



NORTH DAKOTA
DEPARTMENT of HEALTH

ENVIRONMENTAL HEALTH SECTION
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August 3, 2005

DALE FRINK PE
STATE ENGINEER
ND STATE WATER COMMISSION
900 E BOULEVARD AVENUE
BISMARCK ND 58505-0187

RE: Devils Lake Outlet Adaptive Management Plan

Dear Mr. Frink:

We have reviewed the "Adaptive Management Plan" as submitted by your agency and have approved it for use as part of the Devils Lake Outlet permit. The approved Adaptive Management Plan is in the form as attached to this letter. Future amendments to the plan may be required as you gain information on the operation of the outlet.

If you should have any questions, contact either myself or Dennis Fewless.

Sincerely,

L. David Glatt, P.E.
Chief
Environmental Health Section

LDG:mjm

Attach.

Environmental Health
Section Chief's Office
701.328.5150

Air
Quality
701 328 5188

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Adaptive Management Plan for NDPDES Permit # ND-0026247

Disclaimer: This document in no way usurps the powers or responsibilities of the NDSWC, NDDH, or USGS.

1. Introduction

In addition to water quality limitations and monitoring requirements, the permit specified that an adaptive management plan should be developed to "*...ensure compliance with permit requirements and maintenance of beneficial uses of the water resources downstream. The plan should outline the basic procedures for evaluating monitoring data, responding to observed impacts to downstream water resources, and adjusting the operation discharge as needed. The adaptive management plan shall be submitted to the (NDDH) for approval. Upon approval, the operation of the discharge may commence. The adaptive management plan will be considered part of the permit with all future discharges being required to comply with the operational conditions identified in the plan. All other permit limitations and conditions of the permit will remain in effect.*"

2. Assess Issues

Scope of Management Issues:

Spatial scales are the geographic range considered in the plan. For the biological community, the spatial scale ranges from upstream of insertion point of the outlet on the upper Sheyenne River to the confluence with the Red River. For water quality, it ranges from upstream of insertion point of the outlet on the upper Sheyenne River to the Red River at Pembina. For flow, it ranges from upstream of insertion point of the outlet on the upper Sheyenne River to the Red River at Pembina. For erosion, it ranges from insertion point to confluence with the Red River.

Temporal scale, or the time period for which the adaptive management plan is designed to monitor and manage expected operations from 2005-2008, when the permit will need to be renewed.

The range of environmental factors that need to be considered are; biological, erosion, water quality, flow, and flooding.

Finally, the potential alterations to Sheyenne River's sensitive resource values that the plan needs to monitor and address include; erosion, water quality deterioration, impacts on aquatic biological community, and access issues due to higher river stages.

Potential Management Actions

Outlet operations will provide the NDSWC with various results, leading to a range of potential management actions. As outlet operation continues, in consultation with the NDDH, it may be possible or necessary to alter the number and/or intensity of sampling periods, modify outlet flow rate and/or timing. If erosion occurs as a result of outlet operations, and not natural environmental factors, it will be necessary to mitigate erosion resulting from outlet release rates.

Key Indicators

Operation of the outlet will be modified based upon the key indicators that the NDSWC receives from the following sources.

- 1) USGS gauging stations for water quality and flow at various gauges from just above the outlet discharge point, to the confluence with the Red River
- 2) Sampling of biological communities beginning after one full year of operation, and continuing at an interval determined by the NDDH as long as outlet operation continues, perhaps with decreasing sample intervals, assuming acceptable impacts
- 3) Aerial and ground imaging, and topographic data as needed to determine potential flooding and erosion effects
- 4) Status of downstream waters designated uses as determined by the NDDH

Identify and Assess Key Gaps In Understanding:

General relationships are known to exist between water quality and biological communities, and electrical conductivity (EC) and sulfates. However, actual operations of the outlet will undoubtedly allow a refinement of the understanding of those relationships. The NDSWC will use methodologies including biological sampling, and water quality sampling to better understand the relationship between EC and sulfates as prescribed in the NDPDES Permit, to develop a better model for operating the outlet, in order to avoid impacting the water resources of the Sheyenne River.

