

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>

August 27, 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 period between July 1st and July 31st 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.

One sample from the outlet has pH value of 9.27, however, this does not seem to have affected the water quality downstream at Bremen

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

LOCATION: Benson Co, ND

MONITORING PERIOD	
START DATE	END DATE
7/1/09	7/31/09

Devils Lake Outlet discharged 4919 ac-ft over 31 Days

PARAMETER	MINIMUM	MAXIMUM	AVERAGE	UNITS	SAMPLING FREQUENCY	TYPE
pH	8.4	9.27	8.6	SU	4 x Week	GRAB
SPECIFIC CONDUCTANCE	1031	1919	1622	umho/cm	Continuous	Recorder
SULFATE	563	689	581	mg/L	4 x Week	GRAB
7 DAY AVERAGE OF SULFATE	567	618	582	mg/L	4 x Week	GRAB
OUTLET DISCHARGE	7.94	113.73	79.99	cfs	Continuous	Recorder
SIGNATURE	<i>Bruce Engelhardt</i>					
NAME AND TITLE	BRUCE ENGELHARDT, HEAD, INVESTIGATIONS SECTION			8/27/09	701-328-4958	
COMMENT AND EXPLANATION OF ANY VIOLATIONS						
Summary of individual sample results and flow data for outlet, upstream & downstream monitoring locations attached.						

Daily Outlet Discharge

Date	Average Daily Outlet Discharge (cfs)	Total Daily Volume (cu-ft)
7/1/09	109.54	9,464,480
7/2/09	109.51	9,461,476
7/3/09	111.80	9,659,550
7/4/09	112.68	9,735,523
7/5/09	113.73	9,826,641
7/6/09	93.17	8,050,168
7/7/09	15.78	1,363,466
7/8/09	7.94	686,369
7/9/09	26.52	2,291,724
7/10/09	49.66	4,290,659
7/11/09	41.67	3,600,271
7/12/09	42.04	3,632,608
7/13/09	53.83	4,650,984
7/14/09	47.32	4,088,195
7/15/09	48.23	4,167,001
7/16/09	106.77	9,224,735
7/17/09	110.57	9,552,927
7/18/09	112.13	9,688,188
7/19/09	111.70	9,650,594
7/20/09	111.05	9,594,856
7/21/09	92.70	8,009,185
7/22/09	84.15	7,270,269
7/23/09	94.38	8,154,690
7/24/09	96.57	8,343,622
7/25/09	97.33	8,409,623
7/26/09	97.36	8,411,549
7/27/09	72.09	6,228,604
7/28/09	19.63	1,696,179
7/29/09	97.86	8,454,974
7/30/09	98.55	8,514,389
7/31/09	93.54	8,082,043

Total		214,255,544	cu-ft
Total		1603	Mgal
Total		4919	Ac-ft
Average Flow	79.99	cfs	

**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 operating period (mg/L)	Total Suspended Solids (mg/L)	No. of days included in the 7 day Rolling average
7/1/09	7:45	NDSWC	1641.71	8.48	567	576.6	-	7
7/2/09	8:30	NDSWC	1745.40	8.42	567	574.6	-	7
7/3/09	-	-	1660.03	-	-	-	-	-
7/4/09	-	-	1672.55	-	-	-	-	-
7/5/09	-	-	1718.42	-	-	-	-	-
7/6/09	9:00	NDSWC	1731.39	8.49	565	567	-	7
7/7/09	9:30	NDSWC	1781.54	8.72	582	570.25	-	7
7/8/09	8:30	NDSWC	1892.96	8.54	636	587.5	ND	7
7/9/09	14:00	NDSWC	1918.56	9.27	689	618	-	7
7/10/09	10:30	NDSWC	1871.35	8.54	572	608.8	-	7
7/11/09	-	-	1862.49	-	-	-	-	-
7/12/09	-	-	1854.53	-	-	-	-	-
7/13/09	9:00	NDSWC	1864.64	8.69	573	610.4	ND	7
7/14/09	11:30	NDSWC	1882.83	8.52	580	610	-	7
7/15/09	8:00	NDSWC	1889.33	8.4	578	598.4	-	7
7/16/09	8:05	NDSWC	1878.00	8.53	571	574.8	-	7
7/17/09	8:30	NDSWC	1795.46	8.5	572	574.8	-	7
7/18/09	-	-	1825.91	-	-	-	-	-
7/19/09	-	-	1726.80	-	-	-	-	-
7/20/09	9:40	NDSWC	1306.32	8.47	567	573.6	-	7
7/21/09	11:30	NDSWC	1107.45	8.52	572	572	-	7
7/22/09	9:00	NDSWC	1145.96	8.43	570	570.4	8	7
7/23/09	11:00	NDSWC	1180.74	8.53	563	568.8	-	7
7/24/09	8:10	NDSWC	1374.26	8.45	570	568.4	-	7
7/25/09	-	-	1278.93	-	-	-	-	-
7/26/09	-	-	1030.99	-	-	-	-	-
7/27/09	18:30	NDSWC	1048.13	8.92	606	576.2	-	7
7/28/09	9:15	NDSWC	1175.31	8.88	584	578.6	5	7
7/29/09	10:00	NDSWC	1524.86	8.46	563	577.2	-	7
7/30/09	8:40	NDSWC	1670.13	8.46	565	577.6	-	7
7/31/09	8:35	NDSWC	1715.28	8.42	573	578.2	-	7

