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Lower Loup
Natural Resources District
Voluntary Integrated Management Plan

Final Draft

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1.0 INTRODUCTION

The citizens of the Lower Loup Natural Resources District (Lower Loup NRD) depend on abundant, clean water in their homes for domestic use, on their farms for agricultural production, and for their industries to maintain economic viability. Wildlife that live and migrate through the Lower Loup NRD depend on clean water for sustenance and habitat. Furthermore, human inhabitants of the District use water in rivers and lakes for recreation including fishing, hunting, boating, and swimming.

The Lower Loup NRD is located in the southeastern half of the Loup Basin. The Loup Basin is approximately 14,200 square miles in area. The topography of the Loup Basin across the Lower Loup NRD predominately consists of gently rolling and dissected plains, with small areas of upland plains. Inhabitants of the Lower Loup NRD have relied on the abundant water resources of the area; over time, their water use has increased. In continuing with proactive management of natural resources, the Lower Loup NRD and citizen stakeholders within the area determined a water use plan needed to be developed to provide a framework for how to wisely manage water resources so they are available now and in the future.

For these reasons, water management planning was voluntarily initiated by the Lower Loup NRD in collaboration with the Nebraska Department of Natural Resource (NDNR). Groundwater and surface water have been managed independently in the past. However, this plan, called an Integrated Management Plan (IMP), is a water planning document that provides a framework for how the Lower Loup NRD and the NDNR will work collaboratively to manage groundwater and surface water use across an area where the two are hydrologically connected. The IMP was initiated voluntarily by the Lower Loup NRD to ensure that water use is sustainable into the future.

Not only did the Lower Loup NRD volunteer to initiate an IMP, but numerous local stakeholders and other members of the public also volunteered to represent the wide array of water interests and provide invaluable input during the planning process. These stakeholders truly shared the insight and discussions necessary to not only develop a plan, but also to carry it forward into the future. The Lower Loup NRD and the NDNR are grateful for all their time and energy in helping put this plan together. A list of the stakeholder participants and the meeting schedule is included in Appendix B.

1.1 BACKGROUND AND PURPOSE

On January 9, 2004, Nebraska Legislative Bill (LB) 962 was passed, which set the stage for the NDNR and the NRDs to collaborate on the management of groundwater and surface water as a single, integrated resource. LB 962 requires the development of an IMP if a river basin, subbasin, or reach is determined to be fully appropriated by the NDNR. Each year, because of this legislation, NDNR produces a report called the "Annual Evaluation of Availability of Hydrologically Connected Water Supplies." This annual report provides the results of NDNR's evaluation of the expected

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long-term availability of hydrologically connected water supplies for both existing and new surface water uses and existing and new groundwater uses in each of the state's river basins.

On December 16, 2008, NDNR made a preliminary determination that the Lower Platte River Basin, which includes the Lower Loup NRD, was fully appropriated. A basin is considered fully appropriated when certain conditions for hydrologically connected surface water and groundwater are met under Neb. Rev. Stat. §46-713(3). The statute states that a basin is fully appropriated when current uses of hydrologically connected surface water and groundwater will, in the reasonably foreseeable future, cause:

- The surface water supply to be insufficient to sustain over the long term the beneficial or useful purposes for which existing natural-flow or storage appropriations were granted and the beneficial or useful purposes for which, at the time of approval, any existing instream appropriation was granted
- The streamflow to be insufficient to sustain over the long term the beneficial uses from wells constructed in aquifers dependent on recharge from the river or stream involved
- Reduction in the flow of a river or stream sufficient to cause noncompliance by Nebraska with an interstate compact or decree, other formal state contract or agreement, or applicable state or federal laws

The preliminarily determined area included nearly the entire Lower Loup, Upper Loup, and Upper Elkhorn NRDs, and portions of the Lower Platte North, Lower Platte South, Papio-Missouri River, and Lower Elkhorn NRDs. Prior to making a final determination, NDNR held a public hearing in early 2009. Through this hearing, new information was made available that resulted in NDNR reversing the preliminary determination during the Spring of 2009 (Neb. Rev. Stat. §46-714 (12)).

In 2010, Nebraska Legislative Bill (LB) 764 was passed allowing Natural Resource Districts and the Department to work together in a voluntary integrated management planning process. Then, in 2014, the Board of Directors of the Lower Loup NRD adopted a motion to inform NDNR that the Lower Loup NRD intended to develop a voluntary IMP and requested the NDNR's participation. The NDNR approved the Lower Loup NRD's request and the development of this plan began.

This IMP was developed jointly by the Lower Loup NRD and NDNR with the express purpose of achieving and sustaining a balance between water uses and water supplies for the near and long term. The IMP provides the detailed goals, objectives, and action items, both regulatory and non-regulatory, that were developed with stakeholder involvement. This IMP was developed with the understanding that the Lower Loup NRD is not within a fully appropriated river basin; should that designation change, the IMP will be reevaluated. Additionally, the NRD is not subject to any interstate compact or decree or any other formal contract or agreement pertaining to surface water or groundwater use or supplies and so, there was no consideration of this in the IMP.

As this IMP is being entered into on a voluntary basis, the IMP area is not currently fully appropriated. The methodology utilized by NDNR to assess the available supplies and uses in the

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Annual Report will be used to track depletions and gains to streamflow from changes in availability and use. Current supplies are greater than the current level of use and therefore methods to identify water supplies to be used as offsets or for mitigation purposes or an identification de minimus effects are not included in this IMP. Additionally, the IMP area is not subject to any interstate compact or decree, or any other formal contract or agreement pertaining to surface water or groundwater use or supplies.

1.2 AUTHORITY

As authorized in Neb. Rev. Stat. § 46-715(1)(b), "a natural resources district encompassing a river basin, subbasin, or reach that has not been designated as overappropriated or has not been finally determined to be fully appropriated may, jointly with the department, develop an integrated management plan for such river basin, subbasin, or reach located within the district". As part of the requirements, the Lower Loup NRD notified the department of its intention to develop an IMP. A copy of the letters of intent are included in Appendix A. NDNR acknowledged the request, and this IMP was developed and adopted according to Neb. Rev. Stat. §46-715 to 46-717 and subsections (1) and (2) of section 46-718.

1.3 INTEGRATED MANAGEMENT PLANNING PROCESS

The IMP planning process is an adaptive approach to managing Nebraska's hydrologically connected groundwater and surface water. It allows for an integrated inventory of groundwater and surface water supplies and uses; increases collaboration between the entities that manage water resources; enhances public awareness of water resources issues; and increases opportunities to provide input on short- and long-term management of the water resources. An IMP works toward attaining or maintaining a balance between water users and water supplies. In accordance with Section 6.0 Monitoring Plan and Proposed Studies, this IMP may be altered as the affected area or subarea changes and/or more data becomes available to accommodate changing circumstances including hydrology, economics, water demands, and water supplies.

