

**NEBRASKA NATURAL RESOURCES COMMISSION**

Water Sustainability Fund

Application for Funding

Section A.

**ADMINISTRATIVE**

PROJECT NAME: Soil-Moisture and Nitrate Study

*PRIMARY CONTACT INFORMATION*

Entity Name: North Platte Natural Resources District

Contact Name: John Berge, General Manager

Address: 100547 Airport Road, P O Box 280, Scottsbluff, NE 69363-0280

Phone: 308-632-2749

Email: jberge@npnrd.org

Partners / Co-sponsors, if any: Adaptive Resources, Inc.

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

Grant amount requested. \$ 24,416

Loan amount requested. \$ 0

If Loan, how many years repayment period? No loan is requested.

If Loan, supply a complete year-by-year repayment schedule.  
No loan is requested.

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

Application for Grant Funding from the Water Sustainability Fund  
Submitted to the Nebraska Natural Resources Commission

North Platte Natural Resources District

Scottsbluff, Nebraska

July 2016

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   
[Click here to enter text.](#)

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. This application does not cover such a project.

If yes what is the population served by your project? This application does not cover such a project.

If yes provide a demonstration of need. This application does not cover such a project.

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? This application has not been submitted previously.

If yes, describe the changes that have been made since the last application. This application has not been submitted previously.

No, I certify the application is a true and exact copy of the previously submitted and scored application. (Signature required) This application has not been submitted previously.

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

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? This project is anticipated to begin in Spring 2017. To date, the NPNRD has not expended any funds for this project and is not asking for cost-share for such pre-application expenses.

Attach all substantiating documentation such as invoices, cancelled checks etc. along with an itemized statement for these expenses. To date, the NPNRD has not expended any funds for this project and is not asking for cost-share for such pre-application expenses.

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 1<sup>st</sup> for which you are asking cost share assistance from this fund.

In order to begin collecting data in the 2017 irrigation season, the District will have to purchase the sensor equipment during the Winter of 2016-2017 and install the equipment in the Spring of 2017. The District anticipates expending funds totaling \$42,953, including both cash and in-kind components, prior to July 1, 2017. Costs are briefly summarized below and discussed more fully in the technical scope attached as Appendix B to the application narrative.

Projects costs to be expended prior to July 1, 2017.

| <b>Cost Item</b>                     | <b>Total (\$)</b> |
|--------------------------------------|-------------------|
| Equipment                            | 32,643.00         |
| Installation                         |                   |
| Equipment rental and consultant time | 8,050.00          |
| NRD field staff time                 | 1,760.00          |
| NRD field vehicle use                | 500.00            |
| Total cash expenditure               | \$40,693.00       |
| Total in-kind expenditure            | \$2,260.00        |
| Grand total                          | \$42,953.00       |



## 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);  
No physical construction will occur for this project.

A description of all field investigations made to substantiate the feasibility report (004.01 B) No physical construction will occur for this project.;

Maps, drawings, charts, tables, etc., used as a basis for the feasibility report (004.01 C); No physical construction will occur for this project.

A description of any necessary water and land rights and pertinent water supply and water quality information, if appropriate (004.01 D);  
No physical construction will occur for this project.

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

Required geologic investigation (004.01 E 1); No physical construction will occur for this project.

Required hydrologic data (004.01 E 2); No physical construction will occur for this project.

Design criteria for final design including, but not limited to, soil mechanics, hydraulic, hydrologic, structural, embankments and foundation criteria (004.01 E 3). No physical construction will occur for this project.

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);

For this study, the District will select five parcels within the OA management area, according to the following characteristics: soil type; irrigation method; and District telemetry. Map 5 (Appendix A) shows the potential sites from which the District will choose final study sites. The technical scope for the project, provided by Adaptive Resources, Inc.

(ARI), is attached in Appendix B. The District will work with landowners to ensure that the owners of selected sites understand the purpose of the project, the equipment and time involved, and the potential benefits to their farm operations.

A description of field or research investigations utilized to substantiate the project conception (004.02 B); The nature of the project is a five-year field investigation of soil properties and weather conditions at various locations within the overappropriated area. This study will examine the water-holding capacity of and nitrate/nitrogen migration through different soil types and couple these data with on-site weather station measurements of temperature, precipitation, wind speed, and other factors. The soil-moisture and weather-station information will allow the District to refine the field evapotranspiration (ET) assumptions built into the WWUM Model and, thus, more realistic calculations of consumptive use of groundwater on irrigated parcels. Better estimates of ET will also improve the District's understanding of runoff and recharge of irrigation water to groundwater in the sampled soils. Better information on nitrate migration will allow the District to develop additional nitrate-monitoring plans to ensure that the District continues to be protective of groundwater quality.

A description of the necessary water and/or land rights, if applicable (004.02 C); No water or land rights are necessary to conduct this study.

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). No such effects are anticipated.

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 next-best alternative to conducting the study as proposed in this application is to pay UNL, a private contractor, or a combination of both to conduct the full study on the NRD's behalf. If the District were to pay outside entities to gather the desired data for the desired timeframe, then the District would incur the actual costs of data gathering and modeling in every year of the study, unlike the arrangement ARI for this study. Moreover, the District would likely not be permitted to retain ownership rights over the data collected or the instrumentation acquired, if the outside entity mandated that data and/or instruments remain under the ownership of that entity. For example, the cost to install a single weather station (with no subsurface soil or nitrate monitoring capability) has been verbally quoted to the District by the UNL State Climate Office at approximately \$20,000, with additional yearly fees of \$2,600; UNL would retain ownership of equipment and data products, and incidental costs may also apply. Five such sites would cost the District at least \$100,000 for the equipment alone, and the data collected through this kind of arrangement would still not provide the District with the full set of information that the District seeks through this study.

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). The District will incur equipment purchase and installation costs only in year 1 of the five-year study, unless individual sensor components need to be replaced during the study as a result of damage. Total equipment purchase and installation costs will be \$42,953, including NRD in-kind labor and equipment match. The District will incur no data collection or analysis costs, because our partner, Adaptive Resources, Inc. (ARI), will provide these project components in kind and at no cost to the District (total value of at least \$13,400 per year) for the full five years of the study.
  - 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). Because this study does not involve permanent infrastructure or income-generating tasks, the benefits that will be realized are discussed here in terms of intangible benefits that both the District and participating landowners will realize. The results of this study will allow the District to spend its water-management dollars more effectively, both for quantity and quality management. Understanding the amount of recharge that can be expected through various soil types will aid the District in selecting the most favorable sites for potential recharge projects, for example. Better calculations of recharge, ET, and consumptive use on agricultural fields will refine the District's information on the actual streamflow depletions to be expected from that consumptive use, as well as the effects of District management actions to offset those depletions. In addition, the District may be able to use this information to develop new, and possibly less costly, programs to promote additional water-saving activities within the District. The nitrate-migration modeling will allow the District to target additional nitrate sampling to areas where elevated nitrates may be most likely to occur.

Targeted sampling is a more cost-effective monitoring method for the District, because sampling equipment and staff resources will be concentrated in the areas from which the most instructive data may be gathered, rather than trying to sample widely scattered areas with no clear focus. Landowners can use these data as a valuable resource to save money by lowering input costs. For example, soil-moisture information can be used to direct an irrigation system to water only where, when, and how much is necessary, thereby reducing energy costs (from well pump and pivot) and unnecessary water withdrawals. Site-specific nitrate information, along with District education, may encourage participating producers to fertilize less, or to do so more effectively for their operations, which would further reduce operational costs.

- 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). The cash-flow worksheet for this project is attached as part of Appendix C.
- 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). No primary tangible benefits are claimed for this project. Because this study does not involve permanent infrastructure or income-generating tasks, the benefits that will be realized from the project are discussed in terms of intangible benefits that both the District and participating landowners will realize.

4. Provide evidence that sufficient funds are available to complete the proposal. The District has included funds to support this study in the “Miscellaneous Studies” line item of the “Special Projects” category of the draft FY2017 budget. This draft budget, which will be passed by the District’s Board at a September budget hearing, is included in Appendix C. The District will continue to budget contingency funds for the study in subsequent fiscal years, to cover costs for, e.g., sensor replacement as they arise.

5. Provide evidence that sufficient annual revenue is available to repay the reimbursable costs and to cover OM&R (operate, maintain, and replace). Revenues projected for FY2017 are included in the “Revenues” sheet of the draft FY2017 included in Appendix C. In addition, Appendix C includes the report that the District submitted to the State Auditor’s office for FY2016, detailing the District’s financial status. The report for FY2017 has not yet been submitted to the Auditor’s office but, when completed, will contain the same essential information.

6. If a loan is involved, provide sufficient documentation to prove that the loan can be repaid during the repayment life of the proposal. No loan is requested for this project.

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

Sensor equipment will be installed in already-developed agricultural fields.

District and consultant staff will not require access to or modification of any natural landscapes to accomplish this project.

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

The North Platte NRD has statutory responsibility for groundwater quantity and quality management and for integrated management of the fully and overappropriated areas of the District. The District is the only entity in the area with specific water-management goals to reach and is the only entity with specific authorities to regulate nonpoint-source nitrate contamination, which this study will assess. Adaptive Resources, Inc., which is partnering with the District on this project, is headed by a professional agronomist and professional hydrogeologist with extensive experience in collecting and analyzing field data for monitoring projects. Together, this partnership possesses both the technical, financial, and legal capabilities needed to conduct this study and apply its results to future management actions.

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

Data gathered from this study will provide the District will additional tools in planning programs aimed at the reduction of groundwater consumptive use and the offsetting of streamflow depletions to the North Platte River, which form core components of both the Platte River Basinwide Integrated Management Plan and the joint District integrated management plan, both developed in cooperation with DNR. These plans also require that the District conduct technical analyses, using the best information available, to assess the District's progress toward meeting the goals set forth in these plans. Improving the datasets input into the District's Western Water Use Management Model will further the District's achievement of this requirement.

10. Are land rights necessary to complete your project?

YES  NO

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

No land rights are necessary to accomplish this project.

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

No land rights are necessary to accomplish this project.

If yes, provide assurance that you can hold or can acquire title to all lands not currently held.

No land rights are necessary to accomplish this project.

11. Identify how you possess all necessary authority to undertake or participate in the project. The North Platte NRD has statutory responsibility for

groundwater quantity and quality management and for integrated management of the fully and overappropriated areas. The District possesses taxing authority to generate funding for this and all other District expenditures.

12. Identify the probable environmental and ecological consequences that may result as the result of the project. The District will use the data gathered in this study to design additional management and monitoring programs to enhance water supplies and water quality in the area. Landowners may also use the study information to improve their operations, such as reducing fertilizer use. The eventual results of District and landowner actions will be realized as increased streamflows in the North Platte River, which becomes water available for aquatic species and, further downstream, becomes flow which the endangered species managed under the Platte River Recovery Implementation Program can utilize. In addition, the water returning to the river will have improved quality over current nitrate concentrations.

## 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.

Although this project will not directly remediate drinking water contamination, the nitrate-leaching component of this study will guide the District in designing additional monitoring plans and, if needed, designating additional groundwater quality management areas.

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 District's soil-moisture study will provide more accurate data on crop evapotranspiration and recharge to groundwater from irrigation practices. This information will be incorporated into the District's Western Water Use Management Model, which the District uses to assess individual management actions and the overall progress toward achieving the goals and objectives of the District's integrated management plan. Incorporating the best data and information available directly meets Objective 3(a) of Goals I.A.1.a., I.A.1.b., and I.A.1.c of the District's IMP, and Goal I, Objective 2, and Goal 3, Objective 2, of the Basinwide IMP. The District will also use the study results to design additional management programs to continue meeting these goals. Moreover, the nitrate-leaching component of the study will help the District to target additional water-quality monitoring areas, as part of the continued implementation of the District's groundwater management plan, that may be vulnerable to nitrate contamination.

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.

Recharge information gathered over the course of this five-year study will give the District additional guidance in planning and locating future recharge-project sites. In addition, a more accurate measurements of recharge through various soils will provide the District with a better understanding of the amount of recharge from existing management projects that eventually becomes increased streamflow in the North Platte River. This improved understanding will help the District to target water-efficiency and other management programs to the geographic areas which will generate the maximum recharge and enhanced-streamflow benefits possible.

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.

For both integrated-management and long-term sustainability purposes, the District prioritizes the conservation of groundwater resources through its management actions. The District also recognizes, however, that agriculture dominates the Panhandle economy, and groundwater use fuels that sector. As a result, the District continually encourages producers to use less water, and use water more efficiently, in their agricultural operations. This soil-moisture study will provide both the District and participating landowners with additional information that they can use to make smarter, water- and energy-saving irrigation decisions on farms. Understanding the moisture-holding characteristics of the soils on a farm field will allow a producer to anticipate better how much irrigation is needed on that field and, thus, adjust irrigation schedules to water more efficiently based on that need. Implementing the results of this soil-moisture study will allow the District and producers to promote groundwater conservation and beneficial agricultural water use at the same time.

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.

No beneficial uses will be reduced via regulation as a result of this study. The District and landowners may use the results of this study, however, to develop additional incentives or methods of reducing on-farm consumptive use of water without reducing crop yields. In addition, landowners may use the study information to modify fertilization practices on their fields to be more protective of water quality.

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.

This soil-moisture study will provide a relatively inexpensive way for the District to collect crucial site-specific data on soil characteristics, cropping practices, and weather conditions. The sensor package selected for the study provide sufficient data-gathering value for

the cost, and the individual units are modular, allowing for easy installation, replacement and maintenance, if needed, over the course of the five-year study. In addition, Adaptive Resources, Inc. (ARI), the partnering consulting firm on this project, will provide a generous in-kind labor match for data collection and modeling, all of which will keep the total cost of the project low, especially after the first year. Such in-kind contributions from ARI will result in a cost savings to the District of \$13,400 per year for the five years of the study.

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.

This project does not have a direct impact on interstate-agreement obligations. The District will use the information from this study, however, to assess the effectiveness of its integrated-management actions in meeting the goals and objectives of the District's IMP and the Basinwide IMP. Both of these plans include provisions for increasing streamflows so as to remain in compliance with the Nebraska New Depletions Plan component of the Platte River Recovery Implementation Program.

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.

This project is not designed to reduce property damage or protect infrastructure.

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.

In addition to gathering soil-moisture and weather data, the District's study will also model the migration of nitrates through the soil profile into groundwater. The District will use this information to determine where additional water-quality monitoring may be needed, based on how nitrates move through the different soils sampled in the study. This additional targeted monitoring may illustrate the need for expanded or additional water-quality management areas. Moreover, the District will be able to use the results of the study to educate producers on fertilizer management strategies that will be more protective of the District's groundwater quality

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 District will provide both cash (\$16,277) and in-kind labor (valued at \$2,260) matches for the execution of this project, for a total NRD match of \$18,537 in the first year of study implementation; these funds are already included in the draft FY2017 budget. The District will provide additional field staff and equipment time in subsequent years of the study, as needed for sensor equipment maintenance. In addition, the partnering consultant on this project will provide \$13,400 per year in in-kind labor matches for data gathering and modeling. The District will include additional money for continuing the study in future budgets, largely as a contingency to provide for, e.g., equipment replacement as needed.

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 North Platte Natural Resources District is one of twenty-three NRDs in the state with statutory authority to manage groundwater quantity and quality. The District and DNR jointly manage groundwater and surface water in the overappropriated area through the integrated management plan and the Basinwide integrated management plan. The District utilizes a variety of management tools to reduce groundwater consumptive use in the District and meet water-

management goals while ensuring that management activities do not harm the economic viability of the agricultural sector of the Panhandle economy.

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.

Declining streamflows and decreasing aquifer supplies are a statewide issue. The degree to which the state's economy relies on the ability to continue irrigated agriculture demands that the supplies on which that irrigation relies be conserved and managed for current and future uses. In addition, nitrate contamination of groundwater supplies is a statewide issue, with implications for public health and safety and for agricultural practices. This study will gather information aimed at addressing both water-quantity and water-quality problems relative to irrigation and fertilization practices on farm fields. The findings of this study will be published as a journal article and will thus be available to other management entities across the state who are dealing with the same concerns.

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.

If granted, the WSF dollars would match both NRD and private partner dollars to accomplish the purposes of this study. In particular, a multi-year in-kind labor commitment from a private consulting firm, as ARI will contribute during the course of the project, is exceedingly rare; matching WSF dollars for equipment purchase and installation costs will allow the District to take full advantage of this partnership to provide information that will be useful to a wider audience than just the District itself. If this application is not successfully funded, then the District will expend the additional money needed to cover the full equipment purchase and installation costs.

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.

Both water quantity and water quality contribute to the overall health of a watershed. Understanding how water and nitrates move through various soils in the District will help the District to establish better monitoring, education, and management strategies, so that streamflows in the North Platte River continue to increase, and District residents can continue to rely on safe sources of water for human consumption and other uses. Moreover, better data on the behavior of recharge and nitrates in varying soil profiles will illustrate to the District whether additional management is required to ensure that the increased baseflow appearing in the North Platte River does not carry contaminants with it.

