ภาคผนวก ช
เอกสารสอบเทียบเครื่องมือ

รายการใบรับรองสอบเทียบ/ทวนสอบเครื่องมือประจำห้องปฏิบัติการ

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration*	Remark
เครื่องมือหลักประจำห้องปฏิบัติการวิเคราะห์ สำหรับวิเคราะห์คุณภาพอากาศ									
1	Analytical Balance (Readability 0.1 mg)	ฝุ่นละอองรวม	Mettler-Toledo	MS204TS/00 C252436235	National Food Institute, Ministry of Industry, Thailand	2402420-003-01	19 Apr 24	18 Apr 25	-
2	Analytical Balance (Readability 0.1 mg)	ฝุ่นละอองรวม	Mettler-Toledo	AB204-S/FACT / B108115858	National Food Institute, Ministry of Industry, Thailand	2402420-001-01	19 Apr 24	18 Apr 25	-
3	Atomic Absorption Spectrometer (AAS)	สารตะกั่ว	Perkin Elmer	PinAAcle 900F / PFBS20031902	Perkin Elmer Co.,Ltd.	Preventive Maintenance Report	14 May 24	13 May 25	-
เครื่องมือหลักประจำห้องปฏิบัติการวิเคราะห์ สำหรับวิเคราะห์คุณภาพน้ำ									
1	Atomic Absorption Spectrometer (AAS)	สารตะกั่ว	Agilent Technologies	System ID:G8432A AA240FS / MY13160001	Agilent Technologies (Thailand) Co.,Ltd.	Preventive Maintenance Checklist	24 Jan 24	23 Jan 25	-

Due Date of Calibration* : กำหนดตามแผนการสอบเทียบประจำปี อย่างน้อยปีละ 1 ครั้ง

Calibration Certificate

Certificate No.:
Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO., LTD.
Address:

Equipment: Electronic Balance

Manufacturer: METTLER TOLEDO

Model:

Serial No.:

ID No.:

Order No.:

Operation No.:

Date of Receipt: 18 April 2024

Date of Calibration: 19 April 2024

Calibrated by **Approved by**

Vice President, Department of Laboratory Services
Responsible for the Technical Management Team

Date of Issue

Calibration Report

Certificate No.:
Equipment: **Manufacturer:**
Model: **Resolution:**
Serial No.: **ID No.:**
Capacity:
Date of Calibration:
Environment Condition:
Place of Calibration:
Condition of Equipment:
Condition of The Results of Calibration:

Reference Standard	**Model**	**Serial No.**	**Calibrated by**	**Certificate No.**	**Due Date**

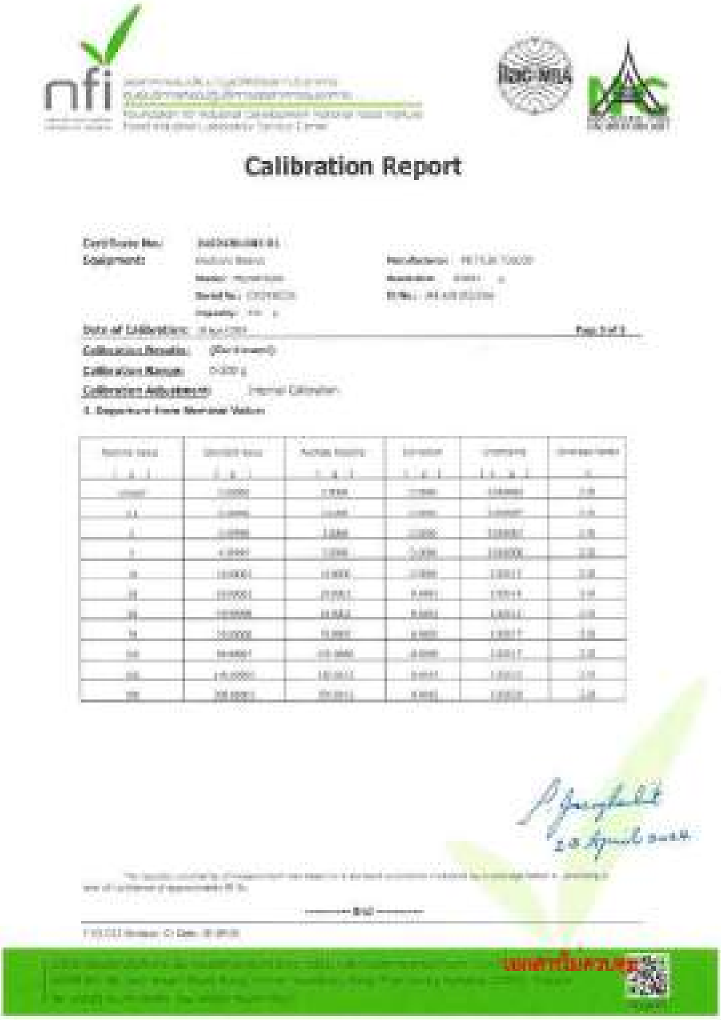
Instrument	**Model**	**Serial No.**	**Calibrated by**	**Certificate No.**	**Due Date**

Calibration Results:

1. Repeatability of Reading

2. Off-Center Errors

23 April 2024



Calibration Report

Certificate No.:
Equipment: **Manufacturer:** METTLER TOLEDO
Model: **Resolution:**
Serial No.: **ID No.:**
Capacity:
Date of Calibration:

Calibration Results: (Continued)
Calibration Range:
Calibration Adjustment: Internal Calibration

3. Departure from Nominal Value

23 April 2024

----- END -----

Calibration Certificate

Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO., LTD.

Equipment: Electronic Balance

Manufacturer: METTLER TOLEDO

Order No.: 2403428

Operation No.: 2403428-001

Date of Receipt: 19 April 2024

Date of Calibration: 19 April 2024

Calibrated by

Approved by

Vice President, Department of Laboratory Services
Responsible for the Technical Management Team

Date of Issue: 23 April 2024

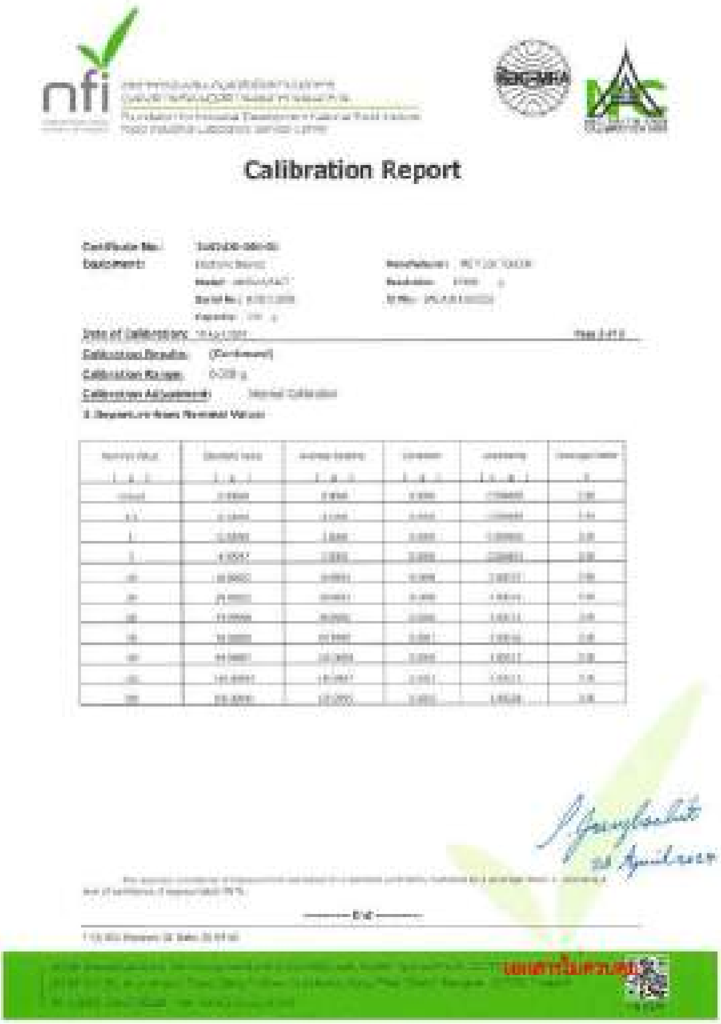
Calibration Report

Calibration Results:

1. Repeatability of Reading:

2. Off-Center Error:

☐ ☑ ☐



Calibration Report

Calibration Results: (Continued)

Calibration Adjustment: Internal Calibration

3. Deviation from Nominal Values

-------- End --------

PerkinElmer
For the Better

PinAAcle 900F
Preventive Maintenance Report

Company Name: UAE Consultant Co., LTD.

Instrument Location: 41 Sukumwhit Rd.,

Phra Khanong, Bangkok 10260

Instrument Serial No.: PFB520031902

Date: 14-May-2024

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PinAAcle 900F Preventive Maintenance (PM)

Company Name	United Analyst and Engineering Consultant Co., LTD.		
Address Instrument Location	41 Sukumwhit Rd, Phra Khanong, Bangkok 10260		
Serial Number	PFB520031902	PM Number	2 of 2
Customer Name (If applicable)	K. Yaddi	Telephone Number	[illegible]
Customer Support Engineer Name	E. Chaipanan	Service Order Number	WO-0275199
Date PM Performed: (yyyy-mm-dd)	14-May-2024	Next PM Due Date: (yyyy-mm-dd)	14-Nov-2024
Standard Labor Hours to Complete PM :		5 Hours	

Part Number	Edition	Publication Date	
0070143 Rev.B	A	January 2008	PerkinElmer

Scope

The purpose of this PM is to verify the continued functionality of the PinAAcle 900F by performing and inspecting a number of designated parts. This procedure should only be performed by a trained maintenance client PerkinElmer.

This procedure should not be conducted before the PM begins.

General Instructions

The customer must provide the engineer qualitative data to determine issues. Information and the customer will be working together.

Always check with the customer before making any changes that may affect the equipment's calibration or performance, including a current hardware and software version.

The completed document should be signed by an authorized PerkinElmer and customer representative and left with the customer.

Update the PM status and instrument logbook as required.

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Component List

Component / Specific Model	Serial #	Configuration Notes
PinAAcle 900F	PFB520031902	Syngistix 6.0.0.1335
Flat 100 Nebulizer	[illegible]	

Parts Lists

Parts Included with the PM		
Part Number (If applicable)	Description	Quantity
[illegible]	Gas Filters	N/A
[illegible]	[illegible]	N/A
[illegible]	[illegible]	N/A
[illegible]	Replacement Acetylene Filter Cartridge	N/A
[illegible]	Replacement Air Intake Cartridge	N/A

Additional Reagents and Standards Required for PM				
Part Number (If applicable)	Description	Quantity	Batch/Lot #	Expired Date (mm/yy)
[illegible]	1000 mg/L Copper Standard	All	22-[illegible]	Apr 2028

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	All	all
N/A	0.5% HNO_3	250 mL	All	all

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Additional Tools Required for PM			
Part Number (If applicable)	Description	Quantity	Serial #
[illegible]	0.04 Inner Diameter Bit	1	[illegible]
[illegible]	1.04 Inner Diameter Bit	1	[illegible]
[illegible]	Torque 2.0 Nm Driver	1	[illegible]
[illegible]	Air System 2 HD	1	[illegible]
[illegible]	Cu Lumina HD	1	[illegible]
[illegible]	Be Lumina HD	1	[illegible]
[illegible]	Ni Lumina HD	1	[illegible]

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Procedure Checklist

Mark (✓) in check all the steps in the checklist that have been completed.

1. **Interview**
   - ☑ Review the instrument performance with the customer and document any recent problems.
   - ☑ Inspect the customer log book and note any appropriate PM entries.
   - ☑ Perform general inspection of system for clean lines.
2. **PC Instrument Software**
   - ☑ Instrument Software version files/database are not lost, passed, and/or updated as needed.
3. **Mechanical**
   - ☑ Inspect and clean all filters and filters. Replace filters if necessary.
   - ☑ Inspect all gas lines for leaks and/or wear. Replace if needed.
   - ☑ Clean exterior of the instrument.
   - ☑ Inspect the burner head, burner chamber, and nozzle. Clean if needed as stated in the Hardware Guide.
   - ☑ Check burner head dimensions with the feeler gauge as stated in the Hardware Guide in the Maintenance chapter section on cleaning the burner head and checking dirt width. Replace if out of specification.
   - ☑ Check the condition of the red cap burner head, and adjustable O-rings. Replace if necessary.
   - ☑ Check the drain system for signs of wear, replace worn or damaged parts.
   - ☑ Visually check for sensor flame condition when ignition is on (CO2 and H2O Chart Flames if applicable).
4. **Electrical**
   - ☑ Inspect PC boards. Clean if necessary.
   - ☑ Carefully check all internal and external cable connections.
   - ☑ Check instrument firmware revisions (upgrade to current levels if necessary).
   - ☑ Run Diagnostic Test within the Advanced function of the Spectrometer page. Check the results in the verifying folder in the Spectrometer Log Viewer.
5. **Optics**
   - ☑ Inspect and clean the sample compartment windows, if needed.
   - ☑ Inspect optics. Clean or replace if necessary.
6. **Sensor**
   - ☑ Verify that the Excess supplied to the instrument are within the pressure and quality specifications found in the PyroVale 900 Series Pre-Installation Checklist.pdf.
   - ☑ Verify that the sample line filter and air filter element is dry. Replace if necessary.

7. **Flame Interlock Checks**

Description: Check to ensure that all safety interlocks are closed.

Parameter	Specification	Test Results	Pass/Fail
Flame Sensor	Air/C_3H_8 flame on results shutdown	Active	Passed
Drain Sensor	Air/C_3H_8 flame on results shutdown	Active	Passed
Insulator Sensor	Air/C_3H_8 flame on results shutdown	Active	Passed
C_3H_8 Pressure Sensor	Air/C_3H_8 flame on results shutdown	Active	Passed
air Pressure Sensor	Air/C_3H_8 flame on results shutdown	Active	Passed
Flame Head Sensor	Opening Mirror Tools on the exhaust should trigger an interlock shutdown	Active	Passed

8. **After PM Performance tests**

8.1 Detector Linearity with Methane

Description: Ensures that the detector is linear in the Middle Range

Parameter	Specification	Certificate Value (in CO2 ppm Abs)	Test Results	Pass/Fail
2.0 A NO Filter	± 5% from Cert.	0.0996	0.0993	Passed
0.1 A NO Filter	± 5% from Cert.	0.0958	0.1000	Passed

8.2 Baseline Noise in CO Absorbance with Nitrogen

Description: Ensures that a high alert barrier will not produce excessive noise.

Parameter	Specification	Results	Pass/Fail
Standard Deviation	< 0.002	0.000	Passed

8.3 A1 Baseline Noise with Copper

Description: Check baseline noise.

Parameter	Specification	Results	Pass/Fail
Standard Deviation	0.0001	0.0001	Passed

8.4 B1 Background Compensation with Copper

Description: Verifies the instrument's ability to compensate for background absorption.

Parameter	Specification	Results	Pass/Fail
Standard Deviation	< 0.002	0.0001	Passed

8.5 A1-B1 Baseline Noise with Copper

Description: Ensures that background correction does not produce excessive noise.

Parameter	Specification	Results	Pass/Fail
Standard Deviation	0.0006	0.000	Passed

8.6 A1-B1 Baseline Noise with Arsenic

Description: Ensures that background correction does not produce excessive noise at a low wavelength.

Parameter	Specification	Results	Pass/Fail
Standard Deviation	0.0006	0.0002	Passed

8.7 Flame Sensitivity

Description: Instrument Sensitivity checked against Copper standard.

Standard Copper Sensitivity	Specification	Results (Abs)	Pass/Fail
5 mg/L Sensitivity 5 mm (if applicable)	> 0.250 Abs	N/A	Not Applicable
2 mg/L Sensitivity 10 mm (if applicable)	> 0.250 Abs	0.0005	Passed

10. **Review**
    - ☑ Review with the customer PM work performed.
    - ☑ Review with the customer recent maintenance concerns.
    - ☑ Discuss recommended customer supplied materials as listed on form.
    - ☑ Attach PM invoice.

Additional Comments

Additional Comments Regarding the PM

Review

The preventive maintenance check and if applicable performance tests for PyroVale 900F have been completed.

Did PyroVale 900F Passed ☑ Fail ☐ the preventive maintenance.

Review of Preventive Maintenance

Customer Point of Contact Representative: Chayanan K	Date: 14-May-2024 (dd-MMM-YYYY)
Technician Supervisor Representative: [illegible]	Date: 14-May-2024 (dd-MMM-YYYY)

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Agilent 55 240 280 Series Atomic Absorption Spectroscopy Systems

Preventive Maintenance Checklist

Agilent Preventive Maintenance provides factory recommended service for your analytical systems to ensure reliable operation and the accuracy of your results.

Delivered by highly trained 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 activities.

Note: Many instrument, production, AA instrument and accessory models are not covered specifically in this document. It can be used as a basic reference.

For more information about Agilent Technologies services, please visit our website using the following URL: http://www.agilent.com/chemlab/services

Introduction

Customer Information

1. Customers should provide all necessary operating supplies upon request of the engineer.
2. A customer representative should be available to the engineer while performing the preventive maintenance procedures.
3. 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.
4. If a system requires the use of new or optional procedures and/or parts for the maintenance service, then these must be noted separately and charged as a repair, which may have additional costs.

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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-tools
- To access Agilent University, visit http://www.agilent.com/crosslab/instrument/ for learn about training options, which include online, classroom and virtual delivery. A training specialist can work directly with you to help streamline your training options.
- A useful Agilent Resource Center web page is available, which includes short videos on maintenance, quick lists of consumables for many instruments, and other valuable information. Check out the Resource Page here: https://www.agilent.com/en-us/agilent-resources
- Need technical support, FAQs, supplies? – Visit our Support Portal page at: http://www.agilent.com/search/support
- Get involved. Share insights. Build connections. Join the Agilent Community at https://community.agilent.com/welcome

Service Engineer's Responsibilities

- Contact the customer and ensure that all necessary supplies are available before the preventive maintenance visit.
- Confirm the ability of the instrument to deliver continued safe operation as established via the Agilent AA safe operation flow chart. **(Refer directly to the AA 55/240/280 Preventive Maintenance Scope of Work to make the decision.)**
- Only spend three days (full week) 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 "Service not applicable" check boxes to indicate services/tasks not delivered, as appropriate.
- Complete the Preventive Maintenance service in the order of the pages listed.
- Complete the Service Review section together with the customer.
- Complete the fields for page numbers of the four checklists selected page.
- Complete the total number of pages field at the Service Completion section.
- Ask the customer to sign the Service Completion section including the customer's and your signature.

The information is subject to change without notice.

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Instrument Maintenance

System Information

☐ Check the box if an item is not configured, repair is unrelated to instrument or not applicable to the task.

Instrument System Name and ID	
Instrument System Site and Location	[illegible] / End Lab [illegible]

List System Components Product Numbers	List the Serial Numbers of each Component
1 G [illegible]	[illegible]
2	
3	
4	
5	
6	
7	
8	
9	

Preparation, Safe operation and initial performance checks

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Preventive Maintenance Procedures

FLAME SYSTEM section

☐ Service not applicable

Electronic components

☑ Check all components installed configuration using the DIAG.

☑ Check power supply voltages using the **DIAG Power Supply diagnostic**.

☑ Check Burner Identity – Burner ID, Frequency using the **DIAG NIC Diagnostic diagnostic**.

Mechanical components

☑ Check the burner assembly for damage or other concerns. If required replace burner head, nebulizer, tubing, O-rings and consumables as required.

☑ Run DIAG tests to exercise all motor movements the full range of their travel.

- ☑ Monochromator drive
- ☑ Slit drive
- ☑ Lamp selector
- ☑ ASA in/out

Optics components

☑ Check that all optical path of surfaces are clear – Clean or replace as required.

☑ Use DIAG to perform **Mono Wavelength Correction**.

☑ Use DIAG to perform **Slit Calibration**.

☑ Use DIAG and perform **Baling Squarewave Diagnostic**.

☑ Use DIAG and perform **Zero Order Offset/Mono Correction**.

☑ Use DIAG and perform **Wavelength Repeatability**.

☑ Manually replace selected HC lamps (replace one to a week per three months) and measure the % Sec for each lamp. Allow customer 2 factor are showing serious degradation due to age.

☑ Check that the signal energy of the D2 and HC lamps are in acceptable ranges. If not, replace the D2 lamp, a deuterium lamp degrades from 4 to 10 hours.

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Sample introduction and Atomization

- ☑ Inspect the burner interlock plate to ensure that the interlock pin is secure and correct for the burner type.
- ☑ Clean the burner slot with a clean white card.
- ☑ Check the uniformity of the slot width.
- ☑ Clean the burner if required.
- ☑ Change the burner o-ring.
- ☑ Clean the nebulizer, spray chamber and tip of the tip.
- ☑ Change all o-rings and seals in the nebulizer, nebulizer block and spray chamber.
- ☑ Check that the pressure relief tubing retains kinks.
- ☑ Change o-rings on the fuel and oxidant delivery hoses.
- ☑ Leave the liquid trap EMPTY and verify the flame will ignite in this state.
- ☑ Refill liquid trap and check that overfill drains freely into the drain waste tube.
- ☑ Check the drain/waste tube for good drainage. It should not have light bends, kinks or loops and the lowest end must be above the liquid level in the waste vessel.
- ☑ Check and clean the igniter electrode.

Gas handling components and safety interlocks

- ☑ Pressure test for leaks.
- ☑ Look and gasbox internal components and connections.
- ☑ Check safety interlock status and operation using the GXD **interlock monitoring diagnostic**.

Analytical performance for Flame systems

- ☑ Ignite a flame.
- ☑ Check that you can adjust the nebulizer uptake rate from 4 to 6.5 mL per minute.
- ☑ Optimize the instrument ready to perform Sensitivity test.
- ☑ Create a manual method to perform a Basic QUANT test - "Final Performance Testing".
- ☑ Run a PM completed sensitivity test for a 1ppm copper sample and record the results in the 6A PM Performance test results and measurements table.

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FURNACE SYSTEM section

- ☑ Sections applicable

Electronic components

- ☐ Review and confirm environment configuration data in SVD.
- ☐ Confirm power supply voltages using the SVD **Power Supply diagnostic**.

Mechanical components

- ☐ Run SVD tests to exercise all motor axes over the full range of their travel.
  - ☐ **Monochromator drive**
  - ☐ **Slit drive**
  - ☐ **Lamp selector**

Optics components

- ☐ Check that internal optical surfaces are clean – Clean or replace as required.
- ☐ Use SVD and perform **Mono Wavelength Correction**.
- ☐ Use SVD and perform **Slit Calibration**.
- ☐ Use SVD and perform **Grating Squareness Diagnostic**.
- ☐ Use SVD and perform **Zero Order Offset/Mono Correction**.
- ☐ Use SVD and perform **Wavelength Repeatability**.
- ☐ Physically inspect selected HC lamps (customer) to rapidly pin their channel and measure the "Lamp Gain" for each lamp. Advise customer of lamps are showing emission degradation due to age.

Gas handling, water system and workhead component checks

- ☐ Inspect the GTA workhead gas hoses and connections for leaks.
- ☐ Pressure test for gas leaks.
- ☐ If the cooler system is accessible, inspect stored chiller for correct operation and coolant/water level – this includes any temperature and pressure sensor and sight glass (after draining coolant and water).
- ☐ Inspect the GTA workhead water hoses and connections for leaks.
- ☐ Check all graphite components and replace if necessary.

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- ☐ **Tube**
- ☐ **Electrodes**
- ☐ **Shroud**

- ☐ Check and clean the end windows on the workhead.
- ☐ Check safety interlock operation.

Analytical performance for Furnace systems

- ☐ Optimize the instrument ready to perform Sensitivity test.
- ☐ Run the sensitivity test for a 50 ppb copper sample and record the results in the results table.

PSD autosampler accessory for Furnace systems

- ☑ Section NOT Applicable
- ☐ Check condition of the PSD capillary – replace if necessary.
- ☐ Check condition and contents of PSD syringe – ensure it does not have any loose bubbles.
- ☐ Change PSD inner bottle o-ring.
- ☐ Clean and clean the inner vessel.
- ☐ Check the drain tube for good drainage. It should not have light bends, kinks or loops and the lowest end must be above the liquid level in the waste vessel.
- ☐ Ensure that the waste container is suitable for use with the furnace system.

Sample introduction pump system (SIPS) accessory

- ☑ Section NOT Applicable
- ☐ Remove peristaltic tubing, check the tubing pressure and the wear and tear factors.
- ☐ Adjust the rack roller so that it rotates freely.
- ☐ Wipe clean the guide drive rollers and pump bands with a dry clean cloth.
- ☐ Ensure that the pump arms and the surfaces near the pump are free from dirt and spills.
- ☐ Remove the pump module rear cover and check for the occurrence of liquids and any signs of corrosion.
- ☐ Re-torque the screws that fasten the micro mounting plates to the chassis.
- ☐ Check clips securing the diluents holder and replace if necessary.
- ☐ Disconnect, clean T pieces and reassemble by taking using the Bullfree system.

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- ☐ Remove the T piece by disconnecting the pump tubes, the pump bands and all other tubing.
- ☐ Place the T piece in an ultrasonic bath containing strong detergent (~8% Decon 90 or similar, for approximately 5-10 minutes.
- ☐ Wash the T piece under a tap with a strong flow of water.
- ☐ Rinse with distilled water through all of the inlets in the reverse direction to normal sample flow.
- ☐ Reassemble.

Sample preparation system (SPS 4) accessory

- ☑ Section NOT Applicable

The Agilent SPS 4 autosampler does not need any regular maintenance.

The following maintenance requirement is only suggested to maintain the performance of the autosampler.

- ☐ Cleaning the outer cover, rack location mat, and trayers and reserve accessories with a clean, soft cloth (or diluted mild detergent).
- ☐ Cleaning the autosampler cover panels with domestic window cleaner.
- ☐ Checking the X- axis and Z- axis drive belts for cracks, splits, damaged teeth, excessive fraying, color changes or degradation from fumes.
- ☐ Check the X- axis, Trays axis and Z- axis FFC cables for cracks, excessive overbending, damaged edge or damaged wire strands.

NOTE: The autosampler requires no extra lubrication throughout its lifetime.
For further details refer to the SPS 4 service manual (G8410-90002).

Sample preparation system (SPS 3) accessory

- ☑ Section NOT Applicable
- ☐ Check the vials and trays for damaged tubes – Replace if there is any sign of cracks, splits or other damage or excessive tension.
- ☐ Check bolt tightness – adjust if required.
- ☐ Check the lubrication pad for single x-axis shaft. If pad is dry or customer has observed any vibration or erratic movements of the x-axis carriage, add 1 mL of Bray Cooney 200 or Fluid 200 CS into the well.
- ☐ Check the autosampler ability to find sample positions – Calibrate if required.
- ☐ Clean the exterior surfaces of the autosampler with soft, lint free cloth. The cloth can be dampened with warm water or a mild detergent. Do not use organic solvents or abrasive cleaning agents.

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Vapor generation accessory VGA (hydride generator)

- ☑ Section NOT Applicable
- ☐ Inspect VGA gas supply hose
- ☐ Inspect/replace VGA pump tubing
- ☐ Check low gas pressure interlock setting – adjust if required
- ☐ Check precision reflux gas flow setting – adjust if required
- ☐ Check gas regulator pressure levels (cylinders) – adjust if required
- ☐ Clean the exterior surfaces of the accessory with soft lint free cloth. This cloth can be dampened with warm water or a mild detergent. Do not use organic solvents or abrasive cleaning agents.

UltrAA lamp accessory (external)

- ☑ Section NOT applicable
- ☐ Check the condition of the power cable
- ☐ Clean the exterior surfaces of the accessory with soft lint free cloth. This cloth can be dampened with water or a mild detergent. Do not use organic solvents or abrasive cleaning agents.

Restore System

- ☑ If you have placed the customer's instrument/system during the course of PM, restore to the original status to allow the customer to conduct day-to-day activities (e.g., reload the customer's method).

Guidance

If this PM service is performed prior to a qualification service, then use the qualification procedure as a guide for final adjustments, set-point checks.

Signature Page

Service Review

- ☑ Check available maintenance alerts (if already in the instrument)
- ☑ Review the Preventive Maintenance Checklist with the customer's records/logbook
- ☑ Update/upgrade instrument maintenance procedures as appropriate
- ☑ After the PM review is complete, sign and date the logbook located on the instrument's engine
- ☑ Complete the Service Engineer Comments section of form (additional comments)
- ☑ Review the service parts replaced and their usage relevant with the customer
- ☑ If the instrument firmware was updated, record the details of the change in the Service Engineer's Comments section (if necessary, to the customer's IQ records)

Test Results

Test Description		
Flame safety PMT Gain test		
[illegible]	[illegible]	[illegible]
[illegible]		
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]		
[illegible]	[illegible]	[illegible]
Deuterium Curvature performance test with 20 ppb copper sample (GTA 8 ml)		
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
Deuterium lamp background performance: 20 ppb copper sample (GTA 8 ml)		
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

AA consumable and parts list table

Part Description		Product Number of Kit/Unit	PM supplied or consumable	Replacement Type
[illegible]	[illegible]	[illegible]	PM supplied	Consumable
[illegible]	[illegible]	[illegible]	PM supplied	Consumable
[illegible]	[illegible]	[illegible]	*	Consumable
[illegible]	[illegible]	[illegible]	PM supplied	Replace
[illegible]	[illegible]	[illegible]	PM supplied	Replace
[illegible]	[illegible]	[illegible]	consumable	Replace
[illegible]	[illegible]	[illegible]	consumable	Replace
[illegible]	[illegible]	[illegible]	consumable	Replace
[illegible]	[illegible]	[illegible]	consumable	Replace
[illegible]	[illegible]	[illegible]	consumable	Replace
[illegible]	[illegible]	[illegible]	consumable	Replace
[illegible]	[illegible]	[illegible]	PM supplied	Inspection
[illegible]	[illegible]	[illegible]	PM supplied	Inspection
[illegible]	[illegible]	[illegible]	PM supplied	Inspection
[illegible]	[illegible]	[illegible]	PM supplied	Inspection
[illegible]	[illegible]	[illegible]	PM supplied	Replace
[illegible]	[illegible]	[illegible]	PM supplied	Replace
[illegible]	[illegible]	[illegible]	PM supplied	Replace
[illegible]	[illegible]	[illegible]	PM supplied	Replace
[illegible]	[illegible]	[illegible]	PM supplied	Replace

* For engineers who only service AA instruments, 5190-8279 can be used as a cheaper alternative for 5181-0330.

Items listed first as PM supplied, in the above table are included in the standard PM.

Items classified as consumable should be provided by the customer or charged to the customer if supplied by the Agilent service engineer.

