	0.03	130
13	1,2-Dichloropropane	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	82
14	1,4-Dioxane	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	860
15	Tetrachloroethylene	µg/m ³	< 0.34	< 0.34	< 0.34	0.04	400
16	1,2-Dibromoethane	µg/m ³	< 0.38	< 0.38	< 0.38	0.09	370
17	1,1,2,2-Tetrachloroethane	µg/m ³	< 0.34	< 0.34	< 0.34	0.06	83
18	1,4-Dichlorobezene	µg/m ³	< 0.30	< 0.30	< 0.30	0.11	1,100
19	Benzyl chloride	µg/m ³	< 0.26	< 0.26	< 0.26	0.11	12
20	Carbon disulfée	µg/m ³	11.48	15.29	13.39	0.03	100 ^(B)
21	Propene	µg/m ³	2.16	4.19	4.35	0.02	-
22	Dichlorodifluoromethane	µg/m ³	1.49	1.36	1.38	0.04	-
23	Difluorochloromethane	µg/m ³	8.09	10.50	5.45	0.04	-
24	1,2-Dichloro-1,1,2,2-tetrafluoroethane	µg/m ³	< 0.35	< 0.35	< 0.35	0.06	-
25	Chloromethane	µg/m ³	1.31	1.87	2.13	0.02	-
26	Isobutene	µg/m ³	5.43	3.92	1.90	0.03	-
27	Methanol	µg/m ³	9.35	9.85	11.52	0.02	-
28	Vinyl bromide	µg/m ³	< 0.22	< 0.22	< 0.22	0.05	-
29	Chloroethane	µg/m ³	< 0.13	< 0.13	< 0.13	0.02	-
30	Trichlorofluoromethane	µg/m ³	0.86	0.92	0.91	0.04	-
31	Pentane	µg/m ³	1.43	3.54	4.09	0.03	-
32	Ethanol	µg/m ³	41.40	142.29	53.86	0.02	-

continue

"Refer to Analysis No. R24-1311 and follow to QF-10-02 No. 022/24 in order to add parameters : m,p-Xylene and o-Xylene on page 3, 6, 9, 12, 15, 18, 21 and 24"

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E-mail : admin@tet1995.com

Tel : 0-2373-7799 (Auto) Fax : 0-2373-7979

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TEST REPORT

Analysis No. : R24-1861

Received Date: 08/04/24

Customer : บริษัท เอ็นไวรอนเม้นท์รีเสิร์ช แอนด์ เทคโนโลยี จำกัด

Address : 25/114 หมู่ 6 ซอยชินเขต 1 ถนนจวนวงศ์วาน แขวงทุ่งทองห้อง
เขตหลักสี่ กรุงเทพฯ 10210

Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747

Report Date : 29/05/24

Analysis Date : 30/04-01/05/24

Job No. : M/240060

Sampling Date : 31/03-03/04/24

Sampling By : Customer

Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(A)
			NS 1				
			2404-AA0435	2404-AA0443	2404-AA0451		
			31/03-01/04/24	01-02/04/24	02-03/04/24		
33	Isoprene	µg/m ³	< 0.14	< 0.14	< 0.14	0.02	-
34	Propanal	µg/m ³	< 0.12	< 0.12	< 0.12	0.02	-
35	1,1-Dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
36	1,1,2-Trichloro-1,2,2-trifluoroethane	µg/m ³	< 0.38	< 0.38	< 0.38	0.04	-
37	Acetone	µg/m ³	54.81	62.58	84.58	0.02	-
38	Iodomethane	µg/m ³	< 0.29	< 0.29	< 0.29	0.03	-
39	Isopropyl Alcohol	µg/m ³	5.74	10.76	7.40	0.02	-
40	Acetonitrile	µg/m ³	< 0.08	< 0.08	< 0.08	0.02	-
41	Allyl chloride	µg/m ³	< 0.16	< 0.16	< 0.16	0.02	-
42	Cyclopentane	µg/m ³	< 0.14	< 0.14	0.21	0.02	-
43	trans-1,2-dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.03	-
44	2-Methoxy-2-methylpropane	µg/m ³	< 0.18	< 0.18	< 0.18	0.03	-
45	Hexane	µg/m ³	11.95	21.17	20.47	0.03	-
46	Methacrolein	µg/m ³	< 0.14	< 0.14	< 0.14	0.03	-
47	1,1-Dichloroethane	µg/m ³	< 0.20	< 0.20	< 0.20	0.03	-
48	Vinyl acetate	µg/m ³	< 0.18	< 0.18	< 0.18	0.05	-
49	Propanol	µg/m ³	< 0.12	< 0.12	< 0.12	0.02	-
50	Butanal	µg/m ³	< 0.15	< 0.15	< 0.15	0.04	-
51	Methyl vinyl ketone	µg/m ³	7.58	17.78	6.54	0.02	-
52	cis-1,2-Dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
53	Methyl ethyl ketone	µg/m ³	1.03	2.00	1.68	0.02	-
54	Ethyl acetate	µg/m ³	0.38	1.25	1.13	0.03	-
55	Tetrahydrofuran	µg/m ³	< 0.15	< 0.15	< 0.15	0.02	-
56	1,1,1-Trichloroethane	µg/m ³	< 0.27	< 0.27	< 0.27	0.02	-
57	Cyclohexane	µg/m ³	1.47	1.68	1.15	0.01	-
58	2,2,4-Trimethylpentane	µg/m ³	< 0.23	< 0.23	< 0.23	0.03	-
59	Heptane	µg/m ³	1.57	1.04	0.51	0.03	-
60	1-Butanol	µg/m ³	11.22	14.29	17.21	0.02	-
61	2-Pentanone	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	-
62	Pentanal	µg/m ³	< 0.18	< 0.18	< 0.18	0.04	-
63	3-Pentanone	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	-
64	Bromodichloromethane	µg/m ³	< 0.34	< 0.34	< 0.34	0.03	-
65	cis-1,3-Dichloropropene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
66	Methyl Isobutyl Ketone	µg/m ³	2.91	5.32	< 0.20	0.04	-

continue

"Refer to Analysis No. R24-1311 and follow to QF-10-02 No. 022/24 in order to add parameters ; m,p-Xylene and o-Xylene on page 3, 6, 9, 12, 15, 18, 21 and 24"

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E-mail : admin@tet1995.com

Tel : 0-2373-7799 (Auto) Fax : 0-2373-7979

Page 18 of 24

TEST REPORT

Analysis No. : R24-1861

Received Date: 08/04/24

Customer : บริษัท เอ็นไวรอนเม้นท์รีเสิร์ช แอนด์ เทคโนโลยี จำกัด

Address : 25/114 หมู่ 6 ซอยชินเขต 1 ถนนจวนวงศ์วาน แขวงทุ่งทองห้อง
เขตหลักสี่ กรุงเทพฯ 10210

Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747

Report Date : 29/05/24

Analysis Date : 30/04-01/05/24

Job No. : M/240060

Sampling Date : 31/03-03/04/24

Sampling By : Customer

Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(A)
			NS 1				
			2404-AA0435	2404-AA0443	2404-AA0451		
			31/03-01/04/24	01-02/04/24	02-03/04/24		
67	Toluene	µg/m ³	5.67	5.15	2.45	0.03	-
68	trans-1,3-Dichloropropene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
69	1,1,2-Trichloroethane	µg/m ³	< 0.27	< 0.27	< 0.27	0.03	-
70	3-Hexanone	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
71	2-Hexanone	µg/m ³	< 0.20	< 0.20	< 0.20	0.05	-
72	Dibromochloromethane	µg/m ³	< 0.42	< 0.42	< 0.42	0.07	-
73	Hexanal	µg/m ³	< 0.20	< 0.20	< 0.20	0.07	-
74	Chlorobenzene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
75	Ethylbenzene	µg/m ³	1.84	2.22	1.12	0.02	-
76	<i>m,p</i> -Xylene	µg/m ³	4.20	3.23	0.70	0.05	-
77	<i>o</i> -Xylene	µg/m ³	3.09	3.16	0.55	0.05	-
78	Total Xylene	µg/m ³	7.29	6.39	1.25	0.05	-
79	Styrene	µg/m ³	3.41	7.67	3.88	0.03	-
80	Bromoform	µg/m ³	< 0.52	< 0.52	< 0.52	0.11	-
81	4-Ethyl toluene	µg/m ³	1.80	0.56	< 0.25	0.06	-
82	1,3,5-Trimethylbenzene	µg/m ³	1.62	0.52	< 0.25	0.02	-
83	1,2,4-Trimethylbenzene	µg/m ³	10.31	3.15	0.64	0.04	-
84	1,3-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.26	-
85	1,2,3-Trimethylbenzene	µg/m ³	1.85	0.67	< 0.25	0.05	-
86	1,2-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.10	-
87	1,2,4-Trichlorobenzene	µg/m ³	< 0.37	< 0.37	< 0.37	0.08	-
88	Hexachloro-1,3-Butadiene	µg/m ³	< 0.53	< 0.53	< 0.53	0.06	-
89	Naphthalene	µg/m ³	< 0.26	< 0.26	< 0.26	0.06	-

Remarks : Concentration of each gas in Ambient is based on 1 atm and 25 °C

MDL = Method Detection Limit

Method : VOCs = Canister, GC/MS (US EPA Method TO-15)

Standard (A) Notification of Pollution Control Departmental (2009) (B.E. 2552)

(B) Notification of the National Environment Board (2017) (B.E. 2560) 24 hours

Reviewed by

Ms. Wanasri Prachumbong
Chief of Laboratory

Approved by

Mrs. Porntip Pethsue
Laboratory Manager

"Refer to Analysis No. R24-1311 and follow to QF-10-02 No. 022/24 in order to add parameters ; m,p-Xylene and o-Xylene on page 3, 6, 9, 12, 15, 18, 21 and 24"

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E-mail : admin@et1995.com

Tel : 0-2373-7799 (Auto) Fax : 0-2373-7979

ORIGINAL
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TEST REPORT

Analysis No. : R24-1861

Received Date: 08/04/24

Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด

Address : 25/114 หมู่ 6 ซอยจินเขต 1 ถนนจางวงศ์วาน แขวงทุ่งสองห้อง
เขตหลักสี่ กรุงเทพฯ 10210

Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747

Report Date : 29/05/24

Analysis Date : 30/04-01/05/24

Job No. : M/240060

Sampling Date : 31/03-03/04/24

Sampling By : Customer

Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(A)
			NL 1				
			2404-AA0436	2404-AA0444	2404-AA0452		
			31/03-01/04/24	01-02/04/24	02-03/04/24		
VOCs							
1	Vinyl chloride	µg/m ³	< 0.13	< 0.13	< 0.13	0.03	20
2	1,3-Butadiene	µg/m ³	< 0.11	< 0.11	< 0.11	0.02	5.3
3	Acetaldehyde	µg/m ³	9.42	8.66	6.54	0.03	860
4	Bromomethane	µg/m ³	< 0.19	< 0.19	< 0.19	0.04	190
5	Acrolein	µg/m ³	< 0.11	< 0.11	< 0.11	0.02	0.55
6	Dichloromethane	µg/m ³	0.66	3.27	0.64	0.04	210
7	Acrylonitrile	µg/m ³	< 0.11	< 0.11	< 0.11	0.03	10
8	Chloroform	µg/m ³	< 0.24	< 0.24	< 0.24	0.03	57
9	Carbon tetrachloride	µg/m ³	< 0.31	< 0.31	< 0.31	0.04	150
10	Benzene	µg/m ³	1.64	1.78	1.50	0.02	7.6
11	1,2-Dichloroethane	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	48
12	Trichloroethylene	µg/m ³	< 0.27	< 0.27	< 0.27	0.03	130
13	1,2-Dichloropropane	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	82
14	1,4-Dioxane	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	860
15	Tetrachloroethylene	µg/m ³	< 0.34	< 0.34	< 0.34	0.04	400
16	1,2-Dibromoethane	µg/m ³	< 0.38	< 0.38	< 0.38	0.09	370
17	1,1,2,2-Tetrachloroethane	µg/m ³	< 0.34	< 0.34	< 0.34	0.06	83
18	1,4-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.11	1,100
19	Benzyl chloride	µg/m ³	< 0.26	< 0.26	< 0.26	0.11	12
20	Carbon disulfide	µg/m ³	< 0.16	4.67	< 0.16	0.03	100 ^(B)
21	Propene	µg/m ³	8.01	5.76	3.24	0.02	-
22	Dichlorodifluoromethane	µg/m ³	1.50	1.17	1.44	0.04	-
23	Difluorochloromethane	µg/m ³	0.70	3.98	0.65	0.04	-
24	1,2-Dichloro-1,1,2,2-tetrafluoroethane	µg/m ³	< 0.35	< 0.35	< 0.35	0.06	-
25	Chloromethane	µg/m ³	1.85	2.03	1.70	0.02	-
26	Isobutene	µg/m ³	< 0.11	< 0.11	< 0.11	0.03	-
27	Methanol	µg/m ³	6.82	6.96	6.20	0.02	-
28	Vinyl bromide	µg/m ³	< 0.22	< 0.22	< 0.22	0.05	-
29	Chloroethane	µg/m ³	< 0.13	< 0.13	< 0.13	0.02	-
30	Trichlorofluoromethane	µg/m ³	0.91	0.95	0.94	0.04	-
31	Pentane	µg/m ³	6.71	4.15	1.86	0.03	-
32	Ethanol	µg/m ³	8.81	36.10	5.17	0.02	-

continue

"Refer to Analysis No. R24-1311 and follow to QF-10-02 No. 022/24 in order to add parameters ; m,p-Xylene and o-Xylene on page 3, 6, 9, 12, 15, 18, 21 and 24"

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Thai Environmental Technic Limited
บริษัท เทคนิคสิ่งแวดล้อมไทย จำกัด

1/6 Soi Ramkhamhaeng 145, Khwaeng / Khet Saphansung, Bangkok 10240
1/6 ซอยรามคำแหง 145 แขวงสะพานสูง เขตสะพานสูง กรุงเทพมหานคร 10240

E-mail : admin@et1995.com

Tel : 0-2373-7799 (Auto) Fax : 0-2373-7979

ORIGINAL
ต้นฉบับ

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TEST REPORT

Analysis No. : R24-1861

Received Date: 08/04/24

Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด

Address : 25/114 หมู่ 6 ซอยจินเขต 1 ถนนจางวงศ์วาน แขวงทุ่งสองห้อง
เขตหลักสี่ กรุงเทพฯ 10210

Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747

Report Date : 29/05/24

Analysis Date : 30/04-01/05/24

Job No. : M/240060

Sampling Date : 31/03-03/04/24

Sampling By : Customer

Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(A)
			NL 1				
			2404-AA0436	2404-AA0444	2404-AA0452		
			31/03-01/04/24	01-02/04/24	02-03/04/24		
33	Isoprene	µg/m ³	< 0.14	< 0.14	< 0.14	0.02	-
34	Propanal	µg/m ³	< 0.12	< 0.12	< 0.12	0.02	-
35	1,1-Dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
36	1,1,2-Trichloro-1,2,2-trifluoroethane	µg/m ³	< 0.38	< 0.38	< 0.38	0.04	-
37	Acetone	µg/m ³	15.09	42.37	14.91	0.02	-
38	Iodomethane	µg/m ³	< 0.29	< 0.29	< 0.29	0.03	-
39	Isopropyl Alcohol	µg/m ³	0.71	4.08	0.64	0.02	-
40	Acetonitrile	µg/m ³	< 0.08	< 0.08	< 0.08	0.02	-
41	Allyl chloride	µg/m ³	< 0.16	< 0.16	< 0.16	0.02	-
42	Cyclopentane	µg/m ³	< 0.14	< 0.14	< 0.14	0.02	-
43	trans-1,2-dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.03	-
44	2-Methoxy-2-methylpropane	µg/m ³	< 0.18	< 0.18	< 0.18	0.03	-
45	Hexane	µg/m ³	3.51	5.79	0.85	0.03	-
46	Methacrolein	µg/m ³	< 0.14	< 0.14	< 0.14	0.03	-
47	1,1-Dichloroethane	µg/m ³	< 0.20	< 0.20	< 0.20	0.03	-
48	Vinyl acetate	µg/m ³	< 0.18	< 0.18	< 0.18	0.05	-
49	Propanol	µg/m ³	< 0.12	< 0.12	< 0.12	0.02	-
50	Butanal	µg/m ³	< 0.15	< 0.15	< 0.15	0.04	-
51	Methyl vinyl ketone	µg/m ³	5.02	5.40	2.38	0.02	-
52	cis-1,2-Dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
53	Methyl ethyl ketone	µg/m ³	0.95	1.29	0.93	0.02	-
54	Ethyl acetate	µg/m ³	0.44	0.79	0.76	0.03	-
55	Tetrahydrofuran	µg/m ³	< 0.15	< 0.15	< 0.15	0.02	-
56	1,1,1-Trichloroethane	µg/m ³	< 0.27	< 0.27	< 0.27	0.02	-
57	Cyclohexane	µg/m ³	1.74	0.98	0.47	0.01	-
58	2,2,4-Trimethylpentane	µg/m ³	< 0.23	< 0.23	< 0.23	0.03	-
59	Heptane	µg/m ³	1.87	0.75	0.34	0.03	-
60	1-Butanol	µg/m ³	1.92	4.80	1.00	0.02	-
61	2-Pentanone	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	-
62	Pentanal	µg/m ³	< 0.18	< 0.18	< 0.18	0.04	-
63	3-Pentanone	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	-
64	Bromodichloromethane	µg/m ³	< 0.34	< 0.34	< 0.34	0.03	-
65	cis-1,3-Dichloropropene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
66	Methyl Isobutyl Ketone	µg/m ³	0.48	2.53	< 0.20	0.04	-

continue

"Refer to Analysis No. R24-1311 and follow to QF-10-02 No. 022/24 in order to add parameters ; m,p-Xylene and o-Xylene on page 3, 6, 9, 12, 15, 18, 21 and 24"

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บริษัท เทคนิคสิ่งแวดล้อมไทย จำกัด

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E-mail : admin@tet1995.com
Tel : 0-2373-7799 (Auto) Fax : 0-2373-7979

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TEST REPORT

Analysis No. : R24-1861
Received Date : 08/04/24
Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด
Address : 25/114 หมู่ 6 ซอยชินเขต 1 ถนนงามวงศ์วาน แขวงทุ่งสองห้อง เขตหลักสี่ กรุงเทพฯ 10210
Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747

Report Date : 29/05/24
Analysis Date : 30/04-01/05/24
Job No. : M/240060
Sampling Date : 31/03-03/04/24
Sampling By : Customer
Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(A)
			NL 1				
			2404-AA0436	2404-AA0444	2404-AA0452		
			31/03-01/04/24	01-02/04/24	02-03/04/24		
67	Toluene	µg/m ³	1.56	1.82	1.30	0.03	-
68	trans-1,3-Dichloropropene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
69	1,1,2-Trichloroethane	µg/m ³	< 0.27	< 0.27	< 0.27	0.03	-
70	3-Hexanone	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
71	2-Hexanone	µg/m ³	< 0.20	< 0.20	< 0.20	0.05	-
72	Dibromochloromethane	µg/m ³	< 0.42	< 0.42	< 0.42	0.07	-
73	Hexanal	µg/m ³	< 0.20	< 0.20	< 0.20	0.07	-
74	Chlorobenzene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
75	Ethylbenzene	µg/m ³	0.49	1.11	0.24	0.02	-
76	<i>m,p</i> -Xylene	µg/m ³	0.49	1.23	< 0.22	0.05	-
77	<i>o</i> -Xylene	µg/m ³	0.48	1.92	< 0.22	0.05	-
78	Total Xylene	µg/m ³	0.97	3.15	< 0.22	0.05	-
79	Styrene	µg/m ³	< 0.21	1.88	< 0.21	0.03	-
80	Bromoform	µg/m ³	< 0.52	< 0.52	< 0.52	0.11	-
81	4-Ethyl toluene	µg/m ³	< 0.25	< 0.25	< 0.25	0.06	-
82	1,3,5-Trimethylbenzene	µg/m ³	< 0.25	< 0.25	< 0.25	0.02	-
83	1,2,4-Trimethylbenzene	µg/m ³	0.56	0.44	< 0.25	0.04	-
84	1,3-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.26	-
85	1,2,3-Trimethylbenzene	µg/m ³	< 0.25	< 0.25	< 0.25	0.05	-
86	1,2-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.10	-
87	1,2,4-Trichlorobenzene	µg/m ³	< 0.37	< 0.37	< 0.37	0.08	-
88	Hexachloro-1,3-Butadiene	µg/m ³	< 0.53	< 0.53	< 0.53	0.06	-
89	Naphthalene	µg/m ³	< 0.26	< 0.26	< 0.26	0.06	-

Remarks : Concentration of each gas is Ambient is based on 1 atm and 25 °C

MDL = Method Detection Limit

Method : VOCs = Canister, GC/MS (US EPA Method TO-15)

Standard (A) Notification of Pollution Control Departmental (2009) (B.E. 2552) 24 hours

(B) Notification of the National Environment Board (2017) (B.E. 2560) 24 hours

Reviewed by

Ms. Wararat Prachumdaeng
Chief of Laboratory

Approved by

Mrs. Purnip Pethsuee
Laboratory Manager

"Refer to Analysis No. R24-1311 and follow to QF-10-02 No. 022/24 in order to add parameters : m,p-Xylene and o-Xylene on page 3, 6, 9, 12, 15, 18, 21 and 24"

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บริษัท เทคนิคสิ่งแวดล้อมไทย จำกัด

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1/6 Soi Ramkhamhaeng 145, Khwaeng / Khet Saphansung, Bangkok 10240
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E-mail : admin@tet1995.com
Tel : 0-2373-7799 (Auto) Fax : 0-2373-7979

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TEST REPORT

Analysis No. : R24-1861
Received Date : 08/04/24
Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด
Address : 25/114 หมู่ 6 ซอยชินเขต 1 ถนนงามวงศ์วาน แขวงทุ่งสองห้อง เขตหลักสี่ กรุงเทพฯ 10210
Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747

Report Date : 29/05/24
Analysis Date : 30/04-01/05/24
Job No. : M/240060
Sampling Date : 31/03-03/04/24
Sampling By : Customer
Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(A)
			NS 4				
			2404-AA0437	2404-AA0445	2404-AA0453		
			31/03-01/04/24	01-02/04/24	02-03/04/24		
VOCs							
1	Vinyl chloride	µg/m ³	< 0.13	< 0.13	< 0.13	0.03	20
2	1,3-Butadiene	µg/m ³	< 0.11	< 0.11	< 0.11	0.02	5.3
3	Acetaldehyde	µg/m ³	9.44	6.24	9.61	0.03	860
4	Bromomethane	µg/m ³	< 0.19	< 0.19	< 0.19	0.04	190
5	Acrolein	µg/m ³	< 0.11	< 0.11	< 0.11	0.02	0.55
6	Dichloromethane	µg/m ³	16.82	0.45	0.86	0.04	210
7	Acrylonitrile	µg/m ³	< 0.11	< 0.11	< 0.11	0.03	10
8	Chloroform	µg/m ³	< 0.24	< 0.24	< 0.24	0.03	57
9	Carbon tetrachloride	µg/m ³	< 0.31	< 0.31	< 0.31	0.04	150
10	Benzene	µg/m ³	4.20	1.36	4.64	0.02	7.6
11	1,2-Dichloroethane	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	48
12	Trichloroethylene	µg/m ³	< 0.27	< 0.27	< 0.27	0.03	130
13	1,2-Dichloropropane	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	82
14	1,4-Dioxane	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	860
15	Tetrachloroethylene	µg/m ³	< 0.34	< 0.34	< 0.34	0.04	400
16	1,2-Dibromoethane	µg/m ³	< 0.38	< 0.38	< 0.38	0.09	370
17	1,1,2,2-Tetrachloroethane	µg/m ³	< 0.34	< 0.34	< 0.34	0.06	83
18	1,4-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.11	1,100
19	Benzyl chloride	µg/m ³	< 0.26	< 0.26	< 0.26	0.11	12
20	Carbon disulfide	µg/m ³	9.75	< 0.16	< 0.16	0.03	100 ^(B)
21	Propene	µg/m ³	100.31	13.23	106.33	0.02	-
22	Dichlorodifluoromethane	µg/m ³	1.56	1.48	1.48	0.04	-
23	Difluorochloromethane	µg/m ³	8.34	0.62	0.62	0.04	-
24	1,2-Dichloro-1,1,2,2-tetrafluoroethane	µg/m ³	< 0.35	< 0.35	< 0.35	0.06	-
25	Chloromethane	µg/m ³	1.96	1.46	2.07	0.02	-
26	Isobutene	µg/m ³	< 0.11	< 0.11	< 0.11	0.03	-
27	Methanol	µg/m ³	11.49	4.50	7.02	0.02	-
28	Vinyl bromide	µg/m ³	< 0.22	< 0.22	< 0.22	0.05	-
29	Chloroethane	µg/m ³	< 0.13	< 0.13	< 0.13	0.02	-
30	Trichlorofluoromethane	µg/m ³	0.86	0.93	0.94	0.04	-
31	Pentane	µg/m ³	186.87	16.20	215.94	0.03	-
32	Ethanol	µg/m ³	36.25	4.86	8.49	0.02	-

continue

"Refer to Analysis No. R24-1311 and follow to QF-10-02 No. 022/24 in order to add parameters : m,p-Xylene and o-Xylene on page 3, 6, 9, 12, 15, 18, 21 and 24"

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E-mail : admin@et1995.com

Tel : 0-2373-7799 (Auto) Fax : 0-2373-7979

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TEST REPORT

Analysis No. : R24-1861

Received Date: 08/04/24

Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด

Address : 25/114 หมู่ 6 ซอยชินเขต 1 ถนนจันทวงศ์วาน แขวงทุ่งสองห้อง
เขตหลักสี่ กรุงเทพฯ 10210

Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747

Report Date : 29/05/24

Analysis Date : 30/04-01/05/24

Job No. : M/240060

Sampling Date : 31/03-03/04/24

Sampling By : Customer

Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(A)
			NS 4				
			2404-AA0437	2404-AA0445	2404-AA0453		
			31/03-01/04/24	01-02/04/24	02-03/04/24		
33	Isoprene	µg/m ³	< 0.14	< 0.14	< 0.14	0.02	-
34	Propanal	µg/m ³	< 0.12	< 0.12	< 0.12	0.02	-
35	1,1-Dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
36	1,1,2-Trichloro-1,2,2-trifluoroethane	µg/m ³	< 0.38	< 0.38	< 0.38	0.04	-
37	Acetone	µg/m ³	44.85	10.10	13.39	0.02	-
38	Iodomethane	µg/m ³	< 0.29	< 0.29	< 0.29	0.03	-
39	Isopropyl Alcohol	µg/m ³	4.69	0.37	0.49	0.02	-
40	Acetonitrile	µg/m ³	< 0.08	< 0.08	< 0.08	0.02	-
41	Allyl chloride	µg/m ³	< 0.16	< 0.16	< 0.16	0.02	-
42	Cyclopentane	µg/m ³	11.09	0.98	13.27	0.02	-
43	trans-1,2-dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.03	-
44	2-Methoxy-2-methylpropane	µg/m ³	< 0.18	< 0.18	< 0.18	0.03	-
45	Hexane	µg/m ³	185.00	12.36	223.50	0.03	-
46	Methacrolein	µg/m ³	< 0.14	< 0.14	< 0.14	0.03	-
47	1,1-Dichloroethane	µg/m ³	< 0.20	< 0.20	< 0.20	0.03	-
48	Vinyl acetate	µg/m ³	< 0.18	< 0.18	< 0.18	0.05	-
49	Propanol	µg/m ³	0.28	< 0.12	< 0.12	0.02	-
50	Butanal	µg/m ³	< 0.15	< 0.15	< 0.15	0.04	-
51	Methyl vinyl ketone	µg/m ³	140.70	12.00	181.11	0.02	-
52	cis-1,2-Dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
53	Methyl ethyl ketone	µg/m ³	1.88	0.81	1.45	0.02	-
54	Ethyl acetate	µg/m ³	0.64	0.40	0.83	0.03	-
55	Tetrahydrofuran	µg/m ³	< 0.15	< 0.15	< 0.15	0.02	-
56	1,1,1-Trichloroethane	µg/m ³	< 0.27	< 0.27	< 0.27	0.02	-
57	Cyclohexane	µg/m ³	72.18	5.42	100.21	0.01	-
58	2,2,4-Trimethylpentane	µg/m ³	< 0.23	< 0.23	< 0.23	0.03	-
59	Heptane	µg/m ³	129.89	8.02	194.85	0.03	-
60	1-Butanol	µg/m ³	4.69	< 0.15	3.55	0.02	-
61	2-Pentanone	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	-
62	Pentanal	µg/m ³	< 0.18	< 0.18	< 0.18	0.04	-
63	3-Pentanone	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	-
64	Bromodichloromethane	µg/m ³	< 0.34	< 0.34	< 0.34	0.03	-
65	cis-1,3-Dichloropropene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
66	Methyl Isobutyl Ketone	µg/m ³	5.52	< 0.20	4.82	0.04	-

continue

"Refer to Analysis No. R24-1311 and follow to QF-10-02 No. 022/24 in order to add parameters ; m,p-Xylene and o-Xylene on page 3, 6, 9, 12, 15, 18, 21 and 24"

- REPORTED RESULTS REFER TO SUBMITTED SAMPLE(S) ONLY
- DO NOT COPY PARTIAL OF THIS ANALYSIS REPORT WITHOUT OFFICIAL APPROVAL



Thai Environmental Technic Limited
บริษัท เทคนิคสิ่งแวดล้อมไทย จำกัด

ORIGINAL
ต้นฉบับ

1/6 Soi Ramkhamhaeng 145, Khwaeng / Khet Saphansung, Bangkok 10240
1/6 ซอยรามคำแหง 145 แขวงสะพานสูง เขตสะพานสูง กรุงเทพมหานคร 10240

E-mail : admin@et1995.com

Tel : 0-2373-7799 (Auto) Fax : 0-2373-7979

Page 24 of 24

TEST REPORT

Analysis No. : R24-1861

Received Date: 08/04/24

Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด

Address : 25/114 หมู่ 6 ซอยชินเขต 1 ถนนจันทวงศ์วาน แขวงทุ่งสองห้อง
เขตหลักสี่ กรุงเทพฯ 10210

Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747

Report Date : 29/05/24

Analysis Date : 30/04-01/05/24

Job No. : M/240060

Sampling Date : 31/03-03/04/24

Sampling By : Customer

Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(A)
			NS 4				
			2404-AA0437	2404-AA0445	2404-AA0453		
			31/03-01/04/24	01-02/04/24	02-03/04/24		
67	Toluene	µg/m ³	12.93	1.42	12.59	0.03	-
68	trans-1,3-Dichloropropene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
69	1,1,2-Trichloroethane	µg/m ³	< 0.27	< 0.27	< 0.27	0.03	-
70	3-Hexanone	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
71	2-Hexanone	µg/m ³	< 0.20	< 0.20	< 0.20	0.05	-
72	Dibromochloromethane	µg/m ³	< 0.42	< 0.42	< 0.42	0.07	-
73	Hexanal	µg/m ³	< 0.20	< 0.20	< 0.20	0.07	-
74	Chlorobenzene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
75	Ethylbenzene	µg/m ³	2.10	0.38	1.30	0.02	-
76	m,p-Xylene	µg/m ³	5.18	0.43	3.52	0.05	-
77	o-Xylene	µg/m ³	3.09	0.42	1.41	0.05	-
78	Total Xylene	µg/m ³	8.27	0.85	4.93	0.05	-
79	Styrene	µg/m ³	4.20	0.85	< 0.21	0.03	-
80	Bromoform	µg/m ³	< 0.52	< 0.52	< 0.52	0.11	-
81	4-Ethyl toluene	µg/m ³	1.40	< 0.25	< 0.25	0.06	-
82	1,3,5-Trimethylbenzene	µg/m ³	1.27	< 0.25	0.65	0.02	-
83	1,2,4-Trimethylbenzene	µg/m ³	7.30	0.26	2.32	0.04	-
84	1,3-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.26	-
85	1,2,3-Trimethylbenzene	µg/m ³	1.41	< 0.25	0.63	0.05	-
86	1,2-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.10	-
87	1,2,4-Trichlorobenzene	µg/m ³	< 0.37	< 0.37	< 0.37	0.08	-
88	Hexachloro-1,3-Butadiene	µg/m ³	< 0.53	< 0.53	< 0.53	0.06	-
89	Naphthalene	µg/m ³	< 0.26	< 0.26	< 0.26	0.06	-

Remarks : 1. Concentration of each gas in Ambient is based on 1 atm and 25 °C

MDL = Method Detection Limit

Method : VOCs = Canister, GC/MS (US-EPA Method TO-15)

Standard : (A) Notification of Pollution Control Department (2009 (B.E. 2552) 24 hours

(B) Notification of the National Environment Board (2017) (B.E. 2560) 24 hours

Reviewed by

Ms. Wareerat Prachumdieng
Chief of Laboratory

Approved by

Mrs. Porriya Petholae
Laboratory Manager

"Refer to Analysis No. R24-1311 and follow to QF-10-02 No. 022/24 in order to add parameters ; m,p-Xylene and o-Xylene on page 3, 6, 9, 12, 15, 18, 21 and 24"

END OF REPORT

- REPORTED RESULTS REFER TO SUBMITTED SAMPLE(S) ONLY
- DO NOT COPY PARTIAL OF THIS ANALYSIS REPORT WITHOUT OFFICIAL APPROVAL

ฤดูฝน

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปุ๋ยอินทรีย์ แปลงสัมปทานปุ๋ยอินทรีย์แบบหมักหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีราชา จังหวัดชลบุรี และอำเภอ
ฉะเชิงเทรา
Project Location : จังหวัดชลบุรี และจังหวัดกำแพงเพชร
Sampling Source : Ambient Air Quality
Sampling Point : สถานีผลิต BY-AIR1 : โรงเรือนบ้านนันทบุรี
(หมู่ที่ 8 ตำบลหนองจิก อำเภอศรีราชา จังหวัดชลบุรี)
GPS. Coordinate : UTM (WGS84) 47Q 0584805 E, 1846929 N
Sampling Date : August 25-28, 2024
Sampling Time : 13:30
Sampling Method : U.S. EPA 40 CFR Part 50
Sampling By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.

Quotation No. : AR2024-00461
Analysis No. : 2024-AE295
Received Date : September 2, 2024
Analytical Date : September 2-9, 2024
Report No. : 2024-RAAS025
Report Date : September 9, 2024

Parameter	Unit	Method of Analysis	Result			Standard ^{1'}
			Aug 25-26, 24	Aug 26-27, 24	Aug 27-28, 24	
Total Suspended Particulate (TSP) 24 Hours Average	mg/m ³	High-Volume, Gravimetric	0.032	0.030	0.033	0.330
Particulate Size Less Than 10 Micron (PM10) 24 Hours Average	mg/m ³	PM10 Size Selective, High-Volume, Gravimetric	0.016	0.016	0.018	0.120

Remark : ^{1'} Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995) and Notification No.24, B.E.2547 (2004), published in the Royal Government Gazette No.121 Special Part 1040 dated September 22, B.E.2547 (2004), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).

(Ms.Natnicha Sermmatiwong)
Laboratory Reviewer

(Ms.Ramita Taengthai)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปุ๋ยอินทรีย์ แปลงสัมปทานปุ๋ยอินทรีย์แบบหมักหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีราชา จังหวัดชลบุรี และอำเภอ
ฉะเชิงเทรา
Project Location : จังหวัดชลบุรี และจังหวัดกำแพงเพชร
Sampling Source : Ambient Air Quality
Sampling Point : สถานีผลิต BY-AIR2 : บ้านเลขที่ 189 บ้านนิคมพัฒนา
(หมู่ที่ 8 ตำบลหนองจิก อำเภอศรีราชา จังหวัดชลบุรี)
GPS. Coordinate : UTM (WGS84) 47Q 0583262 E, 1846488 N
Sampling Date : August 25-28, 2024
Sampling Time : 11:25
Sampling Method : U.S. EPA 40 CFR Part 50
Sampling By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.

Quotation No. : AR2024-00461
Analysis No. : 2024-AE295
Received Date : September 2, 2024
Analytical Date : September 2-9, 2024
Report No. : 2024-RAAS026
Report Date : September 9, 2024

Parameter	Unit	Method of Analysis	Result			Standard ^{1'}
			Aug 25-26, 24	Aug 26-27, 24	Aug 27-28, 24	
Total Suspended Particulate (TSP) 24 Hours Average	mg/m ³	High-Volume, Gravimetric	0.036	0.026	0.038	0.330
Particulate Size Less Than 10 Micron (PM10) 24 Hours Average	mg/m ³	PM10 Size Selective, High-Volume, Gravimetric	0.019	0.014	0.020	0.120

Remark : ^{1'} Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995) and Notification No.24, B.E.2547 (2004), published in the Royal Government Gazette No.121 Special Part 1040 dated September 22, B.E.2547 (2004), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).

(Ms.Natnicha Sermmatiwong)
Laboratory Reviewer

(Ms.Ramita Taengthai)
Laboratory Supervisor

ANALYSIS REPORT

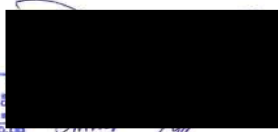
Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตยี่โระเทียม แป้งสับปะพานยี่โระเทียมบนถนนหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย และอำเภอลานกระบือ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Sampling Source : Ambient Air Quality
Sampling Point : ฐานหลุมผลิต NS-AIR1 : บ้านประจักษ์รัง (บ้านเลขที่ 28 หมู่ที่ 8 ตำบลหนองหลวง อำเภอลานกระบือ จังหวัดกำแพงเพชร)
GPS. Coordinate : UTM (WGS84) 47Q 0584155 E, 1839432 N
Quotation No. : AR2024-00461
Analysis No. : 2024-AE295
Received Date : September 2, 2024
Analytical Date : September 2-9, 2024
Report No. : 2024-RAAS027
Report Date : September 9, 2024
Sampling Date : August 25-28, 2024
Sampling Time : 10:28
Sampling Method : U.S. EPA 40 CFR Part 50
Sampling By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.

Parameter	Unit	Method of Analysis	Result			Standard ^{1'}
			Aug 25-26, 24	Aug 26-27, 24	Aug 27-28, 24	
Total Suspended Particulate (TSP) 24 Hours Average	mg/m ³	High-Volume, Gravimetric	0.034	0.026	0.030	0.330
Particulate Size Less Than 10 Micron (PM10) 24 Hours Average	mg/m ³	PM10 Size Selective, High-Volume, Gravimetric	0.019	0.014	0.017	0.120

Remark : ^{1'} Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995) and Notification No.24, B.E.2547 (2004), published in the Royal Government Gazette No.121 Special Part 1040 dated September 22, B.E.2547 (2004), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).



(Ms.Natnicha Sermmatiwong)
Laboratory Reviewer



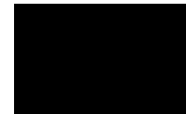
(Ms.Ramita Taengthai)
Laboratory Supervisor

ANALYSIS REPORT

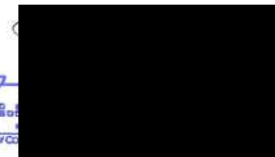
Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตยี่โระเทียม แป้งสับปะพานยี่โระเทียมบนถนนหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย และอำเภอลานกระบือ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Sampling Source : Ambient Air Quality
Sampling Point : ฐานหลุมผลิต NS-AIR2 : บ้านหนองไม้แดง (บ้านเลขที่ 74/1 หมู่ที่ 7 ตำบลหนองหลวง อำเภอลานกระบือ จังหวัดกำแพงเพชร)
GPS. Coordinate : UTM (WGS84) 47Q 0582515 E, 1839023 N
Quotation No. : AR2024-00451
Analysis No. : 2024-AE295
Received Date : September 2, 2024
Analytical Date : September 2-9, 2024
Report No. : 2024-RAAS029
Report Date : September 9, 2024
Sampling Date : August 25-28, 2024
Sampling Time : 09:14
Sampling Method : U.S. EPA 40 CFR Part 50
Sampling By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.

Parameter	Unit	Method of Analysis	Result			Standard ^{1'}
			Aug 25-26, 24	Aug 26-27, 24	Aug 27-28, 24	
Total Suspended Particulate (TSP) 24 Hours Average	mg/m ³	High-Volume, Gravimetric	0.029	0.030	0.037	0.330
Particulate Size Less Than 10 Micron (PM10) 24 Hours Average	mg/m ³	PM10 Size Selective, High-Volume, Gravimetric	0.016	0.015	0.019	0.120

Remark : ^{1'} Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995) and Notification No.24, B.E.2547 (2004), published in the Royal Government Gazette No.121 Special Part 1040 dated September 22, B.E.2547 (2004), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).



(Ms.Natnicha Sermmatiwong)
Laboratory Reviewer



(Ms.Ramita Taengthai)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Manesya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการพัฒนาศูนย์วิจัยและส่งเสริมเทคโนโลยีการเกษตรในเขตภาคกลาง L21/43 ตั้งอยู่ที่อำเภอศรีราชา จังหวัดชลบุรี และอำเภอละหานทราย จังหวัดบุรีรัมย์
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Air Quality
Measured Point : สถานีผลิต BY-AIR1 : โรงเรือนบ้านเนินกุ่ม (หมู่ที่ 8 ตำบลหนองจิก อำเภอศรีราชา จังหวัดสุโขทัย)
: UTM (WGS84) 47Q 0584805 E, 1846929 N
GPS. Coordinate :
Measured Date : August 25-28, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : NOx Chemiluminescence Analyzer Horiba Model APNA-370 Serial Number KCDVY226

Quotation No. : AR2024-00461
Analysis No. : 2024-AE295-001
Report No. : 2024-RAA5756
Report Date : September 18, 2024

Interval Time	Result NO _x (ppm)			Standard ^{1*}
	Aug 25-26, 24	Aug 26-27, 24	Aug 27-28, 24	
14:00-15:00	0.0061	0.0060	0.0060	
15:00-16:00	0.0059	0.0059	0.0061	
16:00-17:00	0.0062	0.0060	0.0061	
17:00-18:00	0.0057	0.0061	0.0069	
18:00-19:00	0.0059	0.0064	0.0063	
19:00-20:00	0.0065	0.0059	0.0062	
20:00-21:00	0.0062	0.0060	0.0064	
21:00-22:00	0.0062	0.0061	0.0063	
22:00-23:00	0.0064	0.0058	0.0062	
23:00-00:00	0.0062	0.0060	0.0061	
00:00-01:00	0.0060	0.0060	0.0060	
01:00-02:00	0.0060	0.0058	0.0072	
02:00-03:00	0.0060	0.0059	0.0060	
03:00-04:00	0.0062	0.0060	0.0062	
04:00-05:00	0.0061	0.0060	0.0059	
05:00-06:00	0.0059	0.0062	0.0061	
06:00-07:00	0.0064	0.0062	0.0061	
07:00-08:00	0.0061	0.0062	0.0063	
08:00-09:00	0.0061	0.0061	0.0062	
09:00-10:00	0.0060	0.0061	0.0060	
10:00-11:00	0.0060	0.0060	0.0062	
11:00-12:00	0.0061	0.0058	0.0062	
12:00-13:00	0.0061	0.0060	0.0064	
13:00-14:00	0.0061	0.0061	0.0064	
24 Hours Average	0.0061	0.0060	0.0062	-
1 Hour Maximum	0.0065	0.0064	0.0072	0.17

Remark : ^{1*} Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 42D dated May 25, B.E.2538 (1995), Notification No.28, B.E.2550 (2007), published in the Royal Government Gazette No.124 Special Part 58D dated May 14, B.E.2550 (2007) and Notification No.33, B.E.2551 (2009), published in the Royal Government Gazette No.126 Special Part 114D dated August 14, B.E.2552 (2009), under the Enhancement and Conservation of National Environmental Quality Act B.E.2538 (1992).



(Ms.Piyatida Pradangkho)
Laboratory Reviewer



(Ms.Panicha Promchai)
Laboratory Supervisor

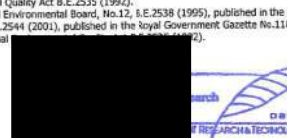
ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Manesya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการพัฒนาศูนย์วิจัยและส่งเสริมเทคโนโลยีการเกษตรในเขตภาคกลาง L21/43 ตั้งอยู่ที่อำเภอศรีราชา จังหวัดชลบุรี และอำเภอละหานทราย จังหวัดบุรีรัมย์
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Air Quality
Measured Point : สถานีผลิต BY-AIR1 : โรงเรือนบ้านเนินกุ่ม (หมู่ที่ 8 ตำบลหนองจิก อำเภอศรีราชา จังหวัดสุโขทัย)
: UTM (WGS84) 47Q 0584805 E, 1846929 N
GPS. Coordinate :
Measured Date : August 25-28, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : SO₂ UV-Fluorescence Analyzer Thermo Model 43C Serial Number 57469-317

Quotation No. : AR2024-00461
Analysis No. : 2024-AE295-001
Report No. : 2024-RAA5757
Report Date : September 18, 2024

Interval Time	Result SO ₂ (ppm)			Standard
	Aug 25-26, 24	Aug 26-27, 24	Aug 27-28, 24	
14:00-15:00	0.0017	0.0017	0.0018	
15:00-16:00	0.0018	0.0017	0.0018	
16:00-17:00	0.0017	0.0019	0.0019	
17:00-18:00	0.0016	0.0020	0.0020	
18:00-19:00	0.0015	0.0021	0.0021	
19:00-20:00	0.0015	0.0019	0.0019	
20:00-21:00	0.0015	0.0018	0.0017	
21:00-22:00	0.0014	0.0017	0.0017	
22:00-23:00	0.0014	0.0016	0.0016	
23:00-00:00	0.0014	0.0014	0.0015	
00:00-01:00	0.0014	0.0014	0.0015	
01:00-02:00	0.0014	0.0013	0.0013	
02:00-03:00	0.0013	0.0013	0.0014	
03:00-04:00	0.0013	0.0012	0.0014	
04:00-05:00	0.0013	0.0012	0.0014	
05:00-06:00	0.0012	0.0014	0.0013	
06:00-07:00	0.0013	0.0014	0.0013	
07:00-08:00	0.0012	0.0014	0.0014	
08:00-09:00	0.0015	0.0013	0.0014	
09:00-10:00	0.0013	0.0017	0.0014	
10:00-11:00	0.0014	0.0013	0.0014	
11:00-12:00	0.0014	0.0014	0.0012	
12:00-13:00	0.0015	0.0017	0.0015	
13:00-14:00	0.0014	0.0017	0.0013	
24 Hours Average	0.0014	0.0016	0.0016	0.12 ^{1*}
1 Hour Maximum	0.0018	0.0021	0.0021	0.30 ^{2*}

Remark : ^{1*} Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 42D dated May 25, B.E.2538 (1995) and Notification No.24, B.E.2547 (2004), published in the Royal Government Gazette No.121 Special Part 104D dated September 22, B.E.2547 (2004), under the Enhancement and Conservation of National Environmental Quality Act B.E.2538 (1992).
^{2*} Notification of National Environmental Board, No.12, B.E.2538 (1995), published in the Royal Government Gazette No.113 Part 42D dated May 13, B.E.2538 (1995) and Notification No.21, B.E.2544 (2001), published in the Royal Government Gazette No.118 Part 42D dated May 13, B.E.2544 (2001), under the Enhancement and Conservation of National Environmental Quality Act B.E.2538 (1992).



(Ms.Piyatida Pradangkho)
Laboratory Reviewer



(Ms.Panicha Promchai)
Laboratory Supervisor

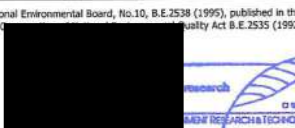
ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปุ๋ยอินทรีย์ แปลงสัมปทานปุ๋ยอินทรีย์แบบกบหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย และอำเภอละงะบือ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Air Quality
Measured Point : สถานีผลิต BY-AIR1 : โรงเรือนบ้านเมืองเก่า (หมู่ที่ 8 ตำบลเมืองเก่า อำเภอศรีนคร จังหวัดสุโขทัย)
GPS. Coordinate : UTM (WGS84) 47Q 0584805 E, 1846929 N
Measured Date : August 25-28, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : CC NDIR Analyzer Horiba Model APMA-370 Serial Number XRP3Y7LA

Quotation No. : AR2024-00461
Analysis No. : 2024-AE295-001
Report No. : 2024-RAAS758
Report Date : September 18, 2024

Interval Time	Result CO (ppm)						Standard ¹¹
	Aug 25-26, 24		Aug 26-27, 24		Aug 27-28, 24		
	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	
14:00-15:00	0.5	-	0.6	0.6	0.3	0.4	
15:00-16:00	0.6	-	0.5	0.6	0.3	0.4	
16:00-17:00	0.6	-	0.5	0.6	0.2	0.4	
17:00-18:00	0.6	-	0.5	0.6	0.3	0.4	
18:00-19:00	0.6	-	0.4	0.5	0.3	0.3	
19:00-20:00	0.5	-	0.4	0.5	0.2	0.3	
20:00-21:00	0.5	-	0.4	0.5	0.2	0.3	
21:00-22:00	0.5	0.6	0.4	0.5	0.3	0.3	
22:00-23:00	0.4	0.5	0.4	0.4	0.3	0.3	
23:00-00:00	0.4	0.5	0.4	0.4	0.4	0.3	
00:00-01:00	0.4	0.5	0.4	0.4	0.4	0.3	
01:00-02:00	0.4	0.5	0.4	0.4	0.4	0.3	
02:00-03:00	0.4	0.4	0.4	0.4	0.3	0.3	
03:00-04:00	0.4	0.4	0.4	0.4	0.4	0.3	
04:00-05:00	0.4	0.4	0.4	0.4	0.4	0.4	
05:00-06:00	0.4	0.4	0.5	0.4	0.4	0.4	
06:00-07:00	0.5	0.4	0.5	0.4	0.4	0.4	
07:00-08:00	0.5	0.4	0.5	0.4	0.3	0.4	
08:00-09:00	0.6	0.4	0.5	0.4	0.4	0.4	
09:00-10:00	0.6	0.5	0.5	0.5	0.4	0.4	
10:00-11:00	0.6	0.5	0.6	0.5	0.6	0.4	
11:00-12:00	0.6	0.5	0.5	0.5	0.7	0.4	
12:00-13:00	0.6	0.6	0.3	0.5	0.7	0.5	
13:00-14:00	0.6	0.6	0.3	0.5	0.5	0.5	
24 Hours Average	0.5	-	0.4	-	0.4	-	-
1 Hour Maximum	0.6	-	0.6	-	0.7	-	30
8 Hours Maximum	-	0.6	-	0.6	-	0.5	9

Remark : ¹¹ Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995), Notification No.28, B.E.2550 (2007), published in the Royal Government Gazette No.124 Special Part 580 dated May 14, B.E.2550 (2007) and Notification No.33, B.E.2552 (2009), published in the Royal Government Gazette No.126 Special Part 1140 dated August 14, B.E.2552 (2009), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).



(Ms.Piyatida Pradangkho)
Laboratory Reviewer



(Ms.Panicha Promchai)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปุ๋ยอินทรีย์ แปลงสัมปทานปุ๋ยอินทรีย์แบบกบหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย และอำเภอละงะบือ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Air Quality
Measured Point : สถานีผลิต BY-AIR2 : บ้านเลขที่ 189 บ้านนิคมพัฒนา (หมู่ที่ 8 ตำบลเมืองเก่า อำเภอศรีนคร จังหวัดสุโขทัย)
GPS. Coordinate : UTM (WGS84) 47Q 0583262 E, 1846488 N
Measured Date : August 25-28, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : NOx Chemiluminescence Analyzer Horiba Model APNA-370 Serial Number U65W031M

Quotation No. : AR2024-00461
Analysis No. : 2024-AE295-004
Report No. : 2024-RAAS759
Report Date : September 18, 2024

Interval Time	Result NO _x (ppm)			Standard ¹¹
	Aug 25-26, 24		Aug 27-28, 24	
	Aug 25-26, 24	Aug 26-27, 24	Aug 27-28, 24	
11:00-12:00	0.0055	0.0060	0.0058	
12:00-13:00	0.0057	0.0057	0.0059	
13:00-14:00	0.0064	0.0057	0.0057	
14:00-15:00	0.0058	0.0057	0.0058	
15:00-16:00	0.0061	0.0058	0.0062	
16:00-17:00	0.0054	0.0062	0.0095	
17:00-18:00	0.0053	0.0068	0.0070	
18:00-19:00	0.0052	0.0060	0.0061	
19:00-20:00	0.0052	0.0058	0.0059	
20:00-21:00	0.0055	0.0056	0.0053	
21:00-22:00	0.0055	0.0057	0.0055	
22:00-23:00	0.0055	0.0054	0.0057	
23:00-00:00	0.0053	0.0053	0.0053	
00:00-01:00	0.0054	0.0053	0.0073	
01:00-02:00	0.0053	0.0055	0.0062	
02:00-03:00	0.0054	0.0054	0.0055	
03:00-04:00	0.0052	0.0056	0.0065	
04:00-05:00	0.0051	0.0054	0.0059	
05:00-06:00	0.0059	0.0053	0.0053	
06:00-07:00	0.0061	0.0060	0.0072	
07:00-08:00	0.0056	0.0060	0.0059	
08:00-09:00	0.0056	0.0057	0.0062	
09:00-10:00	0.0056	0.0053	0.0057	
10:00-11:00	0.0057	0.0056	0.0055	
24 Hours Average	0.0056	0.0057	0.0061	-
1 Hour Maximum	0.0064	0.0068	0.0095	0.17

Remark : ¹¹ Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995), Notification No.28, B.E.2550 (2007), published in the Royal Government Gazette No.124 Special Part 580 dated May 14, B.E.2550 (2007) and Notification No.33, B.E.2552 (2009), published in the Royal Government Gazette No.126 Special Part 1140 dated August 14, B.E.2552 (2009), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).



(Ms.Piyatida Pradangkho)
Laboratory Reviewer



(Ms.Panicha Promchai)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Muang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปิโตรเลียม แปลงสัมปทานปิโตรเลียมบนบกหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีราชา จังหวัดชลบุรี และอำเภอฉะเชิงเทรา จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Air Quality
Measured Point : สถานีผลิต BY-AIR2 : บ้านเลขที่ 189 บ้านนิคมพัฒนา (หมู่ที่ 8 ตำบลหนองจิก อำเภอศรีราชา จังหวัดสุโขทัย)
GPS. Coordinate : UTM (WGS84) 47Q 0583262 E, 1846488 N
Measured Date : August 25-28, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : SO₂ UV-Fluorescence Analyzer Thermo Model 43C Serial Number 58283-317

Quotation No. : AR2024-00461
Analysis No. : 2024-AE295-004
Report No. : 2024-RAA5760
Report Date : September 18, 2024

Interval Time	Result SO ₂ (ppm)			Standard
	Aug 25-26, 24	Aug 26-27, 24	Aug 27-28, 24	
11:00-12:00	0.0014	0.0014	0.0015	
12:00-13:00	0.0013	0.0014	0.0015	
13:00-14:00	0.0013	0.0015	0.0015	
14:00-15:00	0.0013	0.0015	0.0015	
15:00-16:00	0.0013	0.0014	0.0015	
16:00-17:00	0.0012	0.0015	0.0016	
17:00-18:00	0.0012	0.0014	0.0014	
18:00-19:00	0.0013	0.0013	0.0013	
19:00-20:00	0.0012	0.0015	0.0013	
20:00-21:00	0.0012	0.0013	0.0014	
21:00-22:00	0.0012	0.0013	0.0013	
22:00-23:00	0.0012	0.0013	0.0012	
23:00-00:00	0.0012	0.0013	0.0012	
00:00-01:00	0.0012	0.0013	0.0012	
01:00-02:00	0.0013	0.0013	0.0012	
02:00-03:00	0.0013	0.0013	0.0013	
03:00-04:00	0.0013	0.0013	0.0013	
04:00-05:00	0.0013	0.0012	0.0013	
05:00-06:00	0.0013	0.0013	0.0013	
06:00-07:00	0.0014	0.0014	0.0012	
07:00-08:00	0.0014	0.0013	0.0013	
08:00-09:00	0.0013	0.0013	0.0014	
09:00-10:00	0.0014	0.0013	0.0013	
10:00-11:00	0.0014	0.0013	0.0013	
24 Hours Average	0.0013	0.0014	0.0013	0.12 ^{1/}
1 Hour Maximum	0.0014	0.0015	0.0016	0.30 ^{2/}

Remark : ^{1/} Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995) and Notification No.24, B.E.2547 (2004), published in the Royal Government Gazette No.121 Special Part 1040 dated September 22, B.E.2547 (2004), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).
^{2/} Notification of National Environmental Board, No.12, B.E.2538 (1995), published in the Royal Government Gazette No.112 Special Part 270 dated July 13, B.E.2538 (1995) and Notification No.21, B.E.2544 (2001), published in the Royal Government Gazette No.118 Part 5 dated July 13, B.E.2544 (2001), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).

(Ms.Piyatida Pradangkho)
Laboratory Reviewer

(Ms.Panicha Promchai)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Muang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปิโตรเลียม แปลงสัมปทานปิโตรเลียมบนบกหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีราชา จังหวัดชลบุรี และอำเภอฉะเชิงเทรา จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Air Quality
Measured Point : สถานีผลิต BY-AIR2 : บ้านเลขที่ 189 บ้านนิคมพัฒนา (หมู่ที่ 8 ตำบลหนองจิก อำเภอศรีราชา จังหวัดสุโขทัย)
GPS. Coordinate : UTM (WGS84) 47Q 0583262 E, 1846488 N
Measured Date : August 25-28, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : CO NDIR Analyzer Horiba Model APMA-360CE Serial Number 576876072

Quotation No. : AR2024-00461
Analysis No. : 2024-AE295-004
Report No. : 2024-RAA5761
Report Date : September 18, 2024

Interval Time	Result CO (ppm)						Standard ^{1/}
	Aug 25-26, 24		Aug 26-27, 24		Aug 27-28, 24		
	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	
11:00-12:00	0.5	-	0.4	0.4	0.4	0.4	
12:00-13:00	0.6	-	0.4	0.4	0.4	0.4	
13:00-14:00	0.7	-	0.4	0.4	0.4	0.4	
14:00-15:00	0.8	-	0.4	0.4	0.4	0.4	
15:00-16:00	0.5	-	0.4	0.4	0.4	0.4	
16:00-17:00	0.5	-	0.4	0.4	0.5	0.4	
17:00-18:00	0.4	-	0.4	0.4	0.5	0.4	
18:00-19:00	0.4	0.6	0.4	0.4	0.5	0.4	
19:00-20:00	0.4	0.5	0.4	0.4	0.4	0.4	
20:00-21:00	0.5	0.5	0.4	0.4	0.4	0.4	
21:00-22:00	0.4	0.5	0.4	0.4	0.4	0.4	
22:00-23:00	0.5	0.4	0.4	0.4	0.4	0.4	
23:00-00:00	0.4	0.4	0.4	0.4	0.4	0.4	
00:00-01:00	0.5	0.4	0.4	0.4	0.4	0.4	
01:00-02:00	0.5	0.4	0.4	0.4	0.4	0.4	
02:00-03:00	0.5	0.5	0.4	0.4	0.4	0.4	
03:00-04:00	0.4	0.5	0.4	0.4	0.4	0.4	
04:00-05:00	0.4	0.4	0.4	0.4	0.4	0.4	
05:00-06:00	0.5	0.5	0.4	0.4	0.4	0.4	
06:00-07:00	0.5	0.5	0.4	0.4	0.5	0.4	
07:00-08:00	0.5	0.5	0.4	0.4	0.4	0.4	
08:00-09:00	0.5	0.5	0.4	0.4	0.5	0.4	
09:00-10:00	0.4	0.5	0.4	0.4	0.4	0.4	
10:00-11:00	0.4	0.4	0.4	0.4	0.4	0.4	
24 Hours Average	0.5	-	0.4	-	0.4	-	
1 Hour Maximum	0.8	-	0.4	-	0.5	-	
8 Hours Maximum	-	0.6	-	0.4	-	0.4	

Remark : ^{1/} Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995) and Notification No.24, B.E.2547 (2004), published in the Royal Government Gazette No.121 Special Part 1040 dated September 22, B.E.2547 (2004), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).

(Ms.Piyatida Pradangkho)
Laboratory Reviewer

(Ms.Panicha Promchai)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Musang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตซีเมนต์แบบผสมปูนซีเมนต์ร่วนผสมทรายละเอียด L21/43 ตั้งอยู่ที่อำเภอศรีราชา จังหวัดชลบุรี
และสำนักงานประมง จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Air Quality
Measured Point : ฐานหลุมผลิต NS-AIR1 : บานประตาดำเจ็ด
(บานเลขที่ 28 หมู่บ้านประตาดำเจ็ด หมู่ที่ 8 ตำบลหนองหลวง อำเภอลานกระบือ จังหวัดกำแพงเพชร)
GPS. Coordinate : UTM (WGS84) 47Q 0584195 E, 1839432 N
Measured Date : August 25-28, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : NOx Chemiluminescence Analyzer Horiba Model APNA-370 Serial Number J6GUBA4N

Interval Time	Result NO _x (ppm)			Standard ¹
	Aug 25-26, 24	Aug 26-27, 24	Aug 27-28, 24	
10:00-11:00	0.0049	0.0065	0.0062	
11:00-12:00	0.0067	0.0066	0.0059	
12:00-13:00	0.0058	0.0059	0.0059	
13:00-14:00	0.0056	0.0058	0.0061	
14:00-15:00	0.0057	0.0056	0.0065	
15:00-16:00	0.0077	0.0056	0.0078	
16:00-17:00	0.0055	0.0066	0.0073	
17:00-18:00	0.0067	0.0065	0.0099	
18:00-19:00	0.0077	0.0082	0.0078	
19:00-20:00	0.0076	0.0091	0.0085	
20:00-21:00	0.0073	0.0094	0.0092	
21:00-22:00	0.0067	0.0063	0.0069	
22:00-23:00	0.0062	0.0058	0.0065	
23:00-00:00	0.0059	0.0054	0.0063	
00:00-01:00	0.0058	0.0053	0.0061	
01:00-02:00	0.0059	0.0054	0.0080	
02:00-03:00	0.0061	0.0057	0.0076	
03:00-04:00	0.0070	0.0055	0.0056	
04:00-05:00	0.0076	0.0056	0.0057	
05:00-06:00	0.0069	0.0066	0.0060	
06:00-07:00	0.0058	0.0059	0.0057	
07:00-08:00	0.0059	0.0058	0.0061	
08:00-09:00	0.0065	0.0061	0.0060	
09:00-10:00	0.0062	0.0053	0.0100	
24 Hours Average	0.0064	0.0062	0.0070	-
1 Hour Maximum	0.0077	0.0091	0.0100	0.17

Remark : ¹ Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995), Notification No.28, B.E.2550 (2007), published in the Royal Government Gazette No.124 Special Part 580 dated May 14, B.E.2550 (2007) and Notification No.33, B.E.2552 (2009), published in the Royal Government Gazette No.126 Special Part 1140 dated August 14, B.E.2552 (2009), under the Enhancement and Conservation of National Environmental Quality Act B.E.2555 (1992).



(Ms. Piyaatida Pradangkhao)
Laboratory Reviewer



(Ms. Panicha Promchai)
Laboratory Supervisor

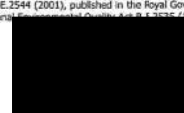
ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Musang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตซีเมนต์แบบผสมปูนซีเมนต์ร่วนผสมทรายละเอียด L21/43 ตั้งอยู่ที่อำเภอศรีราชา จังหวัดชลบุรี
และสำนักงานประมง จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Air Quality
Measured Point : ฐานหลุมผลิต NS-AIR1 : บานประตาดำเจ็ด
(บานเลขที่ 28 หมู่บ้านประตาดำเจ็ด หมู่ที่ 8 ตำบลหนองหลวง อำเภอลานกระบือ จังหวัดกำแพงเพชร)
GPS. Coordinate : UTM (WGS84) 47Q 0584195 E, 1839432 N
Measured Date : August 25-28, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : SO₂ UV-Fluorescence Analyzer Thermo Model 431 Serial Number CN14430005

Interval Time	Result SO ₂ (ppm)			Standard
	Aug 25-26, 24	Aug 26-27, 24	Aug 27-28, 24	
10:00-11:00	0.0013	0.0013	0.0014	
11:00-12:00	0.0015	0.0014	0.0014	
12:00-13:00	0.0017	0.0016	0.0017	
13:00-14:00	0.0015	0.0015	0.0017	
14:00-15:00	0.0020	0.0016	0.0019	
15:00-16:00	0.0021	0.0017	0.0019	
16:00-17:00	0.0018	0.0017	0.0018	
17:00-18:00	0.0015	0.0017	0.0018	
18:00-19:00	0.0013	0.0015	0.0018	
19:00-20:00	0.0015	0.0014	0.0018	
20:00-21:00	0.0016	0.0014	0.0017	
21:00-22:00	0.0017	0.0013	0.0018	
22:00-23:00	0.0015	0.0014	0.0017	
23:00-00:00	0.0015	0.0015	0.0017	
00:00-01:00	0.0014	0.0012	0.0016	
01:00-02:00	0.0015	0.0013	0.0016	
02:00-03:00	0.0013	0.0013	0.0017	
03:00-04:00	0.0013	0.0015	0.0016	
04:00-05:00	0.0015	0.0014	0.0014	
05:00-06:00	0.0014	0.0013	0.0016	
06:00-07:00	0.0014	0.0014	0.0016	
07:00-08:00	0.0013	0.0013	0.0016	
08:00-09:00	0.0015	0.0014	0.0017	
09:00-10:00	0.0013	0.0013	0.0016	
24 Hours Average	0.0015	0.0014	0.0017	0.12 ¹
1 Hour Maximum	0.0021	0.0017	0.0019	0.30 ²

Remark : ¹ Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995) and Notification No.24, B.E.2547 (2004), published in the Royal Government Gazette No.121 Special Part 1040 dated September 12, B.E.2547 (2004), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).

² Notification of National Environmental Board, No.12, B.E.2538 (1995), published in the Royal Government Gazette No.112 Special Part 270 dated July 13, B.E.2538 (1995) and Notification No.21, B.E.2544 (2001), published in the Royal Government Gazette No.118 Special Part 300 dated April 30, B.E.2544 (2001), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).



(Ms. Piyaatida Pradangkhao)
Laboratory Reviewer



(Ms. Panicha Promchai)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Manesya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปิโตรเลียม แปลงสัมปทานปิโตรเลียมหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีราชา จังหวัดชลบุรี และอำเภอฉะเชิงเทรา จังหวัดกาฬสินธุ์
Project Location : จังหวัดสุโขทัย และจังหวัดกาฬสินธุ์
Measured Source : Ambient Air Quality
Measured Point : ฐานหลุมผลิต NS-AIR1 : บ้านประดาดเจริญ (บ้านเลขที่ 28 หมู่บ้านประดาดเจริญ หมู่ที่ 8 ตำบลหนองหลวง อำเภอฉะเชิงเทรา จังหวัดกาฬสินธุ์)
GPS. Coordinate : UTM (WGS84) 47Q 0584195 E, 1839432 N
Measured Date : August 25-28, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : CC NDIR Analyzer Horiba Model APMA-370 Serial Number SFB4TS99

Quotation No. : AR2024-00461
Analysis No. : 2024-AE295-007
Report No. : 2024-RAAS764
Report Date : September 18, 2024

Interval Time	Result CO (ppm)						Standard ¹
	Aug 25-26, 24		Aug 26-27, 24		Aug 27-28, 24		
	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	
10:00-11:00	0.4	-	0.4	0.4	0.4	0.4	
11:00-12:00	0.3	-	0.4	0.4	0.4	0.4	
12:00-13:00	0.3	-	0.4	0.4	0.4	0.4	
13:00-14:00	0.3	-	0.4	0.4	0.4	0.4	
14:00-15:00	0.4	-	0.4	0.4	0.4	0.4	
15:00-16:00	0.4	-	0.4	0.4	0.4	0.4	
16:00-17:00	0.4	-	0.4	0.4	0.5	0.4	
17:00-18:00	0.4	0.4	0.4	0.4	0.6	0.4	
18:00-19:00	0.4	0.4	0.4	0.4	0.4	0.4	
19:00-20:00	0.3	0.4	0.4	0.4	0.4	0.4	
20:00-21:00	0.4	0.4	0.4	0.4	0.4	0.4	
21:00-22:00	0.4	0.4	0.4	0.4	0.4	0.4	
22:00-23:00	0.4	0.4	0.4	0.4	0.4	0.4	
23:00-00:00	0.3	0.4	0.4	0.4	0.4	0.4	
00:00-01:00	0.3	0.4	0.4	0.4	0.4	0.4	
01:00-02:00	0.3	0.4	0.4	0.4	0.4	0.4	
02:00-03:00	0.3	0.3	0.4	0.4	0.4	0.4	
03:00-04:00	0.3	0.3	0.4	0.4	0.4	0.4	
04:00-05:00	0.3	0.3	0.4	0.4	0.4	0.4	
05:00-06:00	0.4	0.3	0.4	0.4	0.4	0.4	
06:00-07:00	0.4	0.3	0.4	0.4	0.4	0.4	
07:00-08:00	0.4	0.3	0.4	0.4	0.4	0.4	
08:00-09:00	0.4	0.4	0.4	0.4	0.4	0.4	
09:00-10:00	0.4	0.4	0.4	0.4	0.4	0.4	
24 Hours Average	0.4	-	0.4	-	0.4	-	-
1 Hour Maximum	0.4	-	0.4	-	0.6	-	30
8 Hours Maximum	-	0.4	-	0.4	-	0.4	9

Remark : ¹ Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).



