CTEH CENTER FOR TOXICOLOGY AND ENVIRONMENTAL HEALTH, LLC

Arkema Facility - Harvey Response

Crosby, TX

Arkema Inc.

September 1, 2017

Project #109489 Summary

1.0 Introduction

As a result of flooding events related to Hurricane Harvey, the Arkema facility located in Crosby, TX suffered a loss of power and failure on refrigeration of manufacturing process. The loss of temperature control resulted in degradation and heating of organic peroxides, with the potential of creating a fire. As a precautionary measure, local authorities established a 1.5-mile radius evacuation zone around the facility.

On August 31, 2017, the Center for Toxicology and Environmental Health, LLC (CTEH®) was contacted by Arkema Inc. (Arkema) to initiate air monitoring and sampling around the community areas outside of the evacuation zone perimeter. This submittal summarizes the results of real-time air monitoring conducted by CTEH® personnel on from August 31, 2017 through September 1, 2017. A map of the site location is provided in **Attachment A**.

2.0 Real-time Air Monitoring

All real-time air monitoring instrumentation was calibrated per the manufacturer's recommendations prior to air monitoring. Handheld, real-time air monitoring was conducted for carbon monoxide (CO) and volatile organic compounds (VOCs) using RAE Systems MultiRAE Plus instruments. Additionally, levels of particulate matter ($PM_{2.5}$) potentially related to fire smoke were assessed using TSI SidePak AM510 and Dusttrak aerosol monitors. **Table 1** summarizes the data for all real-time air monitoring readings recorded in Crosby, TX from 12:57 August 31, 2017 through 06:00 on September 1, 2017. Maps of real-time air monitoring locations are provided as **Attachment B**.

Table 1 Real-time Handheld Air Monitoring Readings
12:57 August 31, 2017 – 06:00 September 1, 2017

Analyte	Instrument	Number of Readings	Number of Detections	Range of Detections*
Benzene	UltraRAE	23	0	< 1.0 ppm
CO	MultiRAE Plus	16	0	< 1.0 ppm
Cumene	Gastec Tube 122L	6	0	< 50 ppm
LEL	MultiRAE Plus	6	0	< 1.0 %
VOCs	MultiRAE Plus	139	0	< 0.1 ppm
$PM_{2.5}$	AM510	110	110	0.023 – 0.074 mg/m^3
	Dusttrak	25	25	0.023 – 0.049 mg/m^3

*If detections were not observed, the instrument detection limit is listed in this column.

3.0 Analytical Air Sampling

To supplement real-time air monitoring, CTEH® deployed areas along the perimeter of the evacuated area within the community. Evacuated canister (Minican™) samplers were regulated to collect air evenly over a 24-hr period. Analytical air samples will be submitted to SGS Galson Laboratories, an AIHA-accredited laboratory, for analysis using EPA Method TO-15. A map highlighting the analytical air sampling locations is provided as **Attachment C**. Analytical Air Sampling Results will be reported upon receipt from the laboratory.

