FOUNTAIN LAKE PHOSPHORUS STORMWATER WATER QUALITY TRADING MANAGEMENT PLAN

SHELL ROCK RIVER WATERSHED DISTRICT

TOPICAL REPORT RSI-3117

PREPARED FOR
Shell Rock River Watershed District
214 W Main St
Albert Lea, Minnesota 56007

JULY 2021

RESPEC

RESPEC.COM

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ACKNOWLEDGEMENTS

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FUNDING

Legislative-Citizen Commission on Minnesota Resources

ENVIRONMENT
AND NATURAL RESOURCES
TRUST FUND

EXECUTIVE SUMMARY

The Shell Rock River Watershed District (SRRWD) is leading a collaborative process to provide Water Quality Trading (WQT) as an option to Municipal Separate Storm Sewer Systems (MS4s) and Wastewater Treatment Facilities (WWTFs) discharging into the Fountain Lake drainage area of the Shell Rock River Watershed. As part of this process, this example WQT Management Plan and attached forms and appendices are provided as templates to consider and support justifications for key policies and methods. This WQT Management Plan, references a multi-permittee watershed overlay General Phosphorus National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) permit. This permit type can be used to simplify the permitting process when a large number of permittees apply for and receive coverage for trading usage. If WQT is being established in a watershed for one or two NPDES/SDS permittees, a modification to the wastewater facility permit or the Stormwater Pollution Prevention Plan can be used to provide the permit coverage for WQT.

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1.0 INTRODUCTION

The Shell Rock River Watershed District (SRRWD) is leading a collaborative process to provide Water Quality Trading (WQT) as an option to Municipal Separate Storm Sewer Systems (MS4s) and Wastewater Treatment Facilities (WWTFs) discharging into the Fountain Lake drainage area of the Shell Rock River Watershed. WQT applies a market-based approach to help National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) permitted entities achieve their permitted wasteload allocations (WLAs) that are specified in the Fountain Lake Total Maximum Daily Load (TMDL).

WQT provides a cost-effective alternative to traditional management approaches used to achieve permitted WLAs by establishing a transactional market for water quality credits. Credits can be generated by both point and nonpoint sources that reduce pollutant loads. Permitted point sources generate credits by reducing pollutant effluent loads relative to each WLA, and landowners generate nonpoint-source credits by implementing best management practices (BMPs) on their land. The credits that are generated are then purchased by a permittee to offset a portion of their pollutant load and help them to achieve the new lower permit effluent limits to comply with a TMDL WLAs. This Management Plan provides the justification for quantifying and developing credits that ensures credit transactions result in the same (or higher) pollutant reductions as traditional management approaches. For a full list of terms used throughout this Management Plan and associated appendices, see Appendix A.

WQT is an accepted water quality management approach that has been used in many point-to-point-source trading permits and for four permits allowing point-to-nonpoint-source trading in Minnesota, but WQT has never been applied to stormwater permits in the state. This Management Plan provides guidance and justification for developing a WQT program for MS4 permittees in Minnesota. The Fountain Lake WQT program will establish a collaborative partnership between watershed stakeholders to ensure that credit trading is a defensible and equitable approach to water quality management. To facilitate the trading market, partner roles are identified and clearly defined by the program, which includes credit generators/sellers, credit buyers, local brokers, third-party verifiers, and the program administrator. A simplified representation of how the partner roles interact within the program framework is shown in Figure 1-1 with a detailed flow path of the program structure presented in Appendix B. As the delegated Clean Water Act (CWA) authority, the Minnesota Pollution Control Agency (MPCA) currently maintains the final approval decision for all of the proposed trades and conducts audits of trades made throughout the permit cycle. The following roles and responsibilities support the MPCA trading oversight roles by establishing methods for the local WQT program teams to facilitate trading and document the necessary eligibility steps that the MPCA uses for approvals:

- Credit Generators/Sellers: Local agriculture producers and other organizations achieving phosphorus reduction by implementing new BMPs.
- Credit Buyers: Permitted entities that fulfill the selection and contracting process with the WQT administrator's assistance.

- Local Brokers: Those individuals/entities who have been trained in program protocols and policies and provide the following:
  - WQT funding opportunity notifications to their clientele
  - Assistance to interested landowners who choose to apply for credit generation projects by providing initial technical support, such as matching the landowner's preferred conservation measures with WQT protocols (including advice regarding the probability of a WQT award) and giving cost projections for the selected BMP(s) and the project's credit generation estimated value.
- Third-Party Verifier: Those individuals who work on behalf of the WQT administrator by providing the following:
  - An objective third-party review of application materials and the project selected regarding the application's compliance with the program policies and protocols
  - Assistance, as directed by the administrator, in complaint and appeal protocols for:
    - Application deficiencies
    - Site discrepancies
    - Protocol differences of opinion between the applicant and WQT Program Administration Office.
- Program Administrator: Organization responsible for operating the WQT program.

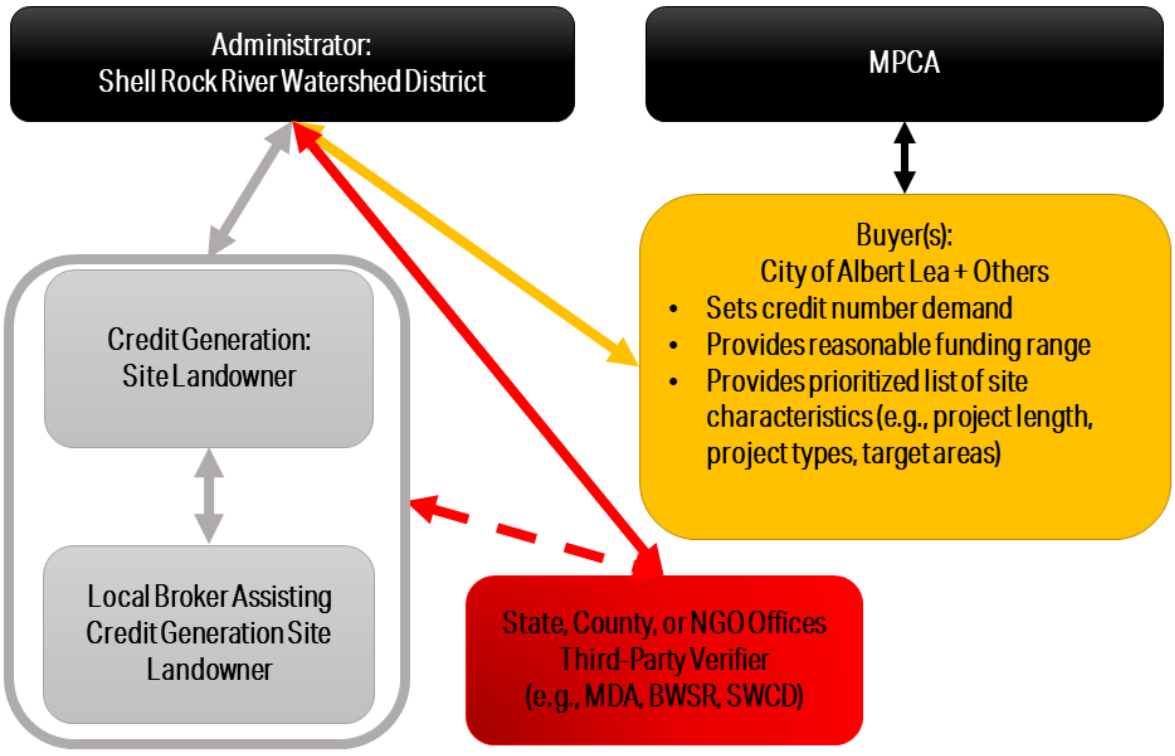


Figure 1-1. Fountain Lake Water Quality Trading Program Partner Roles.

2.0 REGULATORY REQUIREMENTS

The CWA of 1972 authorized the U.S. Environmental Protection Agency (EPA) to regulate pollutant discharges into Waters of the United States through the NPDES/SDS permitting program. The CWA also provides authority to the EPA, delegated states, and tribes to develop WQT permitting programs defined by the EPA as watershed-based permitting. The MPCA is delegated to enforce the NPDES/SDS permitting program under the CWA. The MPCA governance over NPDES/SDS wastewater and/or stormwater permitting and the authorization of WQT are under the authority provided in Minnesota Statute § 115.03, Subdivision 10 and Minnesota Rules Chapters 7050.0250 through 7050.0280 for the purpose of achieving compliance with water quality standards. WQT must also comply with the following list of requirements (as applicable to the permitted discharge type):

- Minnesota Rules, Parts 7050.015, Subpart 8
- Minnesota Rules Chapter 7053.0205, regarding general requirements for discharges to waters of the state
- Minnesota Rules Chapter 7053.0215, regarding requirements for point-source discharges of sewage (for applicable trades involving wastewater permittees).

Stormwater trading requirements for a buyer (for this example WQT program, the City of Albert Lea) will be provided in the Stormwater Pollution Prevention Plan (SWPPP). If additional permittees wish to participate in trading within the Fountain Lake drainage area, the permittees will submit a request for an overlay permit entitled the Fountain Lake Watershed Phosphorus General Permit that authorizes the WQT program's policies, protocols, and framework. The Fountain Lake Watershed Phosphorus General Permit overlay permit authorizes total phosphorus (TP) controls and requirements while the MS4 general permit and existing WWTF permits govern all of the remaining pollution controls and management. In addition, WQT trades are only eligible for assisting with compliance goals that are associated with meeting the new TMDL WLA requirements. For a detailed summary of regulations, see Appendix C of this Management Plan. Key permit requirements are described in the following sections.

2.1 ANTIBACKSLIDING

Antibacksliding is referenced in Section 303(d)(4) of the CWA and prohibits establishing less-stringent standards than those established in previous permits. The proposed Fountain Lake Watershed Phosphorus General Permit overlay permit does not change any effluent limits established by the existing permits nor establish new TMDL, WLA-based effluent limits to be incorporated under the authority of the MPCA. Any point-source discharger of sewage, industrial, or other wastes with an NPDES permit must continue to meet effluent limits established by Parts 7053.0215 to 7053.0265 of the permit unless the permittee establishes that less-stringent effluent limits are allowable pursuant to federal law under Section 402(o) of the CWA, U.S. Code Title 33 § 1342, and Minnesota Rules Chapter 7053.0275. Future changes to effluent limits as a result of changes in water quality standards are evaluated under Minnesota Rules Chapter 7053.0275 and applicable federal law by the MPCA.

The Fountain Lake WQT program verifies compliance with antibacksliding by tracking the combined TP discharge and credit value (bought or sold) for each NPDES/SDS permitted entity (WWTFs, MS4s, and construction and industrial activities) through the following processes:

- **WWTFs:** Future WWTF permits will be held to their permitted WLA mass; however, the WWTF's discharged mass can be adjusted to accommodate participation in the WWTF's buying or selling of WQT credits. For example, if a WWTF has a TP WLA of 100 pounds (lb) per year and sells credits that are based on the WWTF reducing the allowable load by 20 lb TP per year, the WWTF discharge must not exceed 80 lb TP per year so that the facility accounts for no more than its total WLA of 100 lb TP per year. Inversely, a purchase of 20 credits will provide compliance for discharging 120 lb TP per year. A WWTF will use its discharge-monitoring reports (DMRs) to maintain a record of current treatment levels and adjust its effluent loads to account for buying and/or selling credits in a mass-balance accounting process.
- **Stormwater:** Antibacksliding requirements will apply to any stormwater treatment associated with the MS4 general permit, construction activity, and industrial activity. The permittee's baseline pollutant-loading conditions are established by modeling the conditions stated in the SWPPP and the six Minimum Control Measures (6 MCMs). This baseline quantifies the existing TP load associated with the current SWPPP and is defined as the Minimum Control Level (MCL). The planned SWPPP implementation goals, whether currently implemented or not, will be modeled to determine the MCL. The difference between the MCL TP load and the permitted TMDL WLA establishes the current condition's maximum demand, or the amount of the pollutant discharged that is eligible for credit trading (this process is outlined in detail in Appendix J). A stormwater entity may choose to implement additional urban or industrial BMPs rather than trade for the maximum amount when the local implementation is more (or close to being more) cost effective. Over time, credit usage may change because of issues such as growth, new allocations, and improvements in urban BMP technologies. Future pollutant reductions achieved from either the credits purchased or implementing additional urban or industrial BMPs are tracked and recorded in the WQT registry, which creates a mass threshold that will be used to measure backsliding against.

2.2 ANTIDEGRADATION

Antidegradation is included in Minnesota Rules Chapters 7050.0250 to 7050.0325 to maintain the highest possible quality of surface waters in the state. All new or expanding TP discharges from NPDES/SDS permittee applicants in the Fountain Lake drainage area will be required to undergo an antidegradation review as required by Minnesota Rules Chapter 7050.0280 as part of the application for the Fountain Lake Watershed Phosphorus General Permit. As detailed in Section 2.3, *Impaired Waterbodies*, when multiple buyers are covered by a general overlay phosphorus permit that uses a policy of upstream credit generation only, each buyer's upstream contributing area is the buyer's specific eligible trade area. This policy delineates their appropriate credit generation segment of the larger watershed. The Fountain Lake drainage area does not contain any waterbodies classified as Outstanding Resource Value Waters (ORVW), which are waterbodies where expanding or new discharges are prohibited.

2.3 IMPAIRED WATERBODIES

The Fountain Lake WQT program eligible credit generation area(s) are the subwatersheds that are upstream of each credit buyer's discharge location. For the City of Albert Lea's stormwater discharges into Fountain Lake, the whole watershed upstream of Fountain Lake is the eligible trade area. However, for other NPDES/SDS dischargers that participate in trading, the contributing watershed upstream of

the permittee's discharge defines their eligible credit generation segment of the larger Fountain Lake Watershed. If downstream credit generation is adopted in the future, new pollutants of concern will be added or a WQT program will be developed where credit generation is allowed downstream of the credit buyer. The adjusted program's framework, policies. and protocols will adhere to 40 Code of Federal Regulations (CFR) § 122.4 and 40 CFR § 122.44. This adherence is established to avoid discharges that offset credits for a pollutant of concern that can cause or contribute to a local hotspot condition. A local hotspot could occur if the pollutant discharge of a permitted entity enters a water resource that is impaired for the pollutant being traded and is upstream of the site that is generating credits. If downstream credit generation is pursued, program administrators must work with the MPCA to develop a reasonable potential analysis to ensure that the buyer's pollutant discharge levels and locations of credit generation offsets do not increase the stressor conditions in downstream waterbodies.

The requirements outlined in 40 CFR § 122.4 and 40 CFR § 122.44 apply to all NPDES/SDS permits, including permits with WQT provisions; specifically, 40 CFR § 122.4 applies to a new source or a new discharger, and 40 CFR § 122.44 applies to all NPDES/SDS permits. Both regulations list requirements for appropriate effluent limits for all NPDES/SDS permitted discharges to meet water quality standards established under Section 303 of the CWA. The permit application for renewal requires the permitting authority to assess the potential that a discharge causes, has the reasonable potential to cause, or contributes to an instream exceedance of the state water quality standards for an individual pollutant. If a reasonable potential exists, then the permit must contain effluent limits for that pollutant. Because the Fountain Lake WQT program only includes upstream credit generation, the WQT program is considered to protect water quality standards throughout Fountain Lake's contributing watershed.

2.4 CONDITIONS OF OVERLAY PERMIT (AS AN EXAMPLE FOR MULTIPLE PERMITTEES)

For illustrative purposes, this WQT Management Plan has been drafted using a multiple-buyer watershed overlay general permit. To participate in the WQT program, NPDES permittees must file a Notice of Intent (NOI) to apply for and comply with the conditions of the Fountain Lake Watershed General Phosphorus Permit overlay permit. Permittee types expected to file an NOI include NPDES individual WWTF permittees, MS4 General Stormwater permittees, Industrial General Stormwater permittees, and Construction General Stormwater permittees. Tables 2-1 and 2-2 are examples of discharging entity characteristics that are required to be submitted by the respective permittees as a part of the NOI. These characteristics include the permittee's name, Fountain Lake Watershed General Permit enrollment number, individual WWTF permit number or General Stormwater Permit number, the Fountain Lake Location Factor used in crediting, the MCL regarding the current permitted discharge, and the compliance schedule-required reduction in loading to achieve the Fountain Lake phosphorus TMDL WLA. The compliance schedule obligations and respective reporting are different between WWTFs and MS4s. Stormwater permittees are required to submit their compliance schedule as part of the SWPPP in the permittee's existing stormwater general permit.

While stormwater permittees are not locked into a defined compliance schedule like WWTFs, they must still specify their effluent limits in 5-year permit cycle periods to show their progress toward achieving their final TMDL WLA.

Table 2-1. Example of Permit Effluent Limits for Wastewater Treatment Facilities Reported in Overlay Permit

Permittee No.	Permittee Name	Fountain Lake Watershed Permit Number	Individual NPDES Permit Number	Total Phosphorus Monitoring Frequency (samples per week)[a]	Fountain Lake Location Factor	Minimum Control Level (kg/yr)	Compliance Schedule Effluent Limit 2024[b] (kg/yr)	2025[b] (kg/yr)	2026[b] (kg/yr)	Year Compliance Scheduled to Achieve TMDL WLA
i	Example	MNG460001	MN00XXXXX	2	0.75	100	60	60	60	2024

(a) Based on the size of the facility and assuming the facility is a continuous discharge facility with an annual effluent limit that complies with the Fountain Lake phosphorus TMDL.

(b) Compliance schedule to achieve the currently approved TMDL allocation. In this example, the scheduled implementation plan for the 2021 approved TMDL applies a 3-year compliance schedule.

kg/yr = kilograms per year.

Table 2-2. Example of Effluent Limits for Stormwater Permittees Reported in Overlay Permit

Permittee No.	Permittee Name	Fountain Lake Watershed Permit Number	Individual NPDES Permit Number	Fountain Lake Location Factor	Minimum Control Level (kg/yr)	Compliance Schedule Effluent Limit 2026[a] (kg/yr)	Compliance Schedule Effluent Limit 2031[a] (kg/yr)	Compliance Schedule Effluent Limit 2036[a] (kg/yr)	Year Compliance Scheduled to Achieve TMDL WLA[a]
i	Example	MNGSW460001	MN00XXXXX	0.50	100	90	80	70	2036

(a) In this example, the stormwater utility's fulfillment of the NPDES/SDS MNR040000 stormwater permit requirements from Item 12.8, which states: "The applicant must submit a compliance schedule for each applicable Waste Load Allocation (WLA) not being met for oxygen demand, nitrate, total suspended solids (TSS), and total phosphorus (TP). The applicant may develop a compliance schedule to include multiple WLAs…" This example has selected a 15-year compliance schedule.

WQT credit transactions are tracked by the Fountain Lake WQT program's protocols and trade registry, which are structured to assist all buyers with their permit-required annual final report; as such, these individual NPDES/SDS permitted discharger submittals are the necessary recorded compliance-tracking documentation. This information will be kept on record at the NPDES/SDS permittees' administration offices, as well as the Fountain Lake Watershed Phosphorus WQT Program Administration office, for public review.

2.5 MONITORING REQUIREMENTS

Monitoring requirements are clearly defined in a permittee's base permit (WWTF's individual permit and MS4's general permit) with the Fountain Lake Watershed Phosphorus General Permit overlay permit, including additional requirements that verify credits are accurately tracked and WLAs are met. A summary of key monitoring requirements from both base permits and the Fountain Lake Watershed Phosphorus General Permit overlay permit is provided in the following sections along with the permittees who participate in the WQT program.

2.5.1 PERMITTED CONTINUOUSLY DISCHARGING WASTEWATER TREATMENT FACILITIES

Monitoring criteria within a WWTF NPDES/SDS base permit include:

- Monitoring the facility influent and effluent for TP concentration at the frequency specified in the permittee's individual NPDES/SDS permit or an applicable general NPDES/SDS permit, whichever is more frequent
- Measuring flow continuously
- Sampling at the location(s) specified in the permittee's individual NPDES/SDS permit or general NPDES/SDS permit, as applicable
- 24-hour-flow proportional composite samples for TP, unless otherwise approved in writing by the commissioner
- Using a laboratory certified by the Minnesota Department of Health for phosphorus analysis
- Following sample preservation and test procedures that conform to 40 CFR § 136 and Minnesota Rules subpart 7041.3200.

When a WWTF enters the WQT program, the WWTF will submit its base permit for modification. The modified permit will reflect how the WWTF's monitoring will verify the buying or selling of credits while meeting the facility's permitted WLA.

2.5.1.1 BUYER

The monitoring criteria, as required in the WWTF's individual NPDES/SDS permit, will remain in place with the added requirement to submit the results as part of the annual reporting for the Fountain Lake Watershed Phosphorus General Permit. This additional reporting verifies that the WWTF's discharge minus the purchased credits is accounted for in the compliance evaluation for the facility's permitted WLA.

2.5.1.2 SELLER

The monitoring criteria, as required in the WWTF's individual NPDES/SDS permit, will remain in place with the added requirement to submit the records as part of the annual reporting for the Fountain Lake

Watershed Phosphorus General Permit. This additional reporting is used to verify that the adjusted lower WLA effluent limits reflect that the generated credits are only sold once as part of the public transparency documentation provided in the public summary. In this way, the Fountain Lake Watershed Phosphorus General Permit annual reporting will directly reflect the WQT compliance obligation status in both the general permit and as stated in the WWTF's individual facility permit.

2.5.2 PERMITTED MUNICIPAL SEPARATE STORM SEWER SYSTEMS

The monitoring requirements for all of the BMP activities addressing phosphorus within the MS4 footprint will remain the same as the requirements in the MS4 general permit. The MS4 general permit-required SWPPP also must include a description explaining how WQT will be used that references the Fountain Lake Watershed Phosphorus General Permit overlay permit's nonpoint-source credit generating site requirements. Monitoring requirements for all of the urban BMPs are specified in Sections 23.4, 23.5, 23.6, 23.7, 23.8, 23.9, and 25.3 of the MS4 general permit.

2.5.3 NONPOINT-SOURCE CREDIT GENERATING SITES

The monitoring requirements for credit generating sites were developed as a part of the Fountain Lake Watershed Phosphorus General Permit overlay permit supporting protocols, as provided in the inspection forms (IM-1 through IM-7), to verify the project site's performance and meet the buyer's certification requirements under the Fountain Lake Watershed Phosphorus General Permit. To meet the certification requirements, credit generators must follow the monitoring and inspection requirements listed in the forms provided in Appendix K. The requirements include the following:

- Scheduled visits to the credit generation site for pre-implementation, during implementation, and post-implementation to confirm that the installation is consistent with the approved design
- Adherence to the BMP monitoring plan submitted with the project plan
- Annual scheduled audit inspections by an administrative representative during the credit generating time frame as a part of the WQT program's certification approach.

2.6 REPORTING REQUIREMENTS

Permittees participating in the Fountain Lake WQT program must maintain their base permit reporting requirements, which are specified by permittee type in the following sections. In addition to fulfilling the base permit reporting requirements, permittees participating in the WQT program who purchase credits must keep a record of their purchased credits in a registry. Nonpoint-source credit generators must also comply with required record keeping for certain BMPs (e.g., application rates, soil testing, incorporation, for a nutrient management credit) and allow access for third party inspections as established in the WQT program, which are defined below.

2.6.1 PERMITTED WASTEWATER TREATMENT FACILITIES

- The Annual Compliance Report must be received by the MPCA by February 28 of the next year.

2.6.2 PERMITTED MUNICIPAL SEPARATE STORM SEWER SYSTEMS

- All permitted stormwater entities must meet all of the reporting requirements specified in their base (MS4, industrial, construction) stormwater general permits for all of the BMPs and discharges from within their delineated footprint.
- In addition, each of the permittees is covered by the Fountain Lake Watershed Phosphorus General Permit overlay permit (or, for setting with only one trading permittee, the permittee's SWPPP trading explanation [MNR040000]) reporting requirements. These additional requirements are established to align with the provisions of the Small Municipal Separate Storm Sewer Systems General Permit MNR040000, which were created in a manner that complies with the requirements of Minnesota Rule part 7090. The provisions include an annual assessment, the status of compliance, inspection findings, changes in any identified BMPs for MCMs and MCLs, and a summary demonstrating the progress toward achieving the Fountain Lake Phosphorus TMDL WLA.
- The annual compliance report is due by February 28 of each year and will cover the portion of the previous year during which the permittee was authorized to discharge stormwater under the Fountain Lake Watershed Phosphorus General Permit. The annual report will include the following credit generation site details:
  - Description of the site(s) inspected
  - Photographic documentation that the BMPs are still in place and operating properly
  - Certification that the active BMPs approved by the MPCA for trade credits remain active according to the MPCA approval
  - If damage has occurred, photographic documentation of the damage
  - Photographic documentation of the completed repair work
  - If repair work has not been completed, a schedule for completing the repair work
  - A detailed description of the remaining repair work to be completed
  - An estimate of the total cost for each BMP constructed and/or repaired in the previous year
  - Other potential requirements specific to individual BMPs and/or permit requirements.
- The permittee must keep records that include components of the SWPPP and Fountain Lake Watershed Phosphorus General Permit trades available to the public at reasonable times during regular business hours. These components include the number of phosphorus credits, credit generation project types, and a summary of quantification methods for purchased phosphorus credits (without divulging the credit generators' personal information).

2.6.3 NONPOINT-SOURCE CREDIT GENERATING SITES

- The WQT program administrator maintains a credit registry, or ledger, of all of the certified credits and the assigned buyer to assist in tracking the buyer's permit compliance performance.
- The registry records will be provided to each buyer to assist credit purchasers with their annual reporting requirements. While the administrator is not responsible for permittee WQT report submittals to the MPCA, the registry records are to be kept up to date for timely release to buyers or the MPCA upon request.

- The registry also tracks individual credits using a unique identification number to verify that credits are not used twice for compliance purposes.
- Remaining reporting requirements for trades will be met by completing the forms that are described in Chapter 6 of this report, *Program Administration* and Appendix K.

2.6.4 OVERLAY PERMIT

The reporting requirements for the overlay permit are as follows:

- Maintain a registry of credits that centralizes purchased credits from both WWTFs and nonpoint-source credit generation sites to provide a comprehensive summary of the total credits purchased. This summary of total credits purchased, which is equivalent to pollutant load reduction, is added to the MCL modeled discharge levels to track progress toward achieving the Fountain Lake Watershed Phosphorus TMDL.

2.7 PUBLIC NOTICE AND PUBLIC INFORMATION REQUIREMENTS

The Fountain Lake Watershed Phosphorus General Permit, this WQT Management Plan, and the accompanying supporting materials will undergo a formal public notice before permit approval. Recorded permittee MCMs and MCLs, as well as a general summary of the certified credit status, will also be made available to the public at reasonable times during regular business hours. The stormwater permitted entities must provide a minimum of one opportunity for the public to give input on the adequacy of the SWPPP. These steps will be fulfilled according to the NPDES/SDS permit issuance processes. The WQT Management Plan summary results of the registered trades and Fountain Lake Watershed Phosphorus General Permit for multiple buyers (City of Albert Lea MNR040000 SWPPP trading provisions if a single buyer]) should also be made available at each permittee's and WQT administrator's local office for public review during business hours.

3.0 POLICIES

Project policies were developed to ensure that the WQT is equitable for both credit buyers and sellers. These policies provide guidance to account for potential future program changes and ensure that the program maintains its efficacy for the entirety of the permit.

3.1 ADAPTIVE MANAGEMENT

The WQT process for adaptive management is to prepare a review of the program in Year 4 of the Fountain Lake Watershed Phosphorus General Permit overlay permit's 5-year reissuance cycle. The adaptive management objectives are to review the trading protocols for identified cost efficiencies, issues with complexity in agreement regarding past interpretations, and use of staff resources and complaints. At a minimum, a review of key program policies and protocols will be completed while allowing for other known emerging issues to be added if those issues arise. The review should be kept short and concise when a topic is known to be performed adequately in the current system. The key program policies and protocols are as follows:

1. Program organization framework and participating entities' roles and responsibilities
2. Eligible BMP performance and required operation and maintenance (O&M) performance
3. Collaboration and communication between participating partners
4. Buyer-identified reoccurring challenges/preferred methods
5. Seller-identified reoccurring challenges/preferred methods
6. Broker and third-party verifier efficiency and performance on known complex issues related to verifying the following:
    a. Application or certification of eligibility
    b. Project implementation and certification
    c. Inspection frequency and certification process for active credits.
7. Legal agreement protocols
8. Financial transaction processing and accounting
9. Public transparency.

Items identified as problematic during this review will be discussed with the entities raising the issue, other participating collaborators performing similar roles, and the MPCA, as necessary. These discussions will accomplish the following:

- Further clarify the issue at hand
- Identify alternative approaches
- Provide feedback from entities on options and the selected alternative approach (the administrator will take other collaborator and participant opinions into consideration; however, the administrator is the entity that determines the option and program adjustment, if any).

Furthermore, to ensure that the program is using the best available information, adaptive management should include a review of literature from Minnesota and throughout the U.S., analysis of local water quality monitoring, and professional opinions gathered for the following program elements:

- BMP treatment efficiency and performance regarding phosphorus reductions
- Advances in credit quantification methods
- Trade ratio and location factor improvement options
- New or emerging technology to complete inspections and reporting and provide public transparency in a more cost-effective manner.

If potential program changes are identified after an evaluation of the preceding items, a review should be completed to determine the level of effort needed and costs incurred to institute the changes and if the changes would be significant enough to justify the effort and costs. This cost-benefit evaluation should include program elements such as the ratio of loading being traded with the mass balance of all loading sources that contribute to the total permitted WLA, whether or not a change to improved technology is affordable and easy to use, and the extent of changes regarding broker and third-party qualifications and training.

3.2 GRANDFATHER CLAUSE

To protect credit generators from being negatively impacted by future program changes, the grandfather clause states that any program adjustment *will not* and cannot be used to alter the number of awarded certified credits or the associated legal agreement for the length of the enacted legal agreement. This clause also provides assurance to buyers and sellers that a level of certainty exists in the negotiated legal agreement; as such, adaptive management changes do not change preexisting credit legal agreements. All program adjustments and grandfathered-in legal agreements will be presented to the MPCA with supporting materials as part of the permit reissuance process.

3.3 COMPLAINT AND APPEAL

The WQT program offers a complaint and appeal process for interested parties who feel a decision or action taken by one or more SRRWD WQT program representatives was wrong. Complaint and appeal processing by the WQT Program Administration Office pertains only to WQT program policy or protocol violations. All other incidences must be turned over to the proper governing authorities. The WQT program has two levels of review, as follows: (1) Complaint, which is an internal review process; and (2) Appeal, which is an external review process. For the detailed complaint and appeal process, see Forms C-1 through C-5 in Appendix K.

3.4 REASONABLE REPLACEMENT WINDOW

After a catastrophic failure of a credit generation project is experience from impacts outside of the control of normal O&M expectations, the credit generator is granted 4 months to reestablish the credit generation project to a fully functioning site. A longer time period can be negotiated when weather impacts or crop-harvest schedules justify a longer replacement window. Funding for reestablishment is determined by the negotiated credit generation legal agreement.

4.0 TRADE RATIO

A key component of the WQT program is developing a trade ratio that drives equitable trading and ensures that pollutant reductions are realized. The trade ratio development is accomplished by considering factors that impact credits being equal to or greater than the discharge being offset. This WQT Management Plan has determined the single trade ratio values applied by using *The Water Quality Trading Toolkit* [Association of Clean Water Administrators and Willamette Partnership, 2016] guidance on trade ratio factors to consider. The trade ratio factors are applied explicitly as part of the credit buyer's demand calculation. Trade ratio factors include factors of sequestration differences (Location Factor) applied as part of the credit generation quantification method, addressing different forms or types of pollutants (Equivalence Factor), introduced risks (Uncertainty Factor), and a policy regarding providing an additional benefit for the water resource when using trading (Retirement Factor).

4.1 TRADING AREA

The eligible trading area for the Fountain Lake WQT program includes the Fountain Lake drainage area and the portion of the Albert Lea MS4 that drains to Fountain Lake. The boundaries for this project were based on the subwatershed boundaries in the Shell Rock River HSPF model to align the geographic boundaries with those used for quantifying the location factors. To ensure that all locations in the trading area have the potential to cost-effectively generate credits, areas that drain to upstream impoundments or are landlocked were excluded. This process was iterative, and the location factors were used to identify upstream subwatersheds that were deemed unsuitable to generate credits. A detailed example showing how the trading area was developed for Fountain Lake is presented in Appendix D with the resulting trading area presented in **Error! Reference source not found.**.

4.2 LOCATION FACTOR

The Fountain Lake WQT program uses the location factor as the method to address stream fate and transport. The location factor is assessed as part of the credit quantification method's valuation of the site. Although the location factor is not an added discount factor within the buyer's explicit trade ratio, the location factor does serve to reduce the magnitude of the uncertainty factor. Table 4-1 provides the 12-digit HUC location discount factors for the estimated pollutant attenuation; location factors are created by combining geographic information system (GIS) mapping layers and attenuation factors derived from calibrated watershed models. Many 8-digit Hydrologic Unit Code (HUC 8) watersheds in Minnesota have calibrated watershed models because of an MPCA watershed program support effort. Using these models to establish attenuation rates provides assurance that the pollutant fate and transport are addressed by the trading program. This method also allows WQT program managers to identify and consider involving other potential buyers, remove areas with high attenuation rates to eliminate supply areas that are not cost-effective, and develop an indication of the potential for an adequate credit supply. The calibrated HSPF watershed model was used to develop the location factors for the Fountain Lake trading area subwatersheds.

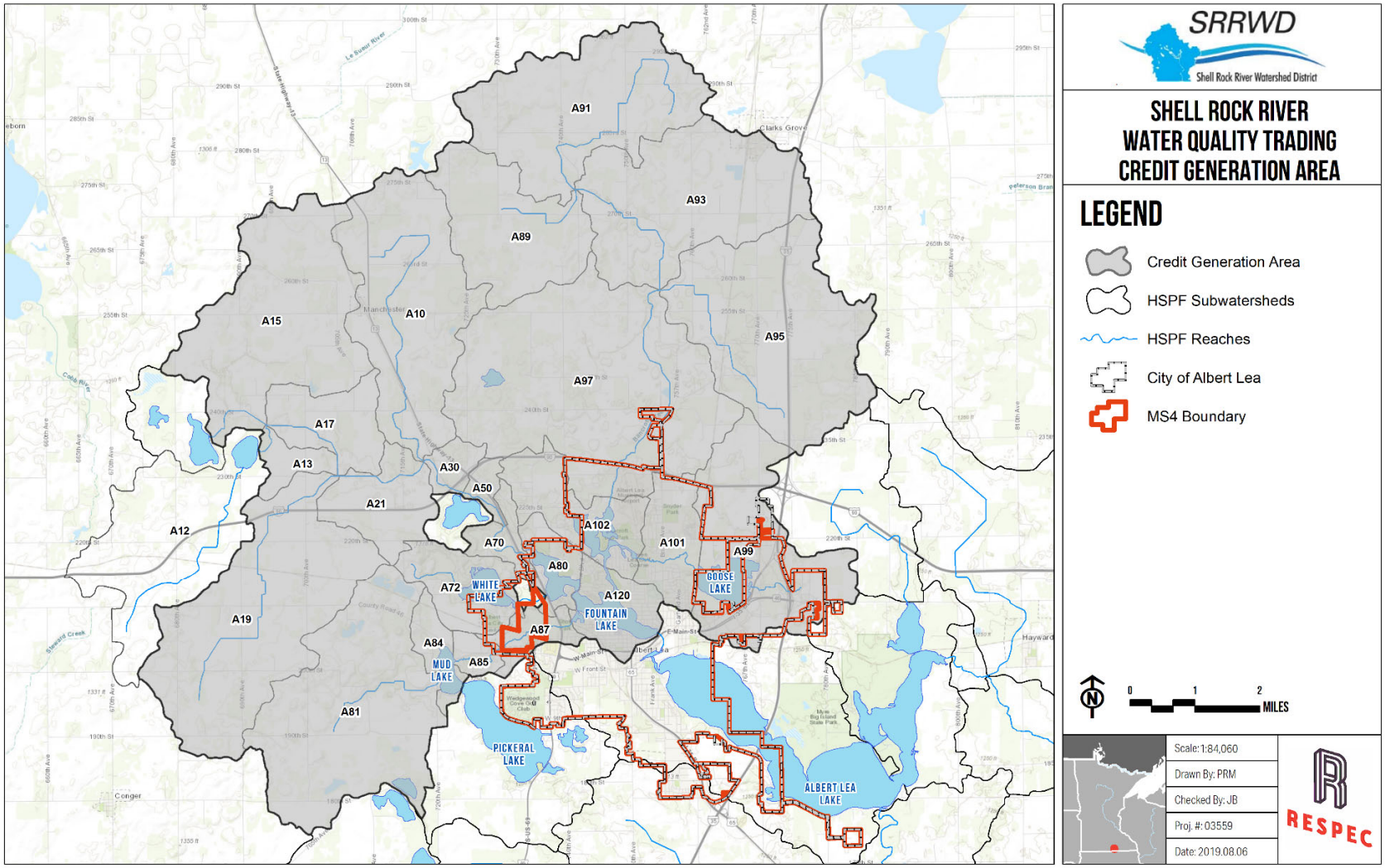


Figure 4-1. Map of Fountain Lake Water Quality Trading Program Credit Generation Area.

Table 4-1. Location Factors for Phosphorus Indicated by 12-Digit Hydrological Unit Code

Reach	Total Phosphorus	
	HUC 12	Location Factor
A89	070802020101	0.75
A91		
A93		
A95		
A97		
A99		
A101		
A10	070802020102	0.79
A13		
A15		
A17		
A19		
A21		
A30		
A50		
A70		
A73	070802020104	0.86
A81		
A84		
A85		
A87		
A102	070802020101	1.00
A80	070802020104	
A120		

The final location factor is calculated by dividing the credit buyer's location factor by the credit seller's location factor. Because the Albert Lea MS4 discharges directly into Fountain Lake, its location factor is 1, which means that the location factor for the Fountain Lake WQT program is simplified to the value in Table 4-1 that associates with the location of the credit seller. Justifications that highlight the eligible watershed boundaries and trade ratio location factors are provided in Appendix E.

4.3 CREDIT UNIT OF TRADE

The credit unit of trade quantifies the tradable pollutant credit in terms of load per unit time. The pollutant of trade for the Fountain Lake phosphorus TMDL is lb of phosphorus with an annual timestep, which results in one credit being equivalent to 1 lb of phosphorus per year at Fountain Lake. Justification for the annual credit timestep is provided in Appendix F.

4.4 TRADE RATIO

The uses for the trade ratio factor as part of the credit demand calculation have been combined into single numerical values that are determined by the type of sector conducting the trade. These trade ratio factors will address the buyer's credit obligation to account for introduced uncertainties, equivalence between forms or types of pollutants, and include a retirement (policy factor) to add additional benefits for the water resource. A single-value trade ratio was developed for the Fountain Lake WQT program with supporting evidence provided in Appendix H. The single-value trade ratio for stormwater nonpoint-to-nonpoint trading is 2.1:1.0 with the exception of credits being generated by treating ephemeral or streambank erosion, which has a trade ratio of 2.4:1.0. The higher trade ratio associated with treating these sources is caused by a change in the equivalency factor, which is described in detail in Appendix G. Trade ratios for different combinations of buyers and sellers are shown in Table 4-2.

Table 4-2. Trade Ratios for Different Combinations of Buyers and Sellers

Credit Buyer Type	Credit Generator Type			
	Wastewater NPDES	Stormwater Non-Permitted	Nonpoint Source (sheet and rill)	Nonpoint Source (gully and streambank stabilization)
Wastewater NPDES Trade Ratios	1.1 to 1.0	2.6 to 1.0	2.6 to 1.0	2.6 to 1.0
Stormwater NPDES Trade Ratios	1.1 to 1.0	2.1 to 1.0	2.1 to 1.0	2.4 to 1.0

As part of the overall trade ratio, the location factor adjustment ratios are also assigned in the credit generation site's quantification method; for example, the City of Albert Lea, with a location factor of 1, is buying credits from an agricultural producer located in the Fountain Lake Watershed Reach A89, which has a location factor of 0.75. Therefore, each lb of reduced TP at the credit generation site equals 0.75 credits for this credit transaction (0.75/1.00 × 1 lb TP per year). For a landowner in this reach subwatershed who implements a BMP that reduces 10 lbs TP per year, the actual credit generation is equal to 7.5 credits. An example of a credit transaction value calculation is shown in Table 4-3.

Table 4-3. Credit Transaction Value Calculation Example

Edge-of-Field Reduction According to Approved Quantification Method	Buyer's Fountain Lake Watershed Location Factor (N)	Credit Generator's Fountain Lake Watershed Location Factor (D)	Buyer/ Generator Location Factor Ratio (N)/(D)	Credits Generated
Example: 10 lb TP per year	Albert Lea, 1.00	Reach A89, 0.75	0.75/1.00 = 0.75	7.5

The final credit value for the credit buyer is calculated by combining the trade ratio with the generated credit value. The example highlighted in Table 4-4 shows how this calculation is done for a stormwater NPDES permittee purchasing credits from the landowner from Table 4-3. This final buyer's credit value reflects the trade ratio that accounts for modeling uncertainty and the location factor that accounts for attenuation to ensure that purchased credits result in the same or greater reduction at the TMDL waterbody.

Table 4-4. Final Buyer Credit Value Calculation Example

TP Reduction Generated by BMP Located in Reach A89 (lb)	Credits Generated (quantified pounds reduced adjusted by location factor)	Buyer's TP Discharged Amount (lb)	Single Value Trade Ratio (for BMPs correcting sheet and rill erosion)	Trade Ratio (for BMPs correcting gully and streambank erosion)	Buyer's TP Credit Demand[(a)]
10	7.5	3.6	2.1 to 1.0		7.5
10	7.5	3.1		2.4 to 1.0	7.5

(a) As represented by rounding off to one significant decimal to reflect an appropriate level of accuracy.

5.0 CREDIT TRANSACTION VALUE

To quantify and track credit transactions in a WQT program, the seller's credit value and buyer's credit demand must be established. To determine the seller's credit value, an approved method must be used to quantify the pollutant reduction achieved by the BMP. The pollutant reduction is used to establish the credit value with one credit equaling 1 lb TP per year treated. The buyer must follow the process outlined in Appendix J to establish the amount of pollutant load that the buyer can offset through the credit purchases.

5.1 SELLER CREDIT GENERATION

To generate credits from a nonpoint source, landowners can implement a preapproved BMP from the following list. Pollutant-reduction quantification methods must be used that are scientifically defensible, accurate, repeatable, and transparent:

- **Soil-Erosion BMPs:** Sheet, rill, and ephemeral gully erosion; stream, river, and ditch-bank erosion
- **Cattle Exclusion:** Separating cattle from waterways for protection against bank erosion and direct manure impacts
- **Rotational Grazing With Cattle Exclusion:** Enhancing forages for pollutant reductions from filtering processes and plant-nutrient uptake
- **Critical Area Set Aside:** Restoring highly erodible land
- **Wetland Treatment Systems:** Phosphorus removal from tile outlets or other agriculture-related runoff
- **Alternative Surface-Tile Inlets:** Improving inlets which connect surface-water ponding to subsurface tile
- **Cover Cropping:** Increasing the residue cover for soil protection against erosion
- **Storm Sewer System Retrofitting:** Adding BMPs to existing systems; BMPs cannot be tied to new developments or redevelopment and cannot be in an area that is subject to NPDES/SDS stormwater permitting requirements (i.e., MS4, industrial, or construction).

Credit generation from project sites using BMPs that are not listed above may be approved. To be approved, the landowner must submit the proposed BMP and quantification method to the SRRWD (the WQT program administrator). After the WQT program administrator grants initial approval of eligibility and estimation methods and a buyer selects the project, the WQT program administrator will submit the supporting justification to the MPCA for final approval of the credit transaction. The application process and signed signature block include acknowledgement that all of the projects awarded eligibility to be considered for WQT credit generation are predicated on the clear intent that implementation will include the following:

- BMPs designed and constructed according to the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) practice standards or a licensed professional engineer's signed plans and specifications
- An O&M plan created for program approval and operated accordingly

- An acknowledgement by the landowner that after the administrator's review of applicants, contested decisions, and/or identified conflicts in protocol applications, with a review of the certification forms and site conditions in question, all administrator decisions are final.

5.1.1 BASELINE

Before generating credits, a site must meet baseline requirements, including established compliance with accepted agricultural practices and applicable regulations. These practices and regulations are as follows:

- Minnesota Buffer Law
- BMP is not present within the last 3-years on the site
- For livestock operations: In compliance with Minnesota Rules Chapter 7020, *Animal Feedlots* and, if applicable, the NPDES/SDS permit for the feedlot operation
- Minnesota Wetland Conservation Act
- Federal Insecticide, Fungicide, and Rodenticide Act and Minnesota statutes regarding pesticide and fertilizer distribution, use, storage, handling, and disposal
- Subsurface sewage treatment system compliance with county ordinances and program
- Shoreland and floodplain management.

A landowner can generate credits from BMPs that bring the landowner into compliance with the NRCS tolerable soil loss "T" and correcting the occurrence of gullies. More explanation and justification for baseline requirements is provided in Appendix I.

5.2 BUYER CREDIT DEMAND

To determine how many credits can be purchased and applied toward achieving an MS4 permittee's permitted WLA, the MS4 permittee must establish their MCL. The MCL minus the TMDL WLA results in the total tradable pollutant load achievable through credit purchases. The MS4 permittee must use an approved quantification method to establish their MCL and certification of compliance with 6 MCMs. Details on determining an MCL, as well as justification for the credit buyer demand, are provided in Appendix J.

In addition to quantifying the base pollutant load to determine the MCL, urban areas must track urban growth and quantify the change in pollutant loading that is associated with this growth. The increase in pollutant loading attributed to the growth can be offset through various approaches, which are described in detail in Appendix J.

6.0 PROGRAM ADMINISTRATION

To effectively manage the WQT program, the following project application roles and responsibilities are clearly defined. The organizational structure of these responsibilities and the process required to certify credits are highlighted in Figure 6-1.

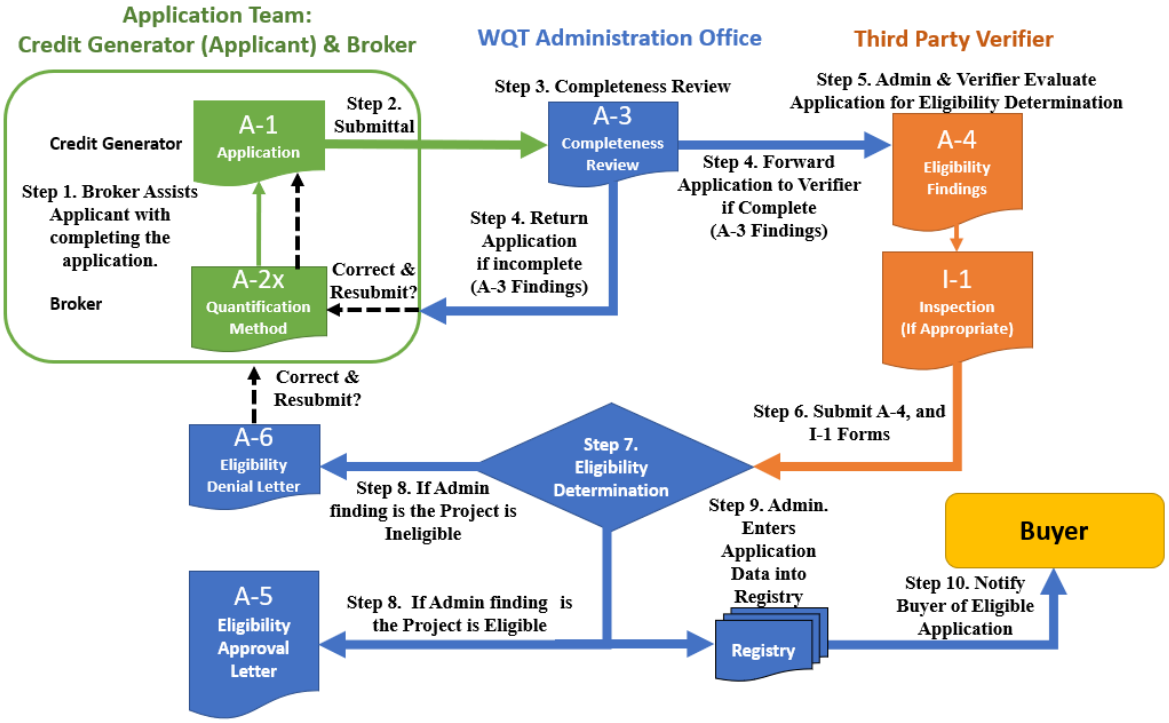


Figure 6-1. Water Quality Trading Program Application Structure to Approve Credit Eligibility.

The process outlined in Figure 6-1 is facilitated by completing the forms that provide a detailed, step-by-step checklist to complete. The forms are provided in Appendix K, and a summary list of the forms, including the party responsible for completion and associated legal agreements, is provided in Table 6-1. If a buyer selects an eligible project, the buyer's application is sent to the MPCA for approval. Similar decision logic diagrams exist for the structural BMP construction period or vegetative BMP's establishment period and the O &M credit purchase verification and certification period.

Table 6-1. List of Water Quality Trading Certification Forms for WQT Program by Crediting Step (Page 1 of 2)

WQT Crediting Step	List of Forms	Entity Responsible for Completing Form	Binding Legal Agreement Options With Responsible Entities
Application Process Forms and Protocols	A-1 Credit Application	Applicant With Broker Assistance	None
	A-2a NTT Quantification Method	Broker (brokers consist of Soil and Water Conservation District technicians, NRCS personnel, crop consultants, engineers, and other service providers who are competent in the land-use management activity that is being proposed as a credit generation project)	None (fees may be recouped as part of credit award for credit purchase funding)
	A-2b Gully Quantification Method		
	A-2c Bank Quantification Method		
	A-2d Stormwater Quantification Method		
	A-2e Professional Justification Quantification Method		
	A-3 Credit Application Completeness Check	Administration Office	Administration Contract With Buyer
	A-4 Third-Party Verifier Findings	Third-Party Verifier	Time-and-Materials Service Contract
	A-5 WQT Project Eligibility Approval Letter	Administration Office	Administration Contract With Buyer
	A-6 Project Site Eligibility Denial Letter		
	Project Site Credit Summary; for Public Transparency and Program Registry[(a)]		
	AI-1 Application Project Inspection	Third-Party Verifier	Time-and-Materials Service Contract
	Approved eligible projects are forwarded to potential buyers, entered into the registry, and filed at the Program Administration Office.[(a)]	Administration Office	Administration Contract With Buyer
Implementation and Vegetation Establishment	IMI-1 Project Establishment Inspection Form; for Implementation	Third-Party Verifier	Time-and-Materials Service Contract
	IM-2 Third-Party Verifier Certification Findings		
	IM-3 Project Establishment Certification Approval	Administration Office	Administration Contract With Buyer
	IM-4 Project Site Deficiency Notification Letter		
	IM-5 Project Establishment Correction Certification Approval		
	IM-6 Establishment of Credit Project Revoked		
	IM-7 Buyer Notification of Credit Project Revoked		

Table 6-1. List of Water Quality Trading Certification Forms for WQT Program by Crediting Step (Page 2 of 2)

WQT Crediting Step	List of Forms	Entity Responsible for Completing Form	Binding Legal Agreement Options With Responsible Entities
Operation and Maintenance Audits	OMI-1 Project Inspection Form; for Operation & Maintenance Reviews (and for site restoration inspection, if needed)	Third-Party Verifier	Time-and-Materials Service Contract
	OM-2 Third-Party Verifier Certification Findings (and for site restoration inspection, as needed)		
	OM-3 Certification Approval Letter	Administration Office	Administration Contract With Buyer
	OM-4 Project Deficiency Notification Letter		
	OM-5 Certification Approval of Site Restoration		
	OM-6 Generator Credit Project Revoked Letter		
	OM-7 Buyer Credit Project Revoked Letter		
Complaint & Appeals Process	C-1 Complaint/Appeal Form	Applicant With Broker Assistance	None
	C-2 Administrator Completeness Review Checklist	Administration Office	Administration Contract With Buyer
	C-3 Third-Party Review Form	Third-Party Verifier	Time-and-Materials Service Contract
	C-4 Letter of Determination	Administration Office	Administration Contract With Buyer
End of Credit Life	EC-1 Buyer 6 Month to End of Agreement Notification Letter	Administration Office	Administration Contract With Buyer
	EC-2 Credit Generator 6 Month to End of Agreement Notification Letter		
	EC-3 Letter Notifying Legal Agreement Ended (to buyer and seller)		

(a) The project site credit summary and approved eligible projects are available in the program registry.

7.0 REFERENCE

Association of Clean Water Administrators and Willamette Partnership, 2016. *The Water Quality Trading Toolkit*, prepared by the Association of Clean Water Administrators, Washington, DC, and Willamette Partnership, Portland, OR. Available online at *http://willamettepartnership.org/wp-content/uploads/2016/09/WQT-Toolkit-Version-1.0-August-2016.pdf*

APPENDIX A
GLOSSARY

APPENDIX A: GLOSSARY OF TERMS

Adaptive Management: A systematic approach for improving natural resource management with an emphasis on learning about management outcomes and incorporating what is learned into ongoing management. Adaptive management in water quality trading programs may focus on improving program operations, quantification methods, and overall program effectiveness.

Additionality: In an environmental market, the environmental benefit secured through the payment is deemed additional if that benefit would not have been generated without the payment provided by the market system.

Aggregator: A third party that collects pollutant-reduction credits from several generation sites to sell in bulk to permitted industrial and municipal facilities.

Antibacksliding: As defined in Clean Water Act (CWA) Sections 303(d)(4) and 402(o) and 40 Code of Federal Regulations (CFR) § 122.44(l), unless falling under a relevant exception, a reissued permit must be as stringent as the previous permit.

Antidegradation: As defined in 40 CFR § 131.12 and relevant state rules and implementation guidelines, these policies ensure the protection of existing uses and water quality for a particular waterbody where the water quality exceeds levels necessary to protect fish and wildlife propagation and recreation on and in the water. Antidegradation also includes special protection of waters designated as outstanding national resource waters. Antidegradation plans are adopted by each state to minimize adverse effects on water.

Attenuation (Pollutant): The loss in pollutant quantity as the pollutant moves between two points, such as from a point upstream to a point downstream.

Baseline: The combined pollutant load and/or best management practice (BMP) installation requirements that must be met before trading. At a minimum, all individual nonpoint sources must meet existing state, local, and tribal regulatory requirements. Where a Total Maximum Daily Load (TMDL) exists and establishes, through the TMDL and/or the TMDL implementation plans, requirements that differ from existing state, local, and tribal requirements, then the requirements stemming from TMDL load allocations (LAs) and/or TMDL implementation plans will supplement the existing regulatory requirements.

Base Year: The date after which implemented BMPs become eligible to generate credits.

Best Management Practice (BMP): BMPs include but are not limited to structural and nonstructural controls and operation and maintenance procedures. BMPs can be applied before, during, and after pollution-producing management activities to reduce or eliminate pollutant introduction into receiving waters. BMPs can consist of land management practices and instream improvements; for example, instream restoration actions or instream flow augmentation (i.e., conservation measures).

Broker: A third party that brings potential trading partners together. A broker performs the research necessary to match credit users and credit generators based on location, pollutant type, amount, and timing.

Buyers: Credit buyers include any public or private entity that chooses to invest in water quality credits and other similarly quantified conservation outcomes. Buyers typically buy credits to meet a regulatory obligation.

Clean Water Act (CWA): 33 U.S. Code (USC) § 1251 et seq. Act that establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters.

Certification: The formal application and approval process for the credits generated from a BMP. Certification occurs after project review and is the last step before credits can be used toward a compliance obligation.

Compliance Obligation: The total number of credits that a regulated entity must hold in its compliance registry at particular points in time. In the case of National Pollutant Discharge Elimination System (NPDES) permittees, this obligation is based on a calculation as to the facility's exceedance over its effluent limit, as adjusted by trading ratio(s) (and, where applicable, other policy obligations, such as a reserve pool requirement).

Compliance Schedule: As defined in 33 USC § 1362(17) and 40 CFR § 122.47, a compliance schedule is a schedule of remedial measures included in a permit or an enforcement order. A sequence of interim requirements (e.g., actions, operations, milestone events) is included that leads a permittee to compliance with the CWA regulations.

Credit: A unit of pollutant reduction per unit of time at a specified location, as adjusted by attenuation and delivery factors, trading ratios, reserve requirements, and baseline requirements.

Credit Contract Period: The duration of a contract between a regulated entity and a project developer (this contract period is relevant where a regulated entity enlists an outside party to fulfill trading plan obligations).

Credit Life: The period from the date that a credit becomes usable as an offset by a permittee (i.e., its "effective" date) to the date that the credit is no longer valid (i.e., its "expiration" date).

Critical Period: The period(s) during which hydrologic, temperature, environmental, flow, and other conditions result in a waterbody experiencing critical conditions with respect to an identified impairment.

Leakage: In environmental markets, leakage means that environmental improvements are happening in one location at the expense of increasing environmental degradation in another location.

Ledger: See also Registry. A service or software that provides a recording function for tracking credit quantities and ownership; accounting summaries that cover primarily transactional information.

Load Allocation (LA): As defined in 40 CFR § 130.2(g), the LA is the portion of a receiving water's loading capacity that is attributed either to one of its existing or future nonpoint sources of pollution or to natural background sources. Load allocations are best estimates of the loading, which may range from reasonably accurate estimates to gross allotments, depending on the availability of data and appropriate techniques for predicting the loading. Wherever possible, natural and nonpoint-source loads should be distinguished.

Minimum Control Level: The pollutant load that a point-source buyer must first meet before buying credits to meet the facility's Technical-Based Effluent Limit (TBEL). This pollutant load is either the TBEL specified in a permit or the current discharge level as defined by a Permittee's MS4 SWPPP at the time of first engaging in a WQT activity and updated periodically as additional treatment is added on site, depending on which is more stringent.

Municipal Separate Storm Sewer System (MS4) Permit: A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) that is: (i) Owned or operated by a state, city, town, borough, county, parish, district, association, or other public body (created to or pursuant to state law), including special districts under state law, such as a sewer district, flood control district, drainage district, or similar entity; an Indian tribe or an authorized Indian tribal organization; or a designated and approved management agency under Section 208 of the CWA that discharges into waters of the United States; (ii) Designed or used for collecting or conveying stormwater; (iii) Not a combined sewer; and (iv) Not part of a Publicly Owned Treatment Works (POTW) as defined in 40 CFR 122.2 (as defined in 40 CFR 122.26[b][8]).

National Pollutant Discharge Elimination System (NPDES) Permit: As defined in 33 USC § 1342.The NPDES permit program addresses water pollution by regulating point sources that discharge pollutants to waters of the United States.