(Ms.Piyaatida Pradangkho)
Laboratory Reviewer



(Ms.Panicha Promchai)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Manesya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปิโตรเลียม แปลงสัมปทานปิโตรเลียมหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีราชา จังหวัดสุโขทัย และอำเภอฉะเชิงเทรา จังหวัดกาฬสินธุ์
Project Location : จังหวัดสุโขทัย และจังหวัดกาฬสินธุ์
Measured Source : Ambient Air Quality
Measured Point : ฐานหลุมผลิต NS-AIR2 : บ้านหนองไม้แดง (บ้านเลขที่ 74/1 หมู่ที่ 7 ตำบลหนองหลวง อำเภอฉะเชิงเทรา จังหวัดกาฬสินธุ์)
GPS. Coordinate : UTM (WGS84) 47Q 0582515 E, 1839023 N
Measured Date : August 25-28, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : NOx Chemiluminescence Analyzer Horiba Model APNA-370 Serial Number 4VWFEBUK

Quotation No. : AR2024-00461
Analysis No. : 2024-AE295-010
Report No. : 2024-RAAS765
Report Date : September 18, 2024

Interval Time	Result NO _x (ppm)			Standard ¹
	Aug 25-26, 24		Aug 27-28, 24	
	Aug 25-26, 24	Aug 26-27, 24	Aug 27-28, 24	
09:00-10:00	0.0119	0.0105	0.0087	
10:00-11:00	0.0114	0.0107	0.0098	
11:00-12:00	0.0112	0.0089	0.0091	
12:00-13:00	0.0097	0.0084	0.0085	
13:00-14:00	0.0094	0.0108	0.0083	
14:00-15:00	0.0085	0.0091	0.0088	
15:00-16:00	0.0085	0.0082	0.0087	
16:00-17:00	0.0095	0.0079	0.0085	
17:00-18:00	0.0091	0.0086	0.0095	
18:00-19:00	0.0130	0.0092	0.0093	
19:00-20:00	0.0108	0.0101	0.0089	
20:00-21:00	0.0117	0.0097	0.0106	
21:00-22:00	0.0100	0.0098	0.0093	
22:00-23:00	0.0096	0.0101	0.0099	
23:00-00:00	0.0091	0.0089	0.0091	
00:00-01:00	0.0095	0.0083	0.0095	
01:00-02:00	0.0088	0.0081	0.0099	
02:00-03:00	0.0087	0.0079	0.0108	
03:00-04:00	0.0091	0.0084	0.0102	
04:00-05:00	0.0103	0.0087	0.0089	
05:00-06:00	0.0119	0.0096	0.0085	
06:00-07:00	0.0101	0.0088	0.0086	
07:00-08:00	0.0088	0.0139	0.0085	
08:00-09:00	0.0096	0.0088	0.0103	
24 Hours Average	0.0100	0.0093	0.0093	-
1 Hour Maximum	0.0130	0.0139	0.0108	0.17

Remark : ¹ Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995), Notification No.38, B.E.2550 (2007), published in the Royal Government Gazette No.124 Special Part 580 dated May 14, B.E.2550 (2007) and Notification No.33, B.E.2552 (2009), published in the Royal Government Gazette No.126 Special Part 1140 dated August 14, B.E.2552 (2009), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).



(Ms.Piyaatida Pradangkho)
Laboratory Reviewer



(Ms.Panicha Promchai)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneya Sol 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตซีเมนต์ แปลงสัมปทานปิโตรเลียมแบบกบดานเลข L21/43 ตั้งอยู่ที่ตำบลศรีราชา จังหวัดชลบุรี และอำเภอฉะเชิงเทรา จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Air Quality
Measured Point : ฐานหลุมผลิต NS-AIR2 : บ้านหนองไม้แดง (บ้านเลขที่ 74/1 หมู่ที่ 7 ตำบลหนองหลวง อำเภอฉะเชิงเทรา จังหวัดกำแพงเพชร)
GPS. Coordinate : UTM (WGS84) 47Q 0582515 E, 1839023 N
Measured Date : August 25-28, 2024
Measured By : M:Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : SO₂ UV-Fluorescence Analyzer Thermo Model 43i Serial Number CM14430002

Interval Time	Result SO ₂ (ppm)			Standard
	Aug 25-26, 24	Aug 26-27, 24	Aug 27-28, 24	
09:00-10:00	0.0014	0.0015	0.0014	
10:00-11:00	0.0015	0.0013	0.0013	
11:00-12:00	0.0016	0.0013	0.0014	
12:00-13:00	0.0016	0.0014	0.0014	
13:00-14:00	0.0017	0.0016	0.0017	
14:00-15:00	0.0015	0.0015	0.0017	
15:00-16:00	0.0020	0.0016	0.0019	
16:00-17:00	0.0021	0.0017	0.0019	
17:00-18:00	0.0018	0.0017	0.0018	
18:00-19:00	0.0015	0.0017	0.0018	
19:00-20:00	0.0013	0.0015	0.0018	
20:00-21:00	0.0015	0.0014	0.0018	
21:00-22:00	0.0016	0.0014	0.0017	
22:00-23:00	0.0017	0.0013	0.0018	
23:00-00:00	0.0015	0.0014	0.0017	
00:00-01:00	0.0015	0.0015	0.0017	
01:00-02:00	0.0014	0.0012	0.0016	
02:00-03:00	0.0015	0.0013	0.0016	
03:00-04:00	0.0013	0.0013	0.0017	
04:00-05:00	0.0013	0.0015	0.0016	
05:00-06:00	0.0015	0.0014	0.0014	
06:00-07:00	0.0014	0.0013	0.0016	
07:00-08:00	0.0014	0.0014	0.0016	
08:00-09:00	0.0013	0.0013	0.0016	
24 Hours Average	0.0015	0.0014	0.0016	0.12 ¹
1 Hour Maximum	0.0021	0.0017	0.0019	0.30 ²

Remark : ¹ Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 42D dated May 25, B.E.2538 (1995) and Notification No.24, B.E.2547 (2004), published in the Royal Government Gazette No.121 Special Part 104D dated September 22, B.E.2547 (2004), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).
² Notification of National Environmental Board, No.12, B.E.2538 (1995), published in the Royal Government Gazette No.112 Special Part 27D dated July 13, B.E.2538 (1995) and Notification No.21, B.E.2544 (2001), published in the Royal Government Gazette No.118 Special Part 39D dated April 30, B.E.2544 (2001), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).

(Ms.Piyatida Pradangkho)
Laboratory Reviewer

(Ms.Panicha Promchai)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneya Sol 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตซีเมนต์ แปลงสัมปทานปิโตรเลียมแบบกบดานเลข L21/43 ตั้งอยู่ที่ตำบลศรีราชา จังหวัดชลบุรี และอำเภอฉะเชิงเทรา จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Measured Source : Ambient Air Quality
Measured Point : ฐานหลุมผลิต NS-AIR2 : บ้านหนองไม้แดง (บ้านเลขที่ 74/1 หมู่ที่ 7 ตำบลหนองหลวง อำเภอฉะเชิงเทรา จังหวัดกำแพงเพชร)
GPS. Coordinate : UTM (WGS84) 47Q 0582515 E, 1839023 N
Measured Date : August 25-28, 2024
Measured By : Mr.Nitad Sirichad
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : CO NDIR Analyzer Horiba Model APMA-360CE Serial Number 41346760054

Interval Time	Result CO (ppm)						Standard ¹
	Aug 25-26, 24		Aug 26-27, 24		Aug 27-28, 24		
	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	
09:00-10:00	0.5	-	0.5	0.5	0.5	0.5	
10:00-11:00	0.4	-	0.5	0.5	0.4	0.5	
11:00-12:00	0.4	-	0.4	0.5	0.4	0.4	
12:00-13:00	0.4	-	0.5	0.5	0.4	0.4	
13:00-14:00	0.5	-	0.4	0.5	0.5	0.4	
14:00-15:00	0.4	-	0.4	0.5	0.5	0.4	
15:00-16:00	0.5	-	0.4	0.4	0.5	0.4	
16:00-17:00	0.4	0.4	0.4	0.4	0.5	0.5	
17:00-18:00	0.4	0.4	0.4	0.4	0.5	0.5	
18:00-19:00	0.5	0.4	0.5	0.4	0.4	0.5	
19:00-20:00	0.5	0.4	0.5	0.4	0.5	0.5	
20:00-21:00	0.4	0.4	0.4	0.4	0.5	0.5	
21:00-22:00	0.5	0.4	0.5	0.4	0.5	0.5	
22:00-23:00	0.5	0.5	0.5	0.4	0.5	0.5	
23:00-00:00	0.5	0.5	0.4	0.4	0.5	0.5	
00:00-01:00	0.5	0.5	0.4	0.4	0.5	0.5	
01:00-02:00	0.5	0.5	0.4	0.4	0.5	0.5	
02:00-03:00	0.5	0.5	0.4	0.4	0.5	0.5	
03:00-04:00	0.5	0.5	0.5	0.4	0.5	0.5	
04:00-05:00	0.5	0.5	0.5	0.4	0.5	0.5	
05:00-06:00	0.5	0.5	0.5	0.4	0.5	0.5	
06:00-07:00	0.5	0.5	0.5	0.4	0.5	0.5	
07:00-08:00	0.5	0.5	0.4	0.4	0.5	0.5	
08:00-09:00	0.5	0.5	0.4	0.4	0.5	0.5	
24 Hours Average	0.5	-	0.4	-	0.5	-	-
1 Hour Maximum	0.5	-	0.5	-	0.5	-	30
8 Hours Maximum	-	0.5	-	0.5	-	0.5	9

Remark : ¹ Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 42D dated May 25, B.E.2538 (1995), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).

(Ms.Piyatida Pradangkho)
Laboratory Reviewer

(Ms.Panicha Promchai)
Laboratory Supervisor



Thai Environmental Technic Limited
บริษัท เทคนิคสิ่งแวดล้อมไทย จำกัด

ORIGINAL
ต้นฉบับ

1/6 Soi Ramkhamhaeng 145, Khwaeng/Khet Saphansung, Bangkok 10240
1/6 ซอยรามคำแหง 145 แขวงสะพานสูง เขตสะพานสูง กรุงเทพมหานคร 10240

Email : admin@tet1995.com
Tel : 0-2373-7799 (Auto) Fax : 0-2373-7979

Page 1 of 16

TEST REPORT

Analysis No. : R24-3031
Received Date : 30/08/24
Customer : บริษัท อินวอร์เนอแมท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด
Address : 25/114 หมู่ 6 ซอยจินเขต 1 ถนนจางวงศ์วาน แขวงทุ่งสองห้อง เขตหลักสี่ กรุงเทพฯ 10210
Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747
Report Date : 12/09/24
Analysis Date : 09-10/09/24
Job No. : M/240138
Sampling Date : 25-28/08/24
Sampling By : Customer
Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(A)
			NS4				
			2408-AA1215	2408-AA1221	2408-AA1227		
			25-26/08/24	26-27/08/24	27-28/08/24		
VOCs							
1	Vinyl chloride	µg/m ³	< 0.13	< 0.13	< 0.13	0.03	20
2	1,3-Butadiene	µg/m ³	< 0.11	< 0.11	< 0.11	0.02	5.3
3	Acetaldehyde	µg/m ³	7.72	3.03	4.37	0.03	860
4	Bromomethane	µg/m ³	< 0.19	< 0.19	< 0.19	0.04	190
5	Acrolein	µg/m ³	0.55	0.24	0.28	0.02	0.55
6	Dichloromethane	µg/m ³	18.33	1.33	< 0.17	0.04	210
7	Acrylonitrile	µg/m ³	< 0.11	< 0.11	< 0.11	0.03	10
8	Chloroform	µg/m ³	< 0.24	< 0.24	< 0.24	0.03	57
9	Carbon tetrachloride	µg/m ³	< 0.31	< 0.31	< 0.31	0.04	150
10	Benzene	µg/m ³	0.85	0.91	0.66	0.02	7.6
11	1,2-Dichloroethane	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	48
12	Trichloroethylene	µg/m ³	< 0.27	< 0.27	< 0.27	0.03	130
13	1,2-Dichloropropane	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	82
14	1,4-Dioxane	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	360
15	Tetrachloroethylene	µg/m ³	< 0.34	< 0.34	< 0.34	0.04	400
16	1,2-Dibromoethane	µg/m ³	< 0.38	< 0.38	< 0.38	0.09	370
17	1,1,2,2-Tetrachloroethane	µg/m ³	< 0.34	< 0.34	< 0.34	0.06	83
18	1,4-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.11	1,100
19	Benzyl chloride	µg/m ³	< 0.26	< 0.26	< 0.26	0.11	12
20	Carbon disulfide	µg/m ³	23.58	0.79	< 0.16	0.03	100 ^(B)
21	Propene	µg/m ³	19.04	33.48	26.78	0.02	-
22	Dichlorodifluoromethane	µg/m ³	1.36	1.22	1.26	0.04	-
23	Difluorochloromethane	µg/m ³	20.15	1.38	0.47	0.04	-
24	1,2-Dichloro-1,1,2,2-tetrafluoroethane	µg/m ³	< 0.35	< 0.35	< 0.35	0.06	-
25	Chloromethane	µg/m ³	1.06	1.07	1.09	0.02	-
26	Isobutene	µg/m ³	< 0.11	< 0.11	< 0.11	0.03	-
27	Methanol	µg/m ³	8.07	2.55	2.22	0.02	-
28	Vinyl bromide	µg/m ³	< 0.22	< 0.22	< 0.22	0.05	-
29	Chloroethane	µg/m ³	< 0.13	< 0.13	< 0.13	0.02	-
30	Trichlorofluoromethane	µg/m ³	0.64	0.65	0.70	0.04	-
31	Pentane	µg/m ³	42.80	70.68	48.89	0.03	-
32	Ethanol	µg/m ³	127.84	7.55	4.19	0.02	-

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TEST REPORT

Analysis No. : R24-3081
Received Date : 30/08/24
Customer : บริษัท อินวอร์เนอแมท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด
Address : 25/114 หมู่ 6 ซอยจินเขต 1 ถนนจางวงศ์วาน แขวงทุ่งสองห้อง เขตหลักสี่ กรุงเทพฯ 10210
Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747
Report Date : 12/09/24
Analysis Date : 09-10/09/24
Job No. : M/240138
Sampling Date : 25-28/08/24
Sampling By : Customer
Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(A)
			NS4				
			2408-AA1215	2408-AA1221	2408-AA1227		
			25-26/08/24	26-27/08/24	27-28/08/24		
33	Isoprene	µg/m ³	< 0.14	< 0.14	< 0.14	0.02	-
34	Propanal	µg/m ³	0.94	0.60	0.70	0.02	-
35	1,1-Dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
36	1,1,2-Trichloro-1,2,2-trifluoroethane	µg/m ³	< 0.38	< 0.38	< 0.38	0.04	-
37	Acetone	µg/m ³	189.18	15.04	4.60	0.02	-
38	Iodomethane	µg/m ³	< 0.29	< 0.29	< 0.29	0.03	-
39	Isopropyl Alcohol	µg/m ³	29.41	1.38	0.63	0.02	-
40	Acetonitrile	µg/m ³	< 0.08	< 0.08	< 0.08	0.02	-
41	Allyl chloride	µg/m ³	< 0.16	< 0.16	< 0.16	0.02	-
42	Cyclopentane	µg/m ³	3.52	6.09	3.89	0.02	-
43	trans-1,2-dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.03	-
44	2-Methoxy-2-methylpropane	µg/m ³	< 0.18	< 0.18	< 0.18	0.03	-
45	Hexane	µg/m ³	59.54	67.24	45.65	0.03	-
46	Methacrolein	µg/m ³	0.49	0.29	< 0.14	0.03	-
47	1,1-Dichloroethane	µg/m ³	< 0.20	< 0.20	< 0.20	0.03	-
48	Vinyl acetate	µg/m ³	< 0.18	< 0.18	< 0.18	0.05	-
49	Propanol	µg/m ³	0.71	< 0.12	< 0.12	0.02	-
50	Butanal	µg/m ³	1.07	0.67	0.64	0.04	-
51	Methyl vinyl ketone	µg/m ³	< 0.14	< 0.14	< 0.14	0.02	-
52	cis-1,2-Dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
53	Methyl ethyl ketone	µg/m ³	2.05	0.65	0.70	0.02	-
54	Ethyl acetate	µg/m ³	1.89	< 0.18	< 0.18	0.03	-
55	Tetrahydrofuran	µg/m ³	< 0.15	< 0.15	< 0.15	0.02	-
56	1,1,1-Trichloroethane	µg/m ³	< 0.27	< 0.27	< 0.27	0.02	-
57	Cyclohexane	µg/m ³	9.54	17.65	11.21	0.01	-
58	2,2,4-Trimethylpentane	µg/m ³	< 0.23	< 0.23	< 0.23	0.03	-
59	Heptane	µg/m ³	17.50	34.08	23.33	0.03	-
60	1-Butanol	µg/m ³	17.96	8.25	9.39	0.02	-
61	2-Pentanone	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	-
62	Pentanal	µg/m ³	0.61	0.36	0.34	0.04	-
63	3-Pentanone	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	-
64	Bromodichloromethane	µg/m ³	< 0.34	< 0.34	< 0.34	0.03	-
65	cis-1,3-Dichloropropene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
66	Methyl Isobutyl Ketone	µg/m ³	1.62	1.08	0.88	0.04	-

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TEST REPORT

Analysis No. : R24-3031
Received Date : 30/08/24
Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด
Address : 25/114 หมู่ 6 ซอยชินเขต 1 ถนนงามวงศ์วาน แขวงทุ่งสองห้อง
เขตหลักสี่ กรุงเทพฯ 10210
Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747
Report Date : 12/09/24
Analysis Date : 09-10/09/24
Job No. : M/240138
Sampling Date : 25-28/08/24
Sampling By : Customer
Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(A)
			NS4				
			2408-AA1215	2408-AA1221	2408-AA1227		
			25-26/08/24	26-27/08/24	27-28/08/24		
67	Toluene	µg/m ³	7.44	4.04	2.84	0.03	-
68	trans-1,3-Dichloropropene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
69	1,1,2-Trichloroethane	µg/m ³	< 0.27	< 0.27	< 0.27	0.03	-
70	3-Hexanone	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
71	2-Hexanone	µg/m ³	< 0.20	< 0.20	< 0.20	0.05	-
72	Dibromochloromethane	µg/m ³	< 0.42	< 0.42	< 0.42	0.07	-
73	Hexanal	µg/m ³	1.69	0.89	0.81	0.07	-
74	Chlorobenzene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
75	Ethylbenzene	µg/m ³	1.11	0.78	0.63	0.02	-
76	m,p-Xylene	µg/m ³	1.27	1.32	1.06	0.05	-
77	o-Xylene	µg/m ³	0.81	0.74	0.57	0.05	-
78	Total Xylene	µg/m ³	2.08	2.06	1.63	0.05	-
79	Styrene	µg/m ³	0.67	2.23	< 0.21	0.03	-
80	Bromoform	µg/m ³	< 0.52	< 0.52	< 0.52	0.11	-
81	4-Ethyl toluene	µg/m ³	< 0.25	< 0.25	< 0.25	0.06	-
82	1,3,5-Trimethylbenzene	µg/m ³	< 0.25	< 0.25	< 0.25	0.02	-
83	1,2,4-Trimethylbenzene	µg/m ³	0.74	0.83	0.70	0.04	-
84	1,3-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.26	-
85	1,2,3-Trimethylbenzene	µg/m ³	< 0.25	< 0.25	< 0.25	0.05	-
86	1,2-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.10	-
87	1,2,4-Trichlorobenzene	µg/m ³	< 0.37	< 0.37	< 0.37	0.08	-
88	Hexachloro-1,3-Butadiene	µg/m ³	< 0.53	< 0.53	< 0.53	0.06	-
89	Naphthalene	µg/m ³	< 0.26	< 0.26	< 0.26	0.06	-

Remarks : Concentration of each gas in Ambient is based on 1 atm and 25 °C

MDL = Method Detection Limit

Method : VOCs = Canister, GC/MS (USEPA Method TO-15)

Standard : (A) Notification of Pollution Control Departmental (2009) (B.E. 2552) : 24 hours

(B) Notification of the National Environment Board (2017) (B.E. 2560) : 24 hours

Reviewed by

Ms. Wareerat Prachumdaeng
Chief of Laboratory



Approved by

Mrs. Porntip Pethshee
Laboratory Manager



Thai Environmental Technic Limited
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TEST REPORT

Analysis No. : R24-3081
Received Date : 30/08/24
Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด
Address : 25/114 หมู่ 6 ซอยชินเขต 1 ถนนงามวงศ์วาน แขวงทุ่งสองห้อง
เขตหลักสี่ กรุงเทพฯ 10210
Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747
Report Date : 12/09/24
Analysis Date : 09-10/09/24
Job No. : M/240138
Sampling Date : 25-28/08/24
Sampling By : Customer
Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(A)
			NL1				
			2408-AA1216	2408-AA1222	2408-AA1228		
			25-26/08/24	26-27/08/24	27-28/08/24		
VOCs							
1	Vinyl chloride	µg/m ³	< 0.13	< 0.13	< 0.13	0.03	20
2	1,3-Butadiene	µg/m ³	< 0.11	< 0.11	< 0.11	0.02	5.3
3	Acetaldehyde	µg/m ³	5.30	4.74	6.76	0.03	860
4	Bromomethane	µg/m ³	< 0.19	< 0.19	< 0.19	0.04	190
5	Acrolein	µg/m ³	0.65	0.26	0.35	0.02	0.55
6	Dichloromethane	µg/m ³	13.96	0.37	0.64	0.04	210
7	Acrylonitrile	µg/m ³	< 0.11	< 0.11	< 0.11	0.03	10
8	Chloroform	µg/m ³	10.90	< 0.24	< 0.24	0.03	57
9	Carbon tetrachloride	µg/m ³	< 0.31	< 0.31	< 0.31	0.04	150
10	Benzene	µg/m ³	0.88	< 0.16	< 0.16	0.02	7.6
11	1,2-Dichloroethane	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	48
12	Trichloroethylene	µg/m ³	< 0.27	< 0.27	< 0.27	0.03	130
13	1,2-Dichloropropane	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	82
14	1,4-Dioxane	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	860
15	Tetrachloroethylene	µg/m ³	< 0.34	< 0.34	< 0.34	0.04	400
16	1,2-Dibromoethane	µg/m ³	< 0.38	< 0.38	< 0.38	0.09	370
17	1,1,2,2-Tetrachloroethane	µg/m ³	< 0.34	< 0.34	< 0.34	0.06	83
18	1,4-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.11	1,100
19	Benzyl chloride	µg/m ³	< 0.26	< 0.26	< 0.26	0.11	12
20	Carbon disulfide	µg/m ³	15.09	< 0.16	0.66	0.03	100 ^(B)
21	Propene	µg/m ³	1.37	7.95	3.71	0.02	-
22	Dichlorodifluoromethane	µg/m ³	1.01	1.21	1.24	0.04	-
23	Difluorochloromethane	µg/m ³	6.16	0.46	1.04	0.04	-
24	1,2-Dichloro-1,1,2,2-tetrafluoroethane	µg/m ³	< 0.35	< 0.35	< 0.35	0.06	-
25	Chloromethane	µg/m ³	1.01	0.93	1.00	0.02	-
26	Isobutene	µg/m ³	1.23	< 0.11	< 0.11	0.03	-
27	Methanol	µg/m ³	26.71	2.19	2.66	0.02	-
28	Vinyl bromide	µg/m ³	< 0.22	< 0.22	< 0.22	0.05	-
29	Chloroethane	µg/m ³	< 0.13	< 0.13	< 0.13	0.02	-
30	Trichlorofluoromethane	µg/m ³	0.79	0.66	0.71	0.04	-
31	Pentane	µg/m ³	3.13	8.80	4.84	0.03	-
32	Ethanol	µg/m ³	18.36	3.37	7.18	0.02	-

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TEST REPORT

Analysis No. : R24-3081
Received Date : 30/08/24
Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด
Address : 25/114 หมู่ 6 ซอยชินเขต 1 ถนนจางวงศ์วาน แขวงทุ่งสองห้อง เขตหลักสี่ กรุงเทพมหานคร 10210
Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747
Report Date : 12/09/24
Analysis Date : 09-10/09/24
Job No. : M/240138
Sampling Date : 25-28/08/24
Sampling By : Customer
Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(A)
			NL1				
			2408-AA1216	2408-AA1222	2408-AA1228		
			25-26/08/24	26-27/08/24	27-28/08/24		
33	Isoprene	µg/m ³	< 0.14	< 0.14	< 0.14	0.02	-
34	Propanal	µg/m ³	3.57	0.71	0.83	0.02	-
35	1,1-Dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
36	1,1,2-Trichloro-1,2,2-trifluoroethane	µg/m ³	< 0.38	< 0.38	< 0.38	0.04	-
37	Acetone	µg/m ³	209.22	6.58	7.59	0.02	-
38	Iodomethane	µg/m ³	< 0.29	< 0.29	< 0.29	0.03	-
39	Isopropyl Alcohol	µg/m ³	34.45	0.51	1.28	0.02	-
40	Acetonitrile	µg/m ³	< 0.08	< 0.08	< 0.08	0.02	-
41	Allyl chloride	µg/m ³	< 0.16	< 0.16	< 0.16	0.02	-
42	Cyclopentane	µg/m ³	< 0.14	0.57	0.39	0.02	-
43	trans-1,2-dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.03	-
44	2-Methoxy-2-methylpropane	µg/m ³	< 0.18	< 0.18	< 0.18	0.03	-
45	Hexane	µg/m ³	57.01	6.06	4.61	0.03	-
46	Methacrolein	µg/m ³	0.78	0.35	0.35	0.03	-
47	1,1-Dichloroethane	µg/m ³	< 0.20	< 0.20	< 0.20	0.03	-
48	Vinyl acetate	µg/m ³	< 0.18	< 0.18	< 0.18	0.05	-
49	Propanol	µg/m ³	0.68	< 0.12	0.38	0.02	-
50	Butanal	µg/m ³	2.70	0.68	0.82	0.04	-
51	Methyl vinyl ketone	µg/m ³	< 0.14	< 0.14	< 0.14	0.02	-
52	cis-1,2-Dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
53	Methyl ethyl ketone	µg/m ³	3.95	0.62	0.84	0.02	-
54	Ethyl acetate	µg/m ³	3.04	< 0.18	< 0.18	0.03	-
55	Tetrahydrofuran	µg/m ³	< 0.15	< 0.15	< 0.15	0.02	-
56	1,1,1-Trichloroethane	µg/m ³	< 0.27	< 0.27	< 0.27	0.02	-
57	Cyclohexane	µg/m ³	0.92	1.14	1.07	0.01	-
58	2,2,4-Trimethylpentane	µg/m ³	< 0.23	< 0.23	< 0.23	0.03	-
59	Heptane	µg/m ³	0.53	1.75	1.92	0.03	-
60	1-Butanol	µg/m ³	5.23	4.46	6.32	0.02	-
61	2-Pentanone	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	-
62	Pentanal	µg/m ³	1.21	0.41	0.49	0.04	-
63	3-Pentanone	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	-
64	Bromodichloromethane	µg/m ³	< 0.34	< 0.34	< 0.34	0.03	-
65	cis-1,3-Dichloropropene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
66	Methyl Isobutyl Ketone	µg/m ³	3.03	< 0.20	< 0.20	0.04	-

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Tel : 0-2373-7799 (Auto) Fax : 0-2373-7979

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TEST REPORT

Analysis No. : R24-3081
Received Date : 30/08/24
Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด
Address : 25/114 หมู่ 6 ซอยชินเขต 1 ถนนจางวงศ์วาน แขวงทุ่งสองห้อง เขตหลักสี่ กรุงเทพมหานคร 10210
Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747
Report Date : 12/09/24
Analysis Date : 09-10/09/24
Job No. : M/240138
Sampling Date : 25-28/08/24
Sampling By : Customer
Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(A)
			NL1				
			2408-AA1216	2408-AA1222	2408-AA1228		
			25-26/08/24	26-27/08/24	27-28/08/24		
67	Toluene	µg/m ³	19.54	0.78	1.02	0.03	-
68	trans-1,3-Dichloropropene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
69	1,1,2-Trichloroethane	µg/m ³	< 0.27	< 0.27	< 0.27	0.03	-
70	3-Hexanone	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
71	2-Hexanone	µg/m ³	< 0.20	< 0.20	< 0.20	0.05	-
72	Dibromochloromethane	µg/m ³	< 0.42	< 0.42	< 0.42	0.07	-
73	Hexanal	µg/m ³	2.12	0.86	0.95	0.07	-
74	Chlorobenzene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
75	Ethylbenzene	µg/m ³	3.21	< 0.22	< 0.22	0.02	-
76	m,p-Xylene	µg/m ³	2.72	< 0.22	< 0.22	0.05	-
77	o-Xylene	µg/m ³	1.77	< 0.22	< 0.22	0.05	-
78	Total Xylene	µg/m ³	4.49	< 0.22	< 0.22	0.05	-
79	Styrene	µg/m ³	3.35	< 0.21	< 0.21	0.03	-
80	Bromoform	µg/m ³	< 0.52	< 0.52	< 0.52	0.11	-
81	4-Ethyl toluene	µg/m ³	< 0.25	< 0.25	< 0.25	0.06	-
82	1,3,5-Trimethylbenzene	µg/m ³	< 0.25	< 0.25	< 0.25	0.02	-
83	1,2,4-Trimethylbenzene	µg/m ³	2.07	< 0.25	< 0.25	0.04	-
84	1,3-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.26	-
85	1,2,3-Trimethylbenzene	µg/m ³	< 0.25	< 0.25	< 0.25	0.05	-
86	1,2-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.10	-
87	1,2,4-Trichlorobenzene	µg/m ³	< 0.37	< 0.37	< 0.37	0.08	-
88	Hexachloro-1,3-Butadiene	µg/m ³	< 0.53	< 0.53	< 0.53	0.06	-
89	Naphthalene	µg/m ³	< 0.26	< 0.26	< 0.26	0.06	-

Remarks : Concentration of each gas in Ambient is based on 1 atm and 25 °C

MDL = Method Detection Limit

Method : VOCs = Canister, GC/MS (US EPA Method TO-15)

Standard : (A) Notification of Pollution Control Departmental (2009) (B.E. 2552) : 24 hours

(B) Notification of the National Environment Board (2017) (B.E. 2560)

Reviewed by

Ms. Wareerut Prachumdaeng
Chief of Laboratory
12/09/24

Approved by

Mrs. Porntip Pettshee
Laboratory Manager
12/09/24

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Thai Environmental Technic Limited
บริษัท เทคนิคสิ่งแวดล้อมไทย จำกัด

ORIGINAL
ต้นฉบับ

1/6 Soi Ramkhamhaeng 145, Khwaeng / Khet Saphansung, Bangkok 10240
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E-mail : admin@tet1995.com
Tel : 0-2373-7799 (Auto) Fax : 0-2373-7979

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TEST REPORT

Analysis No. : R24-3081
Received Date : 30/08/24
Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด
Address : 25/114 หมู่ 6 ซอยชินเขต 1 ถนนงามวงศ์วาน แขวงทุ่งสองห้อง เขตหลักสี่ กรุงเทพฯ 10210
Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747
Report Date : 12/09/24
Analysis Date : 09-10/09/24
Job No. : M/240138
Sampling Date : 25-28/08/24
Sampling By : Customer
Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(A)
			NS1				
			2408-AA1217	2408-AA1223	2408-AA1229		
			25-26/08/24	26-27/08/24	27-28/08/24		
VOCs							
1	Vinyl chloride	µg/m ³	< 0.13	< 0.13	< 0.13	0.03	20
2	1,3-Butadiene	µg/m ³	< 0.11	< 0.11	< 0.11	0.02	5.3
3	Acetaldehyde	µg/m ³	13.70	3.91	39.58	0.03	860
4	Bromomethane	µg/m ³	< 0.19	< 0.19	< 0.19	0.04	190
5	Acrolein	µg/m ³	0.78	0.38	1.43	0.02	0.55
6	Dichloromethane	µg/m ³	6.69	0.38	4.84	0.04	210
7	Acrylonitrile	µg/m ³	< 0.11	< 0.11	< 0.11	0.03	10
8	Chloroform	µg/m ³	< 0.24	< 0.24	1.08	0.03	57
9	Carbon tetrachloride	µg/m ³	< 0.31	< 0.31	< 0.31	0.04	150
10	Benzene	µg/m ³	0.82	< 0.16	< 0.16	0.02	7.6
11	1,2-Dichloroethane	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	48
12	Trichloroethylene	µg/m ³	< 0.27	< 0.27	< 0.27	0.03	130
13	1,2-Dichloropropane	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	82
14	1,4-Dioxane	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	860
15	Tetrachloroethylene	µg/m ³	< 0.34	< 0.34	< 0.34	0.04	400
16	1,2-Dibromoethane	µg/m ³	< 0.38	< 0.38	< 0.38	0.09	370
17	1,1,2,2-Tetrachloroethane	µg/m ³	< 0.34	< 0.34	< 0.34	0.06	83
18	1,4-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.11	1,100
19	Benzyl chloride	µg/m ³	< 0.26	< 0.26	< 0.26	0.11	12
20	Carbon disulfide	µg/m ³	9.32	< 0.16	3.76	0.03	100 ^(B)
21	Propene	µg/m ³	4.41	0.58	1.30	0.02	-
22	Dichlorodifluoromethane	µg/m ³	2.00	1.21	1.31	0.04	-
23	Difluorochloromethane	µg/m ³	7.62	1.55	7.39	0.04	-
24	1,2-Dichloro-1,1,2,2-tetrafluoroethane	µg/m ³	< 0.35	< 0.35	< 0.35	0.06	-
25	Chloromethane	µg/m ³	2.94	1.04	0.96	0.02	-
26	Isobutene	µg/m ³	< 0.11	< 0.11	2.97	0.03	-
27	Methanol	µg/m ³	8.65	2.71	6.68	0.02	-
28	Vinyl bromide	µg/m ³	< 0.22	< 0.22	< 0.22	0.05	-
29	Chloroethane	µg/m ³	< 0.13	< 0.13	< 0.13	0.02	-
30	Trichlorofluoromethane	µg/m ³	1.39	0.67	0.72	0.04	-
31	Pentane	µg/m ³	6.61	0.74	2.96	0.03	-
32	Ethanol	µg/m ³	66.76	6.19	46.23	0.02	-

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E-mail : admin@tet1995.com
Tel : 0-2373-7799 (Auto) Fax : 0-2373-7979

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TEST REPORT

Analysis No. : R24-3081
Received Date : 30/08/24
Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด
Address : 25/114 หมู่ 6 ซอยชินเขต 1 ถนนงามวงศ์วาน แขวงทุ่งสองห้อง เขตหลักสี่ กรุงเทพฯ 10210
Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747
Report Date : 12/09/24
Analysis Date : 09-10/09/24
Job No. : M/240138
Sampling Date : 25-28/08/24
Sampling By : Customer
Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(A)
			NS1				
			2408-AA1217	2408-AA1223	2408-AA1229		
			25-26/08/24	26-27/08/24	27-28/08/24		
33	Isoprene	µg/m ³	< 0.14	< 0.14	< 0.14	0.02	-
34	Propanal	µg/m ³	1.56	0.61	2.64	0.02	-
35	1,1-Dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
36	1,1,2-Trichloro-1,2,2-trifluoroethane	µg/m ³	< 0.38	< 0.38	< 0.38	0.04	-
37	Acetone	µg/m ³	89.63	5.82	30.85	0.02	-
38	Iodomethane	µg/m ³	< 0.29	< 0.29	< 0.29	0.03	-
39	Isopropyl Alcohol	µg/m ³	12.18	1.23	10.21	0.02	-
40	Acetonitrile	µg/m ³	< 0.08	< 0.08	< 0.08	0.02	-
41	Allyl chloride	µg/m ³	< 0.16	< 0.16	< 0.16	0.02	-
42	Cyclopentane	µg/m ³	0.55	< 0.14	< 0.14	0.02	-
43	trans-1,2-dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.03	-
44	2-Methoxy-2-methylpropane	µg/m ³	< 0.18	< 0.18	< 0.18	0.03	-
45	Hexane	µg/m ³	17.55	1.06	11.43	0.03	-
46	Methacrolen	µg/m ³	0.84	0.37	3.83	0.03	-
47	1,1-Dichloroethane	µg/m ³	< 0.20	< 0.20	< 0.20	0.03	-
48	Vinyl acetate	µg/m ³	< 0.18	< 0.18	< 0.18	0.05	-
49	Propanol	µg/m ³	1.60	< 0.12	0.64	0.02	-
50	Butanal	µg/m ³	1.35	0.51	2.22	0.04	-
51	Methyl vinyl ketone	µg/m ³	< 0.14	< 0.14	< 0.14	0.02	-
52	cis-1,2-Dichloroethene	µg/m ³	0.81	< 0.20	< 0.20	0.02	-
53	Methyl ethyl ketone	µg/m ³	2.21	0.68	2.08	0.02	-
54	Ethyl acetate	µg/m ³	0.73	< 0.18	< 0.18	0.03	-
55	Tetrahydrofuran	µg/m ³	< 0.15	< 0.15	< 0.15	0.02	-
56	1,1,1-Trichloroethane	µg/m ³	< 0.27	< 0.27	< 0.27	0.02	-
57	Cyclohexane	µg/m ³	2.15	< 0.17	0.39	0.01	-
58	2,2,4-Trimethylpentane	µg/m ³	< 0.23	< 0.23	< 0.23	0.03	-
59	Heptane	µg/m ³	2.84	< 0.20	0.50	0.03	-
60	1-Butanol	µg/m ³	2.20	0.49	1.54	0.02	-
61	2-Pentanone	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	-
62	Pentanal	µg/m ³	0.90	0.34	1.13	0.04	-
63	3-Pentanone	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	-
64	Bromodichloromethane	µg/m ³	< 0.34	< 0.34	< 0.34	0.03	-
65	cis-1,3-Dichloropropene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
66	Methyl Isobutyl Ketone	µg/m ³	0.63	< 0.20	0.50	0.04	-

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1/6 ซอยรามคำแหง 145 แขวงสะพานสูง เขตสะพานสูง กรุงเทพมหานคร 10240

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TEST REPORT

Analysis No. : R24-3081
Received Date : 30/08/24
Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด
Address : 25/114 หมู่ 6 ซอยชินเขต 1 ถนนจางวงสว่าง แขวงทุ่งสองห้อง เขตหลักสี่ กรุงเทพฯ 10210
Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 934 7747
Report Date : 12/09/24
Analysis Date : 09-10/09/24
Job No. : M/240138
Sampling Date : 25-28/08/24
Sampling By : Customer
Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(A)
			NS1				
			2408-AA1217	2408-AA1223	2408-AA1229		
			25-26/08/24	26-27/08/24	27-28/08/24		
67	Toluene	µg/m ³	3.60	0.37	1.28	0.03	-
68	trans-1,3-Dichloropropene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
69	1,1,2-Trichloroethane	µg/m ³	< 0.27	< 0.27	< 0.27	0.03	-
70	3-Hexanone	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
71	2-Hexanone	µg/m ³	< 0.20	< 0.20	< 0.20	0.05	-
72	Dibromochloromethane	µg/m ³	< 0.42	< 0.42	< 0.42	0.07	-
73	Hexanal	µg/m ³	1.84	0.51	1.62	0.07	-
74	Chlorobenzene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
75	Ethylbenzene	µg/m ³	0.69	< 0.22	< 0.22	0.02	-
76	m,p-Xylene	µg/m ³	0.60	< 0.22	< 0.22	0.05	-
77	o-Xylene	µg/m ³	0.46	< 0.22	< 0.22	0.05	-
78	Total Xylene	µg/m ³	1.06	< 0.22	< 0.22	0.05	-
79	Styrene	µg/m ³	< 0.21	< 0.21	< 0.21	0.03	-
80	Bromoform	µg/m ³	< 0.52	< 0.52	< 0.52	0.11	-
81	4-Ethyl toluene	µg/m ³	< 0.25	< 0.25	< 0.25	0.06	-
82	1,3,5-Trimethylbenzene	µg/m ³	< 0.25	< 0.25	< 0.25	0.02	-
83	1,2,4-Trimethylbenzene	µg/m ³	< 0.25	< 0.25	< 0.25	0.04	-
84	1,3-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.26	-
85	1,2,3-Trimethylbenzene	µg/m ³	< 0.25	< 0.25	< 0.25	0.05	-
86	1,2-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.10	-
87	1,2,4-Trichlorobenzene	µg/m ³	< 0.37	< 0.37	< 0.37	0.08	-
88	Hexachloro-1,3-Butadiene	µg/m ³	< 0.53	< 0.53	< 0.53	0.06	-
89	Naphthalene	µg/m ³	< 0.26	< 0.26	< 0.26	0.06	-

Remarks : Concentration of each gas in Ambient is based on 1 atm and 25 °C

MDL = Method Detection Limit

Method : VOCs = Canister, GC/MS (USEPA Method TO-15)

Standard (A) Notification of Pollution Control Departmental (2009) (B.E. 2552) : 24 hours

(B) Notification of the National Environment Board (2017) (B.E. 2560) : 24 hours

Reviewed by

Ms. Wareerat Prachumdaeng
Chief of Laboratory
12/09/24



Approved by

Mrs. Porntip Pethshee
Laboratory Manager
12/09/24

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TEST REPORT

Analysis No. : R24-3081
Received Date : 30/08/24
Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด
Address : 25/114 หมู่ 6 ซอยชินเขต 1 ถนนจางวงสว่าง แขวงทุ่งสองห้อง เขตหลักสี่ กรุงเทพฯ 10210
Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747
Report Date : 12/09/24
Analysis Date : 09-10/09/24
Job No. : M/240138
Sampling Date : 25-28/08/24
Sampling By : Customer
Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(A)
			BYN3				
			2408-AA1218	2408-AA1224	2408-AA1230		
			25-26/08/24	26-27/08/24	27-28/08/24		
VOCs							
1	Vinyl chloride	µg/m ³	< 0.13	< 0.13	< 0.13	0.03	20
2	1,3-Butadiene	µg/m ³	< 0.11	< 0.11	< 0.11	0.02	5.3
3	Acetaldehyde	µg/m ³	5.35	4.18	3.51	0.03	860
4	Bromomethane	µg/m ³	< 0.19	< 0.19	< 0.19	0.04	190
5	Acrolein	µg/m ³	< 0.11	< 0.11	< 0.11	0.02	0.55
6	Dichloromethane	µg/m ³	0.32	1.49	< 0.17	0.04	210
7	Acrylonitrile	µg/m ³	< 0.11	< 0.11	< 0.11	0.03	10
8	Chloroform	µg/m ³	< 0.24	< 0.24	< 0.24	0.03	57
9	Carbon tetrachloride	µg/m ³	< 0.31	< 0.31	< 0.31	0.04	150
10	Benzene	µg/m ³	0.77	0.50	< 0.16	0.02	7.6
11	1,2-Dichloroethane	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	48
12	Trichloroethylene	µg/m ³	< 0.27	< 0.27	< 0.27	0.03	130
13	1,2-Dichloropropane	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	82
14	1,4-Dioxane	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	860
15	Tetrachloroethylene	µg/m ³	< 0.34	< 0.34	< 0.34	0.04	400
16	1,2-Dibromoethane	µg/m ³	< 0.38	< 0.38	< 0.38	0.09	370
17	1,1,2,2-Tetrachloroethane	µg/m ³	< 0.34	< 0.34	< 0.34	0.06	83
18	1,4-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.11	1,100
19	Benzyl chloride	µg/m ³	< 0.26	< 0.26	< 0.26	0.11	12
20	Carbon disulfide	µg/m ³	0.32	1.50	< 0.16	0.03	100 ^(B)
21	Propene	µg/m ³	35.83	20.02	4.79	0.02	-
22	Dichlorodifluoromethane	µg/m ³	1.19	1.23	1.33	0.04	-
23	Difluorochloromethane	µg/m ³	0.52	1.62	0.50	0.04	-
24	1,2-Dichloro-1,1,2,2-tetrafluoroethane	µg/m ³	< 0.35	< 0.35	< 0.35	0.06	-
25	Chloromethane	µg/m ³	1.98	1.00	1.11	0.02	-
26	Isobutene	µg/m ³	< 0.11	< 0.11	< 0.11	0.03	-
27	Methanol	µg/m ³	3.09	2.43	2.53	0.02	-
28	Vinyl bromide	µg/m ³	< 0.22	< 0.22	< 0.22	0.05	-
29	Chloroethane	µg/m ³	< 0.13	< 0.13	< 0.13	0.02	-
30	Trichlorofluoromethane	µg/m ³	0.69	0.67	0.72	0.04	-
31	Pentane	µg/m ³	56.18	27.37	5.81	0.03	-
32	Ethanol	µg/m ³	4.63	8.98	3.51	0.02	-

continue

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TEST REPORT

Analysis No. : R24-3081 Report Date : 12/09/24
Received Date : 30/08/24 Analysis Date : 09-10/09/24
Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด Job No. : M/240138
Address : 25/114 หมู่ 6 ซอยชินเขต 1 ถนนจางวงค์วาน แขวงทุ่งสองห้อง เขตหลักสี่ กรุงเทพฯ 10210 Sampling Date : 25-28/08/24
Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747 Sampling By : Customer
Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(A)
			BYN3				
			2408-AA1218	2408-AA1224	2408-AA1230		
			25-26/08/24	26-27/08/24	27-28/08/24		
33	Isoprene	µg/m ³	< 0.14	< 0.14	< 0.14	0.02	-
34	Propanal	µg/m ³	0.80	0.65	0.65	0.02	-
35	1,1-Dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
36	1,1,2-Trichloro-1,2,2-trifluoroethane	µg/m ³	< 0.38	< 0.38	< 0.38	0.04	-
37	Acetone	µg/m ³	5.36	16.79	6.78	0.02	-
38	Iodomethane	µg/m ³	< 0.29	< 0.29	< 0.29	0.03	-
39	Isopropyl Alcohol	µg/m ³	0.68	2.03	0.47	0.02	-
40	Acetonitrile	µg/m ³	< 0.08	< 0.08	< 0.08	0.02	-
41	Allyl chloride	µg/m ³	< 0.16	< 0.16	< 0.16	0.02	-
42	Cyclopentane	µg/m ³	4.90	2.49	0.54	0.02	-
43	trans-1,2-dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.03	-
44	2-Methoxy-2-methylpropane	µg/m ³	< 0.18	< 0.18	< 0.18	0.03	-
45	Hexane	µg/m ³	36.73	21.05	4.56	0.03	-
46	Methacrolein	µg/m ³	< 0.14	< 0.14	0.32	0.03	-
47	1,1-Dichloroethane	µg/m ³	< 0.20	< 0.20	< 0.20	0.03	-
48	Vinyl acetate	µg/m ³	< 0.18	< 0.18	< 0.18	0.05	-
49	Propanol	µg/m ³	< 0.12	< 0.12	< 0.12	0.02	-
50	Butanal	µg/m ³	0.94	0.76	0.65	0.04	-
51	Methyl vinyl ketone	µg/m ³	< 0.14	< 0.14	< 0.14	0.02	-
52	cis-1,2-Dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
53	Methyl ethyl ketone	µg/m ³	0.80	0.63	0.61	0.02	-
54	Ethyl acetate	µg/m ³	< 0.18	< 0.18	< 0.18	0.03	-
55	Tetrahydrofuran	µg/m ³	< 0.15	< 0.15	< 0.15	0.02	-
56	1,1,1-Trichloroethane	µg/m ³	< 0.27	< 0.27	< 0.27	0.02	-
57	Cyclohexane	µg/m ³	9.00	5.19	0.98	0.01	-
58	2,2,4-Trimethylpentane	µg/m ³	< 0.23	< 0.23	< 0.23	0.03	-
59	Heptane	µg/m ³	13.69	7.80	1.32	0.03	-
60	1-Butanol	µg/m ³	24.62	8.08	4.62	0.02	-
61	2-Pentanone	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	-
62	Pentanal	µg/m ³	0.50	0.35	< 0.18	0.04	-
63	3-Pentanone	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	-
64	Bromodichloromethane	µg/m ³	< 0.34	< 0.34	< 0.34	0.03	-
65	cis-1,3-Dichloropropene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
66	Methyl Isobutyl Ketone	µg/m ³	0.38	< 0.20	< 0.20	0.04	-

continue

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Tel : 0-2373-7799 (Auto) Fax : 0-2373-7979

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TEST REPORT

Analysis No. : R24-3081 Report Date : 12/09/24
Received Date : 30/08/24 Analysis Date : 09-10/09/24
Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด Job No. : M/240138
Address : 25/114 หมู่ 6 ซอยชินเขต 1 ถนนจางวงค์วาน แขวงทุ่งสองห้อง เขตหลักสี่ กรุงเทพฯ 10210 Sampling Date : 25-28/08/24
Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747 Sampling By : Customer
Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard
			BYN3				
			2408-AA1218	2408-AA1224	2408-AA1230		
			25-26/08/24	26-27/08/24	27-28/08/24		
67	Toluene	µg/m³	2.60	1.58	0.80	0.03	-
68	trans-1,3-Dichloropropene	µg/m³	< 0.23	< 0.23	< 0.23	0.04	-
69	1,1,2-Trichloroethane	µg/m³	< 0.27	< 0.27	< 0.27	0.03	-
70	3-Hexanone	µg/m³	< 0.20	< 0.20	< 0.20	0.02	-
71	2-Hexanone	µg/m³	< 0.20	< 0.20	< 0.20	0.05	-
72	Dibromochloromethane	µg/m³	< 0.42	< 0.42	< 0.42	0.07	-
73	Hexanal	µg/m³	1.18	0.77	0.63	0.07	-
74	Chlorobenzene	µg/m³	< 0.23	< 0.23	< 0.23	0.04	-
75	Ethylbenzene	µg/m³	< 0.22	< 0.22	< 0.22	0.02	-
76	m,p-Xylene	µg/m³	< 0.22	< 0.22	< 0.22	0.05	-
77	o-Xylene	µg/m³	< 0.22	< 0.22	< 0.22	0.05	-
78	Total Xylene	µg/m³	< 0.22	< 0.22	< 0.22	0.05	-
79	Styrene	µg/m³	< 0.21	< 0.21	< 0.21	0.03	-
80	Bromoform	µg/m³	< 0.52	< 0.52	< 0.52	0.11	-
81	4-Ethyl toluene	µg/m³	< 0.25	< 0.25	< 0.25	0.06	-
82	1,3,5-Trimethylbenzene	µg/m³	< 0.25	< 0.25	< 0.25	0.02	-
83	1,2,4-Trimethylbenzene	µg/m³	< 0.25	< 0.25	< 0.25	0.04	-
84	1,3-Dichlorobenzene	µg/m³	< 0.30	< 0.30	< 0.30	0.26	-
85	1,2,3-Trimethylbenzene	µg/m³	< 0.25	< 0.25	< 0.25	0.05	-
86	1,2-Dichlorobenzene	µg/m³	< 0.30	< 0.30	< 0.30	0.10	-
87	1,2,4-Trichlorobenzene	µg/m³	< 0.37	< 0.37	< 0.37	0.08	-
88	Hexachloro-1,3-Butadiene	µg/m³	< 0.53	< 0.53	< 0.53	0.06	-
89	Naphthalene	µg/m³	< 0.26	< 0.26	< 0.26	0.06	-

Remarks : Concentration of each gas in Ambient is based on 1 atm and 25 °C

MDL = Method Detection Limit

Method : VOCs = Canister, GC/MS (USEPA Method TO-15)

Standard (A) Notification of Pollution Control Departmental (2009) (B.E. 2552) : 24 hours

(B) Notification of the National Environment Board (2017) (B.E. 2560)

Reviewed by

Mrs. Wareerut Prachumdaeng
Chief of Laboratory

Approved by

Mrs. Porntip Petshee
Laboratory Manager

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TEST REPORT

Analysis No. : R24-3081
Received Date : 30/08/24
Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด
Address : 25/114 หมู่ 6 ซอยชินเขต 1 ถนนงามวงศ์วาน แขวงทุ่งสองห้อง เขตหลักสี่ กรุงเทพฯ 10210
Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747
Report Date : 12/09/24
Analysis Date : 09-10/09/24
Job No. : M/240138
Sampling Date : 25-28/08/24
Sampling By : Customer
Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(A)
			BYW-1				
			2408-AA1219	2408-AA1225	2408-AA1231		
			25-26/08/24	26-27/08/24	27-28/08/24		
VOCs							
1	Vinyl chloride	µg/m ³	< 0.13	< 0.13	< 0.13	0.03	20
2	1,3-Butadiene	µg/m ³	< 0.11	< 0.11	< 0.11	0.02	5.3
3	Acetaldehyde	µg/m ³	3.29	3.11	4.46	0.03	860
4	Bromomethane	µg/m ³	< 0.19	< 0.19	< 0.19	0.04	190
5	Acrolein	µg/m ³	< 0.11	< 0.11	< 0.11	0.02	0.55
6	Dichloromethane	µg/m ³	0.54	< 0.17	< 0.17	0.04	210
7	Acrylonitrile	µg/m ³	< 0.11	< 0.11	< 0.11	0.03	10
8	Chloroform	µg/m ³	< 0.24	< 0.24	< 0.24	0.03	57
9	Carbon tetrachloride	µg/m ³	< 0.31	< 0.31	< 0.31	0.04	150
10	Benzene	µg/m ³	< 0.16	< 0.16	< 0.16	0.02	7.6
11	1,2-Dichloroethane	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	48
12	Trichloroethylene	µg/m ³	< 0.27	< 0.27	< 0.27	0.03	130
13	1,2-Dichloropropane	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	82
14	1,4-Dioxane	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	860
15	Tetrachloroethylene	µg/m ³	< 0.34	< 0.34	< 0.34	0.04	400
16	1,2-Dibromoethane	µg/m ³	< 0.38	< 0.38	< 0.38	0.09	370
17	1,1,2,2-Tetrachloroethane	µg/m ³	< 0.34	< 0.34	< 0.34	0.06	83
18	1,4-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.11	1,100
19	Benzyl chloride	µg/m ³	< 0.26	< 0.26	< 0.26	0.11	12
20	Carbon disulfide	µg/m ³	0.45	< 0.16	< 0.16	0.03	100 ^(B)
21	Propene	µg/m ³	6.58	0.81	5.04	0.02	-
22	Dichlorodifluoromethane	µg/m ³	1.21	1.23	1.32	0.04	-
23	Difluorochloromethane	µg/m ³	0.63	0.45	0.49	0.04	-
24	1,2-Dichloro-1,1,2,2-tetrafluoroethane	µg/m ³	< 0.35	< 0.35	< 0.35	0.06	-
25	Chloromethane	µg/m ³	1.69	1.04	1.08	0.02	-
26	Isobutene	µg/m ³	< 0.11	< 0.11	< 0.11	0.03	-
27	Methanol	µg/m ³	2.19	2.29	2.60	0.02	-
28	Vinyl bromide	µg/m ³	< 0.22	< 0.22	< 0.22	0.05	-
29	Chloroethane	µg/m ³	< 0.13	< 0.13	< 0.13	0.02	-
30	Trichlorofluoromethane	µg/m ³	0.65	0.69	0.71	0.04	-
31	Pentane	µg/m ³	5.60	1.12	4.12	0.03	-
32	Ethanol	µg/m ³	5.67	4.06	3.13	0.02	-

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TEST REPORT

Analysis No. : R24-3081
Received Date : 30/08/24
Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด
Address : 25/114 หมู่ 6 ซอยชินเขต 1 ถนนงามวงศ์วาน แขวงทุ่งสองห้อง เขตหลักสี่ กรุงเทพฯ 10210
Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747
Report Date : 12/09/24
Analysis Date : 09-10/09/24
Job No. : M/240138
Sampling Date : 25-28/08/24
Sampling By : Customer
Type of Sample : Ambient Air

Item	Parameter	Unit:	Result			MDL	Standard ^(A)
			BYW-1				
			2408-AA1219	2408-AA1225	2408-AA1231		
			25-26/08/24	26-27/08/24	27-28/08/24		
33	Isoprene	µg/m ³	< 0.14	< 0.14	< 0.14	0.02	-
34	Propanal	µg/m ³	0.39	0.64	0.62	0.02	-
35	1,1-Dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
36	1,1,2-Trichloro-1,2,2-trifluoroethane	µg/m ³	< 0.38	< 0.38	< 0.38	0.04	-
37	Acetone	µg/m ³	6.66	5.18	5.23	0.02	-
38	Iodomethane	µg/m ³	< 0.29	< 0.29	< 0.29	0.03	-
39	Isopropyl Alcohol	µg/m ³	0.75	0.77	0.47	0.02	-
40	Acetonitrile	µg/m ³	< 0.08	< 0.08	< 0.08	0.02	-
41	Allyl chloride	µg/m ³	< 0.16	< 0.16	< 0.16	0.02	-
42	Cyclopentane	µg/m ³	0.54	< 0.14	0.36	0.02	-
43	trans-1,2-dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.03	-
44	2-Methoxy-2-methylpropane	µg/m ³	< 0.18	< 0.18	< 0.18	0.03	-
45	Hexane	µg/m ³	4.14	1.04	2.70	0.03	-
46	Methacrolein	µg/m ³	< 0.14	< 0.14	< 0.14	0.03	-
47	1,1-Dichloroethane	µg/m ³	< 0.20	< 0.20	< 0.20	0.03	-
48	Vinyl acetate	µg/m ³	< 0.18	< 0.18	< 0.18	0.03	-
49	Propanol	µg/m ³	< 0.12	< 0.12	< 0.12	0.02	-
50	Butanal	µg/m ³	0.32	0.47	0.49	0.04	-
51	Methyl vinyl ketone	µg/m ³	< 0.14	< 0.14	< 0.14	0.02	-
52	cis-1,2-Dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
53	Methyl ethyl ketone	µg/m ³	0.59	0.76	0.86	0.02	-
54	Ethyl acetate	µg/m ³	< 0.18	< 0.18	< 0.18	0.03	-
55	Tetrahydrofuran	µg/m ³	< 0.15	< 0.15	< 0.15	0.02	-
56	1,1,1-Trichloroethane	µg/m ³	< 0.27	< 0.27	< 0.27	0.02	-
57	Cyclohexane	µg/m ³	0.96	0.39	0.60	0.01	-
58	2,2,4-Trimethylpentane	µg/m ³	< 0.23	< 0.23	< 0.23	0.03	-
59	Heptane	µg/m ³	1.14	< 0.20	0.70	0.03	-
60	1-Butanol	µg/m ³	0.47	0.35	0.52	0.02	-
61	2-Pentanone	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	-
62	Pentanal	µg/m ³	< 0.18	< 0.18	< 0.18	0.04	-
63	3-Pentanone	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	-
64	Bromodichloromethane	µg/m ³	< 0.34	< 0.34	< 0.34	0.03	-
65	cis-1,3-Dichloropropene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
66	Methyl Isobutyl Ketone	µg/m ³	< 0.20	< 0.20	< 0.20	0.04	-

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TEST REPORT

Analysis No. : R24-3031
Received Date : 30/08/24
Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด
Address : 25/114 หมู่ 6 ซอยชินเขต 1 ถนนงามวงศ์วาน แขวงทุ่งสองห้อง เขตหลักสี่ กรุงเทพฯ 10210
Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747
Report Date : 12/09/24
Analysis Date : 09-10/09/24
Job No. : M/240138
Sampling Date : 25-28/08/24
Sampling By : Customer
Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(A)
			BYW-1				
			2408-AA1219	2408-AA1225	2408-AA1231		
			25-26/08/24	26-27/08/24	27-28/08/24		
67	Toluene	µg/m ³	0.86	1.11	0.59	0.03	-
68	trans-1,3-Dichloropropene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
69	1,1,2-Trichloroethane	µg/m ³	< 0.27	< 0.27	< 0.27	0.03	-
70	3-Hexanone	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
71	2-Hexanone	µg/m ³	< 0.20	< 0.20	< 0.20	0.05	-
72	Dibromochloromethane	µg/m ³	< 0.42	< 0.42	< 0.42	0.07	-
73	Hexanal	µg/m ³	< 0.20	< 0.20	< 0.20	0.07	-
74	Chlorobenzene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
75	Ethylbenzene	µg/m ³	< 0.22	< 0.22	< 0.22	0.02	-
76	m,p-Xylene	µg/m ³	< 0.22	< 0.22	< 0.22	0.05	-
77	o-Xylene	µg/m ³	< 0.22	< 0.22	< 0.22	0.05	-
78	Total Xylene	µg/m ³	< 0.22	< 0.22	< 0.22	0.05	-
79	Styrene	µg/m ³	< 0.21	< 0.21	< 0.21	0.03	-
80	Bromoform	µg/m ³	< 0.52	< 0.52	< 0.52	0.11	-
81	4-Ethyl toluene	µg/m ³	< 0.25	< 0.25	< 0.25	0.06	-
82	1,3,5-Trimethylbenzene	µg/m ³	< 0.25	< 0.25	< 0.25	0.02	-
83	1,2,4-Trimethylbenzene	µg/m ³	< 0.25	< 0.25	< 0.25	0.04	-
84	1,3-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.26	-
85	1,2,3-Trimethylbenzene	µg/m ³	< 0.25	< 0.25	< 0.25	0.05	-
86	1,2-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.10	-
87	1,2,4-Trichlorobenzene	µg/m ³	< 0.37	< 0.37	< 0.37	0.08	-
88	Hexachloro-1,3-Butadiene	µg/m ³	< 0.53	< 0.53	< 0.53	0.06	-
89	Naphthalene	µg/m ³	< 0.26	< 0.26	< 0.26	0.06	-

Remarks : Concentration of each gas in Ambient is based on 1 atm and 25 °C

MDL = Method Detection Limit

Method : VOCs = Canister, GC/MS (USEPA Method TO-15)

Standard (A) Notification of Pollution Control Departmental (2009) (B.E. 2552) : 24 hours

(B) Notification of the National Environment Board (2017) (B.E. 2560) : 24 hours

Reviewed by

Ms. Wareerut Prachumdaeng
Chief of Laboratory
12/09/24



Approved by

Mr. Porntip Pethshee
Laboratory Manager
12/09/24

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Thai Environmental Technic Limited
บริษัท เทคนิคสิ่งแวดล้อมไทย จำกัด

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TEST REPORT

Analysis No. : R24-3081
Received Date : 30/08/24
Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด
Address : 25/114 หมู่ 6 ซอยชินเขต 1 ถนนงามวงศ์วาน แขวงทุ่งสองห้อง เขตหลักสี่ กรุงเทพฯ 10210
Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747
Report Date : 12/09/24
Analysis Date : 09-10/09/24
Job No. : M/240138
Sampling Date : 25-28/08/24
Sampling By : Customer
Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(A)
			BYN2				
			2408-AA1220	2408-AA1226	2408-AA1232		
			25-26/08/24	26-27/08/24	27-28/08/24		
VOCs							
1	Vinyl chloride	µg/m ³	< 0.13	< 0.13	< 0.13	0.03	20
2	1,3-Butadiene	µg/m ³	< 0.11	< 0.11	< 0.11	0.02	5.3
3	Acetaldehyde	µg/m ³	3.87	2.43	4.77	0.03	860
4	Bromomethane	µg/m ³	< 0.19	< 0.19	< 0.19	0.04	190
5	Acrolein	µg/m ³	< 0.11	< 0.11	< 0.11	0.02	0.55
6	Dichloromethane	µg/m ³	< 0.17	< 0.17	< 0.17	0.04	210
7	Acrylonitrile	µg/m ³	< 0.11	< 0.11	< 0.11	0.03	10
8	Chloroform	µg/m ³	< 0.24	< 0.24	< 0.24	0.03	57
9	Carbon tetrachloride	µg/m ³	< 0.31	< 0.31	< 0.31	0.04	150
10	Benzene	µg/m ³	< 0.16	< 0.16	< 0.16	0.02	7.6
11	1,2-Dichloroethane	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	48
12	Trichloroethylene	µg/m ³	< 0.27	< 0.27	< 0.27	0.03	130
13	1,2-Dichloropropane	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	82
14	1,4-Dioxane	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	860
15	Tetrachloroethylene	µg/m ³	< 0.34	< 0.34	< 0.34	0.04	400
16	1,2-Dibromoethane	µg/m ³	< 0.38	< 0.38	< 0.38	0.09	370
17	1,1,2,2-Tetrachloroethane	µg/m ³	< 0.34	< 0.34	< 0.34	0.05	83
18	1,4-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.11	1,100
19	Benzyl chloride	µg/m ³	< 0.26	< 0.26	< 0.26	0.11	12
20	Carbon disulfide	µg/m ³	0.31	0.66	0.38	0.03	100 ^(B)
21	Propene	µg/m ³	3.79	4.41	1.69	0.02	-
22	Dichlorodifluoromethane	µg/m ³	1.19	1.22	1.31	0.04	-
23	Difluorochloromethane	µg/m ³	0.57	0.54	0.48	0.04	-
24	1,2-Dichloro-1,1,2,2-tetrafluoroethane	µg/m ³	< 0.35	< 0.35	< 0.35	0.05	-
25	Chloromethane	µg/m ³	1.98	1.08	1.12	0.02	-
26	Isobutene	µg/m ³	< 0.11	< 0.11	< 0.11	0.03	-
27	Methanol	µg/m ³	2.57	2.06	2.58	0.02	-
28	Vinyl bromide	µg/m ³	< 0.22	< 0.22	< 0.22	0.05	-
29	Chloroethane	µg/m ³	< 0.13	< 0.13	< 0.13	0.02	-
30	Trichlorofluoromethane	µg/m ³	0.69	0.70	0.72	0.04	-
31	Pentane	µg/m ³	4.11	4.40	1.72	0.03	-
32	Ethanol	µg/m ³	3.57	3.93	2.46	0.02	-

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TEST REPORT

Analysis No. : R24-3031 Report Date : 12/09/24
Received Date : 30/08/24 Analysis Date : 09-10/09/24
Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด Job No. : M/240138
Address : 25/114 หมู่ 6 ซอยชินเขต 1 ถนนงามวงศ์วาน แขวงทุ่งสองห้อง เขตหลักสี่ กรุงเทพฯ 10210 Sampling Date : 25-28/08/24
Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747 Sampling By : Customer
Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard ^(A)
			BYN2				
			2408-AA1220	2408-AA1226	2408-AA1232		
			25-26/08/24	26-27/08/24	27-28/08/24		
33	Isoprene	µg/m ³	< 0.14	< 0.14	< 0.14	0.02	-
34	Propanal	µg/m ³	0.53	0.46	0.69	0.02	-
35	1,1-Dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
36	1,1,2-Trichloro-1,2,2-trifluoroethane	µg/m ³	< 0.38	< 0.38	< 0.38	0.04	-
37	Acetone	µg/m ³	4.37	4.00	6.31	0.02	-
38	Iodomethane	µg/m ³	< 0.29	< 0.29	< 0.29	0.03	-
39	Isopropyl Alcohol	µg/m ³	0.66	0.63	0.46	0.02	-
40	Acetonitrile	µg/m ³	< 0.08	< 0.08	< 0.08	0.02	-
41	Allyl chloride	µg/m ³	< 0.16	< 0.16	< 0.16	0.02	-
42	Cyclopentane	µg/m ³	0.39	0.37	< 0.14	0.02	-
43	trans-1,2-dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.03	-
44	2-Methoxy-2-methylpropane	µg/m ³	< 0.18	< 0.18	< 0.18	0.03	-
45	Hexane	µg/m ³	3.63	4.63	4.83	0.03	-
46	Methacrolein	µg/m ³	< 0.14	< 0.14	< 0.14	0.03	-
47	1,1-Dichloroethane	µg/m ³	< 0.20	< 0.20	< 0.20	0.03	-
48	Vinyl acetate	µg/m ³	< 0.18	< 0.18	< 0.18	0.05	-
49	Propanol	µg/m ³	< 0.12	< 0.12	< 0.12	0.02	-
50	Butanal	µg/m ³	0.49	0.40	0.53	0.04	-
51	Methyl vinyl ketone	µg/m ³	< 0.14	< 0.14	< 0.14	0.02	-
52	cis-1,2-Dichloroethene	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
53	Methyl ethyl ketone	µg/m ³	0.66	0.46	0.81	0.02	-
54	Ethyl acetate	µg/m ³	< 0.18	< 0.18	< 0.18	0.03	-
55	Tetrahydrofuran	µg/m ³	< 0.15	< 0.15	< 0.15	0.02	-
56	1,1,1-Trichloroethane	µg/m ³	< 0.27	< 0.27	< 0.27	0.02	-
57	Cyclohexane	µg/m ³	0.78	0.69	0.37	0.01	-
58	2,2,4-Trimethylpentane	µg/m ³	< 0.23	< 0.23	< 0.23	0.03	-
59	Heptane	µg/m ³	0.87	0.89	0.41	0.03	-
60	1-Butanol	µg/m ³	0.46	0.32	< 0.15	0.02	-
61	2-Pentanone	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	-
62	Pentanal	µg/m ³	< 0.18	< 0.18	< 0.18	0.04	-
63	3-Pentanone	µg/m ³	< 0.18	< 0.18	< 0.18	0.02	-
64	Bromodichloromethane	µg/m ³	< 0.34	< 0.34	< 0.34	0.03	-
65	cis-1,3-Dichloropropene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
66	Methyl isobutyl Ketone	µg/m ³	< 0.20	< 0.20	< 0.20	0.04	-

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TEST REPORT

Analysis No. : R24-3081 Report Date : 12/09/24
Received Date : 30/08/24 Analysis Date : 09-10/09/24
Customer : บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด Job No. : M/240138
Address : 25/114 หมู่ 6 ซอยชินเขต 1 ถนนงามวงศ์วาน แขวงทุ่งสองห้อง เขตหลักสี่ กรุงเทพฯ 10210 Sampling Date : 25-28/08/24
Contact : Tel. (02) 954 7745-6 Ext. 306 Fax. (02) 954 7747 Sampling By : Customer
Type of Sample : Ambient Air

Item	Parameter	Unit	Result			MDL	Standard
			BYN2				
			2408-AA1220	2408-AA1226	2408-AA1232		
			25-26/08/24	26-27/08/24	27-28/08/24		
67	Toluene	µg/m ³	0.88	0.46	0.47	0.03	-
68	trans-1,3-Dichloropropene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
69	1,1,2-Trichloroethane	µg/m ³	< 0.27	< 0.27	< 0.27	0.03	-
70	3-Hexanone	µg/m ³	< 0.20	< 0.20	< 0.20	0.02	-
71	2-Hexanone	µg/m ³	< 0.20	< 0.20	< 0.20	0.05	-
72	Dibromochloromethane	µg/m ³	< 0.42	< 0.42	< 0.42	0.07	-
73	Hexanal	µg/m ³	< 0.20	< 0.20	< 0.20	0.07	-
74	Chlorobenzene	µg/m ³	< 0.23	< 0.23	< 0.23	0.04	-
75	Ethylbenzene	µg/m ³	< 0.22	< 0.22	< 0.22	0.02	-
76	m,p-Xylene	µg/m ³	< 0.22	< 0.22	< 0.22	0.05	-
77	o-Xylene	µg/m ³	< 0.22	< 0.22	< 0.22	0.05	-
78	Total Xylene	µg/m ³	< 0.22	< 0.22	< 0.22	0.05	-
79	Styrene	µg/m ³	< 0.21	< 0.21	< 0.21	0.03	-
80	Bromoform	µg/m ³	< 0.52	< 0.52	< 0.52	0.11	-
81	4-Ethyl toluene	µg/m ³	< 0.25	< 0.25	< 0.25	0.06	-
82	1,3,5-Trimethylbenzene	µg/m ³	< 0.25	< 0.25	< 0.25	0.02	-
83	1,2,4-Trimethylbenzene	µg/m ³	< 0.25	< 0.25	< 0.25	0.04	-
84	1,3-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.26	-
85	1,2,3-Trimethylbenzene	µg/m ³	< 0.25	< 0.25	< 0.25	0.05	-
86	1,2-Dichlorobenzene	µg/m ³	< 0.30	< 0.30	< 0.30	0.10	-
87	1,2,4-Trichlorobenzene	µg/m ³	< 0.37	< 0.37	< 0.37	0.08	-
88	Hexachloro-1,3-Butadiene	µg/m ³	< 0.53	< 0.53	< 0.53	0.06	-
89	Naphthalene	µg/m ³	< 0.26	< 0.26	< 0.26	0.06	-

Remarks : Concentration of each gas in Ambient is based on 1 atm and 25 °C

MDL = Method Detection Limit

Method : VOCs = Canister, GC/MS (U.S.EPA Method TO-15)

Standard : (A) Notification of Pollution Control Departmental (2009) (B.E. 2552) : 24 hours

(B) Notification of the National Environment Board (2017) (B.E. 2560) : 24 hours

Reviewed by

Mrs. Wareerut Prachumdaeng
Chief of Laboratory
12/9/24

Approved by

Mrs. Porntip Petchshee
Laboratory Manager
12/9/24



END OF REPORT

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บริษัท ซีเอ็นพีซีเอชเค (ไทยแลนด์) จำกัด

รายงานผลการปฏิบัติตามมาตรการป้องกันและแก้ไขผลกระทบสิ่งแวดล้อม และมาตรการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม
โครงการผลิตปิโตรเลียม แปลงสัมปทานปิโตรเลียมบนบกหมายเลข L21/43
ตั้งอยู่ที่อำเภอศรีราชา จังหวัดชลบุรี และอำเภอสานกระบือ จังหวัดกำแพงเพชร
ฉบับเดือนมกราคม - ธันวาคม พ.ศ.2567

ภาคผนวก ง.3

คุณภาพน้ำผิวดิน

ฤดูแล้ง

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปุ๋ยอินทรีย์แบบเร่งสปีดจากปุ๋ยคอกและมูลสัตว์จากฟาร์มสุกร และกากอาหารหมู จังหวัดสุโขทัย
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Sampling Source : Surface Water Sampling
Sampling Point : ฐานหลุมผลิต BYN-SW1 : คลองส่งน้ำทางทิศตะวันออกของบ้านวังสนม
GPS. Coordinate : UTM (WGS84) 47Q 0582938 E, 1848796 N
Sampling Date : March 30, 2024
Sampling Time : 14:34
Sampling Method : Grab
Sampling By : Mr.Romsea Kateh
Analyzed By : Environment Research & Technology Co., Ltd.
Physical Properties : Turbid, Light Yellow, Sediment, Odorless

Quotation No. : AR2024-00461
Analysis No. : 2024-AB383-003
Received Date : April 2, 2024
Analytical Date : April 2-26, 2024
Report No. : 2024-RAAG341
Report Date : April 29, 2024

Parameter	Unit	Method of Analysis ^{1*}	MRL	Result	Standard ^{2*}	
					Class 3	Class 4
pH	-	Electrometric	-	7.9	5.0-9.0	5.0-9.0
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.001	0.002	0.05	0.05
Mercury	mg/L	Digestion, Cold-vapor Atomic Absorption Spectrometry	0.0005	<0.0005	0.002	0.002
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	0.0002	0.0023	0.01	0.01
Barium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	0.01	0.08	-	-
Chloride	mg/L	Mercuric Nitrate	1.0	20	-	-
Conductivity	µs/cm	Electrical Conductivity Meter	0.1	319	-	-
TPH (Gasoline Range Hydrocarbons; C6-C9)	mg/L	Purge and Trap, Gas Chromatographic (GC-FID)	0.040	<0.040	-	-
TPH (Kerosene Range Hydrocarbons; C10-C14)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Diesel Range Hydrocarbons; C15-C24)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Heavy Oil Range Hydrocarbons; C25-C36)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-

Remark : ^{1*} Standard Method for Examination of Water and Wastewater, 24th Edition, 2023.

