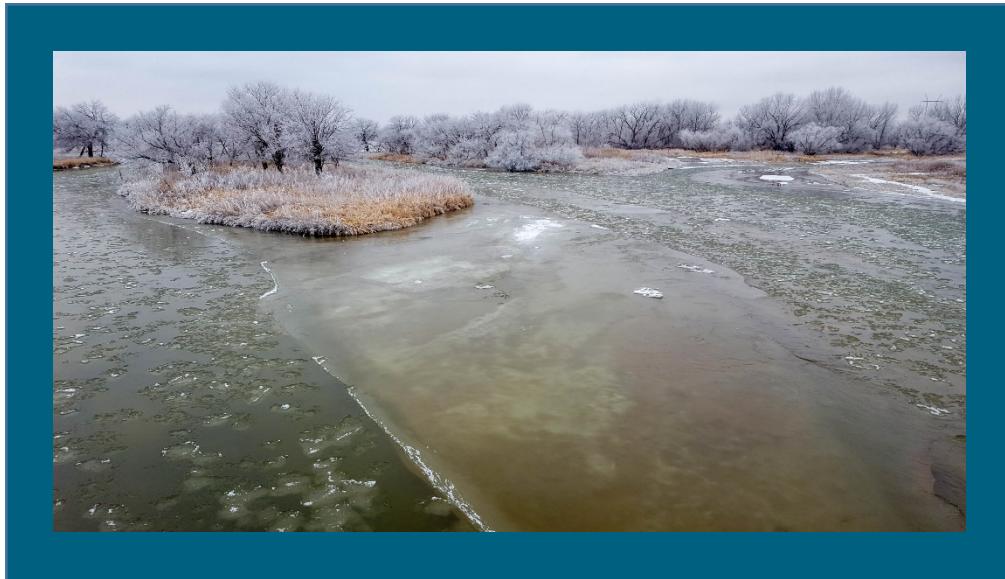


**DRAFT**

Tri-Basin Natural Resources District  
Upper Platte River Basin  
Integrated Management Plan



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**Table of Acronyms and Abbreviations**

AF	Acre-Feet or Acre-Foot
CNPPID	Central Nebraska Public Power and Irrigation District
COHYST	Cooperative Hydrology Study
CPNRD	Central Platte Natural Resources District
CREP	Conservation Reserve Enhancement Program
EQIP	Environmental Quality Incentives Program
ESA	Endangered Species Act
ET	evapotranspiration
ILCA	Interlocal Cooperative Agreement
IMP	Integrated Management Plan
INSIGHT	Integrated Network of Scientific Information and GeoHydrologic Tools
<i>Neb. Rev. Stat.</i>	Nebraska Revised Statutes
NeDNR	Nebraska Department of Natural Resources
NET	Nebraska Environmental Trust
NNPD	Nebraska New Depletion Plan
NPNRD	North Platte Natural Resources District
NRCS	Natural Resources Conservation Service
NRD	Natural Resources District
Post-1997	Refers to water uses initiated or expanded on or after July 1, 1997
PBC	Platte Basin Coalition
PRRIP	Platte River Recovery Implementation Program
SPNRD	South Platte Natural Resources District
TBNRD	Tri-Basin Natural Resources District
TPNRD	Twin Platte Natural Resources District
WCIP	Water Conservation Incentive Program
WRCF	Water Resources Cash Fund
WWUMM	Western Water Use Management Model

## 1: EFFECTIVE DATE

This second increment joint Integrated Management Plan (IMP) for the Upper Platte River Basin within Tri-Basin Natural Resources District was adopted by the Tri-Basin Natural Resources District on \_\_\_\_\_, and by the Nebraska Department of Natural Resources on \_\_\_\_\_. The IMP became effective on \_\_\_\_\_.

## 2: AUTHORITY

This Upper Platte River Basin IMP was cooperatively prepared by the Board of Directors of Tri-Basin Natural Resources District (TBNRD or the District) and the Nebraska Department of Natural Resources (NeDNR) in consultation and collaboration with the TBNRD Upper Platte stakeholders group in accordance with *Neb. Rev. Stat.* §§ 46-715 through 46-720.

## 3: BACKGROUND

TBNRD is responsible for protecting the soil and water resources of Gosper, Phelps, and Kearney counties. Euro-American settlement of the Upper Platte River Basin in the District dates back to the establishment of Fort Kearney in 1848. Groundwater irrigation commenced in the early 1920s in the Platte River Valley. The development of turbine water pumps in the 1930s enabled deeper wells to be drilled, so that the tablelands south of the valley could be irrigated as well. More than 100,000 acres of cropland within the Upper Platte River Basin portion of TBNRD are irrigated with water diverted from the Platte River and distributed through the canals of the Central Nebraska Public Power and Irrigation District (CNPPID), which were constructed beginning in 1935. Surface irrigation water and the canals that distribute it enhance recharge of groundwater supplies within the District. In addition to helping sustain groundwater supplies, incidental recharge from canal seepage and canal water irrigation, has increased streamflows in Platte and Republican tributary streams. Groundwater levels saturated soil and sub-soil in parts of northern Phelps and Kearney counties, requiring CNPPID and TBNRD to construct drainage ditches (Improvement Project Areas) in an attempt to stabilize groundwater levels below the crop root zone. TBNRD has designated portions of the Upper Platte River Basin as a "High Groundwater Management Area" pursuant to Rule 8.6 of the TBNRD *Rules and Regulations for Management and Protection of Land and Water Resources* for purposes of stabilizing the groundwater table at levels that minimize harm to agricultural land. Widespread conversion of irrigation delivery systems from gated pipe and open ditch to center pivots in the 1990s and early 2000s increased irrigation efficiency and reduced irrigation runoff and seepage.

The Upper Platte River Basin west of Highway 183 in TBNRD was declared overappropriated by NeDNR on September 15, 2004. The Upper Platte River Basin east of Highway 183 was declared fully appropriated by NeDNR on April 21, 2006.

Water disputes in the Upper Platte River Basin date back to early Nebraska history. TBNRD has been involved in Upper Platte River Basin water issues since it was established in 1972. Most recently, TBNRD directors and staff have actively participated in committee

meetings of the Platte River Recovery Implementation Program (PRRIP)<sup>1</sup>. This program initiates and manages certain land and water resources to provide defined benefits for four species in Nebraska that are listed as threatened or endangered by the federal and state governments. It is intended to provide Endangered Species Act compliance for water users in the Upper Platte River Basin upstream of Columbus, Nebraska.

This IMP represents the second increment of the integrated water planning process and therefore supersedes the first increment joint Integrated Management Plan for the Upper Platte River Basin within the District. The first increment plan became effective on September 15, 2009, and remained effective until the adoption of this current increment plan.

#### 4: MAP AND MANAGEMENT AREA BOUNDARIES

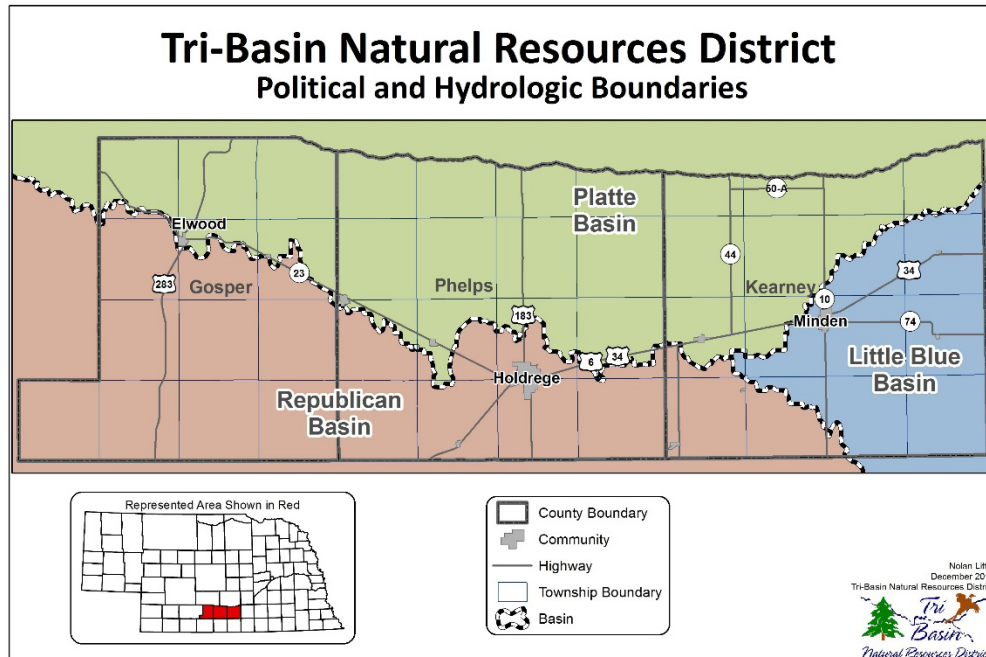
Tri-Basin Natural Resources District encompasses portions of the Republican, Platte and Little Blue River Basins (see Figure 1). Each of the three counties in the District also contain numerous non-tributary wetlands, known as "Rainwater Basins". Their watersheds range in size from a couple hundred acres up to the 28,000-acre Sacramento Creek basin. The District also contains a large area spanning portions of all three basins that is characterized by groundwater levels that are higher than historic "pre-development" groundwater elevations.

The TBNRD board of Directors declared the Republican Basin and the Upper Platte River Basin west of US Highway 183 as both a phase one groundwater quantity management area and as an integrated water management area, effective September 15, 2004. The Upper Platte River Basin east of US Highway 183 and some adjacent sections within the Little Blue river basin were declared as a phase one groundwater quantity management area and an integrated water management area, effective June 15, 2006. The area subject to this IMP is the area of the District within the Upper Platte River surface water basin, as shown in Figure 1. The goals, objectives, and action items described in this IMP pertain to that entire area of the District. The stratigraphic boundaries subject to this IMP include all sediments from ground level downward through all aquifer units.

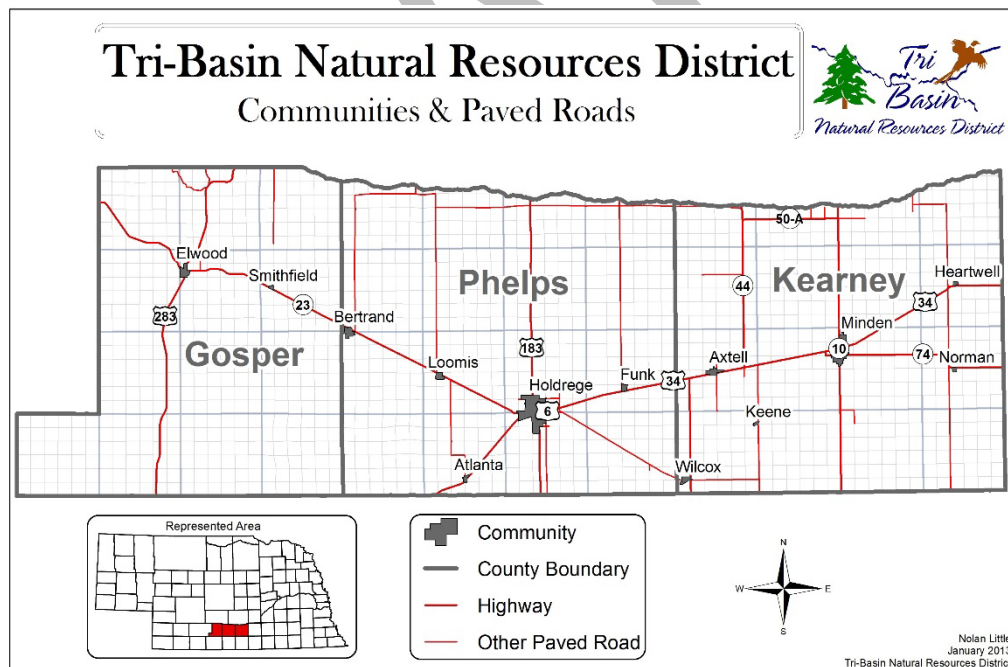
Additional maps of TBNRD, its management areas, and river basins are located in Appendix C.

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<sup>1</sup> More information regarding PRRIP can be found at <https://dnr.nebraska.gov/water-planning/platte-river-recovery-implementation-program>.



**Figure 1.** Political and hydrologic boundaries of TBNRD. The green Platte Basin area is the portion of the NRD to which this IMP applies.



**Figure 2.** Communities and paved roads within TBNRD.

## 5: VISION

The vision (overall goal) of this IMP for TBNRD is to “work cooperatively with District residents and others to promote good stewardship of land and water resources.”

TBNRD’s mission is to “manage, conserve and protect the District’s land and water resources.” This mission will be accomplished by protecting the quality and quantity of surface water and groundwater, reducing soil erosion and flooding, promoting agricultural best management practices, forestry, and wildlife habitat preservation. These tasks can only be accomplished by working cooperatively with local residents and agencies of local, state, and federal government.

## 6: FUNDING

Funding for regulatory and non-regulatory activities described in this plan will derive from several sources. NeDNR receives funds appropriated by the Nebraska Unicameral for water resources management and administration. The primary funding source for natural resources districts is property taxes. Both entities also seek out and use grants from various federal, state, local and private entities. The Nebraska Environmental Trust has also been a generous supporter of water management activities in the Upper Platte River Basin.

TBNRD also intends to use qualified projects described in *Neb. Rev. Stat. § 2-3226.04* to provide river-flow enhancement to achieve the goals and objectives of TBNRD and to achieve the goals and objectives of the State under the PRRIP and the requirements of the *Nebraska Ground Water Management and Protection Act (Neb. Rev. Stat. §§ 46-701 to 46-456)*. TBNRD may pay for such projects by issuing river-flow enhancement bonds, which will be repaid using one or more of the revenue sources (property tax levies or an occupation tax) authorized by *Neb. Rev. Stat. § 2-3226.01 et seq.*, funds granted to TBNRD by the State or Federal government, or the levy authority authorized by *Neb. Rev. Stat. § 2-3225*.

Funding priorities identified in this plan include:

- Reductions in consumptive water use
- Enhancements to water supplies
- Maintenance of existing projects or implementation proposed projects to meet goals of this IMP
- Data acquisition and maintenance, and model improvements for IMP implementation

The ability of NeDNR and TBNRD to implement the goals, objectives, and action items for this IMP, including their ability to meet the implementation timeline and intermediate deadlines set forth herein, may be limited by the availability of resources, including (but not limited to) funding or staff resources.

If limited resources prohibit completion or initiation of a specific management action, or if they delay the ability of NeDNR or TBNRD to complete a task by an established deadline, such limitations and delays will be discussed by NeDNR and TBNRD. If such a delay results in the need for revisions to this IMP, the necessary revisions will be made following the procedures set forth in Chapter 10.9.



## 7: SCIENCE AND METHODS

NeDNR and Tri-Basin NRD, Central Platte NRD, North Platte NRD, South Platte NRD, and Twin Platte NRD (Upper Platte River Basin NRDs) will use the best readily available science, data, and methods when implementing and reviewing the second increment Upper Platte River Basin IMPs. This maintains consistency with state statute and the first increment processes and methodologies. Consistency in the science, data, and methods used to evaluate water management actions across the basin is paramount to provide a common basis for comparison of the effectiveness of various water management actions, regardless of location. Statutes and prudent scientific practices call for clear and transparent procedures to track depletions and accretions. NeDNR and TBNRD, working in cooperation with the other four Upper Platte River Basin NRDs, will jointly develop and agree to all of the data, science, and methods used for the implementation, review, and evaluation of this IMP. The methodologies may be revised upon review of any new information, data, and science by the NeDNR and the Upper Platte River Basin NRDs. The action items in Chapter 10 reference actions outlined within this chapter that are instrumental to the implementation and review of the IMP. This chapter briefly overviews the data, science, and methods used in the first increment and describes how this will continue into the current increment.

### 7.1 Best Available Science, Methods, Data, and Tools Used in the First Increment

The first increment and associated implementation of the NNDP used the Cooperative Hydrology Study (COHYST)<sup>2</sup> model as the best available tool to determine both groundwater depletions and set mitigation targets for each Upper Platte River Basin NRD. The analysis used to determine the targets for the first increment is described in the 2008 COHYST report<sup>3</sup>. This analysis set the basis for the procedures for the Upper Platte River Basin NRDs and NeDNR to perform consistent, ongoing analysis throughout the first increment. Consistency in evaluation is crucial in order to compare the results from the analysis used to determine targets with the results of the analysis to determine how particular management actions meet those targets.

The Upper Platte River Basin NRDs and NeDNR developed an annual protocol to evaluate IMP progress<sup>4</sup>. This protocol used tools developed from the COHYST model to assess the changes in consumptive water use and resulting streamflow changes from annual permit activity. The annual protocol methods are consistent the IMP targets derived from the 2008 COHYST report to provide a valid comparison. The annual process was used each year and results of those analyses can be found on the NeDNR website<sup>5</sup>.

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<sup>2</sup> More information on the COHYST 2010 Model can be found at <https://cohyst.nebraska.gov>

<sup>3</sup> Luckey, R. R. (2008). Estimated Stream Baseflow Depletion by Natural Resources District in the Nebraska Platte Basin due to Gained and Lost Groundwater Irrigated Land after July 1, 1997. Aurora, CO: High Plains Hydrology, LLC. Retrieved from <https://dnr.nebraska.gov/water-planning/upper-platte-river-publications>

<sup>4</sup> The protocol document, Basin-Wide Technical Committee Guidance Document – Procedures for Annual Accounting Review and Robust Review to Assist Integrated Management Planning and Facilitate Reporting to the Platte River Recovery Implementation Program, can be found at <https://dnr.nebraska.gov/water-planning/other-upper-platte-river-documents>

<sup>5</sup> Annual reports for the Upper Platte River Basin can be found at <https://dnr.nebraska.gov/water-planning/upper-platte-basin-wide-meetings-and-annual-reports>

Evaluation of the initial COHYST model led to identification of two major opportunities for refinement. First, the massive expanse of the COHYST model area is now modelled as two separate areas, the Western Water Use Management Model (WWUMM) area and the COHYST 2010 area, due to distinct and significant differences in geology, climate, land use, and water management that require a difference in the approach to modelling in the two areas. Lake McConaughy was chosen as the point of division for the two model areas. Second, splitting the COHYST model area required a reconstruction and recalibration of the groundwater models. This fundamental reorganization and rebuilding of the models means that neither model is consistent with the original 2008 COHYST report modeling analysis and results. Therefore, these models do not offer a direct comparison with the targets as described within the first increment IMP. Modifications to the original 2008 COHYST report analysis are necessary to redefine the targets for a true comparison with the newer modelling tools.

#### **7.1.1 COHYST 2010**

The COHYST 2010 Model includes a portion of the Upper Platte River Basin, extending westward from Chapman to the upstream end of Lake McConaughy. This model is used for the Central Platte NRD, Twin Platte NRD, and TBNRD. The goal of COHYST 2010 is to support water management to maintain the region's extensive irrigation economy and protect river habitats used by endangered species. This goal is accomplished through reasonable and replicable model analysis to determine depletions and accretions that result from various water management actions.

The revised model improves the parties' overall understanding of basin hydrology. The first increment Robust Review used this updated understanding and science for all aspects of the analysis. Application of these tools and understanding resulted in refined estimates of post-1997 depletions that are typically greater than the original estimates included in the first increment plan. The Robust Review also provided estimates of the first increment offsets achieved by each of the Upper Platte River Basin NRDs. A description of the Robust Review can be found in Section 8.3 of this IMP.

#### **7.2 Best Available Science, Methods, Data, and Tools to be Used in Ongoing Increments**

There are several basin-wide tenets regarding best available science, data, and methods that the Upper Platte River Basin NRDs and NeDNR will follow while implementing their respective IMPs. NeDNR and the Upper Platte River Basin NRDs will:

1. Maintain, improve, or acquire data and modeling tools, such as the COHYST 2010 model, land-use, climate data, and other programs or projects needed to implement and assess the progress of this IMP.
2. Use the models or data and tools derived from the COHYST 2010 model to analyze potential management actions, conduct an annual review of progress of the IMP, perform the next Robust Reviews, and carry out any relevant studies identified in this IMP or the Basin-Wide Plan.
3. Use conceptually consistent methods uniformly across the basin for IMP and Basin-Wide Plan compliance-based analysis, such that stream depletion estimates or calculations performed in one area of the basin are comparable to stream depletion estimates or calculations in another area of the basin. The concept "uniformly across the basin" in this IMP means using consistency in analysis, and is not intended to

dictate that the same methods be used throughout the basin. Rather, the intention is to indicate methodologies must be scientifically based and proven as conceptually consistent equivalents through either the scientific literature or independent evaluation of NeDNR and the Upper Platte River Basin NRDs.

4. Use methods consistent with the analysis and tools used to develop the IMP targets when evaluating progress toward achieving current IMP targets. If necessary, new tools will be used to re-evaluate targets as well as progress toward those targets; in either case both the targets and the values estimating progress will be developed in a conceptually consistent manner so that they can be compared.
5. Maintain and expand model applications through collaboration with other model users.
6. Agree to substantial changes to the model before using those changes to evaluate the IMP and management actions. Such changes may include hydrologic properties or refinements of model grids.
7. Periodically review the accretion and depletion estimates and the methodology used in the analysis that generates these estimates. Understanding of the basin hydrology will continue to evolve as new supporting data and information are gathered and evaluated. Due to the improved data, information, and tools, it is anticipated that, through agreement by NeDNR and the Upper Platte River Basin NRDs, the values for depletions or accretions from the Robust Review may change.
8. Share advances or updates to data, models, analysis tools, or hydrological understanding with the public. Methods, tools, and data used will be made available to the stakeholders and the public, as described in the Basin-Wide Plan. The process for incorporating new information and results into this IMP and/or supporting appendices will include a public hearing, as discussed in Section 10.9 of this IMP.

### **7.3 Information Considered in Developing this IMP**

Information used in the preparation of this IMP and to be used in the subsequent implementation of this IMP can be found in the list below. These materials can be obtained by contacting TBNRD or NeDNR.

- The Order Declaring Formal Moratoriums in the Matter of the Platte River Basin above the Mouth of the Loup River, the North Platte River Basin, and the South Platte River Basin, et al. Dated July 14, 2004. (Appendix E)
- The Order Designating Overappropriated River Basins, Subbasins, or Reaches, and Describing Hydrologically Connected Geographic Area, in the Matter of the Platte River Basin upstream of the Kearney Canal Diversion, the North Platte River Basin, and the South Platte River Basin. Dated September 15, 2004. (Appendix F)
- The Order of Final Determination of River Basins, Subbasins, or Reaches as Fully Appropriated, and Describing Hydrologically Connected Geographic Area in the Matter of the Portion of the Platte River Basin Upstream of the Loup River Confluence, the North Platte River Basin, and the South Platte River Basin within the South Platte Natural Resources District, the Twin Platte Natural Resources District, and the Central Platte Natural Resources District. Dated September 30, 2004. (Appendix G)
- The TBNRD *Groundwater Management Plan*

*Draft for Board Approval 6/18/2019*

- The TBNRD *Rules and Regulations for Management and Protection of Land and Water Resources*
- The *Integrated Management Plan Jointly Developed by the Tri-Basin Natural Resources District and the Nebraska Department of Natural Resources*, with an effective date of September 15, 2009 (first increment)
- The *Basin-Wide Plan for Joint Integrated Water Resources Management of Overappropriated Portions of the Platte River Basin, Nebraska*, with an effective of September 11, 2009 (first increment)
- The second increment Upper Platte Basin-Wide Plan
- COHYST, COHYST 2010, and WWUM Models
- The Upper Platte River Basin 2019 Robust Review Analysis
- The Upper Platte River Basin Total Depletions Analysis
- The Upper Platte River Basin INSIGHT Analysis
- The Nebraska New Depletion Plan of the Platte River Recovery Implementation Program
- Information developed by and data collected for the Platte River Recovery Implementation Program
- Applicable Nebraska Revised Statutes
- *Department of Natural Resources Rules for Groundwater, Title 456, Neb. Admin. Code*
- *Department of Natural Resources Rules for Surface Water, Title 457, Neb. Admin. Code*
- The items listed in *Department of Natural Resources Rules for Process and Procedures, Title 454, Neb. Admin. Code*
- Additional data on file with the TBNRD and NeDNR.

## 8: FIRST INCREMENT ACCOMPLISHMENTS

### 8.1 Studies Conducted and Information Obtained in the First Increment

The Upper Platte River Basin NRDs and NeDNR conducted several studies in the first increment, which were specifically identified by the IMPs. Large amounts of information and data were collected and used in these studies and other analyses. The purpose was to help evaluate the potential effectiveness of various strategies in achieving the goals and objectives of that IMP and to help gage progress during the first increment.

#### 8.1.1 Assessing Available Water

##### 8.1.1.1 Surface Water

A study of unappropriated surface water, and its availability in time and location, was conducted during the first increment; see reports by HDR and The Flatwater

Group, Inc. (2010<sup>6</sup>, 2013<sup>7</sup>). A list of existing surface water appropriations within the basin was compiled as part of the study of unappropriated surface water (HDR and The Flatwater Group, Inc. 2010). It was determined that there are times when unappropriated surface water is available in the basin for relocation or retiming projects. Specifically, NeDNR determined that between 1954 and 2008 there were excess flows available in some years. Most excess flow events occurred in May and June. Some events were in excess of 30,000 acre-feet (AF). A planning tool was developed to estimate amount, duration, and frequency of excess flow by reach.

