

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

April 1 – April 30, 2023

**Operational Summaries,
Data Summaries and Plots**

Prepared for

**DEREK PRICE
AIR TOXICS AND OZONE PRECURSOR SECTION
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April 2023

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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 April 1 through April 30, 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 April 1 through April 30, 2023, timeframe include the following:

- None.

Significant deviations from the established sampling schedule include:

- The contract laboratory, Ormantine, failed to ship sorbent tubes on schedule. H₂S sampling at all locations for the sampling period of 4/26/2023 to 5/10/2023 was missed.

Sampling issues or corrective actions taken include:

- An unknown datalogger error caused the loss of wind parameters 4/22/2023 01:00 until 4/22/2023 11:00.
- On 4/28/2023, we had an invalid duplicate HCN sample at C1 due to sample flow being out of tolerance. A make-up duplicate sample is scheduled for May.

3.0 AIR TOXICS SAMPLING STATISTICS

Statistics for samples collected during the April 1, 2023 to April 30, 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
April 1, 2023 to April 30, 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
April 1, 2023 to April 30, 2023

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

Table 3-3
14-day H₂S Sample Collection
April 1, 2023 to April 30, 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
April 1, 2023 to April 30, 2023

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

Table 3-5
HCN Sample Collection
April 1, 2023 to April 30, 2023

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

Table 3-6
HCN Duplicate Sample and Field Blank Collection
April 1, 2023 to April 30, 2023

Duplicate		Field Blank	
Collected	%	Collected	%
3	10%	4	13%

4.0 AIR TOXIC DATA SUMMARIES

The tables below summarize the air toxics data collected during the period of April 1 to April 30, 2023.

Table 4-1
14-Day Benzene Data
April 1, 2023 to April 30, 2023

SITE	Sampling Start Day	Sampling End Day	Days	Concentration (ppb)	MDL (ppb)	Notes
A1	3/29/2023	4/12/2023	14	0.161	0.0592	
A1	4/12/2023	4/26/2023	14	0.140	0.0599	
B1	3/29/2023	4/12/2023	14	0.200	0.0593	
B1	4/12/2023	4/26/2023	14	0.165	0.0599	
B1	4/12/2023	4/26/2023	14	0.183	0.0599	Duplicate
B1	4/12/2023	4/26/2023	14	ND	0.0599	Blank
C1	3/29/2023	4/12/2023	14	0.113	0.0592	
C1	4/12/2023	4/26/2023	14	0.142	0.0599	
		Maximum		0.200		
		Minimum		0.113		
		Average		0.158		

Table 4-2
 14-Day H₂S Data
 April 1 to April 30, 2023

SITE	Sampling Start Day	Sampling End Day	Days	Concentration (ppb)	LOD (ppb)	Notes
A1	3/29/2023	4/12/2023	14	ND	0.14	
A1	4/12/2023	4/26/2023	14	ND	0.14	
B1	3/29/2023	4/12/2023	14	ND	0.14	
B1	4/12/2023	4/26/2023	14	ND	0.14	
C1	3/29/2023	4/12/2023	14	ND	0.14	
C1	4/12/2023	4/26/2023	14	ND	0.14	
C1	4/12/2023	4/26/2023	14	ND	0.14	Duplicate
C1	4/12/2023	4/26/2023	14	ND	0.14	Blank
		Maximum		ND		
		Minimum		ND		
		Average		ND		

Table 4-3
HCN Data
April 1 to April 30, 2023

SITE	Sampling Date	Duration (min)	Concentration (ppb)	MDL (ppb)	Notes
A1	04/10/2023 08:01	468	ND	0.9	
A1	04/12/2023 08:26	474	ND	0.8	
A1	04/12/2023 08:26	474	ND	0.8	Duplicate
A1	04/12/2023 08:26		ND	0.8	Blank
A1	04/14/2023 07:39	470	ND	0.8	
A1	04/18/2023 08:13	545	ND	0.7	
A1	04/20/2023 08:24	495	ND	0.8	
A1	04/24/2023 08:24	487	ND	0.8	
A1	04/24/2023 08:21	484	ND	0.8	Duplicate
A1	04/24/2023 08:24		ND	0.8	Blank
A1	04/26/2023 08:17	445	ND	0.9	
A1	04/29/2023 08:05	477	ND	0.8	
B1	04/04/2023 07:26	472	ND	0.8	
B1	04/06/2023 08:32	488	ND	0.8	
B1	04/10/2023 07:38	468	ND	0.9	
B1	04/12/2023 07:45	538	ND	0.7	
B1	04/14/2023 07:19	510	ND	0.7	
B1	04/18/2023 08:38	493	ND	0.8	
B1	04/20/2023 08:04	487	ND	0.8	
B1	04/20/2023 08:02	490	ND	0.7	Duplicate
B1	04/20/2023 08:04		ND	0.8	Blank
B1	04/24/2023 07:58	483	ND	0.8	
B1	04/26/2023 07:46	493	ND	0.8	
B1	04/29/2023 07:45	484	ND	0.8	
C1	4/4/2023 9:55	182	ND	2.1	
C1	4/6/2023 11:07	179	ND	2.1	
C1	4/10/2023 10:18	180	ND	2.1	
C1	4/12/2023 11:01	180	ND	2.2	
C1	4/14/2023 9:50	480	ND	2.2	
C1	4/18/2023 11:21	180	ND	2.2	
C1	4/20/2023 10:40	188	ND	2.0	
C1	4/24/2023 10:48	179	ND	2.1	
C1	4/26/2023 10:40	185	ND	2.1	

Table 4-3 (continued)

C1	4/29/2023 10:29	190	ND	2.1	
C1	4/29/2023 10:25	194	Invalid	N/A	Duplicate
C1	4/29/2023 10:29		ND	2.1	Blank

4.1 METEOROLOGICAL DATA COLLECTION STATISTICS AND SUMMARIES

The tables and graphs below summarize the meteorological data collected during the period of April 1, 2023 to April 30, 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

