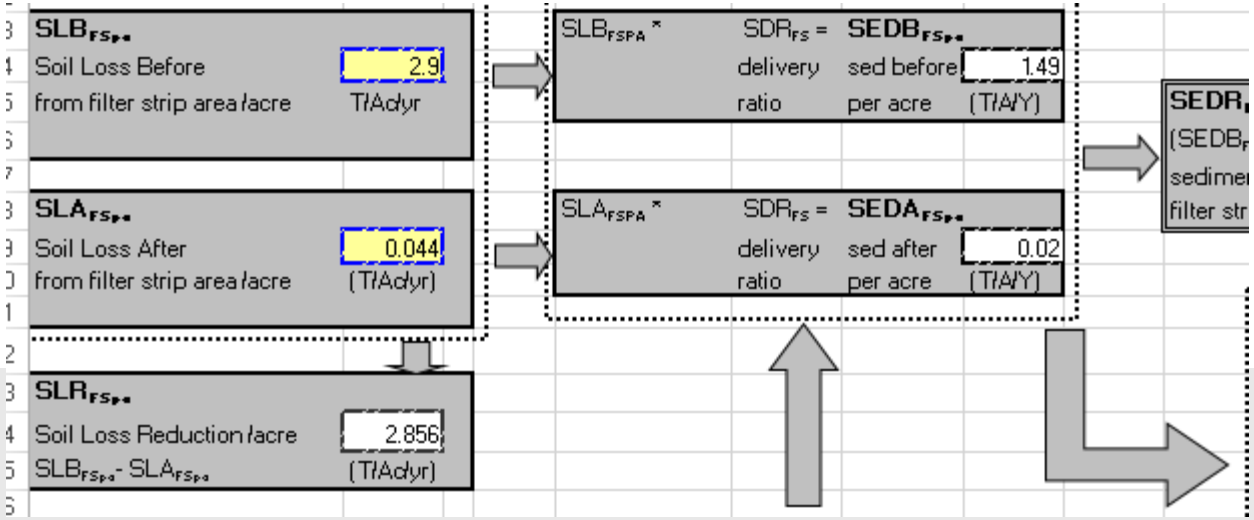
BOARD OF WATER AND SOIL RESOURCES

Module 1: BWSR Estimator 101



What is the history development?

- Created in the 1990s for the first BWSR reporting system LARS (before eLINK),
- BWSR collaborated with the MPCA and a team of technical experts to develop,
- Estimators have been in spreadsheet form since the late 2000's, and
- Algorithms have not been changed since the early 2000's.

Why the BWSR Estimators were initially Developed?

- The need to measure pollution reduction estimates for BWSR funded projects,
- Relatively easy to use tool that would provide estimates for a number of the commonly reported BMPs in eLINK,
- Data outcomes from the estimators used to show level of effort with BMPs with State funding, and
- In the past, more sophisticated watershed models were not available.

What do these estimators actual calculate?

- An estimate of field scale soil erosion, sediment, and attached phosphorus reduction from installed practices,
- Sediment and phosphorus reduction estimates only to the nearest surface water body, and
- Reduction estimates for a limited number agricultural and riparian structural and vegetative practices.

How do these estimators work?

