



LOWER ELKHORN

Natural Resources District



Lower Platte River Basin Coalition Plan – Annual Report (March 2021)

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1.0 Introduction

The Lower Elkhorn Natural Resource District (LENRD) covers approximately 2,591,300 acres; with predominant land uses divided among agriculture (76%), pasture/grassland (20%), and small areas of forests, open water, wetlands, and urbanized areas (<4%).

The District’s Board of Directors approved the interlocal agreement which effectively adopted the Lower Platte River Basin Water Management Plan on November 21st, 2017. This action, along with the six other Natural Resource Districts and the Nebraska Department of Natural Resources, set forth a collective effort to work cooperatively towards the management and development of the water resources within the Lower Platte Basin.

Since 2009, the Lower Elkhorn NRD has utilized a managed-growth philosophy when considering the decision to allow new groundwater uses for agricultural irrigation purposes. Prior to December of 2008, no restrictions were in place that limited property owners regarding the development of agricultural land for irrigation purposes. Current policy requires an approved variance from the District before expanding groundwater use for irrigation purposes. This requirement has been in place since April of 2009 within the LENRD. No limitations have been enacted on the approval of permits for high-capacity groundwater wells for other uses, such as commercial, industrial, livestock, or municipal wells, however, any request to construct a new well for any of those purposes is reviewed for any potential impacts to existing groundwater supplies and/or impacts to groundwater quality prior to approval.

The Lower Platte River Basin Water Management Plan provides guidance to the partners in respect to the amount of (excess) available water that can be allotted for new uses (depletions). Coalition partners have, in return, agreed to adhere to the suggested limits for the first five-year increment of the plan. Table 4.1 (below) lists the allowable depletions for each sub-basin of the Lower Platte Basin and Table 4.2 of the Plan (below) breaks it down into the available amount for each Natural Resource District. As listed in Table 4.2, the amount of water available during the first five-year increment, to be shared between the Lower Elkhorn Natural Resource District and the Nebraska Department of Natural Resources is 4,514 Acre-Feet of allowable new depletions.

TABLE 4.1. FIRST 5-YEAR INCREMENT ALLOWABLE DEVELOPMENT (DEPLETIONS) BY BASIN	
Basin	First 5-year Increment Allowable Development (Depletions) - Peak Season (AF) ^{1/2}
Loup Basin	8,651
Elkhorn Basin	6,018
Lower Platte Sub-basins	4,138

TABLE 4.2. FIRST 5-YEAR INCREMENT ALLOWABLE NEW DEVELOPMENT (DEPLETIONS) BY NRD			
NRD	Sub-Basin	First 5-year Increment Allowable New Development (Depletions) - Peak Season ¹	
		% Sub-Basin	AF
Upper Loup NRD	Loup River	32%	2,768
Lower Loup NRD	Loup River	68%	5,883
Upper Elkhorn NRD	Elkhorn River	25%	1,504
Lower Elkhorn NRD	Elkhorn River	75%	4,514
Papio-Missouri River NRD	Lower Platte River	21%	869
Lower Platte South NRD	Lower Platte River	24%	993
Lower Platte North NRD	Lower Platte River	55%	2,276

¹The allowable new depletion is for all new uses. Apportionment between new surface water and groundwater uses will be made according to each individual NRD Integrated Management Plan.

This report and its content will serve to fulfill the annual data collection and reporting requirement of the Lower Platte River Basin Management Plan for the LENRD for the year 2020, as required in *Section 5.0 – Plan Review and Monitoring, Lower Platte River Basin Management Plan*.

2.0 Certified Irrigated Acres

The District formally began the process of certifying irrigated acres in January of 2013. Since that date, the District has formally certified 7,992 irrigated tracts of private property that have associated irrigated acres and meet the pre-determined criteria for certification purposes.

Rule 14 of the Lower Elkhorn Districts Rules & Regulations for the Enforcement of the Nebraska Groundwater Management and Protection Act indicates that the District will certify, as irrigated, any tract of land greater than two acres that (1) has been irrigated any one out of ten years, from 1999 to 2008, (2) is currently enrolled in a federal, state, or local conservation program and was classified as irrigated land by the local County Assessor within one year prior to being enrolled in such a program, (3) has otherwise been allowed to develop under an approval granted by the District’s Board of Directors since 2007, (4) has otherwise been allowed to develop under an approval granted by the NDNR since 2007, or (5) is irrigated by wastewater effluent from a livestock operation or municipality that is operating in compliance with a Clean Water Act permit.

