



Nebraska Public Power District

"Always there when you need us"

April 8, 2020

Jesse Bradley
Nebraska Department of Natural Resources
301 Centennial Mall South
PO Box 94676
Lincoln, NE 68509

Dear Mr. Bradley:

RE: Recharge Analysis for Temporary Appropriations A-19672 and A-19673

Background

On September 5, 2019, the Nebraska Department of Natural Resources approved applications A-19672, Gothenburg Canal, and A-19673, Dawson County Canal, for recharge activities. These temporary appropriations were cancelled by the Department on February 13, 2020. One condition included in each of the water appropriations was:

15. Within six months after the final date of diversion under this temporary permit, the Appropriator shall provide a report containing the following elements: 1) Table of water deliveries to the Project Facility. 2) An evaluation of the evaporative loss will be provided. 3) A copy of any other data or reports provided to the PRRIP Executive Director's Office, or pursuant to any contractual arrangements between NPPD and the Department. 4) Maps or plans must be provided to the Department, which include a detailed depiction of the areas used to recharge the groundwater aquifer and the infrastructure used to deliver the water. 5) Data gathered from any groundwater level measurements during and after water has been recharged under this appropriation that demonstrated an increase in the elevation of the local water table has occurred around the Project Facilities.

The Nebraska Public Power District (NPPD) intends to fulfill the provision with this letter. NPPD has a contract with the Platte River Recovery Program (PRRIP) for the recharge from the Dawson County and Gothenburg Canals and the information included in this report will be provided to PRRIP. Determination of the recharge at each of the canals is made from data collected including river diversions recorded at the canal head gates (NDNR provisional data) and NPPD used staff gages to determine diversions into canal laterals from the main canal and the water spilled from the canal systems. This data was used to determine the amount of water recharged. Because the appropriations were relinquished mid-way through their one-year time period, the reporting timeframe only pertains to the fall of 2019.

