

Water Committee Meeting  
Wednesday, September 29, 2021 7:00 PM  
Lower Platte North NRD Office  
P.O. Box 126  
Wahoo, NE 68066

1. UNFINISHED BUSINESS

2. REGULATORY

A. GROUND WATER MANAGEMENT AREA

1. Variance Request in the Hydrologically Connected Area (Limited Development Area)

The District received 34 applications requesting 363.928 Acre Feet(AF) of water. LPN Groundwater Rules and Regulations allows 200 AF per year. Included in these numbers are 5 applications located in the Restricted Development Area (red) that are within the 1-mile boundary of the HCA (blue) area.

Scott Loseke attended the meeting to get a better understanding on how the scoring system works. He was wondering if the scoring system should include irrigation and soil management practices. The Committee asked staff to look at the bordering NRDs scoring system and discuss the process at a future Committee meeting.

The Committee reviewed the attached document on the current applications.

2. Well Permit Program

3. Transfer of irrigated acres

Don Wegener wants to transfer 49 certified irrigated acres of his original 62.848 acres from NE1/4 S11-17N-4E to his brother William Wegener, whose parcel is in the N1/2 S23-17N-3E. The map shows the parcel, highlighted on the right, to the parcel receiving the acres, shown by triangle on left. The second image shows the field currently.

The Committee asked staff to contact Don for more detailed maps on what will actually be irrigated. They were questioning how 49 acres could be irrigated on the receiving tract. They wanted to know more information about the other tract and make sure he understood that it could not be irrigated after the acres were transferred.

4. Cost Share Programs

a. Irrigation Well Sample Kits

334 kits went to producers in 2021. 333 of these have now been returned.

5. Bellwood Phase 2 Area

6. 2021 is the nineteenth year for this Phase 2 Area.

						19.
			10.	13.	16.	20.
	8.		11.	14.	17.	
7.						
	9.		12.	15.	18.	21.
			24.	25.	26.	
22.	23.					27.
28.	29.	30.	31.	32.		33.

34.	35.	36.	37.	38.	39.
40.	41.	42.	43.	44.	45.
46.	47.	48.	49.	50.	51.
52.	53.	54.	55.	56.	57.
58.	59.	60.	61.	62.	63.

64.	65.	66.	67.	68.	69.
70.	71.	72.	73.	74.	75.
76.	77.	78.	79.	80.	81.
82.	83.	84.	85.	86.	87.
88.	89.	90.	91.	92.	93.

94	95	96	97	98	99
100	101	102	103	104	105
106	107	108	109	110	111
112	113	114	115	116	117
118	119	120	121	122	123

12	125	126	127	128	129

130. All producer sample results received thus far have been mailed. One sample kit remains outstanding: Terry Micek (1)  
 Staff collected eleven water samples from sections that border this Phase 2 Area:

- T16N-R1E Section 6 23.6 ppm
- Section 7 11.9 ppm
- Section 19 5.03 ppm
- Section 25 4.52 ppm
- Section 26 5.24 ppm
- Section 27 6.04 ppm
- Section 29 6.40 ppm
- Section 29 < R L
- Section 30 3.92 ppm
- T16N-R2E Section 30 0.31 ppm
- Section 31 1.21 ppm

131. Richland - Schuyler Phase 3 Area

132. 2021 is the sixth year of this Phase 3 Area. This Phase 3 area went into effect September 1, 2015. The 55 sections of this area first went into a Phase 2 Area in 2004. The ten sections that were in Phase 2 are now in Phase 3. As such, the 2020 and 2021 numbers (at bottom of table) are for 65 sections.

133. Year	134. Nitrate-nitrogen Range	135. Percent	138. Percent
		136. Nitrate-nitrogen	139. Nitrate-nitrogen
		137. 0 to 8.0 ppm	140. 8.01 to 10.00 ppm

147.	2004	148.	0 to 47 ppm	149.	30% (42 of 139)	150.	10% (14 of 139)
153.	2005	154.	0 to 120 ppm	155.	31.3% (74 of 236)	156.	10.2% (24 of 236)
159.	2006	160.	0 to 53 ppm	161.	28% (50 of 181)	162.	14% (26 of 181)
165.	2007	166.	0 to 99 ppm	167.	32% (75 of 231)	168.	10% (22 of 231)
171.	2008	172.	0 to 46 ppm	173.	28% (53 of 190)	174.	12% (23 of 190)
177.	2009	178.	0 to 57 ppm	179.	33% (72 of 216)	180.	6% (13 of 216)
183.	2010	184.	0 to 57.5 ppm	185.	31% (70 of 229)	186.	7% (15 of 229)
189.	2011	190.	0 to 65.8 ppm	191.	28% (67 of 241)	192.	9% (21 of 241)
195.	2012	196.	0 to 52.6 ppm	197.	29% (70 of 241)	198.	9% (21 of 241)
201.	2013	202.	0 to 94.0 ppm	203.	25% (63 of 252)	204.	9% (23 of 252)
207.	2014	208.	0 to 101.0 ppm	209.	27% (68 of 251)	210.	9% (22 of 251)
213.	2015	214.	0 to 53.3 ppm	215.	23% (55 of 238)	216.	12% (29 of 238)
219.	2016	220.	0 to 50.5 ppm	221.	25% (58 of 228)	222.	10% (22 of 228)
225.	2017	226.	0 to 53.4 ppm	227.	25% (60 of 238)	228.	6% (4 of 238)
231.	2018	232.	0 to 56.9 ppm	233.	26.5% (50 of 189)	234.	6.3% (12 of 189)
237.	2019	238.	0 to 39.4 ppm	239.	25% (53 of 209)	240.	11% (22 of 209)
243.	2020	244.	0 to 50.8 ppm	245.	26% (69 of 261)	246.	6% (5 of 261)
249.	20 21	250.	0 to 43.0	251.	26% (67 of 255)	252.	8% (21 of 255)

All producer sample kits for this area have been returned and sample results sent to them.

255. LPNNRD Operator Certification

A list of planned meetings this winter. The bottom part of the sheet shows the nitrogen certification classes.

3. GROUND WATER PROGRAMS

A. DECOMMISSIONED WELL PROGRAM

1. Well Estimates

2. 2 new wells have been reviewed and approved for decommissioning since the last Committee meeting.

3. Well Owner	4. Type of Well	5. Cost Share Estimate	6. County
7. Justin Krafka	8. Irrigation	9. \$1,000.00	10. Richland
11. Jason Lutjens	12. Irrigation	13. \$1,000.00	14. Richland
15.	16.	17.	18.

19. Plugged Wells

20. # wells have been plugged, reviewed, and ready for cost share payment approval this month.

21. Well Owner	22. Type of Well	23. Cost Share Estimate	24. County
25.	26.	27.	28.
29.	30.	31.	32.
33.	34.	35.	36.

B. NEW MONITORING WELLS

The Lower Platte North received one bid from Dvorak Well Inc for drilling a monitoring well north of Richland. Attached is the quoted price, which staff feel is acceptable and reasonable. Steve Dvorak talked to staff on Tuesday, September 28 and asked permission, if the quote is acceptable by the Committee, to start ordering supplies. He claimed that the supply chain issue has been a challenge in receiving pipe and other parts. Staff would like the Committee to consider giving staff

permission to proceed and have the Board ratify the decision on October 11, 2021.

Attached is a summary of the test hole drilled east of Fremont. The staff would like to drill a monitoring well to an 80-foot depth with screen level 69 -79 feet. The purpose of this well will be water quality, drought management and groundwater — river interaction. Staff would like the Committee to allow us to discuss with Dvorak Well on drilling a second well with the same quote. This well would be only 80 feet deep, so it should be less expensive than the well north of Richland. The concern about this well would be if the well was under too much pressure and flowed all the time. If this is the case, staff would recommend decommissioning the well ASAP, as the information for long range data would not be as valuable.

The Committee gave staff permission to notify Dvorak Well Inc. that his bid would be accepted, so supplies could be ordered. They felt if Dvorak Wells would drill the second monitoring well at the quoted prices, that Dvorak Well would be approved to drill both wells. The staff was directed to receive a written quote from Dvorak Well for drilling the monitoring well east of Fremont.

#### C. LOWER PLATTE NORTH NRD GROUND WATER STUDIES

##### 1. Phase Area Update

Attached are the planned small group meetings to help producers with online reporting. At these meeting it is planned to have discussion on best management practices to help in controlling nitrate leaching. The plan is to find out what practices that producers are willing to try, if money is available. This could help with the direction that the Committee might consider when applying for grants. The staff encourages Board/Committee Members to attend any of the meetings. Other suggestions?

An example is attached of the postcard that was sent out last week.

##### 2. Nebraska Nitrate Working Groups

Attached is a report from a variety of agencies on increasing nitrate awareness.

##### 3. Long Range Plan

Attached is a draft of the long range plan.

#### D. Land Application Discussion

Discussion with the Committee on land application of nutrients. The Committee reviewed the attached documents and asked staff to keep them informed when land tracts were identified or any other actions.

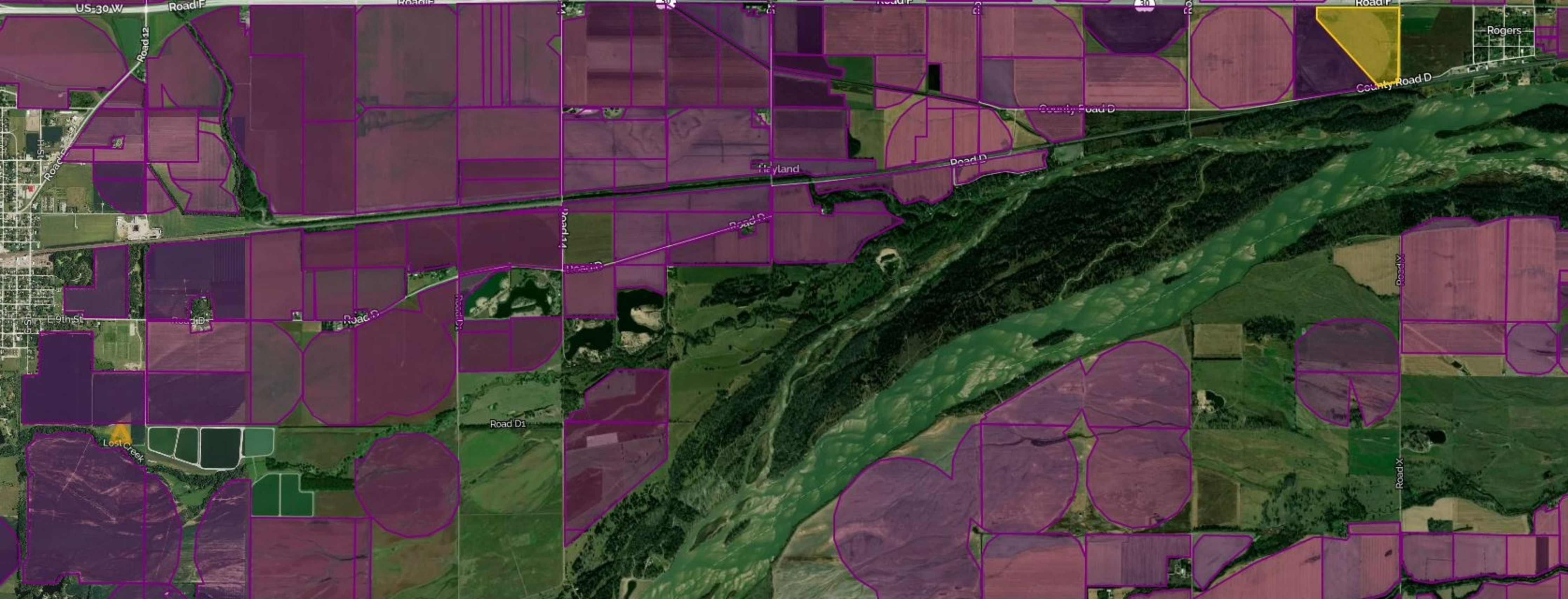
#### 4. OTHER

Water Committee Consider Starting Time Change for Winter Months? The Committee felt for the Winter Months, starting at the November Committee Meeting, to start at 6 pm instead of 7.

Will's Monthly Report attached.

#### A. COMMENTS FROM THE PUBLIC

VarianceNumber	Applicant	ApplicationType	County	SubArea	RankingScore	Acres	Acre Feet	TwN	Rng	Dir	Section
LPN-V-021-0531	Chad Sukstorf	expansion	Saunders	Todd Valley	510.8	20	2.570	16	7	E	16
LPN-V-021-0550	Norman A Kavan, Jr	expansion	Saunders	Todd Valley	469.12	25	3.010	15	8	E	23
LPN-V-021-0557	Damaxco LLC	new	Dodge	North Bend	462.5	91	12.539	18	6	E	32
LPN-V-021-0548	John Gladem	new	Boone	Upper Newman Grove	459	135	12.010	22	5	W	17
LPN-V-021-0561	Norman A Kavan, Jr	expansion	Saunders	Todd Valley	456.26	25	4.681	16	7	E	23
LPN-V-021-0551	John B Ruzicka	expansion	Saunders	Todd Valley	453	15	2.850	16	7	E	33
LPN-V-021-0556	Roland D Kavan	expansion	Saunders	Morse Bluff	442.5	6	0.890	16	6	E	6
LPN-V-021-0534	KPM Farms LLC	new	Platte	Middle Shell Creek	434.7	137	17.640	19	2	W	22
LPN-V-021-0530	Jack W. Nagel	new	Saunders	Todd Valley	426.54	135	27.240	15	8	E	5
LPN-V-021-0536	University of Nebraska	new	Saunders	Todd Valley	414.4	25	3.290	14	9	E	19
LPN-V-021-0560	Laska Land LLC	expansion	Platte	Middle Shell Creek	410	12.38	2.181	19	3	W	9
LPN-V-021-0554	Tyler Mensik	new	Saunders	North Bend	405	63.44	12.470	17	6	E	27
LPN-V-021-0529	Cale Went	new	Platte	Middle Shell Creek	404.3	40	5.720	19	2	W	27
LPN-V-021-0535	Colleen Wachal	expansion	Colfax	Schuyler	396	15	2.750	17	2	E	16
LPN-V-021-0538	Brian Sanderson	expansion	Saunders	Todd Valley	396	226	39.560	16	8	E	20
LPN-V-021-0549	Gene O Novak	expansion	Colfax	Lower Shell Creek	394.2	65	13.060	18	3	E	33
LPN-V-021-0533	Larry & Jeanne Kurtenbach	expansion	Platte	Lower Newman Grove	393.1	10.169	1.530	20	4	W	26
LPN-V-021-0528	Conner Fujan	new	Saunders	Todd Valley	390.4	80	14.210	17	7	E	28
LPN-V-021-0558	Ken Korus	expansion	Platte	Platte Center	388.34	22	3.670	18	3	W	2
LPN-V-021-0559	Kristine J Kosch	new	Platte	Middle Shell Creek	387.64	34	4.139	19	2	W	15
LPN-V-021-0552	Hayden Sabatka	new	Saunders	Todd Valley	377	80	13.759	15	7	E	23
						1261.989	199.769				
LPN-V-021-0553	Gary Torczon	new	Platte	Middle Shell Creek	368.18	90	11.220	19	2	W	25
LPN-V-021-0555	Rolland Otte	new	Saunders	Morse Bluff	360	31.44	5.790	17	5	E	23
LPN-V-021-0541	Larry D Karloff Tree	new	Saunders	Yutan South	342.5	68	13.790	15	9	E	34
LPN-V-021-0532	Kent Lee	new	Madison	Upper Newman Grove	340.66	133	20.270	21	4	W	17
LPN-V-021-0540	Kody Karloff	new	Saunders	Yutan South	325	68	12.420	14	9	E	11
LPN-V-021-0537	Josh Faltys	expansion	Colfax	Lower Shell Creek	319	91	18.360	18	3	E	27
LPN-V-021-0539	Kody Karloff	new	Saunders	Todd Valley	315.4	68	12.701	14	9	E	14
LPN-V-021-0545	Roland D Kavan	new	Saunders	Morse Bluff	302.5	74	10.990	16	5	E	1
					Totals=	1885.429	305.310				
LPN-V-021-0546	Scott Loseke	expansion	Platte	Platte Center	265.68	130	23.300	19	2	W	33
LPN-V-021-0542	Jeffrey J. Brabec	new	Saunders	Prague	265	45	8.800	16	7	E	30
LPN-V-021-0543	Jeffrey J. Brabec	new	Saunders	Prague	252.5	45	9.720	15	7	E	29
LPN-V-021-0544	Jeffrey J. Brabec	new	Saunders	Prague	252.5	45	9.640	15	7	E	17
LPN-V-021-0547	Jeremy Janssen	expansion	Platte	Platte Center	249.7	34	7.158	18	2	W	10
						299	58.618				
						2184.429	363.928				





