



THE 13<sup>TH</sup> ANNUAL ASIA PACIFIC MERCURY MONITORING NETWORK PARTNERS MEETING

UPDATE 2024

# MERCURY MONITORING PROGRESS IN INDONESIA

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KEMENTERIAN  
LINGKUNGAN HIDUP  
DAN  
KEHUTANAN

CENTRE FOR STANDARDIZATION OF ENVIRONMENTAL QUALITY INSTRUMENT (PSIKLH)  
MINISTRY OF ENVIRONMENT AND FORESTRY (KLHK)  
TAIWAN, 3 SEPTEMBER 2024

# INTRODUCTION



**CENTRE FOR STANDARDIZATION OF ENVIRONMENTAL QUALITY INSTRUMENT  
(PSIKLH OR EMC OR CSEQ)  
MINISTRY OF ENVIRONMENT AND FORESTRY OF INDONESIA (KLHK OR MOEF)**



Has a duty for carry out the preparation of technical policies and implementation of planning, formulation, development, and assessment of conformity of environmental quality instrument standard.

Mr. Widhi Handoyo as a counterpart



# INDONESIAN GOVERNMENT COMMITMENT

## Related to NAP for **Reduction & Elimination of Mercury**

### **Law number 11 year 2017**

Ratification  
Minamata  
Convention on  
Mercury

### **Presidential Regulation Number 21 year 2019**

National action  
plan for reduction  
and elimination of  
mercury use

### **Ministerial Regulation of Environment and Forestry Number 81 year 2019**

Implementation  
of Presidential  
Regulation  
Number 21 year  
2019

### **Ministerial Regulation of Health Number 41 year 2019**

Elimination and  
withdrawal of  
medical devices  
containing  
mercury in health  
service facilities

