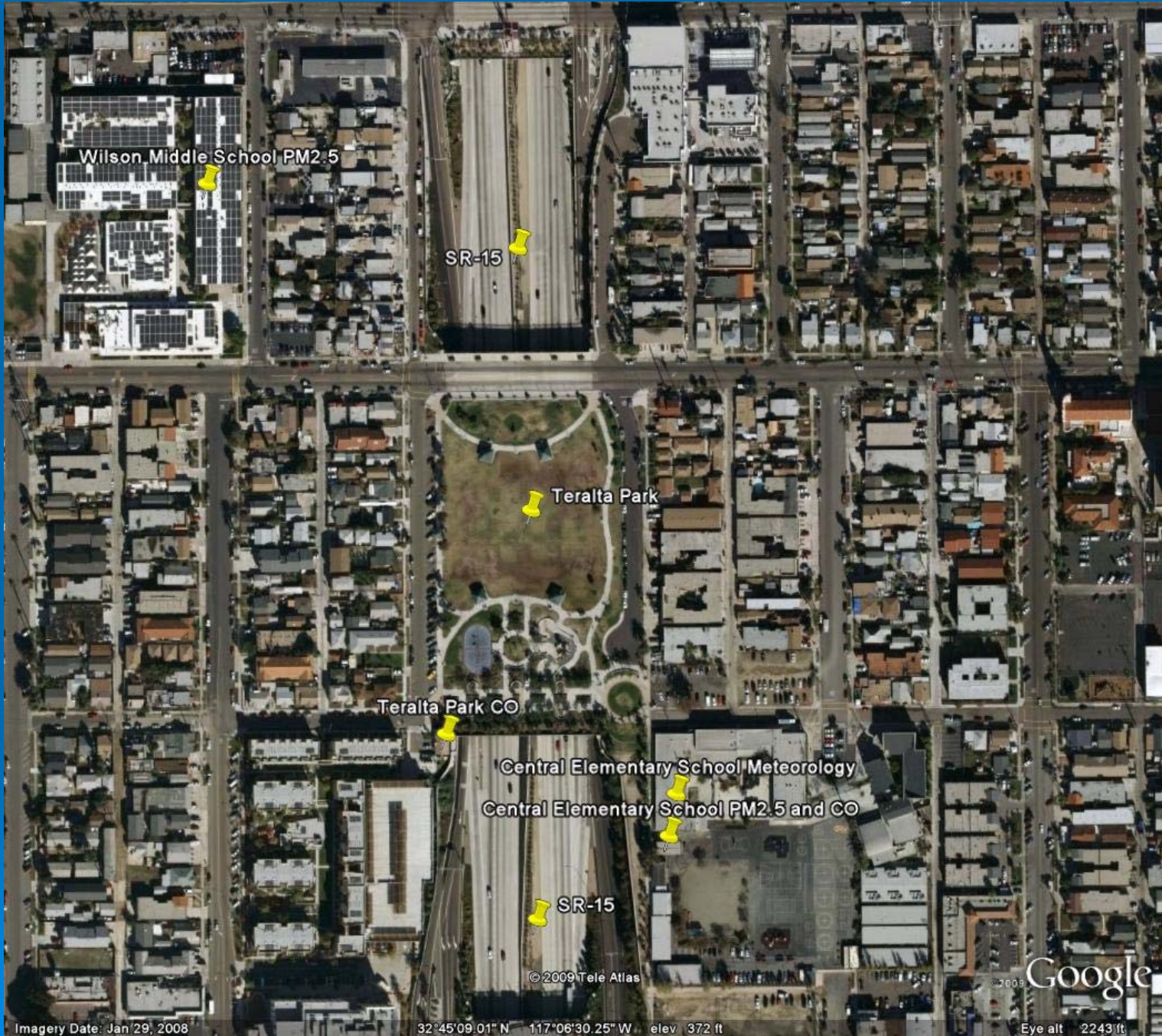


# **City Heights CO and PM2.5 Data Analysis Report**

**Bill Brick – Senior Meteorologist  
San Diego Air Pollution Control District**

**May 26, 2009**





Imagery Date: Jan 29, 2008

32°45'09.01" N 117°06'30.25" W elev. 372 ft

© 2009 Google

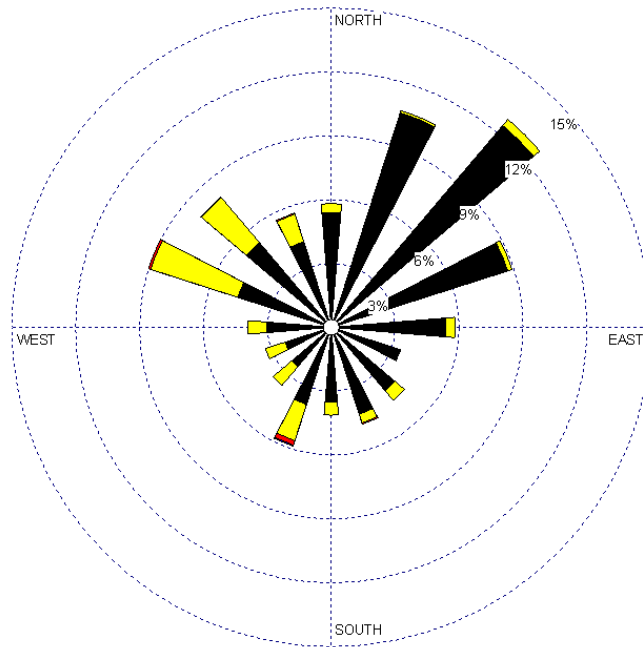
Eye alt 2243 ft

Parameter	Location	Start Date	End Date	Comments
CO	SW Corner Teralta Park	November 1, 2008	December 13, 2008	
CO	Central Elementary	December 22, 2008	January 30, 2009	
PM2.5 (EBAM)	Central Elementary	December 18, 2008	February 4, 2009	
PM2.5 (EBAM)	Wilson Middle School	December 16, 2008	February 4, 2009	
PM2.5 (FRM)	Central Elementary	December 20, 2008	January 29, 2009	January 13 Missing
Meteorology	Central Elementary	November 19, 2008	February 4, 2009	

Location	Latitude	Longitude	Elevation (ft MSL)
SW Corner Teralta Park CO	32° 45' 05" N	117° 06' 33" W	369
Central Elementary CO	32° 45' 03" N	117° 06' 29" W	367
Central Elementary PM2.5 (EBAM and FRM)	32° 45' 03" N	117° 06' 29" W	367
Wilson Middle School PM2.5 (EBAM)	32° 45' 15" N	117° 06' 39" W	375
Central Elementary Meteorological Station	32° 45' 04" N	117° 06' 29" W	368

WIND ROSE PLOT:  
**Station # 2008 - Central Elementary Sch, CA**

DISPLAY:  
**Wind Speed  
 Direction (blowing from)**



WIND SPEED  
 (Knots)

- >= 22
- 17 - 21
- 11 - 17
- 7 - 11
- 4 - 7
- 1 - 4

Calm: 0.00%

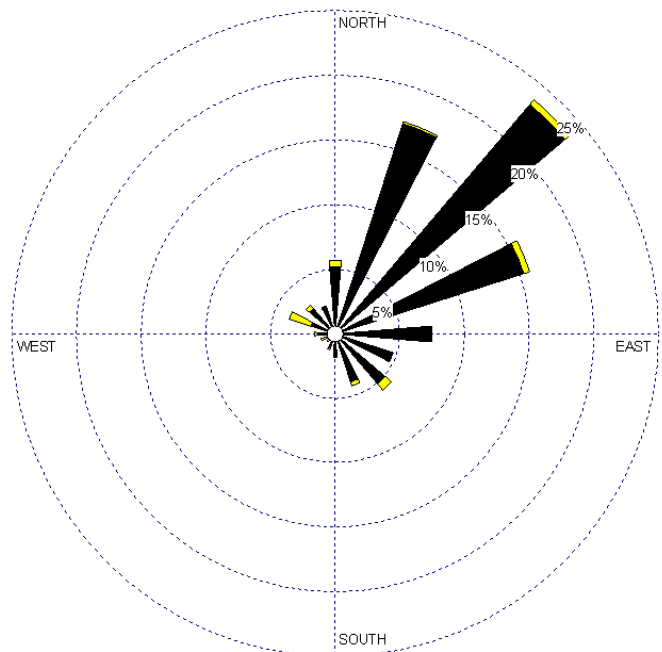
COMMENTS:	DATA PERIOD: <b>2008-2009 Jan 1 - Dec 31 00:00 - 23:00</b>	COMPANY NAME:	
	CALM WINDS: <b>0.00%</b>	MODELER:	
	AVG. WIND SPEED: <b>2.70 Knots</b>	TOTAL COUNT: <b>1845 hrs.</b>	
		DATE: <b>2/18/2009</b>	PROJECT NO.:

WIND ROSE PLOT:

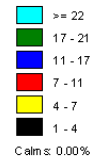
Station # 2008 - Central Elementary Sch, CA

DISPLAY:

Wind Speed  
Direction (blowing from)



WIND SPEED  
(knots)



COMMENTS:

DATA PERIOD:

2008-2009  
Jan 1 - Dec 31  
00:00 - 07:00

COMPANY NAME:

MODELER:

CALM WINDS:

0.00%

TOTAL COUNT:

616 hrs.