Nonpoint Source: Diffuse sources of water pollution, such as stormwater and nutrient runoff from agriculture or forest lands. See 40 CFR § 35.1605-4. U.S. Environmental Protection Agency (EPA) guidance describes a nonpoint source as "including pollution caused by rainfall or snowmelt moving over and through the ground and carrying natural and human-made pollutants into lakes, rivers, streams, wetlands, estuaries, other coastal waters and ground water. Atmospheric deposition and hydrologic modification are also sources of nonpoint pollution."

Offsets: (1) (noun) Off-site treatment implemented by a regulated point source on upstream land not owned by the point source for the purposes of meeting its permit limit; (2) (noun) Load reductions that are purchased by a new or expanding point source to offset its increased discharge to an impaired waterbody; the second use is the more common use of the term offset (note that the EPA considers both offset types to be trading programs); (3) (verb) to compensate for.

Permittee: Any entity with a discharge approved or pending approval under a state or federally issued permit (e.g., NPDES permit). The Water Quality Trading program documents focus on providing certifiable methods, such as policies and protocols, for point-source permittees seeking or granted permission to purchase water quality credits as a means of permit compliance.

Persistent Bio-Accumulative Toxics (PBTs): Chemicals that are toxic, persist in the environment, and bioaccumulate in food chains and, thus, pose risks to human health and ecosystems. PBTs include aldrin/dieldrin, benzo(a)pyrene, chlordane, dichloro-diphenyl-trichloroethane (DDT) and its metabolites, hexachlorobenzene, alkyl-lead, mercury and its compounds, mirex, octachlorostyrene, polychlorinated biphenyls (PCBs), dioxins and furans, and toxaphene.

Point Source: As defined in 33 USC § 1362(14), a point source is any discernible, confined, and discrete conveyance, including but not limited to any permitted pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural stormwater discharges and return flows from irrigated agriculture.

Post-Project Performance: The estimated or measured pollution load associated with the post-project site conditions.

Program Administrator: The organization responsible for the operation and maintenance of a water quality trading program. Specific responsibilities of a program administrator may include defining credit calculation methodologies, protocols, and quality standards; project review; and credit registration.

Project: One or more BMPs or other activities that, taken together, are proposed for generating credits on a single site.

Operation and Maintenance Plan: The document that details (a) how the proposed credit generating actions will be designed and installed to meet BMP guidelines, including a description of the proposed actions, installation practices, anticipated timelines, restoration goals, and anticipated threats to project performance; and (b) how the project developer plans to maintain/steward the practice or action for the duration of the project life, keep the practice or action consistent with BMP guidelines, and report on that progress.

Project Life: The period of time over which a given BMP is expected to generate credits. The project life is typically also the minimum project protection period.

Project Review: The process of confirming that a credit generating project has completed certain elements that should help ensure that the project provides the water quality benefits it promises. Specifically, confirmation that project-site BMPs or credit generating activities and credits conform to the applicable quality standards required by a program administrator or regulator. This process includes: (1) an administrative review for documentation completeness and correctness; (2) technical review for quantification completeness and accuracy; and (3) confirmation of project implementation and/or performance.

Protocols: Step-by-step manuals and guidelines for achieving particular environmental outcomes. Protocols include the actions, sequencing, and documentation necessary to generate credits from eligible BMPs.

Public Funds Dedicated to Conservation: Funding targeted to support voluntary natural resource protection and/or restoration with a primary purpose of achieving a net ecological benefit through creating, restoring, enhancing, or preserving habitats. Examples include Farm Bill Conservation Title cost share and easement programs, EPA Section 319 grant funds, the U.S. Fish and Wildlife Service Partners for Wildlife Program, and state wildlife grants. Public loans intended to be used for capital improvements of public wastewater and drinking water systems (e.g., State Clean Water Revolving Funds and U.S. Department of Agriculture [USDA] Rural Development Funds), bond-backed public financing, and utility stormwater and surface-water management fees from ratepayers are not public funds dedicated to conservation. Public funds dedicated to conservation are often referred to as "cost share" and/or "matching funds."

Quantification Method: The quantification method (i.e., estimation method) is a scientifically based method for determining the load reduction associated with a given credit generating activity or BMP. Quantification methods can be grouped into three general types: predetermined rates/ratios, modeling, and direct monitoring.

Registration (of Credits): The process of assigning a unique serial number to a verified and certified credit that is entered into the registry.

Registry: A ledger that includes more project-specific information. In some WQT programs credit registries, or a summary of the registry acts as a mechanism for public disclosure of trading project documentation.

Technology-Based Effluent Limit (TBEL): As described in 33 USC § 1311(b)(1)(A)-(B), a permit limit for a pollutant that is based on the capability of a treatment method to reduce the pollutant to a certain concentration. TBELs for Publicly Owned Treatment Works (POTWs) are derived from the secondary treatment regulations (40 CFR § 133) or state treatment standards. TBELs for non-POTWs are derived from national effluent limitation guidelines, state treatment standards, or on a case-by-case basis from the best professional judgment of the permit writer.

Total Maximum Daily Load (TMDL): As defined in 33 USC § 1313(d)(1)(C) and 40 CFR § 130.2(i), as well as in relevant state regulations, a TMDL is the calculation of the maximum amount of a pollutant that a waterbody can receive and still meet applicable water quality standards (accounting for seasonal variations and a margin of safety), including an allocation of pollutant loadings to point sources (waste load allocations [WLAs]) and nonpoint sources (load allocations [LAs]).

Tracking: The process of following the status and ownership of credits as they are issued, used, retired, suspended, or cancelled.

Trade Ratio: A trade ratio is a numeric value used to adjust available credits for a seller or credit obligation of a buyer based on various forms of risk and uncertainty. Ratios are applied to account for various factors, such as watershed processes (e.g., attenuation), risk, and uncertainty— both in terms of measurement error and project performance, ensuring net environmental benefit, and/or ensuring equivalency across types of pollutants.

Trading Area: A geographic area within which credits can be bought and sold. A trading area should be defined ecologically where a pollution reduction in one part of a watershed can be linked to a water quality improvement at a point of compliance. Trading areas can also be defined to reduce the risk of localized water quality impairments or localized impacts.

Trading Framework: Watershed-level documents that contain details regarding trading processes and standards.

Trading Program: The general term used to describe the approach to trading taken by a state agency and/or water quality trading (WQT) stakeholders; the full range of policies supported by a state. Active trading programs have completed approved program designs and/or have completed transactions.

Trading Ratio (Delivery): A factor applied to edge-of-field pollutant loading estimates to account for additional losses in the overland flow transport before reaching the closest water resource.

Trade Ratio (Equivalency): The factor applied to pollutant reduction credits to adjust for trading different pollutants or different forms of the same pollutant.

Trade Ratio (Location): The factor applied to pollutant reduction credits when sources are directly discharging to a waterbody of concern that accounts for the distance and unique watershed features (e.g., hydrologic conditions) that will affect pollutant fate and transport between trading partners.

Trade Ratio (Retirement): A factor applied to pollutant reduction credits to accelerate water quality improvement. The ratio indicates the proportion of credits that must be purchased in addition to the credits needed to meet regulatory obligations. These excess credits are taken out of circulation (retired) to accelerate water quality improvement.

Trade Ratio (Uncertainty): The factor applied to pollutant reduction credits generated by nonpoint sources that accounts for a lack of information and risk associated with BMP measurement, implementation, and performance.

Units of Trade: The quantity of tradable pollutants, typically expressed in terms of pollutant load per unit time, at a specified location (e.g., pounds per year at the point of concern).

Waste Load Allocation (WLA): As defined in 40 CFR § 130.2(h), this portion of a receiving water's loading capacity is allocated to one of its existing or future point sources of pollution. WLAs constitute a type of water quality-based effluent limitation.

Water Quality-Based Effluent Limit (WQBEL): As described in 33 USC § 1312(a), a WQBEL is an effluent limitation determined by selecting the most stringent of the effluent limits calculated using all applicable water quality criteria (e.g., aquatic life, human health, wildlife, translation of narrative criteria) for a specific point source to a specific receiving water for a given pollutant or based on the facility's waste load allocation from a TMDL.

Water Quality Credit Trading Management Plan/Trading Plan: Permittee-level trading details; the specific incorporation of trading elements into a permit or other binding agreement. A permittee's trading plan may incorporate the terms of relevant statewide trading guidance or a watershed trading framework by reference, or the trading plan may include all specific details within the permit itself.

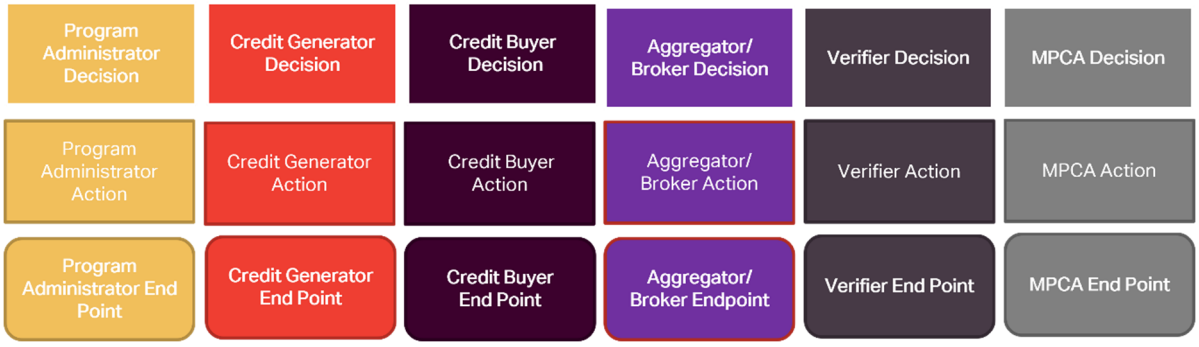
APPENDIX B

FLOW PATH

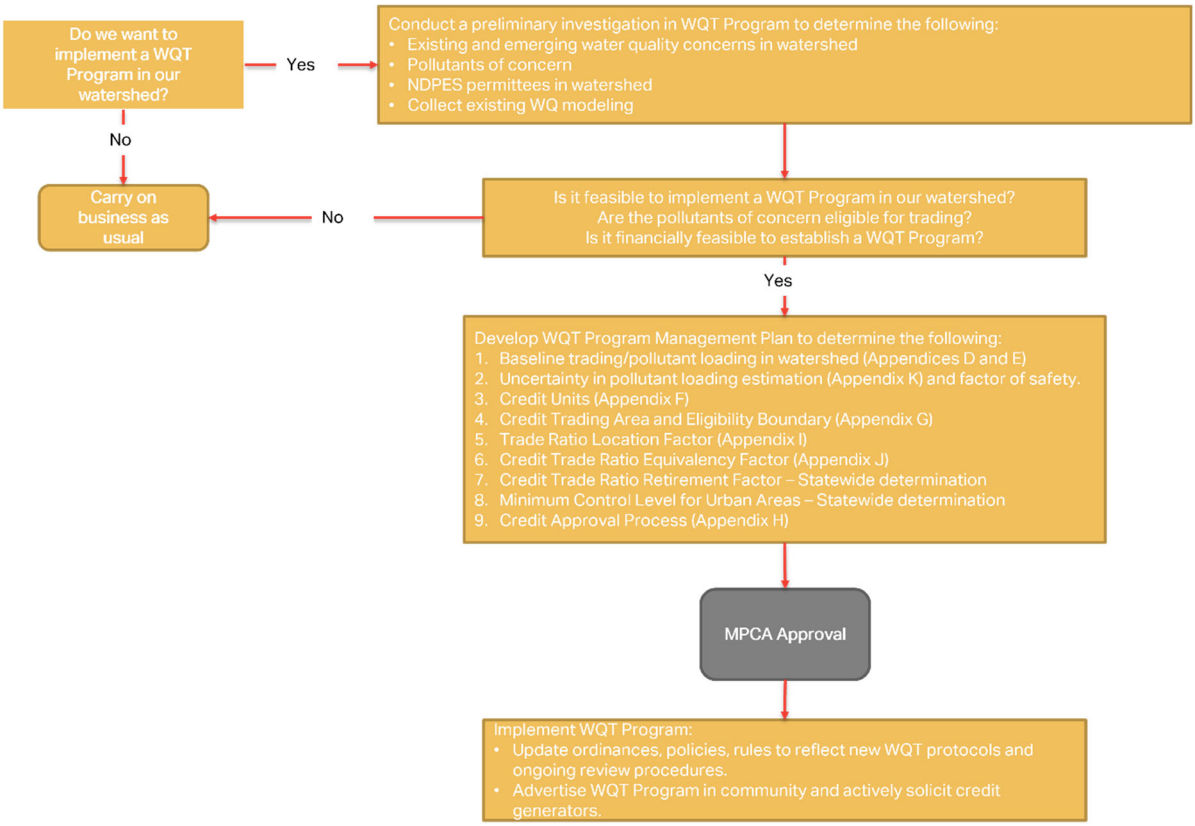
APPENDIX B: FLOW PATH

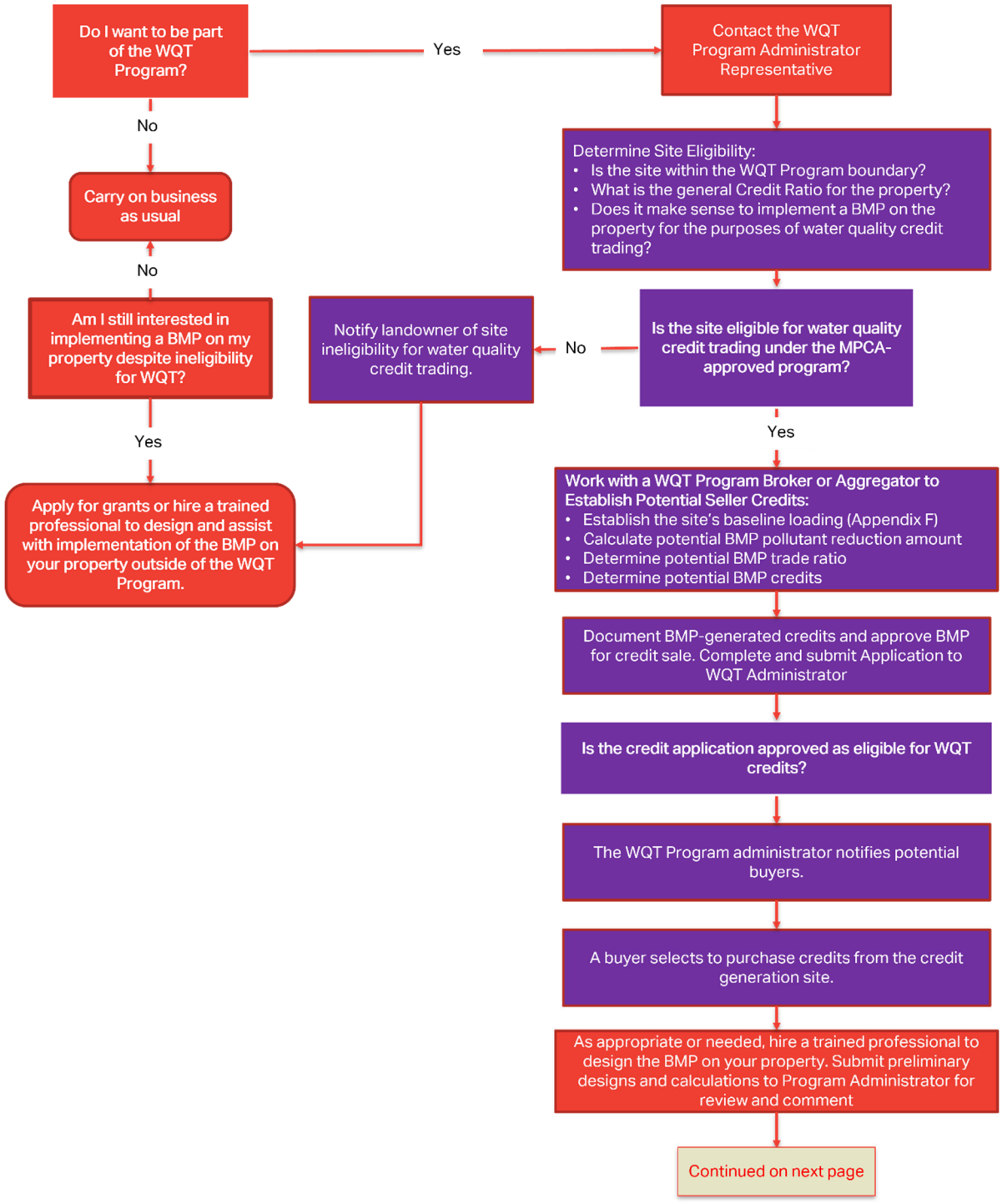
B.1 ACRONYMS AND DEFINITIONS

Aggregator/Broker	A third party that collects pollutant reduction credits from several producers to sell in bulk to permitted industrial and municipal facilities
BMP	Best management practice
Credit Buyer	National Pollutant Discharge Elimination System permittee
Credit Generator	A credit generator may be either a landowner interested in implementing a best management practice (BMP) on their property or an aggregator who has developed multiple BMPs on parcels of land for the purposes of credit generation
Credit Generation Site	The portion of private land that will be impacted and dedicated to the water quality BMP
Landowner	A private individual interested in implementing a BMP on their property
MPCA	Minnesota Pollution Control Agency
NPDES	National Pollutant Discharge Elimination System
PA	Program Administrator (Shell Rock River Watershed District)
O&M	Operation and maintenance
Verifier	A third party objective reviewer, knowledgeable in the site's land-use conservation sciences
WQT	Water Quality Trading



B.2 SITE ELIGIBILITY (APPLICATION)




Do I want to be part of the WQT Program?
Yes
Contact the WQT Program Administrator Representative
No
Determine Site Eligibility:
• Is the site within the WQT Program boundary?
• What is the general Credit Ratio for the property?
• Does it make sense to implement a BMP on the property for the purposes of water quality credit trading?
Carry on business as usual
No
Is the site eligible for water quality credit trading under the MPCA-approved program?
No
Notify landowner of site ineligibility for water quality credit trading.
Am I still interested in implementing a BMP on my property despite ineligibility for WQT?
Yes
Yes
Work with a WQT Program Broker or Aggregator to Establish Potential Seller Credits:
• Establish the site's baseline loading (Appendix F)
• Calculate potential BMP pollutant reduction amount
• Determine potential BMP trade ratio
• Determine potential BMP credits
Apply for grants or hire a trained professional to design and assist with implementation of the BMP on your property outside of the WQT Program.
Document BMP-generated credits and approve BMP for credit sale. Complete and submit Application to WQT Administrator
Is the credit application approved as eligible for WQT credits?
The WQT Program administrator notifies potential buyers.
A buyer selects to purchase credits from the credit generation site.
As appropriate or needed, hire a trained professional to design the BMP on your property. Submit preliminary designs and calculations to Program Administrator for review and comment
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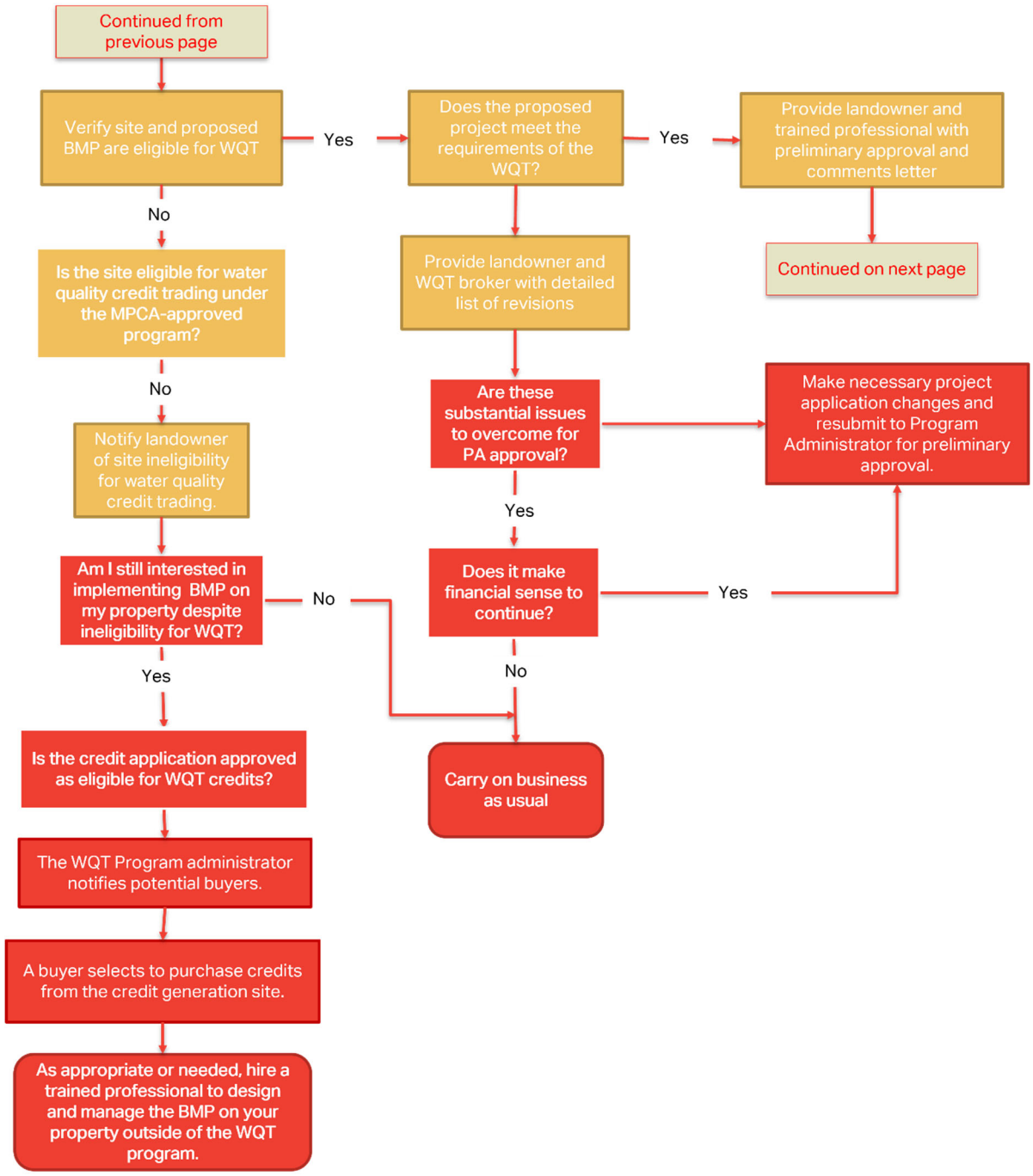
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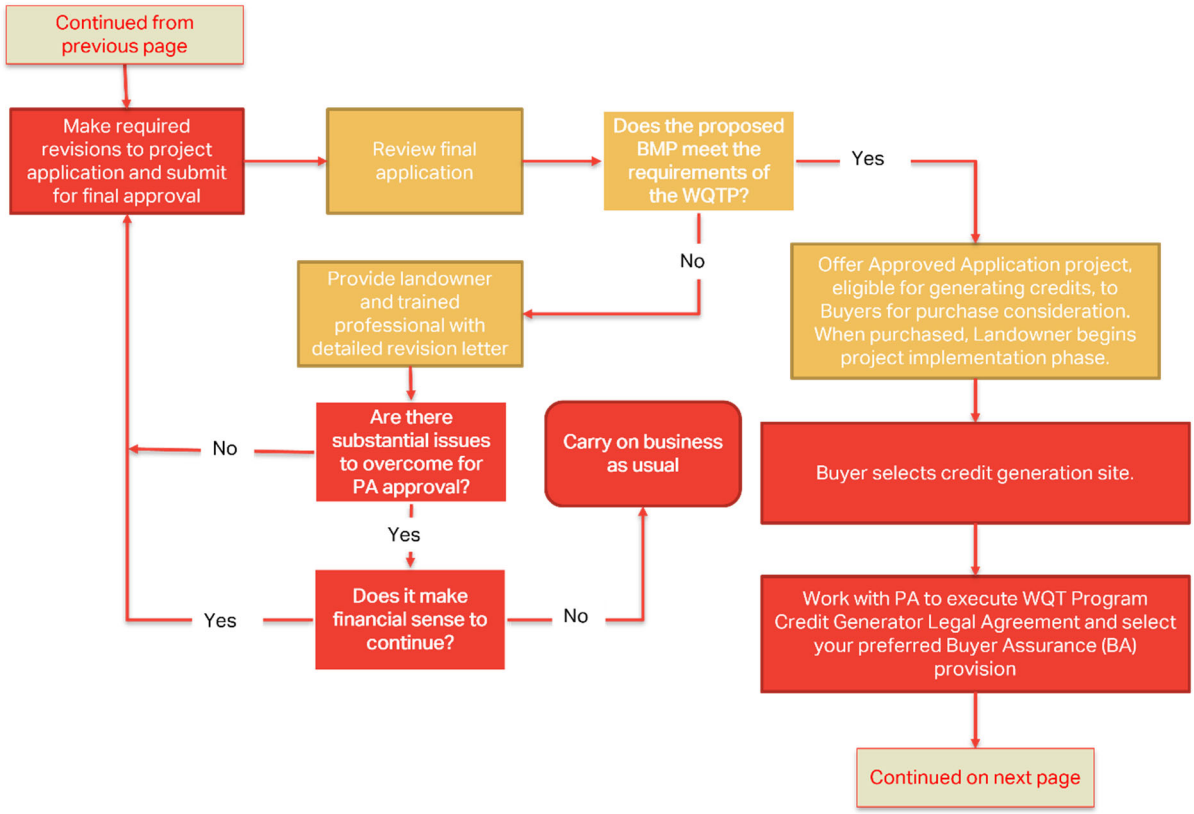
Verify site and proposed BMP are eligible for WQT
Yes
Does the proposed project meet the requirements of the WQT?
Yes
Provide landowner and trained professional with preliminary approval and comments letter
No
Provide landowner and WQT broker with detailed list of revisions
Continued on next page
Is the site eligible for water quality credit trading under the MPCA-approved program?
No
Are these substantial issues to overcome for PA approval?
Make necessary project application changes and resubmit to Program Administrator for preliminary approval.
Yes
No
Notify landowner of site ineligibility for water quality credit trading.
Am I still interested in implementing BMP on my property despite ineligibility for WQT?
No
Does it make financial sense to continue?
Yes
Yes
No
Is the credit application approved as eligible for WQT credits?
Carry on business as usual
The WQT Program administrator notifies potential buyers.
A buyer selects to purchase credits from the credit generation site.
As appropriate or needed, hire a trained professional to design and manage the BMP on your property outside of the WQT program.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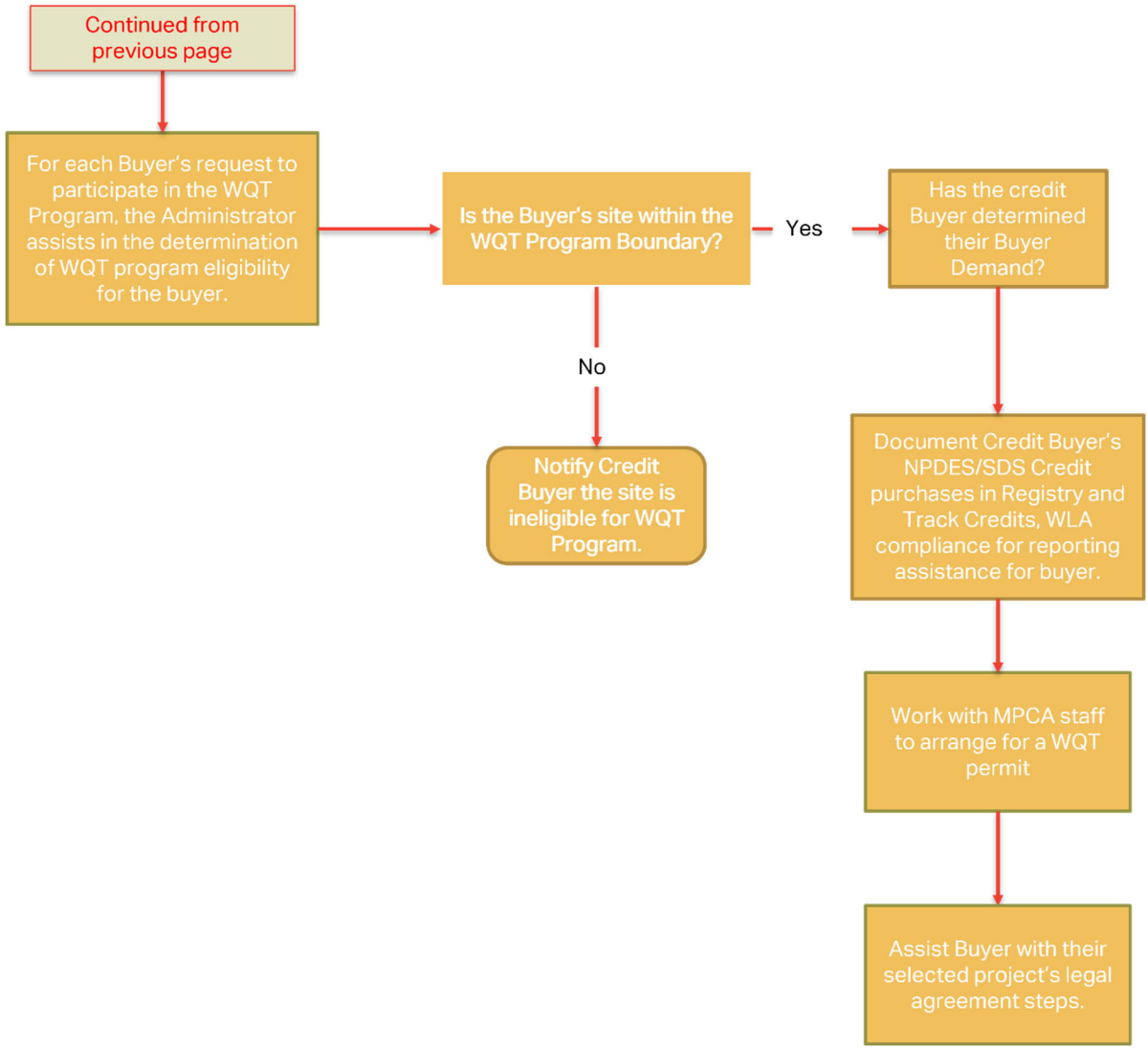
Make required revisions to project application and submit for final approval
Review final application
Does the proposed BMP meet the requirements of the WQTP?
Yes
No
Offer Approved Application project, eligible for generating credits, to Buyers for purchase consideration. When purchased, Landowner begins project implementation phase.
Provide landowner and trained professional with detailed revision letter
Are there substantial issues to overcome for PA approval?
No
Carry on business as usual
Buyer selects credit generation site.
Yes
Does it make financial sense to continue?
Yes
No
Work with PA to execute WQT Program Credit Generator Legal Agreement and select your preferred Buyer Assurance (BA) provision
Continued on next page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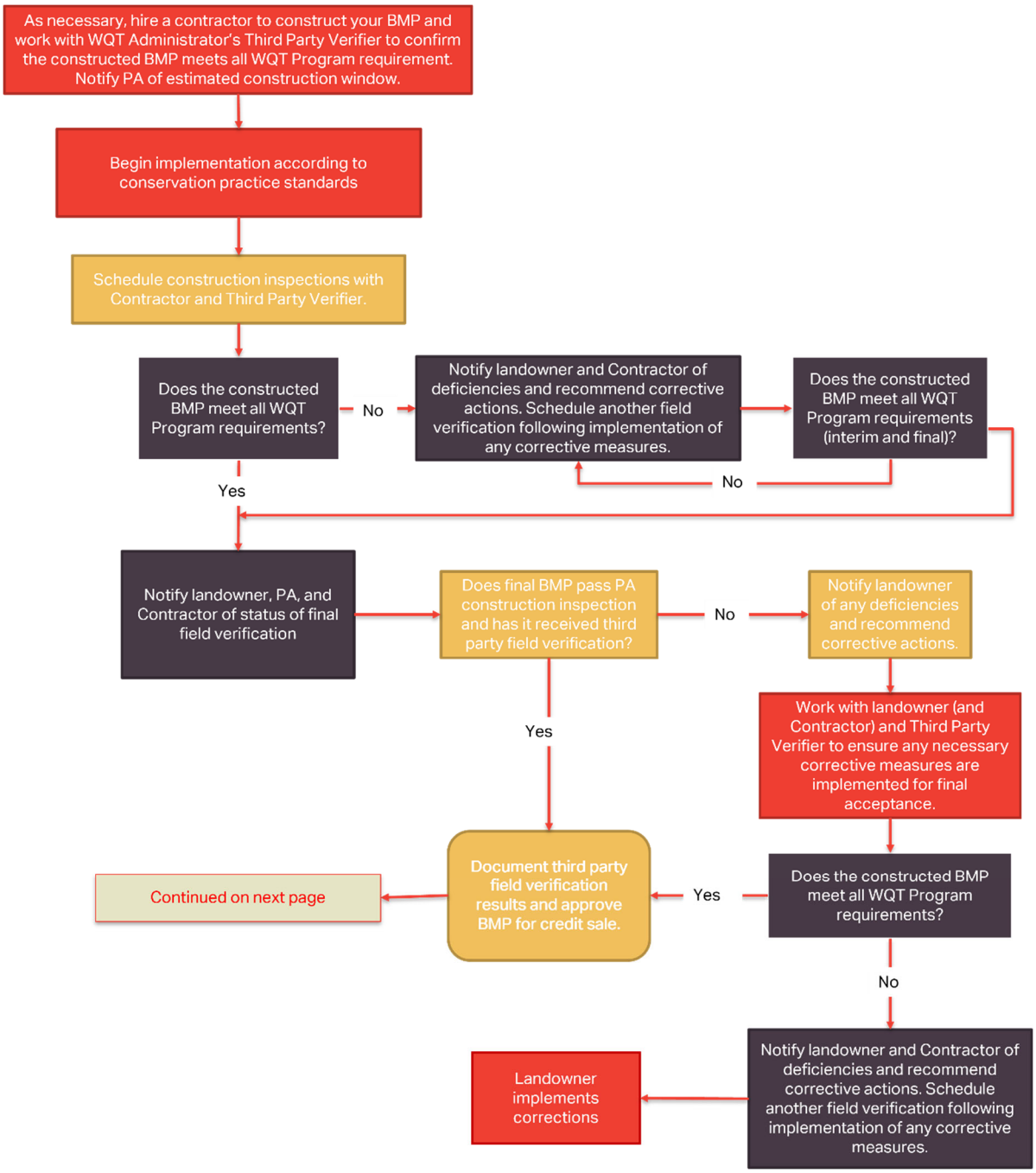
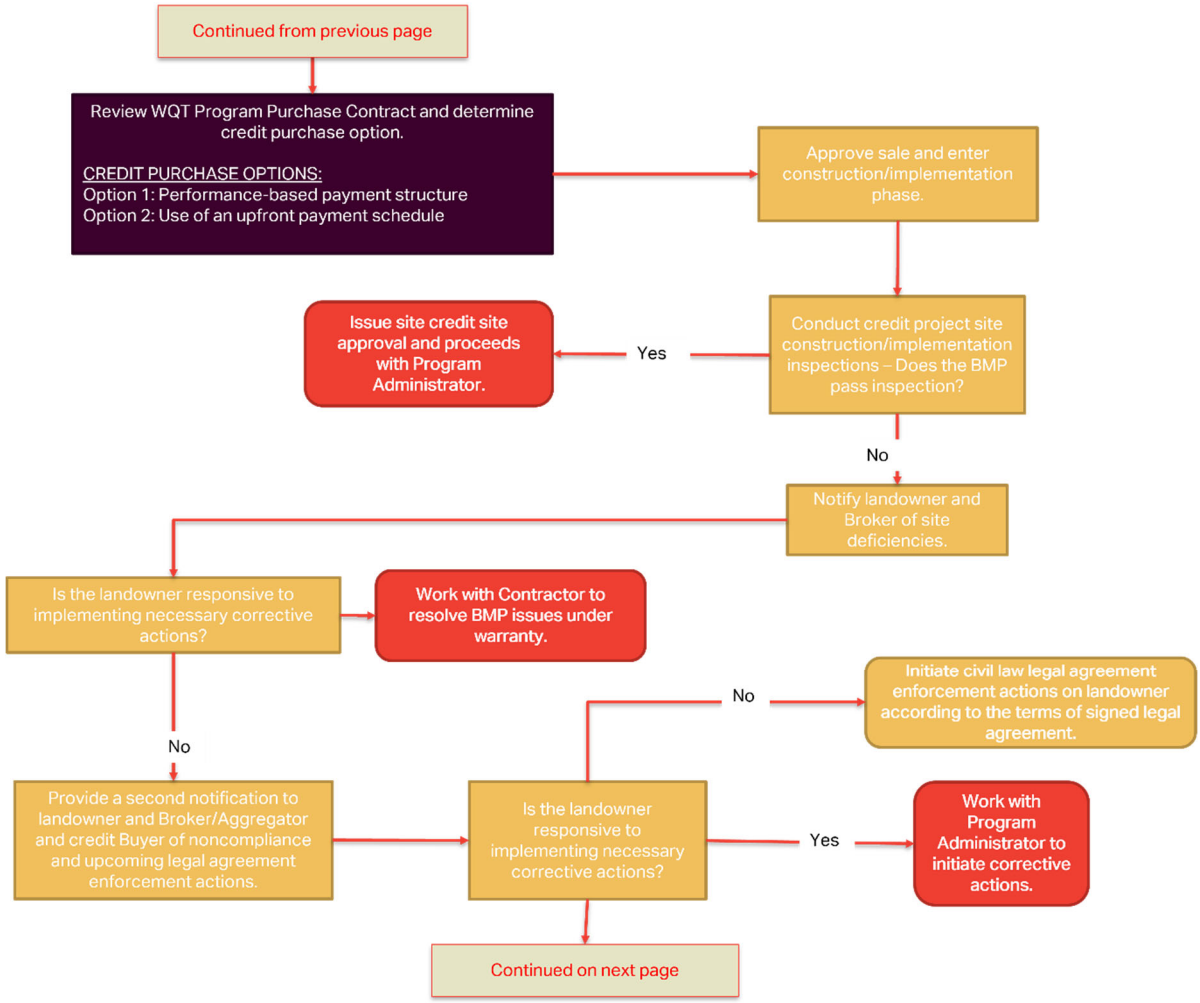
For each Buyer's request to participate in the WQT Program, the Administrator assists in the determination of WQT program eligibility for the buyer.
Is the Buyer's site within the WQT Program Boundary?
Yes
No
Notify Credit Buyer the site is ineligible for WQT Program.
Has the credit Buyer determined their Buyer Demand?
Document Credit Buyer's NPDES/SDS Credit purchases in Registry and Track Credits, WLA compliance for reporting assistance for buyer.
Work with MPCA staff to arrange for a WQT permit
Assist Buyer with their selected project's legal agreement steps.

B.3 FOLLOWING SPECS (CONSTRUCTION/IMPLEMENTATION)

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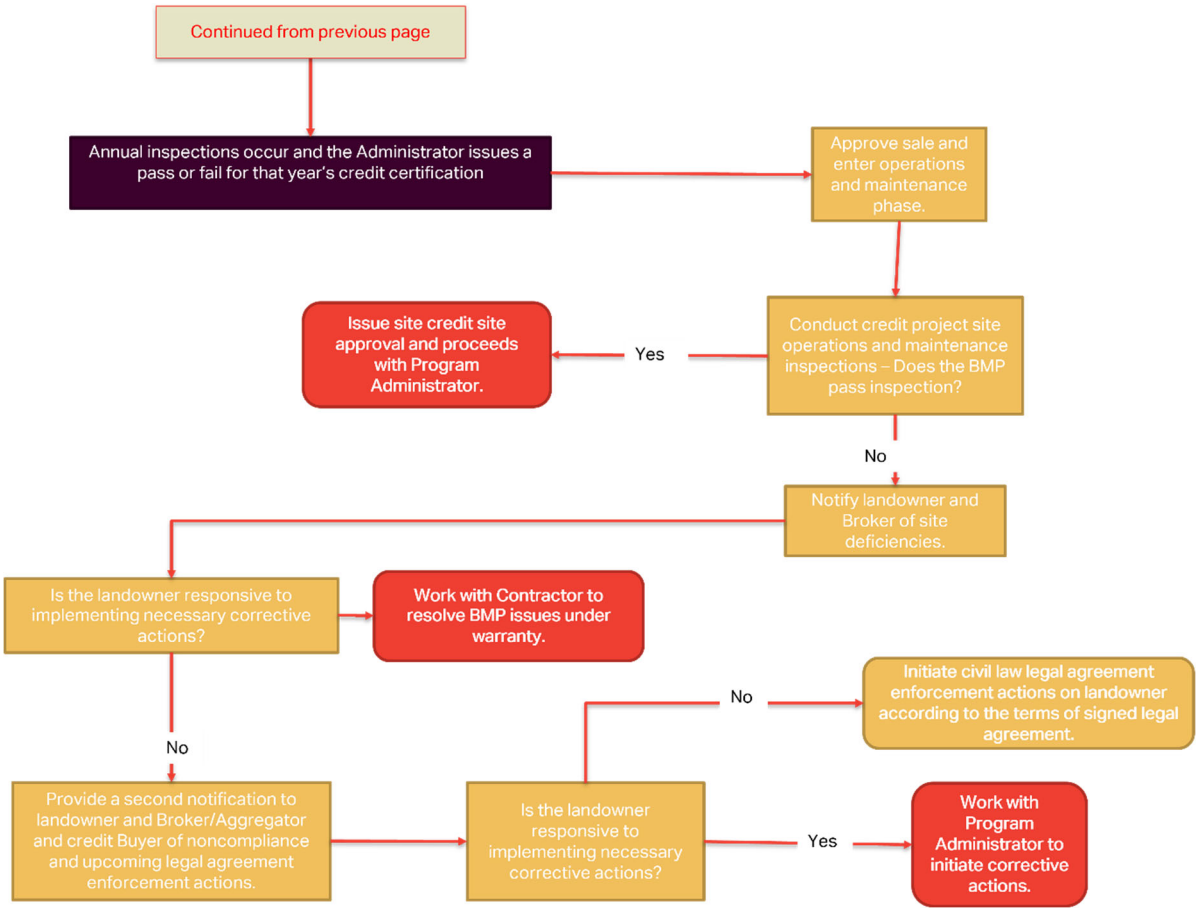
Review WQT Program Purchase Contract and determine credit purchase option.
CREDIT PURCHASE OPTIONS:
Option 1: Performance-based payment structure
Option 2: Use of an upfront payment schedule
Approve sale and enter construction/implementation phase.
Conduct credit project site construction/implementation inspections – Does the BMP pass inspection?
Yes
Issue site credit site approval and proceeds with Program Administrator.
No
Notify landowner and Broker of site deficiencies.
Is the landowner responsive to implementing necessary corrective actions?
Work with Contractor to resolve BMP issues under warranty.
No
Provide a second notification to landowner and Broker/Aggregator and credit Buyer of noncompliance and upcoming legal agreement enforcement actions.
Is the landowner responsive to implementing necessary corrective actions?
No
Initiate civil law legal agreement enforcement actions on landowner according to the terms of signed legal agreement.
Yes
Work with Program Administrator to initiate corrective actions.
Continued on next page

B.4 OPERATION AND MAINTENANCE (ANNUAL CREDITS)



APPENDIX C

CODE OF FEDERAL REGULATIONS

APPENDIX C: CODE OF FEDERAL REGULATIONS

The Code of Federal Regulations and state water quality rules pertain to Minnesota's National Pollutant Discharge Elimination System (NPDES) permit requirements that must be addressed by water quality trading program policies and protocols.

C.1 INTRODUCTION

The Clean Water Act (CWA) and supporting Code of Federal Regulations (CFR) provide the requirements for issuing a National Pollutant Discharge Elimination System (NPDES) permit that protects a water resource's beneficial uses. As a delegated authority of the CWA, the Minnesota Pollution Control Agency (MPCA) NPDES permitting staff follow both the CFR and Minnesota state rules that have been promulgated to protect Minnesota's water quality from point-source impacts. Because Water Quality Trading (WQT) is used as part of the NPDES permit compliance requirements, creating and using credits for WQT must also be accomplished in a manner that fulfills the regulatory requirements. This appendix identifies the CFR and Minnesota rules that govern NPDES permits that include WQT and explains how the Fountain Lake NPDES permit and supporting policies and protocols are established to protect water quality in a manner that achieves these requirements.

According to the January 13, 2003, U.S. Environmental Protection Agency (EPA) Water Quality Trading Policy [EPA, 2003], WQT program activities used wholly or in part to achieve effluent limit monitoring, reporting, and compliance must be governed as part of an NPDES permit. In 2019, the EPA issued a revised WQT Policy (2019 EPA WQT Policy) that discussed methods to improve on the 2003 EPA WQT Policy and make that policy more flexible; however, this policy did not alter the EPA WQT Policy's NPDES permit requirements as spelled out in the CWA, CFR, or state promulgated rules. A discharge from a new or existing NPDES permit that has selected to use WQT as part of the compliance approach must include the relevant and adequate provisions for trading in an NPDES permit. The CWA, CFR, and Minnesota administrative rules provide the requirements and delegated authority for the MPCA to issue all NPDES permits. Therefore, WQT cannot be used in a manner that impedes achieving the requirements stated in the CWA Sections 402 and 404; 40 CFR § 122 and applicable NPDES requirements of 40 CFR Parts 130, 131, 135, 405-471; and Minn. R. Ch. 7001, *Permits and Certifications*. These requirements include providing a permit public notice period and associated opportunities for comments and a public hearing.

The recommendations assembled for the WQT program framework in the Fountain Lake Phosphorus Stormwater WQT program pilot project include either requesting an overlay permit or if only one MS4 permittee is engaged the permittee can include the provisions of WQT to the SWPPP's required list of activities. The example provided in this pilot program provides a mock watershed general phosphorus NPDES overlay permit which governs how WQT will be operated and associated adjusted mass effluent limits for wastewater and stormwater NPDES permittees alike. Furthermore, those applying for coverage under this overlay permit will be eligible to use trading only as part of their compliance approach to meet the pending Total Maximum Daily Load (TMDL) phosphorus wasteload allocation (WLA) reduction requirements. This permit is a second permit for each NPDES permittee. Because all permits are fully reviewed and governed by the MPCA permitting program, all federal and state requirements will be managed appropriately. Permittees using WQT will meet the conditions of two

different permits; the first is a modified permit overseeing all non-phosphorus-related requirements, and the second is a watershed general phosphorus permit that describes an approved WQT program. The WQT framework description includes using standard methods, monitoring, reporting requirements, and each permittee's phosphorus effluent limits. For wastewater, the MPCA has issued numerous wastewater permits, and the structure and protocols for point-nonpoint trading for wastewater will remain relatively the same with the exception of including updated project-site evaluation methods and watershed-specific location factors. For stormwater trading, a Water Quality Trading Management Plan (WQT MP) will be submitted with the permit application request. The WQT MP will explain and state the proposed necessary trading elements, such as the eligible pollutant of concern, trade area, unit of trade, and each permittee's required level of treatment within the Municipal Separate Storm Sewer System (MS4). As such, the 2003 EPA WQT Policy specifically states that "EPA does not expect that an NPDES permit would need to be modified to incorporate an individual trade if that permit contains authorization and provisions for trading to occur and the public was given notice and an opportunity to comment and/or attend a public hearing at the time the permit was issued."

In addition, only loading reductions for the stated pollutant(s) of concern defined in the TMDL WLA(s) and WQT MP are eligible for trading. For wastewater facilities, a Municipal Wastewater Treatment Plant has Technology-Based Effluent Limits (TBELs) in place before a TMDL. Because a waterbody is impaired by the pollutant of concern, EPA-approved TMDL WLAs set new mass effluent limits, which are referred to as Water Quality-Based Effluent Limits (WQBELs). Permitted stormwater entities do not commonly have a concentration- or mass-based TBEL; rather, stormwater permittees use a Stormwater Pollution Prevention Plan (SWPPP) and a Maximum Extent Practicable (MEP) approach to justify a reasonable amount of stormwater treatment. When an EPA approved TMDL includes a stormwater WLA the use of MEP for the pollutant(s) of concern are replaced with quantification based tracking of attainment or progress towards attaining the WLA requirements.

Therefore, an evaluation of the SWPPP-stated urban discharge that considers both land-use loading and the SWPPP-based urban Best Management Practices (BMPs) is needed to determine the equivalent of a TBEL for stormwater. This equivalent TBEL discharged amount is referred to as a Minimum Control Level (MCL).

Using the MS4's current stormwater model or an MPCA commonly used model, the MCL evaluation process is used to estimate the mass loading discharged according to the SWPPP in place before the TMDL. (If the MS4 representatives prefer to use trading as part of their permit compliance approach in later cycles of the stormwater General Permit, the estimated loading for the last submitted SWPPP before using trading will be used to define the MCL.) The MCL's mass loading minus the TMDL WLA mass loading defines the maximum credit demand that the MS4 entity is eligible to use. The MS4 representatives can use trading or continue to implement urban BMPs based on their own site-by-site cost and policy determinations.

Because the MCL sets a numeric mass load as a threshold, the MCL is one of the factors that will be used when establishing antibacksliding requirements, which are further discussed in Section C.2.

For the other NPDES compliance requirements regarding antibacksliding, antidegradation, and preventing localized stream or lake standard violations, the WQT MP has policies in place that address

each phosphorus effluent requirement and specifically states the loading reductions achieved with urban BMPs and phosphorus reductions offset by WQT credits. This and other provisions for obtaining a permit will be addressed in their entirety in the General Fountain Lake Watershed Phosphorus Permit and accompanying WQT MP.

C.2 ANTIBACKSLIDING WATER QUALITY TRADING POLICIES AND PROTOCOLS

Antibacksliding WQT policies and protocols are stated in the CWA (Section 303[d][4] and Section 402[o]) andMinn. R. Ch. 7053.0275, *Antibacksliding*.

WQT activity use under the provisions spelled out in the Shell Rock River Watershed District's WQT MP for small MS4 NPDES permits complies with Minn. R. Ch. 7053.0275, *Antibacksliding*, which states:

> *Any point source discharger of sewage, industrial, or other wastes for which a national pollutant discharge elimination system permit has been issued by the agency that contains effluent limits more stringent than those that would be established by parts 7053.0215 to 7053.0265 shall continue to meet the effluent limits established by the permit, unless the permittee establishes thatless stringent effluent limits are allowable pursuant to federal law, under section 402(o) of the CleanWater Act, United States Code, title 33, section 1342.*

The Shell Rock River Watershed District's WQT MP approved policy structure for WQT activities also has the following provisions for eligibility that provide for antibacksliding compliance:

1. WQT conducted according to the WQT MP's list of small MS4 NPDES and wastewater permittees is only eligible to assist with NPDES permit compliance for pollutant parameters of concern that are listed as part of the approved TMDL WLA reduction goals for the following list of TMDLs:
    a. Shell Rock River Watershed TMDL.
2. The approved TMDL WLAs eligible in the WQT MP include the following list of impaired waters:
    a. Fountain Lake.
3. The approved TMDL WLAs eligible for future consideration in the WQT MP include the following list of impaired waters:
    a. Albert Lea Lake
    b. Shell Rock River.
4. The WQT MP has created an MCL for the pollutant(s) of concern for each small MS4 permittee, which will be continually maintained or exceeded by each participating small MS4 permittee.
5. WQT use is only eligible for offsetting discharged loadings between the MCL and the specific TMDL WLA, which is defined as the WQBEL.
6. The use of WQT credits and their credit generating implementation activities can only be reduced when combined with an equal or greater increase in the MS4 activities that implement urban water quality conservation practices.

C.3 ANTIDEGRADATION WATER QUALITY CREDIT TRADING POLICY FOR SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEM NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMITTEES

WQT use under the provisions spelled out in the Fountain Lake Shell Rock River Watershed District's WQT MP for small MS4 NPDES permits does not violate the Minn. R. Ch. 7050.0270 for antidegradation standards. This antidegradation compliance statement is supported and justified by considering the following approved WQT MP eligibility policy structures and how they are linked together to provide water quality protection. The WQT MP was created specifically for providing assurance that an appropriate use of WQT will take place. The list of salient WQT MP policies that provide antidegradation compliance is as follows:

1. WQT for the WQT MP list of small MS4 NPDES permittees is only eligible to assist with NPDES permit compliance for pollutant parameters of concern that are listed as part of the approved TMDL WLA reduction goals for the following list of TMDLs:
    a. Shell Rock River Watershed TMDL – The approved TMDL was created to restore designated beneficial uses by setting the pollutant ofconcern's allocation of loading that is necessary to achieve water quality standards.
2. The approved TMDL WLAs eligible in the WQT MP include the following list of impaired waters:
    a. Fountain Lake.
3. The approved TMDL WLAs eligible for future consideration in the WQT MP include the following list of impaired waters:
    a. Albert Lea Lake
    b. Shell Rock River.
4. The WQT MP has created an MCL for the pollutant(s) of concern for each small MS4 permittee that will be continually maintained or exceeded by each participating small MS4 permittee.
5. WQT use is only eligible for offsetting discharged loadings between the MCL and the specific TMDL WLA, which is defined as the WQBEL.
6. The WQT MP has designated eligible credit generation areas. The eligible area designation is based on an evaluation that determined which contributing watershed areas can generate credits without having the small MS4 permittees' discharge creating an exceedance of any local water resource's water quality standard. The approved evaluation has found that the local water resource's water quality standards will be protected when using WQT when there is no growth in the community's stormwater footprint or wastewater treatment facility's influent loading. In addition, using upstream credit generation will improve the water resource's water quality current conditions above the small MS4 permittees' discharge locations.
7. Minn. R. Ch. 7050.0255 Definitions. Subp. 23. Defines a "Loading offset" as the reduction in loading from regulated or unregulated activities that creates additional capacity for proposed net increases in loading. A loading offset must:
    a. Occur concurrently with or before the proposed net increase in loading
    b. Be secured with binding legal instruments between any involved persons for the life of the project that is being offset
    c. Occur either adjacent to or upstream of the proposed activity.

8. The list of above eligibility policies has been created to provide a program structure for appropriately using WQT to achieve pollutant loading reductions in a manner that achieves the Minn. R. Ch. 7050.0270 antidegradation standard. The Fountain Lake Shell Rock River Watershed District's WQT MP structure and WQT activities meet the antidegradation requirements for the water resources listed in Item 2 and the local water resources in the water of concern's contributing area. A review of sensitive waters and outstanding resource value waters (ORVWs) in the Shell Rock River Watershed resulted in no additional waterbodies identified.

The Minnesota Stormwater Manual contains a "Sensitive Waters and Other Receiving Waters" web page (https://stormwater.pca.state.mn.us/index.php/Sensitive_waters_and_other_receiving_waters). This web page provides maps that assist in identifying sensitive waters: those waterbodies that contain exceptional characteristics or unique resources designated as ORVWs (Minn. R. Ch. 7050.0335) that must be maintained and protected.

C.4 ADDRESSING LOCALIZED INSTREAM WATER QUALITY CRITERIA VIOLATIONS IN THE WATER QUALITY MANAGEMENT PLAN

EPA promulgated 40 CFR § 122.4 prohibitions and 40 CFR § 122.44 to prevent NPDES permitted discharges from causing or contributing to violations of water quality standards.

For protection against violations of water quality standards for the General Fountain Lake Watershed Phosphorus Permit's pollutant(s) of concern being traded, the program has provisions to address requirements of 40 CFR § 122.4, which specifically states:

No permit may be issued:

(a) …

(i) To a new source or a new discharger, if the discharge from its construction or operation will cause or contribute to the violation of water quality standards. The owner or operator of a new source or new discharger proposing to discharge into a water segment which does not meet applicable water quality standards or is not expected to meet those standards even after the application of the effluent

limitations required by sections 301(b)(1)(A) and 301(b)(1)(B) of CWA, and for which the State or interstate agency has performed a pollutants load allocation for the pollutant to be discharged, must demonstrate, before the close of the public comment period, that:

(1) There are sufficient remaining pollutant load allocations to allow for the discharge; and

(2) The existing dischargers into that segment are subject to compliance schedules designed to bring the segment into compliance with applicable water quality standards. The Director may waive the submission of information by the new source or new discharger required by paragraph (i) of this section if the Director determines that the Director already has adequate information to evaluate the request. An explanation of the development of limitations to meet the criteria of

this paragraph (i)(2) is to be included in the fact sheet to the permit under §124.56(b)(1) of this chapter.

Likewise, for protection against violations of water quality standards for the General Fountain Lake Watershed Phosphorus Permit's pollutant(s) of concern being traded, the program provisions also address 40 CFR § 122.44 which states:

In addition to the conditions established under § 122.43(a), each NPDES permit shall include conditions meeting the following requirements when applicable.

(a)(1) …

(d) Water quality standards and State requirements: any requirements in addition to or more stringent than promulgated effluent limitations guidelines or standards under sections 301, 304, 306, 307, 318 and 405 of CWA necessary to:

(1) Achieve water quality standards established under section 303 of the CWA, including State narrative criteria for water quality.

(i) Limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality.

(ii) When determining whether a discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above a narrative or numeric criteria within a State water quality standard, the permitting authority shall use procedures which account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant or pollutant parameter in the effluent, the sensitivity of the species to toxicity testing (when evaluating whole effluent toxicity), and where appropriate, the dilution of the effluent in the receiving water.

The General Fountain Lake Watershed Phosphorus Permit and accompanied WQT MP establish a program that uses upstream credit generation. Furthermore, the upstream credits generated are verified by using standard methods as set forth in the guidance document *The Water Quality Trading Toolkit*, which was assembled and published by the Association of Clean Water Administrators and the Willamette Partnership [2016]. The WQT MP protocols require using third-party objective verifiers before credits can be certified, which provides assurance that the credits are real, accountable, and enforceable. Because upstream credit generation is required by the eligible WQT trade area boundary, the permittee's discharged loading to the waterbody of concern is offset before the discharge of its phosphorus loads. If a future permittee requests to use downstream credit generation, then the Reasonable Potential Analysis procedure required in 40 CFR § 122.44, Item (d)(1)(ii) and all applicable items in 40 CFR § 122.44 will be used to verify that a reasonable potential does not exist to cause or contribute to an instream excursion or a state water standard narrative/numeric criterion. Figure C-1 illustrates the logic decision tree used to verify that the NPDES permit requirements referenced above are appropriately considered and addressed.

C.5 REFERENCES

Association of Clean Water Administrators and the Willamette Partnership, 2016. *The Water Quality Trading Toolkit*, prepared by the Association of Clean Water Administrators, Washington, DC, and Willamette Partnership, Portland, OR. Available online at *http://nnwqt.org/the-water-quality-trading-toolkit/*

U.S. Environmental Protection Agency, 2003. *Water Quality Trading Policy, January 13, 2003,* prepared by the U.S. Environmental Protection Agency, Office of Water, Washington, DC.

