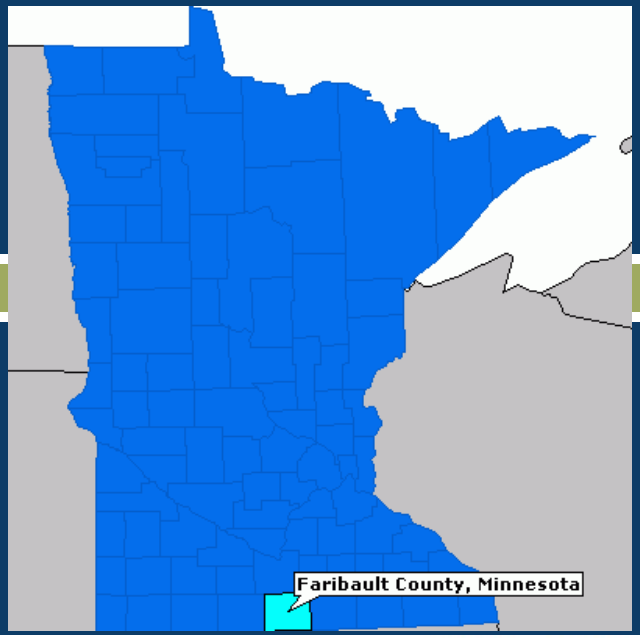
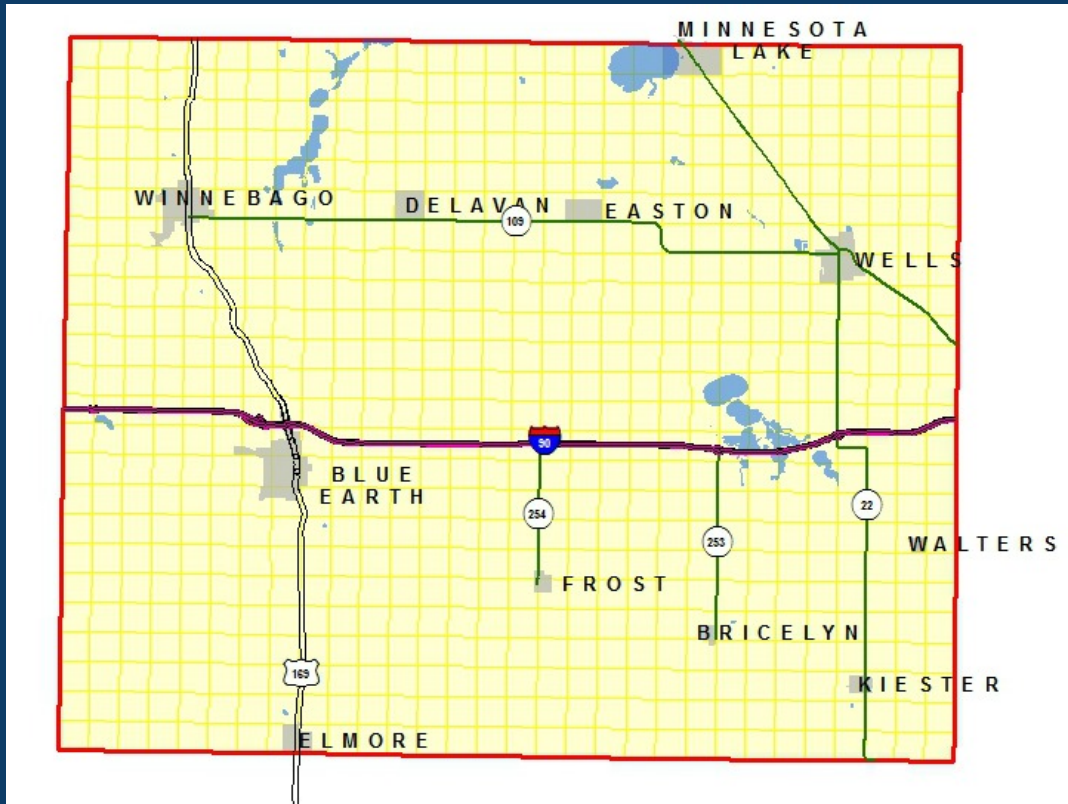