Attachment A

Site Location Map

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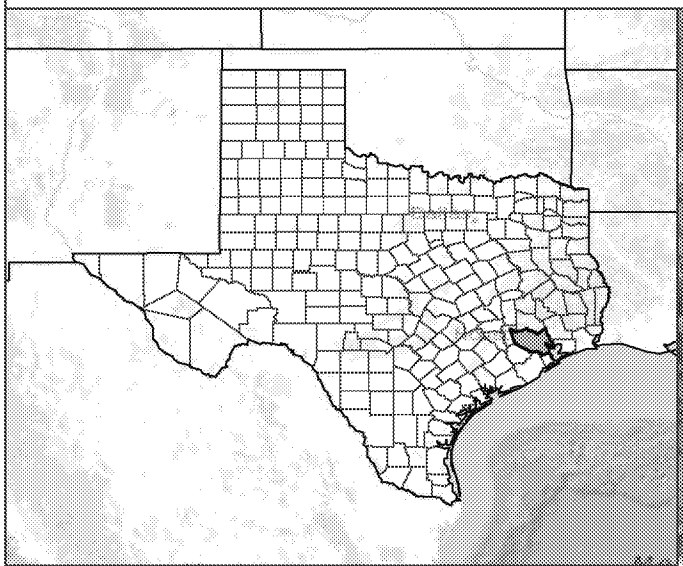
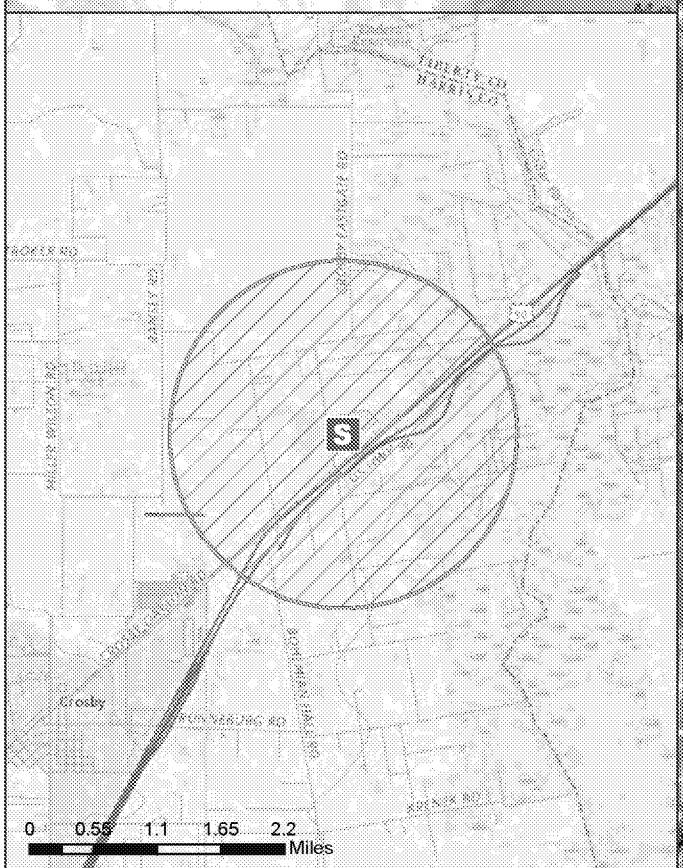
Site Location

Project: 109458
Client: Arkema
City: Crosby, TX
County: Harris





PROJECTION SYSTEM: *Transverse Mercator* DATUM: *WGS 1984* LAST UPDATED: *9/1/2017 10:00:58 AM*

Attachment B

Handheld Real-time Air Monitoring Locations

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Hand-held Real-time Reading Locations

