

State/Industry Ambient Monitoring Network

Air Quality Report

1st Quarter 2009

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June 2009

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SECTION ONE

DISCUSSION OF
MONITORING RESULTS

Sulfur Dioxide (SO₂)

There were no exceedances of either the state or the federal standards during the quarter. The Department was notified prior to the repairs of the pre-heater. The highest 1-hour concentration was 111 ppb at Hess Tioga #3; the highest 3-hour concentration was 62 ppb at Hess — Tioga #3; and, the highest 24-hour concentration was 26 ppb at Hess — Tioga #3. The highest arithmetic mean was 3.2 ppb at Hess — Tioga #3. All sites achieved at least an 80% data recovery for the period operated.

Sulfur Dioxide (SO₂) 5-Minute Average

The highest 5-minute concentration was 198 ppb at Hess — Tioga #3. All sites achieved at least an 80% data recovery for the period operated.

Trace Level Sulfur Dioxide (SO₂)

There were no exceedances of either the state or the federal standards during the quarter. The highest 1-hour concentration was 57.1 ppb at Lostwood NWR; the highest 3-hour concentration was 46.0 ppb at Lostwood NWR; and, the highest 24-hour concentration was 15.0 ppb at Lostwood NWR. The highest arithmetic mean was 2.3 ppb at Lostwood NWR. All sites achieved at least an 80% data recovery for the period operated.

Trace Level Sulfur Dioxide (SO₂) 5-Minute Average

The highest 5-minute concentration was 144.0 ppb at Lostwood NWR. All sites achieved at least an 80% data recovery for the period operated.

Ozone (O₃)

There was no exceedance of the ozone standard during the quarter. The highest observed 1-hour concentration was 65 ppb at Hannover. The highest 4th highest 8-hour concentration was 53 ppb at Beulah-North, Hannover, and Lostwood NWR. All sites achieved at least an 80% data recovery for the period operated.

Nitrogen Dioxide (NO₂)

The highest observed 1-hour concentration was 59 ppb at Beulah-North. The highest arithmetic mean concentration was 7.8 ppb at Bismarck Residential. All sites except DGC #17 achieved at least an 80% data recovery for the period operated. DGC #17 failed to achieve 80% data recovery due to machine malfunction.

Carbon Monoxide (CO)

The highest observed 1-hour concentration was 1186 ppb at Fargo NW. The highest 8-hour concentration was 700 ppb at Fargo NW. The site achieved at least an 80% data recovery for the period operated.

Ammonia (NH₃)

The highest 1-hour concentration was 134.0 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_{fine} Particulates

The highest 24-hour concentration was 60.3 $\mu\text{g}/\text{m}^3$ at Bismarck Residential. The highest arithmetic mean concentration was 7.9 $\mu\text{g}/\text{m}^3$ at Bismarck Residential. All sites achieved at least an 80% data recovery for the period operated.

The analyzer used to collect PM_{fine} at the Bismarck Residential site is designated as a FEM (Federal Equivalent Method). The analyzer used to collect the PM_{fine} at the remaining sites were required by EPA, but never given the reference or equivalent designation. Therefore, the data can only be used as an indicator of PM_{fine} concentrations.

Inhalable PM_{fine} Particulates

There was no exceedance of the 24-hour standard during the quarter. The highest 24-hour average concentration was 35.9 $\mu\text{g}/\text{m}^3$ at Fargo NW. The highest weighted mean was 10.08 $\mu\text{g}/\text{m}^3$ at Fargo NW. All sites achieved at least an 80% data recovery for the period.

Inhalable Continuous PM₁₀ Particulates

There was no exceedance of the 24-hour standard during the quarter. The highest 24-hour concentration was 137.0 $\mu\text{g}/\text{m}^3$ at Bismarck Residential. The highest arithmetic mean was 9.0 $\mu\text{g}/\text{m}^3$ 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 1ST	— HOUR 2ND	M A X 3 1ST	— HOUR 2ND	24 1ST	— HOUR 2ND	ARITH MEAN	1HR #>273	24HR #>99
Bear Paw - MGP #3	2009	2141	51	45	33	16	6	5	1.5				
Bear Paw - MGP #5	2009	2137	7	6	5	4	2	2	1.0				
Beulah - North	2009	2860	26	18	17	12	5	4	1.6				
Bismarck Residential	2009	2861	32	29	25	22	10	8	2.5				
DGC #12	2009	2149	20	18	11	9	4	4	1.5				
DGC #14	2009	2150	21	16	10	9	4	4	1.4				
DGC #16	2009	2148	23	19	14	12	4	4	1.4				
DGC #17	2009	2150	24	19	16	14	5	4	1.5				
Hannover	2009	2854	47	41	30	18	10	6	1.9				
Hess - Tioga #1	2009	2125	44	39	34	17	6	6	1.7				
Hess - Tioga #3	2009	2121	111	87	62	47	26	18	3.2				
TRNP - SU (Painted Canyon)	2009	2863	11	9	7	5	4	3	1.3				

