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

October 1 – October 31, 2023

**Operational Summaries,
Data Summaries and Plots**

Prepared for

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A decorative graphic at the bottom left of the page consists 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 October 1 through October 31, 2023.

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

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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 October 1 through October 31, 2023, timeframe include the following:

- None

Significant deviations from the established sampling schedule include:

- None

Sampling issues or corrective actions taken include:

- None

3.0 AIR TOXICS SAMPLING STATISTICS

Statistics for samples collected during the October 1 to October 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
October 1 to October 31, 2023

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

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

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

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

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

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

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

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

Sampling Region	Site	Monthly		Quarterly	
		Collected	Required	Collected	Required
A	A1	11	10	11	30
B	B1	11	10	11	30
C	C1	11	10	32	30

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

Duplicate		Field Blank	
Collected	%	Collected	%
4	12%	4	12%

4.0 AIR TOXIC DATA SUMMARIES

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

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

SITE	Sampling Start Day	Sampling End Day	Days	Concentration (ppb)	MDL (ppb)	Notes
A1	9/27/2023	10/11/2023	14	0.211	0.0587	
A1	10/11/2023	10/25/2023	14	0.270	0.0591	
B1	9/27/2023	10/11/2023	14	0.288	0.0588	
B1	10/11/2023	10/25/2023	14	0.353	0.0591	
C1	9/27/2023	10/11/2023	14	0.109	0.0588	
C1	9/27/2023	10/11/2023	14	0.126	0.0588	Duplicate
C1	9/27/2023	10/11/2023	14	ND	0.0588	Blank
C1	10/11/2023	10/25/2023	14	0.129	0.0591	
		Maximum		0.353		
		Minimum		0.109		
		Average		0.212		

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

SITE	Sampling Start Day	Sampling End Day	Days	Concentration (ppb)	LOD (ppb)	Notes
A1	9/27/2023	10/11/2023	14	0.281	0.04	
A1	10/11/2023	10/25/2023	14	0.313	0.04	
B1	9/27/2023	10/11/2023	14	0.646	0.04	
B1	10/11/2023	10/25/2023	14	0.495	0.04	
C1	9/27/2023	10/11/2023	14	0.104	0.04	
C1	9/27/2023	10/11/2023	14	0.113	0.04	Duplicate
C1	9/27/2023	10/11/2023	14	ND	0.04	Blank
C1	10/11/2023	10/25/2023	14	0.103	0.04	
		Maximum		0.646		
		Minimum		0.103		
		Average		0.294		

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

SITE	Sampling Date	Duration (min)	Concentration (ppb)	MDL (ppb)	Notes
A1	10/03/2023 08:06	492	ND	0.8	
A1	10/03/2023 08:10	489	ND	0.8	Duplicate
A1	10/03/2023 08:06	0	ND	0.8	Blank
A1	10/05/2023 06:37	484	ND	0.8	
A1	10/09/2023 05:54	455	ND	0.9	
A1	10/11/2023 06:27	442	ND	0.9	
A1	10/13/2023 07:53	478	ND	0.8	
A1	10/16/2023 06:29	542	ND	0.7	
A1	10/19/2023 07:48	507	ND	0.8	
A1	10/23/2023 06:45	470	ND	0.8	
A1	10/25/2023 06:12	438	ND	0.9	
A1	10/27/2023 07:54	481	ND	0.8	
A1	10/27/2023 08:03	476	ND	0.8	Duplicate
A1	10/27/2023 07:54		ND	0.8	Blank
A1	10/31/2023 07:23	461	ND	0.8	
B1	10/03/2023 07:34	559	ND	0.7	
B1	10/05/2023 06:04	540	ND	0.7	
B1	10/09/2023 05:22	510	ND	0.8	
B1	10/11/2023 05:53	499	ND	0.8	
B1	10/11/2023 05:54	498	ND	0.8	Duplicate
B1	10/11/2023 05:53		ND	0.8	Blank
B1	10/13/2023 07:21	534	ND	0.7	
B1	10/16/2023 05:58	599	ND	0.7	
B1	10/19/2023 07:20	565	ND	0.7	
B1	10/23/2023 06:15	575	ND	0.7	
B1	10/25/2023 05:39	495	ND	0.8	
B1	10/27/2023 07:21	543	ND	0.7	
B1	10/31/2023 06:50	538	ND	0.7	
C1	10/3/2023 10:43	189	ND	2.1	
C1	10/5/2023 9:18	180	ND	2.2	
C1	10/9/2023 8:10	180	ND	2.2	
C1	10/11/2023 8:47	180	ND	2.2	
C1	10/13/2023 10:13	185	ND	2.1	

Table 4-3 (continued)

C1	10/16/2023 9:51	180	ND	2.1	
C1	10/19/2023 10:23	189	ND	2.1	
C1	10/19/2023 10:27	184	ND	2.1	Duplicate
C1	10/19/2023 10:23		ND	2.1	Blank
C1	10/23/2023 9:20	180	ND	2.1	
C1	10/25/2023 8:28	180	ND	2.2	
C1	10/27/2023 10:29	179	ND	2.2	
C1	10/31/2023 9:45	180	ND	2.1	

4.1 METEOROLOGICAL DATA COLLECTION STATISTICS AND SUMMARIES

The tables and graphs below summarize the meteorological data collected during the period of October 1 to October 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							
10/01/2023 - 10/31/2023							
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