Lincoln Hwy

30

18

18

18

D

D

## **Producer & NRD Staff Connecting**

### Tentative Agenda

Nitrate Discussion

Field Evaluation with Nitrate Analysis Tool

Best Management Practices Evaluations

Online Reporting Entry conducted by NRD staff

- Wednesday, November 17 – Schuyler Library starting at 1:30 pm
- Wednesday, November 17 – Schuyler Library starting at 6:00 pm
- Monday, November 22 – Schuyler Library starting at 1:00 pm
- Tuesday, November 30 – Reg's 7 Mile Steakhouse starting at 6:30 pm
- Thursday, December 2 – Schuyler Library starting at 2:00 pm
- Thursday, December 9 -Schuyler Library starting at 10:00 am
- Thursday, December 9 – Schuyler Library starting at 1:30 pm
- Tuesday, December 14 – Reg's 7 Mile Steakhouse starting at 10:30 am
- Wednesday, December 15 – Schuyler Library starting at 1:30 pm
- Wednesday, December 15 – Schuyler Library starting at 4 pm

## **Nitrogen/Irrigation Certification Meetings**

- Thursday – January 7 in David City
- Tuesday – January 12 in Fremont
- Tuesday – February 1 in Schuyler

### Tentative Agenda

Vadose sampling Report

Shell Creek Report from the students

Heath

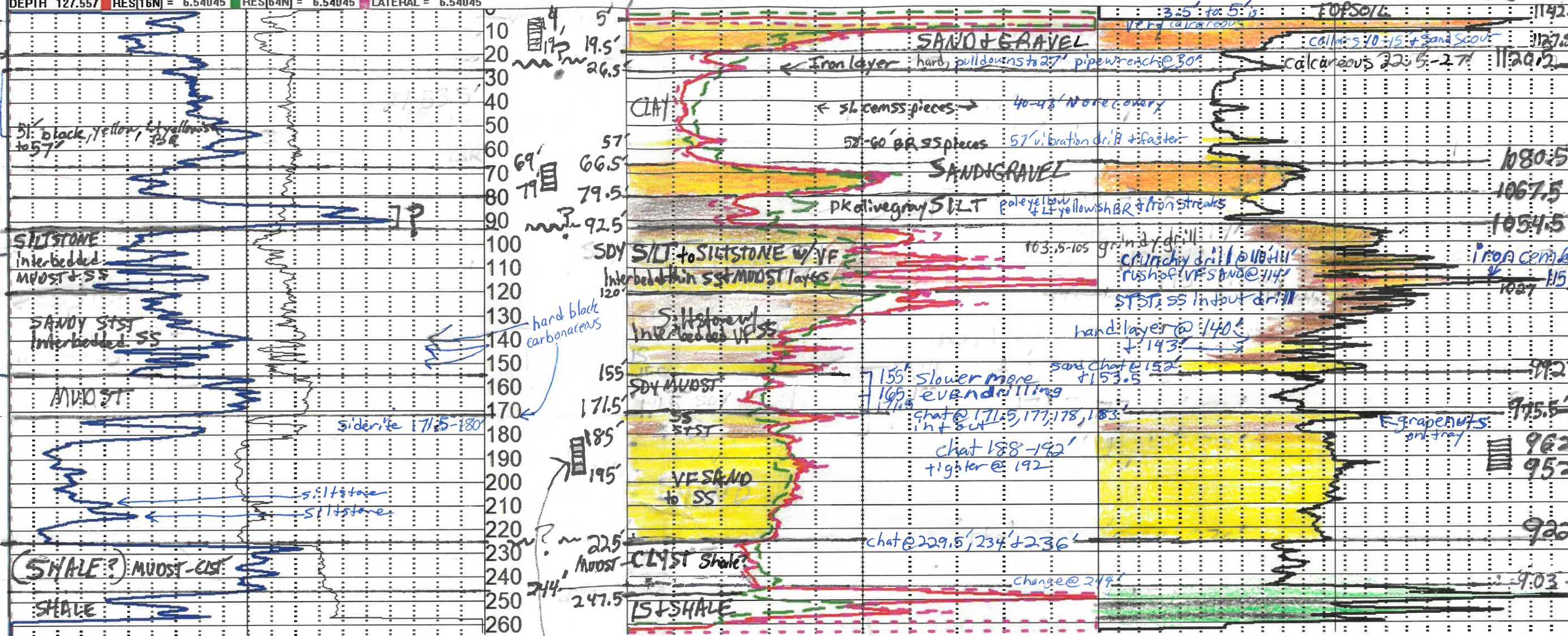
Cover Crop Project

- Thursday – February 3 in Wahoo (Educational Building)
- Monday – February 7 in Lindsay
- Thursday – February 24 in Columbus
- Monday - March 7 in Wahoo (Educational Building)
- Tuesday – March 15 in Columbus for a night meeting.

02-LPN-2021 T17N R9E Sec 35, NE 1/4 of the NE 1/4

1147' Elev ground

File View Options Print Edit Interpret Processing Log Help  
 VERSION 3.64KT  
 DEPTH 127.557 RES(16N) = 6.54045 RES(64N) = 6.54045 LATERAL = 6.54045



1147' genl. Elev. Ft  
 26.5' Questions  
 27-53.5 slow drill  
 Quact.  
 Unknown  
 104'-155' Thinly interbedded  
 Dakota  
 975.5  
 Penn.

5' 19.5' 26.5' 57' 66.5' 79.5' 92.5' 104' 115' 120' 140' 155' 171.5' 185' 195' 225' 247.5'

TD = 264' (883' elev.)

0	API-GR	250
	GAMMA	
-100	MV	0
	SP	
100	OHM-M	250
	RES(FL)	

0	OHM-M	100	0	OHM	100
	RES(16N)			RES	
0	OHM-M	100			
	RES(64N)				
0	OHM-M	100			
	LATERAL				

41.402705, -96.370805

Note: \* 185-195' screen but  
 Poss. flowing well; if installed, plan for top casing seal  
 (questions on purpose w/ WQ + future mon.)  
 could do: 9'-19' or 9' to 14' screen (SWL is at ~5')  
 69-79' screen (confined by clay above, unsure how  
 extensive this unit is or how widely used)

**PRELIMINARY RESULTS**

## **Producer & NRD Staff Connecting**

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# Producer & NRD Staff CONNECTING

Producers in the Schuyler and Bellwood high Nitrate areas will be encouraged to attend an upcoming meeting in November or December.

## NRD Staff will be available for:

- Online reporting entry assistance (paper copies will not be sent out this year)
- General Nitrate discussion
- Field evaluation with Nitrate analysis tool
- Best management practices discussion

Please bring soil samples from each field to your designated meeting.



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Location

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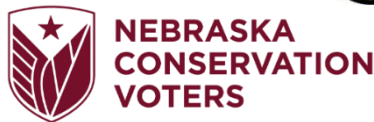


# Nebraska Nitrate Working Groups

*Summary and Call for Action*

Katie Pekarek, Water Quality Extension Educator, School of Natural Resources - UNL  
Crystal Powers, Research and Extension Communication Specialist, Nebraska Water Center,  
Daugherty Water for Food Global Institute, UNL Extension

# Collaborating organizations



For the past several decades, organizations across Nebraska have taken the lead on a variety of programs seeking to address the increasing nitrate concentration in the state’s groundwater. The Nitrate Working Groups were convened with the purpose of complimenting these individual programs by finding common efforts which partner organizations can prioritize and collaboratively address.

### Nitrate Basics

Nitrogen is an essential element for plant growth and therefore, Nebraska's agricultural industry. However, when nitrogen leaves the crop root zone it becomes a liability for groundwater, surface water, and air quality. For more than 40 years, levels of nitrate in Nebraska’s groundwater have been increasing, with several townships now above 20 ppm. In 2017, 349 towns and cities in Nebraska, serving 1.4 million people (about three-quarters of the state’s population), had nitrate levels above background. The primary source of nitrate in Nebraska is identified as commercial fertilizers and is most evident in areas beneath irrigated corn fields, on sandy soils, with shallow depth to groundwater. Currently 26-35% of applied nitrogen to corn is still lost to the environment in Nebraska. This loss is related to management practices, hydrogeology, and climate.

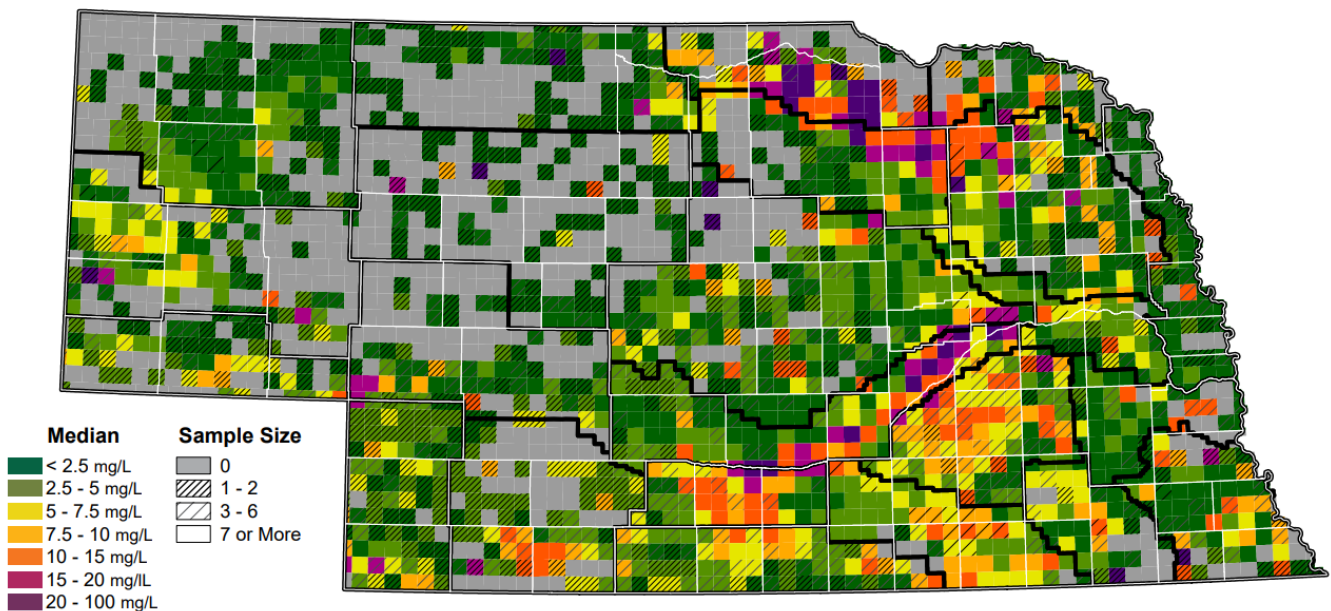


Figure 1. Groundwater Nitrate, township median. NDEE 2020.

### Drinking Water Nitrate is a Lifetime Health Risk

In 1992, Nitrate became a regulated compound under the Federal Clean Drinking Water Act. A maximum safe level of 10 ppm was established based on epidemiological studies of methemoglobinemia (blue baby syndrome). A growing body of recent research is also showing connection with drinking water nitrate and increased lifetime risk for cancers, particularly colorectal and pediatric, thyroid disease, and adverse reproductive outcomes.

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### Nitrate is a Rural Vitality Liability

Fertilizer lost as nitrate is both an economic loss to the farmer and a loss to the community. 80% of Nebraskans rely on groundwater for drinking water and nearly 100% of rural residents utilize domestic (private) drinking water wells. For small communities of less than 500, the cost of nitrate treatment in Nebraska ranges from \$90 to \$650 per person annually. Treating the water at the tap (point of use) costs between \$50 and \$250 per person annually. The impacts of these factors can become a liability to local and regional growth.

### Implementing Practices for Better Water Quality Today and in the Future

Producers and partner organizations in Nebraska have been implementing practices since the 1980s to reduce these high nitrate concentrations in water. Technology and management changes have led to systems with improved irrigation and nitrogen use efficiency. In some shallow groundwater systems, such as the Central Platte NRD, nitrate concentrations have slightly decreased. Unfortunately, scale and scope of these practices have not met the challenge facing the state. All Nebraskans can participate in improving the state's drinking water quality to ensure a prosperous future.

## ESTABLISHING NITRATE WORKING GROUPS

### Broad Consensus: Providing Safe Drinking Water for All Nebraskans is a Priority

In January 2020, the Nebraska Water Center and University of Nebraska Extension convened a group of Nebraska's leaders in agriculture and water management. Attendees established an overall goal that **"all Nebraskans will have access to safe water."** To achieve this goal, three topics were prioritized for multi-sector collaboration: **awareness, education, and policy.**

Working groups were formed based on these topics with a focus on relationships & connections as the basis for creating a broad coalition. A systems thinking approach with facilitated ideation was used to develop actionable projects that can be implemented in 3-5 years and require cross-organizational support. Overall, 85 participants from 31 organizations developed the following initial proposals.

### Next steps

Working group participants acknowledge conditions beyond the reach of this effort, including federal policy, private industry investment, and the global agricultural markets. However, the Nitrate Working Groups identified several initial actions that can collaboratively provide impact. Please note the specific action items identified in each proposal and consider how your organization can provide leadership, collaborate, or promote the deliverables.

## Awareness Working Group Proposal

Most Nebraskans do not perceive nitrate in their drinking water as a concern despite evidence of rising nitrate concentrations throughout most groundwater in the state. As the body of evidence of the impact of Nebraska’s water quality on human health grows, improved *public health communication dealing with these water quality challenges* is needed. The Nitrate Awareness Working Group recommends an awareness campaign as part of a broader strategy designed to motivate locally driven actions and generational changes which restore and protect water resources by providing needed tools, skills, and data.

**Call to Action:** *Commit leadership, time, money, or other resources to support the development of a shared communication resource for Nitrate awareness, identify local champions, deliver programing to protect drinking water and public health, and develop a Nebraska Water Quality App.*

---

**Goal:** Connect all Nebraskans to actionable information about water quality.

Specific short-term recommendations include:

### **Action 1: Develop a Shared Communications Resource**

An essential component for building statewide awareness is to create a shared set of communications resources with unified messaging. Hearing similar messages from multiple partners builds clarity and trust in the information presented. However, it is also critical that messaging is tailored to specific audience needs and interests. The working group proposes the creation of a communications plan and toolbox that includes consistent communication themes, locally relevant messaging, traditional and digital media content development, and a website for public access. Specific short-term tasks include developing:

consistent themes (messages)
locally relevant messaging (tailored for specific audiences)
publicly accessible website (or clearinghouse) with communications plan resources
educational documents (e.g. graphics, flyers, factsheets, posters, presentations, etc.)
video storytelling products (e.g. develop videos which broadly cover nitrate issues)
PR/social media pieces
media campaign plan
water-health communications toolbox

### **Action 2: Empower Local Champions to Deliver Messaging**

Locally trusted messengers are critical for statewide engagement with the communications content. The working group proposes creation of a trained network of local champions who can work in partnership with water professionals and local citizens to deliver the shared communication resources (Action 1). We propose building from existing successful networks including local community leaders, water and health professionals, Water Leaders Academy, high school programs, and AmeriCorps. Specific tasks include:

Develop water science education, leadership, and communications modules to train new and existing local water leaders to deliver the shared communication resources.
Develop a High School Water Ambassadors program collaboratively with established programs.
Train watershed groups (building capacity) on how to communicate with the public, producers, and local media on watershed science and technical topics.
Identify and train local leaders in collaboration with partner organizations.
Facilitate community development of a Source Water Protection Management Plans.
Assist communities in developing a communications plan about local drinking water issues.

**Action 3: Deliver Programing to Protect Drinking Water and Public Health**

Once shared communications resources are developed and messengers are identified, the programming will need to be tailored and delivered to target audiences. The working group proposes to identify the specific needs and available resources of individual communities to address local water pollution, climate, and public health issues related to drinking water. Specific tasks include:

Help local champions identify key programs and activities impacting resources management where local leadership is needed.
Deliver shared communications resources at local events (e.g., community meetings, festival participation, door-to-door communication etc.).
Implement the media campaign (and hiring an associated campaign coordinator).
Analyze and evaluate existing water quality education and outreach practice strategies used with target communities and audiences for effectiveness.

**Action 4: Develop a “Nebraska Water Quality App” and Facilitate Its Use**

To facilitate data sharing, the major water quality related datasets in Nebraska, including the [Clearinghouse database](#), [Vadose zone database](#), [USGS Quantity & Water-Quality Data](#), [Beach Watch Data](#), and other types of data (e.g. real-time sensors data), need to be holistically considered. To make these data sets more publicly accessible, the working group proposes to develop an interactive mobile app. Use of the app will assist Nebraskans in identifying if and how the nitrate is pertinent to them individually, actions they can take, and provide a feedback loop for citizen science data. Specific actions include:

Transfer Nebraska water quality related data to mobile devices for public access.
Provide location-based water data services to access the water quality data from anywhere and anytime across the state.
Incorporate a feedback mechanism for citizen science water quality data collection.
Provide notifications in the app to assist individuals in managing personal water needs (e.g change water filter, annual water testing, pump septic system, etc.).
Develop programs for the facilitated use of the Nebraska Water Quality App.

## Policy Working Group Proposal

Agriculture policy can be a tool for encouraging equitable minimum standards and incentivizing innovation. Nebraska has a robust local water governance structure in the Natural Resource Districts. This working group looked at policies that can compliment on-going local water quality efforts.

