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

**December 1 – December 20, 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 (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 December 1 through December 20, 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 December 1 through December 20, 2023, timeframe include the following:

- The HCN sample for the C1 site on 12/06/2023 was reported as samples above the detection limit by margins smaller than the expected uncertainty of the measurements. This sample are likely a non-detect.
- Sampling ended on 12/20/2023. All equipment was removed from the monitoring sites.

Significant deviations from the established sampling schedule include:

- None

Sampling issues or corrective actions taken include:

- The duplicate HCN sample on 12/04/2023 at the A1 site (Eagle Pointe Recreation Center) was invalidated due to a faulty sampling pump.

### 3.0 AIR TOXICS SAMPLING STATISTICS

Statistics for samples collected during the December 1 to December 20, 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  
December 1 to December 20, 2023

Sampling Region	Site	Monthly		Quarterly	
		Collected	Required	Collected	Required
A	A1	2	1	6	3
B	B1	2	1	6	3
C	C1	2	1	6	3

Table 3-2

Benzene Duplicate Sample and Field Blank Collection  
December 1 to December 20, 2023

Duplicate		Field Blank	
Collected	%	Collected	%
0	0%	0	0%

Table 3-3

14-day H<sub>2</sub>S Sample Collection  
December 1 to December 20, 2023

Sampling Region	Site	Monthly		Quarterly	
		Collected	Required	Collected	Required
A	A1	2	1	6	3
B	B1	2	1	6	3
C	C1	2	1	6	3

Table 3-4  
H<sub>2</sub>S Duplicate Sample and Field Blank Collection  
December 1 to December 20, 2023

<b>Duplicate</b>		<b>Field Blank</b>	
<b>Collected</b>	<b>%</b>	<b>Collected</b>	<b>%</b>
0	0%	0	0%

Table 3-5  
HCN Sample Collection  
December 1 to December 20, 2023

		<b>Monthly</b>		<b>Quarterly</b>	
<b>Sampling Region</b>	<b>Site</b>	<b>Collected</b>	<b>Required</b>	<b>Collected</b>	<b>Required</b>
A	A1	5	6*	26	26
B	B1	5	6*	25	26
C	C1	5	6*	26	26

\* prorated for a 20-day period

Table 3-6  
HCN Duplicate Sample and Field Blank Collection  
December 1 to December 20, 2023

<b>Duplicate</b>		<b>Field Blank</b>	
<b>Collected</b>	<b>%</b>	<b>Collected</b>	<b>%</b>
0	0%	1	7%

#### 4.0 AIR TOXIC DATA SUMMARIES

The tables below summarize the air toxics data collected during the period of December 1 to December 20, 2023.

Table 4-1  
14-Day Benzene Data  
December 1 to December 20, 2023

<b>SITE</b>	<b>Sampling Start Day</b>	<b>Sampling End Day</b>	<b>Days</b>	<b>Concentration (ppb)</b>	<b>MDL (ppb)</b>	<b>Notes</b>
A1	11/22/2023	12/6/2023	14	0.392	0.0605	
A1	12/6/2023	12/20/2023	14	0.37	0.0587	
B1	11/22/2023	12/6/2023	14	0.452	0.0606	
B1	12/6/2023	12/20/2023	14	0.434	0.0591	
C1	11/22/2023	12/6/2023	14	0.143	0.0606	
C1	12/6/2023	12/20/2023	14	0.213	0.0604	
		Maximum		0.452		
		Minimum		0.143		
		Average		0.334		



Table 4-2  
 14-Day H<sub>2</sub>S Data  
 December 1 to December 20, 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	11/22/2023	12/6/2023	14	0.264	0.04	
A1	12/6/2023	12/20/2023	14	0.321	0.04	
B1	11/22/2023	12/6/2023	14	0.575	0.04	
B1	12/6/2023	12/20/2023	14	0.931	0.04	
C1	11/22/2023	12/6/2023	14	0.135	0.04	
C1	12/6/2023	12/20/2023	14	0.156	0.04	
		Maximum		0.931		
		Minimum		0.135		
		Average		0.397		

Table 4-3  
HCN Data  
December 1 to December 20, 2023

<b>SITE</b>	<b>Sampling Date</b>	<b>Duration (min)</b>	<b>Concentration (ppb)</b>	<b>MDL (ppb)</b>	<b>Notes</b>
A1	12/04/2023 04:00	431	ND	0.9	
A1	12/04/2023 04:00	0	ND	0.9	Blank
A1	12/06/2023 07:20	442	ND	0.9	
A1	12/07/2023 07:48	473	ND	0.8	
A1	12/12/2023 04:21	400	ND	0.9	
A1	12/18/2023 08:37	412	ND	0.9	
B1	12/04/2023 03:30	494	ND	0.8	
B1	12/06/2023 06:48	495	ND	0.8	
B1	12/07/2023 07:21	525	ND	0.7	
B1	12/12/2023 03:55	444	ND	0.8	
B1	12/18/2023 08:15	450	ND	0.8	
C1	12/4/2023 6:15	180	ND	2.2	
C1	12/6/2023 9:38	180	ND	2.1	
C1	12/7/2023 10:14	187	ND	2.0	
C1	12/12/2023 6:15	180	ND	2.0	
C1	12/18/2023 10:35	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 December 1 to December 20, 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

