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**Quiz**

<p><b>1) The Wetland Conservation Act is a:</b></p> <ul style="list-style-type: none"> <li>a) Federal Law passed in 1972.</li> <li>b) State Rule, passed as a bipartisan statute in 1991, implemented by Local Government Units.</li> <li>c) State Rule, passed in 1991, which is administered by the MNDNR.</li> <li>d) Recommended set of best management practices for activities in wetlands.</li> </ul>	<p><b>2) When describing a soil profile, which of the following steps should a delineator do first?</b></p> <ul style="list-style-type: none"> <li>a) Texture all layers in profile</li> <li>b) Determine matrix and redoximorphic colors of all layers</li> <li>c) Apply hydric soil indicator</li> <li>d) Determine all hydrology indicators present within the borehole</li> </ul>
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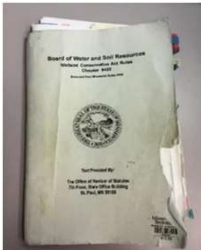
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**3) Which Agency has administrative oversight and Rulemaking authority for the WCA?**

- a) Local Government Units
- b) MN Board of Water and Soil Resources
- c) MN Department of Natural Resources
- d) Local Soil & Water Conservation Districts



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<p>4) While most wetlands are non-navigable, they still may be considered the following and thus regulated under the Federal Clean Water Act:</p> <ul style="list-style-type: none"> <li>a) Incidental wetlands</li> <li>b) Perpetual Conservation Easement</li> <li>c) Upland</li> <li>d) Waters of the United States</li> </ul>	<p>5) Which regulatory program defines its jurisdictional boundary by the ordinary high water level?</p> <ul style="list-style-type: none"> <li>a) Section 404 of Clean Water Act</li> <li>b) Wetland Conservation Act</li> <li>c) Section 401 of Clean Water Act</li> <li>d) Public Water Works Permitting Program</li> </ul>
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<p>6) Which Federal regulatory program regulates the discharge of dredged or fill material:</p> <ul style="list-style-type: none"> <li>a) Food Security Act</li> <li>b) Rules of the Department of the Interior</li> <li>c) Section 401 of the Clean Water Act</li> <li>d) Section 404 of the Clean Water Act</li> </ul>	<p>7) The WCA regulates:</p> <ul style="list-style-type: none"> <li>a) Peat mining</li> <li>b) Normal farming practices</li> <li>c) Draining, filling of all wetland types</li> <li>d) Incidental wetlands</li> </ul>
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<p>8) Which of the following is not a LGU's role in administering the WCA:</p> <ul style="list-style-type: none"> <li>a) Make decisions on applications made under the WCA</li> <li>b) Completely fill out a joint application for the landowner</li> <li>c) Coordinate TEP meetings when needed</li> <li>d) Provide knowledgeable and trained staff</li> </ul>	<p>9) The role of the Technical Evaluation Panel <u>does not</u> include:</p> <ul style="list-style-type: none"> <li>a) Operate objectively.</li> <li>b) Perform LGU duties such as noticing applications.</li> <li>c) Generate findings as requested by the LGU.</li> <li>d) Make recommendations to the LGU based their findings.</li> </ul>
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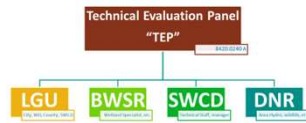
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10) For a project in a shoreland area, the Technical Evaluation Panel consists of:

- a) The LGU, Army Corps and DNR.
- b) The LGU, SWCD, BWSR and Army Corps.
- c) The LGU, SWCD, BWSR and DNR.
- d) The Army Corps and DNR.



7

11) What are the 3 general types of adaptations that plants have made to grow in anaerobic soil conditions:

Morphologic, reproductive, physiologic

12) In the table, place the following plant indicators from most likely to least likely to occur in a wetland.

OBL
FACW
FAC
FACU
UPL

8

13) A delineator walks into a wetland edge and observes over 75% areal coverage of cattail (OBL) with 2 other species (both FAC) that are less than 5% coverage each. What hydrophytic vegetation indicator test should they use?

- a) Rapid Test of Hydrophytic Vegetation
- b) Dominance Text is >50%
- c) Prevalence Index is  $\leq 3.0$
- d) Morphological Adaptations

14) How many dominant species are there in the sample point data below?

Species	Strata	% Coverage
Species A	Shrub/Scapling	5
Species B	Herbaceous	20
Species C	Herbaceous	30
Species D	Herbaceous	30
Species E	Herbaceous	15
Species F	Herbaceous	30
Species G	Tree	3

- a) 1
- b) 2
- c) 3
- d) 4

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Quiz

15) What is the recommended sampling size for the sapling/shrub, herbaceous, and tree strata? Use the table below.

Strata	Plot Size (feet)
Tree	30
Shrub/sapling	15
Herbaceous	5
Woody vine	30

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Basic WCA Decision Types

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WCA

WCA Program Guidance

WCA Program Guidance and Information

"Hit it bro, the lights gray"

WCA Topics of the Week

WCA Exemption Guidance and Policy

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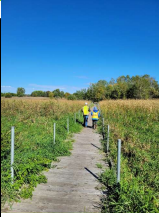
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Basic WCA Decision Types	
WCA Basic Decision Types	
Boundary and Type	Approves wetland delineation
No-Loss	Approves activities that do not result in permanent impacts
Exemption	Approves impacts exempt from replacement



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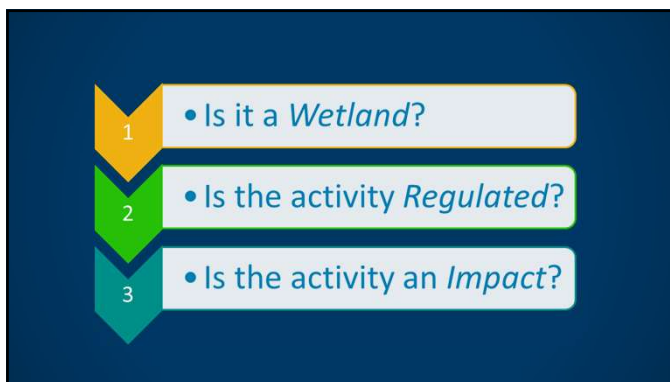
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What is regulated by WCA?	
<p><u>What is considered Impact?</u></p> <p>A loss in quantity, quality, or biological diversity of a wetland <i>caused by</i> <u>draining</u> or <u>filling</u> in all types or by <u>excavation</u> in semipermanently and permanently flooded areas.</p>	

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## What is Drainage?

Any method for removing or diverting waters from a wetland.

- Excavation of a ditch
- Tile Installation
- Filling
- Diking
- Pumping
- Diverted water
- Etc.



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## What is Fill?

Any solid material **added or redeposited** in a wetland

- Alters cross-section or hydrological characteristics,
- Obstructs flow patterns,
- Changes Boundary, or
- Converts to non-wetland.



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## Wetland Fill

- Does not include posts for walkways, bridges, powerline poles, etc.



- Does not include slash or woody vegetation as long as it originated from vegetation growing in the wetland and does not impair flow or circulation of water.



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• Wetland fill *does not* include posts and pilings unless it turns wetland into a nonaquatic use or significantly alters its functions and value.



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What is Excavation?

Removal of soil by any method if it results in an impact.



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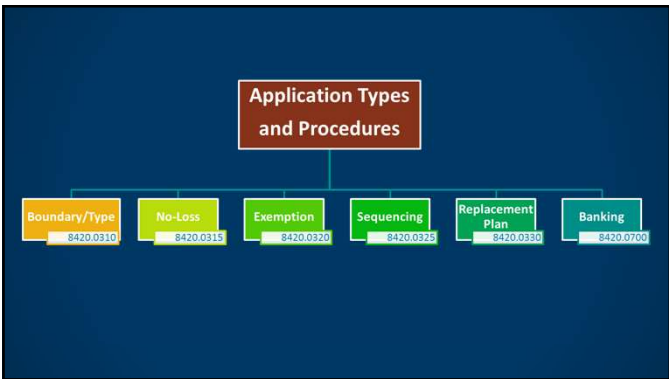
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Boundary/Type Applications:  
Where wetland regulation meets science

- Boundaries must be delineated using USACE 1987 Manual and Supplements (8420.0405 subp 1)
- Wetland Types must be identified using HGM (WCA) and Eggers and Reed (Corps)
- Requires NOA and NOD.
- Technical Decision- one member of TEP must make a site visit



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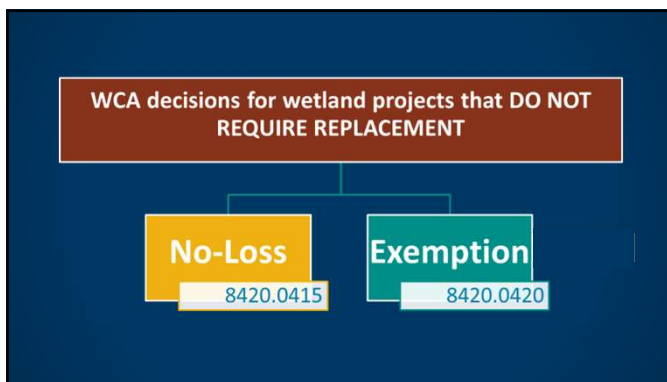
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No-loss and Exemption conditions

- Every activity in wetland, regardless of whether an application is submitted must:
  - Implement erosion control measures to prevent sedimentation of wetlands
  - Not block fish activity
  - Comply with all other applicable local, State, Federal requirements, including best management practices



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## No Loss Activity Basics

### Defined:

No permanent loss of, or impact to, wetlands from an activity.



