

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>

November 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 October 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

| MONITORING PERIOD | |
|-------------------|----------|
| START DATE | END DATE |
| 10/1/09 | 10/31/09 |

FACILITY: Devils Lake Outlet Project

LOCATION: Benson Co, ND

Devils Lake Outlet discharged 5941 ac-ft over 31 Days

| PARAMETER | MINIMUM | MAXIMUM | AVERAGE | UNITS | SAMPLING FREQUENCY | TYPE |
|---|---|---------|---------|----------|--------------------|----------|
| pH | 8.38 | 8.54 | 8.48 | SU | 4 x Week | GRAB |
| SPECIFIC CONDUCTANCE | 1413.64 | 1751.62 | 1593.37 | umho/cm | Continuous | Recorder |
| SULFATE | 573 | 614 | 584.36 | mg/L | 4 x Week | GRAB |
| 7 DAY AVERAGE OF SULFATE | 580.2 | 590.8 | 584.26 | mg/L | 4 x Week | GRAB |
| OUTLET DISCHARGE | 42.1 | 109.87 | 96.62 | cfs | Continuous | Recorder |
| SIGNATURE | <i>Bruce Engelhardt</i> | | | | | |
| NAME AND TITLE | BRUCE ENGELHARDT, HEAD, INVESTIGATIONS SECTION | | | 11/23/09 | 701-328-4958 | |
| COMMENT AND EXPLANATION OF ANY VIOLATIONS | | | | | | |
| Summary of individual sample results and flow data for outlet, upstream & downstream monitoring locations attached. | | | | | | |

**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 |
|----------|-------|---------|--|--------|--------------------|--|-------------------------------|---|
| 10/1/09 | 8:30 | NDSWC | 1594.59 | 8.54 | 580 | 582 | - | 7 |
| 10/2/09 | 10:00 | NDSWC | 1413.64 | 8.54 | 573 | 581.4 | - | 7 |
| 10/3/09 | - | - | 1564.42 | - | - | - | - | - |
| 10/4/09 | - | - | 1725.66 | - | - | - | - | - |
| 10/5/09 | 9:20 | NDSWC | 1664.60 | 8.52 | 582 | 581.2 | - | 7 |
| 10/6/09 | 8:15 | NDSWC | 1605.67 | 8.48 | 583 | 581 | 48 | 7 |
| 10/7/09 | 9:25 | NDSWC | 1574.54 | 8.47 | 583 | 580.2 | - | 7 |
| 10/8/09 | 11:45 | NDSWC | 1491.94 | 8.44 | 585 | 581.2 | - | 7 |
| 10/9/09 | 9:45 | NDSWC | 1442.50 | 8.42 | 586 | 583.8 | - | 7 |
| 10/10/09 | - | - | 1559.53 | - | - | - | - | - |
| 10/11/09 | - | - | 1540.81 | - | - | - | - | - |
| 10/12/09 | 8:30 | NDSWC | 1595.78 | 8.49 | 588 | 585 | 29 | 7 |
| 10/13/09 | 11:58 | NDSWC | 1574.45 | 8.43 | 588 | 586 | - | 7 |
| 10/14/09 | 9:25 | NDSWC | 1551.44 | 8.43 | 581 | 585.6 | - | 7 |
| 10/15/09 | 9:40 | NDSWC | 1551.88 | 8.47 | 581 | 584.8 | - | 7 |
| 10/16/09 | 9:20 | NDSWC | 1570.58 | 8.45 | 584 | 584.4 | - | 7 |
| 10/17/09 | - | - | 1658.52 | - | - | - | - | - |
| 10/18/09 | - | - | 1694.62 | - | - | - | - | - |
| 10/19/09 | 12:15 | NDSWC | 1751.62 | 8.51 | 583 | 583.4 | - | 7 |
| 10/20/09 | 10:45 | NDSWC | 1737.66 | 8.52 | 579 | 581.6 | 54 | 7 |
| 10/21/09 | 10:30 | NDSWC | 1702.15 | 8.46 | 578 | 581 | - | 7 |
| 10/22/09 | 13:40 | NDSWC | 1720.33 | 8.38 | 614 | 587.6 | - | 7 |
| 10/23/09 | 9:00 | NDSWC | 1586.08 | 8.44 | 582 | 587.2 | - | 7 |
| 10/24/09 | - | - | 1502.45 | - | - | - | - | - |
| 10/25/09 | - | - | 1462.08 | - | - | - | - | - |
| 10/26/09 | 13:45 | NDSWC | 1583.49 | 8.52 | 584 | 587.4 | - | 7 |
| 10/27/09 | 8:15 | NDSWC | 1610.41 | 8.48 | 586 | 588.8 | 46 | 7 |
| 10/28/09 | 8:00 | NDSWC | 1616.13 | 8.49 | 588 | 590.8 | - | 7 |
| 10/29/09 | 15:45 | NDSWC | 1606.27 | 8.54 | 581 | 584.2 | - | 7 |
| 10/30/09 | 9:15 | NDSWC | 1570.66 | 8.51 | 587 | 585.2 | - | 7 |
| 10/31/09 | - | - | 1569.88 | - | - | - | - | - |
| Minimum | | | 1413.64 | 8.38 | 573.00 | 580.20 | | |
| Maximum | | | 1751.62 | 8.54 | 614.00 | 590.80 | | |
| Average | | | 1593.37 | 8.48 | 584.36 | 584.26 | | |

