REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
ENVIRONMENTAL MANAGEMENT BUREAU

Asia Pacific Mercury Monitoring Network

# Updates In Mercury Monitoring in the Philippines


## JUNDY TIGLEY DEL SOCORRO

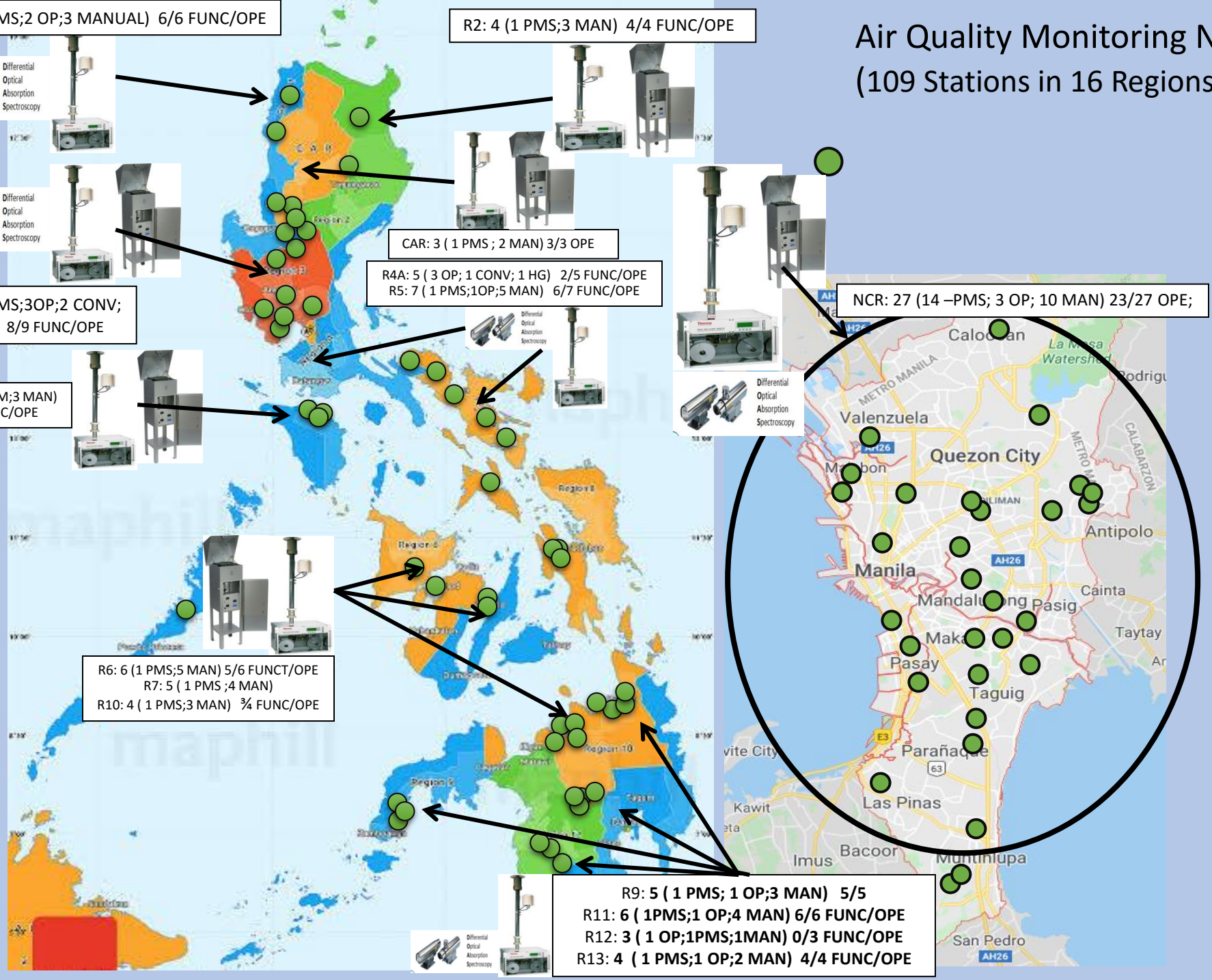

2021 Asia Pacific Mercury Monitoring Network
Partners Virtual Meeting October 6, 2021

Environmental Management

United States Environmental Protection Agency

EPA TAIWAN

# Air Quality Monitoring Network
(109 Stations in 16 Regions)



# MBIENT AIR QUALITY MONITORING - PARTICULATE MATTER 10 (PM10) H

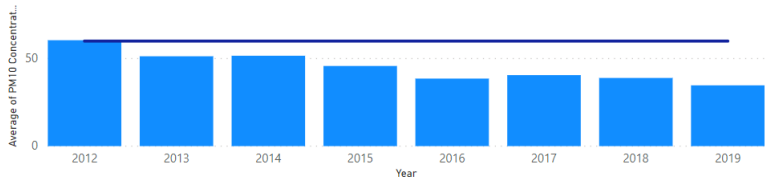
Region: All | Year: All | City: All

90 No. of Stations

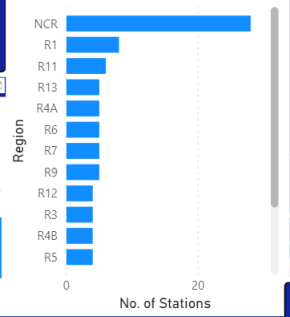
43.53 Average PM10 Concentration (µ...

