VIA ELECTRONIC MAIL ONLY

Date: December 31, 2015

TO: Governance Committee (GC) of the Platte River Recovery Implementation Program (PRRIP)

FROM: Jeff Fassett, State of Nebraska's Representative to the GC
Director, Nebraska Department of Natural Resources

SUBJECT: Nebraska Update on Continued Implementation of the Nebraska New Depletion Plan (NNDP)

Nebraska continues to meet the terms of the Nebraska New Depletions Plan (NNDP). Based upon current estimates, the amount of accretions due to mitigation measures exceeds the amount of depletions from new or expanded uses. Details on the estimates and Nebraska's continued efforts to implement the NNDP are discussed in this memo. This memo also contains a general description of Nebraska's ongoing work to develop and utilize comprehensive tools to continue updating its assessment of all post-July 1, 1997, water related activities.

This update is being provided to the Governance Committee (GC) to outline Nebraska's depletive activities and mitigation measures through September 15, 2015, resulting from new and expanded uses of water as defined in the NNDP. This update utilizes information from previous memos and annual reports as well as additional information developed by Nebraska to summarize the net effect (difference between depletive activities and mitigation measures) through the end of the first increment (2019). The four sections in this update are described in detail below. If there are questions on the contents of this document please contact Jennifer Schellpeper at 402-471-2899 jennifer.schellpeper@nebraska.gov.

MEMO ORGANIZATION

The memo is organized similarly to the December 31, 2014, update provided by Nebraska to the GC. Section 1 includes updates on new or expanded permitted uses post-2005 and other new or expanded uses since July 1, 1997. Section 2 reviews the mitigation measures currently in place to offset the depletions from the activities described in Section 1. Section 3 summarizes the net effect of the combined depletions and mitigation measures from Sections 1 and 2 and the resulting effect of these activities on streamflows of the Platte River in Nebraska. Section 4 describes the continued efforts currently in process to refine assessment methodologies.

1.0 UPDATE ON NEW OR EXPANDED WATER RELATED ACTIVITIES

Post-2005 Permitted Activities

Summarized in Table 1 are the net effects of new or expanded post-2005 permitted activities. Details on the sources of the data can be found in Nebraska's annual reports to the GC[1]. Table 1 shows the total estimated depletions, mitigations, and net effects through the first 10-year increment (2019) by stream reach for permitted new and expanded groundwater and surface water uses issued between January 1, 2006, and December 31, 2014. The table also shows the total impacts of the permitted uses and their associated mitigations through 2019. A negative value in the table represents depletion and positive represents an accretion to streamflow. The total net effects are positive, resulting in accretions to streamflow.

Table 1: 2006-2014 permitted new and expanded groundwater and surface water use depletions and mitigations and the impacts through 2019 in acre-feet. A negative value represents depletion and a positive value represents accretion.

	Upstream of Critical Habitat Reach			Within Critical Habitat Reach			
Year	Depletions	Mitigations	Net Effect	Depletions	Mitigations	Net Effect	**Total**
2006	-9	25	15	-206	4	-202	**-187**
2007	-25	66	41	-11	15	4	**45**
2008	-84	180	95	-31	38	7	**102**
2009	-190	377	187	-60	55	-5	**182**
2010	-285	522	237	-94	124	30	**268**
2011	-386	733	347	-131	159	28	**375**
2012	-509	993	484	-172	197	25	**509**
2013	-683	1249	566	-230	245	15	**582**
2014	-832	1488	656	-293	305	10	**666**
2015	-955	1652	697	-350	346	-4	**693**
2016	-1058	1781	722	-399	346	-20	**703**
2017	-1145	1886	741	-442	404	-37	**704**
2018	-1220	1973	754	-482	426	-55	**700**
2019	-1285	2048	764	-518	445	-73	**691**

[1] Available at this website: http://dnr.ne.gov/PRRIP/docs/PRRIP_NE_DepletionPlan.html

Other New or Expanded Use Activities since July 1, 1997

Nebraska reported on changes in human and livestock population post-1997 to 2010 in the 2011 update dated January 6, 2012[2]. Updates to these uses and industrial uses are scheduled to occur for data collected through 2015 as part of the 5-year review Impacts from post-1997 changes in irrigated acres will also be reassessed with updated models as part of Nebraska's 5-year review.

Analysis of the sandpits and reservoirs less than 15 AF for 2005 to 2010 was completed in 2014 and no further analysis of these small water bodies will be conducted.