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.

This project does not address the objectives listed in the Annual Report.

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.

This project does not have a federal mandate.

## 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 North Platte NRD seeks \$24,416 in WSF funds for the first year of a five-year investigation of soil properties and weather conditions at various locations within the overappropriated area. This study will examine the water-holding capacity of and nitrate/nitrogen migration through different soil types and gather on-site weather station measurements of temperature, precipitation, wind speed, etc. The soil-moisture and weather-station information will allow the District to refine the assumptions built into the WWUM Model, thus providing more realistic calculations of consumptive use of groundwater on irrigated parcels; better estimates of runoff and recharge of irrigation water to groundwater in the sampled soils; and more accurate modeling of groundwater returns to the North Platte River from District management actions. Better information on nitrate migration will allow the District to develop additional nitrate-monitoring plans to ensure that the District continues to be protective of groundwater quality. Landowners will also be able to use study information to tailor their irrigation practices more efficiently.

#### 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.

Winter 2016-2017: Identify study sites and obtain landowner consent; Order sensor equipment. Spring 2017: Install sensor equipment at each site. Summer 2017: Begin data collection. Fall 2017: Begin modeling first season's results. Continue collecting data. Spring 2018-Fall 2022: Continue to collect data and modeling with additional data. Fall 2022: Uninstall sensor equipment and complete modeling. Spring 2023: Publish study results.

#### 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.

The North Platte NRD is partnering with Adaptive Resources, Inc. (ARI), to accomplish the soil-moisture study. ARI will provide technical services to the District during the equipment installation phase of the study. In addition, ARI will contribute in kind the time spent gathering

and modeling the data generated by the sensors installed for the study. The District counts this in-kind contribution as an additional match toward the total cost of the project, but this match is not part of the NRD's own cash match for the grant dollars requested from WSF. The technical scope of work attached in Appendix B discussed more fully ARI's role in the implementation of the study.

#### 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.

The total project cost, as discussed further in Section 3, will be \$56,353 in the first year of the five-year study. The District will incur additional costs in years 2 through 5 only if a piece of sensor equipment must be moved or replaced (e.g., because of malfunction) in a given year; if no such situation arises, then the District will pay no additional costs to complete the study. ARI will continue to contribute in-kind labor match to collect and analyze data for subsequent years of the study, which also keeps total project costs low. The District is providing cash match to order sensors, and cash and in-kind matches to install equipment. If this grant application successfully receives funding, then the District's total contribution in the first year of the study will be \$18,537, and WSF would contribute \$24,416 toward sensor purchase and installation. If this application is not funded, then the District will complete the study using only NRD project dollars to purchase and install equipment.

#### 5. Support/Opposition

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

The District has not received any specific communications of either support or opposition regarding this project.

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## APPENDICES

APPENDIX A: MAPS

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APPENDIX C: ECONOMIC ANALYSIS SUPPORTING DOCUMENTATION



# **1. INTRODUCTION**

## **1.1 Project Purpose**

This application requests a grant of \$24,416 in small-project matching funds from the Water Sustainability Fund to implement a field-scale soil-moisture and water-quality study at five locations within the North Platte River portion of the North Platte Natural Resources District's overappropriated area.

## **1.2 District Background**

The North Platte Natural Resources District (NPNRD, NRD, or District), located in the Nebraska panhandle, is comprised of Scotts Bluff, Banner, Morrill, Garden, and southern Sioux Counties (Appendix A, Map 1). The North Platte NRD is one of twenty-three NRDs in the state, whose statutory duties include groundwater quantity and quality management, flood control, and soil conservation. The District manages groundwater quantity in three specific areas, the Pumpkin Creek Basin, the overappropriated area of the North Platte River (OA), and the fully appropriated area; in addition, the District has one quality management area in the Lisco-Oshkosh-Lewellen area, along the North Platte River in Garden County (Appendix A, Map 2). The District and DNR jointly developed an integrated management plan for the fully and overappropriated areas of the District itself and, along with the other NRDs in the Platte River basin, a basinwide integrated management plan. Both plans were adopted and went into effect in 2009.

Under Chapter 6, Goals I.A.1 and I.A.2.a and the associated objectives of the current NRD integrated management plan, the District must offset a total of 8,000 acre-feet of historical groundwater depletions by 2019. In addition to its integrated-management obligations, the District must also manage groundwater quantity and quality to ensure the health, safety, and welfare of its present and future citizens. The District engages in a number of regulatory and voluntary management actions to meet these goals and responsibilities.

### **1.2.1 Water Quantity**

In order to assess the potential effects of management decisions and overall progress toward achieving the 8,000-acre-foot offset goal mentioned above, the District employs its Western Water Use Management Model (WWUM). This modeling suite, described in Section 2.3, provides guidance on integrated-management and water-quantity projects and ideas. The District continually seeks new and better data for input into these models, to ensure that the models rely on the most accurate, District-specific data available to generate results. The proposed soil-moisture study, which is the subject of this grant application and is discussed more fully in Section 2.0, will provide the District with site-specific information on the moisture infiltration and retention capacities of various soils under groundwater irrigation, in addition to

corresponding site weather data. These measurements will allow the models to calculate field-scale crop evapotranspiration (ET) to assess how much water is actually applied and consumptively used by crops, rather than relying on broad-scale assumptions about crop consumptive use that may not reflect actual conditions. Evaluating more accurately the consumptive use of crops and the recharge associated with irrigation operations in the District will, in turn, allow the District to develop new programs targeted at reducing consumptive use, using real consumptive-use values for program targets, and to evaluate the effectiveness of those programs with more condition-specific performance metrics.

### 1.2.2 Water Quality Monitoring

In addition to the water-quantity related modeling and management activities described in the foregoing sections, the District also monitors groundwater for quality concerns, principally for nitrates. The District established one water-quality management area in 1999 (Appendix A, Map 2) but is planning to expand nitrate monitoring in other areas of the District, as well. Based on the results of that additional monitoring, the District may consider designating additional quality management areas to address other locations of concern. As part of the proposed soil-moisture study, the District will also gather information that will be used to model the leaching of nitrate/nitrogen through the soil profile. The District will use the Root Zone Water Quality Model, discussed in Section 2.4, to calculate the amount of nitrate/nitrogen escaping crop root zones under field-specific conditions. Such information will help the District to target additional water-quality monitoring to areas with similar characteristics, in which excess nitrate leaching may likely be occurring.

## **2. PROJECT DESCRIPTION**

The North Platte NRD will undertake a five-year field-scale investigation of soil properties and weather conditions at various locations within the overappropriated area (Appendix A, Map 3) of the District. This study will examine the water-holding capacity of and nitrate/nitrogen migration through different soil types and couple these data with on-site weather station measurements of temperature, precipitation, wind speed, and other factors. The soil-moisture and weather-station information will allow the District to refine the assumptions built into the WWUM Model. Specifically, more accurate location-specific measurements will allow the District to derive better estimates of field ET and, thus, more realistic calculations of consumptive use of groundwater on irrigated parcels. Better estimates of ET will also improve the District's understanding of runoff and recharge of irrigation water to groundwater in the sampled soils, which will allow the District to model more accurately (1) the return of saved groundwater to the North Platte River from District management actions and (2) the rate of nitrate migration into shallow groundwater. Better information on nitrate migration will allow the District to develop additional nitrate-monitoring plans to ensure that the District continues to be protective of groundwater quality.

The study will also provide participating landowners with field-specific soil-moisture and nitrate-leaching information, which landowners will be able to use to tailor their irrigation and fertilization practices for greater efficiency. Results of this study will be published as a journal article and will, thus, also be available to a wider audience in the state and in the water-management field.

### **2.1 Site Selection**

For this study, the District will select five parcels within the OA management area, according to the following characteristics:

- Soil type: Each site selected will have a different soil type. Map 4 (Appendix A) shows aggregated soil types mapped throughout the District, from which representatives will be chosen.
- Irrigation: Each site will be irrigated only with groundwater, using a pivot-sprinkler system.
- Telemetry: Each site will be equipped with a District telemetry unit, which records water-well flowmeter readings in real time.

Map 5 (Appendix A) shows all of the the potential sites from which the District will choose final study sites. The technical scope for the project, provided by Adaptive Resources, Inc. (ARI), is attached in Appendix B.

The District will work with landowners to ensure that the owners of selected sites understand the purpose of the project, the equipment and time involved, and the potential benefits to their farm operations.

## **2.2 Project Data Acquisition and Use**

The sensor package selected for this study (see Appendix B for specifications) is well-suited to the scale and circumstances of the study. The sensors are relatively inexpensive, modular, and easy to install. Because of this, the District can easily replace a sensor, should a component become damaged or malfunction during the course of the study.

The District, in cooperation with ARI, will download data from the installed sensors monthly. ARI will perform the modeling tasks associated with the project and provide reports of the results to the District. The weather and soil-moisture measurements collected will be used to calculate crop ET and recharge rates for the specific conditions at the field site. These data will be incorporated into the Western Water Use Management Model (see Section 2.3 below) during subsequent model updates. This update will allow the District to use the data from this study, along with the other datasets in the model, as a planning tool for making integrated-management decisions and tracking the success with which the District is meeting its 8,000-acre-foot depletion obligations under the integrated management plan.

Electrical conductance and soil-moisture data will also be modeled through the Root Zone Water Quality Model (see Section 2.4 below). ARI will use this model specifically to examine the movement of nitrate-nitrogen through the root zone and deeper soil profile. Results from this model will give the District a more informed idea of how nitrates migrate to the water table, given the conditions present at each field site. The District can then extrapolate these conditions to other similar areas in the District and design targeted water-quality monitoring studies to determine whether additional nitrate management may be needed in such areas.

In addition to the modeling and future monitoring outcomes, ARI and District staff intend to publish the results of this five-year study as a journal article. Feedback received on that publication may inform the design of future similar studies and will provide additional information that may be incorporated into District monitoring plans. Along with real-time flowmeter telemetry data, the District will also make the data gathered from the study-site sensors available to site-hosting landowners through the District's forthcoming agriculture application (or ag app) for use in improving farm operations.

## **2.3 Western Water Use Management Model**

The Western Water Use Management (WWUM) Modeling effort provides the NPNRD, South Platte NRD, and Nebraska Department of Natural Resources (NDNR) with a set of crop consumptive-use, groundwater, and surface water modeling tools to aid in management of river, stream, and aquifer systems within the model area. As a starting point, the WWUM effort also incorporated previous modeling completed under the Cooperative Hydrology Study (COHYST), covering a similar area to the WWUM Model area. The collective WWUM Model consists of three major components: (1) a regionalized soil-water balance (RSWB) or watershed model, which includes CropSim; (2) a surface water operations (SWO) model for the North Platte NRD,

coupled with two surface-water balance (SWB) models, one each for the South Platte NRD and North Platte NRD, respectively; and (3) a groundwater flow (GW) model.

### 2.3.1 CropSim/Watershed Model

The CropSim and RSWB models provide the surface water and groundwater models with spatial and temporal estimates of evapotranspiration for crops and native grass (or pasture) for each modeled soil type, which is used to create the surface water and/or groundwater demand required to meet crop water needs. The RSWB model also estimates the overland runoff that would occur from irrigation, as a comparison for the SWO model, and provides the GW model with deep percolation (groundwater recharge) from precipitation and irrigation inefficiency.

### 2.3.2 Surface Water Models

Two SWB models have been completed: (1) for the Western Irrigation District area along the South Platte River, to provide the commingled pumping and canal recharge along the canal for the GW Model; and (2) a more extensive SWB model of the area along the North Platte River, used for organizing data, preprocessing, and constraining the SWO model. The SWO and SWB models provide the GW model with the amount and timing of field recharge, commingled pumping, and canal recharge from the delivery to and irrigation of lands watered with surface water. The SWO model can be used as a planning tool to determine the viability of management options and to show, at a broad level, how water-management decisions may affect the administration of surface water rights.

### 2.3.3 Groundwater Model

The GW model was created to provide the NPNRD, the SPNRD, and NDNR with a tool to determine depletion obligations and analyze the effectiveness of strategies to mitigate those depletions. In addition, the respective NRDs conduct individual management analyses to examine the effects of District activities, such as transfers of ground water certified irrigated lands, retirements of certified irrigated lands, and recharge project accretions.

### 2.3.4 Datasets

Extensive datasets, including land use, crop type, metered pumping, geology, hydrology, and climate, comprise the library of information on which each of the abovementioned models relies. These datasets are regularly updated, so that the management decisions made using modeling results incorporate the best data currently available. In addition, the WWUM partners continually seek to refine the assumptions built into the model and, where possible, replace calculated inputs with actual measurements, so as to represent more accurately the conditions in the model area.

In the models, ET and metered pumping data are used to calculate the amount of applied irrigation water that is not used by a crop, but that instead either runs off a field or percolates down past the root zone and becomes recharge to the shallow aquifer. The North Platte NRD

will collect field-scale soil moisture, water quality, and weather data over the course of this soil-moisture study, all of which will be used to calculate better crop ET and recharge rates for the District. This information will be incorporated into the WWUM datasets, replacing current information in the models that lacks site-specific accuracy relative to District conditions.

## **2.4 Root Zone Water Quality Model**

The Root Zone Water Quality Model (RZWQM) is an integrated physical, biological, and chemical processes model that simulates plant growth and the movement of water, nutrients, and pesticides over and through the root zone in a representative area of an agricultural cropping system. Although the model principally focuses on the crop root zone, the model can be extended to simulate the movement of water and nutrients beyond the reach of crop roots.

The model allows simulation of a wide spectrum of management scenarios. Management alternatives include tillage practices; methods and timing of fertilizer and pesticide applications; irrigation technology and timing; and crop rotations. To evaluate the effect of certain long-term management practices on water quality and production, RZWQM can be run for up to 100-year scenario lengths using automated execution of certain management operations relative to crop growth stage, such as fertilizer application based on recommended formulas, irrigation scheduling, and harvesting

The core of the RZWQM consists of six scientific subsystems or processes:

(1) Physical – includes number of interrelated hydrologic processes, such as rain or irrigation water infiltration through soil matrix and macropores; chemical transport during infiltration; redistribution of soil water and chemicals after infiltration; plant water uptake and evaporation; and heat transport and soil temperature changes during infiltration, redistribution, and snow accumulation and melt.

(2) Soil chemical – simulates soil inorganic chemical environment relative to nutrient processes, chemical transport, and pesticide processes.

(3) Nutrient – simulates carbon and nitrogen transformations within the soil profile, given initial levels of such components as soil humus, manure, crop residues, soil microbial populations, nitrate, and ammonium concentrations.

(4) Pesticide – includes degradation and washoff of pesticides applied to plant surfaces, crop residue surfaces, the soil surface, and within each soil layer;

(5) Plant growth – includes population development, plant growth, and environmental fitness components.

(6) Management – includes management activities which influence the state of the system, such as tillage; fertilizer, pesticide, and manure applications; and cropping systems and irrigation.

### **3. ECONOMIC ANALYSIS**

This section provides information on the costs of the proposed study to the District, in terms of equipment and time, as well as District and partner matching dollars. In addition, this section discusses the potential benefits to the District and to participating landowners.

#### **3.1 Project Costs**

The technical scope from ARI, found in Appendix B, includes cost estimates for the equipment acquisition, installation, and data-handling components for the first year of project implementation. Table 1 below generally summarizes these costs, along with the NRD’s projected costs associated with the project, and the anticipated funding source for each category of costs. The highlighted items show the portions of the project for which the District is seeking Water Sustainability Fund (WSF) dollars.

**Table 1.** Costs of soil-moisture study implementation and funding source.

| Cost Item                            | Total (\$) | Funding Source                                   |
|--------------------------------------|------------|--|
| Equipment                            | 32,643.00  | NRD 40% (\$13,057.00) +<br>WSF 60% (\$19,586.00) |
| Installation                         |            |  |
| Equipment rental and consultant time | 8,050.00   | NRD 40% (\$3,220.00) +<br>WSF 60% (\$4,830.00)   |
| NRD field staff time                 | 1,760.00   | NRD 100% (in-kind)                               |
| NRD field vehicle use                | 500.00     | NRD 100% (in-kind)                               |
| Data acquisition                     | \$4,400.00 | Consultant 100% (in-kind)                        |
| Data compilation and modeling        | \$9,000.00 | Consultant 100% (in-kind)                        |
| Total cash requirement               |            | \$40,693.00                                      |
| WSF (60%)                            |            | \$24,416.00                                      |
| NRD (40%)                            |            | \$16,277.00                                      |
| Total in-kind requirement            |            | \$15,660.00                                      |
| Total project cost                   |            | \$56,353.00                                      |

#### 3.1.1 Project Cost Contributions, Year One

The District anticipates three main funding streams for the first year of soil-moisture study, which are summarized as follows:



|                                  |                    |
|----------------------------------|--------------------|
| NRD cash match:                  | \$16,277.00        |
| NRD in-kind contribution:        | \$2,260.00         |
| Consultant in-kind contribution: | \$13,400.00        |
| WSF grant dollars:               | <u>\$24,416.00</u> |
| Total project cost:              | \$56,353.00        |

Note that the District funding stream includes both a cash match toward equipment purchase and installation and an in-kind match of staff time and field equipment use for installation, but the District does not consider its in-kind contribution to be part of the required 40% match for the requested grant funding. In addition, the portion of the project costs for which the District seeks funds from the WSF includes only equipment acquisition and initial installation cost categories for year one of the five-year study.

