DAKOTA COUNTY PLANNING COMMISSION

Dakota County Western Service Center – Room 106
14955 Galaxie Avenue
Apple Valley, MN 55124
Thursday, January 27, 2022
7:00 PM – 9:00 PM

This is an in-person meeting. In accordance with a resolution passed by the County Board of Commissioners, all visitors in Dakota County buildings must wear a mask regardless of their vaccination status. The decision is due to Dakota County being at a substantial level of community transmission of COVID-19. According to the CDC, masks may reduce the transmission of COVID-19 among both vaccinated and unvaccinated persons.

Agenda

I. Call to Order

II. Pledge of Allegiance

III. Public Comments:
Anyone wishing to address the Planning Commission on an item not on the agenda may address the Planning Commission at this time (comments are limited to 5 minutes).

IV. Approval of the Agenda

V. Approval of Previous Meeting Minutes

VI. Welcome New Planning Commissioners—John Ross & Anna Boroff (Led by Amy Hunting)

VII. Election of 2022 Planning Commission Officers – Action (Kurt Chatfield – Planning)

VIII. Establishment of 2022 Meeting Dates - Action (Kurt Chatfield – Planning)

IX. Planning Commission Administrative Forms – Information (Liz Hansen – Administration)

X. 2022 Planning Commission Work Plan – Information (Kurt Chatfield – Planning)

XI. Agricultural Chemical Reduction Effort (ACRE) Program Update -Information
(Valarie Neppl and Jill Trescott – Groundwater Protection)

XII. Dakota County All-Hazard Mitigation Plan – Action
(Ben Rutter and BJ Battig, Dakota County Homeland Security)

XIII. Planning Manager Update and County Board Actions

- Authorized Joint Powers Agreement with Burnsville for Lake Marion Greenway Trailhead
- Authorized River to River Greenway public art pilot project
- Received update on Veterans Memorial Greenway, design, and memorials
- Discussed parks and greenways long-term funding

XIV. Upcoming Public Meetings – Community Outreach

CSAH 6 and CAH 73 Roundabout (Thomson and Oakdale) Open House	March 9th from 5pm-7pm West St. Paul Council Chambers, 1616 Humboldt Avenue, West St. Paul

County 46 and Diamond Path Intersection Open House	February 17, from 6:30pm-8:30pm East Lake Elementary School, Lakeville https://www.co.dakota.mn.us/Transportation/PlannedConstruction/CR33-46/Pages/default.aspx
Veterans Memorial Greenway Open House	February 23, from 4:30pm-6:30pm Veterans Memorial Community Center, Inver Grove Heights https://www.veteransmemorialgreenway.com/

XV. Topics for Next Meeting (Thursday, February 24, 2022)

- North Creek Greenway and Lake Marion Greenway Natural Resource Management Plans
- Veterans Memorial Greenway, design, and memorial concept update

XVI. Planning Commissioner Announcements/Updates

XVII. Adjourn

2022 Planning Commission Meeting Schedule

Proposed for Adopted by Planning Commission on 1/27/2022

Planning Commission Dates	*Physical Development Committee Dates*
Jan 27	*Feb 8*
Feb 24	*Mar 15*
Mar 24	*Apr 12*
Apr 28	*May 10*
May 26	*Jun 14*
Jun 23	*Jul 12*
Jul 28	*Aug 16*
Aug 25	*Sep 13*
Sep 22	*Oct 11*
Oct 27	*Nov 1*
Nov 17 (3rd Thursday)*	*Nov 29*
Dec 15 (3rd Thursday)*	*Jan 2022 TBD*

* Meetings moved from the 4th Thursday to the 3rd Thursday to avoid conflicting with holidays

Dakota County Planning Commission Member
Consent to Release Private Data - 2022

Minnesota Statutes Ch. 13 on data privacy requires that you be informed that the following information about you is considered **private data: home telephone number and e-mail address.**

I hereby grant permission to use the information provided below by me, including that which is considered **private data**, for use in preparing a Planning Committee membership roster to be distributed to members.

Name: _____
Last Name First Name

Home Address: _____
Street

_____ MN _____
City State Zip

Telephone/Fax: (___) _____ (___) _____ (___) _____
Home Business Fax

E-mail Address: _____

This consent expires one year from the date of signature.

_____ _____
Signature of Committee Member **Date**

Citizen Advisory Committee Member
Statement of Representation

The purpose of this form is to either confirm or waive individual eligibility for per diem compensation to citizen appointees to boards, committees, commissions, councils, or task forces appointed by the Dakota County Board of Commissioners.

According to the Citizen Advisory Committee Membership Policy: County Board appointees to the following committees, who are not representing a governmental unit, receive $35 per diem (but no additional expense reimbursement) for attendance at regular and special meetings of the committee:

Community Corrections Advisory Board
Extension Committee
Human Services Advisory Committee
Library Board
Planning Commission
Zoning Board of Adjustment

Please check ONE of the following statements:

o I represent another governmental unit in connection with my presence on this board, committee, commission, council, or task force and:

  o a) I receive compensation, in the form of salary or a per diem, from that governmental unit for my participation. Therefore, I am not eligible to receive per diem compensation from the County for my attendance at regular or special meetings of this group.

  o b) I do not receive compensation from that governmental unit for my participation. Therefore, I am eligible to receive per diem compensation from the County for my attendance at regular or special meetings of this group.

o I do not represent another governmental unit in connection with my presence on this board, committee, commission, council, or task force. I am therefore eligible to receive per diem compensation from the County for my attendance at regular and special meetings of this group.

Name: _____

Signature: _____ **Date:** _____

Name of the board, committee, commission, council, or task force to which you have been appointed to serve:

_____

Please complete and return this Statement of Representation to your Committee Staff Liaison.

Planning Commission 2022 Work Plan

Board Goal	Committee's Goal for 2022	Project/Activity	Outcome Measure	Timeline
A Healthy Environment with Quality Natural Areas	Park Ordinance (Phase II)	Update park ordinance	Recommendation to PDC	Q1
	Miesville Ravine Park Reserve Natural Resource Management Plan	Prepare assessment and plan to restore and manage natural resources	Recommendation to PDC	Q1-Q3
	Miesville Ravine Park Reserve Master Plan Update	Update master plan	Recommendation to PDC	Q1-Q4*
	North Creek Greenway Natural Resource Management Plan	Prepare assessment and plan to restore and manage natural resources	Recommendation to PDC	Q1-Q3
	Lake Marion Greenway Natural Resources Management Plan	Prepare assessment and plan to restore and manage natural resources	Recommendation to PDC	Q1-Q3
	Vermillion River Greenway Natural Resources Management Plan (Hastings)	Prepare assessment and plan to restore and manage natural resources.	Recommendation to PDC	Q1-Q4*
	Veterans Memorial Greenway Natural Resources Management Plan	Prepare assessment and plan to restore and manage natural resources.	Recommendation to PDC	Q2-Q4*
	Park System Plan Update	Review research findings, park units, service levels, and system needs and amend plan as needed	Recommendation to PDC	Q3-Q4*
	Natural Resources Management System Plan Update	Review progress toward NRMP (5-yr update) and update as needed	Recommendation to PDC	Q4*
	Parks Visitor Services Plan Update	Review progress toward VSP (5yr update) and update as needed	Recommendation to PDC	Q4*
	Veterans Memorial Greenway Master Plan Amendment	Review alignment amendment	Recommendation to PDC	Q1
	Groundwater Protection Plan – Program Development	Establish Agricultural Chemical Reduction Effort (ACRE)	Recommendation to PDC	Q2
A great place to live	Regional Roadway Visioning Study Update	Update Regional Roadway Visioning Study in northeast Eagan and northwest Inver Grove Heights	Review and comment to PDC	Q3-Q4
	County Road 42 Visioning Study	Evaluate and plan for highway and multi-modal improvements to CSAH 42.	Review and comment to PDC	Q1
	Trunk Hwy Plans and Design Studies (Highways 77, I-35, 3)	Review and discuss proposed improvements to State highways as part of multi-agency coordination effort	Review and comment to PDC	Q1-Q4
	Pedestrian Crossing Safety Study	Evaluate pedestrian crossing treatments and develop standards for typical situations	Review and comment to PDC	Q1-Q2
Excellence in Public Service	All-Hazard Mitigation Plan	Update All-Hazard Mitigation Plan	Recommendations to PDC	Q1

* Indicates that project will extend into 2023 work plan.

DAKOTA COUNTY PLANNING COMMISSION

January 27, 2022 AGENDA ITEM: Update on the Agricultural Chemical Reduction Effort (ACRE) Plan to protect groundwater quality(*information*)

PURPOSE

Provide the Planning Commission:

1. A review of research findings to-date
2. An overview of public engagement efforts and findings
3. A summary of potential approaches for the Groundwater Program

BACKGROUND

Preparing the ACRE Plan is a follow-up action from the Dakota County Groundwater Protection Plan, adopted in early 2021. A project introduction was presented to the Commission at its May 27, 2021 meeting. The overall water quality goal of the Groundwater Plan is "groundwater and drinking water that are free from unhealthy levels of contaminants." The ACRE Plan seeks to reduce harmful nitrate, pesticide, and chloride levels in drinking water through changes in agricultural practices and proposes to work in partnership with the Soil and Water Conservation District, state agencies, and watershed organizations. A mix of practices known to reduce nitrate contamination (in particular) is being explored, as well as existing and potential new incentives for adopting these practices. The ACRE will rely on enhanced data collection through the addition of shallow groundwater monitoring wells in each township to track the effectiveness of practice adoption over time. Potential regulatory triggers are being considered if groundwater quality fails to improve over time.

ATTACHMENTS

1. ACRE Concept Paper and Research Summary
2. ACRE Phase I Stakeholder Engagement Summary
3. Presentation

QUESTIONS

The following questions are intended to help assist in review of the packet materials.

1. Does the Commission have questions or comments on the concept paper, existing research, or engagement summary?

3. What are the Commission's thoughts on potential new tactics and roles? To include:

- Creation of a permanent Agricultural Advisory Group
- Increasing one-on-one technical assistance to farmers
- Providing incentive payments to all practice adopters (those maintaining practices in addition to new adopters)
- Linking incentives to the MN Agricultural Water Quality Certification program and assessment score

4. What are the Commission's thoughts on potential regulatory approaches, related to the County role and ability to enforce regulation?

Concept Paper and Research Summary for Dakota County Agricultural Chemical Reduction Effort (ACRE)

Introduction: Terminology

In the Dakota County ACRE Plan, "goals" refer to the County's aspirations for its desired future condition as expressed in the 2020 Dakota County Groundwater Plan (Groundwater Plan). "Outcome measures" are measurable benchmarks toward achieving the goals. "Strategies" are an organized framework of activities to achieve those benchmarks. "Tactics" are the intended activities to implement the strategies.

Goal

The Water Quality Goal of the Groundwater Plan is "groundwater and drinking water that are free from unhealthy levels of contaminants." The proposed Goal for ACRE is "Groundwater and drinking water that are free from agricultural chemicals that threaten human health or the environment."

Agricultural Chemical Issues in Dakota County Groundwater

Strategy 1B1 of the Groundwater Plan is "Reduce agricultural chemical contamination."

Nitrate

Nitrate contamination is a well-documented and recalcitrant problem in Dakota County drinking water. Although low levels of nitrate (zero to 3 mg/L) may occur naturally in water, high levels of nitrate in groundwater usually come from human activities, including septic systems and feedlots. In the Upper Midwest, the major source is nitrogen fertilizer used on agricultural crops.

Although a necessary nutrient for plants, high nitrate levels in people can harm the respiratory and reproductive system, kidney, spleen, and thyroid in children and adults. In particular, consumption of drinking water exceeding 10 mg/L nitrate (the Environmental Protection Agency and Minnesota Department of Health, MDH, standard) can lead to a health problem called methemoglobinemia or "blue baby syndrome" in infants younger than 6 months. The condition is characterized by a reduced ability of the infant's blood to deliver oxygen and can lead to death if untreated. Numerous studies suggest that the guideline of 10 mg/L may not be protective of health for people of all ages and it fails to address the chronic, low level exposure of nitrate's effect on health (Ward et al, 2018).

Elevated nitrate is the most common contaminant to exceed health guidelines in Dakota County drinking water. The City of Hastings has had to take multiple actions to maintain safe nitrate levels in their water supply, including a $3 million nitrate removal system. In January 2020, the Minnesota Department of Agriculture (MDA) designated the Hastings Drinking Water Supply Management Area (DWSMA) as a Level 2 mitigation area (most serious priority) and the Rosemount DWSMA as a Level 1 mitigation area (second most serious priority). Between 20% and 30% of the households in Dakota County that rely on private drinking water wells have well water that exceeds the nitrate health guidelines. For them, an effective drinking water treatment system may cost $800 to $1,000 to install, plus ongoing maintenance costs.

Cyanazine and other pesticides

The herbicide Cyanazine was widely used (as Bladex, Fortrol, or other products) on corn crops until 2002, after which it was discontinued. Although cyanazine has been out of use for nearly 20 years, Dakota County's groundwater monitoring finds its breakdown products in private drinking water wells in rural areas, in some cases at levels above safe drinking water guidelines. Since 2019, MDA has found elevated cyanazine degradates in other parts of Minnesota in addition to Dakota County. County staff are currently participating in an MDA/MDH workgroup to develop strategies to address elevated cyanazine degradates throughout the state.

Other crop herbicides and their breakdown products are widely detected in the groundwater in rural parts of the County. Both the number of pesticide breakdown products detected and their concentrations are highly correlated to nitrate concentrations in private wells. Although they are usually at levels far below their respective drinking water guidelines, the presence of such a large number of different chemicals is concerning, especially since the health effects of chemical mixtures are not well understood.

Chloride

Chloride levels in groundwater in the county are increasing (as they are in most metropolitan areas) (Ambient Study Report 2020). Potassium chloride (potash) fertilizer is a source of chloride in Minnesota waters (23%, according to Overby et al, 2019), but the major sources of chloride in groundwater are salt from road and other winter pavement maintenance and from water softeners (by way of septic systems or municipal wastewater treatment plants). In addition, although chloride levels are increasing throughout Dakota County, they are higher in developed areas of the county, especially near major highways and concentrations of roadways, than they are in rural parts of the County. As a result, the County will encourage farmers to follow best management practices for potassium fertilizer use, but chloride reduction will be a secondary concern in the ACRE Plan.

Notes

ACRE Plans to focus on nitrate reduction in groundwater, but address other contaminants where practical.

a. Nitrate is the focus of the MDA's Groundwater Protection Rule (GPR) and Nitrogen Fertilizer Management Plan (NMFP), so ACRE will build on the activities of MDA and MDH to address nitrate in groundwater.

b. Many practices that will reduce nitrate contamination of groundwater will also reduce other agricultural contaminants. In Dakota County, the presence and concentrations of pesticides in groundwater are highly correlated to the presence and concentrations of nitrate in groundwater, leading to the conclusion that some practices can reduce both. Although the expected benefits may be difficult to quantify in advance, practices that can be expected to reduce multiple contaminants include: using fall-to-spring cover crops; adopting a conservation crop rotation (lower-input crops such as small grains, alfalfa, grass hay, pasture, or perennials in rotation with corn, soybeans, or

potatoes); using irrigation water management; transitioning from annual to perennial crops; preserving or restoring wetlands; or retiring crop land (including conservation easements).

c. The County currently has the authority to regulate nitrogen fertilizer practices, but is precluded from regulating phosphorus fertilizer or pesticides.

d. Nitrate water testing (monitoring) is inexpensive and uncomplicated compared to pesticide monitoring.

Non-agricultural sources of rural groundwater contamination

Non-agricultural sources of potential groundwater pollution that are common in rural Dakota County (for example, septic systems, land-spreading of wastewater biosolids, unsealed wells, or aggregate mining) are addressed in the 2020 Dakota County Groundwater Plan.

Draft outcome measures

To achieve the Groundwater Plan goal of "groundwater and drinking water that are free from unhealthy levels of contaminant," the draft agricultural chemical reduction objectives are:

e. In every Dakota County city and township, the percentage of households with private drinking water wells that exceed the drinking water guideline for nitrate (10 mg/L) will decrease to 5% or fewer (of households that use private wells). (A community with fewer than 5% of its private drinking water wells exceeding the drinking water guideline is considered in "Prevention" status in the MDA NFMP. See Appendix B.)

f. No public water supply well exceeds the nitrate drinking water guideline (10 mg/L) and no public water supply well is projected to exceed the nitrate drinking water guideline in the next 10 years.

g. In every Dakota County city and township (or smallest practical geographic area), the median nitrate levels in shallow groundwater (less than 20 feet below the static water level) will be lower than be 10 mg/L.

h. The number of households with private drinking water wells in which pesticide (or pesticide degradate) concentrations exceed 50% of applicable drinking water guidelines will decrease to zero.

i. Contributions of chloride to groundwater from crop fertilizer will decrease.

Nitrate Reduction

The ACRE Plan will be based on pertinent elements of MDA 2015 Nitrogen Fertilizer Management Plan (NFMP) and 2019 Groundwater Protection Rule, such as using results from Township Testing style private well testing plus public water supplier well testing results to establish nitrate mitigation levels at the township/city level; promoting Best Management Practices (BMPs) and Alternative Management Practices (AMTs); and using environmental well networks and private well results to monitor water quality over time, etc. However, the outcome measures for the ACRE Plan will be results-based (contaminant reduction) rather than performance-based (BMP adoption, the standard for the MDA Groundwater Protection Rule).

1. Issues with Groundwater Protection Rule

The Groundwater Protection Rule has gaps that make it likely it will be insufficient to achieve Dakota County's nitrate goals. Specifically, the issues with the MDA Groundwater Protection Rule are:

- Nitrate levels are not required to improve, just not to get worse.
- MDA enforcement of the fall nitrogen fertilizer restrictions would only be done on a complaint basis.
- High nitrate areas outside of Mitigation Level DWSMAs (i.e., the Hastings DWSMA) will not have MDA groundwater monitoring.
- High nitrate areas outside of Mitigation Level DWSMAs (notably, those served only by private wells) will not have their BMP adoption evaluated.
- The criteria by which MDA will evaluate BMP adoption are not identified and may be insufficiently rigorous.
- There are no negative consequences for lack of groundwater improvement in high-nitrate areas that are not a Mitigation Level DWSMA.

2. Sources of Nitrogen in Minnesota Water Resources

As part of Minnesota's Nutrient Reduction Strategy, the Minnesota Pollution Control Agency and University of Minnesota have calculated the relative contributions of various sources of nitrogen to surface waters in the state. This incorporates the sources to groundwater (which ultimately discharges to surface water).

Table 1: Sources of Nitrogen in the Mississippi River basin (including the Minnesota River), Minnesota (MPCA, Nutrient Reduction Strategy, 2014)

Nutrient Source	Average Contribution to Surface Waters*
Agricultural tile drainage	43%
Cropland leaching into groundwater	31%
NPDES permitted wastewater discharges (WWTP)	9%
Atmospheric deposition	6%
Cropland surface runoff	5%
Forest runoff	4%
Individual sewage treatment (septic) systems	2%
Urban runoff and leaching	1%
	*Total is greater than 100% due to rounding.

3. Establish baseline conditions and set nitrogen reduction targets

Estimate baseline (current or recent-year) shallow groundwater nitrate conditions.

a. In 2013-24, Dakota County cooperated with MDA in MDA's pilot "Township Testing" program for nitrate. The uncensored results are shown below.

Table 2: MDA/Dakota County Township Testing, 2013-14, Nitrate Results -- Initial Well Dataset (uncensored results)

Municipality	# of Households (at the time)	# of Samples	Samples w/ Detections	Samples above Drinking Water Guideline (10 mg/L)	Mean (Average) (mg/L)	Median (mg/L)	Maximum (mg/L)
Castle Rock Township	473	101	49 (49%)	15 (15%)	4.0	0.0	59.8
Coates	55	11	11 (100%)	6 (55%)	11.7	10.5	15.9
Douglas Township	250	68	41 (60%)	24 (35%)	8.3	3.1	68.6
Empire Township	220	58	35 (60%)	18 (31%)	5.9	1.7	30.2
Eureka Township	525	123	49 (40%)	8 (7%)	2.5	0.0	27.4
Farmington	80	18	4 (22%)	None	0.9	0.0	9.1
Greenvale Township	283	58	8 (14%)	2 (3%)	0.8	0.0	20.9
Hampton Township & City	326	80	50 (63%)	24 (30%)	5.9	2.3	28.9
Hastings	40	2[2]	2 (100%)	1 (50%)[2]	11.6	11.2	18.3
Marshan Township	401	115	89 (77%)	61 (53%)	10.4	11.2	32.7
Nininger Township	301	88	60 (68%)	31 (35%)	7.7	5.0	29.8
Randolph Township	231	55	23 (42%)	6 (11%)	3.0	0.0	18.7
Ravenna Township	804	298	241 (81%)	113 (38%)	7.3	7.1	22.8
Rosemount	528	165	109 (66%)	10 (6%)	2.8	1.1	21.9
Sciota Township	121	29	12 (41%)	4 (14%)	3.3	0.0	21.2
Vermillion Township	417	83	60 (73%)	37 (45%)	8.1	9.3	27.1
Waterford Township	202	41	22 (54%)	11 (27%)	5.8	1.0	33.2
Total	**5257**	**1393**	**865**	**370 (27%)**	**5.5**	**3.3**	**68.6**

[1]There may be discrepancies in the reported numbers; these do not change the overall conclusions.

[2]Too few samples to draw meaningful conclusions.

b. For assessment and monitoring purposes, “shallow groundwater” is defined as 20 feet deeper than the water table or less. The focus on “shallow groundwater” is because that is the groundwater where changes in practices on the land surface will become evident in the shortest amount of time, if the changes are effective.

To establish baseline shallow groundwater nitrate conditions (June 2021), County staff interpolated 1071 private drinking water well nitrate testing results. They used nitrate samples collected from 2013 through early 2021, from private drinking water wells that were 20 feet or less below the water table, or for which there were no well records and were presumed to be shallow. Using inverse distance weighting, staff interpolated the results to estimate nitrate concentrations spatially distributed around the County and to identify geographic gaps in the data (map below).

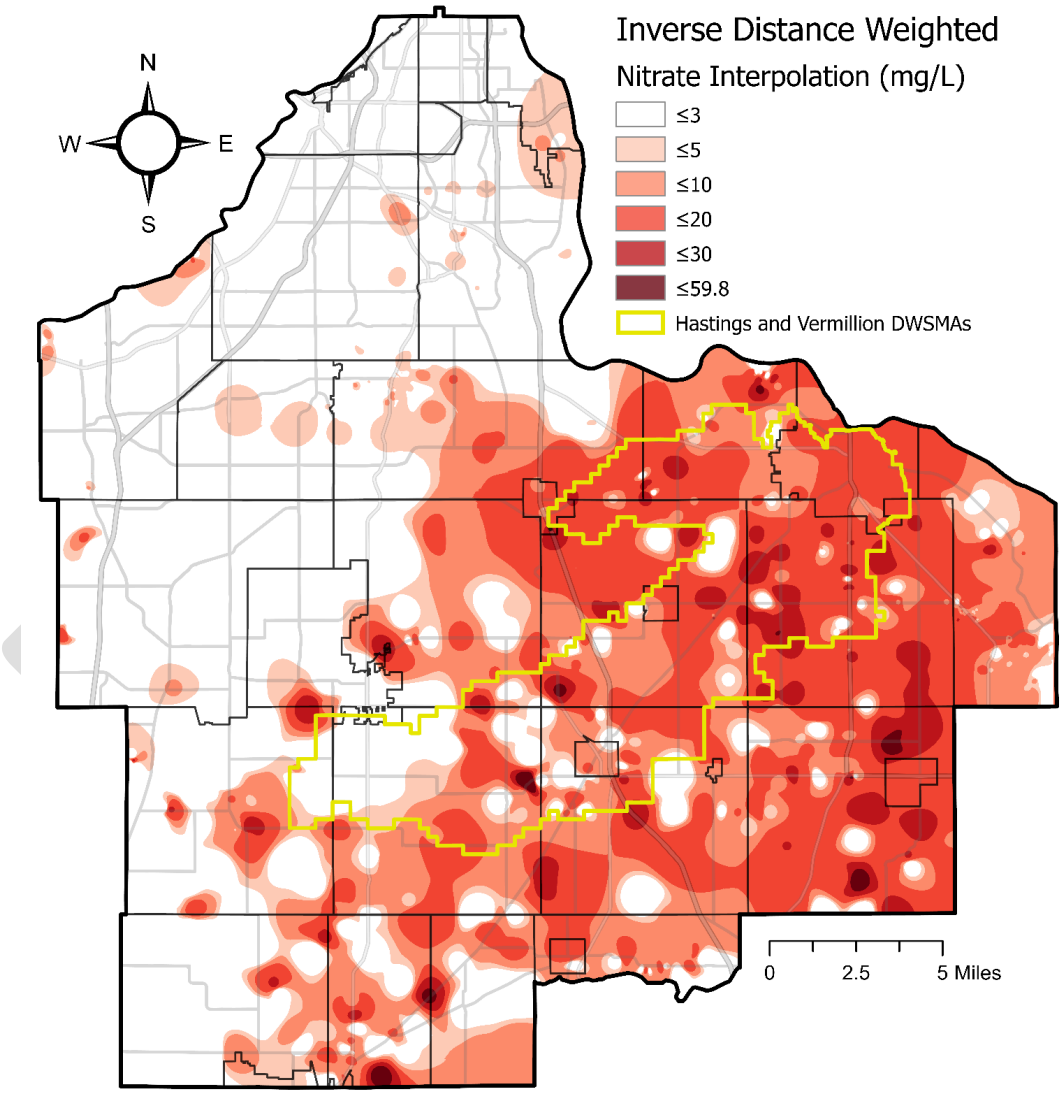


Figure 1. Nitrate Interpolation Map

From this interpolation, staff then estimated the number of agricultural acres in each township or city where the shallow groundwater nitrate levels exceed 10 mg/L of nitrate, as shown in the table below.