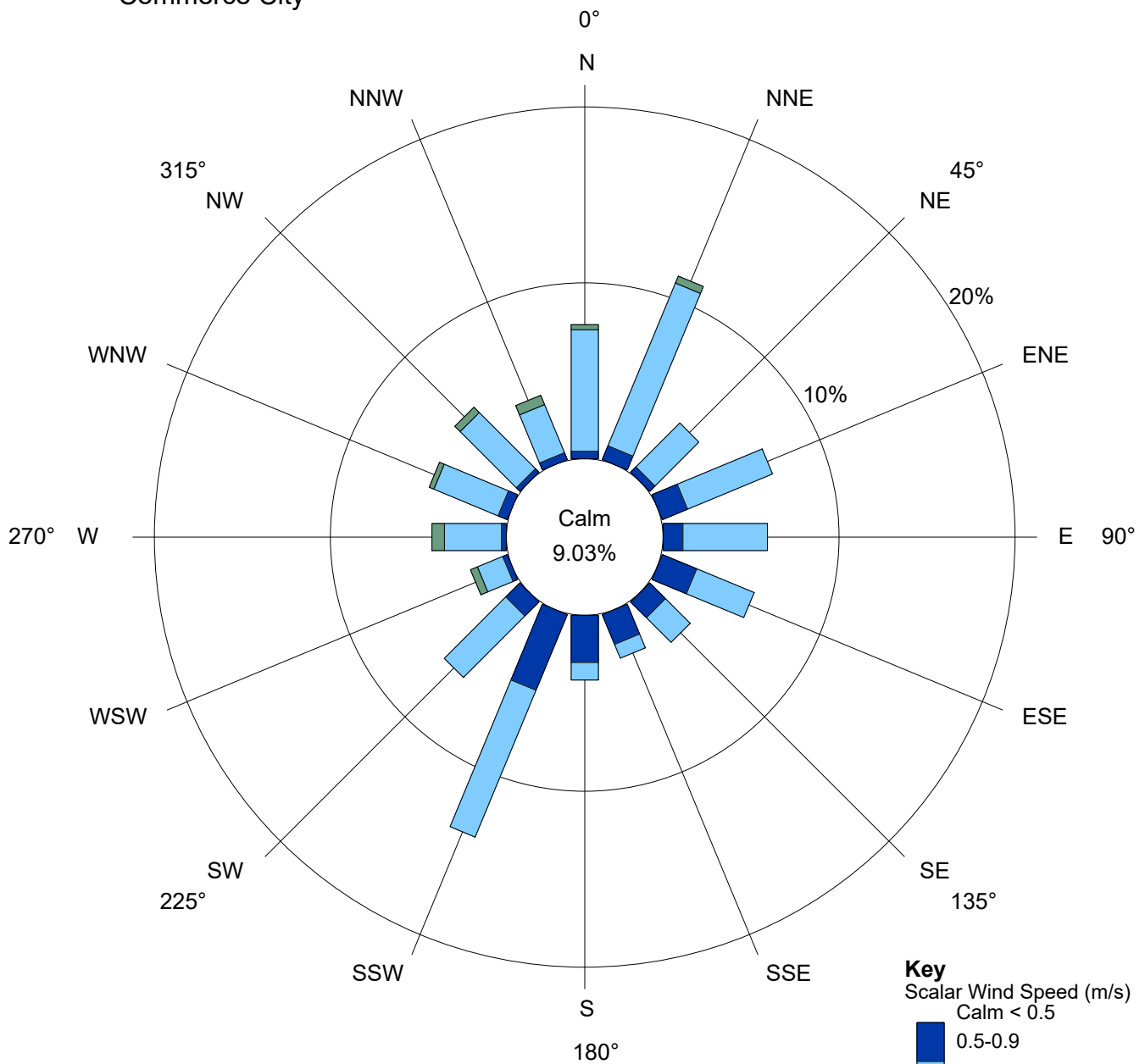
- Data Collection Statistics for C1 - Hourly Data
- Wind Rose for C1
- Stackplots - Hourly Data

Table 4-4

Data Collection Statistics							
Colorado Air Toxics - A1 Commerce City							
04/01/2023 - 04/30/2023							
Parameter	Interval	Par Code	No. Possible	No. Collected	% Collected	No. Valid	% Valid
Relative Humidity	hourly	RH	720	720	100.0	720	100.0
Standard Deviation for Wind Direction	hourly	SDWD	720	709	98.5	709	98.5
Solar Radiation	hourly	SOL	720	720	100.0	720	100.0
Scalar Wind Direction	hourly	SWD	720	709	98.5	709	98.5
Scalar Wind Speed	hourly	SWS	720	709	98.5	709	98.5
Ambient Temperature	hourly	TMP	720	720	100.0	720	100.0
Vector Wind Direction	hourly	VWD	720	709	98.5	709	98.5
Vector Wind Speed	hourly	VWS	720	709	98.5	709	98.5

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%.



98.5% Collected 98.5% Valid
720 Possible /709 Collected /709 Valid
Collection Statistics Include:
Wind Speed and Wind Direction
(SWS-1; SWD-1)

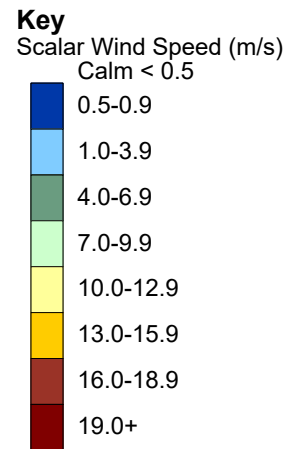


Figure 4-2
 Colorado Air Toxics - A1 (Commerce City) - Hourly Meteorological Data



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

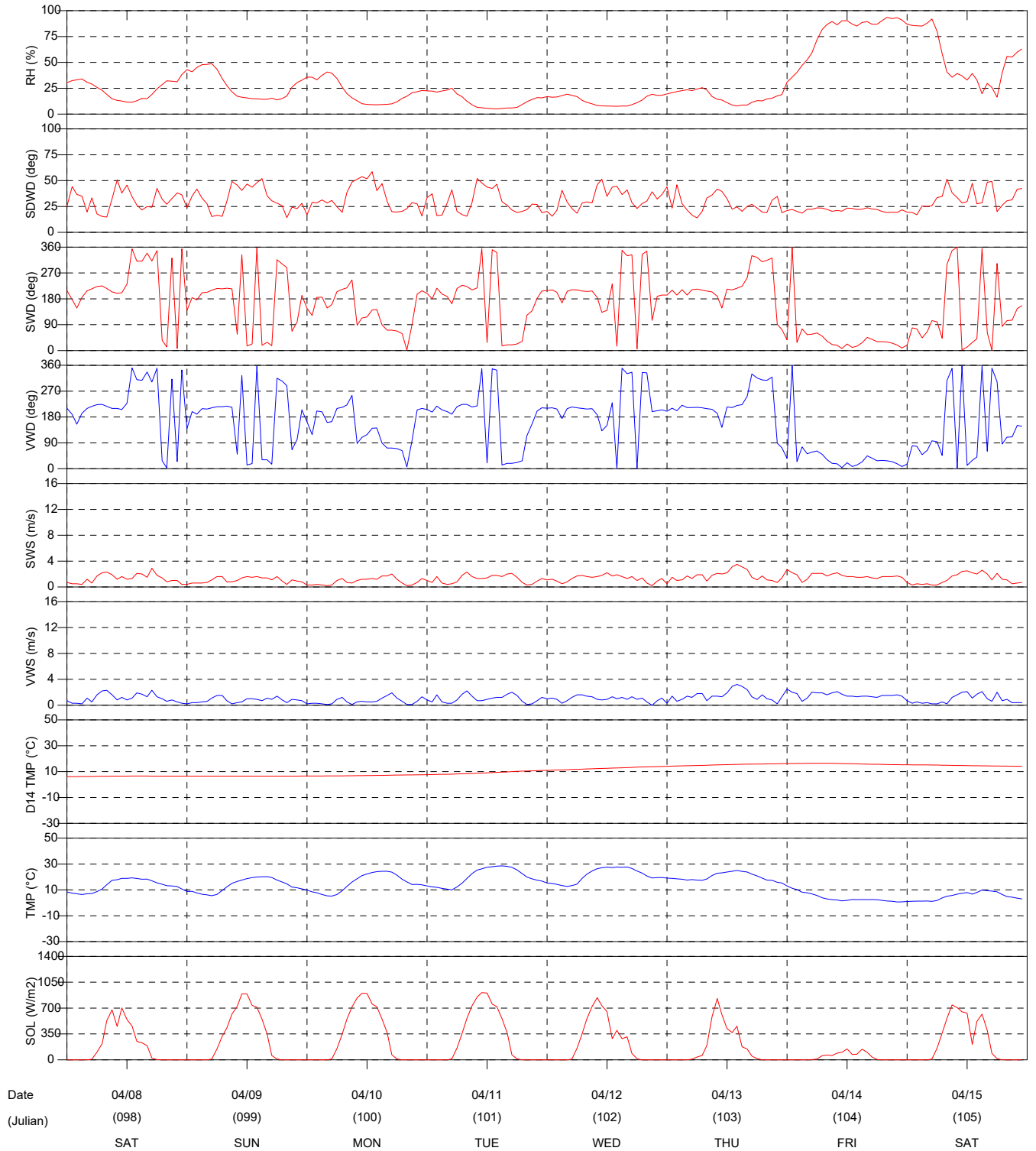


Figure 4-4
 Colorado Air Toxics - A1 (Commerce City) - Hourly Meteorological Data