The District has included year one of this soil-moisture study in its draft FY2017 budget, as one of the projects to be funded under the “Miscellaneous Studies” line item of the “Special Projects” budget expenditures category (Appendix C). Future budgets will continue to include this line item, and the District will allocate sufficient additional funding to cover any contingency costs that may arise during the remaining years of this study.

### 3.1.2 Continued Project Costs, Years Two through Five

Because this study will comprise a total of five years, the District may incur some additional costs beyond those discussed above. If one of the sensors becomes damaged while deployed, for example, then the District will purchase a new piece of equipment to replace the damaged one. Although the District prefers to leave all sensors in place continuously for the full five years, District staff time and vehicle use may be needed to remove and redeploy sensors, if participating landowners request sensor removal for, e.g., harvest or tilling. Data collection and modeling, for which ARI is providing an in-kind contribution in year one, will continue to be handled in kind, and no additional costs will arise from these categories. This partnership arrangement will result in a cost savings to the District of \$13,400 per year for the five years of the study.

The District will pay any continued costs that may arise situationally under its “Special Projects” budget item in subsequent fiscal years and does not anticipate seeking additional outside funding for the continuation of this study through the full five years.

## **3.2 Project Benefits to District and Landowners**

Because this study does not involve permanent infrastructure or income-generating tasks, the benefits that will be realized from the project are discussed here in terms of intangible benefits that both the District and participating landowners will realize.



### 3.2.1 Benefits to District

The results of this study will provide information that will allow the District to spend its water-management dollars more effectively, both for quantity and quality management. Understanding the amount of recharge that can be expected through various soil types will aid the District in selecting the most favorable sites for potential recharge projects. Better calculations of recharge, ET, and consumptive use on agricultural fields will refine the District's information on the actual streamflow depletions that result from that consumptive use, as well as the effects of District management actions to offset those depletions. Such information will enable the District to deploy its quantity-management dollars to areas and circumstances in which they will be most useful for achieving integrated-management goals. In addition, the District may be able to use this information to develop new, and less costly, programs to promote additional water-saving activities within the District.

The nitrate-migration modeling will allow the District to target additional nitrate sampling to areas where elevated nitrates may be most likely to occur, based on those areas' similarity to sample sites in the soil-moisture study. Targeted sampling is a more cost-effective monitoring method for the District, because sampling equipment and staff resources will be concentrated in the areas from which the most instructive data may be gathered, rather than trying to sample widely scattered areas with no clear indication of where the District should focus. In addition, in areas with soils that readily leach nitrate, the District can focus additional educational attention to encourage producers to modify their fertilization practices to be more protective of water quality.

Thus, these other practical applications of the proposed soil-moisture study, in addition to modeling dataset improvements, will allow the District to leverage its tax and external funds more effectively to meet integrated-management obligations and water-quality goals. Though the District has not quantified the magnitude of these advantages, in terms of the effects on future budgets and tax levies, the District considers that these benefits are no less important than the data-gathering components of the study.

### 3.2.2 Benefits to Landowners

Data collected from the soil-moisture study will be made available to the landowners who agree to host monitoring sites for the study. The District will add these data to the suite of parcel-specific information that will be available to landowners through the District's ag app, which the District will begin developing in Fall 2016. Information on ET, recharge rates, and nitrate migration will be a valuable resource for landowners who want to save money by lowering input costs. For example, updated soil-moisture information can be input into a variable-rate irrigation prescription, which directs an irrigation system to water only where, when, and how much is necessary, thereby reducing energy costs (from well pump and pivot) and unnecessary water withdrawals. Site-specific nitrate information, along with District education, may encourage participating producers to fertilize less, or to do so more effectively for their operations, which would further reduce operational costs.

## **4. FUND GOALS AND EVALUATION CRITERIA**

### **4.1 Water Sustainability Fund goals**

The North Platte NRD's soil-moisture study project meets Water Sustainability fund goals 1, 2, 3, 6, and 7, as listed in 261 *Nebraska Admin. Code* 1.001.01. Specifically,

1. Studying soil moisture under a variety of field conditions will give the District a more accurate, realistic picture of how water moves through the soil profile and percolates down to become aquifer recharge. This improved information, when incorporated into the District's Western Water Use Management Model, will allow the District to make better and more effective water-management decisions based on a better understanding of the benefits that will accrue from changing irrigation practices on a field with a particular set of characteristics, for example. In addition, the District will be able to tailor future water-management incentive programs to physical areas that will yield the most benefit to the aquifer and, by extension, to the North Platte River. Finally, the District will also gain insight into the surficial field characteristics that will more likely promote the success of future aquifer recharge projects. All of these outcomes will benefit the District in reaching its integrated management plan goals and in protecting the District's groundwater resources. (Goal 1)
2. In addition to the water-quantity and integrated-management advantages discussed above, this soil-moisture study will provide data on the migration of nitrates through the soil profile and into shallow groundwater sources. The District will use the Root Zone Water Quality Model to assess the leaching of applied nitrate-nitrogen beyond crop root zones under a variety of field conditions. The District will use this information to develop targeted nitrate monitoring plans in additional areas of the District in which elevated nitrates could be occurring, based on the study findings. The results of such additional targeted monitoring will aid the District in determining whether to designate additional groundwater quality management areas. (Goal 2)
3. The District manages both groundwater quantity and quality through its Groundwater Management Plan, and the District also manages water uses in the overappropriated area and the Pumpkin Creek Basin area to meet the goals and objectives of the integrated management plan and the Overappropriated Basinwide Integrated Management Plan. The data derived from the soil-moisture study will assist the District in better understanding how much streamflow accrues to the North Platte River from the District's management actions by improving the datasets used to model the effects of District depletion-offset actions. In addition, the District will be able to design more effective management programs and projects, using the study data, so that the greatest benefits to the aquifer and to streamflow will result. (Goal 3)
4. The District's soil-moisture study will inform both quantity and quality management and will provide participating agricultural producers with additional information to improve

water use and nitrate management. Water quantity analyses, using the study data, will allow the District to develop programs that better conserve groundwater resources, and producers will gain valuable information to assist them in developing more efficient irrigation scheduling, based on the moisture-holding capabilities of the soils on their fields. Water quality analyses will give producers an additional tool for effectively managing nitrates on their fields, thereby increasing the overall sustainability of their agricultural operations by reducing potential nitrate contamination. (Goal 4)

5. Not only will the District see water-quantity and water-quality benefits from application of the data gathered during the soil-moisture study, but the landowners who agree to host study equipment on their farms will also be able to access the information gathered during the study. In conjunction with the District's telemetry units installed on irrigation well flowmeters, which helps landowners track their well pumping in real time, the weather station and soil-moisture data from this study will allow landowners to tailor their irrigation schedules to the specific needs of their fields and crops. For example, the soil data can be incorporated into a variable-rate irrigation prescription, which would adjust watering according to the soil characteristics in particular parts of a field. In addition, producers can use the nitrate-leaching modeling results from this study to rethink their current fertilizer application strategy and adopt better management practices to reduce nitrate contamination of groundwater. (Goal 6)
6. The sensor equipment selected for this study provides the most cost-effective method for obtaining the data the District needs. The chosen sensors are neither the most nor the least expensive on the market, and they are designed to be modular and quick to install. Thus, if one sensor experiences a problem during the course of the five-year study, then the District can replace the problem part easily and relatively inexpensively, without losing an entire site or suite of equipment. The District and Adaptive Resources, Inc., with whom the District is partnering to conduct the study, will both provide in-kind labor to install equipment and work with the data, which further keeps the total project costs low. The value of ARI's in-kind contribution will be \$13,400 per year for the five years of the study. All project costs discussed in this application will be incurred in the first year of the study; except in the case of equipment replacement, the remaining four years will all be covered by consultant in-kind labor match and will cost the District no additional monies. (Goal 7)

The District's soil-moisture study project best fits into category 1 (research, data and modeling), described in 261 *Nebraska Admin. Code* 1.001.02.

#### **4.2 Evaluation criteria (261 NAC 3.001.01)**

This soil-moisture study ranks competitively under the Commission's application ranking criteria, as the following discussion shows.

1. The District's soil-moisture study will provide more accurate data on crop evapotranspiration and recharge to groundwater from irrigation practices. This information will be incorporated into the District's WWUM Model, which the District uses to assess individual management actions and the overall progress toward achieving the goals and objectives of the District's integrated management plan. Incorporating the best data and information available directly meets Objective 3(a) of Goals I.A.1.a., I.A.1.b., and I.A.1.c of the District's IMP, and Goal I, Objective 2, and Goal 3, Objective 2, of the Basinwide IMP. The District will also use the study results to design additional management programs to continue meeting these goals. Moreover, the nitrate-leaching component of the study will help the District to target additional water-quality monitoring areas, as part of the continued implementation of the District's groundwater management plan, that may be vulnerable to nitrate contamination. (Criteria list 1, Item 2)
2. Recharge information gathered over the course of this five-year study will give the District additional guidance in planning and locating future recharge-project sites. In addition, a more accurate measurements of recharge through various soils will provide the District with a better understanding of the amount of recharge from management projects that eventually becomes increased streamflow in the North Platte River. This improved understanding will help the District to target water-efficiency and other management programs to the geographic areas which will generate the maximum recharge and enhanced-streamflow benefits possible. (Criteria list 1, Item 3)
3. For both integrated-management and long-term sustainability purposes, the District prioritizes the conservation of groundwater resources through its management actions. The District also recognizes, however, that agriculture dominates the Panhandle economy, and groundwater use fuels that sector. As a result, the District continually encourages producers to use less water, and use water more efficiently, in their agricultural operations. This soil-moisture study will provide both the District and participating landowners with additional information that they can use to make smarter, water- and energy-saving irrigation decisions on farms. Understanding the moisture-holding characteristics of the soils on a farm field will allow a producer to anticipate better how much irrigation is needed on that field and, thus, adjust irrigation schedules to water more efficiently based on that need. Implementing the results of this soil-moisture study will allow the District and producers to promote groundwater conservation and beneficial agricultural water use at the same time. (Criteria list 1, Item 4)
4. This soil-moisture study will provide a relatively inexpensive way for the District to collect crucial site-specific data on soil characteristics, cropping practices, and weather conditions. The sensor package selected for the study provide sufficient data-gathering value for the cost, and the individual units are modular, allowing for easy installation, replacement and maintenance, if needed, over the course of the five-year study. In addition, Adaptive Resources, Inc., the partnering consulting firm on this project, will provide a generous in-kind labor match for data collection and modeling, all of which

will keep the total cost of the project low, especially after the first year. Such in-kind contributions from ARI will result in a cost savings to the District of \$13,400 per year for the five years of the study. (Criteria list 1, Item 6)

5. In addition to gathering soil-moisture and weather data, the District's study will also model the migration of nitrates through the soil profile into groundwater. The District will use this information to determine where additional water-quality monitoring may be needed, based on how nitrates move through the different soils sampled in the study. This additional targeted monitoring may illustrate the need for expanded or additional water-quality management areas. Moreover, the District will be able to use the results of the study to educate producers on fertilizer management strategies that will be more protective of the District's groundwater quality. (Criteria list 2, Item 1)
6. The District will provide both cash (\$16,277) and in-kind labor (valued at \$2,260) matches for the execution of this project, for a total NRD match of \$18,537 in the first year of study implementation; these funds are already included in the draft FY2017 budget. The District will provide additional field staff and equipment time in subsequent years of the study, as needed for sensor equipment maintenance. In addition, the partnering consultant on this project will provide \$13,400 per year in in-kind labor matches for data gathering and modeling. The District will include additional money for continuing the study in future budgets, largely as a contingency to provide for, e.g., equipment replacement as needed. (Criteria list 2, Item 2)
7. The North Platte Natural Resources District is one of twenty-three NRDs in the state with statutory authority to manage groundwater quantity and quality. The District and DNR jointly manage groundwater and surface water in the overappropriated area through the integrated management plan and the basinwide integrated management plan. The District utilizes a variety of management tools to reduce groundwater consumptive use in the District and meet water-management goals while ensuring that management activities do not harm the economic viability of the agricultural sector of the Panhandle economy. (Criteria list 2, Item 3)
8. Declining streamflows and decreasing aquifer supplies are a statewide issue. The degree to which the state's economy relies on the ability to continue irrigated agriculture demands that the supplies on which that irrigation relies be conserved and managed for current and future uses. In addition, nitrate contamination of groundwater supplies is a statewide issue, with implications for public health and safety and for agricultural practices. This study will gather information aimed at addressing both water-quantity and water-quality problems relative to irrigation and fertilization on farm fields. The findings of this study will be published as a journal article and will thus be available to other management entities across the state who are dealing with the same concerns. (Criteria list 2, Item 4)
9. If granted, the WSF dollars would match both NRD and private partner dollars to accomplish the purposes of this study. In particular, a multi-year in-kind labor

commitment from a private consulting firm, as ARI will contribute during the course of the project, is exceedingly rare; matching WSF dollars for equipment purchase and installation costs will allow the District to take full advantage of this partnership to provide information that will be useful to a wider audience than just the District itself. (Criteria list 2, Item 5)

10. Both water quantity and water quality contribute to the overall health of a watershed. Understanding how water and nitrates move through various soils in the District will help the District to establish better monitoring, education, and management strategies, so that streamflows in the North Platte River continue to increase, and District residents can continue to rely on safe sources of water for human consumption and other uses. Moreover, better data on the behavior of recharge and nitrates in varying soil profiles will illustrate to the District whether additional management is required to ensure that the increased baseflow appearing in the North Platte River does not carry contaminants with it. (Criteria list 2, Item 6)

## **5. CONCLUSION**

The North Platte Natural Resources District considers that the proposed soil-moisture study discussed in this application amply meets the criteria for grant funding through the Water Sustainability Fund. This small-project request of \$24,416 will fund sensor equipment purchase and installation in the first year of the five-year project. The District will match these funds with both cash and in-kind contributions, and Adaptive Resources, Inc., as a partner on the project, will contribute an in-kind labor match, as well. The District will utilize the evapotranspiration, weather, and recharge data to refine the assumptions built into the modeling tools the District currently uses to assess management actions and track progress toward achieving the goals and objectives of the District's integrated management plan. In addition, the District will use the nitrate-leaching information from this study to target additional water-quality monitoring efforts to areas in which elevated nitrates may be likely to occur. The nitrate modeling results will also inform District determinations on whether additional water-quality management areas should be designated. The results of the study will be published as a journal article and will, thus, be available to other management authorities in the state as a reference when addressing the quantity and quality challenges facing other aquifers and watersheds of Nebraska.

