



2021 Annual Report of Integrated Water Management Activities in the Republican Basin Within Tri-Basin NRD



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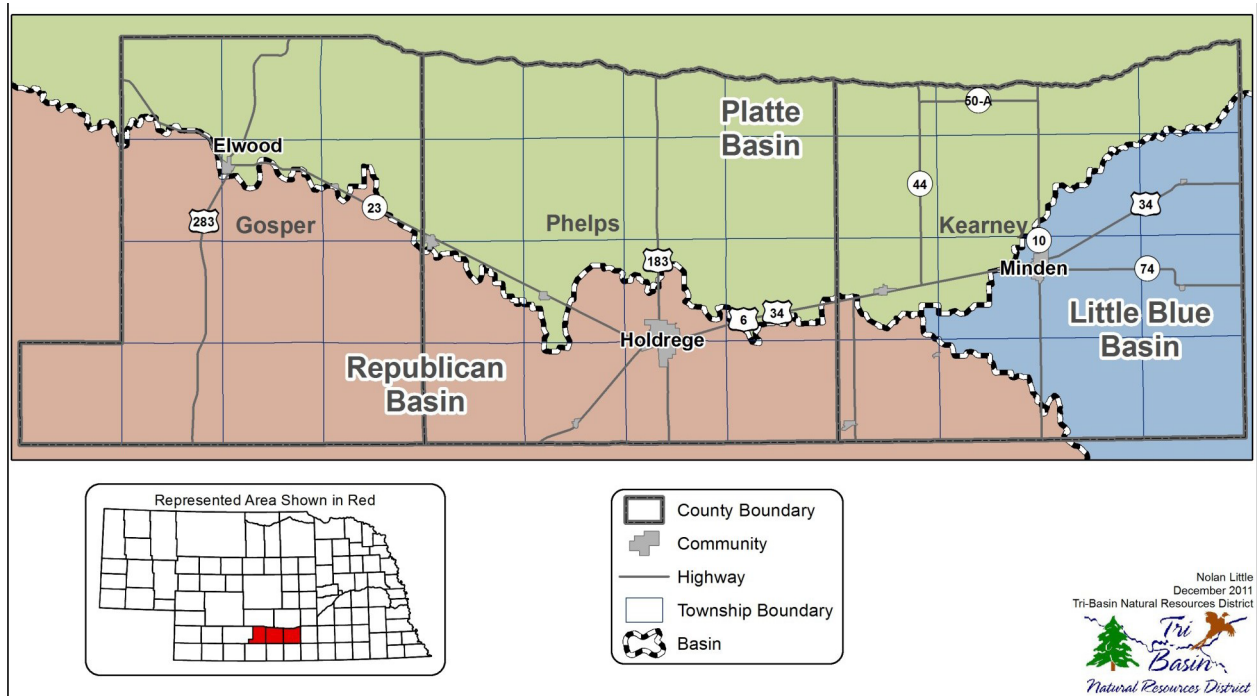
October 2022

**ANNUAL REPORT OF WATER USE ACTIVITIES
IN THE REPUBLICAN BASIN WITHIN TRI-BASIN NRD**
TO MEET THE REQUIREMENTS OF THE JOINT INTEGRATED MANAGEMENT PLAN
FOR THE 2021 JOINT INTEGRATED MANAGEMENT PLAN PROGRESS REVIEW MEETING

I. SUMMARY

The purpose of this report is to convey information that Tri-Basin Natural Resources District (TBNRD) agreed to supply to the State of Nebraska as part of a joint Integrated Water Resources Management Plan for the Republican River Basin portion of the district.

Map 1: Basin Reference Map



II. INTRODUCTION

TBNRD encompasses portions of the Republican, Platte, and Little Blue River Basins (see **Map 1**, above). The district also contains an area commonly referred to as the “Groundwater Mound,” a large area spanning portions of all three basins that is characterized by groundwater levels that are generally higher than historic “pre-development” groundwater elevations.

More than 100,000 acres of cropland within the Platte Basin portion of TBNRD are irrigated with water diverted from the Platte River and distributed through the canals of the Central Nebraska Public Power and Irrigation District (CNPPID). Surface irrigation water and the canals that distribute it enhance recharge of groundwater supplies within the district. In addition to helping sustain groundwater supplies, this incidental recharge has increased streamflows in Platte and Republican tributaries.

III. CERTIFIED IRRIGATED ACRES

The district began certifying irrigated acres in the Republican Basin in 2004. Development of additional certified irrigated acres in the Republican Basin was prohibited as of September 15, 2004. Since that time, corrections and revisions to the certified acre database have occurred with a net result of 189,756.65 certified irrigated acres in the Republican Basin portion of Tri-Basin NRD as of December 31, 2021. Data regarding certified irrigated acres can be found in **TABLE 1: Certified Irrigated Acres**, below. The commingled acres referred to in the table are acres that may be watered with either groundwater or surface water, or a combination of both. Detailed information about locations and distribution of certified irrigated acres is available in the Tri-Basin NRD office.

TABLE 1: Certified Irrigated Acres					
County	Year	Groundwater	Commingled Acres	Surface Water	Totals
Gosper	2012	56,489.90	1,057.16	173.00	57,720.06
	2013	56,501.89	1,013.68	216.48	57,732.05
	2014	56,494.37	1,013.68	123.48	57,631.53
	2015	56,671.20	1,013.68	123.48	57,808.36
	2016	56,707.83	1,013.68	88.48	57,809.99
	2017	56,590.81	1,017.11	87.98	57,695.90
	2018	56,605.10	1,017.11	87.98	57,710.19
	2019	56,604.94	1,017.11	87.98	57,710.03
	2020	56,531.46	888.89	87.98	57,508.33
	2021	56,531.46	888.09	87.98	57,507.53
Kearney	2012	40,955.11	427.59		41,382.70
	2013	40,938.11	427.59		41,365.70
	2014	40,937.45	427.59		41,365.04
	2015	40,918.57	427.59		41,346.16
	2016	40,922.16	427.59		41,349.75
	2017	40,938.16	427.59		41,365.75
	2018	40,941.91	427.59		41,369.50
	2019	40,975.52	427.59		41,403.11
	2020	40,975.52	427.59		41,403.11
	2021	40,996.36	427.59		41,423.95
Phelps	2012	85,504.59	4,532.56	236.51	90,273.66
	2013	85,550.50	4,562.40	236.51	90,349.41
	2014	85,926.68	4,562.66	161.23	90,650.57
	2015	86,090.68	4,488.25	235.65	90,814.58
	2016	86,100.60	4,488.25	235.65	90,824.50
	2017	86,098.12	4,488.25	235.65	90,822.02
	2018	86,071.22	4,645.38	74.42	91,180.93
	2019	86,093.19	4,645.38	74.42	90,812.99
	2020	86,227.27	4,521.34	74.70	90,823.31
	2021	86,079.90	4,670.57	74.70	90,825.17
District Totals	2012	182,949.60	6,017.31	409.51	189,376.42
	2013	182,990.50	6,003.67	452.99	189,447.16
	2014	183,358.50	6,003.93	284.71	189,647.14
	2015	183,680.45	5,929.52	359.13	*189,969.10
	2016	183,730.59	5,929.52	324.13	*189,984.24
	2017	183,627.09	5,932.95	323.63	*189,883.67
	2018	183,618.23	6,090.08	162.40	*189,870.71
	2019	183,673.65	6,090.08	162.40	*189,926.13
	2020	183,734.25	5,837.82	162.68	*189,734.75
	2021	183,607.72	5,986.25	162.68	189,756.65

*Total does not include 342.2 Harlan County acres.