#### **8.1.1.2 Groundwater**

To assist in assessing available groundwater, TBNRD certified all groundwater irrigated acres and other uses of groundwater. This information continues to be maintained in a database of certified acres, which tracks transfers, corrections, adjustments, retirements and other changes in consumptive use related to certified acres.

### **8.1.2 Conservation Measures Study**

#### **8.1.2.1 Phase I**

The Flatwater Group, Inc. completed Phase I of a conservation study in 2013 and provided the results in a Final Technical Memorandum<sup>8</sup>. The purpose of the Phase I study was to assess which conservation measures<sup>9</sup> the Upper Platte River Basin NRDs should consider implementing and also to assess potential methods for developing basin-wide estimates of impacts to streamflow of the conservation measures in the fully appropriated and overappropriated areas of the basin.

Phase I provided a matrix which assessed the assumed magnitude of impact to streamflow of varying intensity for each conservation measure, as well as the required resources and cost of each method. The matrix also provided information on the effect to overland runoff, recharge, and net effect on evapotranspiration (ET) of each conservation measure of varying intensity. Conservation measures assessed included structural (e.g., terraces, dams, canals, etc.) and non-structural (e.g., tillage, irrigation management and efficiency, crop rotation, soil monitoring, buffers, etc.) measures.

#### **8.1.2.2 Phase II**

From the Phase I study, two conservation measures, 1) changes in tillage practices, and 2) improvements in irrigation efficiency, were identified and were subsequently assessed in the Phase II study for their impacts on surface water

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<sup>6</sup> HDR and The Flatwater Group, Inc. (2010). Evaluation of Historic Platte River Streamflow in Excess of State Protected Flows and Target Flows. Retrieved from <https://dnr.nebraska.gov/water-planning/upper-platte-river-publications>

<sup>7</sup> HDR and The Flatwater Group, Inc. (2013). Evaluation of Historic Platte River Streamflow in Excess of State Protected Flows and Target Flows, Technical Memorandum. Retrieved from <https://dnr.nebraska.gov/water-planning/upper-platte-river-publications>

<sup>8</sup> The Flatwater Group, Inc. (2013). *Final Technical Memorandum of Conservation Study*. Retrieved from <https://dnr.nebraska.gov/water-planning/upper-platte-river-publications>

<sup>9</sup> The Final Technical Memorandum defines conservation measures as “practices designed to control or prevent soil erosion, enhance the beneficial use of precipitation and irrigation water, or reduce non-beneficial water consumption.”

and groundwater<sup>10</sup>. To analyze the effects that the two conservation measures had on both surface water and groundwater, each conservation measure was modeled and results were compared to a baseline model scenario. Two scenarios were developed for each conservation measure, a low and high bookend of their potential effects, using historical tillage practices and low irrigation efficiencies, and using no-tillage practices and high irrigation efficiencies, respectively.

#### **A. Changes in Tillage Practices**

In the surface water model scenarios, the no-tillage scenario resulted in a reduced the net irrigation requirement (NIR), corresponding to reduced river diversions, upstream storage releases, and co-mingled pumping, but overall minimal impact on the streamflow at the Lewellen gage. In the groundwater model scenarios, no-tillage resulted in increased baseflow and increased recharge.

#### **B. Changes in Irrigation Efficiency**

In the surface water models, the high efficiency scenario reduced NIR by approximately 30 percent, significantly increased crop consumptive use (as expected in water short systems), and reduced return flow. The increased consumptive use is often met by more efficient use of river diversions, and a significant reduction in upstream releases and co-mingled pumping. The low efficiency scenario resulted in higher streamflow due to reduced crop consumptive use and increased return flows during the non-irrigation season. The conservation measures caused the greatest impact on streamflow during dry years.

The groundwater models found that the effects of each practice varied between Upper Platte River Basin NRDs. North Platte NRD saw an increase in baseflow as a result of low efficiency irrigation, likely due to additional recharge from surface water diversions/canals along the North Platte River. The other Upper Platte Basin NRD's saw an increase in baseflow as a result of high efficiency irrigation, likely due to reduced groundwater withdrawals. High efficiency irrigation decreased recharge for all the Upper Platte River Basin NRDs.

Overall, relatively minor net surface water supply benefits result from increasing irrigation efficiency, primarily due to additional crop consumption and that in areas the reliant on surface water for delivery of irrigation supplies the increased efficiency of water delivery may have negative impacts on the water supply. High efficiency irrigation resulted in reduced groundwater pumping but also reduced groundwater recharge in all five Upper Platte River Basin NRDs. No-tillage practices resulted in reduced groundwater pumping and increased groundwater recharge in all five Upper Platte River Basin NRDs. As a result of these findings, additional ongoing efforts to evaluate the impacts of tillage practices are underway. It is

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<sup>10</sup> INSERT PROPER CITATION FOR THE POAC Area Conservation Measures Study – Irrigation Efficiency and Tillage Strategy. (2017) compilation of Wilson Water Group and Adaptive Resources, Inc.

expected that these updated findings will be integrated into future technical evaluations.

### **8.1.3 Conjunctive Management Study**

In 2011, HDR and The Flatwater Group, Inc. published the Conceptual Design of a Conjunctive Management Project Study<sup>11</sup>. The objectives of this study were to identify general elements, potential approaches, and constraints necessary for planning and evaluation of conjunctive management projects. Findings were then used to evaluate several hypothetical projects involving the Western Canal to illustrate the application of these concepts. Although the Western Canal, a 20-mile canal that diverts from the South Platte River, is located in South Platte and Twin Platte NRDs, the concepts from this case study are applicable basin-wide.

Conjunctive management<sup>12</sup> involves managing surface and groundwater together to maximize storage, timing, and use of the resource. For successful conjunctive management projects, identification and quantification of surface water and groundwater supplies is essential. Projects generally include three components, 1) diversion of surface water, 2) recharge facilities, and 3) use of the water. Project impacts (e.g., water yield, water quality, economics, the environment, etc.) and alternatives must be considered, as well as legal constraints. A monitoring plan should also be developed to assess project performance. All of these components were then used in a case study to evaluate several hypothetical conjunctive management projects on the Western Canal.

### **8.1.4 Inventory of Sandpits and Small Reservoirs**

As part of Nebraska's commitment to the PRRIP, NeDNR has been charged with estimating the cumulative impacts of new or expanded, unregulated surface water activities. Therefore, in 2013, NeDNR conducted an inventory and analysis of sandpits and reservoirs with capacity below 15 AF throughout Upper Platte River Basin<sup>13</sup>. This analysis used multi-temporal aerial imagery from 2005 and 2010, and implemented remote sensing techniques to delineate and compare the number, size, and distribution of these water bodies. Baseline data generated from 2005 imagery were compared to 2010 imagery in order to identify changes in the overall surface areas of these unregulated water bodies within the basin. Once these new or expanded water bodies were identified, the Natural Resources Conservation Service (NRCS) ET calculator was used to estimate the resulting change in consumptive use due to ET.

The inventory component of the study was extremely labor intensive and required approximately 2,500 labor hours to identify, measure, and categorize over 13,000 remotely sensed features. After comparing data from both years, the study found 94 new or expanded sandpits and 9 new reservoirs. New and expanded sand pits

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<sup>11</sup> HDR and The Flatwater Group, Inc. (2011). Conceptual Design of a Conjunctive Management Project. Retrieved from <https://dnr.nebraska.gov/water-planning/upper-platte-river-publications>

<sup>12</sup> The Conjunctive Management Study defines conjunctive management as "the coordinated and planned use and management of both surface water and groundwater resources to maximize the availability and reliability of water supplies in a region to meet various water needs."

<sup>13</sup> Zoller, A. (2014). 2005 – 2010 Consumptive Use of Small Man-made Water Bodies in the Platte Surface Water Basin Above Columbus [PowerPoint Presentation]. Retrieved from <https://dnr.nebraska.gov/water-planning/upper-platte-river-publications>



represented a cumulative increase in open water surface area of 728 acres and new reservoirs were responsible for a cumulative increase of 19 acres for a total of 747 new acres of unregulated surface water throughout the basin from 2005 to 2010.

Once the change in open water acreage attributed to unregulated surface water was determined, the NRCS calculator was used to estimate the resulting change in consumptive use due to ET. The results of the NRCS analysis found a pronounced decrease in consumptive use due to ET during the growing season with a modest increase in consumptive use during the non-growing season. Additionally, the NRCS analysis identified a very slight increase in consumptive use due to new reservoirs, which was consistently distributed across all months. Ultimately, the NRCS analysis estimated that the increase in unregulated surface water acreage from 2005 to 2010 resulted in a net decrease in consumptive use of 678 AF per year throughout the basin. The results of this study were presented to the PRRIP Water Advisory Committee on May 6, 2014.

### **8.1.5 Augmentation Well Study**

TBNRD initiated Phase I of the North Dry Creek Augmentation Project in 2011 to supplement flow in the Platte River by pumping wells in the High Plains Aquifer and discharging the water into North Dry Creek Ditch, which is a tributary to the Platte River. In 2014, an evaluation of the augmentation project was conducted by HDR and a subsequent Augmentation Report<sup>14</sup> was published estimating the net effects on the Platte River, and potential Phase II expansion of the project.

An analytical stream depletion model and the draft COHYST 2010 groundwater model were used to estimate project performance for a 26-year period. The models showed stream depletion from the pumping of the augmentation well largely mimicked the pumping pattern and showed a long-term stream depletion factor of approximately 45 percent. The COHYST 2010 model results were expected to be more realistic in that it considers all potential surface water and groundwater interactions and considers actual flows and operational conditions.

To review the 2011-2013 augmentation well operation, data on groundwater levels and pumpage of the augmentation and nearby wells were collected, in addition to stream flow at the North Dry Creek gaging station.

A sensitivity analysis was performed for the distance between the augmentation well and both the North Dry Creek and the Platte River. Results showed a decrease in stream depletion factor from approximately 42 percent to 15 percent as the well was moved from 0.25 miles to 4.0 miles from North Dry Creek, and a decrease from approximately 90 percent to 49 percent from the Platte River. The Platte River was twice as sensitive to stream depletion as the North Dry Creek.

A sensitivity analysis was also performed for two different operating schedules: 1) pumping for eight weeks continuously and 2) pumping for two weeks on and two weeks off, for 16 weeks. Results showed that the pumping schedules were nearly

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<sup>14</sup> HDR. (2014). Tri-Basin Natural Resources District and Nebraska Department of Natural Resources Augmentation Well Evaluation Report. Retrieved from <https://dnr.nebraska.gov/water-planning/upper-platte-river-publications>



identical, so the interrupted schedule was no more advantageous than the continuous schedule.

Phase II of this project is identical to Phase I, with the same key goal to offset depletive effects in the Platte River from post-1997 development in TBNRD. The location of the Phase II well is approximately four miles upstream of the Phase I well on North Dry Creek. The Augmentation Report also analyzed the stream depletion for the Phase II augmentation well and found similar results, with overall lower depletions and an estimated stream depletion of 40 percent. Recommendations were included for future augmentation well siting.

Conclusions from the Augmentation Report include 1) a strong degree of interconnection between surface water and groundwater during no or low flow conditions in North Dry Creek and therefore wells should not be operated when there is no flow in the creek. 2) Stream depletion estimates of the Phase I well was 45 percent, and was 40 percent for the Phase II well. 3) The Platte River was twice as sensitive to depletion as North Dry Creek mainly due to higher aquifer transmissivity and streambed conductance. 4) Varying the well operation schedules has little to no long-term benefit. Finally, 5) locating wells further from the stream greatly reduces the long-term depletive effects of the augmentation project.

## **8.2 Summary of Management Actions in the First Increment**

TBNRD placed a moratorium on construction of new wells to serve newly developed irrigated cropland and a moratorium on development of additional irrigated acres. NeDNR continued the formal moratorium on all new surface water appropriations for the Upper Platte River Basin including the TBNRD.

NeDNR and TBNRD have cooperated to construct wells to augment streamflows in North Dry Creek (a Platte River tributary), participate in the United States Department of Agriculture Conservation Reserve Enhancement Program (CREP), and contract with CNPPID to divert excess flows from the Platte River into CNPPID's Elwood Reservoir, canal systems, and federally-owned Rainwater Basin wetlands to provide groundwater recharge and offset depletions to streamflow resulting from groundwater pumping.

The first increment IMP also called for several administrative actions regarding groundwater management. These actions were carried out by the TBNRD:

1. The Moratorium on new uses of groundwater was maintained with variances offered to allow new uses in situations where landowners can offset all depletions associated with those uses.
2. Rules regulating physical transfers of groundwater and relocation of certified irrigated acres are enforced by the TBNRD. TBNRD's rules allow relocation of groundwater uses when such transfers result in no new net depletions to the Platte River or its tributaries.

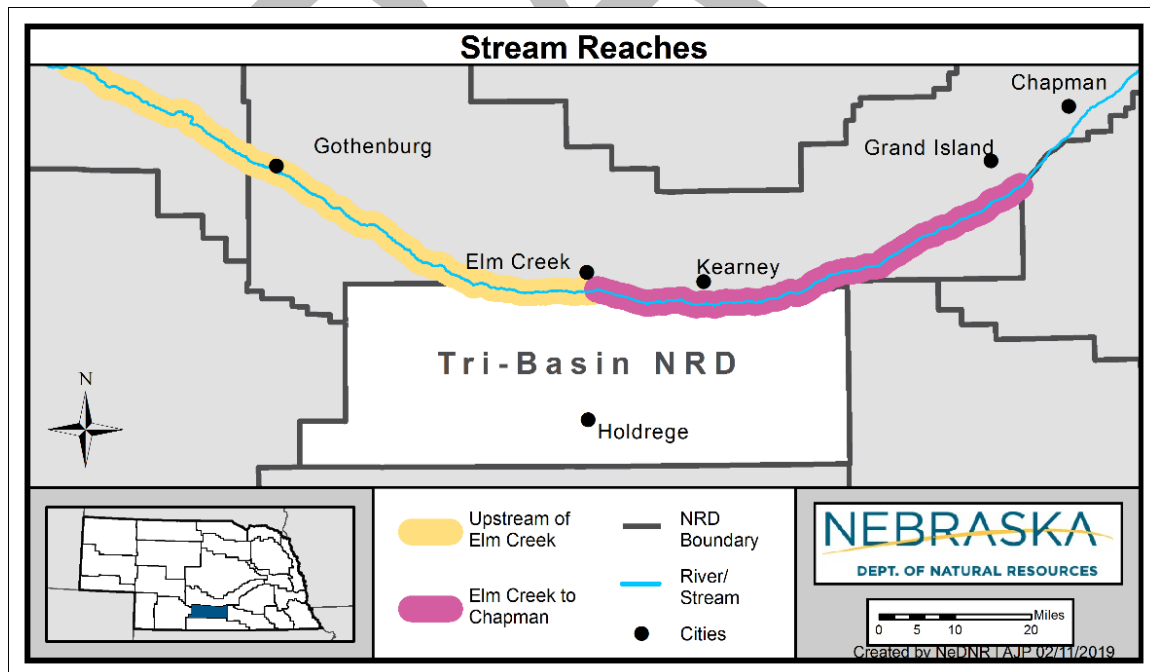
## **8.3 Assessment of the First Increment (2019 Robust Review)**

As required by statute, NeDNR and the Upper Platte River Basin NRDs conducted a Robust Review, finalized in 2019, of the progress made toward achieving the goals and objectives following the process outlined in the first increment IMP. The previous IMP outlined the process for the Robust Review in order to compare the results of that analysis with the 2008 COHYST report (Section 7.1). The 2019 Robust Review was an update of that study.

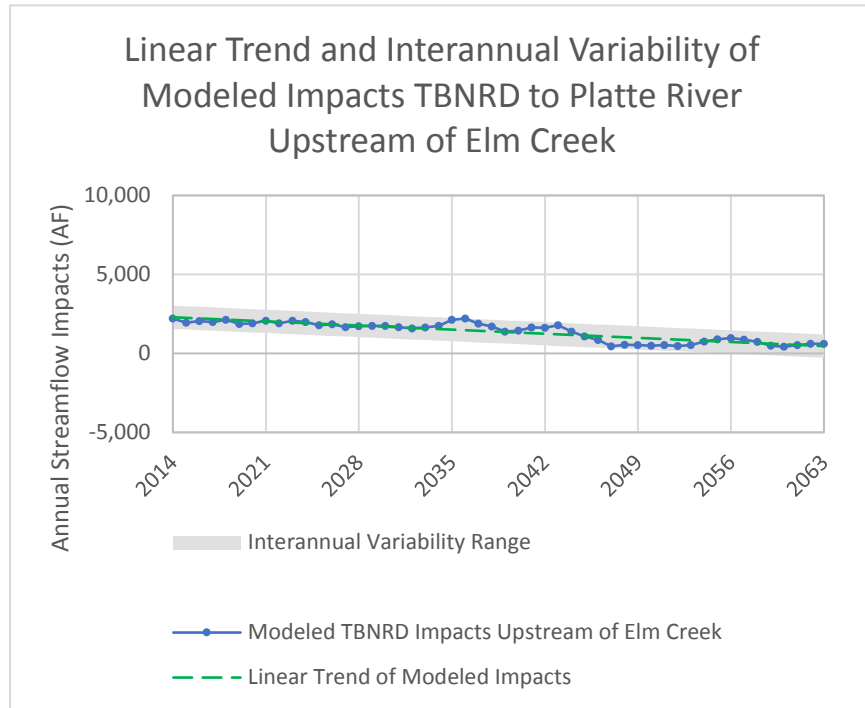
The evaluation used data and information from the annual reports and updates developed in support of Basin-Wide Plan and NNDP implementation.

This evaluation provides summarized estimates of the streamflow impacts resulting from gained and lost irrigated land, controls, expansion and contraction of municipal and industrial uses, managed groundwater recharge, stream augmentation, and permitted uses that occurred through 2013. The 2019 Robust Review is a synthesis of all of these efforts and provides summarized updates of new targets that will be used to guide current increment planning goals and objectives.

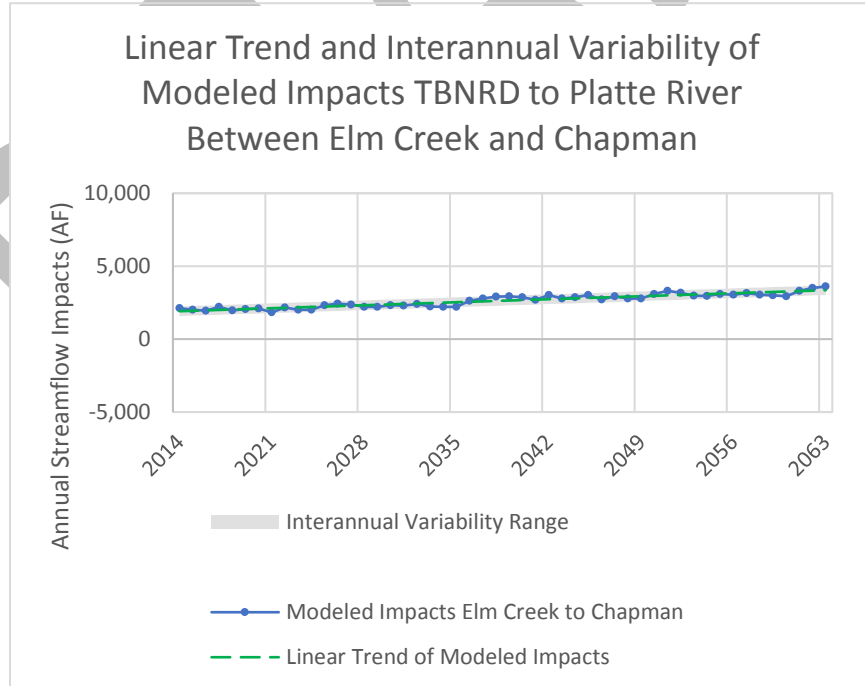
The 2019 Upper Platte River Basin Robust Review report outlines the methods, limitations, and results of the most recent Robust Review and represents the best available science to support current increment planning. The general method for conducting the Robust Review can be found in Section 10.7.3.2. Figures 4 and 5 below illustrate the results for the TBNRD for the period of 2014-2063 from this most recent Robust Review conducted by the NeDNR. Positive values for streamflow impacts indicate accretions and negative values indicate depletions. The charts display the modeled post-1997 impacts of groundwater-only irrigation, municipal and industrial development, allocations, groundwater irrigated acres retirements, streamflow augmentation, and groundwater recharge activities within the TBNRD for the two stream reaches impacted by the TBRND, as shown in Figure 3. Again, the impacts of changes, activities, and actions taken through 2013 are reflected in the results but any changes, activities, or actions occurring after 2013 were not analyzed in this Robust Review and are therefore not shown in the data. A linear trend line has been added to the modeled impacts from 2014 through 2063, and the inter-annual variability range of modeled impacts across the trend shown by the grey band.



**Figure 3.** Stream reaches analyzed in the Robust Review



**Figure 4.** Modeled TBNRD post-1997 impacts to the Platte River upstream of Elm Creek, the linear trend line of the modeled impacts from 2014-2063, and the inter-annual variability range of modeled impacts across the trend



**Figure 5.** Modeled TBNRD post-1997 impacts to the Platte River between Elm Creek and Chapman, the linear trend line of the modeled impacts from 2014-2063, and the inter-annual variability range of modeled impacts across the trend

Potential future offsets and management actions are impacted by the variability in climate, therefore the trend line is shown to smooth out the potential future effects of climate variability and the grey inter-annual variability band encapsulates a potential range of impacts.

It is recognized that while they were not analyzed during this robust review, several excess flow diversions for recharge occurred after 2013 during the first increment that would also provide accretions to the stream. Other actions, such as retirements and land use changes after 2013, provided additional accretions but were not part of this Robust Review analysis.

#### **8.4 Assessment of Fully Appropriated**

There are several factors that play a role in assessing the difference between the current level of development and a fully appropriated conditions in the Upper Platte River Basin. Identifying this difference is critical in tracking progress toward a fully appropriated condition. The *Nebraska Ground Water Management and Protection Act* requires that determination of the difference between current and fully appropriated levels of development account for: (1) cyclical supply, including drought; (2) the portion of the difference that is due to conservation measures; (3) the portion of the overall difference due to water uses initiated prior to July 1, 1997; and (4) the portion of the overall difference due to water uses initiated or expanded on or after July 1, 1997. A more complete description of all of the factors that are used to assess the difference between current levels of development fully appropriated conditions are outlined in Appendix 1 of the Total Depletions Report<sup>15</sup>. Several publications have been developed to support evaluation of these components (see Conservation Measures Study, 2019 Robust Review, INSIGHT analysis) and are further described below.

##### **8.4.1 Streamflow Impacts from Uses Initiated Prior to July 1, 1997, and after July 1, 1997 (Total Depletions)**

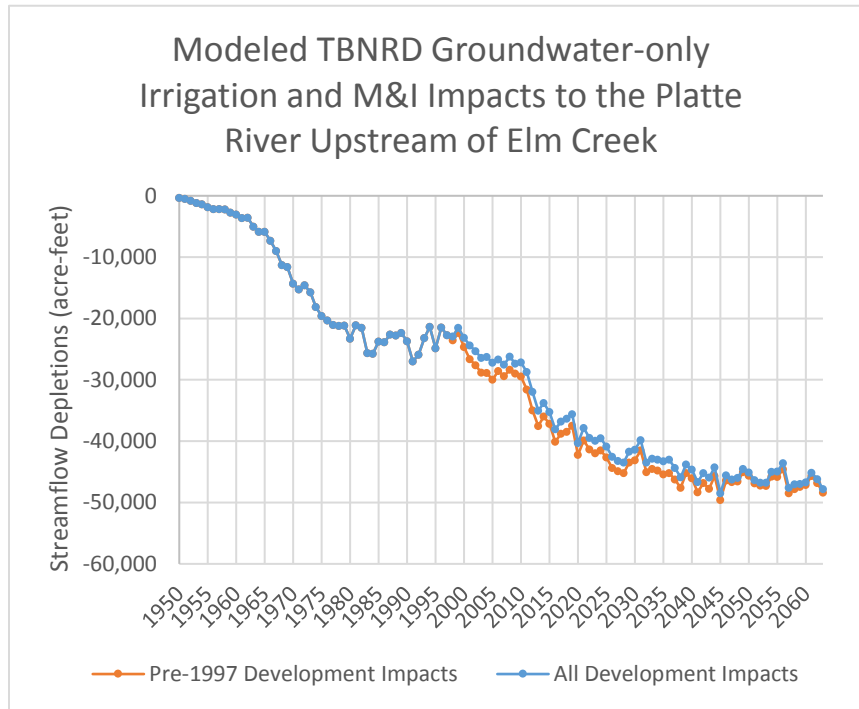
This evaluation provides summarized estimates of the streamflow impacts resulting from development of groundwater-only irrigated lands prior to July 1, 1997, and from development through to 2013 within each Upper Platte River Basin NRD, for the reaches upstream of Elm Creek. The 2019 Robust Review report provides a separate evaluation of the streamflow impacts resulting from gained and lost irrigated land, controls, municipal and industrial expansion and contraction, managed recharge, stream augmentation, and permitted uses initiated or expanded on or after July 1, 1997, within each Upper Platte River Basin NRD. The projections of future stream baseflow effects will be reviewed and updated through the course of the second increment, with future evaluations guiding any necessary refinements and modifications to the planning goals, objectives, actions, and controls.