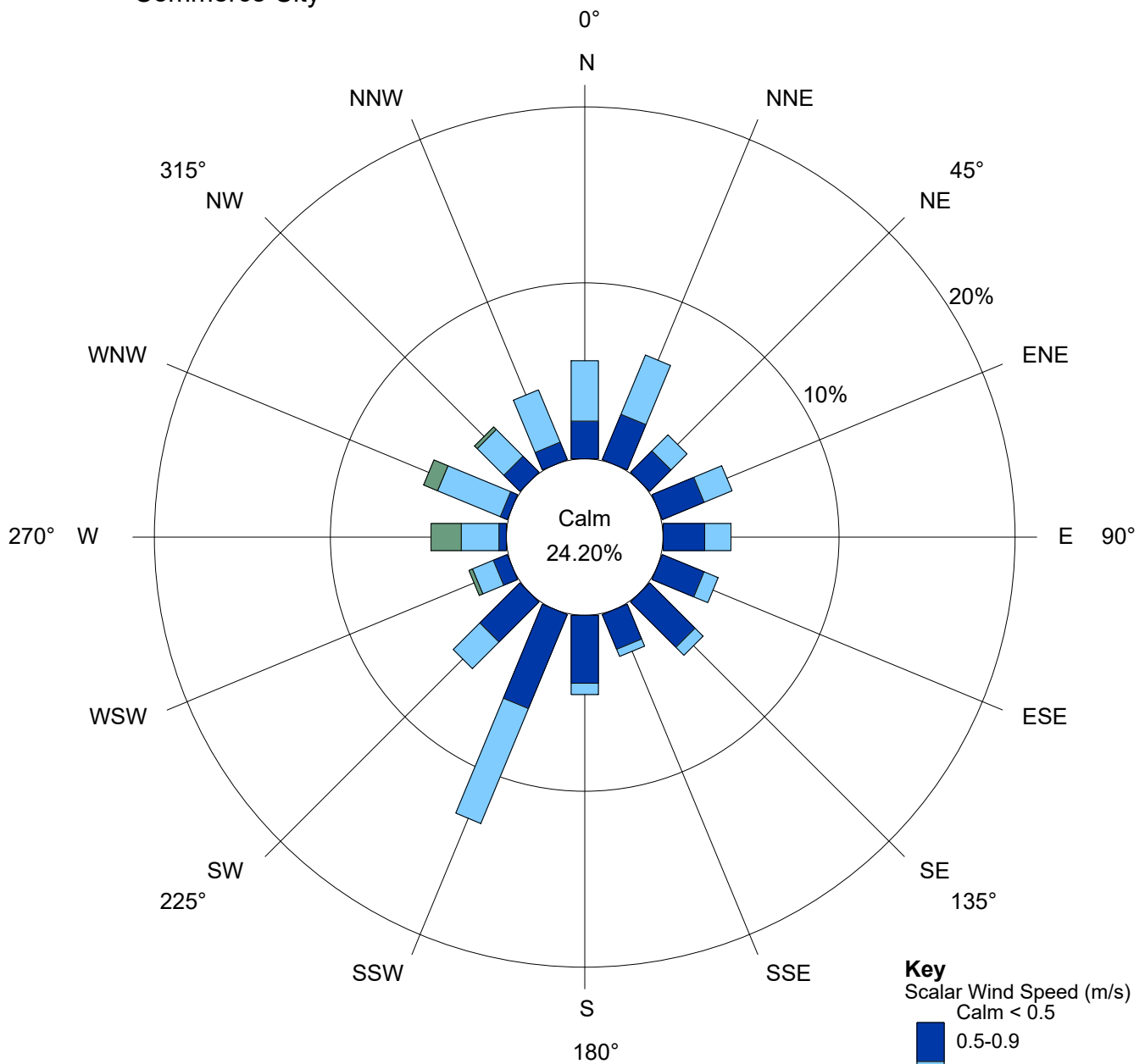
Table 4-4

Data Collection Statistics							
Colorado Air Toxics - A1 Commerce City							
12/01/2023 - 12/20/2023							
Parameter	Interval	Par Code	No. Possible	No. Collected	% Collected	No. Valid	% Valid
Relative Humidity	hourly	RH	471	469	99.6	469	99.6
Standard Deviation for Wind Direction	hourly	SDWD	471	467	99.2	467	99.2
Solar Radiation	hourly	SOL	471	469	99.6	469	99.6
Scalar Wind Direction	hourly	SWD	471	467	99.2	467	99.2
Scalar Wind Speed	hourly	SWS	471	467	99.2	467	99.2
Ambient Temperature	hourly	TMP	471	469	99.6	469	99.6
Vector Wind Direction	hourly	VWD	471	467	99.2	467	99.2
Vector Wind Speed	hourly	VWS	471	467	99.2	467	99.2

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 4-1  
 Colorado Air Toxics - A1  
 Commerce City  
 Wind Rose  
 12/01/2023 - 12/20/2023



99.2% Collected 99.2% Valid  
 471 Possible /467 Collected /467 Valid  
 Collection Statistics Include:  
 Wind Speed and Wind Direction  
 (SWS-1; SWD-1)

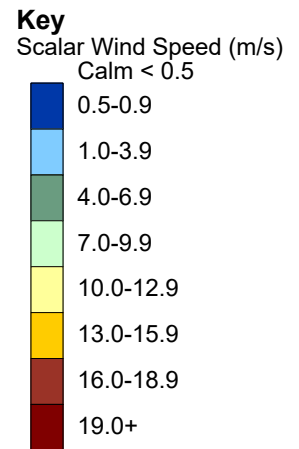


Figure 4-2  
 Colorado Air Toxics - A1 (Commerce City) - Hourly Meteorological Data  
 December 2023

