

Assessing Aquifer Impacts through Remote Monitoring of Wells
in Lower Platte North Natural Resources District Designated
Special Quantity Subareas for Drought Resiliency

Applicant:

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Technical Proposal and Evaluation Criteria

Executive Summary

4/23/2019

The Lower Platte North Natural Resources District (LPNNRD) is headquartered in the city of Wahoo, Saunders County, Nebraska.

LPNNRD has two areas of concern for water quantity, where domestic wells and irrigation wells exist in conflict during irrigation season. These areas are known as Special Quantity Subareas (SQS), and during periods of drought the aquifers that underlay these areas cannot keep up with the demand placed on them. In these areas, LPNNRD has 31 locations with data logging equipment. Procuring readings from all 31 of these sites during the crop season is logistically problematic, making efficient aquifer management difficult. To combat this problem, LPNNRD proposes the installation of remote read transmitters on all 31 sites. This will allow LPNNRD to monitor groundwater fluctuations as they occur and take proactive steps to regulate water usage, ensuring access to all users of the aquifer. This effort is perfectly suited to the WaterSMART program as there are identified areas of conflict between water users that LPNNRD is attempting to mitigate through robust data collection and a series of restrictions aimed at keeping aquifer levels sufficient for all to use.

If selected as a grant recipient, LPNNRD would begin installation of the remote read transmitters 11/19 with an anticipated finish date of no later than 03/20. None of these installations would occur on a Federal facility.

Background Data

Nebraska, the most heavily irrigated state in the nation, has long been a national leader in water policy. Nebraska established Natural Resource Districts (NRD) in 1972, tasking them with a variety of responsibilities. Perhaps the most critical of which is the protection of groundwater quality and quantity. There are 23 NRDs across the state, with their boundaries loosely following drainage basins. Each NRDs groundwater supply is unique. Some overlay the High Plains Aquifer, while others contain aquifers of different origins. Regardless of the aquifer type present in an NRD, each NRD is cognizant of the interaction of groundwater and surface water and the potential for conflicts between different categories of water users.

LPNNRD is responsible for parts of seven counties in eastern Nebraska (Boone, Butler, Colfax, Dodge, Madison, Platte, and Saunders). Within these seven counties LPNNRD oversees 4900 irrigation wells accounting for 396,000 irrigated acres, and 2547 domestic wells. In addition to the large number of irrigation and domestic wells, Omaha and Lincoln, Nebraska's two largest cities, both have municipal well fields within LPNNRD that supply drinking water to over 1 million

Nebraska residents. With such a large number of wells, and competing interests, there are bound to be conflicts.

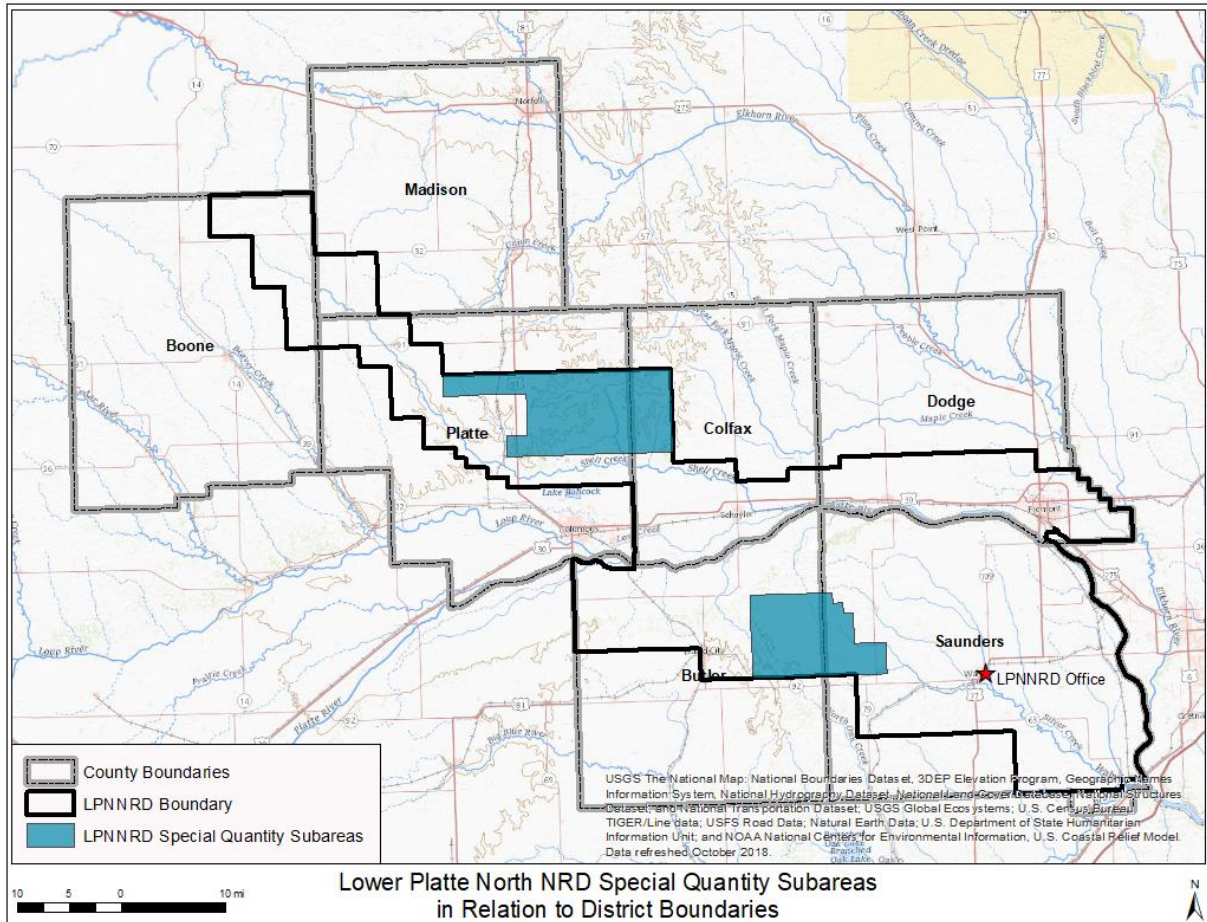
In 2012, LPNNRD suffered an unexpected and severe drought. With months of little to no rain and exceptionally high temperatures, farmers were forced to run their irrigation systems significantly more than in an average year. During this period of intense irrigation and drought, LPNNRD began fielding multiple calls from domestic users about their wells going dry. It was determined that heavy pumping was putting too great a strain on the aquifer and causing widespread domestic well interference. The only available option for most of these domestic users was to drop their well deeper, which was not fiscally feasible for most. Following the 2012 irrigation season LPNNRD instituted two areas where domestic interference was prevalent. These areas came to be known as Special Quantity Subareas (SQS) One and Two, respectively.

