

State/Industry Ambient Monitoring Network

Air Quality Report

2<sup>nd</sup> Quarter 2008

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SECTION ONE

DISCUSSION OF  
MONITORING RESULTS

### Sulfur Dioxide (SO<sub>2</sub>)

There were no exceedances of either the state or the federal standards during the quarter. The maximum 1-hour concentration was 112 ppb at DGC #17; the maximum 3-hour concentration was 41 ppb at Hess — Tioga #3; and, the maximum 24-hour concentration was 19 ppb at Hess — Tioga #3. The highest arithmetic mean was 2.4 ppb at Hess — Tioga #3. All sites achieved at least an 80% data recovery for the period operated.

### Sulfur Dioxide (SO<sub>2</sub>) 5-Minute Average

The maximum 5-minute concentration was 757 ppb at Hess — Tioga #1. All sites achieved at least an 80% data recovery for the period operated.

### Trace Level Sulfur Dioxide (SO<sub>2</sub>)

There were no exceedances of either the state or the federal standards during the quarter. The maximum 1-hour concentration was 42.5 ppb at Lostwood NWR; the maximum 3-hour concentration was 24.0 ppb at Lostwood NWR; and, the maximum 24-hour concentration was 7.0 ppb at Lostwood NWR. The highest arithmetic mean was 1.2 ppb at Lostwood NWR. All sites achieved at least an 80% data recovery for the period operated.

### Trace Level Sulfur Dioxide (SO<sub>2</sub>) 5-Minute Average

The maximum 5-minute concentration was 84.6 ppb at Lostwood NWR. All sites achieved at least an 80% data recovery for the period operated.

### Ozone (O<sub>3</sub>)

There was no exceedance of the ozone standard during the quarter. The highest observed 1-hour concentration was 68 ppb at TRNP – NU and TRNP–SU. The highest 4<sup>th</sup> highest 8-hour concentration was 61 ppb at TRNP–NU and TRNP–SU. All sites achieved at least an 80% data recovery for the period operated.

### Nitrogen Dioxide (NO<sub>2</sub>)

The highest observed 1-hour concentration was 71 ppb at DGC #17. The maximum arithmetic mean concentration was 6.4 ppb at Fargo NW. All sites with the exception of TRNP–NU achieved at least an 80% data recovery for the period operated. TRNP–NU failed to achieve 80% data recovery due to machine malfunction.

### Carbon Monoxide (CO)

The highest observed 1-hour concentration was 828 ppb at Fargo NW. The maximum 8-hour concentration was 500 ppb at Fargo NW. The site achieved at least an 80% data recovery for the period operated.

### Ammonia (NH<sub>3</sub>)

The highest 1-hour concentration was 94.0 ppb at Beulah – North. The site achieved an 80% data recovery for the period.

The data is used as part of the ambient data input used by the newer dispersion models.

### Inhalable Continuous PM<sub>fine</sub> Particulates

The highest 24-hour concentration was 16.6  $\mu\text{g}/\text{m}^3$  at Fargo NW. The highest arithmetic mean concentration was 6.6  $\mu\text{g}/\text{m}^3$  at Hannover. All sites achieved at least an 80% data recovery for the period operated.

The analyzer used to collect the PM<sub>fine</sub> was required by EPA, but never given the reference or equivalent designation. Therefore, the data can only be used as an indicator of PM<sub>fine</sub> concentrations.

### Inhalable PM<sub>fine</sub> Particulates

There was no exceedance of the 24-hour standard during the quarter. The highest 24-hour average concentration was 41.2  $\mu\text{g}/\text{m}^3$  at Bismarck Residential. The highest weighted mean was 9.27  $\mu\text{g}/\text{m}^3$  at Fargo NW. All sites achieved at least an 80% data recovery for the period.

### Inhalable Continuous PM<sub>10</sub> Particulates

There was no exceedance of the 24-hour standard during the quarter. The maximum 24-hour concentration was 108.0  $\mu\text{g}/\text{m}^3$  at Dunn Center. The highest arithmetic mean was 14.6  $\mu\text{g}/\text{m}^3$  at Bismarck Residential. All sites achieved an 80% data recovery for the period.

