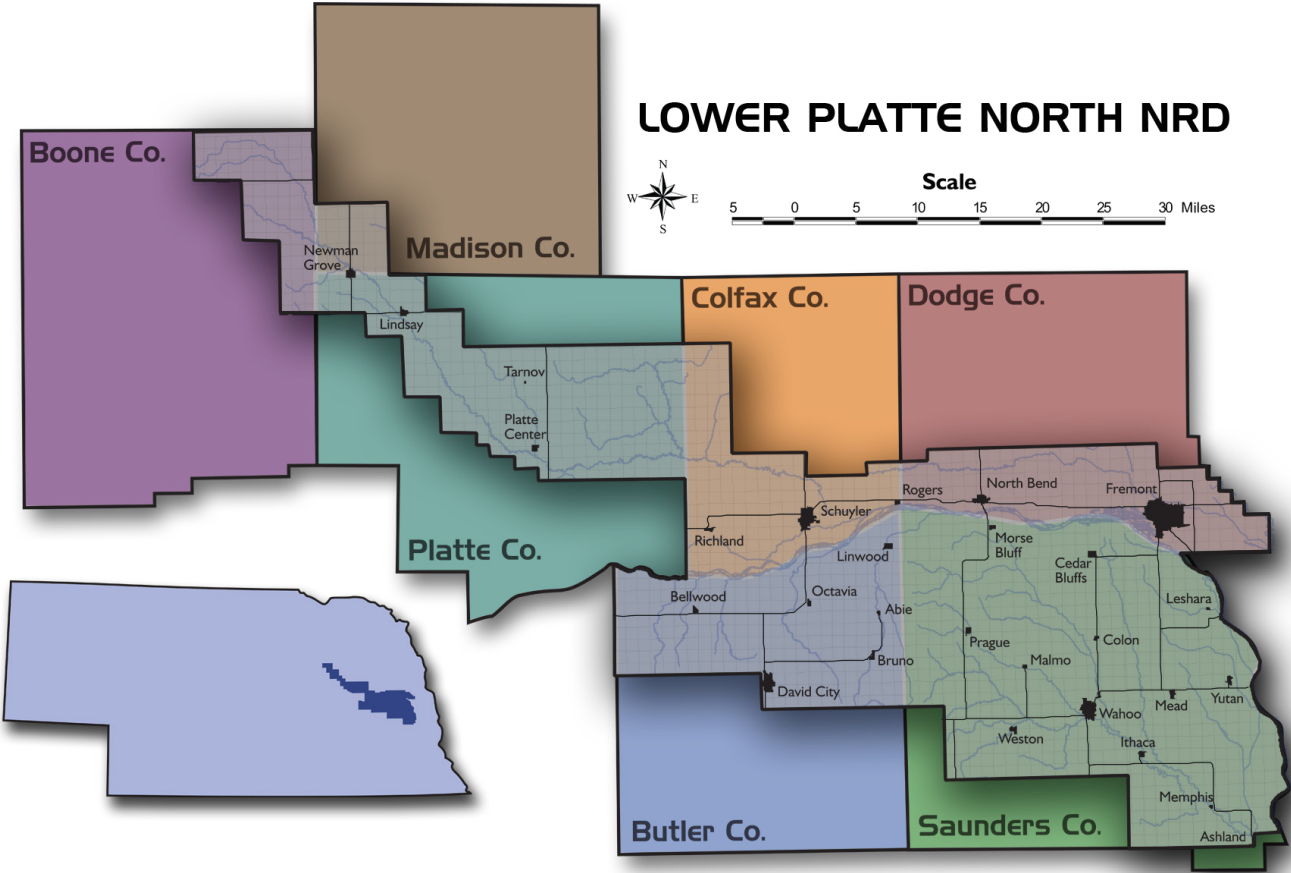




Lower Platte North Natural Resources District

Long Range Implementation Plan
Fiscal Year 2017

LOWER PLATTE NORTH NRD



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LOWER PLATTE NORTH NRD

LONG RANGE IMPLEMENTATION PLAN



Introduction

The Lower Platte North Natural Resources District (LPNNRD) is one of 23 Natural Resources Districts created in 1969 with the passage of LB 1357 by the Nebraska Unicameral. Since its formation in 1972, the LPNNRD has been assisting people in the Lower Platte North River Basin in the development and protection of our soil and water resources. Nebraska Statutes require that Natural Resources Districts develop a Long Range Implementation Plan. The purpose of this plan is to summarize accomplishments during fiscal year 2016 (July 1, 2015 to June 30, 2016) and planned District activities for fiscal year 2017 (July 1, 2016 to June 30, 2017). There are also objectives for a five-year period from fiscal years 2018 to 2022. The plan serves as an implementation tool of the district's Master Plan.

Authority and Responsibilities

The Natural Resources Districts have been given statutory responsibility outlined in Sections 2-3229, R.R.S. 1943. In this section it states that "The purposes of the Natural Resources Districts shall be to develop and execute, through the exercise of powers and authorities contained in this act, plans, facilities, works and programs relating to: (1) erosion prevention and control, (2) prevention of damages from flood water and sediment, (3) flood prevention and control, (4) soil conservation, (5) water supply for any beneficial uses, (6) development, management, utilization, and conservation of groundwater and surface water, (7) pollution control, (8) solid waste disposal and sanitary drainage, (9) drainage improvement and channel rectification, (10) development and management of fish and wildlife habitat, (11) development and management of recreational and park facilities, and (12) forestry and range management."

Lower Platte North NRD programs and projects are available to meet the goal of properly developing our water and related land resources.

Description of the District

The Lower Platte North Natural Resources District is located in the Lower Platte River Basin in eastern Nebraska and includes 1,031,000 acres of land. A portion of Saunders, Butler, Platte, Dodge, Colfax, Boone and Madison Counties are within the district (see Appendix A), which includes twenty-eight cities, towns and villages. Besides the Platte River, other notable tributaries in the district include Wahoo Creek, Skull Creek, Bone Creek, Loseke Creek, Taylor Creek, Shell Creek, Elm Creek, Clear Creek, Rawhide Creek, Silver Creek, Sand Creek, and Duck Creek.

The population of the district is approximately 61,000, of which about half is rural and half urban. The Lower Platte North NRD is financed by a tax levy which may be up to four and one-half cents per \$100 valuation for general purposes and another one cent for water programs. The FY 2017 tax levy is 3.8278 cents per \$100 valuation.

Governing Body

The Lower Platte North Natural Resources District (LPNNRD) is governed by a 19-member Board of Directors. The directors are elected at the general election for a term of four years, with half of the members up for election every two years.

The district is divided into nine (9) subdistricts. Two board members are elected from each of the nine subdistricts. Also, one board member is elected at large every four years.

The district operates by a set of bylaws which are kept on file at the district headquarters at Wahoo, Nebraska.



LOWER PLATTE RIVER BASIN

One of the great natural resources of Nebraska is the Platte River. It is the feature that attracted early settlers to our state and guided the wagon trails. Today, we look at the Platte River differently. It is a water source for agriculture and cities like Fremont, Lincoln and Omaha, a haven for wildlife, and a place for recreation. Issues surrounding the Platte are top priority at the LPNDRD, since approximately 72 miles of the river flow directly through, or border, the district.

FY 2016 Platte River Basin Activities

Platte River Alliance

The Lower Platte River Corridor Alliance entered its twenty first year in FY 16. The Alliance members include the Lower Platte North NRD, Lower Platte South NRD, Papio Missouri River NRD and several state entities dedicated to working with people to protect the long-term vitality of the lower Platte River Corridor. One primary focus has been on building a coalition including counties, cities, businesses and individuals concerned with the preservation and proper use of the river.

The Alliance is primarily concerned with the lower portion of the Platte River. This stretch of the river runs from Columbus to Plattsmouth. It winds past or through towns and cities such as Bellwood, Schuyler, North Bend, Fremont, Waterloo and Louisville. In FY 16, the Alliance was involved with many activities and projects that included: Environmental Suitability Assessment, Water Quality Planning, River Obstruction Removal, Recreation Planning and Development, and numerous educational events.

Ice Jam Agreement

In 1994, the LPNDRD entered into an agreement with two other NRDs and four counties to more effectively deal with ice jams and their resulting flood damages along the Lower Platte River. This area of concern is primarily south of the city limits of Fremont, Nebraska. Besides

the Lower Platte North NRD, other partners include the Papio-Missouri River NRD, Lower Platte South NRD, and Cass, Douglas, Sarpy and Saunders Counties. This group has pooled funds to use explosives, when needed, to remove ice jams in a timely manner.

During the winter of 2015-16, there were no ice jam occurrence.

Rock & Jetty Program

This program was developed to offer cost-share assistance to landowners to construct erosion control devices for stream bank stabilization and to assist Dike and Drainage Districts with maintenance of dikes along the Platte and Elkhorn rivers and perennial streams. In FY 15, this program provided \$5,050 to 3 cooperators.

FY 2017 Platte River Basin Objectives

- Administer \$10,000 in the Rock & Jetty Program to assist with priority stream bank stabilization for a potential 40 cooperators. This includes assisting cooperators with meeting the regulations of the Clean Water Act and 404 permits.
- Participate with LPSNRD, PMNRD and other partners and provide up to \$150,000 for the Western Sarpy/Clear Creek Levee Project and continue work with Nebraska's Delegation for obtaining additional federal funding to complete the Clear Creek Levee portion of the project.
- Assist the City of Schuyler with closing out the completed Shell Creek Levee Project (Army COE 205 Project).
- Provide leadership assistance to the City of Fremont to continue moving forward with exploring flood control solutions through the Army COE General Investigation study.
- Support the Lower Platte Weed Management Area financially and technically in controlling noxious and invasive weeds.

- Support the Nebraska Land Trust in acquiring easements for the protection and preservation of quality lands.
- Participate in evaluating the direction of the Lower Platte River Corridor Alliance to better address the resource needs in the LPNNRD.

FY 2018-2022 Long Range Platte River Basin Objectives

- Continue to budget cost-share funds for priority bank stabilization along the Platte and Elkhorn rivers and other perennial streams in the district.
- Promote riparian buffer zones along the Platte River and other perennial streams.
- Continue to explore new, innovative and cost-effective ways to protect against stream bank erosion.
- Provide education on stream bank protection and regulations.
- Support and budget annually, as needed, for the Ice Jam Agreement Fund.
- Keep up to date on Clean Water Act and Endangered Species Act regulations.
- Continue to participate with Fremont to study potential structural and nonstructural measures to reduce flooding and economic losses from the Lower Platte River.
- Work with the City of Schuyler as they evaluate the need for future federal funding for completing a levee system to reduce flooding and economic losses from the Platte River.
- Encourage cities and counties to initiate floodplain management planning to promote wise floodplain development.
- Assist dike and drainage districts within the LPNNRD to properly maintain levy projects.
- Budget annually, if in need, to support the Lower Platte Weed Management group in controlling noxious weeds.

One of the Lower Platte North NRD's major responsibilities is to conserve and protect our ground and surface water supplies. To accomplish this goal, the Lower Platte North continues to participate in water quality studies, ground water level monitoring, and water resource educational activities.



FY 2016 Ground & Surface Water Activities

Ground Water Management Area

The LPNNRD implemented a District-wide Ground Water Management Area (GWMA) on January 1, 1997, to address both water quality and quantity concerns. Data gathered since 1985 indicates where ground water quality conditions have deteriorated beyond those established as health standards, such as nitrate nitrogen. On that date, ground water quality Phase I (education) regulations in effect for the entire District. One primary rule in Phase I requires certification for fertilizer use. The District has developed a ground water program emphasizing a protection-based approach rather than a reactive, corrective approach.

As of 2011, the District has two Phase 2 groundwater quality control areas, those being Bellwood and Richland/Schuyler. The Bellwood Phase 2 Area was established in 2003. This area covers approximately 30 square miles in the western portion of the Platte Valley in Butler County and includes the town of Bellwood. The Richland/Schuyler Phase 2 Area was established in 2004. This area covers approximately 55 square miles in the Platte Valley of Colfax County and includes the towns of Richland and Schuyler. Elevated nitrate-nitrogen levels continue to be the major concern in both Phase 2 areas.

Due to the drought from 2000 to 2006 and heavy water demand, several of the District's aquifers declined to the point where several wells have reached or exceeded their trigger levels. If more than 50% of the subarea, as measured in our GWEL network wells reach those trigger levels then a management area may be declared. Due to three consecutive years (2004, 2005 & 2006) of groundwater declines in the Butler County Uplands aquifer, the Lower Platte North NRD declared a "Level One Management Area" for the David City area effective in 2007. Due to changes in the District's rules

and regulations the remainder of the district has also been declared a Level One management area. By the spring of 2009, the David City aquifer had recovered for two consecutive spring readings, therefore the District has changed the status of the David City subarea on October 8, 2009 from a potential Level 2 to a Level 1 ground water management area.

As 2007 progressed, the district noted increased ground water demands for irrigation, due in part to good commodity prices. Expansion in the Uplands portion of Saunders and Butler Counties raised concerns that small pocket aquifers in the glaciated areas may not be able to accommodate even one or two additional high capacity wells. On May 14, 2007 the Board of Directors declared these areas as a 'Temporary Stay Management Area.' A second Temporary Stay Management Area was declared on November 12, 2007. The District completed a Subarea Delineation Study to identify aquifer subareas and to help determine if the two consecutive stays should be made permanent in all or portions of the Uplands or be allowed to expire. In 2008, the LPNNRD revised its rules and regulations to take into account glaciated portions of our District, effects of the recent drought and new information from our Subarea Delineation Study. This revision included declaring a Level One District-wide management area for ground water quantity, different classes of water well permits based on annual usage, and adoption of Stay Management Areas. The temporary stay became a Permanent Stay Management Area in May 2008 for the Swedeburg, Prague, Yutan, and Yutan South subareas. Other subareas are being monitored and may be placed in future Stay Management Areas if needed.

In August of 2008, our office received four phone calls from domestic well owners all in or adjacent to the Platte River Uplands subarea northwest of Fremont, that they were running out of water. Following a survey of all well owners in the area, this subarea was declared a temporary Stay Management Area on December

8, 2008. A second temporary stay was declared on June 6, 2009 and was under review to make this a permanent stay or let the temporary stay lapse. On December 3, 2009 this area was declared a permanent Stay Management Area.

In December 2008, the Nebraska Department of Natural Resources (NDNR) declared the Lower Platte River Basin as “fully appropriated”. This designation would mean that no new additional irrigation acres would be allowed in the hydrologically connected area unless offsets were provided. After an intense review of the model that NDNR used, it was discovered that there were errors that lead to this declaration. NDNR reversed their preliminary decision in April 2009 and declared that the basin was not fully appropriated at this time. With the passage of LB 483, the District along with other NRD’s completed an update of our rules and regulations, which were approved by NDNR on August 21, 2009, to help avoid becoming fully appropriated in future years. The District will be able to expand new irrigated acres by an additional 2,500 acres per year for four years in this hydrologically connected area. To assist with providing the best science for future fully appropriated decisions, the District has teamed with NDNR, UNL, and neighboring NRD’s to complete special studies to provide assessments and modeling to provide the best information in determining groundwater effects to the Lower Platte River. These studies include Elkhorn Loup Model, The Eastern Nebraska Water Resources Assessment, and the Platte River Modeling Study. From October 2009 to October 2012 the District has issued 10,000 new irrigated acres in the hydrologically connected or limited water development area (LDA) of the District, as allowed under LB 483. In addition, the District has agreed to limit expansion to 2,500 acres in the LDA for future years. These acres for 2013 were awarded on October 15, 2012 and will be issued in January 2013. The drought of 2012 has also intensified the interest in irrigation and we received twice as many requests for new irrigated acres than could be granted by October 15, 2012. The drought of 2012 also intensified the number of well interference complaints. These were

recorded and mapped to learn more about the long term sustainability of area aquifers and aid future management decisions.