IV. APPROVED CERTIFIED ACRE AND GROUNDWATER TRANSFERS

- A. TBNRD allows certified irrigated acres to be transferred from one parcel to another within the Republican Basin portion of the district, with some limitations. Certified irrigated acres cannot be transferred from parcels with surface water or commingled water resources to parcels that have groundwater wells as their only water source. The NRD also prorates certified acre transfers in which acres are transferred from low to high streamflow depletion zones. Between January 1, 2021, and December 31, 2021, the district approved eight certified irrigated acre transfer in the Republican Basin. A total of 196.28 certified irrigated acres were involved in these transfers. Data regarding the location, amount, and conditions associated with each transfer can be found in **TABLE 2A: Republican Basin Transfers-Acres Original Locations** (below) and **TABLE 2B: Republican Basin Transfers-Destinations for Transferred Acres** (below).

Table 2A: Republican Basin Transfers - Mitigation (From Source)		
NRD Permit Number	Legal Location	Decertified Acres
TBAT-0363	Section 19-6- 23	20.04
TBAT-0364	Section 19-6- 23	30
TBAT-0365	Section 18-5- 17	18.86
TBAT-0370	Section 32-6- 20	25
TBAT-0379	Section 11-6- 22	20.83
TBAT-0380	Section 11-6- 22	56.69
TBAT-0381	Section 2-6-22	20.24
TBAT-0383	Section 27-6- 19	4.62

Table 2B: Republican Basin Transfers - Destination (To Location)		
NRD Permit Number	Legal Location	New Irrigated Acres
TBAT-0363	Section 18-6- 23	20.04
TBAT-0364	Section 18-6- 23	30
TBAT-0365	Section 24-5- 18	18.86
TBAT-0370	Section 22-6- 21	12.17
TBAT-0379	Section 11-6- 22	20.83
TBAT-0380	Section 2-6- 22	56.69
TBAT-0381	Section 2-6- 22	20.24
TBAT-0383	Section 7-5- 19	4.62

- B. TBNRD regulates groundwater pumping off of overlying land by requiring landowners to secure groundwater transfer permits before they can pump groundwater to parcels that are not under the same ownership. Groundwater transfer permits can only be used to supply groundwater for irrigation of certified irrigated acres. Landowners are required to install flowmeters on wells that are permitted for transfers and to report pumping from these wells annually to TBNRD. TBNRD issued three groundwater transfer permits involving 95 acres in the Republican Basin between January 1, 2021, and December 31, 2021. See **TABLE 3: Groundwater Transfers**, below.

TABLE 3: Groundwater Transfers				
NRD Permit Number	Legal Location	Neighboring Certified Acres to be watered with well	Well Registration	Well ID
GWT-0348	Section 24-6- 20	8	G-052804-R1	20846 4
GWT-0351	Section 16-5-19	80	G-169903	22710 3
GWT-0352	Section 11-5- 18	7	G-022539	28916

V. WELL CONSTRUCTION PERMITS

- A. Since 1989, TBNRD has required landowners to secure well construction permits before they drill wells capable of pumping more than 50 gallons per minute. The district issues three categories of well permits: New well permits, Conditional Replacement well permits, and Replacement well permits.

TBNRD requires landowners to agree to several conditions on the operation of new wells and conditional replacement wells before permits are issued. These conditions are listed in an agreement that is signed by landowners when they apply for these types of well permits. A copy of that agreement is attached to this report as **Appendix A**.

Table 4: TBNRD Well Permits	
Permit Type	Number
New (variance) irrigation	0
Replacement irrigation	8
Conditional replacement irrigation - supplemental to groundwater	1
Conditional replacement irrigation - supplemental to surface water	0
Dewatering	0
New Commercial/industrial (Acre transfer involved)	0
Domestic (over 50 gallons per minute)	0

- B. **TABLE 4: TBNRD Well Permits** (above) is a breakdown of well permits TBNRD issued in the Republican Basin between January 1, 2021, and December 31, 2021. A detailed listing of well permits issued by TBNRD in 2021 is found in **TABLE 5: Well Permit Summary** (below).

Table 5: Well Permit Summary				
NRD Permit Number	Well Permit Type	Legal Description	DNR Well Registration Number	DNR Well ID Number
TBRP-005391-R1	Replacement	NW 1/4 Section 35-6- 17	G-005391	264328
TBSG-1532	Supplemental Ground	SE 1/4 Section 28-5- 22	G-192669	266551
TBRP-G048442-R1	Replacement	SW 1/4 Section 22-5- 18	G-048442	264938
TBRP-G030938-R1	Replacement	NE 1/4 Section 19-5- 15	G-030938	266039
TBRP-G031948-R1	Replacement	SW 1/4 Section 36-6- 22	G-031948	265633
TBRP-G049679-R1	Replacement	SW 1/4 Section 26-5- 18	G-049679	265867
TBRP-G059007-R1	Replacement	SE 1/4 Section 21-5- 19	G-059007	266860
TBRP-G013511-R1	Replacement	NW 1/4 Section 31-5- 16	G-013511	267160
TBRP-G029273-R2	Replacement	NW 1/4 Section 36-5- 17	G-029273	267864

VI. VARIANCES

TBNRD considers variances to district rules regarding certified irrigated acre transfers. There were no variances approved by the board in 2021.

VII. MUNICIPAL AND INDUSTRIAL ACCOUNTING

TBNRD collects water use data annually from all municipalities and industries within the district. Municipal and industrial water use data for communities and industries located in the Republican Basin reported to TBNRD in 2021 are shown in the next two tables. A summary of municipal water use may be found in **TABLE 6: Republican Basin Municipal Water Use Data** (below) and **TABLE 7: Industrial and Commercial Water Use Data** (below).

Table 6: Republican Basin Municipal Water Use Data (in gallons)							
Municipality	2015	2016	2017	2018	2019	2020	2021
Atlanta	21,729,800	18,953,600	14,161,100	10,210,500	9,046,300	17,806,800	18,086,500
Arapahoe	91,449,000	103,916,000	101,311,000	90,286,000	83,598,000	115,461,000	98,284,000
Holdrege	470,600,100	478,038,800	441,265,200	402,611,800	373,071,300	491,922,000	407,154,200
Wilcox	27,343,300	25,688,000	25,049,600	26,343,100	28,349,000	34,895,000	30,091,000
Total	611,122,200	626,596,400	581,786,900	529,451,400	494,064,600	660,084,800	553,615,700

TABLE 7: Republican Basin Industrial and Commercial Water Use Data				
DNR Well Registration Number	DNR Well ID Number	Owner	Legal Description	Gallons Used
G-025572	32122	City of Holdrege	Section 9-5- 18	0
G-096786	109719	City of Holdrege	Section 34-6- 18	1,358,700
G-135221	169721	Geer Utility	Section 27-6- 18	2,147,400
G-135220*	171309	Geer Utility	Section 27-6- 18	0
G-069908	78071	Holdrege County Club	Section 29-6- 18	13,481,300
G-009687	14429	Holdrege County Club	Section 29-6- 18	17,209,600
G-070168	78331	Holdrege Well Service	Section 34-6- 18	427,340
G-070393	78555	NE Game & Parks, Sac-Wilcox WMA	Section 27-5- 17	0
G-184679	250906	Norder Supply Inc	Section 12-6- 23	1,343,000
G-071934	80096	Sargent Irrigation Co Inc	Section 34-6- 18	70,300
G-179201	241336	Tri-Basin NRD	Section 7-6- 21	1,297,418

*Series Well with G-135221

VIII. FLOWMETER DATA

TBNRD requires flowmeters to be installed on all irrigation, commercial, and industrial wells in the Republican Basin portion of the district. Annual water use is reported to TBNRD. In 2021, landowners reported data from 1,569 metered wells in the Republican Basin, which provided irrigation for 176,459.70 certified irrigated acres. All district flowmeter data is reported annually to the Nebraska Department of Natural Resources (NDNR) for Republican River Basin Compact Administration accounting. A summary of Republican Basin water use data is included in this report as **Appendix B**. Detailed Republican Basin flowmeter data is available from the Tri-Basin NRD office.

