



Palliser Airshed Society

Ambient Air Monitoring Network Summary

August 2005

Prepared By:
FOCUS
AIR QUALITY MONITORING

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Palliser Airshed Society

July 27, 2005

Alberta Environment
Enforcement and Monitoring Division
11th Floor, Oxbridge Place
9820 - 106th Street
Edmonton, Alberta, T5K 2J6

Attention: Director of Monitoring and Evaluation

RE: Palliser Airshed Society (PAS) Ambient Air Monitoring Report – August 2005

Enclosed is the PAS Ambient Monitoring Report for the month of **August 2005**.

Please note that this report has been prepared in partial fulfillment of the City of Medicine Hat's air monitoring requirement as well as all members of the Palliser Airshed Society.

Continuous Monitoring – Crescent Heights

Included in this report are; monthly sampling table, detailed hourly average reports and multipoint calibration reports of all instruments. The measured ambient air quality was within the Provincial and Federal guidelines with no exceedences recorded. Operational time of all instruments (except the THC analyzer) was above 99% uptime for the month of August. The THC analyzer experienced a flame out resulting in a reduced uptime for the month of August of 84.1%. There were no significant events leading to emergency response for the month of August.

The following is a summary of the monthly averages recorded during sampling:

- Monthly average concentrations of NO₂ was 7.9 ppb
- Monthly average concentrations for O₃ was 26.2 ppb
- Monthly average concentrations for CO was 0.14 ppm
- Monthly average concentrations for PM_{2.5} was 5.8 µg/m³

Passive Monitoring – Six Stations throughout the PAS zone:

The following are the ranges for August 2005 recorded by the six passive stations located throughout the PAS zone.

- Monthly average concentrations for SO₂ passives ranged from 0.2 ppb to 0.4 ppb
- Monthly average concentrations for NO₂ passives ranged from 4.7 ppb to 5.9 ppb
- Monthly average concentrations for O₃ passives ranged from 25.3 ppb to 33.4 ppb

If you have any questions, please contact the Focus office at 1-888-466-6555 or 1-888-869-2252.

Gary Cross, C.E.T.
AQM Technical Manager

Kevin McCullum, Ph.D., P.Eng.
AQM Environmental Specialist



August 2005 Monthly Overall Summary Report

Aug-2005 Palliser Airshed Society					Maximum Recorded Values								
					1-hr		24-hr / 8-hr						
Pollutant (units)	Objectives		Station	Monthly Average	Exceedence		Conc	Day	WSPD (km/hr)	WDIR (Sector)	Conc	Day	Operational Time (%)
	1-hr	24-hr			1-hr	24-hr							
NO (ppb)			Cresent Heights	2.4	-	-	53.5	Aug-26 21:00	2.8	S	6.0	Aug-26	99.7%
NO ₂ (ppb)	212	106	Cresent Heights	7.9	0	0	40.1	Aug-20 20:00	2.2	SSW	13.2	Aug-01	99.7%
NO _x (ppb)			Cresent Heights	10.1	-	-	88.7	Aug-26 21:00	2.8	S	18.1	Aug-06	99.7%
O ₃ (ppb)	82		Cresent Heights	26.2	0	-	65.1	Aug-06 16:00	6.9	WSW	39.9	Aug-05	99.7%
O ₃ (ppb) - 8-hr	65		Cresent Heights		0						58.7	Aug-05	
CO (ppm)	13		Cresent Heights	0.14	0	-	0.7	Aug-26 21:00	2.8	S	0.2	Aug-14	99.7%
CO (ppm) - 8-hr	5		Cresent Heights		0						0.4	Aug-01	
THC (ppm)			Cresent Heights	1.98	-	-	2.6	Aug-03 21:00	4.9	NNW	2.1	Aug-06	84.1%
PM _{2.5} (µg/m ³)		30 ^a	Cresent Heights	5.8		0	60.8	Aug-24 09:00	8.2	SW	25.3	Aug-24	99.3%
RH (%)			Cresent Heights	57.5	-	-	-	-	-	-	-	-	99.7%
SR (W/m ²)			Cresent Heights	220.6	-	-	-	-	-	-	-	-	99.7%
Temp (°C)			Cresent Heights	17.9	-	-	-	-	-	-	-	-	99.7%
WSPD v (km/hr)			Cresent Heights	8.7	-	-	-	Aug-02 17:00	30.0	N	13.6	25-Aug	99.7%
WSPD s (km/hr)			Cresent Heights	9.1	-	-	-	Aug-02 17:00	30.3	N	14.7	24-Aug	99.7%
WDIR (Deg)			Cresent Heights	N	-	-	-	-	-	-	-	-	99.7%

Note: ^a the draft 1-hr Alberta Ambient Air Quality Objectives
 * Wind Direction is the predominate direction for the Month



Continuous Monitoring

Ambient Air Monitoring Network

Crescent Heights Station

General Station Issues

Parameter	Make	Model	Units	Notes
Ozone	Teledyne - API	400E	ppb	No operational issues observed.
Nitrogen Dioxide	Teledyne - API	200E	ppb	No operational issues observed.
Total Hydrocarbons	Bendix	400A	ppm	Power loss occurred; flame went out and did not re-light. Analyzer brought back on-line and new alarm created to notify when flame does not re-light
Carbon Monoxide	TEI	49C	ppm	No operational issues observed.
PM 2.5	R&P TEOM	1400ab	µg/m³	Flows noted as being slightly high, filter replaced, re-build of pump on schedule for next month's calibrations
Wind Speed	Met One	010C	kph	No operational issues observed.
Wind Direction	Met One	020C	Deg	No operational issues observed.
Ambient Temperature	Met One	083D	DegC	No operational issues observed.
Relative Humidity	Met One	083D	%	No operational issues observed.
Solar Radiation	Met One	096-1	W/m²	No operational issues observed.
Data Acquisition System	Titan Logix	AP1000		No operational issues observed.

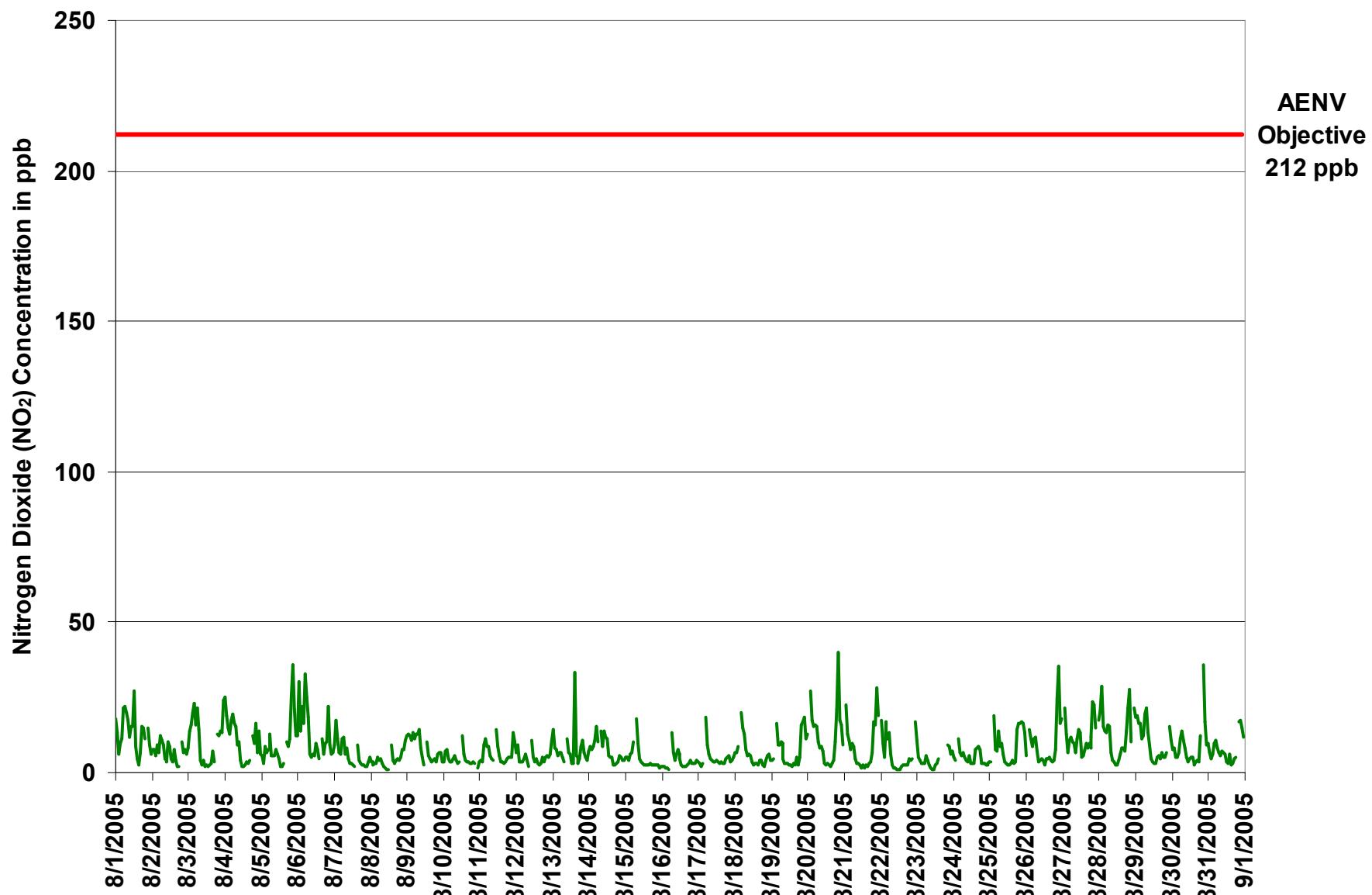


Figure 1. PAS - Crescent Heights Nitrogen Dioxide 1-hr Average Monthly Trend

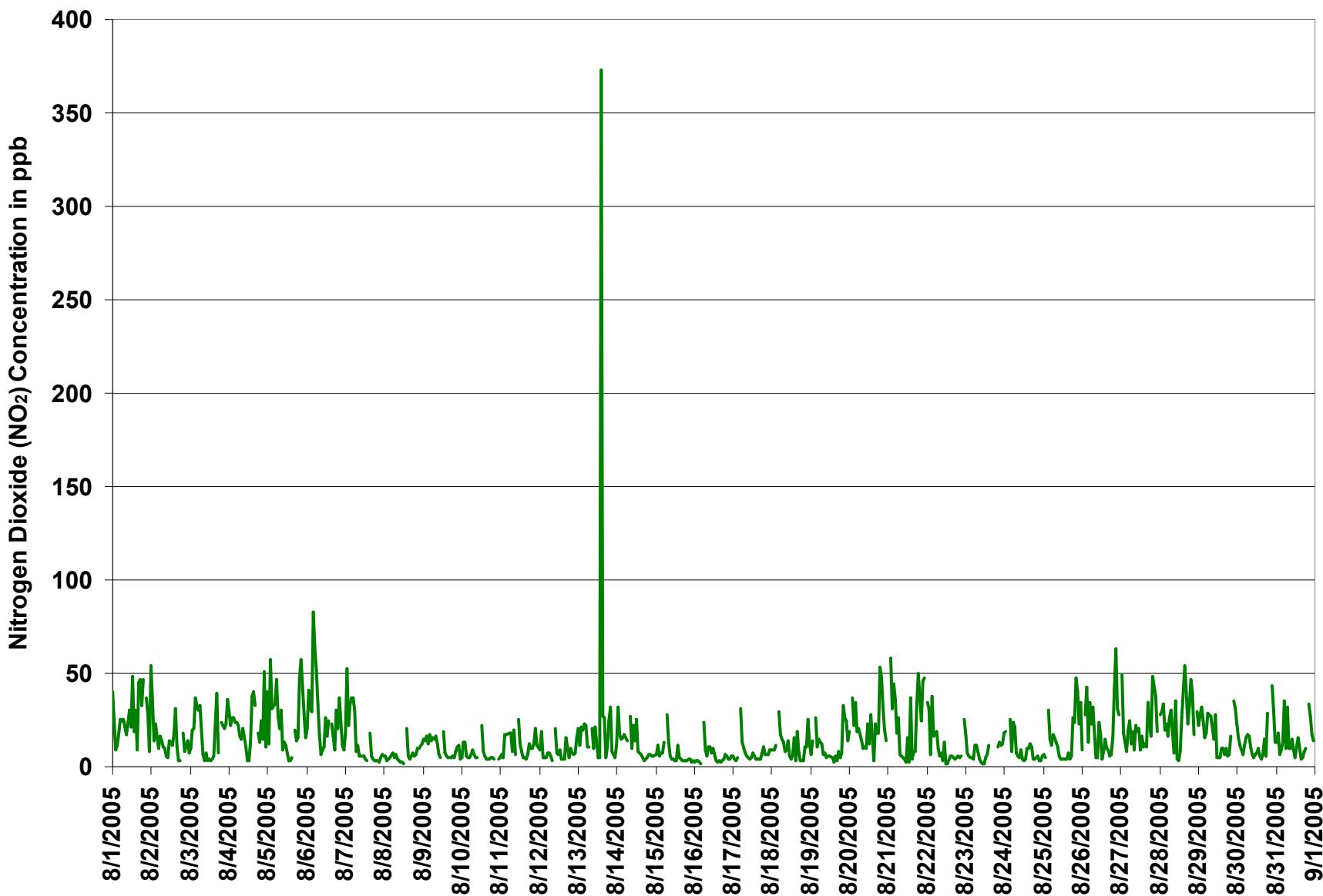
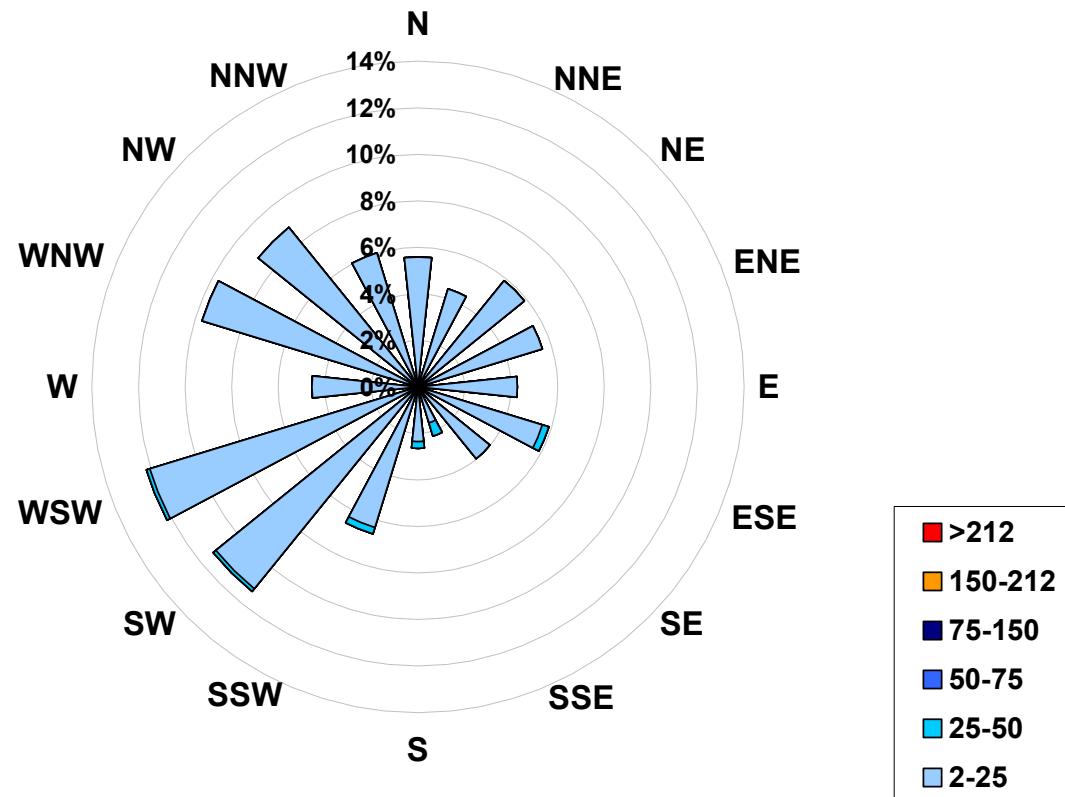


Figure 2. PAS - Crescent Heights Nitrogen Dioxide 1-hr Maximum Value Monthly Trend



1-hr Average Concentration Rose for Nitrogen Dioxide (in ppb) Located at the
Crescent Heights Site for August 2005



Calms:	0%
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Frequency Distribution of NO ₂ in ppb			
Range		Frequency (hrs)	
2.0	<	25	702
25	to	50	1
50	to	75	2
75	to	150	0
150	to	212	0
>	212	0	
Total Non-Zero Values		705	