AVG. WIND SPEED:

2.22 Knots

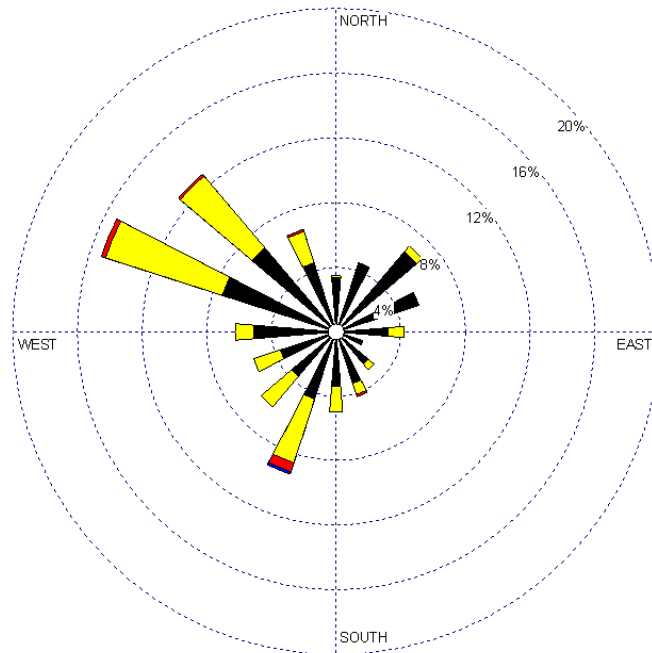
DATE:

2/18/2009

PROJECT NO.:

WIND ROSE PLOT:  
**Station # 2008 - Central Elementary Sch, CA**

DISPLAY:  
**Wind Speed  
 Direction (blowing from)**



WIND SPEED  
 (Knots)

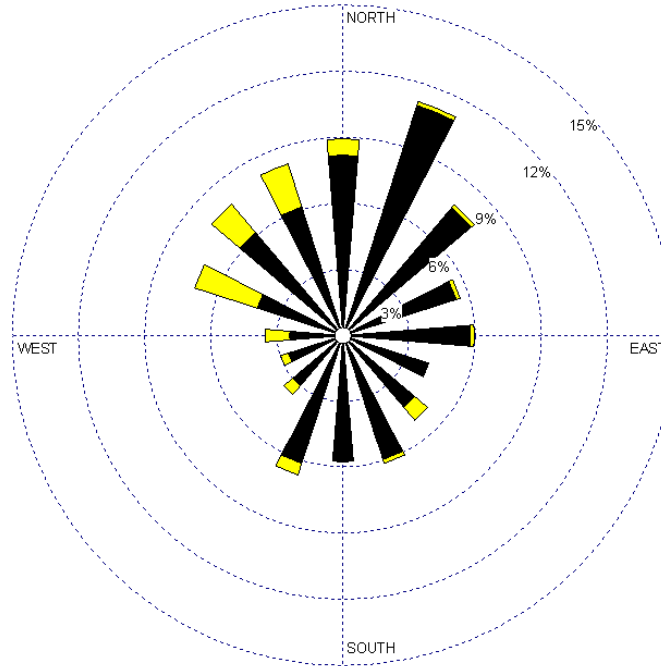
- >= 22
- 17 - 21
- 11 - 17
- 7 - 11
- 4 - 7
- 1 - 4

Calm: 0.00%

COMMENTS:	DATA PERIOD: <b>2008-2009 Jan 1 - Dec 31 08:00 - 16:00</b>	COMPANY NAME:	
	CALM WINDS: <b>0.00%</b>	MODELER:	
	AVG. WIND SPEED: <b>3.32 Knots</b>	TOTAL COUNT: <b>690 hrs.</b>	DATE: <b>2/18/2009</b>

WIND ROSE PLOT:  
**Station # 2008 - Central Elementary Sch, CA**

DISPLAY:  
**Wind Speed  
 Direction (blowing from)**



WIND SPEED  
(Knots)

- >= 22
- 17 - 21
- 11 - 17
- 7 - 11
- 4 - 7
- 1 - 4

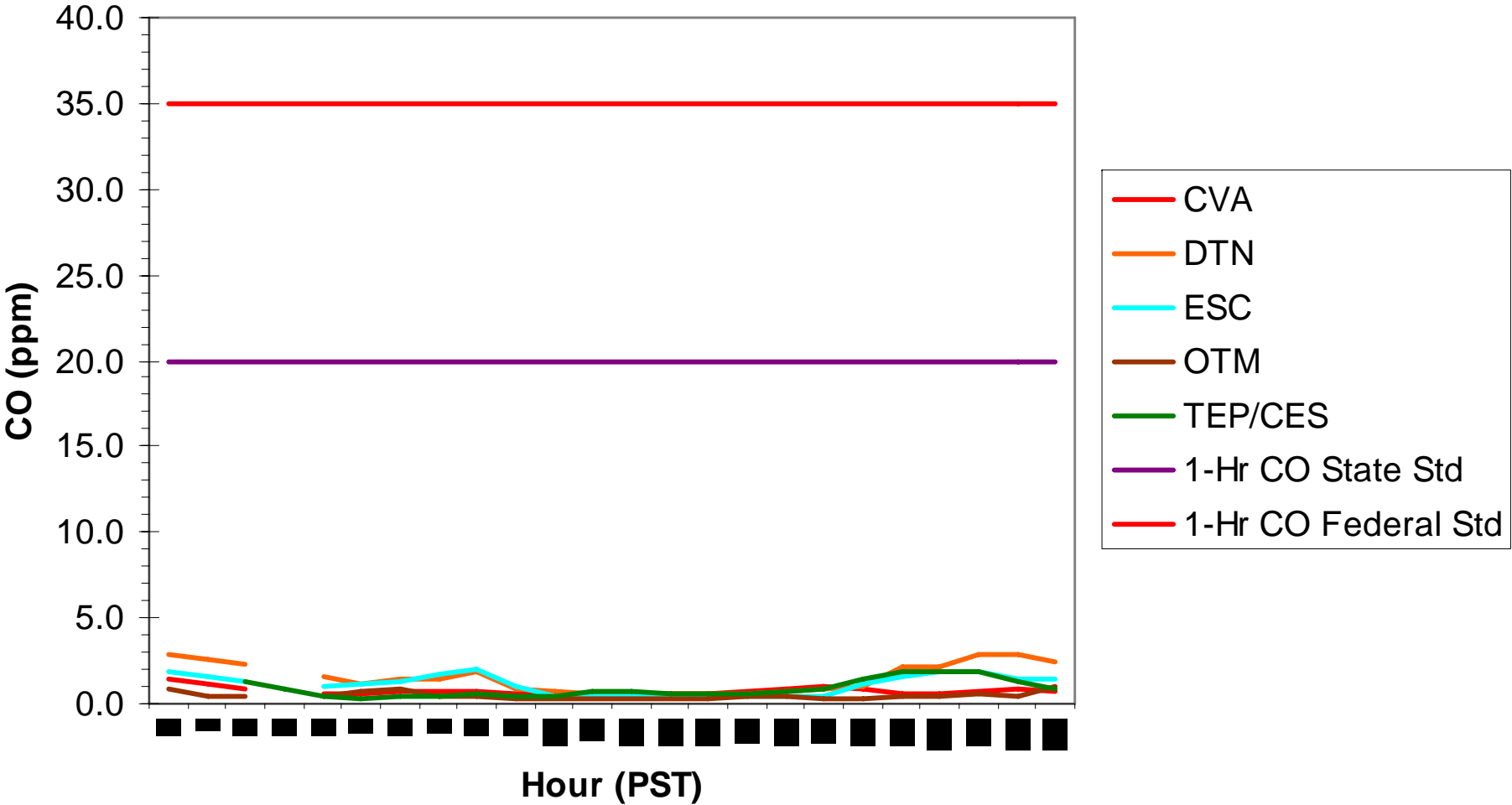
Calm s: 0.00%

COMMENTS:	DATA PERIOD: <b>2008-2009 Jan 1 - Dec 31 17:00 - 23:00</b>	COMPANY NAME:	
	CALM WINDS: <b>0.00%</b>	MODELER:	TOTAL COUNT: <b>539 hrs.</b>
	AVG. WIND SPEED: <b>2.45 Knots</b>	DATE: <b>2/18/2009</b>	