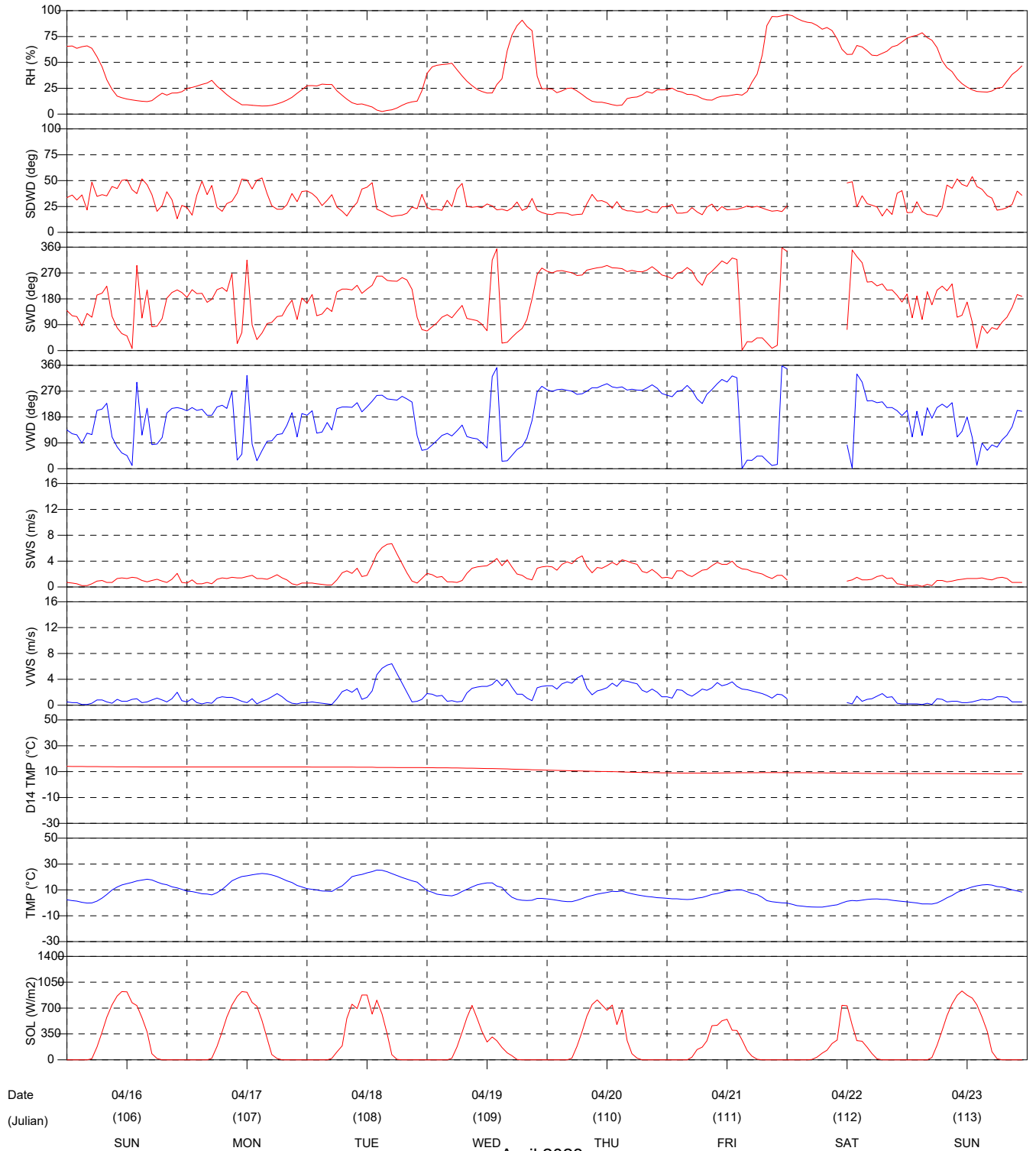


Figure 4-5
 Colorado Air Toxics - A1 (Commerce City) - Hourly Meteorological Data