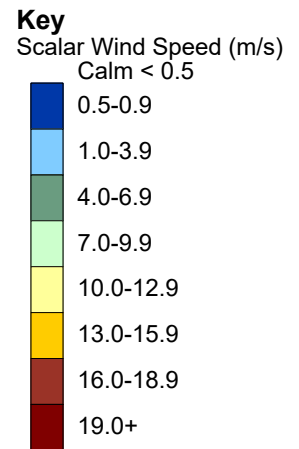
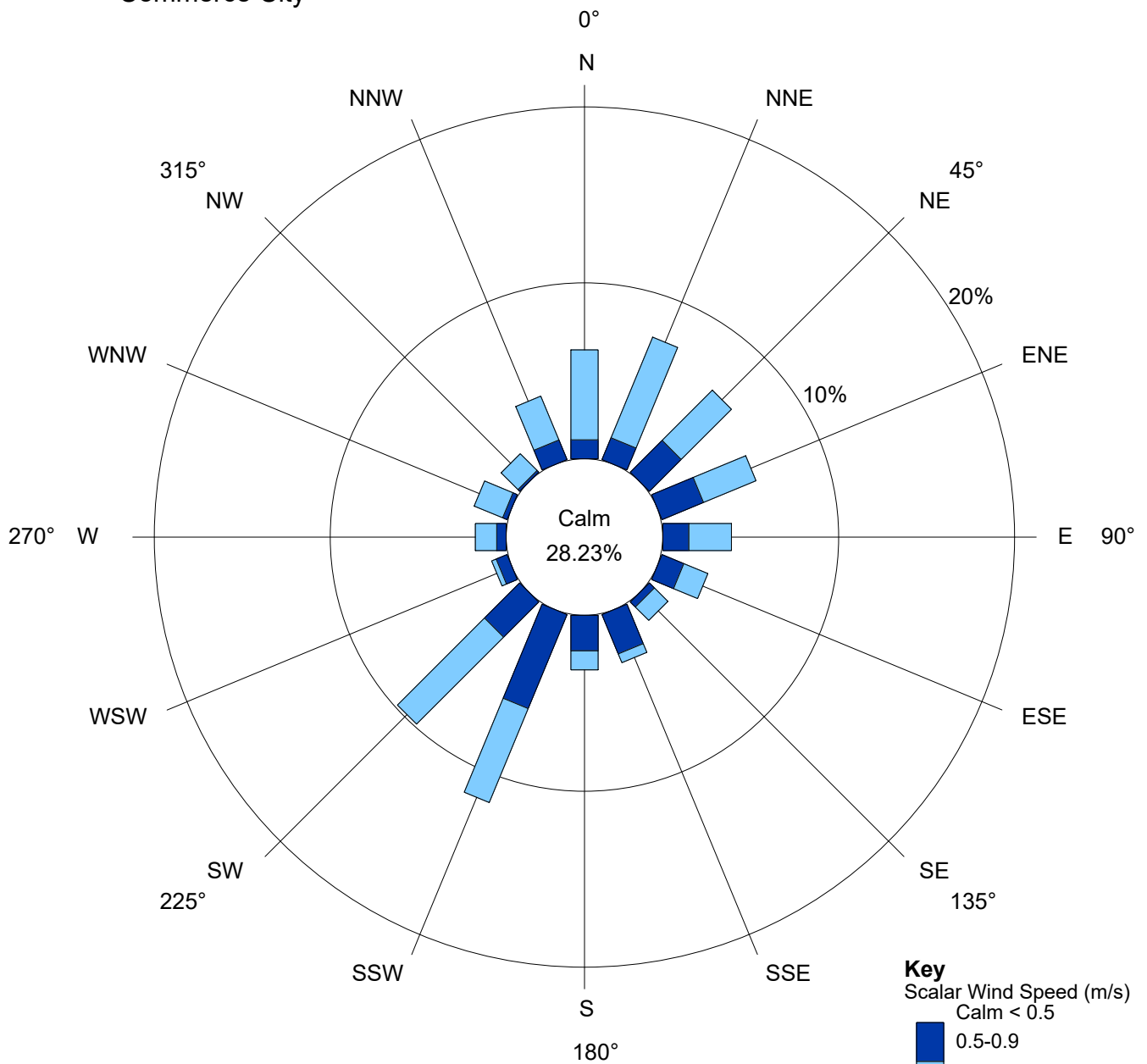
Note: The percent valid is calculated against the number possible.

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

10/01/2023 - 10/31/2023



100.0% Collected 100.0% Valid
 744 Possible /744 Collected /744 Valid
 Collection Statistics Include:
 Wind Speed and Wind Direction
 (SWS-1; SWD-1)

