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Investigation Report

Failure of Five Watershed Structures

CC 21, CC 23, CC 29, WFK 1, WFK MIsna

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Probably Cause of Failure

Weakness of the foundation geology and extreme runoff during the rainfall event on August 27/28, 2018 flood.

- **The storm event exceeded the design capacity of at least 4 of the 5 dams which overtopped.**
- **Full reservoirs exploited the foundation geology which consists of highly jointed sandstone. Internal erosion of embankment material through the joints.**
- **Failure of the 3 Coon Creek sites occurred in the groins opposite the auxiliary spillways.**
- **Failure of the 2 West Fork sites occurred in the auxiliary spillways.**

Committee Recommendations

- **Conduct a planning study to develop and evaluate alternatives flood reduction in the watershed and the final disposition of each dam.**

- **Design considerations for dams that will be repaired or replaced.**
  - Bring the hydraulic capacity up to current standards
  - Additional geologic investigation (i.e. feasible cutoff alternatives)
  - Enhanced seepage control or internal drainage features
  - Elimination or fortification of auxiliary spillways

Hydraulic Capacity of Failed Dams

- **August 27 rainfall that failed the dams was 7” to 11” in a 6-hour period. Equates to about a 400-year event.**

- **Coon Creek principal spillway pipes were designed for the 100-year, 6-hour rainfall of 4.6” ….then auxiliary spillway activated.**
  - The freeboard design storm to set top of dam was about 5.5”

- **Jersey Valley principal spillway pipe was designed for the 50-year, 6-hour rainfall of 3.9”… then auxiliary spillway activated.**
  - The freeboard design storm to set top of dam was 10.9”

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Watershed Planning

Coon Creek
&
West Fork Kickapoo

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Watershed and Flood Prevention Operations (WFPO) Program

- **Funded by 2019 Consolidated Appropriations Act, $150M**
- **The need for watershed planning arises from the failure of 5 dams during the flood on August 27 - 28, 2018.**
- **NRCS applied for funding on behalf of La Crosse, Monroe, and Vernon Counties (*project sponsors*) in June 2019.**
- **NRCS was allocated $1,667,500 to assist with planning in the Coon Creek and West Fork Kickapoo watersheds in Jan. 2020**
- **The primary purpose of planning is to prevent or reduce future flood damages.**

Watershed Flood Prevention and Operations (WFPO) Program

Watershed Program was authorized by Public Law 83-566

"Watershed Protection and Flood Prevention Act of 1954"

Authorizes the Secretary of Agriculture to cooperate with States and local agencies in planning and implementing works of improvement on a watershed scale. Funding:

Planning – Final Design – Construction

Authorized Purposes --

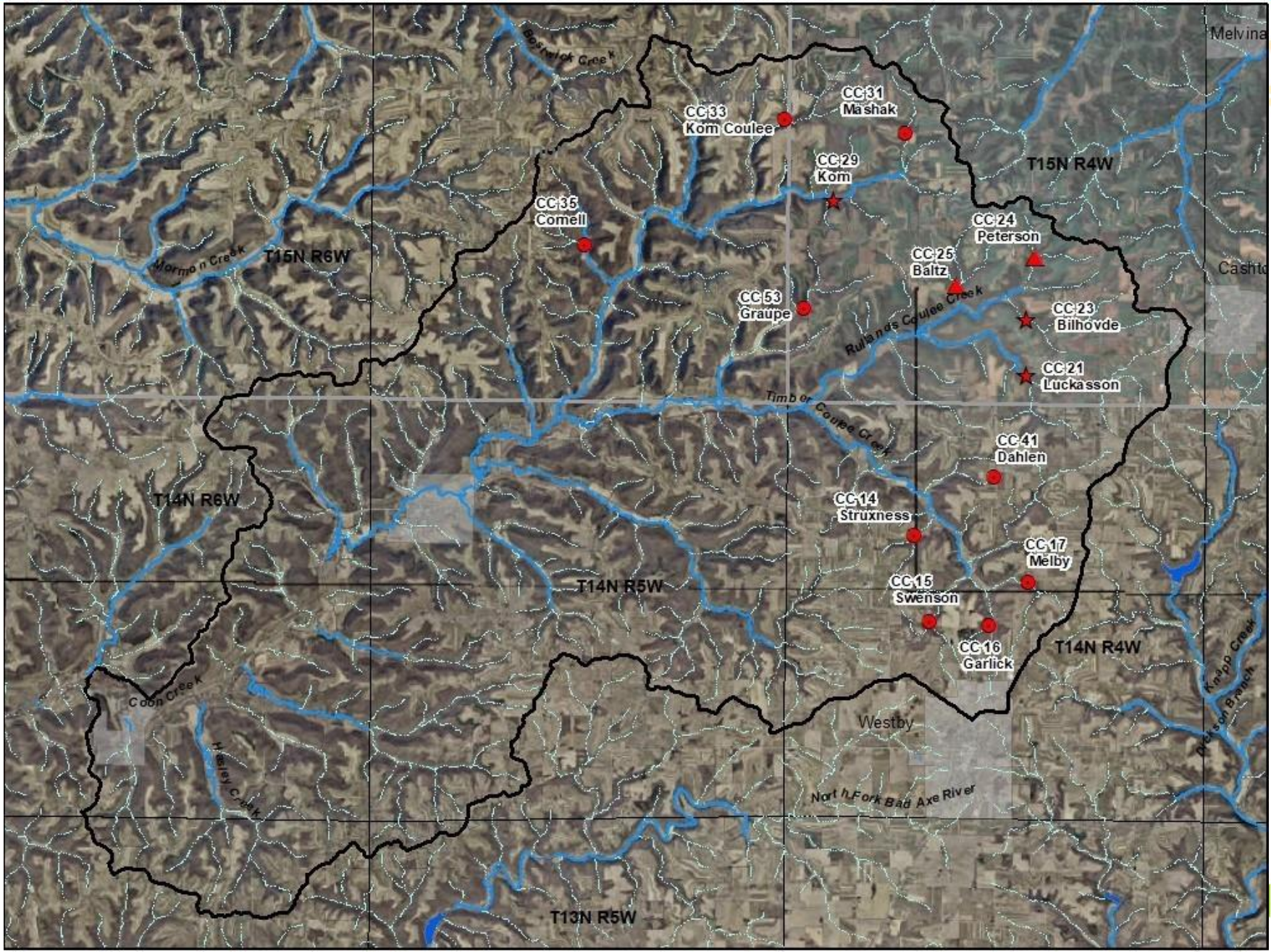
- Flood Prevention (Flood Damage Reduction)
- Watershed Protection
- Public Recreation
- Public Fish & Wildlife
- Agricultural Water Management
- Water Quality Management

Watershed Flood Prevention and Operations (WFPO) Program

Program requires the development of a watershed plan that is feasible and environmentally, socially & economically sound.

Watershed Project Plan & Environmental Impact Statement

- **Coon Creek Watershed 68,762 acres through Chaseburg**
- **West Fork Kickapoo Watershed 75,387 acres through Liberty**


Bostwick Creek
CC 31
Mashak
CC 33
Korn Coulee
CC 29
Korn
T15N R4W
CC 35
Cornell
CC 24
Peterson
CC 25
Baltz
Mormon Creek
T15N R6W
CC 53
Graupe
CC 23
Bilhovde
Rulands Coulee Creek
CC 21
Luckasson
Timber Coulee Creek
CC 41
Dahlen
T14N R6W
CC 14
Struxness
CC 17
Melby
T14N R5W
CC 15
Swenson
CC 16
Garlick
T14N R4W
Coon Creek
Hasley Creek
Westby
North Fork Bad Axe River
T13N R5W