The highest 1-hour concentration is 111 ppb at Hess - Tioga #3
 The highest 3-hour concentration is 62 ppb at Hess - Tioga #3
 The highest 24-hour concentration is 26 ppb at Hess - Tioga #3
 The highest arithmetic mean is 3.2 ppb at Hess - Tioga #3

* The air quality standards are:

STATE Standards -

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

FEDERAL Standards -

- 1) 500 ppb highest 3-hour concentration not to be exceeded more than once per year.
- 2) 140 ppb highest 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	2009	2141	122	105	51	
Bear Paw - MGP #5	2009	2137	9	8	8	
Beulah - North	2009	2860	73	39	30	
Bismarck Residential	2009	2861	57	45	43	
Hannover	2009	2801	76	76	70	
Hess - Tioga #1	2009	2125	111	101	93	
Hess - Tioga #3	2009	2121	198	195	160	
TRNP - SU (Painted Canyon)	2009	2863	24	21	11	

The maximum 5-minute concentration is 198 ppb at Hess - Tioga #3

* 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 - 1ST	24 - 1ST	HOUR 2ND	ARITH MEAN	1HR #>273	24HR #>99
Dunn Center	2009	2809	20.1	17.4	13.0	12.0	6.0	5.0	0.9		
Fargo NW	2009	2699	8.5	8.0	7.0	4.0	3.0	3.0	0.5		
Lostwood NWR	2009	2861	57.1	55.6	46.0	29.0	15.0	11.0	2.3		
TRNP - NU	2009	2865	20.3	11.6	10.0	8.0	4.0	4.0	1.0		

The highest 1-hour concentration is 57.1 ppb at Lostwood NWR
 The highest 3-hour concentration is 46.0 ppb at Lostwood NWR
 The highest 24-hour concentration is 15.0 ppb at Lostwood NWR
 The highest arithmetic mean is 2.3 ppb at Lostwood NWR

* The air quality standards are:

STATE Standards -

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

FEDERAL Standards -

- 1) 500 ppb highest 3-hour concentration not to be exceeded more than once per year.
- 2) 140 ppb highest 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	1ST	5 - M I N U T E 2ND	M A X I M A 3RD	# HOURS >600
Dunn Center	2009	2719	25.6	22.5	20.5	
Fargo NW	2009	2709	14.6	12.6	11.8	
Lostwood NWR	2009	2861	144.0	118.0	113.0	
TRNP - NU	2009	2830	29.0	17.0	15.2	

The maximum 5-minute concentration is 144 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	1 - 1ST	M HOUR 2ND	A X 1ST	I M 2ND	A 8 - 3RD	HOUR 4TH	1HR #>120	8HR #>75
Beulah North	2009	2097	63	62	60	54	53	53		
Bismarck Residential	2009	2145	61	60	58	52	50	49		
Dunn Center	2009	2138	58	58	55	54	53	51		
Fargo NW	2009	2127	56	56	52	51	49	49		
Hannover	2009	2105	65	64	62	55	53	53		
Lostwood NWR	2009	1927	62	61	58	54	53	53		
TRNP - NU	2009	2149	58	57	53	53	51	51		
TRNP - SU	2009	2149	58	58	59	49	49	48		

The highest 1-hour concentration is 65 ppb at Hannover
The 4th highest 8-hour concentration is 53 ppb at Beulah North, Hannover, and Lostwood NWR

* The air quality standards for ozone are:
STATE - 120 ppb highest 1-hour not to be exceeded more than once per year.

FEDERAL Standards -

- 1) 120 ppb highest 1-hour concentration with no more than one expected exceedance per year.
- 2) Fourth highest daily highest 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	2009	2853	59	51	3.4
Bismarck Residential	2009	2851	47	45	7.8
DGC #12	2009	2137	20	20	3.2
DGC #17	2009	992 ***	14	13	1.8
Dunn Center	2009	2814	12	11	1.9
Fargo NW	2009	2818	57	54	6.4
Hannover	2009	2844	53	50	2.7
Lostwood NWR	2009	2855	29	26	2.5
TRNP - NU	2009	2859	13	8	1.1

The highest 1-hour concentration is 59 ppb at Beulah North
The highest Arithmetic Mean concentration is 7.8 ppb at Bismarck Residential