### Carbon Monoxide Standards

	California Standards	Federal Standards
1-Hour	20 ppm	35 ppm
8-Hour	9.0 ppm	9 ppm

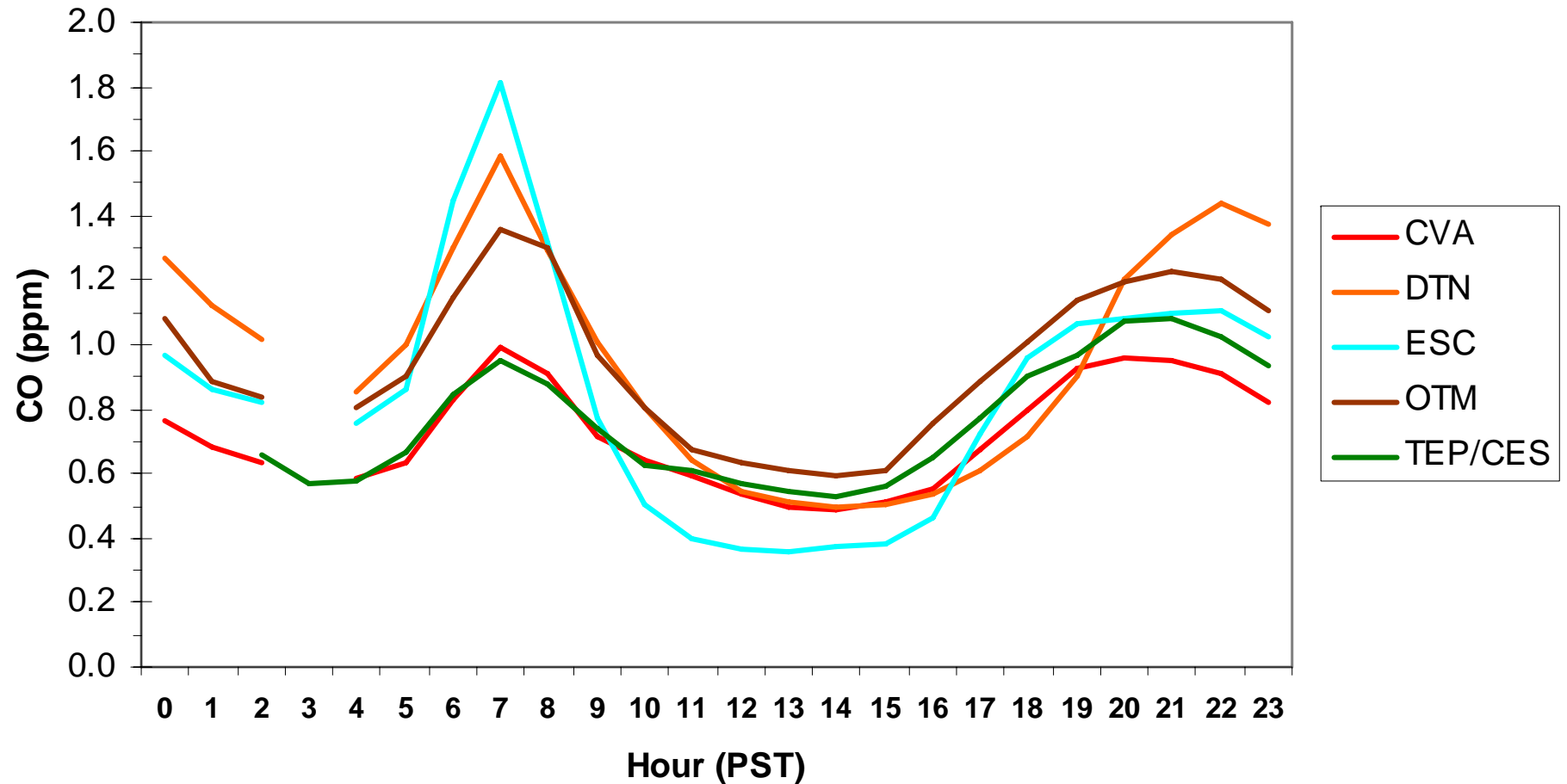
### Hourly CO Data for: Sunday, 1/18/2009



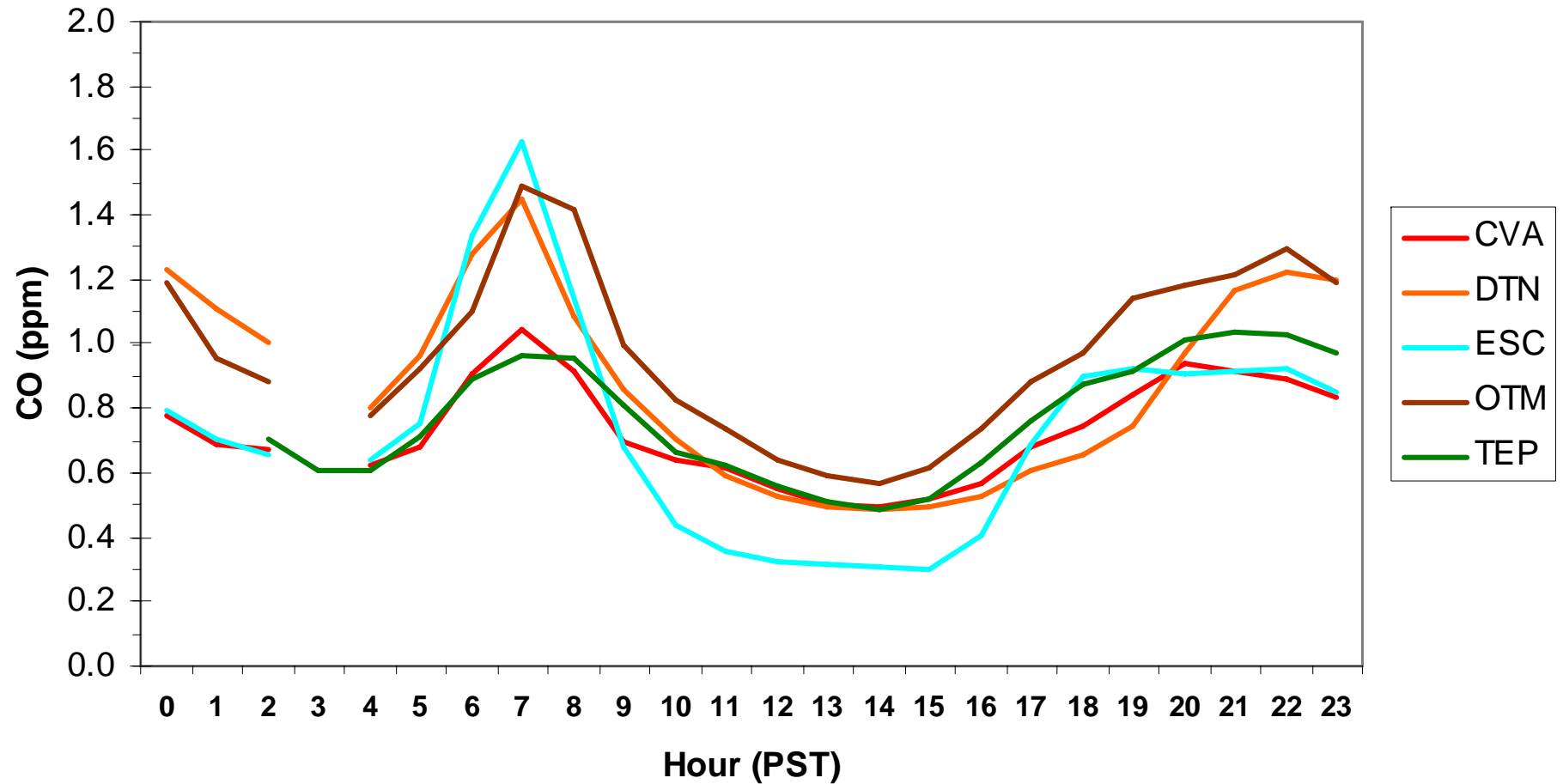
## Carbon Monoxide Statistics

	CVA	DTN	ESC	OTM	TEP/CES
1-hour Maximum (ppm)	2.5	4.0	4.4	4.6	3.1
Average (ppm)	0.7	1.0	0.9	0.9	0.8

