RED RIVER BASIN COMMISSION

Water Quality Strategic Plan

For the Red River Basin

PROGRESS REPORT TO THE

MINNESOTA LEGISLATURE

February 2016

Red River Basin Commission
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Table of Contents

Red River Basin
Water Quality Strategic Plan (WQSP)

Introduction

The 2015 Minnesota Legislature appropriated $200,000 to the Minnesota Pollution Control Agency (MPCA) for the Red River Basin Commission (RRBC) to develop a strategic plan of action. This plan of action will address water quality issues in the Red River Basin that include consistency in water quality goals and objectives for the Red River of the North (RRN) and nutrient reduction allocations for both point and nonpoint sources on the Red River of the North and individual major watershed tributaries to the RRN and report progress and outcomes. The RRBC did not receive funding directly from either North Dakota or Manitoba but have commitments for participation in this initiative. The RRBC received a Community Innovations Grant from the Bush Foundation for nutrient reduction work that can be used in North Dakota and the RRBC and International Joint Commission (IJC) -International Red River Board (IRRB) have applied for funding assistance from US and Canadian IJC to help with this nutrient reduction effort.

The RRBC has completed a similar type project focused on developing a basin flood damage reduction strategy. The Long Term Flood Solutions (LTFS) project was funded jointly by the States of Minnesota and North Dakota. It was completed in September 2011 and set out the framework for addressing the identified flooding issues across the basin. This effort included citizen input forums held throughout the basin that resulted in a basin plan that included 63 recommendations, many of which either are in the process of being implemented or are already completed.

One major part of that plan established a basin goal of reducing the 100 year flood flow in the Red River by 20% mainly through the construction of distributed storage, off-channel flood impoundments. Each subwatershed was assigned a storage goal that would become their contribution to the overall basin flood reduction effort. We will utilize similar efforts on this project to develop local as well as Basinwide nutrient reduction goals. We will summarize existing information on current sources of nutrients within the basin and develop nutrient reduction goals by subwatershed as well as by source type. All nutrient sources, point as well as nonpoint, will be included. A suite of nutrient reduction strategies and actions will be developed that can be utilized by the groups responsible for nutrient reduction implimentation work. Attached in Appendix A is the detailed workplan that was developed with MPCA and a budget spreadsheet for the expected expenditures of the Minnesota Legislature allocation.

There currently are numerous nutrient reduction activities occurring in each of the three jurisdictions. We will work with all of these activities to bring together a Basinwide vision on nutrient reduction approaches we want to use to move forward. The next section of this progress report will identify work anticipated and in some cases work already completed by others that will be incorporated into this overall basin effort.

Progress on Tasks

Objective 1. Organize Steering Committee/Summarize Existing Information

Task 1A. Steering Committee:

The existing RRBC Water Quality Committee will be expanded and utilized as the Steering Team to lead this project. The existing committee includes federal representation from USEPA-Denver, US Army COE- St. Paul, USGS, USDA-NRCS, Environment Canada and Agri-Food Canada. It includes State and Provincial representation from ND Department of Health, MPCA, MN Department Agriculture, and Manitoba Water Conservation and Water Stewardship. We will be adding representation from ND Department of Agriculture. In addition to broaden this Steering Committee to represent all the different nutrient source groups we will add representation from major point source dischargers within the basin. We have already had discussions with the City of Moorhead and they have agreed to participate on our Steering Team. We have meetings scheduled with the Cities of Fargo, Grand Forks and Winnipeg to request their participation on our Steering Team as well. American Crystal Sugar will be invited to participate as a representative of a major industrial point source discharger. Discussions with the Steering Team will take place regarding what other sectors should be represented. We are very interested in increasing the involvement of the Agricultural sector in this project. As part of Task 3C, we will be working directly with several Agricultural groups on the Ag Input Forums but will also consider agricultural groups participation on the Steering Team.

The Steering Team will review what groups are going to be responsible for the implementation of the strategies and actions that are agreed to through this process and to ensure that these groups are represented on the Steering Team as well. The Minnesota Board of Soil and Water Resources may be added to the Steering Team because of their role in implementing water quality improvements in Minnesota. The Steering Team will meet monthly beginning in June 2016 through the duration of the project. The Steering Team will be a large diverse group but the RRBC is built on broad representation and have found that while this does become cumbersome at times, it is critical to build the buy in that is required down the road during the implementation of the strategies we develop.

Task 1B. Existing Nutrient Sources

There has been a large amount of data and information generated from multiple sources including international, federal, state/provincial and local initiatives. Some of this information is from monitoring data gathered for many different purposes and some is from water quality modeling work completed by many different entities. There are data generated from point source dischargers as well as ambient monitoring that has been completed, some with long periods of record.

As part of this project, we will gather historic nutrient information from all the Steering Team members as well as other sources of information that the Steering Team knows about. The US Geological Survey (USGS) and Environment Canada have produced much of the historic water quality data. Several detailed publications have been completed by USGS on water quality and nutrient trends within the Red River basin including a large initiative in 1992-1995 by USGS as part of their National Water Quality Assessment Program. The trend information is critical to documenting what changes in nutrient loads and concentration have occurred in the recent past.

Currently, USGS Grand Forks Office is leading the development and coordination or a water quantity and quality monitoring location and data base effort within the Red River basin. This initiative is being led by Rochelle Nustad of the USGS. This effort gives us a good view of the extent of monitoring that is currently being completed and where we might have either excess sampling or too limited of sampling in any given location throughout the basin. The reporting network that Ms. Nustad put together has a mapping system that identifies known sampling locations where you can click on a location and call up detailed information on what sampling is occurring at that site by who and over what period of record. This new system was built with information being generated from all three jurisdictions and is intended to be all inclusive of sampling being completed in the Red River Basin.