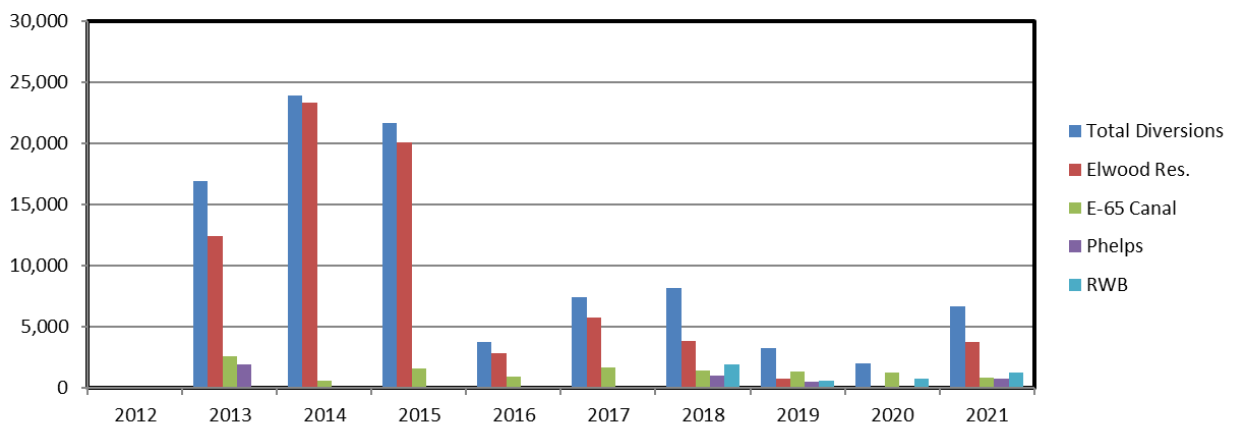
IX. WATER BANKING ACTIVITIES

TBNRD has initiated a new program called the Water Conservation Incentive Program (see program summary in **Appendix D**). Participants in this program sign contracts agreeing to limit irrigation to the UNL Average Corn Crop Irrigation requirement. In exchange, Tri-Basin NRD agrees to pay them if they use less water than their allocated amount. Participants will be provided with credit accounts that track available water use credits for participating fields. A total of 1,579.33 certified irrigated acres in the Republican Basin portion of the district were approved in 2021 for this new program. The TBNRD Board of Directors has committed funds sufficient to pay incentives for as many as 8,000 acres to be enrolled in the program.

X. RETIRED ACRES AND OTHER STREAMFLOW ACCRETION ACTIVITIES

Tri-Basin NRD started utilizing the facilities of Central Nebraska Public Power District (CNPPID) to provide groundwater recharge and to augment streamflows when the district and the NE Game and Parks Commission paid CNPPID to divert 9,551 acre-feet of water from the Platte River into Elwood Reservoir in Gosper County in 2006. Additional diversions (see **Appendix C** and **Graph 1**) have been made regularly over the ensuing 14 years. In all these instances, diversions were made when Platte streamflows exceeded target flows, or when irrigation deliveries were suspended because of heavy rainfall in the CNPPID irrigated area. Diversions into Elwood Reservoir and E-65 Canal provide ground water recharge and “imported water” to augment Republican Basin water supplies.

Graph 1: Platte Excess Flow Diversions by CNPPID for TBNRD and NDNR



Tri-Basin and Lower Republican NRDs commissioned a feasibility study to examine directly diverting excess flows from the Platte via E-65 Canal to Turkey Creek, a Republican tributary in Gosper County. That study concluded that the diversion project is feasible both hydrologically and economically. The partners have purchased a 330-acre parcel of pasture at the upper end of Turkey Creek Canyon. We have also applied for a water right for the project. Construction is anticipated in 2022, assuming that water right is approved this year.

Tri-Basin NRD also constructed a streamflow augmentation well on the east branch of Turkey Creek. This augmentation well is capable of pumping as much as 1,000 acre-feet per year. The well has been tested and is fully functional. It hasn't been used yet for augmentation.

Tri-Basin NRD records indicate that 1,667.37 irrigated acres are enrolled in USDA Conservation Reserve Enhancement Program (CREP) in the Republican Basin portion of the district.

On district water use reports, landowners reported to TBNRD that conservation tillage practices have been adopted or continue to be utilized on 75,980.25 certified irrigated acres in the Republican Basin portion of the district during 2021 (no-till data is available from the Tri-Basin NRD office). University research (Klocke, et al, 2009) indicates that evapotranspiration (ET) is reduced by as much as 3 inches per acre on minimally tilled irrigated cropland, as compared to conventional tillage systems. If the estimates of no-till acres are accurate, as much as 13,074.02 acre-feet of water was conserved in the Republican Basin in TBNRD in 2021 through this conservation practice.

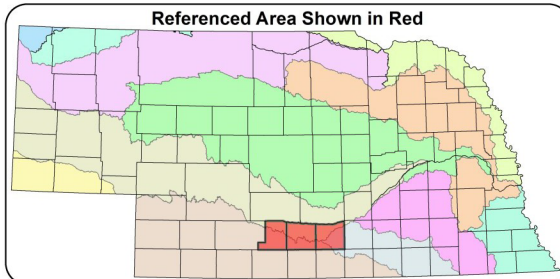
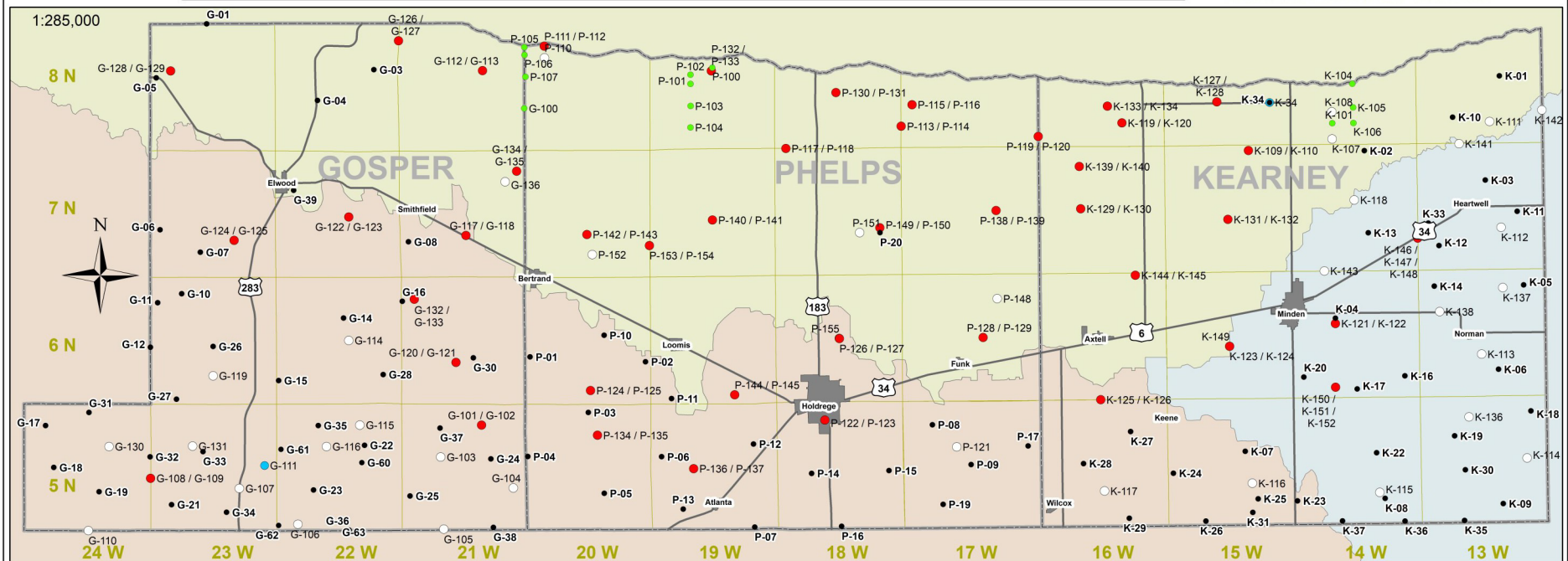
XI. GROUNDWATER LEVELS

TBNRD has an extensive network of 140 dedicated groundwater observation wells (45 in the Republican Basin) and 90 irrigation wells (60 in the Republican Basin) that are used to measure groundwater levels (see **Map 2**). TBNRD also works cooperatively with CNPPID to gather groundwater level data. Data from 10 wells in the Republican Basin that are measured by CNPPID are included in TBNRD's groundwater observation well data base. District water level data is reported semi-annually to U.S. Geological Survey and UNL Conservation and Survey Division. Groundwater level data for the district is available from the Tri-Basin NRD office.

