

DRAFT MEMORANDUM

TO: JASON FARNSWORTH
CC: SETH TURNER
FROM: GEORGE OAMEK
DATE: AUGUST 29, 2024
SUBJECT: REVIEW OF THE PRRIP-CNPPID IRRIGATOR LEASE PROGRAM

The PRRIP-CNPPID Irrigation Water Lease Program

The Platte River Recovery Implementation Program (PRRIP or Program) is pursuing a range of measures to reduce deficits to target flows at Grand Island through implementation of a Water Action Plan. A portion of the total volume of water acquired by the Program comes from the leasing of surface water irrigation supplies. Most of the leased supplies represent unused surface irrigation water stored in Lake McConaughy, negotiated through short-term agreements between the PRRIP and water entities, including the Central Platte Natural Resources District (CPNRD) and the Nebraska Public Power District (NPPD). A smaller portion of the leased surface water supplies is acquired through leases between the PRRIP and individual irrigators within the Central Nebraska Public Power and Irrigation District (CNPPID). The terms and potential future of these direct leases with CNPPID irrigators are the focus of this memorandum.

Since its inception, the PRRIP had periodically examined whether to lease water from surface water irrigators, but opportunities were limited. In 2015, an irrigator lease pilot study was developed between CNPPID irrigators and the PRRIP. Features of the program included:

- Paying irrigators to fallow or dryland farm previously irrigated lands during years of full surface water allocation with lease water being stored in Lake McConaughy's Environmental Account.
- CNPPID managing the sign-up, implementation and verification of the program, but with PRRIP setting the price.
- Annual leases with irrigators, with sign-up in the previous fall for the current year.
- Initial annual payments of \$220 per acre, or \$293 per acre-foot, for 0.75 acre-feet per acre.
- Initially targeting 2,000 acres, which was expanded to 3,000 acres in 2019.

The program continued past its pilot study phase (2015-2018) and through 2024. Enrollment reached its initial target in 2018 and was almost fully subscribed at its expanded 3,000 acres by 2020. In 2019, the PRRIP-CNPPID irrigator lease program was given a score of 1,900 acre-feet for purposes of meeting PRRIP Water Action Plan goals.¹ It should be noted that commodity prices,

¹ If the score were formally revised to reflect enrollment in recent years, it would likely fall in the 700-800 AF range.

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primarily corn, were relatively low during the 2019 through 2020 time frame, close to \$3.50 per bushel, and provided an economic incentive to participate.

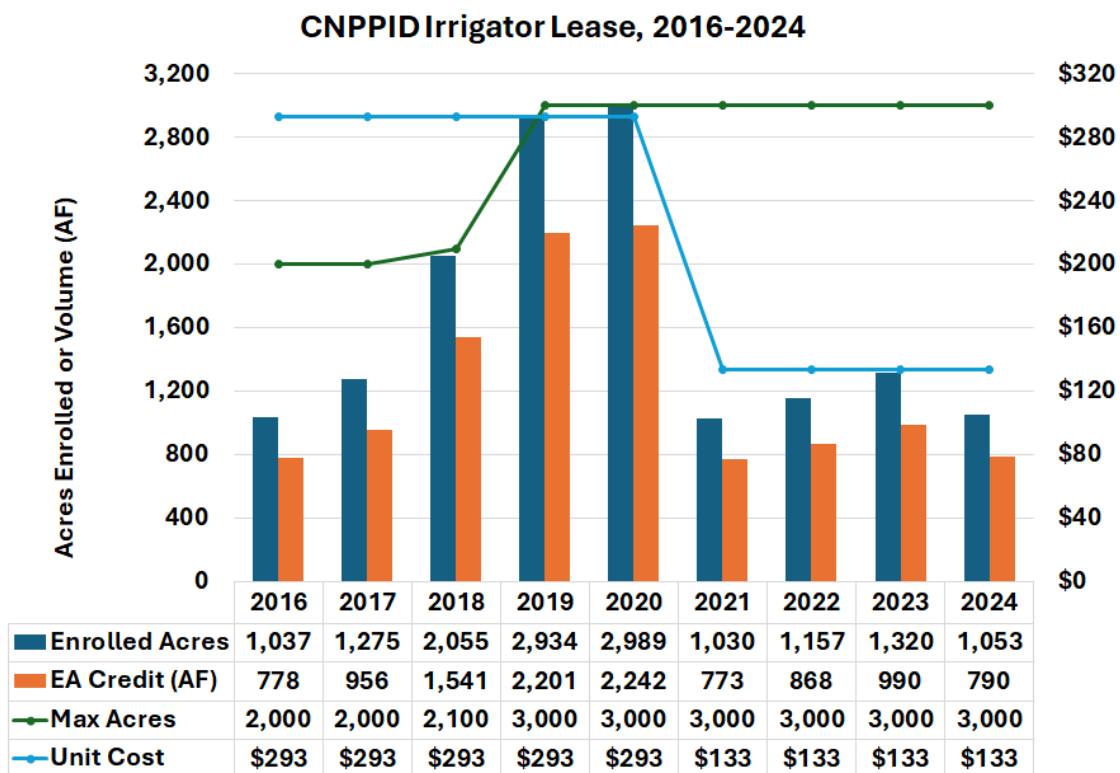
Due to the high unit cost of water relative to the PRRIP's other sources, the PRRIP's offer price was dropped to \$100 per acre, or \$133 per acre-foot, for the years 2021 through 2024. Combined with rising corn prices, enrollment in the program dropped in about the same proportion as the lease price.