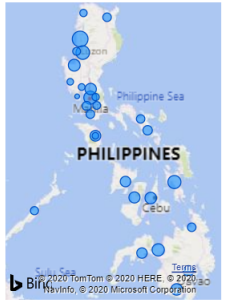
### Average PM 10 Concentration (ug/Ncm) by Year

Average of PM10 Concentration (µg/Ncm) ● Min of Standard (µg/Ncm)



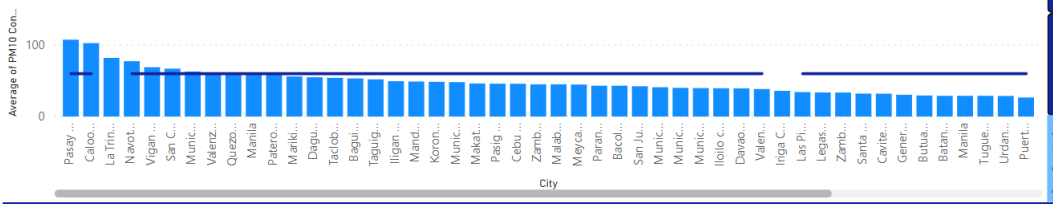

### No. of Stations by Region




### Average PM 10 Concentration (ug/Ncm) by City

Average of PM10 Concentration (µg/Ncm) ● Standard (µg/Ncm)




150.88 Maximum PM10 Concentration (µg/N...

1.93 Minimum PM10 Concentration (µg/Nc...

Average/ Maximum/ Minimum concentration may vary depending on the year/ region /station coverage selected

### Average PM 10 Concentration (ug/Ncm) by City

Urdaneta City 28.8 | Puerto Princesa 26.636666666666667 | Naga City 26.541 | Muntinlupa City

# AMBIENT AIR QUALITY MONITORING IN OTHER URBAN CENTERS -

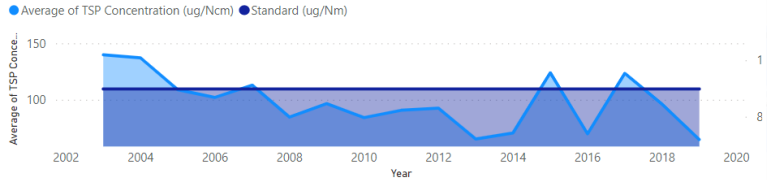
Region: All | Year: All | LOCATION: Search

41 Number of Stations

103.30 Average Concentration (ug/Ncm)

### Average TSP Concentration (ug/Ncm) by Year

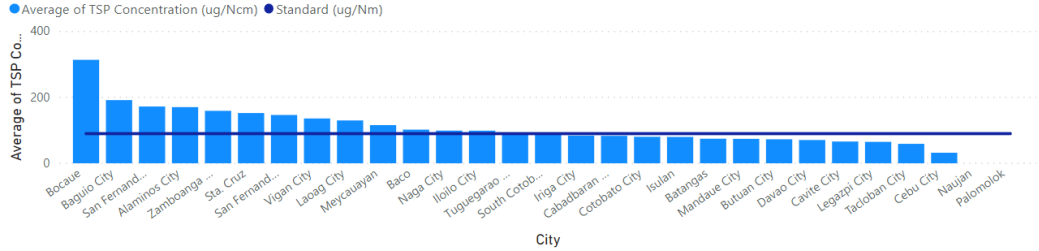
Average of TSP Concentration (ug/Ncm) ● Standard (ug/Nm)




### Average TSP Concentration (ug/Ncm) by City

### Average TSP Concentration (ug/Ncm) by City

Average of TSP Concentration (ug/Ncm) ● Standard (ug/Nm)