### **Ministerial Regulation of Environment and Forestry Number 27 year 2020**

Management of  
medical device  
waste containing  
mercury

Source: Directorate for Toxic and Hazardous Substance Management, MOEF



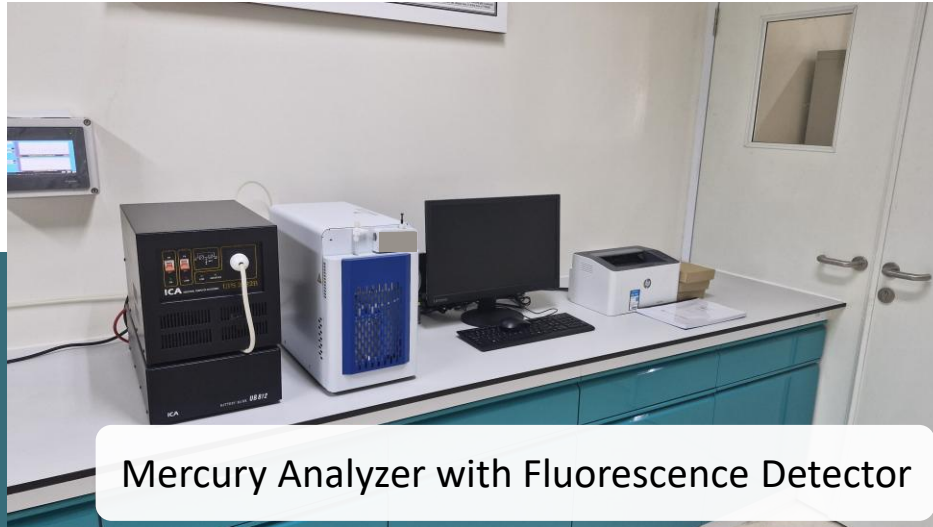
# OUTLINE

Supporting  
infrastructure

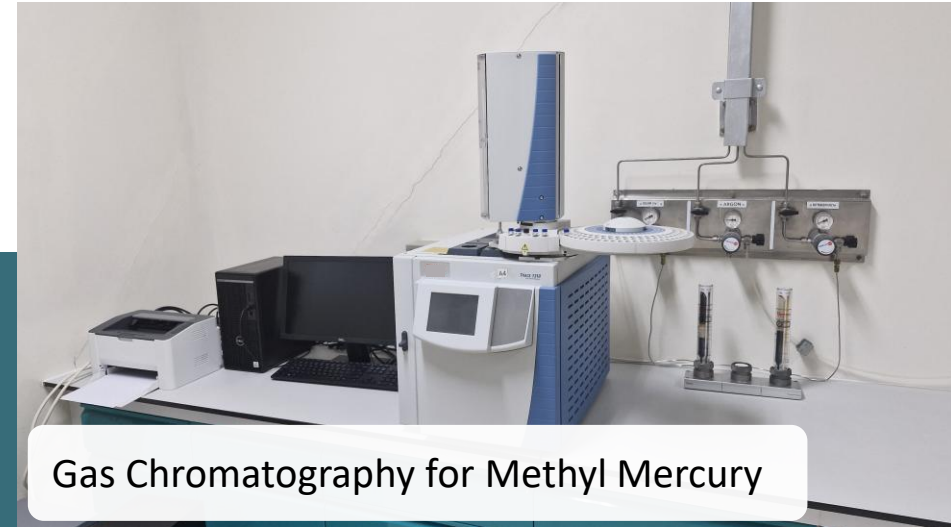
On-going  
activities

Next Step

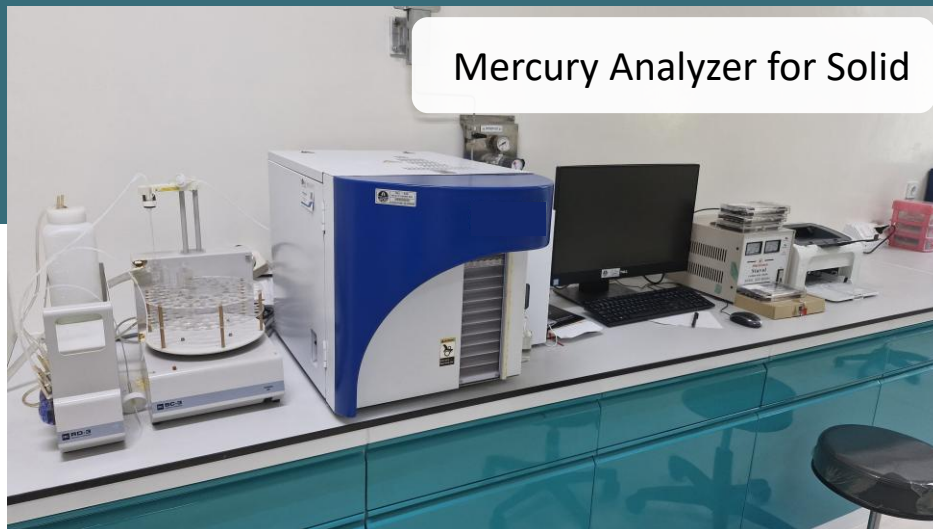
# FACILITIES



Mercury Analyzer with Fluorescence Detector



Gas Chromatography for Methyl Mercury



Mercury Analyzer for Solid



