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MEMORANDUM

To: Board of Directors, Huerfano County Water Conservancy District
From: John Faux, P.E.
Date: July 15, 2018
Re: Cost Recovery for Regional Augmentation Plan in Case No. 13CW3062

An analysis was conducted to determine pricing for augmentation services that will recover the costs involved in developing the regional augmentation plan. Those costs include purchase of the William Craig water right, obtaining a Water Court decree for augmentation, constructing an augmentation station and recharge facility at William Craig Ranch, and constructing a storage reservoir at Sheep Mountain Ranch. These three structures are also known as: William Craig Augmentation Station, William Craig Recharge Facility, and Sheep Mountain Augmentation Facility (SMAF). Most of the development is completed with the important exception that SMAF has yet to be constructed.

Table 1 identifies the expenses incurred to-date in development of the regional augmentation plan. These were tabulated by District Administrator Carol Dunn. Augmentation plan development spanned the years 2013 through 2018. Development costs included engineering and legal fees necessary to obtain approvals for the Substitute Water Supply Plans in 2013 through 2017 since those SWSP approvals were central to negotiating the water court decree. The expenses tabulated do not include engineering and legal fees for incorporating specific water users into the augmentation plan.

Engineering and legal invoicing did not always break out charges for services on projects other than the augmentation plan. A review of invoices led to the conclusion that approximately 85% of legal fees and 99% of engineering fees were for development of the augmentation plan. Expenses to date sum to \$3,618,000.

In addition to the expenses incurred to date, future costs to complete the augmentation plan development are construction of SMAF and interest on the loan. Cost for completion of SMAF is estimated at \$735,000 plus a 10% contingency. Interest on the loan is expected to be an additional \$42,569 in 2018. The cost of development will be reduced by the sale of the William Craig Ranch (currently for sale without the William Craig water right). This is estimated to produce revenue of at least \$500,000 based on \$500 per acre of dryland multiplied by 1,000 acres.

Total project costs were converted to 2018 dollars using the US Bureau of Economic Analysis GDP implicit price deflator, a widely used price index.¹ Total project costs in 2018 dollars is estimated at

¹ US Bureau of Economic Analysis, <https://fred.stlouisfed.org/series/GDPDEF>

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\$4,136,000. Table 2 summarizes the total augmentation plan development costs and calculation of a price per acre-foot that would provide for full cost recovery.

It is intended that augmentation certificates be sold representing a commitment to provide perennial, firm yield augmentation and that the sale of augmentation certificates recover most of the cost of development of the augmentation plan. Revenue attributable to the sale of non-firm water is expected to be limited and generate only about \$4,000 per year and so was left out of this analysis. Recovery of the total project costs of \$4,136,000 from the provision of 52 acre-feet of firm yield corresponds to an augmentation certificate price of \$79,500 per acre-foot, as shown in Table 2.²

Project costs were partially offset by the Colorado Water Conservation Board grant of \$250,000 in 2016 to support development of augmentation water storage. Project costs, net after the CWCB grant, totals \$3,878,000 (in 2018 dollars) and corresponds to a certificate price of \$74,600 per acre-foot, as shown in Table 3.

Project costs can also be considered to be partially offset by a portion of the mill levy and sales tax revenue received by the District. The District Administrator determined that approximately 70% of the tax revenues received by the District during the years 2013 through 2018 were used to support development of the regional augmentation plan. As shown in Table 4, project costs, net after the 70% tax revenue subsidy, totals \$2,915,000 (in 2018 dollars) and corresponds to a certificate price of \$56,000 per acre-foot.

When project costs are subsidized by both the CWCB grant and 70% of the 2013 – 2018 tax revenue, the remaining cost is \$2,657,000 and corresponds to a certificate price of \$51,100, as shown in Table 5.

Lease Price

In certain circumstances the District may agree to lease augmentation instead of selling, for example, when the water use requires firm yield augmentation but the water usage is expected to be of short duration rather than perennial. To determine a lease price, it would be useful to identify a factor to convert from the sale price to an annual lease price. A discount factor can be used for this purpose. A recent survey across the market found the average cost of capital to be 7%.³ Using that as a discount factor would make the unsubsidized, annual lease price for augmentation equal to \$5,600 per acre-foot.

Lease/Purchase

The District's Rules and Regulations provide the opportunity for an augmentation certificate to be purchased in five annual payments. The same discount rate used to determine the annual lease rate (that is, 7%) can be used to amortize the purchase price. Five annual payments at a 7% annual discount

² Due to ground water lagging, 1.0 acre-feet of consumption in 'year one' will result in less than 1.0 acre-feet of depletion in 'year one'. The augmentation certificate amount corresponds to the consumptive use amount, not the current year depletion.