SQS One consists of 48 domestic wells, 30 irrigation wells, nine stock wells, four public water supply wells, and one commercial/industrial well. The 30 irrigation wells are responsible for supplying water to 57 irrigated parcels, including 40 pivots and 17 gravity fed fields for a total of 4015 irrigated acres. This area is predominately on a corn/bean rotation. In 2012 and subsequent years LPNNRD has fielded numerous complaints of water shortages from domestic users during irrigation season, with one gentleman memorably remarking that when his wife wants to wash clothes he has to go down the way and shut off his pivot. The aquifer that supplies this area's groundwater is insufficient to provide water to both domestic and irrigation users in drier years.

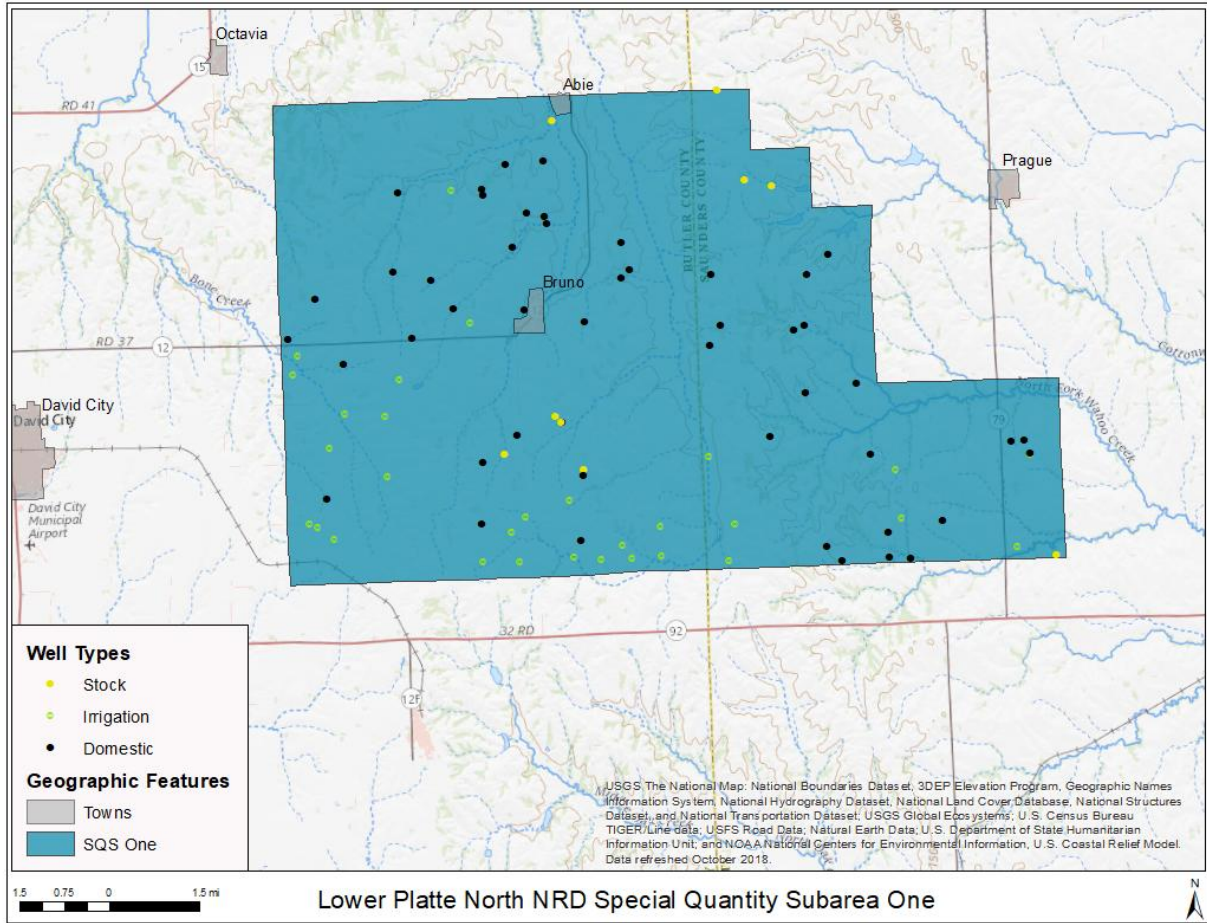
SQS Two consists of 104 domestic wells, 274 irrigation wells, 45 stock wells, one public water supply well, and one commercial/industrial well. The 274 irrigation wells are responsible for supplying water to 600 irrigated parcels, including 586 pivots (46 of which are interspersed with gravity irrigation), 9 gravity fed systems, and 5 volume gun operations. These 600 parcels account for 37,084 total irrigated acres in SQS Two. Much like SQS One, this area is predominantly on a corn/bean rotation. SQS Two is the area where LPNNRD received the majority of well interference complaints. Under normal strain, the aquifer underlying SQS Two has trouble keeping up with all the various uses put upon it, but when faced with a dryer than average year it cannot keep up at all.

