

---

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

**February 1 – February 28, 2023**

**Operational Summaries,  
Data Summaries and Plots**

Prepared for

**DEREK PRICE  
AIR TOXICS AND OZONE PRECURSOR SECTION  
COLORADO DEPARTMENT OF PUBLIC HEALTH & ENVIRONMENT  
4300 CHERRY CREEK DRIVE SOUTH  
DENVER, CO 80246**

Prepared by



1901 Sharp Point Drive, Suite F  
Fort Collins, CO 80525  
970-484-7941  
[www.air-resource.com](http://www.air-resource.com)

April 5, 2023

---

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

## TABLE OF CONTENTS

<u>Section</u>		<u>Page</u>
<b>1.0</b>	<b>INTRODUCTION</b>	<b>1-1</b>
<b>2.0</b>	<b>OPERATIONAL SUMMARIES</b>	<b>2-1</b>
<b>3.0</b>	<b>AIR TOXICS SAMPLING STATISTICS</b>	<b>3-1</b>
<b>4.0</b>	<b>AIR TOXIC DATA SUMMARIES</b>	<b>4-1</b>
4.1	Meteorological Data Collection Statistics and Summaries	4-5
4.1.1	Site A1	4-5
4.1.2	Site B1	4-5
4.1.3	Site C1	4-5

## LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
4-1	A1, Commerce City - Wind Rose – 02/01/2023 – 02/28/2023	4-7
4-2	A1, Commerce City - Hourly Meteorological Data 02/01/2023 – 02/07/2023	4-8
4-3	A1, Commerce City - Hourly Meteorological Data 02/08/2023 – 02/15/2023	4-9
4-4	A1, Commerce City - Hourly Meteorological Data 02/16/2023 – 02/23/2023	4-10
4-5	A1, Commerce City - Hourly Meteorological Data 02/24/2023 – 02/28/2023	4-11
4-6	B1, Dupont Elementary School - Wind Rose – 02/01/2023 – 02/28/2023	4-13
4-7	B1, Dupont Elementary School - Hourly Meteorological Data 02/01/2023 – 02/07/2023	4-14
4-8	B1, Dupont Elementary School - Hourly Meteorological Data 02/08/2023 – 02/15/2023	4-15
4-9	B1, Dupont Elementary School - Hourly Meteorological Data 02/16/2023 – 02/23/2023	4-16
4-10	B1, Dupont Elementary School - Hourly Meteorological Data 02/24/2023 – 02/28/2023	4-17
4-11	C1, Pueblo - Wind Rose – 02/01/2023 – 02/28/2023	4-19
4-12	C1, Pueblo - Hourly Meteorological Data 02/01/2023 – 02/07/2023	4-20
4-13	C1, Pueblo - Hourly Meteorological Data 02/08/2023 – 02/15/2023	4-21
4-14	C1, Pueblo - Hourly Meteorological Data 02/16/2023 – 02/23/2023	4-22
4-15	C1, Pueblo - Hourly Meteorological Data 02/24/2023 – 02/28/2023	4-23

## LIST OF TABLES

<u>Table</u>		<u>Page</u>
3-1	14-day Benzene Sample Collection – 02/01/2023 – 02/28/2023	3-1
3-2	Benzene Duplicate Sample and Field Blank Collection – 02/01/2023 – 02/28/2023	3-1
3-3	14-day H2S Sample Collection – 02/01/2023 – 02/28/2023	3-1
3-4	H2S Duplicate Sample and Field Blank Collection - 02/01/2023 – 02/28/2023	3-2
3-5	HCN Sample Collection - 02/01/2023 – 02/28/2023	3-2
3-6	HCN Duplicate Sample and Field Blank Collection – 02/01/2023 – 02/28/2023	3-2
4-1	14-Day Benzene Data - 02/01/2023 – 02/28/2023	4-1
4-2	14-Day H2S Data - 02/01/2023 – 02/28/2023	4-2
4-3	HCN Data - 02/01/2023 – 02/28/2023	4-3
4-4	Data Collection Statistics - A1, Commerce – 02/01/2023 – 02/28/2023	4-6
4-5	Data Collection Statistics - B1, Henderson - 02/01/2023 – 02/28/2023	4-12
4-6	Data Collection Statistics - C1, Pueblo - 02/01/2023 – 02/28/2023	4-18

## 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 (H<sub>2</sub>S), 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 February 1 through February 28, 2023.

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

Christian Kirk, Project Manager  
[ckirk@air-resource.com](mailto:ckirk@air-resource.com)  
**Air Resource Specialists, Inc.**  
1901 Sharp Point Drive, Suite F  
Fort Collins, Colorado 80525  
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 February 1 through February 28, 2023, timeframe include the following:

- Benzene, H<sub>2</sub>S, and HCN sampling commenced at B1 on February 1.

Significant deviations from the established sampling schedule include:

- Benzene and H<sub>2</sub>S samples were collected 1-day late on February 16 due to a winter storm expected on the February 15 sample change day. The samples collected were 15-day samples. The new sorbent tubes deployed were 13-day samples.

Sampling issues or corrective actions taken include:

- None

### 3.0 AIR TOXICS SAMPLING STATISTICS

Statistics for samples collected during the February 1 to February 28, 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 H<sub>2</sub>S 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  
February 1 to February 28, 2023

Sampling Region	Site	Monthly		Quarterly	
		Collected	Required	Collected	Required
A	A1	2	1	5	3
B	B1	2	1	2	3
C	C1	2	1	5	3

Table 3-2

Benzene Duplicate Sample and Field Blank Collection  
February 1 to February 28, 2023

Duplicate		Field Blank	
Collected	%	Collected	%
1	17%	2	33%

Table 3-3

14-day H<sub>2</sub>S Sample Collection  
February 1 to February 28, 2023

Sampling Region	Site	Monthly		Quarterly	
		Collected	Required	Collected	Required
A	A1	2	1	5	3
B	B1	2	1	2	3
C	C1	2	1	5	3

Table 3-4  
H<sub>2</sub>S Duplicate Sample and Field Blank Collection  
February 1 to February 28, 2023

<b>Duplicate</b>		<b>Field Blank</b>	
<b>Collected</b>	<b>%</b>	<b>Collected</b>	<b>%</b>
6	100%	1	17%

Table 3-5  
HCN Sample Collection  
February 1 to February 28, 2023

<b>Sampling Region</b>	<b>Site</b>	<b>Monthly</b>		<b>Quarterly</b>	
		<b>Collected</b>	<b>Required</b>	<b>Collected</b>	<b>Required</b>
A	A1	11	10	20	30
B	B1	14	10	14	30
C	C1	11	10	20	30

Table 3-6  
HCN Duplicate Sample and Field Blank Collection  
February 1 to February 28, 2023

<b>Duplicate</b>		<b>Field Blank</b>	
<b>Collected</b>	<b>%</b>	<b>Collected</b>	<b>%</b>
4	11%	3	8%

Sampling frequency for HCN will be higher for the remainder of first quarter of 2023. This will ensure the quarterly requirements will be met.

