
**GROUND-BASED SAMPLING FOR TOXINS
AUGUST MONTHLY REPORT**

August 1 – August 31, 2023

**Operational Summaries,
Data Summaries and Plots**

Prepared for

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A decorative graphic at the bottom left of the page consisting of three stylized mountain peaks in shades of green and blue.

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1.0 INTRODUCTION

The Colorado Department of Public Health & Environment Air Pollution Control Division (APCD) is conducting twelve (12) months of community monitoring as a result of the Air Toxics Act (Colorado HB21-1189). The bill created a new program at APCD to regulate toxics air contaminants at four (4) covered facilities located in Commerce City, Henderson, and Pueblo. As a part of this program, APCD is establishing a community monitoring program that prioritizes disproportionately impacted communities to better protect public health. The objectives of the monitoring program consist of monitoring for benzene, hydrogen sulfide (H₂S), and hydrogen cyanide (HCN), with supporting meteorological measurements, to help characterize impacts on the surrounding disproportionately impacted communities.

The facilities covered by HB21-1189 are the Suncor Refinery (Commerce City), the Phillips 66 Pipeline Terminal (Commerce City), the Sinclair Pipeline Terminal (Henderson), and Goodrich Carbon Products (Pueblo). These facilities have been divided into three (3) sampling regions. Air Resource Specialists, Inc. (ARS) is the contractor responsible for this monitoring effort, which will consist of thirty (30) days of sampling of each compound at each sampling region per quarter.

This monthly data submittal report describes all work performed by Air Resource Specialists, Inc. (ARS) for the project site for the monitoring period August 1 through August 31, 2023.

Any questions regarding the content of this report or the accompanying digital data files should be addressed to:

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Telephone: 970-484-7941

2.0 OPERATIONAL SUMMARIES

Operational activities for this project consist of site installations, routine sampling per an established schedule, quarterly maintenance visits, and emergency visits.

Significant events that occurred during the August 1 through August 31, 2023, timeframe include the following:

- None.

Significant deviations from the established sampling schedule include:

- A sample blank analysis for RAD170 was missed.

Sampling issues or corrective actions taken include:

- The samples for H₂S (RAD170) in Sampling Region C (Pueblo) were lost as it fell out of its sample holder during the sampling periods of 08/02/2023 to 08/16/2023 and 08/16/2023 to 08/30/2023. The use of a small piece of tape was implemented to prevent RAD170 samples from unscrewing from their holders during sampling.

3.0 AIR TOXICS SAMPLING STATISTICS

Statistics for samples collected during the August 1 to August 31, 2023, monitoring period are displayed in the table below. The table compares samples collected for each monitoring region against the requirements of the project. The statement of work requires 30 sampling days per quarter. Benzene and H₂S sampling frequency is twice the requirement in the statement of work. Collection statistics are slightly skewed since this report encompasses more than a month of data. Duplicate samples and field blanks are required to be collected at a 10% rate over the course of each quarter.

Table 3-1
14-day Benzene Sample Collection
August 1 to August 31, 2023

Sampling Region	Site	Monthly		Quarterly	
		Collected	Required	Collected	Required
A	A1	2	1	4	3
B	B1	2	1	4	3
C	C1	2	1	4	3

Table 3-2
Benzene Duplicate Sample and Field Blank Collection
August 1 to August 31, 2023

Duplicate		Field Blank	
Collected	%	Collected	%
1	17%	1	17%

Table 3-3
14-day H₂S Sample Collection
August 1 to August 31, 2023

Sampling Region	Site	Monthly		Quarterly	
		Collected	Required	Collected	Required
A	A1	2	1	4	3
B	B1	2	1	4	3
C	C1	0	1	2	3

Table 3-4
H₂S Duplicate Sample and Field Blank Collection
August 1 to August 31, 2023

Duplicate		Field Blank	
Collected	%	Collected	%
1	17%	0	0%

Table 3-5
HCN Sample Collection
August 1 to August 31, 2023

Sampling Region	Site	Monthly		Quarterly	
		Collected	Required	Collected	Required
A	A1	10	10	20	30
B	B1	10	10	20	30
C	C1	10	10	20	30

Table 3-6
HCN Duplicate Sample and Field Blank Collection
August 1 to August 31, 2023

Duplicate		Field Blank	
Collected	%	Collected	%
3	10%	3	10%

4.0 AIR TOXIC DATA SUMMARIES

The tables below summarize the air toxics data collected during the period of August 1 to August 31, 2023.

Table 4-1
14-Day Benzene Data
August 1 to August 31, 2023

SITE	Sampling Start Day	Sampling End Day	Days	Concentration (ppb)	MDL (ppb)	Notes
A1	8/2/2023	8/16/2023	14	0.189	0.0579	
A1	8/16/2023	8/30/2023	14	0.166	0.0578	
B1	8/2/2023	8/16/2023	14	0.226	0.058	
B1	8/16/2023	8/30/2023	14	0.247	0.0579	
B1	8/16/2023	8/30/2023	14	0.206	0.0579	Duplicate
B1	8/16/2023	8/30/2023	14	ND	0.0579	Blank
C1	8/2/2023	8/16/2023	14	0.0892	0.0577	
C1	8/16/2023	8/30/2023	14	0.114	0.0579	
		Maximum		0.247		
		Minimum		0.089		
		Average		0.177		

Table 4-2
 14-Day H₂S Data
 August 1 to August 31, 2023

SITE	Sampling Start Day	Sampling End Day	Days	Concentration (ppb)	LOD (ppb)	Notes
A1	8/2/2023	8/16/2023	14	0.389	0.04	
A1	8/16/2023	8/30/2023	14	0.317	0.04	
B1	8/2/2023	8/16/2023	14	0.461	0.04	
B1	8/16/2023	8/30/2023	14	0.417	0.04	
B1	8/16/2023	8/30/2023	14	0.371	0.04	Duplicate
C1	8/2/2023	8/16/2023	14	Invalid		
C1	8/16/2023	8/30/2023	14	Invalid		
		Maximum		0.461		
		Minimum		0.317		
		Average		0.391		

