Section 9470

Emergency Response Community Air Monitoring Plan

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9470.1 Introduction

Airborne contaminants released during an incident can pose a significant threat to first responders, site workers, and surrounding communities. In particular, high consequence areas (HCAs; e.g., densely populated) or sensitive groups (i.e., individuals with heart and lung diseases/conditions, elderly, children, hospital patients, pregnant women, etc.) who are at a greater risk from exposure to hazardous vapors or particulates are of concern. The identification and quantification of airborne contaminants through pre-identified air monitoring and sampling techniques is essential to protecting human health and well-being. Furthermore, the collection and dissemination of air monitoring data into a simple and easily digestible format is critical to keeping the public and stakeholders informed. Reliable measurements of airborne contaminants are useful for:

- Characterizing airborne threats,
- Delineating areas where protection or evacuation is needed,
- Assessing the potential health effects of exposure, and
- Determining the need for additional monitoring.

Air monitoring in the communities surrounding an incident should be considered when:

- Chemicals, airborne contaminants, and/or smoke are anticipated to impact communities;
- Volatile chemicals have been or may be released; and/or
- Sensitive populations are in close proximity to a release site or airborne contaminants are at a level that impacts healthy populations.

The purpose of community air monitoring (CAM) during emergencies is to measure, identify, and quantify airborne contaminants, and use these results as a baseline to facilitate fact-based decisions made by officials, ultimately safeguarding human health and the environment.

9470.2 Scope

This document is intended to be used as a tool to assist emergency responders in establishing a CAM program during an emergency response. Additionally, this document standardizes the process for air monitoring data collection, analysis, and dissemination. It is designed to be applicable to incidents involving a pollutant, chemical, and/or oil that has or will likely release airborne contaminants that may affect the surrounding community. This may include scenarios where the contaminants are burning, not burning, and/or releasing combustion byproducts. This CAM document is not intended for use in establishing action levels for worker respiratory protection.

The intended audience is response personnel who are responsible for establishing and leading CAM activities.

Other considerations when using this document:

- Air monitoring activities during a response may overlap between site worker health and safety and community protection; however, this document is focused solely on CAM. Health and safety of site workers is covered by the site safety plan for the incident (as required by 29 Code of Federal Regulations 1910.120).
- This document does not address odor investigations or indoor air quality assessments.
- This document is not intended to provide complete training on establishing a CAM program. Personnel engaged in air monitoring should be fully trained and qualified to use the equipment and approaches described herein.

The information provided within this document is not intended to supersede any laws, regulations, or policies and should be modified as appropriate to the conditions of each incident.

9470.3 How to Use this Document

This document is organized into a variety of response tools and supplemental informational attachments. The tools can be used independently or in conjunction with each other to establish a CAM program during an emergency. A brief description of the tools are included below.

Community Air Monitoring Resource Tiers

Suggested equipment, personnel, and data deliverables are organized into response tiers. This tool is intended to aid response organizations in rapidly determining and mobilizing air-monitoring resources for the early phases of incidents of varying scope and scale. These tools can be used to communicate the needs and expectations as required under the ICS structure.

Community Air Monitoring Organization Chart, Information Flow, Roles, and Responsibilities

This figure presents a suggested organization chart that places the CAM group within the Environmental Unit (EU) of the Planning Section with pathways of communication and action level exceedance reporting. Roles and responsibilities within the emergency CAM group are also described.

Community Air Monitoring Implementation Checklists

This section contains checklists capturing the major milestones of CAM during an emergency response. The checklists are loosely arranged in chronological order and further organized into three operational phases: Initial Response and Assessment, Sustained Community Assessment, and Demobilization. The detailed checklists include specific actions, expectations, and best practices.

Community Air Monitoring Plan Template

A Community Air Monitoring Plan (CAMP) should be completed as soon as possible during an emergency response, to document and plan ongoing air monitoring. Plan components and suggested formats and content are presented in this template. A CAMP will serve as official documentation of CAM activities and as a functional tool to implement CAM actions.

Response Tool Attachments

Informational attachments are included to detail technical components of implementing a CAM program. Content within these sections are referred to throughout the document and may be used to complete the CAM Checklist or CAMP. The attachments include:

A. Equipment Considerations
B. Contaminants of Concern and Recommended Action Levels
C. Community Air Monitoring Field Team Checklist
D. CAM Data Management and Information Sharing
E. Laboratory Analysis
F. ICS- 205A- CG Communications Plan

9470.4 Air Monitoring Resource Tiers

Suggested equipment, personnel, and data deliverables are organized into time-based response tiers (see Table 9470-1). This tool is intended to aid response organizations to rapidly determine and mobilize air-monitoring resources for the early phases of incidents of variable scope and scale. This tool can be used to communicate needs and expectations within the ICS structure.

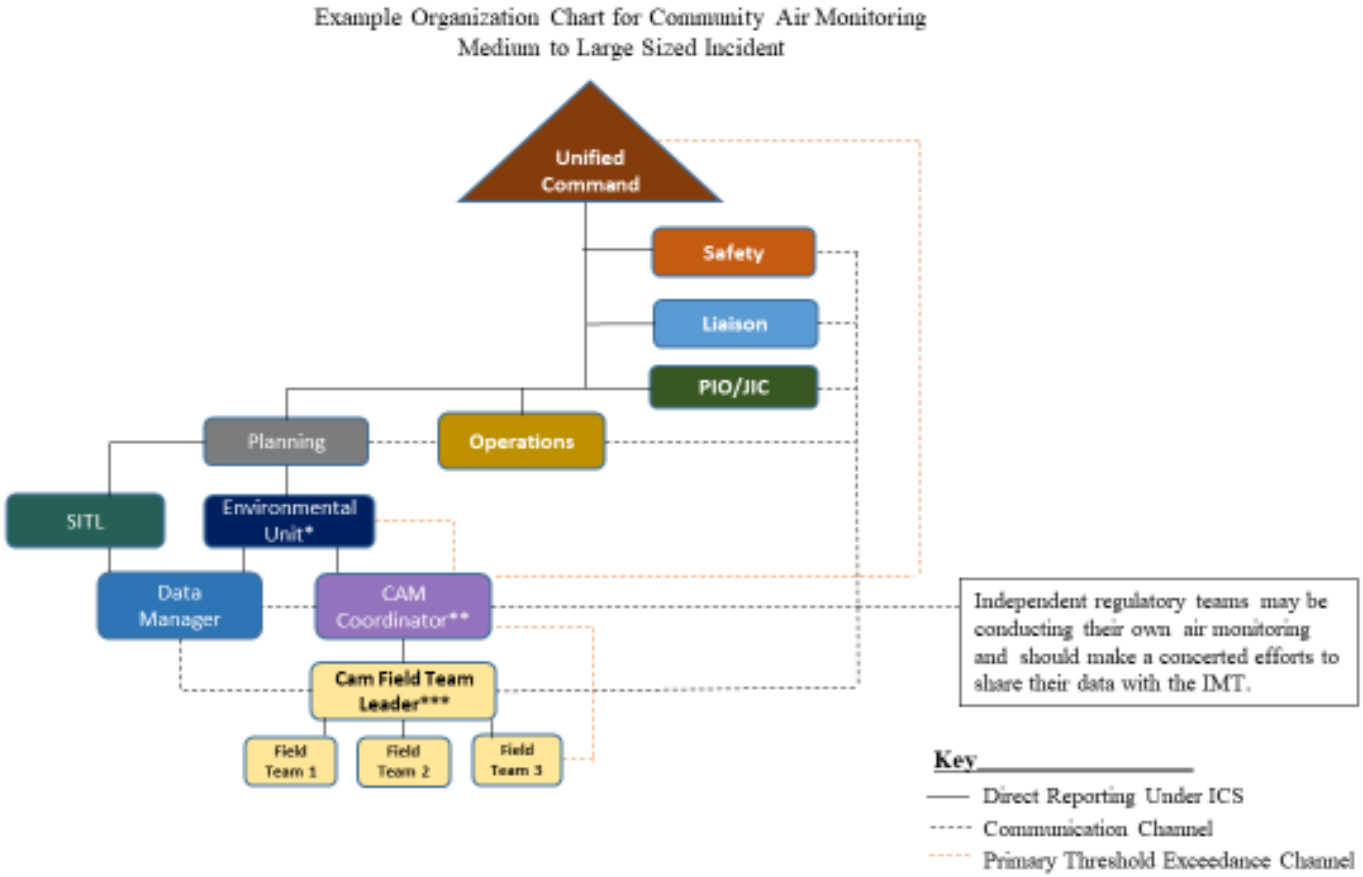
Table 9470-1 Air Monitoring Resource Tiers

Tier				
Time Period after Incident	**1 Within 2 hours of Notification**	**2 2-12 Hours**	**3 2-24 Hours**	**4 2-48 Hours**
Potential Roles	Field Team Leader(s) Field Data Manager Field Team Member(s)	Field Team Leader(s)/CAM Coordinator Field Data Manager Field Team Member(s) Toxicologist /Public Health Specialist	CAM Coordinator Field Team Leader(s) Field/Command Post Data Manager GIS/Telemetry Specialist Field Team Member(s) Toxicologist or Public Health Specialist	CAM Coordinator Field Team Leader(s) Field/Command Post Data Manager GIS Specialist Equipment Specialist Sample Custodian Field Team Member(s) Toxicologist or Public Health Specialist
Personnel (per shift)	2+	4+	5-6	6+
Data Collection Method	Roving	Roving and/or Fixed	Roving and Fixed	Roving and Fixed
Suggested Instrument Capabilities	Roving Air Monitoring (as needed) ▪ PID/FID ▪ LEL ▪ Electrochemical Sensors ▪ Colorimetric Tubes ▪ Particulate Monitors ▪ Specialized instrumentation	Roving Air Monitoring (see Tier 1) Fixed Air Monitoring Telemetry (if available)	Roving Air Monitoring Fixed Air Monitoring Telemetry	Roving Air Monitoring Fixed Air Monitoring Telemetry
Air Sampling	▪ Grab Samples	▪ Grab Samples ▪ Multi-hour Analyte Specific Sampling	▪ Grab Samples ▪ Multi-hour Analyte Specific Sampling	▪ Grab Samples ▪ Multi-hour Analyte Specific Sampling
Deliverable Examples	▪ Site Sketch ▪ Aerial Map ▪ Verbal Result Communication ▪ Summary Data ▪ Weather Data, plume modeling ▪ Develop Written Plan	Tier 1 Deliverables Upgraded+ ▪ Basic Modelling ▪ Basic Telemetry ▪ Basic Geospatial Viewer ▪ Generalized Written Plan	Tier 2 Deliverables Upgraded+ ▪ Limited Monitoring and Sampling Data Streams Integrated in Geospatial Viewer	Tier 3 Deliverables Upgraded + ▪ Monitoring/Sampling Data Streams Integrated in Geospatial Viewer
Frequency of Updates	▪ As Exceedance Occurs ▪ As Determined by UC	▪ As Exceedance Occurs ▪ As Determined by UC ▪ Every Operational Period ▪ Near-Real Time via Telemetry	▪ As Exceedance Occurs ▪ As Determined by UC ▪ Every Operational Period ▪ Near-Real Time via Telemetry ▪ Geospatial Viewer Updates as Needed	▪ As Exceedance Occurs ▪ Every Operational Period ▪ As Determined by UC ▪ Near-Real Time via Telemetry ▪ Ongoing Geospatial Viewer Updates

Area Specific Air Monitoring Resources:
The Following organizations may have air monitoring resources to provide during the response

1. Federal
   a. EPA/Special Teams or Contractors
   b. USCG/Strike Teams
2. State
   a. TCEQ (Houston Regional Office/Statewide)
   b. TGLO
   c. TRRC
   d. Civil Support Team
3. Counties
   a. Harris County Pollution Control
   b. Galveston County
   c. Brazoria County
   d. Chambers County
   e. Matagorda County
4. Cities
   a. City of Houston – Bureau of Pollution Control and Prevention
   b. Local Fire and HAZMAT teams
   c. Port of Houston Fire Dept.
5. RP/Private Entities

Figure 9470-2 Community Air Monitoring Organization Chart and Information Flow



*** Incorporate local, state, and/or federal public health authority and advisory/technical specialist roles within Enviro. Unit**

**** The CAM group may be placed in other ICS groups/sections such as Safety or Operations depending on site-specific needs.**

***** Depending on size and scope of the incident multiple CAM Field Teams/Leaders may be required**

9470.5 Roles and Responsibilities

Community Air Monitoring Coordinator

Recommend this role be filled by responsible party (RP) representative with deputy/assistant(s) filled by representative from local, state, and/or federal agency.

- Develop and coordinate CAM strategies and tactics with the Environmental Unit, SOFR and Incident Commander/Unified Command
- Establish timeline of operations and communicate monitoring plans with the Environmental Unit Leader (ENVL),
- Maintain an ICS 214- Unit Log or other documentation (logbook) of CAM activities,
- Communicate with the Operation Section to ensure team activities are coordinated,
- Identify and recommend Action Levels,
- Determine locations of vulnerable populations with emphasis on populations who may be more sensitive to exposure. (coordinate with Data Manager and Local health authorities),

- Monitor weather, specifically wind speed and direction; temperature,
- Ensure background contaminant levels are documented and updated, if available,
- Determine the number of CAM teams and frequency of monitoring and reporting,
- Delegate and oversee the Field Team Leader and coordinate with the Data Manager,
- Develop and implement the CAMP, and
- Ensure data is communicated to the appropriate parties per information sharing procedures outlined in attachment D.
    - **Ensure action level exceedances are communicated to the UC/IC**
    - **Produce exceedance form for notification to local officials/Offices of Emergency Management (OEM) to support decision making (i.e., shelter in place, evacuations)**
- Ensure all air monitoring data from all potential air monitoring groups defined above is received and documented.

Public Health Authority/Specialist/Toxicologist
Serve as technical specialist within Environmental Unit. Recommend this role be filled by local, state, and/or federal public health authority or RP representative.

- Assist in the development of the community air monitoring plan. (CAMP)
- Evaluate field sampling and data collection, (i.e. instrumentation, methodology, and locations, etc.
- Assist in public messaging related to data collected and potential hazards of chemicals.
- Ensuring adequate resources and sampling locations are included in the potentially impacted areas.
- Assist in QA/QC of data
- Convey information to Poison Center

Data Manager
Recommend this role be filled by RP representative

- Establish and maintain a Data Management Plan (DMP),
- Conduct data collection calibration briefings with Field Team(s) before deployments,
- Perform data quality assurance/quality control (QA/QC) checks prior to dissemination to incident officials and public
- Maintain and manage all data forms,
- Process data from Field Team(s) after it is collected and present to CAM Coordinator,
- Compile data from multiple CAM teams.
- If shared, compile data from IMT independent agency CAM teams.
- Ensure data is archived
- Produce and manage deliverables for site operations and UC

Community Air Monitoring Field Team Leader(s)
Recommend this role is filled by RP representative or by representation from local, county, state and/or federal agencies involved

- Ensure the safety and accountability of CAM field personnel,
- Responsible for directly implementing CAM field operations,
- Direct operations of field teams to implement strategies and/or tactics outlined by the CAM Coordinator and the ENVL to meet Incident and Data Quality Objectives (DQOs),
- Ensure that the Health and Safety Plan includes considerations for CAM field activities,
- Hold operational meetings and daily Health and Safety Meetings,
- Serve as dispatch for CAM field teams,
- Communicate with CAM Coordinator:
    - Monitor parameters and equipment to be utilized,
    - Personnel designated for CAM teams and frequency of monitoring, and
    - Determine communication pathways and frequency.
- Follow Protocols for reporting action level exceedances.
- Communicate with Data Manager:
    - Data flow pathways, data recording utility, valid values, and expectations (QA/QC), and document maintenance and management (storage).

CAM Field Team(s)
Recommend this role be filled by RP contractors but may contain a mix of personnel from local, state, and/or federal agencies.

- Participate in daily health and safety meetings.
- Perform and document calibration-check and deploy air monitoring equipment;
- Document monitoring results, time, and locations;
- Collect field samples and conduct air monitoring at areas of interest;
- Communicate readings and field observations back to field team Leader and/or CAM Coordinator; and
- Perform QA/QC on all data in the field, store in designated location, notify Data Manager of data issues/updates.
- Follow protocols for reporting action level exceedances.

CAM Strike Team (If separate CAM strike team is established)
Recommend this role be fulfilled by mix of agencies and RP representatives:

- Follow protocols outlined above for field teams
- As directed, investigate exceedances
- Report directly to CAM coordinator

9470.6 Community Air Monitoring Implementation Checklists

The following implementation checklist is designed to aid users in establishing a CAM program during an emergency spill or release. The primary reason to assess air quality is for public health therefore, air monitoring site selection will be aimed at demonstrating where there is a potential for public exposure. The checklist is divided into three sections to reflect the major phases in implementing a CAM program and include best practices where applicable. Additional detailed information is provided in the response tool attachments.

The three phases of CAM include:

Initial Response and Assessment – This phase occurs in the early hours of a response and may take place before a formal ICS is established (generally within the first 24 hours or within the first few operational periods) after the incident is reported. It is composed of immediately deploying a field team or teams to conduct an initial rapid assessment and for planning future sustained systematic and/or ad hoc air quality assessments.

Sustained Community Assessments – This phase may begin between one and several days into the response, depending on spill-specific conditions. This phase involves systematic field assessments as well as targeted, ad hoc assessments at locations that may be impacted by a release.

Demobilization Phase – This phase begins as CAM resources begin to demobilize after airborne contaminant threats have been abated or are no longer a sustained concern.

Community Air Monitoring Checklist

1.1 Initial Response and Assessment Phase

The initial response and assessment phase will begin when initial responders first receive notification that a release has occurred. This phase typically lasts approximately 24 hours (or 1–2 operational periods) after the incident is reported and is comprised of the initial assessment(s), planning, and preparation for the sustained community assessment phase.

- ☐ **Conduct/receive initial notification call with the other responding personnel; discussion points should include the following:**
  - Contaminants of concern known or suspected to be airborne at the site
  - The size and/or complexity of the incident, including the extent of the release or evacuation area, if known
  - Air monitoring resources previously deployed or deploying to the site.
  - Delineate between resources deployed for worker's safety vice CAM support.
  - Previous air monitoring results and locations
  - What information decision makers initially need such as unknown odors, location of the suspected report, known detections, etc.
  - Site access/logistical issues
  - Known or suspected High Consequence Areas (HCA)
  - Other staffing or services that may be needed, such as:
    - Weather forecasting
    - Data Management
    - Geographic information system (GIS) support
    - Plume modelling
    - Toxicologist or Public Health Authority/Specialist
- ☐ **Prior to and during deployment, assess safety considerations; collect and assess information about contaminant properties, weather conditions and forecasts, the locations of HCAs (i.e., vulnerable and/or sensitive populations), and potential dispersion of contaminants. This information will help guide initial field team assessments.**

See Table 9470-3 for more information on collecting and using this information.

Table 9470-3: Data Needs to Implement a Community Air Monitoring Plan

Data Need:	Accessible Via:	How to Use Data:
Contaminant Properties	▪ On-scene personnel ▪ Responsible party ▪ Web-based searches ▪ Safety Data Sheets ▪ Toxicological Profiles	▪ Helps determine equipment needs/capabilities ▪ Indicates contaminant fate and behavior ▪ Advises as to personal hazards and methods of protection
Weather Conditions/Forecast	▪ Contact local National Weather Service office; request current conditions and forecast at site and a spot forecast be prepared. ▪ Web-based weather services may also be used. ▪ On-site weather station ▪ Situation Unit	▪ Establish target monitoring areas ▪ Indicates possible changes in future monitoring
Geospatial Data & Maps	▪ Web-based services ▪ Geodatabases ▪ Situation Unit	▪ Develop common operating picture for CAM activities
High Consequence Areas/ Sensitive Groups	▪ Local knowledge ▪ Geodatabases ▪ Consult local health authorities, law enforcement and school officials.	▪ Establish target monitoring areas
Dispersion/Weathering Models	▪ Basic dispersion models ▪ Local NWS office (HYSPLIT etc.) ▪ IMAAC ▪ ADIOS	▪ Establish target monitoring areas. ▪ During the initial assessment, the teams should follow the plume with at least one upwind reading. If plume is not detectable, consider monitoring down the centerline of the wind direction to determine length of plume before attempting to define the width of the plume.

