

NEBRASKA NATURAL RESOURCES COMMISSION

Water Sustainability Fund

Application for Funding

Section A.

ADMINISTRATIVE

PROJECT NAME: The Lower Niobrara NRD Water Use Reduction Program

SPONSOR'S PRIMARY CONTACT INFORMATION (Not Consultant's)

Sponsor Business Name: Lower Niobrara Natural Resources District

Sponsor Contact's Name: Connie McCarthy

Sponsor Contact's Address: 410 Walnut St, Butte, NE 68722

Sponsor Contact's Phone: 402-775-2343

Sponsor Contact's Email: cmccarthy@lnnrd.org

1. **Funding** amount requested from the Water Sustainability Fund:

Grant amount requested. \$ 360,000

- If requesting less than 60% cost share, what %? N/A

If a loan is requested amount requested.

- How many years repayment period? [Click here to enter text.](#)
- Supply a complete year-by-year repayment schedule. [Click here to enter text.](#)

2. **Neb. Rev. Stat. § 2-1507 (2)**

Are you applying for a **combined sewer overflow project**? YES NO

If yes:

- Do you have a Long-Term Control Plan that is currently approved by the Nebraska Department of Environmental Quality? YES NO
- Attach a copy to your application. [Click here to enter text.](#)
- What is the population served by your project? [Click here to enter text.](#)
- Provide a demonstration of need. [Click here to enter text.](#)
- **Do not complete the remainder of the application.**

3. **Permits Required/Obtained** Attach a copy of each that has been obtained. For those needed, but not yet obtained (box “**NO**” checked), 1.) State when you will apply for the permit, 2.) When you anticipate receiving the permit, and 3.) Your estimated cost to obtain the permit.

(N/A = Not applicable/not asking for cost share to obtain)
 (Yes = See attached)
 (No = Might need, don't have & are asking for 60% cost share to obtain)

G&P - T&E consultation (required)	N/A <input checked="" type="checkbox"/>	Obtained: YES <input type="checkbox"/>	NO <input type="checkbox"/>
DNR Surface Water Right	N/A <input checked="" type="checkbox"/>	Obtained: YES <input type="checkbox"/>	NO <input type="checkbox"/>
USACE (e.g., 404/other Permit)	N/A <input checked="" type="checkbox"/>	Obtained: YES <input type="checkbox"/>	NO <input type="checkbox"/>
FEMA (CLOMR)	N/A <input checked="" type="checkbox"/>	Obtained: YES <input type="checkbox"/>	NO <input type="checkbox"/>
Local Zoning/Construction	N/A <input checked="" type="checkbox"/>	Obtained: YES <input type="checkbox"/>	NO <input type="checkbox"/>
Cultural Resources Evaluation	N/A <input checked="" type="checkbox"/>	Obtained: YES <input type="checkbox"/>	NO <input type="checkbox"/>
Other (provide explanation below)	N/A <input checked="" type="checkbox"/>	Obtained: YES <input type="checkbox"/>	NO <input type="checkbox"/>

[Click here to enter text.](#)

4. **Partnerships**

List each Partner / Co-sponsor, attach documentation of agreement:
[The Lower Niobrara NRD \(LNNRD\)](#)

Identify the roles and responsibilities of each Partner / Co-sponsor involved in the proposed project regardless of whether each is an additional funding source.

The LNNRD will supply 40% of the funding for the project. LNNRD will educate, administer, regulate, and monitor this project. We will administer a cost-share program designed to promote effective ground water practices, create, and utilize reliable data, and educate our local producers.

5. **Other Sources of Funding**

Identify the costs of the entire project, what costs each other source of funding will be applied to, and whether each of these other sources of funding is confirmed. If not, please identify those entities and list the date when confirmation is expected. Explain how you will implement the project if these sources are not obtained.

The Water Use Reduction Program will assist with the initial purchase of irrigation management technologies that includes but is not limited to soil moisture probes, flow meters, variable rate irrigation (VRI), DirectET irrigation monitoring, FieldNET irrigation monitoring and other next level technologies. The total cost of this proposed project is \$600,000, with 60% from the WSF grant, 40% from the LNNRD special water projects budget, and additional cost above offered cost-share will be covered by participating producers. LNNRD will continue applying for additional funding throughout 2024. Applications will be completed for the RCPP through the USDA-NRCS and Water Smart Funds through the Bureau of Reclamation starting in the spring and running through October. Consequently, this project will have the potential for leveraging federal funds within the state. Confirmation will be late 2024 and early 2025.

Implementation of The Water Use Reduction Program will remain similar, but the impact will be greatly reduced. We will need to reduce the number of applications to 20 with a 50/50 cost share between LNNRD and producers. The LNNRD's budget comes from a very small levy assessed to the district's property value. We will use some of this money to pay for our share of the cost share. The LNNRD's operating budget for the Fiscal Year of 2024 was approved by the Board of Directors at our September meeting and included up to \$60,000/year for special water projects.

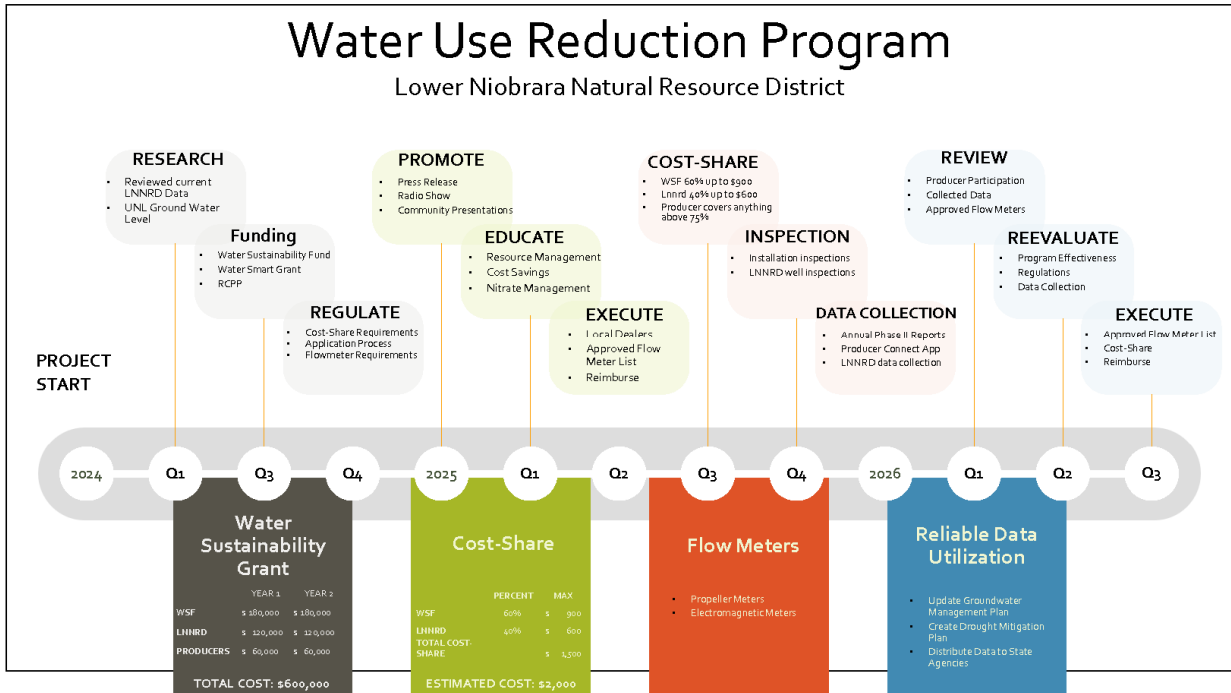
6. **Overview**

In 1,000 words or less, provide a brief description of your project including the nature/purpose of the project and its objectives. Do not exceed one page!

The LNNRD has a Voluntary Integrated Management Plan, developed with The Nebraska Department of Natural Resources (NDNR) and adopted in 2014, includes specific goals to develop and maintain the Districts groundwater supply using the best available data and analysis. Currently the LNNRD has only 175

flow meters in fields that monitor groundwater use on approximately 20,000 of the District's 220,711 groundwater irrigated acres and 11,973 irrigated acres where surface water and groundwater are comingled. The LNNRD Board of Directors feel this data is inadequate. The district is basing current water programs on small amounts of outdated information creating a lack of effective groundwater management. The LNNRD is working to improve irrigation water use efficiency through more effective, widely used irrigation management technology ensuring a sound ground water management plan. The direct objectives of this project are to 1) Reduce aquifer depletion and increase streamflow through decreased ground water use 2) Reduce the infiltration of nitrate contamination into district drinking water 3) Create an accurate and informative groundwater outreach/educational program for producers. 4) Develop an effective drought mitigation plan. 5) Promote and utilize accurate data between LNNRD and producers. Overuse of irrigation water has been identified as a main factor in nitrate leaching. The Nebraska Water Center has recently documented that nitrates can achieve vertical transport rates of 6-7 feet per day in our sandy soils when totally saturated. Our current groundwater use data is reported by most producers using well pumping capacity multiplied by the number of hours pumped. Many of these wells were constructed in the 1960's and 1970's and are not pumping at their registered rates. In addition, flow rates from irrigation wells can fluctuate greatly throughout the season making this method of estimating groundwater extraction highly inaccurate. This data is highly unreliable and in many cases is reported with up to 20% inaccuracy. This data is inadequate to make effective water management decisions within the LNNRD. Flowmeters are currently not required on all wells and the use of irrigation management technologies are not widespread. The installation of permanently installed totalizing flowmeters is the most accurate method of quantifying groundwater extraction from irrigation wells. Through educational programs, accurate data, and an effective cost-share program we can promote a sustainable ground water management program.

7. **Project Tasks and Timeline**



8. **IMP**

Do you have an **Integrated Management Plan** in place, or have you initiated one? YES NO Sponsor is not an NRD

Section B.