Table 4-3
HCN Data
August 1 to August 31, 2023

SITE	Sampling Date	Duration (min)	Concentration (ppb)	MDL (ppb)	Notes
A1	8/2/2023 6:25	442	ND	0.9	
A1	8/8/2023 8:08	457	ND	0.9	
A1	8/10/2023 8:20	456	ND	0.8	
A1	8/14/2023 9:46	502	ND	0.8	
A1	8/16/2023 8:02	506	ND	0.8	
A1	8/18/2023 10:40	536	ND	0.7	
A1	8/21/2023 6:06	430	ND	0.9	
A1	8/24/2023 8:19	446	ND	0.9	
A1	8/28/2023 8:30	431	ND	1.0	
A1	8/30/2023 9:32	441	ND	0.9	
A1	8/30/2023 9:32	441	ND	0.9	Duplicate
A1	8/30/2023 9:32		ND	0.9	Blank
B1	08/02/2023 05:50	498	ND	0.8	
B1	08/08/2023 07:38	509	ND	0.8	
B1	08/10/2023 07:57	497	ND	0.8	
B1	08/14/2023 10:24	483	ND	0.8	
B1	08/14/2023 10:25	482	ND	0.8	Duplicate
B1	08/14/2023 10:24		ND	0.8	Blank
B1	08/16/2023 07:33	563	ND	0.7	
B1	08/18/2023 10:09	547	ND	0.7	
B1	08/21/2023 05:42	481	ND	0.8	
B1	08/24/2023 07:47	496	ND	0.8	
B1	08/28/2023 08:09	472	ND	0.8	
B1	08/30/2023 08:52	517	ND	0.7	
C1	8/2/2023 8:38	180	ND	2.1	
C1	8/8/2023 10:24	180	ND	2.2	
C1	8/10/2023 10:31	183	ND	2.2	
C1	8/14/2023 12:49	181	ND	2.2	
C1	8/16/2023 11:21	180	ND	2.2	
C1	8/18/2023 12:56	180	ND	2.2	
C1	8/21/2023 8:15	183	ND	2.2	
C1	8/21/2023 8:15	183	ND	2.2	Duplicate
C1	8/21/2023 8:25		ND	2.2	Blank

Table 4-3 (continued)

C1	8/24/2023 10:27	181	ND	2.2	
C1	8/28/2023 10:37	186	ND	2.1	
C1	8/30/2023 11:41	180	ND	2.0	

4.1 METEOROLOGICAL DATA COLLECTION STATISTICS AND SUMMARIES

The tables and graphs below summarize the meteorological data collected during the period of August 1 to August 31, 2023.

4.1.1 Site A1

- Data Collection Statistics for A1 - Hourly Data
- Wind Rose for A1
- Stackplots - Hourly Data

4.1.2 Site B1

- Data Collection Statistics for B1 - Hourly Data
- Wind Rose for B1
- Stackplots - Hourly Data

4.1.3 Site C1

- Data Collection Statistics for C1 - Hourly Data
- Wind Rose for C1
- Stackplots - Hourly Data

Table 4-4

Data Collection Statistics							
Colorado Air Toxics - A1 Commerce City							
08/01/2023 - 08/31/2023							
Parameter	Interval	Par Code	No. Possible	No. Collected	% Collected	No. Valid	% Valid
Relative Humidity	hourly	RH	744	744	100.0	744	100.0
Standard Deviation for Wind Direction	hourly	SDWD	744	744	100.0	744	100.0
Solar Radiation	hourly	SOL	744	744	100.0	744	100.0
Scalar Wind Direction	hourly	SWD	744	744	100.0	744	100.0
Scalar Wind Speed	hourly	SWS	744	744	100.0	744	100.0
Ambient Temperature	hourly	TMP	744	744	100.0	744	100.0
Vector Wind Direction	hourly	VWD	744	744	100.0	744	100.0
Vector Wind Speed	hourly	VWS	744	744	100.0	744	100.0