In accordance with Neb. Rev. Stat. §46-717(2), this IMP was developed collaboratively by the Lower Loup NRD and the NDNR, in consultation with the Lower Loup Stakeholder Advisory Committee. The Stakeholder Advisory Committee consisted of a variety of water users representing the following general interest groups: municipal water users, dry land farmers, agriculture industry, groundwater irrigators, surface water irrigators, water recreation, manufacturing/industrial water users, and wildlife conservation (see Appendix B for a complete list of participants). Technical advisory members for the Stakeholder Advisory Committee included representatives from the University of Nebraska-Lincoln and the Nebraska Department of Environmental Quality.

The Stakeholder Advisory Committee met three times throughout 2015 (Appendix B). These meetings helped create and develop the goals, objectives, and action items of this IMP. On

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MONTH XX, 2016, the Lower Loup NRD Board of Directors approved the IMP. On MONTH XX, 2016, the Draft Voluntary IMP was made available to the public for review. On MONTH XX, 2016, a public hearing was held and public testimony on the IMP was taken. The NDNR and Lower Loup NRD reached joint agreement on the IMP in MONTH 2016. The effective date of the IMP is MONTH XX, 2016.

Participants and IMP Development Roles and Responsibilities

2.0 MAP AND DESCRIPTION OF THE INTEGRATED MANAGEMENT PLAN AREA

As part of the process used to develop this IMP, multiple data sources were analyzed. These data sources were used to best report the land use, climate, groundwater, and surface water resources of the Lower Loup NRD. Two maps were generated to better illustrate these data sources, as shown in Appendix C (Figures).

2.1 MAP OF THE INTEGRATED MANAGEMENT PLAN AREA

The Lower Loup NRD is located in central Nebraska and includes all of or portions of Rock, Loup, Garfield, Wheeler, Boone, Platte, Custer, Valley, Greeley, Nance, Sherman, Howard, Butler, Hall, Merrick, and Buffalo counties (Figure 1). The LLNRD is bisected by multiple rivers including the Loup, Cedar, Calamus, North Loup, Middle Loup, Mud Creek, Beaver Creek, and South Loup rivers. The Lower Loup NRD is almost completely contained within the southeastern half of the Loup Basin.

Figure 1 illustrates the boundary of the area included in this IMP. Also illustrated in Figure 1 are the areas within the District where groundwater and surface water are hydrologically connected. As defined by NDNR, a hydrologically connected area is an area where a well pumped for 50 years will deplete the river or a base flow tributary by at least 10 percent of the amount pumped in the 50-year period (the 10/50 area). Hydrologically connected areas are published by the NDNR in the "Annual Evaluation of Availability of Hydrologically Connected Water Supplies" report.

2.2 LAND USE

The Lower Loup NRD covers approximately 5,088,565 acres. Current land uses in the NRD consist of range, pasture, and grasslands (67 percent), irrigated crops (19 percent), dryland crops (10 percent), forested areas (2 percent), urbanized areas and roads (1 percent), and open water and wetlands (1 percent). The most prominent irrigated crops are corn (12 percent of the land area in the NRD and 66 percent of all the irrigated crops in the NRD) and soybeans (5 percent of the land area in the NRD and 25 percent of all the irrigated crops in the NRD; 2005, CALMIT Land Use Data).

2.3 LOCAL HYDROLOGY

As a whole, the Lower Loup NRD receives approximately 22.8 inches of precipitation per year on average (based on 1988 through 2012 records). The amount of average annual precipitation varies across the NRD and increases from west to east. Local precipitation amounts can vary significantly within the growing season and from year to year. Seasonal dry periods and periodic droughts have led many agricultural producers to acquire surface water rights for irrigation or to drill irrigation wells.

The Loup, North Loup, Middle Loup, and South Loup rivers and their tributaries, Calamus and Cedar Rivers are present within the Lower Loup NRD. Most of the Loup River system are gaining streams, that is, most reaches of the stream gain water from the groundwater system. Because streamflow in the Loup River system is almost entirely from groundwater discharge, streamflow is nearly constant throughout the year (Peckenbaugh and Dugan, 1983). Popular recreation areas in the Lower Loup NRD include Davis Creek and Pibel Lake Recreation Areas. Davis Creek is primarily

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used as irrigation storage, and lake levels vary with the time of year. Davis Creek dam and reservoir and part of the North Loup Irrigation Project constructed in the 1980's. Pibel Lake Recreation Area is a 72-acre facility, including a 24-acre lake. Renovations on the lake have taken place in recent years. The Lower Loup NRD has also received a $240,000 grant from the Nebraska Environmental Trust for further renovations. Other important reservoirs in the Lower Loup NRD include the Calamus and Sherman reservoirs.

2.4 GROUNDWATER

The principal groundwater reservoir of the Lower Loup NRD consists of Quaternary sands, gravels, silts, and clays of fluvial origin and silts and clays of eolian origin (Peckenbaugh and Dugan, 1983). During the Quaternary, several periods of fluvial and eolian deposition were followed by periods of glaciation and erosion. The Tertiary Ogallala Formation underlies the Quaternary sediments. The Ogallala is also fluvial is origin and consists of semi consolidated calcareous silt, sand, and sandstone (Peckenbaugh and Dugan, 1983). The Upper Loup NRD GMP (1994) defined the base of the principal groundwater reservoir to be the base of the Ogallala and/or Arikaree Formation. Cretaceous bedrock units underlying the Ogallala consist primarily of shale and chalk and are not considered groundwater reservoirs in the area (Peckenbaugh and Dugan, 1983).

3.0 GOALS AND OBJECTIVES

The purpose of an IMP is to achieve and sustain a balance between water uses and water supplies within the Lower Loup NRD for the long term. The Stakeholder Advisory Committee, working with the Lower Loup NRD and NDNR, developed an appropriate set of goals, objectives, and action items for the IMP that will facilitate sustainable water management in the NRD. Before work began on developing goals and objectives, the Stakeholder Advisory Committee agreed upon the following definitions of goals, objectives, and action items:

- Goals are general statements of broad direction or intent with no time limit. Goals set the stage for meaningful objectives.
- Objectives define the measurable results that a group seeks to accomplish. Generally, an objective is a statement of what will be accomplished.
- Actions items are the specific tasks that the Lower Loup NRD and NDNR will undertake to achieve the goals and objectives.

Four goals and corresponding objectives were developed by the Lower Loup NRD and NDNR, in consultation with the Stakeholder Advisory Committee. Generally these goals and objectives strive to implement water policies that enable sustainable water management, develop a comprehensive water inventory of water supply and demand, and continue educational programs that promote conservation.

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The four goals developed for the IMP are to be implemented simultaneously. As new information is gathered about the water supply and water demands in the NRD, the goals and objectives may be modified, as discussed in Section 8.0. The goals and objectives listed below are supported by detailed action items, as presented in Section 4.0. Action items will be implemented over several years as staff and financial resources are made available for implementation. More information on how progress made toward the goals are measured is provided in Section 7.0.

