

NEBRASKA NATURAL RESOURCES COMMISSION

Water Sustainability Fund

Application for Funding

Section A.

ADMINISTRATIVE

PROJECT NAME: Upper Republican NRD Water Bank

PRIMARY CONTACT INFORMATION

Entity Name: Upper Republican Natural Resources District

Contact Name: Nate Jenkins

Address: PO Box 1140, Imperial, NE 69033

Phone: 308-882-5173

Email: natejenkins@urnrd.org

Partners / Co-sponsors, if any: N/A

1. Dollar amounts requested: (Grant, Loan, or Combination)

Grant amount requested. \$ \$10.5 million

Loan amount requested. \$ N/A

If Loan, how many years repayment period? N/A

If Loan, supply a complete year-by-year repayment schedule.
N/A

2. Permits Needed - Attach copy for each obtained (N/A = not applicable)

Nebraska Game & Parks Commission
(G&P) consultation on Threatened and
Endangered Species and their Habitat

N/A Obtained: YES NO

Surface Water Right

N/A Obtained: YES NO

USACE (e.g., 404 Permit) N/A Obtained: YES NO

Cultural Resources Evaluation N/A Obtained: YES NO

Other (provide explanation below) N/A Obtained: YES NO
N/A

3. Are you applying for funding for a combined sewer over-flow 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

If yes attach a copy to your application. N/A

If yes what is the population served by your project? N/A

If yes provide a demonstration of need. N/A

If yes and you were approved for funding in the most recent funding cycle, then resubmit the above information updated annually but you need not complete the remainder of the application.

4. If you are or are representing an NRD, do you have an Integrated Management Plan in place, or have you initiated one?

N/A YES NO

5. Has this application previously been submitted for funding assistance from the Water Sustainability Fund and not been funded?

YES NO

If yes, have any changes been made to the application in comparison to the previously submitted application? N/A

If yes, describe the changes that have been made since the last application.
N/A

No, I certify the application is a true and exact copy of the previously submitted and scored application. (Signature required) N/A

6. Complete the following if your project has or will commence prior to next July 1st.

As of the date of submittal of this application, what is the Total Net Local Share of Expenses incurred for which you are asking cost share assistance from this fund? \$ N/A

Attach all substantiating documentation such as invoices, cancelled checks etc. along with an itemized statement for these expenses. N/A

Estimate the Total Net Local Share of Expenses and a description of each you will incur between the date of submittal of this application and next July 1st for which you are asking cost share assistance from this fund.
\$ N/A

Section B.

DNR DIRECTOR'S FINDINGS

Does your project include physical construction (defined as moving dirt, directing water, physically constructing something, or installing equipment)?

YES NO

1(a). If yes (structural), submit a feasibility report (to comply with Title 261, CH 2) including engineering and technical data and the following information:

A discussion of the plan of development (004.01 A);
N/A

A description of all field investigations made to substantiate the feasibility report (004.01 B); N/A

Maps, drawings, charts, tables, etc., used as a basis for the feasibility report (004.01 C); N/A

A description of any necessary water and land rights and pertinent water supply and water quality information, if appropriate (004.01 D);
N/A

A discussion of each component of the final plan including, when applicable (004.01 E);

Required geologic investigation (004.01 E 1); N/A

Required hydrologic data (004.01 E 2); N/A

Design criteria for final design including, but not limited to, soil mechanics, hydraulic, hydrologic, structural, embankments and foundation criteria (004.01 E 3). N/A

1(b). If no (non-structural), submit data necessary to establish technical feasibility including, but not limited to the following (004.02):

A discussion of the plan of development (004.02 A);

Since 2012, the Upper Republican NRD (URNRD) has actively pursued programs and incentives to reduce depletions to stream flows and mitigate groundwater declines in areas that have experienced significant groundwater declines over time. The programs have included the permanent retirement of 1,546 acres utilizing more than \$2.1 million in URNRD funds and approximately \$1.47 million in federal funds through

the Agricultural Water Enhancement Program (AWEP) offered by NRCS. The AWEP program within the URNRD has since expired but demonstrated a significant demand for permanent irrigation retirement within the URNRD before commodity prices reached near record-high levels in 2012. The average 50-year stream flow depletion factor of the enrolled acres using the Republican River Compact model was approximately 86 percent and average irrigation usage was near the URNRD district-wide, annual average of 12 inches per acre.

During a similar time period, there has also been significant demand from landowners within the URNRD to transfer their rights to irrigate under the URNRD's system of allocated water supplies from one area of the district to another. This typically involves requests to cease irrigating entire or partial tracts so that the water-use allocation granted by the URNRD and associated with those acres can be applied to other acres. There is a widespread recognition among landowners within the URNRD that the district has an interest in reducing the impacts of groundwater pumping on stream flow to aid State of Nebraska and URNRD compliance with the Republican River Compact. Knowing, then, that requests to transfer water uses from areas with high impact on stream flows to areas with relatively small impacts may be viewed favorably, many of the transfer requests within the district are to move water use from higher stream-flow-depletion (sdf) areas to lower sdf zones.

Also, as the URNRD has made clear in other grant requests to the Water Sustainability Fund this year, we are aggressively pursuing actions to reduce water use within the district in an effort to stabilize water levels, particularly in areas of the district with sharp rates of decline that potentially threaten the ability to fully irrigate crops in coming decades. Consideration of transfer requests by the URNRD increasingly includes as factors groundwater availability and declines. While transferring a use away from close proximity to a stream within the district is generally of benefit, which is increasingly weighed against whether the use is proposed to be transferred to an area where significant groundwater declines have occurred.

Finally, the URNRD faces a challenge within the next few years of irrigated acres temporarily retired under the Conservation Reserve and Enhancement Program (CREP) exiting the program and having the potential to be irrigated again. There are currently 11,700 CREP acres within the URNRD that will incrementally expire by 2020. The district and State have an interest in keeping these acres retired from irrigation to prevent additional depletions to stream flow that could negatively impact efforts to comply with the Republican River Compact.

The aforementioned conditions strongly indicate the existence of a market for the transfer and retirement of irrigated acres in the URNRD. If developed and facilitated by a water bank, such transfers and retirement would benefit the district and State by reducing groundwater pumping in areas where such reductions would help achieve water-preservation goals and aid Republican River Compact compliance by mitigating depletions to stream flow. Retirement of uses in areas that maximize benefits to the URNRD and State would be prioritized.

One function of the water bank proposed to be operated with financial aid from the Water Sustainability Fund would aggregate water supplies from willing sellers and facilitate their sale to willing buyers. However, the water bank will act as more than a clearinghouse or broker and also assume the role of a market creator. This is necessary to achieve the water-preservation goals of the program and prevent the bank from being confined to a simple vehicle for the exchange of water rights. While our analysis of the current, potential market indicates significant interest in willing buyer-to-seller transfers that could benefit the district and State, exponentially greater participation and benefits will be achieved by the bank acting as a market creator and buyer for the purpose of retiring uses in high-priority areas.

Payments using URNRD and WSF funds will be for new retirements of irrigation. This will be done by removing the certification status of irrigated acres that is granted by the URNRD. The certification status to irrigate, or not irrigate, is a legal control and authority of the URNRD. Because of this, decertifying irrigated acres using WSF and URNRD funds will ensure irrigated lands are permanently retired from irrigation.

No WSF funds will be used to pay for the decertification of acres that will be transferred as certified irrigated acres to other areas of the district. Such transfers will be allowed, but only for certified acres paid for by the URNRD or individual landowners. In cases where transfers do occur, parameters established within the water bank rules and algorithm will ensure there is equal or less water use and that the transfer has positive benefits including reduced depletion to stream flow.

The water bank will establish water-rights purchase prices annually based on the market conditions and water rights will be acquired using URNRD tax revenues and funds from the WSF. The current market condition and the basis of the WSF funding request of \$10.5 million is a rate of \$2,500 per certified irrigated acre within the URNRD.

The bank would take an active role in the exchanges by providing administrative services and ensuring that the exchanges met criteria established by the URNRD. The URNRD hasn't considered it prudent to

select as of yet a third party administrator of the water bank before establishment of the program, which is dependent on grant funds from the WSF. But we have been in discussions with entities that have experience administering and establishing water banks and would be candidates to do such work.

Criteria will be established upon which acceptance of water rights into the water bank will be based. They are described below in the next section of this question. Administrative services that will be provided by the water bank include:

- Setting market prices
- Implementing policies and daily operations
- Determining which rights can be banked
- Quantifying the bankable water
- Setting transfer terms

A very important piece of a groundwater banking system such as that proposed is that the amount of water being banked is able to be quantified. We believe the URNRD is uniquely qualified to meet this requirement because of the district's system of allocating groundwater uses and extensive database of prior water usage on each irrigated tract within the district.

A description of field or research investigations utilized to substantiate the project conception (004.02 B);

The project was conceived from, and we believe is substantiated by, the URNRD's extensive experience with efforts to transfer water rights within the District. As described earlier, requests to transfer water rights over substantial distances requires a variance from our rules and regulations. Since 2013, there have been 41 such variance requests, or about one a month. This is not to indicate the requests and the approval of them is especially problematic. It does however indicate that a market has already developed for the transfer of water rights. We believe it is appropriate and beneficial that the URNRD play a lead role in this market because the commodity being bought and sold is a public one, owned by the State and managed by the URNRD, and the consequences of its use relative to preservation of water and Republican River Compact compliance are of keen interest to the State and URNRD. Rather than simply trying to control the market more than what occurs now, the proposed bank can transform and develop it into a tool with significant water preservation benefits in areas where preservation is most needed.

Consideration of a water bank is partially tied to a recent analysis of available water supplies within the district relative to rates of groundwater level declines. The saturated thickness of the aquifer throughout the

district was estimated using available well logs and reductions in water levels that have occurred since wells were drilled. The decline rates applicable to wells that helped determine saturated thickness were estimated using annual groundwater level measurements taken from approximately 400 wells in the district over the past 37 years.

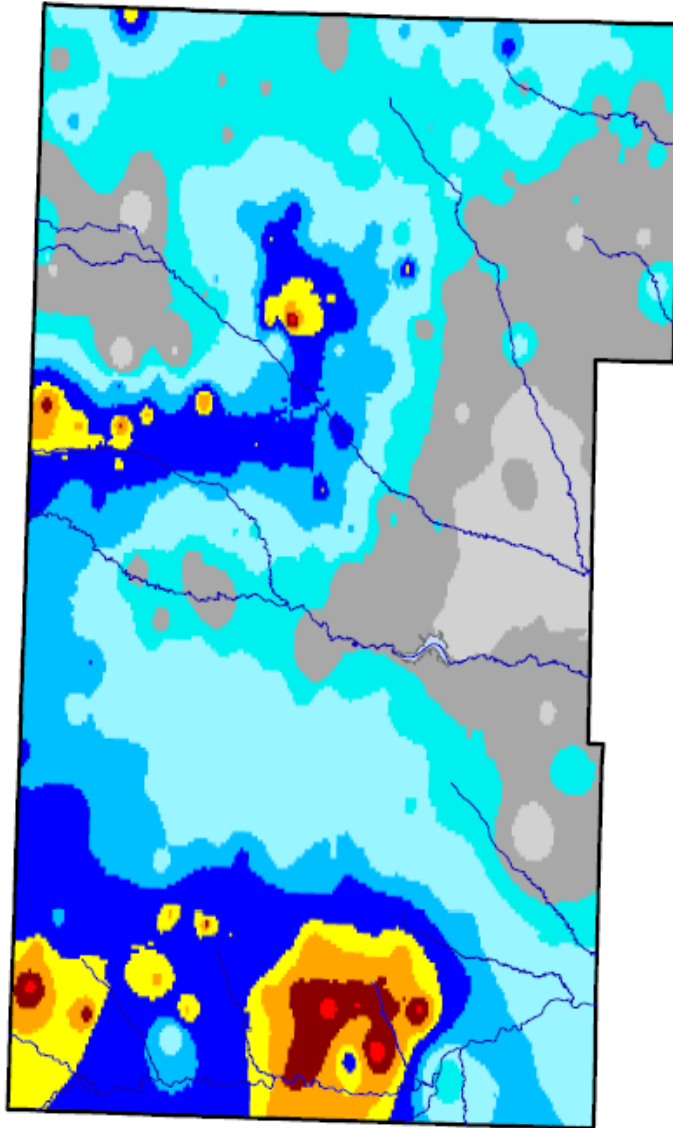
The analysis needs to be refined with aid from a groundwater model the district is proposing in another WSF grant application and that will help determine usable aquifer life for irrigation purposes under different pumping scenarios. However, the current analysis provides us with a clear enough picture to understand that the proposed water bank will help the district meet its water supply challenges. The water bank would supplement the continually tightening regulations on water use in these high-impact areas in reaching a balance between uses and supplies.