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

PARAMETER	MINIMUM	MAXIMUM	AVERAGE	UNITS	SAMPLING FREQUENCY	TYPE
pH	8.15	8.4	8.28	SU	4 x Week	GRAB
SPECIFIC CONDUCTANCE	1290	1490	1399	umho/cm	Continuous	Recorder
SULFATE	222	357	255	mg/L	4 x Week	GRAB
7 DAY AVERAGE OF SULFATE	233	322	255	mg/L	4 x Week	GRAB
FLOW, INSTREAM	31	134	70.97	cfs	Continuous	Recorder
SIGNATURE				8/27/09	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 (μ 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
7/1/09	8:00	NDSWC	1400	8.16	338	308	-	7
7/2/09	8:45	NDSWC	1400	8.17	318	322.4	-	7
7/3/09	-	-	-	-	-	-	-	-
7/4/09	-	-	-	-	-	-	-	-
7/5/09	-	-	-	-	-	-	-	-
7/6/09	8:30	NDSWC	1380	8.2	256	317.25	-	7
7/7/09	9:15	NDSWC	1350	8.15	249	290.25	-	7
7/8/09	9:00	NDSWC	1370	8.17	245	267	20	7
7/9/09	14:20	NDSWC	1350	8.27	242	248	-	7
7/10/09	10:15	NDSWC	1290	8.26	240	246.4	-	7
7/11/09	-	-	-	-	-	-	-	-
7/12/09	-	-	-	-	-	-	-	-
7/13/09	9:30	NDSWC	1310	8.24	237	242.6	17	7
7/14/09	11:15	NDSWC	1330	8.26	238	240.4	-	7
7/15/09	8:15	NDSWC	1350	8.29	240	239.4	-	7
7/16/09	8:20	NDSWC	1370	8.34	236	238.2	-	7
7/17/09	8:45	NDSWC	1380	8.36	229	236	-	7
7/18/09	-	-	-	-	-	-	-	-
7/19/09	-	-	-	-	-	-	-	-
7/20/09	8:40	NDSWC	1400	8.34	222	233	-	7
7/21/09	11:20	NDSWC	1440	8.35	236	232.6	-	7
7/22/09	9:30	NDSWC	1460	8.37	245	233.6	22	7
7/23/09	10:20	NDSWC	1470	8.32	249	236.2	-	7
7/24/09	8:50	NDSWC	1470	8.32	241	238.6	-	7
7/25/09	-	-	-	-	-	-	-	-
7/26/09	-	-	-	-	-	-	-	-
7/27/09	18:15	NDSWC	1490	8.4	229	240	-	7
7/28/09	9:40	NDSWC	1480	8.33	241	241	22	7
7/29/09	10:15	NDSWC	1490	8.33	232	238.4	-	7
7/30/09	8:50	NDSWC	1490	8.31	234	235.4	-	7
7/31/09	8:50	NDSWC	1480	8.29	232	233.6	-	7

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

USGS Gaging Station Data		
Sheyenne River Above Devils Lake		
Date	Streamflow (cfs)	EC (μS/cm)
7/1/09	134	1400
7/2/09	124	1410
7/3/09	120	1410
7/4/09	117	1390
7/5/09	112	1390
7/6/09	103	1380
7/7/09	95	1370
7/8/09	92	1370
7/9/09	89	1360
7/10/09	85	1330
7/11/09	82	1330
7/12/09	79	1320
7/13/09	76	1310
7/14/09	71	1330
7/15/09	69	1360
7/16/09	66	1370
7/17/09	65	1380
7/18/09	64	1380
7/19/09	62	1390
7/20/09	59	1410
7/21/09	55	1440
7/22/09	50	1470
7/23/09	47	1470
7/24/09	43	1470
7/25/09	40	1470
7/26/09	38	1480
7/27/09	35	1480
7/28/09	33	1480
7/29/09	32	1490
7/30/09	31	1490
7/31/09	32	1490

