

# GREEN MEADOW SUBWATERSHED

PL-566 SMALL Watershed Planning



# Meeting Objectives:

- Inform Interdisciplinary Project Team
  - *Present Model Results*
  - *Present Without Project Condition*
  - *Public Meeting / Scoping Outcome*
- Revised Purpose and Need/Goals and Objectives

# Agenda

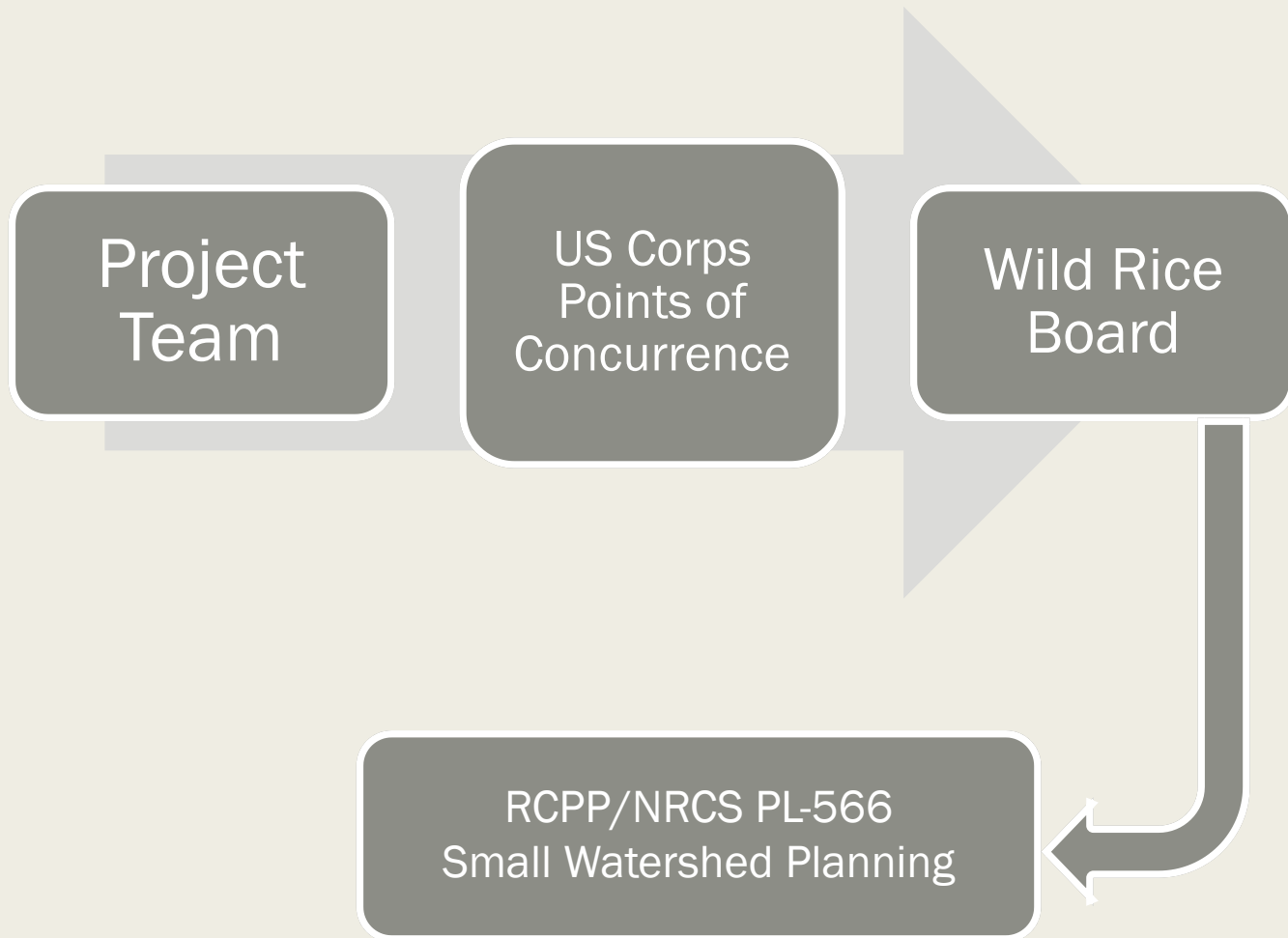
- Activity Re-Cap Since April Meeting
- PL83-566 Process Review/Timeline
- Without Project Condition
  - *H/H Model Results*
  - *Water Quality*
  - *Agriculture*
  - *Structures/infrastructure*
- Scoping
- Review and revise Purpose and Need Goals and Objectives
- Next Steps
- Adjourn

# RECAP/REVIEW

PL 566 Planning Process Roles and Responsibilities



# GREEN MEADOW Mediation Agreement/Points of Concurrence



# Small Watershed Program - Public Law 83-566 (PL-566)

- Federal Program – Federal Assistance to Sponsors (\$)
  - *Watershed Planning*
  - *Project Construction (...maybe)*
- To contribute to national economic development (NED) consistent with protecting the nation’s environment.
- **REQUIRES** the development of physically, environmentally and **ECONOMICALLY** sound plan of improvements

# Small Watershed Program - Public Law 83-566 (PL-566)

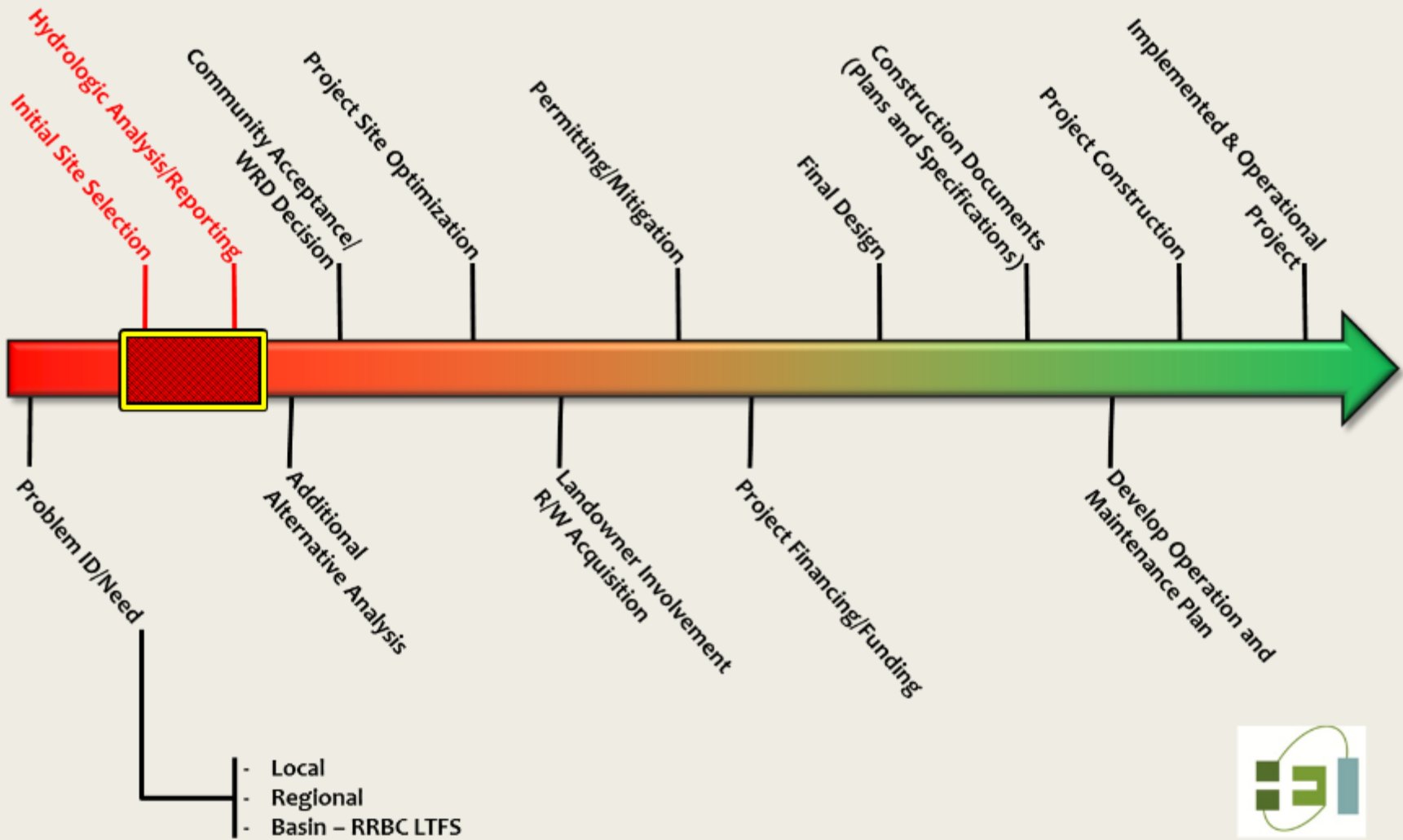
- “Small” Watershed ( $\leq$  250,000 acres)
- Prevent damage from erosion, floodwater and sediment.
- Further conservation, development, utilization and disposal of water.
- Further conservation and proper utilization of land.

# PL-566 Planning Steps

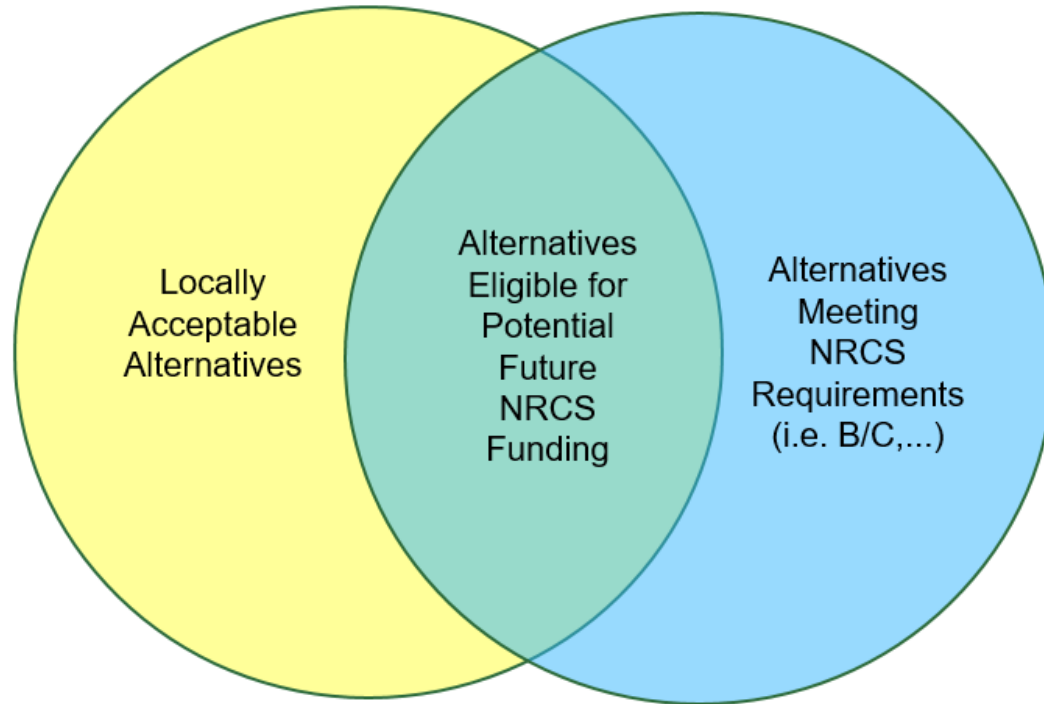
## LOCALLY LED PROCESS

- Identify Problems and Concerns
- Determine Objectives (P and N/Scope)
- Inventory Resources
- Analyze Resource Data
- Formulate Alternatives
- Evaluate Alternatives
- Make Decisions

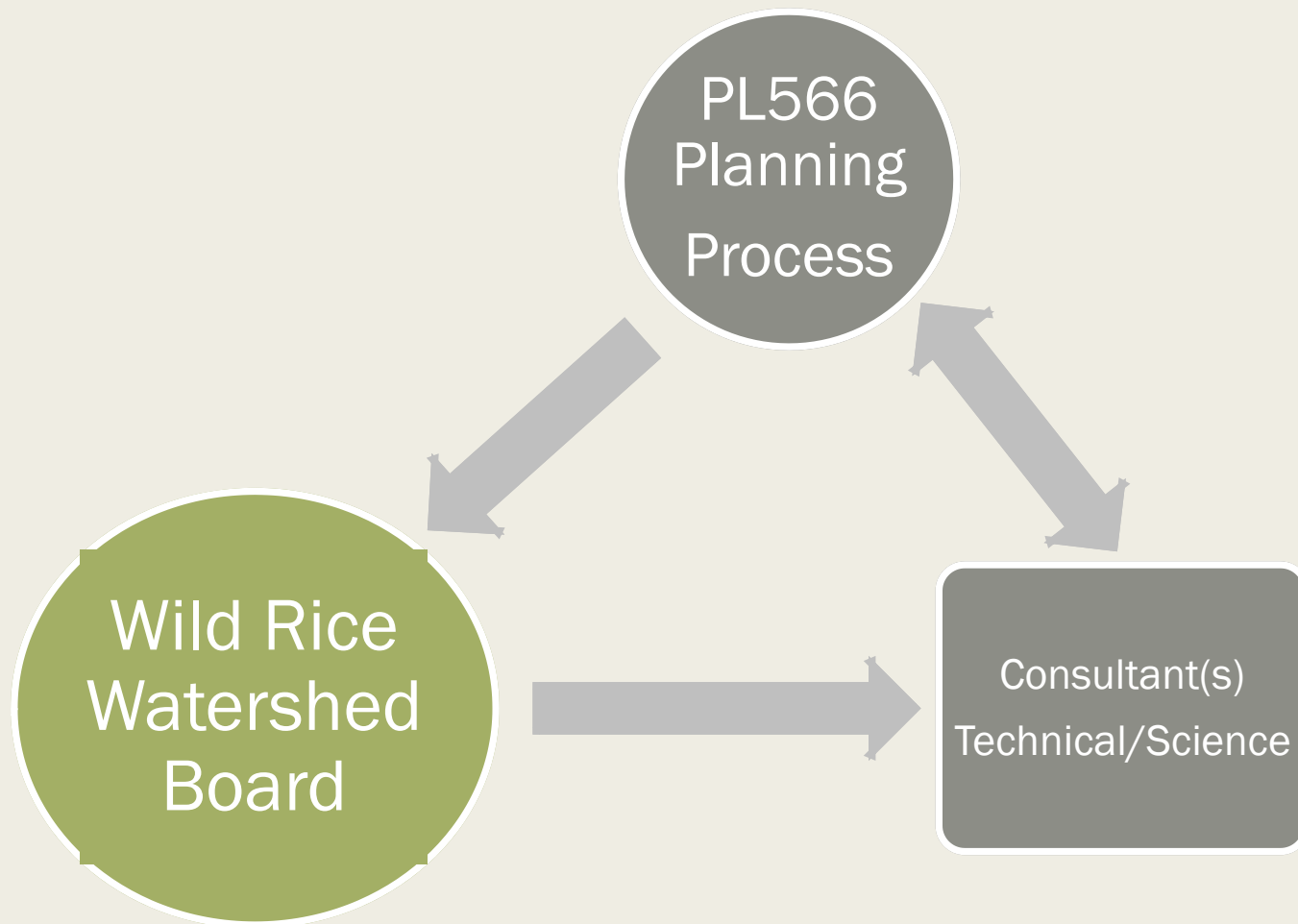




# RCPP Study Process







# STUDY SCOPING



# Public Scoping Meeting

- May 5<sup>th</sup> 2016
- Solicit public comment to help inform the study scope
  - *Flooding/Flood Damages*
  - *Water Quality/Erosion and Sedimentation*
  - *Wildlife and Habitat*