In Figure 6, the modeled streamflow impacts to the Upper Platte River upstream from Elm Creek from all groundwater-only irrigation and municipal and industrial development within the District with offsetting management actions, including allocations, groundwater irrigated acre retirements, and recharge projects on the Upper Platte River upstream of Elm Creek, are shown. Also shown are the modeled streamflow impacts from all groundwater-only irrigation and municipal and industrial

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<sup>15</sup> (Need Citation)

development prior to 1997. The difference between the two lines is the impact from post-1997 activities



**Figure 6.** Modeled TBNRD streamflow impacts to the Platte River upstream of Elm Creek from all groundwater-only irrigation and municipal and industrial (M&I) development with offsetting management actions and the streamflow impacts from development pre-1997

#### 8.4.2 Conservation Measures

As previously noted in Section 8.1, significant effort has been focused on developing an approach to assessing the impacts of conservation measures. The first phase of this work focused on identifying conservation measures thought to be most impactful on water supplies and use. This phase resulted in the development of a matrix that assessed the assumed magnitude of impact to streamflow of varying intensity for each conservation measure, as well as the required resources and cost of methods that could be used to support further quantification. The matrix also provided information on the effect to overland runoff, recharge, and net effect on ET of each conservation measure of varying intensity. Conservation measures assessed included structural (e.g., terraces, dams, canals, etc.) and non-structural (e.g., tillage, irrigation management and efficiency, crop rotation, soil monitoring, buffers, etc.) measures.

The second phase of this effort focused on further quantifying the impacts resulting from changes in tillage practices and irrigation efficiencies. The results of this work were presented to the basin-wide stakeholders with general conclusions as follows:

- Relatively minor net water supply benefits result from increasing efficiency, primarily due to additional crop consumption and that in areas the reliant on

surface water for delivery of irrigation supplies the increased efficiency of water delivery may have negative impacts on the water supply.

- Increased implementation of minimum tillage practice can reduce on-farm ET and increase recharge, but will likely result in decreased runoff contributions to streams. Overall increasing the practice of minimum tillage can have a net water supply benefit of approximately one to three inches per acre depending on the location and existing farming practices.

As a result of the second phase findings additional ongoing efforts to evaluate the impacts of tillage practices changes are underway. It is expected that these updated findings will be integrated into future technical evaluations.

#### **8.4.3 Evaluation of Cyclical Supplies and Demands (INSIGHT)**

The INSIGHT methodology is an approach to assessing the balance between water supplies and water demands within a basin. INSIGHT consolidates data from several sources, including NeDNR, the United States Geological Survey, the United States Bureau of Reclamation, and local NRDs. Those hydrologic data are used to conduct an analysis of the following items at the basin and subbasin level:

1. Groundwater and surface water supplies available for use
2. Current demands on these supplies
3. Long-term impacts on these water supplies due to on-going uses
4. Balance between water supplies and demands.

The overall concept was to examine basin water supplies and total water demands to estimate the water availability within the basin. The INSIGHT analysis used data from 1988-2012 and took into account basin water supply, total demands, and the effects of timing of uses, lag impacts, and water storage.

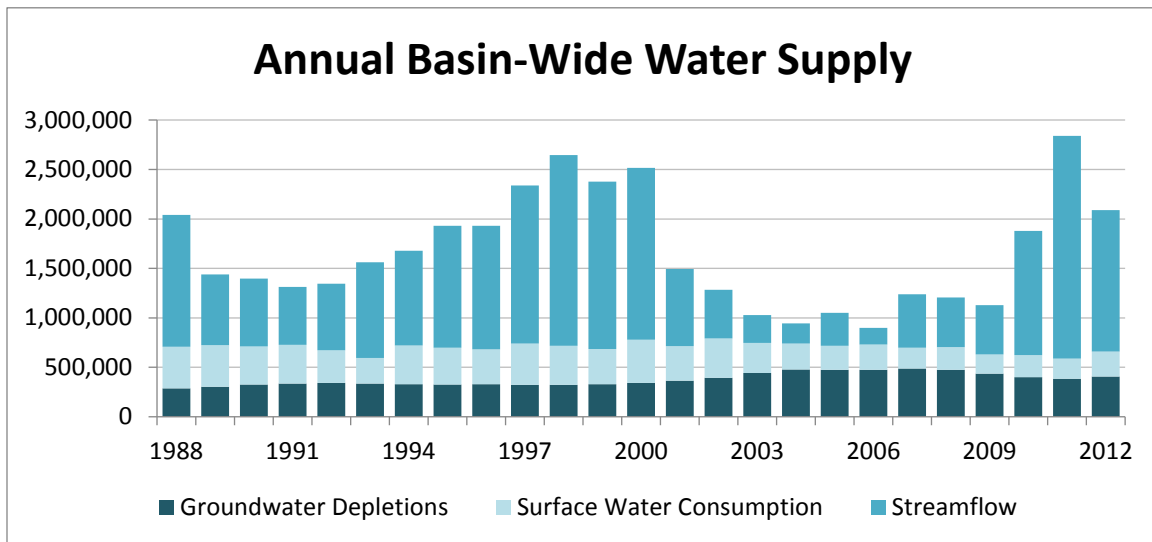
A balance in the basin occurs when water supply equals water demand. There are times when supply exceeds demand, and when demand exceeds supply. If demand exceeds supply, there may not be enough water supply to sustain demands over the long term.

Basin water supply is the amount of water available in the basin before any human use occurs. This is represented by adding streamflow, surface water consumptive use, and streamflow depletions caused by groundwater pumping. This supply fluctuates according to wet and dry years and also vary throughout the year

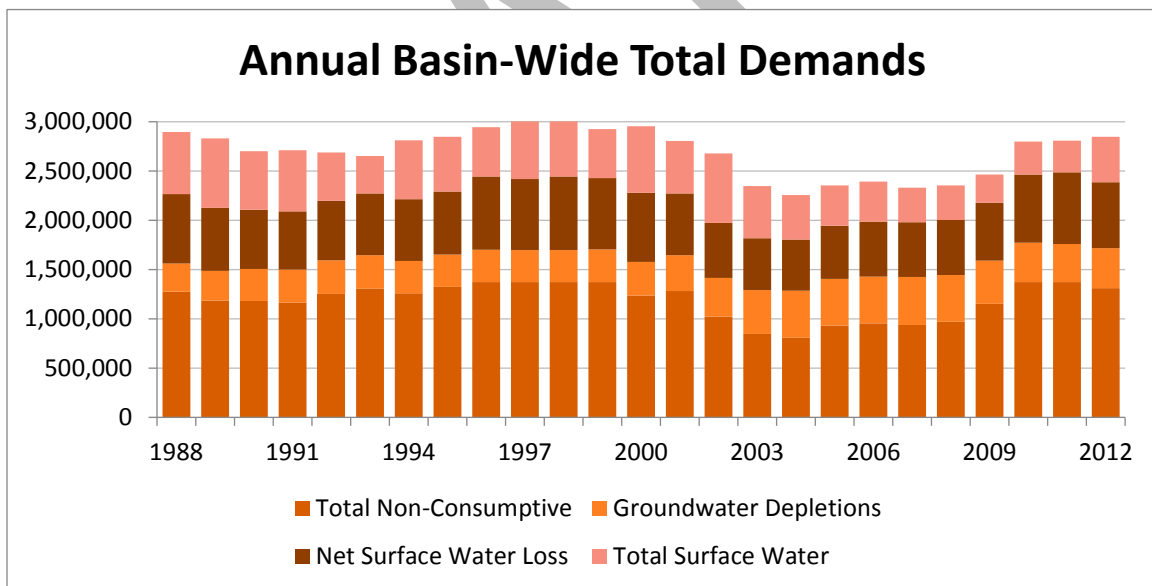
Total demand includes surface water and groundwater demands for irrigation and municipal and industrial uses, net surface water loss (also called canal seepage) and non-consumptive demands such as instream flows or hydropower. These demands vary throughout the year.

Figures 7 and 8 below show the basin water supply and total demands the basin for the period of 1988-2012 for the entire Upper Platte Basin, upstream from Odessa, NE. Each component of the supply and demand is shown on the charts. The final chart (Figure 9) shows the annual balance, which is the supply minus the demand. When all demands in the basin are considered, the demands outweigh the supplies in most

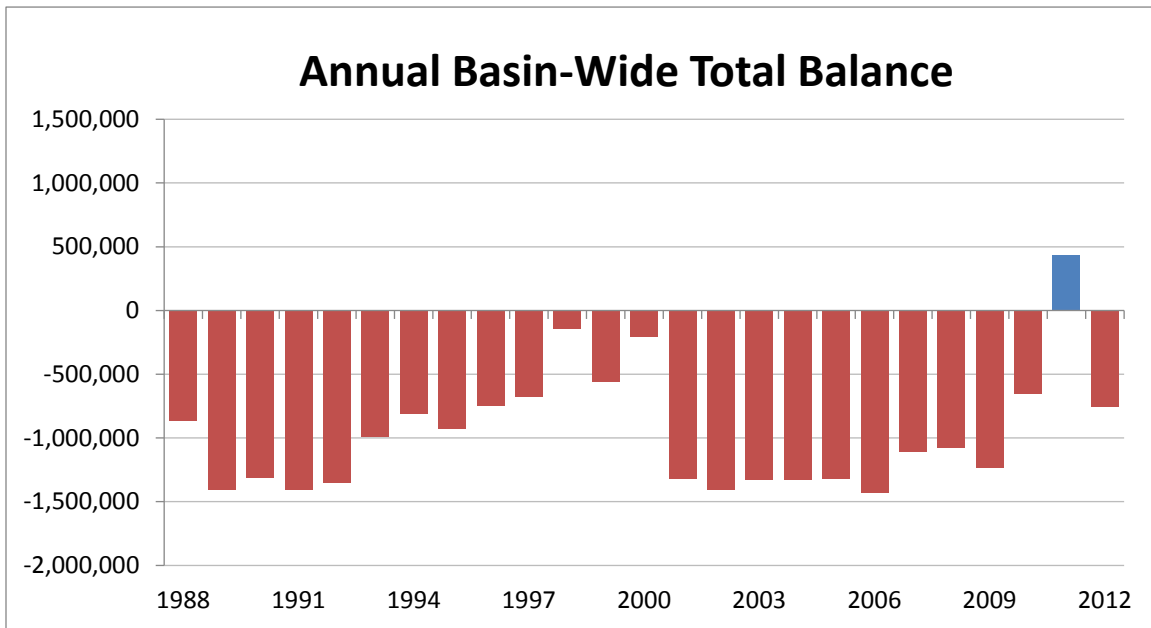
years. This means that there are times when the supplies are not adequate to meet all the demands.



**Figure 7.** Upper Platte River Basin Annual Basin-Wide Water Supply before any human use occurs



**Figure 8.** Upper Platte River Basin Annual Basin-Wide Total Demands for surface water and groundwater demands



**Figure 9.** Upper Platte River Basin Annual Basin-Wide Total Water Balance, supply minus demand.



## **8.5 Basin-wide Coordination in the First Increment (Platte Basin Coalition)**

The first increment IMP called for the development of a list of criteria to evaluate the potential to use available surface water and groundwater supplies in management projects to meet the goals and objectives of the IMP. In order to create a unified approach across the basin NeDNR and the NRDs established an interlocal cooperative agreement (ILCA).

### **8.5.1 Interlocal Cooperative Agreement**

The Platte Basin Coalition (PBC or Coalition) is the ILCA the Upper Platte River Basin NRDs and the NeDNR established. The Coalition serves as a venue for obtaining funding, project evaluation criteria, and technical support, in order to assess incentive programs aimed at reducing or offsetting consumptive use within the overappropriated portion of the Upper Platte River Basin.

#### **8.5.1.1 Protocols**

Through the Coalition, the Upper Platte River Basin NRDs and NeDNR have developed a protocol to follow when evaluating potential projects including the retirement of water uses and the implementation of other offset projects. This protocol provides a means to evaluate potential projects to assess the appropriate amount of funding to allocate toward that project from the Coalition. The evaluation incorporates data from the COHYST 2010 and WWUM models and tools, which include consideration of cyclical water supplies, to evaluate the potential impact of the project on streamflow. Projects with a greater or quicker impact on the stream are given preference over those that do not have as much an impact. Project costs, benefits, permitting and regulatory constraints are also considered.

#### **8.5.1.2 Funding**

The ILCA is partially financed by the Water Resources Cash Fund (WRCF). This fund receives monies from both the general fund and the Nebraska Environmental Trust (NET). Under statute, the WRCF may be used in overappropriated or fully appropriated areas for projects to study, develop, and implement management actions that result in reduction of consumptive use of water, enhancement of streamflows, or enhancement of groundwater recharge. Funding of projects through the PBC is shared between the Upper Platte River Basin NRDs and NeDNR. Coalition members approve all project and study budgets as well as expenditures for studies. The Coalition will simultaneously seek outside sources of funding to increase the leveraging ability of the local dollars spent on projects. More on funding for this IMP is discussed in Chapter 6 above.

#### **8.5.1.3 Technical Work**

The five Upper Platte River NRDs and NeDNR have a technical working group that examines technical issues and statutory aspects of the Basin-Wide Plan and IMPs. The Upper Platte River Basin NRD managers and NeDNR will agree to technical analyses prior to beginning any work, and the PBC will approve any reimbursed expenditures for technical work.

The technical working group evaluates all aspects of analysis, including the conceptual design, data evaluation, analysis, and evaluation of the results. It is then the responsibility of the technical group to explain these analyses to

administrators for incorporation into this plan or evaluation of progress made toward meeting plan goals.

During this increment, the technical group will evaluate various aspects of data and models that may include the effects of conservation measures on depletion results, more efficient methods to track changes in location and amount of irrigated lands and water consumption associated with them. The technical group will follow the basin-wide tenets outlined in Section 7.2 while carrying out any work necessary for the implementation of this IMP.

## 9: GOALS AND OBJECTIVES

NeDNR and the five Upper Platte River Basin NRDs conducted a Robust Review as part of the actions required in the first increment. This analysis provided each Upper Platte River Basin NRD with information they need to assess their progress in meeting the goals and objectives of their individual first increment IMPs as well as overall progress in the Upper Platte River Basin. The outcome of the Robust Review showed that TBNRD met their IMP targets as defined for the first increment. The Robust Review also indicated that a second increment is needed to ensure that TBNRD will continue to meet IMP and Basin-Wide Plan goals and objectives. The Robust Review results have provided IMP targets for this second increment.

Actions to support the successful implementation of the Goals and Objectives in this Chapter can be found in Chapter 10 of this IMP. Refer to Figure 3 in Section 8.3 for a map of the planning reaches described within these Goals and Objectives.

### **Goal 1: Reach and Maintain a Fully Appropriated Condition**

To incrementally achieve and sustain a fully appropriated condition while maintaining economic viability, social and environmental health, safety, and welfare of the basin.

**Objective 1.1:** Within the current increment of this IMP, implement measures to address impacts of streamflow depletions to surface water appropriations and water wells constructed in aquifers dependent upon recharge from streamflow to the extent those depletions are due to water use initiated after July 1, 1997.

Since this goal was part of the first increment IMP, TBNRD has already taken several actions to achieve it. A summary of these actions can be found in Section 8.2 of this IMP. The results of the Robust Review indicate that TBNRD has fully offset impacts to streamflows resulting from Post-1997 water uses. During this increment, TBNRD will need to maintain the progress they made in the first increment. This is covered under Objective 1.2.

If future analysis shows that depletions from post-1997 use are greater than formerly estimated and have not been fully offset, NeDNR and TBNRD will discuss how to address the remaining depletions within this increment.

**Objective 1.2:** Maintain previous increment mitigation progress.

This objective applies to both the near and long term. Within the current ten-year increment, the TBNRD and NeDNR will maintain current levels of accretions to the Platte

River, and seek opportunities to further reduce impacts to Platte River streamflows for the period 2059-2063.

NeDNR and the TBNRD will keep policies, projects, and practices in place, as appropriate, which provide offsets or supply equivalent offsets so that the current level of accretions is maintained. A summary of offset actions taken during the first increment can be found in Section 8.2 of this plan.

It is recognized that some actions undertaken in the first increment are temporary projects, which may come to an end during the current increment. Funding may limit additional offset opportunities. Best efforts must be made to find new projects or ways of providing offsets for projects that are not permanent.

## 1. Targets

To track progress toward meeting Objective 1.2, targets are set based on the trend line of the 2019 Robust Review modeled results (Section 8.3) for the short term and long term. These are the values that are to be maintained through this increment. Future management actions and changes in water use will be analyzed using the technical tools available (according to the tenets in section 7.2). In addition to technical analysis, the policies, projects, and practices continued or implemented will be taken into account. It is recognized that current model projections will be different from model results from analyses that incorporate actual future conditions therefore the technical analysis must account for variability and the actual practices and projects being implemented must be considered. The methodology for evaluating the targets and a description of triggers used to maintain current progress can be found in Chapter 10, Action Items.

### A. Short term planning targets

**Table 1.** *TBNRD Short-Term Accretion Targets*

TBNRD Short-Term Targets (AF)		
Year	Upstream of Elm Creek	Elm Creek to Chapman
2019	2,100	2,100
2020	2,100	2,100
2021	2,000	2,100
2022	2,000	2,100
2023	2,000	2,200
2024	1,900	2,200
2025	1,900	2,200
2026	1,800	2,300
2027	1,800	2,300
2028	1,800	2,300
2029	1,700	2,400

The values shown in Table 1, given in acre-feet (AF), are the best estimate of accretion targets for the second increment of the IMP from the trend line of modeled accretions from the most recent Robust Review, which analyzed groundwater only irrigation development after 1997, expansion of municipal and

*Draft for Board Approval 6/18/2019*

industrial uses after 1997, and management activities through 2013 in TBNRD. The methods used to develop the targets for the TBNRD are described in the 2019 Robust Review Report and in Chapter 8. A graph of the complete Robust Review Results can also be found in Chapter 8. Using the trend line values as the targets recognizes the variability in the modeled Robust Review results. Since the variability is primarily caused by the climate used to simulate the future, it is not expected that the observed conditions will match the modeled conditions; therefore any future analysis used to compare to these targets must also account for this variability and be adjusted accordingly. The accretion amounts shown in Table 1 and these are subject to change based upon the next Robust Review update (described in Section 10.7.3.2), which will use the best scientific data and information available. The process for revising the IMP, if the targets change, is outlined in Section 10.9.

B. Long-term planning targets

**Table 2.** TBNRD Long Term Accretion Targets

<b>TBNRD Long Term (2059-2063 average) Targets</b>	
Upstream of Elm Creek	Elm Creek to Chapman
500 AF	3,300 AF

The long-term targets are shown in table 2. These are the average accretions for the five-year period of 2059-2063 from the most recent Robust Review modeled results trend line. A graph of the complete 2019 Robust Review results can be found in Chapter 8. Using the trend line values as the targets recognizes the variability in the modeled Robust Review results. Since the variability is primarily caused by the climate used to simulate the future, it is not expected that the observed conditions will match the modeled conditions; therefore any future analysis used to compare to these targets must also account for this variability and be adjusted accordingly. These rates are the current best estimates and are subject to change based upon the next Robust Review update (described in Section 10.7.3.2), which will use the best scientific data and information available. The process for revising the IMP, if the targets change, is outlined in Section 10.9.

**Objective 1.3:** Make progress toward a fully appropriated condition.

Impacts of streamflow depletions to surface water appropriations and water wells constructed in aquifers dependent upon recharge from streamflow to the extent those depletions are due to water use initiated prior to July 1, 1997, may be addressed prior to a subsequent increment with the intent of achieving a fully appropriated condition.

During the first increment, two analyses were performed to estimate the balance of water supplies and demands within the Upper Platte River Basin. This included an estimate of all groundwater depletions to streamflow (Total Depletions) and the INSIGHT analysis. Both are described in Chapter 8.

- Continue to evaluate total depletions
- Continue to evaluate water supplies and demands and
- Continue to develop an estimate for a fully appropriated condition

**Objective 1.4:** Review the implementation of this IMP annually to ensure that the IMP provisions are adequate to sustain progress toward and/or maintain a fully appropriated condition.

**Objective 1.5:** Once a fully appropriated condition is achieved, maintain such condition through implementation of the IMP.

**Goal 2: Interstate Compliance**

To ensure that no act or omission of the TBNRD or NeDNR would cause noncompliance by Nebraska with any interstate decree, compact, or other formal state contract or agreement.

**Objective 2.1:** Ensure that no act or omission of the TBNRD or NeDNR would cause noncompliance by Nebraska with the NNDP included within PRRIP, for as long as PRRIP exists.

**Objective 2.2:** Ensure that the groundwater and surface water controls adopted in the TBNRD IMP are sufficient to ensure that the state will remain in compliance with the NNDP.

**Objective 2.3:** Collectively, as defined in the NNDP, offset the new depletions caused by new uses within the Upper Platte River Basin NRDs.

**Objective 2.4:** Ensure that post-1997 new or expanded uses, including irrigation, municipal, industrial, rural domestic and other new water related activities are assessed and offset for compliance with the NNDP. This assessment will be part of the Robust Review, explained in Chapter 10.7 of this plan.

**Objective 2.5:** NeDNR and TBNRD will insure that implementation of the IMP will not interfere with successful implementation of the joint IMP for the Republican Basin portion of TBNRD by reducing potential "imported water" gains to the Republican Basin.

**Goal 3: Consistency, Communication, and Updates**

To keep the IMP current, maintain consistency with the Basin-Wide Plan, and keep water users informed.

**Objective 3.1:** Amend this IMP as needed to remain consistent with the Basin-Wide Plan.

**Objective 3.2:** Participate in basin-wide planning activities

**Objective 3.3:** Improve information sharing with interested parties.

**Objective 3.4:** Conduct planning for subsequent increments of the plan, as necessary.

**Objective 3.5:** If appropriate and necessary, follow the dispute resolution process in the Basin-Wide Plan.

## 10: ACTION ITEMS

Chapter 10 contains the action items that will be carried out to accomplish the goals and objectives of the IMP. These actions range from ongoing non-regulatory actions such as information and education efforts, to maintenance of current regulatory actions, and the potential for future increased controls if certain triggers cannot be achieved through the other actions taken by the NRDs or NeDNR. As described within this Chapter, more details on the statutes or rules followed by the NRDs or NeDNR can be found at the offices of each respective agency. For purposes of transparency/simplicity, the full length of those documents are not repeated herein, so the reader is directed to each agency to read the full details on how any particular action item may be carried out.

### 10.1 Information and Education Programs

TBNRD and NeDNR will provide educational materials to the public and/or carry out educational activities that may include, but not be limited to, the following:

- The fully appropriated determination
- The overappropriated designation
- The Integrated Management Plan
- The Nebraska New Depletion Plan
- The Platte River Recovery and Implementation Program
- Hydrologically connected groundwater and surface water
- Invasive species management
- Conversion of irrigated acres to dryland agriculture or wildlife habitat
- Limited irrigation cropping systems
- Soil residue and tillage management
- Alternative crops
- Water use measurement techniques
- Eco-tourism, crop diversification, changes in land use, to support diversity in revenue streams of water users within the basin, as a means of maintaining economic viability
- Educational programs to support the implementation of Incentive Programs
- Funding sources for programs that enhance water supply

These educational materials and/or activities may include, but not be limited to, joint public meetings, pamphlets, and website information.

### 10.2 Incentive Programs

NeDNR and TBNRD intend to establish, implement, and continue financial or other incentive programs to reduce consumptive use of water within the TBNRD to meet the goals and objectives of this IMP.

1. Incentive programs include any program authorized by state law and/or federal programs such as the CREP, or EQIP.
2. Other State or NRD Programs

The TBNRD and NeDNR may investigate opportunities to reduce the consumptive use of water in order to enhance water supply. The TBNRD and NeDNR may develop an incentive-based program if such an opportunity exists.

A. All projects and programs will:

- (1) Use the best science readily available. This will follow the basin-wide tenets outlined in Section 7.2. These will be consistently evaluated according to the protocol developed by the PBC. Benefits will be assessed using the agreed upon methods and tools.
- (2) Enhance groundwater quantity, groundwater quality, and recognize the value of return flows.
- (3) Remain in compliance with any state or federal laws, contracts, interstate compacts, or decrees that govern the water use of the irrigation districts

B. The general process will be:

- (1) For existing surface water appropriations, contact the appropriators to determine willingness to cooperate, lease and/or sell those appropriations. If willing, develop and execute contract(s) with appropriator(s).
  - (a) Work with CNPPID, not just individual landowners served by the irrigation district, when potential projects affect the operation of the irrigation district.
  - (b) Retired surface water rights are still viable rights under statute. While typically a surface water right which has not been used for more than five years may be cancelled due to nonuse, under *Neb. Rev. Stat. § 46-229.04*, if the appropriation is not being used because it is part of an acreage reserve program, or other state or federal program, there is sufficient cause for nonuse and the right is still valid. If the land is no longer under a program, this applies for up to 15 years as long as there are not more than five consecutive years of nonuse while the land is not under a program.
- (2) For existing groundwater uses, contact landowners to determine willingness to cooperate with proposed projects. If willing, develop and execute contracts with such landowners.
- (3) Submit permit application(s), if required by Nebraska statutes.
- (4) Implement the approved projects.