Service Engineer Comments (optional)

Service Completion

Service Engineer Name: [illegible] Date service completed: 24 January 2014

Agilent signature: [illegible] Customer signature: [illegible]

Total number of pages in this document: 3

SVD Results Report

VARIAN

Customer:
Address:
Service Engineer:
Contact Details:

Instrument Configuration

Configuration:

Serial Number:
Instrument Model:
Flame Instrument: True
Furnace Instrument: True
Zeeman Present: False
Internal Zeeman: False
Internal UltraAA: False
Optics Type: Double Beam
D2 BG Correction Fitted: True
Boot Block Version:

Turret Type: Automatic
Number Of Lamps: 4
Mono Type:
Gasbox Type:
Auto Burner Adjuster: False
Mains Frequency:
Firmware Version:
Photomultiplier Type:
PWB Version:

EEPROM Data:

Instrument Run Hours:
Zero Wavelength Offset:
Mono Correction:
Flame Hours:

D2 Run Hours:
D2 Serial Number:
D2 Install Date:
D2 Original Intensity:
D2 Last Intensity:

Frequency:

Averaging Period:
Datapoint Count: 20

Upper Limit: 51.00
Lower Limit: 49.00

Average Frequency: 50.00

Highest Measured Frequency: 50.00
Lowest Measured Frequency:

Result: Passed

เอกสารไม่ควบคุม

Power Supply:

Averaging Period:
Datapoint Count:

	Lower Limit (V)	Actual (V)	Upper Limit (V)	Result:
12.00 V Rail				Passed
-12.00 V Rail				Passed
5.00 V Rail				Passed
310.00 V Rail				Passed

เอกสารไม่ควบคุม

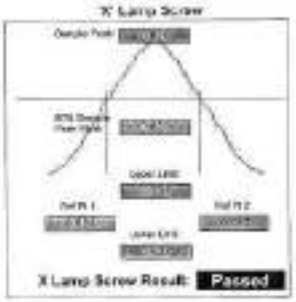
Optics

Beam Balance:

Lamp Type:
Lamp Socket Used:

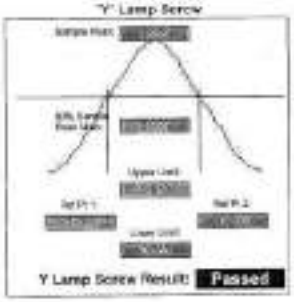
Peak Selected:
Lamp Alignment:

'X' Lamp Screw



X Lamp Screw Result: Passed

'Y' Lamp Screw



Y Lamp Screw Result: Passed

Grating Squareness:

Lamp Element(s):
Lamp Turret Position:
Lamp Current(mA):
Slit Width(nm):
1st Order Wavelength(nm):
Lamp Alignment:

	Lower Limit (nm)	Actual (nm)	Upper Limit (nm)	Result:
Zero Order				Passed
First Order				Passed
Second Order				Passed

เอกสารไม่ควบคุม

Wavelength Repeatability:

Lamp Used:
Peak Used(nm):
Connected to Socket:

Lamp Current(mA): 4
Slit Width(nm): 0.2
Slit Height:

Lamp Alignment:

Lower Limit(nm): Upper Limit(nm)

Sample 1:	Sample 2:
Sample 3:	Sample 4:
Sample 5:	Sample 6:
Sample 7:	Sample 8:
Sample 9:	Sample 10:

Mean:

Standard Deviation:

Result: Passed

เอกสารไม่ควบคุม

Mechanical

Wavelength Drive: Passed

Slit Drive: Passed

Turret Drive: Passed

Auto Burner Adjuster Drive: Untested

Miscellaneous

Signal Processing Linearity:

Calculate Mode: [illegible]

	Lower Limit	Actual	Upper Limit	Result:
S0	114	201	287	Passed
S1	106	118	131	Passed
S2	271	298	322	Passed
S3	474	537	573	Passed
S4	823	906	1000	Passed
S5	1455	1628	1794	Passed
S6	2499	2768	3085	Passed
S7	4347	4768	5215	Passed

Interlocks:

Burner Fitted:	Working	Flame Detect:	Working
N2O Burner Fitted:	Untested	GCU Active:	Working
Flame Shield Closed:	Working	Oxidant Pressure:	Working
Gas Control Fitted:	Untested	Oxidant Changeover:	Untested
Pressure Release Bung Fitted:	Working	Ignition:	Working
Liquid Trap Fitted:	Working		

Auto Lamp Recognition:

Lamp 1: [illegible]	Lamp 5: Not Supported
Lamp 2: [illegible]	Lamp 6: Not Supported
Lamp 3: [illegible]	Lamp 7: Not Supported
Lamp 4: [illegible]	Lamp 8: Not Supported

Result: Passed

GTA Temperature Monitoring: Not Performed

Notes:

[illegible]

Signatures:

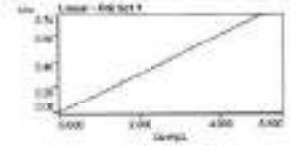
[illegible]	[illegible]	[illegible]	[illegible]
	Date	Witnessed By	Date

Sequential by time report — 1/24/2024 11:46 AM — Page 1 of 1 — SpectrAA

Analyst
Date Started: [illegible]
Workstation: Cu 0 PPM Screen check
Computer: [illegible]
Methods: Cu
Computer name: [illegible]
Serial Number: [illegible]

Workset: Cu (Flame)

Sample ID	Conc. mg/L	%RSD	Abs Abs
CAL ZERO	0.000	33.0	0.0002
Readings			
	0.0002	0.0000	0.0004
[illegible]	0.200	1.1	0.1448
Readings			
	0.2004	0.7513	0.1450



Curve Fit: Linear
Concentration Conc: 0.200 mg/L
r: 1.0000
Calculated Conc: 0.200 0.000
Residual: 0.000 0.000

abs = 0.7600 x C + 0.0020

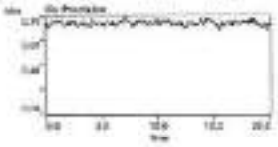
Sample ID	Conc. mg/L	%RSD	Abs Abs
[illegible]	4.000	3.7	0.7601
Readings			
	0.7604	0.7500	0.7548

Sequential by time report — 1/24/2024 11:53 AM — Page 1 of 1 — SpectrAA

Analyst
Date Started: [illegible]
Workstation: Cu 0 PPM Revision
Comment:
Methods: Cu
Computer name: [illegible]
Serial Number: [illegible]

Workset: Cu (Flame)

Sample ID	Conc. mg/L	%RSD	Abs Abs
Cu Revision	0.200	0.5	0.1200
Readings			
	0.2001	0.0196	0.1208
	0.2021	0.0313	0.1200



List of Instruments Certification for Air & Noise Quality Analysis

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration	Remark
Ambient									
1	Orifice Transfer Standard Calibrator	Total Suspended Particulate (TSP) Lead	Andersen Instruments, Inc.	G25A 1901	Jiranatee Associates Co., Ltd.	COF-002-66	14 Jul 23	13 Jul 25	-
2	U-Tube Manometer	Total Suspended Particulate (TSP) Lead	Dwyer	1221-36-W/M -	Technology Promotion Association (Thailand-Japan)	24P1251	11 Apr 24	10 Apr 25	-
3	Aneroid Barometer	Total Suspended Particulate (TSP) Lead	Barigo, Germany	-	Technology Promotion Association (Thailand-Japan)	24P1369	22 Apr 24	21 Apr 25	-
4	Dial Thermo-Hygrometer	Total Suspended Particulate (TSP) Lead	Barigo, Germany	-	Technology Promotion Association (Thailand-Japan)	24H753	10 Apr 24	9 Apr 25	-
5	Nitrogen Dioxide Analyzer	Nitrogen Dioxide	Thermo Electron	42C 42C-0508011076	UAE Consultant Co.,Ltd.	04102024	4 Oct 24	3 Oct 25	-
6	Nitrogen Dioxide Analyzer	Nitrogen Dioxide	Thermo Fisher Scientific	42C 0517512000	UAE Consultant Co.,Ltd.	04102024	4 Oct 24	3 Oct 25	-
7	Nitrogen Dioxide Analyzer	Nitrogen Dioxide	Thermo Electron	42C 0517512001	UAE Consultant Co.,Ltd.	11102024	11 Oct 24	10 Oct 25	-
8	Nitrogen Dioxide Analyzer	Nitrogen Dioxide	Thermo Scientific	42i CM08130002	UAE Consultant Co.,Ltd.	17092024	17 Sep 24	16 Sep 25	-
9	Nitrogen Dioxide Analyzer	Nitrogen Dioxide	Thermo Scientific	42i CM19050148	UAE Consultant Co.,Ltd.	20092024	20 Sep 24	19 Sep 25	-
10	Nitrogen Dioxide Analyzer	Nitrogen Dioxide	Thermo Scientific	42i CM19050149	UAE Consultant Co.,Ltd.	17092024	17 Sep 24	16 Sep 25	-
11	Nitrogen Dioxide Analyzer	Nitrogen Dioxide	Thermo Scientific	42i CM19050150	UAE Consultant Co.,Ltd.	17092024	17 Sep 24	16 Sep 25	-
12	Standard Gases (Mixture)	Nitrogen Dioxide	Airgas	EB0162121 2016PSIG	Airgas an Air Liquide company	E05NI91E15A0014	6 Jun 23	6 Jun 31	-
13	Sulphur Dioxide Analyzer	Sulphur Dioxide	Thermo Scientific	43i CM22387061	UAE Consultant Co.,Ltd.	06092024	6 Sep 24	5 Sep 25	-

List of Instruments Certification for Air & Noise Quality Analysis

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration	Remark
Ambient									
14	Sulphur Dioxide Analyzer	Sulphur Dioxide	Thermo Scientific	43i CM22387063	UAE Consultant Co.,Ltd.	19062024	19 Jun 24	18 Jun 25	-
15	Sulphur Dioxide Analyzer	Sulphur Dioxide	Thermo Scientific	43i CM22387065	UAE Consultant Co.,Ltd.	06092024	6 Sep 24	5 Sep 25	-
16	Sulphur Dioxide Analyzer	Sulphur Dioxide	Thermo Scientific	43i CM22387066	UAE Consultant Co.,Ltd.	06092024	6 Sep 24	5 Sep 25	-
17	Sulphur Dioxide Analyzer	Sulphur Dioxide	Thermo Scientific	43i CM22387067	UAE Consultant Co.,Ltd.	15052024	15 May 24	14 May 25	-
18	Sulphur Dioxide Analyzer	Sulphur Dioxide	Thermo Scientific	43i 1201778111	UAE Consultant Co.,Ltd.	06092024	6 Sep 24	5 Sep 25	-
19	Sulphur Dioxide Analyzer	Sulphur Dioxide	Thermo Scientific	43i 1201778112	UAE Consultant Co.,Ltd.	04092024	4 Sep 24	3 Sep 25	-
20	Standard Gases (Mixture)	Sulphur Dioxide	Airgas	EB0162121 2016PSIG	Airgas an Air Liquide company	E05NI91E15A0014	6 Jun 23	6 Jun 31	-
21	Carbon Monoxide Analyzer	Carbon Monoxide	Thermo	48i CM08140003	UAE Consultant Co.,Ltd.	03092024	3 Sep 24	2 Sep 25	-
22	Carbon Monoxide Analyzer	Carbon Monoxide	Thermo	48i 1180540069	UAE Consultant Co.,Ltd.	14062024	14 Jun 24	13 Jun 25	-
23	Carbon Monoxide Analyzer	Carbon Monoxide	Thermo	48i 1180540074	UAE Consultant Co.,Ltd.	09092024	9 Sep 24	8 Sep 25	-
24	Carbon Monoxide Analyzer	Carbon Monoxide	Horiba	APMA-370 YN43AG7T	UAE Consultant Co.,Ltd.	14062024	14 Jun 24	13 Jun 25	-
25	Carbon Monoxide Analyzer	Carbon Monoxide	Horiba	APMA-370 YRLHTB7G	UAE Consultant Co.,Ltd.	08122023	8 Dec 23	7 Dec 24	-
26	Carbon Monoxide Analyzer	Carbon Monoxide	Thermo	48C 48C-65506-348	UAE Consultant Co.,Ltd.	08122023	8 Dec 23	7 Dec 24	-

List of Instruments Certification for Air & Noise Quality Analysis

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration	Remark
Ambient									
27	Carbon Monoxide Analyzer	Carbon Monoxide	Thermo	48i CM08140004	UAE Consultant Co.,Ltd.	03092024	3 Sep 24	2 Sep 25	-
28	Standard Gases (Mixture)	Carbon Monoxide	Airgas	EB0162121 2016PSIG	Airgas an Air Liquide company	E05NI91E15A0014	6 Jun 23	6 Jun 31	-
29	Total Hydrocarbons Analyzer	Total Hydrocarbons	HORIBA	APHA-370 VUPVTC21	UAE Consultant Co.,Ltd.	15122023	15 Dec 23	14 Dec 24	-
30	Total Hydrocarbons Analyzer	Total Hydrocarbons	HORIBA	APHA-370 PDXEGXF7	UAE Consultant Co.,Ltd.	21122023	21 Dec 23	20 Dec 24	-
31	Total Hydrocarbons Analyzer	Total Hydrocarbons	HORIBA	APHA-370 SSGEJYBJ	UAE Consultant Co.,Ltd.	15122023	15 Dec 23	14 Dec 24	-
32	Total Hydrocarbons Analyzer	Total Hydrocarbons	HORIBA	APHA-370 VV2FY3R3	UAE Consultant Co.,Ltd.	15122023	15 Dec 23	14 Dec 24	-
33	Total Hydrocarbons Analyzer	Total Hydrocarbons	HORIBA	APHA-370 T4FG19AN	UAE Consultant Co.,Ltd.	21122023	21 Dec 23	20 Dec 24	-
34	Total Hydrocarbons Analyzer	Total Hydrocarbons	HORIBA	APHA-370 HAMEHU5M	UAE Consultant Co.,Ltd.	15122023	15 Dec 23	14 Dec 24	-
35	Total Hydrocarbons Analyzer	Total Hydrocarbons	HORIBA	APHA-370 RTHK2PDH	UAE Consultant Co.,Ltd.	15122023	15 Dec 23	14 Dec 24	-
36	Standard Gas	Total Hydrocarbons	Linde	D824432	Linde	09042013	4 Aug 20	4 Aug 28	-

NAC

CALIBRATION 0367

CERTIFICATE OF CALIBRATION

NAC

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)

Certificate of Calibration

Certificate No. : 2021201
Page : 1 of 2

Equipment :	U-Tube Manometer
Manufacturer :	Dwyer
Model :	1201-00-FM
Serial No. :	-
ID No. :	UAE-DFM-071(250)
Condition As Received :	Good Item
Received Date :	03 April 2021
Calibration Date :	13 April 2021
Reference :	2201-01190/RC
Ambient Temperature :	23 ± 2 °C
Relative Humidity :	50 ± 10 %
Atmospheric Pressure :	1010 mbar

Submitted by : Urban Studys and Engineering Consultant Co.,Ltd

Procedure used : The calibration was conducted by direct comparison method against Pressure Measuring Instruments Standard according to calibration procedure CP-PR14 using " DKS-B-04 : Calibration of Pressure Gauges " as a guideline.

Condition of the result of calibration

Reference standard instruments :

Instrument	Model	Serial No.	Certificate No.	Due Date
1) Pressure Calibrator	PC100P	1186	0PC-0 15/22	15 Sep 2021

2. This result of calibration was made on received at the point specified by customer.
3. Errors and conversion factor is 1 kPa = 4.3146309 inch.
4. The instrument was used clean air as pressure media.
5. The instrument was calibrated by applied pressure to high-port (+) side and low-port (-) side open to atmosphere pressure.
6. The instrument was installed in vertical orientation and top of the pressure port was used as the reference level.
7. The certificate is valid only to the item calibrated on date and place of calibration.
8. The Certification is traceable to the International System of Unit maintained through National Institute of Metrology (Thailand), NIMT CPCC Accredited No. Calibration 0194

Calibrated by : Kanon Kitimasu
Issue Date : 07 April 2021

Approved Signatory :
[ ] Thanee Prapapan
[ ] Vorn Suwanasan
[√] Akkpol Panuan

Result of calibration - Without standard
Function: Pressure Measurement
Indicating Pressure

Range : 0 kPa(G) to 30 kPa(G)
Scale Interval : 0.1 kPa(G) (Min Scale Interval)

Applied Pressure	High port side	UUC Indicator Low port side	ΔP	Error
0.00	0.00	0.00	0.00	0.00
2.00	1.99	-1.00	2.99	-0.01
4.00	3.99	-3.00	4.99	-0.01
6.00	5.99	-5.00	6.99	-0.01
8.00	7.99	-7.00	8.99	-0.01
10.00	9.99	-9.00	10.99	-0.01
12.00	11.99	-11.00	12.99	-0.01
14.00	13.99	-13.00	14.99	-0.01
16.00	15.99	-15.00	16.99	-0.01
18.00	17.99	-17.00	18.99	-0.01
20.00	19.99	-19.00	20.99	-0.01
22.00	21.99	-21.00	22.99	-0.01
24.00	23.99	-23.00	24.99	-0.01
26.00	25.99	-25.00	26.99	-0.01
28.00	27.99	-27.00	28.99	-0.01
30.00	29.99	-29.00	30.99	-0.01

The uncertainty of measurement was ± 0.01 kPa(G)
* ΔP = High port side - Low port side
* UUC = Unit Under Calibration
The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k = 2, providing a level of confidence of approximately 95 %.

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES, EQUIPMENT CALIBRATION AND TESTING SERVICES

Certificate of Calibration

Certificate No. : 24P1389
Page : 1 of 2

Equipment :	Aneroid Barometer
Manufacturer :	Belipo
Model :	-
Serial No. :	-
ID No. :	UAE-ANV-210/257
Condition As Received :	Used item
Received Date :	30 April 2024
Calibration Date :	02 April 2024
Reference :	23M-00-CW/BC
Ambient Temperature :	1 2 ± 2 1 °C
Relative Humidity :	1 9 ± 1 2 1 %
Atmospheric Pressure :	1 0 0 7 mbar

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

Submitted by : United Testing and Engineering Consultant Co.,Ltd
31 Soi Udomsuk 41, Sukhumvit Road, Bangchak, Phrakhanong, Bangkok 10260

Procedure used : The calibration was conducted by direct comparison method against Pressure Measuring Instruments Standard according to calibration procedure CP-P10, using " DKSH-84 : Calibration of Pressure Gauges " as a guideline.

Condition of the result of calibration

1.Reference standard instruments :

Instrument	Model	Serial No.	Certificate No.	Due Date
1) Standard Barometer	DPI142	142370/0848	18P-0089-23	03 May 2024

2.This instrument was installed in vertical orientation and zeroed if the dial was used as the reference level.

3.The result of calibration was made on recession at the point specified by customer.

4.Scale and conversion factor is 1 kPa = 7.5062 mmHg

5.The result of calibration instrument was in absolute pressure.

6.This instrument was used clean air as pressure media.

7.The certificate is valid only for the item calibrated on date and place of calibration.

8.The Calibration is traceable to the International System of Unit maintained through :
National Institute of Metrology Thailand (NIMT)

Calibrated by : Kulaporn Kitkhamlo
Issue Date : 23 April 2024

Approved Signatory : _____
( ) Pathree Prapapaet
( ) Somti Benmanon
(✓) Albert Panyam

เอกสารไม่ควบคุม

Cert No.: 24P1389
Page: 2 of 2

Result of calibration : Without adjustment
Function : Absolute Pressure Measurement
Scale interval : 1 mmHg (1 kPa with scale factor)

Increasing Pressure

Applied Pressure (mmHg)	114.00	139.71	167.00	191.03	216.00	243.03	268.01
UUT Indication (mmHg)	116.0	140.0	170.0	190.0	220.0	240.0	270.0
Error (mmHg)	1.99	0.29	-0.01	-1.03	-1.97	-3.03	-3.01

Decreasing Pressure

Applied Pressure (mmHg)	268.01	243.03	216.00	191.03	167.00	139.71	114.00
UUT Indication (mmHg)	270.0	243.0	220.0	190.0	170.0	140.0	116.0
Error (mmHg)	-4.01	-2.97	-1.97	-4.03	-3.01	0.01	1.99

The uncertainty of measurement was a 1.24 mmHg
* UUT = Unit Under Calibration
The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k = 2, providing a level of confidence of approximately 95%.

<End>

เอกสารไม่ควบคุม

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES, EQUIPMENT CALIBRATION AND TESTING SERVICES

Certificate of Calibration

Certificate No. : 24P1391
Page : 1 of 2

Equipment :	Dial Thermo-Hygrometer
Manufacturer :	Belipo
Model :	-
Serial No. :	-
ID No. :	UAE-ANV-1210/250
Condition As Received :	Used item
Received Date :	30 April 2024
Calibration Date :	10 April 2024 to 30 April 2024
Reference :	23M-00-CW/BC
Ambient Temperature :	1 9 ± 0 1 °C
Relative Humidity :	1 9 ± 0 1 %

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

Submitted by : United Testing and Engineering Consultant Co.,Ltd
31 Soi Udomsuk 41, Sukhumvit Road, Bangchak, Phrakhanong, Bangkok 10260

Procedure used : Calibration were conducted using in-house calibration procedure CP-H02, according to comparison with standard chilled mirror sensor for humidity measurement function and comparison with standard temperature sensor for temperature measurement function for humidity / temperature chamber.

Condition of the result of calibration

1.Reference standard instruments :

Instrument	Model	Serial No.	Certificate No.	Due Date
1) Chilled Mirror Hygrometer	Data Master	44750	21-009	07 Aug 2024
2) Handheld Thermometer With Sensor	1521	4840006	23K1258	19 Oct 2024

2.The certificate is valid only for the item calibrated on date and place of calibration.

3.The Certification is traceable to the International System of Unit maintained through :
- Shunder Scientific Corporation (NVLAP Accreditation No. Calibration 200802-0)
- Technology Promotion Association (Thailand-Japan), ISO-IAS0 Accredited No. Calibration 6006

Calibrated by : Chanit Wiboonsiriwat
Issue Date : 18 April 2024

Approved Signatory : _____
( ) Chanit Wiboonsiriwat
(✓) Upsorn Tanboonchi
( ) Uraporn Janaina

เอกสารไม่ควบคุม

Cert No.: 24P1391
Page: 2 of 2

Result of Calibration:- Without Adjustment
Function : Humidity Measurement

Reference Temperature (°C)	Standard Humidity (%RH)	UUT* Reading (%RH)	Error (%RH)	Uncertainty of Measurement (±%RH)
20.0	40.1	43	2.9	1.0
24.0	60.1	59	0.9	1.7
24.0	60.1	59	-0.1	1.8

Result of Calibration:- Without Adjustment
Function : Temperature Measurement

Standard Temperature (°C)	UUT* Reading (°C)	Error (°C)	Uncertainty of Measurement (±°C)
20.014	20.0	-0.014	0.12
25.000	25.0	-0.000	0.12
30.000	30.0	-0.000	0.12
35.027	35.0	-0.027	0.12
40.000	39.9	-0.101	0.12

UUT : Unit Under Calibration
The reported uncertainty of measurement was based on standard uncertainty multiplied by coverage factor k = 2.00, providing a confidence level approximately 95%.

<End>

เอกสารไม่ควบคุม

United Analyst and Engineering Consultant Co., Ltd.
[illegible]
Tel. [illegible] Fax [illegible] www.uaeconsultant.com E-mail: uae@uaeconsultant.com

MULTI-POINT GAS TEST REPORT

Test Date : Oct 4, 2024

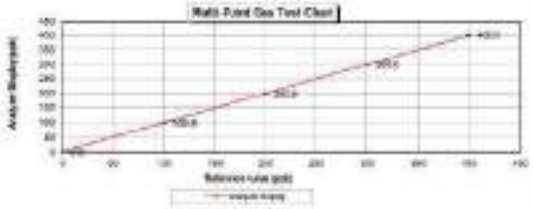
Equipment :	gas analyzer (NDIR)	Model :	42C
Manufacturer :	Thermo Electron Corporation	Serial Number :	42C-[illegible]

Standard Gas Concentration			Bottle Detail	
Sulphur Dioxide (SO2)	42.80	PPM	Manufacturer :	Thermo Scientific
Nitric Oxide (NO)	49.77	PPM	Model :	196
Methane (CH4)	-	PPM	Serial Number :	130540075
Carbon Monoxide (CO)	965.8			
Cylinder No. :	EB0038139			
Expiration Date :	Nov 5,2026			

Multi-point gas test data

Reference Value (ppb)			Analyzer Display (ppb)	Difference Error	Percent Error	[%Error]
Level 1	Zero	0.0	0.0	0.00	0.00	0.00
Level 2	20.00%	100.0	99.1	0.90	0.90	0.90
Level 3	40.00%	200.0	199.6	0.40	0.20	0.20
Level 4	60.00%	300.0	299.3	0.70	0.23	0.23
Level 5	80.00%	400.0	400.0	0.00	0.00	0.00
Remark : Measuring Range 500.0 ppb				Average Difference (%)		0.28
Acceptable Limit ± 5%						

Multi-Point Gas Test Chart



Calculate by: 4 / 10 / 2567

Approve by: 4 / Oct / 2024

เอกสารไม่ควบคุม

United Analyst and Engineering Consultant Co., Ltd.
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Tel. [illegible] Fax [illegible] www.uaeconsultant.com E-mail: uae@uaeconsultant.com

MULTI-POINT GAS TEST REPORT

Test Date : Oct 4, 2024

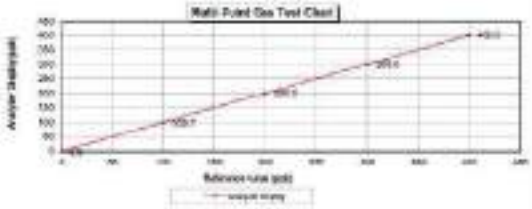
Equipment :	gas analyzer (NDIR)	Model :	42C
Manufacturer :	Thermo Electron Corporation	Serial Number :	[illegible]

Standard Gas Concentration			Bottle Detail	
Sulphur Dioxide (SO2)	42.80	PPM	Manufacturer :	Thermo Scientific
Nitric Oxide (NO)	49.77	PPM	Model :	196
Methane (CH4)	-	PPM	Serial Number :	130540075
Carbon Monoxide (CO)	965.8			
Cylinder No. :	EB0038139			
Expiration Date :	Nov 5,2026			

Multi-point gas test data

Reference Value (ppb)			Analyzer Display (ppb)	Difference Error	Percent Error	[%Error]
Level 1	Zero	0.0	0.0	0.00	0.00	0.00
Level 2	20.00%	100.0	99.1	0.90	0.90	0.90
Level 3	40.00%	200.0	199.6	0.40	0.20	0.20
Level 4	60.00%	300.0	299.3	0.70	0.23	0.23
Level 5	80.00%	400.0	400.0	0.00	0.00	0.00
Remark : Measuring Range 500.0 ppb				Average Difference (%)		0.28
Acceptable Limit ± 5%						

Multi-Point Gas Test Chart



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MULTI-POINT GAS TEST REPORT

Test Date : Oct 11, 2024

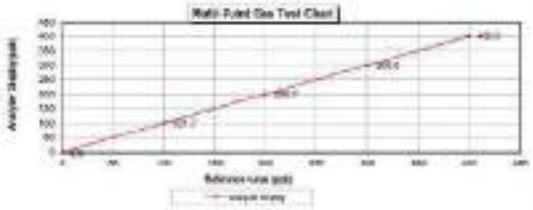
Equipment :	gas analyzer (NDIR)	Model :	42C
Manufacturer :	Thermo Electron Corporation	Serial Number :	[illegible]

Standard Gas Concentration			Bottle Detail	
Sulphur Dioxide (SO2)	42.80	PPM	Manufacturer :	Thermo Scientific
Nitric Oxide (NO)	49.77	PPM	Model :	196
Methane (CH4)	-	PPM	Serial Number :	130540075
Carbon Monoxide (CO)	965.8			
Cylinder No. :	EB0038139			
Expiration Date :	Nov 5,2026			

Multi-point gas test data

Reference Value (ppb)			Analyzer Display (ppb)	Difference Error	Percent Error	[%Error]
Level 1	Zero	0.0	0.0	0.00	0.00	0.00
Level 2	20.00%	100.0	99.1	0.90	0.90	0.90
Level 3	40.00%	200.0	199.7	0.30	0.15	0.15
Level 4	60.00%	300.0	299.3	0.70	0.23	0.23
Level 5	80.00%	400.0	400.0	0.00	0.00	0.00
Remark : Measuring Range 500.0 ppb				Average Difference (%)		0.46
Acceptable Limit ± 5%						

Multi-Point Gas Test Chart



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MULTI-POINT GAS TEST REPORT

Test Date : Sep 17, 2024

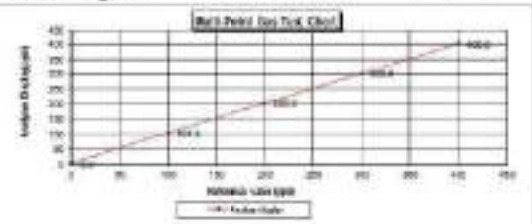
Equipment :	gas analyzer (NDIR)	Model :	42C
Manufacturer :	Thermo Scientific	Serial Number :	[illegible]

Standard Gas Concentration			Bottle Detail	
Sulphur Dioxide (SO2)	42.80	PPM	Manufacturer :	Thermo Scientific
Nitric Oxide (NO)	49.77	PPM	Model :	196
Methane (CH4)	-	PPM	Serial Number :	130540075
Carbon Monoxide (CO)	965.8			
Cylinder No. :	EB0038139			
Expiration Date :	Nov 5,2026			

Multi-point gas test data

Reference Value (ppb)			Analyzer Display (ppb)	Difference Error	Percent Error	[%Error]
Level 1	Zero	0.0	0.0	0.00	0.00	0.00
Level 2	20.00%	100.0	99.3	0.70	1.37	1.37
Level 3	40.00%	200.0	199.3	0.70	0.35	0.35
Level 4	60.00%	300.0	300.0	0.00	0.00	0.00
Level 5	80.00%	400.0	400.0	0.00	0.00	0.00
Remark : Measuring Range 500.0 ppb				Average Difference (%)		0.32
Acceptable Limit ± 5%						

Multi-Point Gas Test Chart



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United Analyst and Engineering Consultant Co., Ltd.

MULTI-POINT GAS TEST REPORT

Test Date : May 30, 2024

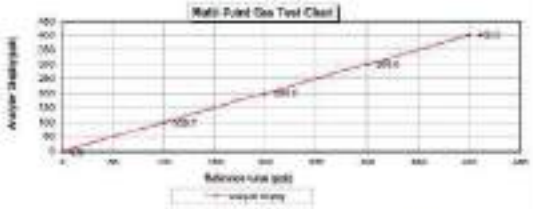
Equipment :	Gas Analyzer (NDIR)	Model :	43
Manufacturer :	Thermo Scientific	Serial Number :	0416050149

Standard Gas Concentration			Bottle Detail	
Sulphur Dioxide (SO2)	42.80	PPM	Manufacturer :	Thermo Scientific
Nitric Oxide (NO)	49.77	PPM	Model :	196
Methane (CH4)	-	PPM	Serial Number :	130154075
Carbon Monoxide (CO)	965.8			
Cylinder No. :	EB0039159			
Expiration Date :	Nov 16, 2026			

Multi-point gas test data

Reference Value (ppb)			Analyzer Display (ppb)	Difference Error	Percent Error	[% Error]
Level 1	Zero	3.3	0.0	0.00	0.00	0.00
Level 2	20.00%	100.8	99.7	0.70	0.70	0.70
Level 3	40.00%	200.8	199.6	0.60	0.60	0.60
Level 4	60.00%	300.8	302.7	2.90	0.30	0.30
Level 5	80.00%	400.8	400.0	0.00	0.00	0.00
Remark : Measuring Range		500.0 ppb		Average Difference (%)		0.28
Acceptable Limit ± 5%						

Multi Point Gas Test Chart



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เอกสารไม่ควบคุม

United Analyst and Engineering Consultant Co., Ltd.