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



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



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

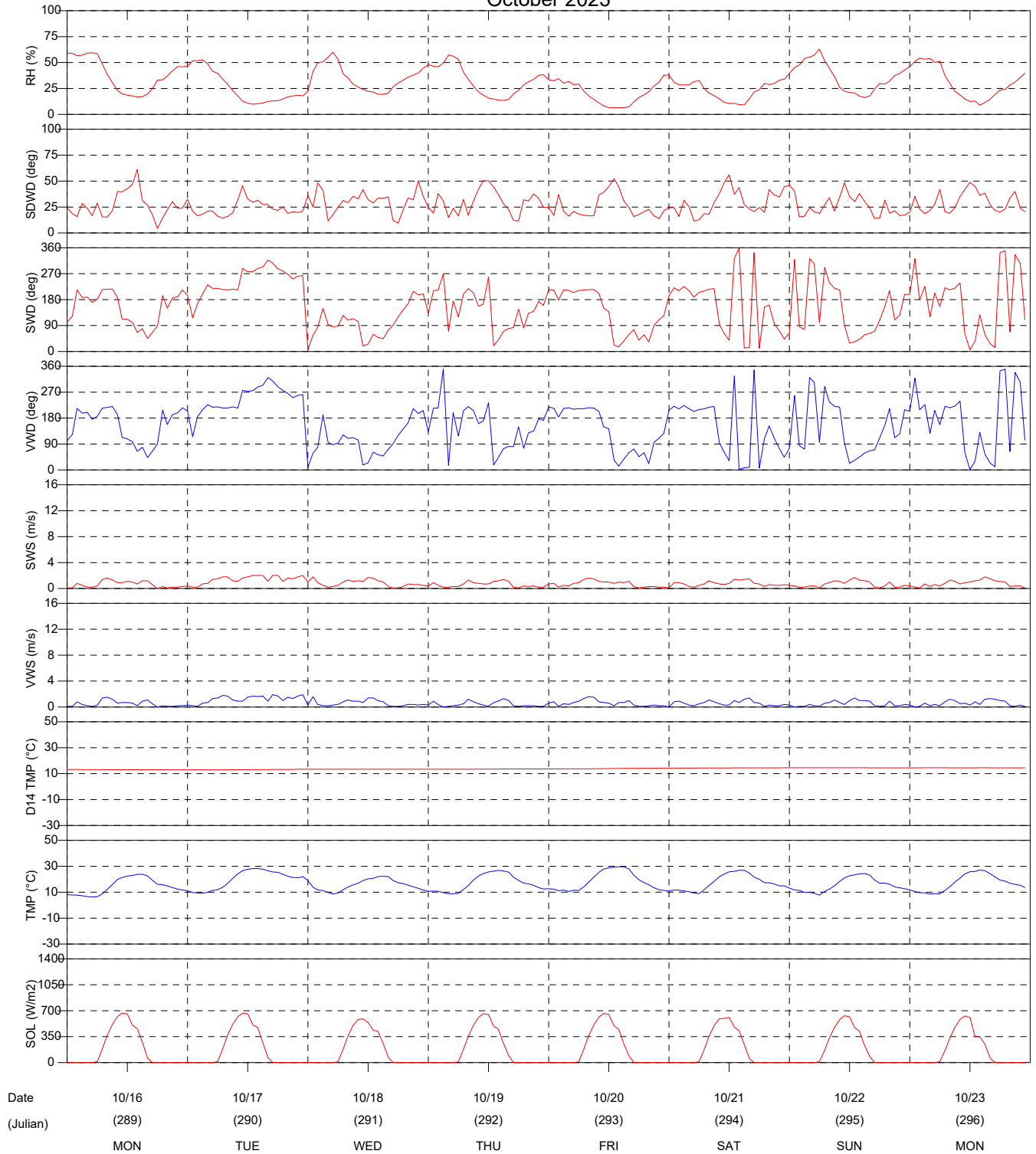


Figure 4-5
 Colorado Air Toxics - A1 (Commerce City) - Hourly Meteorological Data
 October 2023