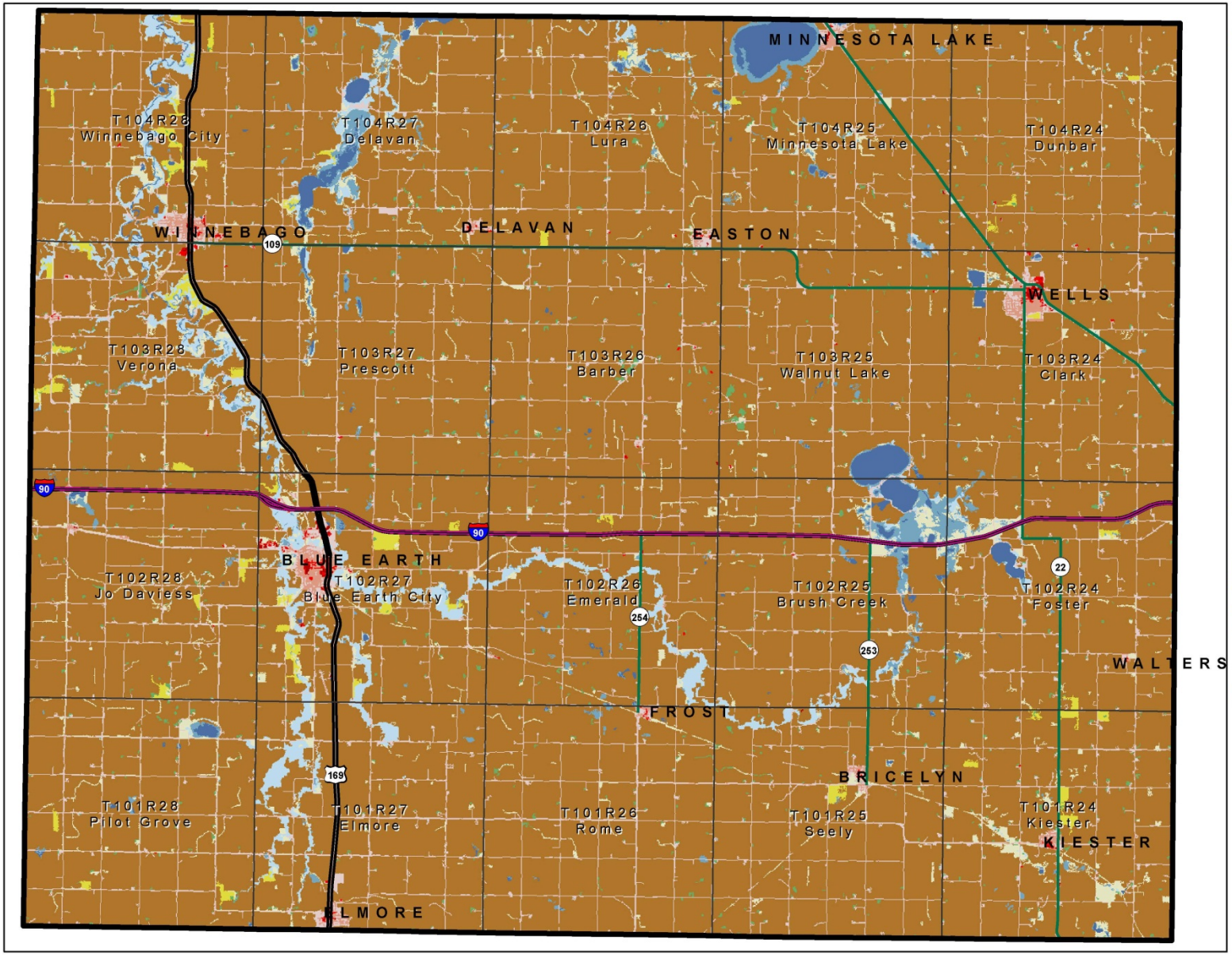
Urban & Community Conservation