Project Location

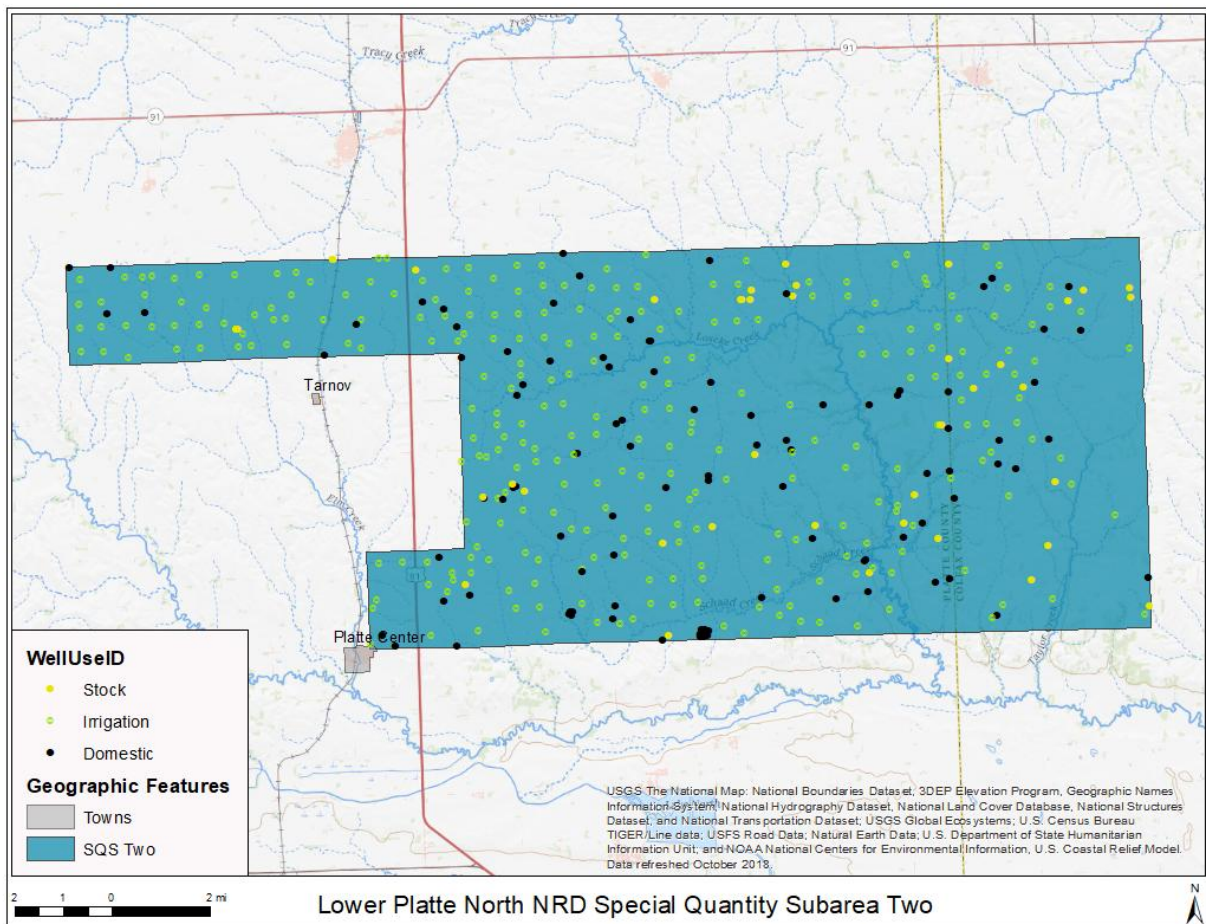
LPNNRD is a large, amorphous, area that is essentially bisected by the Platte River. The following map provides a sense of scale, with following maps being more specific to the individual SQS areas.



SQS One spans parts of Butler and Saunders Counties in Nebraska. It includes the towns of Abie and Bruno, both located in Butler County. The centroid for this area falls at 41.27°N, 96.94°W and encompasses 86 sections, or 86 square miles. Though this is a relatively small area in terms of the entire district, it should be noted that the southern boundary of SQS One borders a neighboring NRD, Lower Platte South. Picking up at, and contiguous with, the southern border of SQS One, the Lower Platte South NRD has a similar, larger, management area of water shortages and restrictions as it is the same underlying aquifer.



The second area of focus, SQS Two, spans parts of Colfax and Platte Counties in Nebraska. It abuts the town of Platte Center, located in Platte County, on the southwestern corner of the project area. The centroid of SQS Two is 41.60°N, 97.34°W and encompasses 132 sections, or 132 square miles. The areas along the northern boundary are in the Lower Elkhorn NRD, and while similar conditions exist, their publically elected board chose not to immediately address this area as they had other areas of greater concern.



Technical Project Description and Milestones

During the extreme drought of 2012, LPNNRD received numerous complaints of wells either underperforming or simply not drawing water. LPNNRD staff undertook an investigation and concluded that in some areas of the district, the underlying aquifers were insufficient to supply water to all users during times of drought or below average rainfall. To combat this problem, LPNNRD's publically elected board directed staff to create Special Quantity Subareas One and Two. LPNNRD is attempting to address this issue in a variety of ways.

