

AGENCY OF NATURAL RESOURCES  
DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
WASTEWATER MANAGEMENT DIVISION  
103 SOUTH MAIN STREET  
WATERBURY, VERMONT 05671-0405

FACT SHEET  
May 2005

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)  
PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES

FILE NO.: 12-13  
PROJECT ID NO.: BR98-0339  
PERMIT NO.: 3-1158  
NPDES NO.: VT0100242

NAME AND ADDRESS OF APPLICANT:

Village of Northfield  
51 South Main Street  
Northfield, VT 05663

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Village of Northfield Wastewater Treatment Facility  
242 Dog River Road  
Northfield, Vermont

RECEIVING WATER AND CLASSIFICATION: Dog River: Class B with a waste management zone. Class B waters are suitable for bathing and recreation; irrigation and agricultural uses; good fish habitat; good aesthetic value; acceptable of public water supply with filtration and disinfection. A waste management zone is a specific reach of Class B waters designated by a permit to accept the discharge of properly treated wastes that prior to treatment contained organisms pathogenic to human beings.

I. Proposed Action, Type of Facility, and Discharge Location

The above named applicant has applied to the Vermont Department of Environmental Conservation for renewal of their discharge permit to discharge into the designated receiving water. The facility is engaged in the treatment of domestic and industrial wastewater from the Village of Northfield. The discharge is from the Village of Northfield Wastewater Treatment Facility (WWTF) outfall to the Dog River.

II. Description of Discharge

This permit authorizes the discharge of 1.0 MGD of treated municipal wastewater. The treatment system consists of sequential batch reactors (SBR), chemical precipitation for phosphorus removal, and chlorine addition for disinfection followed by dechlorination prior to discharge.

A quantitative description of the discharge in terms of significant effluent parameters is presented in section IV. below.

III. Limitations and Conditions

The effluent limitations of the permit, the monitoring requirements, and any implementation schedule (if required), may be found on the following pages of the permit:

Effluent Limitations: Page 2  
Monitoring Requirements: Pages 4, 5, and 6

#### IV. Permit Basis and Explanation of Effluent Limitation Derivation

##### **History & Summary**

The Village of Northfield WWTF provides wastewater treatment for residential, industrial, and commercial properties in the Village of Northfield.

During the past permitting period, the Northfield WWTF underwent an extensive refurbishment and upgrade. Specifically, the former treatment process was constructed in the late 1960s and consisted of a grit removal system at the headworks, primary clarifiers, a trickling filter, secondary clarifiers, and chlorination followed by dechlorination prior to discharge. The upgraded treatment process consists of upgraded headworks, two sequential batch reactors (SBRs), a surge tank, and an upgraded chlorination and dechlorination system. Phosphorus removal takes place by chemical addition (alum) to the SBRs. Improved sludge management was also incorporated into the upgraded WWTF, including refurbishment of the existing digester, the addition of a new digester, and a centrifuge for dewatering.

On December 20, 2004 the Village submitted an application for renewal of their discharge permit. Having completed its review of the application, the Department has made a determination to renew the discharge permit for the WWTF's discharge. Following is a discussion of the specific factors considered in the renewal of this permit.

##### ***Effluent Limitations***

###### **Flow**

This permit includes a current flow limitation of 1.0 MGD, annual average, and is based on the design capacity of the facility. This limitation is unchanged from the previous permit. Continuous flow monitoring is required. This facility has an intermittent discharge based on the SBR treatment process.

###### **Biochemical Oxygen Demand (BOD<sub>5</sub>) and Total Suspended Solids (TSS)**

The BOD and TSS mass limitations are 250 lbs/day, monthly average, and 375 lbs/day, weekly average, and are unchanged from the previous permit. The BOD and TSS effluent concentration limits are 30 mg/l, monthly average, and 45 mg/l, weekly average. These limitations are set in accordance with the limitations specified for secondary treatment in 40 CFR Part 133.102.

