

North Dakota State Water Commission

900 EAST BOULEVARD AVENUE, DEPT 770 • BISMARCK, NORTH DAKOTA 58505-0850
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December 16, 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 November 2009 and the summaries of the sample results and flow data. Discharge occurred on the days highlighted in yellow in the summaries. The pumps for the outlet were shut off on October 31 2009 and the discharge showed in the summaries is due to the canal dewatering.

Attached to the summaries are the tables showing average daily outlet discharge, water quality results of the samples collected from the upstream and the downstream location, the average daily stream flow data and the conductivity data obtained from the USGS gaging station at the upstream and the downstream location. Water samples were not collected from the outlet during the reported period.

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
11/1/09	11/30/09

Devils Lake Outlet discharged 11 ac-ft over 4 Days

PARAMETER	MINIMUM	MAXIMUM	AVERAGE	UNITS	SAMPLING FREQUENCY	TYPE
pH	-	-	-	SU	4 x Week	GRAB
SPECIFIC CONDUCTANCE	1730.87	2172.95	1967.07	umho/cm	Continuous	Recorder
SULFATE	-	-	-	mg/L	4 x Week	GRAB
7 DAY AVERAGE OF SULFATE	-	-	-	mg/L	4 x Week	GRAB
OUTLET DISCHARGE	0.07	4.36	1.42	cfs	Continuous	Recorder
SIGNATURE	<i>Bruce Engelhardt</i>			12/16/09	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 operating period (mg/L)	Total Suspended Solids (mg/L)	No. of days included in the 7 day Rolling average
11/1/09	-	-	1730.87	-	-	-	-	-
11/2/09	-	-	1913.87	-	-	-	-	-
11/3/09	-	-	2050.58	-	-	-	-	-
11/4/09	-	-	2172.95	-	-	-	-	-
11/5/09	-	-	-	-	-	-	-	-
11/6/09	-	-	-	-	-	-	-	-
11/7/09	-	-	-	-	-	-	-	-
11/8/09	-	-	-	-	-	-	-	-
11/9/09	-	-	-	-	-	-	-	-
11/10/09	-	-	-	-	-	-	-	-
11/11/09	-	-	-	-	-	-	-	-
11/12/09	-	-	-	-	-	-	-	-
11/13/09	-	-	-	-	-	-	-	-
11/14/09	-	-	-	-	-	-	-	-
11/15/09	-	-	-	-	-	-	-	-
11/16/09	-	-	-	-	-	-	-	-
11/17/09	-	-	-	-	-	-	-	-
11/18/09	-	-	-	-	-	-	-	-
11/19/09	-	-	-	-	-	-	-	-
11/20/09	-	-	-	-	-	-	-	-
11/21/09	-	-	-	-	-	-	-	-
11/22/09	-	-	-	-	-	-	-	-
11/23/09	-	-	-	-	-	-	-	-
11/24/09	-	-	-	-	-	-	-	-
11/25/09	-	-	-	-	-	-	-	-
11/26/09	-	-	-	-	-	-	-	-
11/27/09	-	-	-	-	-	-	-	-
11/28/09	-	-	-	-	-	-	-	-
11/29/09	-	-	-	-	-	-	-	-
11/30/09	-	-	-	-	-	-	-	-
Minimum			1730.87					
Maximum			2172.95					
Average			1967.07					

Daily Outlet Discharge

Date	Average Daily Outlet	Total Daily Volume (cu-
11/1/09	4.36	376975.445
11/2/09	0.69	59480.5482
11/3/09	0.56	48071.8844
11/4/09	0.07	6181.69639
11/5/09	0.00	0
11/6/09	0.00	0
11/7/09	0.00	0
11/8/09	0.00	0
11/9/09	0.00	0
11/10/09	0.00	0
11/11/09	0.00	0
11/12/09	0.00	0
11/13/09	0.00	0
11/14/09	0.00	0
11/15/09	0.00	0
11/16/09	0.00	0
11/17/09	0.00	0
11/18/09	0.00	0
11/19/09	0.00	0
11/20/09	0.00	0
11/21/09	0.00	0
11/22/09	0.00	0
11/23/09	0.00	0
11/24/09	0.00	0
11/25/09	0.00	0
11/26/09	0.00	0
11/27/09	0.00	0
11/28/09	0.00	0
11/29/09	0.00	0
11/30/09	0.00	0