Harvey Response - 12:57 August 31, 2017 to 06:00 September 1, 2017

Project: 109458
Client: Arkema
City: Crosby, TX
County: Harris

PROJECTION SYSTEM: UTM15 COORDINATE SYSTEM: WGS84

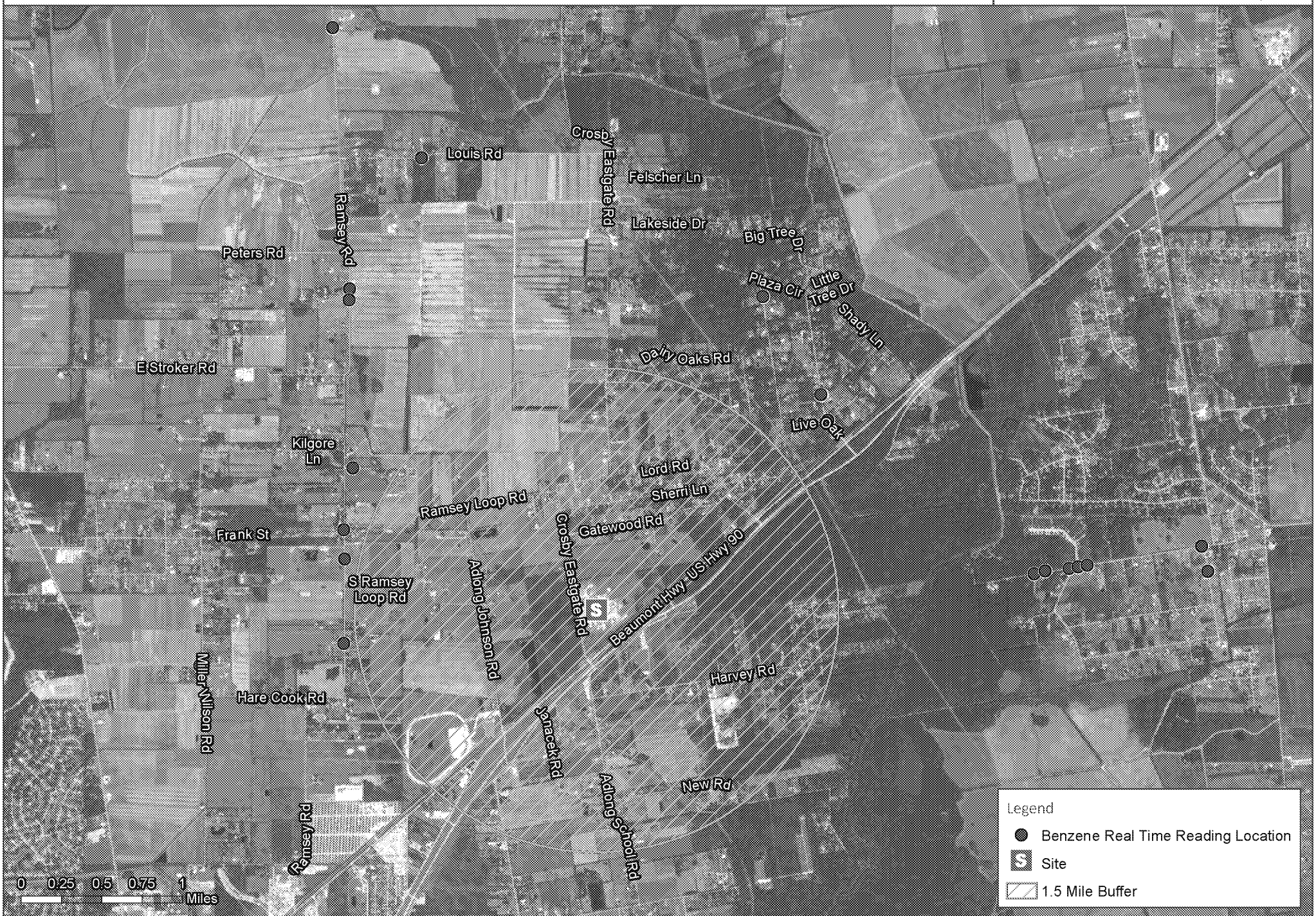
Last Updated: 9/1/2017 9:48:57 AM

CTEH

Benzene Hand-held Real-time Reading Locations