C. Other identified potential programs

At this time, the specific other programs that have been identified are:

- (1) Potential purchase or lease of surface water irrigation district appropriations in order to transfer those appropriations to intentional recharge appropriations

### **10.3 Water Conservation Incentive Program**

The TBNRD is developing a “Water Conservation Incentive Program” (WCIP). TBNRD will purchase or otherwise acquire water use credits from certified groundwater irrigated acres or other groundwater uses or surface water use appropriations. The TBNRD will retire these credits to:

- Offset of new or expanded consumptive uses
  - Save water to meet statutory requirements or interstate agreement obligations
  - Save water to meet future incremental targets toward achieving a fully appropriated condition
  - Sell credits to water users who can then use them to offset new consumptive uses of groundwater within the TBNRD.
1. TBNRD and NeDNR will follow the basin-wide tenets from Section 7.2 when estimating accretions and depletions resulting from operations of the WCIP.
  2. The TBNRD will contact the NeDNR prior to purchasing or acquiring surface water appropriations for deposit in the water bank. The NeDNR will conduct a field investigation of the surface water appropriation and notify the TBNRD of the results of that investigation within 90 days. The TBNRD will work collaboratively with the NeDNR in performing the analysis to evaluate the bankable volume of water resulting from the retirement of the surface water appropriation. The TBNRD will follow the appropriate statutes, rules, and regulations of the NeDNR for approval if the surface water appropriation is to be transferred to another use.
  3. TBNRD will obtain and maintain easements, lease agreements or other agreements on all property from which surface water or groundwater uses have been temporarily or permanently retired.
  4. TBNRD shall annually report all WCIP deposits, withdrawals, and other activities related to the program according to the specifications described in Section 10.7 of this IMP.
  5. TBNRD shall follow the appropriate state statute and NeDNR rules and regulations relevant to operation of the WCIP.

### **10.4 Conjunctive Management**

Conjunctive management projects<sup>16</sup> allow for the optimum use of hydrologically connected surface water and groundwater supplies, so that the variability seen in surface water supplies can be compensated for over time, allowing water users to store water during periods of surplus and, in a managed fashion, withdraw that stored water in times of shortage, overall increasing the available supply through time. Conjunctive management projects can also create benefits such as, mitigating groundwater level declines, reducing flood flows, and offsetting depletions. NeDNR and the NRD will identify conjunctive management opportunities and implement such projects with the purpose of meeting the

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<sup>16</sup> See Section 8.1.3: Conjunctive Management Study for more information and a definition of “conjunctive management.”



goals and objectives of this IMP. Conjunctive Management may include, but is not limited to:

1. Surface water diversions that provide groundwater recharge during either the irrigation or non-irrigation season
2. Infrastructure development (e.g. dams or canals) that may include groundwater recharge, and recovery projects when appropriate
3. Temporary transfer of surface water appropriations within the NRD to streamflow augmentation, instream flow appropriation, or instream use<sup>17</sup>
4. Development of other groundwater projects for the purpose of providing net accretions to the river
5. Facilitation of contractual agreements between water users
6. Reduction of consumptive use by permanent or temporary retirement of irrigated land

The Upper Platte River Basin NRDs and NeDNR will mutually develop procedures to determine when and where projects can be carried out (for example determining and communicating when and where excess flows are available), procedures for carrying out projects (permitting, contracting, and payment procedures), tracking projects and maintaining data records, sharing data, cooperating with other entities wishing to utilize excess flows, and methods for determining benefits from projects (annually for IMP/Basin-Wide Plan/PRRIP reporting and for Robust Review purposes). Techniques which can be actively managed and returned to the stream do have benefits over those that are passive (timing and volume of return is uncontrolled, unmanaged, unknown). Conjunctive management projects can be passively or actively managed. Actively managed projects, such as storage of excess water, can be returned to the stream at a specific time in controlled volumes, passively managed, such as recharge of groundwater through excess flow diversions, return to the stream gradually over time and the rate and volume depends on the underlying aquifer material and proximity to the stream.

The ability to capture and use excess flows is dependent on advanced notice of the availability of excess flows. NeDNR will develop a protocol for assessing, predicting, and communicating 1) the potential of excess flows to basin water users, and 2) notice of actual availability of excess flows. TBNRD and NeDNR will work collaboratively to record the excess flows diverted, the excess flows diverted into recharge sites, and the amount of water returning to the river at canal return flow structures. Additionally, TBNRD and NeDNR will collaboratively review and analyze the data from the excess flow diversions to determine the amount of recharge that occurred during the event within the canal and recharge pits. Data on canal recharge and conjunctive management projects will be

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<sup>17</sup> *Neb. Rev. Stat.* § 46-290(5) in part states that "For any transfer or change approved [to augment flow in a specific stream reach for any instream use determined by the Department to be a beneficial use,] the Department shall be provided with a report at least every five years [...] to indicate whether the beneficial instream use for which the flow is maintained or augmented continues to exist". Title 457 of the Department Rules for Surface Water Chapter 9 Section 002.01 states "For purposes of 46-290(5) R.R.S. 1943, as amended, beneficial use for instream uses shall include: a. Water Quality Maintenance b. Water necessary for compliance with compacts, decrees or other state contracts."

shared as part of the annual reporting process, described in Section 10.7.2. The recharge will be analyzed in future Robust Review or other analyses.

In order to optimize the implementation of various conjunctive management projects where diversions of excess streamflow will occur, operational plans for each project should be developed. These operational plans should include enhanced monitoring and flow of information and data to effectively manage and utilize any available water. These operational plans will provide NeDNR with objective criteria by which various projects may be prioritized in order to most effectively utilize available excess flows. The public interest will be best served when the most effective projects are selected for diversion during excess flow periods. In addition, such plans and operational attributes will be useful in establishing good cause and passing public interest tests when petitions and applications are filed with NeDNR.

### **10.5 Drought Planning**

The basin drought contingency plan will serve as a guide for plans developed by individual NRDs. District-level mitigation measures and response actions corresponding to the drought conditions will be identified and implemented at the individual NRD level. Elements of the NRD drought plan include:

- Drought vulnerabilities
- Drought triggers
- Drought mitigation actions
- Drought response actions
- Drought plan administration

The basin-wide drought plan is expected to be completed within the first three to five years of the increment. It is anticipated that the NRD drought plan will be completed after the basin-wide drought plan, as the basin-wide drought plan is to provide guidance for the NRD drought plan. The TBNRD and NeDNR will work with water users in the District and consider their input when developing the TBNRD drought plan.

### **10.6 Controls and Triggers**

#### **10.6.1 Groundwater Regulatory Actions**

TBNRD will consider the timing, location and estimated amount of streamflow depletion for all actions within its scope of authority in order to prevent adverse impacts on existing groundwater and surface water users. Actions that will be reviewed include, but are not limited to: moratorium variances, certified acre modifications, certified acre and groundwater transfers, high volume consumptive groundwater use permits, municipal and industrial permits, and other variances to rules, regulations and policies of TBNRD.

Evaluation criteria for a control or other action include, but are not limited to:

- Impacts to existing groundwater or surface water users
- Increases in depletions to the Upper Platte River and perennial tributaries
- Increases in consumptive water use

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- The amount, location and timing of any changes in depletions or accretions to the river
- Any adverse effects on the state's ability to comply with PRRIP and the Republican River Compact
- Consistency with the purpose of the IMP
- Protection of the public interest and public welfare

TBNRD will periodically review the controls being implemented to carry out the goals and objectives of this IMP. Any changes to the controls must not be in conflict with the goals and objectives of this IMP. TBNRD may adjust or modify the controls or include additional controls as deemed necessary and appropriate by the Board of Directors to achieve the goals and meet the objectives outlined in this IMP. However, if the Board decides to remove any controls listed below, TBNRD and NeDNR must agree to appropriately amend this IMP in such a way that their removal does not interfere with IMP implementation prior to removal of these controls. Changes to these controls may be made as a result of progress being made toward achieving the goals of this IMP, according to *Neb. Rev. Stat. § 46-715(5)(d)(i)*.

TBNRD and NeDNR will coordinate with the other Upper Platte River Basin NRDs (Central Platte NRD, Twin Platte NRD, South Platte NRD and North Platte NRD) to develop a common method of calculation, following the basic tenets outlined in Section 7.2, that will be applied when calculation of depletions or accretions to the stream are necessary to implement groundwater controls. Any actions taken by TBNRD will be documented and shared with NeDNR pursuant to Chapter 10.7. TBNRD will work with well owners to update water well registrations to reflect newly permitted or additional uses.

Briefly, TBNRD plans to manage groundwater in the following ways:

- Limit increases in irrigated land within the management area or otherwise limit increases in consumptive use of water for any purpose
- Require approval of transfer permits and place appropriate conditions on such transfers
- Close the management area to issuance of additional groundwater permits unless the permit is conditioned to conform to the purposes for which the management area was designated
- Adopt specific controls for unique categories of groundwater uses
- Impose limitations on the operation of water wells constructed before the designation of a management area and those drilled afterward to the extent necessary.

TBNRD will put into place the following controls:

1. Moratorium

TBNRD has implemented a moratorium on the issuance of new water well construction permits and on new or expanded groundwater uses. TBNRD may grant variances from the moratorium if applicants agree to implement adequate measures to offset impacts of water consumption by any new or expanded use, or if there will be no increase in consumptive use due to the or expanded uses.

2. Certification of Irrigation Uses

All groundwater irrigation uses have been certified by TBNRD. TBNRD may grant modifications to certified acres for purposes of improving the accuracy of those records.

3. High Volume Groundwater Consumption Permits

Permit will be required for large commercial or industrial water users, with the exception of municipalities, who desires to modify or expand their consumptive use of water.

4. Variances

TBNRD may grant a variance for good cause shown for any of the controls in this IMP or within the NRDs rules and regulation.

5. Mandatory Education

The NRD already has a water quality education requirement. In addition, the NRD will also seek to implement a water quantity education component with the intent of informing producers about current best management practices for reducing consumptive use of crops and increasing water use efficiency.

6. Mandatory Data Collection

The NRD will continue to require water use data reporting for certain permitted water uses, the intent of which will be to inform the Robust Review analysis and triggers.

7. Transfers

The purpose of a transfer permit is to allow for the consumptive use of groundwater to be changed in either location or purpose. TBNRD may permit, regulate, or take action on groundwater transfers identified below. A transfer permit issued by TBNRD shall be required before any transfer takes place.

- Physical transfer of groundwater off of the overlying land
- Transfer of the type of use or addition of use
- Transfer of certified irrigated acres
- Physical transfer of groundwater and transfer of certified irrigated acres between the TBNRD and an adjoining NRD
- Municipal transfer permit
- Industrial transfer permit

- Transfers out of state.

The following types of groundwater transfer permits require coordination and communication between NeDNR and TBNRD prior to issuance of such permits.

- **Municipal Transfer Permits** – Transfers without a municipal and rural domestic transfer permit from NeDNR will require a transfer permit from the TBNRD.
- **Industrial Transfer Permits** – Transfers without an industrial transfer permit from NeDNR will require a transfer permit from the TBNRD.
- **Transfer Out of State** – NeDNR will consult with the TBNRD when considering applications filed to transfer groundwater out of state, pursuant to *Neb. Rev. Stat. § 46-613.01*. TBNRD will take action to approve or deny transfer requests based on the same criteria that NeDNR uses prior to issuing comparable transfer permits for in-state purposes; and water well construction permits shall not be issued for out-of-state uses unless and until the board of the TBNRD has granted variances to the moratorium on the issuance of water well construction permits and has approved associated transfer permits.

8. Municipal and Industrial Accounting Required for the Calculations of Baselines and the Determination of Allocations

As described within Objective 2.4 of this plan, for purposes of compliance with the NNDP, TBNRD will be responsible for offsetting all increases in consumptive use that result in streamflow depletions due to changes in municipal consumptive use after 1997, unless some portion of the increase is greater than an allocation of the municipality that was set in accordance with *Neb. Rev. Stat. § 46-740*, then the NRD may require the municipality to provide offsets for that portion.

TBNRD has enacted baseline accounting calculations for industrial uses to be consistent with *Neb. Rev. Stat. § 46-740*. On January 1, 2026, the TBNRD will establish baselines and allocations for municipal and industrial users and will require that offsets be provided for any increases in consumptive use of water above the annual allocation that result in a decrease in streamflow shall be offset by the municipality or industry.

### 10.6.2 Triggers

In order to determine whether additional groundwater regulatory actions are needed, the modeled annual stream accretion amounts shown in Table 1 under Objective 1.2 will be compared to the stream accretions resulting from the ongoing and future actions taken by TBNRD and any new depletions resulting from new uses or increased depletions resulting from existing uses. Based on the information shown in Table 1, the estimated stream accretions from existing management actions, projects, and programs have been provided in amounts necessary to obtain a net sum of accretions and depletions greater than zero in the current increment (accretions are represented as a positive number and depletions are negative). Based on those current targets that show post-1997 depletions have been offset, additional regulatory actions will not be required as long as either: 1) the annual net sum of the accretions resulting from the actions taken by TBNRD are greater than or equal to the most recent Robust Review trend line values shown in Table 1; or 2) if the annual net sum of the accretions

is not greater than the most recent Robust Review trend line values, the TBNRD maintains their current policies, projects, and practices (i.e. groundwater acre retirements, excess flow recharge projects) that resulted in the Robust Review trend line. As previously stated, the trend line is the average of the Robust Review results that vary due to the model inputs used for the future simulations. The results of analyses of future conditions and actions taken are not expected to match the Robust Review results. Any analysis of future conditions must take into account the variability of actual future climate conditions. If new analysis indicates there are still post-1997 depletions that need to be offset, the NeDNR and TBNRD will discuss what needs to be done to address those depletions. Post-1997 depletions must be offset by the end of this increment. At this time, it is anticipated that annual progress and maintenance will be measured using an analytical accounting method, similar to that described in the guidance document developed by the Upper Platte River Basin NRDs and the NeDNR<sup>18</sup> to estimate new accretions and depletions as compared to the values in the Table 1 in Chapter 9 of this IMP..

NeDNR and TBNRD recognize the potential for implementation of voluntary programs, incentive measures, and other projects to provide stream accretions that will help maintain a net sum of post-1997 depletions and accretions greater than or equal to the values shown in Table 1 in the current increment and will work diligently to implement measures to provide additional stream accretions in a timely manner. NeDNR and TBNRD also recognize that the current Robust Review results have limitations, which will be addressed throughout the IMP increment and that as Robust Review results are updated to address those limitations, the target values described within the IMP may need to be updated, which will result in the need to update future trigger values. A net sum of accretions and depletions of greater than or equal to the results of the Robust Review must be maintained. Regular progress will be determined by the following indicator and triggers:

- A. Indicator: To determine whether an accretion to the river equal to or exceeding the values in Table 1 has been sustained and to determine progress toward meeting the goals and objectives of this IMP, NeDNR and TBNRD will jointly perform new Robust Review analyses in 2023 and 2027 to evaluate the overall impacts to streamflow and assess the indicator and triggers below. Any analysis to compare future actions with these triggers must take into account the variability of actual future climate conditions and make a comparison using trended results. The new Robust Review may change the values found in Table 1 and Table 2 under Goal 1 Objective 1.2 and therefore may change the target values the indicator and triggers. The process for revising the IMP, if the targets and triggers change based on the next Robust Review, is outlined in Section 10.9. When evaluating the indicator and triggers, the new and continued policies, projects, and practices implemented to provide offsets will also be considered. Figure 11 displays a timeline of the evaluation of the indicator and triggers with the values from the current Robust Review shown. Indicator: If, by the end of 2023, an accretion to the river equal to or exceeding

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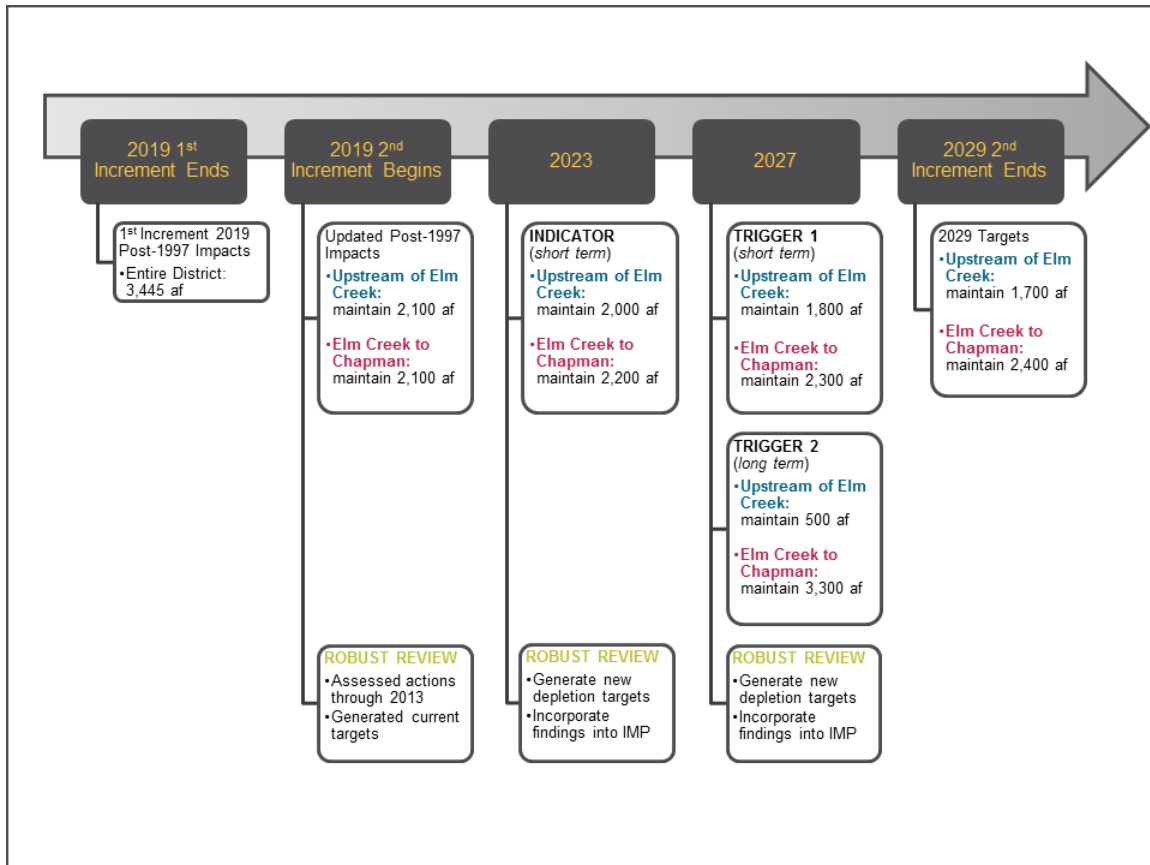
<sup>18</sup> The protocol document, *Basin-wide Technical Committee Guidance Document – Procedures for Annual Accounting Review and Robust Review to Assist Integrated Management Planning and Facilitate Reporting to the Platte River Recovery Implementation Program*, can be found at <https://dnr.nebraska.gov/water-planning/other-upper-platte-river-documents>

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the values in Table 1 throughout the ten-year increment has not been sustained, NeDNR and the TBNRD will jointly determine whether any additional regulatory actions will need to be put in place by the beginning of the 2025 irrigation season.

- B. Trigger 1: If by the end of 2027, accretions to the river equal to or exceeding the annual values resulting from the most recent Robust Review that year and every year throughout the ten-year increment, NeDNR and TBNRD will jointly determine the steps needed to ensure that the agreed upon regulatory actions will be in place by the beginning of the 2028 irrigation season.
- C. Trigger 2: By the end of 2027, measures will be in place to achieve an accretion to the river equal to or exceeding the 50-year long-term planning target. If this trigger has not been met, NeDNR and TBNRD will jointly determine the steps needed to ensure that the agreed upon regulatory actions will be in place by the beginning of the 2028 irrigation season.

Chapter 10.7 describes how progress toward achieving the indicator and triggers will be measured. The indicator and triggers values from Table 1 come from the 2019 Robust Review analysis results trend line through the model data. The trend line is the average of the model results that vary due to climate inputs. It is not expected that the future modeled data will match the 2019 Robust Review analysis results exactly due to differences in the model inputs used for the analysis and future observed conditions. Any analysis to compare future actions with these triggers must take into account the variability of actual future climate conditions and make a comparison using trended results.



**Figure 10.** Planned mitigation measure milestones and Robust Review updates during the current increment

### 10.6.2.2 Groundwater Controls in Response to Triggers

NeDNR and TBNRD have identified the following groundwater controls as potential regulatory actions that may be implemented in response to triggers:

Prior to implementation of any of the groundwater controls listed below, TBNRD and NeDNR will agree to the method of implementation and the methods used to measure the success of the control(s) in reaching the goals and objectives of Chapter 9 of this IMP.

In order to reach these goals and objectives, a limit on the amount of consumptive use on certified irrigated acres within the boundaries of the NRD may be implemented. The methods by which a limit on the amount of consumptive use would be implemented include, but are not limited to, the following:

#### 1. Alternative Crop Mixes (*Neb. Rev. Stat. § 46-739(b)*)

Alternative crop mix means planting a mix of crops over a specified period of years on certified irrigated acres within the overappropriated area. The total amount of consumptive crop water use allowed within the overappropriated portion of the Upper Platte River Basin within TBNRD for purposes of meeting the goals and objectives of this IMP will be determined by the TBNRD after consultation with NeDNR.



2. Reduction of Certified Irrigated Acres

A reduction of certified irrigated acres means a set percentage reduction in certified irrigated acres within the overappropriated area. The amount of any acreage reduction imposed within the overappropriated portion of the Upper Platte River Basin within TBNRD for purposes of meeting the goals and objectives of this IMP will be determined by TBNRD after consultation with NeDNR.

3. Allocation

An allocation means a uniform allotment of withdrawals of groundwater to be distributed among certified irrigated acres during a specified period. The amount of any allocation imposed within the overappropriated portion of the Upper Platte River Basin within TBNRD for the purposes of meeting the goals and objectives of this IMP will be determined by TBNRD after consultation with NeDNR.

**10.6.3 Surface Water Regulatory Actions (Controls)**

**10.6.3.1**

The following surface water controls as authorized by *Neb. Rev Stat. § 46-716* will be implemented and/or continued by NeDNR. NeDNR will periodically review the controls being implemented to carry out the goals and objectives of this IMP. NeDNR may adjust, modify, expand, or add controls, based on the annual reviews of the progress being made toward achieving the goals of this IMP, and pursuant to *Neb. Rev. Stat. § 46-715(5)(d)(ii)*. No controls may be removed, however, unless and until TBNRD and NeDNR amend this IMP. The controls may not be modified in such a manner as to conflict with the goals and objectives of this IMP.

1. NeDNR will continue the moratorium on new surface water appropriations in the portion of the Upper Platte River Basin within the boundaries of the TBNRD, unless a variance is granted by NeDNR according to its rules.
2. NeDNR will continue to require measuring devices for new appropriations and to close any non-metered diversions during times of shortage regardless of priority in the portion of the Upper Platte River Basin within the boundaries of the TBNRD.
3. Transfers of surface water appropriations will be in accordance with statutes and NeDNR rules.
4. NeDNR shall continue to administer surface water appropriations according to the provisions of the permit, statute, Department of Natural Resources rules and regulations, and any applicable interstate compact decree or agreement.
5. NeDNR shall continue to monitor the use of surface water to prevent unauthorized uses.
6. For conjunctive management projects as described in Section 10.4, NeDNR may, via the permit approval process, require additional monitoring, measurements, and reporting of diversions, returns, seepage, and/or ET.
7. Except as provided in (A) below, NeDNR will not require surface water appropriators to apply or use conservation measures.

- A. If, NeDNR requires surface water appropriators to apply or use conservation measures, in accordance with *Neb. Rev. Stat. § 46-716(2)*, surface water appropriators will be allowed a reasonable amount of time, not to exceed one hundred eighty (180) days unless extended by NeDNR, to identify conservation measures to be applied or used and to develop a schedule for such application and use.
- 8. Except as provided in (A) and (B) below, NeDNR will not require any other reasonable restrictions on surface water use.
  - A. If, at some point in the future, NeDNR requires other reasonable restrictions on surface water use, such restrictions must be consistent with the intent of *Neb. Rev. Stat. § 46-715* and the requirements of *Neb. Rev. Stat. § 46-231*.
  - B. If, at some point in the future, NeDNR requires other reasonable restrictions on surface water use, in accordance with *Neb. Rev. Stat. § 46-716(2)*, surface water appropriators will be allowed a reasonable amount of time, not to exceed 180 days, unless extended by NeDNR, to comment on the proposed restrictions.

#### **10.6.3.2 Summary of Variance, Application, and Transfer Process Considerations**

The following are summaries of the Departments variance process, application review process, and transfer process. For full details of these processes, please refer to the applicable statutes and Department rules.

##### **1. Variance Process for new surface water appropriations**

- A. *Department of Natural Resources Rules for Surface Water, Title 457*, provides a process through which a person may request permission to file an application for a new surface water right in a moratorium area.
- B. Prior to filing an application in a moratorium area, a person must first petition NeDNR requesting "leave" (permission) to file an application in a moratorium area. These petitions are called "variances," or "variance petitions."
- C. Because the Upper Platte River Basin is currently undergoing integrated management for the purposes of reducing depletions to streamflow, any new consumptive use or retiming of stream base flow, must be examined for its potential effects on extant surface water and groundwater users and upon all matters of significant public interest and concern. This includes assessing both positive and negative impacts on the State's ability to comply with interstate agreements, programs, decrees and compacts, including PRRIP. Thus, any proposed project must be scrutinized to prevent conflict with (a) the goals and actions necessary to implement the IMPs adopted by the Upper Platte River Basin NRDs and NeDNR and (b) the water needs of projects that will be implemented under PRRIP. Applications for potential beneficial uses that are not clearly non-consumptive will be presumed to be at least partially consumptive.