DNR DIRECTOR'S FINDINGS

Prove Engineering & Technical Feasibility

(Applicant must demonstrate compliance with Title 261, CH 2 - 004)

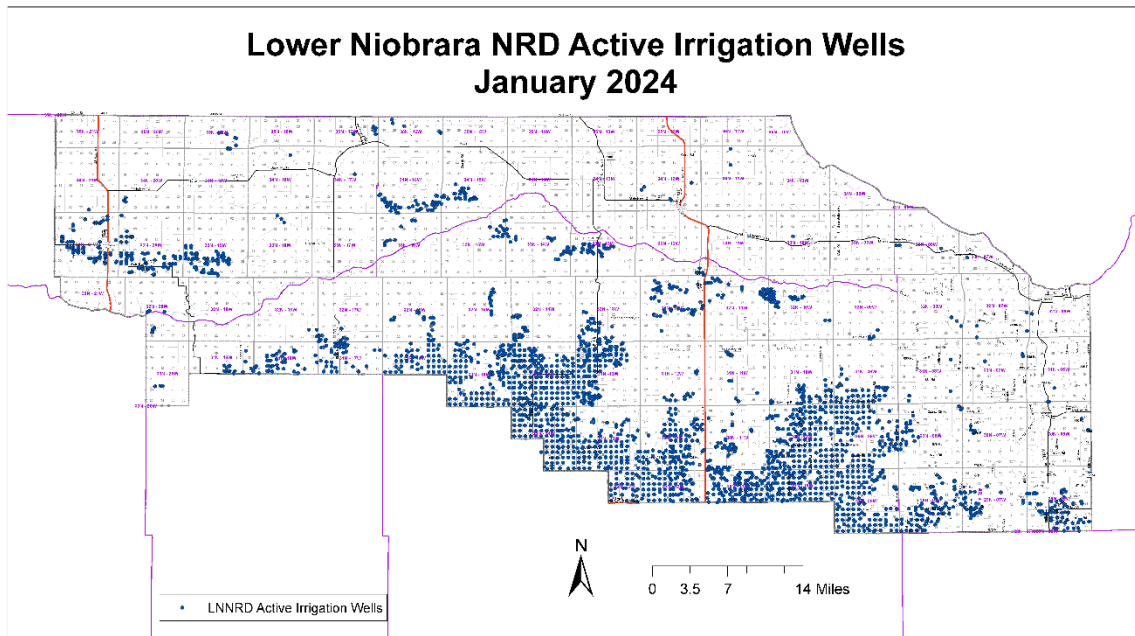
1. Does your project include physical construction (defined as moving dirt, directing water, physically constructing something, or installing equipment)?
YES NO

If you answered "YES" you must answer all questions in section 1.A.
If you answer "NO" you must answer all questions in section 1.B.

If "YES", it is considered mostly structural, so answer the following:

- 1.A.1 Insert a feasibility report to comply with Title 261, Chapter 2, including engineering and technical data; **N/A**
- 1.A.2 Describe the plan of development (**004.01 A**); **N/A**
- 1.A.3 Include a description of all field investigations made to substantiate the feasibility report (**004.01 B**); **N/A**
- 1.A.4 Provide maps, drawings, charts, tables, etc., used as a basis for the feasibility report (**004.01 C**);

See map below of the active irrigation wells in the LNNRD IMP Area



- 1.A.5 Describe any necessary water and/or land rights including pertinent water supply and water quality information (004.01 D); **N/A**
- 1.A.6 Discuss each component of the final plan (004.01 E); **N/A**
- 1.A.7 When applicable include the geologic investigation required for the project (004.01 E 1); **N/A**
- 1.A.8 When applicable include the hydrologic data investigation required for the project (004.01 E 2); **N/A**
- 1.A.9 When applicable include the criteria for final design including, but not limited to, soil mechanics, hydraulic, hydrologic, structural, embankments and foundation criteria (004.01 E 3). **N/A**

If “NO”, it is considered mostly non-structural, so answer the following:

- 1.B.1 Insert data necessary to establish technical feasibility (004.02);

The Lower Niobrara Natural Resources District (LNNRD) depends on abundant, clean water in their homes for domestic use, on their farms for agricultural production, and for municipal uses. Wildlife that lives and migrates through our district depend on clean water for sustenance and habitat. People use water in rivers and lakes for recreation including fishing, hunting, boating, and swimming. Everyone in our district relies heavily on our abundant water resources to live and thrive. During the drought of 2012 the water resources were severely stressed, and we were unprepared. As recent as the summer of 2023 the project area again experienced Severe to Extreme drought as measured by the UNL Drought Monitor. We were unable to obtain accurate data and had to make decisions based on small amounts of inadequate data. Effective irrigation management technology gives us a way to provide accuracy and uniformity of records and documents. Accurate and uniform data allows the LNNRD to create and maintain effective programs for groundwater management. We can make decisions that will ensure that we continue reducing aquifer depletion and increasing streamflow even in seasons that stress our resources. Reliable and adequate information is a great way to create producer buy-in. Through program initiatives and education, we will be able to promote best practices that span beyond the physical boundaries of the LNNRD.

- 1.B.2 Discuss the plan of development (004.02 A);

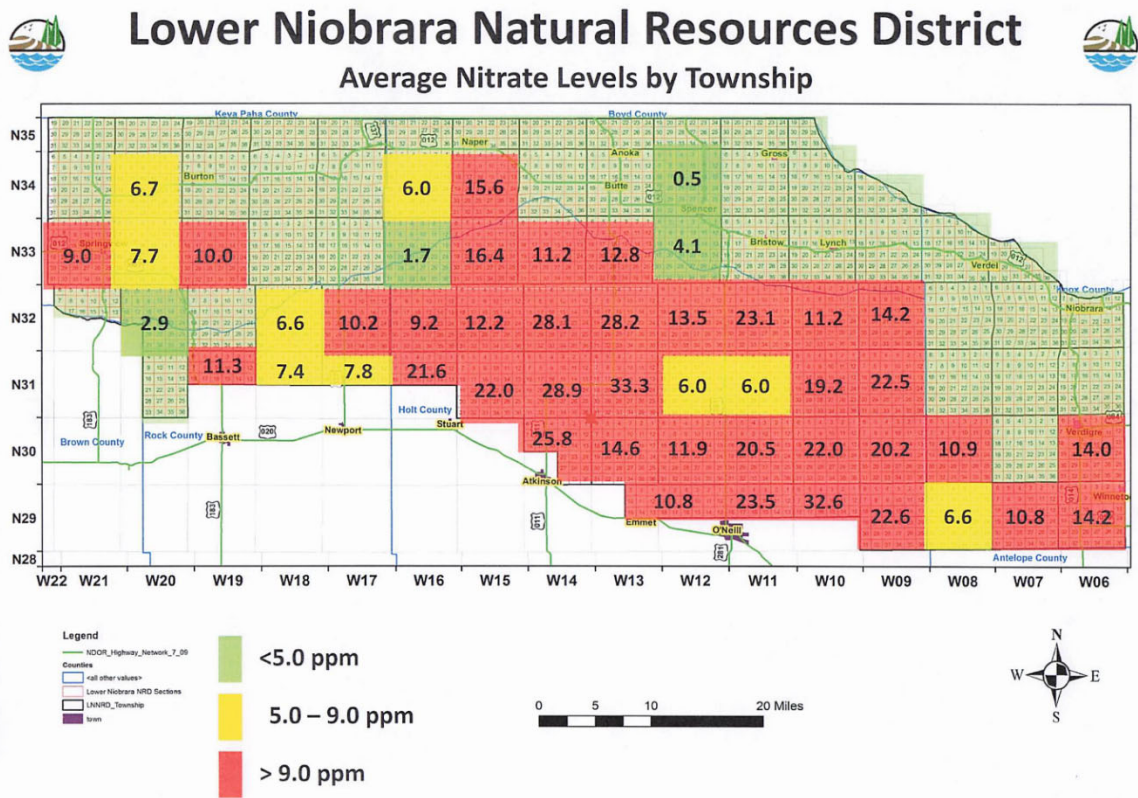
The initial two-year of the program will be grant funded. This allows for the cost-share and installation of flow meters and irrigation technologies on approximately 400 irrigation wells across the LNNRD. We will primarily promote and educate

producers within our Phase II areas as those have been identified as high nitrate areas within the district. This includes the three townships within the Bazille GMA that lie within the LNNRD. Data collected will be recorded and shared based on our Integrated Management Plan (IMP) ensuring information can be used across the district and the state. This allows us to create and implement effective data collection, reporting and management. The estimated cost per flow meter is \$2,000 with a maximum cost-share available of \$1,500 per well with an initial limit of 2 per producer. Anything beyond the total cost-share will be covered by the producer representing an in-kind contribution not reflected in the project budget. Once installation is complete, the producer will be required to report yearly ground water pumped at the end of the growing season.

