



# Pre-Total Maximum Daily Load Phosphorus Trading Permitting Strategy

## Background

Under federal law, the Minnesota Pollution Control Agency (MPCA) cannot issue a permit to a new source or new discharger if the discharge will cause or contribute to a violation of water quality standards (40 C.F.R. § 122.4(i)). Under federal law, if an existing discharge has the reasonable potential to cause or contribute to a violation of water quality standards, then MPCA must include specific controls in the permit for the pollutant of concern (40 C.F.R. § 122.44(d)(1)). In order to demonstrate that a discharge will not cause or contribute or that the discharge does not have the reasonable potential to cause or contribute to a nutrient impairment in a receiving water, a wastewater treatment facility (WWTF) will need to either discharge at or below the water quality based lake/reservoir phosphorus standard (discussed below) or assure that the discharge will not result in additional authorized mass phosphorus loading to the impaired water. Many municipal WWTFs will have difficulty discharging at or below the phosphorus water quality standard. Both the U.S. Environmental Protection Agency (EPA) and the Minnesota Supreme Court have concluded that Pre-Total Maximum Daily Loads (TMDLs) Phosphorus Trading (PTPT) may be an appropriate tool to ensure that discharges to impaired waters do not violate the above-referenced requirements. Without a strategy to deal with this issue, proposed wastewater treatment plant improvements that are needed to protect our environment could be delayed for many years until TMDLs are completed and approved by EPA.

## Purpose

The purpose of PTPT is to develop a consistent framework for developing phosphorus trades in permits for new or expanding WWTFs that discharge upstream of waters impaired for excess nutrients. PTPT is a permitting strategy that will assure a net decrease in the allowable mass of phosphorus that may be legally discharged. If a dissolved oxygen impairment exists downstream of a new or expanding facility, trading may be an option, but not necessarily within the framework offered by PTPT. Discharges to dissolved oxygen impairments will be reviewed separately.

PTPT is temporary. An EPA-approved TMDL will include individual wasteload allocations for any significant National Pollutant Discharge Elimination System (NPDES) permits, which will subsequently be modified or reissued to incorporate the assumptions and requirements of the TMDL. Phosphorus trading may be a viable management tool for achieving the pollutant reduction goals specified in TMDLs that require point source phosphorus reductions. The need for PTPT permit conditions to be eliminated or modified will be addressed through permit modification or reissuance following the completion of the relevant TMDL. PTPT is not intended to be a rule and does not create any rights, substantive, or procedural. The MPCA reserves the right to act at variance with PTPT based on the unique facts of any given permit.

## Federal EPA Trading requirements

The EPA's Water Quality Trading Policy (January 13, 2003) supports Pre-TMDL pollutant trading to achieve progress towards, or attainment of, water quality standards. PTPT is consistent with EPA's trading policy. EPA's policy describes various requirements of the Clean Water Act (CWA) and implementing regulations that are relevant to water quality trading, including: requirements to obtain permits (Sections 402 and 404), antibacksliding provisions (Section 303(d)(4) and Section 402(o)), the development of water quality standards including antidegradation policy (Section 303(c)), federal NPDES permit regulations (40 CFR Parts 122, 123, and 124), TMDLs (Section 303d(1)) and water quality management plans (40 CFR Part 130). These CWA provisions and regulations contain legally binding requirements. EPA's policy and PTPT do not substitute for those provisions or requirements.

When EPA makes a decision with regard to any particular permit that includes provisions for trading to occur, it makes each decision on a case-by-case basis guided by the applicable requirements of the CWA and implementing regulations and the specific facts and circumstances involved. The MPCA will administer PTPT in this same manner. View EPA's Trading Policy at: <http://www.epa.gov/owow/watershed/trading/finalpolicy2003.pdf>.

