

# North Dakota State Water Commission

900 EAST BOULEVARD AVENUE, DEPT 770 • BISMARCK, NORTH DAKOTA 58505-0850  
701-328-2750 • TDD 701-328-2750 • FAX 701-328-3696 • INTERNET: <http://swc.nd.gov>

October 23, 2009

North Dakota Department of Health  
Division of Water Quality  
918, East Divide Avenue  
Bismarck, ND – 58501-1947

RE: North Dakota Pollutant Discharge Elimination System  
Permit Number: ND-0026247

Enclosed are the monthly discharge reports for the Devils Lake Outlet for the month of September 2009 and the summaries of the sample results and flow data. Discharge occurred on all the days in the reporting period.

Attached to the summaries are the tables showing average daily outlet discharge, water quality results of the samples collected from the upstream location, downstream location and the outlet, the average daily stream flow data and the conductivity data obtained from the USGS gaging station at the upstream and the downstream location.

If you have any questions regarding these reports, please contact me at 701-328-4958.

Sincerely,

Bruce Engelhardt P.E.  
Head, Investigations Section  
BE:SPG:416-10  
Enclosure

**OUTLET OPERATOR NAME/ADDRESS**

NAME: ND State Water Commission  
 ADDRESS: 900 E Boulevard Avenue,  
 Bismarck ND 58505

**MONTHLY DISCHARGE REPORT**

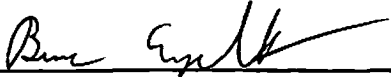
LOCATION: AT OUTLET

FACILITY: Devils Lake Outlet Project

MONITORING PERIOD	
START DATE	END DATE
9/1/09	9/30/09

LOCATION: Benson Co, ND

Devils Lake Oulet discharged 5991 ac-ft over 30 Days

PARAMETER	MINIMUM	MAXIMUM	AVERAGE	UNITS	SAMPLING FREQUENCY	TYPE
pH	8.31	8.64	8.5	SU	4 x Week	GRAB
SPECIFIC CONDUCTANCE	1036.29	1679.13	1339.83	umho/cm	Continuous	Recorder
SULFATE	566	597	581.38	mg/L	4 x Week	GRAB
7 DAY AVERAGE OF SULFATE	576.6	589.25	581	mg/L	4 x Week	GRAB
OUTLET DISCHARGE	91.84	105.72	100.69	cfs	Continuous	Recorder
SIGNATURE				10/23/09	701-328-4958	
NAME AND TITLE	BRUCE ENGELHARDT, HEAD, INVESTIGATIONS SECTION			DATE	TELEPHONE NUMBER	
COMMENT AND EXPLANATION OF ANY VIOLATIONS						
Summary of individual sample results and flow data for outlet, upstream & downstream monitoring locations attached.						

**Water Quality Results of the samples collected at the outlet  
Devils Lake Outlet**

Date	Time	Sampler	Average Daily EC from Outlet Telemetry (µS/cm)	Lab pH	Lab Sulfate (mg/L)	7 Day Rolling Average of Sulfate for the	Total Suspended Solids (mg/L)	No. of days included in the 7 day Rolling average
09/01/09	11:30	NDSWC	1249.25	8.53	583	579	69	7
09/02/09	11:30	NDSWC	1362.52	8.55	582	580.4	-	7
09/03/09	9:00	NDSWC	1250.45	8.58	583	581.8	-	7
09/04/09	8:45	NDSWC	1196.27	8.55	590	583.8	-	7
09/05/09	-	-	1163.39	-	-	-	-	-
09/06/09	-	-	1398.95	-	-	-	-	-
09/07/09	-	-	1355.15	-	-	-	-	-
09/08/09	8:30	NDSWC	1302.14	8.56	597	588	-	7
09/09/09	8:15	NDSWC	1239.88	8.31	585	588.75	102	7
09/10/09	12:45	NDSWC	1125.17	8.5	585	589.25	-	7
09/11/09	12:00	NDSWC	1036.29	8.44	566	583.25	-	7
09/12/09	-	-	1359.10	-	-	-	-	-
09/13/09	-	-	1679.13	-	-	-	-	-
09/14/09	11:30	NDSWC	1569.05	8.5	581	582.8	-	7
09/15/09	8:00	NDSWC	1506.62	8.47	588	581	67	7
09/16/09	8:00	NDSWC	1521.30	8.39	575	579	-	7
09/17/09	11:10	NDSWC	1437.52	8.42	575	577	-	7
09/18/09	9:45	NDSWC	1360.10	8.41	576	579	-	7
09/19/09	-	-	1181.39	-	-	-	-	-
09/20/09	-	-	1303.29	-	-	-	-	-
09/21/09	10:30	NDSWC	1269.69	8.45	580	578.8	-	7
09/22/09	9:10	NDSWC	1288.27	8.46	577	576.6	-	7
09/23/09	8:00	NDSWC	1608.67	8.44	578	577.2	64	7
09/24/09	14:25	NDSWC	1263.53	8.64	578	577.8	-	7
09/25/09	8:25	NDSWC	1503.37	8.55	576	577.8	-	7
09/26/09	-	-	1282.26	-	-	-	-	-
09/27/09	-	-	1448.78	-	-	-	-	-
09/28/09	9:05	NDSWC	1050.07	8.57	583	578.4	-	7
09/29/09	8:30	NDSWC	1228.84	8.56	584	579.8	-	7
09/29/09	9:55	NDSWC	1654.50	8.52	587	581.6	51	7
Min			1036.29	8.31	566.00	576.60	51.00	
Max			1679.13	8.64	597.00	589.25	102.00	
Average			1339.83	8.50	581.38	581.00	70.60	

