
2017 ANNUAL INTEGRATED MANAGEMENT PLAN REPORT:

NEBRASKA DEPARTMENT OF NATURAL RESOURCES
&
UPPER NIOBRARA WHITE NATURAL RESOURCES DISTRICT

REPORTING ON CALENDAR YEAR 2016 DATA

ANNUAL MEETING HELD ON OCTOBER 6, 2017



Serving Box Butte, Dawes, Sheridan and Sioux Counties

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October 6, 2017

Annual report by Upper Niobrara White Natural Resources District (UNWNRD) on the activities related to the joint Integrated Management Plan (IMP) with the Nebraska Department of Natural Resources (DNR).

Purpose: The purpose of the report is to fulfill the UNWNRD's responsibilities under the IMP annual reporting obligations and provide updates to current monitoring projects and studies as outlined in the IMP.

Reporting and exchanging information gathered from monitoring projects, streamflow data or other studies provides a basis to increase understanding of the surface water and hydrologically connected ground water system. As surface and ground water are hydrologically connected throughout much of the district, estimates of water quantity of either surface or ground water cannot be evaluated separately. The data gathered through this IMP's monitoring plan is designed to evaluate and measure the success of the objectives of this IMP. This information exchange also helps to test the validity of the conclusions and information upon which the IMP is based.

UNWNRD Reporting: Permitting

The IMP requires that the UNWNRD annually report to the following permitting actions within the district:

- 1) Ground Water Permitting
- 2) Ground Water Variances/Modifications
- 3) New Ground Water Uses
- 4) Municipal Accounting

- 1) Ground Water Permitting – The following ground water permits were granted in 2016:

A) Replacement well permits

- (1) 6 – Replacement Irrigation
- (2) 0 – Replacement Public Water Supply
- (3) 0 – Replacement Commercial/Industrial

B) New well permits

- (1) 0 – New Public Water Supply
- (2) 0 – New Public Water Supply – Test Wells
- (3) 0 – New Irrigation – Failed to Decommission within 180 Days (Replacement/Conversion)
- (4) 0 – New Industrial Well – Replacing Use From Existing Well (Acre Offset Provided)

2) Ground Water Variances/Modifications – The following ground water variances were requested in 2016:

- A) There is a transfer request for Tim Campbell to shift his pivot from the SE ¼ 10-26-50 to the SW ¼ of the same section. On the east side of the SE ¼ there is a natural drainage that runs through the path of the pivot, in an effort to move irrigation from the drainage and the potential for irrigating better soils without a drainage it is proposed to shift pivot to the SW ¼. Portions of the SE ¼ will be planted to grass for grazing cattle and the irrigated acres decertified there and transferred to the SW ¼. There will be no increase in acres irrigated. The recent purchase of the SW ¼ by Tim has prompted the request. County assessment records will be updated to current certified acre records. Tod Dorshorst moved to approve the variance request for Tim Campbell, Dave Carlson seconded the motion. PASS (January 2016)
- B) The transfer request for Dale Campbell is to shift his pivot from the NE ¼ 09-26-50 to the middle of the E ½ of the same section. On the north end of the NE ¼, there are less productive soils and also there is a natural drainage that runs through the path of the pivot occasionally causing erosion and runoff concerns, in an effort to move irrigation from the drainage and the potential for irrigating better soils without a drainage it is proposed to shift pivot to the south. The pivot would be shifted to the south as far as possible to a position just north of the existing homestead, placing it roughly in the middle of the E ½ of the section. There will be no increase in acres irrigated. The recent purchase of the SE ¼ by Dale has prompted the request. County assessment records will be updated to current certified acre records. Tod Dorshorst moved to approve the variance request for Dale Campbell, Scott Berndt seconded the motion. PASS (January 2016)
- C) The transfer request for Board of Education Land and Funds is to shift the irrigated acres that are in the SE ¼ 16-25-49 to the SW ¼ of the same section and replace existing irrigation well. Historically the well in the NW ¼ irrigated a portion of the W ½ of this section, the well was showing a decrease in water production and at the time it was decided to move the irrigation to the SE ¼ and discontinue irrigating the W ½. The proposal is to transfer the irrigated acres back to the SW ¼ and re-drill the registered irrigation well that historically irrigated the SW ¼ to supply water to that quarter. There will be no increase in irrigated acres. County assessment records will be updated to current certified acre records. Tod Dorshorst moved to approve the variance request for the Board of Education Land and Funds as long as the existing well is decommissioned or converted into a stock well, Rich Zochol seconded the motion. PASS (January 2016)
- D) Duane Sandberg proposes to decertify four (4) gravity irrigated pivot corners, totally 30.3 acres, in section 9 and transfer the acres to section 8. In section 8 there are currently 54.31 certified gravity irrigated acres; by transferring the acres, Duane will be able to consolidate his gravity acres to one field and in the long term create a better opportunity for the future installation of subsurface drip or a center pivot. Tod Dorshorst moved to approve the Variance for Duane Sandberg, Dave Carlson seconded the motion. PASS (March 2016)
- E) Jim Jelinek is proposing to modify field boundaries for a pivot in the SE ¼ of 34-25-48. The highway expansion project is extending west where the current pivot is located. The pivot will be moved approximately 1285 feet to the west. There will be no change in irrigated acres. Rich Zochol moved to approve the transfer request for Jim Jelinek, Tod Dorshorst seconded the motion. PASS (April 2016)