Table 3: Estimated Agricultural Acreage Where the Underlying Shallow Groundwater Is Estimated to Exceed the Drinking Water Guideline

Municipality	Total No. of Ag Acres in Municipality ("AG" Use in County Tax Parcel database)	Est. % of Ag Acres where the groundwater is estimated to exceed > 10 mg/L
CASTLE ROCK TWP	19,671	23.9%
COATES	740	93%
DOUGLAS TWP	18,689	77.2%
EMPIRE TWP	10,296	18.9%
EUREKA TWP	17,894	9.3%
FARMINGTON	4,033	4.5%
GREENVALE TWP	16,202	4.5%
HAMPTON	557	7.9%
HAMPTON TWP	19,999	42.3%
HASTINGS	574	88.6%
MARSHAN TWP	19,069	88.8%
MIESVILLE	1,113	100.0%
NEW TRIER	67	30.8%
NININGER TWP	5,842	54.4%
RANDOLPH	344	52.9%
RANDOLPH TWP	4,112	18.3%
RAVENNA TWP	5,310	42.9%
ROSEMOUNT	6,594	43.9%
SCIOTA TWP	8646	14.1%
VERMILLION	514	67.8%
VERMILLION TWP	19,701	61.2%
WATERFORD TWP	8,005	23.1%

c. The County contracted with Barr Engineering to complete a groundwater nitrate model to evaluate nitrate loss from cropland throughout rural Dakota County. The intent is to utilize shallow groundwater nitrate levels, described above, to estimate current nitrate loss to the groundwater at a local level (e.g., township or municiple boundary), and to use results from the groundwater model to set specific nitrate load reduction goals at the local level to achieve groundwater concentrations of less than 10 mg/L of nitrate. Specifically, the intent is to calculate how many pounds of nitrogen lost per acre of cropland will have to be reduced for each geographic area to meet the desired outcome.

4. Install Dakota County/MDA environmental well network.

a. The County will partner with MDA to install and sample an environmental well network within the Hastings DWSMA. The County will install and sample 30-40 shallow (water table) groundwater environmental wells in a randomized grid pattern in the high-nitrate areas of eastern Dakota County not in the Hastings DWSMA, on public land or rights-of-way, adjacent to row crop agriculture. (MDA is installing a similar environmental well network within the Hastings DWSMA.).
b. The purpose of the environmental well network is to quantify the baseline nitrate conditions at the water table in the vulnerable areas of the County, interpret the results in terms of nitrogen losses per acre, then monitor changes in those conditions over time. Changes in farming practices and water quality trends should be detectable in the shallow groundwater first.
c. The wells will be sampled at least three times per year (spring, summer, and fall) for nitrate, chloride, and possibly other parameters; static water levels will be measured. Digital nitrate sensors may be used in some or all of the wells if funding is available. Precipitation data for eastern Dakota County will be measured at the Dakota Soil and Water Conservation District weather station.
d. Data from the environmental well network will be used to model nitrate losses from farm fields, estimate how much the nitrate losses need to be improved for the groundwater nitrate levels to be below 10 mg/L, and evaluate nitrate trends over time. Data collection methods, results, and modeling will be coordinated and shared with MDA and other agencies.

The below map (Figure 2) shows the locations of the seven Dakota County wells installed, and 11 MDA environmental wells as of January 2022. Additional Dakota County environmental wells are projected be installed in spring 2022.

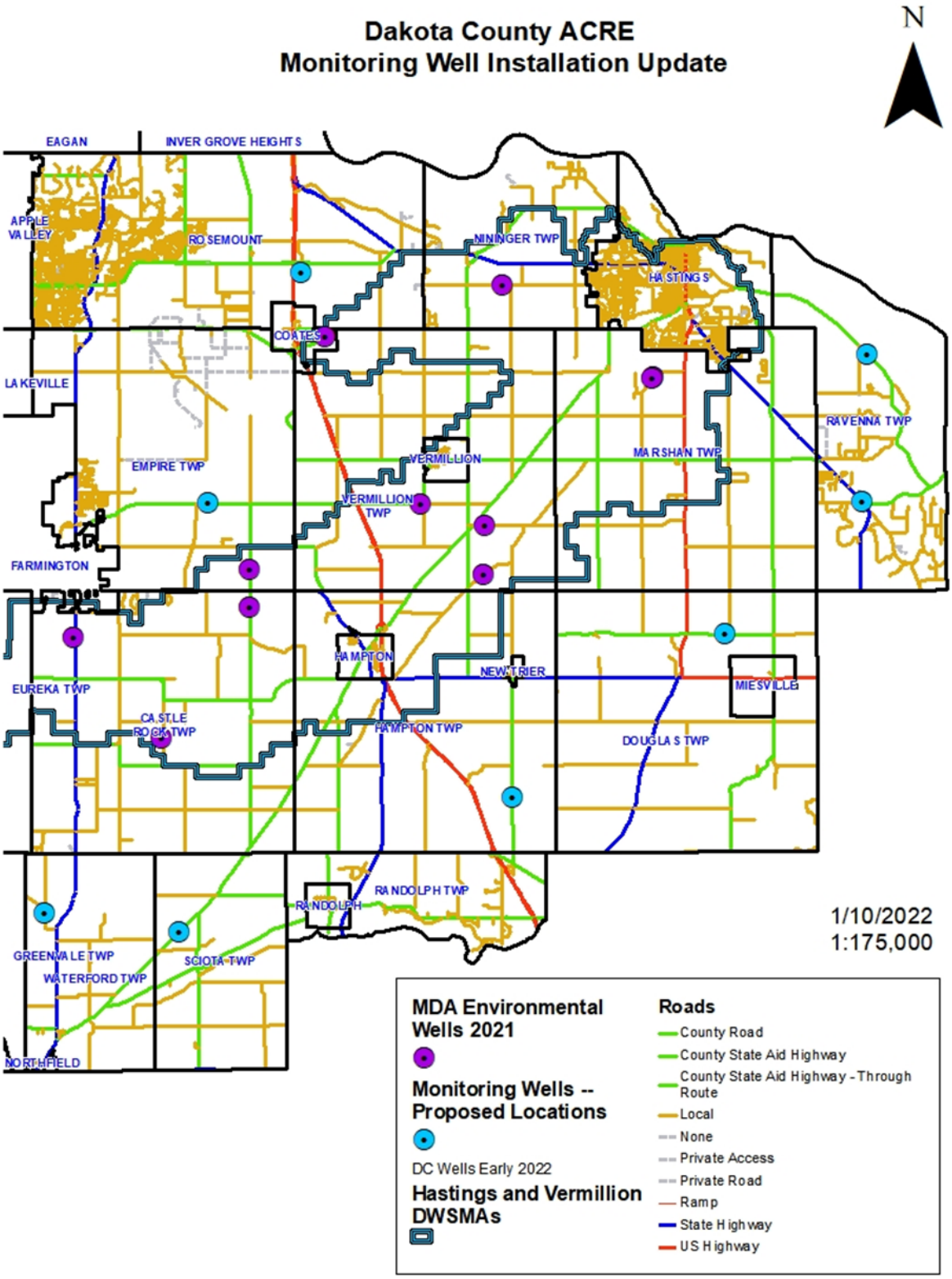


Figure 2. Map of Environmental Wells as of January 2022

5. Use baseline data to prioritize locations and practices.

County and SWCD staff will use County, SWCD, and state agency knowledge; GIS; farmer participation; the baseline nitrate estimates shown above; and University of Minnesota and Minnesota Pollution Control Agency nutrient reduction models to identify and prioritize practices and locations for improving groundwater quality.

6. Inform property owners and farm operators of baseline data and fertilizer waste estimates.

The County will inform property owners within geographic areas where the median shallow groundwater nitrate levels exceed 10 mg/L of that area's estimated groundwater nitrate levels and the loss reductions needed to bring the nitrate level down to the target.

7. Implement Plan

a. The County will partner with state funding agencies, such as MDA or BWSR, and with SWCD and watershed organizations to promote and fund BMPs and AMTs, based on the priorities established above and feedback provided during stakeholder engagement. The County will work with SWCD, MDA, and UMN staff to identify appropriate and cost-effective BMPs and AMTs for local conditions.

   Practices on agricultural lands that protect groundwater quality can be divided into practices that are part of conventional cropping systems, practices that modify or expand cropping systems, and practices that take land out of agricultural production. The Minnesota Board of Water and Soil Resources describes these as Tier I, Tier II, and Tier III practices. (BWSR Groundwater/Drinking Water Protection Practices for Agricultural Lands, April 2021)

   Preliminary examples of practices and tools include those below. N loss reduction estimates from the Minnesota Pollution Control Agency are for surface water (MPCA, 2013); practices will be updated as new information is available, and practices will be prioritized according to their estimated benefit to groundwater. A summary of other state programs for reducing agricultural water quality impacts relative to the practices listed below are presented in Appendix C.

   Tier I, conventional cropping systems

   - Follow recommended "4Rs" of nutrient management – right nutrient source, right rate, right time, right place (~15% N loss reduction)
   - Use nitrogen fertilizer inhibitors or stabilizers (~9% N loss reduction)
   - Take soil tests for nutrients
   - Test irrigation water for nitrate and take N credits
   - Take tissue tests for N
   - Make variable rate fertilizer applications
   - Use Integrated Pest Management
   - Use irrigation water management (follow an irrigation water management plan, use moisture sensors to schedule irrigation, use variable rate irrigation,other)
   - Use reduced tillage or no-till

- Install saturated buffers or other controlled drainage (~91% N loss reduction)
- Install bioreactors (~13% N loss reduction)
- Grow USDA Certified Organic products

Tier II, practices that modify or expand cropping systems

- Plant cover crops for seasonal vegetative cover, including harvestable cover crops (~50% N loss reduction)
- Use conservation crop rotation
- Grow specialty crops/ market gardening/ high tunnel systems
- Plant perennial crops (food, forage, biomass)(~72%-95% N loss reduction)
- Use prescribed grazing
- Grow fruit or nut trees or nursery stock (agroforestry), including silvopasture (combining tree crops with grazing)

Tier III, removing agricultural land from production

- Convert land permanently from an intensive cropping system to perennial native or non-native vegetation. (~95% N loss reduction)
- Convert land temporarily (multiple years) from an intensive cropping system to perennial native or non-native vegetation. (Conservation Reserve Program and similar programs)
- Preserve or restore wetlands in agricultural areas (~50% N loss reduction)
- Installing conservation buffers in excess of those required by State law(~95% N loss reduction);
- Install solar farm with pollinator habitat/ perennials/ grazing.

b. The County will provide cost-share funding for nitrogen fertilizer demonstration projects.

c. In addition to the BMPs and AMTs identified by MDA, the County and SWCD will advocate and facilitate farmers' testing irrigation well water samples for nitrate and taking appropriate nitrogen credits; maintaining records of nitrogen use, including rates, credits, sources, timing, and placement; implementing irrigation and nutrient management plans; and attending annual continuing education programs. The County will subsidize nitrate testing of irrigation well water by farmers.

8. Monitor environmental well and drinking water well nitrate levels over time. Assist private well owners.

As mentioned above, MDA and the County will install and sample environmental wells in high nitrate areas. In addition, the County will monitor drinking water well quality and provide free nitrate testing to private well owners.

a. In accordance with the 2020 Groundwater Plan, on a 5-year rotation, the County will offer every household with a private drinking water well the opportunity to have their well tested, at no cost to the household, for contaminants such as nitrate, arsenic, manganese, lead, and chloride. (Details of the sampling program will be subject to annual review and modification.) The County will use the results from private well testing and environmental wells to evaluate the average nitrate results for each targeted geographic area.

b. Staff will communicate water test results to private well owners, city and township leaders, and other interested parties, and educate private well owners regarding appropriate water treatment so their drinking water meets health guidelines.
c. The County will pursue opportunities to subsidize the installation of appropriate, effective drinking water treatment systems for low-income households that use a private well and have contaminated groundwater.
d. To the extent appropriate and possible, the County will collect demographic data to evaluate if water quality problems disproportionately impact specific populations and to address those inequities.
e. The County will complete and update its Community Drinking Water Profiles to ensure private well sampling results are representative of each community's drinking water.

9. Modify efforts and explore regulatory options if nitrate trends are unacceptable.

If, after five years (five complete growing seasons), "shallow groundwater" nitrate monitoring or Community Focused Sampling Program nitrate results show stable or upward trends (by township or city), Staff may recommend to the County Board ordinance amendments that require agricultural practices to reduce nitrate contamination. Examples of such practices are described below.

i. testing irrigation well water samples for nitrate and taking appropriate nitrogen credits;
ii. soil nitrate tests;
iii. maintaining records of nitrogen use, including rates, credits, sources, timing, and placement;
iv. developing and implementing irrigation and nutrient management plans;
v. periodic (annual or biennial) educational certification;
vi. other requirements as specified.

10. Monitor, respond, and adjust.

MDA and the County will continue to measure changes in water quality. Proposed ordinance language implementing the potential restrictions described above would also include the steps for lifting the restrictions if, after at least five consecutive years, the geographic area's median shallow groundwater nitrate levels are below 10 mg/L; or the 90th percentile of the monitored wells show a downward trend for five consecutive annual sampling events; or sustained, representative, nitrate monitoring results are below 5% of private drinking water wells exceeding the nitrate guideline for five consecutive years.

Pesticide Reduction

Environmental Resources staff from the Groundwater Protection unit have been working with the MDA and MDH to address the problem of cyanazine breakdown products in drinking water. The State considers these chemicals "contaminants of emerging concern" (CECs). MDA, MDH and Dakota County staff are working together to develop and implement a plan to investigate and mitigate cyanazine where it is found in drinking water. The County will assist MDA and MDH in future sampling to understand better the complete extent of cyanazine contamination in private and public drinking water suppliers in the county.

If feasible, the County's rotating private well sampling program will be expanded to include cyanazine degradates and other frequently detected pesticides and pesticide breakdown products.

Chloride Reduction

Potassium chloride (potash) fertilizer is a major source of chloride in Minnesota waters (23%), but at this time practical alternatives are not available. County staff do expect that a number of practices adopted by farmers to reduce nitrate contamination will also reduce other groundwater and surface water contaminants, including chloride. Also, when alternatives are available, the County will work with the SWCD, watershed organizations, MDA, and UM Extension to promote the use of those alternatives to farmers.

Table 4: Statewide annual chloride contributions (to surface waters) from major point and nonpoint sources (Overbo et al, 2019)

Source	Chloride mass (tons)	Percent of total
Road salt (winter paved surface maintenance)	403,600	42%
Fertilizer (potassium chloride)	221,300	23%
WWTPs	209,900	22%
Livestock waste	62,600	6%
Residential septic systems	33,100	3%
Permitted industries	14,200	1%
Atmospheric deposition	14,200	1%
Dust suppressant use	9,400	1%
Total	*968,300*	*100%*

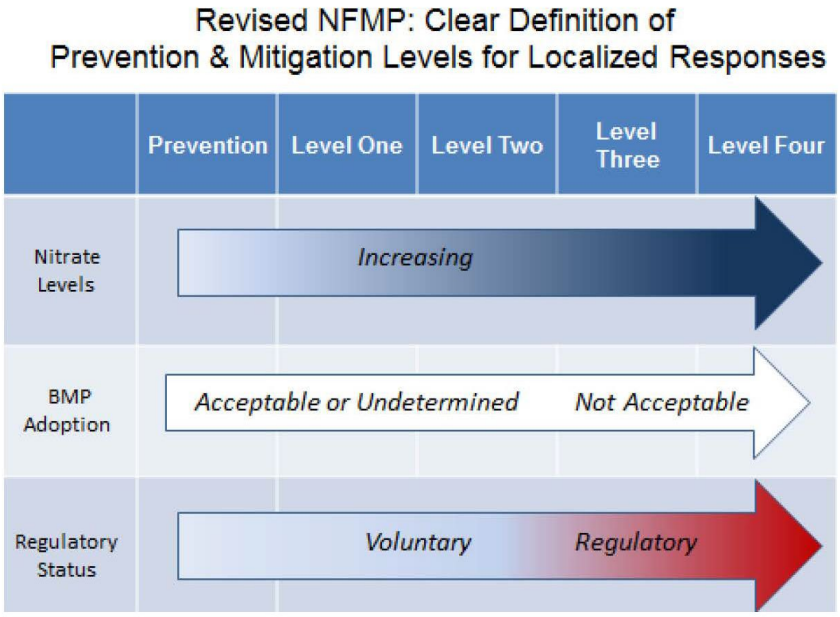
Appendix A. Acronyms and Abbreviations

AAG	Agricultural Advisory Group
ACRE	Agricultural Chemical Reduction Effort
AMT	Alternative Management Tool
BMP	Best Management Practice
BWSR	Minnesota Board of Water and Soil Resources
DWSMA	Drinking Water Supply Management Area
µg/L	Micrograms per liter, equivalent to parts per billion
mg/L	Milligrams per liter, equivalent to parts per million
MDA	Minnesota Department of Agriculture
MDH	MPCA
N	Nitrogen (or pounds of active nitrogen available in fertilizer)
NFMP	Nitrogen Fertilizer Management Plan
NPDES	National Pollution Discharge Elimination System
PLSS	Public Land Survey System (township, range, section)
PMP	Pesticide Management Plan
SWCD	Dakota County Soil and Water Conservation District
TAG	Technical Advisory Group
UMN	University of Minnesota
USEPA	United States Environmental Protection Agency
WHPP	Wellhead Protection Plan
WMO	Watershed management organization
WSP	Water Supply Plan
WWTP	Wastewater treatment plant

Appendix B. MDA Nitrogen Fertilizer Management Plan Mitigation Process Overview

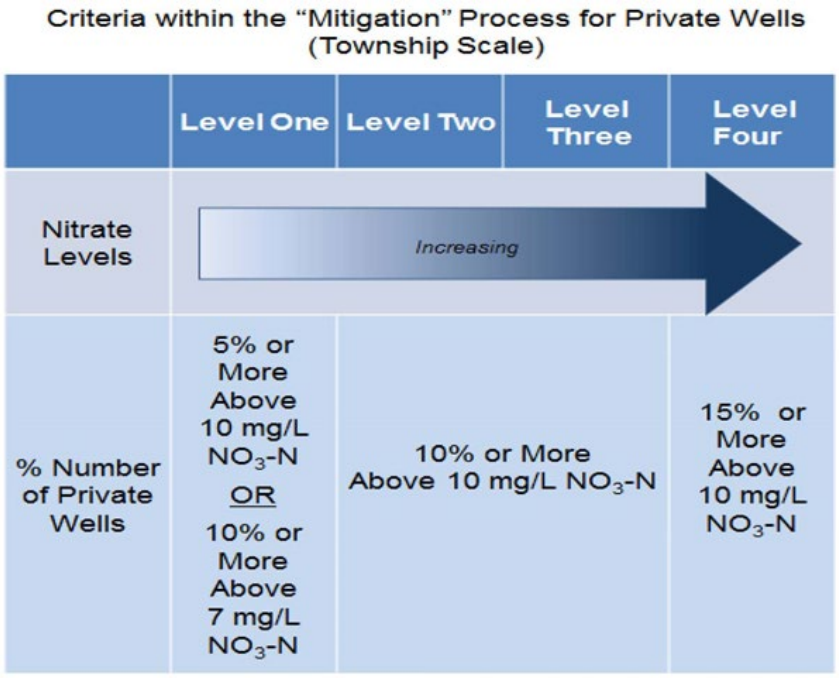
MDA Mitigation Levels and Regulatory Status

(p. 73, MDA Nitrogen Fertilizer Management Plan, 2015)



MDA Mitigation Process for Private Wells

(p. 73, MDA Nitrogen Fertilizer Management Plan, 2015)



MDA Mitigation Process for Public Wells

(p. 74, MDA Nitrogen Fertilizer Management Plan, 2015)

Criteria within the "Mitigation" Process for Public Water Supplies

	Level One	Level Two	Level Three	Level Four
Nitrate Levels	*Increasing*			
Nitrate Conc. mg/L	5.4 mg/L NO_3-N	Nitrate Levels Expected to Exceed 10 mg/L NO_3-N in 10 Years or Less		9.0 mg/L NO_3-N

Appendix C. Summary of State Programs for Reducing Agricultural Water Quality Impacts

The below table provides a very brief summary of "State Legal Approaches to Reducing Water Quality Impacts from the Use of Agricultural Nutrients on Farmland," P. K. Hall and E. Essman, National Agricultural Law Center, May 2019 (Hall and Essman). For the purpose of developing Dakota County's groundwater Agricultural Chemical Reduction Effort (ACRE) Plan, this summary focuses on approaches excluding those intended for animal feeding operations (AFOs and CAFOs) and emphasizing those that should benefit groundwater.

Practices on agricultural lands that protect groundwater quality can be divided into practices that are part of conventional cropping systems, practices that modify or expand cropping systems, and practices that take land out of agricultural production. The Minnesota Board of Water and Soil Resources describes these as Tier I, Tier II, and Tier III practices. (BWSR Groundwater/Drinking Water Protection Practices for Agricultural Lands, April 2021).

- Tier I – practices considered to provide measurable benefits within conventional cropping systems that may have naturally high potential for nutrient and pesticide leaching.
- Tier II – practices that modify or change management of conventional summer annual crops to include longer crop rotations with small grains or perennials, forage and biomass planting, over crops, and grazing practices that utilize forage crops.
- Tier III – practices that take land entirely or partially out of agricultural production, placing it into wildlife habitat, protected open spaces, or other land uses.

The programs described in the summary below are categorized by BWSR practice Tier (as best as possible), and type of practice.

Table 5: Agricultural Water Quality Programs Beyond Minnesota

Practice	Applicable BWSR Tier	States (Regulatory)	States (Voluntary)	Brief Description of Programs (details vary by state)
Nutrient Application limitations	Tier I	All states except AK, CA, HI, ID, KY, LA, MS, NV, NH, NJ, NY, RI, TX, UT, VA, WA, WV, and WY	MI, OH, WI	Regulatory: Limitations to nutrient application based upon depth to water table, distance to surface waterbodies, rainfall events, or frozen ground. Voluntary: Following runoff risk or application forecast service recommendations (weather-based recommendations). Minnesota: Regulatory – Fall application of chemical nitrogen fertilizers not allowed in designated Vulnerable Groundwater Areas.

Practice	Applicable BWSR Tier	States (Regulatory)	States (Voluntary)	Brief Description of Programs (details vary by state)
Nutrient Management Plans	Tier I	All states except NV and NH, usually related to manure mgmt, at minimum.	PA, OH	Regulatory: Nutrient Management Plan (NMP) development and nutrient management application, reporting, and training and certification requirements based upon criteria of gross income, pounds of live animal weight, number of acres where nutrients are applied, or proximity to specified sensitive waters (state dependent). Voluntary: Reimbursement/ incentives for completion of NMP. Minnesota: Regulatory – NMPs required for Animal Feeding Operations of 300 animal units or more. NMP must include non-manure fertilizer in addition to manure.
Nutrient Management Plans, beyond manure mgmt.	Tier I	AR, DE, CT, MD, NC	N/A	Regulatory: NMP development and nutrient management application, reporting, and training and certification requirements based upon criteria of gross income, number of acres where nutrients are applied, or proximity to specified sensitive waters (state dependent).
Fertilizer use records	Tier I	DE, KS, MD, OH	N/A	Regulatory: Maintaining and/or providing copies of all fertilizer records (nitrogen, chemigation, etc.)
Nutrient application education and certification	Tier I	AL, AR, DE, GA, IL, IN, IA, KS, MA, MN, ME, MD, NE, NC, OH, OK, PA, SC, VT, WI	N/A	Regulatory: Agricultural nutrients can only be applied by someone who has completed training or applicable certification course or program (state dependent). Minnesota: Regulatory – Pesticide applicators must be trained and certified.
Conservation Crop Rotation	Tier II	N/A	OH	Voluntary: Incentives for establishing and harvesting wheat, barley, oat, cereal rye, spelt or triticale, making manure applications, and establishing a post-harvest cover crop.