**Call to Action:** *Champion policy actions in Nebraska by providing leadership and support to refine the policy program implementation approach.*

---

**Goal:** Nebraskans will have continued access to safe water through encouraging equitable adoption of behaviors that address the nitrate issues in Nebraska.

### Overview:

Nitrate loss is an economic challenge and community liability, at any scale. Addressing it will continue to be a pressing regional economic development issue. To address this challenge, all Nebraskan's need to work together.

Recent studies show:

- Field losses to excess nitrogen and irrigation applications averaged over \$50/ac annually.
- Nebraska communities are spending \$60 to over \$600 per person annually to treat drinking water.
- U.S. health impacts are estimated from \$250 million to \$1.5 billion annually from nitrate.

### Action: Fertilizer Checkoff

The Policy working group proposes to develop a checkoff program for nitrogen fertilizer. Funds from the checkoff would be placed in a fund governed by a representative board (geographically, producers, municipalities, academics, other industries, homeowners). Prioritization would be data driven and solution oriented. The fund management would include providing a multiplier effect through cost share of up to 3 to 1, depending on the activity supported.

### Potential Activities Supported

The checkoff would fund activities which help ensure all Nebraskan's have access to safe drinking water. Categories may include water treatment, awareness, education, research, or prevention through land and water management. Reducing use of fertilizer reduces individual checkoff obligations and therefore rewards favorable outcomes. Potential activities supported may include, but are not limited to:

- Data driven implementation of priority conservation practices
- Activities which remove barriers to adoption of new technologies and/or management practices (scientific validation, education, ROI analysis, etc.)
- Research that will contribute to safe water for all Nebraskans
- Communications and awareness campaigns
- Point-of-use and community water treatment

## Education Proposals: K-12 and Producer Education

Nebraska has a robust water education system across multiple sectors. Broad alliances from across the state have collectively identified Nebraska nitrate issues as a priority with research, extension, and outreach as a process to encourage the adoption of behaviors.

**Call to Action:** *Continue supporting a broad range of water resources educational activities and evaluate opportunities to improve effective delivery methods through collaboration.*

---

**Goal:** Nebraskans will have continued access to safe water through encouraging adoption of behaviors that address the nitrate issues in Nebraska.

**Overview:**

Nearly every organization involved in the working groups is involved in educational efforts for youth and producers around water and water quality issues, including several collaborative efforts. The consensus of the working group in this first phase of facilitated ideation sessions, is to continue to support ongoing collaborative educational activities (e.g., 4R+ Nutrient Educational programming, TAPS, Know Your Well, groundwater festivals, nitrogen certification programs, school enrichment programs, Extension/4-H/FFA programming, etc.) Further, several materials proposed for development by the Nitrate Awareness Working Group will support future collaborative education efforts by partner organizations.

As people become more engaged in the issues relating to nitrate, the group anticipates that new opportunities will emerge, particularly in collaboration with health education. Educational programming will need to be continually re-evaluated and implemented.

## Appendixes

- Nebraska's Nitrate Challenge
  - References
- Nebraska Nitrate Stakeholder and Working Groups Overview
  - Method
  - Events
  - Participant list

# Nebraska's Nitrate Challenge

Nitrogen is an essential element for plant growth and therefore, food and fiber production. Nitrate is one of two forms of nitrogen that plants can uptake. High crop yields in Nebraska are achieved, in large part, due to fertilization (with nitrogen). Thus, the nitrate ion is essential to the agricultural industry in Nebraska and the state's economy. Unfortunately, when this ion escapes into the environment, it poses a variety of challenges.

## Nitrogen in the Environment

Most studies recognize that nitrate does occur naturally in groundwater. Madison and Brunet (1985) conservatively estimated that nitrate concentrations above 3 mg/L indicate anthropogenic contributions of nitrate. Mueller and Helsel (1996) estimated this number to be closer to 2 mg/L and a more recent nationwide study has estimated that concentrations over 1 mg/L indicate human activity (Dubrovsky and Hamilton 2010).

Nitrate-nitrogen ( $\text{NO}_3\text{-N}$ ) concentrations in groundwater have been found to be a problem in central and western states of the United States, including Nebraska, where groundwater accounts for more than 80% of public water supply withdrawals and almost all private rural domestic water supply.

## Historical Studies

Several studies and evaluations have documented the challenge of increasing nitrate concentrations in Nebraska waters throughout the past 40+ years. The first national evaluation of the distribution of nitrate in groundwater evaluated more than 87,000 wells in 1985 (Madison and Brunett 1985). At that time, two areas in Nebraska with widespread contamination of groundwater due to nitrate were identified: the Central Platte region and the O'Neill-Atkinson area in northern Holt County (Adelman et al. 1985).

In 1999, The US Department of the Interior, Bureau of Reclamation in cooperation with the Nebraska Natural Resources Commission assessed the problems, needs, and alternatives for nitrate and small Nebraska communities and rural domestic water supply users (US Bureau of Reclamation 1999). The assessment concluded that no single solution to nitrate contamination will benefit all Nebraska communities due to the wide variation in geologic and water quality conditions, and many different types of water system infrastructure.

More recent studies have shown increasing nitrate concentrations throughout the state, resulting in the exploration of new groundwater and nitrogen management regulations (Wells et al. 2018).

Between 2003 and 2017, 349 towns and cities in Nebraska, serving 1.4 million people (about three-quarters the population of the state), had nitrate concentrations above 3 mg/L in their community water systems, indicating anthropogenic contributions (Weir Schechinger 2020)

## Nitrogen and Human Health

In 1992, Nitrate became a regulated compound under the Federal Clean Drinking Water Act. A maximum level of 10 ppm was established based on epidemiological studies of methemoglobinemia (blue baby syndrome) (Comely 1945, Walton 1951). A growing body of recent research is also showing connection with drinking water nitrate and increased lifetime risk for cancers, particularly colorectal and pediatric, thyroid disease, and adverse reproductive outcomes (Ward 2018 and 2021).

## Nitrate as a Rural Vitality Liability

Fertilizer lost from a cropping system as nitrate is both an economic loss to the farmer and a loss to the community. 80% of Nebraskans rely on groundwater for drinking water and nearly 100% of rural residents utilize domestic (private) drinking water wells. Ninety-nine of the nearly 550 public water systems in Nebraska perform quarterly nitrate sampling due to elevated nitrate concentrations (NDEE 2020).

For small communities of less than 500, the cost of nitrate treatment in Nebraska ranges from \$90 to \$650 per person annually. Treating the water at the tap (point of use) costs between \$50 and \$250 per person annually. The presence of high concentrations of nitrate in groundwater can also lead to the increased presence of naturally occurring soluble pollutants such as uranium, leading to additional treatment needs. The impacts of these factors can become a liability to local and regional growth.

## Nitrogen Sources and Trends

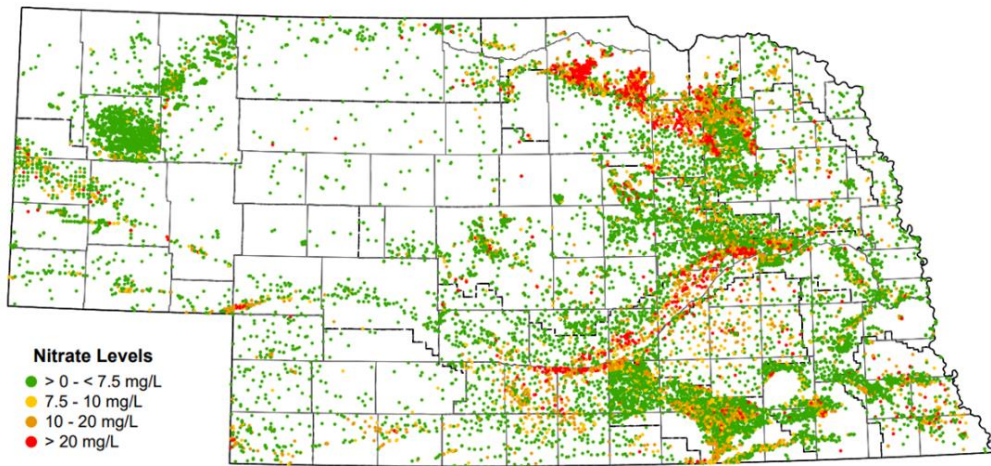
Fertilizers, animal waste, waste lagoon sludge, septic systems, and nitrogen-bearing minerals in the soil may all potentially contribute anthropogenic sources of nitrate. Between 1962 and 2017 the tonnage of commercial fertilizer sold in Nebraska rose 359% (NASS, various years) with the bulk of the increase occurring in the first decade and peak usage occurring in the 1980s. Currently 25% to 36% of fertilizer nitrogen is lost after corn (Miller et al. 2019).

### *Groundwater*

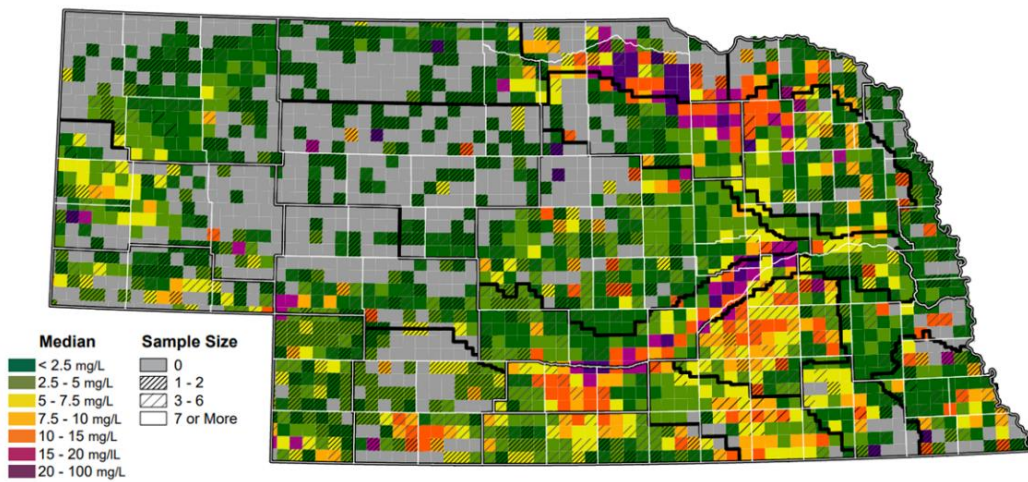
The primary source of nitrate in groundwater is commercial fertilizers (Spalding and Exner, 1993) and is most evident in areas beneath irrigated cropland with shallow depth to groundwater. The rate and quantity of nitrate leaching is related to land management practices, land use, water infiltration rates, and flow rates through the soil.

134,862 nitrate samples have been collected in Nebraska since 1974. Statewide, the median nitrate-nitrogen concentration in groundwater has increased from below 1 ppm in 1974, to under 6 ppm in 1999, to almost 7 ppm in 2019 (NDEE 2020). Of the nearly 550 groundwater-based community Public Water Supply (PWS) systems in Nebraska that supply their own water, 99 of those must perform quarterly sampling for nitrate as a result of high nitrate concentrations. Of the 25,811 distinct wells sampled for Nitrate from 1977 through 2014, 73% (18,843) of those wells have nitrate concentrations above 2ppm, implying anthropogenic contributions (Quality-Assessed Agrichemical Contaminant Database for Nebraska Ground Water).

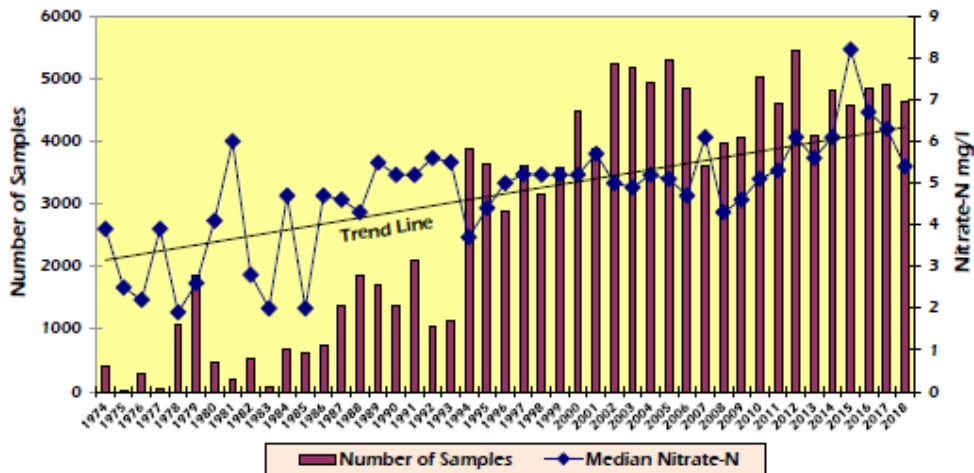
Deep soil sampling of the vadose zone (soil above the water table) across the Nebraska further illustrates that the nitrate concentrations are not likely to decrease. For example, Vadose zone sampling in the Hastings Wellhead Area shows that while some fields showed improvement, the amount of nitrate in the soil beneath cropland has increased more than 30% in the last 5 years, with an average 520 pounds nitrate-N in soil below each acre (Snow et al. 2020).



Groundwater Nitrate, most recent sample 18,247 wells from 2000-2019. NDEE 2020



Groundwater nitrate, township average. NDEE 2020

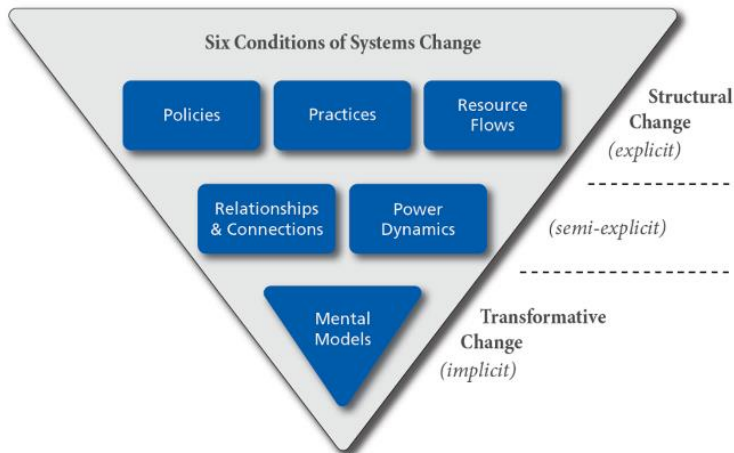


Statewide number and median of nitrate analysis, 1974-2018. NDEE 2020

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# Nebraska Nitrate Stakeholder and Working Groups Overview



In the half century since nitrate was first identified as a concern, progress has been made in understanding how nitrogen moves through the environment, in-field practices which have improved fertilizer and water efficiency, and governance structures for policy programs. However, a scientific understanding of nitrate dynamics and development of technical fixes alone does not constitute a solution to the issue. Lasting progress at scales

needed remains elusive. The interconnection and complexity of the challenge are beyond the ability for any single farmer, organization, or agency to address. Change requires systems thinking about root causes. These processes need to move forward collectively since the limiting conditions are dynamic. (Kania, Kramer, Senge 2018)

## Nebraska Nitrate events

### Nebraska Nitrate Faculty Retreat – January 2019, Lincoln

*Participants:* 49 faculty across 10 departments and 3 campuses. Grown to over 85 faculty.

The goal of the Nebraska Nitrate Faculty Group is to build capacity in Teaching, Extension and Research areas to address rising nitrate concentrations in surface water and groundwater across the state. The function of this group is to coordinate nitrate-related Extension efforts, serve as a communication platform across research and extension faculty system-wide, and connect our faculty and programming with Nebraska water stakeholders.

### Nebraska Water Conference: Building a Clean Water Future – October 2019, Norfolk

*Participants:* 40 speakers with 185 attendees representing 45 organizations

A showcase of the latest research, policy, education, and outreach focused around water quality and public health, innovative solutions to current problems, and community engagement.

### Nitrate Strategy Meeting - January 2020, Lincoln

*Participants:* 44 attendees from 29 organizations

This facilitated ideation session involving a broad set of statewide water and agricultural leaders. Participants worked to develop short-term priorities to improve nitrate-water quality issues. There was consensus around the goal of improving nitrate-water quality issues and ensuring all Nebraskans have access to safe drinking water. The participants identified key working groups to further evaluate actionable remedies: Awareness, Policy, Education: K-12, Education: Producer.

### Nitrate Strategy Working Groups – September 2020 to March 2021

*Participants:* 38 participants from 25 organizations in 3 working groups (Policy, Producer Education, Awareness). Participants used a systems thinking approach of facilitated ideation with the goal of

developing actionable projects. Project ideas proposed to have short-term actions and require cross-organizational support.