³ The 7% discount rate is based on a NYU Stern School of Business study of the weighted-average cost of capital for 6177 firms across the market in 2013.

rate has a capital recovery factor⁴ of 0.24389. That is, the annual payment due at the start of each of five years would be 24.389% of the purchase price.

Annual Fee

In addition to the cost of development of the augmentation plan and facilities, there will be ongoing costs for operation and maintenance (O&M), such as: cleaning and operating the ditch, augmentation station, and recharge pond at William Craig Ranch; operating valves and the pump at SMAF; pump maintenance; flow recording and reporting; augmentation plan projections and accounting; dryup and revegetation operations; and contract administration. It is intended that these O&M costs be recovered with an annual administration fee, which will be subject to adjustment based on recent, actual costs. O&M costs at present are estimated to cost about \$25,000 per year, as itemized in Table 6. The O&M costs will be allocated to the existing plan participants based on acre-feet of augmentation contracted. Since there are currently approximately 17 acre-feet of augmentation contracted, the annual O&M fee in the near term would be about \$1,500 per acre-foot to recover the full cost.

Variable Pricing

It is recommended that the price of augmentation certificates, in terms of dollars per acre-foot, be the same for all participants. Although the cost per acre-foot may be higher for some participants, for example, participants with long-delayed ground water depletions or participants with small acre-foot commitments, the annual fee helps compensate for some of those greater costs and any remaining greater cost per acre-foot is not expected to be large enough to require a higher unit rate.

Some participants will have a greater ability-to-pay. For example, commercial enterprise generally has a greater ability to pay for water as compared to residential water users. However, it is my understanding that public rate setting standards prevent structuring utility pricing based on ability-to-pay.

Contract Size

From an engineering perspective, it would be workable for participants to contract for augmentation in multiples of 0.1 acre-feet. In this way, the contract size could closely conform to the expected water usage and the participant wouldn't have to contract for far more water than needed. To encourage participants to contract for enough water to serve their needs, a significant penalty fee would be imposed on usage in excess of the contract amount. That is, if the actual water use exceeds the contract amount, the participant would be charged for the amount of the overage at the annual lease rate plus (I would suggest) 50%.

⁴ CRF = $\frac{i(1+i)^n}{(1+i)^n - 1}$

Table 1
Huerfano Regional Augmentation Plan Expenses

| Year | Expense | For | Augmentation Plan | |
|------|--------------|-----------------------|-------------------|----------------|
| | | | % | Expense |
| 2013 | 171,929.69 | Legal | 85% | 146,140.24 |
| 2013 | 400.00 | Pond lease | | 400.00 |
| 2013 | 99,998.72 | Engineering | 99% | 98,998.73 |
| 2014 | 138,537.50 | Legal | 85% | 117,756.88 |
| 2014 | 2,227.34 | Garcia mileage | | 2,227.34 |
| 2014 | 400.00 | Pond lease | | 400.00 |
| 2014 | 203,023.00 | Engineering | 99% | 200,992.77 |
| 2014 | 1,808,616.54 | Ranch + improvements | | 1,808,616.54 |
| 2014 | 9,112.50 | Surveys, permits | | 9,112.50 |
| 2014 | 22,000.00 | Loan origination fee | | 22,000.00 |
| 2015 | 93,839.00 | Legal | 85% | 79,763.15 |
| 2015 | 713.00 | Property insurance | | 713.00 |
| 2015 | 2,282.28 | Garcia mileage | | 2,282.28 |
| 2015 | 48,670.00 | Engineering | 99% | 48,183.30 |
| 2015 | 9,215.00 | Eng on RWAf | | 9,215.00 |
| 2015 | 16,040.00 | Ranch + improvements | | 16,040.00 |
| 2015 | 2,208.00 | Surveys, permits | | 2,208.00 |
| 2015 | 6,815.00 | Reservoir (grant) | | 6,815.00 |
| 2016 | 104,965.29 | Legal | 85% | 89,220.50 |
| 2016 | 93,645.45 | Engineering | 99% | 92,709.00 |
| 2016 | 4,070.92 | Ranch + improvements | | 4,070.92 |
| 2016 | 9,761.34 | Reservoir | | 9,761.34 |
| 2017 | 114,243.00 | Legal | 85% | 97,106.55 |
| 2017 | 100.00 | Property insurance | | 100.00 |
| 2017 | 108,876.00 | Engineering | 99% | 107,787.24 |
| 2017 | 14,801.00 | Ranch + improvements | | 14,801.00 |
| 2017 | 117,530.00 | Reservoir (loan) | | 117,530.00 |
| 2017 | 261,083.00 | Reservoir (grant) | | 261,083.00 |
| 2017 | 4,741.00 | Reservoir | | 4,741.00 |
| 2018 | 9,882.00 | Legal | 85% | 8,399.70 |
| 2018 | 2,784.00 | Engineering | 99% | 2,756.16 |
| 2018 | 1,323.00 | Reservoir | | 1,323.00 |
| 2018 | 14,490.00 | Legal | 85% | 12,316.50 |
| 2018 | 4,578.00 | Engineering | 99% | 4,532.22 |
| 2018 | 4,833.00 | Reservoir | | 4,833.00 |
| 2018 | 22,650.00 | Legal | 85% | 19,252.50 |
| 2018 | 6,670.00 | Engineering | 99% | 6,603.30 |
| 2018 | 3,219.00 | Ranch + improvements | | 3,219.00 |
| 2018 | 367.00 | Reservoir | | 367.00 |
| 2018 | 10,441.00 | Legal | 85% | 8,874.85 |
| 2018 | 3,168.00 | Engineering | 99% | 3,136.32 |
| 2018 | 1,355.00 | Reservoir | | 1,355.00 |
| 2018 | 170,276.99 | Loan interest accrued | | 170,276.99 |
| | | Total | | \$3,618,020.81 |