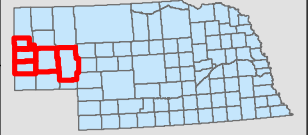
# **APPENDIX A**

## **MAPS**

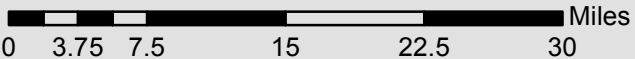


# Map 1: North Platte NRD Geography

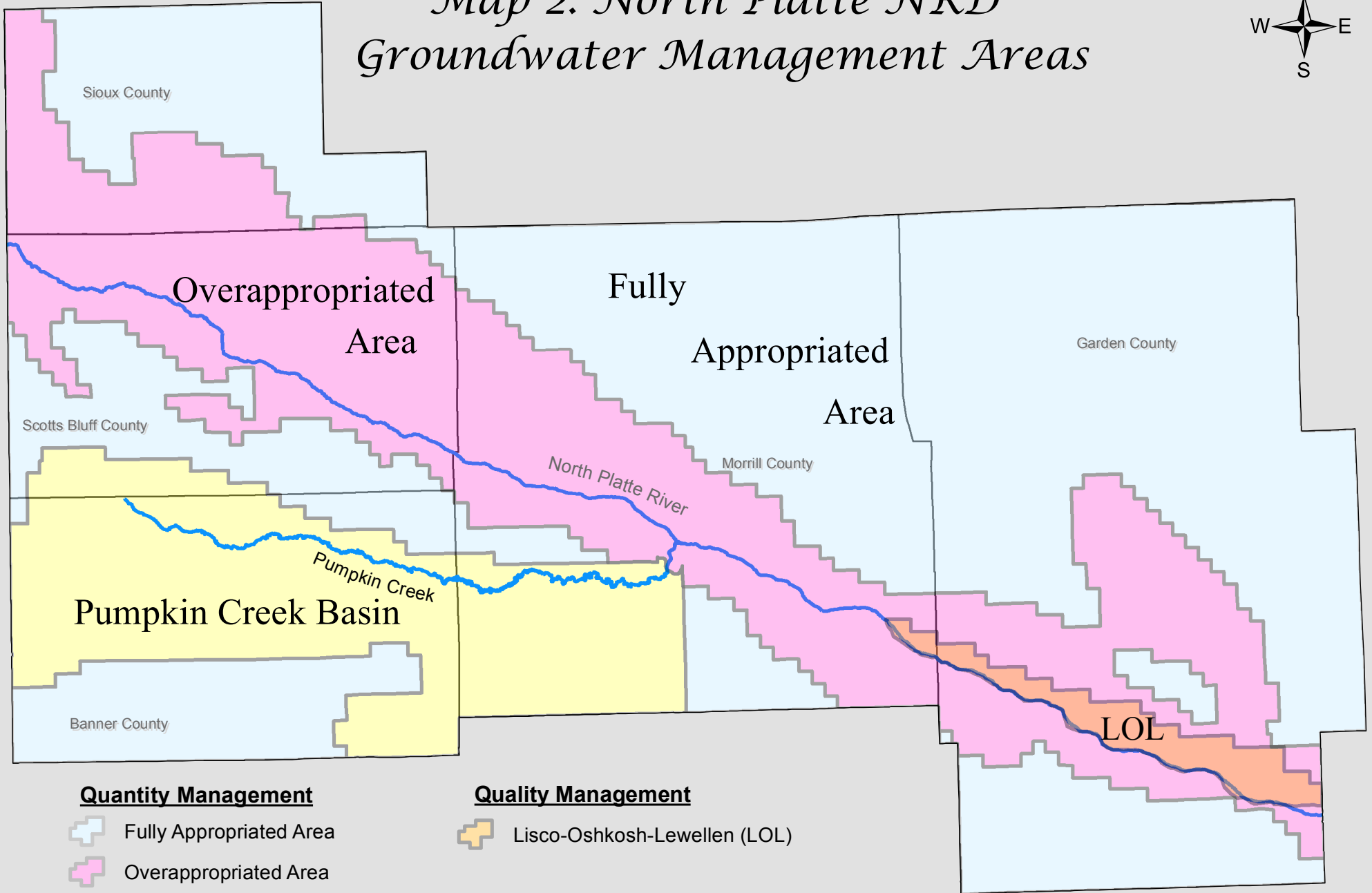
State of Nebraska



|  |          |  |               |
|--|----------|--|---------------|
|  | Cities   |  | Major Roads   |
|  | Counties |  | Major Streams |



# Map 2: North Platte NRD Groundwater Management Areas

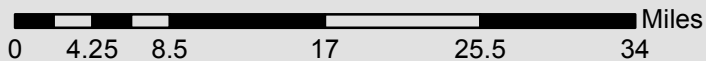


### Quantity Management

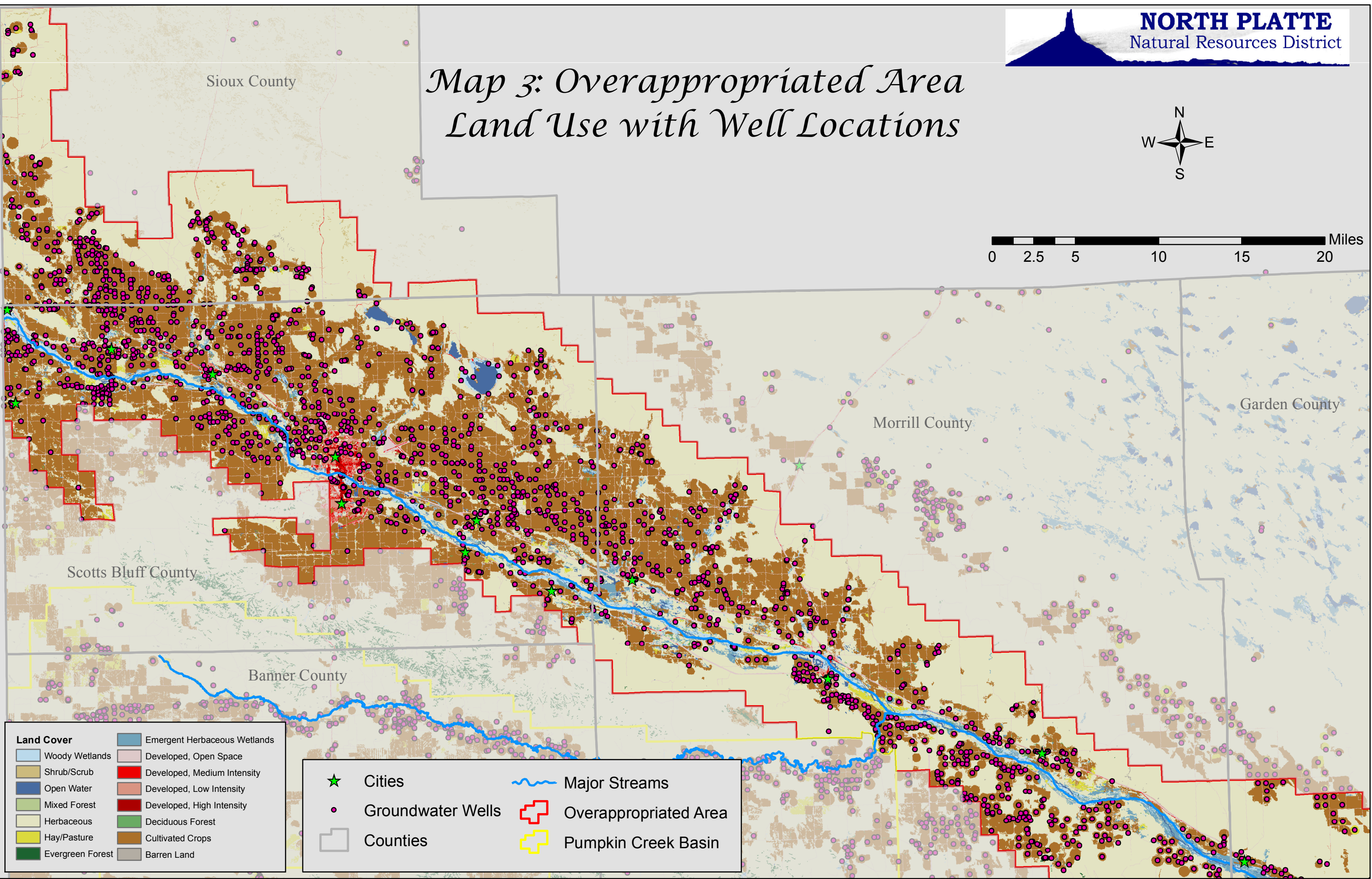
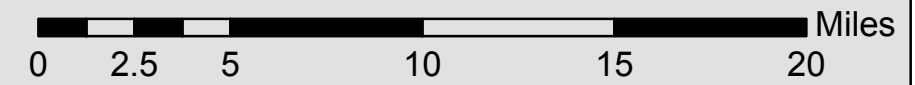
- Fully Appropriated Area
- Overappropriated Area
- Pumpkin Creek Basin

### Quality Management

- Lisico-Oshkosh-Lewellen (LOL)



*Map 3: Overappropriated Area  
Land Use with Well Locations*

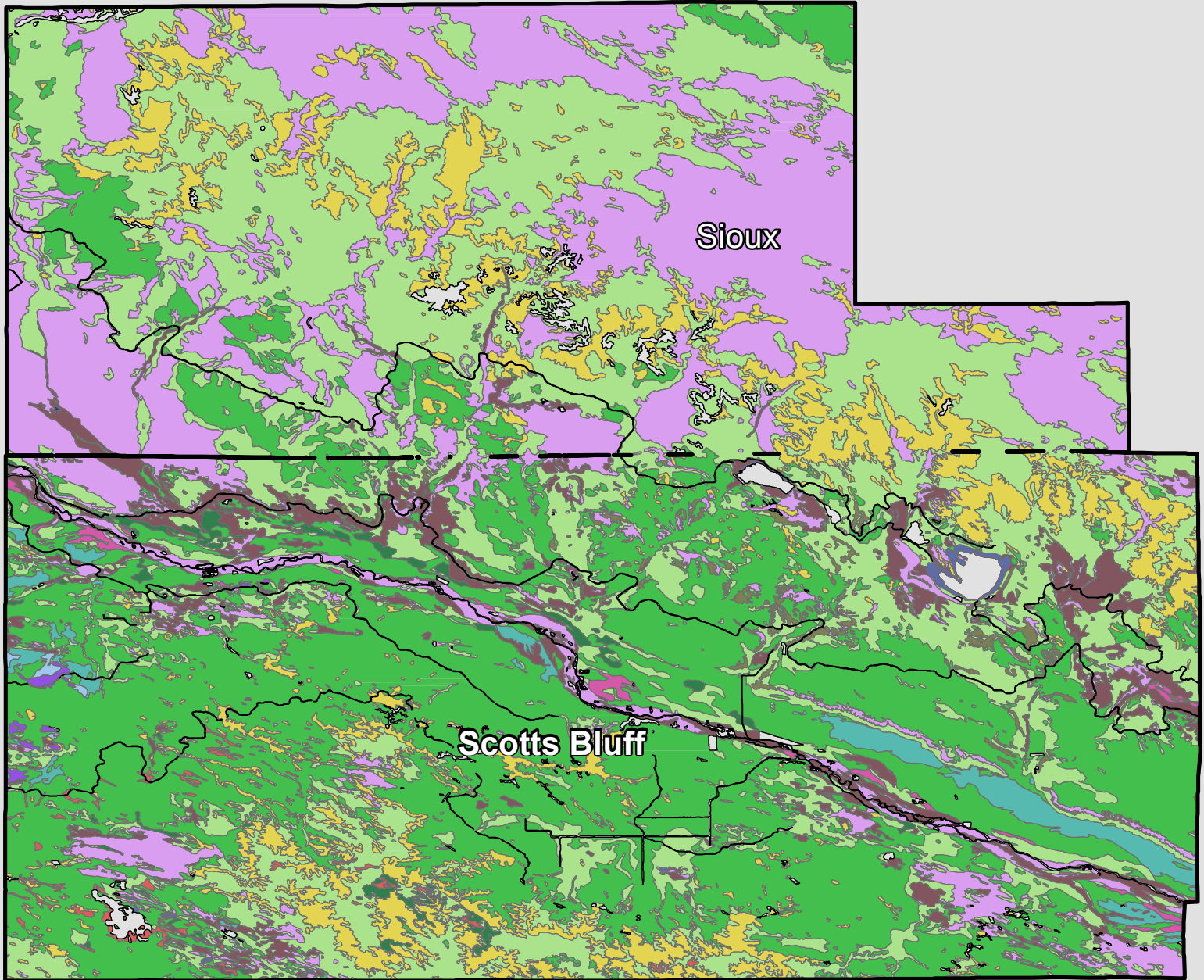


| Land Cover |                              |
|------------|------------------------------|
|            | Woody Wetlands               |
|            | Shrub/Scrub                  |
|            | Open Water                   |
|            | Mixed Forest                 |
|            | Herbaceous                   |
|            | Hay/Pasture                  |
|            | Evergreen Forest             |
|            | Emergent Herbaceous Wetlands |
|            | Developed, Open Space        |
|            | Developed, Medium Intensity  |
|            | Developed, Low Intensity     |
|            | Developed, High Intensity    |
|            | Deciduous Forest             |
|            | Cultivated Crops             |
|            | Barren Land                  |

|  |                   |  |                       |
|--|-------------------|--|-----------------------|
|  | Cities            |  | Major Streams         |
|  | Groundwater Wells |  | Overappropriated Area |
|  | Counties          |  | Pumpkin Creek Basin   |



# Map 4: Aggregated Soils Units within Northwestern Portion of NPNRD





## Soils


 No Data


 Clayey, mixed


 Coarse-loamy, mixed


 Coarse-silty, mixed

 Fine, mixed


 Fine, smectitic


 Fine-loamy, mixed


 Fine-silty, mixed


 Loamy, mixed


 Mesic Aquolls

 Mesic Fluvaquents

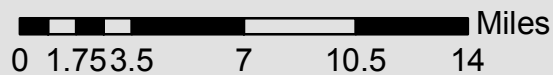
 Mixed, mesic

 Sandy, mixed

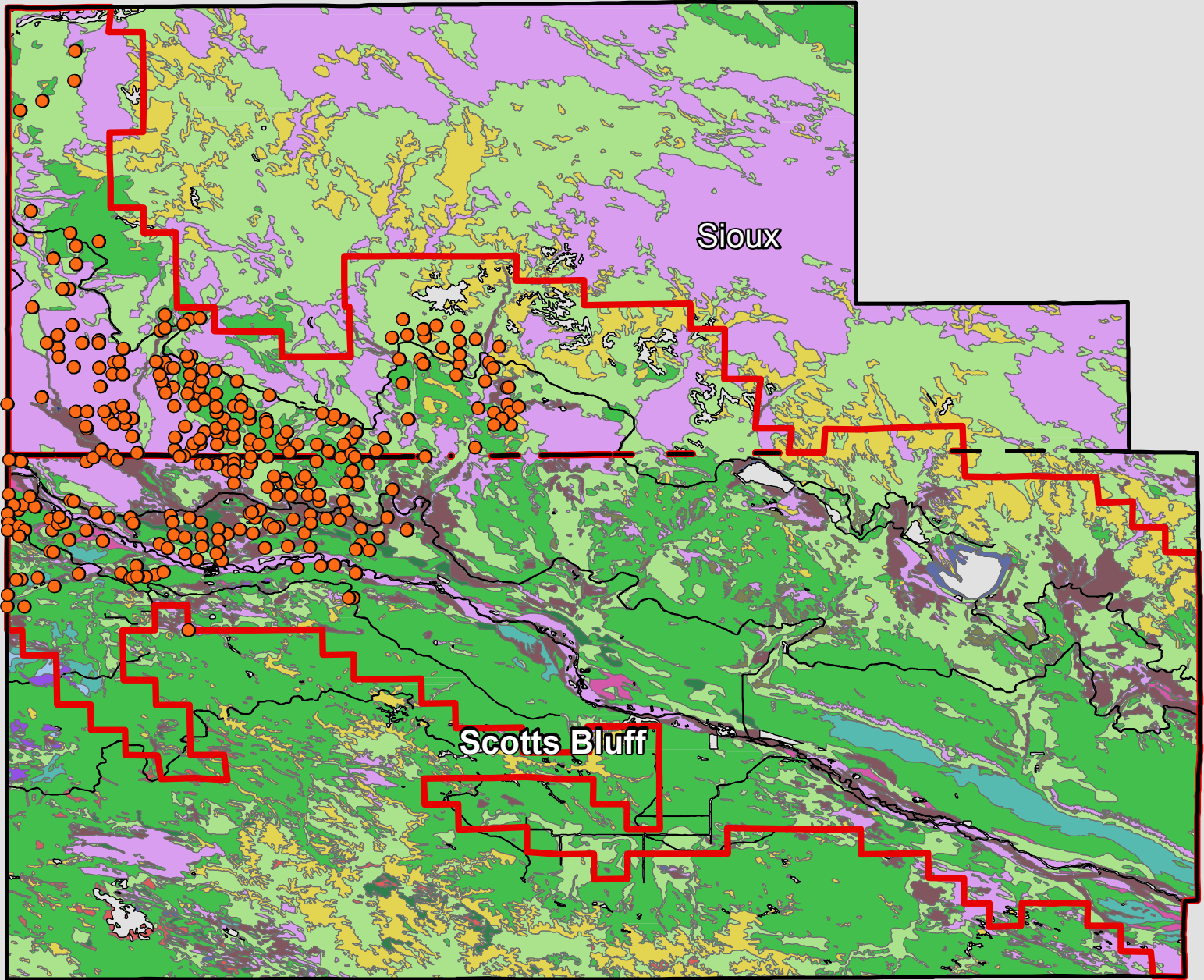
 Sandy-skeletal, mixed

 Fine-loamy over sandy or sandy-skeletal

1:380,000

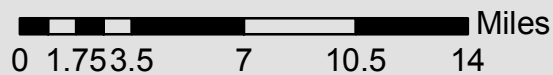


# Map 5: NPNRD Telemetry-Equipped Sites



|  |  |
|--|--|
| <span style="color: red;">●</span> Telemetry Sites   | <span style="color: green;">■</span> Fine-loamy, mixed   |
| <span style="border: 2px solid red; display: inline-block; width: 15px; height: 10px;"></span> Overappropriated Area                               | <span style="color: red;">■</span> Fine-silty, mixed   |
| <b>Soils</b>   | <span style="color: yellow;">■</span> Loamy, mixed   |
| <span style="background-color: white; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> No Data                  | <span style="color: blue;">■</span> Mesic Aquolls  |
| <span style="background-color: purple; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Clayey, mixed           | <span style="color: darkblue;">■</span> Mesic Fluvaquents  |
| <span style="background-color: lightgreen; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Coarse-loamy, mixed | <span style="background-color: lightpurple; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Mixed, mesic                     |
| <span style="background-color: green; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Coarse-silty, mixed      | <span style="background-color: brown; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Sandy, mixed                           |
| <span style="background-color: teal; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Fine, mixed               | <span style="background-color: olive; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Sandy-skeletal, mixed                  |
| <span style="background-color: lightblue; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Fine, smectitic      | <span style="background-color: pink; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Fine-loamy over sandy or sandy-skeletal |

1:380,000



**APPENDIX B**

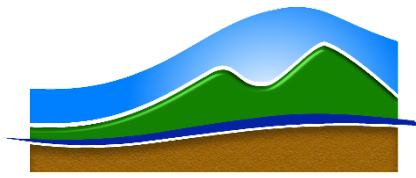
**ADAPTIVE RESOURCES, INC.**

**PROJECT SCOPE**

**AND**

**SENSOR SPECIFICATIONS**





# ADAPTIVE RESOURCES

INC  
WATER • GEOLOGY • MAPPING

April 1, 2016

Tracy Zayac, Policy Advisor  
North Platte NRD  
P.O. Box 280  
Scottsbluff, NE 69363

RE: Soil Moisture Monitoring Scope of Services

Dear Tracy:

The staff at Adaptive Resources, Inc. (ARI) is pleased to provide a scope of services to North Platte Natural Resources District (NPNRD) for Soil Moisture Modeling. It is our understanding that NPNRD is interested in furthering the understanding of the Wester Water Use Management Modeling (WWUM) and to improve upon water quality monitoring in the district by gathering more detailed soils data. To gather this data, we would be proposing a detailed soil moisture recording system that would allow tracking of soil moisture quantities at various depths in the profile. The system would be installed in sprinkler irrigated ground water only parcels that have a daily recording flow meter. The system would also include a rain gauge at the site of the sensors to not only collect rainfall events but also collect irrigation events.