The subwatersheds on the Minnesota side of the basin are all either done with, or are underway with, Watershed Restoration and Assessment Program (WRAPs) work. These WRAPs are giving us information on what lakes and watercourses are impaired and what improvement activities can be done to correct the impairment. The WRAPs that have been completed will identify that local improvement as well as down to the outlet of the subwatershed. The current WRAPs in the Red River basin have not factored in the Basinwide nutrient reduction goals that are currently being discussed and will be implemented as part of this effort. The interim basin nutrient reduction goals that are included in the Red River basin WRAPs called for a 10% reduction in phosphorus from 2003 levels and a 13% reduction in nitrogen levels from 2003 conditions. It has been widely discussed that these were interim reductions and that larger reductions were going to be asked for following completion of this effort. The current reduction goal being discussed for phosphorus on a Basinwide scale will include the need to be large enough to result in a 50% reduction in “in-lake” phosphorus concentrations in the South basin of Lake Winnipeg. A phosphorus reduction goal at the US/Canadian border and at each subwatershed to the Red River will be developed as part of this process. Targets being discussed for the border for the Red River include a 50% reduction in phosphorus concentrations and a 10% reduction in average annual flow to meet this in-lake concentration. This goal for Lake Winnipeg would return the lake to the phosphorus levels that typically existed in the 1990’s. From the 1800’s to around 1900 the in-lake phosphorus concentration was 0.02 mg/l. From 1900 to 1990 the phosphorus concentration increased to 0.05 mg/l. From the early 1990’s till now, we have seen the in-lake phosphorus concentration in Lake Winnipeg double from 0.05 mg/l to 0.10 mg/l.

Several large water quality modeling efforts have been completed for the Red River basin as well as for subwatersheds that are tributaries to the Red River. IJC and USGS have just completed a very detailed SPARROW model for the basin. This was a three year effort utilizing long-term sampling information to calibrate this Spatially Referenced Regression on Watershed Attributes model to give us a tool that can be used on a large scale to identify source contributions across a watershed scale. IJC-IRRB is currently finalizing work completed by RESPEC who developed a Stressor-Response model for the Red River that identifies under what nutrient levels we start seeing impacts on the aquatic ecosystem. This information will also be extremely useful for this project.

Task 1C. Existing Reduction Actions

This task is to identify and accumulate existing practices or actions being undertaken by the three jurisdictions (Minnesota, North Dakota and Manitoba) that contribute to nutrient reduction either in individual jurisdictions or basinwide. Some of this task was completed by IRRB in a document they produced April 2012. We will update and expand on that effort. Examples of specific actions we will include are nutrient reduction options for different types of wastewater treatment facilities, individual onsite wastewater regulations, water quality standards by jurisdictions, nonpoint runoff regulations, livestock runoff regulations, drainage regulations, flood damage reduction/distributed storage practices, and agricultural practices that reduce nutrient runoff. There is

a lot of effort that is currently going into identifying the “tools in the tool box” that can be used by agricultural producers to limit the amount of nutrients they have leaving agricultural land.

Objective 2. Nutrient Reduction Load Allocation

Task 2A. Load Allocation

This task will develop and recommend adoption of nutrient load allocations and water quality targets for nutrients for the Red River at its discharge to Lake Winnipeg, at the International border and at the discharge of subwatersheds that are tributaries to the Red River. These subwatersheds will mostly be based on the Hydrologic Unit Code 8 (HUC 8) watersheds. The recommended nutrient load allocations and water quality targets should at a minimum, be protective of Lake Winnipeg but may be more restrictive at specific locations to protect local water quality issues of the individual jurisdictions.

The water quality targets for Lake Winnipeg are being developed by the Province of Manitoba. Once these targets are completed they will be factored into the development of the overall Basinwide nutrient reductions goals. The SPARROW modeling work of IJC as well as the Stressor-Response and nutrient target development methodology being completed by IRRB will all be used to help build the overall goals. The nutrient reductions by subwatersheds will mostly be completed by the 3 jurisdictions. Minnesota is currently using the WRAPs process to determine these subwatershed reduction strategies. North Dakota is working on the specific methodology they will use to address this nutrient reduction need. Manitoba has some regulatory practices they have adopted in their 2015 Surface Water Management Plan but will need to address techniques that will be used to reduce nutrient exports from agricultural land.

This task will include the development of a nutrient reduction goal by use type also. Each subwatershed overall reduction target will be broken down to identify what reductions will be made by each use type to meet the overall goal. Discussions will include what reduction goals are possible for point sources such as wastewater treatment facilities as well as what reduction will be able to be generated by agricultural nutrient reduction activities that individual landowners can implement on their agricultural land. All significant sources of nutrients will be addressed in this process.

The load allocation recommendations completed under this collaborative process will be given to each of the three jurisdictions for their consideration and implementation. This same process was used in the LTFS and has led to progress towards the 20% flow reduction goal by almost all Water Resource Districts/Watershed Districts throughout the basin.

Objective 3. Implementation Strategy

Task 3A. New Reduction Actions

This task will develop new techniques that could be tested for addressing point and nonpoint source nutrient reduction. The new techniques will be developed from the Steering Team and from the information gathered at the Agricultural outreach meetings that will be discussed in greater detail below. We believe that the success of our nutrient reduction strategy will depend on us finding new creative ways to address this nutrient issue. Current practices have struggled to address nutrient runoff especially from watersheds that are intensively farmed.