Table 1. – LENRD Certified Irrigated Acres

LENRD CERTIFIED IRRIGATED ACRES BY SOURCE				
	GROUNDWATER	SURFACE WATER	WASTEWATER	TOTAL ACRES BY COUNTY
ANTELOPE	468.39	-	-	468.39
BURT	15,952.43	1,077.36	1,505.06	18,534.85
CEDAR	48,578.04	529.80	432.94	49,540.78
COLFAX	24,438.30	407.87	2,249.11	27,095.28
CUMING	56,921.41	1,987.32	14,171.63	73,080.36
DAKOTA	-	-	-	-
DIXON	15,267.06	422.12	191.79	15,880.97
DODGE	65,574.75	3,709.99	2,428.12	71,712.86
KNOX	11,189.86	70.00	-	11,259.86
MADISON	119,732.09	2,210.25	3,268.38	125,210.72
PIERCE	155,363.54	1,478.37	476.94	157,318.85
PLATTE	23,956.59	-	2,190.44	26,147.03
STANTON	38,719.65	1,287.18	1,789.69	41,796.52
THURSTON	11,618.63	373.87	502.04	12,494.54
WAYNE	48,763.99	913.42	1,761.00	51,438.41
TOTAL IRRIGATED ACRES BY SOURCE	636,544.74	14,467.55	30,967.14	
TOTAL IRRIGATED ACRES	681,979.43			

As indicated by the data in Table 1, groundwater is the primary water source for agricultural irrigation in the Lower Elkhorn NRD with current inventory totaling **636,544.74** acres irrigated by this source. **Note: This current inventory only includes a portion of the total new irrigated acres approved in conjunction with the Lower Platte River Basin Management Plan, since only a portion of the new irrigated acres have been formally certified as irrigated acres by the District.**

The District is also home to many livestock operations; species include: beef cattle (feedlot and cow/calf), dairy, swine, and poultry operations; for both egg and meat-bird production. Current production trends for livestock and poultry operations indicate that large numbers of animals are situated on individual farms, which will require large volumes of water necessary for production. Many of these operations are also required to have operating permits to comply with the Clean Water Act requirements. Some of these locations will apply groundwater, as necessary, alongside animal waste/lagoon effluent for irrigation of growing crops.

To date; certification records show that surface water irrigation comprises the smallest increment of the total irrigated acreage in the District, estimated at **14,467.55 (down 1,339.11 from previous report)**. Commingled sources of water have been tracked through the process

of certification of acres, and current data indicates there are approximately **14,386** acres of land that are listed as utilizing both groundwater and surface water for irrigation sources.

3.0 Municipal, Commercial/Industrial and Livestock Uses

Prior to January 1, 2019, the District has only required the reporting of annual groundwater usage reports from new Municipal, Commercial/Industrial, and Livestock wells that were constructed with an approved permit, dated July 29th, 2007 or later. However, recent modifications to the Lower Elkhorn Natural Resource District Groundwater Management Plan Rules & Regulations requires the installation of a Flow Meter for wells classified as Commercial/Industrial, Livestock, and Municipal use by January 1st, 2019. Also required is the annual reporting of groundwater usage data on all wells classified for these other uses beginning January 1, 2020 (see **Appendix A**).

4.0 New Groundwater Consumptive Uses

Previous to participation in the Lower Platte River Basin Management Plan, the only accounting for new groundwater consumptive uses by the Lower Elkhorn Natural Resource District would be the new irrigated acres located within the hydrologically connected areas authorized by an approved Variance from the District, and most importantly those acres approved under the prior requirements of LB 483. The District has required an approved variance to expand irrigated acres districtwide since early 2009. A variance is required for both the Hydrologically Connected and Non-Hydrologically Connected portions of the District, which under the current boundaries (as recognized by the District and the Nebraska Department of Natural Resources) equals approximately a 1/3rd (Hydrologically Connected) and 2/3rd (Non-Hydrologically Connected) split.