BEST PRACTICE*:* May use the Air Monitoring Resource Tier selection tool (Table 9470-1) to determine the appropriate level of initial response resources.

☐ **Establish objectives of the CAM program using the objectives established by IC/UC as guidance.**

BEST PRACTICE: Be clear about the objectives of the CAM program to avoid mission creep – avoid assigning CAM teams extra duties beyond the established objectives (e.g., responder health and safety monitoring, non-essential sampling, etc.) unless warranted.

☐ **Mobilize readily available personnel and equipment: (reference table 9470-1)**

- Ensure responders are trained in CAM practices/approaches, equipment, and data collection/management/communication protocols
- Ensure requested instrumentation is appropriately configured for CAM processes (data logging, appropriate detection limits, fully charged, etc.) and is bump tested and/or calibrated. More detail about air monitoring equipment can be found in Attachment A, Equipment Considerations.

☐ **During the course of CAM activities, responders should continually assess the external variables that affect airborne contaminant behavior and data analysis (see Table 9470-4).**

Table 9470-4: Variables that May Affect Airborne Contaminant Assessment

Variable	Impact
Temperature	▪ An increase in temperature increases the vapor pressure of most chemicals and can result in increased airborne concentrations near spilled chemicals.
Wind Direction/ Speed	▪ An increase in wind speed can affect vapor concentrations near a freestanding liquid surface as well as dust and particulate-bound contaminants.
Rainfall	▪ Water from rainfall can essentially cap or plug vapor emission routes from open or closed containers, saturated soil, or lagoons, thereby reducing airborne emissions of certain substances. Rainfall may also reduce the concentrations of fire smoke particulate matter during fire events.
Moisture/Relative Humidity	▪ Dusts, including finely divided hazardous solids, are highly sensitive to moisture content. This moisture content can vary significantly with respect to location and time and can affect the accuracy of many sampling results.
Vapor Emissions	▪ The physical displacement of saturated vapors can produce short-term, relatively high vapor concentrations. Continuing evaporation and/or diffusion may produce long-term low vapor concentrations and may involve large areas.
Geography/Topography /Location	▪ Acutely hazardous concentrations of chemicals may persist in confined and low-lying spaces/areas. Look for any natural or artificial barriers, such as hills, gulleys, tall buildings, or tanks, behind which air might be still, allowing concentrations to build up. Consider whether the suspected contaminants are lighter or heavier than air.
Vapor Density	▪ Materials with a vapor density greater than one may collect in low lying areas or drains/sewers. Materials with a vapor density less than one will tend to rise and disperse.
Work Activities	▪ Work activities often require the mechanical disturbance of contaminated materials, which may change the concentration and composition of airborne contaminants.

BEST PRACTICE*:* Request a National Oceanic and Atmospheric Administration/NWS Spot forecast (https://www.weather.gov/spot/) or **1-800-846-1828** for localized, hourly tabular weather forecast. This data can be used to develop an air release model. Call local NWS office when submitting a spot to alert them of the request, brief them of the situation. **Also, notify NOAA scientific support coordinator (SSC) of request**. For prolonged response operations, consider establishing an on-site weather station to detect unique conditions at the site (e.g., terrain steering - either natural or constructed).

☐ **Determine the scope and scale of the area(s) to be monitored by initial CAM teams. Determination criteria may include:**

- Safe and permissible access to monitoring locations;
- Established exclusion or evacuation zones; and
- Data previously collected by other responders, including contaminant concentrations and confirmed off site impacts.

BEST PRACTICE*:* Try to identify publicly accessible locations for monitoring to avoid acquiring consent for private property access. If private property access is required, seek consent.

☐ **As soon as practicable, deploy experienced rapid response air monitoring CAM Field Team(s) to collect baseline data for airborne contaminants. Historical data**

may also be used to develop baseline data.

- The goal is to obtain a general snapshot of the areas that may be impacted. These teams can provide valuable information that will support additional planning activities for the CAM process as well as near-real time information for the UC (e.g., presence/absence of contaminants, adjustments of evacuation zones, etc.). Any assessment conducted by these teams should be broad in scope and scale, with obtaining and communicating rapid results as a goal.
- The initial assessment should include:
  - Using basic instrumentation to obtain location-based monitoring results;
  - Monitoring downwind of an incident then moving 360 degrees around the site;
  - Identifying and monitoring at locations with sensitive populations downwind of the incident location;
  - Rapid communication of results;
  - Documenting plume direction(s);
  - An assessment of evacuation areas & boundaries of the exclusion zone; and
  - Identification of potential future fixed monitoring locations.

BEST PRACTICE*:* If possible, collect one or more "grab samples" in SUMMA® canisters or similar sampling containers to aid in quantitative characterization of airborne contaminants as the opportunity to capture such samples may rapidly diminish.

☐ **Establish communication and coordination with appropriate ICS group(s)**

- Determine the most appropriate point of contact in the ICS for CAM personnel placement during the early stages of the response. Because Safety has an early presence during the formation of the ICS, this may be a suitable location for early phase CAM activities; however, as the ICS grows or as increasing threats to public are identified, placement of the CAM activities under the Planning Section/Environmental Unit are warranted, though CAM could still be managed in the Safety and/or Operations Section depending on site specific circumstances.
- Regardless of CAM placement within the response structure, the Safety Officer should be made aware of field team activities. (Reference Figure 9470-2)

☐ **Ensure notification to stakeholders have been made including public health authorities/agencies per ICS-205 (attachment F).**

- Local, State and/or Federal Public Health authority/agencies must be contacted early in a response. Coordinate with Liaison to communicate (if these groups are not already present in the response structure).

☐ **Identify initial CAM action levels for the contaminants of concern.**

- Refer to action level guidelines, IC/UC will approve the recommended action level, one or more of the levels below may be used**.**
- See Attachment B, Contaminants of Concern and Recommended Action Levels, for more info on selecting action levels.

Please note none of the action levels below have been approved nor endorsed by the Central Texas Coastal Area Committee

Recommendations for chemicals:
CTCAC Phased Air Monitoring Tiers (PATS), reference Attachment B (Table B-1)

Recommendations for particulates:
National Ambient Air Quality Standards (NAAQS) for particulates as reflected in Wildfire Smoke A Guide for Public Health Officials (2019) and reference Attachment B (Table B-2). Users will need to verify the values are updated.

☐ **Establish a process and schedule (hourly, daily, etc.) for reporting results and Action Level (or other threshold) exceedances. Utilize data and information sharing flowcharts Figure D-1 & Figure D-2 in Attachment D.**

- Exceedance notifications should be communicated from field team leader to the CAM Coordinator, who then notifies the IC/UC.
- Exceedance reports should be documented on exceedance form (Figure D-3) and include location, instrument readings, field conditions, and proximity to at risk populations.
- In the event of a sustained action level exceedance or other threshold exceedance, establish a process for rapid notification to the appropriate ICS groups. These groups may include but not limited to:
  - IC/UC
  - LNO/PIO
  - Safety
  - Operations
  - CAM Coordinator
  - Situation Unit

BEST PRACTICE*:* Even if Field Teams are not detecting contaminants, it is still prudent to communicate non-detects.

☐ **Determine the number of CAM Field Teams and appropriate level of Command Post staff.**

- Determine the initial positions that need to be filled (CAM Coordinator, Field Team Leader (s), Data Manager, Field Teams, GIS Analyst other CAM support staff, etc.) and by whom. The exact number of roles and individuals to fill those roles can vary widely from incident to incident and as conditions change. Maintain appropriate span of control ratio of 1 to 7, optimal 3 to 5.
- All personnel must meet or exceed incident specific health and safety requirements

for fieldwork and training as defined by the Safety Officer. Individual employers may require training that exceeds the incident specific standards.

- CAM personnel shall have:
  - Safety training that meets or exceeds applicable regulations under 29 Code of Federal Regulations 1910 (e.g., 40-hour Hazardous Waste Operations and Emergency Response training with current refresher and possibly enrolled in medical monitoring program) and the incident specific safety plan
  - Basic ICS training
  - Basic air monitoring training
  - Respirator Fit Test (if APR/SCBA used) or documentation of fit test within the previous twelve months.

☐ **Submit Resource Request (ICS-213RR) for field team personnel and equipment.**

☐ **Establish general expectations, procedures, and accountability for CAM data management tasks.**

- Depending on the scale of the response, these responsibilities may be handled by the Field Team Leader, CAM Coordinator, or a delegated Data Manager.
- Procedures should include identifying and characterizing data anomalies or inconsistencies (i.e., Benzene specific monitor reports a concentration higher than the corresponding total VOCs)

☐ **Establish a data management system.**

- Consider appointing a CAM Data Manager and refer to Attachment D, Community Air Monitoring Data Management and Information Sharing Checklist, to accomplish this task.
- Ensure coordination with overall incident data management plan
- Determine which types of data need to be collected for the response. Examples include:
- Contaminant detection units,
  - Geospatial data,
  - Photographs/video (consider 2 photos per sample/monitor location). One photo away from the source and the other towards the source,
  - Command post documentation, and
  - Access agreements.
- Select the appropriate field data collection forms.

☐ **Create a common operating picture geospatial tool for CAM assessment areas.**

☐ **Develop a field assessment and reporting schedule as appropriate to provide key assessment information as needed by IC/UC, Safety, Liaison, PIO/JIC, or others. Utilize Figures D-1 and D-2 in Attachment D.**

☐ **Identify incident specific health and safety considerations for CAM operations and communicate them to the Safety Officer.**

☐ **Draft CAMP per template (Section 9470.7)**

2.1 Sustained Community Assessment Phase

The Sustained Community Assessment Phase may begin between one and several days into the response, depending on incident-specific conditions. This phase may involve recurring assessments at fixed locations, roving data collection, ad hoc assessments, data analysis, and planning for future operational periods.

- ☐ **At the beginning of each operational period (or as needed), collect and assess critical information that may affect CAM activities. These may include:**
  - Weather forecasts
  - Applicable dispersion models or trajectories
  - Contaminant weathering
  - Determining from the ENVL and/or Planning Section Chief (PSC) any relevant/new information or shift in objectives or priorities from IC/UC which might affect CAM program.
  - Operations Section tasks that may allow airborne contaminants to escape (e.g., excavation, tank transfers)
- ☐ **Determine which locations should be assessed and in what order.**
  - This may involve assessing any previous collected air monitoring data, reviewing the latest information on weather, applicable models, or field reports.
- ☐ **Ensure that all elements of the CAMP have been completed and or updated as needed.**
- ☐ **Prepare, deploy, and manage CAM field teams conducting monitoring assessments. This may be managed by the Field Team Leader or CAM Coordinator.**
  - Assemble CAM teams to meet CAM field objectives and ensure that all teams have the necessary equipment and direction.
  - Ensure that team assignments are made daily or as appropriate.
  - Ensure teams understand the action levels, thresholds, and reporting processes.
  - Identify and ensure Field Team safety and logistical needs (e.g., Equipment, Transportation, Personal protective equipment, Communication options, Food/Water, etc.) are met daily.
  - Report on relevant weather data to Field Teams.
  - Conduct CAM tailgate safety meeting at the beginning of shifts (as appropriate):
    - Review any special considerations that may exist for each team, such as site access (e.g., determine if legal access agreements have been signed; is there a need for specialized transportation; are there special safety considerations, communications, limitations, etc.)

BEST PRACTICE: Conduct standardization training with CAM Field Team members on a periodic basis before sending teams into the field. Ensure that teams use proper terminology and apply guidelines uniformly.

    - Conduct debriefings with CAM team members (or a designated team member)

and other CAM associated members of the EU at the end of shifts. Debriefings may include the following topics:

- Work completed during the shift.
- If applicable, signatures on the data forms document consensus.
- Ensure that documentation and equipment for CAM teams (equipment, maps, photography equipment, gear, communications, etc.) are adequate and all set to the same recording units prior to the next deployment.
- Solicit observations from the Field Team regarding any trends in data
- Discuss assignments for the next operational period.
- Ensure that data is being collected and recorded appropriately.

☐ **Finalize or update the process for summarizing and communicating CAM field data and for meeting the following needs:**

- Update common operating picture geospatial tool for CAM assessment area(s).
- IC/UC Updates
  - As needed or requested by IC/UC (e.g., CIRs, threshold exceedances warrant immediate notification)
- Liaison/Public Information Updates
  - Provide CAM data and updates to ICS Liaisons and PIO as directed by Planning Section Chief and IC/UC
  - Provide interpretation to facilitate presentation of results by PIO as requested
- Situation Unit updates:
  - Monitoring Locations
  - Results
- Pre-Tactics and Tactics Meeting:
  - Coordinate with the ENVL, PSC, and OSC to ensure that field observations are available for Tactics meeting if that information may influence where response resources are deployed.
  - The ENVL and/or CAM Coordinator will coordinate with PSC and OSC during Tactics Meeting; provide key CAM information to OSC/PSC to help develop ICS 204 Work Assignment forms (e.g., monitoring locations, safety constraints, etc.).
- Planning Meeting
  - The ENVL typically attends; the CAM Coordinator may be asked to attend and provide information/updates.

☐ **Ensure that assessment data from the Field Teams is flowing into the command post and disseminated appropriately.**

BEST PRACTICE: Have available mobile data collection tools by CAM Field Teams that constantly feed the geospatial tool, updating the common operating picture. This allows all recorded readings to be communicated near real time back to the Data Manager and CAM Coord.

☐ **Begin developing CAM survey deactivation.**

- Coordinate with IC/UC and ENVL criteria for determining an end to the need of community air monitoring associated with the incident.
- Discuss need for continuing air monitoring for flare-ups/secondary releases.

3.1 Demobilization Phase

The Demobilization Phase begins as CAM resources begin to demobilize after airborne contaminant threats have been abated or are no longer a concern.

☐ **Obtain new expectations and adjusted objectives from UC/IC**

- Reduce resources accordingly

☐ **Establish end points for when which protective measures can be lifted.**

☐ **Finalize assessment summaries and communications as applicable**

☐ **Ensure all CAM personnel follow incident demobilization plan**

9470.7 Community Air Monitoring Plan Template

How to Use this Template

- *The major headings of this document are suggested for the completion of a Community Air Monitoring Plan (CAMP). A CAMP is not required to follow the formats suggested in the following sections, but should contain commensurate content and detail. CAMP templates may be customized to fill individual organization capabilities and requirements.*

- *Instructions, suggestions, and pre-populated information are printed in italics in the following sections. Delete and replace these instructions following completion. Rewrite suggested text to fit incident- and organization-specific needs.*

- *To facilitate rapid planning, many tables are prepopulated with examples or common information that may be relevant to an emergency release scenario. To finish tables, delete irrelevant examples, add further information as dictated by response scenario.*

- *Values presented in these tables should be verified and adjusted to meet the expectations and capabilities of response organizations, receiving analytical laboratories, and local response agencies.*

- *Prepare this document according to the standards and practices presented in the Emergency Response Community Air Monitoring Program Document. Reference checklist sections and attachments for supporting detail and information to create this document.*

- *After completion, review the template as a whole with all parties involved. Evaluate clarity and address potential gaps.*

- *Retain this document for continuing emergency operations. Information assembled here may be used to create additional site documents and Incident Command System (ICS) planning forms.*

TEMPLATE

EMERGENCY RESPONSE COMMUNITY AIR MONITORING PLAN

(Insert Incident Name)

This incident-specific monitoring and sampling plan is approved by:

TITLE	Date
TITLE	Date
TITLE	Date

cc:

1.1 Introduction and Purpose

This emergency response Community Air Monitoring Plan (CAMP) is intended to be used during oil spills, pollutant, or chemical releases where monitoring and/or sampling of atmospheric conditions to protect nearby communities and the public may be required. This plan is designed to consider oil or other hazardous substances that are both burning and not burning.

Data gathered during the implementation of this plan will be used to assess the potential for community exposures. All fieldwork and data collection will be conducted in accordance with approved work plans and standard operating procedures (SOPs).

The use of this monitoring plan will involve forethought and planning that should help direct the monitoring, sampling, and analytical work. It is meant to be used in emergency responses where monitoring and sampling teams (hereafter referred to as field teams) may not have the opportunity to write a more thorough monitoring and sampling plan.

Field teams should always reference standard quality procedures, SOPs, and standard methods for sampling and analytical guidance.

The development of this plan will improve the documentation, communication, planning, and overall quality associated with the monitoring/sampling and analysis by:

- Encouraging field teams to consider their goals and objectives before the generation of environmental data,
- Documenting predetermined information in a standardized format,
- Increasing the communication between sampling personnel and decision makers, and health officials
- Detailing expectations and objectives before samples are collected.

1.2 Objectives

The brief statement about community air monitoring (CAM) Objectives are a short narrative about what field teams should accomplish. These objectives should be based on Incident Commander/Unified Command (IC/UC) objectives.

Example objectives of the CAM program may include:

- *Characterize contaminants and/or determine contamination levels within the specified zone.*
- *Determine the extent and concentrations of contaminants outside of the specified zone.*
- *Determine if the specified zone is appropriately defined.*

Example data quality objectives:

Data that are generated will be used:

- *To compare with site-specific action levels or risk-based action levels to determine if any acute health threat exists.*
- *To compare to an established background level or with collected background sample(s).*
- *To assist with determining the area of impact due to a hazardous material release.*

- *To assist with an off-site acute exposure assessment.*
- *Determine if acute health threat has abated.*

2.1 Contaminants of Concern and Community Action Levels

Provide an overview of the contaminants, volatile compounds and particulate matter as needed and associated action levels. List compounds in narrative or tabular format that may pose a threat to health and the environment relevant to incident release. This section should strive to be exhaustive and include contaminants that may not be detected by Health and Safety air monitoring equipment. Divide vapor phase and particulate airborne contaminants into separate sections. ***Utilize Attachment B for establishment.***

For contaminants without established action levels, complex mixtures, or unknown constituents and composition, provide a narrative description and working action level with justification. Example contaminant narratives follow:

Bakken Crude Oil

Contaminants of concern include Bakken crude oil as well as breakdown byproducts. Bakken Crude Oil commonly contains a high fraction of volatile light hydrocarbons, including benzene, toluene, ethylbenzene, and xylenes. Because no real-time monitoring instrument can specifically detect crude oil vapors, total volatile organic compounds will be used as monitoring criteria. Because no Protective Action Criteria (PACs) levels exist for crude oil vapors, 10% of the PAC value for gasoline will be used as the volatile organic compound (VOC) Action Level. Additional monitoring for explosive atmospheres and oxygen levels will also take place. Chemical-specific monitoring may also take place as necessary (e.g., benzene, carbon monoxide, etc.).

Burning crude oil may release dangerous levels of volatile and semi-volatile organic compounds, carbon monoxide, hydrogen sulfide, sulfur dioxide, and particulate matter.

Complex mixtures will require baseline and periodic air samples to determine constituents in the air. The samples should be collected using a recognized standard method and analyzed by a certified laboratory.

Burning crude oil may release dangerous levels of volatile and semi-volatile organic compounds, carbon monoxide, hydrogen sulfide, sulfur dioxide, and particulate matter. Community action levels for Carbon monoxide, hydrogen sulfide, sulfur dioxide are listed Table 3.1.