Harvey Response - 12:57 August 31, 2017 to 06:00 September 1, 2017

Project: 109458
Client: Arkema
City: Crosby, TX
County: Harris



PROJECTION SYSTEM: UTM15 COORDINATE SYSTEM: WGS84

Last Updated: 9/1/2017 11:45:57 AM

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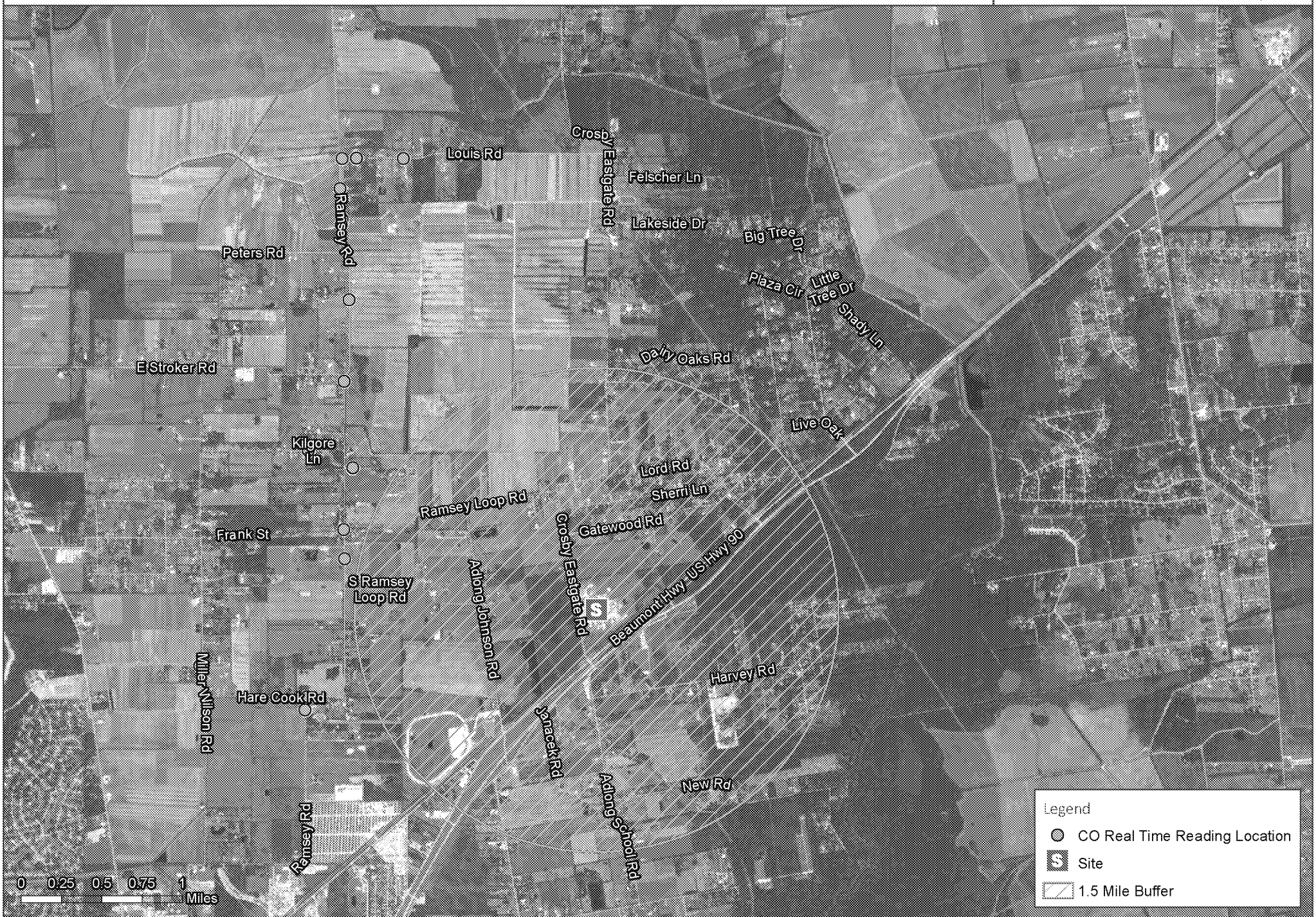
Carbon Monoxide Hand-held Real-time Reading Locations