Enrollment for 2024 was 1,053 acres, consisting of 61 lease agreements among 29 irrigators. CNPPID currently delivers water to about 650 irrigators, so slightly less than 5 percent participate. Average acreage per contract was 17 acres and average acreage per participating irrigator was 36 acres.

Figure 1 provides a PRRIP-produced graphical summary of the program since its first implementation during the 2016 crop year.

At its current price, the leased water remains one of the PRRIP's more expensive water sources while providing only a small percentage of their overall needs. From the irrigators' perspective, few are taking advantage of the program because of the low lease price and recent higher commodity prices, although 2024 commodity prices have dropped to about 2021 levels. As a result, the lease program's status quo provides few direct benefits to the PRRIP other than maintaining a relationship with a few in the irrigator community and keeping the door partially open to expand the program if needed.

Figure 1. Summary of the PRRIP-CNPPID Irrigator Lease Program



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Irrigator Workshops

Two irrigator workshops were conducted during the course of the lease program, one in 2020 during the program's peak participation and the second in early 2024, when participation has been low.

Summary of 2020 workshop

The PRRIP met with eight irrigators participating in the program, plus CNPPID staff, in July 2020, to discuss the current lease program and its possible future. Major points made during the meeting were as follows:

- The current lease program had become an increasingly popular source of revenue as corn prices have dropped.
- The program was achieving its desired results – removing less efficient acreage from irrigation, such as pivot corners and other hard-to-irrigate parcels. In some cases, it allowed the operator to take their pivot off-line for a year for either replacement or major repairs.
- Irrigators would prefer the leases be multi-year in nature to provide a longer-term planning horizon. Terms of 3 to 5 years were discussed. Varying terms were also discussed, such as some proportion of leases being 3 to 5 years in length and some on an annual basis. Whether price would vary with the term was questioned but not discussed in detail.
- With respect to price, the irrigators appeared to accept that future prices would be lower than \$220 per acre. But not much lower. Although there was no intention of asking irrigators about what prices they would accept in this forum, they did question the process in which PRRIP would use to arrive at a price. In response, the PRRIP indicated that it could either (1) set the price and hope that enough irrigators accept it to meet its acreage goal, or (2) use an alternative method, such as a reverse auction, to solicit what price the irrigators would accept to lease water to the PRRIP. These methods are discussed in greater detail.
- In the context of a multi-year lease, the irrigators were concerned about changing economic conditions. Specifically, they cited a “flex lease” concept as desirable because the lease price would be responsive to commodity prices, specifically the price of corn. For example, a 5-year lease may be defined by a base price, say \$150 per acre, and change, or flex, over time in proportion to the change in corn prices over the following 5 years. Conceptually, the PRRIP agreed that any multi-year lease would have to be responsive to crop prices. However, the PRRIP's concern is for the case in which corn prices may double over the course of a year or two and whether there is a way to attenuate these rapid price swings, such as using moving average crop prices.
- There appeared to be a slight preference among the group for the PRRIP to set the price rather than to participate in a reverse auction. It should be noted that the irrigators were relatively well-informed about how a reverse auction works. At this point, they appeared somewhat more comfortable reacting to PRRIP's price than proposing one of their own.
- The irrigators stressed the value of developing a long-term relationship with the PRRIP.