Map 2: Dedicated Groundwater Observation Wells

Tri-Basin Natural Resources District

Static Water Measurement Wells



- Irrigation Well
- Transect Well
- Nested Well
- Single Well
- Other Well
- Community
- Highway
- County Boundary
- Township
- Little Blue Basin
- Republican Basin
- Platte Basin

Observation Well Stats:

- 93 Sites
- 43 Nested Wells
- 137 Data Loggers
- 12 Hour Interval

Irrigation Well Stats:

- 10 Platte Basin
- 21 Little Blue Basin
- 59 Republican Basin
- 90 Measured Wells
- Spring & Fall

Appendix A: Tri-Basin NRD – Republican Basin

Tri-Basin Natural Resources District New Well and Conditional Replacement Well Permit Applicant Certification and Agreement

Applicant Certification and Agreement to be bound by Conditions and Limitations on operation of a Well permitted as a New Well or as a Conditional Replacement Well pursuant to Rule 1.13, Tri-Basin Natural Resources District Rules and Regulations for Management of Land and Water Resources

NRD Permit # _____ Applicant _____

Applicant is the owner of the following- described real estate:

_____ ¼ Section T N - R W _____

Applicant accepts and agrees to be bound by the following conditions and limitations on the operation of a well that is constructed under the authority of a permit issued by the Tri-Basin Natural Resources District (“NRD”). The conditions and limitations are (check the box and initial those that apply):

1. ☐ Applicant agrees to offset any “new depletions” to streamflows of the Platte River, Little Blue River, Republican River, or their tributaries that may be determined to be associated with use of this well. Applicant agrees to use methods to offset those depletions that are deemed acceptable by the NRD and the State of Nebraska. Applicant understands and agrees that Applicant’s failure to offset said new depletions may result in closure of this well or restrictions being imposed by the NRD on the number of acres of land that can be irrigated by this well.
2. ☐ Applicant agrees to abide by well spacing and pumping capacity limitations that apply to the well that is the subject of this permit, whether such limitations arise pursuant to federal or state law or by rule or regulation of the NRD. Applicant understands and agrees that Applicant’s failure to comply with all rules and regulations of the NRD that pertain to this well may result in closure of this well and civil or criminal prosecution and other penalties.
3. ☐ Applicant agrees to comply with all current and future rules and regulations of the NRD that pertain to this well. Applicant understands and agrees that Applicant’s failure to comply with all rules of regulations of the NRD that pertain to this well may result in closure of this well and civil or criminal prosecution and other penalties.
4. ☐ Applicant agrees to maintain any and all surface water rights associated with the land to be irrigated by this well for the lifespan of the permitted well. Applicant understands and agrees that Applicant’s failure to comply with all rules and regulations of the NRD that pertain to this well may result in closure of this well and civil or criminal prosecution and other penalties.
5. ☐ Applicant agrees to irrigate only land that has been certified for irrigation by the NRD (no new irrigated acres will be allowed). Applicant understands and agrees that Applicant’s failure to prevent irrigation of land not certified for irrigation by the NRD may result in closure of this well and prosecution by the State of Nebraska.

Applicant certifies that Applicant is familiar with the information contained in this instrument and that to the best of Applicant’s knowledge and belief, such information is true, complete and accurate. Applicant further acknowledges and agrees that the NRD and/or the State of Nebraska may impose additional conditions, limitations and restrictions on operation of the well that is the subject of this permit. Applicant further acknowledges and agrees that the conditions and limitations agreed to herein shall also be binding upon Applicant’s successors-in-interest to the well and/or the subject real estate.

Appendix A: Tri-Basin NRD – Republican Basin

I certify that I am familiar with the information contained in this application and that to the best of my knowledge and belief such information is true, complete and accurate. I further acknowledge that Tri-Basin Natural Resources District or the State of Nebraska may impose additional conditions, limitations and restrictions on operation of the well that is the subject of this permit.

Date

Signature of Applicant

Date

Signature of Applicant

Date

Signature of Witness

Approval by Tri-Basin Natural Resources District

Date

Signature of Tri-Basin NRD Representative

Appendix B: Tri-Basin NRD – Republican Basin Water Use

	Tri-Basin NRD	Republican Basin	Kearney County		
YEAR	2017	2018	2019	2020	2021
Certified Irrigated Acres	41,370.75	41,369.50	41,403.11	41,403.11	41,423.95
Pivots					
Actual Reported Acres	31,018.14	31,190.1	30,659.10	32,319.00	31,045.70
Gallons Used	5,486,469,797	4,713,924,522	3,331,595,134	9,934,337,498	5,391,603,175
Average acre Inches	6.51	5.6	4.00	11.32	6.40
Gravity					
Actual Reported Acres	2,624.22	2,169.7	1,858.60	2,360.80	2,217.50
Gallons Used	896,621,660	726,021,399	576,820,423	1,413,985,050	641,392,668
Average acre Inches	12.58	12.3	11.40	22.06	10.65
Combination					
Actual Reported Acres	4,977.82	4,968.2	5,075.90	5,171.50	5,038.20
Gallons Used	970,126,131	820,374,310	568,830,323	1,529,432,009	817,566,216
Average acre Inches	7.18	6.1	4.13	10.89	5.98
Drip Tape					
Actual Reported Acres	37.00	37.0	82.00	37.00	37.00
Gallons Used	9,601,700	8,759,500	13,702,512	15,770,700	6,864,200
Average acre Inches	9.56	8.7	6.15	15.70	6.83
Total Irrigation Use					
Actual Reported Acres	38,657.18	38,365.08	37,675.60	39,888.30	38,338.40
Gallons Used	7,362,819,288	6,269,079,731	4,490,948,392	12,893,525,257	6,857,426,259
Average acre Inches	7.01	6.02	4.39	11.90	6.59
Misc [gallons used]					
Wildlife Areas	58,700,000	52,748,000	8,000		
Other Uses		40,459			1,067,967
Total Gallons Used	7,421,519,288	6,321,868,191	4,490,956,392	12,893,525,257	6,858,494,226