Mercury Analyzer for Water



# CURRENT ACTIVITIES OF MERCURY MONITORING IN INDONESIA

Related to atmospheric mercury

## **Monitoring of mercury in rain water**

APMMN project for mercury as a global pollutant

## **Monitoring of mercury in ambient air by gold column**

Weekly monitoring

## **Monitoring of mercury in ambient air by MerPass (Mercury passive sampler)**

3 month monitoring

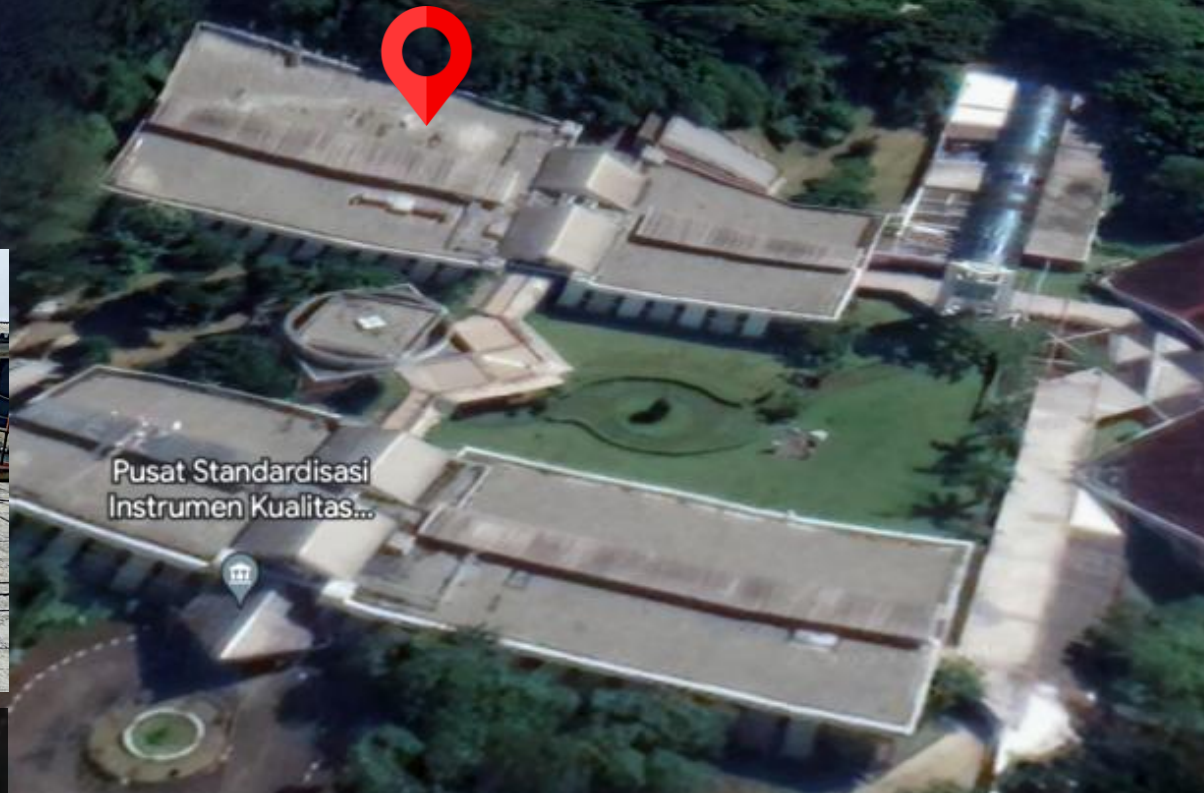
# STATION OF WET DEPOSITION SAMPLER FOR MERCURY IN RAIN WATER ON PSIKLH ROOFTOP (3<sup>rd</sup> FLOOR), SERPONG, INDONESIA