## Participants

Participants include new and expanding WWTFs and their trading partners whose discharges contain phosphorus and who are located upstream of a phosphorus-related water quality impairment where a TMDL is not yet complete. WWTFs include municipal and industrial point source NPDES permit holders. As an example, PTPT can be used by new or expanding phosphorus dischargers upstream of Lake Pepin (at Mississippi River at river mile 763) because Lake Pepin is listed as impaired for excess nutrients and a TMDL is not yet completed. All WWTFs that discharge to surface waters within the following basins are upstream of Lake Pepin: Upper Mississippi River Basin, Minnesota River Basin, and St. Croix River Basin. In addition, WWTFs that discharge within the following two major watersheds of the Lower Mississippi Basin are upstream of Lake Pepin: Mississippi River Watershed (Red Wing and Lake Pepin) and the Cannon River Watershed. PTPT guidelines described here do not apply to non-point source trades. MPCA staff will consider proposals for trades between non-point sources (agricultural operations, stormwater discharges and other non-point sources) and point sources on a case-by-case basis.

For the purposes of PTPT, the EPA's definition of a "new discharger" is used. A "new discharger" is defined as any building, structure, facility, or installation from which there is or may be a discharge of pollutants, specifically phosphorus, and which has never received a NPDES permit. For existing straight pipe communities, pre-NPDES conditions will be considered when establishing baseline conditions.

For the purposes of PTPT, an expanding WWTF is an NPDES discharger that wishes to increase its phosphorus discharge on or after the date the affected nutrient impaired water body is listed on an EPA approved 303 (d) list of impaired waters. For example, Lake Pepin was listed as impaired for excess nutrients in the 2002 Final TMDL List of Impaired Waters approved by the EPA on January 22, 2003. Therefore, any WWTF that exists today upstream of Lake Pepin and wishes to expand would be required to meet the Board-approved Phosphorus Strategy (which will be substituted with Minn. R. 7053 once approved by EPA) and prove no net increase in phosphorus over the current permitted load to Lake Pepin. One way to accomplish this is participation in PTPT. However, PTPT is not the only permitting option for existing dischargers that wish to expand. An existing WWTF can accept a phosphorus mass cap which ensures that the expansion does not result in any additional allowable phosphorus loading to surface waters upstream of an impairment. Such a facility would be able to receive an NPDES permit without participating in PTPT. Many expanding WWTFs will be able to provide phosphorus treatment to assure no net increase in the allowable mass of phosphorus discharged. PTPT offers another option for demonstrating no net increase in allowable phosphorus mass discharged upstream of an impaired water.

PTPT is voluntary. WWTFs interested in receiving NPDES permit prior to completion of the applicable TMDL may choose to participate in PTPT. Alternatively, new WWTFs have the option of waiting for completion of the applicable TMDL before getting their NPDES permits. Expanding WWTFs may be able to delay their expansion until completion of a TMDL. Once a TMDL is complete, it would provide the basis for assigning effluent limits for any such WWTFs. In some situations, new or expanding WWTFs may also have the option of sub-surface discharges, spray irrigation, or connecting to a neighboring facility.

## Water Quality Standards for Lakes and Reservoirs

Upon EPA approval of the December 18, 2007 Board-approved Amendments to Minn. R. 7050.0222, new and expanding WWTFs with effluent pollutant concentrations less than the respective eutrophication standards for lakes and reservoirs (water quality standards) listed below will not need to participate in PTPT.

Ecoregion and Lake Type Units	Total Phosphorus µg/L (ppb)	Total Phosphorus mg/L
<b>Northern Lakes and Forests</b>		
- Lake trout lakes	12	<b>0.012</b>
- Stream trout lakes	20	<b>0.02</b>
- Deep and shallow lakes	30	<b>0.03</b>
<b>North Central Hardwood Forest</b>		
- Stream trout lakes	20	<b>0.02</b>
- Deep lakes	40	<b>0.04</b>
- Shallow lakes	60	<b>0.06</b>
<b>Western Corn Belt Plains and Northern Glaciated Plains</b>		
- Deep lakes	65	<b>0.065</b>
- Shallow lakes	90	<b>0.09</b>

ug/L = Micrograms per Liter

mg/L = milligrams per liter

ppb = parts per billion

Facilities that have the potential for their effluent phosphorus concentration to be below the phosphorus lakes and reservoir standards include:

- Noncontact cooling water with no chemical additives; or
- Facilities where source water is primarily ground water (i.e., ground-water pumpouts and mine dewatering).