If NDPDES permit requirements are violated by operation of the outlet, the course of action includes several possible alternatives to determine why those violations may have occurred including; a determination if violations are the result of outlet operation; altered sampling regime to increase knowledge of poorly understood environmental factors; and altered outlet operation to eliminate violation of permit requirements.

Participants Roles and Responsibilities:

The operation management of the outlet includes several different entities who have varying roles and levels of responsibility in the process.

The NDSWC has the responsibility of funding any changes, monitoring, or mitigating potential impacts resulting from operation of outlet.

The NDDH has the responsibility of approving actions taken by the NDSWC on appropriate courses of action based upon data collected, and recommendations made by contractors. In addition, the NDDH will analyze water quality samples, and store reference samples of biologicals collected by the contractor(s).

The USGS will conduct water quality monitoring and determine flow rates on the Sheyenne River.

Evaluation

Evaluation of the success of the adaptive management plan will be based upon the comparison of measured and gathered data to the NDPDES Permit requirements.

3. Design Management Plan**Monitoring Program and Evaluation of Management Options**

In order to determine whether the assumptions about the effects of the outlet on the Sheyenne River are correct, a monitoring program was developed to evaluate the real world effects of outlet operation. The monitoring program will incorporate an initial biological assessment, biological follow-up monitoring, water quality monitoring for numerous variables, monitoring for erosion, and flow gauging. A protocol to document and mitigate erosion problems is included in the adaptive management plan as an appendix.

As specified in the NDPDES permit # ND-0026247, evaluation of the management options will be based upon compliance with permit requirements and maintenance of beneficial uses of the water resources downstream

Data Management and Analysis

A biological assessment to determine baseline conditions for three biological communities on the Sheyenne River (fish, macroinvertebrates, and periphyton) was conducted prior to outlet operation, and is on file at the NDDH and the NDSWC.

Future biological assessments will be conducted as deemed necessary by the NDDH, with the first to be done in the Fall of 2006. Contractors will follow procedures for collection, analysis, storage, and access for data on any biological assessments as specified by the NDDH. Prior to every sampling event on each of the chosen reaches, a review will be conducted of the stream information, and land access agreements for the sampling sites will be completed for each area.

If the discharge is monitored more frequently than the permit requires, all additional results shall be included in the summary on the Discharge Monitoring Report.

Monitoring results shall be summarized and reported on Discharge Monitoring Report forms. If no discharge occurs during a reporting period, "no discharge" shall be reported. Each report shall cover a period of one month. The first period shall be January 1 to January 31, the second period shall be February 1 to February 28, etc. All reports must be postmarked by the last day of the month following the end of each reporting period. Duplicate signed copies of these, and all other reports required herein, shall be submitted to the NDDH.

The NDSWC shall furnish to the NDDH, within a reasonable time, any information which the NDDH may request to determine whether cause exists for modifying, revoking, reissuing, or terminating this permit, or to determine compliance with this permit. The NDSWC shall also furnish to the NDDH, upon request, required copies of records.

All records and information (including calibration and maintenance) required by this permit shall be kept for at least three years or longer, if requested by the NDDH.

Communication of Results and Information to the Public

Except for data determined to be confidential under 40 CFR Part 2, all data will be made available to the public after an internal review/verification process has been completed by the appropriate entities. Access to this data will be available through the NDDH and NDSWC.

Generalized information on outlet operation and data analysis will be made available to the public in a variety of different formats, including:

- 1) Water flow and quality data (USGS website)
- 2) Discharge Monitoring Report (monthly)
- 3) News Releases
- 4) Annual Status Reports
- 5) Public Meetings

4. Outlet Operations

A website containing the water quality and flow data, which will allow interested individuals to calculate maximum flow rates based upon environmental factors will be developed for public information. (Maintained by NDSWC)

Maintaining Compliance

The NDPDES Permit requires that the NDSWC operate the outlet within prescribed limits for flow, pH, and sulfate concentrations. The USGS gauging sites are capable of monitoring for both flow and pH in real time. However, measurement of sulfate requires taking water samples for lab analysis, with a processing time before results can be obtained. As a result, sulfate concentrations will be estimated by measuring EC in real time. A general relationship is known to exist between EC and total dissolved solids (TDS) in water. Because sulfate is a relatively constant proportion of TDS, a relationship between EC and sulfates can be determined. In 2005, water quality data will provide the NDSWC with a good understanding of the EC to sulfate relationship. This relationship will allow the NDSWC to manage the outlet with an operational buffer to stay within permit conditions. As increasing amounts of water quality data are collected, it will be possible to further refine the relationship between EC and sulfate, and safely reduce the operation buffer.