F) John Hoffman has two adjacent pivots both in the same parcel; the south pivot makes a complete rotation but to do so the pivot crosses a neighbor's property, which he has an easement to do, the north pivot is a wiper pivot. For long term planning John is proposing to modify the field boundaries by putting stops on the south pivot so it no longer crosses onto the neighboring property, in doing so he will decertify some acres in the south pivot and proposes to irrigate most of them with the north pivot by installing an end gun on the pivot and a remaining acre of gravity irrigated ground by the south pivot point to plant trees in. The modification proposal will allow John to irrigate the same number of acres certified. Rich Zochol moved to approve the modification for John Hoffman, Tod Dorshorst seconded the motion. PASS (June 2016)

3) Ground Water Uses – No new ground water uses were granted in 2016.

The UNWNRD does allow additional acres to be added to existing wells in subarea 3. The District received no requests to certify any additional acres.

Road Construction Uses: No requests for 2016

4) Municipal Accounting – This use is required to be reported to the District by October 1 of each year. At meeting time the District has received all reports. Compilation of water use attached.

Integrated Management Studies

Currently, DNR and UNWNRD have several joint/cooperative studies:

- 1) Niobrara Hydrogeologic and Hydrostratigraphic Framework Study: This study provides geospatial coverages of aquifer properties throughout the upper portion of the Niobrara Basin. It is intended to help expand the Box Butte ground water model. The study was finished in 2010, with basin coverages delivered to DNR. (Finished 2010)
- 2) Niobrara Operations Model Study (IWMPPF): The operations model will combine three separate models, CROPSIM, a ground water model and a surface water model to develop operational scenarios that maximize water use efficiency. All portions of the operations model are currently developed and the model has been calibrated. Work continues on data collection needs for model refinement and is currently being utilized to analyze the model area. (Completed with ongoing refinement)
- 3) Niobrara River Basin Study (Bureau of Reclamation Basin Study Program): The basin study will assist in projecting water supply and demand in the basin, analyze water supply operations under alternate water availability conditions and develop and analyze options for providing and optimizing use of future water supplies. The study will include development of a basin-wide ground water model and a surface water operations model used to analyze conjunctive management options. Currently model is completed and continued analysis of basin is ongoing.
- 4) Economic implications of reduced ground water allocations study: The multi-NRD study has a goal to provide farm-level economic analysis of limited irrigation impacts for crops grown in the panhandle of Nebraska and to provide educational programming to assist producers effectively manage ground water irrigation in areas that instituted pumping allocations. The study was completed in 2014, with final reporting being completed by UNL staff. (Completed 2014)

- 5) Upper Niobrara River Basin Model evaluation of existing water use data utilizing the INSIGHT Data enhancement Program (IDEP) to create a program for converting metered water use into model input data sets. The work has been completed on the program for converting actual metered water use to a model input data set. Follow up will be provided by Marc Groff and the Flatwater Group to the NRD and the DNR to finalize deliverables. (Completed 2015)
- 6) Upper Niobrara River Basin Model evaluation of modeled water use in the district as estimated by CROPSIM and comparing estimates to actual water use as measured since 2007 utilizing the INSIGHT Data enhancement Program (IDEP). The work has been completed on the evaluation of estimated model water use vs. actual metered water use. Follow up will be provided by Marc Groff and the Flatwater Group to the NRD and the DNR to finalize deliverables. (Completed 2015)
- 7) The Upper Niobrara White NRD continues to collaborate with the four other NRD's in the Niobrara Basin and the Department to develop or refine management plans for each district in the basin. An ongoing coordinated effort for long term planning is desired by the District's as well as the Department for the management of hydrologically connected surface and ground water.
- 8) The Upper Niobrara White NRD, along with the Department, is utilizing a Citizen's Advisory Committee (CAC) to consult on long term planning within the District. The integrated model consists of a watershed/land use model, surface water operations model and a ground water model. The models have been calibrated to match crop types within the district and actual water use obtained from the meter data. The purpose of the model moving forward will be to evaluate various management schemes that can be used to establish future policy. One of the roles of the CAC will be to recommend scenarios to be evaluated.