As of December 18, 2012, the District had 4,445 active registered irrigation wells and 165 wells in our GWEL network. The Metropolitan Utilities District (MUD) well field became operational in the summer of 2008. The MUD well field has 26 high capacity municipal wells in Saunders County (LPNNRD) and 16 municipal wells in Douglas County (PMNRD). This well field has a Corps of Engineers 404 permit to produce a maximum annual average of 52 Million Gallons per Day (MGD) and a maximum daily yield of 104 MGD. Of the four bio-fuels plants planned for our District, none of them are currently in operation.

At the July 2011 Board meeting, the LPNNRD Directors voted to start the process for a voluntary Integrated Water Management Plan (V-IMP). In the fall of that year, LPSNRD, LPNNRD, and Papio-Missouri River NRD met to discuss working together to develop an IMP for the Lower Platte River basin. LPSNRD has already started the process, while the Board for Papio-Missouri River NRD has not yet voted on the proposal. The four other NRD’s in the basin (LENRD, UENRD, LLNRD, and ULNRD) are still undecided.

For 2012 all seven NRD’s have agreed to develop a Lower Platte Basin plan, but only LPN, LPS, Papio, and LE NRDs have also decided to develop an IMP. All Districts are presently drafting the cooperative agreement for the Basin Plan. The summer of 2012 also turned out to be a strong drought year with high temperatures and very light rain. Many parts of our District during the month of July received no rain at all. Starting in early July the District started receiving numerous well interference complaints (~35) that continued into early September. Usually we receive no complaints over the course of the summer. These complaints were scattered over the District, except no complaints were received from the Todd Valley. The only limitation in the Todd Valley was for the community of Mead which was on voluntary water restrictions due to limitations of their facilities, not lack of water.

The year 2013 proved to be a very active year concerning ground water management in LPNNRD and the entire Lower Platte River basin. The year started with cool temperatures and timely rains into the summer months. The exception was mid July and late August with temperatures in the 90's and low 100's and no rain. In late August we started receiving several complaints from the Bruno to Brainard area within LPNNRD and LPSNRD. This area has confined aquifers existing in many different layers and when area high capacity wells all run at the same time this can cause large pressure drops in these aquifers. During the fall and winter of 2013 the LPNNRD was looking at modifications to our ground water management Rules to address more of these in-season declines. The District is also working with LENRD on 'Request for Proposals' from consulting firms to help develop our Voluntary Integrated Water Management Plan in conjunction with DNR, with the goal to finish this Plan by the summer of 2015. The seven Lower Platte Basin NRD's are also working on a Basin-wide Plan with the first step to develop Goals and Objectives. This work began in earnest during the fall of 2013.

In February 2014, the Board approved our updated GWMA Rules and Regulations that primarily addressed the mid-summer declines in the Bruno area and the uplands of Platte and Colfax Counties. These are now designated as the Butler-Saunders and Platte-Colfax Special Quantity Subareas. Contact was awarded to Olsson Associates for development of a Voluntary Integrated Water Management Plan (V-IMP) for the LPNNRD to direct and organize Stakeholder and Coordination meetings and provide updates to the LPNNRD Board of Directors. Deadline for completion for this contract and completion of this phase of the V-IMP is set for June 1, 2015. The contract for the Lower Platte River Basin Coordination Plan (LPRBC) was awarded to HDR in early summer 2014 to develop a basin-wide approach to managing the water. Seven NRD's and DNR are involved in this process and three committees were formed: Board, Managerial, and Technical.

On April 13, 2015 the LPNNRD updated our GWMA Rules and Regulations to reflect the de-

lay of one year for installation of flow meters and establishment of irrigation water allocations for the Platte-Colfax SQS area. These requirements will now become effective in 2016. These same requirements became effective in the Butler-Saunders SQS area in 2015. While LPNNRD has long recognized a difference in our GWMA Rules between confined and unconfined aquifers, further work is necessary. A new management approach for confined aquifers with large midsummer declines needs to be considered. Work with stakeholders for our Voluntary Integrated Water Management Plan was completed in June 2015 but further work on the Plan was delayed in 2015 due to other staff commitments. This process will resume in early 2016.

For 2016 GWMA activities focused on four areas: the Platte - Colfax Special Quantity Subarea (SQS #2) became effective, Airborne Electromagnetic flights in our two SQS areas, the Voluntary Integrated Water Management Plan (V-IMP), and the Lower Platte River Basin Water Management Plan Coalition (LPRBC). The Platte - Colfax Special Quantity Subarea became effective on January 1, 2016. This is a confined aquifer where large groundwater pressure drops are noted in the aquifer when a large number of irrigation wells run at the same time. Several classes were held from January through March that described the new rules, proper installation of flow meters and the irrigation water allocation system. We have approximately 300 irrigation wells in this SQS area. Most producers installed the meters before they irrigated, but nine producers failed to do so. Compliance actions are being reviewed. During July 2016 Airborne Electromagnetic flights (AEM) were done over both of our SQS areas with approximately ¼ mile spacing to more accurately map the geology of these confined aquifers. The final report won't be completed until August 2017. The District resumed work on our Voluntary Integrated Water Management Plan and our last stakeholder meeting was held on October 5, 2016. The Department of Natural Resources is currently reviewing the plan and we hope to have approval and passage of the Plan in early 2017. The LPRBC NRD's have tentatively agreed to

establishing flows in the Platte, Loup, and Elkhorn river subbasins as a certain percentage of total flow measured at the Louisville gauge on the Platte River. Future work will focus on dividing up river flow contributions from each NRD within each river subbasin. For example, Lower Platte North, Lower Platte South, and Papio-Missouri NRD's make up the Platte River subbasin of the Lower Platte Basin. Following approval of the V-IMP and the LPRBC, a major rewrite of the LPNNRD Ground Water Management Rules and Regulations will be in order.

Current rules and regulations of the GWMA are available at the LPNNRD headquarters in Wahoo and via the district website at lpnnrd.org.

Ground Water Quality Sampling

The Lower Platte North NRD continues efforts to develop a ground water quality inventory. The District has been divided into four primary aquifer regions: Todd Valley, Platte Valley, Shell Creek and the Uplands, and further divided into 26 subareas. Due to current staff limitations the District is focusing on the State-wide ground water quality network, where staff sample the same 53 wells each summer to determine long term trends for nitrate-nitrogen. This information is provided to the Department of Environmental Quality and the Department in turn provides this to the Nebraska Legislature on an annual basis.

Due to above average rainfall in 2016, samples were collected from 38 of the 53 sites.

Year	Nitrate-Nitrogen Range	% Nitrate-nitrogen 0-8.0 ppm	% Nitrate-nitrogen 8.01-10.0 ppm	% Nitrate-nitrogen > 10 ppm
2016	0 - 26.6 ppm	73.7% (28 of 38)	15.8% (6 of 38)	10.5% (4 of 38)

Samples for pesticide analysis were collected from seven of these sites (18%). The pesticide analysis was for a suite of 25 parameters, and all results were less than reporting level.

Ground Water Energy Level Monitoring Network

One of the responsibilities of the NRDs in the State is to monitor fluctuations in ground water levels. With the help of area cooperators, a ground water energy level monitoring network has been established in the LPNNRD. This monitoring network has been established to obtain a better understanding of the ground water levels throughout the District. As of November 2013, the LPNNRD had 168 wells in the ground water energy level monitoring network. These wells are monitored each spring and fall, with selected wells also measured in late August.

The LPNNRD compares the latest spring reading to the 1987 base-year to determine if a subarea needs to be declared a Level 2 or Level 3 ground water management area. Level 2 and 3 management areas require flow meters on wells, annual reporting of water use, and establishment of acre-inch allocations. For the 25 subareas within the District, 17 subareas are currently at Level 1 management, while the other 8 subareas still need additional information before these can be designated. The District prefers at least three years of data before the subarea can be designated as a Level 1, 2, or 3 management area.

Due to three consecutive years (2004-2006) of groundwater declines in the Butler County Uplands aquifer, the Lower Platte North NRD declared a "Level Management Area" for the David City area effective Jan. 15, 2007. This was the district's first management area for ground water quantity. Changes in the district's rules and regulations in 2008 have placed the entire District in a Level One management area. The David City subarea ground water levels have recovered above its designated trigger levels for two consecutive years (2008-2009), therefore this subarea was not placed into a Level Two management area, but reverted back to a Level One.

Subsequent years (2007 to 2011) showed adequate rainfall across the entire District, which allowed recharge to all of the District's aquifers. The spring readings of 2012 indicated that levels had recovered almost to the pre-drought conditions of 2000 to 2006. The drought of 2012 seem to come on fast and strong starting in mid June. Daily temperatures in the mid to upper

90's with very little or no rain caused all water users to pump more frequently in an effort to keep up with crop and other water demands. As a consequence the 2012 fall readings showed a dramatic decline in ground water levels, especially in the confined aquifers of the Shell Creek watershed and the Uplands of Butler and Saunders Counties. Aquifers recharge and/or pressure equalize at different rates, therefore it will not be until the spring readings of 2013 that a true assessment of aquifer levels will be possible. The water levels in 166 wells were measured in the spring of 2013. Of the 166 wells measured, one well showed an increase, three wells were unchanged, and 162 wells decreased. Hydrographs in several of our confined aquifers have shown a one year decline that is equivalent to several years of decline noted in the previous drought of 2000 to 2006.

Spring readings in 2014 showed some improvement over the spring readings from 2013. In part this was due to near normal annual rainfall in 2013 and the flash flooding that occurred near Boulder, Colorado on September 12, 2013. While this flooding was very detrimental in Colorado, it had some benefits to Nebraska. Minor flooding on the Platte River occurred from the Colorado border down to Kearney, but from Grand Island to the mouth of the Platte River at Plattsmouth the river remained in its banks. Nebraska diverted some of the flood waters into the Tri-County Canal to recharge reservoirs that were depleted due to the drought of 2012. Other canal systems did the same. The LPNNRD also believes this helped to recharge several of our aquifers near the Platte River that are in hydrologic connection. The spring readings for 2014 had the following subareas at the second consecutive year were 50% or more of the subarea is below its Level 2 trigger level: Fremont East, Octavia, David City, and Prague subareas.

The Spring readings in 2015 showed continued recharge so the potential Level 2 management areas listed above did not become necessary. Monitoring wells with continuous reading data-loggers also showed mid-summer declines in the uplands of Platte-Colfax SQS. An addi-

tional monitoring well with a data-logger was also installed in 2013 in the Butler-Saunders SQS. Because of these large midsummer declines we are seeing in confined aquifers, the establishment of a new management approach is in order. This will likely require the installation of several more monitoring wells in these SQS areas (and potentially other areas with confined aquifers) so staff don't have to rely on measuring just irrigation wells during the peak of the irrigation season. For the first time in early August of 2015, the NRD measured wells in and around each of the SQS areas. Abundant rainfall in the Butler-Saunders SQS resulted in many of the irrigation wells not even being turned on during the summer.

The District has also established, with the help of Lincoln Water System, Metropolitan Utilities District of Omaha, US Geological Survey, US Army Corps of Engineers, University of Nebraska, Lower Platte South NRD, and Saunders County, a network of monitoring wells to track changes in ground water levels in the Wann Basin area, which is in the Platte River valley north of Ashland. This area has two major municipal well fields and the ongoing cleanup efforts of a former ordnance plant south of Mead, Nebraska. This network was established in the fall of 2003. Readings are taken three times per year in late March, late August, and late October.

Spring and Fall readings in 2016 showed a continued rise in groundwater energy levels due to abundant rainfall. Due to the likely effects of climate change we seem to be experiencing more rainfall in the summer months of June through August and as a consequence less irrigation is needed. Of course there are exceptions such as 2012, which was a drought year. In the Fall of 2016 several wells in each of our four regional aquifers are at the highest level ever measured and in some cases this goes back to when we started taking readings in 1987. A few other aquifers, such as the Bellwood subarea, have a slow downward trend. 2016 also saw the installation of a new monitoring well in the Malmo area into the Dakota bedrock of the Prague subarea, and two nested monitoring wells at different depths in

the North Bend subarea with the deep well also installed into the bedrock. AEM flights using the SkyTEM 508 method have provided new interest in bedrock aquifers.

Chemigation

Chemigation is the practice of applying fertilizers or other agricultural chemicals to land or crops through an irrigation system. To protect Nebraska's groundwater from possible back-flow of chemicals into irrigation wells, the Legislature enacted LB 284, the Chemigation Act in the 1980s. The Act requires the operator of a chemigation system to obtain a permit prior to use. To obtain this permit, the chemigation equipment must be properly equipped, inspected and approved by the NRD before applying any chemicals. The number of chemigation permits continues to slowly rise in the District with each recent successive year setting a new record. In 2015 and 2016 heavy rains before and during the planting season caused a large increase in the number of chemigation requests due to fertilizer being washed out of the root zone.

Chemigation Permits	Total	Renewal	New	Emergency
November 2015	515	420	94	1
November 2016	576	478	98	0

In 2011, LB28 was proposed with changes to Title 195 with the addition of the Chemigation Regulations. Most of these changes were simple house-keeping changes, except for the addition of rules for sub-surface drip irrigation. Maintenance of sub-surface drip irrigation systems is exempt from the chemigation permits provided: 1) the system has an inline check valve and 2) the system has an Underground Injection Control Permit. This is only applicable for one maintenance event each year.

In 2014, the Legislature approved LB272 for additional changes to Title 195 that would allow individual NRD's to set chemigation fees. Chemigation fees for LPNNRD are: \$60 for a New permit, \$30 for a Renewal permit, and \$120 for an Emergency permit. New permits are to be inspected each year they are permitted

and renewal permits are to be inspected on a 3 year rotation. Failure to renew by June 1st of the following year the permit was attained will cause the permit to lapse. If a renewal permit lapses and the producer wishes to use chemigation as a practice of crop application the individual must obtain a new permit.

Decommissioned (Abandoned) Wells

Decommissioned (Abandoned) wells are a health and safety concern and have been ruled as illegal by the Nebraska Legislature. It is estimated that there are approximately one-thousand improperly abandoned wells within the Lower Platte North Natural Resources District boundaries. A well not used for three consecutive years or one which is no longer useful is considered to be abandoned and needs to be properly decommissioned.

The Lower Platte North NRD offers up to 75% cost share assistance to landowners to properly decommission abandoned water wells. In addition, the district will assist with up to 75% of the cost for pump and obstruction removal on domestic and stock wells. To receive cost share assistance, the actual decommissioning must be performed by a certified well driller or pump installer. The landowner has six months from the time of application to accomplish this task.

Since 1992 the district has administered local and state cost-share dollars to decommission 619 wells. During FY 15-16, 13 wells were plugged with this program. The district will administer approximately \$15,000 of state and local funds to plug additional wells during the current fiscal year.