Each subarea is under various restrictions to preserve water quantity. No new irrigation well development, aside from replacement wells, is allowed in either area. Both subareas are required to have flow meters installed on all irrigation wells and their totals reported yearly. Further, each

irrigation system in a subarea is allotted a limited amount of water usage based on recommendations of crop need by the University of Nebraska - Lincoln (UNL). This water usage is a rolling average of not more than 27 inches of water over a three year period. This amount of water is sufficient to grow corn and more than enough for soybeans during an average year. If a year is below average producers are able to apply more water, but must be cognizant that they will not have as much water to apply the next year. Irrigation expansion is restricted in these areas. No new irrigated acres are allowed, excepting for the expansion of an already existing irrigation system. These expansions are not allocated any additional water use, so producers need to plan accordingly.

In addition to restrictions placed on irrigation, LPNNRD is taking steps to better understand the aquifer dynamics in these two areas. Data logging equipment is installed in numerous wells throughout the areas and collect data on water levels. Additionally, LPNNRD has been working with a contractor to obtain airborne electromagnetic survey (AEM) data to better understand the hydrogeology of both areas. Data from both sources allows LPNNRD to provide short term and long term management strategies for the affected areas.

While collecting data on water levels helps LPNNRD to manage aquifer conditions in the short term, the collection of that data is problematic. Current protocol sends a staff member out to periodically collect the data stored on the devices manually. Because of the distances involved, it can easily consume two to three days of staff time to collect all of the data. The data collected, while useful, is often collected at such sporadic intervals that LPNNRD is constantly managing aquifer conditions from behind, which is not an ideal situation.

To combat this, LPNNRD proposes to install remote read transmitters on all wells in the SQS areas that are equipped with data loggers. Gaining the ability to pull data from these wells in real, or near real, time will allow LPNNRD to manage from the front.

One way in which LPNNRD hopes to use this data is to evaluate different irrigation management techniques such as rotational pumping or pumping during certain timeframes. As it stands now, since data collection is sporadic, if LPNNRD imposes these management techniques, it is not known whether the technique was effective or not until data is collected. Having immediate access to data would allow LPNNRD to quickly evaluate which of the various management techniques are most effective and implement them on a full time basis.

If selected as a grant recipient, LPNNRD would follow normal procedures and send out a request for proposals. This would follow immediately upon signing off on all required grant documents. Once a vendor is chosen and product secured LPNNRD staff will begin field installations of the remote read units after harvest, which is usually the first or second week of November. It is expected that installation will take approximately 80 staff hours, or ten working days. Nine of the working days would be spent in SQS Two, while SQS One is expected to only require one day for installations. A single crew of two employees would be tasked with accomplishing the installations.

Once installed and data is collected during the next irrigation season, LPNNRD can start taking proactive steps to balance the water in the aquifer for all users. It is expected that project implementation will save substantial staff time, reduce budget needs relating to staff travel and salary for data collection and lead to a robust management plan for both areas. LPNNRD is confident that with timely data acquisition the available water in the aquifer can be shared amongst all water users with substantially less, or no, conflict.

Evaluation Criteria

E.1.1. Evaluation Criterion A - Project Benefits

Describe the expected benefits and outcomes of implementing the proposed project.

Deploying the ability to remotely monitor data loggers in the SQS areas will be a boon to LPNNRD. It will cut down significantly on staff travel time, vehicle wear, and allow more frequent access to the data LPNNRD needs to successfully manage the aquifers in the SQS areas. Access to this data will allow LPNNRD to put various management techniques in place and quickly gauge their efficacy. LPNNRD expects to be able to utilize this data to ensure ample supply from the aquifer for all classes of water users.

What are the benefits to the applicant's water supply delivery system?

Currently, during drought conditions, or drier than average years, the aquifers underlying the SQS areas are insufficient to keep up with the demand from all groups of water users. LPNNRD is applying various management techniques to mitigate this shortfall, but the techniques employed are only as good as the data collected. Due to staff considerations and distance, the data is often collected after it can be used proactively, leading to a deterioration of aquifer availability. Access to more timely data will allow LPNNRD to recognize signs of aquifer stress before they reach critical levels and have a deleterious impact on water users.

If other benefits are expected explain those as well.

LPNNRD maintains a robust system of education for local producers. Freeing up staff time from collecting data will allow LPNNRD to schedule additional trainings and field days for producers to attend on a wide variety of subjects such as nitrogen management, cover crops, and others. In addition to an increase in staff time, LPNNRD will be able to work with producers in SQS areas directly, allowing them to experience and become comfortable with technological innovations in the agricultural sector. LPNNRD will be able to work with individual producers and share the data collected for micro-areas allowing producers to see how the aquifer reacts in their specific area, this additional education will lead to more efficient use of groundwater.

Consider the following:

Extent to which the proposed project improves overall water supply reliability

Allowing more timely data acquisition will allow the NRD to accurately judge the recharge conditions within the aquifer. Once this data is known, LPNNRD can begin applying management techniques such as rotational pumping or pumping during defined times that ensures irrigators have plenty of access to water for their crops, while ensuring domestic users have ample supply for their needs during normal usage times. This will help eliminate conflict between the major users of water within the SQS areas.

The expected geographic scope benefits from the proposed project (e.g., local, sub-basin, basin)

Amelioration of conflicts between these various users of the aquifer will provide substantial relief to the local areas. This relief can be measured not only in terms of water availability, but in terms of personal relationships amongst the factions. The sub-basin and basin will reap benefits in terms of the interplay between surface water and groundwater. We know that as aquifer levels decline, so too does the level of streams and rivers. With too much aquifer depletion there is the very real chance that recreation and wildlife benefits derived from surface water will suffer, as has been experienced in the Platte River.