3.1 Real-Time Monitoring

Outline the procedures, practices, and logistics necessary to collect, interpret, and act on real-time air monitoring information. Match contaminants of concern with available instrumentation and direct read resources along with respective detection limits. Contaminants may be listed in tabular format. Less common contaminants without reference action levels or detection methods should be listed in narrative format, with actions and conclusions justified.

Table 3.1: Real-Time Air Community Air Monitoring Plan

Analyte	Action Level	Action Level Basis	Field Action	Instrument	Detection Limit	Notes
(Analytes as needed)	(Action levels, as available)	(Rational and Source of Action Level)	(Field action and reporting when level exceed)	(Instrumentation or method of detection)	(Limit of detection)	
VOCs	*1 ppm (general)* *_ ppm based on specific analyte*			MultiRAE Pro	0.1 ppm	
				MultiRAE Plus	1 ppm	
				AreaRAE	0.1 ppm	
				UltraRAE 3000	0.25 ppm	
				ppbRAE	1 ppb	
				MiniRAE 3000	0.1 ppm	
				TVA 1000b	PID: 0.5 ppm, FID: 1 ppm	
				(Other Instruments)		
Oxygen	<19.5 %, >22.0%			MultiRAE Pro	0.1% Volume	
				MultiRAE Plus	0.1% Volume	
				AreaRAE	0.1% Volume	
				(Other Instruments)		
LEL	1 % LEL			MultiRAE Pro	1%	
				MultiRAE Plus	1%	
				AreaRAE	1%	
				(Other Instruments)		
Chlorine				MultiRAE Pro	0.1 ppm	
				MultiRAE Plus	0.1 ppm	
				ToxiRAE	0.1 ppm	
				(Other Instruments)		

Table 3.1: Real-Time Air Community Air Monitoring Plan

Analyte	Action Level	Action Level Basis	Field Action	Instrument	Detection Limit	Notes
Ammonia				MultiRAE Pro	1 ppm	
				MultiRAE Plus	1 ppm	
Hydrogen Cyanide				MultiRAE Pro	0.5 ppm	
				MultiRAE Plus	1.0 ppm	
				(Other Instruments)		
Hydrogen Sulfide				MultiRAE Pro	0.1 ppm	
				AreaRAE	1 ppm	
				(Other Instruments)		
Phosphine				MultiRAE Pro	0.1 ppm	
				(Other Instruments)		
Butadiene				UltraRAE 3000	0.25 ppm	
				(Other Instruments)		
Benzene				UltraRAE 3000	0.05 ppm	
				(Other Instruments)		
Particulates, PM 2.5				TSI AM510	0.001 mg/m^3	
				DustTrak	0.001 mg/m^3	
				DataRam 4000	0.0001 mg/m^3	
				(Other Instruments)		
Particulates, PM 10				TSI AM510	0.001 mg/m^3	
				DustTrak	0.001 mg/m^3	
				DataRam 4000	0.0001 mg/m^3	
				(Other Instruments)		

3.2 Monitoring Locations

Develop strategies and approaches for where real-time monitoring will occur. Where applicable, allocate resources between roving and temporary fixed air monitoring stations. (Generally, at a minimum, there should be 1 upwind location and between 3-5 downwind locations; 1 of the wind centerline and 1-2 offset on either side of the centerline). A reference map may be helpful to delineate roving team areas of responsibility and fixed monitoring locations. (Consider physically marking locations in the field so various teams go to the same location unless otherwise directed).

3.3 Roving

Designate geographic areas for CAM field teams to assess. Establish a systematic naming convention that corresponds with all CAM air monitoring operations. Prioritize areas of public exposure and sensitive populations. Consider wind direction and available plume models to gauge the extent of possible release.

Establish consistent data acquisition practices and communicate procedures to field teams. Include instrument operation and data recording.

Consider instrumentation, logistics, and transportation resources as well as personnel composition for each team.

Establish data reporting practices, criteria, and frequency for field teams per Attachment D. If an exceedance occurs, CAM personnel should ensure that UC is notified immediately through the CAM Coordinator.

3.4 Temporary Fixed Air Monitoring Site

Designate initial locations for fixed air monitoring stations; establish a systematic naming convention and record addresses and/or lat/long for each station. (see Table 3.2)

Example: FS01, Fixed Station 01

Consider plume models and sensitive populations in air station placement. Plan data reporting practices and/or telemetry monitoring. Designate procedures for responding to action level exceedances. These locations may differ from sampling locations (Section 4.2); if so, note the difference.

Table 3.2: Temporary Fixed Air Monitoring Station Locations

Air Monitoring Station Name	Location		Detectable Contaminants	Equipment
	Address	Lat./Long		

4.1 Analytical Air Sampling

Table 4.1: Suggested Air Sampling Methods and Media for Hazardous Substance Releases

Analyte	Method	Media Type	Sample Media Product Number
(Other Analytes as Available)	*(Laboratory Methods)*	*(Method Compliant Media Type)*	(Manufacturer's Product Number)
Ammonia	*NIOSH 6015*	*Sorbent Tube*	
Asbestos	*NIOSH 7402 TEM* *NIOSH 7400 PCM*	*Cassette*	
BTEX/VOCs	*NIOSH 1501* *EPA TO-15*	*Sorbent Tube* *SUMMA Canister or Tedlar Bag*	
Chlorine/Bromine	*NIOSH 6011*	*Sorbent Tube*	
Fire Vapors	*EPA TO-15*	*SUMMA Canister or Tedlar Bag*	
Mercury	*NIOSH 6009*	*Sorbent Tube*	
Metals	*NIOSH 7300*	*Cassette*	
PAHs	*NIOSH 5506*	*Sorbent Tube with Pre Filter*	
Particulates	*NIOSH 0500 or 0600*	*Cassette*	
SVOCs	*NIOSH 5506*	*Sorbent Tube*	

4.2 Contaminants of Concern

List all target analytes, reference methods, and air sampling media in tabular format. Table 4.1 presents example laboratory methods and method compliant sample media. Entries to this table may be substituted for equivalent methods and requisite media. Further analytes and methods may be added to this table as needed.

4.3 Sampling Locations

Establish a systematic naming convention for air sampling locations and record addresses and/or lat/long for each station. An effective naming convention will allow more sample locations to be added throughout a response. These locations may differ from monitoring locations (Section 3.2.2); if so, note the difference.

Sample ID Example: AS01, Air Sample 01, Date

Indicate the Sampling Location Name and describe the rationale for each sample location chosen. Select locations that provide adequate upwind and downwind plume characterization and assess air quality for vulnerable populations. Determine how air sampling for vulnerable populations will be prioritized. (Avoid locations that could produce misleading results such as locations near gas stations etc…)

Include an aerial map or sketch with labeled sample locations.

Table 4.2: Air Sampling Station Locations

Sampling Station Name	Location		Target Analyte	Equipment
	Address	Lat./Long		

5.1 Data Management

See Table 5.1 for example data sources and management.

5.2 Data Quality Objectives

A well-constructed Data Quality Objective (DQO) consists of the following:

- *Activity;*
- *Criteria for making a decision (Action Level); and*
- *What your action is going to be after you make the decision.*

An initial DQO for CAM may be:

- *Air Monitoring will be performed using roving teams. If a reading exceeds the established action levels, the exceedance will be communicated immediately to UC/IC. If no exceedances are found, monitoring will continue.*

5.3 Data Management Plan

Arrange processes into tabular format (see Table 5.1) to ensure consistent data management. Each column represents the practices necessary for retrieving, storing, and processing raw data into usable formats; rows should represent a single data source. Where necessary, specify data management and processing procedures in narrative format.

Table 5.1: Data Sources and Data Management

Data Source	Required Information	Processing Instructions	Processing Frequency	Processing Responsibility	Storage Location [digital storage location and/or physical copy]	Final Output [file format]
Site Documents	*Site Files, Health and Safety Plan, CAMP, calibration logs*	*File hard copies and electronic copies in indicated storage location*	*Beginning of project, and as needed*	*CAM Coordinator*	***Digital:*** ***Hard Copy:***	*.doc, .pdf and other formats*
Camera	*Date, time, direction, photographer, description*			*Data Manager*		
Sample Information	*Sample No., Date, Time, Sampler, Location*			*Sample Custodian*		
Real Time Monitoring Data	*Background Concentrations Instrument Data with time and location*	*(Instrument and equipment specific including needed software)*		*Data Manager*		
(Other Data Sources as Required)						

5.4 Data Reporting

List deliverables from data collected in CAM operations in Table 5.2. Required deliverables should be coordinated with Environmental Unit Leader, SITL and IC/UC.

Table 5.2: Data Reporting Requirements and Deliverables

Reporting Task	Deliverables			
	Data Inputs	Format	Frequency	Responsibility
Community Air Monitoring Reports	*Real-time air monitoring results w/ locations. Air Sampling analytical results,*	*Tabular, .xls & csv.*	*Continually/ Daily*	*Data Manager*
Situational Reports	*Photos, Field reports, Air Monitoring Results*	*Document*	*Daily*	*Data Manager*
Common Operating Picture	*Real-time results w/ locations*	Geospatial	*Daily*	*Data Manager*
(Other Deliverables				

5.5 Quality Assurance and Quality Control

Write in narrative format the steps and considerations to establish robust quality assurance for incoming and published data. As appropriate, identify predetermined standards for data verification, analysis, and reporting. (Consider periodic assessments to ground truth the data).

Quality assurance and quality control (QA/QC) may be organized into functional activities as follows with suggested QA/QC Procedures. Adjust this format and suggested content to fit site-specific needs.

5.5.1 Real-Time Monitoring

- Real-time instruments may be calibrated in excess of the manufacturer's recommendations.
    - At a minimum, calibrate whenever indicated by site conditions or instrument readings.
- Daily instrument checks to verify operations, memory capacity, and data logging functions.
- Co-located sampling for analytical analysis should be conducted to assess accuracy and precision in the field.
- Field Team meetings will be held daily to ensure quality data is correctly collected and applicable.

5.5.2 Sampling and Analytical Results

- Chain–of-custody documents may be completed for each sample
- Level IV data validation may be performed on the first sample group analyzed.
- Level IV data validation may be performed on 10% of all samples

5.5.3 Data Reporting and Deliverables

- Real time data via air monitoring service provider's database and daily data summaries may be provided to official decision makers for informational purposes using data that have not undergone complete QA/QC.
- Comprehensive reports of real-time and/or analytical data may be generated following QA/QC and may be delivered 60 days following receipt of validated results.

6.1 Project Organization and Responsibilities

Designate personnel to fill CAM Roles and Responsibilities within Organizational structure. Use Table 9470-1: Air Monitoring Resource Tiers in the CAM program to determine the appropriate level of initial response and ongoing resources.
Adjust the sample ICS organizational chart accordingly.

6.2 Assigned Roles and Responsibilities

CAM Coordinator

Name:	Click here to enter text	**Primary Contact Phone:**	Click here to enter text
Organization:	Click here to enter text	**Secondary Contact:**	Click here to enter text

Data Manager

Name:	Click here to enter text	**Primary Contact Phone:**	Click here to enter text
Organization:	Click here to enter text	**Secondary Contact:**	Click here to enter text

CAM Field Team Leader

Name:	Click here to enter text	**Primary Contact Phone:**	Click here to enter text
Organization:	Click here to enter text	**Secondary Contact:**	Click here to enter text

Field Team 1 Contact

Name:	Click here to enter text	**Primary Contact Phone:**	Click here to enter text
Organization:	Click here to enter text	**Secondary Contact:**	Click here to enter text

Additional Personnel and Positions as Needed

Name:	Click here to enter text	**Primary Contact Phone:**	Click here to enter text
Organization:	Click here to enter text	**Secondary Contact:**	Click here to enter text

7.1 Community Air Monitoring Plan Attachments

The following attachment list may be populated with organization-specific documents. Where applicable, appropriate procedures, practices, and information may be described here.

A. Documentation

A.1 Field Logbooks
A.2 Sample Labels
A.3 Custody Seals and Chain-of-Custody Record

B. Standard Operating Procedures and Instrument Calibration

B.1 Modification or Additions to Applicable Standard Operating Procedures
B.2 Calibration and Maintenance of Monitoring Instruments

C. Packaging and Shipping

D. References

(a) (NRC), N. R. (1986, 1992).
(b) APHA, A. P. (1992). *Standard Methods for the Examination of Water and Wastewater.* Washington, DC: American Public Health Association, American Water Works Association, Water Environment Federation.
(c) Association, A. I. (n.d.). *https://www.aiha.org/*.
(d) ATSDR, A. f. (2020, February). Retrieved from Minimal Risk Levels (MRLs) for Professionals: www.atsdr.cdc.gov/mrls/index.asp
(e) EPA. (2009). *Graphical Arrays of Chemical-Specific Health Effect, Reference Values for Inhalation Exposures.*
(f) EPA, E. P. (n.d.). Retrieved from https://www.epa.gov/.
(g) EPA, E. P. (1992). *Reference Guide to Odor Thresholds for Hazardous Air Pollutants Listed in the Clean Air Act Amendments of 1990.* Washington, DC: Office of Research and Development.
(h) Information, N. N. (n.d.). *https://www.ncbi.nlm.nih.gov/*.
(i) NOAA, O. o. (2020). Retrieved from Acute Exposure Guideline Levels (AEGLs): https://response.restoration.noaa.gov/oil-and-chemical-spills/chemical-spills/resources/acute-exposure-guideline-levels-aegls.html
(j) NOAA, O. o. (2020). *Emergency Response Planning Guidelines (ERPGs)*. Retrieved from https://response.restoration.noaa.gov/oil-and-chemical-spills/chemical-spills/resources/emergency-response-planning-guidelines-erpgs.html

9470.8 Response Tool Attachments

A. Equipment Considerations
B. Contaminants of Concern and Recommended Action Levels
C. Community Air Monitoring Field Team Checklist
D. Community Air Monitoring Data Management and Information Sharing
E. Laboratory Analysis
F. Notification ICS-205

Attachment A: Equipment Considerations

Broadly speaking, responders should use air monitoring equipment that meets the following performance criteria:

- ☐ Rugged and portable: The monitor should be suitable for fieldwork, withstand shock, and be easily transportable in a vehicle, small boat, or helicopter.
- ☐ Suitability: The instrument should be suitable for the media measured, i.e., smoke particulates, VOCs, etc. and be within the calibration time-frame established by the manufacturer or operating organization.
- ☐ Operating duration: Eight hours or more.
- ☐ Readout: The instrument should provide real-time, continuous readings, as well as time-weighted average readings where necessary.
  Data Logging should also be used and data downloaded from units at the end of shifts. Data logging provides a good backup of data.
- ☐ Reliability: The instrument should be based on tried-and true technology and operate as specified.
- ☐ Sensitivity: The instrument should have a detection limit below the applicable exposure criteria.
- ☐ Data download: The instrument should be compatible with readily available computer technology, and provide software for downloading data.

Other qualities of air monitoring equipment may include the capability to broadcast data over a cellular or radio network (telemetry) or the capability to determine time-weighted averages over a specified period.

During an emergency, real-time air monitoring results are essential for rapid decision making. These results are generated from hand-held instrumentation that produce near-instantaneous measurements of a substance in real-time. The term real-time denotes that the instrument is able to generate immediate readings about the present level of hazardous contaminants in the air. Because these readings pertain to current conditions, results do not represent levels of contamination throughout longer periods and cannot represent contamination exposure to receptors including residences and workers over time.

Direct read instruments are designed to alert operators when early signs of contaminant concentrations are present in the local atmosphere. These instruments typically utilize specialized sensors to detect contaminant concentrations down to one-part contaminant per billion parts of air. These sensors are specific to contaminant qualitative characteristics rather than identifying each contaminant and cannot narrow down if more than one contaminant is present. Sensors are installed in direct read air monitoring units to detect for unsafe atmospheric conditions. These sensors are specific for flammable or explosive atmospheres, oxygen deficiencies, specific gases and vapors, and ionizing radiation. From real- time readings, responders can determine if additional contaminant specific instrumentation is needed and further develop a site-specific air monitoring plan, which may involve an air sampling plan for specific analyses.

While direct read instruments are highly valuable in time sensitive decision making, there are limitations in the array of their detection of hazards. For most sensors, detection limits are set to detect and/or measure no lower than 1 parts per million (ppm) and are specific to measuring only

specific chemical characteristics. Alternatively, some instruments are designed for targeted sampling for only one detectable substance, which commonly do not have a correction factor for chemical interferences, which may result in false positives.

Air monitoring instruments are designed to be easy to operate but do require necessary calibrations and a qualified user who is familiar with operational guidelines and limitations for using the instrument in the field. Calibration methods vary but, in many cases, require additional equipment such as an array of calibration gases with regulators. Calibration requires following a method with a corresponding order of operations that are specific to each sensor. Likewise, is true for the data interpretation and validation of the results the instrument produces, it is necessary to have trained personnel who are knowledgeable of the instrument's operating principles and limitations. Instruments should be calibrated on a schedule designed to meet the requirements for both the instrument manufacturer's instructions and operating organization's standard operating procedures (SOPs). If the instrument is calibrated, a bump test or calibration test can be performed in the field to ensure the unit is holding its calibration.
Remember that instrument readings have value for health and safety decisions but limited value when contaminants are unknown. Additionally, when results read "0 ppm," a contaminant may still be present but below the instrument detection level. Report these non-detections readings as less than the instrument detection limit

Some air monitors can be equipped with telemetry systems capable of transmitting real-time readings to be displayed remotely back at the incident command post and/or stored in an off-site repository (e.g., server or cloud network). This is advantageous for many reasons, but most especially in allowing more than one user to view results instantaneously. Several different types of real- time transmission systems are available for specific types of air monitoring instrumentation. Limitations include instrument specific hardware needed for real-time transmission and possible signal variability and interference.

Attachment B: Contaminants of Concern and Recommended Action Levels

Note: None of the action levels below have been officially approved nor endorsed by the Central Texas Coastal Area Committee (CTCAC). Additionally, information in this document is not intended to interfere or supersede any existing standard operating procedures, policies, regulations, and/or laws. The below levels should be adjusted accordingly per incident specific variables and conditions.

During chemical or oil spill emergencies, questions often arise regarding potential community airborne exposures. Air monitoring can be performed to evaluate whether airborne gaseous vapor chemicals and/or particulate matter (smoke) are present at levels that could potentially cause adverse human health effects. Health-protective action levels are generally employed as part of a CAMP to provide information for corrective action to limit chemical exposure, and the same approaches are applicable to crude oil releases involving fire and without fire.

This section provides emergency responders and officials with tools to help facilitate accurate and timely decision-making. These tools include the Phased Air Monitoring Tiers (PATS), Particulate Matter Recommendations Regarding Community Action Levels for Incidents Involving Crude Oil Fires, and the EPA's Graphical Arrays of Chemical-Specific Health Effect Reference Values for Inhalation Exposures. The PATS provide exposure reference values and recommend action levels to support decisions such as shelters in place and evacuations. PATS also provide a template to communicate air monitoring results to the public. The particulate recommendations provide guidance for the identification of community action levels for particulate matter that may affect communities during crude oil fires. Lastly, the EPA's Graphical Arrays provide an informative summary of existing emergency response, occupational, and general public exposure values for reference.