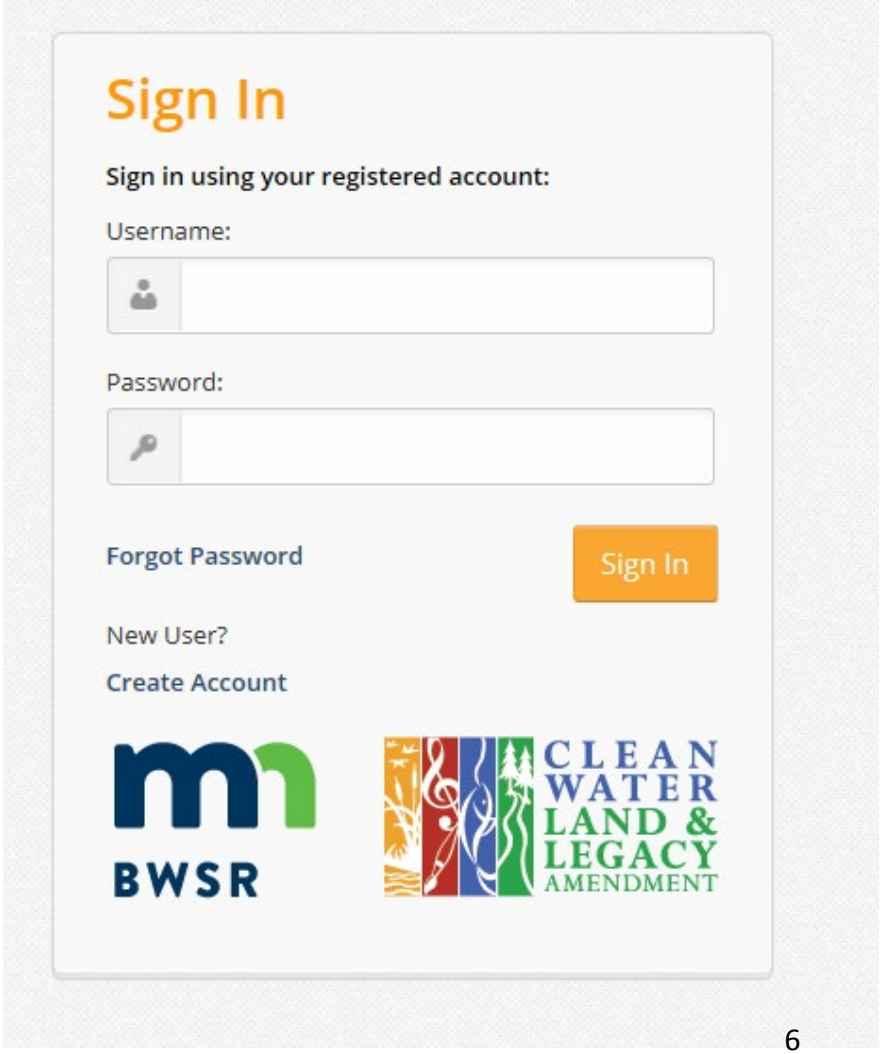
- The edge of field estimates then calculate an estimated **Sediment Delivery Ratio (SDR)** based on the distance to the nearest receiving water body,
- The Estimator applies the SDR to the estimated soil loss reduction to produce an estimate of sediment reduction,
- Attached phosphorus reduction is derived from sediment delivery and a coefficient based on soil type.

The USDA NRCS Agricultural Non-Point Source Pollution Model (AGNPS) was used as the basis for the creation of the Estimator

https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/null/?cid=stelprdb1042468

What are the intended uses of the estimators today?