Harvey Response - 12:57 August 31, 2017 to 06:00 September 1, 2017

Project: 109458
Client: Arkema
City: Crosby, TX
County: Harris



PROJECTION SYSTEM: UTM15 COORDINATE SYSTEM: WGS84

Last Updated: 9/1/2017 11:52:28 AM

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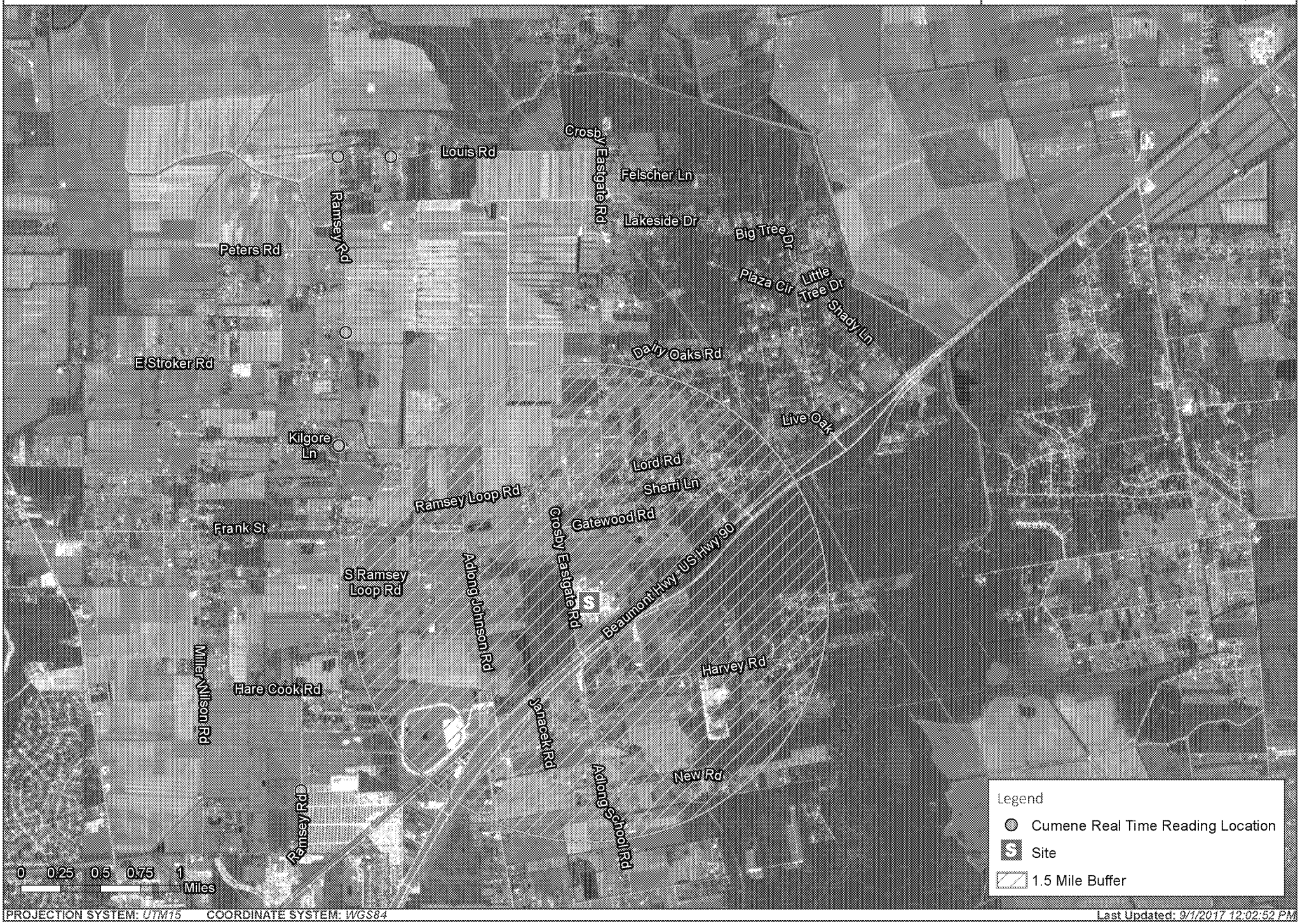
Cumene Hand-held Real-time Reading Locations