Summary of 2024 workshop

The more recent workshop, in April 2024, carried a different tone because the current low lease price tended to dominate the conversation. A memorable quote from an attendee was “for \$100

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per acre I'll still carry pipe, for \$200/acre I'll lease", in reference to his propensity to carry irrigation pipe to center pivot corners. Despite the dissatisfaction with the lease price, the attendees who participated in the program had positive comments about how it was administered. Other observations included:

- Participants are satisfied with the annual nature of the leases and hadn't given much thought to multi-year leases. They appreciate that the annual lease will let them respond relatively quickly to changing commodity prices or lease prices.
- Somewhat related to the above comment, it was asked whether the PRRIP could change the sign-up period to the current Spring, say March, rather than the previous Fall?
- There was discussion of the need for a price benchmark, or some supporting rationale, for setting the price. They seemed to agree that a benchmark related to cropland rental rates is reasonable, although no other benchmarks were discussed in detail. The cropland rental market benchmark is described in a later section of this memorandum.
- Like 2020, the attendees were familiar with the reverse auction process as a form of price-setting. In contrast, however, they were more supportive of a reverse auction. Most likely this support was due to the thought it would result in a higher lease price.
- Multi-year leases did not appeal to the attendees due to the risks posed by crop price volatility. That is, they didn't want to lock themselves in for over one year if corn prices were high. This was followed by some discussion of reducing irrigator risk by indexing price to relevant variables, such as corn prices or cash rents.
- There was also a brief discussion about whether some multi-year leases may eventually be needed for PRRIP planning purposes

Prices Paid for Irrigation Water in Selected Lease Programs

There are a number of programs involving the leasing of irrigation water from individual irrigators, primarily between other irrigators, but also for habitat improvement, municipal water supply, and overall water conservation. Beginning with the existing PRRIP-CNPPID program, Table 1 summarizes six programs intended to improve habitat conditions or promote water conservation.

Table 1. Prices Paid for Irrigation Water Leases

Lease program	Purpose	Source of reduction in consumptive water usage	Lease terms	Source of funding
PRRIP-CNPPID irrigator lease program, current status	Supplement Platte River flow at critical times and locations for T&E species	Conversion to dryland production or fallowing	\$100/acre; \$133/acre-foot for an annual lease	USBR, CO, WY, and NE
Middle Rio Grande Conservancy District ²	Supplement Middle Rio Grande River flow at	Conversion to dryland production,	\$400/acre for partial season (May-Aug);	USBR, USFWS, NM State Engineers Office

² <https://www.mrgcd.com/fallowing-program/>

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Lease program	Purpose	Source of reduction in consumptive water usage	Lease terms	Source of funding
	critical times and locations for T&E species	fallowing, or reducing water usage on irrigated lands	\$700/acre for full season (Mar-Sept), about \$280-\$300/acre-foot, for an annual lease	
Colorado River System Conservation Pilot Plan, 2024 ³	Increase Lake Powell storage; supplement flows in the Colorado River system.	Primarily conversion to dryland production or fallowing, but also crop switching and deficit irrigation	Baseline price varies by Upper Basin state, but near \$500/acre-foot, except for NM (\$300/acre-foot), for an annual lease	For 2024, Inflation Reduction Act, through the Dept. of Interior; prior years funding by USBR and Upper Basin states administered by the Upper Colorado River Commission
Colorado Water Trust ⁴	Supplement flows in the Colorado River system for improved habitat	Conversion to dryland production or reducing irrigation usage	Not published and varies by site; \$200/acre-foot +/- to reduce high elevation irrigation	Colorado Water Trust, CWCB, grants and contributions
Natural Resource Conservation Service (USDA/NRCS) EQIP Program	Conserve water in critical regions and soil management on acres reverted to dryland production	Conversion to dryland production or fallowing	\$350/acre in Nebraska for a minimum 3-year commitment, for eligible operations	USDA/NRCS
Tri-Basin NRD, Water Conservation Incentive Program ⁵	Conserve groundwater and overall water stewardship	Reduction in irrigation usage, provided conserved water is not used to irrigate additional lands	Water is valued at \$5.00/acre-inch for a 5-year contract (\$60/acre-foot), intended to represent its marginal economic value. Other terms are discussed in the text.	Tri-Basin NRD, NDNR

