



Arkansas Department of Health

4815 West Markham Street • Little Rock, Arkansas 72205-3867 • Telephone (501) 661-2000

Governor Asa Hutchinson

Nathaniel Smith, MD, MPH, Director and State Health Officer

December 12, 2018

Matthew Loesel
Region 6 On-Scene Coordinator
US EPA REGION 6
1445 Ross Avenue, Suite 1200
Mail Code: 6SF-EC
Dallas, TX 75202-2733

RE: Former Stump Dump/Trafalgar Road Fire, Bella Vista, AR

Dear Mr. Loesel,

The Environmental Protection Agency (EPA) and the Arkansas Department of Environmental Quality (ADEQ) requested that the Arkansas Department of Health (ADH) evaluate air sampling data from an ongoing underground stump dump fire on Trafalgar Road in Bella Vista, AR. ADH prepared this health consultation to address potential public health issues of exposure related to chemicals in the smoke from the fire. ADH has completed this document under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR), U.S. Department of Health and Human Services*.

Background and History

The Former Stump Dump/Trafalgar Road Fire site is located on the 8000 block of Trafalgar Road, Bella Vista in Benton County, Arkansas. The property was purchased for use by Browns Tree Care in 2018. The site is listed as 4.74 acres, Parcel number 16-77998-007. The approximate geographic coordinates are Latitude 36.461346° North and Longitude 94.209098° West. The Trafalgar Road Fire site is surrounded by residential properties to the north, east, south, and west amongst trees and rolling topography. A commercial storage facility, Blue Mountain Storage, is located directly south of the property [1].

The site was leased by the property owners association (POA) from December 2003 to December 2016 to allow local residents to dispose of yard debris, tree limbs, and tree stumps. The last several years of that lease, the POA did not monitor what materials were being dumped at the site but historically it was monitored and any non-organic material was removed and taken to the transfer station [2].

On August 1, 2018, ADEQ began to receive smoke and odor complaints from residents living in the area [1]. ADEQ and ADH communicated regarding the Trafalgar Road Fire on August 27, 2018 about potential health concerns. Air sample data were requested. On September 18, 2018, ADEQ contacted EPA for assistance with air sampling in the area being impacted by smoke from the fire site [1].

October 2, 2018, ADH met with ADEQ & EPA on-site. EPA's contractor was conducting air sampling to determine if potential contaminants are present in and around the smoldering subterranean fire at the stump dump. The underground dump site is reported to consist of vegetative debris, with possible concerns of other non-vegetative material buried in the

area. EPA’s contractor sampled the air for volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) for 24 hours. The October SVOC data could not be validated, so EPA directed their contractor to conduct a second 24-hour round of VOC and SVOC air sampling, which occurred on November 9, 2018.

Discussion

Exposure to a contaminant of concern (COC) is determined by examining human exposure pathways. An exposure pathway has five parts:

1. A source of contamination (e.g., fire),
2. An environmental medium, such as air that can hold or move the contamination,
3. A point at which people come in contact with a contaminated medium (e.g., smoke in the air),
4. An exposure route, such as inhalation, and
5. A population who could come in contact with the contaminants (i.e., employees, trespassers or general public).

An exposure pathway is eliminated if at least one of the five parts is missing and will not occur in the future. For a completed pathway, all five parts must exist and exposure to a contaminant must have occurred, is occurring, or will occur. For this evaluation, an inhalation pathway based on smoke from the fire exists at the site and in the neighborhood areas adjacent to the site.

As a result of the sampling investigations that began on October 2, 2018 and followed on November 9, 2018, validated data were provided to ADH. These data included ten (10) VOC air samples (two (2) on site and eight (8) off-site/residential areas) and five (5) SVOC air samples (one (1) on site and four (4) off-site/residential areas) [3, 4, 5]. See Figure 1 in Attachment A for general sample locations.

Nineteen (19) different VOCs and thirteen (13) different SVOCs were detected during the sampling investigation. The maximum air concentration value from each VOC and SVOC detected was screened with ATSDR’s Comparison Values (CV) for acute exposure (1-14 days) and intermediate exposure (>14-364 days) using the Public Health Assessment Site Tool (PHAST). Only the on-site air concentration value for benzene collected on November 9, 2018, exceeded any screening values. It exceeded the Reference Concentration (RfC); and the ATSDR’s CVs for acute and intermediate levels (Environmental Media Evaluation Guide or EMEG). These are listed in Table 1. All the other VOC and SVOC sample results were below the screening values.