In August of 2020, the Lower Elkhorn Board of Directors once again authorized a sign-up period to receive applications for Standard Variances to Expand Irrigated acres within the District. This authorization would allow for the development of up to 295.00 AF of new peak season depletions within the hydrologically connected portion of the district and up to 2,500 new irrigated acres in the non-hydrologically connected area.

In November of 2020, the Board of Directors voted to allow up to **286.42** acre feet of new peak season depletions in the *hydrologically connected portion* of the District, and up to **2676.77** new groundwater irrigated acres in the *non-hydrologically connected* portion of the District. ***For accounting purposes, at this time only the new depletions located with the current hydrologically connected portion of the LENRD are accounted for and reported to the Coalition. Any future boundary amendment will require the LENRD to account for any new depletions approved outside of the current hydrologically connected area, dating back to the beginning of the first increment (2016).***

The attached spreadsheet (**LENRD_Appendix B_New Depletions**) lists the site specific information for each allowed new depletion.

3422.70 AF Available – 286.42 New Depletions (LENRD) = 3,136.28 AF Remaining

5.0 Transfers

The Lower Elkhorn Natural Resource District did not receive or approve any groundwater use transfer requests during this reporting period, therefore no data is provided for this section.

6.0 Permits for High Capacity Wells

The attached table entitled **LENRD_Well Permits_2020** lists the well permits issued for 85 high capacity wells in the Lower Elkhorn NRD between January 1, 2020 through December 31, 2020. A breakdown of this inventory includes permits for: irrigation (76 – 18 replacement well permits), commercial/industrial (3), livestock (3), public water supply (2), and fire protection or other (1).

7.0 Retirement of Groundwater Consumptive Uses

During the 2020 reporting period, there were no retirements of groundwater uses inventoried or reviewed within the Lower Elkhorn NRD.

8.0 Flow Meter Data

As of January 1, 2019, all active high-capacity wells are required to be equipped with a flow meter to measure the total annual groundwater withdrawal, and to report water-use readings to the LENRD by December 1 of each calendar year. The water use information is inventoried into a central data management system that was developed for the LENRD by Phoenix Webgroup (PWG) of Waverly, NE. This data management system, which houses the information from over 5,000 flow meters, also contains a user interface that allows well owners or operators to submit their information using a web-based interface.

Water use information on flow meters associated with irrigation use for the 2020 pumping season, is itemized in **three Excel Spreadsheets (LENRD_2020 Water-use_Nonsubarea), (Eastern Madison Subarea_2020_Water-use), (Wayne Subarea_2020_Water-use)** .

