

State/Industry Ambient Monitoring Network

Air Quality Report

3rd Quarter 2007

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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 maximum 1-hour concentration was 70 ppb at Hess - Tioga #3; the maximum 3-hour concentration was 61 ppb at Hess - Tioga #3; and, the maximum 24-hour concentration was 14 ppb at Hess - Tioga #3. The highest arithmetic mean was 2.7 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 maximum 5-minute concentration was 181 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 maximum 1-hour concentration was 26.8 ppb at Lostwood NWR; the maximum 3-hour concentration was 14.8 ppb at Lostwood NWR; and, the maximum 24-hour concentration was 4.4 ppb at Lostwood NWR. The highest arithmetic mean was 0.6 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 maximum 5-minute concentration was 34.0 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 76 ppb at TRNP - NU and TRNP - SU. The highest 4th highest 8-hour concentration was 65 ppb at TRNP - NU. All sites achieved at least an 80% data recovery for the period operated.

Nitrogen Dioxide (NO₂)

The highest observed 1-hour concentration was 32 ppb at Fargo NW. The maximum arithmetic mean concentration was 4.2 ppb at Bismarck Residential. All sites achieved at least an 80% data recovery for the period operated.

Ammonia (NH₃)

The highest 1-hour concentration was 104.3 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 23.8 µg/m³ at TRNP - NU. The highest arithmetic mean concentration was 8.5 µg/m³ at TRNP - SU. All sites achieved at least an 80% data recovery for the period operated.

The analyzer used to collect the PM_{fine} was required by EPA, but never given the reference or equivalent designation. Therefore, the data can be used only 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 17.6 $\mu\text{g}/\text{m}^3$ at TRNP - SU. The highest arithmetic mean was 7.5 $\mu\text{g}/\text{m}^3$ 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 maximum 24-hour concentration was 57.4 $\mu\text{g}/\text{m}^3$ at Dunn Center. The highest arithmetic mean was 20.5 $\mu\text{g}/\text{m}^3$ at Fargo NW. All sites except TRNP - NU achieved an 80% data recovery for the period.

TRNP - NU failed to achieve 80% data recovery due to machine malfunction.

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	SAMPLING PERIOD	NUM OBS	1 - HOUR		M A X I M A		24 - HOUR		ARITH MEAN	1HR #>273	24HR #>99	% >MDV
				1ST	2ND	1ST	2ND	1ST	2ND				
Bear Paw - MGP #3	2007	JUL-SEP	2186	20	15	9	7	3	2	1.1			3.9
Bear Paw - MGP #5	2007	JUL-SEP	2192	39	15	15	10	4	2	1.2			6.9
Beulah - North	2007	JUL-SEP	2185	54	40	30	27	7	6	2.0			20.1
Bismarck Residential	2007	JUL-SEP	2188	17	17	13	11	3	3	1.4			13.1
DGC #12	2007	JUL-SEP	2192	59	37	29	26	9	7	2.1			21.2
DGC #14	2007	JUL-SEP	2197	44	37	27	20	6	4	1.7			15.6
DGC #16	2007	JUL-SEP	2179	33	30	22	20	7	7	2.0			23.7
DGC #17	2007	JUL-SEP	2197	40	36	28	19	8	8	1.9			18.1
Hannover	2007	JUL-SEP	2192	68	45	38	37	12	11	2.0			16.2
Hess - Tioga #1	2007	JUL-SEP	1837	15	11	8	7	2	2	1.1			5.0
Hess - Tioga #3	2007	JUL-SEP	2128	70	69	61	39	14	14	2.7			21.6
TRNP - SU	2007	JUL-SEP	2088	7	6	5	4	2	2	1.0			2.5

