Beneficial Use of Wastewater and Stormwater: Capital Grants for Demonstration Projects

Minnesota Pollution Control Agency

February 2014

Legislative Charge

Minnesota Statutes § 116.195 Beneficial use of Wastewater and Stormwater; Capital Grants for Demonstration Projects; subd. 5. The agency shall report by February 1 of each year to the chairs of the House of Representatives and senate committees with jurisdiction over environment policy and finance and capital investment on the grants made and projects funded under this section. For each demonstration project funded, the report must include information on the scale of water constraints for the area, the volume of treated wastewater supplied or stormwater available, the quality of stormwater or treated wastewater supplied and treatment implications for the industrial user, impacts to stream flow and downstream users, and any considerations related to water appropriation and discharge permits.
HIST: *2008 c 179 s 37; 1Sp2011 c 6 art 2 s 22*

CHAPTER 172 - H.F. No. 1231, Article 2 Clean Water Fund; Sec. 4 Pollution Control Agency (c) $1,500,000 the first year and $3,169,000 the second year are for grants under Minnesota Statutes, section 116.195, to political subdivisions for up to 50 percent of the costs to predesign, design, and implement capital projects that use stormwater or treated municipal wastewater instead of groundwater from drinking water aquifers, in order to demonstrate the beneficial use of wastewater, including the conservation and protection of water resources. Of this amount, $1,000,000 the first year is for grants to ethanol plants that are within one and one-half miles of a city for improvements that reuse greater than 300,000 gallons of wastewater per day.

Author

James R. Anderson

Estimated cost of preparing this report *(as required by Minn. Stat. § 3.197)*

Total staff time: 13 hrs.	$557.00
Production/duplication	$8.00
Total	$565.00

The MPCA is reducing printing and mailing costs by using the Internet to distribute reports and information to wider audience. Visit our website for more information.

MPCA reports are printed on 100% post-consumer recycled content paper manufactured without chlorine or chlorine derivatives.

Minnesota Pollution Control Agency

520 Lafayette Road North | Saint Paul, MN 55155-4194 | www.pca.state.mn.us | 651-296-6300
Toll free 800-657-3864 | TTY 651-282-5332

This report is available in alternative formats upon request, and online at:
http://www.pca.state.mn.us/index.php/about-mpca/legislative-resources/legislative-reports/index.html#2014

Document number: lrwq-wwtp-3sy14

Contents

Executive Summary

The Minnesota Pollution Control Agency (MPCA) has been charged with implementing a pilot grant program for beneficial reuse of wastewater and stormwater. The program provides financial assistance for efforts to reuse treated municipal wastewater or stormwater in industrial processes that would otherwise be using groundwater. Grants are awarded to local units of government which undertake joint projects with industrial and agricultural producers. Established through 2009 legislation[1] the program was subsequently revised by statute to provide for the beneficial use of stormwater in addition to treated wastewater. The program includes two tracks: 1) an ethanol set-aside track, and 2) a general track.

This report provides descriptions of the status of current ethanol set-aside and general track projects followed by a brief consideration of what has proven to be limited interest in and response to the program.

Ethanol set-aside track grants

Ethanol set-aside track grants are for partnerships between municipalities and ethanol producers to replace groundwater with treated wastewater or stormwater in ethanol production. During 2013, the MPCA offered grant awards of 50 percent matching grants in the amount of $500,000 to the cities of Little Falls and Morris. Subsequently, in August of 2013, the MPCA entered into a Beneficial Use Grant contract with the city of Morris. In November 2013, the city of Little Falls notified the MPCA that it would be proceeding without utilizing the grant being offered by the MPCA.

City of Morris
Cooperating Industry: Diversified Energy Company II (DENCO II)
Grant Award: $500,000
Total Project Cost: $1,638,000

The Morris project is a partnership between the city of Morris and Diversified Energy Company II (DENCO II) at an estimated total project cost of $1,638,000. The project will make use of treated wastewater to reduce the use of groundwater in ethanol production. The MPCA is currently reviewing the project facilities plan submitted by the city of Morris and it is anticipated that construction of the project will take place this spring or summer. Once the facility's improvements are operational, the MPCA will be able to assess and report on the overall impacts of the project on wastewater reuse and on groundwater and surface water use and constraints in the area.

Because the city of Little Falls decided not to utilize the MPCA grant, $500,000 of ethanol set-aside grant funds are currently available. The MPCA is in the process of determining whether to proceed with an additional Request for Proposal (RFP) for the award of these funds.

General track grants

Through general track grants municipal wastewater or stormwater can be used for a variety of general industrial and agricultural demonstration projects. These include, for example, cooling water for power generation, cropland and golf course irrigation, and miscellaneous industrial processing water.

During May of 2011, the MPCA awarded Beneficial Use Grants and subsequently entered into grant contracts with the cities of Elk River and Paynesville as described below.

City of Elk River Project
Cooperating Industry: Great River Energy
Grant Award: $285,740
Total Project Cost: $617,080

[1] Minn. Stat. § 116.195, as amended and House File No. 1231, ch. 172, Art 2; Sec. 4 (2009)

Having received a grant, the city of Elk River and the Great River Energy Facility located in Elk River undertook planning for a Beneficial Use project in which wastewater effluent from the city would be used as cooling water at the Great River Energy Facility; replacing surface water use and thereby reducing the thermal impact of the cooling water upon its return to the Mississippi River. As a result of planning efforts, the city of Elk River determined that the project would not be economically feasible. Accordingly the MPCA is taking steps to terminate the grant contract, which means that approximately $270,000 of general track grant funds will become available. The MPCA is in the process of determining whether to proceed with an additional RFP for the award of these funds.