- D. Therefore, an analysis of the effects of a proposed new diversion on existing uses and responsibilities is required in order to determine whether good cause exists to grant a variance to apply for a new use.
- E. As part of the process for granting a variance NeDNR shall review the information provided with the petition and shall make a determination as to whether it is sufficient to indicate good cause for allowing further consideration of the application.<sup>19</sup>
- F. *Nebraska Revised Statute* § 46-706 defines "good cause shown" as, "a reasonable justification for granting a variance for a consumptive use of water that would otherwise be prohibited by rule or regulation and which the granting agency, district, or organization reasonably and in good faith believes will provide an economic, environmental, social, or public health and safety benefit that is equal to or greater than the benefit resulting from the rule or regulation from which a variance is sought;"
- G. The goals and objectives of this IMP will be considered when examining applications for new diversions of excess flows (unappropriated water) in the Platte River Basin. In fully appropriated and overappropriated areas, projects designed to meet the goals and objectives of the IMP are of primary importance. In addition to showing good cause in support of the goals and objectives, the effectiveness of each project will be considered. Operational plans that demonstrate effective use of water along with measuring and monitoring will be prioritized. In assessing the public interest and whether a new project should receive an appropriation, the NeDNR must consider how the project will support the goals of the basin-wide plan and IMPs within the Platte River Basin and reasonable conditions that will need to be imposed on prospective appropriations to ensure that over the long term the best use continues to be made of the limited water resources in the basin. Administering new appropriations that are issued for the purpose of achieving these goals and objectives may require other excess flow diversion projects to be limited or curtailed. These requirements will be clearly established within each new appropriation when issued.

## 2. Application Review Process

- A. NeDNR's application review process is driven by Nebraska statutes, including but not limited to *Neb. Rev. Stat.* §§ 46-233 through 46-235. The following is not an exhaustive list of all factors used to reach a decision on approval or denial of an application.
- B. There must be unappropriated water available in the source of supply and requirements of a variance petition approval must be met and agreed upon by the applicant.
- C. The proposed use must be determined to be beneficial.
- D. An appropriation must not be detrimental to the public welfare.

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<sup>19</sup> NAC Title 457, Chapter 23

- E. Denial of the application is not demanded by the public interest.
- F. If the application will be approved, NeDNR will impose conditions to protect other appropriators and the public interest.

### 3. Transfer Review Process

Using criteria set out in *Nebraska Revised Statutes*, Chapter 46, regarding transfers, the Director shall review an application for a transfer proposing a change in the location of use; type of appropriation; and or purpose of use, including but not limited to the following:

- A. The proposed use of water after the transfer or change will be a beneficial use of water
- B. A request to transfer the location of use is within the same river basin
- C. The change will not diminish the supply of water available or otherwise adversely affect any other water appropriator
- D. The quantity of water that is transferred for diversion or other use at the new location may be the historic consumptive use
- E. The appropriation is not subject to termination or cancellation
- F. If the transfer is to be permanent the preference category may not change
- G. If the transfer is to be temporary, it will be for no less than one year
- H. The transfer or change will not be inconsistent with any applicable state or federal law and will not jeopardize the state's compliance with any applicable interstate water compact or decree or cause difficulty in fulfilling the provisions of any other formal state contract or agreement
- I. The transfer will be in the public interest

(1) Consistent with *Neb. Rev. Stat.* § 46-294, the director's considerations relative to the public interest shall include, but not be limited to, (1) the economic, social, and environmental impacts of the proposed transfer or change and (2) whether and under what conditions other sources of water are available for the uses to be made of the appropriation after the proposed transfer or change.

(2) Transfers subject to *Department of Natural Resources Rules for Surface Water, Title 457, Neb. Admin. Code*, Chapter 9, § 002, are required to be determined to be in the public interest, "... the Director shall determine whether the benefits of the proposed transfer outweigh any adverse impacts that might occur giving consideration to the economic, social and environmental impacts and whether and under what conditions other sources of water are available for the uses to be made of the appropriation after the proposed transfer or change."

(3) The director may impose any reasonable conditions deemed necessary to protect the public interest.

## **10.7 Monitoring and Evaluation**

The overarching purpose of the monitoring and evaluation section of this IMP is to ensure that TBNRD maintain a fully appropriated condition. The objective of the monitoring and evaluation section is to gather and evaluate data, information, and methodologies that could be used to increase understanding of the surface water and hydrologically connected groundwater system, to test the validity of the conclusions and information upon which this IMP is based, and to assist decision makers in properly managing the water resources within TBNRD. The described monitoring actions and evaluations are also important in ensuring the state remains in compliance with the NNDP and in keeping the IMP current.

Various methods will be employed to monitor and evaluate the implementation and progress of this IMP. Sections 10.7.1 and 10.7.2 describe the tracking and reporting of water use activities within the District by TBNRD and NeDNR. The rest of Section 10.7 describes the analyses that will evaluate the progress that has been made toward: addressing streamflow depletions due to new uses begun subsequent to July 1, 1997 (Section 10.7.3); reaching a fully appropriated condition (Section 10.7.4); maintaining a fully appropriated condition (Section 10.7.5); and evaluating whether a subsequent increment is necessary to meet the goals and objectives of this IMP (Section 10.7.6). Statute describes both an annual review (*Neb. Rev. Stat. § 46-715(5)(d)(ii)*) and a second more Robust Review of new and expanded uses and associated mitigation actions (*Neb. Rev. Stat. § 46-715(5)(d)(iii)*), covered in Section 10.7.3

### **10.7.1 Data and Tracking of Water Use Activities**

Data from the five NRDs will be reported in a consistent format across the basin and from year to year to simplify the process of compiling data for the annual review and the Robust Review. A database will be developed to house this data. This database will facilitate the updating of model datasets.

Occasionally, actions for which permits are issued may not actually be implemented. For example, a well permit may be issued but the well not actually drilled. Because of this, in order to maintain accurate records of actual land use, annual permit and land use data should be updated within the database at the end of the next calendar year to reflect which proposed actions actually occurred. This includes NeDNR sharing information on any surface water permits cancelled in the calendar year (including temporary permits that expired one year after they are issued). This will help in creating yearly land use datasets when it is time to conduct the Robust Review. Ideally, permit data should provide a snapshot of changes in land use for that year. This will improve the accuracy of annual land use datasets for the models, which will be used for the Robust Review.

#### **1. NRD Tracking**

TBNRD works closely with county assessors and CNPPID to track the location and number of irrigated acres in the District. Comparison of NRD certified irrigated acres to assessed irrigated acres provides TBNRD with a measure of the District's conformance to its objective of preventing development of additional irrigated land uses, unless those new uses are offset by retirement of an equivalent amount of existing water uses. TBNRD will continue to gather data on crops planted and harvested tillage systems and other soil and water conservation practices. TBNRD will be responsible for maintaining up-to-date records of, ensuring compliance with

rules regulating, and annually tracking and sharing information with the Department on the following activities within the District:

- A. Certification of groundwater uses and any changes to these certifications
- B. Approved transfers of groundwater and certified irrigated land, including all of the information included in the application and approval of the transfer
- C. Groundwater pumping (flow meter) data that is reported to or gathered by the NRD
- D. Any water well construction permits issued
- E. Any other permits issued by TBNRD
- F. Any conditions associated with any permits that are issued
- G. Information gathered through the municipal and non-municipal industrial accounting process
- H. Any variances issued including the specifics and the reasoning behind approval of the variance
- I. Groundwater level data collected from dedicated observation wells and irrigation wells
- J. Information on the Conservation Incentive Program and any other NRD sanctioned water banking activities
- K. Offsets provided for depletions resulting from increased consumptive use related to the above listed items
  - (1) This includes reporting on offsets and mitigation activities for addressing post-1997 depletions and for the purpose of sustaining previous increment progress and reaching a fully appropriated condition. Such activities to be reported include canal diversions for the purpose of groundwater recharge, operation of stream augmentation projects, and irrigated acre retirements.
- L. Summaries of available water conservation plans of municipalities and industries within the basin including strategies that could be applied to other municipalities in the basin (at the Basin-Wide Annual Meeting).

TBNRD will continue to monitor the location of the headwaters of Platte River tributaries that originate within this district. The locations of these headwaters are identified every spring using GPS locators. A significant movement of any of these headwaters upstream or downstream could indicate changes in local groundwater levels.

## **2. NeDNR Tracking**

NeDNR will be responsible for annually tracking and sharing with the TBNRD information on the following activities within the District:

- A. Any surface water permits issued
- B. Any dam safety permits issued
- C. Any groundwater permits issued

- D. Associated offsets for any new permits issued.
- E. Any retirements of irrigated acres or other activities by NeDNR for the purpose of returning to a fully appropriated condition

As new data show a need for further analysis and to the extent that TBNRD meter data or other methods of estimation are not available to determine the consumptive use of water due to livestock, human water use, sandpits and reservoirs less than 15 AF, NeDNR will be responsible for tracking and reporting on the following activities within the District in the current increment:

- A. National Agricultural Statistics Service livestock data
- B. US Census Bureau population data
- C. Inventory of sandpits
- D. Inventory of reservoirs of less than 15 AF
- E. Any necessary offsets provided for depletions resulting from increased consumptive use related to the above listed items.

#### **10.7.2 Reporting**

1. An annual review of the progress toward achieving the goals and objectives of the ten-year increment will include annual reporting by NeDNR and the TBNRD of the information being tracked as described above.
2. Data will be analyzed to assess the collective amount, timing, and locations of both the depletions to streamflows resulting from new or expanded uses and of all mitigation actions. This will involve a simple analysis of impacts to streamflows resulting from permitted changes, which will not require model runs. These analyses will be done using the agreed upon methods and tools. Methods and tools used will be available to the stakeholders and the public. This information will be shared between the TBNRD and NeDNR, presented at the basin-wide annual meeting. The data collected will then be trimmed to the relevant Platte River Recovery Implementation Program area, analyzed, and used for required annual and periodic reporting necessary for the Nebraska New Depletion Plan helping facilitate Nebraska's compliance with the Nebraska New Depletion Plan. NeDNR will generate these reports and will coordinate with the TBNRD to ensure the accuracy of data within any final report.
3. The reports from the TBNRD and NeDNR should include information on the location, amount, and timing of the depletions caused by each permitted new or expanded water use, as well as the associated offset and the location, amount and timing of the offset's accretions to the river. The depletions and/or the accretions should be reported for each year throughout the ten-year increment.
4. These reports should be made available at least four weeks prior to each Basin-Wide Annual Meeting. The format of the reports will be standardized as agreed to by NeDNR and the Upper Platte River Basin NRDs.
5. The data and the analysis will be presented at the Basin-Wide Annual Meeting.
6. The reported information will be used as appropriate in the evaluation process as described below.

### **10.7.3 Evaluation: Measuring the Success of Meeting the Goals and Objectives of this IMP.**

Measuring the success of this IMP in addressing streamflow depletions due to new uses begun subsequent to July 1, 1997, and maintaining current progress (Goal 1 from Chapter 9).

#### **1. Annual Reporting and Review**

In order to meet the requirements of *Neb. Rev. Stat. § 46-715(5)(d)(ii)*, data contained in annual reports submitted by TBNRD and NeDNR will be reviewed and analyzed to assess progress made toward achieving the goals and objectives of this IMP. The annual review will consider both the near-term and long-term effects of any permitted new consumptive uses. A 50-year stream depletion curve may be used to assess the impacts of any new uses contained within the annual reports to show the long-term potential impacts of annual changes.

#### **2. Robust Review**

In addition to the annual review, a more Robust Review of progress made toward achieving the goals and objectives of Chapter 9 of this IMP during the current ten-year increment will be carried out periodically. This review will meet the requirements of reporting for the NNDP as well as *Neb. Rev. Stat. § 46-715(5)(d)(iii)* to determine whether the measures adopted in this IMP are sufficient to offset depletions due to post-July 1, 1997 water uses and to sustain progress toward a fully appropriated level of water use (Robust Review). A Robust Review will be conducted in 2023 and 2027. The purpose of these Robust Reviews will be to address the indicator and triggers outlined in Section 10.6.2 of this IMP, which helps measure progress toward reaching the targets from Chapter 9. The previous Robust Review will also serve as guidance for conducting the next one.

The general method for conducting the Robust Review will be as follows:

- A. The groundwater models used for this process will be calibrated to streamflows/baseflows and groundwater levels in the area with the ability to assess the impacts on a monthly basis. The groundwater models will be updated periodically to simulate the management practices that have been implemented to date. The evaluation period of these models will be 50 years into the future.
- B. The following groundwater model runs will be conducted to measure progress toward reaching Objective 1.2:
  - (1) The 1997 Development Level Run. A model run that simulates holding the number of irrigated acres and crop type mix in 1997 constant through the current date and the fifty-year projection period. It will assume the full crop irrigation requirement for the crop type mix. The run will be conducted using climate data through the current date and will include a fifty-year projection using an agreed to climate pattern.
  - (2) The Historical Run. A model run that simulates, to the extent possible with available data, annual changes in the number and location of irrigated acres, excess flow recharge events, retirements, allocation effects, augmentation projects, and other water management regulations or



projects throughout the evaluation period starting in 1997 through the current date and the fifty-year projection period. The fifty-year projection period will repeat an agreed to land use, regulation, or project dataset. The model will use available flow meter data or, in the absence of flow meter data, assume the full crop irrigation requirement was met at all times. The run will be conducted using climate data through the current date and will include a fifty-year projection using an agreed to climate pattern.

- (3) Difference between the 1997 Development Level Run and the Historical Run. The simulated output from each model run will be compared to determine the difference in the baseflow that has resulted from post-1997 development.
- (4) Other Management Actions Analyses not covered by the Models. If other management actions are taken to offset streamflow depletions due to new uses begun subsequent to July 1, 1997, accretions resulting from those retirements will be determined using agreed upon methodologies. This would include conjunctive management activities that are not otherwise captured in the models.
- (5) Evaluation Results. For Objective 1.2 to be considered achieved, the results of combining the difference between the 1997 Development Level Run and the Historical Run with the addition of surface water accretions and other uses not covered by the models must be greater than or equal to zero.

$$(Q_h - Q_d) + (S_a) = D_{net}$$

Where:  $Q_h$  = Simulated streamflow/baseflow from the Historical Run  
 $Q_d$  = Simulated streamflow/baseflow from the 1997 Development Level Run  
 $S_a$  = Other Surface Water Accretions  
 $D_{net}$  = Net Depletions

\*\*\*Note: In equation above, streamflow/baseflow is positive

- C. An additional groundwater model run will be conducted to measure total depletions. This will be the Pre-Development Run. The Pre-Development Run will compare the Historical Model Run with a simulation of no groundwater development to determine the total depletions associated with all groundwater only land use development. The run will be conducted using climate data through the current date and will include a fifty-year projection using the Historical Run's agreed-to climate pattern.

- (1) Total Depletions Evaluation.

$$(Q_h - Q_p) = D_t$$

Where:  $Q_h$  = Simulated streamflow/baseflow from the Historical Run  
 $Q_p$  = Simulated streamflow/baseflow from the 1997 Development Level Run  
 $D_t$  = Total Depletions

\*\*\*Note: In equation above, streamflow/baseflow is positive

- D. If integrated models are used to assess impacts to the total streamflow, the methods to be used will be developed jointly by NeDNR and the NRDs to properly design and constrain those analyses so that the results can be used to assess progress toward the goals and objectives of the plan.
- E. Municipal, Industrial, Domestic and Livestock use will be evaluated as part of the Robust Review
  - (1) Data will continue to be collected on the water use of municipalities and industries within the basin.
  - (2) Gather information on total pumping, consumptive use, and timing of any return flows and collect data on water use efficiency and conservation methods being employed.

#### **10.7.4 Measure the success of reaching a fully appropriated condition**

A technical analysis to evaluate effectiveness of this plan and its adequacy in sustaining progress toward a fully appropriated level of water use must be conducted. Because a fully appropriated condition is not currently quantified, NeDNR and the TBNRD will work on outlining the process that will measure progress toward reaching the fully appropriated condition, once that condition has been quantified. NeDNR and TBNRD will continue to refine the methodology used to determine the difference between the current and fully appropriated levels of development in each of the Upper Platte River Basin NRDs.

The evaluation of the difference between current and fully appropriated levels of development is tied to Statute and the current rules of the NeDNR for declaring a basin fully appropriated. Statute requires that this evaluation will:

1. Take into account cyclical supply, including drought
2. Identify the portion of the overall difference that is due to conservation measures
3. Identify the portion of the overall difference that is due to water use initiated prior to July 1, 1997
4. Identify the portion of the overall difference that is due to water use initiated or expanded on or after July 1, 1997

The current NeDNR rules for determining fully appropriated status includes evaluation of the most junior appropriator's access to water, adjustments for lag effect of groundwater depletions and accretions on water supplies, and consideration of instream flows, among other guidance for conducting the analysis. The rules also provide flexibility for NeDNR to "....utilize a standard of interference appropriate for the use, taking into account the purpose for which the appropriation was granted...."<sup>20</sup> for uses which are not defined in the rule. These include storage and hydropower appropriations, which are significant appropriators in the Upper Platte River Basin. NeDNR and the NRDs have and will continue to work with impacted water users on the process for determining the difference between the current and fully appropriated condition of the basin. The assessment of total depletions and the INSIGHT analysis

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<sup>20</sup> Title 457, Chapter 24, Section 001.01B of the Nebraska Administrative Code, dated June 27, 2008.

of Upper Platte River Basin water supplies and demands are examples of approaches to assist in this evaluation.

**10.7.5 Measure the success of maintaining a fully appropriated condition.**

Because a fully appropriated condition is not currently determined, NeDNR and the TBNRD will work on outlining the process that will measure the success of maintaining a fully appropriated condition once that condition has been determined. If during this increment it is determined that a fully appropriated condition has been reached, the TBNRD and DNR will continue to monitor the actions taken in the plan to ensure that all plan goals and objectives are maintained.

**10.7.6 Evaluating the Need for a Subsequent Increment**

1. NeDNR and TBNRD will carry out studies and the technical analyses as specified in *Neb. Rev. Stat.* § 46-715(5)(d)(iii) to determine whether or not a subsequent ten-year increment is necessary. This will include a process to test the validity of the conclusions and information upon which this IMP is based, as required by *Neb. Rev. Stat.* § 46-715(2)(e).
2. Within the current ten-year increment, NeDNR and TBNRD will continue to refine the estimation methodology used to calculate the difference between the current and fully appropriated levels of development in accordance with *Neb. Rev. Stat.* § 46-715(5)(c). The evaluation of fully appropriated levels of development will be supported through the following:
  - A. Determine the changes in recharge from surface water diversions and the impacts of those changes on streamflow using readily available data.
  - B. Determine the changes in groundwater irrigation, municipal, industrial, domestic, livestock and other uses and the streamflow depletions caused by those changes using readily available data.
  - C. Determine the effects of conservation measures on streamflows.
  - D. Determine the timing and location of the net changes in streamflow.
  - E. Determine when streamflow changes impact existing users, taking into account the effects of cyclical supply (e.g. drought).
  - F. Evaluation of the existing balance of water uses and water supplies and associated economic viability, social and environmental health, safety, and welfare of the basin.
  - G. NeDNR and TBNRD will review other data and methodologies relevant to the process.
3. The process described above will focus on impacts to hydrologically connected streamflows due to uses initiated prior to July 1, 1997. All uses initiated subsequent to July 1, 1997, will be evaluated using the process described in Section 10.7.3.1.B.

## **10.8 Studies to be Completed in the Current Increment**

### **10.8.1 Priority studies**

The Basin-Wide Plan calls for several studies and collection of information within the basin. Those studies and information are also critical to the successful implementation of this IMP. The studies include:

1. Collect data on commingled acres to identify, quantify, and determine the proportion of water sources and used on acres irrigated with both surface water and groundwater. Gather data that describes both why and when irrigators use surface water or groundwater.
2. Conduct a study that identifies water users that are affected by cyclical variations in water supplies. This hydrologic element analysis will be conducted by NeDNR and the NRDs by evaluating data such as stream gage and diversion records, and well hydrograph data. Focused surveys of, as well as meetings with basin water users can be used to build on stakeholder input gathered throughout the planning process. Once water users who are hydrologically affected by water supply variability are identified, economic impacts can be estimated.
3. NeDNR and the NRD will collaborate with impacted water users and other entities to gather relevant economic data. Potential partners include economists and other subject matter experts familiar with the economic drivers of the basin who can help identify data needs and formulate tools and methodologies for assessing economic impacts. The tools and methodologies will be used to not only evaluate impacts of supply variability, but also evaluate human-made depletion impacts, management actions, regulatory actions, and potential projects or other activities considered during implementation that may affect water availability.
4. Study economic impacts of drought, which will be a component of the drought plan
5. Study potential for developing markets and transfer protocols for surface water and groundwater supplies.
6. Study options for storage water (both surface water reservoirs and aquifer storage; including existing and potential new storage) to provide flexibility to water users and to increase resiliency of water supplies.

### **10.8.2 Potential Studies**

The following topics for potential studies have been identified by NeDNR and TBNRD:

1. Potential for reducing consumptive water use and evaluation of streamflow depletion impacts of various crop rotations
2. Potential for reducing consumptive water use and evaluation of streamflow depletion impacts of various methods of riparian vegetation management
3. Potential for irrigation scheduling as a tool to reduce water use
4. Conducting an update of previous surveys of the type and location of irrigation systems throughout the District
5. Potential for reducing consumptive water use and evaluation of streamflow depletion impacts of various tillage practices

6. Potential for reducing consumptive water use and evaluation of streamflow depletion impacts of other agricultural and land management best management practices
7. Potential for reducing consumptive water use and evaluation of streamflow depletion impacts resulting from various means of enhancing conjunctive water resources management

In regard to Item 2 described above, the TBNRD works with other agencies and private landowners to reduce the density and coverage of infestations of noxious weeds and invasive plants in riparian areas within the District. The TBNRD also works with landowners, agencies and others to implement sustainable, long-term riparian land management plans that have as their goal returning these lands to their native condition. Progress made toward meeting this objective will be measured in terms of acres of riparian land treated using herbicides and other methods to reduce invasive plant infestations and upon which sustainable, long-term management plans are being implemented that will improve the condition of riparian ecosystems. NeDNR and the NRD will work to determine whether any water saved as a result of these activities can provide a water use credit to offset depletions to streamflows resulting from groundwater pumping.

## **10.9: Review and Modification of the IMP**

### **10.9.1 IMP Revisions**

During implementation of the IMPs, NeDNR and the Upper Platte River Basin NRDs will monitor IMP actions consistent with the analyses and methods contained in the Basin-Wide Plan and amend the IMP if activities are determined by the parties to not be capable of meeting goals. If NeDNR and an Upper Platte River Basin NRD determine that management actions have not provided or maintained the offsets required to meet the goals of the Upper Platte River Basin-Wide Plan, they will agree to increase offset activities to the extent possible and revise the individual NRD's IMP if necessary. These revisions may include additional controls to meet goals of the IMP.

1. TBNRD and NeDNR will jointly determine whether amendments to this IMP are necessary. Any proposed modifications will be discussed at the annual basin-wide meeting. Situations that may prompt revision or modification of this IMP are described below.
  - A. TBNRD and NeDNR may amend this IMP after the annual review of progress being made toward achieving the goals and objectives of Chapter 9 of this IMP.
  - B. If the Robust Review indicates annual depletion or accretion values different from those in Goal 1 Table 1, revisions may be necessary.
  - C. NeDNR and TBNRD may amend this IMP as more data and information become available, as provided in *Neb. Rev. Stat. § 46-715(5)(d)(ii)*.
  - D. If the Basin-Wide Plan is revised and therefore this IMP needs to be revised for consistency, this IMP will be revised in accordance with *Neb. Rev. Stat. § 46-715(5)*.

2. An advisory or stakeholder group may be convened for input on proposed IMP changes, at the discretion of TBNRD and NeDNR.
3. If TBNRD and NeDNR agree on revisions to this IMP, then a hearing will be held to solicit formal comment. Revisions to this IMP shall be provided to all other NRDs in the overappropriated basin for comment before revisions are approved.

#### **10.9.2 Basin-Wide Plan Disputes**

1. If a dispute is presented at the Basin-Wide Annual Meeting as described in the Basin-Wide Plan, the Upper Platte River Basin NRDs and NeDNR will determine whether or not the dispute has hydrologic impact. If it is determined that the dispute does have hydrologic impact, then the Upper Platte River Basin NRDs and NeDNR will determine whether the dispute pertains to all of the Upper Platte River Basin NRDs or just to individual NRD(s).
2. If the dispute pertains to all of the Upper Platte River Basin NRDs, the Upper Platte River Basin NRDs will conduct an investigation and NeDNR to determine what management actions will address the dispute(s) in the Basin-Wide Plan and/or the IMPs. If the management action pertains to this IMP, it will be revised accordingly.
3. If the dispute is not a basin-wide issue, but pertains to the TBNRD, NeDNR, TBNRD, and any other affected Upper Platte River Basin NRD(s), working with the affected water user(s), shall develop management solutions as appropriate to address the issue(s).
4. Disputes related to the implementation of the IMP will also be discussed

#### **10.9.3 Additional Ten-Year Increment**

Based on the results of the technical analyses described in Section 10.7.3, TBNRD and NeDNR will evaluate the need for a subsequent increment. This includes determining whether post-July 1, 1997, depletions have been offset and the progress made toward achieving a fully appropriated condition or maintaining such a condition.