- Agriculturally dominated county with small rural communities
- Total County population of 14,500 with 10,000 residing within one of the eleven communities
- Infrastructure is all shared between farmers and communities
- Urban Outreach Program started in 2007
  - Educating elected officials on cause and effect of stormwater runoff
  - Implementation of BMPs



Faribault County Land Cover



NATIONAL LAND COVER DATABASE 2001

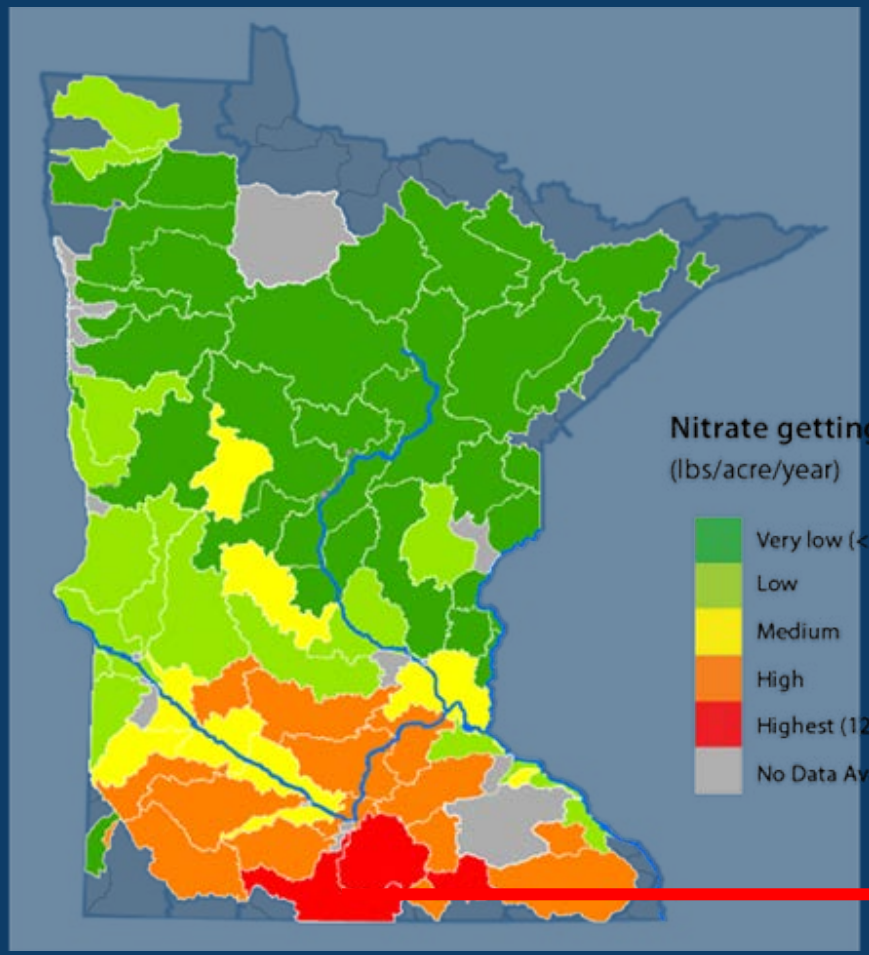
- Open Water
- Developed, Open Space
  Mixture of constructed materials, but mostly vegetation in the form of lawn grasses, and impervious surfaces accounting for less than 20% of total cover.
- Developed, Low Intensity
  Mixture of constructed materials and vegetation, impervious surfaces accounting for 20-49% of total cover.
- Developed, Medium Intensity
  Mixture of constructed materials and vegetation, impervious surfaces accounting for 50-79% of the total cover.
- Developed, High Intensity
  Highly developed areas where people live or work in high numbers. Impervious surfaces account for 80-100% of total cover.
- Barren Land
- Deciduous Forest
  Dominated by trees generally over 5 meters tall, and more than 20% of total vegetation cover.
- Evergreen Forest
  Dominated by trees generally over 5 meters tall, and more than 20% of total vegetation cover.
- Mixed Forest
  Neither deciduous nor evergreen species are more than 75% of total tree cover.
- Shrub/Scrub
  Areas dominated by shrubs under 5 meters tall with shrub canopy typically more than 20% of total vegetation.
- Grassland
- Pasture/Hay
- Cultivated Crops
- Woody Wetlands
  Areas where forest or shrub land vegetation accounts for more than 20% of vegetative cover and the soil is periodically saturated with or covered with water.
- Emergent Herbaceous Wetlands
  Areas where perennial herbaceous vegetation accounts for more than 80% of vegetative cover and the soil is periodically saturated with or covered with water.

N

www.faribaultcountyswcd.com

FARIBAULT COUNTY
COMPREHENSIVE LAND USE PLAN

Faribault SWCD



CLEAN WATER LAND & LEGACY AMENDMENT

BARR

Why the SWCD used MIDS and EPA Calculators

- Cost analysis
- Accurate sizing on of projects
- Where projects need to be located
- What projects should be used
- If a project will work where we want to place it
- Accurate reduction analysis

MIDS Legislation, 2009

"…develop performance standards, design standards or other tools to enable and promote the implementation of low impact development and other stormwater management techniques…."
(MN Statutes 115.03 subd. 5c)

What is Minimal Impact Design Standards (MIDS)?

Four basic components:

1. State-wide stormwater volume performance goals
2. User-friendly calculator to standardize and quantify ("credit") the benefits of Low Impact Development (LID) BMPs
3. Design specifications for a variety of LID BMPs (continuing in Stormwater Manual update)
4. A model MIDS ordinance package

MIDS Calculator

Includes:


Bioretention

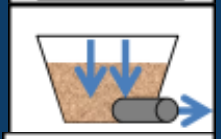

Permeable pavement

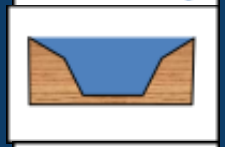

Swales


Infiltration Basin


Trees


Green Roofs


Sand Filter

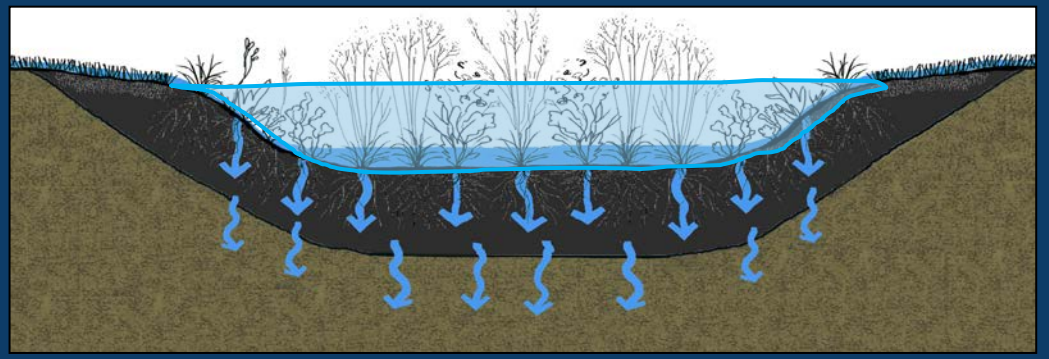

Stormwater Pond


Wetlands

New update as of July 3 now offers: wet swales, side slope swales, and harvesting/re-use and an other category

MIDS Calculator – What is it?

- Evaluation tool for site conformance to MIDS performance goals
  - Volume reduction & pollutant removal (TP & TSS) – annual load and annual percentage removal estimates
- User-friendly GUI with Excel spreadsheet
- Volume reduction goal based on instantaneous calculations
- Calculator translates “kerplunk” volume goal into annual BMP performance
  - “kerplunk” method (Andy Reese terminology)



MIDS Calculator – What is it?

