Minnesota Pollution Control Agency

Minnesota River Basin General Phosphorus Permit – Phase I

Phosphorus Trading Overview

wq-b3-18 • UPDATED: April 2007

This factsheet provides an overview of phosphorus trading as it relates to the Minnesota River Basin General NPDES Phosphorus Phase I Permit.

Pollutant Trading

The Minnesota River Basin General NPDES Phosphorus Phase I Permit allows trading between and among wastewater facilities in the basin. The trading option is currently available to the 40 larger facilities in the basin. Trading provides an opportunity to meet the pollutant reduction goals efficiently by coordinating basin-wide phosphorus load reductions. Future new and expanding facilities cannot cause a net increase in phosphorus discharged to the Minnesota River. As such, phosphorus trading may present a viable option. Trades can be transacted between two individual treatment facilities or through trade associations.

Standardized Trading Units
Water quality modeling techniques helped estimate oxygen demand exerted by each wastewater treatment facility discharge in the basin as it relates to a monitoring point in Jordan, Minnesota. The model accounted for algal productivity stimulated by phosphorus discharged from each facility, the travel time and dynamics of the downstream movement and the oxygen demand exerted as the decomposing algae pass the Jordan monitoring point.

The data helped calculate a Jordan Biochemical Oxygen Demand (JBOD) factor. The JBOD takes into account the geographic location of a facility and converts its discharge to Jordan Trading Units (JTU)s. The JTU is the standard unit of trade for facilities subject to the General Phosphorus Permit; much like a dollar or penny is used to for currency. A JTU discharged by one facility in the basin is equivalent to a JTU by any other discharger in the basin.

Existing Facility: JBOD Factors
JBOD factors for existing facilities appear in Appendix B of the General Phosphorus Permit.

New Facility: JBOD Factors
New facilities should refer to Appendix G of the General Phosphorus Permit to determine their JBOD Factor. The JBOD factor is based on the facility's location within the basin.

Trading Ratios
The trading ratios provide a margin of safety by setting aside a percentage of each transaction's pollutant load. The margin of safety accounts for potential effects of assumptions or errors associated with water quality modeling as well as sampling and analytical variability. Existing facilities have a trade ratio of 1.1 to 1 and new facilities have a trade ratio of 1.2 to 1. An existing facility must purchase 10 percent more JTUs than it needs and a new facility must purchase 20 percent more JTUs than it needs. A sample trading calculation appears on the reverse side of this sheet.

MPCA Area Offices:
Rochester area:
507/285-7343
Mankato area:
507/389-5977
Marshall area:
507/537-7146
Willmar area:
320/214-3786
Detroit Lakes area:
218/847-1519
Brainerd area:
218/828-2492
Duluth area:
218/723-4660
Metro area:
651/296-6300
Toll-Free Number:
800/657-3864
Feedlot Service Center:
877/333-3508

Trading Example

A buyer in this category must purchase ten percent more JTUs than it actually needs.
Buyer JBOD x Pounds Phosphorus needed by buyer = JTUs needed to meet phosphorus limit
JTUs needed x 10% trade ratio (or margin of safety) = Total JTUs purchased

For example, if the City of Renville needs to purchase 100 pounds of phosphorus to meet its effluent limit, the city would go through the following steps to determine the actual purchase amount. Renville's JBOD factor is 0.17.

0.17 JBOD x 100 pounds needed = 17 JTUs
Renville would need to purchase 17 JTUs to meet its phosphorus limit plus an additional 10 percent to account for the trade ratio. Therefore, Renville would actually purchase
a total of 18.7 JTUs.

A seller in this example would have to determine the amount of phosphorus it would need available to cover the trade.
Total JTUs needed by buyer ÷ Seller JBOD = Pounds of Phosphorus necessary from seller

If the City of St. Peter were selling to Renville, it would compute the following. St. Peter would need to have 18.7 JTUs available to cover Renville's need. St. Peter's JBOD is 0.91

18.7 JTUs ÷ 0.91 JBOD ≈ 20.5 pounds of phosphorus
St. Peter would need to have about 20.5 pounds of phosphorus available to cover the trade with Renville. In other words, St. Peter's total phosphorus discharge would need to be
20.5 pounds below its limit.

For More Information

Minnesota River Basin General NPDES Phosphorus Phase I Permit contact:
Lisa McCormick, MPCA Municipal Division,
320-231-5343, e-mail: lisa.mccormick@pca.state.mn.us

Lower Minnesota River dissolved oxygen at low flow TMDL project contact:
Larry Gunderson, MPCA Regional Division,
651-297-3825, e-mail: larry.gunderson@pca.state.mn.us

MPCA phosphorus strategy available on the Web at
www.pca.state.mn.us/water/phosphorus.html

TMDL program information on the Web at
www.pca.state.mn.us/water/tmdl/index.html

Additional information about the Minnesota River Basin General NPDES Phosphorus Phase I Permit is available in the following factsheets on the MPCA Web site: www.pca.state.mn.us.

- Minnesota River Basin General NPDES Phosphorus Phase I Permit
- Minnesota River Basin General NPDES Phosphorus Phase I Permit - Phosphorus Trading Overview
- Minnesota River Basin General NPDES Phosphorus Phase I Permit – Continuous Dischargers with Design Capacity to Discharge Over 1,800 Pounds per Year
- Minnesota River Basin General NPDES Phosphorus Phase I Permit – Continuous Dischargers with Design Capacity to Discharge Under 1,800 Pounds per Year
- Minnesota River Basin General NPDES Phosphorus Phase I Permit – Pond Facilities
- Minnesota River Basin General NPDES Phosphorus Phase I Permit – New and Expanding Facilities