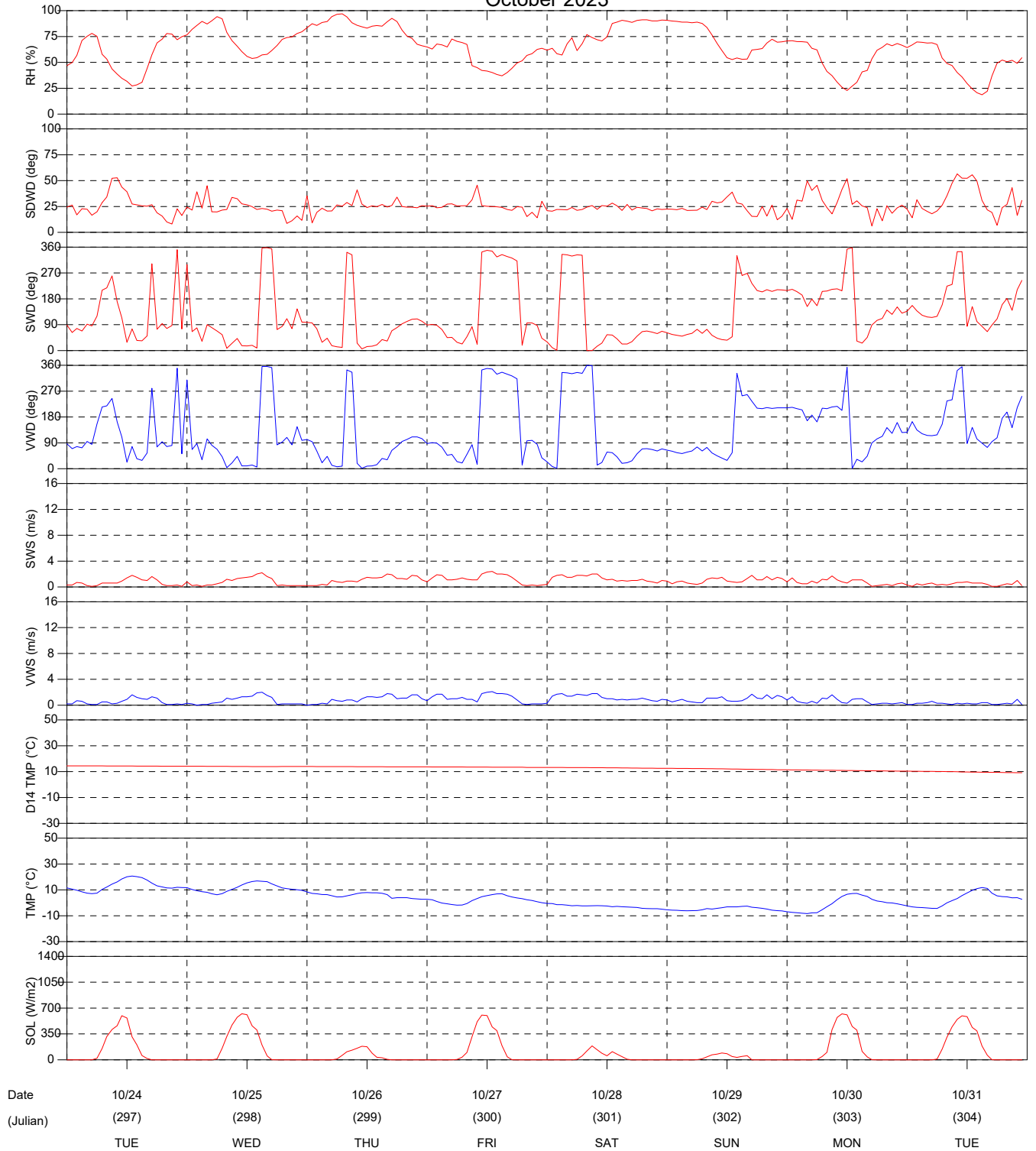


Table 4-5

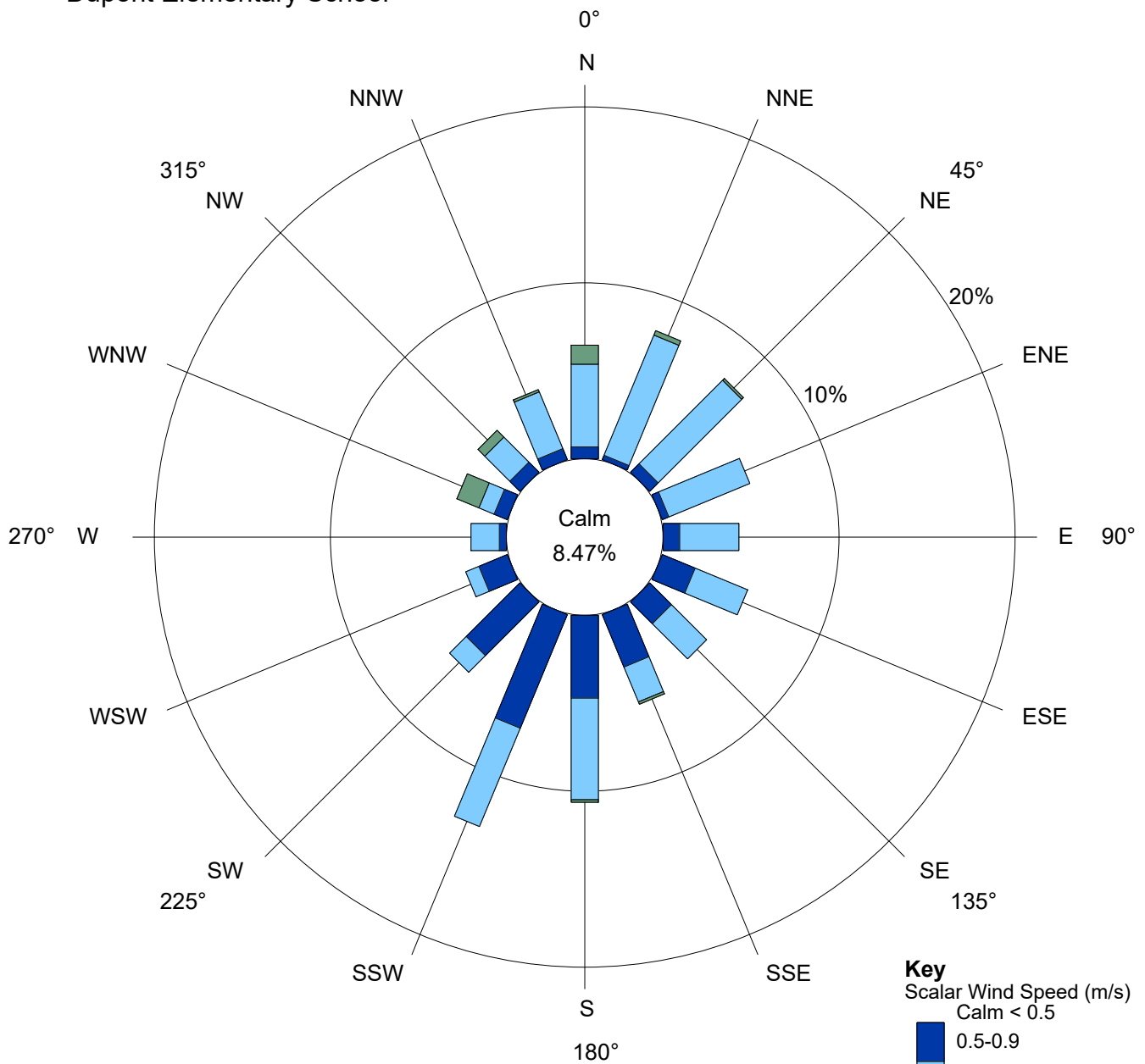
Data Collection Statistics							
Colorado Air Toxics - B1 Dupont Elementary School							
10/01/2023 - 10/31/2023							
Parameter	Interval	Par Code	No. Possible	No. Collected	% Collected	No. Valid	% Valid
Relative Humidity	hourly	RH	744	744	100.0	744	100.0
Standard Deviation for Wind Direction	hourly	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

10/01/2023 - 10/31/2023



100.0% Collected 100.0% Valid
744 Possible /744 Collected /744 Valid
Collection Statistics Include:
Wind Speed and Wind Direction
(SWS-1; SWD-1)

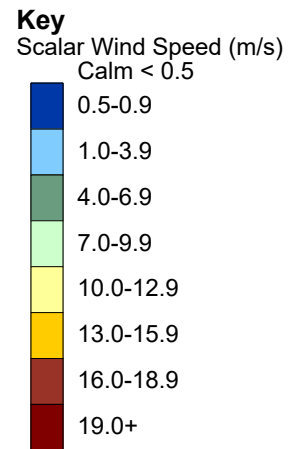


Figure 4-7
 Colorado Air Toxics - B1 (DuPont Elementary School) - Hourly Meteorological Data
 October 2023