GOAL 1 – Promote and support a water supply and use inventory based on the best available data and analysis

Objectives

1.1. Develop and maintain a comprehensive inventory of the location and source of the District's current and future water supplies, water uses and outflows.
1.2. Monitor current and future water demands in the basin.
1.3. Use best available science and technology to monitor water supplies.
1.4. Utilize existing policies and authorities of the District and the Department to address water quantity issues.

GOAL 2 – Implement this water management plan to maintain an efficient and economical balance between current and future water supplies and demands

Objectives

2.1 Collaborate with state and local governments to identify opportunities to augment water supplies within the District and, if necessary, identify opportunities to supplement with imported water from outside the District.
2.2 Monitor the instream flow needs in the Lower Platte Basin to foster an understanding of any existing appropriation priorities and locations, and provide a basis for evaluating impacts of existing and future uses.
2.3 Evaluate options for water banking methodologies.

GOAL 3 – Develop and implement water use policies and practices that prioritize and contribute to the protection of existing surface and groundwater uses while allowing for future water development

Objectives

3.1. Identify available water storage opportunities throughout the District.
3.2. Evaluate, understand, and develop policies to address impacts on stream flows resulting from uses outside of management control.

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GOAL 4 – Continue public education programs that encourage water conservation measures

Objectives

4.1. Investigate and promote water use efficiency.

4.2. Continue public education and cost share programs to encourage conservation and best management practices.

4.0 ACTION ITEMS

Action items were developed by the Lower Loup NRD and the NDNR with input from the Lower Loup NRD Stakeholder Advisory Committee. Action items provide a list of the direct tasks to be performed that are necessary to implement the plan. Action items help accomplish the objectives and move toward completion of the goals. Groundwater and surface water controls are action items which are considered regulatory. Action items listed by goal and objective, unless otherwise stated, are considered non-regulatory.

GROUNDWATER AND SURFACE WATER CONTROLS

There are two specific action items that were written in order to comply with Neb. Rev. Stat. § 46-715 (2) as the regulatory groundwater and surface water action items (or controls). These two action items are presented first with further description as to their applicability across the district. In accordance with the statute, the regulatory action items (or controls) shall:

- Be consistent with the goals and objectives of the plan
- Be sufficient to ensure that the state will remain in compliance with applicable state and federal laws and with any applicable interstate water compact or decree or other formal state contract or agreement pertaining to surface water or ground water use or supplies.

Groundwater Action Item (Control)

1. Establish a limit on the expansion of groundwater-irrigated acres.

Groundwater regulatory action items (or controls) implemented by the Lower Loup NRD are set forth in Neb. Rev. Stat. § 46-739 and apply to the groundwater control area as shown in Figure 2 and as listed in Appendix C. The groundwater regulatory action item will work in combination with Lower Loup NRD's Groundwater Management Plan and Rules and Regulations. The District's Rules and Regulations will contain procedural details for the control listed in this IMP. Persons desiring to apply for new groundwater irrigated acres or to increase existing groundwater irrigated acres should contact the Lower Loup NRD to ensure compliance with this IMP. The limit established on the expansion of groundwater irrigated acres is for agricultural production land irrigated from a new groundwater source, typically an irrigation well, and does not include testholes, replacement wells, water wells constructed to pump 50 gallons per minute or less, monitoring or observation

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wells, wells constructed for the purpose of contamination treatment, municipal, industrial, or commercial wells.

Surface Water Action Item (Control)

1. Establish a limit on the expansion of surface water-irrigated acres.

Surface water regulatory action items (or controls) implemented by the NDNR are set forth in Neb. Rev. Stat. § 46-716 and apply to the surface water control area as shown in Figure 2. NDNR will establish an annual limit on the expansion of surface water-irrigated acres. The limit on the expansion of surface water-irrigated acres shall be a maximum of one-third of the amount the Lower Loup NRD will allow for the expansion of groundwater-irrigated acres. NDNR will utilize the number of additional groundwater irrigated acres in place in the IMP area as of January 1 of each year for determining the number of additional acres for surface water irrigated on each calendar year. The limit established on the expansion of surface water irrigated acres is for agricultural production land irrigated from a new surface water appropriation and does not include other types of irrigation use, municipal use, or industrial use.

This limit will only apply to land within the Surface Water Control Area illustrated in Figure 2. Should Lower Loup NRD issue a moratorium on any increase in groundwater-irrigated acres, NDNR will issue a similar moratorium to limit development of additional acres for surface water irrigation. The NDNR is the State agency authorized by Nebraska statutes to regulate surface waters. All diversions of surface water require a State permit that is granted through the NDNR. To obtain a surface water permit, applicants apply through their local NDNR office.

ACTION ITEMS (BY GOAL AND OBJECTIVE)

4.1 ACTION ITEMS FOR GOAL 1

The Lower Loup NRD and NDNR will work together to ensure that they are using their authorities appropriately and collaboratively to manage the groundwater and surface water resources in the District. Throughout this section, either the Lower Loup NRD or NDNR are listed as the lead for completion of the action item as noted in parentheses at the end of the action item. Where they are working together, the lead is listed as "Both."

GOAL 1 – PROMOTE AND SUPPORT A WATER SUPPLY AND USE INVENTORY BASED ON THE BEST AVAILABLE DATA AND ANALYSIS

Goal 1 is designed to develop and implement water management policies and practices that could potentially provide for additional water resources development opportunities while protecting existing surface and groundwater uses.

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OBJECTIVE 1.1 – Develop and maintain a comprehensive inventory of the location and source of the District's current and future water supplies, water uses and outflows.

Action Item 1.1.1 Collect and record relevant groundwater and surface water supply data in mutually agreeable units and format. (Both)

Action Item 1.1.2 Estimate groundwater inflow and outflow using the best available scientific methods. (Both)

Action Item 1.1.3 Maintain a database of surface water inflow and outflows and identify data gaps. (NDNR)

Action Item 1.1.4 Maintain and inventory of all registered wells and surface water appropriations. (Both)

OBJECTIVE 1.2 – Monitor current and future water demands in the Basin.

Action Item 1.2.1 Obtain short- and long-term water use projections from municipalities. (Lower Loup NRD)

Action Item 1.2.2 Identify water users. (Both)

Action Item 1.2.3 Identify downstream demands. (Both)

Action Item 1.2.4 Encourage voluntary water use reporting. (Both)

Action Item 1.2.5 Develop and require a notice for new demands. (Both)

Action Item 1.2.6 Develop estimates of water use from private, domestic, and other unmetered wells. (Lower Loup NRD)

Action Item 1.2.7 The NDNR will continue any existing stream gaging in the Lower Loup NRD and look for new opportunities to enhance the stream gage network. (NDNR)

Action Item 1.2.8 The NDNR will continue to administer surface water rights according to State law and monitor use of surface water to make sure that unauthorized irrigation is not occurring. (NDNR)

Action Item 1.2.9 The NDNR will continue to map and track surface water irrigated acres. The NDNR will also continue to require that project maps are submitted and approved prior to obtaining a surface water permit. (NDNR)

Action Item 1.2.10 The NDNR will implement a voluntary reporting program for surface water irrigation permit holders in the Lower Loup NRD aimed at identifying the quantity of water pumped, the acres irrigated, and the type of irrigation system used. (NDNR)

Action Item 1.2.11 The NDNR will continue to evaluate the necessity for mandatory installation of water flow meters on all surface water pumps for irrigation, industrial, and municipal uses. (NDNR)

Action Item 1.2.12 The NDNR will continue to enforce legislature (Neb. Rev. Stat. §§ 46-290 to 46-294.04) and NDNR rules pertaining to transfers of surface water rights. Should a moratorium be placed on new surface water appropriations in the Lower Loup NRD, the NDNR may grant a variance

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from the moratorium on a case-by-case basis, following the NDNR's rules and regulations. (NDNR)

OBJECTIVE 1.3 – Use best available science and technology to monitor water supplies.