Appendix B: Tri-Basin NRD – Republican Basin Water Use

	Tri-Basin NRD	Republican Basin	Phelps County		
YEAR	2017	2018	2019	2020	2021
Certified Irrigated Acres	90,822.02	91,180.93	91,186.60	91,236.21	91,215.08
Pivots					
Actual Reported Acres	55,447.14	55,100.54	56,220.80	56,882.10	55,952.40
Gallons Used	10,910,834,987	6,762,281,160	7,482,177,323	15,603,732,760	9,512,532,893
Average acre Inches	7.25	4.52	4.90	10.10	6.26
Gravity					
Actual Reported Acres	6,145.48	5,529.48	5,184.00	5,960.70	5,526.90
Gallons Used	2,295,801,707	1,765,607,050	1,504,333,084	3,461,445,077	1,586,523,774
Average acre Inches	13.76	11.76	10.69	21.39	10.57
Combination					
Actual Reported Acres	22,411.53	22,387.63	21,745.80	22,997.00	22,214.60
Gallons Used	4,819,237,536	2,958,296,992	3,141,038,609	6,985,259,208	3,918,177,276
Average acre Inches	7.92	4.87	5.32	11.19	6.50
Drip Tape					
Actual Reported Acres	732.40	732.40	856.00	733.40	733.40
Gallons Used	155,429,742	100,822,467	135,178,288	200,010,610	151,954,526
Average acre Inches	7.82	5.07	5.82	10.04	7.63
Total Irrigation Use					
Actual Reported Acres	84,736.55	83,750.05	84,006.60	86,573.20	84,427.30
Gallons Used	18,181,303,972	11,587,007,669	12,262,727,304	26,250,447,655	15,169,188,469
Average acre Inches	7.90	5.10	5.38	11.17	6.62
Misc [gallons used]					
Wildlife Areas	58,903,200	43,286,200	21,822,300	96,073,100	92,973,100
Other Uses			5,000	349,200	
Total Gallons Used	18,240,207,172	11,630,293,869	12,284,554,604	26,346,869,955	15,262,161,569

Appendix B: Tri-Basin NRD – Republican Basin Water Use

	Tri-Basin NRD	Republican Basin	Gosper County		
YEAR	2017	2018	2019	2020	2021
Certified Irrigated Acres	57,689.54	57,710.19	57,710.03	57,495.14	57,507.53
Pivots					
Actual Reported Acres	36,932.09	36,354.3	35,626.34	36,422.80	36,512.90
Gallons Used	7,646,156,083	5,415,780,801	4,561,602,106	9,304,414,461	7,564,153,016
Average acre Inches	7.62	5.5	4.72	9.41	7.63
Gravity					
Actual Reported Acres	3,398.67	3,371.67	3,183.67	3,600.60	3,179.90
Gallons Used	1,485,661,126	900,908,023	712,867,325	1,892,260,153	964,522,659
Average acre Inches	16.10	9.84	8.25	19.35	11.17
Combination					
Actual Reported Acres	14,498.23	14,483.43	13,409.90	14,731.30	13,421.10
Gallons Used	3,437,938,742	2,228,362,381	1,809,296,480	4,508,068,545	2,950,413,821
Average acre Inches	8.73	5.67	4.97	11.27	8.10
Drip Tape					
Actual Reported Acres	538.76	538.76	622.80	623.80	538.80
Gallons Used	131,221,335	92,376,011	95,243,727	171,248,794	95,592,030
Average acre Inches	8.97	6.31	5.63	10.11	6.53
Total Irrigation Use					
Actual Reported Acres	55,367.75	54,748.12	52,842.71	55,378.50	53,652.70
Gallons Used	12,700,977,286	8,637,427,217	7,179,009,638	15,875,991,953	11,574,681,526
Average acre Inches	8.45	5.81	5.00	10.56	7.94
Misc [gallons]					
Wildlife Areas					
Other Uses		201,000			
Total Gallons Used	12,700,977,286	8,637,628,217	7,179,009,638	15,875,991,953	11,574,681,526

Appendix B: Tri-Basin NRD – Republican Basin Water Use

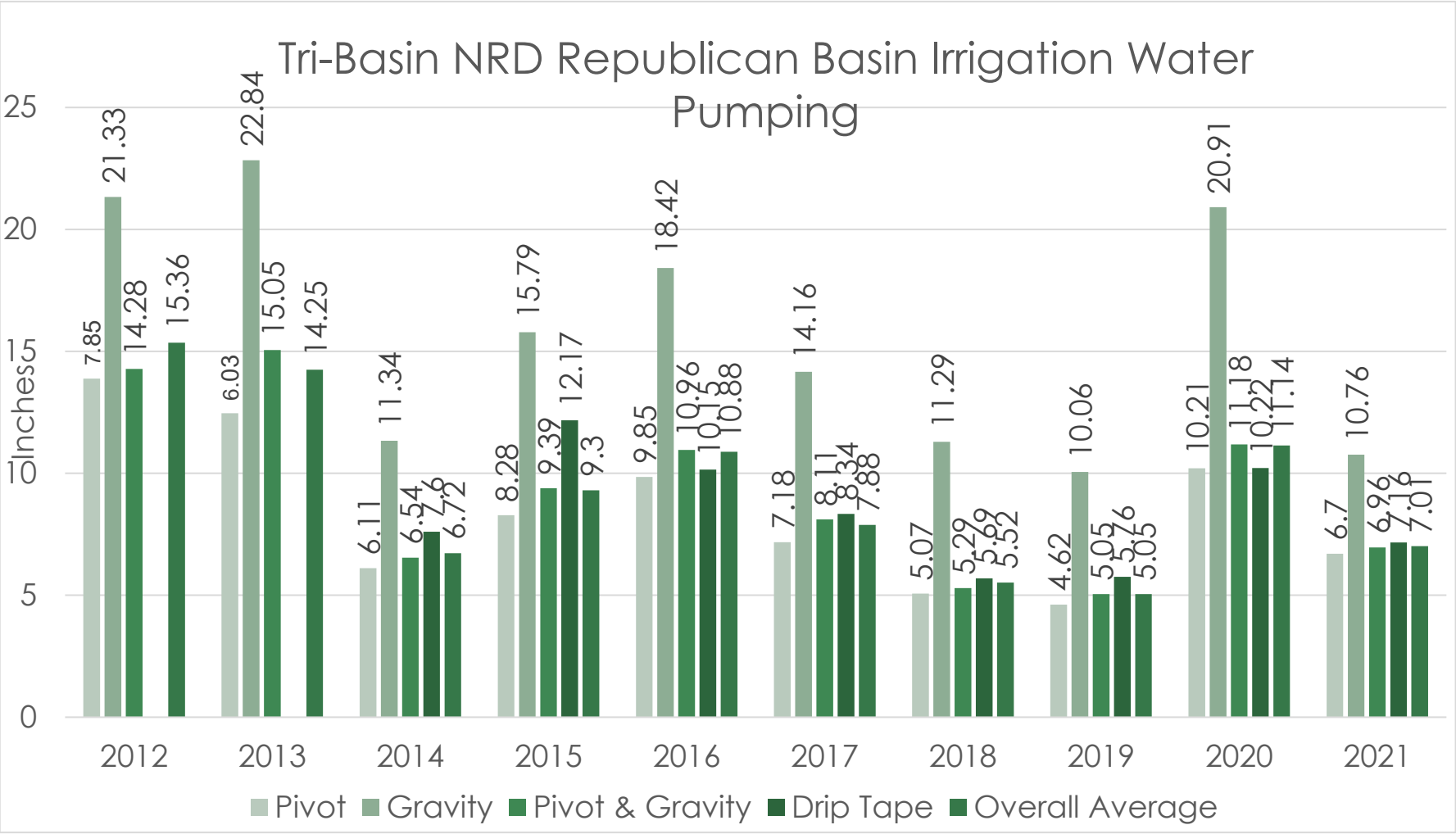
Tri-Basin NRD Total Republican Basin					
YEAR	2017	2018	2019	2020	2021
Certified Irrigated Acres	189,882.31	190,260.62	190,299.74	190,134.46	190,146.56
Pivots					
Actual Reported Acres	123,397.37	122,644.94	122,506.24	125,623.90	123,511.00
Gallons Used	24,043,460,867	16,891,986,484	15,375,374,563	34,842,484,719	22,468,289,084
Average acre Inches	7.18	5.07	4.62	10.21	6.70
Gravity					
Actual Reported Acres	12,168.37	11,070.87	10,226.27	11,922.10	10,924.30
Gallons Used	4,678,084,493	3,392,536,472	2,794,020,832	6,767,690,280	3,192,439,101
Average acre Inches	14.16	11.29	10.06	20.91	10.76
Combination					
Actual Reported Acres	41,887.58	41,839.28	40,231.60	42,899.80	40,673.90
Gallons Used	9,227,302,409	6,007,033,683	5,519,165,412	13,022,759,762	7,686,157,313
Average acre Inches	8.11	5.29	5.05	11.18	6.96
Drip Tape					
Actual Reported Acres	1,308.16	1,308.16	1,560.80	1,394.20	1,309.20
Gallons Used	296,252,777	201,957,978	244,124,527	387,030,104	254,410,756
Average acre Inches	8.34	5.69	5.76	10.22	7.16
Total Volume Pumped					
Actual Reported Acres	178,761.48	176,863.25	174,524.91	181,840.00	176,418.40
Gallons Used	38,245,100,546	26,493,514,617	23,932,685,334	55,019,964,865	33,601,296,254
Basin IPA	7.88	5.52	5.05	11.14	7.01
Wildlife Gallons Used	117,603,200	96,034,200	21,830,300	96,073,100	92,973,100
Other Use [Non-Irrigation]	0	241,459	5,000	349,200	1,067,967
Basin Total Gallons Used	38,362,703,746	26,589,790,276	23,954,520,634	55,116,387,165	33,695,337,321
Basin Acre Feet	117,730.815	81,601.070	73,513.724	169,145.98	103,407.193
Harlan County Acres				342.20	342.20