Harvey Response - 12:57 August 31, 2017 to 06:00 September 1, 2017

Project: 109458
Client: Arkema
City: Crosby, TX
County: Harris



PROJECTION SYSTEM: UTM15 COORDINATE SYSTEM: WGS84

Last Updated: 9/1/2017 12:02:52 PM

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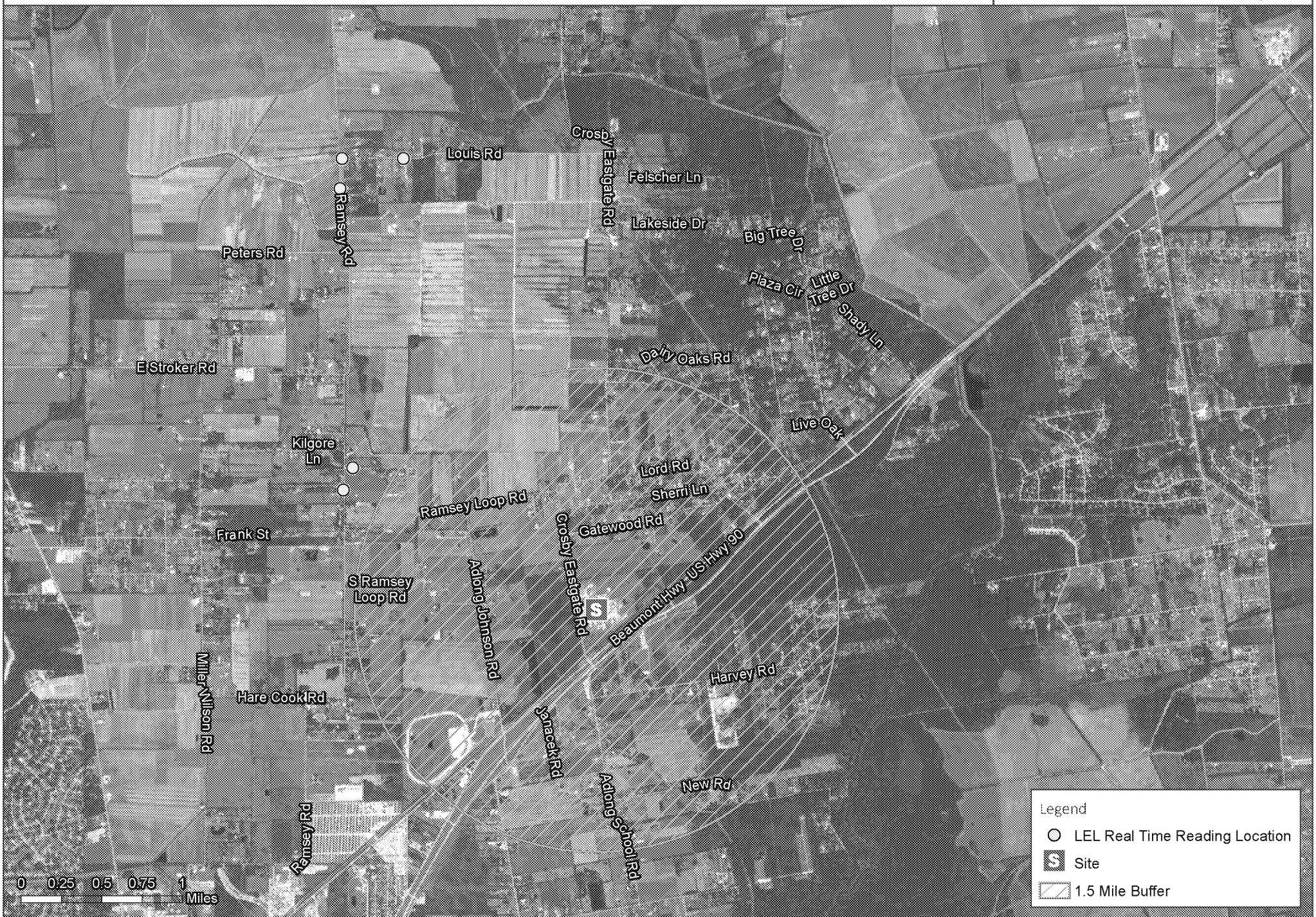
LEL Hand-held Real-time Reading Locations

Harvey Response - 12:57 August 31, 2017 to 06:00 September 1, 2017

Project: 109458
Client: Arkema
City: Crosby, TX
County: Harris



PROJECTION SYSTEM: UTM15 COORDINATE SYSTEM: WGS84

Last Updated: 9/1/2017 12:06:08 PM

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PM2.5 Hand-held Real-time Reading Locations