As expected, the analysis showed widely variable aquifer saturated thickness – from approximately 50 feet in alluvial areas to approximately 400 feet in some upland regions. Using current rates of decline throughout the district – the life of the aquifer varies significantly depending on location – we were able to estimate approximately when aquifer saturated thickness would be at 50 percent of its pre-irrigation level.

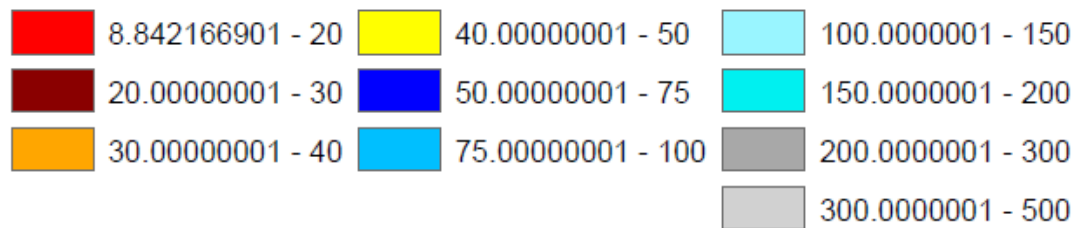
It indicated that under current water usage rates the aquifer underlying 70,000 acres within the URNRD will not be able to provide a full irrigation supply within approximately 40 years. That amount of acres represents more than 15 percent of all irrigated acres within the district. Of those 70,000 acres, approximately 20,000 acres have a 20-30 year water supply adequate for irrigation and 50,000 acres have a useful irrigation life of 30-40 years. The remainder of the URNRD has a water supply estimated to last between 40 and 500 years without changes in pumping levels or location of pumping.

The map below illustrates the estimated, usable life of the aquifer for irrigated ag purposes throughout the URNRD:

Years of Remaining Irrigation Usage in the Upper Republican NRD



Years Remaining



As the map indicates, there are areas of the URNRD where water use needs to be relocated to prevent irrigation water shortages in coming years. The water bank will help facilitate that process. Conversely, we know areas where water rights should not be transferred to prevent exacerbation of water supply issues in some regions of the district.

As for research into the operation and structure of water banks, the URNRD has consulted with entities that have created water banks including the Central Platte Natural Resources District and researched literature on the topic. Water banking has existed in the Western states for various purposes related to surface water for some time and groundwater banking is relatively, though definitely not entirely, new. One reason it isn't as common is because of the lack of groundwater regulations in many areas (O'Donnell et al., 2010), a limitation the NRDs including URNRD obviously don't have.

"Water banks can be a valuable tool to enhance water supply reliability, where legal frameworks and institutions governing water rights and water use allow for water banking activities," (O'Donnell et. al., 2010).

Recently, significant research has been conducted within the Republican Basin on groundwater trading including within the URNRD. In part, the focus has been how groundwater trading (transfers) similar to what is being proposed in this grant application would work in our environment of demands to reduce stream depletions. A study completed in 2014 that focused on conditions within Nebraska's portion Republican Basin concluded that trading might economically benefit farmers constrained by pumping regulations while also mitigating impacts on stream flow.

It's important to note that the studies didn't consider the purchase of water rights that then wouldn't be transferred, as will be the case with some water rights purchased by our proposed water bank, and rather analyzed trade-only schemes where water rights were relocated and used.

"Overall, our results imply that in some portions of the basin, such as the Upper Republican NRD and the westernmost counties of the Lower and Middle Republican NRDs, allowing trading within smaller regions could generate cost savings to farmers without compromising stream flows in the Republican River," (Palazzo, A; Brozovic, N, 2014). The same study went on to conclude that "although we do not model the spatial, dynamic impact of trading on instream flows, our results show that on average,

pumped water moves away from streams after trading relative to the baseline regulation.”

A description of the necessary water and/or land rights, if applicable (004.02 C);

The URNRD, through its certification of irrigated acres, legally controls what lands can be irrigated and new retirement of irrigated acres in high-priority areas that are decertified will remain permanently decertified in the locations where the acres were decertified. The water bank will make payments for lands to have their certified irrigation status removed by the URNRD; buyers may pay to have a commensurate number of acres certified to be irrigated in another location where use doesn't conflict with water preservation and stream flow goals.

As described earlier, no WSF funds will be used to pay for the decertification of acres that will be transferred as certified irrigated acres to other areas of the district.

A discussion of 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

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

The project has the capability to reduce water uses more than any other known method because it would result in complete elimination of water uses in areas from which water was transferred or retired by the water bank. Retirement of irrigated acres is not as economical as acres transferred via the water bank because the economic value of the water is lost via the retirement and is not transferred to other areas of the district where water supplies are sufficient and can be put to beneficial use through crop production. The goal of the water bank during the two-year project period in which WSF funds would be used would be for water bank purchase and retirement of 7,000 acres at a total cost of \$17.5 million.

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

shall be fifty (50) years or with prior approval of the Director, up to one hundred (100) years [T261 CH 2 (005)].

- 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). N/A
- 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 any intangible or secondary benefits 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, such that the economic feasibility of the project can be approved by the Director and the Commission (005.02).

The retirement of irrigation water uses in areas where the supply is insufficient to meet current demands and Republican River Compact requirements will aid in balancing uses and supplies.

As defined by the Republican River Water Sustainability Task Force in 2012, sustainability consists of “Management...allowing the beneficial use of water, in an effective and efficient manner, to satisfy our socio-economic needs and obligations while minimizing the risk that water resources will be insufficient for future generations to meet their socio-economic needs and obligations.”

As indicated in an earlier section, under current water usage rates the aquifer underlying approximately 15 percent of all irrigated acres in the URNRD will not be able to provide a full irrigation supply within approximately 40 years. Retiring irrigated acres in high-decline areas will help balance uses with supplies and prolong usability of the aquifer for ag purposes to the economic benefit of the URNRD and State.

- All benefit and cost data shall be presented in a table form to indicate the annual cash flow for the life of the proposal, not to exceed 100 years (005.03).

Year	Purchase Description	Cost	Total
2017	Water Bank payments to decertify 3,500 acres of irrigation use in high-decline, high-stream flow-impact areas.	WSF: \$5,250,000 NRD: \$3,500,000	\$8,750,000
2018	Water Bank payments to decertify 3,500 acres of irrigation use in high-decline, high-stream flow-impact areas.	WSF: \$5,250,000 NRD: \$3,500,000	\$8,750,000
Total	Water Bank payments to decertify 7,000 acres of irrigation use in high-decline, high-stream flow-impact areas.	WSF: \$10,500,000 NRD: \$7,000,000	\$17,500,000

- 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, the economic feasibility of such proposal shall be demonstrated by such method as the Director and the Commission deem appropriate (005.04).

The water bank will establish water-rights purchase prices annually based on the market conditions and water rights will be acquired using URNRD tax revenues and funds from the WSF. The current market condition and the basis of the WSF funding request of \$10.5 million is a rate of \$2,500 per certified irrigated acre within the URNRD. Acres decertified via participation would still be allowed to farmed as dryland, thus the \$2,500 per acre rate that is significantly lower than the cost of irrigated land. This market price has been established within the district over the last year by private sales of land in which certified irrigated acres have been transferred to other areas, turning tracts or partial tracts where certified acres once existed into dryland acres and allowing water use that previously occurred on those acres to be transferred to other areas.

Assuming a \$2,500 per acre cost to decertify acres, the total estimated cost of water rights under the proposed project that would be purchased by the water bank is \$17.5 million over a two-year period. Of this amount, \$10.5 million would come from the WSF and \$7 million from the URNRD.

Similar benefits related to compact compliance and general preservation of water to stabilize groundwater levels to prolong aquifer life could be

achieved by regulating all groundwater use in the district to an extent that would achieve the same benefits of the proposed project. However, this would come at a steep economic cost.

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

The URNRD has a cash balance of approximately \$8 million and has the ability to levy a \$10/irrigated acre occupation tax that generated approximately \$4.4 million annually. The property tax levy will generate approximately \$2,035,000 in 2016-2017.

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

There are no O/M&R costs associated with the project because the project entails using WSF and URNRD funds to pay for the decertification of irrigated acres, i.e. the purchase of water rights.

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

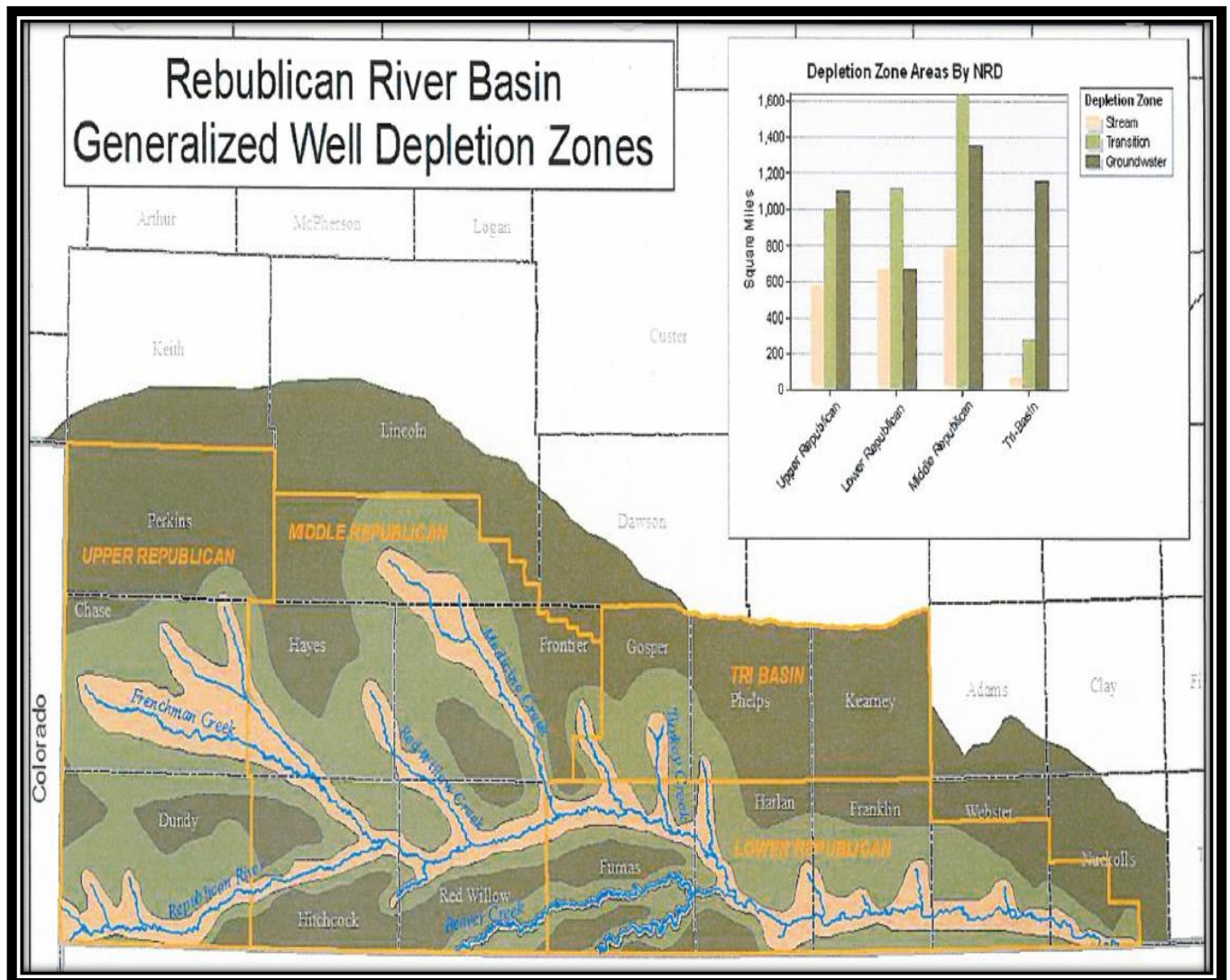
7. Describe how the plan of development minimizes impacts on the natural environment.