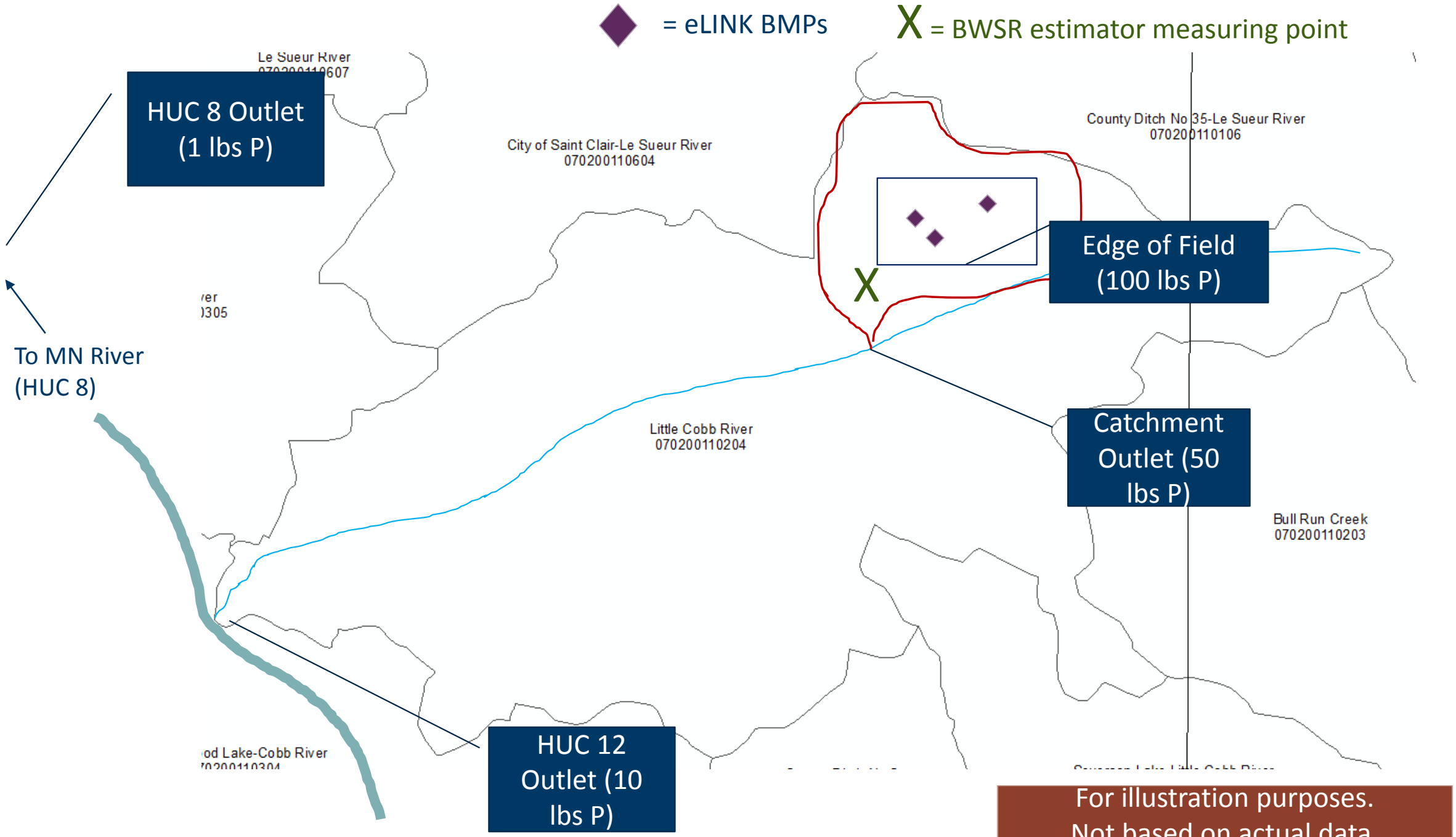
- Provide **pollution reduction estimates** for a limited set of common best management practices,
- Estimates may be used for reporting outcomes for BWSR **grant applications** and **eLINK reporting** for BWSR Grants, and
- Estimators may be used to help determine **feasibility and impact** of proposed practices at the field scale.



What is the scale of the estimators?

- Estimator outputs provide **field scale** reductions for soil, sediment, and phosphorus,
- Estimates do not consider **attenuation of pollutants** to down stream locations or watershed outlets, and
- Watershed based models and more sophisticated tools results can not be directly compared.

SCALE

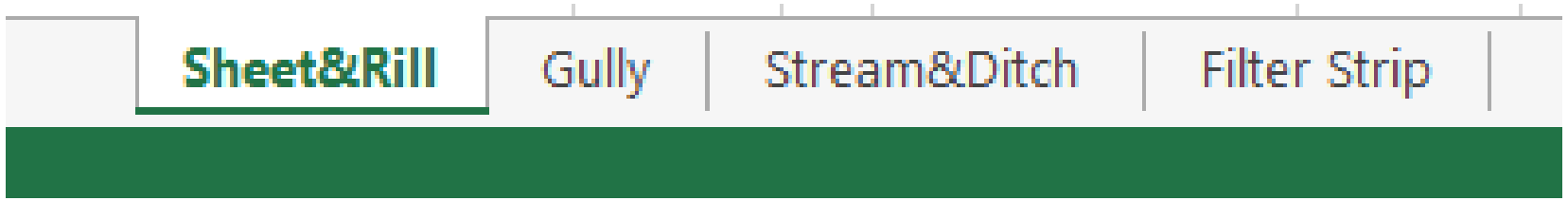

◆ = eLINK BMPs
X = BWSR estimator measuring point
HUC 8 Outlet (1 lbs P)
To MN River (HUC 8)
Le Sueur River
City of Saint Clair-Le Sueur River 070200110604
County Ditch No 35-Le Sueur River 070200110106
Edge of Field (100 lbs P)
X
Little Cobb River 070200110204
Catchment Outlet (50 lbs P)
Bull Run Creek 070200110203
HUC 12 Outlet (10 lbs P)
For illustration purposes. Not based on actual data.