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## No-Loss Criteria

"No-loss" means no permanent loss of, or impact to, wetlands from an activity according to the criteria in this part.

- **Will not impact a wetland** (8420.0415 Subp A.)
- **Excavation limited to removal of sediment or debris** Trees, logs, beaver dams, trash, blockage of culverts (8420.0415 Subp B.)
- **Water level management** (8420.0415 Subp C.)
- **Excavation limited to removal of sediment** in wetlands utilized as storm water basins. (8420.0415 Subp E.)
- **Operation, Maintenance or Emergency Repair.** (culverts) (8420.0415 Subp F.)
- **Temporary impact** if: Returned to previous conditions. Activity completed within 6 months (8420.0415 Subp H.)



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## No-Loss

- **Temporarily crossing or entering a wetland to perform silvicultural activities**, including timber harvest as part of a forest management activity, so long as the activity limits the impact on the hydrologic and biologic characteristics of the wetland; the activity does not result in the construction of dikes, drainage ditches, tile lines, or buildings; and the timber harvesting and other silvicultural practices do not result in the drainage of the wetland or public waters (8420.0415 Subp G)
- **Activity conducted as part of an approved replacement or banking plan, conducted or authorized by public agencies for the purpose of wetland restoration or fish and wildlife habitat restoration** (8420.0415 Subp D)



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## General Exemption Requirements for ALL

- Only has to fit one; not disqualified if not exempt by another
- If impacts exceed max allowed = nothing is exempt
- Max may not apply to all situations or wetlands-**very specific**
- May not be combined on a project
- Must stabilized to prevent sedimentation/erosion.

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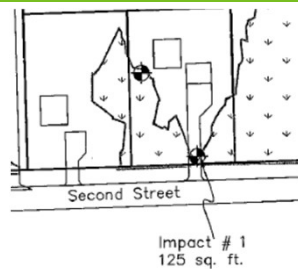
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## Exemptions 8420.0420

- Impacts to wetlands that **DO NOT** require replacement.
  - The activity is still regulated.
  - WCA does not REQUIRE an application; some LGU's may via ordinance.
  - May not be combined on a project.
- Exemptions do not apply to: calcareous fens, wetland bank sites, project-specific replacement sites (8420.0420 Subp 1B)



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## Exemptions – Agricultural Activities

"Agricultural land" means land devoted to the following uses and includes any contiguous land associated with the uses:

- (1) pasture or hayland for domestic livestock or dairy animals;
- (2) producing agricultural crops;
- (3) growing nursery stocks; or
- (4) animal feedlots.



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## NEW Agricultural Exemption Statute

Replacement plan for wetlands is not required for:

- impacts to wetlands on agricultural land labeled prior-converted (PC) lands and
- impacts to wetlands resulting from drainage maintenance activities authorized by the Natural Resources Conservation Service, on areas labeled farmed wetland, former wetland pasture, and wetland.

The prior-converted cropland, farmed wetland, farmed-wetland pasture, or wetland must be labeled on a valid final certified wetland determination issued by the Natural Resources Conservation Service.

Landowner is responsible to provide a copy of the final certificate and determination (026 and CWD map) to, and allow the Natural Resources Conservation Service to share related information with, the local government unit and the board for purposes of verification;

converted (PCRP) and  
activities authorized by the  
and farmed wetland, including  
wetland pasture, or wetland must  
issued by the Natural  
Applies to both  
wetland determination

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## Exemptions – Ag Activities

Exempt under Ag Exemption

- Prior Converted Cropland (PC)

Exempt if applying for drainage maintenance under Ag Exemption

- Wetland (W)
- Farmed Wetland (FW)
- Farmed Wetland Pasture/Hayland (FWP)



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## Other CWD Labels

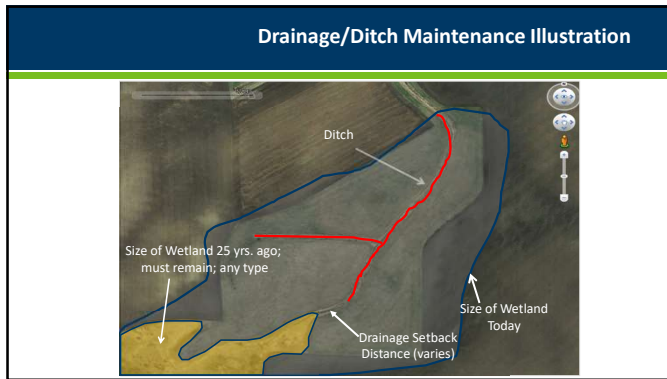
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- Numerous other label codes
- Only PC, W, FW and FWP specific to the new statute









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### Ditch Maintenance

**CONDITIONS:**

- Spoil must be placed and stabilized to minimize impacts.
  - remove
  - place on existing spoil
  - incorporate
  - side cast
- Ditch must be stable and not degrade water quality downstream.



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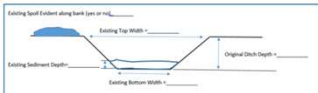

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### Drainage/Ditch Maintenance

What items may be needed to demonstrate this exemption is met?

- Past records of maintenance (receipt to contractors)
- Aerial Photo review
- Amount of Sediment Proposed to be removed (can be critical)
- Depth of ditch/soil types
- Culvert elevation and location
- Site visit
- Lateral Effect Calculations or estimates

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Exemptions

- Federal Approvals 8420.0420 Subp 4
  - Impacts authorized by Corps of Engineers that meet standards agreed to by BWSR, Dept. of Ag., DNR, and MPCA.
  - Pipelines, electrical, broadband, etc.
- Utilities MS 103G.2241

A replacement plan for wetlands is not required for wetland impacts resulting from:

- new placement or maintenance, repair, enhancement, realignment, or replacement of existing utility or utility-type service, including pipelines, when wetland impacts are authorized under and conducted in accordance with a permit issued by the United States Army Corps of Engineers under section 404 of the federal Clean Water Act
- Repair and updating existing septic systems to comply with local, state and federal regulations



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Exemptions – de minimis

- The de minimis exemption covers small impacts to wetlands typically used for driveways, culverts, small projects by landowners, etc.
- Very specific requirements depending on location in state, local area, shoreland, etc.

Table 1: Maximum de minimis exemption amounts for per MS 103G.2241 (Aug. 1, 2024)

Impacts to wetlands, excluding permanent and semipermanently flooded areas of wetland.	Presettlement area of state	Impact area up to (acres):	Impact area up to (square feet):
Outside of Shoreland Wetland Protection Zone	Greater than 80 percent area	One-quarter (1/4)	10,890
	50 to 80 percent area	One-tenth (1/10)	4,356
	Less than 50 percent area	One-twentieth (1/20)	2,178
Within Shoreland Protection Zone, but beyond structure setback	Statewide	N/A	100
Within Shoreland Protection Zone and structure setback	Statewide	N/A	20 (100)
Impacts to permanent and semipermanently flooded areas of wetlands	Statewide	N/A	400

▲ Increased amount shown in parenthesis may be allowed if wetland is isolated from the public water, or if permanent water runoff retention or infiltration measures are established in proximity to the impact and approved by the shoreland management authority.

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De Minimis Exemption

- Can't be combined
- If total area of impacts exceed de minimis, a replacement plan is required for the entire amount.
- May not divide property simply to get more



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Exemptions

- Subp. 7. **Forestry.** The exemption under this subpart is for roads and crossings solely constructed, and primarily used, for the purpose of providing access for the conduct of silvicultural activities. A replacement plan is not required for impacts resulting from construction of forest roads and crossings so long as the activity limits the impact on the hydrologic and biologic characteristics of the wetland; the construction activities do not include, or result in, the access becoming a dike, drainage ditch, or tile line; impacts are avoided wherever possible; and there is no drainage of the wetland or public waters.