B.1 Phased Air Monitoring Tiers (PATS)

1. **First Tier: 0 PPM** (Used only for communicating non-detects of ongoing air monitoring operations)

2. **Odor Threshold Tier**- the odor threshold refers to the theoretical minimum concentration of odorant stimulus necessary for detection in some specified percentage of the population. Threshold values are not fixed physiological facts or physical constants but are a statistical point representing the best estimate value from a group of individual responses. The detection threshold is the lowest concentration of odorant that will elicit an olfactory response without reference to odor quality in a specified percentage of a given population. It should be noted that health effects may occur at the odor threshold and should not be considered as a "safe" level. It should also be noted that indirect health effects (i.e., headaches, nausea) may occur if the odor threshold is persistently exceeded. [Reference (g)]

3. **Minimal Risk Level (MRL) Value Tier -** An MRL is an estimate of the daily human exposure to a hazardous substance that is likely to be without appreciable risk of adverse non-cancer health effects over a specified duration of exposure. [1]. These substance specific estimates, which are intended to serve as screening levels, are used by ATSDR health assessors and other responders to identify contaminants and potential health effects that may

be of concern at hazardous waste sites MRLs are based on non-cancer health effects only and are not based on a consideration of cancer effects [1]. ATSDR uses the no observed adverse effect level/uncertainty factor (NOAEL/UF) approach to derive MRLs for hazardous substances [1]. MRLs are set below levels that, based on current information, might cause adverse health effects in the people most sensitive to such substance-induced effects. MRLs are derived for acute (1-14 days), intermediate (>14-364 days), and chronic (365 days and longer) exposure durations, and for inhalation routes of exposure [1]. MRLs are generally based on the most sensitive substance-induced end point considered to be of relevance to humans. ATSDR does not use serious health effects (such as irreparable damage to the liver or kidneys, or birth defects) as a basis for establishing MRLs. Exposure to a level above the MRL does not mean that adverse health effects will occur [1]. Most MRLs contain some degree of uncertainty because of the lack of precise toxicological information on the people who might be most sensitive (e.g., infants, elderly, and nutritionally or immunologically compromised) to effects of hazardous substances; ATSDR uses a conservative (i.e., protective) approach to address these uncertainties consistent with the public health principle of prevention. [Information and values obtained from reference (d)]

4. **Equipment Detection Limit (approximate) Tier -** equipment detection is the concentration equivalent to a signal, due to the analyte of interest, which is the smallest signal that can be distinguished from background noise by a particular instrument. [Reference (b)]

5. **UC Action Level Tier-** The acute MRL is primarily used for this value. The MRL provides conservative numbers with uncertainty factors built in adjusting for variables such as dosimetric adjustments and human variability. However in circumstances when the MRL for a substance is below the air monitoring/sampling equipment detection limits, the acute no observed adverse effect level (NOAEL) will be used. In certain situations the UC action level is listed as the lowest level possible per detection equipment due to either the severity of the chemical or alignment with other tiers in the PATS. Additionally, in some circumstances, when no acute MRL or NOAEL is available, another value is used such as the chronic NOAEL or the Acute Exposure Guidelines Limit (AEGL-1) value is halved.

   No Observed Adverse Effect Level (NOAEL): The dose of chemical at which there were no statistically or biologically significant increase in frequency or severity of adverse effects seen between the exposed population and its appropriate control. Effects may be produced at this dose, but they are not considered to be adverse.

6. **Local Government Action Level Tier –** during an incident, local officials or offices of emergency management may decide to set additional or separate action levels which are applicable for their decision-making purposes such as initiation of a shelter-in-place or evacuation order (Information, n.d.) (Association, n.d.) (EPA E. P., https://www.epa.gov/, n.d.). This tier provides a location for that value. [Reference (f)]

7. **Emergency Response Planning Guidelines (ERPG-1) Tier:** the maximum airborne concentration below which nearly all individuals could be exposed for up to 1 hour without experiencing more than mild, transient adverse health effects. [Reference (k)]

8. **Acute Exposure Guidelines Level (AEGL-1) Tier -** the airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic non-sensory effects. [Reference (j)]

NOTE: The values above are compiled from various sources which update at varying frequencies. This plan is reviewed annually and its associated values will be updated accordingly. Users of this plan should always verify the values listed in the plan are the most current valued listed in the originating source.

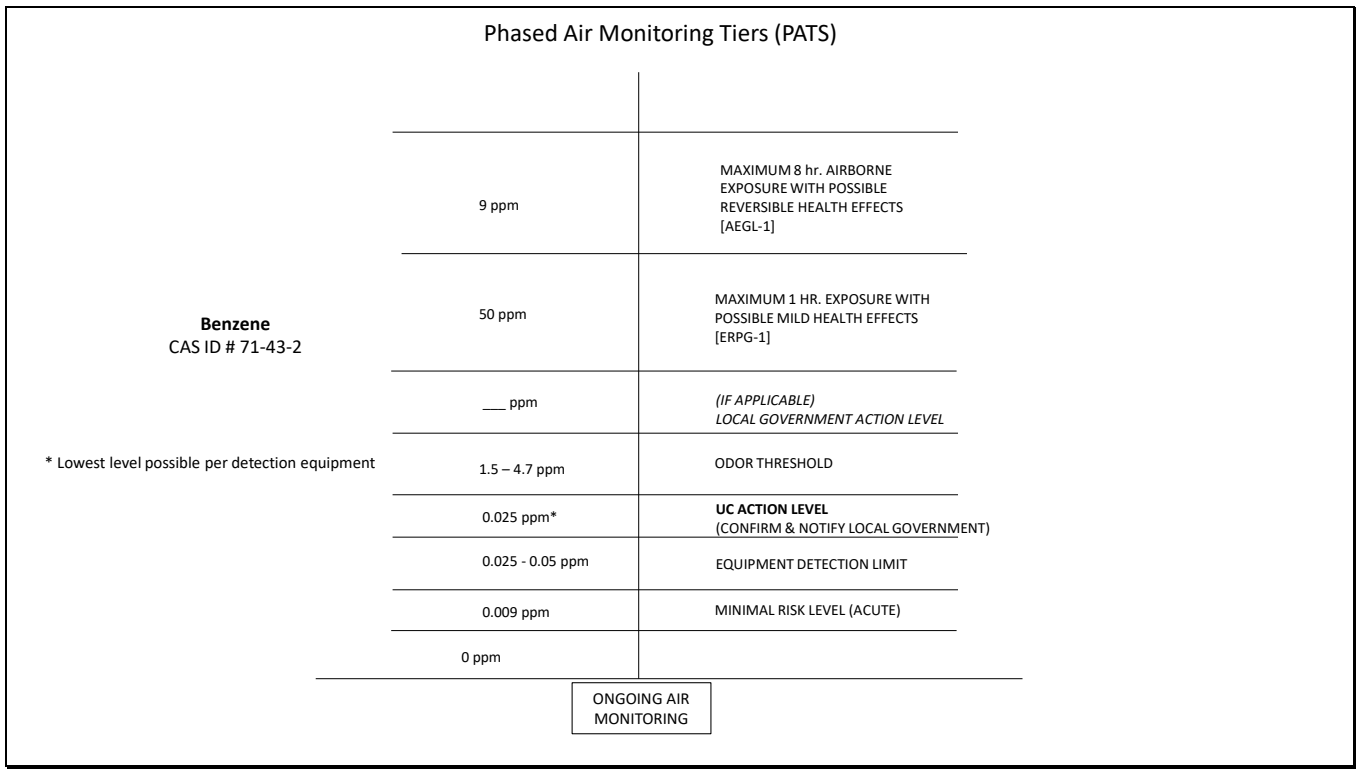
Phased Air Monitoring Tiers (PATS)

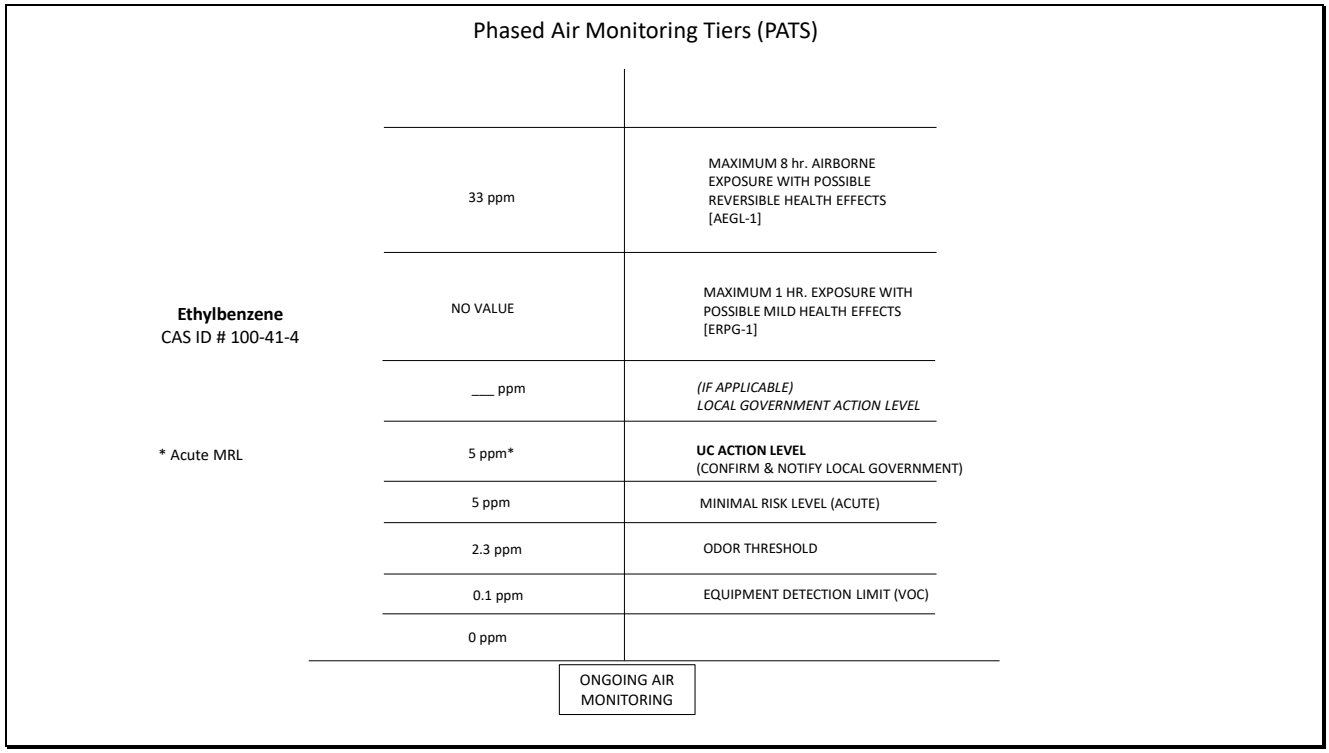
TEMPLATE

	___ ppm	MAXIMUM 8 hr. AIRBORNE EXPOSURE WITH POSSIBLE REVERSIBLE HEALTH EFFECTS [AEGL-1]
Name of Substance CAS ID #_____	___ ppm	MAXIMUM 1 HR. EXPOSURE WITH POSSIBLE MILD HEALTH EFFECTS [ERPG-1]
	___ ppm	*(IF APPLICABLE) LOCAL GOVERNMENT ACTION LEVEL*
* Denotes source of action level	___ ppm*	**UC ACTION LEVEL** (CONFIRM & NOTIFY LOCAL GOVERNMENT)
	___ ppm	EQUIPMENT DETECTION LIMIT
	___ ppm	MINIMAL RISK LEVEL _____
	___ ppm	ODOR THRESHOLD
	0 ppm	

ONGOING AIR MONITORING

Table B-1: Action Levels for Crude Oil Chemical Constituent Releases





Phased Air Monitoring Tiers (PATS)

Hexane
CAS ID # 110-54-3

NO VALUE	MAXIMUM 8 hr. AIRBORNE EXPOSURE WITH POSSIBLE REVERSIBLE HEALTH EFFECTS [AEGL-1]
NO VALUE	MAXIMUM 1 HR. EXPOSURE WITH POSSIBLE MILD HEALTH EFFECTS [ERPG-1]
___ ppm	*(IF APPLICABLE) LOCAL GOVERNMENT ACTION LEVEL*
0.6 ppm*	**UC ACTION LEVEL** (CONFIRM & NOTIFY LOCAL GOVERNMENT)
0.6 ppm	MINIMAL RISK LEVEL (CHRONIC)
0.1 ppm	EQUIPMENT DETECTION LIMIT (VOC)
0.0064 ppm	ODOR THRESHOLD
0 ppm	

ONGOING AIR MONITORING

* Chronic MRL

Phased Air Monitoring Tiers (PATS)

Hydrogen Sulfide
CAS ID # 7783-06-4

0.33 ppm	MAXIMUM 8 hr. AIRBORNE EXPOSURE WITH POSSIBLE REVERSIBLE HEALTH EFFECTS [AEGL-1]
0.1 ppm	MAXIMUM 1 HR. EXPOSURE WITH POSSIBLE MILD HEALTH EFFECTS [ERPG-1]
___ ppm	*(IF APPLICABLE) LOCAL GOVERNMENT ACTION LEVEL*
0.1 ppm*	**UC ACTION LEVEL** (CONFIRM & NOTIFY LOCAL GOVERNMENT)
0.1 ppm	EQUIPMENT DETECTION LIMIT
0.07 ppm	MINIMAL RISK LEVEL ACUTE
0.0005 - .03 ppm	ODOR THRESHOLD
0 ppm	

ONGOING AIR MONITORING

*Lowest level possible per detection equipment

- No NOAEL

Phased Air Monitoring Tiers (PATS)

Naphthalene
CAS ID # 91-20-3

* Lowest level per detection equipment

NO VALUE	MAXIMUM 8 hr. AIRBORNE EXPOSURE WITH POSSIBLE REVERSIBLE HEALTH EFFECTS [AEGL-1]
NO VALUE	MAXIMUM 1 HR. EXPOSURE WITH POSSIBLE MILD HEALTH EFFECTS [ERPG-1]
___ppm	*(IF APPLICABLE) LOCAL GOVERNMENT ACTION LEVEL*
0.1 ppm*	**UC ACTION LEVEL** (CONFIRM & NOTIFY LOCAL GOVERNMENT)
0.1 ppm	EQUIPMENT DETECTION LIMIT (VOC)
0.084 ppm	ODOR THRESHOLD
0.0007 ppm	MINIMAL RISK LEVEL (CHRONIC)
0 ppm	

ONGOING AIR MONITORING

Phased Air Monitoring Tiers (PATS)

Nitrogen Dioxide
CAS ID # 10102-44-0

* 50% of 8hr AEGL-1

- No MRL or NOAEL

0.5 ppm	MAXIMUM 8 hr. AIRBORNE EXPOSURE WITH POSSIBLE REVERSIBLE HEALTH EFFECTS [AEGL-1]
1.0 ppm	MAXIMUM 1 HR. EXPOSURE WITH POSSIBLE MILD HEALTH EFFECTS [ERPG-1]
___ ppm	*(IF APPLICABLE) LOCAL GOVERNMENT ACTION LEVEL*
0.25 ppm*	**UC ACTION LEVEL** (CONFIRM & NOTIFY LOCAL GOVERNMENT)
0.1 ppm	EQUIPMENT DETECTION LIMIT
NO VALUE	MINIMAL RISK LEVEL (ACUTE)
0.002 - 0.01 ppm	ODOR THRESHOLD
0 ppm	

ONGOING AIR MONITORING

Phased Air Monitoring Tiers (PATS)

Sulfur Dioxide
CAS ID # 7446-09-5

0.2 ppm	MAXIMUM 8 hr. AIRBORNE EXPOSURE WITH POSSIBLE REVERSIBLE HEALTH EFFECTS [AEGL-1]
0.3 ppm	MAXIMUM 1 HR. EXPOSURE WITH POSSIBLE MILD HEALTH EFFECTS [ERPG-1]
___ ppm	*(IF APPLICABLE) LOCAL GOVERNMENT ACTION LEVEL*
0.1 ppm*	**UC ACTION LEVEL** (CONFIRM & NOTIFY LOCAL GOVERNMENT)
0.1 ppm	EQUIPMENT DETECTION LIMIT
0.1 – 3.0 ppm	ODOR THRESHOLD
0.01 ppm	MINIMAL RISK LEVEL (ACUTE)
0 ppm	

ONGOING AIR MONITORING

* Lowest level per detection equipment

Phased Air Monitoring Tiers (PATS)

Toluene
CAS ID # 108-88-3

67 ppm	MAXIMUM 8 hr. AIRBORNE EXPOSURE WITH POSSIBLE REVERSIBLE HEALTH EFFECTS [AEGL-1]
50 ppm	MAXIMUM 1 HR. EXPOSURE WITH POSSIBLE MILD HEALTH EFFECTS [ERPG-1]
___ ppm	*(IF APPLICABLE) LOCAL GOVERNMENT ACTION LEVEL*
2.14 ppm	ODOR THRESHOLD
2 ppm	**UC ACTION LEVEL** (CONFIRM & NOTIFY LOCAL GOVERNMENT)
2 ppm	MINIMAL RISK LEVEL (ACUTE)
0.1 ppm	EQUIPMENT DETECTION LIMIT (VOC)
0 ppm	

ONGOING AIR MONITORING

* Acute MRL

Phased Air Monitoring Tiers (PATS)