Action Item 1.3.1 Evaluate adequacy of existing groundwater monitoring and existing stream gaging. (Both)

Action Item 1.3.2 Consider the need for additional groundwater monitoring wells and additional stream gaging sites. (Both)

OBJECTIVE 1.4 – Utilize existing policies and authorities of the District and the Department to address water quantity issues.

Action Item 1.4.1 Review and evaluate the District's Groundwater Management Plan relative to the goals and objectives of the IMP. (Lower Loup NRD)

Action Item 1.4.2 Review and evaluate Department policies and practices relative to the goals and objectives of the IMP. (NDNR)

Action Item 1.4.3 Assess the need for additional study of aquifer properties, extents, and connectivity to surface water. (Both)

4.2 ACTION ITEMS FOR GOAL 2

GOAL 2 – IMPLEMENT THIS WATER MANAGEMENT PLAN TO MAINTAIN AN EFFICIENT AND ECONOMICAL BALANCE BETWEEN CURRENT AND FUTURE WATER SUPPLIES AND DEMANDS

Goal 2 is designed to provide valuable water use information to the Lower Loup NRD and NDNR. This information will be used to enhance the understanding of water demands within the District.

OBJECTIVE 2.1 – Collaborate with state and local governments to identify opportunities to augment water supplies within the District and, if necessary, identify opportunities to supplement with imported water outside the District.

Action Item 2.1.1 Evaluate the potential for conjunctive management programs or project opportunities. (Both)

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OBJECTIVE 2.2 – Monitor the instream flow needs in the Lower Platte Basin to foster an understanding of any existing appropriation priorities and locations, and provide a basis for evaluation impacts of existing and future uses.

Action Item 2.2.1 Require an impact analysis on new large groundwater and surface water appropriations. (Both)

Action Item 2.2.2 Work with the appropriate agencies to identify streamflow necessary to protect and maintain public water supply, fish and wildlife, and public recreation. (Both)

Action Item 2.2.3 Review and assess the benefits from instream flow protection. (Both)

OBJECTIVE 2.3 – Evaluate options for water banking methodologies.

Action Item 2.3.1 Coordinate with other entities to identify, and study, opportunities for the development of water banking. (Both)

Action Item 2.3.2 Evaluate potential for additional groundwater and surface water storage within the District to bank future water supplies. (Both)

4.3 ACTION ITEMS FOR GOAL 3

GOAL 3 - DEVELOP AND IMPLEMENT WATER USE POLICIES AND PRACTICES THAT CONTRIBUTE TO THE PROTECTION OF EXISTING SURFACE AND GROUNDWATER USES WHILE ALLOWING FOR FUTURE WATER DEVELOPMENT

Goal 3 is designed to develop and implement water management policies that provide for additional water resources development opportunities while protecting existing surface and groundwater uses including instream flow rights that benefit recreation and wildlife in the Lower Loup NRD.

OBJECTIVE 3.1 – Identify available water storage opportunities throughout the District.

Action Item 3.1.1 Review and analyze existing studies of storage opportunities. (Both)

Action Item 3.1.2 Consider the potential for multi-agency studies of storage opportunities as necessary. (Both)

OBJECTIVE 3.2 – Evaluate, understand, and develop policies to address impacts on stream flows resulting from uses outside of management control.

Action Item 3.2.1 Identify users of streamflow that are outside of management control and their reason for streamflow use. (Both)

Action Item 3.2.2 Assess the impact of streamflow users outside of management control. (Both)

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Action Item 3.2.3 Implement policies that protect streamflow while accommodating users that are outside of management control. (Both)

4.4 ACTION ITEMS FOR GOAL 4

GOAL 4 – CONTINUE PUBLIC EDUCATION PROGRAMS THAT ENCOURAGE WATER CONSERVATION MEASURES

Goal 4 is designed to increase the knowledge of water conservation and effective use within the Lower Loup NRD. The Lower Loup NRD currently has education and informational programs in place, therefore any new initiatives developed to achieve Goal 4 will be coordinated with the current programs.

OBJECTIVE 4.1 – Investigate and promote water use efficiency.

Action Item 4.1.1 Identify and quantify water usage efficiencies through technology, lower water use crops and improved management. (Both)

Action Item 4.1.2 Explore ways for the reuse of water such as the harvesting of rainwater, capture and reuse of storm water, reuse of municipal or industrial gray water, and reuse of irrigation water. (Both)

OBJECTIVE 4.2 – Continue public education and cost share programs to encourage conservation and best management practices.

Action Item 4.2.1 Continue to use existing and develop additional information and education programs that promote wise water use and quantify conservation. (Both)

Action Item 4.2.2 Identify existing and potential cost-share programs. (Lower Loup NRD)

Action Item 4.2.3 Pursue opportunities for public outreach efforts, such as news releases, in order to support water education or programs. (Lower Loup NRD)

5.0 INCENTIVE PROGRAMS

The Lower Loup NRD and NDNR will explore and evaluate cost-share incentive programs that promote water conservation practices. Incentive programs may include any program authorized by state law or federal programs. Water users or landowners may be required to enter into and perform such agreements or covenants concerning the use of land or water as are necessary to produce the benefits for which the incentive programs are established. The Lower Loup NRD will investigate grant opportunities to supplement the annual budgeting process for funding of water conservation practices.

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6.0 FUNDING OPTIONS

In order to implement some of the action items listed in this IMP, the Lower Loup NRD and NDNR will need to secure additional funding sources. Some of the programs, projects, or activities (PPAs) identified in this IMP have multiple benefits. For example, incentive programs that encourage conversion from flood to center-pivot or drip irrigation have been shown to improve water quality. Specifically, the sprinkler and drip irrigation systems reduced nitrate loading on local aquifers. Incentive programs that encourage irrigation system conversions can reduce groundwater withdrawals and also directly impact rural landowners and small communities by preserving a viable source of drinking water. Ultimately, without these types of incentive programs, the communities may be required to construct costly treatment systems or look to distant systems of distribution for clean water. Thus, an incentive program such as irrigation system conversion may have both water quality and water quantity benefits, and funding opportunities to help achieve the goals may be accessed through different funding programs. This section provides information on a variety of funding options that may be used to by the Lower Loup NRD and/or NDNR.