^{2*} Notification of the National Environment Board, No.8, B.E.2537 (1994), issued under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.111 Part 16, dated February 24, B.E.2537 (1994). (Standard Value of Surface Water for Class 3, 4)



(Ms.Yuwadee Na Ranong)
Laboratory Reviewer



(Mr.Virat Hemvannanukul)
Laboratory Supervisor

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Page 1/1

F-RP-026 Rev. 05, January 18, 2021

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปุ๋ยอินทรีย์แบบเร่งสปีดจากปุ๋ยคอกและมูลสัตว์จากฟาร์มสุกร และกากอาหารหมู จังหวัดสุโขทัย และอำเภอละานกระบือ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Sampling Source : Surface Water Sampling
Sampling Point : ฐานหลุมผลิต BYN-SW2 : ป่าบึงหญ้า
GPS. Coordinate : UTM (WGS84) 47Q 0583583 E, 1847292 N
Sampling Date : March 30, 2024
Sampling Time : 13:44
Sampling Method : Grab
Sampling By : Mr.Romsea Kateh
Analyzed By : Environment Research & Technology Co., Ltd.
Physical Properties : Turbid, Light Yellow, Sediment, Odorless

Quotation No. : AR2024-00461
Analysis No. : 2024-AB383-002
Received Date : April 2, 2024
Analytical Date : April 2-26, 2024
Report No. : 2024-RAAG340
Report Date : April 29, 2024

Parameter	Unit	Method of Analysis ^{1*}	MRL	Result	Standard ^{2*}	
					Class 3	Class 4
pH	-	Electrometric	-	8.4	5.0-9.0	5.0-9.0
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.001	<0.001	0.05	0.05
Mercury	mg/L	Digestion, Cold-Vapor Atomic Absorption Spectrometry	0.0005	0.0005	0.002	0.002
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	0.0002	<0.0002	0.01	0.01
Barium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	0.01	0.08	-	-
Chloride	mg/L	Mercuric Nitrate	1.0	11	-	-
Conductivity	µs/cm	Electrical Conductivity Meter	0.1	254	-	-
TPH (Gasoline Range Hydrocarbons; C6-C9)	mg/L	Purge and Trap, Gas Chromatographic (GC-FID)	0.040	<0.040	-	-
TPH (Kerosene Range Hydrocarbons; C10-C14)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Diesel Range Hydrocarbons; C15-C24)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Heavy Oil Range Hydrocarbons; C25-C36)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-

Remark : ^{1*} Standard Method for Examination of Water and Wastewater, 24th Edition, 2023.

^{2*} Notification of the National Environment Board, No.8, B.E.2537 (1994), issued under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.111 Part 16, dated February 24, B.E.2537 (1994). (Standard Value of Surface Water for Class 3, 4)



(Ms.Yuwadee Na Ranong)
Laboratory Reviewer



(Mr.Virat Hemvannanukul)
Laboratory Supervisor

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ANALYSIS REPORT

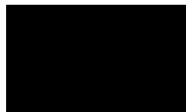
Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตไบโอดีเซล แปลงสัมปทานปิโตรเลียมหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย และอำเภออุตรดิตถ์ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Sampling Source : Surface Water Sampling
Sampling Point : สถานีผลิต BY-SW1 : คลองวังเดื่องทางทิศเหนือของบ้านบึงหญ้า
GPS. Coordinate : UTM (WGS84) 47Q 0585652 E, 1846301 N
Sampling Date : March 30, 2024
Sampling Time : 13:36
Sampling Method : Grab
Sampling By : Mr.Romsea Kateh
Analyzed By : Environment Research & Technology Co., Ltd.
Physical Properties : Turbid, Light Yellow, Sediment, Odorless

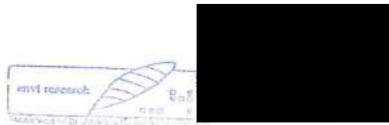
Quotation No. : AR2024-00461
Analysis No. : 2024-AB383-001
Received Date : April 2, 2024
Analytical Date : April 2-26, 2024
Report No. : 2024-RAAG339
Report Date : April 29, 2024

Parameter	Unit	Method of Analysis ^{1*}	MRL	Result	Standard ^{2*}	
					Class 3	Class 4
pH	-	Electrometric	-	7.9	5.0-9.0	5.0-9.0
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.001	0.001	0.05	0.05
Mercury	mg/L	Digestion, Cold-Vapor Atomic Absorption Spectrometry	0.0005	<0.0005	0.002	0.002
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	0.0002	<0.0002	0.01	0.01
Barium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	0.01	0.06	-	-
Chloride	mg/L	Mercuric Nitrate	1.0	5.0	-	-
Conductivity	µs/cm	Electrical Conductivity Meter	3.1	196	-	-
TPH (Gasoline Range Hydrocarbons; C6-C9)	mg/L	Purge and Trap, Gas Chromatographic (GC-FID)	0.040	<0.040	-	-
TPH (Kerosene Range Hydrocarbons; C10-C14)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Diesel Range Hydrocarbons; C15-C24)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Heavy Oil Range Hydrocarbons; C25-C36)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-

Remark : ^{1*} Standard Method for Examination of Water and Wastewater, 24th Edition, 2023.

^{2*} Notification of the National Environment Board, No.8, B.E.2537 (1994), issued under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.111 Part 16, dated February 24, B.E.2537 (1994). (Standard Value of Surface Water for Class 3, 4)


(Ms.Yuwadee Na Ranong)
Laboratory Reviewer


(Mr.Virat Hemvannanukul)
Laboratory Supervisor

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REPORT ANALYSIS REFERS TO SUBMITTED SAMPLE (S) ONLY

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ANALYSIS REPORT

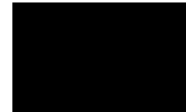
Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตไบโอดีเซล แปลงสัมปทานปิโตรเลียมหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย และอำเภออุตรดิตถ์ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Sampling Source : Surface Water Sampling
Sampling Point : สถานีผลิต BY-SW2 : คลองวังเดื่องทางทิศใต้ของบ้านบึงหญ้า
GPS. Coordinate : UTM (WGS84) 47Q 0583260 E, 1845121 N
Sampling Date : March 30, 2024
Sampling Time : 14:27
Sampling Method : Grab
Sampling By : Mr.Romsea Kateh
Analyzed By : Environment Research & Technology Co., Ltd.
Physical Properties : Turbid, Light Yellow, Sediment, Odorless


Quotation No. : AR2024-00461
Analysis No. : 2024-AB382-001
Received Date : April 2, 2024
Analytical Date : April 2-26, 2024
Report No. : 2024-RAAG332
Report Date : April 29, 2024

Parameter	Unit	Method of Analysis ^{1*}	MRL	Result	Standard ^{2*}	
					Class 3	Class 4
pH	-	Electrometric	-	8.3	5.0-9.0	5.0-9.0
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.001	<0.001	0.05	0.05
Mercury	mg/L	Digestion, Cold-Vapor Atomic Absorption Spectrometry	0.0005	0.0011	0.002	0.002
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	0.0002	<0.0002	0.01	0.01
Barium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	0.01	0.06	-	-
Chloride	mg/L	Mercuric Nitrate	1.0	6.0	-	-
Conductivity	µs/cm	Electrical Conductivity Meter	0.1	197	-	-
TPH (Gasoline Range Hydrocarbons; C6-C9)	mg/L	Purge and Trap, Gas Chromatographic (GC-FID)	0.040	<0.040	-	-
TPH (Kerosene Range Hydrocarbons; C10-C14)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Diesel Range Hydrocarbons; C15-C24)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Heavy Oil Range Hydrocarbons; C25-C36)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-

Remark : ^{1*} Standard Method for Examination of Water and Wastewater, 24th Edition, 2023.

^{2*} Notification of the National Environment Board, No.8, B.E.2537 (1994), issued under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.111 Part 16, dated February 24, B.E.2537 (1994). (Standard Value of Surface Water for Class 3, 4)


(Ms.Yuwadee Na Ranong)
Laboratory Reviewer


(Mr.Virat Hemvannanukul)
Laboratory Supervisor

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F-RP-026 Rev. 05, January 18, 2021

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปุ๋ยอินทรีย์ แปลงสัมปทานปุ๋ยอินทรีย์แบบกบหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีมหา จังหวัดสุโขทัย และอำเภอสามกระบือ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Sampling Source : Surface Water Sampling
Sampling Point : ฐานหลุมผลิต NS-SW1 : คลองส่งน้ำทางทิศเหนือของบ้านประดาดเจ้าศรี
GPS. Coordinate : UTM (WGS84) 47Q 0585289 E, 1839044 N
Sampling Date : March 30, 2024
Sampling Time : 11:26
Sampling Method : Grab
Sampling By : Mr.Romsea Kateh
Analyzed By : Environment Research & Technology Co., Ltd.
Physical Properties : Turbid, Light Yellow, Sediment, Odorless

Quotation No. : AR2024-00461
Analysis No. : 2024-AB382-002
Received Date : April 2, 2024
Analytical Date : April 2-26, 2024
Report No. : 2024-RAAG333
Report Date : April 29, 2024

Parameter	Unit	Method of Analysis ^{1/}	MRL	Result	Standard ^{2/}	
					Class 3	Class 4
pH	-	Electrometric	-	8.1	5.0-9.0	5.0-9.0
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.001	<0.001	0.05	0.05
Mercury	mg/L	Digestion, Cold-vapor Atomic Absorption Spectrometry	0.0005	<0.0005	0.002	0.002
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	0.0002	0.0002	0.01	0.01
Barium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	0.01	0.06	-	-
Chloride	mg/L	Mercuric Nitrate	1.0	8.1	-	-
Conductivity	µs/cm	Electrical Conductivity Meter	0.1	220	-	-
TPH (Gasoline Range Hydrocarbons; C6-C9)	mg/L	Purge and Trap, Gas Chromatographic (GC-FID)	0.040	<0.040	-	-
TPH (Kerosene Range Hydrocarbons; C10-C14)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Diesel Range Hydrocarbons; C15-C24)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Heavy Oil Range Hydrocarbons; C25-C36)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-

Remark : ^{1/} Standard Method for Examination of Water and Wastewater, 24th Edition, 2023.

^{2/} Notification of the National Environment Board, No.8, B.E.2537 (1994), issued under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.111 Part 16, dated February 24, B.E.2537 (1994). (Standard Value of Surface Water for Class 3, 4)

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปุ๋ยอินทรีย์ แปลงสัมปทานปุ๋ยอินทรีย์แบบกบหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีมหา จังหวัดสุโขทัย และอำเภอสามกระบือ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Sampling Source : Surface Water Sampling
Sampling Point : ฐานหลุมผลิต NS-SW2 : คลองส่งน้ำทางทิศตะวันตกของบ้านเนืองเลา
GPS. Coordinate : UTM (WGS84) 47Q 0583636 E, 1837845 N
Sampling Date : March 30, 2024
Sampling Time : 11:06
Sampling Method : Grab
Sampling By : Mr.Romsea Kateh
Analyzed By : Environment Research & Technology Co., Ltd.
Physical Properties : Turbid, Light Yellow, Sediment, Odorless

Quotation No. : AR2024-00461
Analysis No. : 2024-AB382-003
Received Date : April 2, 2024
Analytical Date : April 2-26, 2024
Report No. : 2024-RAAG334
Report Date : April 29, 2024

Parameter	Unit	Method of Analysis ^{1/}	MRL	Result	Standard ^{2/}	
					Class 3	Class 4
pH	-	Electrometric	-	8.0	5.0-9.0	5.0-9.0
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.001	0.001	0.05	0.05
Mercury	mg/L	Digestion, Cold-vapor Atomic Absorption Spectrometry	0.0005	<0.0005	0.002	0.002
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	0.0002	0.0002	0.01	0.01
Barium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	0.01	0.07	-	-
Chloride	mg/L	Mercuric Nitrate	1.0	9.1	-	-
Conductivity	µs/m	Electrical Conductivity Meter	0.1	219	-	-
TPH (Gasoline Range Hydrocarbons; C6-C9)	mg/L	Purge and Trap, Gas Chromatographic (GC-FID)	0.040	<0.040	-	-
TPH (Kerosene Range Hydrocarbons; C10-C14)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Diesel Range Hydrocarbons; C15-C24)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Heavy Oil Range Hydrocarbons; C25-C36)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-

Remark : ^{1/} Standard Method for Examination of Water and Wastewater, 24th Edition, 2023.

^{2/} Notification of the National Environment Board, No.8, B.E.2537 (1994), issued under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.111 Part 16, dated February 24, B.E.2537 (1994). (Standard Value of Surface Water for Class 3, 4)



(Ms. Yuwadee Na Ranong)
Laboratory Reviewer



(Mr. Virat Hemvannanukul)
Laboratory Supervisor



(Ms. Yuwadee Na Ranong)
Laboratory Reviewer



(Mr. Virat Hemvannanukul)
Laboratory Supervisor

ANALYSIS REPORT


Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตบิโตรเคียม แปลงสัมปทานบิโตรเคียมแบบกบหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย และอำเภอละลานกระบือ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Sampling Source : Surface Water Sampling
Sampling Point : ฐานหลุมผลิต NS-SW3 : คลองส่งน้ำทางทิศใต้ของบ้านหนองสระ
GPS. Coordinate : UTM (WGS84) 47Q 0582778 E, 1838506 N
Sampling Date : March 30, 2024
Sampling Time : 11:49
Sampling Method : Grab
Sampling By : Mr.Romsea Kateh
Analyzed By : Environment Research & Technology Co., Ltd.
Physical Properties : Turbid, Light Yellow, Sediment, Odorless


Quotation No. : AR2024-00461
Analysis No. : 2024-AB382-004
Received Date : April 2, 2024
Analytical Date : April 2-26, 2024
Report No. : 2024-RAAG335
Report Date : April 29, 2024

Parameter	Unit	Method of Analysis ^{1,2}	MRL	Result	Standard ²	
					Class 3	Class 4
pH	-	Electrometric	-	7.5	5.0-9.0	5.0-9.0
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.001	<0.001	0.05	0.05
Mercury	mg/L	Digestion, Cold-Vapor Atomic Absorption Spectrometry	0.0005	<0.0005	0.002	0.002
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	0.0002	0.0002	0.01	0.01
Barium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	0.01	0.07	-	-
Chloride	mg/L	Mercuric Nitrate	1.0	8.6	-	-
Conductivity	µs/cm	Electrical Conductivity Meter	0.1	207	-	-
TPH (Gasoline Range Hydrocarbons; C ₆ -C ₉)	mg/L	Purge and Trap, Gas Chromatographic (GC-FID)	0.040	<0.040	-	-
TPH (Kerosene Range Hydrocarbons; C ₁₀ -C ₁₄)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Diesel Range Hydrocarbons; C ₁₅ -C ₂₆)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Heavy Oil Range Hydrocarbons; C ₂₇ -C ₃₆)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-

Remark : ¹ Standard Method for Examination of Water and Wastewater, 24th Edition, 2023.

² Notification of the National Environment Board, No.8, B.E.2537 (1994), issued under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.111 Part 16, dated February 24, B.E.2537 (1994). (Standard Value of Surface Water for Class 3, 4)


(Ms.Yuwadee Na Ranong)
Laboratory Reviewer


(Mr.Virat Hemvannanukul)
Laboratory Supervisor

ANALYSIS REPORT


Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตบิโตรเคียม แปลงสัมปทานบิโตรเคียมแบบกบหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย และอำเภอละลานกระบือ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Sampling Source : Surface Water Sampling
Sampling Point : ฐานหลุมผลิต NS-SW4 : คลองส่งน้ำทางทิศตะวันตกของบ้านหนองสระ
GPS. Coordinate : UTM (WGS84) 47Q 058:336 E, 1839290 N
Sampling Date : March 30, 2024
Sampling Time : 12:10
Sampling Method : Grab
Sampling By : Mr.Romsea Kateh
Analyzed By : Environment Research & Technology Co., Ltd.
Physical Properties : Turbid, Light Yellow, Sediment, Odorless

Quotation No. : AR2024-00461
Analysis No. : 2024-AB382-005
Received Date : April 2, 2024
Analytical Date : April 2-26, 2024
Report No. : 2024-RAAG336
Report Date : April 29, 2024

Parameter	Unit	Method of Analysis ^{1,2}	MRL	Result	Standard ²	
					Class 3	Class 4
pH	-	Electrometric	-	7.7	5.0-9.0	5.0-9.0
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.001	0.001	0.05	0.05
Mercury	mg/L	Digestion, Cold-Vapor Atomic Absorption Spectrometry	0.0005	<0.0005	0.002	0.002
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	0.0002	0.0003	0.01	0.01
Barium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	0.01	0.08	-	-
Chloride	mg/L	Mercuric Nitrate	1.0	8.6	-	-
Conductivity	µs/cm	Electrical Conductivity Meter	0.1	222	-	-
TPH (Gasoline Range Hydrocarbons; C ₆ -C ₉)	mg/L	Purge and Trap, Gas Chromatographic (GC-FID)	0.040	<0.040	-	-
TPH (Kerosene Range Hydrocarbons; C ₁₀ -C ₁₄)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Diesel Range Hydrocarbons; C ₁₅ -C ₂₆)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Heavy Oil Range Hydrocarbons; C ₂₇ -C ₃₆)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-

Remark : ¹ Standard Method for Examination of Water and Wastewater, 24th Edition, 2023.

² Notification of the National Environment Board, No.8, B.E.2537 (1994), issued under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.111 Part 16, dated February 24, B.E.2537 (1994). (Standard Value of Surface Water for Class 3, 4)


(Ms.Yuwadee Na Ranong)
Laboratory Reviewer


(Mr.Virat Hemvannanukul)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปุ๋ยอินทรีย์ แปลงสัมปทานปุ๋ยอินทรีย์แบบกักขังหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย และอำเภอคานกระบือ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Sampling Source : Surface Water Sampling
Sampling Point : ฐานหลุมผลิต NS-SW5 : คลองส่งน้ำทางทิศใต้ของบ้านหนองไม้แดง
GPS. Coordinate : UTM (WGS84) 47Q 0582743 E, 1839813 N
Sampling Date : Maich 30, 2024
Sampling Time : 12:30
Sampling Method : Grab
Sampling By : Mr.Romsea Kateh
Analyzed By : Environment Research & Technology Co., Ltd.
Physical Properties : Turbid, Light Yellow, Sediment, Odorless

Quotation No. : AR2024-00461
Analysis No. : 2024-AB382-006
Received Date : April 2, 2024
Analytical Date : April 2-26, 2024
Report No. : 2024-RAAG337
Report Date : April 29, 2024

Parameter	Unit	Method of Analysis ^{1'}	NRL	Result	Standard ^{2'}	
					Class 3	Class 4
pH	-	Electrometric	-	7.9	5.0-9.0	5.0-9.0
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.001	0.001	0.05	0.05
Mercury	mg/L	Digestion, Cold-vapor Atomic Absorption Spectrometry	0.0005	<0.0005	0.002	0.002
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	0.0002	0.0002	0.01	0.01
Barium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	0.01	0.07	-	-
Chloride	mg/L	Mercuric Nitrate	1.0	8.6	-	-
Conductivity	µS/cm	Electrical Conductivity Meter	0.1	224	-	-
TPH (Gasoline Range Hydrocarbons; C ₆ -C ₉)	mg/L	Purge and Trap, Gas Chromatographic (GC-FID)	0.040	<0.040	-	-
TPH (Kerosene Range Hydrocarbons; C ₁₀ -C ₁₄)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Diesel Range Hydrocarbons; C ₁₅ -C ₂₄)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Heavy Oil Range Hydrocarbons; C ₂₅ -C ₃₆)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-

Remark : ^{1'} Standard Method for Examination of Water and Wastewater, 24th Edition, 2023.

^{2'} Notification of the National Environment Board, No.8, B.E.2537 (1994), issued under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.111 Part 16, dated February 24, B.E.2537 (1994). (Standard Value of Surface Water for Class 3, 4)



(Ms.Yuwadee Na Ranong)
Laboratory Reviewer



(Mr.Virat Hemvannanukul)
Laboratory Supervisor

ฤดูฝน

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปิโตรเลียม แปลงสัมปทานปิโตรเลียมบนบกหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย และอำเภอลานกระบือ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Sampling Source : Surface Water Sampling
Sampling Point : ฐานหลุมผลิต BYN-SW1 : คลองส่งน้ำทางทิศตะวันออกของบ้านบึงสนม
GPS. Coordinate : UTM (WGS84) 47Q 0582938 E, 1848796 N
Sampling Date : August 26, 2024
Sampling Time : 11:06
Sampling Method : Grab
Sampling By : Mr.Suchapong Rungrueang
Analyzed By : Environment Research & Technology Co., Ltd.
Physical Properties : Turbid, Light Yellow, Sediment, Odorless

Quotation No. : AR2024-00461
Analysis No. : 2024-AE210-001
Received Date : August 27, 2024
Analytical Date : August 27-September 11, 2024
Report No. : 2024-RAAR783
Report Date : September 16, 2024

Parameter	Unit	Method of Analysis ^{1*}	MRL	Result	Standard ^{2*}	
					Class 3	Class 4
pH	-	Electrometric	-	8.6	5.0-9.0	5.0-9.0
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.001	0.002	0.05	0.05
Mercury	mg/L	Digestion, Cold-Vapor Atomic Absorption Spectrometry	0.0005	<0.0005	0.002	0.002
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	0.0002	0.0007	0.01	0.01
Barium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	0.01	0.09	-	-
Chloride	mg/L	Mercuric Nitrate	1.0	12	-	-
Conductivity	µs/cm	Electrical Conductivity Meter	0.1	252	-	-
TPH (Gasoline Range Hydrocarbons; C ₆ -C ₈)	mg/L	Purge and Trap, Gas Chromatographic (GC-FID)	0.040	<0.040	-	-
TPH (Kerosene Range Hydrocarbons; C ₁₀ -C ₁₄)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Diesel Range Hydrocarbons; C ₁₅ -C ₂₈)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Heavy Oil Range Hydrocarbons; C ₂₉ -C ₃₈)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-

Remark : ^{1*} Standard Method for Examination of Water and Wastewater, 24th Edition, 2023.

^{2*} Notification of the National Environment Board, No.8, B.E.2537 (1994), issued under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.111 Part 16, dated February 24, B.E.2537 (1994). (Standard Value of Surface Water for Class 3, 4)

(Ms.Yuwadee Na Ranong)
Laboratory Reviewer

(Mr.Virat Hemvannanukul)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปิโตรเลียม แปลงสัมปทานปิโตรเลียมบนบกหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย และอำเภอลานกระบือ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Sampling Source : Surface Water Sampling
Sampling Point : ฐานหลุมผลิต BYN-SW2 : บ่อนึงนกเขา
GPS. Coordinate : UTM (WGS84) 47Q 0583583 E, 1847292 N
Sampling Date : August 26, 2024
Sampling Time : 11:33
Sampling Method : Grab
Sampling By : Mr.Suchapong Rungrueang
Analyzed By : Environment Research & Technology Co., Ltd.
Physical Properties : Turbid, Light Yellow, Sediment, Odorless

Quotation No. : AR2024-00461
Analysis No. : 2024-AE210-002
Received Date : August 27, 2024
Analytical Date : August 27-September 11, 2024
Report No. : 2024-RAAR784
Report Date : September 16, 2024

Parameter	Unit	Method of Analysis ^{1*}	MRL	Result	Standard ^{2*}	
					Class 3	Class 4
pH	-	Electrometric	-	8.3	5.0-9.0	5.0-9.0
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.001	<0.001	0.05	0.05
Mercury	mg/L	Digestion, Cold-Vapor Atomic Absorption Spectrometry	0.0005	<0.0005	0.002	0.002
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	0.0002	<0.0002	0.01	0.01
Barium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	0.01	0.08	-	-
Chloride	mg/L	Mercuric Nitrate	1.0	10	-	-
Conductivity	µs/cm	Electrical Conductivity Meter	0.1	241	-	-
TPH (Gasoline Range Hydrocarbons; C ₆ -C ₈)	mg/L	Purge and Trap, Gas Chromatographic (GC-FID)	0.040	<0.040	-	-
TPH (Kerosene Range Hydrocarbons; C ₁₀ -C ₁₄)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Diesel Range Hydrocarbons; C ₁₅ -C ₂₈)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Heavy Oil Range Hydrocarbons; C ₂₉ -C ₃₈)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-

Remark : ^{1*} Standard Method for Examination of Water and Wastewater, 24th Edition, 2023.

^{2*} Notification of the National Environment Board, No.8, B.E.2537 (1994), issued under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.111 Part 16, dated February 24, B.E.2537 (1994). (Standard Value of Surface Water for Class 3, 4)

(Ms.Yuwadee Na Ranong)
Laboratory Reviewer

(Mr.Virat Hemvannanukul)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11040
Project Name : โครงการผลิตบิโอโพรเซส แป้งสปีททานบิโอโพรเซสแบบกวนหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Sampling Source : Surface Water Sampling
Sampling Point : สถานีผลิต BY-SW1 : คลองวังเจ็ดเหลี่ยมทางทิศตะวันออกของบ้านมิ่งแก้ว
GPS. Coordinate : UTM (WGS84) 47Q 0585652 E, 1846301 N
Sampling Date : August 26, 2024
Sampling Time : 12:00
Sampling Method : Grab
Sampling By : Mr.Suchapong Rungruang
Analyzed By : Environment Research & Technology Co., Ltd.
Physical Properties : Turbid, Light Yellow, Sediment, Odorless

Quotation No. : AR2024-00461
Analysis No. : 2024-AE210-003
Received Date : August 27, 2024
Analytical Date : August 27-September 11, 2024
Report No. : 2024-RAAR785
Report Date : September 16, 2024

Parameter	Unit	Method of Analysis ¹⁾	MEL	Result	Standard ²⁾	
					Class 3	Class 4
pH	-	Electrometric	-	8.0	5.0-9.0	5.0-9.0
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.001	<0.001	0.05	0.05
Mercury	mg/L	Digestion, Cold-Vapor Atomic Absorption Spectrometry	0.0005	<0.0005	0.002	0.002
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	0.0002	0.0012	0.01	0.01
Barium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	0.01	0.05	-	-
Chloride	mg/L	Mercuric Nitrate	1.0	8.6	-	-
Conductivity	µs/cm	Electrical Conductivity Meter	0.1	214	-	-
TPH (Gasoline Range Hydrocarbons; C6-C9)	mg/L	Purge and Trap, Gas Chromatographic (GC-FID)	0.040	<0.040	-	-
TPH (Kerosene Range Hydrocarbons; C10-C14)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Diesel Range Hydrocarbons; C15-C28)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Heavy Oil Range Hydrocarbons; C29-C36)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-

Remark : ¹⁾ Standard Method for Examination of Water and Wastewater, 24th Edition, 2023.

²⁾ Notification of the National Environment Board, No.8, B.E.2537 (1994), issued under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.111 Part 16, dated February 24, B.E.2537 (1994). (Standard Value of Surface Water for Class 3, 4)

(Ms.Yuwadee Na Ranong)
Laboratory Reviewer



(Mr.Virat Hemvannanukul)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตบิโอโพรเซส แป้งสปีททานบิโอโพรเซสแบบกวนหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย และอำเภอละลานกระบือ จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Sampling Source : Surface Water Sampling
Sampling Point : สถานีผลิต BY-SW2 : คลองวังเจ็ดเหลี่ยมทางทิศใต้ของบ้านมิ่งแก้ว
GPS. Coordinate : UTM (WGS84) 47Q 0583260 E, 1845121 N
Sampling Date : August 26, 2024
Sampling Time : 12:54
Sampling Method : Grab
Sampling By : Mr.Suchapong Rungruang
Analyzed By : Environment Research & Technology Co., Ltd.
Physical Properties : Turbid, Light Yellow, Sediment, Odorless

Quotation No. : AR2024-00461
Analysis No. : 2024-AE210-004
Received Date : August 27, 2024
Analytical Date : August 27-September 11, 2024
Report No. : 2024-RAAR786
Report Date : September 16, 2024

Parameter	Unit	Method of Analysis ¹⁾	MRL	Result	Standard ²⁾	
					Class 3	Class 4
pH	-	Electrometric	-	8.3	5.0-9.0	5.0-9.0
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.001	0.001	0.05	0.05
Mercury	mg/L	Digestion, Cold-Vapor Atomic Absorption Spectrometry	0.0005	0.0006	0.002	0.002
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	0.0002	0.0008	0.01	0.01
Barium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	0.01	0.03	-	-
Chloride	mg/L	Mercuric Nitrate	1.0	7.0	-	-
Conductivity	µs/cm	Electrical Conductivity Meter	0.1	184	-	-
TPH (Gasoline Range Hydrocarbons; C6-C9)	mg/L	Purge and Trap, Gas Chromatographic (GC-FID)	0.040	<0.040	-	-
TPH (Kerosene Range Hydrocarbons; C10-C14)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Diesel Range Hydrocarbons; C15-C28)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Heavy Oil Range Hydrocarbons; C29-C36)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-

Remark : ¹⁾ Standard Method for Examination of Water and Wastewater, 24th Edition, 2023.

²⁾ Notification of the National Environment Board, No.8, B.E.2537 (1994), issued under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.111 Part 16, dated February 24, B.E.2537 (1994). (Standard Value of Surface Water for Class 3, 4)

(Ms.Yuwadee Na Ranong)
Laboratory Reviewer



(Mr.Virat Hemvannanukul)
Laboratory Supervisor

ANALYSIS REPORT


Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11080
Project Name : โครงการผลิตบิโอโพรเซสส์ แปรรูปกากขี้เถ้าจากโรงงานผลิตไฟฟ้าจากกากขี้เถ้า จังหวัดสุโขทัย
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Sampling Source : Surface Water Sampling
Sampling Point : ฐานหลุมผลิต NS-SW1 : คลองส่งน้ำทางทิศเหนือของบ้านประชาเจริญ
GPS. Coordinate : UTM (WGS84) 47Q 0585289 E, 1839044 N
Sampling Date : August 26, 2024
Sampling Time : 14:25
Sampling Method : Grab
Sampling By : Mr.Suchapong Rungruang
Analyzed By : Environment Research & Technology Co., Ltd.
Physical Properties : Turbid, Light Yellow, Sediment, Odorless

Quotation No. : AR2024-00461
Analysis No. : 2024-AE210-005
Received Date : August 27, 2024
Analytical Date : August 27-September 11, 2024
Report No. : 2024-RAAR787
Report Date : September 16, 2024

Parameter	Unit	Method of Analysis ^{1/}	MEL	Result	Standard ^{2/}	
					Class 3	Class 4
pH	-	Electrometric	-	8.5	5.0-9.0	5.0-9.0
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.001	0.004	0.05	0.05
Mercury	mg/L	Digestion, Cold-Vapor Atomic Absorption Spectrometry	0.0005	<0.0005	0.002	0.002
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	0.0002	0.0007	0.01	0.01
Barium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	0.01	0.11	-	-
Chloride	mg/L	Mercuric Nitrate	1.0	.12	-	-
Conductivity	µs/cm	Electrical Conductivity Meter	0.1	378	-	-
TPH (Gasoline Range Hydrocarbons; C6-C9)	mg/L	Purge and Trap, Gas Chromatographic (GC-FID)	0.040	<0.040	-	-
TPH (Kerosene Range Hydrocarbons; C10-C14)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Diesel Range Hydrocarbons; C15-C28)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Heavy Oil Range Hydrocarbons; C29-C36)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-

Remark : ^{1/} Standard Method for Examination of Water and Wastewater, 24th Edition, 2023.

^{2/} Notification of the National Environment Board, No.8, B.E.2537 (1994), issued under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.111 Part 16, dated February 24, B.E.2537 (1994). (Standard Value of Surface Water for Class 3, 4)


(Ms. Yuwadee Na Ranong)
Laboratory Reviewer


(Mr. Virat Hemvannanukul)
Laboratory Supervisor

ANALYSIS REPORT


Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11080
Project Name : โครงการผลิตบิโอโพรเซสส์ แปรรูปกากขี้เถ้าจากโรงงานผลิตไฟฟ้าจากกากขี้เถ้า จังหวัดสุโขทัย
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Sampling Source : Surface Water Sampling
Sampling Point : ฐานหลุมผลิต NS-SW2 : คลองส่งน้ำทางทิศตะวันตกของบ้านหนองหลวง
GPS. Coordinate : UTM (WGS84) 47Q 0583636 E, 1837845 N
Sampling Date : August 26, 2024
Sampling Time : 14:04
Sampling Method : Grab
Sampling By : Mr.Suchapong Rungruang
Analyzed By : Environment Research & Technology Co., Ltd.
Physical Properties : Turbid, Light Yellow, Sediment, Odorless

Quotation No. : AR2024-00461
Analysis No. : 2024-AE210-006
Received Date : August 27, 2024
Analytical Date : August 27-September 11, 2024
Report No. : 2024-RAAR788
Report Date : September 16, 2024

Parameter	Unit	Method of Analysis ^{1/}	MRL	Result	Standard ^{2/}	
					Class 3	Class 4
pH	-	Electrometric	-	8.2	5.0-9.0	5.0-9.0
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.001	0.004	0.05	0.05
Mercury	mg/L	Digestion, Cold-Vapor Atomic Absorption Spectrometry	0.0005	0.0005	0.002	0.002
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	0.0002	0.0008	0.01	0.01
Barium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	0.01	0.09	-	-
Chloride	mg/L	Mercuric Nitrate	1.0	.12	-	-
Conductivity	µs/cm	Electrical Conductivity Meter	0.1	311	-	-
TPH (Gasoline Range Hydrocarbons; C6-C9)	mg/L	Purge and Trap, Gas Chromatographic (GC-FID)	0.040	<0.040	-	-
TPH (Kerosene Range Hydrocarbons; C10-C14)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Diesel Range Hydrocarbons; C15-C28)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Heavy Oil Range Hydrocarbons; C29-C36)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-

Remark : ^{1/} Standard Method for Examination of Water and Wastewater, 24th Edition, 2023.

^{2/} Notification of the National Environment Board, No.8, B.E.2537 (1994), issued under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.111 Part 16, dated February 24, B.E.2537 (1994). (Standard Value of Surface Water for Class 3, 4)


(Ms. Yuwadee Na Ranong)
Laboratory Reviewer


(Mr. Virat Hemvannanukul)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตบิโอโพรเซสส์ แปรรูปกากอาหารสัตว์อินทรีย์จากมูลสุกร และกากอาหารหมู จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Sampling Source : Surface Water Sampling
Sampling Point : ฐานหลุมผลิต NS-SW3 : คลองส่งน้ำทางทิศใต้ของบ้านหนองสระ
GPS. Coordinate : UTM (WGS84) 47Q 0582778 E, 1838506 N
Sampling Date : August 26, 2024
Sampling Time : 13:27
Sampling Method : Grab
Sampling By : Mr.Suchapong Rungrueang
Analyzed By : Environment Research & Technology Co., Ltd.
Physical Properties : Turbid, Light Yellow, Sediment, Odorless

Quotation No. : AR2024-00461
Analysis No. : 2024-AE210-007
Received Date : August 27, 2024
Analytical Date : August 27-September 11, 2024
Report No. : 2024-RAAR789
Report Date : September 16, 2024

Parameter	Unit	Method of Analysis ^{1/}	MRL	Result	Standard ^{2/}	
					Class 3	Class 4
pH	-	Electrometric	-	8.2	5.0-9.0	5.0-9.0
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.001	0.001	0.05	0.05
Mercury	mg/L	Digestion, Cold-Vapor Atomic Absorption Spectrometry	0.0005	<0.0005	0.002	0.002
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	0.0002	0.0008	0.01	0.01
Barium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	0.01	0.08	-	-
Chloride	mg/L	Mercuric Nitrate	1.0	9.6	-	-
Conductivity	µs/cm	Electrical Conductivity Meter	0.1	212	-	-
TPH (Gasoline Range Hydrocarbons; C6-C9)	mg/L	Purge and Trap, Gas Chromatographic (GC-FID)	0.040	<0.040	-	-
TPH (Kerosene Range Hydrocarbons; C10-C14)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Diesel Range Hydrocarbons; C15-C28)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Heavy Oil Range Hydrocarbons; C29-C36)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-

Remark : ^{1/} Standard Method for Examination of Water and Wastewater, 24th Edition, 2023.

^{2/} Notification of the National Environment Board, No.8, B.E.2537 (1994), issued under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.111 Part 16, dated February 24, B.E.2537 (1994). (Standard Value of Surface Water for Class 3, 4)

(Ms.Yuwadee Na Ranong)
Laboratory Reviewer



(Mr.Virat Hemvannanukul)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตบิโอโพรเซสส์ แปรรูปกากอาหารสัตว์อินทรีย์จากมูลสุกร และกากอาหารหมู จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Sampling Source : Surface Water Sampling
Sampling Point : ฐานหลุมผลิต NS-SW4 : คลองส่งน้ำทางทิศตะวันตกของบ้านหนองสระ
GPS. Coordinate : UTM (WGS84) 47Q 0581336 E, 1839290 N
Sampling Date : August 24, 2024
Sampling Time : 15:25
Sampling Method : Grab
Sampling By : Mr.Suchapong Rungrueang
Analyzed By : Environment Research & Technology Co., Ltd.
Physical Properties : Turbid, Light Yellow, Sediment, Odorless

Quotation No. : AR2024-00461
Analysis No. : 2024-AE210-008
Received Date : August 27, 2024
Analytical Date : August 27-September 11, 2024
Report No. : 2024-RAAR790
Report Date : September 16, 2024

Parameter	Unit	Method of Analysis ^{1/}	MRL	Result	Standard ^{2/}	
					Class 3	Class 4
pH	-	Electrometric	-	8.3	5.0-9.0	5.0-9.0
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.001	<0.001	0.05	0.05
Mercury	mg/L	Digestion, Cold-Vapor Atomic Absorption Spectrometry	0.0005	0.0005	0.002	0.002
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	0.0002	0.0007	0.01	0.01
Barium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	0.01	0.09	-	-
Chloride	mg/L	Mercuric Nitrate	1.0	8.6	-	-
Conductivity	µs/cm	Electrical Conductivity Meter	0.1	277	-	-
TPH (Gasoline Range Hydrocarbons; C6-C9)	mg/L	Purge and Trap, Gas Chromatographic (GC-FID)	0.040	<0.040	-	-
TPH (Kerosene Range Hydrocarbons; C10-C14)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Diesel Range Hydrocarbons; C15-C28)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Heavy Oil Range Hydrocarbons; C29-C36)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-

Remark : ^{1/} Standard Method for Examination of Water and Wastewater, 24th Edition, 2023.

^{2/} Notification of the National Environment Board, No.8, B.E.2537 (1994), issued under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.111 Part 16, dated February 24, B.E.2537 (1994). (Standard Value of Surface Water for Class 3, 4)

(Ms.Yuwadee Na Ranong)
Laboratory Reviewer



(Mr.Virat Hemvannanukul)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการพัฒนาระบบบำบัดน้ำเสียชุมชนตำบลบ้านนาโพธิ์ จังหวัดสุโขทัย
และอ่างเก็บน้ำประปา จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Sampling Source : Surface Water Sampling
Sampling Point : ฐานหลุมผลิต NS-SW5 : คลองส่งน้ำทางทิศใต้ของบ้านนาโพธิ์แดง
GPS. Coordinate : UTM (WGS84) 47Q 0582743 E, 11839813 N
Sampling Date : August 24, 2024
Sampling Time : 15:00
Sampling Method : Grab
Sampling By : Mr.Suchapong Rungruang
Analyzed By : Environment Research & Technology Co., Ltd.
Physical Properties : Turbid, Light Yellow, Sediment, Odorless

Quotation No. : AR2024-00461
Analysis No. : 2024-AE210-009
Received Date : August 27, 2024
Analytical Date : August 27-September 11, 2024
Report No. : 2024-RAAR791
Report Date : September 16, 2024

Parameter	Unit	Method of Analysis ¹	MFL	Result	Standard ²	
					Class 3	Class 4
pH	-	Electrometric	-	8.2	5.0-9.0	5.0-9.0
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.031	0.004	0.05	0.05
Mercury	mg/L	Digestion, Cold-Vapor Atomic Absorption Spectrometry	0.0005	<0.0005	0.002	0.002
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	0.0002	0.0006	0.01	0.01
Barium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	0.01	0.09	-	-
Chloride	mg/L	Mercuric Nitrate	1.0	8.1	-	-
Conductivity	µs/cm	Electrical Conductivity Meter	0.1	258	-	-
TPH (Gasoline Range Hydrocarbons; C6-C9)	mg/L	Purge and Trap, Gas Chromatographic (GC-FID)	0.040	<0.040	-	-
TPH (Kerosene Range Hydrocarbons; C10-C14)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Diesel Range Hydrocarbons; C15-C28)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-
TPH (Heavy Oil Range Hydrocarbons; C29-C36)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-

Remark : ¹ Standard Method for Examination of Water and Wastewater, 24th Edition, 2023.

² Notification of the National Environment Board, No.8, B.E.2537 (1994), issued under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.111 Part 16, dated February 24, B.E.2537 (1994). (Standard Value of Surface Water for Class 3, 4)

(Ms.Yuwadee Na Ranong)
Laboratory Reviewer



(Mr.Virat Henvannanukul)
Laboratory Supervisor



บริษัท ซีเอ็นพีซีเอชเค (ไทยแลนด์) จำกัด

รายงานผลการปฏิบัติตามมาตรการป้องกันและแก้ไขผลกระทบสิ่งแวดล้อม และมาตรการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม
โครงการผลิตปิโตรเลียม แพลงสัมปทานปิโตรเลียมบนบกหมายเลข L21/43
ตั้งอยู่ที่อำเภอศรีราชา จังหวัดชลบุรี และอำเภอสานกระบือ จังหวัดกำแพงเพชร
ฉบับเดือนมกราคม – ธันวาคม พ.ศ.2567

ภาคผนวก ง.4

คุณภาพน้ำใต้ดิน

ฤดูแล้ง

ANALYSIS REPORT

Customer Name	: Vision E. Consultants Co., Ltd.		
Address	: 101/22 Moo 2, Soi Maneeaya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000		
Project Name	: โครงการผลิตบิโอดีรเม้นแปลงสัมปทานบิโอดีรเม้นแบบกัญชาเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย และอำเภอละลานะรอบ จังหวัดกำแพงเพชร		
Project Location	: จังหวัดสุโขทัย และจังหวัดกำแพงเพชร		
Sampling Source	: Ground Water Sampling		
Sampling Point	: ฐานหลุมผลิต BYN-GW : วัดไผ่ล้อมวัดศรีธรรม หมู่ที่ 8 ตำบลหนองจิก อำเภอศรีนคร จังหวัดสุโขทัย		
GPS. Coordinate	: UTM (WGS84) 47Q 0583583 E, 1847409 N		
Sampling Date	: April 2, 2024	Quotation No.	: AR2024-00461
Sampling Time	: 11:12	Analysis No.	: 2024-AB475-001
Sampling Method	: Mr.Kunakorn Ratanawongsa	Received Date	: April 5, 2024
Sampling By	: Grab	Analytical Date	: April 5-26, 2024
Analyzed By	: Environment Research & Technology Co., Ltd.	Report No.	: 2024-RAAG424
Physical Properties	: Clear, Colorless, No Sediment, Odorless	Report Date	: April 29, 2024

Parameter	Unit	Method of Analysis ¹⁷	MRL	Result	Standard ²⁷	Standard ²⁷	
						Suitable Allowance	Maximum Allowable
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.001	<0.001	0.01	None	0.05
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	0.0002	<0.0002	0.01	None	0.05
Mercury	mg/L	Digestion, Cold-Vapor Atomic Absorption Spectrometry	0.0005	<0.0005	0.001	None	0.001
Barium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	0.01	0.15	-	-	-
pH	-	Electrometric	-	7.3	-	7.0-8.5	6.5-9.2
Chloride	mg/L	Mercuric Nitrate	1.0	15	-	≤250	600
Conductivity	μs/cm	Electrical Conductivity Meter	0.1	450	-	-	-
TPH (Gasoline Range Hydrocarbons; C ₆ -C ₉)	mg/L	Purge and Trap, Gas Chromatographic (GC-FID)	0.040	<0.040	-	-	-
TPH (Kerosene Range Hydrocarbons; C ₁₀ -C ₁₄)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-	-
TPH (Diesel Range Hydrocarbons; C ₁₅ -C ₂₈)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-	-
TPH (Heavy Oil Range Hydrocarbons; C ₂₉ -C ₃₆)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-	-

Remark : 1' Standard Method for Examination of Water and Wastewater, 24th Edition, 2023.

²¹ Notification of the National Environment Board, No.20, 8.E.2543 (2000), issued under the Enhancement and Conservation of National Environmental Quality Act 8.E.2535 (1992), published in the Royal Government Gazette No.117 Part 94D, dated September 15, 8.E.2543 (2000).

³ Notification of the Ministry of Natural Resources and Environment B.E.2551 (2008), published in the Royal Government Gazette, Vol.125, Part 85D, dated May 21, B.E.2551 (2008).

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(Ms. Yuwadee Na Ranong)
Laboratory Reviewer

Figure 1

(Mr. Virat Hemvannanukul)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name	: Vision E. Consultants Co., Ltd.	
Address	: 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000	
Project Name	: โครงการก่อสร้างโครงการปรับปรุงสภาพภูมิประเทศและสิ่งแวดล้อมตามแผน L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย และอำเภอลานกระบือ จังหวัดกำแพงเพชร	
Project Location	: จังหวัดสุโขทัย และจังหวัดกำแพงเพชร	
Sampling Source	: Ground Water Sampling	
Sampling Point	: ฐานหลุมผลิต BYW-1GW : ป่อน้ำใต้ดินในหลุม BYW-1	
GPS. Coordinate	: UTM (WGS84) 47Q 0582677 E, 1845515 N	
Sampling Date	: April 2, 2024	Quotation No. : AR2024-03461
Sampling Time	: 11:33	Analysis No. : 2024-AB475-002
Sampling Method	: Mr.Kunakorn Ratanawongsa	Received Date : April 5, 2024
Sampling By	: Grab	Analytical Date : April 5-26, 2024
Analyzed By	: Environment Research & Technology Co., Ltd.	Report No. : 2024-RAAG425
Physical Properties	: Clear, Colorless, Sediment, Odorless	Report Date : April 29, 2024

Parameter	Unit	Method of Analysis ^{1*}	MRL	Result	Standard ^{2†}	Standard ^{3‡}	
						Suitable Allowance	Maximum Allowable
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.001	<0.001	0.01	None	0.35
Arsenic	mg/L	Digestion, hydride Generation Atomic Absorption Spectrometry	0.0002	0.0005	0.01	None	0.35
Mercury	mg/L	Digestion, Cold-Vapor Atomic Absorption Spectrometry	0.0005	<0.0005	0.001	None	0.001
Barium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	0.01	0.12	-	-	-
pH	-	Electrometric	-	8.1	-	7.0-8.5	6.5-9.2
Chloride	mg/L	Mercuric Nitrate	1.0	5.0	-	≤250	600
Conductivity	µs/cm	Electrical Conductivity Meter	0.1	135	-	-	-
TPH (Gasoline Range Hydrocarbons; C ₆ -C ₉)	mg/L	Purge and Trap, Gas Chromatographic (GC-FID)	0.040	<0.040	-	-	-
TPH (Kerosene Range Hydrocarbons; C ₁₀ -C ₁₄)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-	-
TPH (Diesel Range Hydrocarbons; C ₁₅ -C ₂₈)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-	-
TPH (Heavy Oil Range Hydrocarbons; C ₂₉ -C ₃₅)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-	-

Remark : ¹⁴ Standard Method for Examination of Water and Wastewater, 24th Edition, 2023

² Notification of the National Environment Board, No.20, B.E.2543 (2000), issued under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.117 Part 940, dated September 15, B.E.2543 (2000).

³ Notification of the Ministry of Natural Resources and Environment B.E.2551 (2008), published in the Royal Government Gazette, Vol.125, Part 85D, dated May 21, B.E.2551: (2008)

11/11/2016

(Ms. Yuwadee Na Ranong)
Laboratory Reviewer



(Mr. Virat Hemvannarukul)
Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vison E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Sol 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปิโตรเลียม แปลงสัมปทานปิโตรเลียมฉบับหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย และอำเภอสามเงา จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Sampling Source : Ground Water Sampling
Sampling Point : ฐานหลุมผลิต NS-GW1 : บ่อน้ำใต้ดินบ้านหนองจิ้งสุ่น
GPS. Coordinate : UTM (WGS84) 47Q 0583952 E, 1838406 N
Sampling Date : April 2, 2024
Sampling Time : 12:03
Sampling Method : Mr.Kunakorn Ratanawongsa
Sampling By : Grab
Analyzed By : Environment Research & Technology Co., Ltd.
Physical Properties : Turbid, Light Yellow, Sediment, Odorless

Quotation No. : AR2024-00461
Analysis No. : 2024-AB475-003
Received Date : April 5, 2024
Analytical Date : April 5-26, 2024
Report No. : 2024-RAAG426
Report Date : April 29, 2024

Parameter	Unit	Method of Analysis ^{1'}	MRL	Result	Standard ^{2'}	Standard ^{3'}	
						Suitable Allowance	Maximum Allowable
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.001	0.003	0.01	None	0.05
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	0.0002	0.0003	0.01	None	0.05
Mercury	mg/L	Digestion, Cold-Vapor Atomic Absorption Spectrometry	0.0005	<0.0005	0.001	None	0.001
Barium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	0.01	0.10	-	-	-
pH	-	Electrometric	-	6.6	-	7.0-8.5	6.5-9.2
Chloride	mg/L	Mercuric Nitrate	1.0	15	-	≤250	600
Conductivity	μs/cm	Electrical Conductivity Meter	0.1	157	-	-	-
TPH (Gasoline Range Hydrocarbons; C ₆ -C ₉)	mg/L	Purge and Trap, Gas Chromatographic (GC-FID)	0.040	<0.040	-	-	-
TPH (Kerosene Range Hydrocarbons; C ₁₀ -C ₁₄)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-	-
TPH (Diesel Range Hydrocarbons; C ₁₅ -C ₂₈)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-	-
TPH (Heavy Oil Range Hydrocarbons; C ₂₉ -C ₃₆)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-	-

Remark : ^{1'} Standard Method for Examination of Water and Wastewater, 24th Edition, 2023.

^{2'} Notification of the Natural Environment Board, No.20, B.E.2543 (2000), issued under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.117 Part 940, dated September 15, B.E.2543 (2000).

^{3'} Notification of the Ministry of Natural Resources and Environment B.E.2551 (2008), published in the Royal Government Gazette, Vol.125, Part 850, dated May 21, B.E.2551 (2008).

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Sol 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปิโตรเลียม แปลงสัมปทานปิโตรเลียมฉบับหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย และอำเภอสามเงา จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Sampling Source : Ground Water Sampling
Sampling Point : ฐานหลุมผลิต NS-1GW : บ่อน้ำใต้ดินในหลุม NS-1
GPS. Coordinate : UTM (WGS84) 47Q 0583218 E, 1834552 N
Sampling Date : April 2, 2024
Sampling Time : 13:18
Sampling Method : Mr.Kunakorn Ratanawongsa
Sampling By : Grab
Analyzed By : Environment Research & Technology Co., Ltd.
Physical Properties : Clear, Light Yellow, No Sediment, Odorless

Quotation No. : AR2024-03461
Analysis No. : 2024-AB475-004
Received Date : April 5, 2024
Analytical Date : April 5-26, 2024
Report No. : 2024-RAAG427
Report Date : April 29, 2024

Parameter	Unit	Method of Analysis ^{1'}	MRL	Result	Standard ^{2'}	Standard ^{3'}	
						Suitable Allowance	Maximum Allowable
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.001	0.002	0.01	None	0.05
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	0.0002	0.0008	0.01	None	0.05
Mercury	mg/L	Digestion, Cold-Vapor Atomic Absorption Spectrometry	0.0005	<0.0005	0.001	None	0.001
Barium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	0.01	0.07	-	-	-
pH	-	Electrometric	-	7.4	-	7.0-8.5	6.5-9.2
Chloride	mg/L	Mercuric Nitrate	1.0	2.0	-	≤250	600
Conductivity	μs/cm	Electrical Conductivity Meter	0.1	136	-	-	-
TPH (Gasoline Range Hydrocarbons; C ₆ -C ₉)	mg/L	Purge and Trap, Gas Chromatographic (GC-FID)	0.040	<0.040	-	-	-
TPH (Kerosene Range Hydrocarbons; C ₁₀ -C ₁₄)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-	-
TPH (Diesel Range Hydrocarbons; C ₁₅ -C ₂₈)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-	-
TPH (Heavy Oil Range Hydrocarbons; C ₂₉ -C ₃₆)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-	-

Remark : ^{1'} Standard Method for Examination of Water and Wastewater, 24th Edition, 2023.

^{2'} Notification of the Natural Environment Board, No.20, B.E.2543 (2000), issued under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.117 Part 940, dated September 15, B.E.2543 (2000).

^{3'} Notification of the Ministry of Natural Resources and Environment B.E.2551 (2008), published in the Royal Government Gazette, Vol.125, Part 850, dated May 21, B.E.2551 (2008).



(Ms. Yuwadee Na Ranong)
Laboratory Reviewer



(Mr. Virat Hemvannanukul)
Laboratory Supervisor



(Ms. Yuwadee Na Ranong)
Laboratory Reviewer



(Mr. Virat Hemvannanukul)
Laboratory Supervisor

ฤดูฝน


ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปุ๋ยอินทรีย์ แปลงสัมปทานปีโครงการแบบกฎหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย และอำเภอละหานทราย จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Sampling Source : Ground Water Sampling
Sampling Point : ฐานหลุมผลิต BYN-GW : ใต้โรงแป้งปุ๋ยอินทรีย์รวม หมู่ที่ 8 บ้านฉิมพิกพัฒนา ตำบลหนองจิก อำเภอศรีนคร จังหวัดสุโขทัย
GPS. Coordinate : UTM (WGS84) 47Q 0583583 E, 1847409 N
Sampling Date : August 24, 2024
Sampling Time : 12:37
Sampling Method : Mr.Nitad Sirichad
Sampling By : Grab
Analyzed By : Environment Research & Technology Co., Ltd.
Physical Properties : Clear, Colorless, No Sediment, Odorless

Quotation No. : AR2024-00461
Analysis No. : 2024-AE208-001
Received Date : August 27, 2024
Analytical Date : August 27-September 11, 2024
Report No. : 2024-RAAR781
Report Date : September 3, 2024

Parameter	Unit	Method of Analysis ^{1*}	MRL	Result	Standard ^{2*}	Standard ^{3*}	
						Suitable Allowance	Maximum Allowable
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.001	<0.001	0.01	None	0.05
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	0.0002	0.0003	0.01	None	0.05
Mercury	mg/L	Digestion, Cold-Vapor Atomic Absorption Spectrometry	0.0005	0.0005	0.001	None	0.001
Barium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	0.01	0.17	-	-	-
pH	-	Electrometric	-	7.2	-	7.0-8.5	6.5-9.2
Chloride	mg/L	Mercuric Nitrate	1.0	12	-	≤250	600
Conductivity	μs/cm	Electrical Conductivity Meter	0.1	452	-	-	-
TPH (Gasoline Range Hydrocarbons; C ₆ -C ₉)	mg/L	Purge and Trap, Gas Chromatographic (GC-FID)	0.040	<0.040	-	-	-
TPH (Kerosene Range Hydrocarbons; C ₁₀ -C ₁₄)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-	-
TPH (Diesel Range Hydrocarbons; C ₁₅ -C ₂₈)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-	-
TPH (Heavy Oil Range Hydrocarbons; C ₂₉ -C ₃₆)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-	-

Remark : ^{1*} Standard Method for Examination of Water and Wastewater, 24th Edition, 2023.
^{2*} Notification of the National Environment Board, No.20, B.E.2543 (2000), issued under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.117 Part 940, dated September 15, B.E.2543 (2000).
^{3*} Notification of the Ministry of Natural Resources and Environment B.E.2551 (2008), published in the Royal Government Gazette, Vol.125, Part 85D, dated May 21, B.E.2551 (2008).


(Ms.Yuwadee Na Ranong)
Laboratory Reviewer



(Mr.Virat Hemvannanukul)
Laboratory Supervisor


ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปุ๋ยอินทรีย์ แปลงสัมปทานปีโครงการแบบกฎหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีนคร จังหวัดสุโขทัย และอำเภอละหานทราย จังหวัดกำแพงเพชร
Project Location : จังหวัดสุโขทัย และจังหวัดกำแพงเพชร
Sampling Source : Ground Water Sampling
Sampling Point : ฐานหลุมผลิต BYW-1GW : ป่าน้ำใต้ดินในหลุม BYW-1
GPS. Coordinate : UTM (WGS84) 47Q 0582677 E, 1845515 N
Sampling Date : August 27, 2024
Sampling Time : 13:54
Sampling Method : Mr.Nitad Sirichad
Sampling By : Grab
Analyzed By : Environment Research & Technology Co., Ltd.
Physical Properties : Clear, Colorless, Sediment, Odorless

Quotation No. : AR2024-00461
Analysis No. : 2024-AE277-001
Received Date : August 30, 2024
Analytical Date : August 30-September 16, 2024
Report No. : 2024-RAAR953
Report Date : September 16, 2024

Parameter	Unit	Method of Analysis ^{1*}	MRL	Result	Standard ^{2*}	Standard ^{3*}	
						Suitable Allowance	Maximum Allowable
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.001	0.005	0.01	None	0.05
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	0.0002	0.0006	0.01	None	0.05
Mercury	mg/L	Digestion, Cold-Vapor Atomic Absorption Spectrometry	0.0005	<0.0005	0.001	None	0.001
Barium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	0.01	0.12	-	-	-
pH	-	Electrometric	-	7.5	-	7.0-8.5	6.5-9.2
Chloride	mg/L	Mercuric Nitrate	1.0	5.5	-	≤250	600
Conductivity	μs/cm	Electrical Conductivity Meter	0.1	130	-	-	-
TPH (Gasoline Range Hydrocarbons; C ₆ -C ₉)	mg/L	Purge and Trap, Gas Chromatographic (GC-FID)	0.040	<0.040	-	-	-
TPH (Kerosene Range Hydrocarbons; C ₁₀ -C ₁₄)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-	-
TPH (Diesel Range Hydrocarbons; C ₁₅ -C ₂₈)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-	-
TPH (Heavy Oil Range Hydrocarbons; C ₂₉ -C ₃₆)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-	-

Remark : ^{1*} Standard Method for Examination of Water and Wastewater, 24th Edition, 2023.
^{2*} Notification of the National Environment Board, No.20, B.E.2543 (2000), issued under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.117 Part 940, dated September 15, B.E.2543 (2000).
^{3*} Notification of the Ministry of Natural Resources and Environment B.E.2551 (2008), published in the Royal Government Gazette, Vol.125, Part 85D, dated May 21, B.E.2551 (2008).