Table 1: Maximum Benzene On-site Air Concentrations and ATSDR Comparison Values

Contaminant Name	Sample Date	Concentration	Int EMEG/MRL	RfC	Acute EMEG/MRL
Benzene	10/2-3/2018	4.8 µg/m ³ (1.5 ppb)	19 µg/m ³ (6 ppb)	30 µg/m ³ (9.4 ppb)	29 µg/m ³ (9.1 ppb)
Benzene	11/9-10/2018	100 µg/m³ (32 ppb)	19 µg/m ³ (6 ppb) [1]	30 µg/m ³ (9.4 ppb) [1]	29 µg/m ³ (9.1 ppb) [2] [a]

ATSDR: Agency for Toxic Substances and Disease Registry

µg/m³: Microgram per cubic meter

ppb: parts per billion

Int: Intermediate

EMEG: Environmental Media Evaluation Guide

MRL: Minimal Risk Level

RfC: Reference Concentration

CV: Comparison Value

[1] ATSDR CV met or exceeded

[2] Acute ATSDR CV met or exceeded

[a] Consider acute CVs for acute exposure scenarios only

Source: Exported Friday, November 30, 2018, from PHAST version 1.2.1.0, database rev 3.47.9

Ambient air levels for benzene have been identified for remote/rural areas in the range of 0.16 parts per billion (ppb) to 3.5 ppb and suburban residential-remote from traffic in the range of 1.8 ppb to 4.5 ppb [6]. The off-site/residential area benzene air sample concentrations ranged from none detected to 1.4 ppb (4.6 $\mu\text{g}/\text{m}^3$), well within the background levels that would be expected in rural subdivisions.

Only the on-site air concentration value for benzene taken from November 9-10, 2018, exceeded the acute exposure screening values. Based on the data for this 24-hour period, the workers or visitors on-site had a slightly increased chance to experience symptoms; however, worker exposure is regulated by the Occupational Safety and Health Administration (OSHA), who has set exposure limits for workers at a significantly higher level of 1,000 ppb for an 8-hour shift during a 40-hour work week.

Data Limitations

Air samples provide a “snapshot” of conditions happening at a specific time. With a limited sampling investigation of ten (10) VOC samples from two (2) 24-hour sampling periods (October 2-3, 2018 and November 9-10, 2018), there are not sufficient data to ensure that the samples collected are fully representative of the air quality during the entirety of the Trafalgar Road Fire. Variable atmospheric conditions such as temperatures, barometric pressure, wind speed and direction fluctuate regularly.

Conclusions

Since residents are smelling smoke from the Trafalgar Road Fire off-site, a completed pathway for inhalation exposure exists for residents living near the fire. The off-site air data do not identify levels of benzene that exceed CVs and are reported in the ranges that would be expected for rural subdivisions. Even without elevated chemical levels in the off-site/residential area air, smoke and odors can sometimes trigger physical symptoms such as:

- Dizziness
- Watery eyes, stuffy nose, irritated throat
- Cough or wheeze, especially for those with allergies, asthma, and other chronic lung problems
- Sleep problems due to throat irritation and cough [7]

Based on the air sample results collected offsite during October and November 2018, the general public does not appear to be at risk of exposure to dangerous chemicals in the air; however, in order to make a determination of human health risks for the workers on-site and the residents off-site in the adjacent neighborhood areas, more robust air sample data are needed.

Recommendations

For prudent public health safety, ADH recommends the following:

- EPA perform additional VOC and SVOC air monitoring, both on-site and in the surrounding community near the homes potentially affected by the smoke from the fire, in order to evaluate the potential for public health risk. Due to the unknown underground burn conditions and variable weather conditions, this air investigation should include samples collected at multiple locations, collected regularly during the lifetime of the fire until a discernable data pattern can be determined.
- EPA begin sampling for fine particulate matter (PM_{2.5}).
- EPA provide future air monitoring data to ADH for evaluation of public health exposures.

Please feel free to contact me at 501-614-5227 or chris.hemann@arkansas.gov, if you have any questions.

Sincerely,



Chris C. Hemann, M.S.
ADH Environmental Epidemiologist
ATSDR Cooperative Agreement Health Assessor

cc: Shirley Louie, M.S., CIH, ADH Center for Public Health Practice Director
Lori Simmons, M.S., ADH Epidemiology Branch Chief
Ashley Whitlow, M.S., ADH ATSDR Principal Investigator
Kerry Krell, MPH, ADH ATSDR Health Outreach Coordinator
Laura Shue, ADH General Counsel
Rob Robinson, ATSDR Technical Project Officer
Jennifer Lyke, ATSDR Region 6
Patrick Young, ATSDR Region 6
Stuart Spencer, ADEQ Air Division
Heinz Braun, ADEQ Air Division

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References

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3. Test America. October 19, 2018. *Analytical Report, Job Number: 320-43816-1, Job Description: Emergency Response, Bella Vista, AR*. Prepared for Weston Solutions, Inc.
4. Eurofins Air Toxics Inc. November 28, 2018. *VOC Data for Workorder #: 1811255*. Prepared for Weston Solutions, Inc.
5. Eurofins Air Toxics Inc. November 28, 2018. *SVOC Data for Workorder #: 1811248*. Prepared for Weston Solutions, Inc.
6. Gist, G.L. and J.R. Burg. Benzene – *A Review of the Literature from a Health Effects Perspective*. ATSDR. undated. Referenced in US EPA memo: *Typical Benzene Concentrations in Ambient and Indoor Air*, From: Bart Eklund, To: Henry Schuver. February 13, 2004.
7. Agency for Toxic Substances and Disease Registry. February 2017. *Are Environmental Odors Toxic?* Retrieved from: https://www.atsdr.cdc.gov/odors/docs/Are_Environmental_Odors_Toxic_508.pdf

