

**North Plains Groundwater Conservation District | 2014 ANNUAL REPORT**





# **MISSION STATEMENT**

**“Maintaining our way of life through the conservation, protection and preservation of our groundwater resources.”**

The District covers approximately 7300 square miles in the northern Texas Panhandle encompassing Dallam, Hansford, Lipscomb, Ochiltree, and Sherman Counties, as well as parts of Hartley, Hutchinson, and Moore Counties.

**“Stewardship for today and for future generations.”**



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## LETTER FROM THE PRESIDENT

Dear Stakeholders,

2014 was the 59th year of existence for the North Plains Groundwater Conservation District. It marked the culmination of six decades of conserving, protecting and preserving the groundwater of the northern Texas Panhandle. Many strides were made in the preceding fifty-eight years, and 2014 followed suit as a year full of milestones that would shape the future of the district, the aquifer and the people of the area.

The district gained approval of its new management plan in 2013, including, for the first time, the Desired Future Conditions (DFC's) for the aquifers within the district boundaries. According to Chapter 36 of the Texas Water Code, the board was required, within one year after the management plan was approved, to make sure the rules included a process for achieving the DFC's. To achieve the DFCs the board adopted the new rules detailing the process for reducing the annual allowable production amount, if necessary to meet the established DFC's for the district. This was part of a three-year process to streamline the district's rules that began in 2012 and would continue throughout 2014. Outdated language and concepts were proposed for repeal and new ideas were presented for addressing well density, well classification, metering, production reporting and other issues. The final set of rules would later be passed in 2015. District Rule 8 allows for a reduction only if certain criteria are met, including total annual production exceeding annual available supplies for multiple years. Passage of this rule keeps the district on track in the state planning process and creates a valuable tool for protecting the future of the resource.

I am proud to say that members of the board and management of the district were intimately involved in the regional water planning process in 2014. Districts are required by law to participate in state and regional water planning, and it is our area's seat at the table regarding state water decisions. In 2014, the district was front and center during preparations for the state's next five-year plan starting in 2017. I was privileged to serve as President of the Groundwater Management Area 1 (GMA 1) Joint Planning Committee, encompassing 18 counties of the Texas Panhandle. The committee is comprised of a board member representing each of the districts in GMA 1 and a non-voting member that represents GMA-1 to the regional water planning group. The GMA-1 member districts appointed North Plains GCD board member Danny Krienke to serve as GMA-1 representative to the Panhandle Regional Water Planning Group, representing 21 panhandle counties.

The district also saw the completion of an extremely successful conservation demonstration project in 2014. The "200-12 Project" began in 2010 and concluded in 2014, but not before gaining the attention of producers and policy-makers from here in the district, to the other side of the world. Before it was all said and done the "200-12 Project" had attracted partners on the state and national level, received both the Blue Legacy and Texas Environmental Excellence Awards, and exposed hundreds of area farmers to new ways to save water while remaining economically viable. This project epitomizes what groundwater conservation districts are supposed to be doing, and again I say I am proud to be a part of it!

The Texas Water Development Board (TWDB) provided significant support for district conservation projects in 2014, resulting in over a million dollars in state grants and loans being directed to the district's programs and stakeholders. The district was initially awarded a grant from the Texas Water Development Board (TWDB) for \$197,000 to continue agriculture conservation demonstrations based on the "200-12 Project." Later in the year the TWDB approved a low-interest loan for \$620,000 for improvements at the district's North Plains Water Conservation Center. Improvements included upgrading irrigation and monitoring systems with the latest technologies to allow stakeholders to observe on-farm demonstrations of water-saving strategies. Finally, the district was awarded a \$600,000 grant, again from the TWDB. This time the funding was to be passed on to producers to pay for up to half of the cost of any flow meters installed on irrigation wells after June 26, 2014. These funds have allowed the district to pursue worthwhile projects without increasing the burden on taxpayers.

In closing, I want to highlight one of those worthwhile projects that received new life and direction in 2014. The North Plains Water Conservation Center (the Center), formerly the North Plains Research Field at Etter was renamed and refocused in 2013. On September 1, 2014 the district officially assumed management responsibilities of the facility, which it had owned since 1987 and had leased to Texas A&M AgriLife Research. As I mentioned earlier, funding was secured to allow the facilities to be upgraded to create an opportunity for on-farm, practical demonstrations of technologies and practices that could be readily applied to area operations to allow them to save water and remain profitable. An additional boost to the Center came in the form of a public/private partnership between the district and Crop Production Services of Loveland, Colorado. This agreement reduces risk for the taxpayers of the district while providing for meaningful, practical demonstrations and education to be provided at the Center. Future plans are for the Center to be a showcase destination for stakeholders of all ages to see agricultural as well as residential water conservation strategies applied. The Center promises to offer a future of truly unique educational opportunities, and I am extremely proud to be a part of it!

This is not even an exhaustive list of the progressive, innovative initiatives that started, gained momentum and took flight in 2014 in your North Plains Groundwater Conservation District. I believe this is something we can all be proud of.

Respectfully,

Bob Zimmer, Director Hansford-Hutchison Counties, North Plains Groundwater Conservation District  
President 2014-2016  
npgcd1@gmail.com

## The District's Progress In Achieving Management Goals

With the passing of Senate Bill 1 in 1997 the 75th Texas Legislature required groundwater conservation districts to design management plans to meet specific strategic goals as outlined in the legislation. Senate Bill 1 created a statewide groundwater management and planning process, while preserving local control over the process through the districts. The districts are required to examine and revise their management plan at least every five years. This annual report is intended to give an annual update on North Plains Groundwater Conservation District's progress on each of the strategic goals included in its management plan.

This report will be presented to the district's board of directors in a timely manner, and then made available to the public. A copy of the most current annual report will be available for public review on the district website at [www.northplainsgcd.org](http://www.northplainsgcd.org) and at the district office.

## MANAGEMENT GOALS

### Providing for the Most Efficient Use of Groundwater (31TAC §356.5(A)(1))

#### A.1. Management Objective:

Calculate total annual groundwater withdrawals through water use reporting by all producing water right owners that have a well capable of producing more than 25,000 gallons of groundwater a day.

#### A.1. Performance Standards:

Annually the district will collect production reports on all properties containing non-exempt wells and calculate annual groundwater withdrawals for the district. A summary will be presented to the Board of Directors each year.