³ [Farmers, city offer to cut Colorado River water use \(watereducationcolorado.org\)](https://watereducationcolorado.org/); [System Conservation Pilot Program in 2024 – Upper Colorado River Commission \(ucrccommission.com\)](https://ucrccommission.com/)

⁴ [Project Map - Colorado Water Trust](https://www.coloradowatertrust.org/). The prices associated with the lease contracts are not widely publicized many have been in the \$200/acre-foot range, according to the CWT.

⁵ <https://www.tribasinnrd.org/sites/default/files/Programs/WCIPdescript0624.pdf>

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Although most programs cited above intend to reduce irrigation consumptive use through dryland conversion, several also utilize some form of reduced season or deficit irrigation option. Price comparisons are not always directly applicable due to climatic differences, but it appears safe to state that the PRRIP's lease price is significantly lower than others, excepting that of the Tri-Basin NRD (TBNRD). However, the Tri-Basin program uses an alternative approach to value their leased water program compared to the others.

Although a more detailed explanation of the TBNRD lease program is available from their website (see footnote below), for this analysis it can be described as a program focusing upon the marginal value of irrigation water. It is mentioned here because of its innovative nature and because many CNPPID irrigators are within the TBNRD. The marginal value of water is the value associated with the last few acre-inches of water applied to the crop, which due to the concept of diminishing returns tend to contribute less to yields than the first few acre-inches. By agreeing to subject themselves to a water allocation, the irrigators can either sell those last few acre-inches to the NRD at \$5.00 per acre-inch, market them amongst themselves, or change the location of their usage. The intention is to optimize water usage "at the margin" and achieve a significant level of water conservation. In contrast, prices for the other lease programs cited above are based on an "average" value of water which divides the additional profit generated by irrigation by the total water application.

As applied to the PRRIP, a program like TBNRD's could facilitate reducing irrigation consumptive usage through planned deficit irrigation, allowing irrigators to potentially profit through more precise water and crop management rather than fallowing or dryland conversion. Crop insurability issues aside, Implementation of such a program would likely have other engineering and institutional complexities, but the PRRIP has the opportunity to see how the TBNRD lease program develops.

It should also be noted that many CNPPID irrigators would be eligible for the dryland crop conversion program with the Natural Resource Conservation Service's Environmental Quality Incentives Program (USDA/NRCS/EQIP). With some restrictions on eligibility and agreement to comply with a mutually developed conservation plan, the NRCS will pay producers \$350 per acre per year for a minimum 3-year contract. According to the Lexington NRCS Field Office, relatively few producers have taken advantage of this program, although they anticipated more would participating as current commodity prices continue to remain low.⁶

Price Discovery and Benchmarks

For purposes of this analysis, price discovery is the process of determining, or arriving at, the price that will allow the lease program to achieve its intended goal of converting 3,000 acres from irrigated to dryland production. It's the process of finding a market equilibrium, or market clearing, price.

Economic theory suggests that for an irrigator to enter an annual lease, they would need to be compensated for:

⁶ Personal communication, Kevin Gill, NRCS Lexington Field Office. June 26, 2024.

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1. The foregone profit provided by irrigation.
2. An increment in addition to foregone profit, alternatively viewed as a risk premium or economic rent. For a multi-year lease, this additional increment would also reflect irrigators' views on the future direction of crop prices.

Economists have spent significant energy trying to estimate what the additional increment is, concluding that it varies widely, is site specific, and generally reflects a wide range of hard-to-quantify economic and personal concerns. As a result, rational lease prices would be bounded on the low side by the profitability irrigation with an uncertain high boundary.

Two benchmarks that might assist in discovering price were discussed with CNPPID irrigators, the cropland rental market and a reverse auction.