**Daily Outlet Discharge**

<b>Date</b>	<b>Average Daily Outlet Discharge (cfs)</b>	<b>Total Daily Volume (cu-ft)</b>
9/1/09	99.73	8,616,412
9/2/09	101.57	8,776,080
9/3/09	100.46	8,679,845
9/4/09	103.28	8,923,060
9/5/09	103.39	8,933,080
9/6/09	104.43	9,022,527
9/7/09	105.02	9,073,589
9/8/09	105.72	9,134,373
9/9/09	102.66	8,870,035
9/10/09	102.82	8,883,985
9/11/09	104.68	9,044,533
9/12/09	102.24	8,833,882
9/13/09	101.80	8,795,741
9/14/09	101.80	8,795,174
9/15/09	102.08	8,819,652
9/16/09	102.42	8,848,905
9/17/09	103.99	8,984,635
9/18/09	103.51	8,943,027
9/19/09	102.99	8,898,451
9/20/09	100.14	8,652,325
9/21/09	99.47	8,594,521
9/22/09	99.52	8,598,869
9/23/09	99.81	8,623,333
9/24/09	96.38	8,327,318
9/25/09	98.81	8,536,776
9/26/09	98.27	8,490,166
9/27/09	95.30	8,234,041
9/28/09	91.84	7,934,803
9/29/09	92.75	8,014,023
9/30/09	93.76	8,101,217
<b>Total</b>		260,984,376
<b>Total</b>		1,952
<b>Total</b>		5,991
<b>Average Flow</b>	100.69	cfs
<b>Minimum</b>	91.84	
<b>Maximum</b>	105.72	
<b>Average</b>	100.69	

cu-ft

Mgal

Ac-ft

**OUTLET OPERATOR NAME/ADDRESS**

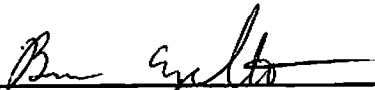
**NAME:** ND State Water Commission  
**ADDRESS:** 900 E Boulevard Avenue  
 Bismarck ND 58505

**MONTHLY DISCHARGE REPORT**

**LOCATION:** UPSTREAM OF THE OUTLET (FLORA)

**FACILITY:** Devils Lake Outlet Project  
**LOCATION:** Benson Co, ND

MONITORING PERIOD	
START DATE	END DATE
9/1/09	9/30/09

PARAMETER	MINIMUM	MAXIMUM	AVERAGE	UNITS	SAMPLING FREQUENCY	TYPE
pH	8.28	8.59	8.43	SU	4 x Week	GRAB
SPECIFIC CONDUCTANCE	1500	1640	1569.52	umho/cm	Continuous	Recorder
SULFATE	248	328	300.52	mg/L	4 x Week	GRAB
7 DAY AVERAGE OF SULFATE	247.2	323.8	294.8	mg/L	4 x Week	GRAB
FLOW, INSTREAM	11	25	16.3	cfs	Continuous	Recorder
SIGNATURE				10/23/09	701-328-4958	
NAME AND TITLE	BRUCE ENGELHARDT, HEAD, INVESTIGATIONS SECTION			DATE	TELEPHONE NUMBER	
COMMENT AND EXPLANATION OF ANY VIOLATIONS						
Summary of individual sample results and flow data for outlet, upstream & downstream monitoring locations attached.						
Instream samples and measurements for this summary pertain only to time periods when outlet is actually operated.						