Groundwater Production by County 2007 - 2014 in Acre Feet (Table 1)

COUNTY	2007	2008	2009	2010	2011	2012	2013	2014
Dallam	268,667	313,451	317,441	302,561	374,733	371,965	399,272	393,624
Hansford	106,887	142,694	152,686	129,984	234,903	218,793	201,914	211,634
Hartley	312,449	364,560	387,305	401,506	519,684	458,696	458,998	442,058
Hutchinson	34,973	52,846	53,869	42,023	73,747	72,230	69,716	73,992
Lipscomb	32,710	30,832	30,242	33,826	52,003	55,572	42,519	48,791
Moore	148,159	191,409	200,220	178,336	271,684	234,688	228,297	209,907
Ochiltree	53,658	75,527	65,840	62,269	114,392	109,213	98,280	106,278
Sherman	220,530	275,128	285,571	261,608	407,265	348,012	346,685	361,336
Total	1,178,033	1,446,447	1,493,174	1,412,113	2,048,411	1,869,169	1,845,681	1,847,620

#### A.2. Management Objective:

Provide support through the District's North Plains Research Field to promote research into drought tolerant crops, efficient water management strategies and other research promoting water use efficiencies.

#### A.2. Performance Standards:

Annually the District will summarize its activities at the North Plains Research Field to be presented to the Board of Directors.

In 2014, the district began repurposing the North Plains Research Field as the North Plains Water Conservation Center (the Center). The board developed a plan for the operations and staffing of the Center. The plan included developing the field mission as a demonstration field, upgrading the irrigation facilities including modifying the piping system, replacing the pivots, installing variable frequency drives (VFDs), changing the wells from gas to electric power, installation of drip and financing the costs of the upgrade.

The district secured a loan from the Texas Water Development Board for \$620,000 to cover the capital costs of construction. The district developed a field plan that included moving the west pivot location to the west and slightly to the north so that it would fully rotate 360 degrees instead of the 270 degree coverage. Xcel Energy and Rita Blanca Electric both served the Center. To simplify electric service, the district discontinued Xcel Energy's service and contracted with Rita Blanca Electric to provide all of the electric service to meet the district's needs. The change in services required installation of new poles, wiring and transformers.



The district completed modification of the underground piping system and removed unnecessary risers and valves. Electricity was extended to the new west pivot location. PivoTrac installed Seometrics meters at each pivot. They rewired the meters to allow the control panels to collect data from the meters. Etter Water Well changed the head shaft to the pump at the west well and set the electric motor on the pump. The district purchased a John Deer Tractor that could be used for farming purposes at the field.

The district entered into a two-year contract with Texas AgriLife Research to continue its wheat breeding operations at the field. Texas AgriLife Research completed soil testing under the old chemical storage facility. The cement slab was removed and no chemical residue from the facility was found.

The district selected Texas Electric to install two new Reinke Pivot Systems and a VFD on the west well at the field. Construction on the pivots began in October. The board selected Stan Spain and Crop Production Services out of five proposals for a three year lease to operate the Center.

The proposals presented by Stan Spain and CPS had the right combination of commitment and cooperation. The CPS proposal offered \$50,000 cash annually in exchange for the 200 acres of irrigated farmland and roughly 80 acres of dryland. In addition, CPS agreed to provide all inputs necessary for the operation. This type of financial and resource commitment on the part of CPS is a good faith investment in the ideals of the Center and an investment in the future of irrigated agriculture in the district. It makes it possible for the district to participate, while eliminating additional cost to taxpayers.

Besides the guaranteed financial compensation, CPS management demonstrated a vision for the Center that matches the vision of the board. The CPS proposal spelled-out a plan of demonstrating graduated irrigation regimens of 3, 4, and 5 gallons per minute pumping capacity to mirror the next phase of conservation demonstrations planned by the district. "CPS stands behind this study and recognizes its importance for the survival of farming with our limited water resources," said Shawn Carter, CPS Agronomist.

CPS also plans to demonstrate various plant populations and multiple crops and crop rotations in their demonstrations at the field including: corn, cotton, sorghum and wheat. These plans are in line with the water conservation focus that the board desires for the Center, but the CPS proposal went even further by also calling for ongoing coordination with the district in the design and implementation of demonstrations and district access to all the data.

CPS is the largest global agricultural retailer, providing growers across North America, South America and Australia with top quality crop input products and services. CPS is also a leading wholesale producer and distributor of crop nutrients, with operations strategically located to supply key global markets. Agrium, the parent company of CPS, has over nine million tons of nutrient production capacity across all three macro nutrients. They are the world's fourth largest nitrogen producer, as well as a major producer of potash and phosphate. Crop Production Services is Agrium's retail unit, supplying crop protection products, crop nutrients, seed, services and other products directly to customers through close to 1500 retail locations in the U.S., Argentina, Chile, Uruguay, Brazil, Australia and Canada.

In addition to the agriculture conservation demonstrations to be conducted by CPS, the district will maintain the Center as a showcase for a variety of conservation practices and innovations. Possible demonstrations could include low water use landscaping, rainwater harvesting and gray water reuse.

### **Controlling and Preventing the Waste of Groundwater (31TAC §356.5(A)(1)(B))**

#### **B.1. Management Objective:**

Control and prevent the waste of groundwater as defined by the Texas Water Code through the enforcement of district "Waste" rules.

#### **B.1. Performance Standards:**

Annually the district will summarize enforcement of "Waste" rule violations and report to the board of directors.

**Waste Rule Violations in 2014 (Table 2)**

Waste Violation Report	Description	Action	Resolution
0	N/A	N/A	N/A

### **Controlling And Preventing Subsidence (31TAC §356.5(A)(1)(C))**

Due to the depth to water and the nature of the geology of the aquifer within the district, subsidence is unlikely and the district's board of directors, upon recommendation from the staff, has determined that this goal is not applicable to the district.

### **Conjunctive Surface Water Management Issues (31TAC §356.5(A)(1)(D))**

Following notice and hearing, the district coordinates the development of the management plan with surface water management entities as required by 31 TAC §356.6(a)(4). Documentation regarding this coordination effort is located in Appendix K of the district's management plan. The district also coordinates the development of the plan with the Panhandle Regional Water Planning Group.

#### **D. 1. Management Objective:**

Each year, the district will participate in the regional planning process by attending at least 75 percent of the Region A – Panhandle Regional Water Planning Group meetings to encourage the development of surface water supplies to meet the needs of water user groups in the district.

#### **D. 1. Performance Standard:**

The summary of attendance of a district representative at Region A - Panhandle Regional Water Planning Group meetings will be reported to the district board of directors.

### **2014 Panhandle Regional Water Planning Group Meetings**

February 21, 2014 - General Manager, Steve Walthour attended on behalf of the district and Director, Danny Krienke attended as Groundwater Management Area - 1 Representative. Board President, Bob Zimmer, Director, Gene Born and Assistant Manager for Science and Tech, Dale Hallmark also attended the meeting.

May 20, 2014 - General Manager, Steve Walthour attended on behalf of the district and Director, Danny Krienke attended as Groundwater Management Area - 1 Representative.