# Summary of public feedback

3 Response Forms Submitted/Returned:

	No Concern	Minimal Concern	Minor Concern	Moderate Concern	Significant Concern	Severe Concern
Flooding/Flood Damages	X	X				
WQ/Erosion/Sedimentation	X		X			
Wildlife & Habitat	X	X				
Others (please describe...)					X	X X

Significant:

- *Repair GM Dam/Dam safety*

Severe Concern:

- *Local culvert issue / local flooding\**
- *"...pleased to remain unmolested by government..."*

# WITHOUT PROJECT CONDITION

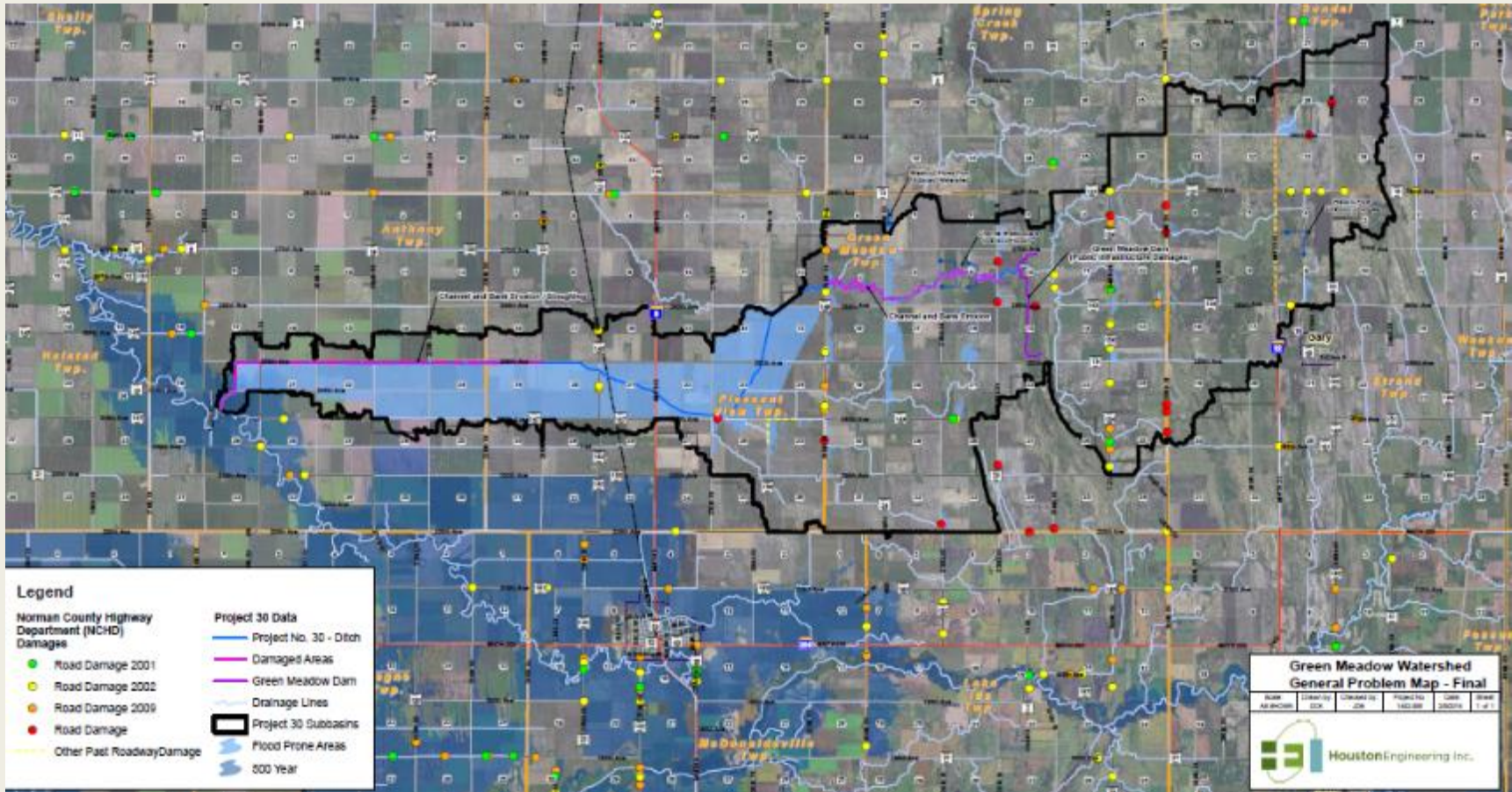
Green Meadow Subwatershed





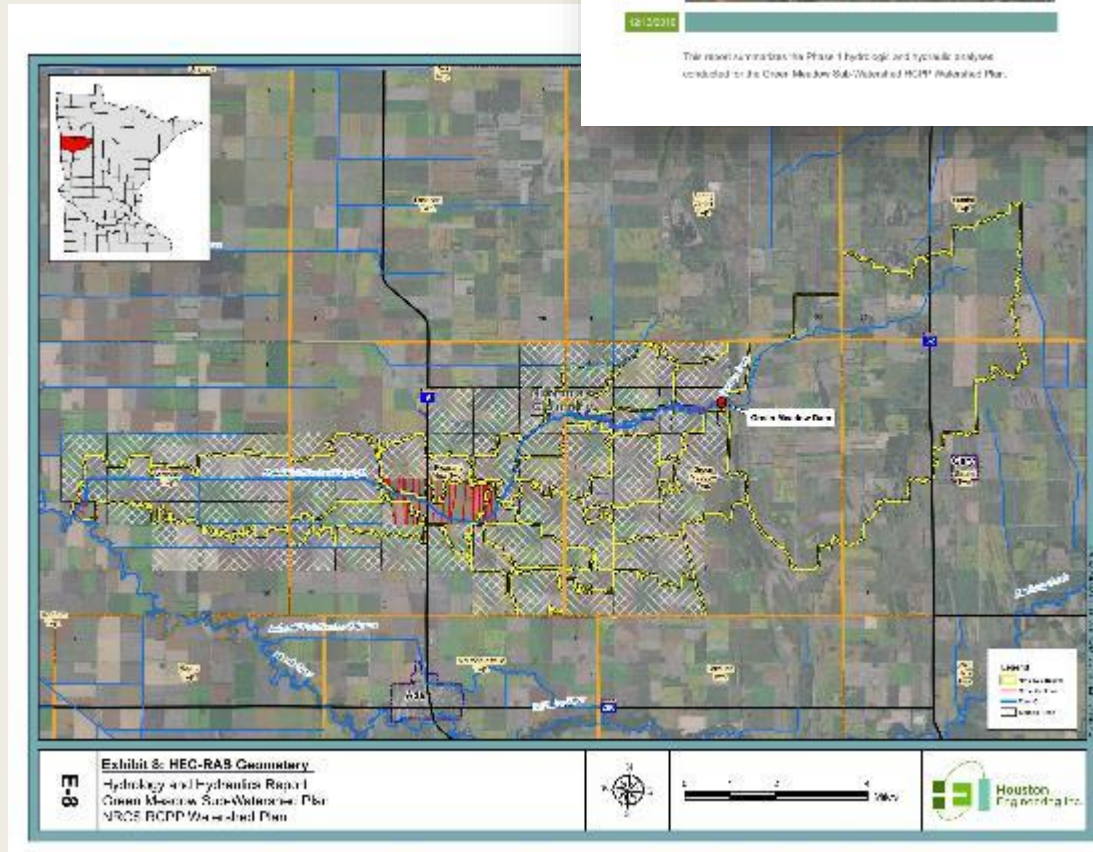
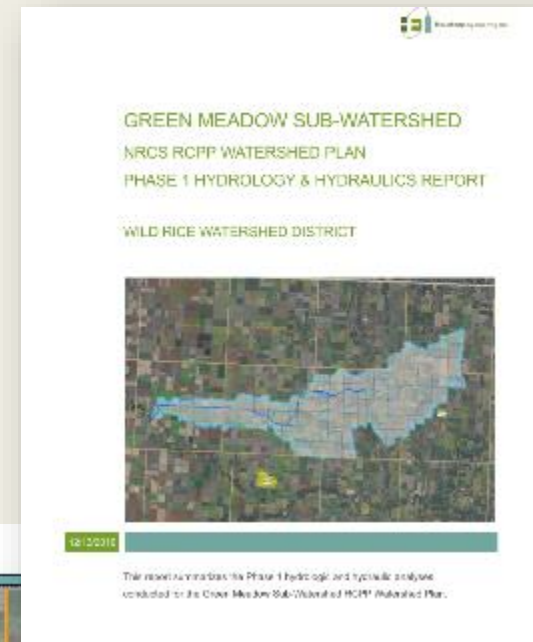
# Flood Damages/Flood Prone areas

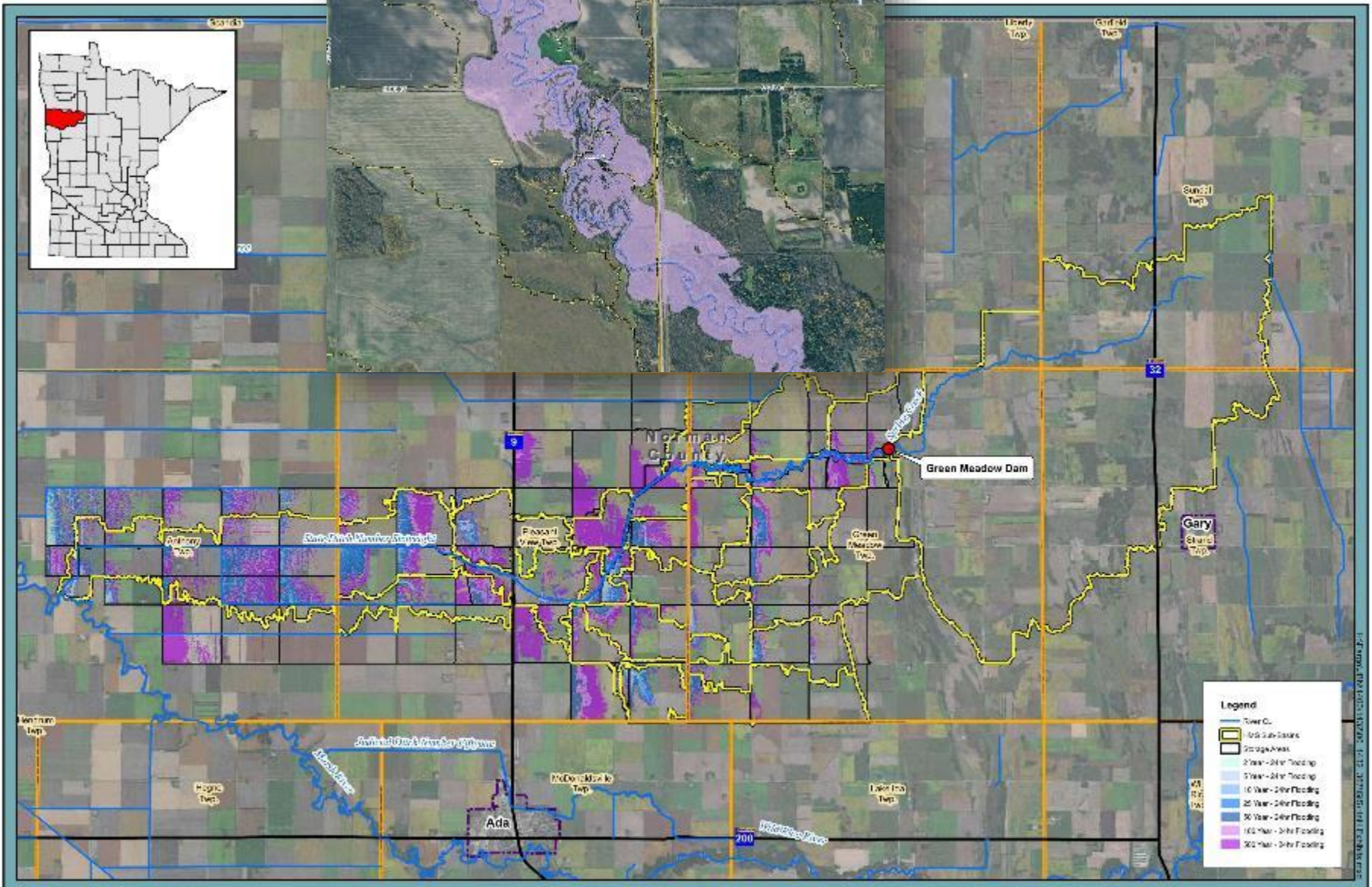
Inundation map used as reference



# Model Results

- H/H Report
  - Various Rain and Runoff Events (24hr - 10day)
  - Flows
  - Inundated Areas