2.0 MITIGATION MEASURES FOR NEW OR EXPANDED WATER USE ACTIVITIES

There are a number of mitigation projects implemented by Nebraska that are ongoing or that have effects to stream flow that will continue throughout the first increment. These projects and current estimates of their potential accretions, if available, include:

- Projects that have operated or are completed and could operate in 2016
    - Diversions of excess flow that have occurred:
        - From 2011 to 2015, over 23 canals across the upper Platte River basin diverted more than 165,000 AF of water. Over 85,000 AF of water was recharged between 2011 and 2013 and over 17,000 AF of that water is estimated to return to the Platte River within the first 10 years after the recharge events. Estimates of the 2014 to 2015 recharge and 10 year benefits have not yet been completed;
        - Diversions into Elwood Reservoir during the non-irrigation season.
    - Potential future diversions of excess flow for which current legal arrangements and temporary permits exist:
        - Cozad Canal, Thirty-Mile Canal, and Southside (Orchard-Alfalfa) Canal excess flow recharge (0 AF – 16,000 AF accretion annually);
        - 5-year agreements, lasting through 2018, signed between Twin Platte Natural Resources District and five irrigation districts to carryout groundwater recharge projects in times of excess flows (No current estimate).
    - Retirement of water use both temporarily and permanently on irrigated land using several programs including the Platte Basin Habitat Enhancement Project (PBHEP), Platte Basin Water Project Coalition (PBC), and Federal programs such as the Agricultural Water Enhancement Program (AWEP), Conservation Reserve Enhancement Program (CREP), and Environmental Quality Incentive Program (EQIP) (5,200 – 8,370 AF accretion annually);
    - Reduced groundwater withdrawals via regulatory measures that place an allocation on groundwater withdrawals within North Platte Natural Resources District (3,800 – 4,700 AF accretion annually);
    - North Dry Creek Augmentation Project (0 – 1,325 AF accretion annually).

[2] Schneider, J., 2012. *Nebraska Update on Continued Implementation of the Nebraska New Depletion Plan (NNDP), Memo to the Governance Committee (GC) of the Platte River Recovery Implementation Program (PRRIP),* January 6, 2012. Available here: http://dnr.nebraska.gov/iwm/prrip-2011-update

- Projects currently planned
    - Reservoirs: J-2 Regulating Reservoirs (10,200 AF accretion annually) [this is a water action plan project, not yet constructed];
    - Transfer of Cozad Canal, Thirty-Mile Canal, and Southside (Orchard-Alfalfa) Canal surface water rights to instream use (0 – 16,500 AF accretion annually) [permits pending];
    - Nebraska Cooperative Republican Platte Enhancement Project (N-CORPE) (0 – 24,000 AF accretion annually) [construction planned for summer 2016].

Table 2 gives a summary of the accretive effect of these mitigation measures through the first increment. Activities included in the table meet one of these three conditions: 1) in operation as of 2015, 2) constructed as of 2015 and able to operate in future years with an accretion estimate, or 3) PRRIP Water Action Plan Projects to which Nebraska has committed. The mitigation measures are categorized by type of project; for example, the excess flow diversions for groundwater recharge are summarized into one column in the table. The measures included in each column are explained below the table.

Table 2: Total accretive effect from other mitigation measures.

Year	1	2	3	4	5	Total Accretive Effect
2015	10,200	740	7,570	6,280	4,010	28,800
2016	10,200	740	5,900	4,870	4,200	25,910
2017	10,200	740	5,760	3,870	4,370	24,940
2018	10,200	740	5,320	3,300	4,560	24,120
2019	10,200	740	5,220	2,950	4,750	23,860

1. J-2 Reservoir[3]
2. North Dry Creek Augmentation Project[4]
3. Retirement of Water Use on Irrigated Land (PBHEP, PBC, AWEP, CREP, EQIP)[5]
4. Diversions of Excess Flow for Groundwater Recharge: 2011 demonstration project[6], 2013 flood flow diversions[7], Elwood Reservoir[8], and Cozad Canal, Thirty-Mile Canal, and Southside (Orchard-Alfalfa) Canal Conjunctive Management Projects (excess flow portion only)[9]
5. Reduced Groundwater Withdrawals in North Platte Natural Resources District[10]