- Quantifies annual BMP performance – not design storm events
- Does not address rate control or pre-project vs. post-project conditions
- Relatively simple tool – not a model, but it is based on continuous simulation modeling
- Also addresses BMPs that do not reduce volume
- Allows for "trains" of multiple BMPs
- Linked to the newly revised MN Stormwater Manual

MIDS Calculator

Input

Project size or watershed

% Impervious surface

Soil type

Precipitation

Choice of stormwater practices

Calculate

1. Amount of stormwater volume control needed (cubic feet)

2. Amount of particulate (sediment) control needed (TSS - total suspended solids)

3. Amount of phosphorus control needed (TP - total phosphorus)

Output

1. Volume removed by practice (cubic feet)

2. Additional volume removal needed to meet requirement.

3. % Volume removed

4. Annual phosphorus load removed by BMP (lbs/yr)

5. % Annual phosphorus removed

6. Annual TSS removed (ls/yr)

7. % of Annual TSS removed

Potential Applications for MIDS Calculator

- MS4 Permit:
- Construction Stormwater Permit: permanent treatment
- TMDL Load Reporting: credits that demonstrate measurable progress
- Watershed Districts' and SWCD BMP Cost-Share Programs
- Grant applications and reporting

How does MIDS calculator compare to the EPA calculator?

EPA Calculator

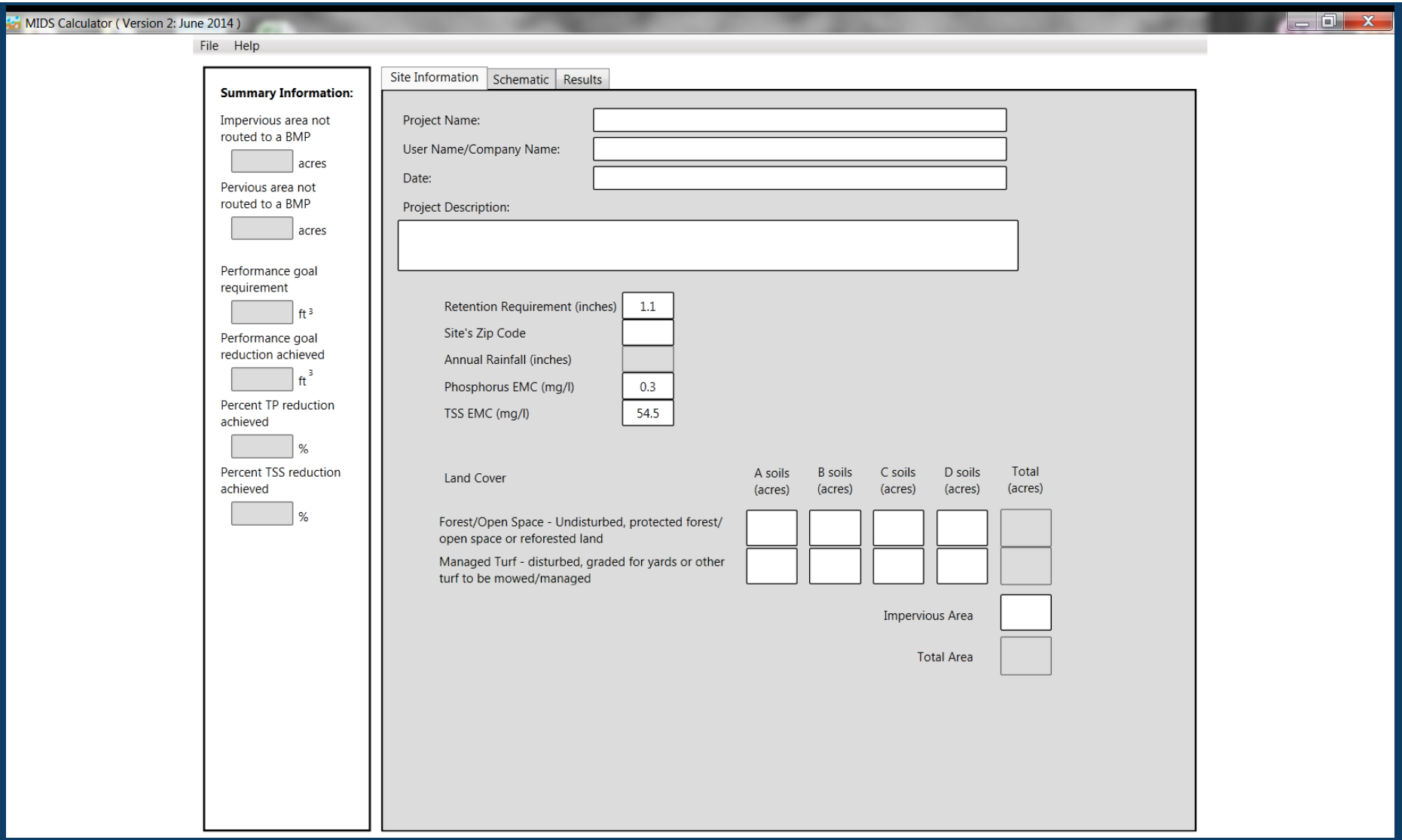
- ✓ Uses SWMM methodology to calculate runoff volumes and reductions
- Does not allow multiple soil types
- Does not allow multiple BMPs of one type
- Only includes volume reduction BMPs. Does not include swales
- Cannot be used to calculate MIDS performance goal requirement or conformance