#### 4.0 AIR TOXIC DATA SUMMARIES

The tables below summarize the air toxics data collected during the period of February 1 to February 28, 2023.

Table 4-1  
14-Day Benzene Data  
February 1 to February 28, 2023

SITE	Sampling Start Day	Sampling End Day	Days	Concentration (ppb)	MDL (ppb)	Notes
A1	2/1/2023	2/16/2023	15	0.375	0.0565	
A1	2/16/2023	3/1/2023	13	0.332	0.0655	
B1	2/1/2023	2/16/2023	15	0.439	0.0565	
B1	2/16/2023	3/1/2023	13	0.351	0.0660	
B1	2/16/2023	3/1/2023	13	0.363	0.0660	Duplicate
B1	2/16/2023	3/1/2023	13	ND	0.0660	Field Blank
C1	2/1/2023	2/16/2023	15	0.155	0.0564	
C1	2/1/2023	2/16/2023	15	0.148	0.0564	Duplicate
C1	2/16/2023	3/1/2023	13	0.146	0.0655	
		Maximum		0.439		
		Minimum		0.146		
		Average		0.289		

∥



Table 4-2  
 14-Day H<sub>2</sub>S Data  
 February 1 to February 28, 2023

<b>SITE</b>	<b>Sampling Start Day</b>	<b>Sampling End Day</b>	<b>Days</b>	<b>Concentration (ppb)</b>	<b>LOD (ppb)</b>	<b>Notes</b>
A1	2/1/2023	2/16/2023	15	ND	0.14	
A1	2/1/2023	2/16/2023	15	ND	0.14	Duplicate
A1	2/16/2023	3/1/2023	13	0.25	0.14	
A1	2/16/2023	3/1/2023	13	ND	0.14	Duplicate
B1	2/1/2023	2/16/2023	15	ND	0.14	
B1	2/1/2023	2/16/2023	15	ND	0.14	Duplicate
B1	2/16/2023	3/1/2023	13	ND	0.14	
B1	2/16/2023	3/1/2023	13	ND	0.14	Duplicate
C1	2/1/2023	2/16/2023	15	ND	0.14	
C1	2/1/2023	2/16/2023	15	ND	0.14	Duplicate
C1	2/1/2023	2/16/2023	15	ND	0.14	Field Blank
C1	2/16/2023	3/1/2023	13	ND	0.14	
C1	2/16/2023	3/1/2023	13	ND	0.14	Duplicate
		Maximum		0.25		
		Minimum		0.25		
		Average		0.25		

Table 4-3  
HCN Data  
February 1 to February 28, 2023

<b>SITE</b>	<b>Sampling Date</b>	<b>Time</b>	<b>Duration (min)</b>	<b>Concentration (ppb)</b>	<b>MDL (ppb)</b>	<b>Notes</b>
A1	2/1/2023	8:05	511	ND	0.8	
A1	2/2/2023	6:57	487	ND	0.7	
A1	2/3/2023	6:11	519	ND	0.7	
A1	2/7/2023	7:35	489	ND	0.6	
A1	2/9/2023	7:45	480	ND	0.7	
A1	2/13/2023	9:11	470	ND	0.7	
A1	2/16/2023	8:18	552	ND	0.8	
A1	2/17/2023	7:55	439	ND	0.7	
A1	2/21/2023	7:54	497	ND	0.8	
A1	2/21/2023	7:59	491	ND	0.8	Duplicate
A1	2/21/2023	7:59		ND	0.9	Field Blank
A1	2/23/2023	7:45	499	ND	0.8	
A1	2/27/2023	7:42	470	ND	0.8	
B1	2/1/2023	9:00	498	ND	0.8	
B1	2/2/2023	7:20	484	ND	0.8	
B1	2/3/2023	6:41	462	ND	0.9	
B1	2/3/2023	6:43	462	ND	0.9	Duplicate
B1	2/7/2023	7:11	539	ND	0.7	
B1	2/8/2023	10:40	180	ND	2.1	
B1	2/9/2023	7:10	500	ND	0.8	
B1	2/13/2023	8:35	527	ND	0.7	
B1	2/13/2023	8:38	525	ND	0.7	Duplicate
B1	2/13/2023	8:38		ND		Field Blank
B1	2/14/2023	11:38	180	ND	2.2	
B1	2/14/2023	11:39	180	ND	2.2	Duplicate
B1	2/14/2023	11:39		ND		Field Blank
B1	2/16/2023	9:23	503	ND	0.7	
B1	2/17/2023	7:33	482	ND	0.8	
B1	2/21/2023	7:25	556	ND	0.7	
B1	2/22/2023	9:04	189	ND	2	
B1	2/23/2023	8:11	499	ND	0.7	
B1	2/27/2023	7:13	476	ND	0.8	

Table 4-3 (continued)  
 HCN Data  
 February 1 to February 28, 2023

C1	2/1/2023	11:17	183	ND	2.0	
C1	2/2/2023	9:57	187	ND	2.0	
C1	2/3/2023	9:06	180	ND	2.2	
C1	2/7/2023	10:15	199	ND	2.0	
C1	2/9/2023	10:25	175	ND	2.2	
C1	2/13/2023	11:34	183	ND	2.1	
C1	2/16/2023	12:02	180	ND	2.1	
C1	2/17/2023	10:01	180	ND	2.2	
C1	2/21/2023	10:18	191	ND	2.0	
C1	2/23/2023	10:49	188	ND	2.1	
C1	2/27/2023	9:55	180	ND	2.2	

