



THE SCIENCE OF READYSM

ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)

BELLA VISTA REFUSE FIRE

Bella Vista, AR

March 14, 2019

Project #111327

1.0 Introduction

Environmental Resources Management (ERM) requested that CTEH® conduct air monitoring in the community surrounding a refuse fire (aka Stump Dump Fire) located on Trafalgar Rd in Bella Vista Arkansas. CTEH® arrived on-site on March 13, 2019 and began air monitoring operations. Activities were comprised of real-time air monitoring and analytical air sampling.

This report summarizes air monitoring data collected from March 13, 2019 07:00 CDT to March 14, 2019 07:00 CDT.

2.0 Air Monitoring and Sampling Methods

CTEH® developed and implemented an air sampling and analysis work plan (SAP) to document and quantify the release of fugitive emissions (if any) produced by the fire. All instrumentation was calibrated at least once per day or per manufacturer's recommendations. Target analytes were measured as benzene, carbon monoxide (CO), formaldehyde, hydrogen sulfide (H₂S), hydrogen cyanide (HCN), nitrogen dioxide (NO₂), 2.5-micron particulate matter (PM_{2.5}), sulfur dioxide (SO₂), and volatile organic compounds (VOCs) using handheld instruments such as RAE Systems MultiRAEs, TSI SidePak™ AM510 Aerosol Monitors, and Gastec GV-100 pumps with chemical-specific colorimetric detection tubes.

Hand-held air monitoring consisted of roaming air monitoring in the surrounding community. Additionally, fixed monitoring locations were established for periodic visitation by field personnel to track trends in air quality (if any). All hand-held air monitoring was conducted in the breathing zone.

Analytical air samples were deployed in the breathing zone at five locations through the community. Each station consisted of a 1-L evacuated cylinder (1-L Minican) co-located with an SKC active sampling pump equipped with sorbent media suitable for collection of polycyclic aromatic hydrocarbons (PAHs).

All samples will be sent to American Industrial Hygiene Association (AIHA) accredited Galson Laboratories for analysis in accordance with EPA Method TO-15 or NIOSH Method 5506. **Figure 4 in Attachment A** depicts these analytical air sampling locations.

3.0 Air Monitoring Results

Figures 1 – 3 in Attachment A depicts the site location and hand-held monitoring locations for this reporting period.

No detections for this reporting period exceeded site specific action levels as outlined in the CTEH® SAP.

Table 1 summarizes the results for hand-held air monitoring readings and **Table 2** summarizes hand-held air monitoring results by their respecting fixed real-time location (FRT).

Table 1: Community Monitoring Hand-Held Real-Time Air Monitoring Results

Analyte	Instrument	# Readings	# Detections	Range ¹
Benzene	UltraRAE	46	0	< 0.05 ppm
CO	MultiRAE Plus	31	0	< 1 ppm
Formaldehyde	MultiRAE Pro	9	0	< 0.01 ppm
H ₂ S	MultiRAE Pro	2	0	< 0.1 ppm
HCN	MultiRAE	14	0	< 0.5 ppm
NO ₂	MultiRAE	18	0	< 0.1 ppm
PM _{2.5}	AM510	126	125	0.002 - 0.045 mg/m ³
SO ₂	MultiRAE	15	0	< 0.1 ppm
VOCs	MultiRAE	77	0	< 0.1 ppm

¹Maximum detections preceded by the "<" symbol are considered non-detections below the limit of detection (LoD) value to the right.