The proposed project minimizes impacts on the environment by causing reduced water use in the district. This is achieved by retiring irrigation uses in areas where groundwater pumping has high impacts on stream flows or where there are significant groundwater declines that threaten future water availability.

The underlying goals and objectives of the water bank that will be reflected in the strategic policy that guide operation of the bank include:

- Retiring uses that will benefit Republican River Compact Compliance by reducing depletions to stream flow. Estimates of stream flow depletion (sdf) reductions caused by ceasing irrigation on such acres will be made using the sdf factors within one mile-by-one mile tracts made available by the Republican River Compact Model. This will allow us to know how much additional stream flow can be expected to accrue over time by retiring irrigation from individual wells/parcels within the district. Tracts with a higher sdf will be given preference over those with a comparatively lower sdf. In order to be considered for participation in the water bank to mitigate impacts on stream flow, tracts must be within an area of

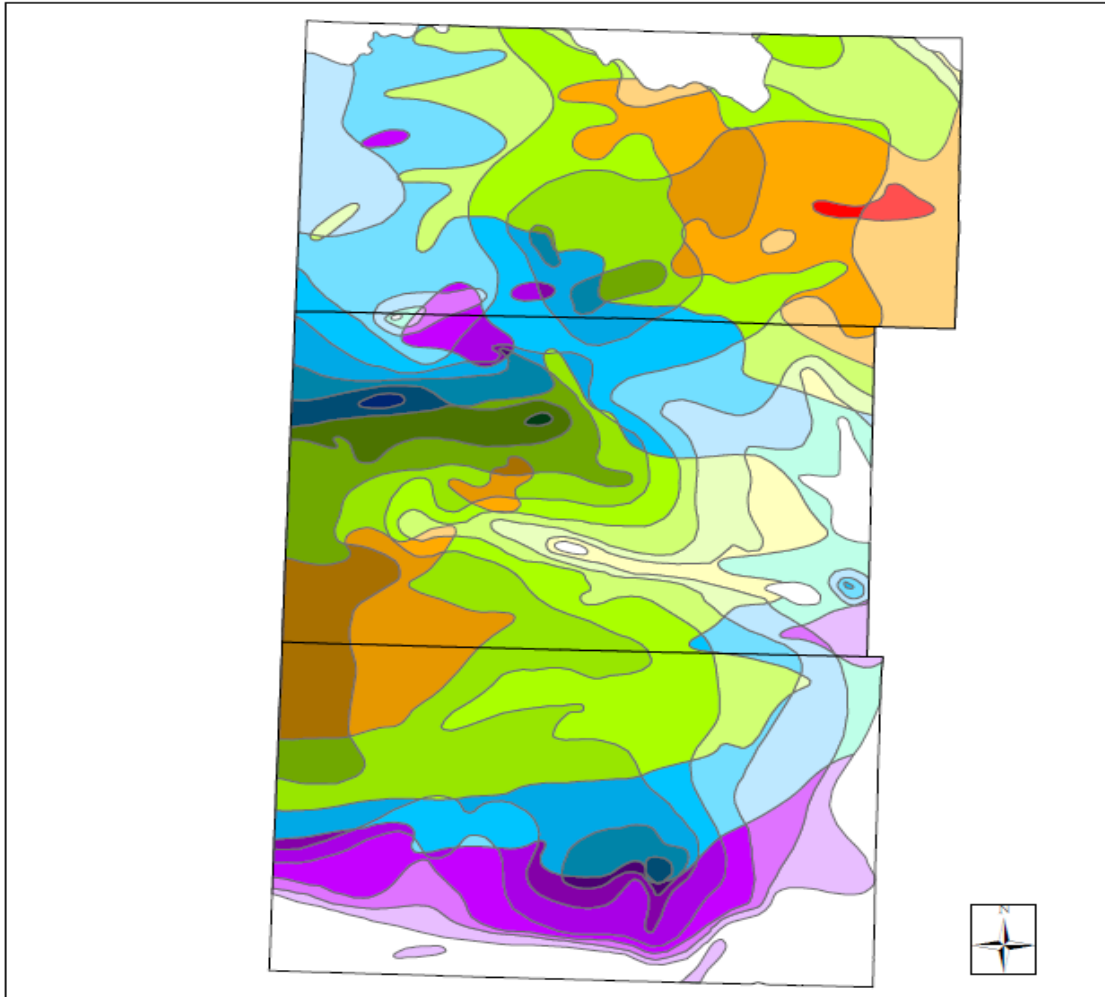
the district considered hydrologically connected to streams. For the purposes of the water bank, hydrologically connected will mean areas where modeling indicates that groundwater pumping has a 10 percent sdf over a 50-year period, commonly called the “10-50” area. The map below illustrates the 10-50 area in the URNRD and the rest of the Republican Basin. It is all areas shaded in tan and light green. Approximately 2/3 of the URNRD is within the 10-50 area; Perkins County, the northernmost county in the district, is not within the 10-50 year with the exception of the southeast corner of the county.



- Retiring uses in areas where at least 10 percent of the saturated thickness of the aquifer as it existed before irrigation development has been depleted since after the time in which groundwater

irrigation began. Areas with higher percentages of declines relative to pre-development groundwater levels will be given preference over those with comparatively lower decline rates. The map below shows the areas in which there have been declines of at least 10 percent. All regions of the URNRD with the exception of the east-central portion of the district have areas with declines of at least 10 percent.

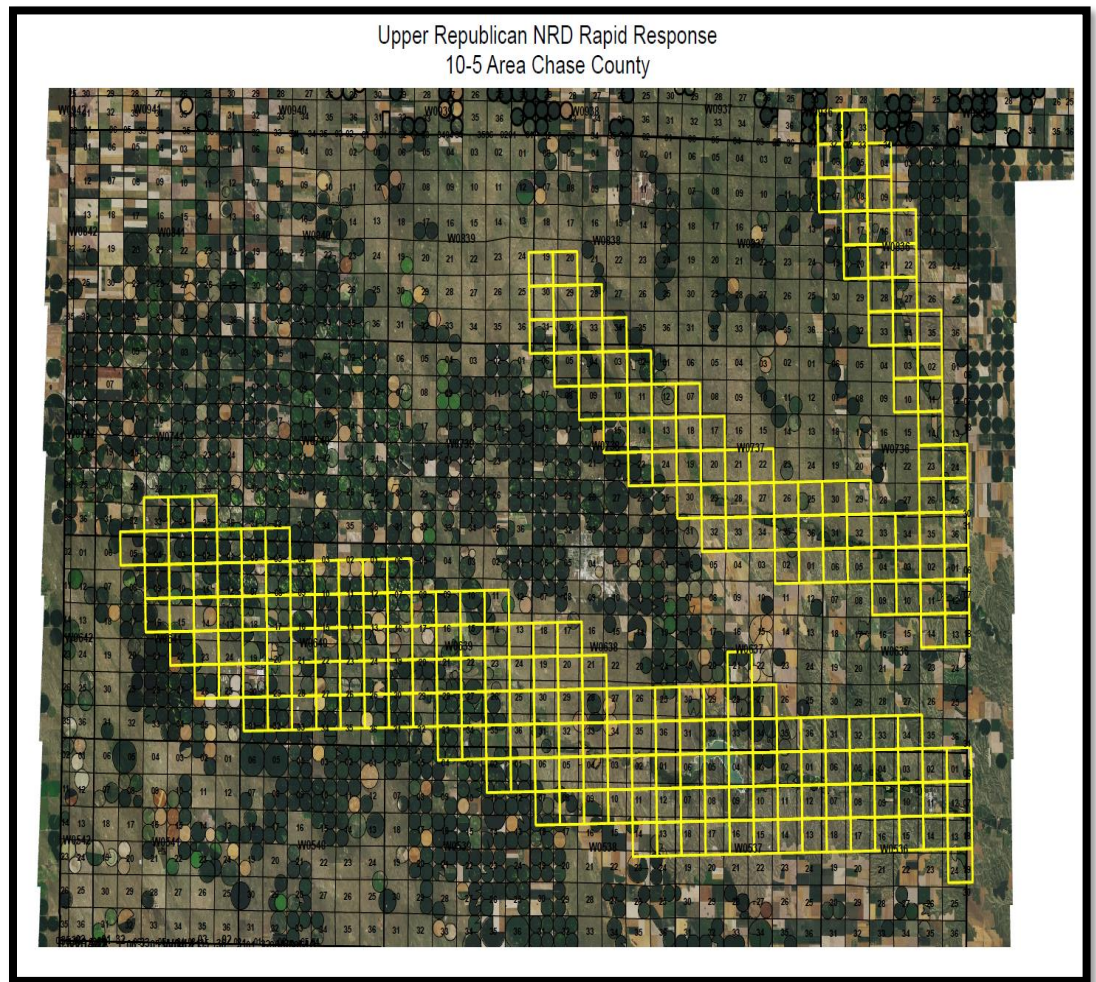
URNRD Declines Relative To Saturated Thickness



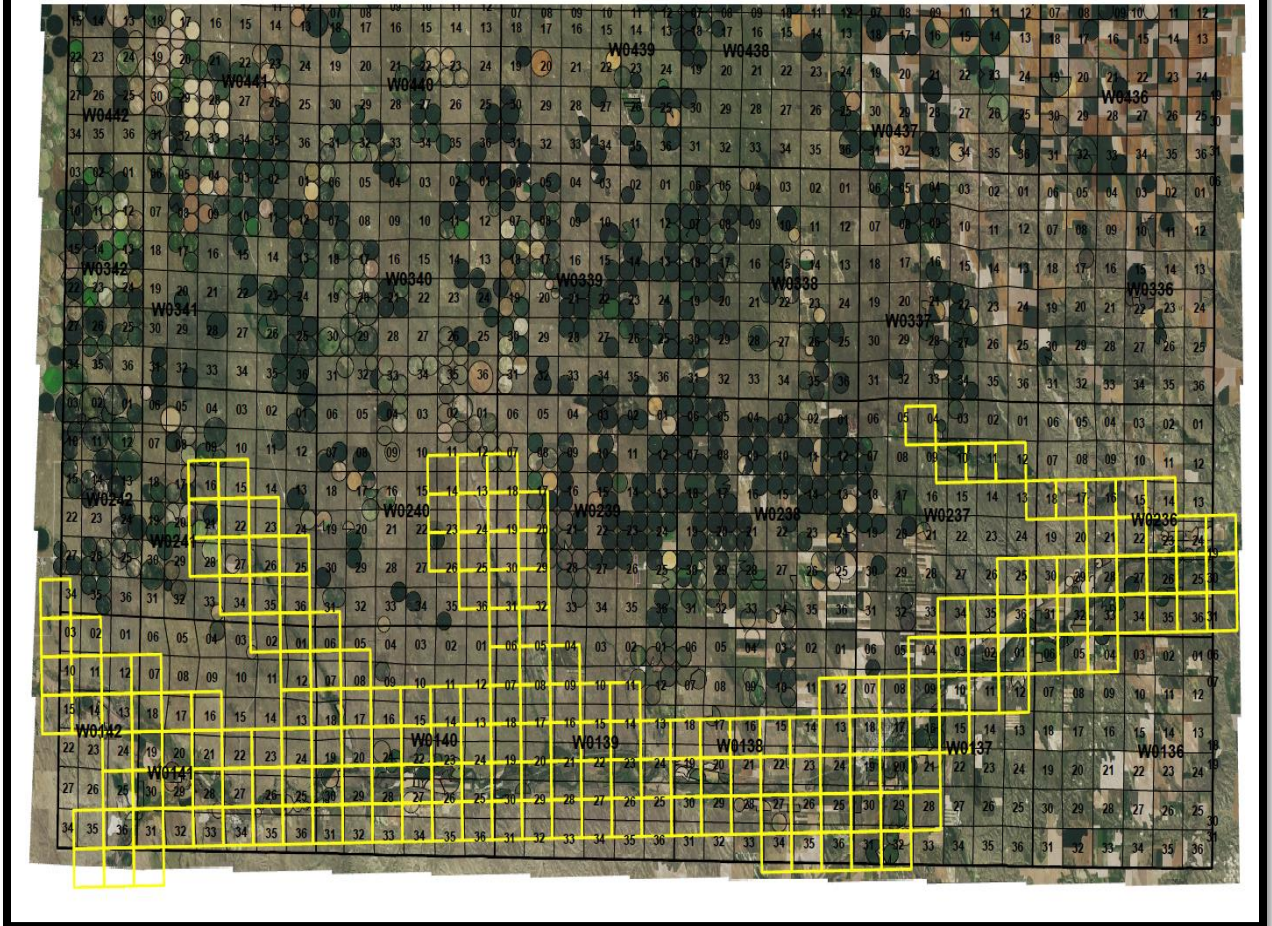
<100ft SatThick	100-200ft SatThick	200-300ft SatThick	300-400ft SatThick	>400ft Sat Thick
% Decline Predev-09	% Decline Predev-09	% Decline Predev-09	% Decline Predev-09	% Decline Predev-09
5-10 %	3.3-6.7%	2.5-5%	3.3-6.7%	5-7.5%
10-20 %	6.7-13.3%	5-10%	6.7-10%	7.5-10%
20-30%	13.3-20%	10-15%	10-13.3%	
30-40%	20-26.7%	15-20%	13.3-16.7%	
40-50%	26.7-33.3%	20-25%	16.7-20%	
50-60%	33.3-40%	25-30%		
60-70%	40-46.7%	30-35%		
	46.7%	>35%		