SECTION TWO

AMBIENT AIR QUALITY DATA

SUMMARIES

COMPARISON OF AIR QUALITY DATA WITH  
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS \*

POLLUTANT: **Sulfur Dioxide** (ppb)

LOCATION	YEAR	NUM OBS	1 1ST	— HOUR 2ND	M A X 3	I 1ST	M A HOUR 2ND	24 — HOUR 1ST 2ND	ARITH MEAN	1HR #>273	24HR #>99
Bear Paw - MGP #3	2008	4330	10	9	6	6	3	2	1.1		
Bear Paw - MGP #5	2008	4326	21	20	17	12	6	4	1.2		
Beulah - North	2008	4091	66	45	39	22	9	6	1.6		
Bismarck Residential	2008	4179	50	34	26	26	12	7	1.8		
DGC #12	2008	4313	35	29	24	16	8	6	1.8		
DGC #14	2008	4333	27	24	15	13	6	5	1.5		
DGC #16	2008	4341	41	34	17	16	6	6	1.5		
DGC #17	2008	4352	112	81	38	28	6	6	1.5		
Hannover	2008	4334	75	60	30	29	8	8	1.8		
Hess - Tioga #1	2008	3998	96	43	35	26	8	6	1.3		
Hess - Tioga #3	2008	4295	46	44	41	37	19	15	2.4		
TRNP - SU (Painted Canyon)	2008	4317	14	8	5	3	2	1	1.0		

The highest 1-hour concentration is 112 ppb at DGC #17  
 The highest 3-hour concentration is 41 ppb at Hess - Tioga #3  
 The highest 24-hour concentration is 19 ppb at Hess - Tioga #3  
 The highest arithmetic mean is 2.4 ppb at Hess - Tioga #3

\* The air quality standards are:

- STATE Standards -
- 1) 273 ppb maximum 1-hour average concentration.
  - 2) 99 ppb maximum 24-hour average concentration.
  - 3) 23 ppb maximum annual arithmetic mean concentration.

- FEDERAL Standards -
- 1) 500 ppb maximum 3-hour concentration not to be exceeded more than once per year.
  - 2) 140 ppb maximum 24-hour concentration not to be exceeded more than once per year.
  - 3) 30 ppb annual arithmetic mean.

COMPARISON OF AIR QUALITY DATA WITH  
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS \*

POLLUTANT : **Sulfur Dioxide 5-Minute Averages** (ppb)

LOCATION	YEAR	NUM OBS	5 - M I N U T E M A X I M A			# HOURS >600
			1ST	2ND	3RD	
Bear Paw - MGP #3	2008	4331	32	24	18	
Bear Paw - MGP #5	2008	4326	55	42	37	
Beulah - North	2008	4091	97	66	61	
Bismarck Residential	2008	4179	67	59	54	
Hannover	2008	4334	163	137	115	
Hess - Tioga #1	2008	3998	757	81	79	1
Hess - Tioga #3	2008	4295	151	141	140	
TRNP - SU (Painted Canyon)	2008	4317	27	23	11	

The maximum 5-minute concentration is 757 ppb at Hess - Tioga #1

\* No Standard is currently in effect:

COMPARISON OF AIR QUALITY DATA WITH  
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS \*

POLLUTANT : **Trace Level Sulfur Dioxide** (ppb)

LOCATION	YEAR	NUM OBS	1 - 1ST	HOUR 2ND	M A X 3 - 1ST	M A X 3 - 2ND	24 - 1ST	HOUR 2ND	ARITH MEAN	1HR #>273	24HR #>99
Dunn Center	2008	4252	20.9	17.2	11.0	11.0	4.0	3.0	0.4		
Fargo NW	2008	4301	4.9	4.9	3.0	3.0	1.0	1.0	0.2		
Lostwood NWR	2008	4334	42.5	40.0	24.0	22.0	7.0	6.0	1.2		
TRNP - NU	2008	4342	16.1	11.0	10.0	6.0	3.0	3.0	0.5		

The highest 1-hour concentration is 42.5 ppb at Lostwood NWR  
 The highest 3-hour concentration is 24.0 ppb at Lostwood NWR  
 The highest 24-hour concentration is 7.0 ppb at Lostwood NWR  
 The highest arithmetic mean is 1.2 ppb at Lostwood NWR

\* The air quality standards are:

- STATE Standards -
- 1) 273 ppb maximum 1-hour average concentration.
  - 2) 99 ppb maximum 24-hour average concentration.
  - 3) 23 ppb maximum annual arithmetic mean concentration.

- FEDERAL Standards -
- 1) 500 ppb maximum 3-hour concentration not to be exceeded more than once per year.
  - 2) 140 ppb maximum 24-hour concentration not to be exceeded more than once per year.
  - 3) 30 ppb annual arithmetic mean.

