

# Appendix O: Trading and Adaptive Management Information

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The purpose of this appendix is to provide additional information to support water quality trading (WQT) and adaptive management (AM). In many cases, the Wisconsin River TMDL expands the geographic extent available for generating WQT credits from just the facility's subbasin to the drainage area of one of the reservoirs. In addition, instead of the downstream reservoirs being the point of standard compliance for AM plan which would eliminate the viability of AM, facilities can evaluate AM at a subbasin scale since subbasin allocations are set to meet the water quality standards of the downstream reservoirs. Throughout this appendix, the use of the word facility refers to individually permitted, wastewater dischargers.

## Water Quality Trading, Adaptive Management and TMDL's

WQT may be used by Wisconsin Pollutant Discharge Elimination System permit holders to demonstrate compliance with water quality-based effluent limitations derived both through Ch. NR 217, Wis. Adm. Code, and those derived from TMDL wasteload allocations. AM is another compliance option that allows point and nonpoint sources (e.g., agricultural producers, storm water utilities, developers) to work together to improve water quality in those waters not meeting phosphorus standards.

Both WQT and AM are designed to be used when it is economically preferable to control nonpoint sources or other point sources of phosphorus compared with upgrading a facility to achieve overall phosphorus reduction. However, there are some key differences in how the two compliance options are implemented.

- AM and WQT have different end goals: AM focuses on achieving water quality criterion for phosphorus in the surface water; WQT focuses on offsetting phosphorus from a discharge to comply with a permit limit.
- Monitoring: Because AM focuses on water quality improvements, in-stream monitoring is required under AM; this is not required under trading.
- Timing: Practices used to generate reductions in WQT must be established before the phosphorus limit takes affect; AM is a watershed project that can be implemented throughout the permit term.
- Quantifying reductions needed: WQT requires trade ratios be used to quantify reductions used to offset a permit limit; the reductions needed for AM are based on the receiving water, not the effluent, and trade ratios are not necessary in this calculation.
- Eligibility: AM and WQT have different eligibility requirements.

More details regarding WQT, AM, and variances including the multi-discharger variance (MDV) can be found at: <https://dnr.wisconsin.gov/topic/Wastewater/Phosphorus>

## Water Quality Trading

### Geographic Extent of Trades

In the Wisconsin River Basin, the geographic extent for WQT varies based on the point of standards application used to develop the wasteload allocation. TMDLs assign wasteload allocations to point sources and load allocations to nonpoint sources so that the impaired water or a downstream impaired reservoir will meet water quality standards. These allocations are assigned to pollutant sources that contribute to the subbasin. Wasteload allocations and water quality based effluent limits are both intended to meet water quality standards at the point of standards application. For a TMDL, the point of standards application is generally the bottom of the subbasin; however, in the Wisconsin River Basin TMDL, the point of standards application for a facility may be the bottom of their subbasin, if their allocations are driven by local water quality, a downstream reservoir if more stringent allocations were required to meet water quality standards for the reservoirs, or a combination of both. In many cases it is a combination of both.

For the portion of a facility's allocation that is driven by local water quality, WQT can occur with other sources within or upstream of the facility's subbasin. For a facility which intends to trade phosphorus credits to offset their discharge, any credits generated to meet the local reduction must be generated upstream of or within the facility's subbasin in order not to be subject to a downstream trading factor<sup>1</sup>. Downstream trading can occur with the use of a downstream trading factor that compares the ratio of the facility's wasteload allocation to the total allocation for the applicable subbasin. When meeting the local wasteload allocation, downstream trades should be limited to trading partners located in the same 12-digit hydrological unit (HUC-12) subwatershed.

If WQT is used to meet the portion of the wasteload allocation assigned due to a downstream reservoir, the credits can be generated anywhere within the drainage area of the reservoir identified for the facility or subbasin; however, there is a maximum number of downstream credits that can be generated to ensure local water quality is maintained. Please refer to Table O more information on the maximum number of downstream credits and the applicable downstream reservoir for each facility and subbasin. Credits used to meet downstream reductions can be generated anywhere upstream of the identified reservoir and are not subject to the downstream trading factor. If a facility does not have a downstream reservoir identified, the allocations are driven only by local water quality and any downstream trades should occur between entities within the same subbasin or HUC-12, with a downstream trading factor, as described in the paragraph above.