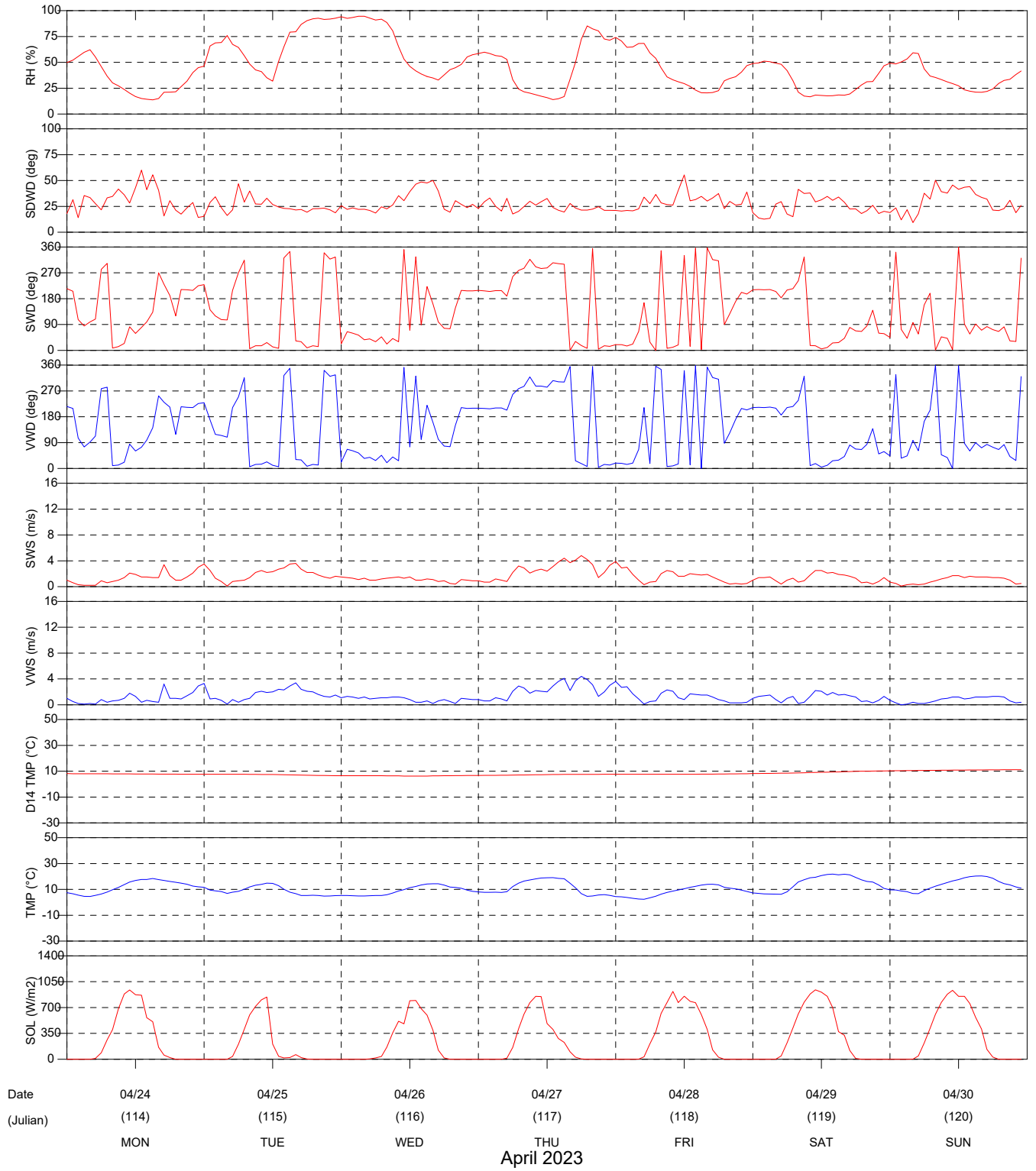


Table 4-5

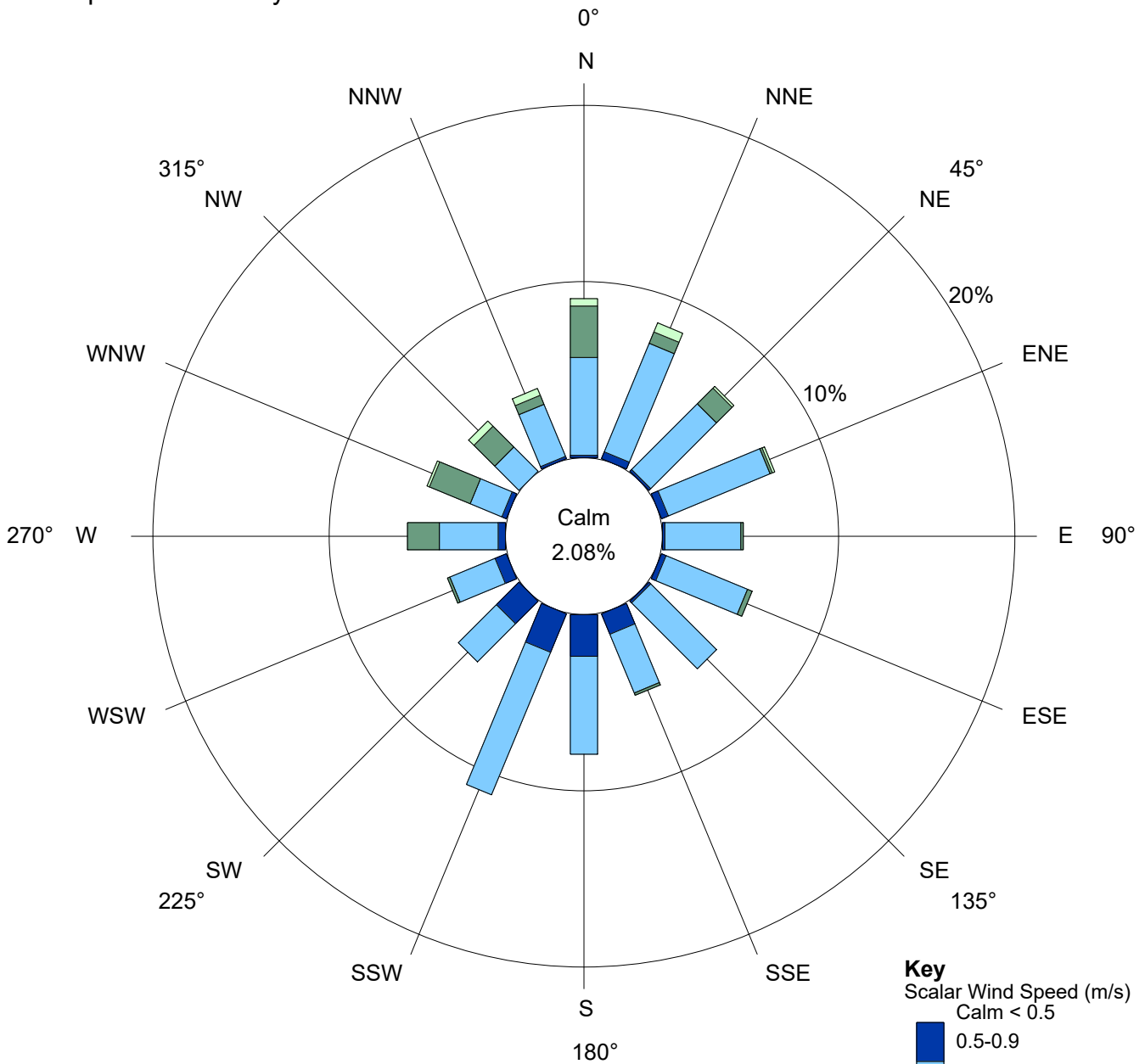
Data Collection Statistics							
Colorado Air Toxics - B1 Dupont Elementary School							
04/01/2023 - 04/30/2023							
Parameter	Interval	Par Code	No. Possible	No. Collected	% Collected	No. Valid	% Valid
Relative Humidity	hourly	RH	720	720	100.0	720	100.0
Standard Deviation for Wind Direction	hourly	SDWD	720	720	100.0	720	100.0
Solar Radiation	hourly	SOL	720	720	100.0	720	100.0
Scalar Wind Direction	hourly	SWD	720	720	100.0	720	100.0
Scalar Wind Speed	hourly	SWS	720	720	100.0	720	100.0
Ambient Temperature	hourly	TMP	720	720	100.0	720	100.0
Vector Wind Direction	hourly	VWD	720	720	100.0	720	100.0
Vector Wind Speed	hourly	VWS	720	720	100.0	720	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%.