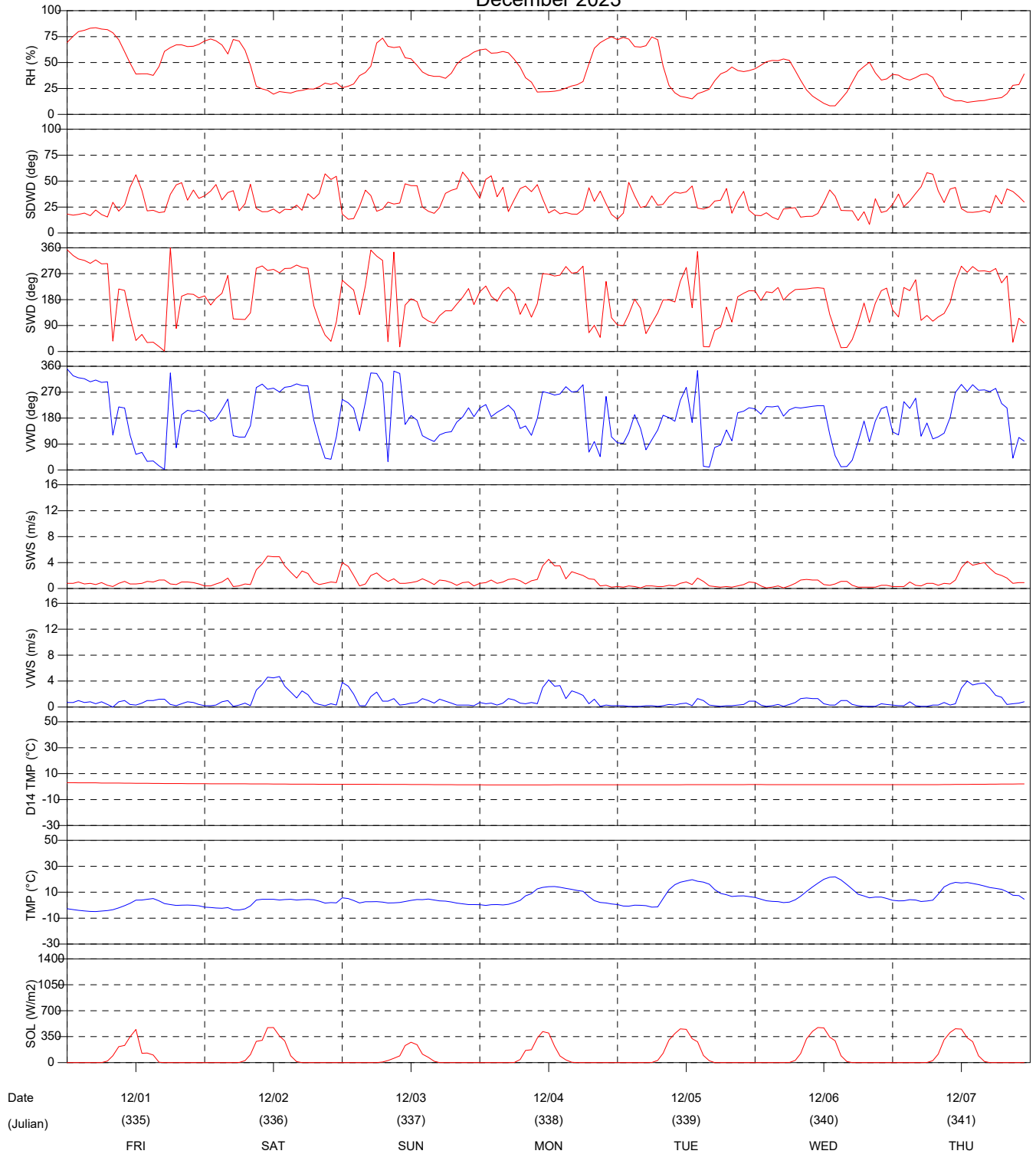


Figure 4-3  
 Colorado Air Toxics - A1 (Commerce City) - Hourly Meteorological Data  
 December 2023