* The air quality standards are:
STATE - 53 ppb highest 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	1 1ST	M A X 1 - 2ND	I M A 8 - 2ND	1HR #>35000	8HR #>9000
Fargo NW	2009	2720	1186.0	1003.0	700.0	500.0	

* The STATE and FEDERAL air quality standards are:
1) The highest allowable 1-hour concentration is 35000 ppb not to be exceeded more than once per year.
2) The highest 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 - 3RD	X I 3RD	M A 4TH
Beulah - North	2009	2813	134.0	132.0		54.0	46.0
Lostwood NWR	2009	2702	9.0	9.0		9.0	9.0

The highest 1-hour concentrations is 134.0 at Beulah - North

* No Standard is currently in effect:

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

POLLUTANT : Inhalable Continuous PM_{fine} Particulates (µg/m³)

LOCATION	YEAR	NUM OBS	1 1ST	M - HOUR 2ND	A X 1ST	I M 2ND	24 - HOUR 3RD	4TH	MEAN	24HR #>35 AM>15
Beulah - North	2009	2857	35.1	30.3	11.9	8.8	6.5	6.4	3.4	
Bismarck Residential	2009	2584	60.3	57.5	27.9	23.6	23.4	20.9	7.9	
Dunn Center	2009	2817	38.9	32.5	13.4	8.8	8.0	5.8	3.1	
Fargo NW	2009	2812	22.7	20.6	12.6	12.3	10.8	9.8	4.1	
Hannover	2009	2778	43.5	28.9	12.1	11.5	10.0	9.6	6.3	
Lostwood NWR	2009	2854	29.1	19.4	7.9	7.2	7.0	6.5	3.0	
TRNP - NU	2009	2840	32.0	23.8	9.6	7.6	7.2	6.0	2.9	
TRNP - SU	2009	2862	19.6	19.5	12.8	10.8	10.1	9.3	5.5	

The highest 24-hour concentration is 27.9 µg/m³ at Bismarck Residential
The highest Annual Mean concentration is 7.9 µg/m³ at Bismarck Residential

* The EPA-required analyzer used to collect this data is not a reference or equivalent method; this data cannot be compared to the PM_{fine} standards. This data can only be used as an indicator of the actual PM_{fine} 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_{fine} Particulates (µg/m³)

LOCATION	YEAR	OBS	MIN	M A X I M A			98th %	WTD MEAN	#>35	AM>15
				1ST	2ND	3RD				
Beulah - North	2009	15		13.5	12.0	10.1	13.5	6.35		
Bismarck Residential	2009	29		17.8	15.7	15.1	17.8	7.90		
Fargo NW	2009	29		35.9	19.9	19.7	35.9	10.08	1	
TRNP - SU (Painted Canyon)	2009	15		9.4	8.0	6.1	9.4	6.35		

The highest 24-hour concentration is 35.9 µg/m³ at Fargo NW
The highest Annual Weighted Mean concentration is 10.08 µg/m³ at Fargo NW

* The ambient air quality standards are:

FEDERAL Standards -

- 1) 24-hour: 3-year average of 98th percentiles not to exceed 35 µg/m³.
- 2) Annual: 3-year average not to exceed 15 µg/m³.

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

POLLUTANT : Inhalable Continuous PM₁₀ Particulates (µg/m³)

LOCATION	YEAR	NUM OBS	M A X I M A		24 - HOUR				MEAN	24HR #>150	AM>50
			1ST	2ND	1ST	2ND	3RD	4TH			
Beulah - North	2009	2850	59.0	57.0	18	16	16	15	7.7		
Bismarck Residential	2009	2830	137.0	91.0	23	19	18	17	9.0		
Dunn Center	2009	2732	58.0	56.0	17	14	11	11	6.9		
Fargo NW	2009	2850	90.0	57.0	16	15	14	14	7.3		
Lostwood NWR	2009	2857	67.0	59.0	15	10	10	10	5.8		
TRNP - NU	2009	2824	29.0	28.0	15	10	9	9	5.8		

The highest 24-hour concentration is 23 µg/m³ at Bismarck Residential
The highest Annual Mean concentration is 9.0 µg/m³ at Bismarck Residential

* The STATE and FEDERAL air quality standards are:

- 1) 150 µg/m³ highest averaged over a 24-hour period with no more than one expected exceedance per year.
- 2) 50 µg/m³ 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_{fine} and PM₁₀ ($\mu\text{g}/\text{m}^3$)

The * Identifies the Exceedances

By Date Hour Site

All Units Are in Parts Per Billion Except Wind Direction (Degrees),
Wind Speed (MPH), CO (PPM), and PM_{fine} and PM₁₀ ($\mu\text{g}/\text{m}^3$)

The * Identifies the Exceedances