Extent to which the proposed project will increase collaboration and information sharing among water managers in the region

The system of Natural Resource Districts in Nebraska is a collaborative system. While each NRD is responsible for their specific geographic area, each with a publically elected board of directors, it has long been known that by cooperating on projects and sharing data, the NRDs can more successfully manage the responsibility areas tasked them by the State of Nebraska. Data collected by NRDs is freely shared amongst their neighbors as well as various State Agencies and Federal partners, such as NRCS, USGS, and USFWS. NRDs work in close concert with all regional stakeholders to provide the best possible outcomes for their constituents. The data collected through this endeavor will help a wide variety of agencies and neighboring NRDs better understand not only this area and those that border it directly, but the efficacy of management techniques can be applied to other areas and help conserve groundwater throughout Nebraska.

Any anticipated positive impacts/benefits to local sectors and economies (e.g., agriculture, environment, recreation, tourism)

In Nebraska, as irrigation goes, so goes agriculture. In a state whose economy revolves around agriculture it is imperative that there be as few impediments to success as possible. While it may seem that placing restrictions on water usage on producers counterintuitive to this, ensuring that all producers have equal access to the water strengthens the system as a whole and allows everyone to benefit from this shared resource of groundwater. In many other states, neighbors compete for

availability of water to the detriment of not only personal relationships but to the agricultural industry of that state as a whole. While not known as a tourist destination, Nebraska has a thriving recreation industry. With plentiful parks, rivers, and lakes there are many opportunities for environmental tourism and recreation in Nebraska. Because groundwater and surface water are so interconnected, depletion of the aquifer has a negative impact on these recreational opportunities. Successfully managing the aquifers will help ensure a strong local recreation industry.

Extent to which the project will complement work done in coordination with NRCS in the area (e.g., with a direct connection to the district's water supply). Describe any on-farm efficiency work that is currently being completed or is anticipated to be completed in the future using NRCS assistance through EQIP or other programs.

LPNNRD and NRCS work closely together on a wide range of projects. So much so that the local NRCS office (located across the parking lot from LPNNRD headquarters) attends all LPNNRD board meetings and gives updates on various projects and initiatives that LPNNRD and NRCS are currently working on together and upcoming opportunities for collaboration. NRCS frequently utilizes LPNNRD's board room for training classes, and NRCS clerks and some field staff are employed by LPNNRD but work with, and under the direction of, NRCS management. Because of this symbiotic relationship LPNNRD is very active in helping identify areas and applicants for NRCS EQIP programs and other opportunities. In just the Wahoo Creek Watershed EQIP funding is responsible for 4717.1 acres of Cover Crop, 106 acres of Critical Area Planting, 30.9 acres of Forage and Biomass Planting, 14.4 acres of Grassed Waterways, 204,769 feet of Terraces, 130,052 feet of Underground Outlet, and 259 Water and Sediment Control Basins since 2014. Examples of this type of work abound in LPNNRD. Once data collection begins, LPNNRD will work with local and state level NRCS staff to put in place a variety of programs that will further help to conserve groundwater and enhance soil productivity.

E.1.2.Evaluation Criterion B - Planning Efforts Supporting the Project

Describe how your project is supported by an existing planning effort.

LPNNRD has an existing groundwater management plan and an integrated management plan (IMP) with the Nebraska Department of Natural Resources (NeDNR). Additionally, LPNNRD worked with a coalition of other NRDs to produce the "Lower Platte River Drought Contingency Plan" that is in the final stages of acceptance with NeDNR and the Bureau of Reclamation, which supplied \$200,000 in funding. This proposed project will help supplement and complete the goals and objectives outlined in all three plans. All the management plans detail the collection and judicious use of data from aquifers. In these most critical areas of SQS, accessing the data quickly and efficiently will bolster the various plans put in place. Data sharing with NeDNR will allow LPNNRD to move quickly to address any deficiencies detected in the plans and amend them as State Law allows.

Does the proposed project implement a goal or address a need or problem identified in the existing planning effort?

In any planning effort, analyzing data is crucial to judging the effectiveness of the plan and if any changes need to be made to assure the plan is working as intended. All the aforementioned LPNNRD plans require robust data collection. Throughout the areas of the district where quantity concerns are minimal, this collection happens in spring and fall so LPNNRD may assess pre and post irrigation impacts to the aquifer. These results are then logged and shared with various partners including NeDNR, USGS, and UNL. These organizations utilize this data to achieve their various goals and objectives delineated to them by state and federal law. Information collection in SQS areas is even more crucial to all the stakeholders and their programs because it is an area of known shortage and conflict. Working together LPNNRD and its partners can mitigate this issue.

Explain how the proposed project has been determined as a priority in the existing planning effort as opposed to other potential projects/measures.

As mentioned earlier, groundwater management is only as effective as the timeliness of the data acquired. Waiting a month or more to retrieve data from the loggers means that by the time LPNNRD has assessed a problem, conditions have changed and the opportunity for amelioration is past. Because of the distances involved and limited personnel, LPNNRD frequently does not have the staff power to collect data as frequently as needed to move decisively and mitigate problems before they arise. The ability to collect this data in a timely fashion is crucial to proper management of these aquifers. Other proposals have been deemed impractical as the cost of additional staff would quickly outweigh the cost of the remote read units. Without the ability to collect data from afar, these areas will continue to suffer water shortages during dry periods as LPNNRD cannot currently react to conditions fast enough.

E.1.3. Evaluation Criterion C - Project Implementation

Describe the implementation plan for the proposed project. Please include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates.