The primary sources of funding for the IMP PPAs are the Natural Resources Conservation Service, Nebraska Department of Environmental Quality, Nebraska Environmental Trust, Nebraska Game and Parks Commission, NDNR, and non-profits. The general criteria and applicability of each of the funding sources are presented. It should be noted, however, that the funding sources presented here are not necessarily inclusive of all funding options available. Additionally, information presented here is subject to change as funding sources may change their terms and criteria.

Federal Funding Opportunities

Natural Resource Conservation Service (NRCS). The 2014 Farm Bill offers conservation programs that benefit both agricultural producers and the environment.

- **Environmental Quality Incentives Program (EQIP).** Through EQIP, technical assistance, cost-share and incentive payments are available to agricultural producers to implement conservation practices that improve water quality, enhance grazing lands, and/or increase water conservation.
- **Conservation Security Program (CSP).** The CSP is available in selected watersheds across the nation. The program is designed to reward farmers and ranchers who are implementing conservation on working lands and to encourage them to do more.
- **Agricultural Management Assistance Program (AMA).** AMA helps agricultural producers use conservation to manage risk and solve natural resource issues.
- **Agricultural Conservation Easement Program (ACEP).** Helps to conserve agricultural lands by preventing the conversions of these lands into non-agricultural lands. This program also acts to protect the restore wetlands.
- **Healthy Forests Reserve Program (HFRP).** The HFRP aids landowners in the restoration, protection, and enhancement of forestland resources on private lands. This program is

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designed to promote the recovery of endangered/threatened species, improve biodiversity, and enhance carbon sequestration.

- **Regional Conservation Partnership Program (RCPP).** The RCPP provides conservation assistance to producers and landowners by combining the authorities of four former conservation programs, the Agricultural Water Enhancement Program, the Chesapeake Bay Watershed Program, the Cooperative Conservation Partnership Initiative, and the Great Lakes Basin Program.

U.S. Department of the Interior – Bureau of Reclamation

- Water-Smart grants are provided to irrigation districts, water districts, and other organizations with water or power delivery to cost-share on projects that conserve and use water more efficiently. The projects should support water sustainability in the west.

State Funding Opportunities

The Nebraska Environmental Trust (NET). The Nebraska Environmental Trust was established in 1992 to conserve, enhance, and restore the natural environments of Nebraska. The Trust especially seeks projects that bring public and private partners together collaboratively to implement high-quality, cost-effective projects.

Nebraska Department of Environmental Quality (NDEQ)

- **Nonpoint Source Water Quality Grants (Section 319).** Under Section 319 of the federal Clean Water Act, the federal government awards funds to the Nebraska Department of Environmental Quality to provide financial assistance for the prevention and abatement of nonpoint source water pollution. This funding is passed through to units of government, educational institutions, and non-profit organizations for projects that facilitate implementation of the state Nonpoint Source Management Plan.

Nebraska Game and Parks Commission (NGPC)

- **Nebraska Wildlife Conservation Fund.** The purpose of this fund is to conserve nongame species and species determined to be endangered or threatened, for human enjoyment, for scientific purposes, and to ensure their continued existence as a part of our natural world.

Nebraska Department of Natural Resources (NDNR)

- **Water Well Decommissioning Fund.** The objective of the Water Well Decommissioning Fund is to encourage proper decommissioning of illegal water wells in the state. This is accomplished through providing financial incentives in the form of cost-share assistance.
- **Nebraska Soil and Water Conservation Fund.** This fund provides state financial assistance to Nebraska landowners for installation of approved soil and water conservation measures that improve water quality, conserve water, and help control erosion and sedimentation.

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- **Small Watersheds Flood Control Fund.** The purpose of this fund is to assist local sponsors with the acquisition of land rights for flood control projects. Local sponsors use the fund to acquire easements or fee title to tracts that are needed to implement a project.
- **Natural Resources Water Quality Fund.** This fund was created to provide state funds to NRDs for their water quality programs.
- **Water Sustainability Fund.** The Water Sustainability Bill (LB 1098) was signed into law during the 2014 legislative session. This bill creates the Water Sustainability Fund, which will be used to address multiple water management and quality issues. This fund will act to improve water quality and usage, supply water management goals, evaluate flood control, and comply with existing interstate agreements and compacts.

Local Funding Opportunities

It is the intent of the Lower Loup NRD to utilize qualified projects described in Neb. Rev. Stat. § 2 3226.04 to provide river-flow enhancement in order to achieve the goals and objectives of the Lower Loup NRD and to achieve the goals and objectives of the NDNR under the Groundwater Management and Protection Act. The Lower Loup NRD may fund projects through one of two ways.

- **Levy Authority (Neb. Rev. Stat. § 2-3225(1) [c]).** This authority allows the Lower Loup NRD to levy an additional property tax of up to three cents per $100 of taxable value for purposes of administering and implementing groundwater management activities and integrated management activities under the Nebraska Groundwater Management and Protection Act. The Revenue Committee amendment to LB 1032 extended the sunset date to fiscal year 2016–17.
- **Occupation Tax (Neb. Rev. Stat. § 2-3226.05).** This authority allows the Lower Loup NRD to levy an occupation tax upon the activity of irrigation of agricultural lands on an annual basis. This tax is not to exceed ten dollars per irrigated acre.

Non-Profit Funding Opportunities

The Nature Conservancy (TNC)

- The Nature Conservancy is the leading conservation organization working around the world to protect ecologically important lands and waters for nature and people. The Conservancy partners with indigenous communities, businesses, governments, multilateral institutions, and other non-profits to pursue non-confrontational, pragmatic solutions to conservation challenges.
- The Conservancy has protected over 107,000 acres in Nebraska through fee-title ownership, easements and deed restrictions, and assisting others with land transactions. TNC works in partnership with farmers and ranchers to promote good stewardship. TNC looks for ways to restore and protect grasslands and rivers.

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Pheasants Forever (PF)

- Pheasants Forever is dedicated to the conservation of pheasants, quail and other wildlife through habitat improvements, public awareness, education and land management policies and programs.
- Nebraska has 60 Pheasants Forever (PF) chapters and 3 Quail Forever (QF) chapter with over 10,388 members. In 2012, Nebraska PF and QF chapters have spent over $4.9 million in the state on 5,456 habitat projects benefiting 148,597 acres.

Ducks Unlimited (DU)

- Ducks Unlimited (DU) is the world's leader in wetlands and waterfowl conservation. DU got its start in 1937 during the Dust Bowl when North America's drought-plagued waterfowl populations had plunged to unprecedented lows. Determined not to sit idly by as the continent's waterfowl dwindled beyond recovery, a small group of sportsmen joined together to form an organization that became known as Ducks Unlimited.
- Nebraska includes diverse wildlife habitats like the Sandhills and the Missouri River floodplain. While most waterfowl migrate to wintering habitats further south each fall, large numbers of mallards and Canada geese do remain in Nebraska during the winter, particularly along the Platte River. DU's highest priority in Nebraska is to protect and restore critical migration habitat in the Rainwater Basin and along the Platte River. It is important that waterfowl arrive in their northern breeding habitats in the Prairie Pothole region in good physical condition, ready to undergo the physically demanding reproductive period. This will be accomplished by providing high quality migration habitat in Nebraska's Rainwater Basin and along the Platte River corridor.

