

AIR MONITORING FREQUENTLY ASKED QUESTIONS AND DATA REVIEW MEMORANDUM

Created during OPERATIONAL PERIOD #4 (Nov. 2 – Nov. 3)

As requested, EPA Region 7's Applied Sciences Branch has prepared a Frequently Asked Questions and data summary review for the Critical Mineral Recovery Fire Emergency Response, Operational Period #4. The data were reviewed by EPA toxicologists. Based on the review, it is recommended that additional monitoring and sampling are appropriate.



What is EPA's role for community air monitoring and sampling?

EPA is supporting the response efforts of the Fredericktown Fire Department, Madison County Health Department, and Missouri Department of Natural Resources by performing air monitoring and air sampling in the community. EPA reports air monitoring data directly to the Fredericktown Fire Department for decision-making purposes.

What is air monitoring?

The goal of real-time air monitoring is to quickly detect contaminants in the air so that actions can be taken to reduce air emissions, if necessary. Air monitoring uses electronic devices to measure concentrations of contaminants. These data are used to guide actions in the field by indicating the location of the chemicals in the air which may be of concern.

What is air sampling?

Air sampling involves collection of air for laboratory analysis. The purpose of air sampling is to measure how much of a specific contaminant is present in the air over a period of time. For this response, samples are collected over time periods ranging from 4 to 24 hours and are submitted to a laboratory for analysis.

What is EPA monitoring and sampling for?

At six locations throughout Fredericktown, EPA is using an array of instruments to detect contaminants often released during fires from lithium-ion batteries. AreaRAEs are used to detect toxic contaminants, DustTraks are used to take particulate matter readings, and SPM Flex gas detectors are used to detect hydrogen fluoride. In addition, EPA is collecting air samples to measure for contaminants including heavy metals and polycyclic aromatic hydrocarbons (PAHs).

Data are compared to the site-specific thresholds. If concentrations for a contaminant are above the threshold, they are given a closer look and action may be needed to protect human health and environment. Thresholds for each contaminant are informed by toxicologists, who are professionals who study the effects of contaminants to humans and other living things. If the data are at or above the threshold, actions may be taken to control or lessen the source of air emissions.

What does EPA do with the data collected?

Data are compared to the site-specific thresholds. If concentrations for a contaminant are above the threshold, they are given a closer look and provided to the Fredericktown Fire Department to decide if action may be needed to protect human health and environment.

EPA is using Acute Exposure Guideline Levels (AEGLs) that are expressed as specific concentrations of airborne chemicals at which health effects may occur. They are designed to protect the elderly and children, and other individuals who may be susceptible. Protective Action Criteria (PAC) are also being used, which are based on emergency exposure limits. AEGLs and PACs are being utilized for comparison of air data for benzene, carbon monoxide, hydrogen fluoride, hydrogen sulfide, and oxygen levels. Particulate Matter (PM) 24-hour averaged Threshold Levels have been developed for the site for PM 2.5 and 10 to determine if the air quality is within an acceptable range. Thresholds for each contaminant are informed by toxicologists, who are professionals who study the effects of contaminants to humans and other living things.

Review of data and risk communication.

During this operational period (Nov. 2 – 3), concentrations of PM2.5 and PM10 went above the 15-minute time-weighted average (TWA) action levels that are used to inform the fire response team. These exceedances occurred at Air Station 3 and Air Station 6.

These exceedances were temporary and related to the continued firefight as workers sifted through debris to extinguish hot spots. The continuous, 24-hour TWA concentration of PM2.5 and PM10 at Air Station 3 did not go above community action levels.

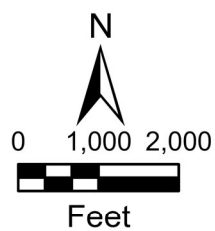
During operational period 4, the continuous, 24-hour TWA of PM2.5 and PM10 concentrations reached communication action levels considered “Unhealthy for Sensitive Groups.” Although the general population is unlikely to be impacted at this level, people with heart and lung disease; diabetes; older adults; children; and people with asthma may have been sensitive to the particulate matter pollution – associated with the fire at Critical Mineral Recovery – in the community during this timeframe.

Anyone experiencing health concerns should contact the Madison County Health Department at 573-783-2747 or the Missouri Department of Health and Senior Services at 573-751-6400 or info@health.mo.gov.



Legend

- ★ Critical Mineral Recovery Site Location
- Fixed Air Monitoring Stations



Critical Mineral Recovery Fire
Fredericktown, Missouri

Figure 2
Fixed Air Monitoring Locations



Air Monitoring Summary Tables

The table below summarize monitoring data collected on using EPA's Viper wireless remote monitoring system.