Daily Outlet Discharge

| Date | Average Daily Outlet Discharge (cfs) | Total Daily Volume (cu-ft) |
|----------|--------------------------------------|----------------------------|
| 10/01/09 | 106.02 | 9,159,804 |
| 10/02/09 | 105.87 | 9,147,244 |
| 10/03/09 | 109.86 | 9,491,757 |
| 10/04/09 | 109.72 | 9,479,571 |
| 10/05/09 | 109.87 | 9,492,942 |
| 10/06/09 | 103.04 | 8,902,761 |
| 10/07/09 | 104.04 | 8,988,969 |
| 10/08/09 | 102.86 | 8,886,878 |
| 10/09/09 | 101.46 | 8,765,721 |
| 10/10/09 | 97.26 | 8,403,102 |
| 10/11/09 | 99.16 | 8,566,999 |
| 10/12/09 | 98.46 | 8,506,701 |
| 10/13/09 | 99.97 | 8,637,478 |
| 10/14/09 | 98.46 | 8,506,580 |
| 10/15/09 | 100.50 | 8,682,913 |
| 10/16/09 | 99.76 | 8,618,925 |
| 10/17/09 | 101.79 | 8,794,879 |
| 10/18/09 | 100.07 | 8,646,012 |
| 10/19/09 | 102.58 | 8,863,078 |
| 10/20/09 | 99.22 | 8,572,695 |
| 10/21/09 | 93.40 | 8,069,867 |
| 10/22/09 | 42.10 | 3,637,074 |
| 10/23/09 | 100.95 | 8,721,919 |
| 10/24/09 | 96.93 | 8,374,740 |
| 10/25/09 | 102.62 | 8,866,181 |
| 10/26/09 | 94.75 | 8,186,158 |
| 10/27/09 | 97.61 | 8,433,160 |
| 10/28/09 | 95.72 | 8,269,944 |
| 10/29/09 | 91.55 | 7,909,597 |
| 10/30/09 | 63.66 | 5,499,971 |
| 10/31/09 | 65.90 | 5,693,998 |

| | | | |
|---------------------|--------|-------------|-------|
| Total | | 258,777,618 | cu-ft |
| Total | | 1,936 | Mgal |
| Total | | 5,941 | Ac-ft |
| Average Flow | 96.62 | | cfs |
| Minimum | 42.10 | | |
| Maximum | 109.87 | | |
| Average | 96.62 | | |