If it is determined from this technical analysis that a subsequent ten-year increment is needed to meet the goals and objectives of this IMP, then pursuant to *Neb. Rev. Stat. § 46-715(5)(d)(iv)*, the goals and objectives for the subsequent ten-year increment will be developed using the consultative and collaborative process described in *Neb. Rev. Stat. § 46-715(5)(b)*. The subsequent ten-year increment shall be completed, adopted and take effect not more than ten years after adoption of this IMP.

NeDNR and the individual Upper Plate River Basin NRDs will engage stakeholders in a collaborative process in the development of goals and objectives for subsequent increments of the individual IMPs if necessary. The need for subsequent increments will be determined through the Robust Review process completed at the end of the second increment and described in section 10.7. Should a subsequent increment be necessary, the planning process will be initiated by NeDNR and each NRD developing a public participation plan that outlines the stakeholder engagement process for the NRD's IMP, including identification of participants/parties, definition of roles, decision

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making protocols, planning processes, and timelines. This public participation plan serves as a reference guide for participants as well as the public throughout the planning process. This effort is analogous to the basin-wide collaborative process described in the Basin-Wide Plan, but focused on the individual NRD stakeholder collaboration. The public participation plan developed for the second increment Basin-Wide Plan development can be found as an appendix to the second increment Upper Platte River Basin-Wide Plan.

DRAFT

**Appendix A:**  
Glossary of Terms



## Glossary of Terms

### Tri-Basin Natural Resources District IMP

Term	Definition
<b>28/40 Area</b>	The area within the North Platte, South Platte, or Platte River watershed in which groundwater intentionally withdrawn for 40 years will result in a cumulative stream depletion to the North Platte, South Platte, or Platte River or a baseflow tributary greater than or equal to 28 percent of the total groundwater consumed as a result of the withdrawals
<b>Accretion</b>	Addition to streamflow that results from an offset/mitigation action or project.
<b>Acre-foot (AF)</b>	Volume of water required to cover one acre of land to a depth of one foot (43,560 cubic feet), equivalent to 325,851 gallons.
<b>Action Item</b>	A specific task that the NRD or NeDNR (or both) will undertake to achieve the goals and objectives of the Integrated Management Plan.
<b>Appropriation</b>	A permit granted by NeDNR to use surface water for a beneficial use in a specific amount, purpose, and location, and is based on first-in-time, first-in-right.
<b>Aquifer</b>	A geological formation or structure of permeable rock or unconsolidated materials that stores and/or transmits water, such as to wells and springs.
<b>Basin-Wide Plan</b>	Following <i>Nebraska Revised Statute</i> § 46-715, a Basin-Wide Plan is required to be developed for areas designated as overappropriated. Overall, basin-wide plans provide a more general framework than IMPs, focusing on regional, cross-boundary issues and opportunities such as those related to hydrologic connectivity and management strategies that cross the NRDs' borders.
<b>Beneficial Use</b>	That use by which water may be put to use to the benefit of humans or other species.
<b>Certified Acres</b>	Lands identified and registered with the District greater than one acre which has water applied for irrigation.

<b>COHYST</b>	Originally developed in 1998 as part of COHYST (the Cooperative Hydrology Study), the COHYST 2010 Model and Western Water Use Management (WWUM) Model were later split into separate models because the geology, climate, and land management of the central portion of the state were determined to be significantly different from those of the western reaches of the state. The COHYST 2010 Model includes a portion of the Platte River Basin, extending westward from Chapman to the upstream end of Lake McConaughy. While the original COHYST model was initially focused only on groundwater modeling, the COHYST 2010 Model now also takes surface water into account. The final model includes a surface water operations model, a groundwater flow model, and a soil-water balance model.
<b>Conjunctive Management</b>	The coordinated and combined process that utilizes the connection between surface and groundwater to maximize water use, while minimizing impacts to streamflow and groundwater levels in an effort to increase the overall water supply of a region and improve the reliability of that supply.
<b>Consumptive Use</b>	The amount of water that is consumed under efficient practices, which satisfies the appropriation without waste. The amount of water removed from available supplies without return to a water resources system.
<b>CREP</b>	Conservation Reserve Enhancement Program in Nebraska is a voluntary program through the US Department of Agriculture and the State of Nebraska, to reduce irrigation water use, replenish streams, rivers, and reservoirs, improve water quality and enhance wildlife habitat through the establishment of vegetative cover.
<b>Department</b>	The Nebraska Department of Natural Resources (NeDNR) a State agency that has the authority over surface water, floodplain management, dam safety, and providing data and analyses needed to make wise resource decisions.
<b>Depletion</b>	Reduction to streamflow that results from a new use of either groundwater or surface water.
<b>District</b>	The Tri-Basin Natural Resources District (TBNRD). A political subdivision of the State responsible for protection and management of the natural resources within the boundaries of the district.

<b>EQIP</b>	The Environmental Quality Incentives Program is a voluntary program through the Natural Resources Conservation Service (NRCS) that provides agricultural producers with financial resources to plan and implement improvements, or conservation practices to improve air and water quality, healthier soil, and better wildlife habitat, all while improving agricultural operations.
<b>Fully Appropriated</b>	From <i>Nebraska Revised Statute</i> § 46-713, subsection (3): A river basin, subbasin, or reach shall be deemed fully appropriated if NeDNR determines based upon its evaluation conducted pursuant to subsection (1) of this section and information presented at the hearing pursuant to subsection (4) of section 46-714 that then current uses of hydrologically connected surface water and ground water in the river basin, subbasin, or reach cause or will in the reasonably foreseeable future cause (a) 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, (b) 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, or (c) 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.
<b>Goal</b>	A general statement of broad direction or intent with no time line.
<b>Groundwater</b>	Water which occurs in or moves, seeps, filters, or percolates through ground under the surface of the land, and shall include groundwater which becomes commingled with waters from surface sources.
<b>Hydrologically Connected</b>	A geographic area where groundwater and surface water are interconnected and withdrawals of one source may influence the availability of the other. In <i>Nebraska Revised Statutes</i> , hydrologically connected waters are those where deep well pumpage over a 50-year period will deplete stream flows by 10 percent of the amount pumped over that time.

<b>INSIGHT</b>	Developed and maintained by NeDNR, INSIGHT stands for an Integrated Network of Scientific Information and GeoHydrologic Tools. The purpose of INSIGHT is to provide an annual snapshot of water conditions across the state. Hydrologic data are consolidated from several different sources, including the NeDNR, U.S. Geological Survey, U.S. Bureau of Reclamation, and local natural resources districts and presented in charts for the following categories: water supplies, water demands, nature and extent of use, and water balance. These data are presented in a consistent format and become more local as the user drills down from the statewide level to the basin-wide and subbasin levels using the database interface.
<b>Instream Use</b>	Water that is appropriated for use within the stream and is not withdrawn from a surface water source.
<b>Integrated Management Plan (IMP)</b>	A plan cooperatively developed by NeDNR and an NRD for the purpose of managing a river basin, subbasin, or reach to achieve and sustain a balance between groundwater and surface water uses and water supplies for the long term.
<b>Irrigation</b>	The artificial application of water to promote the growth of vegetation.
<b>Irrigation Well</b>	A well that provides water for purposes of irrigation for more than two acres of crops and other plants.
<b>LB 962</b>	A bill passed by Nebraska Legislature in 2004 that allows leases of surface water, changes administration of surface water rights, establishes a proactive approach to the integrated management of hydrologically connected groundwater and surface water, and creates funds to direct money toward data gathering, research, conservation, and implementation of integrated management plans in fully and overappropriated basins.
<b>Moratorium</b>	A legally authorized suspension of drilling of groundwater wells or approval of new surface water appropriations.
<b>NeDNR</b>	The Nebraska Department of Natural Resources (NeDNR) a State agency that has the authority over surface water, floodplain management, dam safety, and providing data and analyses needed to make wise resource decisions.
<b>NET</b>	Nebraska Environmental Trust was established to conserve, enhance, and restore the natural environments of Nebraska, by funding projects that leverage private investment in conservation and emphasize long-lasting results.

<b>NNDP</b>	Nebraska New Depletions Plan. The plan, in accordance with PRRIP, describes the actions taken to prevent or mitigate for new depletions to target streamflows, to the extent those new depletions are caused by uses begun or expanded on or after July 1, 1997. Responsibility for implementing the plan is shared between the State of Nebraska and the Platte River Natural Resources Districts.
<b>Objective</b>	A statement that defines a specific outcome that a group seeks to accomplish in working toward a goal.
<b>Offset</b>	A reduction in water use that corresponds with an increased use of water. An offset may be used as a management strategy to balance uses and supplies. The offset will have a corresponding amount, time, and location. Also referred to as mitigation.
<b>Overappropriated</b>	From <i>Nebraska Revised Statute</i> § 46-713 (4)(a): A river basin, subbasin, or reach shall be deemed overappropriated if, on July 16, 2004, the river basin, subbasin, or reach is subject to an interstate cooperative agreement among three or more states and if, prior to such date, the NeDNR has declared a moratorium on the issuance of new surface water appropriations in such river basin, subbasin, or reach and has requested each natural resources district with jurisdiction in the affected area in such river basin, subbasin, or reach either (i) to close or to continue in effect a previously adopted closure of all or part of such river basin, subbasin, or reach to the issuance of additional water well permits in accordance with subdivision (1)(k) of section 46-656.25 as such section existed prior to July 16, 2004, or (ii) to temporarily suspend or to continue in effect a temporary suspension, previously adopted pursuant to section 46-656.28 as such section existed prior to July 16, 2004, on the drilling of new water wells in all or part of such river basin, subbasin, or reach.
<b>PBC</b>	Platte Basin Coalition (or Coalition) is a interlocal cooperation agreement among Upper Platte River Basin NRDs and NeDNR to meet the terms of PRRIP, requirements of the Groundwater Management and Protection Act, and the provisions in the IMPs and the Basin-Wide Plan by obtaining funding for projects to study, develop, and implement management actions to reduce consumptive uses of water.

<b>PRRIP</b>	Platte River Recovery Implementation Program. Developed by the federal government along with basin states of Nebraska, Colorado, and Wyoming and signed in 2006. Local, state and federal government agencies work with groups across the basin to build a framework for a long-term program that will satisfy Endangered Species Act requirements for water users in the basin. The primary focus of PRRIP is to enhance, restore, and protect habitat lands for the endangered whooping crane, interior least tern, pallid sturgeon, and the threatened piping plover.
<b>Recharge</b>	A hydrologic process where water moves downward from surface water to ground water, both naturally through the hydrologic cycle or through intentional practices.
<b>Stakeholder Advisory Committee</b>	Representatives of various interest groups and professional fields who provided comments and suggestions on various aspects of the Integrated Management Plan.
<b>Storage</b>	The capture and holding of water in above-ground man-made structures, or below ground in geologic strata for subsequent use for various purposes.
<b>Streamflow</b>	The discharge that occurs in a natural channel of a surface stream course.
<b>Surface Water</b>	Water which occurs or moves on the surface of the planet such as in a stream, river, lake, wetland, or ocean.
<b>Transfer</b>	To allow for the historic consumptive use of water to be changed, in location and/or purpose without causing an increase in depletions to the river or an impact to existing surface water or groundwater uses.
<b>Use</b>	The legally accepted use of a well or water appropriation.
<b>Variance</b>	To allow an exception to the stay on new irrigated acres and new consumptive uses while providing adequate mitigations or transfers to assure that there is no net increase in depletions to the river or impacts to existing surface water or groundwater uses; any request that is contrary to existing rules or regulations will require a variance. Any person wanting to apply for a new surface water appropriation within a moratorium or stay area must file a variance petition with NeDNR requesting leave to file an application.
<b>Water Conservation Incentive Program</b>	A mechanism used to facilitate the transfer of water between parties, often using market-driven transactions. Water banks can be institutional, physical, or mixtures of both.

<b>WWUM</b>	Western Water Use Management Model assists NeDNR and NRDs with meeting the objectives of local integrated management plans and the Platte River Recovery Implementation Program by assessing the impact of water uses and management practices on long-term water supplies.
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## **Appendix B:**

Exchange Letters Between TBNRD and NeDNR



Tri-Basin NRD  
1723 Burlington  
Holdrege, NE 68949



Phone: (308) 995-6688  
Toll Free: 1-877-995-6688  
Fax: (308) 995-6992  
Email: [tribasin@tribasinnr.org](mailto:tribasin@tribasinnr.org)

General Manager  
JOHN THORBURN

February 14, 2018

Chairman  
DAVID OLSEN  
Minden, Nebraska

Vice Chairman  
BRADLEY LUNDEEN  
Wilcox, Nebraska

Secretary  
TODD GARRELS  
Holdrege, Nebraska

Treasurer  
JOE BILKA  
Holdrege, Nebraska

BRIAN BERGSTROM  
Axtell, Nebraska

MIKE CAVANAUGH  
Minden, Nebraska

ED HARRIS  
Loomis, Nebraska

PHYLLIS JOHNSON  
Bertrand, Nebraska

JOE LARSON  
Loomis, Nebraska

DAVID RAFFETY  
Kearney, Nebraska

LARRY REYNOLDS  
Lexington, Nebraska

RAY WINZ  
Holdrege, Nebraska

Mr. Jeff Fassett, Director  
Nebraska Department of Natural Resources  
301 Centennial Mall South  
PO Box 94676  
Lincoln, NE 68509-4676

RE: Initiation of Tri-Basin NRD's second 10-year Platte Basin integrated management plan increment

Dear Jeff:

This letter is to confirm that Tri-Basin Natural Resources District (TBNRD) and the Department of Natural Resources (NeDNR) have jointly determined that the development of a second 10-year increment integrated management plan (IMP) for the fully and overappropriated portions of the Platte Basin in our district is necessary. In accordance with *Nebraska Revised Statutes* §§ 46-715 through 46-718, the second increment IMP will be developed using a consultative and collaborative process to identify IMP goals and objectives. Following adoption of the first increment IMP in 2009, TBNRD and NeDNR have made collaborative efforts to implement the goals and objectives set forth in the IMP and have met regularly to review progress. The development of a second increment IMP will allow further progress to be made toward meeting the IMP's goals and objectives pursuant to *Neb. Rev. Stat. §46-715(2)* and to reduce the overall difference between the current and fully appropriated levels of development identified in *Neb. Rev. Stat. §46-715(5)(c)*.

As you are aware, work on the development of the Upper Platte River Basin's second increment basin-wide plan will be winding down in 2018, allowing for the Upper Platte NRDs and NeDNR to direct our time and attention to development of individual NRD second increment IMPs. By initiating planning and development of TBNRD's individual IMP now, partners will benefit from knowing the second increment basin-wide plan's proposed goals and objectives, enabling us to maintain consistency between the two plans as well as a concurrent plan development schedule.

TBNRD would like to meet with your staff in the coming weeks in order to discuss a project timeline associated with development of the individual IMP. I will be the TBNRD staff contact leading coordination of the individual IMP development. I look forward to working with you and your staff in our ongoing effort to manage Nebraska's water resources more efficiently, effectively and cooperatively.

Sincerely,



John Thorburn  
General Manager  
Tri-Basin Natural Resources District

CC: TBNRD Directors  
Don Blankenau, TBNRD Legal Counsel  
Don Kraus, CNPPID

# NEBRASKA

Good Life. Great Water.

## DEPT. OF NATURAL RESOURCES

February 14, 2018

John Thorburn  
General Manager  
Tri-Basin NRD  
1723 Burlington  
Holdrege, NE 68949

Dear Mr. <sup>John</sup>Thorburn:

The Nebraska Department of Natural Resources (Department) is pleased to receive the Tri-Basin Natural Resources District's (TBNRD) February 14, 2018 letter to initiate the second 10-year increment integrated management plan per *Nebraska Revised Statutes* §§ 46-715 through 46-718.

Jennifer J. Schellpeper of the Department will contact you to discuss the project timeline and whether to consider hiring outside assistance for coordination and/or facilitation.

We look forward to continued work on the integrated management plans and in furthering the effective working relationship between the District and the Department.

Sincerely,

*Jeff*

Gordon W. "Jeff" Fassett  
Director



Pete Ricketts, Governor

Gordon W. "Jeff" Fassett, P.E., Director

### Department of Natural Resources

301 Centennial Mall South  
P.O. Box 94676  
Lincoln, Nebraska 68509

OFFICE 402-471-2363  
FAX 402-471-2900

[dnr.nebraska.gov](http://dnr.nebraska.gov)

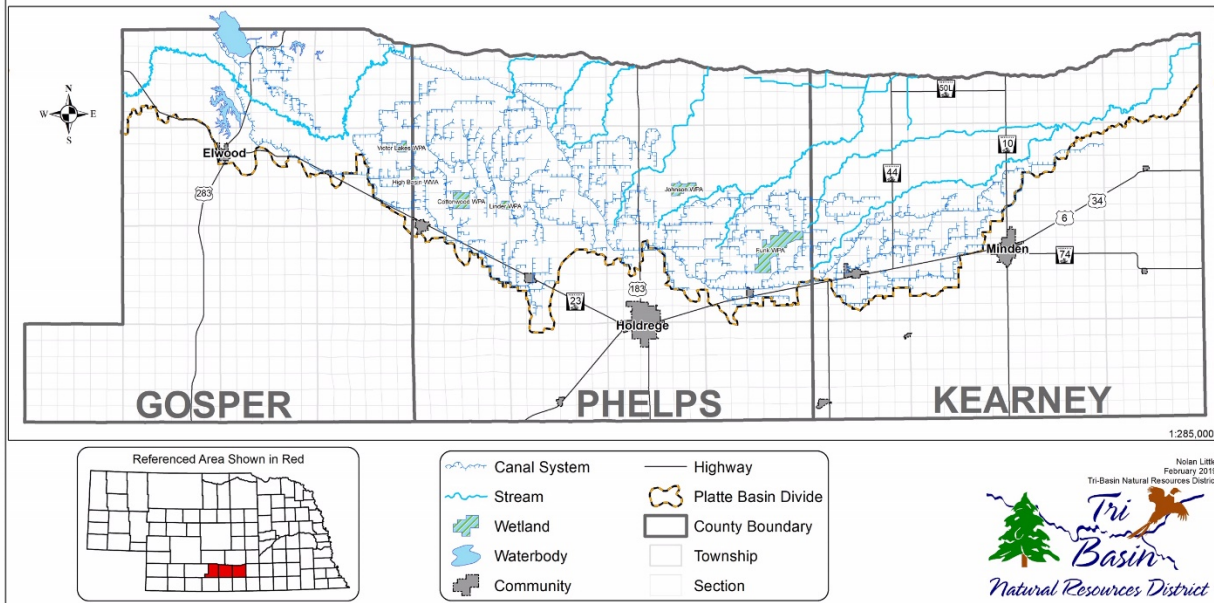
## **Appendix C:**

Additional Maps of Tri-Basin NRD



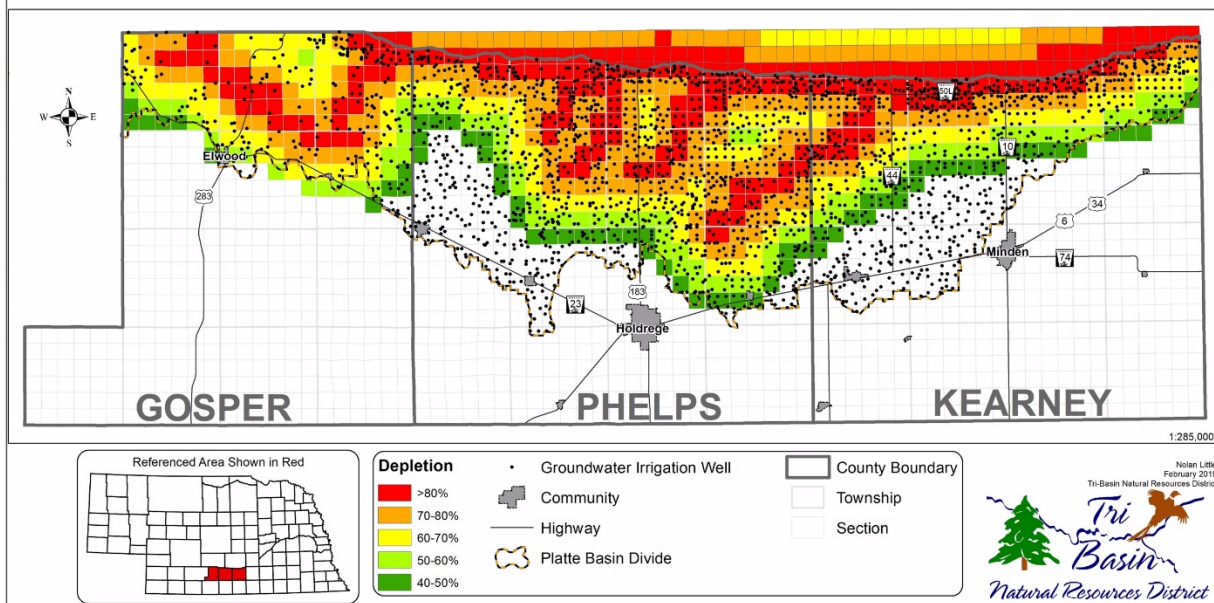
# Tri-Basin Natural Resources District

## Platte Basin Surface Water Features



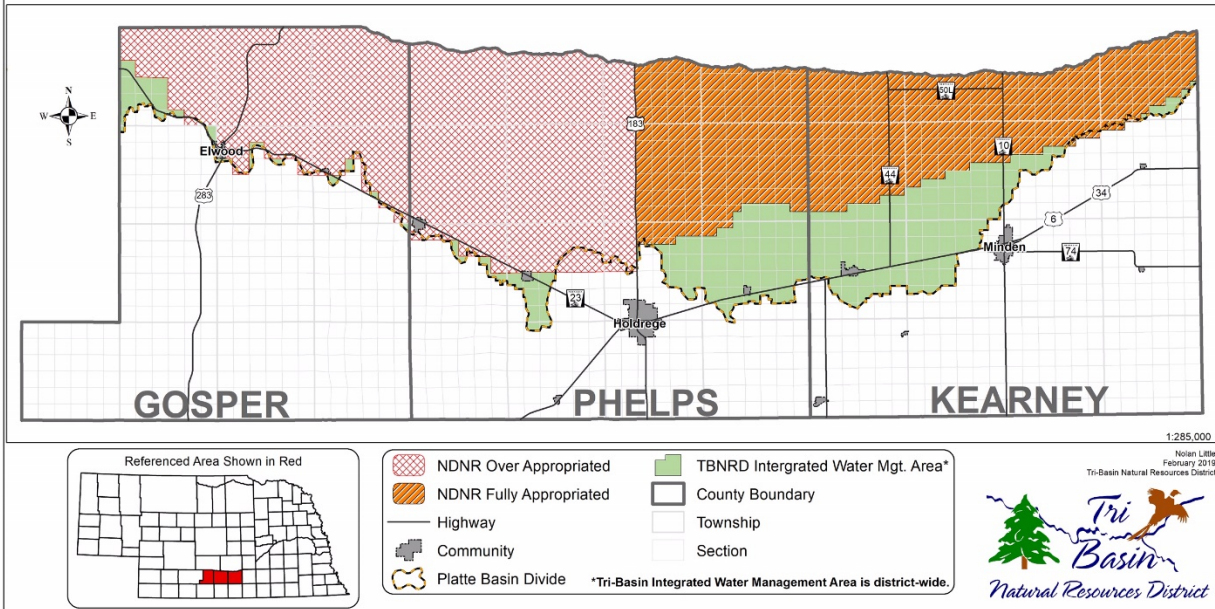
# Tri-Basin Natural Resources District

## Platte Basin Registered Irrigation Wells & Streamflow Depletions



# Tri-Basin Natural Resources District

## Platte Basin Integrated Water Management



**Appendix D:**

Stakeholder Advisory Committee Process,  
Members, and Meeting Dates

## **Stakeholder Advisory Committee Process, Members, and Meeting Dates**

### **Public Involvement**

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Public involvement during the Tri Basin Natural Resources District’s Second Increment Integrated Management Plan development process was designed to encompass broad stakeholder values, interests, future needs and priorities, and raise awareness to encourage broad community support for water quantity management within the District and Basin.

The Stakeholder Advisory Committee was formed through local solicitations and nominations. The District and the Department sent out letters to 10 individuals who were nominated as potential members of the Advisory Committee through District contacts. Eight interested individuals contacted the District and were appointed to the Stakeholder Advisory Committee. The 8-member Stakeholder Advisory Committee included diverse representation from agriculture, irrigation districts, well drillers, public power producers, industry/business, environmental groups, and municipalities.

### **Meeting Topics**

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The main plan development consisted of stakeholder meetings which were open to the public. During stakeholder meetings numerous concepts and topics were discussed, but certain topics were repeatedly discussed by stakeholders across meetings that led to Plan goals, objectives, and action items. To the extent possible, these ideas have been grouped and are listed below in alphabetical order.