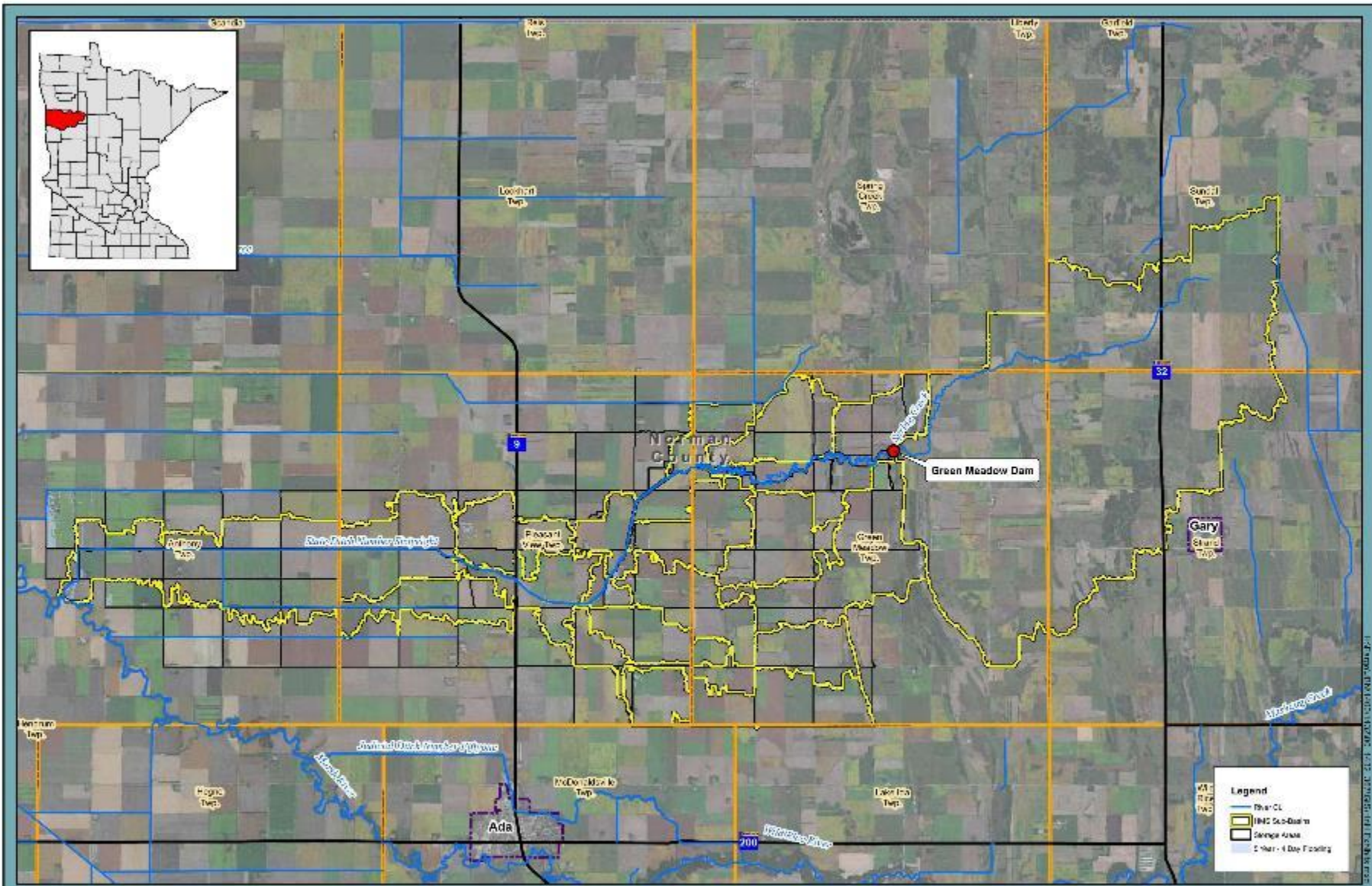


E-9.1

**Exhibit 9.1: 24hr Flood Events (All)**  
 Hydrology and Hydraulics Report  
 Green Meadow Sub-Watershed Plan  
 NRCS RCPP Watershed Plan



1:2" map, 1000' contour, 1:12" aerial photo, 1:25000' topographic

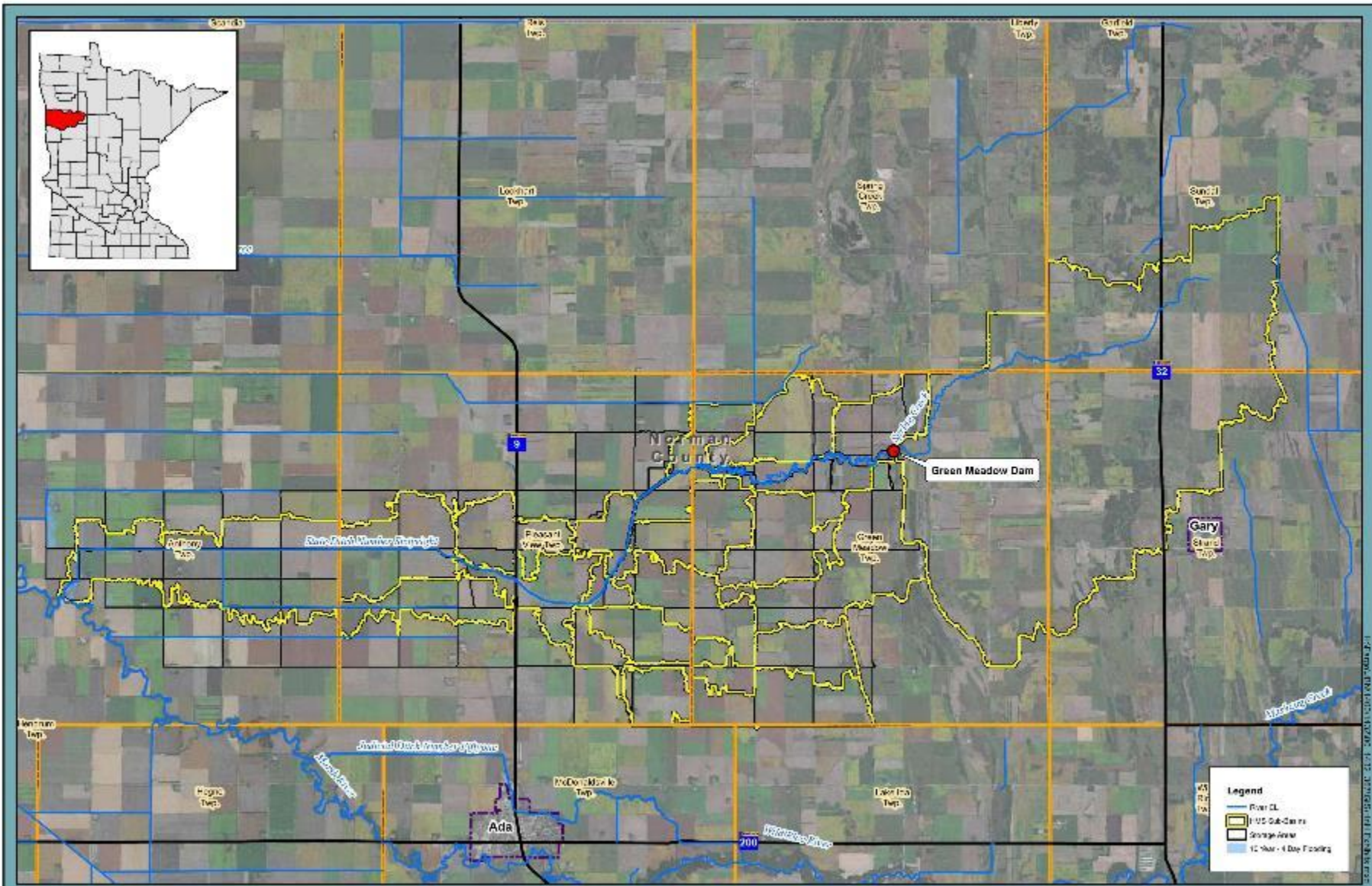


**E-10.3**

**Exhibit 10.3: 4 Day Flood Events (5 - Year)**  
 Hydrology and Hydraulics Report  
 Green Meadow Sub-Watershed Plan  
 NRCS RCPP Watershed Plan



1:2" map - 100 feet contour - 10' contour interval

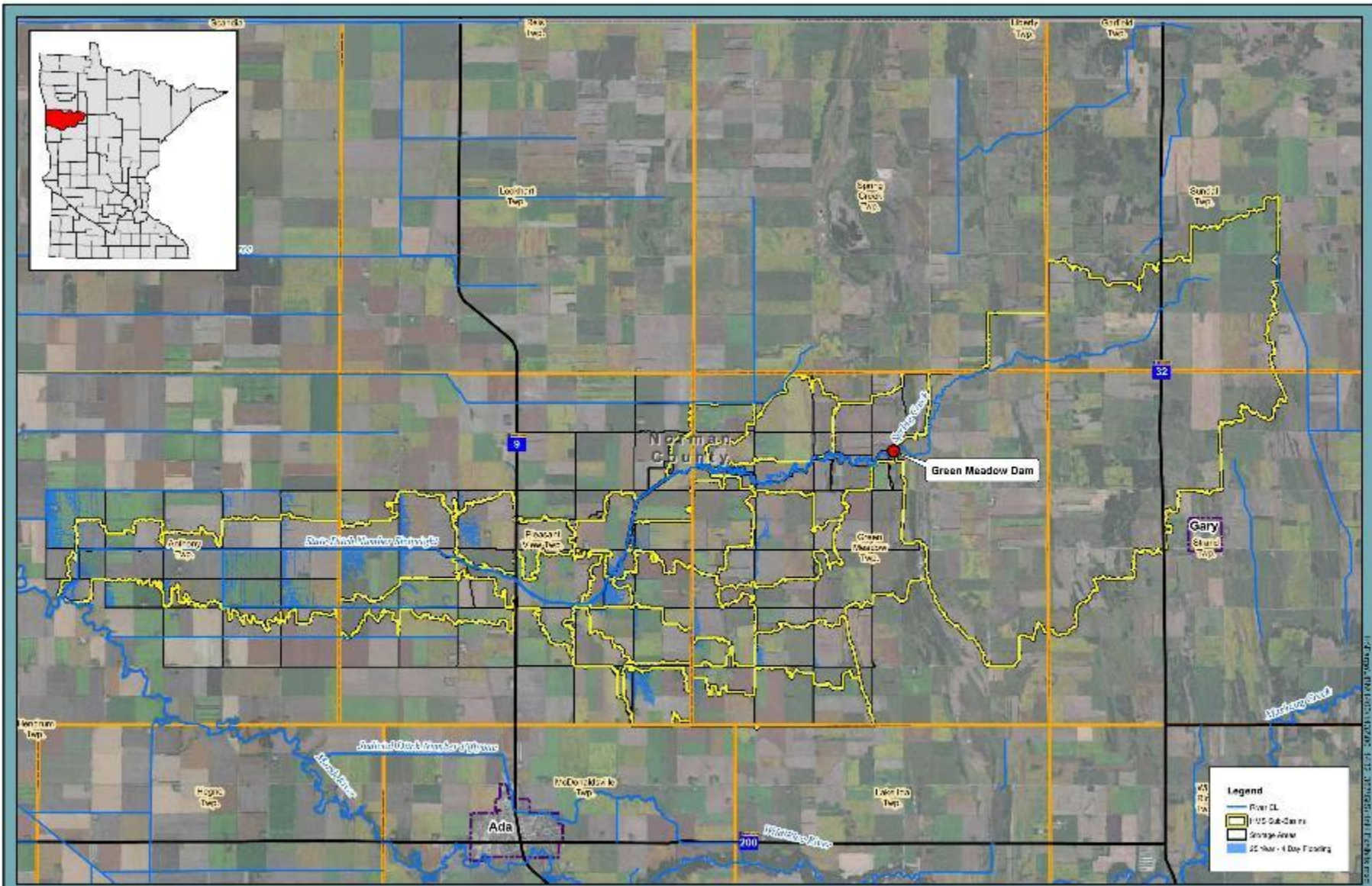


E-10.4

**Exhibit 10.4: 4 Day Flood Events (10 - Year)**  
 Hydrology and Hydraulics Report  
 Green Meadow Sub-Watershed Plan  
 NRCS RCPP Watershed Plan