9.0 Water Banking Activities

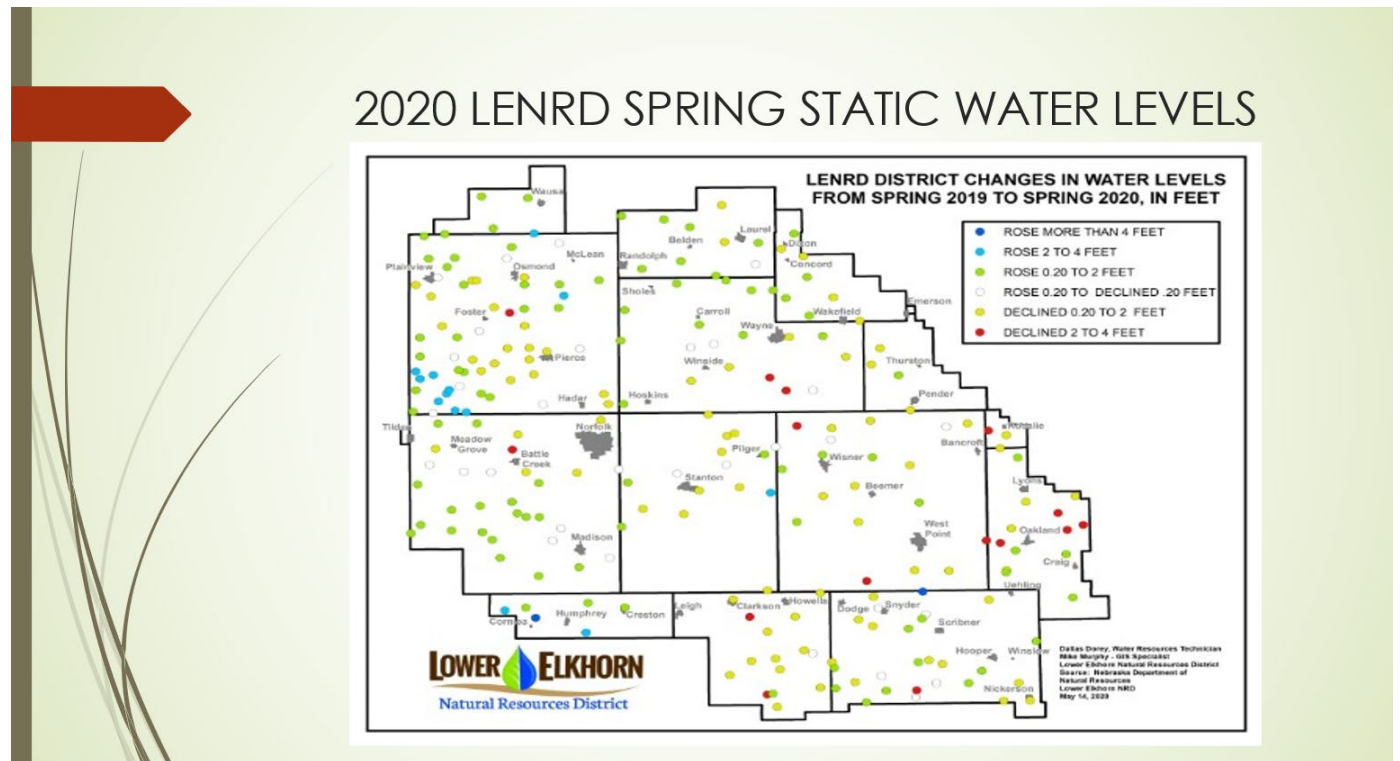
The Lower Elkhorn NRD does not currently participate in any water banking activities and therefore no data exists for this reporting requirement.

10.0 Stream-flow Accretion Activities

Within the Lower Elkhorn NRD there are currently no operating projects that would create reporting data associated with stream flow augmentation or to compensate for any conjunctive management requirements.