This analysis will be completed under paragraph 2.(k) of the Consulting Services Agreement with NPNRD dated April 24, 2012 related to additional services outside the duties described under paragraph 2. However, this study will be a cooperative effort with the NRD, so discounted rates will be applied as detailed below.

## *Scope of Project*

As mentioned above the overall goal of the project is to provide NPNRD with additional information for soil moisture and water quality data for refinement of the WWUM. The modeling will include the following parameters:

- A selection of 5 ground water only sprinkler irrigated parcels that could be secured from cooperation with producers for the location of study throughout the NRD area. These should be of a single crop type or at least ½ of the pivot should be on one crop type for sensor replication.
- Each of the 5 sites will include three soil moisture monitoring stations. These stations will include a data logger, 2 soil moisture only sensors, 2 soil moisture / electrical conductivity sensors, and a rain gauge.
- In addition, one of the stations at each of the 5 sites will be a full weather station that will measure all the above points as well as enough information to calculate Evapotranspiration values as well.

*Equipment List – Total Cost for 5 Sites = \$32,643*

| Equipment Type                                    | Number of Units | Cost / Unit | Total              |
|---|-----------------|-------------|--------------------|
| Spectrum WatchDog 2900ET Weather Station          | 5               | \$1,895.00  | \$9,475.00         |
| Spectrum WatchDog 2800 Weather Station            | 10              | \$895.00    | \$8,950.00         |
| Spectrum WatchDog tipping bucket rain gauge       | 10              | \$169.00    | \$1,690.00         |
| Spectrum WaterScout SM 100 Soil Moisture Sensor   | 30              | \$89.00     | \$2,670.00         |
| Spectrum WaterScout SMEC 300 Soil Moisture Sensor | 30              | \$229.00    | \$6,870.00         |
| Spectrum Weather Station Mount                    | 5               | \$89.00     | \$445.00           |
| Spectrum WaterScout Calibration Device            | 1               | \$69.00     | \$69.00            |
| Spectrum FieldScout Soil Sensor Reader            | 1               | \$279.00    | \$279.00           |
| SpecWare 9 Pro Software                           | 1               | \$195.00    | \$195.00           |
| Misc. Parts <sup>1</sup>                          | 1               | \$2,000     | \$2,000.00         |
| <b>Total</b>                                      |                 |             | <b>\$32,643.00</b> |

1. Misc. Parts include, posts, protection equipment, wires, batteries, and other accessories needed.

*Installation - \$8,050*

The installation of the equipment will be accomplished by using an auger to create a hole that will be a depth of between 6 and 8 feet. The depth will be determined by the bottom of the soil profile. Once the bottom is found, one Soil Moisture sensor with electric conductivity capabilities will be installed at that depth and then the remaining sensors will be distributed evenly throughout the profile. This installation process will include the drilling of 15 separate holes from 6 to 8 feet deep and back filling those wholes as sensors are placed in the profile. It's estimated that a small tractor or truck with an auger will be required to drill each hole and the backfilling process.

| Installation Item            | Number of Units | Cost / Unit | Total             |
|------------------------------|-----------------|-------------|-------------------|
| Equipment Rental             | 1               | \$2,050.00  | \$2,050.00        |
| Time Charge for Installation | 40              | \$150.00    | \$6,000.00        |
| <b>Total</b>                 |                 |             | <b>\$8,050.00</b> |

The installation will also include the setup of the stations, calibration of each soil moisture sensor and the setup of the full ET weather station at the 5 sites.



#### *Data Gathering - \$4,400 (ARI Provided)*

The data will need to be gathered once a month from each of the stations that will include using a PC or other device to read the data from the station and then process the data into a usable format. This will also include checking the health of the station and reviewing any equipment failures or re-calibration that may need to be performed. The time required to gather the information and visit the station is estimated at 40 hours at a cost estimated at \$4,400. In addition, a producer interview will be requested to gather information such as fertilizer application rates and timing, harvest information, and coordination for the next year.

#### *Modeling the Data - \$9,000 (ARI Provided)*

Once the data gathering for one season is completed, the information will be compiled into formats that will be used to input the data into the Root Zone Water Quality Model 2 (RZWQM) to establish some modeling of water irrigation application efficiency, nutrient loads and water quality modeling of the nitrogen applications, and other relevant data to ET rates. This data will be outlined in a summary for the season and present to NPNRD for further evaluation. The estimated costs of the modeling will be \$9,000.

#### *Project Start Timeframe and Completion Date*

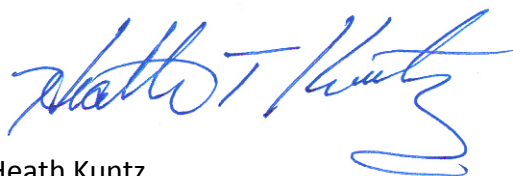
The project has anticipated starting time frame of early Summer of 2017 and the first full year of data will be completed at the end of 2018. Data results will be presented from 2017 in the winter of 2017 or 2018.

#### *Costs*

The tasks provided above are a general representation of work that will need to be completed for the project. The total costs of \$54,093 will be for the project. However, ARI is willing to provide \$13,400 of the services (Data Gathering and Modeling) to NPNRD at no cost to partner for the project goals. The remaining \$40,693 would be the actual project cost to NPNRD.

If you have any questions or comments, please let us know.

Sincerely,



Heath Kuntz  
Principal Hydrologist / Agronomist  
Adaptive Resources, Inc.

---

**SPECTRUM TECHNOLOGIES, INC.**  
**WATCHDOG 2900ET WEATHER STATION SENSOR SPECIFICATIONS**  
**AND CALIBRATION CERTIFICATE**

---

The WatchDog 2900ET weather station and included sensors are calibrated at the time of manufacturing to meet the following specifications:

**WatchDog 2900ET Weather Station**

Data capacity and features

- 8,800 intervals (183 days, based upon a 30-minute interval)
- 12-bit A/D conversion
- Non-volatile memory
- Data retained on the station, permitting multiple downloads. Once memory full, oldest data replaced first
- Measurement intervals of 1, 5, 10, 15, 30, or 60 minutes
- Power source – 4 AA alkaline batteries (included) – provides power for 12 months
- LCD display: review 30 days of high/low history; display chill hours and degree day calculations
- Data communications speed: 9600 baud
- Communication options: direct connection (20 m); wired RS422 connection (to 1 km); spread spectrum wireless (2.4 GHz to 3 km); GSM cellular; GPRS/CDMA to Internet; satellite modem
- External sensor ports: 5

**Internal Sensors**

- a. Temperature sensor:
  - i. -32°C to 100°C;  $\pm 0.6^\circ\text{C}$ ; -60°C to 200°C overall
  - ii. Resolution: 0.1°C
- b. Relative humidity sensor
  - i. 10% to 100% RH @ 5°C to 50°C;  $\pm 3\%$  RH
  - ii. Resolution: 0.1%
- c. Dew Point (calculated)
  - i. -73°C to 60°C,  $\pm 2^\circ\text{C}$
- d. Wind speed
  - i. 0, 3-241 km/h (startup speed is 3 km/h); accuracy  $\pm 3$  km/h or  $\pm 5\%$ , whichever is greater
  - ii. Resolution: 0.1 km/hr
- e. Wind direction
  - i. 1° increments;  $\pm 4^\circ$
- f. Solar radiation
  - i. 0 -1500 W/m<sup>2</sup>,  $\pm 5\%$
  - ii. Resolution: 1.0 W/m<sup>2</sup>

**Internal Sensors, continued**

- g. Rainfall
  - i. 20.3 cm (8") self-emptying collector – meets World Meteorological Organization guidelines
  - ii. Logger records accumulated rainfall during each interval to a theoretical maximum of 1,650 cm per recording interval
  - iii. Minimum logging increment: 0.254 mm (resolution);  $\pm 2\%$
  - iv. Accuracy:  $\pm 2\%$  at 2.54 cm/hour



## WatchDog 2800 Weather Station

This 9-channel data logging weather station is a versatile solution for soil moisture measurement, multiple sensor measurements, microclimate and field research [Read More](#)

SpecWare software required, please order separately.



| Item Name                     | Item Number | Price    | Quantity                       |
|-------------------------------|-------------|----------|--------------------------------|
| WatchDog 2800 Weather Station | 3345WD2     | \$895.00 | <input type="text" value="0"/> |

**Add to Cart**

**Key Accessories \*Please Note:** The following items are required for the product to function properly. They are sold separately.

| Item Name               | Item Number | Price    | Quantity                       |
|-------------------------|-------------|----------|--------------------------------|
| SpecWare 9 Pro Software | 3654P9      | \$195.00 | <input type="text" value="0"/> |

[Add to Cart](#)[Product Features](#)[Specifications / Models](#)[Manuals / Literature](#)[Videos](#)

## WatchDog 2000 Series Weather Stations

[View our full line of Sensors, Software, & Accessories](#)

### Base your growing decisions on your weather, not the airport's

- Full-featured weather stations measure temperature, humidity, rain, wind and solar radiation (varies by model)
- Customize your station with [plug-in sensors to meet your needs](#)
- Accurate, real-time weather information directly from your orchard or vineyard
- Monitor, record and analyze over a dozen important growing conditions
- Log your data in fail-safe, non-volatile memory
- Choose measurement intervals from 1 to 60 minutes (holds 183 days of data with a 30 minute interval)
- Multiple PCs can access the station without impacting a master data collection plan.
- Use the LCD Display to check current and daily high/low readings without a PC
- 12-month battery power with four AA lithium batteries. Four AA alkaline batteries included for 10-month life.
- Communicate via wireless, cellular, shuttle, or direct connect ([see Communications options page](#))
- Requires SpecWare Pro software ([see Software page](#))

## Model 2800

The WatchDog 2800 Station is ideal where multiple sensor measurements are required for temperature, soil moisture, crop canopy light or leaf wetness data. Customize the station to your application by choosing up to eight plug-in sensors, plus one optional rainfall sensor. The 2800 Station features the same memory, power source and LCD as other WatchDog Stations, and accepts the same communication devices and sensors. Requires SpecWare Pro software.

The WatchDog Model 2800 measures, calculates and logs:

- Up to 8 external sensors, plus one optional rainfall sensor



## Related Items



## Tipping Bucket Rain Collector

Measure rainfall in 1/100 inch increments Self-emptying, freeze resistant. [Read More](#)

| Item Name                     | Item Number | Price    | Quantity                       |
|-------------------------------|-------------|----------|--------------------------------|
| Tipping Bucket Rain Collector | 3665R       | \$169.00 | <input type="text" value="0"/> |

[Add to Cart](#)

[Product Features](#)

[Specifications](#)

[Manuals / Literature](#)

### Tipping Bucket Rain Collector

- Measures rainfall 1/100th inch increments
- Self-emptying, tipping bucket design is exceptionally accurate, freeze-resistant and reliable
- Meets the guidelines of the World Meteorological Organization
- Accuracy is +/- 2% at < 2 in (5 cm) per hour

Note: WatchDog rain collectors and SpecWare software can be programmed to record rainfall in either metric (mm) units or U.S. (in).

Not compatible with the WatchDog Sensor Pups, please purchase the [Digital Rain Collector here](#)



## WaterScout SM 100 Soil Moisture Sensor

Place at multiple depths to help determine both when and how much to water [Read More](#)

| Item Name                      | Item Number | Price   | Quantity                       |
|--------------------------------|-------------|---------|--------------------------------|
| WaterScout SM 100 Sensor 6 Ft  | 6460        | \$89.00 | <input type="text" value="0"/> |
| WaterScout SM 100 Sensor 20 Ft | 6460-20     | \$97.00 | <input type="text" value="0"/> |

**Add to Cart**

| Other Accessories:            |             | The following items are optional. |                                |
|-------------------------------|-------------|-----------------------------------|--------------------------------|
| Item Name                     | Item Number | Price                             | Quantity                       |
| WaterScout Calibration Device | 6470CAL3V   | \$69.00                           | <input type="text" value="0"/> |

[Add to Cart](#)
[Product Features](#)
[Specifications](#)
[Manuals / Literature](#)
[Video](#)

## WaterScout SM 100 Soil Moisture Sensors

### The key is knowing both when and how much to water!

Maintaining a healthy soil moisture and water balance is essential for producing high quality plants. Under-watered plants suffer from nutrient deficiencies, stunting and wilting. Conversely, over-watered plants are more susceptible to disease pressure and less tolerant of dry conditions later on in their life cycle. Extreme over-watering will suffocate the plant and lead to root death.

- Measures Volumetric Water Content (VWC) of soil
- Capacitance-type sensor responds immediately to changes in soil moisture content for better irrigation decisions
- Calibrated for mineral soils or soilless media
- Installs easily into 3/4 in (1.9 cm) hole
- Install permanently or use to take spot measurements
- Can be read with the FieldScout® Soil Sensor Reader (Item 6466) or WatchDog® 2000 and 1000 Series Stations
- Connect up to 8 sensors to one station Not compatible with 400/200 loggers. WatchDog Stations sold prior to 2009 must be upgraded. (call for support)
- NEW Calibration feature: Sensors with "3/14" code can be re-calibrated using the FieldScout Soil Sensor Reader (item 6466) or the WaterScout Calibration Device (item 6470CAL3V). Please see the product manual for calibration procedure.

See our Soil Moisture Sensors in action in this video from AgWeb.com - [Click here for the video](#).

The product feature begins at 13:30 of the video. In episode 12 of Corn College TV season 2, head to the field with Farm Journal Associate Field Agronomist Missy Bauer. She shows how her crew is using a technology from Spectrum Technologies to monitor irrigation efficiency.

## Related Items



**FieldScout Soil Sensor Reader**  
\$279.00



**WatchDog 1000 Series WaterScout Irrigation Stations**  
\$458.00 - \$722.00





## WaterScout SMEC 300 Soil Moisture/EC/Temperature Sensor

Track soil moisture, salts, and soil temperature: all with a single sensor! [Read More](#)



| Item Name                         | Item Number | Price    | Quantity                       |
|-----------------------------------|-------------|----------|--------------------------------|
| WaterScout SMEC 300 Sensor - 6ft  | 6470-6      | \$219.00 | <input type="text" value="0"/> |
| WaterScout SMEC 300 Sensor - 20ft | 6470-20     | \$229.00 | <input type="text" value="0"/> |

**Add to Cart**

| <b>Key Accessories *Please Note:</b> |             | The following items are required for the product to function properly. They are sold separately. |                                |
|--------------------------------------|-------------|--|--------------------------------|
| Item Name                            | Item Number | Price  | Quantity                       |
| WaterScout Calibration Device        | 6470CAL3V   | \$69.00  | <input type="text" value="0"/> |

| <b>Other Accessories:</b>                |             | The following items are optional. |                                |
|--|-------------|-----------------------------------|--------------------------------|
| Item Name                                | Item Number | Price                             | Quantity                       |
| Conductivity Standard, 1.41 mS/cm, 250mL | 2251        | \$21.00                           | <input type="text" value="0"/> |

**Add to Cart**

[Product Features](#)

[Specifications](#)

[Manuals / Literature](#)

**WaterScout SMEC 300 Soil Moisture, Temperature, EC Sensor**

**Track soil moisture, salts, and soil temperature: all with a single sensor!**

Whether it's container pots in a greenhouse or turf on a putting green, the salinity of the root zone is a critical element for healthy plant growth. Irrigation, fertilizers, and crop demand all impact salt concentrations. High levels can damage the plant: low levels can lead to nutrient deficiencies.

