

AV Yr Triple ✓

ALL @ = 2004 for both CREP on & off

ALL KS = 2004 " " "

Av Yr No CREP:

2005 Σ Pmp = 1,620,357.2 Agw = 1,707,253

2006 Σ Pmp = 1,656,749.7 Agw = 1,707,253 = 07,08,09,10,11

2006 GWEX mKnedat =

Regular 2004 Σ Pmp = 1,819,480.3 Agw = 1,707,253

→ ~~1,819,480.3~~ × .851 = ~~1,548,495~~ + 6wco (171,962) = ~~1,681,541~~ 1,620,357

1,819,480.3 × .871 = ~~1,584,887~~ + 6wco (119,969) = ~~1,473,867~~ 1,656,749

All Av Yr SW files = 2004, for with & w/out CREP Red  
GOOD!

w/CREP  
Σ\*.pmp 2005: 1,568,097  
2006: 1,603,262

AGW: 1,651,376  
AGW: "

From No CREP RED:

05: Vol: 1,620,357.2 - 1,568,097 = 52,260.2 AF

Acr 1,707,253 - 1,651,376 = 55,877 acres

06 Vol: 1,656,749 - 1,603,262 = 53,487 AF

Acr: Δ = 55,877 acres

Ann,

I have done a lot of work today on doing over the average-year scenario for just shutting off the LR, MR and UR NRDs together. The graphs I am sending show the results. I started off with and above-average pumping volume total of 2,086,000 AF and reduced the total to what I determined to be and average-year pumping of 1,752,000 AF, then re-ran all the scenarios for the 3-NRD run. This does NOT make a significant change in the results; therefore I would not be worried about showing the charts I provided in the previous 'average year' spreadsheets. The resulting change in this ~16% decrease in pumping is an approximate 2.5% average decrease in the impacts, and therefore, little change in the calculation of 'allocation minus CU'. Of course, there was a lag in the effect of the decrease in pumping; in the first year, my impacts decreased about 1.1% and by the sixth year, the impacts were about 3.8% different than the run before I adjusted down the pumping.

I am still puzzled as to how my previous model run for the repeating 2003-2004 drought scenario shows us climbing out of the hole faster, although the impacts are greater. I need to spend some more time on this. The accounting is a result of many factors, so perhaps there is some logic behind it. Since I have redone calculations for the 'average-year' scenario and come up with similar results, I feel more confident in these numbers. Besides, my drought scenario is based on two years that vary considerable whereas, the 'average year run is simpler to follow since it is based on the same repeating data year after year. Those are the results I would discuss with the NRDs, however letting them know these are not my final numbers. I need to spend a little more time on this, unfortunately.

Here is what was used in the 'average year' runs:

Stream package (reservoir levels) from 2004  
1990 Evapotranspiration, KS and CO pumping files  
1990 Precipitation files  
2004 NE SW and GW Comingled files  
municipal pumping from 2004

Thanks,  
--Paul

05-11

Av Yr

No CREP

\*pmp

~~2004~~

Area

Vol

GWEX 05.dbf = 1,707,253

1,548,495

~~GOOD!~~

GWEX 06.dbf =

1,554,887

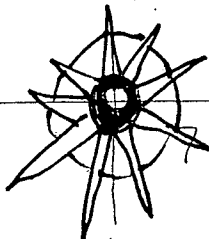
official GWEX 04.dbf 1,707,253

1,819,618

~~\*pmp~~

all years  
GWCO =

119909.8



71862.4

$\Sigma$  \*pmp for ~~2006-2011~~ should be  
each year 2006-2011 = 1,656,749.4

$\Sigma$  pmp for 2005 should = ~~1,656,749.4~~ 1,620,357.4 ← Good!

Aco all years should = ~~1,707,253~~

Agw good, = 1,707,253

$\Sigma$  WEX should = 

acres	Vol
56,800.6	53,943.4

 ← Good  
all ASw files same

Sum RCS = 52857.