Precipitation Gauging Network

The Lower Platte North NRD has a District-wide precipitation gauging network, which consists of six sites maintained by cooperation landowners. Precipitation information is useful when merged with other District water programs including: ground water quality sampling, ground water energy levels, and surface water/ground water correlations, among others.

Our normal yearly precipitation is 28 inches per year and for 2010, some parts of the Dis-

trict were over that amount and others less. Upper Shell Creek had the least rainfall with 26 inches, while the Prague area had the most with over 33 inches.

In March 2011 the forecast for the rest of year appeared that we may be coming back into a dry cycle. The District average precipitation for 2011 was 27.0 inches or slightly under our normal amount of 28.0 inches. Most of the precipitation came during the months of April through August, with the fall again being very dry as in 2010.

For 2012 the spring months through May were slightly less than normal precipitation. However, June through the rest of the summer were very dry and temperatures in the mid to upper 90's almost every day. In the Fall of 2012 most of Nebraska is listed as extreme to exceptional drought conditions by NOAA.

For 2013 the year started with cool temperatures and timely rains into the summer months. The exception was mid July and late August with temperatures in the 90's and low 100's and no rain. The US Drought Monitor website has our District as 'Abnormally Dry'.

For 2014 the spring was relatively dry but in June the District received substantial amounts of rain in excess of 10 inches. Wahoo itself received 10 inches of rain in a one week period, which resulted in lowland flooding. In late August to mid September the southern part of our District again received substantial rainfall, but this was not reflected in the counties of Platte, Madison, and Boone of our District. The US Drought Monitor website has our District (and most of Nebraska) as no longer in drought.

Precipitation in 2015 was more uniform over the time-span of a year but did vary more geographically. While north of the Platte River experienced good rainfall over the summer months, some irrigation was still necessary. South of the River, especially in the Butler-Saunders SQS area, abundant rainfall resulted in little or no additional irrigation needed on crops.

At the start of 2016 we only had four remaining cooperators in the PGN, and three of those were in the Prague to Weston area of our

District. With the advancement in technology, continued operation of the Nebraska Rain Program (NeRAIN) and the uneven distribution of reporting sites in this PGN program, it was decided to discontinue this network. Maps and charts from the High Plains Regional Climate Center (HPRCC) will be used to replace the PGN. Precipitation in 2016 was similar to 2015 in that most of our rainfall was from May through August and this time rainfall in the SQS#2 may have been more than our SQS#1 area.

The effects of climate change are becoming more noticeable in the last 10 years. A shift in precipitation patterns from April - June, which used to be our primarily rainfall months to now May through August or into September. This could be a benefit to our producers (especially for dryland acres) and to our aquifers since less irrigation is needed. However, more extremes have also been noted such as the flooding conditions in 2011 to extreme drought in 2012. It also seems that our falls and winters have become drier and warmer. Again this is of some benefit to producers during the busy harvest season. Temperature swings especially during the winter have become more pronounced. In the 1980's and 1990's typically high temperatures in January and February were in the 30's to maybe 40 degrees F. It generally was not until the end of February that a first real thaw regularly occurred. In the last few years we have had temperatures in the 50's in January and February and in 2016 we saw temperatures in the 70's for about a week in February. Producers may be able to take advantage of warmer winters with the use of cover crops such as nitrogen fixing plants to reduce fertilizer cost. Time will tell if these current conditions will persist or if other changes in climate will occur in the future or intensify.

Registered Wells

The Nebraska Legislature declared that the conservation and the beneficial use of ground water are essential to the future well-being of the State. State Law requires that all water wells in the State of Nebraska be registered with the Department of Water Resources. Wells

that are not registered are illegal and should be registered as soon as possible. A breakdown by decade from 1970 to present shows the growth of active irrigation wells in the District.

Table of Active Irrigation Wells within LPNNRD compiled by Completion Date

Date	Number of Active Irrigation Wells in the District
December 31, 1970	1,428
December 31, 1980	2,756
December 31, 1990	3,241
December 31, 2000	3,686
December 31, 2010	4,307
December 31, 2016	4,608

Well Permits

In May of 2008, the LPNNRD placed a flow meter and water reporting condition on well permits for all permits issued after that date. All well permits require well owners to install a flow meter and report their water use for the calendar year to the LPNNRD by January 31 of the following year. This reporting requirement is effective the year the well is drilled and for each year thereafter, until the well is decommissioned. After experiencing closer to normal average rainfall conditions over the last three years, new well permit requests across the District have decreased. For 2016, the District issued 25 well permits with 7 new irrigation wells, 11 replacement irrigation wells, 1 live-stock well, and 6 wells listed as other.

Special Studies

Elkhorn Loup Model

The LPNNRD is a partner in the Elkhorn Loup Model Study, as this basin overlaps and covers portions of upper Shell Creek. The Elkhorn-Loup Model (ELM) project is a study of surface water and groundwater resources in the Elkhorn River basin upstream of Norfolk, Nebraska and the Loup River basin upstream of Columbus, Nebraska. The study will assist the Nebraska Department of Natural Resources and the Natural Resources Districts within the study area by characterizing the groundwater system and by providing a regional groundwa-

ter flow model that could be used to evaluate surface water/groundwater interaction in the study area. The study will also provide data and interpretations that could serve as the basis for future management of the regional water resources. This study is well underway and some of the reports have been completed and are available online at <http://ne.water.usgs.gov/projects/elm.html>. The ELM model is currently in Phase 3 with emphasis on developing a two layer model to more accurately reflect observed changes in ground water levels.

In early 2011, the ELM project learned that funding from IWMPPF was being reduced due to budget cuts from DNR and the Nebraska Legislature. Further test holes and geophysical work was delayed or eliminated. At subsequent technical meetings the group discussed which scenarios had the highest priority to run by the model once it is completed.

In 2013 the USGS converted the ground water model from a one layer to a two layer model and has now been completed. For 2014 USGS embarked on training NRD personnel on the use of GIS to generate maps using batch files and the completed ELM MODFLOW model. This proved to be to complicated for even typically tech savvy GIS NRD personnel to master and therefore future modeling questions and running of different scenarios should be directed to key personnel at USGS.

Eastern Nebraska Water Resources Assessment

LPNNRD is a partner in the Eastern Nebraska Water Resources Assessment study. In order to better understand and manage this resource, several Natural Resources Districts, State and Federal Agencies have formed the Eastern Nebraska Water Resources Assessment group (ENWRA) and are proposing to do a geologic framework study at three locations. These pilot studies will evaluate different methods and techniques to characterize and map the subsurface. One of these methods will use Helicopter Electromagnetic (HEM) surveys, which is a geophysical method that can quickly map the subsurface geology over a fairly large area. HEM has been used successfully in other parts of the United States. A separate study

funded by the Nebraska Department of Natural Resources will look at other geophysical methods to test their effectiveness, such as Direct Current Resistivity survey. Information from that study will be incorporated into this project. Test holes and monitoring wells will also be installed to verify these different geophysical methods and will be used as long-term ground water quantity and quality monitoring sites in the future. If successful, geophysical techniques could provide a rapid assessment technique to characterize other glaciated areas of eastern Nebraska. This project will lay the groundwork for future studies (including ground water modeling efforts) and improving on existing water management plans.

In the fifth year of the study (2011), the focus shifted to publication of existing C&SD data and updating of the DNR database. C&SD has numerous drilling logs and studies that need to be digitized for publication. Also publication of test results for the three study areas and evaluation of the HEM and Time Domain geophysical methods are being developed. These reports were presented in the spring of 2011.

The latest ENWRA study was looking to fly long Airborne Electromagnetic (AEM) transects over eastern Nebraska to better model the geology of the glaciated portion of the State. ENWRA coordinator Katie Cameron applied to the Nebraska Environmental Trust (NET) for \$198,000 to help fund the study, but was unsuccessful. ENWRA went ahead with the project with a contribution of \$381,000 and NDNR contributed \$500,000. A new AEM method was used called SkyTEM 508, which is expected to see to a depth of 800 to 1,200 feet below the surface. This will provide information on deep geologic formations, such as aquifers and bedrock, that were previously little known. The flights occurred in the fall of 2014 and the spring of 2015 and the results are now listed on the ENWRA website at (www.enwra.org). Click on the "2015 AEM" button to view the results. Using AEM and the new SkyTem method have revolutionized our ability to assess the geology of eastern Nebraska. It has opened several questions concerning

bedrock aquifers both in water quantity and water quality such as salinity.

As a result of the 2014 and 2015 flight lines, several eastern NRD's have submitted several grant requests to the newly established Water Sustainability Fund in December 2015. Most of these requests were to do additional AEM flights and another ENWRA request was to study the water quality in the bedrock aquifers. All of these were funded. The AEM flights in LPNNRD were done in July 2016 of our Special Quantity Subareas with the final report due in August 2017.

Platte River Modeling Study

The University of Nebraska is conducting this ground water modeling effort of the Platte River in the LPNNRD. The purpose of this project is to develop a regional groundwater flow model that will be used to analyze the interactions of aquifer-stream-well systems and to determine the 10-50 boundary line for wells that are hydrologically connected to rivers and streams. The model will focus on the analysis of wells in the following counties: Saunders, Butler, Colfax, and Dodge, which are administered by the Lower Platte North NRD. This project consists of two phases: phase I - development of model framework; phase II - hydrologic data collection and groundwater-stream model development.

In 2008 & 2009, phase 1 of the project were generally completed:

Aquifer tests (pumping and recovery) were conducted at two sites - south of the Platte River [Butler County] northwest of Octavia, and north of the Platte River [Colfax County] northeast of Schuyler.

Collected geoprobe samples (soil cores and electro-conductivity) from sandbars along the banks of the Platte River at ten locations - one in Colfax County, three in Butler County, two in Dodge County, and four in Saunders County. Two more sites still need to be done, but high flows in the Platte River have caused delays.

Permeameter testing at seven sites in the Platte River.

In the fall of 2010, Dr. Chen (chief investigator) reports that calibration of the model is in

progress and hopes to begin actual simulations in the spring of 2011. Grant funding for this project comes from the Nebraska Environmental Trust.

For 2011, Dr. Chen asked for a six month extension to complete the model by the end of the year. This was completed and Dr. Chen presented that information in 2012. The hydrologically connected areas to the Platte River seemed quite extensive south of the river, but with the completion of the Subarea Delineation Study this information was forwarded to Dr. Chen. He has revisited the model and submitted a second iteration in September 2012. The model was completed in early 2013.

Eastern Nebraska HEM Aquifer Mapping (Swedeburg Area)

Grant funding for this project comes from the Nebraska Environmental Trust. In April 2009 portions of the Swedeburg subarea aquifers were mapped using electromagnetic sensors mounted on a helicopter (HEM). This was followed in October 2010 with the installation of three test holes by C&SD to ground truth the HEM data. As an additional measure to assist with ground truthing, LPNNRD GPS selected irrigation and domestic wells in this same area that currently do not have footage or lat. - long. coordinates for their well logs. In the fall of 2011, three additional test holes were drilled by C&SD which fulfilled the contract with the University. Dana Divine (Project Coordinator) gave a presentation on the HEM data at the September 28, 2011 Water Committee, but due to limitations in the NET grant, the comparison of the HEM data with the test hole data had to be cut. Staff will review the cost of ground truthing the HEM data for further discussion by the Board.

For 2012, the correlation of the HEM data to the test holes has been completed and Dana Divine gave a presentation of those results at the December 2012 Board meeting. The HEM worked well to define upper resistive materials (sands and gravels) but had mixed results at deeper formations greater than 80 feet deep. Divine also presented information contrasting an estimate of the thickness of the upper re-

sistive unit vs. the estimated saturated thickness of this same formation. A final report was delivered to LPNNRD in February 2013.

Farm Process Package (FMP) of MODFLOW Groundwater Modeling Software

The Farm Process Package is an application to the MODFLOW software program that looks at consumptive use of water based on precipitation, crop type, and maturity of crop to assist in future management decisions. The FMP can be an important new refinement to MODFLOW to allow the NRD's to more accurately account for water use by irrigated agriculture. This is a cooperative study between the Papio-Missouri River NRD, LPNNRD, and LPSNRD and the USGS who did the actual modeling for this project. The study area included land within the three NRD's and focused primarily on the Todd Valley and the Platte River Valley north of Ashland, Nebraska. This two year study ran from 2010 to 2011 with a possible report to be written in 2012, if additional funding becomes available.

Platte and Elkhorn River Valley Integrated Water Monitoring

A previous study in the mid-1990's by the LPNNRD ("Platte River - Sandpit Levels Recorder Study") established a hydrologic connection between the Platte River and adjacent sand pits, including the sandpits at the Game & Parks Two Rivers State Recreation Area. Many geologists and hydrologists theorized that ground water from the Platte River south of Fremont was flowing toward the Elkhorn River, but the quantity was unknown. This new study is to determine that amount and is a cooperative effort between Papio-Missouri NRD (lead agency), Lower Platte North NRD, and U.S. Geological Survey for real time continuous monitoring of ground water energy levels and streamflow between the Platte River at the Leshara streamgauge and Waterloo streamgauge on the Elkhorn River. This is a two year study which commenced in 2016.

Lower Platte River Consortium Study

Municipal wellfields in the Lower Platte River Basin depend on the Platte River to recharge

the groundwater for their use. This study will look at long term water supplies in the Lower Platte River Basin, and the ability to enhance streamflow, especially in drought conditions, to sustain these municipal water systems. Sustaining water in the river would also provide a benefit to wildlife and agriculture by lessening the likelihood of a 'call' on the river. Due to different hydrologic conditions in the Platte River, such as gaining and losing segments, siting of future reservoirs, groundwater storage projects, etc. becomes important in order to most effectively move water to a desired location downstream.

Agencies involved in the study are the Lower Platte South NRD (lead agency), Lower Platte North NRD, Papio-Missouri NRD, City of Lincoln/Lincoln Water Systems, the Nebraska Department of Natural Resources, and the Metropolitan Utilities District. The year 2016 is the first year of the project and currently funding is being sought with the U.S. Bureau of Reclamation Water Smart Grant and the Nebraska Water Sustainability Fund Grant (WSF).

Certifying Acres

In July 2009, the District signed a contract with GIS workshop to develop a database of county assessor records as the preliminary step to certifying irrigated acres. Using these records, LPNNRD staff, in early 2010, mailed out letters to landowners in Madison County to verify irrigated ground. As of January 2017 all counties within LPNNRD have been largely certified. If a landowner believes the irrigated acres listed on their Acre Certification form to be incorrect, LPNNRD uses a combination of aerial photography and FSA records to determine the correct irrigated acres. Unless there is a clear delineation in the field, FSA considers a field to be fully irrigated, even if the corners are dry. As such, FSA records, while useful, are limited in what they show. When certifying acres has been completed, it will provide a true inventory of the irrigation needs of the District, which will be an important part of future groundwater management and planning. In addition to cataloging irrigated acres, LPNNRD staff have been actively working with

the Nebraska Department of Natural Resources (NDNR), as well as local landowners to bring all irrigation wells in LPNNRD into compliance with Nebraska Revised Statute 46-602 (7). To help facilitate the sheer volume of requested well modifications, LPNNRD staff worked with NDNR to create a form that autofills based on a spreadsheet sent from LPNNRD to NDNR. NDNR supplied the form and LPNNRD staff created the script that autofills. This will save a substantial amount of work for both NDNR and LPNNRD staff and NDNR has plans to roll out this system of modification statewide.