Practice	Applicable BWSR Tier	States (Regulatory)	States (Voluntary)	Brief Description of Programs (details vary by state)
Conservation Buffers	Tier III	VT, MN, PA, NC, NH	OH, WI	Regulatory: Year-round vegetative cover adjacent to surface waters and ditches. Voluntary: Incentives for maintaining buffers in excess of state law requirements (buffer width, duration, etc.). Minnesota: Regulatory – Vegetative buffer up to 50 ft. required next to lakes, rivers, and streams and 16.5 feet along ditches.
Water Quality Trading Programs	Tier I - III	N/A	MD, NC, OH	Voluntary: Allows farmers and industrial facilities to trade pollution credits through establishment of wetlands, implementation of practices (ranging from Tier I – Tier III) that reduce nutrient loads.
Tax Credits or Incentives for Best Management Practice (BMP) Installation	Tier I - III	N/A	KS, OH, VA, WI	Voluntary: Tax credit or incentives for purchase of precision agriculture equipment, installation of voluntary BMPs, improvement to technology or equipment, and other voluntary programs that reduce nutrient loss.

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Agricultural Chemical Reduction Effort
Stakeholder Engagement Summary

January 2022

Dakota County Environmental Resources Department

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Introduction

In Dakota County's 2020-2030 Groundwater Plan, the County identifies chemicals including nitrate, crop herbicides, and chloride as significant drinking water issues for much of rural Dakota County. The Agricultural Chemical Reduction Effort, or ACRE, intends to reduce those chemicals in groundwater so they no longer pose threats to human or environmental health. Over the course of summer and fall 2021, the County, with the assistance of consultant Environmental Initiative, engaged with stakeholders to develop the strategies for the draft plan. A second round of engagement in winter and spring 2022 will seek stakeholder feedback on the draft plan itself.

Timeframe: August to December 2021

Purpose: Gain insight from the agriculture community and other stakeholders about potential strategies for reducing nitrate and other chemicals in groundwater.

Methods and Events:

- Online public survey and written version sent to all County residents with at least 2 acres – 304 responses. Nearly half of the respondents are farmers.
- One Public Townhall for the general agriculture community
- One Public Sector Meeting for local officials
- Presentations at four Township Board meetings
- One presentation at a Watershed Management Organization meeting
- One Technical Advisory Group meeting with members of state and regional agencies
- Three Agriculture (Ag) Advisory Group meetings with farmers and agricultural industry professionals

General promotion of the survey and townhall meeting occurred through the County webpage, social media, and targeted mailings.

Key Themes

- **Preferred practices:** Between the survey, Townhall, and Ag Advisory Group meetings, a range of practices emerged as those most appealing to farmers when incentivized. The practices that rose to the top include plant tissue tests; irrigation management (where applicable); cover crops; forage and small grains; solar farms; and targeted land retirement.
- **Incentive equity:** A County program in which all farmers could receive compensation for implementing practices that benefit water quality was generally received well by Ag Advisory Group as an alternative to the County creating programs around specific practices. In other words, the program would provide payments for ongoing practices in addition to payments for installing or adopting new practices.
- **Regulatory caution:** Regulations around specific practices were not rejected outright in the survey responses. However, the County was cautioned in both written survey answers and by Ag Advisory members that any regulation must be thoughtfully tailored so as to maintain the financial viability of farming in Dakota County. The Ag Advisory committee also raised concerns about regulations that might increase the barriers already facing emerging farmers.

- **Trusted resources:** Farmers value a variety of sources for information, technical assistance, and financial assistance. Dakota County Soil and Water Conservation District (SWCD), University of Minnesota Extension, and U.S. Department of Agriculture (USDA) programs stood out as existing trusted sources of information and assistance. Ag associations like Minnesota Ag Water Resource Center, Minnesota Corn Growers, and Minnesota Soybean Growers were noteworthy in that they are not widely used for technical or financial assistance, but the vast majority of farmers would be interested in working with them.
- **Protecting legacy:** Many resident farmers want to protect the long-term productivity of their soil and health of their water in the hope their descendants will farm the same land. An exception may be the growing number of absentee landowners, where the landowner may be unfamiliar with farming and both the landowner and renter are more focused on short-term profits than on the long-term health of the soil and water.

General Findings

Preferred Practices

The survey and engagement sessions explored interest levels in different conservation practices. In the survey, two practices stand out for the high rates of farmers who express that they would be interested in the practice with the right incentives—plant tissue tests for nitrogen and installing solar panels. These are very different practices with different impacts on the agriculture sector and would require different support from the County.

Practices on agricultural lands that protect groundwater quality can be divided into practices that are part of conventional cropping systems, practices that modify or expand cropping systems, and practices that take land out of agricultural production. The Minnesota Board of Water and Soil Resources describes these as Tier I, Tier II, and Tier III practices, respectively. (BWSR Groundwater/Drinking Water Protection Practices for Agricultural Lands, April 2021) This report will go through each tier of practices, highlight the practices that were most popular in the survey and among Ag Advisory Members.

Tier I Practices – Practices within Conventional Cropping Systems

Tier I management practices provide measurable benefits within conventional cropping systems that have high potential for nutrient/pesticide leaching, such as continuous corn and/or irrigated crops. Examples of Tier I practices are nutrient management; integrated pest management; and irrigation water management, system upgrades, and nitrogen credits.

Based on the survey results, in-season plant tissue tests represent the Tier I practice with the most opportunity for incentives based on the survey results. 41 respondents expressed that they would be interested in tissue tests with the right incentive, far ahead of the next practices—irrigation management and testing irrigation water—which both had 30 respondents express interest with the right incentives. In part, this reflects the low number of respondents already using tissue tests, only 32.

The Ag Advisory Group discussed the value of plant tissue tests at length during their meetings. Members expressed hesitation because the science behind tissue tests lacks reliability for Minnesota row crop farmers. At

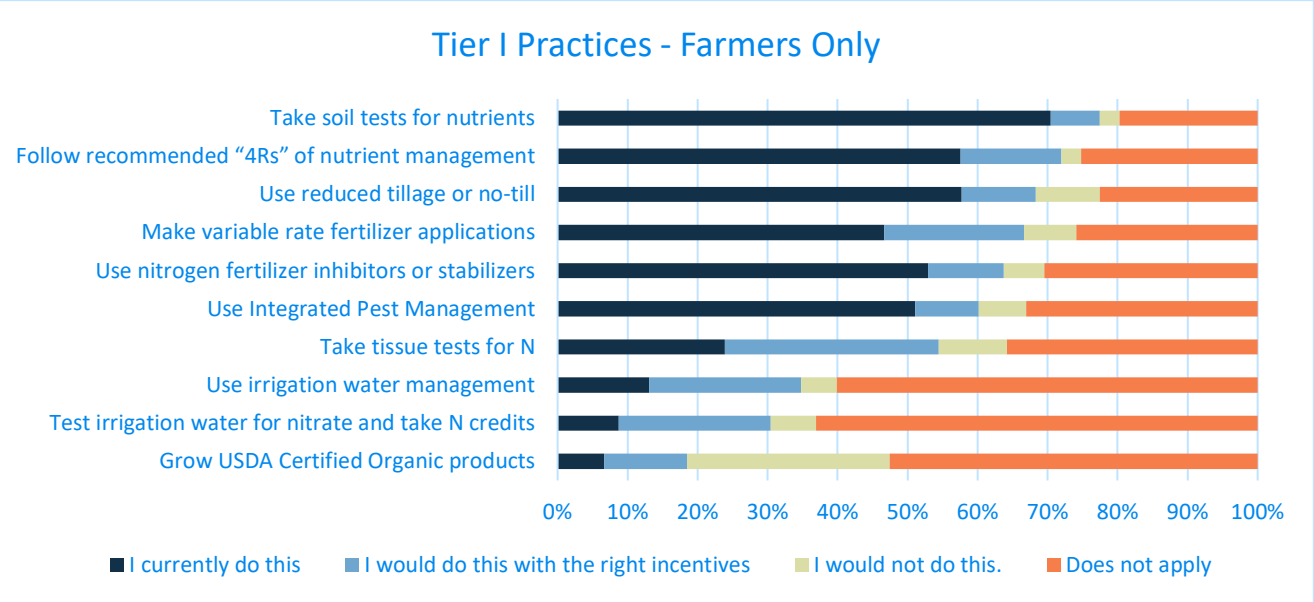
this time (2022), in-season and at-harvest plant tissue tests are only a 'report card' and don't allow for adaptive in-season adjustment of fertilizer rates. However, members agreed that the potential for tissue tests is high. The group suggested that the County work with University of Minnesota Extension to provide free tissue testing during a growing season in a project that would allow Extension to further explore the scientific underpinnings of the tests for row crops while providing farmers with education around the tests and results.

Irrigation management rose to the top of Tier I practices for some members of the Ag Advisory Group for the return-on-investment for farmers. Irrigation scheduling and conversion to low-pressure nozzles are existing technologies that can prevent the overuse of water for relatively low financial investments by the County and/or farmer. This practice did not rank highly in the survey largely because 83 respondents marked "does not apply," potentially indicating that less than half of respondents had irrigation systems. The County will have to weigh the value of incentivizing irrigation management practices with the number of farms and the sensitivity of acres it would impact.

Table 1: Tier I Practice Acceptance, Mail Survey 2021, Farmers Only

Tier I Practice	Currently Do	Would Do with Right Incentive	Would Not Do	Not Applicable	Total
Take soil tests for nutrients	70%	7%	3%	20%	142
Follow "4Rs" of nutrient management – right nutrient source, right rate, right time, right place	58%	14%	3%	25%	139
Use reduced tillage or no-till	58%	11%	9%	23%	142
Make variable rate fertilizer applications	47%	20%	7%	26%	135
Use nitrogen fertilizer inhibitors or stabilizers	53%	11%	6%	30%	138
Use Integrated Pest Management	51%	9%	7%	33%	133
Take tissue tests for N	24%	31%	10%	36%	134
Use irrigation water management	13%	22%	5%	60%	138
Test irrigation water for nitrate and take N credits	9%	22%	7%	60%	138
Grow USDA Certified Organic products	7%	12%	29%	53%	135

Figure 1: Tier I Practice Acceptance Chart, Mail Survey 2021, Farmers Only



Tier II Practices – Cropping System Changes

Tier II practices change or modify conventional summer annual cropping systems to lower the inherent risk of nitrogen loss. These practices include longer crop rotations with small grains or perennials (conservation crop rotation); forage and biomass planting; cover crops (including harvestable cover crops); grazing practices that utilize forage crops; pollinator conservation planting and honey production; and specialty or short-season crops. A "conservation crop rotation" means adding at least one year of a low-nitrogen-input crop (such as oats, wheat, barley, or other small grain) or two or more years of hay to a five-year rotation of corn and soybeans. Tier II practices may overlap; for example, a farmer may plant perennials such as grass hay or alfalfa as part of a conservation crop rotation.

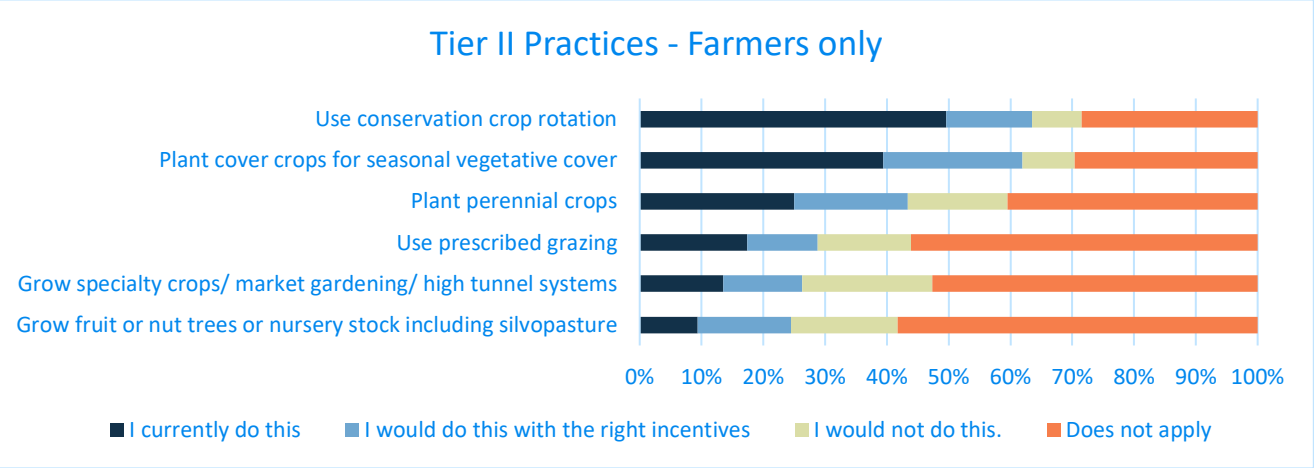
Of the Tier II practices, planting cover crops had the largest number of survey respondents who expressed that they would be interested if provided with the right incentives. When discussed by the Ag Advisory Group, members acknowledged that while cover crop cost share programs exist, they are not widely understood and utilized by the farming community. Also, growing seasonal (fall and winter) cover crops is still subject to trial-and-error in Minnesota because of our short growing season. One takeaway from the conversation was that the County and SWCD could conduct additional outreach about cost share opportunities to try to increase participation in those programs.

The Ag Advisory Group also spent time discussing the value of adding forage or small grains to the landscape (described above as "conservation crop rotation"). This wasn't one of the practices with the highest number of interested survey respondents, but Ag Advisory members recommended focusing on this practice because of the high value of diversifying the rotation for water quality. One member expressed that incentivizing forage or grains makes more sense than incentivizing cover crops given the challenges of using traditional seed application methods in Minnesota's short growing. Members did acknowledge challenges with transitioning to forage or small grains including the need for specialized equipment and different (but already established) markets.

Table 2: Tier II Practice Adoption, 2021 Mail Survey, Farmers Only

Tier II Practice	Currently Do	Would Do with Right Incentive	Would Not Do	Not Applicable	Total
Use conservation crop rotation	50%	14%	8%	28%	137
Plant cover crops for seasonal vegetative cover	39%	23%	8%	30%	142
Plant perennial crops	25%	18%	16%	40%	136
Use prescribed grazing	17%	11%	15%	56%	132
Grow specialty crops/market gardening/high tunnel systems	14%	13%	21%	53%	133
Grow fruit or nut trees or nursery stock including silvopasture	9%	15%	17%	58%	139

Figure 2: Tier II Practice Acceptance, 2021 Mail Survey, Farmers Only



Tier III Practices – Land Use Changes

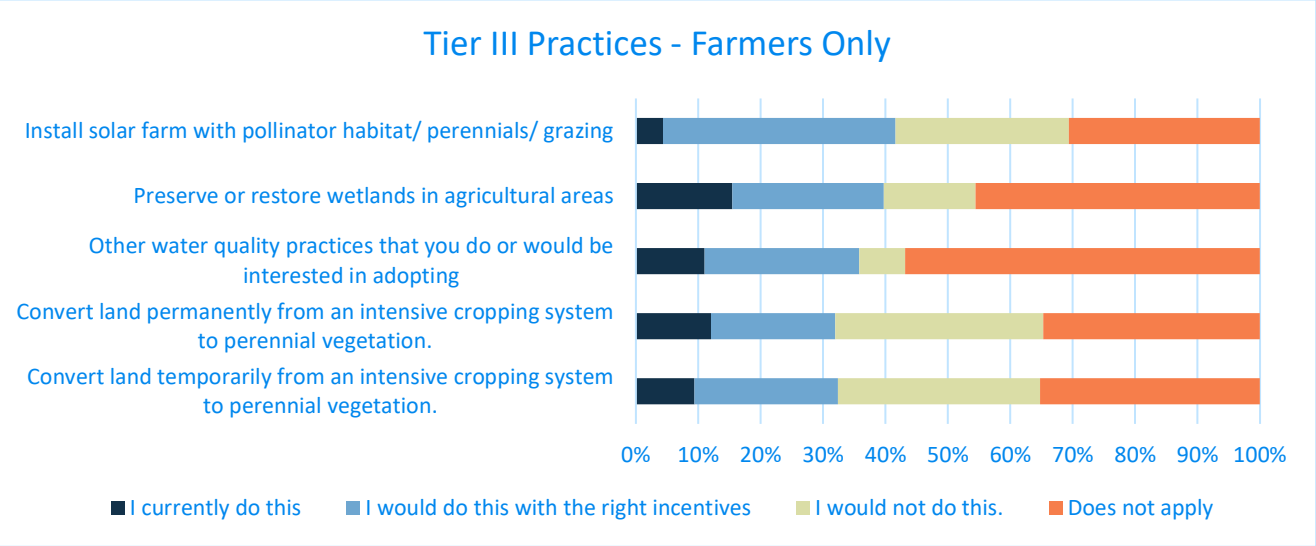
Tier III Practices take land entirely or partially out of agricultural production, placing it into wildlife habitat, protected open space, or other land uses. 51 respondents expressed interest in installing solar farms with pollinator habitat, perennials, or grazing. This number in part reflects the small portion of respondents currently engaged in this practice, only six. It is also a highly polarizing practice with a few write-in responses specifically targeting the idea of installing solar panels. For example, one respondent wrote, "Solar 'farms' are not farms and are being used on productive farmland just to make money. They should be outlawed in ag areas. Put them on rooftops in big cities and stop destroying our farmland." The County will have to weigh the potential environmental benefits with the potential backlash when determining how to address solar farms on agriculture land in future programs.

While the Ag Advisory Group did not discuss solar farms at length, they were more interested in ways the County could supplement existing programs that convert agriculture land to perennial vegetation. In recognition of both the cumbersome nature of federal programs and the number of applications that are not accepted into federal programs, members recommended the County provide incentives for land retirement for 15-years or more. Members believe a long-term but reversible land retirement program would see higher participation than a permanent program. Rather than replicating an existing program, members envisioned an offering that specifically targeted sensitive areas for water quality and therefore prioritized County funding for land with the most return-on-investment.

Table 3: Tier III Practice Adoption, 2021 Mail Survey, Farmers Only

Tier III Practice	Currently Do	Would Do with Right Incentive	Would Not Do	Not Applicable	Total
Install solar farm & pollinator habitat/perennials/grazing	4%	37%	28%	31%	136
Preserve or restore wetlands in agricultural areas	15%	24%	15%	46%	141
Other water quality practices you do or would adopt	11%	25%	7%	57%	139
Convert land permanently from an intensive cropping system to perennial vegetation	12%	20%	33%	35%	109
Convert land temporarily from an intensive cropping system to perennial vegetation	9%	23%	32%	35%	137

Figure 3: Tier III Practice Acceptance, 2021 Mail Survey, Farmers Only



Incentive Equity

At the third Ag Advisory Group meeting, County staff discussed a concept of a voluntary incentive program. The program would compensate farmers each year through a mechanism like a tax rebate for using responsible practices for water quality. Members generally approved of the concept and identified practices like soil and water tests as particularly high priorities for inclusion in a program because they provide farmers with information to understand existing conditions. Using a whole farm assessment tool like the one used in the Minnesota Agricultural Water Quality Certification Program, the County could scale rebates or incentives based on the number of practices in place on a farm.

Some initial concerns from Ag Advisory Group members related to balancing the compensation with the cost of paperwork to participate. No farmer wants more paperwork so creating an easy-to-use program is a high priority. Additionally, the compensation will have to be at least $10 per acre to cover the farmers time for participation. Finally, members stressed the importance of widespread outreach, so farmers learn about and participate in the program for enough years to have the chance to make meaningful impacts on water quality before a regulatory approach is considered.

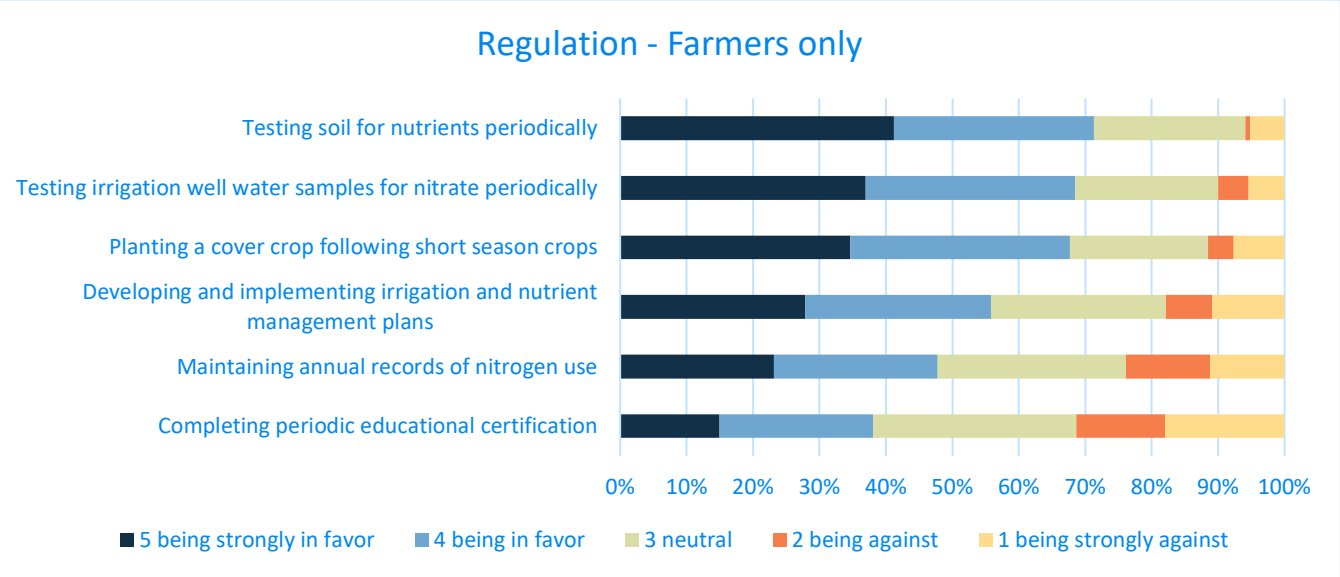
Regulatory Caution

The County received feedback both through the survey and from the Ag Advisory Group on the structure of a regulatory approach to agriculture chemicals in groundwater. The survey results indicate that among farmers and the general population, there is general support for requiring soil testing for nutrients, irrigation well water testing, and planting cover crops. All three of these practices had a higher than 50% approval rating (either scoring a 4 or 5) in both the overall survey and the farmer responses.

Table 4: Support for Potential Regulations, 2021 Mail Survey, Farmers Only

Potential Requirement or Regulation	Strongly Favor	Favor	Neutral	Against	Strongly Against	Total
Testing soil for nutrients periodically (e.g., every five years)	41%	30%	23%	1%	5%	136
Testing irrigation well water samples for nitrate periodically,	37%	32%	22%	5%	5%	130
Planting a cover crop following short season crops	35%	33%	21%	4%	8%	130
Developing and implementing irrigation and nutrient management plans	28%	28%	26%	7%	11%	129
Maintaining annual records of nitrogen use	23%	25%	28%	13%	11%	134
Completing periodic educational certification	15%	23%	31%	13%	18%	134

Figure 4: Support for Potential Regulations, 2021 Mail Survey, Farmers Only

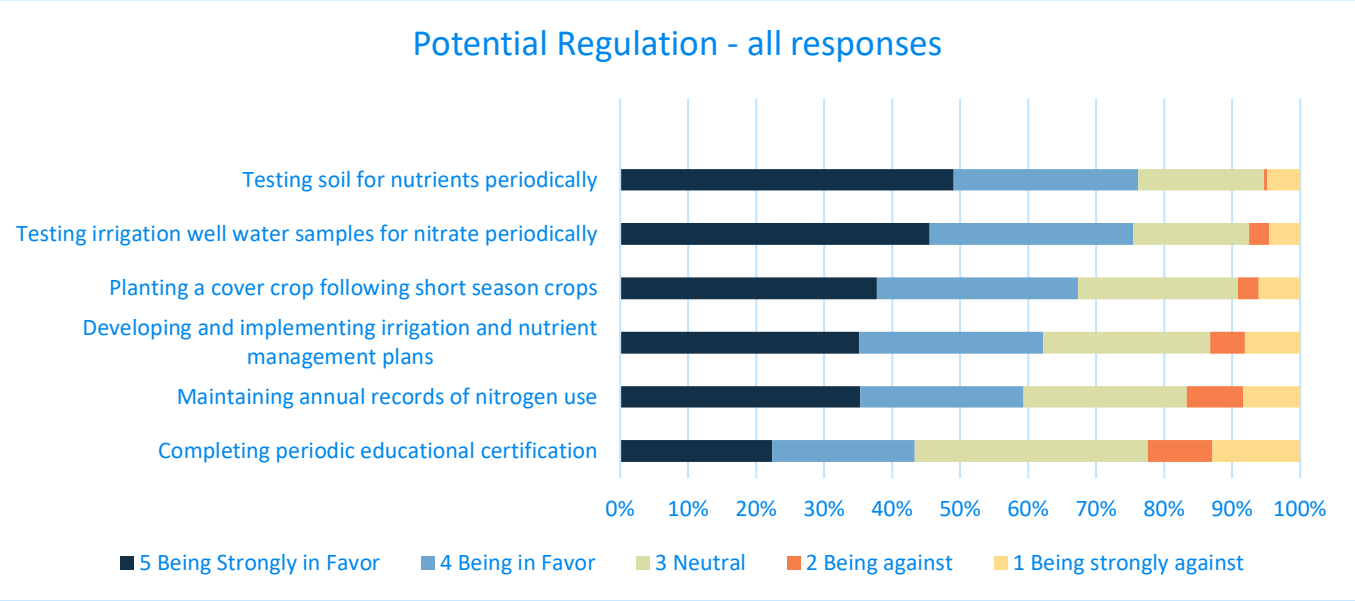


The respondents overall had a more favorable view of potential regulation than the results when sorted out for just the farmers. For example, requiring farmers to develop and implement nutrient management plans and maintain annual records of nitrogen use received higher than 50% favorability.