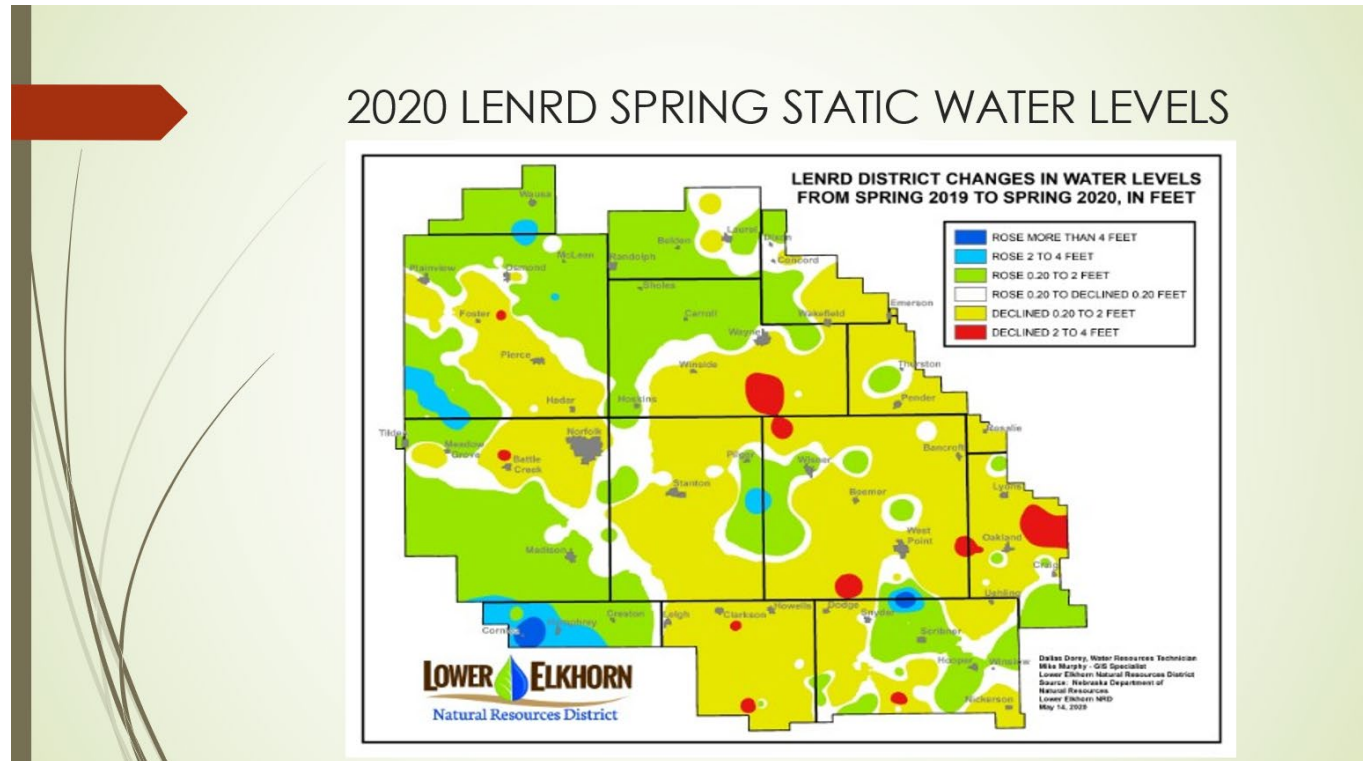
11.0 Groundwater Elevation Observations

The District collects annual water-level observations from approximately 234 privately owned irrigation wells. Data collection typically occurs during March of each calendar year and the map above illustrates the changes in groundwater elevation data between the Spring of 2019 and the Spring of 2020.



As illustrated by the map above, the aquifer systems in the Lower Elkhorn NRD are geologically diverse, and subsequently the groundwater levels react differently by location. This phenomenon presents a situation where the year-to-year water level data will vary significantly at the local level. That being stated, groundwater levels have generally been very resilient in the Lower Elkhorn NRD and have (in the past) recovered from periods of deficit precipitation coupled with increased groundwater demand.

The map below uses spatial analyst to display the same data-set depicted in the map above, and highlights portions of the District that experienced year to year declines in groundwater supplies, which the District will continue to monitor and analyze with future data collection events.



12.0 Stream-gage Measurements

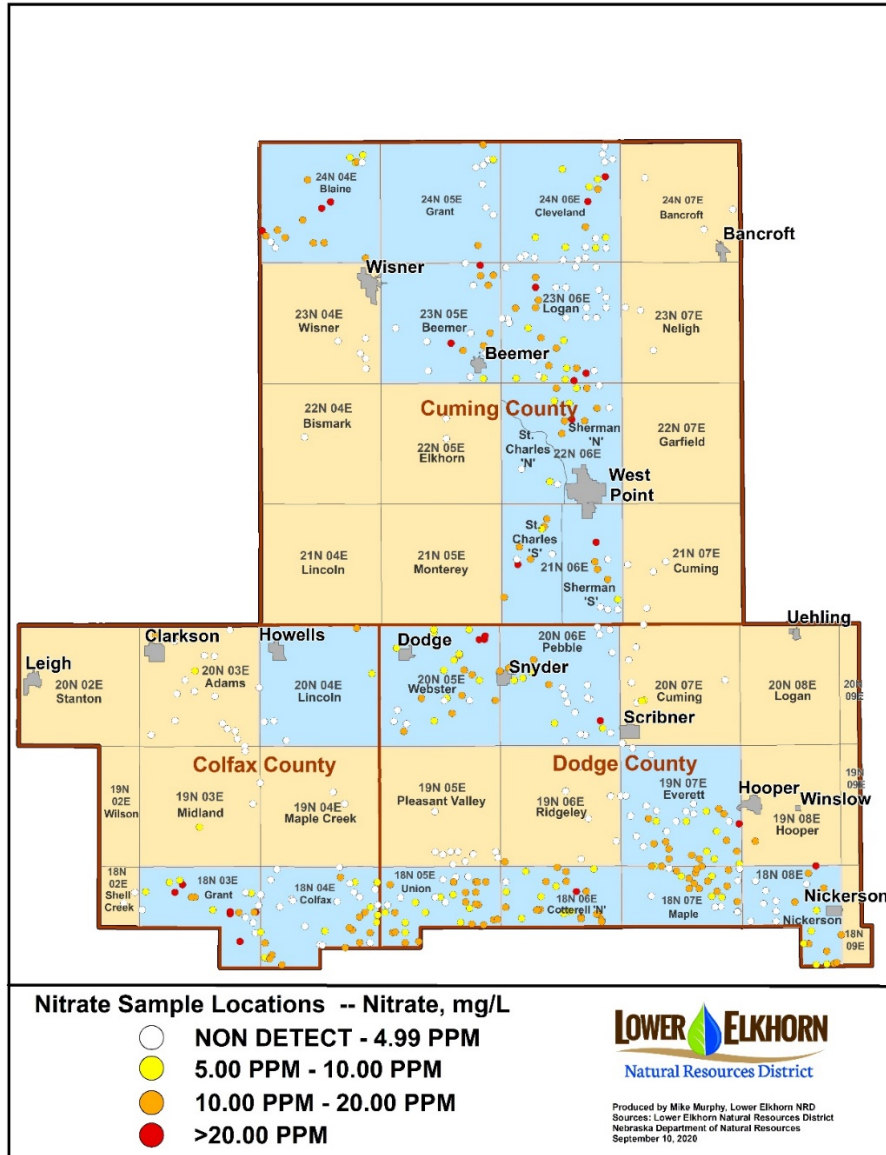
The Lower Elkhorn NRD does not maintain any stream gages within the District that are independent of gage-data collected by the United States Geological Survey (USGS) or the Nebraska Department of Natural Resources (NDNR).