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ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปิโตรเลียม แปลงสัมปทานปิโตรเลียมบนบกหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีราชา จังหวัดชลบุรี
และอำเภอฉะเชิงเทรา จังหวัดชลบุรี
Project Location : จังหวัดชลบุรี และจังหวัดฉะเชิงเทรา
Sampling Source : Ground Water Sampling
Sampling Point : ฐานหลุมผลิต NS-GW1 : ปะปาใต้ดินบนของหินปูน
GPS. Coordinate : UTM (WGS84) 47Q 0583952 E, 1838406 N
Sampling Date : August 30, 2024
Sampling Time : 11:50
Sampling Method : Mr.Nitad Sirichad
Sampling By : Grab
Analyzed By : Environment Research & Technology Co., Ltd.
Physical Properties : Clear, Colorless, No Sediment, Odorless

Quotation No. : AR2024-00461
Analysis No. : 2024-AE290-001
Received Date : September 2, 2024
Analytical Date : September 2-17, 2024
Report No. : 2024-RAAR964
Report Date : September 18, 2024

Parameter	Unit	Method of Analysis ^{1*}	MRL	Result	Standard ^{2*}	Standard ^{3*}	
						Suitable Allowance	Maximum Allowable
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.001	0.008	0.01	None	0.05
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	0.0002	0.0011	0.01	None	0.05
Mercury	mg/L	Digestion, Cold-Vapor Atomic Absorption Spectrometry	0.0005	0.0005	0.001	None	0.001
Barium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	0.01	0.20	-	-	-
pH	-	Electrometric	-	8.1	-	7.0-8.5	6.5-9.2
Chloride	mg/L	Mercuric Nitrate	1.0	2.5	-	≤250	600
Conductivity	μs/cm	Electrical Conductivity Meter	0.1	149	-	-	-
TPH (Gasoline Range Hydrocarbons; C ₆ -C ₉)	mg/L	Purge and Trap, Gas Chromatographic (GC-FID)	0.040	<0.040	-	-	-
TPH (Kerosene Range Hydrocarbons; C ₁₀ -C ₁₄)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-	-
TPH (Diesel Range Hydrocarbons; C ₁₅ -C ₂₈)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-	-
TPH (Heavy Oil Range Hydrocarbons; C ₂₉ -C ₃₆)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-	-

Remark : ^{1*} Standard Method for Examination of Water and Wastewater, 24th Edition, 2023.

^{2*} Notification of the National Environment Board, No.20, B.E.2543 (2000), issued under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.117 Part 940, dated September 15, B.E.2543 (2000).

^{3*} Notification of the Ministry of Natural Resources and Environment B.E.2551 (2008), published in the Royal Government Gazette, Vol.125, Part 850, dated May 21, B.E.2551 (2008).

(Ms.Yuwadee Na Ranong)
Laboratory Reviewer



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Laboratory Supervisor

ANALYSIS REPORT

Customer Name : Vision E. Consultants Co., Ltd.
Address : 101/22 Moo 2, Soi Maneeya Soi 3, Sai Ma, Mueang Nonthaburi, Nonthaburi 11000
Project Name : โครงการผลิตปิโตรเลียม แปลงสัมปทานปิโตรเลียมบนบกหมายเลข L21/43 ตั้งอยู่ที่อำเภอศรีราชา จังหวัดชลบุรี
และอำเภอฉะเชิงเทรา จังหวัดชลบุรี
Project Location : จังหวัดชลบุรี และจังหวัดฉะเชิงเทรา
Sampling Source : Ground Water Sampling
Sampling Point : ฐานหลุมผลิต NS-1GW ปะปาใต้ดินในหินปูน NS-1
GPS. Coordinate : UTM (WGS84) 47Q 05832:8 E, 1834552 N
Sampling Date : August 27, 2024
Sampling Time : 10:57
Sampling Method : Mr.Nitad Sirichad
Sampling By : Grab
Analyzed By : Environment Research & Technology Co., Ltd.
Physical Properties : Turbid, Light Yellow, Sediment, Odor

Quotation No. : AR2024-00461
Analysis No. : 2024-AE277-002
Received Date : August 30, 2024
Analytical Date : August 30-September 16, 2024
Report No. : 2024-RAAR954
Report Date : September 16, 2024

Parameter	Unit	Method of Analysis ^{1*}	MRL	Result	Standard ^{2*}	Standard ^{3*}	
						Suitable Allowance	Maximum Allowable
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.001	0.005	0.01	None	0.05
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	0.0002	0.0004	0.01	None	0.05
Mercury	mg/L	Digestion, Cold-Vapor Atomic Absorption Spectrometry	0.0005	<0.0005	0.001	None	0.001
Barium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	0.01	0.08	-	-	-
pH	-	Electrometric	-	7.4	-	7.0-8.5	6.5-9.2
Chloride	mg/L	Mercuric Nitrate	1.0	13	-	≤250	600
Conductivity	μs/cm	Electrical Conductivity Meter	0.1	136	-	-	-
TPH (Gasoline Range Hydrocarbons; C ₆ -C ₉)	mg/L	Purge and Trap, Gas Chromatographic (GC-FID)	0.040	<0.040	-	-	-
TPH (Kerosene Range Hydrocarbons; C ₁₀ -C ₁₄)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-	-
TPH (Diesel Range Hydrocarbons; C ₁₅ -C ₂₈)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-	-
TPH (Heavy Oil Range Hydrocarbons; C ₂₉ -C ₃₆)	mg/L	Liquid-Liquid Extraction, Gas Chromatographic (GC-FID)	0.020	<0.020	-	-	-

Remark : ^{1*} Standard Method for Examination of Water and Wastewater, 24th Edition, 2023.

^{2*} Notification of the National Environment Board, No.20, B.E.2543 (2000), issued under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette No.117 Part 940, dated September 15, B.E.2543 (2000).

^{3*} Notification of the Ministry of Natural Resources and Environment B.E.2551 (2008), published in the Royal Government Gazette, Vol.125, Part 850, dated May 21, B.E.2551 (2008).

(Ms.Yuwadee Na Ranong)
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บริษัท ซีเอ็นพีซีเอชเค (ไทยแลนด์) จำกัด

รายงานผลการปฏิบัติตามมาตรการป้องกันและแก้ไขผลกระทบสิ่งแวดล้อม และมาตรการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม
โครงการผลิตปิโตรเลียม แปลงสัมปทานปิโตรเลียมบนบกหมายเลข L21/43
ตั้งอยู่ที่อำเภอศรีราชา จังหวัดชลบุรี และอำเภอสานกระบือ จังหวัดกำแพงเพชร
ฉบับเดือนมกราคม - ธันวาคม พ.ศ.2567

ภาคผนวก ง.5

เอกสารขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์

ที่ อก ๐๓๑๐(๑)/ ๖๔๗ ๖



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๐๓ กรกฎาคม ๒๕๖๗

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๒๔ เมษายน ๒๕๖๗

- สิ่งที่ส่งมาด้วย ๑. รายชื่อผู้ควบคุมห้องปฏิบัติการวิเคราะห์เอกชน จำนวน ๑ แผ่น
๒. รายชื่อเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน จำนวน ๒ แผ่น
๓. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๑๔ แผ่น

ตามคำขอที่อ้างถึง บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด ขอต่ออายุหนังสือ
รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๐๕๙ สถานีที่ตั้งเลขที่ ๒๕/๑๑๔ หมู่ที่ ๖
ซอยชินเขต ๑ ถนนงามวงศ์วาน แขวงทุ่งสองห้อง เขตหลักสี่ กรุงเทพมหานคร ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด
ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

- ก. ผู้ควบคุมห้องปฏิบัติการวิเคราะห์เอกชน จำนวน ๒๐ ราย ตามสิ่งที่ส่งมาด้วย ๑
ข. เจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน ๖๑ ราย ตามสิ่งที่ส่งมาด้วย ๒
ค. ขอบข่ายชนิดสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำ/น้ำเสีย น้ำใต้ดิน อากาศเสีย
สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว และดิน ตามสิ่งที่ส่งมาด้วย ๓

หนังสือฉบับนี้จะหมดอายุในวันที่ ๑๔ พฤษภาคม ๒๕๗๑ หากประสงค์จะต่ออายุหนังสือรับขึ้น
ทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อกรมโรงงานอุตสาหกรรม
ภายใน ๖๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ



(นายพรยศ กลิ่นกรอง)

รองอธิบดี ปฏิบัติราชการแทน
อธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๕๙

ไปรษณีย์อิเล็กทรอนิกส์ saraban@diw.mail.go.th



“อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว”



เอกสารแนบท้ายหนังสือต่ออายุรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด

เลขทะเบียน ๖-๐๕๙

ที่ อก ๐๓๑๐(๑)/ ๖๔๗ ๖

ลงวันที่ ๐๓ กรกฎาคม ๒๕๖๗

ก. ผู้ควบคุมห้องปฏิบัติการวิเคราะห์เอกชน จำนวน ๒๐ ราย

- ๑) นางสาวสุภารัตน์ เขจรักษ์
- ๒) นางสาวพิชิตา เขียวนรภัย
- ๓) นางสาวลลิตา โพธิ์เจริญ
- ๔) ว่าที่ร้อยตรีวันชนะ สีหามาตร
- ๕) นางสาวรัชชวีวรรณ ภูประเสริฐ
- ๖) นางสาวปณิชา พรหมชัย
- ๗) นางณัฐธิดา เลี้ยงรักษา
- ๘) นายมงคล บุรภักดิ์
- ๙) นางสาวธนิศา บุญรุ่งเรือง
- ๑๐) นางสาวนิตา แดงไทย
- ๑๑) นางสาวไรวินทร์ โพธิ์สิทธิ์
- ๑๒) นางสาวณัฐธิดา เสริมดวงศ์
- ๑๓) นายณพัทธ์ ทวีพรประดิษฐ์
- ๑๔) นางสาวอติรัตน์ ปุกตะ
- ๑๕) นายอภิชาติ พูลพล
- ๑๖) นายนิทัศน์ ศิริชาติ
- ๑๗) นายสุทธิชาญ สังข์ทอง
- ๑๘) นางสาวยุวดี ณ ระนอง
- ๑๙) นางสาวอุภาวรรณ สุวรรณภา
- ๒๐) นางสาวภาจรัส หมั่นวงษ์

- ทะเบียนเลขที่ ๖-๐๕๙-ค-๐๐๐๑
ทะเบียนเลขที่ ๖-๐๕๙-ค-๐๐๐๒
ทะเบียนเลขที่ ๖-๐๕๙-ค-๐๐๐๓
ทะเบียนเลขที่ ๖-๐๕๙-ค-๐๐๐๔
ทะเบียนเลขที่ ๖-๐๕๙-ค-๐๐๐๕
ทะเบียนเลขที่ ๖-๐๕๙-ค-๐๐๐๖
ทะเบียนเลขที่ ๖-๐๕๙-ค-๐๐๐๗
ทะเบียนเลขที่ ๖-๐๕๙-ค-๐๐๐๘
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ทะเบียนเลขที่ ๖-๐๕๙-ค-๐๐๑๐
ทะเบียนเลขที่ ๖-๐๕๙-ค-๐๐๑๑
ทะเบียนเลขที่ ๖-๐๕๙-ค-๐๐๑๒
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ทะเบียนเลขที่ ๖-๐๕๙-ค-๐๐๑๖
ทะเบียนเลขที่ ๖-๐๕๙-ค-๐๐๑๗
ทะเบียนเลขที่ ๖-๐๕๙-ค-๐๐๑๘
ทะเบียนเลขที่ ๖-๐๕๙-ค-๐๐๑๙
ทะเบียนเลขที่ ๖-๐๕๙-ค-๐๐๒๐

เอกสารแนบท้ายหนังสือต่ออายุรขัณฑ์ทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด

เลขทะเบียน ๖-๐๙๙

ที่ อก ๐๓๑๐(๑)/ ๖๔๙ ๖

ลงวันที่ ๐๓ กรกฎาคม ๒๕๖๓

ข. เจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน จำนวน ๖๑ ราย

- ๑) นางสาวณัฏฐณิชา ขาวสุทธิ
- ๒) นางสาวสุธิดา ทองประภา
- ๓) นายจิรยุทธ์ สามารถ
- ๔) นายอัมภา ไชยวงศ์
- ๕) นางสาวณัฐริสา บุญหนัก
- ๖) นายนฤตม์ โชติกาญจน์
- ๗) นางสาวพรทิพย์ อัมภรัตน์
- ๘) นายอัศวิน คชบก
- ๙) นางสาวธัญทิศา สุดเขียน
- ๑๐) นางสาวพชวิญ นนพละ
- ๑๑) นางสาววิมลรัตน์ แปรงทอง
- ๑๒) นางสาวจรรยาดี ข้าแบ่ง
- ๑๓) นางสาวธารารมย์ สมัยใหม่
- ๑๔) นางสาวรัตนชนก ชนเค้า
- ๑๕) นางสาวกมลทิพย์ พุ่มตาก้อง
- ๑๖) นางสาวสุพัตรา มาสุขพักตร์
- ๑๗) นางสาวฉัตรยาลักษณ์ บรรดิษฐ์
- ๑๘) นางสาวอาภากร หล้าสูงเนิน
- ๑๙) นางสาวพิมพ์ิศา ทับพันธ์
- ๒๐) นางสาวอัจฉริ แก้วเพชรวงศ์
- ๒๑) นางสาวชลธิชา กันยานุช
- ๒๒) นางสาวพิชามญช์ ย่างพ่อง
- ๒๓) นางสาวณิชาธิ์ ปริญญานุวัตร
- ๒๔) นายวัชรพล บุตรดีขันน
- ๒๕) นางสาวณัฐติมา ปัดชา
- ๒๖) นายวัชรพงษ์ พูลเขตกิจ
- ๒๗) นายศิวกร วงศ์ศาล
- ๒๘) นางสาววิภา จารณะ
- ๒๙) นางสาวธัญญาภรณ์ คณะศรี
- ๓๐) นางสาวพัชรพร อนุสร
- ๓๑) นายธนากร อริยพงษ์โสภณ
- ๓๒) นางสาวบุษกร สมรักษ์
- ๓๓) นางสาววิลาวัลย์ แก้วยม
- ๓๔) นางสาวธัญญาลักษณ์ แสงโยธา
- ๓๕) นายสุชาพงศ์ รุ่งเรือง

- ทะเบียนเลขที่ ๖-๐๙๙-จ-๐๐๐๒
- ทะเบียนเลขที่ ๖-๐๙๙-จ-๐๐๐๕
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- ทะเบียนเลขที่ ๖-๐๙๙-จ-๐๐๔๐
- ทะเบียนเลขที่ ๖-๐๙๙-จ-๐๐๔๑
- ทะเบียนเลขที่ ๖-๐๙๙-จ-๐๐๔๒

๓๖) นายสิทธิพร...

- ๓๖) นายสิทธิพร วงษ์คำ
- ๓๗) นางเดชนิ สืบเสระ
- ๓๘) นางสาวณัฏพร คนแรง
- ๓๙) นายภาณุพล โพธิ์แดง
- ๔๐) นายวัชรกร กองแสง
- ๔๑) นางสาวสุราทิพย์ อิมน้อย
- ๔๒) นางสาวชมพูนุท กลีชีวิน
- ๔๓) นางสาววิวรรณ สุขารมย์
- ๔๔) นางสาวกัญญาลักษณ์ กระทาง
- ๔๕) นางสาวปิยิดา ประแดงโค
- ๔๖) นางสาวปิยิดา นาเหล็ก
- ๔๗) นางสาวทิชพร ไกรสิงห์
- ๔๘) นางสาวเบญจวรรณ คำหงษา
- ๔๙) นางสาวพัชรา แก้วน้อย
- ๕๐) นางสาวณัฐชา สัมฤทธิ์ดี
- ๕๑) นายรอมย์ กาเหาะ
- ๕๒) นางสาวอังคณา อุณา
- ๕๓) นายสุริยง พูทอง
- ๕๔) นายฉันทวิทย์ เหลืองกุล
- ๕๕) นายศิวาธร ธรรมนิทา
- ๕๖) นายอนุวัฒน์ เรืองอ่อน
- ๕๗) นายฉัตรชัย โยวะมุข
- ๕๘) นายกฤษณ์ อินทร์คำ
- ๕๙) นางสาวนันทา เนื่อนวล
- ๖๐) นางสาวจิตตวรรณ ลิ้มสมบูรณ์
- ๖๑) ว่าที่ร้อยตรีรัฐพล สุทธิมิล

- ทะเบียนเลขที่ ๖-๐๙๙-จ-๐๐๔๓
- ทะเบียนเลขที่ ๖-๐๙๙-จ-๐๐๔๔
- ทะเบียนเลขที่ ๖-๐๙๙-จ-๐๐๔๕
- ทะเบียนเลขที่ ๖-๐๙๙-จ-๐๐๔๖
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- ทะเบียนเลขที่ ๖-๐๙๙-จ-๐๐๕๒
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- ทะเบียนเลขที่ ๖-๐๙๙-จ-๐๐๕๔
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- ทะเบียนเลขที่ ๖-๐๙๙-จ-๐๐๖๒
- ทะเบียนเลขที่ ๖-๐๙๙-จ-๐๐๖๓
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- ทะเบียนเลขที่ ๖-๐๙๙-จ-๐๐๖๕
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- ทะเบียนเลขที่ ๖-๐๙๙-จ-๐๐๖๘

เอกสารแนบท้ายหนังสือต่ออายุรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอ็นไวรอนเม้นท์ รีเสิร์ช แอนด์ เทคโนโลยี จำกัด เลขทะเบียน ว-๐๙๙

ที่ ออก ๐๓๑๐(๑)/ ๖๔๗๖ ลงวันที่ ๐๓ กรกฎาคม ๒๕๖๓

ขอขยายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๑๙๓ รายการ

น้ำ/น้ำเสีย จำนวน 27 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Arsenic	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[4] 2) Digestion, Inductively Coupled Plasma Method ^[4]
2	Barium	Digestion, Inductively Coupled Plasma Method ^[4]
3	Biochemical Oxygen Demand	1) 5-Day BOD Test, Azide Modification Method ^[4] 2) 5-Day BOD Test, Membrane Electrode Method ^[4]
4	Cadmium	Digestion, Inductively Coupled Plasma Method ^[4]
5	Chemical Oxygen Demand	Closed Reflux, Titrimetric Method ^[4]
6	Chromium	Digestion, Inductively Coupled Plasma Method ^[4]
7	Color	ADMI Weighted-Ordinate Spectrophotometric Method ^[4]
8	Copper	Digestion, Inductively Coupled Plasma Method ^[4]
9	Cyanide	Distillation, Colorimetric Method ^[4]
10	Formaldehyde	Distillation, Colorimetric Method ^[3]
11	Free Chlorine	1) Iodometric Method ^[4] 2) DPD Colorimetric Method ^[4]
12	Hexavalent Chromium	Colorimetric Method ^[4]
13	Lead	1) Digestion, Electrothermal Atomic Absorption Spectrometric Method ^[4] 2) Digestion, Inductively Coupled Plasma Method ^[4]
14	Manganese	Digestion, Inductively Coupled Plasma Method ^[4]
15	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[4]
16	Nickel	Digestion, Inductively Coupled Plasma Method ^[4]
17	Oil & Grease	Liquid-Liquid, Partition-Gravimetric Method ^[4]
18	pH	Electrometric Method ^[4]
19	Phenols	Distillation, Direct Photometric Method ^[4]
20	Selenium	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[4] 2) Digestion, Inductively Coupled Plasma Method ^[4]

21 Sulfide...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
21	Sulfide	Iodometric Method ^[4]
22	Temperature	Laboratory and Field Methods ^[4]
23	Total Dissolved Solids	Dried at 180 °C ^[4]
24	Total Kjeldahl Nitrogen	1) Macro-Kjeldahl Method ^[4] 2) Semi-Micro-Kjeldahl Method ^[4]
25	Total Suspended Solids	Dried from 103 to 105 °C ^[4]
26	Trivalent Chromium	Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation ^[4]
27	Zinc	Digestion, Inductively Coupled Plasma Method ^[4]

น้ำใต้ดิน จำนวน 61 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acetone	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
2	Antimony	Digestion, Inductively Coupled Plasma Method ^[4]
3	Arsenic	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[4] 2) Digestion, Inductively Coupled Plasma Method ^[4]
4	Barium	Digestion, Inductively Coupled Plasma Method ^[4]
5	Benzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
6	Beryllium	Digestion, Inductively Coupled Plasma Method ^[4]
7	Bromodichloromethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
8	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
9	Cadmium	Digestion, Inductively Coupled Plasma Method ^[4]
10	Carbon disulfide	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method ^[4]
11	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
12	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]

13 Chlorodibromomethane...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
13	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
14	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
15	Chromium	Digestion, Inductively Coupled Plasma Method ^[4]
16	Chromium (III)	Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation ^[4]
17	Chromium (VI)	Colorimetric Method ^[4]
18	Cyanide	Distillation, Colorimetric Method ^[4]
19	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
20	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
21	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
22	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
23	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
24	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
25	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
26	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
27	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
28	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
29	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
30	Ethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]

31 Hexachloro-1,3-butadiene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
31	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
32	Lead	1) Digestion, Electrothermal Atomic Absorption Spectrometric Method ^[4] 2) Digestion, Inductively Coupled Plasma Method ^[4]
33	Manganese	Digestion, Inductively Coupled Plasma Method ^[4]
34	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[4]
35	Methyl bromide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
36	Methylene chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
37	Methyl tert-butyl ether	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
38	Naphthalene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
39	Nickel	Digestion, Inductively Coupled Plasma Method ^[4]
40	pH	Electrometric Method ^[4]
41	Selenium	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[4] 2) Digestion, Inductively Coupled Plasma Method ^[4]
42	Silver	Digestion, Inductively Coupled Plasma Method ^[4]
43	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
44	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
45	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
46	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
47	TPH (C ₅ -C ₈)	Purge and Trap, Gas Chromatographic Method ^{[11][9]}
48	TPH (C ₉ -C ₁₆)	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^[9,13]

49 TPH (C₁₆-C₃₃)...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
49	TPH (C ₁₀ -C ₃₅)	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(9,19)
50	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
51	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
52	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
53	Trichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
54	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
55	Vanadium	Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
56	Vinyl chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
57	m-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
59	o-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
59	p-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
60	Xylene (Total)	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
61	Zinc	Digestion, Inductively Coupled Plasma Method ⁽⁴⁾

อากาศเสีย (ปล่องระบาย) จำนวน 26 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Antimony	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
2	Arsenic	1) Isokinetic Sampling, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
3	Beryllium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
4	Cadmium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
5	Carbon Monoxide	Instrumental Analyzer Method ⁽⁵⁾
6	Chlorine	1) Absorption Sampling, Ion Chromatographic Method ⁽⁵⁾ 2) Isokinetic Sampling, Ion Chromatographic Method ⁽⁵⁾
7	Chromium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
8	Cobalt	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
9	Copper	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
10	Dioxins/Furans	Isokinetic Sampling ⁽⁵⁾
11	Hydrogen Chloride	1) Absorption Sampling, Ion Chromatographic Method ⁽⁵⁾ 2) Isokinetic Sampling, Ion Chromatographic Method ⁽⁵⁾
12	Hydrogen Fluoride	1) Absorption Sampling, Ion Chromatographic Method ⁽⁵⁾ 2) Isokinetic Sampling, Ion Chromatographic Method ⁽⁵⁾
13	Hydrogen Sulfide	Absorption Sampling, Iodometric Method ⁽⁵⁾
14	Lead	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method ⁽⁵⁾
15	Manganese	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
16	Mercury	Isokinetic Sampling, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽⁵⁾
17	Nickel	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
18	Opacity	Ringelmann's Method ⁽²⁾
19	Oxides of Nitrogen	1) Absorption Sampling, Alkaline Permanganate/Colorimetric Method ⁽⁵⁾ 2) Instrumental Analyzer Method ⁽⁵⁾
20	Selenium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
21	Sulfur Dioxide	1) Isokinetic Sampling, Barium-Thorin Titrimetric Method ^[5] 2) Absorption Sampling, Barium-Thorin Titrimetric Method ^[5] 3) Instrumental Analyzer Method ^[5]
22	Sulfuric Acid	Isokinetic Sampling, Barium-Thorin Titrimetric Method ^[5]
23	Tin	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5]
24	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method ^[5]
25	Vanadium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5]
26	Xylene	Absorption Sampling, Gas Chromatographic Method ^[5]

สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน 20 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Antimony	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,13] 2) Digestion, Inductively Coupled Plasma Method ^[7,13]
2	Arsenic	1) Waste Extraction, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[1,6,14] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,13] 3) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[7,14] 4) Digestion, Inductively Coupled Plasma Method ^[7,13]
3	Barium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,13] 2) Digestion, Inductively Coupled Plasma Method ^[7,13]
4	Beryllium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,13] 2) Digestion, Inductively Coupled Plasma Method ^[7,13]
5	Cadmium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,13] 2) Digestion, Inductively Coupled Plasma Method ^[7,13]

6 Chromium...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
6	Chromium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,13] 2) Digestion, Inductively Coupled Plasma Method ^[7,13]
7	Chromium (III)	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction, Colorimetric Method; Calculation ^[1,6,13,15] 2) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation ^[7,8,13,15]
8	Chromium (VI)	1) Waste Extraction, Colorimetric Method ^[1,15] 2) Alkaline Digestion, Colorimetric Method ^[8,15]
9	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,5,13] 2) Digestion, Inductively Coupled Plasma Method ^[7,13]
10	Copper	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,5,13] 2) Digestion, Inductively Coupled Plasma Method ^[7,13]
11	Lead	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,13] 2) Digestion, Inductively Coupled Plasma Method ^[7,13]
12	Mercury	1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[1,6,16] 2) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[17]
13	Molybdenum	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,13] 2) Digestion, Inductively Coupled Plasma Method ^[7,13]
14	Nickel	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,13] 2) Digestion, Inductively Coupled Plasma Method ^[7,13]
15	pH	Electrometric Method ^[21,22]
16	Selenium	1) Waste Extraction, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[1,6,18] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,13]

3) Digestion...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
17	Silver	3) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[7,14] 4) Digestion, Inductively Coupled Plasma Method ^[7,13]
18	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,13] 2) Digestion, Inductively Coupled Plasma Method ^[7,13]
19	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,13] 2) Digestion, Inductively Coupled Plasma Method ^[7,13]
20	Zinc	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,13] 2) Digestion, Inductively Coupled Plasma Method ^[7,13]

ดิน จำนวน 59 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acetone	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
2	Antimony	Digestion, Inductively Coupled Plasma Method ^[7,13]
3	Arsenic	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[7,14] 2) Digestion, Inductively Coupled Plasma Method ^[7,13]
4	Barium	Digestion, Inductively Coupled Plasma Method ^[7,13]
5	Benzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
6	Beryllium	Digestion, Inductively Coupled Plasma Method ^[7,13]
7	Bromodichloromethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
8	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
9	Cadmium	Digestion, Inductively Coupled Plasma Method ^[7,13]

10 Carbon disulfide...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
10	Carbon disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
11	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
12	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
13	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
14	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
15	Chromium	Digestion, Inductively Coupled Plasma Method ^[7,13]
16	Chromium (III)	Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation ^[7,8,13,15]
17	Chromium (VI)	Alkaline Digestion, Colorimetric Method ^[8,15]
18	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
19	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
20	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
21	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
22	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
23	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
24	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
25	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
26	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
27	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]

1,3-Dichloropropene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
28	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
29	Ethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
30	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
31	Lead	Digestion, Inductively Coupled Plasma Method ^[7,13]
32	Manganese	Digestion, Inductively Coupled Plasma Method ^[7,13]
33	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[17]
34	Methyl bromide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
35	Methylene chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
36	Methyl tert-butyl ether	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
37	Naphthalene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
38	Nickel	Digestion, Inductively Coupled Plasma Method ^[7,13]
39	Selenium	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[7,18] 2) Digestion, Inductively Coupled Plasma Method ^[7,13]
40	Silver	Digestion, Inductively Coupled Plasma Method ^[7,13]
41	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
42	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
43	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
44	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
45	TPH (C ₅ -C ₈)	Purge and Trap, Gas Chromatographic Method ^[12,19]
46	TPH (C ₈ -C ₁₆)	Ultrasonic Extraction, Gas Chromatographic Method ^[10,19]

47 TPH (C₁₆-C₃₅)...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
47	TPH (C ₁₆ -C ₃₅)	Ultrasonic Extraction, Gas Chromatographic Method ^[10,19]
48	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
49	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
50	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
51	Trichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
52	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
53	Vanadium	Digestion, Inductively Coupled Plasma Method ^[7,13]
54	Vinyl chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
55	m-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
56	o-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
57	p-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
58	Xylene (Total)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[12,20]
59	Zinc	Digestion, Inductively Coupled Plasma Method ^[7,13]

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ที่ กก ๐๓๑๐๑๑/ ๘ ๘ ๗ ๖



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๒ ๒ มิถุนายน ๒๕๖๖

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เทคนิคสิ่งแวดล้อมไทย จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๓ มีนาคม ๒๕๖๖

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เทคนิคสิ่งแวดล้อมไทย จำกัด จำนวน ๒๘ แผ่น

ตามหนังสือที่อ้างถึง บริษัท เทคนิคสิ่งแวดล้อมไทย จำกัด ขอต่ออายุหนังสือรับขึ้นทะเบียน
ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๒๓๖-๑-๐๐๑๑ สถานที่ตั้งเลขที่ ๑/๖ ซอยรามคำแหง ๑๕๕ แขวงสะพานสูง
เขตสะพานสูง กรุงเทพมหานคร ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เทคนิคสิ่งแวดล้อมไทย จำกัด ต่ออายุหนังสือรับขึ้น
ทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์

- ๑) นายณัฐพงศ์ โคตะมา
- ๒) นางสาววริทธิ์นันท์ ประชุมแดง
- ๓) นางพรทิพย์ เพชรชี
- ๔) นายสมชาย ปิยะวรสกุล
- ๕) นายประมวล บุตรสาร
- ๖) นายรัฐพล สุขดี

ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๐๑
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ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๐๔
ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๐๕
ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๐๖

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์

- ๑) นางสาวพณีน อัครชัยสุวิกรม
- ๒) นางสาวกมลลักษณ์ ติมงคล
- ๓) นางสาวกนกวรรณ เริ่มประชาธิปไตย
- ๔) นางสาวฐิติพรณ ศรีสุวรรณ
- ๕) นางสาวอนิศา กุพชาติ
- ๖) นางสาวมาลินี มณีรัตน์
- ๗) นางสาวพัชรพรรณ สว่างภาพ
- ๘) นายสุริเยพงศ์ ยงยุทธ
- ๙) นางสาวตอกรัก สีนเหล็ก
- ๑๐) นางสาวศิริพร กาจิต
- ๑๑) นายสุชาติ ศรีบุญ
- ๑๒) นายเกียรติศักดิ์ วินดี

ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๐๑
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ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๑๐
ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๑๑
ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๑๒

๑๓) นายจิรวัฒน์...

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- ๑๓) นายจิรวัฒน์ อินทเสย์
- ๑๔) นางสาวนิตยา เย็นวัฒนา
- ๑๕) นางสาวณัฐธยาน์ สารแสง
- ๑๖) นายกิตติศักดิ์ เมืองงาม
- ๑๗) นายเทพพงศ์ เขยวิฑเภา
- ๑๘) นายเฉลิมวุฒิ พูลสงวน
- ๑๙) นางสาวนุชศิริ อรรถ
- ๒๐) นางสาววรรณศิริ สุริยวงศ์
- ๒๑) นายวิฑูรย์ วลัยรัตน์
- ๒๒) นางสาวกมลศัล จอกสูงเนิน
- ๒๓) นางสาวสุกัญญา อยู่โนม
- ๒๔) นางสาวลลิตา ตรีโยดม
- ๒๕) นายเจษฎา แซ่หว้า
- ๒๖) นายอรุณพล วงศ์สวัสดิ์
- ๒๗) นายประยงค์ จิวเดช
- ๒๘) นายเบญจพล กริศจาค
- ๒๙) นายวีรพล บุตรสา
- ๓๐) นายพิเชฐ อยู่ศิริรัมย์
- ๓๑) นายณัฐดนัย ศรีรัตนชัยวาลย์

ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๑๓
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ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๑๗
ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๑๘
ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๑๙
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ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๓๑

ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย น้ำใต้ดิน อากาศเสีย สิ่งปฏิกูลหรือ
วัสดุที่ไม่ใช้แล้ว และดิน ตามสิ่งที่ส่งมาด้วย

หนังสือฉบับนี้จะหมดอายุในวันที่ ๓๑ มีนาคม ๒๕๖๙ หากประสงค์จะต่ออายุหนังสือ
รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อ
กรมโรงงานอุตสาหกรรม ภายใน ๓๐ วัน ก่อนวันสิ้นสุดของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
ทั้งนี้ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ที่หน้าเว็บไซต์กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายประสม ดำรงพงษ์)
ผู้อำนวยการกองวิจัยและเฝ้าระวังมลพิษของโรงงาน
ปฏิบัติการแผนกป้องกันมลพิษจากโรงงานอุตสาหกรรม

กองวิจัยและเฝ้าระวังมลพิษของโรงงาน
กลุ่มมาตรฐานวิธีการวิเคราะห์หาคอมมลพิษและทะเบียนห้องปฏิบัติการ
โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๕-๕
โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๕
ไปรษณีย์อิเล็กทรอนิกส์ saraban@dw.mail.go.th



"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เทคนิกลิ่งแวลล์ไทย จำกัด เลขทะเบียน ว-๒๓๖
ที่ ออก ๐๓๑๐(๑)/ ๙ ๘ ๗ ๖ ลงวันที่ ๒๒ มิถุนายน ๒๕๖๖

ขอขยายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๓๗ รายการ

น้ำเสีย จำนวน 40 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
2	Arsenic	Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ⁽⁴⁾
3	Barium	1) Digestion, Direct Nitrous Oxide-Acetylene Flame Method ⁽⁴⁾ 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ⁽⁴⁾ 3) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
4	α-BHC	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
5	γ-BHC	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
6	Biochemical Oxygen Demand	5-Day BOD Test, Azide Modification Method ⁽⁴⁾
7	Cadmium	1) Digestion, Direct Air-Acetylene Flame Method ⁽⁴⁾ 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ⁽⁴⁾ 3) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
8	Chemical Oxygen Demand	Closed Reflux, Titrimetric Method ⁽⁴⁾
9	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
10	Chromium	1) Digestion, Direct Air-Acetylene Flame Method ⁽⁴⁾ 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ⁽⁴⁾ 3) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
11	Color	ADMI Weighted-Ordinate Spectrophotometric Method ⁽⁴⁾
12	Copper	1) Digestion, Direct Air-Acetylene Flame Method ⁽⁴⁾ 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ⁽⁴⁾ 3) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
13	Cyanide	Distillation, Colorimetric Method ⁽⁴⁾
14	4,4'-DDE	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
15	4,4'-DDT	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
16	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾

17 Endosulfan I...

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
17	Endosulfan I	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
18	Endosulfan II	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
19	Endosulfan Sulfate	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
20	Endrin	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
21	Formaldehyde	Distillation, Colorimetric Method ⁽³⁾
22	Free Chlorine	DPD Ferrous Titrimetric Method ⁽⁴⁾
23	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
24	Heptachlor Epoxide	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
25	Hexavalent Chromium	Colorimetric Method ⁽⁴⁾
26	Lead	1) Digestion, Direct Air-Acetylene Flame Method ⁽⁴⁾ 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ⁽⁴⁾ 3) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
27	Manganese	1) Digestion, Direct Air-Acetylene Flame Method ⁽⁴⁾ 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ⁽⁴⁾ 3) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
28	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽⁴⁾
29	Nickel	1) Digestion, Direct Air-Acetylene Flame Method ⁽⁴⁾ 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ⁽⁴⁾ 3) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
30	Oil & Grease	1) Liquid-Liquid, Partition-Gravimetric Method ⁽⁴⁾ 2) Soxhlet Extraction Method ⁽⁴⁾
31	pH	Electrometric Method ⁽⁴⁾
32	Phenols	Distillation, Direct Photometric Method ⁽⁴⁾
33	Selenium	Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ⁽⁴⁾
34	Sulfide	1) Iodometric Method ⁽⁴⁾ 2) Methylene Blue Method ⁽⁴⁾
35	Temperature	Laboratory and Field Methods ⁽⁴⁾
36	Total Dissolved Solids	Dried at 180 °C ⁽⁴⁾
37	Total Kjeldahl Nitrogen	Macro-Kjeldahl Method ⁽⁴⁾
38	Total Suspended Solids	Dried at 103-105 °C ⁽⁴⁾

39 Trivalent Chromium...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
39	Trivalent Chromium	Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation ⁽⁴⁾
40	Zinc	1) Digestion, Direct Air-Acetylene Flame Method ⁽⁴⁾ 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ⁽⁴⁾ 3) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾

น้ำใต้ดิน จำนวน 122 รายการ

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

13 Benzoic acid...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
13	Benzoic acid	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
14	Benzo(a)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
15	Benzo(g,h,i)perylene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
16	Beryllium	1) Digestion, Electrothermal Atomic Absorption Spectrometric Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
17	Bis(2-chloropethyl)ether	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
18	Bis(2-ethylhexyl)phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
19	Bromodichloromethane	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
20	Bromoform	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
21	Butanol	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
22	Butyl benzyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
23	Cadmium	1) Digestion, Electrothermal Atomic Absorption Spectrometric Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
24	Carbazole	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
25	Carbon disulfide	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
26	Carbon tetrachloride	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
27	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
28	p-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
29	Chlorobenzene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
30	Chlorodibromomethane	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
31	Chloroform	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾

32 Chromium...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
32	Chromium	1) Digestion, Direct Air-Acetylene Flame Method ⁽⁴⁾ 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ⁽⁴⁾ 3) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
33	Chromium (III)	1) Digestion, Direct Air-Acetylene Flame Method; Colorimetric Method; Calculation ⁽⁴⁾ 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method; Colorimetric Method; Calculation ⁽⁴⁾ 3) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation ⁽⁴⁾
34	Chromium (VI)	Colorimetric Method ⁽⁴⁾
35	Chrysene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
36	Cyanide	Distillation, Colorimetric Method ⁽⁴⁾
37	2,4-D	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
38	DDD	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
39	DDE	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
40	DDT	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
41	Dibenz(a,h)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
42	Di-n-butyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
43	1,2-Dichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
44	1,3-Dichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
45	1,4-Dichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
46	1,1-Dichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
47	1,2-Dichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
48	1,1-Dichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
49	cis-1,2-Dichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾

50 trans-1,2-Dichloroethylene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
50	trans-1,2-Dichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
51	1,2-Dichloropropane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
52	1,3-Dichloropropane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
53	1,3-Dichloropropane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
54	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
55	Diethyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
56	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
57	2,4-Dinitrophenol	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
58	2,4-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
59	2,6-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
60	Di-n-Octyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
61	Endosulfan	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
62	Endrin	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
63	Ethylbenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
64	Fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
65	Fluorene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
66	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
67	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
68	Hexachloro-1,3-butadiene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
69	n-Hexane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
70	α-HCH	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
71	β-HCH	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
72	γ-HCH	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
73	Hexachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾

74 Hexachloroethane...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
74	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
75	Indeno(1,2,3-cd)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
76	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
77	Lead	1) Digestion, Electrothermal Atomic Absorption Spectrometric Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
78	Manganese	1) Digestion, Direct Air-Acetylene Flame Method ⁽⁴⁾ 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ⁽⁴⁾ 3) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
79	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽⁴⁾
80	Methanol	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
81	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
82	Methyl bromide	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
83	Methylene chloride	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
84	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
85	2-Methylnaphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
86	Methyl tert-butyl ether	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
87	Naphthalene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
88	Nickel	1) Digestion, Electrothermal Atomic Absorption Spectrometric Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
89	Nitrobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
90	N-Nitrosodiphenylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾

91 N-Nitrosodi-n-propylamine...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
91	N-Nitrosodi-n-propylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
92	Polychlorinated Biphenyls PCB-1016 PCB-1221 PCB-1232 PCB-1242 PCB-1248 PCB-1254 PCB-1260	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
93	Pentachlorophenol	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
94	pH	Electrometric Method ⁽⁴⁾
95	Phenanthrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
96	Phenol	1) Distillation, Direct Photometric Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
97	Pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
98	Selenium	Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ⁽⁴⁾
99	Silver	1) Digestion, Direct Air-Acetylene Flame Method ⁽⁴⁾ 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ⁽⁴⁾ 3) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
100	Styrene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
101	1,1,2,2-Tetrachloroethane	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
102	Tetrachloroethylene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
103	Toluene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
104	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
105	TPH (C ₅ -C ₈)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(12,22)

106 TPH (C₈-C₁₆)...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
106	TPH (C ₈ -C ₁₆)	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(9,22)
107	TPH (C ₁₆ -C ₃₅)	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(9,22)
108	1,2,4-Trichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
109	1,1,1-Trichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
110	1,1,2-Trichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
111	Trichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
112	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
113	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
114	1,3,5-Trimethylbenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
115	Vanadium	1) Digestion, Electrothermal Atomic Absorption Spectrometric Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
116	Vinyl acetate	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
117	Vinyl chloride	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
118	m-Xylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
119	o-Xylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
120	p-Xylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
121	Xylene (Total)	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
122	Zinc	1) Digestion, Direct Air-Acetylene Flame Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾

อากาศเสีย...

อากาศเสีย (ปล่องระบาย) จำนวน 18 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Antimony	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method ⁽⁵⁾ 3) Isokinetic Sampling, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ⁽⁵⁾
2	Arsenic	Isokinetic Sampling, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ⁽⁵⁾
3	Carbon monoxide	Instrumental Analyzer Method ⁽⁵⁾
4	Chlorine	Absorption Sampling, Ion Chromatographic Method ⁽⁵⁾
5	Copper	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method ⁽⁵⁾
6	Cresol	Adsorption Sampling, Gas Chromatographic Method ⁽⁵⁾
7	Dioxins/Furans	Isokinetic Sampling, Analysis by ISO/IEC 17025 Accredited Laboratory or Analysis by Department of Industrial Works Registered Laboratory (Dioxins/Furans Analysis Approved) ⁽⁵⁾
8	Hydrogen Chloride	Absorption Sampling, Ion Chromatographic Method ⁽⁵⁾
9	Hydrogen Fluoride	Absorption Sampling, Ion Chromatographic Method ⁽⁵⁾
10	Hydrogen Sulfide	Absorption Sampling, Iodometric Method ⁽⁵⁾
11	Lead	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method ⁽⁵⁾ 3) Isokinetic Sampling, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ⁽⁵⁾
12	Mercury	Isokinetic Sampling, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽⁵⁾
13	Opacity	Ringelmann's Method ⁽²⁾
14	Oxides of Nitrogen	1) Absorption Sampling, Phenoldisulfonic acid Method ⁽⁵⁾ 2) Instrumental Analyzer Method ⁽⁵⁾

15 Sulfur dioxide...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
15	Sulfur dioxide	1) Absorption Sampling, Barium-Thorin Titrimetric Method ^[5] 2) Instrumental Analyzer Method ^[5]
16	Sulfuric acid	Isokinetic Sampling, Barium-Thorin Titrimetric Method ^[5]
17	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method ^[5]
18	Xylene	Adsorption Sampling, Gas Chromatographic Method ^[5]

สิ่งบ่งชี้ทางสิ่งแวดล้อมที่ไม่ใช่แล้ว จำนวน 36 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Waste Extraction, Solid-Phase Extraction, Gas Chromatographic Method ^[1,10,24] 2) Solid-Phase Extraction, Gas Chromatographic Method ^[10,24] 3) Soxhlet Extraction, Gas Chromatographic Method ^[11,24]
2	Antimony	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^[1,6,15] 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^[1,6,16] 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 4) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^[7,16] 6) Digestion, Inductively Coupled Plasma Method ^[7,14]
3	Arsenic	1) Waste Extraction, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[1,6,17] 2) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[7,17]
4	Barium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^[1,6,15] 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^[1,6,16] 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14]

4) Digestion...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
5	Beryllium	4) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^[7,16] 6) Digestion, Inductively Coupled Plasma Method ^[7,14] 1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^[1,6,15] 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^[1,6,16] 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 4) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^[7,16] 6) Digestion, Inductively Coupled Plasma Method ^[7,14]
6	Cadmium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^[1,6,15] 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^[1,6,16] 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 4) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^[7,16] 6) Digestion, Inductively Coupled Plasma Method ^[7,14]
7	Chlordane	1) Waste Extraction, Solid-Phase Extraction, Gas Chromatographic Method ^[1,10,24] 2) Solid-Phase Extraction, Gas Chromatographic Method ^[10,24] 3) Soxhlet Extraction, Gas Chromatographic Method ^[11,24]
8	Chromium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^[1,6,15] 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^[1,6,16]

3) Waste Extraction...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
9	Chromium (III)	3) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,14) 4) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,15) 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^(7,16) 6) Digestion, Inductively Coupled Plasma Method ^(7,14) 1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method; Waste Extraction, Colorimetric Method; Calculation ^(1,6,15,18) 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method; Waste Extraction, Colorimetric Method; Calculation ^(1,6,16,18) 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction, Colorimetric Method; Calculation ^(1,6,14,8) 4) Digestion, Flame Atomic Absorption Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation ^(7,8,15,18) 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation ^(7,8,16,18) 6) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation ^(7,8,14,18)
10	Chromium (VI)	1) Waste Extraction, Colorimetric Method ^(1,18) 2) Alkaline Digestion, Colorimetric Method ^(8,18)
11	Cobalt	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^(1,6,15) 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^(1,6,14) 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,14) 4) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,15) 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^(7,16) 6) Digestion, Inductively Coupled Plasma Method ^(7,14)

12 Copper...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
12	Copper	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^(1,6,15) 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^(1,6,16) 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,14) 4) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,15) 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^(7,16) 6) Digestion, Inductively Coupled Plasma Method ^(7,14)
13	2,4-D	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(1,9,24) 2) Soxhlet Extraction, Gas Chromatographic Method ^(11,24)
14	DDD	1) Waste Extraction, Solid-Phase Extraction, Gas Chromatographic Method ^(1,10,24) 2) Solid-Phase Extraction, Gas Chromatographic Method ^(10,24) 3) Soxhlet Extraction, Gas Chromatographic Method ^(11,24)
15	DDE	1) Waste Extraction, Solid-Phase Extraction, Gas Chromatographic Method ^(1,10,24) 2) Solid-Phase Extraction, Gas Chromatographic Method ^(10,24) 3) Soxhlet Extraction, Gas Chromatographic Method ^(11,24)
16	DDT	1) Waste Extraction, Solid-Phase Extraction, Gas Chromatographic Method ^(1,10,24) 2) Solid-Phase Extraction, Gas Chromatographic Method ^(10,24) 3) Soxhlet Extraction, Gas Chromatographic Method ^(11,24)
17	Dieldrin	1) Waste Extraction, Solid-Phase Extraction, Gas Chromatographic Method ^(1,10,24) 2) Solid-Phase Extraction, Gas Chromatographic Method ^(10,24) 3) Soxhlet Extraction, Gas Chromatographic Method ^(11,24)

18 Endrin...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
18	Endrin	1) Waste Extraction, Solid-Phase Extraction, Gas Chromatographic Method ^(1,10,24) 2) Solid-Phase Extraction, Gas Chromatographic Method ^(10,24) 3) Soxhlet Extraction, Gas Chromatographic Method ^(11,24)
19	Heptachlor	1) Waste Extraction, Solid-Phase Extraction, Gas Chromatographic Method ^(1,10,24) 2) Solid-Phase Extraction, Gas Chromatographic Method ^(10,24) 3) Soxhlet Extraction, Gas Chromatographic Method ^(11,24)
20	Lead	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^(1,6,15) 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^(1,6,16) 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,14) 4) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,15) 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^(7,16) 6) Digestion, Inductively Coupled Plasma Method ^(7,14)
21	Lindane	1) Waste Extraction, Solid-Phase Extraction, Gas Chromatographic Method ^(1,10,24) 2) Solid-Phase Extraction, Gas Chromatographic Method ^(10,24) 3) Soxhlet Extraction, Gas Chromatographic Method ^(11,24)
22	Mercury	1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^(1,6,19) 2) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽²⁰⁾
23	Methoxychlor	1) Waste Extraction, Solid-Phase Extraction, Gas Chromatographic Method ^(1,10,24) 2) Solid-Phase Extraction, Gas Chromatographic Method ^(10,24)

3) Soxhlet...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
24	Mirex	3) Soxhlet Extraction, Gas Chromatographic Method ^(11,24) 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(1,9,24) 2) Soxhlet Extraction, Gas Chromatographic Method ^(11,24)
25	Molybdenum	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^(1,6,15) 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^(1,6,16) 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,14) 4) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,15) 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^(7,16) 6) Digestion, Inductively Coupled Plasma Method ^(7,14)
26	Nickel	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^(1,6,15) 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^(1,6,16) 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,14) 4) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,15) 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^(7,16) 6) Digestion, Inductively Coupled Plasma Method ^(7,14)
27	Polychlorinated Bphenyls Aroclor 1016 Aroclor 1221 Aroclor 1232 Aroclor 1242 Aroclor 1248 Aroclor 1254 Aroclor 1260 2,4,4'-Trichlorobiphenyl 2,2',5,5'-Tetrachlorobiphenyl	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(1,9,25) 2) Waste Extraction, Solid-Phase Extraction, Gas Chromatographic Method ^(1,10,25) 3) Soxhlet Extraction, Gas Chromatographic Method ^(11,25)

2,2',4,5,5'...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
28	2,2',4,5,5'-Pentachlorobiphenyl 2,2',3,4,4',5'- Hexachlorobiphenyl 2,2',4,4',5,5'- Hexachlorobiphenyl 2,2',3,4,4',5,5'- Heptachlorobiphenyl Pentachlorophenol	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(1,9,24) 2) Soxhlet Extraction, Gas Chromatographic Method ^(11,24)
29	Selenium	1) Waste Extraction, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^(1,6,21) 2) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^(7,21)
30	Silver	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^(1,6,15) 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^(1,6,16) 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,14) 4) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,15) 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^(7,14) 6) Digestion, Inductively Coupled Plasma Method ^(7,14)
31	Thallium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^(1,6,15) 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^(1,6,16) 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,14) 4) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,15) 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^(7,14) 6) Digestion, Inductively Coupled Plasma Method ^(7,14)

32 Toxaphene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
32	Toxaphene	1) Waste Extraction, Solid-Phase Extraction, Gas Chromatographic Method ^(1,10,24) 2) Solid-Phase Extraction, Gas Chromatographic Method ^(10,24) 3) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
33	Trichloroethylene	1) Waste Extraction, Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(1,12,26) 2) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,26)
34	Vanadium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^(1,6,15) 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^(1,6,16) 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,14) 4) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,15) 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^(7,16) 6) Digestion, Inductively Coupled Plasma Method ^(7,14)
35	Vinyl chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,26)
36	Zinc	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^(1,6,15) 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^(1,6,16) 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,14) 4) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,15) 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^(7,16) 6) Digestion, Inductively Coupled Plasma Method ^(7,14)

33...

ดิน จำนวน 121 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,27)
2	Acetone	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,26)
3	Aldrin	Soxhlet Extraction, Gas Chromatographic Method ^(11,24)
4	Anthracene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,27)
5	Antimony	1) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,15) 2) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^(7,16) 3) Digestion, Inductively Coupled Plasma Method ^(7,14)
6	Arsenic	Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^(7,17)
7	Atrazine	Soxhlet Extraction, Gas Chromatographic Method ^(11,24)
8	Barium	1) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,15) 2) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^(7,16) 3) Digestion, Inductively Coupled Plasma Method ^(7,14)
9	Benz(a)anthracene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,27)
10	Benzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,26)
11	Benzo(b)fluoranthene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,27)
12	Benzo(k)fluoranthene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,27)
13	Benzoic acid	Soxhlet Extraction, Gas Chromatographic Method ^(11,23)
14	Benzo(a)pyrene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,27)
15	Benzo(g,h,i)perylene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,27)
16	Beryllium	1) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,15)

2) Digestion...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
		2) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^(7,16) 3) Digestion, Inductively Coupled Plasma Method ^(7,14)
17	Bis(2-chloroethyl)ether	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,27)
18	Bis(2-ethylhexyl)phthalate	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,27)
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,26)
20	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,26)
21	Butanol	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,26)
22	Butyl benzyl phthalate	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,27)
23	Cadmium	1) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,15) 2) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^(7,16) 3) Digestion, Inductively Coupled Plasma Method ^(7,14)
24	Carbazole	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,27)
25	Carbon disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,26)
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,26)
27	Chlordane	Soxhlet Extraction, Gas Chromatographic Method ^(11,24)
28	p-Chloroaniline	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,27)
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,26)
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,26)
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,26)
32	Chromium	1) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,15)

2) Digestion...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
33	Chromium (III)	2) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^(7,16) 3) Digestion, Inductively Coupled Plasma Method ^(7,10) 1) Digestion, Flame Atomic Absorption Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation ^(7,8,15,18) 2) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation ^(7,8,16,18) 3) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation ^(7,8,14,18)
34	Chromium (VI)	Alkaline Digestion, Colorimetric Method ^(8,18)
35	Chrysene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
36	Cyanide	1) Extraction, Distillation, Titrimetric Method ^(28,29,30) 2) Extraction, Distillation, Colorimetric Method ^(28,29,30)
37	2,4-D	Soxhlet Extraction, Gas Chromatographic Method ^(11,24)
38	DDD	Soxhlet Extraction, Gas Chromatographic Method ^(11,24)
39	DDE	Soxhlet Extraction, Gas Chromatographic Method ^(11,24)
40	DDT	Soxhlet Extraction, Gas Chromatographic Method ^(11,24)
41	Dibenz(a,h)anthracene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
42	Di-n-butyl phthalate	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
43	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,26)
44	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,26)
45	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,26)
46	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,26)
47	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,26)
48	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,26)

49 cis-1,2-Dichloroethylene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
49	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,26)
50	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,26)
51	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,26)
52	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,26)
53	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,26)
54	Dieldrin	Soxhlet Extraction, Gas Chromatographic Method ^(11,24)
55	Diethyl phthalate	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
56	2,4-Dimethylphenol	Soxhlet Extraction, Gas Chromatographic Method ^(11,23)
57	2,4-Dinitrophenol	Soxhlet Extraction, Gas Chromatographic Method ^(11,23)
58	2,4-Dinitrotoluene	Soxhlet Extraction, Gas Chromatographic Method ^(11,23)
59	2,6-Dinitrotoluene	Soxhlet Extraction, Gas Chromatographic Method ^(11,23)
60	Di-n-Octyl phthalate	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
61	Endosulfan	Soxhlet Extraction, Gas Chromatographic Method ^(11,24)
62	Endrin	Soxhlet Extraction, Gas Chromatographic Method ^(11,24)
63	Ethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,26)
64	Fluoranthene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
65	Fluorene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
66	Heptachlor	Soxhlet Extraction, Gas Chromatographic Method ^(11,24)
67	Heptachlor epoxide	Soxhlet Extraction, Gas Chromatographic Method ^(11,24)
68	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,26)
69	n-Hexane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,26)
70	α-HCH	Soxhlet Extraction, Gas Chromatographic Method ^(11,24)
71	β-HCH	Soxhlet Extraction, Gas Chromatographic Method ^(11,24)
72	γ-HCH	Soxhlet Extraction, Gas Chromatographic Method ^(11,24)

73 Hexachlorocyclopentadiene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
73	Hexachlorocyclopentadiene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,27)
74	Hexachloroethane	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,27)
75	Indeno(1,2,3-cd)pyrene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,27)
76	Isophorone	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,27)
77	Lead	1) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,15) 2) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^(7,14) 3) Digestion, Inductively Coupled Plasma Method ^(7,14)
78	Manganese	1) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,15) 2) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^(7,14) 3) Digestion, Inductively Coupled Plasma Method ^(7,14)
79	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽²⁰⁾
80	Methanol	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,26)
81	Methoxychlor	Soxhlet Extraction, Gas Chromatographic Method ^(11,24)
82	Methyl bromide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,26)
83	Methylene chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,26)
84	2-Methylphenol	Soxhlet Extraction, Gas Chromatographic Method ^(11,23)
85	2-Methylnaphthalene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,27)
86	Methyl tert-butyl ether	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,26)
87	Naphthalene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,26)
88	Nickel	1) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,15) 2) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^(7,14) 3) Digestion, Inductively Coupled Plasma Method ^(7,14)

89 Nitrobenzene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
89	Nitrobenzene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,27)
90	N-Nitrosodiphenylamine	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,27)
91	N-Nitrosodi-n-propylamine	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,27)
92	Polychlorinated Biphenyls Aroclor 1016 Aroclor 1221 Aroclor 1232 Aroclor 1242 Aroclor 1248 Aroclor 1254 Aroclor 1260 2,2',5,5'-Tetrachlorobiphenyl 2,2',4,5,5'-Pentachlorobiphenyl 2,2',3,4,4',5'- Hexachlorobiphenyl 2,2',4,4',5,5'- Hexachlorobiphenyl 2,2',3,4,4',5,5'- Heptachlorobiphenyl	Soxhlet Extraction, Gas Chromatographic Method ^(11,25)
93	Pentachlorophenol	Soxhlet Extraction, Gas Chromatographic Method ^(11,24)
94	Phenanthrene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,27)
95	Phenol	Soxhlet Extraction, Gas Chromatographic Method ^(11,23)
96	Pyrene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,27)
97	Selenium	Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^(7,21)
98	Silver	1) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,15) 2) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^(7,14) 3) Digestion, Inductively Coupled Plasma Method ^(7,14)
99	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,26)

100 1,1,2,2-Tetrachloroethane...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
100	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,26)
101	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,26)
102	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,26)
103	Toxaphene	Soxhlet Extraction, Gas Chromatographic Method ^(11,24)
104	TPH (C ₅ -C ₈)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,26)
105	TPH (C ₈ -C ₁₆)	Soxhlet Extraction, Gas Chromatographic Method ^(11,22)
106	TPH (C ₁₆ -C ₃₅)	Soxhlet Extraction, Gas Chromatographic Method ^(11,22)
107	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,26)
108	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,26)
109	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,26)
110	Trichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,26)
111	2,4,5-Trichlorophenol	Soxhlet Extraction, Gas Chromatographic Method ^(11,23)
112	2,4,6-Trichlorophenol	Soxhlet Extraction, Gas Chromatographic Method ^(11,23)
113	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,26)
114	Vanadium	1) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,15) 2) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^(7,14) 3) Digestion, Inductively Coupled Plasma Method ^(7,14)
115	Vinyl acetate	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,26)
116	Vinyl chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,26)
117	m-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,26)
118	o-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,26)
119	p-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,26)

120 Xylene (Total)

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
120	Xylene (Total)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,26)
121	Zinc	1) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,15) 2) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method ^(7,16) 3) Digestion, Inductively Coupled Plasma Method ^(7,14)

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บริษัท ซีเอ็นพีซีเอชเค (ไทยแลนด์) จำกัด

รายงานผลการปฏิบัติตามมาตรการป้องกันและแก้ไขผลกระทบสิ่งแวดล้อม และมาตรการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม
โครงการผลิตปิโตรเลียม แปลงสัมปทานปิโตรเลียมบนบกหมายเลข L21/43
ตั้งอยู่ที่อำเภอศรีราชา จังหวัดชลบุรี และอำเภอสานกระบือ จังหวัดกำแพงเพชร
ฉบับเดือนมกราคม - ธันวาคม พ.ศ.2567

ภาคผนวก ง.6
เอกสารสอบเทียบเครื่องมือตรวจวัด

ฤดูแล้ง

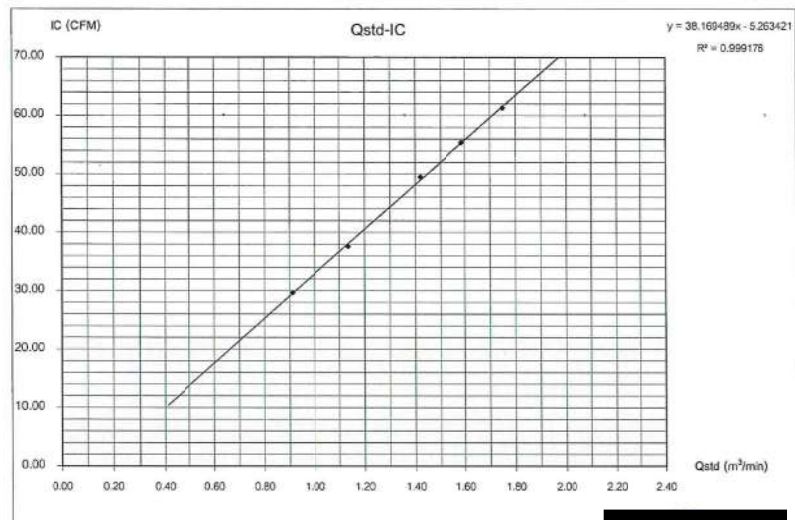
PM10 HIGH VOLUME AIR SAMPLER CALIBRATION REPORT

Quotation	2024-00461	Date	March 31, 2024
Sampler Location	กรุงเทพมหานคร	Start Time	12:15 PM
Sampler Number	PM-10 No.20	Stop Time	12:25 PM
Instrument Model	HIVOL-BMBBE	Transfer Standard Type	Orifice
Motor Serial Number	2140	Calibrator Model	TE-5025A
Recorder Serial Number	2383	Calibrator Serial Number	2914
		Calibrated By	Mr. Autapol Areejit

Plate No.	(Delta H)		(A)	(X)	(I)	(Y)	Temperature	Barometric Pressure	Start Meter	Stop Meter
	Positive	Negative	ΔH_2O	$\Delta H_2O(Pa/P_{atm})(T_{ref}/T_{air})^{1.2}$	$Q_{std} = (1/m)[(A-b)]$ (m ³ /min)	or Set Flow Rate Indicator (ft ³ /min)	$IC = [(Pa/P_{atm})(T_{ref}/T_{air})^{1.2}]$	(°K = °C + 273)	(mmHg)	
5	1.8	1.8	3.6	1.87889	0.91177	30.0	29.67	303.8	756.0	
7	2.8	2.8	5.6	2.34064	1.13496	38.0	37.59	303.8	756.0	
10	4.4	4.4	8.8	2.93415	1.42048	50.0	49.46	303.8	756.0	
13	5.5	5.5	11.0	3.28048	1.58708	56.0	55.39	303.8	756.0	
18	6.7	6.7	13.4	3.82071	1.73076	62.0	61.32	303.8	756.0	
Linear Regression Y ON X: Y=mx+b							Average	303.8	756.0	
1	Slope (m)		2.07871	Linear Equation			r ²	0.999176	Pst/(mmHg)	760.0
2	Intercept (b)		-0.01861	Set Point Flow Rate (X) (m ³ /min)		1.133	r	0.9995879	T _{ref}	298.0
3	Correlation Coefficient (r)		0.99984	Final Set Flow Rate = (I)		0	(Pa/Pstd)(Tstd/Tair)		0.978322043	
Result							C=(Pa/Pstd)(Tstd/Tair)*0.5		0.999101634	

COMMENT

Andersen Instruments, Inc.



Checked By

(Mr. Prayun Detkla)
Technician

Approved By

(Mr. Panupon Podang)
Environmental Scientist

F-AB-028, Rev. 02, June 3, 2019

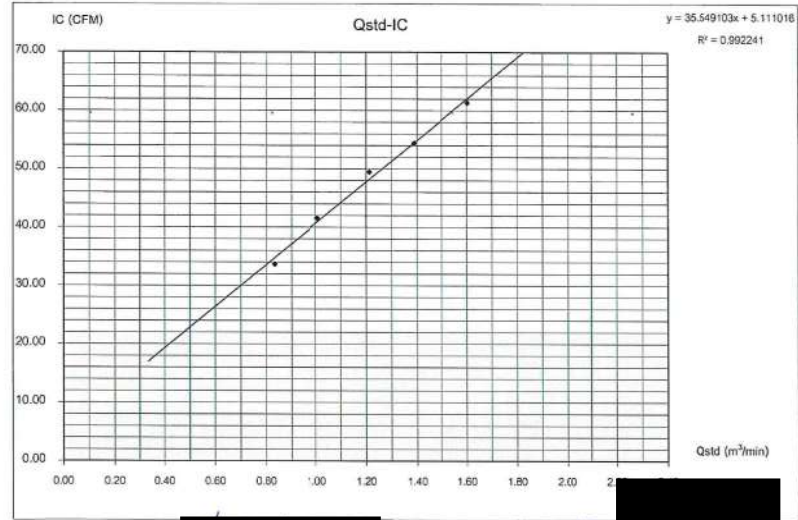
TSP HIGH VOLUME AIR SAMPLER CALIBRATION REPORT

Quotation	2024-00461	Date	March 31, 2024
Sampler Location	กรุงเทพมหานคร	Start Time	12:05 PM
Sampler Number	TSP No.A3	Stop Time	12:15 PM
Instrument Model	HIVOL-BSCBE	Transfer Standard Type	Orifice
Motor Serial Number	704	Calibrator Model	TE-5025A
Recorder Serial Number	4551	Calibrator Serial Number	2914
		Calibrated By	Mr. Autapol Areejit

Plate No.	(Delta H)		(A)	(X)	(I)	(Y)	Temperature	Barometric Pressure	Start Meter	Stop Meter	
	Pressure Drop Across Orifice (mH ₂ O)		$[\Delta H_2O(Pa/P_{atm}(T_{ref}/T_{air})^{1.2})]$	$Q_{std} = (1/m)[(A-b)]$ (m ³ /min)	Sample Flow Rate Indicator (ft ³ /min)	$IC = [(Pa/P_{atm})(T_{ref}/T_{air})^{1.2}]$	(°K = °C + 273)	(mmHg)			
5	1.5	1.5	3.0	1.71317	0.83311	34.0	33.63	303.0	756.0		
7	2.2	2.2	4.4	2.07476	1.00705	42.0	41.54	303.0	756.0		
10	3.2	3.2	6.4	2.50225	1.21270	50.0	49.46	303.0	756.0		
13	4.2	4.2	8.4	2.96609	1.38602	56.0	54.40	303.0	756.0		
18	5.6	5.6	11.2	3.31017	1.60137	62.0	61.32	303.0	756.0		
Linear Regression Y ON X: Y= mx+ b							Average	303.0	756.0		
1	Slope (m)		2.07871	Linear Equation			r ²	0.992241	Pa/(mmHg)	760.0	
2	Intercept (b)		-0.01861	Set Point Flow Rate (X) (m ³ /min)		1.133	r	0.9951129	Pa/(mmHg)	298.0	
3	Correlation Coefficient (r)		0.99984	Final Set Flow Rate = (I)		0	(Pa/Pstd)(Tstd/Tair)		0.978322043		
Result							C=(Pa/Pstd)(Tstd/Tair)*0.5				0.999101634

COMMENT

Andersen Instruments, Inc.