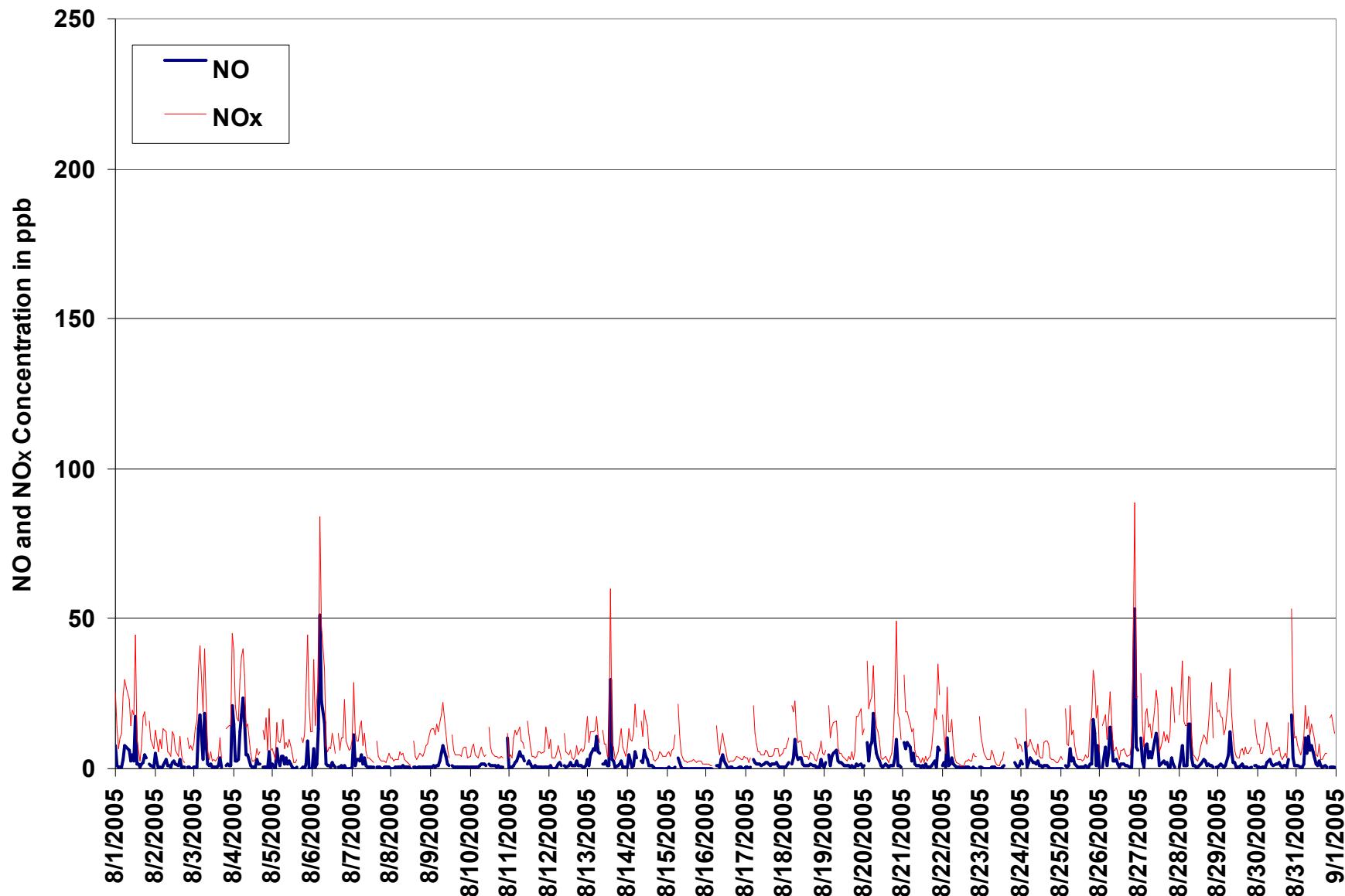


Figure 3. PAS - Crescent Heights Oxides of Nitrogen 1-hr Average Monthly Trend

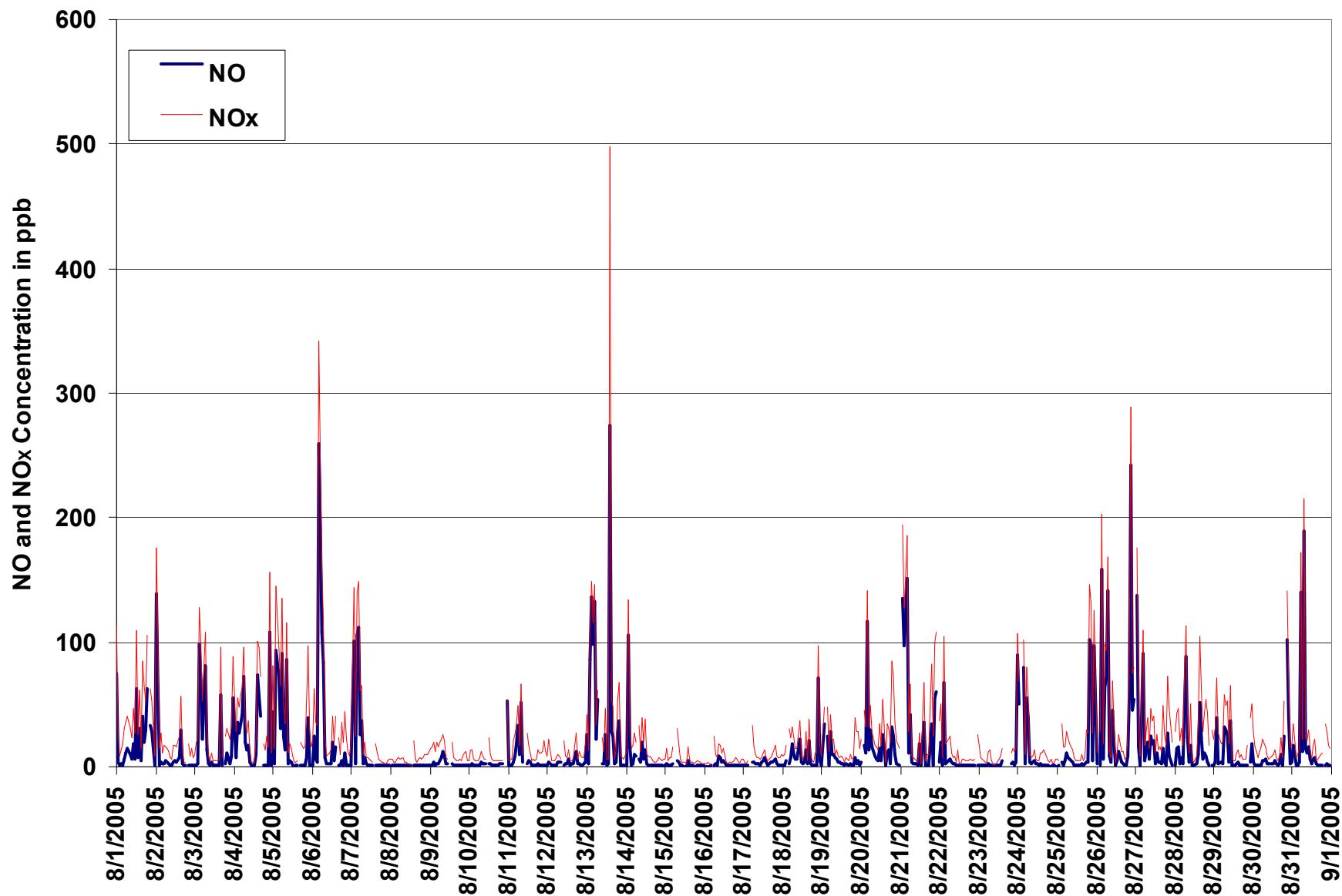


Figure 4. PAS - Cresent Heights Oxides of Nitrogen 1-hr Maximum Value Monthly Trend

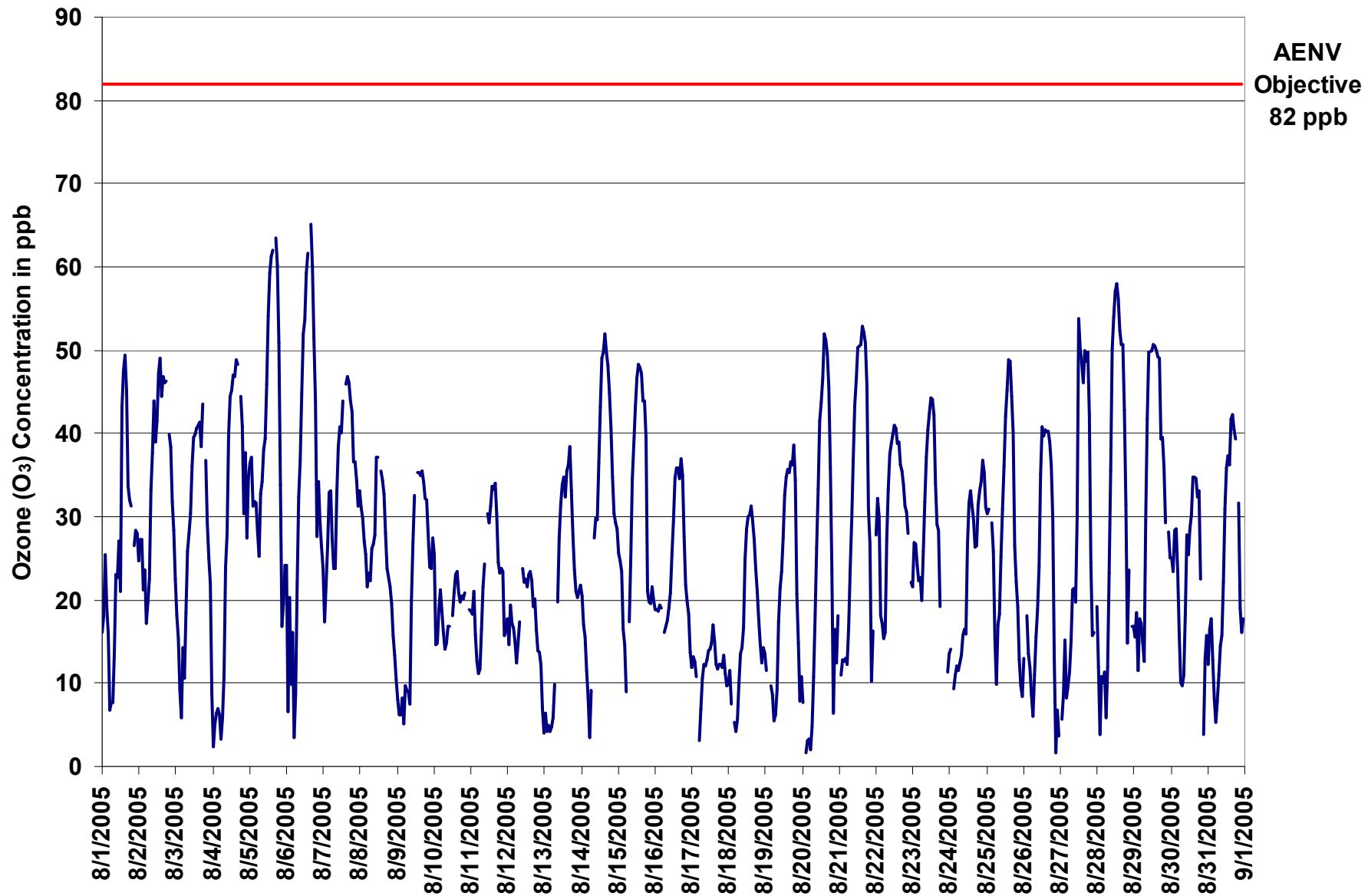


Figure 5. PAS - Cresent Heights Ozone 1-hr Average Monthly Trend

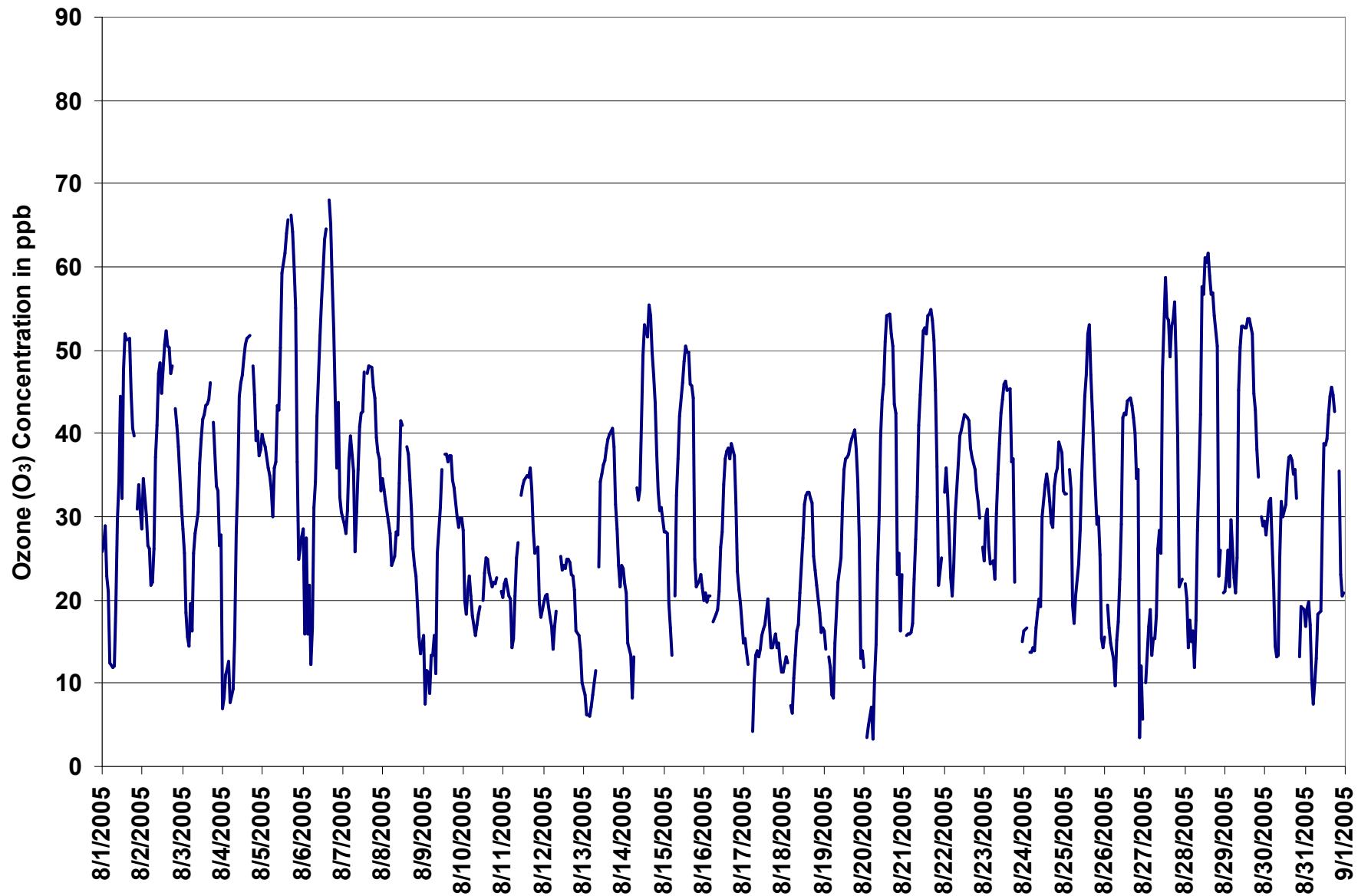
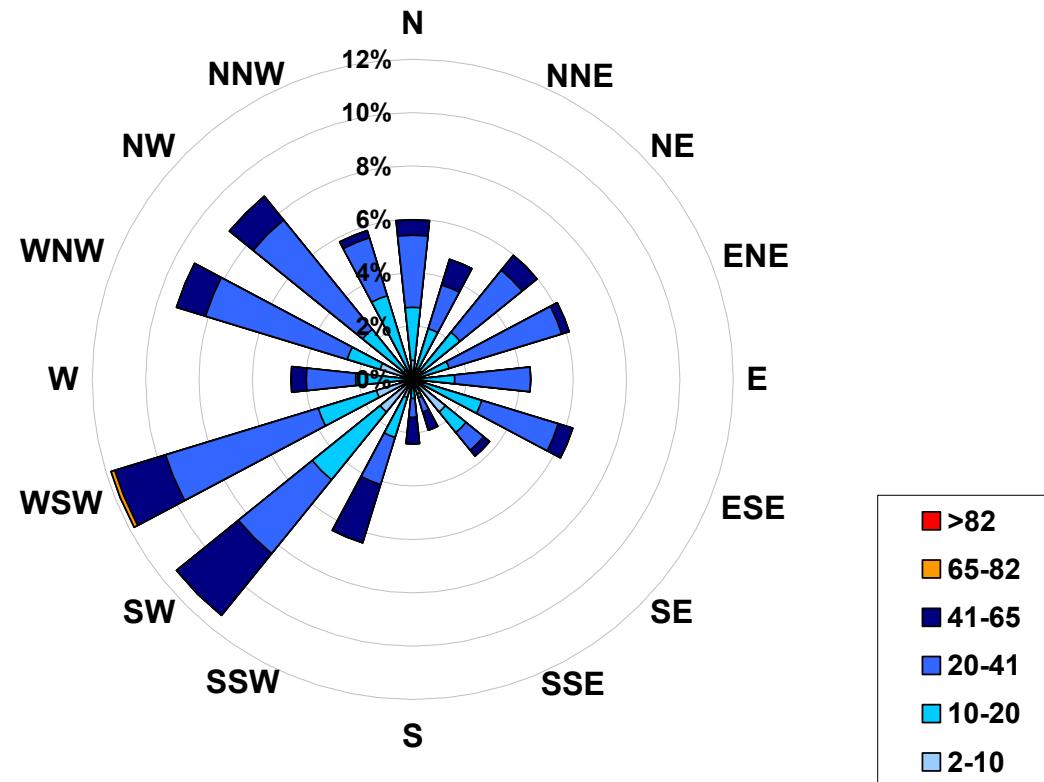