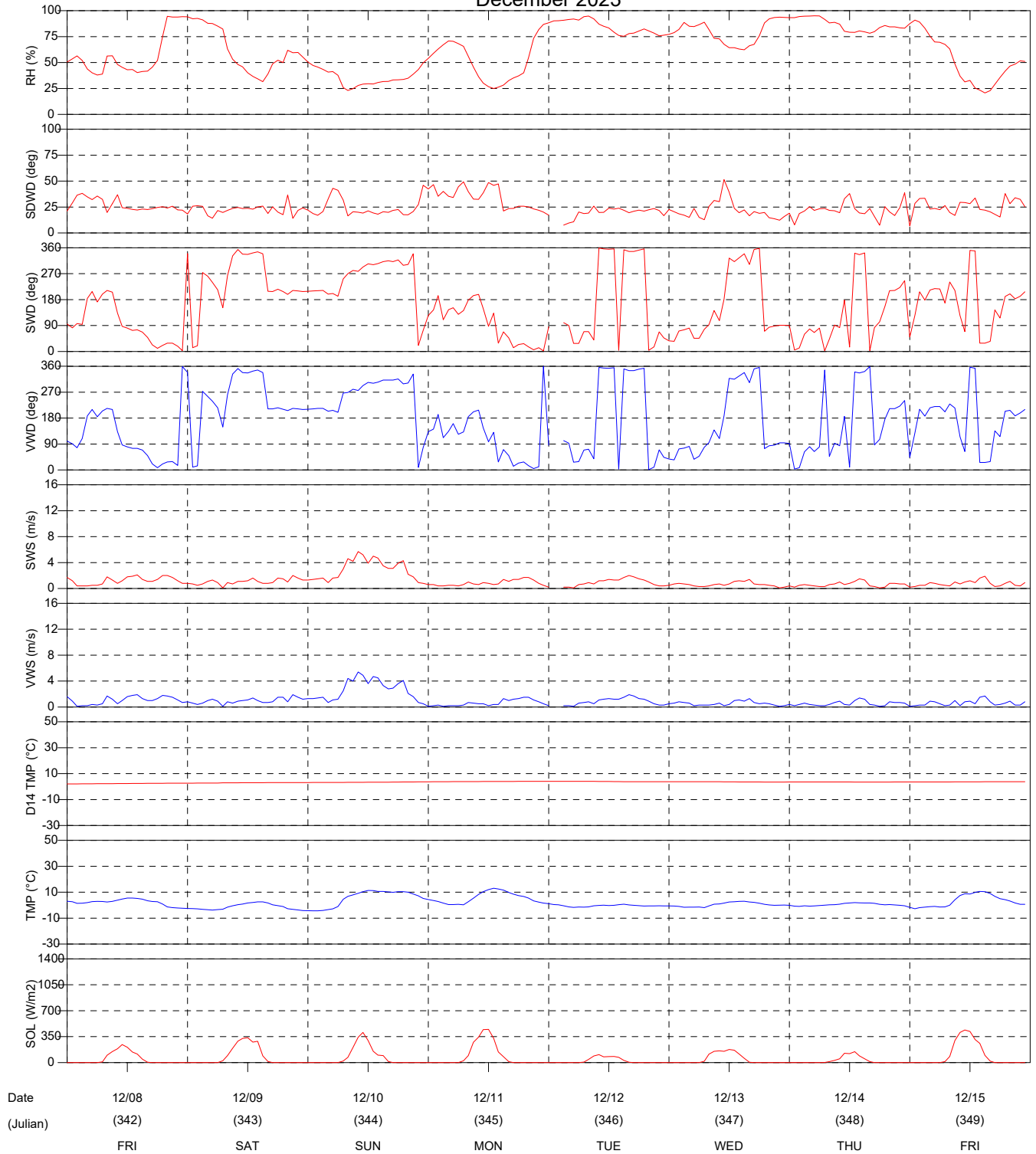


Figure 4-4  
 Colorado Air Toxics - A1 (Commerce City) - Hourly Meteorological Data  
 December 2023