Identify situations where soil salinity is an issue or where certain moisture and temperature conditions facilitate soil-borne diseases

- Capacitance-type soil moisture sensor
- Carbon ink electrodes provide large measuring surface for electrical conductivity (EC)
- Easy, 1-step EC calibration process
- Can be read with the FieldScout® Soil Sensor Reader (Item 6466) or WatchDog® 2000 and 1000 Series Stations
- Connect up to 4 sensors per station
- WaterScout Calibration Device (Item 6470CAL3V) required unless using Soil Sensor Reader (Item 6466)

Not compatible with 400/200 loggers.  
 WatchDog Stations sold prior to 2012 must be upgraded. (Call for support)

**Related Items**





## Tripod Mount

Rugged folding galvanized steel tripod and 3 ft (1 m) pole.

[Read More](#)

| Item Name                | Item Number | Price    | Quantity                       |
|--------------------------|-------------|----------|--------------------------------|
| Tripod Mount             | 3396TP      | \$89.00  | <input type="text" value="0"/> |
| Tripod Mount with Stakes | 3396TPS     | \$104.00 | <input type="text" value="0"/> |

[Add to Cart](#)

[Product Features](#)

[Specifications](#)

[Manuals / Literature](#)

### Mounting Tripod

- Rugged folding galvanized steel tripod and 3 ft (1 m) pole.
- Available with or without ground stakes



## WaterScout Calibration Device

Calibration device for the WaterScout SMEC 300 Soil Moisture/EC/Temperature Sensors and SM 100 Soil Moisture Sensors [Read More](#)

| Item Name                     | Item Number | Price   | Quantity                       |
|-------------------------------|-------------|---------|--------------------------------|
| WaterScout Calibration Device | 6470CAL3V   | \$69.00 | <input type="text" value="0"/> |

**Add to Cart**

| Other Accessories:                       |             | The following items are optional. |                                |
|--|-------------|-----------------------------------|--------------------------------|
| Item Name                                | Item Number | Price                             | Quantity                       |
| Replacement Calibration Cup              | 6470CUP     | \$2.50                            | <input type="text" value="0"/> |
| Conductivity Standard, 1.41 mS/cm, 250mL | 2251        | \$21.00                           | <input type="text" value="0"/> |

**Add to Cart**

[Product Features](#)
[Manuals / Literature](#)
[Specifications](#)

Calibration device for the WaterScout SMEC 300 Soil Moisture/EC/Temperature Sensors and SM 100 Soil Moisture Sensors

- Includes Calibration Device and Calibration cup
- Conductivity Standard not included (Item 2251), required for proper SMEC 300 calibration

## Related Items



**WaterScout SM 100 Soil  
Moisture Sensor**  
**\$89.00 - \$97.00**



**WaterScout SMEC 300 Soil  
Moisture/EC/Temperature  
Sensor**  
**\$219.00 - \$229.00**

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[www.specmeters.com](http://www.specmeters.com)

Spectrum Technologies, 12360 S. Industrial Drive E., Plainfield, IL 60585, Phone - 800-248-8873



## FIELDSCOUT<sup>®</sup> FieldScout Soil Sensor Reader

FieldScout Soil Sensor Reader [Read More](#)

| Item Name                     | Item Number | Price    | Quantity                       |
|-------------------------------|-------------|----------|--------------------------------|
| FieldScout Soil Sensor Reader | 6466        | \$279.00 | <input type="text" value="0"/> |

**Add to Cart**

### Other Accessories:

The following items are optional.

| Item Name   | Item Number | Price   | Quantity                       |
|---|-------------|---------|--------------------------------|
| Watermark Adapter for FieldScout Soil Sensor Reader | 6450FSADPT  | \$36.00 | <input type="text" value="0"/> |
| FieldScout Soft-Sided Carrying Case                 | 7500        | \$35.00 | <input type="text" value="0"/> |

**Add to Cart**

[Product Features](#)[Specifications](#)[Manuals / Literature](#)

## FieldScout Soil Sensor Reader

- Spot-check WaterScout SM 100 sensors in the field
- Also reads Watermark sensors (requires separate adapter)
- Includes soft-sided case (also available separately)
- Item 7500 will also fit the WatchDog 1000/2000 Series Data Shuttle (item 3679WD), LightScout Red/Far-Red Meter (item 3412), LightScout Quantum Light Meters (four models) and the LightScout External Light Sensor Reader (item 3415FX)

## Related Items



**WaterScout SMEC 300 Soil  
Moisture/EC/Temperature  
Sensor**  
**\$219.00 - \$229.00**

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[www.specmeters.com](http://www.specmeters.com)

Spectrum Technologies, 12360 S. Industrial Drive E., Plainfield, IL 60585, Phone - 800-248-8873



## SpecWare 9 Pro Software

Powerful analysis tools that are easy to use. [Read More](#)



| Item Name               | Item Number | Price    | Quantity                       |
|-------------------------|-------------|----------|--------------------------------|
| SpecWare 9 Pro Software | 3654P9      | \$195.00 | <input type="text" value="0"/> |

**Add to Cart**

| Other Accessories:                     |             | The following items are optional. |                                |
|--|-------------|-----------------------------------|--------------------------------|
| Item Name                              | Item Number | Price                             | Quantity                       |
| SpecWare 9 Pro Extra User License      | 3654P9X     | \$95.00                           | <input type="text" value="0"/> |
| SpecWare 9 Pro Upgrade                 | 3654P9U     | \$75.00                           | <input type="text" value="0"/> |
| SpecWare 9 Pro Upgrade From Spec 8 Pro | 3654P9U8    | \$49.00                           | <input type="text" value="0"/> |



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[Product Features](#)
[Specifications](#)
[Manuals / Literature](#)
[Compare Pro vs. Basic](#)

## SpecWare 9 Pro Software

Award-winning SpecWare software delivers crucial information to growers and researchers in an easy-to-use interface. Import data files from other applications and plot graphs quickly and easily. Set sensor alarms that call your phone or pager for frost, rainfall and other conditions. Customize and save your important reports. Spec 9 Pro and [Spec 9 Basic](#) are powerful tools for growers, researchers or other users that need the best data at the right time.

Includes CD, PC interface cable and manual. **Requires Windows 98 or later, CD-ROM drive, and one free USB port.** The included PC interface cable is USB to 3.5 mm Stereo Pin (item 3661U). This eliminates the need for a USB to Serial Adapter.

**Software updates are available online**, a licensed and installed copy of Spec 9 Pro or Basic is required for software updates.

- Download data from [SpecWeather.com](#)
- Enter the adjustment values for calibrated sensors, and Spec 9 Pro will apply them before saving the data.
- Graph on-the-fly with an interactive graphing window.
- Build, customize and save your most important report formats or choose from thirteen standard reports.
- Add optional insect and disease models to forecast pest pressures and reduce pesticide costs. Produce reports with graphs for each pest.
- Set a frost alarm that will call your mobile phone or pager at frost temperatures or other sensor conditions.
- Automate logger downloads with wireless or directly connected stations. Generate scheduled log files for data-to-web applications or create an XML file that can be posted on the web.
- Find and use data easily with an open file management system. All logger data is stored in one file per month, simplifying data sharing and exporting.
- Import data files from other applications.
- International features include handling date, time and numbers with regional formats, setting English or other languages, and Metric or US measurements.
- SpecWare 9 software is compatible with Windows XP, Vista, and 7.

## Related Items



**WatchDog B-Series Button Loggers**  
**\$41.00 - \$139.00**



**WatchDog 2700 Weather Station**  
**\$1,445.00**

Wa

## **APPENDIX C**

# **ECONOMIC ANALYSIS SUPPORTING DOCUMENTATION**

Appendix C  
 FY2017 Draft Budget Extract: Expenditures

| NORTH PLATTE NATURAL RESOURCES<br>DISTRICT<br><br>PROPOSED NPNRD BUDGET WORKSHEET<br>July 1, 2016 - June 30, 2017   | Approved:          |                 |              | DRAFT: As of<br>6/22/2016 |                    |
|---|--------------------|-----------------|--------------|---------------------------|--------------------|
|   | Proposed<br>FY2016 | Spent<br>FY2016 | Difference   | Itemized FY2017           | Proposed<br>FY2017 |
| <b>#4340 Equipment Operation &amp; Maintenance</b>  | \$ 50,000.00       | \$68,103.22     | (18,103.22)  | \$60,000.00               | \$60,000.00        |
| Operation & Maintenance of Equipment. This includes:<br>computers, Bytes maintenance, trailers, tree planters,<br>trash pump, water monitoring equip., tree racks, etc. |                    |                 |              |                           |                    |
| Administrative Department   |                    | \$59,955.33     |              |                           |                    |
| Tree Department   |                    | \$2,621.91      |              |                           |                    |
| Water Department  |                    | \$661.04        |              |                           |                    |
| General   |                    |                 |              |                           |                    |
| WQF   |                    | \$1,348.44      |              |                           |                    |
| PCB   |                    |                 |              |                           |                    |
| HWS   |                    | \$3,516.50      |              |                           |                    |
| <b>#4350 Payroll Taxes</b>  | \$ 91,433.95       | \$74,663.98     | 16,769.97    | \$100,000.00              | \$100,000.00       |
| NRD's portion of \$1,195,214.88 for:  |                    |                 |              |                           |                    |
| Social Security - .0620   | \$ 74,103.33       |                 |              |                           |                    |
| NRD's portion of \$1,195,214.88 for:  |                    |                 |              |                           |                    |
| Medicare - .0145  | \$ 17,330.62       |                 |              |                           |                    |
| <b>#4360 Unemployment Tax</b>   | \$ -               | \$0.00          | 0.00         | \$0.00                    | \$0.00             |
| <b>#4370 Postage</b>  | \$ 5,000.00        | \$6,286.34      | (1,286.34)   | \$7,500.00                | \$7,500.00         |
| Stamps, postcards & mailings  |                    |                 |              |                           |                    |
| <b>#4380 Special Projects</b>   | \$ 2,313,130.00    | \$1,214,089.66  | 1,099,040.34 | \$2,790,710.60            | \$2,790,710.60     |
| General   |                    | \$172,158.97    |              |                           |                    |
| General - Water   |                    | \$8,867.27      |              |                           |                    |
| Corner's for Wildlife   |                    | \$2,780.00      |              | \$25,280.12               |                    |
| Preserving CRP Grassland Benefits in W. NE - NETF (S Platte)  |                    |                 |              | \$40,000.00               |                    |
| USGS Contracts (Other than Grants)  |                    |                 |              | \$30,000.00               |                    |
| Water Quality Fund  | \$ 80,000.00       | \$301.00        |              | \$80,000.00               |                    |
| Monitoring well drilling  |                    |                 |              | \$20,000.00               |                    |
| Flow Meter Cost Share   |                    |                 |              | \$16,250.00               |                    |
| Water Sampling & Analysis   |                    |                 |              | \$5,000.00                |                    |
| Other   |                    |                 |              | \$38,750.00               |                    |
| Ground Water Leases   | \$ 1,300,000.00    | \$428,783.00    |              | \$878,783.00              |                    |
| Existing  |                    |                 |              | \$428,783.00              |                    |
| New   |                    |                 |              | \$450,000.00              |                    |
| Surface Water Leases  |                    | \$234,379.00    |              | \$484,379.00              |                    |
| Existing  |                    |                 |              | \$234,379.00              |                    |
| New   |                    |                 |              | \$250,000.00              |                    |
| HWS - Contingency Fund  |                    | \$590.00        |              | \$25,000.00               |                    |
| 10/30 Program - Existing  |                    |                 |              | \$2,460.00                |                    |
| EPIC Program  |                    |                 |              | \$102,927.48              |                    |
| Existing  |                    |                 |              | \$2,927.48                |                    |
| New   |                    |                 |              | \$100,000.00              |                    |
| KSGB Projects   |                    |                 |              | \$15,000.00               |                    |
| GIS   |                    | \$12,848.24     |              | \$40,000.00               |                    |
| Meters in the FA  |                    |                 |              | \$168,500.00              |                    |
| Bureau of Reclamation   |                    |                 |              | \$68,500.00               |                    |
| NRD Match   |                    |                 |              | \$100,000.00              |                    |
| NET Telemetry Grant   |                    |                 |              | \$571,381.00              |                    |
| NPNRD GW Summit   |                    |                 |              | \$7,000.00                |                    |
| Drought Tournament  |                    |                 |              | \$20,000.00               |                    |
| Excess Flows  |                    |                 |              | \$200,000.00              |                    |
| Miscellaneous Studies   |                    | \$353,382.18    |              | \$100,000.00              |                    |

Appendix C  
 FY2017 Draft Budget Extract: Expenditures

| NORTH PLATTE NATURAL RESOURCES<br>DISTRICT                      | Approved:          |                 | Difference   | DRAFT: As of<br>6/22/2016 | Proposed<br>FY2017 |
|---|--------------------|-----------------|--------------|---------------------------|--------------------|
|   | Proposed<br>FY2016 | Spent<br>FY2016 |              | Itemized FY2017           |                    |
| PROPOSED NPNRD BUDGET WORKSHEET<br>July 1, 2016 - June 30, 2017 |                    |                 |              |                           |                    |
| TOTAL DEBT SERVICE EXPENDITURES                                 | \$ -               |                 |              |                           | \$0.00             |
| TOTAL EXPENDITURES  | \$ 5,470,448.75    | \$3,684,956.74  | 1,785,492.01 |                           |                    |
| TOTAL BUDGET OF EXPENDITURES                                    |                    |                 |              | \$6,412,231.88            | \$6,412,231.88     |
| NECESSARY CASH RESERVE  |                    |                 |              |                           | \$750,000.00       |
| TOTAL REQUIREMENTS  |                    |                 |              |                           | \$7,162,231.88     |

Appendix C  
 FY2017 Draft Budget Extract: Revenues

| NORTH PLATTE NATURAL RESOURCES DISTRICT<br>PROPOSED NPNRD BUDGET WORKSHEET<br><br>July 1, 2016 - June 30, 2017 | Approved:<br>As of 6/30/2016<br>Updated 7/6/2016 |                    | DRAFT: As of 6/30/2016 |                    |
|--|--|--------------------|------------------------|--------------------|
|  | Proposed<br>FY2016                               | Received<br>FY2016 | Itemized<br>A# FY2017  | Proposed<br>FY2017 |
| <b>REVENUES</b>  |  |                    |                        |                    |
| Net Beginning Balance - NPNRD 7-1  | \$347,085.57                                     |                    |                        | \$597,435.57       |
| County/City Treasurer's Balance, 7-1   | \$35,530.10                                      |                    |                        | \$35,317.04        |
| NPNRD Investment(s), 7-1   | \$1,150,917.41                                   |                    |                        | \$1,071,978.98     |
| <b>SUBTOTAL OF BEGINNING BALANCES</b>  | \$0.00   | \$0.00             |                        | \$1,704,731.59     |
| <b>FEDERAL RECEIPTS</b>  |  |                    |                        |                    |
| <b>#3030 Federal Grants &amp; Funds</b>  | \$278,000.00                                     | \$254,726.05       |                        | \$69,100.00        |
| NRCS TSP   | \$0.00   |                    | \$600.00               |                    |
| Bureau of Reclamation Water Grant (Flow Meters)  |  |                    | \$68,500.00            |                    |
| <b>SUBTOTAL OF FEDERAL RECEIPTS</b>  | \$278,000.00                                     | \$254,726.05       |                        | \$69,100.00        |
| <b>STATE RECEIPTS</b>  |  |                    |                        |                    |
| <b>#3010 State Grants &amp; Funds</b>  | \$494,000.00                                     | \$342,129.26       |                        | \$2,090,340.00     |
| Natural Resources Water Quality Fund   | \$50,000.00                                      | \$310,197.26       | \$50,000.00            |                    |
| PBC (Hardt and Tighe)  |  | \$9,432.00         | \$367,610.50           |                    |
| PBC (Cow Camp)   |  |                    | \$626,932.50           |                    |
| NRCS Cost-Share  |  |                    | \$0.00                 |                    |
| NET Telemetry Grant  |  |                    | \$571,381.00           |                    |
| WSF (450,000.00 & \$24,416.00)   |  |                    | \$474,416.00           |                    |
| HMP  |  | \$22,500.00        |                        |                    |
| <b>#3040 Government Aid</b>  | \$0.00   | \$0.00             |                        | \$0.00             |
| <b>#3050 Motor Vehicle Pro-Rata &amp; In Lieu of Taxes</b>   | \$7,000.00                                       | \$2,647,759.71     |                        | \$10,000.00        |
| General Property Tax   |  | \$2,636,319.41     |                        |                    |
| <b>SUBTOTAL OF STATE RECEIPTS</b>  | \$551,000.00                                     | \$2,989,888.97     |                        | \$2,100,340.00     |
| <b>LOCAL RECEIPTS</b>  |  |                    |                        |                    |
| <b>Customer Charges (C.C.)</b>   | \$85,000.00                                      | \$137,526.95       | \$85,000.00            | \$100,000.00       |
| <b>#3090 C.C. - HWS WU</b>   |  | \$32,549.08        |                        |                    |
| <b>#3091 C.C. - Sale of Flags</b>  |  | \$34.24            |                        |                    |
| <b>#3092 C.C. - Tree Sales</b>   |  | \$94,953.85        |                        |                    |
| <b>#3093 C.C. - Tree Planting</b>  |  | \$1,566.30         |                        |                    |
| <b>#3094 C.C. - Spraying Services</b>  |  | \$4,823.48         |                        |                    |
| <b>#3070 C.C. Property Rent</b>  |  | \$3,600.00         |                        |                    |
| Keep SCB/Gering Beautiful  |  | \$0.00             |                        |                    |
| NE Forest Service  |  | \$3,600.00         |                        |                    |
| <b>#3095 Flow Meter Services</b>   | \$10,000.00                                      | \$11,631.11        | \$10,000.00            | \$10,000.00        |
| <b>#3096 Chemigation Services</b>  | \$0.00   | \$131.98           | \$200.00               | \$200.00           |
| <b>Investment Interest (I.I.)</b>  | \$5,000.00                                       | \$3,716.75         | \$5,000.00             | \$5,000.00         |