457 Maximum concentration (ug/Ncm)

6 Minimum concentration (ug/Ncm)

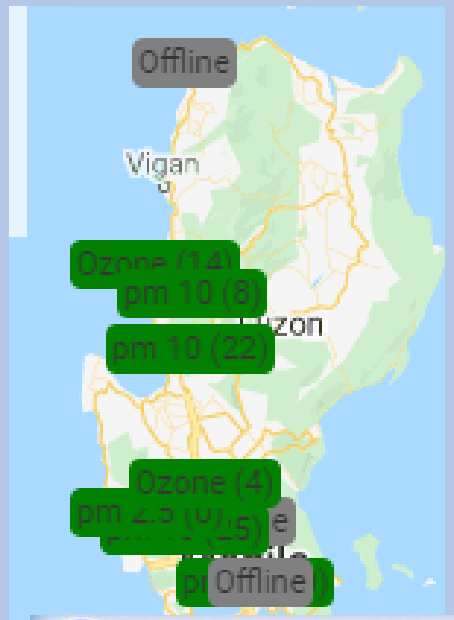
Average/Maximum/Minimum concentration may vary depending on the year/region/station coverage selected

### Average TSP Concentration (ug/Ncm) by City

San Fernando City 172.29 | Alaminos City 170.43 | Zamboanga City 159.19 | Sta. Cruz 152.50

GET IT ON Google Play

Download on the App Store




screenleap

Department of Environment & Natural Resources
Environmental Management Bureau

Taipei Economic and Cultural Office in the Philippines

EPA TAIWAN

Asia Pacific Mercury Monitoring Network

# Wet Deposition Mercury Sampler

Turn Over Ceremony, DENR-EMB, AQMTC

March 7, 2018

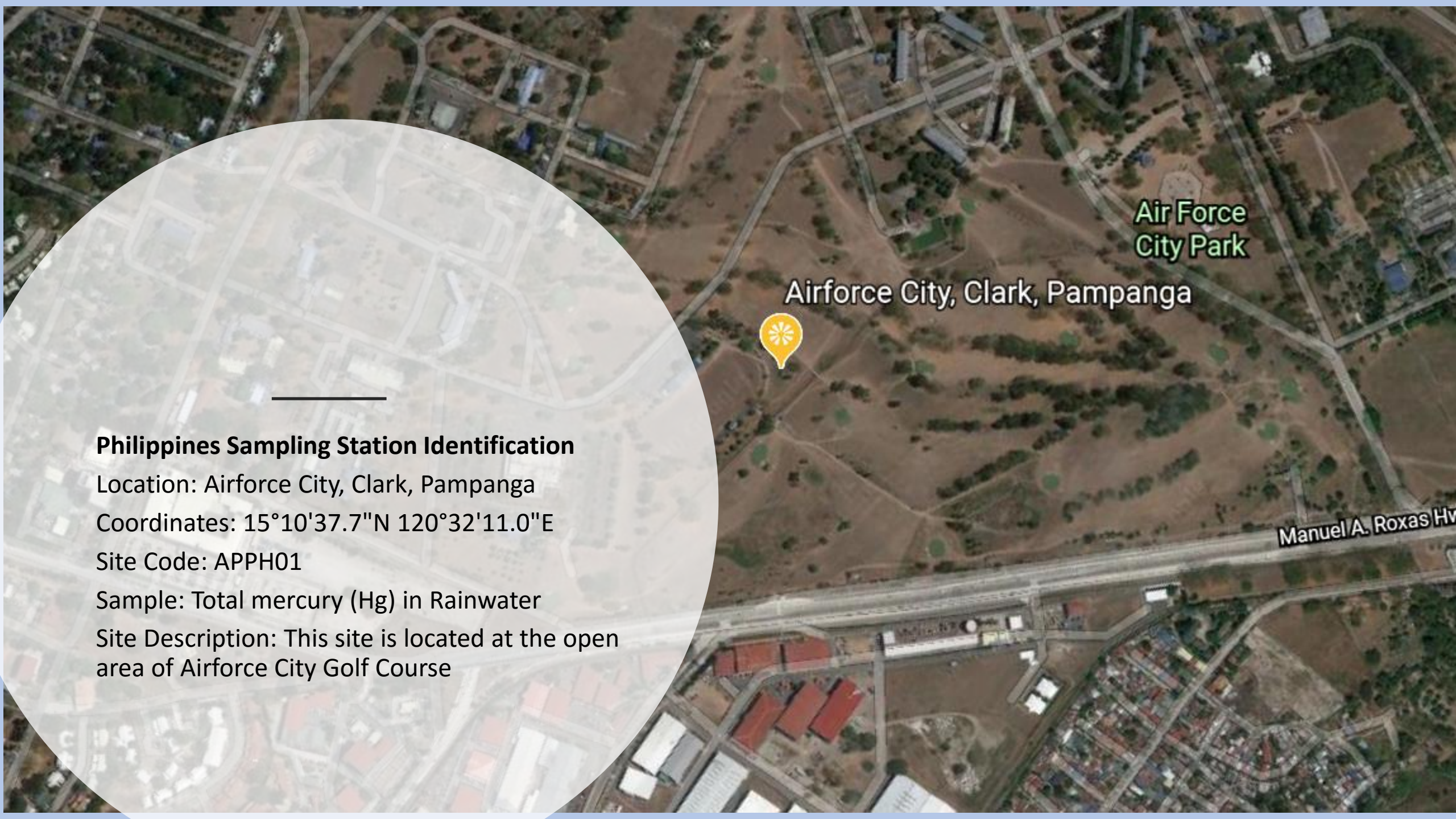
# Technical Assistance / Training to operate the Hg Deposition Sampler ( US-EPA, EPAT, TECO)