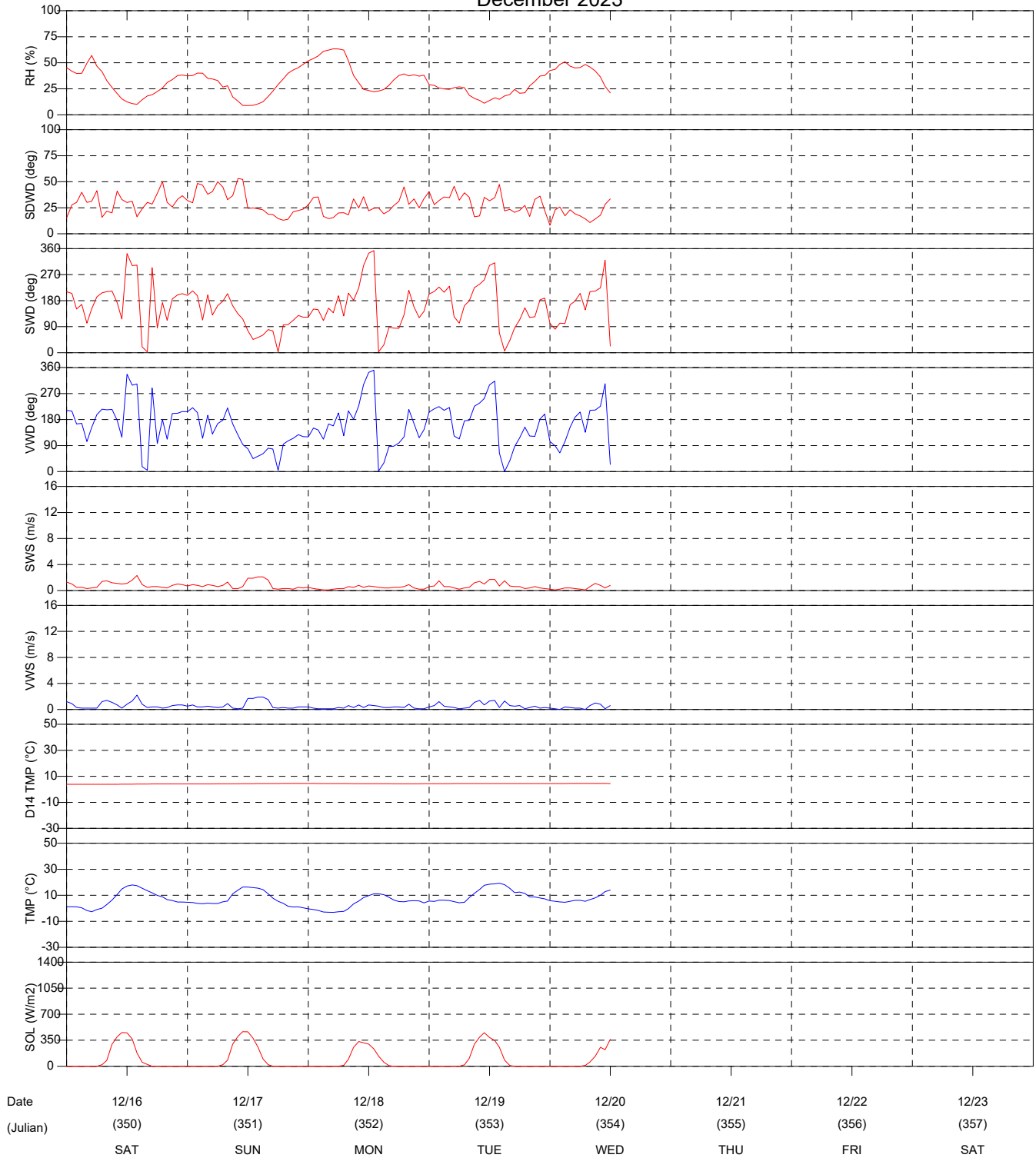




Table 4-5

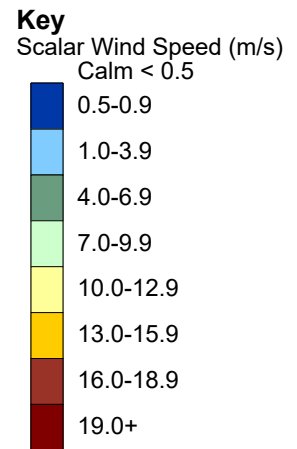
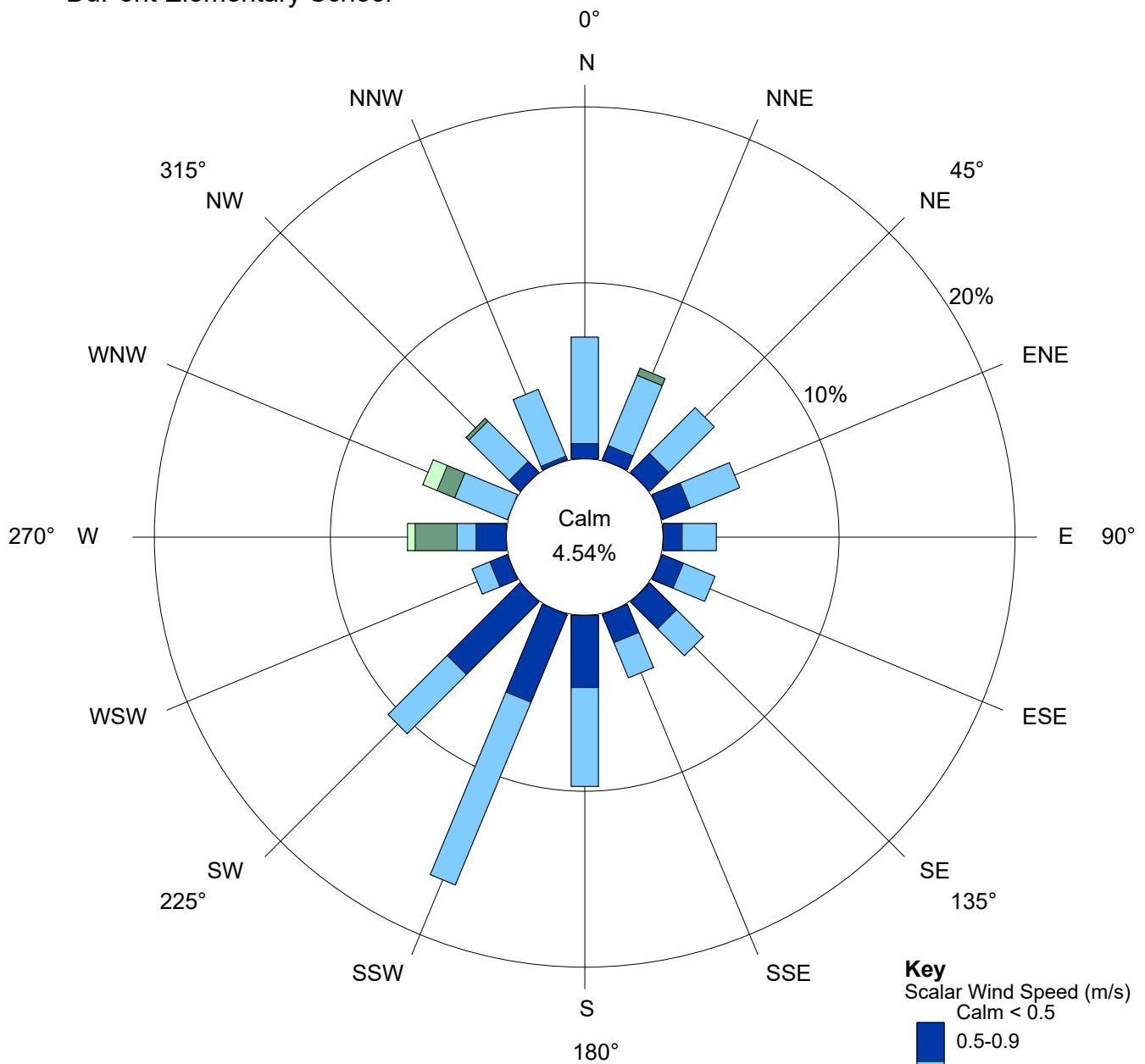
Data Collection Statistics							
Colorado Air Toxics - B1 DuPont Elementary School							
12/01/2023 - 12/20/2023							
Parameter	Interval	Par Code	No. Possible	No. Collected	% Collected	No. Valid	% Valid
Relative Humidity	hourly	RH	469	467	99.6	467	99.6
Standard Deviation for Wind Direction	hourly	SDWD	469	463	98.7	463	98.7
Solar Radiation	hourly	SOL	469	467	99.6	467	99.6
Scalar Wind Direction	hourly	SWD	469	463	98.7	463	98.7
Scalar Wind Speed	hourly	SWS	469	463	98.7	463	98.7
Ambient Temperature	hourly	TMP	469	467	99.6	467	99.6
Vector Wind Direction	hourly	VWD	469	463	98.7	463	98.7
Vector Wind Speed	hourly	VWS	469	463	98.7	463	98.7

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 4-5  
Wind Rose

12/01/2023 - 12/20/2023



98.7% Collected 98.7% Valid  
469 Possible /463 Collected /463 Valid  
Collection Statistics Include:  
Wind Speed and Wind Direction  
(SWS-1; SWD-1)

Figure 4-6  
 Colorado Air Toxics - B1 (DuPont Elementary School) - Hourly Meteorological Data