Board Actions for Additional Ground Water and Integrated Water Management Purposes:

- 1) Transfer of certified acres impacted by a public project: The UNWNRD will work with the landowner and others as needed to determine the amount of certified acres impacted and determine if there is an opportunity to modify or transfer acres, to the landowner(s), within the District's rules and regulations. The UNWNRD will bank any acres that have not been transferred and allow the landowner to maintain the original certified acres and, if allocated, the allocation for the remainder of the current allocation period. The landowner shall have to the end of the allocation period in which the public project impacted the acres to work with the District to determine if there is an option under existing rules to modify or transfer the acres to the landowner(s). If it is determined that there is not an option to complete a transfer, then the acres will remain in the District's bank for potential future offsets levied against the district. The landowners certified acres will be reduced by the amount of acres impacted and if allocated, the allocation will be adjusted accordingly. Land acquired by acquisition will not be allowed to be transferred to anyone else but the same landowner. Rich Zochol moved to adopt the new policy pertaining to the transfer of irrigated acres impacted by a public project, Tod Dorshorst seconded the motion. PASS (April 2016)

Municipal Pumping and Consumption Analysis

IMP Report 6 October 2017

Total Ground Water Consumed						
Year	Harrison	Crawford	Chadron	Hemingford	Alliance	Totals
2001-2002	42,659,770.00	2,317,170.85	290,590,000.00	92,127,600.00	939,049,000.00	1,366,743,540.85
2002-2003	32,881,170.00	1,134,426.67	205,370,000.00	73,471,700.00	747,359,000.00	1,060,216,296.67
2003-2004	38,736,290.00	1,139,258.38	222,540,000.00	80,977,600.00	762,402,000.00	1,105,795,148.38
2004-2005	30,832,360.00	989,245.19	167,290,000.00	73,997,700.00	700,382,000.00	973,491,305.19
2005-2006	34,191,160.00	3,397,553.26	213,950,000.00	73,666,200.00	854,551,000.00	1,179,755,913.26
Baseline Average	35,860,150.00	1,795,530.87	219,948,000.00	78,848,160.00	800,748,600.00	1,137,200,440.87
2006-2007	33,515,350.00	6,098,591.49	215,840,000.00	62,344,500.00	755,301,000.00	1,073,099,441.49
2007-2008	30,508,130.00	6,178,706.41	252,880,000.00	62,902,801.00	726,318,000.00	1,078,787,637.41
2008-2009	28,186,390.00	1,460,376.57	170,430,000.00	62,396,468.00	572,650,000.00	835,123,234.57
2009-2010	23,009,380.00	1,883,287.76	78,112,467.72	63,859,442.00	528,620,000.00	695,484,577.48
2010-2011	28,995,660.00	427,640.96	13,647,502.97	59,925,360.00	527,891,000.00	630,887,163.93
5 Year Average	28,842,982.00	3,209,720.64	146,181,994.14	62,285,714.20	622,156,000.00	862,676,410.98
2011-2012	35,879,760.00	2,673,073.78	92,617,749.00	76,119,700.00	698,624,000.00	905,914,282.78
2012-2013	32,078,600.00	2,772,729.87	69,682,045.72	64,233,900.00	635,348,000.00	804,115,275.59
2013-2014	24,839,900.00	551,335.33	16,981,185.74	64,106,683.00	500,263,000.00	606,742,104.07
2014-2015	25,249,500.00	548,305.56	10,213,875.47	51,234,600.00	509,189,000.00	596,435,281.03
2015-2016	34,348,950.00	782,092.29	42,640,537.83	64,838,532.00	579,441,000.00	722,051,112.12
5 Year Average	30,479,342.00	1,465,507.37	46,427,078.75	64,106,683.00	584,573,000.00	727,051,611.12
2016-2017	26,708,288.00	237,433.27	40,497,289.85	69,501,800.00	564,161,000.00	701,105,811.12
2001-2016 Total	502,620,658.00	32,591,227.64	2,103,282,654.30	1,095,704,586.00	10,601,549,000.00	14,335,748,125.94
Total Ground Water Consumed per person per day						
Year	Harrison	Crawford	Chadron	Hemingford	Alliance	Averages
2001-2002	442.71	5.75	140.73	263.20	295.58	229.59
2002-2003	333.65	2.84	99.04	209.90	236.82	176.45
2003-2004	383.13	2.85	107.49	237.79	247.46	195.74
2004-2005	316.38	2.54	83.44	222.05	232.25	171.33
2005-2006	352.16	8.81	108.17	224.50	287.30	196.19
Baseline Average	365.61	4.56	107.77	231.49	259.88	193.86
2006-2007	357.29	15.99	110.57	192.13	256.61	186.52
2007-2008	327.78	16.37	126.82	193.42	246.09	182.10
2008-2009	312.64	3.91	86.28	192.29	192.93	157.61
2009-2010	262.66	5.01	39.36	201.33	180.99	137.87
2010-2011	316.49	1.12	6.39	204.46	189.50	143.59
5 Year Average	315.37	8.48	73.88	196.73	213.22	161.54
2011-2012	391.64	7.35	43.37	259.71	239.19	188.25
2012-2013	350.15	7.62	32.63	219.16	217.53	165.42
2013-2014	275.52	1.53	8.04	219.54	161.28	133.18
2014-2015	280.07	1.53	4.78	175.46	164.16	125.20
2015-2016	381	2.18	19.97	222.05	186.81	162.40
5 Year Average	335.68	4.04	21.76	219.18	193.79	154.89
2016-2017	307.45	0.68	19.36	239.22	183.94	150.13
2001-2016 Avg.	336.92	5.38	64.78	217.26	219.90	168.85