Table 2: Fixed Monitoring Location Air Monitoring Results

Location Code	Analyte	Instrument	# Readings	# Detections	PM _{2.5} Average	Range ¹
FRT-001	Benzene	UltraRAE	1	0	-	< 0.05 ppm
	CO	MultiRAE Plus	2	0	-	< 1 ppm
	PM _{2.5}	AM510	9	9	0.014 mg/m ³	0.004 - 0.026 mg/m ³
	VOCs	MultiRAE	6	0	-	< 0.1 ppm
FRT-002	Benzene	UltraRAE	3	0	-	< 0.05 ppm
	CO	MultiRAE Plus	2	0	-	< 1 ppm
	NO ₂	MultiRAE	1	0	-	< 0.1 ppm
	PM _{2.5}	AM510	8	8	0.009 mg/m ³	0.002 - 0.019 mg/m ³
	SO ₂	MultiRAE	1	0	-	< 0.1 ppm
	VOCs	MultiRAE	5	0	-	< 0.1 ppm
FRT-003	Benzene	UltraRAE	3	0	-	< 0.05 ppm
	CO	MultiRAE Plus	1	0	-	< 1 ppm
	Formaldehyde	MultiRAE Pro	1	0	-	< 0.01 ppm
	HCN	MultiRAE	1	0	-	< 0.5 ppm
	NO ₂	MultiRAE	1	0	-	< 0.1 ppm
	PM _{2.5}	AM510	7	7	0.008 mg/m ³	0.002 - 0.016 mg/m ³
	SO ₂	MultiRAE	1	0	-	< 0.1 ppm
	VOCs	MultiRAE	4	0	-	< 0.1 ppm
FRT-004	Benzene	UltraRAE	4	0	-	< 0.05 ppm
	CO	MultiRAE Plus	3	0	-	< 1 ppm
	Formaldehyde	MultiRAE Pro	1	0	-	< 0.01 ppm
	H ₂ S	MultiRAE Pro	2	0	-	< 0.1 ppm
	HCN	MultiRAE	3	0	-	< 0.5 ppm
	NO ₂	MultiRAE	3	0	-	< 0.1 ppm

Location Code	Analyte	Instrument	# Readings	# Detections	PM _{2.5} Average	Range ¹
FRT-005	PM _{2.5}	AM510	11	11	0.024 mg/m ³	0.008 - 0.045 mg/m ³
	SO ₂	MultiRAE	3	0	-	< 0.1 ppm
	VOCs	MultiRAE	7	0	-	< 0.1 ppm
	Benzene	UltraRAE	4	0	-	< 0.05 ppm
	CO	MultiRAE Plus	3	0	-	< 1 ppm
	Formaldehyde	MultiRAE Pro	1	0	-	< 0.01 ppm
	HCN	MultiRAE	2	0	-	< 0.5 ppm
	NO ₂	MultiRAE	2	0	-	< 0.1 ppm
	PM _{2.5}	AM510	10	10	0.017 mg/m ³	0.007 - 0.043 mg/m ³
	SO ₂	MultiRAE	2	0	-	< 0.1 ppm
FRT-006	VOCs	MultiRAE	5	0	-	< 0.1 ppm
	Benzene	UltraRAE	5	0	-	< 0.05 ppm
	CO	MultiRAE Plus	3	0	-	< 1 ppm
	Formaldehyde	MultiRAE Pro	1	0	-	< 0.01 ppm
	HCN	MultiRAE	2	0	-	< 0.5 ppm
	NO ₂	MultiRAE	2	0	-	< 0.1 ppm
	PM _{2.5}	AM510	10	10	0.008 mg/m ³	0.003 - 0.023 mg/m ³
	SO ₂	MultiRAE	2	0	-	< 0.1 ppm
	VOCs	MultiRAE	6	0	-	< 0.1 ppm
	Benzene	UltraRAE	3	0	-	< 0.05 ppm
FRT-007	CO	MultiRAE Plus	3	0	-	< 1 ppm
	NO ₂	MultiRAE	1	0	-	< 0.1 ppm
	PM _{2.5}	AM510	8	8	0.014 mg/m ³	0.005 - 0.022 mg/m ³
	VOCs	MultiRAE	6	0	-	< 0.1 ppm
	Benzene	UltraRAE	2	0	-	< 0.05 ppm
FRT-008	CO	MultiRAE Plus	2	0	-	< 1 ppm
	NO ₂	MultiRAE	1	0	-	< 0.1 ppm
	PM _{2.5}	AM510	9	9	0.014 mg/m ³	0.005 - 0.023 mg/m ³
	VOCs	MultiRAE	5	0	-	< 0.1 ppm
	Benzene	UltraRAE	2	0	-	< 0.05 ppm
FRT-009	CO	MultiRAE Plus	2	0	-	< 1 ppm
	Formaldehyde	MultiRAE Pro	1	0	-	< 0.01 ppm
	HCN	MultiRAE	1	0	-	< 0.5 ppm
	NO ₂	MultiRAE	2	0	-	< 0.1 ppm
	PM _{2.5}	AM510	9	8	0.015 mg/m ³	0.005 - 0.028 mg/m ³
	SO ₂	MultiRAE	1	0	-	< 0.1 ppm
	VOCs	MultiRAE	5	0	-	< 0.1 ppm
	Benzene	UltraRAE	3	0	-	< 0.05 ppm
	CO	MultiRAE Plus	3	0	-	< 1 ppm
FRT-010	Formaldehyde	MultiRAE Pro	2	0	-	< 0.01 ppm
	HCN	MultiRAE	2	0	-	< 0.5 ppm