0 5 10 20 Miles

- Lessen the burden of Republican River Compact compliance management actions. Augmentation projects developed by the URNRD and other NRDs in the Republican Basin have the ability to offset depletions to stream flow to the extent necessary to maintain compliance with the compact during Compact Call years. However, the URNRD's Integrated Management Plan (IMP), similar to the IMPs of other NRDs in the basin, have a backstop option whereby the URNRD would impose more stringent restrictions in certain areas of the district during Compact Call years to reduce impacts on stream flow and maintain compliance with the compact. This area where special regulations can be set is the area in which the Republican River Compact model estimates that at least 10 percent of groundwater pumped would have otherwise resulted in stream flow within a five-year period, or the 10-5 area. There are 44,445 such acres in the district, illustrated in the maps below. The water bank presents an opportunity for landowners/farmers in the 10-5 area to retire water uses to prevent the possible, albeit unlikely, consequence of an irrigation shutdown during Compact Call years.



Upper Republican NRD Rapid Response
10-5 Area Dundy County



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

The URNRD's groundwater management authorities provided by the Groundwater Management and Protection Act give it the legal capabilities needed to institute a water bank that will fulfill URNRD and State of Nebraska objectives concerning conservation of water and compliance with an interstate compact, the Republican River Compact. The management of groundwater the URNRD has conducted since the 1970's, particularly as it pertains to institution of a water allocation system that will

greatly aid operation of the water bank, makes it qualified to establish a water banking system. As the regulatory agency that collects, manages, and oversees all information on certified irrigated acres that will be purchased by and in some cases sold the water bank, the URNRD is uniquely qualified to institute a water bank. Additionally, an important attribute of a water bank to ensure it is actually used is that it be instituted by an entity that is widely viewed within the community as an impartial and competent curator of water, a role we believe the URNRD plays within the district.

The water bank proposed to be established with aid from the WSF will not simply be a clearinghouse to facilitate the transfer of certified irrigated acres from one tract to another. Rather, it has the specific purpose of harnessing existing market demand for water transfers and retirement and managing the market in such a way that the water bank purchases water rights that benefit the district. Rights that are purchased will either be held by the bank or sold, but in either case their ultimate fate will be dictated by operational policies of the water bank that are aimed at achieving the district's water conservation and management goals. In this respect, the URNRD is the most qualified and responsible entity to establish the water bank.

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

The project considers plans and programs of the State because it is largely an outcome of plans and programs of the State. The existing demand for transfer of certified acres long distances within the URNRD is largely due to the URNRD's record of allowing such transfers, if other criteria are met, so long as the acres are being transferred from an area with a relatively high sdf to one with a lower sdf. The URNRD has been willing to allow such transfers in many cases because it can aid compliance with the Republican River Compact by lessening impacts on stream flow. This market can be beneficially exploited and grown by a water bank because it will exist as a buyer of water rights that has as a primary purpose what is now an ancillary consequence of landowners who seek transfers: Reducing depletions to Republican River stream flow.

The reduced depletions to stream flow also of course result in increased storage of water in areas where groundwater pumping is eliminated. The State in recent years has strongly encouraged NRDs and other entities to implement conjunctive management projects, and in many cases has helped implement such projects, such as along the Platte. The proposed water bank represents a conjunctive management effort because it will result in increased storage of water that if withdrawn for irrigation would

considered use of part of Nebraska’s allocation under the compact. Reduced use of Nebraska’s allocation during dry years will aid compliance and create new supplies that can be managed during years when Nebraska is not at risk of exceeding its compact allocation. In eight of the last 16 years Nebraska has had surplus allocation totaling approximately 400,000 acre feet (Bradley, 2016). The proposed water bank will help increase surplus allocation that can be more fully utilized via other conjunctive management projects such as intentional recharge and potentially help create surplus supplies in years when surpluses otherwise would not have existed.

The State and URNRD also have an interest in reducing conflicts between water users. As depletion of a shared resource continues, conflicts are inevitable unless steps are taken to reduce or eliminate uses in areas with a high density of irrigation development and relatively low water supplies. There are three areas in the URNRD where those conditions exist. Preference for participation in the water bank could be given to certified irrigated acres in those areas to help prevent potential future conflicts. Conflicts between groundwater users and surface water users could also be mitigated by a water bank that purchased certified acres in close proximity to the Republican River and its tributaries resulting in less impacts on stream flow surface water users rely upon. This represents a current conflict that could be aided by a water bank and it would have benefits outside the URNRD because reduced stream depletions would create benefits downstream of the URNRD.

Finally, the water bank considers the URNRD’s and States interest in preserving water for future use: “Management, protection and conservation of groundwater...is essential to the economic prosperity and future wellbeing of the State...and the public interest demands procedures for the implementation of management practices to conserve and protect groundwater supplies” (Neb. Rev. Stat. 46-702). The water bank through its ability to reduce water consumption in high-priority areas of the URNRD achieves goals and objectives contained in the URNRD’s Long Range Plan, Master Plan, Groundwater Management Plan and Integrated Management Plan.

10. Are land rights necessary to complete your project?

YES NO

If yes, provide a complete listing of all lands involved in the project.
N/A

If yes, attach proof of ownership for each easements, rights-of-way and fee title currently held.
N/A

If yes, 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.

Pursuant to the Nebraska Groundwater Management Act, the entire District has been established as a Groundwater Management Area wherein the URNRD has the authority to implement policies and programs such as the proposed water bank designed to preserve water. The district also has responsibilities contained within its IMP related to Republican River Compact compliance which the district is obligated to fulfill using its authorities under state law.

The proposed water bank does not conflict with and in fact facilitates the transfers of groundwater uses for agricultural purposes allowed under Neb. Rev. Stat. 46-691.

12. Identify the probable environmental and ecological consequences that may result as the result of the project.

No known negative environmental or ecological aspects of the project exist since the primary intent is to preserve water to help meet multiple goals of prolonging aquifer life, increasing stream flows and maintaining compliance with the Republican River Compact. We expect positive environmental and ecological impacts including the innate benefit of preserving a finite resource and additional stream flow benefitting fish and wildlife.

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 in parenthesis. 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. Remediates 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.

Rising nitrate and arsenic levels currently pose risks, and are expected to create increasingly higher risks, to drinking water within the URNRD. The proposed water bank's ability to retire irrigation uses, especially those close to

streams, will contribute to efforts to protect drinking water. For example, the Village of Wauneta is currently addressing a significant issue of arsenic levels exceeding federal drinking water standards. The Nebraska Department of Health and Human Services is currently working closely with the village to assess the extent and source of the arsenic problem. Rising arsenic levels have also been detected in the City of Imperial's water supply and high arsenic levels combined with high levels of uranium prompted the City of Benkelman recently to drill new municipal wells and install water-delivery pipeline from the wells to the city at significant cost.

Benkelman's former municipal wells that provided contaminated water forcing the city to source and install new wells were located immediately adjacent to the Republican River. Similarly, two of Wauneta's four municipal wells are within approximately ½ mile of Frenchman Creek, the largest tributary of the Republican River within the URNRD. The other two wells are also in proximity to the Frenchman Creek.

To date, research has not been done to establish whether high nitrate levels can trigger elevated levels of arsenic. However, the possibility of such a link exists and Frenchman Creek's proximity to one of the most densely irrigated/farmed areas of the district where abundant applications of nitrate-based fertilizers occur makes the creek a potential carrier of nitrates influencing wells such as Wauneta's. A recent University of Nebraska-Lincoln study established a link between nitrates and uranium levels in groundwater aquifers. "...Results indicate that nitrate, a primary contaminant, should be considered as a factor leading to secondary groundwater uranium contamination..." (Nolan J, Weber K, 2015).

Since the URNRD began water-quality testing in 1974, the average nitrate level within the district has risen from 1.85 ppm to 3.91 ppm, a 111% increase. In some areas of the district, levels above the federally accepted level of 10 ppm have been detected. This year, the URNRD created a new position for the sole purpose of analyzing the extent of the nitrate problem in the district and to help determine a course of action.

The water rights associated with irrigated land in close proximity to the Republican River and its tributaries will be given preference for enrollment in the water bank, i.e. acres close to streams will be a primary target for retirement of irrigation. Enrolled land could continue to be farmed without irrigation, which will significantly lessen chances of nitrates leaching into groundwater supplies used for human consumption and/or accreting into streams where nitrates can contaminate drinking water supplies downstream. "The more irrigation takes place, the greater the chances for nitrate leaching," (Haller L, McCarthy P, O'Brien T, Riehle J, Stuhldreher T, 2013).

It is reasonable to assert that, because of the prevalence of irrigated agriculture in the district that increases the risk of nitrate leaching into drinking water supplies, all 9,000 residents of the district will potentially benefit from efforts such as those in this proposal to reduce irrigation withdrawals. The three towns mentioned above represent more than 1/3 of the URNRD's population and about 45% or 4,050, live outside a city or village and rely upon domestic wells for their water supplies. A significant majority of domestic wells are in close enough proximity to irrigated cropland that they face a potential future risk of nitrate contamination above federally accepted levels.

The project will address the issue by using WSF and URNRD funds to retire irrigation uses via water-rights purchases by the water bank in areas where there is a significant hydrologic connection between groundwater and surface water, and in areas of the district where there is a high density of irrigation development that both leads to relatively high rates of groundwater declines and poses higher risk for future nitrate contamination. In other words, the areas in which the URNRD hopes to reduce and/or prevent water uses through the water bank are in many cases the same areas where there are more potential problems associated with nitrates.

Because nitrate levels haven't exceeded the federally accepted drinking water standard or come close to the standard in large swaths of the district, efforts to date to control nitrate levels have been confined to water-quality testing. However, the rate of increase in nitrate levels makes it prudent now to take management steps to prevent unacceptable levels from occurring throughout the district. The long range impacts of not taking action now are costly because they could include expensive remediation steps, especially relative to municipal water supplies, and imposing regulations for example on how much fertilizer farmers can apply, which could have negative economic impacts on the district.

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 Integrated Management Plan addressed by this project has been jointly developed and approved by the URNRD and Nebraska Department of Natural Resources four times and modified twice. The initial plan became effective June 2, 2005; it was revised and approved and then became effective on April 3, 2008; was revised and approved and became effective on

Nov. 1, 2010; and recently was revised, approved and became effective on Jan. 15, 2016. The URNRD also has a Groundwater Management Plan, Master Plan and Long Range Implementation Plan.