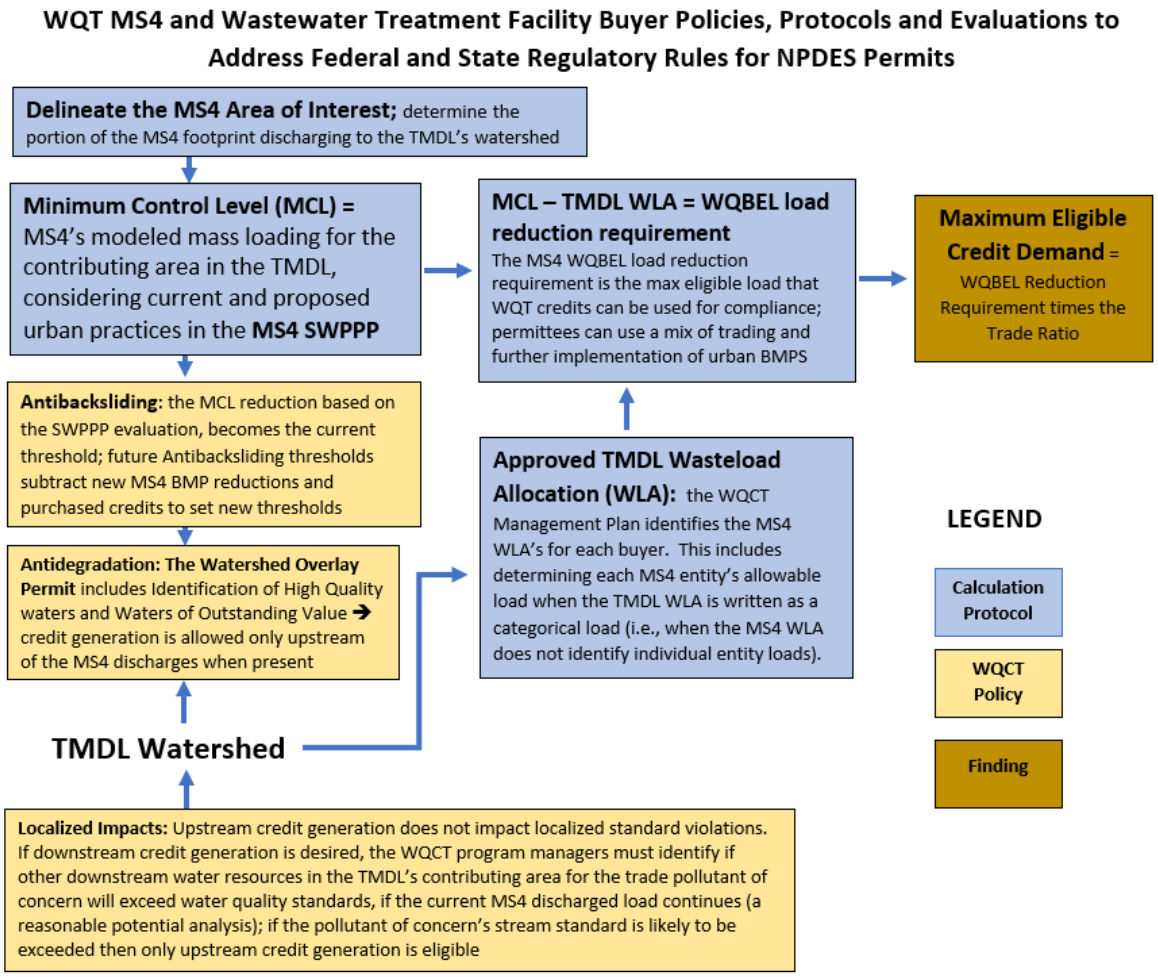


Figure C-1. A Brief Explanation for Decision Processes Used to Evaluate Water Quality Trading Programs' Attainment of Important National Pollutant Discharge Elimination System Permit Requirements That Are Required by the Clean Water Act, Code of Federal Regulations, and Minnesota Administrative Rules.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM AND STATE DISPOSAL SYSTEM PERMIT MNGXXXXXX

FOUNTAIN LAKE WATERSHED PHOSPHORUS GENERAL PERMIT

EXAMPLE TOPICAL REPORT RSI-3143

PREPARED FOR
Company Name
Street Name
Suite ####
City, State #####

JULY 2021

This overlay permit is an example overview of an overlay permit and salient requirements for water quality trading (WQT) programs that serve multiple buyers in the same watershed. If one stormwater buyer exists in the program, similar provisions can be added to the stormwater Storm Water Pollution Prevention Plan (SWPPP). Furthermore, in the Minnesota Pollution Control Agency (MPCA) 2021 Water Quality Trading Guidance document, the MPCA agrees to assist permittees interested in WQT for all permitting aspects of the process [Doucette et al., 2021].

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM AND STATE DISPOSAL SYSTEM PERMIT MNGXXXXXX

FOUNTAIN LAKE WATERSHED PHOSPHORUS GENERAL PERMIT

EXAMPLE TOPICAL REPORT RSI-3143

PREPARED BY
RESPEC
3824 Jet Drive
Rapid City, South Dakota 57703

PREPARED FOR
Company Name
Street Name
Suite ####
City, State #####

JULY 2021

This overlay permit is an example overview of an overlay permit and salient requirements for water quality trading (WQT) programs that serve multiple buyers in the same watershed. If one stormwater buyer exists in the program, similar provisions can be added to the stormwater Storm Water Pollution Prevention Plan (SWPPP). Furthermore, in the Minnesota Pollution Control Agency (MPCA) 2021 Water Quality Trading Guidance document, the MPCA agrees to assist permittees interested in WQT for all permitting aspects of the process [Doucette et al., 2021].

Project Number ####

GENERAL AUTHORIZATION TO DISCHARGE PHOSPHORUS TO THE FOUNTAIN LAKE WATERSHED (FREEBORN COUNTY) AND AUTHORIZATION TO TRANSFER TOTAL PHOSPHORUS FOUNTAIN LAKE TRADING UNITS

Issuance Date: Month Day, Year **Expiration Date: Month Day, Year**

The State of Minnesota, on behalf of its citizens, through the Minnesota Pollution Control Agency (MPCA), authorizes the Permittees covered by this Permit to discharge phosphorus to surface waters in the Fountain Lake Watershed (Watershed) in Freeborn County in accordance with the requirements of this Fountain Lake Watershed Phosphorus General Permit (FLWPG Permit).

The goal of this Permit is to protect the water quality of this Watershed in accordance with Minnesota and United States (U.S.) laws, statutes, regulations, and rules, including Minnesota Statute Chapters 115 and 116, Minnesota Rule Chapters 7001 and 7050, and the U.S. Clean Water Act.

This Permit is effective on the issuance date identified above. This Permit and the authorization to discharge contained herein expire at midnight on the expiration date identified above. Permittees listed in Appendix B are not authorized to trade or accumulate Fountain Lake Credits (FLCs) after the above expiration date. To receive authorization to discharge under this Permit and trade or accumulate Fountain Lake Trading Units (FLTUs) beyond the above date of expiration without interruption in permit coverage, Permittees listed in Appendix B must submit a Request for Notice of Intent for coverage under a general permit, any required fee, and such information and forms as required by the MPCA for coverage under the Fountain Lake Watershed Phosphorus General Permit to the MPCA no later than 180 days before the expiration date pursuant to Minn. R. Ch. 7001.0040 to 7001.0070 (2021). Expiration of this Permit will not affect an entity's ability to discharge phosphorus under the terms of an applicable National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) permit or general NPDES/SDS permit.

Signature Block

If you have questions regarding this Permit, please contact:
Contact Information (i.e., Agency, Section, Address, Phone, Fax, TTY)

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1.0 INTRODUCTION

This overlay permit is an example overview of an overlay permit and salient requirements for water quality trading (WQT) programs that serve multiple buyers in the same watershed. If one stormwater buyer exists in the program, similar provisions can be added to the stormwater Storm Water Pollution Prevention Plan (SWPPP). Furthermore, in the Minnesota Pollution Control Agency (MPCA) 2021 *Water Quality Trading Guidance* document, the MPCA agrees to assist permittees interested in WQT for all permitting aspects of the process [Doucette et al., 2021][1].

This Overlay Permit begins the implementation of the wasteload allocation (WLA) portion of the Fountain Lake Phosphorus Total Maximum Daily Load (TMDL). The TMDL addressed the violations of the eutrophication standards in Fountain Lake, including the lake phosphorus standard. The eutrophication impairment is caused, in part, by excessive phosphorus levels that generate algal blooms. Phosphorus is discharged to the Fountain Lake Watershed from wastewater treatment facilities (WWTFs), agricultural runoff, stormwater, and noncompliant individual sewage treatment systems. This Permit begins the implementation of the phosphorus reductions required by the TMDL for WWTFs and permitted municipal separate storm sewer system (MS4), Industrial Storm Water (ISW), and Construction Storm Water (CSW) entities. The other sources of phosphorus to the Minnesota River are being addressed outside of this permit. The phosphorus reductions for WWTFs will be implemented over a 5-year period. The phosphorus reductions for MS4s and ISWs will be implemented according to the compliance schedule written into the National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) permit or an NPDES/SDS General Permit SWPPP, and CSWs will complete the list of required Phosphorus TMDL items before permit coverage can be issued. The TMDL could be updated within the next 10 years, which may or may not alter the allowed phosphorus discharge limits.

This permit also establishes a phosphorus water quality trading program for Permittees in the Fountain Lake Watershed (Watershed). The trading program allows the Permittees flexibility to meet the assigned phosphorus limit listed in Appendix B while making progress toward the phosphorus reduction goal of the TMDL. The Watershed, as used in the remaining portion of this Permit, refers to the geographical area identified on the map in Appendix A.

[1] **Doucette, E., M. Graziani, B. Henningsgaard, A. Luckstein, and J. Peck, 2021.** *Water Quality Trading Guidance*, wq-gen1-15,prepared by the Minnesota Pollution Control Agency, St. Paul, MN.

2.0 AUTHORITY

This Permit is issued under the authority of Minn. Stat. Ch. 115 and 116, Minn. R. Ch. 7001 and 7050, and Section 401 of the Clean Water Act, Title 33, Part 1341.

3.0 AUTHORIZATION

1. This Permit authorizes the discharge of phosphorus to surface waters of the Fountain Lake Watershed, Freeborn County, Minnesota, from Permittees in accordance with the provisions of this Permit. All entities, including existing WWTFs, MS4s, ISWs, and CSWs in the Watershed, seeking to become Permittees must apply for and obtain coverage under this Permit.
2. This Permit authorizes the discharge of phosphorus from new and expanding WWTFs, MS4s, and ISWs to the Watershed in accordance with the provisions of this Permit. Any entity that intends to initiate, create, or originate a new or expanded discharge of phosphorus must first apply for and obtain permit coverage under an individual NPDES/SDS permit or general NPDES/SDS permit for the new or expanding discharge before applying for coverage under this Permit.
3. This Permit does not authorize the actual construction or modification of a new or existing WWTF, MS4 development, or ISW. Any entity intending to initiate, create, or originate a new or expanding WWTF must first apply for and obtain permit coverage under an individual NPDES/SDS permit for the new or expanding discharge before applying for cover under this permit. Any entities intending to expand within an MS4 footprint or extend a Municipal Storm Water footprint must follow the provisions of the Small Municipal Separate Storm Sewer Systems General Permit MNR040000 and applicable SWPPP requirements, including 24.3 and 24.4 related to modifications. New ISW discharges must first apply for and obtain permit coverage for that activity under the existing NPDES/SDS General Stormwater Associated with Industrial Activity Permit MNR050000. Expanding ISW Permittees must comply with all SWPPP modification requirements [Minn. R. Ch. 7090]. New construction sites that result in land disturbance of equal to or greater than 1 acre, or projects that are part of a common plan of development or sale that ultimately will disturb greater than 1 acre, that wish to trade must first apply for and receive coverage under the Construction Stormwater General Permit MNR100001.
4. This Permit does not authorize any discharge of a pollutant other than phosphorus. WWTFs, MS4s, ISWs, and CWSs should review the requirements in this Permit in addition to their individual NPDES/SDS permit or NPDES/SDS General Permit for a complete assessment of the applicable pollutant requirements.
5. This Permit authorizes pollutant trading of phosphorus to meet limits contained within this Permit. Chapter 7.0 of this Permit details the trading applicability and allowances provisions.
6. This Permit does not authorize pollutant trading to comply with phosphorus limits contained in an individual or applicable general NPDES/SDS permit.
7. This Permit does not authorize any backsliding in violation of state or federal regulations.
8. If a Permittee has an individual NPDES/SDS permit or another applicable general NPDES/SDS permit that contains phosphorus limits or monitoring requirements, the Permittee shall comply with all phosphorus limits and requirements contained in this Permit and their individual NPDES/SDS permit or general NPDES/SDS permit.
9. This Permit and the authorization to discharge contained herein expire at midnight on the expiration date identified above. Permittees listed in Appendix B are not authorized to trade or

accumulate Fountain Lake Credits (FLCs) after the above date of expiration. To receive authorization to discharge under this Permit and trade or accumulate FLCs beyond the expiration date of this Permit without interruption in permit coverage, Permittees listed in Appendix B must submit a request for Notice of Intent for coverage under a general permit, any required fee, and such information and forms as are required by the MPCA for permit coverage under the Fountain Lake Watershed Phosphorus General Permit to the MPCA no later than 180 days before the date of expiration pursuant to Minn. R. Ch. 7001.0040 to 7001.0070 (2005). Expiration of this Permit will not affect an entity's ability to discharge phosphorus under the terms of an applicable individual or general NPDES/SDS permit.

4.0 APPLICABILITY

The requirements of this Permit apply in addition to all applicable requirements of an individual WWTF NPDES/SDS permit or any applicable general NPDES/SDS permit. The specific requirements of this Permit are provided in the following list:

1. **Existing continuously discharging WWTFs that discharge directly to Fountain Lake, Freeborn County, or in the Watershed upstream of Shell Rock River (at or above River Mile XX.X) and its tributaries.** These WWTFs must comply with the following:
   a. Permittees with a calculated phosphorus discharge greater than 1,800 pounds per year listed in Appendix B must:
      i. Submit a Request for Notice of Intent to issue coverage in a general permit and receive coverage under Appendix B of this Permit
      ii. Meet the WWTF's phosphorus effluent limit listed in Appendix B according to the compliance provisions of Chapter 5
      iii. Monitor for phosphorus (influent and effluent) per the frequency listed in Appendix B.
2. **Expanding continuously discharging WWTFs (entities that apply for an increase in their hydraulic or organic capacity under their individual permit or undergo design and construction during the term of this permit).** These entities must comply with the following:
   a. Permittees in Appendix B are limited to the phosphorus mass loading listed in Appendix B.
3. **New continuously discharging WWTFs that discharge directly to Fountain Lake, Freeborn County, or in the Watershed upstream of Shell Rock River (at or above River Mile XX.X).** These WWTFs must:
   a. Apply for, and receive, an individual NPDES/SDS permit or general NPDES/SDS permit
   b. Submit a Request for Notice of Intent to issue coverage in a general permit and receive coverage under Appendix B of this Permit
   c. Offset through trading any mass of phosphorus discharged.
4. **Existing discharging permitted MS4s, ISWs, and CSWs that discharge directly to Fountain Lake, Freeborn County, or in the Watershed upstream of Shell Rock River (at or above River Mile XX.X).** These Permittees must comply with the following:
   a. Permittees listed in Appendix B must:
      i. Submit a Request for Notice of Intent to issue coverage in a general permit and receive coverage under Appendix B of this Permit
      ii. Meet their phosphorus effluent limit listed in Appendix B according to the compliance provisions of Chapter 5
      iii. Modify the appropriate Stormwater General Permit SWPPP to recognize that trading will be conducted under the Fountain Lake Watershed Phosphorus General Permit.

5.0 LIMITS AND COMPLIANCE DEMONSTRATION FOR PERMITTEES LISTED IN APPENDIX B

1. **Limits:** Individual NPDES/SDS and general NPDES/SDS Permittees shall meet the following phosphorus effluent limits:
    a. Except as provided below, Permittees listed in Appendix B must meet their individual Annual Mass Phosphorus Limit.
    b. All Permittees must also meet any applicable phosphorus limit listed in their individual NPDES/SDS permit or general NPDES/SDS permit.
2. **Exclusion From Annual Mass Phosphorus Limit:**
    a. Permittees who have executed a compliance agreement with the MPCA by Month Day, Year, which requires no discharge of phosphorus before expiration of this Permit, are not required to list their individual Annual Mass Phosphorus Limits in Appendix B.
    b. Permittees that are complying with the Fountain Lake Phosphorus TMDL WLA required limit as listed in their individual NPDES/SDS permit or General Stormwater NPDES/SDS SWPPP TMDL requirements, that are not participating in pollutant trading, and that have submitted a completed Exclusion From Annual Mass Phosphorus Limit Form to the MPCA Commissioner by April 30 of a calendar year, are excluded from their Fountain Lake Watershed Phosphorus General Permit Annual Mass Phosphorus listed limit, monitoring requirements, and reporting during that calendar year.
3. **Adjustments to WWTF Annual Mass Phosphorus Limit:** WWTF Permittees that engage in trading, either buying or selling, must adjust their Annual Mass Phosphorus Limit according to the trading provisions of Chapter 7.0 of this Permit.
4. **Compliance Demonstration With Limit:** Permittees are in compliance with their applicable phosphorus limit if they comply with the following:
    a. **For Annual Mass Phosphorus Limit listed in Appendix B** – the Permittee needs to comply with any annual mass phosphorus limits
    b. **For a WWTF Permittee not trading** – The WWTF Permittee's Actual Annual Phosphorus Discharge is less than or equal to its Annual Mass Phosphorus Limit
    c. **For a Stormwater Permittee not trading** – The Stormwater Permittee's authorized representative submits the stormwater modeling results and the authorized representative certification that the SWPPP plan and the SWPPP's fully implemented requirements have complied with their Fountain Lake Phosphorus TMDL.
    d. **For a Permittee participating in trading** – The Permittee's Actual Annual Phosphorus Discharge is less than or equal to its Final Adjusted Phosphorus Limit.

6.0 MONITORING AND REPORTING REQUIREMENTS FOR PERMITTEES LISTED IN APPENDIX B

1. **WWTF Monitoring:**
   a. Monitor facility influent and effluent for total phosphorus concentration at the frequency specified in Appendix B or the frequency specified in their individual NPDES/SDS permit or an applicable general NPDES/SDS permit, whichever is more frequent
   b. Measure flow continuously
   c. Sample at the location(s) specified in the Permittee's individual NPDES/SDS permit or general NPDES/SDS permit, as applicable
   d. Use 24-hour flow proportional composite samples for total phosphorus unless otherwise approved in writing by the Commissioner
   e. Use a laboratory certified by the Minnesota Department of Health for phosphorus analysis
   f. Use sample preservation and test procedures that conform to 40 Code of Federal Regulations (CFR) Part 136 and Minn. R. Ch. 7041.3200.
2. **NPDES/SDS Permitted Stormwater Entity Monitoring:**
   a. All Stormwater General NPDES/SDS monitoring requirements for the permitted facility/entity will be complied with as explained in the permit SWPPP.
   b. All credits generated from nonpoint-source (NPS) projects will be inspected, verified, and certified according to the Fountain Lake Water Quality Trading (WQT) program policies and protocols as documented in the accompanying Fountain Lake WQT Management Plan, Appendix K forms.
3. **WWTF Report:**
   a. **Fountain Lake Watershed Discharge Monitoring Report (FLWDMR).** The Permittee shall submit a monthly FLWDMR within 21 days after the end of each calendar month following permit issuance. The Permittee shall report monitoring results for the completed reporting period in the units specified by this Permit on a Fountain Lake Watershed Digital Monitoring Record (FLWDMR) form provided by the MPCA. A FLWDMR shall be submitted even if no discharge occurred during the reporting period or if the Permittee has received an exclusion from its annual Mass Phosphorus Limit.
   b. **Annual Compliance Report.** The Annual Compliance Report Form A – WWTF, or Annual Compliance Report Form B – Stormwater Permittee is required unless the Permittee has an exclusion from their Annual Mass Phosphorus Limit as allowed by Chapter 5.0, Item 2. By November 30, 20XX, and each November 30 thereafter, the Permittee shall submit to the Commissioner an Annual Compliance Report on a form provided by the MPCA. The annual compliance report is to certify how the Permittee achieved compliance with the phosphorus effluent limit listed in Appendix B of the Permit. In addition, if a Permittee is trading in 20XX or 20YY, the Permittee shall submit an Annual Compliance Report to the MPCA by November 30 of 20XX and 20YY as applicable. The Annual Compliance Report

shall include a copy of each Legal Contract to Trade and each NPS FLC Legal Agreement that the Permittee enters into.

c. **General Reporting Requirements:**

i. FLWDMRs and Supplemental Forms shall be submitted to:

MPCA
Attn: Discharge Monitoring Reports
520 Lafayette Road North
St. Paul, Minnesota 55155-4194

ii. Other reports required by this Permit shall be submitted by the date specified to:

MPCA
Attn: WQ Reports Submittal Center
520 Lafayette Road North
St. Paul, Minnesota 55155-4194

iii. **Required Signatures.** All FLWDMRs, forms, reports, and other documents submitted to the MPCA shall be certified and signed by the Permittee or the duly authorized representative of the Permittee per Minn. R. Ch. 7001.0150 (2005).

7.0 TRADING CONDITIONS

1. **Application.** Permittees or entities that intend to trade and are not yet listed in Appendix B must first submit a Notice of Intent to request for coverage under a general permit using a form provided by the MPCA and receive FLWPG Permit coverage.
2. **General Requirements.** The following requirements apply to all pollutant trading authorized by this FLWPG Permit:
    a. FLCs are the only commodity that may be traded under this FLWPG Permit.
    b. Only Permittees listed in Appendix B may trade FLCs under the authority of this FLWPG Permit.
    c. Permittees that are trading are required to use either the Legal Contract to Trade Form or NPS Credit Legal Agreements that are drafted and facilitate by Registered Lawyer(s) in the state of Minnesota, as applicable.
    d. Trades are not effective or valid, and Permittees' Annual Mass Phosphorus Limits will not be adjusted, until complete MPCA trade forms are received by the MPCA. For a Permittee's protection, all parties signing MPCA trade forms are encouraged to send those forms to the MPCA immediately.
    e. The equations in Appendix I must be used for trading calculations.
    f. When trade forms are completed, received, and recorded by the MPCA, a Buyer's Annual Mass Phosphorus Limit is adjusted upward and a Seller's Annual Mass Phosphorus Limit is adjusted downward according to the equations listed in Appendix I of this Permit.
    g. Permittees selling FLCs in 20XX or 20YY must use the trading baseline value listed in Appendix B to determine how many FLCs are available to sell. During this period, FLCs may only be sold for reductions made below the Permittee's trading Minimum Control Level (MCL) listed in Appendix B.
    h. Permittees that sell FLCs to any Permittee in 20XX, 20YY, or 20ZZ must use the Annual Mass Phosphorus Limit listed in Appendix B to determine how many FLCs are available to sell. Permittees shall use the equations listed in Appendix I when calculating this value.
    i. A Permittee may enter into more than one MPCA Legal Contract to Trade and NPS Credit Legal Agreement per year and may trade with more than one Permittee.
    j. A WWTF Permittee may both buy and sell FLCs during a calendar year.
    k. The MPCA is not a party to any Legal Contract to Trade or NPS Credit Legal Agreement.
    l. Permittees may only enter into Legal Contracts to Trade and NPS Credit Legal Agreements up to September 30 of the trading year.
    m. A Buyer's Trade Ratio for WWTF Permittees Generated FLCs listed in Part 1 of Appendix B is 1.1 to 1.
    n. A WWTF Buyer's Trade Ratio for NPS Credit Generation Sites is 2.6 to 1; a Stormwater Buyer's Trade Ratio for sheet and rill erosion and nutrient management corrections is 2.1 to 1; and 2.4 to 1 is the ratio for gully and streambank stabilizations.

o. Permittees must use the equations listed in Appendix I of this Permit when filling out a Legal Contract to Trade.

p. Permittees must use the quantification methods provided in the Fountain Lake WQT Management Plan, Appendix K forms.

q. Existing Permittees shall use the appropriate Fountain Lake Location Factor listed in Appendix B of this Permit.

r. New Permittees shall use the appropriate Fountain Lake Location Factor listed on the map in Appendix G.

8.0 GENERAL CONDITIONS OF THE PERMIT

PERMIT APPENDIX A

PERMIT COVERAGE MAP

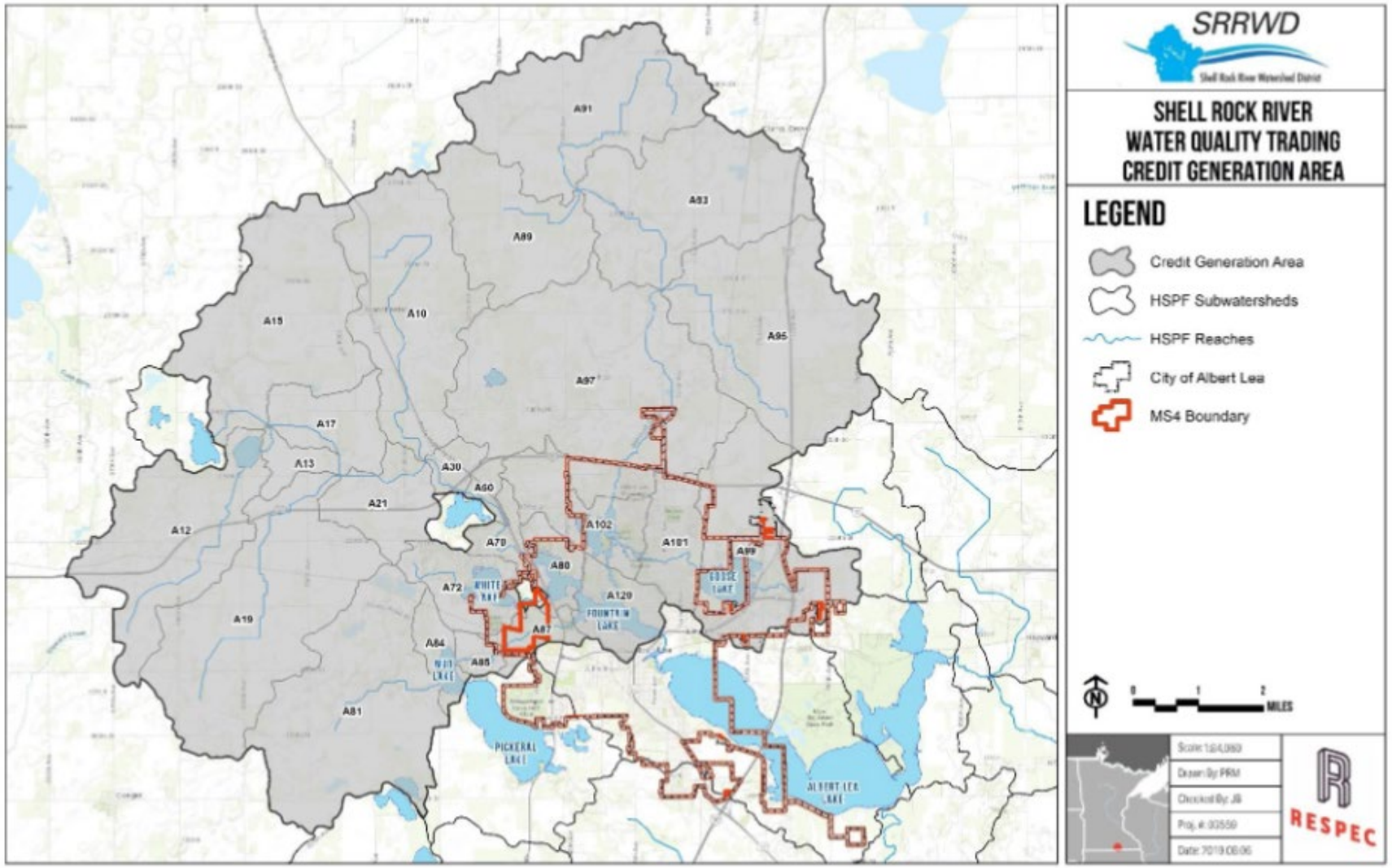

Figure P-A-1. Permit Coverage Map.

PERMIT APPENDIX B

CONTINUOUS DISCHARGE WASTEWATER TREATMENT FACILITIES, MUNICIPAL SEPARATE STORM SEWER SYSTEMS, INDUSTRIAL STORMWATER, AND CONSTRUCTION STORMWATER

PERMIT APPENDIX B: CONTINUOUS DISCHARGE WASTEWATER TREATMENT FACILITIES, MUNICIPAL SEPARATE STORM SEWER SYSTEMS, INDUSTRIAL STORMWATER, AND CONSTRUCTION STORMWATER

Appendix B lists Permittee wastewater treatment facilities (WWTFs) with calculated effluent phosphorus and stormwater modeled loads that are within the geographical area identified in Appendix A as the Fountain Lake credit generation area and city municipal separate storm sewer system (MS4) footprints directly discharging to Fountain Lake. The phosphorus limits listed in Tables B1 and B-2 specify the total phosphorus load permitted for each Permittee during the January 1 to December 31 calendar year. Limits are based on aggregate phosphorus reduction milestones for 20XX, 20YY, and 20ZZ from the Minimum Control Level (MCL) mass.

Table P-B-1. These Wastewater Treatment Facilities Have Received FLWPG Permit Coverage and Must Use a Trade Ratio of 1.1 to 1 When Trading With Other Wastewater Treatment Facilities and 2.6 to 1 When Buying Nonpoint-Source Generated Fountain Lake Credits

Permit No.	Permittee Name	Fountain Lake Watershed Permit Number	Individual NPDES Permit Number	Total Phosphorus Monitoring Frequency (samples per week)[a]	Fountain Lake Location Factor	Minimum Control Level (kg/yr)	Compliance Schedule Effluent Limit 2024[b] (kg/yr)	2025[b] (kg/yr)	2026[b] (kg/yr)	Year Compliance Scheduled to Achieve TMDL WLA
i	Example	MNG460001	MN00XXXXX	2	0.75	100	60	60	60	2024

(a) The monitoring frequency listed is applicable every month; monitoring is required during the entire permit term.

(b) Example compliance with newly approved Total Maximum Daily Load allocation. This limit may change based on an updated Fountain Lake phosphorus wasteload allocation.

Table P-B-2. These National Discharge National Pollutant Discharge Elimination System/State Disposal System Stormwater Permittees Have Received FLWPG Permit Coverage and Must Use a Trade Ratio of 1.1 to 1 When Buying From Wastewater Treatment Facilities, 2.4 to 1 When Buying Nonpoint-Source Generated Fountain Lake Credits Reducing Phosphorus With Nutrient Management or Sheet and Rill Erosion Projects, and 2.4 to 1 When Crediting Gully And Streambank Stabilization Sites

Permit No.	Permittee Name	Fountain Lake Watershed Permit Number	Individual NPDES Permit Number	Fountain Lake Location Factor	Minimum Control Level (kg/yr)	Compliance Schedule Effluent Limit 2026[a] (kg/yr)	Compliance Schedule Effluent Limit 2031[a] (kg/yr)	Compliance Schedule Effluent Limit 2036[a] (kg/yr)	Year Compliance Scheduled to Achieve TMDL WLA
i	Example	MNGSW460001	MN00XXXXX	0.50	100	90	80	70	2036

(a). Example of an MS4 SWPPP longer-term compliance schedule with measurable milestones.

PERMIT APPENDIX C

MAP OF CREDIT GENERATION AREA AND LOCATION FACTORS

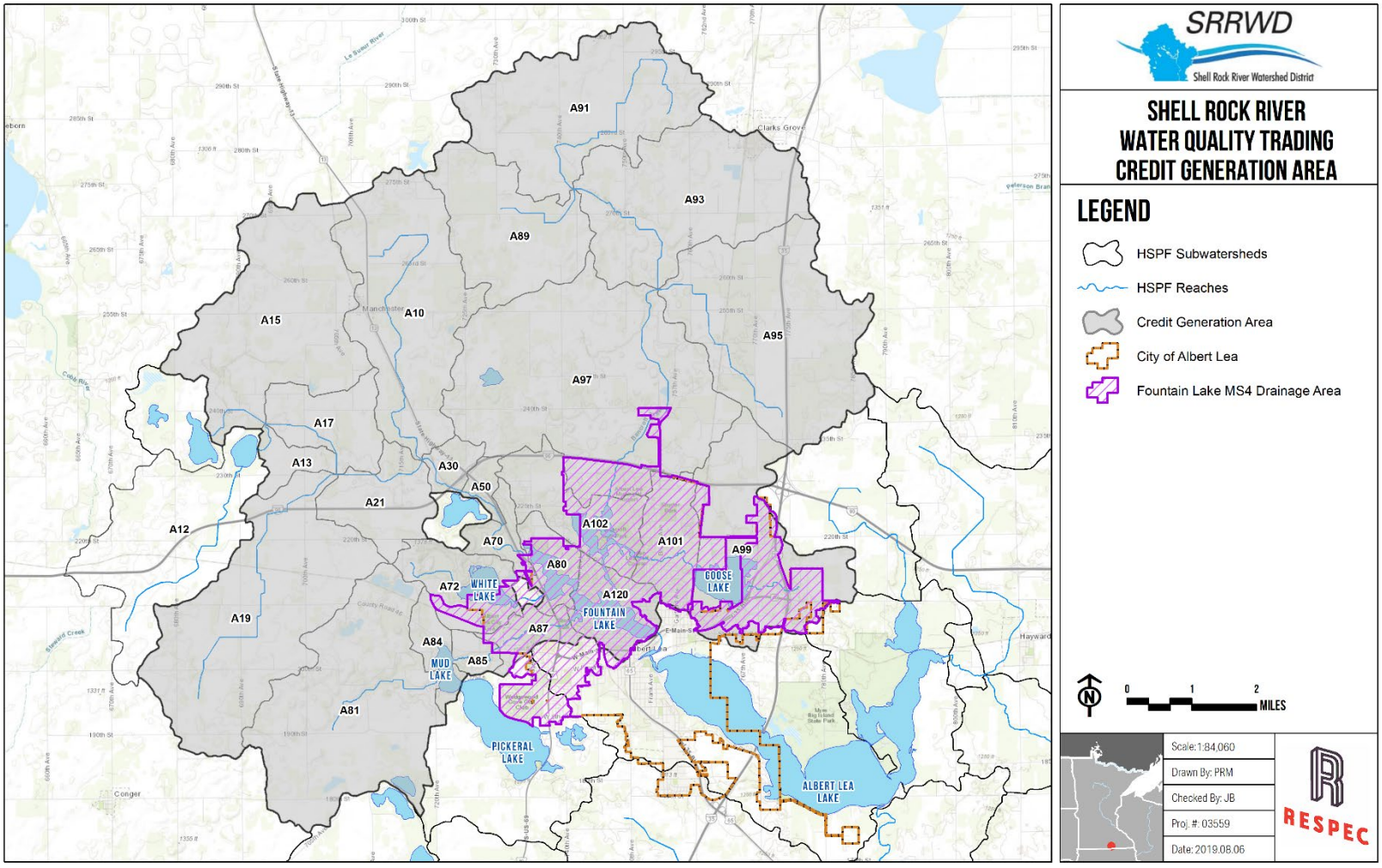

Figure P-C-1. Shell Rock River Water Quality Trading Credit Generation Area.

Table P-C-1. Location Factors for Phosphorus Indicated by 12-Digit Hydrological Unit Code

Reach	Total Phosphorus	
	HUC 12	Location Factor
A89	70802020101	0.75
A91		
A93		
A95		
A97		
A99		
A101		
A10	70802020102	0.79
A13		
A15		
A17		
A19		
A21		
A30		
A50		
A70		
A73	70802020104	0.86
A81		
A84		
A85		
A87		
A102	70802020101	1.00
A80	70802020104	
A120		

PERMIT APPENDIX D

EXAMPLE OF PERMIT DEFINITIONS

PERMIT APPENDIX D: EXAMPLE OF PERMIT DEFINITIONS

Annual Mass Phosphorus Limit means the maximum mass of phosphorus (measured in pounds) that a Permittee may discharge from its facility during the January 1 through December 31 period each year that the phosphorus limit is in effect under this Permit. This is a total facility discharge limit and is listed in Appendix B of this Permit.

Annual Mass Limit Adjustment means the amount (measured in pounds of phosphorus) that a Permittee's Annual Mass Phosphorus Limit is adjusted by buying or selling Fountain Lake Credits (FLCs). The Buyer's Annual Mass Phosphorus Limit is adjusted upward by FLCs purchased, except for the FLCs retired as required by the Trade Ratio. The Seller's Annual Mass Phosphorus Limit is adjusted downward by all FLCs sold to the buyer. including those required by the Trade Ratio. Appendix I of this Permit contains the equation used to determine this value.

24-Hour Flow Composite Sample is a composite sample taken over the operating hours of 1 day, including all cleanup.

Act means the U.S. Clean Water Act, as amended, 33 U.S. Code 1251 et seq.

Actual Annual Phosphorus Discharge means the actual mass of phosphorus discharged by an individual wastewater treatment facility (WWTF) (measured in pounds) during the calendar year. Appendix E of this Permit contains the equations used to determine this value.

Modeled Annual Phosphorus Discharge means the Urban Stormwater Model quantified results for mass of phosphorus discharged by a National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) permit General Stormwater Permitted entity (measured in pounds) during the calendar year. Appendix E of the permit contains the equations used to determine this value.

Fountain Lake Credits (FLCs) means the currency used for trading between Sellers and Buyers. An FLC takes into consideration the Buyer's or Seller's Fountain Lake Location Factor and credit generation-based Trade Ratio so that an FLC discharged by one facility has the same impact at Fountain Lake, Freeborn County, Minnesota, as an FLC discharged by another facility.

Minimum Control Level (MCL) Mass means the Annual Mass Discharge of Phosphorus that represents the average phosphorus discharged, for a specific individual facility, for each calendar year during 20XX and 20YY or another representative period if 20XX–20YY data were unavailable.

Buyer means a Permittee that has entered into a legal contract to purchase FLCs from another Permittee or Nonpoint-Source Credit Generator. The Buyer's Annual Mass Phosphorus Limit is adjusted upward by trading, according to the equations listed in Appendix E of this Permit, at the time the trade is recorded and thus made effective by the Minnesota Pollution Control Agency (MPCA).

Commissioner means the Commissioner of the MPCA.

Entities means the owner(s) of a facility that discharges phosphorus and is not yet covered by this Permit.

Expanding Facility means a Permittee or an entity that is increasing its design flow capacity after the date of issuance of this Permit.

Facility or **Facilities** means equipment, buildings, structures, process or production equipment, or machinery that form a permanent part of a discharge to surface waters of the Fountain Lake Watershed.

Final Adjusted Phosphorus Limit means the sum of the Permittee's Annual Mass Phosphorus Limit and all Mass Limit Adjustments. Appendix E of this Permit contains the equations used to determine this value.

General Permit means a permit issued under Minn. R. Ch. 7001.0210 to a category of Permittees whose operations, emissions, activities, discharges, or facilities are the same or substantially similar.

Individual Permit means an NPDES/SDS permit that has been issued to an individual Permittee. Individual Permit does not mean the Minnesota River Basin Phosphorus Permit.

Individual Trades means legal contracts exchanging FLCs between two Permittees, one Permittee, and a Nonpoint-Source Credit Generator.

Fountain Lake Location Factor means the factor used in trading to convert pounds of phosphorus discharged by a facility into FCLs. Fountain Lake Location Factors are calculated to compensate for changes in loading impacts to the lake related to spatial differences in the Watershed regarding temporary sequestration of pollutants.

Legal Contract or Legal Agreement means a written agreement between two or more parties creating obligations that are enforceable by law. To trade FLCs, Permittees must use the forms provided by the MPCA for WWTF Legal Contracts to Trade.

Limit Adjustment means the upward or downward adjustment of a Permittee's Annual Mass Phosphorus Discharge Limit (lb) based on the trades it makes.

MPCA refers to the Minnesota Pollution Control Agency.

National Pollutant Discharge Elimination System (NPDES) means the program for issuing, modifying, revoking, reissuing, terminating, monitoring, and enforcing permits under the Clean Water Act (Sections 301, 318, 402, and 405) and U.S. Code of Federal Regulations Title 33, Sections 1317, 1328, 1342, and 1345.

Permittee means facility owners covered by this Permit that have applied for and been granted coverage under this Permit by the MPCA.

Phosphorus always refers to total phosphorus.

Seller means a Permittee or Nonpoint-Source Credit Generator that has entered into a legal contract to sell FLCs to a Permittee. The WWTF Seller's Annual Mass Phosphorus Limit is adjusted downward by trading according to the equations listed in Appendix E of this Permit at the time the trade is recorded and thus made effective by the MPCA.

Total Phosphorus means the sum of all organic and inorganic forms of dissolved and particulate phosphorus in a sample.

Trade Ratio means the factor applied to the Buyer during the calculation for the exchange of FLCs. FLCs purchased by the Buyer for the Trade Ratio do not adjust the Buyer's Annual Mass Phosphorus Limit. Appendix E of this Permit indicates how this factor is applied.

Trading means buying or selling FLCs according to the provisions of this Permit.

PERMIT APPENDIX E

PERMIT EQUATIONS

PERMIT APPENDIX E: PERMIT EQUATIONS

E.1 PHOSPHORUS LIMITS

For Individual Permittees:

- Final Adjusted Phosphorus Limit (Buyer) **=** [Annual Mass Phosphorus Limit (lb) + Annual Mass Limit Adjustment (lb)]
  - Annual Mass Phosphorus Limit (lb) (see Appendix B)
  - Annual Mass Limit Adjustment (lb) **=** [(Total FCLs Purchased from Seller – FLCs Required for Trade Ratio)/Fountain Lake Location Factor of Buyer]
- *Final Adjusted Phosphorus Limit (Seller) =* [Annual Mass Phosphorus Limit (lb) – Annual Mass Limit Adjustment (lb)]
  - Annual Mass Phosphorus Limit (lb) (see Appendix B)
  - Annual Mass Limit Adjustment (lb) = [Total FLCs Sold/Fountain Lake Location Factor of Seller].

E.2 ACTUAL PHOSPHORUS DISCHARGE

For WWTF Individual Permittees:

- Actual Annual Phosphorus Discharge (lb) = (The Sum of Values Obtained for the Months of Year) = [Average Monthly Phosphorus Concentration of Effluent (mg/L) × Total Facility Flow During Month (million gallons) × 8.34]

E.3 FOUNTAIN LAKE CREDITS

- FLCs – WWTF: Available to Sell = [Pounds of Phosphorus Permittee is Under Its Annual Mass Phosphorus Limit (or MCL value, during 20XX and 20YY) × Fountain Lake Location Factor of Seller]
- FLCs Required by Trade Ratio = (10% of the Number of Pounds of Phosphorus Needed to Purchase to Adjust Permittee's Annual Mass Phosphorus Limit)
- FLCs Required by Trade Ratio for Nonpoint-Source Credit Generators = (260% of the Number of Pounds of Phosphorus Needed to be Purchased to Adjust Permittee's Annual Mass Phosphorus Limit)
- FLCs – Stormwater Permittees:

PERMIT APPENDIX F

FORMS

Exclusion Application

Exclusion from Phosphorus Limit, and Annual Compliance Report

Fountain Lake Watershed Phosphorus General Permit

Instructions: MNGXXXXXXX permittees should submit this form to the address listed below by April 30th if they qualify for an exclusion based upon the criteria identified below.

Any permitted wastewater treatment facility (WWTF) or stormwater discharger (i.e., Municipal Separate Storm Sewer System (MS4), Industrial and Construction) as listed in Appendix B of the Fountain Lake Watershed Phosphorus General Permit (FLWPG Permit) as of the date of issuance (i.e., Month Day, Year) is eligible to apply for an exclusion from their Annual Mass Phosphorus Limit and Annual Compliance Report requirements (Requirements) of the FLWPG Permit, provided they meet the conditions established in Chapter 5, subpart 2 of the FLWPG Permit.

The following are the two types of exclusion allowed in the FLWPG Permit:

A. **Compliance Agreement** – WWTF Permittees who have executed a compliance agreement with the MPCA by Month Day, Year, which requires a X.X mg/L phosphorus limit in the individual NPDES/SDS permit prior to expiration of this FLWPG Permit are excluded from the Requirements of this FLWPG Permit (identified above); and
B. **Annual Exclusion** – Permittees with a mass effluent limit in compliance with the Fountain Lake Phosphorus Total Maximum Daily Load Wasteload Allocation (TMDL WLA) in their individual WWTF NPDES/SDS permit, or their Stormwater Pollutant Prevention Program (SWPPP) for their stormwater general permits (i.e. MS4, Industrial or Construction Stormwater Permits) that are not participating in pollutant trading and have submitted a completed Exclusion Application From to MPCA Commissioner by April 30th of a calendar year are excluded from the Requirements (identified above) during that calendar year.

Permittees who qualify for and have submitted an exclusion application are still subject to all other applicable permit requirements of both their individual WWTF NPDES/SDS permit, or General Stormwater Permit for (MS4, Industrial or Construction General Stormwater), as well as the requirements of the FLWPG Permit. To apply for this exclusion, complete Exclusion Application Form and submit it to the following address: WQ Submittal Center, Minnesota Pollution Control Agency, 502 Lafayette Road North, St. Paul, MN 55155-4194.

Permittee Information

Permittee name: _____ FLWPG Permit No.: MNG _____

Type of exclusion (choose one): ☐ Compliance Agreement ☐ Annual Exclusion Year (yyyy) 20__

Certification and Signature

I certify under penalty of law that this document and any attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of persons, who manage the system, or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. I hereby apply for an exclusion from this facility's Annual Mass Phosphorus Limit, and Annual Compliance Report under the terms and conditions of the FLWPG Permit. I am

aware that this exclusion does not apply to any requirements listed in my facilities individual WWTF NPDES/SDS permit, Stormwater General Permit or any other applicable permit.

By typing/signing my name below, I certify the above statements to be true and correct, to the best of my knowledge, and that this information can be used for the purposes of processing this form.

Authorized Representative

Signature: _____ Title: _____

(This document has been electronically signed.) Date: (mm/dd/yyyy): _____

Annual Compliance Report – Form A

For Wastewater Treatment Facility Permittees

Fountain Lake Watershed Phosphorus General Permit

Date Received		
Month	Day	Year

Facilities which are listed as a Permittee in Appendix B of the Fountain Lake Watershed Phosphorus General Permit (FLWPG Permit) are required to submit an *Annual Compliance Report (*ACR) unless they have received an exclusion from their Annual Mass Phosphorus Limit (as allowed by Chapter 5, item 2 of the Permit). Use ACR - Form A (i.e. this form) if your facility *is a Wastewater Treatment Facility*. If your entity *has* a General Permit for Small Municipal Separate Storm Sewer Systems (MS4s), Industrial Stormwater or Construction Stormwater discharger you must submit the ACR – Form B instead of this form. The ACR must be submitted in each year in which the Permittee is subject to an Annual Mass Phosphorus Limit. For most Permittees, their Annual Mass Phosphorus Limit will become effective in 20XX; therefore, their first ACR must be submitted by November 30, 20XX. Attach (to this form) a copy of each Legal Contract to Trade, and each Nonpoint Source Credit Legal Agreement that this Permittee entered into for the year covered by this report. The terms used in this form have the same meaning and definitions as used in the Permit. Submit this form to: Water Quality Submittal Center, Minnesota Pollution Control Agency, 520 Lafayette Road North, St. Paul, MN 55155-4194.

General Information

Year Covered by Report (use one form per year)**:** _____

Permittee Name: _____

Fountain Lake Watershed Phosphorus General Permit Number: MNGXX _____

Annual Phosphorus Trade Registry

Provide the following information regarding the Permittee's purchase or sale of Fountain Lake Credits (FLCs). List every trade made for the calendar year of this report. Failure to submit all required information may result in an incorrect compliance determination. Attach additional pages as necessary.

Did this Permittee buy or sell Fountain Lake Credits which will adjust its 4-Month Mass Phosphorus Limit for the year covered by this report? ☐ Yes ☐ No If yes, list all such trades in the table below (Attach Additional Page(s) as Necessary). Be sure to attach a copy of all Legal Contracts to Trade and Nonpoint Source Credit Legal Agreements to this form.

Trade No.[1]	Trade Date[2]	Trade Partner Name[3]	Trade Partner ID[4]	Trade already reported?[5]
1				☐ Yes ☐ No
2				☐ Yes ☐ No
3				☐ Yes ☐ No

[1] Fill out a separate row of the table for each trade. Do not include trades which adjust the Permittee's limit in a year not covered by this report.

[2] Indicate the date that the Legal Contract to Trade or NPS Legal Agreement was finalized. This is the date of the last signature to the contract.

[3] Indicate the name of the entity with which the Permittee traded. The entity can be either an individual Permittee or a NPS Credit Generator.

[4] Provide the ID number of each WWTF trading partner, or Fountain Lake WQT Program Registry number for each NPS credit Generator. If the trading partner is a Permittee, provide their FLWPG Permit number (i.e. their MNG number).

[5] Indicate whether or not the trade has ALREADY been reported to the MPCA in this Permittee's approval process.

Certification and Signature

I certify under penalty of law that this document and any attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person, or persons, who manage the system, or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I specifically certify that this report indicates all Fountain Lake Credit trades made for the calendar year covered by this report. I am aware that I should begin planning on how I will meet my next year's 4-Month Mass Phosphorus Limit (if applicable). I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

_____ _____

Signature (Principal Executive Officer) Date

_____ _____

Printed name of person signing Title

Annual Compliance Report – Form B

For Permitted Stormwater Entities

Fountain Lake Watershed Phosphorus General Permit

Date Received		
Month	Day	Year

Facilities which are listed as a Permittee in Appendix B of the Fountain Lake Watershed Phosphorus General Permit (FLWPG Permit) are required to submit an *Annual Compliance Report (*ACR) unless they have received an exclusion from their Annual Mass Phosphorus Limit (as allowed by Chapter 5, item 2 of the Permit). Use ACR - Form A if your facility *is a Wastewater Treatment Facility*. If your entity *has* General Permit for Small Municipal Separate Storm Sewer Systems (MS4s), Industrial Stormwater or Construction Stormwater discharger you must submit the ACR – Form B (i.e., this form). The ACR must be submitted in each year in which the Permittee is subject to a Annual Mass Phosphorus Limit. For most Permittees, their Annual Mass Phosphorus Limit will become effective in 20XX; therefore, their first ACR must be submitted by November 30, 20XX. Attach (to this form) a copy of each Legal Contract to Trade, and each Nonpoint Source Credit Legal Agreement that this Permittee entered into for the year covered by this report. The terms used in this form have the same meaning and definitions as used in the Permit. Submit this form to: Water Quality Submittal Center, Minnesota Pollution Control Agency, 520 Lafayette Road North, St. Paul, MN 55155-4194.

General Information

Year Covered by Report (use one form per year)**:** _____

Permittee Name: _____

Fountain Lake Watershed Phosphorus General Permit Number: MNGXX _____

Annual Phosphorus Trade Registry

Provide the following information regarding the Permittee's purchase or sale of Fountain Lake Credits (FLCs). List every trade made for the calendar year of this report. Failure to submit all required information may result in an incorrect compliance determination. Attach additional pages as necessary.

Did this Permittee buy or sell Fountain Lake Credits which will adjust its Annual Mass Phosphorus Limit for the year covered by this report? ☐ Yes ☐ No If yes, list all such trades in the table below (Attach Additional Page(s) as Necessary). Be sure to attach a copy of all Legal Contracts to Trade and Nonpoint Source Credit Legal Agreements to this form.

Trade No.[1]	Trade Date[2]	Trade Partner Name[3]	Trade Partner ID[4]	Trade already reported?[5]
1				☐ Yes ☐ No
2				☐ Yes ☐ No
3				☐ Yes ☐ No

[1] Fill out a separate row of the table for each trade. Do not include trades which adjust the Permittee's limit in a year not covered by this report.

[2] Indicate the date that the Legal Contract to Trade or NPS Legal Agreement was finalized. This is the date of the last signature to the contract.

[3] Indicate the name of the entity with which the Permittee traded. The entity can be either an individual Permittee or a NPS Credit Generator.

[4] Provide the ID number of each WWTF trading partner, or Fountain Lake WQT Program Registry number for each NPS credit Generator. If the trading partner is a Permittee, provide their FLWPG Permit number (i.e. their MNG number).

[5] Indicate whether or not the trade has ALREADY been reported to the MPCA in this Permittee's credit trade approval process.

Certification and Signature

I certify under penalty of law that this document and any attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person, or persons, who manage the system, or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I specifically certify that this report indicates all Fountain Lake Credit trades made for the calendar year covered by this report. I am aware that I should begin planning on how I will meet my next year's Annual Mass Phosphorus Limit (if applicable). I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

_____ _____

Signature (Principal Executive Officer) Date

_____ _____

Printed name of person signing Title

Legal Contract to Trade
Form A

Date Received		
Month	Day	Year

Transfer of Fountain Lake Credits

Between Individual Wastewater Treatment Facility and Stormwater Permittees

Fountain Lake Watershed Phosphorus General Permit (Permit)

The terms used in this form have the same meaning and definitions as used in the Permit. This form must be signed by both Permittees to be valid. As stated in the Permit, Permittees may only enter into Legal Contracts to Trade up to December 31th of the trading year. Submit this form to: Water Quality Submittal Center, Minnesota Pollution Control Agency, 520 Lafayette Road North, St. Paul, MN 55155-4194 by November 30th of trading year.

Trade Information

Year of Fountain Lake Credit (FLC) Transfer (use one form per year): _____

SW Buyer Name: _____ **FLWPGP Permit No.:** _____

WWTF Seller Name: _____ **FLWPGP Permit No.:** _____

Buyer Information					Seller Information		
A. Upward Adjustment to Buyer's Annual Mass Phosphorus Limit (kg)	B. Buyer FLW Location Factor	C. FLCs Needed to Adjust Buyer's Annual Mass Phosphorus Limit	D. Buyer Trade Ratio	E. Total FLCs Purchased	F. Total FLCs Sold	G. Seller FLW Location Factor	H. Downward Adjustment to Seller's Annual Mass Phosphorus Limit (kg)
			1.1 : 1				

A - The buyer's chosen upward adjustment (kg) to its facility's Annual Mass Phosphorus Limit due to this trade. This value must be expressed as a whole number.
B – The buyer's FLW Location Factor as indicated in the Appendix B or C of the Permit.
C – Number of FLCs needed to adjust buyer's Annual Mass Phosphorus Limit (C=A*B).
D – Buyer Trade Ratio as required by Appendix B of the Permit.
E – Total number of FLCs required to adjust the buyer's Annual Mass Phosphorus Limit and for the Trade Ratio required by the Permit (E=C*D).
F – Total number of FLCs sold equals the number of FLCs purchased (F=E).
G – The seller's FLW Location Factor as indicated in Appendix B or C of the Permit.
H – The seller's downward adjustment to its facility's Annual Mass Phosphorus Limit due to this trade (H=F/G). This value must be a whole number (round up to nearest whole number if necessary).

Certification and Signatures

I certify under penalty of law that this document and any attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person, or persons, who manage the system, or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. The buyer agrees that its Annual Mass Phosphorus Limit will be adjusted upward as indicated in column A of the table above. The seller agrees that its facility's Annual Mass Phosphorus Limit will be adjusted downward as indicated in column H of the table above. Both parties agree to the terms of this form. I understand that this trade is not valid unless my facility is a Permittee of the Fountain Lake Watershed Phosphorus General Permit (MNGXXXXXXX). This Agreement shall be binding upon each party and its successors and assigns. If either party sells or otherwise conveys or assigns any of its right, title or interest in its facility, the conveyance shall not release the party from any obligation imposed by this Agreement, unless the party to whom the right, title or interest has been transferred or assigned agrees in writing to fulfill the obligations of this Agreement and the MPCA approves the transfer or assignment. The parties to this Agreement shall ensure the party's agents, contractors and subsidiaries comply with the terms and conditions of the Agreement.

_____ _____
Signature of Seller (Principal Executive Office) *Date*

_____ _____
Printed name of person signing *Title*

_____ _____
Signature of Buyer (Principal Executive Office) *Date*

_____ _____
Printed name of person signing *Title*

Instructions For

Legal Contract to Trade
Form A

Transfer of Fountain Lake Credits

Between Individual Wastewater Treatment Facility and Stormwater Permittees

Fountain Lake Watershed Phosphorus General Permit (Permit)

This form is required to be submitted to the MPCA for any trades of Fountain Lake Credits (FLCs) between individual Permittees of the **Fountain Lake Watershed Phosphorus General Permit (Permit).** Trades can only be made by facilities which are Permittees of the Permit. A copy of the trade form must be submitted to the MPCA by each party to the agreement. The trade is not valid until it is received by the MPCA.

1. Trade Information:

- *Facility Name and Permit Number (buyer and seller):* Fill in the facility name as listed in Appendix B of the Permit. If this facility is not listed in Appendix B of the Permit, fill in the name listed in the facility's individual or applicable general NPDES/SDS permit. Provide the facility's Permit ID from Appendix B of the Permit. If this facility does not have a Permit ID number, fill in the facility's ID number from its individual or applicable general NPDES/SDS permit.
- *Year of FLC Transfer:* Specify the year in which this trade will occur. A separate Legal Contract to Trade Form is required for each year in which the facility trades. A trade specified for a particular year may not be transferred to another year.

2. ***Trade Table:*** Trades result in the buyer's Annual Mass Phosphorus Limit to be adjusted upwards and the seller's Annual Mass Phosphorus Limit to be adjusted downwards according to the procedure specified by the Permit.
   - *Column A* – Indicate the mass in kilograms that the buyer wishes to increase its Annual Mass Phosphorus Limit due to this trade. For example, if a facility has a Annual Mass Phosphorus Limit of 0 kg listed in Appendix B of the Permit and it would like authorization to discharge 1000 kg during January 1st to December 31st of the specified year, it would indicate 1000 kg in column A of this table.
   - *Column B* - Indicate the Fountain Lake Watershed (FLW) Location Factor of the buyer in this trade. Existing facility's have their FLW Location Factor listed in Appendix B of the Permit. New facility's can determine their FLW Location Factor by consulting the map in Appendix C of the Permit. This factor is used in the calculation of the number of Fountain Lake Credits (FLCs) that the facility needs for the trade.
   - *Column C* – Calculate the number of FLCs that will be needed to increase the buyer's Annual Mass Phosphorus Limit by the amount requested in Column A. This value is equivalent to the value listed in column A multiplied by the value listed in column B.
   - *Column D* – List the Trade Ratio of the buyer (1.1:1).
   - *Column E* – Calculate the total number of FLCs that the buyer needs to purchase. This value is equal to the sum of the number of FLCs purchased to adjust the buyers limit upwards and the number of FLCs purchased for the Trade Ratio. This value can be calculated by multiplying the values in columns C and D. The difference between column E and column C is the number of FLCs required by the Permit for the trading program margin of safety.
   - *Column F* – List the number of FLCs sold by the seller. This is equivalent to the number of FLCs bought by the buyer (i.e. column F = column E).
   - *Column G* - List the Fountain Lake Watershed Location Factor of the seller. This factor is used to calculate the downward adjustment (in kg) to the seller's Annual Mass Phosphorus Limit. This value can be found in Appendix B or C of the Permit.
   - *Column H* – Calculate the downward adjustment (in kg) to the seller's Annual Mass Phosphorus Limit. This is equivalent to column F divided by column G.

