

State/Industry Ambient Monitoring Network

Air Quality Report

1st Quarter 2010

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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 highest 1—hour concentration was 165 ppb at DGC #12; the highest 3—hour concentration was 86 ppb at Beulah North; and, the highest 24—hour concentration was 22 ppb at Hess — Tioga #3. The highest arithmetic mean was 2.8 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 371 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 84.7 ppb at Lostwood NWR; the highest 3—hour concentration was 45.0 ppb at Lostwood NWR; and, the highest 24—hour concentration was 20.0 ppb at Lostwood NWR. The highest arithmetic mean was 1.6 ppb at Lostwood NWR. All sites with the exception of Dunn Center achieved at least an 80% data recovery for the period operated. Dunn Center failed to achieve 80% Data recovery due to a lighting strike.

Trace Level Sulfur Dioxide (SO₂) 5—Minute Average

The highest 5—minute concentration was 122.0 ppb at Lostwood NWR. All sites with the exception of Dunn Center achieved at least an 80% data recovery for the period operated. Dunn Center failed to achieve 80% Data recovery due to a lighting strike.

Ozone (O₃)

There was no exceedance of the ozone standard during the quarter. The highest observed 1-hour concentration was 63 ppb at TRNP - NU. The highest 4th highest 8-hour concentration was 54 ppb at Dunn Center, Hannover, Lostwood NWR, and TRNP - NU. All sites with the exception of Dunn Center achieved at least an 80% data recovery for the period operated. Dunn Center failed to achieve 80% Data recovery due to a lightning strike.

Nitrogen Dioxide (NO₂)

The highest observed 1-hour concentration was 58 ppb at Fargo NW. The highest arithmetic mean concentration was 7.4 ppb at Fargo NW. All sites with the exception of Dunn Center achieved at least an 80% data recovery for the period operated. Dunn Center failed to achieve 80% Data recovery due to a lightning strike.

Carbon Monoxide (CO)

The highest observed 1-hour concentration was 765 ppb at Fargo NW. The highest 8-hour concentration was 500 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 204.0 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_{2.5} Particulates

The highest 24-hour concentration was 30.0 $\mu\text{g}/\text{m}^3$ at Bismarck Residential. The highest arithmetic mean concentration was 9.8 $\mu\text{g}/\text{m}^3$ at Bismarck Residential. All sites with the exception of Dunn Center achieved at least an 80% data recovery for the period operated. Dunn Center failed to achieve 80% Data recovery due to a lighting strike.

The analyzer used to collect PM_{2.5} at the Bismarck Residential site is designated as a FEM (Federal Equivalent Method). The analyzer used to collect the PM_{2.5} 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_{2.5} concentrations.

Inhalable PM_{2.5} Particulates

There was no exceedance of the 24-hour standard during the quarter. The highest 24-hour average concentration was 30.3 $\mu\text{g}/\text{m}^3$ at Bismarck Residential. The highest weighted mean was 10.6 $\mu\text{g}/\text{m}^3$ 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 39.0 $\mu\text{g}/\text{m}^3$ at Bismarck Residential. The highest arithmetic mean was 11.9 $\mu\text{g}/\text{m}^3$ at Bismarck Residential. All sites with the exception of Dunn Center achieved at least an 80% data recovery for the period operated. Dunn Center failed to achieve 80% Data recovery due to a lighting strike.