## **4.1 METEOROLOGICAL DATA COLLECTION STATISTICS AND SUMMARIES**

The tables and graphs below summarize the meteorological data collected during the period of February 1 to February 28, 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							
02/01/2023 - 02/28/2023							
Parameter	Interval	Par Code	No. Possible	No. Collected	% Collected	No. Valid	% Valid
Relative Humidity	hourly	RH	672	672	100.0	672	100.0
Standard Deviation for Wind Direction	hourly	SDWD	672	672	100.0	672	100.0
Solar Radiation	hourly	SOL	672	672	100.0	672	100.0
Scalar Wind Direction	hourly	SWD	672	672	100.0	672	100.0
Scalar Wind Speed	hourly	SWS	672	672	100.0	672	100.0
Ambient Temperature	hourly	TMP	672	672	100.0	672	100.0
Vector Wind Direction	hourly	VWD	672	672	100.0	672	100.0
Vector Wind Speed	hourly	VWS	672	672	100.0	672	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 4-2

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



Figure 4-3

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

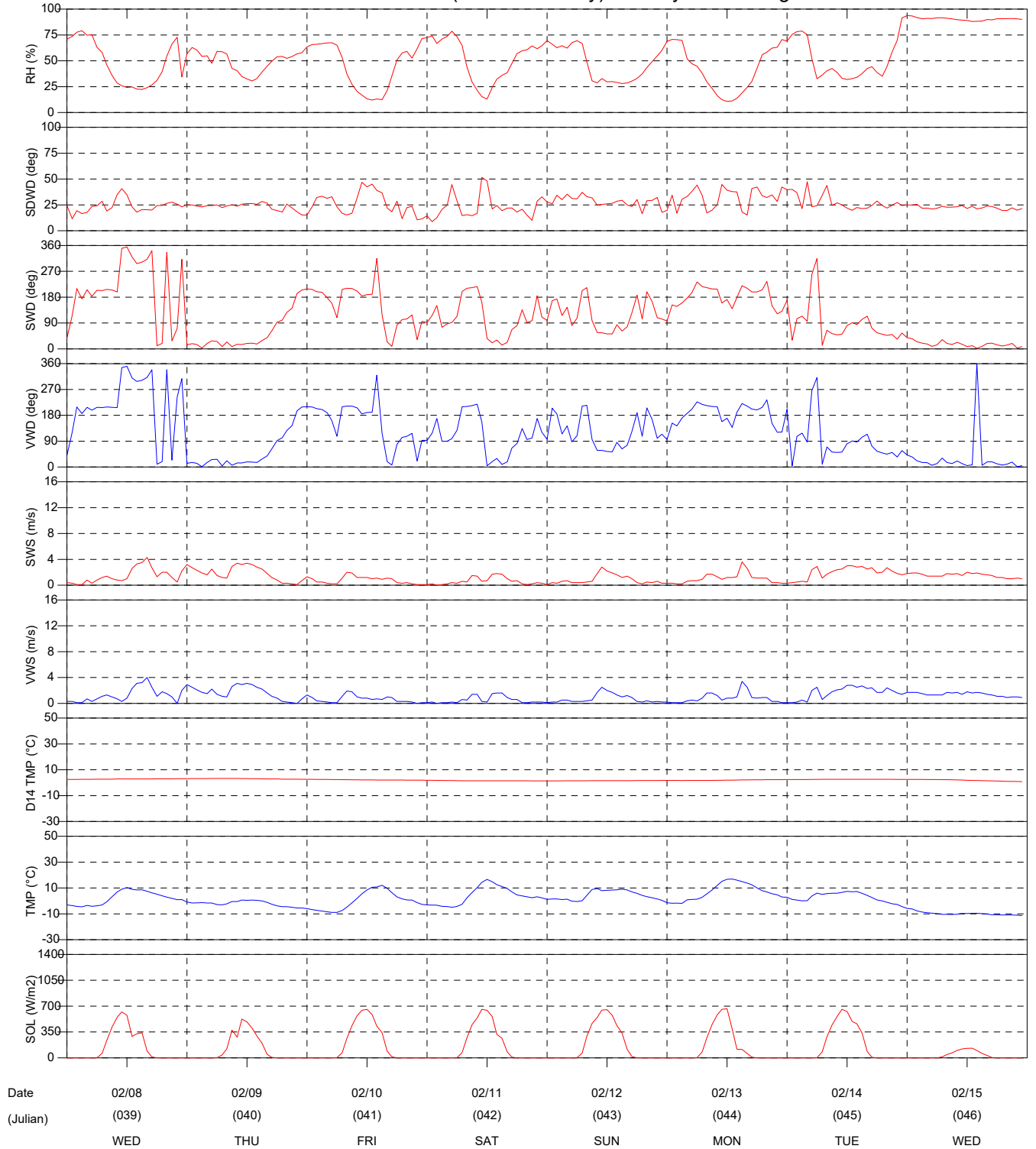




Figure 4-4

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



Date	02/16	02/17	02/18	02/19	02/20	02/21	02/22	02/23
(Julian)	(047)	(048)	(049)	(050)	(051)	(052)	(053)	(054)
	THU	FRI	SAT	SUN	MON	TUE	WED	THU