IEBE PTBBN BATAN



APID02  
Rain Water Sampler  
First run: 31 December 2019

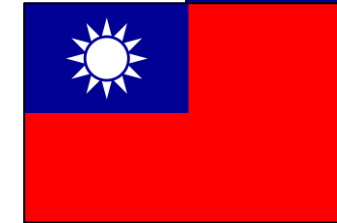


Ambient Air Sampler  
First run: 4 May 2021



# RAIN WATER

## Sampling and Analysis

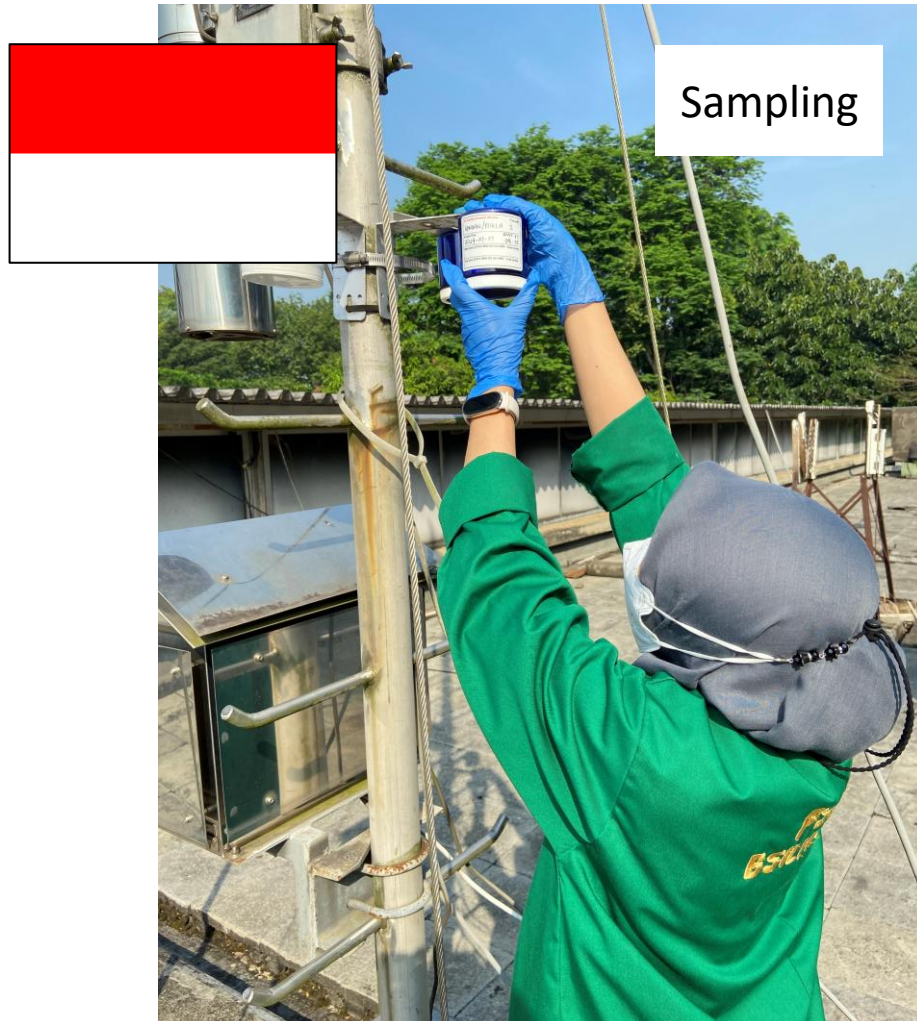


SHIPMENT

Sample Analysis  
in National Central  
University (NCU) Taiwan

# MERPASS

## Sampling and Analysis



SHIPMENT

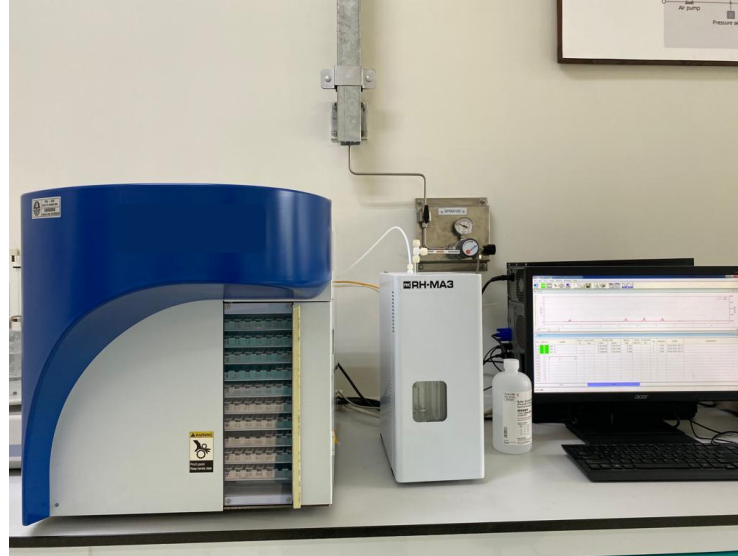
Sample analysis in  
ECCC Canada

# AMBIENT AIR

## Sampling and Analysis



Sampling



Sample Analysis

# Mercury in rain water

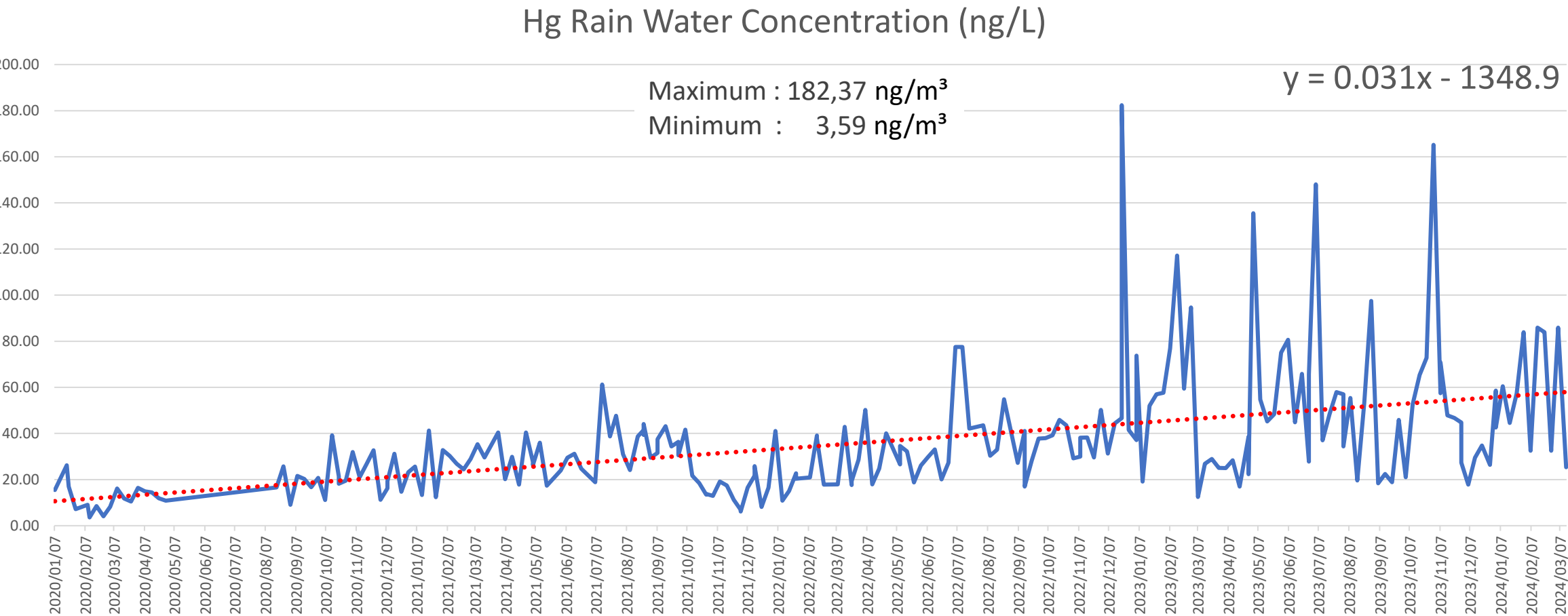
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# Serpong Station's Data Results for T-Hg in Rain Water for period year 2020-2024