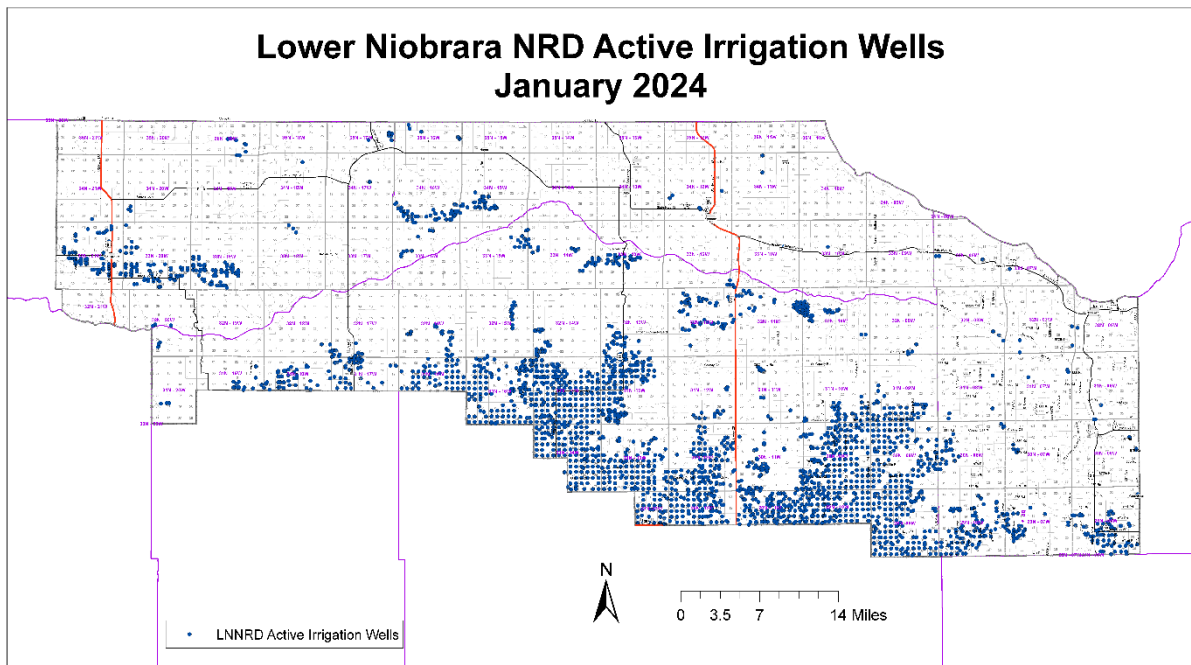
1.B.3 Describe field or research investigations utilized to substantiate the project conception (004.02 B);

LNNRD's current groundwater extraction data is highly inaccurate. Data is currently collected on only 9% of all irrigated acres. The majority of producers are using an outdated method of multiplying pumping capacity in gallons per minute by the time pumped. Even with an accuracy rate of +/- 20%, reporting data indicates over-pumping in LNNRD of nearly 30 billion gallons of water compared to local crop water use (ET). Data collected in our Phase II area has exhibited that over irrigation can increase nitrate leaching. Map 1 indicates current nitrate levels throughout our phase II area. Nitrate levels are elevated within the irrigated portion of our district ranging from 0.5ppm to 32.6ppm throughout the Phase II area. Map 2 shows the concentration of current irrigation wells throughout the LNNRD. As you can see the increased concentration of irrigation wells correlates with the increased nitrate levels. Our current level of data accuracy leads to inadequate programs that is hard to regulate.

Map 1



Map 2



- 1.B.4 Describe any necessary water and/or land rights (004.02 C); N/A
- 1.B.5 Discuss the anticipated effects, if any, of the project upon the development and/or operation of existing or envisioned structural measures including a brief description of any such measure (004.02 D). N/A

Prove Economic Feasibility

(Applicant must demonstrate compliance with Title 261, CH 2 - 005)

2. Provide evidence that there are no known means of accomplishing the same purpose or purposes more economically, by describing the next best alternative.

Collecting accurate groundwater usage during a single growing season is difficult to estimate without a reliable form of measurement. The current forms of manual measurement are multiplying pumping capacity in gallons per minute by the total running time pumped within a growing season or estimating water use through electrical usage records. These methods are highly inaccurate and unreliable forms of data collection since flow rates of irrigation wells can fluctuate significantly throughout the growing season resulting in inaccurate calculations. Even with these inaccurate groundwater measurement methods, water use reports from irrigators indicate an over application of approximately 30 billion gallons of water compared to local crop water use (ET) annually. The LNNRD irrigation season demands are localized to specific areas of the district and accurate flow information is needed to fully understand the complex hydrogeologic factors that impact flow. Our current manual data measurements are inaccurate, unreliable, and in need of change to enforce sound groundwater management practices. Permanently installed totalizing flow meters are the best method to quantify groundwater extraction and are the most affordable and reliable alternative for our district.

3. Document all sources and report all **costs** and **benefit data** using current data, (commodity prices, recreation benefit prices, and wildlife prices as prescribed by the Director) using both dollar values and other units of measurement when appropriate (environmental, social, cultural, data improvement, etc.). The period of analysis for economic feasibility studies is the project life. (Title 261, CH 2 - 005).

The LNNRD Water Use Reduction Program will be utilizing a list of approved flow meters. Based on the current rounded average cost of \$2,000 per flow meter. The LNNRD will be offering a 75% cost-share, up to a maximum of \$1,500 per flow meter. The WSF grant would reimburse 60% up to \$900 per flow meter, the LNNRD will cover the remaining 40% up to \$600. This project will fund the purchase and installation of 400 irrigation flow meters for a total project cost of

\$600,000. Any costs exceeding that of the approved 75% or maximum of \$1,500 is the responsibility of the well owner and will represent an in-kind contribution not reflected in the project budget.

	200 FLOWMETERS	YEAR 1	200 FLOWMETERS	YEAR 2
WSF	60% @ \$900	\$180,000	60% @ \$900	\$180,000
LNNRD	40% @ \$600	\$120,000	40% @ \$600	\$120,000
TOTAL		\$300,000		\$300,000

- 3.A Describe any relevant cost information including, but not limited to the engineering and inspection costs, capital construction costs, annual operation and maintenance costs, and replacement costs. Cost information shall also include the estimated construction period as well as the estimated project life (005.01)

This project will have no engineering, inspection, or construction costs. The LNNRD Water Use Reduction Program will be utilizing a list of approved flow meters. Based on the current average cost of \$2,000 per flow meter, the LNNRD will be offering a 75% cost-share, up to a maximum of \$1,500 per flow meter. The WSF grant would reimburse 60% up to \$900 per flow meter, the LNNRD will cover the remaining 40% up to \$600. Any costs exceeding that of the approved 75% or maximum of \$1,500 is the responsibility of the well owner.

- 3.B Only primary tangible benefits may be counted in providing the monetary benefit information and shall be displayed by year for the project life. In a multi-purpose project, estimate benefits for each purpose, by year, for the life of the project. Describe intangible or secondary benefits (if any) separately. In a case where there is no generally accepted method for calculation of primary tangible benefits describe how the project will increase water sustainability, in a way that justifies economic feasibility of the project such that the finding can be approved by the Director and the Commission (005.02).

This project will increase water sustainability across the LNNRD and enhance data reliability and accuracy. Data will be shared to help ensure consistency with other NRD's and state agencies. Accurate groundwater extraction collection will improve groundwater management across our district. This will allow for accurate and manageable programs designed to reduce aquifer depletion and increased streamflow. When accurate irrigation water measurement is used for on-farm water management, irrigated producers will experience average cost-savings of \$15.95 an acre due reduced pumping costs compared to over irrigating compared to local crop water use (ET). LNNRD's over pumping compared to local ET is 29,974,078,670 gallons resulting from an over-application of 5.2 inches/acre on corn and an over-application of 4.9 inches/acre on soybeans. Over-application of irrigation water is an added expense of over \$3.5M a year to producers. Accurate and reliable flow measurements can decrease over-

application of irrigation water and save producers roughly \$7M over the two-year planned project.

- 3.C Present all cost and benefit data in a table to indicate the annual cash flow for the life of the project (005.03).

Funding Sources	Yr1	Yr2	Total
Lower Niobrara NRD (LNNRD)	\$ 120,000.00	\$ 120,000.00	\$ 240,000.00
Nebraska DNR (NDNR)	\$ 180,000.00	\$ 180,000.00	\$ 360,000.00
Totals			\$ 600,000.00

The total project costs of \$600,000 will be split between the LNNRD and the NDNR at a 40/60 match of \$240,000 from the LNNRD in the form of cash and in-kind funds, while the remaining 60% will come from the NDNR in the amount of \$360,000. These costs are expected to be distributed evenly across the two years of the proposed project.

- 3.D In the case of projects for which there is no generally accepted method for calculation of primary tangible benefits and if the project will increase water sustainability, demonstrate the economic feasibility of such proposal by such method as the Director and the Commission deem appropriate (005.04). (For example, show costs of and describe the next best alternative.)

Our Phase II report data indicates that over-irrigation costs our district's producers over \$3.5M dollars annually with no increase in yield or production. Estimating groundwater usage is common, but very inaccurate. Alternatives to directly measuring the actual water pumped would be directly measuring the evapotranspiration(ET) from various land cover types within district. Accurately measuring actual ET can be very costly using equipment that can apply the Eddy Covariance Method and is only +/- 20% accurate, best. Such instruments and equipment can cost up to \$70,000 apiece and measuring the various crop types and geography across our district would require around 10 equipment sites. This would approximately double the cost. Other methods for monitoring well water pumped do exist, but often require in depth analysis of pump tests for each well within the aquifer. Such pump tests could cost as much as \$10,000 apiece and would certainly limit the number of wells that could be measured.

By installing flow meters on all irrigation wells, agricultural producers will become more aware of their water uses and become more efficient in their operations. Additionally, in periods of drought, flow meters are a necessary tool for effective groundwater management through the implementation of groundwater allocations. The project is economically feasible because even a minor reduction in agricultural water use equates to substantial savings in pumping. For example, if there an annual 1% reduction is agricultural water use according to the Nebraska Department of Natural Resources record, that would equate to approximately 1,383-acre feet of groundwater use reduction pm average for each of the; last 25 years(<http://data/.dnr.ne.gov/insight/>). The price of water varies

across the country but ranges from \$50.00 to \$250.00 per acre foot. Even when using the lowest estimate of \$50.00 per acre for 25 years, the benefit would be \$1.72 million. Thus, using a very conservative estimate the benefit of this project outweighs the cost.

Prove Financial Feasibility

(Applicant must demonstrate compliance with Title 261, CH 2 - 006)

4. Provide evidence that sufficient funds are available to complete the proposal.

See Attachment from the General Manager of the LNNRD documenting the Natural Resources District 2023 budget and line item 36 in the budget summary that provides assurance that the LNNRD has funds that are more than adequate to cover the cost share program.

