

PROJECT PROPOSAL FOR BUREAU OF RECLAMATION FUNDING  
ANNOUNCEMENT NO. R21AS00300

**NORTHEAST REGIONAL WATER DISTRICT:**  
**ADVANCED METERING PROGRAM FOR 2021**

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## **TECHNICAL PROPOSAL**

### **1.0 EXECUTIVE SUMMARY**

#### **1.1 Applicant Information**

Date: March 18<sup>th</sup>, 2021

Applicant Name: Northeast Regional Water District

City: Cavalier

County: Pembina

State: North Dakota

UEI: 153452305

Category A Applicant

#### **1.2 Project Summary**

Northeast Regional Water District (NRWD), located in northeast North Dakota, will upgrade their residential and bulk user metering capabilities on the North Valley Water District (NVWD) Branch of the system. This upgrade will include the addition 1,353 of SmartPoints to each Automatic Meter Read (AMR) compatible meter. NRWD fully expects the addition of SmartPoints to significantly reduce water loss and have a positive impact on managing long-term water supply for the system. SmartPoints will remove both mistakes, and deliberate errors, in self-read reports of customer water use. Furthermore, NRWD will be able to monitor water usage real-time, allowing for accurate assessment of where and when leaks occur. The ability to remotely pinpoint the most probable location of a leak will reduce the volume of water lost by shortening the duration of the leak event.

The proposed project is not located in a federal facility.

#### **1.3 Proposed Project Schedule**

NRWD plans to install at least sixty (60) SmartPoints per month beginning in February of 2022. This is a very reasonable pace for SmartPoint installation for NRWD's staff, therefore by December 2023 all customers within the NVWD Branch of NRWD, will have a SmartPoint.

## **2.0 PROJECT LOCATION**

NRWD provides potable water to residential homes, farms, hog barn operations, commercial businesses, and small towns in Pembina, Cavalier and Walsh counties. This project focuses on the NVWD Branch of NRWD, outlined in red in the figures below, and is comprised of mostly the eastern half of NRWD's system. NRWD operates and maintains its own water treatment facility (WTF) just west of Cavalier, ND where permitted groundwater from the Icelandic aquifer is treated. NRWD also receives finished, water from the City of Devils Lake. Finished water from both sources is blended to meet the needs of all users within the NRWD boundary.