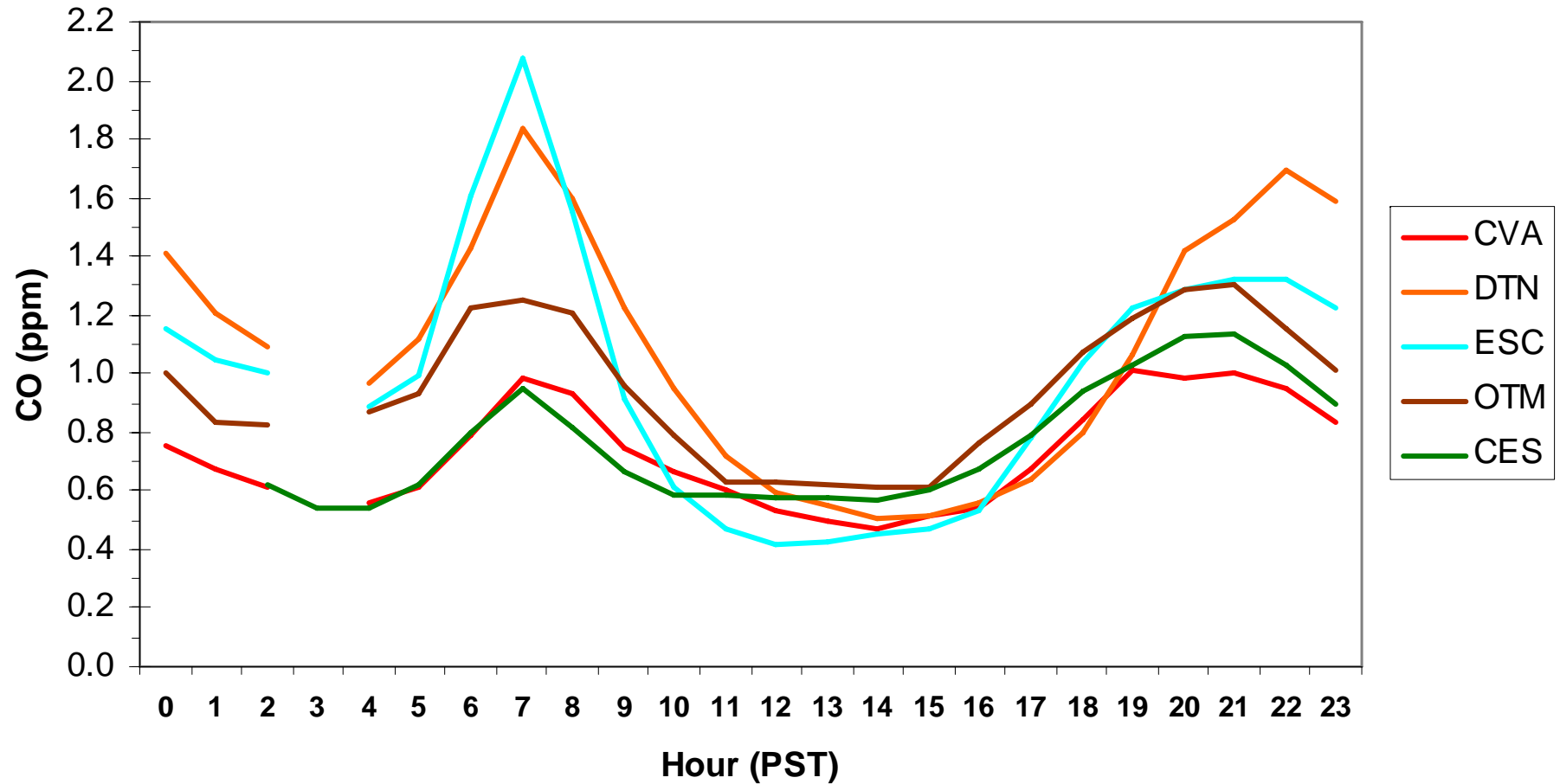
## San Diego Hourly CO Data Averages by Hour: November 1, 2008, through January 30, 2009



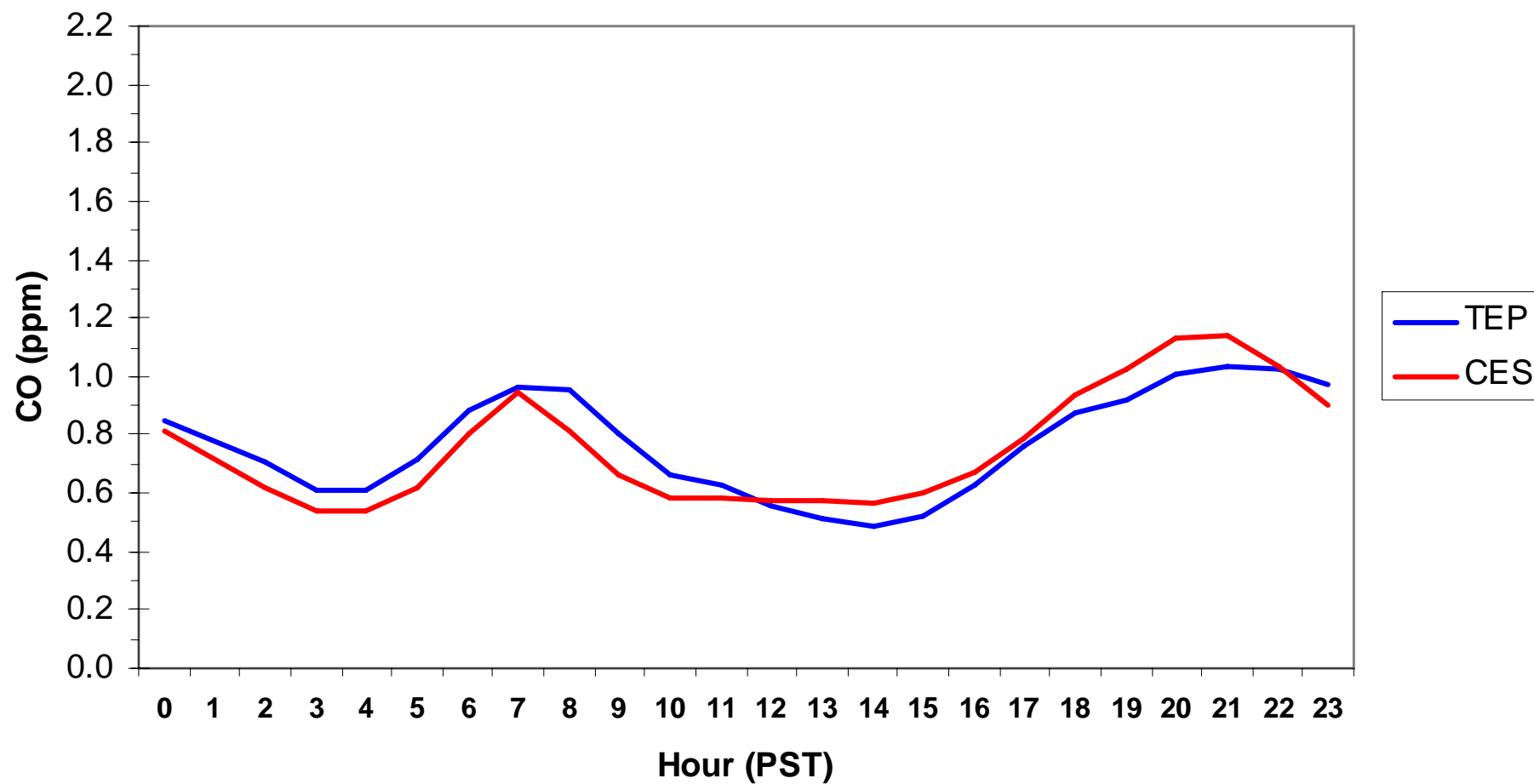
## San Diego Hourly CO Data Averages by Hour: November 1, 2008, through December 13, 2008