LOWER NRD BUDGET					
DISTRICT FUNDS	2019	2020	2021	2022	2023
<u>BEGINNING BALANCE</u>	Actual	Actual	Actual	Actual	Actual
Cash-NRD	\$ 494,447.00	\$ 468,736.00	\$ 464,920.00	\$ 366,558.00	\$ 241,434.00
Cash-NACD		\$ 10,768.00	\$ 19,170.00	\$ 5,420.00	\$ 10,839.46
Cash-Water Quality					\$ 24,533.54
Certificates of Deposit	\$ 154,684.00	\$ 154,907.00	\$ 155,472.00	\$ 155,856.00	\$ 156,124.00
County Treasurer Balance	\$ 9,983.00	\$ 7,801.00	\$ 5,535.00	\$ 3,735.00	\$ 2,815.00
TOTAL BEGINNING BALANCES	\$ 659,114.00	\$ 642,212.00	\$ 645,097.00	\$ 531,569.00	\$ 435,746.00
REVENUES					
Pro-rate Motor Vehicle	\$ 978.00	\$ 871.00	\$ 899.00	\$ 939.00	\$ 913.00
NDNR Water Quality Fund	\$ 32,739.00	\$ 27,368.00	\$ 33,561.72	\$ 30,216.00	\$ 30,086.00
NET Grant			\$ 11,755.00	\$ 5,486.00	\$ 117,357.00
NACD Grant	\$ 28,632.00	\$ 30,095.00	\$ 20,064.00	\$ 30,095.00	
Customer charges	\$ 54,553.00	\$ 60,522.00	\$ 56,425.00	\$ 34,484.00	\$ 44,880.00
Chemigation	\$ 29,490.00	\$ 32,900.00	\$ 40,590.00	\$ 34,620.00	\$ 35,260.00
Admin Fees (WKRW)					
Interest	\$ 1,227.00	\$ 1,477.00	\$ 845.00	\$ 457.00	\$ 528.00
Sales tax Collected	\$ 2,442.00	\$ 3,138.00	\$ 2,486.00		\$ 2,099.00
Buffer Strip Payments	\$ 8,794.00				
Corners for Wildlife	\$ 20,670.00	\$ 12,590.00	\$ 9,110.00	\$ 2,200.00	
Well Permits/Variance	\$ 250.00	\$ 400.00	\$ 1,900.00	\$ 1,700.00	\$ 2,000.00
Lower Niobrara Expanded Acres			\$ 10,500.00	\$ 14,500.00	\$ 10,000.00
Miscellaneous	\$ 11,394.00	\$ 6,295.00	\$ 3,606.00	\$ 2,632.00	\$ 2,173.00
FSA Overpayments		\$ 1,299.00	\$ 1,757.00		
Reimbursements from WKRW	\$ 7.00				
Nameplate Capacity Tax-2017 1st yr	\$ 18,244.00	\$ 11,929.00	\$ 15,320.00	\$ 14,626.00	\$ 14,239.00
Insurance Claims		\$ 21,298.00	\$ 675.00		\$ 6,299.00
Sale of Equipment		\$ 17,368.00			
In-Lieu Tax	\$ 78.00	\$ 80.00	\$ 63.00	\$ 134.00	\$ 128.00
Property Tax Credit	\$ 42,346.00	\$ 47,377.00	\$ 42,516.00	\$ 40,634.00	\$ 40,966.00
Homestead exemption	\$ 1,695.00	\$ 1,526.00	\$ 1,696.00	\$ 1,809.00	\$ 1,882.00
REVENUE	\$ 253,539.00	\$ 276,533.00	\$ 253,768.72	\$ 214,532.00	\$ 308,810.00
REAL AND PERSONAL PROPERTY TAXES	\$ 425,537.00	\$ 392,165.00	\$ 392,784.00	\$ 370,345.00	\$ 371,958.00
					\$ -

5. Provide evidence that sufficient annual revenue is available to repay the reimbursable costs and to cover OM&R (operate, maintain, and replace).

LNNRD’s budget comes from a mill levy assessed to property values. The budget is set on a yearly basis and has remained steady for several years. A portion of the budget has been allocated to ensure there is sufficient funding to cover the LNNRD’s 40 % match of this project. The LNNRD’s operating budget

for fiscal year 2024 was approved with a tax request of \$960,000. The estimated levy based on the property tax request is .031702 cents per \$100 of valuation.

6. If a loan is involved, provide sufficient documentation to prove that the loan can be repaid during the repayment life of the proposal. N/A

7. Describe how the plan of development minimizes impacts on the natural environment (i.e. timing vs nesting/migration, etc.).

Flow meters will be installed at existing irrigation well locations. These areas are generally already disturbed as cropland. There will be no additional environmental disruption from the installation of flow meters.

8. Explain how you are qualified, responsible and legally capable of carrying out the project for which you are seeking funds.

NRDs are responsible for maintaining groundwater quality and quantity for municipal, domestic, and agricultural uses (Nebraska State Statute Chapter 2 Article 32 and Nebraska Groundwater Protection Act Chapter 46 Article 7). The NRD staff members have local knowledge of the area and groundwater resources. Wade Ellwanger, Connie McCarthy and Gary Richardson all staff members and part time staff, Larry Kocian of the LNNRD are licensed Natural Resources Groundwater Technicians.

9. Explain how your project considers plans and programs of the state and resources development plans of the political subdivisions of the state.

This project is being implemented to ensure the requirements in the LNNRD Integrated Management Plan (IMP) and the Groundwater Management Plan (GMP) are being met. Interest in this monitoring project and data collection is a response to numerous objectives and actions in various management plans. We will be analyzing and sharing all data through other state agencies.

10. Are land rights necessary to complete your project? YES NO

If yes:

10.A Provide a complete listing of all lands involved in the project. N/A

10.B Attach proof of ownership for each easements, rights-of-way and fee title currently held. N/A

10.C Provide assurance that you can hold or can acquire title to all lands not currently held. N/A

11. Identify how you possess all necessary authority to undertake or participate in the project.

Nebraska's Natural Resources Districts (NRDs) are specifically tasked by the legislature to manage groundwater as well as the hydrologically connected groundwater and surface water. Which includes municipal, domestic, and agricultural uses (Nebraska State Statute Chapter 2 Article 32 and Nebraska Groundwater Protection Act Chapter 46 Article 7).

12. Identify the probable consequences (environmental and ecological) that may result if the project is or is not completed.

Flow meters will be installed at existing irrigation well locations. These areas are generally already disturbed as cropland. No additional environmental disruption will occur as a result of this project. Environmental and ecologic benefits would reduce aquifer depletion and increase streamflow. Through a substantial increase in reliable data and effective management, positive effects will include a reduction in over-irrigation and an increase in groundwater stored in the local aquifer. Additional improvements will be wetland and stream hydrology and their related habitats. Through accurate water use across the district, the LNNRD will be able to manage groundwater use in an effective manner that achieves and sustains water quality and water quantity. This will provide environmental benefits throughout LNNRD, including but not limited to plant and animal habitat conservation and preservation, human consumption, and utilization.

Section C.

NRC SCORING

In the NRC's scoring process, points will be given to each project in ranking the projects, with the total number of points determining the final project ranking list.

The following 15 criteria constitute the items for which points will be assigned. Point assignments will be 0, 2, 4, or 6 for items 1 through 8; and 0, 1, 2, or 3 for items 9 through 15. Two additional points will be awarded to projects which address issues determined by the NRC to be the result of a federal mandate.

Notes:

- The responses to one criterion *will not* be considered in the scoring of other criteria. Repeat references as needed to support documentation in each criterion as appropriate. The 15 categories are specified by statute and will be used to create scoring matrixes which will ultimately determine which projects receive funding.
- There is a total of 69 possible points, plus two bonus points. The potential number of points awarded for each criteria are noted above. Once points are assigned, they will be added to determine a final score. The scores will determine ranking.
- The Commission recommends providing the requested information and the requests are not intended to limit the information an applicant may provide. An applicant should include additional information that is believed will assist the Commission in understanding a proposal so that it can be awarded the points to which it is entitled.

Complete any of the following (15) criteria which apply to your project. Your response will be reviewed and scored by the NRC. Place an N/A (not applicable) in any that do not apply, an N/A will automatically be placed in any response fields left blank.

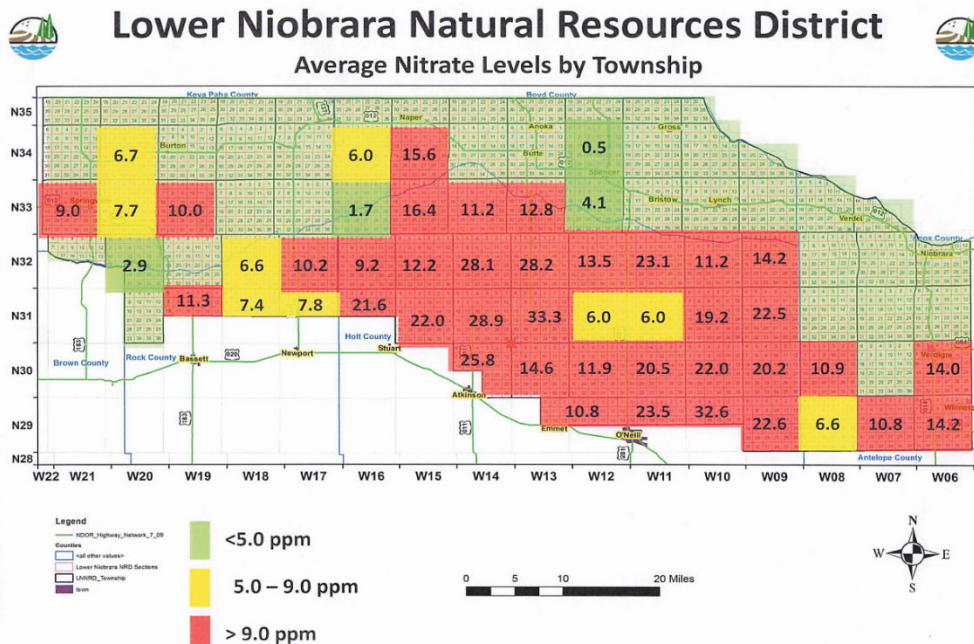
1. Remediate or mitigates threats to drinking water;
 - Describe the specific threats to drinking water the project will address.
 - Identify whose drinking water, how many people are affected, how will project remediate or mitigate.
 - Provide a history of issues and tried solutions.
 - Provide detail regarding long-range impacts if issues are not resolved.