The highest 1-hour concentration is 70 ppb at Hess - Tioga #3
 The highest 3-hour concentration is 61 ppb at Hess - Tioga #3
 The highest 24-hour concentration is 14 ppb at Hess - Tioga #3
 The highest arithmetic mean is 2.7 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	SAMPLING PERIOD	5 - M I N U T E	M A X I M A			# HOURS >600	% >MDV
			NUM OBS	1ST	2ND	3RD		
Bear Paw - MGP #3	2007	JUL-SEP	2186	73	54	49	0	8.1
Bear Paw - MGP #5	2007	JUL-SEP	2192	75	62	55	0	17.7
Beulah - North	2007	JUL-SEP	2185	79	72	60	0	28.2
Bismarck Residential	2007	JUL-SEP	2188	26	25	22	0	22.2
Hannover	2007	JUL-SEP	2192	155	131	125	0	24.3
Hess - Tioga #1	2007	JUL-SEP	1837	64	40	36	0	10.8
Hess - Tioga #3	2007	JUL-SEP	2128	181	163	122	0	33.7
TRNP - SU	2007	JUL-SEP	2093	19	11	10	0	6.2

The maximum 5-minute concentration is 181 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	SAMPLING PERIOD	OBS	1 - HOUR		M A X I M A 3 - HOUR		24 - HOUR		ARITH MEAN	1HR #>273	24HR #>99	% >MDV
				1ST	2ND	1ST	2ND	1ST	2ND				
Dunn Center	2007	JUL-SEP	2182	11.5	8.2	6.6	5.3	2.2	2.2	0.4			35.4
Fargo NW	2007	JUL-SEP	2183	2.6	2.5	1.5	1.4	0.8	0.5	0.2			37.0
Lostwood NWR	2007	JUL-SEP	2195	26.8	12.0	14.8	7.9	4.4	2.4	0.6			53.2
TRNP - NU	2007	JUL-SEP	2195	19.0	15.9	12.0	8.0	2.7	1.9	0.5			65.8

The highest 1-hour concentration is 26.8 ppb at Lostwood NWR
 The highest 3-hour concentration is 14.8 ppb at Lostwood NWR
 The highest 24-hour concentration is 4.4 ppb at Lostwood NWR
 The highest arithmetic mean is 0.6 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.

THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

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

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	5 - MINUTE MAXIMA			DATE >600	# HOURS >MDV	%
				1ST	2ND	3RD			
Dunn Center	2007	JUL-SEP	2182	24.7	17.4	16.6	0	49.9	
Fargo NW	2007	JUL-SEP	2183	5.2	4.0	4.0	0	64.0	
Lostwood NWR	2007	JUL-SEP	2195	34.0	24.3	23.6	0	51.3	
TRNP - NU	2007	JUL-SEP	2194	29.9	25.8	17.2	0	71.8	

The maximum 5-minute concentration is 34.0 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	SAMPLING PERIOD	NUM OBS	1 - 1ST	M A X I M A 8 - HOUR 2ND	1ST	2ND	3RD	4TH	1HR #>120	8HR #>80
Beulah - North	2007	JUL-SEP	2188	68	66	62	61	60	57		
Bismarck Residential	2007	JUL-SEP	2117	67	64	62	60	54	52		
Dunn Center	2007	JUL-SEP	1780	65	62	59	58	54	52		
Fargo NW	2007	JUL-SEP	2183	60	57	56	54	52	52		
Hannover	2007	JUL-SEP	2190	69	68	64	60	59	59		
Lostwood NWR	2007	JUL-SEP	2195	71	67	63	61	57	57		
TRNP - NU	2007	JUL-SEP	2195	76	75	71	69	67	65		
TRNP - SU	2007	JUL-SEP	2089	76	71	69	64	64	64		

The highest 1-hour concentration is 76 ppb at TRNP - NU
The 4th highest 8-hour concentration is 65 ppb at TRNP - NU

* 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 80 ppb.

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

POLLUTANT : **Nitrogen Dioxide** (ppb)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	M A X A M A 1 - HOUR		ARITH MEAN	% >MDV
				1ST	2ND		
Beulah - North	2007	JUL-SEP	1848	30	30	2.8	87.6
Bismarck Residential	2007	JUL-SEP	2181	30	29	4.2	99.8
DGC #12	2007	JUL-SEP	2188	23	22	2.9	98.0
DGC #17	2007	JUL-SEP	2189	22	22	2.3	94.3
Dunn Center	2007	JUL-SEP	2180	26	19	1.9	79.9
Fargo NW	2007	JUL-SEP	2180	32	30	3.4	88.4
Hannover	2007	JUL-SEP	2183	23	21	2.0	84.6
Lostwood NWR	2007	JUL-SEP	1802	20	12	1.3	64.9
TRNP - NU	2007	JUL-SEP	2187	11	9	0.9	34.1