The District has taken a series of actions to achieve the IMP goals including:

- 1) Implementing the Rock Creek and NCORPE augmentation projects that have achieved, and will continue to ensure, compliance with the Republican River Compact as adopted in 1943 and as implemented in accordance with the Settlement Agreement approved by the U.S. Supreme Court in 2003. The augmentation projects kept Nebraska in compliance with the compact in 2013, 2014, 2015 and will be relied upon to do so in 2016. These actions have helped achieve the IMP goal of maintaining compliance with the compact.

- 2) Reached agreements with the other NRDs in the Republican Basin and the State that apportion compact compliance responsibilities to the NRDs based on depletions to stream flow that occur within their respective Districts. This has helped achieve the second IMP goal of ensuring that water users within the URNRD assume their share, but only their share of the responsibility to maintain compliance with the compact.

- 3) Implemented a uniform groundwater allocation system whereby all water users within the district have the same allocation. By implementing the augmentation projects, the district has prevented water users in close proximity to the Republican and River and its tributaries from being subject to lower water allocations. This has helped achieve the third IMP goal of the district apportioning its share of compact compliance responsibility equitably so as to minimize adverse economic, social, and environmental consequences arising from compact compliance activities.

- 4) Continued to prohibit expansion of new irrigated acres and permanently retired approximately 1,500 acres from irrigation using URNRD and federal funds. This has helped achieve the fourth IMP goal of protecting groundwater users whose water wells depend on recharge from the river or stream and the surface water appropriators on such rivers or streams from stream flow depletions caused by water uses begun after the time in which the Republican Basin was designated fully appropriated.

- 5) Tightened rules and regulations to decrease groundwater pumping across the district in an effort to achieve a 20 percent reduction compared to 1998-2002 baseline levels during years of average precipitation. Specifically, recent rules changes have included limitations on the use of "banked" allocation - that which was allocated but not used by individual farmers during previous allocation periods - during the current allocation period and future periods without incurring a penalty.

The primary goal in the district's Groundwater Management Plan is to keep groundwater levels at present levels or minimize declines to ensure future generations have an adequate water supply. The district's allocation system,

prohibition on new irrigation wells, spacing requirements between irrigation wells and other rules and regulations have been efforts to achieve that goal.

Attainment of IMP Goals

The proposed water bank will help achieve the following goals and objectives within the IMP.

1. Maintain compliance with the Republican River Compact:

Certified irrigated acres will be purchased by the proposed water bank using WSF and URNRD funds consistent with the 60 percent (WSF), 40 percent (URNRD) project cost split required under WSF rules. Payments to decertify certified irrigated acres will cause irrigation retirement at the location of the enrolled lands in areas where pumping has significant impacts on stream flow.

Retirement of uses with high impacts on stream flow as will occur under the water banking project has the ability to significantly reduce Nebraska's use of its allocation under the compact. Pursuant to a settlement agreement between the compact states of Nebraska, Kansas and Colorado approved by the U.S. Supreme Court in 2003, Nebraska's allocation of Republican River water under the compact has included variable volumes of groundwater used by crops that, unused, would have resulted in stream flow as calculated by the Republican River Compact Model. Eliminating groundwater uses modeled to cause significant impacts on stream flow and therefore significant usage of Nebraska's compact allocation will help Nebraska not exceed its compact allocation. Allowing transfers of such high-impact uses to areas with low impacts on stream flow produces benefits in the same manner.

Compliance with the compact aided by reduced water use such as that that would occur under the project prevents statewide liability for noncompliance that include significant penalties. For instance, the State of Kansas recently sought but did not successfully receive a court judgement of approximately \$70 million for Nebraska's noncompliance with the compact in 2005-2006.

2. Provide the URNRD's share of compliance responsibility and impact be apportioned within the URNRD in an equitable manner and to the extent possible, minimize adverse economic, social and environmental consequences arising from compliance activities:

By developing a market for the retirement of irrigation on acres that have high impacts on stream flow, the water bank helps create equity for landowners that currently face the potential for bearing a larger share of compact

compliance responsibility than owners of land with low impacts on stream flow.

Recently developed augmentation projects in the Republican Basin, the Rock Creek Augmentation Project in Dundy County and the NCORPE Augmentation Project in Lincoln County, have successfully kept the state in compliance with the compact. But should their capacity at some point be insufficient to ensure compliance, the only other available option to the NRDs in the Republican Basin including URNRD would be to impose stricter allocations, or prohibit irrigation altogether, on acres close to the Republican River and its tributaries (42,445 acres in URNRD) in dry years when compliance action was needed. By reducing water use and therefore the impacts on stream flow caused by groundwater pumping that are considered usage of Nebraska's compact allocation, the project could help prevent or at least mitigate special regulations on water users close to the Republican and its tributaries.

This option to lower or eliminate allocations on the so-called "rapid response" acres where modeling suggests at least 10 percent of groundwater pumped for irrigation would have otherwise resulted in stream flow with five years is in the IMP.

Attainment of IMP Objectives

1. Reduce existing groundwater use within the URNRD by 20 percent from the 1998 to 2002 baseline pumping volumes under average precipitation conditions so that, when combined with stream flow augmentation and incentive programs, the URNRD's groundwater depletions are maintained within their portion of Nebraska's allowable groundwater depletions as computed through the use of the Republican River Compact Model. Additionally, voluntary reductions in baseline pumping volumes will continue to be pursued by the URNRD with the incentive of limiting the level of long-term management actions that are necessary during compact call years:

Pumping reductions caused by enrollment of lands in the water bank will help meet this objective. The requested grant of \$10.5 million and URNRD match of \$7 million could potentially retire approximately 7,000 acres at a cost of \$2,500 per acre. Average annual irrigation withdrawals in the district are 12" per acre. Retirement of 7,000 acres, then, would reduce water use by 7,000 acre feet annually.

To meet the 20 percent reduction objective, pumping in years of average precipitation would have to average approximately 106,000 acre feet less

than average withdrawals from 1998-2002. Assuming retirement of 7,000 acre feet annually, the proposed water bank would represent 7 percent of the reduction needed to meet the pumping reduction objective.

2. Make such additional reductions in compact call years as are necessary, after taking into account any reduction in beneficial consumptive use achieved through basin-wide incentive and stream flow augmentation programs, to achieve a reduction in beneficial consumptive use in the URNRD that ensures the district limits its groundwater depletions to the Allowable Groundwater Depletions for the URNRD:

Should reductions in compact call years be needed, reductions in pumping already achieved by the project preceding and during compact call years will lessen further reductions in pumping that have to be made during compact call years so as not to exceed allowable groundwater depletions to stream flow.

3. Cause the reductions in water use required for compact compliance to be achieved through a combination of regulatory, incentive, and augmentation programs designed to reduce consumptive use. To the extent funds are available, incentive programs will be made available through targeted incentive programs:

The water bank represents an incentive program to lessen stream flow impacts for compact compliance purposes. It is helpful to both the URNRD and State to distribute across multiple methods our efforts to reduce stream flow impacts and offset them. In much the same way it makes sense to diversify a financial portfolio to reduce risks, it's prudent to diversify our compliance methods. Water banking will represent the third compliance effort in addition to augmentation and pumping limitations.

4. Develop a program to provide offsets for new consumptive uses of water so that economic development in the district may continue without producing an overall increase in groundwater depletions as a result of new uses:

The URNRD would have the option of using some of the banked certified irrigated acres as offset that could be granted or sold to new industrial/economic development uses. Currently, new industries such as ethanol plants have to offset their new consumption of water by purchasing and retiring irrigated acres. This can pose a significant and costly barrier to businesses in a region of Nebraska where more business development is needed.

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 three above-listed goals – recharge, reducing aquifer depletion and increasing stream flow – are the three primary goals of the proposed water bank. URNRD and WSF funds will be used to pay landowners in high decline and high stream flow-impact areas to relinquish the irrigation certification status, which is granted by the URNRD, of their land. In the nomenclature of the URNRD and other NRDs that certify irrigated acres, removing this status such as for transfers or to penalize is simply called decertification of certified acres.

It is our intent to make water rights in all areas of the district where remaining aquifer saturated thickness is at least 10 percent less than it was before irrigation development began to be eligible for purchase. This constitutes roughly 60 percent – 75 percent of the district’s 430,000 irrigated acres, or about 260,000-320,000 acres. Similarly, all acres where groundwater is considered to have a hydrologic connection to streams of at least 10 percent impact within a 50-year period will be eligible. Most of these acres are also located in areas where saturated thickness is at least 10 percent less than it was before irrigation development. In sum, then, roughly 75 percent of the irrigated acres in the district, or about 320,000 irrigated acres, will be eligible. However, not all acres that meet those criteria will be considered equally for purchase by the water bank. Water uses in areas with higher declines and/or higher impacts on stream flow will receive preference over acres in areas with comparatively lower declines and/or impacts on stream flow.

The amount that aquifer depletion will be reduced in high-decline areas of the district at the location where water uses will be purchased by the water bank and relinquished is 100 percent. Average annual irrigation withdrawals in the district are 12” per acre and field size is typically 160 acres. Average water saved on a per-field basis, then, would be approximately 160 acre feet annually. Using WSF and URNRD funds, it is our hope to cease water use on 7,000 acres within high-priority areas, resulting in an annual savings of 7,000 acre feet. This is a conservative estimate as it does not include future, reduced water use on additional acres purchased by the water bank.

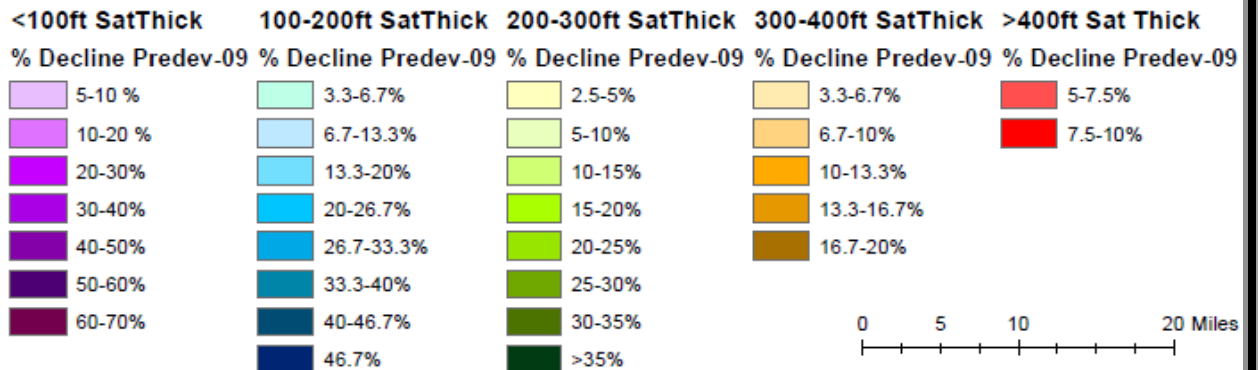
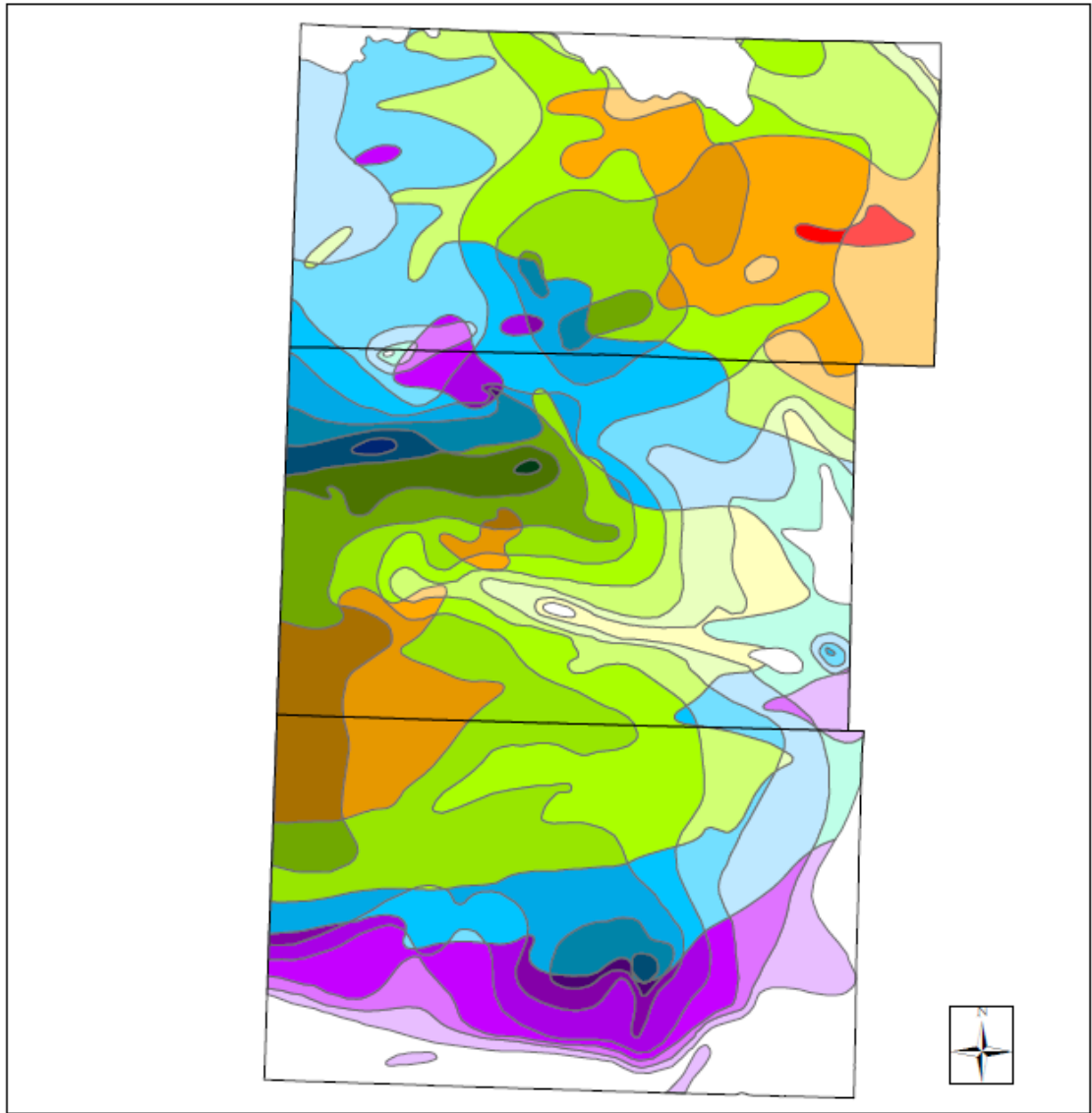
As for increased stream flow, the amount of benefit will largely depend on the location of acres whose water rights are purchased by the water bank. As mentioned earlier, the Republican River Compact Model has calculated the estimated impact of groundwater pumping on stream flow in all areas throughout the Republican Basin and URNRD. Within the URNRD, the average impact is approximately 35 percent over a 50-year period, i.e. 35 percent of groundwater pumped would have resulted in stream flow within 50 years. From 2012-2014, the district participated in a program with the Natural Resources Conservation Service where \$2.1 million in URNRD funds and \$1.47 million in NRCS funds were spent to retire 1,546 acres. The intent of that program was very similar to the water bank proposal – to retire acres near streams and in areas of high declines. The average impact on stream flow of those acres was 86 percent.