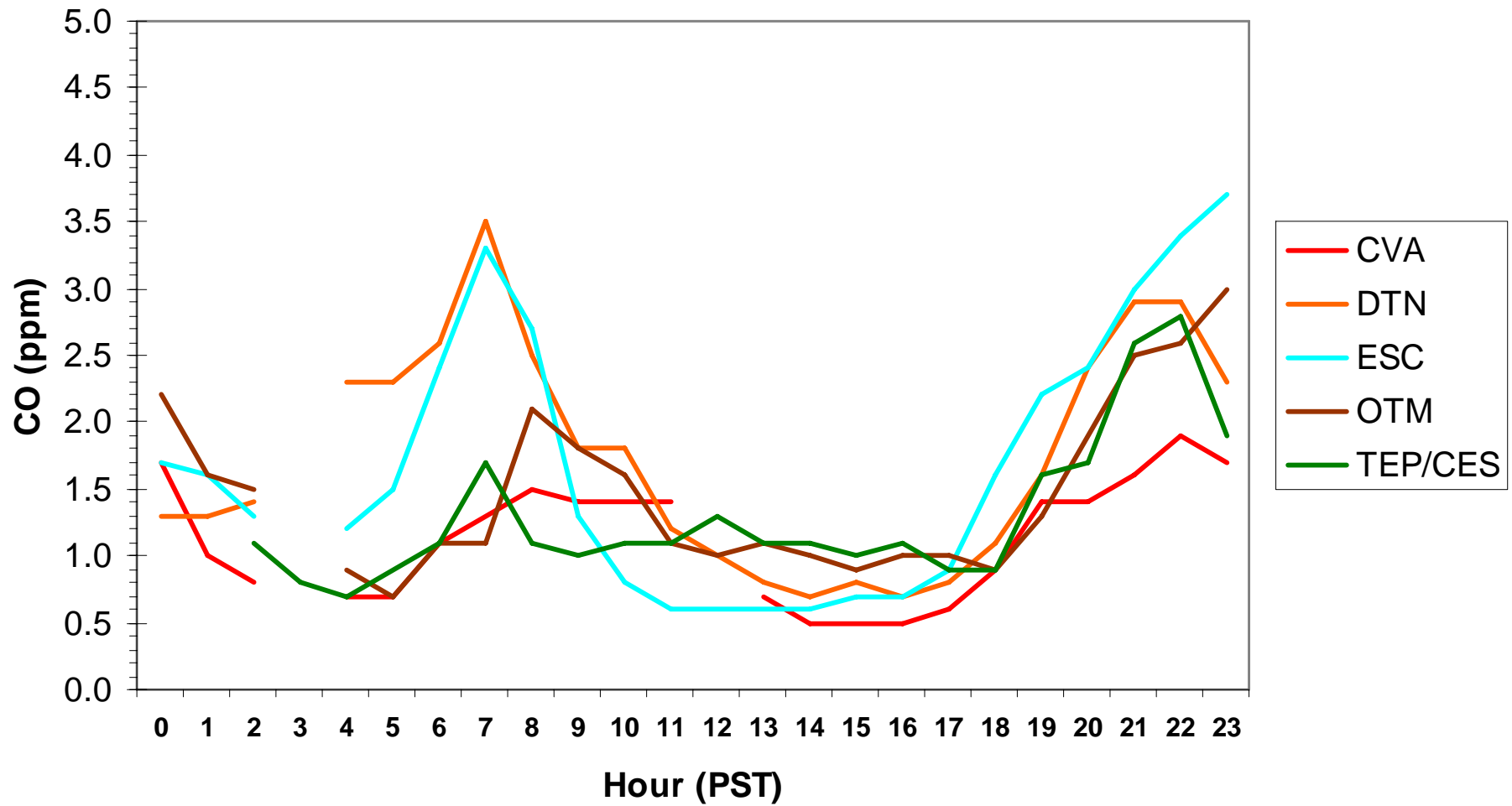
## San Diego Hourly CO Data Averages by Hour: December 22, 2008, through January 30, 2009



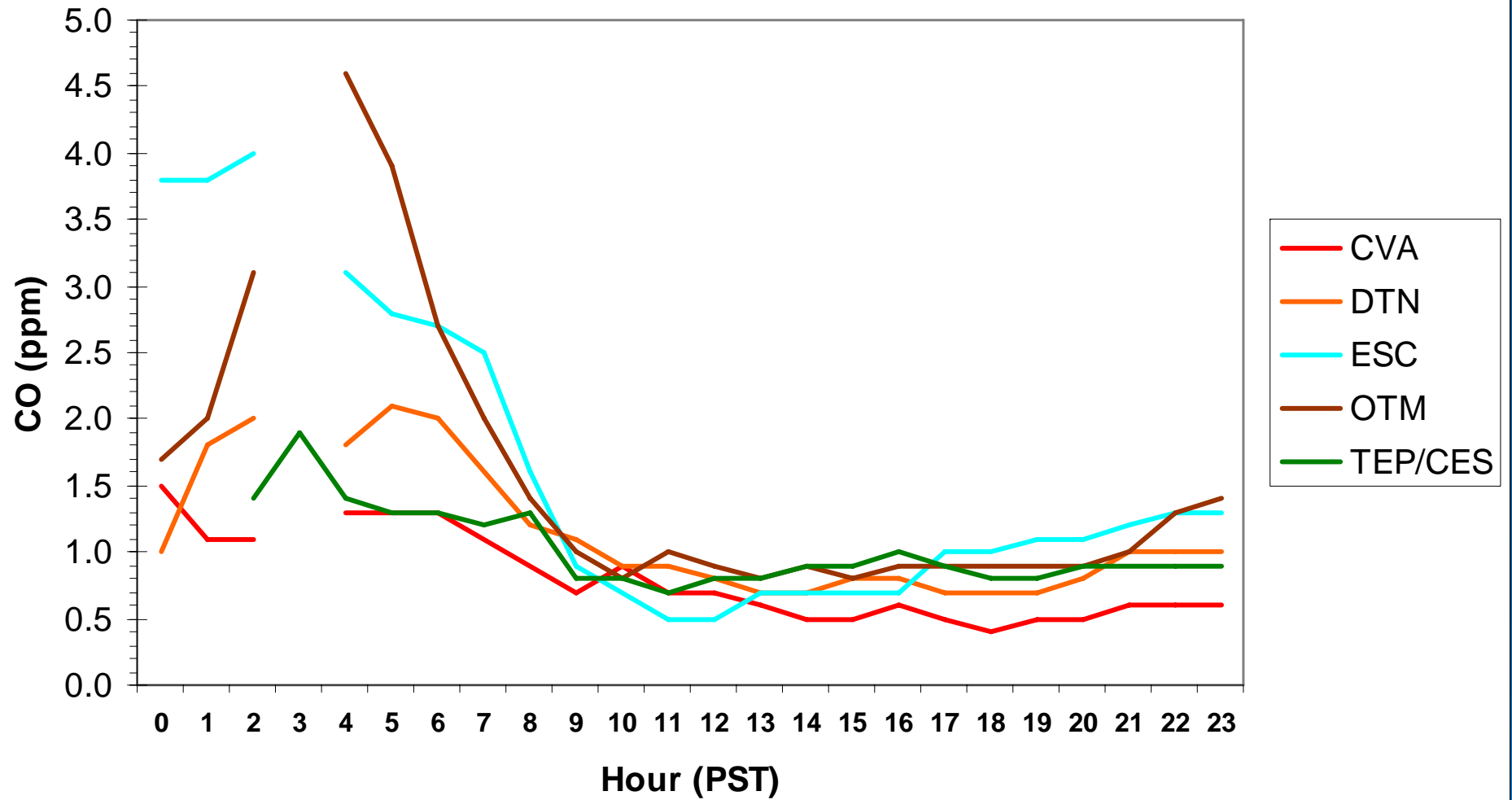
## San Diego Hourly CO Data Averages by Hour (interpolated): November 1, 2008, through January 30, 2009