One approach that is being promoted within the Red River basin is the use of distributed constructed flood water storage structures. Through the LTFS and subsequent work, individual Watershed organizations on both the North Dakota and Minnesota parts of the basin have completed detailed LIDAR based modeling efforts to identify enough storage sites to meet the 20% flow reduction goal. Approximately 200 sites have been identified that if built, they would provide significant local flood damage reduction to roads, rural infrastructure and agricultural lands. A significant portion of our annual nutrient load comes during spring snowmelt flood events as well during large summer rainfall events. If we could construct these distributed storage sites where they would do the most good for reducing this overland flooding issue we will significantly reduce our nutrient runoff from these agricultural watersheds. These distributed storage sites can also provide significant nutrient capture if designed and operated to do so. Most of the sites are being constructed with gated outlet structures that can allow for various operations that can also maximize water quality benefits.

The North Ottawa flood control impoundment constructed in the Bois de Sioux Watershed District is currently being used for multiple purposes including natural resource enhancement and water quality improvement. This site and work being completed with funding from the Minnesota Environment and Natural Resource Trust Fund through the LCCMR is discussed in greater detail later in this report. The “new” technique that we are testing is to utilize part of this impoundment as a nonpoint nutrient capture and treatment system for agricultural nonpoint runoff from the watershed above the impoundment. The North Ottawa impoundment has multiple pools within the overall impoundment. We are currently using two of the pools to provide a “two cell treatment system” where we use the first pool to hold water and settle out as much of the nutrients tied to sediment particles and then discharge to the second pool where we are growing and harvesting cattail biomass to remove dissolved nutrients that get taken up in the cattail plants.

This work will provide valuable information on how we site, build and operate future impoundments to maximize their use for multiple purposes. We have learned already that if we construct these impoundments too far up in the watershed then they will not provide as much water quality benefit mostly because the water quality is typically better in the upper reaches and there is less nutrients and sediment being exported that could be captured by the impoundments.

Task 3B. Priority Areas

This task will develop techniques we can use to identify the high priority areas for implementing nutrient reduction within the basin. This task will focus mainly on nonpoint source reductions. One tool developed by the International Water Institute (IWI) is called PTMApp. This is a LIDAR based prioritization, target, and measure, application that helps identify down to an individual field scale where the highest nutrient exports are occurring within a watershed and also gives you the ability to monitor and estimate benefits that would occur on a watershed scale from practices that are placed on the ground. This tool is being used in many of the watersheds in both Minnesota and North Dakota’s parts of the basin. The work needed to most effectively use this tool is to have a good hydrologically conditioned LIDAR system. This conditioning work is completed for some but not all of the subwatersheds. We will work with IWI to identify the highest priority watersheds based on nonpoint loads and then to develop PTMapp for those priority watersheds. Manitoba is currently developing the LIDAR work that is needed for this tool to be used on the Manitoba side of the basin.

Task 3C. Agricultural Forums

This task will include holding a series of public input meetings across the basin with agricultural sector interests. We have partnered with the State and Provincial Agriculture Departments from Minnesota, North

Dakota and Manitoba in hosting these. We have also partnered with the Minnesota Ag Water Resource Center and Minnesota Farm Bureau on holding 3 of these meetings this summer on the Minnesota side of the basin. We have had some preliminary discussions with Keystone Agriculture a similar Ag commodity organization in Manitoba and will meet with North Dakota Ag Coalition as well. We are developing strategies to reach out to the agricultural sector to identify and implement voluntary nutrient reduction practices that will meet our nutrient reduction goals we develop. Agriculture is by far our biggest landuse in the Red River basin and is critical to the basin. Agriculture is a significant source of nutrients for our basin because of their percentage of the land use. We will partner with Agricultural landowners to develop voluntary practices that will work for them and will reduce the amount of nutrients being exported from our watershed. We feel Agriculture understands this and is interested in working towards water quality improvements.

We have completed two of these Ag Input Sessions on the North Dakota side of the basin. We have three scheduled in June in Minnesota at meetings hosted by Minnesota Farm Bureau and Minnesota Ag Water Resource Center. We will be scheduling additional meetings in Minnesota and North Dakota as well as hosting some in Manitoba. From these sessions, we will frame the current water quality issues in the basin and identify what land practices farmers are currently doing that are beneficial to nutrient reduction and to identify what else should be done to reduce our nonpoint nutrient runoff even further. The early work on these Ag Input Sessions was funded under a grant from the Bush Foundation Community Innovations Program that funds improvement projects in Minnesota and the Dakotas.

Objective 4. Indicators/Reporting

Task 4A. Develop Indicators and Reporting

A set of indicators of water quality improvement for Lake Winnipeg is currently being developed through an effort led by Environment Canada and Manitoba Water Conservation and Stewardship. Environment Canada maintains the International monitoring station at Emerson Manitoba that is used for measuring whether the Red River is meeting the current water quality targets and goals of the Boundary Waters Treaty between Canada and US. There currently are no nutrient targets that are part of the Boundary Waters Treaty but much discussion has occurred through the State Departments of the two countries and the IJC on this issue. We will work with IJC-IRRB on the development of voluntary goals for nutrients at the border as part of this effort. We will continue to work with the USGS on the monitoring activities that they are leading including the compiling of all data from monitoring activities throughout the basin.

This task will develop a progress report framework, to prepare an annual “State of Water Quality in the Red River Basin”. This task will set short term and long term goals and targets throughout the basin. This annual summary will be used to track progress on meeting water quality goals. This task will be coordinated by the RRBC but much of the work will be completed by others in the basin as part of their ongoing water quality work. The RRBC must report progress on this initiative to the Minnesota House of Representatives and Senate Committees and Divisions with jurisdictions over environmental policy and finance by February 15 in 2016 and 2017 and submit the completed plan by December 31, 2017. This first report is being submitted to meet the requirements of the 2015 legislation. This report has been delayed in being submitted.