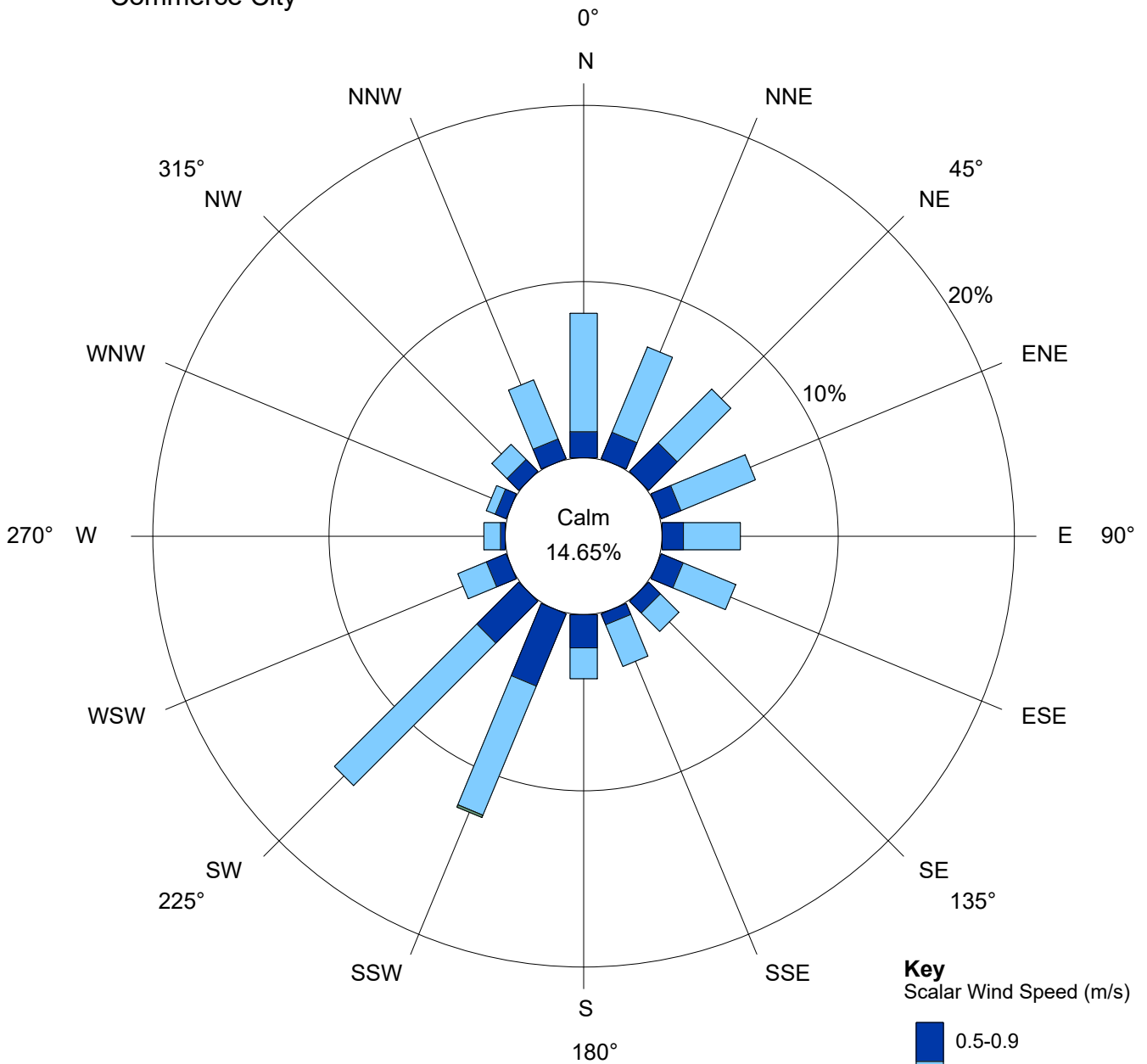
Note: The percent valid is calculated against the number possible.

Automatic zeros and spans are performed daily on most ambient gas analyzers and ambient data can only be reported if the duration of these events is less than 25% of the hour. As a result, the maximum percent valid is generally less than 100%.

Colorado Air Toxics - A1
 Commerce City

Figure 4-1
 Wind Rose

08/01/2023 - 08/31/2023



100.0% Collected 100.0% Valid
 744 Possible /744 Collected /744 Valid
 Collection Statistics Include:
 Scalar Wind Speed, Wind Speed and Wind Direction
 (SWS-1; SWS-1; SWD-1)
 (includes WS and WD) (Calm<0.5m/s)

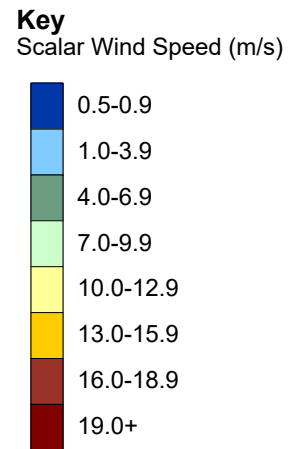


Figure 4-2
 Colorado Air Toxics - A1 (Commerce City) - Hourly Meteorological Data
 August 2023



Figure 4-3
 Colorado Air Toxics - A1 (Commerce City) - Hourly Meteorological Data
 August 2023



Figure 4-4
 Colorado Air Toxics - A1 (Commerce City) - Hourly Meteorological Data
 August 2023



Figure 4-5
 Colorado Air Toxics - A1 (Commerce City) - Hourly Meteorological Data
 August 2023