3. Certification and Signatures:

- Both parties must sign and date this agreement for it to be a valid agreement. All signatures must be made by a responsible official. The MPCA is not a party to this agreement. A copy of this agreement must be recorded by each party. A copy of this agreement must be submitted to the MPCA by each party to this agreement. The terms used in this form have the meanings defined in the Permit. Permittees may enter into Legal Contracts to Trade up to September 30th of the trading year. This completed trade form must be submitted to the MPCA by November 30th of the trading year in order to be valid.

APPENDIX D

TRADING AREA DELINEATION EXAMPLE

APPENDIX D: TRADING AREA OF DELINEATION EXAMPLE

> *The trading area in a Water Quality Credit Trading (WQCT or trading) program is defined as a geographic area within which credits can be bought and sold. The basis of the trading area is that a pollutant reduction in one part of a watershed can be linked to a water quality improvement at a point of compliance. Trading areas can also be defined to reduce the risk of localized water quality impairments of localized impacts.* Adjusted from Association of Clean Water Administrators and Willamette Partnership [2016].

In practice, the trading area is the portion of the watershed (the area that drains to the waterbody of concern) that can provide real, cost-effective reductions to the waterbody of concern. The trading area may exclude areas draining to impoundments (including landlocked areas) or lakes that are known to (or are suspected to) have high attenuation rates for pollutants of concern. The trading area thus focuses on areas with higher location factors (i.e., areas with a high percentage of their loads reaching the waterbody of concern). Limiting the trading area to areas with higher contributing loads helps focus the WQT program on the areas of the greatest benefit and cost effectiveness.

Based on the condition of the receiving waters between the buyer's discharge point and the WQT water of concern, two trading area types are allowed. The first type is to only allow credit generation upstream of the buyer's discharge. This policy is explained in more detail in the NPDES WQT Policy Statement No. 2a (provided below). The upstream credit generation policy will work in every watershed that is appropriate to have a WQT program but may unnecessarily limit credit generation when the downstream waters (between the discharge and WQT water of concern) can receive and transport the buyer's discharged pollutant of concern loading without exceeding stream standards. If the waters between the buyer's discharge point and the WQT water of concern can accept the buyer's pollutant of concern loading without exceeding stream standards, then requesting approval for using NPDES WQT Policy Statement No. 2b is recommended. A WQT program structure must select NPDES WQT Policy Statement No. 2a or No. 2b for each buyer in the program. Most programs apply one policy or the other to every buyer in the program.

NPDES WQT Policy Statement No. 2a: Only upstream credit generation is allowed by this WQT program's framework and rules. The trading area will be defined as one of the two following options:

1. When the buyer's discharge location is into a river or stream reach that is upstream of the WQT program's water of concern, the credit generator's location must discharge into a location within the contributing area of the water resource at the point of the buyer's discharge.
2. When the buyer's discharge is into a water impoundment, the upstream contributing area includes all of the discharges into the water impoundment that are direct or by tributary transport. If the water impoundment has been formally identified to have segments (or bays) that respond to the pollutant of concern differently or are isolated from one another (e.g., different residence times are created because of water-mixing limitations), different segments of the impoundment may have different loading goals to achieve the water quality standard. In such cases, the impoundment segment that the buyer discharges into will be the endpoint location that the contributing area is delineated above.

NPDES WQT Policy Statement No. 2b: Downstream credit generation is allowed in the WQT program ["watershed" name here]. The watershed's water resources between credit buyers and the trading program's focus waterbody have been reviewed for having adequate assimilation capacity. The evaluation was completed by including the credit buyer's discharged loading without any benefit of credit offsets. All of these water resources have been found to not be at risk of exceeding water quality standards for the pollutant(s) being traded.

In watersheds with multiple buyers and upstream credit generation only, each NPDES permit has its own trading area. In larger watersheds with multiple tributaries, a buyer in one tributary will likely have a different eligible trading area than a buyer in a different tributary.

In most cases, the WQT trading area delineation for buyers directly discharging into an impaired segment will still include the drainage segment that the buyer discharges into as an eligible area for others to generate credits; in other words, if the discharge directly enters a stream reach that is impaired or will be impaired based on current loading plus the buyer's discharged loading, other credit generators within the stream reach's subwatershed are eligible to generate credits for that buyer.

D.1.1 TRADING AREA DELINEATION EXAMPLES

Examples of how trading areas are delineated using the NPDES WQT Policy Statements No. 2a (upstream credit generation) and No. 2b (downstream credit generation) are provided in the following sections.

D.1.2 STEPS TO DELINEATE UPSTREAM CREDIT GENERATION AREA (POLICY STATEMENT NO. 2A)

1. Determine the total watershed area that drains to the waterbody of concern.
2. Delineate areas upstream of key impoundments or lakes identified as (or suspected of) having high attenuation rates for the pollutant(s) of concern.
3. Remove areas identified in Step 2 from the trading area.

The Fountain Lake Watershed area was determined using the HSPF model subwatersheds of the rural areas and the XP-SWMM model subwatersheds for the urban MS4 areas around the city of Albert Lea, Minnesota. The project team requested that reaches with lakes that significantly reduce downstream loading be removed from the trading area; thus, the following drainage areas were removed:

1. Pickeral Lake
2. White Lake
3. School Section Lake
4. Hall Lake.

The result of this exercise is the map provide in Figure D-1.

D.1.3 STEPS TO DELINEATE DOWNSTREAM CREDIT GENERATION AREA (POLICY STATEMENT NO. 2B)

Downstream credit generation is not a component of the Shell Rock River Watershed Stormwater Quality Credit Trading Program. In all cases, early discussions with MPCA staff, regarding the

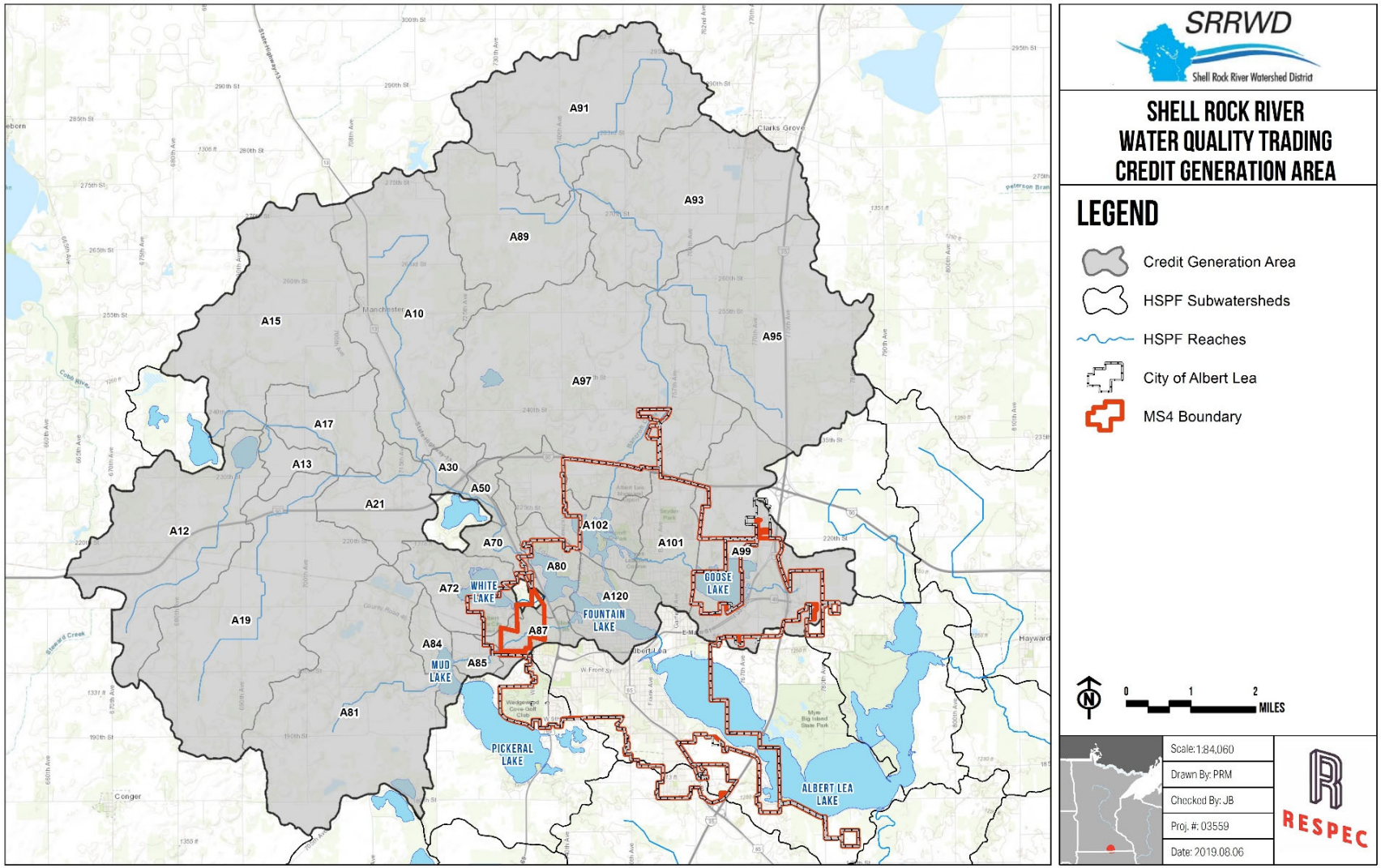

Figure D-1. Example of a Delineation of an Upstream Trading Area as Defined in the National Pollutant Discharge Elimination System Water Quality Trading Policy No. 2a.

appropriateness of downstream credit generation in the given watershed will be needed. If MPCA agrees that downstream credit generation is potentially viable, a request for their assistance for performing a Reasonable Potential Analysis is the next recommended step.

D.2 REFERENCE

Association of Clean Water Administrators and the Willamette Partnership, 2016. *The Water Quality Trading Toolkit*, prepared by the Association of Clean Water Administrators, Washington, DC, and Willamette Partnership, Portland, OR. Available online at *http://nnwqt.org/the-water-quality-trading-toolkit/*

APPENDIX E

TRADE RATIO (LOCATION)

APPENDIX E: TRADE RATIO (LOCATION)

Definition of Trade Ratio (Location):

> *The factor applied to pollutant reduction credits when sources are directly discharging to a waterbody of concern that accounts for the distance and unique watershed features (e.g., hydrologic conditions) that will affect pollutant fate and transport between trading partners* [Association of Clear Water Administrators, 2016].

E.1 DETERMINING THE TRADE RATIO (LOCATION) FACTOR FOR TOTAL PHOSPHORUS AND TOTAL SUSPENDED SOLIDS

The Trade Ratio (Location) factor is used to account for pollutant attenuation between any point of interest in the watershed and the waterbody of concern. For the Shell Rock River Watershed, the Trade Ratio (Location) factor was calculated for each HSPF subwatershed. Those subwatershed factors were merged as described below for each Hydrologic Unit Code 12 (HUC 12) watershed as related to Fountain Lake.

To develop the Trade Ratio (Location) factor, the Shell Rock River Watershed HSPF model was evaluated using the Scenario Application Manager (SAM) software. The HSPF model and SAM software are products that were developed by the MPCA and are supported on the RESPEC website. The SAM software, user tutorials, and SAM project files are available online (https://www.respec.com/sam-file-sharing/). HSPF total phosphorus and total suspended solid (TSS) reach loads and fate loads were output from the model by using SAM. The fate load is the load from each HSPF reach that makes it to the HSPF reach of concern; for the Shell Rock River Watershed WQT pilot trading program, the reach of concern is Fountain Lake. To calculate the Trade Ratio (Location) factor, the fate load for each HSPF subwatershed is divided by the local reach load; for example, Reach A89 has a local reach load of 1,790 pounds per year (lb/yr) and a fate load of 1,316 lb/yr of total phosphorus for a Trade Ratio (Location) factor of 0.735, or 73.5 percent of the subwatershed total phosphorus discharged load. The Trade Ratio (Location) factor is the fraction of the local reach load that makes it to the reach of concern. To aggregate these results for the HUC 12 watersheds, the sum of fate loads is divided by the sum of the local reach loads for all of the HSPF subwatersheds located in an HUC 12. Subwatershed areas draining directly to Fountain Lake were given a factor of 1.0.

The Trade Ratio (Location) factor was calculated at two spatial scales for both total phosphorus and TSS. The two spatial scales are the HSPF subwatersheds and HUC 12 watersheds. The choice of which scale is appropriate for a given application depends on multiple factors. For larger credit generation trading areas, the HUC 12 scale may be more appropriate to simplify the results by lumping larger areas together with one Trade Ratio (Location) factor. For smaller credit generation trading areas, the more detailed HSPF subwatershed scale may provide higher Trade Ratio (Location) factors for specific areas of concern that are more favorable to downstream trading. The decision will ultimately be guided by local knowledge of the specific WQT program.

The eligible credit generation trading area boundary in the Shell Rock River Watershed is shown by HUC 12 in Figures E-1 through E-2. High Trade Ratio (Location) factors are represented by darker-

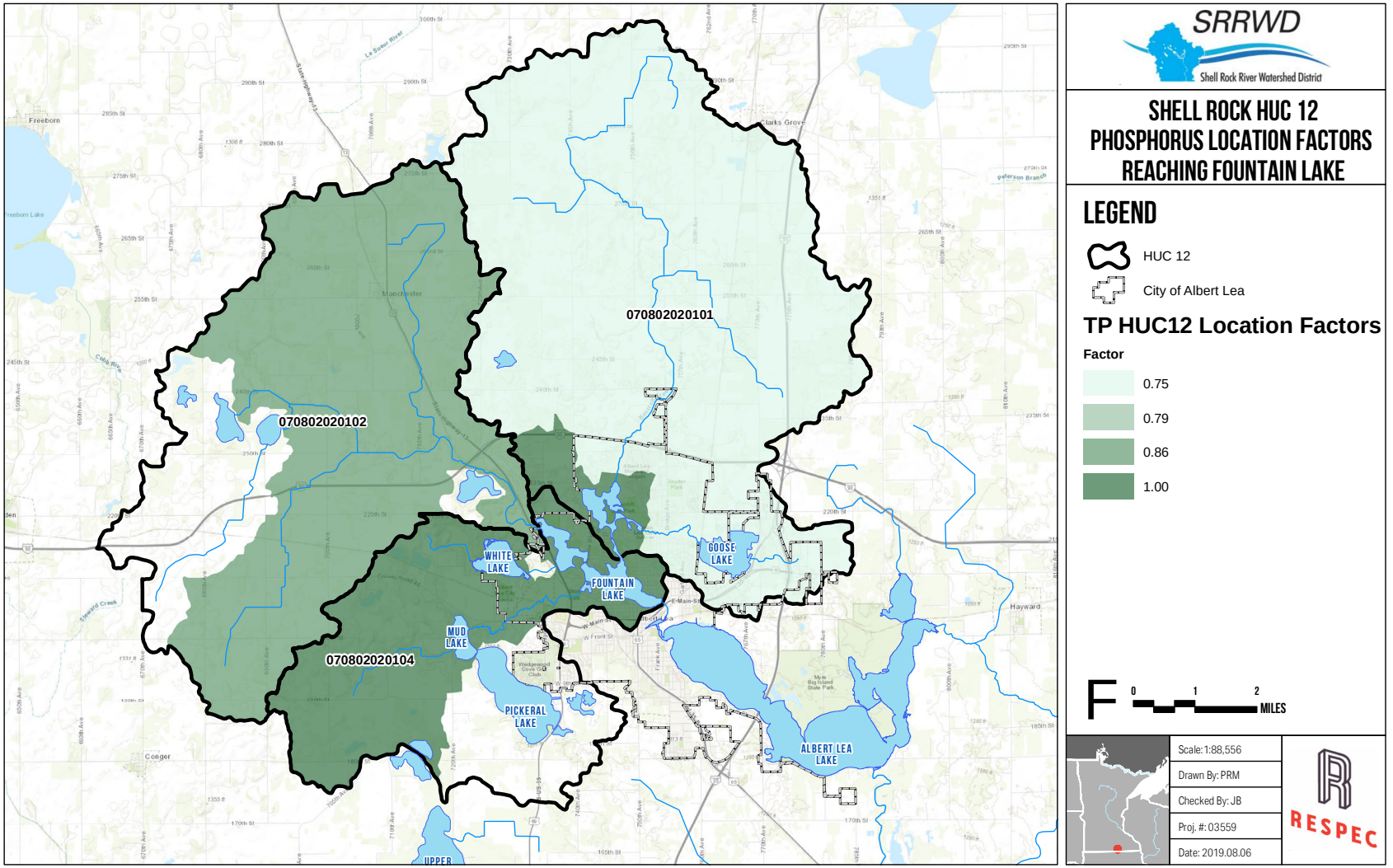

Figure E-1. Eligible Credit Generation Trading Area and Location Factor for Total Phosphorus Trading in Fountain Lake Watershed as Indicated by HUC 12.

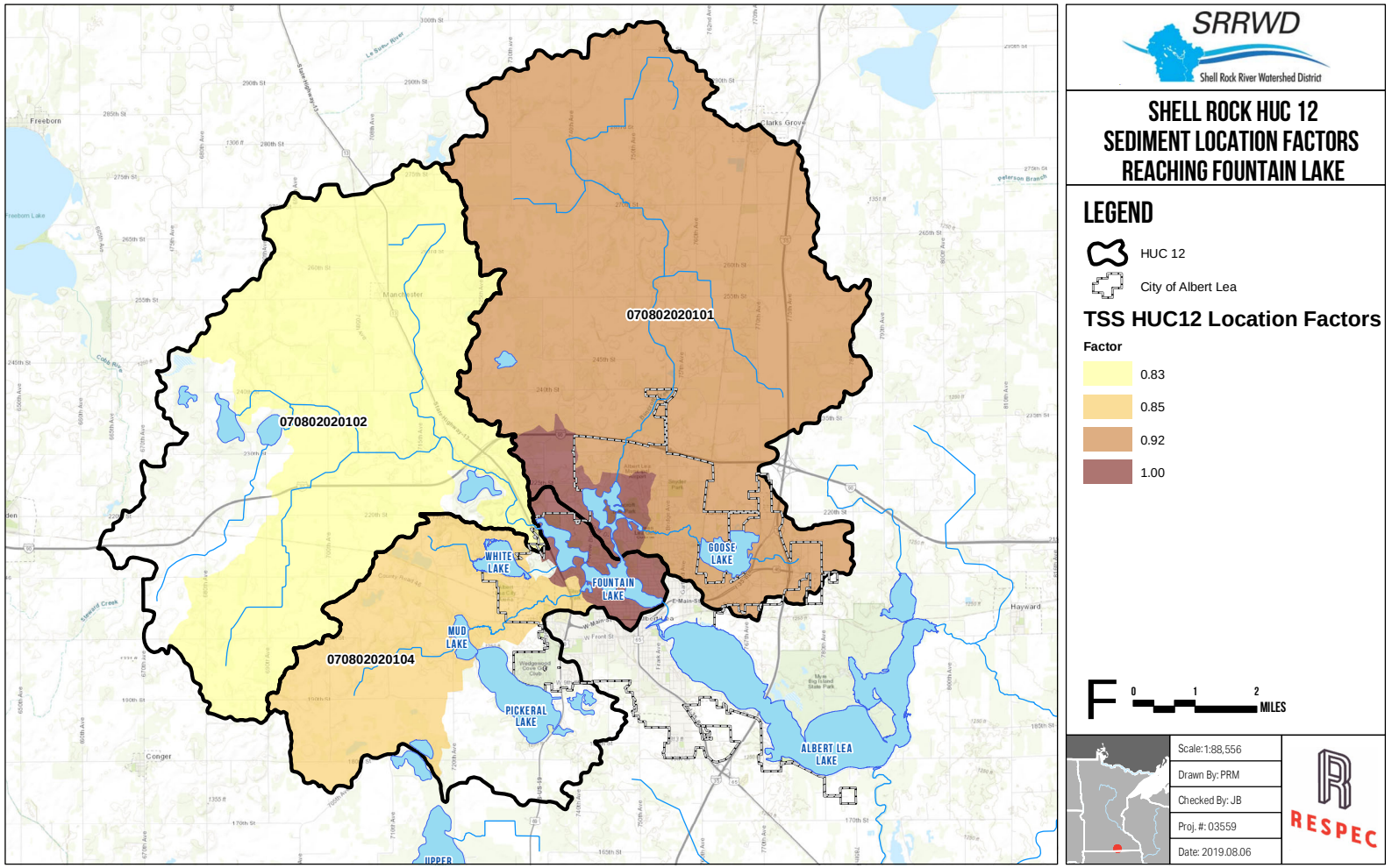

Figure E-2. Eligible Credit Generation Trading Area and Location Factor for Sediment Indicated by HUC 12. The City of Albert Lea's Municipal Separate Storm Sewer System sediment discharge into a stream must be offset by credits generated within the stream's contributing area.

shaded areas, while low Trade Ratio (Location) factors are represented by lighter-shaded areas. The specific location factors for each HUC 12 watershed are provided in Tables E-1 and E-2.

Table E-1. Location Factor for Phosphorus Indicated by HUC 12

Total Phosphorus		
Reach	HUC 12	Location Factor to Fountain Lake
A89	70802020101	0.75
A91		
A93		
A95		
A97		
A99		
A101		
A102		
A10	70802020102	0.79
A12		
A13		
A15		
A17		
A19		
A21		
A30		
A50		
A70		
A73	70802020104	0.89
A81		
A84		
A85		
A87		
A80	Fountain Lake	1.00
A102		
A120		

Table E-2. Location Factor for Sediment Indicated by HUC 12

Sediment		
Reach	HUC 12	Location Factor to Fountain Lake
A89	70802020101	0.92
A91		
A93		
A95		
A97		
A99		
A101		
A10	70802020102	0.84
A12		
A13		
A15		
A17		
A19		
A21		
A30		
A50		
A70		
A73	70802020104	0.93
A81		
A84		
A85		
A87		
A80	Fountain Lake	1.00
A102		
A120		

E.2 REFERENCES

Association of Clean Water Administrators and the Willamette Partnership, 2016. *The Water Quality Trading Toolkit*, prepared by the Association of Clean Water Administrators, Washington, DC, and Willamette Partnership, Portland, OR. Available online at: http://nnwqt.org/the-water-quality-trading-toolkit/

APPENDIX F

UNIT OF TRADE DETERMINATION

APPENDIX F: UNIT OF TRADE DETERMINATION

Evaluation and recommended protocols for projects with an annual unit of trade's unit of time for the Water Quality Trading (WQT) application for Fountain Lake, Minnesota is described below.

F.1 INTRODUCTION

The WQT program unit of trade is a critical component of the credit estimation process. The unit of trade is a part of the supporting justification that crediting programs provide equal or greater environmental protection when compared to traditional National Pollutant Discharge Elimination System (NPDES) permits. The unit of trade is defined to provide protection during the water quality standard's critical period for the pollutant that is being traded.

UNIT OF TRADE

The quantity of tradable pollutants, which is typically expressed in terms of pollutant load per unit time, at a specified location (e.g., pounds per year [pounds (lb)/year] at the point of concern) [ACWA et al., 2016].

The unit of trade is also a determining factor for approving credit estimation methods. Options for estimating credits include simple calculations based on local data input, operating sophisticated models, and referring to professional reports. Each method uses chemical, biological, and/or physical data and applies a level of science with an associated margin of safety to predict future loadings. Each estimation method also includes a timestep that describes the frequency at which the estimator recalculates loading. The timestep could be a one-time calculation or, as in sophisticated models, a 15-minute timestep that is calculated many times over the weather dataset's period of record (e.g., model runs typically simulate conditions across years). The last iteration results are used as the starting conditions for the next recalculation timestep. The results of multiple iterations can be summed and reported as a unit of trade's unit time result; the eligible site discharge period allowed. Models with short timesteps work to update changing outcomes that are influenced by determining factors, such as rainfall, vegetation growth, runoff, and stream flow. Estimators that only calculate an estimate once to provide annual unit time results for the unit of trade (e.g., lb or tons per year) cannot easily or correctly be subdivided into a shorter unit of time. This is because each month of a given year most likely discharge different levels of pollutant due to factors like precipitation, vegetation cover and temperature.

The unit of trade must provide protection during the water quality standard's critical period to be selected; however, the water quality standard's critical period often is not the same as the unit of trade unit time. Other factors that need to be considered include the many dynamics that affect the pollutant discharge's fate and transport time; for instance, lakes and streams typically have areas that may temporarily store nutrients under certain conditions and release them later under different conditions (i.e., internal loading). This appendix provides the Fountain Lake unit time determination as an example for other WQT program managers to use as a guide when creating their WQT management plan.

CRITICAL PERIOD

The period(s) during which hydrologic, temperature, environmental, flow, and other conditions result in a waterbody experiencing critical conditions with respect to an identified impairment [ACWA et al., 2016].

F.2 BACKGROUND AND KEY DIFFERENCES IN CREDIT ESTIMATION TOOLS

Developing reasonable nonpoint-source credits using estimation tools involves many challenges. Storm event-driven runoff and stream flows are variable and soil erosion can be episodic (i.e., sometimes releasing a little discharge and releasing substantial discharge at other times). Few models and estimation methods provide adequate estimates for all of the many types of nonpoint sources that exist.

Models and simpler estimators use calculations (data correlations) that have been demonstrated to provide reasonable loading estimates for many sites in the past. These proven methods are applied to the local condition that is being considered for credit generation along with an adequate margin of safety. Complicated models use algorithms that are built on the current scientific understanding of physical, biological, and chemical processes to provide estimates. Extensive research has been conducted on sheet and rill erosion in agricultural fields; this research has led to loading estimates and tools that have reliable accuracies. As mentioned above, these types of tools consider rainfall events, vegetation growth and associated evapotranspiration, soils, and slopes to provide short timestep updates based on how the preceding factors change over several years.

The less complicated streambank or gully erosion calculators measure the past average annual rate of erosion that was recorded by mapping, photographs, or some other measure to predict the expected future erosion rate. Channelized erosion, such as that found in streambank failures and gully development, is difficult to estimate without looking into past events. The force of channelized water is substantial; however, many sites remain stable while other sites fail in catastrophic events, as opposed to a daily routine of losing a fraction of an inch at a time. These episodic events make monthly or seasonal predictions difficult and usually impossible.

F.3 THE WATER QUALITY STANDARD CRITICAL PERIOD

The WQT program's unit of trade definition establishes the pollutant of concern, the weight measurement units, and the eligible period (or unit of time) in which reductions that occur at a site will cause an impact within the critical period that is defined by the water quality standard. The resulting unit of trade definition determines the number of generated credits with the eligible portion of a site's reduction The starting point for determining the eligible unit of time is reviewing the water quality stream and lake standard's critical period.

F.3.1 TOTAL PHOSPHORUS WATER QUALITY STANDARDS

The lake and stream standards for water quality are outlined in Minn. R. Ch. 7050.0222. Fountain Lake is a shallow Class B (warm-water) lake in the Western Corn Belt Plains nutrient ecoregion with a lake or reservoir water quality total phosphorus standard of 90 micrograms per liter (µg/L) summer average. The water quality standard's unit of time is a summer-average value. The eutrophication summer-average means a representative average of concentrations collected during one summer season (from June 1 to September 30). All of the watershed loading sources to the lake during the water quality standard's unit of time are within the definition of the eligible unit of time.

Stream total phosphorus Class B water quality standards are also used in the lake WQT program to evaluate and identify hot spots. A hot spot is a water resource that is not in compliance with the water quality standard for the pollutant(s) of concern. The Code of Federal Regulations (CFR) prohibits

discharges from NPDES trading permittees from passing through a water-resource hot spot unless that hot spot has already been mitigated by purchasing sufficient credits upstream of the hot spot. The Shell Rock River Watershed's rivers and streams are considered to be a Class 2B water in the South River Nutrient Region with a summer-average TP standard of 150 µg/L.

F.3.2 TOTAL SUSPENDED SOLIDS WATER QUALITY STANDARD (INCLUDED FOR FUTURE TRADING OPTIONS)

The same approach that is used for TP will also work for total suspended solids (TSS) when developing a trading program for suspended sediments. Minnesota uses the suspended-sediment measurement method of TSS to evaluate river and stream conditions. This water quality standard is also located in Minn. R. Ch. 7050.0222. The Shell Rock River Watershed is a cool- or warm-water aquatic biota watershed that is located in the South River Nutrient Region. The 65 milligrams per liter (mg/L) standard is a summer-average value, and the standard's summer season is from April 1 to September 30. The TSS standard cannot be exceeded for more than 10 percent of the time.

F.4 OTHER TOPICS THAT INFLUENCE A UNIT OF TRADE'S UNIT OF TIME

The critical period for a water quality standard represents the window of time the standard would be exceeded. The exceedance will only happen when sufficient pollutants, the right physical conditions (e.g., parameters such as temperature), and either a sensitive aquatic life form or human life needs protection, or, inversely, humans or other aquatic life forms are being protected from a harmful aquatic life's dominant competitive advantage (e.g., blue-green algae). Standards such as total phosphorus are a summer average because between June and the end of September, the water temperature is not conducive to algal growth [Wetzel, 2001]. Fondriest Environmental, Inc. [2019] states that photosynthesis will generally increase with temperature, although different species will have different peak temperatures for optimum photosynthetic activity, as shown in Figure F-1.

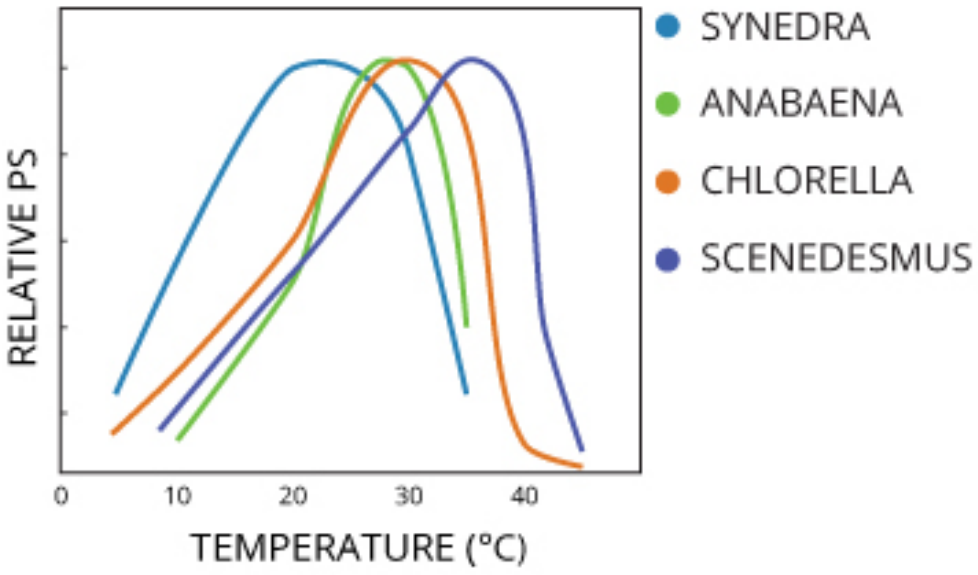

Figure F-1. Water Temperature Affects the Photosynthetic Rates of Different Algae (Figure Credit: Fondriest Environmental, Inc. [2019]).

Phosphorus is the limiting nutrient that controls algal growth in most freshwater systems. If watershed managers can control phosphorus concentrations during the critical period, the expectation is that they

can control the algal population size; therefore, a determining factor in selecting the Fountain Lake WQT program's unit of trade's unit time will be in the answer to the question, "What is the window of time that an upstream TP discharge can occur and still impact Fountain Lake during the water quality standard's critical period?"

F.4.1 WEIGHT-OF-EVIDENCE APPROACH

Physical, biological, and chemical processes influence the total phosphorus load's fate and transport from the credit generation site to the downstream resource of concern. Conducting a local study of the factors that alter the fate of phosphorus or define phosphorus transport rates across various flows and seasons would provide scientific evidence to answer the question, "What is the unit of trade's unit time?" However, conducting such a study is not always timely, financially feasible, or a reasonable expectation for every watershed for which trading is being considered. The project team therefore applied a weight-of-evidence approach [Suter, 2016] to arrive at the recommended unit of trade's unit time. The weight-of-evidence approach is often applied to ecological systems to identify probable causal linkages by assembling evidence that can be used to make an inference regarding a condition assessment. Evaluators apply a systematic review by gathering a reasonably complete set of relevant studies to complete a screening and reviewing the process of each study in a consistent manner. The studies are sorted into categories; for Fountain Lake, the selected categories are local evidence from the Fountain Lake Watershed and chemical, physical, and biological studies that produce predicable processes that can be used as evidence at other locations. The logic path for the weights that are assigned to each study and the weighting of the complete body of evidence is provided in Figure F-2. A weighted score is given to each piece of evidence for local relevance, strength, and reliability. This method allows managers to assemble a diverse set of studies and draw a defensible causal determination. The range of possible weights includes very high, high, moderate, and low for each of the three weighting scoring topics (relevance, strength, and reliability).

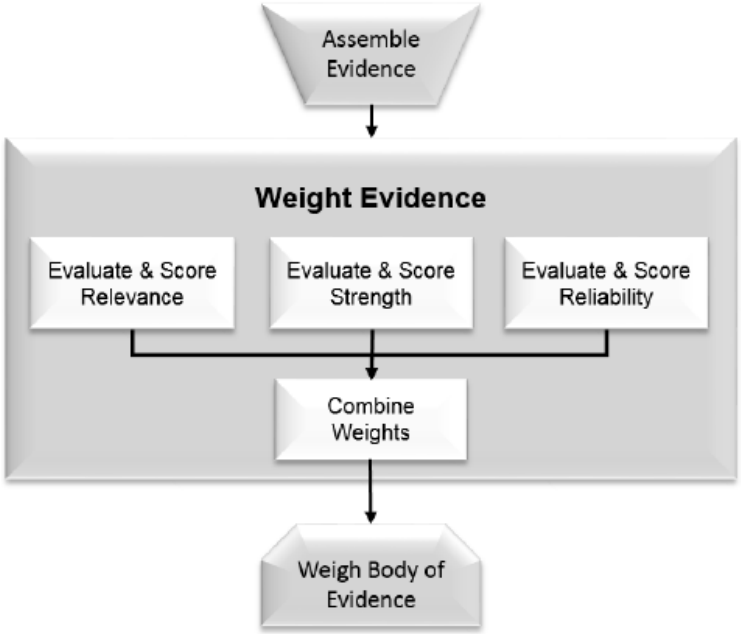

Figure F-2. Second Step in the Weight-of-Evidence Approach, Which Weights Evidence Regarding Its Local Relevance, Strength, and Reliability. This method allows managers to assemble a diverse set of studies and draw a defensible causal determination (Figure credit: Suter [2016]).

The project team reviewed five literature and local studies in the weight-of-evidence process. The studies and literature are sorted into the following categories: three local Fountain Lake studies, one national team's literature review, and one Minnesota statewide monitoring study. A detailed review of each report and the weighting applied within it is provided in Section F.6 of this appendix.

F.5 WEIGHT-OF-EVIDENCE FINDING FOR FOUNTAIN LAKE IN ALBERT LEA, MINNESOTA

The unit of trade's unit time is recommended to be an annual unit time that allows for an annual credit estimation timestep. A weight-of-evidence approach was applied to multiple peer-reviewed papers and government reports and to several professional reports written for the Fountain Lake Watershed. All of the literature and local reports ranked very high or high on the value scale of very high, high, moderate, or low for the three rating categories of local relevance, strength, and reliability. Each study discussed the many delays in suspended-sediment transport that occur naturally because of stream flow and velocity decline. The literature review entitled *Phosphorus Retention in Streams and Wetland: A Review* [Reddy et al., 1999] also discussed the fate of phosphorus caused by vegetation and aquatic organisms. The main points that support the annual unit of time for the WQT program's unit of trade are influenced by many factors that combine to create natural transport delays and nutrient spiraling. The next section (Section F.6), *Detailed Weight of Evidence Results*, provides a thorough summary. The following is a list of key findings from the weight-of-evidence evaluation that support an annual unit time.

- Fountain Lake is impacted by a high level of internal phosphorus loading.
- The sediment bed in Fountain Lake has a higher ratio of clays and silts than sands and gravels.
- Clay and silt particles are documented to have higher phosphorus concentrations than sands.
- Stream phosphorus transport is dominated by particulate phosphorus that is attached to the sediments or is in the form of organic particulates (broken down organic particles that contain phosphorus).
- Aquatic plants and organisms can play an essential role in the short-term storage of phosphorus in small headwater streams.
- Headwater aquatic plants and organisms release phosphorus downstream when the living organism senesce or begin to decompose (seasonally, beginning in the fall).
- The Hydrological Simulation Program - FORTRAN (HSPF) modeling results evaluation for four subwatersheds in the Fountain Lake contributing area supported many of the key elements that were identified in the literature review. Key support was provided for the following:
  - A rising hydrograph hysteresis effect for the pollutograph.
  - Small streams sequester phosphorus for a short-term time period.
  - Loading increases are reflected when stream flows rise sufficiently to move materials in addition to fines (which increases the particulate phosphorus loading).
  - The fall-winter-spring season aligned well with both the Fountain Lake bed sediment particle-size distributions and the recharge of the Fountain Lake internal loading because of fines entering the Lake in calm flow periods.

This weight-of-evidence evaluation supports a phosphorus credit generation unit of trade's unit time of 1 year. This finding also supports the use of credit generation models with an annual timestep. These

models are to be allowed in approved credit estimation processes when they are adequately supported by appropriate margins of safety in the Trade Ratio (Uncertainty) factor.

F.6 DETAILED WEIGHT-OF-EVIDENCE RESULTS

The following sections provide the results of the literature reviews and local studies. The weighting is later compared to local regional datasets for flow and suspended sediment and the current calibrated HSPF daily output for phosphorus [RESPEC, 2019].

F.6.1 CHEMICAL FATE AND TRANSPORT FACTORS

F.6.1.1 EVIDENCE FROM LOCAL STUDIES

Millspaugh, A. M., R. H. Weber, A. Henschel, B. Vehnke, and J. Kieffer, 2017. "Fountain Lake Restoration Project: Internal Phosphorus Loading," *Proceedings, Dredging Summit & Expo '17*, June 20–29, Vancouver, BC, Canada, pp. 164–175

Key Findings: This report summarizes past efforts conducted by the Shell Rock River Watershed District (SRRWD). Fountain Lake is a complex shallow lake with a maximum depth of approximately 8 feet). The report also mentions a 2012 Total Maximum Daily Load (TMDL) that identified that approximately 65 percent of the phosphorus loading to the lake is from internal loading. A Barr Engineering Company sediment sampling study conducted in 2014 indicated that the top several feet are higher in phosphorus concentration than deeper within the lake sediments, and that a significant nutrient source to Fountain Lake is internal phosphorus loading from lakebed sediment [Millspaugh and Weber, 2016]. The sediment samples were graphed and show an increase in iron-bound phosphorus in the top several feet. (Aside: iron-bound phosphorus is susceptible to iron oxidation that releases the phosphorus in anaerobic conditions.)

Weight-of-evidence literature weighting:

1. The local relevance weight is **very high.** (This study evaluated the lake itself.)
2. The strength weight is **very high**. (The study presumably set out to implement reductions in the internal loading estimate stated in the 2012 TMDL [note that the 2012 nutrient TMDL work is currently under revision]. Early estimates in the TDML indicated that 65 percent of the lake phosphorus loading was from internal loading; however, the participants took the steps to verify that the internal loading was indeed a substantial source of phosphorus loading.)
3. The reliability weight is **very high**. (Multiple, respected organizations were contracted for different parts of the study, and the results of each step were integrated to develop the final conclusions.)

Mike Palermo Consulting, 2016. *Fountain Lake CDF Storage and Solids Retention*, technical memorandum from Mike Palermo Consulting, Cary, NC, for A. Millspaugh, Natural Resources Technology, St. Paul, MN, May 3.

Key Findings: This memorandum presents the results from studies that were conducted to properly design a confined disposal facility in preparation for a Fountain Lake dredging project. One of the studies was performed to extract a number of borings in the lake bottom to characterize the sediments to be dredged. The resultant physical properties indicated that the gravel plus sand fraction of the

lakebed sediments was 24 percent, the silt fraction was 48 percent, and the clay fraction was 28 percent.

This study is particularly relevant because it provides a direct indication that although the Fountain Lake retention time for water is considered to be short compared to a larger or deeper body of water, the retention time is still sufficient to trap all of the three soil particle sizes that are transported downstream.

Weight-of-Evidence literature weighting:

1. The local relevance weight is **very high.** (This study evaluated the lake itself.)
2. The strength weight is **high.** (This study verified that a substantial fraction of silts and clays are present in the lakebed. When considered alongside the findings present in the other literature that is reviewed, this result is a strong indicator of the amount of phosphorus internal loading that exists; however, this type of study does not (and cannot) provide any information regarding the tributary flow regimes that deposited the sediment particles in the lakebed, or which flow regimes flush the system.)
3. The reliability weight is **very high.** (A respected organization was contracted for the study, and the results of each step were well explained for the final conclusions.)

F.6.1.2 EVIDENCE DERIVED FROM OTHER LOCATIONS

U.S. Department of Agriculture, 1980. *CREAMS: A Field-Scale Model for Chemicals, Runoff, and Erosion from Agricultural Management Systems*, Conservation Research Report No. 26, W. G. Knisel (ed.), U.S. Department of Agriculture, Science and Education Administration, Washington, DC.

This publication describes a mathematical model that was developed to evaluate nonpoint-source pollution from field-sized areas. The CREAMS pesticide and nutrient enrichment development work became the foundation for how many later models to address the field-scale initial nutrient content, and how independent particle deposition rates for sand, silt, and clay particles can be modeled to address the increase in nutrient concentrations in soils that reach the field edge. Note that regarding particulate phosphorus, the default concentration values for the phosphorus content of sand particles are approximately 85 percent of the silt particle concentration, while clay particles have approximately 115 percent of the phosphorus content of silt particles. This model describes the mathematical process used to predict, on a per-ton basis, the nutrient enrichment that occurs as the heavier sands are dropped out early and a fraction of silts and clays reaches the field edge. Because the phosphorus affinity to bond with clays is higher than for other particle sizes and silts remain in the delivered sediment, phosphorus that is delivered on a per-ton basis has a larger percent of phosphorus than the original parent material.

Key Findings: This report provides an excellent platform to describe how nutrients interact with soil particles. The sheet and rill erosion tool entitled Board of Water and Soil Resources (BWSR) Water Erosion Pollution Reduction Estimator applies a direct application of this model development report. The main point of this theory is that all sediment particles contain phosphorus, and that deposition and re-entrainment rates increase the soil sample's concentration as self-sorting occurs under conditions that lower stream power.

Weight-of-Evidence literature weighting:

1. The local relevance weight is **very high.** (This algorithm process aligns with the Fountain Lake sediment distribution findings [Mike Palermo Consulting, 2016], and resultant internal lake TP loading findings of Millspaugh et al [2017]. When this evidence is combined with later studies (which are provided below), there is a very high or high weight-of-evidence that months outside of the total phosphorus water quality standard's critical period of June to September are loading nutrients into the bed sediment layers to be released during the summer, which is the water quality standard's critical period. This is extremely relevant for many of the simpler credit estimation methods that provide annual TP load estimates. These methods could become approvable with a longer unit time. The methods that are used for streambank and gully stabilization are specifically predicting episodic events that create erosion events periodically throughout the year, and the unit time period becomes challenging to approve in a short summer averaging period.)
2. The strength weight is **very high.** (This theory is in use in many of today's mechanistic models and is used to adjust power functions in empirical models.)
3. The reliability weight is **very high.** (Multiple, respected authors were contracted for different sections of this report and were very thorough in documenting the science used.)

F.6.2 PHYSICAL AND BIOLOGICAL FATE AND TRANSPORT FACTORS

F.6.2.1 EVIDENCE DERIVED FROM OTHER LOCATIONS

Reddy, K. R., R. H. Kadlec, E. Flaig, and P. M. Gale, 1999. "Phosphorus Retention in Streams and Wetlands: A Review," *Critical Reviews in Environmental Science and Technology*, Vol. 29, No. 1, pp. 83–146.

Key Findings: This paper provided the results of a literature review of many research studies regarding the phosphorus uptake and release associate with the chemical, physical, and biological systems in streams and wetlands. The conclusions of this paper indicate that phosphorus retention in streams is dominated by physical processes, such as flow, velocity, discharge, and water depth; however, the same biological and chemical processes that control phosphorus retention in wetlands regulate phosphorus in streams. Abiotic processes that control phosphorus retention in streams are dominated by sediment sorption reactions (i.e., mainly Al, Fe, Ca, and Mg). Biological uptake can account for the majority of the phosphorus transformations into dissolved phosphorus in streams. The long-term storage of phosphorus in stream sediments is inhibited by the rapid mobilization and transport that occur during storm events.

Other key points in the paper are as follows: Mulholland et al. [1985] reported that 75 percent of the particulate organic matter transport occurred during 17 percent of the storm flows in an average year. Minshall et al. [1983] found that small headwater streams were more effective in retaining nutrients than midsized and larger streams. Ecosystems with large pools of organic matter are more stable than systems with low organic matter. [Golley, 1974; O'Neill and Reichle, 1980].

The paper stated that forested wetlands provide long-term hydrologic storage, which implies that the short-term time period is annual in nature. The paper states that floating and emergent macrophytes are usually present along the near shorelines of streams, and the phosphorus that is transported in

streams may not be in direct contact with the plant roots. In nutrient-rich systems, up to 80 percent of the phosphorus that is stored in some aquatic macrophyte detrital is released into the water column either by initial leaching or as a result of decomposition [Reddy et al., 1995]. Submerged vegetation has limited potential for phosphorus storage; however, periphyton (freshwater organisms attached to plants and other objects above the bottom sediments) can be present as floating mates attached to macrophytes or as a benthic layer. Periphyton uses phosphorus from both soil/sediment and the water column [Hansson, 1989].

Weight-of-evidence literature weighting:

1. The local relevance weight is **high.** (This study is a literature review of national papers that are considered to be germane to several of the major contributing factors used to determine the unit of trade's unit of time; however, this paper did not evaluate the lake tributaries themselves, so it received a high rating. The paper also provides insight into quantification of loads, but a lack of resources did not allow a local study to take place.)
2. The strength weight is **very high.** (This study indicated that headwater streams played the greatest role in biological uptake, but the storage is short-term in nature. The main delay in transport is because of flow and velocity requirements to transport sediment-stored phosphorus, whereas a lesser role is provided by aquatic plant and periphyton uptake. Living organisms provide seasonal short-term storages with high growth in the spring, with phosphorus released later, during senescence and decomposition [which is annual for most aquatic life]. This paper highlights nutrient delays in transport caused by "nutrient spiraling." The authors note that stream flow and velocity play a critical role in the physical transport of phosphorus attached to sediments and organic particulates, and stated that sediment and particulate phosphorus transport were the main sources of downstream phosphorus loading transport. The paper also repeatedly cites studies regarding short-term storage provided by aquatic plants (macrophytes) and periphyton. Biological controls release the phosphorus after senescence or decomposition. [Aside: The time period of this release can be much later in the year (fall) and become a source of lake sediment-stored phosphorus].)
3. The reliability weight is **very high.** (The report was authored by a large group of collaborators from well-respected organizations: The Soil and Water Science Department, University of Florida; Department of Chemical Engineering, University of Michigan; Wetland Management Services, South Florida Water Management District; and Department of Agriculture and Natural Resources, University of Tennessee.)

Ellison, C. A., B. E. Savage, and G. D. Johnson, 2013. Suspended-Sediment Concentrations, Loads Total Suspended Solids, Turbidity, and Particle-Size Fractions for Selected Rivers in Minnesota, 2007 Through 2011, Scientific Investigations Report 2013-5205, prepared by the US Geological Survey, Reston, VA.

Key Findings: The U.S. Geological Survey (USGS), in cooperation with the Minnesota Pollution Control Agency (MPCA), established a sediment monitoring network in 2007 and began to systematically sample suspended-sediment concentrations (SSC), TSS, and turbidity in rivers across Minnesota to improve the understanding of fluvial sediment transport relations. The key concepts documented in the 14 selected rivers are:

- **Relationship Between Suspended-Sediment Concentrations and Stream Flow.** Stream flow has predominantly been used as the primary explanatory variable for SSC, even though stream flow is not always directly related to SSC and the relationship between the two is known to vary extensively [Guy, 1970; Tornes, 1986; Tornes et al., 1997; Blanchard et al., 2011]. Knighton [1998] states that this variation occurs largely because the dominant control on SSC is the rate of supply, which is affected by myriad factors, such as sediment availability, season, watershed size, and source location within the watershed. Considerable variation in SSC may also be the result of a hysteresis effect with stream flow. Clockwise hysteresis (i.e., the higher sediment concentration on the rising limb of the hydrograph) is common in small watersheds because sediment sources are closer to the stream channel. Counterclockwise hysteresis may occur in large watersheds where upstream sources continue to supply the bulk of the load after the stream flow peak occurs [Knighton, 1998].

- **Relationship Between Stream Flow and Suspended-Sediment Load, Focus on "Fines."** The report findings showed a dominant relationship between larger sediment particle sizes and higher stream flows (cubic feet per second [cfs]). Percent fines were defined as particle sizes of 0.0625 millimeters (mm) (62.5 micrometers) or less. The relationship plot between suspended-sediment load (lb/day) and stream flow (cfs) from the 14 monitored streams in Minnesota [Ellison et al., 2013] was considered. The project team created the graphics in Figures F-3, F-4, and F-5 to illustrate this relationship in two of the 14 selected rivers using the monitoring data provided by Ellison et al. [2013]. The graphs plot the percent fines on the left vertical axis and the SSC to TSS ratio on the right vertical axis to indicate the lack of transport of large particles as stream velocity declines. An analysis of TSS in very turbid samples requires creating a vortex in a jar at the lab and extracting the sample with a pipette. This process creates an unintended filtering of larger particles. While TSS results does include particles above the 0.625 mm fines definition the very larger particle sizes are limited by the pipet process. Therefore, having both TSS and SSC data allowed for a screening process to check on the distribution of particles across many flows. Because of many factors in the velocity and particle-size relationship the loss of larger particles in lower events is not evident in all stream graphs (e.g., in the Red River Basin the particle sizes are dominated by clays and silts and the steep gradients in the Root River create high velocities in lower cfs regimes). The two rivers selected for graphing are the Des Moines River near Jackson, Minnesota, and the Knife River near Two Harbors, Minnesota. Because the data provided did not include velocity, cfs is being used as a surrogate. Figure F-5 shows a Hjulstrom diagram that hydrologists use to visually explain these same principles. The Fountain Lake WQT project team selected a conservative breakpoint of 200 cfs where lower cfs data depicts where the percent of fines in the suspended-sediment loading is often maximized. These two streams were selected because they had a wide sediment particle-size distribution, gentle gradients, and SSC and TSS data.

This report's key findings document the suspended-sediment transport volume dependence on stream power under higher flows. While the paper acknowledges that there can be substantial variability between locations because of the lack of sediment supply, the sampling record statistics and graphs provided showed a large trend for the suspended sediments transported to mainly consist of fines at lower flows (Table F-1).

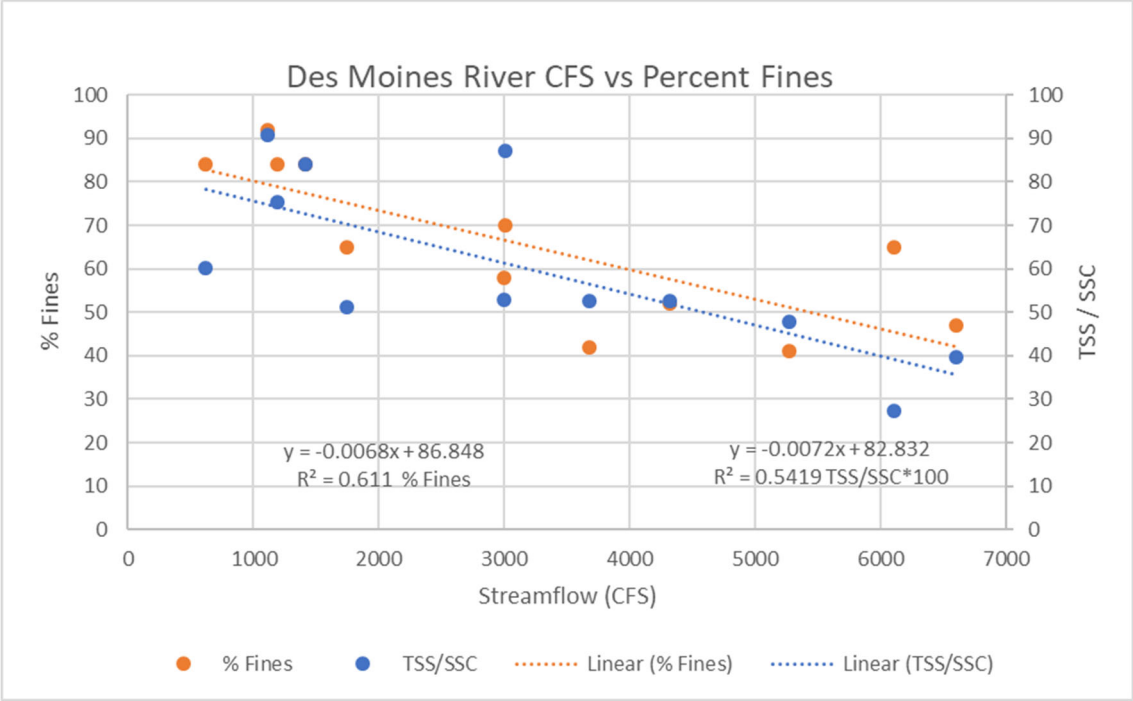

Figure F-3. Relationship of Suspended-Sediment Percent Fines and Stream Flow for the Des Moines River Near Jackson, Minnesota, Using Data Provided by the U.S. Geological Survey Report Regarding Selected Sites in Minnesota, 2007 Through 2011 [Ellison et al., 2013].

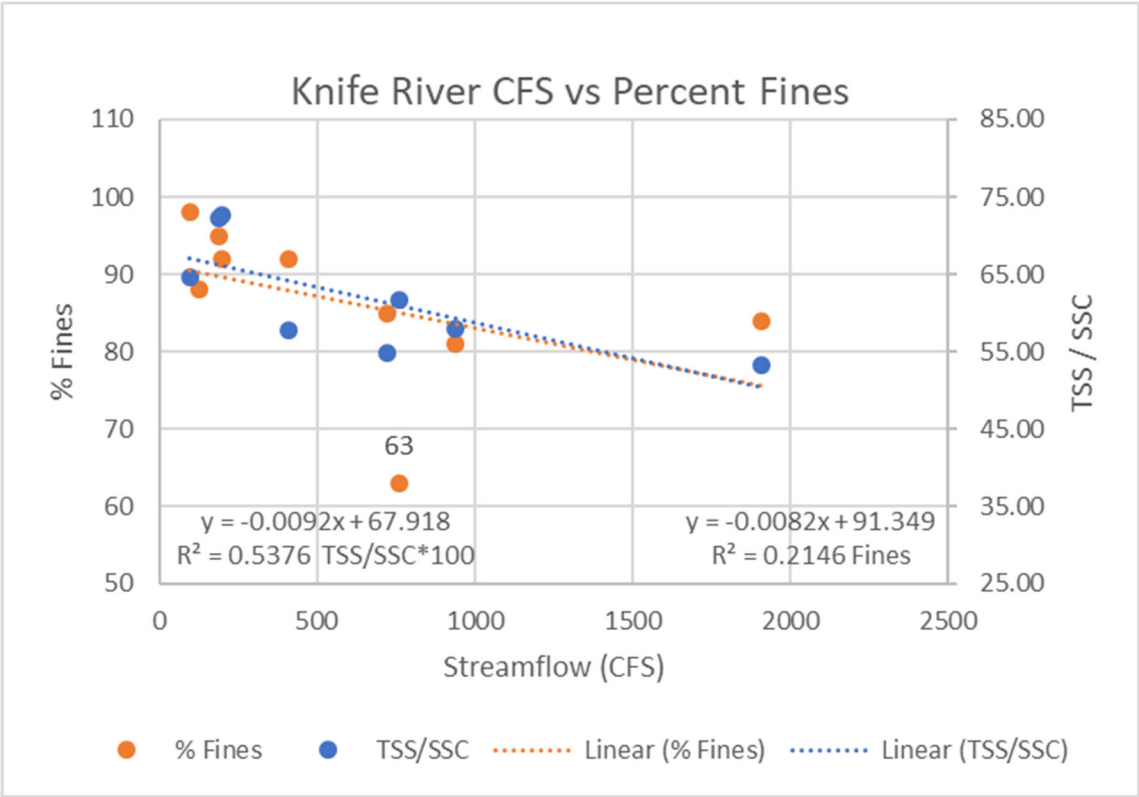

Figure F-4. Relationship of Suspended-Sediment Percent Fines and Stream Flow for the Knife River Near Two Harbors, Minnesota, Using Data Provided by the U.S. Geological Survey Report Regarding Selected Sites in Minnesota, 2007 Through 2011 [Ellison et al., 2013].

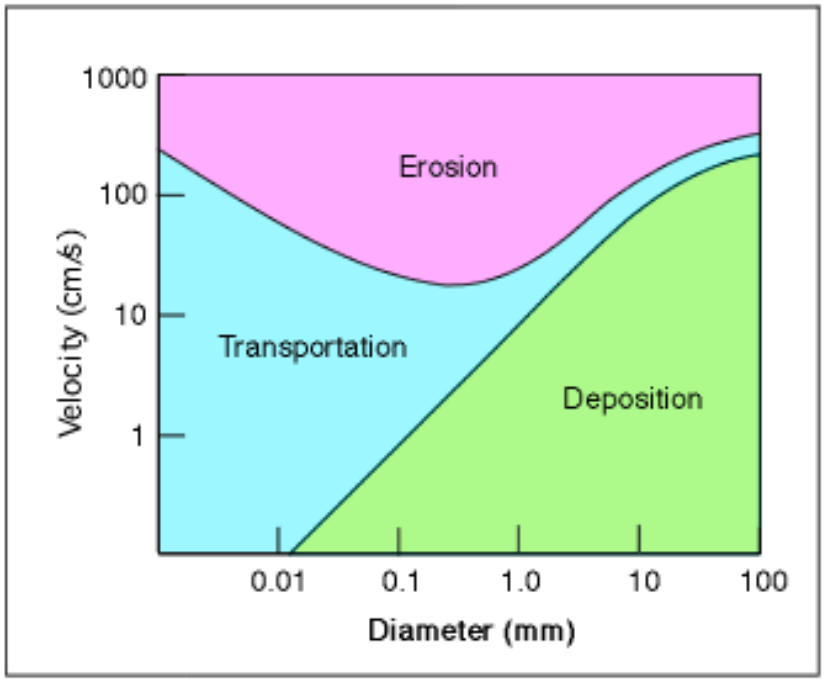

Figure F-5. Hjulstrom Diagram (Figure Credit: Columbia University [2021]).