Appendix C  
 FY2017 Draft Budget Extract: Revenues

NORTH PLATTE NATURAL RESOURCES DISTRICT  
 PROPOSED NPNRD BUDGET WORKSHEET

July 1, 2016 - June 30, 2017

|  |                    | Approved:<br>As of 6/30/2016<br>Updated 7/6/2016 |                       | DRAFT: As of 6/30/2016 |
|--|--------------------|--|-----------------------|------------------------|
|  | Proposed<br>FY2016 | Received<br>FY2016                               | Itemized<br>A# FY2017 | Proposed<br>FY2017     |
| <b>REVENUES</b>  |                    |  |                       |                        |
| #3110 I.I. - Investments General Fund                        |                    | \$1,855.19                                       |                       |                        |
| #3120 I.I. - Investments Sinking Fund                        |                    | \$1,861.56                                       |                       |                        |
| #3130 Miscellaneous Income                                   | \$5,000.00         | \$7,208.50                                       | \$5,000.00            | \$5,000.00             |
| #3081 Chemigation Fees                                       | \$10,000.00        | \$13,032.00                                      | \$10,000.00           | \$10,000.00            |
| #3140 Insurance Proceeds                                     | \$0.00             | \$0.00   | \$0.00                | \$0.00                 |
| #3150 Sale of Fixed Assets                                   | \$0.00             | \$100.00   | \$0.00                | \$0.00                 |
| #3160 Transfer Mitigation Income                             | \$0.00             | \$56,000.00                                      | \$50,000.00           | \$50,000.00            |
|  |                    | \$56,000.00                                      |                       |                        |
| #3170 Inter-Fund Transfer                                    | \$0.00             | \$0.00   | \$0.00                |                        |
| #3180 Reimbursement of Projects                              | \$85,000.00        | \$53,931.12                                      | \$81,000.00           | \$81,000.00            |
| Corners for Wildlife Payments (Existing Contracts)           |                    |  | \$26,000.00           |                        |
| Forestry & Outreach Technician                               |                    |  | \$15,000.00           |                        |
| Preserving CRP Grassland Benefits in W. NE - NETF (S Platte) | \$40,000.00        |  | \$40,000.00           |                        |
| #3200 Fees   | \$1,000.00         | \$11,510.00                                      | \$1,500.00            | \$1,500.00             |
| Well Permits; Transfer Permits etc.                          |                    |  |                       |                        |
| #3300 Western Water Model                                    | \$20,000.00        | \$0.00   | \$0.00                | \$0.00                 |
| #3400 Finance Charge   | \$0.00             | \$77.66  | \$0.00                | \$0.00                 |
| #3920 Transfers In   | \$0.00             | \$30,619.79                                      | \$0.00                | \$0.00                 |
| #105 Accounts Receivable Collections                         | \$0.00             | \$0.00   | \$0.00                | \$0.00                 |
| <b>SUBTOTAL OF LOCAL RECEIPTS</b>                            | \$261,000.00       | \$325,485.86                                     |                       | \$262,700.00           |
| TRANSFERS FROM CAPITAL DEPRECIATION FUND                     |                    |  |                       |                        |
| <b>TOTAL REVENUES &amp; RECEIPTS</b>                         | \$1,090,000.00     | \$3,570,100.88                                   |                       | \$4,136,871.59         |
| #305 PERSONAL AND REAL PROPERTY TAX                          |                    |  |                       | \$3,025,360.29         |
| <b>TOTAL RECEIPTS AVAILABLE</b>                              |                    |  |                       | \$7,162,231.88         |
| <b>PERSONAL AND REAL PROPERTY TAX RECAP</b>                  |                    |  |                       |                        |
| Personal and Real Property Tax Recap                         |                    |  |                       | \$3,025,360.29         |
| Tax Collection Fees 1% - County Treasurer                    |                    |  |                       | \$30,253.60            |
| Delinquent Tax Allowance                                     |                    |  |                       | \$5,000.00             |
| <b>TOTAL PERSONAL AND REAL PROPERTY TAX REQUIREMENT</b>      |                    |  |                       | \$3,060,613.89         |

**Appendix C**  
**Cash Flow Worksheet**

**CASH FLOW WORKSHEET**

Cash flow stream data, showing progression of work by year of project implementation

|                          |  |  |  |
|--------------------------|--|--|--|
|                          |  |  |  |
| <b><u>YEAR</u></b><br>#0 | <b><u>Fall-Winter 2016</u></b><br><b>Project preparation</b><br>Site selection<br>Order equipment  | \$0.00<br>\$32,643.00                                    | <b>\$32,643.00 – C</b>   |
| #1                       | <b><u>Spring 2017-Spring 2018</u></b><br><b>Equipment installation</b><br>5 study sites @ 2 sites per field day = 3 days<br>Installation equipment rental & ARI time<br>NRD staff time and equipment<br><br><b>Data collection</b><br>ARI time<br><br><b>Data modeling</b><br>ARI time | \$8,050.00<br>\$2,260.00<br><br>\$4,400.00<br>\$9,000.00 | <b>\$10,310.00 – C</b><br><br><b>\$0.00 – C*</b><br><br><b>\$0.00 – C*</b> |
| #2 - #5                  | <b><u>Spring 2018 – Spring 2022</u></b><br><b>Data collection</b><br>ARI time<br><br><b>Data modeling and study results</b><br>ARI time  | \$4,400.00<br><br>\$9,000.00                             | <b>\$0.00 – C*</b><br><br><b>\$0.00 – C*</b>                               |

\*Represents total cost to District. This line item will be provided in kind by project partner.

**STATE OF NEBRASKA**  
**NATURAL RESOURCES DISTRICT BUDGET FORM**

This budget is for the Period JULY 1, 2015 through JUNE 30, 2016

**Upon Filing, The Entity Certifies the Information Submitted on the Form to be Correct:**

The following **PERSONAL AND REAL PROPERTY TAX** is requested for the ensuing year:

|                 |  |
|-----------------|--|
| \$ 2,587,107.00 | Property Taxes for Non-Bond Purposes                 |
| \$ -            | Principal and Interest on Bonds                      |
| \$ 2,587,107.00 | <b>Total Personal and Real Property Tax Required</b> |

Outstanding Bonded Indebtedness as of JULY 1, 2015

|                                  |             |
|----------------------------------|-------------|
| Principal                        | \$ -        |
| Interest                         | \$ -        |
| <b>Total Bonded Indebtedness</b> | <b>\$ -</b> |

\$ 4,841,311,685.00 **Total Certified Valuation (All Counties)**

*(Certification of Valuation(s) from County Assessor **MUST** be attached)*

**County Clerk's Use ONLY**

**Report of Joint Public Agency & Interlocal Agreements**

Was this Subdivision involved in any Interlocal Agreements or Joint Public Agencies for the reporting period of July 1, 2014 through June 30, 2015?

YES  NO

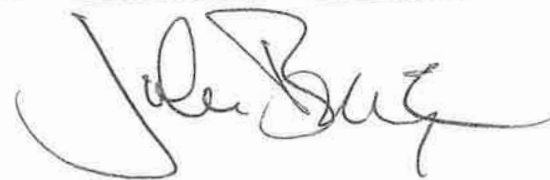
*If YES, Please submit Interlocal Agreement Report by December 31, 2015.*

**Report of Trade Names, Corporate Names & Business Names**

Did the Subdivision operate under a separate Trade Name, Corporate Name, or Business Name during the period of July 1, 2014 through June 30, 2015?

YES  NO

*If YES, Please submit Trade Name Report by December 31, 2015.*



**APA Contact Information**

Auditor of Public Accounts  
Telephone: (402) 471-2111 FAX: (402) 471-3301  
Website: [www.auditors.nebraska.gov](http://www.auditors.nebraska.gov)  
Questions - E-Mail: [Deann.Haeffner@nebraska.gov](mailto:Deann.Haeffner@nebraska.gov)

**Submission Information - Adopted Budget Due by 9-20-2015**

- Auditor of Public Accounts - PO Box 98917 - Lincoln, NE 68509  
**Submit Electronically using Website:**  
<http://www.auditors.nebraska.gov/>
- County Board (SEC. 13-508), C/O County Clerk



North Platte NRD

| Line No.                  | TOTAL ALL FUNDS   | Actual<br>2013 - 2014<br>(Column 1)           | Actual/Estimated<br>2014 - 2015<br>(Column 2) | Adopted Budget<br>2015 - 2016<br>(Column 3) |
|---------------------------|---|---|---|---|
| 1                         | <b>Beginning Balances, Receipts, &amp; Transfers:</b>                           |   |   |   |
| 2                         | Net Cash Balance  | \$ 316,043.25                                 | \$ 354,636.16                                 | \$ 609,159.96                               |
| 3                         | Investments   | \$ 1,809,322.13                               | \$ 1,487,579.10                               | \$ 1,093,246.47                             |
| 4                         | County Treasurer's Balance  | \$ 29,977.50                                  | \$ 35,530.10                                  | \$ 35,317.04                                |
| 5                         | <b>Subtotal of Beginning Balances (Lines 2 thru 4)</b>                          | \$ 2,155,342.88                               | \$ 1,877,745.36                               | \$ 1,737,723.47                             |
| 6                         | Personal and Real Property Taxes (Columns 1 and 2 - See Preparation Guidelines) | \$ 2,105,459.97                               | \$ 2,566,327.75                               | \$ 2,556,541.58                             |
| 7                         | Federal Receipts  | \$ 206.55                                     | \$ 97,552.96                                  | \$ 475,275.00                               |
| 8                         | State Receipts: Motor Vehicle Pro-Rate  | \$ 7,326.41                                   | \$ 8,630.85                                   | \$ 9,000.00                                 |
| 9                         | State Receipts: State Aid (State Statute Section 77-27,136)                     | \$ -  | \$ -  |   |
| 10                        | State Receipts: Other   | \$ 324,128.14                                 | \$ 336,690.17                                 | \$ 1,150,000.00                             |
| 11                        | State Receipts: Property Tax Credit   | \$ -  | \$ -  |   |
| 12                        | Local Receipts: Nameplate Capacity Tax  | \$ -  | \$ -  | \$ -  |
| 13                        | Local Receipts: In Lieu of Tax  | \$ 630.12                                     | \$ 657.33                                     | \$ 1,000.00                                 |
| 14                        | Local Receipts: Other   | \$ 374,478.28                                 | \$ 328,457.39                                 | \$ 289,700.00                               |
| 15                        | Transfers In Of Surplus Fees  | \$ -  | \$ -  | \$ -  |
| 16                        | Transfer In Other Than Surplus Fees (Should agree to Transfers Out on Line 28)  | \$ -  | \$ 244,479.27                                 | \$ 32,991.88                                |
| 17                        | <b>Total Resources Available (Lines 5 thru 16)</b>                              | \$ 4,967,572.35                               | \$ 5,460,541.08                               | \$ 6,252,231.93                             |
| 18                        | <b>Disbursements &amp; Transfers:</b>   |   |   |   |
| 19                        | Operating Expenses  | \$ 2,856,181.41                               | \$ 3,090,192.60                               | \$ 5,663,014.80                             |
| 20                        | Capital Improvements (Real Property/Improvements)                               | \$ -  | \$ -  | \$ -  |
| 21                        | Other Capital Outlay (Equipment, Vehicles, Etc.)                                | \$ 213,677.58                                 | \$ 131,370.82                                 | \$ 115,000.00                               |
| 22                        | Debt Service: Bond Principal & Interest Payments                                | \$ -  | \$ 197,305.02                                 | \$ -  |
| 23                        | Debt Service: Payments to Retire Interest-Free Loans (Public Airports)          |   |   |   |
| 24                        | Debt Service: Payments to Bank Loans & Other Instruments (Fire Districts)       |   |   |   |
| 25                        | Debt Service: Other   | \$ 19,968.00                                  | \$ 59,469.90                                  | \$ -  |
| 26                        | Judgments   | \$ -  | \$ -  | \$ -  |
| 27                        | Transfers Out of Surplus Fees   | \$ -  | \$ -  | \$ -  |
| 28                        | Transfers Out Other Than Surplus Fees (Should agree to Transfers In on Line 16) | \$ -  | \$ 244,479.27                                 | \$ 32,991.88                                |
| 29                        | <b>Total Disbursements &amp; Transfers (Lines 19 thru 28)</b>                   | \$ 3,089,826.99                               | \$ 3,722,817.61                               | \$ 5,811,006.68                             |
| 30                        | <b>Balance Forward/Cash Reserve (Line 17 - Line 29)</b>                         | \$ 1,877,745.36                               | \$ 1,737,723.47                               | \$ 441,225.25                               |
| 31                        | Cash Reserve Percentage   |   |   | 8%  |
| <b>PROPERTY TAX RECAP</b> |   | Tax from Line 6                               |   | \$ 2,556,541.58                             |
|                           |   | County Treasurer's Commission at 1% of Line 6 |   | \$ 25,565.42                                |
|                           |   | Delinquent Tax Allowance                      |   | \$ 5,000.00                                 |
|                           |   | <b>Total Property Tax Requirement</b>         |   | \$ 2,587,107.00                             |

# North Platte NRD

## To Assist the County For Levy Setting Purposes

## Cash Reserve Funds

The Cover Page identifies the Property Tax Request between Principal & Interest on Bonds and All Other Purposes. If your NRD needs more of a breakdown for levy setting purposes, complete the section below.

Statute 13-503 says cash reserve means funds required for the period before revenue would become available for expenditure but shall not include funds held in any special reserve fund. If the cash reserve on Page 2 exceeds 50%, you can list below funds being held in a special reserve fund.

Property Tax Request by Fund:

|                          |              | <u>Property Tax Request</u> |
|--------------------------|--------------|-----------------------------|
| General Fund             | \$           | 2,587,107.00                |
| Bond Fund                | \$           | -                           |
| _____ Fund               |              |                             |
| _____ Fund               |              |                             |
| _____ Fund               |              |                             |
| _____ Fund               |              |                             |
| <b>Total Tax Request</b> | <b>** \$</b> | <b><u>2,587,107.00</u></b>  |

| <u>Special Reserve Fund Name</u>   | <u>Amount</u>     |
|------------------------------------|-------------------|
| _____                              | _____             |
| _____                              | _____             |
| _____                              | _____             |
| _____                              | _____             |
| _____                              | _____             |
| <b>Total Special Reserve Funds</b> | <b>\$ _____ -</b> |
| <br>                               |                   |
| Total Cash Reserve                 | \$ 441,225.25     |
| Remaining Cash Reserve             | \$ 441,225.25     |
| Remaining Cash Reserve %           | 8%                |

\*\* This Amount should agree to the Total Personal and Real Property Tax Required on the Cover Page (Page 1).

