Delisting and not reporting due to dryness may not be the same issue. We report evap. So dry = 0. I would need to review data.

Delisting occured if we no longer believed there was a 15 af structure or in some cases, a structure at all (Ex. sand pit)

Basin wide is still debated.

I don't think we are obligated to do this. We have more important things, to do.

← our method assumes an average surface area was closely approx
- imated by the early summer photography. This could be debated, but we don't have site specific info on many of the locations.

KANSAS
DEPARTMENT OF AGRICULTURE

Kathleen Sebelius, Governor
Adrian J. Polansky, Secretary

www.ksda.gov/dwr

August 1, 2008

By Email and US Mail

Brian Dunnigan, Acting Director
Nebraska Department of Natural Resources
301 Centennial Mall South
Lincoln, Nebraska 68509-4676

Dear Mr. Dunnigan:

In keeping with the provisions of Article IX of the Republican River Compact and the Section I.E. of Republican River Settlement Stipulation related to records pertaining to the annual data exchange, I would like to request additional data files and assistance in verification of data submitted for use in the Republican River Groundwater Model and Accounting procedures.

For the changes made to the Non-Federal dam inventory for 2005 and 2006 please provide the methodology and supporting documentation for the changes made. It is our understanding that a review was made of NAIP imagery and dams were delisted from the inventory for not having any visible water in storage during the times the imagery was taken or were delisted because of the visible water in storage was calculated to a volume to be less than the minimum size for inclusion. It is also our understanding based upon discussion with your staff that the 2007 inventory was unchanged from the preceding 2006 inventory that you have provided to us this spring. Please provide verification of our understanding and outline the procedures taken if it in fact differs from this understanding. Given that 2005-2006 were drought years, we do not believe it appropriate to continue to exclude dams in the wetter year of 2007 unless you verified this through a similar process. Please provide documentation for each change made in your basin wide Non-Federal dam inventory since 2004 explaining each change in detail and its basis.

For dams that were in the inventory, it is our understanding that for both the 2006 and 2007 accounting years the surface area of storage within each reservoir was calculated by a measurement of actual water in storage during the time the NAIP imagery was taken for each respective year. We understand that these surface areas were then used to compute the surface area of impounded water within each structure to be representative of the entire year. We believe that this one point in time measurement is problematic to be used to represent the reservoir surface acres for the entire year since it is measured during the summer period when reservoir conditions are typically lower than

I would have to look, but I don't think we need to be too concerned with this. What he is alluding to would only be applicable if we had area/capacity info. on all sites.

↓

Shuhat identified numerous structures that seem large enough in KS, but no reported mods.

This is much ado about nothing.

We could ask if they have looked in their own yard.

We could counter offer to remove any structure we have not verified to contain 15 af capacity by survey et al.

← I believe we are to report water use, not water non-use

← NAIP may not be the best source to determine irrigation in a wetter than average year.

← NRD responsibility
Did we asked them to certify their results?

We need to review what is required and then make sure we have met that standard. Anything beyond that is part of a verification request that can take time.

average. Since this procedure differs from the prescribed "presumptive average" calculation as outlined in IV.2.f. in the accounting procedures, we would like to propose this procedure to be discussed during the Engineering Committee meeting as part of the August RRCA Compact meeting prior to approval of the 2007 accounting.

Clarification of the Nebraska inventory and evaporative calculations are not only necessary for accounting verification, but also to the study of the impacts of land terraces and non-Federal reservoirs in their final analysis.

For the reported groundwater and surface water diversion records you provided us for 2007 accounting year, there were no records for zero volume pumped wells or surface water diversions and no records provided for municipal and industrial wells. Please provide those records so we can use for verification purposes.

Furthermore, I have included shapefiles of groundwater wells and irrigated acreages within the Republican River Basin in Nebraska that we have questions on regarding amount of water use reported in 2006 and 2007, accounting years. These questions are based upon our review of NAIP imagery and the reported well records provided by NDNR for each year. From our initial analysis, these acres appear to have been irrigated in either 2006 and/or 2007 but it is unclear to us that the water use was reflected in the reported records.

For the groundwater wells please verify to us:

1. The amount pumped in 2006 and 2007 including the beginning and ending meter readings for each year.
2. The acres or place of use to which the wells are associated with along with the appropriate NRD permit number.

