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

Final Report Format

Section 319 and Clean Water Partnership Projects or
Final Progress Report for TMDL / WRAPS Development
and TMDL / WRAPS Implementation Projects

Lake Minnewaska Phase 1 Resource Investigation

Executive Summary of Project (300 words or less)

This summary will help us prepare the Watershed Achievements Report to the Environmental Protection Agency. (Include any specific project history, purpose, and timeline.)

PROBLEM (one paragraph) The project explored the land use in the watershed, point and nonpoint pollution sources, ag practices used, lakeshore development, septic system compliance, and water quality trends. The purpose of the project is to protect Lake Minnewaska from becoming impaired. The steep terrain in the contributing sub watersheds and multiple drainage ways and tributaries contribute to the concern. Gullies and ravine erosion are a large source but identifying which areas are contributing during storm events that exceed standards in that event will be important. Lake Minnewaska is not currently impaired but these tributaries and drainage ways have contributed and in some cases are exceeding standards in storm events. The data gathered will also help to inform implementation efforts and we will be able to then monitor progress and improvements. The lake has highly developed shorelines and high volume of recreational activity.

WATERBODY IMPROVED (one paragraph) The Pope SWCD coordinated monitoring of the tributaries with citizen volunteers and the Chippewa River Watershed. Education and promotional efforts were completed in target areas to obtain buy in from landowners to complete projects. A tour was conducted and website updates were done to inform the public of projects and practices. Newsletters and articles in the paper have featured projects completed and the monitoring that has been done. The SWCD staff has met with the various groups including: Lake Association, Glacial Lakes Environmental Trust Fund, County Commissioners, Water Plan Task Force, and Planning and Zoning staff to gain a better understanding of the resource concerns. Lake Minnewaska has seen improvement on at least one tributary on the south side of the lake in the secchi tube readings.

PROJECT HIGHLIGHTS (one paragraph)

This project included educational information which was made available to the public through a website update, newsletters, tour, and direct mailings. The SWCD staff has met with the various groups including: Lake Association, Glacial Lakes Environmental Trust Fund, County Commissioners, Water Plan Task Force, and Planning and Zoning staff to gain a better understanding of the resource concerns.

The SWCD also completed a Terrain Analysis (PTMapp) for the subwatershed to identify areas where projects should be implemented on a field scale to address the gully and ravine pollution concerns. We will now continue to implement BMPs in these sub watersheds with the information gained.

Monitoring was completed which has provided more details to the stormwater conveyances affecting Lake Minnewaska.

A modeling project was undertaken with the City of Glenwood to complete a P8 and SWMM model of the stormwater conveyance system. This is underway and was secured through a CWF grant through BWSR.

Designs were completed for project implementation including water and sediment basins and ravine repairs.

There were also several **secondary benefits** to the project including a total of 3 Clean Water Fund grants have been obtained through the Board of Water and Soil Resources to implement BMPs to address gully and ravine erosion. A total of 36 projects have been implemented in the past three years or are being implemented as of the fall of 2016 as a result of monitoring information gained by this project. These BMPs include: 32 water and sediment control basins, 1 grade stabilization structure, 1 rock inlet, 10+ alternative intakes, 1 grassed waterway, and 1 wetland creation. The additional investigation done with the help of the MPCA funding has helped to inform the implementation process. We have a sub watershed on the southwest side of the lake that has shown significant improvements in the secchi tube readings taken under this project post-construction of the BMPs. This data has shown improved clarity. In addition there has been no downstream flooding and landowners have indicated no moisture in their basements. Lake Minnewaska has seen improvement on at least one tributary on the south side of the lake in the secchi tube readings. A total of 17 BMPs were implemented in this one sub watershed as a result of the projects.

RESULTS (one paragraph)

The Pope SWCD coordinated monitoring of the tributaries with citizen volunteers and the Chippewa River Watershed. The Chippewa River Watershed did intensive monitoring for Lake Minnewaska at three main tributaries feeding Lake Minnewaska.

Education and promotional efforts were completed in target areas to obtain buy in from landowners to complete projects. A tour was conducted and website updates were done to inform the public of projects and practices. Newsletters and articles in the paper have featured projects completed and the monitoring that has been done. The SWCD staff has met with the various groups including: Lake Association, Glacial Lakes Environmental Trust Fund, County Commissioners, Water Plan Task Force, and Planning and Zoning staff to gain a better understanding of the resource concerns.