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

December 2023

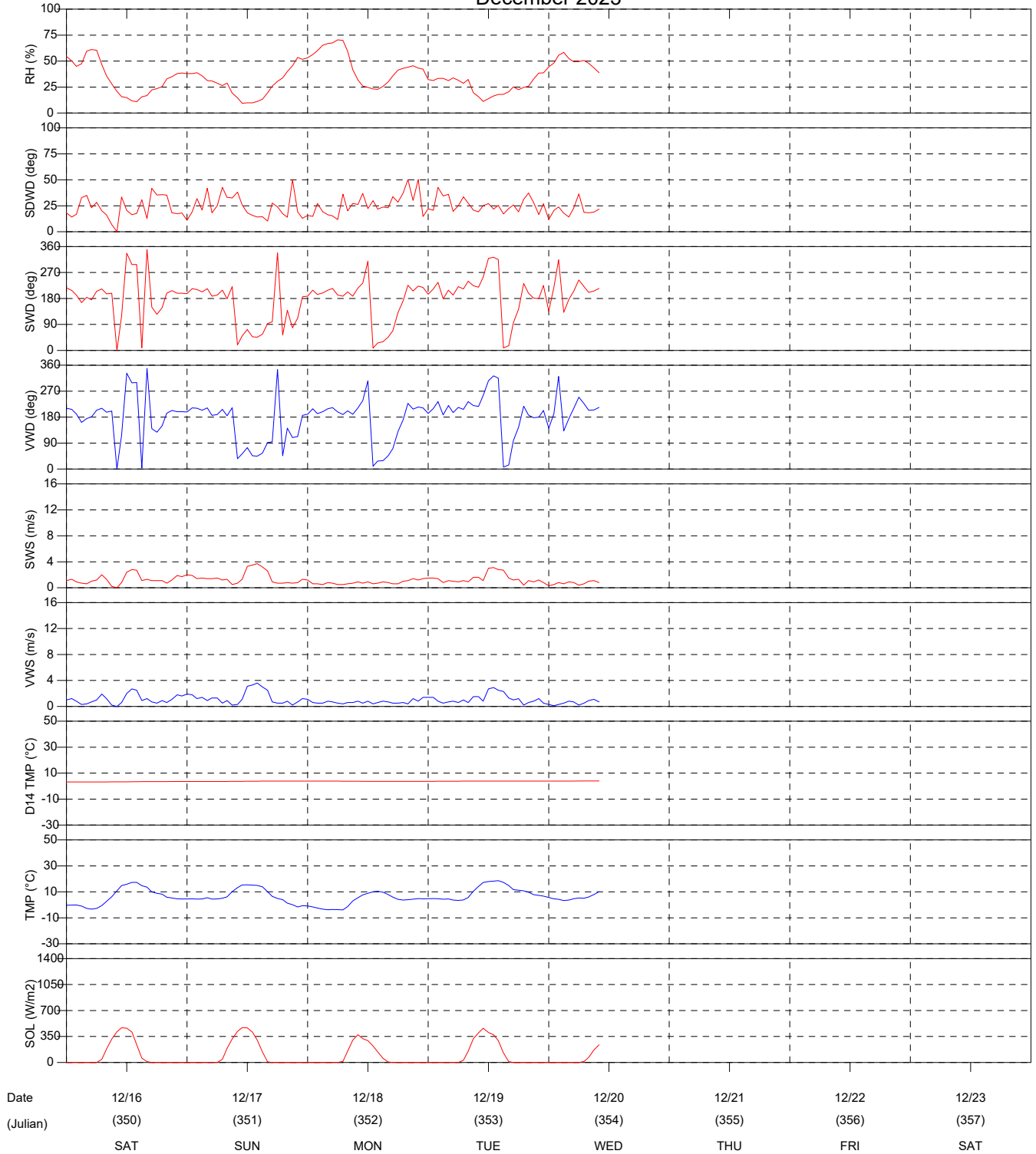
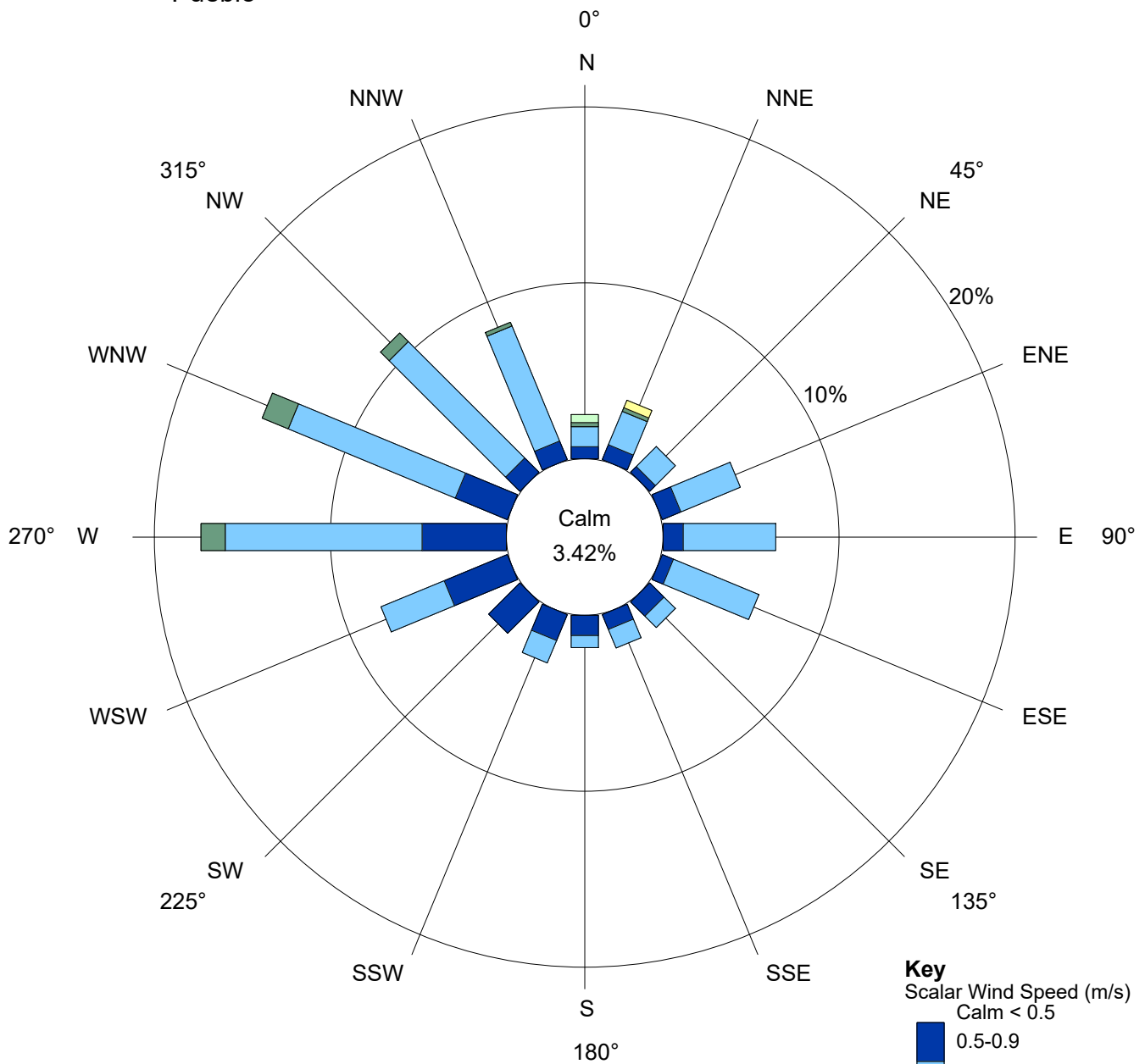