Figure 4-5

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

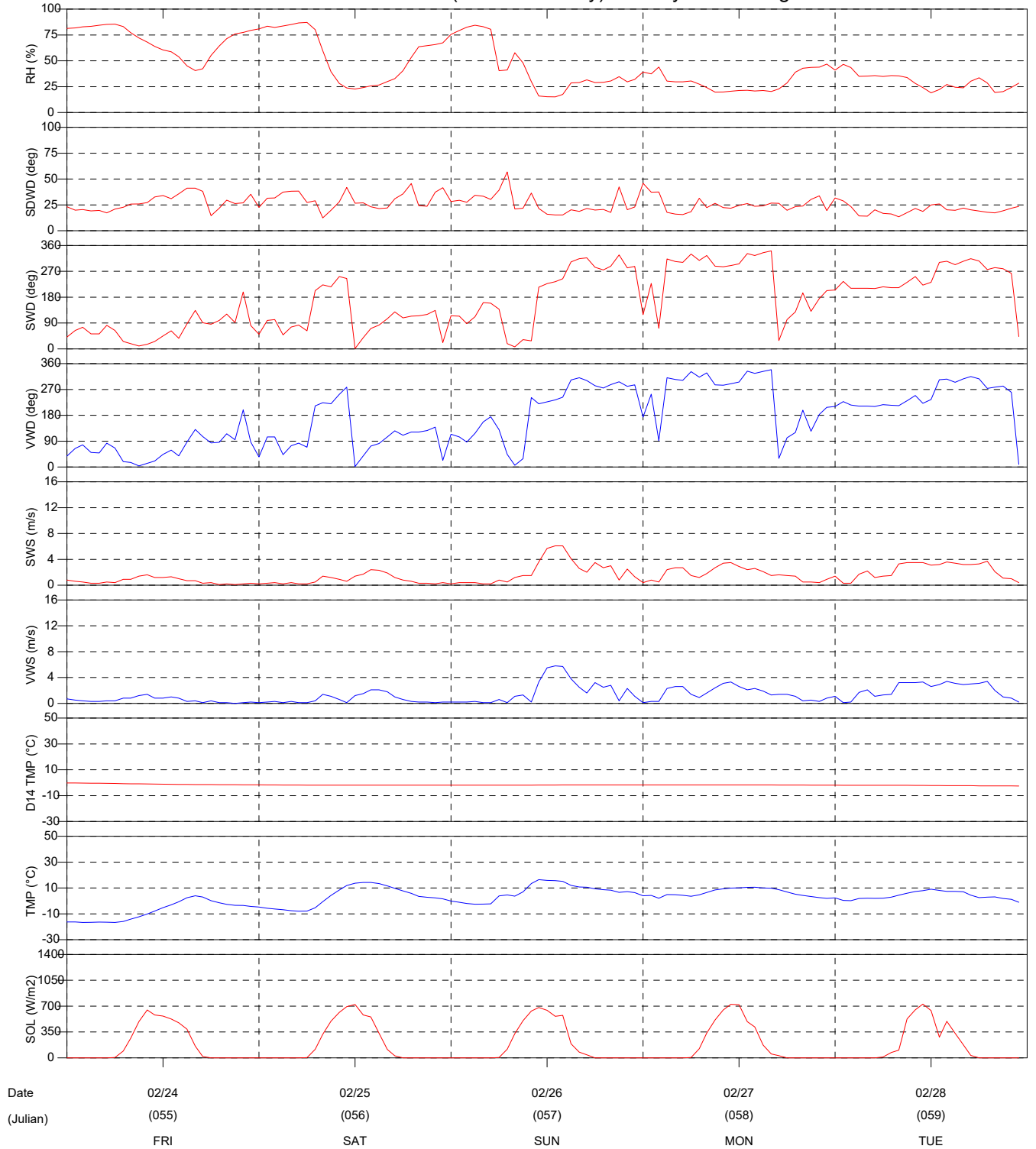


Table 4-5

Data Collection Statistics							
Colorado Air Toxics - B1							
02/01/2023 - 02/28/2023							
Parameter	Interval	Par Code	No. Possible	No. Collected	% Collected	No. Valid	% Valid
Relative Humidity	hourly	RH	672	671	99.9	671	99.9
Standard Deviation for Wind Direction	hourly	SDWD	672	671	99.9	671	99.9
Solar Radiation	hourly	SOL	672	671	99.9	671	99.9
Scalar Wind Direction	hourly	SWD	672	671	99.9	671	99.9
Scalar Wind Speed	hourly	SWS	672	671	99.9	671	99.9
Ambient Temperature	hourly	TMP	672	671	99.9	671	99.9
Vector Wind Direction	hourly	VWD	672	671	99.9	671	99.9
Vector Wind Speed	hourly	VWS	672	671	99.9	671	99.9