Figure 6. PAS - Crescent Heights Ozone 1-hr Maximum Value Monthly Trend

1-hr Average Concentration Rose for Ozone (in ppb) Located at the Crescent Heights Site for August 2005



Calms: 0%

Frequency Distribution of O ₃ in ppb		
Range	Frequency (hrs)	
2.0 < 10	81	
10 to 20	190	
20 to 41	325	
41 to 65	109	
65 to 82	1	
> 82	0	
Total Non-Zero Values	706	

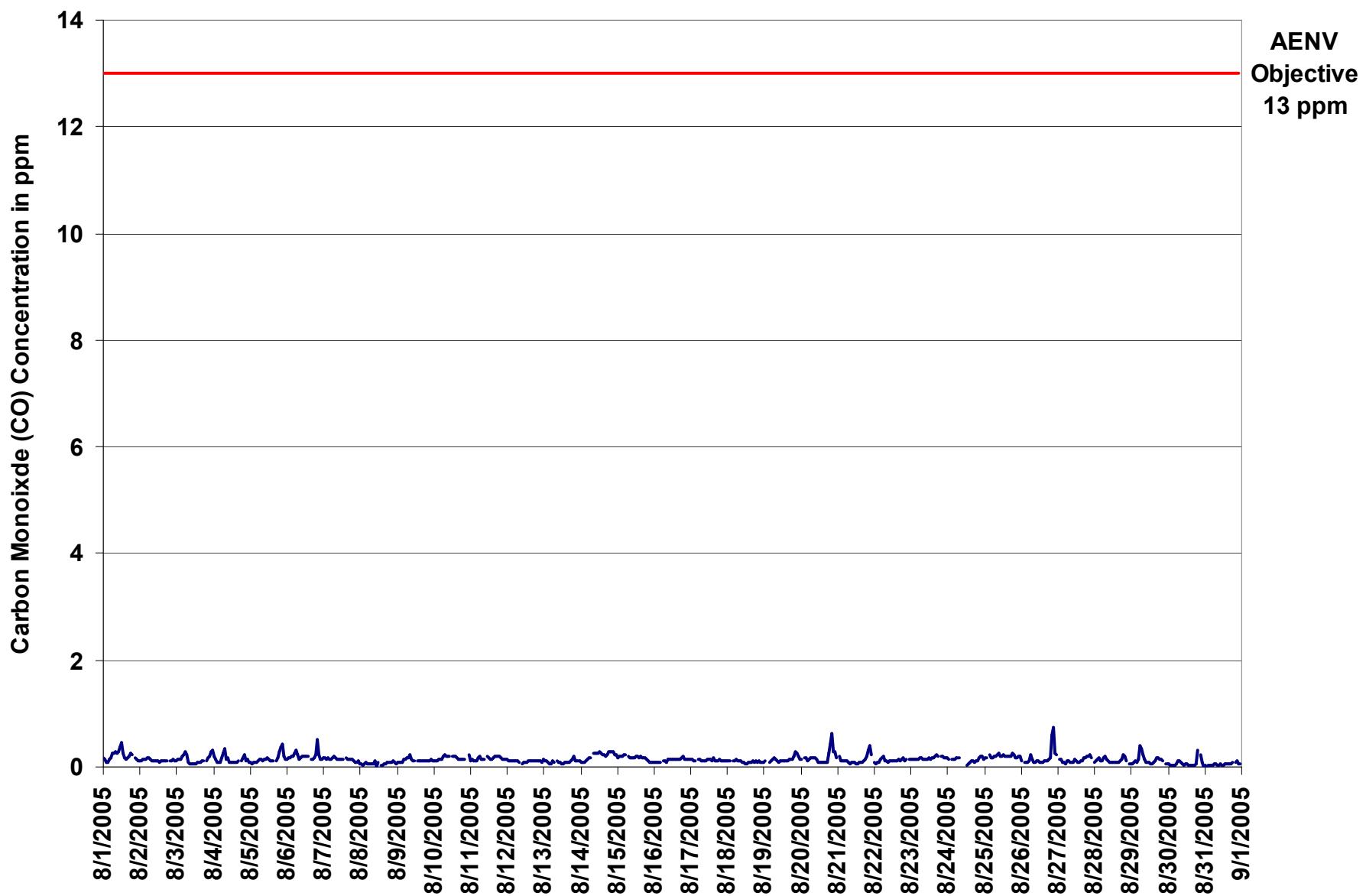


Figure 7. PAS - Cresent Heights Carbon Monoxide 1-hr Average Monthly Trend

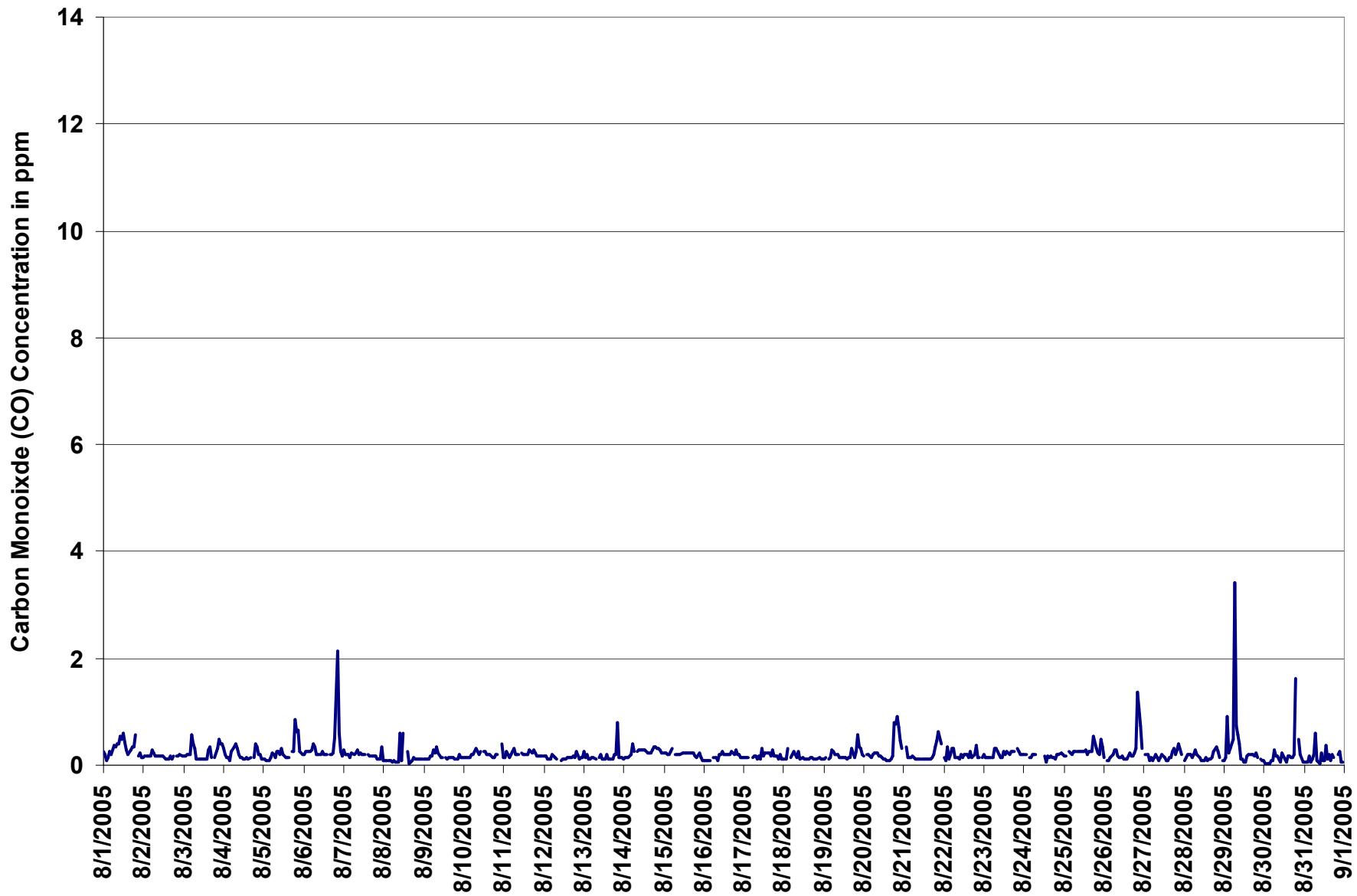
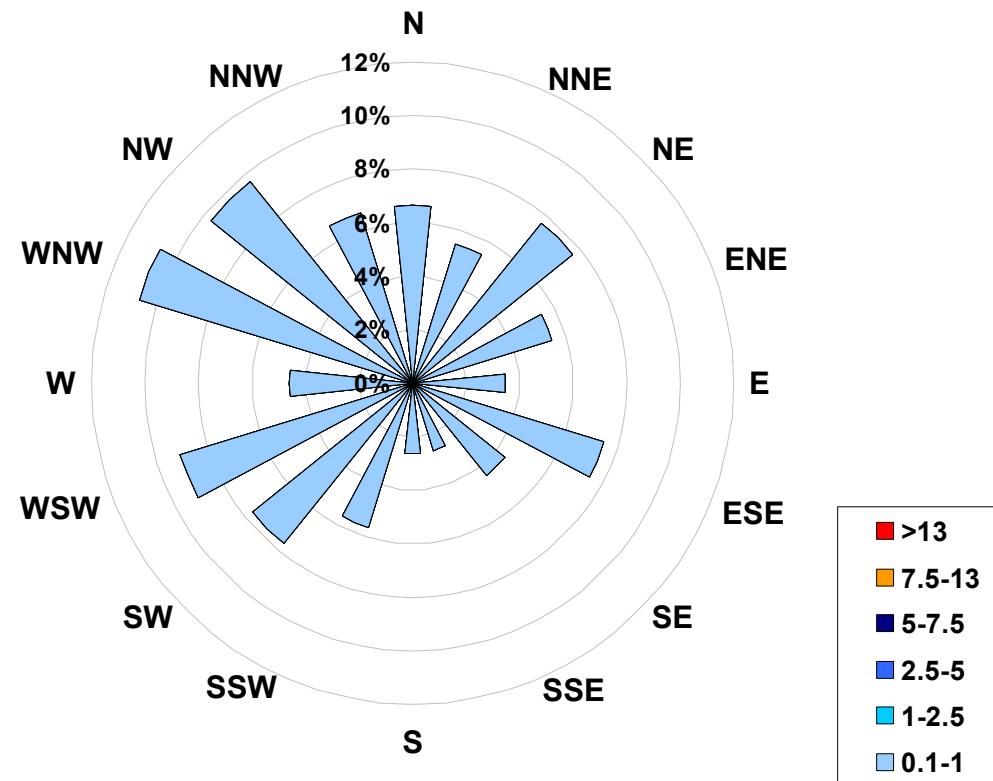


Figure 8. PAS - Crescent Heights Carbon Monoxide 1-hr Maximum Value Monthly Trend



1-hr Average Concentration Rose for Carbon Monoxide (in ppm) Located
at the Crescent Heights Site for August 2005



Calms:	0%
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Range	Frequency Distribution of CO in ppm	
	Frequency (hrs)	
0.1 < 1	705	
1 to 2.5	0	
2.5 to 5	0	
5 to 7.5	0	
7.5 to 13	0	
> 13	0	
Total Non-Zero Values	705	