This project will improve water sustainability across the LNNRD and enhance data reliability. Data will be shared to help ensure consistency with other NRD's

and state agencies. Accurate water quantity data collection will improve groundwater management across our district. Allowing for accurate and manageable programs designed to reduce aquifer depletion and increased streamflow. Improved irrigation water management through effective reliable water measurement data helps mitigate over irrigation throughout our Phase II area. Overuse of irrigation water has been identified as a main factor in nitrate leaching. Currently the average nitrate level across the LNNRD's Phase II area is roughly 14 parts per million(ppm). The current EPA standard for nitrate in drinking water is 10 ppm. The following map indicates current Phase II average nitrate levels by township. The LNNRD holds 7 municipalities, 2 Rural Water Districts and spans 5 counties reaching thousands of people.

LNNRD began monitoring static water levels across the district in 1976, in 2012-2014 offered cost share for 100 flowmeters for LB483 acres through assistance from an NET grant. Rules and Regulations adopted in 2014 required flowmeters on all new and replacement wells. The district currently collects groundwater use data at 175 of the 1700 parcels or roughly 10% of wells in our Phase II area. In 2019 LNNRD was awarded an NET grant to expand our dedicated monitoring network. The LNNRD added 18 new monitoring wells, at 14 sites throughout the district. Data transducers and telemetry were added to dedicated monitoring wells throughout the district in 2023 giving daily static water levels.

If the groundwater nitrate issues are not resolved, domestic water users and municipalities in the district will have greater difficulty in sourcing clean drinking water or will need to deploy expensive treatment systems that will require long-term maintenance at additional expense. In addition, groundwater declines will accentuate the groundwater nitrate issues due to increasing nitrate concentrations with groundwater declines.



2. Meets the goals and objectives of an approved integrated management plan or ground water management plan;
 - Identify the specific plan that is being referenced including date, who issued it and whether it is an IMP or GW management plan.
 - Provide the history of work completed to achieve the goals of this plan.
 - List which goals and objectives of the management plan the project provides benefits for and how the project provides those benefits.

The proposed LNNRD Water Usage Improvement Project will help us meet the groundwater quantity goals and objectives of our IMP, established with NDNR in 2014, and quality goals in our Groundwater Management Plan, established in 1986 in accordance to the Groundwater Management and Protection Act, was last revised in 2003. LNNRD began monitoring static water levels across the district in 1976 and offered cost share for 100 flowmeters for LB483 acres in 2012-2014 with the assistance of an NET grant. Rules and Regulations adopted in 2014 required flowmeters on all new and replacement wells. The district currently collects groundwater use data at 175 of the 1700 parcels or roughly 10% of wells in our Phase II area. In 2019 LNNRD was awarded an NET grant to expand our dedicated monitoring network. The LNNRD added 18 new monitoring wells, at 14 sites throughout the district. Data transducers and telemetry were added to dedicated monitoring well throughout the district in 2023. Real-time static water level data at these locations is publicly available on our website. The proposed program will help achieve groundwater quantity goals stated in Chapter 6 of the LNNRD IMP to collect accurate groundwater extraction data. Current IMP and GMP require accurate groundwater usage data to ensure adequate and effective program regulations. The proposed project will help attain the current objective of the district's Groundwater Management Plan, section B, establishing criteria for groundwater quantity management to reduce significant groundwater changes and protect existing interests while facilitating economic growth and well-being across the district.

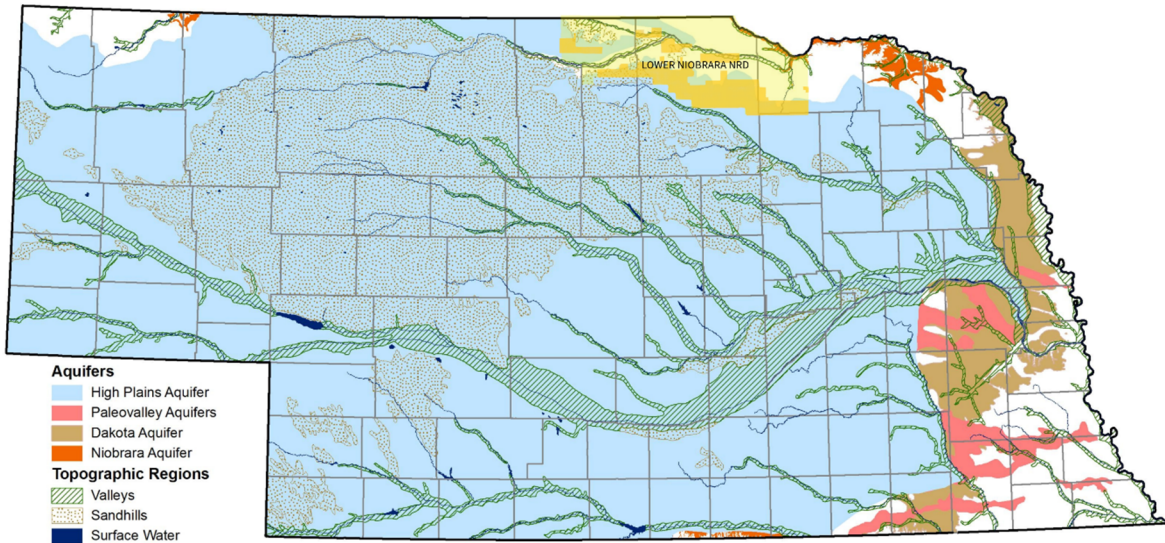
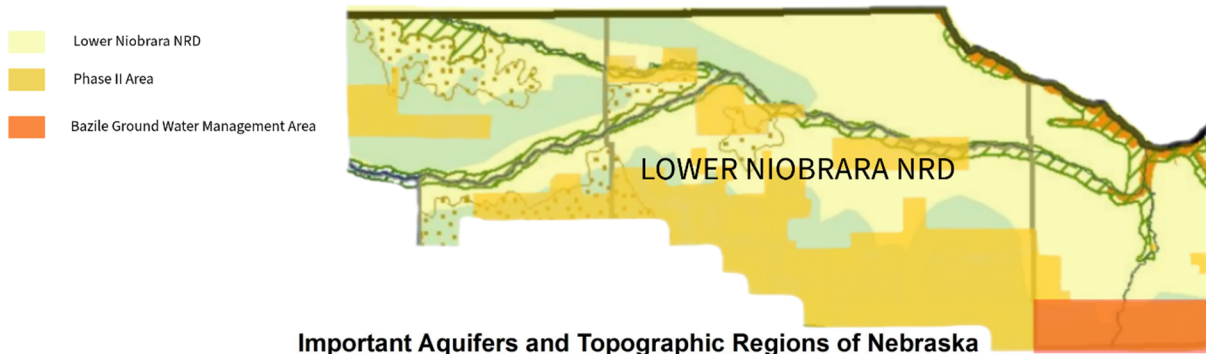
3. Contributes to water sustainability goals by increasing aquifer recharge, reducing aquifer depletion, or increasing streamflow;

List the following information that is applicable:

- The location, area and amount of recharge;
- The location, area and amount that aquifer depletion will be reduced;
- The reach, amount and timing of increased streamflow. Describe how the project will meet these objectives and what the source of the water is;
- Provide a detailed listing of cross basin benefits, if any.

The LNNRD's Water Usage Improvement Project will create accurate water usage data that when and paired with the current Nebraska Mesonet details will create reliable producer information that can reduce over-application of irrigation

water and drastically decrease the incidence of significant chemigation events in the Phase II area of the district which includes the BGMA. The Phase II area and BGMA are delineated on the following map. Long-term, this will effectively reduce aquifer depletion and increase stream flow. Utilization of both accurate water usage and natural precipitation will reduce over-application of irrigation water, decrease nitrogen leaching through the root zone, and improve overall water quality and quantity. The following topographic map shows current aquifers within the LNNRD. Currently these aquifers are being over depleted at a rate of 30 billion gallons annually. Through effective data utilization and regulation, the LNNRD can reduce over irrigation by roughly 300 billion gallons in the next 10 years.






4. Contributes to multiple water supply goals, including, but not limited to, flood control, agricultural use, municipal and industrial uses, recreational benefits, wildlife habitat, conservation of water resources, and preservation of water resources;

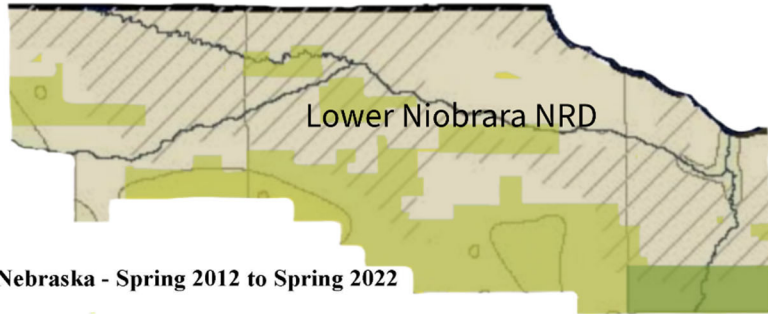
- List the goals the project provides benefits.
- Describe how the project will provide these benefits

- Provide a long range forecast of the expected benefits this project could have versus continuing on current path.