Table 5: Support for Potential Regulations, 2021 Mail Survey, All Respondents

Potential Requirement or Regulation	Strongly Favor	Favor	Neutral	Against	Strongly Against
Testing soil for nutrients periodically (e.g., every five years)	49%	27%	18%	1%	5%
Testing irrigation well water samples for nitrate periodically	46%	30%	17%	3%	4%
Planting a cover crop following short season crops	38%	30%	23%	3%	6%
Developing/implementing irrigation and nutrient management plans	35%	27%	25%	5%	8%
Maintaining annual records of nitrogen use	35%	24%	24%	8%	8%
Completing periodic (annual or biennial) educational certification	22%	21%	34%	9%	13%

Figure 5: Support for Potential Regulations, 2021 Mail Survey, All Respondents



Discussions from the Ag Advisory Group added insight to the survey responses. The group indicated that practices that help farmers understand their nitrogen levels are most impactful. Therefore, they recommended soil tests and education around nitrogen be priorities for the County. Additionally, having clear expectations of farmers is important. For example, if the County decides to require farmers to submit nutrient management plans, they must communicate what information should be included. For the many farmers that work with co-ops, all this information is documented, and the challenge would be getting the right information to the County.

Advisory members also cautioned that cumbersome regulation could force small farms and older farmers out of farming. Older generations of farmers are not interested in meeting new requirements and smaller farms have a harder time justifying the associated costs. A regulatory program would need to be straightforward and highly targeted.

Finally on the topic of enforcement, members expressed that while no farmer likes the idea of paperwork, they prefer submitting documentation to the County on their own terms over having the County conduct visual (drive-by) inspections.

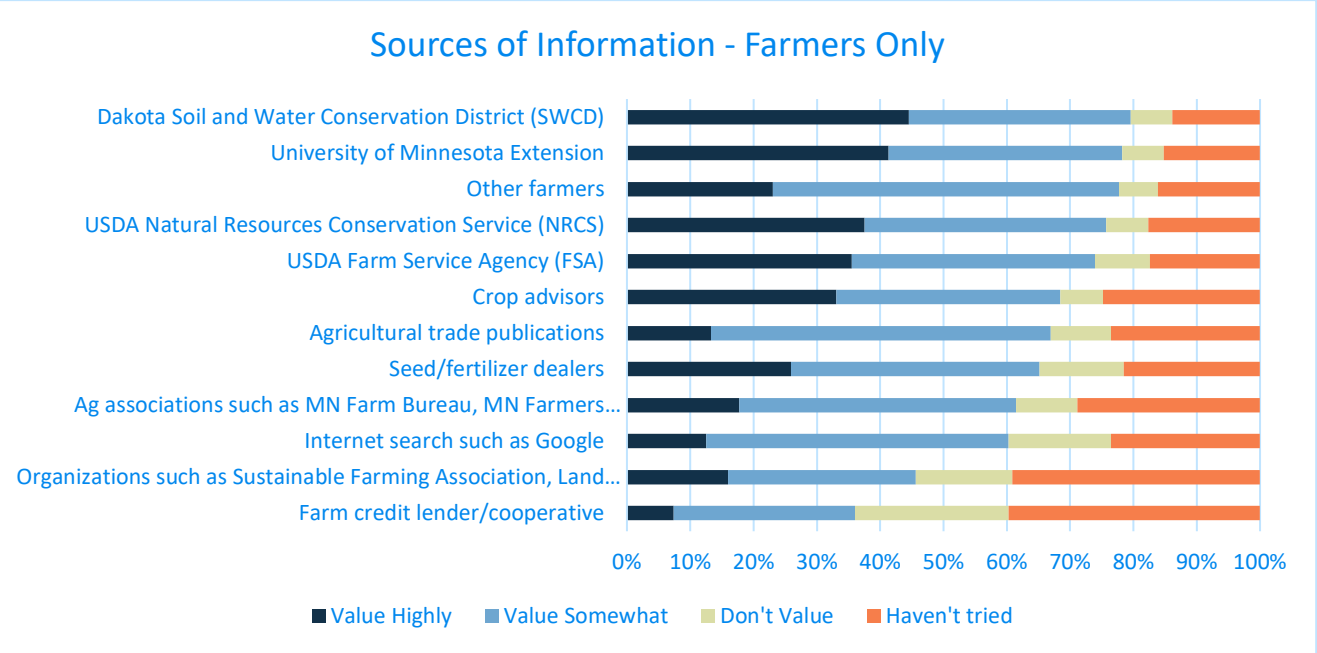
Trusted Resources

Farmers value a large variety of sources for information on farming practices that affect water quality. As seen below, most information sources are valued by at least 50% of respondents. However, Dakota SWCD, University of Minnesota Extension, USDA National Resources Conservation Service and Farm Service Agency, and other farmers stand out with more than 70% of farmers valuing them somewhat or highly.

Table 6: Trusted Information Sources, 2021 Mail Survey, Farmers Only

Information Sources	Value Highly	Value	Don't Value	Haven't Tried	Total
Dakota Soil and Water Conservation District (SWCD)	45%	35%	7%	14%	137
University of Minnesota Extension	41%	37%	7%	15%	138
Other farmers	23%	55%	6%	16%	136
USDA Natural Resources Conservation Service (NRCS)	38%	38%	7%	18%	138
USDA Farm Service Agency (FSA)	36%	38%	9%	17%	130
Crop advisors	33%	35%	7%	25%	133
Agricultural trade publications	13%	54%	10%	24%	136
Seed/fertilizer dealers	26%	39%	13%	21%	135
Agricultural associations, e.g., MN Farm Bureau, MN Farmers Union,	18%	44%	10%	29%	135
Internet search	13%	48%	16%	24%	136
Organizations such as Sustainable Farming Association, Land Stewardship Project, etc.	16%	30%	15%	39%	138
Farm credit lender/cooperative	7%	29%	24%	40%	136

Figure 6: Trusted Information Sources, 2021 Mail Survey, Farmers Only



When it comes to technical assistance, more than 70% of farmers currently use their fertilizer or seed dealer, with crop advisors, other farmers, Dakota SWCD, and NRCS also used by more than 50% of respondents. An inverse pattern exists when respondents identified sources from which they would be interested in receiving technical assistance. More than 70% of farmers would be interested in working with ag organizations like the Minnesota Ag Water Resources Center, Minnesota Corn Growers and Minnesota Soybean Growers. University of Minnesota Extension was the other group receiving interest from more than 50% of respondents.

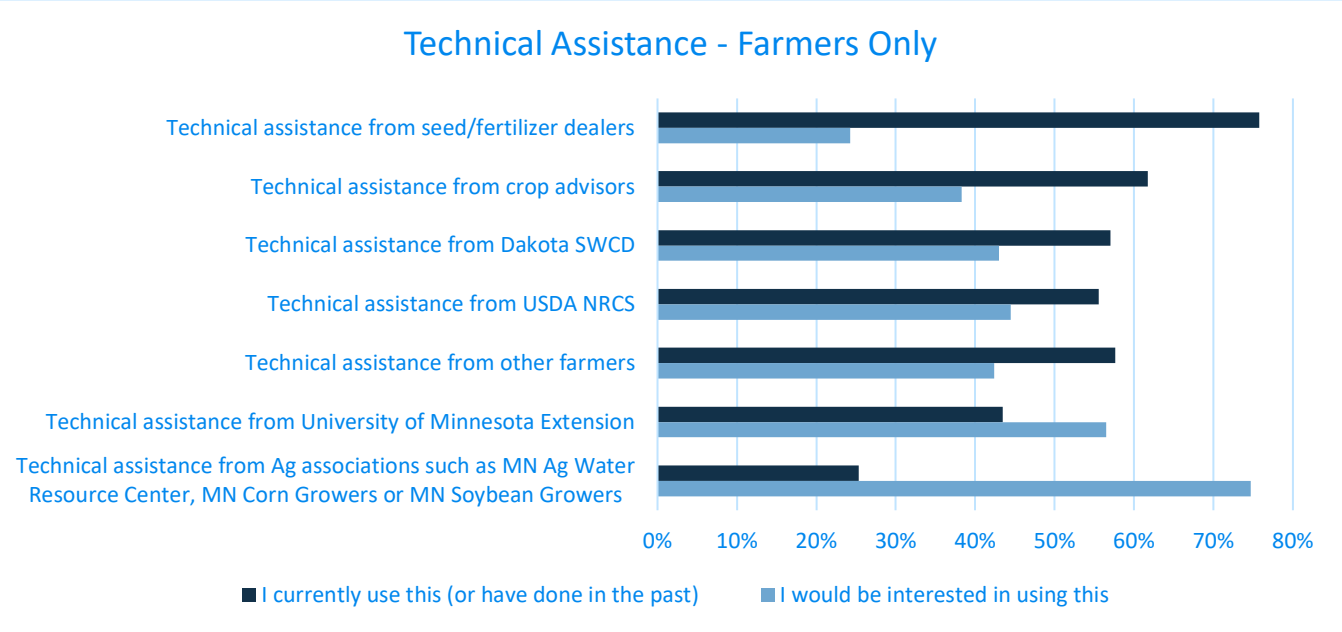
Conversations in the Townhall and with Ag Advisory Group members stressed the importance of having individualized technical assistance. Farmers want information based on regional data with recommendations

specific to their land and soils. This type of assistance goes a long way in mitigating risks for farmers and cannot be replaced by more generic outreach.

Table 7: Technical Assistance Sources, 2021 Mail Survey, Farmers Only

Technical Assistance Sources	Currently Use or Have Used	Would Be Interested	Total
Technical assistance from seed/fertilizer dealers	76%	24%	99
Technical assistance from crop advisors	62%	38%	94
Technical assistance from Dakota SWCD	57%	43%	100
Technical assistance from USDA NRCS	56%	44%	99
Technical assistance from other farmers	58%	42%	92
Technical assistance from University of Minnesota Extension	43%	57%	92
Technical assistance from Ag associations such as MN Ag Water Resource Center, MN Corn Growers or MN Soybean Growers	25%	75%	79

Figure 7: Technical Assistance Sources, 2021 Mail Survey, Farmers Only



Finally, with regards to financial assistance, we saw a similar interest in working with organizations like Minnesota Ag Water Resource Center, Minnesota Corn Growers, and Minnesota Soybean Growers. Overall, fewer respondents currently receive financial assistance than technical assistance from the options provided, but they are very interested in financial assistance with each potential source receiving interest from at least 60% of respondents.

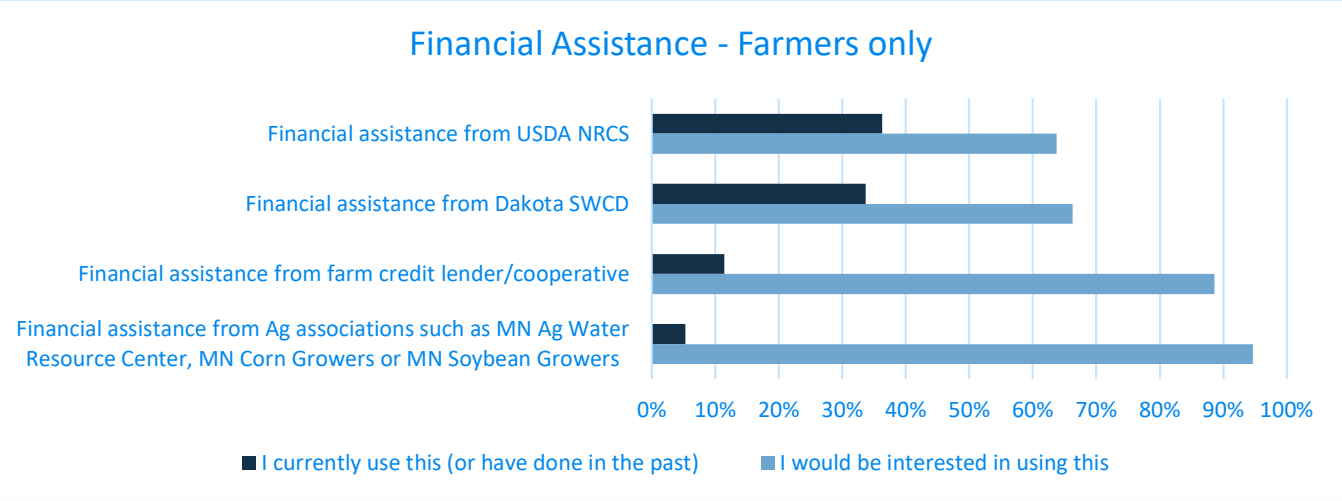
Over twenty survey respondents wrote in answers to this question, and answers generally fell in three categories. First, a group of responses mentioned that the respondent does not qualify for programs because of prior participation or because they have already switched practices or crops. Second, A group of respondents indicated that farmers would do the right thing for their land or future generations without financial incentives. Finally, a few respondents indicated they did not need or want government assistance for practice changes.

Conversations with farmers in both the Townhall and the Ag Advisory Group meetings highlighted that better outreach is required around cost share programs and farmers need guidance in understanding how programs fit together.

Table 8: Financial Assistance Sources, 2021 Mail Survey, Farmers Only

Financial Assistance Sources	Currently Use or Have Used	Would Be Interested	Total
Financial assistance from USDA NRCS	36%	64%	92
Financial assistance from Dakota SWCD	34%	66%	91
Financial assistance from farm credit lender/cooperative	11%	89%	75
Financial assistance from Ag associations such as MN Ag Water Resource Center, MN Corn Growers or MN Soybean Growers	5%	95%	70

Figure 8: Financial Assistance Sources, 2021 Mail Survey, Farmers Only



Acknowledgements

Stakeholder engagement events were facilitated by Dakota County's hired consultant Environmental Initiative. Funding for development of the ACRE Plan is provided through the Clean Water Land and Legacy Amendment, distributed by the Minnesota Department of Health to Dakota County.

Appendix A: Online Survey Summary

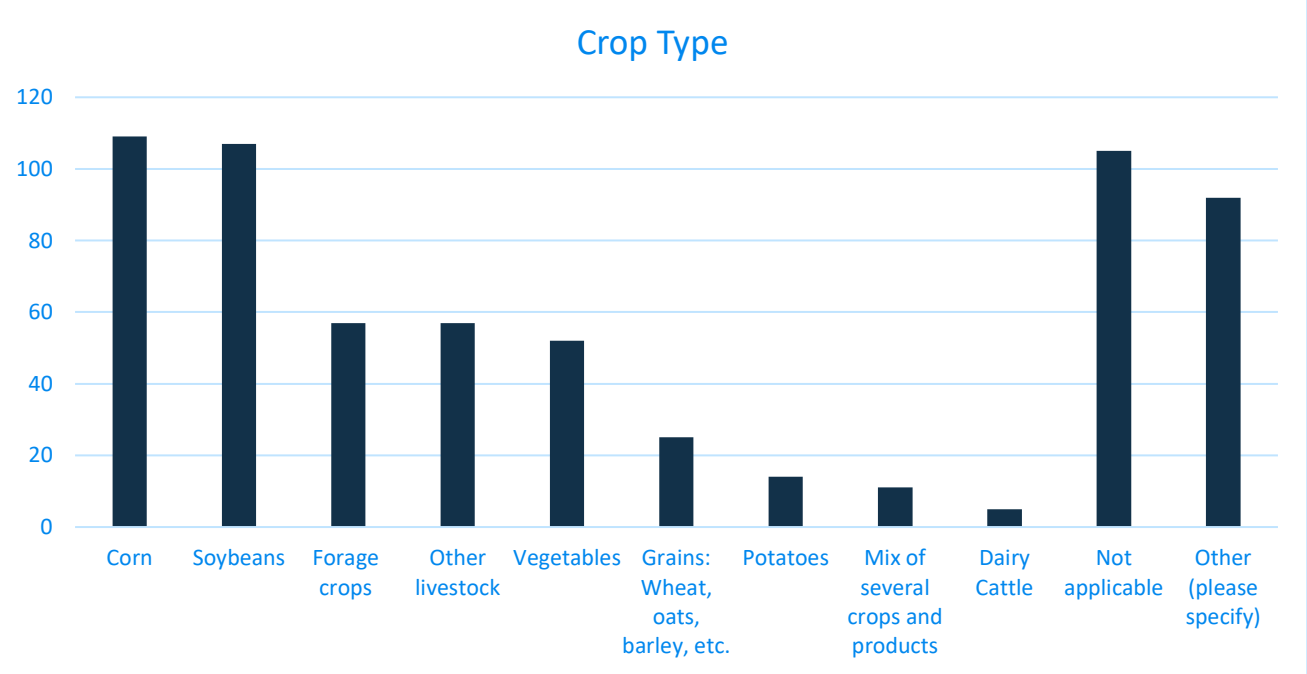
The survey was posted online, and a paper copy was sent by mail to 3,200 people, all of whom owned at least 2 acres in Dakota County. The County received 304 survey responses as of December 22, 2021. Based on question responses, about 56% of respondents appear to be farmers. Tables below show all data while some tables in the report itself have sorted out non-farmers to provide more specific feedback to inform the plan.

Question 1: Do you farm in Dakota County? If so, what type of farm operation do you have?

Table A.1. Farm - Crop Types in Dakota County, 2021 Mail Survey, All Responses

Answer Choices	Response Percent	Number
Corn	41%	109
Soybeans	40%	107
Forage Crops	21%	57
Other Livestock	21%	57
Vegetables	19%	52
Grains: wheat, oats, barley, etc.	9%	25
Potatoes	5%	14
Mix of several crops and products	4%	11
Not applicable	39%	105
Other (please specify)	38%	92
	Answered	**268**

Figure A.1: Farm - Crop Types in Dakota County, 2021 Mail Survey, All Responses



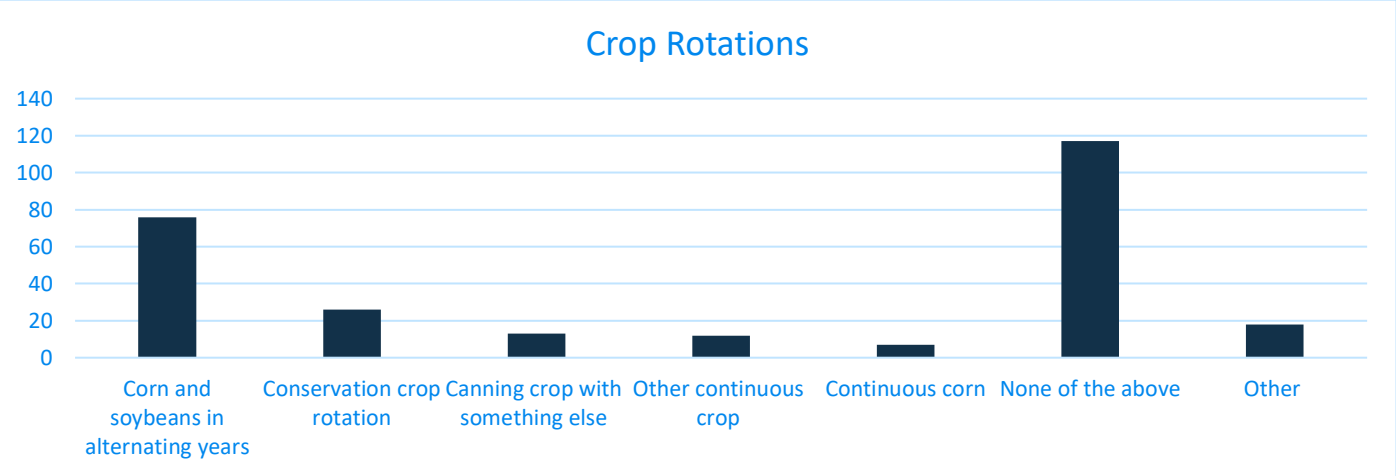
Other responses included notes about landowners who did not farm or rented their land. Additionally, producers made notes about their operations including one small orchard, multiple fruit growers, and land used for hobby farms or horses.

Question 2: Do you rotate crops or grow the same crops on the same fields every year?

Table A.2. Crop Rotation Types in Dakota County, 2021 Mail Survey, All Responses

Answer Choices	Response Percent	Number
Corn and soybeans in alternating years	44%	76
Conservation crop rotation (lower-input crops in two or more years of a five-year rotation, such as alfalfa, grass hay, small grains, etc.)	10%	26
Canning crop with something else	5%	13
Other continuous crop	4%	12
Continuous corn	3%	7
None of the above	44%	117
Other	7%	18
	Answered	**269**

Figure A.2: Crop Rotation Types in Dakota County, 2021 Mail Survey, All Responses



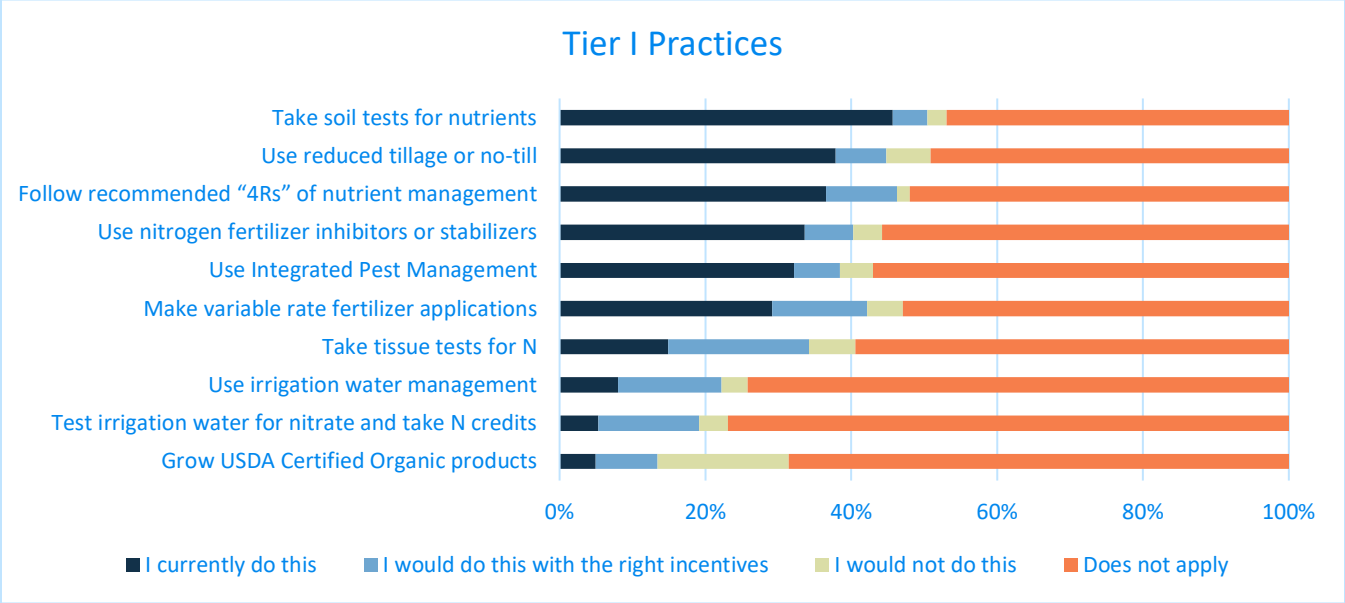
89 respondents provided additional information in the text box provided. Many shared additional details about their rotations including mentioning other crops and cover crops used in their rotations. Others noted that they only had pasture or did not farm at all.

Question 3: Please provide your response to the following Tier 1 practices.