## Nebraska Nitrate Stakeholder and Working Groups Participants

<b>First</b>	<b>Last</b>	<b>Organization</b>	<b>Participant</b>
Dave	Aiken	UNL, College of Law	Policy
Karen	Amen	Lower Platte South NRD/ NE Natural Resources Commission	Strategy Group
Matt	Bailey	Shell Creek Watershed Group/ Lower Platte North NRD	Strategy Group
Melissa	Baker	GC Resolve	Strategy Group
Alisha	Bartling	Santee Sioux Nation	Strategy Group
Hannah	Birge	The Nature Conservancy Nebraska	Strategy group/Policy
Mark	Brohman	Nebraska Environmental Trust	Strategy Group
Kyle	Brunkhorst	Nebraska Corn Growers Association	Policy
Jeff	Buettner	Central NE Public Power and Irrigation District	Strategy Group
Russell	Callan	Lower Loup NRD	Strategy Group
Ryan	Chapman	NE Dept of Environment and Energy	Strategy Group
Graham	Christensen	GC Resolve	Strategy Group
Dan	Clement	Central Platte NRD	Strategy Group
George	Cunningham	Sierra Club Nebraska	Strategy Group/ Policy
Tatiana	Davalia	NE Dept of Environment and Energy	Strategy Group/ Policy/ Producer Education
Jodi	Delozier	UNL, School of Natural Resources	Awareness
Sue	Dempsey	NE Dept of Health & Human Services	Strategy Group
Craig	Derickson	USDA-NRCS	Strategy Group
Dean	Edson	NE Association of Resource Districts	Strategy Group
Josh	Egley	NU Foundation	Strategy Group
Dick	Ehrman	Lower Platte South NRD	Strategy Group
Jacob	Fritton	Nature Conservancy of Nebraska	Strategy Group
Amanda	Gangwish	Nebraska Conservation Voters	Awareness
Troy	Gilmore	UNL, School of Natural Resources	Awareness
Jane	Griffin	Groundwater Foundation	Strategy Group

Karen	Griffin	Ollsen	Strategy Group
Kyle	Hauschild	Little Blue/Nemaha NRD	Strategy Group
Rachael	Herpel	Nebraska Water Center/ Water for Food	Strategy Group/ Awareness/ Policy
Chrystal	Houston	Upper Big Blue NRD	Strategy Group
Anne	Hubbard	Retired physician	Strategy Group
Javed	Iqbal	UNL, Agronomy	Policy, Producer Education
Chelsea	Johnson	Nebraska Conservation Voters	Awareness
Terry	Julesgard	Lower Niobrara NRD	Strategy Group
Andy	Kahle	NE Dept of Health & Human Services	Strategy Group
Michelle	Koch	NE Game & Parks Commission	Strategy Group
Ashley	Kohls	Nebraska Cattlemen	Strategy Group
Marie	Krausnick	Upper Big Blue NRD	Strategy Group, Policy, Producer Education
Meghan	Langel	UNMC, Water and Health	Awareness
Andy	Licht	Nebraska Agri-Business Association	Strategy Group, Policy, Producer Education
Marty	Link	NE Dept of Environment & Energy	Strategy Group
Jim	Macy	NE Dept of Environment & Energy	Strategy Group
Boone	McAfee	Nebraska Corn Board	Strategy Group, Producer Education
Peter	McCornick	Daugherty Water for Food Global Institute/ Univ of NE	Strategy Group
Carla	McCullough	UNL, School of Natural Resources	Awareness
Mike	McDonald	farmer, Nemaha NRD board, Healthy Soils Task Force	Awareness, Policy
Melissa	Mosier	Audubon Nebraska	Awareness
Steve	Melvin	UNL Extension	Producer Education
Scott	Merritt	NE Agri-Business Association	Strategy Group
Ansley	Mick	Nebraska Farm Bureau	Strategy Group
Jeremy	Milander	University of Nebraska Extension	Strategy Group
Mike	Murphy	Middle Niobrara NRD	Strategy Group, Policy, Producer Education
Aaron	Nygren	University of Nebraska Extension	Strategy Group
Pat	O'Brien	Upper Niobrara White NRD	Strategy Group, Policy
Roric	Paulman	Paulman Farms	Strategy Group, Policy
Mark	Porath	NE Game & Parks Commission	Strategy Group

Chittaranjan	Ray	Nebraska Water Center/ Univ of NE	Strategy Group
Jay	Rempe	Nebraska Farm Bureau	Strategy Group
Bruce	Rieker	Nebraska Farm Bureau	Policy
Eleanor	Rogan	Univ of Nebraska Medical Center	Strategy Group
Adam	Rupe	JEO	Strategy Group, Awareness
David	Rus	USGS	Strategy Group, Awareness
Becky	Schuerman	UNL Extension	Awareness
Dennis	Schueth	Upper Elkhorn NRD	Strategy Group
Barbara	Soderlin	NU Foundation	Strategy Group
Mike	Sousek	Lower Elkhorn NRD	Strategy Group
Marty	Stange	Hastings Utilities	Strategy Group, Producer Education
Jeff	Steffen	farmer, Lewis & Clark NRD board, Healthy Soils Task Force	Producer Education
Tim	Storm	Middle Niobrara NRD	Strategy Group
Jennifer	Swanson	Nebraska Association of Resource Districts	Strategy Group, Policy, Producer Education
Zhenghong	Tang	UNL	Awareness, Policy
Megan	Taylor	University of Nebraska Extension	Strategy Group
Kyle	Temple	Middle Niobrara NRD	Producer Education
John	Thorburn	Tri-Basin NRD	Policy, Producer Education
Rich	Uhrenholdt	farmer	Policy
Andrew	Vinton	Natural Resources Committee	Strategy Group
Lyndon	Vogt	Central Platte NRD	Strategy Group
Jessica	Walsh	UNL, College of Journalism	Awareness, Producer Education
Britt	Weiser	USDA-NRCS	Strategy Group
Tyler	Weishahn	Lower Big Blue NRD	Strategy Group
John	Westra	UNL Extension	Producer Education
Greg	Wilke	Middle Niobrara NRD board	Producer Education
Steven	Wolf	Fides Munusque Fidele, Inc.	Awareness
Ron	Yoder	University of Nebraska - Lincoln	Strategy Group



**LOWER PLATTE NORTH**  
**Natural Resources District**



**Long Range Implementation Plan**  
**Fiscal Year 2022**

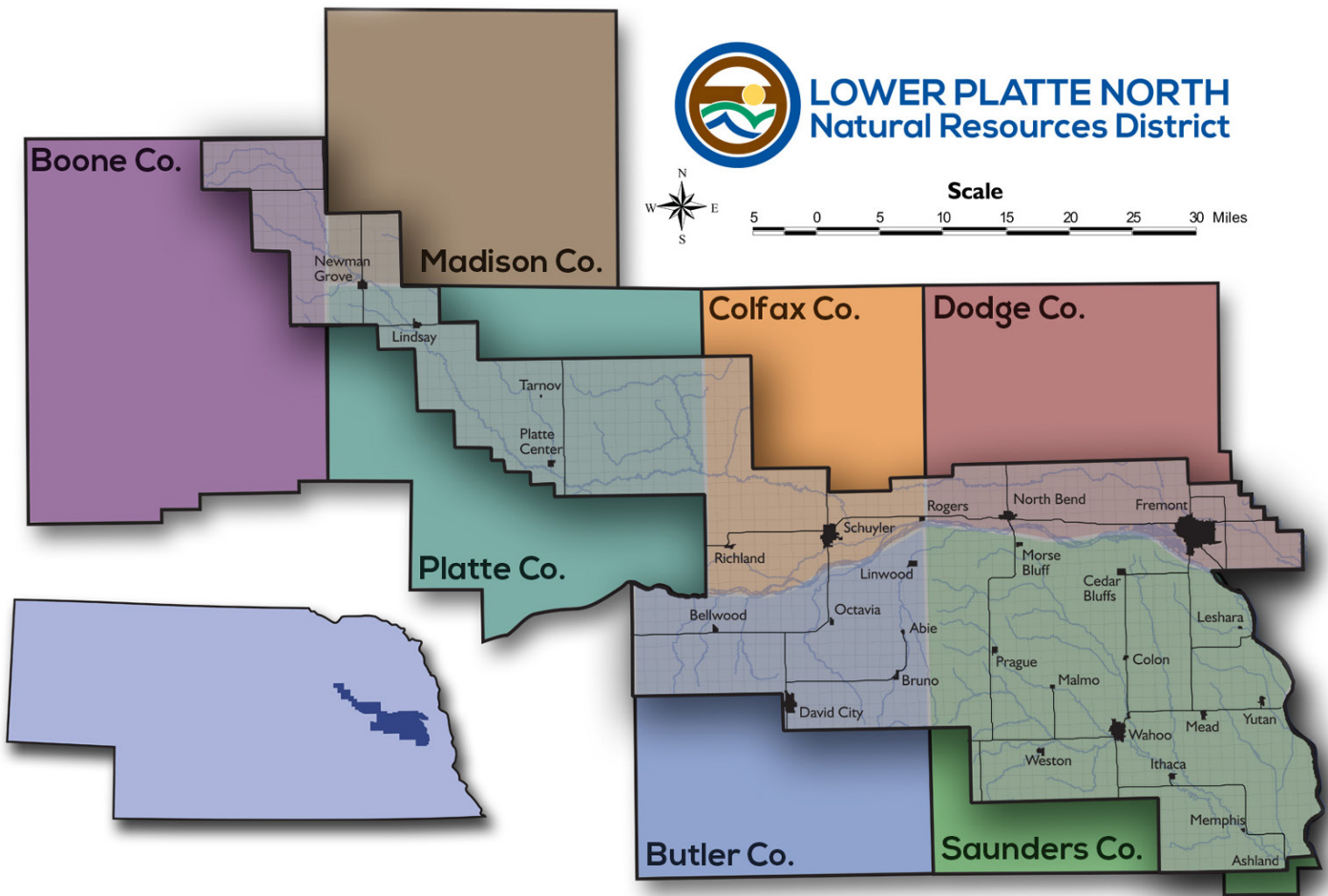


**LOWER PLATTE NORTH**  
Natural Resources District



**Scale**

5 0 5 10 15 20 25 30 Miles



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## Introduction

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The Lower Platte North Natural Resources District (LPNNRD) is one of 23 Natural Resources Districts created in 1969 with the passage of LB 1357 by the Nebraska Unicameral. Since its formation in 1972, the LPNNRD has been assisting people in the Lower Platte North River Basin in the development and protection of our soil and water resources. Nebraska Statutes require that Natural Resources Districts develop a Long Range Implementation Plan. The purpose of this plan is to summarize accomplishments during fiscal year 2021 (July 1, 2021 to June 30, 2022) and planned District activities for fiscal year 2022. There are also objectives for a five-year period from fiscal years 2023 to 2027. The plan serves as an implementation tool of the district's Master Plan, which is updated every ten years.

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## Authority and Responsibilities

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The Natural Resources Districts have been given statutory responsibility outlined in Sections 2-3229, R.R.S. 1943. In this section it states that "The purposes of the Natural Resources Districts shall be to develop and execute, through the exercise of powers and authorities contained in this act, plans, facilities, works and programs relating to: (1) erosion prevention and control, (2) prevention of damages from flood water and sediment, (3) flood prevention and control, (4) soil conservation, (5) water supply for any beneficial uses, (6) development, management, utilization, and conservation of groundwater and surface water, (7) pollution control, (8) solid waste disposal and sanitary drainage, (9) drainage improvement and channel rectification, (10) development and management of fish and wildlife habitat, (11) development and management of recreational and park facilities, and (12) forestry and range management."

Lower Platte North NRD programs and projects are available to meet the goal of properly developing our water and related land resources.

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## Description of the District

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The Lower Platte North Natural Resources District is located in the Lower Platte River Basin in eastern Nebraska and includes 1,031,000 acres of land. A portion of Saunders, Butler, Platte, Dodge, Colfax, Boone and Madison Counties are within the district (see Appendix A), which includes twenty-eight cities, towns and villages. Besides the Platte River, other notable tributaries in the district include Wahoo Creek, Skull Creek, Bone Creek, Loseke Creek, Taylor Creek, Shell Creek, Elm Creek, Clear Creek, Rawhide Creek, Silver Creek, Sand Creek, and Duck Creek.

The population of the district is approximately 62,000, of which about half is rural and half urban. The Lower Platte North NRD is financed by a tax levy which may be up to four and one-half cents per \$100 valuation for general purposes and another one cent for water programs. The FY 2022 tax levy is .03345 cents per \$100 valuation.

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## Governing Body

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The Lower Platte North Natural Resources District (LPNNRD) is governed by a 19-member Board of Directors. The directors are elected at the general election for a term of four years, with half of the members up for election every two years.

The district is divided into nine (9) subdistricts. Two board members are elected from each of the nine subdistricts, and one board member is elected at large every four years.

The district operates by a set of bylaws which are kept on file at the district headquarters at Wahoo, Nebraska.



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### **FY 2021 Platte River Basin Activities**

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One of the great natural resources of Nebraska is the Platte River. It is the feature that attracted early settlers to our state and guided the wagon trails. Today, we look at the Platte River differently. It is a water source for agriculture and cities like Fremont, Lincoln and Omaha, a haven for wildlife, and a place for recreation. Issues surrounding the Platte are a top priority at the LPNNRD, since approximately 72 miles of the river flow directly through, or border, the district.

#### **Ice Jam Agreement**

In 1994, the LPNNRD entered into an agreement with the Pappio-Missouri River NRD, Lower Platte South NRD, and Cass, Douglas, Sarpy and Saunders Counties to more effectively deal with ice jams and their resulting flood damages along the Lower Platte River. This area of concern is primarily from Fremont, Nebraska to the mouth of the Platte River. This group has pooled funds of \$150,000 to retain a contractor to use explosives when needed, to remove ice jams in a timely manner.

During the winter of 2020-21, the explosives contractor was put on stand-by, but no explosives were used.

#### **Rock & Jetty Program**

This program was developed to offer cost-share assistance to landowners to construct erosion control devices for stream bank stabilization and to assist Dike and Drainage Districts with maintenance of dikes along the Platte and Elkhorn rivers and perennial streams. In FY21, \$25,000 is budgeted for projects on rivers & streams. We assisted a couple landowners on maintenance projects in FY 20-21 at a cost of \$3,170.

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### **FY 2022 Platte River Basin Objectives**

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- Administer \$25,000 in the Rock & Jetty Program to assist with priority stream bank stabilization for cooperators sustaining damage from the March 2019 flooding. This includes assisting cooperators with meeting the regulations of the Clean Water Act and 404 permits.
- As a member of the Joint Water Management Advisory Board, provide leadership and assistance to move forward with exploring flood reduction solutions for the lower one-third of Dodge County within the District.
- Support the Lower Platte Weed Management Area financially and technically in controlling noxious and invasive weeds.
- Support the Nebraska Land Trust in acquiring easements for the protection and preservation of quality lands.

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### **FY 2023-2027 Long Range Platte River Basin Objectives**

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- Continue to budget cost-share funds for priority bank stabilization along the Platte and Elkhorn rivers and other perennial streams in the district.
- Continue to be an active member on the Joint Water Management Advisory Board.
- Promote riparian buffer zones along the Platte River and other perennial streams.
- Continue to explore new, innovative and cost-effective ways to protect against stream bank erosion.
- Provide education on stream bank protection and regulations.
- Support and budget annually, as needed, for the Ice Jam Agreement Fund.
- Keep up to date on Clean Water Act and Endangered Species Act regulations.
- Continue to participate with the City of Fremont to study potential nonstructural measures to reduce flooding and economic

losses from the Lower Platte River.

- Work with the City of Schuyler as they evaluate the need for future federal funding for completing structural and non-structural approaches to reduce flooding and economic losses from the Platte River through the LPNNRD District-Wide Hazard Mitigation Plan.
- Encourage cities and counties to initiate floodplain management planning to promote wise floodplain development.
- Assist dike and drainage districts within the LPNNRD to properly repair and maintain levy projects.
- Budget annually as needed to support the Lower Platte Weed Management group in controlling noxious weeds.



## GROUND AND SURFACE WATER

One of the Lower Platte North NRD's major responsibilities is to conserve and protect our ground and surface water supplies. To accomplish this goal, the Lower Platte North continues to participate in water quality studies, ground water level monitoring, and water resource educational activities.

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### **FY 2021 Ground & Surface Water Activities**

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#### **Ground Water Management Area**

LPNNRD implemented a District-wide Groundwater Management Area (GWMA) on January 1, 1997, to address both water quality and quantity concerns. This action was based on data gathered since 1985 indicating where groundwater quality conditions have deteriorated beyond those established as health standards, such as nitrate nitrogen. On that date, groundwater quality Phase I (education) regulations became effective for the entire District. One primary rule in Phase I requires certification for fertilizer and water use. The District has developed a groundwater program emphasizing a protection-based approach rather than a reactive, corrective approach. Since that time, advanced Phase areas have been determined by trigger levels listed in the rules and regulations of the GWMA. The District has two Phase groundwater quality control areas, those being Bellwood and Richland/Schuyler. The Bellwood Phase 2 Area was established in 2003 and presently covers approximately 30 square miles in the western portion of the Platte Valley in Butler County and includes the town of Bellwood. In 2015 nitrate levels decreased to a point that the trigger levels were not being achieved, so this area was decreased to 20 square miles. The Richland/Schuyler Phase 2 Area was established in 2004. In 2015 this area was raised to Phase 3 because of the rising nitrates. This area covers approximately 55 square miles in the Platte Valley of Colfax

County and includes the towns of Richland and Schuyler. In 2015, 10 additional sections north of the Richland/Schuyler Area became a Phase 2 area and in 2020 raised to Phase 3. Elevated nitrate-nitrogen levels continue to be the major concern in both Phase areas. Emphasis on awareness is a priority to the District with numerous grants being considered.