* Lower Republican Reports volume on these wells

Appendix B: Tri-Basin NRD – Republican Basin Water Use

	Tri-Basin NRD	Republican Basin	Union Township		
YEAR	2017	2018	2019	2020	2021
Certified Irrigated Acres	8,167.47	8,169.29	8,169.29	8,169.29	8,169.10
Pivots					
Actual Reported Acres	7,224.67	7,007.70	6,941.00	6,802.90	6,940.20
Gallons Used	1,439,253,491	1,107,044,683	1,024,037,708	1,767,525,855	1,463,271,083
Average acre Inches	7.34	5.82	5.43	9.57	7.76
Gravity					
Actual Reported Acres	45.00	45.00	45.00	45.00	45.00
Gallons Used	10,749,400	8,066,600	6,333,100	11,486,400	9,116,700
Average acre Inches	8.80	6.60	5.18	9.40	7.46
Combination					
Actual Reported Acres	462.80	417.00	171.00	426.00	426.00
Gallons Used	59,907,800	37,224,800	24,930,100	73,908,300	77,143,900
Average acre Inches	4.77	3.29	5.37	6.39	6.67
Drip Tape					
Actual Reported Acres					
Gallons Used					
Average acre Inches					
Total Irrigation Use					
Actual Reported Acres	7,732.47	7,469.70	7,157.00	7,273.90	7,411.20
Gallons Used	1,509,910,691	1,152,336,083.00	1,055,300,908	1,852,920,555	1,549,531,683
Average acre Inches	7.19	5.68	5.43	9.38	7.70

Appendix B: Tri-Basin NRD – Republican Basin Annual Report



Appendix C: CNPPID Groundwater Recharge Diversions Summary - 2021 Republican Basin

Dates	Elwood Reservoir Recharge Diversions		
	AF, in	\$/af	Notes
1-1-17 to 1-30-17	1631.6	\$ 45.68	For TBNRD, 1-23-17 Amendment for \$164,800 limit.
	2447.4	\$ 45.68	For NDNR, 1-23-17 Amendment for \$247,200 limit.
1-1-17 to 1-31-17	4570.7	\$ 45.68	For PRRIP, 9-26-16 Agreement, 8,000 af limit
11-28-17 to 12-22-17	6953.6	\$ 45.68	For PRRIP, 10-20-17 Agreement, 8,000 af limit, All diversion to PRRIP until 12-15-17 when NDNR/TBNRD signed agreement, then 50%/50% split with them
12-15-17 to 12-22-17	657.5	\$ 50.68	For TBNRD, 12-15-17 Agreement, 50/50 split with PRRIP and then 40% of that split to TBNRD, 13,500 af limit for State and TBNRD combined
	986.3	\$ 50.68	For NDNR, 12-15-17 Agreement, 50/50 split with PRRIP and then 60% of that split to State, 13,500 af limit for State and TBNRD combined
1-5-18 to 2-8-18	3854.9	\$ 47.05	For PRRIP, 10-20-17 Agreement, 8,000 af limit, 1-8-18 Amendment took limit to 12,000 af, 50%/50% split with NDNR/TBNRD
	1542	\$ 52.20	For TBNRD, 12-15-17 Agreement, 50/50 split w/PRRIP & then 40% of that split to TBNRD, 13,500 af limit &/or \$362,948 limit for State & TBNRD combined
	2313	\$ 52.20	For NDNR, 12-15-17 Agreement, 50/50 split w/PRRIP & then 60% of that split to State, 13,500 af limit &/or \$362,948 limit for State & TBNRD combined
12-3-18 to 12-31-18	11060.6	\$ 47.05	11-26-18 SWA Amendment No. 2, took limit to 30,000 af. All for PRRIP. NDNR and TBNRD wanted the remainder of their contract in E65 Canal
1-1-19 to 1-28-19	7178.7	\$ 48.46	11-26-18 SWA Amendment No. 2, took limit to 30,000 af. All for PRRIP. NDNR and TBNRD wanted the remainder of their contract in E65 Canal
5-10-19 to 5-16-19	941.3	\$ 48.46	For PRRIP. 11-26-18 SWA Amendment No. 2, took limit to 30,000 af for PRRIP. 1-3-19 WSA Amendment to 1024 extends cost cap to \$402,247 for TBNRD-NDNR. 50% split until TBNRD-NDNR full then all to PRRIP. These deliveries fulfilled both amendments.
	123.2	\$ 53.77	For TBNRD. 11-26-18 SWA Amendment No. 2, took limit to 30,000 af for PRRIP. 1-3-19 WSA Amendment to 1024 extends cost cap to \$402,247 for TBNRD-NDNR. 50% split until TBNRD-NDNR full then all to PRRIP. These deliveries fulfilled both amendments. TBNRD 40%, NDNR 60% of their 50% of total diversions
	184.9	\$ 53.77	For NDNR. 11-26-18 SWA Amendment No. 2, took limit to 30,000 af for PRRIP. 1-3-19 WSA Amendment to 1024 extends cost cap to \$402,247 for TBNRD-NDNR. 50% split until TBNRD-NDNR full then all to PRRIP. These deliveries fulfilled both amendments. TBNRD 40%, NDNR 60% of their 50% of total diversions
7-9-19 to 7-29-19	4955.2	\$ 48.46	For PRRIP. 6-24-19 WSA (30,000 af limit annually)
9-12-19 to 9-28-19	5463.9	\$ 48.46	For PRRIP. 6-24-19 WSA (30,000 af limit annually)
2020			
3-15-21 to 3-24-21	2114.3	\$ 51.41	For PRRIP. 6-24-19 WSA (30,000 af limit annually)
	845.7	\$ 51.41	For TBNRD, Contract #1190
	1268.6	\$ 51.41	For NDNR, Contract #1190
5-19-21 to 5-30-21	1649.4	\$ 51.41	For PRRIP. 6-24-19 WSA (30,000 af limit annually)
	659.7	\$ 51.41	For TBNRD, Contract #1190
	989.6	\$ 51.41	For NDNR, Contract #1190
Total	62392.1		

Appendix C: CNPPID Groundwater Recharge Diversions Summary - 2021 Republican Basin

Dates of Recharge diversions	Elwood Recharge Releases		
	AF, in	\$/af	Notes
2017			
2018			
2019			
2020			
2021			
Total	0		