Nebraska Ordnance Plant Water Pollution Clean Up at Mead

During the 1940s, 1950s and 1960s, an Army Ordnance Plant near Mead was used to assemble bombs and served as an early Atlas Missile ICBM site. Over time, the soil and ground water at the plant site became polluted with various explosive residues and solvents. The cleanup has been divided into three basic project areas: Soils (OU1), Ground Water (OU2), and Building contamination (OU3). This area has been under study by the Army Corps of Engineers (COE) since 1988.

The Soils cleanup was completed in 1998. Sixteen thousand tons of soil contaminated with RDX (an explosive residue) were incinerated. As part of the cleanup efforts for OU3, the COE demolished the load line buildings and storage bunkers in 1998. Approximately 900 cubic yards of soil contamination (antimony may be from a former paint shop) was also removed near Load Line 4 in 2007. Other significant developments included the continued search for the Mustard Gas Agent from Offutt Air Force, which was disposed at the landfill area below the NRD reservoir.

The cleanup of the ground water (OU2) involved drilling 11 wells at the leading edge of the current contaminant plumes to halt their further advance. Water from these wells is treated and then discharged to Wahoo Creek or Clear Creek, or used for beneficial reuse. The time frame for OU2 cleanup is estimated at 90 to 140 years, extracting up to approximately 3.7 million gallons of water per day.

More recent modeling efforts indicate that the majority of the contaminants could be cleaned up within 30 years. The containment wells and constructed water treatment plant were completed in 2002. Additional containment and monitoring wells plus additional treatment plants have since been established to assist with the cleanup effort and to contain the contaminant plumes. Beneficial reuse of the clean up water is currently being used by the University of Nebraska-Lincoln Agricultural Research and Development Center (ARDC) south of Mead, and by two landowner/producers for irrigation, livestock water, and for filling a pond.

The groundwater cleanup has involved modeling efforts to determine the impact of the proposed Omaha Metropolitan Utilities District (MUD) (located in the Platte Valley, two and a half miles northeast of the edge of one of the contaminant plumes) on containment of the contaminant plumes. The COE Omaha office approved a construction permit for MUD in 2003 for this well field and operations began in 2008. The LPNNRD has and will continue to play a vital role in working with the Army COE, MUD and area landowners to help insure containment of the contaminant plumes and eventual cleanup without severe impact to the underground aquifer supplying the area.

At a public meeting on October 19, 2011 the Army COE had the following update:

- TCE total removed = 19,690 pounds from the ground water by the four treatment plants.
- RDX removed by the main treatment plant = 211 pounds
- 2010 ground water model evaluation has modified the use of some containment wells. EW-2, EW-5, EW-8, EW-10, and EW-13 have been turned off since these were causing the contaminant plumes to move further south than expected. New wells FEW-11, FEW-14, FEW-15, EW-16 are now in operation and better placed to contain the contaminant plumes.
- MW-116 on two sampling events had 'detects' of TCE and a new irrigation well in the area is the likely influence of these results. Pump test done on EW-1 shows

the capture zones of this well will normally keep this TCE in containment. In the future the COE will likely pump EW-1 harder during the irrigation season to compensate for this irrigation well.

Major focus on the cleanup efforts during 2012 were: the drop in pressure in the discharge line to Wahoo Creek, since this will affect the long term beneficial use of the cleanup water for irrigation; a plan to inject the cleanup water instead of discharge it, but a ground water model stills needs to be developed to determine the best hydrologic sites that could help speed up the cleanup efforts; HEM flights were conducted by the COE in early October 2012 to further evaluate the geology of the area that will assist in cleanup efforts; the COE is recommending 'No Further Action for OU3', which deals with landfills and other burial sites, as well as, miscellaneous clean-up efforts.

Some of the highlights for 2013 included:

- Three extraction wells have been shut off (EW-3, EW-6, and EW-16) since the clean-up goal of less than 2 ppb of RDX has been obtained at these sites since 2009. FEW-14 will be pumped at a slightly higher rate of 250 pgm to keep the leading edge of LL3 plume in containment. A new extraction well (EW-17) was installed and will pump at 275 gpm. This well will supplement EW-12 and both are designed to contain the LL1 plume. With EW-17, nine containment wells are running.
- At Pilot Study site 1 (PTA-1) a zero valent iron barrier was installed in the aquifer to chemically treat the TCE and change it to a more harmless form. Lactic acid is also being injected into the aquifer as a carbon source to stimulate bacterial growth that will also break down the TCE.
- At Pilot Study site 2 (PTA-2) sodium acetate is being injected into the aquifer to help break down RDX. Both studies are scheduled to take 14 months. If these methods work this could be up scaled to large areas to help shorten the clean up time.

- Results from the HEM flights (that were flown in October 2012) were completed in the fall of 2013. Buried power lines interfered with the study and only limited new geologic information was obtained.
- The COE has announced that the Restoration Advisory Board (RAB) will be dissolved, but that the quarterly public informational meetings will continue. It has been three or four years since the last RAB meeting was held.
- Monitoring well MW-116 had a detection for TCE above the cleanup goals during the August 2012 sampling event but during the March, May, and November 2012 sampling events TCE was below the cleanup goals. This also happened in 2011 and the likely cause was heavy pumping of a nearby irrigation well. The COE has adjusted their pumping rate of a nearby containment well to compensate. MW-116 is at the lower end of the Atlas Missile Area Plume (LL-4 plume).
- A new contractor has been hired by the USACE to work on the cleanup efforts. HydroGeologic (HGL) will replace the current contractor of Environmental Chemical Corporation (ECC) who have worked 10 years at the site.
- The second 5 Year review has been completed. This is required by the Corps to take a fresh look at the clean-up efforts and evaluate any new technology that could shorten the cleanup time or cut cost.
- On site UV treatment systems have been installed on several extraction wells (EW-4, 7 and 9, FEW-11 and 14) to the point that the main treatment plant is no longer needed and therefore has been shutdown since April 30, 2014. Reuse of the cleanup water is still available on the existing discharge lines, but users have had to install booster pumps to increase the pressure for use in center pivots.
- Public availability meetings have gone from quarterly to semi-annual.
- The Pilot Studies for in-situ treatment within the aquifer for RDX and TCE are still on-going.

Updates for 2015 include:

- The 2014 Containment Evaluation has been completed and with the installation of EW-18 the contaminants should remain in containment.
- EW-18 was installed and when it becomes operational, UV light will be used to treat RDX at the source.
- The COE plans to drill 3 test holes deep into the Omadi sandstone in early 2016 to see if contaminants have entered the bedrock.

Updates for 2016 include:

- The 2013 Containment Evaluation has been completed with the recommendation to install an additional extraction well (EW-18) at the leading edge of the LL2 plume that will be placed between EW-7 and EW-9. To date several extraction (EW wells) and focussed extraction wells (FEW) have been shut off, primarily due to these wells pulling the contaminant plumes away from other extraction wells. The wells shut down are EW-8 (LL1), EW-10 (LL2), EW-6, EW-5, EW-16, EW-3, (all LL3), EW-2 (LL4). Extraction wells still operating include EW-12 and EW-17 (LL1), EW-9 and EW-7 (LL2), FEW-14 and EW-4 (LL3), FEW-15 and EW-1R (LL4).
- The highest RDX (explosives) concentrations are in LL2, while the highest TCE concentrations are in LL1 and LL4.
- Results from the Omadi sandstone did detect TCE and/or RDX in the bedrock at the 3 preliminary sites. The COE plans to follow this up over the summer months with additional monitoring wells and sampling outside the leading edge of the contaminant plumes known to exist in the upper aquifer. At the November 16, 2016 open house the COE reported that Phase 2 of the Omadi Formation Assessment showed no detect of either major contaminant in 11 of the 13 sites (3 or 4 wells at different depths for each site). Two sites MW-86 and MW-100 did detect RDX, but these were below the cleanup goals of 2 pbb.

- Modeling efforts and sampling results given on the 2015 Containment Evaluation lead the COE to feel the site is still within containment.
- The COE is revisiting soil cleanup at select locations in a project called the Military Munitions Response Program (MMRP). One site will be the former landfill area near the NRD reservoir and another larger area in the south-west portion of the Former Ordnance Plant south of Load Line 1.

Wellhead Protection Program

The LPNNRD implemented a wellhead protection program in FY 2001. The goal of the program is to minimize potential polluting activities on the land surrounding a community's public water supply well(s). The District has identified 22 communities with public supply wells and they have been encouraged to become involved in the program.

The town of Lindsay is experiencing higher nitrate levels in some of their municipal wells and in 2010 applied to DEQ to develop a wellhead protection area for the town. If a wellhead protection area is established by the community, the LPNNRD may become involved in sampling area wells and the possible establishment of a Phase 2 or 3 ground water management area. In 2016 the community asked the LPNNRD for WHPA signs, of which we have a number in stock. However, the signs for WHPA have recently been changed and our signs are no longer valid. To date the community has not requested a nitrate-nitrogen study of the surrounding area.

Rural Water Districts

In recent years, the District has worked with communities who have had difficulties with water quality and quantity by forming two rural water systems. The Butler County system linked the village of Bruno in 2006, who was having water quality and quantity problems, to David City. Also in 2006, the Saunders County system linked the village of Colon, who was experiencing water quality concerns, to Wahoo. The LPNNRD operates both of these systems. The District purchases water from the larger communities and delivers it to the smaller

communities. Both systems are designed to serve rural customers along each service route. Combined, the two systems serve over 134 households in Saunders and Butler Counties. The District has been in contact with several other communities and anticipates several more communities and rural customers to be serviced by rural water systems in the future. In FY 2016, LPNNRD continued involvement in a joint study that will eventually determine the feasibility of a rural water district for the villages of Brainard and Dwight.

Geographic Information System (GIS) and Global Positioning System (GPS)

The LPNNRD has been using Geographic Information System (GIS) technology since 1996. GIS is an automated system combining database information and maps. Features on a map, created with GIS technology contain attribute or feature descriptions that are referenced by location. Initially, a series of base maps were created including counties, townships, sections, major streams, and major roads within the District. Since that time a variety of new data, using Digital Elevation Models (DEM's), Digital Orthophoto Quarter Quadrangles (DOQQ's), and the NRCS Soil Survey, among other sources, has been created. The District has incorporated the use of GIS into most district functions, including major projects such as the creation and maintenance of Lake Wanhoo and a variety of water projects including mapping of Phase II and III Areas and Certification of Irrigated Acres. In 2002, LPNNRD entered into an agreement with several neighboring NRDs, UNL CSD, and the Lower Platte River Corridor Alliance, leading to the development of the Mapmaker website. The Mapmaker website allows the various partners to display a variety of geographically based data online, which has greatly decreased the number of phone calls into the office, as most consumers prefer to go to the Mapmaker site and print their own maps.

The Global Positioning System (GPS) relies on 28 NAVSTAR satellites, which provide worldwide positioning and navigation information around the clock. Receivers acquire signals from satellites to determine precise locations on earth. The data obtained from taking GPS

positions can be downloaded and mapped with GIS, making the two technologies complementary. In recent years, LPNNRD partnered with NRCS on the purchase of a sub centimeter GPS base station. This allows NRCS and NRD staff to quickly and efficiently perform a variety of tasks in the field with survey level precision.

In addition to in-house GIS activities, LPNNRD GIS staff assist a variety of partners, including projecting FSA aerial photography into Nebraska State Plane Feet coordinates for NDNR, custom authoring of maps for the Nebraska Land Trust, coordination of helicopter flight lines for invasive species control with the Lower Platte Weed Management Area, and helping other NRDs with GIS questions as they emerge.

Recently, LPNNRD entered into agreement with Phoenix Web Group to create a robust, relational database. GIS will be the backbone of this database and will allow LPNNRD to quickly, and efficiently, look up any information pertaining to any project or cost share that has been completed for any constituent with land in LPNNRD.

FY 2017 Ground and Surface Water Objectives

- Continue with LPNNRD Ground Water Management Area (GWMA) programs to help avoid the Lower Platte Basin being designated “fully appropriated.”
- Continue work on a Voluntary Integrated Water Management Plan (V-IMP) for the District. In 2016 stakeholder meetings were completed and currently waiting on Department of Natural Resources review of the Plan.
- Work with the Lower Platte River Basin NRD’s and the DNR to develop a basin-wide integrated water management plan. Many meetings have been held, primarily focusing on water banking in the basin, but no consensus has currently been reached.
- As part of the GWMA, continue with LPNNRD certification classes, demonstration plots, generation of maps indicating problem areas, and development of a landowner database using spreadsheets and GIS.
- Continue to cooperate with the United States Geological Survey (USGS) in monitoring groundwater levels at two sites.
- Use the Subarea Delineation Study to identify ‘small pocket aquifers’ in the Swedeburg, Prague, Yutan, and Yutan South subareas. Review other aquifer subareas to determine if Stay Management Areas are justified in other portions of our District.
- Continue sampling of approximately 53 wells in our District that are part of the Nebraska State-wide Network.
- Following intensive ground water sampling of the Richland - Schuyler Phase 2 area in 2013 and 2014, evaluate continuation of this Phase 2 area and/or modifications of its boundaries. In 2015 the LPNNRD moved the current Phase 2 area to Phase 3, and added the 10 sections of the northern boundary from a Phase 1 to a Phase 2. Nitrate-nitrogen values in the aquifer continue to rise.
- Following intensive ground water sampling of the Bellwood Phase 2 area the LPNNRD

modified the boundaries of this control area by moving 11 sections from Phase 2 to Phase 1. This reduction in size in 2015 reflects the improving ground water quality for nitrate-nitrogen in this area.

- Administer \$15,000 of state and local cost-share funds to decommission abandoned water wells, and provide 100% cost-share assistance within Wellhead Protection Areas.
- Maintain a multi-agency ground water energy level monitoring network in the Wann Basin of the Platte Valley north of Ashland to pool information from different agencies collecting water level data. This information is being used by the COE and MUD to refine their ground water modeling efforts.
- Continue to implement the Chemigation Program to inspect safety equipment on permitted irrigation systems in the district.
- Update the District's Chemigation rules and regulations to reflect an increase in permit fees and non-compliance issues. In 2015 the District assumed greater control of the Chemigation program following approval by DEQ.
- Continue with the district's Well Permitting Program and review of Variances in Stay Management Areas Hydrologically Connected Areas (Limited Development) or Restricted Development areas.
- Continue to review water use reports submitted to the LPNNRD as part of the well permitting process from new and replacement wells.
- Provide information and education on water conservation and safe disposal of farm and household chemicals.
- Continue to site registered and unregistered wells in the district using GPS.
- Promote and sponsor "Spring Conservation Sensation" at Czechland Lake in May 2016.
- Provide information on Integrated Pest Management in news releases and the "Via-duct" newsletter to encourage reduced use of pesticides.