Total		490,710	cu-ft
Total		4	Mgal
Total		11	Ac-ft
Average Flow	1.42		cfs
Minimum	0.07		
Maximum	4.36		
Average	1.42		

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
11/1/09	11/30/09

PARAMETER	MINIMUM	MAXIMUM	AVERAGE	UNITS	SAMPLING FREQUENCY	TYPE
pH	8.46	8.52	8.49	SU	4 x Week	GRAB
SPECIFIC CONDUCTANCE	1570	1590	1583.33	umho/cm	Continuous	Recorder
SULFATE	346	364	352.67	mg/L	4 x Week	GRAB
7 DAY AVERAGE OF SULFATE	362.6	366.26	364.27	mg/L	4 x Week	GRAB
FLOW, INSTREAM	26	27	26.75	cfs	Continuous	Recorder
SIGNATURE				12/16/09	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
 Shesenne River Above Devils Lake Outlet Near Flora

Date	Time	Sampler	USGS EC ($\mu\text{S}/\text{cm}$)	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
11/1/09	-	-	-	-	-	-	-	-
11/2/09	8:30	NDSWC	1570	8.46	346	366.2	-	7
11/3/09	8:00	NDSWC	1590	8.5	348	364	16	7
11/4/09	12:40	NDSWC	1590	8.52	364	362.6	-	7
11/5/09	7:40	NDSWC	1620	8.42	364	-	-	-
11/6/09	8:30	NDSWC	1620	8.43	365	-	-	-
11/7/09	-	-	-	-	-	-	-	-
11/8/09	-	-	-	-	-	-	-	-
11/9/09	9:00	NDSWC	1560	8.42	320	-	22	-
11/10/09	16:30	NDSWC	1540	8.04	321	-	-	-
11/11/09	-	-	-	-	-	-	-	-
11/12/09	11:00	NDSWC	1540	8.13	330	-	-	-
11/13/09	8:00	NDSWC	1540	8.43	337	-	-	-
11/14/09	-	-	-	-	-	-	-	-
11/15/09	-	-	-	-	-	-	-	-
11/16/09	14:40	NDSWC	1620	8.66	359	-	30	-
11/17/09	11:35	NDSWC	1640	8.57	363	-	-	-
11/18/09	10:45	NDSWC	1640	8.58	366	-	-	-
11/19/09	17:00	NDSWC	1640	8.52	373	-	-	-
11/20/09	10:00	NDSWC	1680	8.5	372	-	-	-
11/21/09	-	-	-	-	-	-	-	-
11/22/09	-	-	-	-	-	-	-	-
11/23/09	-	-	-	-	-	-	-	-
11/24/09	-	-	-	-	-	-	-	-
11/25/09	-	-	-	-	-	-	-	-
11/26/09	-	-	-	-	-	-	-	-
11/27/09	-	-	-	-	-	-	-	-
11/28/09	-	-	-	-	-	-	-	-
11/29/09	-	-	-	-	-	-	-	-
11/30/09	-	-	-	-	-	-	-	-
Minimum			1570.00	8.46	346.00	362.60		
Maximum			1590.00	8.52	364.00	366.20		
Average			1583.33	8.49	352.67	364.27		

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 (μ S/cm)
11/1/09	26	1590
11/2/09	27	1570
11/3/09	27	1580
11/4/09	27	1600
11/5/09	26	1620
11/6/09	27	1610
11/7/09	30	1590
11/8/09	31	1580
11/9/09	32	1560
11/10/09	32	1550
11/11/09	32	1540
11/12/09	32	1540
11/13/09	32	1540
11/14/09	30	1540
11/15/09	28	1570
11/16/09	27	1610
11/17/09	25	1630
11/18/09	26	1640
11/19/09	24	1650
11/20/09	22	1650
11/21/09	24	1650
11/22/09	25	1640
11/23/09	23	1650
11/24/09	21	1700
11/25/09	23	1690
11/26/09	22	1730
11/27/09	22	1750
11/28/09	22	1740
11/29/09	21	1730
11/30/09	Ice	1760
Minimum	26	1570
Maximum	27	1600
Average	26.75	1585