In addition, the permit contains a 50 mg/l, maximum day, BOD and TSS limitation. This is a limitation which the Agency implements to supplement the federal technology based limitations to prevent a gross one-day permit effluent violation to be offset by multiple weekly and monthly sampling events which would enable a discharger to comply with the weekly average and monthly average permit limitations. These limitations are unchanged from the previous permit.

The sampling frequency for BOD and TSS has been increased from twice per month to once per week to be consistent with other discharges of this size.

###### **Total Phosphorus**

This draft discharge permit contains a phosphorus effluent concentration limit of 0.8 mg/l, monthly average, and a mass effluent limit of 1827 total pounds, annual limitation. The concentration effluent limitation is based on the requirements of 10 V.S.A. 1266a and is unchanged from the previous permit. The mass annual effluent limitation is based on the Lake Champlain Phosphorus TMDL, effective November 4, 2002. The TMDL allocated 0.829 metric tons per year or 1827 pounds per year to the Northfield WWTF and this allocation is being incorporated into the draft permit. This annual pounds limit replaces the 6.78 lbs/day, monthly average, effluent limitation specified in the previous permit.

The annual total pounds is the total of the twelve monthly totals which are calculated by multiplying the total monthly flow x the monthly average phosphorus concentration x 8.34. The annual total must be submitted with the December monthly monitoring report each year.

To be consistent with similarly sized WWTFs, this permit requires weekly monitoring of effluent composite samples for total phosphorus. In the previous permit phosphorus sampling was required twice per month.

#### **Ultimate Oxygen Demand (UOD) and Total Kjeldahl Nitrogen (TKN)**

Receiving waters are the most sensitive to oxygen depleting wastes during periods of high water temperature and low flow. Due to the low flows that can occur in the Dog River during the late summer, this discharge may have the potential to cause a violation of the dissolved oxygen criteria of the Vermont Water Quality Standards (VWQS). Therefore, the permit contains a seasonal "monitor only" requirement for UOD and TKN from June 1<sup>st</sup> through September 30<sup>th</sup> of each year to ensure that compliance with the dissolved oxygen criteria of the Vermont Water Quality Standards (VWQS).

UOD is a measurement of the total oxygen depletion potential of a wastewater and is dependent on the quantity of BOD and TKN in a discharge, as specified in the following equation:  $UOD \text{ (lbs/day)} = [(BOD \text{ (lbs/day)} \times 1.43) + (TKN \text{ (lbs/day)} \times 4.57)]$

TKN sampling and the calculation of the UOD concentration in the discharge has been increased to once per week to be consistent with similarly sized WWTFs.

In addition, Special Condition I.A.2 specifies that if any two individual Ultimate Oxygen Demand results from the monitoring period equal or exceed 1500 pounds per day, maximum day, then the Agency may reopen the permit to incorporate effluent limitations and implementation schedules necessary to ensure compliance with the Vermont Water Quality Standards (VWQS).

#### **Total Copper**

The permit contains a Total Copper effluent limitation of 0.26 lbs/day, monthly average, and 0.36 lbs/day, maximum day. This limitation is based on Appendix C of the VWQS, a hardness of 50, and an instream waste concentration (IWC) of 0.21 (or 21%) of the discharge at 7Q10 river flows. Total Copper sampling is required twice per month and is unchanged from the previous permit.

#### **Total Residual Chlorine**

The Total Residual Chlorine limitation is 0.1 mg/l, instantaneous maximum, and 0.06 mg/l, weekly average. These limitations are based on Appendix C of the VWQS. The instantaneous maximum limitation will ensure that the instream water quality criteria of 0.019 mg/l, (acute) of the VWQS will be met. The weekly average limitation will ensure that the instream water quality criteria of 0.011 mg/l, (chronic) of the VWQS will be met.

These limitations have been modified from the previous permit, which only contained a 0.1 mg/l, instantaneous maximum limitation. Total residual chlorine sampling is required once per day and is unchanged from the previous permit.