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Exemptions

- Wildlife Habitat 8420.0420 Subp 9**
- Excavation or the associated deposition of spoil within a wetland for the primary purpose of wildlife habitat, if:
  - Deposition is less than 5% or ½ acre
  - No adverse effect on Threatened & Endangered Species
  - Certified by SWCD or TEP
  - All spoil must be stabilized with native, noninvasive vegetation.



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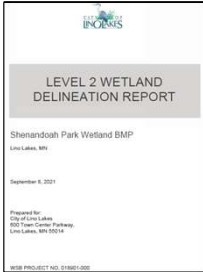
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Summary of Basic WCA Decisions

- Boundary/Type: approving wetland delineation that used Corps manual: Level 1, 2, 3 or comprehensive.
- No-loss: activity that does not result in wetland impacts
- Exemptions: wetland impacts that are exempt from replacement



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Exempt?

• Located in >80% area

• Not in shoreland

• Wetland =154,223 SF

• Proposed impact=7,490 SF

Impacts to wetlands, excluding permanent and semipermanently flooded areas of wetland.

Outside of Shoreland Wetland Protection Zone

Presettlement area of state

Greater than 80 percent area

50 to 80 percent area

Less than 50 percent area

Impact area up to (acres)

One-quarter (1/4)

One-tenth (1/10)

One-twentieth (1/20)

Impact area up to (square feet)

10,890

4,356

2,178

Qualifies for de minimis exemption MN Rule 8420.0420 Subp. 8

Yes, less than ¼ acre (10,890 SF)

Figure 3: Proposed Driveway

Destination Area

Disturbed Wetland

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De minimis - Examples

Table 1: Maximum de minimis exemption amounts for per MS 103G.2241 (Aug. 1, 2024)

Impacts to wetlands, excluding permanent and semipermanently flooded areas of wetland.

Outside of Shoreland Wetland Protection Zone

Within Shoreland Protection Zone, but beyond structure setback

Within Shoreland Protection Zone and structure setback

Impacts to permanent and semipermanently flooded areas of wetlands

Presettlement area of state

Greater than 80 percent area

50 to 80 percent area

Less than 50 percent area

Statewide

Statewide

Statewide

Impact area up to (acres)

One-quarter (1/4)

One-tenth (1/10)

One-twentieth (1/20)

N/A

N/A

N/A

Impact area up to (square feet)

10,890

4,356

2,178

100

20 (100)

400

▲ Increased amount shown in parenthesis may be allowed if wetland is isolated from the public water, or if permanent water runoff retention or infiltration measures are established in proximity to the impact and approved by the shoreland management authority.

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Scenario 1

A project is located outside of shoreland in a 50-80% area of the State and proposes to fill and impact 4,975 ft^2 of saturated mineral flat wetland for a driveway access.

Does Not Qualify:

De minimis is up to 1/10 acre (4,356 sf)

4975ft

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Scenario 2

A project is located within the building setback zone within shoreland in a >80% area of the State and proposes to fill and impact 320 ft<sup>2</sup> of a lacustrine fringe wetland.

**Does not Qualify:**  
De minimis statewide for all wetland types within building setback is up to 20 sf.

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Scenario 3

A project is located outside of shoreland in a greater 80% area of the State and proposes to fill and impact 5,800 ft<sup>2</sup> of a mineral flat wetland.

**Qualifies:**  
De minimis is up to 10,890 sf (1/4 acre)

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Scenario 4

A project is located in the less than 50% area of the State and proposes to excavate 175 ft<sup>2</sup> of a permanently flooded area of wetland.

**Not enough info to determine:**  
What is the shoreland status?

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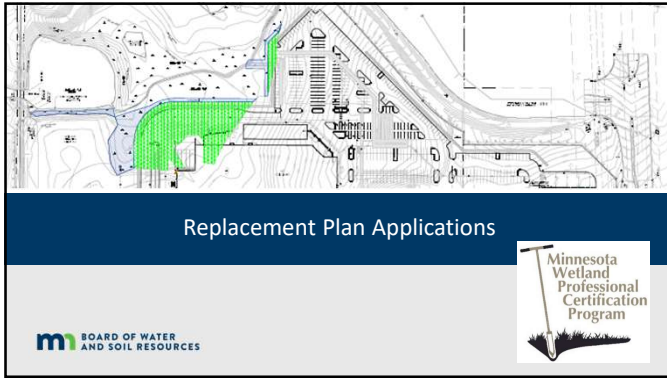
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### Replacement Plans

**8420.0330 REPLACEMENT PLAN APPLICATIONS.**  
**Subpart 1. Requirement.** A landowner proposing a wetland impact that requires replacement under this chapter must apply to the local government unit and receive approval of a replacement plan before impacting the wetland.

**Sequencing**  
**8420.0520**

**Avoid Impact** (8420.0320 subp.3)   **Minimize Impact** (8420.0320 subp.4)   **Replace** (8420.0522)

BWSR Wetland Section | [www.bwsr.state.mn.us/wetlands](http://www.bwsr.state.mn.us/wetlands)

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### Preapplication Meeting

- Prior to preparation of an application;
- Meet with the LGU/TEP, provide basic information of the project
- LGU/TEP inform the applicant of sequencing requirements and criteria to evaluate the replacement plan

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Application Contents

- Information necessary to be considered a complete application (a lot of this info can be pulled from the delineation report)
- For the impacted Wetland:
  - The amount of wetland impact (in sq ft or acres) by type
  - Minor/Major watershed, County, and Bank Service Area (BSA)
  - Soil survey of site, identify hydric soils
  - Hydrologic inlets and outlets, adjacent Public Waters (shoreland), floodplain



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Application Contents Continued...

- Information pertaining to special considerations (8420.0515) (Threatened & Endangered species, rare communities, cultural resources, etc.)
- List of known local, state, and federal permits required for the activity
- Identify project purpose and need and alternatives considered

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Application Contents Continued...

- C. for the replacement wetland when the replacement consists of wetland bank credits:
  - (1) the wetland bank account number;
  - (2) the minor watershed, major watershed, county, and bank service area; (3) the amount of credits to be withdrawn in square feet; and
  - (4) a completed application for withdrawal of wetland credits from the wetland bank in a form provided by the board or a purchase agreement signed by the applicant and bank account holder; and
- D. a description of the required replacement as determined according to the proposed replacement actions and the replacement standards in part 8420.0522.

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Special Considerations (8420.0515)

These factors must be considered by the applicant before submitting a replacement and by the LGU during the review

1. Endangered and threatened species (DNR natural heritage/nongame)
2. Rare natural communities (DNR natural heritage)<https://mce.dnr.state.mn.us/>
3. Special fish and wildlife resources (fish spawning, water birds, waterfowl, deer wintering/wildlife corridor)
4. Archaeological, historic, or cultural resource sites (National Register of Historic Places, State Historical Preservation Office)  
<https://mn.gov/admin/shpo/>
5. Groundwater sensitivity (Decorah edge, Geologic Sensitivity)



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Special Considerations Continued...

6. Sensitive surface waters (trout stream)
7. Education or research use (Cedar Creek, Anoka Co)
8. Waste disposal site (former dump, superfund, TCAAP/AHATS)
9. Consistency with other plans (watershed management, land use, planning and zoning)



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Sequencing: 8420.0520

- **LGU MUST NOT** approve a wetland replacement plan unless the LGU finds the project complies with sequencing.

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### Key Concepts

- Sequencing is a MUST for all replacement plans
- TWO avoidance alternatives
- Evaluate projects...can wetlands be avoided?
- Are impacts minimized?
- Long term effects
- 8420.0520 Subp C – Page 45 of 2009 Rule book

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### Sequencing

- Avoid
- Minimize
- Replace

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### How does applicant *demonstrate* sequencing?

- Clearly define the **purpose** of the project.
- Identify the physical, economic, and/or demographic **requirements** of the project.
- Justify** why this project should or must go on this site.
- Show (concept plans, discarded grading plans, etc.) and describe other *reasonable alternatives* that were considered or could be considered.

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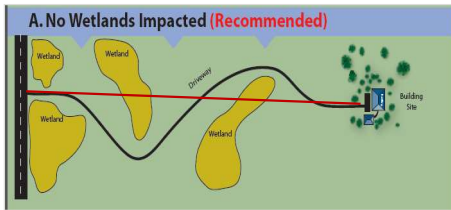
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## Impact Avoidance

- If LGU finds that a Feasible and Prudent Alternative exists that avoids impacts, the application must be denied.



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## Alternatives Analysis

What is *feasible and prudent*?

**WCA rule tells us** (8420.0520 subp 3C(2)):

- Can be done from an engineering perspective
- Is in accordance with accepted engineering standards and practices
- Is consistent with public health, safety, and welfare requirements
- Is environmentally preferable based on social, economic, and environmental impacts
- Would not create any truly unusual problems

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## Evaluating Alternatives (continued)

- LGU must consider (8420.0520 subp 3C(3)):

- Could the size, configuration, or density of the project be modified to avoid wetlands?
- Has the applicant made efforts to remove constraints (zoning restrictions, ordinance requirements, etc.) that are causing wetland impacts (i.e. request for variances, PUD, conditional use permit, etc.)?