August 18, 2014 – General Manager, Steve Walthour attended on behalf of the district and Director, Danny Krienke attended as Groundwater Management Area - 1 Representative. Assistant Manager for Science and Tech, Dale Hallmark, also attended this meeting.

November 5, 2014 – General Manager, Steve Walthour attended on behalf of the district and Director, Danny Krienke attended as Groundwater Management Area - 1 Representative. Assistant Manager for Science and Tech, Dale Hallmark, also attended this meeting.

### **Natural Resource Issues That Impact the Use and Availability of Groundwater and Which Are Impacted By the Use of Groundwater (31TAC §356.5(A)(1)(E))**

The district has determined that the current natural resource issues that may impact the use and availability of groundwater within the district are water quality issues and declining water tables.

#### **E.1. Management Objective:**

Monitor aquifer characteristics that impact the use and availability of groundwater and which are impacted by the use of groundwater through district programs by maintaining a network of water quality and water level monitor wells.

#### **E.1. Performance Standards:**

A. District staff will collect and analyze water samples from appropriate monitor wells periodically but not less often than once every five years.

**Anion and Cation Analyses from Wells Within the District (Table 3)**

Parameter	Units	2013 Number of Analyses	2013 Average Analysis	2014 Number of Analyses	2014 Average Analysis	2015 Number of Analyses	2015 Average Analysis
Sulfate	mg/l	32	30.6	56	55	6	24.3
Nitrate	mg/l	32	10.9	52	9.6	6	7
Total Iron	mg/l	32	0.16	56	0.05	6	0.069
Chlorides	mg/l	32	21.46	56	37	6	19.1
Fluoride	mg/l	32	1.9	56	1.7	6	0.96
Total Hardness	mg/l	32	207	55	222	6	204

\*Note 2015 Test results do not include analyses performed after July 2015 nor the district's routine samples from monitor wells.

B. District staff will perform water quality analyses for select constituents for district well owners upon request. Results for the 2014 testing by request are included in Table 3 above, which is published in the 2014-2015 Hydrology and Groundwater Resources Report.

C. District staff will summarize their water quality activities and make the information available to the board of directors and the public annually. Results for 2014 water quality testing are summarized in the 2014-2015 Hydrology and Groundwater Resources Report and reflected here in Table 3 above.

D. District staff will collect aquifer water level measurements annually.

**Average Depth to Water and Comparisons of Average Declines in Select District Water Level Monitor Wells (Table 4)**

County	Avg. Depth to Water (ft.)	2014 Avg. Well Decline (ft.)	2013 Avg. Well Decline (ft.)	Current 5-Year Avg. Well Decline (ft.)	Previous 5-Year Avg. Well Decline (ft.)	Current 10-Year Avg. Well Decline (ft.)	Previous 10-Year Avg. Well Decline (ft.)
Dallam	271	3.9	3.9	4.0	3.1	3.5	3.7
Hansford	298	2.5	2.4	2.3	1.9	2.2	1.4
Hartley	355	4.5	4.5	4.4	4.1	4.6	3.1
Hutchinson	348	2.0	2.0	2.1	1.9	2.1	1.7
Lipscomb	162	1.1	1.1	1.0	0.8	1.0	0.3
Moore	347	2.7	2.6	2.5	2.2	2.4	1.6
Ochiltree	335	1.7	1.7	1.6	1.2	1.5	0.8
Sherman	298	3.2	3.0	2.9	2.4	2.7	1.8
District-wide	345	3.1	3.0	3.0	2.5	2.9	2.1

\*The information in Table 4 was derived from an analysis of monitor well hydrographs created from the data in the district's water level database. The analysis data from some monitor wells, indicating both rises and declines, are not sufficiently consistent to insure accuracy and reliability in their use. Such data may be excluded during the calculations of declines, depth to water or saturated aquifer formation.

**E.** District staff will summarize groundwater level declines and average depth to water and make the information available to the board of directors and the public annually. Groundwater level declines and average depth to water are summarized in the 2014-2015 Hydrology and Groundwater Resources Report and reflected here in Table 4 above.

**F.** District staff will summarize or update aquifer saturated material information and make the information available to the board of directors and the public at least every two years. (Table 5)



**Saturated Thickness by County for 2014 (Table 5)**

Dallam	Hartley	Sherman	Moore	Hansford	Hutchinson	Ochiltree	Lipscomb
132 ft.	150 ft.	155 ft.	151 ft.	168 ft.	144 ft.	175 ft.	195 ft.

**Estimated District-wide Average Aquifer Thickness is 159 feet.**

The 2014-2015 Hydrology and Groundwater Resources Report was presented to the board of directors on July 21, 2015 as recorded in the minutes of the board meeting.

**E.2. Management Objective:**

Investigate and address deteriorated wells that may cause a threat to water quality.

**E.2. Performance Standard:**

A. District staff will pursue repair or plugging of deteriorated wells. (Table 6)

B. District staff will summarize the deteriorated well activities and make the information available to the board of directors and the public annually.

**Deteriorated Wells (Table 6)**

Reported/Discovered	Investigated	Plugged	Capped
2	2	2	0

**Addressing Drought Conditions (31TAC §356.5(A)(1)(F))**

North Plains Groundwater Conservation District lies in an area of the state of Texas that has a semi-arid climate. Semi-drought conditions are experienced year round and the district works to educate the public about methods to conserve water all year, but particularly during dry periods.

**F.1. Management Objective:**

Provide residential stakeholders with information and tools to conserve during dry and peak use periods.

**F.1. Performance Standards:**

Annually, the district will conduct water conservation communications and education activities. These activities will be summarized annually and presented to the board of directors.

## Summer Municipal Cooperative Conservation Project

2014 marked the fourth year for the district to conduct the Summer Municipal Cooperative Conservation Project, also known as the Summer Showers Campaign. The Summer Showers Campaign links the district with member cities to distribute conservation tools and information to residents where they live. City water utilities serve as distribution points for conservation kits that include: a low-flow showerhead, a sprinkler gauge, a faucet leak gauge and leak detector tablets. In addition, the campaign includes public service announcements on the radio and in local newspapers, as well as social media postings. Seven area city halls served as distribution points for the kits in 2014.

For other District conservation outreach activities see Item G.1b. Performance Standards



## Water Conservation, Recharge Enhancement, Rainwater Harvesting, Precipitation Enhancement, or Brush Control, Where Appropriate And Cost-Effective (31TAC §356.5(A)(1)(G))

### G.1. Water Conservation

#### G.1a. Management Objective:

Support research and field demonstrations to foster adoption of agriculture water conservation technologies and practices.

#### G.1a. Performance Standards:

Annually the district will summarize the project results to be presented to the board of directors.