Table A.3. Interest in Tier I Practices, 2021 Mail Survey, All Responses

Tier I Practices	I currently do this	I would do with right incentives	I would not do this	Does not apply	Total
Take soil tests for nutrients	45%	5%	3%	47%	230
Use reduced tillage or no-till	38%	7%	6%	49%	230
Follow recommended 4Rs of nutrient mgmt.	36%	10%	2%	52%	227
Use nitrogen fertilizer inhibitors or stabilizers	33%	7%	4%	56%	226
Use integrated pest management	32%	6%	5%	57%	221
Make variable rate fertilizer applications	29%	13%	5%	53%	223
Take tissue tests for nitrogen	15%	19%	6%	60%	222
Use irrigation water management	8.00%	14.22%	3.56%	74.22%	225
Test irrigation water for nitrate and take nitrogen credits	5%	14%	4%	77%	225
Grow USDA Certified Organic products	5%	8%	18%	69%	223

Figure A.3: Interest in Tier I Practices, 2021 Mail Survey, All Responses

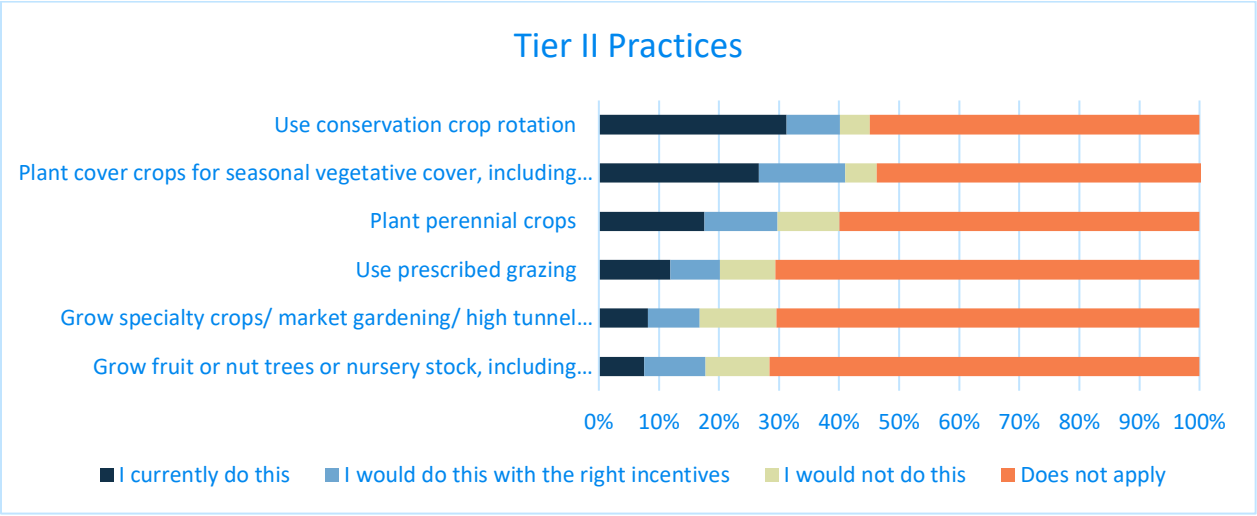


Question 4: Please provide your response to the following Tier 2 practices.

Table A.4. Interest in Tier II Practices, 2021 Mail Survey, All Responses

Tier II Practices	I currently do this	I would do with right incentives	I would not do this	Does not apply	Total
Use conservation crop rotation	31%	9%	5%	55%	224
Plant cover crops for seasonal vegetative cover	27%	14%	5%	55%	229
Plant perennial crops	18%	12%	10%	60%	222
Use prescribed grazing	12%	8%	9%	71%	218
Grow specialty crops/ market gardening/ high tunnel systems	8%	9%	13%	70%	220
Grow fruit or nut trees or nursery stock, including silvopasture	7%	10%	11%	72%	225

Figure A.4: Interest in Tier II Practices, 2021 Mail Survey, All Responses

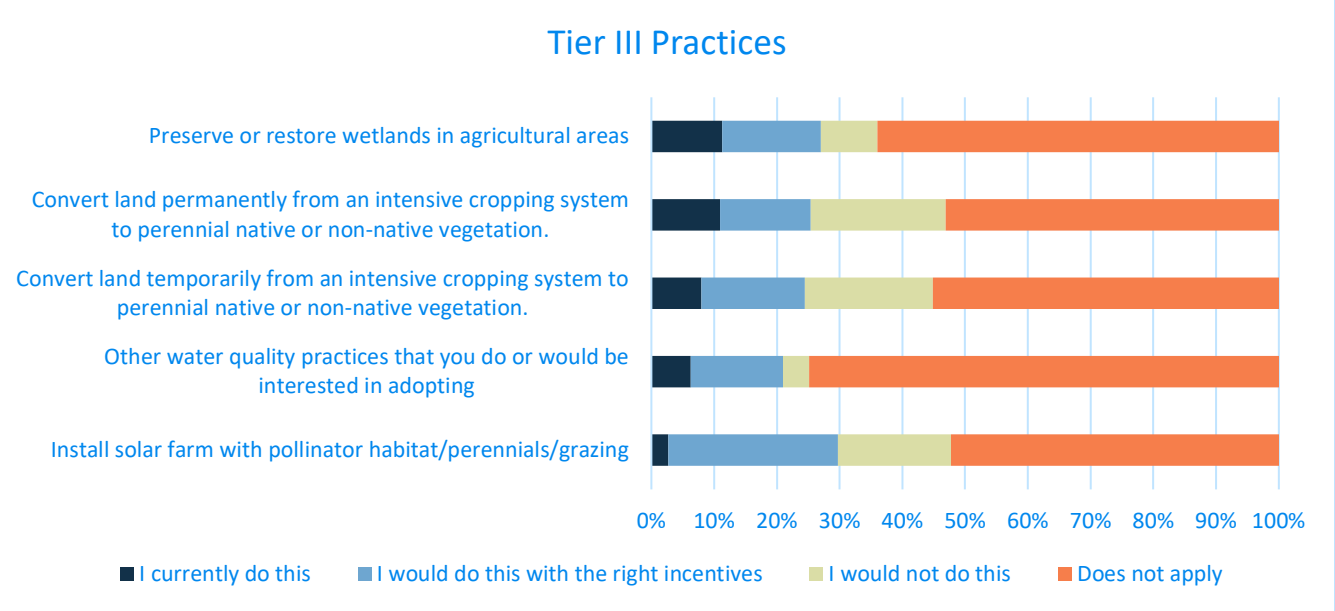


Question 5: Please provide your response to the following Tier 3 practices.

Table A.5. Interest in Tier III Practices, 2021 Mail Survey, All Responses

Tier III Practices	I currently do this	I would do with right incentives	I would not do this	Does not apply	Total
Preserve or restore wetlands in agricultural areas	11%	16%	9%	64%	222
Convert land permanently from an intensive cropping system to perennial native or non-native vegetation	11%	14%	22%	53%	228
Convert land temporarily from an intensive cropping system to perennial native or non-native vegetation	8%	16%	21%	55%	225
Other water quality practices	6%	15%	4%	75%	191
Install solar farm with pollinator habitat/perennials/grazing	3%	27%	18%	52%	222

Figure A.5: Interest in Tier III Practices, 2021 Mail Survey, All Responses



Question 6: Any additional comments about the above questions.

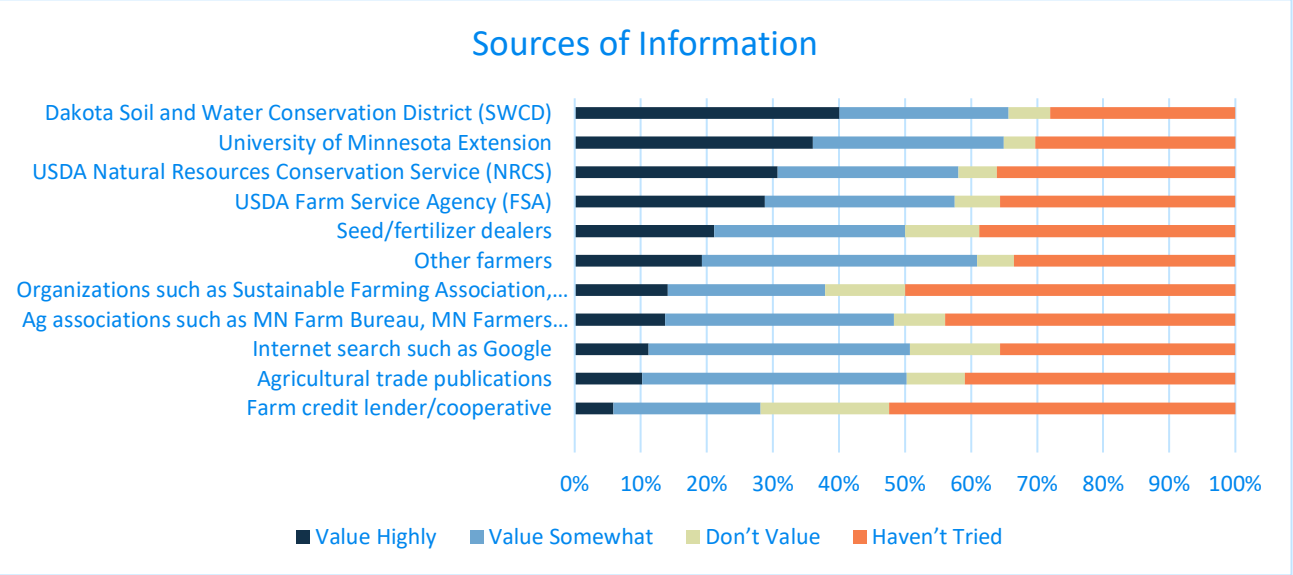
33 respondents wrote in answers, many reiterating that they did not farm the land or providing details on the practices they use. The following practices were written is as practices the respondent would be interested in adopting (in order of most mentions): buffers at the edge of fields, rainwater collection, and low-pressure irrigation.

Question 7: What sources of information do you value regarding farming practices that affect groundwater quality?

Table A.6. Value of Information Sources, 2021 Mail Survey, All Responses

Information Sources	Value Highly	Value Somewhat	Don't Value	Haven't Tried	Total
Dakota Soil and Water Conservation District (SWCD)	40%	26%	6%	28%	207
University of Minnesota Extension	36%	29%	5%	30%	208
USDA Natural Resources Conservation Service (NRCS)	31%	27%	6%	36%	205
USDA Farm Service Agency (FSA)	29%	29%	7%	35%	205
Crop advisors	24%	26%	6%	44%	201
Seed/fertilizer dealers	21%	29%	11%	39%	204
Other farmers	19%	42%	6%	33%	197
Organizations such as Sustainable Farming Association, Land Stewardship Project, etc.	14%	24%	12%	50%	206
Ag associations such as MN Farm Bureau, MN Farmers Union, MN Ag Water Resource Center, MN Corn Growers or MN Soybean Growers	13%	35%	8%	44%	205
Agricultural trade publications	10%	40%	9%	41%	205
Internet search such as Google	11%	39%	14%	36%	205
Farm credit lender/cooperative	6%	22%	20%	52%	206

Figure A.6: Value of Information Sources, 2021 Mail Survey, All Responses

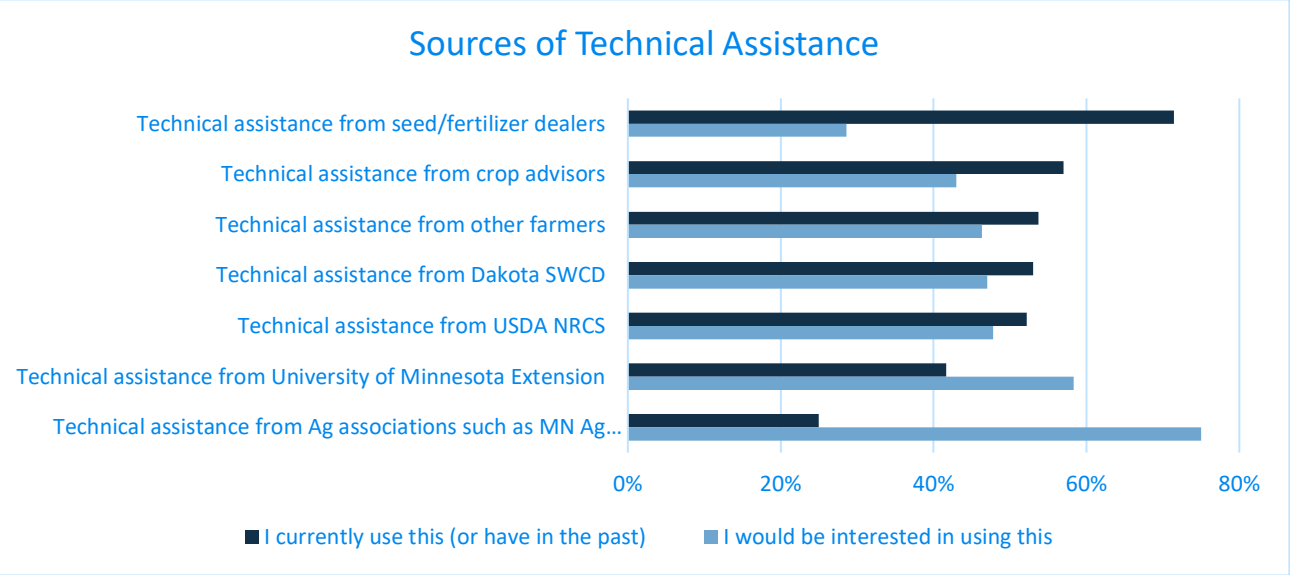


Question 8: What technical assistance would encourage you to adopt new conservation practices?

Table A.7. Use of Technical Assistance Sources-All that Apply, 2021 Mail Survey, All Responses

Technical Assistance Sources	I currently use or have used	I would be interested	Total
Technical assistance from seed/fertilizer dealers	71%	29%	112
Technical assistance from crop advisors	57%	43%	107
Technical assistance from other farmers	54%	46%	108
Technical assistance from Dakota SWCD	53%	47%	117
Technical assistance from USDA NRCS	52%	48%	113
Technical assistance from University of Minnesota Extension	42%	58%	108
Technical assistance from Ag associations such as MN Ag Water Resource Center, MN Corn Growers or MN Soybean Growers	25%	75%	92

Figure A.7. Use of Technical Assistance Sources-All that Apply, 2021 Mail Survey, All Responses

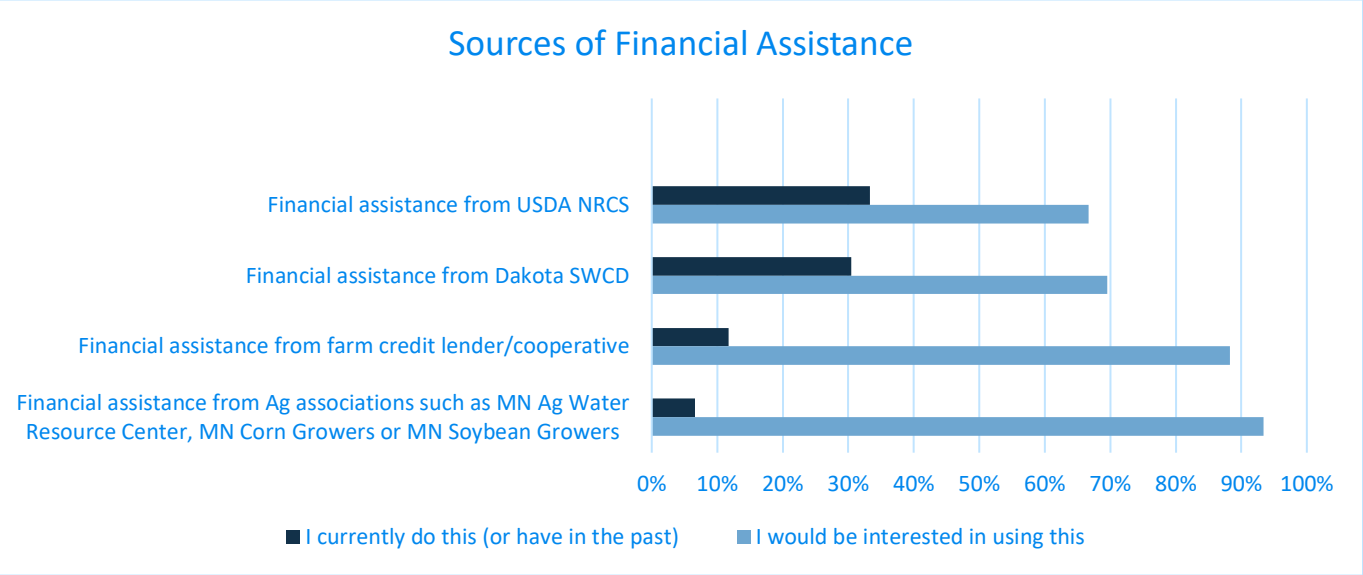


Question 9: What financial assistance would encourage you to adopt new conservation practices?

Table A.8. Use of Financial Assistance Sources – All that Apply, 2021 Mail Survey, All Responses

Financial Assistance Sources	I currently use or have used	I would be interested	Total
Financial assistance from USDA NRCS	33%	67%	111
Financial assistance from Dakota SWCD	30%	70%	115
Financial assistance from farm credit lender/cooperative	12%	88%	85
Financial assistance from Ag associations such as MN Ag Water Resource Center, MN Corn Growers or MN Soybean Growers	7%	93%	91

Figure A.8. Use of Financial Assistance Sources-All that Apply, 2021 Mail Survey, All Responses

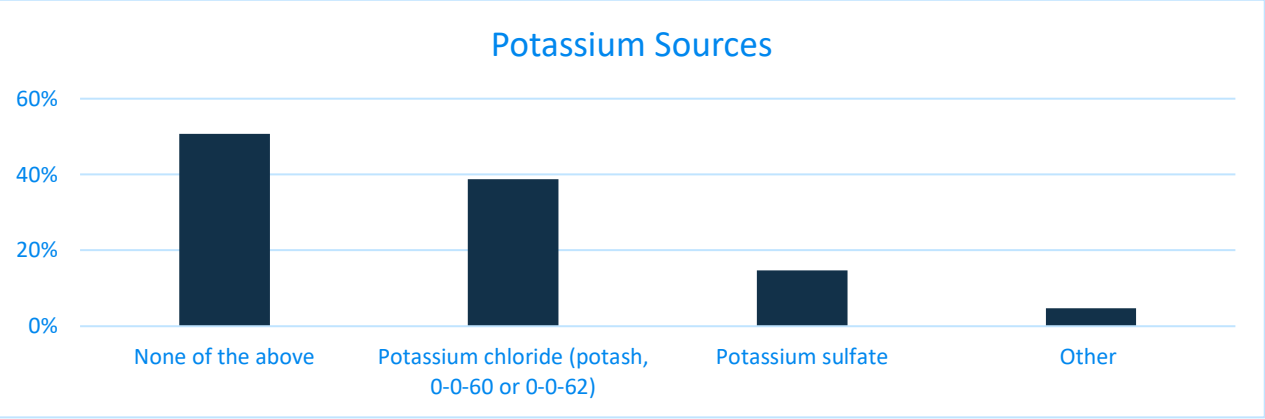


Question 10: Regarding chloride in groundwater, what source of potassium do you use for your crops?

Table A.9. Potassium Fertilizer Use – All that Apply, 2021 Mail Survey, All Responses

Potassium Sources	Responses	Total
None of the above	51%	97
Potassium chloride (potash, 0-0-60 or 0-0-62)	39%	74
Potassium sulfate	15%	28
Other	5%	9

Figure A.9. Potassium Fertilizer Use, 2021 Mail Survey, All Responses

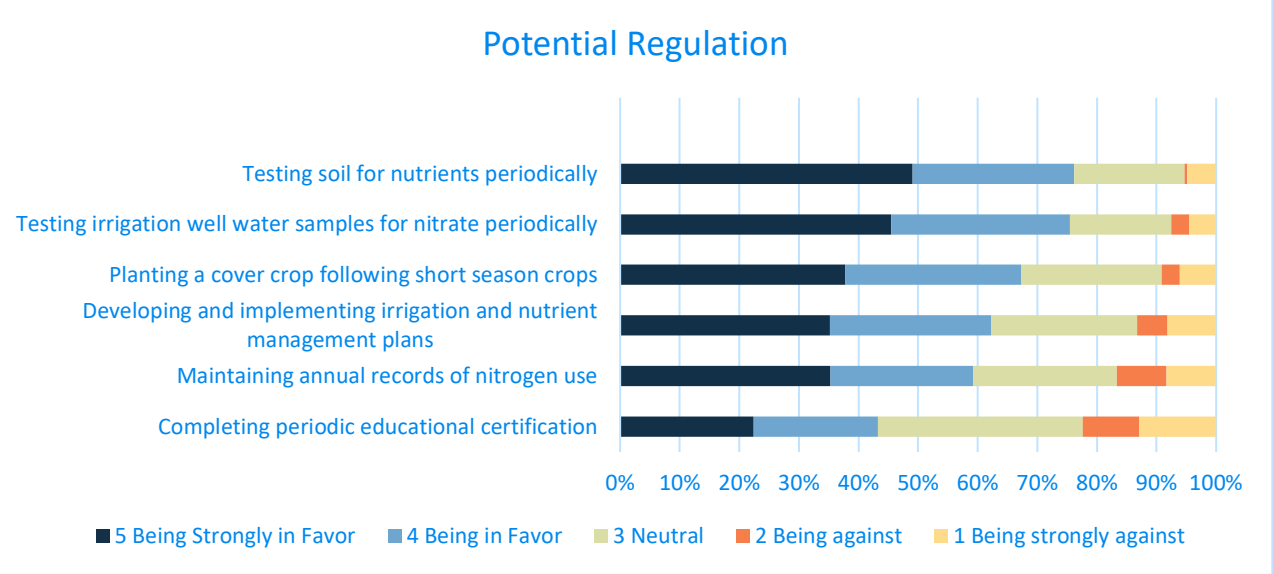


Question 11: What do you think of the following potential requirements for farmers in areas where nitrate levels in shallow groundwater remain high after a period of years?

Table A.10. Support for Potential Requirements, 2021 Mail Survey, All Responses

Potential Requirement	1= Strongly Against	2= Against	3= Neutral	4= Favor	5= Strongly Favor	Total	Weighted Average
Testing soil for nutrients periodically (for example, every five years)	5%	1%	19%	27%	49%	206	4.15
Testing irrigation well water samples for nitrate periodically, if applicable (for example, annually)	5%	3%	17%	30%	45%	200	4.09
Planting a cover crop following short season crops (those harvested before August 15th)	6%	3%	23%	30%	38%	196	3.9
Developing and implementing irrigation and nutrient management plans	8%	5%	25%	27%	35%	196	3.76
Maintaining annual records of nitrogen use including rates, credits, sources, timing, and placement	8%	8%	25%	24%	35%	204	3.7
Completing periodic educational certification (annual or biennial)	13%	10%	34%	21%	22%	201	3.3

Figure A.10. Support for Potential Requirements, 2021 Mail Survey, All Responses



Question 12: How much land in Dakota County do you own, lease to someone else, or rent from someone else?