Results comparison using Exercise 1

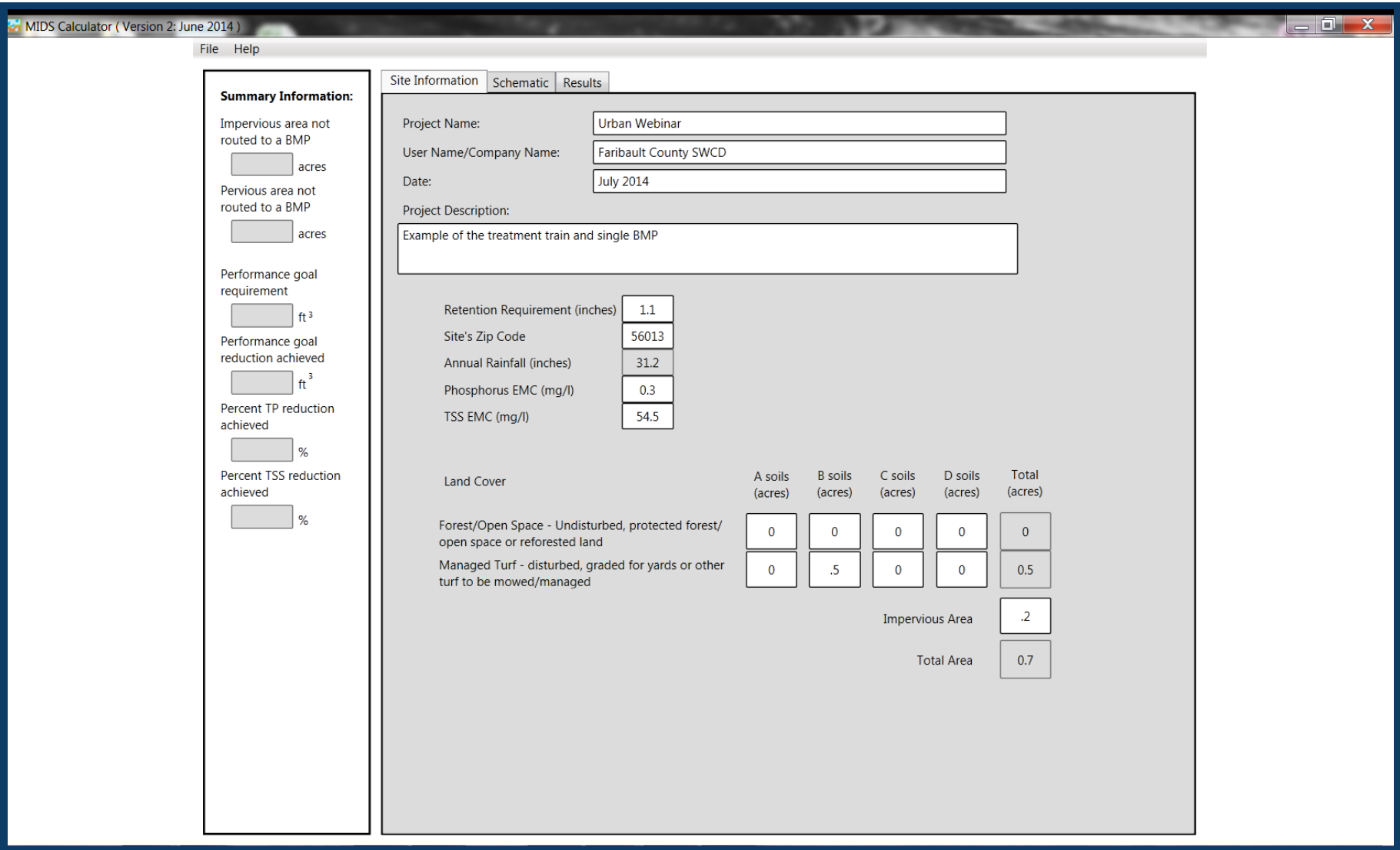
	Percent of Performance Goal Achieved (1.1 inches off impervious surfaces)	Percent Annual Volume Reduction	Percent Annual TP reduction	Percent Annual TSS reduction
MIDS Calculator	86%	87%	87%	87%
EPA Calculator	N/A	91%	N/A	N/A
P8*	N/A	86%	90%	97%
WinSLAMM*	N/A	81%	71%	79%

*Modeling conducted 1955 – 2004. Took out super storm of July 23-24, 1987.