June 27-28, 2018

Center for Environmental Monitoring and Technology
National Central University

Asia Pacific Mercury Monitoring Network

Department of Environment & Natural Resources
Environmental Management Bureau




**Philippines Sampling Station Identification**

Location: Airforce City, Clark, Pampanga

Coordinates: 15°10'37.7"N 120°32'11.0"E

Site Code: APPH01

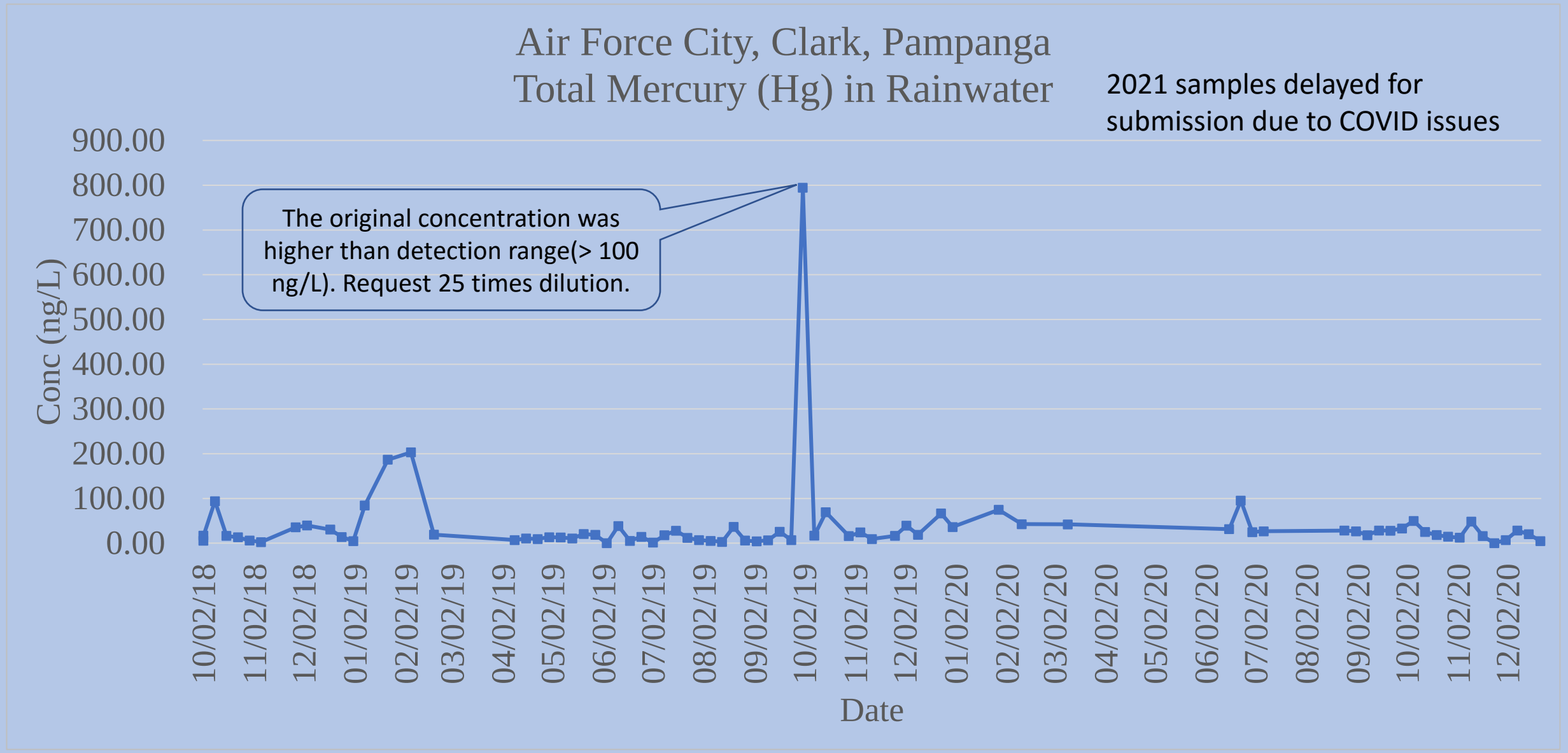
Sample: Total mercury (Hg) in Rainwater

Site Description: This site is located at the open area of Airforce City Golf Course