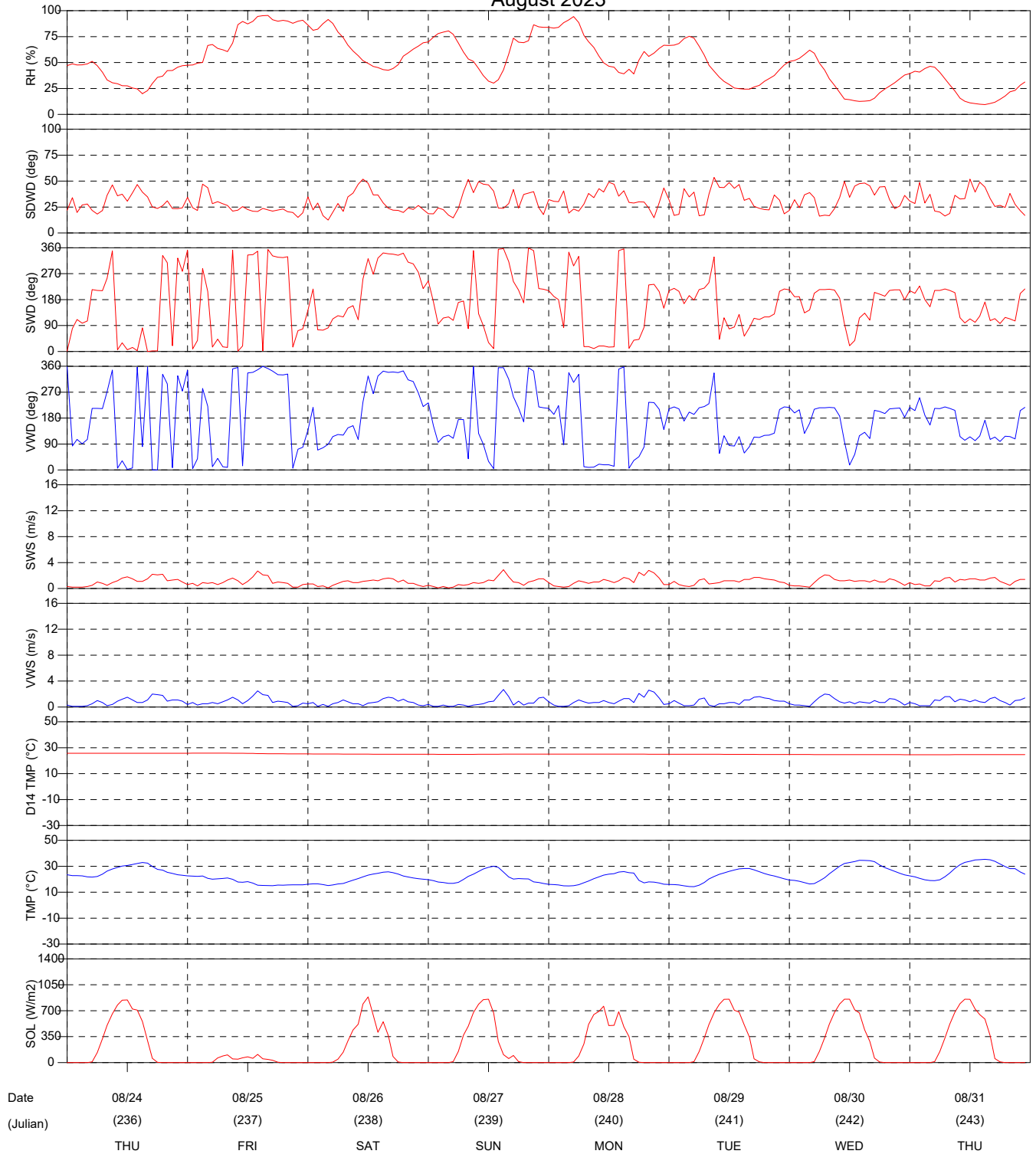


Table 4-5

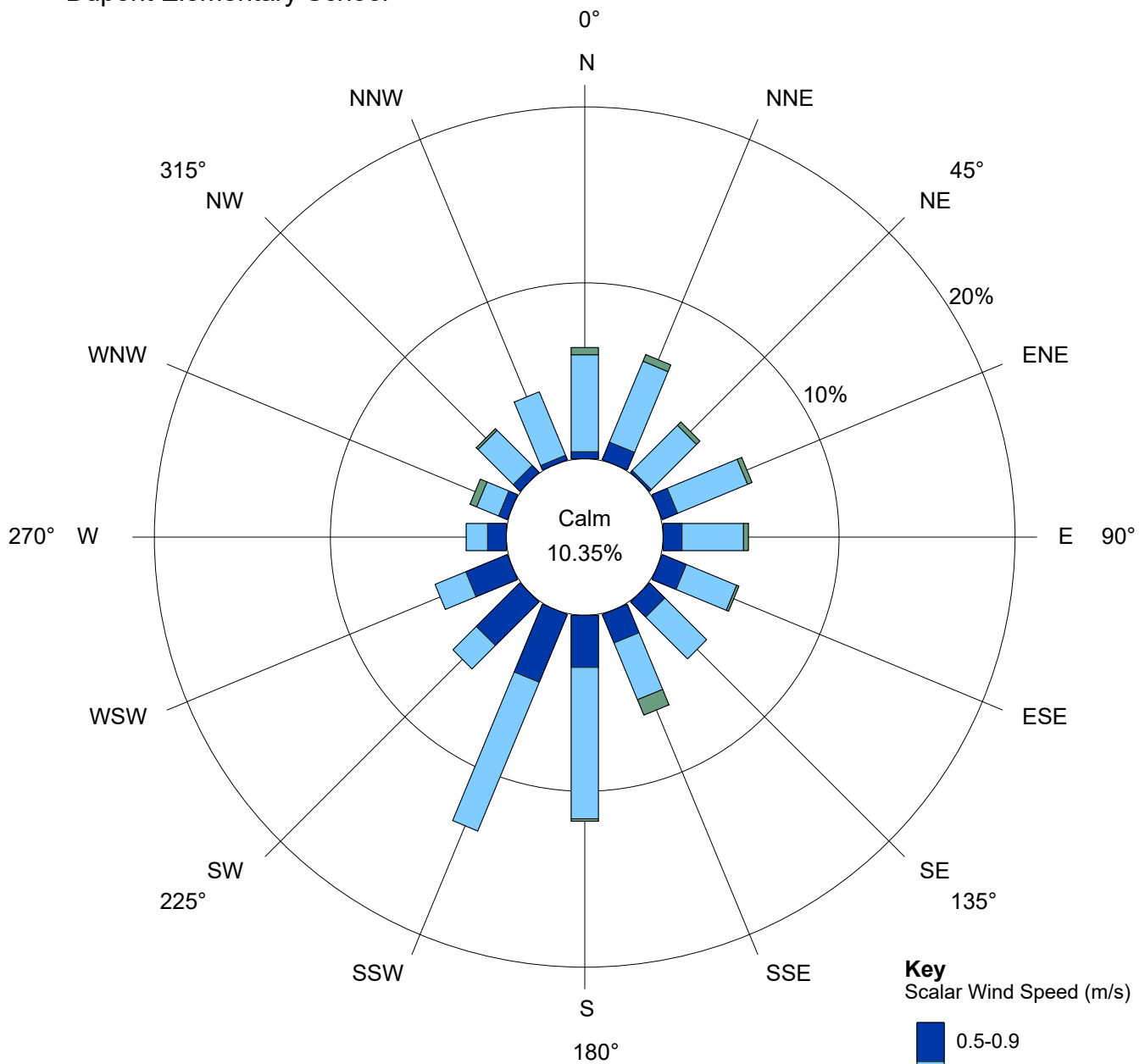
Data Collection Statistics							
Colorado Air Toxics - B1 Dupont Elementary School							
08/01/2023 - 08/31/2023							
Parameter	Interval	Par Code	No. Possible	No. Collected	% Collected	No. Valid	% Valid
Relative Humidity	hourly	RH	744	744	100.0	744	100.0
Standard Deviation for Wind Direction	hourly	SDWD	744	744	100.0	744	100.0
Solar Radiation	hourly	SOL	744	744	100.0	744	100.0
Scalar Wind Direction	hourly	SWD	744	744	100.0	744	100.0
Scalar Wind Speed	hourly	SWS	744	744	100.0	744	100.0
Ambient Temperature	hourly	TMP	744	744	100.0	744	100.0
Vector Wind Direction	hourly	VWD	744	744	100.0	744	100.0
Vector Wind Speed	hourly	VWS	744	744	100.0	744	100.0

Note: The percent valid is calculated against the number possible.