Attachment A

Sampling Locations

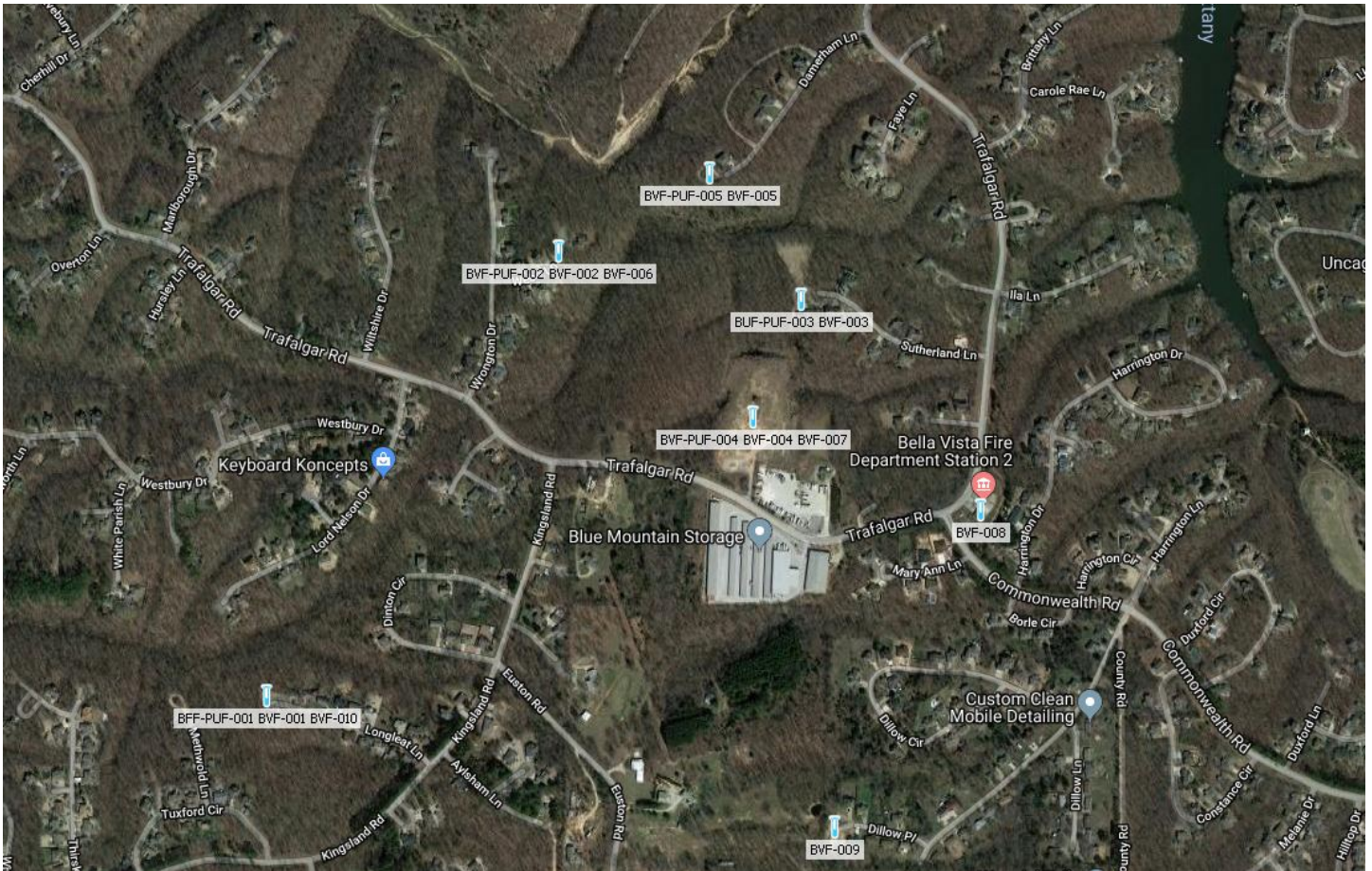


Figure 1: ADH generated sample location map combined from both sampling events

Sample Date	Sample Location ID	Sample Type
10/2/2018	BVF-001	Volatile Organic Compounds
10/2/2018	BVF-002	Volatile Organic Compounds
10/2/2018	BVF-003	Volatile Organic Compounds
10/2/2018	BVF-004	Volatile Organic Compounds
10/2/2018	BVF-005	Volatile Organic Compounds
11/9/2018	BVF-006	Volatile Organic Compounds
11/9/2018	BVF-007	Volatile Organic Compounds
11/9/2018	BVF-008	Volatile Organic Compounds
11/9/2018	BVF-009	Volatile Organic Compounds
11/9/2018	BVF-010	Volatile Organic Compounds
11/9/2018	BVF-PUF-006	Semi-Volatile Organic Compounds
11/9/2018	BVF-PUF-007	Semi-Volatile Organic Compounds
11/9/2018	BVF-PUF-008	Semi-Volatile Organic Compounds
11/9/2018	BVF-PUF-009	Semi-Volatile Organic Compounds
11/9/2018	BVF-PUF-010	Semi-Volatile Organic Compounds