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 |
| 10/1/09 | 10/31/09 |

| PARAMETER | MINIMUM | MAXIMUM | AVERAGE | UNITS | SAMPLING FREQUENCY | TYPE |
|---|---|---------|---------|----------|--------------------|------------------|
| pH | 8.31 | 8.58 | 8.42 | SU | 4 x Week | GRAB |
| SPECIFIC CONDUCTANCE | 1490 | 1630 | 1587.73 | umho/cm | Continuous | Recorder |
| SULFATE | 310 | 380 | 349.91 | mg/L | 4 x Week | GRAB |
| 7 DAY AVERAGE OF SULFATE | 314.4 | 368.4 | 344.42 | mg/L | 4 x Week | GRAB |
| FLOW, INSTREAM | 13 | 30 | 21.77 | cfs | Continuous | Recorder |
| SIGNATURE |  | | | | | |
| NAME AND TITLE | BRUCE ENGELHARDT, HEAD, INVESTIGATIONS SECTION | | | 11/23/09 | 701-328-4958 | 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
Shenoye River Above Devils Lake Outlet Near Flora**

| 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 |
|----------|-------|---------|--------------------|--------|-----------------------|---|--|---|
| 10/1/09 | 8:45 | NDSWC | 1610 | 8.58 | 310 | 314.4 | - | 7 |
| 10/2/09 | 10:30 | NDSWC | 1610 | 8.54 | 346 | 319 | - | 7 |
| 10/3/09 | - | - | - | - | - | - | - | - |
| 10/4/09 | - | - | - | - | - | - | - | - |
| 10/5/09 | 9:40 | NDSWC | 1550 | 8.48 | 362 | 328.8 | - | 7 |
| 10/6/09 | 8:30 | NDSWC | 1500 | 8.4 | 344 | 335.2 | 15 | 7 |
| 10/7/09 | 9:15 | NDSWC | 1490 | 8.41 | 346 | 341.6 | - | 7 |
| 10/8/09 | 11:55 | NDSWC | 1530 | 8.4 | 349 | 349.4 | - | 7 |
| 10/9/09 | 10:00 | NDSWC | 1520 | 8.38 | 363 | 352.8 | - | 7 |
| 10/10/09 | - | - | - | - | - | - | - | - |
| 10/11/09 | - | - | - | - | - | - | - | - |
| 10/12/09 | 8:45 | NDSWC | 1590 | 8.45 | 355 | 351.4 | 17 | 7 |
| 10/13/09 | 11:50 | NDSWC | 1620 | 8.36 | 332 | 349 | - | 7 |
| 10/14/09 | 9:35 | NDSWC | 1630 | 8.36 | 335 | 346.8 | - | 7 |
| 10/15/09 | 11:00 | NDSWC | 1630 | 8.37 | 331 | 343.2 | - | 7 |
| 10/16/09 | 9:35 | NDSWC | 1630 | 8.36 | 335 | 337.6 | - | 7 |
| 10/17/09 | - | - | - | - | - | - | - | - |
| 10/18/09 | - | - | - | - | - | - | - | - |
| 10/19/09 | 12:00 | NDSWC | 1600 | 8.41 | 332 | 333 | - | 7 |
| 10/20/09 | 11:00 | NDSWC | 1600 | 8.42 | 352 | 337 | 16 | 7 |
| 10/21/09 | 10:15 | NDSWC | 1600 | 8.31 | 358 | 341.6 | - | 7 |
| 10/22/09 | 13:50 | NDSWC | 1580 | 8.45 | 357 | 346.8 | - | 7 |
| 10/23/09 | 8:45 | NDSWC | 1590 | 8.41 | 349 | 349.6 | - | 7 |
| 10/24/09 | - | - | - | - | - | - | - | - |
| 10/25/09 | - | - | - | - | - | - | - | - |
| 10/26/09 | 13:30 | NDSWC | 1600 | 8.45 | 357 | 354.6 | - | 7 |
| 10/27/09 | 8:35 | NDSWC | 1600 | 8.44 | 359 | 356 | 16 | 7 |
| 10/28/09 | 8:15 | NDSWC | 1600 | 8.45 | 371 | 358.6 | - | 7 |
| 10/29/09 | 15:30 | NDSWC | 1620 | 8.45 | 375 | 362.2 | - | 7 |
| 10/30/09 | 9:30 | NDSWC | 1630 | 8.43 | 380 | 366.4 | - | 7 |
| 10/31/09 | - | - | - | - | - | - | - | - |
| Minimum | | | 1490.00 | 8.31 | 310.00 | 314.40 | | |
| Maximum | | | 1630.00 | 8.58 | 380.00 | 368.40 | | |
| Average | | | 1587.73 | 8.42 | 349.91 | 344.42 | | |