What are the limitations?

- Limited Number and Measured Parameters
- Limited Best Management Practice Types
- Ball Park Figures
- Connection to Watershed Goals

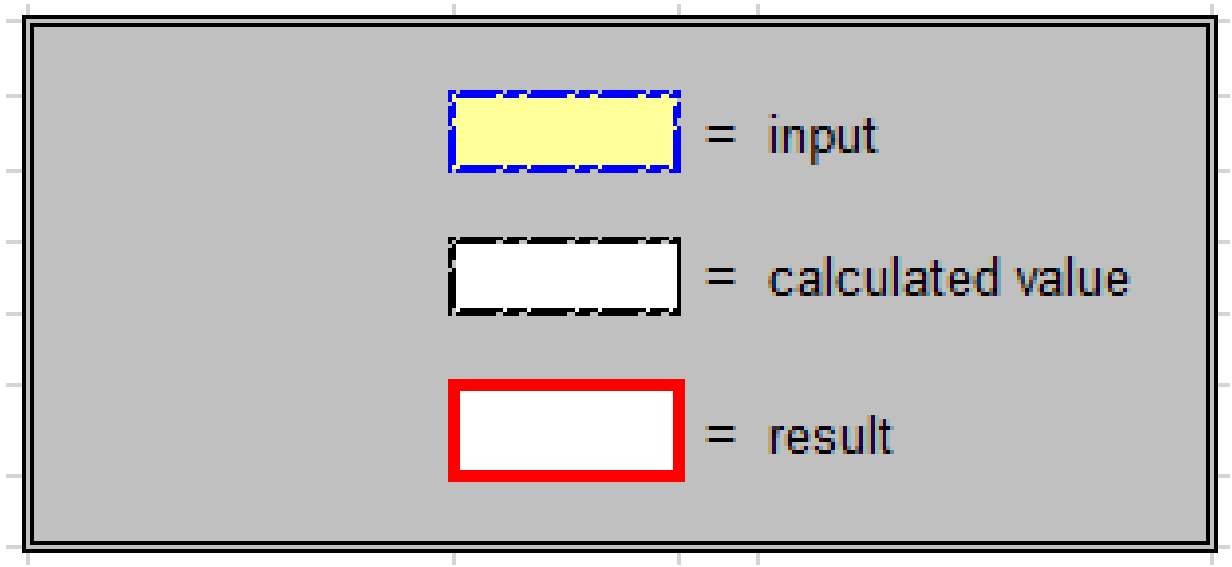
BWSR Estimators not Appropriate for 1W1P Goals

What are the components of this spreadsheet tool?



- 4 Tabs to Spreadsheet representing each individual model, and
- RUSLE2 input data needed for Sheet/Rill and Filter Strip.