Automatic zeros and spans are performed daily on most ambient gas analyzers and ambient data can only be reported if the duration of these events is less than 25% of the hour. As a result, the maximum percent valid is generally less than 100%.

Figure 4-6
Wind Rose

08/01/2023 - 08/31/2023



100.0% Collected 100.0% Valid
744 Possible /744 Collected /744 Valid
Collection Statistics Include:
Scalar Wind Speed, Wind Speed and Wind Direction
(SWS-1; SWS-1; SWD-1)
(includes WS and WD) (Calm<0.5m/s)

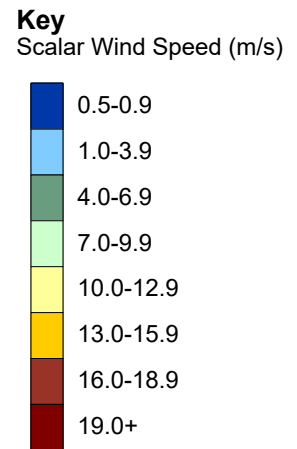


Figure 4-7
 Colorado Air Toxics - B1 (DuPont Elementary School) - Hourly Meteorological Data
 August 2023

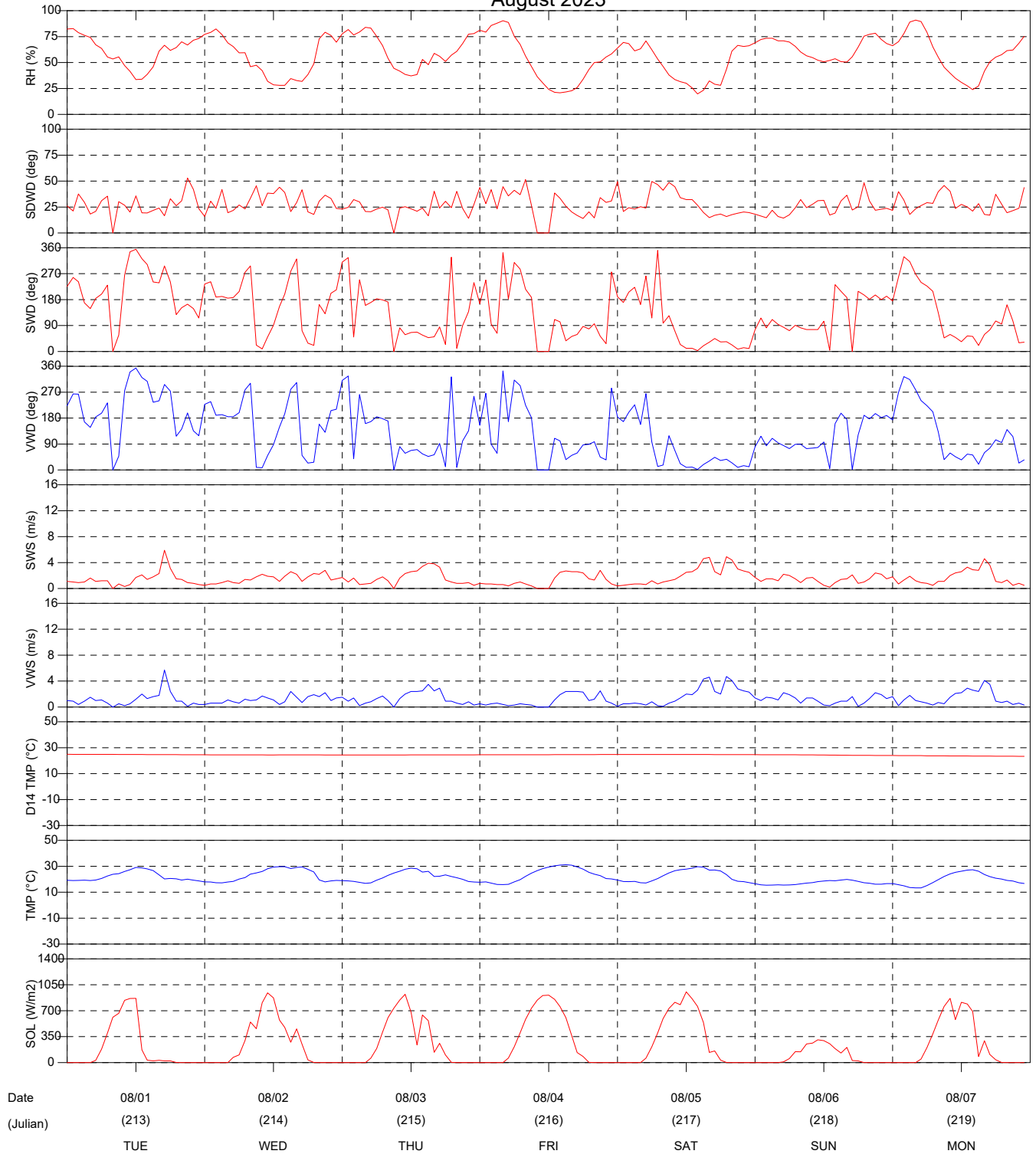


Figure 4-8
 Colorado Air Toxics - B1 (DuPont Elementary School) - Hourly Meteorological Data
 August 2023



Figure 4-9
 Colorado Air Toxics - B1 (DuPont Elementary School) - Hourly Meteorological Data
 August 2023