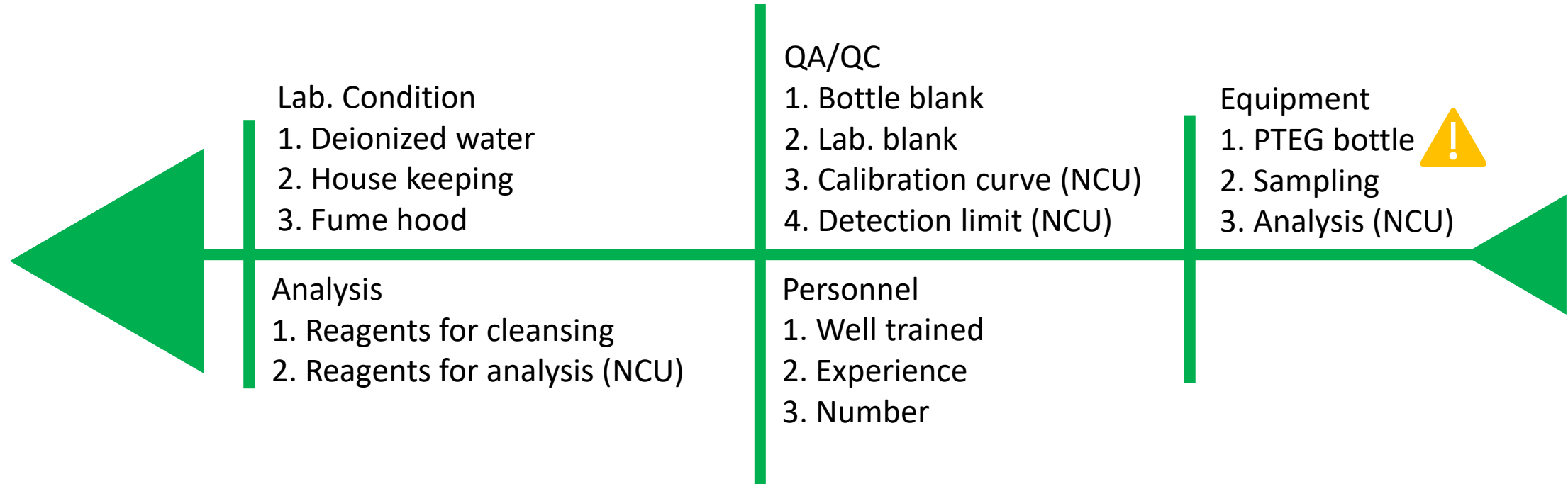
Analysis was done in NCU Taiwan



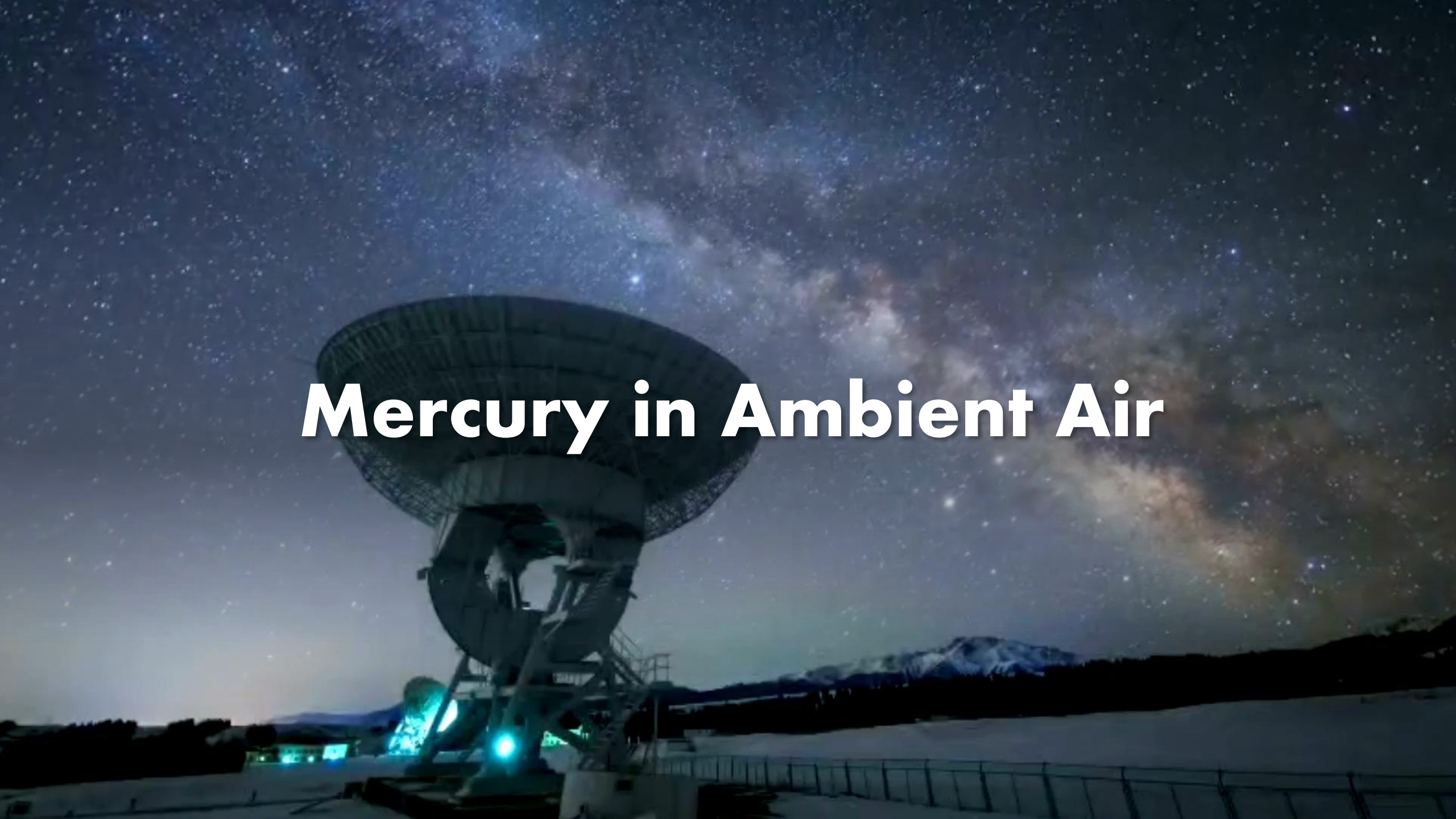
Source: Report on mercury monitoring in CSEQI Station 2020-2024