Table F-1. Statistical Summary of the Percent Fines (< 0.625-Millimeter Particles) From 14 River Monitoring Stations Across Minnesota [Ellison et al., 2013]

Assumed River Flow Resume	Sample Dataset Statistic	14 River Stations Statewide Statistics for Sediment Particle Size Percent Finer Than 0.0625; Fines Threshold					
		Minimum	25th Percentile	Average	Median	17th Percentile	Maximum
Highest	Minimum	2.00	17.25	29.79	29.00	39.25	76.00
Middle	Mean	55.00	72.50	76.50	78.50	82.25	92.00
Middle	Median	60.00	76.00	81.21	84.00	88.25	95.00
Lowest	Maximum	95.00	98.00	98.14	98.50	99.00	100.00

Weight-of-evidence literature weighting:

1. The local relevance weight is **high.** (This report is specific to Minnesota rivers and streams, although Shell Rock River and its tributaries where not included in the study. The principles identified by this report apply to Fountain Lake's contributing area. The clockwise hysteresis condition was also tested by the project team in the nearest watershed with a USGS monitoring station that included both suspended-sediment concentrations and daily stream flow (see the Cedar River USGS information in Section F.7.2 below.) The transport theory also aligns with the paper *Balance of Sediment Supply and Sediment Size With Slope and Discharge* [Lane, 1955]. Lane's [1955] stream balance is a foundation for the stream-sediment dynamics in use today. The findings of the report presented above are used to sort the RESPEC HSPF model flow output for Fountain Lake to show both the seasonality of flow in the river and tributaries and to provide a flow duration curve to illustrate the delay in delivery that occurs with particle sizes greater than 0.625).

2. The strength weight is **very high.** (This study verifies the general trend that is discussed in much of the literature reviewed that indicates sediment fate and transport are linked to a delay in a substantial fraction of suspended-sediment load because of inadequate stream flow during low flow conditions between storm hydrographs.)
3. The reliability weight is **very high.** (The authors of this report operate monitoring stations with the highest level of quality control in the nation and are considered experts in data analysis.)

F.7 PROJECT TEAM COMPARISONS: WEIGHT-OF-EVIDENCE EVALUATION WITH LOCAL REGION DATASETS AND MODELING OUTPUT

To verify the likelihood of the fate and transport weight-of-evidence provided for suspended-sediment and particulate organic phosphorus, two USGS monitoring stations were selected in Southern Minnesota. The two stations sample for stream flow (cfs) and SSCs using the USGS-required sample collection methods and laboratory analyses. This sampling technique is similar to the MPCA methods for TSS but includes capturing and analyzing sand particles that can be within the channel's bedload, as illustrated by Rheinheimer and Yarnell [2017] in the graphic in Figure F-6.

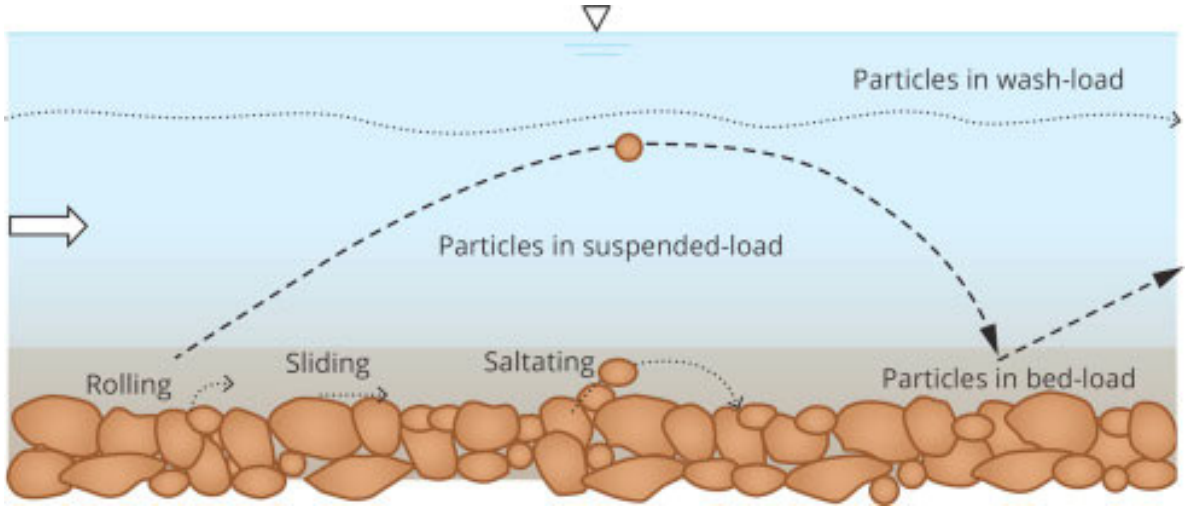

Figure F-6. A Generalized Stream Depth Distribution of Sediment Particle Size (Figure Credit: Horne et al. [2017]).

F.7.1 STRAIGHT RIVER U.S. GEOLOGICAL SURVEY STREAM STATION, NEAR FARIBAULT, MINNESOTA

A data plot called a pollutograph, as shown in Figure F-7, illustrates how SSC concentrations commonly rise and peak before the stream flow peaks and quickly drops off during the remainder of the hydrograph. The pollutograph plots the stream concentration for the same dates of the cfs. Figure F-7 uses the USGS suspended-sediment concentration data from site 05353800, near Faribault, Minnesota, in March and April 1969 to illustrate a pollutograph from the Southern Minnesota Region. The contributing area to the monitoring station is approximately 278,400 acres compared to the Fountain Lake contributing area of approximately 66,000 acres. SSC strongly increased as stream flow increased at the start of the April 1, 1969, event, and SSC begins to drop on April 7, 1969, and then spike on April 9, 1969; one anomaly occurred around April 19, 1969, without a change in flow.

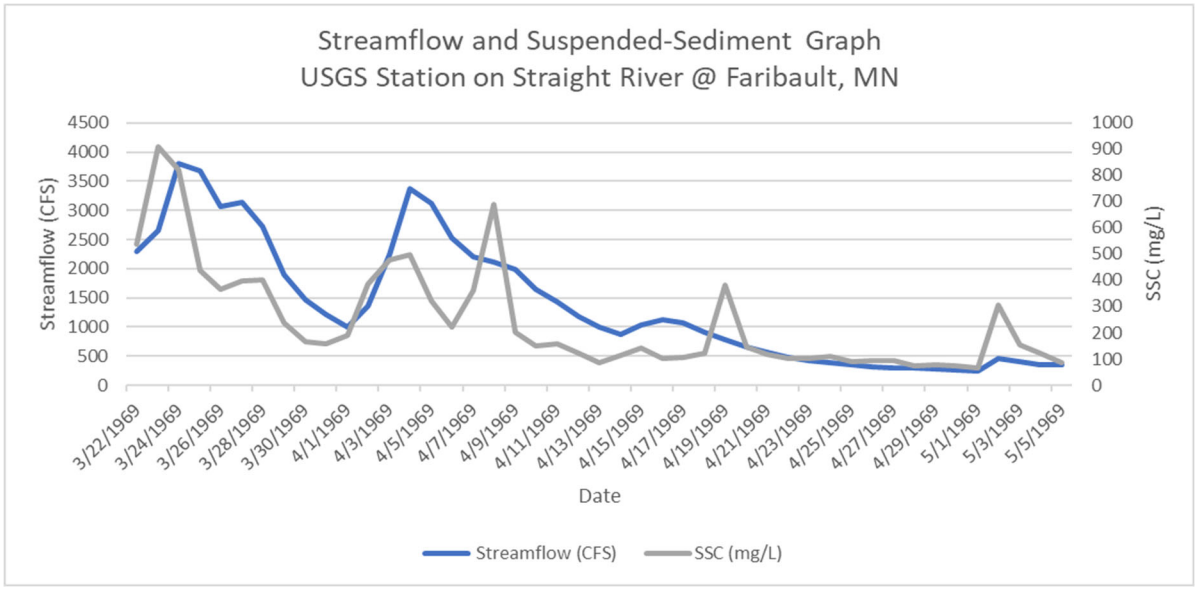

Figure F-7. Suspended-Sediment Pollutograph for Straight River Near Faribault, Minnesota, That Illustrates the Hysteresis Dynamic Before the Peak of the Streamflow Hydrograph.

F.7.2 CEDAR RIVER U.S. GEOLOGICAL SURVEY STREAM STATION, NEAR AUSTIN, MINNESOTA

A similar pollutograph for the Cedar River at Austin, Minnesota, illustrates how SSC concentrations commonly rise and peak before the streamflow peaks and quickly drops off during the remainder of the hydrograph, as shown in Figure F-8. The USGS suspended-sediment concentration data from Site 05457000, near Austin, Minnesota, in March and April 1979, are used to illustrate a pollutograph from a river close to the Shell Rock River location. The contributing area to the monitoring station is approximately 217,000 acres compared to the Fountain Lake contributing area of approximately 66,000 acres. Note the occasional strong increase in SSC from minor increases in stream flow that occurred during the fall of the major event beginning on April 1, 1969, and the one anomaly that occurred around April 19, 1969, without a change in flow.

F.7.3 EVALUATION OF FOUNTAIN LAKE HSPF INITIAL MODELING RESULTS

The HSPF modeling work that is being completed by RESPEC has calibrated the baseline conditions for the Shell Rock River Watershed [RESPEC, 2019]. Baselines are created to represent the current land-use and land management conditions from which reduction scenarios can be added for TMDL assessments. The model setup includes a weather period from January 1, 1996, through December 31, 2018 (8,401 days). HSPF evaluations made were based on the 22 water years from October 1, 1996, through September 30, 2018. The first 9 months were not included, which allowed the model processing to create antecedent conditions. The use of a water year provides a seasonal data organization that aligns with the total phosphorus water quality lake standard's critical period (June through September). Figure F-9 presents the model setup subwatershed boundaries and subwatershed numbers. Subwatershed 120 contains Fountain Lake. The following water quantity and water quality data output for selected subwatersheds were evaluated:

- Stream flow (cfs)
- Total phosphorus subwatershed loading (TP; lb/day)
- Sediment subwatershed loading (sediment; tons/day)

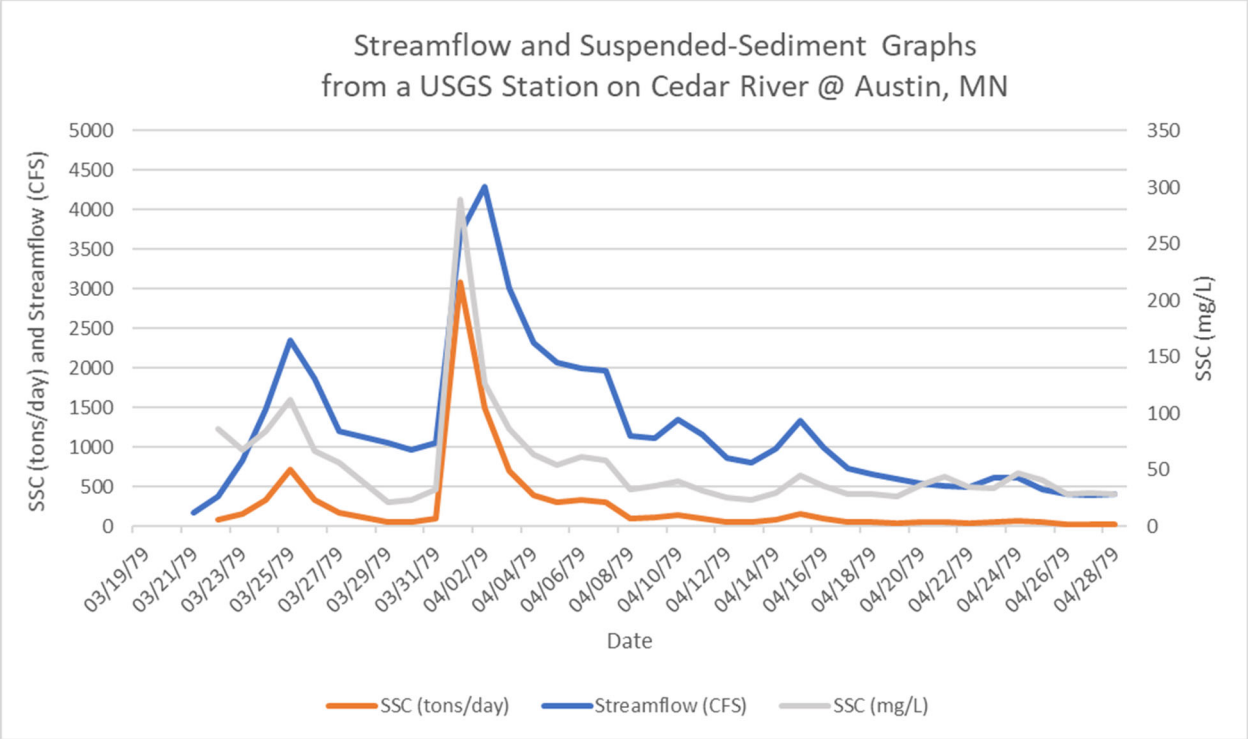

Figure F-8. Suspended-Sediment Pollutograph for Cedar River Near Austin, Minnesota, That Illustrates the Hysteresis Dynamic Before the Peak of the Streamflow Hydrograph.

The contributing area to Fountain Lake has many smaller lakes located up in the tributaries, as shown in Figure F-9, and this heavily influences the attenuation rates. The numbers in Figure F-9 identify each modeled subwatershed. Three subwatersheds were evaluated to describe the seasonality of stream flow, total phosphorus loading, and sediment loading.

To analyze the Fountain Lake HSPF model's output for seasonal loading, the mouths of Subwatersheds 80, 87, and 102 were selected. These subwatersheds are located as the last subwatershed from the three main tributary directions feed from the west, southwest, and northeast, respectively, as shown in Figure F-10. Figure F-10 has circles to identify each subwatershed. Note that Subwatersheds 80 and 102 each contain a small lake that receives and processes a substantial portion of the contributing tributary flows just before entering Fountain Lake.

For each subwatershed, the daily HSPF output was summed by month across the 22 water years. The total monthly stream flow, phosphorus, and sediment loading were ranked from the highest to lowest values for each year. The yearly rankings were then averaged across the 22 years to arrive at the long-term monthly rankings for the months contributing the highest stream flow and pollutant loadings (Tables F-2, F-3, and F-4).

The HSPF model is a well-documented and widely accepted watershed model. HSPF is commonly used for TMDL studies in Minnesota and across the nation. The HSPF modeling process theory integrates the physical, chemical, and biological sciences outlined in the literature review. The model's structure is

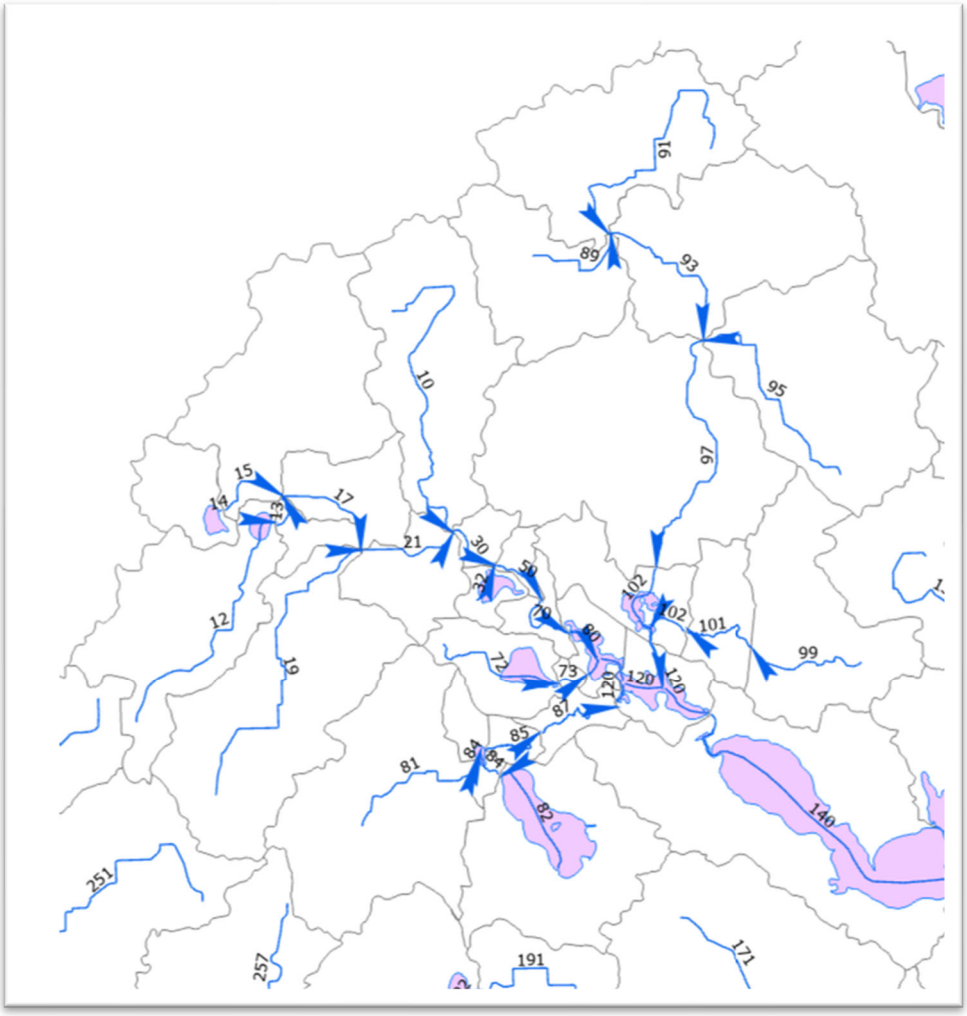

Figure F-9. HSPF Fountain Lake Contributing Area Flow Path Map. Fountain Lake is Subwatershed 120.

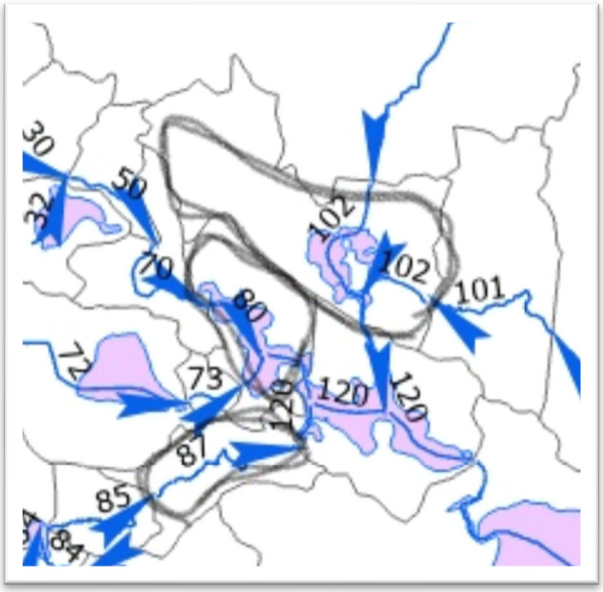

Figure F-10. Location of Selected HSPF Subwatersheds 80, 87, and 102.

Table F-2. HSPF Subwatershed 102's Long-Term Monthly Rankings Averaged for Streamflow

HSPF Subwatershed 102 Monthly Rankings Averaged Across 22 Water Years (1997–2018)			
Month	Average Rank (cfs)	Average Rank TP (lb)	Average Rank Sediment (tons)
October	8	12	12
November	10	9	8
December	11	4	2
January	12	5	3
February	9	3	4
March	5	1	1
April	3	2	5
May	2	6	6
June	1	7	7
July	4	8	9
August	6	10	10
September	7	11	11

Table F-3. HSPF Subwatershed 80's Long-Term Monthly Rankings Averaged for Total Phosphorus

HSPF Subwatershed 80 Monthly Rankings Averaged Across 22 Water Years (1997–2018)			
Month	Average Rank (cfs)	Average Rank TP (lb)	Average Rank Sediment (tons)
October	8	12	12
November	10	9	8
December	11	5	3
January	12	6	2
February	9	4	5
March	5	1	1
April	3	2	4
May	2	3	6
June	1	7	7
July	5	8	9
August	6	10	10
September	7	11	11

built around precipitation-driven runoff and stream flows and terrestrial and aquatic plant life cycles, including evapotranspiration and growth limitations in low temperatures, to recalculate the simulation processes on an extremely short timestep (minutes) across 22 years. This local watershed modeling assessment aligns well with Fountain Lake's in-lake assessments of internal loading [Millspaugh et al., 2017] and lakebed sediment fraction distributions [Mike Palermo Consulting, 2016]. The detailed output evaluation illustrates the results of seasonal biotic and physical processes deliver nutrients and fine sediments contributions that end up in the lakebed. These conditions create sediment nutrient concentrations that are continually renewed by the current year's off-season loadings of nutrient-laden clays and silts during the low-flow winter months and nutrient-laden clays, silts, and sands during spring conditions (discussed in the literature review). The low-flow regimes create longer Fountain Lake hydraulic residence times, which aligns with the high fractions of clays and silts found in the lakebed sediments [Mike Palermo Consulting, 2016]. These nutrient dynamics contribute the substantial internal lake phosphorus during the summer [Millspaugh et al., 2017], the water quality standard's critical time period.

Table F-4. HSPF Subwatershed 87's Long-Term Monthly Rankings Averaged for Sediment

HSPF Subwatershed 87 Monthly Rankings Averaged Across 22 Water Years (1997–2018)			
Month	Average Rank (cfs)	Average Rank TP (lb)	Average Rank Sediment (tons)
October	8	12	12
November	10	9	9
December	11	3	4
January	12	6	3
February	9	5	5
March	5	1	1
April	3	2	2
May	2	4	6
June	1	7	7
July	5	8	8
August	6	10	10
September	7	11	11

Only small changes exist in all of the three subwatersheds' monthly rankings for the three parameters. The small differences may, in part, be caused by the presence of small lakes within Subwatersheds 80 and 102; however, the top 5 months for all three parameters remain consistent in all three subwatersheds.

This HSPF-based seasonal evaluation supports the selection of an annual unit of trade's unit time and modeling timestep for all credit generation models. The weight-of-evidence reviews and HSPF

modeling output align to identify the sizeable fractions of total phosphorus loading from fall, winter, and spring periods that remain in-lake for the summer algal growth season.

An HSPF comparison with the Ellison et al. [2013] discussion regarding a small stream hysteresis effect where the pollutograph peaks and diminishes on the rise of the hydrograph was completed. An August 2002 storm event from Subwatershed 97 confirmed that the model's hysteresis aligns with the USGS discussion (Figure F-11).

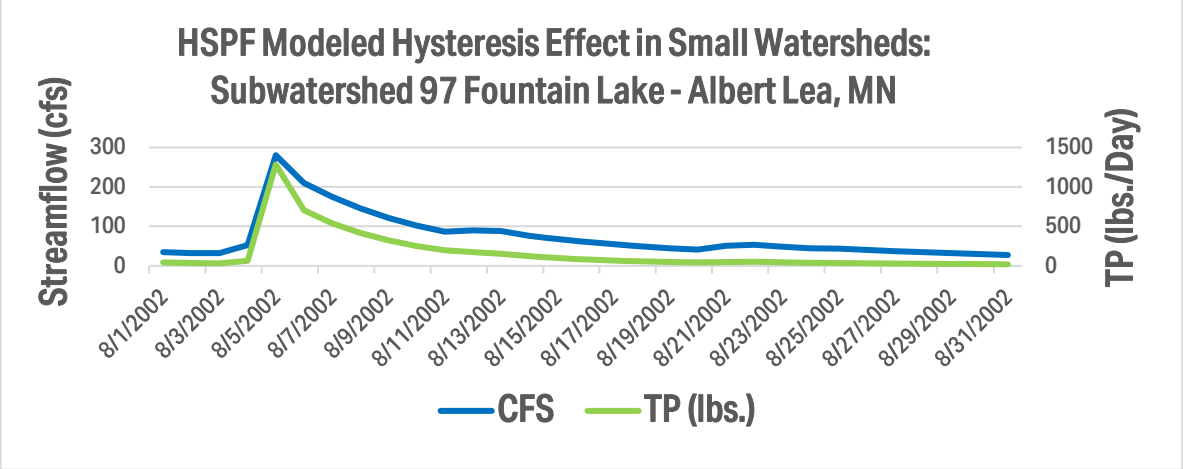

Figure F-11. HSPF Model Data Graph Showing a Leading Hysteresis Effect in Subwatershed 97.

A load duration analysis was then performed on Subwatershed 97 and is presented in Figure F-12. The HSPF modeled cfs estimates indicate that only 110 days out of the 8,035 days modeled in the load duration curve were at or exceeded the 200 cfs. The 200 cfs threshold was previously discussed as a relative streamflow cutoff where flows below approximately 200 cfs have the highest percent "Finer Than" values because of the velocity limitations preventing the suspensions of sands and larger particles. The cfs model output was converted to a load duration curve and the phosphorus loading for a given day's cfs is also plotted in position on the x-axis by linking it to the day's cfs percent exceedance value. The load duration curve graphs the maximum and minimum total phosphorus loading values according to the percentile rank of cfs and that day's phosphorus value. Percent exceedance defines the percentage of days that have a greater stream flow than the day being discussed (i.e., a 42 percent exceedance means that 42 percent of the days in the 22 water years, as shown in Figure F-5) are greater than the value being discussed). As illustrated in Figure F-12, which was used for the hysteresis discussion, the hydrograph has two different total phosphorus loading values occurring at a stream flow estimated value of 200 cfs. Only considering the many different hydrographs, their seasonal characteristics, and the number of 200 cfs linked total phosphorus loads produced a streamflow percent exceedance value that has a wide-ranging loading variability. Therefore, in addition to stream flow, the maximum and minimum associated total phosphorus loading value with each percentage point are provided. To provide the maximum and minimum curves, the stream flow percentile rank was considered as an integer (e.g., 42.3 percent exceedance equals 42 percent exceedance). Then, the total phosphorus maximum and minimum loading range of values assigned to each percent exceedance were selected. As an example, 42 percent exceedance is 23 cfs, and there are 80 days with this percent exceedance for which the maximum and minimum total phosphorus loading values are graphed. The load duration curve also illustrates the variability in total phosphorus loading for a similar stream flow estimate that hysteresis and seasonality can cause.

Table F-5. HSPF Yearly Stream Flow and Total Phosphorus Loading Rankings For 22 Water Years

Subwatershed 87 Stream Flow Ranking			Subwatershed 87 TP Ranking		
	Cubic Feet Per Year	Water Year		TP (lb/yr)	Water Year
1	775,086,634	1999	1	8,734	2017
2	745,706,081	2013	2	8,580	2014
3	723,765,891	2017	3	7,828	2005
4	723,165,846	2016	4	7,182	2002
5	718,286,474	2018	5	5,972	2000
6	658,641,764	2001	6	5,481	2011
7	633,586,785	2006	7	5,018	2007
8	599,797,977	2004	8	4,844	2015
9	575,694,796	2010	9	4,817	2018
10	575,682,002	2011	10	4,808	2008
11	516,721,541	2005	11	4,672	2003
12	501,561,510	2007	12	4,633	2001
13	481,114,485	2008	13	4,498	2006
14	480,191,174	1997	14	4,362	1999
15	462,107,326	2014	15	4,041	2012
16	442,092,232	1998	16	3,980	1998
17	410,429,813	2000	17	2,898	2010
18	378,252,319	2003	18	2,786	2009
19	376,124,650	2002	19	2,519	1997
20	316,994,442	2015	20	2,383	2016
21	272,266,892	2009	21	2,121	2004
22	132,669,435	2012	22	850	2013

Table F-6 was created to present the Subwatershed 97 monthly maximum cfs, which is grouped according to the water quality standard's critical period (June 1 to September 30) and non-critical period for Water Year 2005. The 2005 water year is ranked 11th out of the 22 water years modeled. September of Water Year 2005 had a large event that resulted in a maximum cfs of 620 and atypical total phosphorus loadings. However, the other 3 months in the summer critical season have maximum cfs values below all off-season months except for December, January, and February.

In this agriculturally dominated watershed, the spring and fall higher flows are also associated with higher levels of total phosphorus loading. The preplant preparations in spring and the harvest and post-harvest field activities in fall provide equal or greater loading rates then the critical season months of June, July, and August. Only the unusual event in September exceeds these loading rates. Hydrology contributes to this reoccurring cycle. The higher runoff months typically are during the spring snowmelt and spring rains in March through May. Also, the volume of runoff is dampened by crop emergence and high crop evapotranspiration rates, which divert precipitation back into the atmosphere. In southern

Minnesota's heavily agricultural land use, these influential factors and the resulting range of stream flow and nonpoint-source pollutant loadings are common. When combined with the other weight-of-evidence discussions from the HSPF evaluation and literature, Table F-6 provides another strong supporting indicator that an annual unit of trade unit time is appropriate for the WQT unit of trade for this watershed.

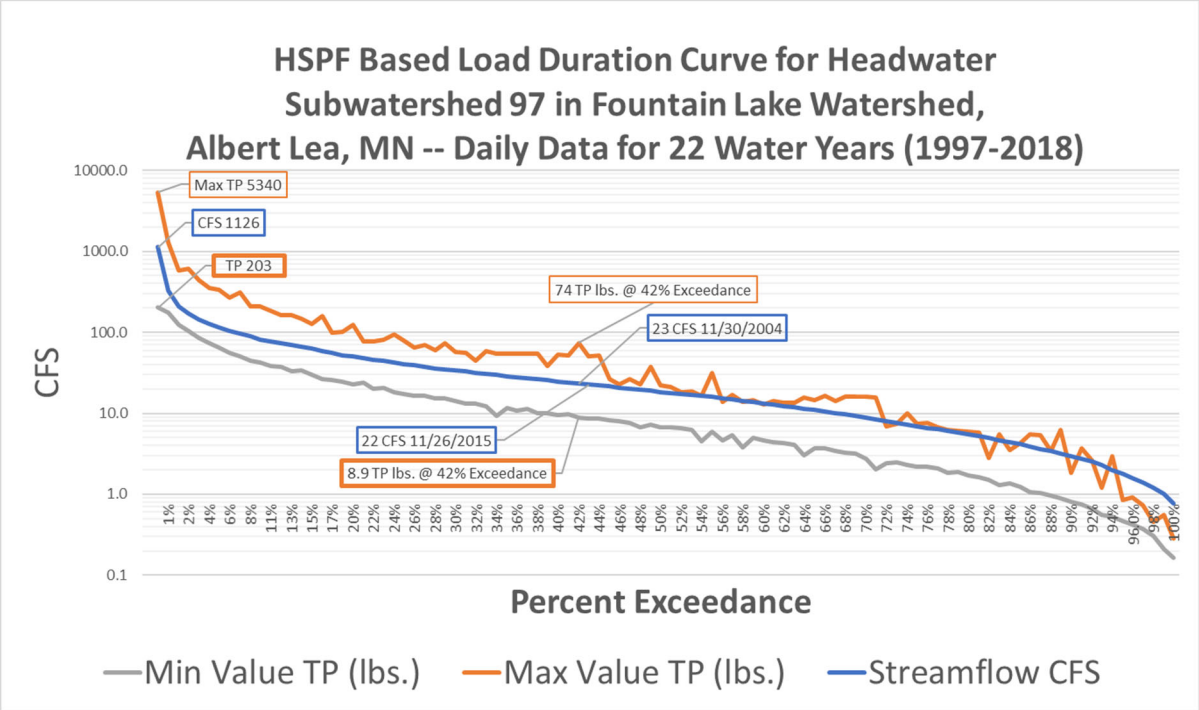

Figure F-12. A Load Duration Curve for Subwatershed 97 Based on HSPF Model Output.

Table F-6. Monthly Maximum Stream Flow Values (cfs) and Monthly Total Phosphorus Total Load Sorted by the Total Phosphorus Water Quality Standard's Critical Period

Summer Months	Maximum Stream Flow (cfs) and TP Loading (lb/month)	Fall-Winter-Spring Months	Maximum Stream Flow (cfs) and TP Loading (lb/month)
June	45/[771]	October	70/[623]
July	35/[571]	November	448/[247]
August	30/[430]	December	15/[146]
September	620/[5,147]	January	10/[79]
—	—	February	30/[345]
—	—	March	133/[992]
—	—	April	118/[1,647]
—	—	May	128/[1,984]
Monthly Stream Flow Maximum and TP Total Loading by Season	620/[6,919]	Monthly Maximum Average	448/[6,063]

F.8 OTHER NOTABLE NATIONAL PROGRAMS WITH A UNIT OF TRADE WITH AN ANNUAL UNIT TIME

F.8.1 WISCONSIN PHOSPHORUS RULES WITH WATER QUALITY TRADING

This unit of time is already approved statewide in Wisconsin by both the Wisconsin Department of Natural Resources (WI DNR), the state's Clean Water Act delegated authority, and by the U.S. Environmental Protection Agency (EPA) Region 5. The WI DNR guidance document briefly explains their rational in Section 2.13. The two reasons listed are that it is much more difficult to establish the timing of credit generation since many nonpoint sources generate credits only during periods of runoff, and many models rely on average datasets rather than actual recorded daily values.

F.8.2 CHESAPEAKE BAY NUTRIENT TRADING

The EPA issued the Chesapeake Bay Program Nutrient Trading Fundamental Principals and Guidelines in March of 2001, which define the program around an annual credit and annual tracking mechanisms. In May 2014, EPA Region III updated its guidance and expectation of Bay State trading programs in a technical memorandum entitled *Components of Credit Calculation* [EPA, 2014]. Page 11 of this memorandum states the following:

> *In their offset and trading programs, EPA expects the Bay jurisdictions to use credits that have been generated using certified projects or practices. Certification is the process through which state agencies that oversee offsets and trading ensure that credits are generated in compliance with all appropriate regulations and policies. The Bay jurisdictions may certify credit generating projects and practices at different times prior to the generation of a credit. Bay jurisdictions may have certified credit generating projects and practices for longer than one year. Credit generation from these certified projects or practices is expected to be calculated on an annual basis.*
>
> *Generally, EPA expects that the life of a credit, once generated from a certified project or practice, will be valid for up to one year.*

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APPENDIX G

TRADE RATIO EQUIVALENCY

APPENDIX G: TRADE RATIO (EQUIVALENCY)

Definition of Trade Ratio (Equivalency):

> *The factor applied to pollutant reduction credits to adjust for trading different pollutants or different forms of the same pollutant [*Association of Clean Water Administrators and the Willamette Partnership, 2016].

G.1 DETERMINING THE TRADE RATIO (EQUIVALENCY) FACTOR FOR TOTAL PHOSPHORUS

Total phosphorus (TP) is the sum of all particulate and soluble forms of phosphorus. Each form has a different bioavailable fraction. Phosphorus bioavailability, as the term is used in this trading program, refers to the fraction of soluble and particulate phosphorus forms that is readily available for aquatic plant uptake within 30 days after being discharged into the water resource. Soluble phosphorus forms are considered to immediately be 100 percent bioavailable. The differences in particulate phosphorus bioavailability are caused by different strengths in ionic bonds when phosphorus interacts with other minerals and/or the nature of phosphorus and phosphorus release when sorbed to organic particles. Sediment attachment and organic processes are considered to be particulate forms that are fractions of total phosphorus.

The Shell Rock Water Quality Trading (WQT) program uses the Minnesota Pollution Control Agency (MPCA) document entitled *Detailed Assessment of Phosphorus Sources to Minnesota Watersheds*, Appendix K [Holmberg et al., 2004] to determine the fraction of TP that is bioavailable. Table G-1 provides the recommended "most likely number" for TP discharges from different nonpoint sources. The data in this table were developed after completing a literature review, an analysis of water quality sampling results (which included Minnesota publicly owned treatment works), and Minnesota basin-specific total and bioavailability phosphorus calculations as a part of the complete report mentioned above.

Table G-1. Assessment of Bioavailable Fractions of Total Phosphorus Discharges From Different Nonpoint Sources [Holmberg et al., 2004]

Nonpoint Phosphorus Sources		Estimate of TP Fraction That Is Bioavailable (%)
Agricultural Runoff	Improperly Managed Manure	0.80
	Cropland Runoff	0.58
Urban Runoff	Turfed Surfaces	0.58
	Impervious Services	0.60
Forested Land		0.44
Road and Sidewalk Deicing Chemicals	Salt	0.92
	Sand	0.36
Streambank Erosion		0.44

To develop the Trade Ratio (Equivalency) factor, the urban impervious surface TP that is most likely to be bioavailable (as shown in the last column of Table G-1) is used as the denominator in the ratio equation for different sources, which are listed in Table G-2; for example, a WQT buyer that is offsetting urban runoff impervious surfaces discharges would use the estimated fraction of TP that is most likely to be bioavailable for impervious surfaces as 0.60, or 60 percent. Table G-2 presents the input factors for four different potential credit generating sources and the factor results for each.

Table G-2. Trade Ratio (Equivalency) Results for a Buyer Interested in Offsetting a Discharge From Urban Stormwater Impervious Surfaces by Purchasing Credits From a Reduction in Loading From a Nonpoint Source for Four Different Nonpoint-Source Types

Land Use	Agricultural Cropland Runoff (%)	Improperly Managed Manure (%)	Forest Land (%)	Stream Bank (%)
Other Land Use	58	80	44	44
Stormwater (Impervious Land Use)	60	60	60	60
Trade Ratio (Equivalency)	97	133	73	73

G.1.1 TOTAL PHOSPHORUS TRADE RATIO (EQUIVALENCY) RECOMMENDED FACTORS

The Trade Ratio (Equivalency) factors are provided in Table G-2 and use the information from the last column in Table G-1; the land use that is being offset is the denominator and the land use that is being used for credit generation is the numerator. For example, the Trade Ratio (Equivalency) factor for a stormwater (SW) WQT credit buyer that is purchasing credits from an agricultural cropland runoff site without manure applications or using appropriate manure nutrient management is 0.97.

G.2 DETERMINING THE TRADE RATIO (EQUIVALENCY) FACTOR FOR TOTAL SUSPENDED SOLIDS

The most important criteria in determining the total suspended solids (TSS) Trade Ratio (Equivalency) factor is particle size as related to specific land uses. This statement is based on a U.S. Geological Survey (USGS) and MPCA report from 2013 [Ellison et al., 2013] that provided statistics from a monitoring network of 14 stations that were located across the state. The sampling data that were collected included stream flow, TSS, suspended-sediment concentrations (SSC), particle size, and turbidity. The USGS/MPCA document discussed the particle-size fractions and specifically tracked percent fines in the monitoring data, including percentages according to flow. Percent fines were defined as 0.0625 millimeters (mm) (62.5 micrometers). A report findings summary table shows the dominance of fines in all of the median, average, and low-flow regimes for most of the rivers that were sampled; the summary results are presented at the end of this document because of the length of the reference. The factor determination process assumes that stream-energy dynamics are relatively equal among all particles of the same size, no matter which source the particle originated from.

A USGS report that is still under development by the Upper Midwest Environmental Sciences Center, Wisconsin Water Science Center studies the particle-size distribution from urban land use and source areas [Selbig, 2019]. Early work provides a graphical comparison of median particle-size distribution from five source areas and one land use (Figure G-1). Researchers previously recorded a wide variability in urban sources of sediment regarding the sediment's particle-size distribution [Selbig and Bannerman, 2011; Selbig and Fienen, 2012]. A careful observation of the log graph for this dataset indicates that the

USGS particle-size fractionation range is from 2 micrometers (0.002 mm) up to the maximum values at 500 micrometers (0.5 mm), which allows for urban and stream data from the two USGS studies to be compared [Ellison et al., 2013; Selbig, 2019]. The samples collected from urban feeder storm sewers [Selbig, 2019] had the highest percentage below the cutoff that denotes "fines" in the Minnesota study of rivers and streams [Ellison et al., 2013].

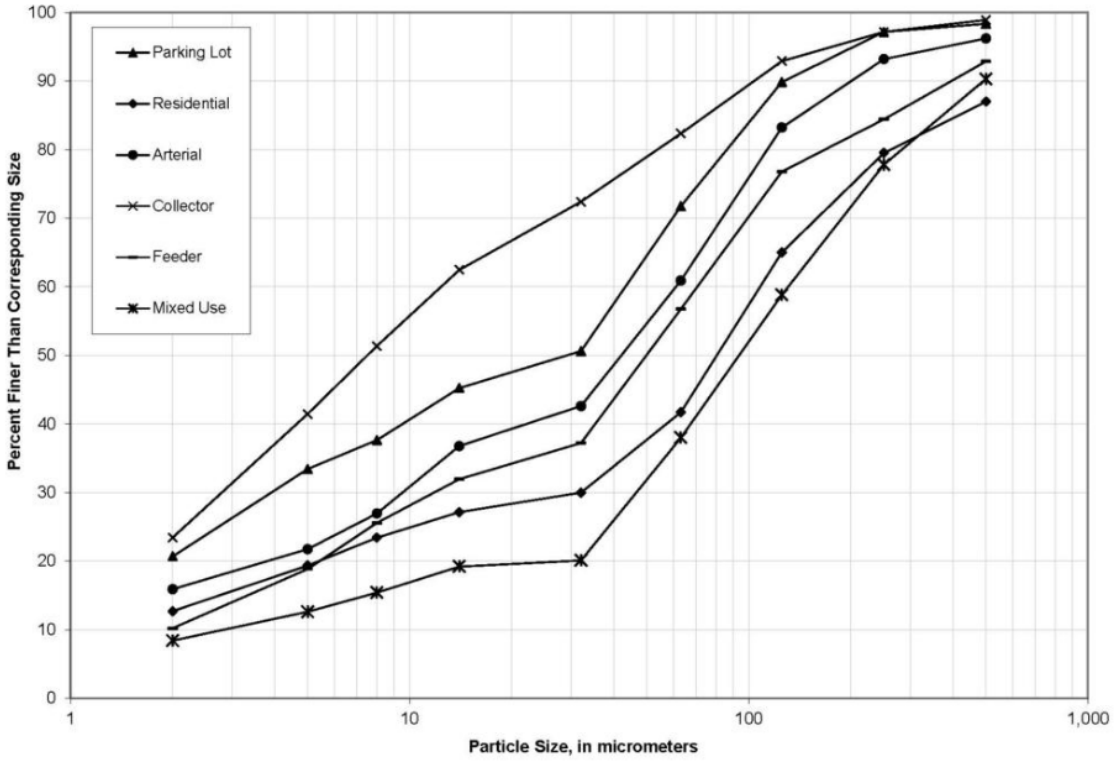

Figure G-1. A Particle-Size Distribution From a Madison, Wisconsin, Study Preliminary Finding for Different Urban Land-Use Types and the Percent "Finer Than" Particle Sizes in Micrometers [Selbig, 2019].

The urban land-use categories are defined by the activities and impervious surface alterations that occur in the catchment area feeding the stormwater outlet; descriptions tend to be based on the size of roads or plat lot use. The following list presents the types of networks that were monitored and the resultant percent of particles with a "finer than" size of 0.0625 mm:

- Feeder street: Approximately 57.5 percent fines
- Collector street: Approximately 82.5 percent fines
- Arterial street: Approximately 61 percent fines
- Residential: Approximately 42.5 percent fines
- Parking lot: Approximately 72.5 percent fines
- Mixed use: Approximately 37.5 percent fines.

This urban dataset, albeit small, was compared with the statistical summary of 14 Minnesota river particle-size distributions across different flow regimes [Ellison et al., 2013]. Table G-3 compares the dataset statistical summary of 14 river monitoring stations (specifically, the particle sizes that are classified as fines) with the results of the same statistical approach as it is applied to the Wisconsin data from five urban land-use categories [Selbig, 2019].

Table G-3. Statistical Comparison of Fines From 14 River-Monitoring Stations Across Minnesota [Ellison et al., 2013] With Five Urban Land-Use Types Monitored in Wisconsin [Selbig, 2019]

Assumed River Flow Regime	Sample Dataset Statistic[a]	14 River Stations Statewide Statistics for Sediment Particle-Size Percent Finer Than 0.0625 Fines Threshold[a]					
		Minimum	25th Percentile	Average	Median	75th Percentile	Maximum
Highest	Minimum	2.00	17.25	29.79	29.00	39.25	76.00
Middle	Mean	55.00	72.50	76.50	78.50	82.25	92.00
Middle	Median	60.00	76.00	81.21	84.00	88.25	95.00
Lowest	Maximum	95.00	98.00	98.14	98.50	99.00	100.00
	Statistical Variation Among Five Different Urban Land Uses[b] [Selbig, 2019]	42.5	57.5	63.2	61.0	72.5	82.5
Urban Mixed Land-Use Percent Fines Sample Result				37.5[b]			

(a) From Ellison et al. [2013]

(b) From Selbig [2019].

Figure G-2 illustrates a generalized Hjulstrom diagram that depicts the relationship between stream velocity and particle size. Figure G-3 shows that increases in cubic feet per second (cfs) (a surrogate for velocity) have an inverse relationship with percent fines for two rivers that were selected from the 14 monitored streams in Minnesota [Ellison et al., 2013]. The two rivers were selected based on their datasets, which included cfs, SSC, TSS, and percent fines. TSS samples can contain particles larger than 0.625 mm; however, TSS is an important screening parameter. When TSS samples are very turbid, the sample preparation includes creating a vortex in a sample jar and using a 20-milliliter (mL) pipette to extract the liter of water for testing. This step inadvertently screens out larger particles. These two streams are of adequate sizes and have the correct particle-size distributions to properly illustrate that velocity (using cfs as a surrogate) has an inverse relationship with percent fines. Differences between TSS and SSC were used to explain whether or not a particle-size distribution existed. Based on the preceding process and an overview of the site descriptions in the report, 12 rivers were excluded because they were clay- and silt-dominated watersheds, had very steep gradients that produced high velocities even at low flows, or did not have TSS data collected. The project team selected 200 cfs as an approximate breakpoint at which larger particle sizes typically begin to suspend. For the TSS equivalence determination, a stream flow of 200 cfs was selected as the threshold, which was a conservative estimate.

G.3 TOTAL SUSPENDED SOLIDS TRADE RATIO (EQUIVALENCY) RECOMMENDED FACTORS

A Trade Ratio (Equivalency) policy for TSS has been developed and provided below. This policy is based on the results listed in Table G-4 and professional judgement given the wide variation and temporal nature of particle-size distributions from influences of the runoff and stream's response to storm intensity, magnitude and return frequency, and the source site's specific conditions.

G.4 REFERENCES

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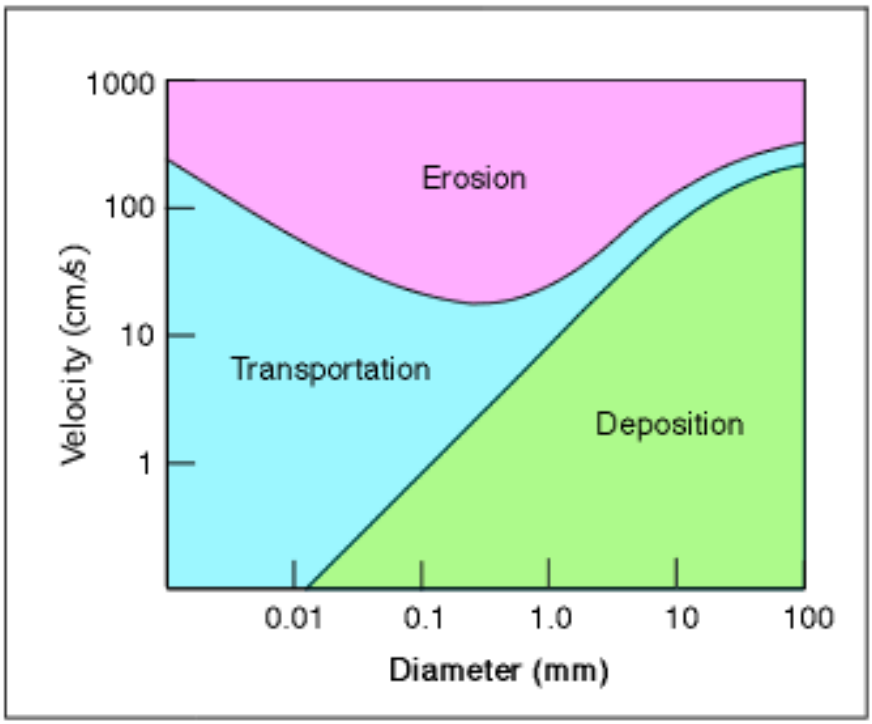
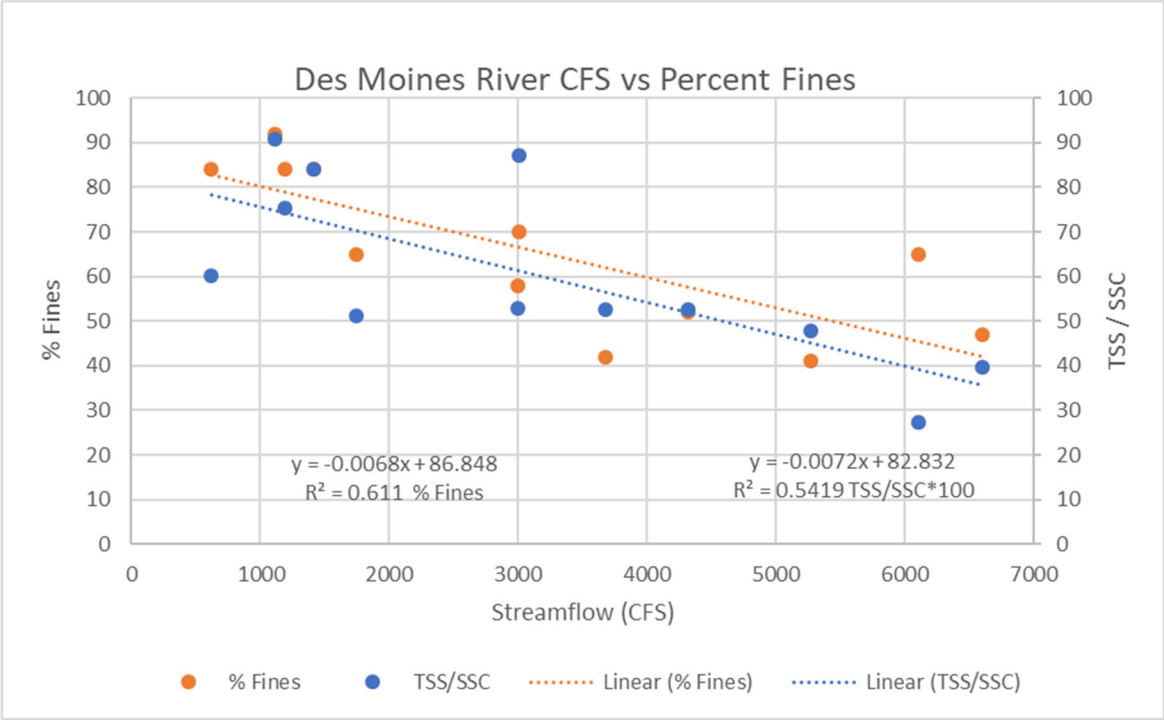


Figure G-2. Hjulstrom Diagram of the Relationship Between Stream Velocity and Particle Diameter Regarding Suspension Deposition or Bed and Bank Erosion (Figure Credit: Columbia University [2021]).



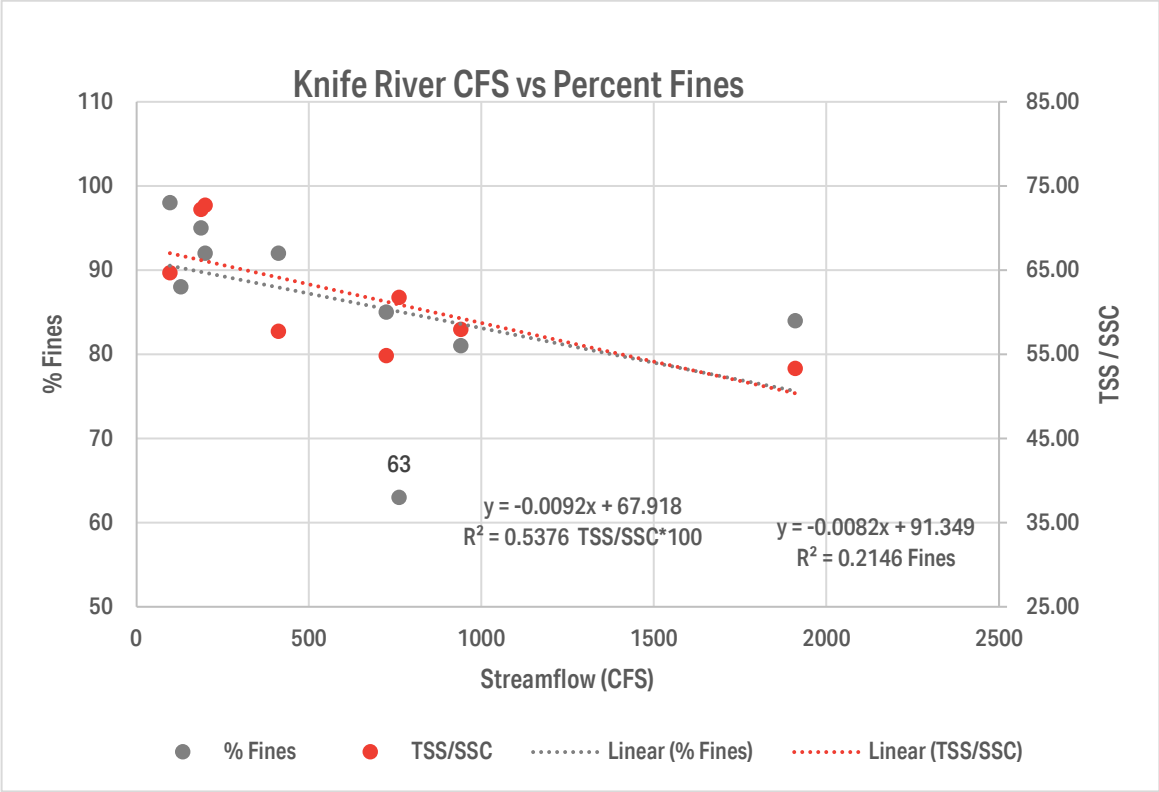


Figure G-3. Relationship Between Suspended-Sediment Percent Fines and Stream Flow for Two Selected Sites in Minnesota, 2007 Through 2011 [Ellison et al., 2013].

Table G-4. The Total Suspended Solids Trade Ratio (Equivalency) Factors for Credit Generation Sites Among Different Flow Regimes

Source Site's Soil Content of Sand or Larger Particle Sizes (%)	Trade Ratio (Equivalency) Factor for Stream Flows	
	Flow Regimes Below 200 cfs (%)	Flow Regimes Above 200 cfs (%)
<25	100	100
25 or Greater	1 (% of Soils in Sand or Larger Particle Size)	100

Table G-5. Summary Statistics Tables for Suspended-Sediment Concentrations, Total Suspended Solids, Turbidity, and Particle Sizes for Selected Sites in Minnesota, 2007 Through 2011 [Ellison et al., 2013] (Page 1 of 4)

Statistic	Suspended Sediment Concentration (mg/L)	Suspended Fines (%)	Total Suspended Solids (mg/L)	Turbidity (NTRU)	Suspended Sands (mg/L)	Suspended Fines (mg/L)
Knife River near Two Harbors, Minn. (Site 1)						
Minimum	2	31	1	1	1	2
Mean	60	80	29	34	14	46
Median	16	84	5	14	1	16
Maximum	414	99	240	210	108	335
Total Number of Samples	31	31	21	31	31	31
Standard Deviation	99.0	18.5	59.2	51.4	27.1	81.0
South Branch Buffalo River at Sabin, Minn. (Site 2)						
Minimum	21	50	11	13	1	17
Mean	94	88	38	45	12	81
Median	69	92	24	27	5	57
Maximum	408	99	100	160	72	384
Total Number of Samples	43	43	28	43	43	43
Standard Deviation	75.0	11.6	28.9	37.4	16.0	70.5
Wild Rice River at Twin Valley, Minn. (Site 3)						
Minimum	3	43	–	5	1	3
Mean	112	83	–	60	18	85
Median	40	89	–	25	5	22
Maximum	775	98	–	400	93	290
Total Number of Samples	29	29	–	29	29	29
Standard Deviation	171.3	15.8	–	92.7	27.0	154.6
Wild Rice River near Ada, Minn. (Site 4)						
Minimum	6	33	–	4	1	5
Mean	185	75	–	89	47	122
Median	39	76	–	27	7	19
Maximum	1,140	96	–	680	332	980
Total Number of Samples	29	29	–	29	29	29
Standard Deviation	287.7	15.9	–	153.0	83.0	239.9

Table G-5. Summary Statistics Tables for Suspended-Sediment Concentrations, Total Suspended Solids, Turbidity, and Particle Sizes for Selected Sites in Minnesota, 2007 Through 2011 [Ellison et al., 2013] (Page 2 of 4)

Statistic	Suspended Sediment Concentration (mg/L)	Suspended Fines (%)	Total Suspended Solids (mg/L)	Turbidity (NTRU)	Suspended Sands (mg/L)	Suspended Fines (mg/L)
South Branch Wild Rice River Near Ulen, Minn. (Site 5)						
Minimum	3	18	—	3	1	3
Mean	37	74	—	16	12	23
Median	25	82	—	7	3	17
Maximum	118	98	—	77	85	71
Total Number of Samples	25	25	—	25	25	25
Standard Deviation	31.5	22.3	—	20.8	19.7	17.8
South Branch Wild Rice River Near Felton, Minn. (Site 6)						
Minimum	4	5	—	1	0	2
Mean	94	67	—	52	30	54
Median	55	66	—	9	13	34
Maximum	715	100	—	500	307	408
Total Number of Samples	27	27	—	27	27	27
Standard Deviation	155.0	21.5	—	119.9	62.2	82.3
Wild Rice River at Hendrum, Minn. (Site 7)						
Minimum	15	76	—	12	1	14
Mean	99	92	—	80	8	95
Median	65	95	—	52	7	62
Maximum	474	99	—	350	47	427
Total Number of Samples	27	27	—	27	27	27
Standard Deviation	93.3	6.1	—	85.2	9.5	87.8
Little Fork River at Littlefork, Minn. (Site 8)						
Minimum	9	25	4	6	0	7
Mean	37	84	25	23	7	31
Median	23	90	12	16	2	17
Maximum	181	100	150	140	75	161
Total Number of Samples	35	35	19	35	35	35
Standard Deviation	36.7	18.6	34.0	27.1	14.1	31.9

Table G-5. Summary Statistics Tables for Suspended-Sediment Concentrations, Total Suspended Solids, Turbidity, and Particle Sizes for Selected Sites in Minnesota, 2007 Through 2011 [Ellison et al., 2013] (Page 3 of 4)

Statistic	Suspended Sediment Concentration (mg/L)	Suspended Fines (%)	Total Suspended Solids (mg/L)	Turbidity (NTRU)	Suspended Sands (mg/L)	Suspended Fines (mg/L)
Buffalo Creek Near Glencoe, Minn. (Site 9)						
Minimum	5	34	3	3	1	4
Mean	63	79	30	27	15	48
Median	44	86	20	19	8	30
Maximum	298	98	81	92	86	262
Total Number of Samples	43	43	18	43	43	43
Standard Deviation	65.2	17.3	23.0	25.9	20.2	53.2
Rice Creek below Old Highway 8 in Mounds View, Minn. (Site 10)						
Minimum	2	17	—	1	1	1
Mean	21	55	—	4	10	11
Median	16	60	—	4	9	7
Maximum	56	95	—	9	46	42
Total Number of Samples	21	21	—	21	21	21
Standard Deviation	16.4	18.6	—	2.2	10.4	10.7
Little Cobb River Near Beauford, Minn. (Site 11)						
Minimum	2	27	13	7	1	17
Mean	103	79	49	52	24	84
Median	92	86	39	28	13	62
Maximum	346	99	170	200	106	339
Total Number of Samples	68	68	24	68	68	68
Standard Deviation	67.4	19.6	37.1	53.4	27.9	65.9
Minnesota River at Mankato, Minn. (Site 12)						
Minimum	27	15	—	5	1	19
Mean	193	72	—	61	58	99
Median	151	76	—	30	20	84
Maximum	671	98	—	170	236	335
Total Number of Samples	33	33	—	33	33	33
Standard Deviation	154.9	21.3	—	65.7	78.0	78.4

Table G-5. Summary Statistics Tables for Suspended-Sediment Concentrations, Total Suspended Solids, Turbidity, and Particle Sizes for Selected Sites in Minnesota, 2007 Through 2011 [Ellison et al., 2013] (Page 4 of 4)

Statistic	Suspended Sediment Concentration (mg/L)	Suspended Fines (%)	Total Suspended Solids (mg/L)	Turbidity (NTRU)	Suspended Sands (mg/L)	Suspended Fines (mg/L)
Zumbro River at Kellogg, Minn. (Site 13)						
Minimum	17	2	7	2	3	10
Mean	226	65	182	101	81	145
Median	107	71	61	16	28	70
Maximum	1,250	96	1,100	990	646	938
Total Number of Samples	34	34	17	34	34	34
Standard Deviation	305.9	23.5	299.8	229.4	136.3	228.3
Des Moines River at Jackson, Minn. (Site 14)						
Minimum	18	41	39	18	1	14
Mean	116	78	95	60	29	87
Median	103	84	74	51	16	82
Maximum	314	99	350	210	185	285
Total Number of Samples	26	26	20	26	26	26
Standard Deviation	81.0	20.6	69.3	46.2	41.1	61.8

mg/L = milligrams per liter

NTRU = nephelometric turbidity ratio unit

Minn. = Minnesota

— = not measured.