#### **Escherichia coli bacteria**

The *E. coli* limitation is 77/100ml, instantaneous maximum and is based on Section 3-04.B.3 of the Vermont Water Quality Standards effective July 2, 2000. This limitation is unchanged from the previous permit. Sampling is required twice per month and is unchanged from the previous permit.

**Settleable Solids**

The Settleable Solids limitation is 1.0 ml/l, instantaneous maximum and is established in support of the narrative standard in Section 3-01.B.5 of the Vermont Water Quality Standards effective July 2, 2000. This limitation is unchanged from the previous permit. Sampling is required once per day and is unchanged from the previous permit.

**pH**

The pH limitation of 6.5 to 8.5 SU, is based on Section 3-01.B.9 of the Vermont Water Quality Standards effective July 2, 2000. This limitation is unchanged from the previous permit. Sampling is required once per day and is unchanged from the previous permit.

**Waste Management Zone**

The previous permit established a waste management zone in the Dog River beginning at the outfall of the Village of Northfield WWTF and extending downstream for 2.2 miles. The draft permit will maintain this waste management zone.

**Whole Effluent Toxicity (WET) Limitation and Testing**

To ensure that this discharge does not cause or contribute to instream toxic impact, the permit contains a Whole Effluent Toxicity effluent limitation of >21% NOEL-C based on two species chronic WET test. This limitation is unchanged from the previous permit.

However, since the WWTF has been upgraded to a SBR treatment process with phosphorus removal, the ability to remove toxicity from the discharge has been significantly increased from the previous wastewater treatment facility. Therefore WET sampling has been reduced from twice per year to once per year.

**Combined Sewer Overflows**

In the early 1990s, Northfield conducted an assessment of their collection system to identify any combined sewer overflows in the system. The assessment identified three overflow locations in the system. In response the Village undertook an extensive sewer separation project which ultimately resulted in the elimination of two overflow locations. The remaining overflow is open and should comply with the Agency's 1990 Combined Sewer Overflow Control Policy. However to date, no evaluation has been completed to confirm whether this overflow is still active.

Therefore Condition I.F. has been added. This condition requires that monitoring of the remaining overflow be conducted through November 30, 2007 and a report submitted to the Agency by December 31, 2007.

V. Procedures for Formulation of Final Determinations

The public comment period for receiving comments on this draft permit is from March 22, 2005 through April 21, 2005. During that time, interested persons may submit their written views on the draft permit. All written comments will be retained by the Department and considered in the formulation of the final determination to issue, deny or modify the draft permit. The period of comment may be extended at the discretion of the Department.

Written comments should be sent to:

Vermont Agency of Natural Resources  
 Department of Environmental Conservation  
 Wastewater Management Division - Sewing Building  
 103 South Main Street  
 Waterbury, VT 05671-0405