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) |
| 10/01/09 | 13 | 1600 |
| 10/02/09 | 16 | 1610 |
| 10/03/09 | 18 | 1620 |
| 10/04/09 | 19 | 1590 |
| 10/05/09 | 20 | 1540 |
| 10/06/09 | 19 | 1480 |
| 10/07/09 | 21 | 1500 |
| 10/08/09 | 22 | 1530 |
| 10/09/09 | 20 | 1520 |
| 10/10/09 | 19 | 1550 |
| 10/11/09 | 19 | 1570 |
| 10/12/09 | 19 | 1590 |
| 10/13/09 | 18 | 1610 |
| 10/14/09 | 18 | 1620 |
| 10/15/09 | 19 | 1630 |
| 10/16/09 | 19 | 1630 |
| 10/17/09 | 19 | 1630 |
| 10/18/09 | 19 | 1620 |
| 10/19/09 | 19 | 1600 |
| 10/20/09 | 22 | 1580 |
| 10/21/09 | 25 | 1600 |
| 10/22/09 | 27 | 1590 |
| 10/23/09 | 27 | 1580 |
| 10/24/09 | 26 | 1600 |
| 10/25/09 | 26 | 1620 |
| 10/26/09 | 28 | 1610 |
| 10/27/09 | 30 | 1600 |
| 10/28/09 | 28 | 1610 |
| 10/29/09 | 26 | 1630 |
| 10/30/09 | 27 | 1630 |
| 10/31/09 | 27 | 1620 |
| Minimum | 13 | 1480 |
| Maximum | 30 | 1630 |
| Average | 21.77 | 1590.65 |