Table 4-6

Data Collection Statistics							
Colorado Air Toxics - C1 Pueblo							
12/01/2023 - 12/20/2023							
Parameter	Interval	Par Code	No. Possible	No. Collected	% Collected	No. Valid	% Valid
Relative Humidity	hourly	RH	465	463	99.6	463	99.6
Standard Deviation for Wind Direction	hourly	SDWD	465	438	94.2	438	94.2
Solar Radiation	hourly	SOL	465	463	99.6	463	99.6
Scalar Wind Direction	hourly	SWD	465	438	94.2	438	94.2
Scalar Wind Speed	hourly	SWS	465	438	94.2	438	94.2
Ambient Temperature	hourly	TMP	465	463	99.6	463	99.6
Vector Wind Direction	hourly	VWD	465	438	94.2	438	94.2
Vector Wind Speed	hourly	VWS	465	438	94.2	438	94.2

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%.



94.2% Collected 94.2% Valid  
 465 Possible /438 Collected /438 Valid  
 Collection Statistics Include:  
 Wind Speed and Wind Direction  
 (SWS-1; SWD-1)

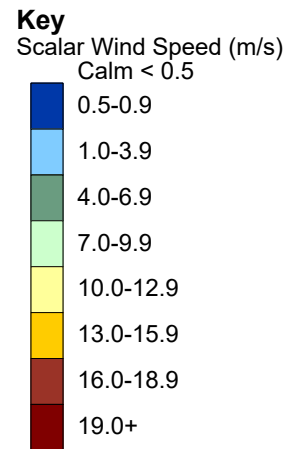


Figure 4-10  
 Colorado Air Toxics - C1 (Pueblo) - Hourly Met Data  
 December 2023

