



EPA R4 Air Monitoring Capabilities

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EPA Air Monitoring Capabilities

EPA R4 :

- Internal R4 air monitoring resources (Norcross, GA)
- National assets (Special Teams)
- Data Interpretation
- Data sharing



Response Types

- Train Derailment (Chemical or Oil)
- Pipeline (Oil)
- Tanker Roll-over (Oil or Chemical)
- Plastic, Tire, Chemical Fires
- Mercury (Residential/Schools)
- Industrial Chemical releases



EPA Special Teams-Environmental Response Team

- Located in Edison NJ, Cincinnati OH, Las Vegas NV and Research Triangle Park NC
- EPA's premier air sampling and air monitoring team.
- Chemical air monitoring, sampling and on-scene laboratory capabilities (TAGA).



TAGA



Trace Atmospheric Gas Analyzer (TAGA)

- Self-contained mobile laboratory capable of real-time monitoring of outdoor air or emissions.
- Contains a gas chromatograph/mass spectrometer (GC/MS), which analyzes volatile organic compounds at the ppbv level or lower in air samples.

TAGA at a School during 2024 BioLab Incident



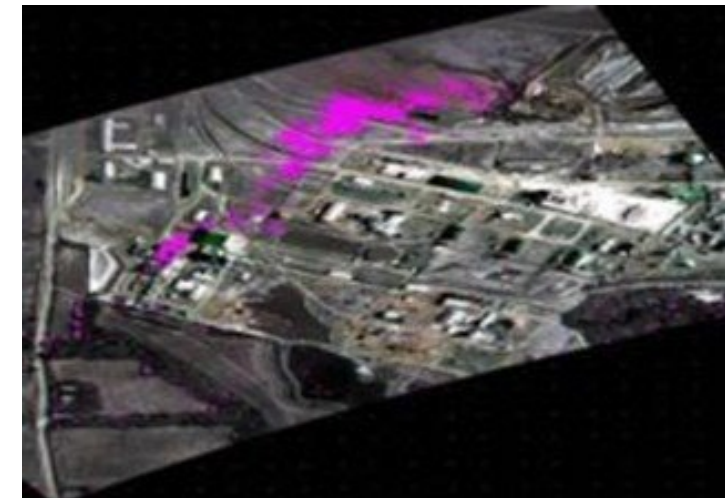


EPA Special Teams-CBRN Consequence Management Team

Airborne Spectral Photometric Environmental Collection Technology

ASPECT

- Located in Dallas, TX
- Detect and identify toxic industrial chemicals, chemical warfare agents, surface oil and radiation sources, and produce thermal and photographic images.





EPA R4 Resources – EPA Warehouse Norcross, GA

EPA R4 Emergency Response Warehouse located in Norcross, GA.

- Air Monitoring Equipment
- Air Sampling
- Personnel Decon Equipment
- Level C, B and A PPE
- Mobile Command Post
- UTVs
- Handheld radios, Starlink, Plum Case

MCP at 2025 MLB All-Star Game Cobb County



EPA ERT/R4: Types of Air Monitoring Instrumentation



Toxic Atmosphere Monitors

- Direct reading instrumentation
 - Photo Ionization Detector (PID)
 - Flame Ionization Detector (FID)
 - Electrochemical sensors
 - Colorimetric
 - Cassette
 - Mercury Vapor Analyzer
 - GC Column
- Particulate monitors



Rae Systems-Chemical



AreaRAE (12) and MultiRAE Pro (12)

- Gamma Sensor/Carbon Monoxide (CO), Hydrogen Sulfide (H₂S), Oxygen (O₂), Lower Explosive Limit (LEL), VOCs PID (10.6 eV lamp) and Electrochemical Sensors
- Weather data
- VIPER Ready

Sensor	QTY
Ammonia	4
Chlorine	4
Hydrogen Cyanide	4
Nitric Oxide	2
Nitrogen Dioxide	2
Sulfur Dioxide	2



UltraRAE 3000 (1)