MULTI-POINT GAS TEST REPORT

Test Date : May 17, 2024

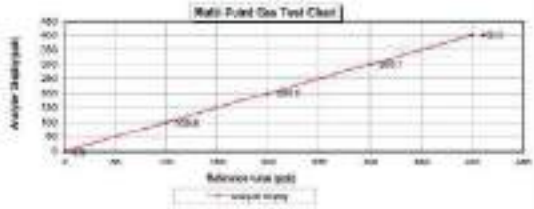
Equipment :	Gas Analyzer (NDIR)	Model :	43
Manufacturer :	Thermo Scientific	Serial Number :	0416050149

Standard Gas Concentration			Bottle Detail	
Sulphur Dioxide (SO2)	42.80	PPM	Manufacturer :	Thermo Scientific
Nitric Oxide (NO)	49.77	PPM	Model :	196
Methane (CH4)	-	PPM	Serial Number :	130154075
Carbon Monoxide (CO)	965.8			
Cylinder No. :	EB0039159			
Expiration Date :	Nov 16, 2026			

Multi-point gas test data

Reference Value (ppb)			Analyzer Display (ppb)	Difference Error	Percent Error	[% Error]
Level 1	Zero	3.3	0.0	0.00	0.00	0.00
Level 2	20.00%	100.8	99.0	0.90	0.90	0.90
Level 3	40.00%	200.8	199.6	0.60	0.60	0.60
Level 4	60.00%	300.8	302.7	0.70	0.23	0.23
Level 5	80.00%	400.8	400.0	0.00	0.00	0.00
Remark : Measuring Range		500.0 ppb		Average Difference (%)		0.27
Acceptable Limit ± 5%						

Multi Point Gas Test Chart



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MULTI-POINT GAS TEST REPORT

Test Date : May 17, 2024

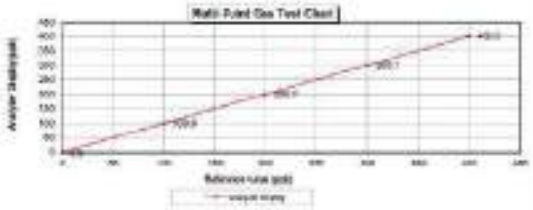
Equipment :	Gas Analyzer (NDIR)	Model :	43
Manufacturer :	Thermo Scientific	Serial Number :	0416050150

Standard Gas Concentration			Bottle Detail	
Sulphur Dioxide (SO2)	42.80	PPM	Manufacturer :	Thermo Scientific
Nitric Oxide (NO)	49.77	PPM	Model :	196
Methane (CH4)	-	PPM	Serial Number :	130154075
Carbon Monoxide (CO)	965.8			
Cylinder No. :	EB0039159			
Expiration Date :	Nov 16, 2026			

Multi-point gas test data

Reference Value (ppb)			Analyzer Display (ppb)	Difference Error	Percent Error	[% Error]
Level 1	Zero	3.3	0.0	0.00	0.00	0.00
Level 2	20.00%	100.8	99.0	0.90	0.89	0.89
Level 3	40.00%	200.8	201.7	0.70	0.35	0.35
Level 4	60.00%	300.8	302.7	0.70	0.23	0.23
Level 5	80.00%	400.8	400.0	0.00	0.00	0.00
Remark : Measuring Range		500.0 ppb		Average Difference (%)		0.28
Acceptable Limit ± 5%						

Multi Point Gas Test Chart



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Airgas

CERTIFICATE OF ANALYSIS

Grade of Product: EPA PROTOCOL STANDARD

Customer: AIR LIQUIDE (THAILAND) LTD.

Part Number: 6200001E1A0014

Cylinder Number: [illegible]

Laboratory: USA - Plumsteadville, PA

PGVP Number: A12027

Gas Code: CO CO2 NO NOx [illegible]

Reference Number: [illegible]

Cylinder Volume: 144 [illegible]

Cylinder Pressure: 2016 PSIG

Valve Outlet: [illegible]

Certification Date: Jul 08, 2021

Expiration Date: Jul 08, 2024

[illegible]

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Analysis Date
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No.	Concentration	Uncertainty	Expiration Date
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

ANALYTICAL EQUIPMENT

Instrument/Manufacturer	Analytical Principle	Last Multipoint Calibration
[illegible]	[illegible]	[illegible]

Approved for Release

Page 1 of 1

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MULTI-POINT GAS TEST REPORT

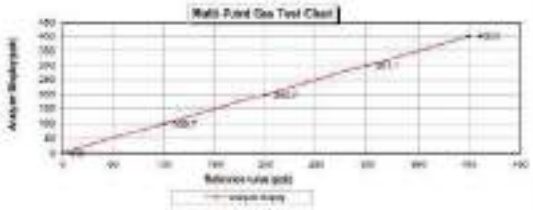
Test Date : May 6, 2014

Equipment :	gas analyzer (NOx)	Model :	43i
Manufacturer :	Thermo SCIENTIFIC	Serial Number :	0412087663

Standard Gas Concentration			Bottle Detail	
Sulphur Dioxide (SO2)	42.80	PPM	Manufacturer :	Thermo SCIENTIFIC
Nitric Oxide (NO)	49.77	PPM	Model :	196
Sulfuric (CH4)	-	PPM	Serial Number :	13050477
Carbon Monoxide (CO)	965.8			
Cylinder No. :	EB0139154			
Expiration Date :	Nov 16, 2015			

Multi-point gas test data

Reference Value (ppb)			Analyzer Display (ppb)	Difference Error	Percent Error	[% Error]
Level 1	Zero	0.0	0.0	0.00	0.00	0.00
Level 2	20.00%	100.8	99.7	0.73	0.73	0.73
Level 3	40.00%	200.8	201.7	0.72	0.40	0.40
Level 4	60.00%	300.8	301.1	0.28	0.07	0.07
Level 5	80.00%	400.8	400.0	0.00	0.00	0.00
Remark : Measuring Range 500.0 ppb				Average Difference (%)		0.24
Acceptable Limit ± 5%						



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MULTI-POINT GAS TEST REPORT

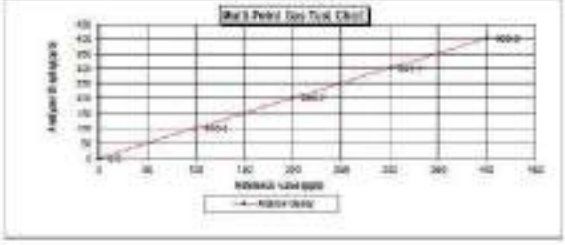
Test Date : June 19, 2014

Equipment :	gas analyzer (NOx)	Model :	43i
Manufacturer :	Thermo SCIENTIFIC	Serial Number :	0412087663

Standard Gas Concentration			Bottle Detail	
Sulphur Dioxide (SO2)	42.80	PPM	Manufacturer :	Thermo SCIENTIFIC
Nitric Oxide (NO)	49.77	PPM	Model :	196
Sulfuric (CH4)	-	PPM	Serial Number :	13050477
Carbon Monoxide (CO)	965.8			
Cylinder No. :	EB0139154			
Expiration Date :	Nov 16, 2015			

Multi-point gas test data

Reference Value (ppb)			Analyzer Display (ppb)	Difference Error	Percent Error	[% Error]
Level 1	Zero	0.0	0.0	0.00	0.00	0.00
Level 2	20.00%	100.0	100.8	0.80	0.79	0.79
Level 3	40.00%	200.0	202.7	2.70	0.95	0.95
Level 4	60.00%	300.0	301.1	1.10	0.37	0.37
Level 5	80.00%	400.0	400.0	0.00	0.00	0.00
Remark : Measuring Range 500.0 ppb				Average Difference (%)		0.35
Acceptable Limit ± 5%						



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MULTI-POINT GAS TEST REPORT

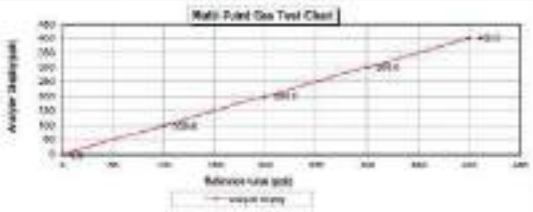
Test Date : May 6, 2014

Equipment :	gas analyzer (NOx)	Model :	43i
Manufacturer :	Thermo SCIENTIFIC	Serial Number :	0412087663

Standard Gas Concentration			Bottle Detail	
Sulphur Dioxide (SO2)	42.80	PPM	Manufacturer :	Thermo SCIENTIFIC
Nitric Oxide (NO)	49.77	PPM	Model :	196
Sulfuric (CH4)	-	PPM	Serial Number :	13050477
Carbon Monoxide (CO)	965.8			
Cylinder No. :	EB0139154			
Expiration Date :	Nov 16, 2015			

Multi-point gas test data

Reference Value (ppb)			Analyzer Display (ppb)	Difference Error	Percent Error	[% Error]
Level 1	Zero	0.0	0.0	0.00	0.00	0.00
Level 2	20.00%	100.8	99.7	0.90	0.89	0.89
Level 3	40.00%	200.8	201.7	0.72	0.40	0.40
Level 4	60.00%	300.8	301.1	0.28	0.07	0.07
Level 5	80.00%	400.8	400.0	0.00	0.00	0.00
Remark : Measuring Range 500.0 ppb				Average Difference (%)		0.24
Acceptable Limit ± 5%						



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MULTI-POINT GAS TEST REPORT

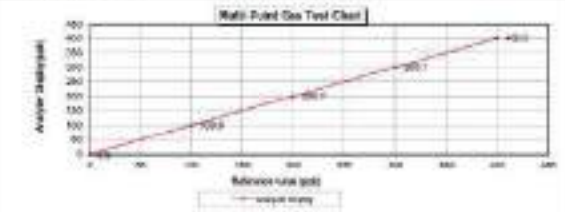
Test Date : May 6, 2014

Equipment :	gas analyzer (NOx)	Model :	43i
Manufacturer :	Thermo SCIENTIFIC	Serial Number :	0412087663

Standard Gas Concentration			Bottle Detail	
Sulphur Dioxide (SO2)	42.80	PPM	Manufacturer :	Thermo SCIENTIFIC
Nitric Oxide (NO)	49.77	PPM	Model :	196
Sulfuric (CH4)	-	PPM	Serial Number :	13050477
Carbon Monoxide (CO)	965.8			
Cylinder No. :	EB0139154			
Expiration Date :	Nov 16, 2015			

Multi-point gas test data

Reference Value (ppb)			Analyzer Display (ppb)	Difference Error	Percent Error	[% Error]
Level 1	Zero	0.0	0.0	0.00	0.00	0.00
Level 2	20.00%	100.8	99.7	0.90	0.89	0.89
Level 3	40.00%	200.8	201.7	0.72	0.40	0.40
Level 4	60.00%	300.8	301.1	0.28	0.07	0.07
Level 5	80.00%	400.8	400.0	0.00	0.00	0.00
Remark : Measuring Range 500.0 ppb				Average Difference (%)		0.24
Acceptable Limit ± 5%						



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MULTI-POINT GAS TEST REPORT

Test Date : May 15, 2024

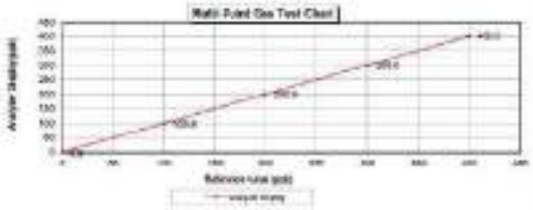
Equipment :	gas analyzer (NOx)	Model :	43i
Manufacturer :	Thermo SCIENTIFIC	Serial Number :	0412087967

Standard Gas Concentration			Bottle Detail	
Sulphur Dioxide (SO2)	44.60	PPM	Manufacturer :	Thermo SCIENTIFIC
Nitric Oxide (NO)	49.90	PPM	Model :	196
Methane (CH4)	-	PPM	Serial Number :	13050407S
Carbon Monoxide (CO)	964.0			
Cylinder No. :	EB0015262			
Expiration Date :	Jun 24 2024			

Multi-point gas test data

Reference Value (ppb)			Analyzer Display (ppb)	Difference Error	Percent Error	[%Error]
Level 1	Zero	0.0	0.0	0.00	0.00	0.00
Level 2	20.00%	100.0	99.0	0.00	0.79	0.79
Level 3	40.00%	200.0	202.0	2.00	0.98	2.98
Level 4	60.00%	300.0	302.0	2.00	0.50	0.50
Level 5	80.00%	400.0	400.0	0.00	0.00	0.00
Remark : Measuring Range 500.0 ppb				Average Difference (%)		0.49

Acceptable Limit ± 5%



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United Analyst and Engineering Consultant Co., Ltd.

MULTI-POINT GAS TEST REPORT

Test Date : Sep 6, 2024

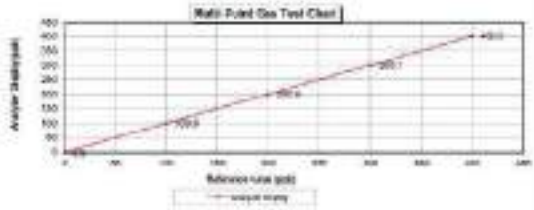
Equipment :	gas analyzer (NOx)	Model :	43i
Manufacturer :	Thermo SCIENTIFIC	Serial Number :	1201278013

Standard Gas Concentration			Bottle Detail	
Sulphur Dioxide (SO2)	42.80	PPM	Manufacturer :	Thermo SCIENTIFIC
Nitric Oxide (NO)	49.77	PPM	Model :	196
Methane (CH4)	-	PPM	Serial Number :	13050407S
Carbon Monoxide (CO)	965.8			
Cylinder No. :	EB0015156			
Expiration Date :	Nov 16, 2025			

Multi-point gas test data

Reference Value (ppb)			Analyzer Display (ppb)	Difference Error	Percent Error	[%Error]
Level 1	Zero	0.0	0.0	0.00	0.00	0.00
Level 2	20.00%	100.0	99.0	0.00	0.79	0.79
Level 3	40.00%	200.0	202.0	2.00	0.98	2.98
Level 4	60.00%	300.0	302.7	2.70	0.90	0.90
Level 5	80.00%	400.0	400.0	0.00	0.00	0.00
Remark : Measuring Range 500.0 ppb				Average Difference (%)		0.61

Acceptable Limit ± 5%



Calculate by

6 / 9 / 2567

Approve by

6 / Sep / 2024

Page: 1 of 1

เอกสารไม่ควบคุม

United Analyst and Engineering Consultant Co., Ltd.

MULTI-POINT GAS TEST REPORT

Test Date : Sep 4, 2024

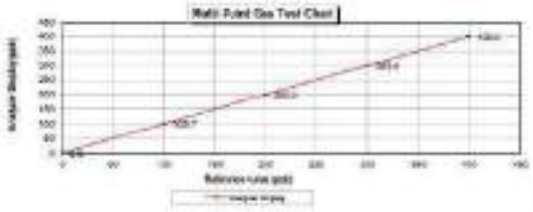
Equipment :	gas analyzer (NOx)	Model :	43i
Manufacturer :	Thermo SCIENTIFIC	Serial Number :	1201278013

Standard Gas Concentration			Bottle Detail	
Sulphur Dioxide (SO2)	42.80	PPM	Manufacturer :	Thermo SCIENTIFIC
Nitric Oxide (NO)	49.77	PPM	Model :	196
Methane (CH4)	-	PPM	Serial Number :	13050407S
Carbon Monoxide (CO)	965.8			
Cylinder No. :	EB0015156			
Expiration Date :	Nov 16, 2025			

Multi-point gas test data

Reference Value (ppb)			Analyzer Display (ppb)	Difference Error	Percent Error	[%Error]
Level 1	Zero	0.0	0.0	0.00	0.00	0.00
Level 2	20.00%	100.0	99.7	0.70	0.70	0.70
Level 3	40.00%	200.0	202.0	2.00	0.98	0.98
Level 4	60.00%	300.0	302.0	2.00	0.50	0.50
Level 5	80.00%	400.0	400.0	0.00	0.00	0.00
Remark : Measuring Range 500.0 ppb				Average Difference (%)		0.29

Acceptable Limit ± 5%



Calculate by

4 / 9 / 2567

Approve by

4 / Sep / 2024

Page: 1 of 1

เอกสารไม่ควบคุม

Airgas

CERTIFICATE OF ANALYSIS

Grade of Product: EPA PROTOCOL STANDARD

Customer: [illegible]

Part Number: [illegible]

Cylinder Number: [illegible]

Laboratory: 124 - Plainsboro, PA

PO/SO Number: [illegible]

Date Code: [illegible]

Reference Number: [illegible]

Cylinder Volume: 144 L CF

Cylinder Pressure: 2015 PSIG

Valve Outlet: [illegible]

Certification Date: Jul 05, 2023

Recertification Date: Jul 05, 2024

[illegible]

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Analysis Date
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No.	Concentration	Uncertainty	Expiration Date
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

ANALYTICAL EQUIPMENT

Instrument Manufacturer/Model	Analytical Principle	Last Multipoint Calibration
[illegible]	[illegible]	[illegible]

Approved for Release

Page 1 of 1

เอกสารไม่ควบคุม

United Analyst and Engineering Consultant Co., Ltd.

MULTI POINT GAS TEST REPORT

Test Date : Sep 3,2014

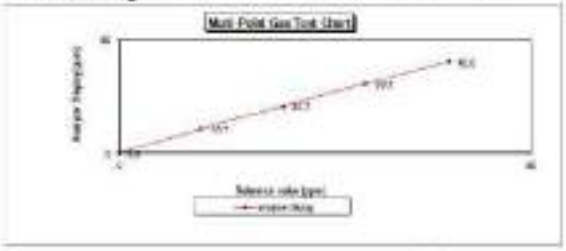
Equipment :	Gas Analyzer (CO)	Model :	48
Manufacturer :	Thermo Scientific	Serial Number :	[illegible]

Standard Gas Concentration			Bottle Detail	
Sulphur Dioxide (SO_2)	42.80	PPM	Manufacturer :	Thermo Scientific
Nitric Oxide (NO)	46.70	PPM	Model :	146i
Methane (CH_4)	-	PPM	Serial Number :	1305480(?)
Carbon Monoxide (CO)	993.0	PPM		
Cylinder No. :	EB0039136			
Expiration Date :	Nov 16,2015			

Multi point gas test data

Reference Value (ppm)			Analyzer Display (ppm)	Difference Error	Percent Error	[%] Error]
Level 1	Zero	0.0	0.0	0.0	0.0	0.0
Level 2	20.00%	10.0	10.7	0.7	0.0	0.0
Level 3	40.00%	20.0	20.7	0.7	0.4	0.4
Level 4	60.00%	30.0	30.8	0.8	1.6	1.6
Level 5	80.00%	40.0	40.8	0.8	0.0	0.0
Remark : Measuring Range 50.0 ppm				Average Difference (%)		0.40

Acceptable Limit ± 5%



Calculate by: 3 / 9 / 2001

Approve by: 3 / Sep / 2014

เอกสารไม่ควบคุม

United Analyst and Engineering Consultant Co., Ltd.

MULTI POINT GAS TEST REPORT

Test Date : June 14,2014

Equipment :	Gas Analyzer (CO)	Model :	48
Manufacturer :	Thermo Scientific	Serial Number :	[illegible]

Standard Gas Concentration			Bottle Detail	
Sulphur Dioxide (SO_2)	42.80	PPM	Manufacturer :	Thermo Scientific
Nitric Oxide (NO)	46.70	PPM	Model :	146i
Methane (CH_4)	-	PPM	Serial Number :	1305480(?)
Carbon Monoxide (CO)	993.0	PPM		
Cylinder No. :	EB0039136			
Expiration Date :	Nov 16,2015			

Multi point gas test data

Reference Value (ppm)			Analyzer Display (ppm)	Difference Error	Percent Error	[%] Error]
Level 1	Zero	0.0	0.0	0.0	0.0	0.0
Level 2	20.00%	10.0	10.0	0.0	0.0	0.0
Level 3	40.00%	20.0	20.4	0.4	2.0	1.0
Level 4	60.00%	30.0	30.8	0.8	2.6	1.6
Level 5	80.00%	40.0	40.0	0.0	0.0	0.0
Remark : Measuring Range 50.0 ppm				Average Difference (%)		1.16

Acceptable Limit ± 5%

Calculate by: 14 / 06 / 2017

Approve by: 14 / June / 2014

เอกสารไม่ควบคุม

United Analyst and Engineering Consultant Co., Ltd.

MULTI POINT GAS TEST REPORT

Test Date : Sep 9,2014

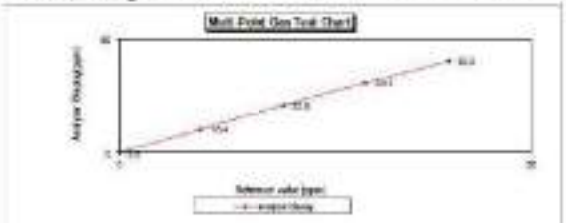
Equipment :	Gas Analyzer (CO)	Model :	48
Manufacturer :	Thermo Scientific	Serial Number :	[illegible]

Standard Gas Concentration			Bottle Detail	
Sulphur Dioxide (SO_2)	42.80	PPM	Manufacturer :	Thermo Scientific
Nitric Oxide (NO)	46.70	PPM	Model :	146i
Methane (CH_4)	-	PPM	Serial Number :	1305480(?)
Carbon Monoxide (CO)	993.0	PPM		
Cylinder No. :	EB0039136			
Expiration Date :	Nov 16,2015			

Multi point gas test data

Reference Value (ppm)			Analyzer Display (ppm)	Difference Error	Percent Error	[%] Error]
Level 1	Zero	0.0	0.0	0.0	0.0	0.0
Level 2	20.00%	10.0	10.4	0.4	2.0	1.0
Level 3	40.00%	20.0	20.8	0.8	2.0	2.0
Level 4	60.00%	30.0	30.8	0.8	2.6	2.6
Level 5	80.00%	40.0	40.8	0.8	0.0	0.0
Remark : Measuring Range 50.0 ppm				Average Difference (%)		1.40

Acceptable Limit ± 5%



Calculate by: 9 / 9 / 2013

Approve by: 9 / Sep / 2014

เอกสารไม่ควบคุม

United Analyst and Engineering Consultant Co., Ltd.

MULTI POINT GAS TEST REPORT

Test Date : June 14,2014

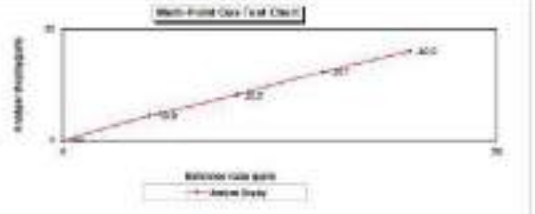
Equipment :	Gas Analyzer (CO)	Model :	[illegible]
Manufacturer :	[illegible]	Serial Number :	[illegible]

Standard Gas Concentration			Bottle Detail	
Sulphur Dioxide (SO_2)	42.80	PPM	Manufacturer :	Thermo Scientific
Nitric Oxide (NO)	46.70	PPM	Model :	146i
Methane (CH_4)	-	PPM	Serial Number :	1305480(?)
Carbon Monoxide (CO)	993.0	PPM		
Cylinder No. :	EB0039136			
Expiration Date :	Nov 16,2015			

Multi point gas test data

Reference Value (ppm)			Analyzer Display (ppm)	Difference Error	Percent Error	[%] Error]
Level 1	Zero	0.0	0.0	0.0	0.0	0.0
Level 2	20.00%	10.0	10.0	0.0	0.0	0.0
Level 3	40.00%	20.0	20.8	0.8	2.4	1.4
Level 4	60.00%	30.0	30.7	0.7	2.3	2.3
Level 5	80.00%	40.0	40.0	0.0	0.0	0.0
Remark : Measuring Range 50.0 ppm				Average Difference (%)		1.40

Acceptable Limit ± 5%



Calculate by: 14 / 06 / 2017

Approve by: 14 / June / 2014

เอกสารไม่ควบคุม

United Analyst and Engineering Consultant Co., Ltd.

MULTI POINT GAS TEST REPORT

Test Date : Dec 8,2013

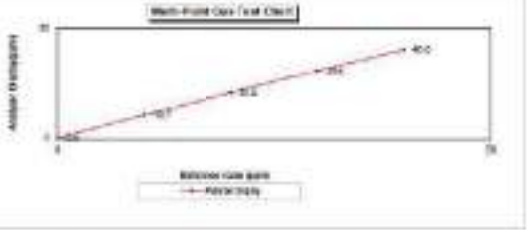
Equipment :	Gas Analyzer (CO)	Model :	[illegible]
Manufacturer :	[illegible]	Serial Number :	[illegible]

Standard Gas Concentration			Bottle Detail	
Sulphur Dioxide (SO2)	44.60	PPM	Manufacturer :	Thermo Scientific
Nitric Oxide (NO)	45.94	PPM	Model :	146i
Methane (CH4)	-	PPM	Serial Number :	1130546171
Carbon Monoxide (CO)	584.6	PPM		
Cylinder No. :	EB0103162			
Expiration Date :	Apr 30,2024			

Multi point gas test data

Reference Value (ppm)			Analyzer Display (ppm)	Difference Error	Percent Error	[%] Error]
Level 1	0%	0.0	0.0	0.0	0.0	0.0
Level 2	25.00%	10.0	10.7	0.7	6.8	6.8
Level 3	45.00%	20.0	20.9	0.9	4.3	4.3
Level 4	65.00%	30.0	30.6	0.6	2.0	2.0
Level 5	85.00%	40.0	40.0	0.0	0.0	0.0
Remark : Measuring Range		50.0 ppm		Average Difference (%)		1.18

Acceptable Limit ± 5%



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8 / 12 / 2013

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8 / Dec / 2013

Page 1 of 1

เอกสารไม่ควบคุม

United Analyst and Engineering Consultant Co., Ltd.

MULTI POINT GAS TEST REPORT

Test Date : Dec 8,2013

Equipment :	Gas Analyzer (CO)	Model :	[illegible]
Manufacturer :	[illegible]	Serial Number :	[illegible]

Standard Gas Concentration			Bottle Detail	
Sulphur Dioxide (SO2)	44.60	PPM	Manufacturer :	Thermo Scientific
Nitric Oxide (NO)	45.94	PPM	Model :	146i
Methane (CH4)	-	PPM	Serial Number :	1130546171
Carbon Monoxide (CO)	584.6	PPM		
Cylinder No. :	EB0103162			
Expiration Date :	Apr 30,2024			

Multi point gas test data

Reference Value (ppm)			Analyzer Display (ppm)	Difference Error	Percent Error	[%] Error]
Level 1	0%	0.0	0.0	0.0	0.0	0.0
Level 2	25.00%	10.0	10.4	0.4	4.7	4.7
Level 3	45.00%	20.0	20.9	0.9	4.3	4.3
Level 4	65.00%	30.0	30.7	0.7	2.3	2.3
Level 5	85.00%	40.0	40.0	0.0	0.0	0.0
Remark : Measuring Range		50.0 ppm		Average Difference (%)		1.10

Acceptable Limit ± 5%

Calculate by

8 / 12 / 2013

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8 / Dec / 2013

Page 1 of 1

เอกสารไม่ควบคุม

United Analyst and Engineering Consultant Co., Ltd.

MULTI POINT GAS TEST REPORT

Test Date : Sep 3,2014

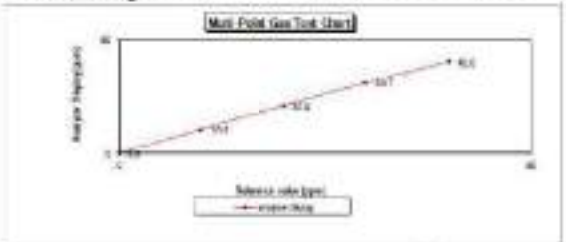
Equipment :	Gas Analyzer (CO)	Model :	[illegible]
Manufacturer :	Thermo Scientific	Serial Number :	[illegible]

Standard Gas Concentration			Bottle Detail	
Sulphur Dioxide (SO2)	42.80	PPM	Manufacturer :	Thermo Scientific
Nitric Oxide (NO)	46.70	PPM	Model :	146i
Methane (CH4)	-	PPM	Serial Number :	1130546171
Carbon Monoxide (CO)	588.0	PPM		
Cylinder No. :	EB0103136			
Expiration Date :	Nov 06,2024			

Multi point gas test data

Reference Value (ppm)			Analyzer Display (ppm)	Difference Error	Percent Error	[%] Error]
Level 1	Zero	0.0	0.0	0.0	0.0	0.0
Level 2	25.00%	10.0	10.4	0.4	4.0	4.0
Level 3	45.00%	20.0	20.8	0.8	4.2	4.2
Level 4	65.00%	30.0	30.7	0.7	2.3	2.3
Level 5	85.00%	40.0	40.0	0.0	0.0	0.0
Remark : Measuring Range		50.0 ppm		Average Difference (%)		2.17

Acceptable Limit ± 5%



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3 / 9 / 2014

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3 / Sep / 2014

Page 1 of 1

เอกสารไม่ควบคุม

Airgas

CERTIFICATE OF ANALYSIS

Grade of Product: EPA PROTOCOL STANDARD

Customer: [illegible]

Part Number: [illegible]
System Number: [illegible]
Laboratory: 124 - Plumsteadville, PA
PO/SP Number: [illegible]
Gas Code: CO CO2 NO NOx [illegible]

Reference Number: [illegible]
Cylinder Volume: 144 L CP
Cylinder Pressure: 2016 PSIG
Valve Outlet: [illegible]
Certification Date: Jul 08, 2013

Expiration Date: Jul 08, 2021

[illegible]

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Analysis Date
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

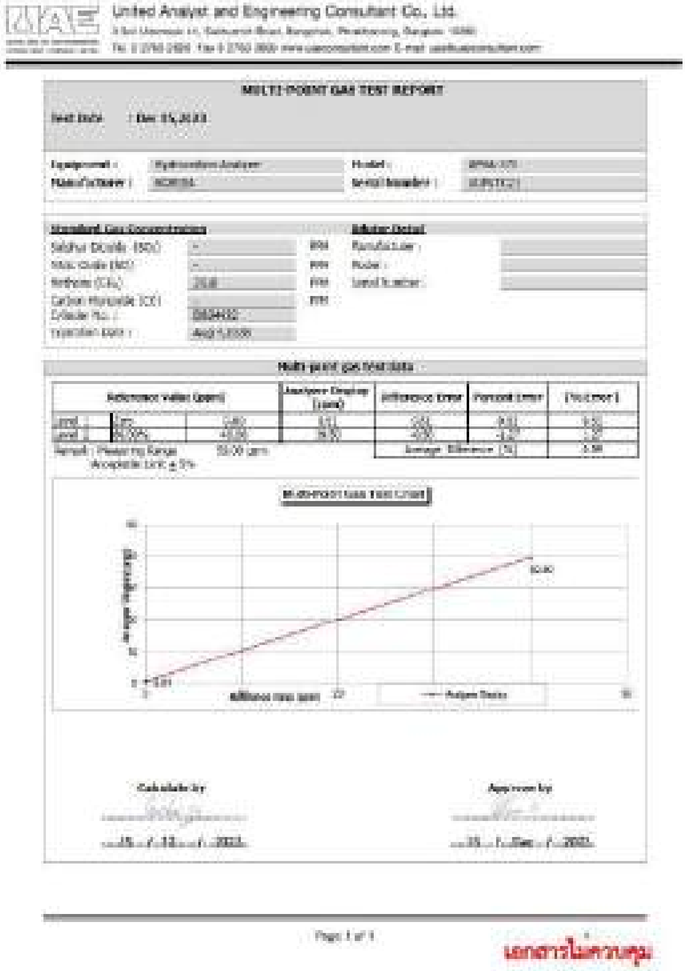
ANALYTICAL EQUIPMENT

Instrument/Model	Analytical Principle	Last Multipoint Calibration
[illegible]	[illegible]	[illegible]

Approved for Release

[illegible]

เอกสารไม่ควบคุม



United Analyst and Engineering Consultant Co., Ltd.

MULTI-POINT GAS TEST REPORT

Test Date : Dec 15,2023

Equipment :	Hydrocarbon Analyzer	Model :	APHA-370
Manufacturer :	HORIBA	Serial Number :	[illegible]

Standard Gas Concentration

Sulphur Dioxide (SO2)	-	PPM
Nitric Oxide (NO)	-	PPM
Methane (CH4)	[illegible]	PPM
Carbon Monoxide (CO)	-	PPM
Cylinder No. :	[illegible]	
Expiration Date :	[illegible]	

Diluter Detail

Manufacturer :

Model :

Serial Number :

Multi-point gas test data

Reference Value (ppm)			Analyzer Display (ppm)	Difference Error	Percent Error	[% Error]
Level 1	Zero	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Level 2	80.00%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
				Average Difference [%]		[illegible]

Remark : Measuring Range 50.00 ppm
Acceptable Limit ± 5%

Multi-Point Gas Test Chart

Calculate by

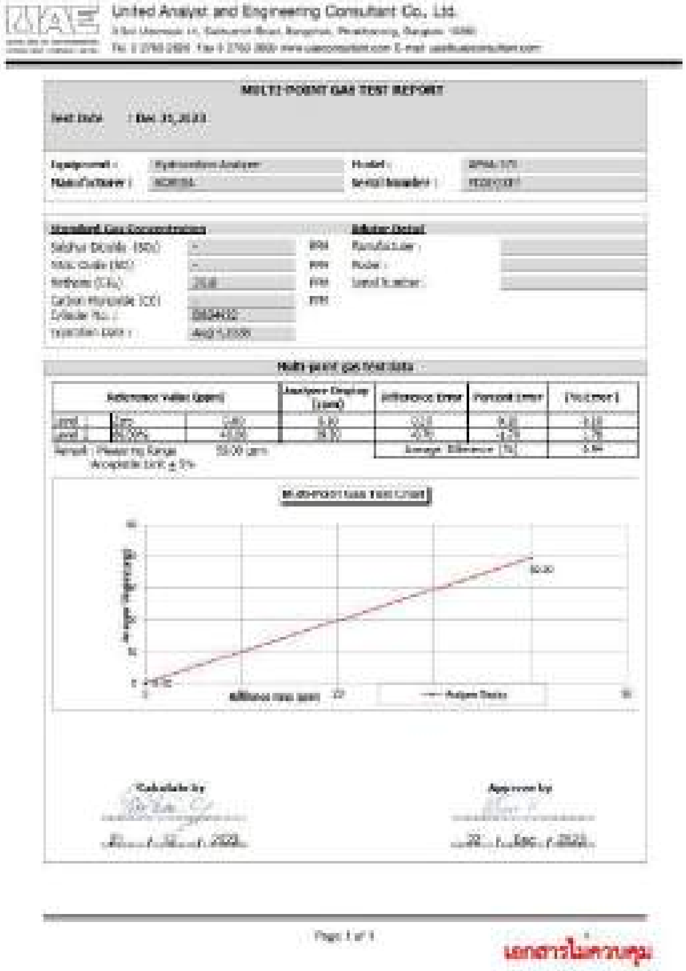
[illegible]

Approve by

[illegible]

Page 1 of 1

เอกสารไม่ควบคุม



United Analyst and Engineering Consultant Co., Ltd.