For example, a facility discharges 1,000 lbs./yr. of phosphorus and their wasteload allocation to meet local water quality in their subbasin is 800 lbs./yr.; however, their wasteload allocation based on meeting water quality standards for a downstream reservoir is 500 lbs./yr. If the facility chooses trading

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<sup>1</sup> Additional factors may be applied in determining the final trade ratio.

as a compliance option, they will need to find 500 lbs./yr. in credits (1,000 minus 500) to meet their overall wasteload allocation. To ensure that the facility meets their local wasteload allocation, 200 lbs./yr. of credits needs to be generated in or upstream of their subbasin or downstream within their HUC-12 with the appropriate downstream trading factor (1,000 minus 800). The remaining 300 lbs./yr. (500 minus 200) in credits can be generated anywhere within the contributory drainage basin of the downstream reservoir without requiring a downstream trading factor. Trades cannot occur downstream of the reservoir identified in Table O.

**Delivery Factor:**

The delivery factor accounts for the distance between trading partners and the impact that this distance has on the fate and transport of the traded pollutant in surface waters. In most cases, a delivery factor will not be necessary when the credit generator and credit user are in the same HUC-12 because of the negligible impacts of fate and transport at this scale. A delivery factor within a HUC-12 subwatershed may be necessary, however, to account for lakes or impoundments between the credit user and credit generator. The delivery factor accounts for the trapping of phosphorus and sediment in the reservoir, lake, or impoundment. In the Wisconsin River Basin TMDL, delivery factors come into play along the mainstem reservoirs and in the Big Eau Pleine Reservoir. Delivery fractions were calculated based on the reservoir modeling that was conducted as part of the TMDL. The delivery fractions and resultant delivery factors from the TMDL are as follows:

Reservoir	Delivery Fraction	Delivery Factor
Big Eau Pleine Reservoir	0.576	0.736
Lake Wausau	0.945	0.058
Lake DuBay	0.880	0.136
Petenwell Lake	0.815	0.227
Castle Rock Lake	0.913	0.095

If a credit generator and credit user are separated by one of the reservoirs listed above, the delivery factor needs to be utilized. Apart from these reservoirs, additional delivery factors do not need to be applied in the Wisconsin River Basin because the allocations in the TMDL implicitly account for the fate and transport mechanisms through the modeling and bias correction that was performed as part of the TMDL analysis.

Additional information regarding WQT with agricultural nonpoint sources can be found in Appendix N and on the department’s water quality trading page at: [Wisconsin's Water Quality Trading | Wisconsin DNR](#)

## Adaptive Management

### Point of Standards Application

Like TMDL implementation, AM focuses on meeting water quality criteria as the ultimate measure of success. TMDLs define the allowable loading that each segment can receive and still meet water quality standards thus informing AM plans on sources and needed reductions.

In the case of the Wisconsin River Basin TMDL, the TMDL allocations have been set to meet water quality standards for downstream reservoirs. As with trading, the point of standards application is the bottom of the subbasin that generated the credit user's wasteload allocation; however, because the TMDL allocations are also set to meet water quality standards for downstream reservoirs a successful AM plan could demonstrate compliance with the resulting stream concentration for that subbasin. This stream concentration, summarized in Table O and labeled as "Adaptive Management Target", is the stream concentration that results from the implementation of reductions and meeting the overall assimilative capacity for the subbasin and contributory subbasins. During the TMDL development process, these allocations were converted to instream concentrations and directly linked to the May - October growing season median concentration needed in each TMDL subbasin to protect downstream reservoirs. This allows the AM compliance point to be applied at the bottom of the subbasin that the facility is in, rather than having to demonstrate that the water quality goals are met in the downstream reservoir.