In June 2018, the District updated its Groundwater Rules and Regulations by adding a Phase Four under Water Quality and managing water by consumptive use or acre feet limitations. As of July 1, 2021, the District had 9155 registered active wells with 4586 irrigation wells and 206 wells in our GWEL network.

In Summer of 2012, the District saw mid-summer declines in the Bruno area and the uplands of Platte and Colfax Counties. These are now designated as the Butler-Saunders and Platte-Colfax Special Quantity Subareas. The District mandated water flow meters, rolling allocations and annual reports in these areas starting in 2016.

In 2012 seven NRD's agreed to develop a Lower Platte Basin plan, which is a cooperative agreement for the Basin Plan. This plan was approved in December of 2017 with each district assigned a depletion allotment within the Basin. The allotment is in 5-year increments starting in 2016 with a formula to determine the acre feet used for new water uses. The District completed its V-IMP in June of 2018 by adding an additional rule of requiring municipalities to report yearly water use, with an annual report due to NDNR. The Coalition contracted with the Flatwater Group to analyze the data that will be used in the next 5-year allotment.

In 2016 the Lower Platte River Consortium, made up of the Lower Platte South NRD, the Lower Platte North NRD, the Papio-Missouri River NRD, Lincoln Water System (LWS), Metropolitan Utilities District (MUD), and the Nebraska Department of Natural Resources

(DNR), embarked on an effort to develop a drought contingency plan to maintain/mitigate sustainable water supplies to the Lower Platte River during drought conditions. The final report was finalized in the Spring of 2020. The group is in the process of ranking the projects to be considered for supplying water into the Platte River.

Current rules and regulations of the GWMA are available at the LPNNRD headquarters in Wahoo and via the district website at [www.lpnrd.org](http://www.lpnrd.org).

### Ground Water Quality Sampling

The Lower Platte North NRD continues efforts to develop a ground water quality inventory. The District has been divided into four primary aquifer regions: Todd Valley, Platte Valley, Shell Creek and the Uplands, and further divided into 26 subareas. Staff samples the same 53 wells each summer, weather permitting, to determine long term trends for nitrate-nitrogen. This is referred to as the Statewide Network. The data collected is provided to the Nebraska Department of Environment and Energy (NDEE). NDEE in turn provides this to the Nebraska Legislature on an annual basis.

In 2021 samples were collected from all 53 sites.

Year	Nitrate-Nitrogen Range	% Nitrate-nitrogen 0-8.0 ppm	% Nitrate nitrogen 8.01-10.0 ppm	% Nitrate nitrogen > 10 ppm
2021	0 - 23.1 ppm	69.8% (37 of 53)	7.6% (4 of 53)	22.6% (12 of 53)

Samples for pesticide analysis were collected from seven of these sites (18%). The pesticide analysis was for a suite of 25 parameters, and all results were less than reporting level.

### Ground Water Energy Level Monitoring Network

One of the responsibilities of the NRDs in the State is to monitor fluctuations in groundwater

levels. With the help of area cooperators, a ground water energy level monitoring network has been established in the LPNNRD. This monitoring network has been established to obtain a better understanding of the groundwater levels throughout the District. As of Spring 2021, the LPNNRD had 206 wells in the groundwater energy level monitoring network. These wells are monitored each spring and fall, with selected wells also measured in late August.

The LPNNRD compares the latest spring reading to the 1987 base-year to determine if a subarea needs to be declared a Level 2 or Level 3 groundwater management area. Level 2 and 3 management areas require flow meters on wells, annual reporting of water use, and establishment of acre-inch allocations. For the 26 subareas within the District, 24 subareas are currently at Level 1 management, while the other 2 subareas still need additional information before these can be designated. The District prefers at least three years of data before the subarea can be designated as a Level 1, 2, or 3 management area.

Fall readings in 2020 and Spring of 2021 showed a decline from the previous year's measurement. This change was likely the effects of less rainfall in the summer months of June through August 2020 and as a consequence more irrigation occurred. Spring readings in 2021 showed 87% of the wells measured had levels lower in Spring 2021 compared to Spring of 2020. There was a 4% rise in 7 wells from a year ago.

### Chemigation

Chemigation is the act of injecting chemicals into the water line of an irrigation system that is then applied onto the crops. It is considered to be one of the most efficient ways of applying essential nutrients in times when the crop is uptaking the most amount of nitrogen through its growing stages. In order to use chemigation, a licensed permit holder must obtain a permit through the Lower Platte North NRD. Special equipment must be installed to

protect Nebraska’s groundwater from possible back-flow of chemicals into the groundwater source. To obtain this permit, administered by NDEE you must pass the Chemigation Certification test taught through UNL Water. There is an online test producers may take due to the recent COVID-19 protocols. The chemigation equipment must be properly equipped, inspected and approved by the NRD before applying any chemicals. The number of chemigation permits continues to slowly rise throughout the district due to chemigation’s efficient application rate when the crops are in the most need of nutrients. In sandier soil types, chemigation is extremely effective due to the soil’s incapability to hold essential nutrients in the root zone after heavy rainfall events.

Chemigation Permits	Total	Renewal	New	Emergency
November 2020	748	695	53	0
November 2021	704	658	46	0

In 2014, the Legislature approved changes to Title 195 that would allow individual NRDs to set chemigation fees. Chemigation fees for LPNNRD are: \$90 for a New permit, \$30 for a Renewal permit, and \$300 for an Emergency permit. New permits are to be inspected each year they are permitted and renewal permits are to be inspected on a 3 year rotation. Failure to renew by June 1st of the following year the permit was obtained will cause the permit to lapse. If a renewal permit lapses and the producer decides to use chemigation as a practice of crop application the individual must obtain a new permit and an inspection is required.

**Decommissioned (Abandoned) Wells**

Decommissioned (Abandoned) wells are a health and safety concern and have been ruled as illegal by the Nebraska Legislature. A well not used for three consecutive years or one which is no longer useful is considered

to be abandoned and needs to be properly decommissioned.

The Lower Platte North NRD offers up to 75% cost share assistance to landowners to properly decommission abandoned water wells. In addition, the district will assist with up to 75% of the cost for pump and obstruction removal on domestic and stock wells. To receive cost share assistance, the actual decommissioning must be performed by a certified well driller or pump installer. The landowner has six months from the time of application to accomplish this task unless good cause is shown.

Since 1992 the district has administered local and state cost-share dollars to decommission 707 wells. Through this program in FY 20-21, a total of \$13,510.62 was administered by LPNNRD for the plugging of 16 wells. The district will administer approximately \$15,000 of state and local funds to plug additional wells during the current fiscal year.

**Flow Meter Maintenance Program/Flow Meter Readings**

Since 2008, the LPNNRD has implemented the requirement of installing a District approved flow meter on any new or replacement well. Thereafter in 2012, the District also required the installation of a flow meter on any expansion of acres from an existing well. This pumping information is invaluable to the District to know what has been pumped during years of extended drought. It is vital that the LPNNRD keeps track of this going forward into the future. In order to know the volume of water within our aquifer systems, we need to know the water that is being extracted.

In 2016, the district chose to contract with a private company through the bidding process. The company was scheduled to maintain the flow meters within the LPNNRD’s SQS areas for the first four years. Since that was completed the District has chosen to open the flow meter maintenance program district wide in 2020. Maintenance on the flow meters will be performed once every four years. The district is in charge of the labor and site visit at each

meter. Each mechanical meter site visit is \$60 and each battery operated site visit is \$75. This maintenance includes the regular greasing of the mechanical meters and changing the batteries on the digitally read meters. Along with the regular maintenance the private company also ensures that the meter is not damaged from water or vibration. There are approximately 1,056 irrigation well flow meters that are getting routine maintenance once every four years.

Along with the irrigation wells, the LPNNRD also records meter readings from all of the municipality wells within the District including MUD, Lincoln and Fremont. Livestock wells and commercial wells are required to report if the well was drilled after the 2012 requirement date. Nearly 1,175 readings are recorded annually throughout the LPNNRD District. This Fiscal year the LPNNRD budgeted \$12,500 for the meter maintenance program.

### Registered Wells

The Nebraska Legislature declared that the conservation and the beneficial use of ground water are essential to the future well-being of the State. State Law requires that all water wells in the State of Nebraska be registered with the Department of Water Resources. Wells that are not registered are illegal and should be registered as soon as possible. A breakdown by decade from 1970 to present shows the growth of active irrigation wells in the District.

*Table of Active Irrigation Wells within LPNNRD compiled by Completion Date*

<b>Date</b>	<b>Number of Active Irrigation Wells in the District</b>
December 31, 1970	1,428
December 31, 1980	2,756
December 31, 1990	3,241
December 31, 2000	3,686
December 31, 2010	4,307
December 16, 2016	4,528
December 31, 2020	4,585
January 1, 2021	4,586

### Well Permits

In May of 2008, the LPNNRD placed a flow meter and water reporting condition on well permits for all permits issued after that date. All well permits require well owners to install a flow meter and report their water use for the calendar year to the LPNNRD by December 15 of each year. This reporting requirement is effective the year the well is drilled and for each year thereafter, until the well is decommissioned. Summer of 2020 brought drier conditions and as wells were being pumped harder than the last 3 years, replacement well permit requests across the District have increased. As of August 1st, 2021, the District has issued 39 well permits with 8 new irrigation wells, 29 replacement irrigation wells, 2 municipal wells.

### Special Studies

The LPNNRD has done a number of studies within the District. The following is a list of studies that is currently being conducted within the District.

#### *Aquifer Vulnerability Mapping and Analysis*

The Lower Platte North has been working with UNL to collect and analyze data within the LPN Water Quality Management Areas. The first stage involved some intensive water sampling of irrigation wells for nitrates. A few samples were collected for isotope nitrate samples for the purpose of determining if the nitrates were organic or inorganic sources. This was followed-up with vadose soil sampling analysis to assist in determining the amount of nitrates in soil and pore water present in the unsaturated zones above the water table. A nitrate tool was developed utilizing this data, along with geological information to assist in determining vulnerability. This project will be wrapping up later in 2021 with informational meetings in the area.

#### *3D Airborne Electromagnetic (AEM) Hydrogeologic Framework and Assessment*

Papio-Missouri River NRD, NeDNR and LPN started a study in January 2021 to assess

AEM survey information, well logs and other geological information. The data will be used to characterize different geological layers and assign variables such as hydraulic conductivity. This data could be used in a groundwater model to better understand, assess and forecast groundwater flow within the geographical areas. This study should be completed in January 2022.

### ***Lower Platte River Consortium Study***

Municipal wellfields in the Lower Platte River Basin depend on the Platte River to recharge the groundwater for their use. This study looked at long term water supplies in the Lower Platte River Basin, and the ability to enhance streamflow, especially in drought conditions, to sustain these municipal water systems. Sustaining water in the river would also provide a benefit to wildlife and agriculture by lessening the likelihood of a 'call' on the river. Due to different hydrologic conditions in the Platte River, such as gaining and losing segments, siting of future reservoirs, groundwater storage projects, etc. becomes important in order to most effectively move water to a desired location downstream. The plan was completed in Spring 2020 with the group now in the process of conducting a desktop exercise on determining which projects are feasible.

### ***Eastern Nebraska Water Resources Assessment***

LPNNRD is a partner in the Eastern Nebraska Water Resources Assessment (ENWRA). The ENWRA study has been utilizing Airborne Electromagnetic (AEM) over eastern Nebraska to better model the geology of the glaciated portion of the State. It has opened several questions concerning bedrock aquifers both in water quantity and water quality such as salinity. New flights were conducted in the summer of 2018 with the final report received in summer 2019. A study is being conducted in the Platte-Colfax Area (SQS#2) utilizing the AEM, additional data loggers and other geologic logs to determine the relationship between confining and unconfined layers

along with determining drawdown levels for management decisions. The flights and the results can be found on the ENWRA website at ([www.enwra.org](http://www.enwra.org)).

### ***Elkhorn-Loup Model***

The Elkhorn-Loup Model (ELM) project is a study of surface water and groundwater resources in the Elkhorn River basin upstream of Norfolk, Nebraska and the Loup River basin upstream of Columbus, Nebraska. Parts of this basin overlap and cover portions of upper Shell Creek.

### ***Certifying Acres***

In July 2009, the District signed a contract with GIS workshop to develop a database of county assessor records as the preliminary step to certifying irrigated acres. Using these records, LPNNRD staff mailed out letters to landowners to verify irrigated ground. As of January 2021, the majority of the irrigation in the district has been catalogued. The District is still granting new irrigation development. Those new acres are not entered into the certification database until such time as they show up on aerial photography and can be accurately modeled. In March of 2021, the District went through all the approved new irrigations and modeled out all those that had yet to be counted. Acre certification provides a true inventory of the irrigation needs of the District, which is an important part of present and future groundwater management and planning. In addition to cataloging irrigated acres, LPNNRD staff have been actively working with the Nebraska Department of Natural Resources (NeDNR), as well as local landowners to bring all irrigation wells in LPNNRD into compliance with Nebraska Revised Statute 46-602 (7).

### ***Nebraska Ordnance Plant Water Pollution Clean Up at Mead***

During the 1940s, 1950s and 1960s, an Army Ordnance Plant near Mead was used to assemble bombs and served as an early

Atlas Missile ICBM site. Over time, the soil and groundwater at the plant site became polluted with various explosive residues and solvents. The cleanup has been divided into three basic project areas: Soils (OU1), Ground Water (OU2), and Building contamination (OU3). This area has been under study by the Army Corps of Engineers (COE) since 1988. Tours and open houses are conducted on an annual basis.

### **Wellhead Protection Program**

The LPNNRD implemented a wellhead protection program in FY 2001. The goal of the program is to minimize potential polluting activities on the land surrounding a community's public water supply well(s). The District has identified 22 communities with public supply wells and they have been encouraged to become involved in the program. The City of Ashland, with assistance from LPSNRD, has conducted some investigations within its wellhead management area in 2019-2020. An open house is planned for Ashland in August 2021. The Cities of David City and Wahoo are in the process of re-evaluating their wellhead management areas along with decommissioning wells within these areas.

### **Rural Water Districts**

In recent years, the District has worked with communities who have had difficulties with water quality and quantity by forming two rural water systems. The Butler County system linked the village of Bruno in 2006, who was having water quality and quantity problems, to David City. Also in 2006, the Saunders County system linked the village of Colon, who was experiencing water quality concerns, to Wahoo. The LPNNRD operates both of these systems. The District purchases water from the larger communities and delivers it to the smaller communities; RW staff manage and maintain Colon's system and billing while Bruno manages their infrastructure and household billing. Both systems are designed to serve rural customers along each service route. Combined, the two

systems serve over 135 households in Saunders and Butler Counties. To address fiscal concerns both RWDs have implemented a phased rate increase strategy to more diligently manage the financial standings of both districts. The District has been in contact with several other communities and anticipates several more communities and rural customers to be serviced by rural water systems in the future. Both systems are greater than 10 years old and repairs/replacements of meters is expected to take up RWD staff's time in 202-22 as a number of meters and components are showing the signs of wearing out.

### **Geographic Information System (GIS) and Global Positioning System (GPS)**

LPNNRD has used Geographic Information System (GIS) technology since 1996. GIS is an automated system combining database information and maps. Features on a map, created with GIS technology contain attribute or feature descriptions that are referenced by location. The data used by a GIS system consists of Vector and Raster Data. Vector data consists of point (wells), line (roads) and polygon data (irrigation boundaries); with Raster data consisting of pixels, where each pixel on the screen corresponds to a data point. Raster data includes aerial photography and elevation data such as LidAR (a highly accurate elevation dataset). The District has incorporated the use of GIS into most district functions, including the certification of irrigated acres, maintenance, project planning and modelling of groundwater availability and the movement of contaminants such as nitrates through the soil profile.

In addition to in-house GIS activities, LPNNRD GIS staff assist a variety of partners, including projecting FSA aerial photography into Nebraska State Plane Feet coordinates for NeDNR, custom authoring of maps for the Nebraska Land Trust, coordination of helicopter flight lines for invasive species control with the Lower Platte Weed Management Area, and helping other NRDs with GIS questions as they emerge.

LPNNRD entered into an agreement with Phoenix Web Group to create a robust, relational database. GIS will be the backbone of this database and will allow LPNNRD to quickly, and efficiently, look up any information pertaining to any project or cost share that has been completed for any constituent with land in LPNNRD.

The Global Positioning System (GPS) relies on 28 NAVSTAR satellites, which provide world wide positioning and navigation information around the clock. Receivers acquire signals from satellites to determine precise locations on earth. The data obtained from taking GPS positions can be downloaded and mapped with GIS, making the two technologies complementary. LPNNRD partnered with NRCS on the purchase of a sub-centimeter GPS base station. This allows NRCS and NRD staff to quickly and efficiently perform a variety of tasks in the field with survey level precision.