MULTI-POINT GAS TEST REPORT

Test Date : Dec 15,2023

Equipment :	Hydrocarbon Analyzer	Model :	APHA-370
Manufacturer :	HORIBA	Serial Number :	[illegible]

Standard Gas Concentration

Sulphur Dioxide (SO2)	-	PPM
Nitric Oxide (NO)	-	PPM
Methane (CH4)	[illegible]	PPM
Carbon Monoxide (CO)	-	PPM
Cylinder No. :	[illegible]	
Expiration Date :	[illegible]	

Diluter Detail

Manufacturer :

Model :

Serial Number :

Multi-point gas test data

Reference Value (ppm)			Analyzer Display (ppm)	Difference Error	Percent Error	[% Error]
Level 1	Zero	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Level 2	80.00%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
				Average Difference [%]		[illegible]

Remark : Measuring Range 50.00 ppm
Acceptable Limit ± 5%

Multi-Point Gas Test Chart

Calculate by

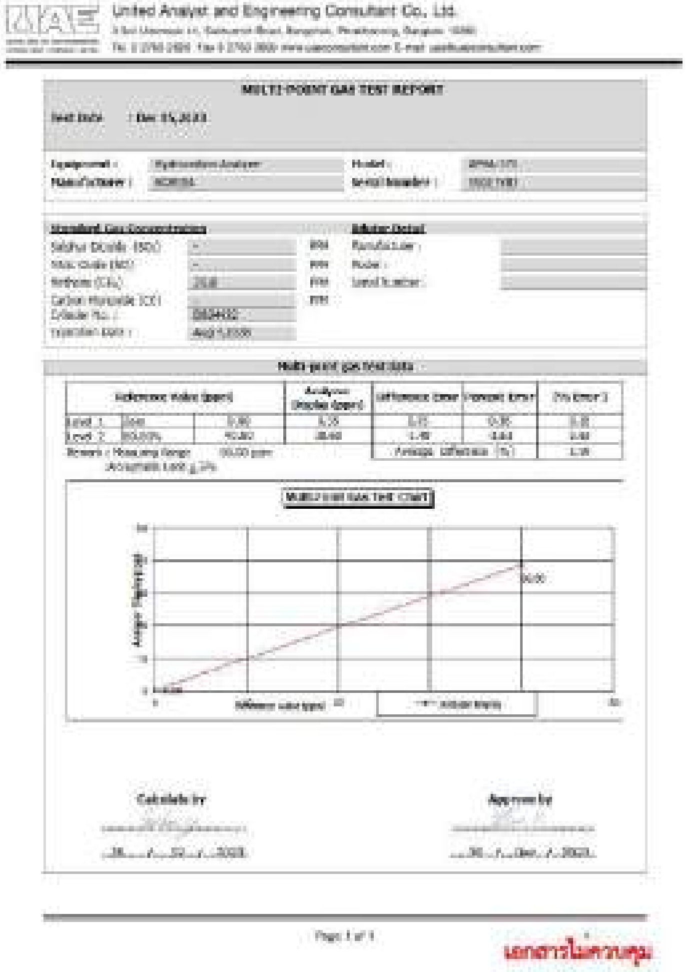
[illegible]

Approve by

[illegible]

Page 1 of 1

เอกสารไม่ควบคุม



United Analyst and Engineering Consultant Co., Ltd.

MULTI-POINT GAS TEST REPORT

Test Date : Dec 15,2023

Equipment :	Hydrocarbon Analyzer	Model :	APHA-370
Manufacturer :	HORIBA	Serial Number :	[illegible]

Standard Gas Concentration

Sulphur Dioxide (SO2)	-	PPM
Nitric Oxide (NO)	-	PPM
Methane (CH4)	[illegible]	PPM
Carbon Monoxide (CO)	-	PPM
Cylinder No. :	[illegible]	
Expiration Date :	[illegible]	

Diluter Detail

Manufacturer :

Model :

Serial Number :

Multi-point gas test data

Reference Value (ppm)			Analyzer Display (ppm)	Difference Error	Percent Error	[% Error]
Level 1	Zero	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Level 2	80.00%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
				Average Difference [%]		[illegible]

Remark : Measuring Range 50.00 ppm
Acceptable Limit ± 5%

Multi-Point Gas Test Chart

Calculate by

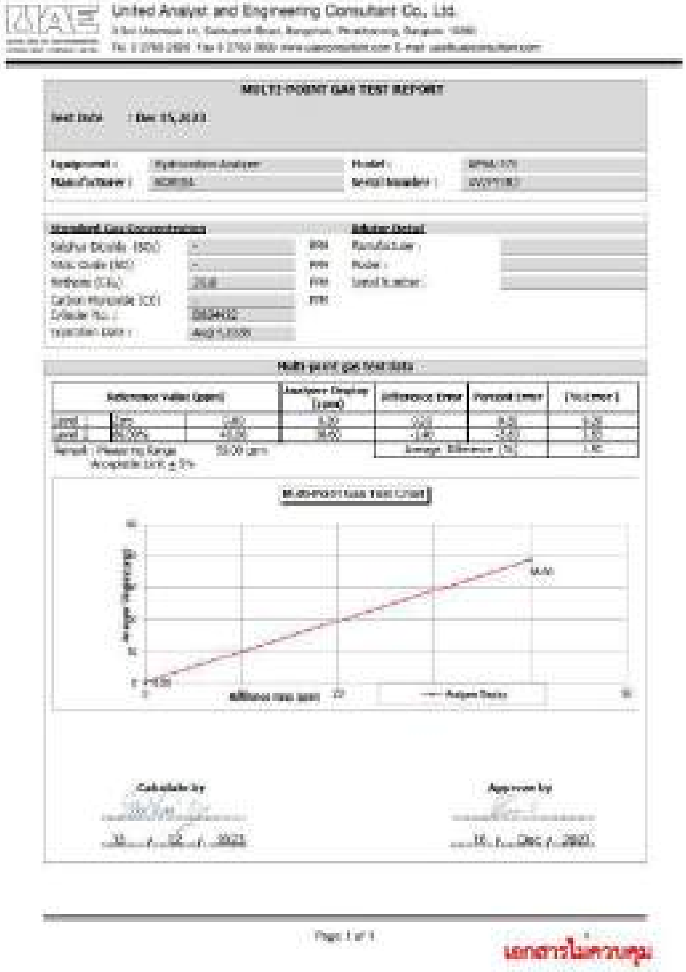
[illegible]

Approve by

[illegible]

Page 1 of 1

เอกสารไม่ควบคุม



United Analyst and Engineering Consultant Co., Ltd.

MULTI-POINT GAS TEST REPORT

Test Date : Dec 15,2023

Equipment :	Hydrocarbon Analyzer	Model :	APHA-370
Manufacturer :	HORIBA	Serial Number :	[illegible]

Standard Gas Concentration

Sulphur Dioxide (SO2)	-	PPM
Nitric Oxide (NO)	-	PPM
Methane (CH4)	[illegible]	PPM
Carbon Monoxide (CO)	-	PPM
Cylinder No. :	[illegible]	
Expiration Date :	[illegible]	

Diluter Detail

Manufacturer :

Model :

Serial Number :

Multi-point gas test data

Reference Value (ppm)			Analyzer Display (ppm)	Difference Error	Percent Error	[% Error]
Level 1	Zero	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Level 2	80.00%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
				Average Difference [%]		[illegible]

Remark : Measuring Range 50.00 ppm
Acceptable Limit ± 5%

Multi-Point Gas Test Chart

Calculate by

[illegible]

Approve by

[illegible]

Page 1 of 1

เอกสารไม่ควบคุม

United Analyst and Engineering Consultant Co., Ltd.

MULTI-POINT GAS TEST REPORT

Test Date : Dec 15, 2023

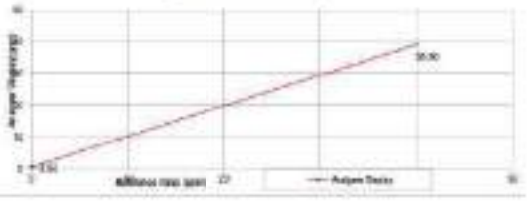
Equipment :	Hydrocarbon Analyzer	Model :	[illegible]
Manufacturer :	[illegible]	Serial Number :	[illegible]

Standard Gas Concentration			Adjuster Detail	
Sulphur Dioxide (SO2)	-	PPM	Manufacturer :	
Nitric Oxide (NO)	-	PPM	Model :	
Methane (CH_4)	25.00	PPM	Serial Number :	
Carbon Monoxide (CO)		PPM		
Cylinder No. :	[illegible]			
Injection Date :	Aug 1, 2023			

Multi point gas test data

Reference Value (ppm)			Analyzer Display (ppm)	Difference Error	Percent Error	(%Error)
Level 1	0%	0.00	0.00	0.00	0.00	0.00
Level 2	80.00%	40.00	39.50	-0.50	-1.25	1.25
Remark : Measuring Range 50.00 ppm Acceptable Limit ± 5%				Average Difference (%)		1.25

Multi-point Gas Test Chart



Calculate by

20 / 12 / 2023

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22 / Dec / 2023

Page 1 of 1

เอกสารไม่ควบคุม

United Analyst and Engineering Consultant Co., Ltd.

MULTI-POINT GAS TEST REPORT

Test Date : Dec 15, 2023

Equipment : Hydrocarbon Analyzer Model : [illegible]
Manufacturer : [illegible] Serial Number : [illegible]

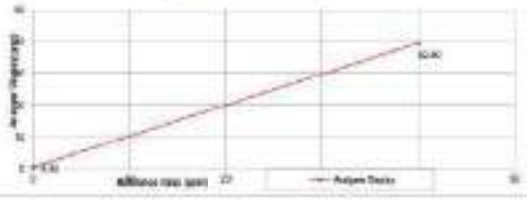
Standard Gas Concentration
Sulphur Dioxide (SO2) - PPM
Nitric Oxide (NO) - PPM
Methane (CH_4) 25.00 PPM
Carbon Monoxide (CO) PPM
Cylinder No. : [illegible]
Injection Date : Aug 1, 2023

Adjuster Detail
Manufacturer :
Model :
Serial Number :

Multi point gas test data

Reference Value (ppm)			Analyzer Display (ppm)	Difference Error	Percent Error	(%Error)
Level 1	0%	0.00	0.00	0.00	0.00	0.00
Level 2	80.00%	40.00	39.50	-0.50	-1.25	1.25
Remark : Measuring Range 50.00 ppm Acceptable Limit ± 5%				Average Difference (%)		0.75

Multi-point Gas Test Chart



Calculate by

20 / 12 / 2023

Approve by

22 / Dec / 2023

Page 1 of 1

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United Analyst and Engineering Consultant Co., Ltd.

MULTI-POINT GAS TEST REPORT

Test Date : Dec 15, 2023

Equipment : Hydrocarbon Analyzer Model : [illegible]
Manufacturer : [illegible] Serial Number : [illegible]

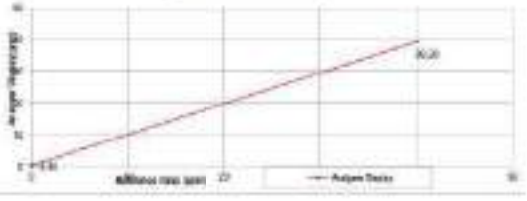
Standard Gas Concentration
Sulphur Dioxide (SO2) - PPM
Nitric Oxide (NO) - PPM
Methane (CH_4) 25.00 PPM
Carbon Monoxide (CO) PPM
Cylinder No. : [illegible]
Injection Date : Aug 1, 2023

Adjuster Detail
Manufacturer :
Model :
Serial Number :

Multi point gas test data

Reference Value (ppm)			Analyzer Display (ppm)	Difference Error	Percent Error	(%Error)
Level 1	0%	0.00	0.00	0.00	0.00	0.00
Level 2	80.00%	40.00	39.50	-0.50	-1.25	1.25
Remark : Measuring Range 50.00 ppm Acceptable Limit ± 5%				Average Difference (%)		1.17

Multi-point Gas Test Chart



Calculate by

20 / 12 / 2023

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Page 1 of 1

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เอกสารไม่ควบคุม

List of Instruments Certification for Air & Noise Quality Analysis

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration	Remark
Ambient									
1	Sound Level Calibrator (Acoustic Calibrator)	Calibrate Sound Level Meter	Larson Davis	CAL150 6458	Innovative Instrument Co.,Ltd.	24-ACT-069	17 May 24	16 May 25	-
2	Sound Level Meter	$L_{Aeq\ 1\ hours}$, $L_{Aeq\ 24\ hrs}$, L_{Amax}, L_{A90},	Larson Davis	LxT2 0005286	Innovative Instrument Co.,Ltd.	24-SLM-234	10 Jul 24	9 Jul 25	-
3	Sound Level Meter	$L_{Aeq\ 1\ hours}$, $L_{Aeq\ 24\ hrs}$, L_{Amax}, L_{A90},	Larson Davis	LxT2 0005290	Innovative Instrument Co.,Ltd.	24-SLM-238	11 Jul 24	10 Jul 25	-
4	Sound Level Meter	$L_{Aeq\ 1\ hours}$, $L_{Aeq\ 24\ hrs}$, L_{Amax}, L_{A90},	Larson Davis	LxT2 0005293	Innovative Instrument Co.,Ltd.	24-SLM-231	10 Jul 24	9 Jul 25	-
5	Sound Level Meter	$L_{Aeq\ 1\ hours}$, $L_{Aeq\ 24\ hrs}$, L_{Amax}, L_{A90},	Larson Davis	LxT2 0005299	Innovative Instrument Co.,Ltd.	24-SLM-240	11 Jul 24	10 Jul 25	-
6	Sound Level Meter	$L_{Aeq\ 1\ hours}$, $L_{Aeq\ 24\ hrs}$, L_{Amax}, L_{A90},	Larson Davis	LxT2 0005372	Innovative Instrument Co.,Ltd.	24-SLM-229	9 Jul 24	8 Jul 25	-
7	Sound Level Meter	$L_{Aeq\ 1\ hours}$, $L_{Aeq\ 24\ hrs}$, L_{Amax}, L_{A90},	Larson Davis	LxT2 0005341	Innovative Instrument Co.,Ltd.	24-SLM-232	10 Jul 24	9 Jul 25	-
8	Sound Level Meter	$L_{Aeq\ 1\ hours}$, $L_{Aeq\ 24\ hrs}$, L_{Amax}, L_{A90},	Larson Davis	LxT2 0005346	Innovative Instrument Co.,Ltd.	24-SLM-235	10 Jul 24	9 Jul 25	-
9	Sound Level Meter	$L_{Aeq\ 1\ hours}$, $L_{Aeq\ 24\ hrs}$, L_{Amax}, L_{A90},	Larson Davis	LxT2 0005348	Electrical And Electronics Institute Foundation For Industrial Development	CP20240292EA	6 Aug 24	5 Aug 25	-
10	Sound Level Meter	$L_{Aeq\ 1\ hours}$, $L_{Aeq\ 24\ hrs}$, L_{Amax}, L_{A90},	Larson Davis	LxT2 0005393	Innovative Instrument Co.,Ltd.	24-SLM-237	10 Jul 24	9 Jul 25	-
11	Sound Level Meter	$L_{Aeq\ 1\ hours}$, $L_{Aeq\ 24\ hrs}$, L_{Amax}, L_{A90},	Larson Davis	LxT2 0005396	Electrical And Electronics Institute Foundation For Industrial Development	CP20240291EA	5 Aug 24	4 Aug 25	-
12	Sound Level Meter	$L_{Aeq\ 1\ hours}$, $L_{Aeq\ 24\ hrs}$, L_{Amax}, L_{A90},	Larson Davis	LxT2 0005398	Innovative Instrument Co.,Ltd.	24-SLM-214	2 Jul 24	1 Jul 25	-
13	Sound Level Meter	$L_{Aeq\ 1\ hours}$, $L_{Aeq\ 24\ hrs}$, L_{Amax}, L_{A90},	Larson Davis	LxT2 0005399	Electrical And Electronics Institute Foundation For Industrial Development	CP20240293EA	6 Aug 24	5 Aug 25	-
14	Sound Level Meter	$L_{Aeq\ 1\ hours}$, $L_{Aeq\ 24\ hrs}$, L_{Amax}, L_{A90},	Larson Davis	LxT2 0006691	Innovative Instrument Co.,Ltd.	24-SLM-236	10 Jul 24	9 Jul 25	-

Certificate of Calibration

Customer

Name: [illegible]

Address: [illegible]

Certificate No. : [illegible]

Request No. : [illegible]

Unit Under Calibration Details

Measurement item: Sound Calibrator

Manufacturer: [illegible]

Model: [illegible]

Serial Number: [illegible]

ID: [illegible]

Class: 1

Range: [illegible]

Internal Check: Good

Calibration Environment and Details

Temperature: [illegible]

Humidity: [illegible]

Barometric Pressure: [illegible]

Received Date: [illegible]

Calibration Date: [illegible]

Location of Calibration: [illegible]

Calibration Procedure: [illegible]

Reference Standard	Model	Serial Number	Traceable	Due Calibration
Sound Calibrator	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Traceability: [illegible]

Note

[illegible]

Calibrated By: [illegible]

Mr. Nuttapong Lungpak

Senior Calibration Engineer

Approved By: [illegible]

Mr. Pitak Mahasarat

Calibration Engineer Supervisor

Issue Date: [illegible]

Certificate No. : [illegible]

Request No. : [illegible]

Calibrated Results : [illegible]

Sound pressure level

Calibration Range (dB)	Without Adjustment (dB)		Adjustment (dB)		Uncertainty (± dB)	Acceptance limit (Class 1) (± dB)
	Measured	Deviation value	Measured	Deviation value		
[illegible]	[illegible]	[illegible]	-	-	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	-	-	[illegible]	[illegible]

Frequency of Sound pressure level

Calibration Range (Hz)	Without adjustment		Adjustment		Uncertainty (± %)	Acceptance limit (Class 1) (± %)
	Measured (Hz)	Deviation value	Measured (Hz)	Deviation value		
[illegible]	[illegible]	[illegible]	-	-	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	-	-	[illegible]	[illegible]

Total Harmonic Distortion of the Sound pressure level (THD) (%)

Calibration Range (Hz)	Without Adjustment	Adjustment	Uncertainty (± %)	Acceptance limit (Class 1) (± %)
	Measured (%)	Measured (%)		
[illegible]	[illegible]	-	[illegible]	[illegible]
[illegible]	[illegible]	-	[illegible]	[illegible]

Note :

Parameter	Maximum permitted Uncertainty of measurement
Sound pressure level	[illegible]
Frequency	[illegible]
Total harmonic distortion	[illegible]

[illegible]

End of Calibration

Certificate of Calibration

Customer

Name: [illegible]

Address: [illegible]

Certificate No. : [illegible]

Request No. : [illegible]

Unit under Calibration Details

Measurement item: Sound Level Meter

Manufacturer: [illegible]

Model: [illegible]

Serial Number: [illegible]

ID: [illegible]

Description: [illegible]

Measurement Class: 1

Microphone Model: [illegible]

Microphone S/N: [illegible]

Preamplifier Model: [illegible]

Preamplifier S/N: [illegible]

Internal Check: Good

Calibration Environment and Details

Temperature: [illegible]

Humidity: [illegible]

Barometric Pressure: [illegible]

Received Date: [illegible]

Calibrated Date: [illegible]

Calibration Procedure: [illegible]

Location of Calibration: Lab Facility

Reference Standard

Equipment	Model	Serial	ID	Cal. Last Date	Traceable
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Note

[illegible]

Calibrated By: [illegible]

Mr. Nuttapong Lungpak

Approved By: [illegible]

Mr. Pitak Mahasarat

Issue Date: [illegible]

Certificate No. : [illegible]

Request No. : [illegible]

1. Indication in the calibration check frequency

EUT Setting	Number	Array Input		Free Input		UNCERTAINTY	Acceptance Limit	Result
[illegible]	Level	[illegible]	[illegible]	[illegible]	[illegible]			
Calibrator Setting	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Note : [illegible]

2. Self generated noise, Microphone connected

EUT Setting	Measured	UNCERTAINTY
[illegible]		
EUT Weighting	[illegible]	[illegible]
A	[illegible]	[illegible]

3. Self generated noise, Microphone replaced by the UNCERTAIN input signal device

EUT Setting	Measured	UNCERTAINTY
[illegible]		
EUT Weighting	[illegible]	[illegible]
A	[illegible]	[illegible]
C	[illegible]	[illegible]
Z	[illegible]	[illegible]

4. Acoustic signal test (all frequency weightings) [illegible]

EUT Setting	Deviation from reference frequency response (Weighting frequency response)			UNCERTAINTY	Acceptance limit	Result
[illegible]	A	C	Z			
EUT Setting	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

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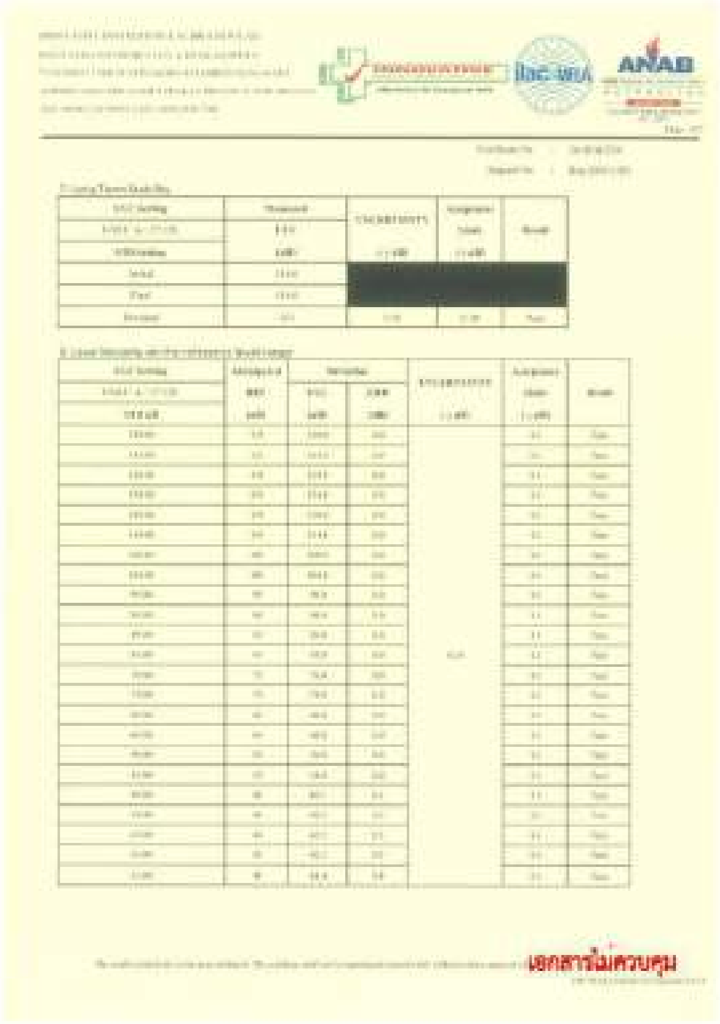

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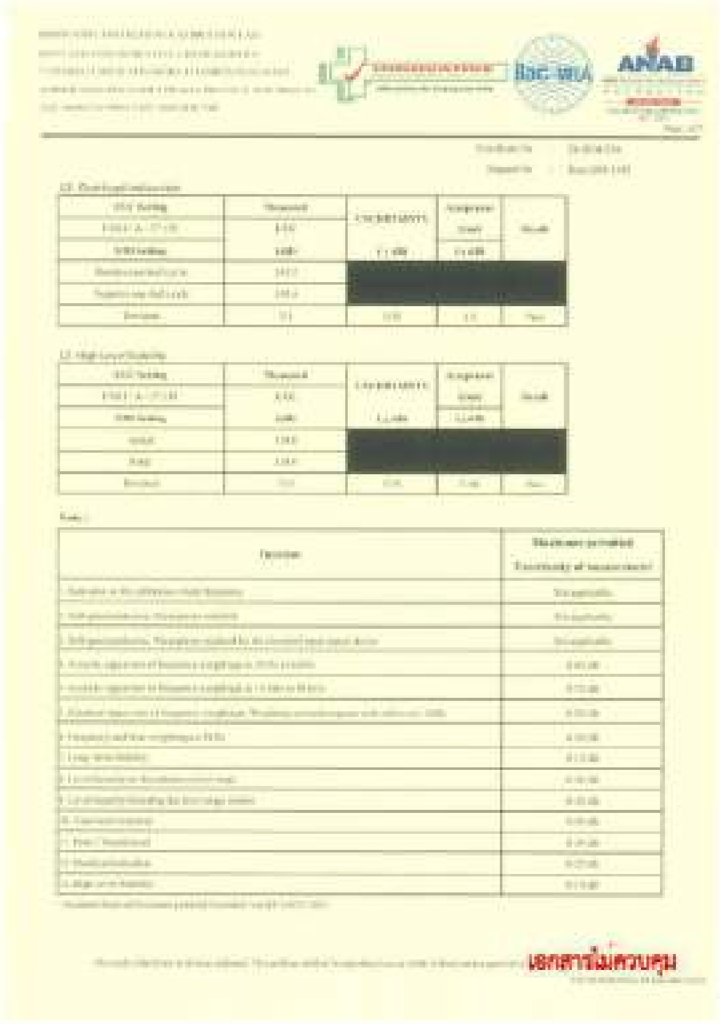
เอกสารไม่ควบคุม



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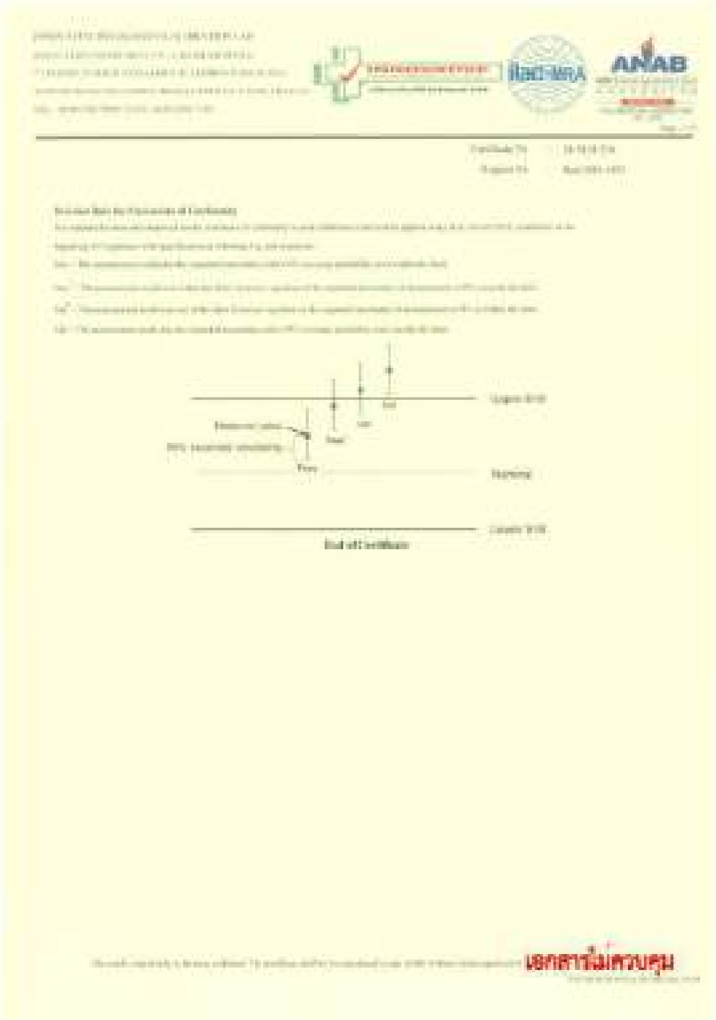
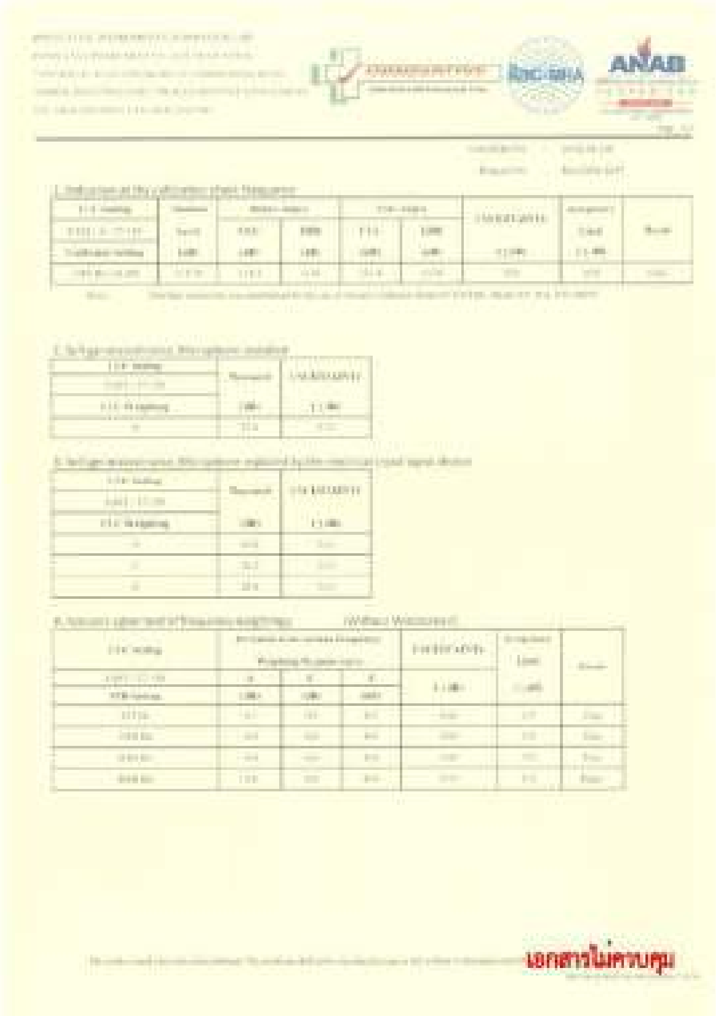