## Final Year of the 200-12 Project Builds on the Past, Sets Stage for Future

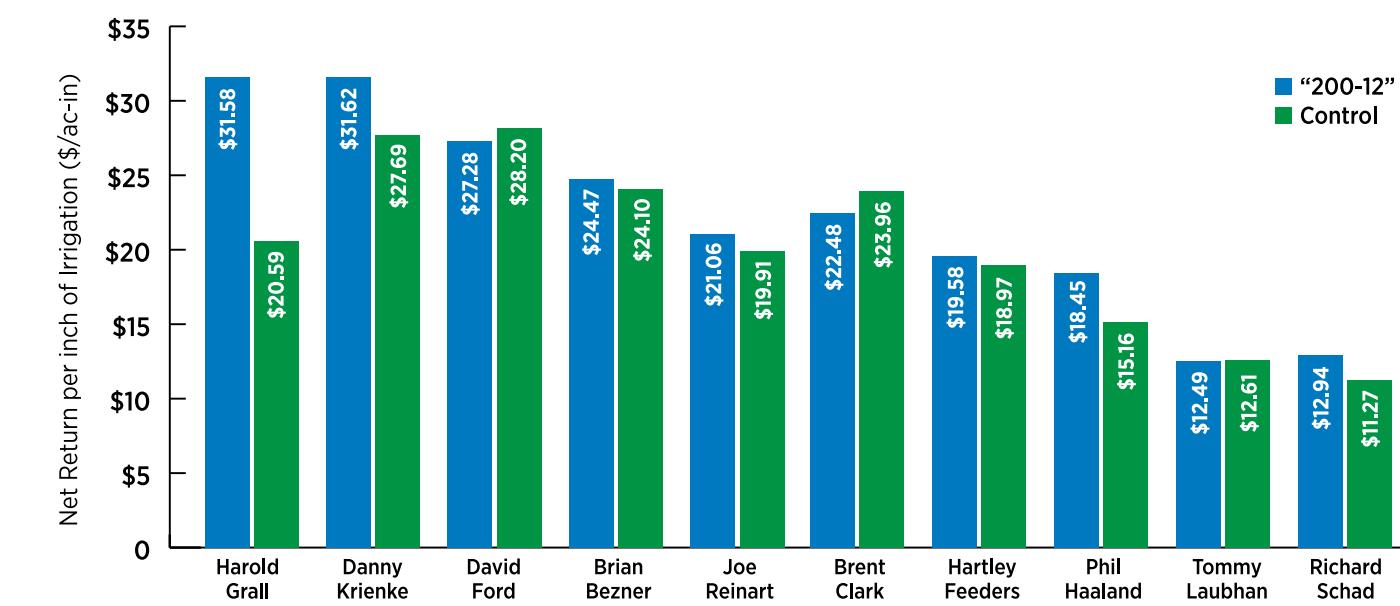
In the final year of the "200-12 Reduced Irrigation on Corn Demonstration Project," ("200-12") the 2014 growing season once again showed that the daunting goal of producing 200 bushels of corn on a mere 12-inches of irrigation water is well within reach. The "200-12" project is based on 8 inches of rainfall combined with 6 inches of stored soil moisture, and the 12-inches of irrigation, to reach a total water use of 26 inches for the crop.



In 2014, with an irrigation capacity of 3 gallons per minute (gpm) per acre, Harold Grall's Moore County "200-12" field yielded 201 bushels per acre on 12.96 inches of irrigation. While the irrigation was almost an inch over the goal, the field only received 9.19 inches of rain for a total of irrigation and rainfall of 22.15 inches. This field started the season with almost no stored soil moisture, so ultimately the field produced an extra bushel of yield above the goal with almost 3.85 inches less total water than the model. The field produced 15.51 bushels per inch of irrigation water compared to the expected average of 9 bushels when using traditional irrigation methods. In addition, in Ochiltree County, with an irrigation capacity of 5 gpm per acre, Danny Krienke produced 217 bushels per acre with 14.42 inches of irrigation and 7.76 inches of seasonal rainfall. His field produced 15.04 bushels per inch of irrigation. Both growers used soil moisture probes to manage irrigation. Grall's field received hail damage in June, however the crop was still in an early growth stage and was able to recover and maintain the yield.

Six of the ten participating producers applied less than 26 inches of total water to the crop, with four of those producing yields of 192 bushels, or higher. The average total water for all "200-12" fields was 27.68 inches, still more than 4 inches below traditional irrigation methods, with an average yield of 198 bushels. The average irrigation for the "200-12" fields was 17.59 inches compared to 18.36 in the 2013 demonstrations, while the average yield slipped slightly from 200 bushels per acre in 2013 to 198 in 2014. Seven of the "200-12" fields made more profit per inch of irrigation than their "control" fields, with the remaining three fields coming within 7, 3 and 1-percent, respectively, of the "control" field's profit per inch. Table 7 shows a summary of the 2014 "200-12" project. The graph shows the net return per acre inch of applied irrigation for the each cooperator's "200-12" and "control" fields. The final report for the "200-12" project is available on the district website at [www.northplainsgcd.org](http://www.northplainsgcd.org).

**Net Return Per Inch of Irrigation for Each "200-12" and "Control" Field (Table 7)**



## What We Learned

- Low Energy Precision Application equipped center pivots get more available water to the crop
- Pivots speeds reduced to 6-8 day revolutions
- Planting tended to be later, mostly in May and June
- Mostly drought tolerant hybrids were planted
- Crop residue is essential
- Growers must manage for production per inch of water
- More knowledge of pre-season and seasonal soil moisture levels is needed
- It is easy to over water, especially with 4 and 5 GPM capacity

By reducing current irrigation volumes by as little as three inches over the one million acres of irrigated cropland within the district, it is possible to save up to 250,000 acre-feet of groundwater per year and prolong the viability of irrigated agriculture in the area. Natural Resources Conservation Service, Conservation Innovation Grants and Texas Water Development Board, Agricultural Conservation Grants partially funded the 2014 NPGCD “200-12 Reduced Irrigation on Corn Demonstration Project.”



## The Next Level

With the end of the “200-12” project in sight, the board and staff began to make preparations for taking the next step and applying the lessons learned to a new demonstration. The next generation of the “200-12” project is called the “3-4-5 Grain Production Maximization” project (“3-4-5”). Participants in the “3-4-5” project will apply variable rate irrigation to simulate 3, 4, and 5 gallon per minute conditions in side-by-side, production-scale demonstrations. The “3-4-5” participants will apply the techniques and technologies used in the “200-12,” and demonstrate their applications under the different levels of available irrigation. Grant support from the Texas Water Development Board will assist in the “3-4-5” project into 2018.

The report of the 2014 “200-12” project was presented to the board of directors at the February 2014 board meeting.