Secondary benefits to the project include: Lake Minnewaska has seen improvement on at least one tributary on the south side of the lake in the secchi tube readings. A total of 17 BMPs were implemented in this one sub watershed as a result of the projects completed.

PARTNERSHIPS (Name all partners and indicate relationship to project)

The Pope SWCD worked with the following groups including: Lake Association, Glacial Lakes Environmental Trust Fund, County Commissioners, Water Plan Task Force, and Planning and Zoning staff to gain a better understanding of the resource concerns. The SWCD also coordinated monitoring with the Chippewa River Watershed project and worked on projects with the NRCS local office.

Section 1. –Workplan Review:

Approved changes: Pope SWCD had a change to the original work plan because of changes in staff at the SWCD and at MPCA with the project manager. There were 3 different project managers from the start of this project and 2 different SWCD staff.

Concerns Completing the Work: Pope SWCD has had staffing changes during the terms of this grant. The grant was written by someone who left the organization and new staff had to step into a project late in the game to accomplish the work. That is why not much happened in 2013. Once staff was on board it took some time to understand the intent of the project. The SWCD staff was able to finalize a workplan by mid-2014. Monitoring began as soon as this could be arranged and the project work was completed. The only other challenges have been trying to meet all the requirements in the grant for matching funds and a misunderstanding on reporting requirements.

Goals, Objectives, Tasks, and Subtasks

Goal: The Lake Minnewaska Phase I Resource Investigation project was to explore land use in the watershed, point and nonpoint pollution sources, agricultural practices being used, lakeshore development, septic system compliance, and water quality trends. The purpose of this study/report is to assure residents through educational efforts and water quality monitoring that the lake will not be impaired in the future (keeping total phosphorus levels below 40 ppb). The investigation has aided in providing information which is informing implementation to achieve lake quality stability. We will gather data from the three main tributaries (1. County Road 17, 2. Trappers Run Inlet, 3. City of Glenwood) that will help in the development of a restoration and protection strategy with parameter-specific targets that will maintain and improve water quality in the sub watersheds directly contributing into Lake Minnewaska. We coordinated with the citizen monitoring network to gain data on an additional 9 tributaries contributing to Lake Minnewaska.

Objective 1 Public Involvement and Civic Engagement

Task A: Created a website page on Pope SWCD website including local water quality projects, water quality status on impaired waters, and information on best management practices that can be implemented to improve water quality.

Subtask 1: A page was created on the Pope SWCD website to feature local water quality projects that have been completed and to create an easy link to water quality reports and information. This information has details on best management practices implemented to improve water quality.

Task B: Complete at least one newsletter, direct mailings and flyers to landowners to promote projects that can be implemented to improve water quality in the sub watersheds contributing to Lake Minnewaska

Subtask 1: 2 newsletters highlighting this project were distributed in 2014, 2015, and 2016 to approximately 1,700 landowners and operators in the county.

Subtask 2: A display was created for the Pope County Fair, Office Display,and Community Expo. A presentation was given to the Water Plan Task Force, Pope County Commissioners,

and SWCD Board members. A display banner was created to promote the project and awareness of erosion and sediment control efforts. Copies of these items can be shared upon request to complement this report and are described in question 2 below in greater detail.

Task C: An educational event and tour was held on June 12th at Captains Bar and Grill with a bus tour highlighting the projects and programs that are being completed to target the protection efforts and water quality improvements in the subwatersheds directly contributing to Lake Minnewaska. Meetings were conducted with the City of Glenwood on the modeling project and staff presented the projects to the Minnewaska Lake Association membership.

Objective 2 Water Quality Monitoring was completed by the Chippewa River Watershed project staff.

Task A: Monitoring Preparation

Sub-task 1: The sampling sites were located through maps and on ground visits and were marked on maps for 3 established sites.

Sub-task 2: The equipment needed to monitor was ordered by Chippewa River Watershed project staff.

Sub-task 3: MVTL laboratory was contacted to request bottles and coolers for the monitoring each season.

Sub-task 4: The equipment was installed for monitoring.

Sub-task 5: CRWP set up monitoring sites in EQuIS and entered results each season 2014, 2015, and 2016.