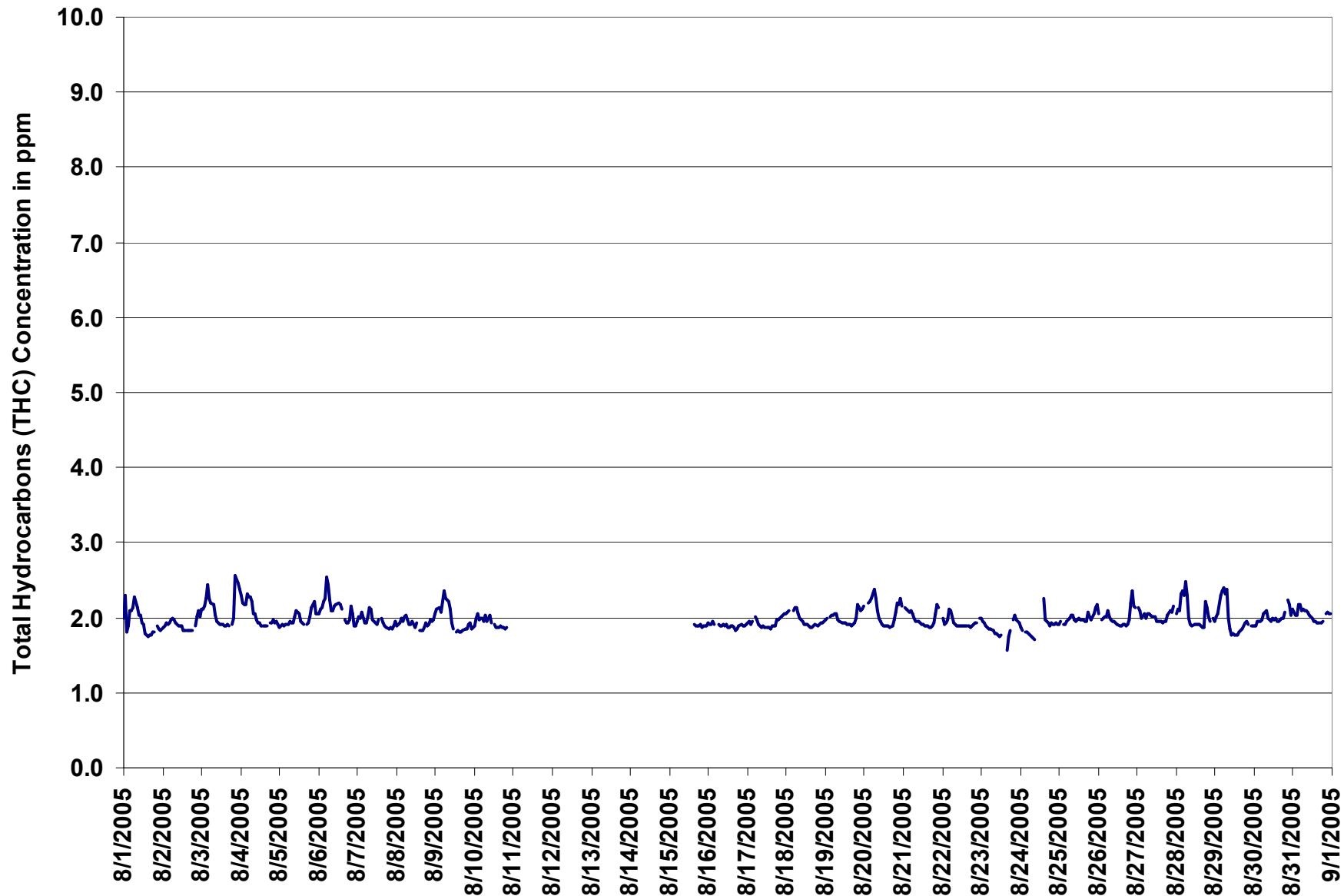


Figure 9. PAS - Crescent Heights Total Hydrocarbons 1-hr Average Monthly Trend

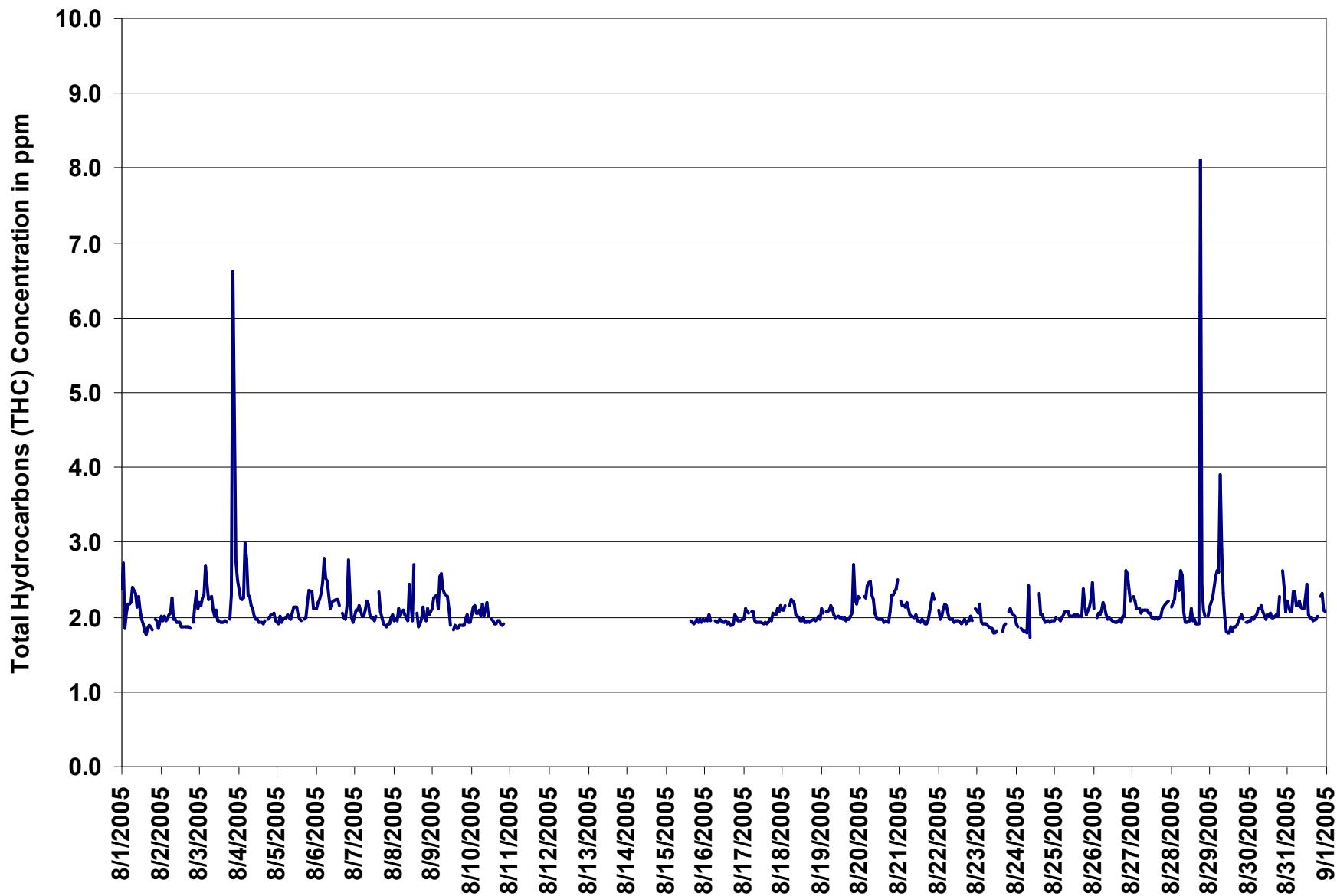
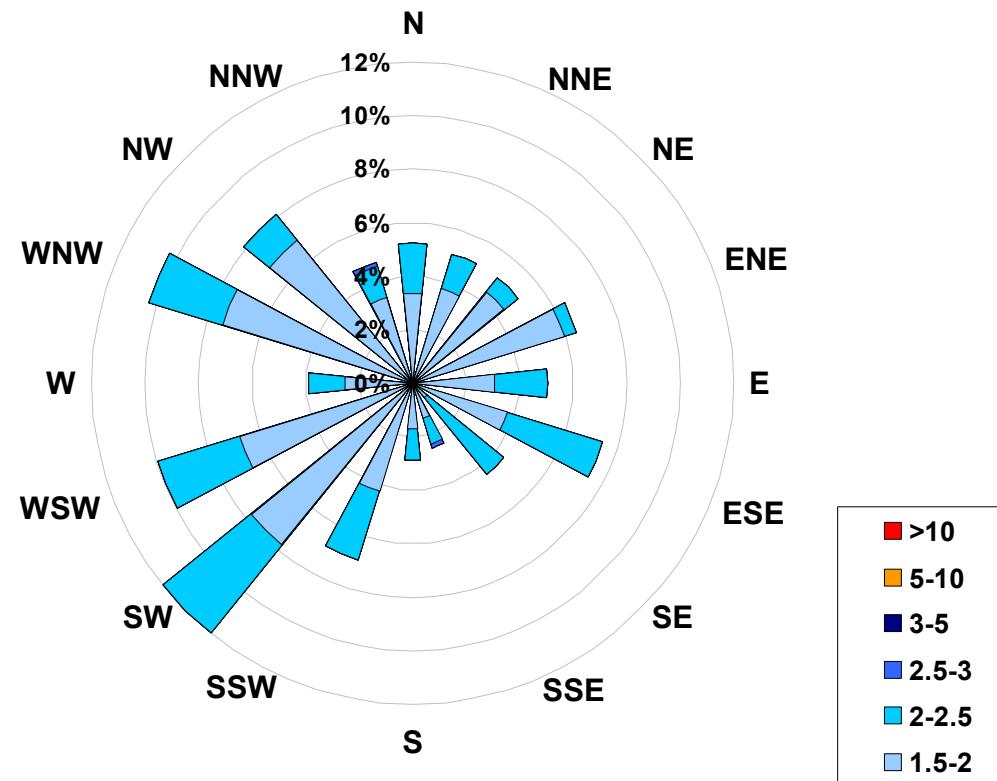


Figure 10. PAS - Crescent Heights Total Hydrocarbons 1-hr Maximum Value Monthly Trend

1-hr Average Concentration Rose for Total Hydrocarbons (in ppm)
Located at the Crescent Heights Site for August 2005



Calms:	0%
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Frequency Distribution of THC in ppm		
Range		Frequency (hrs)
1.5	< 2	396
2	to 2.5	197
2.5	to 3	2
3	to 5	0
5	to 10	0
>	10	0
Total Non-Zero Values		595

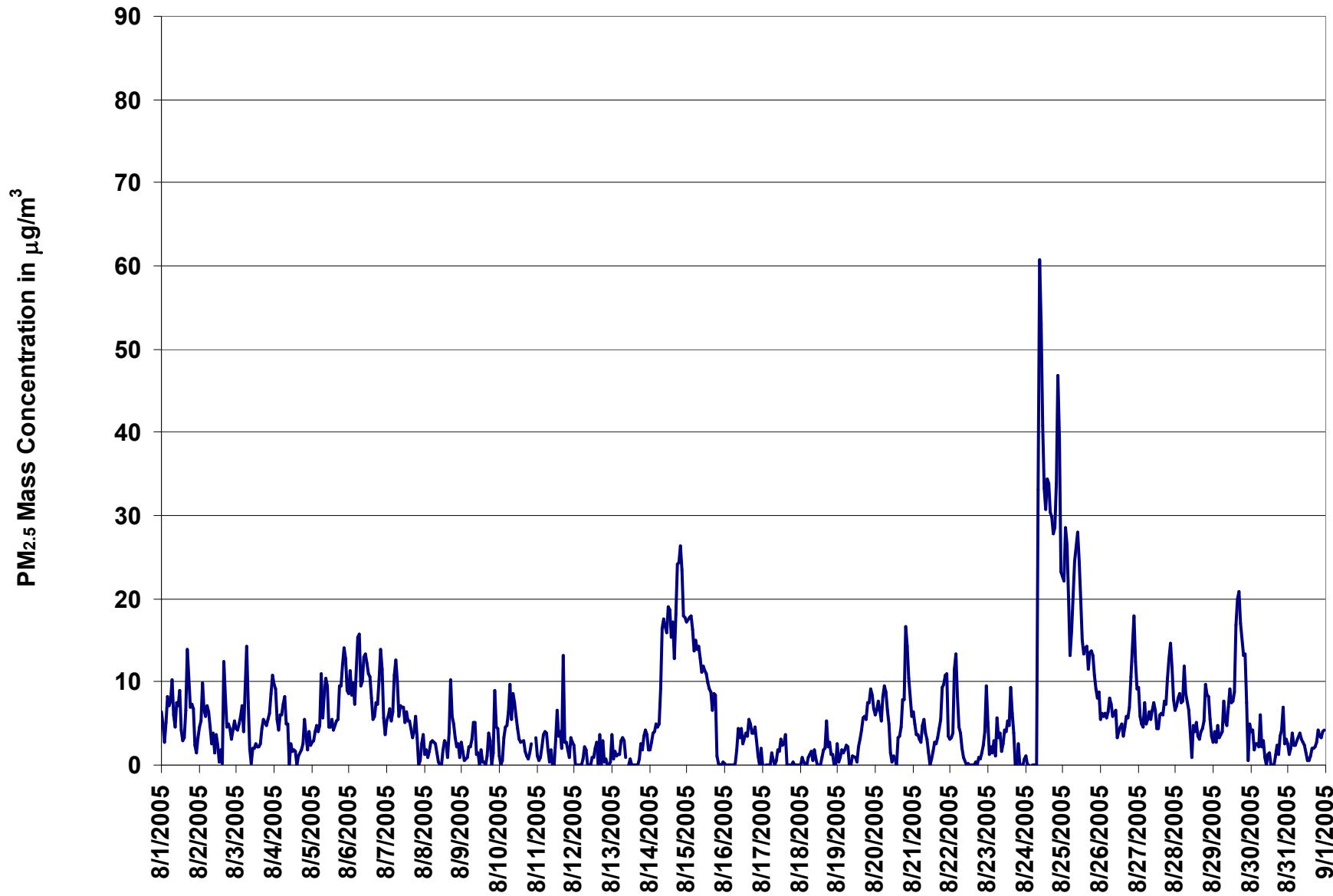


Figure 11. PAS - Crescent Heights Particulate Matter (less than 2.5 microns) 1-hr Average Monthly Trend

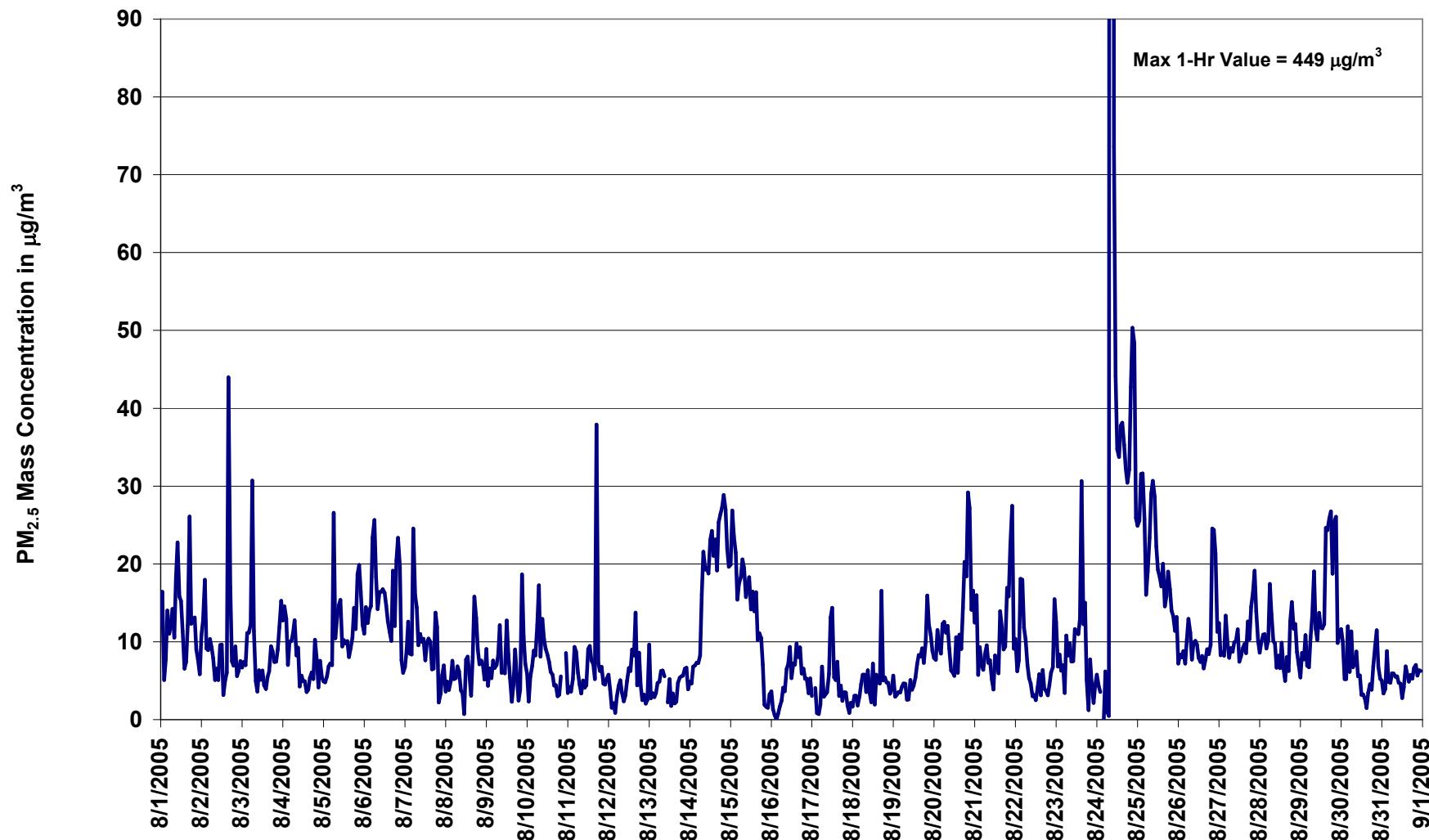
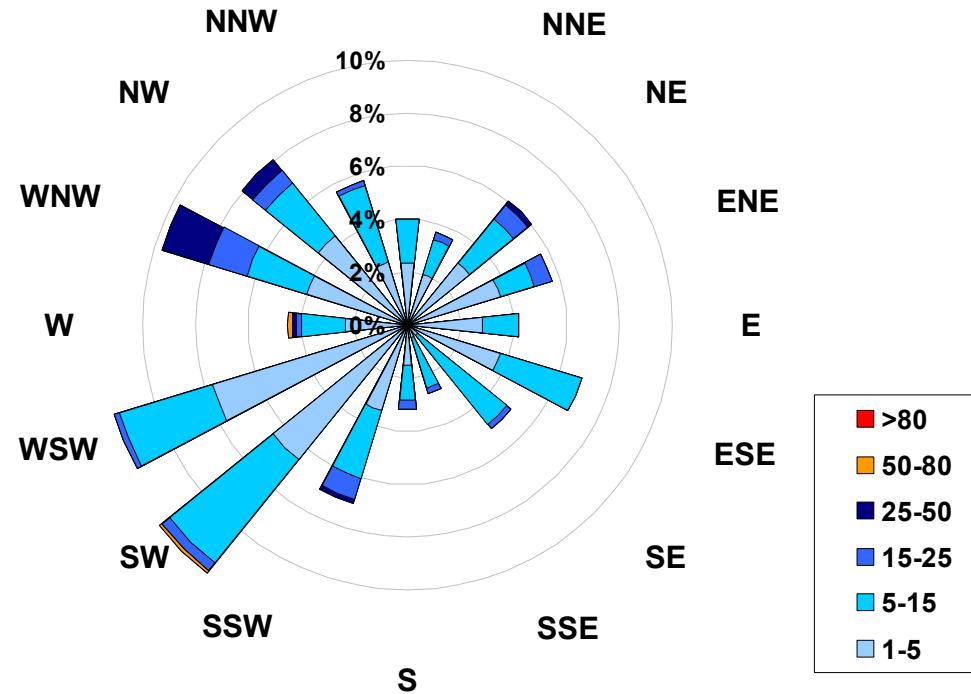


Figure 12. PAS - Crescent Heights Particulate Matter (less than 2.5 microns) 1-hr Maximum Value Monthly Trend



1-hr Average Concentration Rose for Particulate Matter (less than 2.5 microns) (in micrograms per cubic meter) Located at the Crescent Heights Site for August 2005



Calms: 0%

Frequency Distribution of PM _{2.5} in µg/m ³		
Range	Frequency (hrs)	
1.0 < 5	443	
5 to 15	240	
15 to 25	37	
25 to 50	17	
50 to 80	2	
> 80	0	
Total Non-Zero Values	739	