End of Certificate

เอกสารไม่ควบคุม


Certificate of Calibration

เอกสารไม่ควบคุม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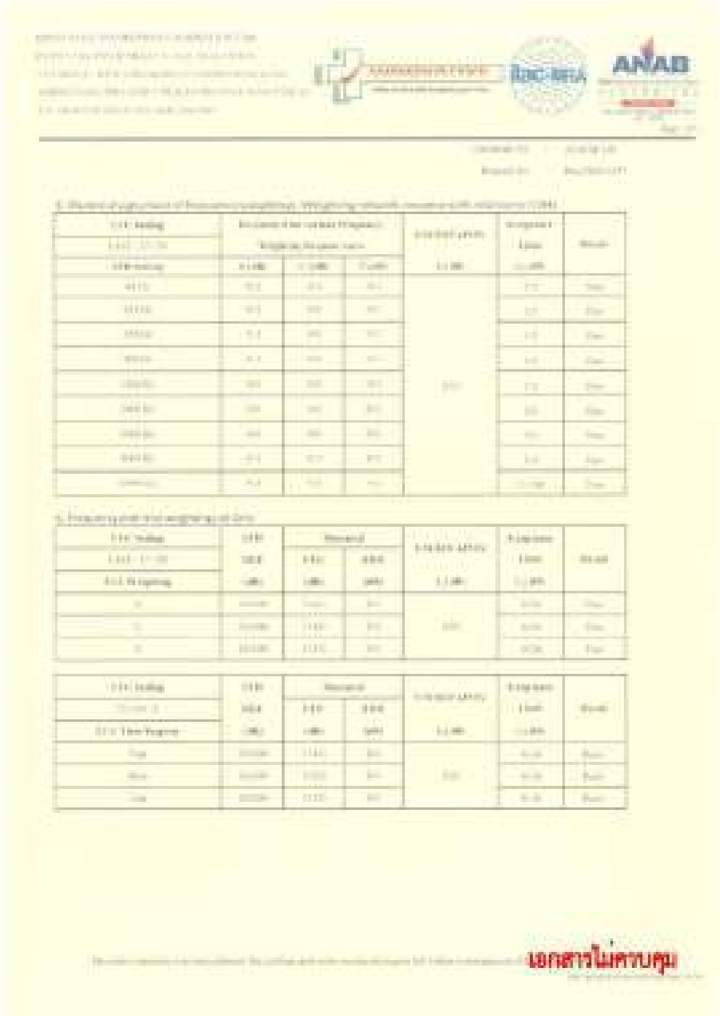
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Certificate of Calibration

เอกสารไม่ควบคุม

เอกสารไม่ควบคุม

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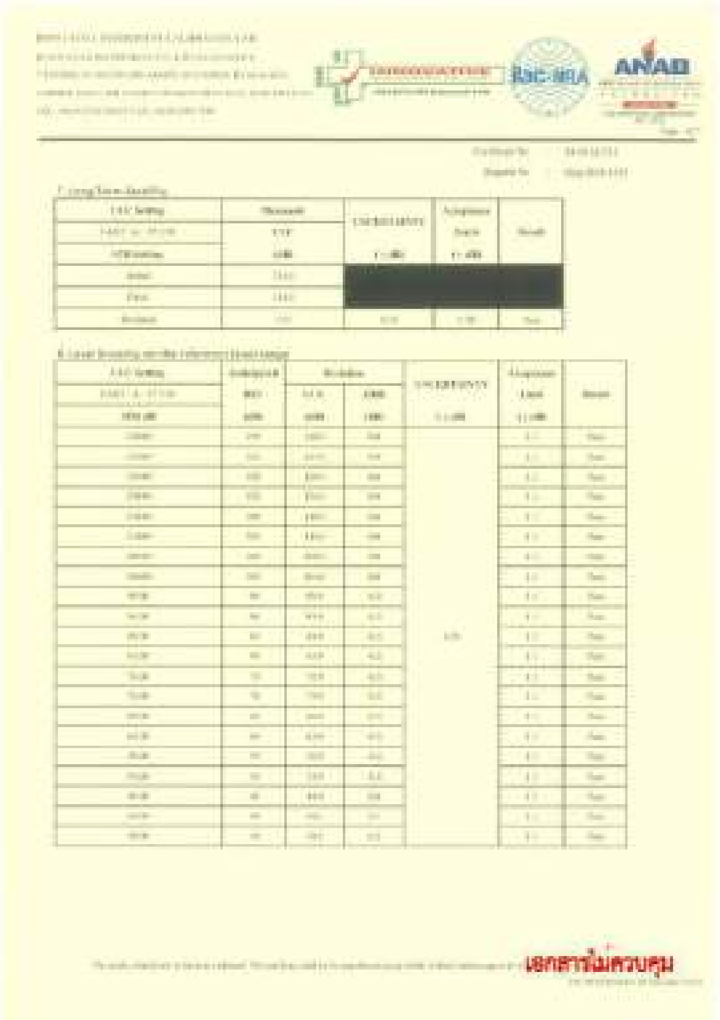

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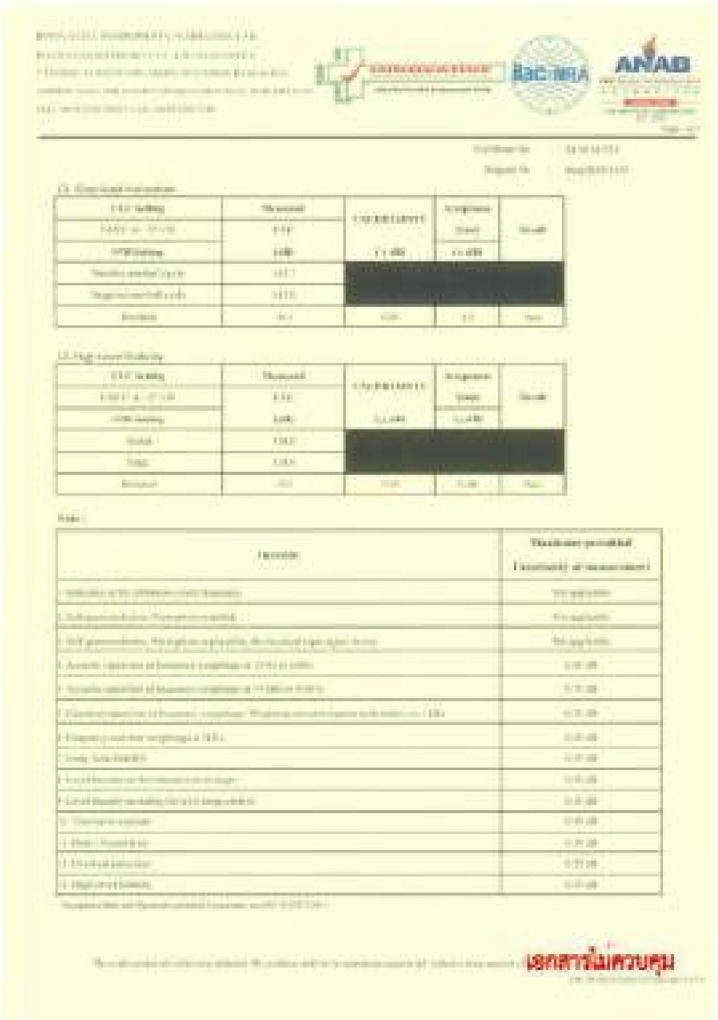
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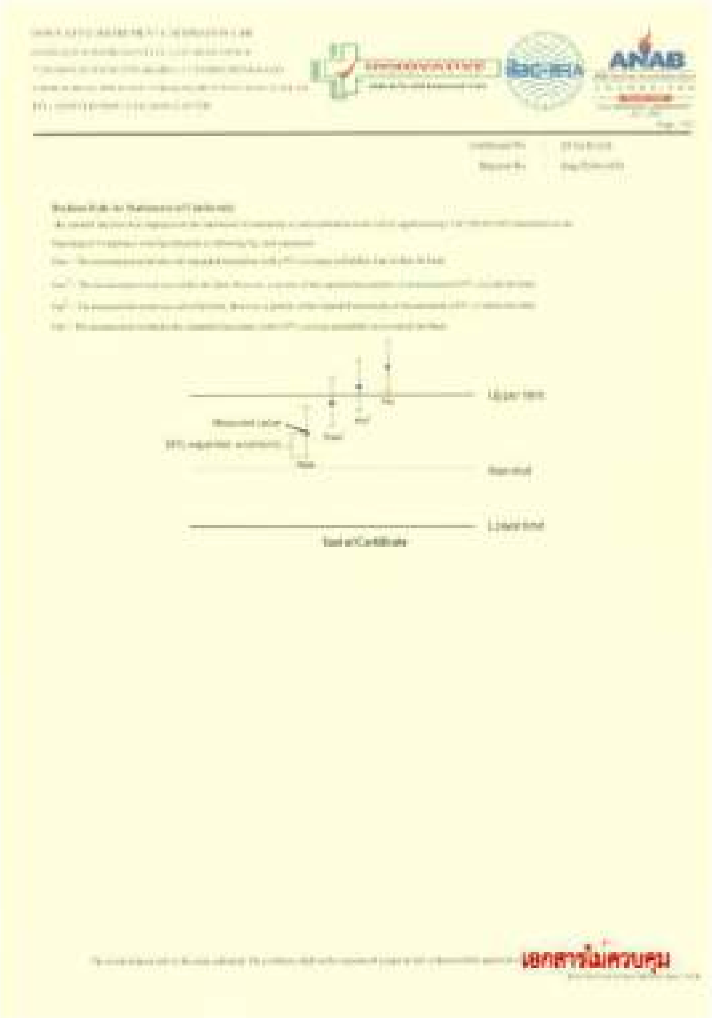
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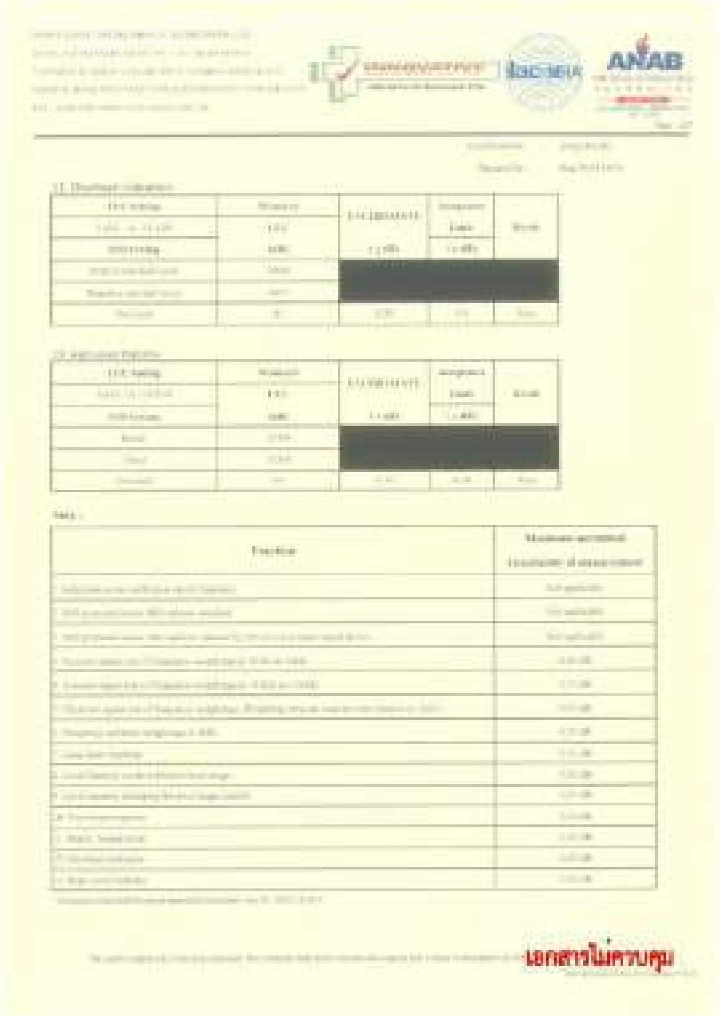

เอกสารไม่ควบคุม

เอกสารไม่ควบคุม

Certificate of Calibration

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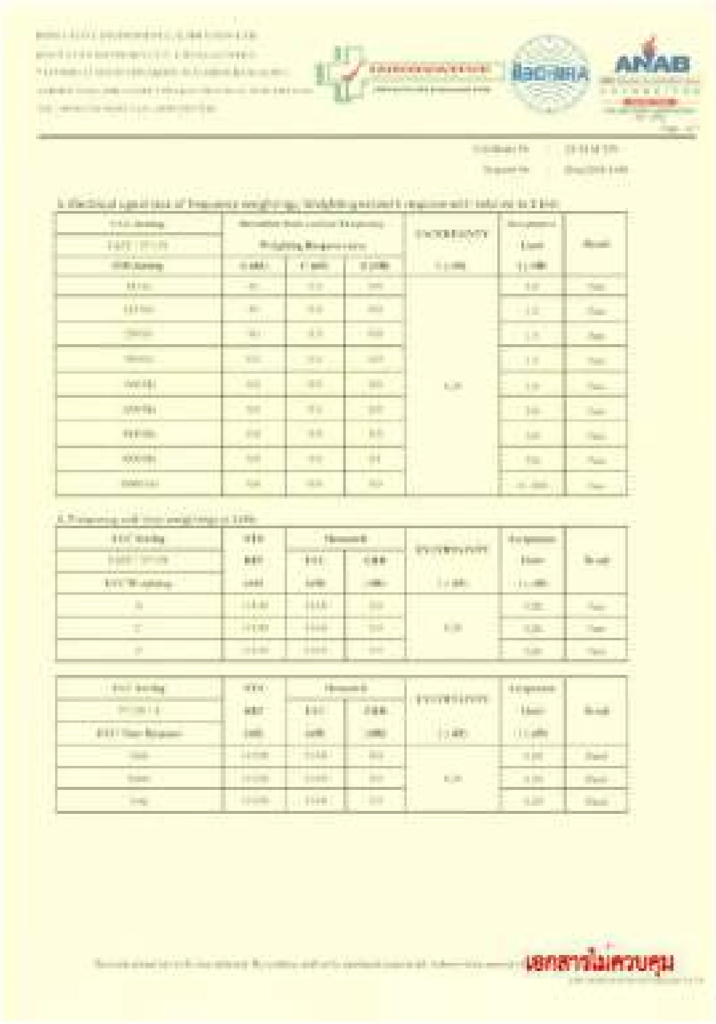
เอกสารไม่ควบคุม



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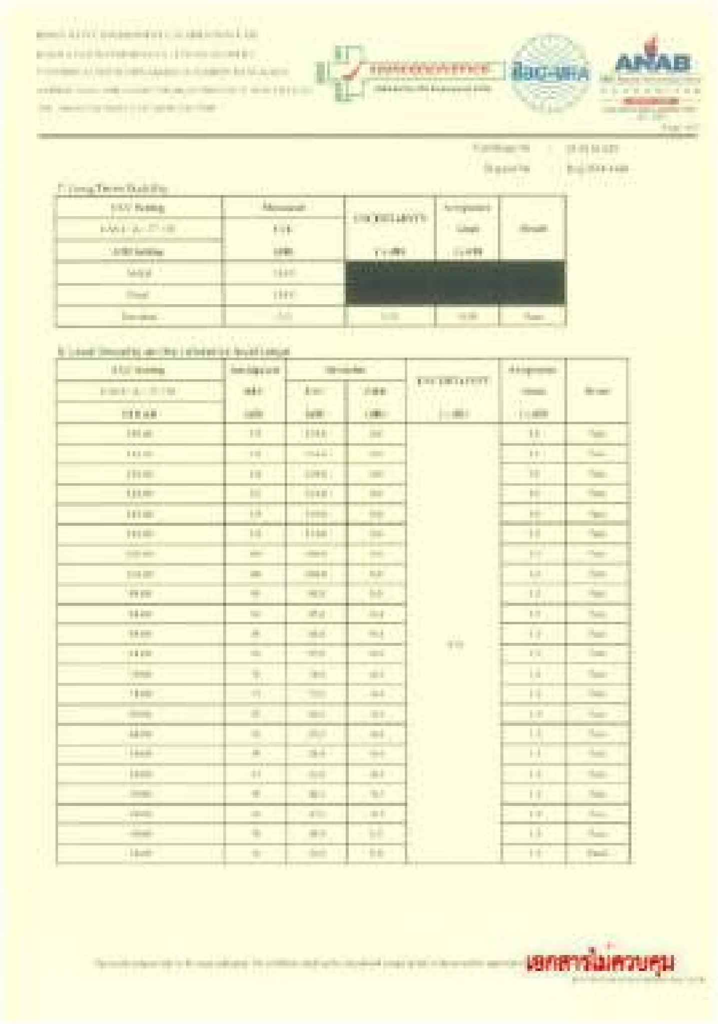

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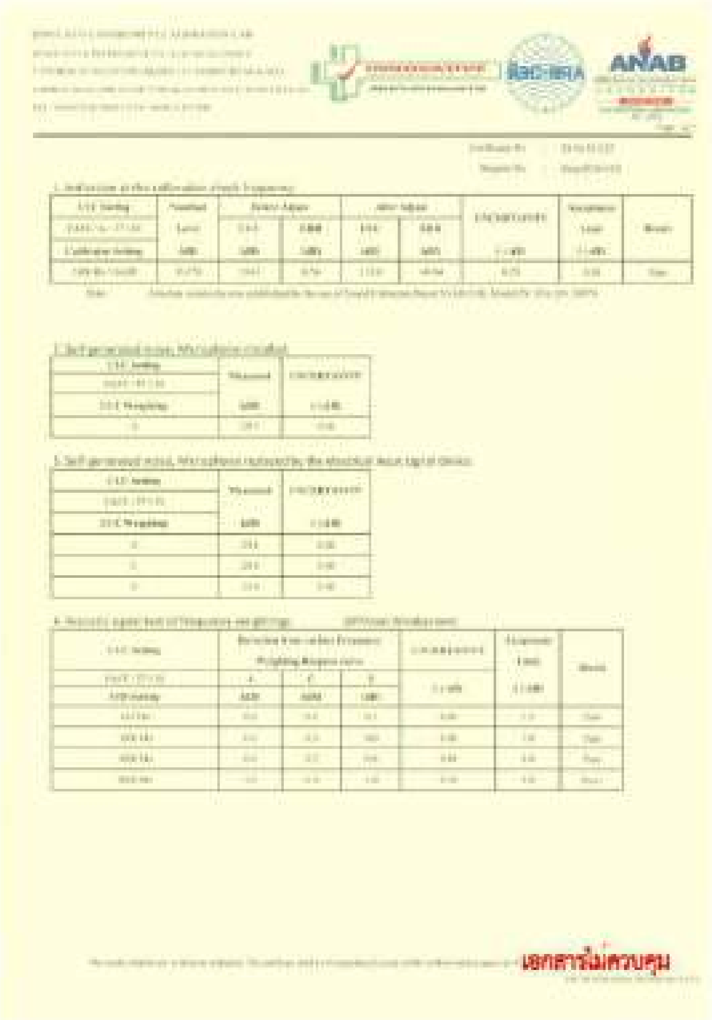
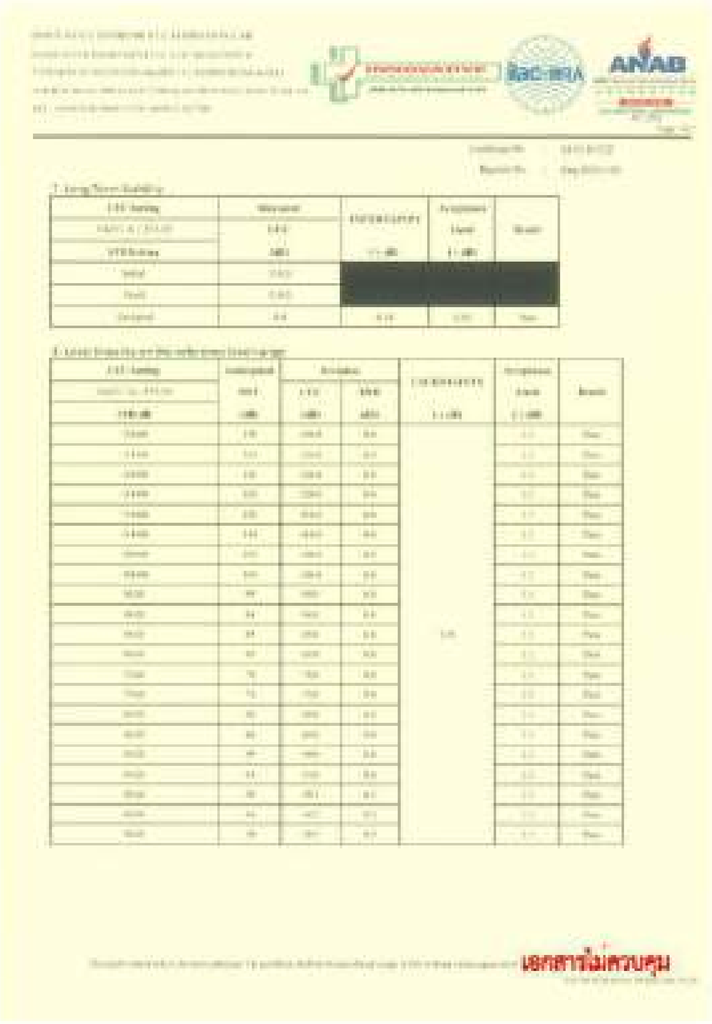
เอกสารไม่ควบคุม

Certificate of Calibration





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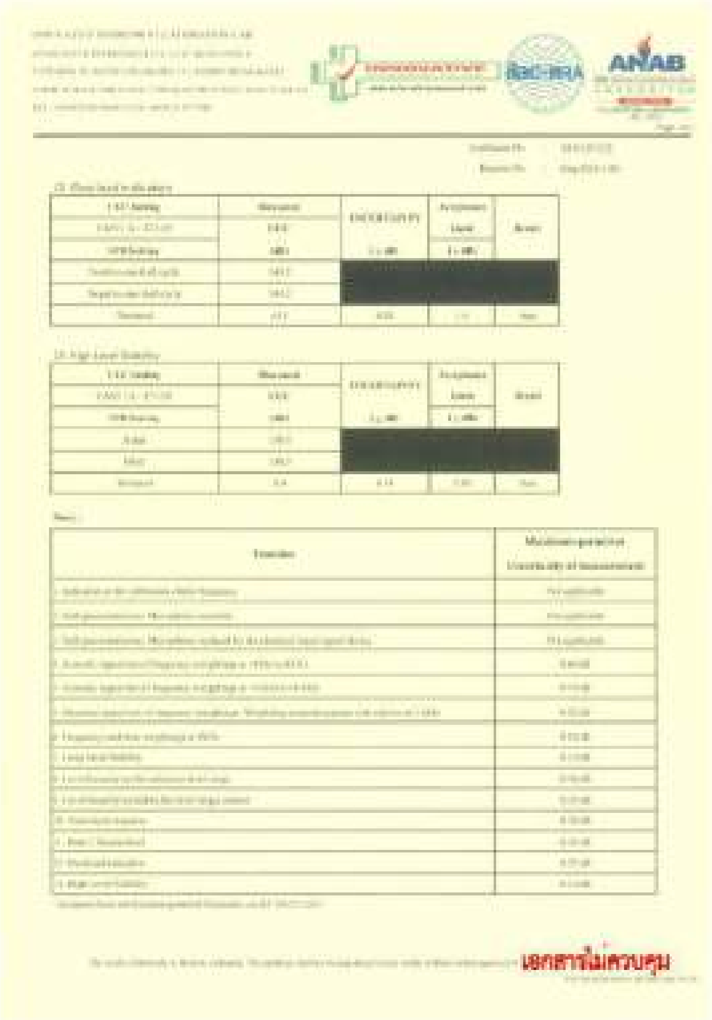

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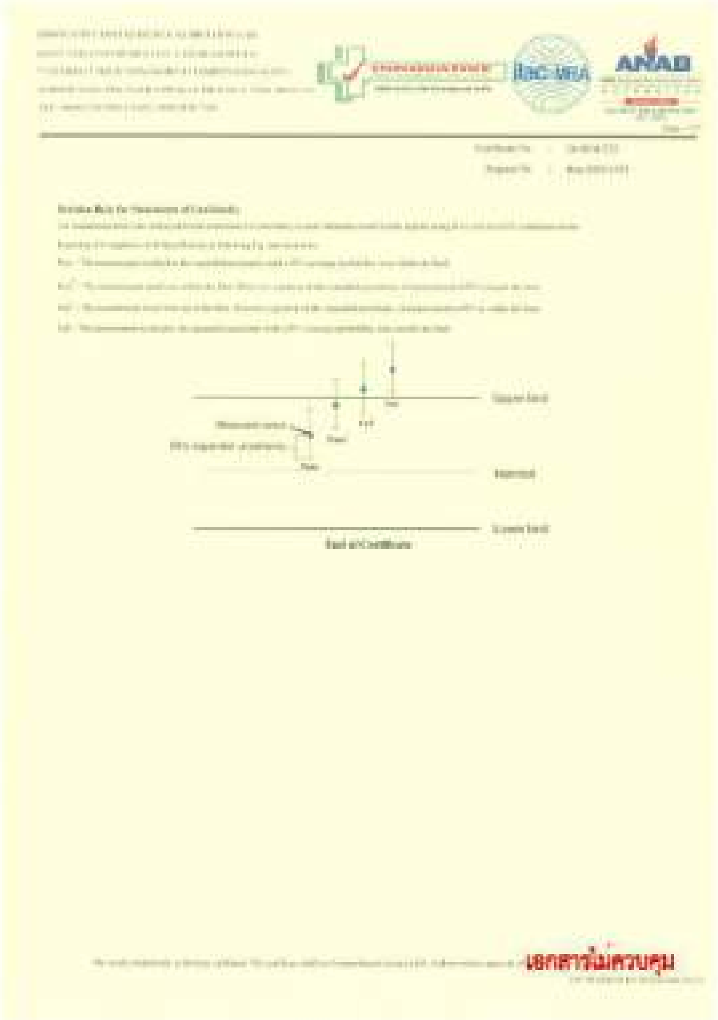

เอกสารไม่ควบคุม

Certificate of Calibration

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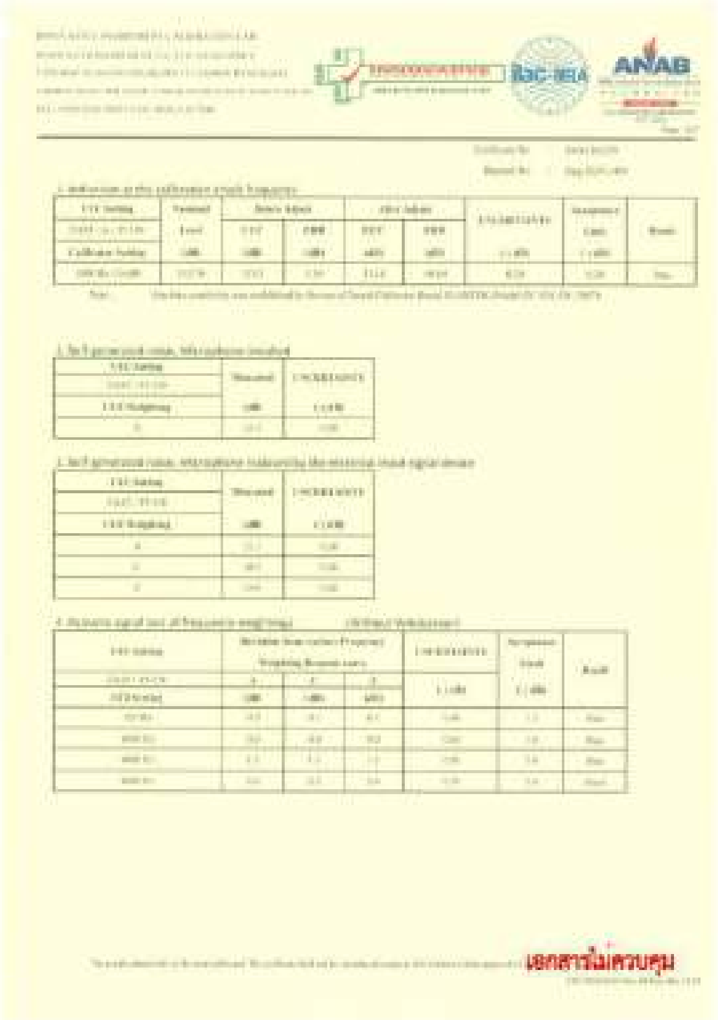

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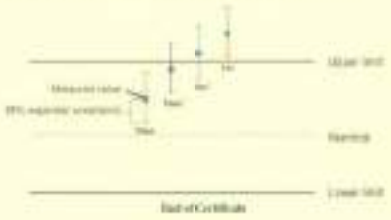

Back of Certificate

เอกสารไม่ควบคุม

ELECTRICAL AND ELECTRONICS INSTITUTE
FOUNDATION FOR INDUSTRIAL DEVELOPMENT
[redacted]

Certificate No.: CF2024120EA
Operation No.: CF2024170285

Certificate of Calibration

Equipment:	Ground Sound Meter
Manufacturer:	Larson Davis (Meter), PCB (Microphone), PCB (Preamplifier)
Model/Type:	LxT2 (Meter), 378B02 (Microphone), PRM426 (Preamplifier)
Serial No.:	0006345 (Meter), 11800 (Microphone), 016140 (Preamplifier)
ID No.:	UAE.ERM.0162563
Customer:	United Analyst and Engineering Consultant Co.,Ltd.
Address:	61 Soi Udomsuk 11, Sukhumvit Road, Bangchak Prawetnonong, Bangkok 10260
Received Date:	25 July 2024
Calibrated Date:	6 – 7 August 2024
Issued Date:	7 August 2024
Calibrated by:	Ms. Juntaporn Furtakon

Approved by: _____
Lt.Col. Sakchai Sirakulyawong
Group Manager

The reported uncertainty of measurement has been on standard uncertainty multiplied by a coverage factor k=2 providing a level of confidence of approximately 95%. This certificate may not be reproduced other than in full, except with the prior written approval of the Electrical and Electronics Institute, Foundation for Industrial Development.