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 - HOUR		M A X I M A		24 - HOUR		ARITH MEAN	1HR #>273	24HR #>99
			1ST	2ND	1ST	2ND	1ST	2ND			
Bear Paw - MGP #3	2010	2142	28	22	19	12	5	2	1.2		
Bear Paw - MGP #5	2010	2142	30	22	20	9	5	3	1.3		
Beulah - North	2010	2133	164	70	86	33	16	11	1.9		
Bismarck Residential	2010	2147	64	41	38	25	9	9	2.0		
DGC #12	2010	2149	165	62	83	36	15	14	2.0		
DGC #14	2010	2147	70	65	48	46	15	10	2.0		
DGC #16	2010	2141	143	54	82	26	12	11	1.9		
DGC #17	2010	2145	117	60	69	28	11	11	1.9		
Hannover	2010	2113	122	66	65	30	11	6	2.0		
Hess - Tioga #1	2010	1957	30	28	14	13	5	5	1.7		
Hess - Tioga #3	2010	2127	58	54	38	35	22	15	2.8		
TRNP - SU	2010	1944	15	10	10	7	3	2	1.1		

The highest 1-hour concentration is 165 ppb at DGC #12
 The highest 3-hour concentration is 86 ppb at Beulah - North
 The highest 24-hour concentration is 22 ppb at Hess - Tioga #3
 The highest arithmetic mean is 2.8 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	2010	2142	78	33	29	
Bear Paw - MGP #5	2010	2142	34	29	27	
Beulah - North	2010	2133	202	162	142	
Bismarck Residential	2010	2147	108	78	56	
Hannover	2010	2113	181	137	102	
Hess - Tioga #1	2010	1957	103	84	65	
Hess - Tioga #3	2010	2127	371	178	131	
TRNP - SU	2010	1944	19	17	12	

The maximum 5-minute concentration is 371 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 - HOUR		M A X I M A		24 - HOUR		ARITH MEAN	1HR #>273	24HR #>99
			1ST	2ND	1ST	2ND	1ST	2ND			
Dunn Center	2010	1588 ***	25.8	19.0	16.0	13.0	4.0	3.0	0.7		
Fargo NW	2010	2134	7.8	6.1	4.0	3.0	2.0	2.0	0.4		
Lostwood NWR	2010	2112	84.7	84.0	45.0	40.0	20.0	13.0	1.6		
TRNP - NU	2010	2138	13.5	11.7	9.0	8.0	3.0	3.0	0.7		

The highest 1-hour concentration is 84.7 ppb at Lostwood NWR
 The highest 3-hour concentration is 45.0 ppb at Lostwood NWR
 The highest 24-hour concentration is 20.0 ppb at Lostwood NWR
 The highest arithmetic mean is 1.6 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.

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

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			# HOURS >600
			1ST	2ND	3RD	
Dunn Center	2010	1588 ***	30.7	28.5	25.3	
Fargo NW	2010	2134	12.5	9.5	9.4	
Lostwood NWR	2010	2112	122.0	109	105	
TRNP - NU	2010	2138	17.6	17.3	16.5	

The maximum 5-minute concentration is 122 ppb at Lostwood NWR
 * No Standard is currently in effect:

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

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	2108	58	58	56	55	53	52		
Bismarck Residential	2009	1762	55	52	55	51	49	49		
Dunn Center	2009	1590 ***	61	58	55	55	55	54		
Fargo NW	2010	2120	59	58	55	55	53	51		
Hannover	2010	2113	60	60	59	58	56	54		
Lostwood NWR	2010	2114	61	59	56	55	54	54		
TRNP - NU	2010	2138	63	62	58	57	56	54		
TRNP - SU	2009	1944	57	56	53	52	52	51		

The highest 1-hour concentration is 63 ppb at TRNP - NU
The 4th highest 8-hour concentration is 54 ppb at Dunn Center, Hannover, and Lostwood NWR, TRNP - NU

* 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.

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

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	2010	1888	48	41	3.0
Bismarck Residential	2010	2142	55	45	6.6
DGC #12	2010	2141	46	37	3.4
DGC #17	2010	2122	28	27	2.6
Dunn Center	2010	1583 ***	24	20	1.6
Fargo NW	2010	2122	58	53	7.4
Hannover	2010	2105	25	25	2.5
Lostwood NWR	2010	2110	29	25	2.4
TRNP - NU	2010	2135	10	10	1.5

The highest 1-hour concentration is 58 ppb at Fargo NW
The highest Arithmetic Mean concentration is 7.4 ppb at Fargo NW

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

FEDERAL - 53 ppb annual arithmetic mean.