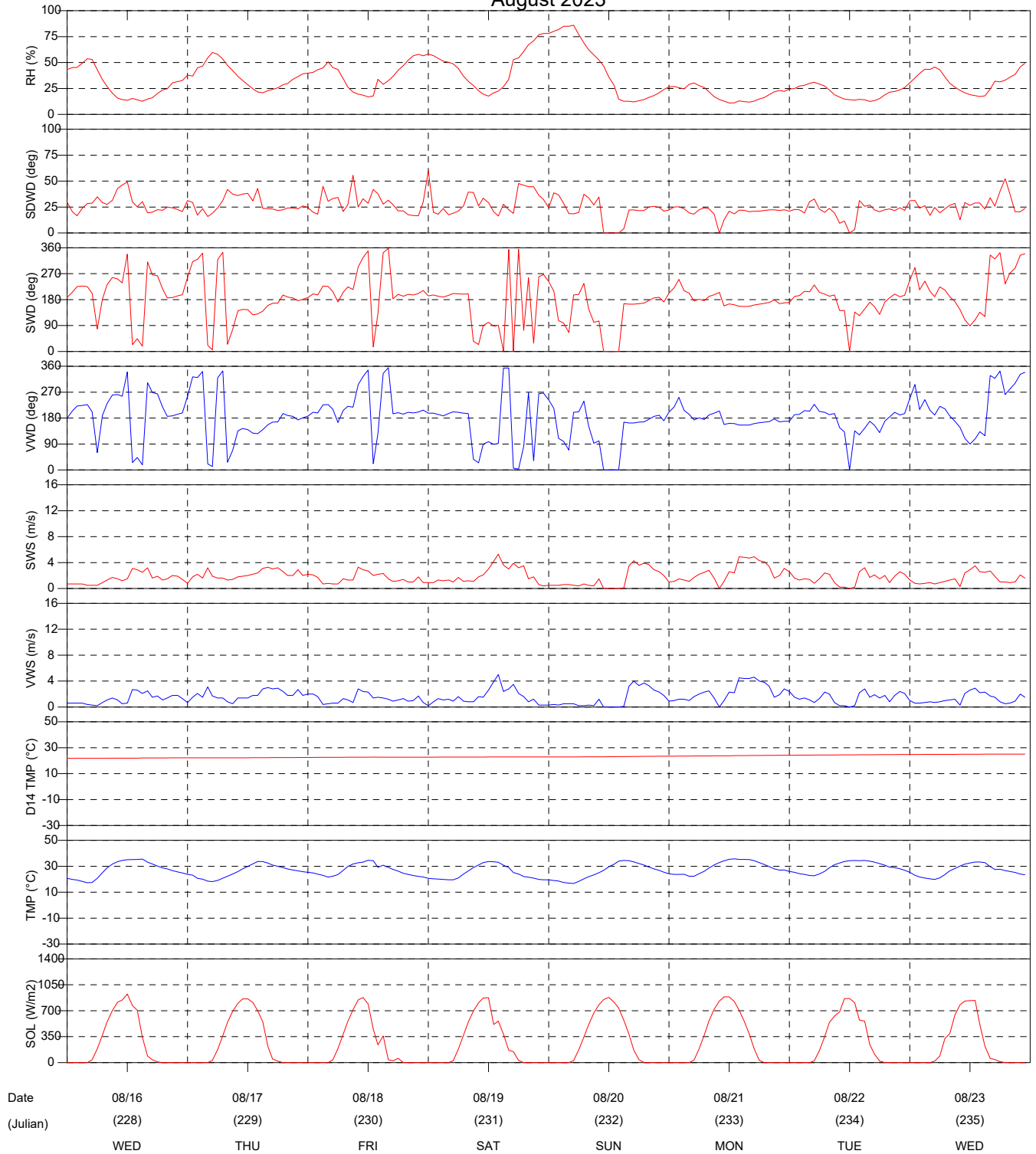


Figure 4-10
 Colorado Air Toxics - B1 (DuPont Elementary School) - Hourly Meteorological Data
 August 2023