Table 2
Rate of Recovery for Unsubsidized Costs

| Cal Yr | a Expense Incurred | b Expense Expected | c Revenue Expected | d Total Cost | e GDP Implicit Price Deflator (June 30th) | f Total Cost (2018 Dollars) | g Firm Yield (AF) | h Total Cost per AF |
|--------|--------------------------|--------------------------|--------------------------|-----------------|--|-----------------------------------|-------------------------|---------------------------|
| 2013 | \$245,539 | | | \$245,539 | 106.57 | \$264,731 | | |
| 2014 | \$2,161,106 | | | \$2,161,106 | 108.69 | \$2,284,581 | | |
| 2015 | \$165,220 | | | \$165,220 | 109.92 | \$172,705 | | |
| 2016 | \$195,762 | | | \$195,762 | 111.25 | \$202,184 | | |
| 2017 | \$603,149 | | | \$603,149 | 113.03 | \$613,127 | | |
| 2018 | \$247,246 | \$851,509 | \$500,000 | \$598,755 | 114.90 | \$598,755 | | |
| Total | \$3,618,021 | | | \$3,969,530 | | \$4,136,084 | 52 | \$79,540 |

- a from Table 1
- b \$42,569.25 interest in 2018 and \$735,400 plus 10% contingency for SMAF Phase II and III
- c Sale of Wm Craig Ranch
- d =a+b+c
- e US Bureau of Economic Analysis, <https://fred.stlouisfed.org/series/GDPDEF>
- f =d/e*114.90
- g from firm yield analysis
- h =f/g

Table 3
Rate of Recovery for Costs Subsidized by CWCB Grant

| Cal Yr | a Expense Incurred | b Expense Expected | c Revenue Expected | d Total Cost | e CWCB Grant | f GDP Implicit Price Deflator (June 30th) | g Net Cost (2018 Dollars) | h Firm Yield (AF) | i Net Cost per AF |
|--------|--------------------------|--------------------------|--------------------------|-----------------|-----------------|--|---------------------------------|-------------------------|-------------------------|
| 2013 | \$245,539 | | | \$245,539 | | 106.57 | \$264,731 | | |
| 2014 | \$2,161,106 | | | \$2,161,106 | | 108.69 | \$2,284,581 | | |
| 2015 | \$165,220 | | | \$165,220 | | 109.92 | \$172,705 | | |
| 2016 | \$195,762 | | | \$195,762 | \$250,000 | 111.25 | -\$56,018 | | |
| 2017 | \$603,149 | | | \$603,149 | | 113.03 | \$613,127 | | |
| 2018 | \$247,246 | \$851,509 | \$500,000 | \$598,755 | | 114.90 | \$598,755 | | |
| Total | \$3,618,021 | | | \$3,969,530 | | | \$3,877,882 | 52 | \$74,575 |