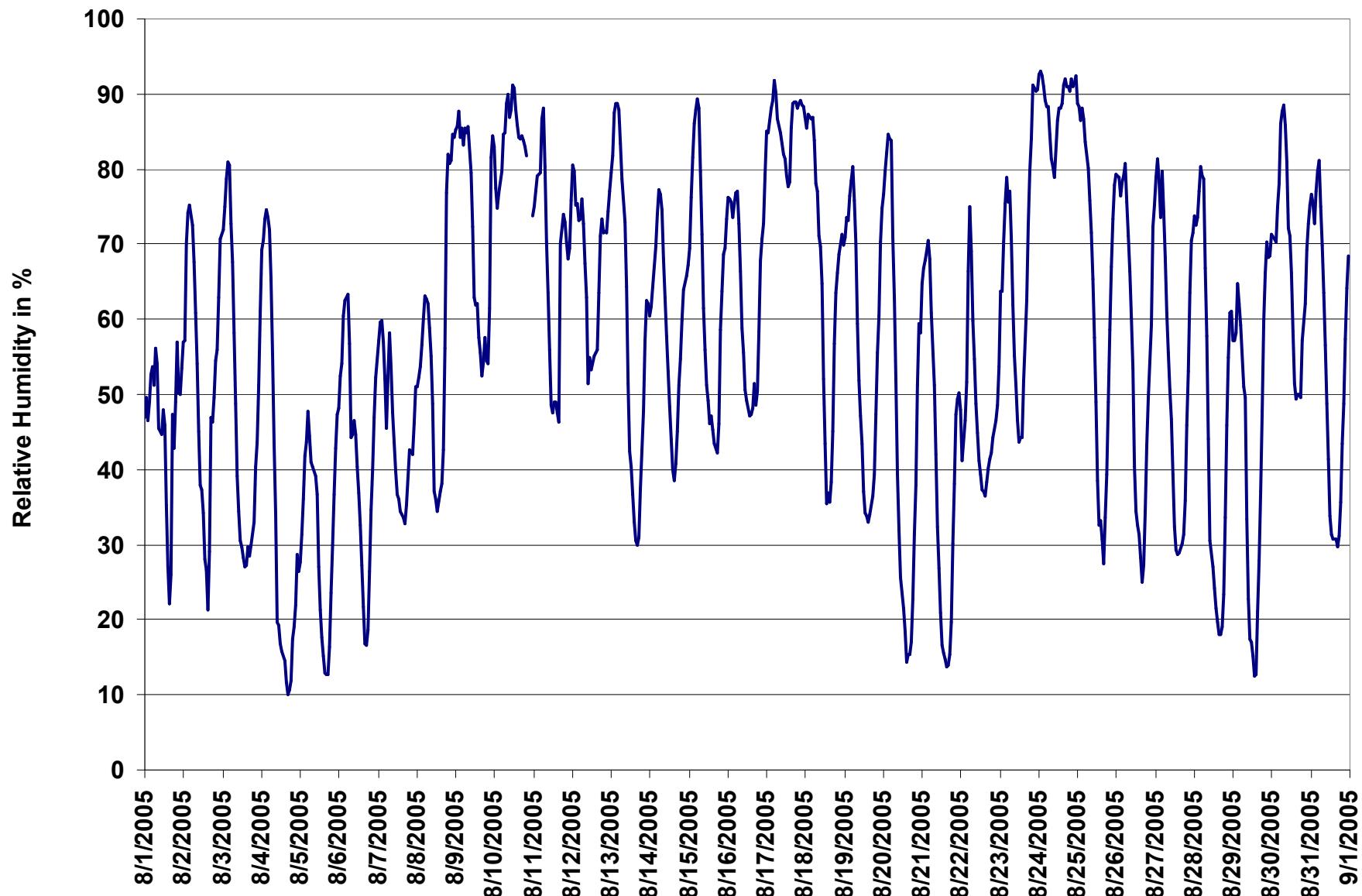


Figure 13. PAS - Cresent Heights Relative Humidity 1-hr Average Monthly Trend

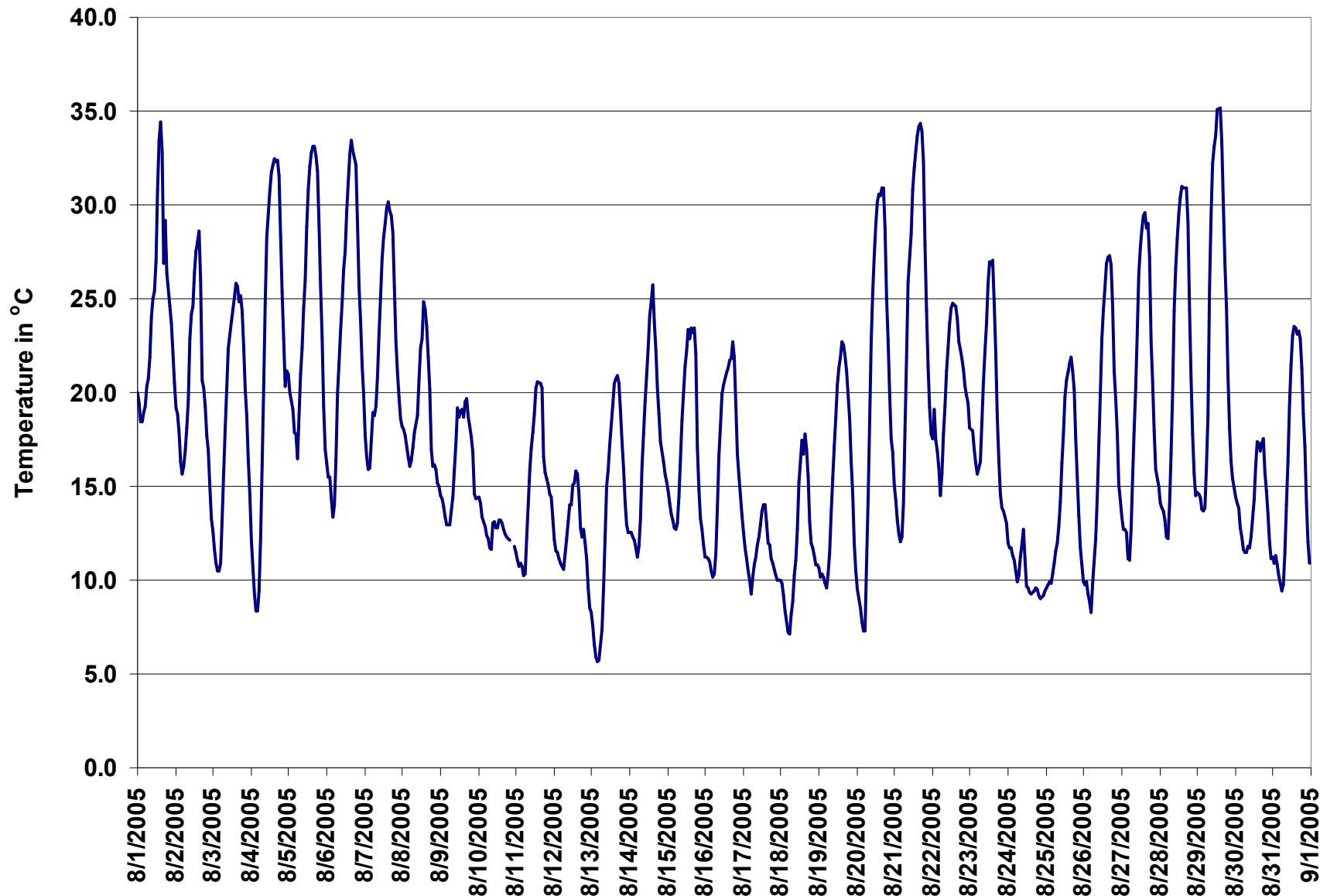


Figure 14. PAS - Crescent Heights Temperature 1-hr Average Monthly Trend

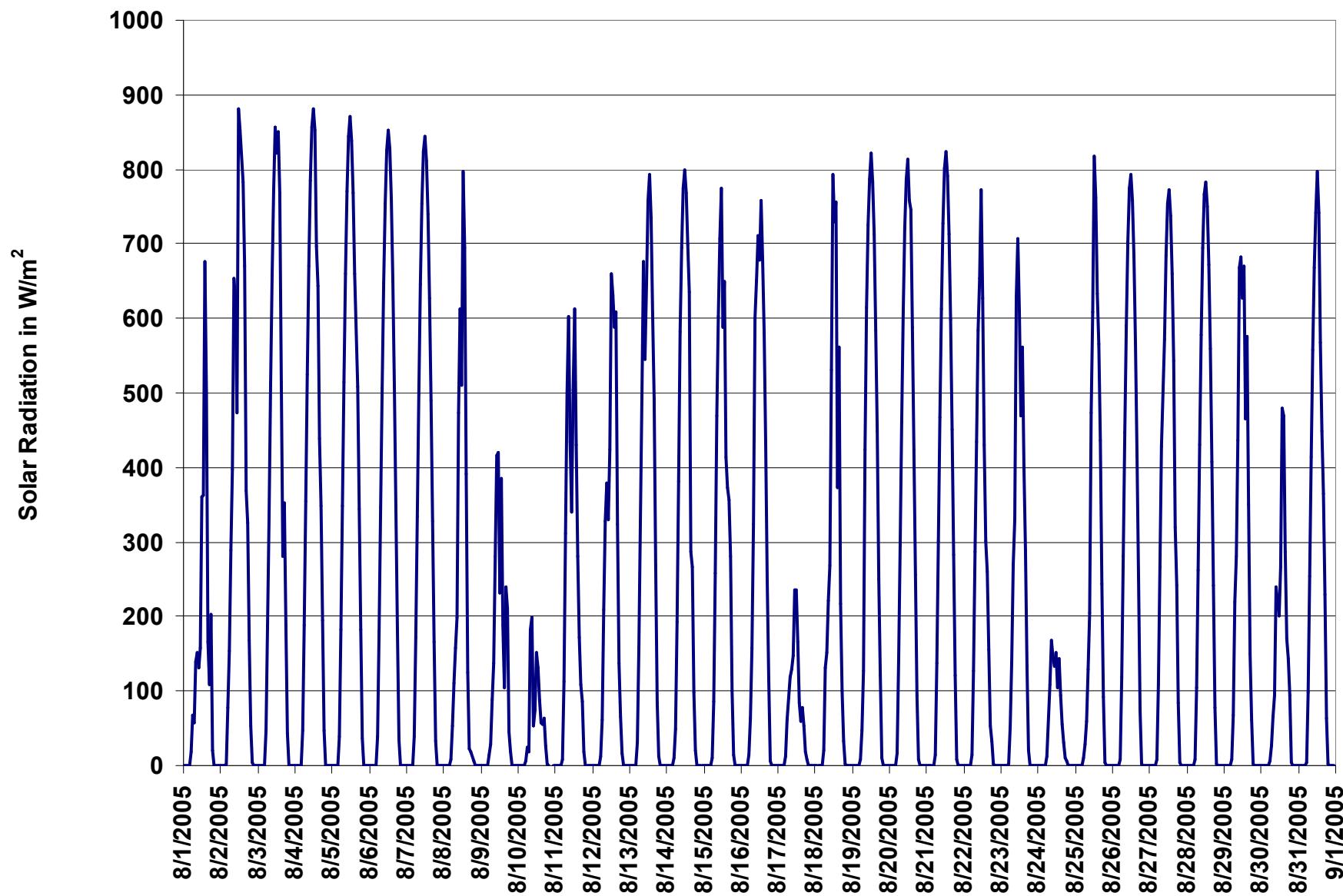
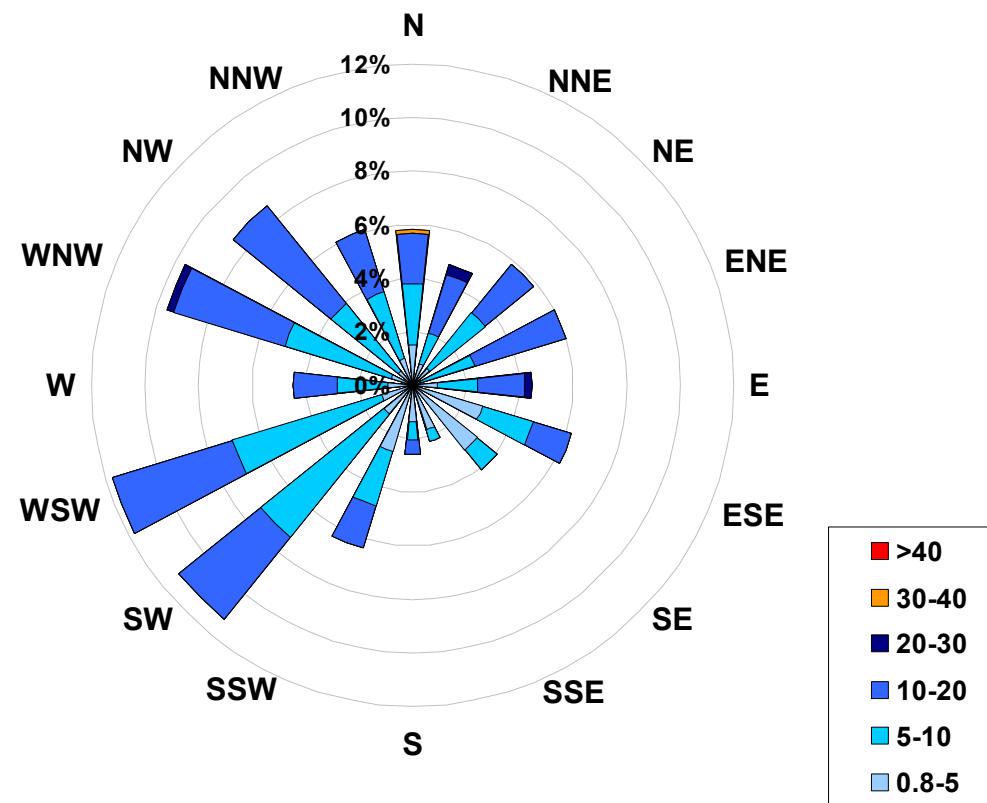


Figure 15. PAS - Crescent Heights Solar Radiation 1-hr Average Monthly Trend



1-hr Average Wind Rose (in km/hr) Located at the Cresent Heights Site for August 2005



Calms: 0%

Frequency Distribution of Wind in km/hr		
Range	Frequency (hrs)	
0.8 < 5	162	
5 to 10	294	
10 to 20	275	
20 to 30	7	
30 to 40	1	
> 40	0	
Total Non-Zero Values	739	



Passive Monitoring – August 2005

Ambient Air Compliance Network

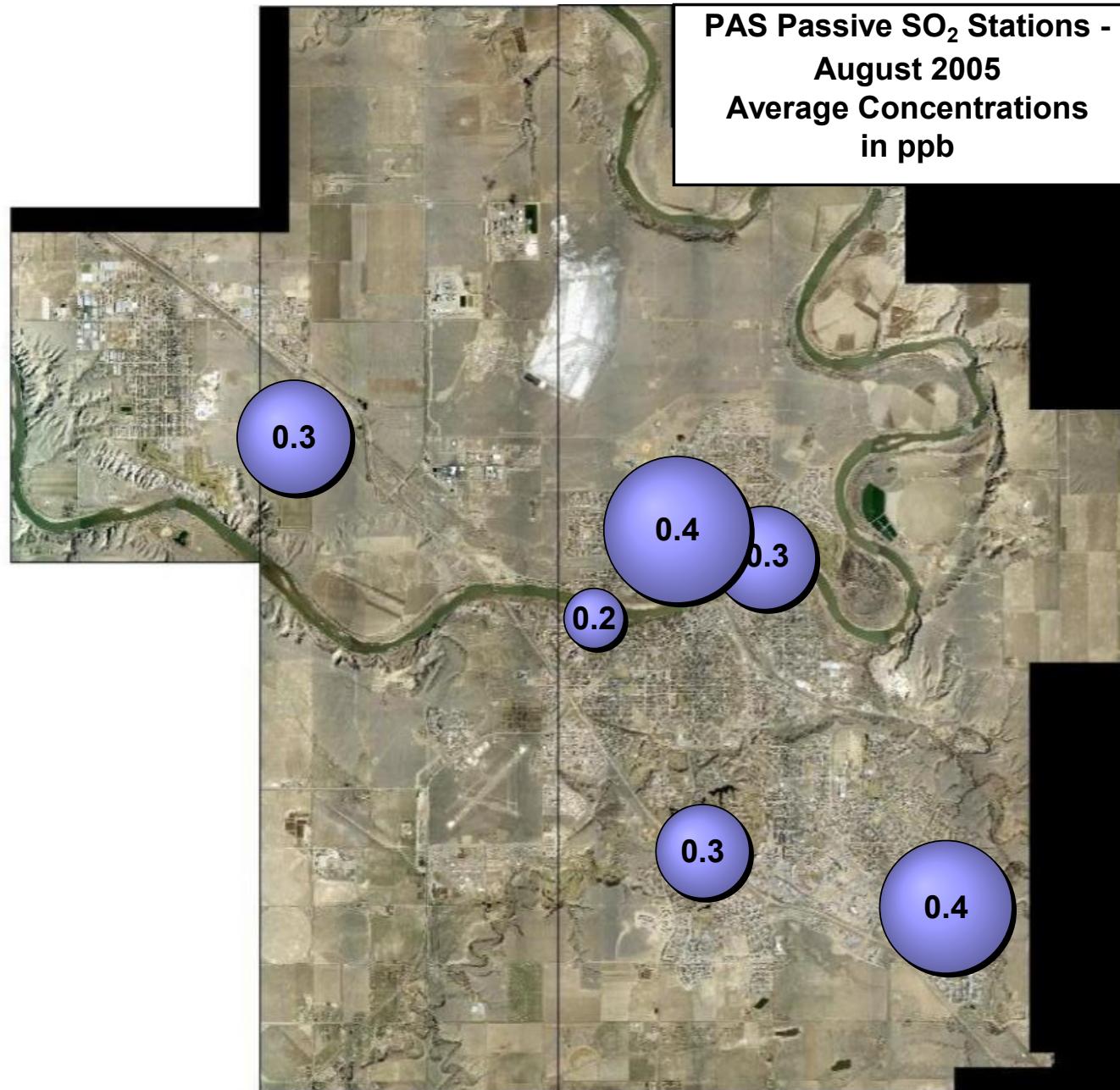


Palliser Airshed Society - PAS Passive Stations for August 2005

Station Number	Station Name				Location		
		SO ₂ ppb	O ₃ ppb	NO ₂ ppb	Easting	Northing	Elevation
Duplicates							
5a	Monitoring Station	0.2	27.4	5.3			
5b		0.3	26.5	4.5			
1	Hospital	0.2	25.3	5.9	521648	5542721	698
2	Ball Park	0.3	25.9	5.5	524019	5543686	660
3	Monitoring Station	0.4	33.4	5.5	522812	5544133	714
4	Redcliff	0.3	29.3	4.7	517448	5545608	725
5	Southridge	0.3	26.9	4.9	523172	5539016	721
6	Christian School Park	0.4	25.9	5.0	526577	5538133	709
Stats:							
	Mean	0.3	27.8	5.2			
	Standard Deviation	0.1	3.1	0.4			
	Minimum	0.2			1	Hospital	
	Maximum	0.4			3	Monitoring Station	
	Minimum		25.3		1	Hospital	
	Maximum		33.4		3	Monitoring Station	
	Minimum			4.7	4	Redcliff	
	Maximum			5.9	1	Hospital	