For an AM plan that has a downstream reservoir, the concentration target for the facility's subbasin that meets both local and downstream reservoir water quality criteria is listed as the "Adaptive Management Target" in Table O. In some cases, the "Adaptive Management Target" may be very low, reflecting the lack of nonpoint sources and other controllable sources of phosphorus in the subbasin or that the existing concentration is already below the criteria. In these cases, facilities may not be eligible for AM and should evaluate other compliance strategies or variances.

Additional information regarding adaptive management can be found on the department's adaptive management page: <https://dnr.wi.gov/topic/SurfaceWater/adaptivemanagement.html>

### Site-Specific Criteria (SSC)

Initially, allocations for the Wisconsin River Basin TMDL were calculated using two different phosphorus criteria. The first set of criteria were based on the then current phosphorus criteria outlined in NR 102.06, Wis. Adm. Code. The second set of allocations used recommended SCC for Lakes Wisconsin, Castle Rock, and Petenwell to determine allocations. On July 9, 2020, U.S. EPA approved the recommended SSC. Tables O-1 and O-2, previously contained in this document, have been consolidated into one new table, Table O, to reflect U.S. EPA's approval of the SSC.

Table O has also been updated to correctly identify the applicable downstream reservoir. In multiple cases, Lake Wisconsin had been identified in the previous Table O-2. While Lake Wisconsin does drive overall upstream reductions, Petenwell still has applicable reductions that must occur upstream of its

drainage basin to ensure attainment of its water quality criteria. This has now been correctly accounted for in Table O. In addition, Table O has been corrected and updated to reflect facilities that have either gone out of business or changed names since the TMDL was approved in April of 2019. Note, the permit numbers have remained the same. The permit number can be used to cross reference with other tables contained in the TMDL report.

Summary of Name Changes since 2019:

BROKAW has been renamed to MAINE WASTEWATER TREATMENT FACILITY  
CROCKETTS RESORT has been renamed to HO CHUNK RV RESORT AND CAMPGROUND  
EXPERA SPECIALTY SOLUTIONS, LLC-MOSINEE has been renamed to AHLSTROM MOSINEE, LLC  
EXPERA SPECIALTY SOLUTIONS, LLC-RHINELANDER has been renamed to AHLSTROM NA SPECIALTY SOLUTIONS, LLC  
GOETZ COMPANIES INC (PORTAGE PETRO TRAVEL P) has been renamed to TA OPERATING LLC  
NEENAH PAPER INC WHITING MILL has been renamed to NEENAH INC WHITING  
NEWPAGE CORPORATION - WATER QUALITY CENTER has been renamed to BILLERUD WISCONSIN LLC  
VERSO MINNESOTA WISCONSIN LLC - WATER RENEWAL CENTER has been renamed to PIXELLE  
ANDROSCOGGIN LLC

Summary of Facilities that have closed since 2019:

EXCEPTIONAL LIVING CENTERS – BETHEL

Outfall and Permit Corrections:

PACKAGING CORPORATION OF AMERICA was listed twice in Table O-2. One of the listings was the just the process wastewater and the other listing, which remains on Table O, correctly represents the combination of the process wastewater and the noncontact colling water discharge.

UNITED WISCONSIN GRAIN PRODUCERS LLC was switched from an individual permit to a general permit and has been removed from Table O.

**Table O. Allocations and Reach Phosphorus Targets by Permitted Point Source Based on Proposed Site-Specific Phosphorus Criteria.**