If all of the 7,000 acres we hope to have purchased by the water bank have a similar stream flow depletion factor of 86 percent, annual increases to stream flow will be approximately 6,000 acre feet in a 50-year period.

The project will result in cross-basin benefits because the additional flow will reach water users in areas downstream of the URNRD.

The following map helps illustrate areas of the district that may be eligible to participate in the water bank because of declines. It illustrates declines relative to saturated thickness by showing what percentage of pre-development aquifer thickness has been depleted throughout the district. Those with at least 10 percent depletion will be eligible:

URNRD Declines Relative To Saturated Thickness



The two lighter-shaded areas within the URNRD on the map on p. 16 indicate what areas of the district will be eligible for water bank participation because groundwater there is considered hydrologically connected to groundwater.

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 proposed project benefits agricultural use, municipal and industrial uses, recreation, wildlife and conservation and preservation of water resources in the following ways:

Agricultural use: Retiring uses from willing sellers will prevent negative water-supply impacts on neighboring irrigators because there will be less demand for water in the area of retirement. In high-decline areas especially, preservation of water that would otherwise be used will help preserve, hopefully indefinitely, usable volumes of water for irrigated agriculture in the future. Additional stream flow generated by retirement of uses close to the stream will benefit irrigators who rely on surface water. It will also increase groundwater recharge in alluvial areas, aiding groundwater irrigators in those areas. Finally, to the extent that the water bank will aid compact compliance, it could help keep the URNRD from severely limiting or barring irrigation on 42,445 acres close to the Republican River and tributaries in years known as Compact Call years when action is needed to maintain compliance. The district's IMP specifies this action as a potential tool for compliance.

Municipal and industrial uses: The Village of Wauneta's municipal wellfield is located near the Frenchman Creek and relies upon recharge from the river. Increased recharge and therefore municipal supplies can be expected from retiring water uses via the water bank. All other municipal wellfields in the URNRD serving approximately 5,000 people are in or near areas where there have been groundwater declines so could benefit by retirement that could increase water availability. The same is true for remaining residents who rely on domestic wells. As mentioned earlier, the water bank could be used to provide offset for industrial uses because in the current environment new industrial uses must find and buy irrigated acres to retire to provide offset for their new anticipated water uses. Finally, retirement of irrigation may reduce nitrate leaching into municipal and domestic water supplies.

Recreation and wildlife: Two recreation areas, Enders Reservoir and Champion Lake, have been negatively impacted by decreasing inflows from the Frenchman Creek. Retirement of water uses near the Frenchman could help boost inflows into both recreation areas. Recreation areas downstream of the district along the Republican River including Swanson Reservoir in the Middle Republican NRD and Harlan County Lake in the Lower Republican NRD would also be positively impacted by increasing base flow produced by retiring acres with high-impacts on stream flow. Generally, increased stream flow will of course aid wildlife including fish.

Conservation and preservation of water resources: In general, the project seeks to conserve and preserve groundwater in an area where there have been significant groundwater declines over time. On average, groundwater levels are approximately 25 feet lower in the district compared to the period before irrigation development. Retiring water uses in high-decline areas will help lower decline rates, preserving and conserving water resources.

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.

To the extent that the project helps reduce water use so that the district and State stay within their allowable depletions to stream flow caused by groundwater pumping under the Republican River Compact, the project will help maintain compact compliance and reduce the State's liability for noncompliance. In its most recent lawsuit against the State, the State of Kansas sought \$70 million from the State for noncompliance in 2005-2006.

The project also provides a beneficial economic impact to residents of the State by helping sustain water resources and therefore income tax revenue derived from irrigated crops. The total, average annual market value of agricultural products produced in Chase, Dundy and Perkins Counties that comprise the URNRD is approximately \$840 million. Should groundwater availability decline to the point that a 15 percent reduction in irrigation and resulting decreases in yields occur in upland areas with more water availability and a 40 percent reduction in irrigation near streams where there tends to be less groundwater available occur, annual economic output impacting state revenues could drop by an estimated \$27 million (UNL Bureau of Business research, 2007).

Beneficial uses of water may be reduced on acres that the water bank pays to decertify as irrigated acres, but it is important to note that the decertification will not be forced and instead occur by participation from willing landowners. Also, some water rights purchased by or via the water bank by the URNRD or landowners but not using WSF funds will be sold to be used in parts of the district that are not in high-decline areas or those without significant impacts on stream flow. In these cases, there will be no reduction in beneficial use. In cases where water rights are not sold to be used in other areas, beneficial use may decrease in the short term but the increased water availability will allow for beneficial uses in the future that might not otherwise occur. Because the URNRD is in a region of declining water supplies, this approach uses what we believe is the necessary “long-view” to ensure that Nebraska’s water resources are available for as long as possible for the benefit of the district and the State as a whole.

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.

There are no O/M costs associated with the project because the project entails using WSF and URNRD funds to pay for the decertification of irrigated acres, i.e. the purchase of water rights. No land will be purchased.

The water bank will establish water-rights purchase prices annually based on the market conditions and water rights will be acquired using URNRD tax revenues and funds from the WSF. The current market condition and the basis of the WSF funding request of \$10.5 million is a rate of \$2,500 per certified irrigated acre within the URNRD. Acres decertified via participation would still be allowed to farmed as dryland, thus the \$2,500 per acre rate that is significantly lower than the cost of irrigated land. This market price has been established within the district over the last year by private sales of land in which certified irrigated acres have been transferred to other areas, turning tracts or partial tracts where certified acres once existed into dryland acres and allowing water use that previously occurred on those acres to be transferred to other areas so long as the transfers don’t conflict with water-conservation goals.

Assuming a \$2,500 per acre cost to decertify acres, the total estimated cost of water rights under the proposed project that would be purchased by the water bank is \$17.5 million over a two-year period. Of this amount, \$10.5 million would come from the WSF and \$7 million from the URNRD.

2017: Water rights on 3,500 acres purchased for \$8,750,000 (\$5,250,000 from WSF; \$3,500,000 from URNRD).

2018: Water rights on 3,500 acres purchased for \$8,750,000 (\$5,250,000 from WSF; \$3,500,000 from URNRD).

Similar benefits related to compact compliance and general preservation of water to stabilize groundwater levels to prolong aquifer life could be achieved by regulating all groundwater use in the district to an extent that would achieve the same benefits of the proposed project. However, this would come at a steep economic cost.

For example, if all 7,000 acres worth of water rights purchased by the water bank over the two-year period in which WSF funds were used had an average 50-year stream flow depletion factor (sdf) of 86 percent similar to what was experienced under a previous retirement program, depletions to stream flow would eventually be reduced by about 6,000 acre feet annually. Achieving the same benefit by regulating irrigated acres in the district with an average sdf of 35 percent, which is the district-wide average, would require prohibiting irrigation entirely on about 18,000 acres. The economic cost of such a policy would far exceed the \$17.5 million cost of water bank purchases as proposed. Using the average per bushel corn value of \$5.11 under the WSF guidelines provided by the Natural Resources Commission, 100 bushel per acre yield reductions caused by an irrigated-to-dryland conversion on 18,000 acres would reduce economic output in terms of grain sales by approximately \$9.2 million annually. Of course, yield reductions can be expected from water bank purchases of water rights but that economic output is significantly offset by landowner revenue generated from the sale of the water rights.

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.

The compact the project will help meet is the Republican River Compact between Nebraska, Kansas and Colorado as adopted in 1943 and as implemented in accordance with the Settlement Agreement approved by the U.S. Supreme Court in 2003.

Water consumption reduced under the project will help ensure Nebraska doesn't overuse its compact allocation. It will also reduce the amount of water use in excess of the allocation that must be offset by increasing stream flow via stream flow augmentation projects developed in the Republican River Basin. The project will help prevent and/or reduce statewide liability for noncompliance that include significant penalties. As an example, the State of Kansas recently sought but did not successfully receive a court judgement of approximately \$70 million for Nebraska's noncompliance with the compact in 2005-2006.

Pursuant to a settlement agreement between the compact states of Nebraska, Kansas and Colorado approved by the U.S. Supreme Court in 2003, Nebraska's allocation of Republican River water under the compact has included variable volumes of groundwater used by crops that, unused, would have resulted in stream flow as calculated by the Republican River Compact Model. Eliminating groundwater uses modeled to cause significant impacts on stream flow and therefore significant usage of Nebraska's compact allocation will help Nebraska not exceed its compact allocation. Allowing transfers of such high-impact uses to areas with low impacts on stream flow produces benefits in the same manner.

Recently developed augmentation projects in the Basin, the Rock Creek Augmentation Project in Dundy County and the NCORPE Augmentation Project in Lincoln County, have successfully kept the state in compliance with the compact. But should their capacity at some point be insufficient to ensure compliance, the only other available option to the NRDs in the Republican Basin including URNRD would be to impose stricter allocations, or prohibit irrigation altogether, on acres close to the Republican River and its tributaries (approximately 42,445 acres in URNRD) in dry years when compliance action was needed. By reducing water use and therefore the impacts on stream flow caused by groundwater pumping that are considered usage of Nebraska's compact allocation, the project could help prevent or at least mitigate special regulations on water users close to the Republican and its tributaries.

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.