Project Name: Critical Mineral Recovery ER - Operational Period 4

**From: 11/2/24
7:00 AM**

**To: 11/3/24
6:59 AM**



Air Station 1 - Fredericktown High School							
Instrument	Analyte	Action Level Exceedance?	Number of Readings	Number of Detections	Concentration Range	24-hour TWA	Preliminary Notification Level
AreaRAE Pro	VOC	No	1331	0	0-0 ppm	0 ppm	52 ppm
	CO	No	1331	0	0-0 ppm	0 ppm	75 ppm
	H ₂ S	No	1331	0	0-0 ppm	0 ppm	0.51 ppm
	O ₂	No	1331	1331	20.90-20.90 %	20.90 %	<19.5 or >23%
DustTrak 8533	PM2.5	No	11652	8757	0-16 µg/m ³	3.55 µg/m ³	35.5 µg/m ³
	PM10	No	11652	8768	0-16 µg/m ³	3.61 µg/m ³	150 µg/m ³
SPM Flex	HF	No	15433	0	0-0 ppm	0 ppm	1 ppm

Air Station 3 - Private Residence within Evacuation Zone							
Instrument	Analyte	Action Level Exceedance?	Number of Readings	Number of Detections	Concentration Range	24-hour TWA	Preliminary Notification Level
AreaRAE Pro	VOC	No	3218	43	0-0.021 ppm	0.00005 ppm	52 ppm
	CO	No	3218	4	0-19 ppm	0.01 ppm	75 ppm
	H ₂ S	No	3218	0	0-0 ppm	0 ppm	0.51 ppm
	O ₂	No	3218	3218	18.20-23.90 %	19.22 %	<19.5 or >23%
DustTrak 8533	PM2.5	Yes	1177	1177	3-281 µg/m ³	16.81 µg/m ³	35.5 µg/m ³
	PM10	Yes	1177	1177	3-295 µg/m ³	17.31 µg/m ³	150 µg/m ³

Air Station 4 - Madison County Social Services Office							
Instrument	Analyte	Action Level Exceedance?	Number of Readings	Number of Detections	Concentration Range	24-hour TWA	Preliminary Notification Level
AreaRAE Pro	VOC	No	1133	0	0-0 ppm	0 ppm	52 ppm
	CO	No	1133	0	0-0 ppm	0 ppm	75 ppm
	H ₂ S	No	1133	0	0-0 ppm	0 ppm	0.51 ppm
	O ₂	No	1133	1133	20.90-20.90 %	20.90 %	<19.5 or >23%
DustTrak 8533	PM2.5	No	1247	1247	2-45 µg/m ³	7.48 µg/m ³	35.5 µg/m ³
	PM10	No	1247	1247	2-82 µg/m ³	7.55 µg/m ³	150 µg/m ³

Air Station 5 - Azalea/Wanda Park							
Instrument	Analyte	Action Level Exceedance?	Number of Readings	Number of Detections	Concentration Range	24-hour TWA	Preliminary Notification Level
AreaRAE Pro	VOC	No	1134	0	0-0 ppm	0 ppm	52 ppm
	CO	No	1134	0	0-0 ppm	0 ppm	75 ppm
	H ₂ S	No	1134	0	0-0 ppm	0 ppm	0.51 ppm
	O ₂	No	1134	1134	20.90-20.90 %	20.90 %	<19.5 or >23%
DustTrak 8533	PM2.5	No	1146	1005	0-50 µg/m ³	4.81 µg/m ³	35.5 µg/m ³
	PM10	No	1145	1009	0-50 µg/m ³	4.90 µg/m ³	150 µg/m ³

Air Station 6 - Commercial Business within Evacuation Zone							
Instrument	Analyte	Action Level Exceedance?	Number of Readings	Number of Detections	Concentration Range	24-hour TWA	Preliminary Notification Level
AreaRAE Pro	VOC	No	1118	0	0-0 ppm	0 ppm	52 ppm
	CO	No	1118	0	0-0 ppm	0.00 ppm	75 ppm
	H ₂ S	No	1118	0	0-0 ppm	0 ppm	0.51 ppm
	O ₂	No	1118	1118	20.90-20.90 %	20.90 %	<19.5 or >23%
DustTrak 8533	PM2.5	Yes	17161	17156	0-1260 µg/m ³	36.75 µg/m ³	35.5 µg/m ³
	PM10	Yes	17161	17157	0-1520 µg/m ³	44.49 µg/m ³	150 µg/m ³
SPM Flex	HF	No	12966	1629	0-0.17 ppm	0.07 ppm	1 ppm

Notes:
Preliminary notification levels are being utilized to inform the Fredericktown Fire Department Chief of potential exposures that may warrant community protective actions.

% Percent

< Less than

> Greater than

AEGL Acute Exposure Guideline Levels for Airborne Chemicals

HF Hydrogen fluoride

µg/m³ Micrograms per cubic meter

ppm Parts per million

PM Particulate matter

SPM Single Point Monitor

TWA Time-weighted average

Analyte	Definition	Preliminary Notification Level Reference
CO	Carbon Monoxide	AEGL-1 1hr
H ₂ S	Hydrogen Sulfide	AEGL-1 1hr
HF	Hydrogen Fluoride	AEGL-1 1hr
LEL	Lower Explosive Limit	29 CFR 1910.146, Confined Spaces
O ₂	Oxygen	29 CFR 1910.146, Confined Spaces
PM10	Particulate Matter <10 microns	EPA AQI Categories for PM10, 15-minute TWA
PM2.5	Particulate Matter <2.5 microns	EPA AQI Categories for PM2.5, 15-minute TWA
VOC	Volatile Organic Compounds	AEGL-1 1hr