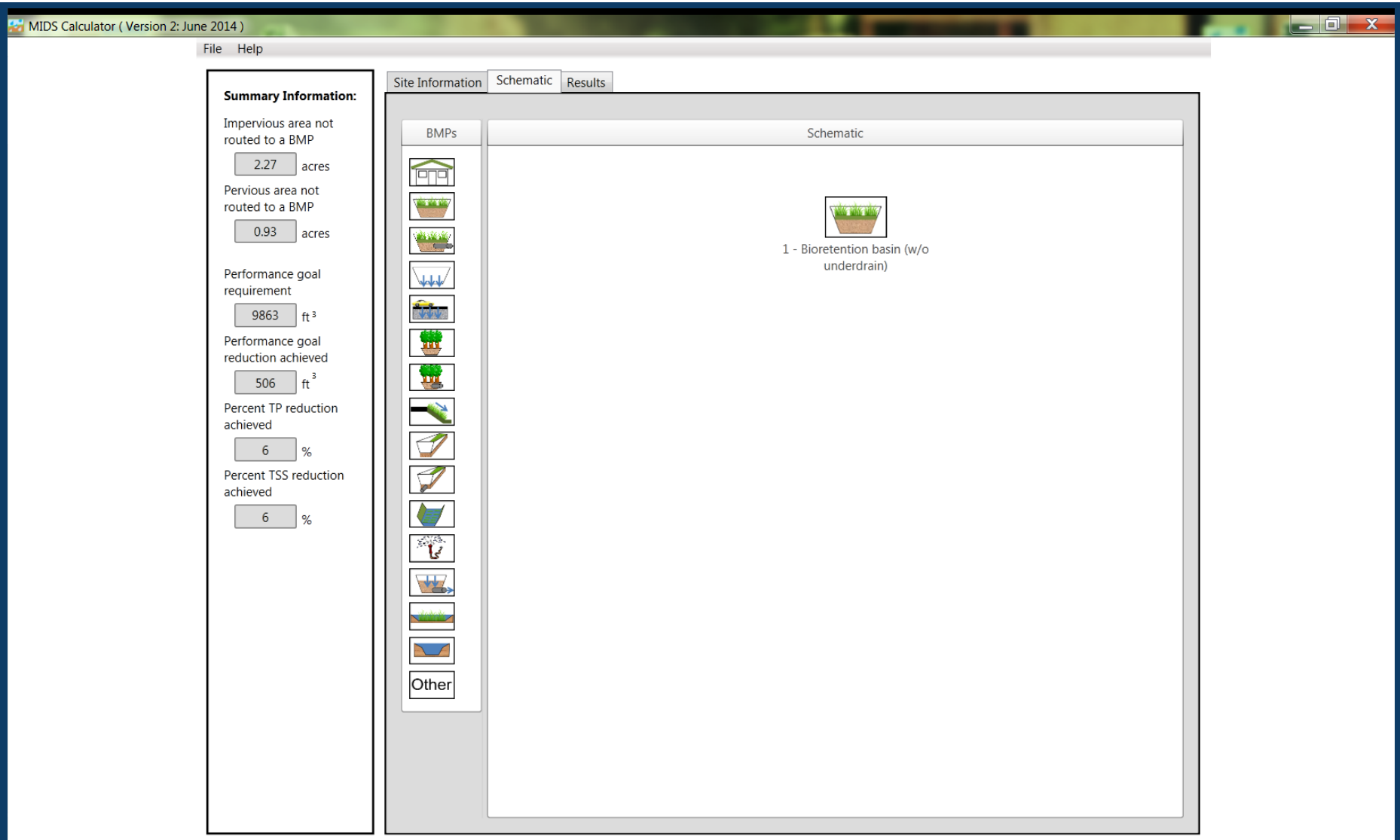
Process


MIDS Calculator (Version 2: June 2014)
File
Help
Summary Information:
Impervious area not routed to a BMP
acres
Pervious area not routed to a BMP
acres
Performance goal requirement
ft 3
Performance goal reduction achieved
ft 3
Percent TP reduction achieved
%
Percent TSS reduction achieved
%
Site Information
Schematic
Results
Project Name:
User Name/Company Name:
Date:
Project Description:
Retention Requirement (inches)
1.1
Site's Zip Code
Annual Rainfall (inches)
Phosphorus EMC (mg/l)
0.3
TSS EMC (mg/l)
54.5
Land Cover
A soils (acres)
B soils (acres)
C soils (acres)
D soils (acres)
Total (acres)
Forest/Open Space - Undisturbed, protected forest/ open space or reforested land
Managed Turf - disturbed, graded for yards or other turf to be mowed/managed
Impervious Area
Total Area