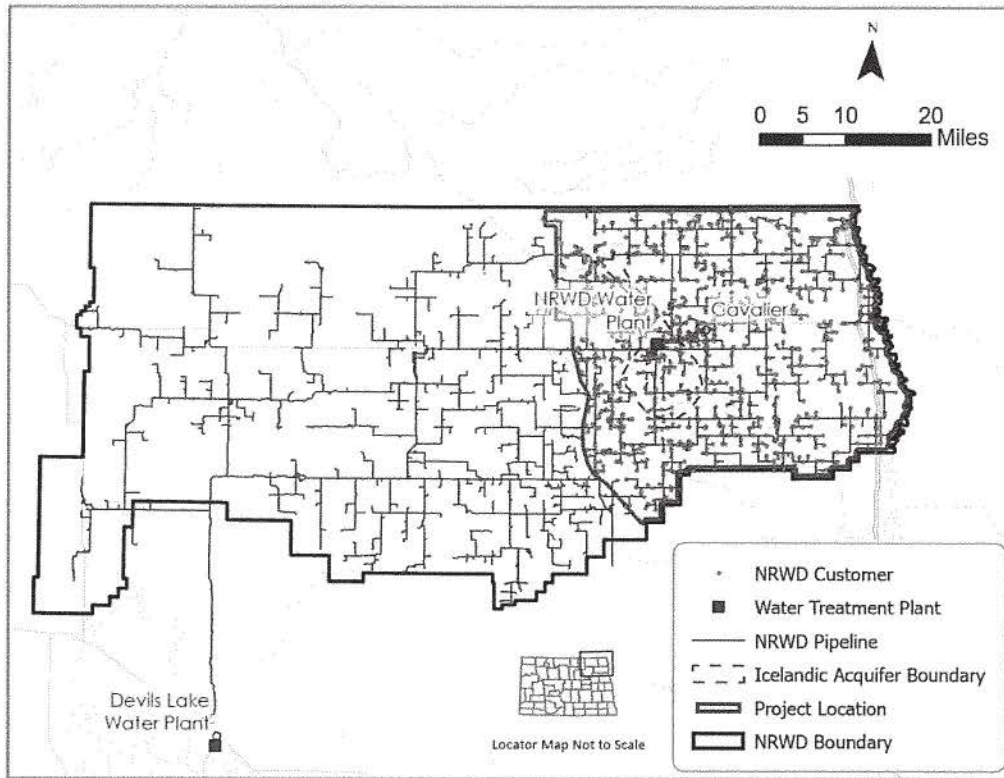


Figure 1: NRWD System Wide Map

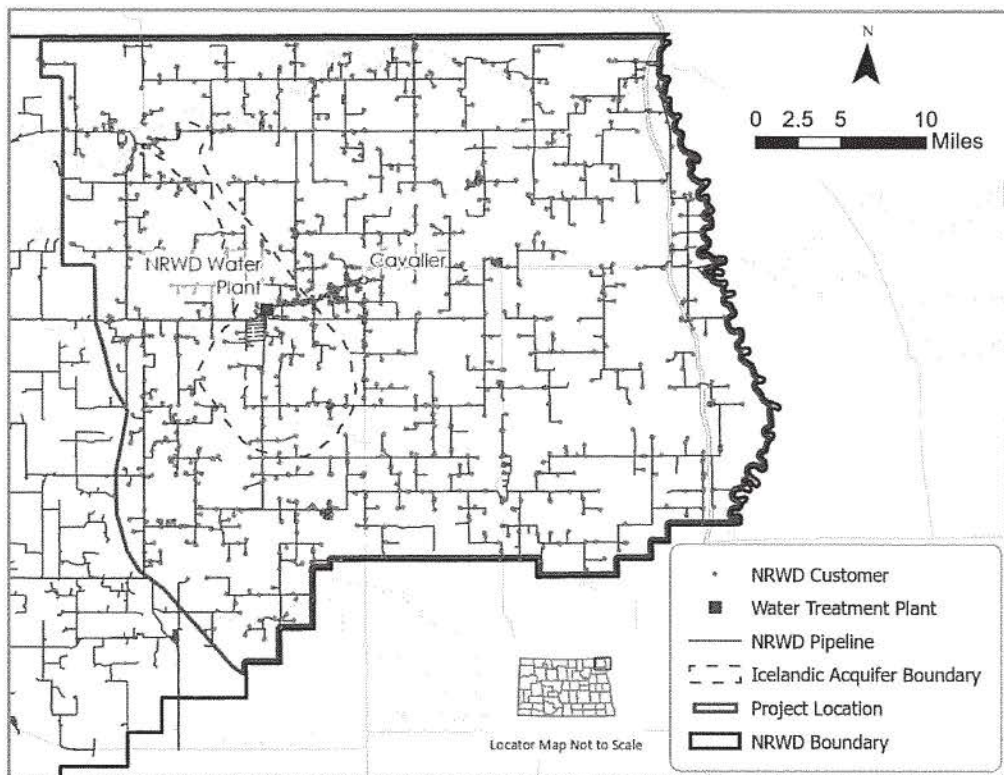


Figure 2: Project Location – NVWD Branch of NRWD

### **3.0 PROJECT DESCRIPTION**

#### **3.1 Technical Description of Project**

NRWD's Board of Directors prioritized their commitment to reducing system water loss beginning in 2018 after experiencing water loss in the magnitude of 246.4 AF/yr. In the years prior to 2018, NRWD was concerned with water loss but methods of detecting areas of loss were terribly time-consuming. Since 2018, NRWD has invested an immense amount of effort in detecting problem areas through their Advanced Metering Program. To date, the Advanced Metering Program has consisted of SCADA improvements and transmission pipeline metering upgrades. These upgrades allowed NRWD to reduce 246.4 AF/yr of water loss by 174 AF/yr. This leaves NRWD with 72.4 AF/yr in water loss across the entire system.