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 |
| 10/1/09 | 10/31/09 |

| PARAMETER | MINIMUM | MAXIMUM | AVERAGE | UNITS | SAMPLING FREQUENCY | TYPE |
|---|--|---------|---------|----------|--------------------|----------|
| pH | 8.38 | 8.59 | 8.45 | SU | 4 x Week | GRAB |
| SPECIFIC CONDUCTANCE | 1870 | 1950 | 1899.55 | umho/cm | Continuous | Recorder |
| SULFATE | 531 | 564 | 544.5 | mg/L | 4 x Week | GRAB |
| 7 DAY AVERAGE OF SULFATE | 534 | 559.6 | 546.56 | mg/L | 4 x Week | GRAB |
| FLOW, INSTREAM | 94 | 137 | 122.97 | cfs | Continuous | Recorder |
| SIGNATURE | <i>Bruce Engelhardt</i> | | | 11/23/09 | 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
Shenoye 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 |
|----------|-------|---------|--------------------|--------|-----------------------|---|--|---|
| 10/01/09 | 9:05 | NDSWC | 1950 | 8.59 | 564 | 559.2 | - | 7 |
| 10/02/09 | 11:00 | NDSWC | 1900 | 8.52 | 554 | 559.6 | - | 7 |
| 10/03/09 | - | - | - | - | - | - | - | - |
| 10/04/09 | - | - | - | - | - | - | - | - |
| 10/05/09 | 10:15 | NDSWC | 1920 | 8.49 | 554 | 558.8 | - | 7 |
| 10/06/09 | 9:30 | NDSWC | 1910 | 8.46 | 553 | 557.6 | 23 | 7 |
| 10/07/09 | 8:55 | NDSWC | 1900 | 8.46 | 549 | 554.8 | - | 7 |
| 10/08/09 | 12:15 | NDSWC | 1900 | 8.42 | 546 | 551.2 | - | 7 |
| 10/09/09 | 10:30 | NDSWC | 1880 | 8.41 | 542 | 548.8 | - | 7 |
| 10/10/09 | - | - | - | - | - | - | - | - |
| 10/11/09 | - | - | - | - | - | - | - | - |
| 10/12/09 | 9:10 | NDSWC | 1910 | 8.48 | 554 | 548.8 | 19 | 7 |
| 10/13/09 | 11:30 | NDSWC | 1910 | 8.4 | 555 | 549.2 | - | 7 |
| 10/14/09 | 10:15 | NDSWC | 1920 | 8.41 | 554 | 550.2 | - | 7 |
| 10/15/09 | 11:30 | NDSWC | 1910 | 8.43 | 544 | 549.8 | - | 7 |
| 10/16/09 | 10:00 | NDSWC | 1900 | 8.44 | 544 | 550.2 | - | 7 |
| 10/17/09 | - | - | - | - | - | - | - | - |
| 10/18/09 | - | - | - | - | - | - | - | - |
| 10/19/09 | 11:40 | NDSWC | 1910 | 8.44 | 546 | 548.6 | - | 7 |
| 10/20/09 | 11:30 | NDSWC | 1900 | 8.45 | 537 | 545 | 39 | 7 |
| 10/21/09 | 9:45 | NDSWC | 1890 | 8.38 | 534 | 541 | - | 7 |
| 10/22/09 | 14:10 | NDSWC | 1880 | 8.44 | 537 | 539.6 | - | 7 |
| 10/23/09 | 8:20 | NDSWC | 1900 | 8.42 | 531 | 537 | - | 7 |
| 10/24/09 | - | - | - | - | - | - | - | - |
| 10/25/09 | - | - | - | - | - | - | - | - |
| 10/26/09 | 13:00 | NDSWC | 1870 | 8.46 | 534 | 534.6 | - | 7 |
| 10/27/09 | 9:00 | NDSWC | 1900 | 8.46 | 539 | 535 | 24 | 7 |
| 10/28/09 | 8:45 | NDSWC | 1890 | 8.47 | 535 | 535.2 | - | 7 |
| 10/29/09 | 15:00 | NDSWC | 1870 | 8.47 | 531 | 534 | - | 7 |
| 10/30/09 | 11:00 | NDSWC | 1870 | 8.46 | 542 | 536.2 | - | 7 |
| 10/31/09 | - | - | - | - | - | - | - | - |
| Minimum | | | 1870.00 | 8.38 | 531.00 | 534.00 | | |
| Maximum | | | 1950.00 | 8.59 | 564.00 | 559.60 | | |
| Average | | | 1899.55 | 8.45 | 544.50 | 546.56 | | |

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) |
| 10/01/09 | 115 | 1940 |
| 10/02/09 | 123 | 1900 |
| 10/03/09 | 121 | 1880 |
| 10/04/09 | 121 | 1910 |
| 10/05/09 | 122 | 1920 |
| 10/06/09 | 122 | 1910 |
| 10/07/09 | 118 | 1900 |
| 10/08/09 | 118 | 1900 |
| 10/09/09 | 120 | 1890 |
| 10/10/09 | 118 | 1910 |
| 10/11/09 | 118 | 1920 |
| 10/12/09 | 120 | 1910 |
| 10/13/09 | 122 | 1920 |
| 10/14/09 | 125 | 1920 |
| 10/15/09 | 128 | 1920 |
| 10/16/09 | 127 | 1910 |
| 10/17/09 | 126 | 1910 |
| 10/18/09 | 128 | 1910 |
| 10/19/09 | 127 | 1910 |
| 10/20/09 | 131 | 1890 |
| 10/21/09 | 131 | 1880 |
| 10/22/09 | 107 | 1890 |
| 10/23/09 | 94 | 1880 |
| 10/24/09 | 129 | 1870 |
| 10/25/09 | 134 | 1880 |
| 10/26/09 | 133 | 1880 |
| 10/27/09 | 133 | 1890 |
| 10/28/09 | 137 | 1880 |
| 10/29/09 | 135 | 1880 |
| 10/30/09 | 128 | 1880 |
| 10/31/09 | 101 | 1880 |
| Minimum | 94 | 1870 |
| Maximum | 137 | 1940 |
| Average | 122.97 | 1899.03 |