Cropland Rental Market

The cropland rental market is a useful benchmark for gaging the profitability of irrigation. Under this method, the profitability of irrigation, in terms of dollars per acre, is estimated by the difference between rental prices for irrigated cropland and rental prices for dryland cropland.⁷ This benchmark is economically "efficient" because, theoretically, all relevant information about crop yield, price, and resulting profit expectations should be indirectly embodied in these rental rates. University of Nebraska publishes cropland rental rates annually, resulting in a reliable source of data.⁸ However, its weaknesses include rental rates being summarized at the regional level rather than being more site specific and some irrigators feel, in an anecdotal manner, that the data may better reflect the previous year.

Two other similar benchmarks considered included the cropland real estate market and the use of crop enterprise budgeting. The cropland real estate market also looks at the difference in sales price of irrigated cropland and irrigable dryland cropland, but the values associated with irrigated cropland have tended to be biased upward due to factors beyond farm profitability, such as tax management and portfolio diversification. As a result, this difference is not thought to reflect the farm-level value of irrigation. Crop enterprise budgeting focuses upon profitability and can be site specific but is subject to a wide range of arguable assumptions about yields, prices, and production costs. As a result of these shortcomings, this effort focused upon the cropland rental market as the most practical benchmark.⁹

Historical cropland rental rates through 2024 for Central Nebraska, as published by University of Nebraska Extension, are shown in Figure 2. For this discussion, the rental rate for center pivot irrigation is used.

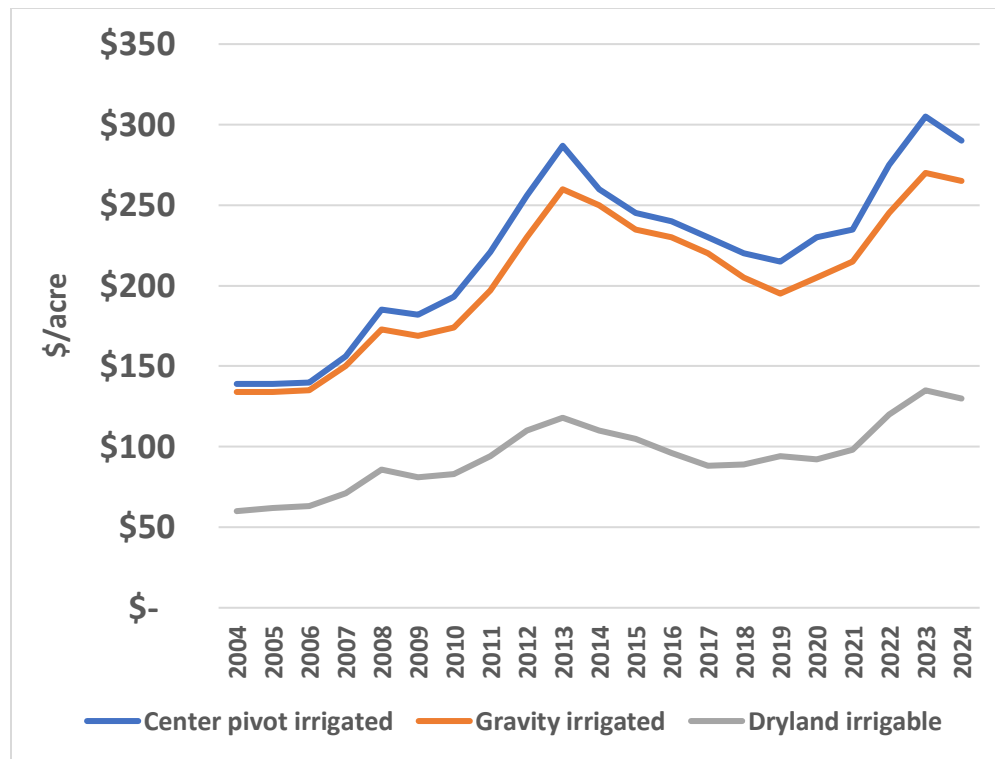
⁷ The rental price of irrigated cropland may or may not include the cost of the irrigation system, the data does not differentiate between the two. Also, dryland rental prices are for irrigable dryland cropland.