BACKGROUND: RED RIVER BASIN COMMISSION (RRBC)

The RRBC was formed in 2002 to address land and water issues in a basin-wide context. The RRBC was formed as a result of a merger between the Red River Basin Board, the International Coalition, and the Red River Water Resources Council. The RRBC is a chartered, not-for-profit corporation in the United States operating in Minnesota, North Dakota and South Dakota and a charity in Canada operating in Manitoba. RRBC has offices in Fargo, North Dakota and Winnipeg, Manitoba, and is dedicated to innovation in the management of the Red River Basin's water resources.

The RRBC has a 41-member Board of Directors. These directors represent: local governments such as cities, counties, municipalities, watershed districts, and water resource districts; First Nations; environmental groups; and at-large citizen members. The Governors of Minnesota, North Dakota, and South Dakota and the Premier of Manitoba also appoint members to the Board. In Minnesota, the Governor's appointments are: Department of Natural Resources Commissioner Tom Landwehr, Minnesota Pollution Control Agency Commissioner John Stine, and Minnesota Board of Water and Soil Resources Executive Director John Jaschke. RRBC is currently in the process of adding the Commissioners of Agriculture from Minnesota, North Dakota and Manitoba to our board.

The RRBC has adopted a vision, a mission statement and a set of Guiding Principles, based on input provided by basin residents, to guide its activities. These basic documents provide the foundation to develop reasonably specific goals and objectives for water management in the basin. These goals and objectives, along with the mission statement and the Guiding Principles, provide a framework for the Board.

RRBC Board of Directors 2016

FIRST NAME	LAST NAME	RRBC STATE/PROV	RRBC REPRESENTATIVE
Bud	Oliver	MB	City of Selkirk
Steven	Topping	MB	Provincial
Herm	Martens	MB	At-Large
Laurie	Hunt	MB	Municipalities
Hank	Enns	MB	Municipalities
Nicole	Armstrong	MB	Provincial
Gordon	Martel	MB	Water Cooperative
Gavin	van der Linde	MB	Municipalities
Hon. Ron	Kostyshyn	MB	Provincial
Randy	Woroniuk	MB	Municipalities
Jennifer	David	MB	Environmental
Stephanie	Miranowski	MN	Counties
Gary	Kiesow	MN	Counties
John	Finney	MN	Watersheds
Jon	Evert	MN	At Large
Curt	Johannsen	MN	Cities
John	Jaschke	MN	State
John Linc	Stine	MN	State
Tom	Landwehr	MN	State
Dan	Wilkens	MN	Watersheds
Dave	Frederickson	MN	State
Del Rae	Williams	MN	Cities
Mike	Williams	ND	Cities
Ben	Varnson	ND	Water Resource Districts
Hetty	Walker	ND	Counties
Dan	Jacobson	ND	Water Resource District

Terry	Steinwand	ND	State
Doug	Goehring	ND	State
Jake	Gust	ND	At-Large
Allen	Grasser	ND	Cities
Todd	Sando	ND	State
Bob	Werkhoven	ND	Cities
Dave	Glatt	ND	State
Mary	Scherling	ND	Counties
Roger	Smith	ND	Environmental

**Each Director has an alternate. For the full list of Directors and their Alternates, please visit www.redrivebasincommission.org*

RRBC Vision and Mission

Vision: A Red River Basin where residents, organizations and governments work together to achieve basin-wide commitment to comprehensive integrated watershed stewardship and management.

Mission: To develop Red River Basin integrated natural resources framework plan; to achieve commitment to implement the framework plan; and to work toward a unified voice for the Red River Basin.

For more information, contact:

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Upon request, this material will be made available in an alternative format such as large print

ATTACHMENT A
RED RIVER BASIN COMMISSION FY16-18
Water Quality Strategic Plan Work Plan

Project Background

Minnesota Legislative General Fund funding ($200,000) to the Red River Basin Commission to complete a water quality strategic plan for the Red River of the North. The legislation states that "the plan must include but is not limited to, consistency in water quality goals and objectives for the Red River of the North and pollution reduction allocations for both point source and nonpoint sources on the Red River and for major watersheds tributary to the Red River". This project will develop a nutrient reduction strategy for the Red River basin that will include reduction goals by subwatersheds and actions to implement the strategy addressing all sources of nutrients in the basin. These reduction goals will be adopted to meet State/Province goals for specific reaches as well as the basinwide overall goal for nutrient reduction for the Red River at its outlet Lake Winnipeg, to meet the water quality improvement goals for Lake Winnipeg.

Project start date: ***May 15, 2016 (or as soon as documents are signed)***
Project end date: ***June 30, 2018***

Proposed Work Summary

Excess nutrient levels in lakes and streams have been identified as a major water quality problem within the Red River basin. Each of the three water quality jurisdictions in the Red River basin, Minnesota, Manitoba and North Dakota either have or are in the process of completing nutrient reduction strategies within their jurisdictions. The Minnesota Nutrient Reduction Strategy was completed in September 2014. At that time the proposed nutrient standards for streams had not been completed and the Red River basin water quality goals had not been finalized. In 2011, Manitoba committed to a 50 per cent reduction in phosphorus concentrations in the South Basin of Lake Winnipeg. Work is underway to develop specific targets for the lake and its tributaries including the Red River. Manitoba also adopted its Surface Water Protection Strategy in September 2015. That document established new targets for point source nutrient reduction as well as specific actions for nonpoint source nutrient reduction work within the Province of Manitoba. North Dakota is currently completing their nutrient reduction strategy. The North Dakota plan will address point and nonpoint nutrient reduction goals. They are implementing this new strategy by major basins with the Red River basin proceeding first.