The implementation plan for the project is fairly straightforward. Once approved, the grant will need to be ratified by LPNNRD Board of Directors. LPNNRD Board Meetings are the second Monday of every month. If grant approval and that month's board meeting do not coincide, LPNNRD will begin drafting a Request for Proposals in anticipation of ratification. Once ratified, LPNNRD will advertise the RFP according to state law and choose a supplier for materials. Once supplies arrive, LPNNRD staff will do any of the prep work necessary to ensure a smooth field installation. After harvest LPNNRD will quickly move to install the remote read devices and estimate 10 working days (80 hours) to complete the installations. After installation and testing is complete, LPNNRD will begin utilizing the data immediately so as to familiarize staff with the format of the data and how to work with it so there will be no learning curve come irrigation season. Physical installation of the project should wrap up no later than March 2020 with an additional two months for staff to become familiar with the data format. Irrigation season generally begins in June, depending on local weather conditions. A table view follows:

Project Objective	Timeline
Ratify grant and sign relevant paperwork	Second Monday of the month (Board Meeting)
Prepare and advertise RFP	Prepare RFP prior to board meeting and begin advertising immediately after grant ratification.
Choose vendor and order equipment	Vendor selection and order equipment on RFP close date.
Prep equipment for field installation	Late September or early October 2019
Field installation	Nov. 2019, complete by March 2020
System Testing	March 2020 through May 2020
Data Collection	March 2020 through irrigation season 2020

Describe any permits that will be required, along with the process for obtaining such permits.

As the permitting agency for groundwater wells, LPNNRD will not require any additional permits for installation and utilization.

Identify and describe any engineering or design work performed specifically in support of the proposed project.

Prior to field installations, staff will call upon their knowledge and notes of each well to be outfitted and plan the installations in the proper way to ensure a smooth field experience and assure data collection is effective.

Describe any new policies or administrative actions required to implement the project.

Current LPNNRD policy accounts for installation and maintenance of the remote read devices.

Describe how the environmental compliance estimate was developed. Have the compliance costs been discussed with the local Reclamation office?

No construction or disturbance to soil will occur with installation of these devices. Accordingly, no environmental compliance estimate was developed. There will be minimal to no impact to the landscape.

E.1.4. Evaluation Criterion D - Nexus to Reclamation

Is the proposed project connected to a Reclamation project or activity? If so, how?

Yes, the Bureau of Reclamation contributed \$200,000 towards the “Lower Platte River Drought Contingency Plan.”

Does the applicant receive Reclamation project water?

The applicant does not receive Reclamation project water.

Is the project on Reclamation project lands or involving Reclamation facilities?

The project is neither on Reclamation project lands or involves Reclamation facilities.

Is the project in the same basin as a Reclamation project or activity?

The Bureau of Reclamation was the major contributor to the “Lower Platte River Drought Contingency Plan.”

Will the proposed work contribute water to a basin where a Reclamation project is located?

As the major contributor to the “Lower Platte River Drought Contingency Plan,” any water savings realized through implementation of the project will contribute water back to the Lower Platte Basin.

Will the project benefit any tribe(s)?

No tribes will benefit from the implementation of the project.

E.1.5. Evaluation Criterion E - Department of the Interior Priorities

1. Creating a conservation stewardship legacy second only to Teddy Roosevelt

a. Utilize science to identify best practices to manage land and water resources and adapt to changes in the environment;

The project will utilize cellular or radio connectivity to relay data directly to LPNNRD’s office which will help LPNNRD to identify the best management practices to implement to positively impact the aquifers. Models will be developed and tested against real world outcomes.

b. Examine land use planning processes and land use designations that govern public use and access;

c. Revise and streamline the environmental and regulatory review process while maintaining environmental standards.

d. Review DOI water storage, transportation, and distribution systems to identify opportunities to resolve conflicts and expand capacity;

e. Foster relationships with conservation organizations advocating for balanced stewardship and use of public lands;

LPNNRD currently works with Pheasants Forever, Ducks Unlimited and the Nebraska Land Trust to foster proper stewardship of public lands.

f. Identify and implement initiatives to expand access to DOI lands for hunting and fishing;

g. Shift the balance towards providing greater public access to public lands over restrictions to access.

2. Utilizing our natural resources

a. Ensure American Energy is available to meet our security and economic needs;

Proper utilization of irrigation equipment is a substantial savings both to the electrical grid and fuel supplies. Being able to work with producers to cut back the time they are irrigating will be a large net gain to the local power grid, which often struggles under load during irrigation season.

b. Ensure access to mineral resources, especially the critical and rare earth minerals needed for scientific, technological, or military applications;

As this project is geared towards aquifer sustainability it will not impact mineral resources

c. Refocus timber programs to embrace the entire 'healthy forests' lifecycle;

d. Manage competition for grazing resources.

Nebraska's native grasses root deep. Proper maintenance of aquifer levels will ensure these pasture grounds have adequate water to supply livestock operations with the forage they need in the SQS areas.

3. Restoring trust with local communities

a. Be a better neighbor with those closest to our resources by improving dialogue and relationships with persons and entities bordering our lands;

As LPNNRD has witnessed, water quantity disputes turn acrimonious quickly. Effectively managing the aquifer will greatly enhance the relationships between neighbors in the SQS areas, where the solution to overuse of water is often litigious.

b. Expand the lines of communication with Governors, state natural resource offices, Fish and Wildlife offices, water authorities, county commissioners, Tribes, and local communities.

As previously mentioned LPNNRD collaborates with a variety of state and federal agencies and freely shares data and takes part in studies resulting from this shared data. The data collected will be utilized by many agencies to enhance the quality of the environment and life for area residents.

4. Striking a regulatory balance

a. Reduce the administrative and regulatory burden imposed on U.S. industry and the public;

This project is the first step towards familiarizing producers with the technologies available to lift many of the paperwork requirements currently burdening producers during various times of the year. The next steps involve remote readers for water meters and an online reporting system to simplify the reports producers are required to submit.

b. Ensure that Endangered Species Act decisions are based on strong science and thorough analysis.

No threatened or endangered species will be impacted by this project.