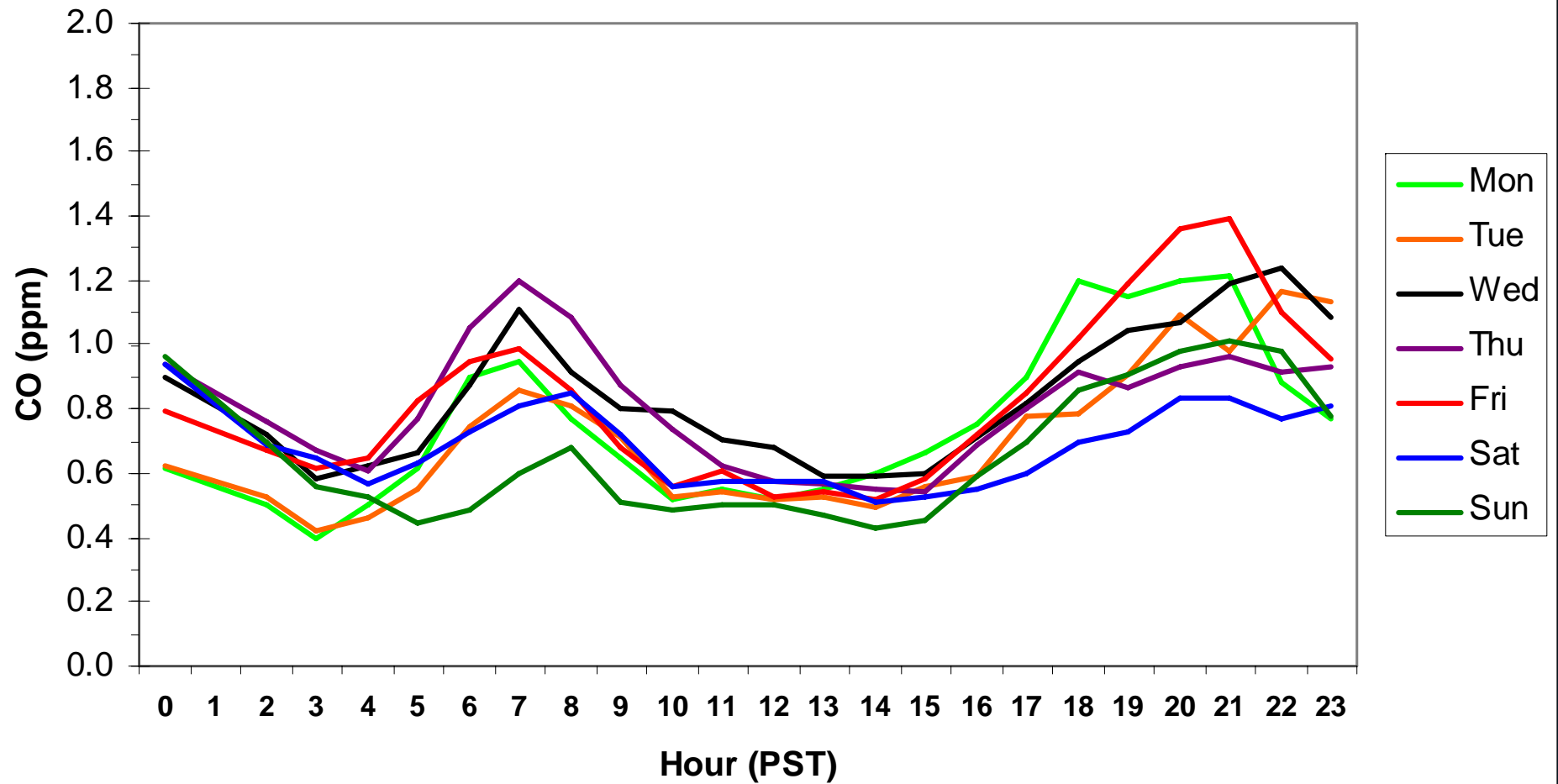
### Hourly CO Data for: Wednesday, 12/31/2008



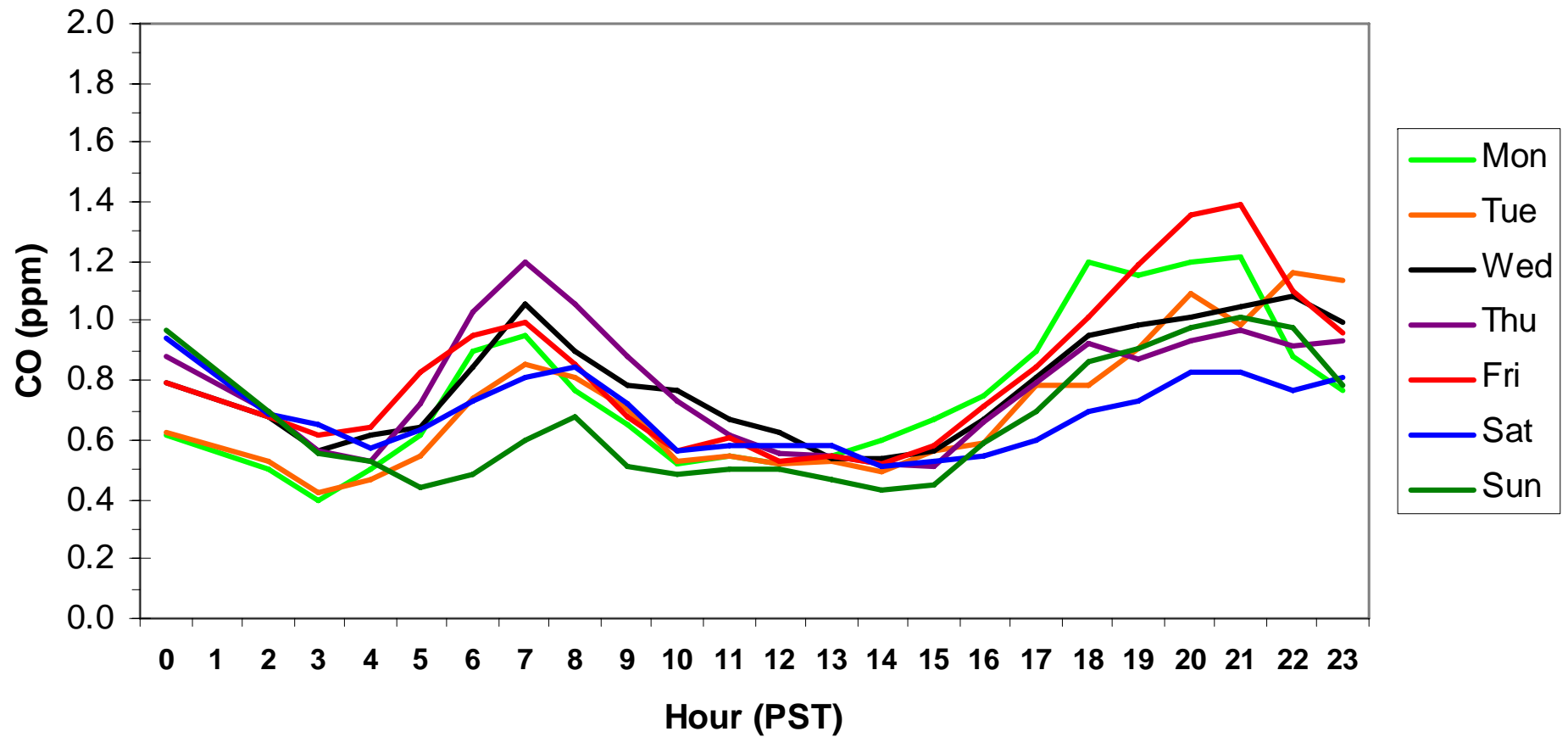
## Hourly CO Data for: Thursday, 1/1/2009