Dates of Recharge diversions	Phelps Canal Recharge Releases		
	AF, in	\$/af	Notes
1-1-17 to 2-14-17	338.50	\$ 30.08	down to MP 13.3, 25% of diversions for NDNR, 9-20-2016 Agreement, 2,666 af limit
1-1-17 to 2-14-17	1015.40	\$ 30.08	down to MP 13.3, 75% of diversions for PRRIP, 9-26-2016 Agreement, 8,000 af limit
9-15-17 to 10-12-17	1353.50	\$ 30.08	down to MP 13.3, 75% of diversions for PRRIP, 10-20-17 Agreement
	451.20	\$ 30.08	down to MP 13.3, 25% of diversions for NDNR, 9-20-2016 Agreement, 2,666 af limit
12-1-17 to 12-31-17	1317.70	\$ 30.08	down to MP 13.3, 75% of diversions for PRRIP, 10-20-17 Agreement
	439.20	\$ 30.08	down to MP 13.3, 25% of diversions for NDNR, 9-20-2016 Agreement, 2,666 af limit
1-1-18 to 2-12-18	1066.00	\$ 30.98	10-20-17 Agreement. No agreement with NDNR, PRRIP got all diversions. Diversions down to MP 13.3. NOTE: Total diversions were reduced by 200 af for water left in the Phelps Canal at the start of irrigation season.
11-19-18 to 12-31-18	2191.80	\$ 30.98	10-20-17 WSA w/PRRIP, Diversions down to MP 13.3
11-21-18 to 12-20-18	1001.00	\$ 30.98	11-15-17 WPA WSA with TBNRD, from MP 13.3 to MP 34.2.
1-1-19 to 1-24-19	712.10	\$ 31.91	10-20-17 WSA w/PRRIP, Diversions down to MP 13.3
3-19-20 to 4-14-20	910.40	\$ 32.87	9-25-19 WSA w/PRRIP, Diversions down to MP 13.3
9-21-20 to 9-22-20	20.90	\$ 32.87	9-25-19 WSA w/PRRIP, Diversions down to MP 13.3
11-17-20 to 12-3-20	1054.40	\$ 32.87	9-25-19 WSA w/PRRIP, Diversions down to MP 13.3
1-7-21 to 1-15-21	626.30	\$ 33.86	9-25-19 WSA w/PRRIP, Diversions down to MP 13.3
3-15-21 to 3-24-21	1168.30	\$ 33.86	9-25-19 WSA w/PRRIP, Diversions down to MP 13.3
3-15-21 to 3-24-21	307.80	\$ 33.86	For TBNRD, Contract #1190, From MP 13.3 to 34.2
3-15-21 to 3-24-21	461.80	\$ 33.86	For NDNR, Contract #1190, From MP 13.3 to 34.2
Total	14436.30		

Dates of Recharge diversions	Cottonwood Ranch Recharge Releases		
	AF, in	\$/af	Notes
2017			
2018			
2019			
7-20-20 to 9-22-20	360.6	\$ 26.53	EA water released to test Cottonwood Ranch Project. No recharge credit in Phelps Canal since irrigation season was underway. No charges as deliveries will be credited against Pipeline Construction cost until credit is gone.
2021			
Total	360.6		

Appendix C: CNPPID Groundwater Recharge Diversions Summary - 2021 Republican Basin

Dates of Recharge diversions	Funk Lagoon Recharge Releases		
	AF, in	\$/af	Notes
2017			
11-22-18 to 12-20-18	1952.4	\$ 25.50	11-15-17 WPA WSA with TBNRD, Delivery to Funk Lagoon
2019			
2020			
5-19-21 to 5-30-21	176.9	\$ 27.06	For TBNRD, Contract #1190
5-19-21 to 5-30-21	265.4	\$ 27.06	For NDNR, Contract #1190
Total	1952.4		

Dates of Recharge diversions	Johnson WPA Recharge Releases		
	AF, in	\$/af	Notes
2017			
2018			
12-20-19 to 12-31-19			
2020			
5-19-21 to 5-30-21	66.3	\$ 27.06	For TBNRD, Contract #1190
5-19-21 to 5-30-21	99.5	\$ 27.06	For NDNR, Contract #1190
Total	0		

Dates of Recharge diversions	Victor WPA Recharge Releases		
	AF, in	\$/af	Notes
2017			
2018			
12-20-19 to 12-31-19	312.3	\$ 38.75	For TBNRD, 11-15-17 WPAs WSA with TBNRD
1-1-20 to 2-23-20	778.3	\$ 39.53	For TBNRD, 11-15-17 WPAs WSA with TBNRD
3-15-21 to 3-31-21	136.2	\$ 40.32	For TBNRD, Contract #1190
3-15-21 to 3-31-21	204.4	\$ 40.32	For NDNR, Contract #1190
5-19-21 to 5-30-21	133.1	\$ 40.32	For TBNRD, Contract #1190
5-19-21 to 5-30-21	199.6	\$ 40.32	For NDNR, Contract #1190
Total	1431.2		

Appendix C: CNPPID Groundwater Recharge Diversions Summary - 2021 Republican Basin

Dates	Recharge Diversion Funds				
	Total \$	PRRIP	NDNR	TBNRD	NGPC
1-1-17 to 1-30-17	\$ 74,531.49			\$ 74,531.49	
	\$ 111,797.23		\$ 111,797.23		
1-1-17 to 1-31-17	\$ 208,789.58	\$ 208,789.58			
1-1-17 to 2-14-17	\$ 25,372.60			\$ 25,372.60	
	\$ 38,058.90		\$ 38,058.90		
1-1-17 to 2-14-17	\$ 10,182.08		\$ 10,182.08		
1-1-17 to 2-14-17	\$ 30,543.23	\$ 30,543.23			
9-15-17 to 10-12-17	\$ 40,713.28	\$ 40,713.28			
	\$ 13,572.09		\$ 13,572.09		
11-28-17 to 12-22-17	\$ 317,640.45	\$ 317,640.45			
12-15-17 to 12-22-17	\$ 33,322.10			\$ 33,322.10	
	\$ 49,985.68		\$ 49,985.68		
	\$ 2,819.18			\$ 2,819.18	
	\$ 4,233.00		\$ 4,233.00		
12-1-2017 to 12-31-17	\$ 39,636.42	\$ 39,636.42			
	\$ 13,211.14		\$ 13,211.14		
1-3-18 to 3-22-18	\$ 15,717.80			\$ 15,717.80	
	\$ 23,578.88		\$ 23,578.88		
1-5-18 to 2-8-18	\$ 181,373.05	\$ 181,373.05			
	\$ 80,492.40			\$ 80,492.40	
	\$ 120,738.60		\$ 120,738.60		
1-1-18 to 2-12-18	\$ 33,024.68	\$ 33,024.68			
11-19-18 to 12-31-18	\$ 67,901.96	\$ 67,901.96			
11-21-18 to 12-20-18	\$ 31,010.98			\$ 31,010.98	
11-22-18 to 12-20-18	\$ 49,786.20			\$ 49,786.20	
12-3-18 to 12-31-18	\$ 520,401.23	\$ 520,401.23			
	\$ 8,580.48			\$ 8,580.48	
	\$ 12,866.36		\$ 12,866.36		
1-1-19 to 1-24-19	\$ 22,723.11	\$ 22,723.11			
1-1-19 to 1-28-19	\$ 347,879.80	\$ 347,879.80			
1-1-19 to 1-31-19	\$ 13,338.27			\$ 13,338.27	
	\$ 20,007.40		\$ 20,007.40		
5-10-19 to 5-16-19	\$ 45,615.40	\$ 45,615.40			
	\$ 6,624.46			\$ 6,624.46	
	\$ 9,942.07		\$ 9,942.07		
5-10-19 to 5-20-19	\$ 6,557.12			\$ 6,557.12	
7-9-19 to 7-29-19	\$ 240,128.99	\$ 240,128.99			
9-12-19 to 9-28-19	\$ 264,780.59	\$ 264,780.59			
12-16-19 to 12-31-19	\$ 11,245.46			\$ 11,245.46	
12-16-19 to 12-31-19	\$ 16,868.20		\$ 16,868.20		
12-20-19 to 12-31-19	\$ 12,101.63			\$ 12,101.63	