Location Code	Analyte	Instrument	# Readings	# Detections	PM _{2.5} Average	Range ¹
	NO ₂	MultiRAE	2	0	-	< 0.1 ppm
	PM _{2.5}	AM510	8	8	0.013 mg/m ³	0.005 - 0.018 mg/m ³
	SO ₂	MultiRAE	2	0	-	< 0.1 ppm
	VOCs	MultiRAE	5	0	-	< 0.1 ppm
FRT-011	Benzene	UltraRAE	2	0	-	< 0.05 ppm
	CO	MultiRAE Plus	1	0	-	< 1 ppm
	PM _{2.5}	AM510	7	7	0.016 mg/m ³	0.005 - 0.024 mg/m ³
	VOCs	MultiRAE	5	0	-	< 0.1 ppm
FRT-012	Benzene	UltraRAE	3	0	-	< 0.05 ppm
	CO	MultiRAE Plus	1	0	-	< 1 ppm
	PM _{2.5}	AM510	8	8	0.01 mg/m ³	0.003 - 0.018 mg/m ³
	VOCs	MultiRAE	4	0	-	< 0.1 ppm
FRT-013	Benzene	UltraRAE	2	0	-	< 0.05 ppm
	CO	MultiRAE Plus	1	0	-	< 1 ppm
	PM _{2.5}	AM510	6	6	0.007 mg/m ³	0.002 - 0.016 mg/m ³
	VOCs	MultiRAE	3	0	-	< 0.1 ppm
FRT-014	Benzene	UltraRAE	5	0	-	< 0.05 ppm
	CO	MultiRAE Plus	2	0	-	< 1 ppm
	Formaldehyde	MultiRAE Pro	1	0	-	< 0.01 ppm
	HCN	MultiRAE	2	0	-	< 0.5 ppm
	NO ₂	MultiRAE	2	0	-	< 0.1 ppm
	PM _{2.5}	AM510	9	9	0.015 mg/m ³	0.007 - 0.021 mg/m ³
	SO ₂	MultiRAE	2	0	-	< 0.1 ppm
	VOCs	MultiRAE	6	0	-	< 0.1 ppm
FRT-015	Benzene	UltraRAE	4	0	-	< 0.05 ppm
	CO	MultiRAE Plus	2	0	-	< 1 ppm
	Formaldehyde	MultiRAE Pro	1	0	-	< 0.01 ppm
	HCN	MultiRAE	1	0	-	< 0.5 ppm
	NO ₂	MultiRAE	1	0	-	< 0.1 ppm
	PM _{2.5}	AM510	7	7	0.008 mg/m ³	0.002 - 0.015 mg/m ³
	SO ₂	MultiRAE	1	0	-	< 0.1 ppm
	VOCs	MultiRAE	5	0	-	< 0.1 ppm

¹Maximum detections preceded by the “<” symbol are considered non-detections below the limit of detection (LoD) value to the right.

²Particulate matter averages are provided for additional context. Due to the uneven temporal distribution of particulate matter monitoring data at these locations, averages may be biased and are not directly comparable to National Ambient Air Quality Standards (NAAQS).

4.0 Air Sampling Results

A total of 35 samples have been collected to date. All samples will be sent to Galson Laboratories with an analysis turnaround time of 5 business days. **Table 3** details the types of samples collected.