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### **FY 2021 Ground and Surface Water Objectives**

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- Continue to monitor changes in groundwater levels and quality in the district.
- Continue with LPNNRD Groundwater Management Area (GWMA) programs to help avoid the Lower Platte Basin being designated “fully appropriated.”
- Continue to implement Voluntary Integrated Water Management Plan (V-IMP) for the District and basin-wide plan. Utilize acre feet allotments assigned to the District for the benefit of the basin.
- As part of the GWMA, continue with LPNNRD certification classes, demonstration plots, generation of maps indicating problem areas, and evolving the development of a master database.
- Continue to cooperate with the United States Geological Survey (USGS) in monitoring groundwater levels at two sites.
- Continue to cooperate with the United States Geological Survey (USGS) in

- monitoring surface water levels at four sites and one site for contamination evaluation.
- Use the Subarea Delineation Study to identify ‘small pocket aquifers’ in the Swedeburg, Prague, Yutan, and Yutan South subareas. Review other aquifer subareas to determine if Stay Management Areas are justified in other portions of our District.
- Continue sampling of approximately 53 wells in our District that are part of the Nebraska State-wide Network.
- Continue to monitor the Phase Areas in Richland-Schuyler and Bellwood for nitrate and elevate these areas as needed.
- Implement extensive sampling of soil and water in the Phase Areas for the purpose of identifying workable best management practices for curbing the rising nitrate trend.
- Administer \$15,000 of state and local cost-share funds to decommission abandoned water wells, and provide 100% cost-share assistance within Wellhead Protection Areas to communities that are actively doing projects within it’s management area.
- Maintain a multi-agency groundwater energy level monitoring network in the Wann Basin of the Platte Valley north of Ashland to pool information from different agencies collecting water level data. This information is being used by the COE and MUD to refine their groundwater modeling efforts.
- Continue to implement the Chemigation Program to inspect safety equipment on permitted irrigation systems in the district.
- Continue with the District’s Well Permitting Program and Variance Process throughout the District.
- Continue to review water use reports submitted to the LPNNRD as part of the well permitting process from new and replacement wells.
- Provide information and education on water conservation and safe disposal of farm and household chemicals.
- Continue to site registered and unregistered wells in the district using GPS.

- Promote and sponsor LPNNRD's Spring Conservation Sensation
- Provide information on Integrated Pest Management in news releases and the "Viaduct" newsletter to encourage reduced use of pesticides.
- Support and promote urban water conservation and chemical disposal throughout the District.
- Assist in organizing the annual NRD Water Programs Conference held each year to update the NRD's on activity of State and Federal Agencies, new research and Legislative issues.
- Continue to install flow meters on irrigation wells that are part of our Ground Water Energy Level (GWEL) Network.
- Expand the GWEL network to monitor aquifer sub-areas as designated in the 2009 Subarea Delineation Study. This will be done by incorporating additional high capacity wells and the drilling of new monitoring wells.
- Continue to monitor clean up efforts by the COE at the Former Ordnance Plant at Mead, Nebraska.
- Work with the COE to establish spacing requirements for future high capacity irrigation, industrial, and/or municipal wells that are requesting to be installed near known contaminant plumes from the Former Ordnance Plant near Mead, so these wells will not interfere with the COE's clean up efforts.
- Continue to monitor clean up efforts by the University of Nebraska at the Eastern Nebraska Research and Extension Center (ENREC) facilities east of Ithaca, Nebraska.
- Maintain transducers placed in District monitoring wells to record changes in groundwater energy levels and to start the process of installing real-time remote reads.
- Declare Level 2 or Level 3 Management areas as warranted caused by declining groundwater energy levels in 50% or more of the monitoring wells reaching their trigger levels after three consecutive spring readings.
- Review livestock permits from DEQ.
- Investigate irrigation runoff and groundwater management area complaints as needed.
- Expand the NeRain program within our District.
- Continue to be a sponsor member of the Elkhorn-Loup Model (ELM)
- Continue groundwater studies with the University and NeDNR in the SQS areas. Study will focus on confined and unconfined aquifers and drawdowns within these areas.
- Communicate with well drillers and pump installers on water concerns within the District.
- Continue to assist the Eastern Nebraska Water Resources Assessment (ENWRA) with the use of AEM (Airborne Electromagnetic) to study the eastern glaciated portions of Nebraska to provide a geologic framework map.
- Improve irrigation efficiency by working with UNL Extension on the Nebraska Agricultural Water Management Network (NAWMN) to install Watermark sensors and ET gauges with producers each year in our District.
- Continue with the process of updating Irrigated Acre Certification within the District.
- Continue working on projects identified within the Shell Creek Watershed Water Quality Plan.
- Update water quality objectives as identified in the Wahoo Creek Watershed and the Shell Creek Watershed Water Quality Plans.
- To increase producer participation in online reporting for entering their data to improve efficiency and quality of data.
- To complete the process of developing a hydro-geological framework utilizing AEM data, boreholes and other geological information.
- To utilize the real-time water level measurement network in Special Quantity Areas for in-season management decisions.

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## **FY 2022-2026 Long Range Ground and Surface Water Objectives**

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- Continue groundwater quality sampling throughout the LPNNRD, both the State-wide network and intensive sampling of selected regional aquifers.
- Continue water quality education programs based on the goals and objectives of the LPNNRD Groundwater Management Area, which includes LPNNRD certification classes for landowners, municipal and industrial water users.
- If needed, designate further Phase II, III & IV boundaries for the Groundwater Quality Management Areas.
- To educate the need for check valves in protecting the aquifer from contamination.
- Continue with nitrogen application demonstrations and participate with demonstrations on integrated pest management and sustainable agriculture.
- Assist in the proper decommissioning of water wells in the district.
- Continue to use GPS to site registered and unregistered wells within the district.
- If necessary, designate Level II and III boundaries within the district to manage declining groundwater levels.
- If necessary, designate new Special Quantity Subareas (SQS) within the district to manage mid summer declines of groundwater energy levels in aquifers that operate under large pressure swings.
- Continue measurement of ground water energy levels in the district.
- Develop a groundwater model for each sub-area. Additional information on water use from all wells will be needed for accurate information.
- Continued partnership with the Eastern Nebraska Water Resources Assessment (ENWRA) and apply information to the glaciated portions of our District.
- Additional studies to identify vulnerable aquifers and modify GWMA rules and regulations to protect these aquifers and

- their long term sustainability. Continue geophysical work, installation of monitoring wells and test holes to better define these vulnerable sub-areas. Additional AEM flights with  $\frac{1}{4}$  to  $\frac{1}{3}$  mile spacing would gratefully assist in defining such areas. Eventually cover the entire District with these detailed AEM investigations.
- Continue using AEM (airborne electromagnetic) information to analyze bedrock aquifers both in water quantity and water quality. Test holes and monitoring wells will have to be installed and sampled to determine these as a possible source of usable groundwater. New management strategies need to be developed for these aquifers such as summer trigger levels for confined bedrock aquifers, especially if these are hydrologically isolated from overlying alluvial aquifers. This could develop into three dimensional management where aquifers at different depths are treated by a separate set of rules for each one. This could become very complex but will likely be the only way to sustain the use of these aquifers far into the future.
  - Install precipitation gauges near monitoring wells in important sub-areas.
  - Utilize the completed Lower Platte River Consortium Study for possible locations for recharge and reservoir sites to better convey water downstream to municipal wellfields.
  - Complete water quality objectives as identified in the Watershed Quality Plans.
  - Continue to update the Groundwater Management Plan to include Integrated Management of surface and ground water. It may be necessary to install additional surface water gauging sites coupled with nearby groundwater monitoring wells as tools for integrated water management.
  - Expand the GWEL network to have continuous recording monitoring wells in each sub-area to better manage the resource with the ability for remote real-time readings. This is especially important

in confined aquifers.

- Continue to update the certification of irrigated acres.
- Continue to assist District communities who have difficulties with water quality and quantity by helping determine rural water system feasibility.
- Keep the Saunders County Rural Water System study as an alternative in the event of changing federal regulations governing municipal water supplies.
- Update the Platte Valley modeling efforts using MODFLOW software. This information will be used to further define the 10/50 boundary line.
- Keep abreast of updates and new iterations of the Elkhorn-Loup Model (ELM) to determine which areas in the Shell Creek watershed are in hydrologic connection with the Elkhorn or Loup River basins.

In summary, the LPNNRD needs to focus on five areas in the next five years:

1. Using information from the AEM flights and test holes, establish a monitoring well network in these confined aquifers to record continuous ground water energy levels. It is midsummer declines (late July to mid-August) when large drops in aquifer pressure can cause some wells to run low on water. Map locations of potential recharge sites. More flights, test holes and/or monitoring wells might be necessary in areas to provide the necessary information.

2. Establish ground water management rules to better address confined aquifers. This could involve comparing spring to summer ground water energy levels and comparing this to the potentiometric aquifer thickness and the depth of bedrock. The current management rules for unconfined aquifers should be adequate for future conditions. These controls are based on three consecutive spring readings at or below their trigger levels in at least 50% of the GWEL wells in a given subarea.

3. AEM flights have given a new interest in bedrock aquifers such as the Dakota formation. Monitoring wells in selected areas are needed to determine the water quality and quantity of these bedrock aquifers. Also are these bedrock aquifers in hydrologic connection to any overlying aquifers? If this is the case and new high capacity wells are being established in these bedrock aquifers then management should shift focus to the more vulnerable aquifer to sustain long term viability of both aquifers. If these bedrock aquifers are isolated from the overlying aquifer then "three dimensional management" where wells are managed differently due to their depth may be in order. This could get complex but management needs to take the chemical and physical characteristics of the aquifer in account. For example, what is the salinity of the groundwater and is the bedrock aquifer cemented, unconsolidated, sandstone, limestone, or shale.

4. Horizontal wells. In the immediate future horizontal high capacity irrigation water wells will likely be established in thin aquifers to increase well output or yield. On the plus side, these could replace several vertical wells that are used in series and therefore be a cost savings to the well owner. On the negative side these could quickly dry up thin aquifers less than 20 feet in thickness and affect nearby wells. How do you manage such a system? At the least you could require 600 feet spacing from any point of the lateral to a neighbor's well but again this may not provide much protection in thin aquifers such as the area immediately west of Fremont. Other management options would be to restrict the number of acres irrigated, restrict the length and direction of the laterals, restrict well output such as limit the gallons per minute, establish water allocation, install monitoring wells such as near the end of the laterals to track groundwater levels, etc.

5. Integrated Water Management. Siting of potential recharge sites, storage reservoirs

(both surface and groundwater), and potential water reuse projects to enhance the water supply in the District. Additional monitoring wells, streamflow gauging, and precipitation sites will likely be necessary. Effects of climate change will also need to be considered as part of integrated water management.



In response to the Erosion and Sediment Control Act (LB 474), passed in 1986, the Natural Resources Commission developed the Nebraska Soil and Water Conservation Strategy. This strategy outlines a course of action for efficiently conserving and managing the state's natural resources.

The Lower Platte North NRD administers the Erosion and Sediment Act and has patterned its local program after the state strategy. The district administers state and local cost-share funds through Soil and Water Conservation Programs (SWCP) to offer incentives to farmers for installation of land treatment practices. LPNNRD staff also worked with NRCS staff to utilize Farm Bill Programs to repair erosion problems.

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## **FY 2021 Soil Conservation Activities**

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### **Soil and Water Conservation Programs (SWCP)**

Under Soil and Water Conservation Programs (SWCP), the LPNNRD administered \$83,029.99 of state funds and \$11,513.56 of local funds for land treatment practices during fiscal year 2021 in cooperation with 13 different landowner projects. In addition, 9 Buffer Strip contracts were administered with \$ 15,008 in state funds.

For fiscal year 2022, \$85,024.81 of state funds (from the Nebraska Department of Natural Resources) and \$25,000 of local funds will be allocated for soil and water conservation practices.

### **Wahoo Creek Water Quality Land Treatment Efforts**

Wahoo Creek in Saunders County, Nebraska, has resided on the Environmental Protection Agency's (EPA) Section 319 list of impaired water bodies. To address the impaired status of Wahoo Creek, LPNNRD in partnership with the U.S. Environmental Protection Agency (EPA)

and the Nebraska Department of Environment and Energy (NDEE) developed the Wahoo Creek Watershed Water Quality Management Plan in 2013. These plans are updated every 5 years and the District will complete another update in 2021. This plan identifies goals to reduce excess phosphorus, nitrogen, soil sediments and E. coli bacteria in the Wahoo Creek Watershed. This plan meets the EPA requirement of containing "Nine Elements" of an effective watershed plan. The plan identifies water quality goals to protect and enhance the quality of all water resources within the Wahoo Creek. Sub-watersheds within the Wahoo Creek Watershed were prioritized for future water quality projects. LPNNRD in partnership with EPA, NDEQ and the Natural Resource Conservation Service (NRCS) identified four Wahoo Creek sub-watersheds as Water Quality Initiative (WQI) areas to receive special EQIP and EPA 319 funding for landowners to complete conservation practices to help achieve the numerous identified water quality goals.

Approximately \$32,185 of 319 Grant Funds in FY 2021 were spent in the Wahoo Creek watershed. These cost-share monies helped construct practices including approximately 7,000 linear feet of terraces, 3,000 linear feet of tile outlets. The Wahoo Creek Grant also included approximately 157 acres in the Lands for Conservation program that helps generate Summer work in the watershed.

In FY 2022, we will complete the Wahoo Creek Watershed Water Quality Plan Phase II, Part B, which is combining \$177,250 of remaining EPA 319 grant funds and \$43,000 of the remaining Nebraska Environmental Trust grant funds. These funds will be used to complete a large Shoreline/Road Stabilization Project at Czechland Lake, Lands for Conservation landowner payments, and for the Wahoo Creek Watershed Plan Update. For example, septic systems that are over 30 years old or have an open discharge are eligible for up to \$4,800 of

cost-share assistance to bring the system up to EPA/NDEE code. To accomplish water quality goals, as outlined in the EPA Water Quality Watershed Plan, is to continue this partnership effort for many years to come. The Railroad Road/Czechland Lake Shoreline Stabilization Project will be completed in the Fall of 2021. This is a cooperative effort between LPNNRD and Saunders County.

### **Shell Creek Watershed EPA Section 319 Water Quality Improvement Efforts**

Shell Creek is a major tributary of the Lower Platte River. Land use in the approximately 305,000 acre watershed is predominantly row crop agriculture. The designated beneficial uses (Primary Contact Recreation and Aquatic Life) of some segments of Shell Creek are impaired by elevated levels of Escherichia coli (E. coli) bacteria, selenium, Atrazine and excessive erosion from storm water flow.

The Shell Creek Watershed Improvement Group (SCWIG) is a volunteer committee that formed in 1999 to lead local efforts to identify problems and to promote implementation of conservation practices to improve water quality in Shell Creek. This evolved into an advisory group to LPNNRD continuing to provide local leadership toward reducing erosion and quality impairments in the watershed. A community-based planning approach was used to gather input from the citizens of the watershed for development of the Shell Creek Watershed Environmental Enhancement Plan that emphasizes combinations of practices that improve water quality. Efforts are underway on the plan update to be completed by the end of 2021.

Over the past 20 years, the Shell Creek Watershed has benefited with over \$2 million in EPA Section 319 funds combined with approximately \$4 million in partnering federal and local funds for assisting landowners in establishing Best Management Practices on their farms. These efforts resulted in Shell Creek becoming the first watershed in the nation to be delisted for atrazine contamination in FY 2018.

In FY 2021, in cooperation with Colfax County, Shell Creek Channel and Bank Stabilization Project near Schuyler north of the Union Pacific Railroad bridge replacement near Colfax County Road 15 was completed. Completion of Shell Creek Channel Improvement and Bank Stabilization will occur south of the railroad bridge to the Platte River will occur in the fall of 2021. In addition, a large Wetland Project was completed in December 2020, in cooperation with a private Platte County landowner. There are over \$390,000 of EPA 319 grant funds and approximately \$14,000 of NET funds remaining to assist with other Shell Creek Watershed projects.

### **Erosion and Sediment Complaints**

The LPNNRD responds to occasional erosion and sediment complaints. In most cases, these complaints are resolved before going through the formal complaint process. Many cases are drainage issues that are resolved between the District and landowners. During FY 2021 the district received no formal complaints, but one verbal and some minor drainage issues.

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### **FY 2022 Soil Conservation Objectives**

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- Use technical assistance from the NRCS in the planning, design, construction, and maintenance of conservation measures applied to the land.
- Use Federal, state and local funds to promote and implement land and water treatment projects in the Dunlap Creek, North Branch and Miller Branch of Wahoo Creek, along with Cottonwood Creek Watershed and Shell Creek Watershed, to reduce erosion and improve water quality.
- Continue encouraging the implementation of summer conservation construction utilizing federal funding within the Wahoo Creek Watershed through the Lands for Conservation program; for FY22 the NRD has approved \$43,050.00 for the set aside of 210 acres.
- Administer \$85,024.81 of State NSWCP

funds and \$25,000 of local cost-share and grant funds to landowners for the construction of terraces, tile outlets, waterways, diversions, small dams, planting of permanent vegetation, and maintaining water quality.