Appendix C: CNPPID Groundwater Recharge Diversions Summary - 2021 Republican Basin

	Recharge Diversion Funds Continued				
Dates	Total \$	PRRIP	NDNR	TBNRD	NGPC
1-1-20 to 2-14-20	\$ 21,534.03			\$ 21,534.03	
1-1-20 to 2-14-20	\$ 32,303.36		\$ 32,303.36		
1-1-20 to 2-23-20	\$ 30,766.20			\$ 30,766.20	
3-19-20 to 4-14-20	\$ 29,924.85	\$ 29,924.85			
3-26-20 to 4-14-20	\$ 11,745.41			\$ 11,745.41	
	\$ 17,615.81		\$ 17,615.81		
7-20-20 to 9-22-20	NA				
9-21-20 to 9-22-20	\$ 686.98	\$ 686.98			
11-17-20 to 12-3-20	\$ 34,658.13	\$ 34,658.13			
1-7-21 to 1-15-21	\$ 21,206.52	\$ 21,206.52			
3-15-21 to 3-24-21	\$ 108,696.16	\$ 108,696.16			
3-15-21 to 3-24-21	\$ 43,477.44			\$ 43,477.44	
3-15-21 to 3-24-21	\$ 65,218.73		\$ 65,218.73		
3-15-21 to 3-24-21	\$ 15,849.83			\$ 15,849.83	
3-15-21 to 3-24-21	\$ 23,772.36		\$ 23,772.36		
3-15-21 to 3-31-21	\$ 5,491.58			\$ 5,491.58	
3-15-21 to 3-31-21	\$ 8,241.41		\$ 8,241.41		
3-15-21 to 3-24-21	\$ 39,558.64	\$ 39,558.64			
3-15-21 to 3-24-21	\$ 10,422.11			\$ 10,422.11	
3-15-21 to 3-24-21	\$ 15,636.55		\$ 15,636.55		
5-19-21 to 5-30-21	\$ 84,795.65	\$ 84,795.65			
5-19-21 to 5-30-21	\$ 33,915.18			\$ 33,915.18	
5-19-21 to 5-30-21	\$ 50,875.34		\$ 50,875.34		
5-19-21 to 5-30-21	\$ 4,786.91			\$ 4,786.91	
5-19-21 to 5-30-21	\$ 7,181.72		\$ 7,181.72		
5-19-21 to 5-30-21	\$ 1,794.08			\$ 1,794.08	
5-19-21 to 5-30-21	\$ 2,692.47		\$ 2,692.47		
5-19-21 to 5-30-21	\$ 5,366.59			\$ 5,366.59	
5-19-21 to 5-30-21	\$ 8,047.87		\$ 8,047.87		
Total	\$ 3,913,955.49	\$ 2,680,678.70	\$ 676,627.26	\$ 556,649.53	\$ -

Appendix D: Tri-Basin NRD Water Conservation Incentive Program

3/12/19

Introduction: The Tri-Basin NRD Water Conservation Incentive Program (WCIP) is intended to address two natural resources management issues: ensuring sustainability of groundwater supplies and protecting streamflows from diminishment due to groundwater pumping. The goal of this voluntary program is to reduce groundwater pumping and increase irrigation water use efficiency in Tri-Basin NRD.

The Program: Tri-Basin will allow landowners to enroll up to 8000 NRD-certified irrigated acres in the program. The enrollment period will be from March 26 through April 19, or until the program acre enrollment limit is reached. Once the enrollment limit is reached, water savings to the district could reach 650 acre-feet per year. Incentives in this program will likely be most attractive to landowners in phase two and phase three groundwater quantity management areas, so the water-use reductions should be greatest where the need is greatest (there are approximately 30,000 certified irrigated acres in Tri-Basin's phase two and phase three townships).

In exchange for their participation, landowners will be paid for the equivalent of one acre-inch of water credit per acre per year, with the opportunity to sell additional credits to the NRD at a set price. In addition to NRD purchases, landowners will have the opportunity to sell water credits on the open market at any agreed-upon price (private transactions require NRD board approval). Tri-Basin will maintain an "electronic bulletin board" to facilitate connections between buyers and sellers. Landowners will also be granted flexibility to irrigate any acres within enrolled parcels and to share (pool) allocations between parcels. Pooling agreements will be required to enable sharing allocations between parcels under different ownership.

The Contract: The NRD and the landowner will sign a five-year agreement. The agreement commits the landowner to limiting water use (allocation) on parcels that they select. The allocation will be equal to the UNL average corn crop consumptive irrigation requirement, which is nine inches per acre per year in Kearney County, ten inches per acre per year in Phelps County and eleven inches per acre per year in Gosper County (allocation will be limited to current allocation of nine inches per acre per year in Union Township in Gosper County).

Landowners will be required to have flowmeters installed on all wells serving participating parcels and to report water use annually to the NRD. Tri-Basin NRD will offer cost share on flowmeters for participants. Tri-Basin NRD will spot check flowmeter readings on 20% of participating parcels annually. As a condition of their participation, landowners will agree to subject enrolled parcels to (most of) the same rules that apply to all landowners in Phase three groundwater quantity management areas. An instrument will be filed with the county clerk recording these contracts, to provide notice to potential buyers of water use limitations associated with program participation.

In exchange for their participation, the NRD agrees to buy one acre-inch per acre per year from every acre enrolled in the contract. Landowners will have two payment options: an annual payment of \$5 per acre-inch credit for one acre-inch per year, or payment at the end of the contract period for up to five acre-inches of credits per acre (assuming the landowner has that much unused allocation) at a rate of \$4 per acre-inch. The NRD may also choose to purchase additional credits from participants. NRD purchases of additional acre-inches will be prioritized in Groundwater Quantity Management Phase 2 and Phase 3 areas and 50%+ stream depletion zones. The NRD will have the right of first refusal to purchase unused allocations from landowners, so landowners would need NRD board approval before they make private sales.

Landowners will also have the option to irrigate any and all acres within participating parcels. They can also pool acre-inches between parcels under the same ownership (pooling water credits associated with parcels under different ownership, but the same management will

Appendix D: Tri-Basin NRD Water Conservation Incentive Program

require a separate NRD-approved pooling agreement). Pools are only allowed for multiple parcels in the same basin and with the same groundwater quantity management phase status.

Water use will be deducted from landowner water credit “accounts.”

If a producer overuses their allocation, they will need to purchase credits from other landowners to eliminate their deficit. Otherwise, they will be prohibited from irrigating enrolled parcels until the deficit is eliminated. The only way a landowner can cancel a contract would be to pay the NRD for the full contracted amount (refund any payments that we’ve already made to them and pay the NRD the amount we would have paid them at the end of the contract period).

Terminology

Accounts- An account will track the number of acre-inches of water available for pumping on a parcel. Each parcel will have a separate account unless landowners form pool accounts.

Allocations- Allocation amounts would be based on estimated safe yields from aquifers that would not result in long-term declines in groundwater levels. An initial allocation will be equal to the University of Nebraska’s average annual irrigation water consumption requirement for corn (that amount is nine inches per acre in Kearney County, ten inches per acre in Phelps County and eleven inches per acre in Gosper County).

Credits (Water Use Credits)- Credits are accumulated on a per-NRD-certified irrigated acre per-parcel basis. Allocation credits are granted at the beginning of each allocation period.

Debits- Debits would be made against accounts based on actual pumping or water credits marketed and sold to the NRD or other water users.