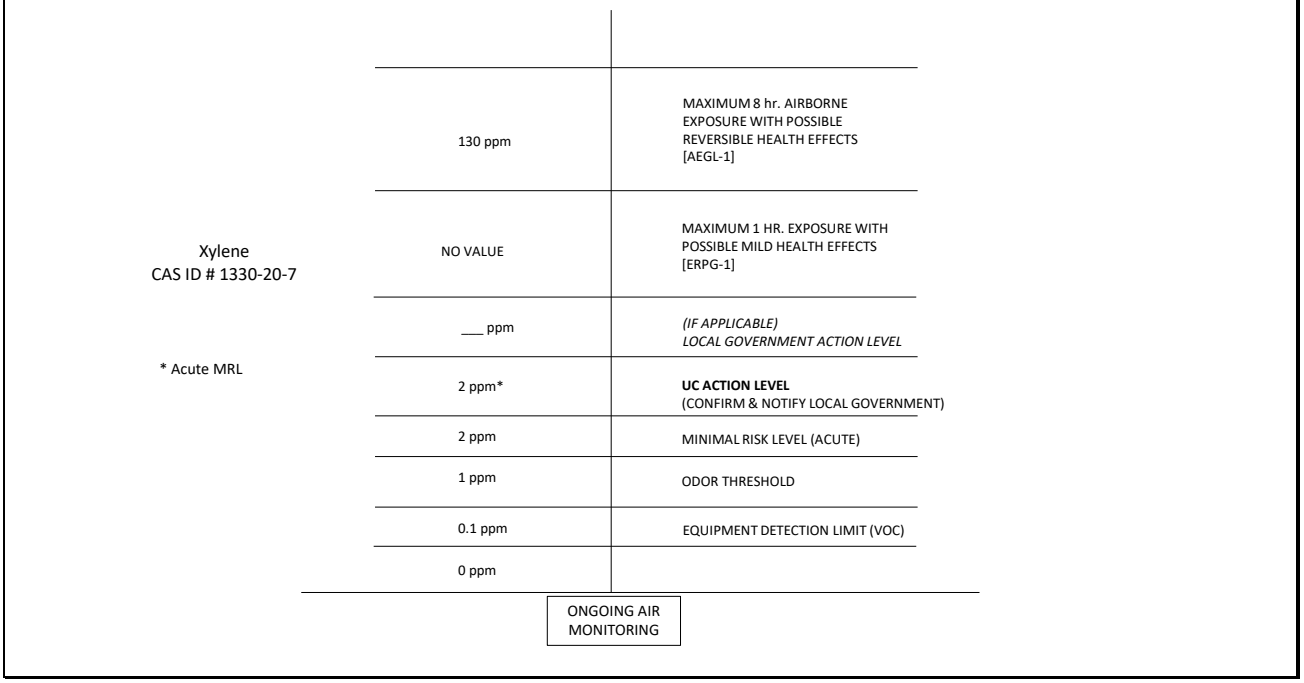
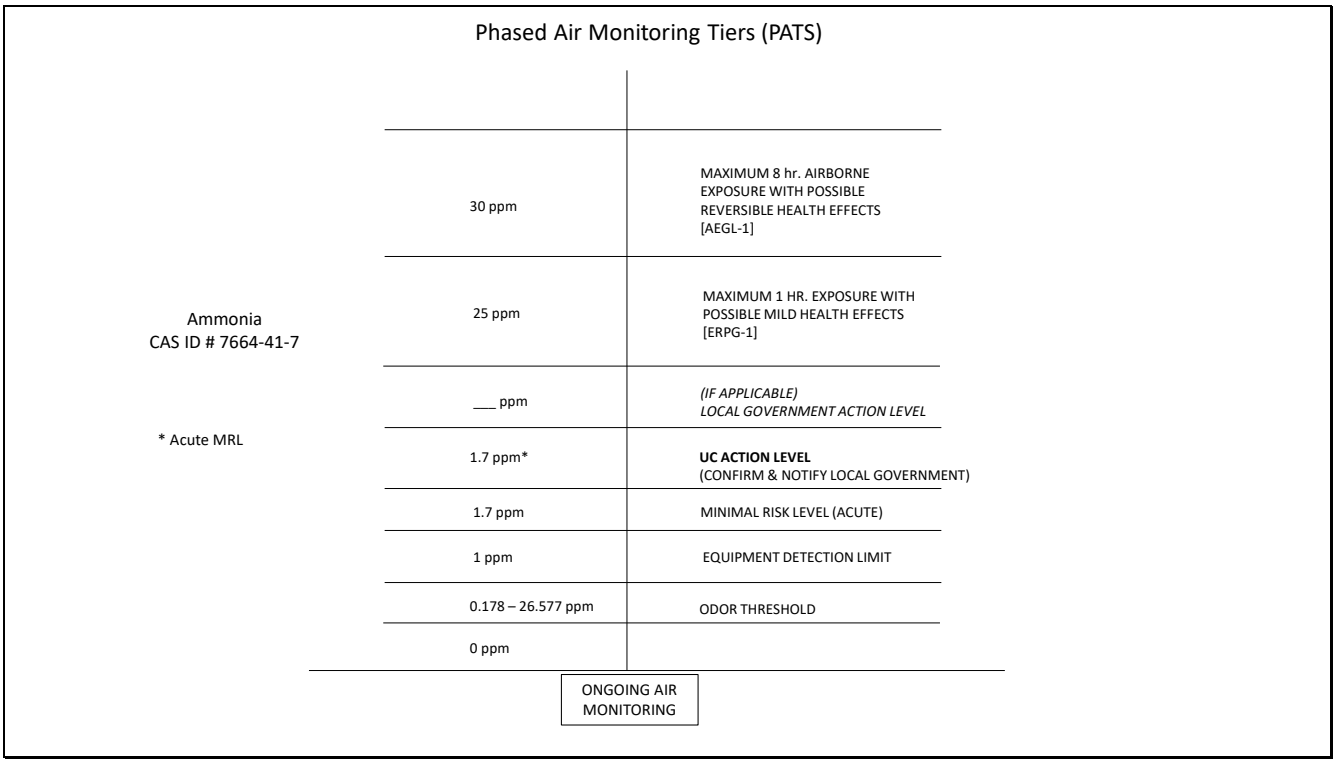
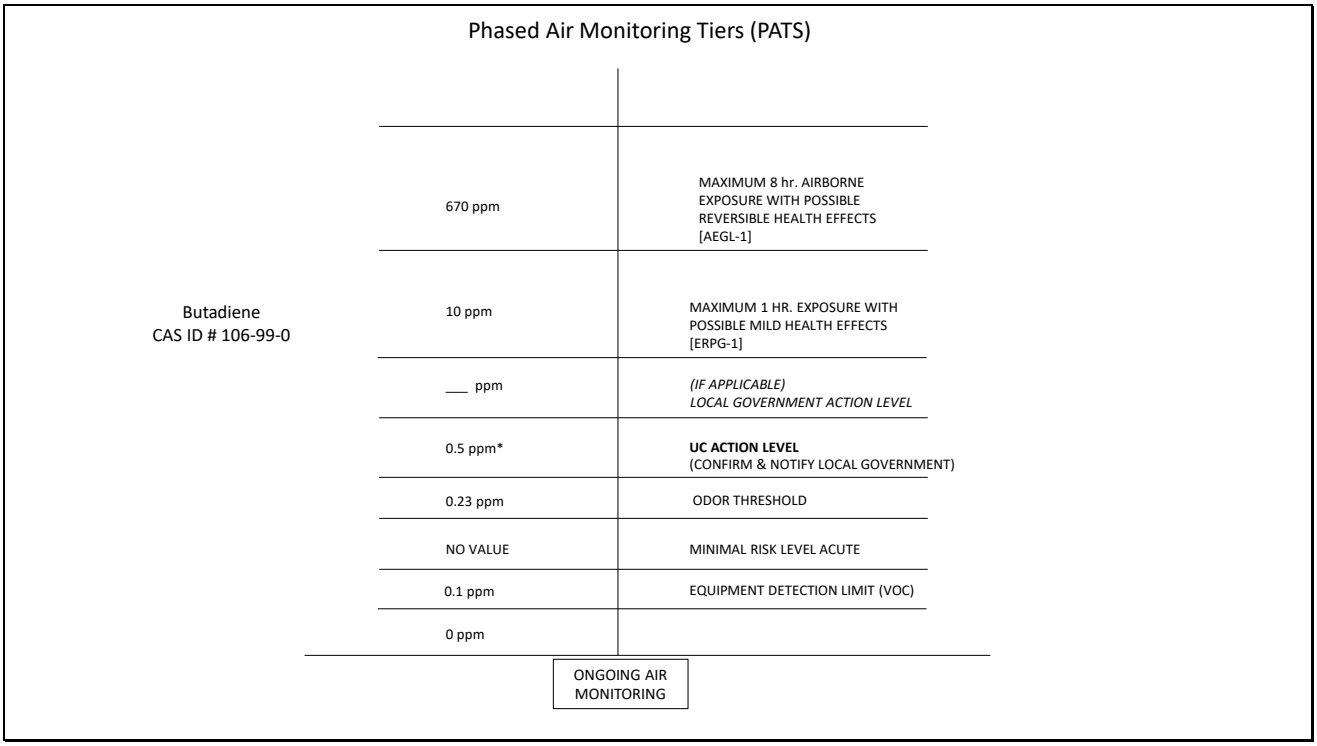


Table B-2: Action Levels for Commonly Transported Hazardous Material Release Emergencies





Phased Air Monitoring Tiers (PATS)

Carbon Disulfide
CAS ID # 75-15-0

* Chronic MRL

- No acute or intermediate MRLs

6.7 ppm	MAXIMUM 8 hr. AIRBORNE EXPOSURE WITH POSSIBLE REVERSIBLE HEALTH EFFECTS [AEGL-1]
1.0 ppm	MAXIMUM 1 HR. EXPOSURE WITH POSSIBLE MILD HEALTH EFFECTS [ERPG-1]
-- ppm	*(IF APPLICABLE) LOCAL GOVERNMENT ACTION LEVEL*
0.3 ppm*	**UC ACTION LEVEL** (CONFIRM & NOTIFY LOCAL GOVERNMENT)
0.3 ppm	MINIMAL RISK LEVEL (CHRONIC)
0.1 ppm	EQUIPMENT DETECTION LIMIT (VOC)
0.1 – 0.2 ppm	ODOR THRESHOLD
0 ppm	

ONGOING AIR MONITORING

Phased Air Monitoring Tiers (PATS)

Chlorine
CAS ID #7782-50-5

*NOAEL (adjusted)

0.5 ppm	MAXIMUM 8 hr. AIRBORNE EXPOSURE WITH POSSIBLE REVERSIBLE HEALTH EFFECTS [AEGL-1]
1.0 ppm	MAXIMUM 1 HR. EXPOSURE WITH POSSIBLE MILD HEALTH EFFECTS [ERPG-1]
-- ppm	*(IF APPLICABLE) LOCAL GOVERNMENT ACTION LEVEL*
0.2- 3.5 ppm	ODOR THRESHOLD
0.167 ppm*	**UC ACTION LEVEL** (CONFIRM & NOTIFY LOCAL GOVERNMENT)
0.1 ppm	EQUIPMENT DETECTION LIMIT
0.06 ppm	MINIMAL RISK LEVEL (ACUTE)
0 ppm	

ONGOING AIR MONITORING

Phased Air Monitoring Tiers (PATS)

Ethanol
CAS ID # 64-17-5

NO VALUE	MAXIMUM 8 hr. AIRBORNE EXPOSURE WITH POSSIBLE REVERSIBLE HEALTH EFFECTS [AEGL-1]
1800 ppm	MAXIMUM 1 HR. EXPOSURE WITH POSSIBLE MILD HEALTH EFFECTS [ERPG-1]
-- ppm	*(IF APPLICABLE) LOCAL GOVERNMENT ACTION LEVEL*
46 ppm*	**UC ACTION LEVEL** (CONFIRM & NOTIFY LOCAL GOVERNMENT)
10 ppm	ODOR THRESHOLD
NO VALUE	MINIMAL RISK LEVEL ACUTE
0.1 ppm	EQUIPMENT DETECTION LIMIT (VOC)
0 ppm	

ONGOING AIR MONITORING

* NOAEL

Phased Air Monitoring Tiers (PATS)

Formaldehyde
CAS ID # 50-00-0

0.9 ppm	MAXIMUM 8 hr. AIRBORNE EXPOSURE WITH POSSIBLE REVERSIBLE HEALTH EFFECTS [AEGL-1]
1.0 ppm	MAXIMUM 1 HR. EXPOSURE WITH POSSIBLE MILD HEALTH EFFECTS [ERPG-1]
___ ppm	*(IF APPLICABLE) LOCAL GOVERNMENT ACTION LEVEL*
0.5 – 1.0 ppm	ODOR THRESHOLD
0.04 ppm*	**UC ACTION LEVEL** (CONFIRM & NOTIFY LOCAL GOVERNMENT)
0.04 ppm	MINIMAL RISK LEVEL (ACUTE)
0.01 ppm	EQUIPMENT DETECTION LIMIT
0 ppm	

ONGOING AIR MONITORING

* Acute MRL

Phased Air Monitoring Tiers (PATS)

Hydrochloric Acid
CAS ID #7647-01-0

1.8 ppm	MAXIMUM 8 hr. AIRBORNE EXPOSURE WITH POSSIBLE REVERSIBLE HEALTH EFFECTS [AEGL-1]
3 ppm	MAXIMUM 1 HR. EXPOSURE WITH POSSIBLE MILD HEALTH EFFECTS [ERPG-1]
___ ppm	*(IF APPLICABLE) LOCAL GOVERNMENT ACTION LEVEL*
2 ppm*	**UC ACTION LEVEL** (CONFIRM & NOTIFY LOCAL GOVERNMENT)
2 ppm	EQUIPMENT DETECTION LIMIT
NO VALUE	MINIMAL RISK LEVEL ACUTE
0.26 – 0.3 ppm	ODOR THRESHOLD
0 ppm	

*Lowest level possible per detection equipment

ONGOING AIR MONITORING

Phased Air Monitoring Tiers (PATS)

Hydrogen Chloride
CAS ID # 7647-01-0

1.8 ppm	MAXIMUM 8 hr. AIRBORNE EXPOSURE WITH POSSIBLE REVERSIBLE HEALTH EFFECTS [AEGL-1]
3.0 ppm	MAXIMUM 1 HR. EXPOSURE WITH POSSIBLE MILD HEALTH EFFECTS [ERPG-1]
___ ppm	*(IF APPLICABLE) LOCAL GOVERNMENT ACTION LEVEL*
1 ppm*	**UC ACTION LEVEL** (CONFIRM & NOTIFY LOCAL GOVERNMENT)
1 ppm	EQUIPMENT DETECTION LIMIT
NO VALUE	MINIMAL RISK LEVEL ACUTE
0.26 – 0.3 ppm	ODOR THRESHOLD
0 ppm	

*Lowest level possible per detection equipment
*Approximately 50% of AEGL-1

ONGOING AIR MONITORING

Phased Air Monitoring Tiers (PATS)

Hydrogen Cyanide
CAS ID # 74-90-8

* 50% of 8 hr AEGL-1

- No MRL or NOAEL

1.0 ppm	MAXIMUM 8 hr. AIRBORNE EXPOSURE WITH POSSIBLE REVERSIBLE HEALTH EFFECTS [AEGL-1]
NO VALUE	MAXIMUM 1 HR. EXPOSURE WITH POSSIBLE MILD HEALTH EFFECTS [ERPG-1]
___ ppm	*(IF APPLICABLE) LOCAL GOVERNMENT ACTION LEVEL*
1.0 – 5.0 ppm	ODOR THRESHOLD
0.5 ppm*	**UC ACTION LEVEL** (CONFIRM & NOTIFY LOCAL GOVERNMENT)
0.5 ppm	EQUIPMENT DETECTION LIMIT
NO VALUE	MINIMAL RISK LEVEL ACUTE
0 ppm	

ONGOING AIR MONITORING

Phased Air Monitoring Tiers (PATS)

Hydrogen Fluoride
CAS ID # 7664-39-3

* 50% of 8 hr AEGL-1

1.0 ppm	MAXIMUM 8 hr. AIRBORNE EXPOSURE WITH POSSIBLE REVERSIBLE HEALTH EFFECTS [AEGL-1]
2.0 ppm	MAXIMUM 1 HR. EXPOSURE WITH POSSIBLE MILD HEALTH EFFECTS [ERPG-1]
___ ppm	*(IF APPLICABLE) LOCAL GOVERNMENT ACTION LEVEL*
0.5 ppm*	**UC ACTION LEVEL** (CONFIRM & NOTIFY LOCAL GOVERNMENT)
0.5 ppm	EQUIPMENT DETECTION LIMIT
0.04 ppm	ODOR THRESHOLD
0.02 ppm	MINIMAL RISK LEVEL ACUTE
0 ppm	

ONGOING AIR MONITORING

Phased Air Monitoring Tiers (PATS)

Styrene
CAS ID # 100-42-5

* Acute MRL

20 ppm	MAXIMUM 8 hr. AIRBORNE EXPOSURE WITH POSSIBLE REVERSIBLE HEALTH EFFECTS [AEGL-1]
50 ppm	MAXIMUM 1 HR. EXPOSURE WITH POSSIBLE MILD HEALTH EFFECTS [ERPG-1]
___ ppm	*(IF APPLICABLE) LOCAL GOVERNMENT ACTION LEVEL*
5.0 ppm	**UC ACTION LEVEL** (CONFIRM & NOTIFY LOCAL GOVERNMENT)
5.0 ppm	MINIMAL RISK LEVEL ACUTE
0.1 ppm	EQUIPMENT DETECTION LIMIT (VOC)
0.047 ppm	ODOR THRESHOLD
0 ppm	

ONGOING AIR MONITORING

Phased Air Monitoring Tiers (PATS)

Sulfuric Acid
CAS ID #766-93-9

* Lowest possible level per detection equipment

0.04986 ppm	MAXIMUM 8 hr. AIRBORNE EXPOSURE WITH POSSIBLE REVERSIBLE HEALTH EFFECTS [AEGL-1]
0.5 ppm	MAXIMUM 1 HR. EXPOSURE WITH POSSIBLE MILD HEALTH EFFECTS [ERPG-1]
-- ppm	*(IF APPLICABLE) LOCAL GOVERNMENT ACTION LEVEL*
0.671 ppm	ODOR THRESHOLD
0.04986 ppm*	**UC ACTION LEVEL** (CONFIRM & NOTIFY LOCAL GOVERNMENT)
0.04986 ppm*	EQUIPMENT DETECTION LIMIT
NO VALUE	MINIMAL RISK LEVEL (ACUTE)
0 ppm	

ONGOING AIR MONITORING

B.2 Particulate Matter Recommendations Regarding Community Action Levels for Incidents Involving Crude Oil Fires

The following section provides guidance for the identification of community action levels for fire smoke particulate matter that may affect communities during crude oil fires. The combustion of petroleum, which occurs after an accidental release, is generally a short-lived event (i.e., lasting hours to a few days) and associated air quality impacts would be transient in nature.

Responders can consider utilizing values published jointly by the EPA, United States Forest Service, Centers for Disease Control, and the California Air Resources in Wildfire Smoke: A Guide for Public Health Officials (hereafter referred to as the Wildfire Smoke Guidelines). Fire smoke originating from a crude oil fire could be similar in composition and characteristics to smoke from other types of fires (i.e., wildland fires, chemical plant fires, volcanic activity). As such, the Wildfire Smoke Guidelines may be adapted to advise decision makers on the safety of communities, including sensitive subgroups, whose air quality is affected by a crude oil fire (or other fire types).

The action levels in the Wildfire Smoke Guidelines are based on the NAAQS values for particulate matter of particle sizes <2.5 and <10 micrometers (PM 2.5 and PM 10) and thus are based on a 24 hour average. In addition to providing particulate matter levels as $\mu g/m^3$, the relative hazards are also expressed in terms of the EPA Air Quality Index (AQI), which is a nationally uniform index used for reporting and forecasting daily air quality. The AQI informs the public how clean or polluted the air is using a standardized vocabulary (i.e., Good, Moderate, Unhealthy, etc.,) and an easy-to-understand normalized numerical scale of 0 to 500.

Equally as important as providing a numerical action level value, the Wildfire Smoke Guidelines also list actions that would be appropriate based on varying severities of air quality impacts. Most actions involve public notifications, limitation of outdoor activities, and shelter-in-place recommendations. Of note, evacuation or relocation of sensitive subpopulations is only recommended in instances where severe air quality impacts from particulate matter are sustained for more than a few hours. As stated in the Wildfire Smoke Guidelines: “Leaving an area of thick smoke may be a good protective measure for members of at-risk groups, but it is often difficult to predict the duration, intensity, and direction of smoke, making this an unattractive option to many people. There is stress associated with evacuation and most people do not want to leave their homes. Even if smoky conditions are expected to continue for weeks, it may not be feasible for a large percentage of the affected population to evacuate. Moreover, the process of evacuation can entail serious risks, particularly if poor visibility makes driving hazardous. In these situations, the risks posed by driving need to be weighed against the potential benefits of evacuation. Therefore, in areas where fires are likely to occur, public health officials are encouraged to develop plans to help at-risk groups shelter locally.” In addition, in the context of crude oil fires, smoke impacts on air quality may be so transient that by the time actions for evacuation and/or relocation can be organized, communicated and implemented, the hazard could have already subsided.

There may be other smoke and crude oil vapor constituents such as irritant gases (sulfur dioxide), asphyxiant gases (carbon monoxide), and volatile hydrocarbons (i.e., benzene, etc.) which may be of a relatively lesser concern to a community in proximity to a crude oil spill and fire. Though communities may experience air quality impacts due to fire smoke, members of the public tend to stay away from, or are prevented from going near, fires for their safety. It is important to note that the composition of fire smoke changes dramatically as smoke travels away from a fire toward downwind/distant receptors. Irritant and asphyxiant gases and

hydrocarbons tend to dissipate out of the smoke into the atmosphere beginning at very short distances from the fire. As a result, particulate matter remains as the primary constituent of the smoke distant from a fire, hence the focus on particulate matter in the Wildfire Smoke Guidelines for community smoke impacts. Impacts of irritant and asphyxiant gases and hydrocarbons in fire smoke tend to pose a risk only to individuals in close proximity to a fire, such as first responders and emergency response workers.