- Support "Landscape Connection" event in Lincoln to promote the wise use of chemicals in urban areas.
- Assist in organizing the annual NRD Water Programs Conference held each year to update the NRD's on activity of State and Federal Agencies, new research and Legislative issues.
- Continue to Monitor changes in ground water levels and quality in the district.
- Continue to install flow meters on irrigation wells that are part of our Ground Water Energy Level (GWEL) Network.
- Expand the GWEL network to monitor aquifer subareas as designated in the Subarea Delineation Study. This will be done by incorporating additional high capacity wells and the drilling of new monitoring wells.
- Maintain a homepage for the Groundwater Management Districts Association (GMDA). GMDA is composed of Management Districts in Nebraska, Kansas, Colorado, Texas, Oklahoma, Louisiana, Mississippi and New Mexico
- Continue to monitor clean up efforts by the COE at the Former Ordnance Plant at Mead, Nebraska.
- Work with the COE to establish spacing requirements for future high capacity irrigation, industrial, and/or municipal wells that are requesting to be installed near known contaminant plumes from the Former Ordnance Plant near Mead, so these wells will not interfere with the COE's clean up efforts.
- Continue to monitor clean up efforts by the University of Nebraska at the ARDC facilities east of Ithaca, Nebraska.
- Maintain transducers placed in District monitoring wells to record changes in ground water energy levels.
- Declare Level 2 or Level 3 Management areas as warranted caused by declining ground water energy levels in 50% or more of the monitoring wells reaching their trigger levels after three consecutive spring readings.

- Declare Special Quantity Subareas (SQS) due to mid-summer declines in aquifers that are vulnerable to large pressure drops caused by heavy pumping of large capacity wells at the same time.
- Develop informational classes for well operators in the SQS as to proper installation of flow meters, set acre inch allocations and reporting annual pumpage to the LPNNRD. The Butler - Saunders SQS (SQS #1) became effective in 2015. The Platte - Colfax SQS (SQS #2) became effective in 2016.
- Review livestock permits from DEQ.
- Investigate irrigation runoff and ground-water management area complaints as needed.
- The LPNNRD Precipitation Gauging Network has been discontinued due to lack of cooperators. Data from the High Plains Regional Climate Center will be used instead.
- Expand the NeRain program within our District.
- Continue to be a sponsor member of the Elkhorn - Loup Model (ELM)
- Continue ground water modeling efforts with the University on the Platte Valley. Study will focus on determining hydrologic connection between surface water and ground water and determination of the 10/50 boundary.
- Contact well drillers and pump installers to further define areas that are experiencing well inference problems.
- Continue to assist the Eastern Nebraska Water Resources Assessment (ENWRA) with the use of AEM (Airborne Electromagnetic) to study the eastern glaciated portions of Nebraska to provide a geologic framework map. Flightlines were flown in the fall of 2014 and the spring of 2015. In July 2016 AEM flights of approximately ¼ mile spacing were flown over our two SQS areas. With grant funding we hope to continue these ¼ to ½ mile spacing flight lines into the future.
- Improve irrigation efficiency by working with UNL Extension on the Nebraska Agricultural Water Management Network (NAWMN) to install Watermark sensors and ET gauges with 20 producers each year in our District.
- Continue with the process of Irrigated Acre Certification within the District.
- Complete the Shell Creek Watershed Water Quality Plan.
- Complete water quality objectives as identified in the Wahoo Creek Watershed and the Shell Creek Watershed Water Quality Plans.
- Complete the Brainard/Dwight Rural Water System Feasibility Study.
- to Phase 1. This reduction in size in 2015 reflects the improving ground water quality for nitrate-nitrogen in this area.
- Administer \$15,000 of state and local cost-share funds to decommission abandoned water wells, and provide 100% cost-share assistance within Wellhead Protection Areas.
- Maintain a multi-agency ground water energy level monitoring network in the Wann Basin of the Platte Valley north of Ashland to pool information from different agencies collecting water level data. This information is being used by the COE and MUD to refine their ground water modeling efforts.
- Continue to implement the Chemigation Program to inspect safety equipment on permitted irrigation systems in the district.
- Update the District's Chemigation rules and regulations to reflect an increase in permit fees and non-compliance issues. In 2015 the District assumed greater control of the Chemigation program following approval by DEQ.
- Continue with the district's Well Permitting Program and review of Variances in Stay Management Areas Hydrologically Connected Areas (Limited Development) or Restricted Development areas.
- Continue to review water use reports submitted to the LPNNRD as part of the well permitting process from new and replacement wells.
- Provide information and education on water conservation and safe disposal of farm and household chemicals.

- Continue to site registered and unregistered wells in the district using GPS.
- Promote and sponsor “Spring Conservation Sensation” at Czechland Lake in May 2015.
- Provide information on Integrated Pest Management in news releases and the “Via-duct” newsletter to encourage reduced use of pesticides.
- Support “Landscape Connection” event in Lincoln to promote the wise use of chemicals in urban areas.
- Assist in organizing the annual NRD Water Programs Conference held each year to update the NRD’s on activity of State and Federal Agencies, new research and Legislative issues.
- Continue to Monitor changes in ground water levels and quality in the district.
- Continue to install flow meters on irrigation wells that are part of our Ground Water Energy Level (GWEL) Network.
- Expand the GWEL network to monitor aquifer subareas as designated in the Subarea Delineation Study. This will be done by incorporating additional high capacity wells and the drilling of new monitoring wells.
- Maintain a homepage for the Groundwater Management Districts Association (GMDA). GMDA is composed of Management Districts in Nebraska, Kansas, Colorado, Texas, Oklahoma, Louisiana and Mississippi.
- Continue to monitor clean up efforts by the COE at the Former Ordnance Plant at Mead, Nebraska.
- Work with the COE to establish spacing requirements for future high capacity irrigation, industrial, and/or municipal wells that are requesting to be installed near known contaminant plumes from the Former Ordnance Plant near Mead, so these wells will not interfere with the COE’s clean up efforts.
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- Review livestock permits from DEQ.
- Investigate irrigation runoff and ground-water management area complaints as needed.
- Continue to administer the Precipitation Gauging Network established by the district.
- Expand the NeRain program within our District.
- Continue to be a sponsor member of the Elkhorn - Loup Model (ELM)
- Continue ground water modeling efforts with the University on the Platte Valley. Study will focus on determining hydrologic connection between surface water and ground water and determination of the 10/50 boundary.
- Contact well drillers and pump installers to further define areas that are experiencing well inference problems.
- Continue to assist the Eastern Nebraska Water Resources Assessment (ENWRA) with the use of AEM (Airborne Electromagnetic) to study the eastern glaciated portions of Nebraska to provide a geologic framework map. Flightlines were flown in the fall of 2014 and the spring of 2015. Through additional grant requests, the LPNNRD hopes to do more extensive flightlines in our two SQS areas.

- Improve irrigation efficiency by working with UNL Extension on the Nebraska Agricultural Water Management Network (NAWMN) to install Watermark sensor's and ET gauges with 20 producers each year in our District.
- Continue with the process of Irrigated Acre Certification within the District.
- Complete the Shell Creek Watershed Water Quality Plan.
- Complete water quality objectives as identified in the Wahoo Creek Watershed and the Shell Creek Watershed Water Quality Plans.
- Complete the Brainard/Dwight Rural Water System Feasibility Study.

FY 2018-2022 Long Range Ground and Surface Water Objectives

- Continue ground water quality sampling throughout the LPNNRD, both the State-wide network and intensive sampling of selected regional aquifers.
- Continue water quality education programs based on the goals and objectives of the LPNNRD Ground Water Management Area, which includes LPNNRD certification classes for landowners, municipal and industrial water users.
- If needed, designate further Phase II & III boundaries for the Groundwater Quality Management Areas.
- Continue with nitrogen application demonstrations and participate with demonstrations on integrated pest management and sustainable agriculture.
- Assist in the projected decommissioning of 1,000 water wells in the district.
- Continue to use GPS to site registered and unregistered wells within the district.
- If necessary, designate Level II and III boundaries within the district to manage declining ground water levels.
- If necessary, designate new Special Quantity Subareas (SQS) within the district to manage mid summer declines of ground water energy levels in aquifers that operate under large pressure swings.
- Continue measurement of ground water energy levels in the district.
- Develop a ground water model for each sub-area.
- Install at least one monitoring well in each sub-area with continuous recording of ground water energy levels.
- Continued partner with the Eastern Nebraska Water Resources Assessment (ENWRA) and apply information to the glaciated portions of our District.
- Additional studies to identify vulnerable aquifers and modify GWMA rules and regulations to protect these aquifers and their long term sustainability. Continue geophysical work, installation of monitoring wells and test holes to better define these vulnerable sub-areas. Additional AEM flights with ¼ to ½ mile spacing would gratefully assist in defining such areas. Eventually cover the entire District with these detailed AEM investigations.
- Using AEM and the skyTEM 508 method has increased interest in bedrock aquifers both in water quantity and water quality. Test holes and monitoring wells will have to be installed and sampled to determine these as a possible source of useable groundwater. New management strategies need to be developed for these aquifers such as summer trigger levels for confined bedrock aquifers, especially if these are hydrologically isolated from overlying alluvial aquifers. This could develop into three dimensional management were aquifers at different depths are treated by a separate set of rules for each one. This could become very complex but will likely be the only way to sustain the use of these aquifers far into the future.
- Install precipitation gauges near monitoring wells in important sub-areas.
- Complete the Lower Platte River Consortium Study which looks at possible siting locations for recharge and reservoir sites to better convey water downstream to municipal wellfields.

- Complete water quality objectives as identified in the Wahoo Creek Watershed and the Shell Creek Watershed Water Quality Plans.
- Update the Ground Water Management Plan to include Integrated Management of surface and ground water. It maybe necessary to install additional surface water gauging sites coupled with nearby ground water monitoring wells as tools for integrated water management. Study possible changes to how the District manages confined aquifers that experience large mid-summer declines.
- Expand GWEL network to have recording monitoring wells in each sub-area to better manage the resource. This is especially important in confined aquifers.
- Complete the certification of irrigated acres and incorporate this into our Ground Water Management Plan and rules and regulations.
- Continue to assist District communities who have difficulties with water quality and quantity by helping determine rural water system feasibility.
- Keep the Saunders County Rural Water System study as an alternative in the event of changing federal regulations governing municipal water supplies.
- Update the Platte Valley modeling efforts using MODFLOW software. This information will be used to further define the 10/50 boundary line.
- Keep abreast of updates and new iterations of the Elkhorn - Loup Model (ELM) to determine which areas in the Shell Creek watershed are in hydrologic connection with the Elkhorn or Loup River basins.

In summary the LPNNRD needs to focus on six areas in the next five years:

1. Further AEM flights and test holes to better map the geologic framework of the District especially in the SQS areas and other areas where confined aquifers dominate.

2. Using information from the AEM flights and test holes, establish a monitoring well network in these confined aquifers to record spring and summer ground water energy levels. It is the midsummer declines (late July to mid-August) when large drops in aquifer pressure can cause some wells to run low on water. Map locations of potential recharge sites.

3. Establish ground water management rules to better address confined aquifers. This could involve comparing spring to summer ground water energy levels and comparing this to the potentiometric aquifer thickness and to the depth of bedrock. The current management rules for unconfined aquifers should be adequate for future conditions. These controls are based on three consecutive spring readings at or below their trigger levels in at least 50% of the GWEL wells in a given subarea.

4. AEM flights have given a new interest in bedrock aquifers such as the Dakota formation. Monitoring wells in selected areas are needed to determine the water quality and quantity of these bedrock aquifers. Also are these bedrock aquifers in hydrologic connection to any overlying aquifers? If this is the case and new high capacity wells are being established in these bedrock aquifers then management should shift focus to the more vulnerable aquifer to sustain long term viability of both aquifers. If these bedrock aquifers are isolated from the overlying aquifer then “three dimensional management” where wells are managed differently due to their depth maybe in order. This could get complex but management needs to take the chemical and physical characteristics of the aquifer in account. For example, what is the salinity of the ground water and is the bedrock aquifer cemented, unconsolidated, sandstone, limestone, or shale.

5. Horizontal wells. In the immediate future horizontal high capacity irrigation water wells will likely be established in thin aquifers to increase well output or yield. On the plus side, these could replace several vertical

wells that are used in series and therefore be a cost savings to the well owner. On the negative side these could quickly dry up thin aquifers less than 20 feet in thickness and affect nearby wells. How do you manage such a system? At the least you could require 600 feet spacing from any point of the lateral to a neighbor's well but again this may not provide much protection in thin aquifers such as the area immediately west of Fremont. Other management options would be to restrict the number of acres irrigated, restrict the length and direction of the laterals, restrict well output such as limit the gallons per minute, establish water allocation, install monitoring wells such as near the end of the laterals to track ground water levels, etc.

6. Integrated Water Management. Siting of potential recharge sites, storage reservoirs (both surface and ground water), and potential water reuse projects to enhance the water supply in the District. Additional monitoring wells, streamflow gauging, and precipitation sites will likely be necessary. Effects of climate change will also need to be considered as part of integrated water management.

In response to the Erosion and Sediment Control Act (LB 474), passed in 1986, the Natural Resources Commission developed the Nebraska Soil and Water Conservation Strategy. This strategy outlines a course of action for efficiently conserving and managing the state's natural resources.

The Lower Platte North NRD administers the Erosion and Sediment Act and has patterned its local program after the state strategy. Strategy objectives include completing 80% of the 1987 land treatment needs by the year 2010 and reducing soil loss on all lands to soil levels ("T") by 2025. The LPNNRD updated the district's Erosion and Sediment Control Program in FY 96 to include provisions for sediment runoff control in urban areas. The district administers state and local cost-share funds through Soil and Water Conservation Programs (SWCP) to offer incentives to farmers for installation of land treatment practices.

FY 2016 Soil Conservation Activities

Soil and Water Conservation Programs (SWCP)

Under Soil and Water Conservation Programs (SWCP), the LPNNRD administered \$112,046.42 of state funds and \$33,000 of local funds for land treatment practices during fiscal year 2016. Approximately \$111,391 in 319 Grant Funds have been spent in the Wahoo Creek watershed. These cost-share monies helped construct practices including approximately 20,560 linear feet of terraces, 4,918 linear feet of tile outlets, 23 risers and 15 basins. The Wahoo Creek Grant also included approximately 354 acres in the Lands for Conservation program that helps generate Summer work in the watershed. In addition, 9 Buffer Strip contracts were administered with \$ 15,008 in state funds.

For fiscal year 2016, approximately \$109,594.74 of state funds (from the Nebraska

Department of Natural Resources) and \$23,000 of local funds will be allocated for soil and water conservation practices.

Erosion and Sediment Complaints

The LPNNRD responds to occasional erosion and sediment complaints. In most cases, these complaints are resolved before going through the formal complaint process. Many cases are drainage issues that are resolved between the District and landowners. During FY 16 the district received no formal complaints, but some minor drainage issues.

FY 2017 Soil Conservation Objectives

- Use technical assistance from the NRCS in the planning, design, construction, and maintenance of conservation measures applied to the land.
- Use Federal, state and local funds to promote and implement land and water treatment projects in the Dunlap Creek, North Branch and Miller Branch of Wahoo Creek, along with Cottonwood Creek Watershed, to reduce erosion and improve water quality.
- Administer \$109,594.74 of State NSWCP funds and \$23,000 of local cost-share and grant funds to landowners for the construction of terraces, tile outlets, waterways, diversions, small dams, planting of permanent vegetation, and maintaining water quality.
- Continue to promote conservation tillage measures, pasture & range management, sustainable agriculture, and the Conservation Reserve Program (CRP), through news releases and the district's newsletter.
- Recognize the Outstanding Soil and Water Conservationist, at the LPNNRD Recognition Banquet.
- Continue to assist landowners in resolving soil erosion and sediment complaints.
- Provide financial support and staff time to conservation education activities.