## CORRESPONDENCE INFORMATION

### ENTITY OFFICIAL ADDRESS

*If no official address, please provide address where correspondence should be sent*

|                 |                               |
|-----------------|-------------------------------|
| NAME            | <b>North Platte NRD</b>       |
| ADDRESS         | <b>PO Box 280</b>             |
| CITY & ZIP CODE | <b>Scottsbluff 69363-0280</b> |
| TELEPHONE       | <b>(308) 632-2749</b>         |
| WEBSITE         | <b>www.npnrd.org</b>          |

|                  | BOARD CHAIRPERSON | CLERK/TREASURER/SUPERINTENDENT/OTHER | PREPARER |
|------------------|-------------------|--------------------------------------|----------|
| NAME             | Gerald Dillman    | John Berge                           |          |
| TITLE /FIRM NAME | Chairperson       | Manager                              |          |
| TELEPHONE        | (308) 623-2201    | (308) 632-2749                       |          |
| EMAIL ADDRESS    |                   | jberge@nprnd.org                     |          |

For Questions on this form, who should we contact (please v one): Contact will be via email if supplied.

- Board Chairperson
- Clerk / Treasurer / Superintendent / Other
- Preparer

**NOTE:** If Budget Document is used as an Audit Waiver, approval of the Audit Waiver will be sent to the Board Chairperson via email. If no email address is supplied for the Board Chairperson, notification will be mailed via post office to address listed above.

North Platte NRD  
2015-2016 LID SUPPORTING SCHEDULE

**Calculation of Restricted Funds**

|   |      |                 |
|---|------|-----------------|
| Total Personal and Real Property Tax Requirements   | (1)  | \$ 2,587,107.00 |
| Motor Vehicle Pro-Rate  | (2)  | \$ 9,000.00     |
| In-Lieu of Tax Payments   | (3)  | \$ 1,000.00     |
| Transfers of Surplus Fees   | (4)  | \$ -            |
| Prior Year Budgeted Capital Improvements that were excluded from Restricted Funds.                                |      |                 |
| Prior Year Capital Improvements Excluded from Restricted Funds<br>(From 2014-2015 LC-3 Lid Exceptions, Line (10)) | (5)  | \$ -            |
| <b>LESS:</b> Amount Spent During 2014-2015  | (6)  | \$ -            |
| <b>LESS:</b> Amount Expected to be Spent in Future Budget Years   | (7)  | \$ -            |
| Amount to be included as Restricted Funds <b>(Cannot be a Negative Number)</b>                                    | (8)  | \$ -            |
| Nameplate Capacity Tax  | (8a) | \$ -            |

|                                   |     |                        |
|-----------------------------------|-----|------------------------|
| <b>TOTAL RESTRICTED FUNDS (A)</b> | (9) | <b>\$ 2,597,107.00</b> |
|-----------------------------------|-----|------------------------|

**Lid Exceptions**

|   |      |                 |
|---|------|-----------------|
| Capital Improvements (Real Property and Improvements on Real Property)  | (10) | _____           |
| <b>LESS:</b> Amount of prior year capital improvements that were excluded from previous lid calculations but were not spent and now budgeted this fiscal year <i>(cannot exclude same capital improvements from more than one lid calculation.)</i> |      |                 |
| Agrees to Line (7) above.   | (11) | \$ -            |
| Allowable Capital Improvements  | (12) | \$ _____        |
| Bonded Indebtedness   | (13) | _____           |
| Interlocal Agreements/Joint Public Agency Agreements  | (14) | \$ 517,271.08   |
| Judgments   | (15) | _____           |
| Refund of Property Taxes to Taxpayers   | (16) | _____           |
| Repairs to Infrastructure Damaged by a Natural Disaster   | (17) | _____           |
| Ground Water Management Activities <i>(Amount exceeding FY 2003-04)</i>   | (18) | \$ 1,159,094.17 |

|                                 |      |                        |
|---------------------------------|------|------------------------|
| <b>TOTAL LID EXCEPTIONS (B)</b> | (19) | <b>\$ 1,676,365.25</b> |
|---------------------------------|------|------------------------|

|  |                      |
|--|----------------------|
| <b>TOTAL RESTRICTED FUNDS<br/>For Lid Computation (To Line 9 of the LC-3 Lid Form)</b> | <b>\$ 920,741.75</b> |
| To Calculate: Total Restricted Funds (A)-Line 9 MINUS Total Lid Exceptions (B)-Line 19 |                      |

*Total Restricted Funds for Lid Computation **cannot** be less than zero. See Instruction Manual on completing the LC-3 Supporting Schedule.*

North Platte NRD

**COMPUTATION OF LIMIT FOR FISCAL YEAR 2015-2016**

2014-2015 Restricted Funds Authority (Base Amount) = Line (8) of last year's LC-3 Form 1,476,104.38  
(1)

**ALLOWABLE INCREASES**

**1** BASE LIMITATION PERCENT INCREASE (2.5%) 2.50 %  
(2)

**2** ALLOWABLE GROWTH PER THE ASSESSOR MINUS 2.5% - %  
(3)

$$\frac{\text{2015 Growth per Assessor}}{\text{2014 Valuation}} = \frac{-}{100} \text{ Multiply times To get \%}$$

**3** ADDITIONAL ONE PERCENT BOARD APPROVED INCREASE - %  
(4)

$$\frac{\text{\# of Board Members voting "Yes" for Increase}}{\text{Total \# of Members in Governing Body}} = \frac{-}{.75} \text{ Must be at least .75 (75\%) of the Governing Body}$$

**ATTACH A COPY OF THE BOARD MINUTES APPROVING THE INCREASE.**

**4** SPECIAL ELECTION/TOWNHALL MEETING - VOTER APPROVED % INCREASE 1.00 %  
(5)

**Please Attach Ballot Sample and Election Results OR Record of Action From Townhall Meeting**

TOTAL ALLOWABLE PERCENT INCREASE = Line (2) + Line (3) + Line (4) + Line (5) 3.50 %  
(6)

Allowable Dollar Amount of Increase to Restricted Funds = Line (1) x Line (6) 51,663.65  
(7)

Total Restricted Funds Authority = Line (1) + Line (7) 1,527,768.03  
(8)

**Less:** Restricted Funds from Lid Supporting Schedule 920,741.75  
(9)

Total Unused Restricted Funds Authority = Line (8) - Line (9) 607,026.28  
(10)

**LINE (10) MUST BE GREATER THAN OR EQUAL TO ZERO OR YOU ARE IN VIOLATION OF THE LID LAW.**

**THE AMOUNT OF UNUSED RESTRICTED FUNDS AUTHORITY ON LINE (10) MUST BE PUBLISHED IN THE NOTICE OF BUDGET HEARING.**

2015-2016 Levy Limit Form  
Natural Resources Districts

North Platte NRD

|  |                                 |                                   |
|--|---------------------------------|-----------------------------------|
| Total Personal and Real Property Tax Request   |                                 | \$ <u>2,587,107.00</u><br>(1)     |
| Less Personal and Real Property Tax Request for:   |                                 |                                   |
| Judgments (not paid by liability insurance coverage)   | ( _____ )<br>(A)                |                                   |
| Preexisting lease-purchase contracts approved prior to <b>July 1, 1998</b>   | ( _____ )<br>(B)                |                                   |
| Bonded Indebtedness  | ( _____ )<br>(C)                |                                   |
| Ground Water Management Activities (Exceeding FY 2003-2004)  | ( \$ <u>366,819.15</u> )<br>(D) |                                   |
| Ground Water Management Activities (For District fully appropriated or overappropriated) (Exceeding FY 2005-2006)                                | ( \$ <u>244,546.10</u> )<br>(E) |                                   |
| Interstate Compact (LB 701)  | ( _____ )<br>(F)                |                                   |
| Total Exclusions   |                                 | ( \$ <u>611,365.25</u> )<br>(2)   |
| Personal and Real Property Tax Request subject to Levy Limit   |                                 | <u>\$ 1,975,741.75</u><br>(3)     |
| 2015 Valuation (Per the County Assessor)   |                                 | <u>\$ 4,841,311,685.00</u><br>(4) |
| Calculated Levy for Levy Limit Compliance<br>[Line (3) <b>Divided By</b> Line (4) <b>Times</b> 100]  |                                 | <u>0.040810</u><br>(5)            |
| Calculated Ground Water Management Activities Levy (Shall Not Exceed 1 Cent)<br>[Line (D) <b>Divided By</b> Line (4) <b>Times</b> 100]           |                                 | <u>0.007577</u><br>(6)            |
| Calculated Ground Water Management Activities Levy (For District fully appropriated or<br>[Line (E) <b>Divided By</b> Line (4) <b>Times</b> 100] |                                 | <u>0.005051</u><br>(7)            |
| Calculated LB 701 Interstate Compact Levy (Shall Not Exceed 10 Cents)<br>[Line (F) <b>Divided By</b> Line (4) <b>Times</b> 100]                  |                                 | <u>0.000000</u><br>(8)            |
| Total Calculated Levy for Limit Compliance<br>[Line (5) <b>Plus</b> Line (6) <b>Plus</b> Line (7) <b>Plus</b> Line (8)]                          |                                 | <u>0.053438</u><br>(9)            |

**Note :** Levy Limit established by State Statute Section 77-3442:

Natural Resources District (NRD) - 4.5 Cents  
 PLUS Ground Water Management Activities as allowed by State Statute Section 2-3225. Ground Water Management Activities shall not exceed 1 Cent.  
 PLUS Ground Water Management Activities (For District fully appropriated or overappropriated) as allowed by State Statute 2-3225. Ground Water Management Activities shall not exceed 3 Cents.  
 PLUS Interstate Compact as allowed by LB 701, shall not exceed 10 Cents.

**Attach supporting documentation if a vote was held to exceed the levy limit.**

**CERTIFICATION OF TAXABLE VALUE  
And VALUE ATTRIBUTABLE TO GROWTH**

B

*{format for all political subdivisions other than  
a) sanitary improvement districts in existence five years or less, and  
b) community colleges, and c) school districts}*

**TAX YEAR 2015**

*{certification required on or before August 20<sup>th</sup>, of each year}*

**TO: North Platte NRD  
P O Box 280  
  
Scottsbluff, NE 69361**

**TAXABLE VALUE LOCATED IN THE COUNTY OF: BANNER**

| <b>Name of Political Subdivision</b> | <b>Subdivision Type<br/>(e.g. city, fire, NRD)</b> | <b>Value attributable to Growth</b> | <b>Total Taxable Value</b> |
|--------------------------------------|--|-------------------------------------|----------------------------|
| NORTH PLATTE NRD                     | N.R.D.   | 212,452                             | 260,621,556                |

*\*Value attributable to growth is determined pursuant to section 13-518 which includes real and personal property and annexation, if applicable.*

I SHARON SANDBERG, BANNER County Assessor hereby certify that the valuation listed herein is, to the best of my knowledge and belief, the true and accurate taxable valuation for the current year, pursuant to Neb. Rev. Stat. §13-509 and §13-518.

Sharon Sandberg  
*(signature of county assessor)*



August 14, 2015  
*(date)*

CC: County Clerk, BANNER County  
CC: County Clerk where district is headquarter, if different county, \_\_\_\_\_ County

*Note to political subdivision: A copy of the Certification of Value must be attached to the budget document.*

JB

**CERTIFICATION OF TAXABLE VALUE  
And VALUE ATTRIBUTABLE TO GROWTH**

*{format for all political subdivisions other than  
a) sanitary improvement districts in existence five years or less, and  
b) community colleges, and c) school districts}*

**TAX YEAR 2015**

*{certification required on or before August 20<sup>th</sup>, of each year}*

**TO: NORTH PLATTE NRD**  
*John Berge*  
**P O BOX 280**  
**SCOTTSBLUFF, NE 69363**

**TAXABLE VALUE LOCATED IN THE COUNTY OF: MORRILL**

| <b>Name of<br/>Political Subdivision</b> | <b>Subdivision<br/>Type</b><br><i>(e.g. city, fire, NRD)</i> | <b>Value attributable<br/>to Growth</b> | <b>Total Taxable Value</b> |
|--|--|---|----------------------------|
| NRD                                      | N.R.D.   | 11,264,372                              | 1,026,464,210              |

*\*Value attributable to growth is determined pursuant to section 13-518 which includes real and personal property and annexation, if applicable.*

I ROSE M NELSON, MORRILL County Assessor hereby certify that the valuation listed herein is, to the best of my knowledge and belief, the true and accurate taxable valuation for the current year, pursuant to Neb. Rev. Stat. §13-509 and §13-518.

*Rose M. Nelson*  
*(signature of county assessor)*

8-14-15  
*(date)*

CC: County Clerk, MORRILL County  
CC: County Clerk where district is headquarter, if different county, \_\_\_\_\_ County

*Note to political subdivision: A copy of the Certification of Value must be attached to the budget document.*





JB

**CERTIFICATION OF TAXABLE VALUE  
And VALUE ATTRIBUTABLE TO GROWTH**

*{format for all political subdivisions other than  
a) sanitary improvement districts in existence five years or less, and  
b) community colleges, and c) school districts}*

**TAX YEAR 2015**

*{certification required on or before August 20<sup>th</sup>, of each year}*

**TO: NORTH PLATTE NATURAL RESOURCE DISTRICT**  
John Berge  
P O BOX 280  
SCOTTSBLUFF, NE 69363-0280

**TAXABLE VALUE LOCATED IN THE COUNTY OF: GARDEN**

| Name of Political Subdivision | Subdivision Type<br>(e.g. city, fire, NRD) | Value attributable to Growth | Total Taxable Value |
|-------------------------------|--|------------------------------|---------------------|
| NORTHPLATTE NRD               | N.R.D.                                     | 6,625,554                    | 629,035,858         |

*\*Value attributable to growth is determined pursuant to section 13-518 which includes real and personal property and annexation, if applicable.*

I JANET L. SHAUL, GARDEN County Assessor hereby certify that the valuation listed herein is, to the best of my knowledge and belief, the true and accurate taxable valuation for the current year, pursuant to Neb. Rev. Stat. §13-509 and §13-518.

Janet L. Shaul  
(signature of county assessor)

8/12/15  
(date)

CC: County Clerk, GARDEN County  
CC: County Clerk where district is headquarter, if different county, \_\_\_\_\_ County

*Note to political subdivision: A copy of the Certification of Value must be attached to the budget document.*

JTB

**CERTIFICATION OF TAXABLE VALUE  
And VALUE ATTRIBUTABLE TO GROWTH**

*{format for all political subdivisions other than  
a) sanitary improvement districts in existence five years or less, and  
b) community colleges, and c) school districts}*

**TAX YEAR 2015**

*{certification required on or before August 20<sup>th</sup>, of each year}*

**TO: NORTH PLATTE NATURAL RESOURCE DIST  
100547 AIRPORT ROAD**

**SCOTTSBLUFF, NE 69361**

**TAXABLE VALUE LOCATED IN THE COUNTY OF: SIoux**

| Name of Political Subdivision | Subdivision Type<br>(e.g. city, fire, NRD) | Value attributable to Growth | Total Taxable Value |
|-------------------------------|--|------------------------------|---------------------|
| NORTH PLATTE NRD              | N.R.D.                                     | 312,023                      | 210,105,179         |

*\*Value attributable to growth is determined pursuant to section 13-518 which includes real and personal property and annexation, if applicable.*

I MICHELLE ZIMMERMAN, SIoux County Assessor hereby certify that the valuation listed herein is, to the best of my knowledge and belief, the true and accurate taxable valuation for the current year, pursuant to Neb. Rev. Stat. §13-509 and §13-518.

Michelle J. Zimmerman  
*(signature of county assessor)*



August 11, 2015  
*(date)*

CC: County Clerk, SIoux County  
CC: County Clerk where district is headquarter, if different county, \_\_\_\_\_ County

*Note to political subdivision: A copy of the Certification of Value must be attached to the budget document.*

**CERTIFICATION OF TAXABLE VALUE  
And VALUE ATTRIBUTABLE TO GROWTH**  
*{format for all political subdivisions other than  
a) sanitary improvement districts in existence five years or less, and  
b) community colleges, and c) school districts}*

**TAX YEAR 2015**  
*{certification required on or before August 20<sup>th</sup>, of each year}*

**TO: NORTH PLATTE NRD**  
  
**P O BOX 280**  
**SCOTTSBLUFF, NE. 69361**

**TAXABLE VALUE LOCATED IN THE COUNTY OF: SCOTTS BLUFF**

| Name of Political Subdivision | Subdivision Type<br>(e.g. city, fire, NRD) | Value attributable to Growth | Total Taxable Value |
|-------------------------------|--|------------------------------|---------------------|
| N P NATURAL RESOURCE          | N.R.D.                                     | 32,214,320                   | 2,715,084,882       |

*\*Value attributable to growth is determined pursuant to section 13-518 which includes real and personal property and annexation, if applicable.*

I AMY RAMOS, SCOTTS BLUFF County Assessor hereby certify that the valuation listed herein is, to the best of my knowledge and belief, the true and accurate taxable valuation for the current year, pursuant to Neb. Rev. Stat. §13-509 and §13-518.

*Amy Ramos*  
*(signature of county assessor)*

8-11-15  
*(date)*

CC: County Clerk, SCOTTS BLUFF County  
CC: County Clerk where district is headquarter, \_\_\_\_\_ County

*Note to political subdivision: A copy of the Certification of Value must be attached to the budget document.*