Checked By

(Mr. Prayun Detkla)
Technician

Approved By

(Mr. Panupon Podang)
Environmental Scientist

F-AB-028, Rev. 01, November 16, 2018

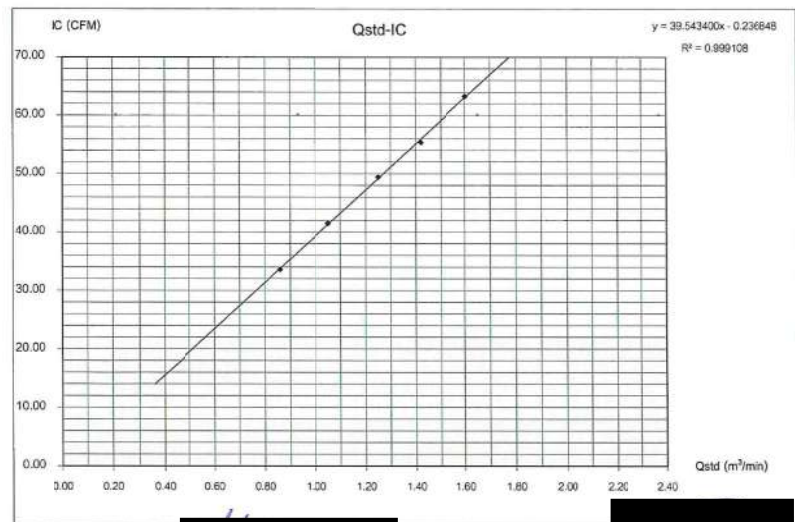
PM10 HIGH VOLUME AIR SAMPLER CALIBRATION REPORT

Quotation	2024-02461	Date	March 31, 2024
Sampler Location	บ้านสวนพริกขี้หนู	Start Time	11:40 AM
Sampler Number	PM-10 No.29	Transfer Standard Type	Office
Instrument Model	HIVOL-BMBBE	Calibrator Model	TE-9025A
Motor Serial Number	2210	Calibrator Serial Number	2514
Recorder Serial Number	2614	Calibrated By	Mr. Auttapol Areejit

Plate No.	(Delta H)	(A)	(X)	(Y)	Temperature	Barometric	Start	Stop
No.	Pressure Drop Across Orifice (inH ₂ O)	$\Delta H_0(Pa/P_{std}(T_{std}/T_a))^{1.2}$	Qstd = (10m)(A-b)	Sample Flow Rate Indicator IC = (Pa/Pstd)(Tstd/Ta) ^{1.2}	(°K = °C+273)	Pressure	Motor	Motor
	Positive Negative ΔH_0		(m ³ /min)	(ft ³ /min)				
5	1.6 1.6 3.2	1.76936	0.86013	34.0	303.3	756.0		
7	2.4 2.4 4.8	2.16701	1.05143	42.0	303.3	756.0		
10	3.4 3.4 6.8	2.57926	1.24975	50.0	303.3	756.0		
13	4.4 4.4 8.8	2.93415	1.42048	56.0	303.3	756.0		
18	5.6 5.6 11.2	3.31017	1.60137	64.0	303.3	756.0		
Linear Regression Y ON X: Y = mX + b					Average	303.3	756.0	
1	Slope (m)	2.07871	Linear Equation			0.999108	Pstd(mnHg)	760.0
2	Intercept (b)	-0.01861	Set Point Flow Rate (X) (m ³ /min)	1.133	r	0.9995539	T _{std}	298.0
3	Correlation Coefficient (r)	0.99994	Final Set Flow Rate = (1)	0	(Pa/Pstd)(Tstd/Ta)	0.978322043		
Result					C=(Pa/Pstd)(Tstd/Ta) ^{0.5}	0.989101634		

COMMENT

Andersen Instruments, Inc.



Checked By

(Mr. Prayun Detkla)
Technician

Approved By

(Mr. Panupon Podang)
Environmental Scientist

FAB-029, Rev. 02, June 3, 2019

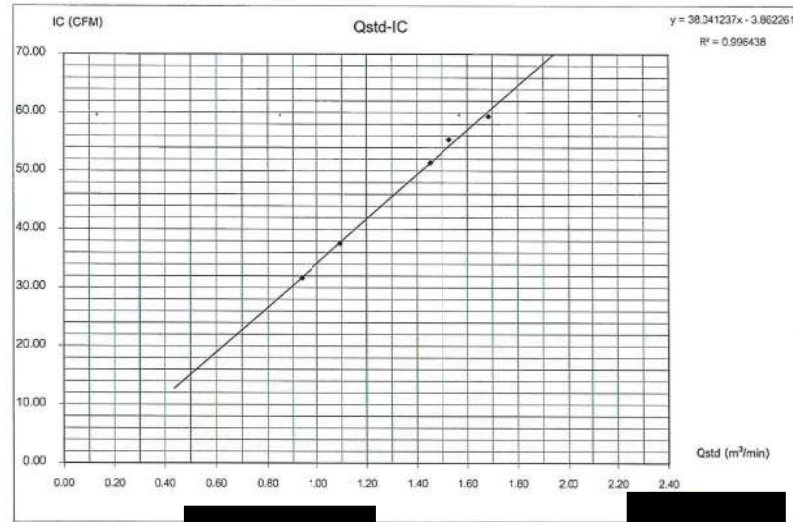
TSP HIGH VOLUME AIR SAMPLER CALIBRATION REPORT

Quotation	2024-02461	Date	March 31, 2024
Sampler Location	บ้านสวนพริกขี้หนู	Start Time	11:30 AM
Sampler Number	TSP No. A2	Transfer Standard Type	Office
Instrument Model	HIVOL-BBCBE	Calibrator Model	TE-9025A
Motor Serial Number	6215-402	Calibrator Serial Number	2914
Recorder Serial Number	4542	Calibrated By	Mr. Auttapol Areejit

Plate No.	(Delta H)	(A)	(X)	(Y)	Temperature	Barometric	Start	Stop
No.	Pressure Drop Across Orifice (inH ₂ O)	$\Delta H_0(Pa/P_{std}(T_{std}/T_a))^{1.2}$	Qstd = (10m)(A-b)	Sample Flow Rate Indicator IC = (Pa/Pstd)(Tstd/Ta) ^{1.2}	(°K = °C+273)	Pressure	Motor	Motor
	Positive Negative ΔH_0		(m ³ /min)	(ft ³ /min)				
5	1.9 1.9 3.8	1.92811	0.93651	32.0	31.65	303.0	756.0	
7	2.6 2.6 5.2	2.25550	1.09400	38.0	37.59	303.0	756.0	
10	4.6 4.6 9.2	3.00098	1.45220	52.0	51.43	303.0	756.0	
13	5.1 5.1 10.2	3.15894	1.52862	56.0	55.39	303.0	756.0	
18	6.2 6.2 12.4	3.48299	1.68450	60.0	59.35	303.0	756.0	
Linear Regression Y ON X: Y = mX + b					Average	303.0	756.0	
1	Slope (m)	2.07871	Linear Equation			0.996436	Pstd(mnHg)	760.0
2	Intercept (b)	-0.01861	Set Point Flow Rate (X) (m ³ /min)	1.133	r	0.9982171	T _{std}	298.0
3	Correlation Coefficient (r)	0.99994	Final Set Flow Rate = (1)	0	(Pa/Pstd)(Tstd/Ta)	0.978322043		
Result					C=(Pa/Pstd)(Tstd/Ta) ^{0.5}	0.989101634		

COMMENT

Andersen Instruments, Inc.



Checked By

(Mr. Prayun Detkla)
Technician

Approved By

(Mr. Panupon Podang)
Environmental Scientist

FAB-029, Rev. 01, November 16, 2019

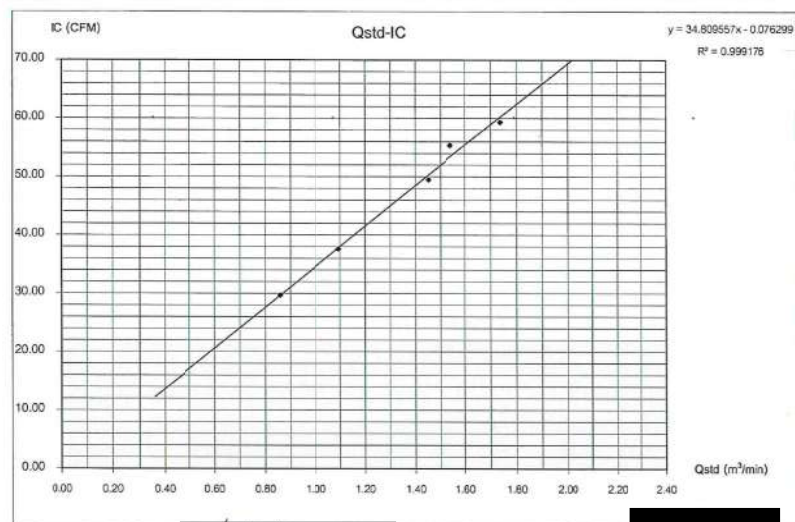
PM10 HIGH VOLUME AIR SAMPLER CALIBRATION REPORT

Quotation	1024-00461	Date	March 31, 2024
Sampler Location	บ้านดินนาเกลือ	Start Time	9:25 AM
Sampler Number	PM-10 No.30	Stop Time	9:35 AM
Instrument Model	HIVOL-BMBBE	Transfer Standard Type	On-site
Motor Serial Number	2208	Calibrator Model	TE-5025A
Recorder Serial Number	2616	Calibrator Serial Number	2914
		Calibrated By	Mr. Autaijai Areejit

Plate No.	(Delta H)		(A)	(X)	(I)	(Y)	Temperature	Barometric Pressure	Start Meter	Stop Meter
	Pressure Drop Across Orifice (inH ₂ O)		$\Delta H_{20} (Pa/P_{atm} (T_{at}/T_{at})^{1.5})$	$Q_{std} = (I \cdot \ln(A/B))$	sample Flow Rate indicator	$IC = (I(Pa/P_{atm}) (T_{at}/T_{at})^{1.5})$	(°K = °C+273)	(mmHg)		
	Positive	Negative	ΔH_{20}	(m ³ /min)	(m ³ /min)					
5	1.6	1.6	3.2	1.76936	0.89013	30.0	29.67	303.3	756.0	
7	2.6	2.6	5.2	2.25550	1.09400	36.0	37.59	303.3	756.0	
10	4.6	4.6	9.2	3.00009	1.45220	50.0	48.46	303.3	756.0	
13	5.2	5.2	10.4	3.16976	1.54344	56.0	55.39	303.3	756.0	
18	6.6	6.6	13.2	3.59358	1.73771	80.0	59.35	303.3	756.0	
Linear Regression Y ON X: Y= mX + b							Average	303.3	756.0	
1	Slope (m)		2.07871		Linear Equation		r^2		0.999176	760.0
2	Intercept (b)		-0.01661		Set Point Flow Rate (X) (m ³ /min)		1.133		r	0.9995879
3	Correlation Coefficient (r)		0.99984		Final Set Flow Rate = (i)		0		(Pa/Pstd)*(Tstd/Ta)	0.97832043
Result							C= (Pa/Pstd)*(Tstd/Ta)*0.5		0.989101634	

COMMENT

Andersen Instruments, Inc.



Checked By

(Mr. Prayun Detkla)
Technician

Approved By

(Mr. Panupon Podang)
Environmental Scientist

F-AB-025, Rev. 02, Jan. 3, 2019

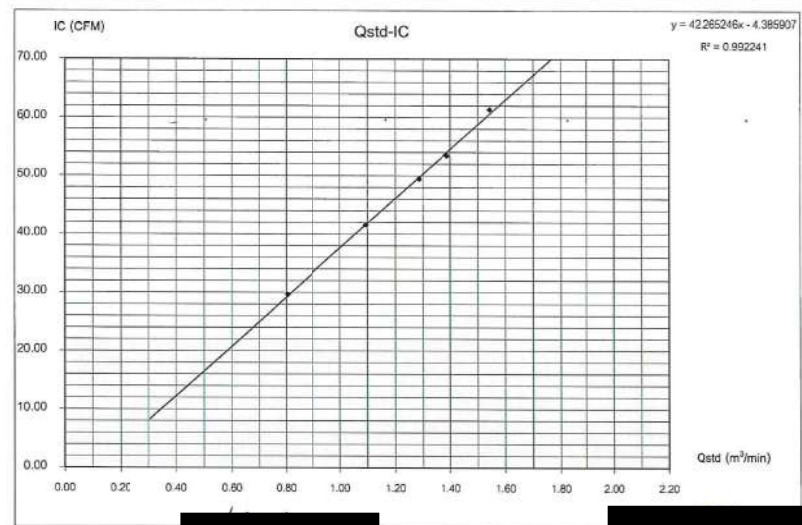
TSP HIGH VOLUME AIR SAMPLER CALIBRATION REPORT

Quotation	2024-00461	Date	March 31, 2024
Sampler Location	บ้านดินนาเกลือ	Start Time	9:15 AM
Sampler Number	TSP No.A27	Stop Time	9:25 AM
Instrument Model	HIVOL-BBCE	Transfer Standard Type	On-site
Motor Serial Number	2215	Calibrator Model	TE-5025A
Recorder Serial Number	2133	Calibrator Serial Number	2914
		Calibrated By	Mr. Autaijai Areejit

Plate No.	(Delta h)		(A)	(X)	(Y)	(Y)	Temperature	Barometric	Start	Stop	
	Pressure Drop Across Orifice (mmHg)		$(\Delta H)(\rho(P_{atm}(T_{ref}/T_{at})^{1.7})$	$Q_{std} = (1/\pi)(\Delta h/b)$	sample Flow Rate Indicator	$IC = ((P_{atm}(P_{atm}(T_{ref}/T_{at})^{1.7})$		Pressure	Meter	Meter	
	Positive	Negative	ΔH_{H_2O}	(m^3/min)	(ft^3/min)		($^{\circ}K = ^{\circ}C+273$)	(mmHg)			
5	1.4	1.4	2.8	1.65508	0.89516	30.0	29.67	303.0	756.0		
7	2.6	2.6	5.2	2.25550	1.09400	42.0	41.54	303.0	756.0		
10	3.6	3.6	7.2	2.65404	1.28572	50.0	48.46	303.0	756.0		
13	4.2	4.2	8.4	2.86669	1.38802	54.0	53.41	303.0	756.0		
18	5.2	5.2	10.4	3.18976	1.54344	62.0	61.32	303.0	756.0		
Linear Regression Y ON X: Y = mx + b							Average	303.0	756.0		
1	Slope (m)			2.07871	Linear Equation		r^2	0.992241	Pstd(mmHg)	760.0	
2	Intercept (b)			-0.01661	Set Point Flow Rate (X) (m ³ /min)		1.133	r	0.9991428	T _{atm}	298.0
3	Correlation Coefficient (r)			0.99984	Final Set Flow Rate = (i)		0	(Pa/Pstd)*(Tstd/Ta)		0.97832043	
Result								C=(Pa/Pstd)*(Tstd/Ta)*0.5		0.989101634	

COMMENT

Andersen Instruments, Inc.



Checked By

(Mr. Prayun Detkla)
Technician

Approved By

(Mr. Panupon Podang)
Environmental Scientist

F-AB-025, Rev. 01, November 16, 2019

CERTIFICATE OF CALIBRATION

Certificate No. : COF-006-66

Page 1 of 2 Pages

MEASUREMENT ITEM
MANUFACTURER
MODEL/TYPE
SERIAL NUMBER
ID NUMBER
CONDITION AS-RECEIVED
CUSTOMER

: Top Load Orifice
: TISCH
: TE-S025A
: 2914
: -
: Used item
: Environment Research & Technology Co., Ltd.
25/114 Moo 6 Soi Chinaket 1, Ngamwongwan Road,
Toongsonghong, Laksi, Bangkok 10210

Calibration procedure:

The Orifice gas flow device was calibrated against
Standard Rotary Displacement Meter (Roots
Meter) Model G65/IMC/W2-dp. The WI-CL-004
was used as a calibration guideline.

Traceability:

This certificate provides a traceability of The
measurement to recognized the national
standards, and to realization of the international
system of units (SI) through the VSL (National
Metrology Institute of Netherlands) via Certificate
number: G2211901

Uncertainty of Measurement:

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

RECEIVED DATE : 27 Jul 2023
MEASUREMENT DATE : 31 Jul 2023
ISSUE DATE : 31 Jul 2023

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:

Temperature : 23.0 ± 3.0 °C
Relative Humidity : 55.0 ± 15.0 %RH
Atmospheric Pressure : 1010 ± 10 hPa

CALIBRATION CONDITION:

Preconditioning : 24 hours at ambient conditions.
Measurement Condition : The average values during measurement are 24.3 °C and 50.5 %RH.

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

TABULATION OF RESULTS:

The table on next page give the measured values.

Calibrated by:

☒ Mr. Sorawit Thachalad
☐ Miss Jitraporn Lertsomphol



Approved signatory:

Mr. Parinya Booncharoen
Calibration Department Manager

MEASUREMENT RESULTS:

The Orifice gas flow device was calibrated by direct comparison method with the Standard Rotary Displacement Meter (Roots Meter). The Humid air was used as a medium in the system. The standard conditions are 25 °C (298.15 K) and 760 mmHg for standard temperature and standard pressure respectively.

Table 1: The results of Q Standard calibration data

Plate	Flow rate m^3/min	Pressure [Pa] mmHg	Temperature [Ta] °C	Temperature [Tm] °C	Δp_{meter} mmHg	$\Delta p_{Orifice}$ inH ₂ O	γ	Standard Flow [Q_s] m^3/min
1	0.699	755.476	24.24	23.40	53.510	1.786	1.334	0.649
2	1.000	755.470	24.17	23.68	58.170	3.598	1.894	0.921
3	1.111	755.481	24.19	23.60	40.793	4.682	2.160	1.050
4	1.167	755.465	23.87	23.48	31.004	5.323	2.305	1.118
5	1.411	755.522	24.29	23.78	30.145	7.846	2.796	1.352

Slope (m): 2.07871

Intercept (b): -0.01861

Correlation coefficient (r): 0.99984

Uncertainty (k=2): 0.015 m^3/min

Table 2: The results of Q actual calibration data

Plate	Flow rate m^3/min	Pressure [Pa] mmHg	Temperature [Ta] °C	Temperature [Tm] °C	Δp_{meter} mmHg	$\Delta p_{Orifice}$ inH ₂ O	γ	Standard Flow [Q_s] m^3/min
1	0.699	755.476	24.24	23.40	53.510	1.786	0.839	0.651
2	1.000	755.470	24.17	23.68	58.170	3.598	1.190	0.924
3	1.111	755.481	24.19	23.60	40.793	4.682	1.357	1.053
4	1.167	755.465	23.87	23.48	31.004	5.323	1.447	1.121
5	1.411	755.522	24.29	23.78	30.145	7.846	1.758	1.357

Slope (m): 1.30200

Intercept (b): -0.01171

Correlation coefficient (r): 0.99984

Uncertainty (k=2): 0.015 m^3/min

End of Certificate of Calibration



Mettler-Toledo (Thailand) Ltd.
846/4 - 846/5 Lasalle Rd., Bangna Tai Sub-District
Bangna District, Bangkok 10260
+662 723 0382
MT-TH.ServiceSupport@mt.com



Accuracy Calibration Certificate

Customer

Company: Environment Research & Technology Co., Ltd.
Address: 25114 Moo 6, Soi Chinaket 1, Ngamwongwan Rd., Toongsonghong
City: Laksi Contact: Ramita Taengthai
Zip / Postal: 10210
State / Province: Bangkok
Order Number:



Weighing Device

Manufacturer: Mettler Toledo Instrument Type: Weighing Instrument
Model: AE204-S Asset Number: ERTC-L-IN-0048
Serial No.: 1123103723 Terminal Model: N/A
Building: N/A Terminal Serial No.: N/A
Floor: 4 Terminal Asset No.: N/A
Room: 406

Range	Max. Capacity	Readability (d)
1	220 g	0.0001 g

Procedure

Calibration Guideline: EURAMET cg-18 v. 4.0 (11/2015)
METTLER TOLEDO Work Instruction: CPW00220

This calibration certificate contains measurements for As Found and As Left calibrations.
The sensitivity/span of the weighing instrument was adjusted before As Found and As Left calibrations with a built-in weight.
In accordance with EURAMET cg-18 (11/2015), the test loads were selected to reflect the specific use of the weighing device or to accommodate specific calibration conditions.

	Temperature		Humidity	
As Found	Start: 25.4 °C	End: 25.3 °C	Start: 36.4 %	End: 34.9 %
As Left	Start: 25.3 °C	End: 25.2 °C	Start: 34.9 %	End: 34.1 %

As Found Calibration Date: 15-Jan-2024 Calibrator: [Redacted]
As Left Calibration Date: 15-Jan-2024
Issue Date: 15-Jan-2024
Approved Signatory: Nithit Jongkrod
Technical Manager / Head of Calibration Center

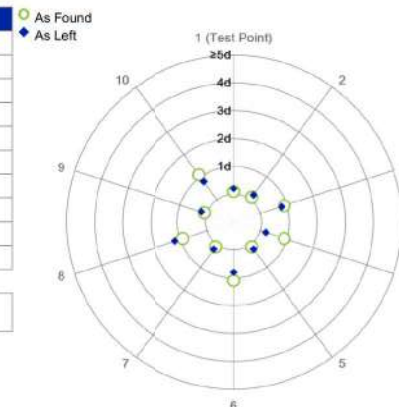
Measurement Results

Repeatability

Test Load: 100 g

	As Found	As Left
1	99.9993 g	100.0002 g
2	99.9993 g	100.0002 g
3	99.9992 g	100.0003 g
4	99.9992 g	100.0002 g
5	99.9993 g	100.0002 g
6	99.9994 g	100.0003 g
7	99.9993 g	100.0002 g
8	99.9992 g	100.0001 g
9	99.9993 g	100.0002 g
10	99.9994 g	100.0003 g

Standard Deviation	0.00007 g	0.00006 g
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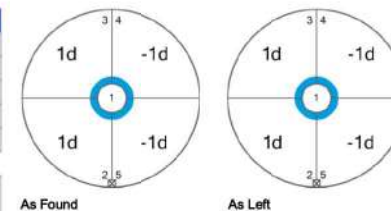
The "d" in the graph represents the readability of the range/interval in which the test was performed.
The results of this graph are based upon the absolute values of the differences from the mean value.

Eccentricity

Test Load: 100 g

Position	As Found	As Left
1	99.9993 g	100.0002 g
2	99.9994 g	100.0003 g
3	99.9994 g	100.0003 g
4	99.9992 g	100.0001 g
5	99.9992 g	100.0001 g

Maximum Deviation	0.0001 g	0.0001 g
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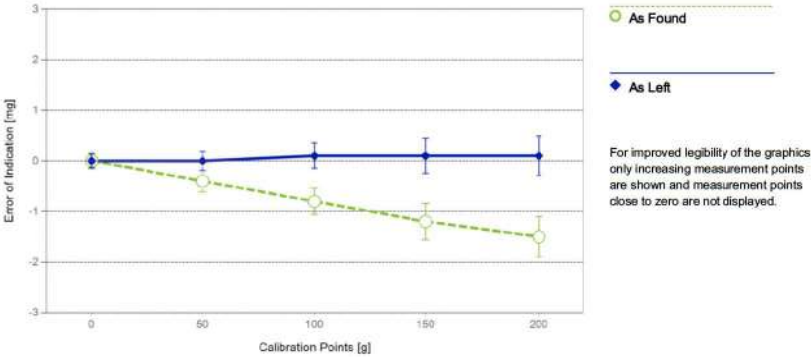


The "d" in the graph represents the readability of the range/interval in which the test was performed.

Error of Indication

As Found					
	Reference Value	Indication	Error of Indication	Expanded Uncertainty	k
1	0.0000 g	0.0000 g	0.0000 g	0.16 mg	2
2	0.0500 g	0.0501 g	0.0001 g	0.17 mg	2
3	0.1000 g	0.1000 g	0.0000 g	0.17 mg	2
4	0.5000 g	0.5001 g	0.0001 g	0.17 mg	2
5	1.0000 g	1.0000 g	0.0000 g	0.17 mg	2
6	5.0000 g	4.9999 g	-0.0001 g	0.17 mg	2
7	10.0000 g	9.9998 g	-0.0002 g	0.18 mg	2
8	50.0000 g	49.9996 g	-0.0004 g	0.21 mg	2
9	100.0001 g	99.9993 g	-0.0008 g	0.26 mg	2
10	150.0001 g	149.9989 g	-0.0012 g	0.36 mg	2
11	200.0000 g	199.9985 g	-0.0015 g	0.40 mg	2

As Left					
	Reference Value	Indication	Error of Indication	Expanded Uncertainty	k
1	0.0000 g	0.0000 g	0.0000 g	0.14 mg	2
2	0.0500 g	0.0500 g	0.0000 g	0.15 mg	2
3	0.1000 g	0.1000 g	0.0000 g	0.15 mg	2
4	0.5000 g	0.5000 g	0.0000 g	0.15 mg	2
5	1.0000 g	1.0000 g	0.0000 g	0.15 mg	2
6	5.0000 g	5.0000 g	0.0000 g	0.16 mg	2
7	10.0000 g	10.0000 g	0.0000 g	0.16 mg	2
8	50.0000 g	50.0000 g	0.0000 g	0.19 mg	2
9	100.0001 g	100.0002 g	0.0001 g	0.25 mg	2
10	150.0001 g	150.0002 g	0.0001 g	0.35 mg	2
11	200.0000 g	200.0001 g	0.0001 g	0.39 mg	2



The uncertainty stated is the expanded uncertainty at calibration obtained by multiplying the standard combined uncertainty by the coverage factor k – which can be larger than 2 according to EURAMET cg-18. The value of the measurand lies within the assigned range of values with a probability of approximately 95%.

The user is responsible for maintaining environmental conditions and the settings of the weighing instrument when it was calibrated. The results of this calibration certificate relate only to the calibrated item.

Test Equipment

All weights used for metrological testing are traceable to national or international standards. The weights were calibrated and certified by an accredited calibration laboratory.

Weight Set 1: OIML E2			
Weight Set No.:	WS52	Date of Issue:	22-Nov-2022
Certificate Number:	182272	Calibration Due Date:	21-May-2024
Thermo Hygromeier			
Equipment No.:	IN302	Date of Issue:	11-Oct-2023
Certificate Number:	SG-H-00656/66	Calibration Due Date:	08-Oct-2024

Remarks

Value of the built-in weight adjusted
Equipment condition: Good
Next calibration according to customer's procedure
Calibration data not decide by calibration laboratory

End of Accredited Section

The information below and any attachments to this calibration certificate are not part of the accredited calibration.

Measurement Uncertainty of the Weighing Instrument in Use

Stated is the expanded uncertainty with $k=2$ in use. The formula shall be used for the estimation of the uncertainty under consideration of the errors of indication. The value R represents the net load indication in the unit of measure of the device.

Temperature coefficient for the evaluation of the measurement uncertainty in use: $3.0 \cdot 10^{-6} / K$

Temperature range on site for the evaluation of the measurement uncertainty in use: $3 K$

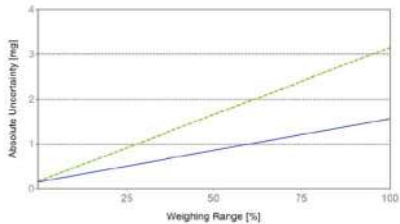
Linearization of Uncertainty Equation

	Range		As Found	As Left
	d	Max		
1	0.0001 g	220 g	$U_1 = 0.17 \text{ mg} + 0.0136 \text{ mg/g} \cdot R$	$U_1 = 0.15 \text{ mg} + 0.00644 \text{ mg/g} \cdot R$

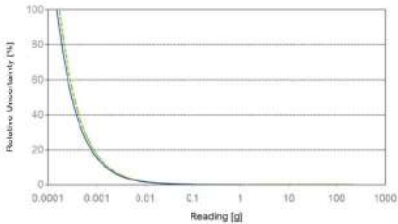
To optimize the stability of the linearization, besides of the zero load only increasing measurement points with a test load of 5% of the measurement range or larger are taken for the calculation of the linear equation.

Absolute and Relative Measurement Uncertainty in Use for Various Net Indications (Examples)

Net Indication	As Found		As Left	
	Value	Relative [%]	Value	Relative [%]
0.0220 g	0.17 mg	0.77%	0.15 mg	0.68%
0.2200 g	0.17 mg	0.075%	0.15 mg	0.069%
2.2000 g	0.20 mg	0.0091%	0.15 mg	0.0075%
22.0000 g	0.47 mg	0.0021%	0.29 mg	0.0013%
220.0000 g	3.2 mg	0.0014%	1.6 mg	0.00071%



As Found



As Left

GWP®
Certificate



As Found



As Left



The weighing device meets the given process requirements.

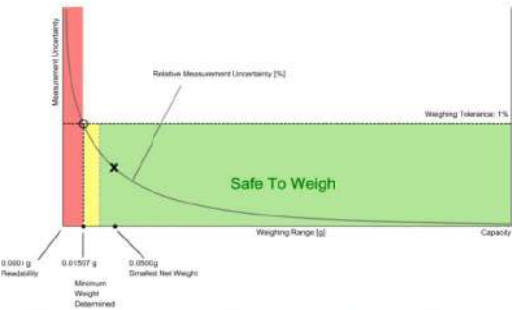
The weighing device meets the given process requirements.

Tests Performed: ☒ As Found ☒ As Left

Process Requirements

Weighing Tolerance: 1% | Smallest Net Weight: 0.0500 g | Safety Factor: 2

Safe Weighing Range



While the values in this graph reflect the actual calibration results, the measurement uncertainty curves are simply a visual representation. This graph reflects As Left testing, unless only As Found was performed.

Minimum Weight

As Found Minimum Weight Table

Minimum weights for different weighing tolerances and safety factors					
Tolerance	Safety Factor				
	1	2	3	5	10
0.1%	0.17097 g	0.34671 g	0.52742 g	0.90460 g	1.95110 g
0.2%	0.08490 g	0.17097 g	0.25823 g	0.43643 g	0.90460 g
0.5%	0.03382 g	0.05783 g	0.10202 g	0.17097 g	0.34671 g
1%	0.01689 g	0.03382 g	0.05080 g	0.08490 g	0.17097 g
2%	0.00844 g	0.01689 g	0.02535 g	0.04231 g	0.08490 g
5%	0.00337 g	0.00675 g	0.01013 g	0.01689 g	0.03382 g

✓ Pass: The determined minimum weight meets the requirement for the smallest net weight.

As Left Minimum Weight Table

Minimum weights for different weighing tolerances and safety factors					
Tolerance	Safety Factor				
	1	2	3	5	10
0.1%	0.15153 g	0.30304 g	0.46056 g	0.77780 g	1.60910 g
0.2%	0.07552 g	0.15153 g	0.22803 g	0.38254 g	0.77780 g
0.5%	0.03015 g	0.06030 g	0.09068 g	0.15153 g	0.30304 g
1%	0.01507 g	0.03015 g	0.04525 g	0.07552 g	0.15153 g
2%	0.00753 g	0.01507 g	0.02261 g	0.03770 g	0.07552 g
5%	0.00301 g	0.00602 g	0.00904 g	0.01507 g	0.03015 g

✓ Pass: The determined minimum weight meets the requirement for the smallest net weight.

At these net minimum weight values, the measurement uncertainty of the weighing device is equal to or less than 1/1 (no safety factor), 1/2, 1/3, 1/5, or 1/10 of the required tolerance. The values are calculated with $k=2$ and based on the linear formula of the measurement uncertainty of the weighing device in use.

The safety factor for As Found is always 1. This implies no safety factor. As Found testing looks at the behavior of the instrument from the past until test occurred. For the past, it is necessary to know that the tolerance was met, but not the safety factor. The safety factor is a proactive measure to apply for future measurements.

Notes on minimum weight values in above table:

- If "N/A" is shown above, no appropriate value could be calculated.
- METTLER TOLEDO is not responsible for the definition of the process requirements.

Measurement Results

Results Summary

	Repeatability	Eccentricity	Error of Indication
As Found	✓	✓	✓
As Left	✓	✓	✓

✓ = Passed
✗ = Failed
⚠ = Safety Factor not met

Repeatability

Test Load: 100 g

Tolerance	Control Limit	As Found		As Left	
		Std. Deviation	Result	Std. Deviation	Result
0.1%	N/A	0.00007 g*	N/A	0.00006 g*	N/A
0.2%	0.00005 g		✗		✗
0.5%	0.00013 g		✓		✓
1%	0.00025 g		✓		✓
2%	0.00050 g		✓		✓
5%	0.00125 g		✓		✓

*The calculated standard deviation value is below the rounding error of the balance. The 0.41° d rule is used for the assessment of this repeatability test and the calculation of the minimum weight.

The weighing tolerance is met if the standard deviation is less than or equal to the corresponding control limit.

Eccentricity

Test Load: 100 g

Tolerance	Control Limit	As Found		As Left	
		Deviation	Result	Deviation	Result
0.1%	0.0500 g	0.0001 g	✓	0.0001 g	✓
0.2%	0.1000 g		✓		✓
0.5%	0.2500 g		✓		✓
1%	0.5000 g		✓		✓
2%	1.0000 g		✓		✓
5%	2.5000 g		✓		✓

The weighing tolerance is met if the deviation is less than or equal to the corresponding control limit.

Attachment to Calibration Certificate:

TH3067-067-011524-ACC-TH

GWP® Certificate

Error of Indication

As Found

Control limits for various weighing tolerances							
Reference Value	Error	0.1%	0.2%	0.5%	1%	2%	5%
0.0000 g	0.0000 g	N/A	N/A	N/A	N/A	N/A	N/A
50.0000 g	-0.0004 g	0.0250 g	0.0500 g	0.1250 g	0.2500 g	0.5000 g	1.2500 g
100.0001 g	-0.0008 g	0.0500 g	0.1000 g	0.2500 g	0.5000 g	1.0000 g	2.5000 g
150.0001 g	-0.0012 g	0.0750 g	0.1500 g	0.3750 g	0.7500 g	1.5000 g	3.7500 g
200.0000 g	-0.0015 g	0.1000 g	0.2000 g	0.5000 g	1.0000 g	2.0000 g	5.0000 g
Result		✓	✓	✓	✓	✓	✓

As Left

Control limits for various weighing tolerances							
Reference Value	Error	0.1%	0.2%	0.5%	1%	2%	5%
0.0000 g	0.0000 g	N/A	N/A	N/A	N/A	N/A	N/A
50.0000 g	0.0000 g	0.0250 g	0.0500 g	0.1250 g	0.2500 g	0.5000 g	1.2500 g
100.0001 g	0.0001 g	0.0500 g	0.1000 g	0.2500 g	0.5000 g	1.0000 g	2.5000 g
150.0001 g	0.0001 g	0.0750 g	0.1500 g	0.3750 g	0.7500 g	1.5000 g	3.7500 g
200.0000 g	0.0001 g	0.1000 g	0.2000 g	0.5000 g	1.0000 g	2.0000 g	5.0000 g
Result		✓	✓	✓	✓	✓	✓

The weighing tolerance is met if the error (of indication) for each test point is less than or equal to the corresponding control limit for that particular weighing tolerance. Results at or close to the zero point cannot be assessed.



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E-mail : env@envresearch.co.th

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Head Office/Tax ID 0195 542 664 981

Calibration Data of CO Analyzer

Analyzer Performance Test

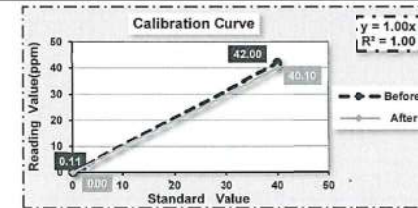
Equipment	Gas Analyzer (CO)	Customer Name	Vision E.
Manufacture	Thermo	Location	Env Research
Model	48C	Quotation	2024-00461
Serial No.	0415406564	Calibration Date	March 25, 2024
Analyzer Unit	ppm	Time	3:27 PM

Instruments for Calibration

Instruments	Manufacture	Model	Serial Number
Zero Air Supply	Thermo Env.	111	0700419829
Dynamic Dilution Calibrator	Tanabyte	300T	0165
Standard Gas Components	CO = 4.516	ppm	
Cylinder No : EB0123013	NO = 55.3	ppm	
Expire Date : Oct 22, 2027	SO ₂ = 54.9	ppm	

Single Point Calibration

Standard Gas	Standard Gas Value	Analyzer Value (ppm)		Stability		% Abs Error
		Before	After	Before	After	
Zero	0	0.11	0.00	-	-	-
Span	40	42.00	40.10	-	-	4.75



STATUS TEST AND VALIDATION OF CO ANALYZER MODEL 48C

Parameter	Display As	Unit	Observed Value		Nominal Range
			Before Adjust	After Adjust	
Range	RANGE	ppm	50	50	0 - 100 standard
Internal Temp	INTERNAL TEMP	°C	39.8	39.4	8.0 to 47.0
Chamber Temp	CHAMBER TEMP	°C	46.1	46.1	40.0 to 59.0
Pressure	PRESSURE	mmHg	740.9	754.1	250 to 1,000
Sample Flow	FLOW	LPM	0.910	0.987	0.350 to 1.500
Bias Voltage	BIAS VOLT	V	-115.3	-115.8	-130 to -100
AGC Intensity	AGC	Hz	203129	203709	150,000 to 300,000
Motor Speed	SPEED	%	100	100	100
Concentration	Conc.	ppm	1.344	0.375	0 to 10,000
Motherboard Status	MOTHERBOARD	-	OK	OK	OK
Interface Status	INTERFACE	-	OK	OK	OK

Calibrate By :

(MR.PANUPON PODANG)

March 25, 2024



Checked By :

(MS.SUTATIP IM-NOI)

March 25, 2024

Calibration Data of CO Analyzer

Analyzer Performance Test

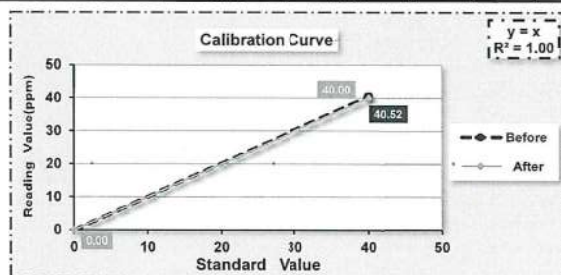
Equipment	Gas Analyzer (CO)	Customer Name	Vision E.
Manufacture	HORIBA	Location	Envi Research
Model	APMA-370	Quotation	2024-00461
Serial No.	4N02XP27	Calibration Date	February 29, 2024
Analyzer Unit	ppm	Time	1:21 PM

Instruments for Calibration

Instruments	Manufacture	Model	Serial Number
Zero Air Supply	Thermo Env.	111	0700419829
Dynamic Dilution Calibrator	Tanabyte	300	0165
Standard Gas Components	CO = 4.487 ppm NO = 46.1 ppm SO ₂ = 46.0 ppm		
Cylinder No :	EB0123013		
Expire Date :	Oct 22, 2027		

Single Point Calibration

Standard Gas	Standard Gas Value	Analyzer Value (ppm)		Stability		% Abs Error
		Before	After	Before	After	
Zero	0	-0.12	0.00	-	-	-
Span	40	40.52	40.00	-	-	1.30



STATUS TEST AND VALIDATION OF CO ANALYZER MODEL APMA-370

Parameter	Unit	Observed Value		Nominal Range
		Before Adjust	After Adjust	
SIGNAL (MAIN)	mV	8.7	10.7	Voltage of the measured CO Value
SIGNAL (COMP)	mV	5.4	6.9	Voltage of the interference component Value
CELL	°C	33.6	34.0	Ambient + (5 to 10 °C)
PUMP	kpa	56.9	56.8	less than 65
AMBIENT	kpa	101.5	101.3	Atmospheric pressure
DC 24V	mV	23.9	23.9	24 +/- 0.5 V
DC 5V	mV	4.9	4.9	5 +/- 0.5 V

Calibrate By :

(MR.PANUPON PODANG)
February 29, 2024

Checked By :

(MS.SUTATIP IM-NOI)
February 29, 2024

Calibration Data of SO₂ Analyzer

Analyzer Performance Test

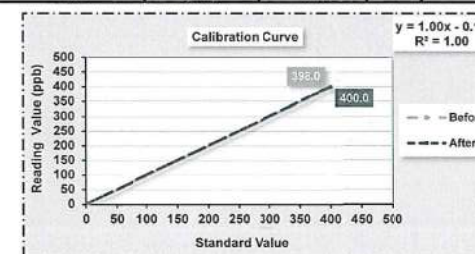
Equipment	Gas Analyzer (SO ₂)	Customer Name	Vision E.
Manufacture	Thermo	Location	Envi Research
Model	43C	Quotation	2024-00461
Serial No.	57469-317	Calibration Date	March 13, 2024
Analyzer Unit	ppb	Time	1:50 PM

Instruments for Calibration

Instruments	Manufacture	Model	Serial Number
Zero Air Supply	Thermo Env.	111	0700419829
Dynamic Dilution Calibrator	Tanabyte	300	0165
Standard Gas Components	CO = 4.516 ppm NO = 55.3 ppm SO ₂ = 54.9 ppm		
Cylinder No :	EB0123013		
Expire Date :	Oct 22, 2027		

Single Point Calibration

Standard Gas	Standard Gas Value	Analyzer Value (ppb)		Stability		% Abs Error
		Before	After	Before	After	
Zerc	0	-0.1	-0.1	-	-	-
Span	400	398.0	400.0	-	-	0.5



STATUS TEST AND VALIDATION OF SO₂ ANALYZER MODEL 43C

Parameter	Display As	Unit	Observed Value		Nominal Range
			Before Adjust	After Adjust	
Range	RANGE	ppb	500	500	0 - 500 standard
Internal Temperature	INTERNAL	°C	32.7	33.2	8.0 °C to 47.0 °C
Chamber Temp	CHAMBER	°C	45	44.5	43.0 °C to 47.0 °C
Pressure	PRESSURE	mmHg	719.1	761.9	400.0 to 1,000
Sample Flow	SAMP FLOW	LPM	0.430	0.371	0.350 to 1.000
Lamp Intensity	INTENSITY	Hz	24781	24364	20,000 to 50,000
Lamp Voltage	LAMP VOLTAGE	V	919	830	750 to 1,200
SO2 Concentration	SO2 CONCENTRATION	ppb	0.8	1.8	0 to 10,000
Motherboard Status	MOTHERBOARD STATUS	-	OK	OK	OK
Interface Status	INTERFACE STATUS	-	OK	OK	OK

Calibrate By :

(MR.PANUPON FODANG)
March 13, 2024

Checked By :

(MS.SUTATIP IM-NOI)
March 13, 2024

Calibration Data of SO₂ Analyzer

Analyzer Performance Test

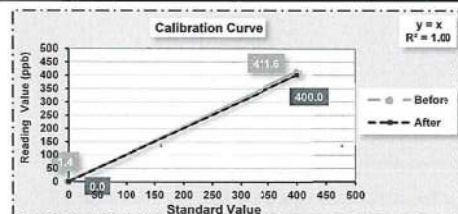
Equipment	Gas Analyzer (SO ₂)	Customer Name	Vision E.
Manufacture	Horiba	Location	Envi Research
Model	APSA-370	Quotation	2024-00461
Serial No.	ESKBWB08	Calibration Date	March 21, 2024
Analyzer Unit	ppb	Time	11:17 AM

Instruments for Calibration

Instruments	Manufacture	Model	Serial Number
Zero Air Supply	Thermo Env.	111	0700419829
Dynamic Dilution Calibrator	Tanabyte	300	0165
Standard Gas Components	CO = 4.516 ppm		
Cylinder No : EB0123013	NO = 55.3 ppm		
Expire Date : Oct 22, 2027	SO ₂ = 54.9 ppm		

Single Point Calibration

Standard Gas	Standard Gas Value	Analyzer Value (ppb)		Stability		% Abs Error
		Before	After	Before	After	
Zero	0	1.4	0.0	-	-	-
Span	400	411.6	400.0	-	-	2.9



STATUS TEST AND VALIDATION OF SO₂ ANALYZER MODEL APSA-370

Parameter	Unit	Observed Value		Nominal Range
		Before Adjust	After Adjust	
Range	ppb	500	500	0 - 500 Standard
Signal (SO ₂)	mV	7.0	6.3	Voltage of the measured SO ₂ value
LAMP	mV	270.9	270.8	200 mV - 1200 mV
CELL	°C	28.9	28.7	Ambient temperature + 5 °C - 15 °C
PUMP	Kpa	64.3	65.0	65 kPa or less
AMBIENT	kPa	101.3	101.3	Current atmospheric pressure
DC 24V	V	24.0	24.0	24 V ±0.5 V
DC 5V	V	5.0	5.0	5 V ±0.5 V

Calibrate By :

(MR.PANUPON PODANG)
March 21, 2024

Checked By :

(MS.SUTATIP IM-NOI)
March 21, 2024

Calibration Data of CO Analyzer

Analyzer Performance Test

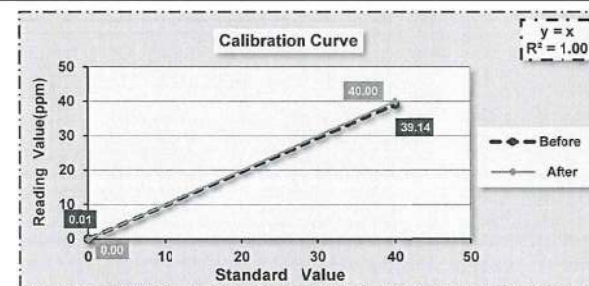
Equipment	Gas Analyzer (CO)	Customer Name	Vision E.
Manufacture	HORIBA	Location	Envi Research
Model	APMA-370	Quotation	2024-00461
Serial No.	3VJ73T6X	Calibration Date	March 21, 2024
Analyzer Unit	ppm	Time	1:24 PM

Instruments for Calibration

Instruments	Manufacture	Model	Serial Number
Zero Air Supply	Thermo Env.	111	0700419829
Dynamic Dilution Calibrator	Tanabyte	300	0165
Standard Gas Components	CO = 4.516 ppm		
Cylinder No : EB0123013	NO = 55.3 ppm		
Expire Date : Oct 22, 2027	SO ₂ = 54.9 ppm		

Single Point Calibration

Standard Gas	Standard Gas Value	Analyzer Value (ppm)		Stability		% Abs Error
		Before	After	Before	After	
Zero	0	0.01	0.00	-	-	-
Span	40	39.14	40.00	-	-	2.15



STATUS TEST AND VALIDATION OF CO ANALYZER MODEL APMA-370

Parameter	Unit	Observed Value		Nominal Range
		Before Adjust	After Adjust	
SIGNAL (MAIN)	mV	3.1	2.7	Voltage of the measured CO Value
SIGNAL (COMP)	mV	3.1	0.1	Voltage of the interference component Value
CELL	°C	33.6	35.4	Ambient + (5 to 10 °C)
PUMP	kPa	43.8	40.3	less than 65
AMBIENT	kPa	102.1	101.2	Atmospheric pressure
DC 24V	mV	23.9	23.9	24V ± 0.5 V
DC 5V	mV	4.9	4.9	5V ± 0.5 V

Calibrate By :

(MR.PANUPON PODANG)
March 21, 2024

Checked By :

(MS.SUTATIP IM-NOI)
March 21, 2024

Calibration Data of NOx Analyzer

Analyzer Performance Test

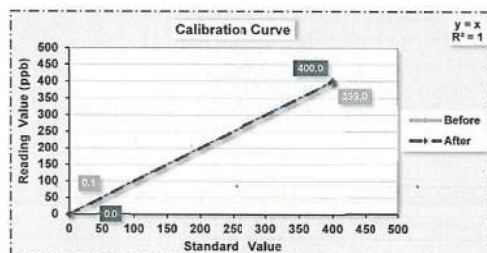
Equipment	Gas Analyzer (NOx)	Customer Name	Vision E.
Manufacture	HORIBA	Location	Envi Research
Model	APNA-370	Quotation	2024-00461
Serial No.	NT2CRTL2	Calibration Date	February 27, 2024
Analyzer Unit	ppb	Time	11:18 AM

Instruments for Calibration

Instruments	Manufacture	Model	Serial Number
Zero Air Supply	Thermo Env.	111	0700419829
Dynamic Dilution Calibrator	Tanabyte	300	0165
Standard Gas Components	CO = 4,516 ppm		
Cylinder No : EB0123013	NO = 55.3 ppm		
Expire Date : Oct 22, 2027	SO ₂ = 54.9 ppm		

Single Point Calibration

Standard Gas	Standard Gas Value	Analyzer Value								% Abs Error
		NO _x (ppb)		NO (ppb)		NO ₂ (ppb)		Stability		
		Before	After	Before	After	Before	After	Before	After	
Zero	0	-0.3	0.0	0.1	0.0	-0.4	0.0	-	-	-
Span	400	399.0	400.0	399.0	400.0	0.0	0.0	-	-	0.3



STATUS TEST AND VALIDATION OF NOx ANALYZER MODEL APNA-370

Parameter	Unit	Observed Value		Nominal Range
		Before Adjust	After Adjust	
Range	ppb	500	500	0 - 500 Standard
Signal NO	mV	1.3	1.1	Voltage of the measured NO value
Signal NOx	mV	17.2	16.1	Voltage of the measured NOx value
Detector	°C	41.8	41.8	43 °C ± 5 °C
Ambient	kPa	101.7	101.8	Current atmospheric pressure
DC 24V	V	23.7	23.7	24V ±0.5
DC 5V	V	5.0	5.0	5V ±0.5
NO Slope	-	1.06338	1.06240	0.50000 - 2.0000
NOx Slope	-	1.06538	1.05150	0.50000 - 2.0000

Calibrate By:

(MR.PANUPON PODANG)
February 27, 2024

Checked By:

(MS.SUTATIP IM-NOI)
February 27, 2024

Calibration Data of NOx Analyzer

Analyzer Performance Test

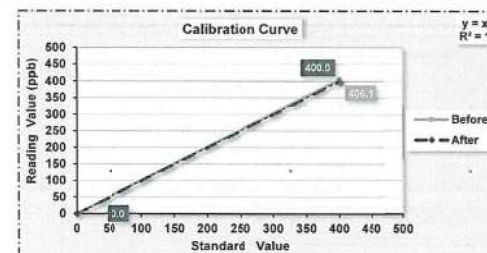
Equipment	Gas Analyzer (NOx)	Customer Name	Vision E.
Manufacture	HORIBA	Location	Envi Research
Model	APNA-370	Quotation	2024-00461
Serial No.	PA6WVAJ9	Calibration Date	February 9, 2024
Analyzer Unit	ppb	Time	11:07 AM

Instruments for Calibration

Instruments	Manufacture	Model	Serial Number
Zero Air Supply	Thermo Env.	111	0700419829
Dynamic Dilution Calibrator	Tanabyte	300	0165
Standard Gas Components	CO = 4,516 ppm		
Cylinder No : EB0123013	NO = 55.3 ppm		
Expire Date : Oct 22, 2027	SO ₂ = 54.9 ppm		

Single Point Calibration

Standard Gas	Standard Gas Value	Analyzer Value								% Abs Error
		NO _x (ppb)		NO (ppb)		NO ₂ (ppb)		Stability		
		Before	After	Before	After	Before	After	Before	After	
Zero	0	-0.3	0.0	-0.1	0.0	-0.2	0.0	-	-	-
Span	400	404.6	400.0	406.1	400.0	-1.5	0.0	-	-	1.5



STATUS TEST AND VALIDATION OF NOx ANALYZER MODEL APNA-370

Parameter	Unit	Observed Value		Nominal Range
		Before Adjust	After Adjust	
Range	ppb	500	500	0 - 500 Standard
Signal NO	mV	2.0	0.6	Voltage of the measured NO value
Signal NOx	mV	18.5	8.8	Voltage of the measured NOx value
Detector	°C	41.0	41.0	43 °C ± 5 °C
Ambient	kPa	100.6	100.6	Current atmospheric pressure
DC 24V	V	23.5	23.6	24V ±0.5
DC 5V	V	5.0	5.0	5V ±0.5
NO Slope	-	1.19250	1.19120	0.50000 - 2.0000
NOx Slope	-	1.19650	1.19540	0.50000 - 2.0000

Calibrate By:

(MR.PANUPON PODANG)
February 9, 2024

Checked By:

(MS.SUTATIP IM-NOI)
February 9, 2024

Calibration Data of NOx Analyzer

Analyzer Performance Test

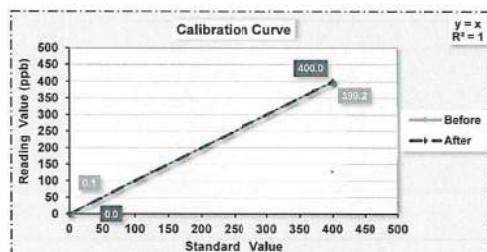
Equipment	Gas Analyzer (NOx)	Customer Name	Vision E.
Manufacture	HORIBA	Location	Envi Research
Model	APNA-370	Quotation	2024-00461
Serial No.	U9LS50WU	Calibration Date	February 12, 2024
Analyzer Unit	ppb	Time	10:02 AM

Instruments for Calibration

Instruments	Manufacture	Model	Serial Number
Zero Air Supply	Thermo Env.	111	0700419829
Dynamic Dilution Calibrator	Tanabyte	300	0165
Standard Gas Components	CO = 4.516 ppm NO = 55.3 ppm SO ₂ = 54.9 ppm		
Cylinder No :	E80123013		
Expire Date :	Oct 22, 2027		

Single Point Calibration

Standard Gas	Standard Gas Value	Analyzer Value								% Abs Error
		NO _x (ppb)		NO (ppb)		NO ₂ (ppb)		Stability		
		Before	After	Before	After	Before	After	Before	After	
Zero	0	0.1	0.0	0.1	0.0	0.0	0.0	-	-	-
Span	400	399.1	400.0	399.2	400.0	-0.1	0.0	-	-	0.2



STATUS TEST AND VALIDATION OF NOx ANALYZER MODEL APNA-370

Parameter	Unit	Observed Value		Nominal Range
		Before Adjust	After Adjust	
Range	ppb	500	500	0 - 500 Standard
Signal NO	mV	0.1	2.1	Voltage of the measured NO value
Signal NOx	mV	11.6	8.0	Voltage of the measured NOx value
Detector	°C	41.5	41.4	43 °C ± 5 °C
Ambient	kPa	102.0	101.6	Current atmospheric pressure
DC 24V	V	23.5	23.6	24V ±0.5
DC 5V	V	5.0	5.0	5V ±0.5
NO Slope	-	0.83013	0.83250	0.50000 - 2.0000
NOx Slope	-	0.82457	0.82680	0.50000 - 2.0000

Calibrate By :

(MR.PANUPON PODANG)
February 12, 2024

envi research
Checked By :

(MS.SUTATIP IM-NOI)
February 12, 2024

Calibration Data of SO₂ Analyzer

Analyzer Performance Test

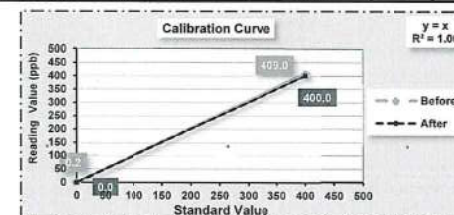
Equipment	Gas Analyzer (SO ₂)	Customer Name	Vision E.
Manufacture	Horiba	Location	Envi Research
Model	APSA-370	Quotation	2024-00461
Serial No.	X7L602W6	Calibration Date	March 5, 2024
Analyzer Unit	ppb	Time	11:13 AM

Instruments for Calibration

Instruments	Manufacture	Model	Serial Number
Zero Air Supply	Thermo Env.	111	0700419829
Dynamic Dilution Calibrator	Tanabyte	300	0165
Standard Gas Components	CO = 4.516 ppm NO = 55.3 ppm SO ₂ = 54.9 ppm		
Cylinder No :	EB0123013		
Expire Date :	Oct 22, 2027		

Single Point Calibration

Standard Gas	Standard Gas Value	Analyzer Value (ppb)		Stability		% Abs Error
		Before	After	Before	After	
Zero	0	0.2	0.0	-	-	-
Span	400	409.0	400.0	-	-	2.3



STATUS TEST AND VALIDATION OF SO₂ ANALYZER MODEL APSA-370

Parameter	Unit	Observed Value		Nominal Range
		Before Adjust	After Adjust	
Range	ppb	500	500	0 - 500 Standard
Signal (SO ₂)	mV	6.2	6.3	Voltage of the measured SO2 value
LAMP	mV	240.3	243.9	200 mV - 1200 mV
CELL	°C	30.0	29.2	Ambient temperature + 5 °C - 15 °C
PUMP	Kpa	44.0	42.9	65 kPa or less
AMBIENT	kPa	102.0	101.8	Current atmospheric pressure
DC 24V	V	24.0	24.0	24 V ±0.5 V
DC 5V	V	5.0	5.0	5 V ±0.5 V

Calibrate By :

(MR.PANUPON PODANG)
March 5, 2024

envi research
Checked By :

(MS.SUTATIP IM-NOI)
March 5, 2024



THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-67/0064

MTC No. EEL. BP. 121/1066

CALIBRATION CERTIFICATE

Submitted by : Environment Research & Technology Co.,Ltd.

Address : 25/114 Moo 6, Soi Chinaket 1, Ngamwongwan Road, Toongsonghong, Laksi, Bangkok, 10210.

Calibrated at : Electrical and Electronic Standards Laboratory, Industrial Metrology and Testing Service Centre.
Soi 1C, Bangpoo Industrial Estate, Sukhumvit Rd., Muang, Samutprakan 10280.

Instrument Calibrated :

Description : Precision Acoustic Calibrator

Manufacturer : Larson Davis

Model : CAL200

Serial No. : 3606

Standards used : 1. Digital Function Synthesizer NF Electronic DF-193A S/N 122037.

2. Measuring Amplifier Bruel&Kjaer 2636 S/N 1537484.

3. Programmable Attenuator Tamagawa TPA-303A S/N OF 2214.

4. Digital Multimeter Agilent 34401A S/N MY44005560.

5. Pressure Transmitter Vaisala PTB202AD S/N T0650001.

6. Audio Analyzer Panasonic VP-7722A S/N 041477D122.

7. Condenser Microphone B&K 4180 S/N 2633526.

Ambient Environment

Temperature : $(23 \pm 3) ^\circ\text{C}$

Relative Humidity : $(50 \pm 15) \%$

Ambient Pressure : $(101.325 \pm 1.500) \text{ kPa}$

Calibration Procedure: CP-102-04 based on IEC 60942:2003. The sound pressure level of instrument was measured by standard microphone using an insert voltage technique.

This instrument has been calibrated against standards maintained at Electrical and Electronic Standards Laboratory (EEL), which are traceable to the International System of Units through the National Institute of Metrology (Thailand).

The information on actual reading is attached herewith and the uncertainty limits quoted refer to the measured values only.

Date of Receipt : 30 Oct. 2023

Date of Calibration : 31 Oct. 2023

1 / 2

The results relate only to the items tested/calibrated or value assigned.
Advertising the Report/Certificate and publicity of the results except in full are prohibited unless written permission is obtained from the governor of TISTR.

FM.BL.MTC.002 Rev.4

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THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-67/0064

MTC No. EEL. BP. 121/1066

The reported expanded uncertainty is based upon a standard uncertainty multiplied by a coverage factor $k = 2$, providing a level of confidence of approximately 95%.

Nominal Output of Unit Under Test = 94 dB re 20 μPa at 1000 Hz

Acoustic Output in dB re 20 μPa , Corrected to Reference Conditions : 101.325 kPa, 23.0 $^\circ\text{C}$ and 50 %RH

1. Sound Pressure Level

Standard Microphone Type	Measured Sound Pressure Level (dB)	Deviated value (dB)	Uncertainty (dB)	Tolerance limit IEC60942:2003 Class 1
1/2 inch Bruel&Kjaer4180	93.42	-0.58	± 0.10	$\pm 0.40 \text{ dB}$

2. Frequency

Standard Microphone Type	Measured Frequency (Hz)	Deviated value (Hz)	Uncertainty (Hz)	Tolerance limit IEC60942:2003 Class 1
1/2 inch Bruel&Kjaer4180	1000.4	0.4	± 1.5	$\pm 1.0\%$

3. Total distortion

Standard Microphone Type	Measured Total distortion (%)	Uncertainty (%)	Tolerance limit IEC60942:2003 Class 1
1/2 inch Bruel&Kjaer4180	1.80	± 0.50	$\pm 3.0\%$

Note : 1. No adjustment.

2. The calibrator pressure correction was not included.

3. The microphone volume correction was included at level of 0.26 dB from manual.

Date of Calibration : 31 Oct. 2023

2

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FM.BL.MTC.002 Rev.4

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E-mail : sumalee@tistr.or.th



THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-67/0064

MTC No. EEL. BP. 121/1066

Nominal Output of Unit Under Test = 114 dB re 20µPa at 1000 Hz

Acoustic Output in dB re 20µPa, Corrected to Reference Conditions : 101.325 kPa, 23.0 °C and 50 %RH

1. Sound Pressure Level

Standard Microphone Type	Measured Sound Pressure Level (dB)	Deviated value (dB)	Uncertainty (dB)	Tolerance limit IEC60942:2003 Class 1
1/2 inch Bruel&Kjaer 4180	113.45	-0.55	± 0.10	±0.40 dB

2. Frequency

Standard Microphone Type	Measured Frequency (Hz)	Deviated value (Hz)	Uncertainty (Hz)	Tolerance limit IEC60942:2003 Class 1
1/2 inch Bruel&Kjaer 4180	1000.2	0.2	± 1.5	±1.0%

3. Total Distortion

Standard Microphone Type	Measured Total Distortion (%)	Uncertainty (%)	Tolerance limit IEC60942:2003 Class 1
1/2 inch Bruel&Kjaer 4180	0.60	± 0.50	±3.0%

Note : 1. No adjustment.

2. The calibrator pressure correction was not included.

3. The microphone volume correction was included at level of 0.26 dB from manual.

Calibrated by :



(Mr. Weerachai Deechaiyae)

Approved by :



(Mr. Prawate Klaiyapa)

Director

Electrical and Electronic Standards Laboratory

Industrial Metrology and Testing Service Centre

Date of Calibration : 31 Oct. 2023

Date of Issue : 1 Nov. 2023

Ref : 2011266103004305003

End of Certificate

3 / 3

The results relate only to the items tested/calibrated or value assigned.

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FM.BLMTC.002 Rev.4

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Fax. (66) 0 2579 8592
E-mail : sumalee@tistr.or.th



PinAAcle 900Z Preventive Maintenance Report

Company Name:

ENVIRONMENT RESEARCH

Instrument Location: 25/114 M.6, THANON NGAMWONGWAN
THUNGSONGHONG, LAKSI, BANGKOK, 10210

Instrument Serial No.:

PZAS19031401

Date: 30-Jun-2023

PinAAcle 900Z Preventive Maintenance (PM)

Company Name:	ENVIRONMENT RESEARCH		
Address (Instrument Location):	25/114 M.6, THANON NGAMWONGWAN, THUNGSONGHONG, LAKSI, BANGKOK		
Serial Number:	PZAS19031401	PM Number:	1/2
Customer Name (if applicable):	K. RAIWIN	Telephone Number:	099-182-9241
Customer Support Engineer Name:	K. DUANG	Service Order Number:	WO-02273780
Date PM Performed: (DD-MMM-YYYY)	30-Jun-2023	Next PM Due Date: (DD-MMM-YYYY)	30-Dec-2023
Standard Labor Hours to Complete PM :		5 hours	

Part Number	Release	Publication Date	
09370144 Rev.9	A	January 2018	

Scope

The purpose of this PM is to ensure the continued functionality of the PinAAcle 900Z by inspecting and replacing any worn or damaged parts. This service should only be performed by a trained representative of PerkinElmer.

The customer should save their method before the PM begins.

General Instructions:

The customer must provide the engineer operational data to demonstrate recent instrument performance prior to starting the PM.

Always check with the customer before making any changes that may affect the customer's analysis or calibration, including a current back-up of system software and/or data files.

The completed document should be signed by an authorized PerkinElmer and customer representative and left with the customer.

Update the PM sticker and instrument logbook as required.

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Component List

Component / Specific Model	Serial #	Configuration Notes

Parts Lists

Parts Included with the PM		
Part Number (if applicable)	Description	Quantity
B0501696	Fan Filters	2
B3002013	THGA Contact Cylinders	1
B3141064	Glycerol for THGA Cooling	N/A

Additional Reagents and Standards Required for PM

Part Number (if applicable)	Description	Quality	Batch/Lot #	Expired Date (MM/YY)
N9300244	GFAAS Mixed Standard	AR	56-021CRY1	30-Jun-2023

Additional Reagents and Standards Required for PM (Customer Support Solution)

Part Number (if applicable)	Description	Quantity	Batch/Lot #	Expiration Date (MM/YY)
N/A	DI Water	250 mL	AR	AR
N/A	0.5% HNO ₃	250 mL	AR	AR

Additional Tools Required for PM			
Part Number (if applicable)	Description	Quantity	Serial #
B3100652 Or N9307029	Electronic Flow Meter	1	NA
B0505495	Test Jig	1	NA
03030997	System 2 EDL Driver	1	03030997
N3050605	As System 2 EDL	1	16148
N3050121	Cu Lumina HCL	1	092216-010130
N3050109	Ba Lumina HCL	1	102416-040160
N3050139	K Lumina HCL	1	110716-010060
N3050152	Ni Lumina HCL	1	100516-030190
N3050119	Cr Lumina HCL	1	091911-020150

Procedure Checklist

Use (✓) to check off those steps in the checklist that have been completed.

1. General:

- ☒ Review the instrument performance with the customer and document any recent problems.
- ☒ Inspect the customer log book and make any appropriate PM entries.
- ☒ Perform general inspection of system for cleanliness.

2. PC Instrument Software:

- ☒ Instrument Software user files/databases archived, packed, and/or deleted as needed.

3. Mechanical:

- ☒ Inspect and clean all fans and filters. Replace filters if necessary.
- ☒ Inspect all gas and water lines for leaks and/or wear. Replace if needed. Thoroughly inspect all quick connects. Replace the Y connector, P/N 09921079, if needed.
- ☒ Clean exterior of the instrument.
- ☒ Check the drain system for signs of wear. Replace worn or damaged parts.
- ☒ Inspect the pole pieces and clean where the pole pieces contact the furnace. Replace the pole piece p-rings as needed, P/N's B0501018 & B0501250. Grease the O-rings as needed with Apiezon L grease, P/N 09905148.
- ☒ Inspect the four insulation pads on the front contact housing of the THGA in furnace. If the pads are missing replace the TH-GA furnace or replace the insulator pads on the furnace.
- ☒ Inspect the graphite tube and clean the contact cylinders. Replace if necessary.
- ☒ Check internal and external gas flows with the Electronic Gas Flow Meter and the Gas Flow Test Probe as described in the Service Manual. Correct if necessary.
- ☒ Check furnace open/close function.
- ☒ Verify the operation of the GFTV Camera for proper operation and viewing alignment in the furnace camera Tube View window. Align if needed.
- ☒ Check the operation of the Halogen Light ASSY for the GFTV Camera. Replace if needed.
- ☒ Check the water level/quality in the recirculation (if applicable). Add distilled water if necessary.
- ☒ Check the cooling system fluid flow rate with the FCS In-Line Flow Meter for proper levels if needed. Refer to SDB# COSY008.STN
- ☒ Perform Cooling System maintenance if needed per SDB# COSY005.STN.
- ☒ Check auto sampler operation.
- ☐ Perform an auto sampler check valve test as described in the Service Manual.
- ☒ Lubricate the spindles of the auto sampler pumps and all moving parts of the tray mechanics as described in the Service Manual.
- ☒ Inspect the auto sampler sampling capillary as described in the Service Manual. Replace if necessary.
- ☒ Inspect the four insulation pads on the front contact housing of the THGA in furnace. If the pads are missing replace the TH-GA furnace or replace the insulator pads on the furnace.
- ☒ Inspect the graphite tube and clean the contact cylinders. Replace if necessary.
- ☒ Check internal and external gas flows with the Electronic Gas Flow Meter and the Gas Flow Test Probe as described in the Service Manual. Correct if necessary.
- ☒ Check furnace open/close function

4. Electrical:

- ☒ Inspect PC boards. Clean if necessary.
- ☒ Check instrument firmware revisions upgrade to current levels (if necessary)
- ☒ Run Diagnostics Test within the Advanced function of the Spectrometer page. Check the results in the service log folder in the Spectrometer BM log Viewer.

5. Optics:

- ☒ Inspect and clean the sample compartment windows, if needed.
- ☒ Inspect and clean the furnace windows, if needed.
- ☒ Inspect and clean the GFTV camera lens, if needed.
- ☒ Inspect optics. Clean or replace if necessary,

6. Gasses:

- ☒ Verify that the Gasses supplied to the instrument are within the pressure and purity specifications found in the PinAAcle 900 Series Pre-installation Checklist SDB.
- ☒ Verify that the air filter element is dry. Replace if necessary.

7. After PM Performance tests [THGA]:

7.1 Furnace Gas Flows

Description: Ensures the flow rates are within specification.

Parameter	Specification	Test Results	Pass/Fail
Internal flow Rate	250 mL/min \pm 25 mL/min	255	Passed
External flow Rate	100 mL/min \pm 10 mL/min	105	Passed

7.2 Chromium Baseline Noise

Description: Signal to noise check.

Parameter	Specification	Results	Pass/Fail
Baseline Noise	\leq 0.005 Abs.	0.0011	Passed
Standard Deviation	\leq 0.005	0.0003	Passed

7.3 Chromium Characteristic Mass and Precision

Description: Calculate the characteristic mass using the characteristic mass tool and precision from the integrated absorbance values.