- Continue to work closely with locally-led conservation groups to promote soil and water conservation throughout the district.
- Partner with the Shell Creek Watershed Improvement Group (SWIG) and NDEQ toward beginning implementation of the Shell Creek Environmental Enhancement Plan Implementation.
- Work with NRCS, NDEQ, NET, and Saunders County and the Wahoo Creek locally led Steering Committee in pursuing additional federal and state funds to assist with land treatment practices as defined in water quality objectives in the Wahoo Creek Watershed Water Quality Plan.
- Update the District's Erosion & Sediment Control Act Regulations

FY 2018-2022 Soil Conservation Long Range Objectives

Maintain existing land treatment practices and programs.

Continue to work with all counties in the district to reduce roadside erosion.

Administer the NDEQ/EPA 319 Grant Program to improve water quality throughout Wahoo Creek, Shell Creek priority watersheds.

Look for new and innovative soil and water conservation methods.

Partner with NRCS, UNL Extension and land-owners to improve all aspects of their water and soil quality.

Continue to support the Land and Range Judging Contests.

Continue targeting SWCP land treatment program funds for priority watersheds in the District.

Use existing and new technology and GIS software programs for implementing and promoting soil conservation practices.

Promote the use of and make available soil surveys and land use information.

Continue to support Locally Led Landowner Groups to promote and implement soil and water conservation practices.

Watershed projects have been completed in five of eleven sub-watersheds (see Appendix E) in the LPNNRD to help control floodwater and provide grade stabilization. These projects include Bellwood, Clear Creek, Cottonwood Creek, and Swedeburg watersheds, along with Rawhide Creek. Future flood control priority areas include Shell Creek, Skull Creek and Wahoo Creek watersheds. On federal and state projects where the LPNNRD acts as project sponsor, the district obtains land rights and mitigates for loss of trees, wildlife habitats and fences destroyed by project construction. The LPNNRD is also responsible for operation and maintenance activities on these projects after they are built.

The LPNNRD offers local assistance for the construction of small dams that can help counties and/or landowners protect county roads, control erosion and provide water for livestock and wildlife.

FY 2016 Flood Control and Damage Reduction Activities

Sand Creek Environmental Restoration Project (Lake Wanhoo)

In 1993, the Lower Platte North NRD, City of Wahoo and Saunders County began investigating the possibility of constructing a multipurpose dam site on Sand Creek, one mile north of Wahoo. A feasibility study was completed to look at soil types, water budget and benefits derived from the possible construction of the lake. The report gave a positive benefit cost ratio should the lake be constructed. The study identified reduction in storm damages and recreation as two major benefits, with no fatal flaws identified. A later study by the U.S. Army Corps of Engineers identified Lake Wanhoo and seven smaller upstream dams as the preferred alternative for environmental restoration and flood control in the watershed.

With the invaluable assistance of numerous local, state and federal partners, 2011 witnessed the completion of construction on Lake Wanhoo's earth embankment. The breakwater feature and the fisheries component have also been completed. Recreation components were also started for Lake Wanhoo in FY 2011 and landrights were secured for five of the seven upstream sediment/nutrient trap structures. Construction of the five upstream structures were completed in FY 2012 and the final two structures were completed in FY 2014.

In FY 16, LPNNRD continued to work with the Army Corps of Engineers toward final closeout of the project and development of an operations and maintenance manual. The district also began addressing operational procedures of Lake Wanhoo with a group of local downstream landowners who experienced flooding from intense rainfall in the spring of 2016.

Operation and Maintenance

District staff completed inspections on 50 watershed structures and special projects in the NRD in FY 15/16. These inspections help detect problems before they become serious. Also during the 2016 fiscal year, noxious weeds were sprayed on 50 structures and along Rawhide Ditch 8. Annual maintenance activities such as removing debris, repairing fences and unplugging risers were completed at many of the dam locations.

Army Corps of Engineers 205 Flood Studies

Over the past few years, the District has partnered with local entities and the US Army Corps of Engineers to study flood protection alternatives for their areas. In 2004, LPNNRD partnered with Fremont, Inglewood and Dodge County to look at a potential levee project to remove areas from the Platte River 100-year ice induced floodplain. In 2005, LPNNRD entered into an interlocal agreement with the City of Schuyler to evaluate levee protection options to protect the city from flooding from the Platte River and Shell Creek. In FY 2016,

the study is now a General Investigation (GI) Study. I

In FY 2012, the Schuyler 205 Study was completed and entered into the project design phase. In FY 2014 the design phase was completed and LPNNRD assisted Schuyler with obtaining needed landrights for the Shell Creek Levee portion of the project which began construction activities in the spring of 2014 and most construction activities were completed in the fall of 2015. LPNNRD continued to assist Schuyler in FY 2016 with working toward closing out the project with the Army Corps of Engineers.

FY 2017 Flood Control and Damage Reduction Objectives

- Continue with accelerated land treatment efforts in identified priority watersheds in the District.
- Complete biannual inspections on 50 watershed structures; spray noxious weeds on 50 dams and 10 miles of ditch; complete regular maintenance activities at all sites.
- Continue to educate the public on watershed management and flood control in LPNNRD newsletters and news releases.
- Cooperate with landowners and counties in evaluating small dam sites for cost-share throughout the district.
- Continue to partner with the Army Corps of Engineers, City of Fremont, Englewood and Dodge County to complete the General Investigation study efforts to identify a feasible flood control solution.
- Continue to support the City of Schuyler on the completed construction of the Shell Creek levee project and budget \$125,000 in FY 2017 for the project.
- Work with Communities, Counties and other entities on projects identified in our District-wide All Hazard Mitigation Plan.
- Commit funds and staff time toward obtaining funds for floodwater control structures in the Wahoo Creek Watershed.

FY 2018-2022 Flood Control and Damage Reduction Long Range Objectives

- Continue to commit funds and staff time toward obtaining funds for floodwater control structures in the Wahoo Creek Watershed.
- Continue to budget staff time and funds to maintain and operate completed flood control structures that are sponsored by the LPNNRD.
- Continue to investigate flood control/ water storage structure opportunities for Wahoo Creek, Shell Creek and Skull Creek Watersheds.
- Continue to encourage cities and counties in the district to accept and implement Floodplain Management Authorities.
- Assist Schuyler with pursuing federal assistance for completing construction of the Platte River Levee flood protection project as identified and preliminarily designed as a result by the Army Corps of Engineers 205 study.
- Assist Fremont, Inglewood and Dodge County with flood protection projects as identified by the Army Corps of Engineers General Investigation study.
- Assist District Communities in evaluating future flood protection for their communities through updating the District's Hazard Mitigation Plan and assisting with identified projects.



The district administers several programs designed to enhance the region's forest, range, and wildlife land, including the Tree Planting Program, Wildlife Habitat Program, SWCP Program, and Mitigation Program. The district also sponsors educational activities such as Range Judging and Land Judging contests, and other school-oriented activities.

FY 2016 Forestry, Range and Wildlife Habitat Activities

Tree Program

One of the most visible and popular programs offered by the LPNNRD is the district's tree planting program. As a direct result of this program, begun in 1973, an estimated 800,000 trees and shrubs have been planted in the district. Trees and shrubs may be obtained from the NRD for windbreaks, shelter belts, wildlife habitat, woodlots, and Christmas tree plantings. Besides providing a planting service, the NRD also designs tree plans and offers technical advice on ground preparation for tree sites.

During the spring of 2016, 12,900 trees and shrubs were distributed to District residents. Of this total, approximately 2,510 were planted by the NRD field crew at 8 sites.

WILD Nebraska Program

WILD Nebraska is intended to encourage landowners to set aside land for wildlife habitat, but payment rates and acceptable practices have been adjusted in the new program to make it more flexible.

The new program bases its payments on average county rental rates. There are numerous habitat practices eligible for funding in three major categories: Woodlands, Wetlands and Grasslands. Funding for the program is split between the Nebraska Game and Parks Commission (75%) and the NRD (25%).

The district did not receive any new applications for the program in FY 15/16. The District did receive a grant through WILD NE to enhance the wildlife habitat at Homestead and

Czechland Lakes. A tree removal contractor was hired to remove many trees at Czechland Lake. Other improvements will take place over the next year.

Community Forestry Program

In FY 2015/16, the LPNNRD donated 1,000 seedlings to Conservation Sensation, Fremont Eco Fair, and schools for educational purposes. The District budgets \$2,000 for such projects.

FY 2017 Forestry, Range and Wildlife Habitat Objectives

- Plant and distribute conservation trees and shrubs through the district's Tree Planting Program.
- Continue to include tree planting as an eligible cost-share practice under the SWCP program.
- Offer trees and give staff presentations to elementary students across the district.
- Sign cooperators into the district's WILD Nebraska Program and assist with funding from the CREP program.
- Cooperate with the Extension Service and the NRCS in obtaining tree orders from District residents.
- Recognize a cooperator for outstanding tree planting efforts at the Annual Recognition Banquet.
- Provide cost-sharing for the conversion of cropland to grassland through the SWCP program.
- Cooperate with Pheasant Forever Chapters to enhance wildlife habitat and establish windbreaks.

FY 2018-2022 Forestry, Range and Wildlife Habitat Long Range Objectives

- Sell between 20,000 and 30,000 trees and shrubs each year through the district's Tree Planting Program, and to plant at least half of the trees ordered.

- Provide information and education on tree planting, woodland management, grassland management, and proper wildlife habitat enhancement through the media, tours, and schools.
- Continue to administer Wildlife Habitat programs in cooperation with the Nebraska Game and Parks Commission and other partnering entities as opportunities arise.

FY 2016 Recreation Activities

Czechland Lake Recreation Area

Czechland Lake Recreation Area is a multipurpose project located one mile north of Prague, Nebraska on Highway 79. Flood control, recreation and education are the main benefits of the project. Located at a convenient distance from Omaha, Lincoln, Fremont and Wahoo, the 85 surface acre lake is situated on 265 acres of public access land operated and maintained by the LPNNRD.

State park permits and fees are not required for entrance to the area. The District installed electrical service to 8 camper pads and established an \$18/night fee for the use a camping pad. There are also three non-electrical pads. A Nebraska Fishing License is required for anglers. The lake fishery is managed by the Nebraska Game and Parks Commission, which stocks and monitors fish populations. Catfish, Bluegill, Northern Pike and Largemouth Bass were initially stocked in Czechland Lake.

Originally built as one of twelve floodwater structures in the Cottonwood Creek Watershed, Czechland Lake has developed into one of the area's most popular recreation spots. The reservoir and recreation area development was built at a total cost of \$1.8 million. Funding for the project was shared by the Nebraska Natural Resources Commission, Saunders County, USDA Natural Resources Conservation Service and LPNNRD. Grant monies from the U.S. Environmental Protection Agency have been used to reduce non-point source pollution entering the lake and to provide educational resources.

The Czechland recreation area was used extensively during FY 16 generating approximately \$7,000 in camping revenue. Mowing, trash removal, repair and upkeep of park equipment, and thistle control kept LPNNRD park staff very busy during the spring and summer.

Homestead Lake (Skull Creek Site #55)

Construction was completed on Homestead Lake in 2001. The dam offers flood control for nearby communities, and has been developed

for public recreation. Recreation facilities include a shelter, restroom, picnic areas, a boat ramp, and hunting areas. FY 2016 proved to be another very popular year for recreators as the area was extensively used.

Lake Wanahoo

Work was completed on recreation facilities at Lake Wanahoo one mile north of Wahoo in FY 2012. Recreation facilities at the 1,600 acre site straddle the 662-acre lake, with camping and boating access on the west side and a day use area on the east. A rocked hiking/biking trail winds throughout the park, linking the east and west side recreation areas over a breakwater levee one mile north of the dam. Mowed trails north of the levee provide access to undeveloped areas set aside for wildlife habitat.

The camping area contains 74 camper pads and 60 tent camping sites. All camper pads are equipped with electrical hookups and 50 of them are hard surfaced, with the remainder on grass. All tent sites have fire rings and picnic tables.

The camping area also offers access to a large boat ramp that's wide enough to accommodate three boats at a time. Boating at the lake will be no-wake only.

The day use area on the east side of the lake has two large picnic shelters and two smaller ones, all offering scenic views of the lake.

Both the camping and day use areas provide excellent fishing access, with a total of seven fishing jetties. One jetty on each side has an attached handicapped pier. The lake was stocked with largemouth bass, bluegill, blue catfish, crappie, northern pike, and walleye beginning in 2008.

Limited hunting opportunities will continue to be available at Lake Wanahoo through the popular PATH Program, where adults can schedule a time to mentor a youth hunter at designated hunting sites north of the recreation area.

The Lake Wanahoo Recreation Area was opened to the public in spring 2012. An opera-

tion and maintenance plan was developed with the assistance of the Nebraska Game and Parks Commission and Pheasants Forever in FY 2014 which identified activities were implemented in 2015 .

In the summer of 2016, with the assistance of NGPC, a controlled burn was conducted on approximately 200 acres of grassland was burned to inhibit small tree encroachment and stimulate warm season grass and forb growth for wildlife habitat. With the assistance of many local volunteers, LPNNRD staff also erected playground equipment on the lake's west campground area and on the east day use area.

Wildlife Habitat Public Access Areas

Under the WILD Nebraska program, administered jointly with the Nebraska Game & Parks Commission, the LPNNRD encourages landowners to allow public access on habitat lands signed up under the program. The NRD currently has a total of 15 habitat acres in the CREP program, none of which offer public access.

FY 2017 Recreation Objectives

- Continue to budget funds for maintenance, including grass mowing, painting, tree trimming, road grading, outhouse cleaning, trash removal, and noxious weed control, at Lake Wanahoo, Czechland Lake and Homestead Lake Recreation Areas.
- Acquire additional acres of wildlife habitat lands which allow public access under the WILD Nebraska program.

FY 2018-2022 Recreation Long Range Objectives

- Continue to evaluate development of new outdoor public recreational facilities as opportunities arise.
- Continue to administer the WILD Nebraska programs and pursue developing new areas offering public access.

It is the general policy of the LPNNRD not to provide financial assistance for drainage improvement and channel rectification unless a project has public benefit and is sponsored by a county, city and a group of landowners through an established Improvement Project Area. Under this policy, the district has cooperated on several projects that have provided public benefit.

FY 2017 Drainage Improvement & Channel Rectification Objectives

- Continue to oversee the progress of the Rawhide Creek West Branch Project to ensure that landowners control vegetation on Rawhide Creek to help it stay clean.
- Provide continued assistance to Platte Center with stabilizing a segment of Elm Creek.
- Work with local landowners and Colfax County to improve Shell Creek flows east of Schuyler.

FY 2018-2022 Drainage Improvement & Channel Rectification Long Range Objectives

- Continue to assist counties and cities in the district that sponsor sound drainage and channel improvement projects.



WASTE DISPOSAL AND POLLUTION CONTROL

In recent years, vast changes have occurred in Nebraska's solid waste regulations. Landfills that weren't properly designed, operated or sited were required to shut down, as were unauthorized dumps. Now, in order for a landfill to operate, it must be approved by the State and receive a permit. If a permit is not issued, the landfill cannot legally operate. Currently, the only permitted landfill in the Lower Platte North NRD is a facility near David City.