⁸ [2024 Nebraska Farmland Values and Cash Rental Rates | Agricultural Economics \(unl.edu\)](#)

⁹ It should be noted that Federal water resource planning guidelines, including the 1983 Principles and Guideline (P&G) and the 2015 Principles, Requirement, and Guidelines (P,R,&G), recognize the use of existing land market data for estimating the benefit of irrigation.

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Figure 2. Cropland Rental Rates in Central Nebraska



Using the cropland rental market, the foregone profit of drying-up irrigated lands for Central Nebraska irrigators was estimated to be about \$140 per acre in 2015, the year in which the initial lease price was developed. This is the difference in irrigated land rental, \$245 per acre and dryland rental, \$105 per acre. Ultimately, the price was set at \$220 per acre – an \$80 per acre, or 57 percent, premium in addition to the profit level. Even at this apparently high level, it took several years to reach the program’s acreage goals. However, once the program was established and the perceived risk of participation reduced, it seems reasonable that lease price could have been reduced to some extent. However, the reduction in price from \$220 per acre to \$100 eliminated the risk premium and cut into anticipated profit, eliminating the incentive to participate for most irrigators.

For 2024, the difference in cropland rental method implies a profit of \$160 per acre (\$290 irrigated - \$130 dryland). In terms of the CNPPID lease, this translates to an equivalent of \$213 per acre-foot. However, in general terms, it should be noted that \$160 per acre would only make the irrigator “whole” and does not contribute to the risk premium discussed above. Additional economic incentive may be needed to engage a typical irrigator.

Reverse Auction

The reverse auction is a measure of an irrigator’s willingness-to-accept, measuring how much the irrigator would take for leasing a portion of their irrigation water. The City of San Antonio, for instance, has leased groundwater for over a decade from nearby Edwards Aquifer irrigators through

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this process. In addition, prices paid for the NRCS's Conservation Reserve Program (CRP) are discovered at the regional level through reverse auction. A reverse auction is well-suited for a market with few buyers and many sellers, which describes PRRIP's situation for leasing water from irrigators. In addition, attendees at both irrigator workshops were familiar with the reverse auction process.

The benefit of a reverse auction is that it relieves the PRRIP from the uncertainties of pricing irrigator lease water by using a competitive approach and economic efficiency. It is inherently fair to irrigators because they set the price themselves. Offsetting this benefit are increased administrative costs associated with conducting the reverse auction, an educational component involved in greater familiarizing irrigators with the concept, and the remote chance the irrigators collude to drive the price up. Also, whether the reverse auction would be used to set initial lease prices that would be adjusted annually using some other method, or would the reverse auction be conducted annually would require consideration? Finally, the PRRIP may also need to consider a reserve price, or a maximum that could be paid, and other boundaries on the program.

An example of the reverse auction process is described in Appendix A.

Multi-Year Contracts

Most in attendance during the initial irrigator workshop in 2020 appeared to agree that some form of multi-year irrigator contracts would be needed to supplement annual contracts, in order to provide a reliable source of water for the PRRIP and to assist in farm planning for the irrigators. With the lease price at \$220 per acre, irrigators appeared open to multi-year contracts, especially if the lease price was sufficiently high or if there was an adjustment mechanism built into the price.

Unsurprisingly, the irrigators didn't want to lock themselves into a price too firmly if corn prices shot upwards during the next year or two. In response, a discussion on multi-year contracts and price escalators, or indices, followed.

Relatively little time was spent during the 2020 workshop on the discussion of a contract's term length but discussions instead focused upon the use of the price of corn as a logical price index, the length of a corn price cycle, and how volatile prices can be within this cycle. As previously indicated, with lower lease prices, the 2024 workshop participants were less interested in multi-year agreements and more interested in the flexibility of getting into and out of the lease program easily.