COMPARISON OF AIR QUALITY DATA WITH  
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS \*

POLLUTANT : **Trace Level Sulfur Dioxide 5-Minute Averages** (ppb)

LOCATION	YEAR	NUM OBS	5 - M I N U T E M A X I M A			# HOURS >600
			1ST	2ND	3RD	
Dunn Center	2008	4209	32.9	30.0	29.9	
Fargo NW	2008	4302	12.6	11.6	7.5	
Lostwood NWR	2008	4334	84.6	61.5	60.5	
TRNP - NU	2008	4342	23.9	13.4	13.3	

The maximum 5-minute concentration is 84.6 ppb at Lostwood NWR

\* No Standard is currently in effect:

COMPARISON OF AIR QUALITY DATA WITH  
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS \*

POLLUTANT : Ozone (ppb)

LOCATION	YEAR	NUM OBS	M A X I				M A - HOUR				1HR #>120	8HR #>75
			1ST	2ND	1ST	2ND	3RD	4TH				
Beulah North	2008	4330	62	62	61	59	58	57				
Bismarck Residential	2008	4168	65	62	60	59	58	57				
Dunn Center	2008	4349	65	65	62	62	57	57				
Fargo NW	2008	4325	64	61	58	56	56	55				
Hannover	2008	4338	65	64	62	60	59	58				
Lostwood NWR	2008	4355	64	63	60	59	59	58				
TRNP - NU	2008	4345	68	67	63	62	61	61				
TRNP - SU	2008	4340	68	64	66	62	61	61				

The highest 1-hour concentration is 68 ppb at TRNP - NU and TRNP - SU  
The 4th highest 8-hour concentration is 61 ppb at TRNP- SU and TRNP - SU

\* The air quality standards for ozone are:  
STATE - 120 ppb not to be exceeded more than once per year.

FEDERAL Standards -

- 1) 120 ppb maximum 1-hour concentration with no more than one expected exceedance per year.
- 2) Fourth highest daily maximum 8-hour averages for a 3-year period not to exceed 75 ppb.

COMPARISON OF AIR QUALITY DATA WITH  
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS \*

POLLUTANT : Nitrogen Dioxide (ppb)

LOCATION	YEAR	NUM OBS	M A X 1 - 1ST	I M A 2ND	ARITH MEAN
Beulah - North	2008	4320	23	21	2.8
Bismarck Residential	2008	4332	43	43	6.3
DGC #12	2008	4290	67	24	2.8
DGC #17	2008	4350	71	60	1.9
Dunn Center	2008	4165	24	24	1.8
Fargo NW	2008	3936	53	49	6.4
Hannover	2008	4053	33	31	2.1
Lostwood NWR	2008	4325	22	22	1.5
TRNP - NU	2008	3192 ***	22	14	1.1

The maximum 1-hour concentration is 71 ppb at DGC #17  
The maximum Arithmetic Mean concentration is 6.4 ppb at Fargo NW

\*\*\* Less than 80% of the possible samples (data) were collected.

\* The air quality standards are:  
STATE - 53 ppb maximum annual arithmetic mean.

FEDERAL - 53 ppb annual arithmetic mean.

COMPARISON OF AIR QUALITY DATA WITH  
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS \*

POLLUTANT : CARBON MONOXIDE (PPB)

LOCATION	YEAR	NUM OBS	M A X 1 - 1ST	I M A 8 - 2ND	1HR #>35000	8HR #>9000
Fargo NW	2008	4308	828.0	710.0	500.0	500.0

\* The STATE and FEDERAL air quality standards are:  
1) The maximum allowable 1-hour concentration is 35000 ppb not to be exceeded more than once per year.  
2) The maximum allowable 8-hour concentration is 9000 ppb not to be exceeded more than once per year.

COMPARISON OF AIR QUALITY DATA WITH  
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS \*

POLLUTANT : Ammonia (ppb)

LOCATION	YEAR	NUM OBS	1ST	M 1 2ND	A - HOUR 3RD	X I 3RD	M A 4TH
Beulah - North	2008	4288	94.0	72.0		71.0	69.0

\* No Standard is currently in effect:

COMPARISON OF AIR QUALITY DATA WITH  
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS \*

POLLUTANT : Inhalable Continuous PM<sub>fine</sub> Particulates (µg/m<sup>3</sup>)