Recent efforts to digest data captured through SCADA improvements, transmission pipeline metering upgrades, and billing data; have helped NRWD to prove that the majority of the remaining water loss can be attributed to; customers stealing water by mis-reporting monthly usage, customers not reporting usage at all, or residential meters beyond their useful life being incapable of measuring flow properly. That said, NRWD is in the process of a system-wide residential meter replacement. Every user in the system will have an AMR compatible meter, which will further be equipped with SmartPoint technology under the project described in this proposal.

NRWD operations and distribution system staff will be responsible for installing and setting up a SmartPoint at each customer meter within the NVWD Branch of the system. Each customer will be contacted by NRWD and notified that a SmartPoint will be installed at a reasonable location at the service address.

SmartPoints are high-powered radio-frequency transmitters that read, and store data captured from water meters in real-time. Data retrieved from the SmartPoints provide inbound and outbound access to flow measurement and are then downloaded to a computer for entry into billing software.

NRWD has already purchased and is utilizing SmartPoint technology on the west branch of their system. They can collect flow data via a drive-by meter reading system called a Vehicle Gateway base station. This system will be used to collect flow data a residential/commercial endpoint in the system immediately after the SmartPoints are installed. Therefore, as NRWD progresses through the SmartPoint installation process on the NVWD Branch, they can immediately increase the amount of real-time data they are able to capture, ultimately further reducing water loss little by little.

#### **4.0 EVALUATION CRITERIA Application Evaluation Scoring Criteria (Answers seen in black)**

##### **E.1.1 Evaluation Criterion A – Project Benefits (35 Points)**

- Describe the expected benefits and outcomes of implementing the proposed project.
  - What are the benefits to the applicant’s water supply delivery system?

The benefits to NRWD’s water supply delivery system from implementation of SmartPoint technology will be system-wide, real-time, monitoring of water usage. Real-time trending will allow NRWD to pinpoint the location of leaks, and accurately capture consumption. These factors play an instrumental role in managing the longevity of permitted water supply by having precise data to evaluate how water supply is being used throughout the system. When leaks cannot be pinpointed, and consumption data is estimated or not reported, NRWD is unable to understand the reality of how much of the permitted water supply is being utilized. SmartPoint technology will also help NRWD’s customers conserve water by being notified when water use seems erratic or out of the ordinary, such even may indicate a leak within the customers residence.

In 2018, 246.4 AF of water was lost throughout the distribution system, this amounts to 80,289,791 gallons. It costs NRWD \$5.30 to treat and deliver 1000 gallons of water. The 246.4 AF of loss in 2018 equates to \$425,536 in expense. Efforts to reduce water loss in 2019-2020 through the first stages of NRWD’s Advanced Metering Program, have allowed NRWD to correct the 246.4 AF/yr loss by 174 AF/yr; leaving NRWD with 72.4 AF/yr in loss. Efforts to date have reduced NRWD’s water loss expense by \$300,500.

The addition of 1,353 SmartPoints to the NVWD Branch are expected to correct the 72.4 AF/yr loss by 65.5 AF/yr. This would reduce NRWD’s total system losses to an expected 0 AF/yr to 6.9 AF/yr equating to a maximum of \$11,916.40 in water loss expense.

The significant reduction in water loss expense will allow NRWD to make more reinvestments in the water supply delivery system. These reinvestments will enhance the overall sustainability of NRWD.