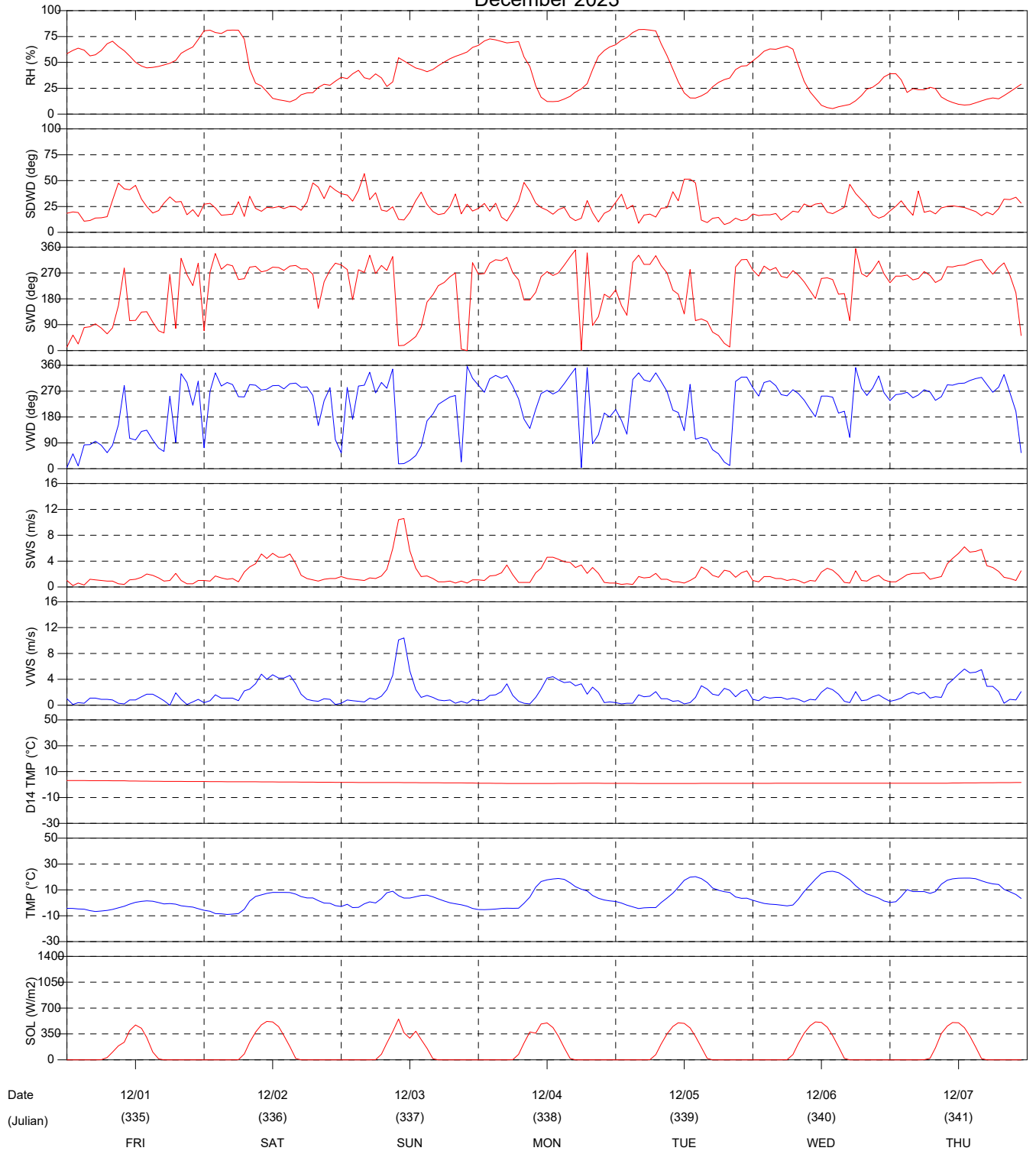




Figure 4-11  
 Colorado Air Toxics - C1 (Pueblo) - Hourly Met Data  
 December 2023

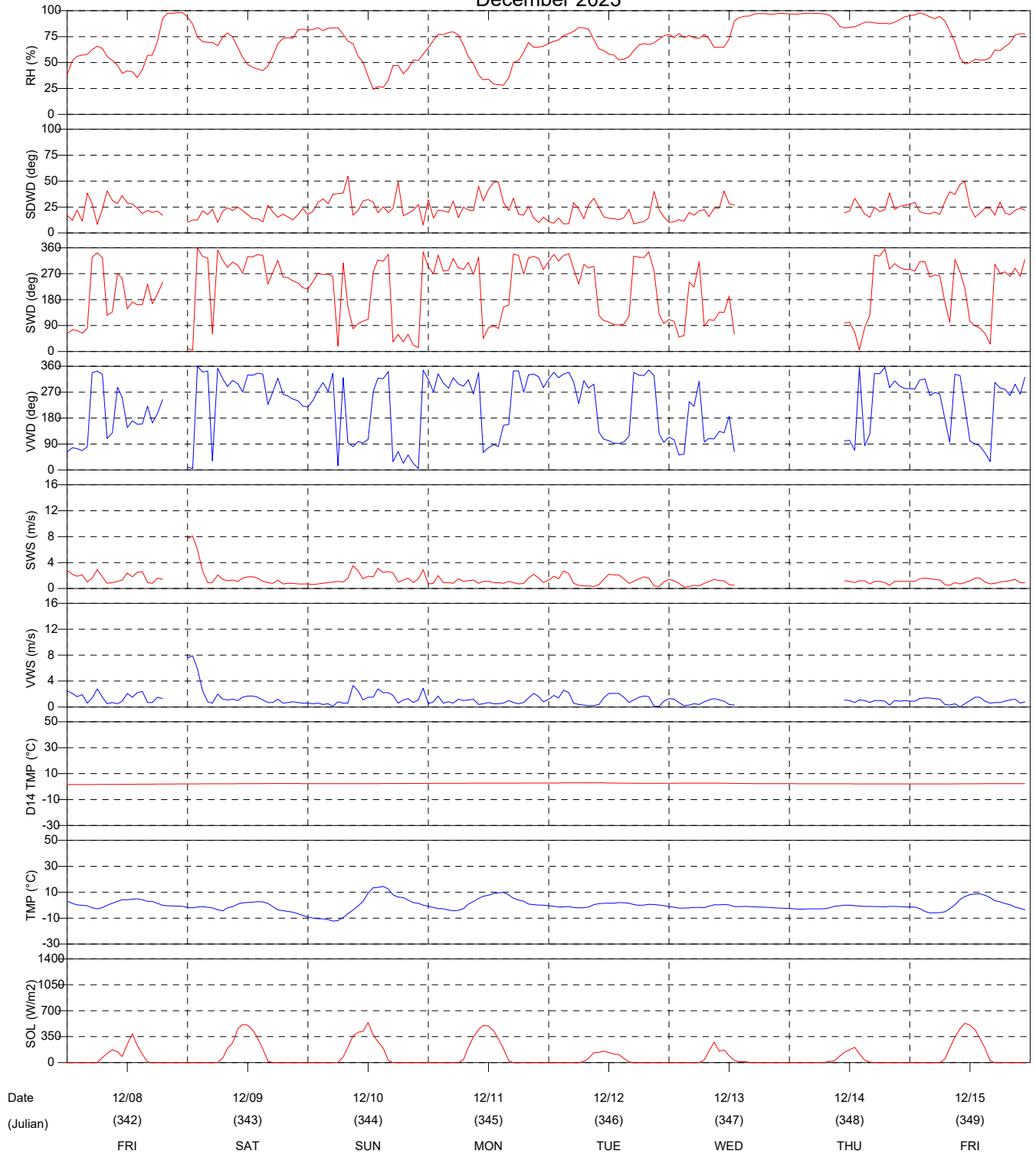


Figure 4-12  
 Colorado Air Toxics - C1 (Pueblo) - Hourly Met Data  
 December 2023