Table A.11. Land in Dakota County Owned, Leased, or Rented; 2021 Mail Survey; All Responses

Land in the County That You:	None	Less than 20 Acres	20-49 Acres	50-179 Acres	180-499 Acres	500-999 Acres	1,000 Acres or more	Total
Own?	1%	42%	13%	19%	18%	4%	3%	262
Lease to another farmer/ operator?	66%	10%	6%	12%	6%	0%	1%	253
Rent from someone else?	74%	7%	2%	8%	7%	1%	1%	245

Figure A.11a. Land Owned in Dakota County, 2021 Mail Survey, All Responses

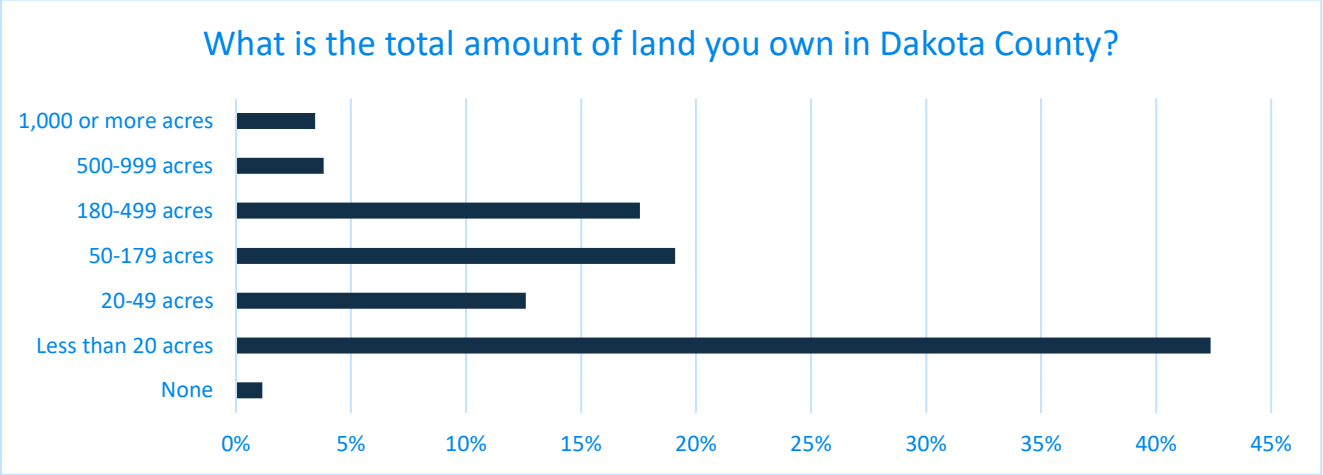


Figure A.11b. Land Leased in Dakota County, 2021 Mail Survey, All Responses

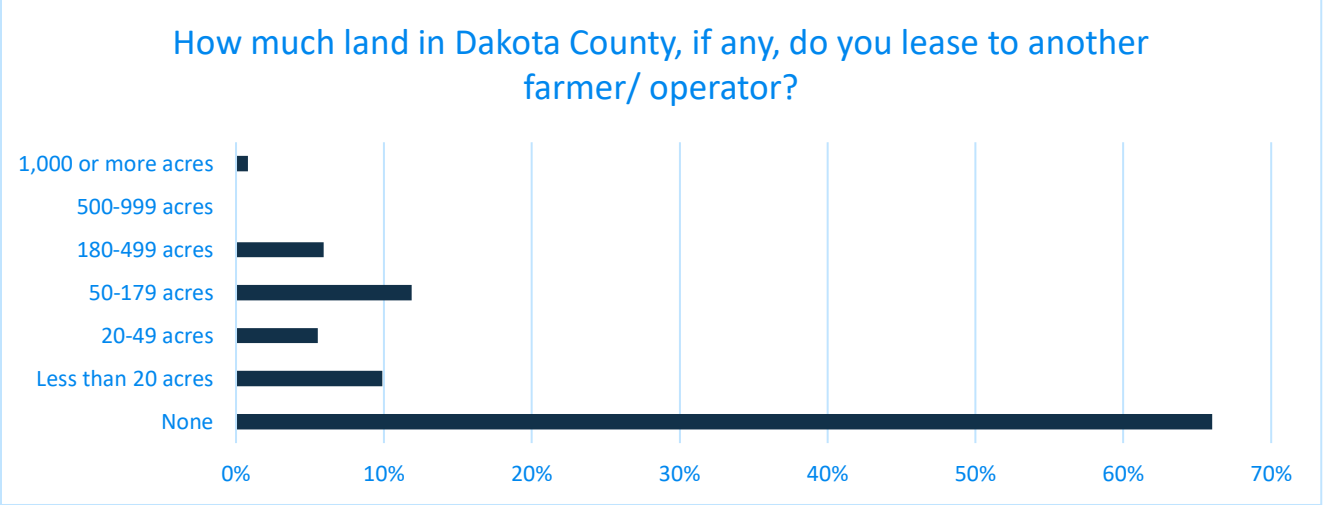
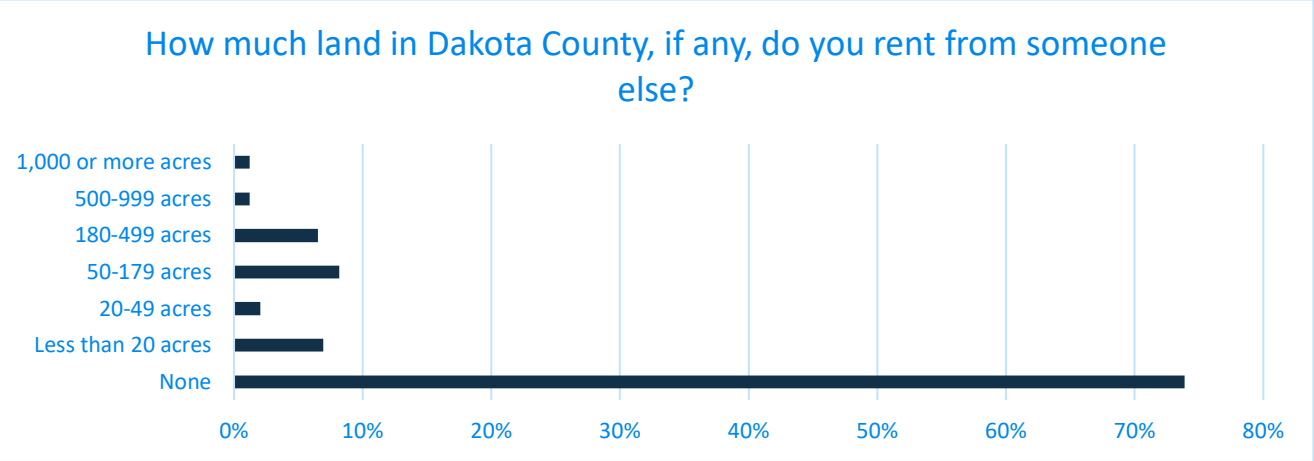


Figure A.11c. Land Rented in Dakota County, 2021 Mail Survey, All Responses



Question 13: Where do you have farm operations?

Table A.12. Where Respondents Farm, 2021 Mail Survey, All Responses

Municipality	Percent	Number
Castle Rock Township	16 %	38
Douglas Township	9%	21
Empire Township	8%	19
Eureka Township	13%	30
Greenvale Township	12%	28
Hampton Township	14%	32
Marshan Township	12%	27
Nininger Township	4%	9
Randolph Township	5%	12
Ravenna Township	1%	3
Sciota Township	4%	10
Vermillion Township	15%	36
Waterford Township	9%	21
Farmington	3%	6
Hastings	3%	8
Lakeville	3%	6
Miesville	1%	2
Rosemount	3%	8
Other, including outside of Dakota County	11%	25

Figure A.12a. Where Respondents Farm, 2021 Mail Survey, All Responses

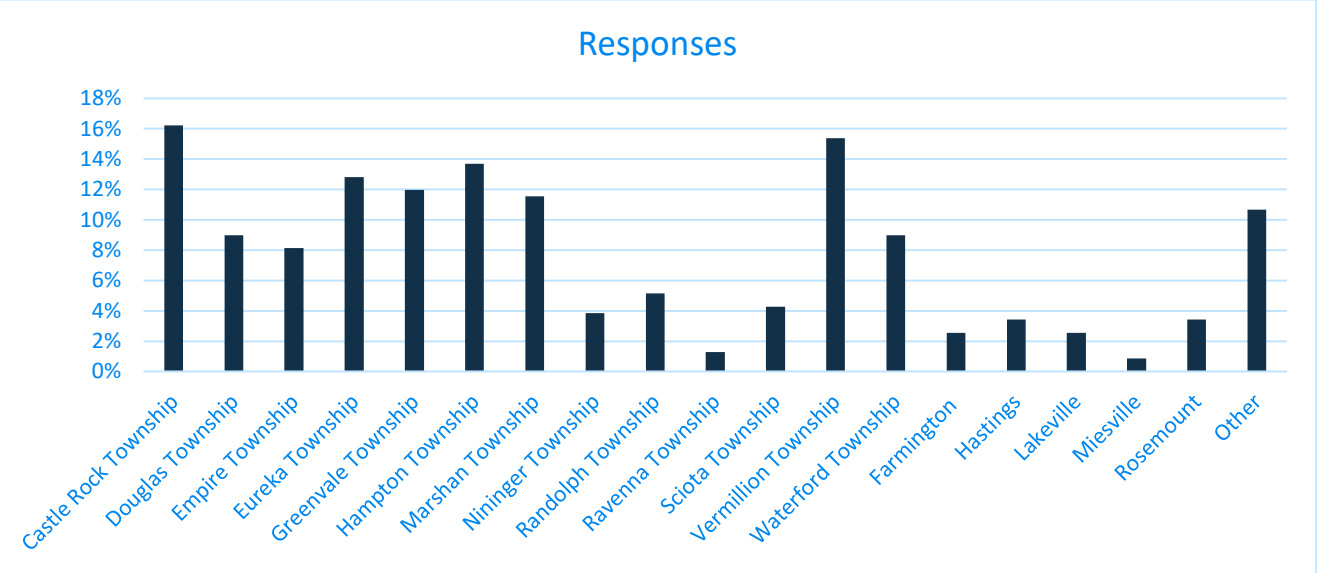
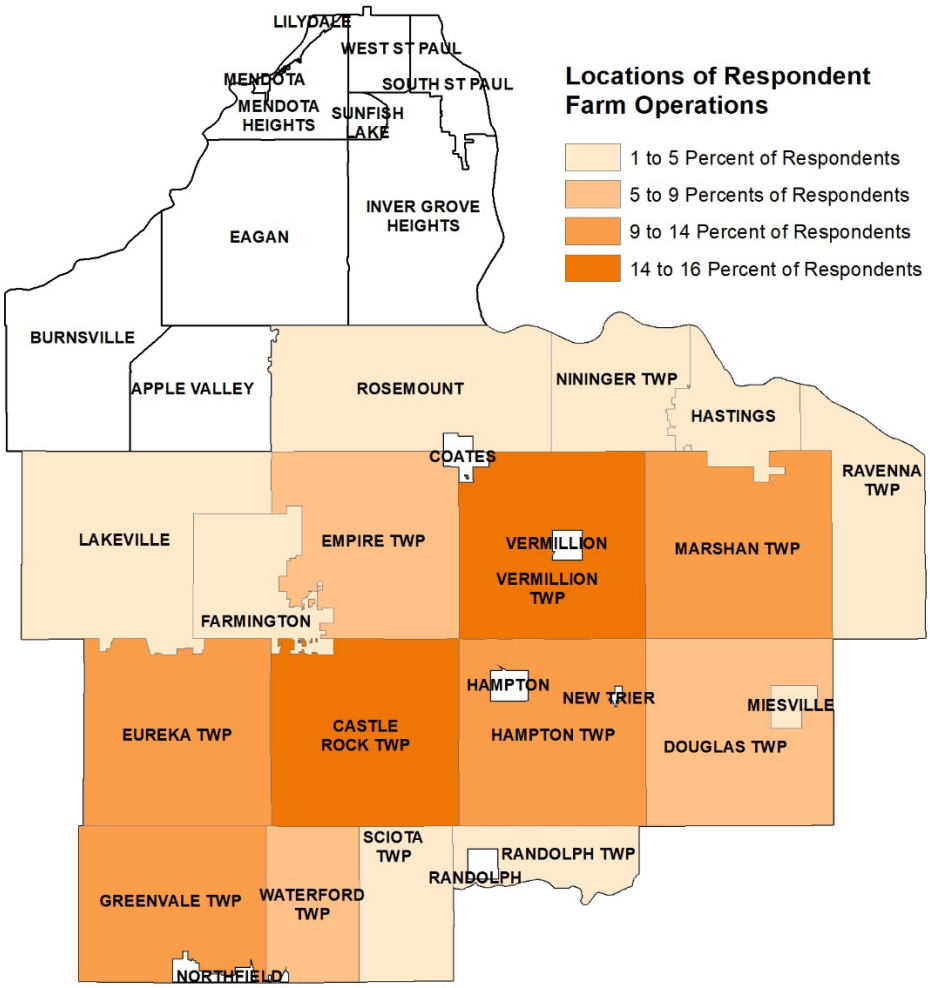


Figure A.12b. Where Respondents Farm, 2021 Mail Survey, All Responses

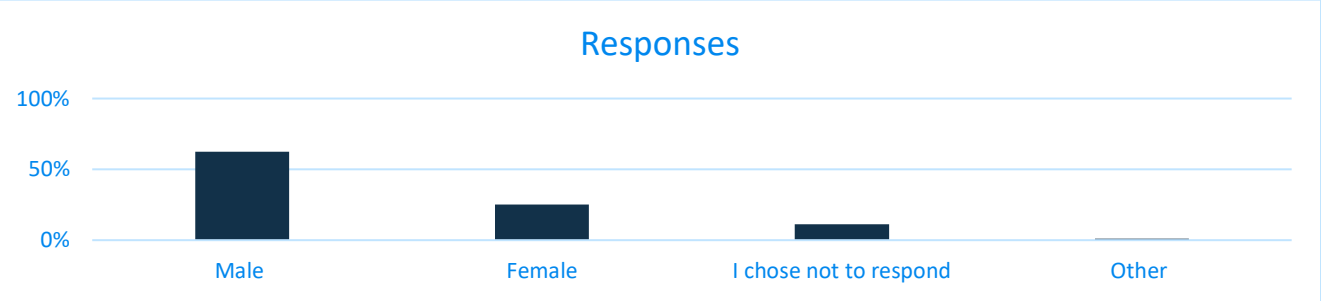


Question 14. Gender

Table A.13. Respondent Gender, 2021 Mail Survey, All Responses

Answer Choices	Percent	Number
Male	62%	170
Female	25%	69
I chose not to respond	12%	31
Other	1%	3

Figure A.13. Respondent Gender, 2021 Mail Survey, All Responses

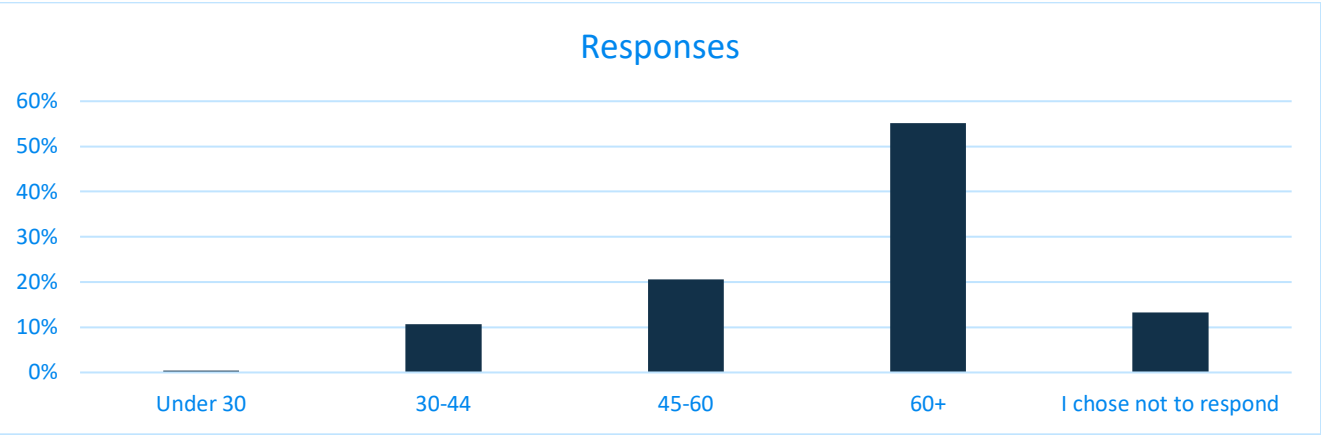


Question 15. Age

Table A.14. Respondent Age; 2021 Mail Survey; All Responses

Age	Percent	Number
Under 30	0.37%	1
30-44	10.66%	29
45-60	20.59%	56
60+	55.15%	150
I chose not to respond	13.24%	36

Figure A.14. Respondent Age, 2021 Mail Survey, All Responses

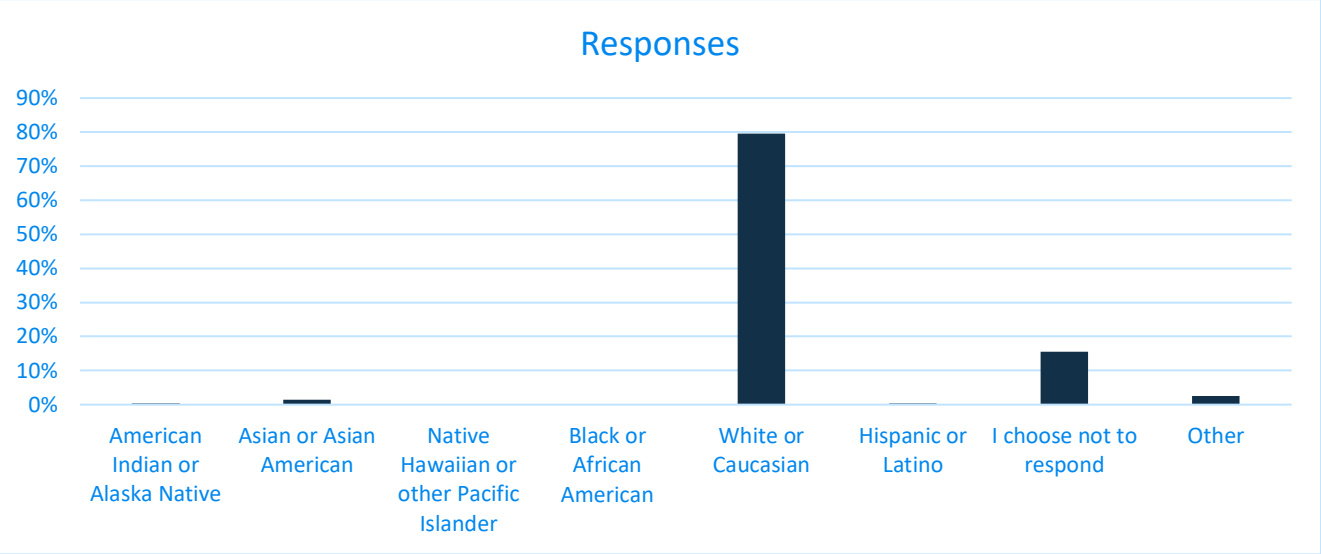


Question 16. What is your race?

Table A.15. Respondent Race (all categories that apply), 2021 Mail Survey, All Responses

Answer Choices	Percent	Number
American Indian or Alaska Native	0.5%	1
Asian or Asian American	1%	4
Native Hawaiian or other Pacific Islander	0%	0
Black or African American	0%	0
White or Caucasian	80%	215
Hispanic or Latino	0.5%	1
I choose not to respond	16%	42
Other	3%	7

Figure A.15. Respondent Race (all categories that apply), 2021 Mail Survey, All Responses



ACRE
Summary of Findings & Overview of Potential Strategies

Dakota County Planning Commission

Jill V. Trescott & Valerie Grover
Environmental Resources
January 27, 2022

1

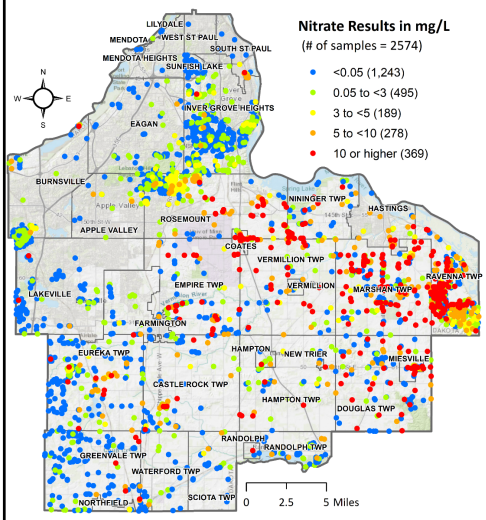
Overview

- Introduction
- Research Summary
- Stakeholder Engagement Summary
- Goals & Outcome Measures
- Proposed Strategies
- Next Steps
- Questions


Pic: Buffer Strip

2

Introduction



Why develop ACRE Plan?

Groundwater Plan identified ag. chemicals as significant concern

Goal 1:
Water Quality

Strategy 1B1:
Reduce Ag chemical contamination

Tactic 1B1B:
Develop & Implement ACRE

3

Introduction - Plan Progress

Task	2021 Q1	2021 Q2	2021 Q3	2021 Q4	2022 Q1
ACRE Development Preparation:					
Adoption of 2020-2030 Dakota County Groundwater Plan					
Application and award of MDH Grant for ACRE Development ($50k)					
Planning Commission: Present ACRE into and receive initial guidance (May)					
Technical Research:					
Review available data, regs., precedent					
Develop and install monitoring well network					⇒
Hire contractor to complete nitrate modelling (Barr Engineering)					⇒
Stakeholder Engagement:					
Award Engagement Contract (Environmental Initiatives)					
Partner with SWCD to establish Ag. Advisory Group					
Finalize Engagement Plan					
Phase I Stakeholder Engagement (Aug – Dec 2021)					
Plan Development, Review, Adoption:					
Develop draft goals, strategies and tactics					
Planning Commission: Present Summary of findings and receive feedback on new opportunities (Jan 2022)					
PDC – Board: Present summary of findings and receive feedback on new opportunities (Feb 2022)					

⇒ Task in ongoing beyond Q1, 2022

4

Introduction - Draft Concept

Purpose:

- Reduce ag. chemicals in groundwater to levels that no longer pose a threat to human or ecological health
- Develop stronger ag. chemical drinking water protection goals (compared to current MDA Plans and Rules)
- Partner with farmers, SWCD, state, regional, and local agencies and non-governmental organizations
- Develop prioritized, targeted, and measurable strategies

Pic: Irrigator on corn field

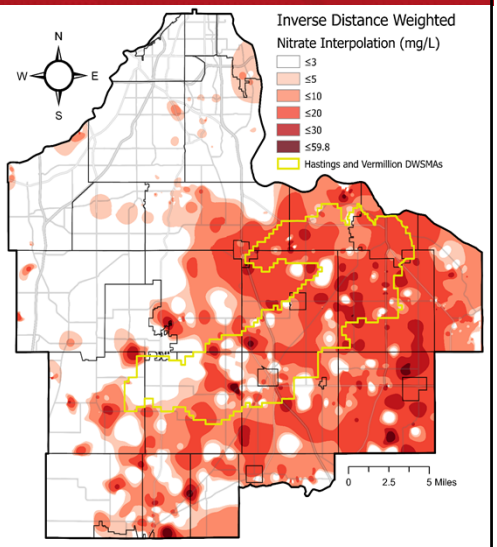
Pic: Fertilizer application on field

5

Introduction - Draft Concept

Primary Focus:

- Ag. contamination only - sources from farming practices
- High nitrate areas
- Outside of Hastings' Drinking Water Supply Management Area (DWSMA)
- Collaborate with MDA within Hastings' DWSMA



MDA addressing nitrate in Hastings' DWSMA as part of Groundwater Protection Rule

6

Research Summary - Agricultural Practices

Groundwater/ Drinking Water Protection Practices for Agricultural Lands*

Practice Tier	Practice Examples
Tier I – Cropping practices with known benefits	**Nutrient Management "4Rs"** - Right nutrient, rate, time, & place
	Irrigation Water Nitrogen Credits – fertilizer credits for nitrate in water
	Irrigation Water Management – control volume, frequency, and application
	Integrated Pest Management – plan to avoid unnecessary pesticides
Tier II – Cropping system changes	**Cover Crops** – grasses, legumes and forbs for seasonal veg. cover
	Conservation Crop Rotation – rotation of crops on same field, with at least 1 low-nitrogen input crop in 5-year rotation
	Forage and Biomass Planting – perennial veg. for pasture, hay, or biomass
	Pollinator Conservation/ Honey-Bee Production – pollinator habitat
	Specialty & Short-Season Crops – specialty, canning crops

*(BWSR Groundwater/Drinking Water Protection Practices for Agricultural Lands, April 2021)

7

Research Summary - Agricultural Practices

Groundwater/ Drinking Water Protection Practices for Agricultural Lands*

Practice Tier	Practice Examples
Tier III – Land Use Changes	**Conservation Cover** – convert land use from intense annual cropping to permanent vegetation
	Open Space Design/ Limit Development – purchase and protection of land in sensitive natural areas or public open spaces
	Outdoor Recreational Uses – game/hunting preserve, wildlife management areas, waterfowl production areas
	Solar Farm with Pollinator Habitat – solar installation with native prairie plantings

*(BWSR Groundwater/Drinking Water Protection Practices for Agricultural Lands, April 2021)

Pic: Bean field

8

Research Summary - Agricultural Practices

Current Incentive Programs and Practices	Estimated Nitrate (N) Reduction	Estimated Current Adoption Rates
Nutrient Management Plan Development & Implementation (Tier I)	9-15% N reduction $2-4 lb/N removed	< 5%
Irrigation Water Management Plan Development & Implementation (Tier I)	57-60% N reduction $2-3 lb/ N removed	< 5%
Cover Crops (Tier II)	50% N reduction $18-38 lb/ N removed	4-5%
Perennial Crops (Tier II)	72-95% N reduction $4 lb/N removed	< 1%
Conservation Cover (Tier III)	95% N reduction $15 lb/ N removed	< 1 %
MDA Water Quality Certification Program (Combination of practices in Tier I – III)	Not known	5%

9

Research Summary - Other State Programs

- **Common Regulatory Requirements:**
  - Preparation & implementation of nutrient management plans
  - Periodic education and certification
  - Submission of annual fertilizer or chemigation records
- **Common Voluntary Programs:**
  - Technical assistance through Universities, SWCDs, or equivalent organization
  - Cost-share programs for installing water quality-related practices
  - Tax credits for maintaining water quality-related practices
  - Water quality trading programs within a specific area (e.g., watershed)

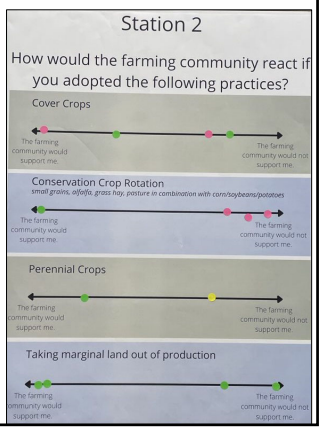
10

Stakeholder Engagement Summary

Phase I Engagement:

- 3 Ag. Advisory Group Meetings – select group of local farmers and ag. operators
- 1 Ag. Community Townhall – open to all farmers and ag. operators
- 1 Public Sector Meeting – rural cities/townships
- 4 Township Board Meetings
- 1 Watershed Management Organization Meeting
- 1 Tech Advisory Meeting - state and regional agencies
- Paper & Online survey - 304 participants

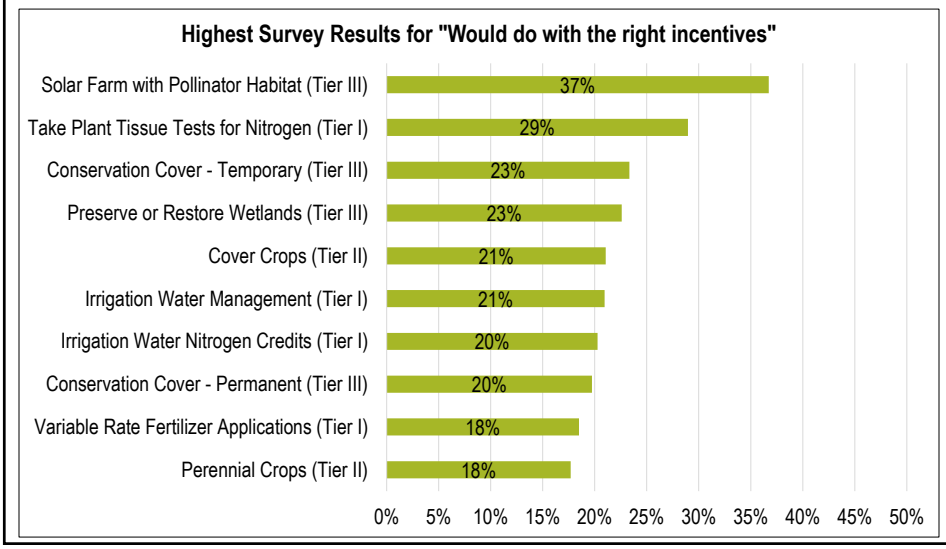
Pic: Ag. Advisory Group Meeting



11

Stakeholder Engagement Summary - Overarching Themes

- **Preferred Practices:** Voluntary practices more appealing with incentives



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Stakeholder Engagement Summary - Overarching Themes

- **Incentive Equity:** Consider programs that reward farmers for continuing to do the right thing, in addition to incentives for adoption of practices that benefit water quality
- **Trusted Resources:** Top sources farmers value are SWCD, UMN Extension, and USDA
- **Regulatory Caution:**
  - Not rejected outright by farming community
  - Must be carefully tailored to be fair, respect the variety of land conditions, and maintain farmers' financial viability
- **Protecting Legacy:**
  - Most farmers want to protect long-term productivity to pass down to descendants
  - Exception is with growing number of absentee landowners that rent out land for short-term profits (33%)

13

Question 1 for Planning Commission:

Does the Commission have questions or comments on the concept paper, existing research, or engagement summary?