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



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

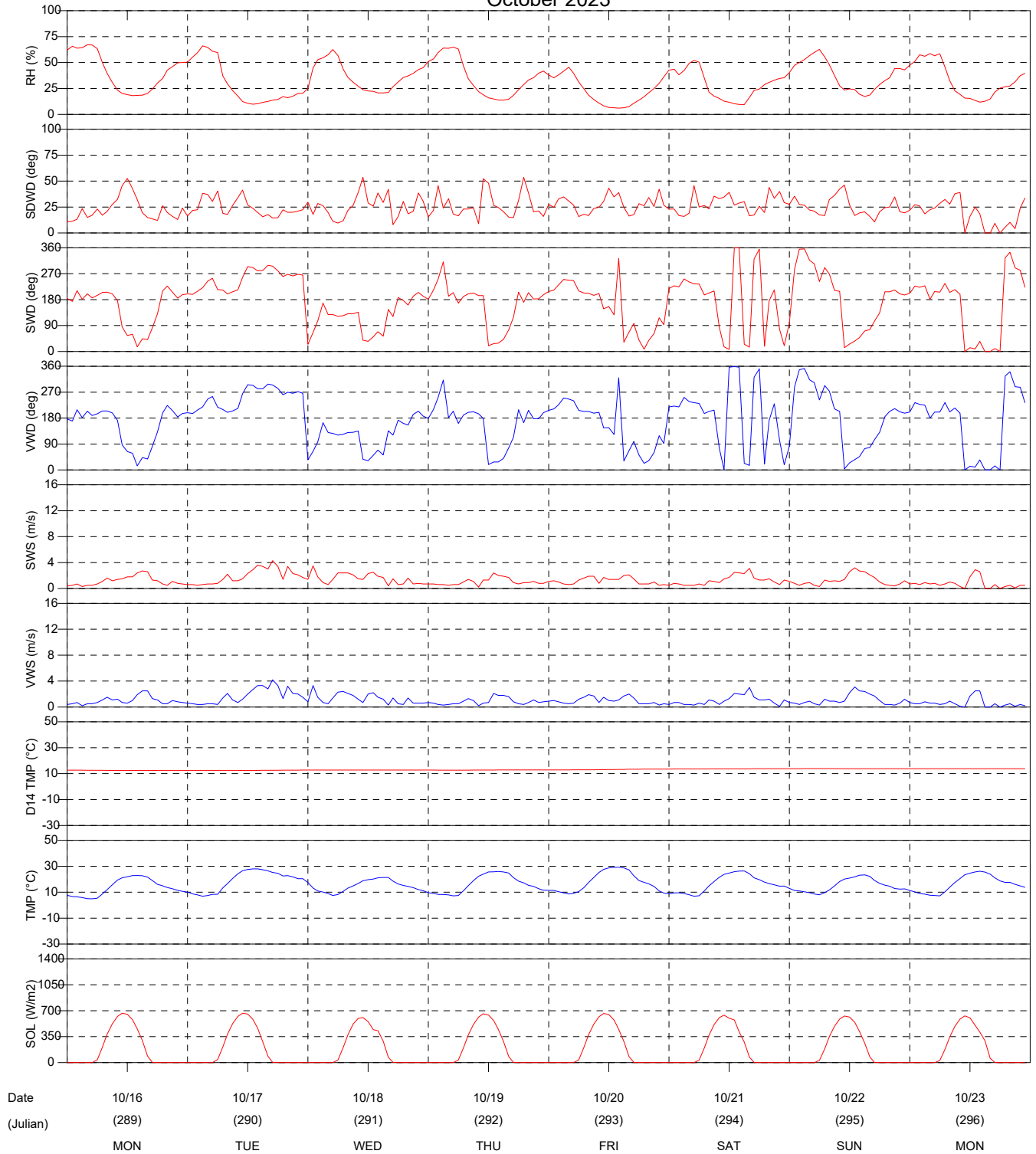


Figure 4-10
 Colorado Air Toxics - B1 (DuPont Elementary School) - Hourly Meteorological Data
 October 2023