- VOCs PID (9.8 eV lamp) and Benzene tube installed

Chemical	Measurement	Resolution
Benzene	0-200 ppm	.010 ppm

TVA 2020 Toxic Vapor Analyzer-Chemical



- PID and a Flame Ionization Detector (FID)
- Rapid reading of organic and inorganic compounds

FID

- Uses a hydrogen source for fuel
- Can detect methane
- Not impacted by humidity

Single Ponut Monitor (SPM) Flex-Chemical



- Draws gas samples to a Chemcassette tape-based optical gas detection system.
- No field calibration needed
- 14 and 90 Day Tapes
- VIPER ready

Analyte	Quantity
Phosgene	4
Mineral Acid (Hydrogen Flouride, Hydrogen Chloride, Hydrogen Bromide, Boron Trifluoride, Nitric Acid, Sulfuric Acid))	4
Diisocyanates	2
Hydrides (Phosphine)	2



DustTrack 8533-Particulate Matter

- Contains a laser photometer that measures aerosol contaminants—dust, smoke, fumes, and mists—in real-time. It simultaneously measures size-segregated mass fractions (PM1, PM2.5, Respirable, and PM10)
- Use for chemical fires and plumes and for fugitive dust
- VIPER ready





Draeger Systems-Chemical

XPID

- Based on gas chromatography (GC) and photoionization detection (PID) technologies.
- Focus is on benzene, butadiene, and VOC

X-act 7000

- Opto-electronic analysis using micro-tubes
- Acetic acid, ammonia, benzene, butadiene, 1,3-, carbon monoxide, chlorine, hydrochloric acid, hydrocyanic acid, hydrogen sulfide, nitrogen dioxide, nitrous fumes, perchloroethylene, phosgene, sulphur dioxide, trichloroethylene, vinyl chloride
- PPB range
- No need for manual field calibration

Draeger Dräger PPB-Booster Basic Tube set





Mercury Vapor Analyzers

Mercury spills at residences/schools

Lumex 915M, Lumex Light, 915+

- Highly sensitive Zeeman atomic absorption spectrometer designed for real-time monitoring of mercury vapor in air
- Used for conducting clearance operations



Jerome 405

- Gold film sensor technology
- If it is in high mercury environment, instrument has regeneration mode to recover