The Red River Basin Commission currently has a Water Quality committee that will be used to advance this basinwide nutrient reduction initiative. This committee is currently made up of representatives from Federal, and State/Provincial water organizations from both the US and Canada including: USEPA, US Army COE, USGS, USDA-NRCS, Environment Canada, Agri-Food Canada, ND Health, Manitoba Conservation and Water Stewardship, MPCA and MN Dept. Agriculture. The existing committee is chaired by Mike Ell ND, Nicole Armstrong MB, and Jim Ziegler MN. This existing water quality committee will be expanded to include additional interests including municipal and industrial point source dischargers and additional agricultural sector representation.

This project will be led by the RRBC Water Quality Committee and facilitated by RRBC staff. This initiative will incorporate current ongoing efforts on a number of different fronts including ongoing efforts of the International Joint Commission (IJC) – International Red River Board (IRRB). Much of the detailed water quality modeling work required to advance this basinwide nutrient reduction strategy is currently underway by projects advancing under the guidance of IRRB. There is also currently nutrient reduction work progressing in each of the three jurisdictions including the WRAPs progressing on the Minnesota subwatersheds. The RRBC will closely coordinate with all these efforts as we move forward with a basinwide strategy. The RRBC will develop consistent reduction strategies across all jurisdictions that will meet the basinwide goals. The RRBC will utilize a public input process to develop nonpoint source nutrient reduction actions that can be implemented by basin landowners. In September 2011 RRBC completed a Long Term Flood Solutions Plan (LTFS) for the basin that resulted in flood damage reduction strategies being adopted basinwide. We intend to use a similar process to develop our water quality plan. The LTFS allocated flood reduction targets by subwatersheds and set goals for the construction of distributed storage sites within each subwatershed. The current water quality initiative will result in targets by subwatershed for nutrient reduction to meet individual jurisdictions and our overall basin water quality goals.

RRBC staff who will be assigned to work on this grant include: Jeff Lewis Executive Director, Julie Goehring South Basin Manager, Aaron Ostlund Project Coordinator, Leah Thvedt Outreach Coordinator, and Jacque Radke Financial Administrative Assistant. At this time we do not anticipate utilizing any consultants or subcontractors.

Detailed Work Description

Objective 1. Organize Committee/Summarize Existing Info

Task 1A. Steering Committee

The existing RRBC Water Quality Committee will be utilized and expanded to lead this initiative. The existing committee includes representation from USEPA-Denver, US Army COE-St.Paul, USGS, USDA-NRCS, Environment Canada, Agri-Food Canada, ND Health, Manitoba Conservation and Water Stewardship, MPCA, MN Dept. of Agriculture. We will be adding ND Dept. of Agriculture, as well as point source representation from municipalities of Moorhead, Fargo, Grand Forks and Winnipeg and American Crystal Sugar, an industrial waste water discharger. We will also discuss adding MN BWSR because of their role in implementing water quality programs on the Minnesota side of the basin. The Steering Committee will meet monthly beginning in June 2016. The role of the Steering Committee is to lead the initiative. RRBC staff that will be involved in this task will mainly be Jeff Lewis, Julie Goehring and Leah Thvedt with some limited work by Aaron Ostlund, and Jacque Radke.

Task 1B. Existing Sources

There has been a large amount of data and information generated from multiple sources including international, federal state/provincial and local initiatives. Some of this information is from monitoring data gathered within the basin and some is from water quality modeling work. There are data generated from point source dischargers as well as ambient monitoring work throughout the basin. There is watershed assessment work that has been completed by MPCA as part of the WRAPs process that may help. We will include historic trend data developed by USGS and Environment Canada and others within the basin that will help us identify trends and the need for nutrient reduction. This summary will help determine nutrient load reduction allocations by watersheds and source types. This task will result in a summary document of water quality data between the three jurisdictions. RRBC staff who will principally be involved in this task is Aaron Ostlund, Julie Goehring and Leah Thvedt with limited involvement from Jeff Lewis and Jacque Radke. This task will be completed by October 2016.

Task 1C. Existing Nutrient Reduction Actions

This task is to identify existing actions or activities currently being undertaken by the three jurisdictions that contribute to nutrient reduction either in individual jurisdictions or basinwide. Some of this task was completed by IRRB in a document they produced April 2012. This task will update and expand that work. Examples of specific actions that will be included are nutrient reduction work at wastewater treatment facilities, individual onsite wastewater regulations, water quality standards, nonpoint regulations, livestock runoff regulations, drainage regulations, flood damage reduction/distributed storage work, and agricultural practices that reduce nutrient runoff. This task will result in a summary of existing tools currently being used within the basin. RRBC staff will principally be Julie Goehring and Leah Thvedt with limited assistance from Aaron Ostlund and Jeff Lewis. This task will be completed by December 2016.

Objective 2. Load Reduction Allocation

Task 2A. Load Reduction Allocation

This task will develop and recommend adoption of nutrient load allocations and water quality targets for nutrients for the Red River at its discharge to Lake Winnipeg, at the International border and at the discharge of subwatersheds of the Red River. It is recognized that Lake Winnipeg is the receiving surface water body for the Red River. The recommended nutrient load allocations and water quality targets should, at a minimum, be protective of Lake Winnipeg but may be more restrictive at specific locations to protect local water quality of the individual jurisdictions. The water quality nutrient objectives for Lake Winnipeg are being developed by the Province of Manitoba. IJC and USGS have recently completed a new updated water quality model for the Red River basin using the USGS SPARROW model. This model does provide estimates of loads by different sectors as well as by different reaches within the Red River basin. Nutrient targets for the Red River itself including at the International border are currently being developed by IRRB.