APPENDIX H
UNCERTAINTY FACTOR

APPENDIX H: UNCERTAINTY FACTOR

H.1 INTRODUCTION

The Water Quality Trading (WQT) project team recommends a single-value Trade Ratio for Minnesota stormwater nonpoint-nonpoint WQT. This single-value Trade Ratio is recommended for WQT programs operating in lake watersheds where the Total Maximum Daily Load (TMDL) requires total phosphorus (TP) reductions from stormwater National Pollutant Discharge Elimination System (NPDES) permittees.

The recommended single-value Trade Ratio is 2.1:1 with a Location Factor determination as part of the quantification. This Trade Ratio consists of an Uncertainty Factor of 2:1 plus a Retirement Factor of 0.10. The NPDES permit holder has the opportunity to change the 2:1 Uncertainty Factor for credits generated by nonpoint sources if the permit holder can demonstrate that uncertainty has been reduced through monitoring (to verify performance) or projects that include a permanent legal protection, such as an easement, to ensure reliable load reductions. Examples of verifying performance through monitoring may include lake and stream dredging as well as chemical precipitation of phosphorus. Conservation measures for permanent protection include reforested lands, vegetated buffers, and restored wetlands that are subject to perpetual easement and annual inspections. Jurisdictions are assumed to be able to submit their justification for a different Uncertainty Factor in the Trade Ratio to the Minnesota Pollution Control Agency (MPCA) to determine whether or not an Uncertainty Factor other than 2:1 is appropriate.

To justify the recommended values for the statewide Trade Ratio, the project team reviewed literature of selected states with active trading and two U.S. Environmental Protection Agency (EPA) Region 3 Chesapeake Bay technical memoranda written specifically for Trade Ratio requirements. The findings of this literature review were compared with the Shell Rock River Watershed District (SRRWD) WQT project's previous work to evaluate and determine Location and Equivalence Factors (see Appendices E and G). The project team considered the Trade Ratio factors listed in the *Water Quality Trading Toolkit* [Association of Clean Water Administrators and Willamette Partnership, 2016] and the *Water Quality Trading Toolkit for Permit Writers* [EPA, 2009] to develop appropriate values for Minnesota.

H.2 SINGLE-VALUE TRADE RATIO CONSIDERATIONS

A single-value Trade Ratio must provide assurance that the trading transactions will provide equal pollutant reductions when compared to conventional stormwater best management practices (BMPs). Typically, this assurance is met through the Uncertainty, Equivalency, and Location Factors. The SRRWD WQT program uses the best available science, and a protocol was developed for applying the Location Factor in all quantification methods with the exception of adding an additional Equivalency Factor of 30 percent for bank and gully erosion quantification methods. As described in Appendix H, an uncertainty factor is also added based on the coefficient of determination of the model used to establish the Minimum Control Level (MCL) in the demand determination.

The 2:1 Uncertainty Factor is based on commonly acceptable standards. As illustrated in Table H-1, the Chesapeake Bay state jurisdictions selected a 2:1 Uncertainty Factor and implemented the Location Factor in the credit quantification method [EPA, 2014]. The EPA states:

In a review of more than 20 water quality trading programs across the United States, EPA found that a 2:1 uncertainty ratio was most widely adopted, although uncertainty ratios as high as 4:1 were observed. EPA believes that 2:1 represents an uncertainty ratio that is adequately conservative and protective of water quality while not being unduly restrictive so as to discourage transactions. As the Bay jurisdictions gain additional experience from trading programs, the ratio may be reevaluated.

Location factors were not included when developing Trade Ratio in earlier programs because of scientific limitations with the state of Wisconsin being the only Midwest state program to include a Location Factor. Other Midwest programs used the Uncertainty Factor to account for site variability and implicitly accounted for the Location and Equivalence Factors. The one exception was Rahr Malting Company's multiparameter trading permit, which includes Equivalency Factors for different pollutant parameters; however, the phosphorus bioavailability estimates were not available when that permit was developed. Therefore, the Uncertainty Factor was used to address the bioavailability differences between sources of phosphorus.

The results of Table H-1 were compared to the project team's completed work on the Location and Equivalency Factors (see Appendices E and G). The analysis method, results, and applied factor are presented in Table H-2.

H.3 POLICY FACTORS CONSIDERED

Optional Trade Ratio policy factors can be considered to fulfill local program or societal goals that create greater reductions than would occur if conventional stormwater BMPs were implemented. The two Trade Ratio policy factors considered for this program were the Retirement Factor and an option for a Reserve Factor.

Retirement Factor: A Retirement Factor of 10 percent is recommended to reflect EPA Region 3's statement. This factor is the maximum Reserve or Retirement Factor applied in any of the reviewed programs outside of Minnesota. The 10 percent Retirement Factor is justified by the following reasons:

1. Minnesota previously used an explicit Uncertainty Factor of 1.6:1 with an acknowledged program process that provided at least 40 percent coverage in implicit conservative assumptions.
2. The Uncertainty Factor was increased by 40 percent to 2:1.
3. The Location Factor is included in the quantification method, which reduces the previous level of uncertainty in credit site evaluations.
4. An Equivalency Factor of 1.1 was assumed for agricultural and other stormwater sources, which is appropriate and conservative in cases where improperly applied manure is being credited.
5. The credit quantification methods for all site estimates, except for bank and gully erosion, are based on state-of-the-art mechanistic models calibrated with the best available science.

Table H-1. Trade Ratio Component Review of Selected States and U.S. Environmental Protection Agency Region 3's Chesapeake Bay Technical Memoranda

Entity	Quantification Methods	Location (method)	Equivalency	Retirement	Reserve	Uncertainty	Other
EPA Region 3, Chesapeake Bay	CBWM and NTT[a]	Yes (CBWM)	Not Quantified	Not Applied	No	2:1 minimum, can be lowered if justified	No
Virginia	CBWM and NTT	Yes CBWM	Not Quantified	Not Applied	No	2:1 minimum, can be lowered if justified	No
Maryland	CBWM and NTT	Yes (CBWM)	Not Quantified	Not Applied	5%	2:1 minimum, can be lowered if justified	No
Pennsylvania	CBWM and WRI Spreadsheets; (soon to be CBWM and NTT)	Yes CBWM	Not Quantified	Not Applied	Spreadsheet Yes 10%	2:1 (2007 spreadsheets, increased to 3:1 to address the lack of an adequate baseline calculation)	No
Ohio	Region 5 Model and Related Methods	Not Quantified	Not Quantified	3:1 Uncertainty Coefficient Increased in EPA-Approved TMDL Watersheds	"Insurance Pool" in the Great Miami River WQT; This Pool is Not Funded by Compliance Buyers	2:1	No
Existing Minnesota Permits	Region 5 Model and Related Methods	Not Quantified	Not Quantified	2:1	No	1.6:1 explicit 40% implicit conservative assumptions	No
Wisconsin	SNAP-Plus, SPARROW, Barnyard Tool APLE RUSLE2	Yes	Set as Zero for TP	No	No	1:1 to 4:1 by practice without environmental enhancement (aquatic life habitat; with ratio as high as 3:1)	Environmental Enhancement[b]

(a) The quantification methods used in the Chesapeake Bay programs have evolved into the Chesapeake Bay Watershed Model (CBWM), which is an HSPF model application, and the U.S. Department of Agriculture (USDA) Nutrient Tracking Tool (NTT) for agricultural sites.

(b) The Wisconsin Department of Natural Resources added an Environmental Enhancement Trade Ratio factor in biotic-impaired watersheds to incentivize BMPs to enhance aquatic life habitat. Adding aquatic life habitat to the correct BMPs can reduce the Trade Ratio Uncertainty Factor from 4 to 3 (or from 3 to 2).

6. The bank and gully erosion quantification method will include appropriate discount factors for valuation estimates and fate and transport determinations.
7. The EPA Region 3 states that a 2:1 Uncertainty Factor and using Location Factors are protective of the environment.
8. The EPA Region 3 states that the 2:1 Uncertainty Factor and using Location Factors are not considered to be unduly restrictive so as to discourage transactions.

Table H-2. Trade Ratio Location and Equivalence Factor Evaluation Results

Trade Ratio Factor		Quantification Method	Results	Where the Factor is Applied
Location		Shell Rock River Watershed HSPF Modeling	Modeled reach phosphorus delivered as a percentage of reach subwatershed's loading	Applied during the Quantification Method for credit valuation; not part of the Trade Ratio factors
Equivalency	For Cropland Sources	Literature Review[(a)]	0.97 (cropland) to 1.33 (improperly managed manure)	Addressed by Uncertainty Factor; adds a conservative assumption when BMPs address sites with improperly managed manure
	For Bank and Gully	Literature Review[(a)]	0.73	Applied as part of the Quantification Method for credit valuation; not part of the Trade Ratio factors

(a) **Holmberg, H., J. DePinto, and J. Kaur, 2004.** "Assessment of Phosphorus Sources to Minnesota Watersheds," *pca.state.mn.us*, accessed August 19, 2019, from *https://www.pca.state.mn.us/sites/default/files/pstudy-appendix-k.pdf*

Reserve Factor: The Reserve Factor is not proposed at this time. Populating a 5 or 10 percent Reserve Factor pool would likely require a high volume of transactions when buyers request replacement credits at the same time. The use of a Reserve Factor to assist with offsetting uncertainties is considered to be unnecessary. The single-value Trade Ratio explanation of the acceptable Uncertainty Factor above demonstrates a substantial increase in protective program improvements that will already exist to reduce risk and uncertainty. Furthermore, the following program protocols to protect the buyer's interest are being considered in the development process:

1. Use of buyer payment schedules that are based on performance. By incorporating low-interest loans signed by the credit seller into the WQT program, the payments can be funded by the credit buyer unless the site performance fails. In instances when site performance fails, the payments are to be made by the seller of the credits.
2. Establishing a reasonable replacement period for credit generation sites in need of repair caused by factors outside of the control of the responsible operator and management party.

H.4 CONCLUSION

The stormwater WQT nonpoint-nonpoint, single-value Trade Ratio recommendation for a uniform lake watershed phosphorus WQT program is 2.1:1. Other ratios for uncertainty may be justified if the conditions of permanent land-use conversion protection, reliable determination, monitoring, and/or operational consistency are present. Location Factors for all transactions and appropriate bank and gully fate and transport discount factors are also included. This recommendation is based on the

justification findings that the 2.1:1 Trade Ratio and supporting quantification methods are protective of the environment and will not be unduly restrictive so as to discourage transactions.

H.5 REFERENCES

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APPENDIX I

CREDIT GENERATION SITE BASELINES

APPENDIX I: CREDIT GENERATION SITE BASELINES

I.1 INTRODUCTION

The approved Water Quality Trading (WQT) baseline definition is:

> *The combined pollutant load and/or BMP installation requirements that must be met before trading. All individual nonpoint sources must, at a minimum, meet existing state, local, and tribal regulatory requirements. The parcel's highest conservation level that occurs across the last 3 years will be considered the current conditions. The baseline is set by combining the regulatory requirements with the current conditions* [adjusted from Association of Clean Water Administrators and the Willamette Partnership, 2016].

Each credit generation site has a baseline that provides the WQT program with assurance that the reductions that are being credited are new reductions. WQT programs provide a flexible compliance option to meet newly issued Total Maximum Daily Load (TMDL) allocation requirement(s). Because the TMDL-based National Pollutant Discharge Elimination System (NPDES) permit effluent requirement is new, the credits that are used in trading must also provide a new reduction to achieve the water quality protection requirement. The definition of baseline considers the site conditions before best management practice (BMP) installation and other state and local legal requirements as the credit generation baseline condition, even if the site does not have these legal requirements in place. The baseline mathematically sets the pre-BMP condition of the site that the credit estimation method uses to estimate the "before" condition pollutant discharged load. The credit generating BMP is then added to the site characteristics so that the credit estimation method can determine the "after" condition pollutant discharged load. The site's reduction of pollutant load is equal to the before condition pollutant discharged load minus the after condition pollutant discharged load; however, a credit process must also account for other discount factors, such as location, equivalence, uncertainty, and policy conditions such as retiring a fraction of the purchase to benefit the water resource as an added value when purchasing offsets (as described in Appendices E, G, and H, respectively) . If the credit generation site has not met its legally required obligations, the before amount of pollutant discharged load is reduced by adding the operations that are necessary to achieve the legal requirement(s). The credit estimation process will then add the proposed BMP(s) to meet the existing baseline legal obligation. A credit cannot be certified until the legal obligations are fulfilled.

The Shell Rock River Watershed WQT program's baseline policy requirements fulfill the intended outcome of the 2019 WQT policy update. The U.S. Environmental Protection Agency (EPA) memorandum [Ross, 2019] states that the EPA cannot mandate the changes to encourage creativity and innovation; however, the baseline requirements that are presented below are interpreted to provide suggested EPA principles that seek appropriate balance between implementing cost-effective and practical trading processes that achieve the necessary water quality protection.

The organization of this appendix provides information regarding the general credit generation baseline requirements and specific requirements for credit generating land-use categories and natural resource types. The initial land uses and natural resource types that are provided below are those that are expected to generate the most opportunity for credit generation. New categories can be added to this list when new or updated WQT management plans are approved. The approval of these baseline

categories is an important component of the WQT program rules to ensure that the Clean Water Act (CWA) and Code of Federal Regulations (CFR) NPDES permit requirements for antibacksliding and effluent reduction compliance and reporting are fulfilled.

The initial land-use categories and natural resource types are as follows:

1. Agriculture land uses, including:
   a. Cropland and hayfields
   b. Livestock operations, manure management, and livestock access to lakes and streams.
2. Small urban stormwater utilities that are not Municipal Separate Storm Sewer System (MS4) NPDES permittees
3. Near channel erosion sources (specifically, bank and river bluff erosion)
4. In-lake treatment systems.

I.2 GENERAL BASELINE REQUIREMENTS APPLICABLE TO ALL LAND-USE CATEGORIES AND NATURAL RESOURCE TYPES

The baseline definition requires that (a) a 3-year site history is documented to establish the current operations, and (b) required legal obligations for the credit generation site are fulfilled. Once the baseline is established, the before condition will be used to estimate the site's pollutant reduction for implemented BMPs. The following two subsections present supporting justification for the baseline policy and explain why the TMDL load allocation is not included as a baseline requirement.

I.2.1 GENERAL BASELINE REQUIREMENTS

The baseline requirements provide assurance that the pollutant reductions being sold as credits are new to the watershed. Because the NPDES/SDS permittee is buying credits to fulfill a new water quality-based effluent limit, the nonpoint-source credits that are being purchased must also be from newly implemented reductions after legal requirements have been met.

When the 3-year history is used in combination with compliance verification for all relevant legal obligations, the two baseline requirements present the strongest protocol to ensure that additionality (which has been defined by other national WQT programs as follows) is achieved:

> *In an environmental market, the environmental benefit secured through the payment is deemed additional if it would not have been generated absent the payment provided by the market system* [Association of Clean Water Administrators and the Willamette Partnership, 2016].

Using the history and legal obligation combination avoids introducing uncertainty by presenting the unanswerable question of whether or not the activity would have ever been undertaken otherwise.

Additionality verification, under this definition, can be challenging (or impossible, in many settings). Questions like the following are nearly impossible to answer: "Would the landowner implement streambank protection via other funding in the future?" A 3-year history and review of legal site management requirements, however, provides a simple, documentable, and low-cost process to ensure that additionality is being provided at every credit generation site. In all cases, the approval of a

credit generator that is participating in trading will also be contingent on the project obtaining the necessary local government permits before proceeding.

For sites that received credit payments in the past but did not renew the credit contracts, the baseline will include the past credit generating practice's level of reduction as a baseline requirement.

I.2.2 MPCA GUIDANCE REGARDING TOTAL MAXIMUM DAILY LOAD ALLOCATION GOALS AS A BASELINE REQUIREMENT

The MPCA Water Quality Trading Guidance document [Doucette et al., 2021] provides an explanation of how baselines consider TMDL WLAs and LAs. For point source credit generation, the most protective of the following applies:

- "Effluent limitation established by an applicable requirement including a state discharge restriction or antidegradation-based effluent limit
- Water quality-based effluent limitation established by an applicable requirement
- WLA specified under a total maximum daily load
- WLA specified in a watershed effluent limit analysis approved by the MPCA
- WLA determined by the MPCA to be consistent with water quality standards and specified in a Watershed Restoration and Protection Strategy or similar such document
- Unpermitted sources subject to an applicable requirement in a TMDL, WRAPS, or other watershed protection and/or restoration report, including an effluent limit analysis, approved by the MPCA:
  - The most protective of the following site-specific pollutant specific cap and loading allocation:
    - In a TMDL
    - BMPs determined by the MPCA to be consistent with water quality standards and specified in a WRAPS or similar such document
    - In a watershed effluent limit analysis approved by the MPCA.

I.3 LAND-USE AND NATURAL RESOURCE-SPECIFIC BASELINE REQUIREMENTS

I.3.1 AGRICULTURAL LAND-USE BASELINE REQUIREMENTS

All agricultural land uses that apply for credit generation must present two or more of the following items in the credit generation application. The items with a mandatory label (i.e., [Mandatory]) must be included in the application package according to WQT participation requirements. The items in the list consist of examples of past proven site verification methods. The number of these methods that is required will vary according to the site circumstances and strength of each item's justification. This successful submittal will verify the current condition of the site for at least the last 3 years:

- A landowner-signed signature block stating that all representations of site condition descriptions are true and accurate to the best of the signatory's knowledge. The signatory must understand that fraudulent claims can be prosecuted to reclaim costs expended on the administrative process during the application and credit verification process (Mandatory).
- Verification of the site's history for 3 years (Mandatory) using one or more of these options:

- Dated aerial photograph documentation of the site conditions that depict the past status of the site that is relevant to the new conservation practice being installed. (Optional, based on submittal of other options, not including the [Mandatory] signature block for WQT requirements).
- Sign a release to allow the WQT program representatives to review the otherwise confidential Natural Resources Conservation Service (NRCS) file records that are pertinent to the site's credit application (Optional, based on submittal of other options, not including the [Mandatory] signature block for WQT requirements).
- Submit signed plans and/or operation plans from a certified or licensed technical service professional that provides supporting evidence in the narratives and dates of the plans supporting the 3-year history, including a newly signed signature block by the technical service provider that the documents in question are accurate and representative for the timestamped period discussed, to the best of their knowledge (Optional, based on submittal of other options, not including the [Mandatory] signature block for WQT requirements).
- Other methods will be considered; the items must specifically address the site history regarding the operation and level of practices.

I.3.2 CROPLAND, HAYFIELDS, AND PASTURES

The credit generation site applicant and their representatives will provide additional information, as follows:

1. **Minnesota Buffer Law and Improved Ditch Mandatory Buffer requirement applicability:** ([Mandatory]; all of the E.3.2 Item 1 steps below must be provided.)
   a. The applicant will provide sufficient information for the WQT program administrators to locate and verify the field's requirements under the Buffer Law and Ditch Buffer Law.
   b. The applicant will provide landmark references to assist the WQT administrators in finding the field within the township, row, and section number location on the Minnesota Department of Natural Resources (DNR) website's Buffer Map Viewing Application (http://arcgis.dnr.state.mn.us/gis/buffersviewer/). A set of two screen captures from the Buffer Map Viewing Application should be submitted.
   c. The two screen captures should identify the specific field(s) that the credit generation application is proposing. The set of screen captures should include one larger-area screen capture to assist in locating the field by using the Buffer Map Viewing Application in the Street Map mode with arrows or highlighted physical features that will be used as landmark guides by the reviewers to locate the field within the section. The second map will use the aerial mapping feature to highlight the exact field by providing other landmark features.

   An example of a method to fulfill the screen capture requirement is provided in Figures I-1 and I-2; the site was randomly selected, and Microsoft Office symbols were added (hand-drawn circles and arrows that are placed onto a screen capture will also be accepted for review).

2. **State and local rules and ordinances that govern agricultural cropland, hayfields, and pasture fields:**

Providing information regarding all local ordinances and state laws that may apply to the credit generation site is beyond the scope of these appendices. WQT program managers are strongly encouraged to contact local governmental entities with delegated land-use authority to inquire about what agricultural requirements exist. These contacts will establish the local list of applicable state and local rules and ordinances. An incomplete list of state and local permit authorities that possibly govern agricultural cropland, hayfield, and pasture environmental concerns is as follows:

a. Minnesota Board of Water and Soil Resources
b. Local county environmental and/or planning offices
c. Watershed districts or watershed management organizations
d. Cities or townships, when the field location is under their authority.

3. **The treatment of wetlands under The Wetlands Conservation Act (Minnesota Statutes Sections 103G.221-103G.2375)**

4. **Riparian farming and shoreland protection requirements (including the Minnesota Buffer Law and Ditch Buffers)**

5. **Excessive soil loss local ordinances; the following specifically apply:**
   a. If a soil loss ordinance exists
   b. The authority issuing the ordinance
   c. Status of compliance
   d. How the BMP generating credits integrates the ordinance into the calculation that estimates credits.

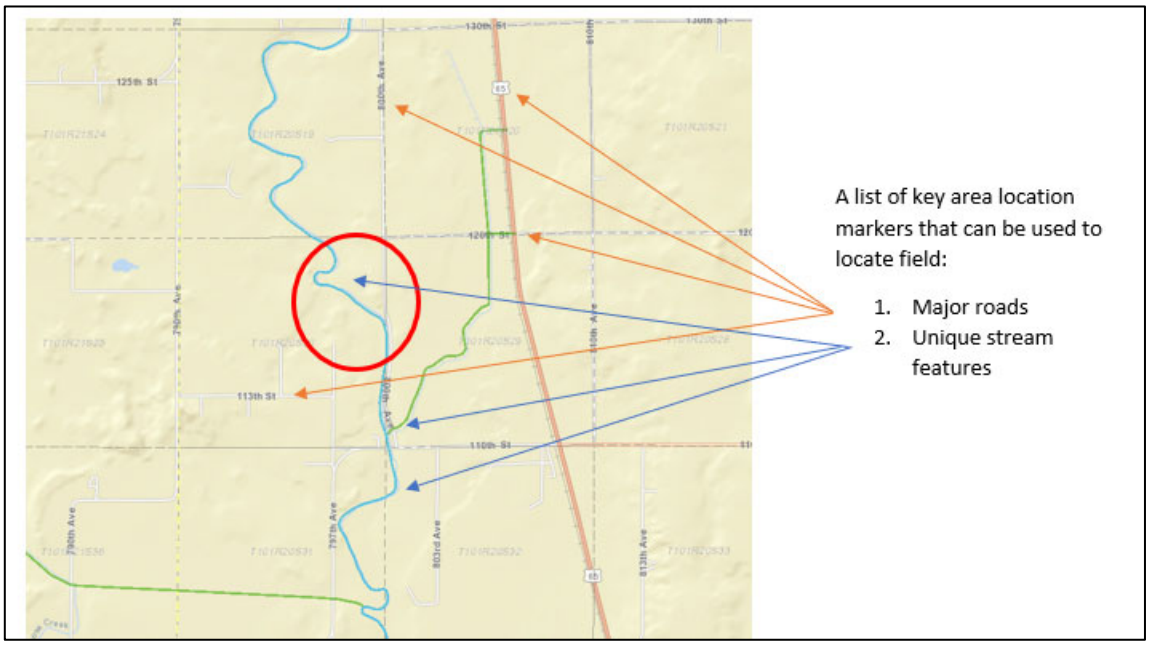

Figure I-1. Illustration of Locating the Site on the Street Map Layer.

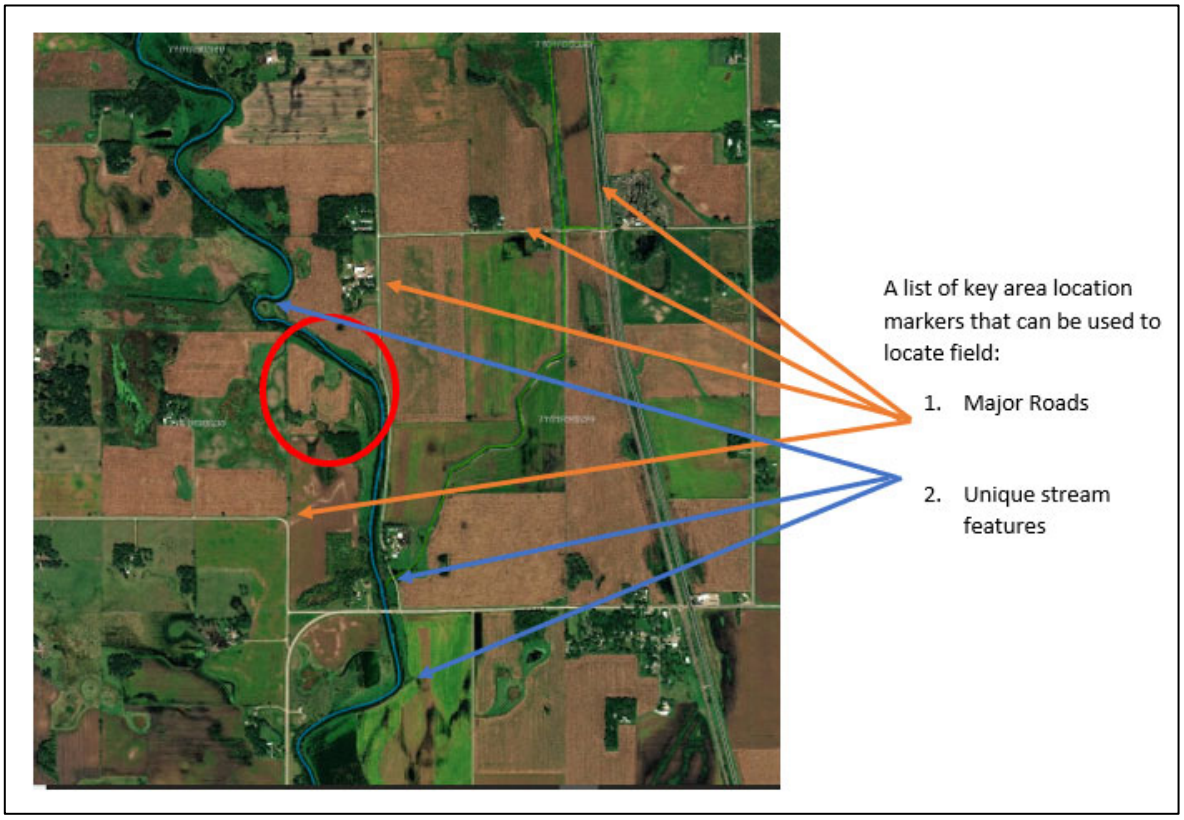

Figure I-2. The Minnesota Department of Natural Resources Buffer Map Viewing Application Has Identified That the Field Is Required to Provide a 50-Foot Buffer, or Equivalent.

I.3.3 LIVESTOCK OPERATIONS; MANURE MANAGEMENT

Livestock operations subject to the Federal Confined Animal Feeding Operations (CAFO) NPDES permit and Animal Feeding Operations (AFO) Minnesota State Disposal System (SDS) permits must comply with all of the permit requirements before implementing an additional creditable conservation practice.

The feedlot permit programs are sometimes operated by an approved delegated county. The map of delegated counties is available online (https://www.pca.state.mn.us/sites/default/files/wq-f1-12.pdf).

Land application of manure: All feedlot owners and manure handlers are required to manage and apply manure in a manner that prevents water pollution, including applying manure in a quantity that will not exceed the estimated nitrogen needs of the crop and following required setbacks from lakes, drainage ditches, open tile inlets, sinkholes, wells, streams, and grassed waterways. (MPCA: Language in this paragraph is excerpted from the Information Brief for Minnesota House of Representatives entitled *A Minnesota Lawmaker's Guide to the Agri-Environmental Policy Landscape* [Minnesota House Research Department, 2020])

WQT program participation is considered to be a voluntary action and agricultural participants enter in the crediting Project Protection Agreement for trading of their own free will; therefore, the baseline requirements are that all AFOs participating in the WQT program, regardless of size, must complete a manure management plan for every field receiving the facility's manure. This baseline requirement includes fields owned by other entities that receive the AFO's manure using a manifest process. This

baseline requirement safeguards against creating applications on fields owned by other farms being used to achieve the AFO farm's manure management plan (MMP) requirements for nutrient management rates on the farm generating credits.

For fields that already have extremely high soil test phosphorus, the MMP will include application methods and application rates that are required for feedlots with 300 or more animal units, as described in the Minnesota Pollution Control Agency (MPCA) General Animal Feedlot Permit. These provisions will be creditable. The MPCA SDS Animal Feedlot Permit does not have authority over the AFO under 300 animal units to require these provisions; however, given the voluntary nature of farmer involvement in the WQT program, improving management at sites where farmer involvement occurs is a valuable opportunity to generate credits and protect water quality. The permit provisions adopted as the crediting site requirements for fields where the 3-year site history includes extremely high phosphorus soil tests will be required to include the following management provisions.

Phosphorus management on extremely high soil test phosphorus soils: According to the MPCA Manure Application Rate Guide [MPCA, 2020], Tables I-1 through I-3 and associated guidance provides the phosphorus management requirements when applying manure:

Table I-1. Minimum Setback Requirements[a]

Sensitive Area	No Incorporation or Incorporation After 24 Hours	Injection or Incorporation Within 24 Hours
Lake	300 ft[b]	25 ft[d]
Perennial stream	300 ft[b]	25 ft[d]
Intermittent stream	300 ft[c]	25 ft[d]
Protected wetlands (10+ acres)	300 ft[c]	25 ft[d]
Drainage ditches (no berms)	300 ft[c]	25 ft[d]
Sinkhole (no berms/diversions)	300 ft up/ 50 ft down	50 ft
Well, mine, quarry, or gravel pit	50 ft	50 ft
Open tile intakes (including rock/blind inlets)	300 ft	0 ft
Road ditches	No application directly into the road ditch	
DWSMA/Wellhead protection	Permit may be needed	
Steeply sloping land	Permit may be needed	
Non-protected wetlands	Develop a management strategy	
Flooded or high water table soils	Develop a management strategy	
Coarse-Textured soils	Develop a management strategy	
Shallow soils over bedrock	Develop a management strategy	

(a) County and/or NPDES permit requirements may be more restrictive

(b) 100-ft non-manured vegetated buffer can be used instead of the 300-ft setback (non-winter)

(c) 50-ft non-manured vegetated buffer can be used instead of the 300-ft setback (non-winter)

(d) Where soil phosphorus exceeds 21 ppm Bray or 16 ppm Olsen, phosphorus must be managed to prevent buildup over a 6-year period.

Table I-2. Minimum State Soil Phosphorus Requirements[a]

Bray P1 (ppm)[b]	< 22	22–75	79–150	> 150
Olsen (ppm)[b]	< 17	17–60	61–120	> 120
More than 300 ft from waters[c]	No Phosphorus management requirements	No Phosphorus management requirements	No Phosphorus management requirements	Permit required if over 300 AU [c]
Less than 300 ft from waters[c]	No Phosphorus management requirements	Prevent long-term build-up of Soil P[d]	Prevent long-term build-up of Soil P[d] Permit required if over 300 AU[e]	Prevent long-term build-up of Soil P[d] Permit required if over 300 AU[e]

(a) Restrictions do not apply if a 100 ft non-manured vegetative buffer along lakes and streams, or a 50 ft non-manured vegetative buffer along intermittent streams, protected wetlands, and unbermed drainage ditches is maintained.

(b) If soil test are in lbs/acre divide by 2 for approximate levels in ppm. If the Mehlich III test is used, the values in the table columns are approximately 180.

(c) Lakes, rivers, streams, intermittent streams, protected wetlands, or unbermed drainage ditches. Also includes tile intakes when soil P levels are above 75 Bray (60 Olsen) or at a CAFO or NPDES permitted site above 21 Bray (16 Olsen)

(d) The rate and frequency of manure applications must not allow soil phosphorus build-up over a six year period. Single year applications can be based on crop nitrogen needs if remaining phosphorus is removed by subsequent crops. (see next page for more information).

(e) Only if over 300 AU. MMP must describe how phosphorus will be managed to prevent phosphorus transport (diet manipulation, soil conservation, and fewer applications).

Guidance page 23:

Table I-3. Phosphorus Removal by Various Crops

Crop	P_2O_5 Removal		Crop	P_2O_5 Removal	
Alfalfa	10.8	lb/ton	Peas or edible beans	0.01	lb/ton
Barley (grain)	0.41	lb/ton	Potatoes	0.14	lb/ton
Barley (grain and straw)	0.55	lb/ton	Rye (grain)	0.44	lb/ton
Corn (grain)	0.34	lb/ton	Rye (grain and straw)	0.59	lb/ton
Corn silage	3.8	lb/ton	Soybeans	0.82	lb/ton
Grass hay or pasture	8.9	lb/ton	Sugar beets	0.73	lb/ton
Grass/legume	11.2	lb/ton	Sweet corn	11	lb/ton
Oats (grain)	0.25	lb/ton	Wheat (grain)	0.53	lb/ton
Oats (grain and straw)	0.32	lb/ton	Wheat (grain and straw)	0.64	lb/ton

How to calculate crop P_2O_5 removal over a 6-year period

- **Step 1:** Determine average P uptake during the crop rotation (multiply yields by values above)
  Example: 170 bu Corn - [170 * 0.34] = 58 lb P_2O_5 removed per year
  45 bu Soybeans - [45 * 0.82] = 37 lb P_2O_5 removed per year
  Average = 48 lb P_2O_5 removed per year

- **Step 2** - Determine the amount of P_2O_5 that is typically applied in manure applications
  Example: 4,000 gallons per acre × 35 lb P_2O_5 /1,000 gallons × 0.8 (availability factor) = 112 lb P_2O_5 applied
- **Step 3** Divide step 2 by the average in Step 1
  Example: 112/48 = 2.3
- **Step 4** Take 6 years divided by the Step 3 result and round down to the nearest whole number
  Example: 6 years/2.3 = 2.6, then round down =

I.3.4 SMALL URBAN STORMWATER UTILITIES THAT ARE NOT MUNICIPAL SEPARATE STORM SEWER SYSTEM NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMITTEES

City and township governments that operate an MS4 that is not permitted by the MPCA can generate credits for other MS4 permitted entities. Baseline mandatory requirements for the nonpermitted MS4 utilities include the documentation of the 3-year catchment history required of all sources and the appropriate local ordinances that support and fund proper operation, maintenance, and replacement of the proposed project.

I.3.5 NEAR CHANNEL EROSION SOURCES; SPECIFICALLY, BANK EROSION, RAVINES, AND RIVER BLUFF EROSION

River and streambank stability, ravines, or near-shore river bluffs contribute a substantial amount of sediment and associated phosphorus to some Minnesota waterbodies. The items with a mandatory label (i.e., [Mandatory]) must be included in the application package according to WQT participation requirements. Examples are available of past proven site verification methods. The number of these methods that are required will vary according to the site circumstances and strength of the initial justification. This successful submittal will verify the current and historical condition of the site for at least the last 3 years:

- A landowner-signed signature block stating that all representations of site condition descriptions are true and accurate to the best of the signatory's knowledge, and that the signatory understands that any fraudulent claims can and will be prosecuted to reclaim the costs expended on the administrative processes during the application period and credit payments and site verification processes (Mandatory).
- Verification of the site's current and historical conditions (Mandatory) using one or more of the following options:
  - Dated aerial photograph documentation of the site conditions that depict the past status of the site that is relevant to the new conservation practice being installed (Optional, based on submittal of other options, not including the [Mandatory] signature block for WQT requirements).
  - Historical maps and dated documents with enough resolution to establish preexisting topography or shorelines as a "timestamped" reference (Optional, based on submittal of other options, not including the [Mandatory] signature block for WQT requirements).
  - Signed release allowing WQT program representatives to review confidential NRCS file records that are considered relevant to the site's credit application (Optional, based on submittal of other options, not including the [Mandatory] signature block for WQT requirements).

- Submit signed plans and/or operation plans from certified technical service providers or licensed engineers that provide supporting evidence in dated reports and plans developed that support a 3-year history. Must include a signed signature block by the plan preparer that the documents presented are accurate and representative to the best of their knowledge (Optional, based on submittal of other options, not including the [Mandatory] signature block for WQT requirements).
- Physical evidence of recession rates for banks and ravines that can include counting the rings of trees that have roots suspended in air, dated family photographs that include key landmarks that are still in place (e.g., fence posts or building foundations that are in close proximity to receding banks and can be identified on Google Earth) (Optional, based on submittal of other options, not including the [Mandatory] signature block for WQT requirements).

I.3.6 IN-LAKE TREATMENT PRACTICES

Approvable in-lake treatment practices include addition of chemical precipitants that bind the phosphorus and settle it to the bottom in order to prevent bioavailability, lake dredging to remove phosphorus enriched of bottom sediments, carp management programs, and other technologies. Each in-lake treatment practice application must provide the following list of supporting documents:

- A thorough description of the in-lake treatment process, design plans and specifications, and an operation and maintenance plan.
- A detailed itemization of the total cost of implementation and operation and maintenance.
- A science-based analysis of how the in-lake practice removes the key limiting nutrient with sufficient studies and reports to verify that this method will fit the local water resource. The analysis must include the estimated reductions and estimates of the reasonable variation in performance expected. For practices specific to preventing internal loading from lakebed sediments, the analysis will include supporting studies regarding lake-specific stratification or wind resuspension characteristics and determination of lakebed particle-fraction distribution and their nutrient concentrations. The analysis approval process and projections of reduction rates will generate credits based on current nutrient release rates, future release rates, and the expected useful life of the practice.
- Monitoring plans and adaptative management plans to verify the number of credits generated within a plan's useful life and how the number of credits generated will be tracked.
- Estimated schedules for implementation, operation, and monitoring.

I.4 REFERENCES

Association of Clean Water Administrators and the Willamette Partnership, 2016. *The Water Quality Trading Toolkit*, prepared by the Association of Clean Water Administrators, Washington, DC, and Willamette Partnership, Portland, OR. Available online at: *http://nnwqt.org/the-water-quality-trading-toolkit/*

Doucette, E., M. Graziani, B. Henningsgaard, A. Luckstein, and J. Peck, 2021. *Water Quality Trading Guidance*, prepared by the Minnesota Pollution Control Agency, St. Paul, MN. Available online at *https://www.pca.state.mn.us/sites/default/files/wq-gen1-15.pdf*

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U.S. Environmental Protection Agency, 2002. "Guidelines for Reviewing TMDLs Under Existing Regulations," accessed September 30, 2019, from *https://www.epa.gov/sites/production/files/2015-10/documents/2002_06_04_tmdl_guidance_final52002.pdf*

APPENDIX J

CREDIT BUYER'S DEMAND DETERMINATION

APPENDIX J: CREDIT BUYER'S DEMAND DETERMINATION

This appendix explains how Municipal Separate Storm Sewer System (MS4) permittees will apply a Minnesota Pollution Control Agency (MPCA) approvable stormwater model to create a Minimum Control Level (MCL) and determine their associated credit demand. The methods described can be applied to a permittee's existing model that has been setup to support permit reporting and planning needs, or to guide the selection and development of a simpler modeling approach like the MPCA Simple Estimator if the permittee has not invested in their own, more sophisticated approach. Determining the MCL is required as a condition of water quality trading (WQT); the MCL is used as critical input for antibacksliding permit requirements and is the first step in developing a permittee's credit demand necessary to achieve their Total Maximum Daily Load (TMDL) wasteload allocation (WLA) reduction obligation. Discharges into water resources without a U.S. Environmental Protection Agency- (EPA-) approved TMDL require a Stormwater Pollution Prevention Plan (SWPPP) that includes justification that practices implemented fulfilled the requirement of Maximum Extent Practicable (MEP) without requiring a quantification of the amount of a pollutant being discharged, or the fraction treated by urban best management practices (BMPs). However, when using WQT credits for compliance, protocols are necessary to provide assurance that the credit offset is equal to or greater than the discharge being offset. These protocols require pollutant discharges, MS4 reductions of discharges, and the credits from off-site reductions be defined in the same mass units (e.g., pound of total phosphorus per year). This appendix outlines key model selection considerations and modeling processes used to determine a MS4's specific MCL for the pollutant parameter being traded as well as methods to manage increases in pollutant loading because of urban growth. An MCL is determined by evaluating the portion of the MS4 footprint that discharges into the TMDL water and its most recent SWPPP commitments as submitted to the MPCA as required under the 2020 MS4 General Permit. Once the MCL loading is quantified, the difference between the allowable loading under the TMDL WLA and the MCL is the maximum possible demand. However, it may be cheaper for an MS4 to blend additional urban BMP implementation with WQT to achieve full compliance. The load determination method to establish the MCL can also be used to provide the MS4 representatives with a method to track TMDL WLA compliance progress.

J.1 URBAN DEMAND MODEL

To calculate the urban demand for credit trading, an MS4 permittee must first select an approvable modeling method, ensure the method is setup properly, and include all relevant information to accurately represent the existing pollutant loads attributed to the MS4 drainage area.

J.1.1 URBAN DEMAND MODELS

A list of commonly used models or calculators assembled by the MPCA used to meet MS4 TMDL permit requirements is presented in Table J-1. If the MS4 permittee already uses an approved model or calculator for their MS4 permit requirements, they must review the guidance steps below to ensure that their current model is properly setup for the WQT program requirements. If a model has not yet been developed to quantify MS4 pollutant loading, the permittee must select one of the approved models and follow the guidance below during development. When selecting which model to use, additional information is available online to the weigh pros and cons of each model (https://stormwater.pca.state.mn.us/index.php?title=Overview_of_models_used_to_meet_MS4_TMDL_permit_requirements).

Table J-1. Excerpt of the Minnesota Pollution Control Agency's Table of Total Maximum Daily Load Model Description and Overview [MPCA, 2019]

Model	Model Description
P8	P8 is a physically-based water quality model which simulates the generation and transport of sediment and associated pollutants from urban watersheds. The model is capable of predicting sediment particulate removal of five (5) particle sizes (including one soluble fraction) and associated pollutants at a variety of BMP types.
MIDS Calculator	The MIDS Calculator is an Excel-based stormwater quality tool used to estimate runoff and pollutant removal at a variety of stormwater BMPs. The model was originally developed by the MPCA to assist designers and regulators evaluate conformance to MIDS performance goals for development-scale models. The MIDS Calculator is an empirical model which predicts pollutant removal based on correlation to P8 results and design-standard BMP removal rates from literature.
MPCA Simple Estimator	The MPCA Simple Estimator is a spreadsheet-based tool that utilizes the Simple Method to estimate land use based pollutant loading from urban watersheds. The empirically-based model estimates pollutant removal from nine (9) BMP types based on design-standard BMP removal rates from literature.
WinSLAMM	WinSLAMM is a water quality model originally developed for the USGS to evaluate nonpoint pollution in urban areas. The model predicts pollutant loading from a variety of land use and impervious area types and calculates pollutant reduction at a variety of control devices (BMPs). Pollutant reduction at control devices is based both on experimental field results (empirical) and tracking of particulate settling and filtration (physically-based).

MIDS = Minimal Impact Design Standard.

J.1.1.1 MODEL SETUP

An approvable modeling method must be able to delineate the MS4's contributing area to the TMDL water of concern, include sufficient resolution to clearly delineate the Area of Interest for each individual BMP, or have the ability to be refined to obtain this level of sufficient detail.

J.1.1.2 MODEL TIMESTEP

If using simpler methods to reduce MS4 setup costs that provide results in annual timesteps, the WQT program must also be appropriate for using an annual unit of trade timestep, as discussed in Appendix F, that creates a unit of trade with a mass per year definition (e.g., January 1 to December 31). Models with timesteps less than annual, typically provide output results options that include annual loading. This models also provide output results for shorter unit of trade time units; while models that only provide annual results cannot be used for trade units requiring a shorter period of time (e.g., mass per April to September seasonal period).

J.1.1.3 COEFFICIENT OF DETERMINATION

If available, the monitoring data discussed in Section 1.2.5 will be used to calibrate the Urban Demand model as feasible and determine the error associated with the modeling results in the form of the R^2 value, Nash-Sutcliffe coefficient, or coefficient of determination. This error will be used to represent the uncertainty factor of the modeling results for the purpose of WQT. In the absence of any meaningful monitoring data (local or regional), the assumed error will be 30 percent. In contrast, annual goodness-of-fit results are often at or below 10 percent for more sophisticated models using an adequate dataset, and this should be considered as part of the model selection process, as an upfront investment in an improved model may pay for itself over the long run in the form of using a lower margin of safety and associated lower credit demand.

J.1.1.4 ESTIMATING TREATMENT EFFICIENCIES FROM BEST MANAGEMENT PRACTICES IN A TREATMENT TRAIN

Not all models identified in the MPCA list of commonly used models provide accurate treatment efficiencies when practices are used in a treatment train. Individual practice treatment efficiencies are not linearly additive, and practices introduced lower in the sequence of treatment can expect to have lower treatment efficiencies than if the practice was the only treatment. Therefore, less sophisticated models, such as the MPCA Simple Estimator operation instructions, recommend subdividing BMP catchment areas in the lower treatment train approach so BMPs are in different subwatersheds. A more sophisticated modeling approach would provide a more accurate representation of treatment efficiencies for treatment trains.

J.1.2 URBAN DEMAND MODEL DATA NEEDS

Once an approved model is selected, the following data are needed to calculate the urban demand:

- Long-term rainfall record (Section 1.1.1)
- Area of interest (Section 1.1.2)
- Event mean concentrations (Section 1.1.3)
- BMP inventory (Section 1.1.4)
- Monitoring data (Section 1.1.5).

J.1.2.1 LONG-TERM RAINFALL RECORD

A long-term daily rainfall record from a local rain gauge is required. The National Oceanic and Atmospheric Administration (NOAA) Climate Data Online is a useful resource to obtain nearby rain gage data. Ideally, this record would have 20 to 30 years of daily timestep data so that statistical analyses may be performed to determine the following:

- A typical precipitation year, represented by the average annual rainfall
- A moderately wet year, represented by the 75th percentile of the average annual rainfall
- A historically wet year, represented by the maximum precipitation year on record.

These three precipitation values will be used to simulate pollutant loading scenarios in the selected water quality model.

J.1.2.2 AREA OF INTEREST

The urban demand area must first be delineated to include all of the impaired waterbody's drainage area that directly enters the MS4 system (i.e., all of the land within the MS4 that drains directly to the impaired waterbody as well as any land outside of the MS4's political boundary that directly drains to their MS4 system). Defining this drainage boundary, which is different from a standard watershed delineation, will be key to determining the level of loading that is eligible for future WQT opportunities.

Using a geographic information system (GIS), the area of interest is recommended to be further subdivided into subbasins at each major entry point to the MS4 system. Major entry points for a WQT program are defined as subbasins (catchments) that enter:

- Apron inlets or drop inlets providing drainage for overland flows to enter the MS4 storm sewer
- Locations where one or more catch basin(s) are connected to the mainline storm sewer

- Stormwater pump station(s) connected to storm sewer drainage areas
- Locations where there may be a major change in the quality or quantity of stormwater in the system.

The more the area of interest is refined by adding subbasins at major entry points, the more accurate the modeling results and pollutant loading calculations will be.

J.1.2.3 EVENT MEAN CONCENTRATIONS

Land-use data within the area of interest are also required for establishing urban demand. The land use can be provided by the city, county, or Natural Resources Conservation Service (NRCS) data, as available. Table J-2 provides the recommended event mean concentrations to be used for determining the baseline conditions.

Table J-2. Summary of Event Mean Concentrations by Land Use

Land Use	Total Phosphorus Event Mean Concentration (mg/L)	Total Suspended Solids Event Mean Concentration (mg/L)
Commercial[a]	0.25	140
Industrial[a]	0.25	150
Institutional[a]	0.25	120
Multi-Use[a]	0.4	140
Municipal[a]	0.3	140
Open Space[a]	0.2	90
Residential – High Density[a]	0.4	140
Residential – Medium Density[a]	0.3	120
Residential – Low Density[a]	0.5	150
Transportation[a]	0.4	135
Agriculture	0.32[a]	120[b]
Open Water	0.01[a]	0[c]
Wetland	0.02[a]	10.2[d]
Golf Courses	0.5[e]	150[d]
Forest	0.04[a]	113[d]

mg/L = milligrams per liter.

(a) MPCA [2015b].
(b) MPCA [2015a].
(c) Assumed.
(d) Lin [2004]
(e) Lee and Pilgrim [2003].

J.1.2.4 BEST MANAGEMENT PRACTICE INVENTORY

A database of the existing BMPs located within the local government unit's (LGU's) MS4 boundary is required to determine the MCL for WQT. This database should include:

- x- and y-coordinates of individual BMPs
- Type of BMP (stormwater pond, infiltration basin, and raingarden).

Depending on the type of water quality model being used for the WQT Program, more details of each individual BMP may be necessary based on software requirements. If the individual details of all of the BMPs are unavailable, the user may assign a standard pollutant-removal efficiency. A list of standard pollutant-removal efficiencies for common BMPs, as cited in the Minnesota Stormwater Manual, is provided in Table J-3, and a more comprehensive list of BMP treatment efficiencies is provided online (https://stormwater.pca.state.mn.us/index.php?title=Median_pollutant_removal_percentages_for_BMPs).

Table J-3. Summary of Pollutant Reductions by Stormwater Best Management Practice Type for Water Quality Trading [MPCA, 2018]

Best Management Practice	Total Phosphorus (%)	Total Suspended Solids (%)
Constructed Wet Pond	50	84
Constructed Wetland	38	73
Infiltration Basin	100	100
Bioinfiltration With Underdrain	80	85
Structural Pollutant Control Devices	N/A	Varies by Manufacturer

J.1.2.5 MONITORING DATA

Monitoring data should be used to validate and calibrate the model being developed. To assess the level of error, or coefficient of determination, of a model, monitoring data to be used include:

- Field data collection of streams, ditches, and/or storm sewer
- Lake monitoring data (elevation, pollutant concentrations from dataloggers)
- Event data collection (the above data, but spontaneously collected from grab samples or site visits, rather than continuous).

While past monitoring data are used to validate the model, monitoring data should continue to be collected as required by the 2020 Small MS4 General Permit and incorporated into the WQT program's adaptive management approach.

J.1.3 USE OF URBAN DEMAND MODELS

The purpose of the urban demand model is to determine how much pollutant enters the impaired waterbody, including existing BMPs in place, on an annual basis. The results from the urban demand model will be used to determine the following results for the WQT program:

- A detailed Area of Interest within the MS4 that will define the WQT area as a buyer
- The minimum control level, or baseline removal rates, of the existing and future installed water quality BMPs according to the currently approved SWPPP within the Area of Interest
- Annual loading for an average precipitation year, moderately wet year, and historically wet year (as discussed in Section J 1.2.1). Results should be reported in terms of pounds of pollutant annually entering the impaired waterbody for each of these three scenarios.

J.1.4 APPROVAL OF URBAN DEMAND MODELS

The MS4 urban demand model must be approved by the MPCA for the stormwater permit section for TMDL compliance schedule tracking and compliance tracking in WQT. The approvals must be in place before the NPDES permit public notice and establishment of any trade agreements or sale of any water quality credits. The accepted model, when developed by a trained professional, will seamlessly integrate into the single-value trade ratio as defined in the Fountain Lake Phosphorus WQT Management Plan. To that end, using an annual timestep for all numerical modeling is recommended for startup as it reduces computational requirements and allows for simple methods (such as the MPCA Estimator) to be used. The MS4 urban demand model will provide the basis for any MS4 MCL study.

J.2 URBAN GROWTH IMPACTS TO STORMWATER TOTAL MAXIMUM DAILY LOAD WASTELOAD ALLOCATION

MS4 permittees discharging into impaired waters will not only be required to reduce their current loading but will also be required to manage loading from new growth within the watershed. No formal policy decision has been adopted as a part of this WQT program; therefore, the following information should be used to guide the decision-making process. Multiple approaches are available for permittees to maintain a cap on loading as development pressure arises. While WQT credits can be used to offset the increase in stormwater phosphorus loading, there may be more suitable management options. To guide the selection of the best urban growth management option, it is important to quantify the change in loading that occurs from converting an existing site's land use (including BMPs, if present) to the new development site's land use (including BMPs, if present). Quantifying changes applies to both urban growth and urban retrofit projects since any changes in land use within the MS4 boundaries will result in loading changes. As an example of how to quantify these changes, a version of the MPCA Simple Estimator spreadsheet model was adjusted to work at a smaller scale to calculate phosphorus and total suspended solid runoff loading for retrofits and new development.

Below are common runoff management options that are used in local ordinances that require developers to manage their site's pollutant discharge in a manner that addresses the TMDL requirements. These options are not intended to be an all-inclusive development management option list; instead, these options offer a combination of solutions that allow flexibility to accommodate unique circumstances from site to site. The options are listed in suggested priority from highest to lowest.

When developers change land uses, the first step is to perform a pre- and post-development pollutant loading comparison to quantify the changes in loading attributed to the development. This process is as follows:

- If the site expands into previously non-MS4 drainage areas, use the average TMDL Load Allocation value as a pre-existing load "credit" for the to-be-converted land use when calculating the proposed development discharged loading (an example is provided using the MPCA Simple Estimator). Following this analysis, one of two results will be identified:
  - If the site's development (and expansion) does not increase the pollutant of concern's loading rate over the credited previous land-use value, then the evaluation process can end with a no-action finding regarding further reduction requirements.
  - The proposed site development increases the pollutant of concern's loading rate (discharges above the previous land-use WLA rate per acre).

If the proposed site development results in an increase in pollutant loading, actions must be taken to offset that increase through implementing one of the following management options, which are ordered based on priority:

- A city ordinance can be adopted to require the developer to work with city officials to fund an urban BMP project from their shortlist of prioritized projects within the location of their development site. A comparison evaluation report will be required and will include pre- and post-development loading, comparison results that justify adequate treatment is provided, or the level of treatment provided and the remaining loading that will require an offset.

Some sites may not be suitable for on-site BMP installation because of site restrictions. If this is the case, the next three management options allow for the developers to offset their pollutant load increase with off-site options:

- Option 1: If the proposed development requires an off-site offset, a city ordinance can be adopted to require the developer to work with city officials to fund an urban BMP project from their shortlist of prioritized projects. The project(s) selected for implementation must offset the increase in loading attributed to the land-use change. To account for uncertainties in the estimation method, a ratio will be applied so that the BMP offset exceeds the calculated pollutant loading increase, such as 1.5 to 1.0. A WQT program authorized city ordinance that requires a trade ratio for urban growth does not need to match the trade ratio developed for the WQT program. For example, if the MPCA Simple Estimator is used for a new development and shows an increase in total phosphorus of 10 pounds (lb) per year and the developer cannot offset this loading increase by implementing BMPs on site, it can fund priority urban BMPs off-site that treat 15 lb per year TP.
- Option 2: If the proposed development requires an off-site offset, the city could create an In-Lieu Fee program. In-Lieu Fee programs allow "buyers" to pay into a fund that the city would manage to implement their next urban BMP projects. The developer is the buyer in this program. The payment into the In-Lieu Fee program can be based on the city's policies for appropriate development. Options to consider for incentivizing high-priority options are:
  - Including an additional reduction discount factor (e.g., a trade ratio like the internal WQT ordinance in Option 1 above of 1.5 to 1.0, or increasing the trade ratio to be 2.0 to 1.0 as an incentive to use the internal WQT program)
  - Basing In-Lieu Fee rates on implementation costs of historical city unit costs for urban BMPs plus an administrative overhead charge (e.g., an additional 20 percent of estimated capital unit costs).
- Option 3: Participation in the Fountain Lake Phosphorus WQT program as defined in the WQT MP. Developers participating in this WQT program must provide permanent WQT credits. A new development represents a long-term change in land use and pollutant runoff loading. Therefore, the crediting project and governing legal agreement must have terms and conditions for the project life that represent a permanent supply of the required number of annual credits. Land-use conversion from common land uses, such as agriculture, can be planted with perennial vegetation to generate a supply of annual credits if the legal agreement stipulates operation and maintenance requirements. As an example, another Minnesota Point-to Nonpoint-Source Permit issued to the Rahr Malting Company approved the purchase of soybean fields and the subsequent land-use conversion to perennial planting land uses. The

plantings included perennial native grasses and trees. Rahr Malting Company then sold the land to the City of New Ulm, which uses the land as open space recreation for its citizens. The cost of the land sale was minimal. The City of New Ulm assumed the operation and maintenance responsibility as part of the legal agreement terms. In many environmental markets, other market payments can be stacked to benefit the new landowner, such as a natural area access fee to offer hunting or fishing rights.

