RRCC Management Options

Objectives

Short-term

Reduce consumptive use in 2006 to meet anticipated allocation.

Long-term

Plan for reducing consumptive use up to 20% in extended drought periods.

Water plans for extended drought that comply with Settlement Agreement provisions for 3 year extension. Drought / Water Short Year management plans require Compact approval before the 3-year averaging can be implemented.

Information Needs

Objective confirmation of model reliability.

Measure and document model output against available data including measured heads in observed well network, stream flow (following base flow separation), pumping data, etc.

Evaluate model's ability to function given changes in acres irrigated, additional pumping and drought conditions that have occurred since model was last verified.

Management Options

In the narrative that follows, management options that were included in the Compact Settlement Agreement are marked by an asterisk (*). Option numbers below refer to the attached "Water Supply Management Options for 2006" table. A common thread among all the options that involve foregoing irrigation is the need to understand how the "Prevented Planting" claims process and eligibility standards are administered. This and other issues will be investigated, so that the adopted management options can realistically incorporate available assistance from federal programs.

1) Expand the CREP program by an additional 20,000 acres in the Republican River Basin. This is a work already in progress. The goal is to have 70,000 acres enrolled in the CREP program in the Republican.

2) Add 10,000 acres to EQIP in the Republican. Targeted areas will be selected to maximize the benefits of conversion of crop acres to dryland practice. This would result in a total of 20,000 acres of EQIP in the Republican.

3) *Dry year leasing of water diversions at or above Guide Rock. This could include surface water and ground water diversions. Per acre costs should be similar to the EQIP program. Two areas within the quick response area were investigated to estimate the relative benefits of targeted dry year leases.

A) An area roughly from Arapahoe to Harlan County Lake (HCL) that contained about 73,000 acres of irrigated land.

B) HCL to the Guide Rock Diversion Dam containing about 43,000 acres.

4) *Reducing storage use in the Bostwick Irrigation District in Nebraska. This could include reduced natural flow diversions too. Nebraska shares the amount of water in the irrigation pool with Kansas Bostwick. The current estimate for Nebraska's share of the storage in June 2006 is about 10,000 AF. Superior Canal has been diverting around 5,000 AF of natural flow so the total benefit could be around 15,000 AF. The District has about 22,406 acres under permit. In addition to the dryland conversion cost, the irrigators have annual Operation and Maintenance (O&M) costs to consider.

5) Reduce natural flow and storage diversions in the Frenchman-Cambridge Irrigation District (FCID). FCID has 4 canals that divert water from 3 reservoirs. The most stable supply is from Medicine Creek which is stored in Harry Strunk Reservoir. Cambridge Canal diverts mostly Medicine Creek water. The diversion could yield around 20,000 acre-feet annually. Non-traditional storage and release procedures could be used to potentially gain several thousand AF, while allowing FCID to divert into Cambridge Canal.

Red Willow, Bartley and Meeker-Driftwood Canal's water supply from Swanson and Hugh Butler Reservoirs are computed as one supply. Operating the releases to more adequately supply one canal while compensating another to continue to forgo irrigation could benefit irrigators and the river flows. This may not be a viable option depending on Bureau of Reclamation rules or contracts.

6) Reduce diversions of the Frenchman Valley Irrigation District (FVID). FVID has been diverting only natural flow for the past two years. The storage and inflow into Enders Reservoir is negligible. Only a small fraction of the 9,000 or so acres received water this past irrigation season. The diversion was 6,500 AF. Nebraska gets about 76% of the flow passing the Frenchman Creek near Culbertson gage, which is downstream of the FVID diversion dam. Nebraska's allocation could be increased by several thousand AF and the consumptive use would drop some, if the water were left in the river. H&RW Irrigation District diverts from the same dam as FVID. However, it has not received water for several years, since it has a junior water right to FVID. H&RW has about 11,000 acres under water right permit.

7) Reduce natural flow diversions of Riverside Canal. Riverside is also along the Frenchman Creek and has been diverting a significant amount of water, but delivering to a small amount of acres. Passing flows to the Culbertson gage would have the same effect as those in option 6.

8) Retire or Lease irrigated acres in the Frenchman Creek Basin below Enders Reservoir. This would have the benefit of the higher allocation to Nebraska of flow past the Culbertson gage.

9) Reducing certified acres in the quick response area would have a similar effect as reducing pumping in the quick response area. Reductions between 10% and 20% can be studied. The quick response has roughly 300,000 irrigated acres. Options A-C are fractions of the 300,000 acres.

10) Reduce all pumping by 10% plus an additional 25% in the quick response area. This is an option that addresses short and long term goals and has been modeled. The quick response reduction could be accomplished in a similar fashion to the EQIP program.

11) *Adjust multi-year Integrated Management Plan (IMP) allocations in the quick response area above Guide Rock. Reducing consumptive use in the quick response area has the most immediate benefit to stream flows.

12) * Adjust multi-year IMP allocations outside of the quick response area above Guide Rock. This could be part of a long-term solution that reduces consumptive use of stream flow to a more manageable level.