Parameter	Specification	Results	Pass/Fail
Cr m_0 Results	\leq 7.0 pg/0.0044 A-s	6.6	Passed
Precision	\leq 2.0 %	1.47	Passed

7.4 Copper Characteristic Mass and Zeeman Ratio

Description: Calculate the characteristic mass using the characteristic mass tool and check the Zeeman Ratio.

Parameter	Specification	Results	Pass/Fail
Cu m_0 Result	\leq 16.5 pg/0.0044 A-s	15.4	Passed
Zeeman Ratio	0.52 \pm 0.04	0.52	Passed

8. Review:

- ☒ Review with the customer PM work performed.
- ☒ Review with the customer routine maintenance procedures.
- ☒ Discuss recommended customer supplied materials to have on hand.
- ☒ Attach PM sticker.

Additional Comments

Additional Comments Regarding the PM	
Zeeman Ratio	$= \frac{\text{Atomic Signal (Peak area)}}{\text{Atomic Signal (Peak area)} + \text{Background Signal (Peak area)}}$
	$= \frac{0.1456}{0.1456 + 0.1293}$
	$= 0.52$

Review

<i>The preventive maintenance checks and if applicable performance tests for PinAAcle 900Z have been completed.</i>	
<i>This PinAAcle 900Z Passes <input checked="" type="checkbox"/> Fails <input type="checkbox"/> the preventive maintenance.</i>	
Review of Preventive Maintenance:	
Authorized PerkinElmer Representative:	<div style="background-color: black; width: 100px; height: 40px;"></div> Date: 30-Jun-2023 (DD-MMM-YYYY)
Authorized Customer Representative:	<div style="background-color: black; width: 100px; height: 40px;"></div> Date: 30-Jun-2023 (DD-MMM-YYYY)



Agilent CrossLab Compliance

Qualification Type:	ES-OQ
System ID:	MY15330001
EQP Name:	AgilentRecommended
EQP Revision:	ES.02.50
EQP Publish Date:	March 2020
Date:	November 28, 2023 1:10:31 PM
Report Type:	Report
Org. Name:	Environment Research & Technology Co.,Ltd
Org. Location:	25/114 Moo 6 Soi Chinaket, Ngamwongwan Rd., Bangkok 10210

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Test Summary

Purpose

This section includes the Overall Qualification Status and details for each test that meets at least one of the following criteria: (1) was not scheduled; (2) was scheduled but not run; (3) was processed more than once; (4) passed recommended limits only when dual limits were selected; (5) required deviation(s) or comment(s); (6) required integration event change(s). Tests that pass and do not meet any criteria above are not included.

For a complete list of scheduled tests, see the table of contents. For supporting documentation, refer to the Attachments section.

NOTE: A Pass for the Overall Qualification Status indicates that all scheduled tests were run and passed; R, I, D, and C are blank if not applicable for that specific test.

R: runs

I: integration event changes

D: number of deviations submitted

C: number of comments submitted

Status: NS (not scheduled); NR (scheduled but not run); NC (unlocked but not completed)

Details

Test

Status

R I D C

There were no repeated or re-integrated tests. All test resulted in a pass status.

Overall Qualification Status

Pass

Service Details

Purpose

This section includes local contact and delivery details for this service.

General Details

Service Order No./Request: 6006377416
EQP Name: AgilentRecommended
EQP Revision: ES.02.50
Report Type: Report

Organization Details

Name: Environment Research & Technology Co.,Ltd
Location: 25/114 Moo 6 Soi Chinaket, Ngamwongwan Rd., Bangkok 10210

Local Contact Details

Name: K Raiwin Posit
Job Title: Supervisor Scientist
Qualification Location: ICPOES Room

Operator Details

Name: Worawit Timakul
Job Title: Field Service Engineer

Data Acquisition Details

Acquisition Software Name: ICP Expert
Acquisition Software Revision: 7.1.0.6821

Customer Data System (CDS): Es: ICP Expert

Date: November 28, 2023 1:10:31 PM
System ID: MY15330001

Instrument Details

Purpose

This section describes the as found system configuration.

Details

Spectrometer 1

Manufacturer: Agilent Technologies
Name: 5100 VDV
Model Number: G8011A
Sample Introduction: Double pass glass cyclonic spraychamber and seaspray nebulizer
Serial Number: MY15330001
Firmware Revision: 2994

Chiller 1

Manufacturer: Agilent Technologies
Name: Chiller
Model Number: G8481A
Serial Number: 1A1560387

Autosampler 1

Manufacturer: Agilent Technologies
Name: SPS4
Model Number: G8410A
Serial Number: AU15220240

Vapor Generator 1

Manufacturer: Agilent Technologies
Name: VGA77P
Model Number: G8475A
Serial Number: MY15330002

Date: November 28, 2023 1:10:31 PM
System ID: MY15330001

Protocol Details

Purpose

This section lists the revisions for all test units used in this report. For complete test-specific and high-level change details, refer to the Revision History document.

Test Revision	Test
ES.02.50	Autosampler Operation
ES.02.50	Instrument Tests
ES.02.50	Preparation

Preparation

Purpose

This test records a status for each preparation task for the Agilent ICP-OES.

Configuration Details

Model/Serial No.:	G8011A	MY15330001
-------------------	--------	------------

Results

Criteria	Observed Result	Expected Result	Status
Does the plasma ignite successfully in the first three attempts?	Yes	Yes	Pass
Was the detector calibration performed and completed successfully?	Yes	Yes	Pass
Was the instrument calibration performed and completed successfully?	Yes	Yes	Pass

Test Evidence

Image Details:	Was the detector calibration performed and completed successfully?
Date and Time:	November 28, 2023 12:56:03 PM
Host Name:	5CGC202NQ4

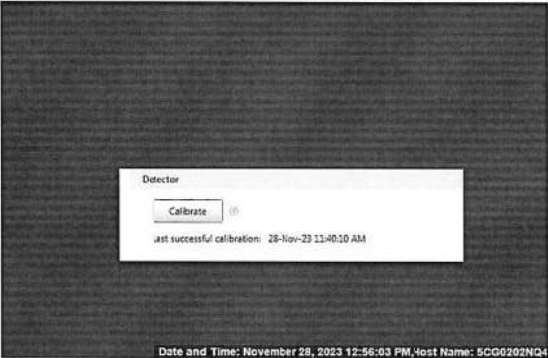
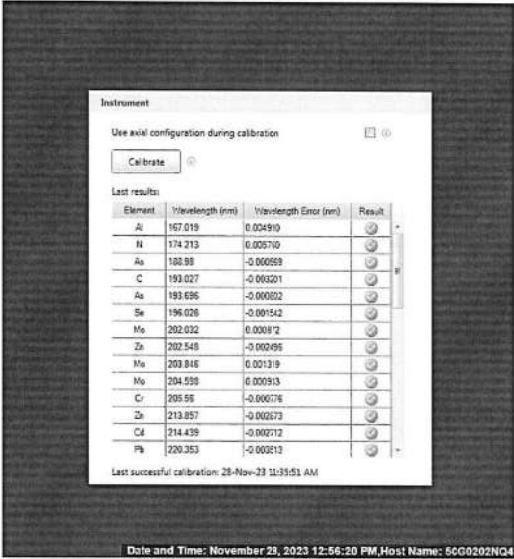


Image Details: Was the instrument calibration performed and completed successfully?
Date and Time: November 28, 2023 12:56:20 PM
Host Name: 5CG0202NQ4



Overall Test Status

Pass

Runs: 1

Instrument Tests

Purpose

This test records a status for each of the automated tests within the Agilent ICP-OES CDS. For detailed test criteria, refer to the attached report.

Configuration Details

Model/Serial No.: G8011A MY15330001

Results

	Observed Result	Expected Result	Status
Are the Functional Tests results within acceptance criteria?			
Subsystem Communications	Yes	Yes	Pass
Air Flow	Yes	Yes	Pass
Water Flow	Yes	Yes	Pass
Gas Flows	Yes	Yes	Pass
RF Generator	Yes	Yes	Pass
Camera	Yes	Yes	Pass
Optics	Yes	Yes	Pass

Are the Instrument Performance Tests results within acceptance criteria?

Resolution	Yes	Yes	Pass
Sensitivity	Yes	Yes	Pass
Precision	Yes	Yes	Pass

Overall Test Status

Pass

Runs: 1

Autosampler Operation

Purpose
This test verifies that the autosampler operates properly.

Configuration Details

Model/Serial No.:	G8410A	AU15220240
-------------------	--------	------------

Results

Criteria	Observed Result	Expected Result	Status
Does the autosampler successfully move to the specified location(s)?	Yes	Yes	Pass

Overall Test Status

Pass	Runs: 1
------	---------

Declaration of Change Control

This document is under change control. Revision history is maintained and printed on each document. Access to the master documents is limited to process owners. Documents receive periodic review and cannot be assigned an evergreen status. The qualification performed according to this document refers only to the hardware/software configuration in place at the time of the qualification. Agilent Technologies recommends that instrument configuration change management procedures be in place in order to maintain the validation process. Any changes to the analytical or computer hardware or software must be clearly specified. A change management system provides a means for determining the degree of requalification required according to the extent of the changes made. All details of the changes must be thoroughly recorded and documented, together with details of completed tests and their results. Note: Hardware/software configuration management is the customer's responsibility.

Attachments


Training requirements note: The delivery engineer attaches an ACE technique-specific training certificate to the Equipment Qualification Report (EQR). Obtaining ACE technique-specific certification includes pre-requisite trainings for Data Integrity, General Compliance topics (GMP, GLP, ALCOA, etc.), instrument hardware and software components, and the ACE technique itself. The one certificate encompasses all pre-requisite trainings as documented in the Agilent Learning Management System called Success Factors.

Location	Category	Document Name	Page
EQR	General	Certificate of Qualification for ACE	13
EQR	General	Operator's training certificate and qualifications	14
EQR	General	Operator's training certificate and qualifications	15
EQR	General	Certificate of System Qualification	16
EQR	General	Instrument's Test Report	17
EQR	General	Software Verification	20
EQR	Material	Certificate of Analysis Wavelength calibration solution	21

General

Document Name:

Certificate of Qualification for ACE

Agilent Technologies

Agilent Compliance Engine Self Qualification

Date:October 18, 2023 10:19:46 AM

Drive Serial #:90593EBAPlatform Revision:ACE 1.12.112

Individual self-qualification reports for each specific technique installed are also available upon request. They provide additional details on the general report from the concise summary and are structured by the actual algorithms challenged during the process. There is not a one-to-one relationship between algorithms and OQ program tests because some algorithms are used by several tests and across multiple similar hardware components of the qualified systems.

Technique Type	Tests Completed	Result
Atomic Absorption	7	Conforms
Capillary Electrophoresis	10	Conforms
Dissolution	6	Conforms
Emission Spectroscopy	3	Conforms
Gas Chromatography - GCMS	17	Conforms
Gas Chromatography	29	Conforms
Gel Permeation Chromatography	9	Conforms
ICPMS	6	Conforms
Infrared Spectroscopy	7	Conforms
Liquid Chromatography	17	Conforms
Liquid Chromatography - LCMS	8	Conforms
Microfluidics	18	Conforms
Sample Preparation - Gas Chromatography	9	Conforms
Sample Preparation - Liquid Chromatography	8	Conforms
Supercritical Fluid Chromatography	15	Conforms
Software	6	Conforms
UV-Vis Spectrophotometer	13	Conforms

Overall Qualification Status

Conforms

General

Document Name: Operator's training certificate and qualifications



Certificate of Completion

Learner Name: Worawit Timakul

Title Of Course: ANV-CE-ICPOES-2-008-A: Agilent 5100 ICP-OES Support Neophyte Training

Completion Date: August 25, 2016

Certified By Company: Learning at Agilent

All Service and Support training certificates have the following specific limitations.

A certificate for Service and Support training is only valid while employed by Agilent Technologies or while working as an Agilent-authorized service provider, through which the service employee has ongoing access to Agilent's Safety Alerts, Service Notes, internal technical updates, update training, current documentation, technical support, current parts, and parts updates. Completion of training alone, without being employed by Agilent Technologies, does not qualify an individual to safely install, service or maintain Agilent products.

Date: November 28, 2023 1:10:31 PM
System ID: MY15330001

General

Document Name: Operator's training certificate and qualifications



Certificate of Completion

Learner Name: Worawit Timakul

Title Of Course: ANV-CE-ICPOES-2-007-C: CrossLab Compliance Hardware Specific Delivery for Agilent ICP-OES Systems

Completion Date: October 30, 2020

Certified By Company: Learning at Agilent

All Service and Support training certificates have the following specific limitations.

A certificate for Service and Support training is only valid while employed by Agilent Technologies or while working as an Agilent-authorized service provider, through which the service employee has ongoing access to Agilent's Safety Alerts, Service Notes, internal technical updates, update training, current documentation, technical support, current parts, and parts updates. Completion of training alone, without being employed by Agilent Technologies, does not qualify an individual to safely install, service or maintain Agilent products.

Date: November 28, 2023 1:10:31 PM
System ID: MY15330001

General

Document Name: Certificate of System Qualification



Certificate of Completion

Learner Name: Worswit Timakul

Title Of Course: AN-CE-SS-II-030-A: ACE 3 X User Update Training

Completion Date: July 1, 2020

Certified By Company: Learning at Agilent

All Service and Support training certificates have the following specific limitations.

A certificate for Service and Support training is only valid while employed by Agilent Technologies or while working as an Agilent-authorized service provider, through which the service employee has ongoing access to Agilent's: Safety Alerts, Service Notes, internal technical updates, update training, current documentation, technical support, current parts, and parts updates. Completion of training alone, without being employed by Agilent Technologies, does not qualify an individual to safely install, service or maintain Agilent products.

Date: November 28, 2023 1:10:31 PM
System ID: MY15330001

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General

Document Name: Instrument's Test Report

Report Summary

Instrument Model: Agilent 5100 VDV ICP-OES
Instrument ID: G8011A
Instrument Serial Number: MY15330001
Software Version: 7.1.0.6821
Firmware Version: 2994
Tested By: Worawit T.
Test Completed On: 27-Nov-23 2:23:13 PM

Result Summary

Resolution Test: Pass
Sensitivity Test: Pass
Precision Test: Pass

Resolution Test: Pass

Element Wavelength	Specification	Width
N (174.213 nm)	≤ 9.40	7.28
As (188.960 nm)	≤ 8.20	6.66
C (193.027 nm)	≤ 11.50	8.01
Mo (202.032 nm)	≤ 8.20	6.71
Cr (206.158 nm)	≤ 13.40	10.27
Zn (213.857 nm)	≤ 8.70	7.56
Pb (220.353 nm)	≤ 9.50	7.70
Co (228.615 nm)	≤ 17.20	10.70
Ba (230.424 nm)	≤ 9.40	8.14
Mn (257.610 nm)	≤ 13.30	9.43
Mn (260.568 nm)	≤ 20.30	15.91
Cr (267.716 nm)	≤ 11.00	9.30
Cu (324.754 nm)	≤ 25.00	17.80
Cu (327.395 nm)	≤ 14.20	12.73
Sr (338.071 nm)	≤ 33.50	27.28
Ba (455.403 nm)	≤ 44.00	31.08
Sr (460.733 nm)	≤ 36.00	21.11
Ba (493.408 nm)	≤ 36.00	29.33
Ba (614.171 nm)	≤ 42.00	32.02
Ar (675.283 nm)	≤ 74.00	64.85
K (766.491 nm)	≤ 80.00	62.51

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Document Name:

Instrument's Test Report

Sensitivity Test					
Pass					
Radial					
Element Wavelength	Specification	Method	Ratio	Standard	Blank
As (188.980 nm)	≥ 46.0	SRBR	111.1	1111.0	85.2
Se (196.026 nm)	≥ 41.0	SRBR	68.5	856.2	116.6
Zn (213.857 nm)	≥ 1421.0	SRBR	3583.1	52766.1	215.1
Pb (220.353 nm)	≥ 46.0	SRBR	183.7	2811.8	201.3
Mn (257.610 nm)	≥ 3518.0	SRBR	10296.2	279763.9	735.3
Al (396.152 nm)	≥ 3.4	SBR	8.2	37571.9	4071.0
Ba (493.408 nm)	≥ 34.0	SBR	100.5	1198903.7	11867.1
K (766.491 nm)	≥ 1.8	SBR	3.8	100874.8	20871.5
Axial					
Element Wavelength	Specification	Method	Ratio	Standard	Blank
As (188.980 nm)	≥ 208.0	SRBR	248.6	3738.6	202.3
Se (196.026 nm)	≥ 159.0	SRBR	163.8	3040.9	283.3
Zn (206.200 nm)	≥ 234.0	SRBR	1402.0	19648.6	192.3
Zn (213.857 nm)	≥ 1743.0	SRBR	8340.9	200514.1	574.3
Cd (214.439 nm)	≥ 4227.0	SRBR	7606.2	156421.5	420.7
Pb (220.353 nm)	≥ 320.0	SRBR	631.4	16069.9	600.3
Mn (257.610 nm)	≥ 10625.0	SRBR	32328.3	1472044.4	2067.5
Cr (267.716 nm)	≥ 1048.0	SRBR	4308.3	155802.6	1286.3
Cu (324.754 nm)	≥ 19.0	SBR	57.8	242584.8	4123.5
Al (396.152 nm)	≥ 6.0	SBR	21.9	239924.8	10474.6
Ba (493.408 nm)	≥ 60.0	SBR	236.0	7235267.3	30527.2
K (766.491 nm)	≥ 24.0	SBR	68.8	3110677.8	44585.8

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Document Name:

Instrument's Test Report

Precision Test		
Pass		
Radial		
Element Wavelength	Specification	Measured Value % RSD
As (188.980 nm)	≤ 2.60	0.74
Se (196.026 nm)	≤ 2.60	0.65
Zn (213.857 nm)	≤ 1.50	0.21
Pb (220.353 nm)	≤ 2.60	0.51
Mn (257.610 nm)	≤ 1.50	0.25
Al (396.152 nm)	≤ 1.50	0.30
Ba (493.408 nm)	≤ 1.50	0.60
K (766.491 nm)	≤ 1.50	0.20
Axial		
Element Wavelength	Specification	Measured Value % RSD
As (188.980 nm)	≤ 1.50	0.51
Se (196.026 nm)	≤ 1.50	0.37
Zn (206.200 nm)	≤ 1.50	0.30
Zn (213.857 nm)	≤ 1.50	0.26
Cd (214.439 nm)	≤ 1.50	0.21
Pb (220.353 nm)	≤ 1.50	0.30
Mn (257.610 nm)	≤ 1.50	0.63
Cr (267.716 nm)	≤ 1.50	0.17
Cu (324.754 nm)	≤ 1.50	0.32
Al (396.152 nm)	≤ 1.50	0.30
Ba (493.408 nm)	≤ 1.50	0.48
K (766.491 nm)	≤ 1.50	0.53

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General

Document Name: Software Verification

Software Verification Report			
Date:	Monday, November 27, 2023	Time:	1:58:23 PM [UTC -07:00:00]
Windows User Name:	Admin	Base Revision Number:	1.0.1
Install Type:	N/A	Additional Packages:	RA
Host Name: 500NDV-HP			
Product Name: ICP Expert			
Base Reference File Name: ICPReferenceFile.xml			
Summary :			
Overall Evaluation of Installation Check : PASS			
File Report Summary			
No missing files or invalid files found			
No system file difference found			
Files Registration Report Summary			
Files Registration check not required for this product			
Registry Report Summary			
Registry entries check not required for this product			

Date: November 28, 2023 1:10:31 PM
System ID: MY15330001

Materials

Document Name: Certificate of Analysis Wavelength calibration solution

Agilent							
CERTIFICATE OF ANALYSIS							
Agilent Product Name: Wavelength Calibration Solution for ICP-OES & MP-AES, 5 mg/L, 500mL							
Agilent Part No: 661030100							
Lot No: 0012990411							
Product Specifications							
Analyte	Starting Material	CAS #	Certified Conc.	Analyte	Starting Material	CAS #	Certified Conc.
Al	Al(NO ₃) ₃	7704-27-2	5.000 ± 0.025 mg/L	Mn	Mn	7439-96-5	5.000 ± 0.025 mg/L
As	As	7440-38-2	5.000 ± 0.025 mg/L	Mo	(NH ₄) ₂ MoO ₄	13166-76-6	5.000 ± 0.025 mg/L
Ba	Ba(NO ₃) ₂	10022-31-9	5.000 ± 0.025 mg/L	Ni	Ni	7440-02-0	5.000 ± 0.025 mg/L
Cd	Cd	7440-43-8	5.000 ± 0.025 mg/L	Pb	Pb	7439-92-1	5.000 ± 0.025 mg/L
Co	Co	7440-48-4	5.000 ± 0.025 mg/L	Se	Se	7782-49-2	5.000 ± 0.025 mg/L
Cr	Cr(NO ₃) ₃	13448-38-4	5.000 ± 0.025 mg/L	Sr	Sr(NO ₃) ₂	10043-70-9	5.000 ± 0.025 mg/L
Cu	Cu	7440-50-8	5.000 ± 0.025 mg/L	Zn	Zn	7440-66-6	5.000 ± 0.025 mg/L
K	KNO ₃	7757-79-1	50.00 ± 0.25 mg/L				
Matrix: 5% HNO ₃							
Intended Use: This solution is intended for use as a certified reference material or calibration standard for inductively coupled plasma optical emission spectroscopy (ICP-OES), inductively coupled plasma mass spectrometry (ICP-MS), atomic absorption spectroscopy (flame AAS or GFAAS), microwave plasma atomic emission spectroscopy (MP-AES), x-ray fluorescence spectroscopy (XRF), and other techniques for elemental analysis.							
Certification & Traceability: This CRM was manufactured under a quality management system that is registered to ISO 9001, ISO 17030 and ISO/IEC 17025. This CRM was prepared to the certified concentrations shown above by gravimetric methods using single-element concentrates that were certified using the "High Performance ICP-OES" protocol developed by NIST and are directly traceable to the NIST SRMs listed below. This solution was stabilized using high purity nitric acid (HNO ₃) and diluted with filtered (0.22µm), 18 M-ohm deionized water. The balances used in the preparation of this CRM are calibrated regularly with traceability to NIST. All volumetric dilutions are performed in Class A calibrated glassware. The certified concentrations were determined based upon gravimetric procedures. Secondary verification of the certified concentrations was performed using ICP-OES that was calibrated and/or referenced against NIST SRMs: 3101a, 3103a, 3104a, 3108, 3112, 3112a, 1114, 3141a, 3132, 3134, 3136, 3128, 3148, 3153a, and 3168a. The uncertainty associated with each certified concentration represents the expanded uncertainty at the 95% confidence level using a coverage factor of k=2.							
Instructions for Use: Agilent recommends that the solution be thoroughly mixed by repeated shaking or swirling of the bottle immediately prior to use. To achieve the highest accuracy the analyst should: (1) use only pre-cleaned containers and transferware, (2) avoid pipetting directly from the CRM's original container, (3) use a minimum sub-sample size of 500µL, (4) make dilutions using calibrated balances or certified volumetric class A flasks and pipettes, (5) dilute to volume using the same matrix as the original CRM, and (6) never pour used product back into the original container. The solution should be kept tightly capped and stored under normal laboratory conditions. Do not freeze, heat, or expose to direct sunlight. Minimize exposure to moisture or high humidity.							

Date: November 28, 2023 1:10:31 PM
System ID: MY15330001

Document Name: Certificate of Analysis Wavelength calibration solution



Period of Validity: Agilent ensures the accuracy of this solution until the expiration date shown below, provided the instructions for use are followed. During the period of validity, the purchaser will be notified if this product is recalled due to any significant changes in the stability of the solution.

Date of release: 18 October 2022
Date of expiration: 30 April 2024

Sample lot approval:


Chad Gendreau, Certifying Officer

Page 2 of 3

Document Name: Certificate of Analysis Wavelength calibration solution



Hazard Information: Refer to the Safety Data Sheet (SDS), which can be obtained at www.agilent.com/chem/sds.

Homogeneity: This solution was determined to be homogeneous by procedures consistent with the requirements of ISO 17034 and ISO Guide 35. Replicate samples of the finished solution were analyzed to confirm its homogeneity, in accordance with OSP 6-13 Assessment of Homogeneity and Stability. To ensure homogeneity, users should not take a smaller sub-sample than specified in the Instructions for Use, or doing so will invalidate the certified values and uncertainties.

Further Information: Please contact Agilent for further information about this CRM.

Quality Certifications: This CRM was prepared under a quality management system that is:

- Registered to ISO 9001 – Quality Management Systems – Requirements (TUV NORD Cert. No. 44 100 18580231)
- Accredited to ISO 17034 – General Requirements for the Competence of Reference Material Producers (AZLA Cert. No. 284832)
 - ISO 17034 references additional requirements specified in ISO Guide 31 and ISO Guide 35.
- Accredited to ISO/IEC 17025 – General Requirements for the Competence of Testing and Calibration Laboratories (AZLA Cert. No. 2548.01)
- LGC Standards, 219 Midway Road, Manchester, NY 12042

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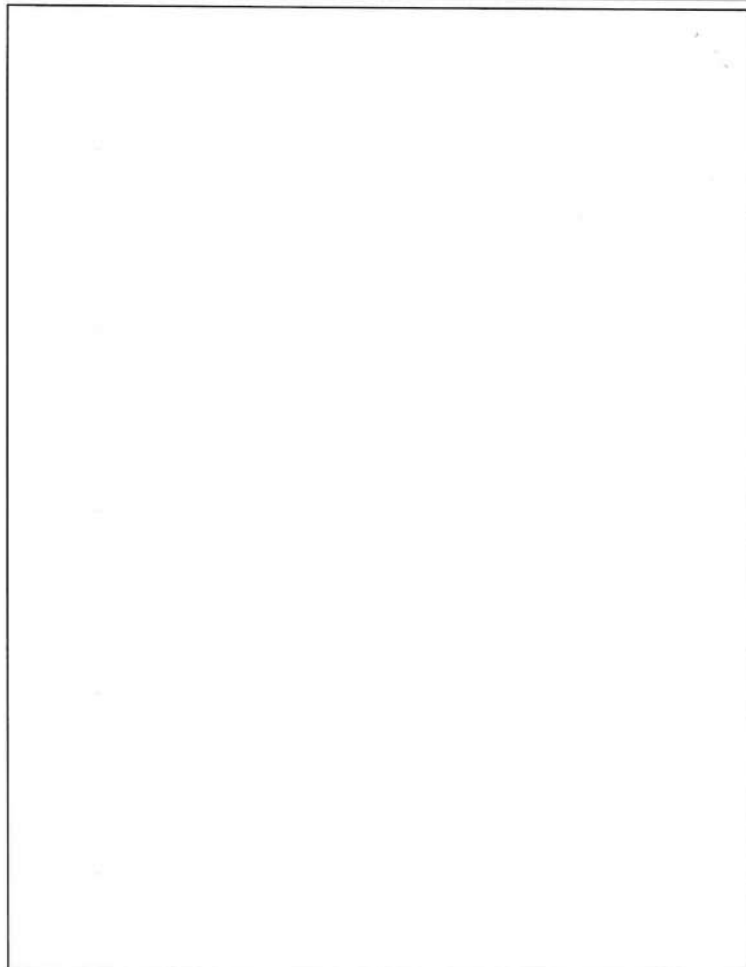
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Document Name:

Certificate of Analysis Wavelength calibration solution



Date: November 28, 2023 1:10:31 PM
System ID: MY15330001

Electronic Signature

Purpose

This signature page was created and published because the ACE sign-off action was executed, which is valid for the entire document, including attachments. The ACE sign-off is an electronic signature that requires two distinct identification components: unique username and personal password. The Agilent representative who has delivered this service understands the meaning and legal status of an electronic signature. As a trained official operator, the Agilent representative has a unique password and login to access ACE and electronically sign this document. (Other e-signatures can be applied to this document using a Document Content Management or other suitable method defined in your data access and control procedures.)

Details

Full Name of Signer	Worawit Timakul
Logged On User Name:	worawit.timakul@agilent.com
Signature Creation Date:	November 28, 2023
Reason for Signature:	Executed protocol and published this original version of document

Regulatory Disclaimer

This document provides a protocol to verify and record instrument configuration and evidence of proper operation. It has been prepared from our interpretation of applicable regulations as well as industry best practices. The document is designed to provide an important component of a complete compliance package. Validation depends upon many factors and use of this protocol alone does not assure compliance. Agilent Technologies makes no promises or representations as to its sufficiency for any specific regulatory program.

Warranty

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Date: November 28, 2023 1:10:31 PM
System ID: MY15330001

User Name: worawit.timakul
Report Generated by Hostname: SCG0202NQ4

System Id: MY15330001
Print Date: November 28, 2023 1:10:41 PM

OQHW ICP 5100 ENVI Research Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
November 28, 2023 12:54:06 PM	Audit	SessionCreated	Session	None
November 28, 2023 12:54:06 PM	Start	Configuration	Session	None
November 28, 2023 12:54:06 PM	Audit	Entitlement	Licensing	User is FieldEngineer and does not require an unlock code
November 28, 2023 12:54:32 PM	Audit	EqpLoaded	Session	EQP details for primary technique [Es] - File path: [ProtocolPacks\Es\Configurations\02.50\Es.02.50.eqp], EQP File Name: [Es.02.50.eqp], EQP Name: [AgilentRecommended], Protocol Revision: [Es.02.50]
November 28, 2023 12:54:38 PM	End	Configuration	Session	None
November 28, 2023 12:54:41 PM	Start	Qualification	Session	OQ
November 28, 2023 12:54:41 PM	Start	Execution	Preparation : 5100 VDV: Qualitative Test - No setpoints associated	None
November 28, 2023 12:56:26 PM	End	Execution	Preparation : 5100 VDV: Qualitative Test - No setpoints associated	Run Count : 1
November 28, 2023 12:56:27 PM	Start	Execution	Instrument Tests : 5100 VDV: Qualitative Test - No setpoints associated	None
November 28, 2023 12:56:57 PM	End	Execution	Instrument Tests : 5100 VDV: Qualitative Test - No setpoints associated	Run Count : 1

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User Name: worawit.timakul
Report Generated by Hostname: SCG0202NQ4

System Id: MY15330001
Print Date: November 28, 2023 1:10:41 PM

OQHW ICP 5100 ENVI Research Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
November 28, 2023 12:57:03 PM	Start	Execution	Autosampler Operation : Autosampler 1 - SPS4; Qualitative Test - No setpoints associated	None
November 28, 2023 12:57:08 PM	End	Execution	Autosampler Operation : Autosampler 1 - SPS4; Qualitative Test - No setpoints associated	Run Count : 1
November 28, 2023 12:57:09 PM	End	Qualification	Session	OQ
November 28, 2023 12:57:09 PM	Start	Reporting	Session	None
November 28, 2023 1:04:49 PM	Audit	AceRestarted	Session	None
November 28, 2023 1:04:50 PM	Audit	SessionReloaded	Session	None
November 28, 2023 1:04:58 PM	Start	Qualification	Session	OQ
November 28, 2023 1:08:10 PM	Audit	Reporting	Session	Report Generated : Certificate
November 28, 2023 1:09:28 PM	Audit	Reporting	Session	Report Generated : Report

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Date: November 28, 2023 1:10:31 PM
System ID: MY15330001

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User Name: worawit.timakul
Report Generated by Hostname: SCG0202NQ4

System Id: MY15330001
Print Date: November 28, 2023 1:10:41 PM

QQHW ICP 5100 ENVI Research Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
November 28, 2023 1:10:31 PM	Audit	Reporting	Session	Report Signed : Certificate PDF Name: QQHW ICP 5100 ENVI Research_20231128_Certificate_1.pdf User Name: worawit.timakul@agilent.com Full Name of Signer: Worawit Timakul Reason for signature: Executed protocol and published this original version of document

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Agilent CrossLab Start Up Services Agilent 8890 Gas Chromatograph Preventive Maintenance Checklist

Agilent Preventive Maintenance provides factory recommended service for your analytical instruments to assure reliable operation and the accuracy of your results.

Delivered by highly trained and certified service engineers using genuine Agilent parts and supplies, Agilent Preventive Maintenance provides everything you need to reduce unplanned downtime and keep your systems operating at their peak. This checklist will be completed at the end of the service and provided to you as a record of the preventive maintenance activities.

Introduction

Customer Information

- Customers should provide all necessary operating supplies upon request of the engineer.
- A customer representative should be available to the engineer while performing the preventive maintenance procedures.
- Any parts, not included in the Parts Lists section of this document, are not part of the recommended Preventive Maintenance service, nor are they included in the price of this service.
- If a system requires the use of extra or special procedures and/or parts for the maintenance service, then these must be ordered separately and charged as a repair, which may incur additional costs.

Important Customer Web Links

- For more information about *Agilent Technologies services*, please visit our website using the following URL: <http://www.agilent.com/en-us/products/crosslab-instrument-services/service-repair>
- The **Agilent Community** is an excellent place to get answers, collaborate with others about applications and Agilent products, and find in-depth documents and videos relevant to Agilent technologies. Visit <https://community.agilent.com/welcome>.
- To access **Agilent University**, visit <http://www.agilent.com/crosslab/university/> to learn about training options, which include online, classroom and onsite delivery. A training specialist can work directly with you to help determine your best options.
- A useful **Agilent Resource Center** web page is available, which includes short videos on maintenance, quick lists of consumables for new instruments, and other valuable information. Check out the Resource Page here: <https://www.agilent.com/en-us/agilentresources>.
- Need technical support, FAQs, supplies? – visit our **Support Home page** <http://www.agilent.com/search/support>.
- Videos about specific preparation requirements for your instrument can be found by searching the *Agilent YouTube* channel at <https://www.youtube.com/user/agilent>.

Service Engineer's Responsibilities

- Contact the customer and ensure that all necessary supplies are available before the preventive maintenance visit.
- Only select those pages that relate to the system or module being serviced.
- Complete empty fields with the relevant information.
- Complete the relevant checkboxes in the checklist using either a "X" or tick mark "✓".
- Check **"Section not applicable"** check boxes to indicate services/tasks not delivered, as appropriate.
- Complete the Preventive Maintenance service in the order of the tasks listed.
- Complete the Service Review section together with the customer.
- Complete the fields for page numbers at the foot of each selected page
- Complete the total number of pages field in the Service Completion section
- **Ask the customer to sign the Service Completion section including the customer's and your signature.**

Additional Instruction Notes

- Check for any active service notes for this unit. If there are any applicable "Safety" or "Modification Recommended" Service notes, plan to implement the changes on this unit before doing any qualification service.
- Do not implement firmware updates, unless you get approval from the customer and are sure that they are compatible with the instrument control software.

System Information

- ☒ Check this box if an instrument configuration report is attached instead of completing the table below.

Instrument System Name and ID	ERTC-L-In-175	US2125A011
Instrument System Site and Location	Environment Research	Laboratory

List System Component Product Numbers	List the Serial Numbers of each Component
1. 64513 A	US2125A011
2. 64514 A	CN2109505
3. 64515 A	CN2107024
4.	US2125A011
5.	
6.	
7.	
8.	
9.	
10.	

Preparation

- ☒ Discuss any specific issues with the customer before starting.
- ☒ Review the instrument logbook for recorded problems and comments.
- ☒ Save instrument control settings before starting the procedure.
- ☒ Perform a general inspection of the system for cleanliness.
- ☒ Check for proper installation of parts, assemblies, sensors etc.
- ☒ Check system for required installation of components, settings as defined by current Service Notes.
- ☒ Check for required firmware updates and verify with customers if they would like them installed.
- ☒ Before starting the following procedures, record the Detector Signal Output(s) in the results table. If the GC is turned OFF or in a service mode, comparing the detector outputs before and after the service is not possible.

Preventive Maintenance Procedure

Clean and inspect GC

- ☒ Unplug power cord from the power source.
- ☒ Open GC covers and vacuum/remove any dust/debris. Pay particular attention to cooling fans.
- ☒ Inspect internal connectors for proper contact and placement.
- ☒ Reconnect Power to the GC. Power the GC on and verify the power on self-test passed.
- ☒ Verify oven motor spins freely and turns on with the oven door closed; off when the door is opened.
- ☒ Verify operation of all other fans - the inlet and EPC cooling fans.
- ☒ Verify oven intake/outlet flap assembly is operating smoothly while heating and cooling the oven

Inlet and detector consumable replacement

- ☒ Replace the split vent trap cartridge filter using the Maintenance procedure from either the Browser User interfaces on units with these inlets: Split/Splitless Capillary (SSL), Multi-Mode Inlet (MMI), Programmed Temperature Vaporizer (PTV), Volatiles Interface (VI).
- ☒ If the inlet system is used in Split Mode with viscous samples, inspect and clean the split vent tube on the inlet and flush or replace the tubing between the inlet and the split vent trap.
- ☒ For the inlets installed, perform inlet maintenance using the Maintenance procedure from the Browser User interfaces. Record the results. (Leak and Restriction Test)
- ☒ If the GC includes a Flame Ionization Detector (FID), replace the jet. If the ignitor shows any buildup of sample or corrosion, replace the ignitor. Examine the FID collector and castle assemblies for contamination - clean as necessary.

Zero Sensors and Leak test

- ☒ Zero all pressure sensors using the Browser interface.
- ☒ Perform inlet pressure decay test(s) from the diagnostics screen on the Browser User interface. Record if test passed or failed in the results table.

Note: If the PM is done in preparation for an Operational Qualification, then the pressure decay test defined within that protocol can be used for the PM.

ALS Maintenance

☐ Section NOT applicable

- ☒ Check all cabling and configuration settings between GC, tray, and injectors.
- ☒ Vacuum or remove any dust, especially around fans.
- ☒ Check operation of all fans.
- ☒ Check syringe for smooth plunger operation.
- ☒ Check for smooth operation of the needle support – clean if necessary

Restore Instrument

- ☒ Restore the normal operating conditions or customer method using the Browser interface or Data System.
- ☒ Purge the system with carrier flow for 15 minutes
- ☒ Bake out the system, then restore the normal operating conditions
- ☒ After equilibration, check and record the post PM detector signal output values. Results should be similar or lower than the detector outputs recorded prior to PM.
- ☒ Perform a chemical checkout. If this is a routine PM, inject the customer's sample using the ALS if applicable. This will act as a final checkout of both the ALS and the GC.

Note: If the PM Service is performed prior to a qualification service, then use the qualification procedure as a guide for final instrument set up and checkout.

Signature Page

Service Review

- ☐ Attach available reports/printouts of all tests to this documentation.
- ☒ Record the Preventive Maintenance service activity in the customer's records/logbook.
- ☒ Update/reset instrument maintenance counters as appropriate.
- ☒ Affix the PM sticker to the system or instrument logbook based on the customer's request.
- ☒ Complete the Service Engineer Comments section if there are additional comments.
- ☒ Review with the customer this service, parts replaced, and test results obtained.
- ☐ If the instrument firmware was updated, record the details of the change in the Service Engineer's Comments box or if necessary, in the customer's IQ records.
- ☐ Supply the customer with a copy of the Smart Alerts flyer.
- ☐ Describe Smart Alerts to the customer.
- ☐ Install Smart Alerts if requested.

PM Test Results Table

Test description	Before PM Service	After PM Service
Front detector output	N/A	282.6
Back detector output	N/A	349.2
AUX 1 detector output	N/A	282.6
AUX 2 detector output CFPD	N/A	12.6
Test description	Expected test result	Actual test result
Leak and Restriction Test after front inlet maintenance	Pass	pass
Leak and Restriction Test after back inlet maintenance	Pass	pass
Leak and Restriction Test after front inlet Split Vent Trap replacement	Pass	pass
Leak and Restriction Test after back inlet Split Vent Trap replacement	Pass	pass
Front inlet pressure decay test	Pass	pass
Back inlet pressure decay test	Pass	pass

PM Parts List Table

Note: The following kits are recommended for capillary and purged packed inlets. If this is a general PM and the customer has a preferred set of consumables, you may use the customer's consumables.

Part description	Part number	Product or model# where used	Quantity consumed
SSL Capillary Inlet PM kit, Splitless	5188-6497	8890 GC	2
SSL Capillary Inlet PM kit, Split	5188-6496	8890 GC	N/A
SSL Capillary Ultra Inert Inlet Gold Seal with Washer	5190-6144	8890 GC	N/A
SSL Capillary Ultra Inert Inlet Splitless Liner - Single taper with Glass Wool	5190-2293	8890 GC	N/A
SSL Capillary Ultra Inert Inlet Low Pressure Drop Split Liner - with Glass Wool	5190-2295	8890 GC	N/A
PP Inlet PM kit	5188-6498	8890 GC	N/A
Split vent trap PM kit, single cartridge (for MMI, PTV & VI)	5188-6495	8890 GC	N/A
MMI Cleaning Kit	G3510-60820	8890 GC	N/A
PTV Septumless Head Rebuild Kit	5182-9747	8890 GC	N/A
PTV Septumless Head Teflon Guide	5182-9748	8890 GC	N/A
Ignitor (glow plug) assembly with O-ring	19231-60680	8890 GC	1
FID Collector Rebuild/Cleaning Kit	G1531-67000	8890 GC	N/A
FID Collector Replacement Kit	G1531-67001	8890 GC	N/A
Standard .011-inch FID Jet	5200-0176	8890 GC	1
Universal .018-inch FID Jet	5200-0177	8890 GC	N/A

Service Engineer Comments

If there are any specific points you wish to note as part of performing the service or other items of interest for the customer, please write include them in this box.

Service Completion

Service request number 60590679 Date service completed 12-13 June 2023

Agilent signature  Customer signature _____

Total number of pages in this document 9 pages



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Talingchan, Bangkok 10170

PAGE: 1 of 2

ANALYSIS REPORT

Sales#: 117404289 Cylinder Size: 185 (3.2" X 9.4")
Production#: 1602683 Cylinder #: AB-116946
Report Date: Jan-18-2024 Cylinder Pressure: 1700 psig
P.O.#: 0573518-ENTECH Cylinder Valve: CGA 180 / Aluminum
Blend Type: QUALIFIED Cylinder Volume: 0.8 Liter
Material#: 24086377 Cylinder Material: Aluminum
Traceability: NIST by weight Gas Volume: 98 Liters
Expiration Date: Jan-18-2025 Blend Tolerance: 10% Relative
Do NOT use under: 150 psig Analytical Accuracy: 5% Relative

COMPONENT	CAS NUMBER	REQUESTED CONC	QUALIFIED CONC
Dichlorodifluoromethane	75-71-8	1.00 ppm	0.99 ppm
Chloromethane	74-87-3	1.00 ppm	0.99 ppm
Freon-114	76-14-2	1.00 ppm	0.95 ppm
Vinyl Chloride	75-01-4	1.00 ppm	0.98 ppm
Bromomethane	74-83-9	1.00 ppm	0.97 ppm
Chloroethane	75-06-3	1.00 ppm	0.96 ppm
Freon-11	75-66-4	1.00 ppm	0.94 ppm
1,1-Dichloroethene	75-35-4	1.00 ppm	1.02 ppm
Methylene Chloride	75-06-2	1.00 ppm	0.98 ppm
Freon-113	76-13-1	1.00 ppm	1.02 ppm
1,1-Dichloroethane	75-34-3	1.00 ppm	0.97 ppm
Cis-1,2-Dichloroethylene	156-59-2	1.00 ppm	0.98 ppm
Chloroform	67-66-3	1.00 ppm	1.01 ppm
1,2-Dichloroethane	107-06-2	1.00 ppm	0.97 ppm
1,1,1-Trichloroethane	71-55-6	1.00 ppm	0.99 ppm
Benzene	71-43-2	1.00 ppm	0.99 ppm
Carbon Tetrachloride	56-23-5	1.00 ppm	0.98 ppm
1,2-Dichloropropane	78-87-5	1.00 ppm	0.98 ppm
Trichloroethylene	79-01-6	1.00 ppm	0.98 ppm
Cis-1,3-Dichloropropene	10061-01-5	1.00 ppm	0.98 ppm
Trans-1,3-Dichloropropene	10061-02-6	1.00 ppm	0.92 ppm
1,1,2-Trichloroethane	79-00-5	1.00 ppm	0.98 ppm
Toluene	108-88-3	1.00 ppm	1.01 ppm
1,2-Dibromoethane	106-93-4	1.00 ppm	0.99 ppm
Tetrachloroethylene	127-18-4	1.00 ppm	0.98 ppm
Chlorobenzene	108-90-7	1.00 ppm	0.99 ppm
Ethylbenzene	100-41-4	1.00 ppm	0.99 ppm
P-Xylene	106-42-3	1.00 ppm	0.97 ppm



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Talingchan, Bangkok 10170

PAGE: 2 of 2

ANALYSIS REPORT

Sales#: 117404289 Cylinder Size: 185 (3.2" X 9.4")
Production#: 1602683 Cylinder #: AB-116946
Report Date: Jan-18-2024 Cylinder Pressure: 1700 psig
P.O.#: 0573518-ENTECH Cylinder Valve: CGA 180 / Aluminum
Blend Type: QUALIFIED Cylinder Volume: 0.8 Liter
Material#: 24086377 Cylinder Material: Aluminum
Traceability: NIST by weight Gas Volume: 98 Liters
Expiration Date: Jan-18-2025 Blend Tolerance: 10% Relative
Do NOT use under: 150 psig Analytical Accuracy: 5% Relative

COMPONENT	CAS NUMBER	REQUESTED CONC	QUALIFIED CONC
M-Xylene	108-38-3	1.00 ppm	0.97 ppm
Styrene	100-42-5	1.00 ppm	0.97 ppm
O-Xylene	95-47-6	1.00 ppm	0.97 ppm
1,1,2,2-Tetrachloroethane	79-34-5	1.00 ppm	0.97 ppm
1,3,5-Trimethylbenzene	108-67-8	1.00 ppm	0.95 ppm
1,2,4-Trimethylbenzene	95-63-6	1.00 ppm	0.93 ppm
1,3-Dichlorobenzene	541-73-1	1.00 ppm	0.92 ppm
1,4-Dichlorobenzene	106-46-7	1.00 ppm	0.91 ppm
1,2-Dichlorobenzene	95-50-1	1.00 ppm	0.93 ppm
1,2,4-Trichlorobenzene	120-82-1	1.00 ppm	0.93 ppm
Hexachloro-1,3-Butadiene	87-68-3	1.00 ppm	0.92 ppm
Nitrogen	7727-37-9	Balance	Balance

ANALYST: 
Brian Bramkamp

DATE: Jan-18-2024

THE LINDE GROUP



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PAGE: 1 of 2

ANALYSIS REPORT

Sales#: 117494289
Production#: 1602690
Report Date: Jan-24-2024
P.O.#: 0573518-Entech
Blend Type: QUALIFIED
Material#: 24110866
Traceability: NIST by weight
Expiration Date: Jan-24-2025
Do NOT use under: 150 psig

Cylinder Size: 185 (3.2" X 9.4")
Cylinder #: AB-118316
Cylinder Pressure: 1700 psig
Cylinder Valve: CGA 180 / Aluminum
Cylinder Volume: 0.8 Liter
Cylinder Material: Aluminum
Gas Volume: 98 Liters
Blend Tolerance: 10% Relative
Analytical Accuracy: 5% Relative

COMPONENT	CAS NUMBER	REQUESTED CONC	QUALIFIED CONC
Chlorodifluoromethane	75-45-6	1.00 ppm	1.05 ppm
Acetaldehyde	75-07-0	1.00 ppm	1.08 ppm
Isobutene	115-11-7	1.00 ppm	1.07 ppm
Methanol (Analytical Accuracy \pm 10%)	67-56-1	1.00 ppm	1.20 ppm
Ethanol (Analytical Accuracy \pm 10%)	64-17-5	1.00 ppm	1.19 ppm
Acetonitrile (Analytical Accuracy \pm 10%)	75-05-8	1.00 ppm	1.12 ppm
Acrolein (Analytical Accuracy \pm 10%)	107-02-8	1.00 ppm	1.18 ppm
Propanal	123-38-6	1.00 ppm	1.07 ppm
Acrylonitrile	107-13-1	1.00 ppm	1.10 ppm
n-Pentane	109-66-0	1.00 ppm	1.07 ppm
Methyl Iodide	74-88-4	1.00 ppm	1.06 ppm
Isoprene	78-79-5	1.00 ppm	1.10 ppm
Dichloromethane	75-09-2	1.00 ppm	1.06 ppm
Methacrolein	78-85-3	1.00 ppm	1.06 ppm
1-Propanol	71-23-8	1.00 ppm	1.00 ppm
Cyclopentane	287-92-3	1.00 ppm	1.05 ppm
Methyl Vinyl Ketone	78-94-4	1.00 ppm	1.10 ppm
n-Butanal	123-72-8	1.00 ppm	1.07 ppm
1-Butanol	71-36-3	1.00 ppm	1.10 ppm
Carbon Tetrachloride	56-23-5	1.00 ppm	1.07 ppm
2-Pentanone	107-87-9	1.00 ppm	1.07 ppm
3-Pentanone	96-22-0	1.00 ppm	1.07 ppm
Pentanal (Analytical Accuracy \pm 10%)	110-62-3	1.00 ppm	1.16 ppm
3-Hexanone	589-38-8	1.00 ppm	1.06 ppm
Hexanal (Analytical Accuracy \pm 10%)	66-25-1	1.00 ppm	0.86 ppm

THE LINDE GROUP



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Talingchan, Bangkok 10170

PAGE: 2 of 2

ANALYSIS REPORT

Sales#: 117494289
Production#: 1602690
Report Date: Jan-24-2024
P.O.#: 0573518-Entech
Blend Type: QUALIFIED
Material#: 24110866
Traceability: NIST by weight
Expiration Date: Jan-24-2025
Do NOT use under: 150 psig

Cylinder Size: 185 (3.2" X 9.4")
Cylinder #: AB-118316
Cylinder Pressure: 1700 psig
Cylinder Valve: CGA 180 / Aluminum
Cylinder Volume: 0.8 Liter
Cylinder Material: Aluminum
Gas Volume: 98 Liters
Blend Tolerance: 10% Relative
Analytical Accuracy: 5% Relative

COMPONENT	CAS NUMBER	REQUESTED CONC	QUALIFIED CONC
1,2,3-Trimethylbenzene	526-73-8	1.00 ppm	1.06 ppm
Naphthalene (Analytical Accuracy \pm 10%)	91-20-3	1.00 ppm	1.18 ppm
Nitrogen	7727-37-9	Balance	Balance

ANALYST:

Lou Lorenzetti

DATE: Jan-24-2024



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PAGE: 1 of 2

ANALYSIS REPORT

Sales#: 117494289
Production#: 1602685
Report Date: Jan-23-2024
P.O.#: 0573518-ENTECH
Blend Type: QUALIFIED
Material#: 24086380
Traceability: NIST by weight
Expiration Date: Jan-23-2025
Do NOT use under: 150 psig

Cylinder Size: 185 (3.2" X 9.4")
Cylinder #: AB-117844
Cylinder Pressure: 1700 psig
Cylinder Valve: CGA 180 / Aluminum
Cylinder Volume: 0.8 Liter
Cylinder Material: Aluminum
Gas Volume: 98 Liters
Blend Tolerance: 10% Relative
Analytical Accuracy: 5% Relative

COMPONENT	CAS NUMBER	REQUESTED CONC	QUALIFIED CONC
Propylene	115-07-1	1.00 ppm	1.00 ppm
1,3-Butadiene	106-99-0	1.00 ppm	0.99 ppm
Vinyl Bromide	593-60-2	1.00 ppm	1.00 ppm
Acetone	67-64-1	1.00 ppm	0.99 ppm
Isopropyl Alcohol	67-63-0	1.00 ppm	0.96 ppm
Carbon Disulfide (Analytical Accuracy \pm 10%)	75-15-0	1.00 ppm	1.07 ppm
Allyl Chloride	107-05-1	1.00 ppm	0.94 ppm
Trans-1,2-Dichloroethene	156-60-5	1.00 ppm	1.04 ppm
Methyl Teri-Butyl Ether	1634-04-4	1.00 ppm	0.99 ppm
Vinyl Acetate	108-05-4	1.00 ppm	1.10 ppm
Methyl Ethyl Ketone	78-93-3	1.00 ppm	1.01 ppm
n-Hexane	110-54-3	1.00 ppm	1.01 ppm
Ethyl Acetate	141-78-6	1.00 ppm	0.95 ppm
Tetrahydrofuran	109-99-9	1.00 ppm	0.92 ppm
Cyclohexane	110-82-7	1.00 ppm	1.00 ppm
Bromodichloromethane	75-27-4	1.00 ppm	0.95 ppm
1,4-Dioxane	123-91-1	1.00 ppm	0.95 ppm
2,2,4-Trimethylpentane	540-84-1	1.00 ppm	0.97 ppm
n-Heptane	142-82-5	1.00 ppm	0.97 ppm
Methyl Isobutyl Ketone	108-10-1	1.00 ppm	0.96 ppm
Methyl Butyl Ketone	591-78-6	1.00 ppm	0.92 ppm
Dibromochloromethane	124-48-1	1.00 ppm	0.97 ppm
Bromoform	75-25-2	1.00 ppm	1.03 ppm



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ANALYSIS REPORT

Sales#: 117494289
Production#: 1602685
Report Date: Jan-23-2024
P.O.#: 0573518-ENTECH
Blend Type: QUALIFIED
Material#: 24086380
Traceability: NIST by weight
Expiration Date: Jan-23-2025
Do NOT use under: 150 psig

Cylinder Size: 185 (3.2" X 9.4")
Cylinder #: AB-117844
Cylinder Pressure: 1700 psig
Cylinder Valve: CGA 180 / Aluminum
Cylinder Volume: 0.8 Liter
Cylinder Material: Aluminum
Gas Volume: 98 Liters
Blend Tolerance: 10% Relative
Analytical Accuracy: 5% Relative

COMPONENT	CAS NUMBER	REQUESTED CONC	QUALIFIED CONC
4-Ethyltoluene	622-56-8	1.00 ppm	0.93 ppm
Benzyl Chloride (Analytical Accuracy \pm 10%)	100-44-7	1.00 ppm	1.09 ppm
Nitrogen	7727-37-9	Balance	Balance

ANALYST:

Brian Bramkamp

DATE: Jan-23-2024

ฤดูฝน

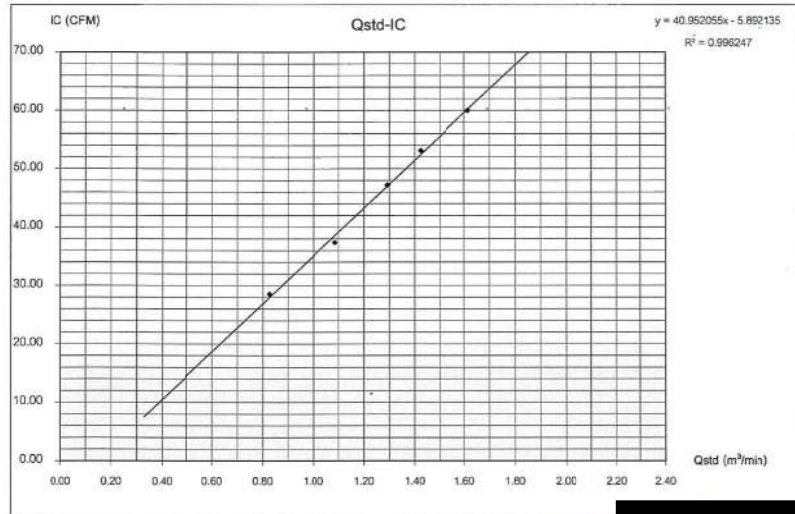
PM10 HIGH VOLUME AIR SAMPLER CALIBRATION REPORT

Quotation	0024-00461	Date	August 25, 2024
Sampler Location	โรงเรียนบ้านวัดทอง	Start Time	3:24 PM
Sampler Number	PM-10 No.20	Transfer Standard Type	Orifice
Instrument Model	HIVOL-BMBBE	Calibrator Model	TE-5025A
Motor Serial Number	2140	Calibrator Serial Number	2912
Recorder Serial Number	2393	Calibrated By	Mr. Autapol Areejit

Plate No.	(Delta H)		(A)	(X)	(I)	(Y)	Temperature	Barometric	Start	Stop	
	Pressure Drop Across Orifice (mH ₂ O)		$\Delta H_2O(Pa) \times (T_{std}/T_{atm})^{1.7}$	$Q_{std} = (1/m)[(A-b)]$	Sample Flow Rate Indicator	$IC = [(Pa/P_{std})(T_{std}/T_{atm})]^{1.5}$	(°K = °C+273)	Pressure	Meter	Meter	
	Positive	Negative	ΔH_2O	(m ³ /min)	(s ³ /min)						
5	1.5	1.5	3.0	1.70363	0.82671	29.0	26.52	306.3	755.0		
7	2.6	2.6	5.2	2.24509	1.08595	38.0	37.36	306.3	755.0		
10	3.7	3.7	7.4	2.67566	1.29210	48.0	47.21	306.3	755.0		
13	4.5	4.5	9.0	2.95077	1.42382	54.0	53.11	306.3	755.0		
16	5.8	5.8	11.6	3.34999	1.61496	61.0	60.00	306.3	755.0		
Linear Regression Y ON X: Y= mx + b						Average		306.3	755.0		
1	Slope (m)			2.08853	Linear Equation		r ²	0.999247	Pstd(mmHg)	760.0	
2	Intercept (b)			-0.02307	Set Point Flow Rate (X) (m ³ /min)	1.133	r	0.9991217	T _{std}	298.0	
3	Correlation Coefficient (r)			0.99990	Final Set Flow Rate = (i)	0	(Pa/Pstd)(Tstd/Tat)		0.96744926		
Result						C=(Pa/Pstd)(Tstd/Tat) ^{0.5}					0.983589986

COMMENT

Andersen Instruments, Inc.



Checked By

(Mr. Prayun Detkla)
Technician

Approved By

(Mr. Panupon Podang)
Environmental Scientist

FAB-028, Rev. 02, June 3, 2019

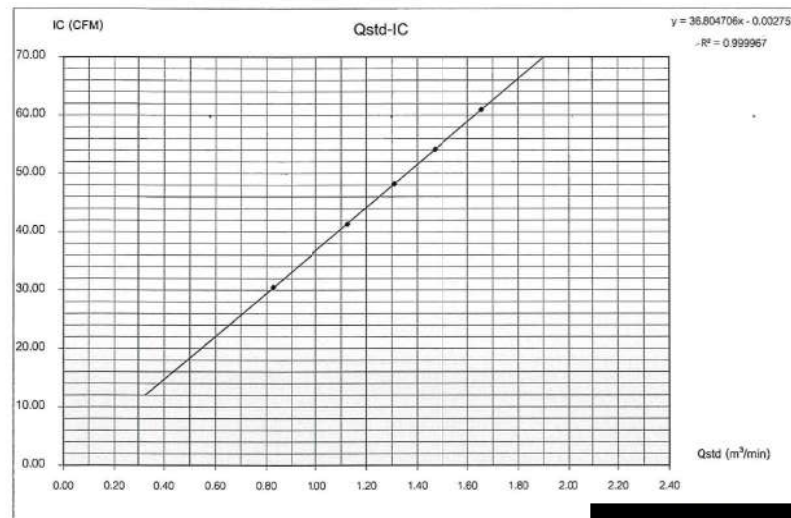
TSP HIGH VOLUME AIR SAMPLER CALIBRATION REPORT

Quotation	0024-00461	Date	August 25, 2024
Sampler Location	โรงเรียนบ้านวัดทอง	Start Time	3:14 PM
Sampler Number	TSP No.A2	Transfer Standard Type	Orifice
Instrument Model	HIVOL-8BCBE	Calibrator Model	TE-5025A
Motor Serial Number	8215-482	Calibrator Serial Number	2912
Recorder Serial Number	4042	Calibrated By	Mr. Autapol Areejit

Plate No.	(Delta P)		(A)	(X)	(Y)	Temperature	Barometric	Start	Stop
	Pressure Drop Across Orifice (psi/ft)		$\Delta H_{H_2O}(Pa)(P_{atm}/T_{std})^{1.7}$	$Q_{std} = (1/m)[(A-b)]$ (m ³ /min)	sample Flow Rate Indicator (ft ³ /min)	$IC = [(Pa/P_{atm})(T_{std}/T_{atm})]^{1.5}$ (% = °C+273)	Pressure (mmHg)	Meter	Meter
5	1.5	1.5	3.0	1.70363	0.82671	31.0	30.49	306.0	755.0
7	2.8	2.8	5.6	2.32760	1.12548	42.0	41.31	306.0	755.0
10	3.8	3.8	7.6	2.71157	1.30930	49.0	48.20	306.0	755.0
13	4.8	4.8	9.6	3.04754	1.47016	55.0	54.10	306.0	755.0
16	6.1	6.1	12.2	3.43553	1.65592	62.0	60.96	306.0	755.0
Linear Regression: Y ON X: Y = mx + b						Average	306.0	755.0	
1	Slope (m)		2.08853	Linear Equation		r ²	0.999907	Point(mmHg)	760
2	Intercept (b)		-0.02307	Set Point Flow Rate (X) (m ³ /min)	1.133	r	0.9999835	T _{std}	298
3	Correlation Coefficient (r)		0.99950	Final Set Flow Rate = (1)	0	(Pa/P _{atm})(T _{std} /T _{at})	0.96744926		
Result						C=(Pa/P _{atm})(T _{std} /T _{at}) ^{0.5}			
						0.983589998			

COMMENT

Andersen Instruments, Inc.



Checked By

(Mr. Prayun Detkla)
Technician

Approved By

(Mr. Panupon Podang)
Environmental Scientist

FAB-028, Rev. 01, November 16, 2019

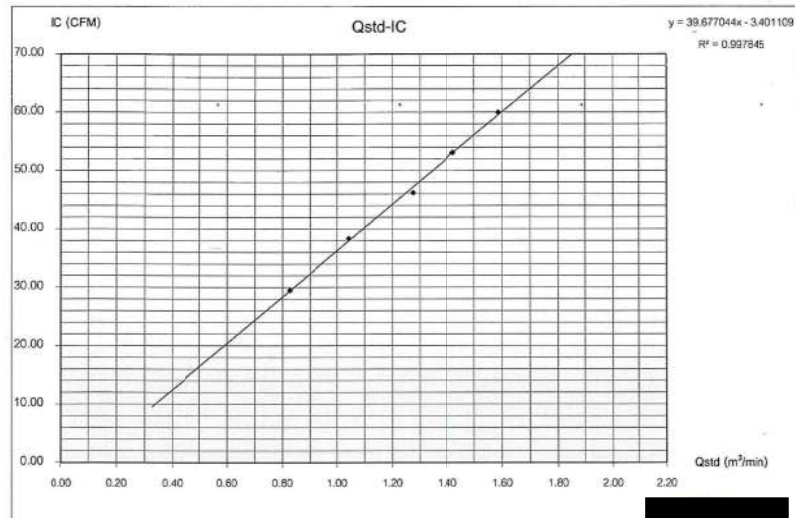
PM10 HIGH VOLUME AIR SAMPLER CALIBRATION REPORT

Quotation	1024-00461	Date	August 25, 2021
Sampler Location	บ้านฉาง/ชลบุรี	Start Time	2:35 PM
Sampler Number	PM-10 No.9	Transfer Standard Type	Office
Instrument Model	HIVOL-8MSBE	Calibrator Model	TE-5025A
Motor Serial Number	2012-05	Calibrator Serial Number	2912
Recorder Serial Number	R0411-003	Calibrated By	Mr. Auttapol Areejit

Plate No.	(Delta H)		(A)	(X)	(I)	(Y)	Temperature	Barometric Pressure	Start Meter	Stop Meter
	Pressure Drop Across Orifice (mmHg)		$\Delta H_0(Pa/P_{std} \cdot T_{std}/T_a)^{1/2}$	$Q_{std} = (1/m)[(A-b)]$ (m ³ /min)	sample Flow Rate indicators (ft ³ /min)	$IC = [(Pa/P_{std})(T_{std}/T_a)]^{1/2}$	(°K = °C+273)	(mmHg)		
5	1.5	1.5	3.0	1.70353	0.82671	30.0	29.51	305.9	755.0	
7	2.4	2.4	4.8	2.15494	1.04279	39.0	38.36	306.0	755.0	
10	3.6	3.6	7.2	2.63925	1.27467	47.0	46.23	306.0	755.0	
13	4.5	4.5	9.0	2.95077	1.42382	54.0	53.11	306.0	755.0	
18	5.6	5.6	11.2	3.29172	1.58707	61.0	60.00	306.0	755.0	
Linear Regression Y ON X: Y= mx + b							Average	306.0	755.0	
1	Slope (m)		2.08863	Linear Equation			r ²	0.997845	Pos/mmHg	760.0
2	Intercept (b)		-0.02307	Set Point Flow Rate (X) (m ³ /min)		1.133	r	0.9989219	T _{std}	298.0
3	Correlation Coefficient (r)		0.99990	Final Set Flow Rate = (i)		0	(Pa/P _{std})(T _{std} /T _a)	0.96744926		
Result							C = (Pa/P _{std})(T _{std} /T _a) ^{-0.5}	0.983589986		

COMMENT

Andersen Instruments, Inc.



Checked By

(Mr. Prayun Detkila)
Technician

Approved By

(Mr. Panupon Podang)
Environmental Scientist

F-AB-028, Rev. 02, Jan 3, 2019

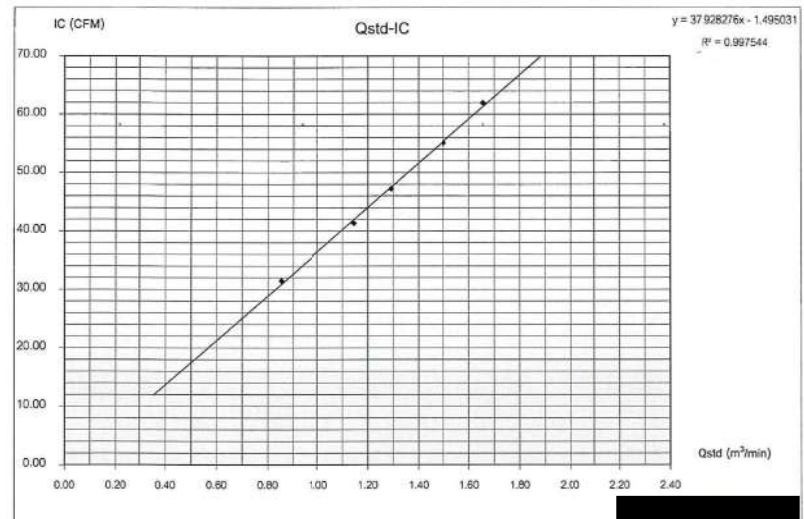
TSP HIGH VOLUME AIR SAMPLER CALIBRATION REPORT

Quotation	2024-00461	Date	August 25, 2021
Sampler Location	บ้านฉาง/ชลบุรี	Start Time	2:25 PM
Sampler Number	TSP No. A27	Transfer Standard Type	Office
Instrument Model	HIVOL-8BCBE	Calibrator Model	TE-5025A
Motor Serial Number	2215	Calibrator Serial Number	2912
Recorder Serial Number	2133	Calibrated By	Mr. Auttapol Areejit

Plate No.	[Delta H]		(A)	(X)	(I)	(Y)	Temperature	Barometric Pressure	Start Meter	Stop Meter
	Pressure Drop Across Orifice (mmHg)		$[\Delta H_0(Pa/P_{std} \cdot T_{std}/T_a)^{1/2}]$	$Q_{std} = (1/m)[(A-b)]$ (m ³ /min)	Sample Flow Rate Indicator (m ³ /min)	$IC = [(Pa/P_{std})(T_{std}/T_a)]^{1/2}$	(°K = °C+273)	(mmHg)		
5	1.6	1.6	3.2	1.75950	0.85348	32.0	31.47	306.0	755.0	
7	2.9	2.9	5.8	2.36880	1.14518	42.0	41.31	306.0	755.0	
10	3.7	3.7	7.4	2.67565	1.29210	48.0	47.21	306.0	755.0	
13	5.0	5.0	10.0	3.11038	1.50024	56.0	55.08	306.0	755.0	
18	6.1	6.1	12.2	3.43533	1.65592	63.0	61.97	306.0	755.0	
Linear Regression Y ON X: Y = mx + b						Average	306.0	755.0		
1	Slope (m)		2.08863	Linear Equation			r ²	0.994514	Pos/mmHg	760.0
2	Intercept (b)		-0.02307	Set Point Flow Rate (X) (m ³ /min)		1.133	r	0.9973034	T _{std}	298.0
3	Correlation Coefficient (r)		0.99950	Final Set Flow Rate = (i)		0	(Pa/P _{std})(T _{std} /T _a)		0.96744925	
Result		C=(Pa/P _{std})(T _{std} /T _a) ^{-0.5} 0.983589986								

COMMENT

Andersen Instruments, Inc.