Facility Name	Permit Number	TMDL Reach	TP Wasteload Allocation SSC (lbs./year)	Local Wasteload Allocation SSC (lbs./year)	Max Downstream Credits (lbs./year)	Downstream Reservoir	Adaptive Management Target (mg/L)
ABBOTSFORD WASTEWATER TREATMENT FACILITY	0023141	323	160	162	2	Big Eau Pleine	0.074
ABBYLAND FOODS INC ABBOTSFORD PLANT	0057436	323	198	201	3	Big Eau Pleine	0.074
ADAMS WASTEWATER TREATMENT FACILITY	0023159	202	486	1,328	842	Lake Wisconsin	0.021
ANTIGO CITY OF	0022144	216	1,874	4,121	2,247	Petenwell	0.036
ARPIN WASTEWATER TREATMENT FACILITY	0031267	314	42	42	0	-	0.075
ATHENS WASTEWATER TREATMENT FACILITY	0022365	215	209	304	95	Petenwell	0.045
AUBURNDALE WASTEWATER TREATMENT FACILITY	0022411	211	112	112	0	-	0.075
BARABOO WASTEWATER TREATMENT FACILITY	0020605	179	2,487	6,793	4,306	Lake Wisconsin	0.073
BLENKER SHERRY SANITARY DISTRICT WWTF	0031950	207	31	85	54	Petenwell	0.059
MAINE WASTEWATER TREATMENT FACILITY	0022136	217	40	110	70	Petenwell	0.044
CAMBRIA WASTEWATER TREATMENT FACILITY	0023523	176	141	164	23	Lake Wisconsin	0.065
CAZENOVIA WASTEWATER TREATMENT FACILITY	0031801	14	36	36	0	-	0.075
CHILI WASTEWATER TREATMENT FACILITY	0030961	71	46	46	0	-	0.075
COLBY CITY WWTF	0023655	95	168	168	0	-	0.075
HO CHUNK RV RESORT AND CAMPGROUND	0061263	193	9	26	17	Lake Wisconsin	0.039
DOMTAR - NEKOOSA	0003620	204	18,088	49,461	31,373	Petenwell	0.054
DOMTAR PAPER CO LLC	0026042	154	9,218	25,179	15,961	Petenwell	0.050
EAGLE RIVER CITY OF	0022004	224	577	1,575	998	Petenwell	0.027
EDGAR WASTEWATER TREATMENT FACILITY	0021784	105	490	490	0	-	0.075
ELROY WASTEWATER TREATMENT FACILITY	0023931	274	344	344	0	-	0.071
ERCO WORLDWIDE (USA) INC - PORT EDWARDS	0003565	204	1,998	4,195	2,197	Petenwell	0.054
AHLSTROM MOSINEE LLC	0003671	262	12,043	32,892	20,849	Petenwell	0.053
AHLSTROM NA SPECIALTY SOLUTIONS, LLC	0003026	221	7,681	20,978	13,297	Petenwell	0.030
FENWOOD WASTEWATER TREATMENT FACILITY	0031411	90	7	14	7	Big Eau Pleine	0.045
FOREMOST FARMS USA COOP PLOVER	0003859	208	576	1,491	915	Petenwell	0.047
FOREMOST FARMS USA REEDSBURG	0000035	184	45	45	0	Lake Wisconsin	0.074
TA OPERATING LLC	0035998	4	46	125	79	Lake Wisconsin	0.067
GRANDE CHEESE COMPANY, CUSTOM INGREDIENT DIV.	0050547	202	10	25	15	Lake Wisconsin	0.021
GRANDE CHEESE CORP WYOCENA	0051764	173	26	62	36	Lake Wisconsin	0.042
HEWITT SANITARY DISTRICT WWTP	0031275	331	83	83	0	-	0.075