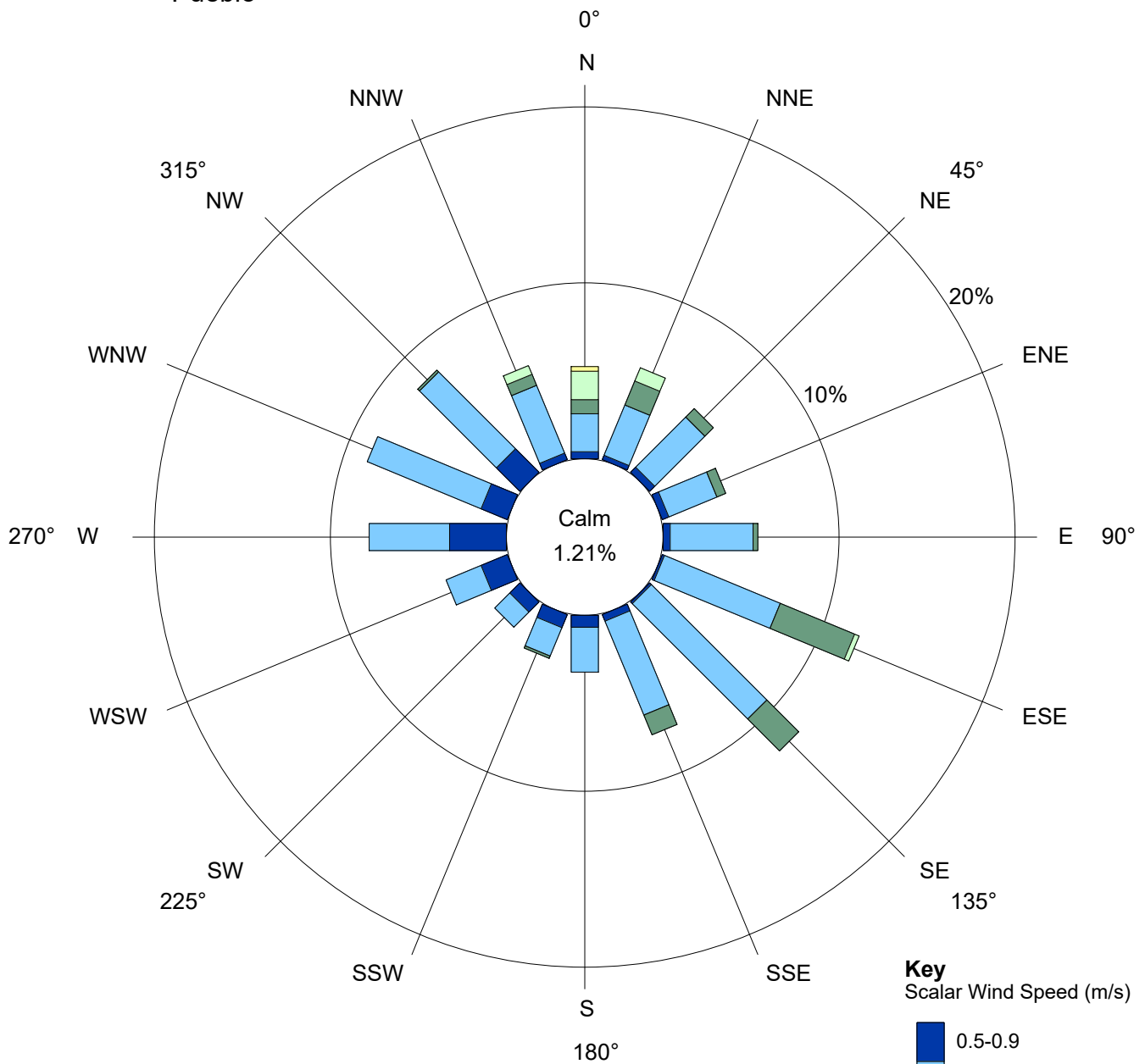
Table 4-6

Data Collection Statistics							
Colorado Air Toxics - C1 Pueblo							
08/01/2023 - 08/31/2023							
Parameter	Interval	Par Code	No. Possible	No. Collected	% Collected	No. Valid	% Valid
Relative Humidity	hourly	RH	744	744	100.0	744	100.0
Standard Deviation for Wind Direction	hourly	SDWD	744	744	100.0	744	100.0
Solar Radiation	hourly	SOL	744	743	99.9	743	99.9
Scalar Wind Direction	hourly	SWD	744	744	100.0	744	100.0
Scalar Wind Speed	hourly	SWS	744	744	100.0	744	100.0
Ambient Temperature	hourly	TMP	744	744	100.0	744	100.0
Vector Wind Direction	hourly	VWD	744	744	100.0	744	100.0
Vector Wind Speed	hourly	VWS	744	744	100.0	744	100.0

Note: The percent valid is calculated against the number possible.

Automatic zeros and spans are performed daily on most ambient gas analyzers and ambient data can only be reported if the duration of these events is less than 25% of the hour. As a result, the maximum percent valid is generally less than 100%.

Colorado Air Toxics - C1
 Pueblo
 Figure 4-11
 Wind Rose
 08/01/2023 - 08/31/2023



100.0% Collected 100.0% Valid
 744 Possible /744 Collected /744 Valid
 Collection Statistics Include:
 Scalar Wind Speed, Wind Speed and Wind Direction
 (SWS-1; SWS-1; SWD-1)
 (includes WS and WD) (Calm<0.5m/s)