Checked By

(Mr. Prayun Detkila)
Technician

Approved By

(Mr. Panupon Podang)
Environmental Scientist

F-AB-028, Rev. 02, Jan 3, 2019

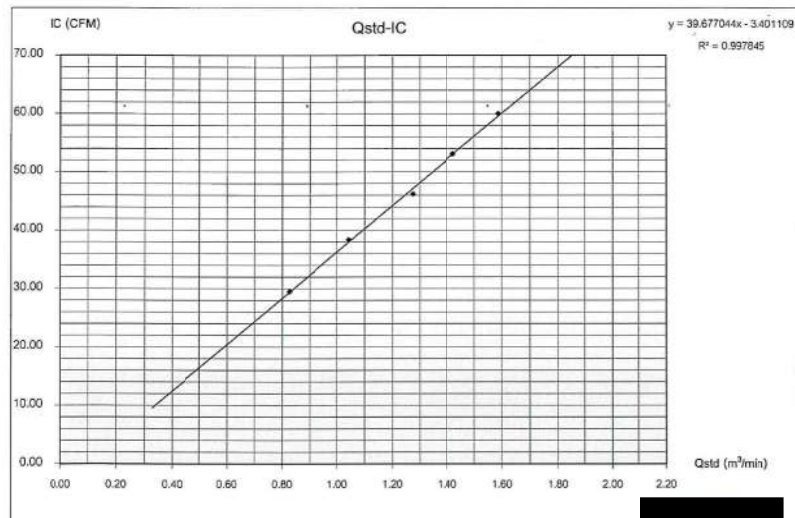
PM10 HIGH VOLUME AIR SAMPLER CALIBRATION REPORT

Quotation	2024-00461	Date	August 21, 2024
Sampler Location	จังหวัดนนทบุรี	Start Time	2:35 PM
Sampler Number	PM-10 No.9	Transfer Standard Type	Office
Instrument Model	HIVOL-BMSBE	Calibrator Model	TE-5025A
Motor Serial Number	2012-05	Calibrator Serial Number	2912
Recorder Serial Number	RD411-003	Calibrated By	Mr. Autapal Areeqi

Plate No.	(Delta H)	(A)	(X)	(I)	(Y)	Temperature	Barometric	Start	Stop
	Pressure Drop Across Orifice (mmHg)	$\Delta H_1 O(Pa/P_{atm})(T_{ref}/T_{act})^{1.2}$	$Q_{std} = (1/m)[(A-b)]$	Sample Flow Rate Indicator (l/min)	$IC = [(P/P_{atm})(T_{ref}/T_{act})]^{1.2}$	(°K = °C+273)	Pressure (mmHg)	Motor	Motor
	Positive Negative $\Delta H_1 O$		(m³/min)	(l/min)					
5	1.5 1.5 3.0	1.70363	0.82671	30.0	29.51	306.9	755.0		
7	2.4 2.4 4.8	2.15494	1.04279	39.0	38.36	306.9	755.0		
10	3.6 3.6 7.2	2.63925	1.27467	47.0	46.23	306.9	755.0		
13	4.5 4.5 9.0	2.95077	1.42382	54.0	53.11	306.9	755.0		
18	5.6 5.6 11.2	3.29172	1.58707	61.0	60.00	306.9	755.0		
Linear Regression Y ON X: Y= mx + b						Average	306.9	755.0	
1	Slope (m)	2.08963	Linear Equation			r²	0.997945	Positive	760.0
2	Intercept (b)	-0.02307	Set Point Flow Rate (X) (m³/min)	1.133	r	0.9969219	T _{ref}	298.0	
3	Correlation Coefficient (r)	0.99990	Final Set Flow Rate = (I)	0	(Pa/P _{std})(T _{std} /T _{act})	0.96744926			
Result						C=(Pa/P _{std})(T _{std} /T _{act}) ^{0.5}	0.95356986		

COMMENT

Andersen Instruments, Inc.



Checked By

(Mr. Prayun Detkla)
Technician

Approved By

(Mr. Panupon Podang)
Environmental Scientist

F-AB-028, Rev. 02, June 3, 2019

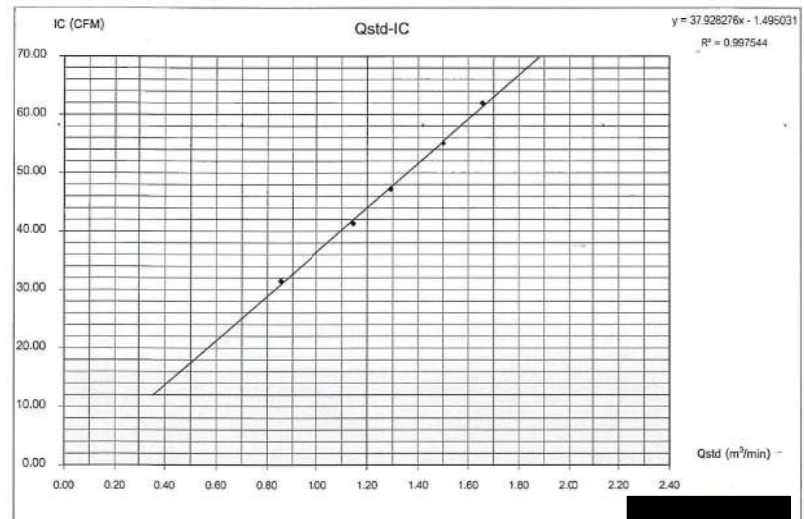
TSP HIGH VOLUME AIR SAMPLER CALIBRATION REPORT

Quotation	2024-00461	Date	August 21, 2024
Sampler Location	จังหวัดนนทบุรี	Start Time	2:25 PM
Sampler Number	TSP No.A27	Transfer Standard Type	Office
Instrument Model	HIVOL-BBCBE	Calibrator Model	TE-5025A
Motor Serial Number	2215	Calibrator Serial Number	2912
Recorder Serial Number	2133	Calibrated By	Mr. Autapal Areeqi

Plate No.	(Delta H)	(A)	(X)	(I)	(Y)	Temperature	Barometric	Start	Stop
	Pressure Drop Across Orifice (mmHg)	$\Delta H_1 O(Pa/P_{atm})(T_{ref}/T_{act})^{1.2}$	$Q_{std} = (1/m)[(A-b)]$	Sample Flow Rate Indicator (l/min)	$IC = [(P/P_{atm})(T_{ref}/T_{act})]^{1.2}$	(°K = °C+273)	Pressure (mmHg)	Motor	Motor
	Positive Negative $\Delta H_1 O$		(m³/min)	(l/min)					
5	1.6 1.6 3.2	1.75950	0.85346	32.0	31.47	306.0	755.0		
7	2.9 2.9 5.8	2.36880	1.14518	42.0	41.31	306.0	755.0		
10	3.7 3.7 7.4	2.67565	1.20210	48.0	47.21	306.0	755.0		
13	5.0 5.0 10.0	3.11038	1.50024	58.0	55.08	306.0	755.0		
18	6.1 6.1 12.2	3.43553	1.65592	63.0	61.97	306.0	755.0		
Linear Regression Y ON X: Y= mx + b						Average	306.0	755.0	
1	Slope (m)	2.08863	Linear Equation			r²	0.994514	Positive	760.0
2	Intercept (b)	-0.02307	Set Point Flow Rate (X) (m³/min)	1.133	r	0.9673034	T _{ref}	298.0	
3	Correlation Coefficient (r)	0.99950	Final Set Flow Rate = (I)	0	(Pa/P _{std})(T _{std} /T _{act})	0.96744926			
Result						C=(Pa/P _{std})(T _{std} /T _{act}) ^{0.5}	0.96356986		

COMMENT

Andersen Instruments, Inc.



Checked By

(Mr. Prayun Detkla)
Technician

Approved By

(Mr. Panupon Podang)
Environmental Scientist

F-AB-028, Rev. 02, June 3, 2019

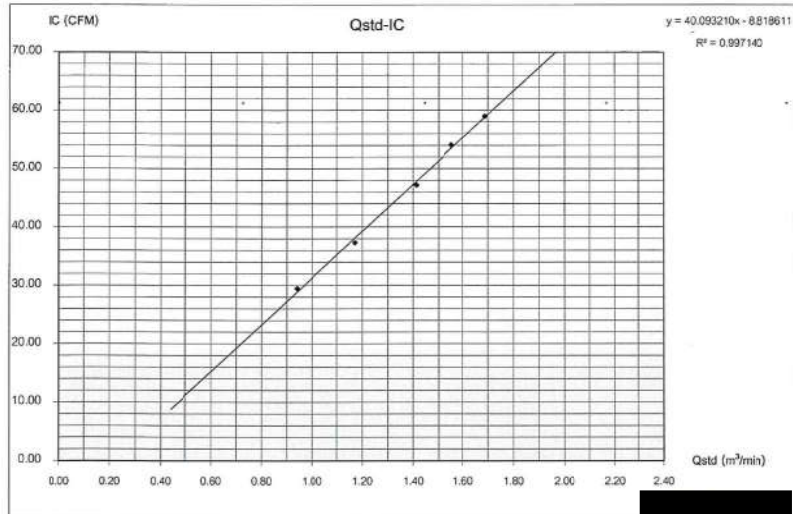
PM10 HIGH VOLUME AIR SAMPLER CALIBRATION REPORT

Quotation	2024-00401	Date	August 21, 2024
Sampler Location	บ้านนาเกลือ	Start Time	6:23 PM
Sampler Number	PM-10 No.5	Transfer Standard Type	Office
Instrument Model	HIVOL-BMBBE	Calibrator Model	TE-5025A
Motor Serial Number	2015-5	Calibrator Serial Number	2912
Recorder Serial Number	R-C21	Calibrated By	Mr. Auttapol Areejit

Plate No.	(Delta H)	(A)	(X)	(I)	(Y)	Temperature	Barometric Pressure	Start Meter	Stop Meter
	Pressure Drop Across Orifice (mmHg)	$[\Delta H_O(Pa/P_{atm})/(T_{ref}/T_a)]^{1/2}$	$Q_{std} = (U_{ref}/[A-b])$ (m ³ /min)	Sample Flow Rate Indicator (l/min)	$IC = (P/P_{atm})/(T_{ref}/T_a)^{1/2}$ (m ³ /min)	(°K = °C+273)	(mmHg)		
5	1.6	1.6	3.2	1.78950	0.93964	30.0	305.3	755.0	
7	2.6	2.6	5.2	2.24293	1.17119	36.0	305.3	755.0	
10	3.9	3.9	7.8	2.74702	1.41245	48.0	305.3	755.0	
13	4.8	4.8	9.6	3.04754	1.55634	55.0	305.3	755.0	
18	5.7	5.7	11.4	3.32098	1.66726	60.0	305.3	755.0	
Linear Regression Y ON X: Y= mx + b						Average	305.3	755.0	
1	Slope (m)	2.08863	Linear Equation			r ²	0.99714	Pstd/mmHg	760.0
2	Intercept (b)	-0.20307	Set Point Flow Rate (X) (m ³ /min)	1.133	r	0.998509	T _{ref}		298.0
3	Correlation Coefficient (r)	0.99990	Final Set Flow Rate = (I)			0	(Pa/Pstd)/(Tstd/Ta)	0.96749026	
Result								C=(Pa/Pstd)/(Tstd/Ta)*0.5	0.983589986

COMMENT

Andersen Instruments, Inc.



Checked By

(Mr. Prayun Detkla)
Technician

Approved By

(Mr. Panupon Podang)
Environmental Scientist

F-AB-028, Rev. 02, June 3, 2019

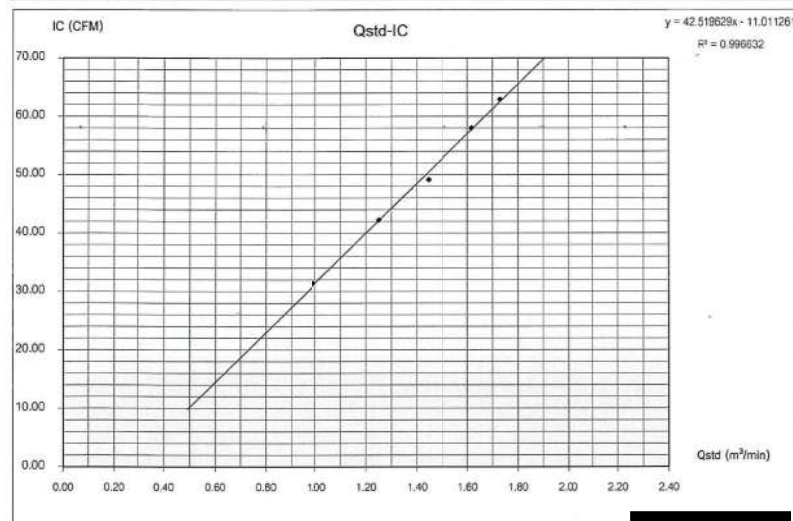
TSP HIGH VOLUME AIR SAMPLER CALIBRATION REPORT

Quotation	2024-00401	Date	August 21, 2024
Sampler Location	บ้านนาเกลือ	Start Time	6:12 PM
Sampler Number	TSP No.A30	Transfer Standard Type	Office
Instrument Model	HIVOL-BBCE	Calibrator Model	TE-5025A
Motor Serial Number	2213	Calibrator Serial Number	2912
Recorder Serial Number	2136	Calibrated By	Mr. Auttapol Areejit

Plate No.	(Delta P)	(A)	(X)	(I)	(Y)	Temperature	Barometric Pressure	Start Meter	Stop Meter
	Pressure Drop Across Orifice (mmHg)	$[\Delta H_O(Pa/P_{atm})/(T_{ref}/T_a)]^{1/2}$	$Q_{std} = (U_{ref}/[A-b])$ (m ³ /min)	Sample Flow Rate Indicator (l/min)	$IC = (P/P_{atm})/(T_{ref}/T_a)^{1/2}$ (m ³ /min)	(°K = °C+273)	(mmHg)		
5	1.8	1.8	3.6	1.86623	0.99075	32.0	306.0	755.0	
7	3.0	3.0	6.0	2.40929	1.25075	43.0	306.0	755.0	
10	4.1	4.1	8.2	2.81857	1.44575	50.0	306.0	755.0	
13	5.2	5.2	10.4	3.17198	1.61592	58.0	306.0	755.0	
18	6.0	6.0	12.0	3.40726	1.72856	64.0	306.0	755.0	
Linear Regression Y ON X: Y= mx + b						Average	306.0	755.0	
1	Slope (m)	2.08853	Linear Equation			r ²	0.996632	Pstd/mmHg	760.0
2	Intercept (b)	-0.20307	Set Point Flow Rate (X) (m ³ /min)	1.133	r	0.9983146	T _{ref}		298.0
3	Correlation Coefficient (r)	0.99990	Final Set Flow Rate = (I)			0	(Pa/Pstd)/(Tstd/Ta)	0.96744026	
Result								C=(Pa/Pstd)/(Tstd/Ta)*0.5	0.983589986

COMMENT

Andersen Instruments, Inc.



Checked By

(Mr. Prayun Detkla)
Technician

Approved By

(Mr. Panupon Podang)
Environmental Scientist

F-AB-028, Rev. 02, June 3, 2019

CERTIFICATE OF CALIBRATION

Certificate No. : COF-021-67

Page 1 of 2 Pages

MEASUREMENT ITEM : Top Load Orifice
MANUFACTURER : TISCH
MODEL/TYPE : TE-S025A
SERIAL NUMBER : 2912
ID NUMBER : -
CONDITION AS-RECEIVED : Used Item
CUSTOMER : Environment Research & Technology Co. Ltd.
25/114 Moo 6 Soi Chinaket 1, Ngamwongwan Road,
Toongsonghong, Laksi, Bangkok 10210

RECEIVED DATE : 26 Jun 2024
MEASUREMENT DATE : 26 Jun 2024
ISSUE DATE : 27 Jun 2024

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:
Temperature : 23.0 ± 3.0 °C
Relative Humidity : 55.0 ± 15.0 %RH
Atmospheric Pressure : 1010 ± 10 hPa

CALIBRATION CONDITION:

Preconditioning : 24 hours at ambient conditions.
Measurement Condition : The average values during measurement are 23.2 °C and 52.0 %RH.

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

TABULATION OF RESULTS:

The table on next page give the measured values.

Calibration procedure:

The Orifice gas flow device was calibrated against Standard Rotary Displacement Meter (Roots Meter) Model G65/IMC/W2-dp. The WI-CL-004 was used as a calibration guideline.

Traceability:

This certificate provides a traceability of the measurement to recognized the national standards, and to realization of the international system of units (SI) through the NIMT (National Metrology Institute of Thailand) via Certificate number: MW-0063-23.

Uncertainty of Measurement:

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

MEASUREMENT RESULTS:

The Orifice gas flow device was calibrated by direct comparison method with the Standard Rotary Displacement Meter (Roots Meter). The Humid air was used as a medium in the system. The standard conditions are 25°C (298.15 K) and 760 mmHg for standard temperature and standard pressure respectively.

Table 1: The results of Q Standard calibration data

Plate	Flow rate m ³ /min	Pressure [Pa] mmHg	Temperature [Ta] °C	Temperature [Tm] °C	Δp_meter mmHg	Δp_Orifice inH ₂ O	γ	Standard Flow [Qs] m ³ /min
1	0.705	751.990	23.18	22.54	54.902	1.808	1.341	0.652
2	1.008	751.892	23.34	22.78	59.350	3.618	1.897	0.921
3	1.124	751.798	23.56	23.02	42.179	4.788	2.182	1.057
4	1.167	751.706	23.67	23.23	30.570	5.346	2.305	1.114
5	1.409	751.685	23.75	23.28	29.576	7.845	2.791	1.346

Slope (m): 2.08863
Intercept (b): -0.02307
Correlation coefficient (r): 0.99990
Uncertainty (k=2): 0.015 m³/min

Table 2: The results of Q actual calibration data

Plate	Flow rate m ³ /min	Pressure [Pa] mmHg	Temperature [Ta] °C	Temperature [Tm] °C	Δp_meter mmHg	Δp_Orifice inH ₂ O	γ	Standard Flow [Qs] m ³ /min
1	0.705	751.990	23.18	22.54	54.902	1.808	0.844	0.655
2	1.008	751.892	23.34	22.78	59.350	3.618	1.194	0.926
3	1.124	751.798	23.56	23.02	42.179	4.788	1.375	1.063
4	1.167	751.706	23.67	23.23	30.570	5.346	1.453	1.122
5	1.409	751.685	23.75	23.28	29.576	7.845	1.760	1.356

Slope (m): 1.30815
Intercept (b): -0.01449
Correlation coefficient (r): 0.99990
Uncertainty (k=2): 0.015 m³/min

End of Certificate of Calibration

Calibrated by:

☐ Mr. Sorawit Thachalad
☒ Miss Jittraporn Lertsomphol



Approved sign

Mr. Parinya Booncharoen
Calibration Department Manager



Mettler-Toledo (Thailand) Ltd.
846/4 - 846/5 Lasalle Rd., Bangna Tai Sub-District
Bangna District, Bangkok 10260
+662 723 0382
MT-TH.ServiceSupport@mt.com



Accuracy Calibration Certificate

Customer

Company: Environment Research & Technology Co., Ltd.
Address: 25114 Moo 6, Soi Chinaket 1, Ngamwongwan Rd., Toongsonghong
City: Laksi Contact: Ramita Taengthai
Zip / Postal: 10210
State / Province: Bangkok
Order Number:



Weighing Device

Manufacturer: Mettler Toledo Instrument Type: Weighing Instrument
Model: AE204-S Asset Number: ERTC-L-IN-0048
Serial No.: 1123103723 Terminal Model: N/A
Building: N/A Terminal Serial No.: N/A
Floor: 4 Terminal Asset No.: N/A
Room: 406

Range	Max. Capacity	Readability (d)
1	220 g	0.0001 g

Procedure

Calibration Guideline: EURAMET cg-18 v. 4.0 (11/2015)

METTLER TOLEDO Work Instruction: CPW00220

This calibration certificate contains measurements for As Found and As Left calibrations.

The sensitivity/span of the weighing instrument was adjusted before As Found and As Left calibrations with a built-in weight.

In accordance with EURAMET cg-18 (11/2015), the test loads were selected to reflect the specific use of the weighing device or to accommodate specific calibration conditions.

	Temperature		Humidity	
As Found	Start: 25.4 °C	End: 25.3 °C	Start: 36.4 %	End: 34.9 %
As Left	Start: 25.3 °C	End: 25.2 °C	Start: 34.9 %	End: 34.1 %

As Found Calibration Date: 15-Jan-2024 Calibrator: [Redacted]
As Left Calibration Date: 15-Jan-2024
Issue Date: 15-Jan-2024
Approved Signatory: [Redacted]
Technical Manager / Head of Calibration Center

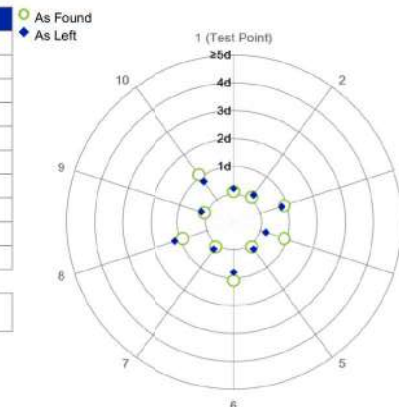
Measurement Results

Repeatability

Test Load: 100 g

	As Found	As Left
1	99.9993 g	100.0002 g
2	99.9993 g	100.0002 g
3	99.9992 g	100.0003 g
4	99.9992 g	100.0002 g
5	99.9993 g	100.0002 g
6	99.9994 g	100.0003 g
7	99.9993 g	100.0002 g
8	99.9992 g	100.0001 g
9	99.9993 g	100.0002 g
10	99.9994 g	100.0003 g

Standard Deviation	0.00007 g	0.00006 g
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The "d" in the graph represents the readability of the range/interval in which the test was performed.

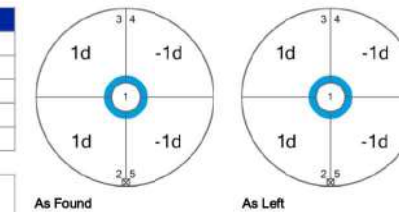
The results of this graph are based upon the absolute values of the differences from the mean value.

Eccentricity

Test Load: 100 g

Position	As Found	As Left
1	99.9993 g	100.0002 g
2	99.9994 g	100.0003 g
3	99.9994 g	100.0003 g
4	99.9992 g	100.0001 g
5	99.9992 g	100.0001 g

Maximum Deviation	0.0001 g	0.0001 g
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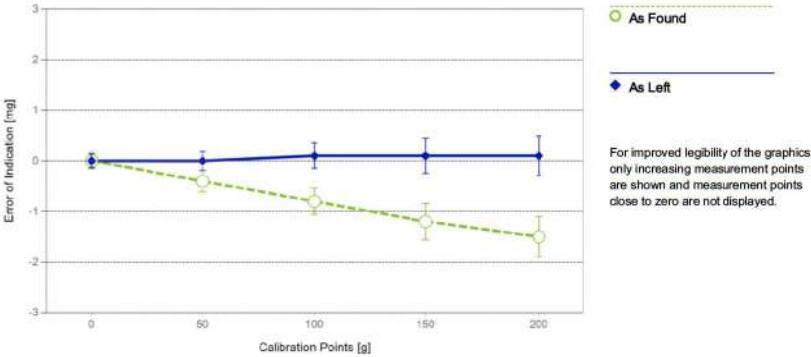


The "d" in the graph represents the readability of the range/interval in which the test was performed.

Error of Indication

As Found					
	Reference Value	Indication	Error of Indication	Expanded Uncertainty	k
1	0.0000 g	0.0000 g	0.0000 g	0.16 mg	2
2	0.0500 g	0.0501 g	0.0001 g	0.17 mg	2
3	0.1000 g	0.1000 g	0.0000 g	0.17 mg	2
4	0.5000 g	0.5001 g	0.0001 g	0.17 mg	2
5	1.0000 g	1.0000 g	0.0000 g	0.17 mg	2
6	5.0000 g	4.9999 g	-0.0001 g	0.17 mg	2
7	10.0000 g	9.9998 g	-0.0002 g	0.18 mg	2
8	50.0000 g	49.9996 g	-0.0004 g	0.21 mg	2
9	100.0001 g	99.9993 g	-0.0008 g	0.26 mg	2
10	150.0001 g	149.9989 g	-0.0012 g	0.36 mg	2
11	200.0000 g	199.9985 g	-0.0015 g	0.40 mg	2

As Left					
	Reference Value	Indication	Error of Indication	Expanded Uncertainty	k
1	0.0000 g	0.0000 g	0.0000 g	0.14 mg	2
2	0.0500 g	0.0500 g	0.0000 g	0.15 mg	2
3	0.1000 g	0.1000 g	0.0000 g	0.15 mg	2
4	0.5000 g	0.5000 g	0.0000 g	0.15 mg	2
5	1.0000 g	1.0000 g	0.0000 g	0.15 mg	2
6	5.0000 g	5.0000 g	0.0000 g	0.16 mg	2
7	10.0000 g	10.0000 g	0.0000 g	0.16 mg	2
8	50.0000 g	50.0000 g	0.0000 g	0.19 mg	2
9	100.0001 g	100.0002 g	0.0001 g	0.25 mg	2
10	150.0001 g	150.0002 g	0.0001 g	0.35 mg	2
11	200.0000 g	200.0001 g	0.0001 g	0.39 mg	2



The uncertainty stated is the expanded uncertainty at calibration obtained by multiplying the standard combined uncertainty by the coverage factor k – which can be larger than 2 according to EURAMET cg-18. The value of the measurand lies within the assigned range of values with a probability of approximately 95%.

The user is responsible for maintaining environmental conditions and the settings of the weighing instrument when it was calibrated. The results of this calibration certificate relate only to the calibrated item.

Test Equipment

All weights used for metrological testing are traceable to national or international standards. The weights were calibrated and certified by an accredited calibration laboratory.

Weight Set 1: OIML E2

Weight Set No.: WS52 Date of Issue: 22-Nov-2022
Certificate Number: 182272 Calibration Due Date: 21-May-2024

Thermo Hygromeier

Equipment No.: IN302 Date of Issue: 11-Oct-2023
Certificate Number: SG-H-00656/66 Calibration Due Date: 08-Oct-2024

Remarks

Value of the built-in weight adjusted
Equipment condition: Good
Next calibration according to customer's procedure
Calibration data not decide by calibration laboratory

End of Accredited Section

The information below and any attachments to this calibration certificate are not part of the accredited calibration.

Measurement Uncertainty of the Weighing Instrument in Use

Stated is the expanded uncertainty with $k=2$ in use. The formula shall be used for the estimation of the uncertainty under consideration of the errors of indication. The value R represents the net load indication in the unit of measure of the device.

Temperature coefficient for the evaluation of the measurement uncertainty in use: $3.0 \cdot 10^{-6} / K$

Temperature range on site for the evaluation of the measurement uncertainty in use: $3 K$

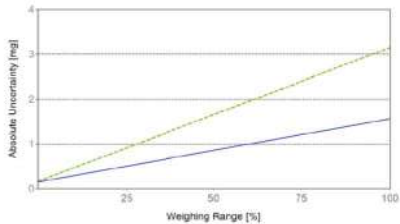
Linearization of Uncertainty Equation

	Range		As Found	As Left
	d	Max		
1	0.0001 g	220 g	$U_1 = 0.17 \text{ mg} + 0.0136 \text{ mg/g} \cdot R$	$U_1 = 0.15 \text{ mg} + 0.00644 \text{ mg/g} \cdot R$

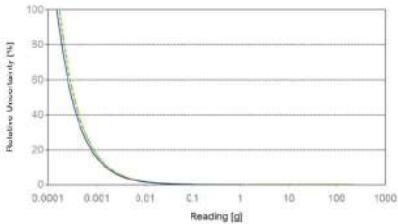
To optimize the stability of the linearization, besides of the zero load only increasing measurement points with a test load of 5% of the measurement range or larger are taken for the calculation of the linear equation.

Absolute and Relative Measurement Uncertainty in Use for Various Net Indications (Examples)

Net Indication	As Found		As Left	
0.0220 g	0.17 mg	0.77%	0.15 mg	0.68%
0.2200 g	0.17 mg	0.075%	0.15 mg	0.069%
2.2000 g	0.20 mg	0.0091%	0.15 mg	0.0075%
22.0000 g	0.47 mg	0.0021%	0.29 mg	0.0013%
220.0000 g	3.2 mg	0.0014%	1.6 mg	0.00071%



As Found



As Left

GWP®
Certificate



As Found



As Left



The weighing device meets the given process requirements.

The weighing device meets the given process requirements.

Tests Performed: ☒ As Found ☒ As Left

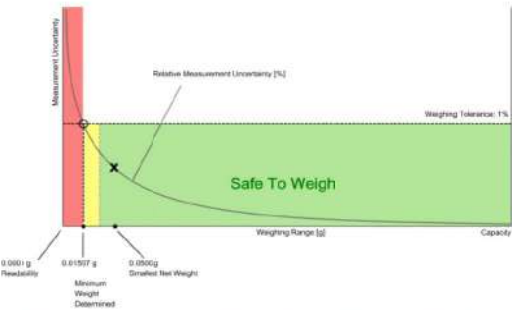
Process Requirements

Weighing Tolerance: 1%

Smallest Net Weight: 0.0500 g

Safety Factor: 2

Safe Weighing Range



While the values in this graph reflect the actual calibration results, the measurement uncertainty curves are simply a visual representation. This graph reflects As Left testing, unless only As Found was performed.

Minimum Weight

As Found Minimum Weight Table

Minimum weights for different weighing tolerances and safety factors					
Tolerance	Safety Factor				
	1	2	3	5	10
0.1%	0.17097 g	0.34671 g	0.52742 g	0.90460 g	1.95110 g
0.2%	0.08490 g	0.17097 g	0.25823 g	0.43643 g	0.90460 g
0.5%	0.03382 g	0.05783 g	0.10202 g	0.17097 g	0.34671 g
1%	0.01689 g	0.03382 g	0.05080 g	0.08490 g	0.17097 g
2%	0.00844 g	0.01689 g	0.02535 g	0.04231 g	0.08490 g
5%	0.00337 g	0.00675 g	0.01013 g	0.01689 g	0.03382 g



Pass: The determined minimum weight meets the requirement for the smallest net weight.

As Left Minimum Weight Table

Minimum weights for different weighing tolerances and safety factors					
Tolerance	Safety Factor				
	1	2	3	5	10
0.1%	0.15153 g	0.30304 g	0.46056 g	0.77780 g	1.60910 g
0.2%	0.07552 g	0.15153 g	0.22803 g	0.38254 g	0.77780 g
0.5%	0.03015 g	0.06030 g	0.09068 g	0.15153 g	0.30304 g
1%	0.01507 g	0.03015 g	0.04525 g	0.07552 g	0.15153 g
2%	0.00753 g	0.01507 g	0.02261 g	0.03770 g	0.07552 g
5%	0.00301 g	0.00602 g	0.00904 g	0.01507 g	0.03015 g



Pass: The determined minimum weight meets the requirement for the smallest net weight.

At these net minimum weight values, the measurement uncertainty of the weighing device is equal to or less than 1/1 (no safety factor), 1/2, 1/3, 1/5, or 1/10 of the required tolerance. The values are calculated with $k=2$ and based on the linear formula of the measurement uncertainty of the weighing device in use.

The safety factor for As Found is always 1. This implies no safety factor. As Found testing looks at the behavior of the instrument from the past until test occurred. For the past, it is necessary to know that the tolerance was met, but not the safety factor. The safety factor is a proactive measure to apply for future measurements.

Notes on minimum weight values in above table:

- If "N/A" is shown above, no appropriate value could be calculated.
- METTLER TOLEDO is not responsible for the definition of the process requirements.

Measurement Results

Results Summary

	Repeatability	Eccentricity	Error of Indication
As Found	✓	✓	✓
As Left	✓	✓	✓

✓ = Passed

✗ = Failed

⚠ = Safety Factor not met

Repeatability

Test Load: 100 g

Tolerance	Control Limit	As Found		As Left	
		Std. Deviation	Result	Std. Deviation	Result
0.1%	N/A	0.00007 g*	N/A	0.00006 g*	N/A
0.2%	0.00005 g		✗		✗
0.5%	0.00013 g		✓		✓
1%	0.00025 g		✓		✓
2%	0.00050 g		✓		✓
5%	0.00125 g		✓		✓

*The calculated standard deviation value is below the rounding error of the balance. The 0.41° d rule is used for the assessment of this repeatability test and the calculation of the minimum weight.

The weighing tolerance is met if the standard deviation is less than or equal to the corresponding control limit.

Eccentricity

Test Load: 100 g

Tolerance	Control Limit	As Found		As Left	
		Deviation	Result	Deviation	Result
0.1%	0.0500 g	0.0001 g	✓	0.0001 g	✓
0.2%	0.1000 g		✓		✓
0.5%	0.2500 g		✓		✓
1%	0.5000 g		✓		✓
2%	1.0000 g		✓		✓
5%	2.5000 g		✓		✓

The weighing tolerance is met if the deviation is less than or equal to the corresponding control limit.

As Found

Control limits for various weighing tolerances							
Reference Value	Error	0.1%	0.2%	0.5%	1%	2%	5%
0.0000 g	0.0000 g	N/A	N/A	N/A	N/A	N/A	N/A
50.0000 g	-0.0004 g	0.0250 g	0.0500 g	0.1250 g	0.2500 g	0.5000 g	1.2500 g
100.0001 g	-0.0008 g	0.0500 g	0.1000 g	0.2500 g	0.5000 g	1.0000 g	2.5000 g
150.0001 g	-0.0012 g	0.0750 g	0.1500 g	0.3750 g	0.7500 g	1.5000 g	3.7500 g
200.0000 g	-0.0015 g	0.1000 g	0.2000 g	0.5000 g	1.0000 g	2.0000 g	5.0000 g
Result		✓	✓	✓	✓	✓	✓

As Left

Control limits for various weighing tolerances							
Reference Value	Error	0.1%	0.2%	0.5%	1%	2%	5%
0.0000 g	0.0000 g	N/A	N/A	N/A	N/A	N/A	N/A
50.0000 g	0.0000 g	0.0250 g	0.0500 g	0.1250 g	0.2500 g	0.5000 g	1.2500 g
100.0001 g	0.0001 g	0.0500 g	0.1000 g	0.2500 g	0.5000 g	1.0000 g	2.5000 g
150.0001 g	0.0001 g	0.0750 g	0.1500 g	0.3750 g	0.7500 g	1.5000 g	3.7500 g
200.0000 g	0.0001 g	0.1000 g	0.2000 g	0.5000 g	1.0000 g	2.0000 g	5.0000 g
Result		✓	✓	✓	✓	✓	✓

The weighing tolerance is met if the error (of indication) for each test point is less than or equal to the corresponding control limit for that particular weighing tolerance. Results at or close to the zero point cannot be assessed.

Calibration Data of NOx Analyzer

Analyzer Performance Test

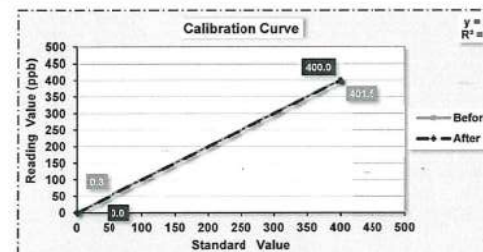
Equipment	Gas Analyzer (NOx)	Customer Name	Vision E.
Manufacture	HORIBA	Location	Envi Research
Model	APNA-370	Quotation	2024-00461
Serial No.	4VWFEBUK	Calibration Date	August 13, 2024
Analyzer Unit	ppb		

Instruments for Calibration

Instruments	Manufacture	Model	Serial Number
Zero Air Supply	Thermo Env.	111	0700419829
Dynamic Dilution Calibrator	Tanabyte	300	0165
Standard Gas Components	CO = 4,516 ppm		
Cylinder No : EB0123013	NO = 55.3 ppm		
Expire Date : Oct 22, 2027	SO ₂ = 54.9 ppm		

Single Point Calibration

Standard Gas	Standard Gas Value	Analyzer Value								% Abs Error
		NO _x (ppb)		NO (ppb)		NO ₂ (ppb)		Stability		
		Before	After	Before	After	Before	After	Before	After	
Zero	0	0.3	0.0	0.3	0.0	0.0	0.0	-	-	-
Span	400	401.8	400.0	401.5	400.0	0.3	0.0	-	-	0.4



STATUS TEST AND VALIDATION OF NOx ANALYZER MODEL APNA-370

Parameter	Unit	Observed Value		Nominal Range
		Before Adjust	After Adjust	
Range	ppb	500	500	0 - 500 Standard
Signal NO	mV	1.4	0.3	Voltage of the measured NO value
Signal NOx	mV	7.2	7.9	Voltage of the measured NOx value
Detector	°C	41.0	41.0	43 °C ± 5 °C
Ambient	kPa	100.3	100.2	Current atmospheric pressure
DC 24V	V	23.5	23.2	24V ±0.5
DC 5V	V	5.0	5.0	5V ±0.5
NO Slope	-	1.32560	1.32540	0.50000 - 2.0000
NOx Slope	-	1.14810	1.14750	0.50000 - 2.0000

Calibrate By :

(MR.PANUPON P0DANG)
August 13, 2024

Checked By :

(MS.SUTATIP IM-NOI)
August 13, 2024

Calibration Data of NOx Analyzer

Analyzer Performance Test

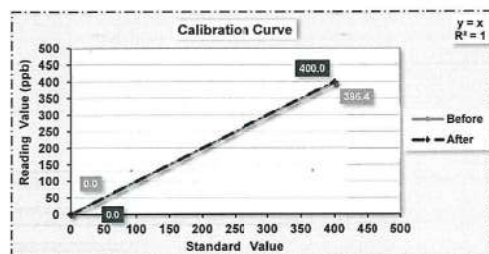
Equipment	Gas Analyzer (NOx)	Customer Name	Vision E.
Manufacture	HORIBA	Location	Envi Research
Model	APNA-370	Quotation	2024-00461
Serial No.	J6GUBA4N	Calibration Date	August 8, 2024
Analyzer Unit	ppb		

Instruments for Calibration

Instruments	Manufacture	Model	Serial Number
Zero Air Supply	Thermo Env.	111	0700419829
Dynamic Dilution Calibrator	Tanabyte	300	0165
Standard Gas Components	CO = 4,516 ppm NO = 55.3 ppm SO ₂ = 54.9 ppm		
Cylinder No : EB0123013			
Expire Date : Oct 22, 2027			

Single Point Calibration

Standard Gas	Standard Gas Value	Analyzer Value						% Abs Error		
		NO _x (ppb)		NO (ppb)		NO ₂ (ppb)			Stability	
		Before	After	Before	After	Before	After		Before	After
Zero	0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-
Span	400	394.9	400.0	396.4	400.0	-1.5	0.0	-	-	0.9



STATUS TEST AND VALIDATION OF NOx ANALYZER MODEL APNA-370

Parameter	Unit	Observed Value		Nominal Range
		Before Adjust	After Adjust	
Range	ppb	500	500	0 - 500 Standard
Signal NO	mV	2.2	1.6	Voltage of the measured NO value
Signal NOx	mV	20.3	17.2	Voltage of the measured NOx value
Detector	°C	41.5	41.5	43 °C ± 5 °C
Ambient	kPa	101.6	101.5	Current atmospheric pressure
DC 24V	V	23.7	23.7	24V ±0.5
DC 5V	V	5.0	5.0	5V ±0.5
NO Slope	-	0.78266	0.79540	0.50000 - 2.0000
NOx Slope	-	0.76216	0.76840	0.50000 - 2.0000

Calibrate By :

(MR.PANUPON PODANG)
August 8, 2024



Checked By :

(MS.SUTATIP IM-NOI)
August 8, 2024

Calibration Data of NOx Analyzer

Analyzer Performance Test

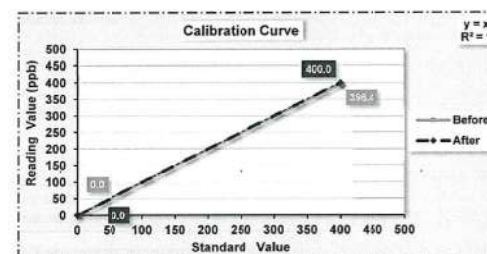
Equipment	Gas Analyzer (NOx)	Customer Name	Vision E.
Manufacture	HORIBA	Location	Envi Research
Model	APNA-370	Quotation	2024-00461
Serial No.	KCDVY226	Calibration Date	August 8, 2024
Analyzer Unit	ppb		

Instruments for Calibration

Instruments	Manufacture	Model	Serial Number
Zero Air Supply	Thermo Env.	111	0700419829
Dynamic Dilution Calibrator	Tanabyte	300	0165
Standard Gas Components	CO = 4,516 ppm NO = 55.3 ppm SO ₂ = 54.9 ppm		
Cylinder No : EB0123013			
Expire Date : Oct 22, 2027			

Single Point Calibration

Standard Gas	Standard Gas Value	Analyzer Value								% Abs Error
		NO _x (ppb)		NO (ppb)		NO ₂ (ppb)		Stability		
		Before	After	Before	After	Before	After	Before	After	
Zero	0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-
Span	400	394.9	400.0	396.4	400.0	-1.5	0.0	-	-	0.9



STATUS TEST AND VALIDATION OF NOx ANALYZER MODEL APNA-370

Parameter	Unit	Observed Value		Nominal Range
		Before Adjust	After Adjust	
Range	ppb	500	500	0 - 500 Standard
Signal NO	mV	2.2	1.6	Voltage of the measured NO value
Signal NOx	mV	20.3	17.2	Voltage of the measured NOx value
Detector	°C	41.5	41.5	43 °C ± 5 °C
Ambient	kPa	101.6	101.5	Current atmospheric pressure
DC 24V	V	23.7	23.7	24V ±0.5
DC 5V	V	5.0	5.0	5V ±0.5
NO Slope	-	0.78260	0.78540	0.50000 - 2.0000
NOx Slope	-	0.72621	0.76840	0.50000 - 2.0000

Calibrate By :

(MR.PANUPON PODANG)
August 8, 2024



Checked By :

(MS.SUTATIP IM-NOI)
August 8, 2024

Calibration Data of NOx Analyzer

Analyzer Performance Test

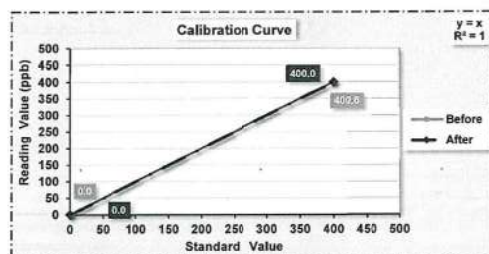
Equipment	Gas Analyzer (NOx)	Customer Name	Vision E.
Manufacture	HORIBA	Location	Envi Research
Model	APNA-370	Quotation	2024-00461
Serial No.	U65W031M	Calibration Date	August 1, 2024
Analyzer Unit	ppb		

Instruments for Calibration

Instruments	Manufacture	Model	Serial Number
Zero Air Supply	Thermo Env.	111	0700419829
Dynamic Dilution Calibrator	Tanabyte	300	0165
Standard Gas Components	CO = 4,516 ppm NO = 55.3 ppm SO ₂ = 54.9 ppm		
Cylinder No : E30123013			
Expire Date : Oct 22, 2027			

Single Point Calibration

Standard Gas	Standard Gas Value	Analyzer Value								% Abs Error
		NO _x (ppb)		NO (ppb)		NO ₂ (ppb)		Stability		
		Before	After	Before	After	Before	After	Before	After	
Zero	0	-0.1	0.0	0.0	0.0	-0.1	0.0	-	-	-
Span	400	400.7	400.0	400.6	400.0	0.1	0.0	-	-	0.2



STATUS TEST AND VALIDATION OF NOx ANALYZER MODEL APNA-370

Parameter	Unit	Observed Value		Nominal Range
		Before Adjust	After Adjust	
Range	ppb	500	500	0 - 500 Standard
Signal NO	mV	1.3	1.8	Voltage of the measured NO value
Signal NOx	mV	14.3	14.8	Voltage of the measured NOx value
Detector	°C	42.0	42.0	43 °C ± 5 °C
Ambient	kPa	101.6	101.7	Current atmospheric pressure
DC 24V	V	23.6	23.6	24V ±0.5
DC 5V	V	0.0	5.0	5V ±0.5
NO Slope	-	1.08133	1.07840	0.50000 - 2.0000
NOx Slope	-	1.02573	1.02560	0.50000 - 2.0000

Calibrate By :

(MR.PANUPON PODANG)
August 1, 2024

envi research
Checked By :
ENVIRONMENT RESEARCH & TECHNOLOGY CO., LTD.

(MS.SUTATIP IM-NOI)
August 1, 2024

Calibration Data of SO₂ Analyzer

Analyzer Performance Test

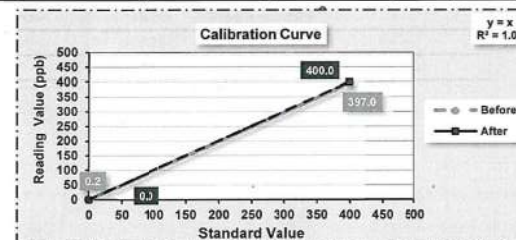
Equipment	Gas Analyzer (SO ₂)	Customer Name	Vision E.
Manufacture	Thermo	Location	Envi Research
Model	43i-BNSAA	Quotation	2024-00461
Serial No.	CM14430005	Calibration Date	August 13, 2024
Analyzer Unit	ppb		

Instruments for Calibration

Instruments	Manufacture	Model	Serial Number
Zero Air Supply	Thermo Env.	111	0700419829
Dynamic Dilution Calibrator	Tanabyte	300	0165
Standard Gas Components	CO = 4,516 ppm NO = 55.3 ppm SO ₂ = 54.9 ppm		
Cylinder No : EB0123013			
Expire Date : Oct 22, 2027			

Single Point Calibration

Standard Gas	Standard Gas Value	Analyzer Value (ppb)		Stability		% Abs Error
		Before	After	Before	After	
Zero	0	0.2	0.0	-	-	-
Span	400	397.0	400.0	-	-	0.8



STATUS TEST AND VALIDATION OF SO₂ ANALYZER MODEL 43i-BNSAA

Parameter	Display As	Unit	Observed Value		Nominal Range
			Before Adjust	After Adjust	
Range	RANGE	ppb	500	500	0 - 500 standard
Internal Temperature	INTERNAL	°C	32.4	32.4	8.0 °C to 45.0 °C
Chamber Temp	CHAMBER	°C	45.1	45.0	43.0 °C to 47.0 °C
Pressure	PRESSURE	mmHg	730.7	730.8	400.0 to 1,000
Sample Flow	SAMP FLOW	LPM	0.447	0.472	0.350 to 0.750
Lamp Intensity	LAMP INTENSITY	%	71	72	20 to 100
Lamp Voltage	LAMP VOLTAGE	V	848	848	500 to 1200
SO2 Concentration	SO2 CONCENTRATION	ppb	3.4	2	0 to 10,000
Motherboard Status	MOTHERBOARD STATUS	-	OK	OK	OK
Interface Status	INTERFACE STATUS	-	OK	OK	OK

Calibrate By :

(MR.PANUPON PODANG)
August 13, 2024

envi research
Checked By :
ENVIRONMENT RESEARCH & TECHNOLOGY CO., LTD.

(MS.SUTATIP IM-NOI)
August 13, 2024

Calibration Data of SO₂ Analyzer

Analyzer Performance Test

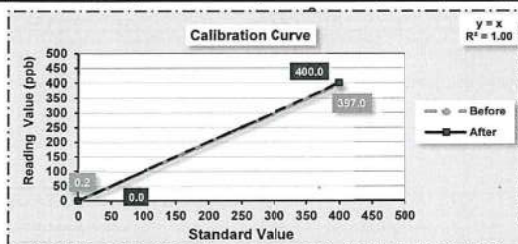
Equipment	Gas Analyzer (SO ₂)	Customer Name	Vision E.
Manufacture	Thermo	Location	Envi Research
Model	43i-BNSAA	Quotation	2024-00461
Serial No.	CM14430002	Calibration Date	August 15, 2024
Analyzer Unit	ppb		

Instruments for Calibration

Instruments	Manufacture	Model	Serial Number
Zero Air Supply	Thermo Env.	111	0700419829
Dynamic Dilution Calibrator	Tanabyte	300	0165
Standard Gas Components	CO = 4,516 ppm NO = 55.3 ppm SO ₂ = 54.9 ppm		
Cylinder No : EB0123013			
Expire Date : Oct 22, 2027			

Single Point Calibration

Standard Gas	Standard Gas Value	Analyzer Value (ppb)		Stability		% Abs Error
		Before	After	Before	After	
Zero	0	0.2	0.0	-	-	-
Span	400	397.0	400.0	-	-	0.8



STATUS TEST AND VALIDATION OF SO₂ ANALYZER MODEL 43i-BNSAA

Parameter	Display As	Unit	Observed Value		Nominal Range
			Before Adjust	After Adjust	
Range	RANGE	ppb	500	500	0 - 500 standard
Internal Temperature	INTERNAL	°C	32.8	32.4	8.0 °C to 45.0 °C
Chamber Temp	CHAMBER	°C	45.1	45.0	43.0 °C to 47.0 °C
Pressure	PRESSURE	mmHg	732.2	730.8	400.0 to 1,000
Sample Flow	SAMP FLOW	LPM	0.352	0.472	0.350 to 0.750
Lamp Intensity	LAMP INTENSITY	%	92	92	20 to 100
Lamp Voltage	LAMP VOLTAGE	V	379	848	500 to 1200
SO ₂ Concentration	SO ₂ CONCENTRATION	ppb	2.9	2	0 to 10,000
Motherboard Status	MOTHERBOARD STATUS	-	OK	OK	OK
Interface Status	INTERFACE STATUS	-	OK	OK	OK

Calibrate By :

(MR.PANUPON PODANG)
August 15, 2024

Checked By :
(MS.SUTATIP IM-NOI)
August 15, 2024

Calibration Data of SO₂ Analyzer

Analyzer Performance Test

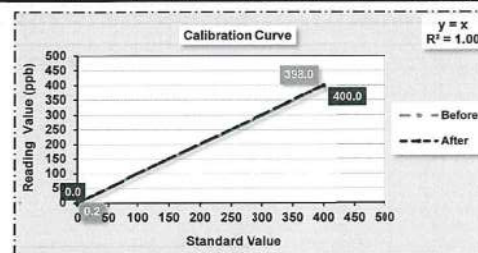
Equipment	Gas Analyzer (SO ₂)	Customer Name	Vision E.
Manufacture	Thermo	Location	Envi Research
Model	43C	Quotation	2024-00461
Serial No.	58283-317	Calibration Date	August 15, 2024
Analyzer Unit	ppb		

Instruments for Calibration

Instruments	Manufacture	Model	Serial Number
Zero Air Supply	Thermo Env.	111	0700419829
Dynamic Dilution Calibrator	Tanabyte	300	0165
Standard Gas Components	CO = 4,516 ppm NO = 55.3 ppm SO ₂ = 54.9 ppm		
Cylinder No : EB0123013			
Expire Date : Oct 22, 2027			

Single Point Calibration

Standard Gas	Standard Gas Value	Analyzer Value (ppb)		Stability		% Abs Error
		Before	After	Before	After	
Zero	0	0.2	0.0	-	-	-
Span	400	398.0	400.0	-	-	0.5



STATUS TEST AND VALIDATION OF SO₂ ANALYZER MODEL 43C

Parameter	Display As	Unit	Observed Value		Nominal Range
			Before Adjust	After Adjust	
Range	RANGE	ppb	500	500	0 - 500 standard
Internal Temperature	INTERNAL	°C	30.5	33.2	8.0 °C to 47.0 °C
Chamber Temp	CHAMBER	°C	46.6	44.5	43.0 °C to 47.0 °C
Pressure	PRESSURE	mmHg	731.9	761.9	400.0 to 1,000
Sample Flow	SAMP FLOW	LPM	0.476	0.371	0.350 to 1,000
Lamp Intensity	INTENSITY	Hz	38,583	24364	20,000 to 50,000
Lamp Voltage	LAMP VOLTAGE	V	875	830	750 to 1,200
SO ₂ Concentration	SO ₂ CONCENTRATION	ppb	2.2	1.8	0 to 10,000
Motherboard Status	MOTHERBOARD STATUS	-	OK	OK	OK
Interface Status	INTERFACE STATUS	-	OK	OK	OK

Calibrate By :

(MR.PANUPON PODANG)
August 15, 2024

Checked By :
(MS.SUTATIP IM-NOI)
August 15, 2024

(MS.SUTATIP IM-NOI)
August 15, 2024

Calibration Data of SO₂ Analyzer

Analyzer Performance Test

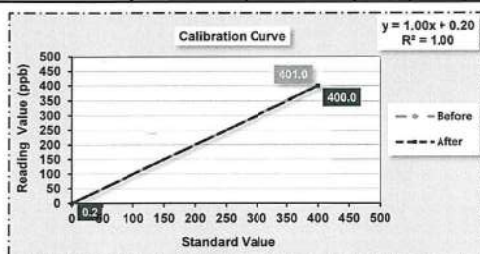
Equipment	Gas Analyzer (SO ₂)	Customer Name	Vision E.
Manufacture	Thermo	Location	Envi Research
Model	43C	Quotation	2024-00461
Serial No.	57469-317	Calibration Date	August 15, 2024
Analyzer Unit	ppb		

Instruments for Calibration

Instruments	Manufacture	Model	Serial Number
Zero Air Supply	Thermo Env.	111	0700419829
Dynamic Dilution Calibrator	Tanabyte	300	0165
Standard Gas Components	CO = 4.516 ppm NO = 55.3 ppm SO ₂ = 54.9 ppm		
Cylinder No :	EB0123013		
Expire Date :	Oct 22, 2027		

Single Point Calibration

Standard Gas	Standard Gas Value	Analyzer Value (ppb)		Stability		% Abs Error
		Before	After	Before	After	
Zero	0	-0.1	0.2	-	-	-
Span	400	401.0	400.0	-	-	0.3



STATUS TEST AND VALIDATION OF SO₂ ANALYZER MODEL 43C

Parameter	Display As	Unit	Observed Value		Nominal Range
			Before Adjust	After Adjust	
Range	RANGE	ppb	500	500	0 - 500 standard
Internal Temperature	INTERNAL	°C	30.7	33.0	8.0 °C to 47.0 °C
Chamber Temp	CHAMBER	°C	45.3	45.5	43.0 °C to 47.0 °C
Pressure	PRESSURE	mmHg	721.6	660.6	400.0 to 1,000
Sample Flow	SAMP FLOW	LPM	0.432	0.581	0.350 to 1,000
Lamp Intensity	INTENSITY	Hz	29,554	30899	20,000 to 50,000
Lamp Voltage	LAMP VOLTAGE	V	798	1029	750 to 1,200
SO ₂ Concentration	SO ₂ CONCENTRATION	ppb	1.2	1.4	0 to 10,000
Motherboard Status	MOTHERBOARD STATUS	-	OK	OK	OK
Interface Status	INTERFACE STATUS	-	OK	OK	OK

Calibrate By :

(MR.PANUPON PODANG)
August 15, 2024

Checked By :
(MS.SUTATIP IM-NOI)
August 15, 2024

Calibration Data of CO Analyzer

Analyzer Performance Test

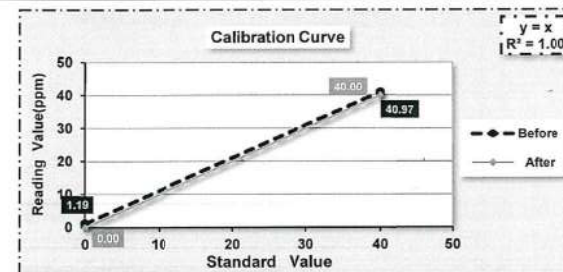
Equipment	Gas Analyzer (CO)	Customer Name	Vision E.
Manufacture	HORIBA	Location	Envi Research
Model	APMA-370	Quotation	2024-00461
Serial No.	XRP3Y7LA	Calibration Date	August 1, 2024
Analyzer Unit	ppm		

Instruments for Calibration

Instruments	Manufacture	Model	Serial Number
Zero Air Supply	Thermo Env.	111	0700419829
Dynamic Dilution Calibrator	Tanabyte	300	0165
Standard Gas Components	CO = 4.487 ppm NO = 46.1 ppm SO ₂ = 46.0 ppm		
Cylinder No :	EB0123013		
Expire Date :	Oct 22, 2027		

Single Point Calibration

Standard Gas	Standard Gas Value	Analyzer Value (ppm)		Stability		% Abs Error
		Before	After	Before	After	
Zero	0	1.19	0.00	-	-	-
Span	40	40.97	40.00	-	-	2.43



STATUS TEST AND VALIDATION OF CO ANALYZER MODEL APMA-370

Parameter	Unit	Observed Value		Nominal Range
		Before Adjust	After Adjust	
SIGNAL (MAIN)	mV	1.8	0.9	Voltage of the measured CO Value
SIGNAL (COMP)	mV	0.4	0.1	Voltage of the interference component Value
CELL	°C	30.5	30.4	Ambient + (5 to 10 C)
PUMP	kpa	40.9	40.8	less than 65
AMBIENT	kpa	101.5	101.4	Atmospheric pressure
DC 24V	mV	23.9	23.9	24 +/- 0.5 V
DC 5V	mV	5.0	5.0	5 +/- 0.5 V

Calibrate By :

(MR.PANUPON PODANG)
August 1, 2024

Checked By :
(MS.SUTATIP IM-NOI)
August 1, 2024

Calibration Data of CO Analyzer

Analyzer Performance Test

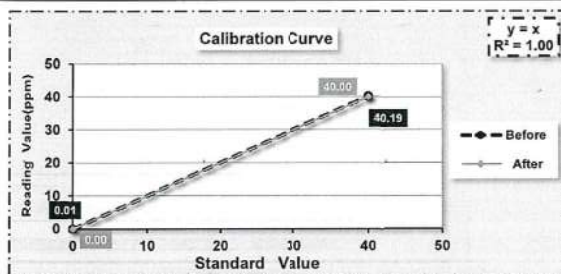
Equipment	Gas Analyzer (CO)	Customer Name	Vision E.
Manufacture	HORIBA	Location	Envi Research
Model	APMA-370	Quotation	2024-00461
Serial No.	SFB4TS99	Calibration Date	August 8, 2024
Analyzer Unit	ppm		

Instruments for Calibration

Instruments	Manufacture	Model	Serial Number
Zero Air Supply	Thermo Env.	111	0700419829
Dynamic Dilution Calibrator	Tanabyte	300	0165
Standard Gas Components	CO = 4,516 ppm NO = 55.3 ppm SO ₂ = 54.9 ppm		
Cylinder No : EB0123013			
Expire Date : Oct 22, 2027			

Single Point Calibration

Standard Gas	Standard Gas Value	Analyzer Value (ppm)		Stability		% Abs Error
		Before	After	Before	After	
Zero	0	0.01	0.00	-	-	-
Span	40	40.19	40.00	-	-	0.47



STATUS TEST AND VALIDATION OF CO ANALYZER MODEL APMA-370

Parameter	Unit	Observed Value		Nominal Range
		Before Adjust	After Adjust	
SIGNAL (MAIN)	mV	4.0	4.1	Voltage of the measured CO Value
SIGNAL (COMP)	mV	0.7	0.3	Voltage of the interference component Value
CELL	°C	29.4	29.5	Ambient + (5 to 10 °C)
PUMP	kpa	39.2	39.3	less than 65
AMBIENT	kpa	101.6	101.7	Atmospheric pressure
DC 24V	mV	23.6	23.6	24 +/- 0.5 V
DC 5V	mV	4.9	4.9	5 +/- 0.5 V

Calibrate By :

(MR.PANUPON PODANG)
August 8, 2024

Checked By :
(MS.SUTATIP IM-NOI)
August 8, 2024

Calibration Data of CO Analyzer

Analyzer Performance Test

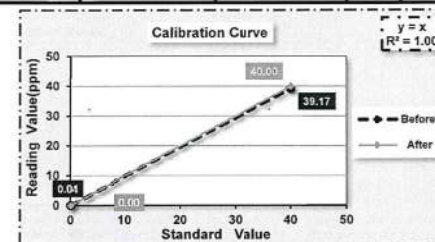
Equipment	Gas Analyzer (CO)	Customer Name	Vision E.
Manufacture	HORIBA	Location	Envi Research
Model	APMA-360 CE	Quotation	2024-00461
Serial No.	576876072	Calibration Date	August 14, 2024
Analyzer Unit	ppm		

Instruments for Calibration

Instruments	Manufacture	Model	Serial Number
Zero Air Supply	Thermo Env.	111	0700419829
Dynamic Dilution Calibrator	Tanabyte	300	0165
Standard Gas Components	CO = 4,516 ppm NO = 55.3 ppm SO ₂ = 54.9 ppm		
Cylinder No : EB0123013			
Expire Date : Oct 22, 2027			

Single Point Calibration

Standard Gas	Standard Gas Value	Analyzer Value (ppm)		Stability		% Abs Error
		Before	After	Before	After	
Zero	0	0.04	0.00	-	-	-
Span	40	39.17	40.00	-	-	2.08



STATUS TEST AND VALIDATION OF CO ANALYZER MODEL APMA-360CE

Parameter	Unit	Observed Value		Nominal Range
		Before Adjust	After Adjust	
SIGNAL (MAIN)	mV	1.7	1.2	Voltage of the measured CO Value
SIGNAL (COMP)	mV	0	0.6	Voltage of the interference component Value
CELL	°C	35.7	35.2	Ambient + (5 to 15 °C)
SAMPLE	L/min	1.1	1.0	1 L/min to 2 L/min
OVER FLOW	LPM	0.0	0.0	< 1.2

Calibrate By :

(MR.PANUPON PODANG)
August 14, 2024

Checked By :
(MS.SUTATIP IM-NOI)
August 14, 2024

Calibration Data of CO Analyzer

Analyzer Performance Test

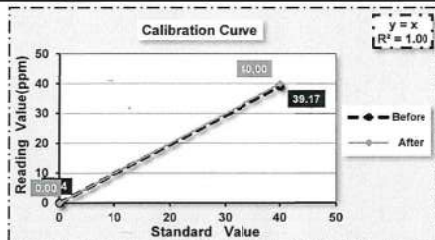
Equipment	Gas Analyzer (CO)	Customer Name	Vision E.
Manufacture	HORIBA	Location	Envi Research
Model	APMA-360 CE	Quotation	2024-00461
Serial No.	41346760054	Calibration Date	July 18, 2024
Analyzer Unit	ppm		

Instruments for Calibration

Instruments	Manufacture	Model	Serial Number
Zero Air Supply	Thermo Env.	111	0700419629
Dynamic Dilution Calibrator	Tanabyte	300	0165
Standard Gas Components	CO = 4.516 ppm		
Cylinder No : EB0123013	NO = 55.3 ppm		
Expire Date : Oct 22, 2027	SO ₂ = 54.9 ppm		

Single Point Calibration

Standard Gas	Standard Gas Value	Analyzer Value (ppm)		Stability		% Abs Error
		Before	After	Before	After	
Zero	0	0.04	0.00	-	-	-
Span	40	39.17	40.00	-	-	2.08



STATUS TEST AND VALIDATION OF CO ANALYZER MODEL APMA-360CE

Parameter	Unit	Observed Value		Nominal Range
		Before Adjust	After Adjust	
SIGNAL (MAIN)	mV	6.7	1.2	Voltage of the measured CO Value
SIGNAL (COMP)	mV	0.0	0.6	Voltage of the interference component Value
CELL	°C	35.7	35.8	Ambient + (5 to 15 °C)
SAMPLE	L/min	1.1	1.0	1 L/min to 2 L/min
OVER FLOW	LPM	0.0	0.0	< 1.2

Calibrate By :

(MR.PANUPON PODANG)
July 18, 2024

Checked By :
envi research
Environment Research & Technology Co., Ltd.

(MS.SUTATIP IM-NOI)
July 18, 2024

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number: E04NI99E15A0292
Cylinder Number: EB0123013
Laboratory: 124 - Plumsteadville - PA
PGVP Number: A12019
Gas Code: CO,NO,NOX,SO₂,BALN

Reference Number: 160-401604495-1
Cylinder Volume: 144.4 Cubic Feet
Cylinder Pressure: 2015 PSIG
Valve Outlet: 660
Certification Date: Oct 22, 2019

Expiration Date: Oct 22, 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 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS					
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
NOX	55.00 PPM	55.27 PPM	G1	+/- 0.6% NIST Traceable	10/14/2019, 10/22/2019
NITRIC OXIDE	55.00 PPM	55.27 PPM	G1	+/- 0.6% NIST Traceable	10/14/2019, 10/22/2019
SULFUR DIOXIDE	55.00 PPM	54.93 PPM	G1	+/- 0.6% NIST Traceable	10/14/2019, 10/22/2019
CARBON MONOXIDE	4500 PPM	4516 PPM	G1	+/- 0.6% NIST Traceable	10/14/2019
NITROGEN	Balance				

CALIBRATION STANDARDS					
Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	13010429	KAL004123	57.6 PPM NITRIC OXIDE/NITROGEN	+/- 0.8%	Jul 23, 2025
NTRM	13010429	KAL004123	57.6 PPM NOx/NITROGEN	+/- 0.8%	Jul 23, 2025
NTRM	16010235	KAL004419	57.69 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.8%	Dec 23, 2021
NTRM	08012318	KAL004620	4657 PPM CARBON MONOXIDE/NITROGEN	+/- 0.6%	Jun 07, 2024

ANALYTICAL EQUIPMENT		
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
MKS FTIR - CO - 000928781	FTIR	Sep 26, 2019
MKS FTIR - NO - 000928781	FTIR	Oct 18, 2019
MKS FTIR - NOx - 000928781	FTIR	Oct 18, 2019
MKS FTIR - SO ₂ - 000928781	FTIR	Oct 03, 2019

Triad Data Available Upon Request

NOTES: Gross Weight: 28.0 Kg, Net Weight: 4.6 Kg.



Approved for Release

Sound Level Meter Calibration Report

Support Equipment Type	:	Sound Level Calibrator
Manufacture	:	Larson Davis
Model	:	CAL200
Serial No.	:	3605
Range of Calibrator		
- Support Equipment Type	:	93.8
- Frequency	:	1,000 Hz.
Calibrated By	:	Mr.Nitad Sirichad
Calibration Date	:	August 25, 2024
Customer Name	:	Vision E. Consultants Co., Ltd. : โครงการการผลิตปิโตรเลียม แปลงสัมปทาน ปิโตรเลียมบนบกหมายเลข L21/43

[illegible]

Checked By

Mr.Pravun Detkla

Technician

Approved By

Ms.Sutatip Im-noi

Environmental Scientist

THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-67/0190

MTC No. EEL. BP. 95/0167

CALIBRATION CERTIFICATE

Submitted by : Environment Research & Technology Co.,Ltd.
Address : 25/114 Moo 6, Soi Chinaket 1, Ngamwongwan Road, Toongsonghong, Laksi, Bangkok, 10210.
Calibrated at : Electrical and Electronic Standards Laboratory, Industrial Metrology and Testing Service Centre.
 Soi 1C, Bangpoo Industrial Estate, Sukhumvit Rd., Muang, Sarutprakan 10280.