13) Stream flow augmentation from pumping wells into the Republican River or tributaries from inside or outside Republican River Basin. Augmenting flows into HCL and between HCL and the Guide Rock Diversion dam have been studied. The main challenge is how to handle the transport of water without losing too much flow in the year that it is needed. Within the basin it is a "borrow-now, pay-later" scheme. If you place the pumping wells too close to flowing streams, the ground water draw-down could have a quick and negative impact on stream flow from above the well group. If you place the wells too far from the flowing streams, then seepage into dry creek and ditch beds absorb too much of the flow, although most is not permanently lost to the system. Pumping from outside the basin into a pipeline for delivery at the desired location is effective, but very expensive to set up. Annual operating costs are reasonably affordable. This would be an imported water supply so Nebraska gets all of the flow as a credit.

A) Use 179 existing wells immediately upstream along north-side tributaries to the Republican River above the Guide Rock Diversion dam.
B) Use 154 existing wells near the confluence of the branches of Thompson Creek near Riverton.
C) Use 361 existing wells on north-side tributaries above immediately above HCL
D) A state-owned well field outside of the Republican Basin with a pipeline to the Guide Rock Diversion Dam

Other considerations are whether existing wells would be used for irrigation too. This brings up the timing issue. It has been noted that irrigation wells are not setup to pump in cold weather. There also has been noted resistance from well owners in an informal poll.

14) * Stream flow augmentation from the Platte River Basin or below Guide Rock diversion dam. A demonstration project could be undertaken with voluntary participants to obtain mound credits or otherwise increase the virgin water supply at a time when imported water supply credit would not otherwise be available. Another project could be used to augment Bostwick I.D. water supply from below the Guide Rock Diversion dam.

15) Conduct a pilot project to investigate the merits of removal and annual maintenance of riparian vegetation along a selected stream reach. This could be done to study the costs of clearing and maintaining a cleared area, plus investigate potential water supply benefits of this activity.

16) Investigate all replacement wells drilled after December 15, 2002 and enforce the limitations required under the Settlement Agreement.

17) Breach small dams on tributaries or drainages that could reach a flowing stream and enhance the virgin water supply.

18) Investigate the possible increase in rainfall in the basin due to weather modification techniques.

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Water Supply Management Options for 2006

		Project	Estimated Annual Yield (AF)	Aditional Acres Affected
1		Expand CREP to 70,000 Acres[1]	3,000 - 7,400	20,000
2		Targeting EQIP on Quick Response Area[2]	1,350 - 1,850	10,000
3		Dry Year Leasing in Quick Response Area		
	A.	Above Harlan County Lake[3A]	800-6,200	73,000
	B.	Harlan County Lake to Guide Rock[3B]	5,800 - 8,000	43,000
4		Buy Out Bostwick Irrigation District[4]	15,000	22,406
5		Buy Out Frenchman Cambridge[5]	20,000 - 25,000	17,232
6		Buy Out Frenchman Valley[6]	2,250 - 5,000	9,292
7		Buy Out Riverside Canal[7]	600-1,200	652
8		Retire or Lease GW Irrigated Acres in the Frenchman Cr. Basin below Enders Res.[8]	?	?
9		Regulatory Reduction in Certified Acres		
	A.	Reduce by 10% in Quick Resp.[9A]	?	30,000
	B.	Reduce by 15% in Quick Resp.[9B]	?	45,000
	C.	Reduce by 20% in Quick Resp.[9C]	?	60,000
10		Reduce All Pumping by 10% plus 25% Quick Response Area[10]	4,500 - 10,500	QR 75,000
11		Adjust Multi-Year Allocations in Quick Resp. above Guide Rock Diversion Dam[11]		300,000
12		Adjust Multi-Year Allocations in non-Quick Resp. above Guide Rock Diversion Dam[12]		All Above G.R.
13		Stream Flow Augmentation		
	A.	Upstream Guide Rock[13A]	7,200	Dryland Option
	B.	Thompson Creek[13B]	6,400	Dryland Option
	C.	Above Harlan County Lake[13C]	15,600	Dryland Option
	D.	Outside of Republican Basin[13D]	9,500	4,000
14		Supplement Virgin Water Supply or Bostwick Irrigation supply with alternate supplies from below Guide Rock or outside the basin[14]	?	N/A
15		Pilot Project to Investigate Impact of Removal of Riparian Vegetation[15]	?	N/A
16		Investigate illegal acres expansion from replacement wells drilled after Dec. 15, '02[16]	?	?
17		Breach Small Dams[17]	?	N/A
18		Investigate Weather Modification[18]	?	N/A

$1 million/annual

Numbers in these tables are rough estimates and will require refinement if selected.
Super Script number/letter corresponds to narrative report section.

Dec 16, 2005
Cambridge, NE

	HOURS PUMPED BY YEAR REP. PORTION OF DISTRICTS					
	2001	2002	2003	2004	2005	Change
DAWSON	690.4	1086	912.7	839.4	incomplete	
HIGHLINE		1419	1197	969.5	927.7	-4%
MCCOOK	914.9	1208.7	990.1	856.7	658	-23%
MIDWEST	1068.6	1415.9	1237.5	1096.2	924	-16%
SOUTH CENTRAL	709	989	880.1	742.9	666.4	-10%
SOUTHERN	721	951.7	903.8	815	692.2	-15%
SOUTHWEST	1154	1518	1245.7	1093.8	902	-18%
TWIN VALLEYS	720.6	1113.5	845.7	802.2	717	-11%