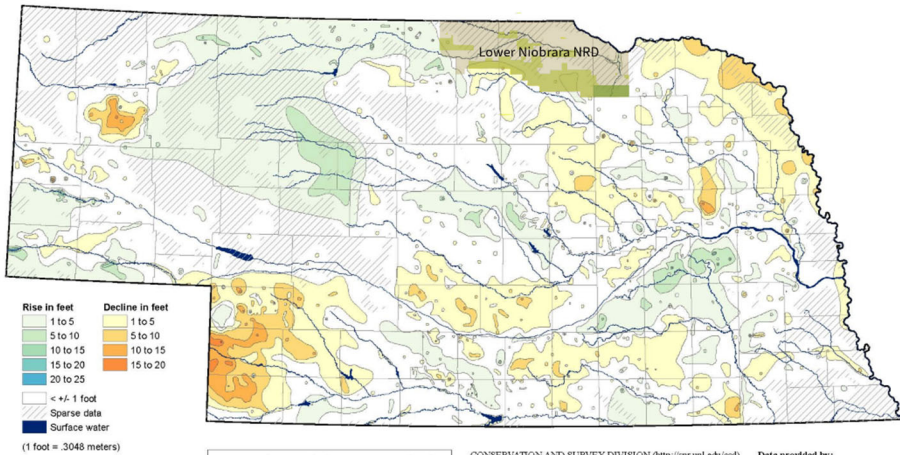
The LNNRD Water Usage Improvement Project will provide a reduction in groundwater nitrates across the Niobrara River valley and its tributaries by achieving the goals of acquiring accurate water use data and protecting water for domestic, irrigation, and municipal uses. Accurate groundwater usage informs not only the irrigator but the state. In the following maps the LNNRD currently does not have a sufficient amount of accurate data. Map 1 indicates water level changes from spring of 2012- 2022 and Map 2 indicates water level changes from spring of 2021-2022. In much of the project area the one-year groundwater declines from the spring of 2021-2022 were 1 - 5 feet. The remaining area of the district is within the area described as sparse data. Our requested project would first address the lack of adequate data. It would create a reliable data source that can be shared with multiple agencies. This ensures that a true measurement of groundwater is reported for accurate and reliable aquifer depletion. A reduction in aquifer depletion will improve streamflow retained for wildlife habitat and recreational uses. Second, this will help to protect municipal water use through protection from overuse and significant chemigation events. This project should help reduce groundwater consumption across the LNNRD's District. Irrigators that make educated decisions about pumping will help reduce aquifer depletion and increase the Niobrara River streamflow. The overall effect in which this project has stretches well beyond our district boundaries. It creates reliable data that be shared across the state, decreased usage of shared aquifers and increased stream flows that can be utilized well beyond the Niobrara River valley.

Map 1

-  Lower Niobrara NRD
-  Phase II Area
-  Bazile Ground Water Management Area



Groundwater-Level Changes in Nebraska - Spring 2012 to Spring 2022



- | | |
|---------------------|------------------------|
| Rise in feet | Decline in feet |
| 1 to 5 | 1 to 5 |
| 5 to 10 | 5 to 10 |
| 10 to 15 | 10 to 15 |
| 15 to 20 | 15 to 20 |
| 20 to 25 | 15 to 20 |
| < +/- 1 foot | |
| Sparse data | |
| Surface water | |
- (1 foot = 3048 meters)

For an explanation of information presented on this map, see the 2022 Nebraska Statewide Groundwater-Level Monitoring Report, available for download at go.unl.edu/groundwater

CONSERVATION AND SURVEY DIVISION (<http://sr.unl.edu/csd/>)
 School of Natural Resources (<http://snr.unl.edu/>)
 Institute of Agriculture and Natural Resources
 University of Nebraska-Lincoln
 Aaron Young, Survey Geologist, CSD
 Mark Burbach, Water Levels Program Supervisor, CSD

Data provided by:
 Nebraska Natural Resources Districts
 Central Nebraska Public Power and Irrigation District
 U.S. Geological Survey
 Nebraska Water Science Center
 U.S. Bureau of Reclamation
 Kansas-Nebraska Area Office
 Conservation and Survey Division,
 University of Nebraska - Lincoln

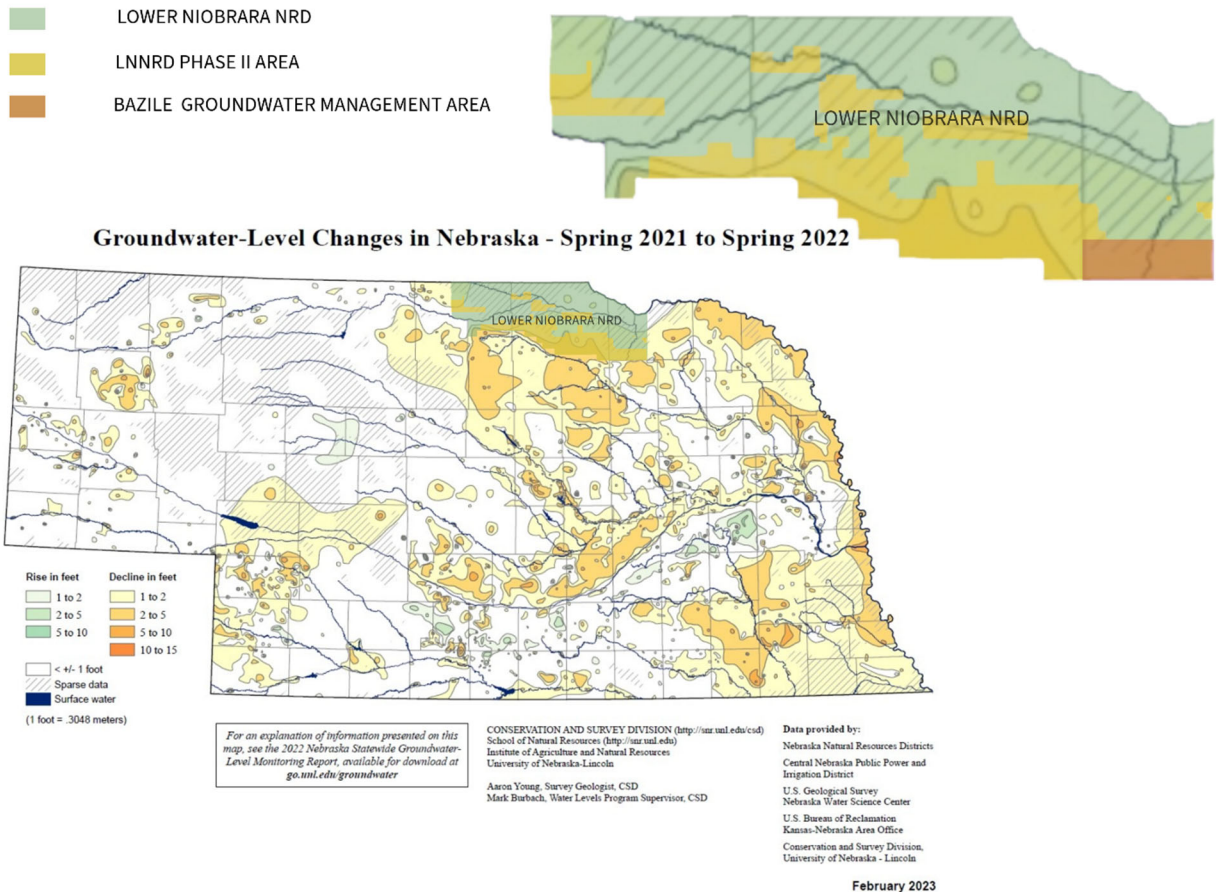
February 2023

Disclaimer: groundwater-level changes on this map are depicted at a small scale. They are intended to provide only a general overview of regional variation.



The University of Nebraska-Lincoln does not discriminate based on gender, age, disability, race, color, religion, marital status, veteran's status, national or ethnic origin, or sexual orientation.

MAP 2



5. Maximizes the beneficial use of Nebraska's water resources for the benefit of the state's residents;

- Describe how the project will maximize the increased beneficial use of Nebraska's water resources.
- Describe the beneficial uses that will be reduced, if any.
- Describe how the project provides a beneficial impact to the state's residents.

The LNNRD Water Usage Improvement Project will provide multiple benefits across the Niobrara River valley and its tributaries. Accurate groundwater usage informs not only the irrigator but the state. This project maximizes the beneficial use of Nebraska's water resources for irrigation. Sustainability of groundwater will be improved in the LNNRD by improving irrigation water use efficiency through limiting or reducing excessive or unnecessary pumping. Our requested project will address the lack of adequate data, excessive over-application of irrigation water, and increased incidence of chemigation events. The only way that beneficial use will be reduced is by reducing the pumping of irrigation water

that is currently being pumped, but not needed. In this manner, the beneficial use of irrigation water is not being curtailed or restricted beyond the reasonable regulations established by LNNRD. Instead, the beneficial use is becoming more efficient and sustainable where the resource is diminished. Through accurate groundwater management we can mitigate inadequate data through increased accuracy and efficiency over a broader area. Reduce over ET and the threat of significant chemigation events through data incorporated between that of the Nebraska Mesonet and accurate flow meters data. Utilization of real time levels of natural precipitation, current soil moisture, and groundwater usage creates a holistic water usage index. That can be utilized to create effect regulations that will decrease our aquifer depletion and increase Niobrara River streamflow through our district and beyond. This project will provide an example for other districts in the state with similar water shortage issues for effective water conservation practices that will benefit the waters of the state.

6. Is cost-effective;

- List the estimated construction costs, O/M costs, land and water acquisition costs, alternative options, value of benefits gained.
- Compare these costs to other methods of achieving the same benefits.
- List the costs of the project.
- Describe how it is a cost-effective project or alternative.