Instrument Calibrated :		Ambient Environment	
Description	: Precision Acoustic Calibrator	Temperature	: (23 ± 3) °C
Manufacturer	: Larson Davis	Relative Humidity	: (50 ± 15) %
Model	: CAL200	Ambient Pressure	: (101.325 ± 1.500) kPa
Serial No.	: 3605		

Standards used :

1. Digital Function Synthesizer NF Electronic DF-193A S/N 122037.
2. Measuring Amplifier Bruel&Kjaer 2636 S/N 1537484.
3. Programmable Attenuator Tamagawa TPA-303A S/N OF 2214.
4. Digital Multimeter Agilent 34401A S/N MY44005560.
5. Pressure Transmitter Vaisala PTB202AD S/N T0650001.
6. Audio Analyzer Panasonic: VP-7722A S/N 041477D122.
7. Condenser Microphone B&K 4180 S/N 2889871

Calibration Procedure: CP-102-04 based on IEC 60942-2003. The sound pressure level of instrument was measured by standard microphone using an insert voltage technique.

This instrument has been calibrated against standards maintained at Electrical and Electronic Standards Laboratory (EEL), which are traceable to the International System of Units through the National Institute of Metrology (Thailand).

The information on actual reading is attached herewith and the uncertainty limits quoted refer to the measured values only.

Date of Receipt : 8 Jan, 2024

Date of Calibration : 10 Jan. 2024

1/3

The results relate only to the items tested/calibrated or value assigned.
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FM.BLM.MTC002 Rev.4

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E-mail : sumalee@tistr.or.th



THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-67/0190

MTC No. EEL. BP. 95/0167

The reported expanded uncertainty is based upon a standard uncertainty multiplied by a coverage factor $k = 2$, providing a level of confidence of approximately 95%.

Nominal Output of Unit Under Test = 94 dB re 20 μ Pa at 1000 Hz

Acoustic Output in dB re 20 μ Pa, Corrected to Reference Conditions : 101.325 kPa, 23.0 °C and 50 %RH

1. Sound Pressure Level

Standard Microphone Type	Measured Sound Pressure Level (dB)	Deviated value (dB)	Uncertainty (dB)	Tolerance limit IEC60942:2003 Class 1
1/2 inch Bruel&Kjaer4180	93.85	-0.15	± 0.10	± 0.40 dB

2. Frequency

Standard Microphone Type	Measured Frequency (Hz)	Deviated value (Hz)	Uncertainty (Hz)	Tolerance limit IEC60942:2003 Class 1
1/2 inch Bruel&Kjaer4180	1000.3	0.3	± 1.5	$\pm 1.0\%$

3. Total distortion

Standard Microphone Type	Measured Total distortion (%)	Uncertainty (%)	Tolerance limit IEC60942:2003 Class 1
1/2 inch Bruel&Kjaer4180	0.32	± 0.50	$\pm 3.0\%$

Note : 1. No adjustment.

2. The calibrator pressure correction was not included.

3. The microphone volume correction was included at level of 0.26 dB from manual.

Date of Calibration : 10 Jan. 2024

2 / 3

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THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-67/0190

MTC No. EEL. BP. 95/0167

Nominal Output of Unit Under Test = 114 dB re 20 μ Pa at 1000 Hz

Acoustic Output in dB re 20 μ Pa, Corrected to Reference Conditions : 101.325 kPa, 23.0 °C and 50 %RH

1. Sound Pressure Level

Standard Microphone Type	Measured Sound Pressure Level (dB)	Deviated value (dB)	Uncertainty (dB)	Tolerance limit IEC60942:2003 Class 1
1/2 inch Bruel&Kjaer 4180	113.80	-0.20	± 0.10	± 0.40 dB

2. Frequency

Standard Microphone Type	Measured Frequency (Hz)	Deviated value (Hz)	Uncertainty (Hz)	Tolerance limit IEC60942:2003 Class 1
1/2 inch Bruel&Kjaer 4180	999.8	-0.2	± 1.5	$\pm 1.0\%$

3. Total Distortion

Standard Microphone Type	Measured Total Distortion (%)	Uncertainty (%)	Tolerance limit IEC60942:2003 Class 1
1/2 inch Bruel&Kjaer 4180	0.38	± 0.50	$\pm 3.0\%$

Note : 1. No adjustment.

2. The calibrator pressure correction was not included.

3. The microphone volume correction was included at level of 0.26 dB from manual.

Calibrated by :

(Mr. Weerachai Deechaiyai)

Approved by :

(Mr. Prawate Kluaypa)

Director

Electrical and Electronic Standards Laboratory

Industrial Metrology and Testing Service Centre

Date of Calibration : 10 Jan. 2024

Date of Issue : 11 Jan. 2024

Ref : 2011267010800067006

End of Certificate

3 / 3

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



Cert.No.: 24CH17
Page.: 1 of 2

Certificate of Calibration

Equipment : pH Meter
Manufacturer : Water Proof
Model : pHTestr 30
Serial No. : 3066320
ID No. : -
Condition As-Received: Used Item
Received Date : 05 January 2024
Calibration Date : 09 January 2024
Reference : 2401-0077DN-3
Submitted by : Environment Research & Technology Company Limited.
25/114 Moo 6, Soi Chinakei 1, Ngamwongwan Road,
Toongsonghong, Laksi, Bangkok 10210
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)

Calibrated by : Walalak Sirithean

Approved by :

(✓) Salthip Meangmai
() Warakorn Lemgagtrakul
() Ponpan Paipim

Issue Date : 10 January 2024

The Uncertainties are for a confidence probability of approximately 95%

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

A 0062385



Cert.No.: 24CH17
Page.: 2 of 2

Condition of this calibration result

1. Certified Reference Materials : The measurement results are traceable to SI through CPA chem Ltd.,
ANSI-ASQ National Accreditation Board, Accredited No. AR-1835

Buffer Solution	Manufacturer	Lot No.	Exp. date
pH 4.008	CPA chem	940102	27 Nov 2025
pH 6.986	CPA chem	931959	01 Oct 2024
pH 9.997	CPA chem	940106	02 Nov 2024

2. 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	4.01	N/A	0.0071	2.00
S/N.: 3066320	6.986	7.00	N/A	0.0093	2.00
	9.997	10.00	N/A	0.0095	2.00

Remark - pH meter does not have voltage mode.
- Can not connect the BNC because the plug does not match with the socket.
- N/A = Not Available

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

-o0o-

a 1196385




PinAAcle 900Z Preventive Maintenance Report

Company Name: ENVIRONMENT RESEARCH
Instrument Location: 25/114 M.6, THANON NGAMWONGWAN
THUNGSONGHONG, LAKSI, BANGKOK, 10210
Instrument Serial No.: PZAS19031401
Date: 23-Jul-2024

PinAAcle 900Z Preventive Maintenance (PM)

Company Name:	ENVIRONMENT RESEARCH		
Address (Instrument Location):	25/114 M.6, THANON NGAMWONGWAN, THUNGSONGHONG, LAKSI, BANGKOK		
Serial Number:	PZAS19031401	PM Number:	1/2
Customer Name (if applicable):	K. RAIWIN	Telephone Number:	099-182-9241
Customer Support Engineer Name:	Khwanchai	Service Order Number:	WO-02879967
Date PM Performed: (DD-MMM-YYYY)	23-Jul-2024	Next PM Due Date: (DD-MMM-YYYY)	23-Jan-2025
Standard Labor Hours to Complete PM :		5 hours	

Part Number	Release	Publication Date	
09370144 Rev.9	A	January 2018	

Scope

The purpose of this PM is to ensure the continued functionality of the PinAAcle 900Z by inspecting and replacing any worn or damaged parts. This service should only be performed by a trained representative of PerkinElmer.

The customer should save their method before the PM begins.

General Instructions:

The customer must provide the engineer operational data to demonstrate recent instrument performance prior to starting the PM.

Always check with the customer before making any changes that may affect the customer's analysis or calibration, including a current back-up of system software and/or data files.

The completed document should be signed by an authorized PerkinElmer and customer representative and left with the customer.

Update the PM sticker and instrument logbook as required.

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Component List

Component / Specific Model	Serial #	Configuration Notes

Parts Lists

Parts Included with the PM		
Part Number (if applicable)	Description	Quantity
B0501696	Fan Filters	2
B3002013	THGA Contact Cylinders	1
B3141064	Glycerol for THGA Cooling	N/A

Additional Reagents and Standards Required for PM				
Part Number (if applicable)	Description	Quality	Batch/Lot #	Expired Date (MM/YY)
N9300244	GFAAS Mixed Standard	AR	60-004CRY1	Feb-2025

Additional Reagents and Standards Required for PM (Customer Support Solution)				
Part Number (if applicable)	Description	Quantity	Batch/Lot #	Expiration Date (MM/YY)
N/A	DI Water	250 ml.	AR	AR
N/A	0.5% HNO ₃	250 ml.	AR	AR

Additional Tools Required for PM

Part Number (if applicable)	Description	Quantity	Serial #
B3100652 Or N9307029	Electronic Flow Meter	1	NA
B0505495	Test Jig	1	NA
03030997	System 2 EDL Driver	1	03030997
N3050605	As System 2 EDL	1	16148
N3050121	Cu Lumina HCL	1	092216-010130
N3050109	Ba Lumina HCL	1	102416-040160
N3050139	K Lumina HCL	1	110716-010060
N3050152	Ni Lumina HCL	1	100516-030190
N3050119	Cr Lumina HCL	1	091911-020150

Procedure Checklist

Use (✓) to check off those steps in the checklist that have been completed.

1. General:

- ☒ Review the instrument performance with the customer and document any recent problems.
- ☒ Inspect the customer log book and make any appropriate PM entries.
- ☒ Perform general inspection of system for cleanliness.

2. PC Instrument Software:

- ☒ Instrument Software user files/databases archived, packed, and/or deleted as needed.

3. Mechanical:

- ☒ Inspect and clean all fans and filters. Replace filters if necessary.
- ☒ Inspect all gas and water lines for leaks and/or wear. Replace if needed. Thoroughly inspect all quick connects. Replace the Y connector, P/N 09921079, if needed.
- ☒ Clean exterior of the instrument.
- ☒ Check the drain system for signs of wear. Replace worn or damaged parts.
- ☒ Inspect the pole pieces and clean where the pole pieces contact the furnace. Replace the pole piece p-rings as needed, P/N's B0501018 & B0501250. Grease the O-rings as needed with Apiezon L grease, P/N 09905148.
- ☒ Inspect the four insulation pads on the front contact housing of the THGA in furnace. If the pads are missing replace the THGA furnace or replace the insulator pads on the furnace.
- ☒ Inspect the graphite tube and clean the contact cylinders. Replace if necessary.
- ☒ Check internal and external gas flows with the Electronic Gas Flow Meter and the Gas Flow Test Probe as described in the Service Manual. Correct if necessary.
- ☒ Check furnace open/close function.
- ☒ Verify the operation of the GFTV Camera for proper operation and viewing alignment in the furnace camera Tube View window. Align if needed.
- ☒ Check the operation of the Halogen Light ASSY for the GFTV Camera. Replace if needed.
- ☒ Check the water level/quality in the recirculation (if applicable). Add distilled water if necessary.
- ☒ Check the cooling system fluid flow rate with the FCS In-Line Flow Meter for proper levels if needed. Refer to SDB# COSY008.STN.
- ☒ Perform Cooling System maintenance if needed per SDB# COSY005.STN.
- ☒ Check auto sampler operation.
- ☐ Perform an auto sampler check valve test as described in the Service Manual.
- ☒ Lubricate the spindles of the auto sampler pumps and all moving parts of the tray mechanics as described in the Service Manual.
- ☒ Inspect the auto sampler sampling capillary as described in the Service Manual. Replace if necessary.
- ☒ Inspect the four insulation pads on the front contact housing of the THGA in furnace. If the pads are missing replace the THGA furnace or replace the insulator pads on the furnace.
- ☒ Inspect the graphite tube and clean the contact cylinders. Replace if necessary.
- ☒ Check internal and external gas flows with the Electronic Gas Flow Meter and the Gas Flow Test Probe as described in the Service Manual. Correct if necessary.
- ☒ Check furnace open/close function

4. Electrical:

- ☒ Inspect PC boards. Clean if necessary.
- ☒ Check instrument firmware revisions upgrade to current levels (if necessary)
- ☒ Run Diagnostics Test within the Advanced function of the Spectrometer page. Check the results in the service log folder in the Spectrometer BM Log Viewer.

5. Optics:

- ☒ Inspect and clean the sample compartment windows, if needed.
- ☒ Inspect and clean the furnace windows, if needed.
- ☒ Inspect and clean the GFTV camera lens, if needed.
- ☒ Inspect optics. Clean or replace if necessary.

6. Gasses:

- ☒ Verify that the Gasses supplied to the instrument are within the pressure and purity specifications found in the PinAAcle 900 Series Pre-installation Checklist SDB.
- ☒ Verify that the air filter element is dry. Replace if necessary.

7. After PM Performance tests [THGA]:

7.1 Furnace Gas Flows

Description: Ensures the flow rates are within specification.

Parameter	Specification	Test Results	Pass/Fail
Internal Flow Rate	250 mL/min ± 25 mL/min	208	Passed
External Flow Rate	100 mL/min ± 10 mL/min	101	Passed

7.2 Chromium Baseline Noise

Description: Signal to noise check.

Parameter	Specification	Results	Pass/Fail
Baseline Noise	≤ 0.005 Abs.	-0.0002	Passed
Standard Deviation	≤ 0.005	0.0001	Passed

7.3 Chromium Characteristic Mass and Precision

Description: Calculate the characteristic mass using the characteristic mass tool and precision from the integrated absorbance values.

Parameter	Specification	Results	Pass/Fail
Cr m ₀ Results	≤ 7.0 pg/0.0044 A-s	5.6	Passed
Precision	≤ 2.0 %	1.68	Passed

7.4 Copper Characteristic Mass and Zeeman Ratio

Description: Calculate the characteristic mass using the characteristic mass tool and check the Zeeman Ratio.

Parameter	Specification	Results	Pass/Fail
Cu m ₀ Result	≤ 16.5 pg/0.0044 A-s	16.3	Passed
Zeeman Ratio	0.52 ± 0.04	0.53	Passed

8. Review:

- ☒ Review with the customer PM work performed.
- ☒ Review with the customer routine maintenance procedures.
- ☒ Discuss recommended customer supplied materials to have on hand.
- ☒ Attach PM sticker.

Additional Comments

Additional Comments Regarding the PM

Zeeman Ratio

=

Atomic Signal (Peak area)

Atomic Signal (Peak area) + Background Signal (Peak area)

=

0.1375

0.1375+0.1198

=

0.53

Review

The preventive maintenance checks and if applicable performance tests for PinAAcle 900Z have been completed.

This PinAAcle 900Z

Passes ☒

Fails ☐

 the preventive maintenance.

Review of Preventive Maintenance:

Authorized PerkinElmer Representative:

Date:

23-Jul-2024

(DD-MMM-YYYY)

Authorized Customer Representative:

Date:

23-Jul-2024

(DD-MMM-YYYY)



Agilent CrossLab Compliance

Qualification Type: ES-OQ

System ID: MY15330001

EQP Name: AgilentRecommended

EQP Revision: ES.02.50

EQP Publish Date: March 2020

Date: November 28, 2023 1:10:31 PM

Report Type: Report

Org. Name: Environment Research & Technology Co.,Ltd

Org. Location: 25/114 Moo 6 Soi Chinaket, Ngamwongwan Rd., Bangkok 10210

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Test Summary

Purpose

This section includes the Overall Qualification Status and details for each test that meets at least one of the following criteria: (1) was not scheduled; (2) was scheduled but not run; (3) was processed more than once; (4) passed recommended limits only when dual limits were selected; (5) required deviation(s) or comment(s); (6) required integration event change(s). Tests that pass and do not meet any criteria above are not included.

For a complete list of scheduled tests, see the table of contents. For supporting documentation, refer to the Attachments section.

NOTE: A Pass for the Overall Qualification Status indicates that all scheduled tests were run and passed; R, I, D, and C are blank if not applicable for that specific test.

R: runs
I: integration event changes
D: number of deviations submitted
C: number of comments submitted
Status: NS (not scheduled); NR (scheduled but not run); NC (unlocked but not completed)

Details

Test	Status			
	R	I	D	C
There were no repeated or re-integrated tests. All test resulted in a pass status.				
Overall Qualification Status				
Pass				

Service Details

Purpose

This section includes local contact and delivery details for this service.

General Details

Service Order No./Request: 6006377416
EQP Name: AgilentRecommended
EQP Revision: ES.C2.50
Report Type: Report

Organization Details

Name: Environment Research & Technology Co.,Ltd
Location: 25/114 Moo 6 Soi Chinaket, Ngamwongwan Rd., Bangkok 10210

Local Contact Details

Name: K Relwin Posit
Job Title: Supervisor Scientist
Qualification Location: ICP0ES Room

Operator Details

Name: Worawit Timakul
Job Title: Field Service Engineer

Data Acquisition Details

Acquisition Software Name: ICP Expert
Acquisition Software Revision: 7.1.0.6821

Customer Data System (CDS): Es: ICP Expert

Instrument Details

Purpose

This section describes the as found system configuration.

Details

Spectrometer 1	
Manufacturer	Agilent Technologies
Name	5100 VDV
Model Number	G8011A
Sample Introduction	Double pass glass cyclonic spraychamber and seaspray nebulizer
Serial Number	MY15330001
Firmware Revision	2994
Chiller 1	
Manufacturer	Agilent Technologies
Name	Chiller
Model Number	G8481A
Serial Number	1A1560387
Autosampler 1	
Manufacturer	Agilent Technologies
Name	SPS4
Model Number	G8410A
Serial Number	AU15220240
Vapor Generator 1	
Manufacturer	Agilent Technologies
Name	VGA77P
Model Number	G8475A
Serial Number	MY15330002

Protocol Details

Purpose

This section lists the revisions for all test units used in this report. For complete test-specific and high-level change details, refer to the Revision History document.

Test Revision	Test
ES.02.50	Autosampler Operation
ES.02.50	Instrument Tests
ES.02.50	Preparation

Preparation

Purpose

This test records a status for each preparation task for the Agilent ICP-OES.

Configuration Details

Model/Serial No.: G8011A MY15330001

Results

Criteria

Observed Result	Expected Result	Status
-----------------	-----------------	--------

Does the plasma ignite successfully in the first three attempts?

Yes	Yes	Pass
-----	-----	------

Was the detector calibration performed and completed successfully?

Yes	Yes	Pass
-----	-----	------

Was the instrument calibration performed and completed successfully?

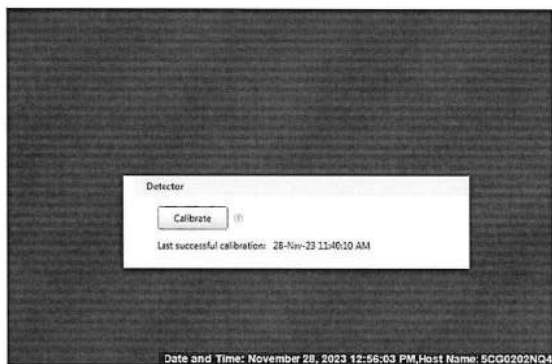
Yes	Yes	Pass
-----	-----	------

Test Evidence

Image Details: Was the detector calibration performed and completed successfully?

Date and Time: November 28, 2023 12:56:03 PM

Host Name: 5CG0202NQ4



Date: November 28, 2023 1:10:31 PM
System ID: MY15330001

Image Details:

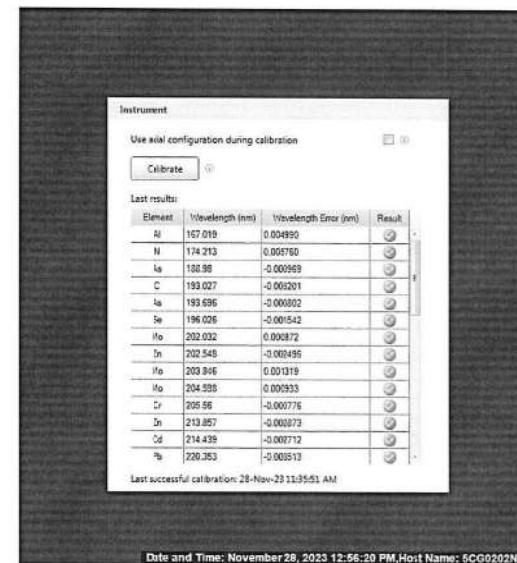
Was the instrument calibration performed and completed successfully?

Date and Time:

November 28, 2023 12:56:20 PM

Host Name:

5CG0202NQ4



Overall Test Status

Pass

Runs: 1

Date: November 28, 2023 1:10:31 PM
System ID: MY15330001

Instrument Tests

Purpose

This test records a status for each of the automated tests within the Agilent ICP-OES CDS. For detailed test criteria, refer to the attached report.

Configuration Details

Model/Serial No.:	G8011A	MY15330001
-------------------	--------	------------

Results	Observed Result	Expected Result	Status
---------	-----------------	-----------------	--------

Are the Functional Tests results within acceptance criteria?

Subsystem Communications	<input type="text" value="Yes"/>	<input type="text" value="Yes"/>	<input type="text" value="Pass"/>
Air Flow	<input type="text" value="Yes"/>	<input type="text" value="Yes"/>	<input type="text" value="Pass"/>
Water Flow	<input type="text" value="Yes"/>	<input type="text" value="Yes"/>	<input type="text" value="Pass"/>
Gas Flows	<input type="text" value="Yes"/>	<input type="text" value="Yes"/>	<input type="text" value="Pass"/>
RF Generator	<input type="text" value="Yes"/>	<input type="text" value="Yes"/>	<input type="text" value="Pass"/>
Camera	<input type="text" value="Yes"/>	<input type="text" value="Yes"/>	<input type="text" value="Pass"/>
Optics	<input type="text" value="Yes"/>	<input type="text" value="Yes"/>	<input type="text" value="Pass"/>

Are the Instrument Performance Tests results within acceptance criteria?

Resolution	<input type="text" value="Yes"/>	<input type="text" value="Yes"/>	<input type="text" value="Pass"/>
Sensitivity	<input type="text" value="Yes"/>	<input type="text" value="Yes"/>	<input type="text" value="Pass"/>
Precision	<input type="text" value="Yes"/>	<input type="text" value="Yes"/>	<input type="text" value="Pass"/>

Overall Test Status

Pass	Runs: 1
------	---------

Autosampler Operation

Purpose

This test verifies that the autosampler operates properly.

Configuration Details

Model/Serial No.:	G8410A	AU15220240
-------------------	--------	------------

Results

Criteria	Observed Result	Expected Result	Status
----------	-----------------	-----------------	--------

Does the autosampler successfully move to the specified location(s)?	<input type="text" value="Yes"/>	<input type="text" value="Yes"/>	<input type="text" value="Pass"/>
--	----------------------------------	----------------------------------	-----------------------------------

Overall Test Status

Pass	Runs: 1
------	---------

Declaration of Change Control

This document is under change control. Revision history is maintained and printed on each document. Access to the master documents is limited to process owners. Documents receive periodic review and cannot be assigned an evergreen status. The qualification performed according to this document refers only to the hardware/software configuration in place at the time of the qualification. Agilent Technologies recommends that instrument configuration change management procedures be in place in order to maintain the validation process. Any changes to the analytical or computer hardware or software must be clearly specified. A change management system provides a means for determining the degree of requalification required according to the extent of the changes made. All details of the changes must be thoroughly recorded and documented, together with details of completed tests and their results. Note: Hardware/software configuration management is the customer's responsibility.

Attachments

Training requirements note: The delivery engineer attaches an ACE technique-specific training certificate to the Equipment Qualification Report (EQR). Obtaining ACE technique-specific certification includes pre-requisite trainings for Data Integrity, General Compliance topics (GMP, GLP, ALCOA, etc.), instrument hardware and software components, and the ACE technique itself. The one certificate encompasses all pre-requisite trainings as documented in the Agilent Learning Management System called Success Factors.

Location	Category	Document Name	Page
EQR	General	Certificate of Qualification for ACE	13
EQR	General	Operator's training certificate and qualifications	14
EQR	General	Operator's training certificate and qualifications	15
EQR	General	Certificate of System Qualification	16
EQR	General	Instrument's Test Report	17
EQR	General	Software Verification	20
EQR	Material	Certificate of Analysis Wavelength calibration solution	21

General

Document Name: Certificate of Qualification for ACE



Agilent Technologies

Agilent Compliance Engine Self Qualification

Date: October 18, 2023 10:13:46 AM

Drive Serial #: 90593EBA

Platform Revision: ACE 3.12.112

Individual self-qualification reports for each specific technique installed are also available upon request. They provide additional details on the general report from the concise summary and are structured by the actual algorithms challenged during the process. There is not a one-to-one relationship between algorithms and OQ program tests because some algorithms are used by several tests and across multiple similar hardware components of the qualified systems.

Technique Type	Tests Completed	Result
Atomic Absorption	7	Conforms
Capillary Electrophoresis	10	Conforms
Dissolution	6	Conforms
Emission Spectroscopy	3	Conforms
Gas Chromatography - GCMS	17	Conforms
Gas Chromatography	29	Conforms
Gel Permeation Chromatography	9	Conforms
ICP-MS	6	Conforms
Infrared Spectroscopy	7	Conforms
Liquid Chromatography	17	Conforms
Liquid Chromatography - LCMS	8	Conforms
Microfluidics	18	Conforms
Sample Preparation - Gas Chromatography	9	Conforms
Sample Preparation - Liquid Chromatography	8	Conforms
Supercritical Fluid Chromatography	15	Conforms
Software	6	Conforms
UV-Vis Spectrophotometer	13	Conforms

Overall Qualification Status

Conforms

Date: November 28, 2023 1:10:31 PM
System ID: MY15330001

General

Document Name: Operator's training certificate and qualifications



Agilent Technologies

Certificate of Completion

Learner Name: Werawit Timakul

Title Of Course: ANV-CE-ICPOES-2-008-A: Agilent 5100 ICP-OES Support Neophyte Training

Completion Date: August 25, 2016

Certified By Company: Learning at Agilent

All Service and Support training certificates have the following specific limitations.

A certificate for Service and Support training is only valid while employed by Agilent Technologies or while working as an Agilent-authorized service provider, through which the service employee has ongoing access to Agilent's Safety Alerts, Service Notes, internal technical updates, update training, current documentation, technical support, current parts, and parts updates. Completion of training alone, without being employed by Agilent Technologies, does not qualify an individual to safely install, service or maintain Agilent products.

Date: November 28, 2023 1:10:31 PM
System ID: MY15330001

General

Document Name: Operator's training certificate and qualifications



Certificate of Completion

Learner Name: Worawit Timakul

Title Of Course: ANV-CE-ICPOES-2-007-C: CrossLab Compliance Hardware Specific Delivery for Agilent ICP-OES Systems

Completion Date: October 30, 2020

Certified By Company: Learning at Agilent

All Service and Support training certificates have the following specific limitations.

A certificate for Service and Support training is only valid while employed by Agilent Technologies or while working as an Agilent-authorized service provider, through which the service employee has ongoing access to Agilent's Safety Alerts, Service Notes, internal technical updates, update training, current documentation, technical support, current parts, and parts updates. Completion of training alone, without being employed by Agilent Technologies, does not qualify an individual to safely install, service or maintain Agilent products.

Date: November 28, 2023 1:10:31 PM
System ID: MY15330001

General

Document Name: Certificate of System Qualification



Certificate of Completion

Learner Name: Worawit Timakul

Title Of Course: AN-CE-SS-II-030-A: ACE 3.X User Update Training

Completion Date: July 1, 2020

Certified By Company: Learning at Agilent

All Service and Support training certificates have the following specific limitations.

A certificate for Service and Support training is only valid while employed by Agilent Technologies or while working as an Agilent-authorized service provider, through which the service employee has ongoing access to Agilent's Safety Alerts, Service Notes, internal technical updates, update training, current documentation, technical support, current parts, and parts updates. Completion of training alone, without being employed by Agilent Technologies, does not qualify an individual to safely install, service or maintain Agilent products.

Date: November 28, 2023 1:10:31 PM
System ID: MY15330001

General

Document Name: Instrument's Test Report

Report Summary		
Instrument Model	Agilent 5100 VDV ICP-OES	
Instrument ID	G8011A	
Instrument Serial Number	MY15330001	
Software Version	7.1.0.6821	
Firmware Version	2994	
Tested By	Worawit T.	
Test Completed On	27-Nov-23 2:23:13 PM	
Result Summary		
Resolution Test		Pass
Sensitivity Test		Pass
Precision Test		Pass
Resolution Test		
		Pass
Element Wavelength	Specification	Width
N (174.213 nm)	≤ 9.40	7.28
As (188.980 nm)	≤ 8.20	6.66
Se (193.027 nm)	≤ 11.50	8.01
Mo (202.032 nm)	≤ 8.20	6.71
Cr (206.158 nm)	≤ 13.40	10.27
Zn (213.857 nm)	≤ 8.70	7.56
Pb (220.353 nm)	≤ 9.50	7.70
Co (228.615 nm)	≤ 17.20	10.70
Ba (230.424 nm)	≤ 9.40	8.14
Mn (257.610 nm)	≤ 13.30	9.43
Mn (260.568 nm)	≤ 20.30	15.91
Cr (267.716 nm)	≤ 11.00	9.30
Cu (324.754 nm)	≤ 25.00	17.80
Cu (327.395 nm)	≤ 14.20	12.73
Sr (338.071 nm)	≤ 33.50	27.28
Ba (455.403 nm)	≤ 44.00	31.08
Sr (460.733 nm)	≤ 36.00	21.11
Ba (493.408 nm)	≤ 36.00	29.33
Ba (614.171 nm)	≤ 42.00	32.02
Ar (675.283 nm)	≤ 74.00	64.85
K (766.491 nm)	≤ 80.00	62.51

Document Name: Instrument's Test Report

Sensitivity Test					
Pass					
Radial					
Element Wavelength	Specification	Method	Ratio	Standard	Blank
As (188.980 nm)	≥ 46.0	SRBR	111.1	1111.0	85.2
Se (196.026 nm)	≥ 41.0	SRBR	68.5	856.2	116.6
Zn (213.857 nm)	≥ 1421.0	SRBR	3583.1	52766.1	215.1
Pb (220.353 nm)	≥ 46.0	SRBR	183.7	2611.8	201.8
Mn (257.610 nm)	≥ 3518.0	SRBR	10286.2	2797639	735.8
Al (396.152 nm)	≥ 3.4	SBR	8.2	37571.9	4071.0
Ba (493.408 nm)	≥ 34.0	SBR	100.5	1198903.7	11807.1
K (766.491 nm)	≥ 1.8	SBR	3.8	100874.8	20871.5
Axial					
Element Wavelength	Specification	Method	Ratio	Standard	Blank
As (188.980 nm)	≥ 206.0	SRBR	248.6	3738.6	202.3
Se (196.026 nm)	≥ 159.0	SRBR	163.8	3040.9	283.3
Zn (206.200 nm)	≥ 234.0	SRBR	1402.0	19648.6	192.6
Zn (213.857 nm)	≥ 1743.0	SRBR	8340.9	200514.1	574.6
Cd (214.439 nm)	≥ 4227.0	SRBR	7606.2	156421.5	420.7
Pb (220.353 nm)	≥ 320.0	SRBR	631.4	16069.9	600.3
Mn (257.610 nm)	≥ 10625.0	SRBR	32328.3	1472044.4	2057.5
Cr (267.716 nm)	≥ 1048.0	SRBR	4308.3	1558026	1286.3
Cu (324.754 nm)	≥ 19.0	SBR	57.8	242584.8	4123.5
Al (396.152 nm)	≥ 6.0	SBR	21.9	239924.8	10474.6
Ba (493.408 nm)	≥ 60.0	SBR	236.0	7235267.3	30527.2
K (766.491 nm)	≥ 24.0	SBR	68.8	3110677.8	44585.8

Document Name: Instrument's Test Report

Precision Test			Pass
Radial			
Element Wavelength	Specification	Measured Value % RSD	
As (188.980 nm)	≤ 2.60	0.74	
Se (196.026 nm)	≤ 2.60	0.65	
Zn (213.857 nm)	≤ 1.50	0.21	
Pb (220.353 nm)	≤ 2.60	0.51	
Mn (257.610 nm)	≤ 1.50	0.25	
Al (396.152 nm)	≤ 1.50	0.30	
Ba (493.408 nm)	≤ 1.50	0.60	
K (766.491 nm)	≤ 1.50	0.20	
Axial			
Element Wavelength	Specification	Measured Value % RSD	
As (188.980 nm)	≤ 1.50	0.51	
Se (196.026 nm)	≤ 1.50	0.37	
Zn (206.200 nm)	≤ 1.50	0.30	
Zn (213.857 nm)	≤ 1.50	0.26	
Cd (214.439 nm)	≤ 1.50	0.21	
Pb (220.353 nm)	≤ 1.50	0.30	
Mn (257.610 nm)	≤ 1.50	0.63	
Cr (267.716 nm)	≤ 1.50	0.17	
Cu (324.754 nm)	≤ 1.50	0.32	
Al (396.152 nm)	≤ 1.50	0.30	
Ba (493.408 nm)	≤ 1.50	0.48	
K (766.491 nm)	≤ 1.50	0.53	


General

Document Name: Software Verification

Software Verification Report			
Date:	Monday, November 27, 2023	Time:	2:58:23 PM [UTC: +07:00:00]
Windows User Name:	Admin	Base Revision Number:	7.0.1
		Product Name:	ICP Expert
Install Type:	N/A	Additional Packages:	NA
Base Reference File Name: ICPReferenceFile.xml			
Summary:			
Overall Evaluation of Installation Check: PASS			
File Report Summary			
No missing files or invalid files found			
No system file difference found			
Files Registration Report Summary			
Files Registration check not required for this product			
Registry Report Summary			
Registry entries check not required for this product			

Materials

Document Name: Certificate of Analysis Wavelength calibration solution



CERTIFICATE OF ANALYSIS

Agilent Product Name: Wavelength Calibration Solution for ICP-OES & MP-AES, 5 mg/L, 500mL
Agilent Part No: 66100100
Lot No: 0012990411

Product Specifications			
Analyte	Starting Material	CAS #	Certified Conc.
Al	Al(NO ₃) ₃	7784-27-2	5.000 ± 0.025 mg/L
As	As	7440-38-2	5.000 ± 0.025 mg/L
Ba	Ba(NO ₃) ₂	10023-31-5	5.000 ± 0.025 mg/L
Cd	Cd	7440-43-9	5.000 ± 0.025 mg/L
Co	Co	7440-48-4	5.000 ± 0.025 mg/L
Cr	Cr(NO ₃) ₃	13549-38-4	5.000 ± 0.025 mg/L
Cu	Cu	7440-50-8	5.000 ± 0.025 mg/L
K	KNO ₃	7757-79-1	50.00 ± 0.25 mg/L

Metric: 5% HNO₃

Intended Use: This solution is intended for use as a certified reference material or calibration standard for inductively coupled plasma optical emission spectroscopy (ICP-OES), inductively coupled plasma mass spectrometry (ICP-MS), atomic absorption spectroscopy (flame AAS or GFAAS), microwave plasma atomic emission spectroscopy (MP-AES), x-ray fluorescence spectroscopy (XRF), and other techniques for elemental analysis.


Certification & Traceability: This CRM was manufactured under a quality management system that is registered to ISO 9001, ISO 17034 and ISO/IEC 17025. This CRM was prepared to the certified concentrations shown above by gravimetric methods using single-element concentrates that were certified using the "High Performance ICP-OES" protocol developed by NIST and are directly traceable to the NIST SRMs listed below. This solution was stabilized using high purity nitric acid (HNO₃) and diluted with filtered (0.22µm), 18 M-ohm deionized water. The balances used in the preparation of this CRM are calibrated regularly with traceability to NIST. All volumetric dilutions are performed in Class A calibrated glassware. The certified concentrations were determined based upon gravimetric procedures. Secondary verification of the certified concentrations was performed using ICP-OES that was calibrated and/or referenced against NIST SRMs: 3101a, 3103a, 3104a, 3108, 3113, 3112a, 3114, 3141a, 3152, 3134, 3136, 3108, 3149, 3153a, and 3108a. The uncertainty associated with each certified concentration represents the expanded uncertainty at the 95% confidence level using a coverage factor of k=2.

Instructions for Use: Agilent recommends that the solution be thoroughly mixed by repeated shaking or swirling of the bottle immediately prior to use. To achieve the highest accuracy the analyst should: (1) use only pre-cleaned containers and transferware, (2) avoid pipetting directly from the CRM's original container, (3) use a minimum sub-sample size of 500µL, (4) make dilutions using calibrated balances or certified volumetric class A flasks and pipettes, (5) dilute to volume using the same matrix as the original CRM, and (6) never pour used product back into the original container. The solution should be kept tightly capped and stored under normal laboratory conditions. Do not freeze, heat, or expose to direct sunlight. Minimize exposure to moisture or high humidity.

Document Name: Certificate of Analysis Wavelength calibration solution



Period of Validity: Agilent insures the accuracy of this solution until the expiration date shown below, provided the instructions for use are followed. During the period of validity, the purchaser will be notified if this product is recalled due to any significant changes in the stability of the solution.

Sample lot approval: 

Date of release: 18 October 2022
Date of expiration: 30 April 2024

Chuck Gouffreau, Certifying Officer

Page 2 of 3

Document Name:

Certificate of Analysis Wavelength calibration solution



Hazard Information: Refer to the Safety Data Sheet (SDS), which can be obtained at www.agilent.com/chem/sds.

Homogeneity: This solution was determined to be homogeneous by procedures consistent with the requirements of ISO 17034 and ISO Guide 35. Replicate samples of the finished solution were analyzed to confirm its homogeneity, in accordance with USP <1>13 Assessment of Homogeneity and Stability. To ensure homogeneity, users should not take a smaller sub-sample than specified in the Instructions for Use, as doing so will invalidate the certified values and uncertainties.

Further Information: Please contact Agilent for further information about this CRM.

Quality Certifications: This CRM was prepared under a quality management system that is:

- Registered to ISO 9001 – Quality Management Systems – Requirements (TUV NORD Cert. Reg. No. 44 100 18082231)
- Accredited to ISO 17034 – General Requirements for the Competence of Reference Material Producers (AZLA Cert. No. 2848.02)
 - ISO 17034 references additional requirements specified in ISO Guide 31 and ISO Guide 35.
- Accredited to ISO/IEC 17025 – General Requirements for the Competence of Testing and Calibration Laboratories (AZLA Cert. No. 2848.01)
- LSC Standards, 200 Almy Road, Winchester, NY 12792

Document Name:

Certificate of Analysis Wavelength calibration solution

Electronic Signature

Purpose

This signature page was created and published because the ACE sign-off action was executed, which is valid for the entire document, including attachments. The ACE sign-off is an electronic signature that requires two distinct identification components: unique username and personal password. The Agilent representative who has delivered this service understands the meaning and legal status of an electronic signature. As a trained official operator, the Agilent representative has a unique password and login to access ACE and electronically sign this document. (Other e-signatures can be applied to this document using a Document Content Management or other suitable method defined in your data access and control procedures.)

Details

Full Name of Signer: Worawit Timakul
Logged On User Name: worawit.timakul@agilent.com
Signature Creation Date: November 28, 2023
Reason for Signature: Executed protocol and published this original version of document

Regulatory Disclaimer

This document provides a protocol to verify and record instrument configuration and evidence of proper operation. It has been prepared from our interpretation of applicable regulations as well as industry best practices. The document is designed to provide an important component of a complete compliance package. Validation depends upon many factors and use of this protocol alone does not assure compliance. Agilent Technologies makes no promises or representations as to its sufficiency for any specific regulatory program.

Warranty

Agilent Technologies makes no warranty of any kind to this material, including but not limited to, the implied warranties or merchantability and fitness for a particular purpose. Agilent Technologies shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this material.

User Name: worawit.timakul
Report Generated by Hostname: 5CG0202NQ4
System ID: MY15330001
Print Date: November 28, 2023 1:10:41 PM

OQHW ICP 5100 ENVI Research Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
November 28, 2023 12:54:08 PM	Audit	SessionCreated	Session	None
November 28, 2023 12:54:08 PM	Start	Configuration	Session	None
November 28, 2023 12:54:08 PM	Audit	Entitlement	Licensing	User is FieldEngineer and does not require an unlock code
November 28, 2023 12:54:32 PM	Audit	EqpLoaded	Session	EQP details for primary technique [Es] - File path: [ProtocolPacks\Es\Configurations\02_50\Es_02_50.eqp], EQP File Name: [Es_02_50.eqp], EQP Name: [AgilentRecommended], Protocol Revision: [Es_02_50]
November 28, 2023 12:54:38 PM	End	Configuration	Session	None
November 28, 2023 12:54:41 PM	Start	Qualification	Session	OQ
November 28, 2023 12:54:41 PM	Start	Execution	Preparation : 5100 VDV: Qualitative Test - No setpoints associated	None
November 28, 2023 12:56:26 PM	End	Execution	Preparation : 5100 VDV: Qualitative Test - No setpoints associated	Run Count : 1
November 28, 2023 12:56:27 PM	Start	Execution	Instrument Tests : 5100 VDV: Qualitative Test - No setpoints associated	None
November 28, 2023 12:56:57 PM	End	Execution	Instrument Tests : 5100 VDV: Qualitative Test - No setpoints associated	Run Count : 1

User Name: worawit.timakul
Report Generated by Hostname: 5CG0202NQ4

System Id: MY15330001
Print Date: November 28, 2023 1:10:41 PM

QQHW ICP 5100 ENVI Research Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
November 28, 2023 12:57:03 PM	Start	Execution	Autosampler Operation : Autosampler 1 - SPS4: Qualitative Test - No setpoints associated	None
November 28, 2023 12:57:08 PM	End	Execution	Autosampler Operation : Autosampler 1 - SPS4: Qualitative Test - No setpoints associated	Rur Count : 1
November 28, 2023 12:57:09 PM	End	Qualification	Session	OQ
November 28, 2023 12:57:09 PM	Start	Reporting	Session	None
November 28, 2023 1:04:49 PM	Audit	AccRestarted	Session	None
November 28, 2023 1:04:50 PM	Audit	SessionReloaded	Session	None
November 28, 2023 1:04:58 PM	Start	Qualification	Session	OQ
November 28, 2023 1:08:10 PM	Audit	Reporting	Session	Report Generated : Certificate
November 28, 2023 1:09:28 PM	Audit	Reporting	Session	Report Generated : Report

Page 2 / 3

User Name: worawit.timakul
Report Generated by Hostname: 5CG0202NQ4

System Id: MY15330001
Print Date: November 28, 2023 1:10:41 PM

QQHW ICP 5100 ENVI Research Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
November 28, 2023 1:10:31 PM	Audit	Reporting	Session	Report Signed : Certificate PDF Name: QQHW ICP 5100 ENVI Research_20231128_Certificate_1.pdf User Name: worawit.timakul@agilent.com Full Name of Signer: Worawit Timakul Reason for signature: Executed protocol and published this original version of document

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Agilent CrossLab Start Up Services

Agilent 8890 Gas Chromatograph

Preventive Maintenance Checklist

Agilent Preventive Maintenance provides factory recommended service for your analytical instruments to assure reliable operation and the accuracy of your results.

Delivered by highly trained and certified service engineers using genuine Agilent parts and supplies, Agilent Preventive Maintenance provides everything you need to reduce unplanned downtime and keep your systems operating at their peak. This checklist will be completed at the end of the service and provided to you as a record of the preventive maintenance activities.

Introduction

Customer Information

- Customers should provide all necessary operating supplies upon request of the engineer.
- A customer representative should be available to the engineer while performing the preventive maintenance procedures.
- Any parts, not included in the Parts Lists section of this document, are not part of the recommended Preventive Maintenance service, nor are they included in the price of this service.
- If a system requires the use of extra or special procedures and/or parts for the maintenance service, then these must be ordered separately and charged as a repair, which may incur additional costs.

Important Customer Web Links

- For more information about *Agilent Technologies* services, please visit our website using the following URL: <http://www.agilent.com/en-us/products/crosslab-instrument-services/service-repair>
- The **Agilent Community** is an excellent place to get answers, collaborate with others about applications and Agilent products, and find in-depth documents and videos relevant to Agilent technologies. Visit <https://community.agilent.com/welcome>.
- To access **Agilent University**, visit <http://www.agilent.com/crosslab/university/> to learn about training options, which include online, classroom and onsite delivery. A training specialist can work directly with you to help determine your best options.
- A useful **Agilent Resource Center** web page is available, which includes short videos on maintenance, quick lists of consumables for new instruments, and other valuable information. Check out the Resource Page here: <https://www.agilent.com/en-us/agilentresources>.
- Need technical support, FAQs, supplies? – visit our **Support Home page** <http://www.agilent.com/search/support>.
- Videos about specific preparation requirements for your instrument can be found by searching the **Agilent YouTube** channel at <https://www.youtube.com/user/agilent>.

Service Engineer's Responsibilities

- Contact the customer and ensure that all necessary supplies are available before the preventive maintenance visit.
- Only select those pages that relate to the system or module being serviced.
- Complete empty fields with the relevant information.
- Complete the relevant checkboxes in the checklist using either a "X" or tick mark "✓".
- Check "Section not applicable" check boxes to indicate services/tasks not delivered, as appropriate.
- Complete the Preventive Maintenance service in the order of the tasks listed.
- Complete the Service Review section together with the customer.
- Complete the fields for page numbers at the foot of each selected page
- Complete the total number of pages field in the Service Completion section
- **Ask the customer to sign the Service Completion section including the customer's and your signature.**

Additional Instruction Notes

- Check for any active service notes for this unit. If there are any applicable "Safety" or "Modification Recommended" Service notes, plan to implement the changes on this unit before doing any qualification service.
- Do not implement firmware updates, unless you get approval from the customer and are sure that they are compatible with the instrument control software.

System Information

- ☐ Check this box if an instrument configuration report is attached instead of completing the table below

Instrument System Name and ID ERTC-L-in-175 / US2125A011
 Instrument System Site and Location Environment Research & Technology Co., Ltd / GE ECD

List System Component Product Numbers	List the Serial Numbers of each Component
1. G35A0A	US2125A011
2. G4513A	CN21195125
3. G4514A	CN21207024
4.	
5.	
6.	
7.	
8.	
9.	
10.	

Preparation

- ☒ Discuss any specific issues with the customer before starting.
- ☒ Review the instrument logbook for recorded problems and comments.
- ☒ Save instrument control settings before starting the procedure.
- ☒ Perform a general inspection of the system for cleanliness.
- ☒ Check for proper installation of parts, assemblies, sensors etc.
- ☒ Check system for required installation of components, settings as defined by current Service Notes.
- ☒ Check for required firmware updates and verify with customers if they would like them installed.
- ☒ Before starting the following procedures, record the Detector Signal Output(s) in the results table. If the GC is turned OFF or in a service mode, comparing the detector outputs before and after the service is not possible.

Preventive Maintenance Procedure

Clean and inspect GC

- ☒ Unplug power cord from the power source.
- ☒ Open GC covers and vacuum/remove any dust/debris. Pay particular attention to cooling fans.
- ☒ Inspect internal connectors for proper contact and placement.
- ☒ Reconnect Power to the GC. Power the GC on and verify the power on self-test passed.
- ☒ Verify oven motor spins freely and turns on with the oven door closed; off when the door is opened.
- ☒ Verify operation of all other fans - the inlet and EPC cooling fans.
- ☒ Verify oven intake/outlet flap assembly is operating smoothly while heating and cooling the oven

Inlet and detector consumable replacement

- ☒ Replace the split vent trap cartridge filter using the Maintenance procedure from either the Browser User interfaces on units with these inlets: Split/Splitless Capillary (SSL), Multi-Mode Inlet (MMI), Programmed Temperature Vaporizer (PTV), Volatiles Interface (VI).
- ☒ If the inlet system is used in Split Mode with viscous samples, inspect and clean the split vent tube on the inlet and flush or replace the tubing between the inlet and the split vent trap.
- ☒ For the inlets installed, perform inlet maintenance using the Maintenance procedure from the Browser User interfaces. Record the results. (Leak and Restriction Test)
- ☒ If the GC includes a Flame Ionization Detector (FID), replace the jet. If the ignitor shows any buildup of sample or corrosion, replace the ignitor. Examine the FID collector and castle assemblies for contamination – clean as necessary.

Zero Sensors and Leak test

- ☒ Zero all pressure sensors using the Browser interface.
- ☒ Perform inlet pressure decay test(s) from the diagnostics screen on the Browser User interface. Record if test passed or failed in the results table.

Note: If the PM is done in preparation for an Operational Qualification, then the pressure decay test defined within that protocol can be used for the PM.

ALS Maintenance

- ☐ **Section NOT applicable**
- ☒ Check all cabling and configuration settings between GC, tray, and injectors.
- ☒ Vacuum or remove any dust, especially around fans.
- ☒ Check operation of all fans.
- ☒ Check syringe for smooth plunger operation.
- ☒ Check for smooth operation of the needle support – clean if necessary

Restore Instrument

- ☒ Restore the normal operating conditions or customer method using the Browser interface or Data System.
- ☒ Purge the system with carrier flow for 15 minutes
- ☒ Bake out the system, then restore the normal operating conditions
- ☒ After equilibration, check and record the post PM detector signal output values. Results should be similar or lower than the detector outputs recorded prior to PM.
- ☒ Perform a chemical checkout. If this is a routine PM, inject the customer's sample using the ALS if applicable. This will act as a final checkout of both the ALS and the GC.

Note: If the PM Service is performed prior to a qualification service, then use the qualification procedure as a guide for final instrument set up and checkout.

PM Parts List Table

Note: The following kits are recommended for capillary and purged packed inlets. If this is a general PM and the customer has a preferred set of consumables, you may use the customer's consumables.

Part description	Part number	Product or model# where used	Quantity consumed
SSL Capillary Inlet PM kit, Splitless	5188-6497	8890 GC	GA 2
SSL Capillary Inlet PM kit, Split	5188-6496	8890 GC	GA N/A
SSL Capillary Ultra Inert Inlet Gold Seal with Washer	5190-6144	8890 GC	N/A
SSL Capillary Ultra Inert Inlet Splitless Liner - Single taper with Glass Wool	5190-2293	8890 GC	N/A
SSL Capillary Ultra Inert Inlet Low Pressure Drop Split Liner - with Glass Wool	5190-2295	8890 GC	N/A
PP Inlet PM kit	5188-6498	8890 GC	N/A
Split vent trap PM kit, single cartridge (for MMI, PTV & VI)	5188-6495	8890 GC	N/A
MMI Cleaning Kit	G3510-60820	8890 GC	N/A
PTV Septumless Head Rebuild Kit	5182-9747	8890 GC	N/A
PTV Septumless Head Teflon Guide	5182-9748	8890 GC	N/A
Ignitor (glow plug) assembly with O-ring	19231-60680	8890 GC	1
FID Collector Rebuild/Cleaning Kit	G1531-67000	8890 GC	N/A
FID Collector Replacement Kit	G1531-67001	8890 GC	N/A
Standard .011-inch FID Jet	5200-0176	8890 GC	N/A
Universal .018-inch FID Jet	5200-0177	8890 GC	N/A

Signature Page**Service Review**

- ☒ Attach available reports/printouts of all tests to this documentation.
- ☒ Record the Preventive Maintenance service activity in the customer's records/logbook.
- ☒ Update/reset instrument maintenance counters as appropriate.
- ☒ Affix the PM sticker to the system or instrument logbook based on the customer's request.
- ☒ Complete the Service Engineer Comments section if there are additional comments.
- ☒ Review with the customer this service, parts replaced, and test results obtained.
- ☐ If the instrument firmware was updated, record the details of the change in the Service Engineer's Comments box or if necessary, in the customer's IQ records.
- ☐ Supply the customer with a copy of the Smart Alerts flyer.
- ☐ Describe Smart Alerts to the customer.
- ☐ Install Smart Alerts if requested.

PM Test Results Table

Test description	Before PM Service	After PM Service
Front detector output	N/A	155.4
Back detector output	N/A	11.5
AUX 1 detector output	N/A	22.0
AUX 2 detector output	N/A	
Test description	Expected test result	Actual test result
Leak and Restriction Test after front inlet maintenance	Pass	Passed
Leak and Restriction Test after back inlet maintenance	Pass	Passed
Leak and Restriction Test after front inlet Split Vent Trap replacement	Pass	Passed
Leak and Restriction Test after back inlet Split Vent Trap replacement	Pass	Passed
Front inlet pressure decay test	Pass	Passed
Back inlet pressure decay test	Pass	Passed

Service Engineer Comments

If there are any specific points you wish to note as part of performing the service or other items of interest for the customer, please write include them in this box.

Completed, AM Result passed.

Service Completion

Service request number 6006981701 Date service completed 05 JUN 2024
 Agilent signature [Signature] Customer signature [Signature]
 Total number of pages in this document 9



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



Cert.No.: 24CH10
 Page.: 1 of 2

Certificate of Calibration

Equipment : Conductivity Meter
 Manufacturer : HM DIGITAL
 Model : COM-100
 Serial No. : PONPE5863548
 ID No. : NO.4
 Condition As-Received: Used Item
 Received Date : 05 January 2024
 Calibration Date : 08 January 2024
 Reference : 2401-0077DN-6
 Submitted by : Environment Research & Technology Company Limited.
 25/114 Moo 6, Soi Chinaket 1, Ngamwongwan Road,
 Toongsonghong, Laksi, Bangkok 10210
 Ambient Temperature : (25 ± 2.5) °C
 Relative Humidity : (50 ± 15) %
 Calibration Procedure: In -house method :
 - CP-CH6 : based on direct measurement by
 using certified reference material (CRM)
 Calibrated by : Walalak Sirithean
 Approved by : [Signature]
 Approved Signatory
 (✓) Saithip Meangmai
 () Warakorn Lerngagtrakul
 () Ponpan Paipim
 Issue Date : 10 January 2024

The Uncertainties are for a confidence probability of approximately 95%

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



Cert.No.: 24CH10

Page.: 2 of 2

Condition of this result of calibration

1. Reference Standard Instrument :-

Instrument	Serial No.	ID No.	Certificate No.	Due date
1) Thermometer	9549224	130RC003	231435	10 Apr 2024

- This Certification is traceable to SI Throught Technology Promotion Association (Thailand - Japan)

2. Certified Reference Materials :-

- Conductivity calibration solution, CPA chem Ltd., The measurement results are traceable to SI through CPA chem Ltd., ANSI-ASQ National Accreditation Board, Accredited No. AR-1835
- Conductivity calibration solution, Thermo Scientific (traceable to NIST)

Conductivity Solution	Manufacturer	Lot No.	Exp. date
*100 μ S/cm	Thermo Scientific	193/01	11 May 2024
1413.0 μ S/cm	CPA Chem	931955	30 Sep 2024

- Control Conductivity calibration solution temperature by Water bath (25 \pm 0.1) $^{\circ}$ C

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

Calibration results**Function : Conductivity Measurement**(*) After Adjustment at 1413.0 μ S/cm

Conductivity Electrode Serial No.: PONPE5863548

Standard Conductivity Solution	Before Adjustment UUC* Reading	After Adjustment UUC* Reading	Uncertainty of Measurement (\pm)	Coverage factor k
*100 μ S/cm	101 μ S/cm	99.9 μ S/cm	5.1 μ S/cm	2.00
1413.0 μ S/cm	1445 μ S/cm	1410 μ S/cm	11 μ S/cm	2.00

Remark - UUC* = Unit Under Calibration

- * = Not NSC - ONSC Accredited

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

-o0o-

a 1196383

ISO 9001:2015

Linde SPECTRA Environmental Gases, 80 Industrial Drive, Alpha, NJ 08865

THE LINDE GROUP

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PAGE: 1 of 2

ANALYSIS REPORT

Sales#:	117494289	Cylinder Size: 185 (3.2" X 9.4")
Production#:	1602683	Cylinder # : AB-116946
Report Date:	Jan-18-2024	Cylinder Pressure: 1700 psig
P.O.# :	0573518-ENTECH	Cylinder Valve: CGA 180 / Aluminum
Blend Type:	QUALIFIED	Cylinder Volume: 0.8 Liter
Material#:	24086377	Cylinder Material: Aluminum
Traceability:	NIST by weight	Gas Volume: 98 Liters
Expiration Date:	Jan-18-2025	Blend Tolerance: 10% Relative
Do NOT use under:	150 psig	Analytical Accuracy: 5% Relative

COMPONENT	CAS NUMBER	REQUESTED CONC	QUALIFIED CONC
Dichlorodifluoromethane	75-71-8	1.00 ppm	0.99 ppm
Chloromethane	74-87-3	1.00 ppm	0.99 ppm
Freon-114	76-14-2	1.00 ppm	0.95 ppm
Vinyl Chloride	75-01-4	1.00 ppm	0.98 ppm
Bromomethane	74-83-9	1.00 ppm	0.97 ppm
Chloroethane	75-00-3	1.00 ppm	0.96 ppm
Freon-11	75-69-4	1.00 ppm	0.94 ppm
1,1-Dichloroethene	75-35-4	1.00 ppm	1.02 ppm
Methylene Chloride	75-09-2	1.00 ppm	0.98 ppm
Freon-113	76-13-1	1.00 ppm	1.02 ppm
1,1-Dichloroethane	75-34-3	1.00 ppm	0.97 ppm
Cis-1,2-Dichloroethylene	156-59-2	1.00 ppm	0.98 ppm
Chloroform	67-66-3	1.00 ppm	1.01 ppm
1,2-Dichloroethane	107-06-2	1.00 ppm	0.97 ppm
1,1,1-Trichloroethane	71-55-6	1.00 ppm	0.99 ppm
Benzene	71-43-2	1.00 ppm	0.99 ppm
Carbon Tetrachloride	56-23-5	1.00 ppm	0.98 ppm
1,2-Dichloropropane	78-87-5	1.00 ppm	0.98 ppm
Trichloroethylene	79-01-6	1.00 ppm	0.98 ppm
Cis-1,3-Dichloropropene	10061-01-5	1.00 ppm	0.98 ppm
Trans-1,3-Dichloropropene	10061-02-6	1.00 ppm	0.92 ppm
1,1,2-Trichloroethane	79-03-5	1.00 ppm	0.98 ppm
Toluene	108-68-3	1.00 ppm	1.01 ppm
1,2-Dibromoethane	106-63-4	1.00 ppm	0.99 ppm
Tetrachloroethylene	127-18-4	1.00 ppm	0.98 ppm
Chlorobenzene	108-90-7	1.00 ppm	0.99 ppm
Ethylbenzene	100-41-4	1.00 ppm	0.99 ppm
p-Xylene	106-42-3	1.00 ppm	0.97 ppm

Linde Gas North America LLC

(908) 329-9700 Main (908) 329-9740 Fax
www.Lindeus.com



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Talingchan, Bangkok 10170

PAGE: 2 of 2

ANALYSIS REPORT

Sales#: 117494289 Cylinder Size: 185 (3.2" X 9.4")
Production#: 1602690 Cylinder #: AB-118316
Report Date: Jan-18-2024 Cylinder Pressure: 1700 psig
P.O.#: 0573518-ENTECH Cylinder Valve: CGA 180 / Aluminum
Blend Type: QUALIFIED Cylinder Volume: 0.8 Liter
Material#: 24086377 Cylinder Material: Aluminum
Traceability: NIST by weight Gas Volume: 98 Liters
Expiration Date: Jan-18-2025 Blend Tolerance: 10% Relative
Do NOT use under: 150 psig Analytical Accuracy: 5% Relative

COMPONENT	CAS NUMBER	REQUESTED CONC	QUALIFIED CONC
M-Xylene	108-33-3	1.00 ppm	0.97 ppm
Styrene	100-42-5	1.00 ppm	0.97 ppm
O-Xylene	95-47-6	1.00 ppm	0.97 ppm
1,1,2,2-Tetrachloroethane	79-34-5	1.00 ppm	0.97 ppm
1,3,5-Trimethylbenzene	108-67-8	1.00 ppm	0.95 ppm
1,2,4-Trimethylbenzene	95-63-6	1.00 ppm	0.93 ppm
1,3-Dichlorobenzene	541-73-1	1.00 ppm	0.92 ppm
1,4-Dichlorobenzene	106-46-7	1.00 ppm	0.91 ppm
1,2-Dichlorobenzene	95-50-1	1.00 ppm	0.93 ppm
1,2,4-Trichlorobenzene	120-82-1	1.00 ppm	0.93 ppm
Hexachloro-1,3-Butadiene	87-68-3	1.00 ppm	0.92 ppm
Nitrogen	7727-37-9	Balance	Balance

ANALYST:

Brian Bramkamp

DATE: Jan-18-2024



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ANALYSIS REPORT

Sales#: 117494289 Cylinder Size: 185 (3.2" X 9.4")
Production#: 1602690 Cylinder #: AB-118316
Report Date: Jan-24-2024 Cylinder Pressure: 1700 psig
P.O.#: 0573518-Entech Cylinder Valve: CGA 180 / Aluminum
Blend Type: QUALIFIED Cylinder Volume: 0.8 Liter
Material#: 24110866 Cylinder Material: Aluminum
Traceability: NIST by weight Gas Volume: 98 Liters
Expiration Date: Jan-24-2025 Blend Tolerance: 10% Relative
Do NOT use under: 150 psig Analytical Accuracy: 5% Relative

COMPONENT	CAS NUMBER	REQUESTED CONC	QUALIFIED CONC
Chlorodifluoromethane	75-45-6	1.00 ppm	1.05 ppm
Acetaldehyde	75-07-0	1.00 ppm	1.09 ppm
Isobutene	115-11-7	1.00 ppm	1.07 ppm
Methanol (Analytical Accuracy \pm 10%)	67-56-1	1.00 ppm	1.20 ppm
Ethanol (Analytical Accuracy \pm 10%)	64-17-5	1.00 ppm	1.19 ppm
Acetonitrile (Analytical Accuracy \pm 10%)	75-05-8	1.00 ppm	1.12 ppm
Acrolein (Analytical Accuracy \pm 10%)	107-02-8	1.00 ppm	1.18 ppm
Propanal	123-38-6	1.00 ppm	1.07 ppm
Acrylonitrile	107-13-1	1.00 ppm	1.10 ppm
n-Pentane	109-66-0	1.00 ppm	1.07 ppm
Methyl Iodide	74-88-4	1.00 ppm	1.06 ppm
Isoprene	78-79-5	1.00 ppm	1.10 ppm
Dichloromethane	75-09-2	1.00 ppm	1.06 ppm
Methacrolein	78-85-3	1.00 ppm	1.06 ppm
1-Propanol	71-23-8	1.00 ppm	1.00 ppm
Cyclopentane	287-92-3	1.00 ppm	1.05 ppm
Methyl Vinyl Ketone	78-94-4	1.00 ppm	1.10 ppm
n-Butanal	123-72-8	1.00 ppm	1.07 ppm
1-Butanol	71-36-3	1.00 ppm	1.10 ppm
Carbon Tetrachloride	56-23-5	1.00 ppm	1.07 ppm
2-Pentanone	107-67-9	1.00 ppm	1.07 ppm
3-Pentanone	96-22-0	1.00 ppm	1.07 ppm
Pentanal (Analytical Accuracy \pm 10%)	110-62-3	1.00 ppm	1.16 ppm
3-Hexanone	589-38-8	1.00 ppm	1.06 ppm
Hexanal (Analytical Accuracy \pm 10%)	66-25-1	1.00 ppm	0.86 ppm

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ANALYSIS REPORT

Sales#: 117494289
Production#: 1602690
Report Date: Jan-24-2024
P.O.#: 0573518-Entech
Blend Type: QUALIFIED
Material#: 24110866
Traceability: NIST by weight
Expiration Date: Jan-24-2025
Do NOT use under: 150 psig

Cylinder Size: 185 (3.2" X 9.4")
Cylinder #: AB-118318
Cylinder Pressure: 1700 psig
Cylinder Valve: CGA 180 / Aluminum
Cylinder Volume: 0.8 Liter
Cylinder Material: Aluminum
Gas Volume: 98 Liters
Blend Tolerance: 10% Relative
Analytical Accuracy: 5% Relative

COMPONENT	CAS NUMBER	REQUESTED CONC	QUALIFIED CONC
1,2,3-Trimethylbenzene	526-73-8	1.00 ppm	1.06 ppm
Naphthalene (Analytical Accuracy \pm 10%)	91-20-3	1.00 ppm	1.18 ppm
Nitrogen	7727-37-9	Balance	Balance

ANALYST:

Lou Lorenzetti

DATE: Jan-24-2024

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ANALYSIS REPORT

Sales#: 117494289
Production#: 1602685
Report Date: Jan-23-2024
P.O.#: 0573518-ENTECH
Blend Type: QUALIFIED
Material#: 24086380
Traceability: NIST by weight
Expiration Date: Jan-23-2025
Do NOT use under: 150 psig

Cylinder Size: 185 (3.2" X 9.4")
Cylinder #: AB-117844
Cylinder Pressure: 1700 psig
Cylinder Valve: CGA 180 / Aluminum
Cylinder Volume: 0.8 Liter
Cylinder Material: Aluminum
Gas Volume: 98 Liters
Blend Tolerance: 10% Relative
Analytical Accuracy: 5% Relative

COMPONENT	CAS NUMBER	REQUESTED CONC	QUALIFIED CONC
Propylene	115-07-1	1.00 ppm	1.00 ppm
1,3-Butadiene	106-99-0	1.00 ppm	0.99 ppm
Vinyl Bromide	593-60-2	1.00 ppm	1.00 ppm
Acetone	67-64-1	1.00 ppm	0.99 ppm
Isopropyl Alcohol	67-63-0	1.00 ppm	0.96 ppm
Carbon Disulfide (Analytical Accuracy \pm 10%)	75-15-0	1.00 ppm	1.07 ppm
Allyl Chloride	107-05-1	1.00 ppm	0.94 ppm
Trans-1,2-Dichloroethene	156-60-5	1.00 ppm	1.04 ppm
Methyl Tert-Butyl Ether	1634-04-4	1.00 ppm	0.99 ppm
Vinyl Acetate	108-05-4	1.00 ppm	1.10 ppm
Methyl Ethyl Ketone	78-93-3	1.00 ppm	1.01 ppm
n-Hexane	110-54-3	1.00 ppm	1.01 ppm
Ethyl Acetate	141-78-6	1.00 ppm	0.95 ppm
Tetrahydrofuran	109-99-9	1.00 ppm	0.92 ppm
Cyclohexane	110-82-7	1.00 ppm	1.00 ppm
Bromodichloromethane	75-27-4	1.00 ppm	0.95 ppm
1,4-Dioxane	123-91-1	1.00 ppm	0.95 ppm
2,2,4-Trimethylpentane	540-84-1	1.00 ppm	0.97 ppm
n-Heptane	142-82-5	1.00 ppm	0.97 ppm
Methyl Isobutyl Ketone	108-10-1	1.00 ppm	0.96 ppm
Methyl Butyl Ketone	591-78-6	1.00 ppm	0.92 ppm
Dibromochloromethane	124-48-1	1.00 ppm	0.97 ppm
Bromoform	75-25-2	1.00 ppm	1.03 ppm

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PAGE: 2 of 2

ANALYSIS REPORT

Sales#:	117494289	Cylinder Size:	185 (3.2" X 9.4")
Production#:	1602685	Cylinder #:	AB-117844
Report Date:	Jan-23-2024	Cylinder Pressure:	1700 psig
P.O.#:	0573518-ENTECH	Cylinder Valve:	CGA 180 / Aluminum
Blend Type:	QUALIFIED	Cylinder Volume:	0.8 Liter
Material#:	24086380	Cylinder Material:	Aluminum
Traceability:	NIST by weight	Gas Volume:	98 Liters
Expiration Date:	Jan-23-2025	Blend Tolerance:	10% Relative
Do NOT use under:	150 psig	Analytical Accuracy:	5% Relative

COMPONENT	CAS NUMBER	REQUESTED CONC	QUALIFIED CONC
4-Ethyltoluene	622-96-8	1.00 ppm	0.93 ppm
Benzyl Chloride (Analytical Accuracy \pm 10%)	100-44-7	1.00 ppm	1.09 ppm
Nitrogen	7727-37-9	Balance	Balance

ANALYST: [REDACTED]
Brian Bramkamp

DATE: Jan-23-2024