Page 1 of 6

เอกสารไม่ควบคุม

F-CALI004 Ed.2

Certificate No.: [illegible]

Calibration Report

Equipment: Sound Level Meter
Manufacturer: [illegible]
Model/Type: [illegible]
Serial No.: [illegible]
ID No.: [illegible]
Ambient Temperature: 23 ± 2 °C
Relative Humidity: 50 ± 15 %
Pressure: [illegible] kPa
Method of Calibration :-
IEC [illegible]

Condition of the result of calibration

1. Reference standards used :-

	Instrument	Model	Serial No.	Cert. No.	Due Date
1	Standard Microphone	4180	2307990	[illegible]	12 November 2004
2	Arbitrary Function Generator	AFG3021	C013035	[illegible]	25 June 2004
3	Programmable Attenuator	9102	2759	[illegible]	1 October 2004
4	5½ Digit precision multimeter	3245A	910014	[illegible]	15 November 2004
5	Pressure Humidity and Temperature Transmitter	PTU301	U3550165	[illegible]	24 March 2005
6	Pressure Humidity and Temperature Transmitter	PTU301	U3550456	[illegible]	11 April 2005
7	Performance Audio Analyzer	UA2026	UA2026[illegible]	[illegible]	25 February 2005

2. The result of calibration was found accurate as shown on date and place of calibration only.
3. The certification is traceable to the international system of unit maintained at :-
Reference standards instrument for Acoustic function
- National Institute of Metrology (Thailand)
Reference standards instrument for Electrical function
- National Institute of Metrology (Thailand)
- Electrical and Electronics Institute, NIC Accredited Calibration No.0119

Result of Calibration:

Function : 1. Indication at the calibration check frequency

Reference Acoustic Signal (dB)	Measured value (dB)	Deviation (dB)	Acceptance limits (dB)
-	-	-	-

เอกสารไม่ควบคุม

Certificate No.: [illegible]

Calibration Report

Function : 2. Self-generated Noise
2.1 Microphone installed

Measured value (dB)
21.6

2.2 Microphone replaced by the electrical input signal device

Frequency Weighting	Measured value (dB)
A-weighting	21.2
C-weighting	21.0
Z-weighting	26.6

Function : 3. Acoustical signal tests of frequency weightings (Without Windscreen)

Make sure that acoustic response at a level of 94 dB

Frequency (Hz)	Deviation from various Frequency Weighting Response Curve			
	C-Weighting (dB)	A-Weighting (dB)	Z-Weighting (dB)	Acceptance limits (dB)
125	0.1	0.0	0.0	±1.5
1000	0.2	-0.2	-0.2	±1.0
8000	-2.4	-3.9	-2.4	+3.0

Function : 4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz

Frequency (Hz)	Deviation from various Frequency Weighting Response Curve			
	C-Weighting (dB)	A-Weighting (dB)	Z-Weighting (dB)	Acceptance limits (dB)
31.5	0.0	0.0	0.0	±3.0
125	0.0	0.0	0.0	±1.5
250	0.0	0.0	0.0	±1.5
500	0.1	0.0	0.0	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.1	0.0	0.0	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	0.0	0.1	±5.0

Function : 5. Frequency and time weighting at 1 kHz

5.1 Frequency weighting at 1 kHz

Frequency Weighting	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
C-weighting	94.1	0.0	±0.2
A-weighting	94.1	0.0	±0.2
Z-weighting	94.1	0.0	±0.2

เอกสารไม่ควบคุม

Certificate No.: [illegible]

Calibration Report

5.2 Time weighting at 1 kHz

Time Weighting	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
Fast	94.0	0.0	±0.3
Slow	94.0	0.0	±0.3
Leq	94.0	0.0	±0.1

Function : 6. Long-Term Stability

Long-term stability over 30 minutes, with steady 1 kHz signal at reference level

Time Period to Apply Signal (min)	Reference SPL (dB)	Record SPL at conclusion of Time Period (dB)	Deviated value (dB)	Acceptance limits (dB)
30	94.0	94.1	0.0	±0.5

Function : 7. Level Linearity on the reference level range

7.1 Level Linearity on the reference level range, Upper

Anticipated Value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
94.0	94.0	0.0	±1.1
99.0	99.0	0.0	±1.1
104.0	104.1	0.0	±1.1
109.0	109.1	0.0	±1.1
114.0	114.1	0.0	±1.1
119.0	119.1	0.0	±1.1
124.0	124.1	0.0	±1.1
129.0	129.1	0.0	±1.1
134.0	134.1	0.1	±1.1
139.0	139.1	0.1	±1.1
140.0	140.1	0.1	±1.1
141.0	141.1	0.1	±1.1
142.0	142.1	0.1	±1.1

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Certificate No.: [illegible]

Calibration Report

7.2 Level Linearity on the reference level range, Lower

Anticipated Value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
94.0	94.0	0.0	±1.1
89.0	89.0	0.0	±1.1
84.0	84.0	0.0	±1.1
79.0	79.0	0.0	±1.1
74.0	74.0	0.0	±1.1
69.0	69.0	0.0	±1.1
64.0	64.0	0.0	±1.1
59.0	59.0	0.0	±1.1
54.0	54.0	0.0	±1.1
49.0	49.0	0.0	±1.1
44.0	44.1	0.1	±1.1
43.0	43.0	0.0	±1.1
42.0	42.0	0.0	±1.1
41.0	41.0	0.0	±1.1
40.0	40.0	0.0	±1.1

Function : 8. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
Fast	200	106.0	0.0	±2.0
	2	118.0	-0.2	+10 ; -15
	0.25	109.1	-0.9	+15 ; -10
Slow	200	109.0	-0.1	±2.0
	2	109.0	-0.1	+10 ; -15
Leq	200	109.0	0.0	±2.0
	2	109.0	0.0	+10 ; -15
	0.25	109.0	-0.1	+15 ; -10

Function : 9. Peak C sound level

Number of cycles in test signal	Anticipated Value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
Complete cycle	139.0	139.0	-0.0	±3.0
Positive half cycle	139.0	139.1	-0.1	±2.0
Negative half cycle	139.0	139.1	-0.1	±2.0

Function : 10. Overload Indication

Measured value (dB)		Deviated value (dB)	Acceptance limits (dB)
Positive overhalf cycle	Negative overhalf cycle		
140.1	140.1	-0.1	±1.5

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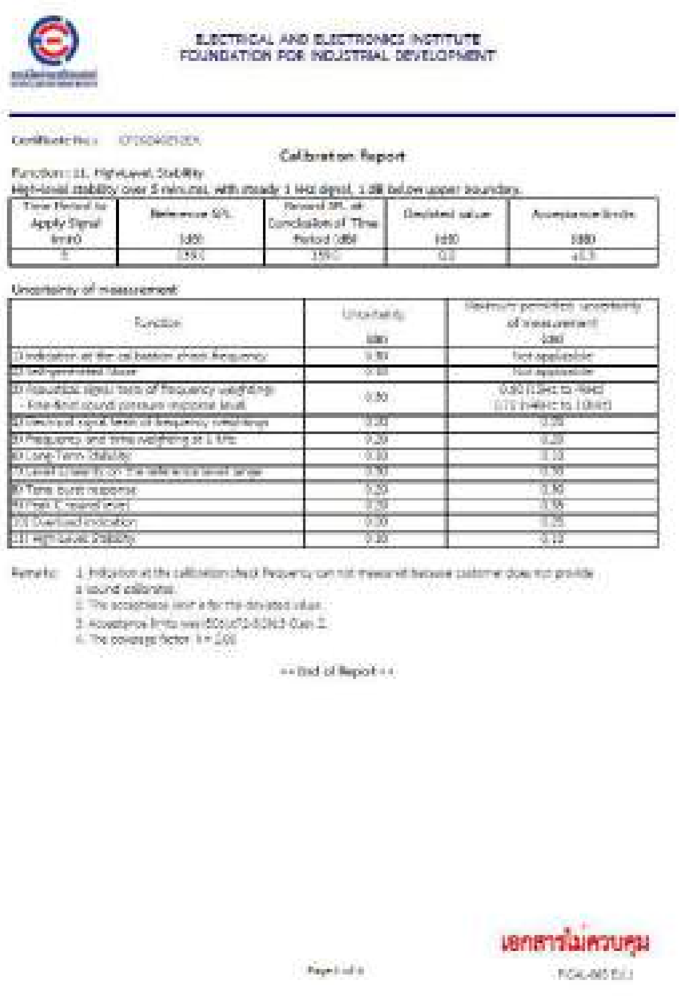

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FOUNDATION FOR INDUSTRIAL DEVELOPMENT

Certificate No.: [illegible]

Calibration Report

Function : 11. High Level Stability

High-level stability over 5 minutes, with steady 1 kHz signal, 1 dB below upper boundary.

Time Period to Apply Signal (min)	Reference SPL (dB)	Record SPL at Conclusion of Time Period (dB)	Deviated value (dB)	Acceptance limits (dB)
5	[illegible]	[illegible]	0.0	±0.3

Uncertainty of measurement

Function	Uncertainty (dB)	Maximum permitted uncertainty of measurement (dB)
1) Indication at the calibration check frequency	0.30	Not applicable
2) Self-generated Noise	0.30	Not applicable
3) Acoustical signal tests of frequency weightings - Free-field sound pressure response level	0.50	0.50 (125Hz to 4kHz) [illegible] (>4kHz to 10kHz)
4) Electrical signal tests of frequency weightings	0.20	0.20
5) Frequency and time weighting at 1 kHz	0.20	0.20
6) Long-Term Stability	0.10	0.10
7) Level linearity on the reference level range	0.30	0.30
8) Tone burst response	0.20	0.30
9) Peak C sound level	0.20	0.35
10) Overload indication	0.20	0.25
11) High Level Stability	0.10	0.10

Remarks: 1. Indication at the calibration check frequency can not measured because customer does not provide a sound calibrator.
2. The acceptance limit is for the deviated value.
3. Acceptance limits was IEC 61672-3:2013 Class 2.
4. The coverage factor k = 2.00

-- End of Report --

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Certificate of Calibration

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Certificate No.: CF2024291EA
Operation No.: CF2024170284

Certificate of Calibration

Equipment:	Sound Level Meter
Manufacturer:	Larson Davis (Metrel), PCB (Microphone), PCB (Preamplifier)
Model/Type:	LxT2 (Metrel), 377A04B02 (Microphone), PRMLxT2C (Preamplifier)
Serial No.:	0008396 (Metrel), 329190 (Microphone), 171905 (Preamplified)
ID No.:	UAE.ERI.033/2564
Customer:	United Analyst and Engineering Consultant Co.,Ltd.
Address:	81 Soi Udomsuk, 81, Sukhumvit Road, Bangchak Prawetnanong, Bangkok 10260
Received Date:	25 July 2024
Calibrated Date:	6 – 8 August 2024
Issued Date:	7 August 2024
Calibrated by:	Mr. Juntaporn Furtakon

Approved by: _____
Lt.Col. Sittichai Sivakunjaiwong, I
Group Manager

This document prepared electronically using qualified electronic signature. Printing a copy of file will considered as a copy of the document.
The reported uncertainty of measurement was based on standard uncertainty multiplied by a coverage factor (k) providing a level of confidence of approximately 95%. This certificate may not be reproduced other than in full except with prior written approval of the Electrical and Electronics Institute, Foundation for Industrial Development.

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FCAL-004 Ed.1

Certificate No.: CF2024291EA

Calibration Report

Equipment:	Sound Level Meter
Manufacturer:	Larson Davis (Metrel), PCB (Microphone), PCB (Preamplifier)
Model/Type:	LxT2 (Metrel), 377A04B02 (Microphone), PRMLxT2C (Preamplified)
Serial No.:	0008396 (Metrel), 329190 (Microphone), 171905 (Preamplifier)
ID No.:	UAE.ERI.033/2564
Ambient Temperature:	23 ± 2 °C
Relative Humidity:	50 ± 15 %RH
Pressure:	101.3 ± 1.5 kPa

Method of Calibration :-
IEC 61672-3:2013

Condition of the result of calibration

1. Reference standards used :-

	Instrument	Model	Serial No.	Cert. No.	Due Date
1	Microphone	4180	232490	[illegible]	12 November 2024
2	Pistonphone Function Generator	[illegible]	[illegible]	[illegible]	25 June 2025
3	Programmable Attenuator	PA2	2759	[illegible]	1 October 2024
4	6½ Digit precision multimeter	3458A	[illegible]	[illegible]	15 November 2024
5	Relative Humidity and Temperature Transmitter	PTU301	[illegible]	[illegible]	24 April 2025
6	Pressure, Humidity and Temperature Transmitter	PTU301	[illegible]	[illegible]	11 April 2025
7	Performance Audio Analyzer	UA1000	[illegible]	[illegible]	13 February 2025

2. The result of calibration was found accurate as shown on date and place of calibration only.
3. The certification is traceable to the international system of unit maintained at :-
Reference standards instrument for Acoustic function
- National Institute of Metrology (Thailand)
Reference standards instrument for Electrical function
- National Institute of Metrology (Thailand)
- Electrical and Electronics Institute ISO Accredited Calibration No.0119

Result of Calibration

Function : 1. Indication at the calibration check frequency

Reference Acoustic Signal (dB)	Measured value (dB)	Deviation (dB)	Acceptance limits (dB)
-	-	-	-

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FCAL-005 Ed.1

Certificate No.: CF2024291EA

Calibration Report

Function : 2. Self-generated Noise

2.1 Microphone Installed

Measured value (dB)
29.0

2.2 Microphone replaced by the electrical input signal device

Frequency Weighting	Measured value (dB)
A-weighting	28.1
C-weighting	28.0
Z-weighting	34.1

Function : 3. Acoustical signal tests of frequency weightings (Without Windscreen)

Under free-field acoustic response at a level of 94 dB

Frequency (Hz)	Deviation from various Frequency Weighting Response Curve			
	C-Weighting (dB)	A-Weighting (dB)	Z-Weighting (dB)	Acceptance limits (dB)
125	0.0	0.0	0.0	±1.5
1000	0.0	0.0	0.0	±1.0
8000	0.0	0.0	0.0	±3.0

Function : 4. Electrical signal tests of frequency weightings

Weighting relevant response with relative to 1 kHz

Frequency (Hz)	Deviation from various Frequency Weighting Response Curve			
	C-Weighting (dB)	A-Weighting (dB)	Z-Weighting (dB)	Acceptance limits (dB)
63	0.0	0.0	0.0	±1.0
125	0.0	0.0	0.0	±1.5
250	0.0	0.0	0.0	±1.5
500	0.0	0.0	0.0	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.0	0.0	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	-0.1	0.0	±5.0

Function : 5. Frequency and time weighting at 1 kHz

5.1 Frequency weighting at 1 kHz

Frequency Weighting	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
C-weighting	94.0	0.0	±0.2
A-weighting	94.1	0.0	±0.2
Z-weighting	94.1	0.0	±0.2

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FCAL-005 Ed.1

Certificate No.: CF2024291EA

Calibration Report

5.2 Time weighting at 1 kHz

Time Weighting	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
Fast	94.0	0.0	±0.3
Slow	94.0	0.0	±0.3
LAeq	94.0	0.0	±0.1

Function : 6. Long-Term Stability

Long-term stability over 30 minutes, with steady 1 kHz signal at reference level

Time Period to Apply Signal (min)	Reference SPL (dB)	Record SPL at conclusion of Time Period (dB)	Deviated value (dB)	Acceptance limits (dB)
30	94.0	94.0	0.0	±0.5

Function : 7. Level Linearity on the reference level range

7.1 Level Linearity on the reference level range, Upper

Anticipated value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
94.0	94.0	0.0	±0.1
99.0	99.0	0.0	±0.1
104.0	104.1	0.0	±0.1
109.0	109.0	0.0	±0.1
114.0	114.0	0.0	±0.1
119.0	119.0	0.0	±0.1
124.0	124.0	0.0	±0.1
129.0	129.0	0.0	±0.1
134.0	134.1	0.1	±0.1
139.0	139.0	0.1	±0.1
140.0	140.1	0.1	±0.1
141.0	141.1	0.1	±0.1

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FCAL-005 Ed.1

Certificate No.: 07/2024/01/EN

Calibration Report

7.2 Level Linearity on the reference level range, Lower

Anticipated Value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
99.0	98.9	0.0	±0.1
89.0	89.0	0.0	±0.1
84.0	84.0	0.0	±0.1
79.0	79.0	0.0	±0.1
74.0	74.0	0.0	±0.1
69.0	69.0	0.0	±0.1
64.0	64.0	0.0	±0.1
59.0	59.0	0.0	±0.1
54.0	54.0	0.0	±0.1
49.0	49.0	0.0	±0.1
44.0	44.1	0.1	±0.1
43.0	43.1	0.1	±0.1
42.0	42.2	0.2	±0.1
41.0	41.2	0.2	±0.1
40.0	40.3	0.3	±0.1

Function : 8. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
Fast	200	118.1	0.1	±2.0
	2	118.0	-0.2	+1.0 ; -2.5
	0.25	109.0	-0.2	+1.5 ; -5.0
Slow	200	124.1	0.1	±2.0
	2	109.1	0.1	+1.0 ; -2.5
	0.25	100.0	0.0	+1.5 ; -5.0
LIN	200	118.0	0.0	±2.0
	2	110.0	0.0	+1.0 ; -2.5
	0.25	101.0	0.0	+1.5 ; -5.0

Function : 9. Peak C sound level

Number of cycles in test signal	Anticipated Value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
Complete cycle	138.1	134.0	-0.4	±2.0
Positive half cycle	134.1	134.0	-0.4	±2.0
Negative half cycle	134.1	134.0	-0.4	±2.0

Function : 10. Overload indication

Measured value (dB)		Deviated value (dB)	Acceptance limits (dB)
Positive overhalf cycle	Negative overhalf cycle		
145.4	145.4	0.0	±1.5

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ELECTRICAL AND ELECTRONICS INSTITUTE
FOUNDATION FOR INDUSTRIAL DEVELOPMENT

Certificate No.: 07/2024/01/EN

Calibration Report

Function : 11. High-Level Stability

High-level stability over 5 minutes, with steady 1 kHz signal, 1 dB below upper boundary.

Time Period for Apply Signal (min)	Reference SPL (dB)	Record SPL at Conclusion of Time Period (dB)	Deviated value (dB)	Acceptance limits (dB)
5	159.0	159.0	0.0	±0.3

Uncertainty of measurement

Function	Uncertainty (dB)	Maximum permitted uncertainty of measurement (dB)
1) Indication at the calibration check frequency	0.30	Not applicable
2) Indicated level	0.30	Not applicable
3) Acoustical signal tests of frequency weighting - Free-field sound pressure response level	0.30	0.80 (12kHz to 16kHz) 0.70 (16kHz to 20kHz)
4) Electrical signal tests of frequency weightings	0.20	0.20
5) Frequency and time weighting at 1 kHz	0.20	0.20
6) Long-Term stability	0.10	0.10
7) Level linearity on the reference level range	0.30	0.30
8) Tone burst response	0.20	0.30
9) Peak C sound level	0.20	0.35
10) Overload indication	0.20	0.25
11) High level stability	0.20	0.12

Remarks: 1. Indication at the calibration check frequency can not measured because customer does not provide a sound calibrator.
2. The acceptance limit is for the deviated value.
3. Acceptance limits was IEC61672-3:2013 Class 2.
4. The coverage factor k = 2.00

<< End of Report >>

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ELECTRICAL AND ELECTRONICS INSTITUTE
FOUNDATION FOR INDUSTRIAL DEVELOPMENT

Certificate No.: CF2024/293EA
Operation No.: CF2024/170284

Certificate of Calibration

Equipment:	Sound Level Meter
Manufacturer:	Larson Davis (Metrel), PCB (Microphone), PCB (Preamplifier)
Model/Type:	LxT2 (Metrel), 377B02 (Microphone), PRMLxT2B (Preamplifier)
Serial No.:	0003399 (Metrel), 11789 (Microphone), 056125 (Preamplifier)
ID No.:	UAE.EPM.036/2548
Customer:	United Analyst and Engineering Consultant Co.,Ltd.
Address:	81 Soi Udomsuk, 81, Sukhumvit Road, Bangchak Prawetnong, Bangkok 10260
Received Date:	25 July 2024
Calibrated Date:	6 – 7 August 2024
Issued Date:	7 August 2024
Calibrated By:	Ms. Juntaporn Funhakon

Approved by: _____
Group Manager

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

Page 1 of 6

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FOA-L004 Ed.1

ELECTRICAL AND ELECTRONICS INSTITUTE
FOUNDATION FOR INDUSTRIAL DEVELOPMENT

Certificate No.: CF2024/293EA

Calibration Report

Equipment:	Sound Level Meter
Manufacturer:	Larson Davis (Metrel), PCB (Microphone), PCB (Preamplifier)
Model/Type:	LxT2 (Metrel), 377B02 (Microphone), PRMLxT2B (Preamplifier)
Serial No.:	0003399 (Metrel), 11789 (Microphone), 056125 (Preamplifier)
ID No.:	UAE.EPM.036/2548
Ambient Temperature:	23 ± 2 °C
Relative Humidity:	50 ± 15 %
Pressure:	101.3 ± 1.0 kPa
Method of Calibration :-	
IEC 61672-3:2013	

Condition of the result of calibration

1. Reference standards used :-

	Instrument	Model	Serial No.	Cert. No.	Due Date
1.1	Sound Microphone	4180	232490	AA-[illegible]	12 November 2024
1.2	Acoustic Function Generator	AFG2021	[illegible]	[illegible]	20 June 2024
1.3	Programmable Attenuator	PA2	2759	EP-[illegible]-23	1 October 2024
1.4	6½ Digit precision multimeter	3458A	[illegible]	[illegible]	15 November 2024
1.5	Pressure Humidity and Temperature Transmitter	PTU301	[illegible]	[illegible]	24 April 2025
1.6	Pressure Humidity and Temperature Transmitter	PTU301	[illegible]	[illegible]	11 April 2025
1.7	Performance Audio Analyzer	UPA56	[illegible]	[illegible]	15 February 2025

2. The result of calibration was found accurate as shown on date and place of calibration only.
3. The certification is traceable to the International system of unit maintained at :-
   Reference standards used for Acoustic function
   - National Institute of Metrology (Thailand)
   Reference standards instrument for Electrical function
   - National Institute of Metrology (Thailand)
   - Electrical and Electronics Institute, NSC Accredited Calibration No.0119

Result of Calibration

Function : 1. Indication at the calibration check frequency

Reference Acoustic Signal (dB)	Measured value (dB)	Deviation (dB)	Acceptance limits (dB)
-	-	-	-

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Page 2 of 6

FOA-L005 Ed.1

ELECTRICAL AND ELECTRONICS INSTITUTE
FOUNDATION FOR INDUSTRIAL DEVELOPMENT

Certificate No.: CF2024/293EA

Calibration Report

Function : 2. Self-generated Noise

2.1 Microphone installed

Measured value (dB)
35.6

2.2 Microphone replaced by the electrical input signal device

Frequency Weighting	Measured value (dB)
A-weighting	28.5
C-weighting	28.9
Z-weighting	34.2

Function : 3. Acoustical signal tests of frequency weightings (Without Windscreen)

Under free-field acoustic response at a level of 94 dB

Frequency (Hz)	Deviation from various Frequency Weighting Response Curve			
	C-Weighting (dB)	A-Weighting (dB)	Z-Weighting (dB)	Acceptance limits (dB)
125	0.1	0.0	0.1	±1.5
1000	-0.1	-0.1	-0.1	±1.0
8000	1.4	1.9	1.4	±3.0

Function : 4. Electrical signal tests of frequency weightings

Weighting relevant response with relative to 1 kHz

Frequency (Hz)	Deviation from various Frequency Weighting Response Curve			
	C-Weighting (dB)	A-Weighting (dB)	Z-Weighting (dB)	Acceptance limits (dB)
63	-0.1	0.0	0.1	±1.0
125	0.0	0.0	0.1	±1.5
250	-0.1	0.0	0.0	±1.5
500	0.0	-0.1	0.0	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.0	0.0	±2.0
4000	0.0	0.0	0.0	±3.0
8000	-0.1	0.0	0.0	±5.0

Function : 5. Frequency and time weighting at 1 kHz

5.1 Frequency weighting at 1 kHz

Frequency Weighting	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
C-weighting	94.0	0.0	±0.2
A-weighting	94.0	0.0	±0.2
Z-weighting	94.0	0.0	±0.2

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Page 3 of 6

FOA-L005 Ed.1

Certificate No.: [illegible]

Calibration Report

5.2 Time weighting at 1 kHz

Time Weighting	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
Fast	94.0	0.0	±0.1
Slow	94.0	0.0	±0.1
LAeq	94.0	0.0	±0.1

Function : 6. Long-Term Stability

Long-term stability over 30 minutes, with steady 1 kHz signal at reference level

Time Period to Apply Signal (min)	Reference SPL (dB)	Record SPL at conclusion of Time Period (dB)	Deviated value (dB)	Acceptance limits (dB)
30	94.0	94.1	0.1	±0.5

Function : 7. Level Linearity on the reference level range

7.1 Level Linearity on the reference level range, Upper

Anticipated Value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
104.0	104.0	0.0	±1.1
99.0	99.0	0.0	±1.1
104.1	104.1	0.0	±1.1
109.0	109.1	0.0	±1.1
114.0	114.1	0.0	±1.1
119.0	119.1	0.0	±1.1
124.0	124.1	0.0	±1.1
129.0	129.1	0.0	±1.1
134.0	134.1	0.1	±1.1
139.0	139.1	0.1	±1.1
140.0	140.1	0.1	±1.1
141.0	141.1	0.1	±1.1

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Certificate No.: [illegible]

Calibration Report

7.2 Level Linearity on the reference level range, Lower

Anticipated Value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
94.0	94.0	0.0	±1.1
89.0	89.0	0.0	±1.1
84.0	84.0	0.0	±1.1
79.0	79.0	0.0	±1.1
74.0	74.0	0.0	±1.1
69.0	69.0	0.0	±1.1
64.0	64.0	0.0	±1.1
59.0	59.0	0.0	±1.1
54.0	54.0	0.0	±1.1
49.0	49.0	0.0	±1.1
44.0	44.1	0.1	±1.1
41.0	41.1	0.1	±1.1
42.0	42.1	0.1	±1.1
43.0	43.1	0.1	±1.1
44.0	44.4	0.4	±1.1

Function : 8. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
Fast	200	118.9	-0.1	±2.0
	2	118.9	-0.7	+1.0 ; -2.5
	0.25	109.5	-4.4	+1.5 ; -5.0
Slow	200	124.5	-0.1	±2.0
	2	109.5	-0.1	+1.0 ; -2.5
LIE	200	100.0	0.0	±2.0
	2	100.0	0.0	+1.0 ; -2.5
	0.25	100.0	-0.0	+1.5 ; -5.0

Function : 9. Peak C sound level

Number of cycles in test signal	Anticipated Value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
Complete cycle	155.1	154.7	-0.7	±2.0
Positive half cycle	154.1	154.1	-0.3	±2.0
Negative half cycle	154.1	154.1	-0.3	±2.0

Function : 10. Overload indication

Measured value (dB)		Deviated value (dB)	Acceptance limits (dB)
Positive overload cycle	Negative overload cycle		
147.0	147.0	-0.1	±1.5

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Certificate No.: [illegible]

Calibration Report

Function : 11. High-Level Stability

High-level stability over 5 minutes, with steady 1 kHz signal, 1 dB below upper boundary.

Time Period to Apply Signal (min)	Reference SPL (dB)	Record SPL at Conclusion of Time Period (dB)	Deviated value (dB)	Acceptance limits (dB)
5	139.1	139.0	0.1	±1.5

Uncertainty of measurement

Function	Uncertainty (dB)	Maximum permitted uncertainty of measurement (dB)
1) Indication at the calibration check frequency	0.30	Not applicable
2) Self-generated noise	0.30	Not applicable
3) Acoustic signal tests of frequency weighting - Free-field sound pressure response level	0.50	0.5(31.5Hz to 16kHz) 0.75 (>16kHz to 16kHz)
4) Electrical signal tests of frequency weightings	0.20	0.25
5) Frequency and time weighting at 1 kHz	0.20	0.25
6) Long-term stability	0.10	0.15
7) Level Linearity on the reference level range	0.10	0.15
8) Tone burst response	0.20	0.30
9) Peak C sound level	0.20	0.35
10) Overload indication	0.20	0.25
11) High-level stability	0.10	0.15

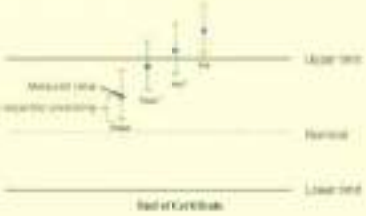
Remarks: 1. Indication at the calibration check frequency can not measured because customer does not provide a sound calibrator.
2. The acceptance limit is for the deviated value.
3. Acceptance limits was IEC61672-3:2013 Class 2.
4. The coverage factor k = 2.00

<< End of Report >>

เอกสารไม่ควบคุม

Certificate of Calibration

เอกสารไม่ควบคุม



End of Certificate

List of Instruments Certification for Water Quality Analysis

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration	Remark
Water									
1	pH Meter	pH	Horiba	LAQUA-PH210 HA1M0036	Technology Promotion Association (Thailand-Japan)	24CH240	20 Feb 24	19 Feb 25	-

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)

Cert.No.: 24CH240
Page: 1 of 5

Certificate of Calibration

Equipment :	pH Meter
Manufacturer :	Horiba
Model :	LAQUA-PH310
Serial No. :	HA1M0030
ID No. :	UAI-EPM-01/2008/pH/pH12/003
Condition As-Received:	Used Item
Received Date :	19 February 2024
Calibration Date :	20 February 2024
Reference :	24C2-088/WI/C-4
Submitted by :	United Analyst and Engineering Consultant Co.,Ltd. c/o Lumsuk 15, Bangkok Road, Bangkok, Phaisalong, Bangkok 10200
Ambient Temperature :	(25 ± 2.0) °C
Relative Humidity :	(50 ± 10) %
Calibration Procedure :	In - house method : - CP-CH3 by direct measurement with DC Voltage Standard and direct measurement with certified reference material (CRM) - CP-CH3 by comparison with temperature standard
Calibrated by :	Nakalin Siritawa
Approved by :	Approved signatory

( ) Pornthaya Tanayakul
( ) Uraporn Hirachal
(✓) Sirilu Honrayal

Issue Date : 22 February 2024

The Uncertainties are for a confidence probability of approximately 95%

เอกสารไม่ควบคุม

4-0163842

Cert.No.: 24CH240
Page: 2 of 5

Condition of this calibration result

1. Reference Standard Instrument

Instrument	Serial No.	ID No.	Cert. No.	Due Date
1) Document Process Calibrator	54000849	120RC110	23C2/850	27 Aug 2024
2) Ref. Standard Thermometer	4662081	110RC040	23R/05	29 July 2024

This certificate is traceable to the International System of Unit established through:
- Technology Promotion Association (Thailand-Japan)

2. Certified Reference Materials: This measurement results are traceable to SI through CPA chem Ltd., ANSI-ASQ National Accreditation Board, Accreditation No. AR-1808

Buffer Solution	Manufacturer	Lot No.	Exp. date
pH 4.000	CPA chem	842100	27 Nov 2023
pH 6.860	CPA chem	842104	03 Nov 2023
pH 9.067	CPA chem	842108	02 Nov 2023

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

Calibration Results

Function : mV Measurement

Performing standard curve by Document Process Calibrator at pH (4,7,9,10)

Unit Under Calibration	Nominal Value	Standard Voltage Input	Actual Reading		Uncertainty of Measurement	Coverage factor
	pH	mV	mV	pH	(±mV)	k
pH Meter	4.00	177.40	177.5	4.01	0.066	2.00
S/N: HA1M0030	7.00	0.00	3.0	7.00	0.066	2.00
	7.00	0.00	3.0	7.00	0.066	2.00
	10.00	-177.40	-177.4	10.01	0.066	2.00

เอกสารไม่ควบคุม

a 1203790

Cert.No.: 24C2-088
Page: 3 of 5

Calibration Results

Function : pH Measurement

Performing three buffers standard curve by using buffer nominal pH (4,7,9,10)

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH Measurement (±)	Coverage factor k
pH Electrode	4.000	4.01	177.0	0.0011	2.00
S/N: 0024C181	6.860	6.86	3.5	0.0069	2.00
	6.860	6.86	1.0	0.0069	2.00
	9.067	10.00	-166.3	0.0069	2.00

Function : Temperature Measurement

(*) Without adjustment

This equipment was connected with Temperature Probe:

- Model : 0828-100
- Serial No. : 1200M0181

Dimension of probe

- Length : 107 cm.
- Diameter : 15 cm.
- Immersion Depth : 100 cm.

Calibration Point (°C)	Standard Temperature (°C)	UUC* Reading (°C)	Error* (°C)	Uncertainty of measurement (± °C)	Coverage factor k
25.0	25.000	25.0	0.000	0.10	2.00
35.0	35.000	35.0	0.000	0.10	2.00
35.0	34.999	35.0	0.001	0.10	2.00

Remark : UUC* = Unit Under Calibrator

The reported uncertainty of measurements was based on a standard uncertainty multiplied by a coverage factor k, providing a level of confidence of approximately 95 %.