## The EPIC Project Concludes

*Efficient Profitable Irrigation in Corn (EPIC)* is a results demonstration effort conducted by the Texas A&M AgriLife Extension Service and funded primarily by the North Plains Groundwater Conservation District. The EPIC project began in 2011 founded on the principle of managing irrigation water for maximized profitability as a means for making optimal economic and agronomic use of the water resource (Table 8).

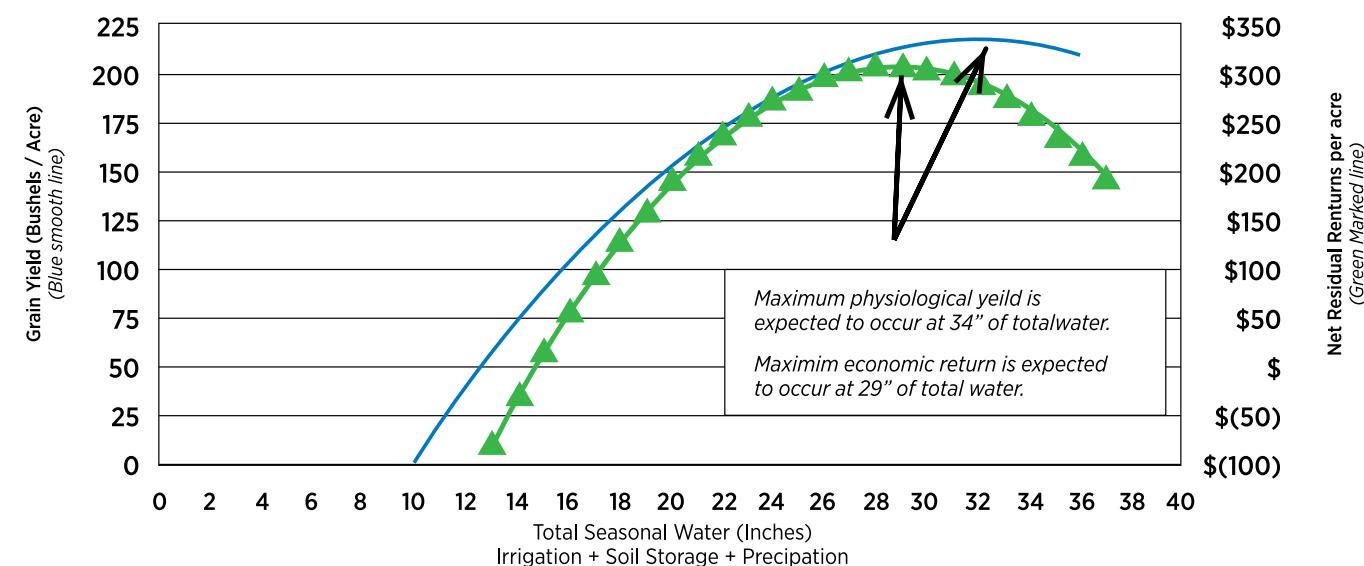


Table 8: Texas North Plains Grain Corn Production Function (smooth blue line) and Net Per-Acre Grain Corn Residual Returns per unit of total Seasonal Water (marked green line). The production function was developed based on Texas North Plains field and research data including localized AgriPartners Data.

EPIC targets grain corn producers who historically employ efficient irrigation systems and solid agricultural practices in a production strategy focusing on maximized yields (revenue). EPIC is designed to be a multi-year, staged project to help high-yield grain corn producers maximize their on-farm production potential and reduce applied irrigation water. Potential regional water savings under partial adoption of this practice is estimated to exceed 37,500 acre-feet or 12 billion gallons annually.

## Project Methodology

EPIC's in-field, scientific approach utilized two side-by-side field plots (separate fields or split fields), maintaining one plot as a control and the other plot as the experimental plot where irrigation is managed to meet two objectives; 1) maintain or improve yield as compared to the control and 2) reduce pumped irrigation water by one to four inches. In 2014, five irrigated corn producers in the Texas North Plains cooperated in the EPIC project, contributing field-scale control and experimental plots, all farm operations, and all production costs with no monetary compensation from EPIC. The EPIC project provided pivot monitoring (where applicable) and soil probes and a crop modeling. The control plot was titled the “Legacy” plot and was managed according to the specific producer’s standard practice and the “EPIC” plot was managed with Texas AgriLife inputs based on best management practices and information from the management tools.

## Ochiltree County

In 2014 the EPIC side of the field utilized 1.89 inches less of applied irrigation than the Legacy side. Yield average for the EPIC was 1.28 bushels more per acre.

### **Moore County**

The EPIC field had a significantly higher yield with slightly more irrigation, but there were several factors that led to the better performance. The Legacy field, while receiving two inches more precipitation, had considerable hail damage that was a factor in the reduced yield. The EPIC fields total in season precipitation was 6.32 inches, which is well below average annual rainfall for both fields.

### **Hutchinson County**

Hutchinson County was one of five counties who participated in the North Plains EPIC Project which proved using technology to monitor corn water use could reduce total irrigated inches applied and maintain or increase yield.

### **Lipscomb County**

The project had to be abandoned due to herbicide drift which killed fifty percent (50%) of the field while the remaining fifty percent (50%) was damaged.

### **Hartley County Spray vs. Bubbler**

Irrigation applied was roughly the same for both the plot using bubble mode and the plot using spray mode. The gypsum blocks were placed in Dumas loam soil, which was the predominate soil type for the fields. Soil moisture difference was only significant in the upper foot of the soil profile as timely rains and adequate irrigation allowed the lower zones to remain saturated through the season. Looking at the June-July gypsum block readings, the bubble mode had a 3" soil moisture advantage in that time period over the spray mode.

The results of the 2014 EPIC Project were presented during the April 14, 2015 meeting of the board of directors. The 2014 EPIC Report is available on the district website at [www.northplainsgcd.org](http://www.northplainsgcd.org).

### **G.1b. Management Objective:**

Conduct conservation education activities to encourage water conservation (prevention of waste) and create informed and educated citizens who will be dedicated stewards of their resources.

### **G.1b. Performance Standards:**

Annually the district will disseminate groundwater conservation and waste prevention information through a variety of media, activities and events. Activities will target agricultural, residential and young stakeholders. A summary of educational activities will be presented to the board of directors each year.

## **Conservation Outreach Activities**

### **Annual Water Festivals**

The annual water festivals are a full day of water conservation and natural resource educational activities for the district's fourth grade students. Over 800 students visit multiple hands-on activity stations during the three festivals where they learn about topics including, the Ogallala aquifer,

watershed protection, the history of water in the region and much more. In 2014, the events were held May 7th in Dalhart, May 8th in Dumas and May 9th in Perryton. 867 students attended the events. For the second year in 2014, the festivals featured a finale presentation from Kevin Barnes, the Green Magician. Barnes has presented his Green Earth Magic Show to young people all over the country, including 17 years at the Orange County Children's Water Education Festival in Irvine, CA, the largest children's water festival in the country.