- a from Table 1
- b \$42,569.25 interest in 2018 and \$735,400 x 110% SMAF Phase II and III
- c Sale of Wm Craig Ranch
- d =a+b+c
- e CWCB Grant
- f US Bureau of Economic Analysis, <https://fred.stlouisfed.org/series/GDPDEF>
- g =(d-e)/f*114.90
- h from firm yield analysis
- i =g/h

Table 4
Rate of Recovery for Costs Subsidized by HCWCD Tax Revenue

| Cal Yr | a Expense Incurred | b Expense Expected | c Revenue Expected | d Total Cost | e 70% of Tax Revenue | f GDP Implicit Price Deflator (June 30th) | g Net Cost (2018 Dollars) | h Firm Yield (AF) | i Net Cost per AF |
|--------|--------------------------|--------------------------|--------------------------|-----------------|----------------------------|--|---------------------------------|-------------------------|-------------------------|
| 2013 | \$245,539 | | | \$245,539 | \$196,000 | 106.57 | \$53,411 | | |
| 2014 | \$2,161,106 | | | \$2,161,106 | \$196,000 | 108.69 | \$2,077,382 | | |
| 2015 | \$165,220 | | | \$165,220 | \$196,000 | 109.92 | -\$32,175 | | |
| 2016 | \$195,762 | | | \$195,762 | \$196,000 | 111.25 | -\$246 | | |
| 2017 | \$603,149 | | | \$603,149 | \$196,000 | 113.03 | \$413,885 | | |
| 2018 | \$247,246 | \$851,509 | \$500,000 | \$598,755 | \$196,000 | 114.90 | \$402,755 | | |
| Total | \$3,618,021 | | | \$3,969,530 | | | \$2,915,012 | 52 | \$56,058 |

- a from Table 1
- b \$42,569.25 interest in 2018 and \$735,400 x 110% SMAF Phase II and III
- c Sale of Wm Craig Ranch
- d =a+b+c
- e 70% of District tax revenue 2013-18
- f US Bureau of Economic Analysis, <https://fred.stlouisfed.org/series/GDPDEF>
- g =(d-e)/f*114.90
- h from firm yield analysis
- i =g/h

Table 5
Rate of Recovery for Costs Subsidized by CWCB Grant and HCWCD Tax Revenue

| Cal Yr | a Expense Incurred | b Expense Expected | c Revenue Expected | d Total Cost | e CWCB grant | f 70% of Tax Revenue | g GDP Implicit Price Deflator (June 30th) | h Net Cost (2018 Dollars) | i Firm Yield (AF) | j Net Cost per AF |
|--------|--------------------------|--------------------------|--------------------------|-----------------|-----------------|----------------------------|--|---------------------------------|-------------------------|-------------------------|
| 2013 | \$245,539 | | | \$245,539 | | \$196,000 | 106.57 | \$53,411 | | |
| 2014 | \$2,161,106 | | | \$2,161,106 | | \$196,000 | 108.69 | \$2,077,382 | | |
| 2015 | \$165,220 | | | \$165,220 | | \$196,000 | 109.92 | -\$32,175 | | |
| 2016 | \$195,762 | | | \$195,762 | \$250,000 | \$196,000 | 111.25 | -\$258,448 | | |
| 2017 | \$603,149 | | | \$603,149 | | \$196,000 | 113.03 | \$413,885 | | |
| 2018 | \$247,246 | \$851,509 | \$500,000 | \$598,755 | | \$196,000 | 114.90 | \$402,755 | | |
| Total | \$3,618,021 | | | \$3,969,530 | | | | \$2,656,810 | 52 | \$51,092 |

- a from Table 1
- b \$42,569.25 interest in 2018 and \$735,400 x 110% SMAF Phase II and III
- c Sale of Wm Craig Ranch
- d =a+b+c
- e CWCB grant
- f 70% of District tax revenue 2013-18
- g US Bureau of Economic Analysis, <https://fred.stlouisfed.org/series/GDPDEF>
- h $=(d-e-f)/g*114.90$
- i from firm yield analysis
- j $=h/i$

Table 6
Components of Annual Fee

| | |
|--|----------|
| Wm Craig Ditch and Recharge Facility O & M | \$6,000 |
| Sheep Mountain Augmentation Facility O & M | -- * |
| Revegetation (follow-up) | -- * |
| Metering and Reporting | \$1,600 |
| Projection and Accounting | \$16,000 |
| Contract Administration | \$1,200 |
| TOTAL | \$24,800 |

* Beginning 2019 or 2020