

**Watershed:** Rock and Little Sioux Watersheds (HUC8s 10170204 & 10230003) - Two separate models  
**Delivery date:** May 30, 2014  
**Modeler(s):** A. Rutz, C. Lupo  
**Reviewer(s):** C. Lupo, S. Kenner, M. Burke, C. McCutcheon

wq-iw7-44q

The QA/QC procedure outlined below was performed on the HSPF Model Application developed for the above listed watershed(s).  
The following components have been reviewed:

Component	Modeler	Reviewer
UCI file	AJR - May 2013	CDL - Mar, 2014
WDM file	AJR - May 2013	CDL - Mar, 2014
Hydro Calibration	CDL - Oct, 2013	CDL - Mar, 2014
WQ Calibration	CDL - Apr, 2014	SJK - May, 2014
GenScn Project	CDL - May, 2014	CMM - May, 2014
Deliverables	CDL - May, 2014	CMM, TPW - May, 2014

#### QAQC for UCI and Model Development

Item	Notes
Files	All files called/created correctly, correct HBNS being writing to correct files
Simulation Flags	All correct flags turned on for complete hydro WQ simulation, no lakes
Parameters	All possible PERLNDS, IMPLNDS, RCHRES operations accounted for in all parameter blocks
Opn Sequence	All operations in schematic are called out in opn sequence, rch to rch connections are correct
F-Tables	Correct slope used, all Ftable values are consistent and reasonable
<i>SCHEMATIC BLOCK</i>	
Total Area	Less than 0.001% difference between schematic and GIS total areas
Landuse Area	Less than 2% difference for schematic LU and GIS LU - differences due to feedlots
Subwatershed Area	Average 0.8% difference in area from schematic subwatersheds and GIS subwatersheds
LU Area by Sub	Average 0.8% difference - large differences observed due to feedlot classification in GIS - not an issue
Feedlot Areas	Feedlot areas correct. Animal Units > 1000 separated out correctly
Tillage Data	Tillage data applied correctly
<i>MASS LINK BLOCK</i>	
Operations	All valid constituents from Land routed to Reaches
Soils	Not enough difference in soils so only 1 PERLND mass link

Factors	All factors are the standards currently being used
Feedlots	Separate Mass Links for MN Feedlots >1000 AU and Feedlots < 1000
Special cases	MS4 areas separated and called out correctly. No non-contrib area, multiple exits - no action needed
<b>EXT SOURCES BLOCK</b>	
Met	PEVT was used from BASINS - fixed to use calculated Penman Pan values based on other met data - not an issue
Ag Detached Sed	Detached sediment applied correctly to low and high till cropland
Point Sources	All facilities are Class C, D, or POWER - if no class was given, assumed class was based on description and flow. Assumed missing N loads applied correctly; all other factors applied correctly
Atm Deposition	Correct stations used; correct member #s applied to operations
Boundary Conditdions	No boundary conditdions needed

### QAQC for Hydrologic and Water Quality Calibration

Item	Notes
Water Balance	Pasure/Grasslandshigher SURO than Ag low till - most pasture area is in a hydrozone with a slope > 3X that of the average Ag slope - not an issue
Hydro Stats	All daily r <sup>2</sup> range from 0.63 to 0.82 (fair to very good) and monthly from 0.83 to 0.89 (good to very good) for all primary and secondary gages - statistics and duration withing acceptable ranges
Hydro Validation	There was little change in statistics for the 2001 landuse and the split sample periods for all primary and secondary gages
Source Allocation	Loadings values by landuse seem reasonable. Larger per acre loadings for subwatersheds seems to be due to # of feedlots and developed areas
Upstream/Local Conc	Rch 170 Rock (high load - Lavurne WWTP)

### QAQC for Deliverables

Item	Notes
Model	All models run when coppied from folder to C: drive
GenScn	All projects open and run. All projects' WDMs are linked to features
Memos	Memos reviewed by two people, all maps and wordage match what was actually modeled
Geodatabase	All features used in model development, all features contain metadata