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7.0 MONITORING PLAN AND PROPOSED STUDIES

The overall objective of the monitoring plan is to gather and evaluate data, information, and methodologies that could be used to accomplish the purpose of the IMP.

The Lower Loup NRD and the NDNR have agreed to accomplish the following actions set forth in the monitoring plans as required by Neb. Rev. Stat. § 46-715 (2)(e):

- Gather and evaluate data, information, and methodologies that could be used to accomplish the purpose of this IMP.
- Increase understanding of the surface water and hydrologically connected groundwater system.
- Test the validity of the conclusions and information upon which the IMP is based.

The NDNR will be responsible for collecting, tracking, evaluating, and reporting the following activities within the IMP Area on an annual basis:

- Department stream gage measurements on NDNR maintained gages
- Surface water permits issued, cancelled or denied
- Irrigation water use data collected
- Other data as agreed to

The Lower Loup NRD will be responsible for collecting, tracking, evaluating, and reporting the following activities within the IMP Area on an annual basis:

- Groundwater level measurements
- Stream gage measurements on NRD maintained gages
- Municipal, commercial and industrial water use
- Agricultural / irrigation water use
- Certified irrigated acres and any changes to certifications
- Well water construction permits approved, cancelled or denied
- Variances granted, cancelled or denied
- Water transfer permits granted, cancelled, or denied
- Water banking transactions (if a water banking system is established)

The Lower Loup NRD and the NDNR will jointly evaluate the data and information gathered for accuracy and flag data that may require closer inspection and reviews. In addition, the Lower Loup NRD and the NDNR will review annual water use data to historically reported water usage data to evaluate the impacts of new water users on existing water users within the IMP Area.

The Lower Loup NRD and NDNR will jointly, or separately, issue an annual report.

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The NDNR has developed a methodology, in conjunction with several of the Loup River Basin NRDs, to quantitatively assess the hydrologically connected groundwater and surface water of the State for use in the Annual Evaluation of Hydrologically Connected Water Supplies. This methodology will be used to monitor the balance of water supplies within the IMP Area. This methodology will be updated with the best available data and analysis as provided by the Lower Loup NRD and the NDNR.

8.0 MODIFICATIONS TO THE INTEGRATED MANAGEMENT PLAN

Lower Loup NRD and NDNR will hold an annual review to evaluate the IMP. Action items undertaken by the Lower Loup NRD and NDNR will be reviewed to determine if these items are fulfilling the goals and objectives of the IMP. The NDNR and Lower Loup NRD will jointly determine if amendments to the IMP are necessary. Amendments to the IMP will require agreement by both parties. If amendments to the IMP are necessary, the Lower Loup NRD and NDNR will hold a joint hearing and issue the pertinent orders to formally adopt the revised IMP.

9.0 INFORMATION CONSIDERED IN DEVELOPMENT OF THIS PLAN

The following were sources of information used in the preparation of this IMP:

- Historic data on streamflows in the Lower Loup NRD and adjoining NRDs
- Past and present surface water use within and bordering the Lower Loup NRD
- Data on groundwater supplies and groundwater uses within and bordering the Lower Loup NRD
- Records on climate and precipitation trends within the Lower Loup NRD and adjoining NRDs
- Records on land use within the Lower Loup NRD and adjoining NRDs
- Stakeholder Involvement Plan for the Lower Loup NRD, 2015
- Rules and regulations for groundwater management within the Lower Loup NRD

10.0 GLOSSARY OF TERMS

Action Item – A specific task that the Lower Loup NRD or NDNR (or both) will undertake to achieve the goals and objectives of the Integrated Management Plan.

Aquifer - An underground geological formation of sand, soil, gravel, and rock able to store and yield water. Alluvial aquifers are comprised of unconsolidated materials such as sand and gravel. Bedrock aquifers are comprised of rock.

Appropriation – A permit to use water that has been perfected in accordance with terms stipulated by the NDNR.

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Conjunctive management – An adaptive process that utilizes the connection between surface water and groundwater to maximize water use, while minimizing impacts to streamflow and groundwater levels.

Fully Appropriated – A determination made by the NDNR that a river basin, subbasin, or reach has reached a point where water uses are equal to water supplies.

Goal – A general statement of broad direction or intent with no time limit.

Groundwater – Water that occurs in or moves, seeps, filters, or percolates through ground under the surface of the land.

Groundwater Control Area - That portion of the Lower Loup NRD where groundwater is hydrologically connected to surface water (see Figure 2).

Groundwater management plan – The Lower Loup NRD's plan that identifies the water quantity and quality characteristics, supplies, uses, data collection methods, management objectives, and management areas of groundwater supplies within an NRD.

Hydrologically connected – An area where groundwater and surface water are interconnected, and withdrawals from one can affect the other. To determine if an area is hydrologically connected (as defined in Nebraska State Statute), one calculates if a well pumped for 50 years will deplete the river or a base flow tributary by at least 10 percent of the amount pumped in the 50-year period (the 10/50 area).

Integrated Management Plan – A document to manage a river basin, subbasin, or reach to achieve and sustain a balance between water uses and water supplies for the long term.

Lower Loup NRD – The Lower Loup Natural Resources District, a political subdivision of the state.

NDNR – The Nebraska Department of Natural Resources, a state agency.

NRD – Natural Resources District, a political subdivision of the state

Objective – A statement that defines the measurable results that a group seeks to accomplish.

River basin – The land area that is drained by a river and its tributaries.

Stakeholder Advisory Committee – Representatives from various interest groups and professional fields who provide consultation on aspects of the Integrated Management Plan.

Surface water – Water that is on the Earth's surface, such as a stream, river, lake, or reservoir.

Surface Water Control Area – That portion of the Lower Loup NRD that drains to the Platte River (see Figure 2).

Subbasin – A portion of a river basin that is drained by a waterway.

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APPENDIX A

Letters Initiating the IMP Process

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LOWERLOUP
NATURAL RESOURCES DISTRICT

2620 Airport Drive
Ord, Nebraska 68862-0210
PHONE (308) 728-3221
FAX (308) 728-5669
www.llnrd.org

February 25, 2014

Mr. Brian Dunnigan, P.E.
Director
Nebraska Department of Natural Resources
301 Centennial Mall South
Lincoln, Nebraska 68509-4676

Dear Director Dunnigan,

The Lower Loup Natural Resources District's Board of Directors, at their meeting on January 23, 2014, unanimously approved a motion to pursue an integrated management plan with the Department of Natural Resources. A copy of the item taken from the January, 2014, board minutes is enclosed with this letter.