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

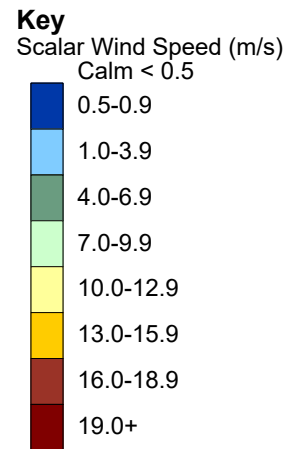
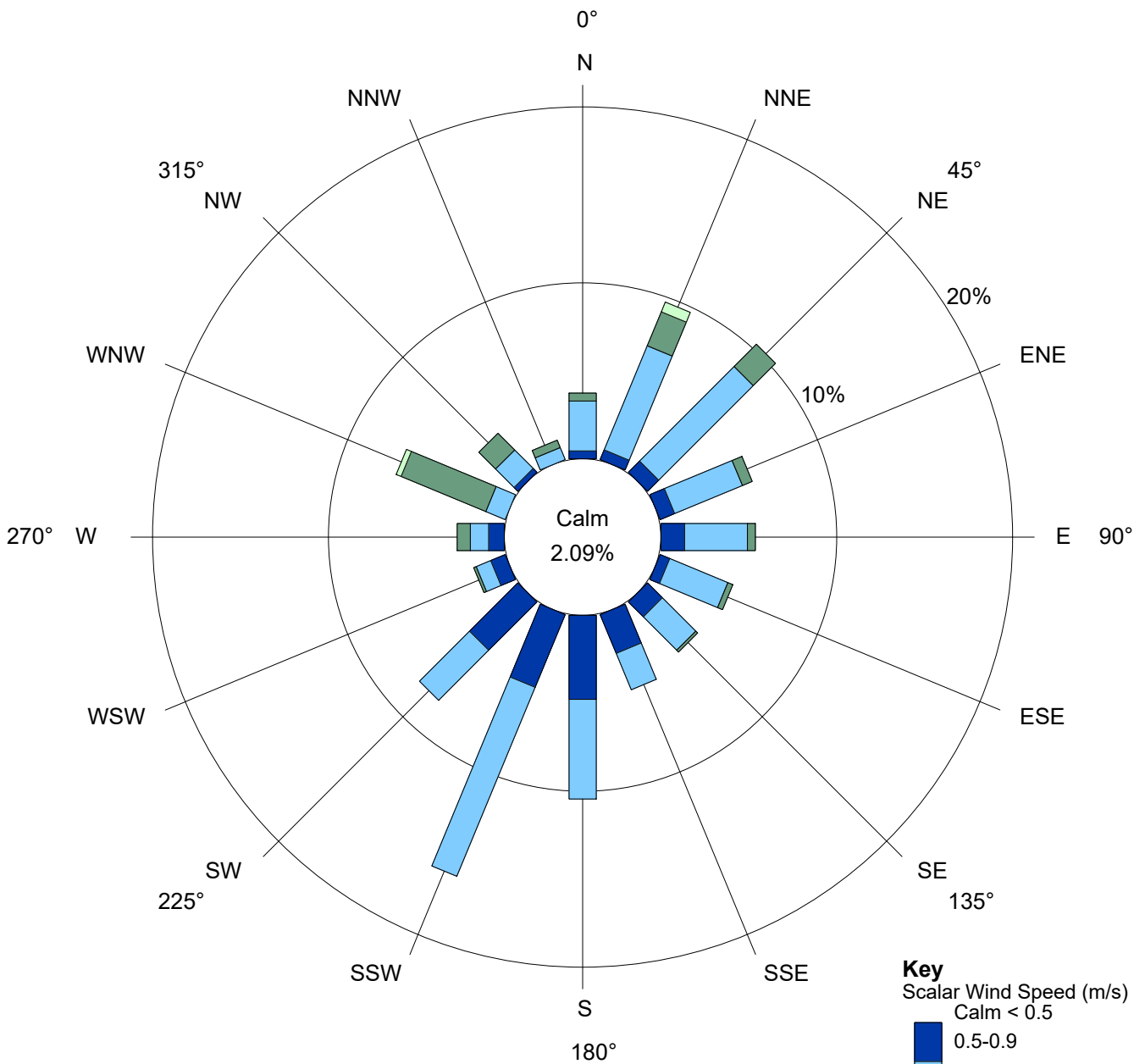
Automatic zeros and spans are performed daily on most ambient gas analyzers and ambient data can only be reported if the duration of these events is less than 25% of the hour. As a result, the maximum percent valid is generally less than 100%.

Figure 4-6

Colorado Air Toxics - B1

Wind Rose

02/01/2023 - 02/28/2023



99.9% Collected 99.9% Valid  
672 Possible /671 Collected /671 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