The initial two-years of the program will be grant funded. This allows for the cost-share and installation of flow meters and irrigation technologies on approximately 400 irrigation wells across the LNNRD. We will primarily promote and educate producers within our Phase II area, including the Bazile Ground Water Management Area (BGMA), as these have been identified as high nitrate areas within the district. Data collected will be recorded and shared based on our Integrated Management Plan (IMP) ensuring information can be used across the district and the state. This allows us to create and implement effective data collection, reporting and management. The estimated cost per flow meter is \$2,000 with a maximum cost-share available of \$1,500 per well with an initial limit of 2 per producer. Anything beyond the total maximum cost-share will be covered by the producer. This represents an additional in-kind contribution not reflected in the project budget. Once installation is complete, the producer will be required to report groundwater used yearly during the growing season.

Collecting groundwater extraction data with the use of permanently installed totalizing flow meters is the most economical way of acquiring this data. The current method used by the majority of producers is an outdated manual method of multiplying flow rate (in gallons per minute) by the time pumped (in hours). This data has an accuracy of +/-20% on reported fields. The current methods report over irrigation of roughly 30 billion gallons of water a year creating an average cost of \$15.95/ acre resulting in over \$3.5 million a year in additional cost to irrigators.

Other methods of collecting flow data with portable ultrasonic flow meters would require district staff to drive thousands of miles each year to perform field measurements of flow rates at wells which would generate similar inaccurate data while requiring additional staff time and vehicle expense.

	200 FLOWMETERS	YEAR 1	200 FLOWMETERS	YEAR 2	TOTAL
WSF	60% @ \$900	\$180,000	60% @ \$900	\$180,000	\$360,000
LNNRD	40% @ \$600	\$120,000	40% @ \$600	\$120,000	\$240,000
TOTAL		\$300,000		\$300,000	\$600,000

7. Helps the state meet its obligations under interstate compacts, decrees, or other state contracts or agreements or federal law;
 - Identify the interstate compact, decree, state contract or agreement or federal law.
 - Describe how the project will help the state meet its obligations under compacts, decrees, state contracts or agreements or federal law.
 - Describe current deficiencies and document how the project will reduce deficiencies.

Currently the LNNRD participates in the administration of the Bazile Groundwater Management Area (BGMA). The BGMA is a federally recognized groundwater quality area since many of the wells in the area exceed the 10 ppm Maximum Contaminant Level (MCL) for Nitrate-nitrogen established by the Environmental Protection Agency. This has created an issue for many of the communities to supply clean drinking water under the Safe Drinking Water Act. BGMA is affected by high levels of nitrates in the drinking water supply. Due to predominantly sandy soils in the BGMA, precipitation and irrigation water can infiltrate quickly and deeply. Nebraska Water Center, UNL, and Bazile Groundwater Management Area data indicates that nitrate leaching has a vertical transport rate of 6-7 feet per day in saturated sandy soils creating significant chemigation events. Accurate flow measurements decrease water application reducing stress from chemigation events on district aquifers and streams. The current deficiency in LNNRD is the lack of accurate groundwater measurement on irrigation wells in the district. Once this is corrected, improved water management will affect improved groundwater management in LNNRD.

The Niobrara River is a gaining stream and flows are approximately 80% groundwater. Increased flows due to reduced groundwater usage in the LNNRD could help minimize surface water calls at the former Spencer Dam, allow for an increase in beneficial uses, and support fish, wildlife, and recreation on the Niobrara River. The lower portion of the Niobrara River in LNNRD has a National Wild and Scenic designation at the upper end and National Recreation designation at the lower end.

8. Reduces threats to property damage or protects critical infrastructure that consists of the physical assets, systems, and networks vital to the state or the United States such that their incapacitation would have a debilitating effect on public security or public health and safety;

- Identify the property that the project is intended to reduce threats to.
- Describe and quantify reductions in threats to critical infrastructure provided by the project and how the infrastructure is vital to Nebraska or the United States.
- Identify the potential value of cost savings resulting from completion of the project.
- Describe the benefits for public security, public health and safety.

If groundwater levels continue to decline, irrigated land may be forced to be converted to dryland which could reduce the value of the property by 50% or more. If nitrate levels remain at higher levels, municipal wells or domestic wells may be rendered unusable for drinking water. If groundwater quality remains in the current state, high quality drinking water may not be available which would be extremely detrimental to the population in LNNRD. Maintaining high quality drinking water in the district is one of the highest priorities for public health and safety.

Several types of property damage can be prevented through the implementation of this project. When significant groundwater declines occur, subsidence can also occur which constricts the available storage in the local aquifer, has the potential to damage critical infrastructure such as buildings, roads, and even the irrigation system itself.

Quite often when groundwater tables decline, well owners are required to drill deeper wells at significant cost. This also can lower the water table in the local aquifer below the screens of existing wells that may be the source for domestic, municipal, industrial, or other irrigation wells having significant effects on critical water supply infrastructure for these various uses. The cost of replacing a domestic well could be tens of thousands of dollars while replacing a larger municipal, industrial, or irrigation well could be hundreds of thousands of dollars. Several of these sources of water would be beneficial to public health, safety, and security.

9. Improves water quality;

- Describe what quality issue(s) is/are to be improved.

- Describe and quantify how the project improves water quality, what is the target area, what is the population or acreage receiving benefits, what is the usage of the water: residential, industrial, agriculture or recreational.
- Describe other possible solutions to remedy this issue.
- Describe the history of the water quality issue including previous attempts to remedy the problem and the results obtained.

Nebraska Water Center, UNL, and Bazile Groundwater Management Area data indicates that nitrate leaching has a vertical transport rate of 6-7 feet per day in saturated sandy soils. With our current rate of over-application of irrigation water, irrigators within the LNNRD are not only decreasing water quantity but increasing the chance of significant chemigation events at an alarming rate. Increasing nitrate levels creates a lack of clean drinking water throughout the district. Many of the townships in the Phase II area of LNNRD have groundwater nitrate concentrations that range from 10 ppm to over 30 ppm representing serious drinking water concerns. The LNNRD currently has 2 rural water districts and 7 municipalities spanning 5 county's reaching hundreds of people. Each well head protection area has seen some indications of nitrate leaching. The LNNRD Water Use Reduction Program will help mitigate the impact of nitrates. Reliable irrigation well measurements can help decrease excessive groundwater pumping reducing the effects of the deep percolation of nitrates.

Due to a continued rise of nitrate levels LNNRD's Phase II requirements went into effect on April 2, 2004. In 2014 the Bazile Groundwater Management area was identified after excessive nitrate levels were located. In 2019 the Board moved all but 10% of all irrigated acres into our current Phase II area. Currently all Phase II producers are required to submit on-line reporting showing nitrogen credits, nitrogen applied, irrigation water pumped, and herbicides used. Groundwater quality monitoring consists of roughly 500 irrigation wells being tested annually to track nitrate nitrogen levels. Long range impacts of failure to accurately measure and regulate water usage in the LNNRD will drastically deplete current aquifer levels, reduce streamflow, and heavily contaminate clean drinking water. With a current rate of 30 billion gallons of over-applying irrigation water annually the producers of the LNNRD will have used an excess of 300 billion gallons of water over the next 10 years.

Historically the LNNRD began monitoring static water levels across the district in 1976 and offered cost share for 100 flowmeters for LB483 acres in 2012-2014 with the assistance of an NET grant. Rules and Regulations adopted in 2014 required flowmeters on all new and replacement wells. The district currently collects groundwater use data at 175 of the 1700 parcels or roughly 10% of wells in our Phase II area. In 2019 the LNNRD was awarded an NET grant to expand our dedicated monitoring network. The LNNRD added 18 new monitoring wells, at 14 sites throughout the district. In 2023 transducers and telemetry were added to dedicated monitoring well tracking real-time static water levels that is publicly available on our website.

10. Has utilized all available funding resources of the local jurisdiction to support the program, project, or activity;

- Identify the local jurisdiction that supports the project.
- List current property tax levy, valuations, or other sources of revenue for the sponsoring entity.
- List other funding sources for the project.

The LNNRD is a political subdivision of the State of Nebraska, created by the Legislature and given taxing authority under Nebraska Statute 77-3442. Our total certified valuation for 2023 was \$3,058,504,078 with a current tax request of \$960,000, a levy of 0.021702, and Groundwater Management Activities levy maxed out at 0.01. The LNNRD's valuation is the third lowest among the NRDs in Nebraska, we are very limited in our controlled budget increases, including groundwater management activities. We also use the Natural Resources Water Quality Fund of \$31,912.44 for our cost-share programs. Subsequent to the submittal of this application, additional funding will be pursued through the WaterSMART grant program through the Bureau of Reclamation and an RCPP grant through the USDA-NRCS. Consequently, this grant project has the potential to bring federal funding into the state as well.

11. Has a local jurisdiction with plans in place that support sustainable water use;

- List the local jurisdiction and identify specific plans being referenced that are in place to support sustainable water use.
- Provide the history of work completed to achieve the goals of these plans.
- List which goals and objectives this project will provide benefits for and how this project supports or contributes to those plans.
- Describe and quantify how the project supports sustainable water use, what is the target area, what is the population or acreage receiving benefits, what is the usage of the water: residential, industrial, agriculture or recreational.
- List all stakeholders involved in project.
- Identify who benefits from this project.