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### What if an avoidance alternative DOES exist?

- If the LGU determines that a feasible and prudent alternative exist that avoids wetland impacts, it **MUST DENY** the replacement plan.

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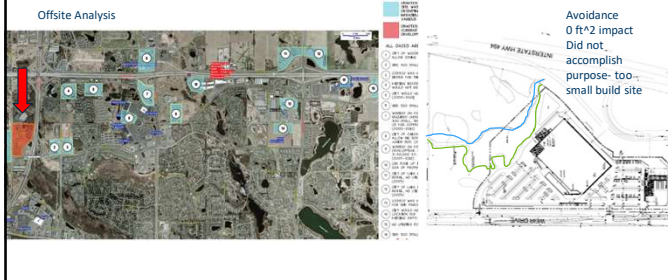
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### Avoidance



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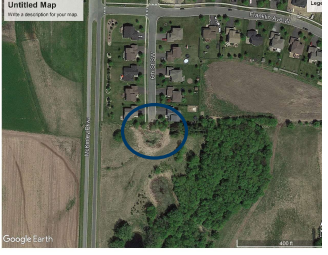
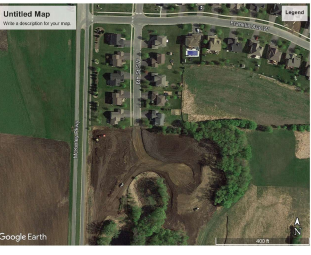
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### Alternatives Analysis Continued...

Future considerations when reviewing a site and potential off-site impacts

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### Alternatives Analysis Continued...

- Direct and secondary impacts:

A wetland may not be directly impacted (filled/drained/excavated) but can be impacted through loss of hydrology (storm pond, curb/gutter, pipes, etc.)




Figure 4 - Proposed Plan and Wetland Tributary Impacts

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### What if an avoidance alternative does NOT exist?

- LGU evaluates:
  - Minimization
  - Rectification
  - Reduction/Elimination of impacts over time
  - Replacement

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### Impact Rectification

- Temporary impacts must be rectified by repairing, rehabilitating, or restoring the affected wetland to pre-project conditions



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### Reduction or Elimination of Impacts Over Time

- Once complete, further impacts must be reduced or eliminated and preserve or maintain wetland functions
- Best Management Practices (BMP)
- Silt fence
- Storm-ponds
- Buffers
- Rip-Rap



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### Sequencing Flexibility

Allowed at the discretion of the LGU if:

1. Impacted wetland degraded;
2. Avoidance results in severe degradation;
3. Upland site of the project or replacement has greater function and value;
4. Human health and safety is a factor.



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## Credit Transactions

When processing transactions we need LGU name and contact. Typed or printed information makes it easier to figure out.

Transaction forms cannot be processed without required signatures.

Applicant and LGU will get verification letter once BWSR processes.

[illegible][illegible]

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# MN Conservation Explorer

## Welcome to the Minnesota Conservation Explorer



The Minnesota Conservation Explorer is an online tool to explore the diversity of Minnesota's Natural Heritage Data and to discover the location of Natural Heritage programs. The Minnesota Conservation Explorer can be used to explore the location of Natural Heritage programs, the location of Natural Heritage Data, and the location of Natural Heritage Data. The Minnesota Conservation Explorer is an online tool to explore the diversity of Minnesota's Natural Heritage Data and to discover the location of Natural Heritage programs. The Minnesota Conservation Explorer can be used to explore the location of Natural Heritage programs, the location of Natural Heritage Data, and the location of Natural Heritage Data.

Sign Up

I am a new user

Log In

Forgot my account

Reset my account

Log In

### Conservation Planning

The Minnesota Conservation Explorer allows users to view and explore natural resources, land use, and planning information. The Minnesota Conservation Explorer is an online tool to explore the diversity of Minnesota's Natural Heritage Data and to discover the location of Natural Heritage programs. The Minnesota Conservation Explorer can be used to explore the location of Natural Heritage programs, the location of Natural Heritage Data, and the location of Natural Heritage Data.

### Natural Heritage Review

The Minnesota Conservation Explorer allows users to view and explore natural resources, land use, and planning information. The Minnesota Conservation Explorer is an online tool to explore the diversity of Minnesota's Natural Heritage Data and to discover the location of Natural Heritage programs. The Minnesota Conservation Explorer can be used to explore the location of Natural Heritage programs, the location of Natural Heritage Data, and the location of Natural Heritage Data.

### Nonpoint Source Data

The Minnesota Conservation Explorer allows users to view and explore natural resources, land use, and planning information. The Minnesota Conservation Explorer is an online tool to explore the diversity of Minnesota's Natural Heritage Data and to discover the location of Natural Heritage programs. The Minnesota Conservation Explorer can be used to explore the location of Natural Heritage programs, the location of Natural Heritage Data, and the location of Natural Heritage Data.

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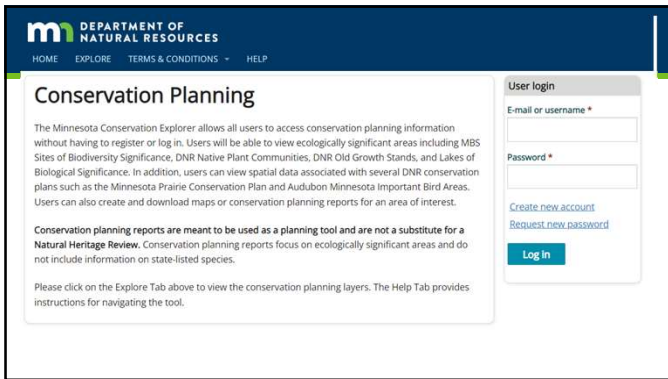
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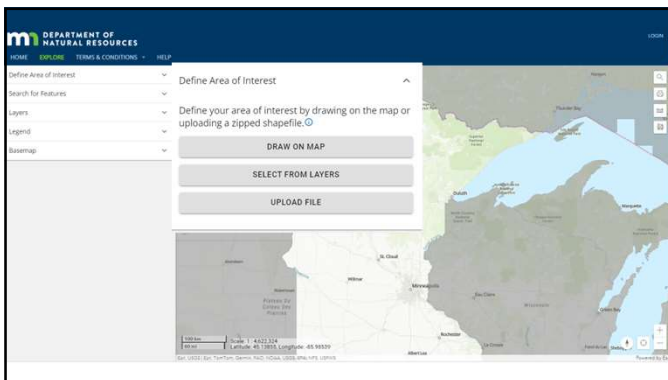
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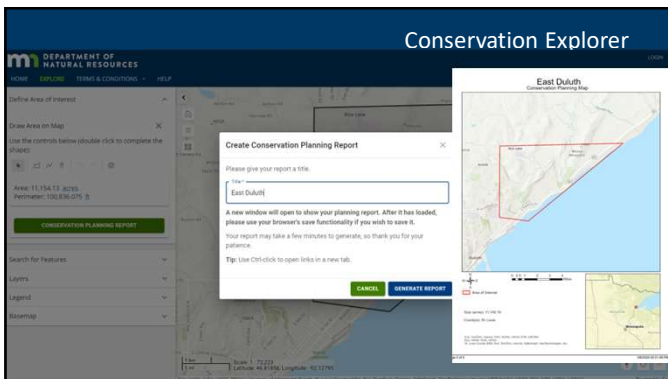
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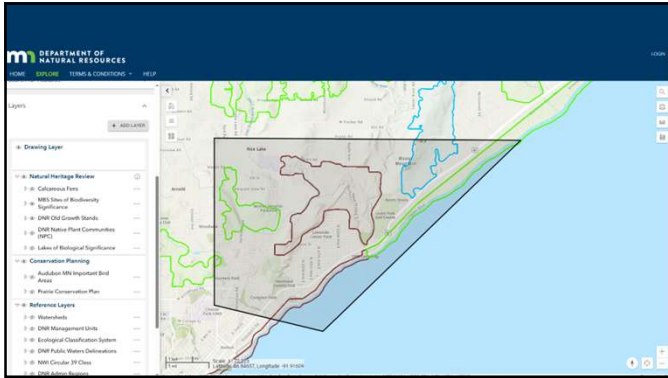
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Banking

- Wetland Bank Guidance and Information

### Wetland Bank Guidance and Information

The screenshot shows the Minnesota Wetland Bank website. It features a navigation menu on the left with links to 'Wetland Bank Credits and Fees', 'Wetland Bank Transactions and Information', 'Local Government Road Wetland Replacement Program', 'Wetland Bank & Mitigation License', 'Agriculture Wetland Bank', and 'In-Lieu Fee Mitigation Program'. The main content area is titled 'Wetland Bank Credits and Fees' and contains a table with columns for 'Program', 'Description', and 'Credits per Acre'. The table lists several programs including 'Standard Wetland Bank', 'Agriculture Wetland Bank', and 'In-Lieu Fee Mitigation Program', each with a brief description of the program and the number of credits generated per acre.