[3] J-2 Reservoir value from PRRIP Water Action Plan Project score.
[4] A value of 742 AF (rounded to 740 AF) assumed for North Dry Creek based upon annual pumping of 1,325 AF and depletion factor of 44 percent.
[5] Department analysis of retirements through 2013
[6] The 2011 demonstration project report is located here: http://dnr.nebraska.gov/iwm/conjunctive-management-toolbox. The supporting spreadsheet can be found here: http://dnr.nebraska.gov/iwm/upper-platte#PubsEtc
[7] The 2013 flood flow diversion recharge estimated using same methodology as the 2011 project.
[8] Department analysis of recharge from 2009 and 2010.
[9] Canal Conjunctive Management Project values estimated based upon Central Platte Natural Resources District's accretion estimates reduced by 50 percent to account for PRRIP contract.
[10] Department analysis done for NPNRD IMP in 2009

3.0 SUMMARY OF DEPLETIVE ACTIVITIES AND MITIGATION MEASURES

Table 3 shows the overall impacts to streamflow resulting from depletive activities and mitigation measures covered in this report, including all post-1997 new or expanded uses that are to be offset in accordance with the NNDP. Column 2 in Table 3, the 'net effect of the permittied activities' is the result of permits issued by the NRDs and Department from 2006 through 2014, given in Table 1 of this report. Column 3 in Table 3, the 'depletive effect from other activities' includes impacts from changes in irrigated acres, human population, and livestock populations from 1997 to 2005, reported in Nebraksa's January 6, 2012, Update. Column 4 in Table 3, the 'accretive effect from other mitigation measures' is the result of the mitigation projects summarized in section 2 of this report and quantified in Table 2 above. According to this preliminary assessment, current and projected accretive effects from mitigation measures exceed the calculated depletive effect of permitted and other activities by approximately 5,600 acre-feet per year at the end of the first increment.

Updated analysis on these depletive effects and mitigation measures, including analysis of the additional projects listed in section 2.0 and not quantified in Table 2, will be done as part of Nebraska's more robust assessment to be completed by 2016.

Table 3: Net effect through 2019 of depletions and accretions (acre-feet). A negative value represents depletion and a positive value represents accretion.[11]

Year	Net effect of permitted activities[12]	Depletive effect from other activities[13]	Accretive effect from other mitigation measures[14]	**Net effect of permitted, other and mitigation activities**
2015	690	-20,200	28,800	**9,300**
2016	700	-20,400	25,900	**6.200**
2017	700	-20,800	24,900	**4,800**
2018	700	-21,300	24,100	**3,500**
2019	690	-21,600	23,900	**3,000**

4.0 CONTINUED EFFORTS TO REFINE ASSESSMENT METHODOLOGIES

The guidance document that outlines the general process by which a more robust assessment of all water use activities and mitigation measures will be evaluated is available at: http://dnr.nebraska.gov/iwm/basin-wide-technical-committee-guidance-document. This process

[11] All Values in Table 3 have been rounded
[12] Values from Table 1 above, permitted activities from calendar year 2006 through 2014
[13] Values reported in Tables 2 & 5 in the January 6, 2012, Update; includes changes in irrigated acres, human population and livestock between 1997 and 2005.
[14] Values from Table 2 above, including reservoirs, streamflow augmentation from groundwater pumping, retirement of irrigated land, diversions of excess flows, and reduced groundwater withdrawals.

will provide a means to temporally and spatially refine Nebraska's assessment of the combined effects of depletive activities and mitigation measures. This approach will utilize integrated groundwater, watershed, and operations models to assess the timing, amount, and location of depletive effects and mitigation measures.

The modeling tools being developed by Nebraska are calibrated and have been peer reviewed by independent experts. Nebraska is working to develop the necessary datasets and incorporate all of its compiled data on all new or expanded uses and all mitigation measures since July 1, 1997, and a comprehensive assessment will be made of the impacts on the streamflow of the Platte River and its tributaries. Nebraska's work plan anticipates completion of the analysis in 2016.

Nebraska has begun planning for the development of the second increment of the Upper Platte Basin-Wide Plan. With the assistance of the University of Nebraska Public Policy Center, a public participation plan for the second increment plan development has been drafted which follows the stakeholder involvement requirements laid out in *Nebraska Revised Statutes* §46-715. The current timeline in the public participation plan anticipates that the basin-wide plan development process will begin in June 2015 with a public stakeholder meeting and the plan will be in place by January 1, 2019. Each of the Upper Platte Basin natural resources districts' integrated management plans will also be updated corresponding to the basin-wide plan and improvements to modeling tools.