Continued aquifer depletion that the proposed project seeks to address could impact both critical infrastructure and the economy at the local, regional and national levels, according to the U.S. Department of Homeland Security (DHS) Office of Cyber and Infrastructure Analysis. Decreases in critical infrastructure caused by dwindling water supplies could be experienced in the food and agriculture, energy, and chemical sectors according to the analysis.

Specifically, food and fuel (ethanol) prices could rise due to less crop production and water and wastewater systems could be negatively impacted by growing populations and declining groundwater levels. Transportation systems infrastructure could be affected by potentially less demand for transportation services as a result of less agriculture and ethanol production. Interestingly, for purposes of projecting future crop yields that might impact those infrastructure areas, DHS used Dundy County in the URNRD as the lone example.

DHS modeling showed that in the future, dryland crop yields might actually decline slightly and reliance on groundwater irrigation could be more tenuous. "Whereas farmers have used irrigation to offset impacts of climate variability on crop yields in the past, the depletion of the High Plains Aquifer could hinder their ability to do so in the future," according to the report. "As groundwater availability decreases over time, it is possible that more agricultural land will be converted from irrigated to dryland farming."

Counties of highest concern overlying the aquifer are those the modeling described in the report showed as having 25 or fewer years of groundwater use available. No such counties in Nebraska were shown to be facing that imminent of a problem, but of the seven counties in Nebraska where the life of the aquifer usable for irrigation was shown to be 50-100 years, two are in the URNRD (Dundy and Chase). One of the four counties in the Nebraska with a usable aquifer life of 100-200 years was in the District (Perkins).

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.

Rising nitrate and arsenic levels currently pose risks, and are expected to create increasingly higher risks, to drinking water within the URNRD. The

proposed water bank's ability to retire irrigation uses, especially those close to streams, will contribute to efforts to protect drinking water. For example, the Village of Wauneta is currently addressing the significant issue of arsenic levels exceeding federal drinking water standards. The Nebraska Department of Health and Human Services is currently working closely with the village to assess the extent and source of the arsenic problem. Rising arsenic levels have also been detected in the City of Imperial's water supply and high arsenic levels combined with high levels of uranium prompted the City of Benkelman to drill new municipal wells and install water-delivery pipeline from the wells to the city at significant cost.

Benkelman's former municipal wells that provided contaminated water forcing the city to source and install new wells were located immediately adjacent to the Republican River. Similarly, two of Wauneta's four municipal wells are within approximately ½ mile of Frenchman Creek, the largest tributary of the Republican River within the URNRD. The other two wells are also in proximity to the Frenchman Creek.

To date, research has not been done to establish whether high nitrate levels can trigger elevated levels of arsenic. However, the possibility of such a link exists and Frenchman Creek's proximity to one of the most densely irrigated/farmed areas of the district where abundant applications of nitrate-based fertilizers occur makes the creek a potential carrier of nitrates influencing wells such as Wauneta's. A recent University of Nebraska-Lincoln study established a link between nitrates and uranium levels in groundwater aquifers. "...Results indicate that nitrate, a primary contaminant, should be considered as a factor leading to secondary groundwater uranium contamination..." (Nolan J, Weber K, 2015).

Since the URNRD began water-quality testing in 1974, the average nitrate level within the district has risen from 1.85 ppm to 3.91 ppm, a 111% increase. In some areas of the district, levels above the federally accepted level of 10 ppm have been detected. This year, the District created a new position for the sole purpose of analyzing the extent of the nitrate problem in the District and to help determine a course of action.

The water rights associated with irrigated land in close proximity to the Republican River and its tributaries will be given preference for enrollment in the water bank, i.e. acres close to streams will be a primary target for retirement of irrigation. Enrolled land could continue to be farmed without irrigation, which will significantly lessen chances of nitrates leaching into groundwater supplies used for human consumption and/or accreting into streams where nitrates can contaminate drinking water supplies downstream. "The more irrigation takes place, the greater the chances for nitrate leaching," (Haller L, McCarthy P, O'Brien T, Riehle J, Stuhldreher T, 2013).

It is reasonable to assert that, because of the prevalence of irrigated agriculture in the district that increases the risk of nitrate leaching into drinking water supplies, all 9,000 residents of the district will potentially benefit from efforts such as those in those proposal to reduce irrigation withdrawals. The three towns mentioned above represent more than 1/3 of the URNRD's population and about 45% or 4,050, live outside a city or village and rely upon domestic wells for their water supplies. A significant majority of domestic wells are in close enough proximity to irrigated cropland that they face a potential future risk of nitrate contamination above federal accepted levels.

The project will address the issue by using WSF and URNRD funds to retire irrigation uses via water-rights purchases by the water bank in areas where there is a significant hydrologic connection between groundwater and surface water, and in areas of the district where there is a high density if irrigation development that both leads to relatively high rates of groundwater declines and poses higher risk for future nitrate contamination. In other words, the areas in which the URNRD hopes to reduce and/or prevent water uses through the water bank are in many cases the same areas where there are more potential problems associated with nitrates.

Because nitrate levels haven't exceeded the federally accepted drinking water standard or come close to the standard in large swaths of the district, efforts to date to control nitrate levels has been confined to water-quality testing. However, the rate of increase in nitrate levels makes it prudent now to take management steps to prevent unacceptable levels from occurring throughout the district. The long range impacts of not taking action now are costly because they could include expensive remediation steps, especially relative to municipal water supplies, and imposing regulations for example on how much fertilizer farmers can apply, which could have negative economic impacts on the district.

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 jurisdiction that supports the project is the URNRD. We believe our regulating and managing all agricultural water use in the area since the 1970's makes it uniquely qualified to pursue the proposed project.

The District's 2015-2016 tax levy is \$.055216 per \$100 of valuation and will generate \$2,055,350 of revenue. The District's other source of revenue is the

\$10-per-irrigated-acre occupation tax that generates approximately \$4.4 million annually.

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 Upper Republican NRD is the local jurisdiction applying for the grant. The URNRD has a Groundwater Management Plan, Long Term Implementation Plan, Master Plan and Integrated Management Plan with water sustainability goals. Slowing and eventually stopping groundwater declines is the URNRD's overarching goal. Specifically, the district has formally adopted goal of "developing, promulgating and enforcing rules and regulations that provide for appropriate protection of the aquifer so as to slow and eventually stop water table declines in order that beneficially usable quantities of water remain in the aquifer; incentives to use water efficiently; conservation of groundwater; and maintaining or enhancing groundwater quality." (URNRD Master Plan, 2010-2020).

The district's Integrated Management Plan has been approved and revised four times since 2005 and has a purpose of "sustaining a balance between water uses and water supplies so that the economic viability, social and environmental health, safety and welfare of the river basin...can be achieved and maintained for both the near and long term."

Collectively, plans approved by the district have goals relative to decreasing impacts on stream flows and preserving water that will be addressed by the project because it will retire water uses in high priority areas of the district.

The URNRD is believed to be possibly the first entity in the country, and was the first in Nebraska, to limit agricultural water use by establishing an allocation on the use of groundwater in 1979. Since that time, allocations have been reduced by approximately 40%. The regulations have slowed groundwater declines compared to what was predicted to occur absent regulations. Average groundwater declines are approximately 60% less than what USGS predicted they would be if regulations weren't established

(Lappala, 1978) and the most significant groundwater declines are approximately half what USGS estimated would occur without regulations.

In addition to allocations, regulations limiting proximity of irrigation wells to one another were approved in 1979 and again in 1992. In 1997, the URNRD approved and implemented the first well-drilling moratorium in Nebraska. Larger declines in areas that abut the URNRD in Kansas and Colorado which do not have regulations or whose regulations are less stringent also illustrate the beneficial impact of these actions within the URNRD. Average annual declines in areas of Kansas with a similar climate have been more than double what has occurred in the URNRD over a similar time period.

Most recently, in 2013, the District made some of its most significant rules changes in its history when it restricted the use of unused allocation, or “carry-forward”, and created new penalties for water users who use more than their water allotments. All agricultural water use has been metered since the late 1970’s and approximately 400 wells are measured in the spring and fall. Metering, well measurements and allocations have created an extensive database from which the URNRD can base decisions to further its long term goal of slowing groundwater declines in the URNRD.

The primary goals which the project will help achieve are to preserve groundwater for future use and slow groundwater declines, and reduce depletions to stream flow caused by groundwater pumping to aid compliance with the Republican River Compact. This is consistent with the primary goal in the district’s Groundwater Management Plan to keep groundwater levels at present levels or minimize declines to ensure future generations have an adequate water supply.

The project will also help achieve the following objectives contained in the URNRD’s Long Range Implementation Plan:

- Develop, promulgate and enforce rules and regulations that provide for appropriate protection of the aquifer, incentives to use water efficiently, conservation of ground water, and maintenance and enhancement of groundwater quality: The water bank represents an incentive program to encourage retirement of water rights within high-decline areas and those with high impacts on stream flows.
- Reduce the potential for non-point contamination of ground and surface water through education, research, management practices, incentives and rules that protect the water but also minimize adverse effects on the economy of the area: Less water use and subsequently less leaching of nitrates into the groundwater supply via retirement of water uses will help achieve this objective.

The target area of the project is the 1.7 million-acre land area of the URNRD and specifically the approximately 430,000 irrigated acres in the district. It is our intent to make water rights in all areas of the district where remaining aquifer saturated thickness is at least 10 percent less than it was before irrigation development began to be eligible for purchase. This constitutes roughly 60 percent – 75 percent of the district’s 430,000 irrigated acres, or about 260,000-320,000 acres. Similarly, all acres where groundwater is considered to have a hydrologic connection to streams of at least 10 percent impact within a 50-year period will be eligible. Most of these acres are also located in areas where saturated thickness is at least 10 percent less than it was before irrigation development. In sum, then, roughly 75 percent of the irrigated acres in the district, or about 320,000 irrigated acres, will be eligible and are the target area of the project.

Over the two-year period in which WSF and URNRD funds are proposed to be used to retire uses in high-priority areas, it is expected that water use will be retired on approximately 7,000 acres in such areas, reducing water use by an estimated 7,000 acre feet assuming average use on the acres is approximate to the district-wide, annual average use of 12” per acre.

The population of the area directly benefitting from the project is the 9,000 residents of the district and all residents of the Republican Basin and Nebraska generally that benefit from the agricultural output and stream flow generated in the URNRD.

The URNRD considers all residents of the district stakeholders in and beneficiaries of the project.

The project also helps leverage funds paid for a federal irrigation retirement program, the U.S.D.A Conservation Reserve and Enhancement Program (CREP). Over the last 10 years, the URNRD has contributed approximately \$3 million to the program.

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.

Establishment of a water bank addresses the following issues that have statewide implications:

1. Relocation and/or retirement of water uses to balance uses with changing localized supplies: Irrigation development within the URNRD and State has occurred under a reasonable standard that residents have the right to beneficially use groundwater of the State, with much if not the majority of the development occurring before local policies were implemented to prevent levels of development that could jeopardize long term water availability. Within the URNRD, for example, most of the irrigation development that exists in the district was initiated before the URNRD even had the legal authority to limit water use. This is the case in most of the rest of Nebraska with significant irrigation development. The URNRD's use of this management authority, as is the case with other NRDs, has produced immense benefits in terms of groundwater preservation for future use. Within the URNRD, for example, groundwater modeling conducted by the USGS shortly before regulations were imposed in the late 1970's projected water level declines of up to 140 feet and average declines in the range of 60 feet would occur without limits on development or use. Due to regulations implemented by the URNRD, average declines have been approximately 25 feet and the worst declines 60-70 feet. Additionally, comparisons to declines in regions of other states with similar climates, as noted before, clearly show regulations have mitigated declines.

However, in many cases regulations have not been enough to offset impacts caused by rapid irrigation development that occurred before legal authority existed to control it. This is a difficult issue to remedy, and water banks may be the most effective tool to address it. Irrigation development can't be undone, or at least it's impractical to do so, but uses can be retired and/or transferred to prevent exacerbation of water supply problems in localized areas. Using the proposed water bank, the district will be able to retire uses in areas that unabated will contribute to significant water supply problems within a fairly short time period – roughly 30-40 years. Water rights that allow the uses to occur – in the URNRD the rights are essentially the certification status of irrigated land granted by the URNRD – may also be transferred to other areas where imminent problems do not exist. Such transfers can be managed in such a way that a problem isn't simply being relocated. They could be allowed, for instance, to areas of the district where there is a relatively low density of irrigation development and future water supplies wouldn't be hindered by limited, additional uses. In short, a water bank has the capability of easing heightened demand on localized water supplies caused by development that can't be reversed.