For the irrigated acreage shapefiles (includes pivot and non-pivot tracts) please verify to us:

1. The source of water, including identification of all associated wells and/or surface water diversions with the applicable identifying information (i.e. well ids, surface water diversion numbers, etc.) and the appropriate NRD permit number.
2. The quantity of water pumped from the above wells or diversions with the identifiable id numbers that serves these acres or portions of these acres specific to each well or surface water diversion, including beginning and ending meter readings for both the 2006 and 2007 years.

As part of the Republican River Compact Administration annual accounting procedures, I believe that the facilitation of open data exchange and review is essential and in the overall best interest of all involved States. Your prompt attention to this matter is appreciated.

After the follow up information is provided, Kansas may wish in the future to request for accompanied field visits to examine the appropriate well or surface water diversion records and possibly accompanied field visitations if deemed necessary.

Sincerely,

David W. Barfield, P.E.
Chief Engineer

Attachment
DWB/mb

Cc: Dick Wolfe

of each month and converted to a "free water surface" (FWS) evaporation, also referred to as "lake" evaporation. The FWS evaporation is determined by multiplying the observed pan evaporation by a coefficient of .70 at each of the reservoirs. This coefficient can be affected by several factors including water and air temperatures. The National Oceanic and Atmospheric Administration (NOAA) has published technical reports describing the determination of pan coefficients. The coefficient used is taken from the "NOAA Technical Report NWS 33, Map of coefficients to convert class A pan evaporation to free water surface evaporation". This coefficient is used for the months of April through October when evaporation pan readings are recorded at the dams. The monthly FWS evaporation is then multiplied by the average surface area of the reservoir during the month in acres. Dividing this value by twelve will result in the amount of water lost to evaporation in Acre-feet during the month.

During the winter months when the evaporation pan readings are not taken, monthly evaporation tables based on the percent of ice cover are used. The tables used were developed by the Corps of Engineers and were based on historical average evaporation rates. A separate table was developed for each of the reservoirs. The monthly evaporation rates are multiplied by the .70 coefficient for pan to free water surface adjustment, divided by twelve to convert inches to feet and multiplied by the average reservoir surface area during the month in acres to obtain the total monthly evaporation loss in Acre-feet.

To obtain the net evaporation, the monthly precipitation on the lake is subtracted from the monthly gross evaporation. The monthly precipitation is calculated by multiplying the sum of the month's daily precipitation in inches by the average of the end of the month lake surface area for the previous month and the end of the month lake surface area for the current month in acres and dividing the result by 12 to obtain the precipitation for the month in acre feet.

f) Non-Federal Reservoir Evaporation:

For Non-Federal Reservoirs with a storage capacity less than 200 Acre-feet, the presumptive average annual surface area is 25% of the area at the principal spillway elevation. Net evaporation for each such Non-Federal Reservoir will be calculated by multiplying the presumptive average annual surface area by the net evaporation from the nearest climate and evaporation

station to the Non-Federal Reservoir. A State may provide actual data in lieu of the presumptive criteria.

Net evaporation from Non-Federal Reservoirs with 200 Acre-feet of storage or greater will be calculated by multiplying the average annual surface area (obtained from the area-capacity survey) and the net evaporation from the nearest evaporation and climate station to the reservoir. If the average annual surface area is not available, the Non-Federal Reservoirs with 200 Acre-feet of storage or greater will be presumed to be full at the principal spillway elevation.

B. Specific Formulas for Each Sub-basin and the Main Stem

All calculations shall be based on the calendar year and shall be rounded to the nearest 10 Acre-feet using the conventional rounding formula of rounding up for all numbers equal to five or higher and otherwise rounding down.

Abbreviations:

CBCU	= Computed Beneficial Consumptive Use
CWS	= Computed Water Supply
D	= Non-Federal Canal Diversions for Irrigation
Ev	= Evaporation from Federal Reservoirs
EvNFR	= Evaporation from Non-Federal Reservoirs
FF	= Flood Flow
GW	= Groundwater Computed Beneficial Consumptive Use (includes irrigation and non-irrigation uses)
IWS	= Imported Water Supply Credit from Nebraska
M&I	= Non-Irrigation Surface Water Diversions (Municipal and Industrial)
P	= Small Individual Surface Water Pump Diversions for Irrigation
RF	= Return Flow
VWS	= Virgin Water Supply
c	= Colorado
k	= Kansas
n	= Nebraska
ΔS	= Change in Federal Reservoir Storage
%	= Average system efficiency for individual pumps in the Sub-basin
% BRF	= Percent of Diversion from Bureau Canals that returns to the stream
###	= Value expected to be zero