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
11/1/09	11/30/09

PARAMETER	MINIMUM	MAXIMUM	AVERAGE	UNITS	SAMPLING FREQUENCY	TYPE
pH	8.43	8.44	8.43	SU	4 x Week	GRAB
SPECIFIC CONDUCTANCE	1790	1910	1866.67	umho/cm	Continuous	Recorder
SULFATE	476	540	517.33	mg/L	4 x Week	GRAB
7 DAY AVERAGE OF SULFATE	525	537.4	533.07	mg/L	4 x Week	GRAB
FLOW, INSTREAM	30	85	47	cfs	Continuous	Recorder
SIGNATURE	<i>Bruce Engelhardt</i>			12/16/09	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 (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
11/1/09	-	-	-	-	-	-	-	-
11/2/09	8:05	NDSWC	1900	8.43	540	537.4		
11/3/09	9:00	NDSWC	1910	8.44	536	536.8	32	
11/4/09	12:00	NDSWC	1790	8.43	476	525		
11/5/09	8:20	NDSWC	1790	8.36	421	503		
11/6/09	9:00	NDSWC	1210	8.37	421	478.8		
11/7/09	-	-	-	-	-	-	-	-
11/8/09	-	-	-	-	-	-	-	-
11/9/09	9:40	NDSWC	955	8.44	397		32	
11/10/09	17:00	NDSWC	-	8.16	345			
11/11/09	-	-	-	-	-	-	-	-
11/12/09	10:30	NDSWC	-	8.35	355			
11/13/09	8:30	NDSWC	-	8.49	356			
11/14/09	-	-	-	-	-	-	-	-
11/15/09	-	-	-	-	-	-	-	-
11/16/09	14:45	NDSWC	-	8.58	365			
11/17/09	11:05	NDSWC	-	8.56	358			
11/18/09	11:10	NDSWC	-	8.61	358			
11/19/09	17:30	NDSWC	1660	8.61	376			
11/20/09	9:30	NDSWC	1720	8.59	376			
11/21/09	-	-	-	-	-	-	-	-
11/22/09	-	-	-	-	-	-	-	-
11/23/09	-	-	-	-	-	-	-	-
11/24/09	-	-	-	-	-	-	-	-
11/25/09	-	-	-	-	-	-	-	-
11/26/09	-	-	-	-	-	-	-	-
11/27/09	-	-	-	-	-	-	-	-
11/28/09	-	-	-	-	-	-	-	-
11/29/09	-	-	-	-	-	-	-	-
11/30/09	-	-	-	-	-	-	-	-
Minimum			1790	8.43	476	525		
Maximum			1910	8.44	540	537.4		
Average			1866.67	8.43	517.33	533.07		

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)
11/1/09	85	1880
11/2/09	41	1900
11/3/09	32	1900
11/4/09	30	1830
11/5/09	30	-
11/6/09	30	-
11/7/09	29	-
11/8/09	31	-
11/9/09	32	-
11/10/09	33	-
11/11/09	34	-
11/12/09	35	-
11/13/09	35	-
11/14/09	33	-
11/15/09	30	-
11/16/09	28	-
11/17/09	26	-
11/18/09	26	-
11/19/09	26	1670
11/20/09	25	1710
11/21/09	23	1740
11/22/09	23	1760
11/23/09	25	1780
11/24/09	24	1800
11/25/09	21	1810
11/26/09	22	1810
11/27/09	24	1830
11/28/09	22	1820
11/29/09	22	1820
11/30/09	Ice	Ssn
Minimum	30	1830
Maximum	85	1900
Average	47	1877.5