FY 2017 Waste Disposal & Pollution Objectives

- Promote recycling efforts in the district through education programs, newsletters, and news releases.
- Participate in education efforts to promote the reduction of pollution to our air, water, and soil resources.
- Cooperate and be supportive of other group and agency pollution control efforts, education, and/or regulation.

FY 2018-2022 Waste Disposal & Pollution Long Range Objectives

- Assist and encourage all District communities in establishing collection locations for recyclable wastes.
- Assist District cities and counties in establishing pickup days for hazardous household and farmstead wastes.
- Promote waste reduction efforts in the district through education and incentives.

A major responsibility of the Lower Platte North NRD is to keep the public aware of the district's various projects and programs, and to inform and educate children and adults about the wise use and management of our natural resources.

FY 2016 Information & Education Activities

During fiscal year 2016, the Lower Platte North NRD conducted many activities to help residents learn the importance of our soil and water resources and keep abreast of natural resource issues and concerns. Some of the highlights included:

Education Programs

The district once again sponsored the "Spring Conservation Sensation" activities held at the Czechland Lake Recreation Area in May 2016. During this all-day event, nearly 225 fifth- and sixth-grade students from Saunders, Butler, Platte, Colfax and Dodge Counties participated in various activities. Hands-on activities were presented by agency personnel and volunteers to teach the students about the environment and their natural resources. Students visited stations demonstrating tree planting, fishing, wildlife education, water sampling and more.

The district hosted the East Central Land Judging Contest in October 2016 for area FFA chapters, with nearly 200 students and a record number of schools participating.

District staff presented various activities at natural resources festivals, field days, and school classrooms.

Awards, Contests, and Events

The district participated in the Soil and Water Stewardship Week by distributing free educational materials to churches and schools.

The LPNNRD also provided displays at exhibit booths during three county fairs.

Publications

In FY 2012, the district switched distribution of the "The Viaduct" newsletter from direct mail subscriptions to inserts in area newspapers. In FY 2016, more than 28,000 copies of the newsletter went out in area papers and via email. This issue included the district's 2016 Annual Report, which was previously a separate publication.

Various brochures describing LPNNRD programs and services were updated as needed in FY 2016. A Fact Sheet for use with the NARD's public relations campaign was updated.

News releases were mailed to district papers and radio stations, and numerous ads spotlighting different NRD programs were aired on KTIC Radio. In FY 14 the district also began running digital ads on the Wahoo newspaper website which continued in FY16.

Web Site

The NRD's website at www.lpnrd.org contains information on nearly all of the district's projects and programs, as well as staff and director information, committee and board meeting minutes, and more. Online application and registration forms for various projects and programs are available as well. In FY 2008, online payment capabilities were added to the site to allow customers to pay for trees and rural water bills.

The district also has a custom-built Rural Water app for in-house use.

FY 2017 Information & Education Objectives

- Publish the district newsletter "Viaduct" biannually in an electronic format and as a printed newspaper insert in 10 area newspapers, and produce supplemental electronic issues on an as-needed basis.
- Send timely news releases to the local media on various LPNNRD programs, projects and activities.

- Continue with the annual Award Program.
- Provide District elementary students free trees, as requested, in the spring.
- Disseminate pamphlets and other publications about LPNNRD programs.
- Provide LPNNRD staff as requested to speak to community organizations and schools on NRD activities and environmental topics.
- Continue to provide a display at county fairs (up to five major counties) within the district.
- Promote Soil & Water Stewardship Week and distribute free materials to churches throughout the NRD.
- Sponsor the Spring Conservation Sensation in spring 2017.
- Provide support to the Lower Platte South NRD, the host of the area Land Judging Contest, in fall 2017.
- Participate in Nebraska Alliance for Conservation and Environmental Education.
- Update the district's web site regularly.
- Continue social networking outreach for the district through use of tools such as Facebook, Twitter, etc.

FY 2018-2022 Information & Education Long Range Objectives

- Search for new and effective ways to inform and educate the public on the NRD purpose and programs.
- Increase participation in activities sponsored by other agencies related to NRD responsibilities.
- Seek to have conservation/environmental education as a part of the school curriculum.
- Support environmental education activities and events.
- Assist in development of an outdoor classroom for a District school.
- Participate with the Information & Education Staff Group to coordinate statewide I&E activities and produce statewide products.

NRD Staff

The staff of the Lower Platte North NRD includes 16 full-time and part-time employees at the district office in Wahoo. The NRD also staffs a full-time field technician, four clerks in Natural Resource Conservation Service county offices, and a Recreation Facilitator for Czechland Lake Recreation Area. Current staff as of December 31, 2016 are listed below.

In addition to the listed full-time and part-time positions, the district employs seasonal conservation technicians to assist in the layout of land treatment structures. There are also seasonal summer employees hired to help with water sampling, tree planting and maintenance of NRD projects.

Personnel positions and assigned responsibilities could increase in the future as increased project and program responsibilities increase.

Larry Angle, Water Resources Manager
Tyler Benal, NRD Programs Coordinator
Jill Breunig, Administrative Manager
Duke Dokulil, Operations & Maintenance Specialist
Eric Gottschalk, Rural Water Manager, Projects Coordinator
Bob Heimann, Operations & Maintenance Manager
John Miyoshi, General Manager
Tom Mountford, Assistant Manager
Russell Oaklund, Lead Water Resources Specialist
Dave Odvody, Recreation Facilitator
Mitch O'Reilly, O&M Specialist
Chris Poole, GIS/Computer Specialist
Karen Rezac, Secretary/Bookkeeper
Bret Schomer, Water Resources Specialist
Desirae TePoel, Information & Education Specialist
Melissia Foreman, Shell Creek Watershed Coordinator

Kelly Bartek, Conservation Technician
Susie Leu, NRD/NRCS Field Office Assistant (Butler County)
Patty Holmberg, NRD/NRCS Field Office Assistant (Colfax County)
Luz Schafersman, NRD/NRCS Field Office Assistant (Dodge County)
Marla Milliken, NRD/NRCS Field Office Assistant (Saunders County)



FY 2017 Financial Objectives

Funding required for the LPNNRD projects and programs for Fiscal Year 2017 requires a general operating budget of \$6,632,439. A tax levy of .038278 cents per \$100 actual valuation is required from District property. Projected expenses and income for FY 2017-2022 is shown in Appendix F.

A tax levy of .038278 means that an owner of a \$150,000 home will pay about \$57 in NRD taxes in FY 2017. An owner of farm land valued at \$8,000 per acre will pay about \$3.06 an acre/year in FY 2017. The LPNNRD levy represents about 2.0 percent of the total property tax collected.

FY 2018-2022 Long Range Financial Objectives

Although it is expected that the amount of revenue from all sources will fluctuate during the next few years, it is anticipated that the LPNNRD will operate at a mill levy between \$0.040 and \$0.055 per \$100 actual valuation as the District continues to pay down past project indebtedness, assists with new project requests, and increases activities in groundwater management.

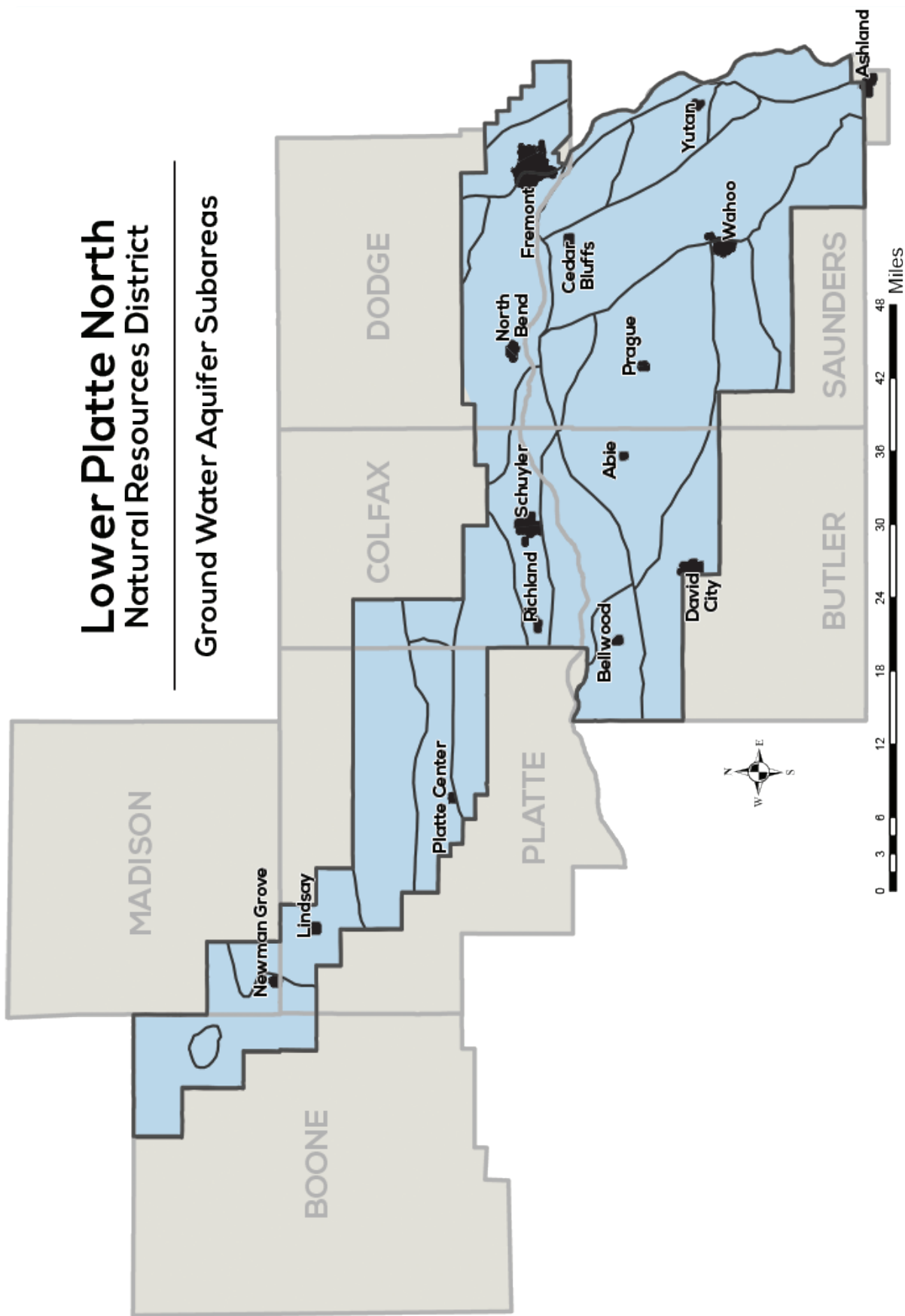
APPENDIX A - Estimated Population by County



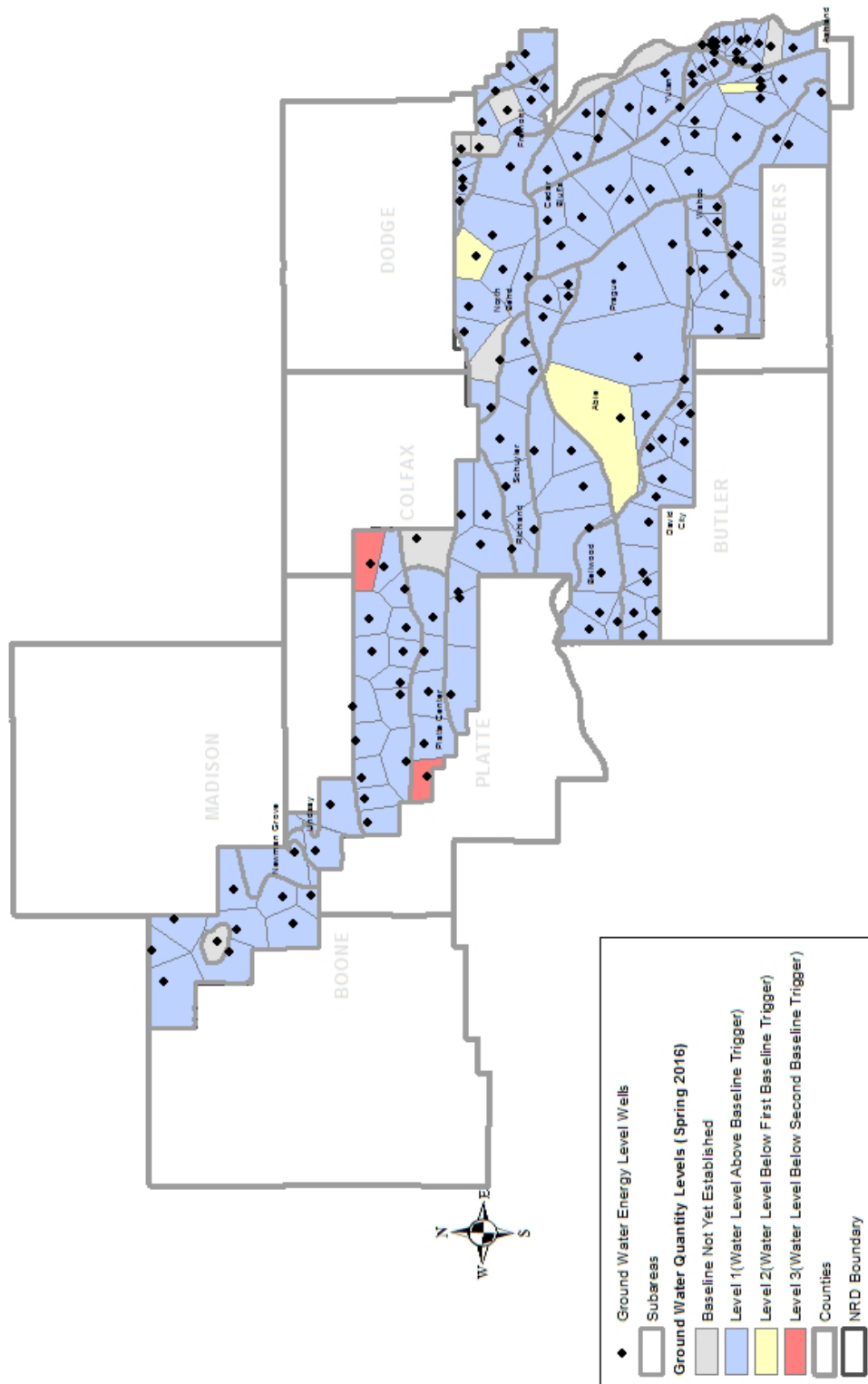
COUNTY	% OF COUNTY IN DISTRICT	ACRES IN DISTRICT	RURAL POPULATION IN DISTRICT	URBAN POPULATION IN DISTRICT	TOTAL	% OF FISCAL INPUT
Boone	12.6	54,473	362	--	362	2.3
Butler	44.3	165,476	2,022	3,387	5,409	11.0
Colfax	41.9	111,528	1,414	4,237	5,651	10.0
Dodge	30.2	104,245	3,100	25,215	28,315	35.7
Madison	6.3	23,086	194	770	964	1.5
Platte	38.5	169,432	2,878	723	3,571	10.5
Saunders	81.5	401,234	6,698	6,949	13,647	29.0

