FDM 10-30-1 Project Stormwater Quality Analysis Process

October 22, 2012

1.1 Description and Purpose

Each WisDOT project that has a stormwater component must have a completed Stormwater Report (SR) spreadsheet. There are two components to the spreadsheet - a drainage section and a water quality section. This section describes how to fill out the water quality section of the sheet. Refer to FDM 13-1-10 for instructions on how to fill out the drainage section.

1.2 Water Quality Analysis Instructions

The WisDOT Stormwater Report spreadsheet incorporates the design guidelines and calculations needed to determine if a project meets the required TSS load reduction. The spreadsheet has a series of worksheets that a designer shall use to methodically prepare and summarize an analysis of the pollution control performance of the various stormwater quality practices used on a project.

The water quality section of the Stormwater Report spreadsheet has two parts. The first part, which is on a worksheet shared with the drainage section, is the Summary worksheet. This Summary worksheet includes basic project information, (project name, limits, county, etc.), a water quality analysis results summary and a list of questions that will help the designer determine the project's water quality requirements.

The second part includes the list of stormwater quality practices that are typically used to evaluate WisDOT facility sites. These practices include catchbasins, filter strips, grass swales, street cleaning and wet detention ponds. To identify these worksheets, the letters 'WQ', for Water Quality, have been inserted in front of the worksheet tab for each practice name.

To determine the overall project TSS percent reduction, the project engineer enters the required data for each control practice that is proposed for the project in the control practice worksheet. The percent reduction values for each practice are then automatically applied to the summary tab, which summarizes the values and calculates an overall percent TSS reduction for the project.

1.3 Stormwater Report Applicability

Each WisDOT project that has a stormwater component must have a completed Stormwater Report spreadsheet. The stormwater quality section of a Stormwater Report is not needed if the project is considered to be minor reconstruction, with no TSS reduction required. To determine this, refer to FDM 10-25-1. It is also not needed if there is no increase in paved area for a project or no change to the culvert or storm sewer system that drains the project. Stormwater Reports for water quality analyses are typically filed for the planning stage, the 60% design stage and the final design stage, although some projects might require submittals at different stages. If the project does not require any stormwater control features, then only fill in the Water Quality Results Summary Sheet to the extent necessary to explain why no features are required.

1.4 Water Quality Spreadsheet Description

There are ten worksheets in the SR. The Drainage-Summary and Drainage-Data worksheets are discussed in FDM 13-1-10. The water quality summary worksheet (WQ-Summary) is discussed in detail below and the water quality control practice worksheets are briefly discussed below. A line-by-line review of each water quality control practice worksheet is in the FDM section for that control practice. Access the SR at FDM 13-1-10, Attachment 10.1. Be sure to enable the spreadsheet Macros by clicking on the security warning "options" box on the top of the spreadsheet and then highlight the "enable this content" button.

1.4.1 Water Quality Summary

This worksheet includes basic project information, a Water Quality Results Summary section that includes a summary of the TSS reduction analysis for the project's control practices and a series of questions that address water quality issues. For Basic Project Information, only enter information in columns B and C of the Drainage-Summary worksheet; the information you enter there will be automatically entered in the WQ-Summary worksheet and the water quality control practice worksheets.

Basic Project Information (entered in the Drainage-Summary worksheet)

Line 2: Project ID Number: Enter the project ID number

Line 3: Title: Enter the project title

Line 4: Designer/Checker: Enter the name of designer and the checker

Line 5: DOT Region/Firm Name: Enter the WisDOT region the project is in and, if the form is filled out by a consultant, the name of the consultant firm.

Line 6: Date: Enter the date the spreadsheet was completed

Line 7: Highway: Enter the name of the highway

Line 8: Limits: Enter the limits of the project

Line 9: County: Enter the county of the project

Line 10: Description of Work: Describe the type of project

Line 11: Enter the name of the project manager(s)

Line 12: Enter the PS&E date

Line 13: Check the planning or design stage of the project.

1.4.2 Complete "Water Quality Results Discussion" Narrative

The 'Water Quality Results Discussion' narrative begins with line 14 on the WQ-Summary worksheet. The first section of the discussion narrative, from lines 15 to 17, calculates the percent TSS reduction for the project by transferring the TSS reduction percentages from each control practice worksheet to the WQ-Summary worksheet and calculates the overall percent TSS reduction for the project. The water quality objectives for the project are developed and explained in the Project Water Quality Objectives section. These goals are defined in lines 18-21 of this section and the description of how they were met is addressed in the balance of the questions on the worksheet.

Line 15: Drainage Area (ac): Enter the total project drainage basin area, which is the sum of the areas of all the drainage sub basins, for the entire project. This should include areas that are both within the WisDOT ROW and outside of the WisDOT ROW.

Line 16: ROW Drainage Area (ac): For the total project drainage area defined in cell above, enter the drainage area of the project that is within the WisDOT ROW.