The highest 1-hour concentration is 32 ppb at Fargo NW
The maximum Arithmetic Mean concentration is 4.2 ppb at Bismarck Residential

* 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 : **Ammonia** (ppb)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	M A X I M A 1 - HOUR					
				1ST	2ND	3RD	4TH	5TH	6TH
Beulah - North	2007	JUL-SEP	2163	104.3	101.3	94.6	89.5	75.8	62.1

* 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	SAMPLING PERIOD	NUM OBS	M A X I M A 1 - HOUR						24 - HOUR 3RD	4TH	ARITH MEAN	24HR #>35	AM>15
				1ST	2ND	1ST	2ND	1ST	2ND					
Beulah - North	2007	JUL-SEP	2010	40.9	37.3	18.7	14.3	14.2	14.2	5.4				
Bismarck Residential	2007	JUL-SEP	2052	55.9	54.7	21.0	16.2	13.1	12.8	6.0				
Dunn Center	2007	JUL-SEP	1985	45.6	44.6	19.1	17.9	15.8	13.3	5.4				
Fargo NW	2007	JUL-SEP	2184	32.9	29.7	17.4	17.1	15.2	15.0	6.1				
Hannover	2007	JUL-SEP	2047	43.6	37.8	21.9	18.1	16.5	16.4	8.3				
Lostwood NWR	2007	JUL-SEP	1931	113.0	76.2	15.1	11.7	10.3	9.7	4.5				
TRNP - NU	2007	JUL-SEP	2117	71.0	68.3	22.2	19.9	14.3	13.2	5.2				
TRNP - SU	2007	JUL-SEP	1930	82.6	76.6	23.8	20.6	19.2	17.7	8.5				

The highest 24-hour concentration is 23.8 µg/m³ at TRNP - SU
The highest Annual Mean concentration is 8.5 µg/m³ at TRNP - SU

* The EPA-required analyzer used to collect this data is not a reference or equivalent method, this data can not 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	SAMPLING PERIOD	NUM OBS	MIN	M A X I M A			ARITH MEAN	#> 35	AM>15	% >MDV
					1ST	2ND	3RD				
Beulah - North	2007	JUL-SEP	15	2.8	11.3	11.0	9.5	6.4			100.0
Bismarck Residential	2007	JUL-SEP	31	2.5	13.5	11.4	11.1	6.9			100.0
Fargo NW	2007	JUL-SEP	30	2.9	13.7	12.8	12.0	7.5			100.0
TRNP - SU	2007	JUL-SEP	14	1.6	17.6	10.0	9.8	6.3			92.9

The highest 24-hour concentration is 17.6 µg/m³ at TRNP - SU
The highest Annual Mean concentration is 7.5 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	SAMPLING PERIOD	NUM OBS	1 1ST	— HOUR 2ND	M A X I M A	24 — HOUR 3RD	4TH	MEAN	ARITH #>150	24HR AM>50
Beulah - North	2007	JUL-SEP	2182	105.0	95.0	40.6	38.1	34.2	33.7	19.0	
Bismarck Residential	2007	JUL-SEP	2186	109.0	103.0	40.9	38.7	37.0	36.4	19.1	
Dunn Center	2007	JUL-SEP	2111	239.0	167.0	57.4	41.0	35.5	34.7	18.7	
Fargo NW	2007	JUL-SEP	2189	219.0	201.0	45.8	40.7	37.9	37.8	20.5	
Lostwood NWR	2007	JUL-SEP	2192	140.0	138.0	34.5	32.5	32.0	30.4	15.5	
TRNP - NU	2007	JUL-SEP	1171 ***	92.0	62.0	25.5	25.5	23.8	22.8	12.6	

The highest 24-hour concentration is 57.4 µg/m³ at Dunn Center
The highest Annual Mean concentration is 20.5 µg/m³ at Fargo NW

- * The STATE and FEDERAL air quality standards are:
 1) 150 µg/m³ maximum 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_{fine} and PM₁₀ (µg/m³)

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_{fine} and PM₁₀ (µg/m³)

The * Identifies the Exceedances

NONE