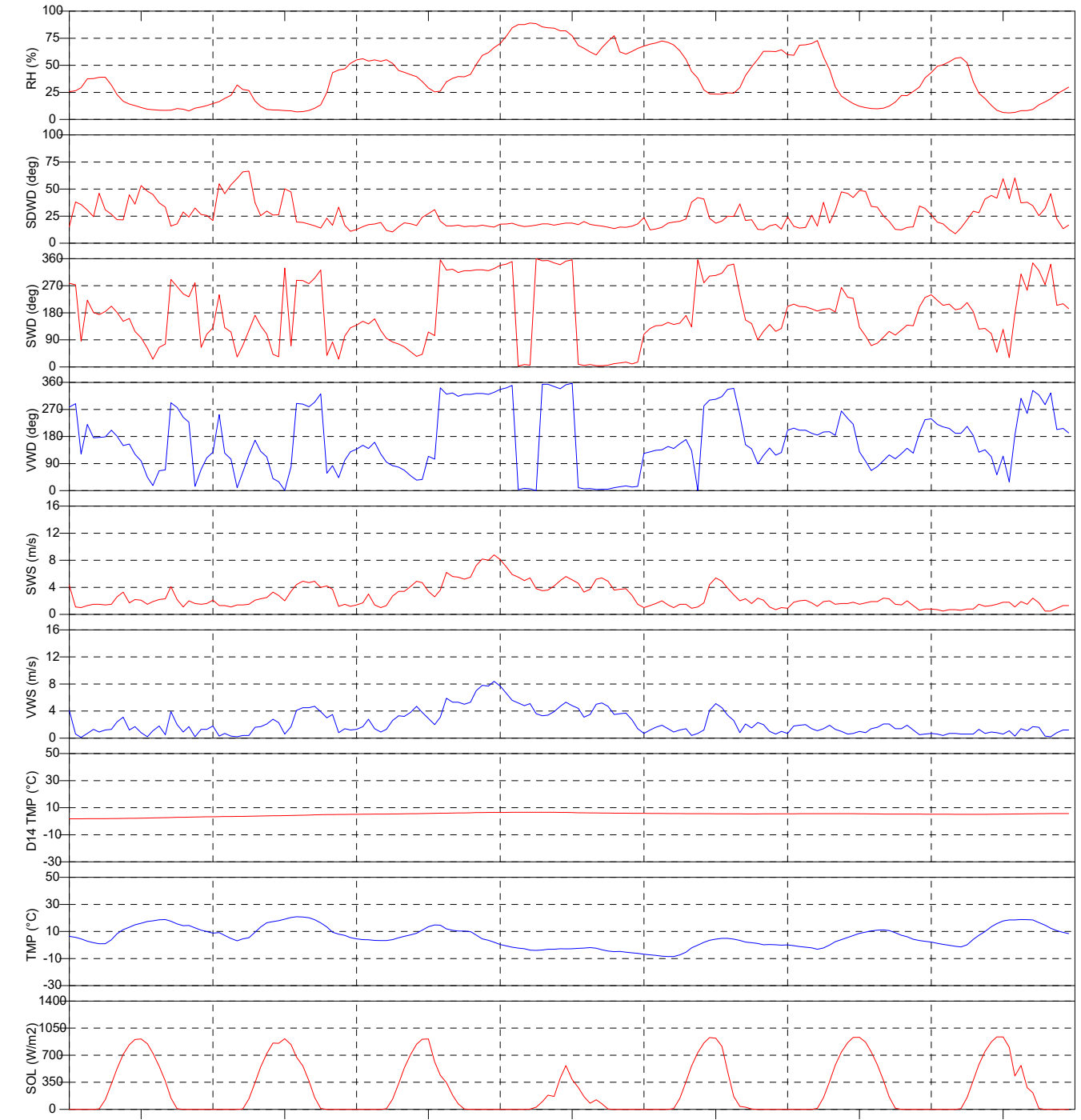
Figure 4-6
 Wind Rose

04/01/2023 - 04/30/2023



100.0% Collected 100.0% Valid
 720 Possible /720 Collected /720 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



Date	04/01	04/02	04/03	04/04	04/05	04/06	04/07
(Julian)	(091)	(092)	(093)	(094)	(095)	(096)	(097)
	SAT	SUN	MON	TUE	WED	THU	FRI

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

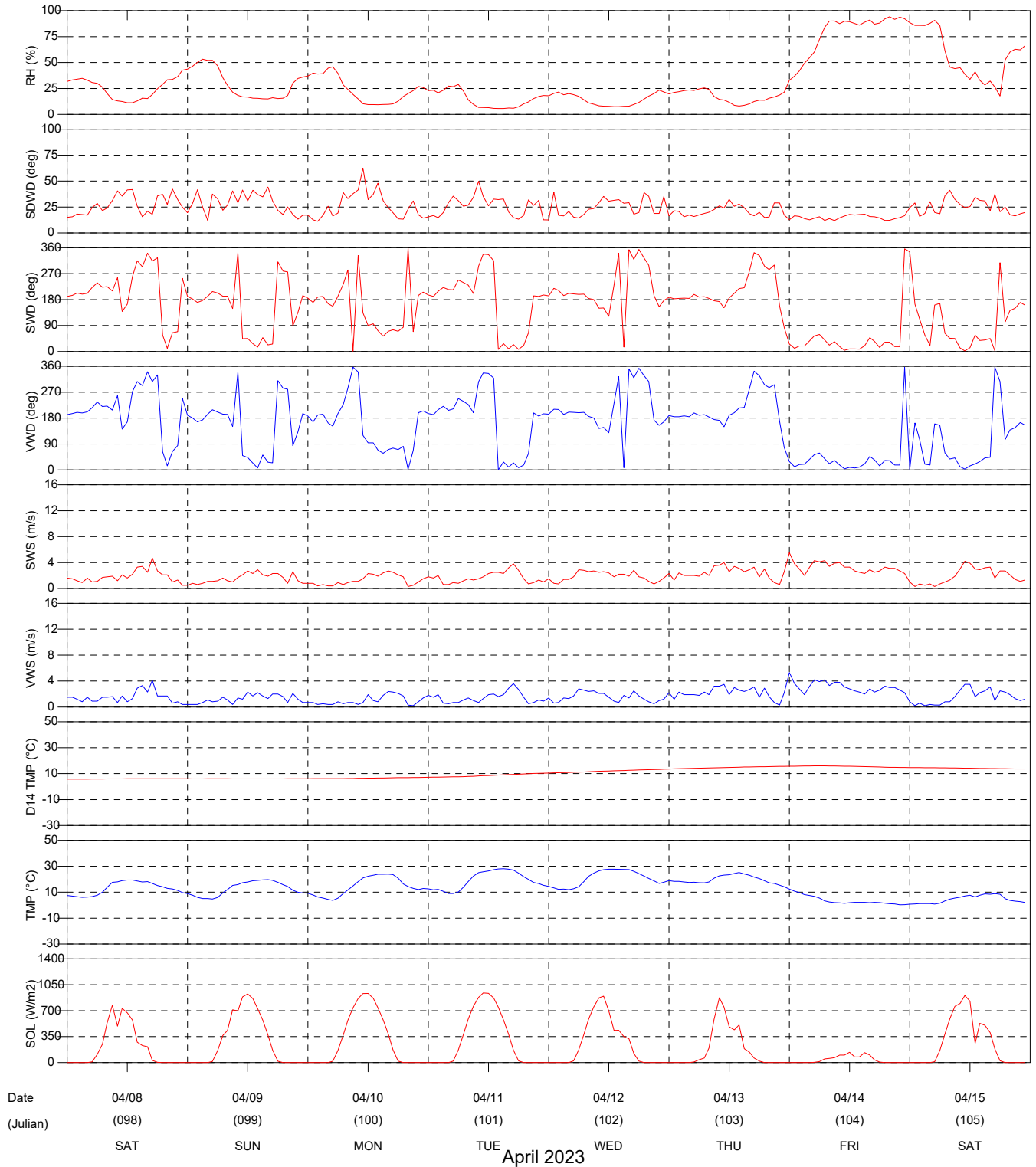
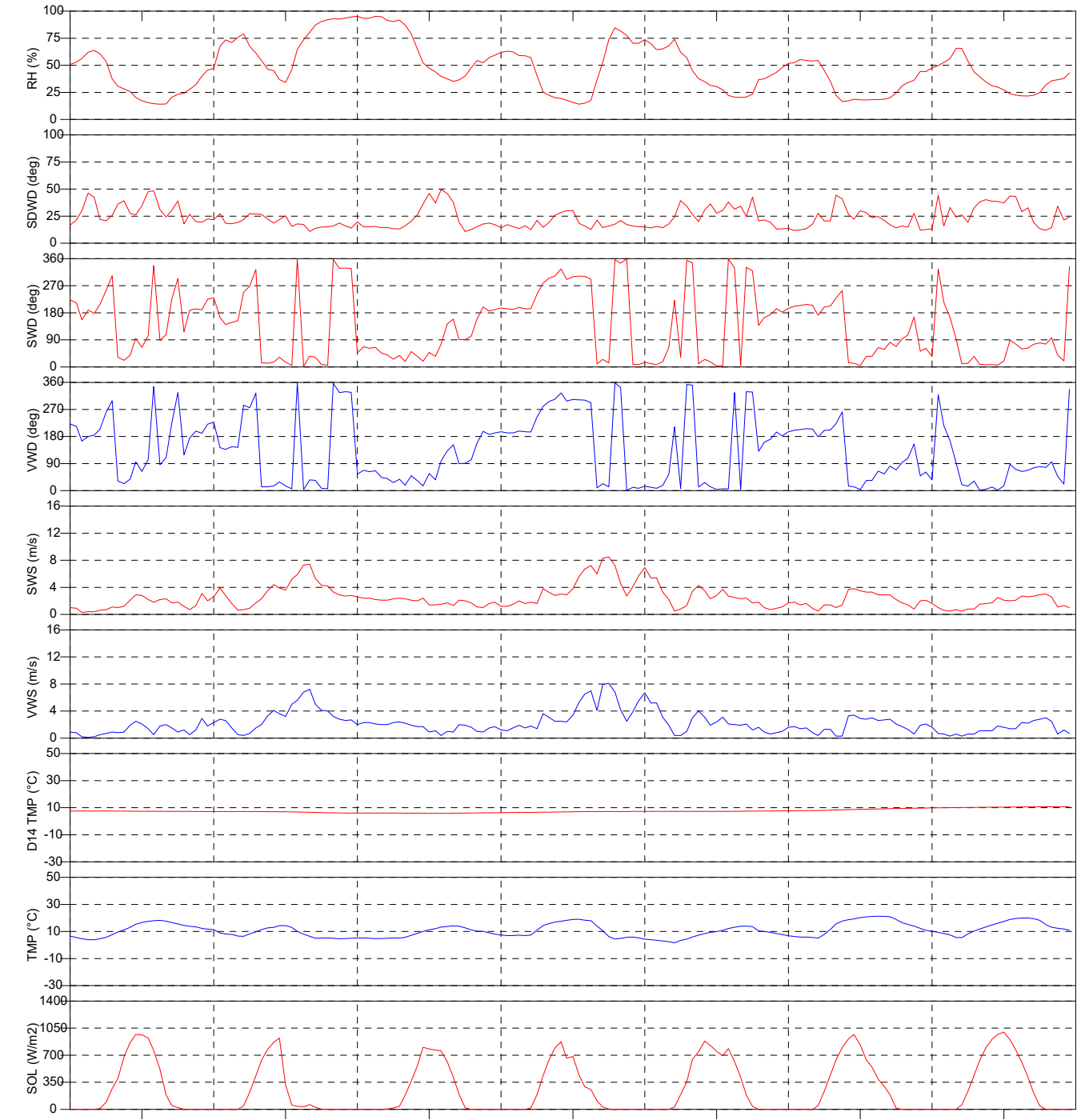