### **In-Class Groundwater Conservation Presentations**

District personnel provided in-class groundwater conservation education for fourth grade classes in Moore County reaching more than 320 students. In addition, staff presented soil labs to 65 fourth and fifth grade students in Booker, bringing the total of students participating in on-site educational programs to 385 across the district. The district provides in-class presentations by request on a first come, first served basis to any classes in the district, grades K-12.



### **Groundwater Conservation Presentations**

The District provides presentations to community and civic organizations and stakeholders within the District, and to industry groups locally, state-wide and beyond. Presentations in 2014 included:

January 13	Leon New/Steve Walthour, Pioneer Crop Production Clinic - Dalhart
January 14	Leon New/Steve Walthour, Pioneer Crop Production Clinic - Dumas
January 15	Leon New/Steve Walthour, Pioneer Crop Production Clinic - Stratford
January 16	Leon New/Steve Walthour, Pioneer Crop Production Clinic - Spearman
January 28	Danny Krienke, Colorado Farm Show - Greely, CO
February 12	Danny Krienke, Texas Panhandle-High Plains Water Conservation Symposium, Amarillo
March 19	Steve Walthour, Desired Future Conditions Stakeholders Meeting - Dalhart
March 25	Steve Walthour, Desired Future Conditions Stakeholders Meeting - Perryton
March 26	Steve Walthour, Desired Future Conditions Stakeholders Meeting - Dumas
April 1	Steve Walthour/Bob Zimmer, Rules Stakeholders Meeting - Dalhart
April 8	Steve Walthour/Bob Zimmer, Rules Stakeholders Meeting - Dumas
April 9	Steve Walthour/Bob Zimmer, Rules Stakeholders Meeting - Spearman
April 15	Steve Walthour/Bob Zimmer, Rules Stakeholders Meeting - Perryton
May 7	4th Grade Water Festival - Dalhart
May 8	4th Grade Water Festival - Dumas
May 9	4th Grade Water Festival - Perryton
May 12	Kirk Welch, Moore County Water Wise Living Conference - Dumas
August 19	Hutchinson County Irrigation Field Day, Morse (NPGCD/AgriLife Ext.)
August 26	Steve Walthour, TAGD Summit - San Marcos
September 8	Leon New/Steve Walthour, North Plains Irrigation Field Day - Stratford
September 10	Leon New/Steve Walthour, North Plains Irrigation Field Day - Perryton
September 11	Leon New/Steve Walthour, North Plains Irrigation Field Day - Etter
October 21	Steve Walthour, Global Water for Food Conference, Seattle, WA
November 13	Moore County Farm Bureau Ag Day - Dumas
December 2-4	Amarillo Farm and Ranch Show



### **North Plains Water News**

The North Plains Water News (NPWN) was published four times in 2014. The NPWN is a four-page newsletter that features articles highlighting the district's regulatory, scientific and education outreach activities, as well as other relevant news relating to water. In addition to mailing the print version to over 1400 recipients, the newsletter is also available on the district website at [www.northplainsgcd.org](http://www.northplainsgcd.org). In 2014, the district began distributing the newsletter via email to approximately 500 subscribers.

## Conservation News Releases

The district employs a consistent media relations and public relations campaign featuring news releases highlighting the activity of the board of directors and updates on the district's conservation outreach programs. The district also responds to media requests for information and assists television, radio, print and online news agencies in the coordination of coverage that will extend the conservation message.



## Rainwater Harvesting

The district co-hosted the Water Wise Living Conference in Dumas on Monday, May 12th at the Moore County Community Building along with Texas A&M AgriLife Extension and the Moore County Extension Leadership Advisory Board. The program featured residential water conservation presentations on topics ranging from rainwater harvesting to water smart turf care.

Chad Dietz, Rainwater Harvesting Engineer at Parkhill, Smith and Cooper, presented residential rainwater harvesting strategies for attendees. The district also has rainwater harvesting information available upon request at the district offices.

## Xeriscaping Class

As a part of the Water Wise Living Conference, former Master Gardner and author of the website [highplainsgardner.com](http://highplainsgardner.com), Angie Hanna, explained the system of xeriscape gardening and highlighted numerous low water use and native plants that are well adapted to the Panhandle climate.



## Major Rivers Curriculum

The Major Rivers Curriculum was made available by request to any class within the district.

## Fifth Grade WaterWise Education Curriculum

The WaterWise Conservation Education Program was made available to all fifth graders in the district. 814 fifth grade students and their teachers participated in the program. Through an in-class, teacher-led conservation curriculum and a take-home kit filled with conservation tools, students and their families are learning and saving water.



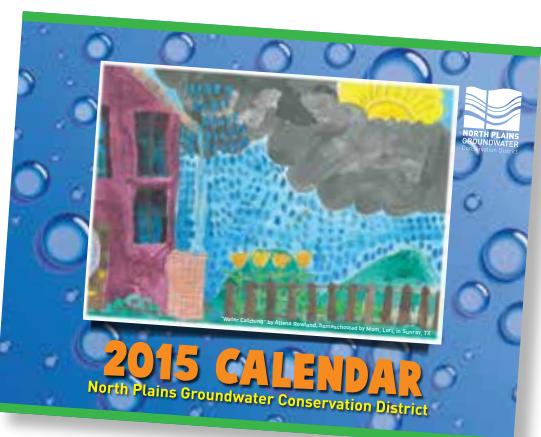
## TOTAL PROJECTED PROGRAM SAVINGS:

Annual	Lifetime
4,789,549	32,373,616 gallons of water
14,417	102,600 therms of gas
231,618	1,654,984 kWh of electricity

## Water Conservation Calendar Art Contest

The district sponsored the annual Water Conservation Calendar Art Contest in 2014. The contest was open to fourth, fifth and sixth grade students throughout the district. Students submitted their entries to the district

office where staff selected 12 winners and one grand prize winner. All winners were featured in the 2015 Water Conservation Calendar. The grand prize winner received a \$50 gift card and the entry was displayed on the cover of the calendar. The other winners received \$25 gift cards. The district produced 400 calendars and distributed them to the winners, other individuals by request, and through the district office and city offices throughout the district.



### **Groundwater Presentation at Farm Bureau Ag Fairs**

Approximately 350 students participated in the “Edible Aquifer” activity presented in cooperation with the Moore County Farm Bureau. The “Edible Aquifer” teaches the students about aquifers through the unique experience of constructing an aquifer out of all edible materials. Crushed ice is used to represent the mineral layers of the aquifer, lemon-lime soda takes the place of the water, ice cream is substituted for the confining layer of clay and finally chocolate milk mix tops off the structure as top soil. Once the straw, which represents the well casing, is lowered into the formation, it’s time to activate the pump and drink it down, dirt and all. The students are left with a satisfied sweet tooth and a memory that makes it easy to remember where their water comes from!