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HILL POINT SANITARY DISTRICT WWTF	0035483	182	11	11	0	-	0.075
HILLSBORO WASTEWATER TREATMENT FACILITY	0020583	188	128	128	0	-	0.075
HUSTLER WASTEWATER TREATMENT FACILITY	0032085	196	10	10	0	-	0.075
JUNCTION CITY WASTEWATER TREATMENT FACILITY	0028070	146	122	332	210	Petenwell	0.044
KENDALL WASTEWATER TREATMENT FACILITY	0020516	189	53	53	0	-	0.075
KERRY BIOFUNCTIONAL INGREDIENTS INC	0003875	263	648	1,770	1,122	Petenwell	0.051
LA VALLE WASTEWATER TREATMENT FACILITY	0028878	186	64	174	110	Lake Wisconsin	0.073
LAKE TOMAHAWK TOWNSHIP SANITARY DISTRICT 1	0036374	167	60	165	105	Petenwell	0.024
LAKELAND SANITARY DISTRICT	0022837	300	837	2,285	1,448	Petenwell	0.026
LAKESIDE FOODS INC. - REEDSBURG	0057738	185	181	494	313	Lake Wisconsin	0.070
LIGNOTECH USA, INC.	0003450	154	185	307	122	Petenwell	0.050
LIME RIDGE WASTEWATER TREATMENT FACILITY	0036447	183	8	8	0	-	0.075
LODI CANNING CO	0002658	171	2	2	0	Lake Wisconsin	0.026
LODI WASTEWATER TREATMENT FACILITY	0022918	170	605	1,427	822	Lake Wisconsin	0.034
LOGANVILLE WASTEWATER TREATMENT FACILITY	0029114	181	101	101	0	-	0.075
LYNDON STATION WASTEWATER TREATMENT FACILITY	0060488	192	70	170	100	Lake Wisconsin	0.040
MARATHON WATER & SEWER DPT WW TREATMNT PLANT	0020273	214	393	1,072	679	Petenwell	0.039
MARSHFIELD WASTEWATER TREATMENT FACILITY	0021024	331	3,356	3,356	0	-	0.075
MAUSTON WASTEWATER TREATMENT FACILITY	0024635	194	1,673	4,570	2,897	Lake Wisconsin	0.053
MCCAIN FOODS USA, INC., PLOVER	0054518	145	1,939	5,295	3,356	Petenwell	0.047
MERRILL CITY OF	0020150	321	3,413	9,322	5,909	Petenwell	0.043
MILAN S D WASTEWATER TREATMENT FACILITY	0031500	94	148	207	59	Big Eau Pleine	0.054
MILLADORE WASTEWATER TREATMENT FACILITY	0022381	332	156	340	184	Petenwell	0.055
MULLINS CHEESE INC	0054127	81	1,339	3,656	2,317	Petenwell	0.046
MULLINS CHEESE INC MARSHFIELD	0053694	85	157	157	0	-	0.075
NASONVILLE DAIRY INC	0040312	68	67	67	0	-	0.075
NECEDAH WASTEWATER TREATMENT FACILITY	0020133	199	279	762	483	Lake Wisconsin	0.038
NEENAH INC WHITING	0003611	208	2,834	7,741	4,907	Petenwell	0.047
NEKOOSA WASTEWATER TREATMENT FACILITY	0020613	203	477	1,304	827	Petenwell	0.054
NEW LISBON WASTEWATER TREATMENT FACILITY	0020699	195	425	1,161	736	Lake Wisconsin	0.050