Task B: Citizen Monitoring

Sub Task 1: Four citzen monitors were contacted by staff and materials including secchi tubes were sent to the Citizen Monitors to complete the work each season 2014, 2015, and 2016. The citizen monitors/SWCD staff submitted their data to Pope SWCD staff and this information was entered into the proper format by the SWCD staff and submitted to meet the November 1 deadline.

SubTask 2: Pope SWCD located sampling sites through maps and site visits and marked using ArcGIS all sites on a map. This map and GPS locations were sent to MPCA to be established in EQuIS and the Citizen Monitoring program.

Sub Task 3: Staff completed a packet for each citizen monitor on the location of the site and conducted a site visit with the citizen monitor to ensure that they knew how to complete the sampling properly and had the correct location for the sampling.

Task C: Stream Monitoring

Sub Task 1: Followed sample collection protocols as defined in the CRWP's WPLMN SOP and the QA/QC procedures in the QAPP. Shipped samples to MVTL for analyses of total suspended solids, suspended volatile solids, total phosphorus, dissolved orthophosphorus, nitrate-nitrite nitrogen, and turbidity. Collected photos, DO, temperature, pH, specific conductivity, secchi tube, visual observations and water level information at each site visit.

Sub Task 2: Collected 22 samples at the 3 EQuIS sites from April through October 7, 2014. Collected 8 water quality samples at the 3 EQuIS sites from Janurary- June 2015. Collected 9 water quality samples at the 3 EQuIS sites from July-October 2015. Samples based on storm events and low flow conditions. Collected 9 water quality samples at the 3 EQuIS sites from March-June 2016. Samples based on storm events and flow conditions.

Sub Task 3: Conducted flow measurements to establish rating curves at the 3 EQuIS sites. The three sites were estabilshed in HYDSTRA and site inspection forms were completed and forwarded to MPCA. Once the flow record is verified it can be used to complete FLUX. Conducted 4 flow measurements to establish rating curves at the 3 EQuIS sites January to October 2015 to aid in establishing a rating curve. (S007-994-3 flows, S000-883 6 flows, S000-859-7 flows) Completed flow measurerments at each EQUiS site to aid in establishing flow rating curves July-October 2016 (S007-994, S000-883, and S000859)

Sub Task 4: Ensured field meter was in good operational order and was calibrated weekly during monitoring season

Task D: Complete load calculations using the FLUX32 model

Sub Task 1: The completed EQuIS template was submitted to the MPCA on October 30, 2015 for the November reporting deadline. Flow measurements and site inspection forms were submitted to the project manager on October 30, 2015. An equipment malfunction with the baralogger prohibited daily flows and season hydrographs from being generated. The barologger was sent in for service and returned in January. That data is currently being worked on and will be submitted as soon as possible. Still awaiting xml file generation from the MPCA to perform FLUX analysis on 2014 data. Loads are not available at this time but individual sample analysis is available.

Objective 3 Resource Investigation:

Task A: To complete a terrain analysis on two subwatersheds (Trappers Run watershed 070200050302 and Lake Minnewaska watershed 070200050303) that drain to Lake Minnewaska that will create a hydrologically correced DEM of the target area which will help to 9 identify areas of potential erosion by priority.

Sub Task 1: Pope SWCD worked with Houston Engineering to complete the Terrain Analysis project funded by the Board of Water and Soil Resources Accelerated Implementation Grant. There were 2 meetings completed with Houston Engineering and Becker SWCD to gather data and information and to present the final product to the Pope SWCD Board and Staff. The Pope SWCD staff had to field verify a few of the areas and provided direction to the final work products. A copy of the full report is included with our report. This part of the project and grant is complete.

Task B: To design water and sediment control basin projects that are identified thorugh the terrain analysis. Designs will be created for landowners that voluntariliy want to implement a project.

Sub Task 1: There were 14 water and sediment control basins, 1 grassed waterway, and a grade stabilization structure project installed in the direct subwatershed to Lake Minnewaska utilizing the Terrain Analysis tool to target the optimum locations for implementation. Included is a map and fact sheet of some of the projects that were completed. They were all surveyed in October-November 2014 and technical staff are working on completing designs. These sites have been funded through NRCS EQIP funding or through the Pope SWCD BWSR Clean Water Fund Projects and Practices grant from 2014 and a new one recently received in 2015 for this project area. We are coordinating the implementation of the remaining projects in this subwatershed in the fall of 2015.

We are coordinating the implementation of the remaining projects in this subwatershed in the spring of 2016. In 2015 several projects were implemented in these two subwatersheds and staff spent time coordinating and gathering info for the design work.