City of Paynesville Project
Cooperating Industry: A consortium of local agricultural producers
Grant Award: $2,494,362
Total Project Cost: $5,900,000

The city of Paynesville is undertaking a joint project with area farmers in which wastewater effluent from the city will replace groundwater in the irrigation of cropland. Wastewater effluent discharged from the treatment facilities will be treated to MPCA secondary standards suitable for the irrigation of agricultural cropland. The annual volume of wastewater to be reused, as identified in the Grant Contract and Work Plan, is 267.30 million gallons, replacing water that would otherwise be acquired from Quarternary Buried Artisan Aquifers (QBAA) and Quarternary Buried Unconfined Aquifers (QBUA).

The MPCA consulted with the Minnesota Department of Natural Resources (DNR) regarding groundwater sensitivity for project applications received through the Beneficial Use program and the effected aquifers in the Paynesville area were assigned to the intermediate category.

The Paynesville treatment facility currently disposes of wastewater effluent through spray irrigation according to a State Disposal System (SDS) permit, so there are effectively no impacts on stream flow and downstream users. The Beneficial Use project is being undertaken in conjunction with a significant expansion of the overall capacity of the treatment facilities to accommodate the increased flows from Associated Milk Producers Incorporated, an expanding dairy facility located in Paynesville. The project provides for beneficial use through a corresponding expansion of spray irrigation structures and appurtenances, ensuring that there continues to be no impacts on stream flow and downstream users. Prior to approval to construct the project, the city's SDS permit for spray irrigation has been revised and finalized according to permit program guidelines and requirements to ensure that standards are met.

Paynesville completed and received MPCA approval of Facilities Planning and Plans & Specifications for the project, spring of 2011. The Paynesville project has been under construction and is substantially completed, with final improvements to the irrigation system awaiting the beginning of the 2014 construction season. Once the facilities improvements are operational the MPCA will be able to assess and report on the overall impacts of the project on wastewater reuse and on groundwater and surface water use and constraints in the area.

State agency partners

In developing and implementing this program, the MPCA continues to work cooperatively with the Minnesota DNR and the Minnesota Public Facilities Authority.

Limited interest in and response to the program

Beginning in 2010, the MPCA has published a total of eight Requests for Proposals (RFP) to solicit the submittal of grants projects. Four of the RFPs have been for ethanol set-aside track projects and four for general track projects. In response, the MPCA has received a total of four proposals; represented by the four projects described above. As indicated only two of these projects are proceeding to completion. In the Agency's experience this is a comparatively low level of interest and participation for a 50 percent grants program. Recognizing that this limited response may be in part characteristic of a new program; are there also

specific environmental and economic conditions that are necessary to facilitate the beneficial use of wastewater?

MPCA staff preliminary investigations of beneficial use of wastewater projects in other states indicates that the implementation of wastewater reuse projects depend on one or a combination of environmental and economic drivers. The drivers are: (1) a lack of availability or the high cost of supply water for municipal or industrial purposes, and (2) very stringent discharge limitations or the outright prohibition of discharges to specific waters. Where suitable supply water in adequate volumes is unavailable or expensive, the additional cost of treating wastewater effluent so it is suitable for reuse becomes feasible. Correspondingly, where discharges face stringent limits or are prohibited it becomes feasible to provide additional, advanced treatment so that wastewater effluent can be used, for example, for agricultural purposes or an auxiliary fire hydrant system.

An additional resource for evaluating the feasibility of beneficial use is the *Minnesota Water Sustainability Framework* (January 15, 2011), developed by the University of Minnesota Water Resources Center (Twin Cities) as a comprehensive long-range water sustainability planning document for the state. The *Framework* recommends beneficial use of wastewater; however it is important to note how the anticipated implementation of beneficial use is sequenced. The *Framework* sequences objectives and actions as Phases 1 – 4, with Phases 1- 3 being initiated during the ten-year plan (2011 – 2021). Phase 4 activities, having primarily to do with water reuse, are to be initiated thereafter (2021-2025):

> Phase 4 recommendations, most related to water re-use, are not urgent. Non-urgency should not be interpreted to mean a recommendation is non-essential. In some cases, the Phase 3 or 4 recommendations cannot be initiated until the recommendations in the earlier phases have been instituted, yet are highly essential to sustainable water resources in Minnesota.[2]

The reasoning of the *Framework* is that instituting the recommendations of the earlier Phases (i.e. primarily water quality protections and limiting surface and groundwater allocations to what is sustainable) according to the integrated water management objectives of the *Framework* will create the conditions in which an "increased demand for water makes water reuse a more cost-effective supply option."[3]

The *Framework's* extended timeframe for widespread implementation of beneficial use would seem to help account for the limited interest and response to the Beneficial Use Program. Correspondingly the *Framework* does not take up what may be an important role of demonstration projects such as those supported by this program in piloting future widespread reuse projects.

[2] *Minnesota Water Sustainability Framework;* Page 9

[3] *Minnesota Water Sustainability Framework*; Page 35