14

ACRE Goal

Groundwater and drinking water that are free from agricultural chemicals that threaten human health or the environment

Pic: Cover crops on corn field

15

Draft Long-Term Outcome Measures

Current Conditions:	Outcome Measures:
9 communities have >10% of wells exceed 10 mg/L nitrate 3 communities have 5-10% of wells exceed 10 mg/L nitrate	< 5% private drinking water wells within each township exceed 10 mg/L nitrate
Hastings' public water supply approaching 10 mg/L nitrate	No public water supply exceeds or projected to exceed 10 mg/L nitrate
Median nitrate levels exceed 10 mg/L in some townships	Median nitrate levels in shallow groundwater are below 10 mg/L

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Draft Long-Term Outcome Measures

Current Conditions:	Outcome Measure:
30 of 268 wells tested exceed cyanazine guidelines 65 wells tested exceed 50% of cyanazine guidelines	No private drinking water wells have pesticide concentrations that exceed 50% drinking water guidelines
75% of wells show human impact (1033 of 1381 wells)	Contributions of chloride to groundwater from crop fertilizer are decreasing

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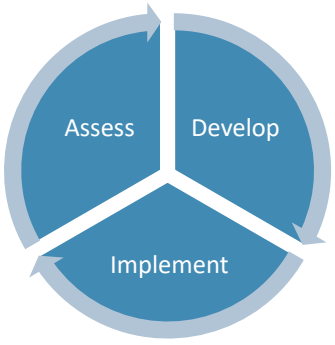
Strategies

1. Information for Decision Making
2. Communication, Outreach, and Education
3. Technical Assistance
4. Financial Assistance
5. Potential Regulation



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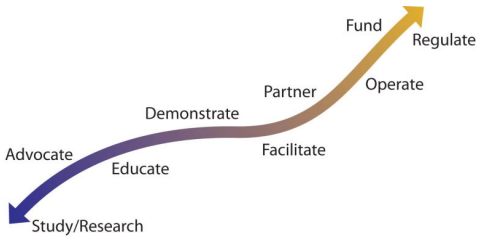
Question 2 for Planning Commission:

Please keep in mind the below question for the following slides:

What are the Commission's thoughts on potential new tactics and roles presented?



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Strategy 1

Information for Decision Making

Ongoing or Expanded Tactics/Roles:

- Conduct gw monitoring – county & private wells [Operate]
- Update groundwater models and nitrate leaching estimates [Operate]
- Collect info on farming practices, nitrogen usage, demographic data, & costs [Research]

Potential New Tactics/ Roles:

- Develop scenarios for practice adoption to prioritize funding [New, Operate]

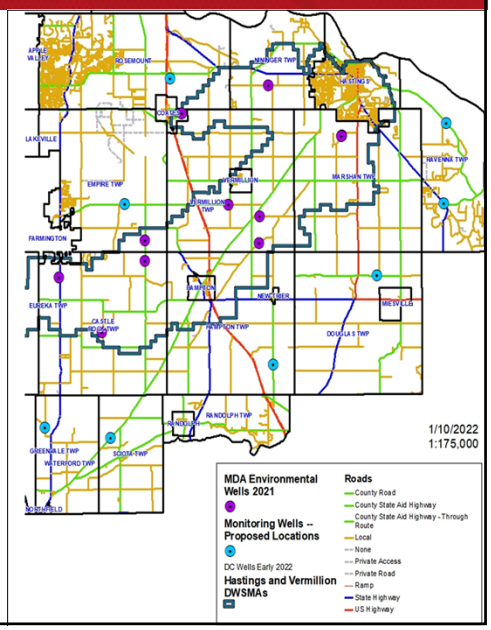

Pic: Monitoring well installation

20

Strategy 1

Groundwater Monitoring Network

- 7 Dakota County Wells – outside of Hastings' DWSMA
- 11 MDA Wells – within Hastings' DWSMA



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Strategy 2

Communication, Outreach, and Education

Ongoing or Expanded Tactics/Roles:

- Provide groundwater data and progress updates to farmers and rural residents [Educate]
- Increase promotion of SWCD and other local, state, and federal technical and financial assistance programs [Educate]
- Promote educational opportunities for farmers and ag. operators [Educate/ Facilitate]
- Partner with agronomists, co-ops, retailers, and lenders to promote water quality practices [Educate/Partner]

Potential New Tactics/ Roles:

- Create a permanent Agricultural Advisory Group [New, Facilitate]

Pic: Weather Station Sign

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Strategy 3

Technical Assistance

Ongoing or Expanded Tactics/Roles:

- Provide opportunities for assistance at individual farm level [Educate]
- Assist with completion of Nutrient Management and Irrigation Management Plans [Educate/Facilitate]
- Partner with U of M, MDA and others to provide certification programs [Partner]

Potential New Tactics/ Roles:

- Increase availability of one-on-one assistance to farmers [Expand, Educate]

Pic: SWCD staff doing survey

23

Strategy 4

Financial Assistance

Ongoing or Expanded Tactics/Roles:

- Seek sources of funding for water quality incentive programs [Advocate]
- Increase incentives for initial adoption of water quality practices (short-term subsidies) [Fund]
- Increase incentives for completion of Nutrient Management and Irrigation Management Plans [Fund]

Potential New Tactics/ Roles:

- Provide incentives to farmers for maintaining water quality practices (long-term subsidies) [New, Fund]
- Provide incentives for completing MN Ag Water Quality Certification process, or scale to score [New, Fund/Facilitate]

Pic: Kernza

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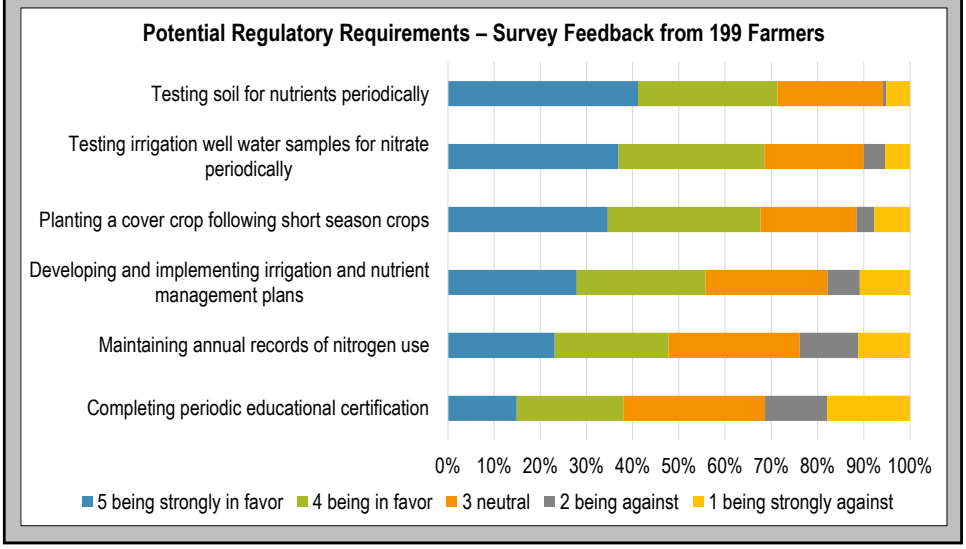
Strategy 5

Regulation – Potential New Tactics/Roles



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Question 3 for Planning Commission:

What are the Commission's thoughts on potential regulatory approaches, related to the County role and ability to enforce regulation?

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Plan Development – Next Steps

Task	2022 Q1	2022 Q2	2022 Q3	2022 Q4
Technical Research				
Review available data, regs., precedent				
Develop and install monitoring well network				
Hire contractor to complete nitrate modelling (Barr Engineering)				
Conduct baseline well monitoring				
Stakeholder Engagement:				
Phase II Stakeholder Engagement				
Finalize Stakeholder Engagement Report				
Plan Finalization, Review, Adoption				
Develop Draft Plan based on Planning Commission, PDC-Board, and Stakeholder Feedback				
Update Planning Commission and County Board (May-Jun 2022)				
Review/ Refine Plan				
Public Review (45 – 60 days)				
Finalize Plan - County Board adoption				

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Questions?

Partial funding for the ACRE Plan is provided through the Clean Water Land and Legacy Amendment, distributed by the Minnesota Department of Health to Dakota County.

CLEAN WATER LAND & LEGACY AMENDMENT

Pic: Old well in field

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Agricultural Advisory Group Members

Representative	Organization
Al Bester	Dakota County Farmer
Christy Bauer-Schmidt	River County Coop and Dakota County Farmer
Chuck Clanton	Vermillion River Watershed Joint Powers Operation Planning Commission and Dakota County Farmer
Mike Conzemius	Dakota County Cattle and Crop Farmer
Colin Cureton	Forever Green Initiative, University of Minnesota
Warren Formo	Minnesota Agricultural Water Resources Center
Jean-Marc Versolato	Bailey Nursery

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DAKOTA COUNTY PLANNING COMMISSION

January 27, 2022 AGENDA ITEM: All Hazard Mitigation Plan Draft Recommendation (*Action*)

PURPOSE

Provide Planning Commission:

1. A brief recap on the Plan purpose
2. A summary of community engagement findings
3. An overview of new content in the 2022 All-Hazard Mitigation Plan Update
4. A request for the Commission's recommendation on releasing the draft plan update for public review.

BACKGROUND

Plan Purpose: The Disaster Mitigation Act of 2000 required counties and cities to prepare All-Hazard Mitigation Plans, with mitigation strategies to reduce impacts to public safety and damage. Counties and cities must have an approved and adopted plan to be eligible for both federal disaster relief and mitigation project grant dollars and plans must be updated every five years. Dakota County's plan is multi-jurisdictional – cities participate in the County plan in lieu of developing their own plans. The County's current plan expires in 2022. The County planning team and 14 participating cities have completed preparation of a draft plan update, which includes the new strategies presented to the Commission at its meeting in July 2021.

Community Engagement: Several methods were used to evaluate public perceptions on hazard threats, plan priorities, and individual preparedness efforts: an updated version of the online survey used in the past, intercepts at the Dakota County Fair, interactive display boards at Dakota County Library branches, and materials provided at Dakota County vaccination clinics.

New Content: Civil Disturbance has been added as a new hazard. Strategies for mitigating civil disturbance impacts include improving situational awareness, partnerships, communications, training, and facility security. New strategies also have been developed for hazards that have increased since the 2016 update (e.g., Pandemic and Cyber-Attack), or to leverage new approaches in other recent County Plans (e.g., Groundwater Plan and Land Conservation Plan). Cities have also updated their vulnerabilities and strategies.

Request: Staff request that the Commission recommend to the County Board that the draft Dakota County All-Hazard Mitigation Plan be released for a 45-day public review period, from February 23-April 8, 2022.

The Plan will also be submitted to Minnesota Homeland Security and Emergency Management and to the Federal Emergency Management Agency for preliminary review. Additional opportunities for public comment will be provided in a manner appropriate to the ongoing pandemic.

ATTACHMENTS

- Public Engagement Summary
- New Content Summary
- Draft Dakota County All Hazard Mitigation Plan County Emergency Planning| Dakota County

QUESTIONS

The following questions are intended to help assist in review of the packet materials.

1. Does the Commission have comments or questions on the Plan purpose?

2. What stands out from the public engagement report?

3. Does the Plan adequately address significant hazards of concern, from a public and technical perspective?

4. REQUEST: The Planning Commission recommends to the Dakota County Board of Commissioners that the 2022 All-Hazard Mitigation Plan be released for a 45-day public review period.

ALL-HAZARD MITIGATION PLAN COMMUNITY ENGAGEMENT FINDINGS, 2021

The public was engaged throughout the 2022 All-Hazard Mitigation Plan update process. Because of the SARS-CoV-2 pandemic, virtual methods to seek public comments and the online survey became primary engagement tools. The pandemic also provided engagement opportunities, such as distribution of hazard mitigation fact sheets with the survey link at county-operated vaccination clinics. Before the delta variant surge, staff provided information home preparedness at the Dakota County Fair (August).

Online Survey

More than 1,000 people who live or work in Dakota County completed the ADA-accessible online survey through mid-September 2021.

Question 1: Do you have a safe place to be on your property/residence during a natural disaster, such as severe storms or a tornado?

Response	Percent
Yes	95%
No	2%
I'm not sure	3%

Question 2: If evacuation was necessary, I or someone else in my family would need physical assistance to leave my home.

Response	Percent
Yes	5%
No	92%
Not Sure	3%

Question 3: How concerned are you that the following hazards could happen in your community? The following chart weighted the total number of responses as follows: very concerned=3, moderately concerned=2, and not concerned =1.

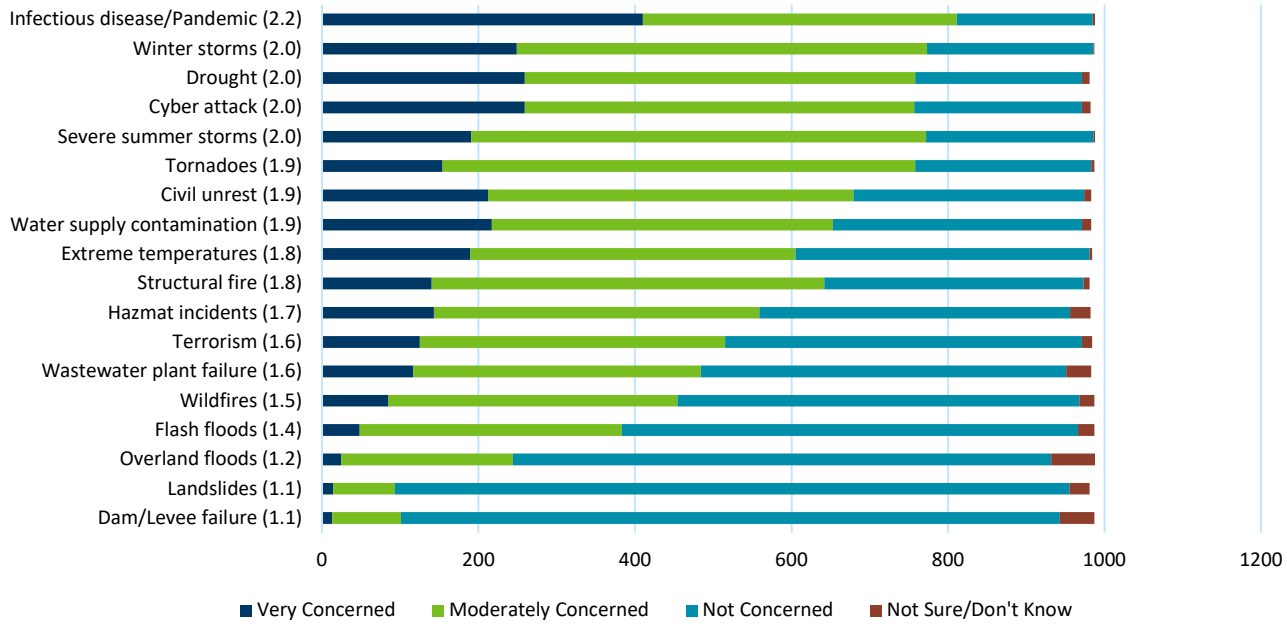

Figure A2.1: Question 3 Graph

Question 4: You may need to survive on your own after a disaster. Emergency management experts recommend having enough food, water, and other supplies to last until help arrives. How prepared is your immediate family for an emergency?

Response	Percent
Less than 3-day supply	19%
3-day supply	35%
More than a 3-day supply	46%

Question 5: Which hazard preparation measures has your household taken? Check all that apply.

Hazard Preparation Measures	Percent
Installed smoke detectors on every floor	94%
Installed carbon monoxide detectors on every floor	79%
Replace batteries in detectors annually	76%
Keep a First Aid kit in home or car	74%
Fire extinguisher(s) are onsite	72%
Signed up for countywide notification system through 911 dispatch center	44%
Bought hazard insurance (renter's, enhanced homeowner's, or flood)	36%
Bought a National Weather Service weather radio or battery-operated radio	30%
Completed First Aid/CPR training in the last year	29%
Prepared a Disaster Supply Kit for sheltering in place if necessary	12%
Prepared a Household Emergency Plan	10%
Assembled a family "Go Kit" in case of evacuation for several days	9%
Attended community meetings or events	7%

Additional measures added by respondents include:

- Staying current with events, politics, weather
- Purchased weapons and ammunition
- Survival training
- Bought a generator
- Emergency phone numbers on refrigerator, emergency binder, and in phones
- Determined who goes to be with whom and a meet-up place

Question 6: I cannot afford to buy detectors, fire extinguishers, radios, first aid kits, or other items mentioned in the last question.

Response	Percent
Yes	6%
No	94%

Question 7: During an emergency, where do you get information on what to do? Check all that apply.

Response	Percent
Local media	23%
Friends, family, or neighbors	17%
Employer (when in the workplace)	17%
Smart phone app	16%
Social media	14%
Government website	12%

Additional sources added by respondents include:

- Radio
- SMS notification
- Reliable social media outlets only
- American Red Cross and University of Minnesota
- City-sponsored neighborhood association
- Amateur radio
- Boy Scouts

Question 8: Before disasters, where do you get information about how to prepare? Check all that apply.

Response	Percent
Local media (TV, radio, newspaper)	25%
Emergency preparedness websites (FEMA, NWS, Red Cross, MN Health Department)	15%
Social media	15%
Dakota County or City website	14%
Email notice	12%
Brochure or fact sheet sent in the mail	5%
Information sent home from school with my child	5%
Information sent with a utility bill	5%
Public meetings/events	3%

Question 9: What level of priority should Hazard Mitigation Plans assign to each of these actions?

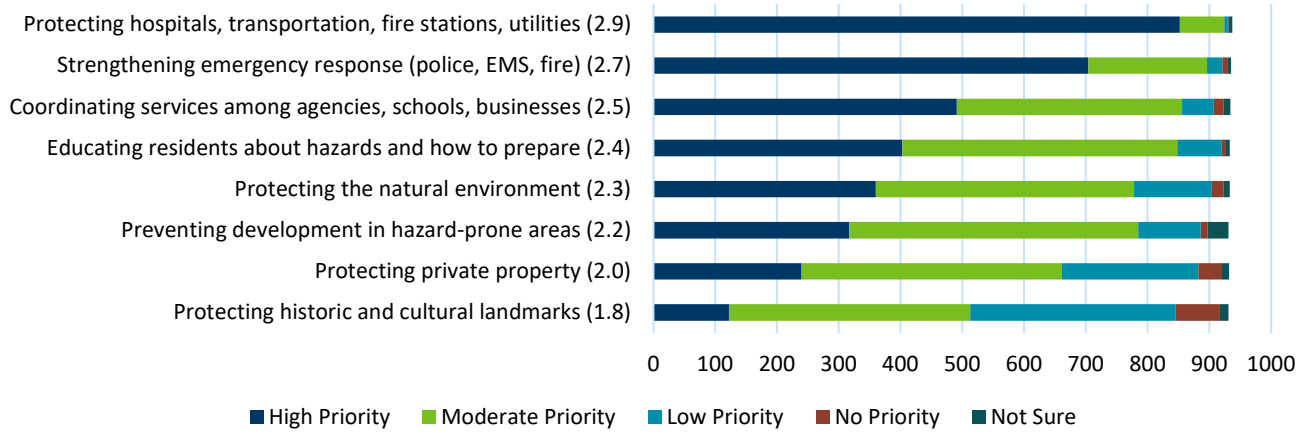

Figure A2.1: Question 9 Graph

Question 10: Except for monthly siren tests, when you hear a severe weather warning siren in your community, do you: (please check all that apply)

Response	Percent
Check cellphone for more information	35%
Turn on the TV or radio to find out what's going on	33%
Go outside and look at the sky	16%
Immediately take shelter if outside	13%
Do nothing	2%

Question 11: In which city or township do you live?

Response	Percent
Any township in Dakota County	4%
Apple Valley	7%
Burnsville	6%
Eagan	7%
Farmington	5%
Hastings	13%
I live outside of Dakota County	29%
Inver Grove Heights	4%
Lakeville	12%
Lilydale, Mendota, or Mendota Heights	1%
Not sure	<1%
Rosemount	6%
Rural cities (Coates, Hampton, Miesville, New Trier, Randolph, Vermillion)	1%
South St. Paul	2%
West St. Paul or Sunfish Lake	2%

Question 12: What is your gender?

Response	Percent
Female	62%
Male	33%
Non-binary / another gender	<1%
I prefer not to say	5%

Question 13: Are you Spanish, Hispanic, or Latino?

Answer	%
Yes	3%
No	97%

Question 14: Please mark one or more races to indicate what race(s) you consider yourself to be.

Answer	%
American Indian or Alaskan Native	1%
Asian, Asian Indian or Pacific Islander	2%
Black or African American	2%
White	91%
Other	4%

Question 15: Which category includes your age?

Answer	%
Under 30	6%
30-44	32%
45-59	43%
60 or older	16%
I choose not to respond	3%

Intercepts

Library Displays

Interactive displays were posted for several weeks during 2021 at six branches of the Dakota County Library System, with branches selected to provide geographic and demographic representation. The boards consisted of an exercise for people to place a sticky dot next to no more than six hazards of greatest concern to them.

The libraries included:
Burnhaven, Burnsville
Farmington, Farmington
Galaxie, Apple Valley
Pleasant Hill, Hastings
Wentworth, West St. Paul
Wescott, Eagan

An estimated 331 library visitors participated in the exercise. The following table includes results from each branch, and a combined total. Water supply contamination emerged as the top concern for participants, followed by severe storms, extreme temperatures, cyber-attack, pandemic, and civil unrest, all identified as a major concern by at least half of participants. Water supply contamination was not identified as the top concern by participants in the online survey, although the remaining results are mostly consistent between the two public opinion pieces.