# CAUSE EFFECT FOR ABNORMAL DATA for Hg in Rain Water

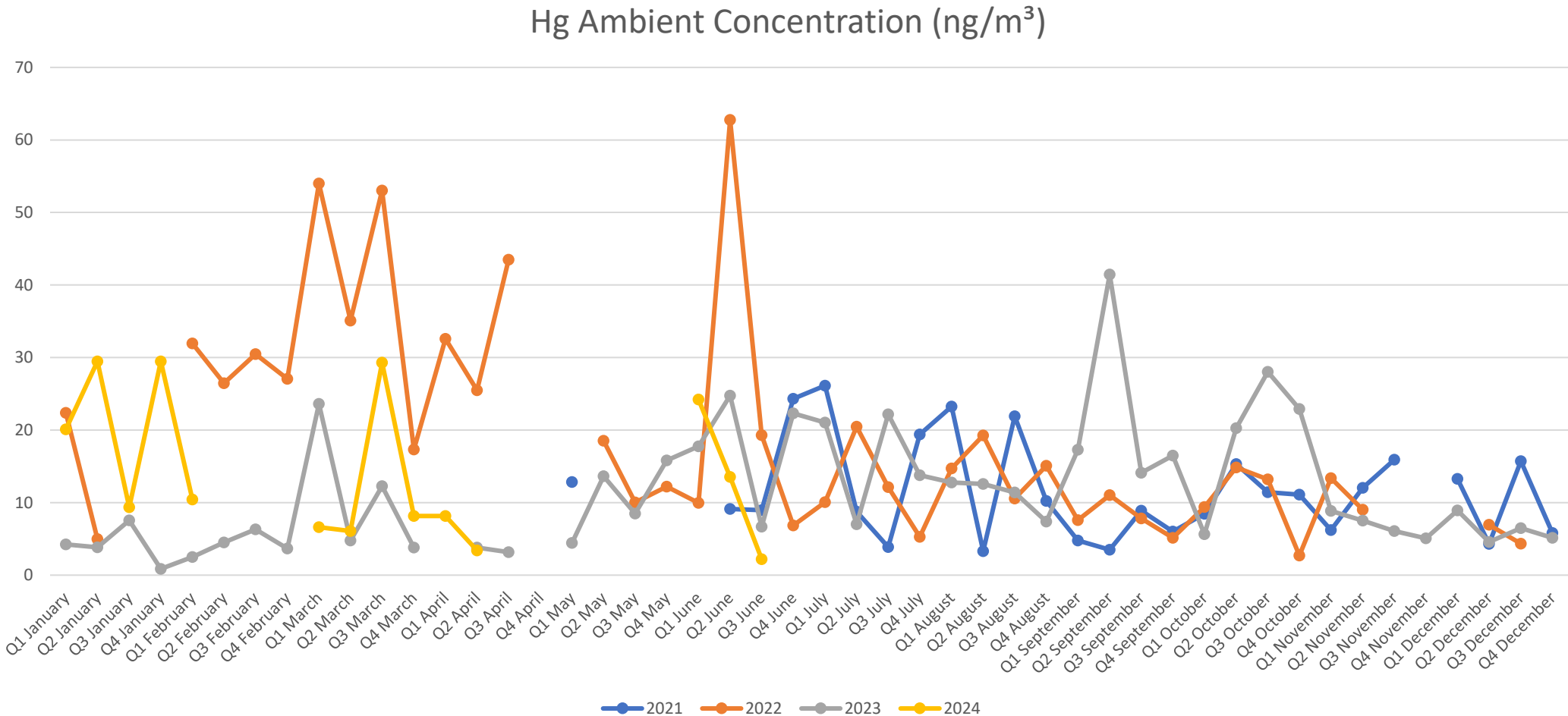


# Mercury in Ambient Air



# Serpong Station's Data Results for T-Hg in Ambient Air by Gold Column Methods

Analysis was done in CSEQI

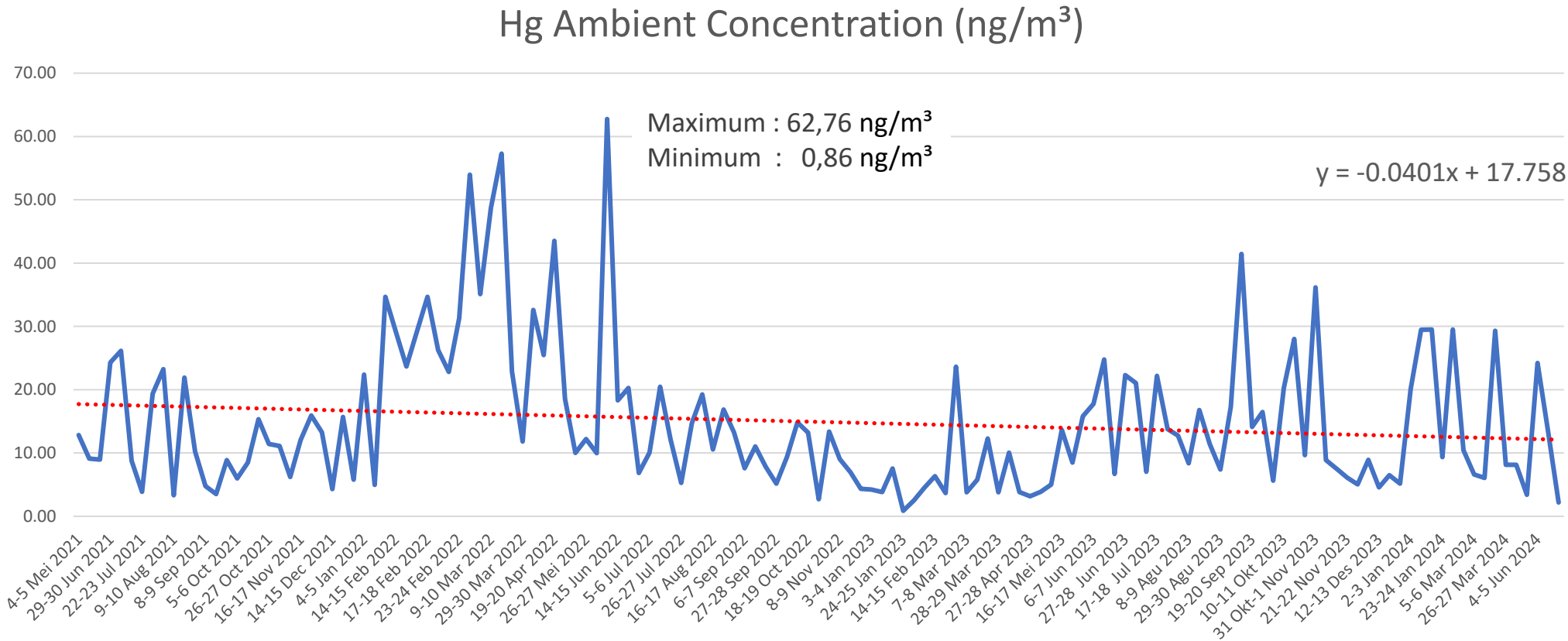


\*WHO Guideline : 300 ng/M<sup>3</sup>

Source: Report on mercury monitoring in CSEQI Station 2020-2024

# Serpong Station's Data Results for T-Hg in Ambient Air by Gold Column Methods

Analysis was done in CSEQL



\*WHO Guideline : 300 ng/m<sup>3</sup>

Source: Report on mercury monitoring in CSEQL Station 2020-2024

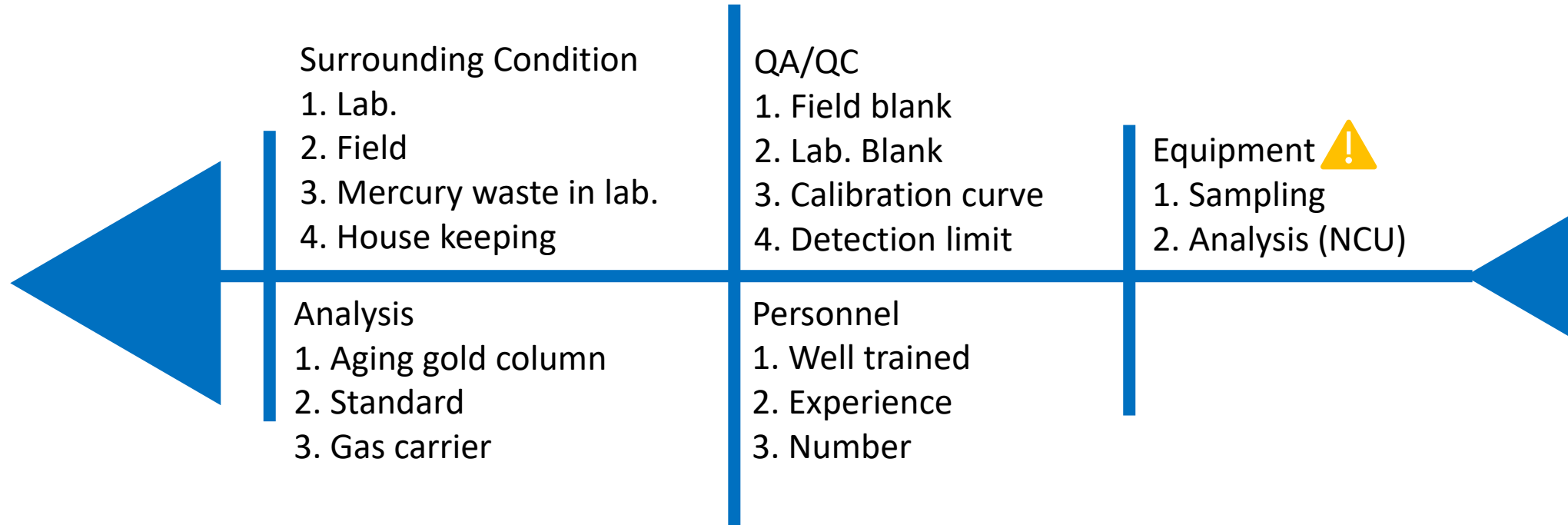
# Same day sampling with Partners

With MOEJ

|  | Date       | PSIKLH<br>Hg Concentration<br>(ng/L) |  |
|--|------------|--------------------------------------|--|
|  | 19/09/2023 | 14,11                                |  |
|  | 17/10/2023 | 28,03                                |  |
|  | 21/11/2023 | 6,09                                 |  |
|  | 19/12/2023 | 6,49                                 |  |
|  | 16/01/2024 | 29,49                                |  |
|  | 20/02/2024 | 10,44                                |  |
|  | 19/03/2024 | 29,29                                |  |
|  | 21/04/2024 | 3,42                                 |  |
|  | 16/05/2024 |                                      |  |
|  | 19/06/2024 | 2,20                                 |  |



# CAUSE EFFECT FOR ABNORMAL DATA for Hg in Ambient Air



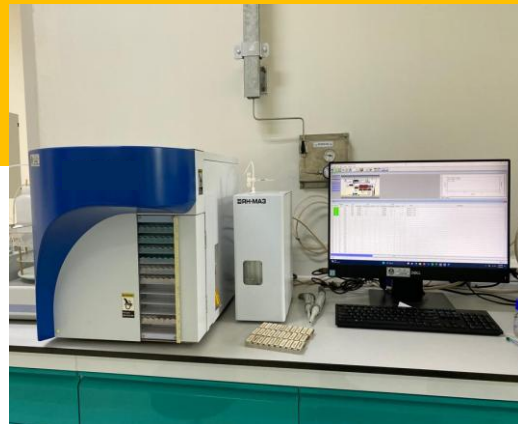