Table B-3 lists the threshold levels for different concentrations of PM 2.5 and PM 10 and the recommended actions that should be taken to prevent harm to community members. If only PM 10 measurements are available during smoky conditions, it can be assumed that the PM 10 is composed primarily of fine particles (PM 2.5), and that therefore the AQI and associated cautionary statement and advisories for PM 2.5 may be used. Table B-3 can be used as guidance for public health officials with regards to measures that can be taken to protect public health at different AQI categories. These AQI categories correspond to particulate matter levels (PM 2.5 and PM 10) at 24-hour average exposure periods. The AQI value for particulate matter is derived from estimated or measured 24-hour average concentrations. The Wildfire Smoke Guidelines does not publish levels for shorter average times (e.g., 1- to 3-hour or 8-hour averages) similar to PACs. As such, responders will have to determine how to assess the threats posed when particulates have not been present nor measured for 24 hours.

Additionally, TCEQ's website (https://www.tceq.texas.gov/response/wildfires) provides wildfires information including current PM2.5 levels at multiple sites throughout Texas.

Table B-3: Threshold Levels and Recommended Response Actions for PM 2.5 and PM 10

PM 2.5 and PM 10 Threshold[1] Levels (µg/m^3) 24 Hr. Avg. [2]	Level of Health Concern and AQI Range	Meaning[3]	Action(s)[4]
0.0 – 12.0	Good (0-50)	Air quality is considered satisfactory, and air pollution poses little or no risk.	▪ If smoke event anticipated, implement communication plan.
12.1 - 35.4	Moderate (51-100)	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people. For example, people who are unusually sensitive[5] to ozone may experience respiratory symptoms.	▪ Prepare for full implementation of School Activity Guidelines (https://www3.epa.gov/airnow/flag/school-chart-2014.pdf) ▪ Issue public service announcements (PSAs) advising public about health effects, symptoms and ways to reduce exposure ▪ Distribute information about exposure avoidance
35.5 - 55.4	Unhealthy for Sensitive Groups (101 – 150)	Although the public is not likely to be affected at this level, people with lung disease, and older adults and children are at a greater risk from exposure to ozone, whereas persons with heart and lung disease, and older adults and children are at greater risk from the presence of particles in the air.	▪ Evaluate implementation of School Activity Guidelines ▪ If smoke event projected to be prolonged, evaluate and notify possible sites for cleaner air shelters ▪ If smoke event projected to be prolonged, prepare evacuation plans
55.5 - 150.4	Unhealthy (151 – 200)	Everyone may begin to experience some adverse health effects, and members of the sensitive groups[6] may experience effects that are more serious.	▪ Full implementation of School Activity Guidelines ▪ Consider canceling outdoor events (e.g., concerts and competitive sports), based on public health and travel considerations

Table B-3: Threshold Levels and Recommended Response Actions for PM 2.5 and PM 10

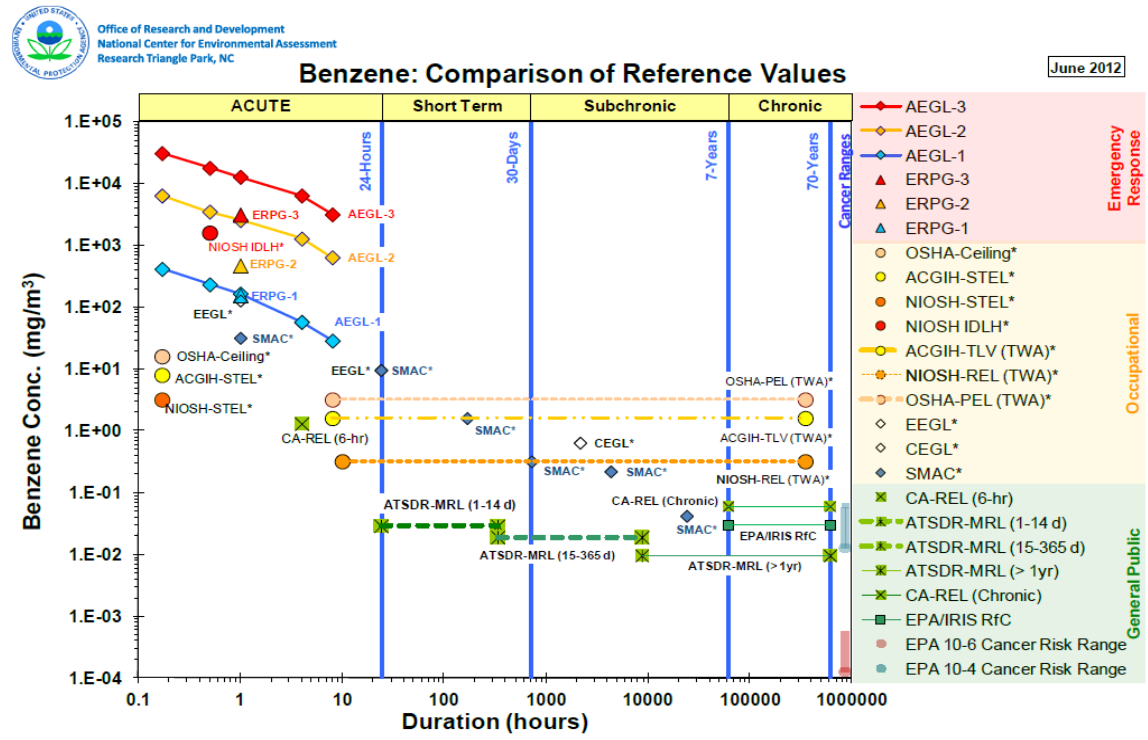
PM 2.5 and PM 10 Threshold[1] Levels ($\mu g/m^3$) 24 Hr. Avg. [2]	Level of Health Concern and AQI Range	Meaning[3]	Action(s)[4]
150.5 - 250.4	Very Unhealthy (201-301)	This would trigger a health alert signifying that everyone may experience more serious health effects.	▪ Schools move all activities indoors or reschedule them to another day. ▪ Consider closing some or all schools ▪ Cancel outdoor events involving activity (e.g., competitive sports) ▪ Consider cancelling outdoor events that do not involve activity (e.g., concerts)
> 250.5	Hazardous (> 300)	This would trigger a health warning of emergency conditions. The entire population is more likely to be affected.	▪ Consider closing schools ▪ Cancel outdoor events (e.g., concerts and competitive sports) ▪ Consider closing workplaces not essential to public health ▪ If particulate matter level is projected to remain high for a prolonged time, consider evacuation of at-risk populations

[1] Threshold values taken from EPA AQI online calculator found at https://www.airnow.gov/index.cfm?action=airnow.calculator [2] 24 Hour PM 2.5 "breakpoints" verified via Federal Register for National Ambient Air Quality Standards (NAAQS) rulemaking, https://www.gpo.gov/fdsys/pkg/FR-2013-01-15/pdf/2012-30946.pdf
[3] As defined by https://www.airnow.gov/index.cfm?action=aqibasics.aqi
[4]Recommendations from Wildfire Smoke: A Guide for Public Health Officials at https://www3.epa.gov/airnow/wildfire-smoke/wildfire-smoke-guide-revised-2019.pdf
[5] People who are unusually sensitive to air pollution are a subset of Sensitive Individuals. Unusually sensitive to air pollution can be defined as the very young, the elderly, pregnant women, and the immunocompromised.
[6] Sensitive groups are defined as people with lung disease, and older adults and children who are at a greater risk from exposure to ozone; and persons with heart and lung disease, and older adults and children who are at greater risk from the presence of particles in the air. http://www.airnow.gov/index.cfm?action=aqibasics.aqi

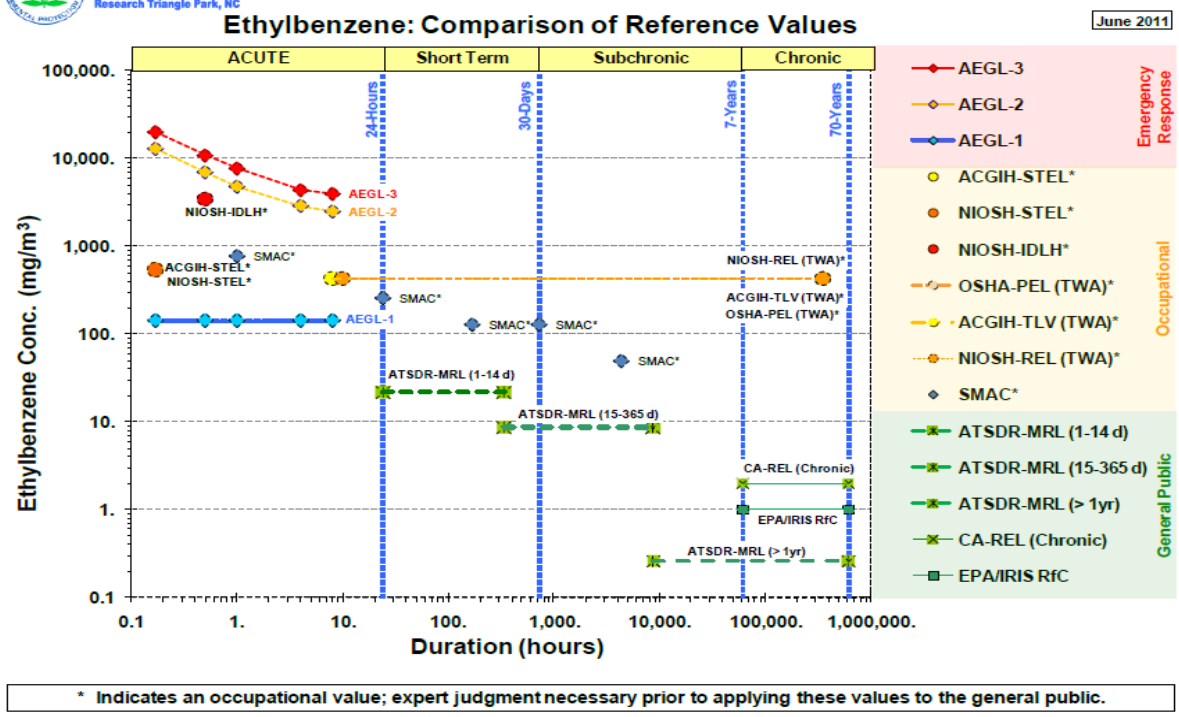
Table B-4: EPA Graphical Arrays - Reference (e)

The following section contain excerpts from the EPA's Graphical Arrays of Chemical-Specific Health Effect Reference Values for Inhalation Exposures for various chemicals. The aforementioned document consolidates various emergency response, occupational, and general public reference values. The purpose of EPA's Graphical Arrays document/tables as it related to this CAM plan is solely to provide a summary of available reference values. Specific reference values (ppm etc.) can be found within the document at the below link:

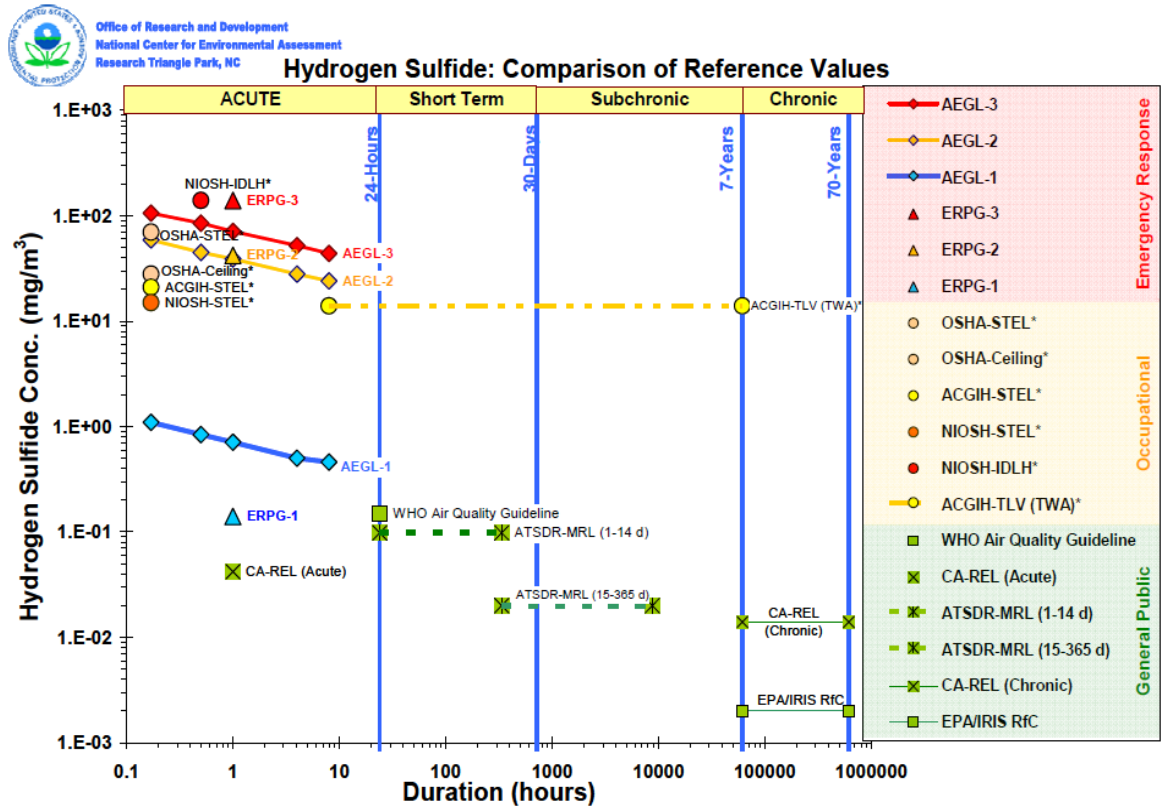
http://ofmpub.epa.gov/eims/eimscomm.getfile?p_download_id=495646.



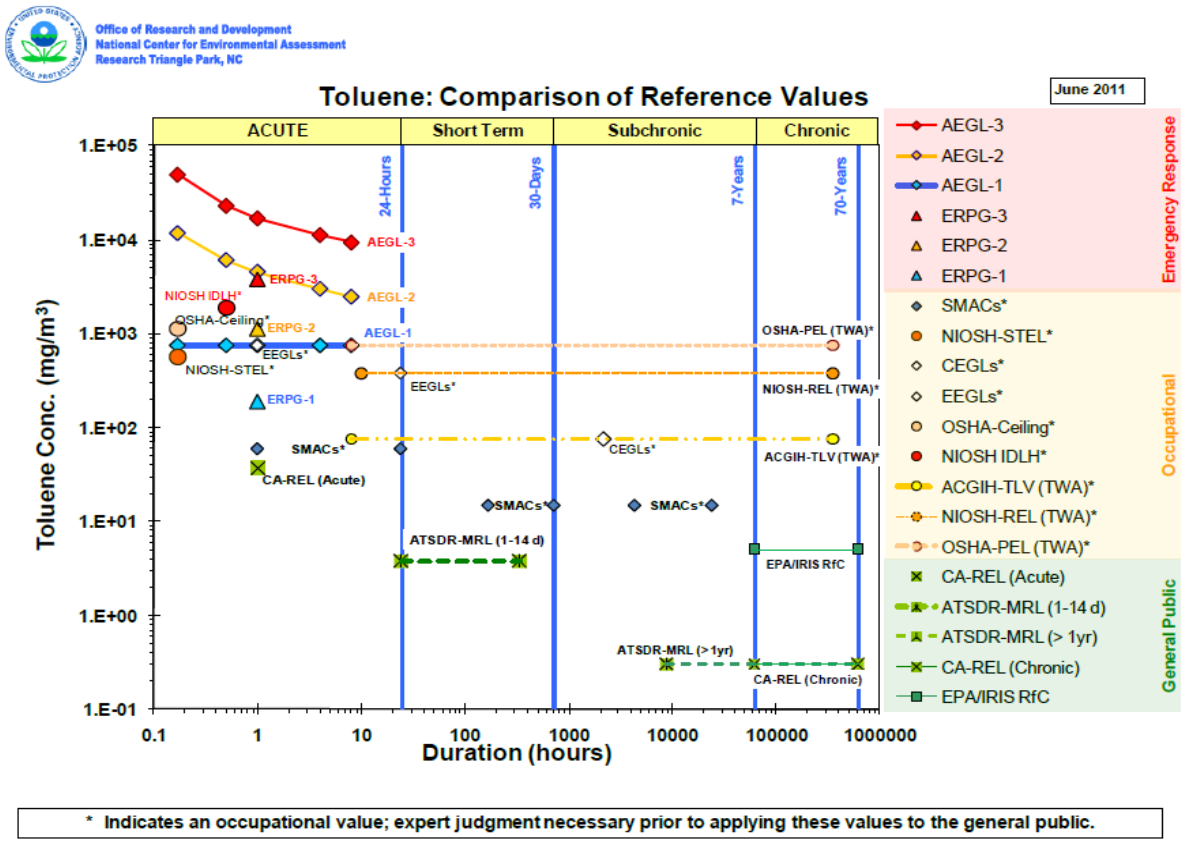
* Indicates an occupational value; expert judgment necessary prior to applying these values to the general public.



* Indicates an occupational value; expert judgment necessary prior to applying these values to the general public.



* Indicates an occupational value; expert judgment necessary prior to applying these values to the general public.