New and expanding industrial WWTFs not listed above will be required to submit a Total Composition Report. This report shall list all chemical additives that are present in the wastewater, including non-hazardous or inert ingredients and phosphorus content. This report will be used to calculate the concentration of phosphorus in the discharge. The MPCA will use Maximum Daily Design Flow in calculating the projected phosphorus loading. If the facility is unable to reduce the concentration below the water quality standard, the facility will be required to address no net increase in phosphorus.

New and expanding WWTFs that do not fit the aforementioned criteria will be allowed to participate in PTPT and trade phosphorus loading to assure no net increase in the allowable mass of phosphorus discharged upstream of the nutrient impaired water. This includes WWTFs that have been determined to be *de minimus* (discharge less than 1800 pounds per year) and therefore not subject to a concentration limit of 1.0 mg/L per Minn. R. 7053.

## Phosphorus Trading

Trading is the temporary transfer of a portion of one WWTF's (seller's) NPDES permitted phosphorus *mass limit* to another WWTF's (buyer's) NPDES permit. Because the TMDL is not complete, it is not possible to identify any geographical discounts which would reflect how much of the phosphorus discharged would actually affect the nutrient impaired water nor is it possible for potential discounts that would occur because of the proximity of the buyer to the seller. Therefore, PTPT will take a conservative approach and require a pound of phosphorus discharged by the buyer to be offset by a pound of phosphorus removed from the seller. In addition, a trade ratio will be added to the transaction to assure a net aggregate reduction.

The first step in the trading process is for the interested parties to submit to the MPCA a completed PTPT *Application to Trade* form (wq-ntp2-01.doc, found at [www.pca.state.mn.us/water/tmdl/ptpt.html](http://www.pca.state.mn.us/water/tmdl/ptpt.html)). The *Application to Trade* form specifies the mass of phosphorus that is being traded and the effective period of the trade.

The following definitions refer to trading calculations:

“Buyer’s Baseline” is the phosphorus mass limit at the facility wishing to build a new facility or expanding an existing one. In the case of a new facility, the baseline for trading will be zero to insure no net increase. For an expanding facility, the Baseline is the phosphorus mass discharged prior to the expansion based on the facility’s permitted Average Wet Weather Design Flow and phosphorus concentration limit for municipal dischargers. The Baseline for Industrial dischargers is based on the Maximum Daily Design Flow and the facility’s phosphorus concentration limit.

“Seller’s Baseline” is the current phosphorus mass limit in the seller’s permit prior to the trade. The Baseline for municipal dischargers is calculated from the facility’s permitted Average Wet Weather Design Flow and the facility’s phosphorus concentration limit. For industrial dischargers, the Baseline is based on the Maximum Daily Design Flow and the facility’s phosphorus concentration limit.

“Trade Ratio” is a factor that requires buyers in a phosphorus trade to purchase a specified mass of phosphorus that has been adjusted to provide a margin of safety and contribute toward water quality improvement. Buyers cannot use this purchased phosphorus mass to increase their own permit limit.

## Trade Ratios

Each trade is subject to a trade ratio which is intended to account for uncertainty and provide a water quality benefit. The trade ratio specifies an additional percentage of the load which the buyer is required to purchase but which may not be used to increase the buyers permit limit. Expanding dischargers are subject to a minimum trade ratio of 1.1 to 1 (10 percent of the traded load). New dischargers are subject to a minimum trade ratio of 1.2 to 1 (20 percent of the traded load). If the proposed trade crosses a major watershed boundary and the buyer is closer to the impairment than the seller, the buyer is subject to a trade ratio of 1.4 to 1 (40 percent of the traded load).