-oOo-

เอกสารไม่ควบคุม

a 1203789

ภาคผนวก ซ
การประกันและควบคุมคุณภาพ (QA/QC)

United Analyst and Engineering Consultant Co., Ltd.
3 Soi Udomsuk 41, Sukhumvit Road, Bangchak, Phrakanong, Bangkok 10260
Tel. 0 2743 8808 Fax 0 2743 2000 www.uaeconsultant.com E-mail: uae@uaeconsultant.com

ผลการประกันคุณภาพของห้องปฏิบัติการวิเคราะห์ (QA/QC) สำหรับ บริษัท ทางด่วนและรถไฟฟ้ากรุงเทพ จำกัด (มหาชน)

(เก็บตัวอย่างของเหลวก่อนที่จุดสูบน้ำเข้าโรงกรองน้ำสามเสน (NEAR INLET) โรงผลิตน้ำสามเสน 2 เมื่อวันที่ 2 - 7 มิถุนายน 2567)

ANALYSIS NO.	UNIT	DETECTION LIMIT	METHOD BLANK	LEAD RESULT	ICV			CCV			LFB		
					NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)	NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)	NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)
AM581-1	$\mu g/m^3$	0.002	< 0.002	< 0.002	0.700	0.710	101	0.700	0.745	106	0.700	0.685	98
AM581-2	$\mu g/m^3$	0.002	< 0.002	< 0.002	0.700	0.710	101	0.700	0.745	106	0.700	0.685	98
AM581-3	$\mu g/m^3$	0.002	< 0.002	< 0.002	0.700	0.710	101	0.700	0.745	106	0.700	0.685	98
AM581-4	$\mu g/m^3$	0.002	< 0.002	< 0.002	0.700	0.710	101	0.700	0.745	106	0.700	0.685	98
AM581-5	$\mu g/m^3$	0.002	< 0.002	0.003	0.700	0.710	101	0.700	0.745	106	0.700	0.685	98
ACCEPTABLE LIMIT		< 0.002					90-110			90-110			90-110

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ผลการประกันคุณภาพของห้องปฏิบัติการวิเคราะห์ (QA/QC) สำหรับ บริษัท ทางด่วนและรถไฟฟ้ากรุงเทพ จำกัด (มหาชน)

(เก็บตัวอย่างที่ของเหลวก่อนที่จุดสูบน้ำเข้าโรงกรองน้ำไปพาดต้นน้ำในระยะ 1.5 กิโลเมตรห่างจากร้าน 7-11) เมื่อวันที่ 2 - 7 มิถุนายน 2567)

ANALYSIS NO.	UNIT	DETECTION LIMIT	METHOD BLANK	LEAD RESULT	ICV			CCV			LFB		
					NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)	NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)	NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)
AM585-6	$\mu g/m^3$	0.002	< 0.002	< 0.002	0.700	0.710	101	0.700	0.745	106	0.700	0.685	98
AM585-7	$\mu g/m^3$	0.002	< 0.002	0.013	0.700	0.710	101	0.700	0.745	106	0.700	0.685	98
AM585-8	$\mu g/m^3$	0.002	< 0.002	0.019	0.700	0.710	101	0.700	0.745	106	0.700	0.685	98
AM585-9	$\mu g/m^3$	0.002	< 0.002	< 0.002	0.700	0.710	101	0.700	0.745	106	0.700	0.685	98
AM585-10	$\mu g/m^3$	0.002	< 0.002	< 0.002	0.700	0.710	101	0.700	0.745	106	0.700	0.685	98
ACCEPTABLE LIMIT		< 0.002					90-110			90-110			90-110

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ผลการประกันคุณภาพของห้องปฏิบัติการวิเคราะห์ (QA/QC) สำหรับ บริษัท ทางด่วนและรถไฟฟ้ากรุงเทพ จำกัด (มหาชน)

(เก็บตัวอย่างที่ระยะห่างจากจุดสูบน้ำเข้าโรงกรองน้ำไปทางต้นน้ำในระยะ 3 กิโลเมตร(กองส่วนต่อขยายเก่า) เมื่อวันที่ 2 - 7 มิถุนายน 2567)

ANALYSIS NO.	UNIT	DETECTION LIMIT	METHOD BLANK	LEAD RESULT	ICV			CCV			LFB		
					NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)	NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)	NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)
AM585-11	mg/m^3	0.002	< 0.002	0.008	0.700	0.710	101	0.700	0.745	106	0.750	0.695	98
AM585-12	mg/m^3	0.002	< 0.002	< 0.002	0.700	0.710	101	0.700	0.745	106	0.750	0.695	98
AM585-13	mg/m^3	0.002	< 0.002	< 0.002	0.700	0.710	101	0.700	0.745	106	0.750	0.655	98
AM585-14	mg/m^3	0.002	< 0.002	< 0.002	0.700	0.710	101	0.700	0.745	106	0.750	0.695	98
AM585-15	mg/m^3	0.002	< 0.002	< 0.002	0.700	0.710	101	0.700	0.745	106	0.750	0.695	98
ACCEPTABLE LIMIT		< 0.002					90-110			90-110			90-110

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ผลการประกันคุณภาพของห้องปฏิบัติการวิเคราะห์ (QA/QC) สำหรับ บริษัท ทางด่วนและรถไฟฟ้ากรุงเทพ จำกัด (มหาชน)

(เก็บตัวอย่างที่ระยะห่างจากจุดสูบน้ำเข้าโรงกรองน้ำไปทางต้นน้ำในระยะ 4.5 กิโลเมตร(หลังป้อมตำรวจ สน.ลาดปลาเค้า) เมื่อวันที่ 2 - 7 มิถุนายน 2567)

ANALYSIS NO.	UNIT	DETECTION LIMIT	METHOD BLANK	LEAD RESULT	ICV			CCV			LFB		
					NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)	NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)	NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)
AM585-16	mg/m^3	0.002	< 0.002	< 0.002	0.700	0.710	101	0.700	0.745	106	0.750	0.685	98
AM585-17	mg/m^3	0.002	< 0.002	0.013	0.700	0.710	101	0.700	0.745	106	0.750	0.685	98
AM585-18	mg/m^3	0.002	< 0.002	< 0.002	0.700	0.710	101	0.700	0.745	106	0.750	0.685	98
AM585-19	mg/m^3	0.002	< 0.002	< 0.002	0.700	0.710	101	0.700	0.745	106	0.750	0.685	98
AM585-20	mg/m^3	0.002	< 0.002	< 0.002	0.700	0.710	101	0.700	0.745	106	0.750	0.685	98
ACCEPTABLE LIMIT		< 0.002					90-110			90-110			90-110

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ผลการประกันคุณภาพของห้องปฏิบัติการวิเคราะห์ (QA/QC) สำหรับ บริษัท ทางด่วนและรถไฟฟ้ากรุงเทพ จำกัด (มหาชน)

(เก็บตัวอย่างบริเวณโรงเรียนสายรุ้งพิทยา เมื่อวันที่ 2 - 7 พฤศจิกายน 2567)

ANALYSIS NO.	UNIT	DETECTION LIMIT	METHOD BLANK	LEAD RESULT	ICV			CCV			LFB		
					NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)	NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)	NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)
BA131-1	µg/m³	0.002	< 0.002	0.025	0.700	0.711	102	0.700	0.670	96	0.730	0.648	93
BA131-2	µg/m³	0.002	< 0.002	0.009	0.700	0.711	102	0.700	0.670	96	0.730	0.648	93
BA131-3	µg/m³	0.002	< 0.002	0.007	0.700	0.711	102	0.700	0.670	96	0.730	0.648	93
BA131-4	µg/m³	0.002	< 0.002	0.013	0.700	0.711	102	0.700	0.670	96	0.730	0.648	93
BA131-5	µg/m³	0.002	< 0.002	0.009	0.700	0.711	102	0.700	0.670	96	0.730	0.648	93
ACCEPTABLE LIMIT		< 0.002					90-110			90-110			90-110

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ผลการประกันคุณภาพของห้องปฏิบัติการวิเคราะห์ (QA/QC) สำหรับ บริษัท ทางด่วนและรถไฟฟ้ากรุงเทพ จำกัด (มหาชน)

(เก็บตัวอย่างบริเวณหมู่บ้านเสรี(ด้านหลัง) เมื่อวันที่ 2 - 7 พฤศจิกายน 2567)

ANALYSIS NO.	UNIT	DETECTION LIMIT	METHOD BLANK	LEAD RESULT	ICV			CCV			LFB		
					NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)	NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)	NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)
BA131-6	µg/m³	0.002	< 0.002	0.011	0.700	0.711	102	0.700	0.670	96	0.730	0.648	93
BA131-7	µg/m³	0.002	< 0.002	< 0.002	0.700	0.711	102	0.700	0.670	96	0.730	0.648	93
BA131-8	µg/m³	0.002	< 0.002	< 0.002	0.700	0.711	102	0.700	0.670	96	0.730	0.648	93
BA131-9	µg/m³	0.002	< 0.002	0.009	0.700	0.711	102	0.700	0.670	96	0.730	0.648	93
BA131-10	µg/m³	0.002	< 0.002	0.016	0.700	0.711	102	0.700	0.670	96	0.730	0.648	93
ACCEPTABLE LIMIT		< 0.002					90-110			90-110			90-110

United Analyst and Engineering Consultant Co., Ltd.
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ผลการประกันคุณภาพของห้องปฏิบัติการวิเคราะห์ (QA/QC) สำหรับ บริษัท ทางด่วนและรถไฟฟ้ากรุงเทพ จำกัด (มหาชน)

(เก็บตัวอย่างบริเวณอนุสาวรีย์ชัยสมรภูมิ(ถนนพญาไท) เมื่อวันที่ 2 - 7 พฤศจิกายน 2567)

ANALYSIS NO.	UNIT	DETECTION LIMIT	METHOD BLANK	LEAD RESULT	ICV			CCV			LFB		
					NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)	NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)	NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)
BA230-11	$\mu g/m^3$	0.002	< 0.002	0.042	0.700	0.711	102	0.700	0.670	96	0.730	0.648	93
BA230-12	$\mu g/m^3$	0.002	< 0.002	0.038	0.700	0.711	102	0.700	0.670	96	0.730	0.648	93
BA230-13	$\mu g/m^3$	0.002	< 0.002	0.050	0.700	0.711	102	0.700	0.670	96	0.730	0.648	93
BA230-14	$\mu g/m^3$	0.002	< 0.002	0.021	0.700	0.711	102	0.700	0.670	96	0.730	0.648	93
BA230-15	$\mu g/m^3$	0.002	< 0.002	0.030	0.700	0.711	102	0.700	0.670	96	0.730	0.648	93
ACCEPTABLE LIMIT		< 0.002					90-110			90-110			90-110

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(เก็บตัวอย่างบริเวณโรงเรียนนิพัทธ์วิทยา(ถนนเจริญกรุง) เมื่อวันที่ 2 - 7 พฤศจิกายน 2567)

ANALYSIS NO.	UNIT	DETECTION LIMIT	METHOD BLANK	LEAD RESULT	ICV			CCV			LFB		
					NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)	NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)	NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)
BA230-16	$\mu g/m^3$	0.002	< 0.002	0.057	0.700	0.711	102	0.700	0.670	96	0.730	0.648	93
BA230-17	$\mu g/m^3$	0.002	< 0.002	0.043	0.700	0.711	102	0.700	0.670	96	0.730	0.648	93
BA230-18	$\mu g/m^3$	0.002	< 0.002	0.051	0.700	0.711	102	0.700	0.670	96	0.730	0.648	93
BA230-19	$\mu g/m^3$	0.002	< 0.002	0.049	0.700	0.711	102	0.700	0.670	96	0.730	0.648	93
BA230-20	$\mu g/m^3$	0.002	< 0.002	0.008	0.700	0.711	102	0.700	0.670	96	0.730	0.648	93
ACCEPTABLE LIMIT		< 0.002					90-110			90-110			90-110

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ผลการประกันคุณภาพของห้องปฏิบัติการวิเคราะห์ (QA/QC) สำหรับ บริษัท ทางด่วนและรถไฟฟ้ากรุงเทพ จำกัด (มหาชน)

(เก็บตัวอย่างบริเวณโรงเรียนอนุบาลสายแสนใจ(ถนนพหลโยธิน) เมื่อวันที่ 2 - 7 พฤศจิกายน 2567)

ANALYSIS NO.	UNIT	DETECTION LIMIT	METHOD BLANK	LEAD RESULT	ICV			CCV			LFB		
					NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)	NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)	NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)
BA131-21	$\mu g/m^3$	0.002	< 0.002	0.038	0.700	0.711	102	0.700	0.670	96	0.730	0.648	93
BA131-22	$\mu g/m^3$	0.002	< 0.002	0.034	0.700	0.711	102	0.700	0.670	96	0.730	0.648	93
BA131-23	$\mu g/m^3$	0.002	< 0.002	0.037	0.700	0.711	102	0.700	0.670	96	0.730	0.648	93
BA131-24	$\mu g/m^3$	0.002	< 0.002	0.039	0.700	0.711	102	0.700	0.670	96	0.730	0.648	93
BA131-25	$\mu g/m^3$	0.002	< 0.002	0.039	0.700	0.711	102	0.700	0.670	96	0.730	0.648	93
ACCEPTABLE LIMIT		< 0.002					90-110			90-110			90-110

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ผลการประกันคุณภาพของห้องปฏิบัติการวิเคราะห์ (QA/QC) สำหรับ บริษัท ทางด่วนและรถไฟฟ้ากรุงเทพ จำกัด (มหาชน)

(เก็บตัวอย่างบริเวณปูนซีเมนต์ไทย(ถนนบางซื่อ) เมื่อวันที่ 2 - 7 พฤศจิกายน 2567)

ANALYSIS NO.	UNIT	DETECTION LIMIT	METHOD BLANK	LEAD RESULT	ICV			CCV			LFB		
					NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)	NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)	NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)
BA131-26	$\mu g/m^3$	0.002	< 0.002	0.035	0.700	0.711	102	0.700	0.670	96	0.730	0.648	93
BA131-27	$\mu g/m^3$	0.002	< 0.002	0.029	0.700	0.711	102	0.700	0.670	96	0.730	0.648	93
BA131-28	$\mu g/m^3$	0.002	< 0.002	0.030	0.700	0.711	102	0.700	0.670	96	0.730	0.648	93
BA131-29	$\mu g/m^3$	0.002	< 0.002	0.011	0.700	0.711	102	0.700	0.670	96	0.730	0.648	93
BA131-30	$\mu g/m^3$	0.002	< 0.002	0.030	0.700	0.711	102	0.700	0.670	96	0.730	0.648	93
ACCEPTABLE LIMIT		< 0.002					90-110			90-110			90-110

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ผลการประกันคุณภาพของห้องปฏิบัติการวิเคราะห์ (QA/QC) สำหรับ บริษัท ทางด่วนและรถไฟฟ้ากรุงเทพ จำกัด (มหาชน)

(เก็บตัวอย่างบริเวณแพ่งพลพลศรัลศัพท์การทดสอบ(ถนนสามเสน) เมื่อวันที่ 2 - 7 พฤศจิกายน 2567)

ANALYSIS NO.	UNIT	DETECTION LIMIT	METHOD BLANK	LEAD RESULT	ICV			CCV			LFB		
					NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)	NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)	NOMINAL (mg/L)	MEASURED (mg/L)	RECOVERY (%)
6A131-31	$\mu g/m^3$	0.002	< 0.002	0.049	0.700	0.711	102	0.709	0.670	96	0.730	0.648	93
6A131-32	$\mu g/m^3$	0.002	< 0.002	0.058	0.700	0.711	102	0.709	0.670	96	0.730	0.648	93
6A131-33	$\mu g/m^3$	0.002	< 0.002	0.057	0.700	0.711	102	0.709	0.670	96	0.730	0.648	93
6A131-34	$\mu g/m^3$	0.002	< 0.002	0.063	0.700	0.711	102	0.709	0.670	96	0.730	0.648	93
6A131-35	$\mu g/m^3$	0.002	< 0.002	0.063	0.700	0.711	102	0.709	0.670	96	0.730	0.648	93
ACCEPTABLE LIMIT		< 0.002					90-110			90-110			90-110

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ผลการประกันคุณภาพภายในห้องปฏิบัติการวิเคราะห์ คุณภาพน้ำผิวดิน ของโครงการระบบทางด่วนขั้นที่ 2 ทางพิเศษศรีรัช

ดัชนี	หน่วย	DETECTION LIMIT	METHOD BLANK	INITIAL CALIBRATION VERIFICATION (ICV)			LABORATORY FORTIFIED BLANK (LFB)			T24AZ281-0001 ผลการวิเคราะห์ DUPLICATE		
				NOMINAL	MEASURED	%RECOVERY	NOMINAL	MEASURED	%RECOVERY	1	2	RPD
LEAD	mg/L Pb	0.007	< 0.007	0.700	0.710	101	0.700	0.681	97.3	< 0.007	< 0.007	-
เกณฑ์ที่ยอมรับได้						**90 - 110%**			**85 - 115%**			**≤ 10%**

ดัชนี	หน่วย	T24AZ281-0001 ผลการวิเคราะห์ LABORATORY FORTIFIED MATRIX (LFM)				LABORATORY FORTIFIED BLANK (LFB)			CONTINUOUS CALIBRATION VERIFICATION (CCV)		
		SAMPLE	NOMINAL	MEASURED	%RECOVERY	NOMINAL	MEASURED	%RECOVERY	NOMINAL	MEASURED	%RECOVERY
LEAD	mg/L Pb	< 0.007	0.700	0.682	97.4	0.700	0.682	97.4	0.700	0.703	100
เกณฑ์ที่ยอมรับได้					**85 - 115%**			**85 - 115%**			**90 - 110%**

ภาคผนวก ฌ
หนังสืออนุญาตขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

[redacted]

สำเนาถูกต้อง

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สำเนาถูกต้อง

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ลำดับ	การทดสอบ	วิธีทดสอบ
1	[illegible]	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
2	[illegible]	1) Digestion, Nitric Spectrophotometric Analysis Spectrometric Method[illegible] 2) Digestion, Inductively Coupled Plasma Method[illegible]
3	[illegible]	Digestion, Inductively Coupled Plasma Method[illegible]
4	[illegible]	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
5	[illegible]	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
6	[illegible]	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
7	[illegible]	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
8	Bacterial Oxygen Demand	1) 5-Day BOD Test, Azide Modification Method[illegible] 2) 5-Day BOD Test, Membrane Electrode Method[illegible]
9	Cadmium	1) Digestion, Direct Air-Acetylene Flame Method[illegible] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method[illegible] 3) Digestion, Inductively Coupled Plasma Method[illegible]
10	Chemical Oxygen Demand	1) Closed Reflux, Titrimetric Method[illegible] 2) Closed Reflux, Colorimetric Method[illegible] 3) Open Reflux, Titrimetric Method[illegible]
11	Chloroform	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
12	Chromium	1) Digestion, Direct Air-Acetylene Flame Method[illegible] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method[illegible] 3) Digestion, Inductively Coupled Plasma Method[illegible]
13	Color	APHA Weighted Ordinate Spectrophotometric Method[illegible]
14	Copper	1) Digestion, Direct Air-Acetylene Flame Method[illegible] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method[illegible] 3) Digestion, Inductively Coupled Plasma Method[illegible]
15	Cyanide	1) Distillation, Titrimetric Method[illegible] 2) Distillation, Colorimetric Method[illegible] 3) Flow Injection Analysis Method[illegible]
16	[illegible]	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]

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สำเนาถูกต้อง

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ลำดับ	การทดสอบ	วิธีทดสอบ
17	[illegible]	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
18	[illegible]	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
19	[illegible]	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
20	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
21	Endosulfan I	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
22	Endosulfan II	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
23	Endosulfan sulfate	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
24	Endrin	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
25	Endrin aldehyde	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
26	Formaldehyde	Nethamin, Colorimetric Method[illegible]
27	Free Chlorine	1) Iodometric Method[illegible] 2) DPD Ferrous Titrimetric Method[illegible]
28	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
29	Heptachlor Epoxide	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
30	Hexavalent Chromium	1) Colorimetric Method[illegible] 2) Digestion, Direct Air-Acetylene Flame Method[illegible]
31	Lead	1) Digestion, Direct Air-Acetylene Flame Method[illegible] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method[illegible] 3) Digestion, Inductively Coupled Plasma Method[illegible]
32	Manganese	1) Digestion, Direct Air-Acetylene Flame Method[illegible] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method[illegible] 3) Digestion, Inductively Coupled Plasma Method[illegible]
33	Mercury	Digestion, Cold Vapor Atomic Absorption Spectrometric Method[illegible]
34	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
35	Nickel	1) Digestion, Direct Air-Acetylene Flame Method[illegible] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method[illegible] 3) Digestion, Inductively Coupled Plasma Method[illegible]
36	Oil & Grease	1) Liquid-Liquid Extraction Method[illegible] 2) Soxhlet Extraction Method[illegible]
37	pH	Electrometric Method[illegible]

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สำเนาถูกต้อง

ลำดับ	รายการ	วิธีการ
18	Phenols	1) Distillation, Chloroform Extraction Method[4] 2) Distillation, Direct Photometric Method[4]
19	Selenium	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method[4] 2) Digestion, Inductively Coupled Plasma Method[4]
20	Sulfide	1) Iodometric Method[4] 2) Methylene Blue Method[4]
21	Temperature	Laboratory and Field Method[4]
22	Total Dissolved Solids	Dried at 180 °C[4]
23	Total Kjeldahl Nitrogen	Semi-Micro Kjeldahl Method[4]
24	Total Suspended Solids	Dried from 103 to 105 °C[4]
25	Trivalent Chromium	1) Digestion, Direct Air-Acetylene Flame Method, Colorimetric Methods Calculation[4] 2) Digestion, Inductively Coupled Plasma Method, Colorimetric Methods Calculation[4]
26	Zinc	1) Digestion, Direct Air-Acetylene Flame Method[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method[4] 3) Digestion, Inductively Coupled Plasma Method[4]

2) วิธีวิเคราะห์ [illegible]

ลำดับ	รายการ	วิธีการ
1	Acenaphthene	1) Liquid-Liquid Extraction, Gas Chromatographic Method[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
2	Acrylonitrile	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
3	Aldrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
4	Anthracene	1) Liquid-Liquid Extraction, Gas Chromatographic Method[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]

[redacted]

สำเนาถูกต้อง

ลำดับ	รายการ	วิธีการ
5	Antimony	Digestion, Inductively Coupled Plasma Method[4]
6	Arsenic	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method[4] 2) Digestion, Inductively Coupled Plasma Method[4]
7	Atrazine	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
8	Barium	1) Digestion, Electrothermal Atomic Absorption Spectrometric Method[4] 2) Digestion, Inductively Coupled Plasma Method[4]
9	Benzo(a)pyrene	1) Liquid-Liquid Extraction, Gas Chromatographic Method[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
10	Benzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
11	Benzo(b)fluoranthene	1) Liquid-Liquid Extraction, Gas Chromatographic Method[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
12	Benzo(k)fluoranthene	1) Liquid-Liquid Extraction, Gas Chromatographic Method[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
13	Benzoic acid	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
14	Benzo(ghi)perylene	1) Liquid-Liquid Extraction, Gas Chromatographic Method[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
15	Benzo(g,h,i)perylene	1) Liquid-Liquid Extraction, Gas Chromatographic Method[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
16	Beryllium	Digestion, Inductively Coupled Plasma Method[4]
17	Bis(2-chloroethyl)ether	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
18	Bis(2-ethylhexyl)phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]

[redacted]

สำเนาถูกต้อง

ลำดับ	รายการ	วิธีการ
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, Direct Air-Acetylene Flame Method[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method[4] 3) Digestion, Inductively Coupled Plasma Method[4]
24	Carbaryl	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
25	Carbon disulfide	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
26	Carbon tetrachloride	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
27	Chlordane	1) Liquid-Liquid Extraction, Gas Chromatographic Method[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
28	p-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
29	Chlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
30	Chlorodibromomethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
31	Chloroform	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
32	2-Chlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
33	Chromium	1) Digestion, Direct Air-Acetylene Flame Method[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method[4] 3) Digestion, Inductively Coupled Plasma Method[4]

[redacted]

สำเนาถูกต้อง

ลำดับ	รายการ	วิธีการ
34	Chromium (VI)	1) Digestion, Direct Air-Acetylene Flame Method, Colorimetric Methods Calculation[4] 2) Digestion, Inductively Coupled Plasma Method, Colorimetric Methods Calculation[4]
35	Chromium (VI)	1) Colorimetric Method[4] 2) Extraction, Air-Acetylene Flame Method[4]
36	Chrysene	1) Liquid-Liquid Extraction, Gas Chromatographic Method[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
37	Cyanide	Distillation, Colorimetric Method[4]
38	2,4-D	Liquid-Liquid Extraction, Gas Chromatographic Method[4]
39	DDD	1) Liquid-Liquid Extraction, Gas Chromatographic Method[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
40	DDE	1) Liquid-Liquid Extraction, Gas Chromatographic Method[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
41	DDT	1) Liquid-Liquid Extraction, Gas Chromatographic Method[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
42	Dibenz(a,h)anthracene	1) Liquid-Liquid Extraction, Gas Chromatographic Method[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
43	Di-n-butyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
44	1,2-Dichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
45	1,3-Dichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
46	1,4-Dichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
47	3,3'-Dichlorobenzidine	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]

[redacted]

สำเนาถูกต้อง

ลำดับ	การเจือปน	วิธีการวิเคราะห์
48	1,1-Dichloroethane	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method[5]
49	1,2-Dichloroethane	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method[5]
50	1,1-Dichloroethylene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method[5]
51	cis-1,2-Dichloroethylene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method[5]
52	trans-1,2-Dichloroethylene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method[5]
53	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]
54	1,2-Dichloropropane	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method[5]
55	1,3-Dichloropropene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method[5]
56	1,3-Dichloropropene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method[5]
57	Dieldrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method[5] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]
58	Diethyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]
59	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]
60	2,4-Dinitrophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]
61	2,4-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]
62	2,6-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]
63	Di-n-octyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5] [redacted]
64	Endosulfan	1) Liquid-Liquid Extraction, Gas Chromatographic Method[5] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]

ลำดับ	การเจือปน	วิธีการวิเคราะห์
65	Endrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method[5] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]
66	Ethylbenzene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method[5]
67	Fluoranthene	1) Liquid-Liquid Extraction, Gas Chromatographic Method[5] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]
68	Fluorene	1) Liquid-Liquid Extraction, Gas Chromatographic Method[5] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]
69	Heptachlor	1) Liquid-Liquid Extraction, Gas Chromatographic Method[5] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]
70	Heptachlor epoxide	1) Liquid-Liquid Extraction, Gas Chromatographic Method[5] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]
71	Hexachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]
72	Hexachloro-1,3-butadiene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method[5]
73	n-Hexane	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method[5]
74	α-HCH	1) Liquid-Liquid Extraction, Gas Chromatographic Method[5] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]
75	β-HCH	1) Liquid-Liquid Extraction, Gas Chromatographic Method[5] [redacted] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]

ลำดับ	การเจือปน	วิธีการวิเคราะห์
76	γ-HCH	1) Liquid-Liquid Extraction, Gas Chromatographic Method[5] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]
77	Hexachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]
78	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]
79	Indeno(1,2,3-cd)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]
80	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]
81	Lead	1) Digestion, Direct Air-Acetylene Flame Method[5] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method[5] 3) Digestion, Inductively Coupled Plasma Method[5]
82	Manganese	1) Digestion, Direct Air-Acetylene Flame Method[5] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method[5] 3) Digestion, Inductively Coupled Plasma Method[5]
83	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method[5]
84	Methanol	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method[5]
85	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic Method[5]
86	Methyl bromide	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method[5]
87	Methylene chloride	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method[5]
88	2-Methylnaphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]
89	2-Methylnaphthalene	1) Liquid-Liquid Extraction, Gas Chromatographic Method[5] [redacted] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]
90	Methyl tert butyl ether	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method[5]

ลำดับ	การเจือปน	วิธีการวิเคราะห์
91	Naphthalene	1) Liquid-Liquid Extraction, Gas Chromatographic Method[5] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]
92	Nickel	1) Digestion, Direct Air-Acetylene Flame Method[5] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method[5] 3) Digestion, Inductively Coupled Plasma Method[5]
93	Nitrobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]
94	N-Nitrosodiphenylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]
95	N-Nitrosodi-n-propylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]
96	Polychlorinated Biphenyls - PCB-1016 - PCB-1221 - PCB-1232 - PCB-1242 - PCB-1248 - PCB-1254 - PCB-1260	1) Liquid-Liquid Extraction, Gas Chromatographic Method[5] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]
97	Pentachlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]
98	pH	Electrometric Method[5]
99	Phenanthrene	1) Liquid-Liquid Extraction, Gas Chromatographic Method[5] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]
100	Phenol	1) Distillation, Chloroform Extraction Method[5] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]
101	Pyrene	1) Liquid-Liquid Extraction, Gas Chromatographic Method[5] [redacted] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[5]

ลำดับ	รายการตัวอย่าง	วิธีวิเคราะห์
102	Selenium	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method[illegible] 2) Digestion, Inductively Coupled Plasma Method[illegible]
103	Silver	Digestion, Inductively Coupled Plasma Method[illegible]
104	Styrene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method[illegible]
105	1,1,1,2-Tetrachloroethane	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method[illegible]
106	Tetrachloroethylene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method[illegible]
107	Toluene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method[illegible]
108	Toxaphene	1) Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[illegible]
109	$TPH(C_6 - C_{10})$	1) Purge and Trap, Gas Chromatographic Method[illegible] 2) Purge and Trap, Gas Chromatographic/ Mass spectrometric Method[illegible]
110	$TPH(C_{10} - C_{28})$	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
111	$TPH(C_{28} - C_{40})$	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
112	1,2,4-Trichlorobenzene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method[illegible]
113	1,1,1-Trichloroethane	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method[illegible]
114	1,1,2-Trichloroethane	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method[illegible]
115	Trichloroethylene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method[illegible]
116	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[illegible]
117	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[illegible]
118	1,2,3-Trimethylbenzene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method[illegible]

ลำดับ	รายการตัวอย่าง	วิธีวิเคราะห์
119	Vanadium	Digestion, Inductively Coupled Plasma Method[illegible]
120	Vinyl acetate	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method[illegible]
121	Vinyl chloride	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method[illegible]
122	m-Xylene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method[illegible]
123	o-Xylene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method[illegible]
124	p-Xylene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method[illegible]
125	Xylene (Total)	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method[illegible]
126	Zinc	1) Digestion, Direct Aspiration Flame Method[illegible] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method[illegible] 3) Digestion, Inductively Coupled Plasma Method[illegible]

[illegible]

ลำดับ	รายการตัวอย่าง	วิธีวิเคราะห์
1	Aldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
2	Antimony	Digestion, Inductively Coupled Plasma Method[illegible]
3	Arsenic	1) Waste Extraction, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method[illegible] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method[illegible] 3) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method[illegible]
4	Barium	[illegible] 2) Digestion, Inductively Coupled Plasma Method[illegible]

ลำดับ	รายการตัวอย่าง	วิธีวิเคราะห์
5	Benzidine	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[illegible] 2) Digestion, Inductively Coupled Plasma Method[illegible]
6	Cadmium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method[illegible] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method[illegible] 3) Digestion, Flame Atomic Absorption Spectrometric Method[illegible] 4) Digestion, Inductively Coupled Plasma Method[illegible]
7	Chlordane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
8	Chromium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method[illegible] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method[illegible] 3) Digestion, Flame Atomic Absorption Spectrometric Method[illegible] 4) Digestion, Inductively Coupled Plasma Method[illegible]
9	Chromium (VI)	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method; Waste Extraction, Colorimetric Method, Calculation[illegible] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction, Colorimetric Method, Calculation[illegible] 3) Digestion, Flame Atomic Absorption Spectrometric Method; Alkaline Digestion, Colorimetric Method, Calculation[illegible] 4) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method, Calculation[illegible]
10	Chromium (III)	[illegible]
11	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[illegible] 2) Digestion, Inductively Coupled Plasma Method[illegible]

ลำดับ	รายการตัวอย่าง	วิธีวิเคราะห์
12	Copper	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method[illegible] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method[illegible] 3) Digestion, Flame Atomic Absorption Spectrometric Method[illegible] 4) Digestion, Inductively Coupled Plasma Method[illegible]
13	2,4-D	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
14	DDD	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
15	DDE	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
16	DDT	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
17	Dieldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
18	Endrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
19	Heptachlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) [illegible] Gas Chromatographic Method[illegible]

ลำดับ	รายการทดสอบ	วิธีทดสอบ
20	Lead	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method[illegible] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method[illegible] 3) Digestion, Flame Atomic Absorption Spectrometric Method[illegible] 4) Digestion, Inductively Coupled Plasma Method[illegible]
21	Lindane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
22	Mercury	1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method[illegible] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method[illegible] 3) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method[illegible] 4) Digestion, Inductively Coupled Plasma Method[illegible] 5) Thermal Decomposition Amalgamation and Atomic Absorption Spectrometric Method[illegible]
23	Methoxychlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
24	Nitrobenzene	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[illegible] 2) Digestion, Inductively Coupled Plasma Method[illegible]
25	Nickel	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method[illegible] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method[illegible] 3) Digestion, Flame Atomic Absorption Spectrometric Method[illegible] 4) Digestion, Inductively Coupled Plasma Method[illegible]