# Hg Deposition Mercury Sampler

## Urban Area Station, Clark , Angeles

Department of Environment & Natural Resources
Environmental Management Bureau




Graphical presentation of Total Mercury (Hg) concentration in Clark, Philippines Station

Department of Environment & Natural Resources
Environmental Management Bureau

# Mercury Monitoring in Ambient Air Quality in Coal Fired Power Plants

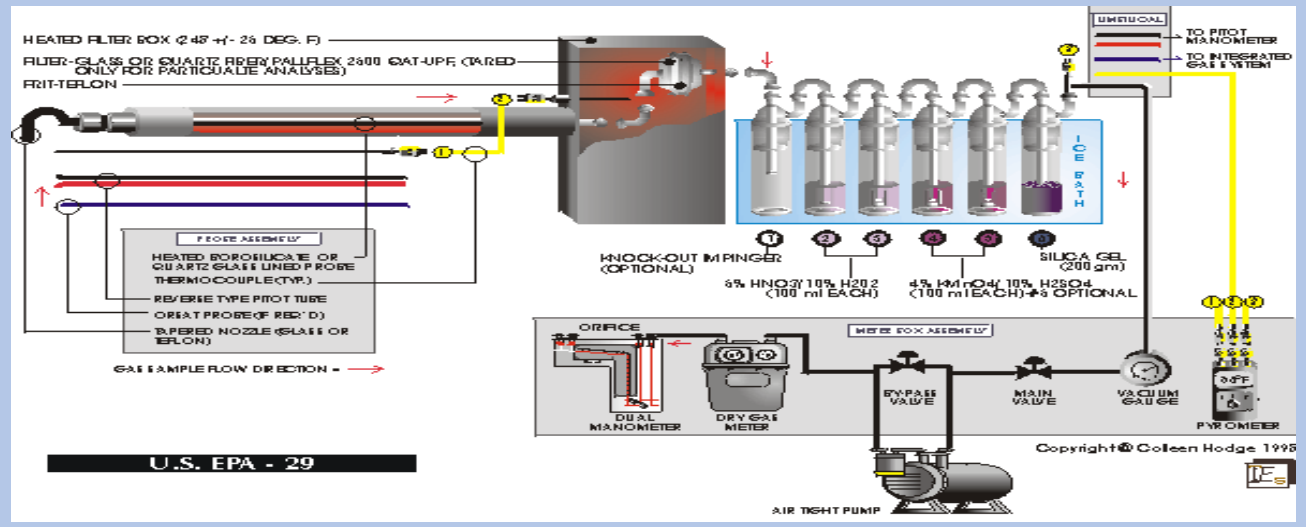
Asia Pacific Mercury Monitoring Network

United States Environmental Protection Agency

EPA TAIWAN

# Mercury Monitoring in Stationary Sources

## US EPA Stack Emission Testing US EPA Method 29



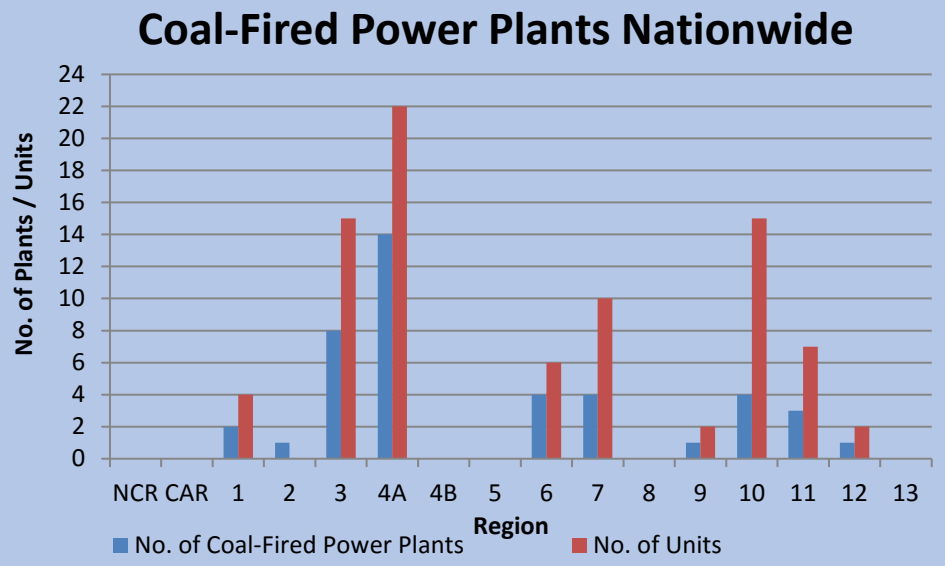
Department of Environment & Natural Resources
Environmental Management Bureau

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
ENVIRONMENTAL MANAGEMENT BUREAU