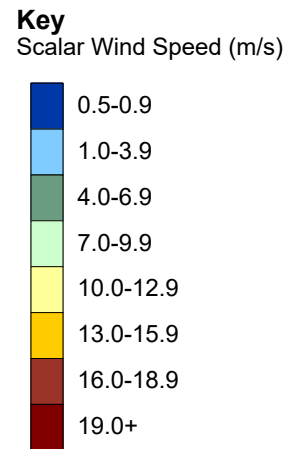


Figure 4-12
 Colorado Air Toxics - C1 (Pueblo) - Hourly Met Data
 August 2023



Figure 4-13
 Colorado Air Toxics - C1 (Pueblo) - Hourly Met Data
 August 2023

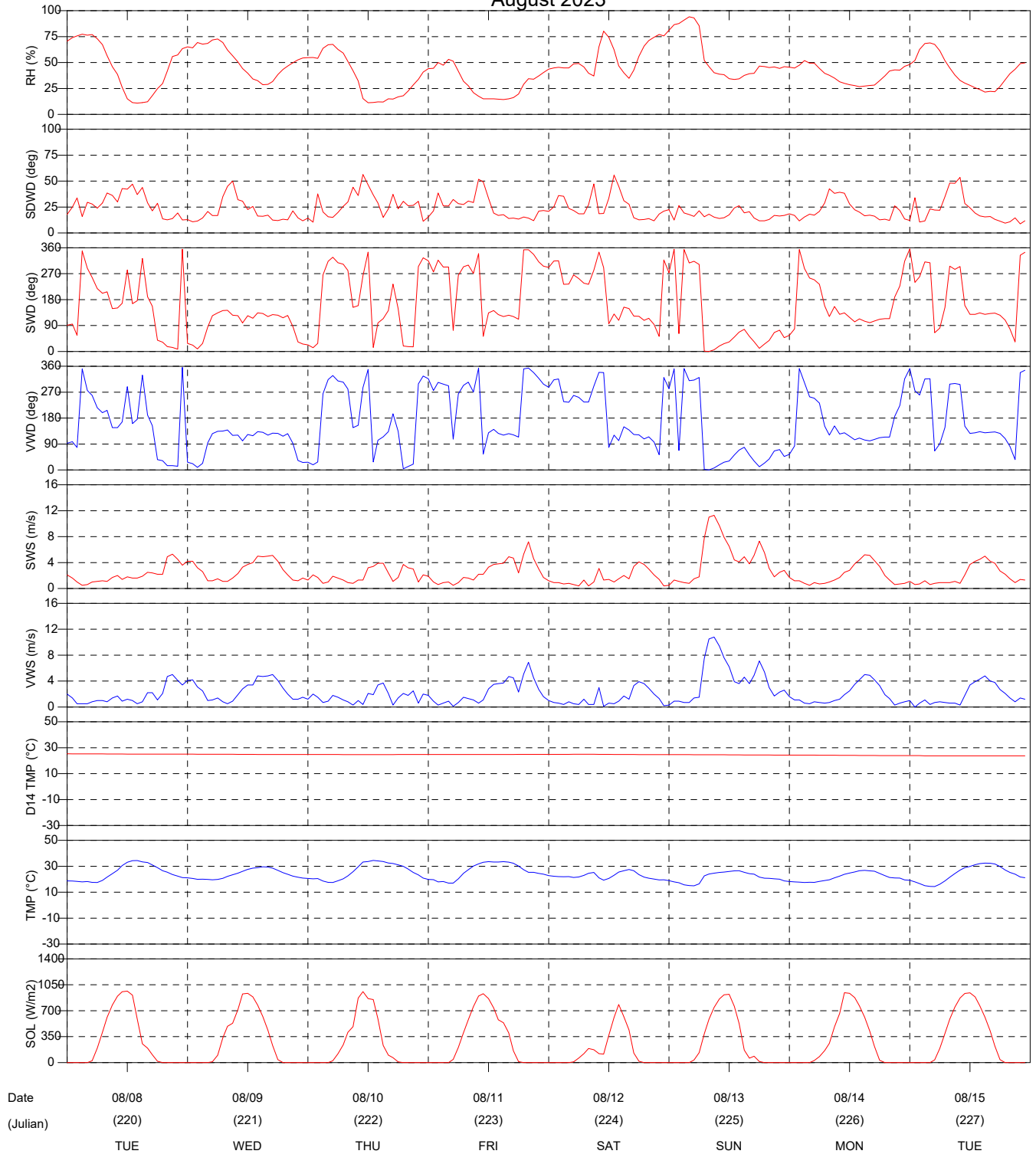


Figure 4-14
 Colorado Air Toxics - C1 (Pueblo) - Hourly Met Data
 August 2023

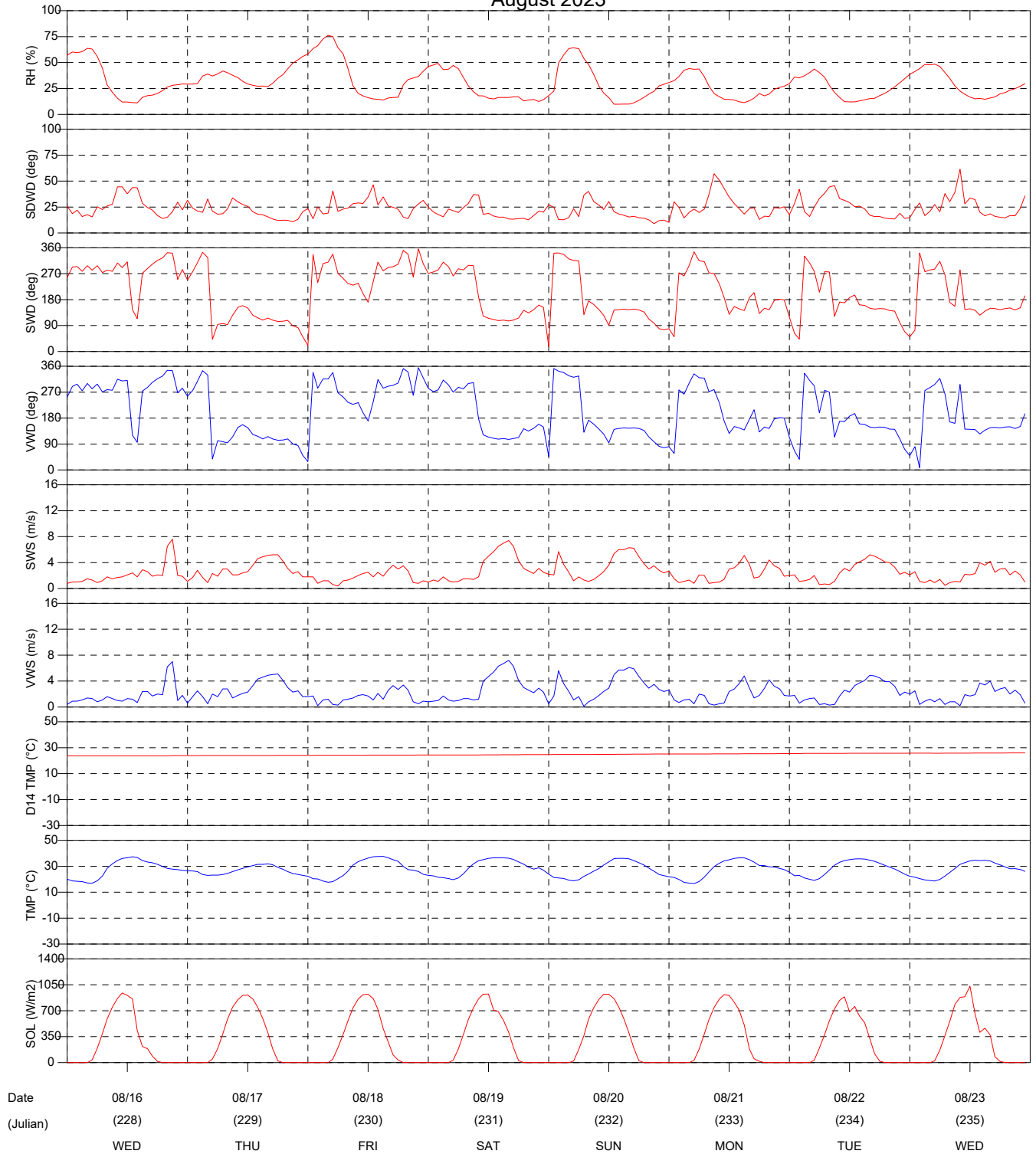


Figure 4-15
 Colorado Air Toxics - C1 (Pueblo) - Hourly Met Data
 August 2023