Figure 4-9
 Colorado Air Toxics - B1 (DuPont Elementary School) - Hourly Meteorological Data



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



Date	04/24	04/25	04/26	04/27	04/28	04/29	04/30
(Julian)	(114)	(115)	(116)	(117)	(118)	(119)	(120)
	MON	TUE	WED	THU	FRI	SAT	SUN

Table 4-6

Data Collection Statistics							
Colorado Air Toxics - C1							
Pueblo							
04/01/2023 - 04/30/2023							
Parameter	Interval	Par Code	No. Possible	No. Collected	% Collected	No. Valid	% Valid
Relative Humidity	hourly	RH	720	720	100.0	720	100.0
Standard Deviation for Wind Direction	hourly	SDWD	720	720	100.0	720	100.0
Solar Radiation	hourly	SOL	720	720	100.0	720	100.0
Scalar Wind Direction	hourly	SWD	720	720	100.0	720	100.0
Scalar Wind Speed	hourly	SWS	720	720	100.0	720	100.0
Ambient Temperature	hourly	TMP	720	720	100.0	720	100.0
Vector Wind Direction	hourly	VWD	720	720	100.0	720	100.0
Vector Wind Speed	hourly	VWS	720	720	100.0	720	100.0

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

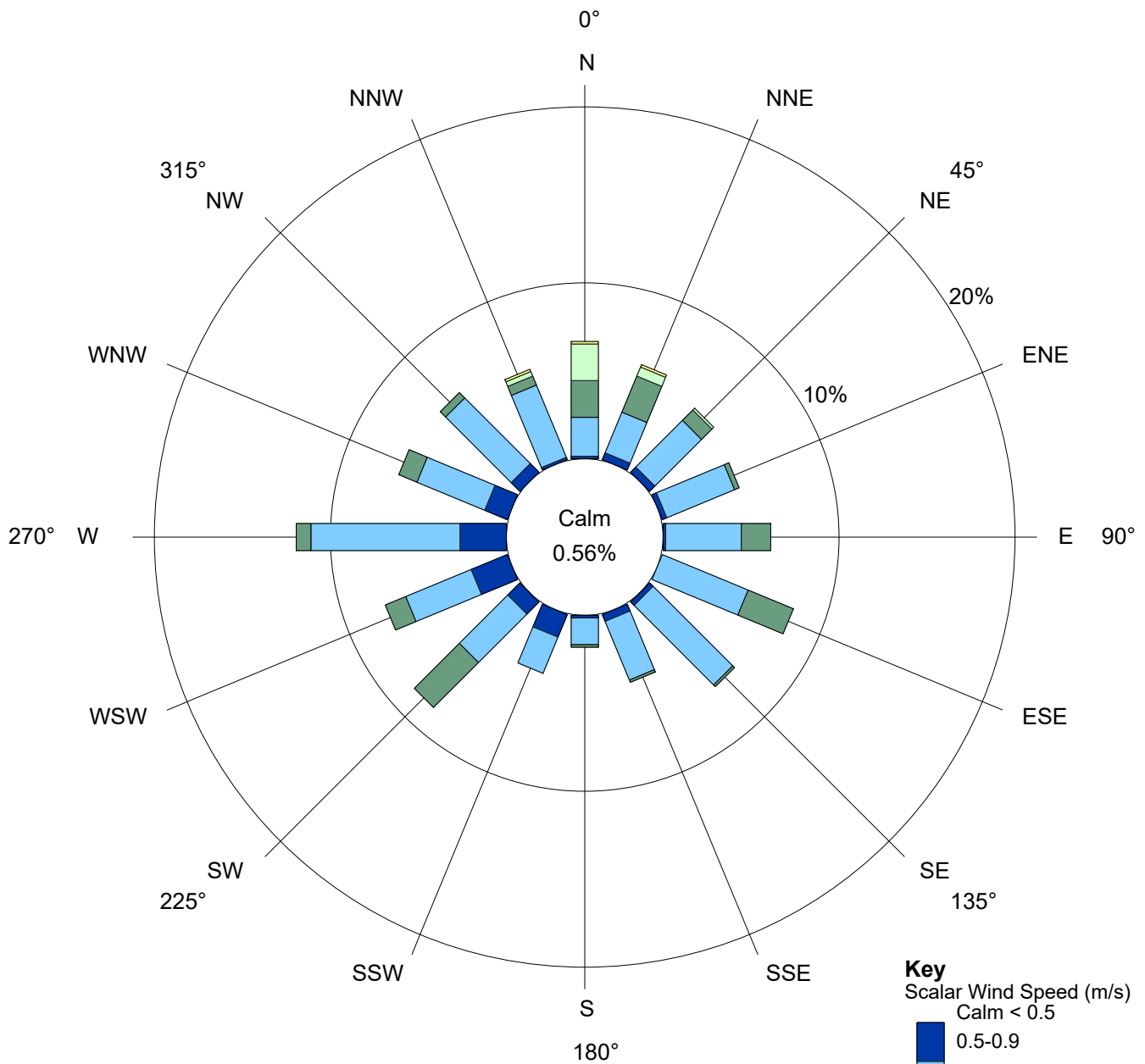
Automatic zeros and spans are performed daily on most ambient gas analyzers and ambient data can only be reported if the duration of these events is less than 25% of the hour. As a result, the maximum percent valid is generally less than 100%.