- Continue to enhance groundwater modeling
- Economic viability of the TBNRD
- Education
- Effects to stream-flow from on-farm efficiency
- Equitability among users
- Keeping current progress made
- Upstream and downstream partnerships
- Water sustainability



## Members of the Stakeholder Advisory Committee

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At the end of plan development, the Stakeholder Advisory Committee had 8 members, whose names and affiliations are listed below.

Mike Drain  
Randy Zach  
Bob Dahlgren  
Russ Edeal  
Vernon Nelson  
Dave Nickel  
Blake Reynolds  
Dave Rowe

In addition to the Stakeholder Advisory Committee meetings, NeDNR and the CPNRD held coordination meetings to plan stakeholder meetings. Meeting dates are listed below.

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Stakeholder Advisory Committee Meetings	Coordination Meetings
	May 21, 2018
	September 6, 2018
September 12, 2018	
	October 30, 2018
	December 6, 2018
December 12, 2018	
	December 18, 2018
	January 23, 2019
	March 14, 2019
March 19, 2019	

**Appendix E:**

Order Declaring Formal Moratoriums (7/14/2004)

STATE OF NEBRASKA

DEPARTMENT OF NATURAL RESOURCES

In the Matter of the Platte River )  
Basin, the North Platte River )  
Basin, the South Platte River )  
Basin, the Republican River ) ORDER DECLARING FORMAL MORATORIUMS  
Basin, the White River Basin, )  
and the Hat Creek River Basin. )

This matter came on for consideration before the Director of the Department of Natural Resources in part because of the provisions of Section 53, subsection (4) of LB962 (2004 Nebraska Legislature) and in part because of the need to formalize actions previously taken by the Department relative to the issuance of additional appropriations in several river basins in the state. The Director FINDS:

1. On February 27, 1979, by a memorandum to staff, the Director of the Department of Water Resources (now the Department of Natural Resources) ordered staff to deny all applications for natural flow for consumptive purposes in the Lodgepole Creek basin. The memorandum states the action was taken because the Director did not believe the public interest was served by continued issuance of permits for natural flow and that the moratorium would avoid the additional State costs from the added administration and cancellation of permits in the future. Documents in the Department's records indicate that storage and storage use appropriations could still be considered and approved. Such action was to take effect immediately and remain in effect until further notice. Lodgepole Creek is a tributary to the South Platte River.
2. On December 13, 1979, the same Director of the Department of Water Resources issued another memorandum to staff directing them to deny all applications for the direct use of natural flow from Pumpkinseed Creek and tributaries for irrigation purposes. The memorandum states that applications for storage and applications to use stored water for irrigation purposes could be processed. The reason given for this action was public interest and that it would avoid additional state costs from added administration and cancellation work in future years. Pumpkinseed Creek is a tributary to the North Platte River.
3. On November 30, 1990, the Department declared a formal moratorium on the Niobrara River from the Nebraska-Wyoming state line downstream to the headgate of the Mirage Flats Canal. The moratorium included all applications to use natural flow for irrigation, storage, and other beneficial uses. The Order states that the Department shall not approve any applications for permits for new water appropriations on this stream reach while the moratorium remains in effect, and any interested person may petition the Department to reconsider the moratorium designation.

4. Through actions taken since approximately 1993, the Department of Natural Resources has effectively maintained other informal moratoriums through its discussions with possible applicants and through its orders regarding applications filed. The actions taken and the Department's policy have been as follows:
  - a. North Platte River and tributaries above Lake McConaughy. The Department has denied applications on the basis of a preliminary determination that there is insufficient unappropriated water. Applicants were given an opportunity to request a hearing to prove that unappropriated water was available. The basis for this preliminary determination was that in most years Lake McConaughy has not filled. This determination resulted in additional restrictions in the Pumpkinseed Creek area.
  - b. South Platte River and tributaries, North Platte River and tributaries below Lake McConaughy and Platte River and tributaries above Cozad Canal. The Department has denied applications that would reduce natural flow during the irrigation season on the basis of a preliminary determination that there is insufficient unappropriated water during the irrigation season. Applicants were given an opportunity to request a hearing to prove that unappropriated water was available. The basis for the preliminary determination was the fact that in most years the Department has closed appropriations that were junior to a 1927 water right for Thirty Mile Canal, and in many years for a 1894 water right for Cozad Canal.
  - c. Platte River and tributaries above the mouth of the Loup River. The Department has denied applications that would reduce the natural flow for the instream water appropriations that have a 1993 water right on the preliminary determination that there is insufficient unappropriated water for these water rights that have 1990 or 1993 priority dates. Applicants were given an opportunity to request a hearing to prove that unappropriated water was available.
  - d. White River Basin and Hat Creek Basins. Again, the Department has denied applications that would reduce the natural flow of the stream. The Department's preliminary determination was based on the total lack of flow existing in most locations of these basins and the number of old water rights that do not receive the full allotment allowed under their appropriations. Applicants were given opportunity to request a hearing to prove that unappropriated water was available.
5. No applications for permanent water rights in the Republican River Basin have been filed or granted since 1994. In discussions with possible applicants since then, Department staff discussed the need for showing the availability of unappropriated water. On May 19, 2003, the United States Supreme Court approved a final settlement


stipulation with Kansas and Colorado regarding the Republican River Compact. While that settlement does not specifically require that the Republican River Basin be made subject to a formal moratorium on the issuance of such rights, such a moratorium is consistent with that settlement and with Nebraska's required compliance with that Compact.

It is therefore CONCLUDED that it is in the public interest to declare an official moratorium on the issuance of new surface water appropriations for all of those areas described above for which the Department previously has not formally declared such a moratorium, that is the areas described in paragraphs Nos. 1, 2, 4 and 5 above. The Nebraska Constitution, Article XV, Section 6 states, "The right to divert unappropriated waters of every natural stream for beneficial use shall never be denied except when such denial is demanded by the public interest." By declaring the official moratorium the public is well served by notice of such intentions and requirements. Further, the public would not be well served by the continuance of granting permits where sufficient water is not available. This action would result in "paper water rights" that would cause additional costs to the taxpayer because of the costs of processing such applications, the costs of administering such applications, and the costs of canceling such appropriations in the future. However, there may be certain situations where the public interest would be served by allowing new water rights, and because of the type of project and/or its operation, if an applicant can show that unappropriated water is available. A process for allowing such action should be authorized.

It is therefore ORDERED that:

1. A moratorium on all new surface water appropriations is hereby declared for the following basins or subbasins in Nebraska:
  - a. The Republican River Basin, including all subbasins
  - b. The North Platte River Basin including all subbasins
  - c. The South Platte River Basin including all subbasins
  - d. The Platte River Basin above the mouth of the Loup River including all subbasins
  - e. The White River Basin including all subbasins
  - f. The Hat Creek Basin including all subbasins
2. Interested persons may petition the Department to reconsider the moratorium designation as it relates to a specific project. The petition for reconsideration must clearly state the basis for such request. For sufficient cause shown, the Director may re-examine the action imposed by this Order at any time.

DEPARTMENT OF NATURAL RESOURCES

  
\_\_\_\_\_  
Roger K. Patterson, Director

July 14, 2004

## CERTIFICATE OF SERVICE

A copy of the foregoing ORDER DELARING FORMAL MORATORIUMS was mailed on July 14, 2004 to the following:

Lower Republican Natural  
Resources District  
P.O. 618  
Alma, Nebraska 68920-0618

Middle Republican Natural  
Resources District  
P.O. Box 81  
Curtis, Nebraska 69025-0081

Upper Republican Natural  
Resources District  
P.O. Box 1140  
Imperial, Nebraska 69033-1140

Tri-Basin Natural Resources  
District  
1308-2<sup>nd</sup> Street  
Holdrege, Nebraska 68949-2803

Central Platte Natural Resources  
District  
215 North Kaufman Avenue  
Grand Island, Nebraska 68803-  
4915

Twin Platte Natural Resources  
District  
P.O. Box 1347  
North Platte, Nebraska 69103-  
1347

South Platte Natural Resources  
District  
P.O. Box 294  
Sidney, Nebraska 69162-0294

North Platte Natural Resources  
District  
P.O. Box 36  
Gering, Nebraska 69341

Upper Niobrara White Natural  
Resources District  
430 East 2<sup>nd</sup> Street  
Chadron, Nebraska 69337-2433

Alliance Irrigation District  
P.O. Box 412  
Bridgeport, Nebraska 69336-0412

Beerline Canal Company  
R.R. 2, Box 15  
Broadwater, Nebraska 69125

Birdwood Irrigation District  
25362 W. North River Road  
Hershey, Nebraska 69143

Blue Creek Irrigation District  
5277 Road 197  
Lewellen, Nebraska 69147

Bostwick Irrigation District  
P.O. Box 446  
Red Cloud, Nebraska 68970-0446

Bridgeport Irrigation District  
P.O. Box 1028  
Bridgeport, Nebraska 69336-1028

Browns Creek Irrigation District  
P.O. Box 40  
Broadwater, Nebraska 69125-0040

Castle Rock Irrigation District  
P.O. Box 6  
McGrew, Nebraska 69353-0006

Central Irrigation District  
P.O. Box 497  
Scottsbluff, Nebraska 69363

Central Nebraska Public Power  
and Irrigation District  
P.O. Box 740  
Holdrege, Nebraska 68949-0740

Chimney Rock Irrigation District  
P.O. Box 398  
Bayard, Nebraska 69334-0398

Cody-Dillon Ditch Company  
6396 North Splinter Road  
North Platte, Nebraska 69101

Court House Rock Company  
HC 85 Box 156  
Bridgeport, Nebraska 69336-9530

Cozad Ditch Company, Inc.  
P.O. Box 286  
Cozad, Nebraska 69130-0286

Empire Canal Company  
C/o Tim Riggs  
P.O. Box 69336  
Bridgeport, Nebraska 69336

Enterprise Irrigation District  
P.O. Box 1558  
Scottsbluff, Nebraska 69361-1558

Farmers Irrigation District  
1505 Second Avenue  
Scottsbluff, Nebraska 69361

Frenchman-Cambridge Irrigation  
District  
P.O. Box 116  
Cambridge, Nebraska 69022-0116

Frenchman Valley Irrigation  
District  
P.O. Box 297  
Culbertson, Nebraska 69024

Gering Irrigation District  
981 Rundell Road  
Gering, Nebraska 69341

Gering-Ft. Laramie Irrigation  
District  
P.O. Box 69341-0541  
Gering, Nebraska 69341

H & RW Irrigation District  
P.O. Box 297  
Culbertson, Nebraska 69024

Hooper Irrigation District  
19576 Road 50  
Lewellen, Nebraska 69147

Keith-Lincoln County Irrigation  
District  
P.O. Box 308  
Sutherland, Nebraska 69165-0308

Lisco Irrigation District  
15170 Hwy 26  
Lisco, Nebraska 69148-8827

Midland-Overland Canal Company  
18920 Hwy 26  
Oshkosh, Nebraska 69154

Minatare Mutual Canal and  
Irrigation Company  
P.O. Box 367  
Minatare, Nebraska 69356

Mitchell Irrigation District  
120322 County Road F  
Mitchell, Nebraska 69357

Nebraska Public Power District  
P.O. Box 499  
Columbus, Nebraska 68602-0499

Nine Mile Irrigation District  
P.O. Box 597  
Bayard, Nebraska 69334-0597

Northport Irrigation District  
RR 1 Box 164  
Bridgeport, Nebraska 69336-0535

Paisley Irrigation District  
5277 Road 197  
Lewellen, Nebraska 69147

Pathfinder Irrigation District  
P.O. Box 338  
Mitchell, Nebraska 69357

Paxton-Hershey Water Company  
25751 West Suburban Road  
Hershey, Nebraska 69143

Pioneer Irrigation District  
RR 1 Box 44  
Haigler, Nebraska 69030

Platte Valley Irrigation  
District  
P.O. Box 104  
Hershey, Nebraska 69143

Riverside Irrigation Company  
RR 3 Box 33  
Culbertson, Nebraska 69024-9318

Short Line Irrigation District  
P.O. Box 575  
Bayard, Nebraska 69334-0575

Six Mile Ditch Company  
P.O. Box 243  
Gothenburg, Nebraska 69138

South Side Irrigation Company  
P.O. Box 174  
Cozad, Nebraska 69130-0174

Steamboat Irrigation District  
180038 County Road 29  
Gering, Nebraska 69341

Suburban Irrigation District  
P.O. Box 885  
North Platte, Nebraska 69103

Thirty Mile Canal Company  
75885 Road 414  
Cozad, Nebraska 69130

Twin Loups Irrigation Company  
P.O. Box 98  
Scotia, Nebraska 68875-0098

Twin Loups Reclamation District  
P.O. Box 98  
Scotia, Nebraska 68875-0098

Union Irrigation District  
5277 Road 197  
Lewellen, Nebraska 69147

Western Irrigation District  
1351 Road West 40  
Brule, Nebraska 69127

White River Irrigation District  
P.O. Box 446  
Crawford, Nebraska 69339

Whitney Irrigation District  
P.O. Box 185  
Whitney, Nebraska 69367

Winters Creek Canal Company  
230710 Highland Road  
Scottsbluff, Nebraska 69361



**Appendix F:**

Order Designating Overappropriated River Basins,  
Subbasins, or Reaches, and Describing Hydrologically  
Connected Geographic Area (9/15/2004)

STATE OF NEBRASKA

DEPARTMENT OF NATURAL RESOURCES

In the Matter of the	)	ORDER DESIGNATING
Platte River Basin upstream of	)	OVERAPPROPRIATED RIVER BASINS,
the Kearney Canal Diversion, the	)	SUBBASINS, OR REACHES, AND
North Platte River Basin, and	)	DESCRIBING HYDROLOGICALLY
the South Platte River Basin	)	CONNECTED GEOGRAPHIC AREA

This matter came on for consideration before the Director of the Department of Natural Resources (the "Department") pursuant to Section 53, subsection (4) of LB 962 (2004 Nebraska Legislature), codified at Neb. Rev. Stat. Section 46-713(4), which requires the Department to designate which river basins, subbasins, or reaches are overappropriated within sixty days after the operative date of that section. Furthermore, the designation shall include a description of the geographic area within which the Department has determined that surface water and ground water are hydrologically connected and the criteria used to make such determination.

Section 46-713(4)(a) provides as follows:

A river basin, subbasin, or reach shall be deemed overappropriated if, on July 16, 2004, the river basin, subbasin, or reach is subject to an interstate cooperative agreement among three or more states and if, prior to such date, the department has declared a moratorium on the issuance of new surface water appropriations in such river basin, subbasin, or reach and has requested each natural resources district with jurisdiction in the affected area in such river basin, subbasin, or reach either (i) to close or to continue in effect a previously adopted closure of all or part of such river basin, subbasin, or reach to the issuance of additional water well permits in accordance with subdivision (1)(k) of section 46-656.25 as such section existed prior to July 16, 2004, or (ii) to temporarily suspend or to continue in effect a temporary suspension, previously adopted pursuant to section 46-656.28 as such section existed prior to July 16, 2004, on the drilling of new water wells in all or part of such river basin, subbasin, or reach.

The Director FINDS:

1. In 1997, the States of Nebraska, Wyoming, and Colorado and the U.S. Department of the Interior signed the Cooperative Agreement for Platte River Research and Other Efforts Relating to Endangered Species Habitats Along the Central Platte River, Nebraska (the "Cooperative Agreement").
  - a. Pursuant to the Cooperative Agreement, Nebraska has prepared the Nebraska New Depletion Plan (the "New Depletion Plan"), a purpose of which is to describe the actions Nebraska proposes to take to prevent or mitigate for new depletions to the extent those new depletions are caused by new and expanded uses of water since the target date of July 1, 1997.

2.
  - a. On February 27, 1979, by a memorandum to staff, the Director of the Department of Water Resources (now the Department of Natural Resources) ordered staff to deny all applications for natural flow for consumptive purposes in the Lodgepole Creek basin.
  - b. On December 13, 1979, the same Director of the Department of Water Resources issued another memorandum to staff directing them to deny all applications for the direct use of natural flow from Pumpkinseed Creek and tributaries for irrigation purposes.
  - c. Through actions taken since approximately 1993, the Department of Natural Resources has effectively maintained other informal moratoriums through its discussions with possible applicants and through its orders regarding applications filed in the North Platte River and its tributaries, the South Platte River and its tributaries, and the Platte River and its tributaries above the mouth of the Loup River.
  - d. On July 14, 2004, the Department issued an Order Declaring Formal Moratorium on the issuance of new surface water appropriations in the Platte River Basin above the mouth of the Loup River, the North Platte River Basin, and the South Platte River Basin.
  - e. Numerous new wells have been registered with the Department since the Department stopped issuing surface water rights as described in this Section.
3. The Department has made written requests to each Natural Resources District ("NRD") with jurisdiction in the affected area, as follows:
  - a. By letter dated July 13, 2004, to Jim Olson, Chair of the North Platte NRD, the Department requested the North Platte NRD to continue in effect a previously adopted closure of the Pumpkin Creek integrated ground water management subarea to the issuance of additional water well permits and to continue in effect a previously adopted temporary suspension on the drilling of new water wells in the remainder of the Natural Resources District.
  - b. By letter dated July 13, 2004, to Alicia Haussler, Chair of the Central Platte NRD, the Department requested the Central Platte NRD to continue in effect a temporary suspension of well construction that took effect November 20, 2003 in a portion of the Natural Resources District, and to extend the temporary suspension to include all of the area the Department had preliminarily determined to be hydrologically connected to the overappropriated basin.

- c. By letter dated July 13, 2004, to Bradley Lundeen, Chair of the Tri-Basin NRD, the Department requested the Tri-Basin NRD to either close the geographic area the Department preliminarily determined to be hydrologically connected to the overappropriated basin, as identified on a map enclosed with the Department's letter, to the issuance of additional water well permits, or temporarily suspend the drilling of new water wells within that identified area.
  - d. By letter dated July 13, 2004, to Keith Rexroth, Chair of the South Platte NRD, the Department requested the South Platte NRD to continue in effect a previously adopted closure of the Lodgepole Creek integrated ground water management subarea to the issuance of additional water well permits and to continue in effect a previously adopted temporary suspension on the drilling of new water wells in the remainder of the Natural Resources District.
  - e. By letter dated July 13, 2004, to Jim Rubenthaler, Chair of the Twin Platte NRD, the Department requested the Twin Platte NRD to continue in effect a previously adopted temporary suspension of well construction in a portion of the Natural Resources District, and to extend the temporary suspension to include all of the area the Department had preliminarily determined to be hydrologically connected to the overappropriated basin, as identified on a map enclosed with the Department's letter.
- 4. Included with the Department's July 13, 2004 correspondence listed in Section 3 of this Order were maps identifying the portions of each of the Natural Resources Districts within which the Department was preliminarily considering the surface water and ground water to be hydrologically connected to the overappropriated basin.
  - 5. The criteria used to make the determination of hydrologically connected surface water and ground water for purposes of the overappropriated designation is as follows:
    - a. The area within which pumping of a well for 40 years will deplete the North Platte River, South Platte River, Platte River or a base flow tributary thereof by at least 28% of the amount pumped in that time (referred to as the "28/40 line"). The 28/40 line is also relevant for management purposes in terms of the Cooperative Agreement, which is one of the criteria on which the overappropriated designation rests. The New Depletion Plan prepared as a result of the Cooperative Agreement requires that the NRDs responsible for its implementation have groundwater management areas that cover all land area within the Platte River Basin and also the area within the 28/40 line.
    - b. To the extent not included as a result of the 28/40 line, any other land area that is within the North Platte NRD's current integrated ground water management subarea of the Pumpkin

Creek subbasin, or the South Platte NRD's current integrated ground water management subarea of the Lodgepole Creek subbasin. This criteria is relevant because the Cooperative Hydrology Study ("COHYST") Model, discussed below, does not have modeling for all parts of Nebraska. In areas not covered by COHYST, NRD information analysis relating to integrated management areas was relied upon in order to determine the areas to be considered hydrologically connected for the relevant management purposes.

6. The preliminary map sent on July 13<sup>th</sup> to each NRD was based on data from the United States Geological Survey's Regional Aquifer Study Assessment. In the July 13, 2004 letters to the NRDs, the Department reserved the ability to utilize data from the COHYST Model, when available, in making the final designation, as such data was anticipated to be the best data available.
7. The COHYST Model is now available. The Department has examined the results of the current COHYST Model's 28/40 line. The Department determines that the current COHYST Model is the best data available for purposes of obtaining the 28/40 line.
8. The Department held public information meetings and public hearings for the purpose of collecting evidence and testimony concerning the final determination of certain NRDs as "fully appropriated" in their entirety. The public hearings were held in North Platte on August 31, 2004, in Sidney on September 1, 2004, and in Kearney on September 9, 2004. Prior to each hearing, Department personnel indicated that testimony could be given during the hearing on the extent of the area within which the surface water and groundwater supplies for the river basin, subbasin or reach are determined to be hydrologically connected for purposes of the overappropriated designation. The Department duly considered such testimony and evidence produced at the hearings.

It is therefore CONCLUDED that it is in the public interest to designate the Platte River Basin above the Kearney Canal Diversion, the North Platte River Basin, and the South Platte River Basin as overappropriated, and to designate the area within which surface water and ground water are hydrologically connected for purposes of the overappropriated designations.

It is therefore ORDERED that:

1. The Platte River Basin above the Kearney Canal Diversion, the North Platte River Basin including Pumpkinseed Creek, and the South Platte River Basin including Lodgepole Creek are hereby designated as overappropriated.
2. Surface water and ground water are determined to be hydrologically connected for purposes of the overappropriated designations in the area within the 28/40 line, based on data from the COHYST Model. It is further ordered that each full Public Land Survey System section, fifty percent or more of which is within the area having as its outer boundary the 28/40 line, shall be designated as hydrologically connected for purposes of the overappropriated designations. The legal description of the geographic area within

which the Department has determined that the surface water and ground water are hydrologically connected for purposes of the overappropriated designations is attached hereto as Appendix I. Appendix II attached hereto is a map showing the designated overappropriated basins and the geographic area within which the Department has determined that surface water and groundwater are hydrologically connected for purposes of the overappropriated designations.

3. Interested persons may petition the Department to reconsider the designation of the overappropriated basins, the determination of the geographic area within which the Department has determined that surface water and groundwater are hydrologically connected for purposes of the overappropriated designations, or the criteria used to make the determination of hydrologic connectivity for purposes of the overappropriated designations. The petition for reconsideration must clearly state the basis for such request. For sufficient cause shown, the Director may re-examine the action imposed by this Order at any time.