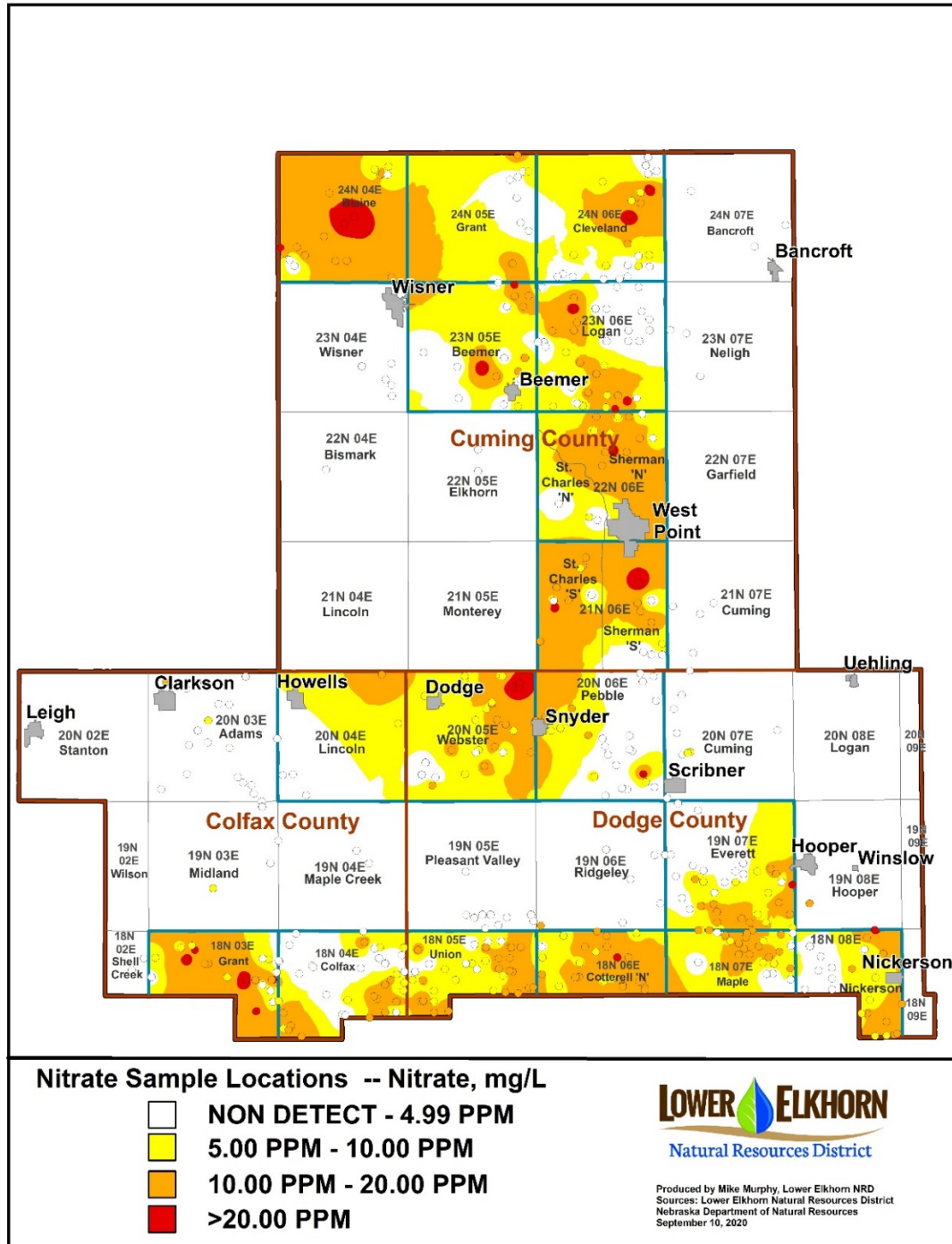
13.0 NRD Regulations and Management Activities