Harvey Response - 12:57 August 31, 2017 to 06:00 September 1, 2017

Project: 109458
Client: Arkema
City: Crosby, TX
County: Harris

PROJECTION SYSTEM: UTM15 COORDINATE SYSTEM: WGS84

Last Updated: 9/1/2017 12:09:21 PM

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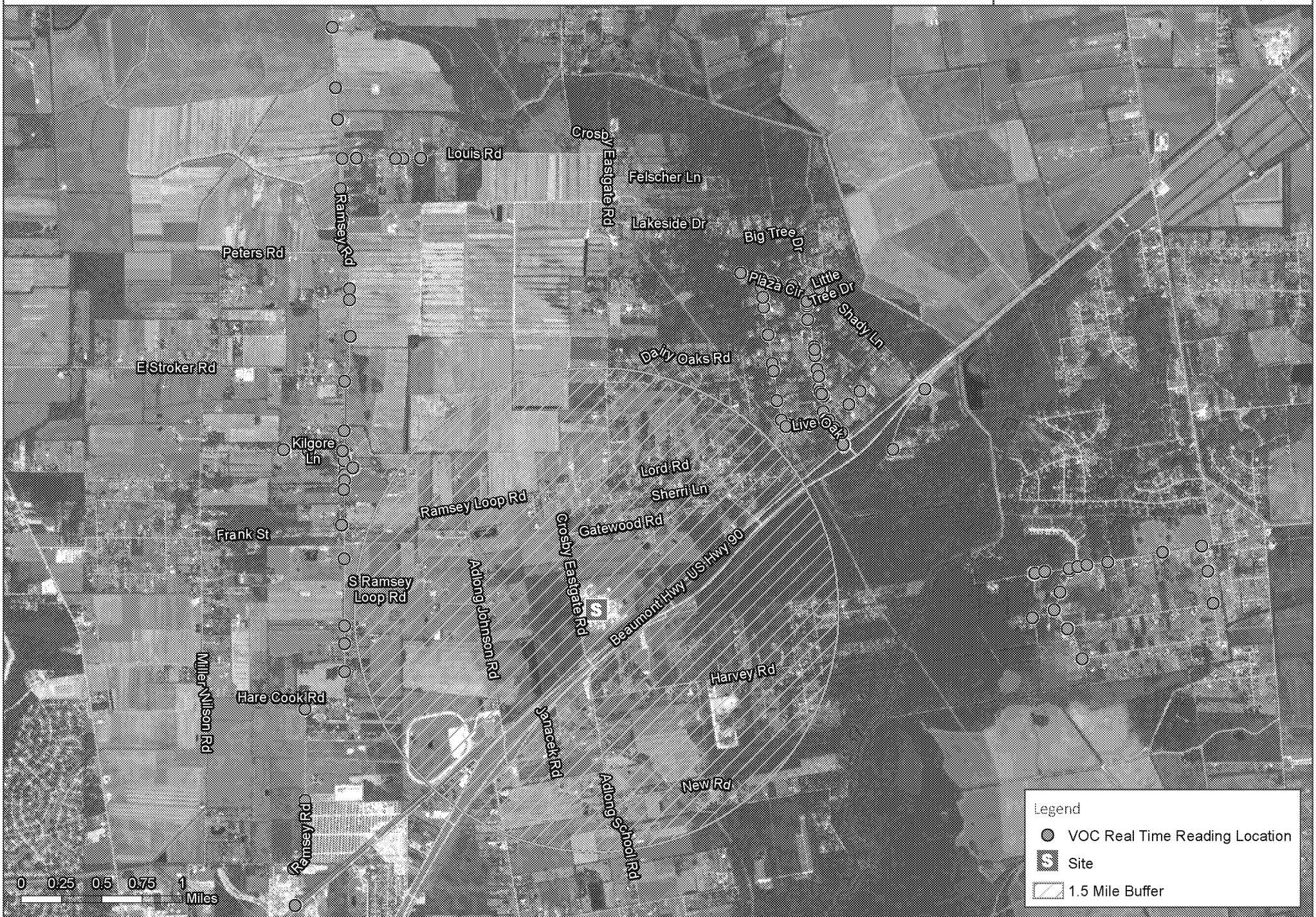
VOC Hand-held Real-time Reading Locations

Harvey Response - 12:57 August 31, 2017 to 06:00 September 1, 2017

Project: 109458
Client: Arkema
City: Crosby, TX
County: Harris



PROJECTION SYSTEM: UTM15 COORDINATE SYSTEM: WGS84

Last Updated: 9/1/2017 12:18:14 PM

Attachment C

Map of Analytical Air Sampling Locations

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Analytical Air Monitoring Station Locations

Harvey Response - August 31, 2017

Project: 109458
Client: Arkema
City: Crosby, TX
County: Harris

PROJECTION SYSTEM: *UTM15* COORDINATE SYSTEM: *WGS84*

Last Updated: *9/1/2017 10:06:50 AM*

Attachment D

KHPY Windrose

(Highland Park Airport - 12.5 miles SSE of Site)