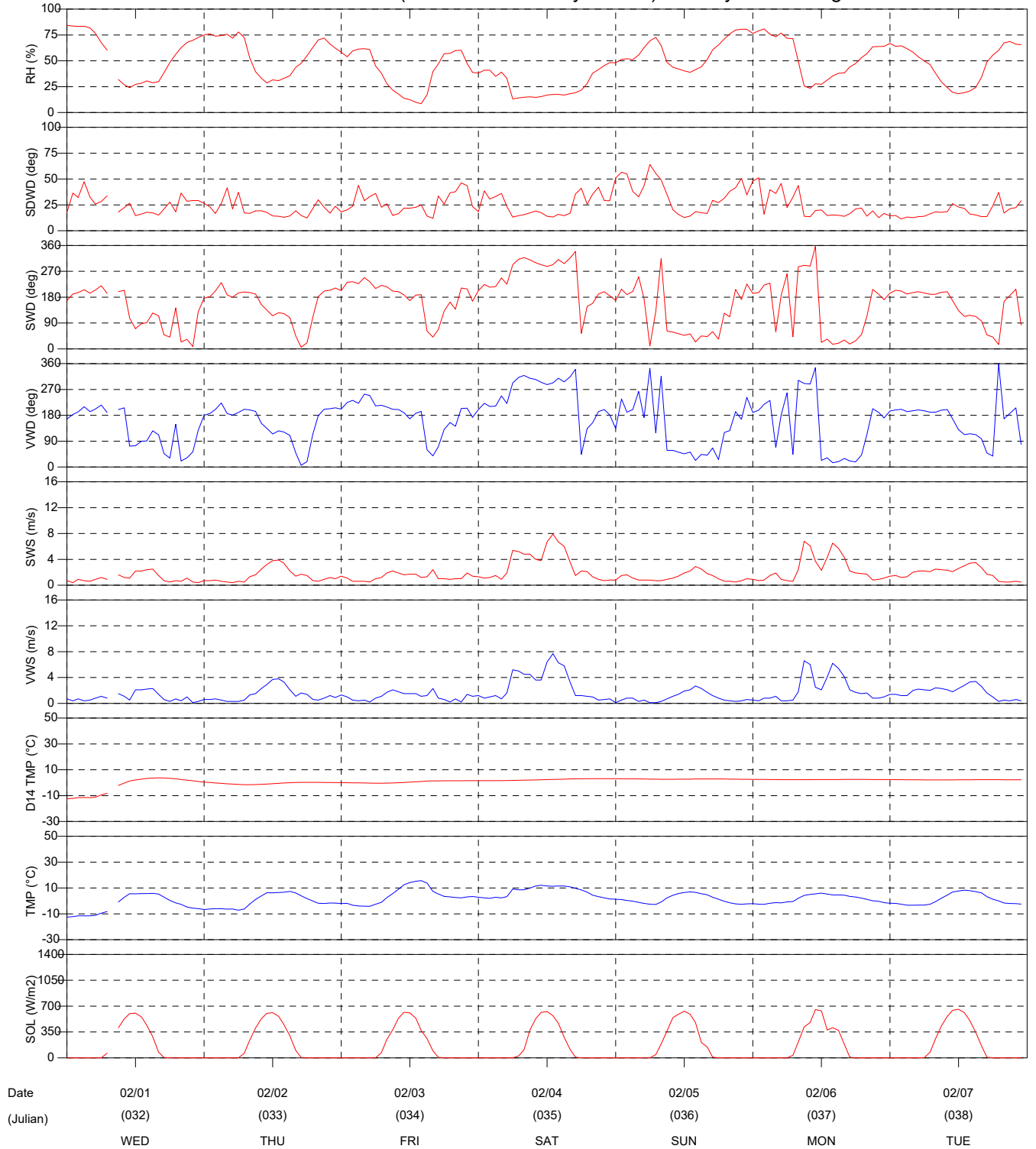


Figure 4-8

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



4-15

February 2023

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





Table 4-6

Data Collection Statistics							
Colorado Air Toxics - C1							
02/01/2023 - 02/28/2023							
Parameter	Interval	Par Code	No. Possible	No. Collected	% Collected	No. Valid	% Valid
Relative Humidity	hourly	RH	672	672	100.0	672	100.0
Standard Deviation for Wind Direction	hourly	SDWD	672	672	100.0	672	100.0
Solar Radiation	hourly	SOL	672	672	100.0	672	100.0
Scalar Wind Direction	hourly	SWD	672	672	100.0	672	100.0
Scalar Wind Speed	hourly	SWS	672	672	100.0	672	100.0
Ambient Temperature	hourly	TMP	672	672	100.0	672	100.0
Vector Wind Direction	hourly	VWD	672	672	100.0	672	100.0
Vector Wind Speed	hourly	VWS	672	672	100.0	672	100.0

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

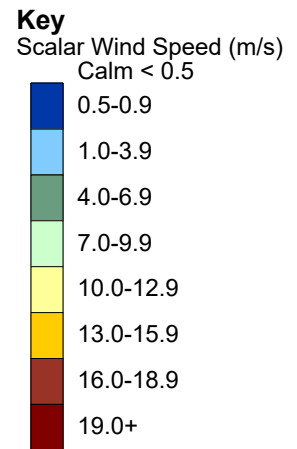
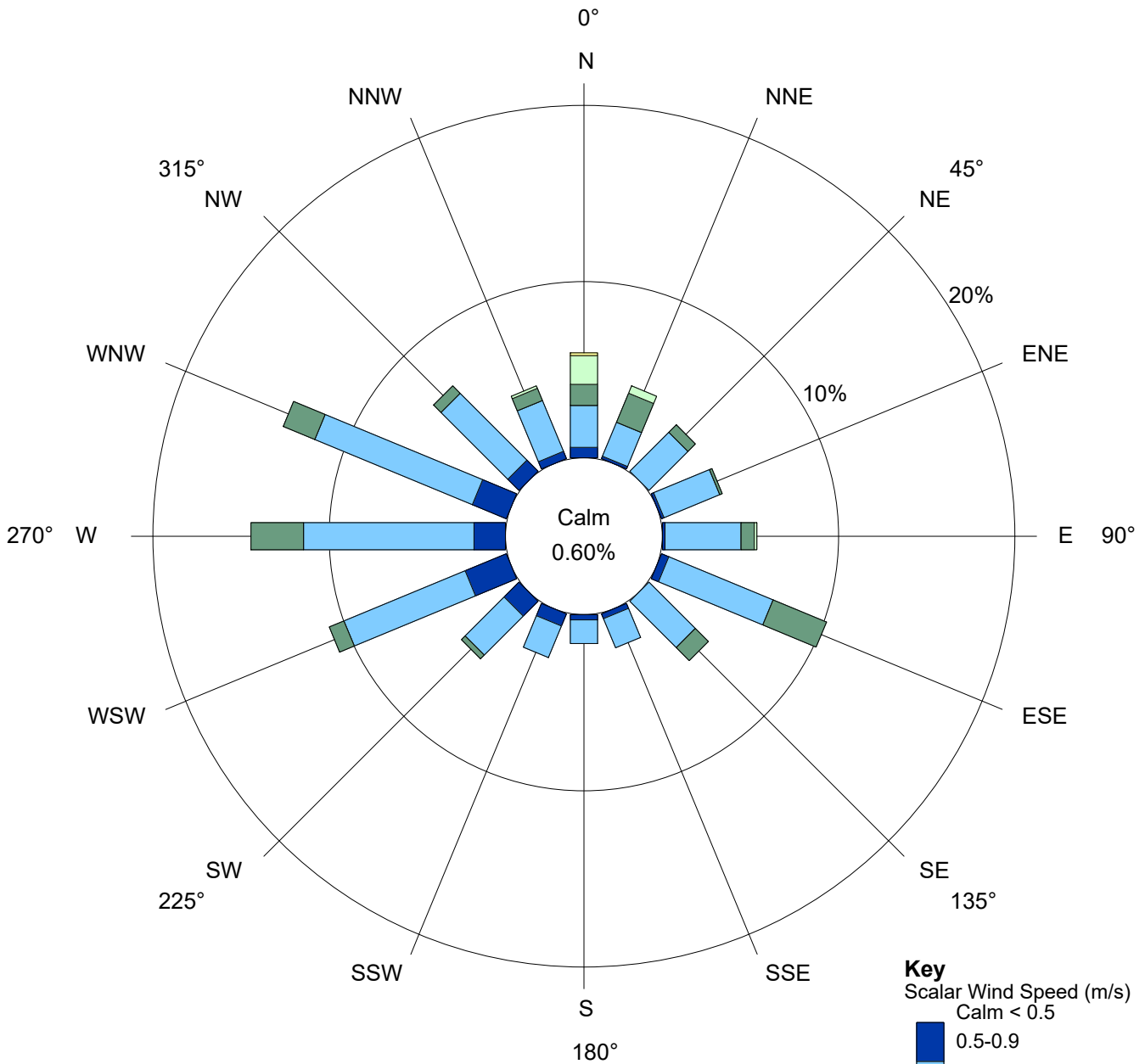
Automatic zeros and spans are performed daily on most ambient gas analyzers and ambient data can only be reported if the duration of these events is less than 25% of the hour. As a result, the maximum percent valid is generally less than 100%.