Line 17: Percent TSS Reduction by Treatment Type: This row collects the percent reduction values from the WQ-Control Practice spreadsheets and, in the column "Total Project Drainage Basin" calculates the overall percent TSS reduction for the project. This is the value the designer should use to determine if the percent reduction requirement, as determined in Row 20 of this worksheet, is met. The designer should not enter any values in this row.

Line 18: THE PROJECT IS EXEMPT FROM TRANS 401 STORMWATER REQUIREMENTS AND REQUIRES NO FURTHER WATER QUALITY INFORMTION. DESCRIBE BELOW WHY IT IS EXEMPT. Check the box if the project is exempt from the stormwater quality requirements described in TRANS 401.

Line 19: Describe why the project is exempt.

Line 20: DESCRIBE THE STORMWATER QUALITY MANAGEMENT REQUIREMENTS PER TRANS 401 OR THE TMDL WASTELOAD ALLOCATION: Select the expected TSS reduction requirement per TRANS 401 or check 'Other Reduction' and enter the TMDL Wasteload Allocation value, if appropriate. Review FDM 10-25-1 or confer with the Region Stormwater Engineer if you are uncertain of the required TSS reduction percentage or TMDL wasteload allocation.

Line 21: Use Line 21 to describe the specific requirements in TRANS 401 or the TMLD Wasteload Allocation to document the selected TSS reduction value. Examples might be: "The project has more than 1.5 miles of new alignment, so per TRANS 401.106(3)(a), suspended sediments will be reduced by 80% or to the maximum extent practicable" or "The reconstruction project that replaces the existing pavement and storm sewer system is not widening the roadbed by more than 100 ft., and no rural cross sections are converted to urban cross sections, so no TSS reduction is required." Refer to FDM 10-25-1 for additional information on TRANS 401 requirements.

Line 22: IF THE PROJECT REQUIRES STORMWATER MANAGEMENT EXPLAIN HOW THE TRANS 401 2-YEAR PEAK DISCHARGE REQUIREMENT WAS MET OR NOT REQUIRED. Note one of the following: a) the project is constructed on a new alignment, so this requirement applies, b) the project is a highway reconstruction site so this requirement does not apply (TRANS 401.106(4)(b)(2), c) the project does not increase the downstream receiving water surface by more than 0.01 feet as determined by a water surface model so this requirement does not apply, d) existing and proposed condition models of each basin show that the 2-year peak discharge has not increased so this requirement does not apply, or e) the project discharges directly into a lake over 5000 acres in area or to a stream or river segment draining more than 500 square miles (refer to http://dnr.wi.gov/topic/stormwater/documents/Modeling_Post-Construction_Guidance_2011.pdf), so this requirement does not apply. If the project cannot meet the 2-year peak reduction requirement, explain how the proposed design meets the requirement to the maximum extent practicable.

Line 24: HAS THE DEPARTMENT AGREED TO MEET ANY LOCAL STORMWATER QUALITY REQUESTS

FOR THIS PROJECT? IF SO, DESCRIBE. Enter either “Designed to meet WisDOT standards only.” or describe the municipal, county or regional ordinance, regulation or agreement(s) that the project is intended to meet and why it was necessary to meet the requirement.

Line 26: IF THE PROJECT REQUIRES STORMWATER MANAGEMENT EXPLAIN HOW THE TSS REDUCTION REQUIREMENT WAS MET. If the project meets the TSS reduction goal described in line 18, then state: “See practices as shown in lines 15-17.” Describe any practices or issues of special note. If any ‘Other Devices’ are used, describe them and where they are located. If the project does not meet the goal described in line 18, describe the proposed practices and provide a narrative that describes how the sediment reduction for the project has been controlled to the maximum extent practicable.

Line 28: LIST THE POST CONSTRUCTION STORMWATER QUALITY CONTROL TREATMENT MEASURES FOR THE PROJECT. List the control practices, distinguishing between the rural and urban sections of the project. An example might be: “Urban Section: one wet detention pond, catchbasins, median biofilters. Rural Section: Grass swales, filter strips.”

1.4.3 Water Quality Control Practice Worksheets

There are seven water quality control practice spreadsheets. They are listed below, with a brief description of how the designer can use them. Each worksheet can be expanded to increase the number of practices on each worksheet. To do this, follow these steps:

1. highlight the number of columns you want to add,
2. right-mouse click,
3. select insert,
4. select shift rows right, and
5. press the ‘OK’ button.

Do not enter data in the grey boxes on each worksheet - they contain formulas used to calculate values from other cells in the worksheet.

WQ-Wet Detention Ponds. The worksheet summarizes the analysis of TSS control from wet detention ponds. The data includes drainage area information and the information needed to evaluate wet detention pond performance using either the design process described in FDM 10-35-15 or using a computer model.

WQ-Catchbasins. The worksheet summarizes the analysis of suspended solids reduction using catchbasins. The data includes drainage area information and the information needed to evaluate catchbasin performance using the design charts in FDM 10-35-20.

LIST OF ATTACHMENTS

Attachment 1.1	Water Quality Results Summary Sheet
Attachment 1.2	Water Quality - Wet Detention Ponds Summary Sheet
Attachment 1.3	Water Quality - Catchbasins Summary Sheet