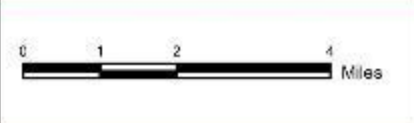


1:2" map - 100 feet contour - 10' contour interval

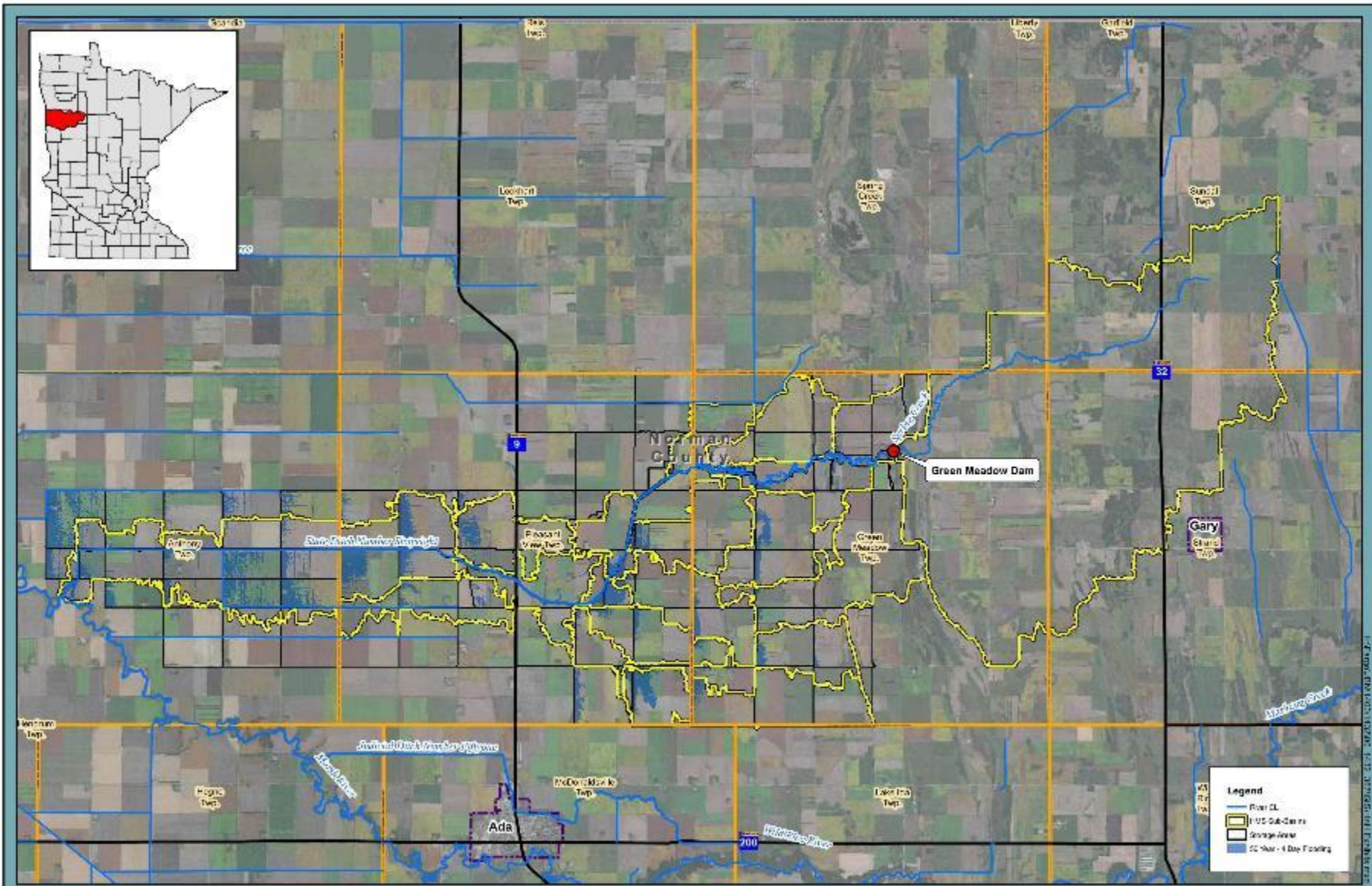


**E-10.5**

**Exhibit 10.5: 4 Day Flood Events (25 - Year)**  
 Hydrology and Hydraulics Report  
 Green Meadow Sub-Watershed Plan  
 NRCS RCPP Watershed Plan

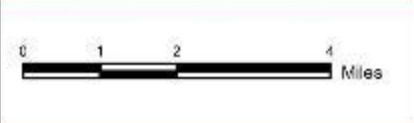


1:2" map - 100 feet contour - 10' - 20' interval and 100 feet

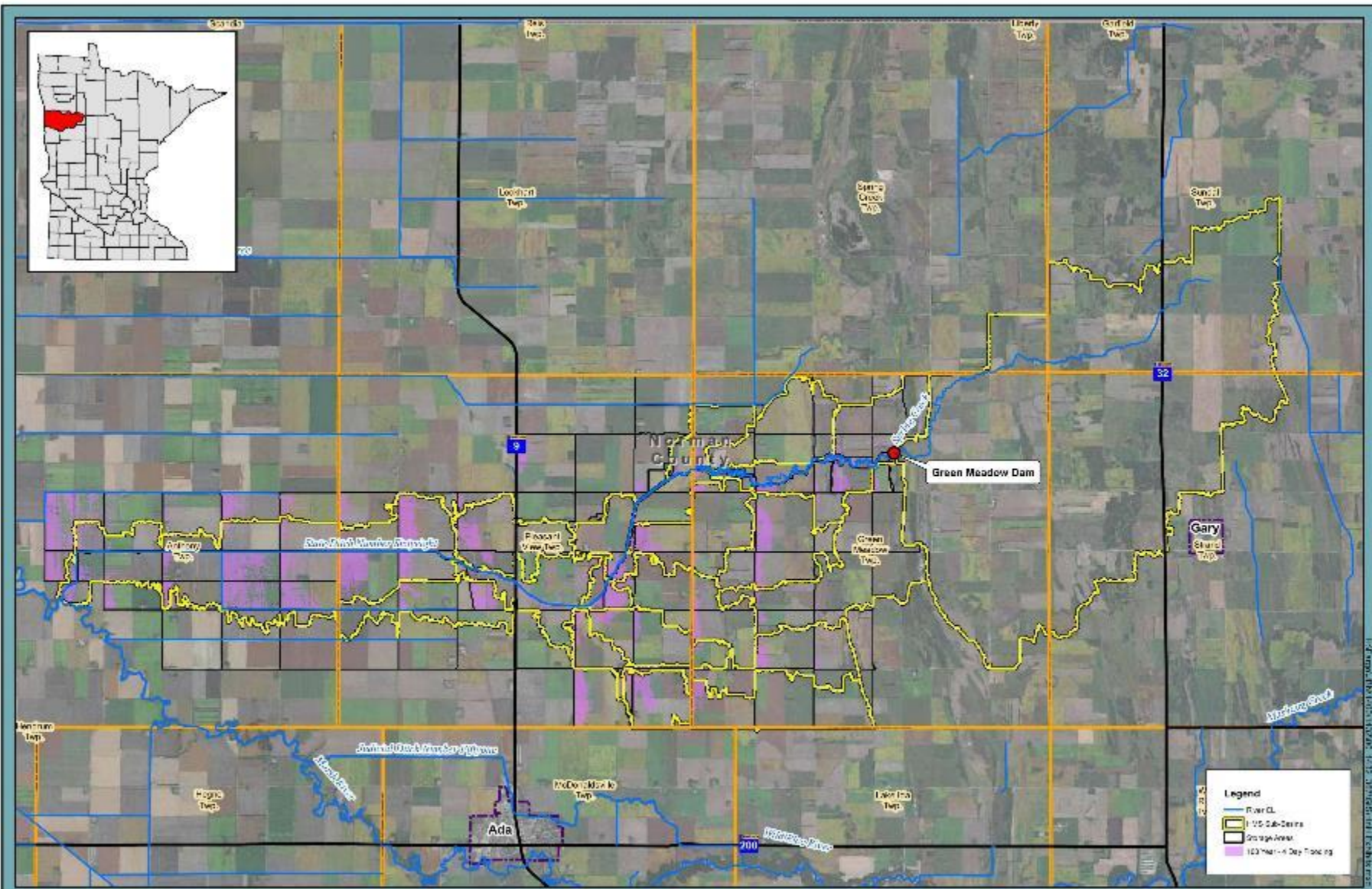


**E-10.6**

**Exhibit 10.6: 4 Day Flood Events (50 - Year)**  
 Hydrology and Hydraulics Report  
 Green Meadow Sub-Watershed Plan  
 NRCS RCPP Watershed Plan



1:2" map - 100 feet contour - 10' contour interval

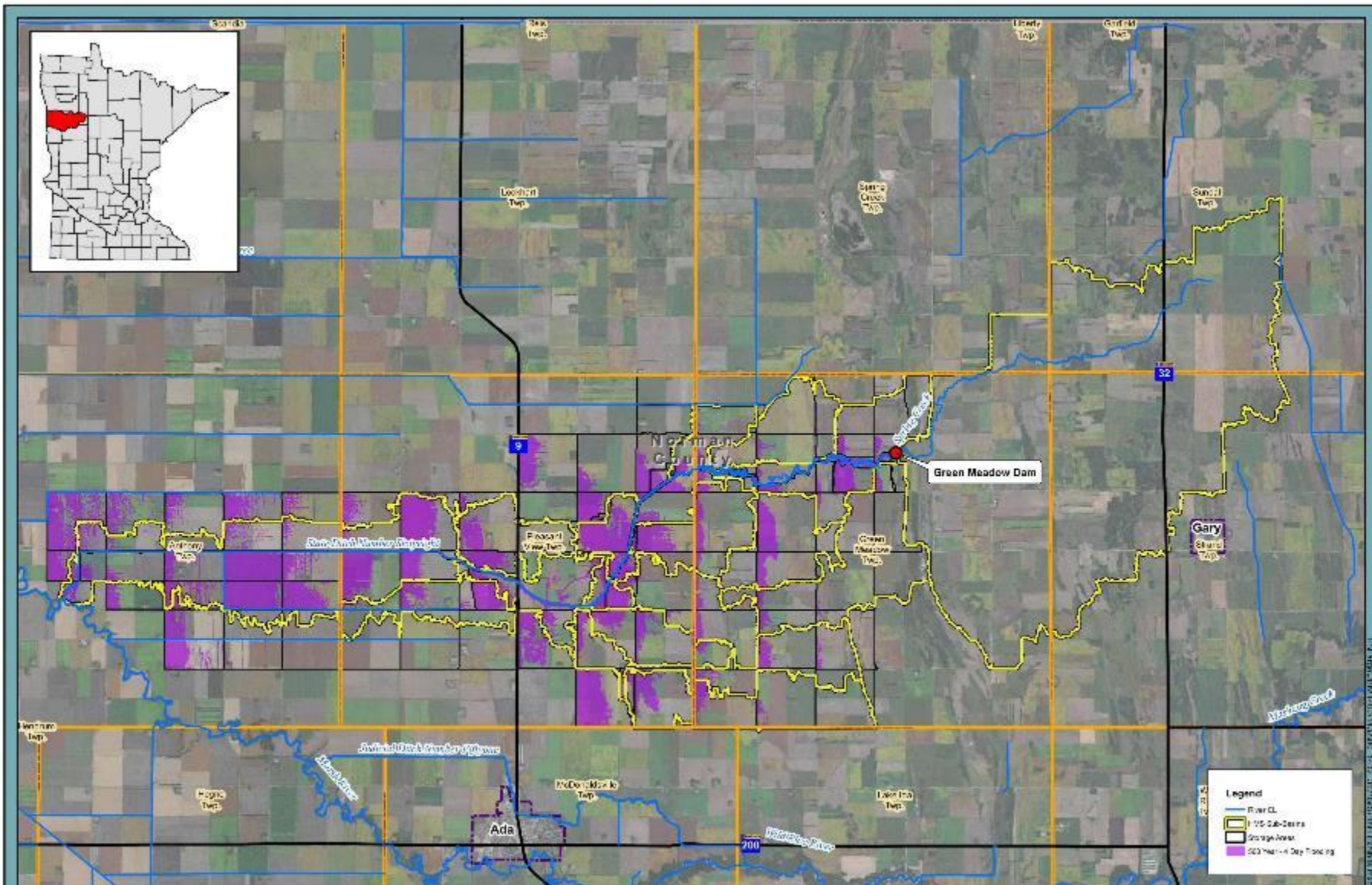


1:2" map - 100 Year - 4 Day - 100 - Year - 4 Day - 100 Year - 4 Day - 100 Year - 4 Day - 100 Year - 4 Day

**E-10.7** **Exhibit 10.7: 4 Day Flood Events (100 - Year)**  
 Hydrology and Hydraulics Report  
 Green Meadow Sub-Watershed Plan  
 NRCS RCPP Watershed Plan

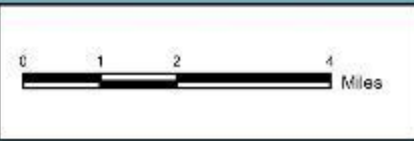


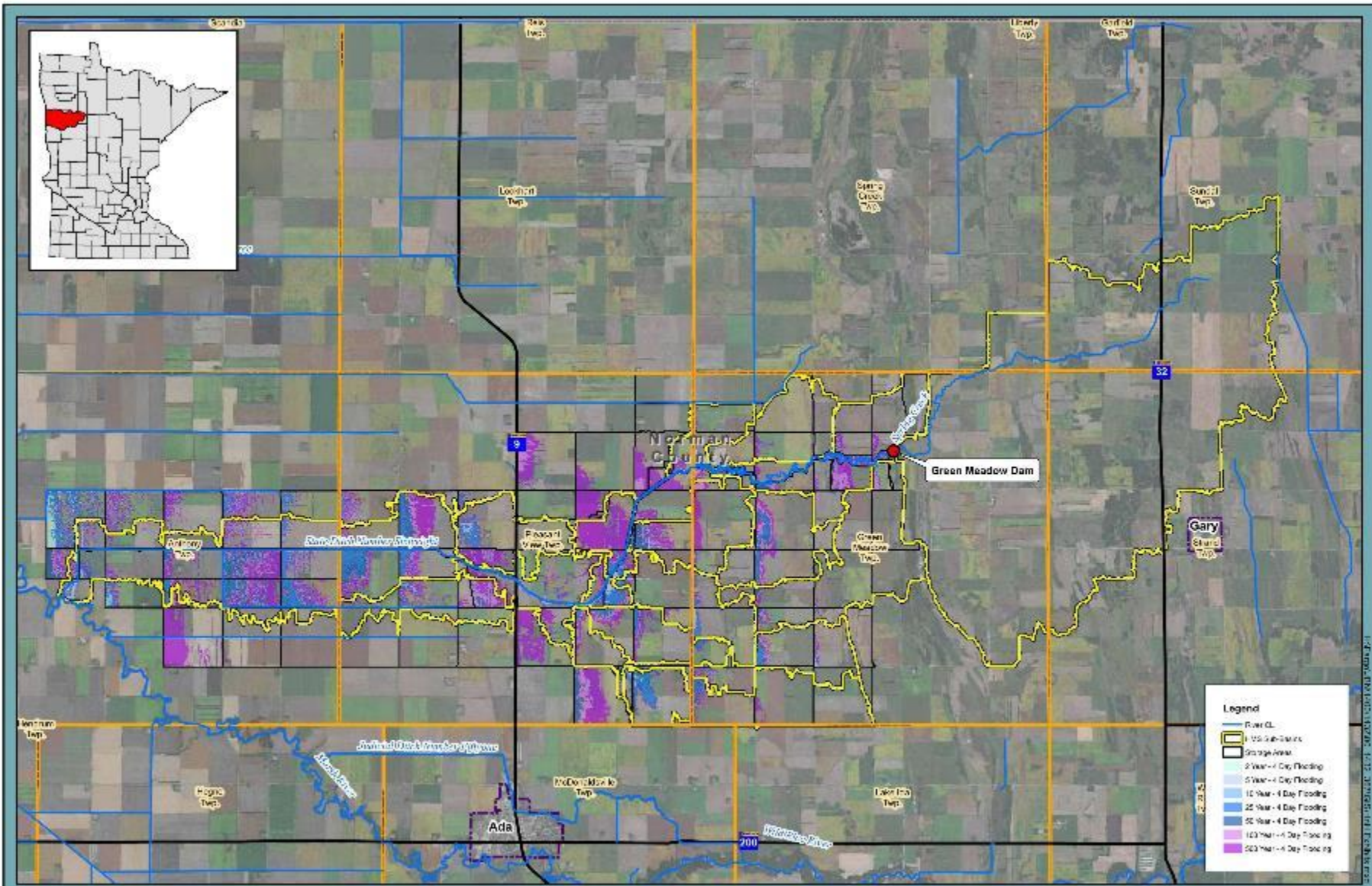




1:2" map - 1000' contour - 10' contour interval

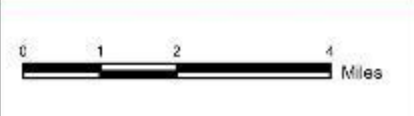
**E-10.8** **Exhibit 10.8: 4 Day Flood Events (500 - Year)**  
 Hydrology and Hydraulics Report  
 Green Meadow Sub-Watershed Plan  
 NRCS RCPP Watershed Plan