5. Modernizing our infrastructure

a. Support the White House Public/Private Partnership Initiative to modernize U.S. infrastructure;

b. Remove impediments to infrastructure development and facilitate private sector efforts to construct infrastructure projects serving American needs;

c. Prioritize DOI infrastructure needs to highlight:

Construction of infrastructure;

Cyclical maintenance;

Deferred maintenance.

As this is not an infrastructure project it will have no impact on modernizing U.S. infrastructure, though it will help to modernize data collection in agricultural sectors.

Project Budget

Funding plan and letters of commitment:

Funding for the proposed project will consist of 50% Reclamation funds and 50% Applicant funds. Due to the timing of the grant cycle, there will be no third party funds utilized during this grant. Lower Platte North NRD (LPNNRD) will contribute the 50% applicant share through a combination of in-kind match and funds budgeted for the upcoming fiscal year, beginning July 1st. As a local government institution LPNNRD is funded through a property tax levy. As budget discussions begin to take shape, LPNNRD will set aside a portion of this budget to fund the project. To date LPNNRD has expended no budget towards project costs and will seek no reimbursement for costs incurred prior to grant approval.

Budget Proposal:

Source	Amount
Costs to be reimbursed with the requested Federal funding	\$52,726.35
Costs to be paid by the applicant	\$52,726.35
Value of third party contributions	\$0.00
TOTAL PROJECT COST	\$105,452.70

Detailed Budget Breakdown:

BUDGET ITEM DESCRIPTION	COMPUTATION		Quantity Type	TOTAL COST
	\$/Unit	Quantity		
Salaries and Wages				
Grant Manager	\$29.31	20	hr	\$586.20
Water Resources Manager	\$36.10	30	hr	\$1,083.00
Water Resources Specialist	\$29.82	80	hr	\$2,385.60
Water Resources Specialist	\$23.54	80	hr	\$1883.20
Fringe Benefits				
Employees Benefits	28%			1662.64
Supplies and Materials				
Production Well Monitoring - w/ Rain	\$3,453.00	10	ea	\$34,530.00
Production Well Monitoring - w/o Rain	\$2,883.00	19	ea	\$54,777.00
Non-production Well Monitoring - w/ Rain	\$2,760.00	2	ea	\$5,520.00
ET Guages	\$755.00	3	ea	\$2,265.00
Contractual/Construction				
Data Monitoring	\$144.00		ea	\$0.00

TOTAL DIRECT COSTS				\$104,692.64
Indirect Costs				
De minimis	10%	7600.64	MTDC	760.06
TOTAL ESTIMATED PROJECT COSTS				\$105,452.70

FUNDING SOURCES	Percent of Total Project Cost	Total Cost By Source
Recipient Funding	50%	\$52,726.35
Other Recipient Funding		\$0.00
Reclamation Funding	50%	\$52,726.35
Other Federal Funding		\$0.00
TOTALS	100%	\$105,452.70

Budget Narrative:

Salaries and Wages

The following employees will be involved with the project:

1. Christopher Poole – Grant Manager
2. Daryl Andersen – Water Resources Manager
3. Russell Oaklund – Water Resources Specialist
4. Tyler Benal/Will Brueggemann – Water Resources Specialist

Mr. Poole will be responsible for grant administration including compliance and reporting. It is estimated Mr. Poole will spend 20 hours in this role at a salary rate of \$29.31/hr (\$586.20) with a fringe benefit rate of 0.28 (\$164.14), Mr. Poole will account for \$750.34 towards the project.

Mr. Andersen will be responsible for scheduling and managing the crew that will handle the physical installation. Mr. Andersen will be further responsible for testing and utilizing the data that is generated by the project. It is estimated that Mr. Andersen will spend 30 hours in his role at a salary of \$36.10/hr (\$1,083.00) with a fringe benefit rate of 0.28 (\$303.24), Mr. Andersen will account for \$1,386.24 towards the project.

Mr. Oaklund will be the lead specialist in the field doing the installs. It is estimated that installs will take 80 hours. At a salary of \$29.82/hr (\$2,385.60) and fringe benefit rate of 0.28% (\$667.97), Mr. Oaklund will account for \$3,053.57 toward the project.

Either Mr. Benal or Mr. Brueggemann will accompany Mr. Oaklund to assist in installations. These installs will take 80 hours. At a salary rate of \$23.54 (1883.20) and a fringe benefit rate of 0.28% (\$527.60), either Mr. Benal or Mr. Brueggemann will account for \$2,410.50 towards the project.

The following table breaks out the employee, task, time and compensation.

Employee	Task	Time	Salary + Fringe Benefits	Compensation (total)
Poole	Project Manager	20	\$29.31 * 0.28	\$750.34
Andersen	Scheduling and Staff Management	12	\$36.10 * 0.28	554.50
Andersen	System Testing and Data Utilization	18	\$36.10 * 0.28	831.74
Oaklund	Installations	80	\$29.82 * 0.28	\$3,053.57
Benal/Brueggemann	Installations	80	\$23.54 * 0.28	\$2,410.50

Employee salaries and benefits are pulled directly from LPNNRD HR records, a copy of which can be provided if necessary.

Fringe Benefits

Fringe benefits include health insurance and retirement contributions. The rate of 0.28% is derived from standard LPNNRD in-kind billable hours for grant requirements.