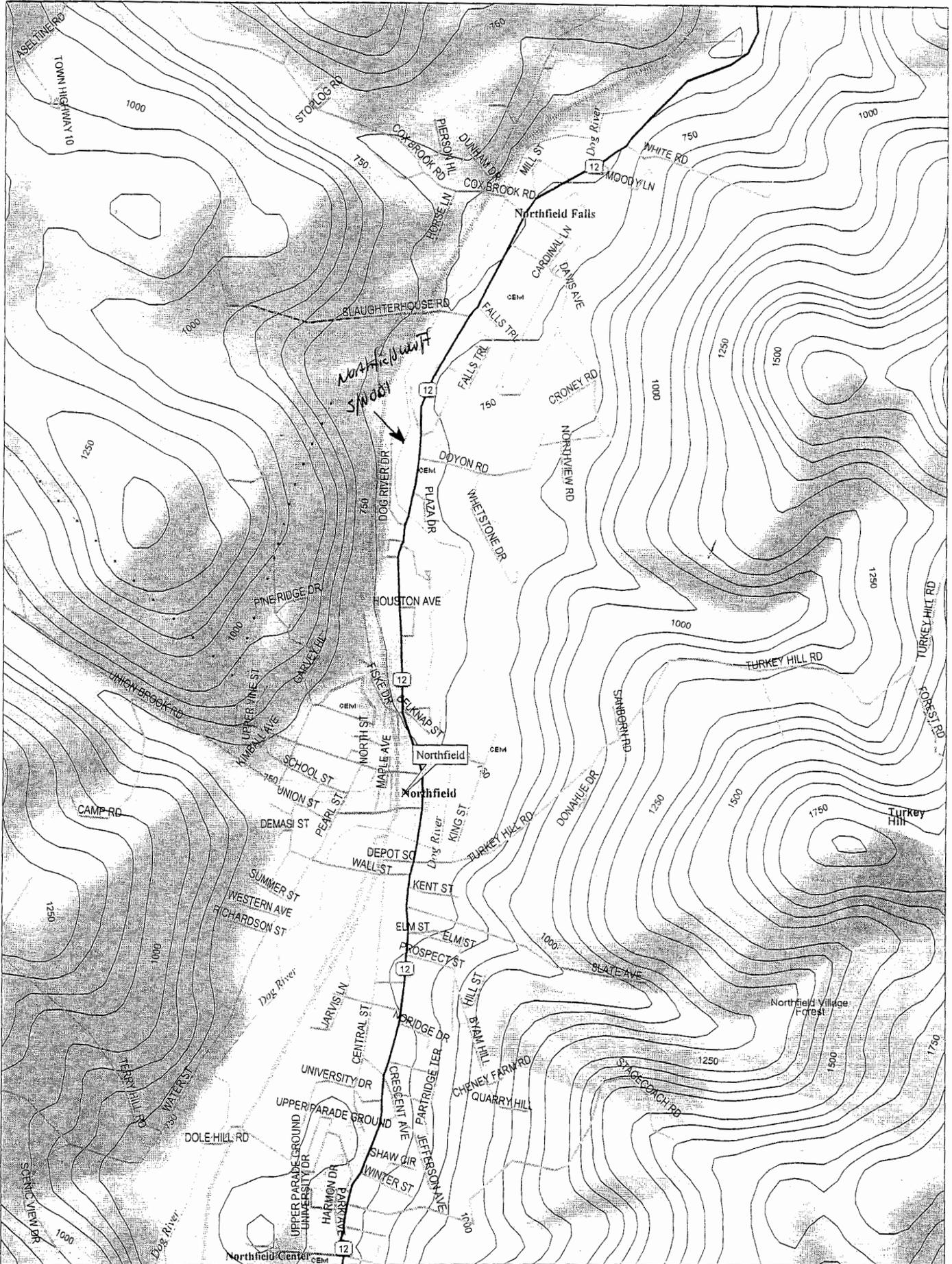
Comments may also be faxed to: 802-241-2596.

Any interested person or groups of persons may request or petition for a public hearing with respect to this draft permit. Any such request or petition for a public hearing shall be filed within the public comment period described above and shall indicate the interest of the party filing such request and the reasons why a hearing is warranted.

The Department will hold a hearing if there is significant public interest in holding such a hearing. Any public hearing brought in response to such a request or petition will be held in the geographical area of the draft discharge or other appropriate area, at the discretion of the Department and may, as appropriate, consider related groups of draft permits. Any person may submit oral or written statements and data concerning the draft permit at the public hearing. The Department may establish reasonable limits on the time allowed for oral statements and may require the submission of statements in writing. All statements, comments, and data presented at the public hearing will be retained by the Department and considered in the formulation of the final determination to issue, deny, or modify the draft permit.

The complete application, draft permit, and other information are on file and may be inspected at the VTDEC, Wastewater Management Division, Waterbury Office. Copies will be made at a cost based on the previous Secretary of State Official Fee Schedule for Copying Public Records from 8:00 am to 4:00 pm, Monday through Friday.

The draft permit and this fact sheet may also be viewed on the Wastewater Management Division's web site at [www.anr.state.vt.us/dec/ww/wwmd.cfm](http://www.anr.state.vt.us/dec/ww/wwmd.cfm)



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