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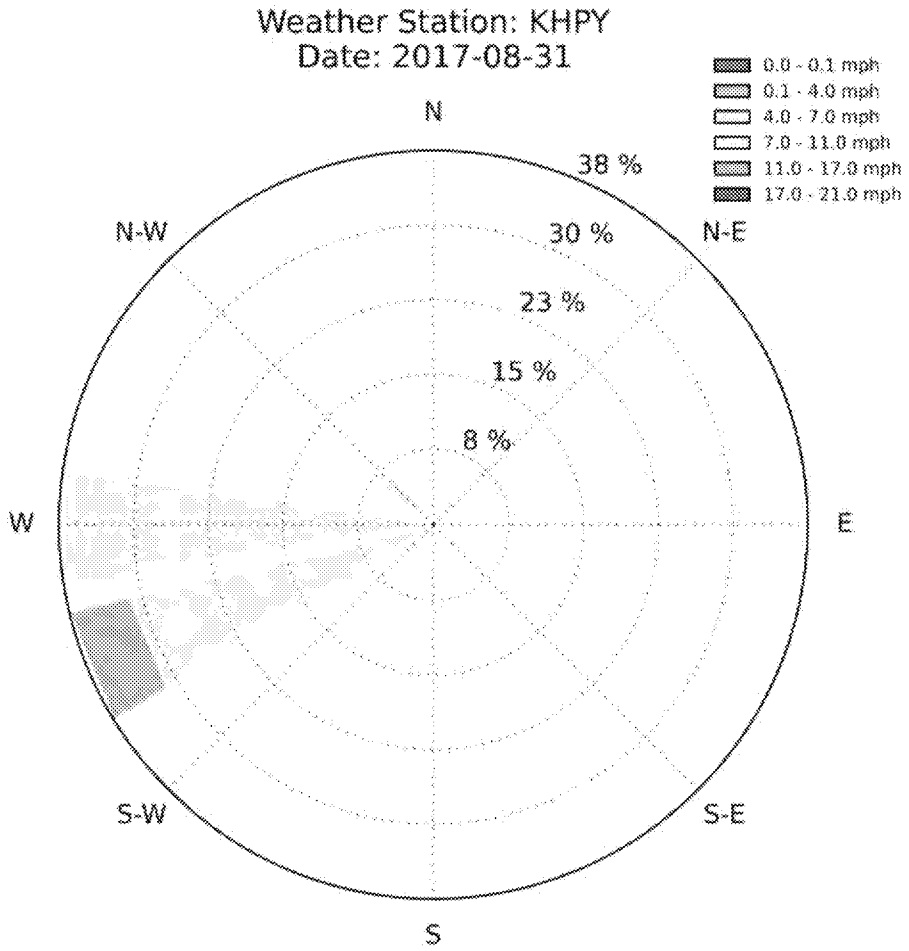
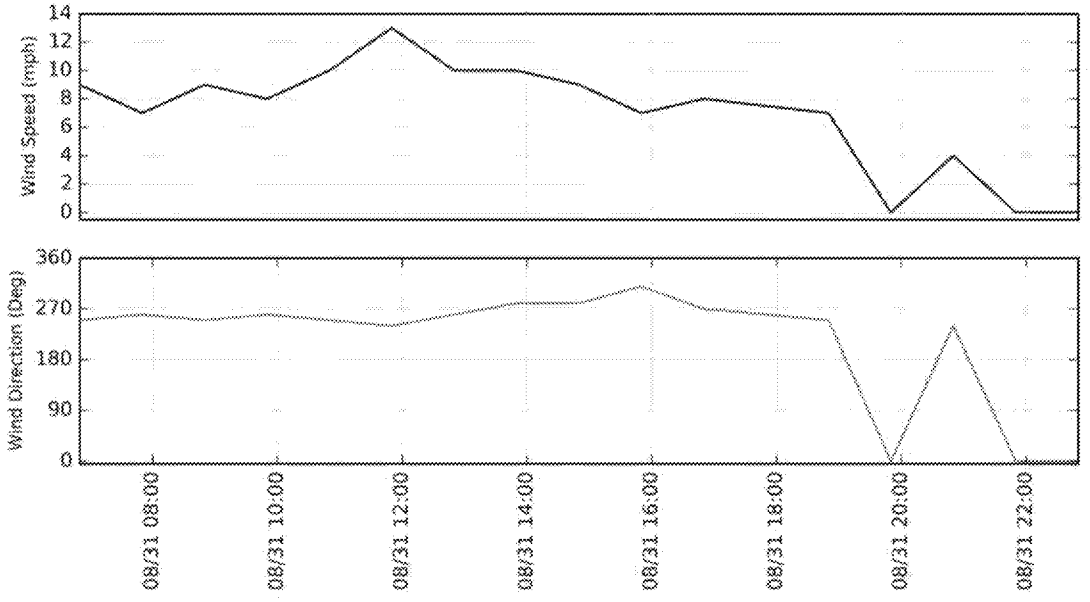

Weather Station: KHPY
Date: 2017-08-31
0.0 - 0.1 mph
0.1 - 4.0 mph
4.0 - 7.0 mph
7.0 - 11.0 mph
11.0 - 17.0 mph
17.0 - 21.0 mph
N
N-E
E
S-E
S
S-W
W
N-W
38 %
30 %
23 %
15 %
8 %


Wind Speed (mph)
0
2
4
6
8
10
12
14
Wind Direction (Deg)
0
90
180
270
360
08/31 08:00
08/31 10:00
08/31 12:00
08/31 14:00
08/31 16:00
08/31 18:00
08/31 20:00
08/31 22:00

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