## NPDES Permit Notification

The phosphorus trade is implemented through each WWTF’s individual NPDES permit. The buyer’s phosphorus mass limit will be adjusted upwards and the seller’s phosphorus mass limit will be adjusted downwards in proportion to the extent of the trade. The NPDES permit issued to the buyer, or new or expanding WWTF, will be subject to public notification. This notification includes the public notice document, which will include the trading partners, impairment of concern, and explain the baseline and trade calculations. A minor modification of the seller’s permit will be completed to reflect the change. The permit for both facilities will contain monitoring to assure accountability. The trade is not effective until it is reflected in the WWTF’s NPDES permit. Adjusted mass limits apply to both the buyer’s and seller’s discharge, in addition to any other phosphorus limits that may be applicable to the WWTF, for example, a concentration limit. Once the period of the trade ends, each WWTF’s phosphorus permit limit reverts to its original value. Once the applicable TMDL implementation plan is complete, each WWTF will be required to comply with the TMDL waste load allocation. Post-TMDL pollutant trading may still be a viable option for a facility to meet its regulatory obligations, but will occur within the TMDL framework.

Only WWTFs with effluent phosphorus limits are eligible to participate in Pre-TMDL Phosphorus Trading as sellers. WWTFs willing to accept a phosphorus limit in an existing permit can choose to be sellers.

## Geographic Restrictions and Associated Trade Ratios

**Both parties’ effluent discharge must be upstream of the applicable impaired water body.** The MPCA will not approve trades where a nutrient impaired water is located between an upstream buyer and a downstream seller. The following options give permittees direction in determining trading partners.

- Option 1:** Buyer and seller are both in the same major watershed
- Option 2:** Buyer and seller are in different major watersheds, but in the same basin and the seller is closer, in river miles, to the impaired water than the buyer  
Both of the above options would result in a trade ratio of 1.2 to 1 for new facilities and 1.1 to 1 for expanding facilities.
- Option 3:** Trading is between different major watersheds in the same basin and the buyer is closer, in river miles, to the impaired water than the seller. Option 3 would result in a trade ratio of 1.4 to 1.

If trading partners believe they have a viable option that is protective of downstream waters but differs from those listed above, the MPCA will review proposals on a case-by-case basis. The MPCA will also consider trades that involve pollutant load reductions made by non-point sources (agricultural operations, stormwater discharges, and other non-point sources), but these situations are not addressed by this PTPT proposal and would require additional review.

## Mass Discharge Limits

PTPT phosphorus mass discharge limits are calculated as follows:

**Limit Calculation For Buyers:** In PTPT, a buyer is required to obtain a phosphorus mass discharge that is equal to its anticipated phosphorus mass loading (new facility’s “baseline”) or current phosphorus mass loading plus a phosphorus increase based on an expansion (existing facility’s “baseline”) in addition to an adjustment based on the applicable trade ratio. The limit assigned in the permit is based on the amount needed by the buyer, but does not include the trade ratio adjustment. The phosphorus removed by applying the trade ratio is an overall reduction in the phosphorus mass cap to the impaired waterbody.

As an example trade, if a new buyer (with an initial permitted limit of zero phosphorus mass) wishes to receive a PTPT phosphorus mass limit of 100 Kilograms per year (kg/year), it must purchase 120 kg/year from the seller. In this trade, 100 kg/year of phosphorus transfers to the buyer’s limit and 20 kg/year of phosphorus cannot be used by either party.

**Limit Calculation For Sellers:** The seller’s PTPT phosphorus mass discharge limit is equal to its current NPDES-permitted mass limit (“Baseline”), minus the mass of phosphorus that it has sold through trading. Again, the trade ratio adjustment is not included in the limit, but is an overall reduction in the phosphorus mass cap to the impaired waterbody.