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ลำดับ	รายการทดสอบ	วิธีทดสอบ
26	Polychlorinated Biphenyls - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260 - 2-Chlorobiphenyl - 2,3-Dichlorobiphenyl - 2,2',6-Trichlorobiphenyl - 2,4,5-Trichlorobiphenyl - 2,2',3,5'-Tetrachlorobiphenyl - 2,2',5,5'-Tetrachlorobiphenyl - 2,3,4,4'-Tetrachlorobiphenyl - 2,2',4,5,5'-Pentachlorobiphenyl - 2,2',4,5,5'-Pentachlorobiphenyl - 2,3,3',4,4'-Pentachlorobiphenyl - 2,2',3,4,4',5'-Hexachlorobiphenyl - 2,2',3,4,5,5'-Hexachlorobiphenyl - 2,3',4,4',5,5'-Hexachlorobiphenyl - 2,2',4,4',5,5'-Hexachlorobiphenyl - 2,2',3,3',4,5'-Heptachlorobiphenyl - 2,2',3,3',4,6'-Heptachlorobiphenyl - 2,2',3,4,4',5,5'-Heptachlorobiphenyl - 2,2',3,4,4',5',6-Heptachlorobiphenyl - 2,2',3,4',5,5',6-Heptachlorobiphenyl - 2,2',3,3',4,4',5,5'-Octachlorobiphenyl	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Ultrasonic Extraction, Gas Chromatographic Method[illegible]

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ลำดับ	รายการทดสอบ	วิธีทดสอบ
27	Pentachlorophenol	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
28	pH	Electrometric Method[illegible]
29	Selenium	1) Waste Extraction, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method[illegible] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method[illegible] 3) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method[illegible] 4) Digestion, Inductively Coupled Plasma Method[illegible]
30	Silver	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[illegible] 2) Digestion, Inductively Coupled Plasma Method[illegible]
31	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[illegible] 2) Digestion, Inductively Coupled Plasma Method[illegible]
32	Tetrachloroethylene	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
33	Trichloroethylene	1) Waste Extraction, Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible] 2) Waste Extraction, Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method[illegible] 3) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible] 4) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method[illegible]
34	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[illegible] 2) Digestion, Inductively Coupled Plasma Method[illegible]

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ลำดับ	รายการทดสอบ	วิธีทดสอบ
35	Zinc	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method[illegible] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method[illegible] 3) Digestion, Flame Atomic Absorption Spectrometric Method[illegible] 4) Digestion, Inductively Coupled Plasma Method[illegible]

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สำเนาถูกต้อง

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ลำดับที่	การทดสอบ	วิธีวิเคราะห์
1	Benzene	Equilibrium Headspace, Gas Chromatography/ Mass Spectrometric Method [1,2]
2	Carbon tetrachloride	Equilibrium Headspace, Gas Chromatography/ Mass Spectrometric Method [1,2]
3	1,2-Dichloroethane	Equilibrium Headspace, Gas Chromatography/ Mass Spectrometric Method [1,2]
4	1,1-Dichloroethylene	Equilibrium Headspace, Gas Chromatography/ Mass Spectrometric Method [1,2]
5	cis-1,2-Dichloroethylene	Equilibrium Headspace, Gas Chromatography/ Mass Spectrometric Method [1,2]
6	trans-1,2-Dichloroethylene	Equilibrium Headspace, Gas Chromatography/ Mass Spectrometric Method [1,2]
7	Ethylbenzene	Equilibrium Headspace, Gas Chromatography/ Mass Spectrometric Method [1,2]
8	Methylene chloride	Equilibrium Headspace, Gas Chromatography/ Mass Spectrometric Method [1,2]
9	Styrene	Equilibrium Headspace, Gas Chromatography/ Mass Spectrometric Method [1,2]
10	Tetrachloroethylene	Equilibrium Headspace, Gas Chromatography/ Mass Spectrometric Method [1,2]
11	Toluene	Equilibrium Headspace, Gas Chromatography/ Mass Spectrometric Method [1,2]
12	Trichloroethylene	Equilibrium Headspace, Gas Chromatography/ Mass Spectrometric Method [1,2]
13	m-Xylene	Equilibrium Headspace, Gas Chromatography/ Mass Spectrometric Method [1,2]
14	o-Xylene	Equilibrium Headspace, Gas Chromatography/ Mass Spectrometric Method [1,2]
15	p-Xylene	[redacted]
16	Xylene (Total)	[redacted]

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ลำดับ	การเจือปน	วิธีวิเคราะห์
1	Alpha	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
2	Alpha	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method[illegible] 2) Digestion, Inductively Coupled Plasma Method[illegible]
3	Beta	Digestion, Inductively Coupled Plasma Method[illegible]
4	[illegible]	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
5	[illegible]	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
6	[illegible]	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
7	[illegible]	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
8	Bromodichloromethane	1) 1-Day BOD Test, Azide Modification Method[illegible] 2) 5-Day BOD Test, Membrane Electrode Method[illegible]
9	Cadmium	1) Digestion, Direct Air-Acetylene Flame Method[illegible] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method[illegible] 3) Digestion, Inductively Coupled Plasma Method[illegible]
10	Chemical Oxygen Demand	1) Closed Reflux, Titrimetric Method[illegible] 2) Closed Reflux, Colorimetric Method[illegible] 3) Open Reflux, Titrimetric Method[illegible]
11	Chloroform	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
12	Chromium	1) Digestion, Direct Air-Acetylene Flame Method[illegible] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method[illegible] 3) Digestion, Inductively Coupled Plasma Method[illegible]
13	Color	ADM Weighted Dominant Wavelength Spectrophotometric Method[illegible]
14	Copper	1) Digestion, Direct Air-Acetylene Flame Method[illegible] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method[illegible] 3) Digestion, Inductively Coupled Plasma Method[illegible]
15	Cyanide	1) [illegible] 2) [illegible] 3) [illegible] Method[illegible]

ลำดับ	การเจือปน	วิธีวิเคราะห์
16	4,4'-DDT	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
17	4,4'-DDD	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
18	4,4'-DDE	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
19	4,4'-DDT	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
20	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
21	Endosulfan I	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
22	Endosulfan II	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
23	Endosulfan sulfate	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
24	Endrin	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
25	Endrin aldehyde	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
26	Formaldehyde	Distillation, Colorimetric Method[illegible]
27	Free Chlorine	1) Iodometric Method[illegible] 2) DPD Ferrous Titrimetric Method[illegible]
28	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
29	Heptachlor Epoxide	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
30	Hexavalent Chromium	1) Colorimetric Method[illegible] 2) Extraction, Direct Air-Acetylene Flame Method[illegible]
31	Lead	1) Digestion, Direct Air-Acetylene Flame Method[illegible] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method[illegible] 3) Digestion, Inductively Coupled Plasma Method[illegible]
32	Manganese	1) Digestion, Direct Air-Acetylene Flame Method[illegible] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method[illegible] 3) Digestion, Inductively Coupled Plasma Method[illegible]
33	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method[illegible]
34	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
35	Mirex	1) Digestion, Direct Air-Acetylene Flame Method[illegible] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method[illegible] 3) Digestion, Inductively Coupled Plasma Method[illegible]

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

ลำดับ	การเจือปน	วิธีวิเคราะห์
1	Acrylonitrile	1) Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
2	Antimony	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[illegible]
3	Arsenic	1) [illegible] 2) [illegible] Method[illegible]

ลำดับ	การเจือปน	วิธีวิเคราะห์
4	Acrylonitrile	1) Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
5	Antimony	Digestion, Inductively Coupled Plasma Method[illegible]
6	Arsenic	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method[illegible] 2) Digestion, Inductively Coupled Plasma Method[illegible]
7	Atrazine	Liquid-Solid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
8	Barium	1) Digestion, Electrothermal Atomic Absorption Spectrometric Method[illegible] 2) Digestion, Inductively Coupled Plasma Method[illegible]
9	Benzo(a)pyrene	1) Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
10	Benzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[illegible]
11	Bromodichloromethane	1) Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
12	Bromoform (Tribromomethane)	1) Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
13	Bromoacetic acid	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
14	Bromodichloroacetic	1) Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]

ลำดับ	สารเคมีที่	วิธีวิเคราะห์
13	Styrene/Vinylbenzene	1) Liquid-Liquid Extraction, Gas Chromatographic Method[*] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[*]
14	Sulfur	Digestion, Inductively Coupled Plasma Method[*]
15	1,1,2,2-Tetrachloroethane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[*]
16	1,1,2,2-Tetrachloroethylene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[*]
17	Tetrachlorocarbon/Tetrachloromethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[*]
18	Tribromomethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[*]
19	Toluene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[*]
20	Butyl benzyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[*]
21	Cadmium	1) Digestion, Direct Air-Acetylene Flame Method[*] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method[*] 3) Digestion, Inductively Coupled Plasma Method[*]
22	Cellulose	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[*]
23	Carbon disulfide	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[*]
24	Carbon tetrachloride	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[*]
25	Chlordane	1) Liquid-Liquid Extraction, Gas Chromatographic Method[*] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[*]
26	p-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[*]
27	Chlorobenzene	[redacted]

ลำดับ	สารเคมีที่	วิธีวิเคราะห์
28	Chlorodibromomethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[*]
29	Chloroform	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[*]
30	2-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[*]
31	Chromium	1) Digestion, Direct Air-Acetylene Flame Method[*] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method[*] 3) Digestion, Inductively Coupled Plasma Method[*]
32	Chromium III	1) Digestion, Direct Air-Acetylene Flame Method Colorimetric Method Calculation[*] 2) Digestion, Inductively Coupled Plasma Method, Colorimetric Method Calculation[*]
33	Chromium VI	1) Colorimetric Method[*] 2) Extraction, Air-Acetylene Flame Method[*]
34	Chrysene	1) Liquid-Liquid Extraction, Gas Chromatographic Method[*] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[*]
35	Cyanide	Distillation, Colorimetric Method[*]
36	2,4-D	Liquid-Liquid Extraction, Gas Chromatographic Method[*]
37	DDD	1) Liquid-Liquid Extraction, Gas Chromatographic Method[*] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[*]
38	DDE	1) Liquid-Liquid Extraction, Gas Chromatographic Method[*] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[*]
39	DDT	1) [redacted]

ลำดับ	สารเคมีที่	วิธีวิเคราะห์
40	Dibenzo(a,h)anthracene	1) Liquid-Liquid Extraction, Gas Chromatographic Method[*] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[*]
41	Di-n-butyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[*]
42	1,2-Dichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[*]
43	1,3-Dichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[*]
44	1,4-Dichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[*]
45	3,3'-Dichlorobenzidine	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[*]
46	1,1-Dichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[*]
47	1,2-Dichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[*]
48	1,1-Dichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[*]
49	cis-1,2-Dichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[*]
50	trans-1,2-Dichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[*]
51	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[*]
52	1,2-Dichloropropane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[*]
53	1,3-Dichloropropene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[*]
54	1,3-Dichloropropene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[*]
55	Dieldrin	1) [redacted] 2) [redacted]

ลำดับ	สารเคมีที่	วิธีวิเคราะห์
56	Diethyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[*]
57	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[*]
58	Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[*]
59	2,4-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[*]
60	2,6-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[*]
61	Di-n-octyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[*]
62	Endosulfan	1) Liquid-Liquid Extraction, Gas Chromatographic Method[*] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[*]
63	Endrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method[*] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[*]
64	Ethylbenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[*]
65	Fluoranthene	1) Liquid-Liquid Extraction, Gas Chromatographic Method[*] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[*]
66	Fluorene	1) Liquid-Liquid Extraction, Gas Chromatographic Method[*] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[*]
67	Heptachlor	1) Liquid-Liquid Extraction, Gas Chromatographic Method[*] 2) [redacted]

ลำดับ	สารเคมีที่	วิธีวิเคราะห์
70	Heptachlor epoxide	1) Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
71	Hexachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
72	Hexachloro-1,3-butadiene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[illegible]
73	Indene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[illegible]
74	α-HCH	1) Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
75	β-HCH	1) Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
76	γ-HCH	1) Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
77	Hexachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
78	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
79	Hexyl-2,5-hexadiyne	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
80	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
81	Lead	1) Digestion, Direct Air-Acetylene Flame Method[illegible] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method[illegible] [redacted]

ลำดับ	สารเคมีที่	วิธีวิเคราะห์
82	Manganese	1) Digestion, Direct Air-Acetylene Flame Method[illegible] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method[illegible] 3) Digestion, Inductively Coupled Plasma Method[illegible]
83	Mercury	Digestion, Cold Vapor Atomic Absorption Spectrometric Method[illegible]
84	Methanol	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[illegible]
85	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
86	Methyl bromide	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[illegible]
87	Methylene chloride	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[illegible]
88	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
89	2-Methylnaphthalene	1) Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
90	Methyl tert-butyl ether	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[illegible]
91	Naphthalene	1) Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
92	Nickel	1) Digestion, Direct Air-Acetylene Flame Method[illegible] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method[illegible] 3) Digestion, Inductively Coupled Plasma Method[illegible]
93	Nitrobenzene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
94	4-Nitroaniline	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
95	4-Nitrophenol	[redacted]

ลำดับ	สารเคมีที่	วิธีวิเคราะห์
96	Polychlorinated Biphenyls - PCB 1016 - PCB 1221 - PCB 1232 - PCB 1242 - PCB 1248 - PCB 1254 - PCB 1260	1) Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
97	Pentachlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
98	pH	Electrometric Method[illegible]
99	Phenanthrene	1) Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
100	Phenol	1) Distillation, Chloroform Extraction Method[illegible] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
101	Pyrene	1) Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
102	Selenium	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method[illegible] 2) Digestion, Inductively Coupled Plasma Method[illegible]
103	Silver	Digestion, Inductively Coupled Plasma Method[illegible]
104	Styrene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[illegible]
105	1,1,2,2-Tetrachloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[illegible]
106	Tetrachloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[illegible]
107	Toluene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[illegible] [redacted]

ลำดับ	สารเคมีที่	วิธีวิเคราะห์
108	Toxaphene	1) Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
109	TPH (C_6 - C_9)	1) Purge and Trap, Gas Chromatographic Method[illegible] 2) Purge and Trap, Gas Chromatographic/Mass spectrometric Method[illegible]
110	TPH (C_{10} - C_{14})	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
111	TPH (C_{15} - C_{36})	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]
112	1,2,4-Trichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[illegible]
113	1,1,1-Trichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[illegible]
114	1,1,2-Trichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[illegible]
115	Trichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[illegible]
116	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
117	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
118	1,2,3-Trimethylbenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[illegible]
119	Vanadium	Digestion, Inductively Coupled Plasma Method[illegible]
120	Vinyl acetate	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[illegible]
121	Vinyl chloride	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[illegible]
122	m-Xylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[illegible]
123	o-Xylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[illegible] [redacted]

ลำดับ	ความเข้ม	วิธีการ
124	p-Xylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[illegible]
125	Xylene (Total)	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[illegible]
126	Zinc	1) Digestion, Direct Air-Acetylene Flame Method[illegible] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method[illegible] 3) Digestion, Inductively Coupled Plasma Method[illegible]

[illegible] จำนวน 23 รายการ

ลำดับ	ความเข้ม	วิธีการ
1	Antimony	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[illegible]
2	Arsenic	1) Isokinetic Sampling, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method[illegible] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[illegible]
3	Cadmium	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method[illegible] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[illegible]
4	Carbon Monoxide	Instrumental Analyzer Method[illegible]
5	Chlorine	Isokinetic Sampling, Ion Chromatographic Method[illegible]
6	Chromium	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method[illegible] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[illegible]
7	Cobalt	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[illegible]
8	Copper	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method[illegible] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[illegible]
9	Cyanide	Amenable Cyanide Digestion, Colorimetric Method[illegible]

[redacted]

ลำดับ	ความเข้ม	วิธีการ
10	Dioxin/Furans	Isokinetic Sampling[illegible]
11	Hydrogen Chloride	Isokinetic Sampling, Ion Chromatographic Method[illegible]
12	Hydrogen Fluoride	Isokinetic Sampling, Ion Chromatographic Method[illegible]
13	Hydrogen Sulfide	Absorption Sampling, Isokinetic Method[illegible]
14	Lead	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method[illegible] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[illegible]
15	Manganese	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method[illegible] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[illegible]
16	Mercury	Isokinetic Sampling, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method[illegible]
17	Nickel	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method[illegible] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[illegible]
18	Opacity	Ringelmann's Method[illegible]
19	Oxides of Nitrogen	1) Absorption Sampling, Phenoldisulfonic acid Method[illegible] 2) Instrumental Analyzer Method[illegible]
20	Selenium	1) Isokinetic Sampling, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method[illegible] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[illegible]
21	Sulfur Dioxide	1) Absorption Sampling, Barium Thorin Titrimetric Method[illegible] 2) Instrumental Analyzer Method[illegible]
22	Sulfuric Acid	Isokinetic Sampling, Barium Thorin Titrimetric Method[illegible]
23	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method[illegible]
24	Vanadium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[illegible]
25	Xylene	1) Purge and Trap Gas Chromatographic Method[illegible] 2) Purge and Trap Gas Chromatographic Method[illegible]

[redacted]

[illegible] จำนวน 20 รายการ

ลำดับ	ความเข้ม	วิธีการ
1	Acid	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
2	Antimony	Digestion, Inductively Coupled Plasma Method[illegible]
3	Arsenic	1) Waste Extraction, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method[illegible] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method[illegible] 3) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method[illegible] 4) Digestion, Inductively Coupled Plasma Method[illegible]
4	Barium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[illegible] 2) Digestion, Inductively Coupled Plasma Method[illegible]
5	Beryllium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[illegible] 2) Digestion, Inductively Coupled Plasma Method[illegible]
6	Cadmium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method[illegible] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method[illegible] 3) Digestion, Flame Atomic Absorption Spectrometric Method[illegible] 4) Digestion, Inductively Coupled Plasma Method[illegible]
7	Chloroform	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
8	Chromium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method[illegible] 2) [illegible]

[redacted]

ลำดับ	ความเข้ม	วิธีการ
		3) Digestion, Flame Atomic Absorption Spectrometric Method[illegible] 4) Digestion, Inductively Coupled Plasma Method[illegible]
9	Chromium (III)	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method, Waste Extraction, Colorimetric Method, Calculation[illegible] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method, Waste Extraction, Colorimetric Method, Calculation[illegible] 3) Digestion, Flame Atomic Absorption Spectrometric Method, Alkaline Digestion, Colorimetric Method, Calculation[illegible] 4) Digestion, Inductively Coupled Plasma Method, Alkaline Digestion, Colorimetric Method, Calculation[illegible]
10	Chromium (VI)	1) Waste Extraction, Colorimetric Method[illegible] 2) Alkaline Digestion, Colorimetric Method[illegible]
11	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[illegible] 2) Digestion, Inductively Coupled Plasma Method[illegible]
12	Copper	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method[illegible] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method[illegible] 3) Digestion, Flame Atomic Absorption Spectrometric Method[illegible] 4) Digestion, Inductively Coupled Plasma Method[illegible]
13	DDT	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
14	DDD	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[illegible]

[redacted]

ลำดับ	สารเคมีที่	วิธีวิเคราะห์
15	DDE	1) Water Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
16	DDT	1) Water Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
17	Dieldrin	1) Water Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
18	Endrin	1) Water Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
19	Heptachlor	1) Water Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
20	Lead	1) Water Extraction, Digestion, Flame Atomic Absorption Spectrometric Method[illegible] 2) Water Extraction, Digestion, Inductively Coupled Plasma Method[illegible] 3) Digestion, Flame Atomic Absorption Spectrometric Method[illegible] 4) Digestion, Inductively Coupled Plasma Method[illegible]
21	Lindane	1) Water Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
22	Mercury	1) Water Extraction, Digestion, Cold Vapor Atomic Absorption Spectrometric Method[illegible] 2) Water Extraction, Digestion, Inductively Coupled Plasma Method[illegible]

ลำดับ	สารเคมีที่	วิธีวิเคราะห์
		3) Digestion, Cold Vapor Atomic Absorption Spectrometric Method[illegible] 4) Digestion, Inductively Coupled Plasma Method[illegible] 5) Thermal Decomposition Amalgamation and Atomic Absorption Spectrometric Method[illegible]
23	Methoxychlor	1) Water Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
24	Molybdenum	1) Water Extraction, Digestion, Inductively Coupled Plasma Method[illegible] 2) Digestion, Inductively Coupled Plasma Method[illegible]
25	NOVs	1) Water Extraction, Digestion, Flame Atomic Absorption Spectrometric Method[illegible] 2) Water Extraction, Digestion, Inductively Coupled Plasma Method[illegible] 3) Digestion, Flame Atomic Absorption Spectrometric Method[illegible] 4) Digestion, Inductively Coupled Plasma Method[illegible]
26	Polychlorinated Biphenyls - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260 - 3,4-Dichlorobiphenyl - 3,5-Dichlorobiphenyl - 2,2',5-Trichlorobiphenyl - 2,4',5-Trichlorobiphenyl - 2,2',3,5'-Tetrachlorobiphenyl - 2,2',5,5'-Tetrachlorobiphenyl - 2,2',4,5'-Tetrachlorobiphenyl - 2,2',3,4',6-Pentachlorobiphenyl	1) Water Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Ultrasonic Extraction, Gas Chromatographic Method[illegible]

ลำดับ	สารเคมีที่	วิธีวิเคราะห์
	- 2,2',4,5,5'-Pentachlorobiphenyl - 2,3,3',4,4'-Pentachlorobiphenyl - 2,2',3,4,5',6-Hexachlorobiphenyl - 2,2',3,4,5,5'-Hexachlorobiphenyl - 2,2',3,4,5',6'-Hexachlorobiphenyl - 2,2',4,4',5,5'-Hexachlorobiphenyl - 2,3,3',4,4',5-Hexachlorobiphenyl - 2,2',3,4,4',5',6-Heptachlorobiphenyl - 2,2',3,4',5,5',6-Heptachlorobiphenyl - 2,2',3,3',4,4',5,6-Octachlorobiphenyl	
27	Pentachlorophenol	1) Water Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
28	pH	Electrometric Method[illegible]
29	Selenium	1) Water Extraction, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method[illegible] 2) Water Extraction, Digestion, Inductively Coupled Plasma Method[illegible] 3) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method[illegible] 4) Digestion, Inductively Coupled Plasma Method[illegible]

ลำดับ	สารเคมีที่	วิธีวิเคราะห์
30	Silver	1) Water Extraction, Digestion, Inductively Coupled Plasma Method[illegible] 2) Digestion, Inductively Coupled Plasma Method[illegible]
31	Thallium	1) Water Extraction, Digestion, Inductively Coupled Plasma Method[illegible] 2) Digestion, Inductively Coupled Plasma Method[illegible]
32	Toxaphene	1) Water Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[illegible] 2) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
33	Trihalomethanes	1) Water Extraction, Purge and Trap, Gas Chromatography/Mass Spectrometric Method[illegible] 2) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
34	Vanadium	1) Water Extraction, Digestion, Inductively Coupled Plasma Method[illegible] 2) Digestion, Inductively Coupled Plasma Method[illegible]
35	Zinc	1) Water Extraction, Digestion, Flame Atomic Absorption Spectrometric Method[illegible] 2) Water Extraction, Digestion, Inductively Coupled Plasma Method[illegible] 3) Digestion, Flame Atomic Absorption Spectrometric Method[illegible] 4) Digestion, Inductively Coupled Plasma Method[illegible]

ชื่อ ปีตรอน และ ทอลูอีน

ลำดับ	สารเคมีที่	วิธีวิเคราะห์
1	Acetophenone	1) Ultrasonic Extraction, Gas Chromatographic Method[illegible] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
2	Acetone	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
3		

ลำดับ	การเจือปน	วิธีการวิเคราะห์
2	Alpha	1) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
		2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
4	Anthracene	1) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
		2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
5	Antimony	Digestion, Inductively Coupled Plasma Method[illegible]
6	Arsenic	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method[illegible]
		2) Digestion, Inductively Coupled Plasma Method[illegible]
7	Asbestos	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
8	Barium	Digestion, Inductively Coupled Plasma Method[illegible]
9	Benzo(a)anthracene	1) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
		2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
10	Benzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
11	Benzo(b)fluoranthene	1) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
		2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
12	Benzo(k)fluoranthene	1) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
		2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
13	Benzoic acid	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
14	Benzo(g,h,i)perylene	1) Ultrasonic Extraction, Gas Chromatographic [redacted]
		2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]

[illegible]

ลำดับ	การเจือปน	วิธีการวิเคราะห์
15	Benzo(g,h,i)-perylene	1) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
		2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
16	Beryllium	Digestion, Inductively Coupled Plasma Method[illegible]
17	Bis(2-chloroethyl)ether	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
18	Bis(2-ethylhexyl)phthalate	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
20	Bromoform	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
21	Boron	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
22	Butyl benzyl phthalate	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
23	Cadmium	1) Digestion, Flame Atomic Absorption Spectrometric Method[illegible]
		2) Digestion, Inductively Coupled Plasma Method[illegible]
24	Carbazole	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
25	Carbon disulfide	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
27	Chlordane	1) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
		2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
28	p-Chloroaniline	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible] [redacted]
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]

[illegible]

ลำดับ	การเจือปน	วิธีการวิเคราะห์
31	Chloroform	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
32	2-Chlorophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
33	Chromium	1) Digestion, Flame Atomic Absorption Spectrometric Method[illegible]
		2) Digestion, Inductively Coupled Plasma Method[illegible]
34	Chromium (VI)	1) Digestion, Flame Atomic Absorption Spectrometric Method; Alkaline Digestion, Colorimetric Method, Calculation[illegible]
		2) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method, Calculation[illegible]
35	Chromium (VI)	Alkaline Digestion, Colorimetric Method[illegible]
36	Chrysene	1) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
		2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
37	Cyanide	Extraction, Distillation, Colorimetric Method[illegible]
38	2,4-D	Ultrasonic Extraction, Gas Chromatographic Method[illegible]
39	DDD	1) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
		2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
40	DDE	1) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
		2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
41	DDT	1) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
		2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
42	Dibenz(a,h)anthracene	1) Ultrasonic Extraction, Gas Chromatographic [redacted]
		Spectrometric Method[illegible]

[illegible]

ลำดับ	การเจือปน	วิธีการวิเคราะห์
43	Di-n-butyl phthalate	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
47	3,3'-Dichlorobenzidine	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
48	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
49	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
50	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
53	2,4-Dichlorophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
55	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
57	Dieldrin	1) Ultrasonic Extraction, Gas Chromatographic Method[illegible]
		2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
58	Diethyl phthalate	Ultrasonic Extraction, Gas Chromatographic [redacted]
59	2,4-Dimethylphenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]

[illegible]

ลำดับ	สารมลพิษ	วิธีตรวจ
60	2,4-Dinitrophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method
61	2,4-Dinitrotoluene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method
62	2,6-Dinitrotoluene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method
63	Di-n-octyl phthalate	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method
64	Endosulfan	1) Ultrasonic Extraction, Gas Chromatographic Method 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method
65	Endrin	1) Ultrasonic Extraction, Gas Chromatographic Method 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method
67	Fluoranthene	1) Ultrasonic Extraction, Gas Chromatographic Method 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method
68	Fluorene	1) Ultrasonic Extraction, Gas Chromatographic Method 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method
69	Heptachlor	1) Ultrasonic Extraction, Gas Chromatographic Method 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method
70	Heptachlor epoxide	1) Ultrasonic Extraction, Gas Chromatographic Method 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method

สำเนาถูกต้อง

[redacted]

71. Hexachlorobenzene ...

ลำดับ	สารมลพิษ	วิธีตรวจ
71	Hexachlorobenzene	1) Ultrasonic Extraction, Gas Chromatographic Method 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method
73	n-Hexane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method
74	α-HCH	1) Ultrasonic Extraction, Gas Chromatographic Method 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method
75	β-HCH	1) Ultrasonic Extraction, Gas Chromatographic Method 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method
76	γ-HCH	1) Ultrasonic Extraction, Gas Chromatographic Method 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method
77	Hexachlorocyclopentadiene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method
78	Hexachloroethane	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method
79	Indeno(1,2,3-cd)pyrene	1) Ultrasonic Extraction, Gas Chromatographic Method 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method
80	Isophorone	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method
81	Lead	1) Digestion, Flame Atomic Absorption Spectrometric Method 2) Digestion, Inductively Coupled Plasma Method
82	Manganese	1) Digestion, Flame Atomic Absorption Spectrometric Method 2) Digestion, Inductively Coupled Plasma Method

สำเนาถูกต้อง

[redacted]

83 Mercury ...

ลำดับ	สารมลพิษ	วิธีตรวจ
83	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method 2) Digestion, Inductively Coupled Plasma Method 3) Thermal Decomposition, Amalgamation and Atomic Absorption Spectrometric Method
84	Methanol	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method
85	Methoxychlor	1) Ultrasonic Extraction, Gas Chromatographic Method 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method
86	Methyl bromide	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method
87	Methylene chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method
88	2-Methylphenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method
89	2-Methylnaphthalene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method
90	Methyl tert-butyl ether	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method
91	Naphthalene	1) Ultrasonic Extraction, Gas Chromatographic Method 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method
92	Nickel	1) Digestion, Flame Atomic Absorption Spectrometric Method 2) Digestion, Inductively Coupled Plasma Method
93	Nitrobenzene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method
94	N-Nitrosodiphenylamine	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method
95	N-Nitrosodi-n-propylamine	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method

สำเนาถูกต้อง

[redacted]

96 Polychlorinated biphenyls ...

ลำดับ	สารมลพิษ	วิธีตรวจ
96	Polychlorinated biphenyls - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260	1) Ultrasonic Extraction, Gas Chromatographic Method 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method
	Polychlorinated Biphenyls - 2-Chlorobiphenyl - 2,3-Dichlorobiphenyl - 2,2',5-Trichlorobiphenyl - 2,4',5-Trichlorobiphenyl - 2,2',5,5'-Tetrachlorobiphenyl - 2,2',3,5'-Tetrachlorobiphenyl - 2,3',4,4'-Tetrachlorobiphenyl - 2,2',3,4,5'-Pentachlorobiphenyl - 2,2',4,5,5'-Pentachlorobiphenyl - 2,3,3',4',6-Pentachlorobiphenyl - 2,2',3,4,4',5'-Hexachlorobiphenyl - 2,2',3,4,5,5'-Hexachlorobiphenyl - 2,2',3,5,5',6-Hexachlorobiphenyl - 2,2',4,4',5,5'-Hexachlorobiphenyl - 2,2',3,3',4,4',5-Heptachlorobiphenyl - 2,2',3,4,4',5,5'-Heptachlorobiphenyl - 2,2',3,4,4',5',6-Heptachlorobiphenyl	Ultrasonic Extraction, Gas Chromatographic Method

สำเนาถูกต้อง

[redacted]

- 2,2',3,4',5,5',6- ...

ลำดับ	สารเคมี	วิธีวิเคราะห์
	1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	
97	Pentachlorophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
98	Phenanthrene	1) Ultrasonic Extraction, Gas Chromatographic Method[illegible] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
99	Phenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
100	Pyrene	1) Ultrasonic Extraction, Gas Chromatographic Method[illegible] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
101	Selenium	1) Digestion, Flame Atomic Absorption/Atomic Atmosphere Spectrometric Method[illegible] 2) Digestion, Inductively Coupled Plasma Method[illegible]
102	Silver	Digestion, Inductively Coupled Plasma Method[illegible]
103	Styrene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
104	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
105	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
106	Toluene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
107	Toxaphene	Ultrasonic Extraction, Gas Chromatographic Method[illegible]
108	Tri-Cresyl	1) Purge and Trap, Gas Chromatographic Method[illegible] 2) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
109	Tri-Butyl	[illegible]
110	Tri-Phenyl	[illegible]
111	1,2,3-Trichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]

1,2,4,5,6,7,8,9-Octachlorodibenzo...

ลำดับ	สารเคมี	วิธีวิเคราะห์
112	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
113	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
114	Trichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
115	2,3,5-Trichlorophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
116	2,4,6-Trichlorophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[illegible]
117	1,2,3-Trimethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
118	Vanadium	Digestion, Inductively Coupled Plasma Method[illegible]
119	Vinyl acetate	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
120	Vinyl chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
121	m-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
122	o-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
123	p-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
124	Xylene (Total)	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[illegible]
125	Zinc	1) Digestion, Flame Atomic Absorption Spectrometric Method[illegible] 2) Digestion, Inductively Coupled Plasma Method[illegible]

[illegible]

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2. [illegible] [illegible] [illegible] [illegible]

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