2017 ANNUAL REPORT
BY THE DEPARTMENT OF NATURAL RESOURCES OF 2016 DATA
TO MEET THE REQUIREMENTS OF THE UPPER NIOBRARA WHITE NATURAL
RESOURCES DISTRICT'S INTEGRATED MANAGEMENT PLAN

Purpose

The purpose of the report is to fulfill the Department of Natural Resources' (Department or NeDNR) responsibilities as outlined in the Upper Niobrara White Natural Resources District (District or UNWNRD) integrated management plan (IMP) and provide updates to current projects and studies in the area.

Reporting and exchanging information gathered from monitoring projects, streamflow data, or other studies provides a basis to increase understanding of the hydrologically connected surface water and groundwater system. In areas where surface water and groundwater are hydrologically connected, estimates of water quantity of either surface water or groundwater cannot be evaluated separately. The data gathered through the IMP's monitoring plan and reported here are provided to assist evaluation of the success of the IMP's objectives. This information exchange also helps to test the validity of the conclusions and information upon which the IMP is based. This report contains information on variance activities and permit activities from January 1 through December 31, 2016. Also included are canal diversion measurements from October 1, 2015 through September 30, 2016.

Department Reporting

The IMP requires that the Department annually report on the following surface water data within the district:

1. *Surface water permitting*
 - a. Any order of cancellation issued pursuant to Neb. Rev. Stat. § 46-229.04(5) or any assignment of the right to use that portion of an appropriation which was relinquished.
 - b. Variances granted by the Department, facts offered as justification for the variance to be granted and the reasons for the action taken.
2. *Diversions*
 - a. Records of surface water diversions collected by the Department upstream of the Box Butte Reservoir.
3. *Streamflow*
 - a. Records of streamflow measurements taken in non-gaged streams within the District.

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1. Surface Water Permitting

a. Cancelled Surface Water Rights

During calendar year 2016, the Department did not cancel any appropriations, nor did the Department cancel or assign any appropriations pursuant to *Neb. Rev. Stat. § 46-229.04(5)*.

b. Surface Water Variances

During calendar year 2016, six petitions requesting leave to file an application for a new surface water appropriation within an area under a moratorium or stay (also known as variances) were granted. The sole petitioner, Dawes County Road Department, requested to file applications for temporary permits for road construction (Table 1). The variances were granted on the basis that the proposed water use addressed public safety issues, were for temporary use for public construction, and would be less than 10 acre-feet, meeting Department rules 457 *Neb. Admin. Code* Chapter 23, §§ 001.05 and 001.06. The variances were granted, and six corresponding applications were subsequently filed and approved, each allowing the appropriator to divert, in priority, a maximum volume of 10 acre-feet (maximum rate of 0.89 cubic feet per second (cfs)). The permits were temporary, active for one year from the date of approval.