Travel

Travel funds such as travel to and from installation areas are not included in this grant application

Equipment

None

Materials and Supplies

Material and Supply costs were calculated through a quote from a vendor of these materials. Final costs on materials and supplies may change through the RFP process, but will not exceed the amounts listed in the budget narrative or supplied in this section. Please refer to the budget table for quantities. The per item cost estimates are as follows:

Production Well Monitoring Station - with Rain Gauge				
Item Number	Description	List Price	QTY	Extended Price
CERES06	CERES Pump Management Bundle	\$1,950.00	1	\$1,950.00
A200733049	ADCON RG1-200 Rain Gauge, 0.2mm	\$410.00	1	\$410.00
A800000225	Bird Protector for RG1-200	\$50.00	1	\$50.00
7M-006-OE	7-pin Cable, open-ended, 6ft	\$45.00	1	\$45.00
0053310	RuggedCable, Stripped-and-Tinned, 3ft	\$365.00	1	\$365.00

EA618-02	EA618 Pulse Transmitter	\$318.00	1	\$318.00
A200800012	7pin-7pin Extension Cord 8m	\$105.00	1	\$105.00
Gara	Y-cable 7-pin	\$110.00	1	\$110.00
MISC	Installation Supplies (mounting, junction box, etc)	\$100.00	1	\$100.00
Total:				\$3,453.00

Production Well Monitoring Station - without Rain Gauge

Item Number	Description	List Price	QTY	Extended Price
CERES06	CERES Pump Management Bundle	\$1,950.00	1	\$1,950.00
7M-006-OE	7-pin Cable, open-ended, 6ft	\$45.00	1	\$45.00
0053310	RuggedCable, Stripped-and-Tinned, 3ft	\$365.00	1	\$365.00
EA618-02	EA618 Pulse Transmitter	\$318.00	1	\$318.00
A200800012	7pin-7pin Extension Cord 8m	\$105.00	1	\$105.00
MISC	Installation Supplies (mounting, junction box, etc)	\$100.00	1	\$100.00
Total:				\$2,883.00

Non-production Well Monitoring Station - with Rain Gauge

Item Number	Description	List Price	QTY	Extended Price
A100760001	A760 RTU - 4G LTE	\$1,590.00	1	\$1590.00
A200733522	Solar Set, 540mA	\$250.00	1	\$250.00
A200733049	ADCON RG1-200 Rain Gauge, 0.2mm	\$410.00	1	\$410.00
A800000225	Bird Protector for RG1-200	\$50.00	1	\$50.00
7M-006-OE	7-pin Cable, open-ended, 6ft	\$45.00	1	\$45.00
0053310	RuggedCable, Stripped-and-Tinned, 3ft	\$365.00	1	\$365.00
MISC	Installation Supplies (mounting, junction box, etc)	\$50.00	1	\$50.00
Total:				\$2,760.00

ET Gauge / Weather Sensors

Item Number	Description	List Price	QTY	Extended Price
TBD	ET Gauge	\$600.00	1	\$600.00
7M-006-OE	7-pin Cable, open-ended, 6ft	\$45.00	1	\$45.00
A200720510	Y-cable 7-pin	\$110.00	1	\$110.00
L8375.U10-ADC	Lufft WS502 Compact Weather Sensor (w/Cable)	\$2,318.00	0	\$
Total:				\$755.00

Contractual

LPNNRD will handle all of the installations and data collection in-house. No contractors will be utilized.

Third Party In-Kind Contributions

There will be no third party in-kind contributions to the project.

Environmental and Regulatory Compliance Costs

There are no environmental or regulatory costs anticipated with this project.

Other Expenses

Depending on the type of remote transmitter chosen, there may be costs associated with data transmission. That cost will be borne by the applicant.

Indirect Costs

De minimis costs may be incurred of up to 10% of total direct costs or 760.06.

Environmental and Cultural Resources Compliance

Will the proposed project impact the surrounding environment (e.g., soil [dust], air, water [quality and quantity], animal habitat)? Please briefly describe all earth-disturbing work and any work that will affect the air, water, or animal habitat in the project area. Please also explain the impacts of such work on the surrounding environment and any steps that could be taken to minimize the impacts.

No, the project will not disturb the surrounding physical environment.

Are you aware of any species listed or proposed to be listed as a Federal threatened or endangered species, or designated critical habitat in the project area? If so, would they be affected by any activities associated with the proposed project?

There are no T&E species impacted by this project.

Are there wetlands or other surface waters inside the project boundaries that potentially fall under CWA jurisdiction as “Waters of the United States?” If so, please describe and estimate any impacts the proposed project may have.

While some of the fields irrigated may include or be adjacent to wetlands, there will be no impact to these areas as a result of this project.

When was the water delivery system constructed?

The irrigation systems were developed at various times over the last 100 years.

Will the proposed project result in any modification of or effects to, individual features of an irrigation system (e.g., headgates, canals, or flumes)? If so, state when those features were constructed and describe the nature and timing of any extensive alterations or modifications to those features completed previously.

There will be no modifications to individual irrigation systems aside from the installation of the transmitters, which will have no functional impact.

Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places? A cultural resources specialist at your local Reclamation office or the State Historic Preservation Office can assist in answering this question.

There are no features listed in the National Register of Historic Places that will be impacted.

Are there any known archeological sites in the proposed project area?

While there may be known archeological features in the project area, this project will not disturb those features in any way. It is unknown the type or number of sites that may be in the SQS areas.

Will the proposed project have a disproportionately high and adverse effect on low income or minority populations?

The project will have no adverse effect on low income or minority populations.

Will the proposed project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands?

No access to ceremonial sites or tribal lands will be impacted

Will the proposed project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area?

The project will not contribute to the introduction or spread of any noxious or invasive species.

Required Permits or Approvals

The project does not require any permits or approvals to be completed.

Official Resolution

The timing of the applicant's regularly scheduled Board of Directors meeting falls on the second Monday of each month. Due to this constraint, applicant is unable to provide an Official Resolution with this application. Applicant will present this grant proposal to the proper committee for a motion to move the resolution to the full board for approval on May 13th 2019. Once the official resolution is passed it will be submitted by the applicant that week.

Unique Entity Identifier and System for Award Management

LPNNRD's Unique Entity Identifier (Duns #) is 602681520. LPNNRD is currently registered and active with SAM with an expiration date of 04/08/2020.