For both chemical and physical parameter permit requirements, the NDSWC will utilize an operational buffer to stay within permit conditions. As any of the chemical and physical parameter buffers are approached, the NDSWC (through consultation between the on-site operator and the main office) will reduce outlet operations, in order to avoid violating the conditions of the permit.

Meteorological conditions and their effects on the flow in the Sheyenne River will be monitored by both the on-site operator, and the main office in Bismarck, drawing upon the assistance of the Atmospheric Resources Board when necessary. If a significant storm event appears likely to affect the Sheyenne River, operations will be reduced or stopped as deemed appropriate.

Complaints

Complaints regarding operation of the state outlet, as it relates to the NDPDES permit, should be referred to the NDDH through the following contact information:

Permitting Authority
Dave Glatt, Chief of the Environmental Health Section
North Dakota Department of Health
1200 Missouri Ave.
P.O. Box 5520
Bismarck, ND 58506-5520
Phone: (701) 328-5150 Fax: (701) 328-5200

To address potential erosion concerns, the NDSWC has developed an Erosion Mitigation Plan (EMP). The EMP, which is an appendix to the Adaptive Management Plan, will detail where people can refer erosion complaints, and how they will be addressed.

Complaints that do not specifically relate to the NDPDES permit or the EMP, should be referred to the NDSWC through the following contact information:

Devils Lake Outlet Project Manager
North Dakota State Water Commission
900 East Boulevard Ave, Department 770
Bismarck, ND 58505-0850
Phone: (701) 328-2752 Fax: (701) 328-3747

5. Monitoring

While it is not a requirement of the permit to do so, at the direction of the NDDH, the NDSWC may use available resources for additional monitoring to further analyze potential water quality impacts on the Red River.

6. Implementation

Implementation of the management plan will begin as soon as the NDDH approves the NDSWC Adaptive Management Plan, and outlet operation commences.

7. Adjustments

While all best efforts have been made in the design, operating plan, and monitoring program related to the Devils Lake outlet, adjustments to aspects of the project may be required.

If the requirements laid out in the permit are met, the NDSWC may attempt to refine process further (see **Maintaining Compliance** in Section 4).

If for some reason the in-stream limitations are not met, the NDSWC will pursue a range of activities. First, the NDSWC shall report any violations of the objectives that may seriously endanger health or the environment as soon as possible, but no later than 24 hours from the time the NDSWC first became aware of the circumstances. The report shall be made as required in the NDPDES permit.

In consultation with NDDH, USGS, contractor(s), or other entities, the NDSWC will modify outlet discharge flow or outlet operation in order to halt the exceedance of permit conditions. Further, the NDSWC in consultation with NDDH, USGS, contractor(s), or other entities, will identify possible causes for permit conditions not being met. Those reasons could be due to factors such as outlet operation, environmental factors, or other unanticipated influences.

Outlet Operations

Based upon data collected to determine a baseline condition, water quality sampling, and constraints of the NDPDES permit, the best rate and periodicity of outlet discharge will be determined and enacted.

The NDDH and the NDSWC will be the designated recipient entities for the coordination and management of information regarding operation of the state outlet.

The NDSWC, under the guidance of the NDDH will be responsible for identification of changes requiring modifications of management objectives or actions, exceedance of the water quality or flow constraints, or a negative change in the beneficial uses of the water resources downstream.

8. Future Outlet Operations

Adaptive management plans are dynamic documents that provide the needed flexibility to work towards some management objective, while at the same time refining that objective and monitoring variables that effect or are affected by the objective.

The goal of this plan is to provide a rational framework under which to operate the Devils Lake outlet.

Because of the dynamic nature of adaptive management plans, this framework can be altered to more accurately reflect the unique needs and problems that may be encountered in the years to come.