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Purpose

### What is Wetland Banking?

- WCA rule: “The purpose of the state **wetland banking** system is to provide a market-based structure that allows for replacement of unavoidable impacts with pre-established replacement wetlands.”
- Federal Mitigation Rule definition (33 CFR 332.2): “A **mitigation bank** sells compensatory mitigation credits to permittees whose obligation to provide compensatory mitigation is then transferred to the mitigation bank sponsor.”

The graph shows the number of withdrawal transactions per year in the Minnesota Wetland Bank from 1995 to 2021. The y-axis is labeled 'Number of Withdrawals' and ranges from 0 to 1000. The x-axis is labeled 'Year' and ranges from 1995 to 2021. The data shows a general upward trend with significant fluctuations, peaking around 2005 and 2021.

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Bank types

- Private
  - Standard- Landowners establish bank on private land to mitigate impacts on non-ag or transportation projects
  - Agriculture- Credits can only be used for Ag projects
- In-lieu Fee (proposed)
  - Mitigation NOT completed in advance
  - Open to only government and NGOs, mitigation completed in advance, requires compensation planning framework
- Local Government Road Wetland Replacement Program
  - Replaces impacts resulting from local transportation projects

The diagram shows the flow of credits between four entities: ILF (proposed), Minnesota Wetland Bank, LGRWRP, and Private (agricultural and standard). Arrows indicate the direction of credit flow: from ILF (proposed) to Minnesota Wetland Bank, from LGRWRP to Minnesota Wetland Bank, and from Private (agricultural and standard) to Minnesota Wetland Bank.

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### Actions Eligible for Credit

- Restoration of completely drained wetland
- Restoration of partially drained wetland
- Vegetative restoration of farmed wetlands
- Protection of wetland previously restored via conservation easements
- Wetland Creations
- Restoration and protection of Exceptional Natural Resource Value
- Preservation of wetlands
- (Upland) buffer areas



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### Actions Eligible for Credit 8420.0526

Subpart	Action
2	Buffer
3	Restoration, Completely Drained or Filled
4	Restoration, Partially Drained or Filled
5	Vegetative Restoration of Farmed Wetland
6	Protection of Wetlands Previously Restored
7	Wetland Creation
8	ENRV
9	Preservation

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### Establishing a Wetland Bank

#### State and Federal Review Process in Minnesota

- Draft Prospectus
  - State: Optional
  - Federal: Optional
- Prospectus
  - State: Optional
  - Federal: Required
- Mitigation Plan/Draft MBI
  - State and Federal: Required
- Final Mitigation Plan and MBI
  - Federal only and required

#### WCA

Draft Prospectus (optional)

Prospectus (optional)

Mitigation Plan (required)

Easement Acquisition

#### Corps

Draft Prospectus (optional)

Prospectus (required)

Mitigation Plan (required)

Final Mitigation Plan (MBI) (required)

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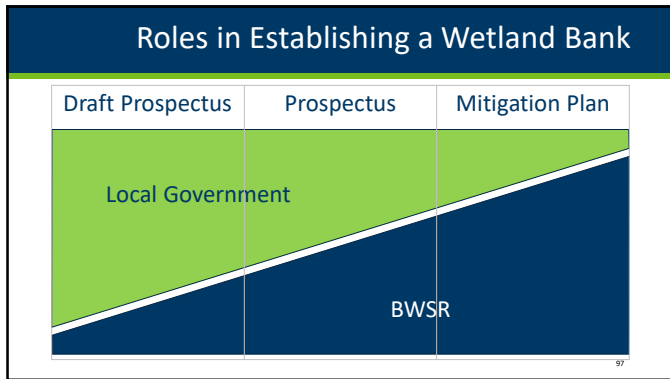
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### Draft Prospectus

- Optional
- No decision required
- Help sponsors
- Complex or difficult projects
- Minimal investment

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### Draft Prospectus

- Basic project information
- Easement questionnaire
- Basic Features
- Why is it a good bank project
- Constraints
- Existing wetlands

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### Roles for reviewing prospectus

**TEP/LGU Roles:**

- Verify previous comments addressed
- Verify sponsor adequately described the site
- Review wetland delineation or determination
- Review crop history (if necessary)
- Provide LOCAL perspective on project and eligibility

**BWSR Role:**

- Evaluate easement issues
- Vegetation, Engineering, and Bank Coordinator comments included
- Statewide consistency
- Technical answers and interpretations
- Coordination with Corps

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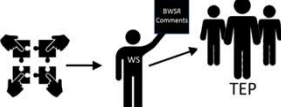
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### Review

- Comments become more direct
- Baseline information must justify credit actions and allocations
- Some credit actions require more information
- Project takes shape but detailed plans not required
- Balance information needs versus sponsor's cost



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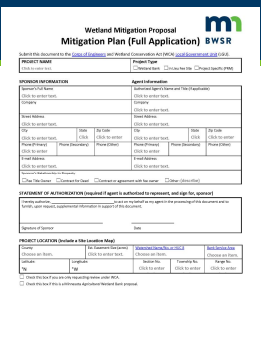
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### Mitigation Plan

- Document of record
- Required for both programs
- LGU Decision Required
- Section 15.99 time limits!
- Attached to Corps' MBI

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Mitigation Plan

Required:

- Detailed vegetation plans
- Detailed construction plans
- Detailed monitoring plans
- Performance standards
- Credit release schedule

WATER CONTROL STRUCTURE  
PROPOSED DIKE  
REMOVE TILE  
RELAY TILE

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TEP Review

- Verify Corps has completed Prospectus phase
- Verify Prospectus information carried forward and comments addressed
- Verify Baseline Information is complete and adequate
- Wetland delineation approval
- Review detailed plans to your comfort level

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"Plans are nice but performance releases credits." J. Overland

Mitigation Plan

- Monitoring plan must relate to performance standards
- Performance standards must relate to credit releases
- The Mitigation Plan is the basis for implementation, credit releases, and allowable actions into the future
- DOCUMENTATION IS CRITICAL

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## Mitigation Plan Decision

- Track 15.99 time limits, extensions needed
- Most Mitigation Plans will require some revision
- Make final decision in accordance with section 15.99
- Clearly identify and retain approved Mitigation Plan
- When possible the WCA and Corps approved plans should be the same



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## Easement Acquisition

### GENERAL PROCESS INFORMATION

- Easement acquisition is typically initiated after mitigation plan approval
- Easement acquisition does not have to be completed prior to construction
- The process is managed at BWSR by Easement Section Staff, not Wetland Specialists
- It is the responsibility of the sponsor/landowner to initiate the easement acquisition process



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## LGU role in Easement Acquisition

- Help the sponsor find the [“Conservation Easement Acquisition Overview for Private Wetland Banks”](#)
- BWSR easement staff will take it from there



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Easement Acquisition

The significant steps in the easement acquisition process include:

1. **Sponsor** submits initial \$1,000 Easement Acquisition Fee **to BWSR** along with application
2. **BWSR** performs a preliminary review of ownership information to identify potential issues
3. **Sponsor provides** DRAFT Certificate of Survey in required format **for BWSR review & comment**
4. **BWSR provides** sponsor with instructions to obtain Title Commitment
5. **Sponsor (landowner) provides** Title Commitment **to BWSR** for State Attorney General (AG) review & comment
6. **BWSR prepares** Conservation Easement document to be signed by landowner
7. **Landowner signs Easement and returns to BWSR** with \$2,400 Easement Acquisition Fee balance
8. **BWSR sends** instructions to record the Easement and issue a Title Insurance Policy
9. **BWSR notifies sponsor** that easement acquisition process is complete

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Construction Certification

- LGU must certify the initial construction
  - Documentation:
    - as-built drawing
    - surveyed map
    - seed tags
    - construction photos
  - Site Visit with TEP
    - Recommend TEP Findings of Fact

7-29-2015 view east

Ditch M12 ~Sta. 50

8-19-2015 view west

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Credit Deposits

- Up to 15% of the credits are eligible for deposit after the certification of construction
- Remaining credits are eligible for deposit based on the credit release schedule and performance standards in the approved bank plan
- Subject to review by the LGU & TEP
- After certifying the credit for deposit, the LGU must forward to BWSR banking administrator

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## Local Government Road Wetland Replacement Program

- WCA exempts certain local road projects from State wetland replacement requirements
- BWSR is required to replace the associated wetland impacts so the local governments don't have to
- These wetland credits also satisfy Corps of Engineers' Section 404 permit requirements



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## What projects Qualify?