Figure 4-11

Colorado Air Toxics - C1
Pueblo

Wind Rose

04/01/2023 - 04/30/2023



100.0% Collected 100.0% Valid
720 Possible /720 Collected /720 Valid
Collection Statistics Include:
Wind Speed and Wind Direction
(SWS-1; SWD-1)

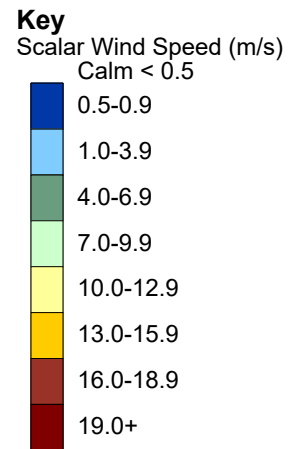


Figure 4-12
 Colorado Air Toxics - C1 (Pueblo) - Hourly Met Data

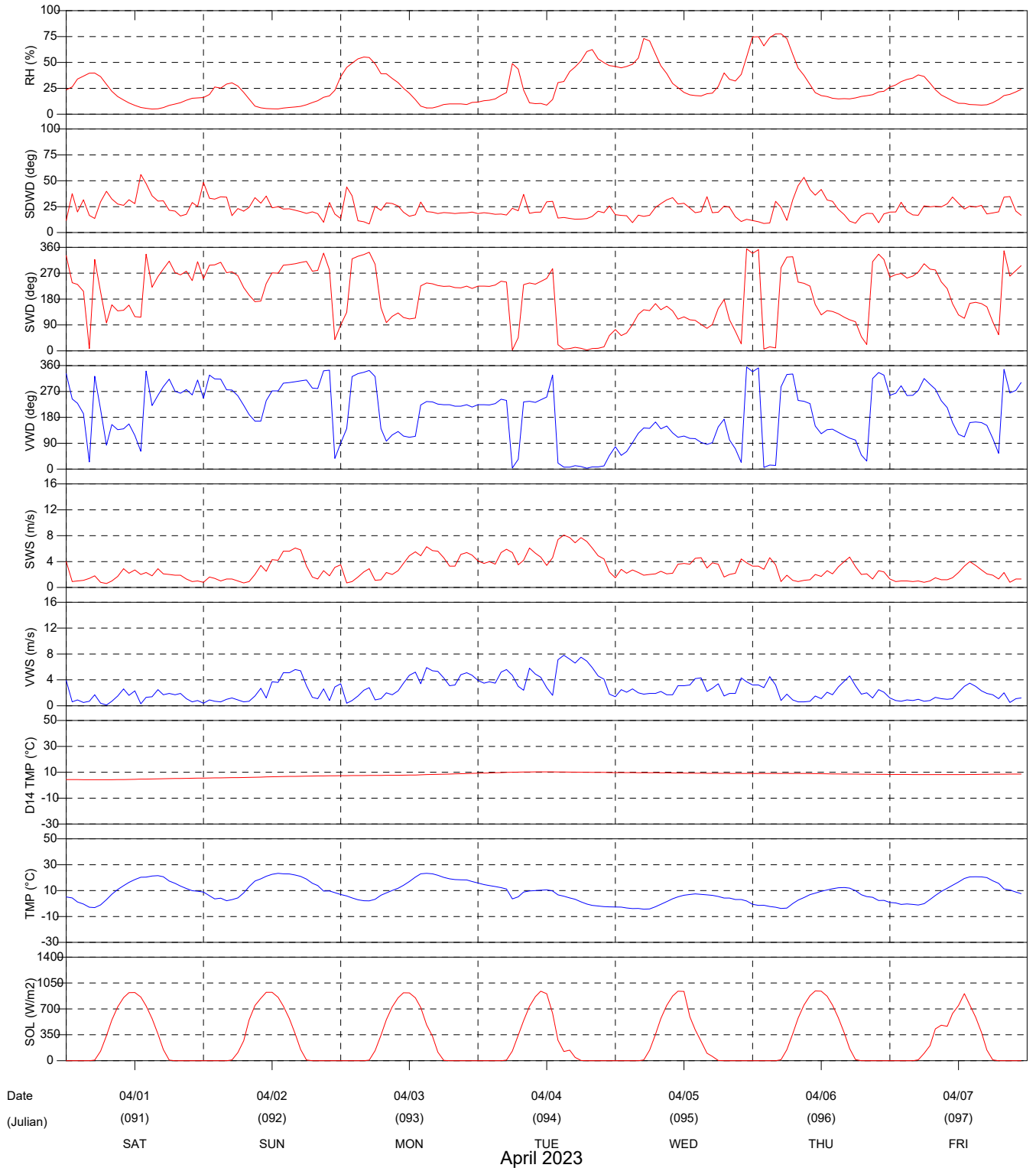


Figure 4-13