IJC through an International Watershed Initiative project has contracted with RESPEC Consulting Services to develop approaches to setting nutrient targets for the Red River. This report was completed March 2013. In the fall of 2014 RESPEC was retained on a second contract to develop a stressor-response model for the Red River. RESPEC is finalizing work based on algae sampling completed during July 2015. This work will be used to develop targets for nutrient levels along the whole length of the Red River from Breckenridge to Lake Winnipeg. With tools such as the SPARROW model, and through this project, RRBC will help jurisdictions to distribute load allocations by subwatersheds. Nutrient reduction goals for each subwatersheds will be developed similar to the storage goal allocations that were completed in the LTFS project.

This task will include discussions with point source dischargers, about their contribution to the overall Red River basin load of nutrients, a potential framework for consistent standards for the basin, reduction targets for major point source contributors and timetables for implementation of reduction targets. This discussion will result in a recommendation to the individual jurisdictions. Jeff Lewis will lead this task for the RRBC with assistance from the rest of the RRBC staff. This task will be completed by June 2017.

Objective 3. Implementation Strategy

Task 3A. New Reduction Actions

This task will develop new techniques that could be tested for addressing both point and nonpoint source nutrient reduction. This list of new and/or innovative techniques will be developed from the Steering Committee and from the Agricultural outreach meetings. One approach that is being promoted within the Red River basin is the use of distributed constructed flood water storage structures. The LTFS work has identified approximately 200 storage sites that could be constructed to meet the flood reduction goals of the basin. These same structures can be built to provide water quality benefits as well. RRBC and partners are documenting nutrient capture benefits at the North Ottawa flood storage impoundment in the Bois de Sioux Watershed District. This work will provide valuable information on how the basin can maximize water quality improvements with the proposed and current flood control structures that are being built to meet the flood damage reduction goals. This task will be completed by the Steering Committee with assistance from the RRBC staff. This task will be completed by October 2017.

Task 3B. Priority Areas

This task will develop techniques we can use to identify the high priority areas for implementing nutrient reduction within the basin. This task will focus mostly on nonpoint sources. A tool developed by the International Water Institute called PTMApp, that is LIDAR based, is starting to be used by both North Dakota and Minnesota to prioritize, target and measure areas within watersheds that generate higher nutrient export levels than elsewhere in the watershed. This tool can be used to help us generate which small scale areas to work on first within each subwatershed. Currently the work needed to use this tool has been completed for some of the subwatersheds. We will work with the International Water Institute to use already developed water quality modeling information to identify several subwatersheds that are contributing the largest loads of nutrients. We will then use the PTMApp to narrow down to the individual field level scale on where practices should be applied to provide the greatest nutrient load reductions. Manitoba is currently developing the LIDAR work that is needed for this tool to be used on the Manitoba side of the basin. This task will be completed by October 2017.

Task 3C. Agricultural Forums

This task will include holding a series of input meetings across the basin with agricultural sector interests. We have partnered with the Departments of Agriculture in North Dakota and Minnesota as well as had discussions with Manitoba Agriculture, Food and Rural Development on this effort. We have also partnered with the Minnesota Ag Water Resource Center, North Dakota Ag Coalition and Keystone Ag Manitoba who are all agricultural grower group organizations, that are interested in working with us on identifying voluntary nutrient reduction activities that landowners can implement to continue the nutrient reduction work that will be required of the agricultural sector in the basin. Agriculture is by far the largest landuse and source of nutrients in the basin. We feel agriculture understands this and is interested in working towards water quality improvements.

We have completed two Ag Input sessions already on the North Dakota side. We have three scheduled in June with MN Farm Bureau and AG Water Resource Center on the Minnesota side of the basin. We will be scheduling sessions in Manitoba plus additional sessions in Minnesota and North Dakota for this summer and late fall. From these sessions we will frame the current water quality issues in the basin and get input on voluntary nutrient reduction efforts landowners are currently doing or are willing to do. This early work on the Ag Input Sessions was funded under a grant from the Bush Foundation Community Innovations Program. This task will be completed by April 2017. All RRBC staff will be working on this task with Jacque Radke having limited work on this task.

Objective 4. Indicators/Reporting

Task 4A. Develop Indicators and Reporting

A set of indicators of water quality improvement for Lake Winnipeg is currently being developed through an effort led by Environment Canada and Manitoba Water Conservation and Stewardship. Environment Canada maintains the monitoring station at the Canadian border that is used for measuring whether the Red River is meeting the current water quality targets and goals of the Boundary Waters Treaty. The IRRB Water Quality Committee is working on a combined network of monitoring activities currently being done within the basin. This task will develop a progress report framework to prepare a "State of the Red River" annual report that can be used to document water quality within the basin on an annual basis. This task will also set short-term goals and targets as well as long term goals and targets for the basin and report on progress towards meeting those short and long term goals. This task will be coordinated by the RRBC but much of the work will be completed by others as part of their ongoing water quality work in the basin. The RRBC must report progress on the plan to the House of Representatives and Senate committees and divisions with jurisdiction over environmental policy and finance by February 15 in 2016 and 2017 and must submit the completed plan by December 31, 2017.