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Date	Canal Diversions cfs	Canal Returns cfs	Net Recharge (acre-feet)	Net Canal Recharge (AF)			Canal Information (AF)				Lateral Information (AF)												
				Date	Total River Diversion	Total River Returns	Net Recharge	Main Canal River Diversion	Main Canal Returns (Buffalo Creek)	Note: There is no measurement in the canal at Lake Helen	Main Canal Returns (Buffalo Creek)	6		16		18		20		20F (feet from 20)		30	
												Div	Return	Div	Return	Div	Return	Div	Return	Div	Return	Div	Return
Gothenburg Canal				Gothenburg Canal																			
9/13/2019	80	-	159	9/13	158.7	-	158.7	158.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
9/14/2019	76	(30)	92	9/14	150.7	(58.5)	92.2	150.7	-	(49.6)	4.0	(1.0)	7.9	(1.0)	-	-	15.9	(4.0)	(2.0)	4.0	(1.0)		
9/15/2019	77	(30)	94	9/15	152.7	(58.5)	94.2	152.7	-	(49.6)	4.0	(1.0)	7.9	(1.0)	-	-	15.9	(4.0)	(2.0)	4.0	(1.0)		
9/16/2019	76	(29)	92	9/16	150.7	(58.3)	92.4	150.7	-	(49.6)	4.0	(1.0)	7.9	(0.8)	-	-	15.9	(4.0)	(2.0)	4.0	(1.0)		
9/17/2019	75	(29)	91	9/17	148.8	(57.3)	91.4	148.8	-	(49.6)	-	-	7.9	(0.8)	-	-	15.9	(4.0)	(2.0)	4.0	(1.0)		
9/18/2019	75	(27)	95	9/18	148.8	(53.4)	95.4	148.8	-	(45.6)	-	-	7.9	(0.8)	-	-	15.9	(4.0)	(2.0)	4.0	(1.0)		
9/19/2019	76	(26)	100	9/19	150.7	(50.8)	100.0	150.7	-	(43.6)	-	-	6.0	(0.4)	-	-	15.9	(4.0)	(2.0)	4.0	(0.8)		
9/20/2019	75	(26)	98	9/20	148.8	(50.8)	98.0	148.8	-	(43.6)	-	-	6.0	(0.4)	-	-	15.9	(4.0)	(2.0)	4.0	(0.8)		
9/21/2019	75	(23)	103	9/21	148.8	(45.8)	102.9	148.8	-	(39.7)	-	-	6.0	(0.4)	-	-	15.9	(4.0)	(1.0)	4.0	(0.8)		
9/22/2019	76	(21)	108	9/22	150.7	(42.2)	108.5	150.7	-	(35.7)	-	-	6.0	(0.8)	-	-	15.9	(4.0)	(1.0)	4.0	(0.8)		
9/23/2019	71	(19)	104	9/23	140.8	(37.3)	103.5	140.8	-	(29.8)	-	-	6.0	(0.8)	-	-	15.9	(4.0)	(2.0)	-	(0.8)		
9/24/2019	61	(19)	84	9/24	121.0	(36.7)	84.3	121.0	-	(29.8)	-	-	6.0	(1.0)	-	-	15.9	(4.0)	(2.0)	-	-		
9/25/2019	58	(17)	81	9/25	115.0	(34.5)	80.5	115.0	-	(27.8)	-	-	6.0	(0.8)	-	-	15.9	(4.0)	(2.0)	-	-		
9/26/2019	58	(15)	85	9/26	115.0	(29.6)	85.5	115.0	-	(25.8)	-	-	6.0	(0.8)	-	-	15.9	(2.0)	(1.0)	-	-		
9/27/2019	58	(15)	85	9/27	115.0	(29.6)	85.5	115.0	-	(25.8)	-	-	6.0	(0.8)	-	-	15.9	(2.0)	(1.0)	-	-		
9/28/2019	58	(16)	83	9/28	115.0	(32.3)	82.7	115.0	-	(25.8)	-	-	6.0	(0.6)	-	-	15.9	(4.0)	(2.0)	-	-		
9/29/2019	59	(16)	84	9/29	117.0	(32.5)	84.5	117.0	-	(25.8)	-	-	6.0	(0.8)	-	-	15.9	(4.0)	(2.0)	-	-		
9/30/2019	58	(16)	83	9/30	115.0	(31.7)	83.3	115.0	-	(25.8)	-	-	6.0	(1.0)	-	-	15.9	(4.0)	(1.0)	-	-		
10/1/2019	59	(16)	86	10/1	117.0	(31.3)	85.7	117.0	-	(25.8)	-	-	-	(0.6)	-	-	15.9	(4.0)	(1.0)	-	-		
10/2/2019	59	(13)	92	10/2	117.0	(24.8)	92.2	117.0	-	(19.8)	-	-	-	-	-	-	15.9	(4.0)	(1.0)	-	-		
10/3/2019	52	(16)	71	10/3	103.1	(31.7)	71.4	103.1	(31.7)	-	-	-	-	-	-	-	-	-	-	-	-		
10/4/2019	33	(16)	34	1																			