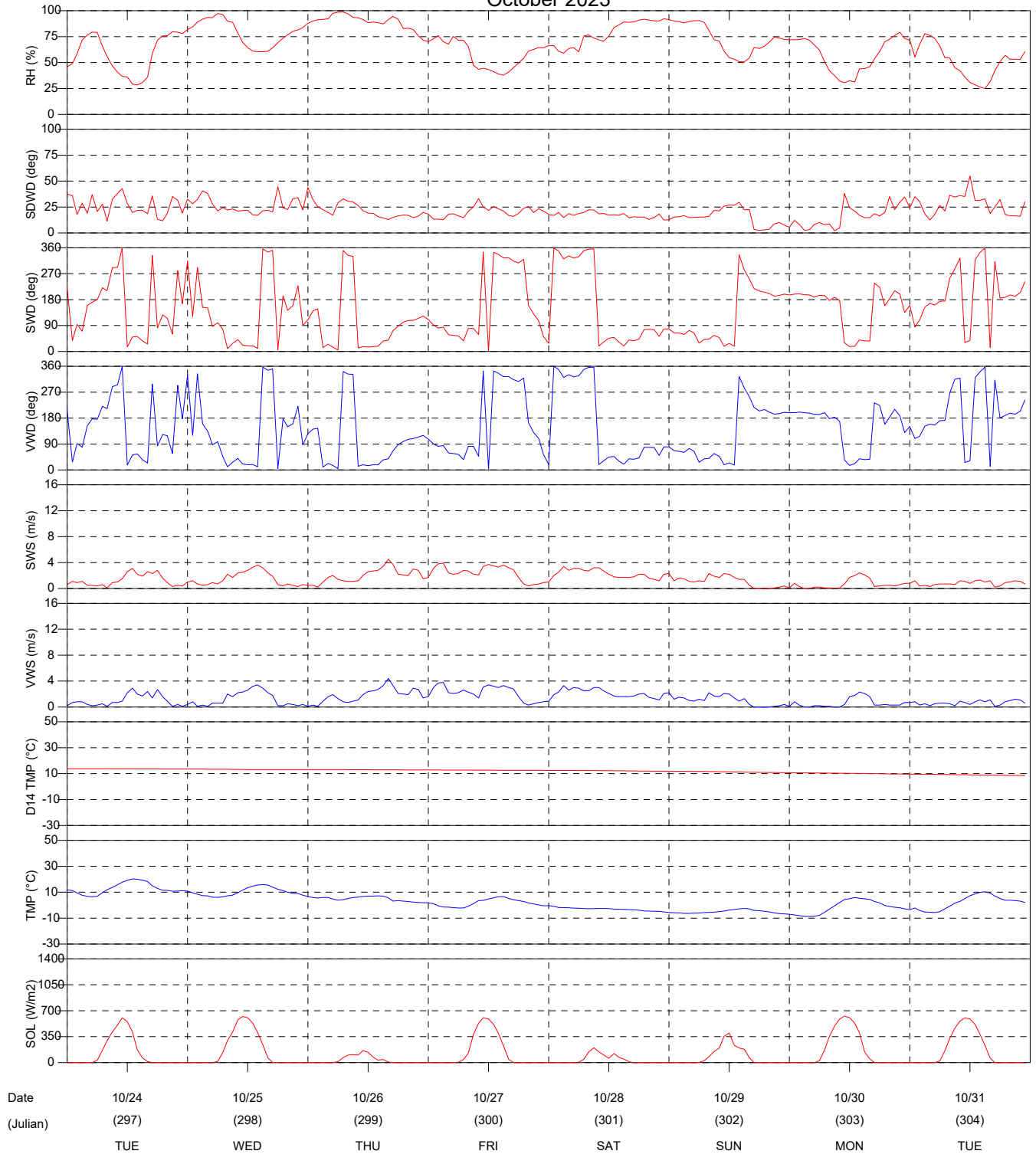


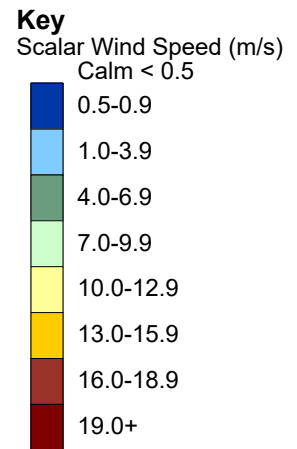
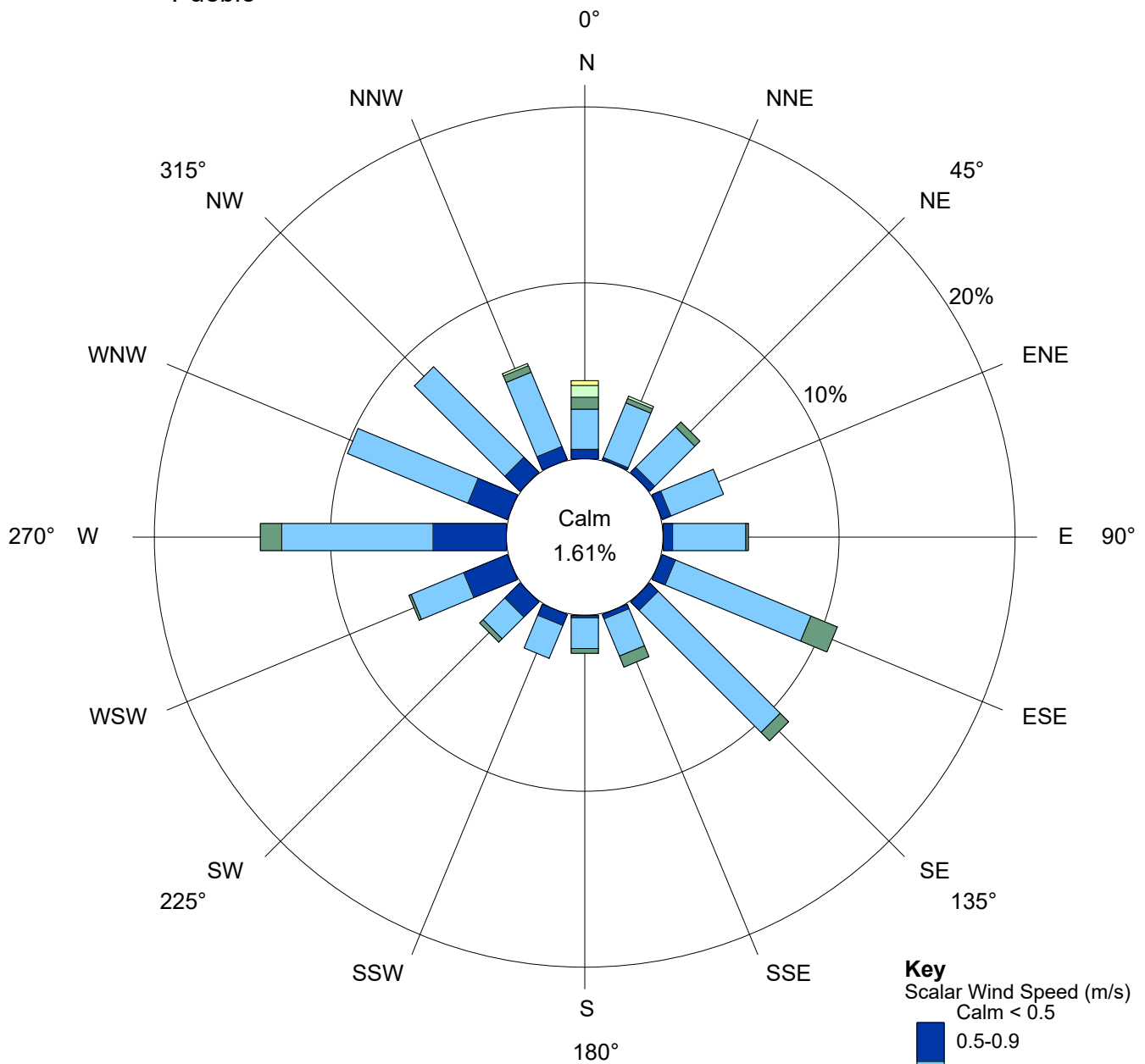
Table 4-6

Data Collection Statistics							
Colorado Air Toxics - C1 Pueblo							
10/01/2023 - 10/31/2023							
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 - C1
 Pueblo
 Figure 4-11
 Wind Rose
 10/01/2023 - 10/31/2023



100.0% Collected 100.0% Valid
 744 Possible /744 Collected /744 Valid
 Collection Statistics Include:
 Wind Speed and Wind Direction
 (SWS-1; SWD-1)