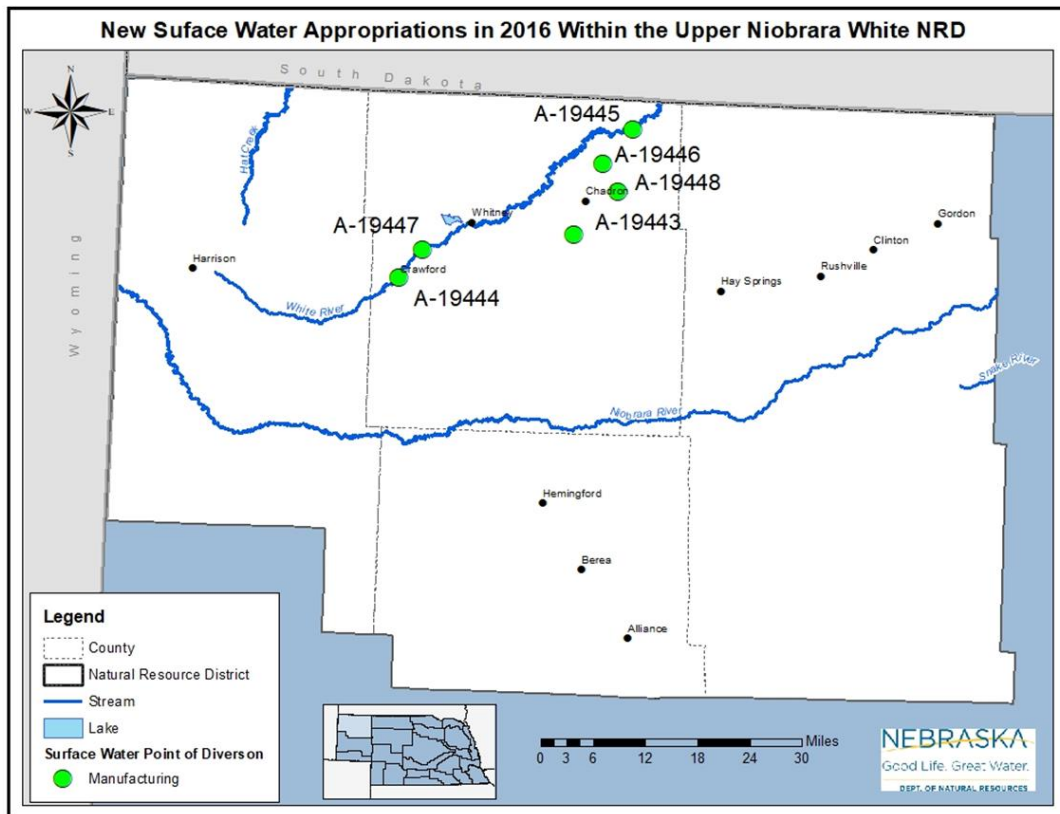
Table 1 provides detailed information on the permits approved in 2016. Figure 1 (following page) shows the locations of the permits approved in 2016.

Table 1: Variances granted and the associated applications approved during 2016 in the UNWNRD

Variance Number	Variance Grant Date	Appropriation Number	Application Approval Date	Point of Diversion Location				Source	Use	Grant in AF
				S	T	R	Dir.			
VAR-5673	6/10/2016	A-19443	7/12/2016	12	32	49	W	Chadron Creek	Temporary Construction	10
VAR-5668		A-19444	7/12/2016	3	31	52	W	White River		
VAR-5669		A-19445	7/12/2016	6	34	47	W	White River		
VAR-5670		A-19446	7/12/2016	27	34	48	W	Bordeaux Creek		
VAR-5671		A-19447	7/12/2016	24	32	52	W	White River		
VAR-5672		A-19448	7/12/2016	13	33	48	W	Bordeaux Creek, Little		

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2)