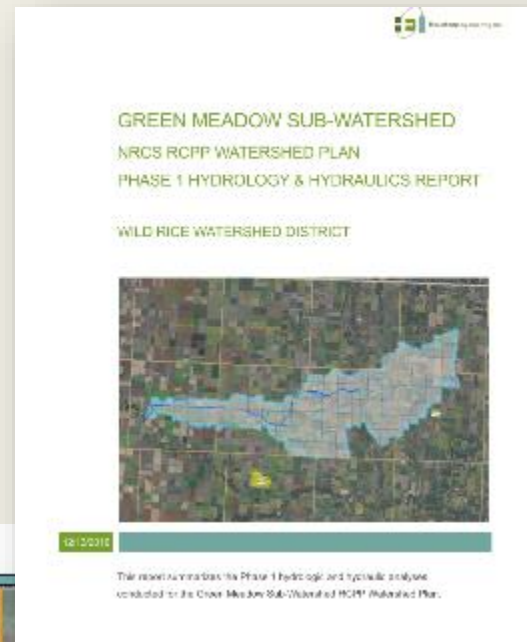
E-10.1

**Exhibit 10.1: 4 Day Flood Events (All)**  
 Hydrology and Hydraulics Report  
 Green Meadow Sub-Watershed Plan  
 NRCS RCPP Watershed Plan

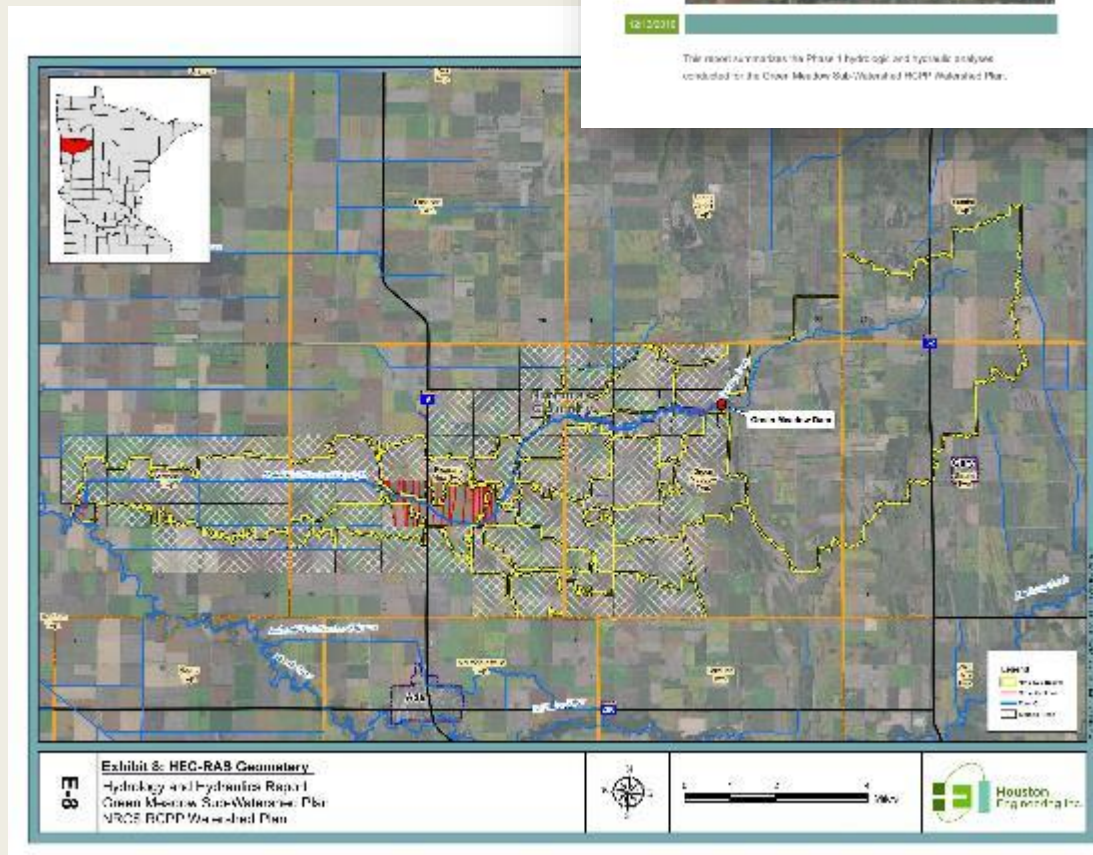


# Model Results

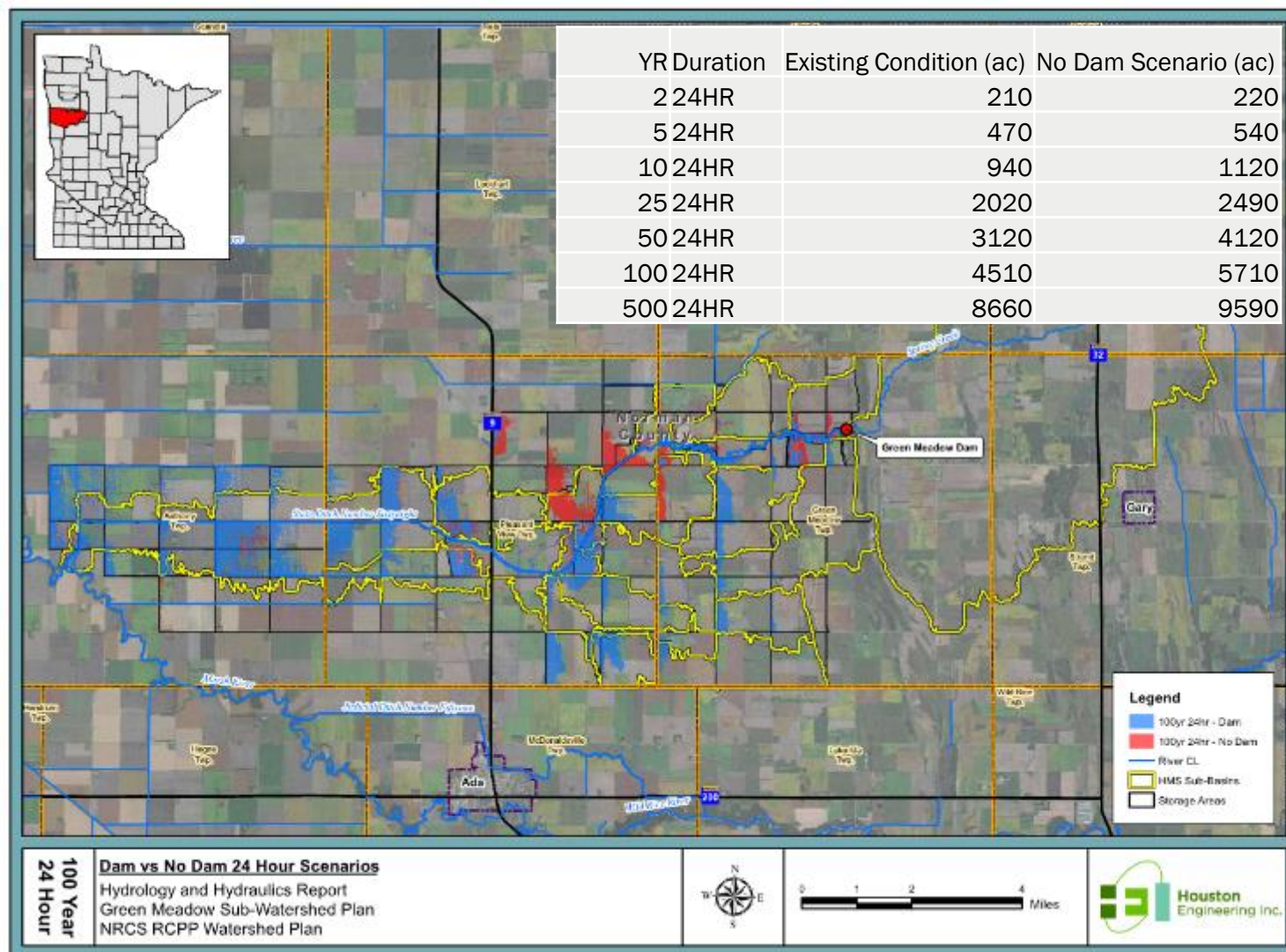
- H/H Report
  - Various Rain and Runoff Events (24hr - 10day)
  - Flows
  - Inundated Areas



YR Duration	Existing Condition (ac)
2 24HR	210
5 24HR	470
10 24HR	940
25 24HR	2020
50 24HR	3120
100 24HR	4510
500 24HR	8660