RCS =  $\Sigma$  2005 = 332,859

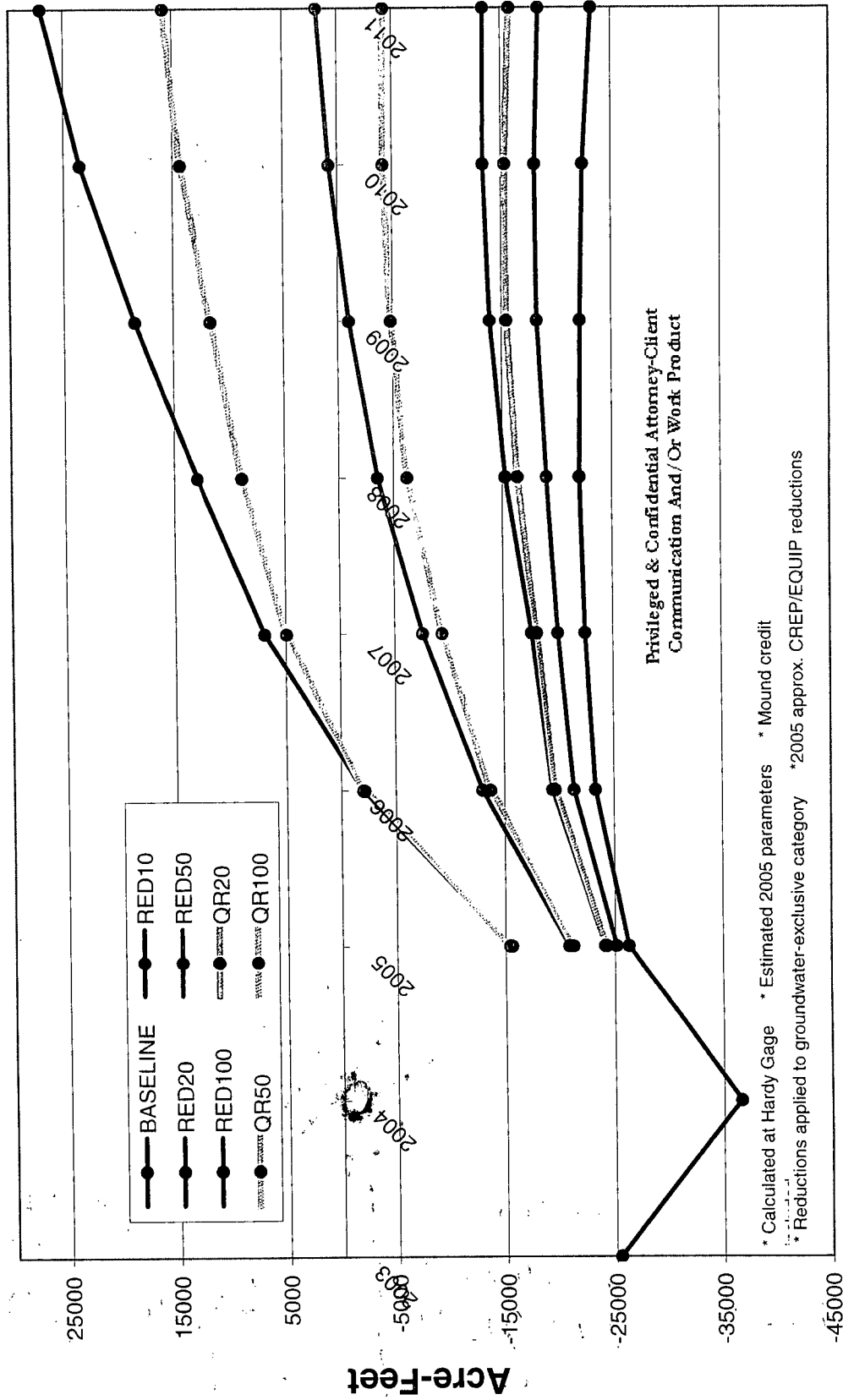
$\Sigma$  2006 = 346,137.9

387,083.9

All good

CO = 2004  
KS = 2004

# NE Allocation Minus Consumptive Use, Average-Year Climate Conditions; Reductions for Lower, Middle and Upper Republican NRDs



2005-2011  
 ✓ AU Yr - W / CREP

2005-2011	Acres	Vol
GWEX 05 dbf in →	1,651,376	1,496,235
"	"	1,531,399
official 2004. dbf	1,707,253	1,819,618

2004 Vol x .871 = ~~1,548,495~~ 1,548,495  
 x .85 = ~~1,548,495~~ 1,584,877

Δ acres = ~~1,651,376~~ 2005 = 558,777 less  
 2006 = " "

No CREP Vols:  
 (\*.85) 2005 = 1,548,495  
 (\*.871) 2006 = 1,584,887  
 Σ 2005 GWCO = 119,909.8 71,862.4  
 2006 GWCO = " "

CREP Δ Vols = 2005 = 52,260  
 2006 = 53,488  
 CREP Δ Acres 2005 = 55,877  
 2006 = " "

✓ \*pmp files

Σ \*pmp 2005 = 1,568,097  
 Σ \*pmp 2006 = 1,603,262

← Good!