Table 3: Analytical Samples Collected to Date

Collection Date	Sample Media	Sample Type	# Samples
03/12/19	PAHs (NIOSH 5506)	Background Sample	1
		Field Sample	5
	1-L Minican (TO-15)	Background Sample	1
		Field Sample	4
03/13/19	PAHs (NIOSH 5506)	Field Blank	1
		Field Duplicate	1
		Field Sample	4

5.0 Weather Conditions

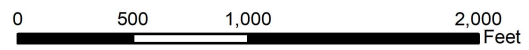
Figure 5 in attachment B contains a wind rose depicting wind speed and direction for this reporting period. Data was acquired from darksky.net which registered the nearest weather station to the site being approximately 6 miles away.

Attachment A

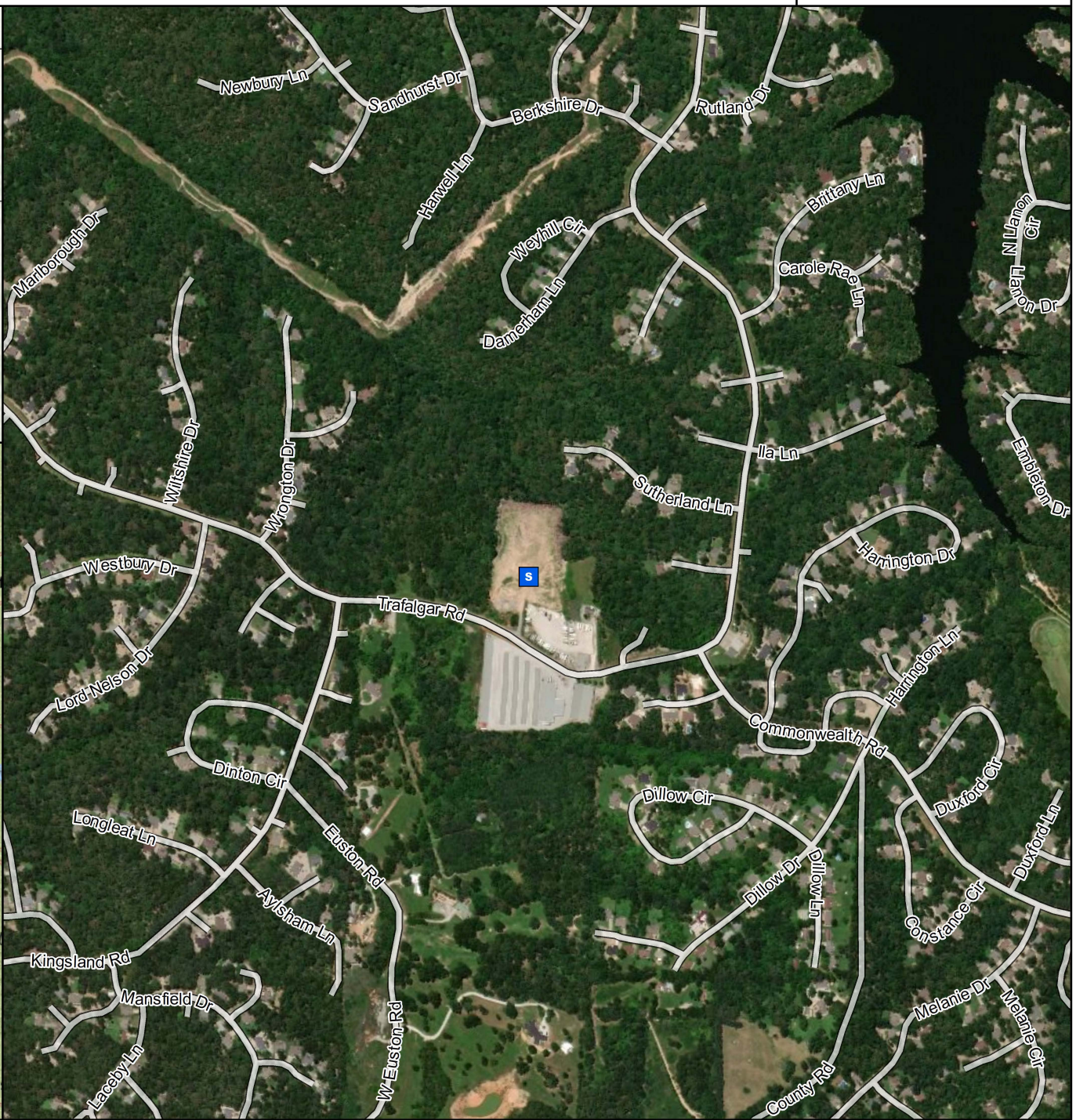
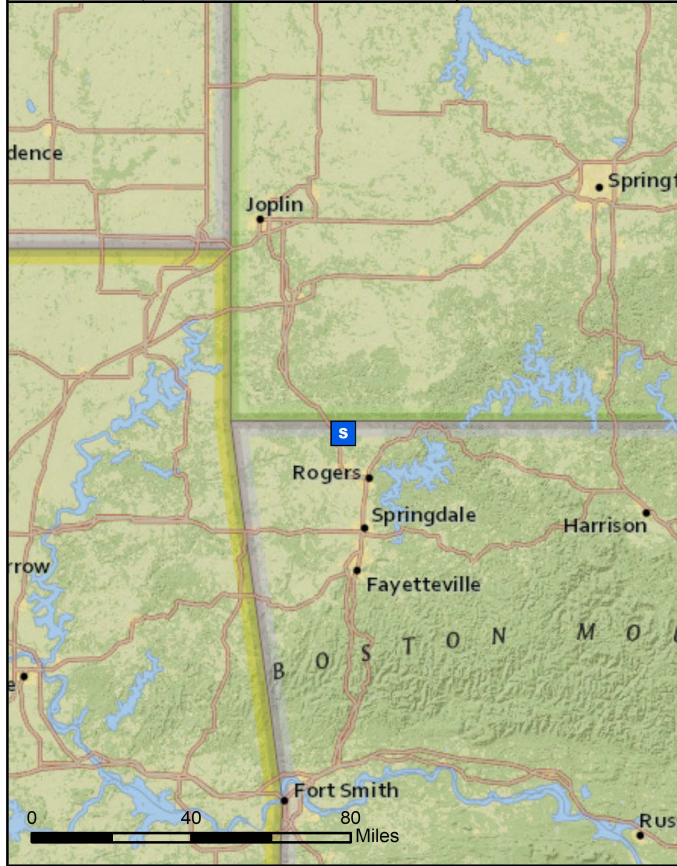
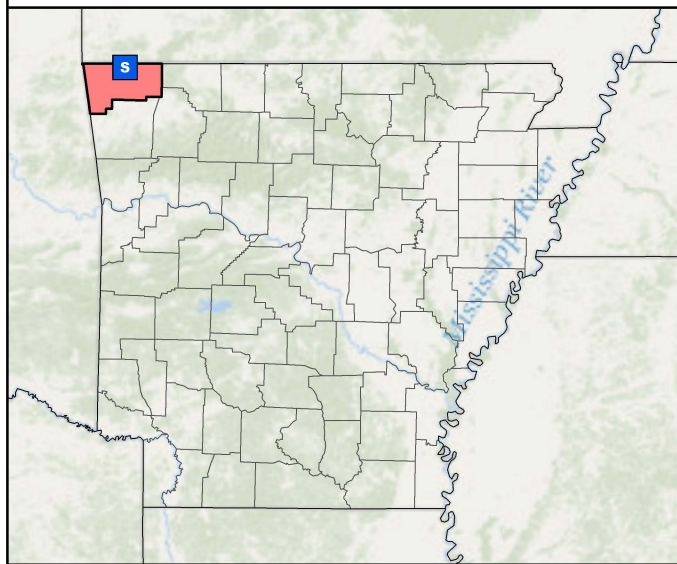
CTEH Air Sampling and Monitoring Locations