ATTACHMENT A
RED RIVER BASIN COMMISSION FY16-18
Water Quality Strategic Plan Project Budget

Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

Attachment A
Project Budget
Doc Type: Contract

Project title: Red River Basin Commission Water Quality Strategic Plan
CR#
SWIFT ID#

	1. Personnel					2. Printing/Meeting Expenses/Supplies	3. Travel	Totals
Project Budget	Executive Director	US Basin Manager	Project Coordinator	Outreach Coordinator	Financial Admin Assistant		Mileage (IRS Rate)	
$ Rate per Hour/Unit	$62.00	$52.00	$34.00	$33.00	$21.00		$0.540	
Objective;. 1 - Organize Committee / Summarize Existing Info								
Total hours/mile	60	200	300	250	100		4,630	
Total $	**$3,720.00**	**$10,400.00**	**$10,200.00**	**$8,250.00**	**$2,100.00**	**$5,000.00**	**$2,500.20**	**$42,170.20**
Objective 2 - Nutrient Load Allocation								
Total hours/miles	200	200	300	216	100		18,520	
Total $	**$12,400.00**	**$10,400.00**	**$10,200.00**	**$7,128.00**	**$2,100.00**	**$5,000.00**	**$10,000.80**	**$57,228.80**
Objective 3 - Implementation Strategy								
Total hours/miles	156	169	280	250	100		9,260	
Total $	**$9,672.00**	**$8,788.00**	**$9,520.00**	**$8,250.00**	**$2,100.00**	**$5,000.00**	**$5,000.40**	**$48,330.40**
Objective 4 - Indicators / Reporting								
Total hours/miles	100	200	300	250	462		4,630	
Total $	**$6,200.00**	**$10,400.00**	**$10,200.00**	**$8,250.00**	**$9,702.00**	**$5,018.40**	**$2,500.20**	**$52,270.60**
Total Project Hours/Miles	516	769	1180	966	762		37,040	
Column Totals:	**$31,992.00**	**$39,988.00**	**$40,120.00**	**$31,878.00**	**$16,002.00**	**$20,018.40**	**$20,001.60**	**$200,000.00**

ATTACHMENT B
RED RIVER BASIN COMMISSION FY16-18
North Ottawa Nutrient Capture and Biomass Harvesting

Red River Basin Commission

Vision: *A Red River Basin where residents, organizations and governments work together to achieve basin-wide commitment to comprehensive integrated watershed stewardship and management.*

Mission: *To create a comprehensive integrated basin-wide vision, to build consensus and commitment to the vision, and to speak with a unified voice for the Red River Basin.*

North Ottawa Nutrient Capture and Biomass Harvesting

Project Partners: Bois de Sioux Watershed District, International Institute for Sustainable Development (IISD), University of Minnesota, and North Dakota State University.

Current Project Funding:

* $300,000 ~ State of Minnesota LCCMR/Environment and Natural Resources Trust Fund for Nutrient capture and water quality monitoring within North Ottawa Impoundment.
  Project Timeline: July 1, 2014 –June 30,2017
* $290,000 ~ EPA 319 Funding through MPCA for Nutrient load reduction monitoring from the upstream North Ottawa drainage system.
  Project Timeline: March 15, 2015 - August 31,2018
* $180,000 ~ Bush Foundation for nutrient reduction outreach

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND

Project Outcome

The project outcome is to maximize the capture and remove of phosphorus and nitrogen nutrients found in surface runoff from the 75 square mile agricultural watershed above the North Ottawa impoundment. The RRBC working with the partners will develop a detailed nutrient budget for the North Ottawa Impoundment. The project as funded will utilize a multiple cell treatment system that will work with the natural resource enhancement (NRE) plan being developed by the NRE committee. Using a two stage process pre-treatment sediment settling and treatment designed to:

Upstream event based monitoring from multiple locations to target nutrient loads coming from differing land use areas within the upstream drainage basin.

- **Investigate how to maximize Impoundment water quality benefits**
- **Evaluate treatment times for nutrient uptake**
- **Pre-treatment process to reduce suspended sediments entering the impoundment**
- **Treatment process designed for maximum nutrient uptake by vegetation**
- **Manage water levels in treatment cells to maximize nutrient settling and vegetative growth**
- **Harvest vegetation (cattails) during optimal times of the growing season to maximize nutrient (phosphorus/nitrogen) removal with harvesting**
- **Timed harvesting will be based on cattail crop desired.**
  - Early season = Ag field amendment / Late season = Bio based processing

PROJECT UPDATE

Detailed nutrient monitoring of the waters being discharged from the watershed above the North Ottawa flood reservoir, analyzing the soil water relationship within the pool area, testing of harvested vegetation and monitoring of water discharged from the impoundment are being completed. Preliminary sampling results showed a significant capture of phosphorus and nitrogen occurring within the impoundment. Summer 2014 results indicated a 84% reduction in Total Suspended Sediment, 70% reduction in Total Nitrogen and 38% reduction in Total Phosphorus from upstream loading by the impoundment, without management. Summer 2015 sampling is currently being compiled. During the 2015 construction season the interior dike work completing the separation of the "A" and "B" pools into eight 160 acre cells was completed. An operating plan was adopted that will result in the 640 acre "C" pool continuing to be the primary storage pool, six cells in the "A" and "B" pools being used for natural resource management through a moist soils management rotation, and two cells, A4 and B4 being set aside for water level management and cattail harvesting. Based on preliminary sampling of cattail material at North Ottawa and work completed by ISSD in Manitoba we are expecting the potential harvesting of cattails will result in a 17-18 pounds of phosphorus per acre harvested. This assumes a yield of cattails of 7 tons/acre. We also looked at various cattail processing activities to examine the potential to extract nutrients in liquid form by using presses as well as processing of dried cattails bailed and run through a grinder to facilitate land application. We anticipate that we will harvest about 160 acres of cattails in 2016.

Separation of liquid from plant solids in growing cattail at the University of Minnesota, Crookston to analyze agriculture related nutrient utilization potential.