## TEP/CES CO Averages by Day of Week: November 1, 2008 through January 30, 2009



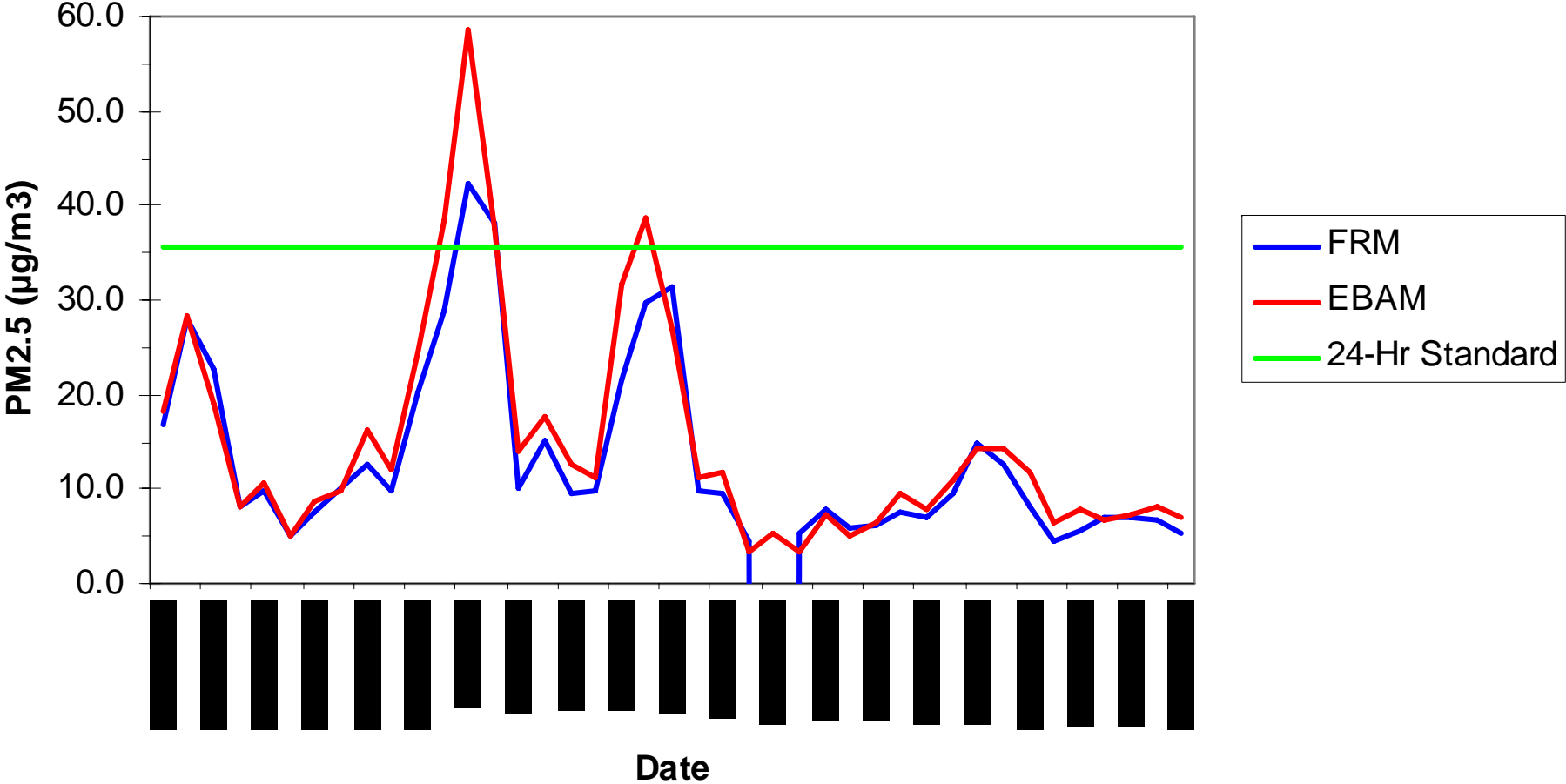
**TEP/CES CO Averages by Day of Week (without New Year's  
Eve and New Year's Day):  
November 1, 2008 through January 30, 2009**



### PM2.5 Standards

	California Standards	Federal Standards
24-Hour	No separate State Standard	35 $\mu\text{g}/\text{m}^3$
Annual Arithmetic Mean	12 $\mu\text{g}/\text{m}^3$	15.0 $\mu\text{g}/\text{m}^3$

# Central Elementary School: FRM vs. EBAM December 20, 2008, through January 29, 2009



Date	CES FRM	CES EBAM	WMS EBAM
12/20/2008	16.7	18.1	17.1
12/21/2008	27.9	28.4	30.2
12/22/2008	22.6	19.1	27.1
12/23/2008	8.2	8.1	8.4
12/24/2008	9.8	10.7	11.6
12/25/2008	5.1	5.0	7.7
12/26/2008	7.7	8.6	8.9
12/27/2008	10.1	9.7	10.2
12/28/2008	12.6	16.3	16.1
12/29/2008	9.7	12.0	14.2
12/30/2008	20.1	24.5	19.5
12/31/2008	29.0	38.3	32.0
1/1/2009	42.4	58.5	45.3
1/2/2009	38.1	37.7	30.9
1/3/2009	10.2	14.1	8.1
1/4/2009	15.2	17.6	15.2
1/5/2009	9.6	12.7	10.6
1/6/2009	9.9	11.1	9.6
1/7/2009	21.5	31.8	37.4
1/8/2009	29.7	38.7	35.8
1/9/2009	31.3	27.0	23.4
1/10/2009	9.8	11.3	7.9
1/11/2009	9.4	11.9	9.7
1/12/2009	4.6	3.5	3.2
1/13/2009	-999.0	5.3	13.7
1/14/2009	5.2	3.4	4.8
1/15/2009	7.8	7.2	9.2
1/16/2009	5.9	5.0	5.5
1/17/2009	6.2	6.4	6.4
1/18/2009	7.7	9.5	6.6
1/19/2009	6.9	7.8	6.0
1/20/2009	9.6	11.0	12.5
1/21/2009	14.8	14.2	13.7
1/22/2009	12.5	14.2	13.5
1/23/2009	8.1	11.7	10.3
1/24/2009	4.5	6.4	6.4
1/25/2009	5.5	7.9	7.3
1/26/2009	7.0	6.6	7.5
1/27/2009	7.0	7.2	9.1
1/28/2009	6.7	8.2	8.5
1/29/2009	5.4	7.1	5.2