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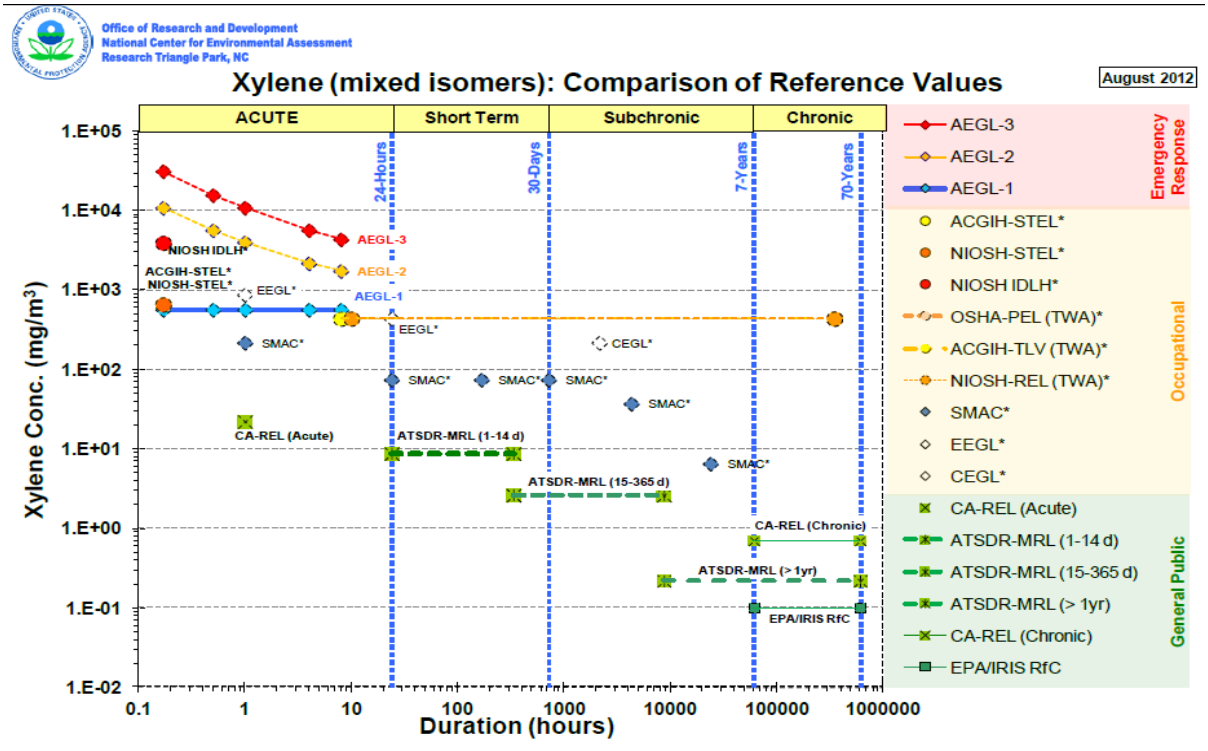
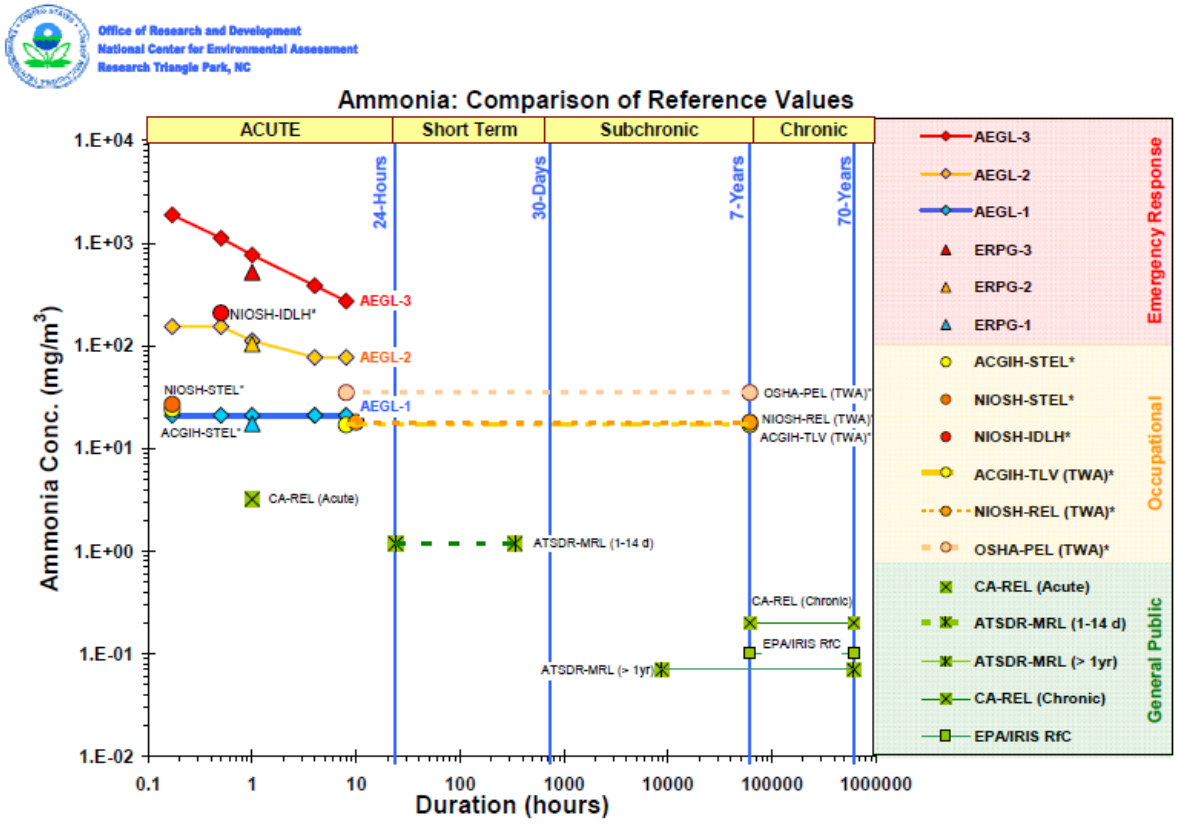
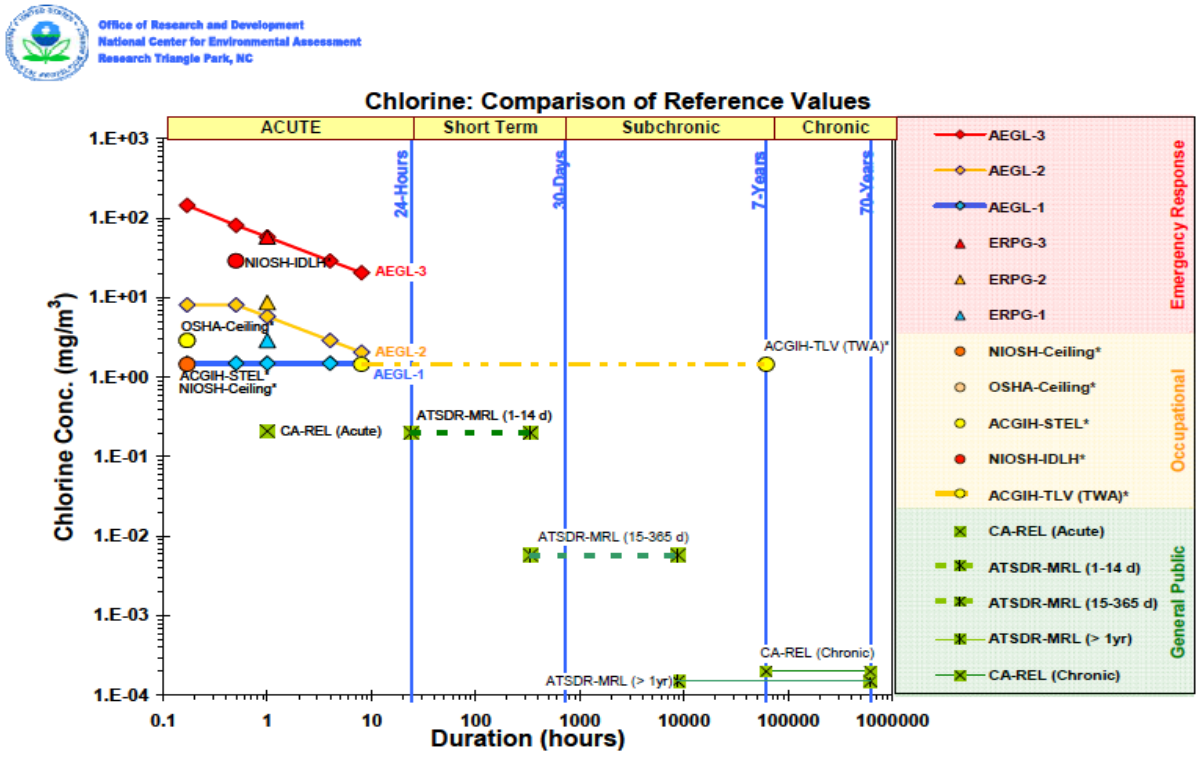


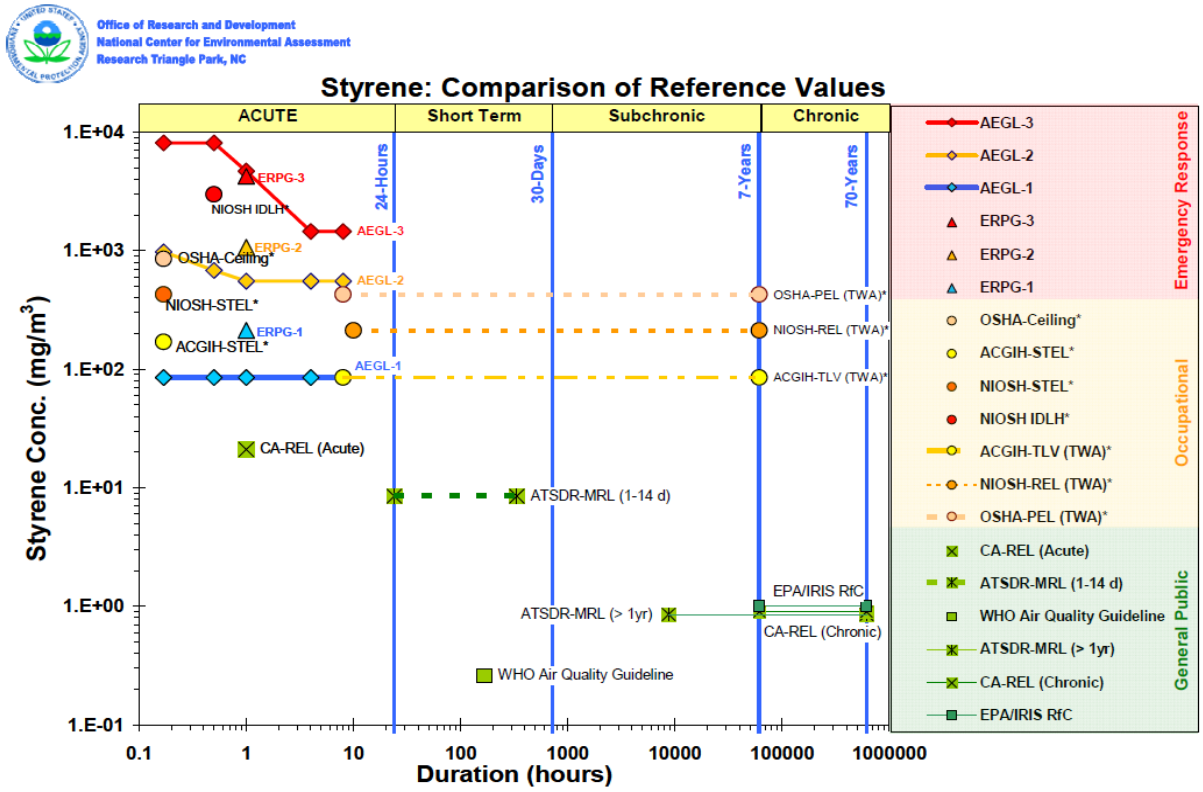
* Indicates an occupational value; expert judgment necessary prior to applying these values to the general public.



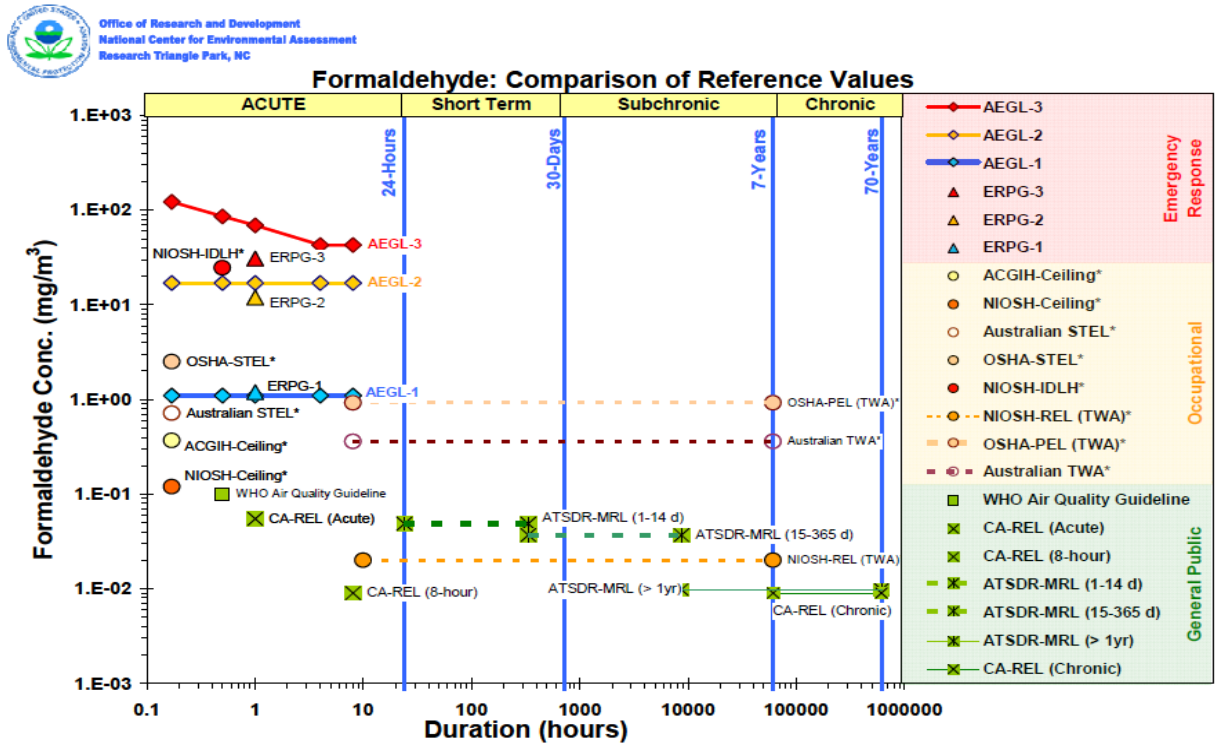
* Indicates an occupational value; expert judgment necessary prior to applying these values to the general public.



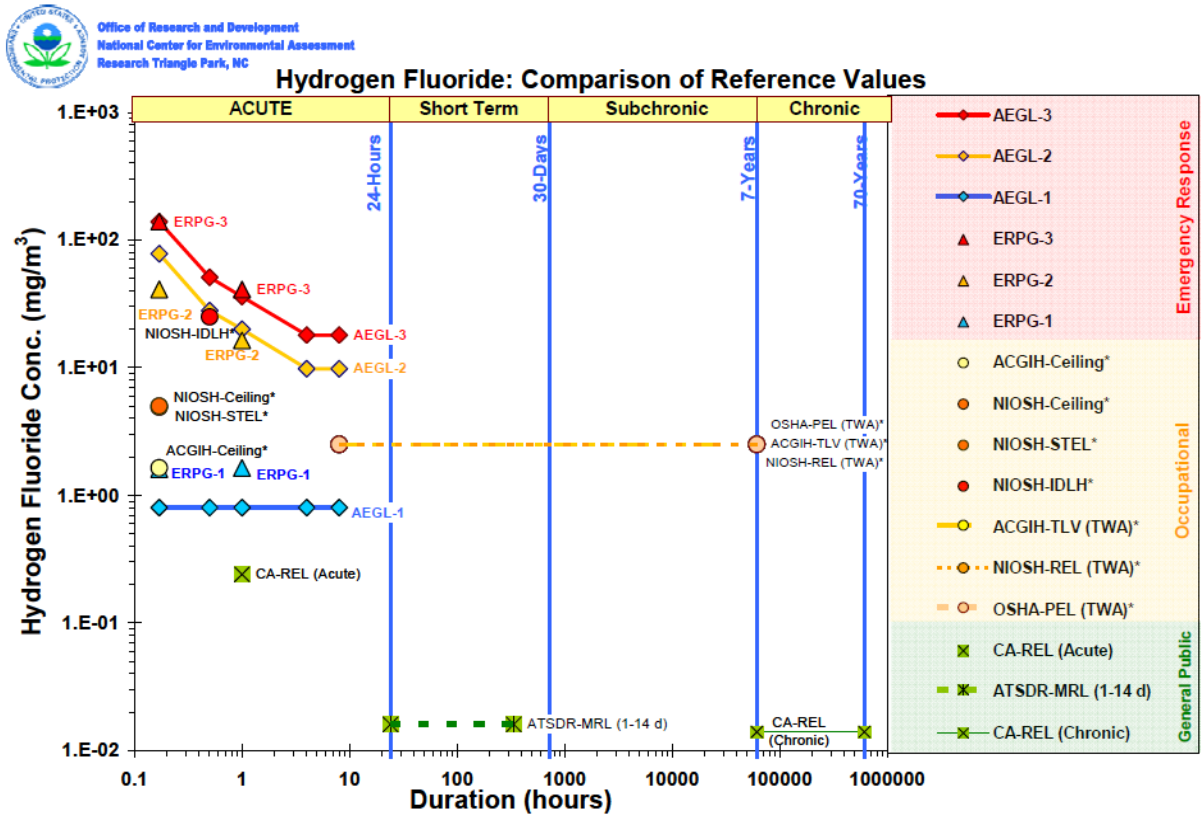
* Indicates an occupational value; expert judgment necessary prior to applying these values to the general public.



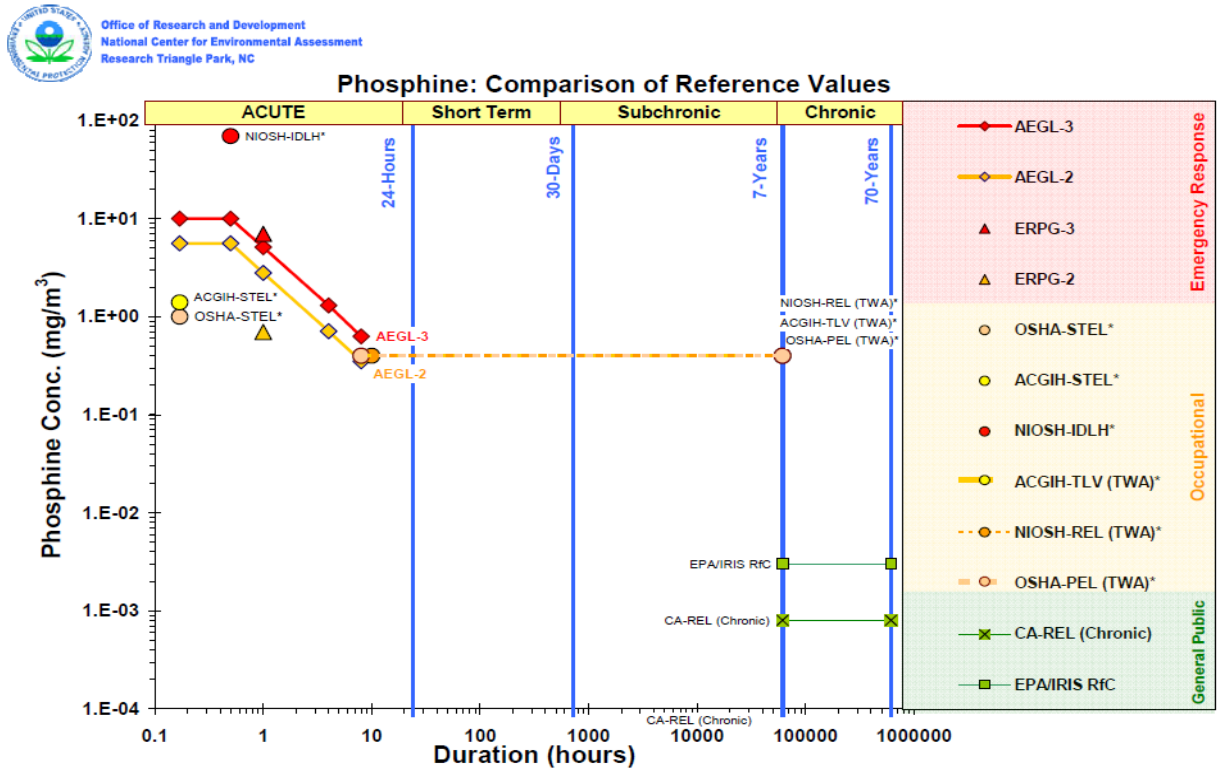
* Indicates an occupational value; expert judgment necessary prior to applying these values to the general public.



* Indicates an occupational value; expert judgment necessary prior to applying these values to the general public.



* Indicates an occupational value; expert judgment necessary prior to applying these values to the general public.



* Indicates an occupational value; expert judgment necessary prior to applying these values to the general public.

Attachment C: Community Air Monitoring Field Team Checklist

☐ **Prepare air monitoring instruments for deployment**

- Consult with Project Manager to determine resource needs and ensure instrumentation is calibrated and ready for monitoring.

☐ **Verify communications pathway between CAM Coordinator and Data Manager**

☐ **Take rapid baseline field readings and relay back to CAM Coordinator**

- Establishing baseline reading within the first 24 hours Include non- detections as well as high readings.
- Time is critical for this data collection; consider this before troubleshooting advanced collection methods.
- Report readings back quickly to Field Team Leader/CAM Coordinator and provide context Location:
- Date/Time,
  - Measurements Visual Observations,
  - Odor and Visibility (if applicable), and

BEST PRACTICE*:* Collect background readings at a location far from anticipated contaminant dispersion or at minimum upwind of a release location.