 Colorado Air Toxics - C1 (Pueblo) - Hourly Met Data

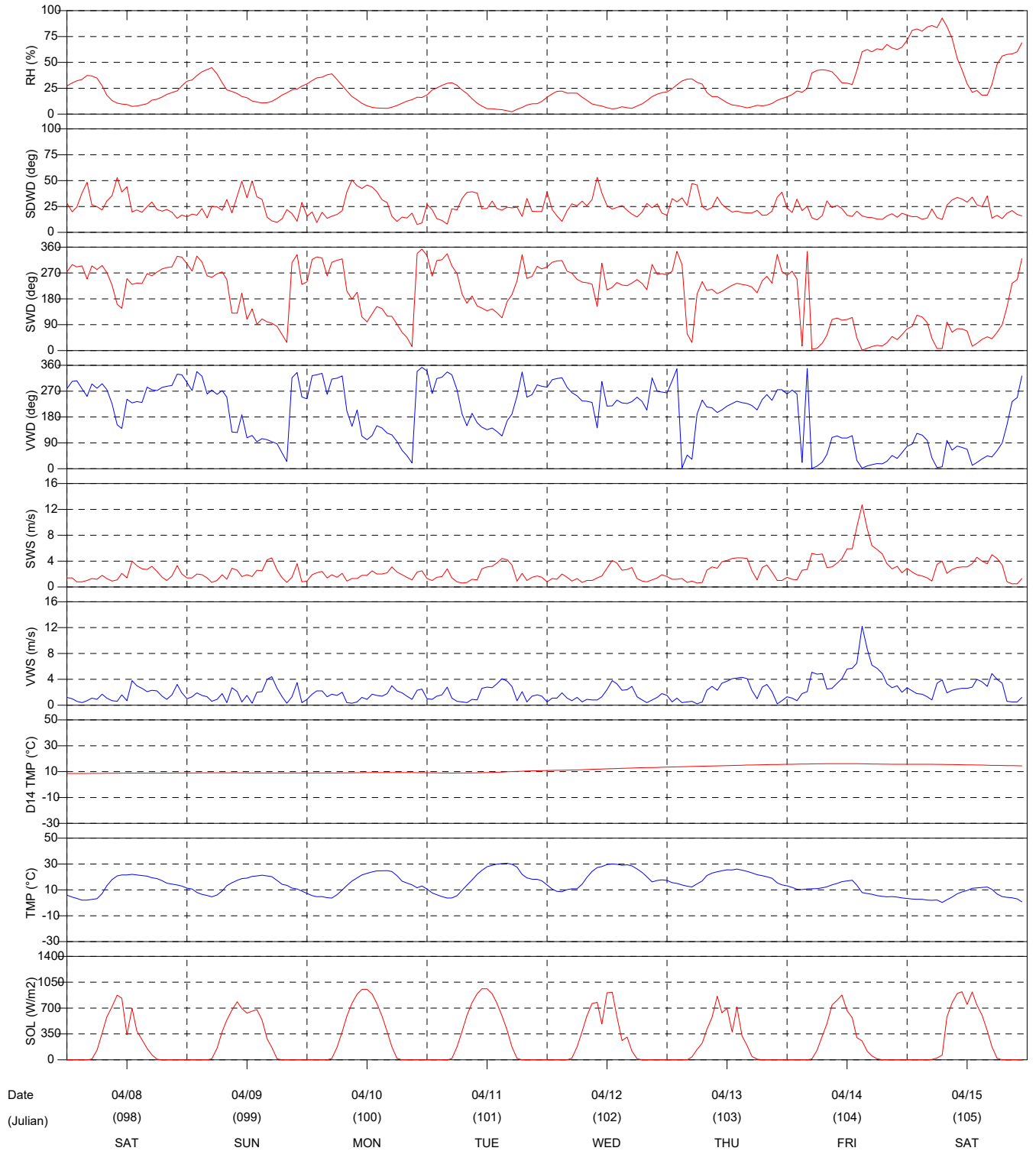


Figure 4-14
 Colorado Air Toxics - C1 (Pueblo) - Hourly Met Data

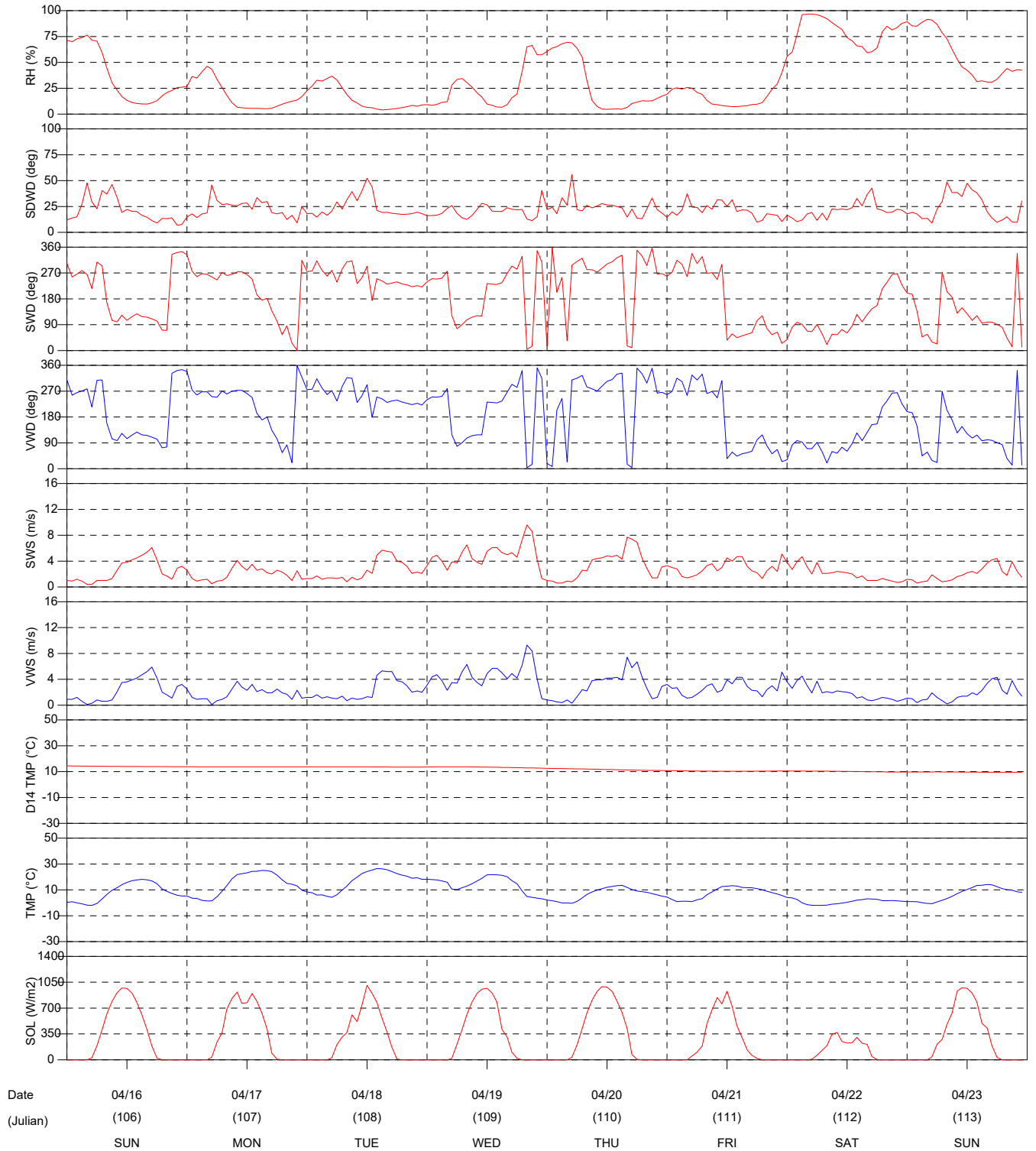


Figure 4-15
 Colorado Air Toxics - C1 (Pueblo) - Hourly Met Data



Date	04/24	04/25	04/26	04/27	04/28	04/29	04/30
(Julian)	(114)	(115)	(116)	(117)	(118)	(119)	(120)
	MON	TUE	WED	THU	FRI	SAT	SUN