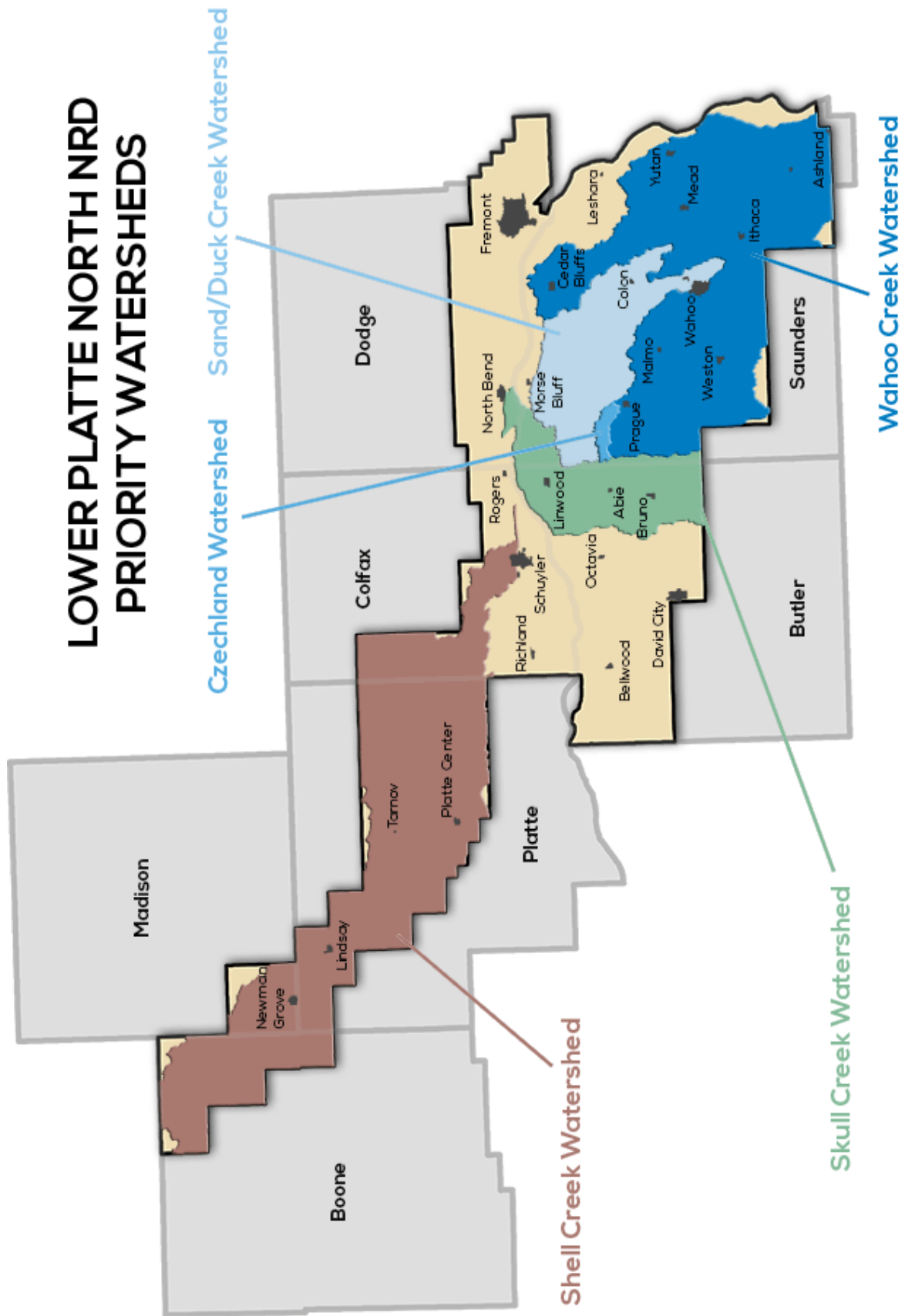
Twenty-eight cities, towns and villages are located within the Lower Platte North NRD, listed below with their populations:

Fremont	23,680	Inglewood	286
Wahoo	3,681	Prague	282
Schuyler	4,052	Weston	299
David City	2,522	Morse Bluff	128
North Bend	1,249	Malmö	114
Ashland	219	Tarnov	141
Newman Grove	770	Colon	128
Cedar Bluffs	591	Leshara	118
Yutan	626	Richland	96
Ithaca	133	Linwood	91
Mead	513	Octavia	132
Platte Center	341	Rogers	117
Lindsay	321	Memphis	117
Bellwood	395	Abie	106



Lower Platte North Natural Resources District
Ground Water Energy Level Network
(Spring 2016)





APPENDIX E - Projected Budget (Expenses), Fiscal Years 2017-2022



Description	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
ADMINISTRATION						
Bonds	\$0	\$750	\$800	\$850	\$900	\$950
Dues and Membership	\$33,342	\$33,500	\$33,750	\$34,000	\$34,250	\$34,500
Fees & Licenses	\$9,600	\$9,984	\$10,383	\$10,799	\$11,231	\$11,680
GIS	\$1,000	\$2,500	\$3,000	\$3,500	\$4,000	\$4,500
Insurance	\$47,983	\$49,902	\$51,898	\$53,974	\$56,133	\$58,379
Interest Expense	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Legal Notices	\$4,000	\$4,160	\$4,326	\$4,499	\$4,679	\$4,867
Maintenance Contracts	\$7,000	\$7,210	\$7,498	\$7,798	\$8,110	\$8,435
Office Supply & Expense	\$9,150	\$9,516	\$9,897	\$10,293	\$10,704	\$11,132
Computer Supply & Expense	\$30,800	\$31,000	\$31,500	\$32,000	\$32,500	\$33,000
Postage	\$11,000	\$11,440	\$11,898	\$12,374	\$12,868	\$13,383
Professional Services	\$115,500	\$118,000	\$120,500	\$123,000	\$125,500	\$128,000
Rent Expense	\$800	\$850	\$900	\$950	\$1,000	\$1,050
Support to Organizations	\$1,000	\$1,200	\$1,300	\$1,400	\$1,500	\$1,600
Telephone	\$19,050	\$19,812	\$20,604	\$21,429	\$22,286	\$23,177
Utilities	\$8,000	\$8,320	\$8,653	\$8,999	\$9,359	\$9,733
INFORMATION & EDUCATION						
Education	\$4,300	\$4,472	\$4,651	\$4,837	\$5,030	\$5,232
Information	\$20,730	\$21,559	\$22,422	\$23,318	\$24,251	\$25,221
Scholarships & Grants	\$2,750	\$2,860	\$2,974	\$3,093	\$3,217	\$3,346
Other	\$14,539	\$8,000	\$8,250	\$8,500	\$8,750	\$9,000
OPERATION/MAINTENANCE						
Auto & Truck Expense	\$20,000	\$20,800	\$21,632	\$22,497	\$23,397	\$24,333
Building Maintenance	\$9,050	\$9,412	\$9,788	\$10,180	\$10,587	\$11,011
Comm. Forestry Program	\$2,000	\$2,000	\$2,500	\$2,500	\$3,000	\$3,000
Operation and Maintenance	\$68,450	\$71,188	\$74,036	\$76,997	\$80,077	\$83,280
Project Repairs	\$17,000	\$17,500	\$18,000	\$18,500	\$19,000	\$19,500
Stream Bank Stabilization	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000
WILE NE/CREP	\$15,261	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000
Other	\$51,324	\$52,000	\$52,500	\$53,000	\$53,500	\$54,000
PERSONNEL						
Directors Expense	\$45,440	\$47,258	\$49,148	\$51,114	\$53,158	\$55,285
Directors Per Diem	\$40,000	\$41,000	\$42,000	\$43,000	\$44,000	\$45,000
Employee Benefits	\$403,897	\$420,053	\$436,855	\$454,329	\$472,502	\$491,402
Payroll Taxes	\$84,000	\$87,360	\$90,854	\$94,489	\$98,268	\$102,199
Personnel Expense	\$47,500	\$47,500	\$47,500	\$47,500	\$47,500	\$47,500
Salaries	\$1,265,793	\$1,303,767	\$1,342,880	\$1,383,166	\$1,424,661	\$1,467,401
PROJECTS						
Inter-governmental	\$33,937	\$50,000	\$75,000	\$100,000	\$150,000	\$200,000
Special Projects	\$5,500	\$10,000	\$15,000	\$20,000	\$25,000	\$30,000
Wanahoo (Includes interest)	\$33,918	\$17,000	\$6,000			
Other Projects	\$476,380	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000
PR CORRIDOR ALLIANCE	\$9,696	\$10,000	\$10,000			
WATER						
Groundwater Management Plan	\$288,000	\$50,000	\$55,000	\$60,000	\$65,000	\$70,000
Groundwater Programs	\$29,750	\$30,940	\$32,178	\$33,465	\$34,803	\$36,195
Regulatory	\$500	\$500	\$500	\$500	\$500	\$500
Surface Water Programs	\$20,000	\$20,000	\$21,000	\$22,000	\$23,000	\$24,000
Special Projects	\$567,650	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000
Land Treatment	\$514,967	\$525,000	\$525,000	\$525,000	\$525,000	\$525,000
RURAL WATER DISTRICT	\$88,635	\$90,000	\$92,000	\$94,000	\$96,000	\$98,000
CAPITAL IMPROVEMENTS						
Sand Creek- Wanahoo Dam	\$873,786	\$450,000	\$200,000			
Sand Creek Recreation	\$215,666	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000
Czechland Lake & Homestead Lake	\$22,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000
Western Sarpy/Clear Creek Const.	\$150,000	\$150,000	\$150,000	\$150,000	\$150,000	\$150,000
Monitoring Wells & Test Holes	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000
Rawhide - Gifford Culvert	\$50,000					
Sand Creek Site 15 Land Purchase	\$542,000					
Rural Water	\$0					
CAPITAL OUTLAY	\$167,795	\$70,000	\$50,000	\$50,000	\$50,000	\$50,000
BUDGET TOTAL	\$6,632,439	\$6,105,313	\$5,941,576	\$5,844,850	\$5,992,224	\$6,141,791



APPENDIX F - Projected Budget (Income), Fiscal Years 2017-2022

Description	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
ADMINISTRATION						
Bonds	\$0	\$750	\$800	\$850	\$900	\$950
Dues and Membership	\$33,342	\$33,500	\$33,750	\$34,000	\$34,250	\$34,500
Fees & Licenses	\$9,600	\$9,984	\$10,383	\$10,799	\$11,231	\$11,680
GIS	\$1,000	\$2,500	\$3,000	\$3,500	\$4,000	\$4,500
Insurance	\$47,983	\$49,902	\$51,898	\$53,974	\$56,133	\$58,379
Interest Expense	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Legal Notices	\$4,000	\$4,160	\$4,326	\$4,499	\$4,679	\$4,867
Maintenance Contracts	\$7,000	\$7,210	\$7,498	\$7,798	\$8,110	\$8,435
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Computer Supply & Expense	\$30,800	\$31,000	\$31,500	\$32,000	\$32,500	\$33,000
Postage	\$11,000	\$11,440	\$11,898	\$12,374	\$12,868	\$13,383
Professional Services	\$115,500	\$118,000	\$120,500	\$123,000	\$125,500	\$128,000
Rent Expense	\$800	\$850	\$900	\$950	\$1,000	\$1,050
Support to Organizations	\$1,000	\$1,200	\$1,300	\$1,400	\$1,500	\$1,600
Telephone	\$19,050	\$19,812	\$20,604	\$21,429	\$22,286	\$23,177
Utilities	\$8,000	\$8,320	\$8,653	\$8,999	\$9,359	\$9,733
INFORMATION & EDUCATION						
Education	\$4,300	\$4,472	\$4,651	\$4,837	\$5,030	\$5,232
Information	\$20,730	\$21,559	\$22,422	\$23,318	\$24,251	\$25,221
Scholarships & Grants	\$2,750	\$2,860	\$2,974	\$3,093	\$3,217	\$3,346
Other	\$14,539	\$8,000	\$8,250	\$8,500	\$8,750	\$9,000
OPERATION/MAINTENANCE						
Auto & Truck Expense	\$20,000	\$20,800	\$21,632	\$22,497	\$23,397	\$24,333
Building Maintenance	\$9,050	\$9,412	\$9,788	\$10,180	\$10,587	\$11,011
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Operation and Maintenance	\$68,450	\$71,188	\$74,036	\$76,997	\$80,077	\$83,280
Project Repairs	\$17,000	\$17,500	\$18,000	\$18,500	\$19,000	\$19,500
Stream Bank Stabilization	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000
WILE NE/CREP	\$15,261	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000
Other	\$51,324	\$52,000	\$52,500	\$53,000	\$53,500	\$54,000
PERSONNEL						
Directors Expense	\$45,440	\$47,258	\$49,148	\$51,114	\$53,158	\$55,285
Directors Per Diem	\$40,000	\$41,000	\$42,000	\$43,000	\$44,000	\$45,000
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Payroll Taxes	\$84,000	\$87,360	\$90,854	\$94,489	\$98,268	\$102,199
Personnel Expense	\$47,500	\$47,500	\$47,500	\$47,500	\$47,500	\$47,500
Salaries	\$1,265,793	\$1,303,767	\$1,342,880	\$1,383,166	\$1,424,661	\$1,467,401
PROJECTS						
Inter-governmental	\$33,937	\$50,000	\$75,000	\$100,000	\$150,000	\$200,000
Special Projects	\$5,500	\$10,000	\$15,000	\$20,000	\$25,000	\$30,000
Wanahoo (Includes interest)	\$33,918	\$17,000	\$6,000			
Other Projects	\$476,380	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000
PR CORRIDOR ALLIANCE						
	\$9,696	\$10,000	\$10,000			
WATER						
Groundwater Management Plan	\$288,000	\$50,000	\$55,000	\$60,000	\$65,000	\$70,000
Groundwater Programs	\$29,750	\$30,940	\$32,178	\$33,465	\$34,803	\$36,195
Regulatory	\$500	\$500	\$500	\$500	\$500	\$500
Surface Water Programs	\$20,000	\$20,000	\$21,000	\$22,000	\$23,000	\$24,000
Special Projects	\$567,650	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000
Land Treatment	\$514,967	\$525,000	\$525,000	\$525,000	\$525,000	\$525,000
RURAL WATER DISTRICT						
	\$88,635	\$90,000	\$92,000	\$94,000	\$96,000	\$98,000
CAPITAL IMPROVEMENTS						
Sand Creek- Wanahoo Dam	\$873,786	\$450,000	\$200,000			
Sand Creek Recreation	\$215,666	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000
Czechland Lake & Homestead Lake	\$22,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000
Western Sarpy/Clear Creek Const.	\$150,000	\$150,000	\$150,000	\$150,000	\$150,000	\$150,000
Monitoring Wells & Test Holes	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000
Rawhide - Gifford Culvert	\$50,000					
Sand Creek Site 15 Land Purchase	\$542,000					
Rural Water	\$0					
CAPITAL OUTLAY						
	\$167,795	\$70,000	\$50,000	\$50,000	\$50,000	\$50,000
BUDGET TOTAL	\$6,632,439	\$6,105,313	\$5,941,576	\$5,844,850	\$5,992,224	\$6,141,791

APPENDIX G - Projected Expenses Breakdown, Fiscal Years 2017-2022