Process Continued



Process Continued



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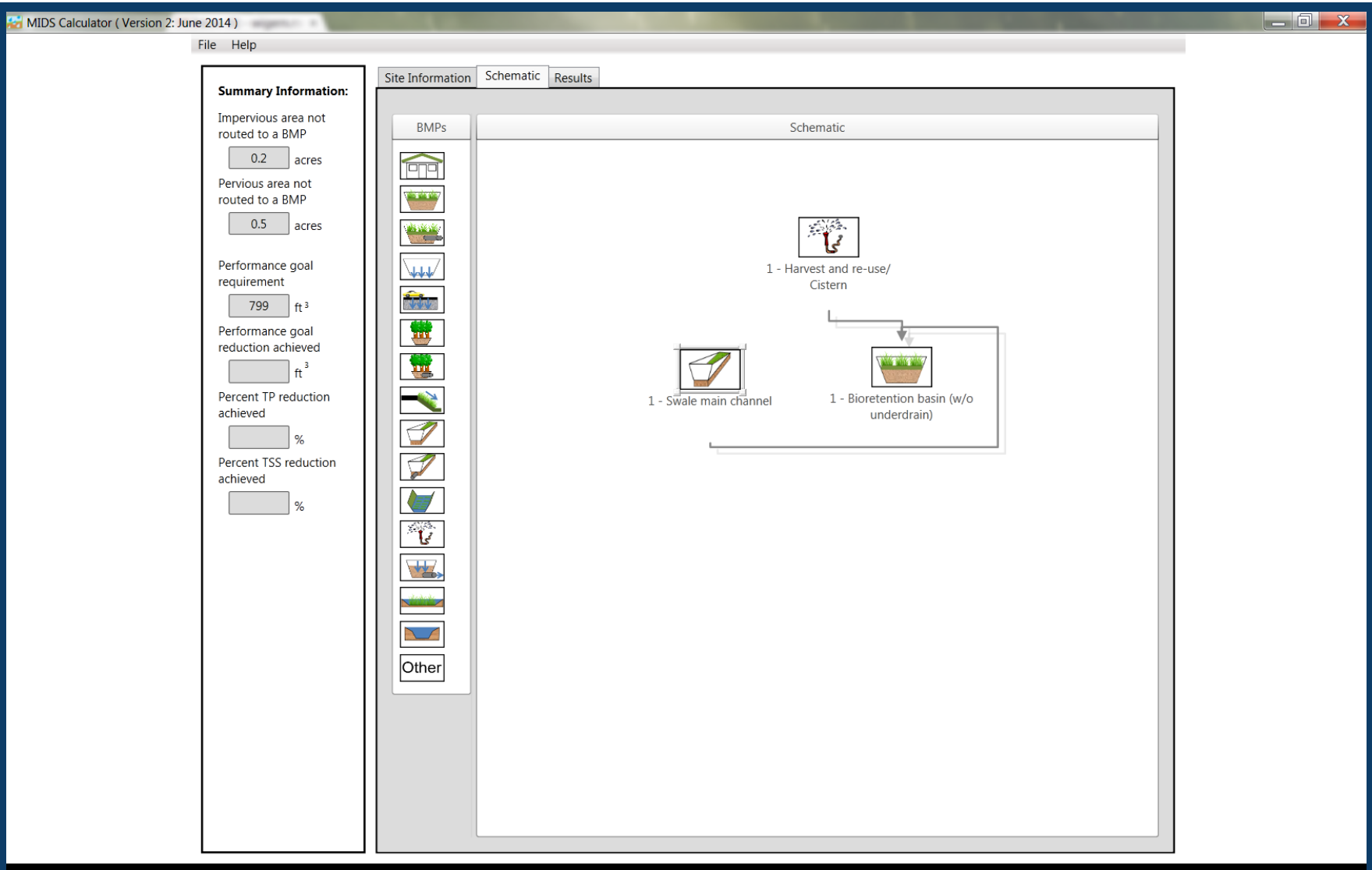
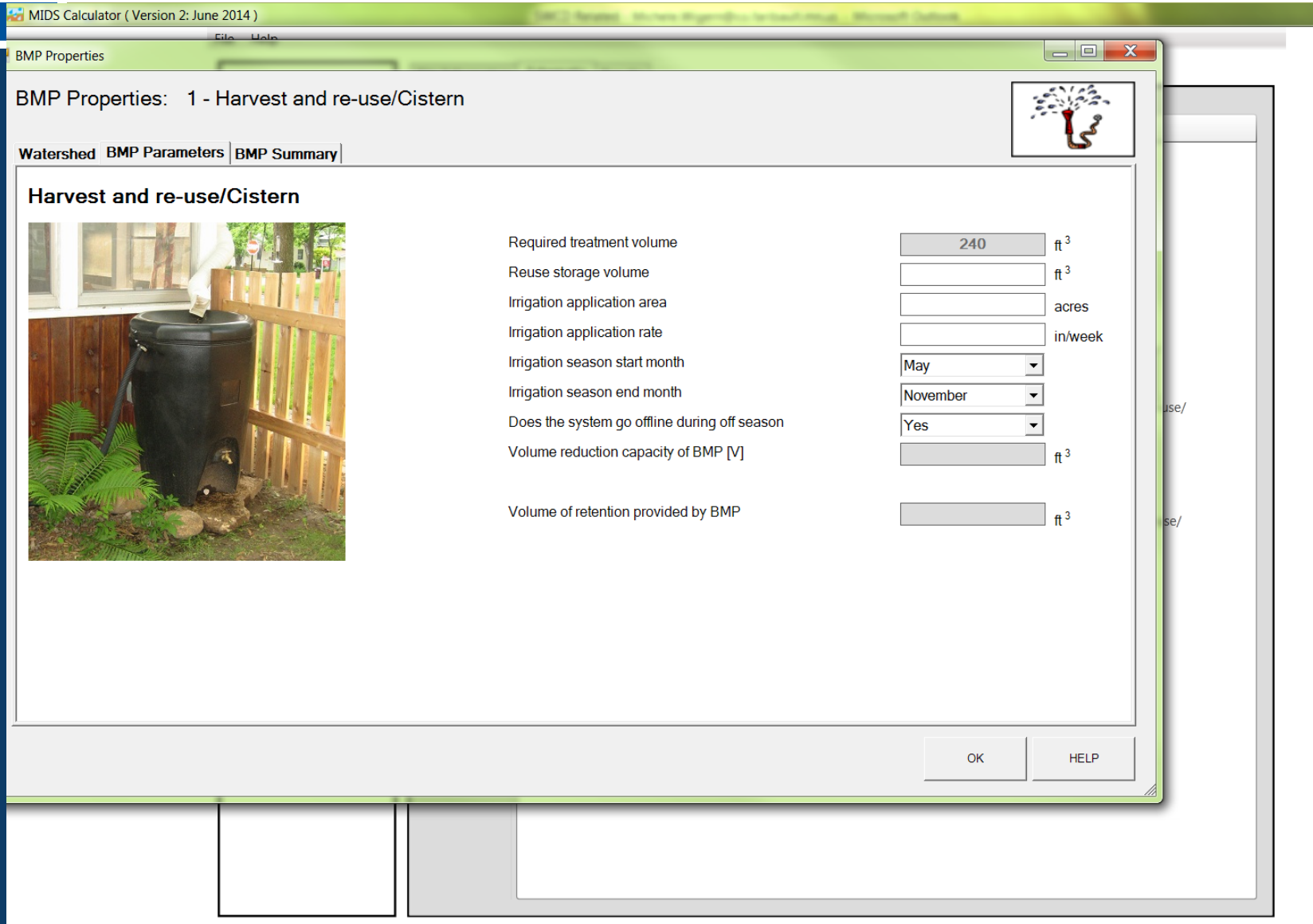