**Water Quality Results of the samples collected from the upstream location near Flora  
Sheyenne River Above Devils Lake Outlet Near Flora**

Date	Time	Sampler	USGS EC ( $\mu$ S/cm)	Lab pH	Lab Sulfate (mg/L)	7 Day Rolling Average of Sulfate for the operating period (mg/L)	Total Suspended Solids (mg/L)	No. of days Included in the 7 day Rolling average
9/1/09	11:45	NDSWC	1590	8.38	248	247.2	37	7
9/2/09	11:45	NDSWC	1610	8.45	248	247.4	-	7
9/3/09	8:50	NDSWC	1620	8.45	257	248.8	-	7
9/4/09	9:00	NDSWC	1620	8.43	263	252.2	-	7
9/5/09	-	-	-	-	-	-	-	-
9/6/09	-	-	-	-	-	-	-	-
9/7/09	-	-	-	-	-	-	-	-
9/8/09	8:45	NDSWC	1600	8.51	269	259.25	-	7
9/9/09	8:35	NDSWC	1610	8.28	275	266	45	7
9/10/09	13:00	NDSWC	1640	8.42	297	276	-	7
9/11/09	12:15	NDSWC	1590	8.4	324	291.25	-	7
9/12/09	-	-	-	-	-	-	-	-
9/13/09	-	-	-	-	-	-	-	-
9/14/09	11:15	NDSWC	1530	8.37	321	297.2	-	7
9/15/09	8:20	NDSWC	1500	8.41	327	308.8	45	7
9/16/09	8:20	NDSWC	1520	8.33	311	316	-	7
9/17/09	11:30	NDSWC	1540	8.34	304	317.4	-	7
9/18/09	10:00	NDSWC	1530	8.32	308	314.2	-	7
9/19/09	-	-	-	-	-	-	-	-
9/20/09	-	-	-	-	-	-	-	-
9/21/09	10:15	NDSWC	1550	8.41	321	314.2	-	7
9/22/09	9:30	NDSWC	1530	8.39	328	314.4	-	7
9/23/09	8:30	NDSWC	1530	8.41	321	316.4	15	7
9/24/09	14:35	NDSWC	1570	8.59	327	321	-	7
9/25/09	8:15	NDSWC	1570	8.51	322	323.8	-	7
9/26/09	-	-	-	-	-	-	-	-
9/27/09	-	-	-	-	-	-	-	-
9/28/09	8:55	NDSWC	1550	8.56	314	322.4	-	7
9/29/09	8:45	NDSWC	1560	8.55	312	319.2	-	7
9/30/09	9:25	NDSWC	1600	8.57	314	317.8	11	7
Min			1500.00	8.28	248.00	247.20	11.00	
Max			1640.00	8.59	328.00	323.80	45.00	
Average			1569.52	8.43	300.52	294.80	30.60	

**Average daily streamflow and conductivity data at the upstream location near Flora**

<b>USGS Gaging Station Data</b>		
<b>Sheyenne River Above Devils Lake</b>		
<b>Date</b>	<b>Streamflow (cfs)</b>	<b>EC (<math>\mu</math>S/cm)</b>
9/1/09	20	1600
9/2/09	19	1610
9/3/09	18	1620
9/4/09	18	1620
9/5/09	17	1630
9/6/09	16	1640
9/7/09	16	1640
9/8/09	16	1620
9/9/09	16	1620
9/10/09	16	1640
9/11/09	20	1590
9/12/09	25	1610
9/13/09	22	1560
9/14/09		1530
9/15/09	18	1500
9/16/09	18	1540
9/17/09	17	1550
9/18/09	16	1540
9/19/09	15	1530
9/20/09	14	1540
9/21/09		
9/22/09		
9/23/09	14	1540
9/24/09	14	1570
9/25/09	14	1570
9/26/09	14	1570
9/27/09	13	1560
9/28/09	12	1560
9/29/09	11	1580
9/30/09	11	1600
<b>Minimum</b>	11	1500
<b>Maximum</b>	25	1640
<b>Average</b>	16.30	1581.43

OUTLET OPERATOR NAME/ADDRESS

NAME: ND State Water Commission  
 ADDRESS: 900 E Boulevard Avenue  
 Bismarck ND 58505

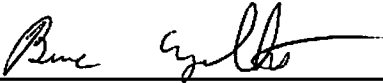
MONTHLY DISCHARGE REPORT

LOCATION: DOWNSTREAM OF THE OUTLET (BREMEN)

FACILITY: Devils Lake Outlet Project

LOCATION: Benson Co, ND

MONITORING PERIOD	
START DATE	END DATE
9/1/09	9/30/09

PARAMETER	MINIMUM	MAXIMUM	AVERAGE	UNITS	SAMPLING FREQUENCY	TYPE
pH	8.3	8.66	8.47	SU	4 x Week	GRAB
SPECIFIC CONDUCTANCE	1860	1950	1905.71	umho/cm	Continuous	Recorder
SULFATE	523	563	544.19	mg/L	4 x Week	GRAB
7 DAY AVERAGE OF SULFATE	513.2	556.2	540.08	mg/L	4 x Week	GRAB
FLOW, INSTREAM	96	122	111.5	cfs	Continuous	Recorder
SIGNATURE				10/23/09	701-328-4958	
NAME AND TITLE	BRUCE ENGELHARDT, HEAD, INVESTIGATIONS SECTION			DATE	TELEPHONE NUMBER	
COMMENT AND EXPLANATION OF ANY VIOLATIONS						
Summary of individual sample results and flow data for outlet, upstream & downstream monitoring locations attached.						
Instream samples and measurements for this summary pertain only to time periods when outlet is actually operated.						