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

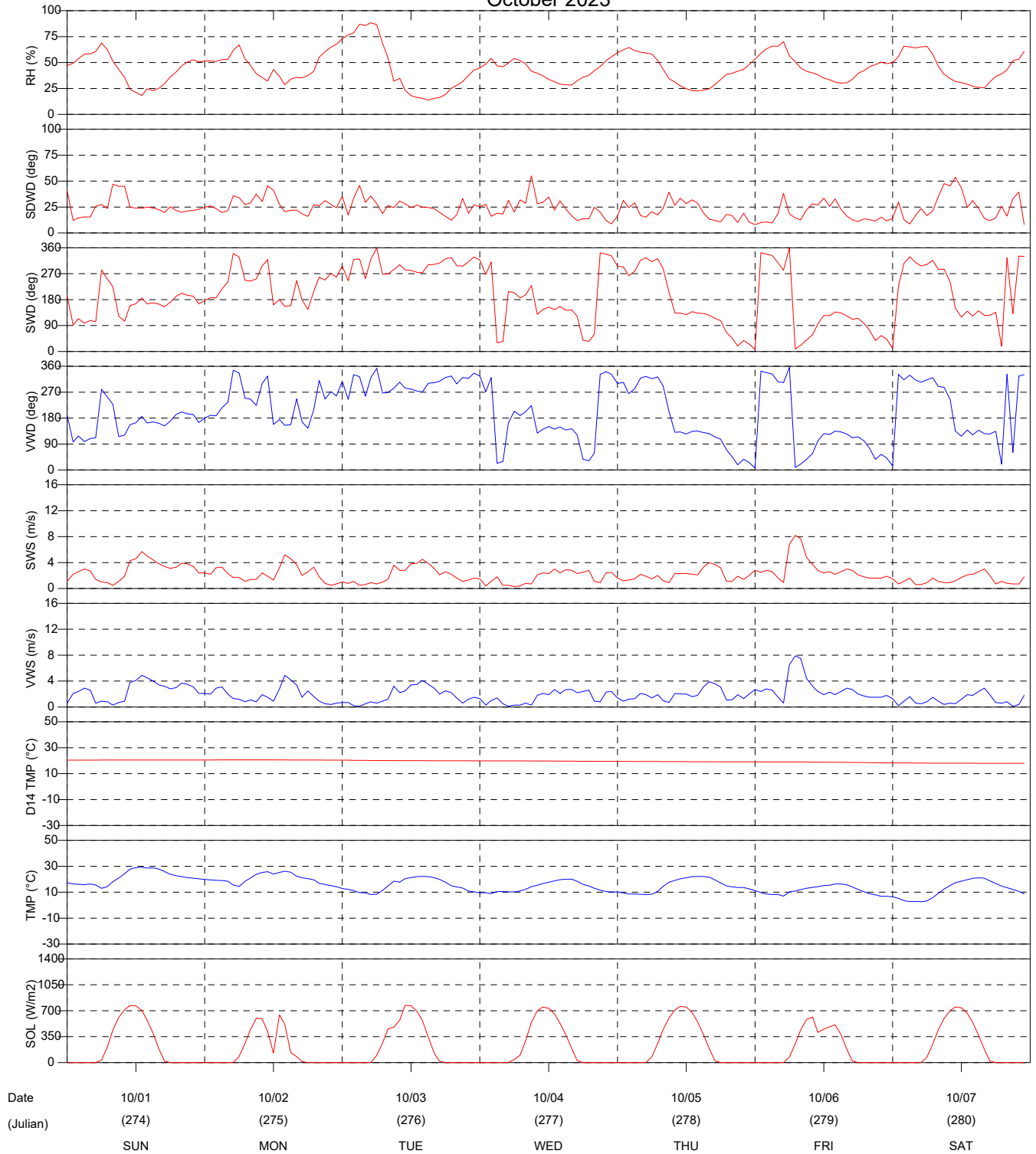


Figure 4-13
 Colorado Air Toxics - C1 (Pueblo) - Hourly Met Data
 October 2023

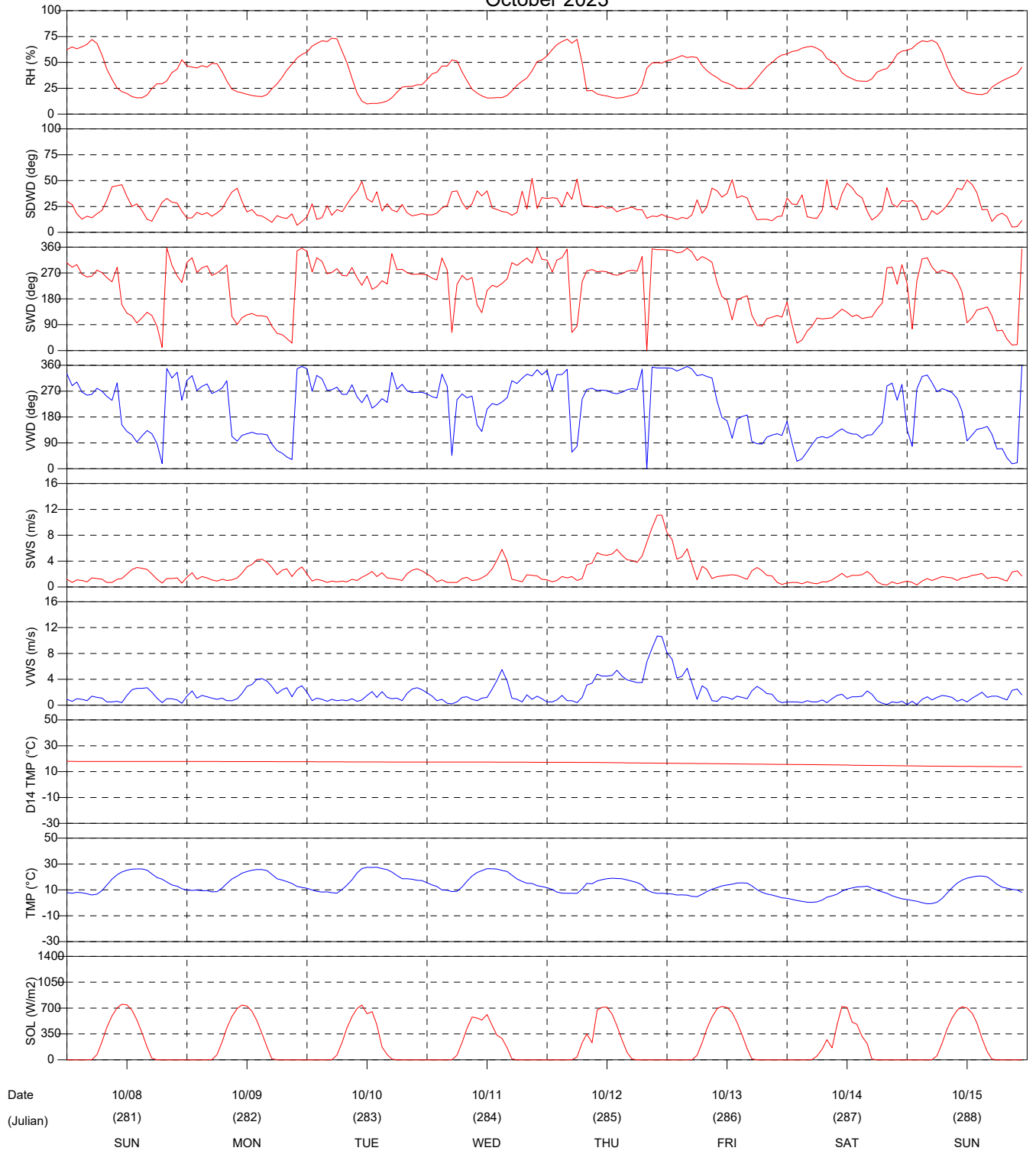