# Sources of Mercury (Emission) in the Philippines

## Coal-Fired Power Plants:

## 42 Power Plants and 83 Units in 10 Regions



# Mercury in Emission Standards for Source Specific Air Pollutants under Philippine Clean Air Act (RA 8749) DAO2000-81

**National Emission Standards for Source Specific Air Pollutants (NESSAP)**

| POLLUTANT | STANDARD APPLICABLE TO SOURCE | MAXIMUM PERMISSIBLE LIMITS (mg/Ncm) | METHOD OF SAMPLING[a] | METHOD OF ANALYSIS[a] |
|---|---|---|---|---|
| Antimony and its Cmpds. | Any source | 10 as Sb | USEPA Methods 1 through 5 or 29 | AAS[b] or per sampling method |
| Arsenic and its Cmpds. | Any source | 10 as As | USEPA Methods 1 through 5 or 29 | AAS[b] or per sampling method |
| Cadmium and its Cmpds. | Any source | 10 as Cd | USEPA Methods 1 through 5 or 29 | AAS[b] or per sampling method |
| Carbon Monoxide | Any industrial source | 500 as CO | USEPA Method 3 or 10 | Orsat Analysis or NDIR |
| Copper and its Cmpds. | Any industrial source | 100 as Cu | USEPA Methods 1 through 5 or 29 | AAS[b] or per sampling method |
| Hydrofluoric Acid and Fluoride Compounds | Any source other than manufacture of Aluminum from Alumina | 50 as HF | USEPA Method 13 or 14 as appropriate | As per sampling method |
| Hydrogen Sulfide | i) Geothermal power plants<br>ii) Geothermal Exploration And Well Testing<br>iii) Any source other than (i) and (ii) | [c, d]<br>[e]<br>7 as $H_2S$ | USEPA Method 11, 15 or 16 as appropriate | Cadmium Sulfide Method or per sampling method |
| Lead | Any trade, industry or process | 10 as Pb | USEPA Methods 1 through 5or 12 or 29 | AAS[b] or per sampling method |
| Mercury | Any source | 5 as elemental Hg | USEPA Methods 1 through 5 or 29 or 101 | AAS[b] / Cold-Vapor Technique or Hg Analyzer |

Table 5

**Limits for Metals, Dioxins and Furans - Treatment Facilities Using Non-burn Technologies**

| Item | Average Values[a] |
|---|---|
| Cadmium and its compounds, expressed as cadmium (Cd) | total 0.05mg/Ncm |
| Thallium and its compounds, expressed as thallium (Tl) | |
| Mercury and its Compounds, expressed as mercury (Hg) | 0.05 mg/Ncm |
| Antimony and its compounds, expressed as antimony (Sb) | |
| Arsenic and its compounds, expressed as arsenic (As) | |
| Lead and its compounds, expressed as lead ( Pb) | |
| Chromium and its compounds, expressed as chromium (Cr) | |
| Cobalt and its compounds, expressed as cobalt (Co) | total 0.5 mg/Ncm |
| Copper and its compounds, expressed as copper (Cu) | |
| Manganese and its compounds, expressed as manganese (Mn) | |
| Nickel and its compounds, expressed as nickel (Ni) | |
| Vanadium and its compounds, expressed as vanadium (V) | |
| Tin and its compounds, expressed as tin (Sn) | |

Department of Environment & Natural Resources
Environmental Management Bureau

# Policies in Hg Chemical Control and as Waste

**DENR ADMINISTRATIVE ORDER NO. 38**
**Series of 1997**

**Subject:** **CHEMICAL CONTROL ORDER FOR MERCURY AND MERCURY COMPOUNDS**

**Section 1. Legal Authority**

This Chemical Control Order (CCO) is being issued on the basis of authorities given to the Department of Environment and Natural Resources under Republic Act 6969 of 1990 and DENR Administrative Order (DAO) No. 29, Series of 1992.

The requirements and procedures presented in this CCO are in addition to all the other requirements of Title II and Title III of DAO 29 as they pertain to the importation, manufacture, distribution and use of mercury and mercury compounds and the storage, transport, and disposal of their wastes.

**Section 2. Policy**

It is the policy of DENR to minimize hazards to human health and the environment from the improper use, management, disposal, and subsequent release and exposure to harmful substances.