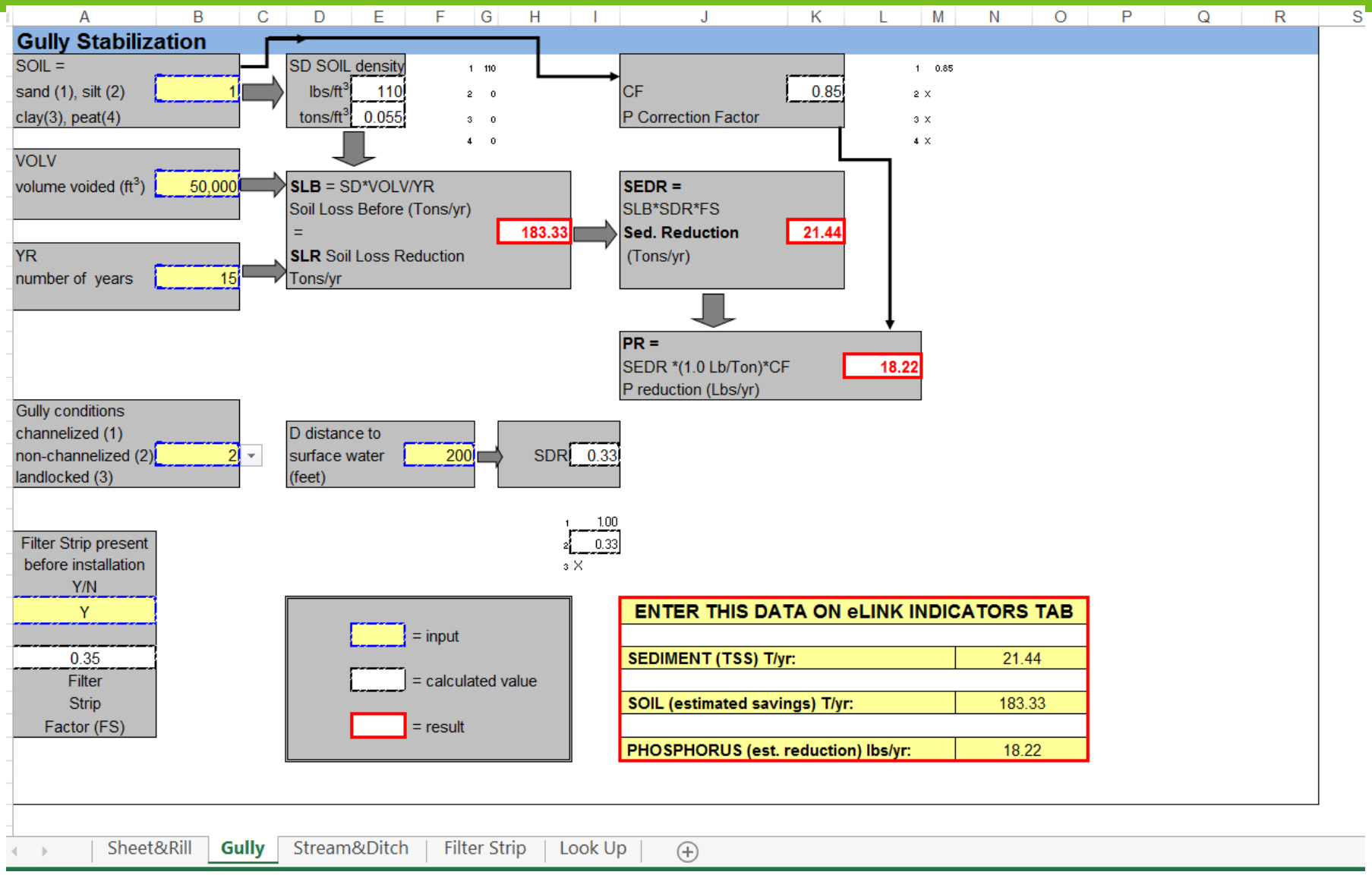
Input Data in the YELLOW Boxes



Estimator Outcomes

ENTER THIS DATA ON eLINK INDICATORS TAB	
SEDIMENT (TSS) T/yr:	17.67
SOIL (estimated savings) T/yr:	11.98
PHOSPHORUS (est. reduction) lbs/yr:	47.59

What do the spreadsheets look like?



What are common errors when using the spreadsheets?

- Field data collection errors,
- Selecting the wrong menu option from the pull downs,
- Data entry errors (typing 100 when you mean 10),
- Underestimating the time for stream bank failures and gullies to form,
- Inputting incorrect RUSLE2 data, and
- Using the estimators to calculate reductions for BMPs not appropriate for the estimator.

What are BWSR's future plans for the estimators?

User support and training,

No planned enhancements,

Gradual replacement from newer models/tools/estimators, and

Phase out plan in 2020s.

Where can I get more information?

- BWSR Estimator Manual (2010)
- PowerPoint Presentations on BWSR website
- Videos on how to use BWSR Estimators
  - BWSR will be developing videos in 2020.
- Staff Contact: Matt Drewitz, Measures and Outcomes Coordinator
  - Email: matt.Drewitz@state.mn.us
  - Phone: 507-344-2821