2. Evaluation of Evaporation

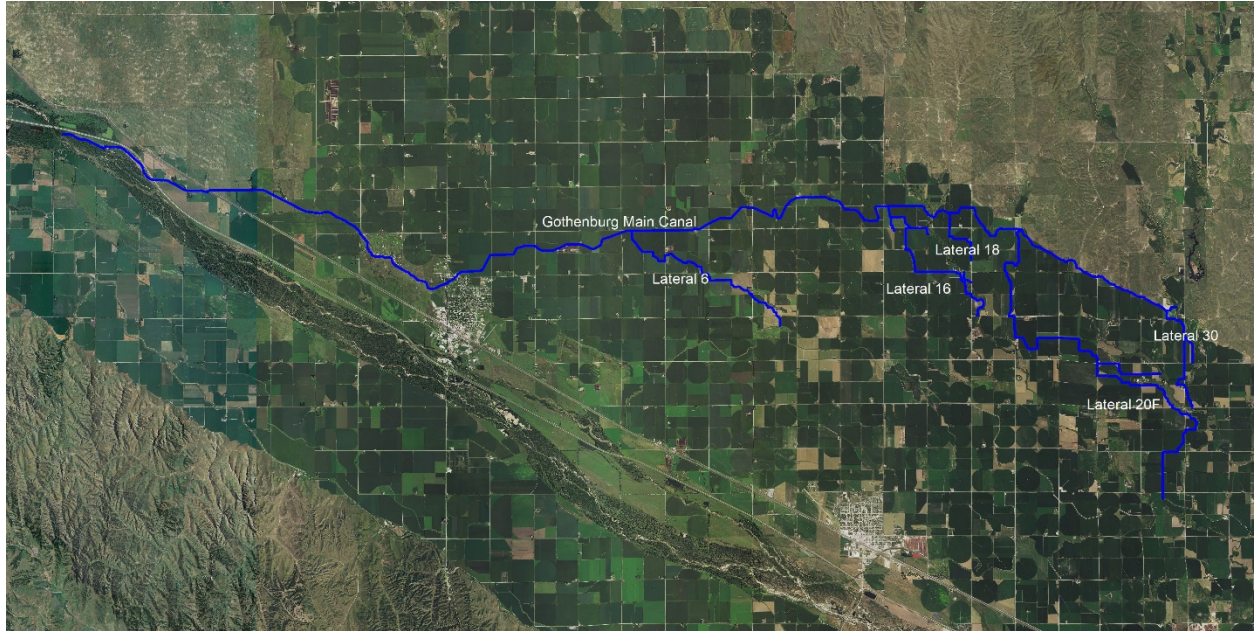
NPPD does not have an evaluation of evaporation.

3. Data or Reports Provided to the PRRIP

NPPD provided the table above to the PRRIP.

4. Maps of Recharge

The portions of the canal which recharged groundwater during this period can be found on the map below.



5. Groundwater level measurements:

NPPD does not have any groundwater level measurements.

The Dawson County Canal ceased operating for irrigation needs on September 9, 2019. Subsequently, water was diverted into the canal for groundwater recharge as shown below.