- **Repair, rehabilitation, reconstruction or replacement of currently serviceable** existing State, City, County or Town public road.
- Provided that:
  - Project **minimizes impacts**
  - **Plans are provided** to the LGU
- What doesn't qualify?
  - New roads
  - Roads expanded solely for additional capacity lanes



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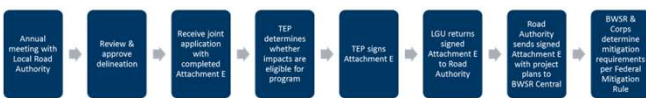
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## Reviewing Local Road Projects



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Joint Application Form

Joint Application Form for Activities Affecting Water Resources in Minnesota

For Local Road Projects:

• Parts 1-5; Attachments C and E

• May need Attachment D if there will be impacts that do not meet the Local Road Program eligibility requirements

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Application Requirements

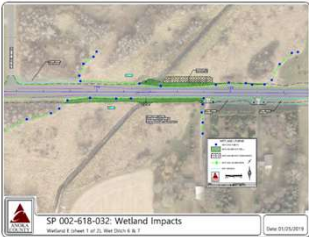
Local Road Unit should provide TEP the following:

• Project plans depicting wetland boundaries

• Description of wetland impacts by type

• Information demonstrating wetland impact minimization

• Only one alternative is required



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Good Example

MnDOT's Road Design Manual (2000) also recommends turn and/or bypass lanes for rural undivided roadways with traffic volumes over 1,500 ADT and speed limits above 45 mph. Current road condition compared with required and proposed are laid out in the table below.

	Existing	Required	Proposed
Lane Width (ft)	12	11-12	12
Shoulder Width (ft)	0-6	8	8
In-Slope	1:4	1:4	1:4

This project is proposed to improve CSAH 18 to meet today's State Aid Standards and improve safety along the corridor.

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[illegible]

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### Overview of Wetland Bank Monitoring

- Monitoring process
  - Construction Certification
  - Duration of monitoring
  - Deposit of Credits
- Maintenance responsibilities
  - Monitoring reports
  - Timeline
  - Reports
- Corrective Actions

- Hydrology Monitoring
  - Performance standards
- Vegetation Monitoring
  - Performance standards

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### General Monitoring roles once wetland bank is approved

<p>LGU/Corps roles:</p> <ul style="list-style-type: none"> <li>• certify construction</li> <li>• certify credits for deposit</li> <li>• review monitoring reports</li> <li>• may require corrective actions as needed</li> </ul>	<p>Sponsor/landowner roles:</p> <ul style="list-style-type: none"> <li>• Sponsor responsible for maintenance</li> <li>• Submitting as-built documentation</li> <li>• Submitting wetland credit deposit transaction form(s)</li> <li>• Submitting monitoring reports</li> <li>• Paying administrative fees</li> </ul>
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# Performance Standards

- Performance standard: observable or measurable physical (including hydrological), chemical and/or biological attributes that are used to determine if a compensatory mitigation project meets its objectives.
- Vegetation
  - *"85% of the site is vegetated by planted species and/or regenerated species as per approved plan by end of 5<sup>th</sup> complete growing season."*
- Hydrology
  - *"Hydrology must meet wetland definition of 1987 Corps of Engineers Manual with saturation to the surface of the soil for at least 31 days of the growing season."*

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- Submitted following the first full growing season no later than 12/31
- Then submitted as per approved bank plan
- May include Transaction Form to Deposit Credits



The image shows a 'Transaction Form to Deposit Credits' from the Minnesota Wetland Bank Program. It is a detailed form with multiple sections for recording transaction information, including dates, amounts, and descriptions. The form is titled 'Transaction Form to Deposit Credits' and 'Minnesota Wetland Bank Program'. It includes sections for 'A. Deposit Bank Information', 'B. Account Number Information', and 'C. Credits to be Deposited'. The form is designed to be filled out by the bank and submitted to the Minnesota Department of Natural Resources.

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## Reviewing Monitoring Reports

### A. Success Criteria Summary

Summary of Success Criteria Standards and Current Metrics for 2017.

Metric	Success Criteria	Measured Criteria	Success Criteria Met?	Comments
Hydrology - Standards used for 2017 - 2018	Water between 6 inches above and one foot below ground surface.	Measured hydrology is between 6 inches above and one foot below ground surface.	Yes	Final hydrology monitoring not required for 2017. Results based on direct site observations.
Elevation	Majority of the growing season.	Hydrology was within the desired range for the majority of the growing season.	Yes	
Vegetation				
Diversity	Minimum of five native species.	75 native species have been observed.	Yes	Species diversity increased from 2016 to 2017.
Composition	Minimum of two sedges and two grasses.	Eight sedges and eight grasses have been identified.	Yes	Species composition stable.
Invasive species coverage	No more than 10% total cover.	Total cover of invasive species is less than 10%, and has been effectively controlled.	Yes	Reed canary grass is less than 5% coverage.
Invasive species concentration	No single area greater than one quarter acre in size.	Invasive species remain under control with no single area greater than one-quarter acre in size.	Yes	Slight increase of along ditches, but spotted again in May 2017 to control.

- Know performance standards
- Interpret data to determine whether the site meets those standards
- If not, document with data what is not meeting standard
- Consult with TEP & Corps
- Then corrective actions should be recommended

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## Hydrology

Considerations in planning hydrologic monitoring project:

- What is the question?
- What is the performance criteria?
  - Precision?
- Site characteristics
  - Landscape position, hydrology setting, soil, vegetation, drainage features
- Pre-existing data
- Timeline and available resources

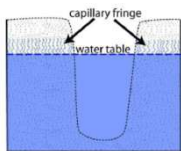
- [BWSR Hydrology Guidance documents](#)



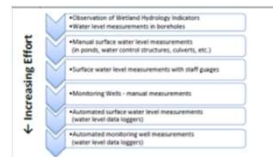
131

## Methods to monitor hydrology

- Observation of indicators
- Staff gauges
- Open boreholes



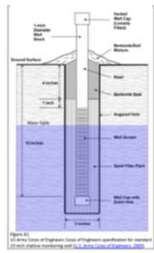
- Monitoring wells
  - Manual measurements
  - Automated measurements



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## Design and location of monitoring wells



### Monitoring wells

- Screen, Riser, Sand Pack, Bentonite seal

### Well location

- Depends on the question:
  - Single well will tell if hydrology is present
  - Complex sites require transects based on landscape position, etc.
    - Professional judgement

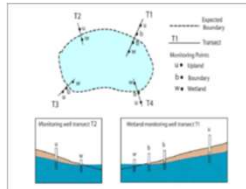


Figure 11: Example of monitoring well transects perpendicular to wetland boundaries designed to confirm wetland boundaries based on ground water measurements.

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## Monitoring Well Data

### Hydrograph:

- Growing season
- Normal "envelope"
- 30 day rolling total
- Daily Precipitation

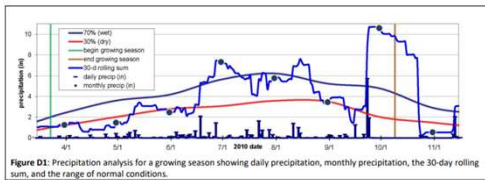
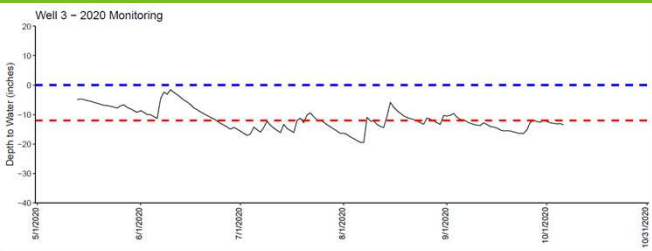


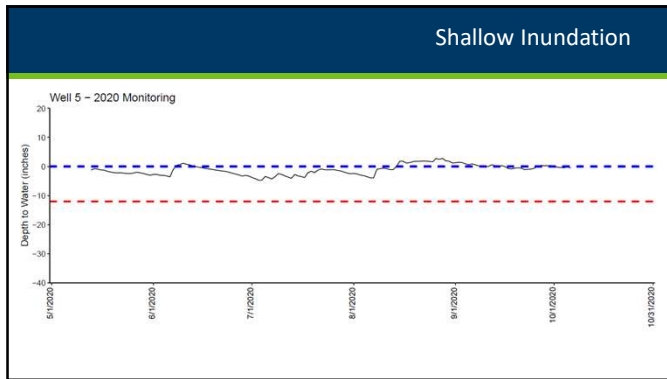
Figure D1: Precipitation analysis for a growing season showing daily precipitation, monthly precipitation, the 30-day rolling sum, and the range of normal conditions.