If other benefits are expected explain those as well. Consider the following:

- Extent to which the proposed project improves overall water supply reliability

The reduction of water loss will not only help with more reliable water source throughout the system but will also make sure water service remains affordable for all who use the water. Reducing water loss to an amount as close to 0 AF/yr as possible is critical in managing the longevity of permitted water supply. Water supply is one of the largest expenses for a water system,

therefore the more conservatively and wisely it is used in the delivery system, the less indirect cost is incurred by the customers.

- The expected geographic scope benefits from the proposed project (e.g., local, sub-basin, basin) N/A
- Extent to which the proposed project will increase collaboration and information sharing among water managers in the region  
NRWD expects the SmartPoint technology to drastically reduce system water loss. Neighboring water districts that have implemented the same system are seeing a drastic reduction in water loss, by being able to better track water throughout their system. These managers are working together to understand the long-term ground water supply availability in the region through accurate measurements of current consumption and loss through leaks. As the managers in the region continue improving data captured, more regionalization efforts will be possible to maximize the potential of available groundwater in northeast North Dakota.
- Any anticipated positive impacts/benefits to local sectors and economies (e.g., agriculture, environment, recreation, tourism)  
SmartPoint technology will increase efficiencies in the water system by allowing NRWD to understand the how the capacity previously consumed by water loss can be applied to benefit the agricultural sector. For example, during spray season the system is generally stretched to its water capacity limits, the elimination of water loss will increase capacity for farmers to use for spraying. Reduced water loss will also be a benefit the environment in ways such as - less chemical used during water production, and less power used for the pumping of the lost water. The reduction in water loss through SmartPoint technologies will keep water rates more stable.
- 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.  
By implementing SmartPoint technology in residences, farms, hog barn operations and commercial businesses, efficiencies will be recognized by allowing the district to notify the customer if any water is being lost

through the meter and provide a snapshot of water used over a specific time period.

**E.1.2. Evaluation Criterion B – Planning Efforts Supporting the Project (35 points)**

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

The NRWD board has made it a priority to reduce water loss. This implementation of SmartPoint technology is the final stage identified in NRWD’s Advanced Metering Program. NRWD’s Advanced Metering Program was implanted after the system experienced 246.4 AF/yr, equivalent to \$425,536, of water loss in 2018. The stages of the Advanced Metering Program planning effort complete to date include significant SCADA improvements and transmission system metering upgrades. NRWD is currently working to install a new AMR compatible meter for every customer in the system, and the addition of SmartPoint technology, as described in this proposal, is the final stage. NRWD has high confidence that water loss will be reduced to close to 0 AF/yr.

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

The implementation of SmartPoint technology is the final measure of the Advanced Metering Program planning effort. There are no other comparable alternatives. The project is a priority for NRWD because without the ability to keep water loss expense to as close to \$0.00 and 0 AF/yr as possible, NRWD will have to continue to raise customer rates to cover this indirect customer expense. The expense of water loss provides no value to system when it comes to utilizing rate revenue to make strategic reinvestments to improve system sustainability.

**E.1.3 Evaluation Criterion C – Project Implementation (10 points)**

- 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 proposed project, addition of SmartPoint technology at every customer meter on the NVWD Branch would begin in February 2022 and end in December 2023 based on the reasonable estimate that up to sixty (60) SmartPoints would be installed each month by NRWD staff. Table 1 below shows this timeline and major milestones.



Table 1: SmartPoint Installation Schedule and Project Milestones

<b>Month-Year</b>	<b>Cumulative Number of SmartPoints Installed</b>	<b>Milestone</b>
Feb-22	60	
Mar-22	120	
Apr-22	180	
May-22	240	
Jun-22	300	
Jul-22	360	
Aug-22	420	
Sep-22	480	
Oct-22	540	
Nov-22	600	
Dec-22	660	
Jan-23	720	
Feb-23	780	Water loss reduced from 72.4 AF/yr to 39.65 AF/yr.
Mar-23	840	
Apr-23	900	
May-23	960	
Jun-23	1020	
Jul-23	1080	
Aug-23	1140	
Sep-23	1200	
Oct-23	1260	
Nov-23	1320	
Dec-23	1353	
Jan-24	1353	
Feb-24	1353	Water loss reduced from to between 0 AF/yr and 6.9 AF/yr.