# OTHER RELATED ACTIVITIES

## Quick Measurement of Hg in Human Hair



# Measurement of MeHg in Biota

## Sample analysis



# Measurement of MeHg in Human Hair

## Sample analysis



# Macrozoobenthos Sampling for Total Mercury Analysis



# Accredited by National Accreditation Agency for Methyl Mercury in Biota and Biomarker



# NIMD Mercury Laboratory Proficiency Testing for Methylmercury



## Results of methylmercury

Participant ID: 30

| ID                               | Results submitted (mg/kg) |       |                  | Average |
|----------------------------------|---------------------------|-------|------------------|---------|
|                                  | 1                         | 2     | 3                |         |
| 30                               | 3.23                      | 3.19  | 3.33             | 3.25    |
| Participants' statistics (mg/kg) |                           |       | z score obtained |         |
| Median                           |                           | NIQR  |                  |         |
| 3.557                            |                           | 0.333 | -0.921           |         |

Performance of the result is classified by z score as follows:

- $|z| \leq 2$ : Performance is **satisfactory** (satisfactory)
- $2 < |z| < 3$ : Performance is **questionable** (caution)
- $|z| \geq 3$ : Performance is **unsatisfactory** (action)

# NIMD Mercury Laboratory Proficiency Testing for Total Mercury



## Results of total mercury

Participant ID: 30

| ID                               | Results submitted (mg/kg) |       |                  | Average |
|----------------------------------|---------------------------|-------|------------------|---------|
|                                  | 1                         | 2     | 3                |         |