LOCATION	YEAR	NUM OBS	1ST	M 1 2ND	A - HOUR 2ND	X I 1ST	M A 2ND	24 - 3RD	HOUR 4TH	MEAN	24HR #>65	AM>15
Beulah - North	2008	4327	67.2	42.6		11.1	10.7	9.4	9.3	3.6		
Bismarck Residential	2008	4334	35.6	27.4		12.3	10.6	9.4	9.3	4.4		
Dunn Center	2008	4228	81.0	52.8		12.2	11.7	9.8	9.3	3.5		
Fargo NW	2008	4333	138.5	45.7		16.6	11.9	10.4	9.6	4.5		
Hannover	2008	4324	30.8	23.7		14.5	14.1	12.7	12.4	6.6		
Lostwood NWR	2008	4321	39.9	27.9		9.0	8.7	8.7	8.2	3.6		
TRNP - NU	2008	4284	35.3	26.0		8.8	7.4	7.1	6.8	3.0		
TRNP - SU	2008	4322	34.1	23.9		12.8	11.3	11.3	11.0	6.0		

The highest 24-hour concentration is 16.6 µg/m<sup>3</sup> at Fargo NW  
The highest Annual Mean concentration is 6.6 µg/m<sup>3</sup> at Hannover

\* The EPA-required analyzer used to collect this data is not a reference or equivalent method, this data cannot be compared to the PM<sub>fine</sub> standards. This data can only be used as an indicator of the actual PM<sub>fine</sub> ambient concentrations. If this data were to indicate there may be an exceedance of the ambient standards, then the department could be required to install a designated reference or equivalent sampler.

COMPARISON OF AIR QUALITY DATA WITH  
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS \*

POLLUTANT : **Inhalable PM<sub>fine</sub> Particulates** ( $\mu\text{g}/\text{m}^3$ )

LOCATION	YEAR	OBS	MIN	M A X I M A			98th %	WTD MEAN	#>35	AM>15
				1ST	2ND	3RD				
Beulah - North	2008	35		16.4	13.2	12.6	16.4	7.06		
Bismarck Residential	2008	72		41.2	14.9	13.8	14.9	8.39	1	
Fargo NW	2008	66		34.6	23.8	23.5	23.8	9.27		
TRNP - SU (Painted Canyon)	2008	33		11.0	10.8	10.0	11.0	5.41		

The highest 24-hour concentration is 41.2  $\mu\text{g}/\text{m}^3$  at Bismarck Residential  
The highest Annual Weighted Mean concentration is 9.27  $\mu\text{g}/\text{m}^3$  at Fargo NW

\* The ambient air quality standards are:

FEDERAL Standards -

- 1) 24-hour: 3-year average of 98th percentiles not to exceed 35  $\mu\text{g}/\text{m}^3$ .
- 2) Annual: 3-year average not to exceed 15  $\mu\text{g}/\text{m}^3$ .

COMPARISON OF AIR QUALITY DATA WITH  
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS \*

POLLUTANT : Inhalable Continuous PM<sub>10</sub> Particulates (µg/m<sup>3</sup>)

LOCATION	YEAR	NUM OBS	1 - HOUR		M A X I M A		24 - HOUR		MEAN	24HR #>150	AM>50
			1ST	2ND	1ST	2ND	3RD	4TH			
Beulah - North	2008	4329	281.0	238.0	62.0	50.0	50.0	50.0	12.9		
Bismarck Residential	2008	4336	330.0	282.0	86.0	85.0	49.0	45.0	14.6		
Dunn Center	2008	4227	389.0	387.0	108.0	53.0	49.0	41.0	14.3		
Fargo NW	2008	4331	263.0	169.0	64.0	34.0	30.0	27.0	11.7		
Lostwood NWR	2008	4322	211.0	130.0	32.0	29.0	28.0	28.0	10.2		
TRNP - NU	2008	4339	351.0	297.0	58.0	31.0	30.0	29.0	9.5		

The highest 24-hour concentration is 108.0 µg/m<sup>3</sup> at Dunn Center  
The highest Annual Mean concentration is 14.6 µg/m<sup>3</sup> at Bismarck Residential

\* The STATE and FEDERAL air quality standards are:

- 1) 150 µg/m<sup>3</sup> maximum averaged over a 24-hour period with no more than one expected exceedance per year.
- 2) 50 µg/m<sup>3</sup> expected annual arithmetic mean.

SECTION THREE

EXCEEDANCE LISTINGS

By Site Date Hour

All Units Are in Parts Per Billion Except Wind Direction (Degrees),  
Wind Speed (MPH), CO (PPM), and PM<sub>fine</sub> and PM<sub>10</sub> (µg/m<sup>3</sup>)

The \* Identifies the Exceedances

NONE

By Date Hour Site

All Units Are in Parts Per Billion Except Wind Direction (Degrees),  
Wind Speed (MPH), CO (PPM), and PM<sub>fine</sub> and PM<sub>10</sub> (µg/m<sup>3</sup>)

The \* Identifies the Exceedances

NONE