Figure 4-11

Colorado Air Toxics - C1

Wind Rose

02/01/2023 - 02/28/2023



100.0% Collected 100.0% Valid  
672 Possible /672 Collected /672 Valid  
Collection Statistics Include:  
Wind Speed and Wind Direction  
(SWS-1; SWD-1)

Figure 4-12

Colorado Air Toxics - C1 (Pueblo) - Hourly Met Data

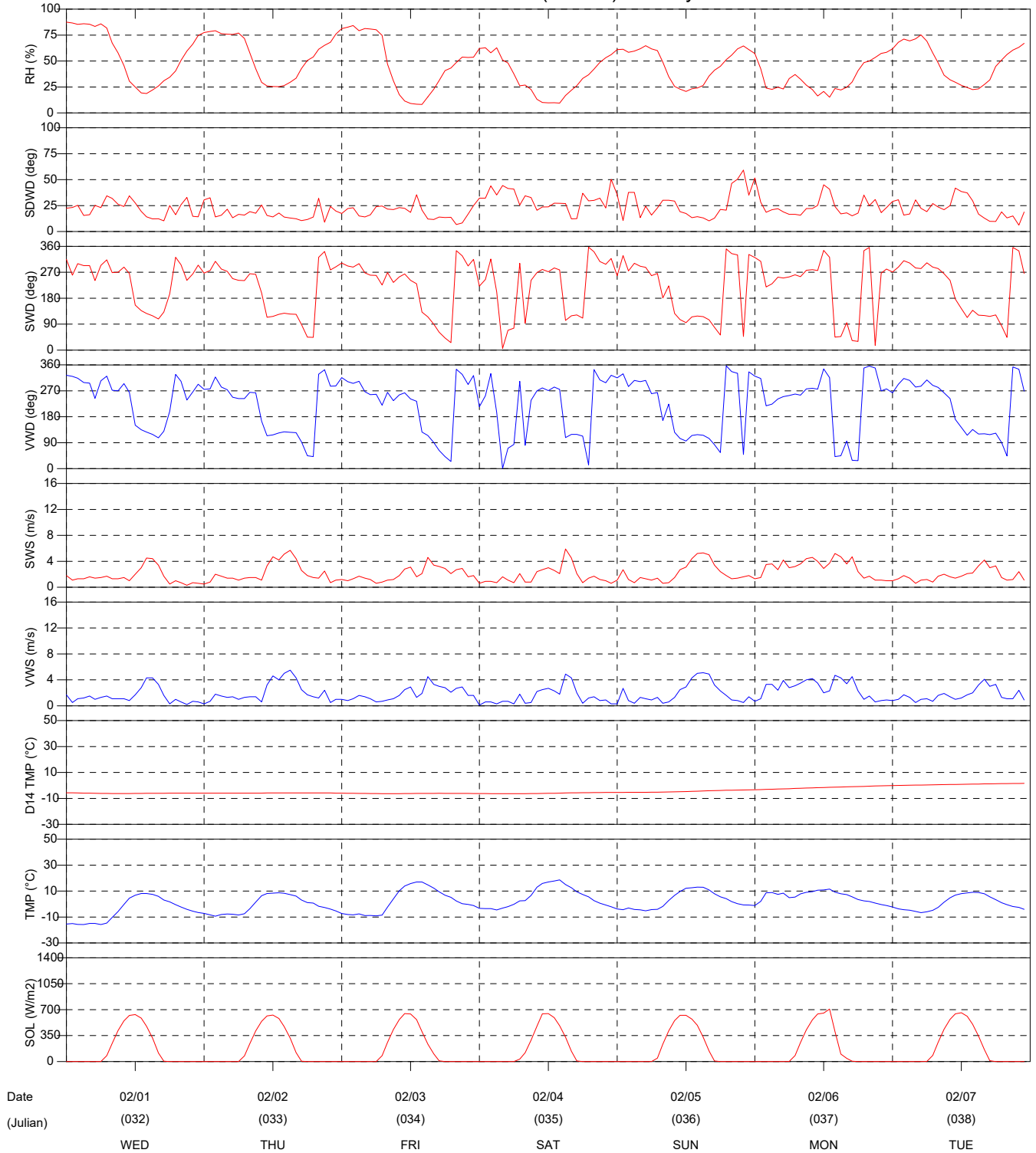


Figure 4-13

Colorado Air Toxics - C1 (Pueblo) - Hourly Met Data