**Section 3. Definition & Rationale**

Republic of the Philippines
**Department of Environment and Natural Resources**
Visayas Avenue, Diliman, Quezon City
Tel. Nos. (632) 920-4301 * (632) 928-0691 to 93
924-2540 * 928-8592 * 929-6626 loc.2012-2014 ; 2135
Website: http://www.denr.gov.ph / Email: web@denr.gov.ph

DEC 0 4 2013

**DENR ADMINISTRATIVE ORDER**
**No. 2013 - 22**

**Subject:** **REVISED PROCEDURES AND STANDARDS FOR THE MANAGEMENT OF HAZARDOUS WASTES (REVISING DAO 2004-36)**

**Revised Procedures and Standards for the Management of Hazardous Wastes (Revising DAO 2004-36)**

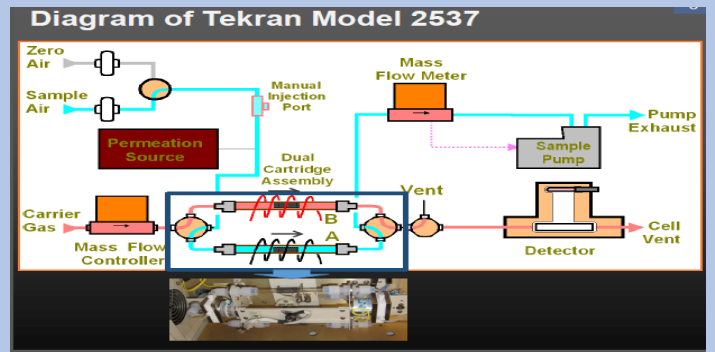
| Class | Description | Waste Number |
|---|---|---|
| Chromium compounds* | analysis of an extract Includes all wastes with a total Cr concentration > 5 mg/L based on analysis of an extract | D405 |
| Lead compounds* | Includes all wastes with a total Pb concentration > 1 mg/L based on analysis of an extract | D406 |
| Mercury and mercury compounds* | Includes all wastes with a total Hg concentration > 0.1 mg/L based on analysis of an extract. These also includes organomercury compounds. Refer to CCO. | D407 |

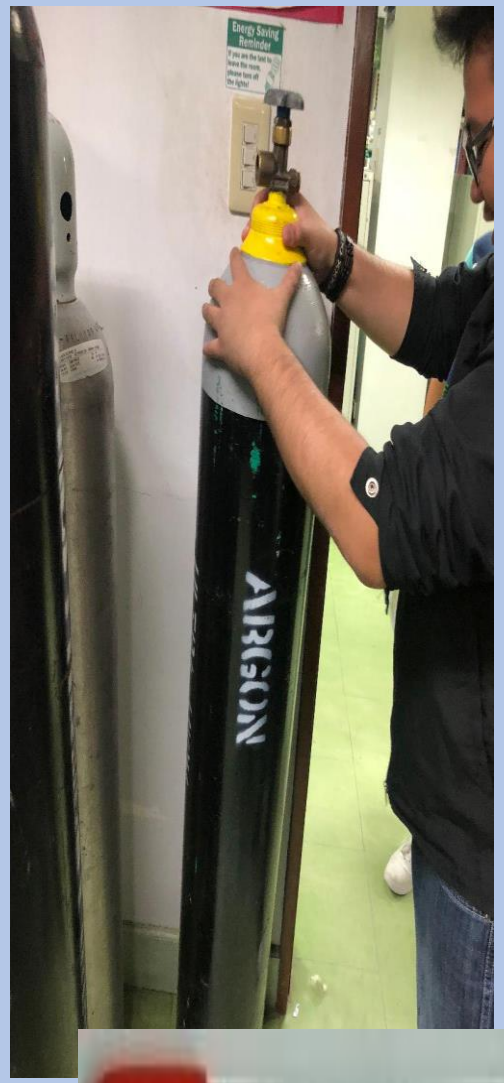
# Location of the TEKRAN 2537X, 1135 in Coal Fired Power Plants in Calaca, Batangas

# Tekran 2537X 1130A

Department of Environment & Natural Resources
Environmental Management Bureau

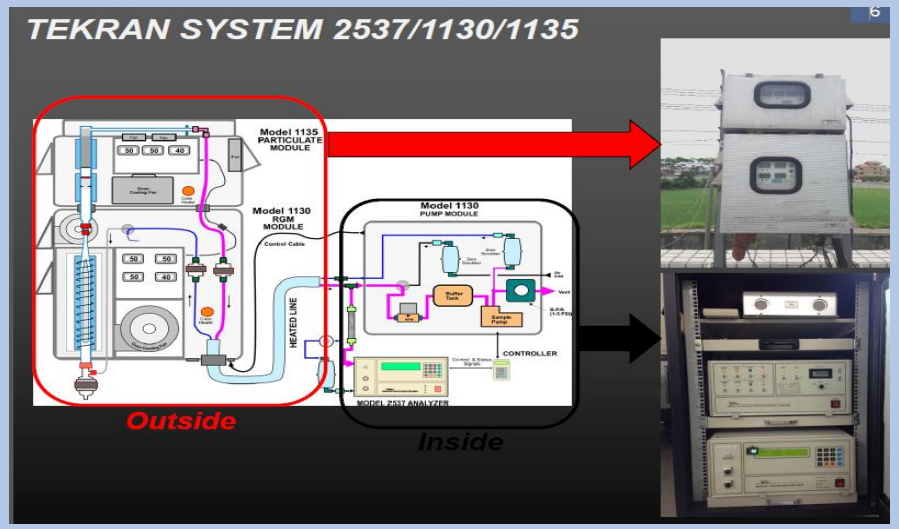
Analyte: TGM (Total Gaseous Mercury)
Principle: Gold preconcentration with atomic fluorescence detection.
Sensitivity: < 0.1 ng/m3 (5 min samples)
Dual channel gold trapping for uninterrupted sampling
Pure Gold as Hg Adsorbent