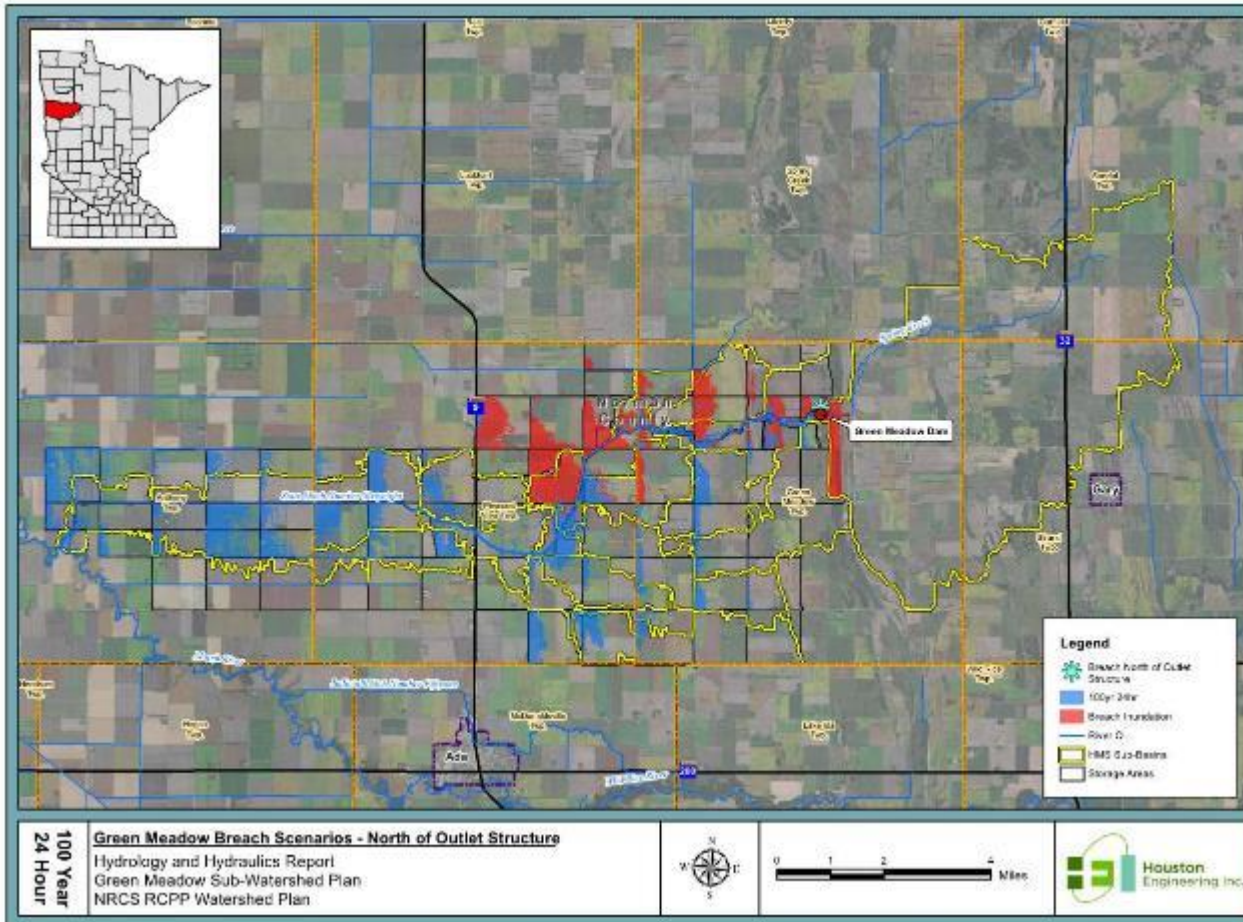


# Model Results – Other Scenarios – No Dam



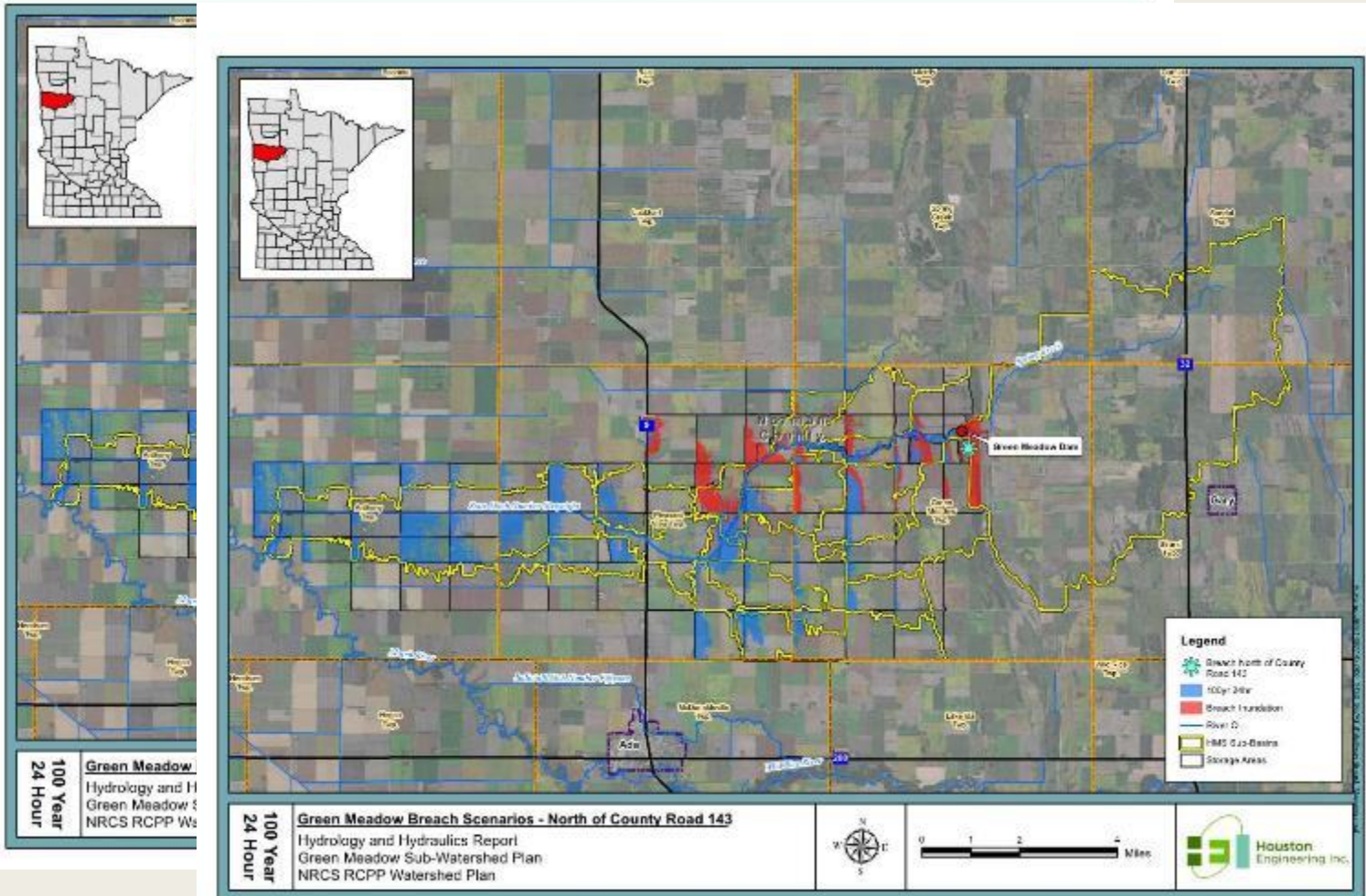
# Model Results – Other Scenarios

## – Approx Breach Analysis



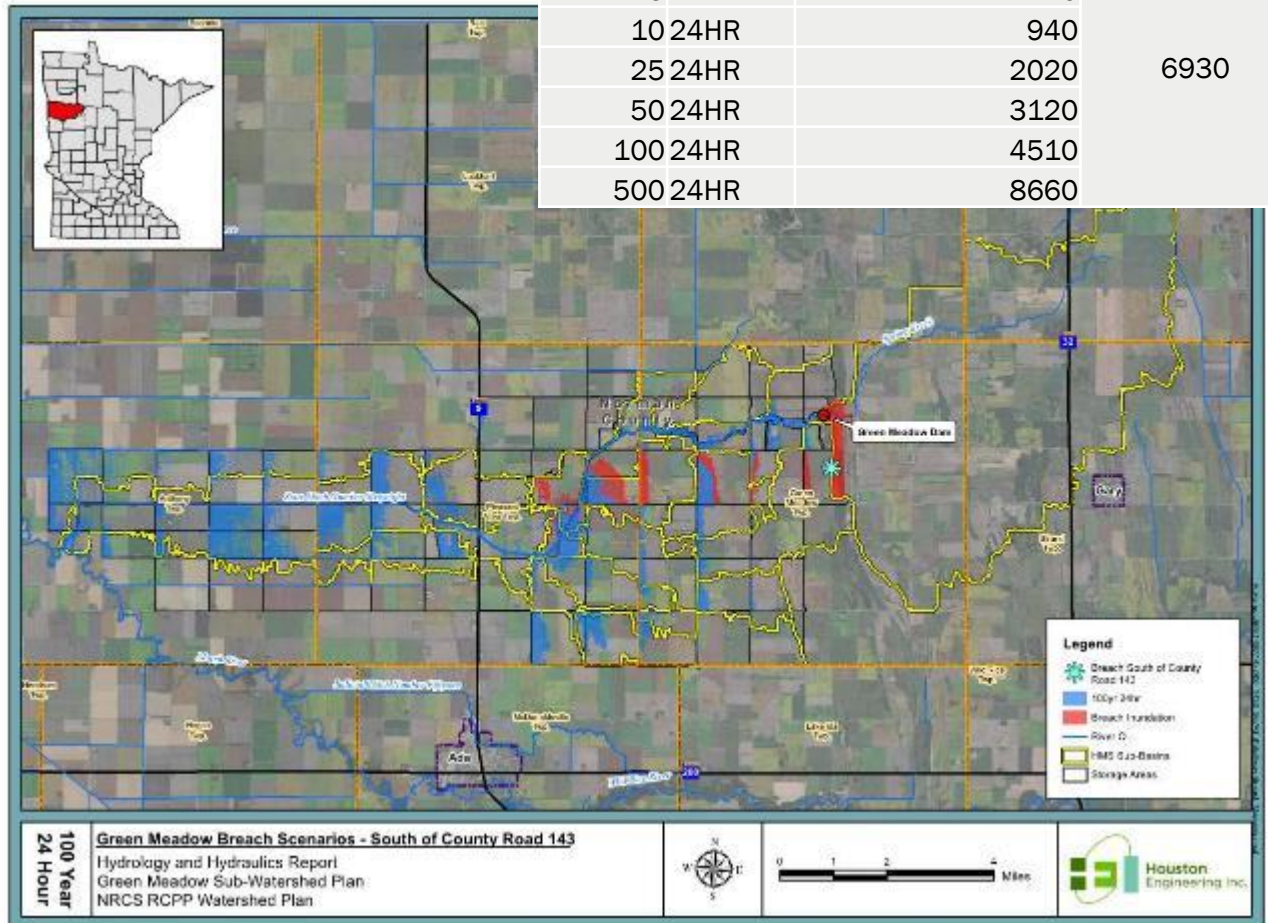
# Model Results – Other Scenarios

## – Approx Breach Analysis



# Model Results – Other Scenarios

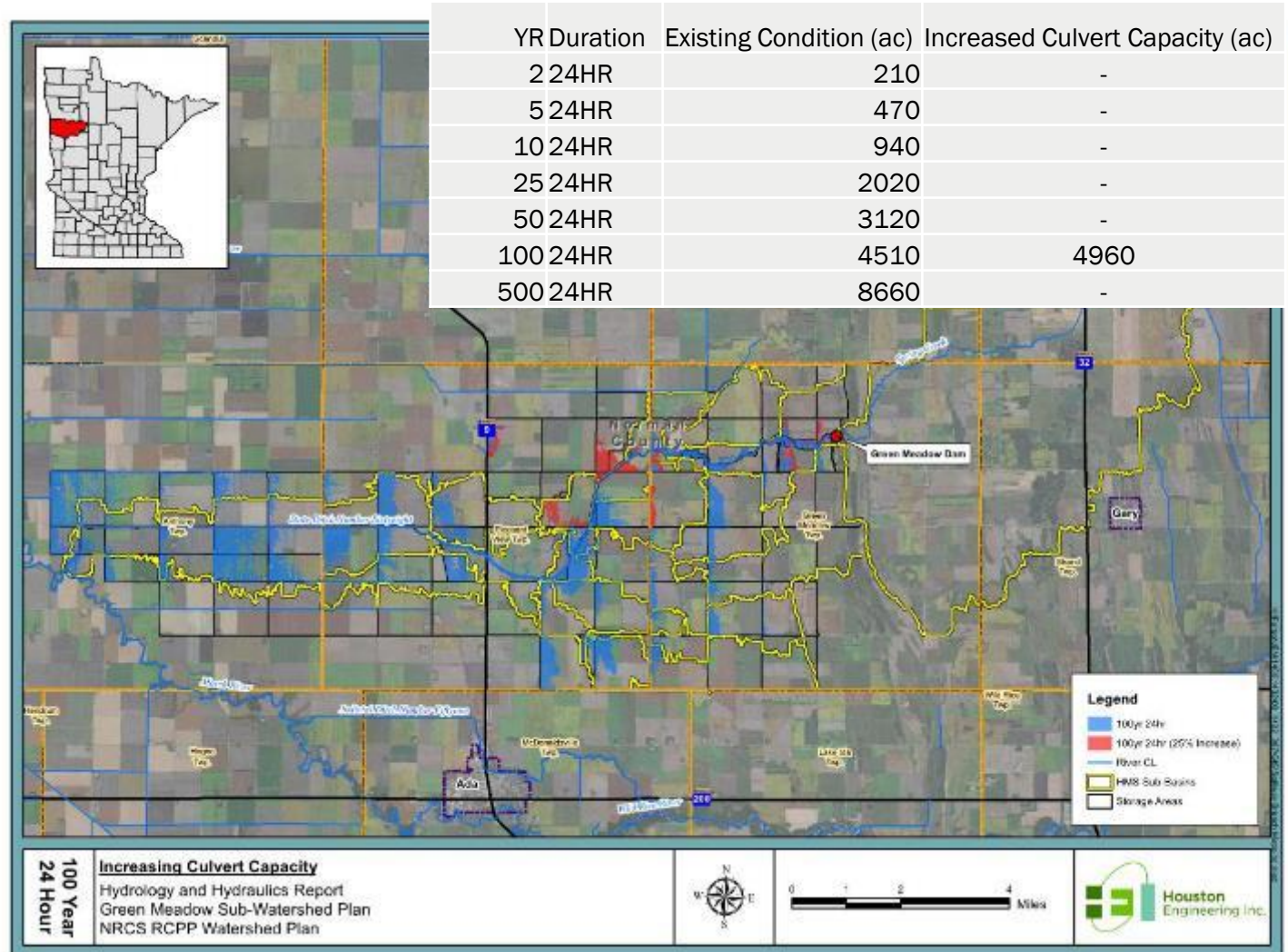
## – Approx Breach Analysis



YR Duration	Existing Condition (ac)	North Breach (ac)
2 24HR	210	
5 24HR	470	
10 24HR	940	
25 24HR	2020	6930
50 24HR	3120	
100 24HR	4510	
500 24HR	8660	