Figure 4-14
 Colorado Air Toxics - C1 (Pueblo) - Hourly Met Data
 October 2023

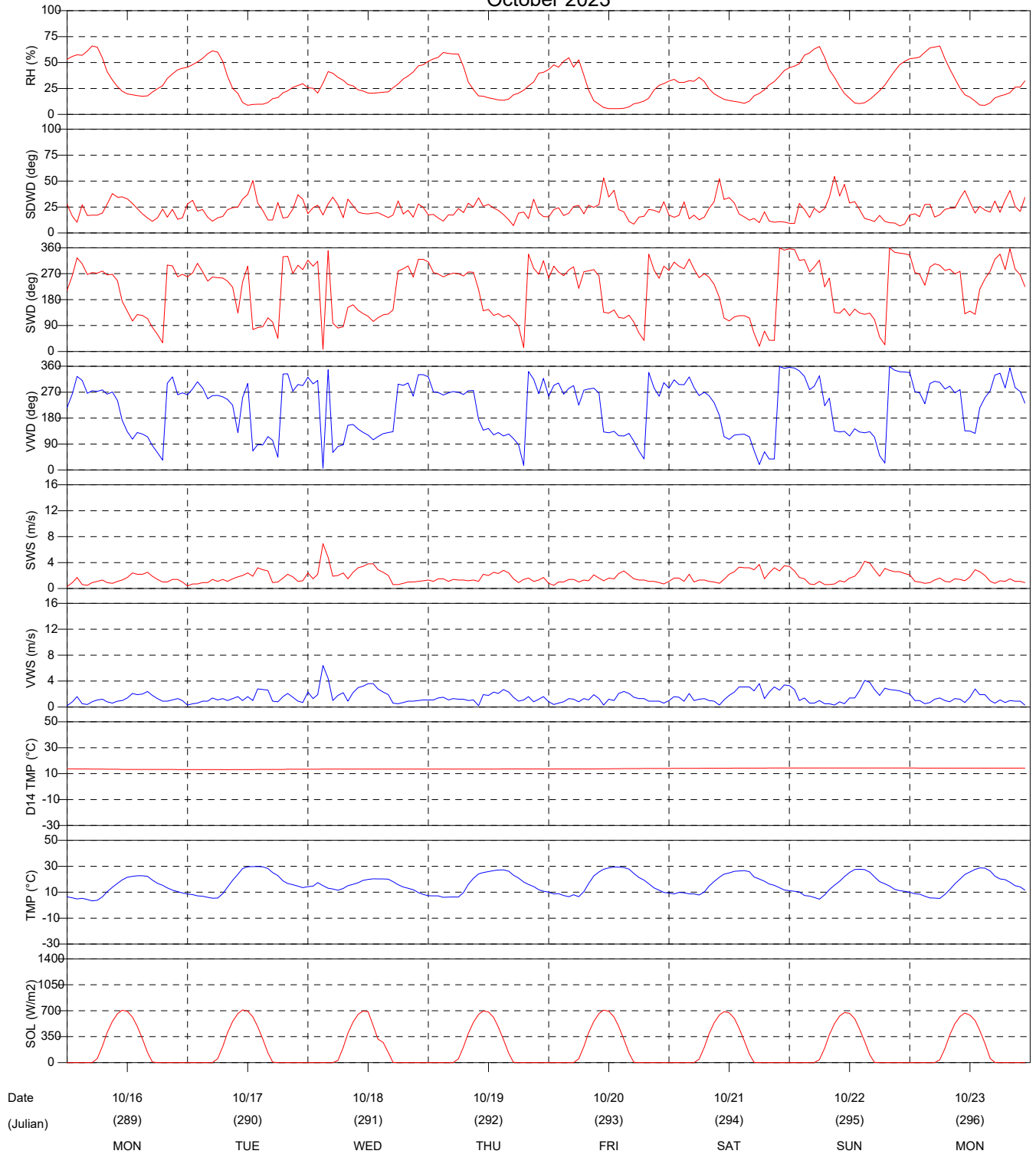


Figure 4-15
 Colorado Air Toxics - C1 (Pueblo) - Hourly Met Data
 October 2023