### **G.2. Recharge Enhancement**

The district has limited surface water resources to enhance recharge through diversion or infiltration of surface water. The district explored recharge enhancement through its precipitation enhancement program. The district discontinued its funding for the precipitation enhancement program in 2006. The district could not quantify if, and to what extent, the program positively affected precipitation and subsequent recharge. Therefore, recharge enhancement through surface water diversion or infiltration, or through precipitation enhancement could not be proven to be effective. The district has determined that this objective is not applicable at this time.

### **G.3. Rainwater Harvesting**

#### **G.3. Management Objective:**

Provide public information regarding rainwater harvesting.

#### **G.3. Performance Standards:**

The district’s activities in rainwater harvesting education will be summarized annually and presented to the board of directors.

The rainwater harvesting education and outreach activities conducted by the district are described in detail under the Performance Standards for Item G.1b.

### **G.4. Precipitation Enhancement**

The district has determined that this objective is not applicable at this time.

### **G.5. Brush Control**

#### **G.5. Management Objective:**

Provide public information regarding brush control

#### **G.5. Performance Standards:**

Maintain brush control literature in the district offices. The district’s activities in addressing brush control education will be summarized annually and presented to the Board of Directors.

Brush control information is available in the district offices at 603 E. 1st Street, Dumas, TX.

## **Desired Future Conditions (DFC) of the Groundwater Resources (31TACs356.5(A)(1)(H))**

### **H.1. Management Objective:**

Revise District Rules to achieve Desired Future Conditions (DFC) of the Ogallala, Rita Blanca and Dockum aquifers.

### **H.1. Performance Standards:**

The district will update its rules within one year of adoption of the management plan. Annually the district will review its rules and conservation programs to determine if they are achieving the DFCs.

The new District Management Plan was adopted by the board of directors in May of 2013 and approved by the Texas Water Development Board (TWDB) in July of 2013. The acceptance by the TWDB began the 1-year window for adoption of rules to achieve the DFCs. In July of 2014 the district passed new rules designed to make adjustments in the Annual Allowable Production, if necessary to meet the DFCs.

### **H.2. Management Objective:**

Monitor the condition of the aquifers and status of groundwater production compared to the adopted DFCs.

### **H.2. Performance Standards:**

Annually review groundwater production information, Groundwater Availability Models, and water level measurements to characterize aquifer conditions compared to the DFCs and report findings to the board of directors.

General Manager, Steve Walthour, compiled the following information showing the status of the aquifer in relation to Modeled Available Groundwater (MAG) based on the district’s DFCs.

**District Production Trend Compared to Ogallala Modeled Available Groundwater (Table 9)**

County	Average Annual Production 2010-2014 (Acre-Feet)	MAG Average 2010-2014 (Acre-Feet)	Annual Average MAG Above or Below Production	MAG Percent Above or Below Production
Dallam	368,431	398,214	29,783	7%
Hansford	199,446	280,125	80,679	29%
Hartley	456,188	417,103	-39,085	-9%
Hutchinson	66,342	60,721	-5,620	-9%
Lipscomb	46,542	289,167	242,625	84%
Moore	224,582	197,027	-27,556	-14%
Ochiltree	98,086	264,865	166,779	63%
Sherman	344,981	318,919	-26,062	-8%
<b>Total</b>	<b>1,804,599</b>	<b>2,226,142</b>	<b>421,543</b>	<b>19%</b>

**2010-2014 Average Groundwater Production Compared to the Current Estimated MAG (Modeled Available Groundwater) from the District's West Management Area. (Table 10)**

West - Production Average				
County	Average Annual Production 2010-2014 (Acre-Feet)	MAG Average 2010-2014 (Acre-Feet)	Annual Average DFC Available Reserve	MAG Percent Above or Below Production
Dallam	368,431	398,214	29,783	7%
Hartley	456,188	417,103	-39,085	-9%
Moore	224,582	197,027	-27,556	-14%
Sherman	344,981	318,919	-26,062	-8%
Total	<b>1,394,183</b>	<b>1,331,390</b>	<b>-62,793</b>	<b>-5%</b>

**2010-2014 average Groundwater Production Compared to the Current Estimated MAG (Modeled Available Groundwater) from the District's East Management Area. (Table 11)**

East - Production Average				
County	Average Annual Production 2010-2014 (Acre-Feet)	MAG Average 2010-2014 (Acre-Feet)	Annual Average DFC Available Reserve	MAG Percent Above or Below Production
Hansford	199,446	280,125	80,679	20%
Hutchinson	66,342	60,721	-5,620	-9%
Lipscomb	46,542	289,167	242,625	84%
Ochiltree	98,086	264,865	166,779	63%
Total	<b>410,416</b>	<b>894,878</b>	<b>484,463</b>	<b>54%</b>

**H.3. Management Objective:**

Joint plan with other Groundwater Conservation Districts to achieve DFC's.

**H.3. Performance Standards:**

At least annually report the joint planning committee activities to the board of directors.

**February 21, 2014** – Bob Zimmer, GMA-1 Board Member and North Plains GCD Board President, attended the GMA 1 meeting as did Board Secretary, Danny Krienke; Director, Gene Born and General Manager, Steve Walthour. Additional district attendees included, Keith Good and Dale Hallmark.

**April 11, 2014** – Bob Zimmer, GMA-1 Board Member and North Plains GCD Board President, attended the GMA-1 meeting as did North Plains GCD Board Secretary, Danny Krienke; Director, Gene Born and General Manager, Steve Walthour. Additional district attendees included, Paul Sibley and Dale Hallmark.

**May 30, 2014** – Bob Zimmer, GMA-1 Board Member and North Plains GCD Board President, attended the GMA-1 meeting as did North Plains GCD Board Secretary, Danny Krienke; Director, Gene Born and General Manager, Steve Walthour. Additional district attendees included, Keith Good, Haley Rader and Dale Hallmark.

**August 18, 2014** – Bob Zimmer, GMA-1 Board Member and North Plains GCD Board President, attended the GMA-1 meeting as did North Plains GCD Board Secretary, Danny Krienke; Director, Gene Born and General Manager, Steve Walthour. Additional district attendees included, Keith Good, Haley Rader and Dale Hallmark.

The report for the joint planning committee was presented to the board of directors at multiple board meetings including the November 18, 2014 meeting as reflected in the district's official minutes.