***Upper Right/Upper Left/Lower Right**: Automated sampling equipment set up at the North Ottawa Impoundment located at the Inlet channel and Pool C discharge*

NORTH OTTAWA IMPOUNDMENT PROJECT BENEFITS

Flood Damage Reduction: (*Primary objective):* Provides 16,000 acre feet of gate-controlled storage.
Water Quality: Improvement via sedimentation and nutrient uptake by wetland plants
Habitat Enhancement: Feeding and resting areas for migrating waterfowl and shorebirds and stream flow maintenance for downstream fish habitat
Downstream Flow Augmentation: Release of about 5 cfs flow during the ice free season in most years.

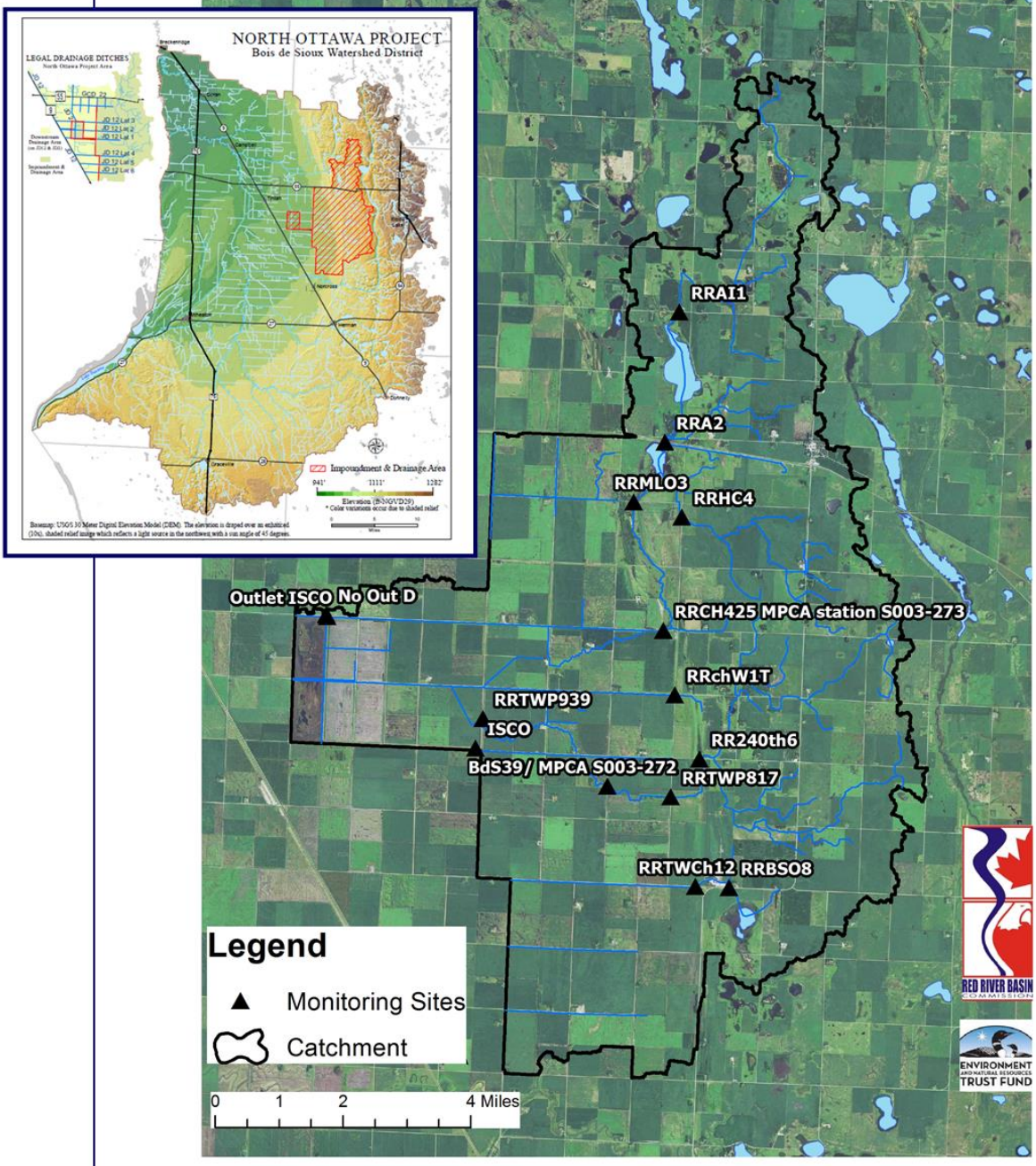
PROJECT BENEFITS TO THE RED RIVER BASIN

This project supports the current nutrient reduction strategies being developed by Minnesota, North Dakota and Manitoba. Over 80% phosphorus and 90% Nitrogen in the Red River is from non-point sources. We need new tools for addressing future goals of up to 50% reduction in phosphorus loading.

- ***Nutrient removal***: Harvesting cattails captures nutrients, especially phosphorus that would normally flow downstream to the Red River and eventually to Lake Winnipeg. For each acre of cattails harvested will remove approximately 17 –18 pounds of phosphorus.
- ***Phosphorus recovery***: Application of harvested material to agricultural lands like a green manure, extracting nutrients from harvested plants, or ash from the burning of cattails all contains phosphorus, which can be recycled into fertilizer.
- ***Habitat improvement***: Vegetation management leads to improved wildlife habitat. Waterfowl, shorebirds and marshland animal species benefit from stand reduction and access to more open water areas within marsh
- ***Bioenergy production***: Harvested cattails can be turned into compressed fuel products (e.g., pellets and cubes) or torrefied to create a charcoal based product .

LEFT: *Pelletized cattails have burning quality similar to wood pellets and high absorption capacity creating a product suited well to hazardous spill absorption.*
RIGHT: *Harvesting cattails and creating an open "Hemi Marsh" concept maximizes waterfowl value of large stands of cattail*

North Ottawa Catchment



December 2015

www.redriverbasincommission.org