Harlan County Lake
Lovewell Reservoir

c. Non-federal reservoirs obtained by each state: an updated inventory of reservoirs that includes the location, surface area (acres), and capacity (in Acre-feet), of each non-federal reservoir with storage capacity of fifteen (15) Acre-feet or greater at the principal spillway elevation. Supporting data to substantiate the average surface water areas that are different than the presumptive average annual surface area may be tendered by the offering State.

d. Diversions and related data from USBR

Irrigation diversions by canal, ditch, and pumping station that irrigate more than two (2) acres
Diversions for non-irrigation uses greater than 50 Acre-feet
Farm Deliveries
Wasteway measurements
Irrigated acres

e. Diversions and related data – from each respective State

Irrigation diversions by canal, ditch, and pumping station that irrigate more than two (2) acres
Diversions for non-irrigation uses greater than 50 Acre-feet
Wasteway measurements, if available

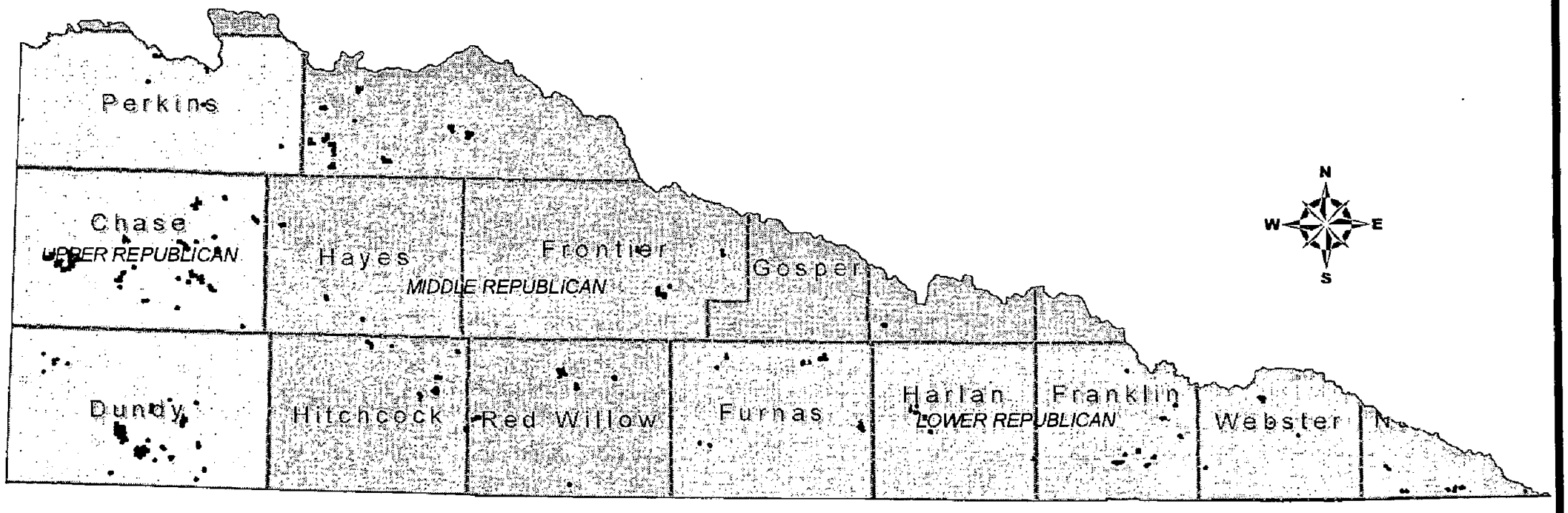
2. Groundwater Information

(From the RRCA Groundwater model as output files as needed for the accounting procedures)

a. Imported water - mound credits in amount and time that occur in defined streamflow points/reaches of measurement or compliance – ex: gaging stations near confluence or state lines

b. Groundwater depletions to streamflow (above points of measurement or compliance – ex: gaging stations near confluence or state lines)

Nebraska Well Registry Records and Irrigated Acre Tracts Identified by Kansas for Follow Data Request for the 2006 and 2007 Accounting Years.