☐ **Review CAMP with CAM Field Team Leader and CAM Coordinator**

- Note CAM action levels,
- Analytes for contaminants of concern, and
- CAM locations.

❑ **Review DMP with Data Manager**

- Familiarize site scope and data collection objectives,
- Understand valid values to be used for data entry, and
- Understand the data pathways.

☐ **Conduct Sustained Assessments**

- QA Troubleshoot/deploy field equipment;
- QC all data in the field;
- Keep note of monitoring and instrumentation: log unit ID, user, location, date/time; battery life of instrumentation varies; and
- If instruments are switched out, if time allots, note instrument serial number or ID numbers, this will be important when instrument data is downloaded to know the location/task that the data was collected in.

☐ **Report readings back quickly to CAM Field Team Leader and CAM Coordinator and provide context**

- Location,
- Date/Time,

- Measurements (exceedances above action levels?), and
- Odor and Visibility (if applicable).

❑ **Record Instrument Data to pre-determined destination**

- Download data in pre-determined location for Data Manager and back-up.

❑ **Report results to CAM Coordinator as outlined**

❑ **Field Teams conduct CAM Surveys until instructed otherwise by CAM Coordinator or IC/UC**

❑ **Ensure that all logged data is downloaded into the pre-determined location for the Data Manager and CAM Coordinator.**

❑ **Once communicated by CAM Coordinator and IC/UC to end monitoring efforts, return instruments to charging location, update logbook.**

Attachment D: Community Air Monitoring Data Management and Information Sharing Checklist

The purpose of this attachment is to provide guidance to personnel responsible for setting up a data management system for CAM. The following checklist items are listed chronologically, but due to potential changes in size and scope of CAM deployments, some items may be reprioritized based on incident needs.

Depending on the scale of the incident, Data Manager Responsibilities may be handled by the CAM Field Team Leader, CAM Coordinator, or a delegated Data Manager. The following checklist is broken into several sections:

- Initial Data Management,
- Data Collection,
- Data Processing,
- Data Presentation, and
- Continuing Data Management/ Storage

Initial Data Management

❑ **Select a Data Manager to oversee CAM Data Management**

- Assess the status of incident data management. As data may already be being collected and processed, it is imperative to quickly come up to speed on the following:
  - How is data being collected, processed, presented or communicated?
  - Are there established DQOs?
  - Is there a DMP?

BEST PRACTICE: A DMP is a great tool to document DQOs, data collection, processing, presentation, and deliverable schedules. However, the creation of a DMP should not hinder the active communication of data and can be completed as time permits.

❑ **Determine DQOs**

- A well-constructed DQO consists of the following:
  - Activity/Use of the data,
  - Criteria for making a decision (Action Level), and
  - What your action is going to be after you make the decision.

- An initial DQO for CAM may be:
  - *Air Monitoring will be performed using roving teams. If a reading exceeds the established action levels, the exceedance will be communicated immediately to UC/IC. If no exceedances are found, monitoring will continue.*

Data Collection

- ❑ **Develop a data collection process that meets established incident DQOs. Ensure that the appropriate CAM forms and associated data collection documents/tools are available.**
  - Define the data elements CAM teams will collect (required fields, photos, other observations, etc.)
  - Choose forms to meet incident-specific needs as appropriate. Ensure that forms are designed to meet established DQOs.
  - Ensure CAM teams/forms are using standardized location naming conventions (e.g., location identification numbers) that can be integrated into mapping/database/GIS systems being developed, and that are consistent with Operational Division naming conventions.

BEST PRACTICE: Prioritize tasks in the early phase of a CAM incident to get Field Teams out collecting data as soon as practicable. Systems can be refined later as long as essential data can be collected expeditiously**.**

- ❑ **Evaluate equipment requirements/standards for data collection and management**
  - Coordinate this review with the CAM Field Team Leader or CAM Coordinator as appropriate.
  - Common data collection equipment may include real-time air monitoring instruments, digital cameras, hand-held global positioning system units, forms, personal digital assistants, tablet computers, etc.

- ❑ **Establish a communication plan for Field Teams to communicate results.**
  - Develop and maintain contact list for CAM team members.
  - Verify that teams know how results will be communicated (radio, cell phone, email, data submission).
  - Establish a communication schedule with Field Teams to meet data reporting needs for ICS meetings.

- ❑ **Conduct data collection calibration meeting for CAM teams prior to initial assessment.**
  - The following topics should be covered:
    - DQOs, Data Elements and Valid Values;
    - Methods of data collection with alternatives for effectively collecting data for a rapid assessment. Ensure a backup data collection method is available (logbook, verbal reporting, etc.);
    - Communication pathway for reporting exceedances;
    - On-going communication of results below action levels; and
    - Post field data transfer and QA/QC process

Data Processing

☐ **Establish a DMP**

- Outline the following:
  - DQOs;
  - Instrumentation (data pathway for data logging instruments);
  - Data Flow Pathways (Data Entry to Quality Assurance to Decision Makers to Data Storage); and
  - Reporting schedule.
  - Identify predetermined standard for data verification and analysis; and
  - Identify and put in place verification SOPs and checklists such as standard verification queries (auditing of data) and reporting SOPs.

☐ **Establish process for collecting and archiving digital and paper documents.**

- Establish file directory structure and file naming conventions for managing documents, data, and photos.
  - Establish both on-site backup and an off-site, secure repository for all data and documentation. Coordinate with Documentation Unit for final archiving.
  - Determine/establish appropriate permissions for database access and editing.

☐ **Share and Communicate Resources**

- Coordinate data and map transfers with the PSC and EU (e.g., base maps, overflight maps, etc.) as appropriate.
- Acquire the spatial data and maps necessary to meet the data needs of the CAM program and (in particular) the Field Teams.
- Create base maps for field planning and use.

❑ **Oversee QA/QC of field data**

- Collate results from multiple teams if applicable,
- Ensure required data elements have been recorded,
- Ensure units are correct and appropriate for action levels, and
- Ensure data is in a clean format for generation of deliverables

Data Presentation

- ❑ **Initially real-time data should be made available on responsible party's air monitoring service provider's database/system to UC/IC, officials, and other decision makers. Incident air monitoring data should be posted to the official incident website for public viewing within the first two operational periods. The incident website shall serve as the official messaging site for all incident related information. Other organizations or agencies should make a concerted effort to share their separate air monitoring data and attempt similar messaging.**

- ❑ **Brief with CAM Coordinator and EU to determine deliverable needs and establish deliverable schedule**

  - Deliverable types may include:
    - Site sketch,
    - Aerial Map,
    - Verbal Result Communication,
    - Summary Data,
    - Dispersion Modelling,
    - Real-Time Telemetry, and
    - Geospatial Viewer.
  - Review deliverable schedule with the CAM Coordinator and the SOFR to best fit incident requirements:
    - As exceedance occurs, (Reference Figure D-1)
    - For ICS meetings:
      - Command & General Staff Meeting,
      - Tactics Meeting, and
      - Planning Meeting.
    - Every operational period,
    - Real-time telemetry, and
    - Real-time mapping.

- ❑ **Create and manage deliverables for EU including GIS Maps, models, and data tables.**
  - Coordinate with the EU or CAM Coordinator and identify what maps or models are important for decisions.
  - Ensure that all deliverables requested by EU are completed.

Continuing Data Management and Storage

- ❑ **Develop a document management system and/or CAM database (if appropriate).**
  - Determine/establish appropriate permissions for database access and editing.
  - Ensure every data stream is captured and managed appropriately.

- ❑ **Ensure that all data from Field Teams has been downloaded and backed- up to appropriate location for site documentation, deliverables, and reports.**

- ❑ **Establish general expectations, procedures, and accountability for CAM data management tasks.**
  - Address data sharing protocols and data access issues between stakeholders (i.e., Fed/State/Responsible Party) when making these determinations.
  - Each agency/organization representative working on CAM data should be familiar with their own organization's data policy and be able to discuss any critical issues including public disclosure requirements.

BEST PRACTICE*:* Be sure to discuss the following: frequency of data archiving, who can access the data and how, will copies be permitted, etc.

- ❑ **Adjust data management organization for future operational periods**
  - Is the current system meeting the response needs and/or scale (e.g., electronic vs. paper-based)?
    - If not, recommend to CAM Coordinator to upgrade tiers.
  - Are there issues affecting the quality of data?
    - Recommend and implement corrective actions as necessary.
  - Maintain data quality:
    - Hold team meetings daily to ensure quality data is correctly collected and applicable.
    - Ensure Field Teams are performing field QC of their data collected.
    - QC data daily update Field Teams if a corrective action is required.

Figure D-1 Internal IMT and External Officials Information Sharing Process

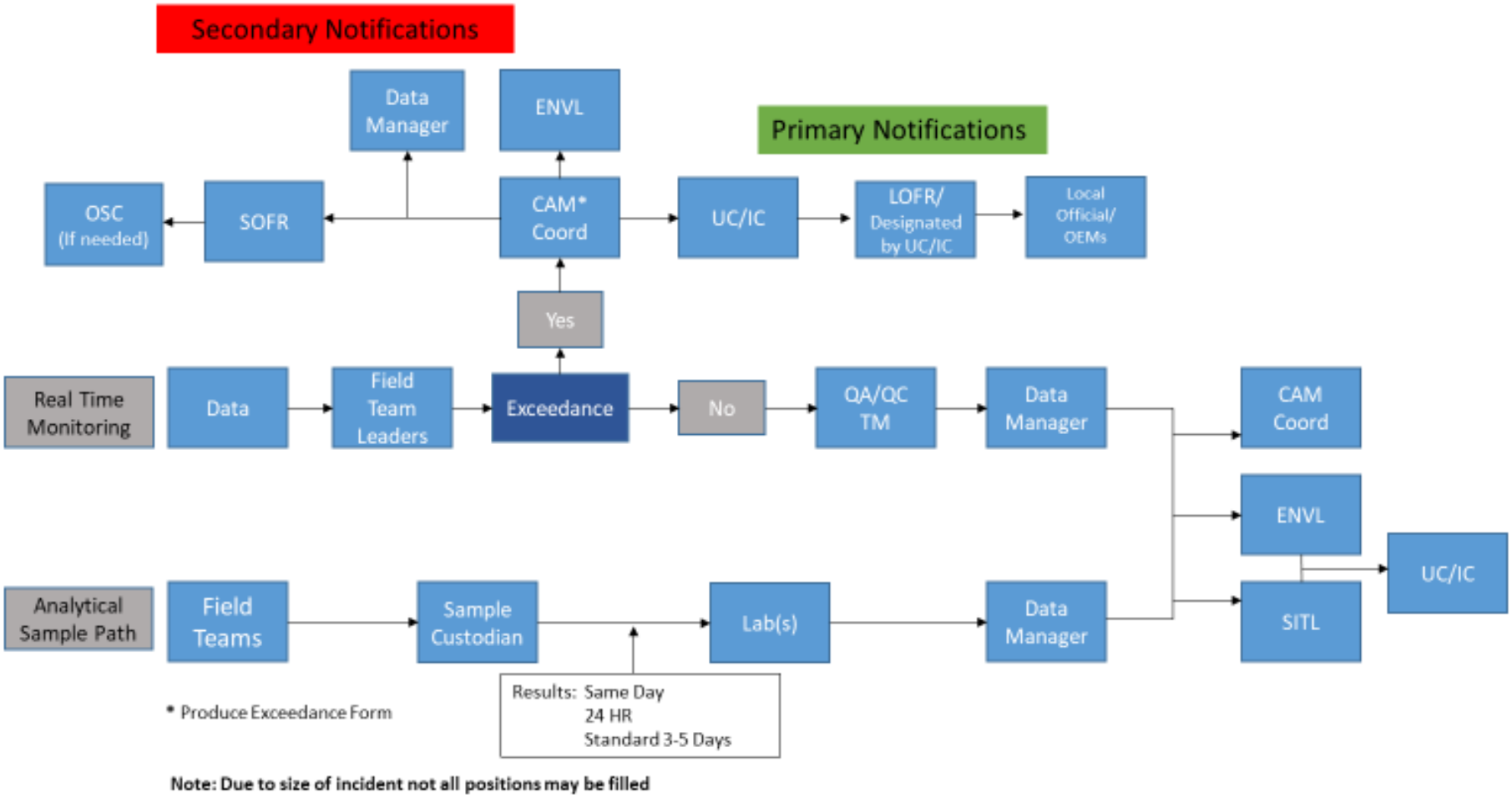


Figure D-2 General Public Information Sharing Process

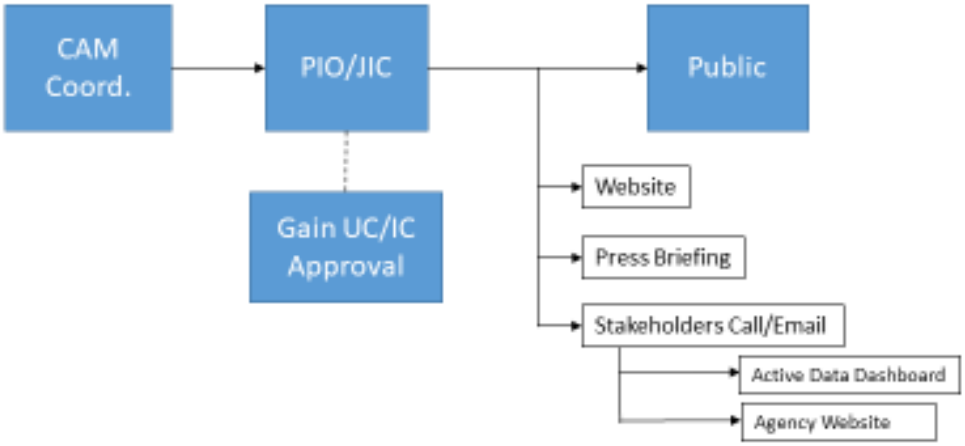


Figure D-3 Exceedance Template

IC/UC Exceedance Message

1. Incident Name:
2. Distribution Date: **Distribution Time:**
3. Chemical of Concern:
4. Established Exceedance Level and Action Description:
5. Concentration:
6. Location Description:
7. Wind direction at exceedance location:
8. Date and Time of detection:
9. Field Team who documented the exceedance:
10. Additional information suggested for communication:
11. Contact information for questions or additional information needed:

Attachment E: Laboratory Analysis

While direct read monitors are essential for real time air monitoring and used for time critical decision making, they are limited to a handful of specific substances and generally do not have low detection limits for contaminants. Air sampling can be used to detect minute concentrations of known chemicals. As stated previously, analytical air sampling refers to the collection of discrete quantities of air using containers or chemical specific media for further analysis by an off-site laboratory. Laboratory analysis of analytical air samples provides chemical- specific results at lower chemical detection limits than real-time air monitoring instrumentation albeit a delay is required to receive the results of analytical air samples. Sampling can be in the form of fixed, stationary samples or mobile samplers worn by responders to monitor responder health and safety. Choosing between different types of air samplers is dependent on the type of contaminant aimed to detect and the use of results. The following text is focused on fixed air sampling stations used in community air assessments as opposed to personal air samplers, which are typically used to monitor worker exposures.

Air samplers are broken into active or passive samplers, active samplers draw ambient air into the pump and through the filter medium, whereas passive samplers simply expose the medium to the ambient air. Samplers can be outfitted with a variety of sampling media types. Media types are often contaminant specific, and largely dependent on the physical state of the contaminant. Media is often in the form of a Glass Fiber Filter (used for particulates including PM 10 and PM 2.5) or a sorbent tube (used for gases such as benzene). In most cases, samples are shipped to analytical labs with variable turnaround times on delivery of results dependent on lab and analytical methods.

Fixed air sampler instrumentation generally includes a power source with a fixed flow adjustable air sampling pump containing attached tubing and media. Air sample duration and flow rate is specific to laboratory method requirements but usually several hours of sampling are needed to obtain a minimum liters per minute needed for analysis. Air sampling results are generally used in aiding specific types of decisions involving health and safety as well as contaminant clearances.

The lag of time from initial sampling to result reporting and data validation is a large disadvantage, and because of this, air samples are generally not used for rapid decision making. In some cases, by the time the results are received from the lab, the airborne contaminants may have already dissipated. These data, however, can still be used to confirm air monitoring results obtained via direct read instrumentation.

Attachment F: Communications List- ICS 205A-CG

https://homeport.uscg.mil/Lists/Content/Attachments/2914/ICS205a-CG%20CommList%20rev%207-04.pdf

1. Incident Name Environmental Health Notification	2. Operational Period (Date / Time) From: To:	COMMUNICATIONS LIST ICS 205A-CG

3. Basic Local Communications Information

Assignment	Name	Method(s) of contact (radio frequency, phone, pager, cell #(s), etc.)	Email
	ATSDR	(770) 488-7100 : Emergencies 770-488-3430 Duty Officer Not Monitored 24/7	atsdrer@cdc.gov Not Monitored 24/7
	CDC	(770) 488-7100 – information line only	N/A
	DSHS	(512) 776-7268 (epidemiology) & 7219 (ER) *call both sections	N/A
	Harris Co. Health Dept.	713-439-6179	N/A
	Galveston Co. Health Dept.	(409) 938-2314 & 24 Hr # 409-795-7150	N/A
	Chambers Co. Health Dept.	(409) 267-2731	N/A
	Montgomery Co. Health Dept.	(936) 523-5026	N/A
	Brazoria Co. Health Dept.	1 800-511-1632	N/A
	Matagorda Co. Health Dept.	(979) 244-2717	N/A
	Poison Center	1 800-222-1222	N/A
	UTMB	(409) 747-1380	N/A
	Harris Co. Pollution Control	713-249-3819	pollution.control@pcs.hctx.net
	Port of Houston Authority	713-670-3611	N/A
	Applicable city OEM	----------	N/A
	Chambers County OEM	(409) 267-2245	N/A
	Brazoria County OEM	(979) 864-1201	N/A
	Galveston County OEM	(281) 309-5002	N/A
	Harris County OEM	(713) 881-3300	N/A
	Matagorda County OEM	(979) 323-0707	N/A
	Montgomery County OEM	(936) 523-3900	N/A

4. Prepared by: (Communications Unit) **Date / Time**

COMMUNICATIONS LIST ICS 205a-CG (Rev. 07/04)

Acronyms

AEGL	Acute Exposure Guidelines Level
AQI	Air Quality Index
CAMP	Community Air Monitoring Plan
CEGL	Continuous Exposure Guidance Level
CIR	Critical Information Requirements
CMA	Community Air Monitoring
CTCAC	Central Texas Coastal Area Committee
DMP	Data Management Plan
DQO	Data Quality Objective
EEGL	Emergency Exposure Guidance Level
ENVL	Environmental Unit Leader
EPA	Environmental Protection Agency
ERPG	Emergency Response Planning Guidelines
EU	Environmental Unit
GIS	Geographic Information System
HCA	High Consequence Area
IC/UC	Incident Command/Unified Command
ICS	Incident Command System
JIC	Joint Information Center
LEL	Lower Exposure Limit
LNO	Liaison Officer
MDL	Minimum Detection Limit
MRL	Minimal Risk Level
NAAQS	National Ambient Air Quality Standards
NOAA	National Oceanic and Atmospheric Administration
NWS	National Weather Service
OEM	Office of Emergency Management
OSC	Operations Section Chief
PAC	Protective Action Criteria
PATS	Phased Air Monitoring Tiers
PIO	Public Information Officer
PPM	Parts per million
PSC	Planning Section Chief
RP	Responsible Party
SITL	Situation Unit Leader
SMAC	Spacecraft Maximum Allowable Concentration
SOFR	Safety Officer
SOP	Standard Operating Procedure
SSC	Scientific support coordinator
VOC	Volatile Organic Compounds