Sub Task 2: NRCS/West Central Technical Service Area engineers worked with Pope SWCD staff to complete preliminary designs on projects.

Task C: City of Glenwood/Starbuck Stormwater Analysis

Sub Task 1: A a Terrain Analysis of the subwatersheds to Lake Minnewaska that includes the city of Starbuck was completed. However due to the extensive nature of the City of Glenwood stormwater project no additional work was undertaken for the City of Starbuck at this time.

Sub Task 2: The Pope SWCD has written a grant to do a P8 stormwater model for the City of Glenwood and this project has started. The P8 and SWMMM modeling project is nearing completion in 2016. Survey of the stormwater conveyance system was completed for the City of Glenwood. The survey work was completed by S.E.H. and Pope SWCD staff. Pictures of the stormwater conveyance system have been documented through photos and notes.

Task D: To report findings, write reports, and consult with other agencies and groups regarding findings.

Sub Task 1: Pope SWCD completed written reports.

Sub Task 2: Pope SWCD consulted and has shared information with other agnecies on the work being accomplished through the newsletters, newspaper, and the Comprehensive Water Plan.

Objective 4: Administration and Coordination

Task A: CRWP tracked project expenditures and submitted invoices to the Pope SWCD. Pope SWCD reviewed expenditures and compiled information for reporting to MPCA.

Sub Task 1: CRWP and Pope SWCD developed budget tracking spreadsheet and tracked expenditures

Sub Task 2: CRWP compiled and submitted invoices to the Pope SWCD for reimbursement. Pope SWCD completed payment reimbursements and tracking of expenditures to the overall project.

Task B: Complete Reporting Requirements;

Sub Task 1: Pope SWCD completed reporting requirements for the project and gathered all necessary information to complete the reporting for annual samples collected and semi-annual reports.

Sub Task 2: Pope SWCD has been working to complete the final reporting requirements.

Task C: Reported to the Pope SWCD Board and the CRWP Board of Directors.

Sub Task 1: Prepared monthly budget reports

Sub Task 2: CRWP staff attended CRWP monthly board meetings and Pope SWCD staff attended monthly meetings and presented budget reports on grant activities

Above: Sample taken with Secchi Tube by SWCD Intern at one of the 9 sites monitored under this program.

Pictured top right: A picture of one of the locations samples were taken.

Pictured bottom right: Flooding in the City of Glenwood and resource concern for water quality. The Chippewa River Watershed monitored this area at a location just to the west of where this photo was taken.

Above: Erosion issue on North side of Lake Minnewaska before and after construction of lined waterway.

Above: Pictures of BMPs installed under Clean Water Funding project but focus narrowed due to MPCA monitoring efforts from this project.

Above: Educational tour with County Commissioners conducted and a picture of secchi tube during monitoring.

Grant Project Summary

Project title: Lake Minnewaska Phase I Resource Investigation

Organization (Grantee): Pope Soil and Water Conservation District

Project start date: August 29, 2013 Project end date: June 30, 2016 Report submittal date: 10/19/16

Grantee contact name: Holly Kovarik Title: Manager

Address: 1680 Franklin Street North

City: Glenwood State: MN Zip: 56334

Phone number: 320-634-5327 Fax: NA E-mail: Holly.kovarik@mn.nacdnet.net

Basin (Red, Minnesota, St. Croix, etc.)
/ Watershed & 8 digit HUC:: Minnesota/Chippewa River/07020005 County: Pope

Project type (check one):

- ☒ Clean Water Partnership
- ☐ Total Maximum Daily Load (TMDL)/Watershed Restoration or Protection Strategy (WRAPS) Development
- ☐ 319 Implementation
- ☐ 319 Demonstration, Education, Research
- ☐ TMDL/WRAPS Implementation

Grant Funding

Final grant amount: $94,340.53 Final total project costs: $193,768.48

Matching funds: Final cash: $ $99,966.67 Final in-kind: Final Loan: $

MPCA project manager: Paul Wymar

For TMDL / WRAPS Development or TMDL / WRAPS Implementation Projects only

Impaired reach name(s):

AUID or DNR Lake ID(s):

Listed pollutant(s):

303(d) List scheduled start date: Scheduled completion date:

AUID = Assessment Unit ID
DNR = Minnesota Department of Natural Resources