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BILLERUD WISCONSIN LLC	0037991	144	32,220	87,995	55,775	Petenwell	0.051
NORTH FREEDOM WASTEWATER TREATMENT FACILITY	0028011	180	78	213	135	Lake Wisconsin	0.073
OAKDALE WASTEWATER TREATMENT FACILITY	0031259	312	78	176	98	Lake Wisconsin	0.043
O'DELL'S BAY SANITARY DISTRICT NO. 1	0036536	59	70	192	122	Lake Wisconsin	0.037
PACKAGING CORPORATION OF AMERICA	0002810	161	8,118	20,450	12,332	Petenwell	0.034
PHELPS SANITARY DISTRICT #1	0029050	225	128	200	72	Petenwell	0.057
PITTSVILLE WATER AND SEWER DEPT WWTF	0020494	200	49	49	0	-	0.075
PLOVER WASTEWATER TREATMENT FACILITY	0027995	208	2,007	5,484	3,477	Petenwell	0.047
PORT EDWARDS WASTEWATER TREATMENT FACILITY	0020451	204	599	1,639	1,040	Petenwell	0.054
PORTAGE WASTEWATER TREATMENT FACILITY	0020427	190	2,345	6,404	4,059	Lake Wisconsin	0.039
POYNETTE WASTEWATER TREATMENT FACILITY	0021091	172	524	914	390	Lake Wisconsin	0.045
REEDSBURG WASTEWATER TREATMENT FACILITY	0020371	184	2,954	8,073	5,119	Lake Wisconsin	0.074
RHINELANDER CITY OF	0020044	222	1,721	4,701	2,980	Petenwell	0.032
RIB LAKE VILLAGE OF	0029017	218	223	609	386	Petenwell	0.024
RIB MOUNTAIN METRO SEWAGE DISTRICT WWTF	0035581	263	4,919	13,435	8,516	Petenwell	0.051
RIO WASTEWATER TREATMENT FACILITY	0020117	174	128	350	222	Lake Wisconsin	0.026
ROCK SPRINGS WASTEWATER TREATMENT FACILITY	0029041	180	85	232	147	Lake Wisconsin	0.073
ROZELLVILLE SANITARY DISTRICT NO 1	0029076	328	8	8	0	-	0.075
RUSSELL SANITARY DISTRICT #1 TOWN OF	0029319	219	54	146	92	Petenwell	0.037
SAPUTO CHEESE USA INC REEDSBURG	0059404	184	14	14	0	Lake Wisconsin	0.074
SARTORI COMPANY	0032794	216	9	9	0	-	0.036
SENECA FOODS CORPORATION CAMBRIA	0003891	175	28	36	8	Lake Wisconsin	0.062
SPENCER WASTEWATER TREATMENT FACILITY	0021521	212	280	280	0	-	0.075
STETSONVILLE, VILLAGE OF	0060216	100	44	129	85	Big Eau Pleine	0.031
STEVENS POINT WASTEWATER TREATMENT FACILITY	0029572	210	5,075	13,861	8,786	Petenwell	0.047
STRATFORD WASTEWATER TREATMENT FACILITY	0025569	91	116	240	124	Big Eau Pleine	0.055
THREE LAKES SANITARY DISTRICT #1	0022853	284	75	204	129	Petenwell	0.022
TOMAH WASTEWATER TREATMENT FACILITY	0021318	54	1,185	1,185	0	-	0.071
TOMAHAWK CITY OF	0021946	160	669	1,828	1,159	Petenwell	0.036
UNION CENTER WASTEWATER TREATMENT FACILITY	0025640	187	48	55	7	Lake Wisconsin	0.073



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UNITY WASTEWATER TREATMENT FACILITY	0060526	213	16	16	0	-	0.075
PIXELLE ANDROSCOGGIN LLC - WATER RENEWAL CENTER	0003468	210	3,199	8,737	5,538	Petenwell	0.047
VESPER WASTEWATER TREATMENT FACILITY	0030309	201	59	59	0	-	0.075
WARRENS WASTEWATER TREATMENT FACILITY	0060259	198	235	241	6	Lake Wisconsin	0.074
WAUSAU WATER WORKS WW TREATMENT FACILITY	0025739	154	9,145	24,981	15,836	Petenwell	0.050
WHITING WASTEWATER TREATMENT FACILITY	0021636	210	747	2,041	1,294	Petenwell	0.047
WI AIR NATIONAL GUARD	0023078	197	223	609	386	Lake Wisconsin	0.047
WI DELLS LK DELTON SEWERAGE COMMISSION WWTF	0031402	191	3,045	8,317	5,272	Lake Wisconsin	0.039
WI DNR ART OEHMCKE STATE FISH HATCHERY	0058271	226	128	159	31	Minocqua - Kawaguesaga	0.023
WI DNR ART OEHMCKE STATE FISH HATCHERY	0058271	226	0	0	0	Minocqua - Kawaguesaga	0.023
WI DNR DEVILS LAKE STATE PARK	0060241	29	736	1,043	307	Lake Wisconsin	0.057
WI DOC LINCOLN HILLS SCHOOL	0026701	220	84	228	144	Petenwell	0.048
WISCONSIN DAIRY STATE CHEESE, INC.	0055751	259	279	513	234	Petenwell	0.047
WISCONSIN RAPIDS WWTF	0025844	205	3,949	10,784	6,835	Petenwell	0.052
WONEWOC WASTEWATER TREATMENT FACILITY	0029688	187	158	181	23	Lake Wisconsin	0.073

Table O updated, November 2023.