2. Market response to market demand: Groundwater declines and efforts to reduce stream depletions within the URNRD have in and of themselves created a demand for water transfers and retirement that prevents a purely regulatory response to the issues. This condition may not exist in

many other parts of Nebraska now, but may in the future. A water bank is a means of harnessing this demand for the mutual benefit of water users, the district and the State.

For example, it is well known within the URNRD that our IMP has as an option the shutdown of 42,445 acres of irrigation as a tool to maintain compliance with the Republican River Compact in dry years. Concern over this shutdown option is one reason there has been a desire to enroll in programs such as the USDA's Conservation Reserve and Enhancement Program (CREP) and Agricultural Water Enhancement Programs (AWEP) that targeted acres with high impacts on stream flows. The same concern is what has prompted some requests within our district to transfer water rights from river bottoms to upland areas.

Similarly, concerns over declining groundwater supplies as illustrated on page 9 of this application have led to consideration of water transfers out of such areas. Under current water usage rates, it is estimated the aquifer underlying 70,000 acres within the URNRD will not be able to provide a full irrigation supply within approximately 40 years. That amount of acres represents more than 15 percent of all irrigated acres within the district. Of those 70,000 acres, approximately 20,000 acres have a 20-30 year water supply adequate for irrigation and 50,000 acres have a useful irrigation life of 30-40 years. The remainder of the URNRD has a water supply estimated to last between 40 and 500 years without changes in pumping levels or location of pumping.

These two conditions have created a demand for water transfers and retirement that can be met by a water bank. Coupled with progressive limitations on groundwater use, transfers and retirement facilitated by a water bank create a multipronged approach to water management and conservation that will be more effective than regulations alone.

In regards to who the proposed project benefits, the State has explicitly identified in state statute (46-702) protection and conservation of groundwater as being essential to the economic prosperity and wellbeing of the State. The proposed project we believe corresponds with this statewide objective and therefore benefits all residents of Nebraska. The direct economic benefit to the whole State of preserving water in one portion of the State such as our district is sustaining tax revenues and economic outputs associated with irrigated agriculture that touch people outside our district and across Nebraska.

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.

There are no other sources of funding for the project.

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.

There are seven watersheds defined by the U.S. Environmental Protection Agency that are entirely or partially contained within the District: Arikaree; Red Willow; Stinking Water; North Fork of the Republican; South Fork of the Republican; Upper Republican; and Frenchman. All are considered impaired waters for the following reasons:

Arikaree – E. Coli

Red Willow – E. Coli, Biointegrity; Chlorophyll; Dissolved Oxygen; Phosphorus

Stinking Water – E. Coli

North Fork of the Republican – E. Coli

South Fork of the Republican – E. Coli

Upper Republican – E. Coli; Chlorophyll; Dissolved Oxygen; Nitrogen; Phosphorus; Selenium

Frenchman – E. Coli; Chlorophyll; Selenium

To the extent that reduced groundwater pumping under the proposed project can mitigate decreases in stream flow, the project could reduce impairment of the Red Willow, Upper Republican and Frenchman watersheds by increasing dissolved oxygen and dilution of phosphorus, nitrogen and selenium. Less leaching of nitrogen and phosphorus due to reduced irrigation may decrease their presence in groundwater and therefore natural discharges to streams (base flow), improving 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 project meets the following objective cited in the NeDNR September 2015 Annual Report and Plan of Work for the Nebraska State Planning and Review Process:

Republican River Basin IMPs (p. 24): The annual report states that NDNR and the NRDs in the Republican Basin including URNRD will continue to meet annually to “review the IMPs and progress made towards achieving the goals of each plan. These reviews focus on the assessment of two key compliance standards: limitations on groundwater depletions and limitations on groundwater pumping.” The proposed project will help achieve IMP goals of reduced pumping – specifically, reducing pumping over the long term and during periods of average precipitation by 20 percent compared to 1998-2002 baseline pumping volumes.

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.

Congressional approval was required for the Republican River Compact to be entered into by Nebraska, Colorado and Kansas and Congressional approval would be required to dissolve it. Therefore, it is reasonable to consider the compact a federal mandate.

It was entered into with Congressional approval in 1943 and allocates the annual, average supply of the Republican River among the three states thusly: 49 percent to Nebraska; 40 percent to Kansas; and 11 percent to Colorado. The amount of water subject to those percentages varies annually depending upon stream flows.

Before a 2002 settlement agreement between the compact states, the accounting that determined each state’s consumptive use under the compact included surface water and alluvial groundwater for irrigation, municipal and industrial uses, and evaporation from U.S. Bureau of Reclamation Reservoirs. Subsequent to the 2002 agreement approved by the U.S. Supreme Court, depletions to stream flow caused by all groundwater use including from upland

wells is included in the calculations. A groundwater model was developed to compute depletions to stream flow caused by groundwater pumping.

Annually, the State, using estimates of surface water supplies and depletions, forecasts whether action will need to be taken the following year to ensure compliance with the compact. A primary intent of the IMPs developed by the NRDs in the Republican Basin and NEDNR is to ensure compact compliance. One way it seeks to do this is by mitigating impacts on stream flow caused by establishing goals to reduce groundwater pumping. Reducing groundwater pumping is the main intent of the proposed project and, if achieved as projected, will therefore aid the federal mandate of compact compliance.

The compact by constraining uses to allocations between the states is naturally a limiting force on groundwater pumping and this has been demonstrated in many ways over the past approximately 20 years. All wells in the Lower and Middle Republican NRDs were metered because of the compact (wells in URNRD were metered because of water quantity concerns that predated compact issues); moratoriums on new irrigation development were established because of efforts to comply with the compact; and water use restrictions, or allocations, were implemented in the Lower and Middle Republican NRDs because of the compact (water quantity concerns predating compact concerns caused allocations in the URNRD). In this way, there is a direct connection between the federal mandate of compact compliance and water sustainability goals.

Section D.

PROJECT DESCRIPTION

1. Overview

In 1,000 characters or less, provide a brief description of your project including the nature and purpose of the project and objectives of the project.

The Upper Republican NRD (URNRD) wishes to harness market demand that exists for the transfer and/or retirement of groundwater irrigation uses to address problems of declining water tables and depletions to stream flow. We propose to do this by establishing a water bank that will pay landowners in high decline areas or those where pumping has significant impacts on stream flow to decertify their certified irrigated acres.

Once these certified acres, i.e. “water rights”, are held by the water bank, they can either be retained by the bank or sold to allow for the transfer of water uses to areas where doing so won’t create or exacerbate water-level declines or depletions to stream flow. The URNRD controls the certification of irrigated acres within the district and this certification is what payments will be made to landowners to decertify acres to retire water uses. Conversely, other landowners may pay to attain certification of a roughly equal number of acres that have been decertified. The proceeds from such sales will be used to retire water uses in additional high-priority where significant issues relative to groundwater declines and stream flow depletions exist. The two main objectives of the water bank will be to reduce stream depletions caused by groundwater pumping and preserving water in high-decline areas of the URNRD.

One function of the water bank will be to aggregate water supplies from willing sellers and facilitate their sale to willing buyers. However, this function of the bank will not require WSF or URNRD funds. Our analysis of the market includes knowledge of water transfers that occur because the URNRD is charged with considering such transfers for approval. This analysis indicates significant interest in particular for retiring uses with high impacts on stream flows. We believe a water bank that acts as a buyer and potential seller of water rights in addition to being a clearinghouse to facilitate transfers that meet URNRD objectives has the potential to both develop and manage the existing market in ways that will help achieve water sustainability in the district.

Payments using URNRD and WSF funds will be for new retirements of irrigation. This will be done by removing the certification status of irrigated acres that is granted by the URNRD. The certification status to irrigate, or not irrigate, is a legal control and authority of the URNRD. Because of this, decertifying irrigated

acres using WSF and URNRD funds will ensure irrigated lands are permanently retired from irrigation.

No WSF funds will be used to pay for the decertification of acres that will be transferred as certified irrigated acres to other areas of the district. Such transfers will be allowed, but only for certified acres paid for by the URNRD or individual landowners. In cases where transfers do occur, parameters established within the water bank rules and algorithm will ensure there is equal or less water use and that the transfer has positive benefits including reduced depletion to stream flow.

The water bank will establish water-rights purchase prices annually based on the market conditions and water rights will be acquired using URNRD tax revenues and funds from the WSF. The current market condition and the basis of the WSF funding request of \$10.5 million is a rate of \$2,500 per certified irrigated acre within the URNRD.

There is significant need for a multipronged approach to water management within the URNRD. The URNRD has the most widespread and severe groundwater declines within the State, with water levels, on average, 25 feet lower now than they were before irrigation development began. The average, annual rate of decline is approximately .75 feet and the most significant declines have been a total of 60-70 feet. This has occurred despite the URNRD having limited irrigation withdrawals via an allocation system across the whole district since 1979, and allocations having been reduced by approximately 40 percent since that time. The restrictions, as described in more detail in the scoring section of the grant application, have achieved significant results such as average groundwater declines being approximately 60 percent less than what was projected to occur in the late 1970's without regulations. However, the high density of irrigation within the URNRD is difficult to offset with pumping limitation and declines persist. Use of a water bank as proposed will help reduce this density through retirement of irrigation in such areas.

Most are well aware of the challenges the State and NRDs within the Republican Basin have faced over the past 15 years maintaining compliance with the Republican River Compact. The State was recently sued by the State of Kansas for noncompliance in 2005-2006 and sought approximately \$70 million. That lawsuit was subsequent to a lawsuit filed by Kansas against Nebraska in 1998 that led to a settlement agreement among the compact states of Nebraska, Kansas and Colorado approved by the U.S. Supreme Court in 2003. A key piece of the settlement agreement was an entirely new compact accounting method that included groundwater withdrawals and crop use of that water, to the extent they are modeled to impact Republican River stream flow, as part of Nebraska's use of its Republican River Compact allocation.

Since then, mitigating and offsetting stream flow depletions from groundwater pumping has been imperative to the NRDs in the Republican Basin and the State. Under the proposed project, WSF and URNRD dollars will target retirement of water uses near the Republican River and its tributaries to reduce depletions to stream flow.

Combined with progressively tightening regulations within the URNRD, a water bank such as that proposed in the grant application has the ability to improve compact compliance capabilities of the URNRD and State and stabilize groundwater levels.

2. Project Tasks and Timeline

Identify what activities will be conducted by the project. For multiyear projects please list what activities are to be completed each year.

Upon grant approval in early or mid-2017, general and daily operating policies for the water bank will be established. This will include specific criteria for acceptance into the water bank following guidelines that are explained elsewhere in this grant application. This aspect of the project will occur over an approximately three-month time period.

Upon establishment of the water bank in 2017, the water-rights purchase price of \$2,500 per certified acre will be advertised through a variety of means including the URNRD website. Water rights proposed to be purchased will be analyzed to determine whether their associated uses meet water bank criteria related to reducing stream flow depletions and stabilizing groundwater levels in areas of high declines. Water rights associated with an estimated 3,500 acres will be purchased at an estimated cost of \$8.75 million, with 60 percent paid by the WSF and 40 percent paid by the URNRD. The same process will occur in 2018 and it is estimated that water rights associated with a similar number of acres and price will be purchased by the water bank. Total project costs will be an estimated \$17.5 million, with \$10.5 million of that amount coming from WSF funds and \$7 million from the URNRD over the two-year period.

3. Partnerships

Identify the roles and responsibilities of agencies and groups involved in the proposed project regardless of whether each is an additional funding source. List any other sources of funding that have been approached for project support and that have officially turned you down. Attach the rejection letter.

N/A

4. 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.

N/A

5. Support/Opposition

Discuss both support and opposition to the project, including the group or interest each represents.

Previous retirement programs within the URNRD have demonstrated district-wide support for retiring uses with high impacts on groundwater levels and stream depletions and the same support is expected for the proposed program. There is no known opposition.