2005 \*pmp GWEX only = 1,568,097 - <sup>GWCO</sup> 71,862 = 1,496,234.6  
 official 2004 vol x .871 = 1,548,495 minus 2005 \*pmp = 52,260

2006 \*pmp GWEX only = 1,603,262 - 71,862 = 1,531,400  
 official 04 vol x .851 = 1,584,877 - 1,531,400 = 53,477

GOOD!

CO=04  
 KS=04

## **'DRY YEARS' 2005 THROUGH 2011 MODEL SCENARIO WITH CREP/EQUIP REDUCTIONS**

This run was performed to calculate and analyze the stream impacts of a series of years with below-average precipitation conditions. These model runs are based on an estimate of 2005 parameters, followed by six years of estimated 'dry year' parameters.

In addition to the groundwater-exclusive (GWEX) acreage and volume estimates explained below, approximations were made of county-specific CREP and EQUIP program acreage reductions to date. The reductions were applied evenly to both the acreages and volumes of GWEX category irrigation in the quick-response areas of counties having acres registered in the CREP and EQUIP programs. The proportion of acres registered into these programs to the total irrigated acreages in the quick response area in each county was calculated. Then, the acres and volumes for all quick-response model grid cells (in counties where there were estimated CREP or EQUIP registered acreages) in the GWEX model input file were multiplied by (1 - this proportion). The adjustment was applied to all seven years of this model run. There were 50,000 acres reduced through this process. This estimation procedure was a best estimate using limited geographic data.

The 2005 parameters are as follows:

1990 precipitation; this year was chosen because like 2005, there was 13.5 inches of irrigation-season precipitation.

2004 Kansas and Colorado pumping and surface-water files

2005 canal seepage files as calculated using preliminary canal data

2004 surface water files (exclusive and commingled categories)

2004 groundwater-commingled pumping files

2004 evapotranspiration file

2004 reservoir levels

2004 municipal pumping files

2004 groundwater-exclusive category acres

2004 groundwater-exclusive category pumping multiplied by a factor of .851. This factor was determined by multiplying the ratio of the irrigation-season rainfall (May through August) in 2004 to the irrigation-season rainfall in 2005 by the pumping volumes in 2004, then multiplying this ratio by .95 to account for the 5% decrease in pumping agreed to by the NRDs in their Integrated Management Plans:

$$12.1''(2004) / 13.5''(2005) * .95 = .851$$

For 2006 through 2011, 2003 and 2004 parameters were repeated three times

### **Chart Definitions**

QR20: 20% Quick-Response area reduction.

QR50: 50% Quick-Response area reduction.

QR100: 100% Quick-Response area reduction.

RED10: 10% Reduction across the defined region.

RED20: 20% Reduction across the defined region.

Av Yrs 06-20 → ~~KS are OK'd from 2004~~  
 ALL <sup>Acres</sup> GWCO = for both w + w/out CREP Red  
 also ASW & RCS all =  
 SW from 2004 OK'd  
 \* Mi OK'd = 2004 for w/w/o CREP Red

06-20 Av Yr No CREP Red: All \*.pmp files same  
 $\Sigma *.pmp = 1,656,749.7$   $\Sigma GWCO$  from dbf = Acres = 119,909.8  
 Vol = 71,862.4


$1,656,749.7 - 71,862.4 = GWEX Vol = 1,584,887.4$  <sup>co good here</sup>  
 2004 dbf GWEX = ~~1,819,618~~ 1,819,618  
 ALL  
 Good!

$1,819,618 \times .871 = 1,584,887.4$   
 Agw = 1,707,253

Av Yrs 06-20 w- CREP Red  
 $\Sigma GWCO$  from dbf = 119,909.8 acres & 71,862.4 Vol  
 without CREP was 1,584,877 GWEX Vol

$\Sigma *.pmp = 1,587,458.8 - GWCO 71,862.4 = 1,515,596.4$   
 $\rightarrow$  No CREP (1,584,877) =  $\Sigma *.pmp$  (1,515,596.4) = 69,280.6  
 ATF reduce to CREP RED

Agw = 1,637,252  
 No CREP Red Agw (1,707,253) - 1,637,252 = 70,001  
 acre reduction  
 GOOD!