By using an appropriately prioritized combination of flexible management options, cities can continue to grow with confidence that their TMDL WLA requirements will not conflict with the new growth.

J.3 REFERENCES

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Minnesota Pollution Control Agency, 2015a. "Guidance and Examples for Using the MPCA Estimator," *stormwater.pca.state.mn.us,* accessed March 26, 2019, from *https://stormwater.pca.state.mn.us/index.php/Guidance_and_examples_for_using_the_MPCA_Estimator*

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APPENDIX K

FORMS

Stormwater Water Quality Trading Credit Site Application

SRRWD
Shell Rock River Watershed District
Working Together to Improve Water Quality

A-1

Office Use Only

Assigned Application No. _____

Submittal Date: _____

Shell Rock River Watershed Water Quality Trading Credit Generation Site Application

Applicants interested in generating credits will complete this eligibility application form for the Shell Rock River Watershed (SRRW) Water Quality Trading (WQT) program. Application completion by the applicant provides the necessary information for program representatives to determine if the project is eligible for entering into the credit generating competitive selection process. Site selection during the competitive process is made by credit buyers while the Trading Program Administrator facilitates the selection process by providing application eligibility reviews and follow-up communications. Therefore, applicants must work closely with their WQT Program Broker to ensure this application is complete and verifies the project's eligibility for trading in the SRRW.

Applicant Contact and Location Information **Submittal Date:** _____

1. Credit Generator Applicant	**2. Water Quality Trading Program Broker**
Credit Generator Name: Address: Phone Number: Email Address:	Broker Name: Address: Organization: Phone Number: Email Address:

3. Credit Generation Site Location Information (Duplication of Application for Review Assurance)
Applicant's Credit Site Location Name:
Number of Acres:
Trading Area Subwatershed Number:
Location Discount Factor:
Latitude and Longitude: _____, _____; or
Parcel Identification Number:
Is a project site location map attached? Yes ☐ No ☐
Is a project site map with an aerial photograph background attached? Yes ☐ No ☐

Proposed Credit Site Summary Information

Credit Unit Cost = Requested Funding/(Number of Credits per Year × Number of Years)

4. Site Proposal Summary			
Credits	**Credit Start and End Dates**	**Requested Funding ($)**	
Credits/Year:	**Start:**	**Project:**	
No. of Years:	**End:**	**Credit Unit Cost:**	

Proposal Project Description(s)

The proposed project consists of the following credit generating activities, which may comprise one or multiple best management practices (BMPs). Each BMP included in the application must have a unique name, practice description, proposed location, and supporting credit quantification result. The following three tables are organized to lead the Applicant and Broker through the application process. These tables also contain requests for attachments, such as site maps (or sketches) and forms. The tables also contain alerts for applicants to prepare for the review of their operation records, which are to be maintained on site for review during inspections. The combined completion of this application and appropriate quantification method are sufficient for the WQT program eligibility decisions.

Project Category and Team Assignments

5. Select From the Following Project Categories

Check one of the following boxes. Multiple BMPs can be in the same category; however, the applicant should complete a separate application for another list of BMPs in a different category box:

Agriculture: Field, Sheet Erosion ☐ (Attach Form A-2a) | Nutrient Management ☐ (Attach Form A-2a; a farm-wide nutrient management plan is required to be kept at farm) | Gully ☐ (Attach Form A-2b)

Stormwater: NPDES Stormwater Permittee BMP ☐ (Attach Form A-2d; requires each Permittee's waste load allocation [WLA] to be defined in the WQT management plan) | Non-NPDES Stormwater BMP ☐ (Attach Form A-2d)

Lake or Stream: Bank or Bluff Erosion Project ☐ (Attach Form A-2c) | Chemical Treatment ☐ (Attach Form A-2e) | Dredging ☐ (Attach Form A-2e)

Other: ☐ (Example: Animal Feeding Operation [AFO] manure management BMP, Attach Form A-2e)

6. Provide an Entity (if Known) or Organization for Service Providers Supporting the Applicant

If a line is left empty, the applicant will be assumed to be responsible for filling the role.

Design(s) and Plan(s) (e.g., NRCS, SWCD, agronomist, engineer):

Operation and Maintenance Plan:

Construction Oversight (if earth moving or construction are involved):

Vegetation Seeding and Establishment:

Operation and Maintenance (if not the applicant):

Project Details

7. Project Components and Descriptions
Describe the BMP(s) or conservation practices (CPs) that will reduce phosphorus loading from the site. If installing more than one BMP in this category, the description must provide the following: 1. All projects in this application are using the same quantification method and Form A-2. 2. Project name, design standard (e.g., Natural Resources Conservation Service [NRCS] no-till, Professional Engineer [PE]), and practice number if agricultural (e.g., 329). 3. Sequence order of all practices entered into quantification method (e.g., current conditions, Minnesota Buffer Law, Project 1, Project 2). 4. An attached site map or sketch that includes area boundaries, each project location, and the contributing area to each project if it is treating nonpoint-source runoff generated on the site. 5. An attached site map or sketch that includes area boundaries, existing conditions, where each BMP will be placed, and nonpoint-source run-on or bank stabilization location being treated. 6. If a project's contributing area is not the whole site area, the contributing area must be delineated on a map according to surface slopes or subsurface tiling. 7. If the quantification for this project has been determined by professional justification, include the list of investigation reports, science methodologies, monitoring evaluations, and post-implementation monitoring that support the project quantification methods.
Project Description (or reference list of attachments):

Additional Applicant Site Eligibility Requirements

		Circle One	
1	Are you in compliance with Minnesota Administrative Rules Chapter 7020 - Animal Feedlots and, if applicable, do you have a valid National Pollutant Discharge Elimination Systems (NPDES)/State Disposal System (SDS) permit for your feedlot operation?	Yes	N/A
2	Are you in compliance with (not cited with any unresolved violations of) the Minnesota Wetlands Conservation Act (Minnesota Statutes Section 103G.221-103G.2375)?	Yes	N/A
3	Do you have a subsurface sewage treatment system (septic system) that is deemed an Imminent Threat to Public Health and/or has been cited in violation of local ordinance, thus requiring an immediate upgrade?	No	N/A

4	Are you in compliance with the Federal Insecticide, Fungicide, and Rodenticide Act and Minnesota Statutes (18B, 18C, 18D, 103H) regarding pesticide and fertilizer distribution, use, storage, handling, and disposal?	Yes	N/A
5	Are you in compliance with current State rules and statutes pertaining to shoreland and riparian protection?	Yes	N/A

I certify by signing this application that the above information and the credit quantification attachment are complete and accurate to the best of my knowledge. I understand that to participate in WQT, the site must be in compliance with and free of any unresolved violations of existing applicable State water protection rules and regulations. I agree that any compensation I receive from selling credits will be contingent upon complying with all conditions and requirements of the SRRW trading program's legal agreement. I hereby give my permission for the Trading Program Administrator to assign a Third-Party Verifier who will have access to the site and relevant credit generation records for inspection and verification purposes. Buyers of credits are typically governed by NPDES permits. I hereby give my permission for the Trading Program Administrator to share all site trading records with, and allow inspection(s) by, staff of the Minnesota Pollution Control Agency who regulate the NPDES permit program. I further understand that all credit sales are governed by the trading program's legal agreement and not the NPDES permit, and MPCA inspections are for the buyer's compliance oversight. Furthermore, I agree that I have been informed about the conditions and requirements of the trading program to my satisfaction and that the trading program administration reserves the right to make all final determinations regarding program eligibility, compliance, complaints, and appeal processes.

_____ _____

(Signature) (Date)

_____

(Printed Name)

Maps, Site Sketches, or List of Attachments

Glossary

Angle of Repose: The soil slope that is considered stable for a long-term period given the soil classes present. Angle of repose soil slopes are typically at or below a 45-degree angle.

Baseline: The combined pollutant load and/or best management practice (BMP) installation requirements that must be met before trading. At a minimum, all of the individual nonpoint sources must meet existing state, local, and tribal regulatory requirements, including the Minnesota Buffer Law, Ditch Buffer Law, and shoreland water quality protection requirements.

Best Management Practice (BMP): BMPs include but are not limited to structural and nonstructural controls and operation and maintenance procedures to reduce the release of pollutants to receiving waters. BMPs can also consist of land-use conversions and instream improvements.

Broker: A Broker is a person or entity that identifies credit generators to bring them together with trading partners (Buyers). The Broker is trained in the WQT Program Policies and Protocols to assist credit generators with their credit project application, project implementation, and project reporting requirements in a manner that fulfills the program's certification policies.

Buyer: Buyers of credits include any public or private entity that chooses to invest in water quality credits to enhance water quality outcomes. Buyers typically buy credits to meet a regulatory obligation.

Credit End Date: A credit end date is established in the credit sales legal agreement. The credit end date is based on the BMP project's life and the number of replacement life cycles that the seller is willing to make a commitment to provide and operate correctly throughout.

Credit Start Date: A credit start date begins when all of the BMPs included in a project are fully established. For structural BMPs, full establishment may be at the end of construction. For BMPs that have a vegetation pollutant treatment component, the start date begins when the vegetation establishment meets the specified density and plant species requirements to achieve the pollutant reduction amount indicated by the results of the program's quantification method; for example, when using native plant species to filter runoff, establishing the full planting may take up to 3 years to complete.

Credit Unit Cost: The credit unit cost is the amount of requested funding divided by the number of credits generated across the credit life. The unit cost can be a substantial determinant in selecting the credit generation site to make a contract award. Other determining factors include the amount of credits available in the trading program's supply, the Buyer's BMP preferences for their credit portfolio, and the Buyer's understanding of the likelihood a project may falter or fail because of weather or other circumstances (i.e., Requested Funding / [Number of Credits per Year × Number of Years in the Project Life]).

Conservation Practice: See Best Management Practice.

Location Discount Factor: The factor applied to pollutant-reduction credits when sources are directly discharging to a waterbody of concern that accounts for the distance and unique watershed features (e.g., hydrologic conditions) that will affect pollutant fate and transport between trading partners. This factor is applied to the quantification method estimate of generated credits based on site pollutant reductions.

Project: One or more BMPs or other activities that, taken together, are proposed for generating credits on a single site.

Project Life: The time period over which a given BMP is expected to generate credits. The project life is typically also the minimum project protection period.

Trading Area: The delineated watershed contributing eligible area for buying and selling credits.

Trading Program Administrator: The organization responsible for the operation and maintenance of a quarter quality trading program. Specific responsibilities of a Program Administrator may include defining credit calculation methodologies, protocols, and quality standards; project review; and credit registration.

Trading Subwatershed: Delineated small watersheds within the trading area whereby a watershed model has defined the pollutant of concern's fate and transport attenuation rate for use in the WQT program (Location Discount Factor).

Quantification Method: Mathematical and/or statistical representation of processes driving changes in water quality based in science and used to estimate the water quality benefits provided by the credit generating activities. Modeling is also frequently used to predict pollutant attenuation.

Nutrient Tracking Tool Quantification Method for Farm Field Projects

A-2a

Office Use Only

Assigned Application No. _____

Submittal Date: _____

Shell Rock River Watershed Water Quality Trading Credit Generation Site Quantification

This quantification method is for farm-field projects addressing sheet and ephemeral rill erosion. This form is to be completed by the Applicant's Broker who is assisting with the Shell Rock River Watershed (SRRW) Water Quality Trading (WQT) program. This form's completion provides the applicant with the necessary project credit quantification and baseline assessment for trading program representatives to complete the eligibility review. If the site is eligible, the approved application will be entered into a competitive selection process where trading program Buyers select which sites are to be offered a purchase legal agreement.

Applicant Contact and Location Information **Submittal Date:** _____

1. Credit Generator Applicant	**2. Assisting Trading Program Broker**
Credit Generator Name:	Broker Name: Phone Number: Email: Credentials:
3. Credit Generation Site Location Information (Duplication of Application for Review Assurance)	
Applicant's Credit Site Location Name: Number of Acres: Trading Area Subwatershed Number: Location Discount Factor: Latitude and Longitude: _____, _____; or Parcel Identification Number: Is a project site location map attached? Yes ☐ No ☐ Is a project site map with an aerial photograph background attached? Yes ☐ No ☐	

Proposed Credit Site Quantification Summary

4. Site Proposal Summary	
Credits	**Credit Start and End Dates**
Credits/Year:	**Start:**
No. of Years:	**End:**

Proposal Project Description(s)

The proposed project—the credit generating activity—may consist of one or multiple best management practices (BMPs). Each BMP included in the application must have a unique name, practice description, and credit quantification result.

Does this application include a change in nutrient management for credit generation? Yes ☐ No ☐

The following instructions and entry fields are tailored to summarize the main baseline site requirements. A more detailed discussion of baselines is provided in the WQT manual's Appendix I. Additional agricultural topics, such as Concentrated Animal Feeding Operation (CAFO) and Animal Feeding Operation (AFO) requirements, are provided there.

Baseline: 3-Year History

5. Provide Complete Crop Rotation and 3-Year Field Operation Description
Describe the field operating system over the last 3 years, including preexisting BMPs. Include application rates if proposing nutrient management changes for credit generation. • If crediting nutrient management changes is part of the project, provide a complete list of the crop rotation, its nutrient sources, and: – Phosphorus application rates – Phosphorus application methods – Phosphorus application timing. • When manure or other organic sources are included, nutrient management for all fields with or without organic sources must be provided. • Provide the verification source to confirm 3-year history (e.g., Natural Resources Conservation Service [NRCS] field records; signed affidavit from a technical or chemical application service provider; affidavit signed by the Applicant).
Description:

Baseline: Minnesota Buffer Law

Attach screen captures of the field's requirements under the Buffer Law and Ditch Buffer Law.

- The applicant will provide landmark references to assist the WQT administrators with finding the field within the Township, Row, Range, and Section number location on the Minnesota Department of Natural Resources (DNR) Buffer Map Viewing Application at http://arcgis.dnr.state.mn.us/gis/buffersviewer/.

- Two screen captures from the Buffer Map Viewing Application should be submitted to identify the specific field(s) that the credit generation application is proposing:
  - A larger-area screen capture to assist the reviewers with locating the field. Use the Buffer Map Viewing Application in the street map mode with arrows or highlight the physical features that will be used as landmark guides to locate the field within the Section.
  - The second map will use the aerial mapping feature to highlight the exact field by providing other landmark features. This screen capture should be taken with the aerial photograph option selected and clearly support the existence of the required buffer. If the buffer is not present, please specify the compliance method.

If the field is required to have a buffer by law, when calculating the site's phosphorus reduction, the pre-BMP conditions include the required buffer at the required width or approved equivalent practice.

Project Details

6. Project Components and Descriptions (Duplication of Application Details for Review Assurances)
Describe the BMPs that will reduce phosphorus loading from the site. If installing more than one BMP in this category, provide the following in the description: • Site BMP name, standard name (e.g., NRCS no-till), and practice number if agricultural (e.g., 329). • Sequence order used in the quantification method. • Attach a site map or sketch that includes area boundaries, each BMP location, and the contributing area to each BMP if it is treating nonpoint-source runoff generated at the site. • Attach a site map or sketch that includes area boundaries, existing conditions, where each BMP will be placed, and the nonpoint-source runoff or bank stabilization location being treated. • In Bullet Points 3 and 4 above, when a BMP's contributing area is not the whole area mapped, delineate the contributing area according to slopes. • Ratio of public versus private funds provided to obtain the total project cost. WQT credit purchase funds and NRCS Environmental Quality Incentives Program (EQIP) funds are considered private funds. • Provide the soil phosphorus test results and type of test used (e.g., Bray P1 or Olsen)
Soil phosphorus test results and type of test used (e.g., Bray P1 or Olsen):
Description (attach additional pages, maps, or plans, as necessary):

Nutrient Tracking Tool Operation Summary and Results Printout Requirement

The Nutrient Tracking Tool (NTT) from the Texas Institute for Applied Environmental Research (TIAER) is calibrated for Minnesota online (https://ntt.tiaer.tarleton.edu/welcomes/new?locale=en). The broker

will create an account and proceed to enter data by following the instructions that can be found at the bottom of each web page in the "Page Instructions" tab. The NTT will automatically calculate the nutrient and sediment reductions in order of the implemented conservation that the Broker selects on the output page. The first step is to delineate the field's boundaries. Care must be taken in this step; delineations that do not delineate a proper Area of Interest (AOI) will either add acres or subtract acres from the project site. The NTT also allows Brokers to upload field files to determine this delineation. After the field has been selected, the Broker inputs the same unique project name as used in the application in the soils web page that pops up automatically. While the soil phosphorus test results are recorded by the NTT process, the supporting NTT input documentation does not list the soil test type; therefore, the type must be listed in the "Soil phosphorus test results and type of test used" box above. The projects are entered into the NTT manually and named according to the description above. If adding more than one project, adding each project in the sequence that is to be credited is important. A treatment train of BMPs receives more reduction from those BMPs early in the order than those BMPs installed later in the order; for instance, the Broker may enter the baseline conditions of conventional tillage and include a buffer to fulfill the Buffer Law requirement. After the field's complete crop rotation has been entered and the typical dates for implementation passes, the type of equipment used, and the nutrient application's methods and rates have been provided, the Broker can add each credit project BMP to be used (e.g., cover crops). The NTT offers other practices on the Conservation Practices page that pops up next. Many of these options are not approved for estimating phosphorus reductions for credit calculations at this time; only the tile drain, grass buffer/forest buffer, ephemeral gully, and contour buffers options are approved for use in credit calculations. Note that the gully option does not calculate a classical gully's erosion rate; rather, the NTT only assesses gullies that do not run deeper than the tillage depth in the field. The gully also must reach the edge of field without losing its channelized flow or being treated by an existing edge-of-field practice, such as a buffer.

The NTT modeler will need to create a summary report of project BMP model scenarios in a required sequence. For the WQT Program Administrator and Credit Buyer to understand the unit cost ($/credit) of each BMP proposed in the project, the following sequence must be used when creating NTT phosphorus load reduction summary reports:

- Current conditions
- Baseline requirements (if not currently fulfilled)
- Each project BMP's reduction:
  - If only one BMP is in the project it is one scenario
  - When more than one BMP is included in the project, a separate scenario is necessary for each BMP.

NTT allows modelers to compare and report out up to three scenarios at time. An NTT summary report provides loading for the first scenario, as well as loading after application of BMP, and reduced load and percent reduction from application of BMP for the last two scenario summaries. Each scenario creation must contain all of the previous scenario practices and the new practice to appropriately track loading reductions. For projects with two or more BMPs the sequence for creating a summary report requires simulating all of the scenarios and requesting to view the scenario results in the following order:

Summary Report, First Output (1 of 2):

1. Select the scenario with current conditions first.
2. Select the scenario with the current conditions and baseline requirement (only if the baseline is not part of the current condition).
3. Select the scenario with the current condition, baseline, and added first project BMP.

Summary Report, Second Output (2 of 2)

1. Select the third scenario in the Summary Report, First Output (1 of 2) to be repeated here.
2. Select the scenario with the cumulative practices above, plus the second project BMP next.
3. If there is a third BMP in the project select the cumulative project end point scenario to be viewed last.

For projects with more than three BMPs, the NTT modeler can repeat the defined sequence in the second summary report output method multiple times to add additional BMPs. The Broker **must** print out the downloaded portable document format (PDF) version of the results in the "Total Area" view selected NTT option.

Conversion of Phosphorus Reduction Results to Credits

The edge-of-field results provided by the NTT's Total Area results must now be converted into the downstream yield that impacts the water resource of concern. The first step is to round-off the NTT results to a whole number. Next, multiply the rounded off NTT results by the Location Discount Factor and ratio of public vs private funds (if applicable) used to determine the Seller's credit value.

7. Credit Value Determination					
1. Subwatershed	**2. Location Discount Factor (LDF, %)**	**3. NTT Total Area Reduction Results (lb/yr)**	**4. NTT Total Rounded Off (lb/yr)**	**5. *Ratio of Public Funds vs. Private Funds Used to Achieve Total Project Cost (%)**	**6. Credits = LDF (Item 2) × NTT Results (Item 4) × Ratio of Public Funds (Item 5)**
A					
B					
C					
D					
E					

** The Permittee shall receive credit for BMPs that have been funded by the Permittee and/or the landowner of the BMP site. In cases where cost sharing and/or grant funding occurs, the rules and agreements governing the BMPs funding may specify BMP credit generation eligibility, including the proportion of credit ownership between the funding entity and the Permittee.*

Broker Signature

I certify by signing this application that the above information and the credit quantification data entries are accurate to the best of my knowledge. I understand that the Program Administrator is fully authorized to make all determinations regarding program eligibility, compliance, complaints, and appeal processes, and that the Program Administrator's determination is final.

Broker:

_____ _____

(Signature) (Date)

_____

(Printed Name)

Maps, Site Sketches, or List of Attachments

Glossary

Angle of Repose: The soil slope that is considered stable for a long-term period given the soil classes present. Angle of repose soil slopes are typically at or below a 45-degree angle.

Baseline: The combined pollutant load and/or best management practice (BMP) installation requirements that must be met before trading. At a minimum, all of the individual nonpoint sources must meet existing state, local, and tribal regulatory requirements, including the Minnesota Buffer Law, Ditch Buffer Law, and shoreland water quality protection requirements.

Best Management Practice (BMP): BMPs include but are not limited to structural and nonstructural controls and operation and maintenance procedures to reduce the release of pollutants to receiving waters. BMPs can also consist of land-use conversions and instream improvements.

Broker: A Broker is a person or entity that identifies credit generators to bring them together with trading partners (Buyers). The Broker is trained in the WQT Program Policies and Protocols to assist credit generators with their credit project application, project implementation, and project reporting requirements in a manner that fulfills the program's certification policies.

Buyer: Buyers of credits include any public or private entity that chooses to invest in water quality credits to enhance water quality outcomes. Buyers typically buy credits to meet a regulatory obligation.

Credit End Date: A credit end date is established in the credit sales legal agreement. The credit end date is based on the BMP project's life and the number of replacement life cycles that the seller is willing to make a commitment to provide and operate correctly throughout.

Credit Start Date: A credit start date begins when all of the BMPs included in a project are fully established. For structural BMPs, full establishment may be at the end of construction. For BMPs that have a vegetation pollutant treatment component, the start date begins when the vegetation establishment meets the specified density and plant species requirements to achieve the pollutant reduction amount indicated by the results of the program's quantification method; for example, when using native plant species to filter runoff, establishing the full planting may take up to 3 years to complete.

Credit Unit Cost: The credit unit cost is the amount of requested funding divided by the number of credits generated across the credit life. The unit cost can be a substantial determinant in selecting the credit generation site to make a contract award. Other determining factors include the amount of available credits in the trading program's supply, the Buyer's BMP preferences for their credit portfolio, and the Buyer's understanding of the likelihood a project may falter or fail because of weather or other circumstances (i.e., Requested Funding / [Number of Credits per Year × Number of Years in the Project Life]).

Conservation Practice: See Best Management Practice.

Location Discount Factor: The factor applied to pollutant-reduction credits when sources are directly discharging to a waterbody of concern that accounts for the distance and unique watershed features (e.g., hydrologic conditions) that will affect pollutant fate and transport between trading partners. This factor is applied to the quantification method estimate of generated credits based on site pollutant reductions.

Project: One or more BMPs or other activities that, taken together, are proposed for generating credits on a single site.

Project Life: The time period over which a given BMP is expected to generate credits. The project life is typically also the minimum project protection period.

Trading Area: The delineated watershed contributing eligible area for buying and selling credits.

Trading Program Administrator: The organization responsible for the operation and maintenance of a quarter quality trading program. Specific responsibilities of a Program Administrator may include defining credit calculation methodologies, protocols, and quality standards; project review; and credit registration.

Trading Subwatershed: Delineated small watersheds within the Trading Area whereby a watershed model has defined the pollutant of concern's fate and transport attenuation rate for use in the WQT program (Location Discount Factor).

Quantification Method: Mathematical and/or statistical representation of processes driving changes in water quality based in science and used to estimate the water quality benefits provided by the credit generating activities. Modeling is also frequently used to predict pollutant attenuation.

Gully Stabilization Quantification Method for Trading Projects

SRRWD
Shell Rock River Watershed District
Working Together to Improve Water Quality

A-2b

Office Use Only

Assigned Application No. _____

Submittal Date: _____

Shell Rock River Watershed Water Quality Trading Credit Generation Site Quantification

This quantification method is for classical gully stabilization projects. Classical gullies are deeper than the tillage depth, which typically cannot be plowed through. This form is to be completed by Brokers assisting applicants for the Shell Rock River Watershed (SRRW) Water Quality Trading (WQT) program as a credit generator. This form's completion provides the applicant with the necessary project credit quantification and baseline assessment for trading program representatives to complete the eligibility review. If the site is eligible, the approved application will be entered into a competitive selection process wherein trading program Buyers select which sites will be offered credit purchase legal agreements.

Applicant Contact and Location Information **Submittal Date:** _____

1. Credit Generator Applicant	**2. Assisting Trading Program Broker**
Credit Generator Name:	Broker Name: Phone Number: Email: Credentials:
3. Credit Generation Site Location Information (Duplication of Application for Review Assurance)	
Applicant's Credit Site Location Name: Number of Acres: Trading Area Subwatershed Number: Location Discount Factor: Latitude and Longitude: _____, _____; or Parcel Identification Number: Is a project site location map attached? Yes ☐ No ☐ Is a project site map with an aerial photograph background attached? Yes ☐ No ☐	

Proposed Credit Site Quantification Summary

4. Site Proposal Summary	
Credits	**Credit Start and End Dates**
Credits/Year:	**Start:**
No. of Years:	**End:**

Proposal Project Description(s)

The proposed project (the credit generating activity) consists solely of best management practices (BMPs) that correct classical gully erosion in the field. Eligible BMPs include grass waterways, terraces,

water and sediment control basins, and grade-stabilization structures. Each BMP in the project must have a unique name, practice location description, and credit quantification result.

The following instructions and entry fields are tailored to summarize the main baseline site requirements. A more detailed discussion of baselines is provided in the WQT manual's Appendix I.

Baseline: 3-Year History

5. Provide Complete Crop Rotation and 3-Year Field Operation Description
Describe the field operating system over the last 3 years, including preexisting BMPs. Please provide a verification source to confirm the 3-year history (e.g., Natural Resources Conservation Service [NRCS] field records, a signed affidavit from a technical service provider, or an affidavit signed by the Applicant).
Description:

Baseline: Minnesota Buffer Law

The Minnesota Buffer Law and Ditch Buffer Law apply only to farm operations. A buffer does not provide treatment for channelized runoff; however, if the gully terminates before reaching the edge-of-field, the buffer can treat the sheet-flow runoff. If the Applicant is agricultural, attach screen captures of the field's requirements under the Buffer Law and Ditch Buffer Law:

- The Applicant will provide landmark references to assist the WQT administrators with finding the field within the township, row, range, and section number location on the Minnesota Department of Natural Resources (DNR) Buffer Map Viewing Application at http://arcgis.dnr.state.mn.us/gis/buffersviewer/.
- Two screen captures from the Buffer Map Viewing Application should be submitted to identify the specific field(s) that the credit generation application is proposing:
  - A larger-area screen capture to assist the reviewers with locating the field. Use the Buffer Map Viewing Application in the street map mode with arrows or highlight the physical features that will be used as landmark guides to locate the field within the Section.
  - The second map will use the aerial mapping feature to highlight the exact field by providing other landmark features. This screen capture should be taken with the aerial photograph option selected and clearly support the existence of the required buffer. If the buffer is not present, please specify the compliance method.

If the field is required to have a buffer by law and channelized flow does not continue to the water resource the 'Filter Strip present before installation' option should be entered as "Y" (yes) in the ;Gully Quantification' Excel workbook.

Project Details

6. Project Components and Descriptions (Duplication of Application Details for Review Assurances)

Describe the BMPs that will reduce phosphorus loading from the site. If installing more than one gully stabilization BMP in this category, provide the following in the description:

- Site BMP name, standard name (e.g., NRCS no-till), and practice number if agricultural (e.g., 638).
- Sequence order used in the quantification method.
- Attach a site map or sketch that includes area boundaries, each BMP location, and the contributing area to each BMP if it is treating nonpoint-source runoff generated at the site.
- Attach a site map or sketch that includes area boundaries, existing conditions, where each BMP will be placed, and the nonpoint-source runoff or bank stabilization location being treated.
- Attach a sketch of the gully depicting the individual soil total phosphorus collection points and sample name for correlation with laboratory results.
- Ratio of public versus private funds provided to obtain the total project cost. WQT credit purchase funds and NRCS Environmental Quality Incentives Program (EQIP) funds are considered private funds.

List each composite sample's Soil Total Phosphorus Test results by reach used in the quantification.

A. _____ B. _____ C. _____ D. _____ E. _____

Description (attach additional pages, maps, or plans, as necessary):

Gully Quantification and Operation Summary and Results Printout Requirement

The Broker will provide a screen capture for each reach of the fully populated gully quantification spreadsheet. The Broker will also provide the calculations used to estimate the Volume Voided (VOLV), which includes recording the end of the reach's total length and erosion measurements by name and the completed VOLV results.

VOLV = (Top Width [ft] + Bottom Width [ft])/(2 × Depth [ft] × Length [ft])

Reach	Reach Length (ft)	Top Width (ft)	Bottom Width (ft)	Depth (ft)	Reach VOLV (ft^3)
A					
B					
C					

D					
E					

Gully VOLV Total: _____

Conversion of Phosphorus-Reduction Results to Credits

The edge-of-field results are provided by the SRRW WQT *Gully Quantification* Excel workbook. A screen capture of the spreadsheet calculation results must be attached for each VOLV estimated. The gully quantification must now be converted into project credits that include factors for the downstream yield, additional equivalence ratio requirement, and ratio of public funds in the project's total cost. The first step is to round-off the gully quantification results to a whole number. Next, multiply the rounded number by the location discount factor, equivalence discount factor, and ratio of public funds versus private funds (if applicable) to determine the Seller's credit value.

Credit Value Determination

1. Subwatershed	2. Location Discount Factor (LDF, %)	3. Equivalence Discount Factor (EDF, 0.70)	4. Gully Erosion Total Rounded Off (GET, lb/yr)	5. *Ratio of Public Funds Versus Private Funds Used to Achieve Total Project Cost (%)	6. Credits = LDF (Item 2) × EDF (Item 3) × GET (Item 4) × Ratio of Public Funds (Item 5)
A					
B					
C					
D					
E					

** The Permittee shall receive credit for BMPs that have been funded by the Permittee and/or the landowner of the BMP site. In cases where cost sharing and/or grant funding occurs, the rules and agreements governing the BMPs funding may specify BMP credit generation eligibility, including the proportion of credit ownership between the funding entity and the Permittee.*

Broker Signature

I certify by signing this application that the above information and the credit quantification data entries are accurate to the best of my knowledge. I understand that the Program Administrator is fully authorized to make all of the determinations regarding program eligibility, compliance, and complaints and appeal processes, and that the Program Administrator's determination is final.

Broker:

_____ _____

(Signature) (Date)

_____

(Printed Name)

Maps, Site Sketches, or List of Attachments

Glossary

Angle of Repose: The soil slope that is considered stable for a long-term period given the soil classes present. Angle of repose soil slopes are typically at or below a 45-degree angle.

Baseline: The combined pollutant load and/or best management practice (BMP) installation requirements that must be met before trading. At a minimum, all of the individual nonpoint sources must meet existing state, local, and tribal regulatory requirements, including the Minnesota Buffer Law, Ditch Buffer Law, and shoreland water quality protection requirements.

Best Management Practice: BMPs include but are not limited to structural and nonstructural controls and operation and maintenance procedures to reduce the release of pollutants to receiving waters. BMPs can also consist of land-use conversions and instream improvements.

Broker: A Broker is a person or entity that identifies credit generators to bring them together with trading partners (buyers). The Broker is trained in the WQT Program Policies and Protocols to assist credit generators with their credit project application, project implementation, and project reporting requirements in a manner that fulfills the program's certification policies.

Buyer: Buyers of credits include any public or private entity that chooses to invest in water quality credits to enhance water quality outcomes. Buyers typically buy credits to meet a regulatory obligation.

Credit End Date: A credit end date is established in the credit sales legal agreement. The credit end date is based on the BMP project's life and the number of replacement life cycles that the seller is willing to make a commitment to provide and operate correctly throughout.

Credit Start Date: A credit start date begins when all of the BMPs included in a project are fully established. For structural BMPs, full establishment may be at the end of construction. For BMPs that have a vegetation pollutant treatment component, the start date begins when the vegetation establishment meets the specified density and plant species requirements to achieve the pollutant reduction amount indicated by the results of the program's quantification method ; for example, when using native plant species to filter runoff, establishing the full planting may take up to 3 years to complete.

Credit Unit Cost: The credit unit cost is the amount of requested funding divided by the number of credits generated across the credit life. The unit cost can be a substantial determinant in selecting the credit generation site to make a contract award. Other determining factors include the amount of available credits in the trading program's supply, the Buyer's BMP preferences for their credit portfolio, and the Buyer's understanding of the likelihood a project may falter or fail because of weather or other circumstances (i.e., Requested Funding / [Number of Credits per Year × Number of Years in the Project Life]).

Conservation Practice: See Best Management Practice.

Location Discount Factor: The factor applied to pollutant-reduction credits when sources are directly discharging to a waterbody of concern that accounts for the distance and unique watershed features (e.g., hydrologic conditions) that will affect pollutant fate and transport between trading partners. This factor is applied to the quantification method estimate of generated credits based on site pollutant reductions.

Project: One or more BMPs or other activities that, taken together, are proposed for generating credits on a single site.

Project Life: The time period over which a given BMP is expected to generate credits. The project life is typically also the minimum project protection period.

Trading Area: The delineated watershed contributing eligible area for buying and selling credits.

Trading Program Administrator: The organization responsible for the operation and maintenance of a quarter quality trading program. Specific responsibilities of a Program Administrator may include defining credit calculation methodologies, protocols, and quality standards; project review; and credit registration.

Trading Subwatershed: Delineated small watersheds within the Trading Area whereby a watershed model has defined the pollutant of concern's fate and transport attenuation rate for use in the WQT program (Location Discount Factor).

Quantification Method: Mathematical and/or statistical representation of processes driving changes in water quality based in science and used to estimate the water quality benefits provided by the credit generating activities. Modeling is also frequently used to predict pollutant attenuation.

Bank Stabilization Quantification Method for Trading Projects

A-2c

Office Use Only

Assigned Application No._____

Submittal Date: _____

Shell Rock River Watershed Water Quality Trading Credit Generation Site Quantification

This quantification method is for stream, ditch, and lake bank stabilization projects. This form is to be completed by Brokers assisting applicants for the Shell Rock River Watershed (SRRW) Water Quality Trading (WQT) program as a credit generator. This form's completion provides the Applicant with the necessary project credit quantification and baseline assessment for trading program representatives to complete the eligibility review. If the site is eligible, the approved application will be entered into a competitive selection process wherein trading program Buyers select which sites will be offered purchase legal agreements.

Applicant Contact and Location Information **Submittal Date:** _____

1. Credit Generator Applicant	**2. Assisting Trading Program Broker**
Credit Generator Name:	Broker Name: Phone Number: Email: Credentials:
3. Credit Generation Site Location Information (Duplication of Application for Review Assurance)	
Applicant's Credit Site Location Name: Number of Acres: Trading Area Subwatershed Number: Location Discount Factor: Latitude and Longitude: _____, _____; or Parcel Identification Number: Is a project site location map attached? Yes ☐ No ☐ Is a project site map with an aerial photograph background attached? Yes ☐ No ☐	

Proposed Credit Site Quantification Summary

4. Site Proposal Summary	
Credits	**Credit Start and End Dates**
Credits/Year:	**Start:**
No. of Years:	**End:**

Proposal Project Description(s)

The proposed crediting project can consist solely of best management practices (BMPs) that stabilize stream, ditch, or lake bank erosion. Eligible BMPs include riprap, bioengineering designs (e.g., rock cribs

and tree plantings), and Rosgen design methods (e.g., rock weirs and J-hooks). Each reach and associated BMP in the project must have a unique name, practice description, and credit quantification result.

Project Details

5. Project Components and Descriptions (Duplication of Application Details for Review Assurances)

Below and on the next page, describe the BMP that will stabilize the bank and reduce phosphorus loading from the site. If installing bank stabilization BMP's on more than one reach in this category, the Broker will attach descriptions of the required quantification details for each reach.

Is this a: Stream Bank ☐ Ditch Bank ☐ Lake Bank ☐

The project description narrative shall include a clear and concise presentation of the following items:

- Site BMP name and number of reaches.
- Reference to an attached site plan-view map or sketch that includes the project boundaries, each reach, and each reach's transect locations.
- For each reach, attach a sketch of the bank's side profile depicting individual soil layers (with measured dimensions) that the Broker visually or texturally identified.
- List all of the soil total phosphorus (TP) collection points by sample name for correlation with laboratory results in the table below.
- Ratio of public versus private funds provided to obtain the total project cost. WQT credit purchase funds and NRCS Environmental Quality Incentives Program (EQIP) funds are considered private funds.

List each composite sample's soil TP test results and laboratory information by the reach and transect line used during the quantification and/or attach your own table to this form with an appropriate title.

T #1. Top Soil Layer _____ T #2 Top Soil Layer _____ T #3 Top Soil Layer _____

T #1. Mid-Soil Layer _____ T #2 Mid-Soil Layer _____ T #3 Mid-Soil Layer _____

T #1. Mid-Soil Layer _____ T #2 Mid-Soil Layer _____ T #3 Mid-Soil Layer _____

T #1. Bottom Soil Layer _____ T #2 Bottom Soil Layer _____ T #3 Bottom Soil Layer _____

Top Soil Layer average measured TP concentration (parts per million [ppm]): _____

Upper Mid-Soil Layer average measured TP concentration (ppm): _____

Lower Mid-Soil Layer average measured TP concentration (ppm): _____

Bottom Soil Layer average measured TP concentration (ppm): _____

Description of the First BMP (add additional sheets as needed):

Bank Quantification and Operation Summary and Results Printout Requirement

The Broker will provide a screen capture of the fully populated quantification spreadsheet for each reach. The Broker will also provide the calculations used to estimate the Volume Voided (VOLV) estimate in the table below or attached tables used in the site evaluation, which includes recording the method used to determine the Later Recession Rate for each project reach.

Soil Classes	Transect 1 Height (ft)	Transect 2 Height (ft)	Transect 3 Height (ft)	Soil Layer Average Heights (ft)
1st (Top)				
2nd (Mid)				
3rd (Mid)				
4th (Bottom)				
Total				

Average Long-Term Lateral Recession Rate (ft/yr)		
Soil Classes	**VOLV = Length × Height × Lateral Recession Rate (ft^3)**	**VOLV (ft^3)**
1st (Top)		
2nd (Mid)		
3rd (Mid)		
4th (Bottom)		

Lateral Recession Rate Description of Determination Method:

Final Site Reduction Estimate

Complete the final site reduction estimate table below or attach similar tables that were created by the Broker to record the site procedures. Attach the screen captures for verification of the bank quantified

reduction and then multiply the results by the required 0.70 coefficient for the additional Equivalence Discount Factor.

Bank Stabilization Project TP Loading Reduction	Site Sediment (TSS) Reduction Estimate (tons/yr)	Site TP Reduction Estimate (lb/yr)	Site TP With Additional 30% Equivalence Discount Factor (TP*0.70)	Site Reduction WQT Application Form A-2c Values (lb/yr)
Transect #1				
Transect #2				
Transect #3				
Total TP Reduced				

Conversion of Phosphorus Reduction Results to Credits

The bank stabilization phosphorus reduction results are provided by the SRRW WQT *Stream or Lake Bank Quantification* Excel workbook. The Excel results must now be converted into the TP load that impacts the downstream water resource of concern. The first step is to round-off the spreadsheet results into a whole number. Next, multiply the adjusted bank reduction results by the location discount factor and ratio of public versus private funds (if applicable) to determine the Seller's credit value.

Credit Value Determination

1. Subwatershed	2. Location Discount Factor (LDF, %)	3. Bank Erosion Total Rounded Off (BET, lb/yr)	4. *Ratio of Public Funds Versus Private Funds Used to Achieve Total Project Cost (%)	5. Credits = LDF (Item 2) × BET (Item 3) × Ratio of Public Funds (Item 4)

** The Permittee shall receive credit for BMPs that have been funded by the Permittee and/or the landowner of the BMP site. In cases where cost sharing and/or grant funding occurs, the rules and agreements governing the BMPs funding may specify BMP credit generation eligibility, including the proportion of credit ownership between the funding entity and the Permittee.*

Broker Signature

I certify by signing this application that the above information and the credit quantification data entries are accurate to the best of my knowledge. I understand that the Program Administrator is fully authorized to make all of the determinations regarding program eligibility, compliance, and complaints and appeal processes, and that the Program Administrator's determination is final.

Broker:

_____ _____

(Signature) (Date)

_____

(Printed Name)

Maps, Site Sketches, or List of Attachments

Glossary

Angle of Repose: The soil slope that is considered stable for a long-term period given the soil classes present. Angle of repose soil slopes are typically at or below a 45-degree angle.

Baseline: The combined pollutant load and/or best management practice (BMP) installation requirements that must be met before trading. At a minimum, all of the individual nonpoint sources must meet existing state, local, and tribal regulatory requirements, including the Minnesota Buffer Law, Ditch Buffer Law, and shoreland water quality protection requirements.

Best Management Practice: BMPs include but are not limited to structural and nonstructural controls and operation and maintenance procedures to reduce the release of pollutants to receiving waters. BMPs can also consist of land-use conversions and instream improvements.

Broker: A Broker is a person or entity that identifies credit generators to bring them together with trading partners (buyers). The Broker is trained in the WQT Program Policies and Protocols to assist credit generators with their credit project application, project implementation, and project reporting requirements in a manner that fulfills the program's certification policies.

Buyer: Buyers of credits include any public or private entity that chooses to invest in water quality credits to enhance water quality outcomes. Buyers typically buy credits to meet a regulatory obligation.

Credit End Date: A credit end date is established in the credit sales legal agreement. The credit end date is based on the BMP project's life and the number of replacement life cycles that the seller is willing to make a commitment to provide and operate correctly throughout.

Credit Start Date: A credit start date begins when all of the BMPs included in a project are fully established. For structural BMPs, full establishment may be at the end of construction. For BMPs that have a vegetation pollutant treatment component, the start date begins when the vegetation establishment meets the specified density and plant species requirements to achieve the pollutant reduction amount indicated by the results of the program's quantification method ; for example, when using native plant species to filter runoff, establishing the full planting may take up to 3 years to complete.

Credit Unit Cost: The credit unit cost is the amount of requested funding divided by the number of credits generated across the credit life. The unit cost can be a substantial determinant in selecting the credit generation site to make a contract award. Other determining factors include the amount of available credits in the trading program's supply, the Buyer's BMP preferences for their credit portfolio, and the Buyer's understanding of the likelihood a project may falter or fail because of weather or other circumstances (i.e., Requested Funding / [Number of Credits per Year × Number of Years in the Project Life]).

Conservation Practice: See Best Management Practice.

Location Discount Factor: The factor applied to pollutant-reduction credits when sources are directly discharging to a waterbody of concern that accounts for the distance and unique watershed features (e.g., hydrologic conditions) that will affect pollutant fate and transport between trading partners. This factor is applied to the quantification method estimate of generated credits based on site pollutant reductions.

Project: One or more BMPs or other activities that, taken together, are proposed for generating credits on a single site.

Project Life: The time period over which a given BMP is expected to generate credits. The project life is typically also the minimum project protection period.

Trading Area: The delineated watershed contributing eligible area for buying and selling credits.

Trading Program Administrator: The organization responsible for the operation and maintenance of a quarter quality trading program. Specific responsibilities of a Program Administrator may include defining credit calculation methodologies, protocols, and quality standards; project review; and credit registration.

Trading Subwatershed: Delineated small watersheds within the Trading Area whereby a watershed model has defined the pollutant of concern's fate and transport attenuation rate for use in the WQT program (Location Discount Factor).

Quantification Method: Mathematical and/or statistical representation of processes driving changes in water quality based in science and used to estimate the water quality benefits provided by the credit generating activities. Modeling is also frequently used to predict pollutant attenuation.

Stormwater Project Quantification Method

A-2d

Stormwater Quantification Method

SRRW WQT Program Office Use Only: Assigned Application #: _____

Submittal Date: _____

Shell Rock River Watershed Water Quality Trading Credit Generation Site Quantification

This quantification method is for non-permitted stormwater entities that are adding a best management practice (BMP) project that will generate credits to trade with another permittee. This form is to be completed by Brokers assisting applicants for the Shell Rock River Watershed (SRRW) Water Quality Trading (WQT) program. Completion of this form provides the Applicant the necessary project credit quantification and baseline assessment for trading program representatives to complete the eligibility review. If the site is eligible, the approved application will be entered into a competitive selection process where trading program buyers select which sites will be offered purchase legal agreements.

Applicant and Broker Name _____

1. Credit Generator Applicant	**2. Assisting Trading Program Broker**
Credit Generator Entity:	Broker Entity:

3. Credit Generation Site Location Information (Duplication of Application for Review Assurance)
Applicant's Credit Site Project Name:
Number of Contributing Acres:
WQT Subwatershed Location Name:
Trading Area Subwatershed #:
Location Discount Factor:
Latitude and Longitude _____, _____; or
Parcel Identification Number:
Is a project site regional location map attached? Yes ☐ No ☐
Is a project field map with an aerial photograph background attached? Yes ☐ No ☐

Proposed Credit Site Quantification Summary

4. Site Proposal Summary	
Credits	**Credit Start and End Dates**
Credits/Year:	**Start:**
No. of Years:	**End:**

Proposal Project Description(s)

The proposed project, the credit generating activity, may consist of one BMP or multiple BMPs. Each BMP included in the application must have a unique name, practice description, and credit quantification result.

The following instructions and entry fields are tailored to be a summary of the main baseline site requirements. A more detailed discussion of baselines is provided in the WQT Manual's Appendix E. Additional agricultural topics, such as concentrated animal feeding operation (CAFO) and animal feeding operation (AFO) requirements, are provided there.

Baseline 3-Year History and the MS4 SWPPP Requirements if Permitted

5. Baseline, Provide Complete Crop Rotation and 3-Year Field Operation Description
• Describe the urban practices in place in the contributing area over the last 3 years; including preexisting BMPs. • If the catchment has any past monitoring or special flow features, discuss these in detail. • Provide a verification source that will confirm the 3-year history (e.g., designs, mapping efforts, and aerial photographs for aboveground structures. • If permitted, provide the catchment's required practices according to the MS4 SWPPP, including those identified as required practices not yet installed. These pending practices will need to be included in the baseline loading quantification method's calculations.

Project Details

6. Project Components and Descriptions (Duplication of Application Details for Review Assurances)
On the next page, describe the BMPs that will be reducing phosphorus loading from the site. If installing more than one BMP in this category, the description will provide the following: • Site BMP name, Standard name (e.g., rain garden) • Attach a site map or sketch that includes area boundaries, each BMP location, and contributing area to each BMP, including non-MS4 loadings if that BMP is treating nonpoint-source runoff generated outside of the MS4 footprint. • Make sure to consider surface and storm sewer conveyance pathways. • Ratio of state public grants versus private funds provided to obtain the total project cost. (WQT funds are considered private funds.) • Provide the method for calculations (i.e., model's name and entity modeling)
Description: Attach additional pages, maps, or plans as necessary

Stormwater Credit Quantification Method Instructions

This stormwater credit quantification is for an MS4 area that is not permitted under a Minnesota Statewide General Stormwater permit. Nonpermitted MS4s can generate credits for NPDES/SDS permitted dischargers by following the steps provided:

Step 1 – A professional engineer, working with city officials, will review and document the extent of the contributing area involved with the proposed credit generating BMP. This review will include:

- Delineating the surface area contributing to the proposed BMP project; this delineation includes separate delineations of all areas of different land-use types
- Extending the surface area delineation with a delineated map of storm sewer networks, associated storm drains/intakes and associated land uses, with notes whether or not the storm sewer areas will drain, be influent into, the proposed BMP project
- Identifying existing BMPs and previously implemented and removed BMPs within the surface delineated area and storm sewer influent network for the proposed BMP project

Step 2 – Depending on the number of BMPs, the Unit of Trade, unit of time the professional engineer will select an appropriate stormwater TMDL model from the MPCA stormwater program review materials. For the following steps, the MPCA_simple_estimator_version_3.0.xlsx and guidance are used for illustration. Available at: https://stormwater.pca.state.mn.us/index.php?title=Quick_Guide:_MPCA_Estimator_tab.

Step 3 – The MPCA Simple Estimator can be used in areas without BMP treatment trains (including the proposed BMP project), where stormwater monitoring of the treatment train is not available. As such, each separate land-use Event Mean Concentration and land-use acres are entered following the model's accompanying guidance. The contributing area for the proposed BMP project is identified (even if it extends past the current MS4 footprint) and entered as a planned BMP.

Step 4 – The reduction from the BMP calculation results is then multiplied by the appropriate Location Factor and any Buyer of credits using this BMP will be able to use a Trade Ration of 2.1 to 1 to determine their stormwater credit demand offset by such a BMP.

Conversion of Phosphorus Reduction Results to Credits

The edge-of-field results provided by the total stormwater calculation's Total Area results must now be converted into the downstream yield that impacts the water resource of concern. The first step is to round off the results to a whole number. Next, multiply the adjusted results by the Location Discount Factor to determine the Seller's credit value.

Credit Value Determination

1. Subwatershed	2. Location Discount Factor (LDF, %)	3. Stormwater Total Area Reduction Results (lb/yr)	3. SW Total Rounded Off (lb/yr)	5. *Ratio of Public Funds Versus Private Funds Used to Achieve Total Project Cost (%)	6. Credits = LDF (Item 2) × BET (Item 3) × Ratio of Public Funds (Item 4)

Broker Signature

Broker:

_____ _____

(Signature) (Date)

_____

(Printed Name)

Maps, Site Sketches, or List of Attachments

Glossary

Angle of Repose: The soil slope that is considered stable for a long-term period given the soil classes present. Angle of repose soil slopes are typically at or below a 45-degree angle.

Baseline: The combined pollutant load and/or best management practice (BMP) installation requirements that must be met before trading. At a minimum, all of the individual nonpoint sources must meet existing state, local, and tribal regulatory requirements, including the Minnesota Buffer Law, Ditch Buffer Law, and shoreland water quality protection requirements.

Best Management Practice: BMPs include but are not limited to structural and nonstructural controls and operation and maintenance procedures to reduce the release of pollutants to receiving waters. BMPs can also consist of land-use conversions and instream improvements.

Broker: A Broker is a person or entity that identifies credit generators to bring them together with trading partners (buyers). The Broker is trained in the WQT Program Policies and Protocols to assist credit generators with their credit project application, project implementation, and project reporting requirements in a manner that fulfills the program's certification policies.

Buyer: Buyers of credits include any public or private entity that chooses to invest in water quality credits to enhance water quality outcomes. Buyers typically buy credits to meet a regulatory obligation.

Credit End Date: A credit end date is established in the credit sales legal agreement. The credit end date is based on the BMP project's life and the number of replacement life cycles that the seller is willing to make a commitment to provide and operate correctly throughout.

Credit Start Date: A credit start date begins when all of the BMPs included in a project are fully established. For structural BMPs, full establishment may be at the end of construction. For BMPs that have a vegetation pollutant treatment component, the start date begins when the vegetation establishment meets the specified density and plant species requirements to achieve the pollutant reduction amount indicated by the results of the program's quantification method ; for example, when using native plant species to filter runoff, establishing the full planting may take up to 3 years to complete.

Credit Unit Cost: The credit unit cost is the amount of requested funding divided by the number of credits generated across the credit life. The unit cost can be a substantial determinant in selecting the credit generation site to make a contract award. Other determining factors include the amount of available credits in the trading program's supply, the Buyer's BMP preferences for their credit portfolio, and the Buyer's understanding of the likelihood a project may falter or fail because of weather or other circumstances (i.e., Requested Funding / [Number of Credits per Year × Number of Years in the Project Life]).

Conservation Practice: See Best Management Practice.

Location Discount Factor: The factor applied to pollutant-reduction credits when sources are directly discharging to a waterbody of concern that accounts for the distance and unique watershed features (e.g., hydrologic conditions) that will affect pollutant fate and transport between trading partners. This factor is applied to the quantification method estimate of generated credits based on site pollutant reductions.

Project: One or more BMPs or other activities that, taken together, are proposed for generating credits on a single site.

Project Life: The time period over which a given BMP is expected to generate credits. The project life is typically also the minimum project protection period.

Trading Area: The delineated watershed contributing eligible area for buying and selling credits.

Trading Program Administrator: The organization responsible for the operation and maintenance of a quarter quality trading program. Specific responsibilities of a Program Administrator may include defining credit calculation methodologies, protocols, and quality standards; project review; and credit registration.

Trading Subwatershed: Delineated small watersheds within the Trading Area whereby a watershed model has defined the pollutant of concern's fate and transport attenuation rate for use in the WQT program (Location Discount Factor).

Quantification Method: Mathematical and/or statistical representation of processes driving changes in water quality based in science and used to estimate the water quality benefits provided by the credit generating activities. Modeling is also frequently used to predict pollutant attenuation.

Shell Rock River Watershed Water Quality Trading Credit Generation Site Quantification

The Shell Rock River Watershed (SRRW) Water Quality Trading (WQT) program will consider approval of professional reports that adequately quantify a phosphorus-reduction technology that does not have an approved quantification method (model). This form guides project professionals through the required application process and the monitoring programs that will be required to achieve eligibility in the WQT program. The project types that can be submitted for consideration using this quantification method include in-lake treatment systems, stream or river dredging projects, and innovative conservation technology with sufficient monitoring evaluations to determine the technology's treatment efficiency. This form is to be completed by a professional skilled in the treatment method itself acting as the Broker overseeing the credit quantification documentation. The Broker must work on behalf of the Applicant and submit their credentials as part of the process. If the project's eligibility is approved by the SRRW WQT Program Administration Office, the application will be submitted to the Minnesota Pollution Control Agency (MPCA) for its staff's approval. After the project has been fully approved, it will be placed in a competitive selection process for Buyers. Project selection by a Buyer begins the negotiation process to establish a mutually beneficial legal agreement between the Buyer and Seller.

Applicant Contact and Location Information **Submittal Date:**_____

1. Credit Generator Applicant	**2. Assisting Trading Program Broker**
Credit Generator Name:	Broker Name: Phone Number: Email: Credentials:

3. Project Category
Check the box that best describes this project's category: Chemical Precipitation of Phosphorus ☐ Stream Dredging ☐ Lake Dredging ☐ Innovative Technology ☐ If the Innovative Technology box is checked, provide a brief description:

4. Credit Generation Site Location Information (Duplication of Application for Review Assurance)
Applicant's Credit Site Location Name: Applicant's Preferred Project Name: Trading Area Subwatershed Number: Project Units and Treated Area (e.g., acres, technology units):

Location Discount Factor:

Latitude and Longitude: _____, _____; or

Parcel Identification Number:

Is a project map with treatment locations attached? Yes ☐ No ☐

Does the map identify other relevant land features (e.g., an aerial map)? Yes ☐ No ☐

Proposed Credit Site Quantification Summary

5. Site Proposal Summary	
Credits	**Credit Start and End Dates**
Credits/Year:	**Start:**
No. of Years:	**End:**

Proposed Project's List of Supporting Documentation

6. List the attached set of documents that provide the explanations and justifications used for the quantification and the uncertainty used to determine the project's credit value.

Project reports that describe the scientific approach used to evaluate the project:

Project site data collection methods, resulting datasets, and data evaluations:

6. List the attached set of documents that provide the explanations and justifications used for the quantification and the uncertainty used to determine the project's credit value (continued).
Post-implementation project verification monitoring program: List the required permits to complete the project:

Project Reduction Estimate Required Contents

7. The documents listed in Item 6 must address the following topics.
a. The science applied to quantify the annual credits generated. b. The methods applied to fit the reduction estimation science to the local project details. c. The recommended Uncertainty Discount Factor for the Buyer-side trade ratio based on the potential variability of credits generated year to year. d. The expected project's credit generating life. e. If the project is expected to have a declining rate of annual credits, provide: – How the actual level of credits generated each year will be forecasted. – A thorough explanation of the required monitoring verification program. f. The Fountain Lake subwatershed number and associated Location Discount Factor. g. The additional Equivalence Discount Factor required above a 1:1 ratio, if any. h. The ratio of public funding versus private funding to obtain the project's total cost.

Phosphorus Reductions, Recommended Uncertainty Discount Factors by Year of Project Life

Provide a summary of the report's justified annual credits and recommended Uncertainty Discount Factor by project year in the table below.

Project Summary of Equivalent Phosphorus Reduction Across Project Life

Project Name:		Estimated Project Life:		
Year/Range by Years Within Project Life (e.g., 1–10, or 1, 2, 3, …)	**1. Phosphorus Reduction by Year (TP, lb/yr)**	**2. Additional Equivalence Discount Factor (%)**	**3. Equivalent Phosphorus Reductions by Year (Item 1 × Item 2) (lb/yr)**	**4. Recommended Buyer Uncertainty Discount Factor by Year (%)**

Conversion of Phosphorus-Reduction Results to Credits

The edge-of-field results provided by the professional justification quantification method must be converted into the downstream yield and equivalent bioavailability credits that impact the water resource of concern. The first step is to round-off the justified results to a whole number. The next step is to multiply the rounded off phosphorus reduction results by the location discount factor and ratio of public vs private funds (if applicable) to determine the project's credit value.

Credit Value Determination

1. Subwatershed	2. Location Discount Factor (LDF, %)	3. Phosphorus Reduction Rounded Off (TP, lb/yr)	4. Ratio of Public Funds Versus Private Funds Used to Achieve Total Project Cost (%)	5. Credits = LDF (Item 2) × TP (Item 3) × Ratio of Public Funds (Item 4)

** The Permittee shall receive credit for BMPs that have been funded by the Permittee and/or the landowner of the BMP site. In cases where cost sharing and/or grant funding occurs, the rules and agreements governing the BMPs funding may specify BMP credit generation eligibility, including the proportion of credit ownership between the funding entity and the Permittee.*

Broker Signature

I certify by signing this application that the above information and the credit quantification data entries are accurate to the best of my knowledge. I understand that the Program Administrator is fully authorized to make all of the determinations regarding program eligibility, compliance, and complaints and appeal processes, and that the Program Administrator's determination is final.

Broker:

_____ _____

(Signature) (Date)

_____

(Printed Name)

Maps, Site Sketches, or List of Attachments

Glossary

Angle of Repose: The soil slope that is considered stable for a long-term period given the soil classes present. Angle of repose soil slopes are typically at or below a 45-degree angle.

Baseline: The combined pollutant load and/or best management practice (BMP) installation requirements that must be met before trading. At a minimum, all of the individual nonpoint sources must meet existing state, local, and tribal regulatory requirements, including the Minnesota Buffer Law, Ditch Buffer Law, and shoreland water quality protection requirements.