Process Continued



Site Information | Schematic | Results

Summary Information

Performance Goal Requirement

Performance goal volume retention requirement:	799	ft3
Volume removed by BMPs towards performance goal:	92	ft3
Percent volume removed towards performance goal	**12**	**%**

Annual Volume and Pollutant Load Reductions

Post development annual runoff volume	0.6786	acre-ft
Annual runoff volume removed by BMPs:	0.065	acre-ft
Percent annual runoff volume removed:	**10**	**%**
Post development annual particulate P load:	0.3	lbs
Annual particulate P removed by BMPs:	0.03	lbs
Post development annual dissolved P load:	0.25	lbs
Annual dissolved P removed by BMPs:	0.02	lbs
Percent annual total phosphorus removed:	**9**	**%**
Post development annual TSS load:	101	lbs
Annual TSS removed by BMPs:	10	lbs
Percent annual TSS removed:	**10**	**%**

BMP Summary

Performance Goal Summary

BMP Name	BMP Volume Capacity (ft3)	Volume Recieved (ft3)	Volume Retained (ft3)	Volume Outflow (ft3)	Percent Retained (%)
1 - Bioretention basin (w/o underdrain)	169	79	79	0	100
1 - Swale main channel	5	32	5	27	16
1 - Harvest and re-use/Cistern	8	20	8	12	40

Annual Volume Summary

Site Information | Schematic | Results

BMP Name	Volume From Direct Watershed (acre-ft)	Volume From Upstream BMPs (acre-ft)	Volume Retained (acre-ft)	Volume outflow (acre-ft)	Percent Retained (%)
1 - Bioretention basin (w/o underdrain)	0.0339	0.0207	0.0535	0.0011	98
1 - Swale main channel	0.0211	0	0.0075	0.0136	35
1 - Harvest and re-use/Cistern	0.0111	0	0.004	0.0071	36

Particulate Phosphorus Summary

BMP Name	Load From Direct Watershed (lbs)	Load From Upstream BMPs (lbs)	Load Retained (lbs)	Outflow Load (lbs)	Percent Retained (%)
1 - Bioretention basin (w/o underdrain)	0.02	0	0.02	0	98
1 - Swale main channel	0.01	0	0.01	0	83
1 - Harvest and re-use/Cistern	0	0	0	0	36

Dissolved Phosphorus Summary

BMP Name	Load From Direct Watershed (lbs)	Load From Upstream BMPs (lbs)	Load Retained (lbs)	Outflow Load (lbs)	Percent Retained (%)
1 - Bioretention basin (w/o underdrain)	0.01	0.01	0.02	0	98
1 - Swale main channel	0.01	0	0	0.01	35
1 - Harvest and re-use/Cistern	0	0	0	0	36

TSS Summary

BMP Name	Load From Direct Watershed (lbs)	Load From Upstream BMPs (lbs)	Load Retained (lbs)	Outflow Load (lbs)	Percent Retained (%)
1 - Bioretention basin (w/o underdrain)	5	2	7	0	98
1 - Swale main channel	3	0	2	1	79
1 - Harvest and re-use/Cistern	2	0	1	1	36

Stormwater Smart

Stormwater planters, pervious pavement, rain barrels and raingardens

Total reduction using MIDS calculator was 336 cubic feet, .58# total Phosphorus and 207# TSS annually.

More Information

- Faribault County SWCD: Michele Wigern; michele.wigern@co.faribault.mn.us
- Minnesota Stormwater Manual: http://stormwater.pca.state.mn.us/index.php/Overview_of_Minimal_Impact_Design_Standards_(MIDS)
- MN Pollution Control Agency contact: Anne Gelbmann; anne.gelbmann@state.mn.us