~~CS~~ files prep 2003 → should be 2004  
 KS good  
 ALL GOOD  
 FIXED  
 CO = 2004  
 KS = 2004  
 Good  


RED50: 50% Reduction across the defined region.

RED100: 100% Reduction across the defined region.

AllRegRed: Reduction across entire model region, including outside the Republican Basin.

LR: Lower Republican NRD.

MR: Middle Republican NRD.

TB: Tri-Basin NRD.

UR: Upper Republican NRD.

3NRD: The LR, MR and UR region.

\* *OFFICIAL\_05-11DryYrs\_Base0304\_WithCREP\_Red\_EXP.doc. October 16, 2005*



AvYr0620\_NoCREP\_Red → Double check ☺

from RRP Agw = 1,707,253 ACO = 119,909.8 ASW = 56,800 Mi = 2004!  
 \*Pmp = 1,656,749.7 minus 71,862 = 1,584,887 AF

From \*dbf used to produce these post-mknedat files:

GWCO:	Acres = 119,909.8 ✓	Vol = 71,862
SWCO:	119,909.8 ✓	110,788
SWEX:	56,800.6 ✓	53,943.4
GWEX:	1,707,253 <del>1,637,252</del>	1,584,887 ← 3000

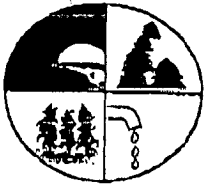
*(adjusted)*  
 L "06AvYrGWEX-Est.dbf"

2004 official \*dbf Acres = 1,707,253 Vol = 1,819,618. x .85 = 1,548,495  
 x .87 = 1,584,887

~~(1,584,887) + 1,548,495 = 1,105,7817 ← surface~~

GWCO	Acres = 119,909.8	Vol = 71,862.4	} ALL 2004 data
SWCO	Acres = 119,909.8	Vol = 110,788	
SWEX	Acres = 56,800.6	Vol = 53,943.4	

ALLCO = 2004 ALLKS = 2004



220 Center Ave.  
PO Box 81  
Curtis, NE 69025

Phone: 800-873-5613 or  
308-367-4281  
Fax: 308-367-4285  
Email: cpeterson@mrnr.org

# Middle Republican Natural Resources District

Local Conservation Program  
Water Meters

Village of Wallace

Village of Wallace

PO Box 40

Wallace NE 69169-40

Twn: 10 Rng: 34 Sec: 14 Qtr: NW 1/4 of NW 1/4

RegNo: G-027465 S DNR ID: 34143

Meter No: 0

Meter Units (please circle one from each line below)

gallons    acre-feet    acre-inches  
x100    x1000    x.01    x.001    x \_\_\_\_\_

2004 Year end reading 164,829

142,217 gallons x 1000

69.4

**Please complete the meter reading and usage for 2004. Please return the completed form to the Middle Republican NRD no later than January 31, 2005. After all meter readings are received and usages calculated, reports will be sent out showing annual usage. Thank you for your assistance.**

AvYrs 06-20 W\_CREP\_Red

Booble ✓

Σ RRPPK.PMP = 1,587,458.8

6 WGO  
04

71,862.4

AVYR  
w/CREP VOL

1,515,596

1,584,877

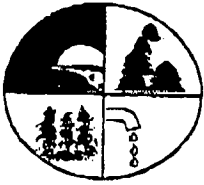
-69,281

6 WGX  
VOL  
Red  
from  
CREP

ACO = 119,909.8

AGN = 1,637,252 good!

ASW = 56,801



220 Center Ave.  
PO Box 81  
Curtis, NE 69025

Phone: 800-873-5613 or  
308-367-4281  
Fax: 308-367-4285  
Email: cpeterson@mrnrd.org

## Middle Republican Natural Resources District

Local Conservation Program  
Water Meters

Thomas & Pamela Logsdon

Thomas & Pamela Logsdon

PO Box 236

Trenton NE 69044

Twn: 2 Rng: 33 Sec: 2 Qtr: SE 1/4 of NW 1/4

RegNo: G-070151 DNR ID: 78317

Meter No: 98-6093-3

Meter Units (please circle one from each line below)

gallons    acre-feet    acre-inches  
x100    x1000    x.01    x.001    x 10

2004 Year end reading 081257

678520 gallons x 100

**Please complete the meter reading and usage for 2004. Please return the completed form to the Middle Republican NRD no later than January 31, 2005. After all meter readings are received and usages calculated, reports will be sent out showing annual usage. Thank you for your assistance.**

Received Time: Apr. 12. 2:40PM