Portion of Republican River Basin in Nebraska

0 12.5 25 50 Miles

Legend

- Wells identified for follow up data
- Tracts identified for follow up data

Kansas Department of Agriculture
Division of Water Resources
Interstate Water Issues
August 1, 2008

COPY

KANSAS
DEPARTMENT OF AGRICULTURE

Kathleen Sebelius, Governor
Adrian J. Polansky, Secretary

www.ksda.gov/dwr

August 1, 2008

By Email and US Mail

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Chief Engineer

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DWB/mb

Cc: Dick Wolfe

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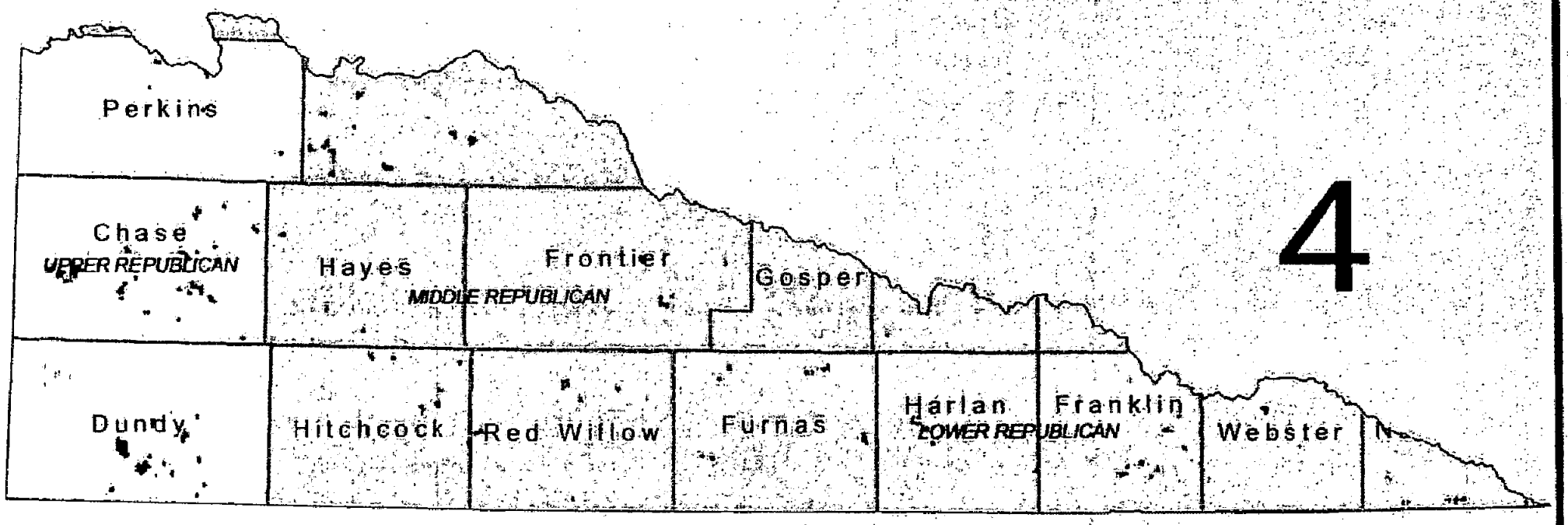

4

Portion of Republican River Basin in Nebraska

0 12.5 25 50 Miles

Legend

Wells identified for follow up data

Tracts identified for follow up data

Kansas Department of Agriculture
Division of Water Resources
Interstate Water Issues
August 1, 2008

DNR 018716

KANSAS
DEPARTMENT OF AGRICULTURE

Division of Water Resources
109 SW 9th Street, 2nd Floor
Topeka, KS 66612-1283

KANSAS CITY 641-651
TOPEKA KS 666
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DEPARTMENT OF
NATURAL RESOURCES

BRIAN DUNNIGAN, ACTING DIRECTOR
NEBRASKA DEPT OF NATURAL RESOURCES
301 CENTRNNIAL MALL SOUTH
LINCOLN NE 68509-4676

68508252S C012

DNR 018717

Amber Woods-Rodgers

Home | Maps | Wells | Water Rights | Dams | Crep | Event Tracking | Documents

Unassigned Documents | All Documents

Legal Document Detail

Document Scan's

Effective Date	First Code	Second Code	Comment
8/5/2008	Correspondence		

Primary Document

	Document ID	Staff Lead	Completion Date	Create User	Create Date	Modify User	Modify Date	Comment
Edit	238	BDunnigan		DNR\lkoehne	8/5/2008	DNR\lkoehne	8/5/2008	Kansas Dept Agriculture request a files and verification of data submi Republican River Groundwater Mo Accounting

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Associated Document Descriptions

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Records Request	Records Request
Republican Compact	Republican Compact

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Edit			BDunnigan			8/5/2008	jwilliams;akessler;jschneider;sfrance	8/5/2008	DNR\sfr