The LNNRD has a Groundwater Management Plan and an Integrated Management Plan in place to govern water use in the district. The LNNRD began monitoring static water levels across the district in 1976 and offered cost share for 100 flowmeters for LB483 acres in 2012-2014 with the assistance of an NET grant. Rules and Regulations adopted in 2014 required flowmeters on all new and replacement wells. The district currently collects groundwater use data at 175 of the 1700 parcels or roughly 10% of wells in our Phase II area. LNNRD's Phase II requirements went into effect on April 2, 2004 in 2014 the Bazile Groundwater Management area was identified after excessive nitrate levels were located, in 2019 the Board moved all but 10% of all irrigated acres into our current Phase II area. Currently all Phase II producers are required to

submit on-line reporting showing nitrogen credits, nitrogen applied, irrigation water pumped, and herbicides used. Groundwater quality monitoring consists of roughly 500 irrigation wells being tested annually to track nitrate nitrogen levels. Our current objective of this project is to 1) Reduce aquifer depletion and increase streamflow through decreased groundwater use 2) Reduce the infiltration of nitrate contamination into district drinking water 3) Create an accurate and informative groundwater outreach/educational program for producers. 4) Develop an effective drought mitigation plan. 5) Promote and utilize accurate data between LNNRD and producers.

Currently the LNNRD has flow meters on approximately 20,000 acres or roughly 9% of the District's 220,711 groundwater irrigated acres and 11,973 comingled irrigated acres. The LNNRD Board of Directors feel this data is inadequate, they are basing current water programs on small amounts of outdated information creating a lack of effective groundwater management throughout the district. The LNNRD is working to increase accuracy through more effective, widely used irrigation management technology ensuring a sound groundwater management plan. The LNNRD currently has 2 rural water districts and 7 municipalities spanning 5 counties reaching hundreds of people. Each well head protection area has seen some indication of nitrate leaching. The LNNRD Water Use Reduction Program will help mitigate the impact of nitrates. Reliable irrigation well measurements can help decrease excessive over ET reducing the effects of saturated nitrate leaching. Long range impacts of failure to accurately measure and regulate water usage in the LNNRD will drastically deplete current aquifer levels, reduce streamflow, and heavily contaminate clean drinking water in our rural communities.

Stakeholders in this initiative include the LNNRD Board and committee members, municipal water providers, including rural water districts, private well owners, and irrigators within the district. Each of these stakeholders have a vested interest in the success of improving groundwater management to sustain water quantity for all uses and improving drinking water quality.

12. Addresses a statewide problem or issue;

- List the issues or problems addressed by the project and why they should be considered statewide.
- Describe how the project will address each issue and/or problem.
- Describe the total number of people and/or total number of acres that would receive benefits.
- Identify the benefit, to the state, this project would provide.

The LNNRD and several other areas within the State of Nebraska have documented and well-known groundwater nitrate contamination issues. Within the LNNRD Phase II areas, many of the average groundwater nitrate contaminant levels are 10 ppm to over 30 ppm well over the 10 ppm MCL set by

the EPA. Currently 80% of Nebraska residents have safe, clean, monitored drinking water provided by local municipalities and the remaining 20% have unmonitored private domestic wells. The current nitrate levels have doubled since 1978 causing significant dangers along with it. The LNNRD is not alone in this, Nebraska is facing increased nitrate levels that have been linked to significant dangers in children. The LNNRD Water Use Reduction Program will address the leading cause of groundwater leaching, through over irrigation. The Nebraska Water Center has recently documented that nitrates can achieve vertical transport rates of 6-7 feet per day in our sandy soils when totally saturated. Our current groundwater use data is reported by most producers is highly unreliable and in many cases is reported with an accuracy of +/- 20%. Current water use reporting indicates a yearly over-application of roughly 30 billion gallons of water in our District. The impact of inaccurate, unreliable data goes way beyond the 7 municipalities, 2 rural water districts and 5 counties that lie within our district.

This project will provide flow meters on 400 irrigation wells in the district to benefit irrigation water management on an estimated 50,000 acres for approximately 200 farmers. This project will not only benefit landowners and operators in LNNRD, but also other areas in the State of Nebraska that may replicate similar programs.

13. Contributes to the state's ability to leverage state dollars with local or federal government partners or other partners to maximize the use of its resources;

- List other funding sources or other partners, and the amount each will contribute, in a funding matrix.
- Describe how each source of funding is made available if the project is funded.
- Provide a copy or evidence of each commitment, for each separate source, of match dollars and funding partners.
- Describe how you will proceed if other funding sources do not come through.

The Water Use Reduction Program will assist with the initial purchase of irrigation management technologies that includes but is not limited to soil moisture probes, flow meters, variable rate irrigation (VRI), DirectET irrigation monitoring, FieldNET irrigation monitoring and other next level technologies. The total cost of this proposed project is \$600,000, with 60% from the WSF grant, 40% from the LNNRD special water projects budget, and additional cost above offered cost-share will be covered by participating producers. LNNRD will continue applying for additional funding throughout 2024. An application will be completed for the RCPP and Water Smart Funds starting in the spring and running through October. Confirmation will be late 2024 and early 2025. Implementation of The Water Use Reduction Program will remain similar and expand the program. The LNNRD's budget comes from a very small levy assessed to the district's property value. We will use some of this money to pay

for our share of the cost share. The LNNRD’s operating budget for the Fiscal Year of 2024 was approved by the Board of Directors at our September meeting and included up to \$60,000/year for special water projects.

	200 FLOWMETERS	YEAR 1	200 FLOWMETERS	YEAR 2	TOTAL
WSF	60% @ \$900	\$180,000	60% @ \$900	\$180,000	\$360,000
LNNRD	40% @ \$600	\$120,000	40% @ \$600	\$120,000	\$240,000
TOTAL		\$300,000		\$300,000	\$600,000

14. Contributes to watershed health and function;

- Describe how the project will contribute to watershed health and function in detail and list all of the watersheds affected.

The LNNRD Groundwater Use Improvement Project will provide cost-share to producers for irrigation technologies that improve the Niobrara River watershed health and function by stabilizing groundwater levels, stabilizing and/or increasing Niobrara River flows, and give us another tool to help mitigate groundwater nitrate contamination. Nothing is more important to the health and function of a watershed than an adequate water supply for wildlife, people, and plants for the natural landscape and food production. This project will implement water saving practices for agriculture that will support groundwater sustainability for all uses. Agriculture is the primary user of groundwater resources in the district and will consequently have the greatest impact on watershed health.

15. Uses objectives described in the annual report and plan of work for the state water planning and review process issued by the department.

- Identify the date of the Annual Report utilized.
- List any and all objectives of the Annual Report intended to be met by the project
- Explain how the project meets each objective.

The development of this irrigation management program to deploy flow meters on irrigation wells in an opportunistic project for the NDNR to collaborate with LNNRD and meets several of the goals identified by the NDNR to implement Neb. Rev. Stat. 5-1599 described below:

1. Maintain data, information, and analysis capabilities for water planning, including specific programs for collecting, maintaining, and distributing information on streamflow’s, as well as analyzing water uses and water supplies across the state.

This project clearly meets Objective 1 by developing the necessary tools to acquire water use data for irrigation management on the farm level as well as the watershed level. Additionally, the NDNR will directly benefit as a collaborator with the LNNRD when collecting and analyzing water use data and supplies across the district.

2. Provide staff and resources to support planning and implementation of water resources projects.

LNNRD will partner with NDNR on this project with the financial assistance of NDNR and has allocated staff to provide resources and support the implementation of the project.

3. Support locally developed water management plans for managing hydrologically connected water supplies.

This project supports the basis for scientifically based decisions for irrigation water management which is in direct alignment with the implementation of the LNNRD Voluntary IMP.

4. Provide coordination of federal agencies, state agencies, local NRDs, and other water interests for the development of water resources programs and projects.

LNNRD intends to utilize funding from the NDNR to initiate this program in priority areas of the district and then expand upon this by leveraging federal funds with the district and state dollars to support groundwater management in the LNNRD.

5. Participate in interagency collaboration with federal agencies, state agencies, local natural resources districts (NRDs), and other water interest entities on various water resources programs and projects, and;

This project is a joint venture between the LNNRD and the NDNR which will also include the cooperation of private industry to implement technology. As this program evolves, the Bureau of Reclamation will likely be involved to provide funding through the Water SMART program as well.

6. Consolidate and present information in a form that is understandable and useful to the public and interagency collaborators.

This project will generate water use data in a usable digital format that will be readily available for irrigators for water management decisions as well as water managers for basin wide water management and reporting. LNNRD is a partner in the Producer Connect App that will facilitate the reporting of water use data to the district for use by the farmer as well as the district

16. Federal Mandate Bonus. If you believe that your project is designed to meet the requirements of a federal mandate which furthers the goals of the WSF, then:

- Describe the federal mandate.
- Provide documentary evidence of the federal mandate.
- Describe how the project meets the requirements of the federal mandate.
- Describe the relationship between the federal mandate and how the project furthers the goals of water sustainability.

Congress created the National Wild and Scenic Rivers System in 1968 (Public Law 90-542; 16 U.S.C. 1271 et seq.) to protect rivers with outstandingly remarkable values (ORVs) in a free-flowing condition for the enjoyment of present and future generations. The NPS manages and provides guidance on rivers that are administered by a variety of different parties and works closely with many partners to protect and enhance the Wild and Scenic Rivers placed under its care (National Parks Service, nps.gov). The use of flowmeters and irrigation technologies through the proposed project may increase and/or stabilize flows in the Niobrara River to help protect flow-dependent values associated with the Wild and Scenic designation of the Niobrara River, as well as the Recreation designation on the lowest end of the Niobrara River.

Elevated groundwater nitrate concentrations are well-documented in the Bazile Groundwater Management Area (BGMA), a federally recognized groundwater quality area. The BGMA was originally identified as the Bazile Triangle area of concern in the late 1980s because of nitrate contamination affecting municipal wells in the vicinity of the Villages of Winnetoon, Brunswick, Creighton, Orchard, Osmond, Plainview, Royal, and Wausa, Nebraska. This was later expanded to the current BGMA, which covers 21 townships, or 756 square miles. Three of these townships are in the LNNRD. Two thirds of the total land use, or about 324,000 acres, is used for row crop production. While no federal mandates currently exist for this federally recognized groundwater quality area, this proposed project has the potential to be implemented by irrigators in the BGMA and present a possible solution to nitrate concerns in the BGMA.