				Canal Information (AF) (2 measurable segments)				Lateral Information (AF)											
				Net Canal Recharge (AF)			River Diversion to French Creek		French Creek to End of Canal		Berquist		#1		#2		F		
Date	Canal Diversions cfs	Canal Returns cfs	Net Recharge (acre-feet)	Date 2019	Total River Diversion	Total River Returns	Net Recharge	Main Canal River Diversion	French Creek Return	Main Canal After French Creek Return	Main Canal Return (Elm Creek)	Div	Return	Div	Return	Div	Return	Div	Return
Dawson Cty Canal:				Dawson Cty Canal:															
9/10/2019	97	(25.9)	141	9/10	192.4	(51.4)	141.0	192.4	-	49.6	(8.7)	23.8	(13.9)	35.7	(6.9)	39.7	(21.8)	-	-
9/11/2019	96	(25.9)	139	9/11	190.4	(51.4)	139.0	190.4	-	49.6	(8.7)	23.8	(13.9)	35.7	(6.9)	39.7	(21.8)	-	-
9/12/2019	97	(25.9)	141	9/12	192.4	(51.4)	141.0	192.4	-	49.6	(8.7)	23.8	(13.9)	35.7	(6.9)	39.7	(21.8)	-	-
9/13/2019	98	(25.9)	143	9/13	194.4	(51.4)	143.0	194.4	-	49.6	(8.7)	23.8	(13.9)	35.7	(6.9)	39.7	(21.8)	-	-
9/14/2019	96	(25.9)	139	9/14	190.4	(51.4)	139.0	190.4	-	49.6	(8.7)	23.8	(13.9)	35.7	(6.9)	39.7	(21.8)	-	-
9/15/2019	95	(25.9)	137	9/15	188.4	(51.4)	137.1	188.4	-	49.6	(8.7)	23.8	(13.9)	35.7	(6.9)	39.7	(21.8)	-	-
9/16/2019	96	(29.4)	132	9/16	190.4	(58.3)	132.1	190.4	-	49.6	(8.7)	23.8	(13.9)	35.7	(6.9)	39.7	(21.8)	9.3	(6.9)
9/17/2019	95	(30.0)	129	9/17	188.4	(59.5)	128.9	188.4	-	45.6	(6.9)	27.8	(15.9)	31.7	(7.9)	39.7	(21.8)	9.3	(6.9)
9/18/2019	94	(28.5)	130	9/18	186.4	(56.5)	129.9	186.4	-	35.7	(6.9)	27.8	(15.9)	31.7	(7.9)	39.7	(19.8)	7.9	(6.0)
9/19/2019	0	-																	
9/26/2019	33	-	65	9/26	65.5	-	65.5	65.5	-	35.7	-	27.8	-	49.6	-	39.7	-	-	-
9/27/2019	89	(8.0)	161	9/27	176.5	(15.9)	160.7	176.5	-	35.7	-	27.8	-	31.7	(15.9)	39.7	-	-	-
9/28/2019	90	(17.0)	145	9/28	178.5	(33.7)	144.8	178.5	-	35.7	-	27.8	(13.9)	31.7	(19.8)	39.7	-	-	-
9/29/2019	89	(37.0)	103	9/29	176.5	(73.4)	103.1	176.5	(27.8)	35.7	-	27.8	(13.9)	31.7	(15.9)	39.7	(15.9)	-	-
9/30/2019	86	(36.0)	99	9/30	170.6	(71.4)	99.2	170.6	(27.8)	35.7	-	23.8	(13.9)	31.7	(13.9)	39.7	(15.9)	-	-
10/1/2019	89	(34.5)	108	10/1	176.5	(68.4)	108.1	176.5	(27.8)	31.7	(5.0)	31.7	(9.9)	27.8	(17.9)	27.8	(7.9)	4.0	-
10/2/2019	89	(29.5)	118	10/2	176.5	(58.5)	118.0	176.5	(23.8)	49.6	(7.9)	25.8	(9.9)	17.9	(8.9)	27.8	(7.9)	4.0	-
10/3/2019	72	(30.5)	82	10/3	142.8	(60.5)	82.3	142.8	(11.9)	49.6	(17.9)	25.8	(9.9)	17.9	(8.9)	27.8	(9.9)	4.0	(2.0)
10/4/2019	61	(25.3)	71	10/4	121.0	(50.2)	70.8	121.0	(6.5)	4.0	(17.9)	25.8	(7.9)	17.9	(7.9)	27.8	(9.9)	-	-
10/5/2019	60	(25.3)	69	10/5	119.0	(50.2)	68.8	119.0	(6.5)	-	(17.9)	25.8	(7.9)	17.9	(7.9)	27.8	(9.9)	-	-
10/6/2019	59	(17.3)	83	10/6	117.0	(34.3)	82.7	117.0	(6.5)	-	(4.0)	25.8	(7.9)	15.9	(7.9)	25.8	(7.9)	-	-
10/7/2019	59	(12.3)	93	10/7	117.0	(24.4)	92.6	117.0	(6.5)	-	-	23.8	(7.9)	11.9	(4.0)	19.8	(6.0)		

2. Evaluation of Evaporation

NPPD does not have a evaluation of evaporation.

3. Data or Reports Provided to the PRRIP

NPPD provided the table above to the PRRIP.

4. Maps of Recharge

The portions of the canal which recharged groundwater during this period can be found on the map below.



5. Groundwater level measurements:

NPPD does not have any groundwater level measurements.

If you would like electronic copies of any information contained in this report, please call me at 402-366-3633 or email me at jtshafer@nppd.com.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jeff T. Shafer', written in a cursive style.

Jeff Shafer

Water Resources Advisor

cc: Seth Turner, Platte River Recovery Implementation Program
J.C. Citta Jr.