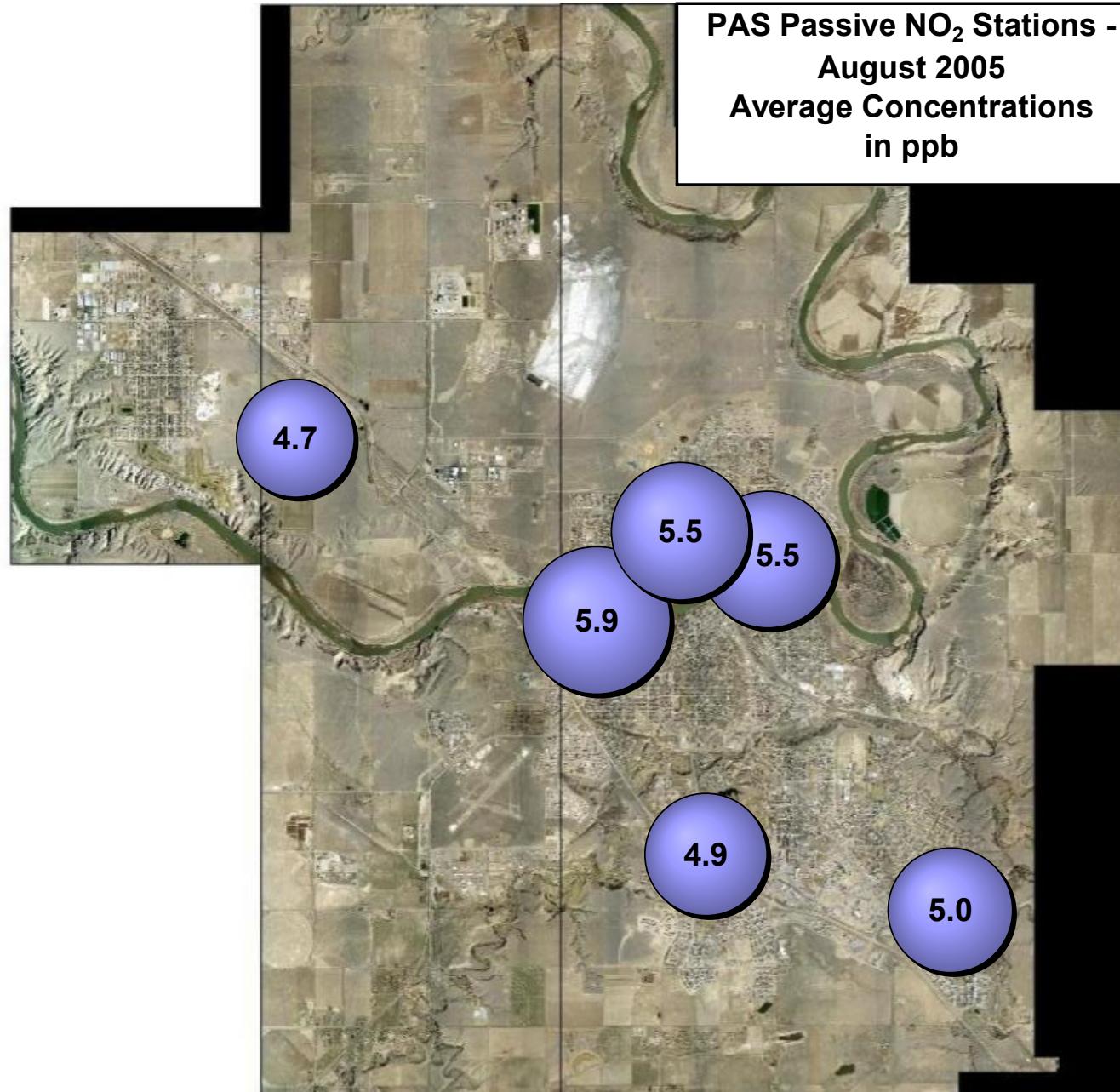


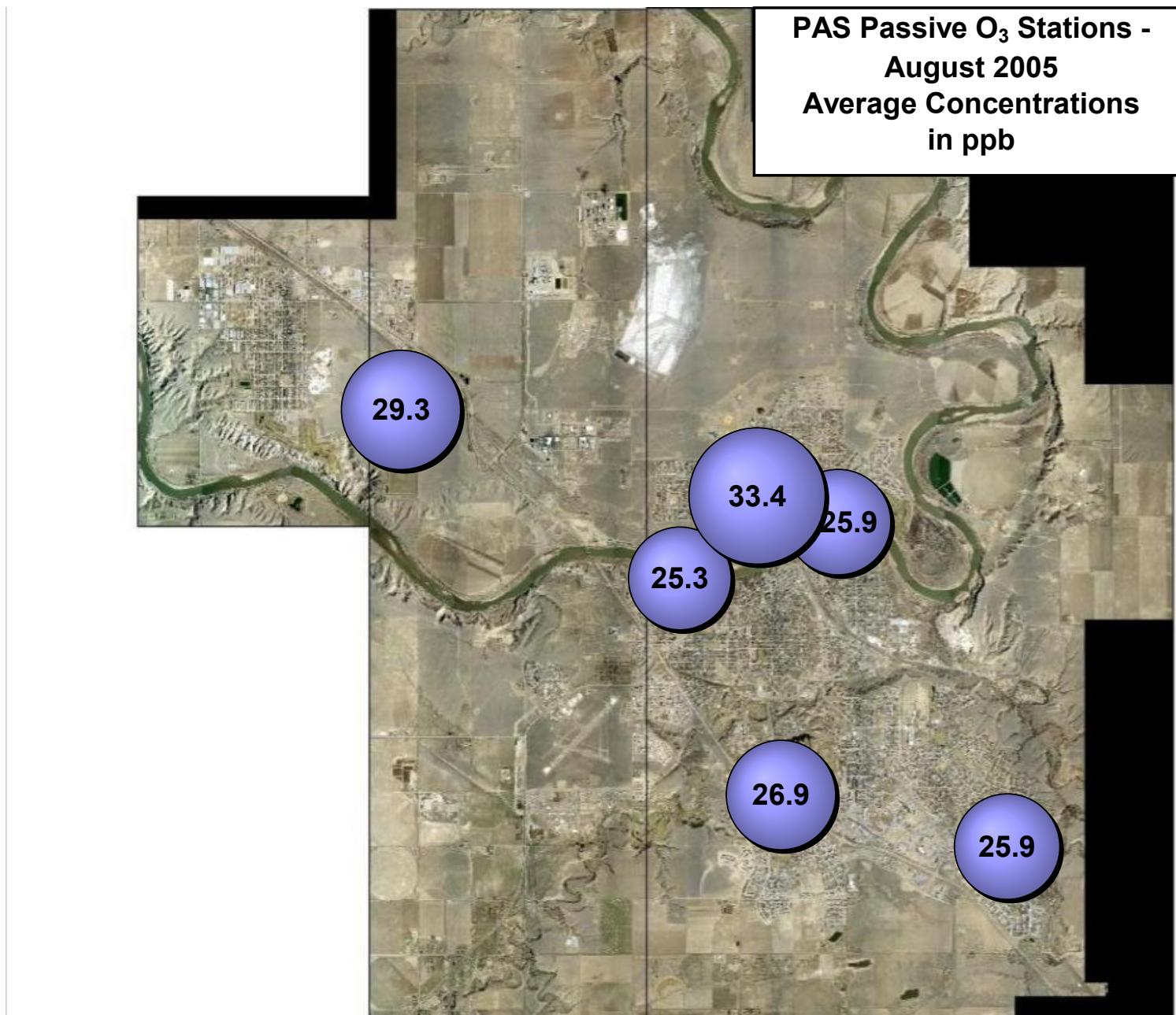
**PAS Passive SO₂ Stations -
August 2005
Average Concentrations
in ppb**





PAS Passive NO₂ Stations -
August 2005
Average Concentrations
in ppb





August 2005 - Calibration Reports

PAS - Crescent Heights Station:

O₃, NO_x, NO, NO₂, THC, CO, PM_{2.5}, and Wind Speed / Wind Direction

Calibration Report

Parameter

O3

Air Monitoring Network

Palliser Airshed

Station Information

Calibration Date	August 23, 2005	Previous Calibration	July 25, 2005
Station Number	1	Station Location	Crescent Heights
Reason:	Routine	Install	Removal
			Other:
Start Time (MST)	19:00	End Time (MST)	22:10
Barometric Pressure	0.911 ATM	Station Temperature	20.5 Deg C
Calibrator	Environics 6100	Serial Number	3016
Cal Gas Concentration	NA	Cal Gas Expiry Date	NA
DACS make	Focus AP1000	DACS serial No.	NA
DACS voltage range	0 - 1 volt	DACS channel #	5
	<u>Before</u>		<u>After</u>
DACS slope	0.050000	DACS slope	0.050000
DACS intercept	0.000000	DACS intercept	0.000000
Calculated slope	1.002594	Calculated slope	0.991858
Calculated intercept	1.097165	Calculated intercept	2.557796
Analyzer make	API Model 400E	Analyzer serial #	331
before		after	
Concentration range	0 - 500	ppb	0 - 500
Background	-5.3	ppb	-4.7
coefficient	1.075		0.997
Lamp measure	2759.0	mV	2722.0
Lamp Reference	2759.7	mV	2724.4
Pressure	26.0	inches Hg	25.8
Sample Flow	732	ccm	727
Lamp temp	52	Deg C	52

Calibration Data

Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
4995	0.00	0.0	-0.3	N/A
4995	0.00	293.0	294.6	0.9946
4995	0.00	196.9	194.6	1.0116
4995	0.00	102.2	97.7	1.0459
4995	0.00	0.0	4.5	0.0000
4995	0.00	293.0	264.1	1.1094
Average Correction Factor				1.0174

Calculated value of As Found Response: 261.3 ppm Percent Change of As Found: -10.8%

Auto zero	before calibration		after calibration	
	0.2	ppb	0.0	ppb
	357.1	ppb	362.3	ppb

Notes: Both zero and span adjustments performed.

Calibration Performed By: Kelly Baragar

Calibration Summary

Parameter

O3

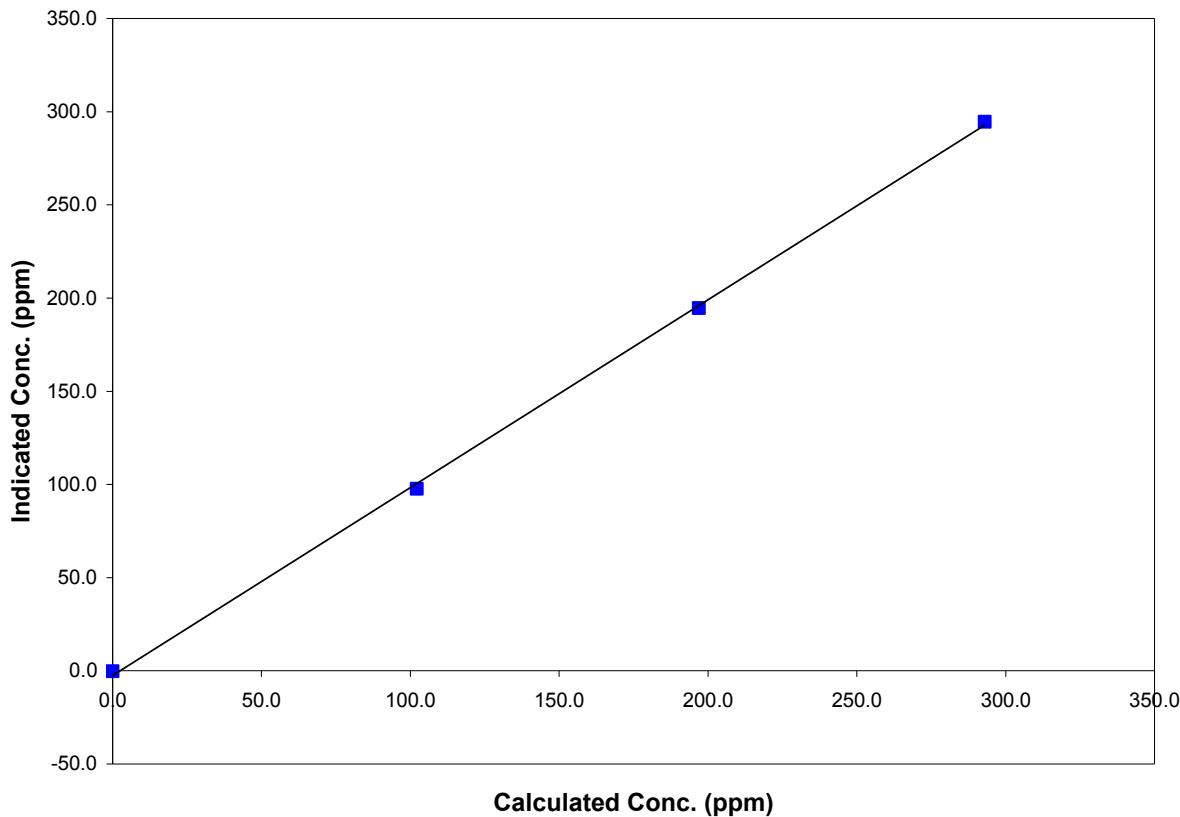
Air Monitoring Network

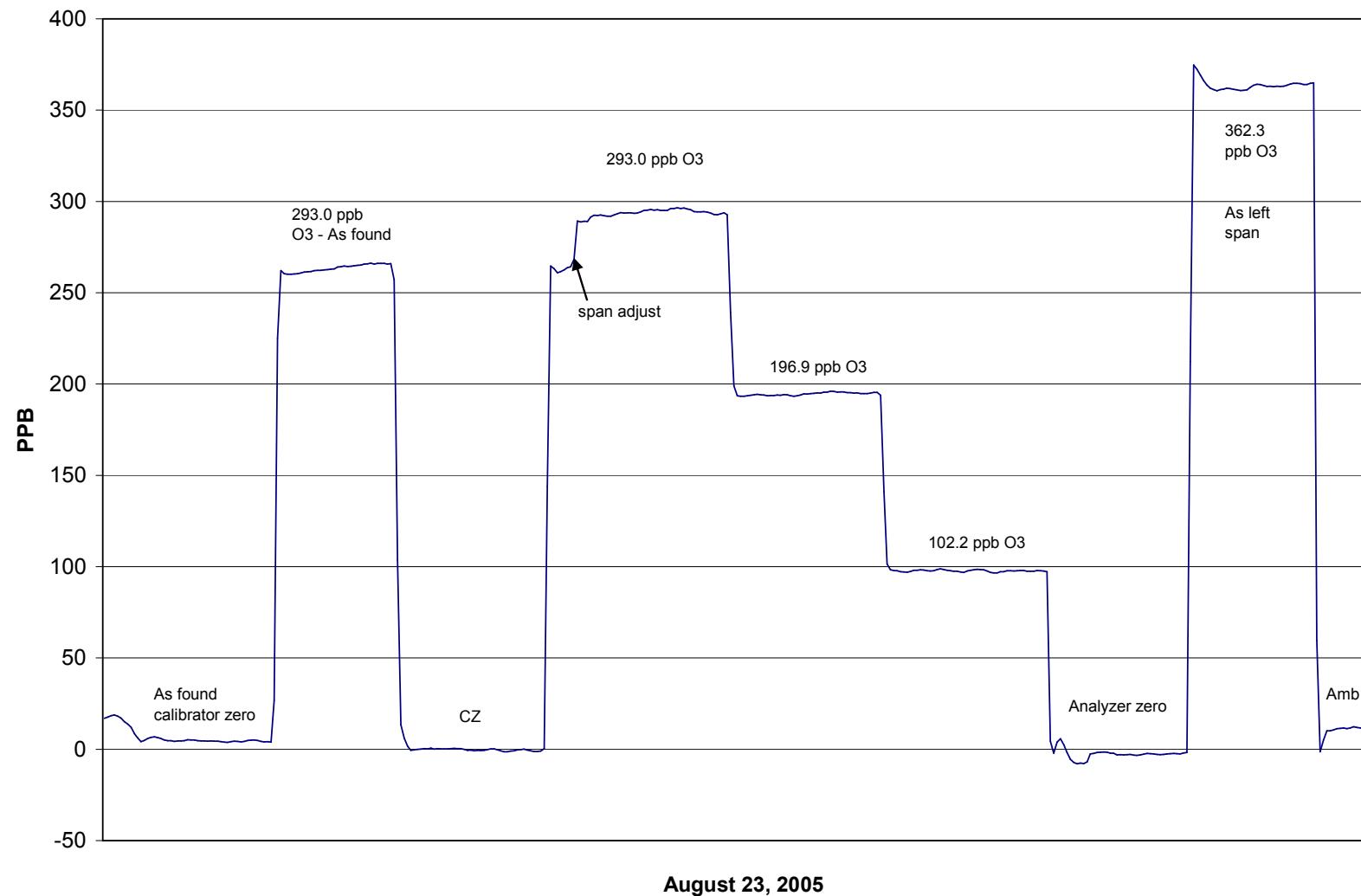
Palliser Airshed***Station Information***

Calibration Date	August 23, 2005	Previous Calibration	July 25, 2005
Station Number	1	Station Location	Crescent Heights
Start Time (MST)	19:00	End Time (MST)	22:10
Analyzer make/model	API Model 400E	Analyzer serial #	331

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
			Correlation Coefficient	Slope
293.0	294.6	0.9946		
196.9	194.6	1.0116		
102.2	97.7	1.0459		
0.0	-0.3	N/A		
			Intercept	2.557796

O3 Calibration Curve

O3 Calibration

August 23, 2005

Calibration Report

Parameter **NOx-NO-NO₂**
 Air Monitoring Network **Palliser Airshed**



Station Information

Calibration Date	<u>August 23, 2005</u>			Previous Calibration	<u>July 25, 2005</u>	
Station Number	<u>1</u>			Station Location	<u>Crescent Heights</u>	
Reason:	<input checked="" type="checkbox"/> Routine <input type="checkbox"/> Installation <input type="checkbox"/> Removal			Other:		
Start Time (MST)	<u>15:00</u>			End Time (MST)	<u>19:55</u>	
Barometric Pressure	<u>0.911</u>		<u>ATM</u>	Station Temperature	<u>19.5</u>	Deg C
Calibrator	<u>Environics 6100</u>			Serial Number	<u>3016</u>	
NO Cal Gas Conc	<u>49.8</u>	ppm		Cal Gas Expiry Date	<u>12-Dec-05</u>	
NOx Cal Gas Conc	<u>49.8</u>	ppm		Cal Gas Serial #	<u>ALM011558</u>	

DACS Information

DACS make	<u>FOCUS AP1000</u>			DACS serial No.	<u>45270</u>
Parameter	NO2	NOx	NO		
Before	DACS slope	0.050000	0.050000	0.050000	
	DACS offset	0.000000	0.000000	0.000000	
After	DACS slope	0.050000	0.050000	0.050000	
	DACS offset	0.000000	0.000000	0.000000	
Before	Data Slope	1.006548	0.998057	0.995388	
	Data Offset	-2.887676	-2.544346	-1.071806	
After	Data Slope	1.001868	0.995950	0.992593	
	Data Offset	-1.375140	-0.766117	0.296495	
	Channel #	8	6	7	
	Voltage Range	0 - 1 VDC	0 - 1 VDC	0 - 1 VDC	

Analyzer Information

Analyzer make/model **API Model 200E** Analyzer serial # **219**

Test Point	before		after	
Concentration range	0 - 500	ppb	0 - 500	ppb
NO background	-0.5	mV	-0.5	mV
NOx background	0.4	mV	0.4	mV
NO coefficient	1.855		1.954	
NOx coefficient	1.881		1.970	
Chamber Temp	50.0	Deg C	50.0	Deg C
Cooler Temp	7.0	Deg C	7.0	Deg C
Azero	32.6		32.9	
Perm Temp	40.0	Deg C	40.0	Deg C
Pressure	4.1	inches Hg	4.0	inches Hg
Sample Flow	459.0	ccm	455.0	ccm

Notes: Analyzer was span adjusted.