| 30                               | 3.77                      | 3.83  | 3.81             | 3.80    |
| Participants' statistics (mg/kg) |                           |       | z score obtained |         |
| Median                           |                           | NIQR  |                  |         |
| 4.046                            |                           | 0.279 | -0.862           |         |

Performance of the result is classified by z score as follows:

$|z| \leq 2$ : Performance is **satisfactory** (satisfactory)

$2 < |z| < 3$ : Performance is **questionable** (caution)

$|z| \geq 3$ : Performance is **unsatisfactory** (action)

# Formulating National Indonesia Standard about Methylmercury test on Biota and Biomarker





# NEXT STEP

## STRENGTHENING TECHNICAL CAPACITY FOR CSEQI

Developing Methods for methyl mercury analysis in Water

Developing Method standardization in Hg monitoring to be applied widely in local laboratory in Indonesia

Developing Methods for methyl mercury analysis in Sediment

Developing capability as a provider in Mercury proficiency test

Building a clean room and developing method with CV-AFS so that in the future we can do our own analysis of mercury in rainwater

Comparison testing for Hg using Gold Column and MerPass Sample with IDEA and NCU Taiwan



# CONTRIBUTORS

## Materials Preparations

- Rina Aprishanty, Ernawita Nazir, Ely Rahmy T, and Ricky Nelson from CSEQI, MOEF
- Yunik Kuncaraning Purwandari from Directorate for Toxic and Hazardous Substance Management, MOEF

## Sampling Team

- Muhammad Azzam, Maulana Kusumardhani & Miya Riski Untari
- Nurmalia Syafitri, Adi Mulyadi, & Muhammad Azzam

## Special Thanks to

- Da Wei Lin



THANK YOU