# Model Results – Other Scenarios

## – Increase Drainage Upstream

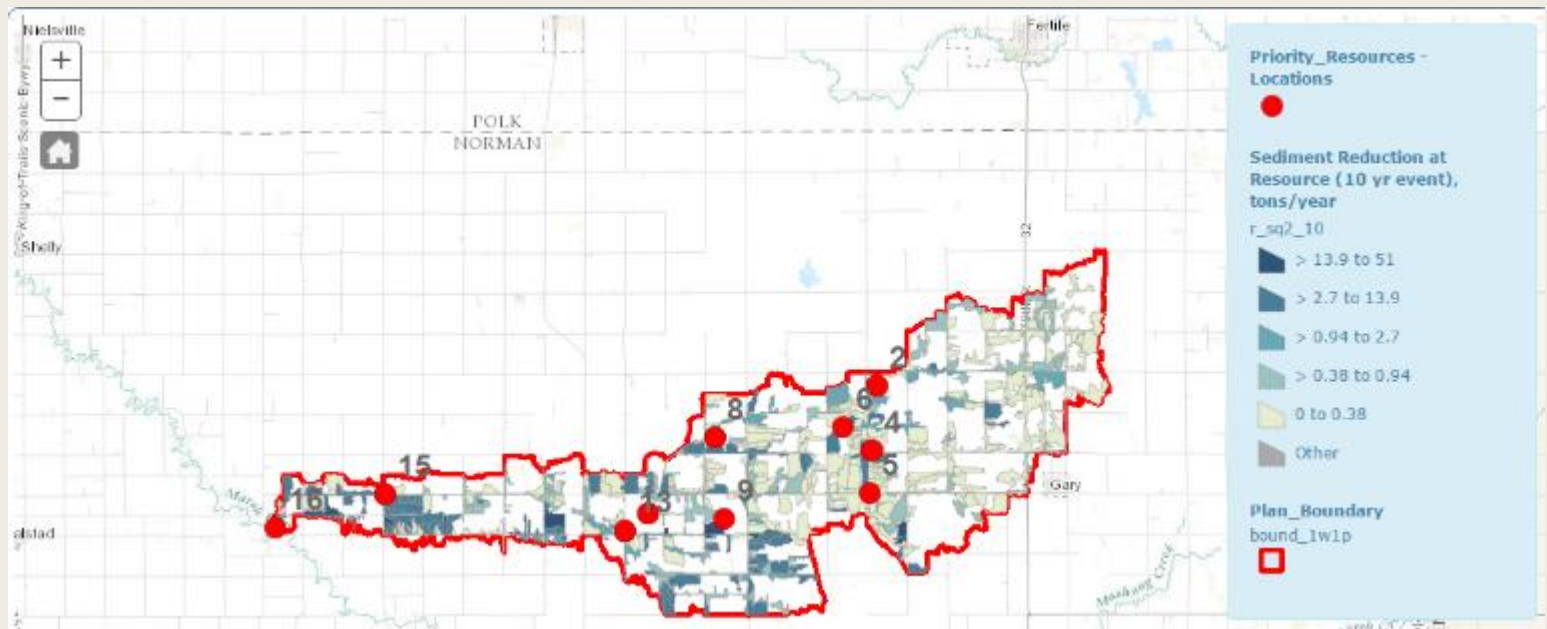




# Water Quality

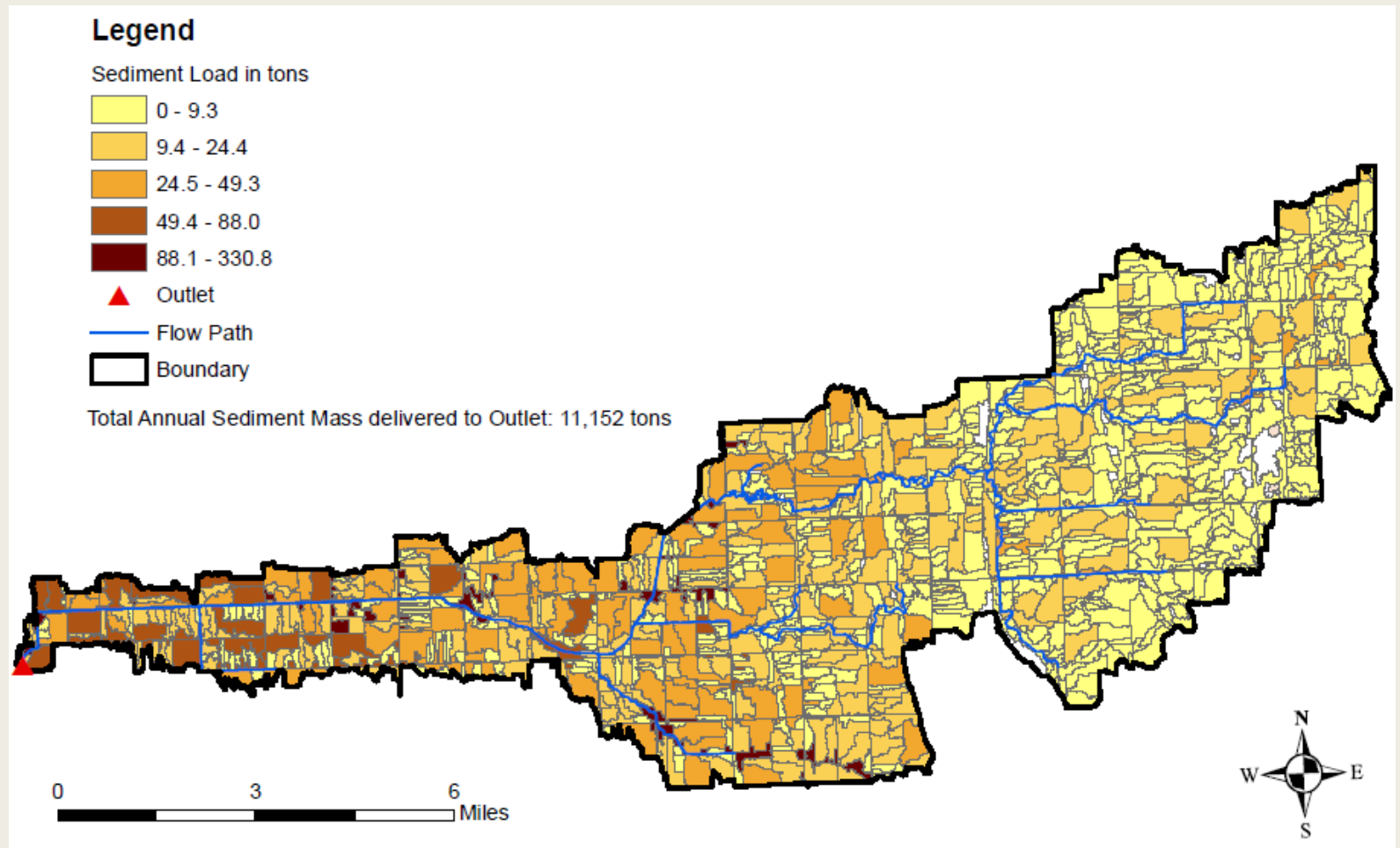
- Load estimates (sediment, total N, total P) at outlet of Spring Creek/Green Meadow Watershed
- Prioritize, Target, and Measure Application (PTMApp)

<http://ptmapp.rrbdin.org/>



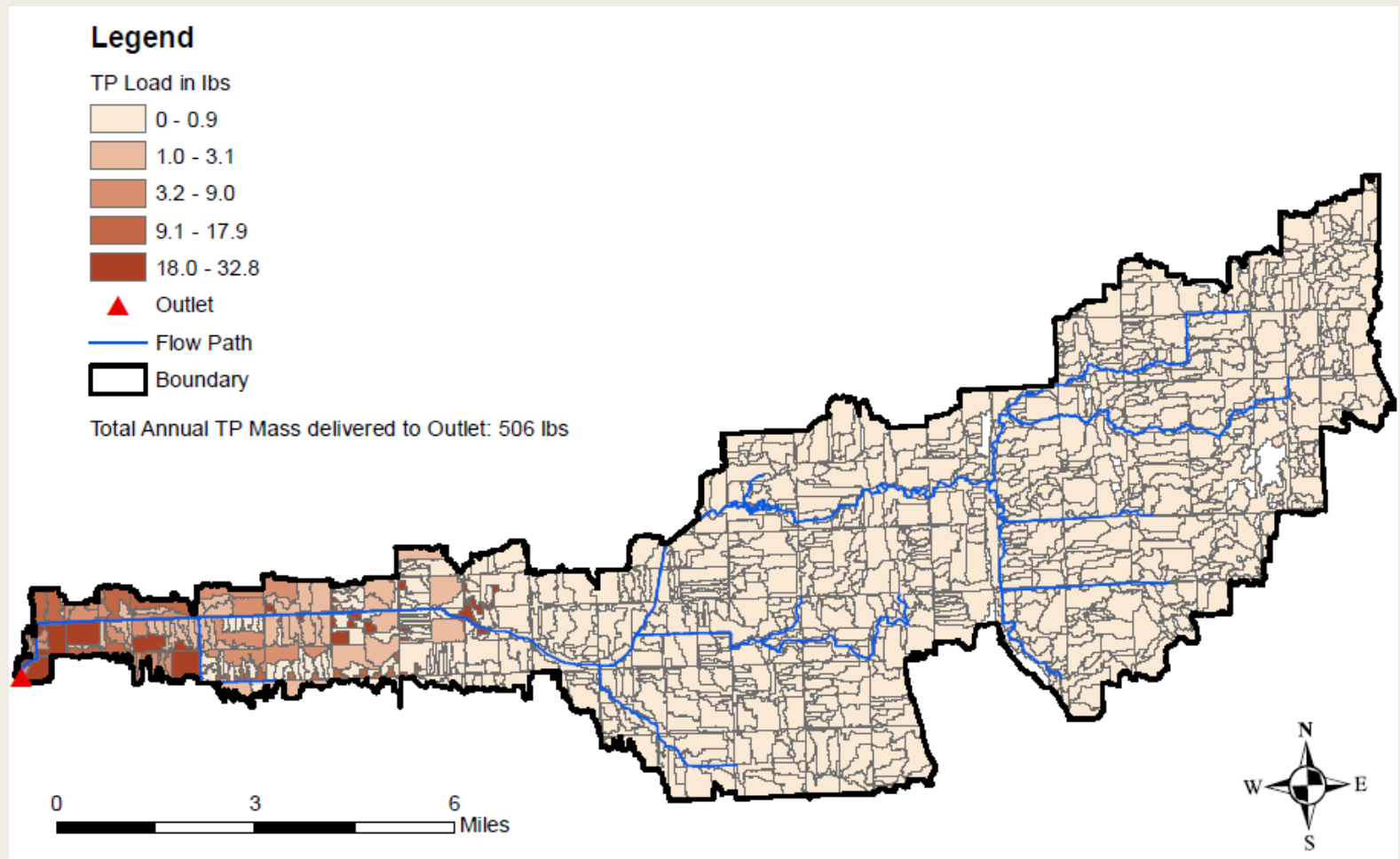
# Water Quality

Sediment - 11,152 Tons/Year @ outlet (PMTApp)



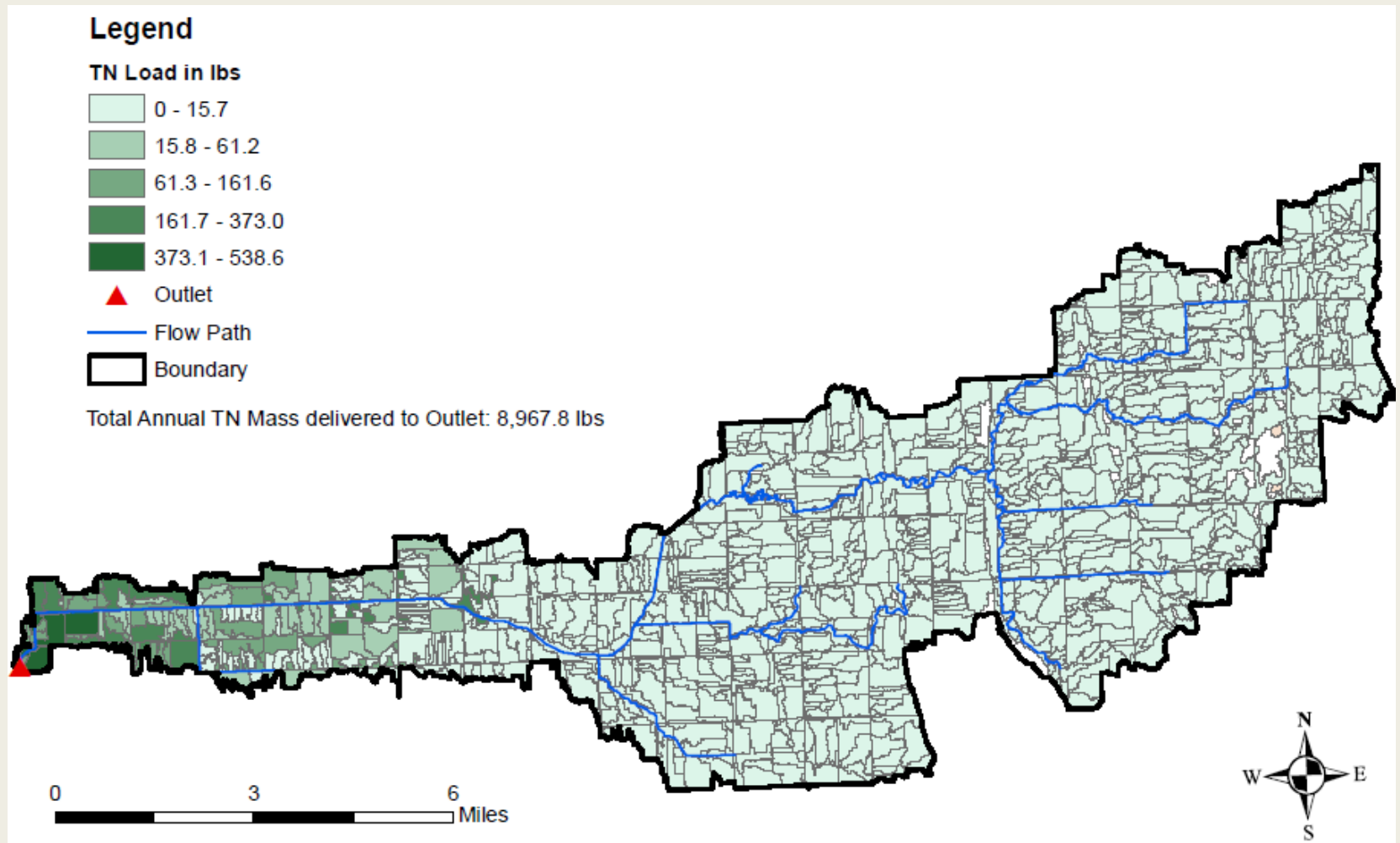
# Water Quality

Total Phosphorous - 506 pounds/Year @ outlet (PMTApp)

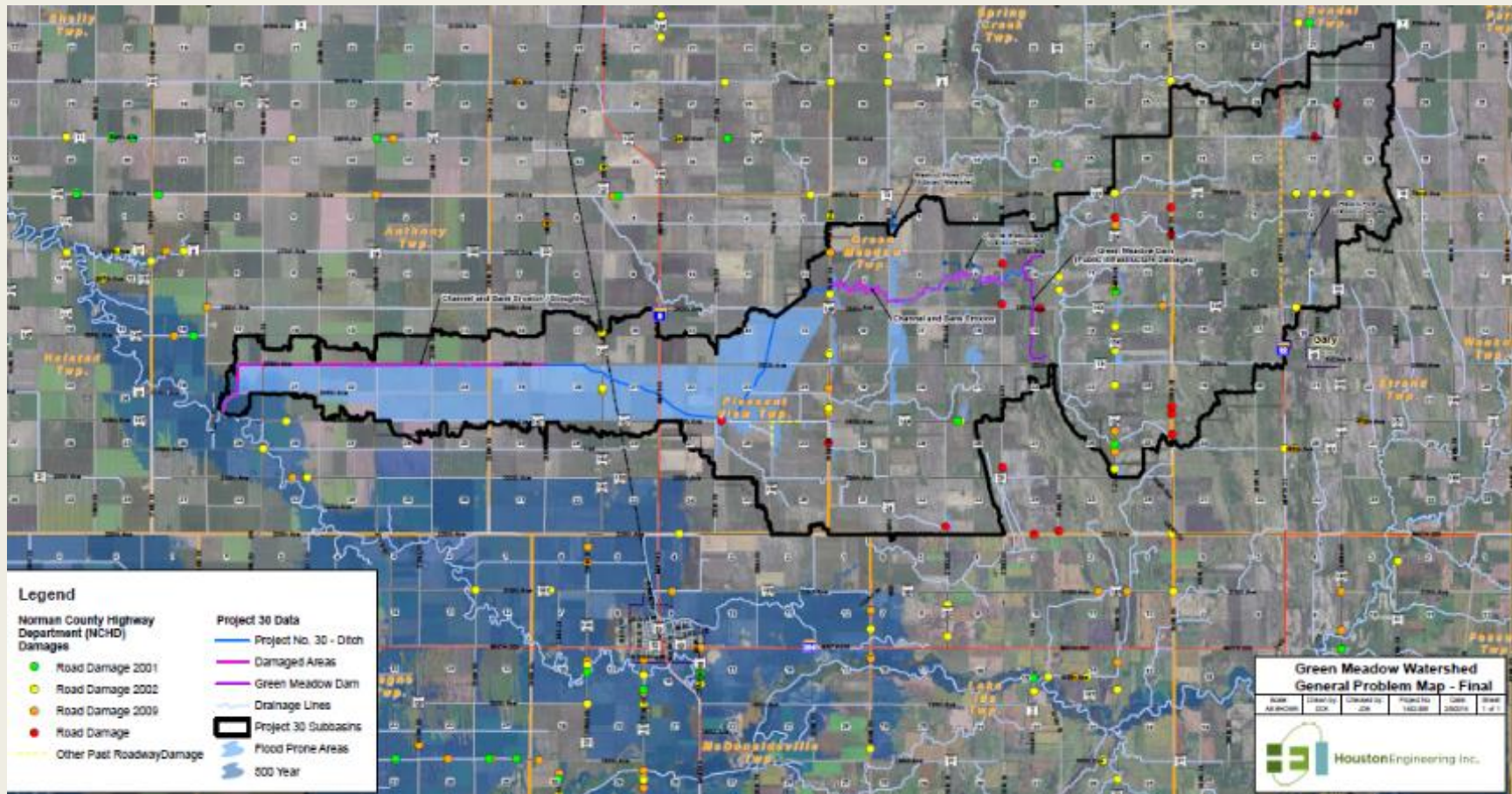


# Water Quality

Total Nitrogen - 8,968 pounds/Year @ outlet (PMTApp)