There were no amendments to the Groundwater Management Area Rules and Regulations during 2020, however the District has proposed the delineation of a Phase 2 Area in portions of Cuming, Colfax, and Dodge Counties within the LENRD. Well sampling studies conducted during 2018, 2019, and 2020 have provided sufficient data to effectively evaluate groundwater nitrate concentrations in these areas. There are a sufficient number of wells within these proposed areas that contain the minimum threshold of nitrate

concentration per location to warrant the delineation of a management area for the protection of groundwater quality.

A webinar was hosted via Zoom on December 17, 2020 to inform stakeholders of the proposed changes and an Open House and Public Hearing is planned for March of 2021 to receive public input on the amendments. Maps of the proposed management area, along with information regarding the nitrate concentrations are displayed below.





14.0 New Depletions Accounting Report

Peak season new depletions are recorded in a separate attachment entitled *LENRD_Appendix B_New Depletions*.

15.0 New Data Collected Through Models or Studies

Hydrogeologic Groundwater Modeling

The LENRD continues to invest in the development of new tools that will further the understanding of the groundwater resource within the District. As reported in the past, the LENRD, in partnership with NeDNR, continues the development of the multi-dimensional hydrogeologic groundwater model under the direction of JEO Consulting Group. Building upon the pilot-scale effort that centered over a portion of Wayne, Cedar, and Pierce Counties, the effort was expanded to include the entire District.

The current status of the model development includes the first draft of the geologic cross sections and associated map units, the continued calibration and development of the transient model, and the development of a web-based graphic user interface (GUI) which will allow for easier software troubleshooting and updates, as well as multi-user functionality. The project is tentatively scheduled to conclude by the second quarter of 2021.