This letter is the Lower Loup NRD's notification to the Department of Natural Resources of its intent to discuss options with DNR on the joint development of a voluntary integrated management plan in accordance with Sections 46-715 through 46-717 and Subsections (1) and (2) of Section 46-718. The Lower Loup NRD is committed to remaining proactive in its groundwater management activities, and the development of a comprehensive long-term integrated management plan seems a logical next step in this mission. The Lower Loup NRD has already compiled a significant amount of data and has initiated numerous rules, regulations and action items toward the protection of both surface water and groundwater resources. The Lower Loup NRD is hopeful a process can be initiated and a working plan developed with DNR in a suitable amount of time.

We look forward to meeting with DNR staff to initiate this process and explore the options available to us in the development of an IMP. Please advise us of a good time to meet and discuss this matter.

Thank you for your attention.

Sincerely,

Leon Koehlmoos
General Manager

Enclosure

Voluntary Integrated Management Plan

Callan said that an integrated management plan is required if a basin becomes fully-appropriated. Although the lower Platte River Basin is not fully-appropriated, Callan said the committee recommended looking into a voluntary plan, which would allow the Lower Loup NRD access to additional funding sources and is looked on favorably by members of the Legislature.

Callan said the plan has five requirements and would be a joint plan by the NRD and DNR that looks at groundwater/surface water interaction and the management of it.

There was discussion on groundwater restrictions, controls, and funding.

Callan said the NRD already has a lot of the information that is needed for the plan. Koehlmoos commented that the law says that if an integrated management process is started, the NRD would have three years, with the option of two more years, to complete the plan. He felt that it wouldn't take long to write up. He said there is oversight from the state which has a say in any rules and regulations that deal with integrated management plans.

Koehlmoos reminded the Board that this would be a 'voluntary' plan, and if the NRD gets partway through the plan and decides not to pursue it, the process can be discontinued. He said there is more leniency with a voluntary plan. Eventually, a plan will need to be written, whether it's voluntary or required.

There was discussion on banked acres, LB-517 task force, review of the plan, whether or not a plan would be beneficial, and staff time needed to complete the plan.

Thoene motioned, seconded by Adams, that the Lower Loup NRD pursue a voluntary integrated management plan. Motion carried by roll call vote, all present voting yes.

Dave Heineman
Governor

STATE OF NEBRASKA
DEPARTMENT OF NATURAL RESOURCES
Brian P. Dunnigan, P.E.
Director

March 5, 2013

IN REPLY TO:

12804

Gary Kruse, Chairman
Lower Loup Natural Resources District
2620 Airport Drive
PO Box 210
Ord, NE 68862-0210

Dear Mr. Kruse:

The Department is pleased to receive the Lower Loup Natural Resources District's February 25, 2014, letter stating the District's intent to develop a voluntary integrated management plan (IMP) per *Neb. Rev. Stat.* § 46-715(1)(b). The Department agrees with the District that developing an IMP is an appropriate step to continue proactive water planning.

Department staff will be contacting your District to discuss details and the next steps in the integrated management planning process. The Department looks forward to developing the IMP with the District, in addition to furthering the effective working relationship between the District and the Department.

Sincerely,

Brian P. Dunnigan

Brian P. Dunnigan, P.E.
Director

cc: Leon Koehlmoos, General Manager

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APPENDIX B
Stakeholder Advisory Committee

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Lower Loup Natural Resources District Voluntary Integrated Management Plan
Stakeholder Advisory Committee*

First Name	Last Name	Affiliation
Mike	Archer	Government, Water Recreation
Ryan	Chapman	Government
Shane	Cool	Municipal, Groundwater Irrigator, Dry Land Farmer
Miles	Danner	Groundwater Irrigator
Craig	Frenzen	Groundwater Irrigator, Dry Land Farmer, Surface Water Irrigator, Ag Industry
Clifford	Hanna	Groundwater Irrigator, Dry Land Farmer, Surface Water Irrigator
Dick	Harrington	Groundwater Irrigator, Dry Land Farmer, Surface Water Irrigator, Water Recreation
David	Haupt	Banking
Lex	Jeffres	Groundwater Irrigator, Dry Land Farmer, Surface Water Irrigator
Matt	Jeffres	Sand/Gravel Industry
Tim	Kayton	Groundwater Irrigator, Dry Land Farmer, Surface Water Irrigator, manufacturing/Industry, Ag Industry, Banking
Tom	Knutson	Municipal, Surface Water Irrigator, Ag Industry, Government
Jason	Kock	Ag Industry
Alphonse	Kowalski	Groundwater Irrigator, Dry Land Farmer, Surface Water Irrigator, Ag Industry, Wildlife, Water Recreation
John	Kriha	Groundwater Irrigator, Dry Land Farmer, Wildlife
John	Krohn	Groundwater Irrigator, Dry Land Farmer
Drew	Luebe	Manufacturing/Industry
Rex	Mahoney	Realtor
Mark	McGuire	Groundwater Irrigator, Dry Land Farmer
Joe	Novotny	Dry Land Farmer, Surface Water Irrigator
Corey	Schaaf	Groundwater Irrigator, Ag Industry
Gerry	Sheets	Surface Water Irrigator
Michael	Spotanski	Dry Land Farmer, Surface Water Irrigator
Brad	Stephens	Groundwater Irrigator, Dry Land Farmer, Ag Industry
Mark	Stock	Groundwater Irrigator, Realtor
Neal	Suess	Municipal, Government, Water Recreation
Allen	Volf	Dry Land Farmer
Mike	Wells	Surface Water Irrigator
Richard	Woollen	Groundwater Irrigator, Dry Land Farmer, Government

* This list only includes those who attended one or more meetings.