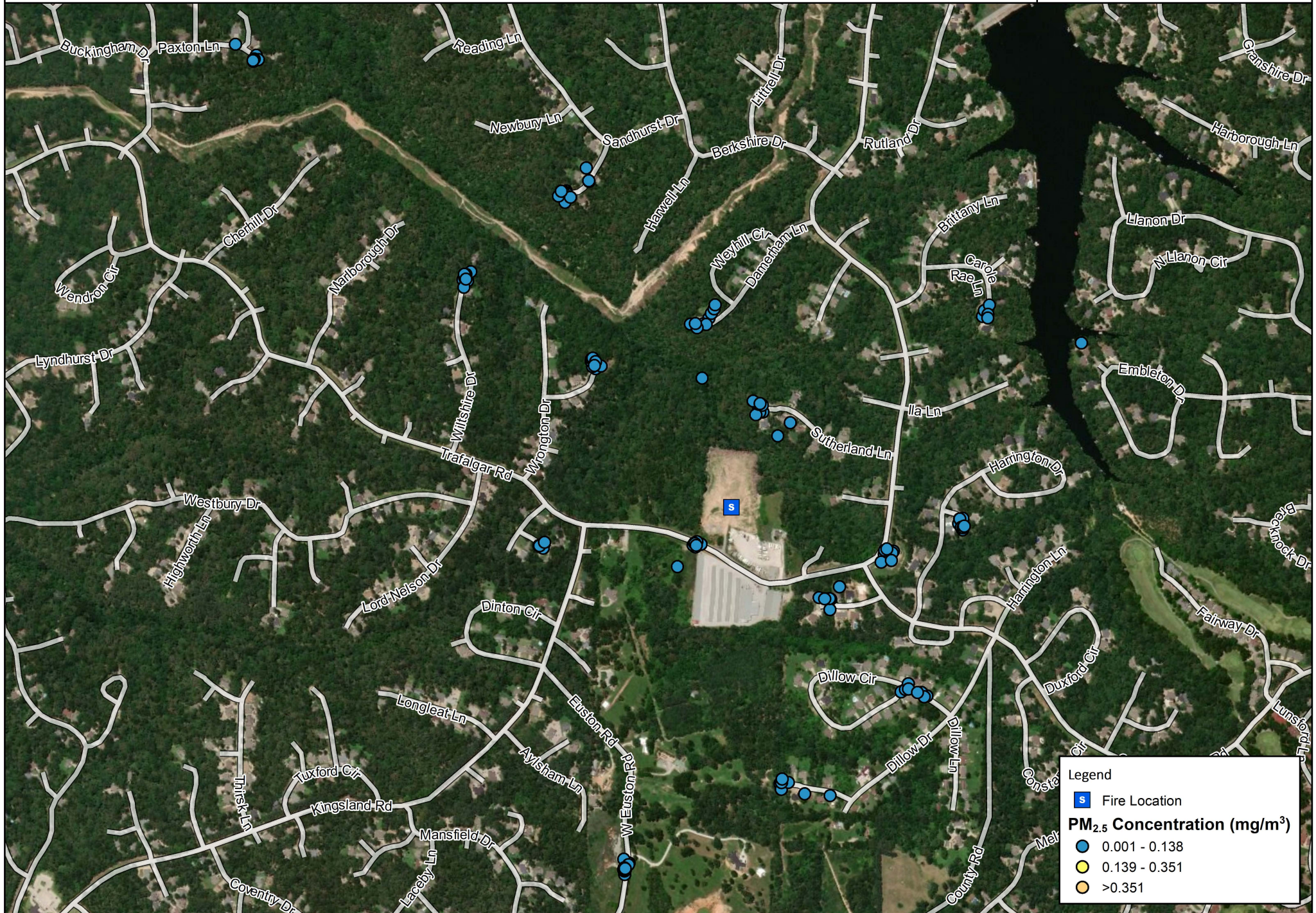


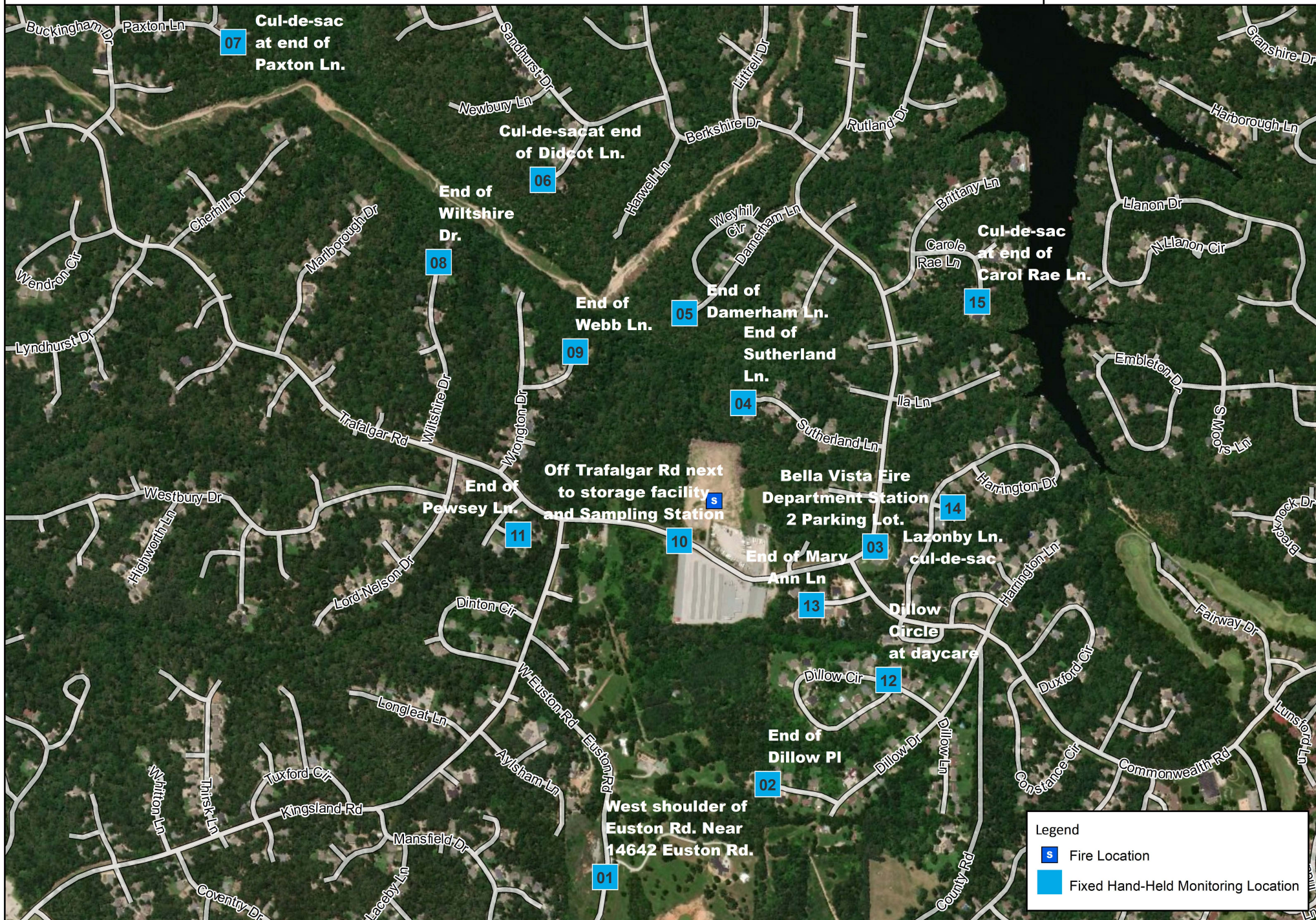
Figure 1: Incident Location
Bella Vista Refuse Fire