- Continue to promote conservation tillage measures, pasture & range management, sustainable agriculture, and the Conservation Reserve Program (CRP), through news releases and the district's newsletter.
- Recognize the Outstanding Soil and Water Conservationist, at the LPNDRD Recognition Banquet.
- Continue to assist landowners in resolving soil erosion and sediment complaints.
- Provide financial support and staff time to conservation education activities.
- Continue to work closely with locally-led conservation groups to promote soil and water conservation throughout the district.
- Partner with the Shell Creek Watershed Improvement Group (SWIG), EPA/NDEE and NET toward continuing implementation of Best Management Practices in the Shell Creek Environmental Enhancement Plan Implementation.
- Work with NRCS, NDEQ, NET, and Saunders County and the Wahoo Creek locally led Steering Committee in pursuing additional federal and state funds to assist with land treatment practices as defined in water quality objectives in the Wahoo Creek Watershed Water Quality Plan.
- Assist local landowner groups form advising steering committees in the Wahoo and Bone/Skull Creek Watersheds.

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### **FY 2023-2027 Soil Conservation Long Range Objectives**

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- Maintain existing land treatment practices and programs.
- Continue to work with all counties in the district to reduce roadside erosion.
- Administer the NDEQ/EPA 319 Grant

Program to improve water quality throughout Wahoo Creek, Shell Creek priority watersheds.

- Begin implementing Best Management Practices under NDEQ/EPA Corridor Alliance Watershed Water Quality Plan.
- Look for new and innovative soil and water conservation methods.
- Partner with NRCS, UNL Extension and landowners to improve all aspects of their water and soil quality.
- Continue to support the Land and Range Judging Contests.
- Continue targeting SWCP land treatment program funds for priority watersheds in the District.
- Use existing and new technology and GIS software programs for implementing and promoting soil conservation practices.
- Promote the use of and make available soil surveys and land use information.
- Continue to support Locally Led Landowner Groups to promote and implement soil and water conservation practices.



## FLOOD CONTROL & DAMAGE REDUCTION ACTIVITIES

Watershed projects have been completed in five of eleven sub-watersheds (see Appendix E) in the LPNNRD to help reduce floodwater and provide grade stabilization. These completed projects include Bellwood, Clear Creek, Cottonwood Creek, Sand and Duck Creek and Swedeburg watersheds, along with Rawhide Creek. Current high priority flood reduction areas include Shell Creek, Wahoo Creek, Skull Creek and Bone Creek watersheds. On federal and state projects where the LPNNRD acts as project sponsor, the district obtains land rights and mitigates for loss of trees, wildlife habitats and fences destroyed by project construction. The LPNNRD is also responsible for operation and maintenance activities on these projects after they are built.

The LPNNRD offers local assistance for the construction of small dams that can help counties and/or landowners protect county roads, control erosion and provide water for livestock and wildlife.

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### **FY 2021 Flood Control and Damage Reduction Activities**

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#### **Wahoo Creek Flood Reduction Efforts**

In 2017, the Natural Resource Conservation Service (NRCS) approved \$1.5 million under their Regional Conservation Partnership Program (RCP) to assist with planning, design and construction of three Wahoo Creek flood reduction dams, sites 26a, 26b & 27. These dam sites were originally identified as potential projects in the NRCS Wahoo Creek Watershed Plan completed in 1998. The total estimated cost to complete the three dams is \$4.1 million. In addition to RCP funding, there is another \$2.3 million of state funds approved through the Nebraska Department of Natural Resources Water Sustainability Fund, leaving \$1.5 million needed from local sources. An RCP agreement with NRCS was approved in September 2017

to accomplish planning, design, permits and construction of the project.

In the fall of 2017, NRCS approved additional funding for the Wahoo Creek Watershed under the federal Watershed Flood Prevention Operations Program (WFPO), historically referred to as P.L. 566. LPNNRD then entered into a three year agreement with NRCS to use federal funds for watershed planning to include sites 26a, 26b, 27 plus an additional seven remaining Wahoo Creek Watershed flood reduction dam sites (55, 66, 77, 82,, 84, 85 & 86). FYRA Engineering has been assisting LPNNRD with completing the Wahoo Creek Watershed plan which will be submitted to NRCS for approval in the fall of 2021. After watershed plan approval, LPNNRD has hired Olsson (Engineering) for completing the design, permitting, bid letting and construction oversight for dam sites 26a., 26b. & 27, along with designing the other seven dams.

After the watershed plan is approved, dam designs will be completed in 2022- 2023. After the first 3 dams are underway, it is anticipated that future federal and state assistance through the federal WFPO program and the state Water Sustainability Fund will be provided to assist with future construction of the remaining seven additional dams.

#### **Sand Creek Environmental Restoration Project (Lake Wanahoo)**

With the invaluable assistance of numerous local, state and federal partners, 2011 witnessed the completion of construction on Lake Wanahoo's earth embankment. The breakwater feature and the fisheries component were completed a few years prior to the embankment. Recreation components were completed for Lake Wanahoo in FY 2011. Construction of seven upstream flood reduction/environmental enhancement structures were completed in FY 2012 - FY 2014.

In FY19, LPNNRD assumed Lake Wanahoo's

recreation management responsibilities from the Nebraska Game and Parks Commission.

### **Operation and Maintenance**

District staff completed inspections on 45 watershed structures and special projects in the NRD in FY 20/21. These inspections help detect problems before they become serious. Also during the 2020 fiscal year, noxious weeds and volunteer trees were sprayed on 45 dams, Clear Creek Levee and the Rawhide Ditch System. Annual maintenance activities such as removing debris, repairing fences and unplugging risers were completed at many of the dam locations.

### **Army Corps of Engineers 205 Flood Studies**

Over the past few years, the District has partnered with local entities and the US Army Corps of Engineers to study flood protection alternatives for their areas. In 2004, LPNNRD partnered with Fremont, Inglewood and Dodge County to look at a potential levee project to remove areas from the Platte River 100-year ice induced floodplain. In FY 2017, the Fremont study evolved into a General Investigation (GI) Study which determined that there is not a feasible structural solution (levee) to the City of Fremont's flood threat from the Platte River. In 2018 the GI Study evolved back to a 205 Non-Structural Study for the City of Fremont and Dodge County. This effort will continue in FY 2022.

In 2005, LPNNRD entered into an interlocal agreement with the City of Schuyler to evaluate levee protection options to protect the city from flooding from the Platte River and Shell Creek. In FY 2012, the Schuyler 205 Study was completed and entered into the project design phase. In FY 2014 the design phase was completed and LPNNRD assisted Schuyler with obtaining needed land rights for the Shell Creek Levee portion of the project which began construction activities in the spring of 2014 and most construction activities were completed in

the fall of 2015. LPNNRD continued to assist Schuyler in FY 2018 with closing out the project with the Army Corps of Engineers. Schuyler continues to do a good job in maintaining the levee.

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### **FY 2022 Flood Control and Damage Reduction Objectives**

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- Continue with accelerated land treatment efforts in identified priority watersheds in the District.
- Complete biennial inspections on 45 watershed structures; spray noxious weeds & cut and treat trees on 45 dams, Clear Creek Levee and Rawhide ditch; complete regular maintenance activities at all sites.
- Continue to be an active partner on the Joint Water Management Advisory Board to explore flood reduction and drainage solutions in the lower one-third of Dodge County within LPNNRD.
- Partner with the City of Fremont, Dodge County and Papio-Missouri River NRD to establish cameras and water sensors at five locations along the Platte River.
- Partner with Dodge County, City of Fremont, Dodge County, City of North Bend and the North Bend Drainage District toward an eventual FEMA Drainage Improvement Project.
- Partner with City of Fremont, Dodge County and the Fremont Rod & Gun Club on completing the Platte River Levee Breach Repair Project.
- Continue to educate the public on watershed management and flood reduction in LPNNRD newsletters, news releases and our website.
- Cooperate with landowners and counties in evaluating small dam sites for cost-share throughout the district.
- Continue to partner with the Army Corps of Engineers, FEMA, City of Fremont, Englewood and Dodge County on exploring non-structural opportunities for feasible

flood control solutions.

- Support the City of Schuyler for exploring non-structural opportunities for feasible flood control solutions from the Platte River through the LPNNRD District-wide Hazard Mitigation Plan.
- Work with Communities, Counties and other entities on projects identified in our District-wide All Hazard Mitigation Plan.
- Complete the Wahoo Creek Watershed Plan that identifies the future completion of ten flood water reduction dams.
- Complete engineering designs on Wahoo Creek Dam Sites 26a, 26b and 27.
- Begin engineering designs on Wahoo Creek Dam Sites 55, 66, 77, 82, 84, 85, 86.
- Commit funds and staff time toward seeking federal and state funds for constructing the remaining seven unfunded flood water control structures (sites 55, 66, 77, 82, 84, 85, 86) in the Wahoo Creek Watershed.
- Begin the process of updating LPNNRD's district-wide All Hazard Mitigation Plan.
- Work with Dodge County and City of Fremont and other JWMAB members toward the completion of the Rawhide Watershed WFPO Planning efforts.
- Assist Fremont, Inglewood and Dodge County with non-structural flood protection projects as identified by the Army Corps of Engineers study and the Hazard Mitigation Plan Flood Resiliency study.
- Assist Schuyler with non-structural Platte River flood protection project opportunities as they become available.
- Assist District Communities in evaluating future flood protection for their communities through updating the District's Hazard Mitigation Plan and assisting with identified projects.
- Construct Wahoo Creek flood water reduction dams 26a., 26.b and 27.
- Complete engineering designs for eight remaining Wahoo Creek Dam Sites 55, 66, 77, 82, 84, 85 & 86.
- Commit funds and staff time toward obtaining federal and state funds for construction of the ten flood water reduction dams in the Wahoo Creek Watershed.
- Continue to work with JWMAB members on the numerous projects identified as flood reduction/drainage improvement projects.

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### **FY 2023-2027 Flood Control and Damage Reduction Long Range Objectives**

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- Continue to commit funds and staff time toward obtaining additional funding for flood water control/reduction structures in the Wahoo Creek Watershed.
- Continue to budget staff time and funds to maintain and operate completed flood control structures that are sponsored by the LPNNRD.
- Continue to explore flood reduction opportunities for Shell Creek and Skull Creek Watersheds.
- Continue to encourage cities and counties in the district to accept and implement Floodplain Management Authorities.



The district administers several programs designed to enhance the region’s forest, range, and wildlife land, including the Tree Planting Program, Wildlife Habitat Programs with Game & Parks and Pheasants Forever, SWCP Program, and Mitigation Program. The district also sponsors educational activities such as Range Judging and Land Judging contests, and other school-oriented activities.

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**FY 2021 Forestry, Range, and Wildlife Habitat Activities**

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**Tree Program**

One of the most visible and popular programs offered by the LPNNRD is the district’s tree planting program. As a direct result of this program, begun in 1973, an estimated 862,750 trees and shrubs have been planted in the district. Trees and shrubs may be obtained from the NRD for windbreaks, shelterbelts, wildlife habitat, woodlots, and Christmas tree plantings. Besides providing a planting service, the NRD also designs tree plans and offers technical advice on ground preparation for tree sites.

During the spring of 2021, 6,215 trees and shrubs were distributed to District residents. Of this total, 5,245 were planted by the NRD field crew at 12 sites.

**Wildlife Program**

Lower Platte North continues to encourage landowners to set aside land for wildlife habitat by using Federal Programs and Programs provided by Nebraska Game & Parks and Pheasant Forever. Programs such as Corners For Wildlife and Wild Nebraska.

The district assisted with one Corners for Wildlife payment in FY 2020-2021.

**Community Forestry Program**

In FY 2020-2021 LPNNRD donated 900 seedlings for children in Fremont, and Newman Grove and provided trees to Conservation Sensation and Fremont EcoFair for educational purposes. The District budgets \$2,000 for Community tree development projects. The District assisted the American Legion Post in Newman Grove with their RollCall Veterans Memorial for Community Forestry funding.

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**FY 2022 Forestry, Range, and Wildlife Habitat Objectives**

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- Plant and distribute conservation trees and shrubs through the district’s Tree Planting Program.
- Continue to include tree planting as an eligible cost-share practice under the SWCP program.
- Offer trees and give staff presentations to elementary students across the district.
- Assist cooperators to sign up for Wildlife Programs.
- Cooperate with the Extension Service and the NRCS in obtaining tree orders from District residents.
- Recognize a cooperator for outstanding tree planting efforts at the Recognition Picnic/Banquet.
- Provide cost-sharing for the conversion of cropland to grassland through the SWCP program.
- Cooperate with Pheasant Forever Chapters to enhance wildlife habitat and establish windbreaks.

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**FY 2023-2027 Forestry, Range, and Wildlife Habitat Long Range Objectives**

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- Sell as many trees and shrubs each year

through the district's Tree Planting Program, and to plant as many trees and shrubs for qualified property owners.

- Provide information and education on tree planting, woodland management, grassland management, and proper wildlife habitat enhancement through the media, tours, and schools.
- Continue to administer Wildlife Habitat programs in cooperation with the Nebraska Game and Parks Commission and other partnering entities as opportunities arise.

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## FY 2021 Recreation Activities

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### **Czechland Lake Recreation Area**

Czechland Lake Recreation Area is a multipurpose project located one mile north of Prague, Nebraska on Highway 79. Flood control, recreation and education are the main benefits of the project. Located at a convenient distance from Omaha, Lincoln, Fremont and Wahoo, the 85 surface acre lake is situated on 265 acres of public access land operated and maintained by the LPNNRD.

State park permits and fees are not required for entrance to the area. Czechland Lake has 11 electrical camper pads at an \$18/night fee for the use of a camping pad. There are also three non-electrical pads. A Nebraska Fishing License is required for anglers. The lake fishery is managed by the Nebraska Game and Parks Commission, which stocks and monitors fish populations. Catfish, Bluegill, Northern Pike and Largemouth Bass were initially stocked in Czechland Lake.

Originally built as one of twelve floodwater structures in the Cottonwood Creek Watershed, Czechland Lake has developed into one of the area's most popular recreation spots. The reservoir and recreation area development was built at a total cost of \$1.8 million. Funding for the project was shared by the Nebraska Natural Resources Commission, Saunders County, USDA Natural Resources Conservation Service and LPNNRD. Grant monies from the U.S. Environmental Protection Agency have been used to reduce nonpoint source pollution entering the lake and to provide educational resources.

The Czechland recreation area was used extensively during FY 2021 generating approximately \$18,000 in camping revenue. Mowing, trash removal, repair and upkeep of park equipment, and thistle control kept LPNNRD park staff very busy during the spring and summer.

### **Homestead Lake (Skull Creek Site #55)**

Construction was completed on Homestead Lake in 2001. The dam offers flood control for nearby communities, and has been developed for public recreation. Recreation facilities include a shelter, restroom, picnic areas, a boat ramp, and hunting areas. FY 2021 proved to be another very popular year for recreators as the area was extensively used.

### **Lake Wanahoo**

Work was completed on recreation facilities at Lake Wanahoo one mile north of Wahoo in FY 2012. Recreation facilities at the 1,600 acre site straddle the 662-acre lake, with camping and boating access on the west side and a day use area on the east. A rocky hiking/biking trail winds throughout the park, linking the east and west side recreation areas over a breakwater levee one mile north of the dam. Mowed trails north of the levee provide access to undeveloped areas set aside for wildlife habitat.

The camping area contains 75 camper pads, 54 tent camping sites and 6 primitive cabins. All camper pads are equipped with electrical hookups and are rock surfaced. All sites, electrical, cabin and tent have fire rings and picnic tables.

The recreation area offers access to two large boat ramps wide enough to accommodate four boats at a time. Boating on the entire lake is no-wake only.

The day use area on the east side of the lake has two large picnic shelters and two smaller ones, all offering scenic views of the lake. In FY 2017 a dump station for RV's was constructed on the east day use area as well as a disc golf course/nature educational trail.

Both the camping and day use areas provide excellent fishing access, with a total of seven fishing jetties. One jetty on each side has an attached handicapped pier. The lake was

stocked with largemouth bass, bluegill, blue catfish, crappie, northern pike, and walleye beginning in 2008.

Limited hunting opportunities will continue to be available at Lake Wanahoo through the Game & Parks Commission PATH Program, where adults can schedule a time to mentor a youth hunter at designated hunting sites north of the recreation area.

The Lake Wanahoo Recreation Area was opened to the public in spring 2012. An operation and maintenance plan was developed with the assistance of the Nebraska Game and Parks Commission and Pheasants Forever in FY 2014 which identified activities that were implemented in 2015 .

In FY 2019, LPNNRD assumed the responsibilities of administering Lake Wanahoo as a public recreation area from the Nebraska Games & Park Commission.

In FY 2020, the Clint Johannes Education Building was completed on the day use portion of the recreation area. This facility provides a protected outdoor education space for LPNNRD education activities, as well as a rentable event facility for the public. Also in FY 2020, six new primitive cabins were installed in the primitive camping portion of the park to give visitors a unique alternative to tent camping.

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### **FY 2022 Recreation Objectives**

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- Continue to budget funds for maintenance, including grass mowing, tree trimming, grading roads, outhouse cleaning, trash removal, painting and noxious weed control, at Lake Wanahoo, Czechland Lake and Homestead Lake Recreation Areas.
- LPNNRD will continue managing all recreation at the Lake Wanahoo recreation area.