North Plains Groundwater Conservation District joint planned with the three other GMA-1 member districts in 2014. The groundwater management area planning process included four public meetings held at the Panhandle Regional Planning Commission, 415 SW 8th Avenue in Amarillo. Board President Bob Zimmer presided over the committee. Board Secretary Danny Krienke served as its representative to the Panhandle Regional Water Planning Group. Throughout the five meetings the representatives of the member districts retained the Panhandle Regional Planning Commission for administrative services including: preparation of meetings, assistance in development of agenda packets, fulfilling secretary of state requirements with regards to Texas Open Meetings Act, and maintaining Texas Public Records. North Plains GCD offered to assist in the planning process by providing technical services and coordinating the groundwater availability modeling of proposed DFC's, as needed. The member districts considered various presentations and information to address Texas Water Code Chapter 35 and Chapter 36 requirements.

**H.4. Management Objective:**

Manage groundwater withdrawal amounts based on an allowable production limitation in order to achieve DFC's.

**H.4. Performance Standards:**

Annually the District will summarize the previous year's allowable production compliance. Each year the compliance results will be presented to the board of directors.

**Compliance Statistics for 2014 (Table 12)**

In Compliance	Overproduced Properties	Administratively Resolved	Fine Paid/Meters Installed
2829	55	43	12

**Other Management Goals Included In the Plan by the District**

No other management goals are listed at this time.

**DISTRICT FINANCIALS**

For the fiscal year ending September 30, 2014, the district's net financial position decreased by \$0.036 million, or nearly 0.96%, as a result of 2014 district operations. During the year, the district had expenditures that were \$0.36 million more than the \$2.812 million generated in tax and other revenues for district programs. The total cost of all of the district's programs and activities was \$2.85 million. However, our taxpayers ultimately paid only \$2.26 million because some of the costs were paid by those who directly benefited from the programs (\$0.28 million), or by grants the district acquired at the direction of the board (\$0.31 million) that subsidized certain conservation programs.

The general fund ended the year with a fund balance of \$1.70 million, which is down from the previous year's balance of \$1.89 million.

At the end of the fiscal year the district had \$2.05 million invested in a broad range of capital assets including facilities and equipment for water conservation. The amount represents a net increase of just over \$0.23 million or 12.94% more than last year.

The district's elected and appointed officials considered many factors when setting the fiscal year 2015 budget tax rates. Some of those factors were grant aid from the state and water conservation issues. The district's board set a tax rate for the following fiscal year to collect no more taxes than were collected during the 2014 fiscal year.

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## BOARD OF DIRECTORS



**Gene Born,**  
*Director*  
Lipscomb County



**Brian Bezner,**  
*Director*  
Dallam County  
January - May 2014



**Bob Zimmer,**  
*President*  
Hansford / Hutchinson  
County



**Justin Crownover,**  
*Director*  
Sherman County



**Danny Krienke,**  
*Secretary*  
Ochiltree County



**Phil Haaland,**  
*Director*  
Hartley County  
January - May 2014



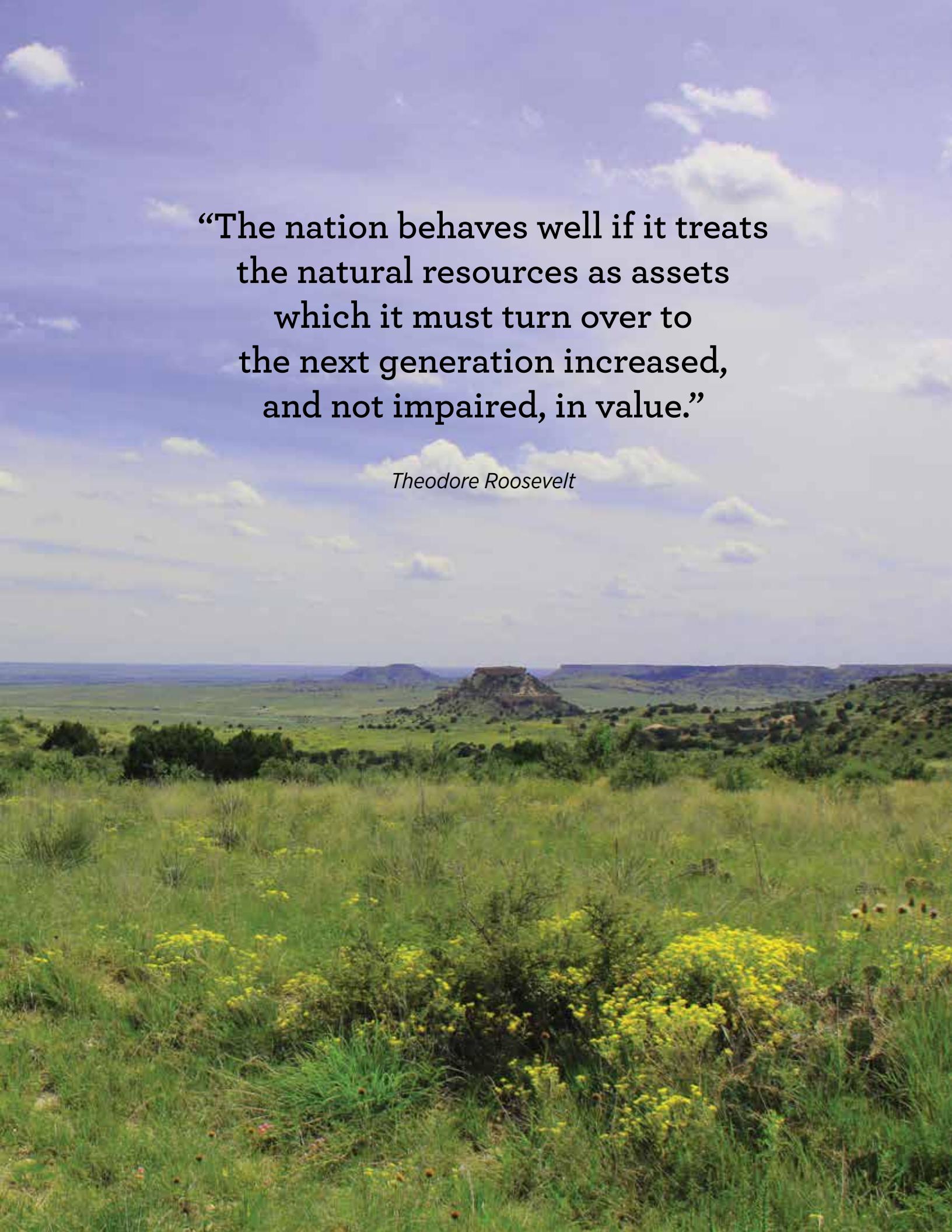
**Harold Grall,**  
*Vice-President*  
Moore County



**Zac Yoder,**  
*Director*  
Dallam County  
May 2014 - To Present



**Mark Howard,**  
*Director*  
Hartley County  
May 2014 - To Present



**“The nation behaves well if it treats the natural resources as assets which it must turn over to the next generation increased, and not impaired, in value.”**

*Theodore Roosevelt*



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