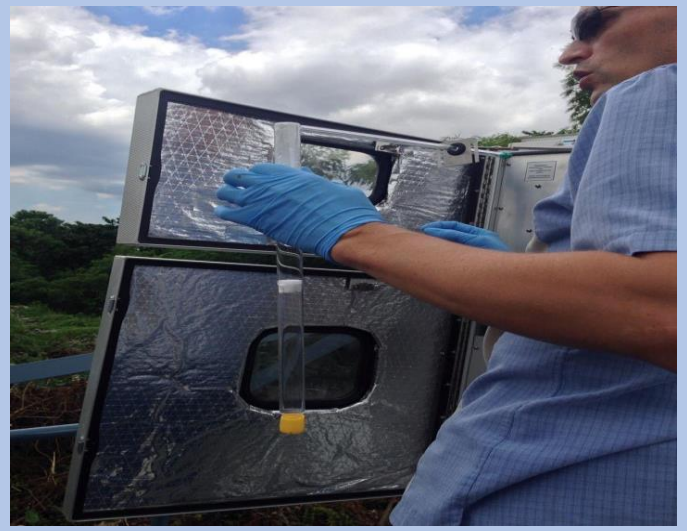


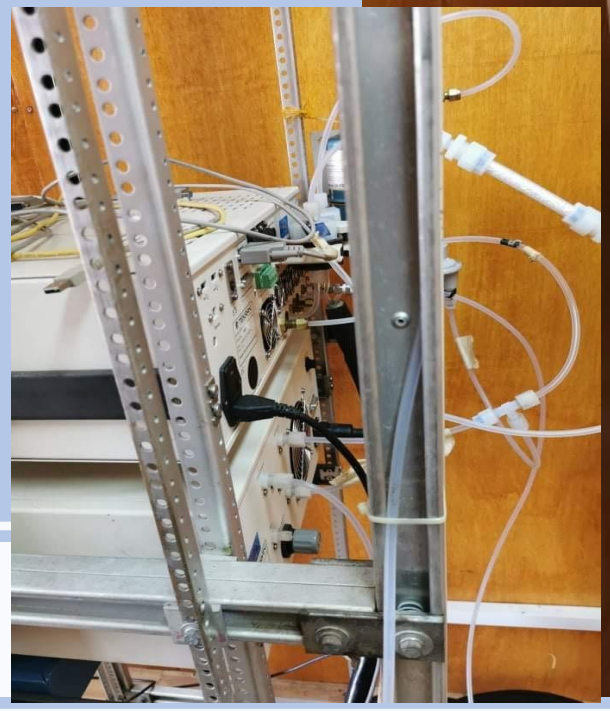
# Tekran 1135-Particulate Hg Monitor

Allows simultaneously monitor particulate bound mercury ($Hg^P$), elemental mercury ($Hg^0$ ) and reactive gaseous mercury (RGM) in ambient air.



Department of Environment & Natural Resources
Environmental Management Bureau



# Updates on the installation of Hg Air Quality Monitoring Station (Tekran)
Location: Calaca, Batangas, Philippines  September 2021

# Training Preparation

TEKRAN Instruments Corporation

330 Nantucket Boulevard, Toronto, Canada M1P 2P4
Ph: +1-416-449-3084 Fax: +1-416-449-9298
www.tekran.com lab-air-info@tekran.com

October 6, 2020

Air Quality Management Training Center
DENR Compound, Visayas Avenue, Diliman, Quezon City
PHILIPPINES

**RE: Web-Based Training for Tekran 2537X**

**Budgetary Cost Estimate**
***2537X 2-Day Training Course:*** ***$ USD***

The above pricing includes all costs associated with training. Tekran host all presentations on Microsoft Teams as selected by EMB. Copies of all presentation materials will be made available after the conclusion of the final training seminar.

Sincerely,

# Thanks for Your Attention

- **Contact Information**
  - Telephone: (632) 927-15-17 / (632) 928-37-15
  - E-mail: mail@emb.gov.ph
  - Website: http://www.emb.gov.ph

United States Environmental Protection Agency

Asia Pacific Mercury Monitoring Network

EPA TAIWAN