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### **FY 2023-2027 Recreation Long Range Objectives**

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- Continue to evaluate the development of new outdoor public recreational opportunities as they arise.
- Continue to assist NE Game & Parks and Pheasant Forever in developing new areas offering public access.



It is the general policy of the LPNNRD not to provide financial assistance for drainage improvement and channel rectification unless a project has public benefit and is sponsored by a county, city, Drainage District or a group of landowners through an established Improvement Project Area. Under this policy, the district has cooperated on several projects that have provided public benefit.

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### **FY 2022 Drainage Improvement & Channel Rectification Objectives**

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- Work with Colfax County to complete the Shell Creek South Channel Improvement/Benching Project.
- In partnership with the North Bend Drainage District, Dodge County and City of Fremont, support the drainage improvement project assessment of the North Bend drainage ditch through FEMA.
- Continue to oversee the progress of the Rawhide Creek West Branch Project to ensure that landowners control vegetation on Rawhide Creek to help it stay clean.
- Provide continued assistance to Platte Center with stabilizing a segment of Elm Creek.
- Work with local landowners and Colfax County to improve Shell Creek flows east of Schuyler.

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### **FY 2023-2027 Drainage Improvement & Channel Rectification Long Range Objectives**

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- Evaluate potential technical and funding assistance to counties, cities and other entities in the district that sponsor sound drainage and channel improvement projects.



## WASTE DISPOSAL & POLLUTION CONTROL

Over 30 years ago, vast changes occurred in Nebraska's solid waste regulations. Landfills that weren't properly designed, operated or sited were required to shut down, as were unauthorized dumps. In order for a landfill to operate, it must be approved by the State and receive a permit. If a permit is not issued, the landfill cannot legally operate. Currently, the only permitted landfill in the Lower Platte North NRD is a facility near David City.

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### **FY 2022 Waste Disposal & Pollution Objectives**

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- Promote recycling efforts in the district through education programs, newsletters, and news releases.
- Participate in education efforts to promote the reduction of pollution to our air, water, and soil resources.
- Cooperate and be supportive of other group and agency pollution control efforts, education, and/or regulation.

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### **FY 2023-2027 Waste Disposal & Pollution Long Range Objectives**

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- Assist and encourage all District communities in establishing collection locations for recyclable wastes.
- Assist District cities and counties in establishing pickup days for hazardous household and farmstead wastes as opportunities arise.
- Promote waste reduction efforts in the district through education and incentives.



A major responsibility of the Lower Platte North NRD is to keep the public aware of the district's various projects and programs, and to inform and educate children and adults about the wise use and management of our natural resources.

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### **FY 2021 Information & Education Activities**

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During fiscal year 2021, the Lower Platte North NRD conducted many activities to help residents learn the importance of our soil and water resources and to stay informed of issues and concerns regarding natural resources. Some of the highlights included:

#### **Publications and Marketing**

In FY 2012, the district switched distribution of "The Viaduct" newsletter from direct mail subscriptions to inserts in area newspapers. In FY 2021, more than 26,000 copies of the newsletter were distributed in area newspapers and via email.

Various brochures describing LPNNRD programs and services were updated as needed in FY 2021. These brochures are displayed in the office and distributed during LPNNRD sponsored events and exhibit booths. A Fact Sheet for use with the NARD's public relations campaign at public events is updated yearly.

Press releases are distributed to district papers and radio stations. Numerous ads spotlighting different NRD programs and upcoming deadlines air on KTIC Radio throughout the year. Digital ads on the Wahoo newspaper website continued in FY 2021. In FY 2020, the LPNNRD began airing 30-second program commercials on News Channel Nebraska. The Lake Wanhoo commercial aired during the summer of FY 2020. In FY 2021, the LPNNRD aired the newly produced Projects video, and Operations and Maintenance video,

along with the Lake Wanhoo video.

The NRD continues to maintain information and education outreach for the district through the use of social media outlets on Facebook, Twitter, and YouTube. Photos, videos and information is updated and maintained bi-weekly.

#### **Website**

The NRD's website at [www.lpnrd.org](http://www.lpnrd.org) contains information on nearly all of the district's projects and programs, along with staff and director information, committee and board meeting minutes, and more. Online application and registration forms for various projects and programs are available as well. Online payment capabilities continue to allow customers to pay for trees, rural water bills, and Lake Wanhoo permits. In 2019, the district began tracking the activity on the website including which pages are viewed to help keep current information available online. The website continues to be updated to allow for different types of viewing devices – desktop, mobile and tablet devices.

#### **Video Promotion**

During FY 2018, the district worked with redthread to create a 1 minute and 30 second video that promotes the conservation efforts of the district. The video is very unique to the Lower Platte North NRD because no professional acting or voice talent was hired for the video. A past director, current director, and current staff are featured in the video. The children of a current employee and a current director were also featured in the video.

During FY 2019, redthread created a promotional video for the Lake Wanhoo NRD Recreation Area. With the need to bring nature and outdoor recreation to people during the pandemic, the commercial was featured in 30-second spots on News Channel Nebraska during the summer of 2020.

KLKN produced a video to promote

LPNNRD's water conservation efforts. The video featured LPNNRD Water Department staff and various water quality and quantity efforts.

During FY 2020, redthread created a promotional video for the duties and responsibilities of the Operations & Maintenance department, and a video to promote the activities of the Projects department. The videos featured current staff, and the video was narrated by a current LPNNRD director.

The LPNNRD plans to create a video for the Information and Education department during FY 2022. This video will focus on the district's information outreach efforts and environmental education. Once completed, clips from the department videos will be combined to create another video that will feature all of the programs at the LPNNRD.

These videos are shown as commercials through area television stations, educational purposes for presentations and featured on social media platforms.

## **Education Programs**

During FY 2021 the district continued with two year-long programs. The St. Wenceslaus Pre-kindergarten students learn about wildlife, trees, birds, recycling and water conservation through books, pictures, stories, and hands-on activities. The students also came out to Lake Wanahoo at the end of the year for a field trip filled with nature hikes and disc golf. The district teamed up Wahoo Public 8th Grade students for the Survival Club program, making a total of three full school years of the program. LPNNRD staff and other outdoor enthusiasts meet monthly with students during the school year to learn about hiking, knot tying, 2-legged predators, 4-legged predators, fishing, first aid, foraging for wild foods, fire building and other outdoor survival skills. Towards the end of the school year, the Survival Club meets at Lake Wanahoo for a year-end campout to test their new outdoor skills. The year-end campout was not held in 2021.

The district continues to participate in

the Career Exploration Opportunities (CEO) Program with Wahoo Public Schools. During the Spring semester of 2021, LPNNRD staff hosted one high school senior and he rotated between each department to learn about the LPNNRD responsibilities.

Since the completion of the Education Building on the East side of Lake Wanahoo, the LPNNRD staff has been able to hold events in conjunction with area teachers and students for hands-on education. LPNNRD staff started a monthly educational event, "Coffee, Lakeside," that has discussed topics such as gardening activities, migratory birds of Lake Wanahoo, fishes of Nebraska, tall-grass prairies, bats of Nebraska, and lake ecosystems.

The Lower Platte North NRD and Lower Platte South NRD rotate in hosting the East Central Land Judging Contest. Land Judging is a competition for high students that challenges them to gain a better understanding of soil structure and land evaluation. The Lower Platte North NRD works with local NRCS employees to choose a site location and help with site preparation. On October 6, 2020, the Lower Platte North NRD hosted the East Central Land Judging contest with special modifications to accommodate school guidelines and area health department guidelines. Over 180 students from 11 FFA chapters competed at the contest near Prague. The Lower Platte North NRD staff and NRCS staff assisted in the preparation, contest monitoring, and scoring efforts during the contest. The East Central Land Judging Contest will be held by Lower Platte South NRD in October 2021.

The annual LPNNRD Spring Conservation Sensation celebrated its 30th anniversary this year! Fifth and sixth grade students from Saunders, Butler, and Dodge Counties participated in various activities. Hands-on activities were presented by LPNNRD staff, additional personnel from various agencies and organizations, and volunteers to teach students about the environment, natural resources, tree planting, lake ecosystems, wildlife education and more.

The Outdoor Recreation Youth Workshop coordinated by the LPNNRD and Saunders County UNL-Extension was held at Lake Wanahoo. 4H students and other participants who attended learned a variety of outdoor recreation activities including how to kayak, how to play disc golf, how to start campfires, and they also had the opportunity to learn about owls by dissecting owl pellets. The other event coordinated between LPNNRD and Saunders County UNL-Extension is the Saunders County Youth Ag Tour, and due to low numbers, that was canceled.

Test Your Well Event is a program that partners with area FFA chapters to host public events, providing nitrate testing on water samples from private wells at no cost to the attendees. The district held an event with East Butler where over 50 water samples were collected and tested by the FFA students.

District staff provided various presentations and activities during natural resources festivals, field days, out-of-school time programs, school classrooms, online activities on the LPNNRD website, and adult education events. As a result of the district's educational outreach efforts, there was interaction with approximately 809 youth and 43 adults in FY 2021.

### **Awards, Contests, and Events**

The LPNNRD provided a display at the 2021 Butler County Fair. Most of the County Fairs in the District did not offer booth space due to the lingering effects of the pandemic. The LPNNRD plans to provide displays at up to five area county fairs, and agriculture related events in the district in the future.

The LPNNRD provided assistance through preparation and completion during the 2021 NCF-Envirothon Virtual Contest. Staff helped to prepare media and advertising, prepare packages for contestants, and help with judging the oral presentations. The NCF-Envirothon was postponed from 2020 due to the pandemic, and for safety precautions, was held virtually in 2021.

In FY2021, LPNNRD directors voted to

rename the Lake Wanahoo Education Building to honor a former influential LPNNRD director. In a unanimous vote, the building was renamed to the Clint Johannes Education Building at Lake Wanahoo. An open house and dedication ceremony was held in August 2021. The LPNNRD holds environmental education programs for all ages throughout the year at the building for special programs and events with area schools, and outside-of-school groups.

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### **FY 2022 Information & Education Objectives**

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- Publish the district newsletter "Viaduct" biannually in an electronic format and as a printed newspaper insert in 10 area newspapers.
- Send timely news releases to the local media on various LPNNRD programs, projects, and activities.
- Disperse pamphlets and other publications about LPNNRD programs.
- Update the district's website frequently.
- Continue to provide a display at county fairs (up to five major counties) within the district.
- Continue information and education outreach for the district through the use of tools such as local radio stations, local tv stations, and social media outlets (Facebook, Twitter, YouTube, etc.).
- Continue with the annual awards and recognition program.
- Provide district elementary students with free trees, as requested, in the spring.
- Provide LPNNRD staff as requested to speak to community organizations and schools on NRD activities and environmental topics.
- Provide various education programs, events, and activities to area schools and out-of-school time programs.
- Provide assistance for the East Central Region Land Judging Contest in the fall of 2021, hosted by Lower Platte South NRD.
- Host the 31st Annual Spring Conservation

- Sensation in May 2022.
- Develop new programs and promotional projects to aid in outreach efforts of the district.
  - Develop a video for the Information and Education department.
  - Provide assistance and publications for the students involved in the Shell Creek Watershed Monitoring Program.

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### **FY 2023-2027 Information & Education Long Range Objectives**

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- Search for new and effective ways to inform and educate the public on the NRD purpose and programs.
- Participate with the Information & Education Staff Group to coordinate statewide I&E activities and produce statewide products.
- Increase participation in activities sponsored by other agencies related to NRD responsibilities.
- Seek to have conservation/environmental education as a part of the school curriculum.
- Support environmental education activities and events throughout the district, and neighboring NRDs.
- Provide assistance for the East Central Region Land Judging Contest in the fall of 2022, hosted by Lower Platte South NRD.
- Assist in the development of an outdoor classroom for a district school.
- Partner with district schools to host Test Your Well Events annually.



## LPNNRD Staff

The staff of the Lower Platte North NRD includes 17 full-time and part-time employees stationed at the district office in Wahoo. The NRD administers a full-time field technician, four field office assistants in Natural Resource Conservation Service county offices, and a Recreation Facilitator for Czechland & Homestead Lake Recreation Areas.

In addition to the listed full-time and part-time positions, the district employs seasonal conservation technicians to assist in the layout of land treatment structures. There are also seasonal summer employees hired to help with Lake Wanhoo, water sampling, tree planting and maintenance of LPNNRD projects. Personnel positions and assigned responsibilities could increase in the future as increased project and program responsibilities increase.

### Current staff as of September 1, 2021:

Sydney Abbott, **Education Coordinator**  
 Daryl Andersen, **Water Resources Manager**  
 Tyler Benal, **Water Resources Specialist**  
 Jill Breunig, **Bookkeeping Department Head/Administrative Assistant**  
 Will Brueggemann, **Water Resources Specialist**  
 Duke Dokulil, **Operations & Maintenance Technician**  
 Sean Elliott, **Projects/Rural Water Manager**  
 Eric Gottschalk, **General Manager**  
 Bob Heimann, **Operations & Maintenance Manager**  
 David Moore, **Operations & Maintenance Technician**  
 Tom Mountford, **Assistant General Manager**  
 Russell Oaklund, **Lead Water Resources Specialist**  
 Dave Odvody, **Recreation Facilitator**  
 Chris Poole, **Grants/GIS Department Head**  
 Karen Rezac, **Department/Administrative Assistant**  
 Lacey Sabatka, **Information Coordinator**  
 Bret Schomer, **Wanhoo Recreation Supervisor/Water Resources Specialist**

### Staff Support for NRCS Offices:

Vacant, **Conservation Technician**  
 Kimberly Piitz, **NRD/NRCS Field Office Assistant (Butler County)**  
 Kristin Miller, **NRD/NRCS Field Office Assistant (Colfax County)**  
 Luz Schafersman, **NRD/NRCS Field Office Assistant (Dodge County)**  
 Marla Milliken, **NRD/NRCS Field Office Assistant (Saunders County)**  
 Melissa Foreman, **Shell Creek Watershed Coordinator (LPN & SCWIG Volunteer)**



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### **FY 2022 Financial Objectives**

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- Funding required for the LPNNRD projects and programs for Fiscal Year 2022 requires a general operating budget of \$7,782,546 of which \$3,458,000 is required from the district's local tax levy. The 2022 tax levy of .033457 cents per \$100 actual valuation is required from District property. Projected expenses and income for FY 2022-2027 are shown in Appendix F.
- A tax levy of .03345 means that an owner of a \$150,000 home will pay \$50.19 in NRD taxes in FY 2022. An owner of farm land valued at \$7,000 per acre will pay \$2.34 an acre/year to the NRD in FY 2022. The LPNNRD levy represents about two percent of the total property tax collected.

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### **FY 2023-2027 Financial Long Range Objectives**

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- Although it is expected that the amount of revenue from all sources will fluctuate during the next few years, it is anticipated that the LPNNRD will operate at a mill levy between \$0.035 and \$0.055 per \$100 actual valuation as the District continues to assist with flood reduction project priorities and addresses our responsibilities with groundwater water quality and quantity management.

## APPENDIX A - Estimated Population by County



COUNTY	% OF COUNTY IN DISTRICT	ACRES IN DISTRICT	RURAL POPULATION IN DISTRICT	URBAN POPULATION IN DISTRICT	TOTAL
Boone	12.78	56,175	231	--	231
Butler	44.38	167,700	1,863	3,724	5,587
Colfax	40.76	108,582	1,218	6,379	7,597
Dodge	31.96	111,147	3,075	27,923	30,998
Madison	6.25	22,998	129	721	850
Platte	37.78	165,401	2,222	637	2,859
Saunders	81.39	395,098	7,028	8,313	15,341
<b>TOTAL</b>		<b>1,027,101</b>	<b>15,766</b>	<b>47,697</b>	<b>63,463</b>

Twenty-eight cities, towns and villages are located within the Lower Platte North NRD, listed below with their populations (according to 2010 United States Census):

Abie .....	69	Memphis.....	114
Ashland .....	2,453	Morse Bluff .....	135
Bellwood.....	435	Newman Grove .....	721
Bruno .....	88	North Bend .....	1,177
Cedar Bluffs .....	610	Octavia .....	127
Colon.....	110	Platte Center .....	336
David City.....	2,906	Prague .....	303
Fremont .....	26,397	Richland .....	73
Inglewood .....	325	Rogers.....	95
Ithaca .....	148	Schuyler .....	6,211
Leshara .....	112	Tarnov .....	46
Lindsay .....	255	Wahoo .....	4,508
Linwood .....	88	Weston .....	324
Malmo .....	120	Yutan.....	1,174
Mead.....	569		

Projects started:

Yield Goal vs. Actual Yield.

Are yield goals appropriate for the actual yield producers are seeing?

Putting together 3-5 year Yield averages

Get fertilizer prices on average and build excel calculator for producers

Field Climate

Monitoring Metos units out in the field/diagnosing problems if possible

Helping other water staff with firmware updates/Teaterm checks out in the field

Organic Matter

Started gathering Organic Matter data from phase reports from past years and mapping out what regions of our phase areas are higher in Organic Matter

General Database Work

Cleaning up tasks/workflow dashboard as things get done. Start working with new reports coming in for this reporting year.

Clean up People database

Work with producer side of site as things go from beta site to live site.