LE-2020-62-R	Pat Brockhaus	23 1W	7 SE	SE	9/30/2020	9/30/2021	Irrigation	Yes	122.41	Yes	No	Dietz Well & F G-069566	Madison	
LE-2020-61-R	Tim & Carol Schellp	23 3E	5 SW	SE	9/30/2020	9/30/2021	Irrigation	Yes	21.18	Yes	No	Dietz Well & F G-122850	Stanton	
LE-2020-63-R	Marvin Gesell Irr Tri	25 1W	25 NW		10/20/2020	10/20/2021	Irrigation	Yes	120	Yes	No	Dietz Well & F G-052479	Pierce	
LE-2020-64-R	Jason Lauritsen - Ha	23 9E	36 NW	SE	10/20/2020	10/20/2021	Irrigation	Yes	188.81	Yes	No	Dietz Well & F G-052723	Burt	
LE-2020-65	Joan Lackas	27 3W	6 SE	NE	10/28/2020	10/28/2021	Irrigation	No	111.47	No	No	Sargent Irrigation	Pierce	New well for existing irrigated acres - no new acres
LE-2020-66-R	Alan Krienert	26 4w	2 SE	NE	11/17/2020	11/17/2021	Irrigation	Yes	131.09	Yes	No	Sargent Irriga	G-054453	Pierce
LE-2020-67-R	Sam Woodrow - Cot	23 2W	12 NE	SE	11/17/2020	11/17/2021	Irrigation	Yes	146.09	Yes	No	Dietz Well & F G-049610	Madison	
LE-2020-68-R	Herb Hasenkamp	23 5E	29 SE	SW	11/20/2020	11/20/2021	Irrigation	Yes	70	Yes	No	Dietz Well & F G-047835	Cuming	
LE-2020-69-R	Robert Mulliken - IV	18 8E	25 SW	NE	12/9/2020	12/9/2021	Irrigation	Yes	96.5	Yes	No	Webster Well G-074355	Dodge	Accompanies approved variance to expand irrigated acres.
LE-2020-70	John & Karen Mang	26 1E	23 NE	SW	12/9/2020	12/9/2021	Irrigation	No	117.32	No	No	Christensen Well Co. - Hæ Wayne		New well for new irrigated acres.
LE-2020-71	Eric Knobbe	22 5E	20 SW		12/10/2020	12/10/2021	Irrigation	No	135.13	No	No	Dietz Well & Pump Co. - I Cuming		New well for new irrigated acres.
LE-2020-75	Allen Knapp	23 3W	27 NE		12/14/2020	12/14/2021	Irrigation	No	116.95	No	No	Dietz Well & Pump Co. - I Madison		New well for new irrigated acres.
LE-2020-76	John Frey	23 4W	35 NE	SW	12/14/2020	12/14/2021	Irrigation	No	66.78	No	No	Sargent Irrigation - Neligl Madison		New well for new irrigated acres.
LE-2020-74	Grain Belt LLC	28 2E	13 SW		12/14/2020	12/14/2021	Irrigation	No	138.29	No	No	Christensen Well Co. - Hæ Cedar		New well for new irrigated acres.
LE-2020-73	Terry Sorensen	29 3W	32 N1/1	NW1/4	12/14/2020	12/14/2021	Irrigation	No	63.5	No	No	Sargent Irrigation - Neligl Knox		New well for new irrigated acres.
LE-2020-72	Barbara Brahmer	22 4E	18 SE		12/14/2020	12/14/2021	Irrigation	No	119.47	No	No	Dietz Well Co.	Cuming	New well for new irrigated acres.
LE-2020-81	Keith Dittrich	23 4W	16 NE	SE	12/22/2020	12/22/2021	Irrigation	No	78	No	No	Sargent Irrigation - Neligl Madison		New well for new irrigated acres.
LE-2020-78	Floyd Melcher	21 3W	1 SW		12/22/2020	12/22/2021	Irrigation	No	133.97	No	No	Grosch Irrigation - Albion Madison		New well for new irrigated acres.
LE-2020-77	Todd Mink	22 3W	17 SE		12/22/2020	12/22/2021	Irrigation	No	134.28	No	No	Sargent Irrigation - Neligl Madison		New well for new irrigated acres.
LE-2020-82	Boyd Ebberson	27 1E	11 SE	NW	12/22/2020	12/22/2021	Irrigation	No	130.17	No	No	Dietz Well & Pump Co. - I Wayne		New well for new irrigated acres.
LE-2020-83	Greg Lackas	28 2E	32 SW		12/22/2020	12/22/2021	Irrigation	No	134.74	No	No	Christensen Well Co. - Hæ Cedar		New well for new irrigated acres.
LE-2020-80	Dirk Petersen	23 3E	27 NE		12/22/2020	12/22/2021	Irrigation	No	124.27	No	No	Dietz Well & Pump Co.	Stanton	New well for new irrigated acres.
LE-2020-79	Virgil Preister	21 3W	25 SE	NW	12/22/2020	12/22/2021	Irrigation	No	137.19	No	No	Sargent Irrigation - Neligl Madison		New well for new irrigated acres.
LE-2020-84	Brent Tietz	23 7E	18 NE		12/28/2020	12/28/2021	Irrigation	No	90.37	No	No	Christensen Well Co. - Hæ Cuming		New well for new irrigated acres.
LE-2020-85	Grothe Farms LLC	25 1E	29 NW		12/28/2020	12/28/2021	Irrigation	No	124.47	No	No	Buchanan Well Co. - Osm Wayne		New well for new irrigated acres.
LE-2020-86	Larry Faltin	20 5E	3 NE	SW	12/28/2020	12/28/2021	Irrigation	No	100.63	No	No	Sargent Irrigation Co. - G Dodge		New well for new irrigated acres.