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Appendix C
Figures

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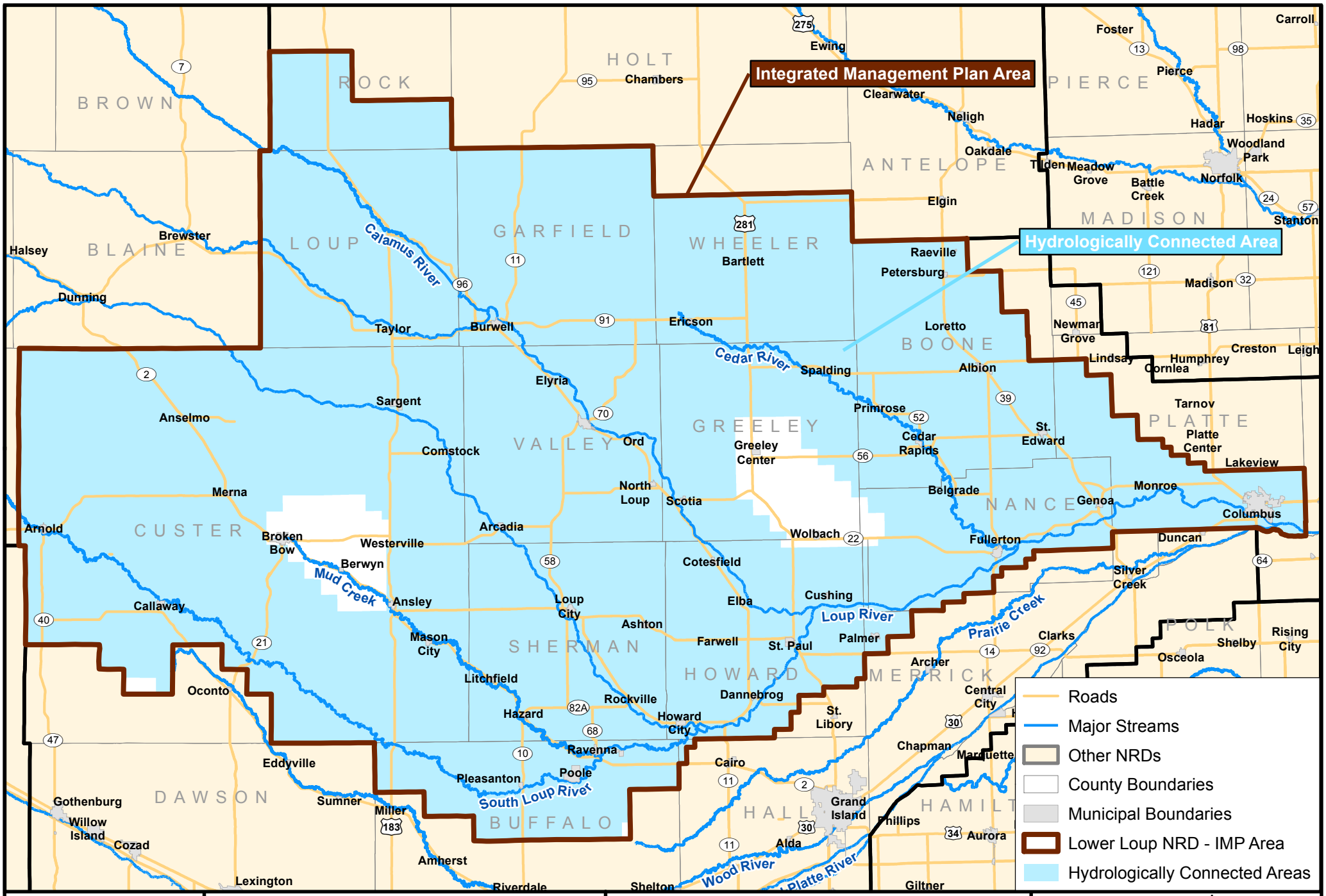
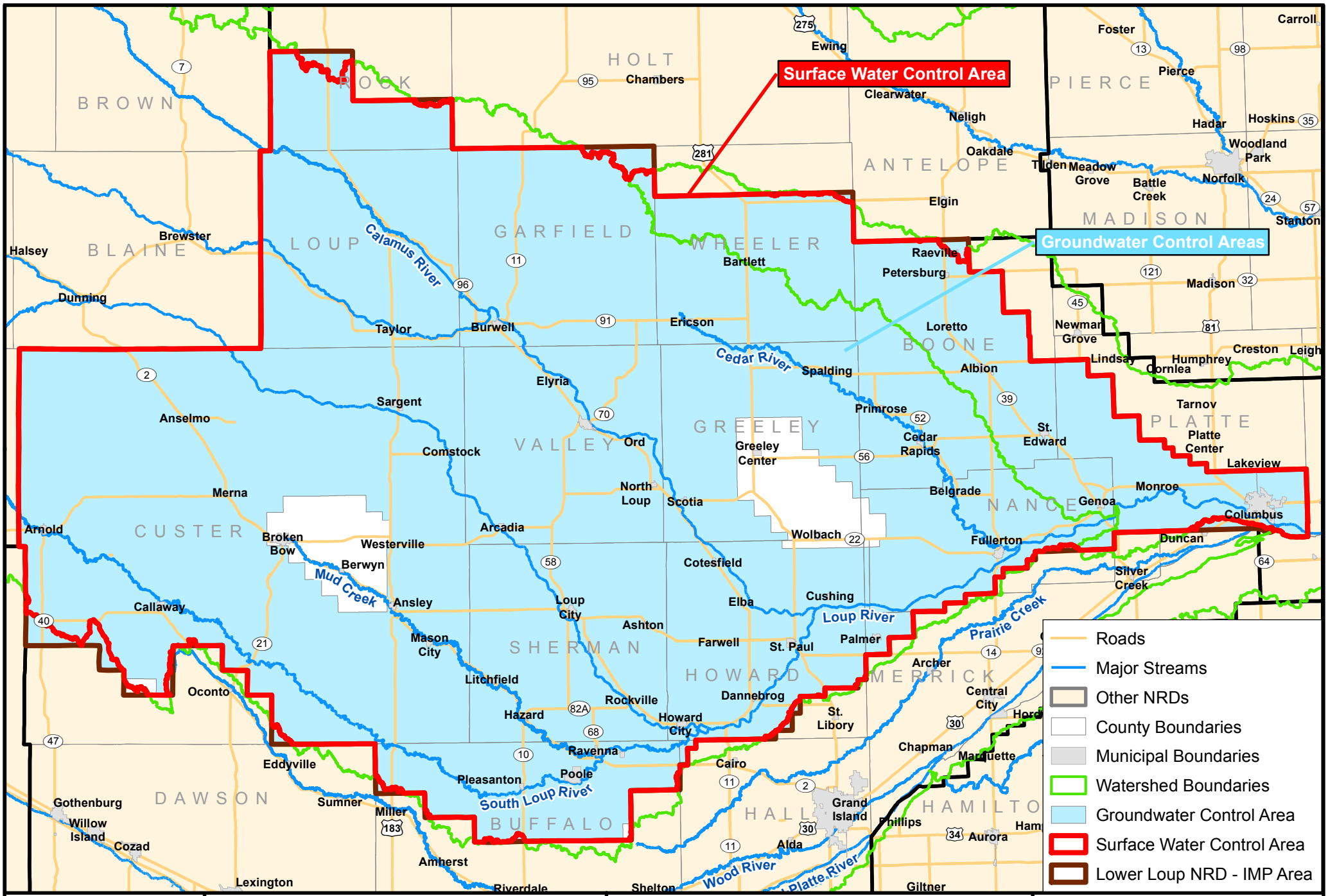


Figure 1. General Location Map of the Integrated Management Plan Area

Sources: NDNR - NRD Bound, Hydrologically Connected Areas; USGS - National Hydrography Dataset; U.S. Census Bureau - Roads, County Boundaries, Municipal Boundaries



LOWERLOUP NATURAL RESOURCES DISTRICT

0 15 30 Miles

1 inch = 15 miles

Figure 2. Detailed Location Map of the Groundwater and Surface Water Control Areas

Sources: NDNR - HUC04 Watersheds, NRD Bound, Hydrologically Connected Areas; USGS - National Hydrography Dataset; U.S. Census Bureau - Roads, County Boundaries, Municipal Boundaries