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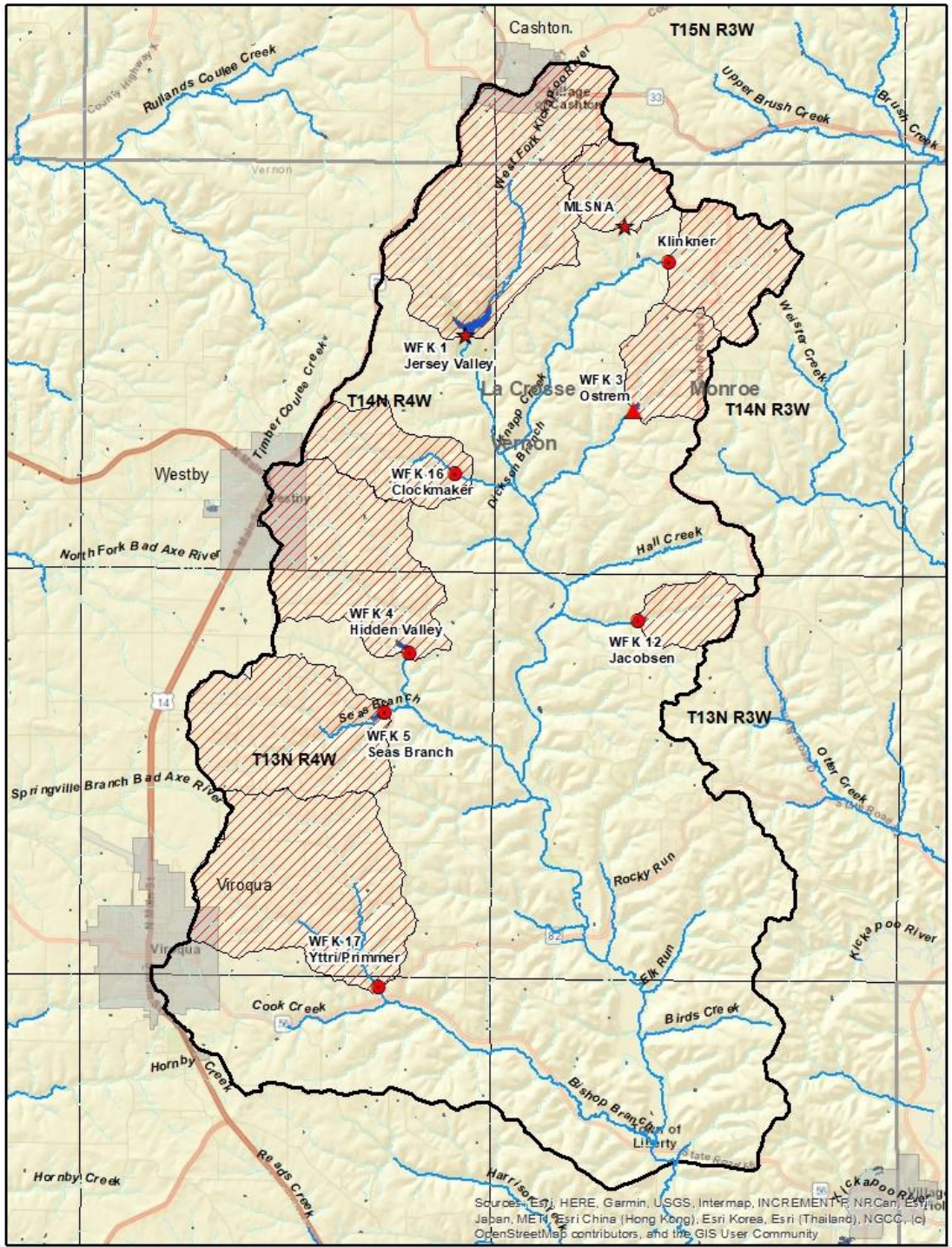

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Architectural & Engineering Contract

-18 month performance period-

- **Ackerman-Estvold (Minot, Williston ND)**
- **Ad Astra (Overland Park, KS)**
- **Conservation Works Joint Venture**
  - Mauer-Stutz Inc. (Peoria, IL)
  - Prairie Engineers (Columbia, IL)
  - Curry-Willie & Associates (Aimes, IA),
  - Banning Eng., (Plainfield, IN)
- **M-E Consultants (Heidenhiemer, TX)**
- **RJH Consultants (Englewood, CO)**

Nine Steps of Conservation Planning

1. Identify the Problems and Opportunities
2. Determine Stakeholders Objectives
3. Inventory Resources
4. Analyze Resource Data
5. Formulate Alternatives
6. Evaluate Alternatives
7. Make Decision – Finalize the Plan-EIS
8. Implement Plan – Seek Final Design & Construction Funds
9. Evaluate the Plan

Step 6: Evaluate Alternatives

- ✓ **Baseline Condition – No project dams**
- ✓ **Baseline Conditions w/ watershed treatment –**
- ✓ **Present Condition – all dams fully functional**
- ✓ **Present Condition w/ failed dams –**
- ✓ **Future Conditions w/ project dams at optimal locations –**
- ✓ **Channel and Floodplain Improvement –**
- ✓ **Land Use Conversion in the Floodplain –**
- ✓ **Dam Removal –**
- ✓ **Dam Replacement w/ Geologic Investigation –**

Proposed Schedule of Work

1. A&E Contract, Notice-To-Proceed
2. Formal Invitations to Cooperating Agencies
3. Develop a Public Participation Plan
4. Develop and Host a Website
5. Stakeholders' Orientation Meeting
6. 1st Public Scoping Meeting
7. 2nd Public Scoping Meeting
8. Progress Review Meetings with the Sponsors
9. Develop a Draft EIS
10. Develop the Final EIS
11. Assemble the Administrative Record
12. Close A&E Contract