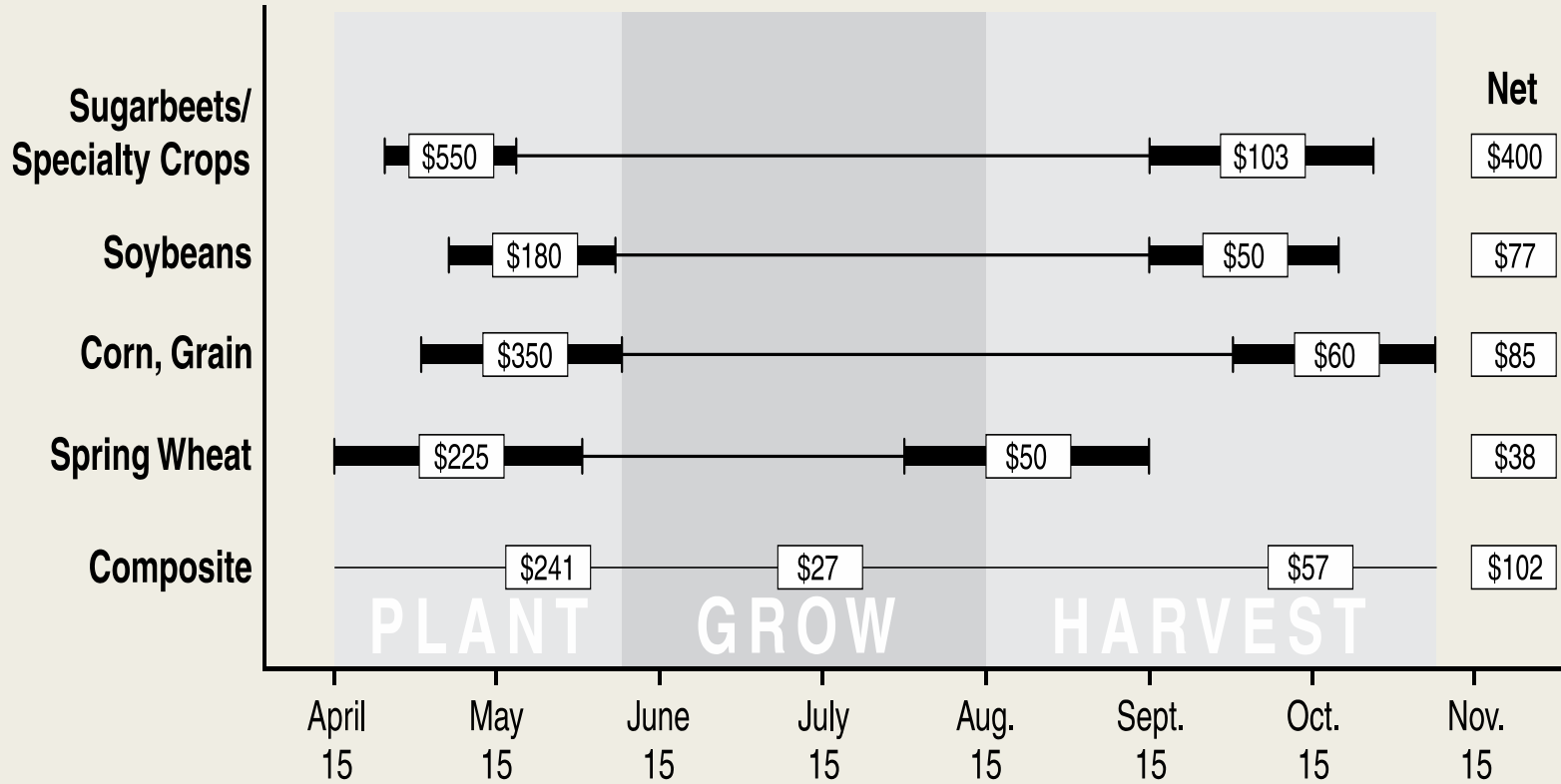
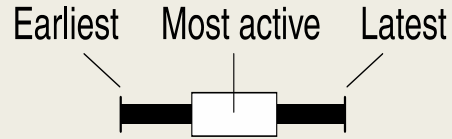


# Damages



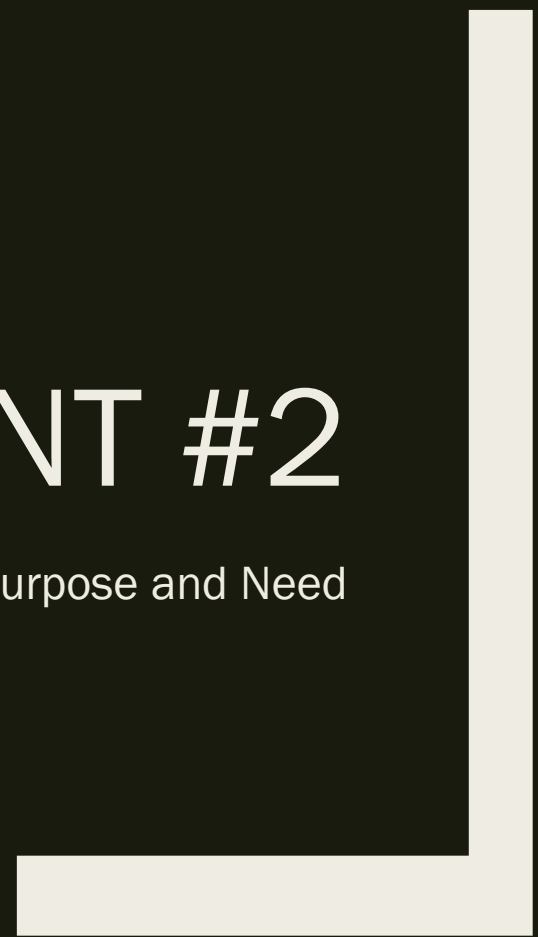
# Damages

- Existing conditions: 2, 5, 10, 25, 50, and 100 year floods. Roughly 7000 acres in the 100-year flood plain, of which about 94% is cropland.
  - *Previous flood prone/flood damages map*
  - *100% loss*
- Agriculture: PVB/D = \$2 to \$5 million (crops); \$365,000 non-crop cropland
- Infrastructure: P/DVB = \$90,000 to \$200,000
- Structures: PVB/D = 130,000



# NRCS REVIEW POINT #2

Revised Purpose and Need





# Environmental Scoping Document (501.24)

**SCOPE OF THE ENVIRONMENTAL ASSESSMENT**

Systematic scoping was used to identify resource concerns within the watershed, and to rate their significance. An abbreviated list of concerns was initially presented to the public during the May 5, 2010 public meeting in Ada, MN. This meeting allowed general known concerns within the watershed, and allowed the general public to rate the level of concern for several various considerations. The following concerns were initially presented to the public for consideration:

**Identified Resource Concerns**

- e. **Flooding/Flood Damages** (i.e. agricultural effects from delayed planting, prevented plowing, and flood inundation, road damages, culvert/bridge damages, breakout flows, field erosion/deposition, floodplain management, etc.)
- e. **Water Quality/Depletion and Sedimentation** (water quality, water resources, soil resources, field erosion/deposition, channel erosion/deposition, etc.)
- e. **Wildlife and Habitat** (fish and wildlife, wetlands, endangered and threatened species, invasive species, migratory birds, forest resources, etc.)
- e. **Other**

Following the meeting and subsequent public comment period, the Green Meadow Flood Damage Reduction Project team reviewed the public input and also considered the following resource concerns as set forth in Section 204.24 of the 200 National Watershed Program Manual:

- |                                     |                               |                                |
|-------------------------------------|-------------------------------|--------------------------------|
| 1. Watershed issues                 | 13. Invasives                 | 24. Wetlands                   |
| 2. Development (MSD, FSR)           | 14. Land use                  | 25. Soil resources             |
| 3. Agriculture                      | 15. Planning/Policy           | 26. Water quality              |
| 4. Cultural resources               | 16. Public access             | 27. Watershed vision           |
| 5. Biological resources             | 17. Recreation                | 28. Watershed threats          |
| 6. Endangered species               | 18. Agricultural practices    | 29. Wetland and riparian       |
| 7. Environmental justice and equity | 19. Agricultural conservation | 30. Wildlife and fisheries     |
| 8. Essential fish habitat           | 20. Agricultural conservation | 31. Watershed planning and the |
| 9. Fish and wildlife                | 21. Agricultural conservation | 32. Watershed planning and the |
| 10. Fish and wildlife               | 22. Agricultural conservation | 33. Watershed planning and the |
| 11. Flood management                | 23. Agricultural conservation | 34. Watershed planning and the |
| 12. Flood resources                 | 24. Agricultural conservation | 35. Watershed planning and the |

Each of the concerns was ranked based on their relevance within the study area. The results of this scoping process are listed in the following table:

**Table 28 – Evaluation of Identified Concerns**

Resource	Relevance	Comments
<b>EXISTING RESOURCE CONCERN COMMENTS</b>		
[1] Wetland, Economic Development (EOD, FSR)	NCDROW	Relevance is addressed by local, state, and federal funding depending on the selected alternative.
[2] Agriculture	LOW	No concern as it is addressed in the existing EIS. Agricultural conservation is addressed only by the proposed conservation easement.
[3] Cultural resources	N/A	N/A
[4] Cultural resources	LOW	WV Riparian Area Alternative includes the following: 1) riparian area conservation and 2) riparian area management.
[5] Decadent wetland areas	LOW	WV Riparian Area Alternative riparian features, but it is not shown in riparian area map. Riparian area conservation is addressed by the proposed conservation easement.
[6] Wetland special interest areas	LOW	WV Riparian Area Alternative riparian features, but it is not shown in riparian area map. Riparian area conservation is addressed by the proposed conservation easement.
[7] Environmental justice and equity	LOW	See EIS, Appendix A (Equity and Justice) for discussion.
[8] Essential fish habitat	LOW	Essential fish habitat is described in Appendix B and is addressed by the proposed conservation easement.
[9] Fish and wildlife	LOW	See EIS, Appendix A (Equity and Justice) for discussion.
[10] Flood management	LOW	See EIS, Appendix A (Equity and Justice) for discussion.
[11] Flood resources	LOW	See EIS, Appendix A (Equity and Justice) for discussion.
[12] Flood resources	LOW	See EIS, Appendix A (Equity and Justice) for discussion.
[13] Land use	NCDROW	Land use is addressed by riparian area map in the study area and the riparian area map is addressed by the riparian area conservation easement.
[14] Agricultural resources	LOW	See EIS, Appendix A (Equity and Justice) for discussion.
[15] Agricultural resources	LOW	See EIS, Appendix A (Equity and Justice) for discussion.
[16] Wildlife	LOW	See EIS, Appendix A (Equity and Justice) for discussion.

[17] Environmental justice and equity	LOW	See EIS, Appendix A (Equity and Justice) for discussion.
[18] Flood management	NCDROW	See EIS, Appendix A (Equity and Justice) for discussion.
[19] Flood resources	N/A	N/A
[20] Flood resources	LOW	See EIS, Appendix A (Equity and Justice) for discussion.
[21] Flood resources	LOW	See EIS, Appendix A (Equity and Justice) for discussion.
[22] Flood resources	LOW	See EIS, Appendix A (Equity and Justice) for discussion.
[23] Flood resources	LOW	See EIS, Appendix A (Equity and Justice) for discussion.
[24] Flood resources	LOW	See EIS, Appendix A (Equity and Justice) for discussion.
[25] Flood resources	LOW	See EIS, Appendix A (Equity and Justice) for discussion.
[26] Flood resources	NCDROW	See EIS, Appendix A (Equity and Justice) for discussion.
[27] Flood resources	NCDROW	See EIS, Appendix A (Equity and Justice) for discussion.
[28] Flood resources	NCDROW	See EIS, Appendix A (Equity and Justice) for discussion.
[29] Flood resources	NCDROW	See EIS, Appendix A (Equity and Justice) for discussion.
[30] Flood resources	N/A	N/A
[31] Flood resources	See below	See below
<b>OTHER RESOURCE CONCERN COMMENTS</b>		
Transportation	NCDROW	Addressed in the flood damage reduction project study area.

# Revised Purpose and Need

- Purpose and Need revisited/review

# Next Steps

- Task – Provide feedback on Revised PN
  - *WD incorporate comments/feedback*
- Continue Resource Inventory (fill in the PN “blanks”)
- Submit the PN to NRCS
  
- ....
  
- Alternatives