### As an example:

New WWTF Phosphorus discharge limit (kg/year)	New WWTF wishes to discharge (kg/year):	Trade Ratio	New WWTF must purchase (kg/year)	New WWTF NPDES permitted limit based on trade (kg/year)	Downward Adjustment to Seller's NPDES Phosphorus Limit (kg/year)
0	100	1.2	120	100	120

### Another example:

Existing WWTF permitted limit (kg/year)	Expansion of WWTF discharge requires additional loading of (kg/year):	Buyer Trade Ratio	Existing WWTF must purchase (kg/year)	Modified NPDES permitted limit based on trade (kg/year)	Downward Adjustment to Seller's NPDES Phosphorus Limit (kg/year)
1000	100	1.1	110	1100	110

## Trade Agreements

The term of the trade is determined by each trade agreement. A trade can last as long as the trading partners agree to trade. The MPCA anticipates trades of at least five years to match the NPDES permit cycle. A trade is not effective until its terms are implemented through the WWTF’s respective NPDES permits. The trade will remain in effect for the life of the permit unless the permit is modified to reflect the waste load allocation consistent with an EPA approved TMDL. After the TMDL for the affected impaired water body is approved by EPA, the MPCA will modify NPDES permits to replace PTPT provisions with requirements consistent with the waste load allocations of the applicable final TMDL.

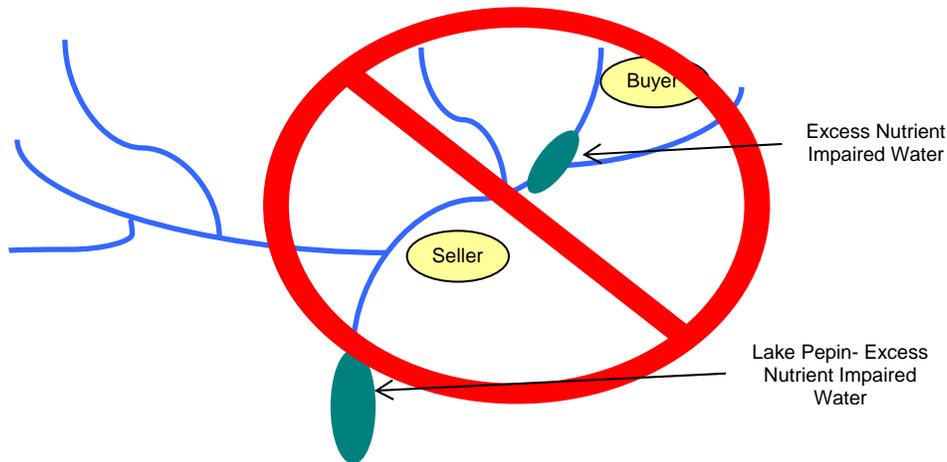
WWTFs can sell as much as they want as long as they remain in compliance with the modified permit limit. Because the modified permit limits will be enforceable, buyers and sellers should be conservative in determining how much phosphorus they need and can sell in order to comply with their respective permit limits. The MPCA will take appropriate enforcement action against any violation of any permit provision.

## Restrictions

Trading cannot be used to meet technology-based effluent limitations. Also, trades will not be allowed if the trade itself would cause or contribute to a water quality impairment and trades must not adversely affect water quality at an intake for drinking water supply. In accordance with the Minnesota Supreme Court’s decision in the Annandale/Maple Lake matter, the MPCA will utilize PTPT in a manner that ensures that point source discharges do not cause or contribute to violations of water quality standards.

## Impaired Water Bodies

PTPT is not intended to address multiple impaired water bodies. PTPT is therefore limited to buyers and sellers upstream of the closest nutrient impaired water body. For example, if a facility discharges phosphorus upstream of Lake Pepin but also contributes to the impairment of a closer nutrient impaired lake, PTPT will not authorize the purchase of phosphorus credits from a WWTF located downstream of the closest impairment. Assuming localized impacts can be avoided, the WWTF would however be authorized to purchase phosphorus credits from another WWTF located upstream of the closest downstream nutrient impaired water.



## General NPDES Permits

General NPDES permits cannot accommodate the facility-specific requirements necessary to implement PTPT. This includes process specific general permits, such as industrial byproducts or ponds, not basin-wide general permits, such as the Minnesota River Basin General Phosphorus Permit. If a WWTF currently has a General NPDES permit and wishes to sell phosphorus credits, the facility must apply for an individual NPDES permit.

## Existing TMDLs

Discharges whose permit requirements satisfy phosphorus waste load allocations contained in an EPA approved TMDL must comply with their permit requirements.

## Pollutants

PTPT is limited to phosphorus trades.