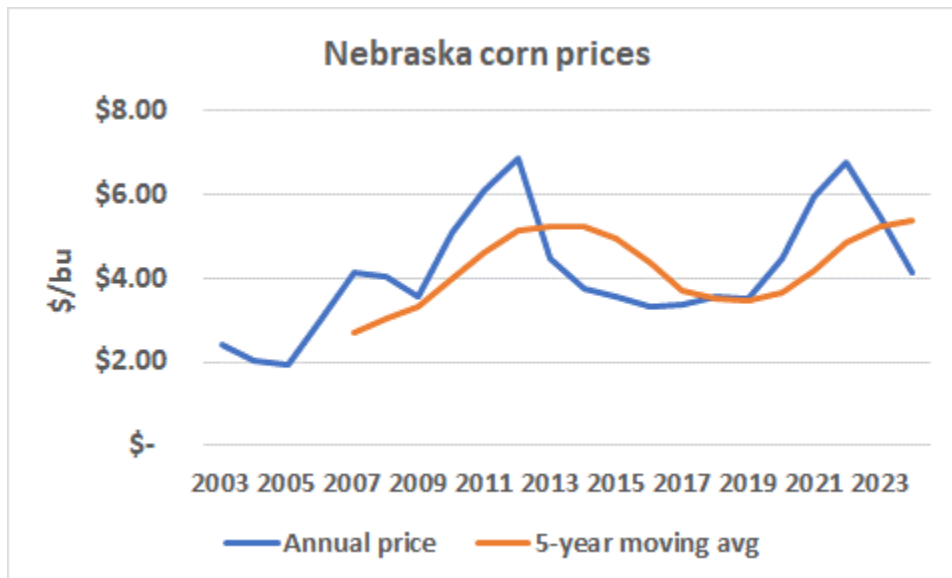
Using the price of corn as an index may be problematic for the PRRIP due to its volatility. Although long-term price trends for corn suggest annual increases averaging a reasonable 2 to 3 percent, the price swings wildly along this trend. This is shown with the blue line in Figure 3. It is hard for to budget and cash flow a water source whose price may be 2 to 3 times higher one year than it was in the previous years. However, it should be noted that irrigators are inherently exposed to these wide swings in price. As a result, if corn prices are to be used as a price index, dampening these swings would be essential to work within the PRRIP's financial constraints.

Figure 3 also maps a 5-year moving average corn price, which does dampen the price swings and results in it being a more reasonable basis for lease price adjustment than annual corn price. In addition, comparing Figures 2 and 3 show that the 5-year moving average price of corn tends to

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follow the same shape as the cropland rental market. As a result, annual changes in the cropland rental market would also appear to be reasonable index for lease price.

Figure 3. Annual Corn Prices for Nebraska and Their 5-Year Moving Average



Multi-year contracts would increase administrative costs over that of the current program due to start-up costs associated with developing the initial price discovery and price adjustment processes. In addition, the annual cost will likely be greater than its current level due to somewhat more complicated contracts and staff time required to conduct the background research for price adjustments over time. How these additional costs would be allocated between the PRRIP and CNPPID has not been considered.

Future Direction for the Irrigator Lease Program

There appear to be three to four options for the PRRIP Governance Committee to consider with respect to moving forward with the irrigator lease program:

Options 1 and 2 are to either explicitly discontinue the program or let it fade away by continuing under the same terms, respectively. It is highly unlikely that future farm economics will change to the extent that the current price of \$100 will attract additional participation, so either option will likely yield the same long-term result. The current program does not provide a significant volume of water relative to PRRIP's needs and it is still a more expensive source than other surface water leases contributing to the Lake McConaughy EA. Note that because the approved project score of 1,900 AF is not reflective of recent irrigator lease enrollment, the GC may want to consider revising that score if the project is extended and similar enrollment continues. Further, the low participation rate among irrigators does not significantly contribute to the relationship between PRRIP and the irrigator community.

There is risk associated with discontinuing the irrigator lease regardless of its relatively small volumetric contribution because the Program has not yet fully achieved its First Increment Water Objective and it may take time to restart the program if these irrigation supplies are needed in the

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future. Discontinuing the current program doesn't eliminate the irrigator lease option from restarting in the future, but it may take some additional time to re-energize the relationship and "rediscover" the price.

Option 3 would be to continue to the program for another year or more but with a higher lease price. Although what price this may be would have to be determined, supporting the price with some form of benchmark would be useful. For now, it appears the cropland rental market is a practical option.