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
7/1/09	7/31/09

PARAMETER	MINIMUM	MAXIMUM	AVERAGE	UNITS	SAMPLING FREQUENCY	TYPE
pH	8.2	8.51	8.35	SU	4 x Week	GRAB
SPECIFIC CONDUCTANCE	1410	1820	1630	umho/cm	Continuous	Recorder
SULFATE	266	495	416	mg/L	4 x Week	GRAB
7 DAY AVERAGE OF SULFATE	336	471	408	mg/L	4 x Week	GRAB
FLOW, INSTREAM	67	297	152.19	cfs	Continuous	Recorder
SIGNATURE				8/27/09	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
Sheneye River Below Devils Lake Outlet Near Bremen**

Date	Time	Sampler	USGS EC (µS/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
7/1/09	8:30	NDSWC	1560	8.22	457	414.8	-	7
7/2/09	9:15	NDSWC	1600	8.27	448	436.8	-	7
7/3/09	-	-	-	-	-	-	-	-
7/4/09	-	-	-	-	-	-	-	-
7/5/09	-	-	-	-	-	-	-	-
7/6/09	8:00	NDSWC	1640	8.29	418	446.3	-	7
7/7/09	9:30	NDSWC	1650	8.28	418	435.3	-	7
7/8/09	9:30	NDSWC	1610	8.2	399	420.8	21	7
7/9/09	14:50	NDSWC	1430	8.29	275	377.5	-	7
7/10/09	9:45	NDSWC	1410	8.25	266	355.2	-	7
7/11/09	-	-	-	-	-	-	-	-
7/12/09	-	-	-	-	-	-	-	-
7/13/09	10:00	NDSWC	1540	8.28	369	345.4	23	7
7/14/09	10:15	NDSWC	1560	8.36	376	337.0	-	7
7/15/09	8:45	NDSWC	1590	8.4	395	336.2	-	7
7/16/09	8:45	NDSWC	1580	8.4	390	359.2	-	7
7/17/09	9:15	NDSWC	1670	8.46	427	391.4	-	7
7/18/09	-	-	-	-	-	-	-	-
7/19/09	-	-	-	-	-	-	-	-
7/20/09	9:05	NDSWC	1720	8.46	443	406.2	-	7
7/21/09	10:45	NDSWC	1720	8.46	445	420.0	-	7
7/22/09	10:00	NDSWC	1740	8.47	446	430.2	18	7
7/23/09	9:45	NDSWC	1730	8.51	448	441.8	-	7
7/24/09	9:20	NDSWC	1750	8.49	459	448.2	-	7
7/25/09	-	-	-	-	-	-	-	-
7/26/09	-	-	-	-	-	-	-	-
7/27/09	17:45	NDSWC	1800	8.51	483	456.2	-	7
7/28/09	10:15	NDSWC	1790	8.47	495	466.2	45	7
7/29/09	10:40	NDSWC	1810	8.32	470	471.0	-	7
7/30/09	9:10	NDSWC	1660	8.32	396	460.6	-	7
7/31/09	9:10	NDSWC	1820	8.37	487	466.2	-	7

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

USGS Gaging Station Data		
Sheyenne River Below Devils Lake		
Date	Streamflow (cfs)	EC (μS/cm)
7/1/09	297	1560
7/2/09	271	1600
7/3/09	254	1630
7/4/09	245	1640
7/5/09	238	1640
7/6/09	227	1640
7/7/09	179	1640
7/8/09	113	1580
7/9/09	92	1440
7/10/09	96	1410
7/11/09	108	1490
7/12/09	110	1530
7/13/09	113	1510
7/14/09	122	1510
7/15/09	121	1530
7/16/09	127	1540
7/17/09	150	1670
7/18/09	156	1710
7/19/09	157	1720
7/20/09	157	1730
7/21/09	154	1730
7/22/09	146	1750
7/23/09	137	1750
7/24/09	139	1770
7/25/09	137	1790
7/26/09	135	1800
7/27/09	133	1810
7/28/09	97	1820
7/29/09	67	1810
7/30/09	114	1750
7/31/09	126	1840