

AIR MONITORING FREQUENTLY ASKED QUESTIONS AND DATA REVIEW MEMORANDUM

Created during OPERATIONAL PERIOD #13 (Nov. 11 – Nov. 12)

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 #13. 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.

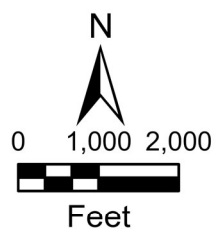
During this operational period (Nov. 11 – 12), concentrations of PM_{2.5} and PM₁₀ went above the 15-minute time-weighted average (TWA) action levels that are used to inform the fire response team. These exceedances occurred at Air Station 5 and Air Station 6.

The EPA investigated these exceedances immediately and determined they were not site-related. The continuous, 24-hour TWA concentration of PM_{2.5} and PM₁₀ at Air Station 5 and Air Station 6 did not go above community action levels.



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 13



From: 11/11/24
7:00 AM

To: 11/12/24
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	1380	837	0-0.085 ppm	0.016 ppm	52 ppm
	CO	No	1380	19	0-9 ppm	0.055 ppm	75 ppm
	H ₂ S	No	1380	0	0-0 ppm	0 ppm	0.51 ppm
	O ₂	No	1380	1380	20.30-21.20%	20.74%	<19.5 or >23%
DustTrak 8533	PM2.5	No	1401	1400	0-19 µg/m ³	5.92 µg/m ³	35.5 µg/m ³
	PM10	No	1401	1400	0-20 µg/m ³	6.00 µg/m ³	150 µg/m ³
SPM Flex	Ammonia	No	1382	1029	0-0.03 ppm	0.0078 ppm	30 ppm
	HF	No	1383	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	1766	130	0-0.03 ppm	0.00074 ppm	52 ppm
	CO	No	1766	0	0-0 ppm	0 ppm	75 ppm
	H ₂ S	No	1766	0	0-0 ppm	0 ppm	0.51 ppm
DustTrak 8533	PM2.5	No	1440	1440	2-23 µg/m ³	8.10 µg/m ³	35.5 µg/m ³
	PM10	No	1440	1440	2-23 µg/m ³	8.20 µg/m ³	150 µg/m ³

Air Station 4 - Madison County Social Services Building							
Instrument	Analyte	Action Level Exceedance?	Number of Readings	Number of Detections	Concentration Range	24-hour TWA	Preliminary Notification Level
AreaRAE Pro	VOC	No	1399	1	0-0.004 ppm	0.0000029 ppm	52 ppm
	CO	No	1399	39	0-6 ppm	0.099 ppm	75 ppm
	H ₂ S	No	1399	0	0-0 ppm	0 ppm	0.51 ppm
	O ₂	No	1399	1399	20.90-20.90%	20.90%	<19.5 or >23%
DustTrak 8533	PM2.5	No	1440	1440	2-47 µg/m ³	7.57 µg/m ³	35.5 µg/m ³
	PM10	No	1440	1440	2-48 µg/m ³	7.84 µg/m ³	150 µg/m ³
SPM Flex	Ammonia	No	11579	3990	0-0.04 ppm	0.0052 ppm	30 ppm
	HF	No	1440	0	0-0 ppm	0 ppm	1 ppm

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	1405	229	0-0.044 ppm	0.001 ppm	52 ppm
	CO	No	1405	0	0-0 ppm	0 ppm	75 ppm
	H ₂ S	No	1405	0	0-0 ppm	0 ppm	0.51 ppm
	O ₂	No	1405	1405	20.90-20.90%	20.90%	<19.5 or >23%
DustTrak 8533	PM2.5	Yes - Not Site Related	1440	643	0-345 µg/m ³	5.07 µg/m ³	35.5 µg/m ³
	PM10	Yes - Not Site Related	1440	658	0-345 µg/m ³	5.15 µg/m ³	150 µg/m ³
SPM Flex	Ammonia	No	1440	130	0-0.03 ppm	0.00094 ppm	30 ppm
	HF	No	1440	24	0-0.055 ppm	0.00056 ppm	1 ppm

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	1388	0	0-0 ppm	0 ppm	52 ppm
	CO	No	1388	1	0-4 ppm	0.0029 ppm	75 ppm
	H ₂ S	No	1388	0	0-0 ppm	0 ppm	0.51 ppm
	O ₂	No	1388	1388	20.90-21.70%	21.08%	<19.5 or >23%
DustTrak 8533	PM2.5	Yes - Not Site Related	1438	994	0-298 µg/m ³	5.95 µg/m ³	35.5 µg/m ³
	PM10	Yes - Not Site Related	1438	1040	0-298 µg/m ³	6.48 µg/m ³	150 µg/m ³
SPM Flex	Ammonia	No	6199	1322	0-1.13 ppm	0.015 ppm	30 ppm
	HF	No	1440	0	0-0 ppm	0 ppm	1 ppm

Air Station 7 - Childcare Center							
Instrument	Analyte	Action Level Exceedance?	Number of Readings	Number of Detections	Concentration Range	24-hour TWA	Preliminary Notification Level
AreaRAE Pro	VOC	No	1385	338	0-0.05 ppm	0.0042 ppm	52 ppm
	CO	No	1385	0	0-0 ppm	0 ppm	75 ppm
	H ₂ S	No	1385	0	0-0 ppm	0 ppm	0.51 ppm
	O ₂	No	1385	1385	20.50-22.00%	20.97%	<19.5 or >23%
DustTrak 8533	PM2.5	No	1405	1405	1-21 µg/m ³	7.05 µg/m ³	35.5 µg/m ³
	PM10	No	1405	1405	1-21 µg/m ³	7.28 µg/m ³	150 µg/m ³

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

Analyte	Definition	Preliminary Notification Level Reference
CO	Carbon Monoxide	AEGL-1 1hr

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From: 11/11/24
7:00 AM

To: 11/12/24
6:59 AM



AEGL Acute Exposure Guideline Levels for Airborne Chemicals	H ₂ S	Hydrogen Sulfide	AEGL-1 1hr
HF Hydrogen fluoride	HF	Hydrogen Fluoride	AEGL-1 1hr
µg/m ³ Micrograms per cubic meter	LEL	Lower Explosive Limit	29 CFR 1910.146, Confined Spaces
ppm Parts per million	O ₂	Oxygen	29 CFR 1910.146, Confined Spaces
PM Particulate matter	PM10	Particulate Matter <10 microns	EPA AQI Categories for PM10, 15-minute TWA
SPM Single Point Monitor	PM2.5	Particulate Matter <2.5 microns	EPA AQI Categories for PM2.5, 15-minute TWA
TWA Time-weighted average	VOC	Volatile Organic Compounds	AEGL-1 1hr