Project: 111327
Client: ERM
City: Bella Vista, AR
County: Benton









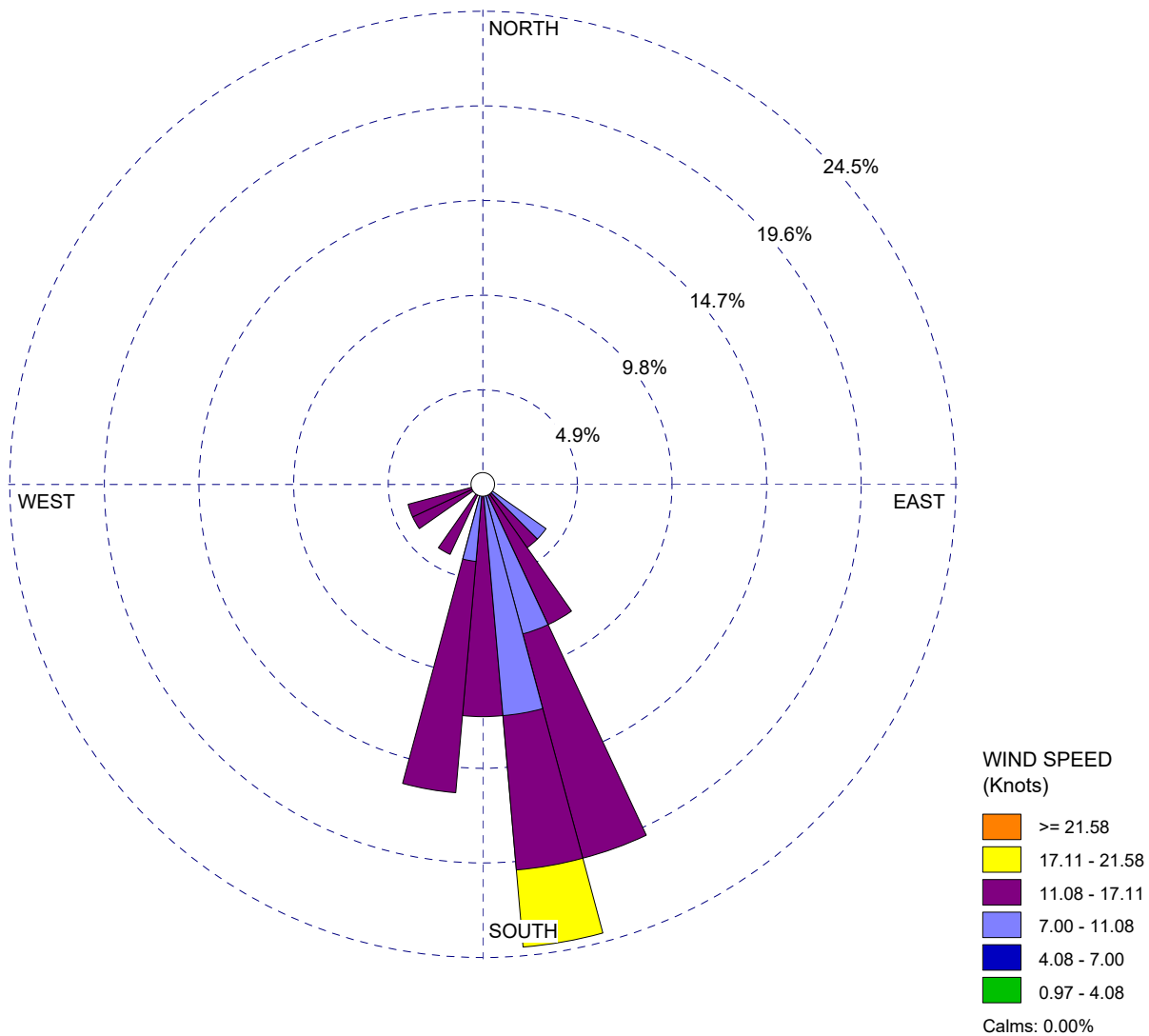
Attachment B

Meteorological Conditions

WIND ROSE PLOT:

Station #DarkSky API

DISPLAY:

Wind Speed
Direction (blowing from)

COMMENTS:

DATA PERIOD:

Start Date: 3/13/2019 - 07:00
End Date: 3/14/2019 - 07:00

COMPANY NAME:

MODELER:

CALM WINDS:

0.00%

TOTAL COUNT:

25 hrs.

AVG. WIND SPEED:

13.00 Knots

DATE:

3/14/2019

PROJECT NO.:

111327