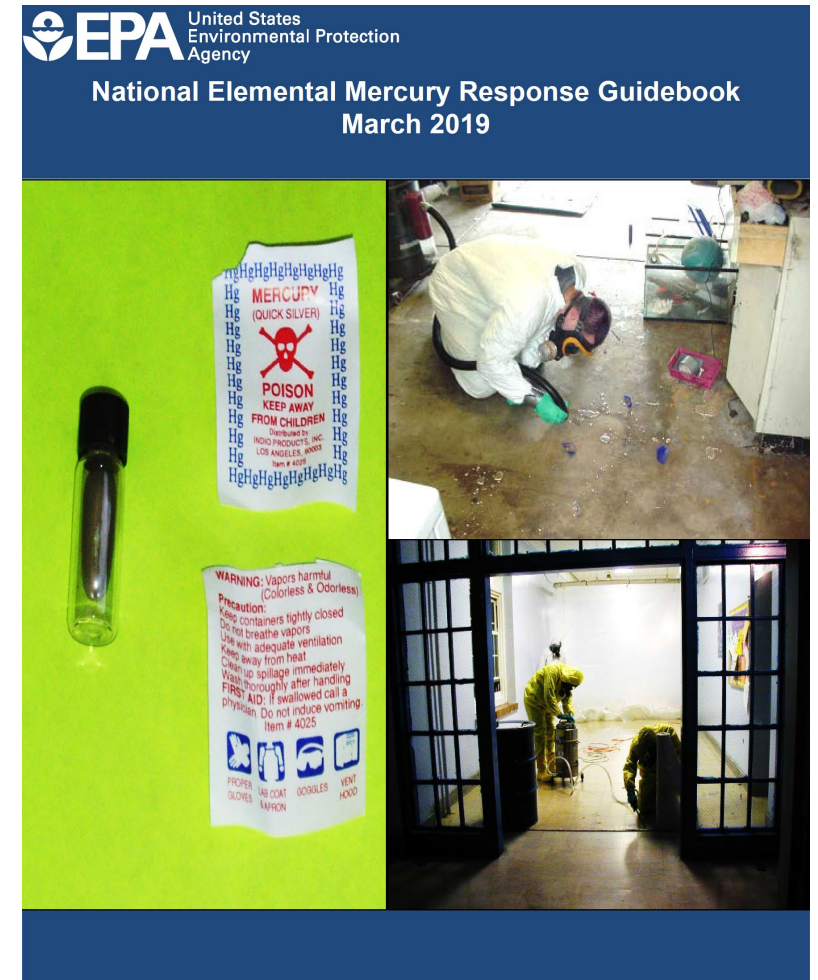


Residential	Schools	Personnel Items	Relocation	IDLH
1,000 ng/m ³	3,000 ng/m ³	3,000-6,000 ng/m ³	10,000 ng/m ³	10,000,000 ng/m ³



EPA Mercury Information

- EPA On Scene Coordinators use Elemental Mercury Response Guidebook.
- Latest issued in March 2019.
- Excellent source of information for response actions.
- <https://www.epa.gov/mercury>





EPA R4 Air Sampling Capabilities

- Summa Cannister
 - Volatile Organic Compounds
 - Vapor intrusion and ambient air testing
- Low and high volume pumps
 - Asbestos and metals (lead) sampling on a dry filter
 - Pesticides and semi-volatile organic compounds using absorbent tubes

Samples need to be analyzed at a laboratory.



Case Study - Greensboro Trichloroacetaldehyde Spill

- In March 2020, a tractor trailer carrying up to 4,000 gallons of trichloroacetaldehyde ruptured after an accident. Local responders established a **half-mile evacuation/shelter-in-place** and closed I-20.
- Responders initially prepared to **downgrade PPE** because their **PID readings were zero**.
- **EPA R4 On-Scene Coordinator** used a **TVA 2020 (FID)** and confirmed the chemical was **still present**, preventing a premature and unsafe PPE downgrade.



IDLH	Level B	Short Term Exposure Limit	Ground Level Readings Around the Tank	Background
43 ppm	7 ppm	.6 ppm	40 – 200 ppm	.5 ppm

EPA R4 Air Monitoring – Common Operating Picture

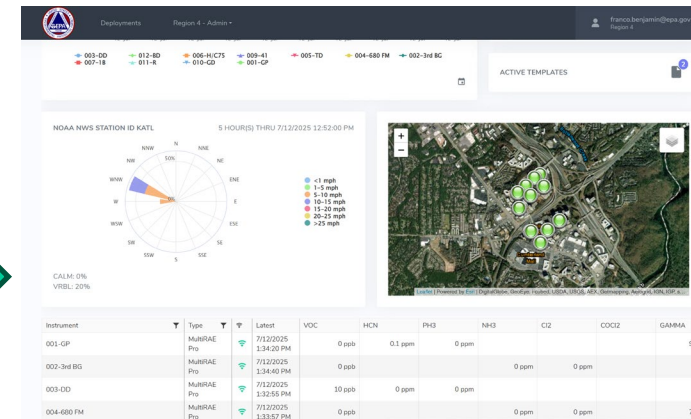


SPM Flex
 • Chemical cassette

VIPER EPA System

Wireless transmission to a common operating picture

AreaRae Pro
 • Photoionization Detector
 • Electrochemical sensors.





EPA R4 Air Monitoring Capabilities-Value Added

- Share data in a common operating picture
- Risk Assessment interpretation of the data:
 - Internal EPA R4 SEMD Scientific Support Section
 - ERT
 - ATSDR
- Provides data that supports State and Local authorities' decisions and actions:
 - Establishing/shrinking/removing shelter in place or evacuation orders
 - Worker and community protection



Questions



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