- Describe any permits that will be required, along with the process for obtaining such permits.  
No permits will be required. All work will be located within customer homes, farms, hog barn operations, or commercial businesses.
- Identify and describe any engineering or design work performed specifically in support of the proposed project.  
NRWD’s engineer has modeled consumption data and developed a financial model to help NRWD understand how the cost of water loss, and all other system expenses, drive the need for increases to customer rates.
- Describe any new policies or administrative actions required to implement the project.  
The NRWD Board of Directors passed an official resolution on February 25<sup>th</sup>, 2021 regarding participation in funding for a Bureau of Reclamation WaterSMART Grant Project.

- Describe the timeline for completion of environmental and cultural resource compliance. Was the timeline for completion of environmental and cultural resource compliance discussed with the local Reclamation office?  
All work associated with the project will be installed within customer homes, farms, hog barn operations and commercial businesses. Therefore, no environmental compliance is required.

#### **E.1.4. Evaluation Criterion D – Nexus to Reclamation (10 Points)**

- Is the proposed project connected to a Reclamation project or activity? If so, how?  
Please consider the following:
  - Does the applicant receive Reclamation project water?  
No.
  - Is the project on Reclamation project lands or involving Reclamation facilities?  
No.
  - Is the project in the same basin as a Reclamation project or activity?  
No.
  - Will the proposed work contribute water to a basin where a Reclamation project is located?  
No.
- Will the project benefit any tribe(s)? No tribes are located within NRWD's boundary.

## **5.0 PROJECT BUDGET**

### **5.1 Funding Plan and Letters of Commitment**

The funding plan for the project will be funding through two sources. The funding sources will be NRWD’s reserve account and the federal cost share through the Bureau of Reclamation. The breakdown of funding is as follows:

#### **NRWD: \$379,901.88**

- NRWD has already committed \$379,901.88 towards new meters, a computer with AMR mapping software, drive-by device, and labor for this project. These items will not be requested as a match for this project.

#### **NRWD: \$109,576.26**

- NRWD has set aside funds from the O&M Reserve for SmartPoint Heads for this project. There are no constraints on the availability of funds, nor contingencies with funding commitment as NRWD will utilize the O&M Reserve Fund to fund this portion of the project.

#### **BOR Federal Funding: \$75,000.00**

- If federal funding is appropriated for this project, NRWD is ready to complete this very important project as soon as possible.

### **5.2 Budget Proposal**

*Table 2: Project Funding Plan*

<b>Source</b>	<b>Amount</b>
Costs to be reimbursed with the requested Federal funding (BOR)	\$75,000.00
Costs to be paid by the applicant (NRWD O&M Reserve)	\$109,576.26
<i>Costs incurred by applicant prior to February 2022 (NRWD O&amp;M Reserve)</i>	<i>\$379,901.88</i>
<b>Total Project Costs</b>	<b>\$564,478.14</b>

NRWD has committed a total of \$379,901.88 towards the purchase and installation of new meters capable of SmartPoint technology, associated software and data recording device, and labor costs for the project prior to the date of submission of this report. The expenditures will be fully spent regardless of the funding decision and will not be included in the sum of cost-share expenditures for the project. They are shown as a point of reference of NRWD’s commitment to this very important project. Table 3 below provides detail on the anticipated total probable costs for the project.