Calibration Report

Parameter **NOx-NO-NO₂**
 Air Monitoring Network **Palliser Airshed**



Station Information

Calibration Date: August 23, 2005 Station Location: Crescent Heights

Calibration Data

	Dilution flow rate (ccm)	Source gas flow rate (ccm)	Calculated NOx conc (ppb)	Calculated NO conc (ppb)	Calculated NO ₂ conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO ₂ conc (ppb)	NOx Correction factor	NO Correction factor
zero	4993	0.00	0.0	0.0	0.0	1.0	0.1	0.8	N/A	N/A
1	4993	39.97	395.5	395.5	0.0	397.9	398.2	0.1	0.9939	0.9931
2	4993	19.97	198.4	198.4	0.0	200.1	199.6	0.3	0.9914	0.9937
3	4993	9.97	99.2	99.2	0.0	100.0	99.1	0.7	0.9927	1.0010
AFZ	4993	0.00	0.0	0.0	0.0	1.0	0.1	0.8	0.0000	0.0000
AFS	4993	39.97	395.5	395.5	0.0	376.5	376.4	0.4	1.0505	1.0507
							Average Correction Factor	0.9927	0.9960	

As Found Concentrations NO_x= 372.9 NO= 375.3 As Found Percent Change NO_x= -5.7% NO= -5.1%

GPT Calibration Data

Dilution Flow 4993 ccm Source Gas Flow 39.97 ccm

O ₃ Setpoint (ppb)	Calculated NOx conc (ppb)	Calculated NO conc (ppb)	Calculated NO ₂ conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO ₂ conc (ppb)	NOx Correction factor	NO Correction factor	NO ₂ Correction factor	Converter Efficiency	
0	398.0	394.1	3.9	398.6	396.8	0.8	N/A	N/A	N/A	N/A	
350	398.0	105.0	293.0	399.4	105.5	293.3	0.9966	0.9954	0.9988	100.1%	
200	398.0	201.1	196.9	400.3	202.4	198.2	0.9942	0.9941	0.9932	100.7%	
100	398.0	295.8	102.2	401.5	297.7	104.1	0.9913	0.9936	0.9823	101.8%	
							Average Correction Factor	0.9940	0.9944	0.9914	100.9%

AIC Data

Parameter	Previous calibration				Current calibration				ppb
	NOx	NO ₂	NO		NOx	NO ₂	NO		
	0.2	-1.2	0.2	ppb	0.7	-0.6	1.1	ppb	
Auto span	457.0	450.0	9.9	ppb	468.0	458.8	12.0	ppb	

Calibration Performed By: Kelly Baragar

Calibration Summary

Parameter **NO₂**
 Air Monitoring Network **Palliser Airshed**



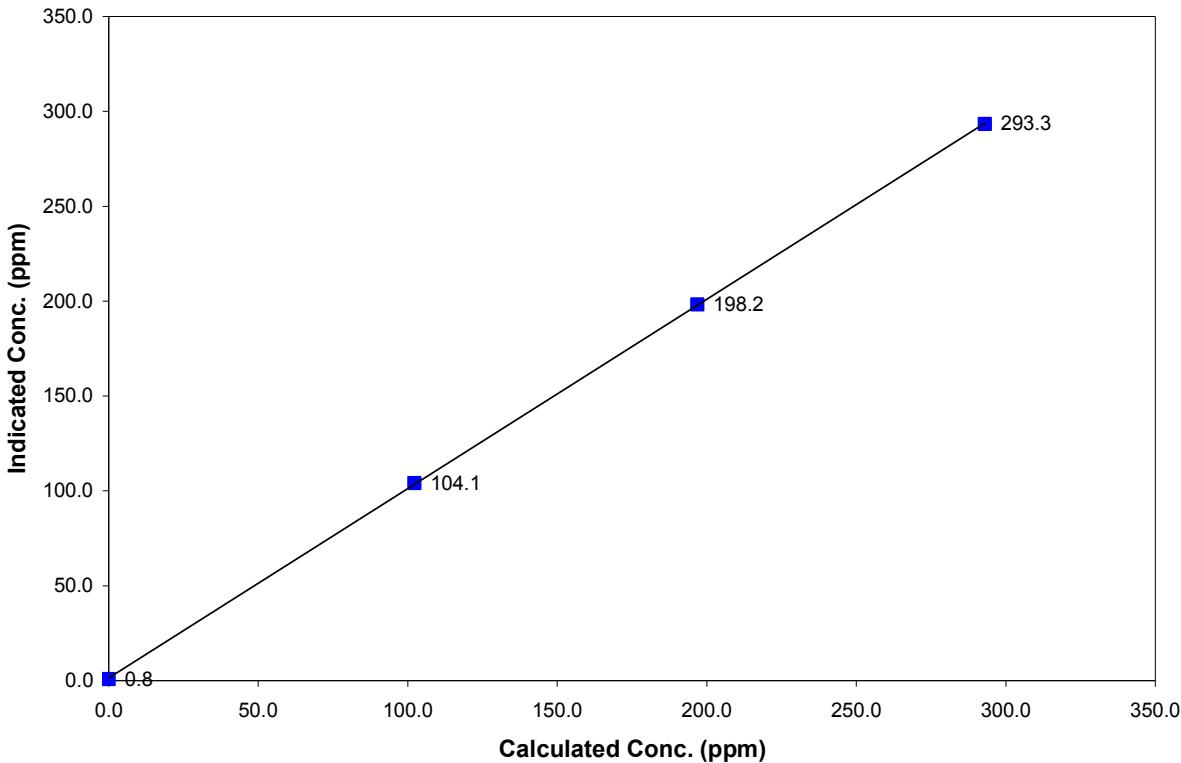
Station Information

Calibration Date	August 23, 2005	Previous Calibration	July 25, 2005
Station Number	1	Station Location	Crescent Heights
Start Time (MST)	15:00	End Time (MST)	19:55
Analyzer make	API Model 200E	Analyzer serial #	219

Calibration Data

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
			Correlation Coefficient	Slope
0.0	0.8	0.0000	Correlation Coefficient 0.9999977	Slope 1.001868
102.2	104.1	0.9823		
196.9	198.2	0.9932		Intercept -1.375140
293.0	293.3	0.9988		

NO₂ Calibration Curve



Calibration Summary

Parameter **NO_x**
 Air Monitoring Network **Palliser Airshed**



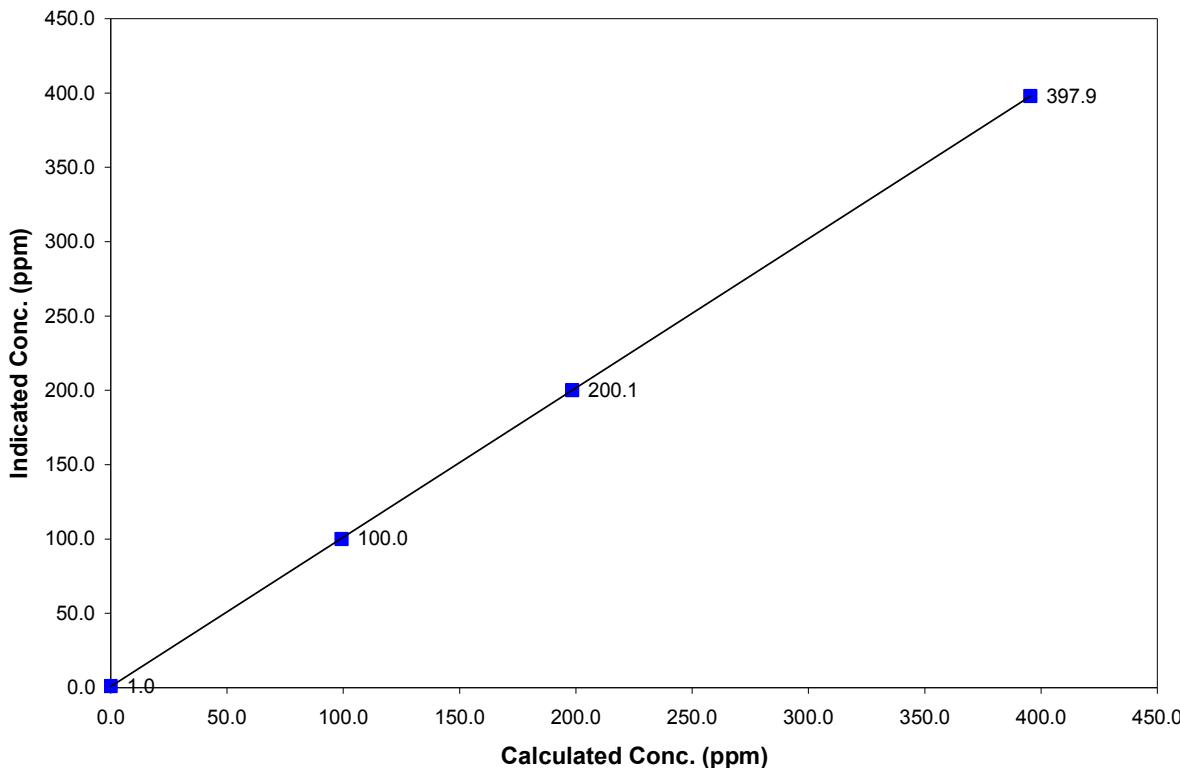
Station Information

Calibration Date	August 23, 2005	Previous Calibration	July 25, 2005
Station Number	1	Station Location	Crescent Heights
Start Time (MST)	15:00	End Time (MST)	19:55
Analyzer make	API Model 200E	Analyzer serial #	219

Calibration Data

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	1.0	0.0000		
395.5	397.9	0.9939	Correlation Coefficient	0.999997
198.4	200.1	0.9914		
99.2	100.0	0.9927		Slope 0.995950
				Intercept -0.766117

NOx Calibration Curve



Calibration Summary

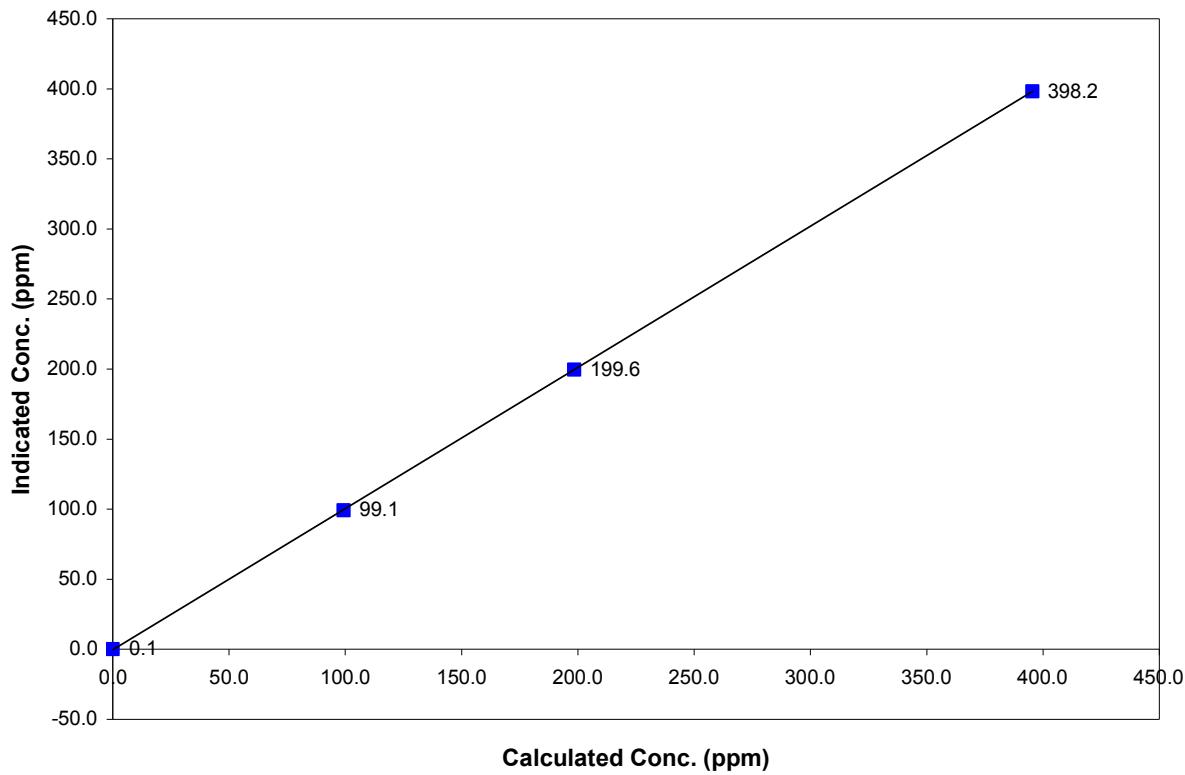
Parameter **NO**
 Air Monitoring Network **Palliser Airshed**

**Station Information**

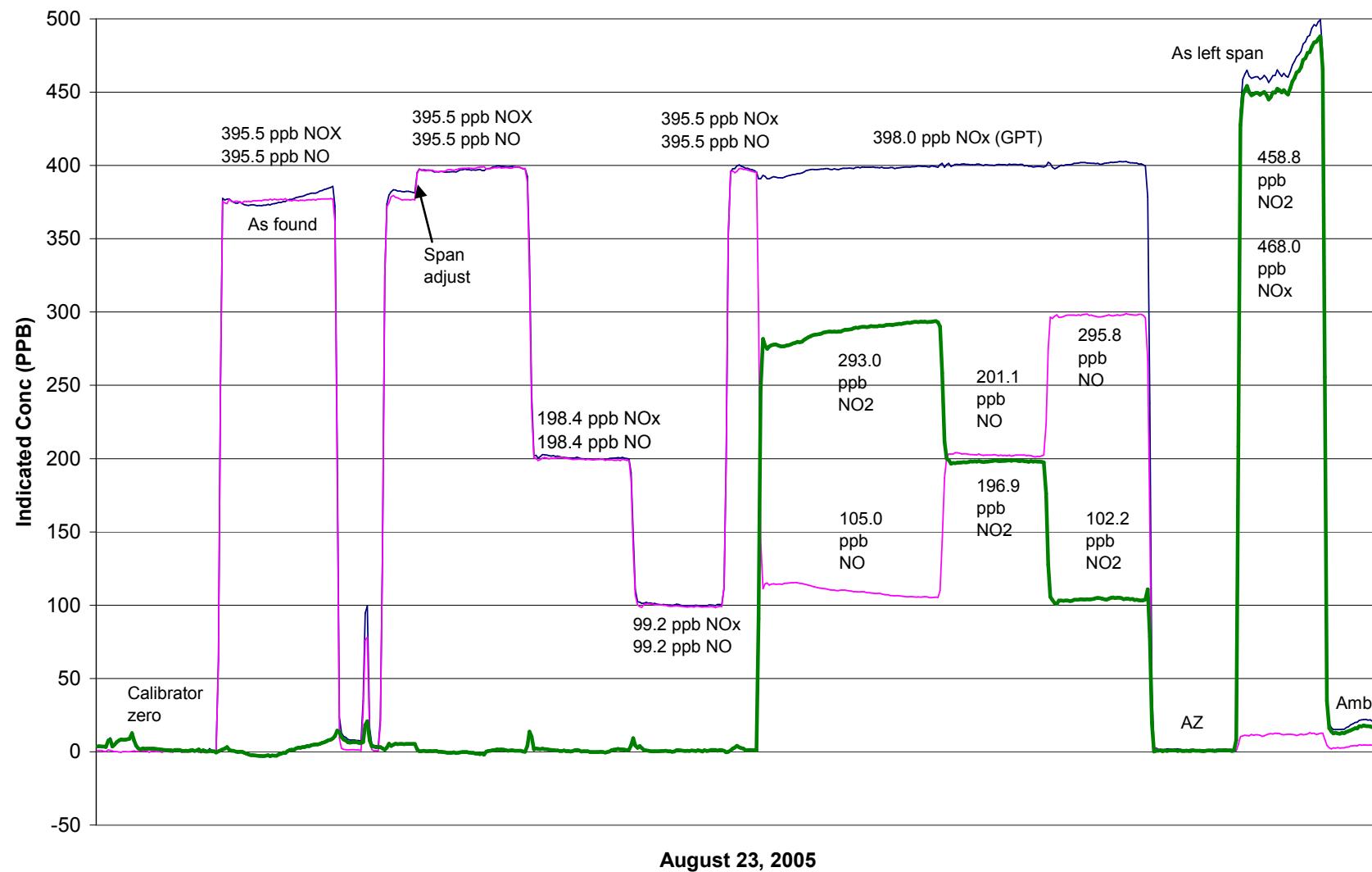
Calibration Date	August 23, 2005	Previous Calibration	July 25, 2005
Station Number	1	Station Location	Crescent Heights
Start Time (MST)	15:00	End Time (MST)	19:55
Analyzer make	API Model 200E	Analyzer serial #	219