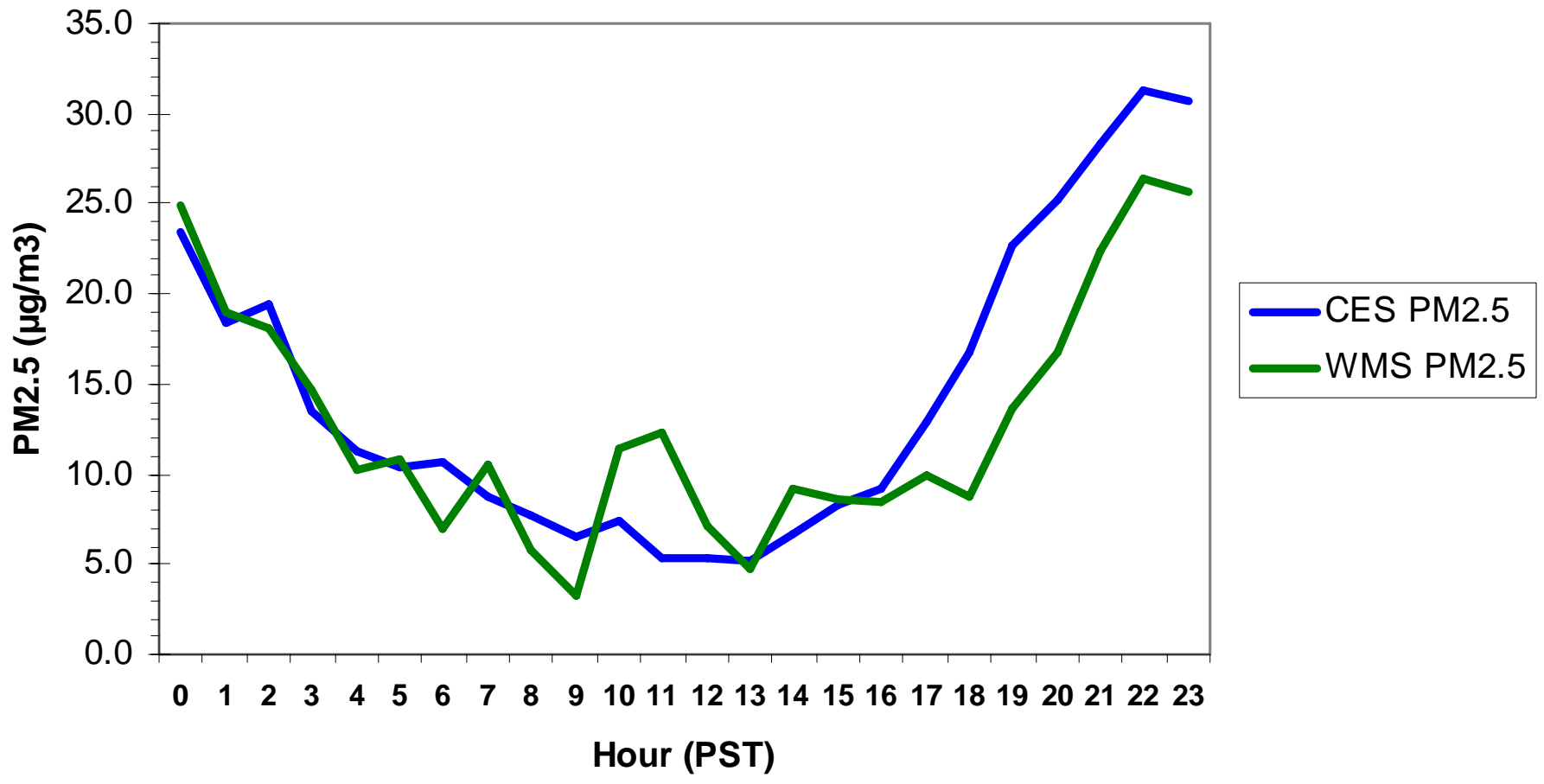


### PM2.5 Averages

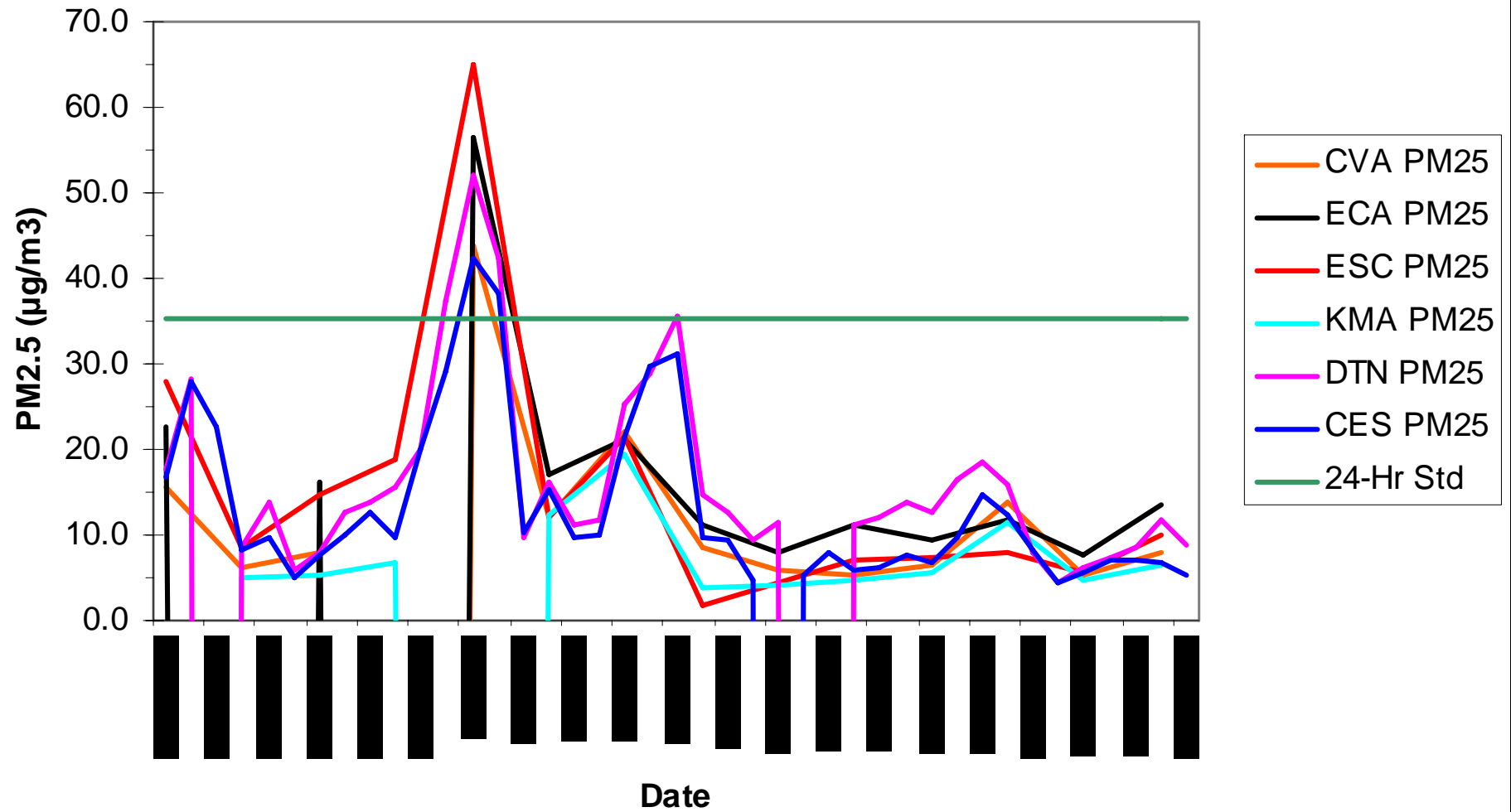
	ALP BAM	DTN BAM	ECA BAM	ESC BAM	CMP BAM	CES EBAM	WMS EBAM
Average	8.9	12.5	16.4	13.7*	10.8	14.4	12.9

Table 7. PM2.5 (BAM and EBAM) averages for all hourly data collected from December 16, 2008, through February 3, 2009. \* The Escondido (ESC) average is biased downward since the BAM unit lost data for December 26 – 29, 2008.

### Central Elementary School and Wilson Middle School Hourly PM2.5 Averages: December 16, 2008 through February 4, 2009



# San Diego County FRM PM2.5 Data (Interpolated): December 20, 2008, through January 29, 2009



Date	CVA PM25	ECA PM25	ESC PM25	KMA PM25	DTN PM25	CES PM25
12/20/2008	15.7	22.6	27.9	-980.0	17.6	16.7
12/21/2008					28.3	27.9
12/22/2008					-973.0	22.6
12/23/2008	6.1	-973.0	8.4	5.0	8.4	8.2
12/24/2008					13.7	9.8
12/25/2008					6.0	5.1
12/26/2008	8.0	16.2	14.7	5.4	8.0	7.7
12/27/2008					12.7	10.1
12/28/2008					13.7	12.6
12/29/2008	-999.0	-999.0	18.7	6.8	15.5	9.7
12/30/2008					19.9	20.1
12/31/2008					37.4	29.0
1/1/2009	43.7	56.5	64.9	-999.0	52.1	42.4
1/2/2009					42.4	38.1
1/3/2009					9.6	10.2
1/4/2009	12.0	17.2	12.0	12.5	16.2	15.2
1/5/2009					11.2	9.6
1/6/2009					11.7	9.9
1/7/2009	22.2	21.2	21.5	19.5	25.2	21.5
1/8/2009					28.9	29.7
1/9/2009					35.7	31.3
1/10/2009	8.6	11.2	1.9	3.8	14.8	9.8
1/11/2009					12.6	9.4
1/12/2009					9.5	4.6
1/13/2009	5.9	7.8	4.5	4.2	11.4	-999.0
1/14/2009					-999.0	5.2
1/15/2009					-999.0	7.8
1/16/2009	5.4	11.3	7.0	4.7	11.2	5.9
1/17/2009					12.2	6.2
1/18/2009					13.9	7.7
1/19/2009	6.4	9.4	7.5	5.5	12.6	6.9
1/20/2009					16.4	9.6
1/21/2009					18.6	14.8
1/22/2009	13.9	11.9	8.0	11.4	15.8	12.5
1/23/2009					7.9	8.1
1/24/2009					4.4	4.5
1/25/2009	5.4	7.7	5.6	4.8	6.2	5.5
1/26/2009					7.4	7.0
1/27/2009					8.6	7.0
1/28/2009	8.0	13.4	9.9	6.5	11.7	6.7
1/29/2009					8.7	5.4

# Conclusions

- CO and PM2.5 exhibit similar patterns to other locations in San Diego County, and the measured concentrations fall mid-range to other San Diego sites for both pollutants.
- CO levels at all monitoring sites in San Diego, including City Heights, meet all state and federal air quality standards (measured levels were well below the standards).
- CO measurements, in close proximity and on both sides of SR-15, found concentrations that were less than other areas of the County where population density, traffic, topography, and meteorology result in higher concentrations.
- City Heights is in an area with adequate ventilation and without topography for cold air to settle and trap pollutants in the surface layer. This combination of meteorology and topography contributes to good air quality in City Heights.

# Conclusions (continued)

- Based upon the official FRM sampling, the 24-hour PM2.5 standard was exceeded in City Heights on two days during the study (New Year's Day and the following day, when the highest particulate concentrations are frequently measured in the County).
- City Heights had the lowest PM2.5 concentration of all monitoring sites on New Year's Day, when all sites in San Diego County exceeded the 24-hour standard.
- The PM2.5 data collected at the City Heights' locations exhibit similar patterns to other areas of the County, with concentrations in City Heights mirrored by concentrations in other locales. This indicates a strong correlation to atmospheric conditions and regional air quality patterns; not a locally-based problem.

# Conclusions (concluded)

- Similar to other locations in San Diego County, the daily PM2.5 averages in City Heights are strongly influenced by night and morning concentrations, where atmospheric stability plays an important role in surface concentrations. During the day, when local traffic, and therefore emissions, is highest, surface concentrations tend to be at their lowest point in the diurnal cycle.
- The PM2.5 measurements in City Heights are consistent with longer-term measurements in other monitoring sites in San Diego County, falling mid-range between other locations. Along with the rest of San Diego County, City Heights meets the federal air quality standards for PM2.5.