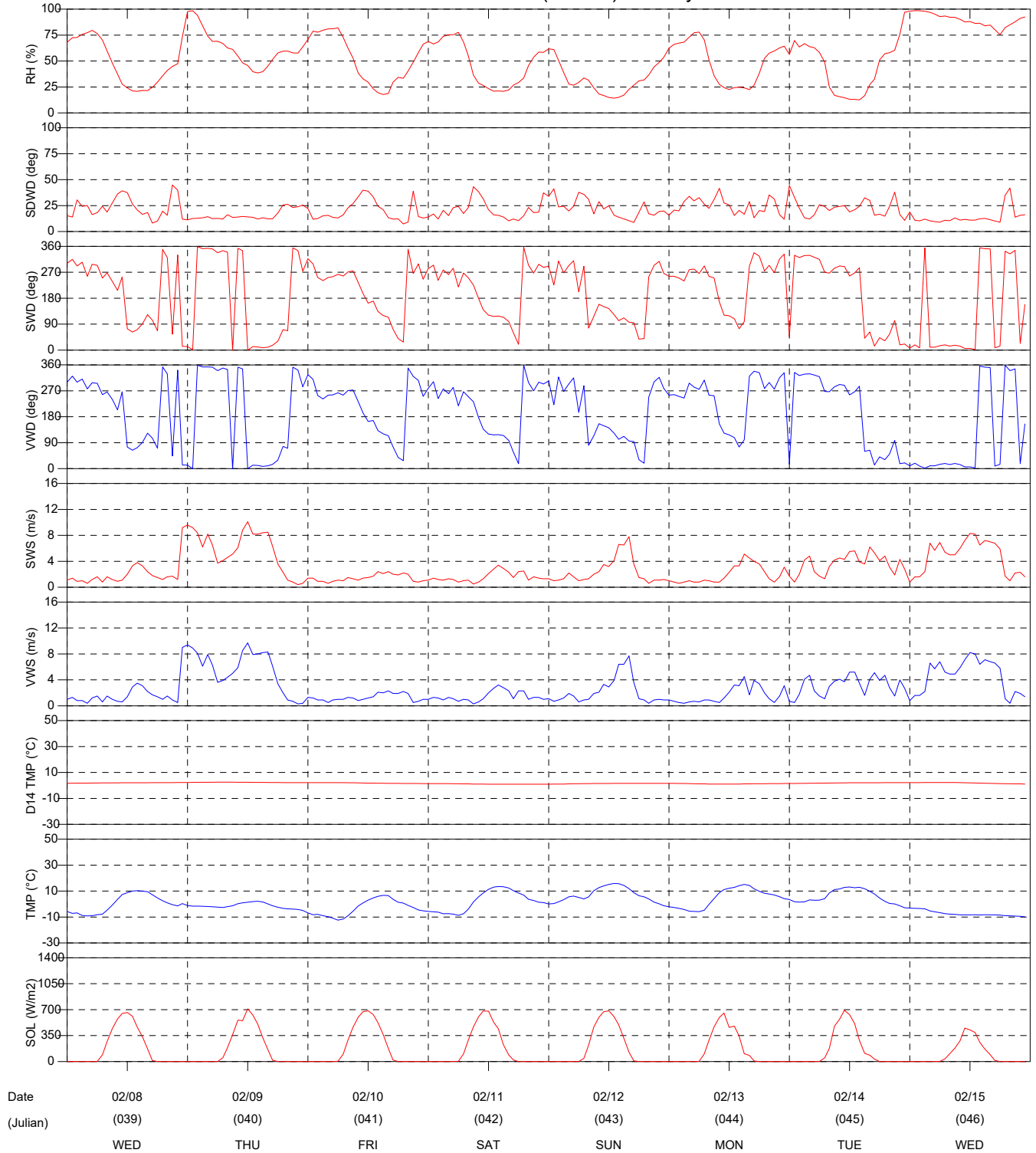
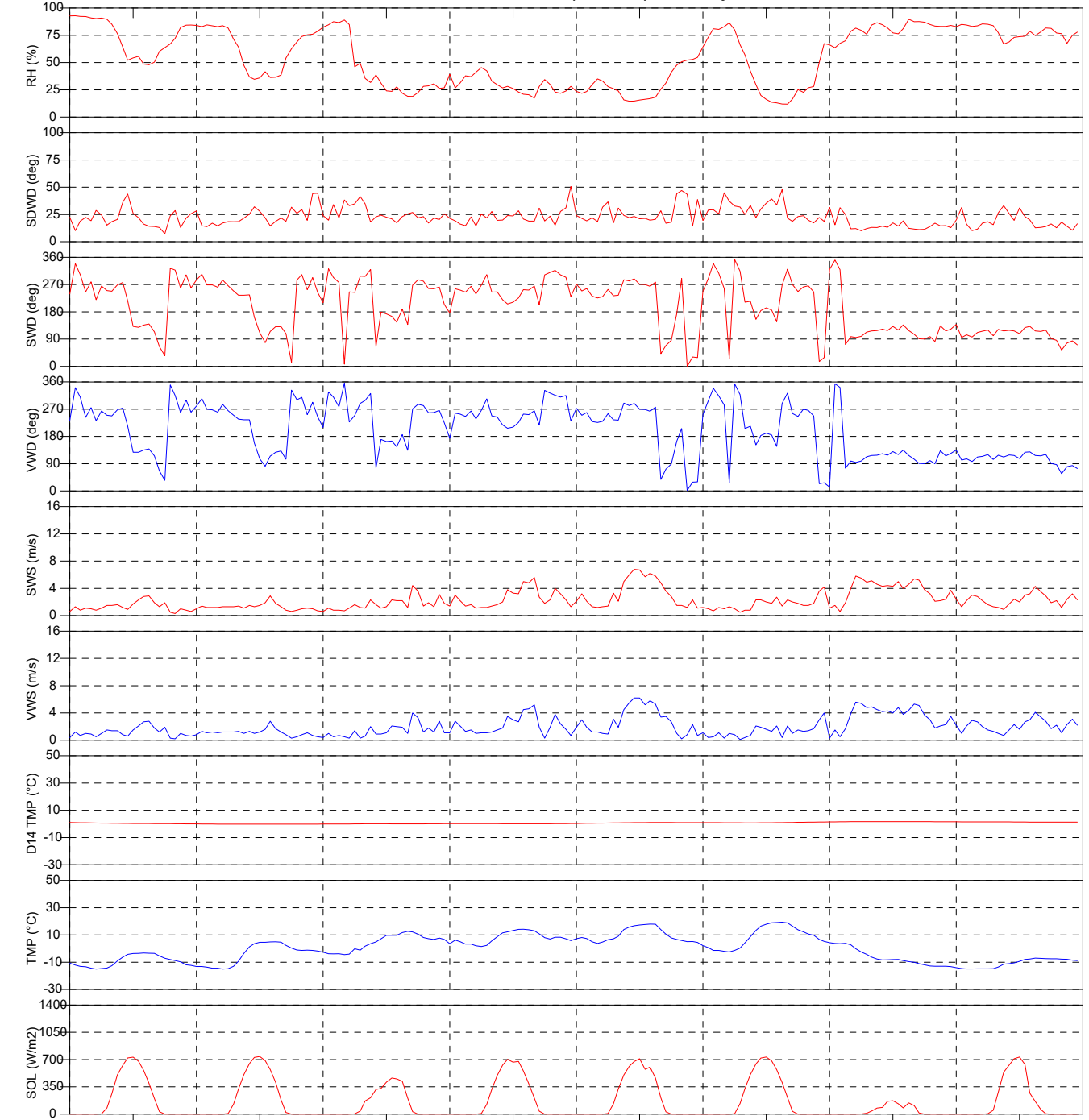


Figure 4-14

Colorado Air Toxics - C1 (Pueblo) - Hourly Met Data



Date	02/16	02/17	02/18	02/19	02/20	02/21	02/22	02/23
(Julian)	(047)	(048)	(049)	(050)	(051)	(052)	(053)	(054)
	THU	FRI	SAT	SUN	MON	TUE	WED	THU

Figure 4-15

Colorado Air Toxics - C1 (Pueblo) - Hourly Met Data