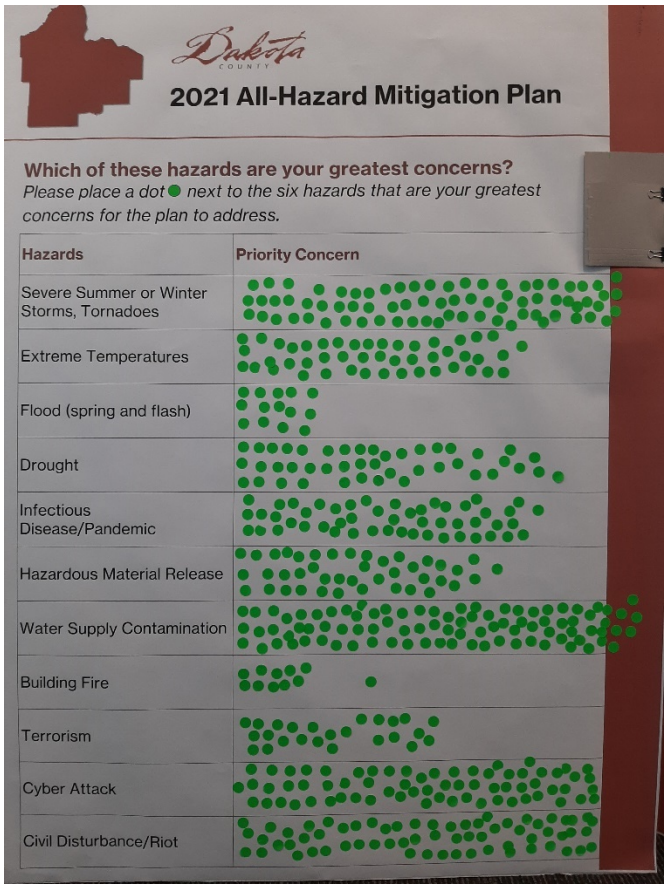

Figure A2.3: Burnhaven Library Intercept, 2021

Intercept Board Summary

Hazard	Burnhaven	Farmington	Galaxie	Hastings	Wentworth	Wescott	Total
Water Contamination	92	47	63	44	58	26	330
Severe Storms, Tornadoes	75	33	64	31	41	25	269
Extreme Temperatures	47	21	62	28	45	17	220
Cyber Attack	68	23	49	20	38	19	217
Pandemic/Infectious Disease	51	23	43	23	32	16	188
Civil Disturbance	65	19	37	23	35	6	185
Hazmat Release	42	14	33	19	36	13	157
Drought	44	24	39	20		14	141
Terrorism	25	22	26	7	7	5	92
Flood (spring or flash)	14	22	22	6	9	9	82
Building Fire	11	4	22	5	4	4	50
Maximum	**92**	**47**	**64**	**44**	**58**	**26**	**331**

Vaccination Clinic Flyers

A flyer was distributed at County COVID-19 vaccination clinics in the spring, as people entered the 15-minute post-vaccination observation area. The flyer included a web link and Q-R code to the County's online survey.

While You Wait…

Dakota County

Oldest known photograph of a tornado, 1884

Please take a few minutes to participate in a Dakota County survey.

Dakota County is updating its All Hazard Mitigation Plan, to reduce risks to life and property from hazards, such as severe weather events, flooding, and infectious disease outbreaks. The plan is required to maintain eligibility for federal disaster relief funding.

The plan was last updated in 2016, and the world has seen significant changes since then. Concerns and ideas from the public are an important part of this plan update. We hope you'll take a few minutes to complete an online survey and tell us about your hazard concerns. All information is confidential.

To participate in the survey, focus your phone camera on the adjacent Q-R Code and tap the link that comes up.

For more information on the plan, visit www.dakotacounty.com and search "All-Hazard." A survey link is also on the plan page.

Thank you!

Figure A2.4: Vaccination Clinic Flyer, 2021

County Fair Displays

The Dakota County Fair was held in the second week of August 2021, after a one-year hiatus due to the pandemic. Visitors to the County Law Enforcement display area were asked to indicate which preparedness measures their household had taken. Among 30 or more participants, more than half had acquired smoke detectors, first aid kits, fire extinguishers, and first aid or CPR training.

Preparedness Measure	My household has done this
Smoke detectors, each floor, new batteries annually	29
First Aid Kit, in home and car	22
Fire Extinguisher	22
First Aid / CPR Training	22
Hazard Insurance	11
Essential Supply Kit	11
Signed up for reverse 911	10
NOAA Weather Radio	10
Household Emergency Plan	10
Attended preparedness meetings or events	7
"Go Kit" for evacuation	5

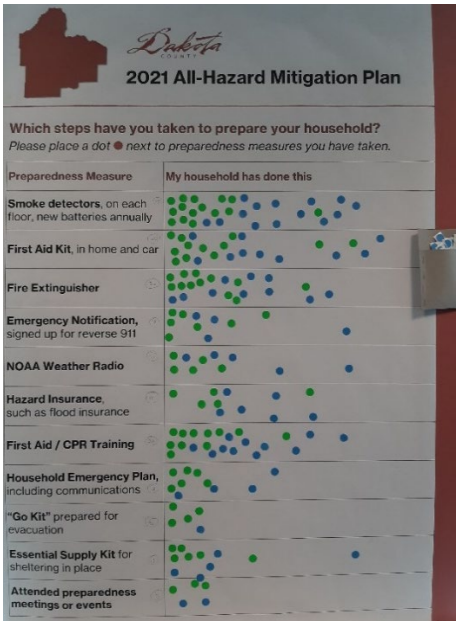

Figure A2.5: County Fair Intercept, 2021

Dakota County All Hazard Mitigation Plan: Proposed New Goals and Strategies

January 19, 2022

Flood

Flood Goal 3 (new): Use land protection and natural resource management to mitigate flood risks.
1. Protect and restore wetlands to retain water on the land and reduce flood severity.
2. Use Conservation Focus Areas to prioritize, protect, and restore wetlands, shoreland, headwaters and significant groundwater recharge areas to reduce flood impacts.

Drought

Drought Goal 3 (new): Preserve existing groundwater resources.
1. Promote and support water conservation and water reuse projects.
2. Protect and improve high quality groundwater recharge areas.

Water Supply Contamination

Water Supply Goal 1 (existing): Protect the quality of Dakota County's groundwater. (new strategies)
1. Strategically restore drained wetlands to enhance filtration and recharge of groundwater
2. Partner to improve groundwater recharge by promotion and assistance of water quality improvement practices such as low impact development, wetland restoration and permanent vegetation
3. Use Conservation Focus Areas to prioritize, protect, and restore wetlands, shoreland, headwaters and significant groundwater recharge areas for water quality and supply.
Water Supply Goal 2 (existing): Protect residents from contaminated groundwater. (new strategies)
1. Facilitate the installation of appropriate, effective drinking water treatment systems for low-income private well households with contaminated groundwater.
Water Supply Goal 3 (existing): Protect drinking water supplies. (new strategies)
1. Conduct feasibility study for establishment of a rural water supply.
2. Advocate for state and federal funding for local water infrastructure improvement projects and encourage municipal projects that improve drinking water quality.

Pandemic

Pandemic Goal 1 (existing): Maintain public health response preparedness. (new strategies)
1. Maintain adequate level of Personal Protective Equipment (PPE)
2. Conduct after action reviews to identify needs and update response, COOP, and mitigation plans accordingly
3. Develop and maintain a communication strategy for hard-to-reach/ limited English proficiency populations/ ADA accessible communications
4. Ensure that Dakota County Continuity of Operations Plans address potential needs during a long-term pandemic with adequate technological systems, individual staff ability to effectively work remotely, supplies and vehicles, and new service delivery methods.

Cyber-Attack

Cyber-Attack Goal 1 (existing): Reduce Risk to County Network Infrastructure and Software Applications (new strategies)
1. Continue completing cyber security exercises as part of COOP planning
2. Regularly develop programs and projects to identify and address cyber-security weaknesses and new threats (e.g., USB lockdown, vendor management)
3. Continue ongoing staff training in cyber security and new threats
4. Invest in hardware and IT infrastructure improvements (e.g., encrypted storage)
5. Periodically review best practices through the IT Advisory Team

Civil Disturbance (new hazard in 2021 update)

Civil Disturbance Goal 1 (new): Improve situational awareness and monitoring efforts.
1. Monitor situations with potential for inciting civil disturbance across a wide range of communication channels, including social media.
Civil Disturbance Goal 2 (new): Build community partnerships to promote timely response.
1. Build agreements for coordinated multi-agency joint emergency operation center (EOC) operations to improve response.
2. Refine communications and pre plans with impacted groups (County administration, Sheriff, Local Chiefs)
3. Work with County Social Services to identify and develop key community liaisons.
4. Build partnerships and agreements to enhance communications, with cities and community groups.
5. Work with communities on curfew plans, restrictions, and enforcement.
Civil Disturbance Goal 3 (new): Increase preparedness training to reduce injuries and damages from civil disturbance.
1. Train response personnel to protect health and safety of public in events, including de-escalation and non-lethal methods of riot control.
2. Train response personnel to protect their own health and safety in responding to events.
3. Enhance 2-way communications between public authorities and participants, and strengthen outgoing public communications including social media.
4. Develop and exercise multi-agency EOC plans that address responses to civil disturbance.
Civil Disturbance Goal 4 (new): Reinforce security and resilience of County facilities and infrastructure likely to be targeted during civil disturbance.
1. Strengthen building security infrastructure, including windows, doors, and entry points
2. Develop and update a facility preparedness checklist for civil disturbance situations
3. Make improvements to facilitate rapid deployment of security barriers, such as pre-placement of fence post sleeves
Civil Disturbance Goal 5 (new): Restore and maintain public confidence in County governance in the aftermath of civil disturbance.
1. Evaluate civil disturbance causes and the County's response through after-action review with partner agencies and community groups

Dakota County All-Hazard Mitigation Plan Update: Draft Plan Review

Dakota County Planning Commission
January 27, 2022

Ben Rutter, Risk Management
Mary Jackson, Office of Planning

1

Presentation Overview

1. Recap on Plan Purpose
2. Public Engagement Findings
3. New Plan Content
4. Request for Commission Recommendation

2

Plan Purpose

Mitigation:

Actions intended to eliminate or reduce long term risks to human life and property from natural and technological hazards

3

Plan Purpose

Plan Requirements:

- Disasters incur loss of life, damage, economic disruption.
- Disaster Management Act of 2000: FEMA began a national disaster mitigation program to reduce vulnerability and to save funds
- Approved Plans are required for federal disaster relief and hazard mitigation funding

4

Plan Purpose

Hazards Addressed:

- Violent storms, extreme temperatures
- Tornado
- Structural Fire
- Floods
- Drought
- Hazardous materials release
- Infectious disease outbreak
- Terrorism
- Water supply contamination
- Dam and structural collapse
- Landslide
- Cyber-Attack
- Wildfire
- Civil Disturbance (added in 2021)

5

Plan Purpose

Questions or comments on the Plan purpose?

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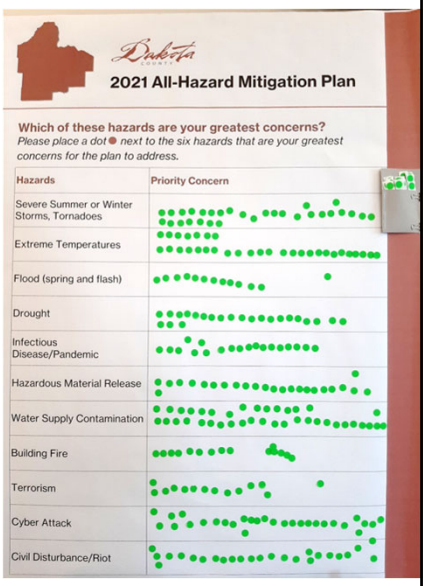
Public Engagement

- County Webpage Update
- Update Publicized with Cities
  - City Managers
  - Emergency Personnel
  - City Communications
- 2021 Online Survey
  - Promoted to Community Liaisons
  - COVID Vax Clinic flyers
  - Social Media
- Library Intercepts
- County Fair Booth



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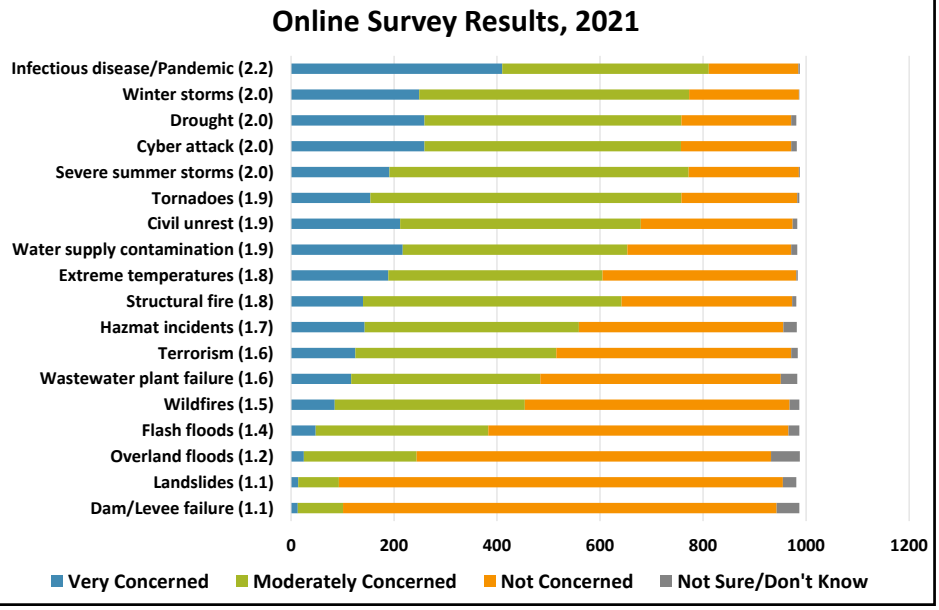
Public Engagement



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Public Engagement

Library Intercept Summary: Identify Your Top Five Concerns

Hazard	Burn-haven	Farming-ton	Galaxie	Hastings	Went-worth	Wescott	Total
Water Contamination	92	47	63	44	58	26	**330**
Severe Storms, Tornadoes	75	33	64	31	41	25	**269**
Extreme Temperatures	47	21	62	28	45	17	**220**
Cyber Attack	68	23	49	20	38	19	**217**
Pandemic/Infectious Disease	51	23	43	23	32	16	**188**
Civil Disturbance	65	19	37	23	35	6	**185**
Hazmat Release	42	14	33	19	36	13	**157**
Drought	44	24	39	20		14	**141**
Terrorism	25	22	26	7	7	5	**92**
Flood (spring or flash)	14	22	22	6	9	9	**82**
Building Fire	11	4	22	5	4	4	**50**
Maximum	*92*	*47*	*64*	*44*	*58*	*26*	***331***

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Public Engagement

New Survey Questions on Individual Preparedness in 2021

1. Do you have a safe place to be on your property/residence during a natural disaster, such as severe storms or a tornado?

   Yes: 95% *No:* 2% *Not Sure:* 3%

2. If evacuation was necessary, I or someone else in my family would need physical assistance to leave my home.

   Yes: 5% *No:* 92% *Not Sure:* 3%

3. I cannot afford to buy detectors, fire extinguishers, radios, first aid kits…

   Yes: 6% *No:* 94%

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Public Engagement

County Fair Intercept, August 2021 (~30 participants)

Preparedness Measure	My household has done this
Smoke detectors, each floor, new batteries annually	**29**
First Aid Kit, in home and car	**22**
Fire Extinguisher	**22**
First Aid / CPR Training	**22**
Hazard Insurance	11
Essential Supply Kit (food, water, medications)	11
Signed up for reverse 911	10
NOAA Weather Radio	10
Household Emergency Plan	10
Attended preparedness meetings or events	7
"Go Kit" for evacuation	5

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Public Engagement

Comments and questions on
the public engagement summary?

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New Plan Content

FEMA National Risk Index (NRI): model based on annualized losses, social vulnerability, and community resilience

Measure	Dakota County Score	Comparison to US
Risk Index	10.5	Relatively Low
Expected Annual Loss	26.79	Relatively Moderate
Social Vulnerability	19.75	Very Low
Community Resilience	58.21	Very High

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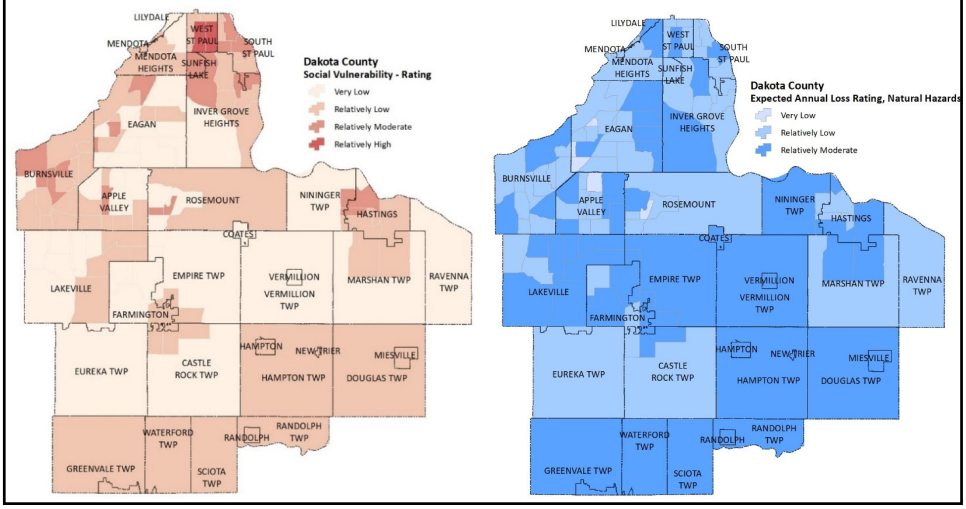
New Plan Content

FEMA National Risk Index (NRI):



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New Plan Content

FEMA NRI Natural Hazard Score/Ratings for Dakota County

Hazard	Index Rating	Score
Strong Wind	24.69	Relatively High
Cold Wave	18.34	Relatively Moderate
Tornado	17.65	Relatively Moderate
Hail	16.52	Relatively Moderate
Lightning	10.84	Relatively Low
Winter Weather	10.54	Relatively Low
Ice Storm	10.08	Relatively Low
Landslide	8.02	Relatively Low
Riverine Flooding	6.74	Relatively Low
Drought	3.28	Very Low
Wildfire	3.07	Very Low
Earthquake	0.85	Very Low

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New Plan Content

FEMA NRI Expected Annual Losses for Dakota County

Hazard	Annual Loss Rating	Annual Loss Score	Total Annual Loss	Sector of Greatest Impact, Percent
Strong Wind	Very High	93.51	$14,665,676	Buildings, 79%
Tornado	Relatively High	38.76	$8,163,706	Buildings, 63%
Hail	Relatively High	39.47	$4,121,745	Buildings, 86%
Heat Wave	Relatively High	29.52	$1,805,750	Population, 99%
Riverine Flooding	Relatively Moderate	14.81	$1,626,654	Buildings, 73%
Cold Wave	Relatively High	42.05	$483,696	Population, 72%
Lightning	Relatively High	35.62	$382,824	Population, 67%
Ice Storm	Relatively Moderate	28.66	$258,471	Population, 86%
Winter Weather	Relatively Moderate	28.82	$154,156	Buildings, 95%
Landslide	Relatively Moderate	22.44	$98,166	Buildings, 58%
Drought	Relatively Low	6.88	$79,932	Agriculture, 100%
Wildfire	Relatively Low	6.74	$48,543	Buildings, 87%
Earthquake	Very Low	2.17	$19,556	Buildings, 94%

Assessed Value of All Buildings in County: $63,002,022,008

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New Plan Content

Does the Commission have comments on the FEMA NRI Modeling?

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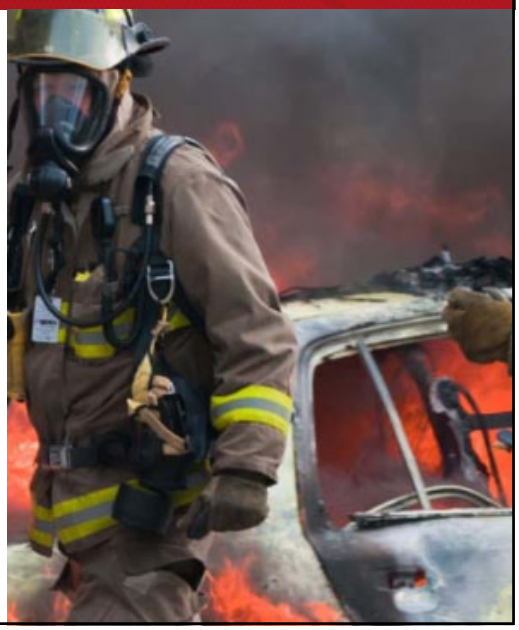
New Plan Content

Civil Disturbance:

- Precipitated by actions of those who believe that their needs or rights are not being met.
- Disruption requires intervention to maintain public safety, prevent injuries and deaths, and avoid major property damage.
- May involve multiple precipitating situations and groups with different intentions and agendas.



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New Plan Content

Civil Disturbance Vulnerability Assessment

Frequency of Occurrence:	Likely-Highly Likely*
Warning Time:	3 to 6 hours
Geographic Extent:	County-wide or greater
Likely Adverse Impact:	Critical

***Frequency of Occurrence:** Probability - How often hazard can be expected to occur.
1 = Unlikely: <1 percent probability of occurrence in the next 100 years.
2 = Occasionally: 1-10 percent probability per year, at least once in next 100 years.
3 = Likely: 10-100 percent probability per year, at least once in next 10 years.
4 = Highly Likely: 100 percent probable in a year.

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New Plan Content

Civil Disturbance Goals:

1. Improve situational awareness and monitoring efforts.
2. Build community partnerships to promote timely response.
3. Increase training to reduce injuries and damages from civil disturbance.
4. Reinforce security and resilience of County facilities and infrastructure likely to be targeted during civil disturbance.
5. Restore and maintain public confidence in County governance in the aftermath of civil disturbance.

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New Plan Content

Cyber-Attack Threats: overall increase, ransomware attacks

Enhanced Strategies:

1. Conduct regular exercises
2. Conduct regular assessments and develop new programs/projects
3. Increase staff training
4. Invest in hardware and infrastructure improvements
5. Review best practices
6. Communicate with cities and local forums on cyber security.

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New Plan Content

Pandemic: COVID-19, multiple variants and surges

Enhanced Strategies:

1. Maintain adequate levels of PPE.
2. Conduct after-action reviews to identify needs/update plans.
3. Develop/maintain a communication strategy for hard-to-reach/limited English proficiency populations and ADA accessible communications.
4. Ensure that Continuity of Operations Plans address long-term pandemic needs with adequate technological systems, staff ability to work remotely, supplies and vehicles, and new service delivery methods.

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New Plan Content

Water Supply Contamination: naturally-occurring elements, manmade substances, broadened County plans to address.

Enhanced Strategies:

1. Strategically restore drained wetlands to enhance filtration and recharge of groundwater
2. Partner to improve groundwater recharge through water quality practices such as low impact development, wetland restoration and permanent vegetation
3. Use Conservation Focus Areas to prioritize, protect, and restore wetlands, shoreland, headwaters and significant groundwater recharge areas for water quality and supply

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New Plan Content

Water Supply Contamination Enhanced Strategies:

1. Facilitate installation of appropriate, effective drinking water treatment systems for low-income private well households with contaminated groundwater.
2. Conduct feasibility study for establishment of a rural water supply.
3. Advocate for state and federal funding for local water infrastructure improvement projects and encourage municipal projects that improve drinking water quality.

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New Plan Content

Does the Commission have questions or comments on potential new hazards, goals, and strategies?

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Staff Request:

The Planning Commission recommends that the 2022 All-Hazard Mitigation Plan update be released for a 45-day public review period

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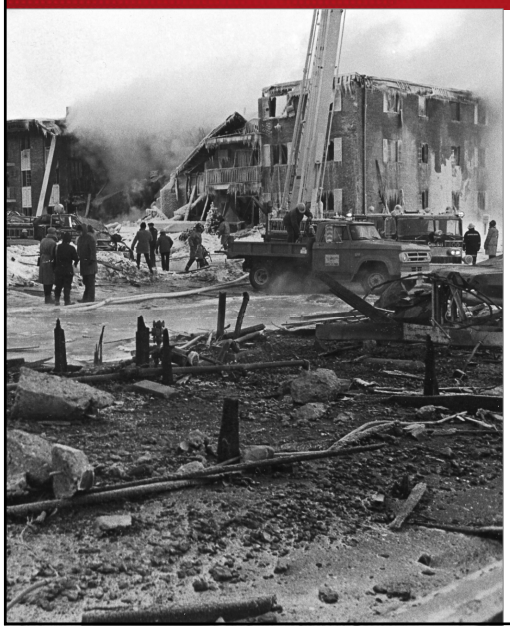
Next Steps



- Preliminary review by MN HSEM and FEMA
- Request public review period at February GGP
- 45-day public review, online engagement
- Formal submittal to HSEM and FEMA for approval
- County adoption of plan
- City adoptions

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Thank you!

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