**Water Quality Results of the samples collected from the downstream location near Bremen  
 Sheyenne River Below Devils Lake Outlet Near Bremen**

Date	Time	Sampler	USGS EC ( $\mu$ S/cm)	Lab pH	Lab Sulfate (mg/L)	7 Day Rolling Average of Sulfate for the operating period (mg/L)	Total Suspended Solids (mg/L)	No. of days included in the 7 day Rolling average
09/01/09	12:30	NDSWC	1900	8.44	523	513.2	42	7
09/02/09	12:30	NDSWC	1920	8.66	532	519.2	-	7
09/03/09	8:30	NDSWC	1930	8.53	537	525.2	-	7
09/04/09	9:30	NDSWC	1930	8.5	554	533.6	-	7
09/05/09	-	-	-	-	-	-	-	-
09/06/09	-	-	-	-	-	-	-	-
09/07/09	-	-	-	-	-	-	-	-
09/08/09	9:00	NDSWC	1900	8.56	542	541.25	-	7
09/09/09	9:00	NDSWC	1900	8.3	540	543.25	52	7
09/10/09	13:25	NDSWC	1910	8.43	547	545.75	-	7
09/11/09	12:45	NDSWC	1860	8.42	534	540.75	-	7
09/12/09	-	-	-	-	-	-	-	-
09/13/09	-	-	-	-	-	-	-	-
09/14/09	10:45	NDSWC	1860	8.4	537	540	-	7
09/15/09	8:50	NDSWC	1870	8.46	548	541.2	48	7
09/16/09	8:40	NDSWC	1890	8.36	535	540.2	-	7
09/17/09	11:45	NDSWC	1900	8.38	536	538	-	7
09/18/09	10:30	NDSWC	1880	8.39	539	539	-	7
09/19/09	-	-	-	-	-	-	-	-
09/20/09	-	-	-	-	-	-	-	-
09/21/09	9:45	NDSWC	1920	8.48	554	542.4	-	7
09/22/09	9:50	NDSWC	1890	8.44	546	542	-	7
09/23/09	9:00	NDSWC	1890	8.4	543	543.6	43	7
09/24/09	14:55	NDSWC	1920	8.55	549	546.2	-	7
09/25/09	7:55	NDSWC	1920	8.56	552	548.8	-	7
09/26/09	-	-	-	-	-	-	-	-
09/27/09	-	-	-	-	-	-	-	-
09/28/09	8:30	NDSWC	1940	8.59	558	549.6	-	7
09/29/09	9:20	NDSWC	1940	8.54	559	552.2	-	7
09/30/09	9:00	NDSWC	1950	8.57	563	556.2	39	7
Min			1860.00	8.30	523.00	513.20	39.00	
Max			1950.00	8.66	563.00	556.20	52.00	
Average			1905.71	8.47	544.19	540.08	44.80	

**Average daily streamflow and conductivity data at the downstream location near Bremen**

<b>USGS Gaging Station Data</b>		
<b>Sheyenne River Below Devils Lake</b>		
<b>Date</b>	<b>Streamflow (cfs)</b>	<b>EC (<math>\mu</math>S/cm)</b>
9/1/09	113	1910
9/2/09	113	1920
9/3/09	114	1930
9/4/09	111	1940
9/5/09	111	1940
9/6/09	111	1940
9/7/09	109	1940
9/8/09	114	1920
9/9/09	113	1920
9/10/09	110	1930
9/11/09	120	1880
9/12/09	122	1850
9/13/09	121	1880
9/14/09	118	1890
9/15/09	116	1900
9/16/09	115	1890
9/17/09	113	1900
9/18/09	113	1900
9/19/09	111	1910
9/20/09	109	1920
9/21/09		
9/22/09		
9/23/09	111	1900
9/24/09	110	1920
9/25/09	107	1920
9/26/09	108	1920
9/27/09	108	1930
9/28/09	103	1940
9/29/09	96	1940
9/30/09	102	1950
Minimum	96	1850
Maximum	122	1950
Average	111.50	1915.36