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

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

POLLUTANT : CARBON MONOXIDE (PPB)

LOCATION	YEAR	NUM OBS	M 1 1ST	A X HOUR 2ND	I M A 8 - 1ST	2ND	1HR #>35000	8HR #>9000
Fargo NW	2010	2135	765.0	735.0	500.0	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	A	X	I	M	A
				1	2ND	1 -	HOUR 3RD	2ND	4TH
Beulah - North	2010	2126	204.0	83.0	82.0				78.0
Lostwood NWR	2010	1985	53.0	49.0	40.0				37.0

The highest 1-hour concentrations is 204.0 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_{2.5} Particulates (µg/m³)

LOCATION	YEAR	NUM OBS	1 1ST	M	A	X	I	M	A	24 - 3RD	HOUR 4TH	MEAN	24HR #>35	AM>15
				1 -	HOUR 2ND	1ST	2ND							
Beulah - North	2010	2131	67.6	56.3	13.9	12.2	10.0	9.6	3.7					
Bismarck Residential(FEM)	2010	2078	52.2	47.7	30.0	25.9	25.5	21.0	9.8					
Dunn Center	2010	1580 ***	32.3	30.1	13.0	12.8	12.2	9.4	3.9					
Fargo NW	2010	2113	60.4	56.9	13.3	11.2	11.1	10.6	5.0					
Hannover	2010	1886	46.3	39.9	17.7	13.1	12.4	11.4	6.6					
Lostwood NWR	2010	2101	31.4	29.8	15.4	10.8	9.6	8.7	3.6					
TRNP - NU	2010	2010	25.9	24.4	12.2	11.4	10.9	8.5	3.1					
TRNP - SU	2010	1868	21.0	20.3	15.2	14.5	10.5	10.5	6.1					

The highest 24-hour concentration is 30.0 µg/m³ at Bismarck Residential
The highest Annual Mean concentration is 9.8 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_{2.5} standards. This data can only be used as an indicator of the actual PM_{2.5} 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.

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

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

POLLUTANT : Inhalable PM_{2.5} Particulates (µg/m³)

LOCATION	YEAR	OBS	MIN	M A X I M A			98th %	WTD MEAN	#>35	AM>15
				1ST	2ND	3RD				
Beulah - North	2010	15		14.9	13.9	13.5	14.9	5.9		
Bismarck Residential	2010	30		23.6	17.5	17.3	23.6	7.9		
Fargo NW	2010	30		30.3	28.0	26.7	28.0	10.6		
TRNP - SU (Painted Canyon)	2010	12		12.7	8.3	7.3	12.7	4.7		

The highest 24-hour concentration is 30.3 µg/m³ at Fargo NW
The highest Annual Weighted Mean concentration is 10.6 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	1 - HOUR		M A X I M A		24 - HOUR		MEAN	24HR #>150	AM>50
			1ST	2ND	1ST	2ND	3RD	4TH			
Beulah - North	2010	1883	76.0	75.0	32	31	28	27	9.6		
Bismarck Residential	2010	2140	87.0	87.0	39	35	32	31	11.9		
Dunn Center	2010	1227 ***	115.0	100.0	32	32	31	29	9.7		
Fargo NW	2010	2137	61.0	59.0	28	20	19	18	8.1		
Lostwood NWR	2010	2102	55.0	45.0	30	27	27	22	8.2		
TRNP - NU	2010	2128	105.0	75.0	29	26	25	24	7.9		

The highest 24-hour concentration is 39 µg/m³ at Bismarck Residential
The highest Annual Mean concentration is 11.9 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.

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

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_{2.5} 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_{2.5} and PM₁₀ ($\mu\text{g}/\text{m}^3$)

The * Identifies the Exceedances