Table 3: Total Project Costs

NRWD: Advanced Metering Program for 2021							
ITEM	ITEM DESCRIPTION	UNITS	QUANTITY	ENGINEER'S ESTIMATE		BOR FUNDING	NRWD FUNDING
				UNIT PRICE	EXTENDED PRICE		
A.	Smart Point Heads AMR/SmartPoint Technology Compatible	ea.	1353	\$ 136.42	\$ 184,576.26	\$ 75,000.00	\$ 109,576.26
B.	New Meters Computer, Mapping Software, & Drive-By	ea.	1353	\$ 120.68	\$ 163,280.04	\$ -	\$ 163,280.04
C.	Device	l.s.	1	\$39,000.00	\$ 39,000.00	\$ -	\$ 39,000.00
D.	Labor	ea.	1353	\$ 131.28	\$ 177,621.84	\$ -	\$ 177,621.84
<b>Total Project Cost:</b>					<b>\$ 564,478.14</b>	<b>\$ 75,000.00</b>	<b>\$ 489,478.14</b>

### 5.3 Budget Narrative

As described in Section 5.1, NRWD has already committed \$379,901.88 for the labor and all equipment associated with new meters compatible with SmartPoint technology. SmartPoint technology is being utilized in the western half of NRWD’s system and throughout the transmission pipeline metering system wide. The total cost to purchase the remaining 1,353 SmartPoint Heads is \$184,576.26. NRWD is requesting funding from the BOR in the amount of \$75,000.00 – for a 40.63% cost share from Reclamation on the proposed project. NRWD will fund the remaining 109,576.26 with its O&M Reserve.

### 6.0 ENVIRONMENTAL AND CULTURAL RESOURCES COMPLIANCE (Answers seen in black)

- 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.  
The proposed project will have no impact on the surrounding environment. The SmartPoints will only be installed in NRWD customer residences, farms, hog bard operations, and commercial businesses.
- 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 activates associated with the proposed project?  
No
- 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 projects may have. NA
- When was the water delivery system constructed? 1976
- Will the proposed project result in any modifications 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. None.

- 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. No
- Are there any known archeological sites in the proposed project area? No
- Will the proposed project have a disproportionately high and adverse effect on low income or minority populations? No
- Will the proposed project limit access to and ceremonial use of Indian sacred sites or result in other impacts on Tribal lands? No tribal lands are located within the project area.
- 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? No

### **7.0 REQUIRED PERMITS OR APPROVALS**

There are no permits required for NRWD to install SmartPoint Heads in customers homes, farms, hog barn operations, or commercial businesses. NRWD owns the water metering equipment for every customer so will only provide notification as a courtesy to customers that the SmartPoint Head will be installed.

### **8.0 OFFICIAL RESOLUTION**

**See attached Appendix A.**

**APPENDIX A – Official Resolution**

**OFFICIAL RESOLUTION OF THE NORTHEAST REGIONAL WATER DISTRICT  
REGARDING PARTICIPATION IN FUNDING FOR A BUREAU OF  
RECLAMATION WaterSMART GRANT PROJECT.**


A. WHEREAS, the United States Department of the Interior, Bureau of Reclamation, under its WaterSMART Grant Program, has made available to qualifying applicants grant funding on a matching fund or challenge grant basis funds for water conservation and management projects; and

B. WHEREAS, Northeast Regional Water District has identified a project that exemplifies the objectives of the WaterSMART grant program in its Advanced Metering Structure Program;

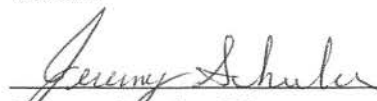
NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of Northeast Regional Water District:

1. The Board of Directors verifies that (Rick Bigwood) has legal authority to enter into an agreement with Reclamation.
2. The Board of Directors has reviewed and supports the application submitted.
3. The Board of Directors is capable of providing the amount of funding and/or in-kind contributions specified in the funding plan.
4. That if selected for a WaterSMART Grant under the Fiscal Year 2021/2022, the board will negotiate and execute a Cooperative Agreement with Reclamation on/or prior to the established deadline, to fund at least 50% of the project costs and provide documentation showing the sources of non-Reclamation funding that totals 50% of project costs for the Project.

ADOPTED AND APPROVED this 25<sup>th</sup> day of February, 2021.

  
\_\_\_\_\_  
Rick Bigwood, President

Attest:

  
\_\_\_\_\_  
Jeremy Schuler, Manager