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## Seasonally Saturated



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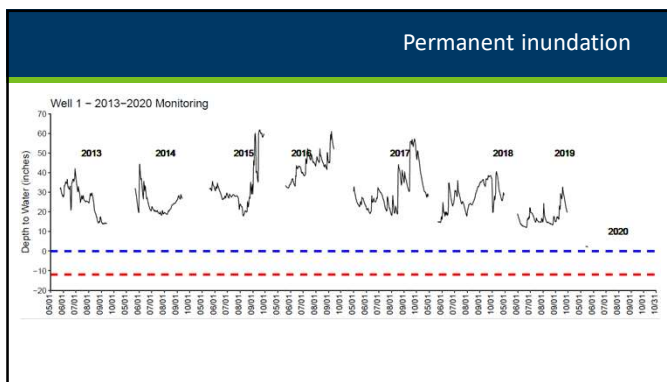
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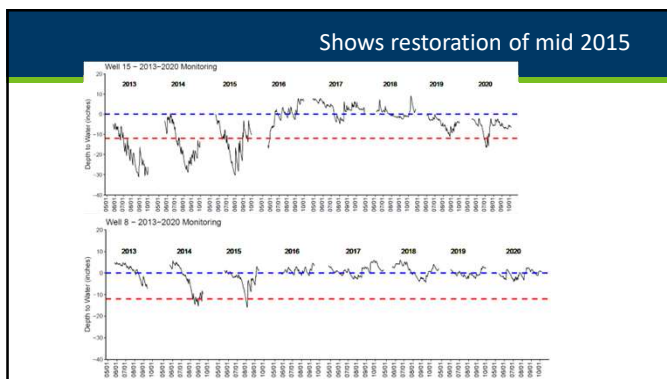
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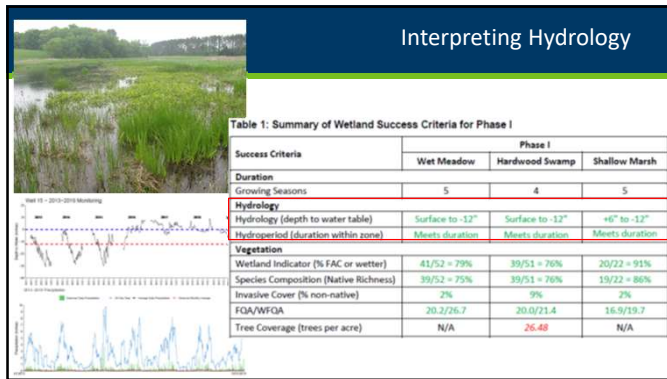
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### Vegetation Monitoring for Wetland Bank Sites

[Vegetation Monitoring for Compensatory Wetland Mitigation Sites](#)

- Developing a vegetation monitoring plan
- Sampling methods
- Where and when to monitor
- Monitoring plan considerations
- Reporting monitoring results

BOARD OF WATER AND SOIL RESOURCES  
Vegetation Monitoring for  
Compensatory Wetland Mitigation Sites  
03/09/2015  
Version 1

This document was prepared by the Arkansas Board of Water and Soil Resources with money and material from the Arkansas Department of Reclamation, Arkansas Game and Inland Fisheries, and the United States Army Corps of Engineers. It is the property of the Arkansas Board of Water and Soil Resources. Page 2.

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### Vegetation

- Methods to monitor vegetation:
  - Floristic Quality Assessment
  - Mapping plant communities
  - Estimating invasive species

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### Vegetation

- Interpreting vegetation data
  - Indicator status (% FAC or wetter)
  - Composition (% native species richness)
  - Invasive cover (%)
  - Floristic Quality Assessment (index rating)

Table 1: Summary of Wetland Success Criteria for Phase I


Success Criteria	Phase I		
	Wet Meadow	Hardwood Swamp	Shallow Marsh
Duration	5	4	5
Growing Seasons	5	4	5
Hydrology	Surface to -12"	Surface to -12"	+6" to -12"
Hydroperiod (duration within zone)	Meets duration	Meets duration	Meets duration
Vegetation	41/52 = 79%	39/51 = 76%	20/22 = 91%
Wetland Indicator (% FAC or wetter)	41/52 = 79%	39/51 = 76%	20/22 = 91%
Species Composition (Native Richness)	39/52 = 75%	39/51 = 76%	19/22 = 86%
Invasive Cover (% non-native)	2%	9%	3%
FOA/WFOA	20.2/26.7	20.0/21.4	16.9/19.7
Tree Coverage (trees per acre)	N/A	26.48	N/A

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### Corrective Actions

- If, during the monitoring period, the LGU/Corps or TEP determine that a bank site does not meet the approved plan's specifications, the LGU must require corrective actions
- BWSR can freeze accounts by restricting deposits, withdrawals, transfers until the LGU determines the site is in compliance
- Noncompliance of bank sites is subject to enforcement procedures

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Altered Hydrology

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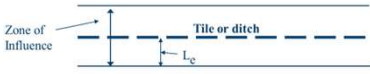

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Lateral Effect

- Lateral Effect ( $L_e$ )
- The distance on each side of a tile or ditch in its longitudinal direction where the ditch or tile has an influence on the hydrology
- Measured perpendicular from midpoint of tile line or toe of ditch bank

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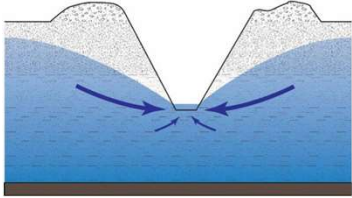
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Lateral Effect

- Factors influencing Lateral Effect
- Depth
- Soil Properties
  - Hydraulic conductivity
  - Drainable porosity
- Grade
- Impermeable Layer



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Effectively Drained

- A condition where ground or surface water has been removed by artificial means to the point that an area no longer meets the wetland hydrology criterion
- “Artificial means” is usually a ditch, tile or diversion
- The area will not support a dominance of hydrophytes but hydric soil will persist

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Drainage Setback Tables

- Developed by NRCS using the van Schilfgaarde equation from the ND-Drain program
- **Setback distance** is the minimum distance from the wetland boundary to the tile line or ditch necessary to minimize adverse hydrologic impacts to adjacent wetlands
- Developed by NRCS to advise farmers

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Lateral Effect & Drainage Setback

Wetland Delineation

Delineation Guidance & Resources

Delineation Manuals

Hydrology & Antecedent Precipitation

Lateral Effect & Drainage Setback

Wetland Functional Assessment

Wetland Restoration

All drains have some effect on an adjacent wetland. The question, then, concerns what is an acceptable negligible hydrologic effect on the wetland. To this, various lateral effect or scope and effect equations have been developed to estimate the extent that a drain will lower the adjacent water table. The lateral effect is variously defined by different wetland-related programs. The Natural Resource Conservation Service (NRCS) defines lateral effect as the distance on either side of a ditch or tile line within which wetland hydrology would be impacted by the installation of the ditch or tile line such that it may result in loss of eligibility for USDA program benefits. Some have defined it as the width of a strip of land drained such that it no longer meets the wetland hydrology criteria set forth in the 1987 Corps of Engineers Wetland Delineation Manual. For wetland regulatory purposes in Minnesota, lateral effect is defined more broadly as the effect of a drain on the adjacent water table. Estimates of these effects can sometimes be used to evaluate whether or not a drain will cause an unacceptable loss of wetland hydrology.

A series of setback tables have been developed and refined over time by NRCS to estimate the lateral effect of various drains in different soil types. These tables have become the standard for estimating lateral effect in Minnesota. BWSR in coordination with the St. Paul District Army Corps of Engineers (Corps) has developed specific guidance on the use of these tables in relation to wetland regulatory programs and wetland delineation manuals as follows. Note that the links within this 2013 document are no longer operable, but the guidance is still applicable aside from the clarification below.

**BWSR Guidance Concerning NRCS Developed Drainage Setback Tables (pdf)**

Subsequent revisions and clarifications to setback tables have been provided further clarification on assessing lateral effect for wetland regulatory purposes. Users should first go to the **Minnesota NRCS Engineering Institute** and select the Lateral Effect Distance link. You must download the Lateral Effect Dist Tool and open it in the **Excel** software program. **Follow** the instructions on the website and you will be able to enter County and mapped soil series which will generate the lateral effect setback distance for various soil types (e.g. soils known to have high organic content) users will be prompted to seek further assistance from NRCS staff. In those instances, users should not seek NRCS staff assistance and should instead use the setback distance in the 2012 drain setback tables that BWSR has adopted. NRCS can only provide technical support for USDA program eligibility, not the Wetland Conservation Act. The 20 BWSR drainage setback guidance applies regardless of which tables are used.