DEPARTMENT OF NATURAL RESOURCES

September 15, 2004

  
Roger K. Patterson, Director

# Legal Description of the Geographic Area within which Surface Water and Ground Water are Hydrologically Connected for Purposes of the Overappropriated Designation

Township Range Sections			
6	N	18 W	05,06,07,08,17,18
6	N	19 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18
6	N	20 W	01,02,03,04,05,06,10,11,12,13
7	N	18 W	05,06,07,08,17,18,19,20,29,30,31,32
7	N	19 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
7	N	20 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
7	N	21 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,17,18,22,23,24,25,26,36
7	N	22 W	01,02,03,04,05,06,07,08,10,11,12,13,17
8	N	18 W	04,05,06,07,08,09,17,18,19,20,29,30,31,32
8	N	19 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
8	N	20 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
8	N	21 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
8	N	22 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
8	N	23 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,22,23,24,25,26,27,35,36
8	N	24 W	01,02
9	N	18 W	29,30,31,32,33,34
9	N	19 W	25,26,31,32,33,34,35,36
9	N	20 W	31,32
9	N	21 W	17,18,19,20,21,22,26,27,28,29,30,31,32,33,34,35,36
9	N	22 W	03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
9	N	23 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
9	N	24 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,34,35,36
9	N	25 W	01,02,03,04,05,06,09,10,11,12,13,14,24
10	N	22 W	30,31,32
10	N	23 W	07,08,15,16,17,18,19,20,21,22,23,25,26,27,28,29,30,31,32,33,34,35,36
10	N	24 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
10	N	25 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
10	N	26 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,21,22,23,24,25,26,27,36
10	N	27 W	01,02,03,11,12
11	N	24 W	06,07,18,19,20,28,29,30,31,32,33,34
11	N	25 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
11	N	26 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
11	N	27 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,33,34,35,36
11	N	28 W	01,02,03,04,05,10,11,12,13,14

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**Township Range Sections**

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12 N	25 W	17,18,19,20,21,26,27,28,29,30,31,32,33,34,35,36
12 N	26 W	02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
12 N	27 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
12 N	28 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
12 N	29 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,21,22,23,24,25,26
12 N	30 W	01,02,03,04,05,06,08,09,10,11,12,13
12 N	31 W	01,02,03
12 N	39 W	03,04,05,06,07
12 N	40 W	01,02,03,04,05,06,07,08,09,10,11,12,14,15,16,17,18
12 N	41 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18
12 N	42 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24
12 N	43 W	01,02,03,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24
12 N	44 W	06,07,08,09,15,16,17,18,19,20,21,22,24
12 N	45 W	01,02,10,11,12,13,14,15,22,23,24
12 N	52 W	01,02,03,04,05,06,07,08,09,17,18,19,20
12 N	53 W	01,02,03,04,09,10,11,12
13 N	26 W	18,19,20,27,28,29,30,31,32,33,34,35
13 N	27 W	03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
13 N	28 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
13 N	29 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
13 N	30 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
13 N	31 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
13 N	32 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29
13 N	33 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,28,29,30
13 N	34 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30
13 N	35 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31
13 N	36 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,32,33,34,35,36
13 N	37 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30
13 N	38 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34
13 N	39 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
13 N	40 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
13 N	41 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
13 N	42 W	12,13,14,22,23,24,25,26,27,28,31,32,33,34,35,36
13 N	44 W	19,30,31,32
13 N	45 W	07,08,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,35,36
13 N	46 W	01,02,03,04,05,06,07,08,09,10,11,12,13
13 N	47 W	1
13 N	48 W	01,02,03,04,05,06
13 N	49 W	01,02,03,04,05,06
13 N	50 W	01,02,03,04,05,06,07,08,09,10,11,12,18,19
13 N	51 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,28,29,30,31,32
13 N	52 W	01,02,03,04,09,10,11,12,13,14,22,23,24,25,26,27,28,31,32,33,34,35,36
14 N	27 W	30,31,32,33



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**Township Range Sections**

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14	N	28 W	16,17,18,19,20,21,22,23,25,26,27,28,29,30,31,32,33,34,35,36
14	N	29 W	03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
14	N	30 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
14	N	31 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
14	N	32 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
14	N	33 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
14	N	34 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
14	N	35 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
14	N	36 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
14	N	37 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
14	N	38 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
14	N	39 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
14	N	40 W	01,02,03,04,10,11,12,13,24,25,26,27,29,30,31,32,33,34,35,36
14	N	41 W	25,26,27,32,33,34,35,36
14	N	46 W	30,31,32,33,34
14	N	47 W	11,13,14,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
14	N	48 W	18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
14	N	49 W	13,24,25,26,27,28,29,30,31,32,33,34,35,36
14	N	50 W	07,17,18,19,20,21,25,26,27,28,29,30,31,32,33,34,35,36
14	N	51 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,24,25,36
14	N	52 W	01,02,03,04,05,06,07,08,09,10,11,12,33,34,35,36
14	N	53 W	01,02,03,04,05,06,11,12
14	N	54 W	01,02,03,04
14	N	56 W	04,05,06
14	N	57 W	01,02,03,04,05,06
14	N	58 W	01,02,03,04,05,06,07,08,09,10,11,12,15,16,17,18,19,20,21,22
14	N	59 W	01,02,11,12,13,14
15	N	29 W	30,31,32
15	N	30 W	07,08,15,16,17,18,19,20,21,22,23,25,26,27,28,29,30,31,32,33,34,35,36
15	N	31 W	02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
15	N	32 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
15	N	33 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
15	N	34 W	01,02,03,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
15	N	35 W	13,14,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
15	N	36 W	17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
15	N	37 W	04,05,06,07,08,09,10,11,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
15	N	38 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
15	N	39 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
15	N	40 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
15	N	41 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,35,36
15	N	42 W	01,02,03,11,12,13,24
15	N	51 W	32,33
15	N	52 W	31,32,33

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**Township Range Sections**

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15	N	53 W	27,28,29,30,31,32,33,34,35,36
15	N	54 W	19,20,21,22,23,25,26,27,28,29,30,31,32,33,34,35,36
15	N	55 W	17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
15	N	56 W	21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
15	N	57 W	25,26,27,28,29,30,31,32,33,34,35,36
15	N	58 W	25,35,36
16	N	31 W	31,32
16	N	32 W	03,04,05,06,07,08,09,10,15,16,17,18,19,20,21,22,23,25,26,27,28,29,30,31,32,33,34,35,36
16	N	33 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
16	N	34 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,33,34,35,36
16	N	35 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,22,23,24,25
16	N	36 W	01,02,12
16	N	37 W	30,31,32
16	N	38 W	20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
16	N	39 W	19,20,25,26,27,28,29,30,31,32,33,34,35,36
16	N	40 W	07,08,09,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
16	N	41 W	07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
16	N	42 W	04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
16	N	43 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30
16	N	44 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,21,22,23,24,25
16	N	45 W	01,02,03,05,06,07,11,12,13
16	N	46 W	01,02,03,04,11,12
17	N	32 W	05,06,07,08,09,16,17,18,19,20,21,22,27,28,29,30,31,32,33,34
17	N	33 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
17	N	34 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
17	N	35 W	01,12,13,14,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
17	N	42 W	03,04,05,06,07,08,09,10,14,15,16,17,18,19,20,21,22,23,26,27,28,29,30,31,32,33,34
17	N	43 W	01,02,12,18,19,20,21,27,28,29,30,31,32,33,34,35,36
17	N	44 W	03,04,05,06,07,08,09,10,11,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
17	N	45 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
17	N	46 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,34,35,36
17	N	47 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,21,22,23,24,25,26
17	N	48 W	01,02,12
17	N	50 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18
17	N	51 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18
17	N	52 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18
17	N	53 W	01,02,03,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
17	N	54 W	10,11,12,13,14,15,21,22,23,24,25,26,27,28,34,35,36
18	N	32 W	30,31,32
18	N	33 W	16,17,18,19,20,21,22,23,25,26,27,28,29,30,31,32,33,34,35,36
18	N	34 W	13,14,21,22,23,24,25,26,27,28,29,31,32,33,34,35,36
18	N	42 W	05,06,07,08,16,17,18,19,20,21,22,27,28,29,30,31,32,33,34
18	N	43 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,32,33,34,35,36

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**Township Range Sections**

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18	N	44 W	01,02,03,10,11,12,13,14,15,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34
18	N	45 W	07,08,09,10,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
18	N	46 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
18	N	47 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
18	N	48 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,34,35,36
18	N	49 W	01,02,12,13
18	N	50 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
18	N	51 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
18	N	52 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
18	N	53 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,21,22,23,24,25,26,27,34,35,36
18	N	54 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23
18	N	55 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24
18	N	56 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24
18	N	57 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24
18	N	58 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34
19	N	42 W	31
19	N	43 W	05,06,07,08,09,15,16,17,18,19,20,21,22,23,25,26,27,28,29,30,31,32,33,34,35,36
19	N	44 W	01,02,03,04,05,08,09,10,11,12,13,14,15,16,17,20,21,22,23,24,25,26,27,28,33,34,35,36
19	N	47 W	29,30,31,32,33,34
19	N	48 W	04,05,06,07,08,09,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
19	N	49 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,33,34,35,36
19	N	50 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
19	N	51 W	01,02,03,11,12,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
19	N	52 W	16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
19	N	53 W	06,07,08,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
19	N	54 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
19	N	55 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
19	N	56 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
19	N	57 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
19	N	58 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
20	N	43 W	31
20	N	44 W	21,22,23,25,26,27,28,29,32,33,34,35,36
20	N	48 W	29,30,31,32
20	N	49 W	06,07,08,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
20	N	50 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
20	N	51 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
20	N	52 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,32,33,34,35,36
20	N	53 W	01,02,03,06,11,12,13
20	N	54 W	31,32
20	N	55 W	16,17,18,19,20,21,22,25,26,27,28,29,30,31,32,33,34,35,36
20	N	56 W	04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
20	N	57 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
20	N	58 W	01,02,03,09,10,11,12,13,14,15,16,21,22,23,24,25,26,27,28,31,32,33,34,35,36

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**Township Range Sections**

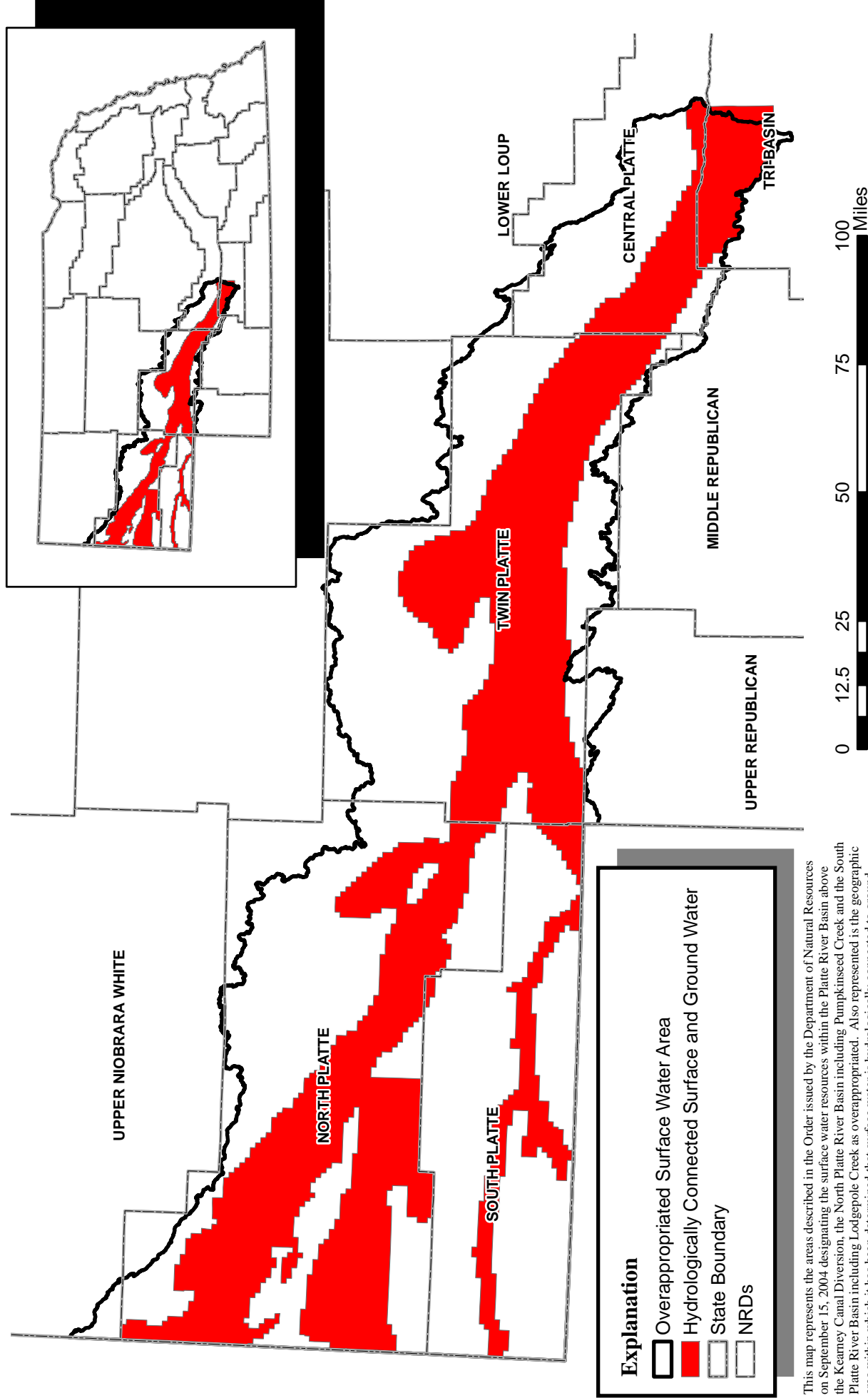
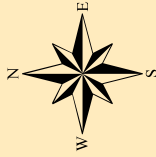
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21	N	49 W	30,31,32
21	N	50 W	06,07,16,17,18,19,20,21,22,25,26,27,28,29,30,31,32,33,34,35,36
21	N	51 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
21	N	52 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
21	N	53 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,32,33,34,35,36
21	N	54 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,23,24
21	N	55 W	01,02,07,08,11,12,13,14,16,17,18,19,20,21,22,23,24,28
21	N	56 W	10,11,12,13,14
21	N	57 W	04,05,31,32,33,34
21	N	58 W	36
22	N	51 W	18,19,20,26,27,28,29,30,31,32,33,34,35,36
22	N	52 W	02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
22	N	53 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
22	N	54 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
22	N	55 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,35,36
22	N	56 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,22,23,24,25,26
22	N	57 W	01,02,03,04,06,19,29,30,31,32
22	N	58 W	01,02,03,04,10,11,12,13,14,23,24,25
23	N	52 W	19,29,30,31,32,33
23	N	53 W	06,07,08,09,10,11,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
23	N	54 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
23	N	55 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
23	N	56 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
23	N	57 W	01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
23	N	58 W	01,02,03,04,09,10,11,12,13,14,15,16,21,22,23,24,25,26,27,28,33,34,35,36
24	N	53 W	31
24	N	54 W	19,30,31,32,34,35,36
24	N	55 W	02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
24	N	56 W	01,02,03,04,05,08,09,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
24	N	57 W	04,05,06,07,08,09,10,11,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
24	N	58 W	01,02,03,04,09,10,11,12,13,14,15,16,21,22,23,24,25,26,27,28,33,34,35,36
25	N	55 W	29,30,31,32,33,34
25	N	56 W	25,26,27,34,35,36
25	N	57 W	05,06,07,08,16,17,18,19,20,21,22,27,28,29,30,31,32,33,34
25	N	58 W	01,02,11,12,13,14,23,24,25,26,35,36
26	N	57 W	05,06,07,08,09,16,17,18,19,20,21,28,29,30,31,32



Planning Section

# Overappropriated Surface Water and the Geographic Area Determined to Have Surface Water Hydrologically Connected to Ground Water for the Purpose of Overappropriated Designation.



This map represents the areas described in the Order issued by the Department of Natural Resources on September 15, 2004 designating the surface water resources within the Platte River Basin above the Kearney Canal Diversion, the North Platte River Basin including Pumpkinseed Creek and the South Platte River Basin including Lodgepole Creek as overappropriated. Also represented is the geographic area within which it has been determined that surface water is hydrologically connected to ground water for the purpose of designating the surface water resources within this same area. Additional information regarding the designation can be found in the Order issued by the Department of Natural Resources on September 15, 2004.

**Appendix G:**

Order of Final Determination of River Basins,  
Subbasins, or Reaches as Fully Appropriated and  
Describing Hydrologically Connected Geographic Area  
(9/30/2004)

Date: 9/30/2004  
Reference #:231  
Code 1: leg  
Code 2:  
Comment: Fully appropriated/Platte

STATE OF NEBRASKA

DEPARTMENT OF NATURAL RESOURCES

In the Matter of the Portion of the )	ORDER OF FINAL
Platte River Basin Upstream of )	DETERMINATION OF RIVER BASINS,
the Loup River Confluence, )	SUBBASINS, OR REACHES AS
the North Platte River Basin, and )	FULLY APPROPRIATED, AND DESCRIBING
the South Platte River Basin within )	HYDROLOGICALLY CONNECTED
the South Platte Natural Resources )	GEOGRAPHIC AREA
District, the Twin Platte Natural )	
Resources District and the Central )	
Platte Natural Resources District )	

This matter came on for consideration before the Director of the Department of Natural Resources (the "Department") pursuant to Section 54, subsection (5) of LB 962 (2004 Nebraska Legislature), codified at Neb. Rev. Stat. Section 46-714(5). That section requires the Department to: (1) notify the appropriate natural resources districts, within thirty days after the final hearing required by Section 46-714(4), of the Department's final determination as to whether a river basin, subbasin, or reach is fully appropriated; and (2) if the final determination is that the river basin, subbasin, or reach is fully appropriated, at the same time (a) decide whether to continue or to terminate the stays on new surface water uses and on increases in the number of surface water irrigated acres and (b) designate the geographic area within which the Department considers surface water and ground water to be hydrologically connected to the river basin, subbasin, or reach, and describe the methods and criteria used in making that determination.

The Director FINDS:

1. Prior to July 16, 2004, the Director of the Department made preliminary determinations, pursuant to subsection (2) of Neb. Rev. Stat. Section 46-656.28, as it existed prior to that date, that there was reason to believe that the use of hydrologically connected ground water and surface water in the South Platte Natural Resources District, the Twin Platte Natural Resources District, and the Central Platte Natural Resources District, was contributing to or was in the reasonably foreseeable future likely to contribute to a conflict, dispute, or difficulty listed in such subsection. Each preliminary determination related to the entirety of the specific natural resources district. The preliminary determination was in response to the written request of each of these natural resources districts that the Department consult with and conduct studies on the natural resources district, and hold a hearing on the preparation of a joint action plan. Prior to July 16, 2004, the Director did not make a determination that a joint action plan should not be prepared, and the preparation of a joint action plan was not completed for any of the subject natural resources districts.

2. On July 16, 2004, the South Platte Natural Resources District, the Twin Platte Natural Resources District, and the Central Platte Natural Resources District became subject to the provisions of subsection (3) of Section 60 of LB 962, codified at Neb. Rev. Stat. Section 46-720, and also Sections 53 to 59 of LB 962, codified at Neb. Rev. Stat. Sections 46-713 to 46-719.
3. Pursuant to Neb. Rev. Stat. Section 46-713, the Department duly provided notices to the public of its preliminary determinations that the South Platte Natural Resources District, the Twin Platte Natural Resources District, and the Central Platte Natural Resources District were each fully appropriated in their entirety.
4. The Department and each of the referenced natural resources districts sent letters as follows:
  - a. Letter dated August 11, 2004 from the Department and the South Platte Natural Resources District;
  - b. Letter dated August 11, 2004 from the Department and the Twin Platte Natural Resources District;
  - c. Letter dated August 11, 2004 from the Department and the Central Platte Natural Resources District.

The appropriate letter which was sent to each irrigation district, reclamation district, public power and irrigation district, mutual irrigation company, canal company, or municipality that relies on water from the affected river basin, subbasin, or reach, and to other water users and stakeholders deemed appropriate by the Department or the affected natural resources district. Each letter offered the recipient the opportunity to consult with the Department and the appropriate natural resources district on the question as to whether the Department should make a final determination that the portion of the Platte, North Platte or South Platte Basin within that district is fully appropriated. The Department received, and duly considered, letters in response to the request for consultation.

5. The Department issued notice of, and held, two public information meetings in each natural resources district, as follows:
  - a. South Platte Natural Resources District public information meetings were held on August 25, 2004, and September 1, 2004.
  - b. Twin Platte Natural Resources District public information meetings were held on August 26, 2004, and August 31, 2004.



- c. Central Platte Natural Resources District public information meetings were held on August 27, 2004, and September 9, 2004.
- 6. Pursuant to statute, the Department issued notice of, and held, public hearings in each natural resources district, as follows:
  - a. South Platte Natural Resources District public hearing was held on September 1, 2004.
  - b. Twin Platte Natural Resources District public hearing was held on August 31, 2004.
  - c. Central Platte Natural Resources District public hearing was on September 9, 2004.
- 7. Public testimony was taken at each public hearing, and the record in each public hearing was held open for at least one full week following the date of the public hearing, in order to allow the receipt of any additional written testimony into the record.
- 8. A transcript was made for each public hearing, and the Department duly considered the testimony and evidence produced at the hearings.
- 9. In 1997, the States of Nebraska, Wyoming, and Colorado and the U.S. Department of the Interior signed the Cooperative Agreement for Platte River Research and Other Efforts Relating to Endangered Species Habitats Along the Central Platte River, Nebraska (the "Cooperative Agreement"). Pursuant to the Cooperative Agreement, Nebraska has prepared the Nebraska New Depletion Plan (the "New Depletion Plan"), a purpose of which is to describe the actions Nebraska proposes to take to prevent or mitigate for new depletions to the extent those new depletions are caused by new and expanded uses of water begun since the date of July 1, 1997.
- 10.
  - a. On February 27, 1979, by a memorandum to staff, the Director of the Department of Water Resources (now the Department of Natural Resources) ordered staff to deny all applications for natural flow for consumptive purposes in the Lodgepole Creek basin.
  - b. On December 13, 1979, the Director of the Department of Water Resources issued another memorandum to staff directing them to deny all applications for the direct use of natural flow from Pumpkinseed Creek and tributaries for irrigation purposes.
  - c. Through actions taken since approximately 1993, the Department of Natural Resources has effectively maintained other informal moratoriums through its discussions with possible applicants and through its orders regarding applications filed in the North

Platte River and its tributaries, the South Platte River and its tributaries, and the Platte River and its tributaries above the mouth of the Loup River.

- d. On July 14, 2004, the Department issued an Order Declaring Formal Moratorium on the issuance of new surface water appropriations in the Platte River Basin above the mouth of the Loup River, the North Platte River Basin, and the South Platte River Basin.
  - e. Numerous new wells have been registered with the Department since the Department stopped issuing surface water rights as described in this Section.
  - f. Departmental administration would have occurred frequently during the previous twenty years in the Platte River Basin upstream of the confluence with the Loup River, and in the North Platte River Basin and the South Platte River Basin if the surface water rights existing on July 16, 2004, had been in existence during the previous twenty years
11. a. South Platte Natural Resources District ordered a temporary suspension of well construction for all of the South Platte Natural Resources District, except for the Lodgepole Creek integrated management subarea, which temporary suspension took effect on January 14, 2004. The moratorium for the Lodgepole Creek integrated management subarea took effect on November 7, 2002.
- b. Twin Platte Natural Resources District ordered a temporary suspension of well construction in a portion of the natural resources district; that temporary suspension took effect July 1, 2004.
- c. Central Platte Natural Resources District ordered a temporary suspension of well construction in a portion of the natural resources district; that temporary suspension took effect November 20, 2003.
12. The method used to determine the hydrological connection for purposes of the final fully appropriated determination was to review and evaluate available and relevant data from the United States Geological Survey, the University of Nebraska Conservation and Survey Division, the data used in the development of the Cooperative Hydrology Study ("COHYST") Model, and other information that was included in the record of the public hearings referenced in finding Number 6 above.
13. In determining the hydrologically connected areas for purposes of the final fully appropriated determination, consideration was given to the following criteria:

- a. the boundaries of the area for which each of the natural resources districts initiated the joint action planning process under previous Section 46-656.28, which in the case of each of the natural resources districts was all areas within such natural resources district's boundaries; and
- b. the extent to which the methods used to determine hydrologic connectivity demonstrated that withdrawal of ground water from within the area would, at some future time, impact the surface water supply of the fully appropriated basin.

It is therefore CONCLUDED that it is in the public interest to (1) make a final determination that the portions of each of the Platte River Basin upstream of the Loup River confluence, the North Platte River Basin, and the South Platte River Basin within each of the South Platte Natural Resources District, the Twin Platte Natural Resources District and the Central Platte Natural Resources District are fully appropriated, (2) to continue the stays on new surface water uses and on increases in the number of surface water irrigated acres, and, (3) to designate the area within which surface water and ground water are hydrologically connected for purposes of the final determination of fully appropriated.


It is therefore ORDERED that:

1. The portions of each of the Platte River Basin upstream of the Loup River confluence, the North Platte River Basin and the South Platte River Basin that are within each of the South Platte Natural Resources District, the Twin Platte Natural Resources District and the Central Platte Natural Resources District are hereby determined to be fully appropriated, final determination.
2. The stays on new surface water uses and on increases in the number of surface water irrigated acres, that were effective as a result of the provisions of Section 46-720 and the Department's July 16, 2004, preliminary determination that the affected natural resources districts were fully appropriated, are continued as a result of this determination, and shall remain in effect until (a) they are terminated pursuant to law, (b) an integrated management plan for the affected area has been adopted and has taken effect, (c) the Department has completed a reevaluation of the area and has determined that the affected area is not fully appropriated, or (d) the stays expire pursuant to law. To the extent the geographic area subject to such stays is now within the land area designated as the overappropriated basin on September 15, 2004, or within the land area considered to be hydrologically connected for purposes of the overappropriated designation, such stays shall continue in effect as stays for that overappropriated basin and area considered to be hydrologically connected for purposes of the overappropriated designation.

3. The geographic area within which the Department has determined ground water to be hydrologically connected to the surface water for the purposes of the final fully appropriated determination includes the entire geographic area of the South Platte Natural Resources District, the Twin Platte Natural Resources District, and the Central Platte Natural Resources District. Because none of the geographic area subject to the Department's preliminary determination of fully appropriated is excluded from the area for which this final determination is made, the stays on the construction of new water wells and on increases in acres irrigated with ground water will remain in effect unless terminated by the applicable district pursuant to subsection (7) and (8) of Section 46-714.
4. Interested persons may petition the Department for a rehearing to reconsider the final determination that the portions of the Platte River Basin upstream of the Loup River confluence, the North Platte River Basin and the South Platte River Basin within the South Platte Natural Resources District, the Twin Platte Natural Resources District and the Central Platte Natural Resources District are fully appropriated, the determination of the geographic area within which the Department has determined that surface water and ground water are hydrologically connected for purposes of the final determination of fully appropriated, or the criteria used to make the determination of hydrologic connectivity for purposes of the final determination of fully appropriated. Such petition for a rehearing must be filed within fifteen days of this order and must clearly state the basis for such request. For sufficient cause shown, the Director may re-examine the action imposed by this Order at any time.

DEPARTMENT OF NATURAL RESOURCES

September 30, 2004

  
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Roger K. Patterson, Director

CERTIFICATE OF SERVICE

A copy of the foregoing ORDER DETERMINING FULLY APPROPRIATED RIVER BASINS, SUBBASINS, OR REACHES, AND DESCRIBING HYDROLOGICALLY CONNECTED GEOGRAPHIC AREA was mailed on September 30, 2004, to the following:

Central Platte Natural Resources District  
215 North Kaufman Avenue  
Grand Island, Nebraska 68803

South Platte Natural Resources District  
P.O. Box 294  
Sidney, Nebraska 69162

Twin Platte Natural Resources District  
P.O. Box 1347  
North Platte, Nebraska 69103