Option 4 would include incentivizing participation in the irrigator lease program in a manner that could result in its becoming a more substantial contributor to the PRRIP's water score. This could include revising the pricing rationale such as in Option 3 and taking measures to make it a reliable source for purposes of long-term planning. This would likely involve developing multi-year contracts or other mechanisms to ensure that the annual irrigator lease market can supply a reliable volume of water year-to-year. Overall, the price of these leases would reflect the water's opportunity cost in irrigation, such as that embodied in the cropland rental benchmark, plus some additional economic incentive to encourage long-term participation. Whether to pursue these options is not further considered here and would require further exploration by the Program, CNPPID, and participating irrigators.

Appendix A

Lease Price is Determined by Reverse Auction

The reverse auction is a measure of an irrigator's willingness-to-accept, measuring how much the irrigator would take for leasing a portion of their irrigation water. The City of San Antonio, for instance, has leased groundwater for over a decade from nearby Edwards Aquifer irrigators through this process. In addition, prices paid for the NRCS's Conservation Reserve Program (CRP) are "discovered" at the regional level through reverse auction. Further, the short-lived CPNRD groundwater lease market used this process to derive the local supply curve for groundwater. From an economics standpoint, the reverse auction is suited for a market with few buyers and many sellers, which describes PRRIP's situation for leasing water from irrigators.

The benefit of a reverse auction is that it relieves the PRRIP from the uncertainties of pricing irrigator lease water by using a competitive approach and economic efficiency. It is intrinsically fair to irrigators because they set the price themselves. Offsetting this benefit is that there may be an educational component involved in familiarizing irrigators with the concept and the possible, but remote, chance the irrigators collude to drive the price up. The PRRIP could put bounds on maximum prices paid or otherwise restrict the market to its available budget.

Example Reverse Auction

A hypothetical example applied to the CNPPID irrigators best explains how a reverse auction would work here. Assume that the PRRIP announces a desire to lease irrigation water from 1,000 acres of CNPPID cropland. This translates to 750 acre-feet based on a 0.75 acre-foot per acre allocation. The PRRIP asks that irrigators submit sealed bids of how many acres they would be willing to dry-up and at what price they would have to receive to do it, on a \$/acre basis.

Further, assume that 15 irrigators submit sealed bids. Table A-1 shows the unsealed bids for this hypothetical transaction. Each bidder submits a price and acres associated with that price. One can observe that the bid prices range from \$71/acre to \$214/acre for quantities ranging from 25 to over 151 acres.

Table A-2 ranks these bids from lowest to highest. Note the cumulative number of acres associated with each ranked price. Figure 3 is the resulting graphical relationship between the bid prices and the cumulative quantity of water.

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Table A-1. Results of Unsealed Bids for a Reverse Auction

Unsealed bids		
Bidder	Bid, \$/acre	Acres offered for following
1	\$ 150	130
2	\$ 84	35
3	\$ 71	147
4	\$ 135	80
5	\$ 111	21
6	\$ 163	48
7	\$ 120	90
8	\$ 132	70
9	\$ 78	62
10	\$ 165	160
11	\$ 99	142
12	\$ 152	160
13	\$ 75	49
14	\$ 159	65
15	\$ 175	101
Total		1,360

Figure A-3 represents the PRRIP's supply curve for irrigation water, or more specifically, for irrigated acres. If the PRRIP desires water from 1,000 acres, one finds the price in Figure 3 corresponding to 1,000 acres. From this hypothetical example, it appears 1,000 acres corresponds to a price of about \$150 per acre, or \$200 per acre-foot. As such, all bidders below the 1,000 acre cap would be paid \$150 per acre.

Table 2. Unsealed Bids Ranked

Unsealed bids			
Bidder	Bid, \$/acre	Acres offered for following	Cumulative acres
3	\$ 71	147	147
13	\$ 75	49	196
9	\$ 78	62	258
2	\$ 84	35	293
11	\$ 99	142	435
5	\$ 111	21	456
7	\$ 120	90	546
8	\$ 132	70	616
4	\$ 135	80	696
1	\$ 150	130	826
12	\$ 152	160	986
14	\$ 159	65	1,051
6	\$ 163	48	1,099
10	\$ 165	160	1,259
15	\$ 175	101	1,360

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Figure A-3. Irrigated Acres Supply Curve Associated with Hypothetical Reverse Auction.