Best Management Practice: BMPs include but are not limited to structural and nonstructural controls and operation and maintenance procedures to reduce the release of pollutants to receiving waters. BMPs can also consist of land-use conversions and instream improvements.

Broker: A Broker is a person or entity that identifies credit generators to bring them together with trading partners (buyers). The Broker is trained in the WQT Program Policies and Protocols to assist credit generators with their credit project application, project implementation, and project reporting requirements in a manner that fulfills the program's certification policies.

Buyer: Buyers of credits include any public or private entity that chooses to invest in water quality credits to enhance water quality outcomes. Buyers typically buy credits to meet a regulatory obligation.

Credit End Date: A credit end date is established in the credit sales legal agreement. The credit end date is based on the BMP project's life and the number of replacement life cycles that the seller is willing to make a commitment to provide and operate correctly throughout.

Credit Start Date: A credit start date begins when all of the BMPs included in a project are fully established. For structural BMPs, full establishment may be at the end of construction. For BMPs that have a vegetation pollutant treatment component, the start date begins when the vegetation establishment meets the specified density and plant species requirements to achieve the pollutant reduction amount indicated by the results of the program's quantification method; for example, when using native plant species to filter runoff, establishing the full planting may take up to 3 years to complete.

Credit Unit Cost: The credit unit cost is the amount of requested funding divided by the number of credits generated across the credit life. The unit cost can be a substantial determinant in selecting the credit generation site to make a contract award. Other determining factors include the amount of available credits in the trading program's supply, the Buyer's BMP preferences for their credit portfolio, and the Buyer's understanding of the likelihood a project may falter or fail because of weather or other circumstances (i.e., Requested Funding / [Number of Credits per Year × Number of Years in the Project Life]).

Conservation Practice: See Best Management Practice.

Location Discount Factor: The factor applied to pollutant-reduction credits when sources are directly discharging to a waterbody of concern that accounts for the distance and unique watershed features (e.g., hydrologic conditions) that will affect pollutant fate and transport between trading partners. This factor is applied to the quantification method estimate of generated credits based on site pollutant reductions.

Project: One or more BMPs or other activities that, taken together, are proposed for generating credits on a single site.

Project Life: The time period over which a given BMP is expected to generate credits. The project life is typically also the minimum project protection period.

Trading Area: The delineated watershed contributing eligible area for buying and selling credits.

Trading Program Administrator: The organization responsible for the operation and maintenance of a quarter quality trading program. Specific responsibilities of a program administrator may include defining credit calculation methodologies, protocols, and quality standards; project review; and credit registration.

Trading Subwatershed: Delineated small watersheds within the Trading Area whereby a watershed model has defined the pollutant of concern's fate and transport attenuation rate for use in the WQT program (Location Discount Factor).

Quantification Method: Mathematical and/or statistical representation of processes driving changes in water quality based in science and used to estimate the water quality benefits provided by the credit generating activities. Modeling is also frequently used to predict pollutant attenuation.

Credit Project Application Completeness Check

A-3

Application Completeness Check

Date: _____ **Project Number:** _____

Shell Rock River Watershed Water Quality Trading Credit Application Completeness Check

WQT program administration staff will complete this review of the credit application (Forms A-1 and A-2) for completeness, including appropriate attachments. After verification that the application documents are complete, the administration staff can assign a Third-Party Verifier to assist in completing the eligibility review of the credit generation site's application.

Application Form A-1

Applicant Contact and Location Information by Item:

1. Credit Generation Applicant contact information and date of submittal are complete. Yes ☐
2. Trading Broker contact information is complete. Yes ☐
3. Credit generation site location information is complete, and the site is relatively easy to locate on your desktop computer. Yes ☐
4. Proposed summary is complete and the math is correct. Yes ☐

Project Proposal Description

1. Only one project category is selected, and the Quantification Method Form A-2*x* review is complete. Yes ☐
2. Project technical support (entities or organizations) are listed, if possible at this time. Yes ☐
3. Project best management practices (BMPs), unique names, location identification, and practice number (if appropriate) are clear and complete. Yes ☐
4. The crediting sequence is presented, and the Form A-2 credit information follows this sequence. Yes ☐
5. The attached maps or sketches provide an adequate representation of the area, BMP footprint, and contributing area. Yes ☐
6. Additional application site eligibility requirement boxes are complete. Yes ☐
7. The signature block is signed and dated. Yes ☐

Quantification Forms A-2a, b, c, d, or e

1. Are the Applicant's and Broker's names and site locations completely filled in? Yes ☐
2. Is the Site Proposal Summary completed, and does it match the credit results in Item 4 of the Applicant Contact and Location Information? Yes ☐
3. Are the Baseline Requirements presented and included in the Quantification Method? Yes ☐
4. Do the Project Details in the Quantification Method match the Proposal Project Description in the application? Yes ☐
5. Does the credit value include the Location Discount Factor conversion from the quantified estimate to credits? Yes ☐
6. Are all of the required maps or sketches provided, and was the credit generation site's location information successfully tested on your desktop computer? Yes ☐
7. Did the Broker sign and date Form A-2a, b, c, d, or e? Yes ☐

Completeness Check Findings

The completeness check review found that:

☐ All of the review boxes were checked "Yes" and the application can be advanced to a full review.

☐ The circled items above did not comply with the submittal requirements. The WQT Program Administrator's next step is to send a written correspondence to the Applicant and Broker regarding the application deficiencies and place all of the documents in the WQT program file.

Administration Staff Performing the Completeness Check:

_____ _____

(Signature) (Date)

_____

(Printed Name)

Site Application Third-Party Verification

SRRWD
Shell Rock River Watershed District
Working Together to Improve Water Quality

A-4

Third-Party Application Verification

Date: _____ **Project Number:** _____

Shell Rock River Watershed Water Quality Trading Credit Application Verification and Certification

The Third-Party Verifier will complete the verification and certification review of the project application (Forms A-1 and A-2 and attachments). The verification includes accessing cited data (e.g., Minnesota Buffer Law compliance), performing calculations to ensure repeatability of results, and conducting a site inspection as appropriate. After verification that the application is complete and repeatable, the Third-Party Verifier will certify that the application and quantification method comply with Water Quality Trading (WQT) program protocols. If the application contains issues that need to be addressed, the Third-Party Verifier will note these findings concisely in the provided section summary lines on Page 2.

Application Form A-1

Applicant Contact and Location Information by Item:

1. Credit Generation Applicant contact information is verifiable. ☐ Yes ☐ No (Explain issues below.)
2. Trading Broker data confirmation enquiry has been completed. ☐ Yes ☐ No (Explain issues below.)
3. Credit generation site location information is complete and the site has been verified. ☐ Yes ☐ No (Explain issues below.)

Project Proposal Description

1. Review entry data and repeatability quantification method results have been completed based on the submitted Form A-2__ (Quantification Method a, b, c, d, or e):
   a. Data and results confirmed. ☐ Yes ☐ No (Explain issues below.)
   b. Project technical support has been provided and is acceptable for the conservation practice implementation and operation provisions of a legal agreement. ☐ Yes ☐ No (Explain issues below.)
   c. Each project conservation practice has a unique name, location identifier, and design standard type provided (if appropriate); methods are clear and complete. ☐ Yes ☐ No (Explain issues below.)
   d. The project description explains the sequence of conservation practice baselines and project practices that the crediting quantification method follows. ☐ Yes ☐ No (Explain issues below).
   e. The attached maps or sketches provide an adequate representation of the area, best management practice (BMP) footprint, and contributing area. ☐ Yes ☐ No (Explain issues below.)
   f. Additional application site eligibility requirement boxes have been completed. ☐ Yes ☐ No (Explain issues below.)
   g. Signature block is signed and dated. ☐ Yes ☐ No (Explain issues below.)

For each "No" boxed checked, provide the form's item number and briefly explain the issue: _____

Quantification Form A-2a, b, c, d, or e

1. Is the Site Proposal Summary complete? ☐ Yes ☐ No (Explain issues below.)
2. Are the Baseline requirements accurate? ☐ Yes ☐ No (Explain issues below.)
3. Does the credit quantified value include required discount factors? ☐ Yes ☐ No (Explain issues below.)

For each "No" boxed checked, provide the form's item number and briefly explain the issue:_____

Application Site Inspection, Form AI-1

☐ **A site project inspection was completed to confirm the stated conditions in the application and quantification method Forms A-1 and A-2.**

☐ **A site project inspection was not completed for the following reasons:** _____

☐ **The site project inspection identified issues noted in Form AI-1 that must be addressed before the project can be certified as eligible.**

Third-Party Verifier Findings

The verification certification recommendation is:

☐ The application and quantification method forms were completed using the WQT Program Protocols and the project is eligible for generating credits.

☐ The identified items above were not completed according to WQT Program Protocols. The descriptions of the incomplete or inaccurate items above should be sent in a written correspondence to the Applicant and Broker to determine the next steps.

Third-Party Verifier Signature

I certify that the work completed to verify the accuracy and repeatability of the application and quantification method was completed to the best of my professional ability. The recommendation and program noncompliance issues discovered, if any, are hereby submitted.

_____ _____

(Signature) (Date)

_____

(Printed Name)

_____ _____

(Email) (Telephone)

SRRW WQT Credit Generation Project Eligibility Approval

A-5

Application Eligibility Approval

DATE: _____

TO:

FROM: SRRW WQT Program Administration Office
214 West Main Street
Albert Lea, MN 56007

RE: Eligibility Approval for the Credit Generation Project at (Insert Project Name) _____

Dear _____,

Congratulations; this letter is to notify you that your credit generation application has been evaluated and deemed eligible for competition in the Shell Rock River Watershed (SRRW) Water Quality Trading (WQT) program. This project eligibility approval moves your project into the next WQT selection phase where credit buyers will consider purchasing credits from your site.

With this approval, _____ <insert number of credits> credits at a credit cost of $ _____ per credit will be entered into the next round of a Buyer's purchasing decisions. Being selected by a Buyer for credit purchases can be a competitive step as one of the items on the list of decision criteria is the cost per credit. WQT program administrative staff will notify you when a determination has been made. If this project is selected by a buyer, the following step will be to enter into a credit purchase legal agreement with the buyer. The signed legal agreement must be in place before design and implementation fees for the project can begin. The beginning date of the contract will be the start date for the credit project's agreed-upon payment schedule.

If you have any additional questions about your participation or the next steps, please contact the SRRW WQT Program Administration Office by telephone (507.379.8782) or Courtney Phillips by email (Courtney.phillips@co.freeborn.mn.us). The SRRW WQT Program Administration Office appreciates the opportunity to work with you.

Sincerely,

Courtney Phillips
SRRW WQT Program Administrator

cc: Field Representative Broker
Third-Party Verifier
SRRW WQT Program Administration Office Project Files

Water Quality Trading Credit Generation Project Site Eligibility Denial

A-6

Application Eligibility Denial

DATE: _____

TO:

FROM: SRRW WQT Program Administration Office
214 West Main Street
Albert Lea, MN 56007

RE: Eligibility Denial for the Credit Generation Project at (Insert Project Name) _____

Dear _____,

We regret to inform you that your credit generation application has been denied for eligibility in the Shell Rock River Watershed (SRRW) Water Quality Trading (WQT) program. The application contents did not fulfill the eligibility requirements to certify that actual credit reductions will take place. Because the Buyers of credits are fulfilling regulatory requirements by using credit purchases, your project must be certified as complying with all of the WQT program eligibility policies and protocol requirements. We encourage you to resubmit the application after you and your WQT program Broker have corrected the deficient items that are listed in the attachment to this letter. The list of application deficiencies was generated by the WQT Program Administration Office staff and an objective Third-Party Verifier based on reviews and evaluations in the project application Form A-1, a site inspection (Write "No Inspection" If Inspection Was Not Completed) _____, and credit Quantification Method Form A-2.

The SRRW WQT program staff encourage you to work with your Broker and reapply. If you have any additional questions about your participation or the next steps, please contact the SRRW WQT Program Administration Office by telephone (507.379.8782) or Courtney Phillips by email (Courtney.phillips@co.freeborn.mn.us). The SRRW District appreciates your participation in trading and hopes that you will reapply.

Sincerely,

Courtney Phillips
SRRW WQT Program Administrator

Enclosure (Itemized Explanation of Deficiencies in Application Form A-1 and Quantification Form A-2)
cc: Field Representative Broker
Third-Party Verifier
SRRW WQT Program Administration Office Project Files

Project Site Inspection for Application

SRRWD
Shell Rock River Watershed District
Working Together to Improve Water Quality

AI-1

Application Project Inspection Form

Date: _____ **Project Number:** _____

Landowner Name:	Area of Field:	Project Location County: Township: Range: Section:
Address:	Conservation Practice(s):	

Third-Party Verifier Name: _____

Attach Photograph(s) for Each Category, as Appropriate

Conservation Practice Inspection Checklist	Satisfactory	Unsatisfactory	N/A	Comments/ Actions Required
Site Physical Conditions				
Site Soil Conditions Are as Stated in Project Application				
Minnesota Buffer Law Requirements Are as Stated in Project Application				
Vegetation Management and Existing Best Management Practices				
Vegetative Cover Management Is as Stated in Project Application				
List of BMPs at the Site Is Accurate				
Contributing Area for BMPs Is as Stated in Project Application				

Additional Comments: _____

Conservation Practice Inspection Checklist	Satisfactory	Unsatisfactory	N/A	Comments/ Actions Required
Site Drainage				
Per Plan Grading Design, No Evidence of Ponding Water on Site				
Runoff Pathways Appropriately Discussed				

Additional Comments: _____

Conservation Practice(s):	
Inspection Date:	
Final Inspection Assessment (circle one):	
Satisfactory	Unsatisfactory (restoration actions required)

On behalf of the Shell Rock River Watershed (SRRW) Water Quality Trading (WQT) program, I certify that I have inspected the conservation practice area and, to the best of my knowledge, this inspection form and the associated documentation accurately represent the current condition of the conservation practice and contributing area at the time of inspection.

_____ _____

(Signature) (Date)

_____

(Printed Name)

Copies of signed forms and photographs provided to the SRRW WQT Program Administration Office and the Landowner. Yes ☐ No ☐

Credit Generator Complaint or Request for Appeal

C-1

Credit Generator Compliant or Request for Appeal

Shell Rock River Watershed WQT Program Complaint or Appeal Process

The Shell Rock River Watershed (SRRW) Water Quality Trading (WQT) Program offers a complaint and appeal process for interested parties who feel a decision or action taken by one or more SRRW WQT program representatives was wrong. The SRRW Program Administration takes contested issues seriously. The processing of complaints and appeals by the WQT Program Administration Office pertains only to WQT Program Policy or Protocol violations. All other incidences must be turned over to the proper governing authorities. The SRRW WQT program has two levels of review as follows: (1) "Complaint" which is an internal review process; and (2) "Appeal" which is an external review process.

An interested party may file a Complaint by submitting a completed Form C-1 to the SRRW Program Administrator within 30 days of the decision complained of. Upon timely receipt of a Complaint, the SRRW WQT Program Administrator will appoint a group of individuals to review the Complaint and recommend a course of action to the Program Administrator. This group may consist of Shell Rock River Watershed District (SRRWD) board member(s) and SRRWD staff member(s). The SRRWD will make every effort to process complaints without undue delay, while taking into consideration the degree of complexity involved in the Complaint and underlying issue(s). The SRRW WQT Program Administrator will notify the interested party of the disposition of the Complaint in writing.

The interested party may appeal the disposition of the Complaint by filing a Request for Appeal within thirty (30) days of the SRRWD's written disposition of Complaint by submitting Form C-1 (marked Appeal) to the SRRW WQT Program Administrator. The SRRWD will review the request and determine whether the interested party is entitled to a contested case proceeding. If the SRRWD determines that the interested party is entitled to contested case proceedings, the SRRWD will issue a notice of and order for a hearing. The notice will state the time, date, and location of the hearing. It will also contain a citation to the SRRWD's statutory authority to hold the hearing and take the proposed actions, a statement of the contested issues, and the name of the Administrative Law Judge who has been assigned to the case.

As indicated by your signatures on this form, the Project Application Form A-1, and in the credit purchase legal agreement, you understand and acknowledge that all Administration Office WQT Program decisions are final.

Submit this form and any attachments to the SRRW WQT Program Administration Office in person or by certified mail to:

SRRW WQT Program
214 West Main Street
Albert Lea, MN 56007

1. Project Grievance, Personal Contact Information, and WQT Program Role

WQT Program Project Number: _____

Is This a Complaint ☐ or Request for Appeal of a WQT Program Decision ☐

Name of Person Filing Grievance: _____

Phone Number: _____

Email: _____

Address: _____

Your Activity in Project (e.g., Credit Generator, Broker) _____

2. WQT Program Involved Representatives

List the WQT program representatives involved in the project activities that led up to filing the complaint or request for appeal. For each action or event, list the date that it occurred. The WQT program list of possible representative titles includes the Broker (who assists you with credit applications and program processes), Third-Party Verifier (who provides reviews and inspections regarding project performance and conditions to the Program Administrator), Program Administrator, and Program Administration Office staff (who oversee the program's assigned parties, perform record keeping activities, and make project performance determinations).

Involved WQT Program Representatives and the Approximate Dates of Activities: _____

_____	_____
(Name)	(WQT Program Title)
_____	_____
(Name)	(WQT Program Title)
_____	_____
(Name)	(WQT Program Title)
_____	_____
(Name)	(WQT Program Title)

3. Description of the Event That Led Up to Filing a Complaint or Request for Appeal

In 500 words or less, provide a description of the action or event and the WQT Program context that led up to filing the Complaint or Request for Appeal: _____

4. List the Attachments Supporting the Compliant or Request for Appeal

Provide the list of attachments, if any, that support the complaint or request for appeal. Examples of supporting attachments are WQT program documents (e.g., forms and letters), notarized eye-witness accounts, and dated photographs with narratives regarding the location and descriptions of how the photograph supports the site conditions at the time of the contested action: _____

5. Provide the Desired WQT Program Outcome from Filing This Form (C-1)

6. Signature Block

The above information and contents of the attachments are submitted in good faith and represent the conditions, actions, and determination finding truthfully and to the best of my ability. I understand that the contested actions will be reviewed against the WQT Program Policies and Protocols. I fully understand that all decisions regarding WQT Program Policy and Protocol compliance made by the Program Administration Office are final.

_____ State of: _____

Signature County of: _____

The forgoing document was acknowledged before me on the _____ day of _____, _____

_____ _____

Printed Name

Notary Public
My Commission Expires: _____

Completeness Check for Initial Processing of Received Complaint or Request for Appeal

C-2

Complaint or Appeal Completeness Checklist

Date: _____ **Project Number:** _____

SRRW WQT Program Project Complaint or Request for Appeal Processing Completeness Checklist

The Shell Rock River Watershed (SRRW) Water Quality Trading (WQT) Program Administration Office staff take all contested program issues seriously. Complaints and appeal requests must be processed according to the protocols explained in this checklist.

Form C-1 Identified WQT Program Entities Involved in the Contested Activities

The SRRW WQT Program Administrator must first check to see if they are identified in the grievance as a party who broke the WQT Program protocol according to assigned roles. If the Administrator is identified they should recuse themselves from processing this grievance and await the due process to take place without speaking of the project details with anyone else. A different staff member should be assigned to process the Complaint or Appeal.

If the SRRW WQT Program Administrator was not identified in Form C-1 as an involved party, the Administrator should contact all WQT Program staff named in Form C-1 to inform them that there has been a Complaint filed against the WQT Program. The WQT Program entities should be further advised that they are named as having a program role involving the actions that generated the complaint or request for appeal and they should not speak about this project with anyone other than as required for the contested case proceedings until those proceedings are completed.

Check each box upon completion:

- ☐ All of the indicated parties have been informed that a WQT program grievance has been filed and that they are to refrain from speaking about the project with everyone except those assigned to process the grievance.
- ☐ If the Administrator is an involved party identified in Form C-1, all of the processing duties have been reassigned to the next senior staff available.

Assemble WQT Program Project Site Records

Identify the timing and context of the project activities taking place that created the situation were the grievance took place. Gather all WQT Program records (e.g., forms, letters and photos) that were used in the identified context of the events leading up to the Complaint or Appeal. Make copies of all documents and retain originals.

Check each box upon completion:

- ☐ A record search has been completed for project files that contain information relevant to WQT Program activities that are associated with the context of the Complaint or Appeal.
- ☐ Copies of all relevant materials have been made.

☐ A request has been sent to all of the WQT program representatives to immediately submit all outstanding project forms, documents, and associated photographs.

Assign Evaluation Duties and Provide Copies of WQT Program Records

Check boxes when complete:

If it is a Complaint:

☐ Review the Complaint and appoint a group to review the Complaint.

☐ Send out notice of the hearing to the interested party who filed the Complaint.

If it is a Request for Appeal:

☐ Review the Request for Appeal to determine whether to initiate a contested case proceeding.

☐ If the decision to is made to initiate a contested case proceeding, contact the Office of Administrative Hearing to get an Administrative Law Judge assigned to the case.

☐ Send out appropriate notice to the interested party who filed the Request for Appeal.

Signature of Individual Who Completed These Activities and Recorded This Form

(Administrator or Assigned Administration Staff)

_____ _____

(Signature) (Date)

_____

(Printed Name)

cc: Third-Party Verifier
SRRW WQT Program Administration Office Project Files

Internal Review Group Recommended Findings Regarding Form C-1 Complaint Filed

C-3

Internal Review Investigation

Date: _____ **Project Number:** _____

Shell Rock River Watershed Water Quality Trading Credit Application Verification and Certification

The Shell Rock River Watershed (SRRW) Water Quality Trading (WQT) program takes all contested program actions and events seriously. As such, this form is to be completed by the appointed group tasked with completing an evaluation of the Complaint lodged to determine the merit of the claim. Positive findings on behalf of the individual will be made based on actions and events made by WQT Program representatives that did not follow WQT program protocols or policies. Other complaints that are outside of the WQT program designated authority are to be made to appropriate governing bodies that oversee the topics of concern. The appointed group's task is to determine if the contested action of WQT program event is merit based, as indicated by completing some or all of the following tasks:

- Reviewing Form C-1 and its attachments
- An interview with the individual lodging the Complaint and any eyewitnesses submitting an attachment in Form C-1
- Review of project generation site files of required record keeping
- Interviews with any necessary parties in the matter
- Reviewing salient WQT program project documents (e.g., forms, letters, and photographs).

Interviews With Individual(s) Filing Form C-1 (Provide detailed notes, and the interview process must be with an accompanying WQT program assigned staff.)

1. The interview discussions aligned with Form C-1 statements. ☐ Yes ☐ No (Explain below.)
2. The interview included presentations from eyewitness(es) as an attachment to Form C-1. ☐ Yes ☐ No (Explain below.)
3. The interview process was able to confirm that the grievance was based on WQT Program Policies and Protocols. ☐ Yes ☐ No (Explain below.)
4. Those individuals participating in filing Form C-1 are correctly interpreting the WQT Program Policies and Protocols. ☐ Yes ☐ No (Explain below.)

_____
_____
_____
_____
_____
_____
_____
_____
_____

Internal Review Group Recommended Findings Regarding Form C-1 Complaint Filed

C-3

Internal Review Investigation

Interviews With Identified WQT Program Parties in Form C-1 (Provide detailed notes.)

[For each individual interviewed, the interview process must be with an accompanying WQT program assigned staff.]

1. The interview discussion(s) aligned with WQT recorded forms. ☐ Yes ☐ No (Explain below.)

2. If interviewing multiple WQT program entities, the discussions independently provided aligned with the other discussions held with WQT program entities interviewed. ☐ Yes ☐ No (Explain below.)

3. The interview process was able to discern if the entities followed WQT Program Policies and Protocols. ☐ Yes (Explain the basis for this decision below.) ☐ No (Explain below.)

Review of Required Project Operation Records and WQT Program Forms and Letters

1. Review of required operation records found the documents in order. ☐ Yes ☐ No (Explain below.)

2. Review of WQT program forms and letters was supported by WQT program entity interviews and aligns with recorded photographs of the site. ☐ Yes ☐ No (Explain below.)

3. Review of WQT program forms and letters was completed fully in accordance with WQT Program Policies and Protocols? ☐ Yes ☐ No (Explain below.)

Internal Review Group Recommended Findings Regarding Form C-1 Complaint Filed

C-3

Internal Review Investigation

Appointed Group's Findings and Recommended Next Step Actions

Having reviewed the Complaint filed in Form C-1 for the SRRW WQT Program Project No. _____, I attest that these findings and recommended next steps are truthfully submitted and reflect the actual conditions leading to the issue being filed. My work was performed to the best of my ability. In addition, at no point in time did I work outside of my area of expertise in these duties.

_____ _____

(Signature) (Date)

_____

(Printed Name)

☐ The evaluation findings are in favor of the grievances lodged by _____. The records and interview notes provided are sufficient to support this finding.

☐ The evaluation findings are in favor of the documented WQT program activities. The records and interview notes provided are sufficient to support this finding.

☐ The evaluation findings are inconclusive, as relevant records indicate that parties on both sides of the contested actions did not follow proper WQT Program Policies and Protocols. The recommended next steps are to (check all that apply):

- ☐ Conduct a WQT program in-house meeting without the WQT program staff who are indicated in the contested issues in attendance. The meeting's objective is to interview myself and the administrative staff who accompanied me during interviews so that the Program Administrator can fully understand the complexities of the situation to make an informed decision regarding the complaint or request for appeal of a program decision.
- ☐ Have the Program Administrator or assigned staff conduct a similar set of interviews with involved parties specific to the discrepancies to gather more information.
- ☐ Refer this matter and the entire set of records to the SRRW District Attorney.

cc: SRRW WQT Program Administration Office Staff Who Attended Interviews
Third Party Verifier's Project File

Response to Complaint - SRRW WQT Program Findings and Determination

C-4

Letter of Determination; Re: Complaint

DATE: _____

TO:

FROM: SRRW WQT Program Administration Office
214 West Main Street
Albert Lea, MN 56007

RE: Findings and Determination for the Submitted Complaint Regarding Shell Rock River Watershed Water Quality Trading Program Project No. _____

Dear _____**[Landowner Name]**,

This letter provides you with the final determination regarding your Complaint submitted to the Shell Rock River Watershed (SRRW) Water Quality Trading (WQT) program. The issues brought to our attention regarding (Insert Topic) _____ occurring during the (Insert Event) _____ on Project No. _____ have been thoroughly reviewed internally by the appointed group.

The SRRW WQT Program Administration Office has made the following findings of fact and conclusions of law:

1. _____
2. _____
3. _____
4. _____
5. _____

Based upon these findings of fact and careful consideration of the complete list of gathered information, the SRRW WQT Program Administration Office has found (in favor of/against your complaint [Circle One]). It is important to note that the WQT Program Administrator's authority to make such a determination only applies to the WQT Program operations for certification of credit projects like yours. The certification process exists to confirm the credits purchased by buyers to comply with their permit requirements provide real phosphorus reductions as compared to treatment options the buyer may otherwise have implemented to treat their own discharge. The WQT Program staff are available to discuss this determination and next steps with you. If you have further questions, please contact our office by telephone (507.379.8782) or Courtney Phillips by email (Courtney.phillips@co.freeborn.mn.us).

Sincerely,

Courtney Phillips
SRRW WQT Program Administrator

cc: Field Representative Broker
Third-Party Verifier
SRRW WQT Program Administration Office Project Files
Credit Purchaser

Response to Request for Appeal - SRRW WQT Program Findings and Determination

C-5

Letter of Determination; Re: Request for Appeal

DATE: _____

TO:

FROM: SRRW WQT Program Administration Office
214 West Main Street
Albert Lea, MN 56007

RE: Findings and Determination for the Submitted Request for Appeal Regarding Shell Rock River Watershed Water Quality Trading Program Project No. _____

Dear _____**[Landowner Name]**,

This letter provides you with the final determination regarding your Request for Appeal submitted to the Shell Rock River Watershed (SRRW) Water Quality Trading (WQT) program. The issues brought to our attention regarding (Insert Topic) _____ occurring during the (Insert Event) _____ on Project No. _____ has been heard by an Administrative Law Judge (ALJ). The SRRW WQT Program Administration Office has thoroughly reviewed the ALJ's written recommendation.

The SRRW WQT Program Administration Office has made the following findings of fact and conclusions of law:

1. _____
2. _____
3. _____
4. _____
5. _____

Based upon these finding of fact, a careful consideration of the complete list of gathered information, and the recommendation of the ALJ, the SRRW WQT Program Administration Office finds (in favor of/against your complaint [Circle One]). It is important to note that the WQT Program Administrator's authority to make such a determination only applies to the WQT Program operations for certification of credit projects like yours. The certification process exists to confirm the credits purchased by buyers to comply with their permit requirements provide real phosphorus reductions as compared to treatment options the buyer may otherwise have implemented to treat their own discharge. The WQT Program staff are available to discuss this determination and next steps with you. If you have further questions, please contact our office by telephone (507.379.8782) or Courtney Phillips by email (Courtney.phillips@co.freeborn.mn.us).

Sincerely,

Courtney Phillips
SRRW WQT Program Administrator

cc: Field Representative Broker
Third-Party Verifier
SRRW WQT Program Administration Office Project Files
Credit Purchaser

Water Quality Trading Credit Generation Project Eligibility Approval

EC-1

WQT Credit Generation Project Eligibility Approval

DATE: _____

TO [Buyer's Authorized Representative]:

FROM: SRRW WQT Program Administration Office
214 West Main Street
Albert Lea, MN 56007

RE: Credit Generation Project Number _____ Agreement End Date _____

Dear _____,

As highlighted in last year's annual crediting report, the Shell Rock River Watershed (SRRW) Water Quality Trading (WQT) Program Administration Office is notifying you that the Credit Generation Project No._____ agreement will be ending on (Insert End Date) _____. This project has generated (Insert Number) _____ of credits per year for your compliance needs.

The SRRW WQT program staff encourage you to work with us to meet next year's compliance needs. Several options are available should you wish to replace some or all of these previously purchased credits. If you have any additional questions about participation or the next steps, please contact the SRRW WQT Program Administration Office by telephone (507.379.8782) or Courtney Phillips by email (Courtney.phillips@co.freeborn.mn.us). The SRRW WQT program staff appreciates your participation in trading, and we are here to help with your future compliance needs.

Sincerely,

Courtney Phillips
SRRW WQT Program Administrator

cc: Field Representative Broker
Third-Party Verifier
SRRW WQT Program Administration Office Project Files

Water Quality Trading Credit Contract End Date in 6 Months

EC-2

6 Months to End of Crediting Agreement Notification

DATE: _____

TO [Landowner Name]:

FROM: SRRW WQT Program Administration Office
214 West Main Street
Albert Lea, MN 56007

RE: Credit Generation Project Number _____ Agreement End Date _____

Dear _____,

Thank you for your participation in the Shell Rock River Watershed (SRRW) Water Quality Trading (WQT) program. The WQT Program Administration Office is sending you this courtesy notification that your Credit Generation Project No. _____ legal agreement will be ending on _____. This project has successfully generated _____ credits per year for the Buyer of the credits. If you are interested in continuing your participation in the WQT program, our administrative staff or a WQT program Broker will assist you in this pursuit.

The SRRW WQT program staff encourage you to explore future trading options. If you have questions about participation or project closeout, please contact the SRRW WQT Program Administration Office by telephone (507.379.8782) or Courtney Phillips by email (Courtney.phillips@co.freeborn.mn.us). The SRRW District appreciates your participation in trading.

Sincerely,

Courtney Phillips
SRRW WQT Program Administrator

cc: Field Representative Broker
Third-Party Verifier
SRRW WQT Program Administration Project Office Files

Water Quality Trading Credit Project Termination

EC-3

End of Contract Notification

DATE: _____

TO **[Landowner Name]:**

[Authorized Buyer Representative]:

FROM: SRRW WQT Program Administration Office
214 West Main Street
Albert Lea, MN 56007

RE: Credit Generation Project No. _____ Contract Term Has Ended

Dear _____ and _____,

Thank you for your participation in the Shell Rock River Watershed (SRRW) Water Quality Trading (WQT) program. The SRRW WQT Program Administration Office is sending you this courtesy notification that your Credit Generation Project No. _____ legal agreement has expired. This project has successfully generated _____credits per year. If either the Landowner or Authorized Buyer Representative are interested in continuing their participation in the WQT program, our staff are available to assist you in this pursuit. Please contact the SRRW WQT Program Administration Office by telephone (507.379.8782) or Courtney Phillips by email (Courtney.phillips@co.freeborn.mn.us).

The SRRW District appreciates your participation in trading.

Sincerely,

Courtney Phillips
SRRW WQT Program Administrator

cc: Field Representative Broker
Third-Party Verifier
SRRW WQT Program Administration Office Project Files

Project Establishment Inspection

SRRWD
Shell Rock River Watershed District
Working Together to Improve Water Quality

IMI-1

Establishment Inspection

Date: _____ **Project Number:** _____

Landowner Name:	Area of Field:	Project Location County: Township: Range: Section:
Address:	Conservation Practice(s):	

Third-Party Verifier Name: _____

Attach Photograph(s) for Each Category as Appropriate

Conservation Practice Inspection Checklist	Satisfactory	Unsatisfactory	N/A	Comments/ Actions Required
Required Design and Record Keeping				
Best Management Practices (BMPs) Required Record Keeping in Place				
Built According to Construction Plans and Specifications (for site establishment only)				
BMP in Place and Maintained According to Operation and Maintenance (O&M) Plan				
Vegetation Management				
Unwanted Vegetation Managed				
Exposed Ground Evident				
Vegetation Stand Density Adequate				
Erosion				
No Evidence of Soil Erosion Present				

Additional Comments: _____

Attach Photograph(s) for Each Relevant Inspection Category

Conservation Practice Inspection Checklist	Satisfactory	Unsatisfactory	N/A	Comments/ Actions Required*
Site Drainage				
No Evidence of Standing Water				
Runoff Pathways Appropriate				
Sedimentation				
Sediment Accumulation Managed				
Energy Dispersion				
Condition of Dispersion Devices				
Condition of Level Spreaders				
Condition of Check Dams/Drop Structures				
Condition of Weirs				
Permanent Structures				
Condition of Dissipaters				
Condition of Inlets/Outlets				
Condition of Terraces/Dikes				
Condition of Spillway/Tiles				
Other				
Miscellaneous				
Conservation Practice Reestablishment Needed?				
Conservation Practice Functioning Properly?				

* Add additional pages for comments/actions required if needed.

Additional Comments: _____

_____

_____

_____

Conservation Practice(s):	
Inspection Date:	
Final Inspection Assessment (Circle One)	
Satisfactory	Unsatisfactory (restoration actions required)

On behalf of the Shell Rock River Watershed (SRRW) Water Quality Trading (WQT) program, I certify that I have inspected the conservation practice area and, to the best of my knowledge, this inspection form and the associated documentation accurately represent the current condition of the conservation practice and contributing area at the time of inspection.

Third-Party Verifier:

_____ _____

(Signature) (Date)

_____

(Printed Name)

Copies of signed forms and photographs provided to the SRRW WQT Program Administration Office and the Landowner. Yes ☐ No ☐

Third-Party Verifier Project Establishment Certification Findings

IM-2

Third-Party Verifier Project Establishment Certification Findings

Date: _____ **Project Number:** _____

Shell Rock River Watershed Water Quality Trading Credit Operation and Maintenance Verification and Certification

The Third-Party Verifier will complete the following evaluation and certification process steps for the credit generating project's installation and establishment certification determination. The project verification steps may include reviewing vegetation establishment plans, site structural design and specifications (as required), and the operation and maintenance (O&M) plan, as well as completing a project site inspection. After verification has been completed that the credit generation site is established according to the contractual obligations for Water Quality Trading (WQT), a recommendation for site certification will be forwarded to the Shell Rock River Watershed (SRRW) WQT Program Administration Office. If the project site has deficiencies that need to be addressed, the Third-Party Verifier will provide the records of the findings and a concise summary in the provided section summary lines below.

Conservation Practice Establishment Required Records

For each project that generates credits, check the approved category regarding installation and vegetation establishment per the Credit Generator's contractually required credit purchase legal agreement:

- ☐ Proper O&M plan available
- ☐ Project's structural component is installed according to plans and specifications (If the project does not have a structural component, check the box and initial here: _____)
- ☐ Proper vegetation establishment provided according to the installation plan
- ☐ Site clear of all construction/establishment debris

For each implementation category above that was in a condition where the component box could not be checked or a required plan was missing, provide an explanation of the issue and recommendation of the corrective action needed: _____

_____

_____

_____

Credit Generation Site O&M Plan Inspection (Attach Inspection Form IMI-1):

The credit generating conservation practice inspection found the site to be:

- ☐ In full compliance with the credit purchase legal agreement.

☐ In partial compliance with the credit purchase legal agreement; after necessary minor repair has been completed, the project can be certified for credit generation (see attached Form IMI-1 for details).

☐ In noncompliance with the credit purchase legal agreement requirements; the site conditions are not certifiable in their current condition. Complete reestablishment of the practice is required to be eligible for certification and credit generation (see attached Form IMI-1 for details).

☐ A copy of the signed establishment inspection Form IMI-1 was provided to the Credit Generator on _____ by certified mail.

On behalf of the SRRW WQT program, I certify that I have inspected and reviewed the required record keeping for the conservation practice and, to the best of my knowledge, this inspection form and the associated documentation accurately represent the current condition of the conservation practice and contributing area at the time of inspection.

Third-Party Verifier:

_____ _____

(Signature) (Date)

_____

(Printed Name)

Submit signed original to the SRRW WQT Program Administration Office and maintain a copy for your records.

Project Establishment Certification Approval Letter

IM-3

Project Establishment Approval

DATE: _____

TO [Landowner Name]:

FROM: SRRW WQT Program Administration Office
214 West Main Street
Albert Lea, MN 56007

RE: Water Quality Trading Program Establishment Approval for Project Number _____

Dear _____,

This letter notifies you that the Shell Rock River Watershed (SRRW) Water Quality Trading (WQT) program site inspection regarding project establishment has been completed and your project was found to be in good standing. The WQT program staff appreciate your participation and continued operation and maintenance of the credit generating project. The good standing finding means that the conservation practice certification has been updated, which fulfills this phase of your WQT program's credit generation contract.

If you have any additional questions about your ongoing participation, please contact the SRRW WQT Program Administration Office by telephone (507.379.8782) or Courtney Phillips by email (Courtney.phillips@co.freeborn.mn.us). Thank you for completing a successful credit generation cycle. The SRRW WQT program is grateful for the opportunity to work with you.

Sincerely,

Courtney Phillips
SRRW WQT Program Administrator

Enclosure (Itemized Explanation of Deficiencies Found in IMI-1 Inspection Form)
cc: Field Representative Broker
Third-Party Verifier
SRRW WQT Program Administration Office Project Files

Credit Generation Project Establishment Deficiencies

IM-4

Project Deficiency Notification

DATE: _____

TO [Landowner Name]:

FROM: SRRW WQT Program Administration Office
214 West Main Street
Albert Lea, MN 56007

RE: Operation and Maintenance Inspection for Project Number _____ Site Deficiency Notice

Dear _____,

The recent project site inspection conducted by _____ as a Third-Party Verifier for the Shell Rock River Watershed (SRRW) Water Quality Trading (WQT) program found the attached list of site deficiencies. As part of the National Pollutant Discharge Elimination System (NPDES) permit requirements, (Insert Buyer Organization Name) _____ is required to have certified credits in good standing as part of its phosphorus-reduction requirements. The credit purchase contract requirements include proper construction, vegetation establishment, and keeping an operation and maintenance (O&M) plan on the project site. Because the generated credits are fulfilling a regulatory requirement for the Buyer, your project must be certified as complying with all of the WQT program's eligibility and performance requirements to remain in compliance with your credit purchase legal agreement.

As mentioned above, the attached documents indicate which project components are not in compliance with the site design, vegetation establishment, and/or O&M plan. Corrections to the stated items must be completed or your project will be in violation of the legal purchase agreement and reimbursement payments will not be required. If noncompliance continues, the credit buyer will be notified regarding these deficiencies so that they can make an informed decision regarding the enforcement provisions of your agreement. To prevent enforcement from occurring, please send the WQT Program Administration Office a list of actions (with dates) that you plan to take to correct these deficiencies within 10 business days.

If you feel that this inspection finding has been made in error, please contact the SRRW WQT Program Administration Office and notify us of why you believe an error has occurred. If our conversation fails to resolve the matter in a mutually agreeable way, you have the option to complete Form C-1 to file a

complaint or request for appeal. The WQT program Form C-1 will be sent to you upon request. As recorded by signing the credit project's application (Form A-1) and the legally binding credit purchase agreement, you understand that all of the decisions made in this matter will follow the WQT Program Policies and Protocols and that the Program Administrator Office's decision on certification will be final.

If you have questions regarding these findings and the attached documents, please contact the SRRW WQT Program Administration Office by telephone (507.379.8782) or Courtney Phillips by email (Courtney.phillips@co.freeborn.mn.us). The SRRW District remains hopeful that the conflicts in this matter will be appropriately resolved.

Sincerely,

Courtney Phillips
SRRW WQT Program Administrator

Enclosure (Itemized Explanation of Deficiencies Found in IMI-1 Inspection Form)
cc: Field Representative Broker
Third-Party Verifier
SRRW WQT Program Administration Office Project Files

Project Establishment Correction Certification and Approval

IM-5

Establishment Correction Approval

DATE: _____

TO [Landowner Name]:

FROM: SRRW WQT Program Administration Office
214 West Main Street
Albert Lea, MN 56007

RE: Operation and Maintenance Restoration and Certification Approval for Project Number _____

Dear_____,

This letter notifies you that the Shell Rock River Watershed (SRRW) Water Quality Trading (WQT) program's recent site inspection of the required construction and project establishment correction has been completed, and your project was found to be in good standing. The WQT program staff appreciate your participation and continued proper operation and maintenance of the credit generating project. The good standing finding means that the conservation practice certification has been updated, which fulfills this phase of your WQT program credit generation contract.

If you have any additional questions about your ongoing participation, please contact the SRRW WQT Program Administration Office by telephone (507.379.8782) or Courtney Phillips by email (Courtney.phillips@co.freeborn.mn.us). Thank you again for completing a successful cycle of credit generation. The SRRW WQT program is grateful for the continued opportunity to work with you.

Sincerely,

Courtney Phillips
SRRW WQT Program Administrator

cc: Field Representative Broker
Third-Party Verifier
SRRW WQT Program Administration Office Project Files

Credit Generation Project Site Revoked

IM-6

Establishment of Credit Project Revoked

DATE: _____

TO [Landowner Name]:

FROM: SRRW WQT Program Administration Office
214 West Main Street
Albert Lea, MN 56007

RE: Project Number _____ is Revoked Because of Noncompliance

Dear _____,

This letter provides formal notice that the Shell Rock River Watershed (SRRW) Water Quality Trading (WQT) program Project Number _____ credit certification has been revoked. This status places you in noncompliance with the conditions of the credit purchase legal agreement. Because credit Buyers are fulfilling regulatory requirements by using credit trading, your project site must be certified to have been constructed, have vegetation properly established, and have an appropriate operation and maintenance (O&M) plan on site to comply with all of the agreement's conditions. The WQT Program Administration Office has followed all of the WQT policy requirements of the program to date and is now notifying you that the Buyer of the credits has been notified of the project's noncompliance. This Program Administrator's statement of noncompliance, with copies of all administrative project records documenting this finding, will allow the credit Buyer to take all of the legal actions available under the provisions of the credit purchase agreement to recover their losses.

The SRRW WQT program staff can answer a limited range of questions should any additional questions arise regarding the next steps. This discussion cannot pertain to anything related to the future legal enforcement of the contract. Please contact the SRRW WQT Program Administration Office by telephone (507.379.8782) or Courtney Phillips by email (Courtney.phillips@co.freeborn.mn.us).

Sincerely,

Courtney Phillips
SRRW WQT Program Administrator

cc: Field Representative Broker
Credit Purchaser
Third-Party Verifier
SRRW WQT Program Administration Office Project Files

Credit Generation Project Site Revoked

IM-7

Credit Project Revoked Buyer Notification

DATE: _____

TO [Authorized Representative]:

FROM: SRRW WQT Program Administration Office
214 West Main Street
Albert Lea, MN 56007

RE: Project Number _____ is Revoked Because of Noncompliance

Dear _____,

This letter provides formal notice that the Shell Rock River Watershed (SRRW) Water Quality Trading (WQT) program Project Number _____ credits have been revoked. This project's implementation was not in accordance with your credit purchase legal agreement for _____ credits per year for your National Pollutant Discharge Elimination System (NPDES) permit compliance efforts. With this notification, your organization is encouraged to pursue all of the legal compensations available under the terms of the credit purchase legal agreement. The WQT program is assisting you by providing the attached project administrative records and contact information of the Third-Party Verifiers involved in the project's evaluations. The WQT Program Administration Office staff will assist you as possible regarding advice on next steps and our technical interpretations of the written record's content. If you wish to discuss available options to replace any of these credits, do not hesitate to contact our office.

The SRRW WQT Program Administration Office recognizes the unacceptable nature of this outcome. Our office now lists this credit generator as ineligible on all future project applications. If we can assist you further, please contact the SRRW WQT Program Administration Office by telephone (507.379.8782) or Courtney Phillips by email (Courtney.phillips@co.freeborn.mn.us).

Sincerely,

Courtney Phillips
SRRW WQT Program Administrator

Enclosure (Administrative Project Records)
cc: SRRW WQT Program Administration Office Project Files

Operation and Maintenance Inspection Form

SRRWD
Shell Rock River Watershed District
Working Together to Improve Water Quality

OMI-1

O&M Project Inspection

Date: _____ **Project Number:** _____

Landowner Name:	Area of Field:	Project Location County: Township: Range: Section:
Address:	Conservation Practice(s):	

Third-Party Verifier Name: _____

Attach Photograph(s) for Each Category as Appropriate

Conservation Practice Inspection Checklist	Satisfactory	Unsatisfactory	N/A	Comments/ Actions Required*
Required Record Keeping				
Best Management Practices (BMPs) Required Record Keeping in Place				
Built According to Construction Plans and Specifications (for site establishment only)				
BMPs in Place and Maintained According to Operation and Maintenance (O&M) Plan				
Vegetation Management				
Unwanted Vegetation Managed				
Exposed Ground Evident				
Vegetation Stand Density Adequate				
Erosion				
No Evidence of Soil Erosion Present				

* Add additional pages for comments/actions required if needed.

Additional Comments: _____

Attach Photograph(s) for Each Category as Appropriate

Conservation Practice Inspection Checklist	Satisfactory	Unsatisfactory	N/A	Comments/ Actions Required*
Site Drainage				
No Evidence of Standing Water				
Runoff Pathways Appropriate				
Sedimentation				
Sediment Accumulation Managed				
Energy Dispersion				
Condition of Dispersion Devices				
Condition of Level Spreaders				
Condition of Check Dams/Drop Structures				
Condition of Weirs				
Permanent Structures				
Condition of Dissipaters				
Condition of Inlets/Outlets				
Condition of Terraces/Dikes				
Condition of Spillway/Tiles				
Other				
Miscellaneous				
Conservation Practice Reestablishment Needed?				
Conservation Practice Functioning Properly?				

* Add additional pages for comments/actions required if needed.

Additional Comments: _____

_____

_____

_____

_____

_____

_____

Conservation Practice(s):	
Inspection Date:	
Final Inspection Assessment (Circle One)	
Satisfactory	Unsatisfactory (Restoration Actions Required)

On behalf of the Shell Rock River Watershed (SRRW) Water Quality Trading (WQT) program, I certify that I have inspected the conservation practice area and, to the best of my knowledge, this inspection form and the associated documentation accurately represent the current condition of the conservation project and the contributing area at the time of inspection.

Third-Party Verifier:

_____ _____

(Signature) (Date)

_____

(Printed Name)

Copies of signed forms and photographs provided to the SRRW WQT Program Administration Office and the Landowner. Yes ☐ No ☐

Third-Party Verifier Operation and Maintenance Certification Findings

OM-2

Operation and Maintenance Third-Party Verification

Date: _____ **Project Number:** _____

Shell Rock River Watershed Water Quality Trading Credit Operation and Maintenance Verification and Certification

The Shell Rock River Watershed (SRRW) Water Quality Trading (WQT) program Third-Party Verifier will complete the project inspection and certification review of the credit generating project for proper operation and maintenance (O&M). This review is required for continued credit certification. The certification evaluation includes reviewing the project O&M plan and related operation records (as required) as well as conducting a project site inspection. After the credit generation project has been verified to be performing as required by WQT Program Policies and Protocols, a recommendation for certification will be forwarded to the SRRW WQT Program Administration Office. If the project has O&M deficiencies, the Third-Party Verifier will record these findings concisely in the provided section below and in Inspection Form OMI-1 and will also photograph the conditions.

Conservation Practice Operation and Maintenance Required Records

For each conservation practice that generates credits, list the credit generator's contractual required record keeping and status of record keeping:

_____ ☐ Operation records kept at the frequency required ☐ No (see below)

_____ ☐ Operation records kept at the frequency required ☐ No (see below)

_____ ☐ Operation records kept at the frequency required ☐ No (see below)

_____ ☐ Operation records kept at the frequency required ☐ No (see below)

_____ ☐ Operation records kept at the frequency required ☐ No (see below)

For each operation record found to be deficient as noted in the list above, provide an explanation of the issue and recommendation of the corrective action needed or the contractual breach, if severe:

_____

_____

_____

_____

_____

_____

_____

_____

Credit Generation Site Operation and Maintenance Inspection (Attach Inspection Form OMI-1)

The credit generating conservation practice inspection found the site to be:

- ☐ In full compliance with the WQT legal agreement.
- ☐ In partial compliance with the WQT legal agreement with minor repair required to remain certified for credit generation (see attached Inspection Form OMI-1 for details).
- ☐ In noncompliance with the WQT legal agreement; the site conditions are not certifiable in their current condition. A complete restoration of the conservation practice is required within the WQT program's reasonable restoration window of 120 days to remain eligible for credit generation (see attached Inspection Form OMI-1 for details).

A copy of the signed O&M Inspection Form OMI-1 with appropriate photographs was provided to the credit generator on _____ by certified mail.

On behalf of the SRRW WQT program, I certify that I have inspected and reviewed the required record keeping for the conservation practice and, to the best of my knowledge, this inspection form and the associated documentation accurately represent the current condition of the conservation practice and contributing area at the time of inspection.

Third-Party Verifier:

_____ _____

(Signature) (Date)

_____

(Printed Name)

Submit signed original to the SRRW WQT Program Administration Office and maintain a copy for your records.

Operation and Maintenance Certification Approval Letter

OM-3

O&M Approval

DATE: _____

TO [Landowner Name]:

FROM: SRRW WQT Program Administration Office
214 West Main Street
Albert Lea, MN 56007

RE: Water Quality Trading Program Operation and Maintenance Certification Approval for Project Number _____

Dear _____,

This letter notifies you that the Shell Rock River Watershed (SRRW) Water Quality Trading (WQT) program site inspection regarding proper operation and maintenance (O&M) has been completed and your project was found to be in good standing. The WQT program staff appreciate your participation and continued O&M of the credit generating project. The good standing finding means that the conservation practice certification has been updated, which fulfills this cycle of your WQT program's credit generation contract.

If you have any additional questions about your ongoing participation, please contact the SRRW WQT Program Administration Office by telephone (507.379.8782) or Courtney Phillips by email (Courtney.phillips@co.freeborn.mn.us). Thank you for completing a successful credit generation cycle. The SRRW WQT program is grateful for the opportunity to work with you.

Sincerely,

Courtney Phillips
SRRW WQT Program Administrator

cc: Field Representative Broker
Third-Party Verifier
SRRW WQT Program Administration Office Files

DATE: _____

TO [Landowner Name]:

FROM: SRRW WQT Program Administration Office
214 West Main Street
Albert Lea, MN 56007

RE: Operation and Maintenance Inspection for Project No. _____ Site Deficiency Notice

Dear _____,

The recent project site inspection conducted by _____ as a Third-Party Verifier for the Shell Rock River Watershed (SRRW) Water Quality Trading (WQT) program found the project site to be in noncompliance with the WQT program requirements. A list of the project's deficiencies is attached. As part of the National Pollutant Discharge Elimination System (NPDES) permit requirements, (Insert Buyer Organization Name) _____ is required to have certified credits in good standing as part of its phosphorus-reduction requirement. The credit purchase contract requirements include proper record keeping and operation and maintenance (O&M) of the project site. Because the generated credits are fulfilling regulatory requirements with credit trading, your project must remain in proper operation to be certified according to your credit purchase legal agreement.

Circle One of the Following Two Paragraphs

[Option 1] The SRRW WQT program policy offers you a 120-day window to restore the project to good standing and remain certified. This project restoration window will begin on _____.

[Option 2] The SRRW WQT program inspection of required operation records and project conditions has determined that your project deficiencies are from operational negligence. This finding results in a noncertifiable project status, which places you in violation of the legal purchase agreement's requirements. As such, the credit Buyer is being notified regarding the noncertification and to begin the enforcement actions available to them under the conditions of the legal purchase agreement. If you feel that this inspection finding has been made in error, please contact the SRRW WQT Program Administration Office and notify us that you are completing the attached Form C-1, *Complaint or Request for Appeal*. Our office will allow a 10-business-day grace period to receive Form C-1 before contacting the credit Buyer. After you have completed Form C-1, have your signature notarized and submit the form to our office using the U.S. Postal Service certified mail option or present the form in person. After our office has been served with your complaint or appeal request, the WQT Program Policies and Protocols require that a new Third-Party Verifier be assigned to review your operational

records, site conditions, and WQT program documents to advise our Program Administration Office on how to proceed with the matter. The new Third-Party Verifier who is assigned will not have had any previous experience with you or your project site. After the Third-Party Verifier's findings are submitted back to our office, a consultation with the Purchaser will take place and our office will notify you of the findings and next steps. As recorded by your signature on the credit project's application (Form A-1) and the legally binding credit purchase agreement, you understand that all of the decisions made by the Program Administration Office in this matter will be final.

If you need further assistance or have questions regarding these findings and attached documents, please contact the SRRW WQT Program Administration Office by telephone (507.379.8782) or Courtney Phillips by email (Courtney.phillips@co.freeborn.mn.us). The SRRW District remains hopeful that the conflicts in this matter will be appropriately resolved.

Sincerely,

Courtney Phillips
SRRW WQT Program Administrator

Enclosure (Itemized Explanation of Deficiencies Found in Inspection Forms OMI-1 and OM-2; Photographs; and a Blank Form C-1, *Complaint or Request for Appeal*, if Appropriate)
cc: Field Representative Broker
Third-Party Verifier
SRRW WQT Program Administration Office Project Files

Operation and Maintenance Restoration and Certification Approval

OM-5

O&M Restoration Approval

DATE: _____

TO [Landowner Name]:

FROM: SRRW WQT Program Administration Office
214 West Main Street
Albert Lea, MN 56007

RE: Operation and Maintenance Restoration and Certification Approval for Project No. _____

Dear _____,

This letter notifies you that the Shell Rock River Watershed (SRRW) Water Quality Trading (WQT) program's recent project inspection regarding the restoration and proper operation and maintenance (O&M) of the project has been completed, and your project was found to be in good standing. The WQT program staff appreciate your participation and continued proper O&M of the credit generating project. The good standing finding means that the conservation practice certification has been updated, which fulfills this cycle of your WQT program's credit generation contract.

If you have any additional questions about your ongoing participation, please contact the SRRW WQT Program Administration Office by telephone (507.379.8782) or Courtney Phillips by email (Courtney.phillips@co.freeborn.mn.us). Thank you again for completing a successful credit generation cycle. The SRRW WQT program is grateful for the continued opportunity to work with you.

Sincerely,

Courtney Phillips
SRRW WQT Program Administrator

cc: Field Representative Broker
Third-Party Verifier
SRRW WQT Program Administration Office Project Files

Operation and Maintenance Credit Generation Project Site Revoked

OM-6

O&M Credit Project Revoked

DATE: _____

TO [Landowner Name]:

FROM: SRRW WQT Program Administration Office
214 West Main Street
Albert Lea, MN 56007

RE: Project Number _____ Revoked Because of Noncompliance

Dear _____,

This letter provides formal notice that the Shell Rock River Watershed (SRRW) Water Quality Trading (WQT) program Project Number _____ credit certification has been revoked. This status places you in noncompliance with the WQT Program Policies and Protocols and associated credit purchase legal agreement. Because credit Buyers are fulfilling regulatory requirements by using credit trading, your project certification impacts (Insert Buyer Organization) _____ compliance with its National Pollutant Discharge Elimination System (NPDES) permit. Now that you have been provided with all of the required WQT program opportunities to restore your project site, the Program Administration Office is notifying you and (Insert Buyer Organization) _____ of your revoked credits and project. The project's administrative records are also being forwarded to the credit Purchaser with the recommendation that all legal actions available under the credit purchase agreement be enforced to compensate the Buyer for this failure to comply.

The SRRW WQT program staff can answer a limited range of questions should any arise regarding the next steps. This discussion cannot pertain to anything related to the future legal enforcement actions regarding the legal agreement. Please contact the SRRW WQT Program Administration Office by telephone (507.379.8782) or Courtney Phillips by email (Courtney.phillips@co.freeborn.mn.us).

Sincerely,

Courtney Phillips
SRRW WQT Program Administrator

cc: Field Representative Broker
Credit Purchaser
Third-Party Verifier
SRRW WQT Program Administration Office Project Files

Operation and Maintenance Credit Generation Project Site Revoked

OM-7

O&M Credit Generation Project Site Revoked Buyer Notification

DATE: _____

TO [Authorized Representative]:

FROM: SRRW WQT Program Administration Office
214 West Main Street
Albert Lea, MN 56007

RE: Project Number _____ Revoked Because of Noncompliance

Dear _____,

This letter provides formal notice that the Shell Rock River Watershed (SRRW) Water Quality Trading (WQT) program Project Number _____ credits have been revoked. This project generated _____credits per year for your National Pollutant Discharge Elimination System (NPDES) permit compliance efforts. With this notification and the attached copies of the project's administrative records, your organization is encouraged to pursue all of the legal compensations available under the terms of the credit purchase legal agreement. The WQT program will assist you by providing our technical expertise regarding the historical administration records and providing the contact information for previous Third-Party Verifiers who conducted project inspections. The WQT Program Administration Office staff will also assist you as much as possible regarding replacement of credits or the next steps to remain in compliance with your permit requirements.

The SRRW WQT Program Administration Office recognizes the unacceptable nature of this outcome. Our office now lists this credit generator as ineligible on all future project applications. If we can assist you further regarding the next steps or replacing credits, please contact the SRRW WQT Program Administration Office by telephone (507.379.8782) or Courtney Phillips by email (Courtney.phillips@co.freeborn.mn.us).

Sincerely,

Courtney Phillips
SRRW WQT Program Administrator

cc: SRRW WQT Program Administration Office Project Files