**2012 Drainage Setback Tables by County** (use only if no value given in current NRCS tables per above)

**2012 Drainage Setback Tables by County**

(use only if no value given in current NRCS tables above)

Select a County:

BWSR Wetland Services | [www.bwsr.state.mn.us/wetlands](http://www.bwsr.state.mn.us/wetlands)

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USDA **Lateral Effect Database**  
for use in IA, MN, ND, & SD

Instructions Database General Information

User Name: [ ] Date: 08/07/23

Customer Info  
Customer Name: [ ] Location: [ Select State ]  
Farm #: [ ] Tract #: [ ] Field #: [ ] Survey Area: [ Select Area ]

Drain/Ditch Configuration  
Depth (ft): [ Select Depth ]  
Diameter (in): [ Select Diameter ]

Soils Information  
Field Soil: [ Select Soil ]  
Wetland Soil: [ Select Soil ]

Lateral Effect  
Lateral Effect Distance (ft): [ Null ]  
Select parameters to determine lateral effect

Clear Print PDF Exit

Page 1

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**BWSR Guidance Concerning NRCS – Developed Drainage Setback Tables**  
October 2013 Version 2.0

**Purpose:** Provide consistency among wetland managers when determining the impact of a drainage system on wetland hydrology.  
**Audience:** Wetland managers  
**Rule reference or statute:** Not applicable  
**Intended use:** Guidance intended to complement other NRCS Drainage Setback Tables and Corps of Engineers Regional Supplemental for wetland delineation.

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2. Purpose and Applicability	2
3. Background	3
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[https://bwsr.state.mn.us/sites/default/files/2018-12/WETLANDS\\_Delin\\_Drainage\\_setback\\_guidance\\_BWSR\\_2013.pdf](https://bwsr.state.mn.us/sites/default/files/2018-12/WETLANDS_Delin_Drainage_setback_guidance_BWSR_2013.pdf)

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**Drainage Setback Tables**

- County-specific
- MN NRCS uses setback distance rather than lateral effect.
- Setback distance** and **lateral effect** are not the same thing!!
- Setback tables not directly applicable for use in determining drainage impact.
- <https://bwsr.state.mn.us/lateral-effect-drainage-setback>

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Setting function-based restoration goals and performance standards.

Establishing Goals & Measurable Outcomes:

- Restore natural hydrology
- Reestablish native plant community to site
- Performance Standards (banking)- measurable attributes to determine if restoration goals are met



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MN Wetland Restoration Guide

[MN Wetland Restoration Guide:](#)

- Planning
- Site Assessment
- Design and Construction
- Vegetation establishment
- Site Management & Monitoring



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General considerations for wetland restoration

- Identifying and selecting projects
  - Restoration over creation
- Consider potential complications from degraded sites
- Adjacent land uses (present and future?)
  - Changes to adjacent landowners?
- Location of area ditches
  - Public or private?
  - Drainage Law?
- Understand soil conditions of site (permeability, chemistry)
- Water quality



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[illegible]

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## Functional Assessment Methods


- **WI/MN Wetland Rapid Assessment Method**
  - Rapid method for assessing wetland functions based on functional capacity and value.

- **Floristic Quality Assessment**
  - Vegetation based ecological condition assessment method



**WI/MN Wetland Rapid Assessment Method User Guide**  
Version 1.0 (2016)

This guide focuses on the ability of a wetland to perform water quality, water supply, and other functions. It provides a rapid assessment method for wetlands, based on functional capacity and value. The guide is designed to be used by a wide range of users, from landowners to regulators. It provides a rapid assessment method for wetlands, based on functional capacity and value. The guide is designed to be used by a wide range of users, from landowners to regulators.



**Floristic Quality Assessment Manual**  
Version 1.0 (2016)

This manual provides a rapid assessment method for wetlands, based on functional capacity and value. It provides a rapid assessment method for wetlands, based on functional capacity and value. The guide is designed to be used by a wide range of users, from landowners to regulators.

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## WI/MN Wetland Rapid Assessment Method

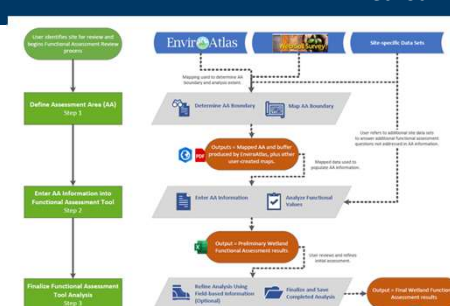
- Developed by Committee of MN, Wisconsin and Federal Agencies
  - Released for public comment in 2024
- Tool assesses 17 wetland functions under five categories: hydrologic, water quality, ecological, climate, anthropogenic

Functional Group	Function
Hydrology	Surface Water Attenuation
	Surface Water Supply
	Groundwater Recharge
Water Quality	Nitrate Removal
	Phosphorus Retention
	Sediment and Pollutant Retention
	Shoreline Stabilization
	Temperature Maintenance
Ecological	Native Plant Habitat
	Wildlife Habitat
	Fish Habitat
Climate	Carbon Sequestration
	Historic or Cultural Uses
Anthropogenic	Scientific or Educational Importance
	Commercial Uses
	Recreational Uses
	Scenic Beauty

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## Method

- 1) Identify area of interest (AOI)
- 2) Level one delineation of wetlands and HGM type
- 3) Conduct desktop review using information sources
- 4) Field visit- verify AOI, conduct Rapid FQA, and answer questions
- 5) Complete Data input and save



The flowchart illustrates the process of the Functional Assessment Method. It starts with identifying the area of interest (AOI) and defining the assessment area (AA). This is followed by a desktop review using information sources and a field visit to verify the AOI and conduct a Rapid Functional Quality Assessment (Rapid FQA). The process then involves entering AA information into the Functional Assessment Tool (FAT) and analyzing the results. The final step is to complete data input and save the results.

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## Data Entry in Spreadsheet

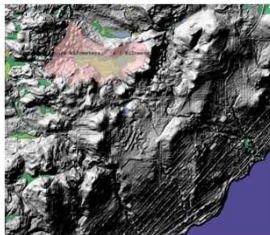
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Assessment Area Name		
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## Results Summary

Questions Organized by Ranking			
Highest	Moderate	Lower	Not Applicable
Surface Water Supply (SWS)	Water Removal (WR)	Groundwater Recharge (GR)	
Thermoregulation (TR)	Sediment and Pollutant Retention (SPR)	Commercial Users (CU)	
Native Plant Habitat (NP)	Shoreline Stabilization (SS)		
Historic or Cultural Uses (HCU)	Carbon Sequestration (CS)		
Scientific or Educational Importance (SEI)			
Recreational Uses (RU)			
Scenic Beauty (SB)			



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## Floristic Quality Assessment

- Vegetation condition assessment to measure the quality of a native plant community
- Developed by the MN Pollution Control Agency
  - 2007, Statewide C-values
  - Efforts to regionalize C-values underway
- Intended to complement functional assessments such as MNRAM



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FQA Key Concepts

- Key concepts:
  - Species conservatism- tolerance to degradation
    - Coefficients of Conservatism (C-value)
  - Floristic Quality Index
    - Species richness and mean C-values
- Sampling methods
  - Rapid FQA
  - Full Method

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FQA Key Concepts

- Coefficients of Conservatism
  - Numeric rating of an individual species fidelity in relationship to disturbance
  - C-values range from 0-10
    - 0= most tolerant, found in wide variety of plant communities
    - 10= least tolerant, found in narrow range of plant communities
  - Non-native species = 0
    - Reed Canary Grass (introduced) C=0
    - Ostrich Fern (FAC, NCNE) C=5
    - Pink lady slipper C=9

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Sampling Methods Overview

- FQA Sampling Protocol:
  - Map Assessment Area
  - Determine Plant community types
  - Conduct timed meander (rapid) or plot-based sampling
  - Conduct shoreland sampling (if necessary)
  - Make Areal cover estimations
  - Calculations
- Full FQA -Plot-based sampling
- Rapid FQA- Timed meander rules
  - Areal cover in cover classes for each species

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### Metrics

Variables:

- Number of species = Species Richness
- Mean C-value
- Mean C-value (weighted) ( $wC$ )
  - $wC = \sum pC$



Floristic Quality Index

- Integral measurement of FQA

$$FQI = \bar{C} \sqrt{S}$$

- mean C value
- S= number of species (i.e. species richness)
- Both stand alone indices

Greater the FQI, the closer the condition is to a natural state

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### Add slides

- NWI
- Soil survey
- Ecological site description

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### Small Group Delineation Exercise

Plan:

- Work in small groups
- Field pack, shovel, auger, field maps
- Complete at least one upland and one wetland data sheet
- Determine wetland boundary



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