Calibration Data

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.1	N/A	Correlation Coefficient	0.999995
395.5	398.2	0.9931		
198.4	199.6	0.9937		
99.2	99.1	1.0010		
			Slope	0.992593
			Intercept	0.296495

NO Calibration Curve

NOx Calibration



Calibration Report

Parameter THC
 Air Monitoring Network Palliser Airshed



Station Information

Calibration Date	August 24, 2005	Previous Calibration	July 25, 2005
Station Number	1	Station Location	Crescent Heights
Reason:	Routine	Install	Removal
			Other:
Start Time (MST)	10:42	End Time (MST)	14:00
Barometric Pressure	0.910 ATM	Station Temperature	20.0 Deg C
Calibrator	Environics 6100	Serial Number	3016
Cal Gas Concentration	700 ppm CH ₄ / 301 ppm C ₃ H ₈	Cal Gas Expiry Date	8/28/2005
Cal Gas CH4 equiv	1527.75 ppm	Cal Gas Cylinder #	ALM030358
DACS make	Focus AP1000	DACS serial No.	45270
DACS voltage range	0 - 10 volt	DACS channel #	9
	Before		After
DACS slope	0.005000	DACS slope	0.005000
DACS intercept	0.000000	DACS intercept	0.000000
Calculated slope	1.001951	Calculated slope	0.994850
Calculated intercept	-0.083577	Calculated intercept	0.038348
Analyzer make	TEI model 51C-LT	Analyzer serial #	407505596
Concentration range	before	after	
THC sample pressure	0 - 50 ppm	0 - 50 ppm	
THC span counts	5.75 PSI	5.75 PSI	
THC zero counts	10965 raw	10678 raw	
	1784 raw	1639 raw	

Calibration Data

Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
2994	0.00	0.00	0.00	N/A
2994	39.98	20.13	20.23	0.9951
2994	19.98	10.13	10.08	1.0046
2994	9.97	5.07	5.04	1.0058
zero	0.00	0.00	-0.31	As Found Zero
2994	39.98	20.13	19.57	As Found Span
Average Correction Factor				1.0018

Calculated value of As Found Response: 19.827 ppm Percent Change of As Found: 1.5%

Auto zero	before calibration		after calibration	
	0.02	ppm	0.04	ppm
	23.43	ppm	23.53	ppm

Notes: Analyzer was zero and span adjusted.

Calibration Performed By: Kelly Baragar

Calibration Summary

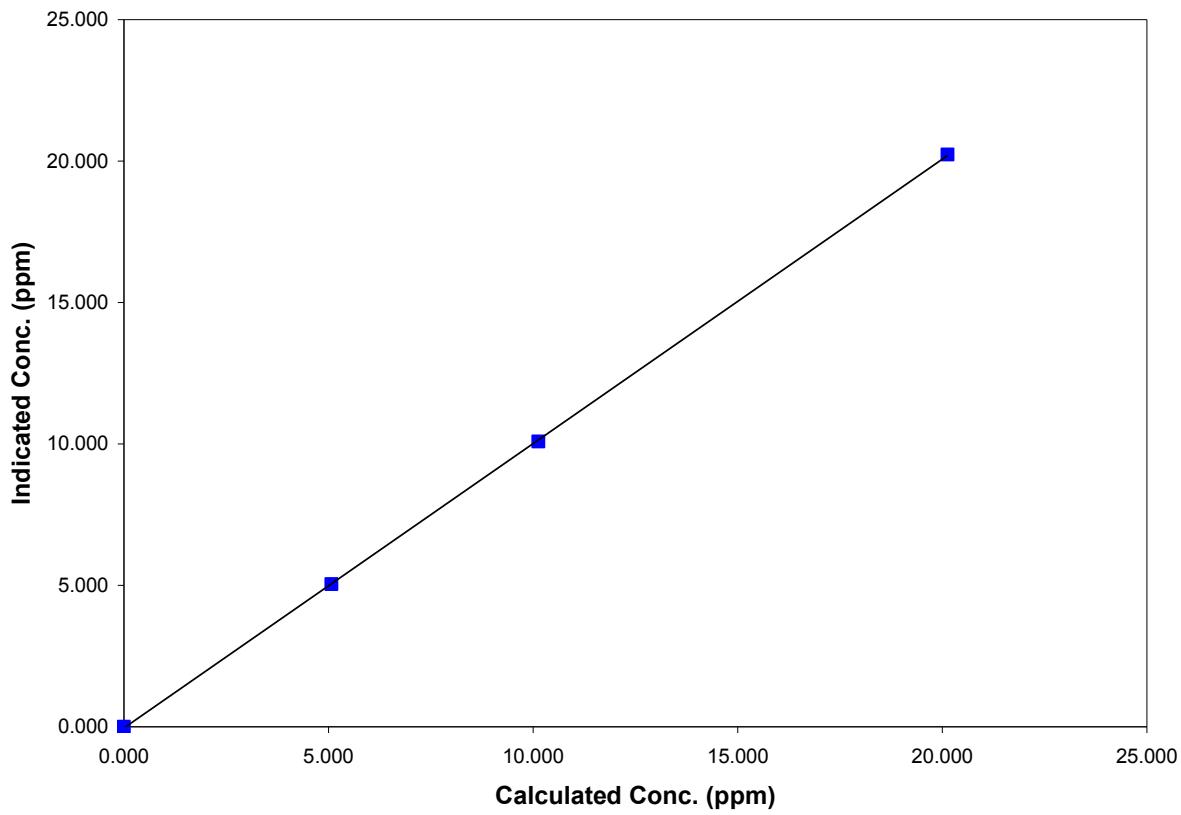
Parameter THC
 Air Monitoring Network Palliser Airshed

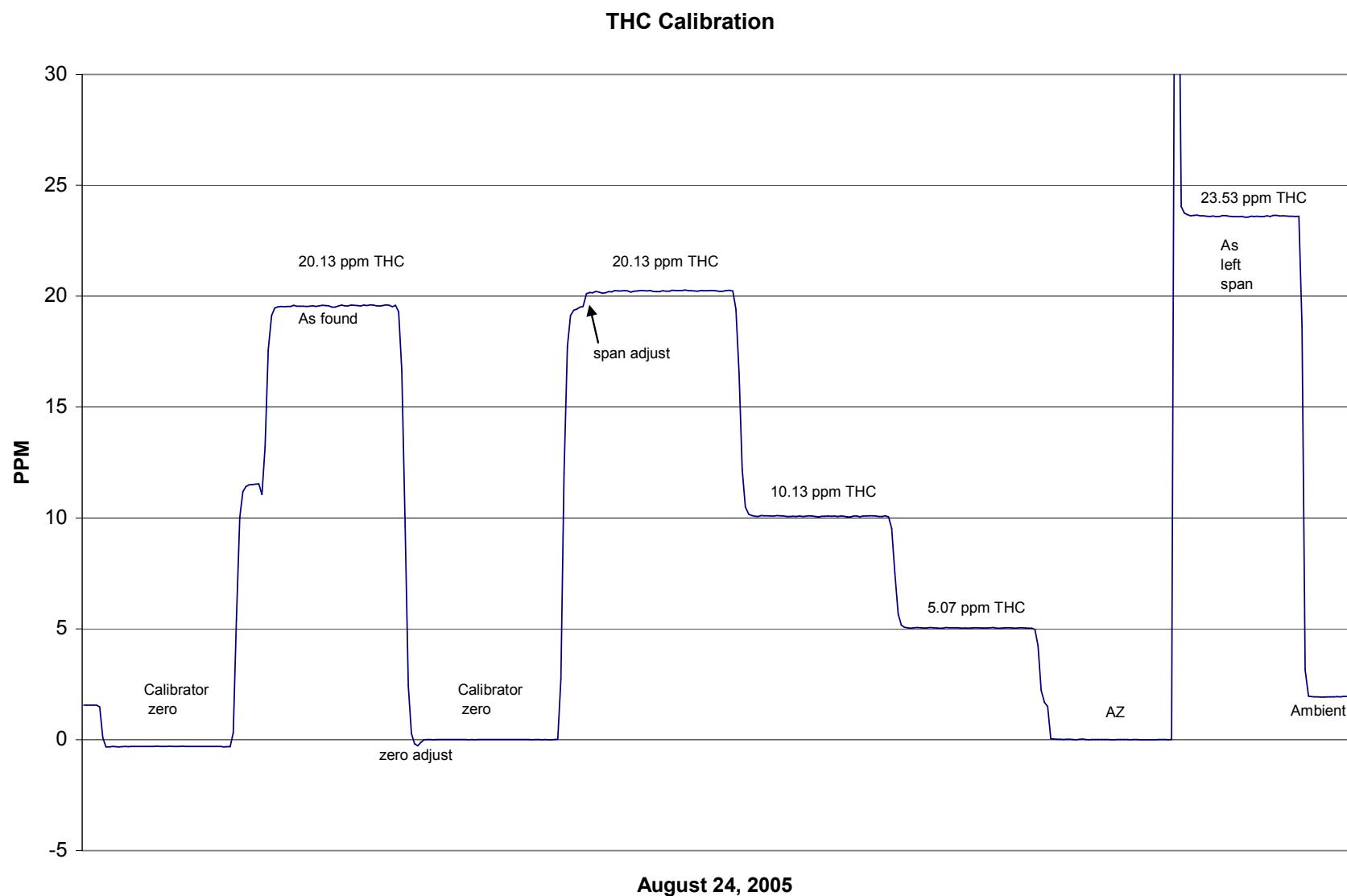
**Station Information**

Calibration Date	August 24, 2005	Previous Calibration	July 25, 2005
Station Number	1	Station Location	Crescent Heights
Start Time (MST)	10:42	End Time (MST)	14:00
Analyzer make/model	TEI model 51C-LT	Analyzer serial #	407505596

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.000	0.005	N/A		
20.132	20.232	0.9951	Correlation Coefficient	0.9999969
10.128	10.081	1.0046	Slope	0.994850
5.071	5.041	1.0058	Intercept	0.038348

THC Calibration Curve



Calibration Report



Parameter CO
Air Monitoring Network Palliser

Station Information

Calibration Date	August 24, 2005		Previous Calibration	July 25, 2005
Station Number	1		Station Location	Crescent Heights
Reason:	Routine	Install	Removal	Other:
Start Time (MST)	8:00	End Time (MST)	20:30	
Barometric Pressure	0.910	ATM	20.0	Deg C
Calibrator	Environics 6100	Serial Number	3016	
Cal Gas Conc	2998	ppm	3/14/2008	
DACS make	Focus AP1000	DACS serial No.	1	
DACS voltage range	0 - 1 volt	DACS channel #	9	
	<u>Before</u>		<u>After</u>	
DACS slope	0.005000	DACS slope	0.005000	
DACS intercept	0.000000	DACS intercept	0.000000	
Calculated slope	1.009148	Calculated slope	0.998465	
Calculated intercept	-0.031214	Calculated intercept	0.117233	
Analyzer make	TEI Model 48CLT	Analyzer serial #	436609887	
	<u>before</u>		<u>after</u>	
Concentration range	0 - 50	ppm	0 - 50	ppm
CO coefficient	1.015		1.045	
CO bkg setting	4.844		5.945	
Lamp ratio	1.1566		1.1545	
Lamp intensity	199960	Hz	200200	Hz
Sample Flow	1.009	LPM	1.007	LPM

Calibration Data

Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
4993	0.00	0.00	0.00	N/A
4993	49.97	29.71	29.69	1.0007
4993	19.96	11.94	11.74	1.0166
4993	9.97	5.97	5.79	1.0312
4993	0.00	0.00	0.39	0.0000
4993	49.97	29.71	30.03	0.9892
Average Correction Factor				1.0162

Calculated value of As Found Response: 29.876 ppm Percent Change of As Found: -0.6%

Auto zero	before calibration		after calibration	
	0.04	ppm	0.06	ppm
	19.22	ppm	18.99	ppm

Notes: A zero and span adjustment was performed following an internal A/D calibration.

Calibration Performed By: Kelly Baragar

Calibration Summary

Parameter co
Air Monitoring Network Palliser



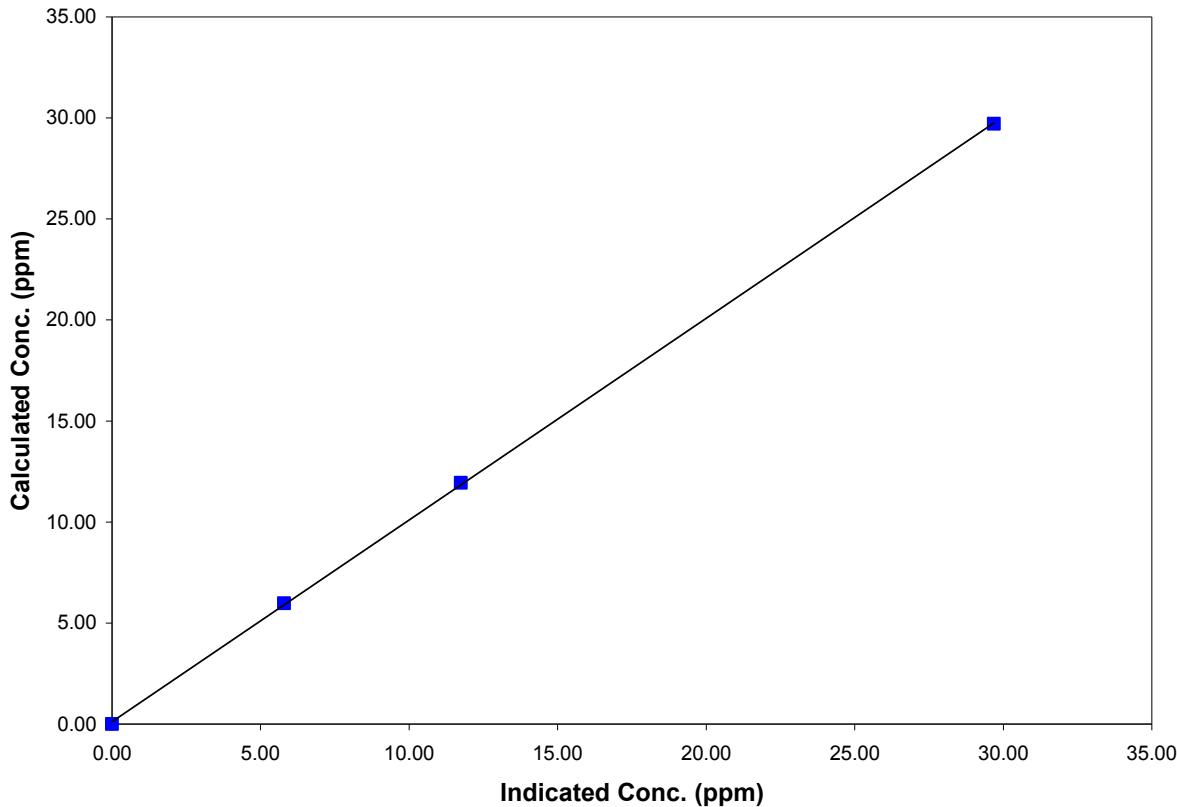
Station Information

Calibration Date	August 24, 2005	Previous Calibration	July 25, 2005
Station Number	1	Station Location	Crescent Heights
Start Time (MST)	8:00	End Time (MST)	20:30
Analyzer make/model	TEI Model 48CLT	Analyzer serial #	436609887

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A		
29.71	29.69	1.0007	Correlation Coefficient	0.999938
11.94	11.74	1.0166	Slope	0.998465
5.97	5.79	1.0312	Intercept	0.117233

CO Calibration Curve



CO Calibration