NeDNR Point of Diversion Data KJS 9/19/2017

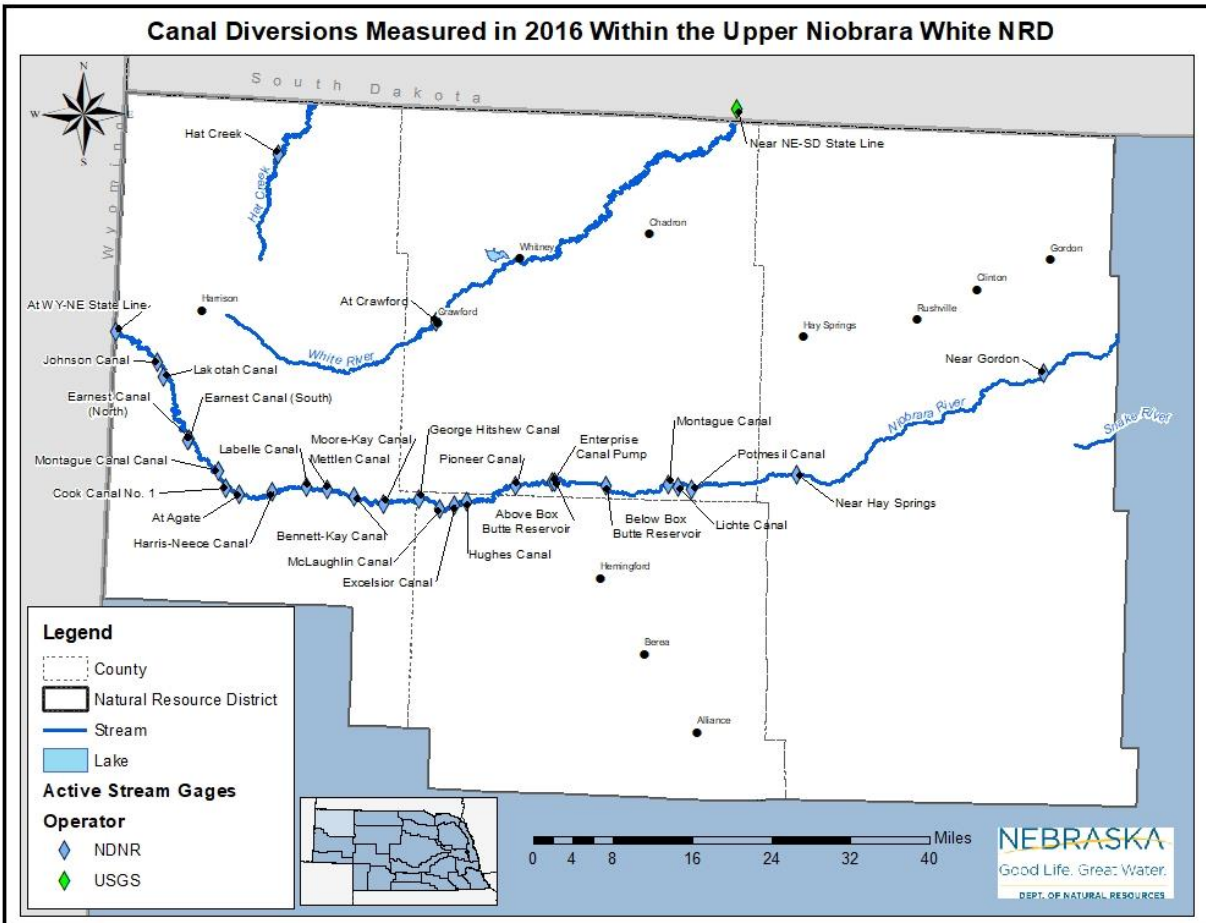
Figure 1: Locations of temporary surface water permits granted in 2016 in the UNWNRD

2. Diversions

a. Records of Surface Water Diversions Upstream of Box Butte Reservoir

Surface water diversion records for the water year 2016 are included in Appendix A and their locations are shown in Figure 2. The canals measured include: Bennett-Kay Canal; Cook Canal No. 1; Earnest Canal (North); Earnest Canal (South); Excelsior Canal; Harris-Neece Canal; Geo. Hitsheew Canal; Hughes Canal; Johnson Canal; Labelle Canal; Lakota Canal; Lichte Canal; McGinley-Stover Canal; McLaughlin Canal; Mettlen Canal; Moore-Kay Canal and the Pioneer Canal.

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NeDNR Streamgage Data KJS 9/28/2017

Figure 2: Locations of canal headgates measured in 2016, and streamgages within the UNWNRD

3. Streamflow

a. Records of Streamflow Measurements of Non-gaged Streams

Non-gaged stream measurements for water year 2016 are included in Appendix B. Measurements were taken of: Niobrara River, White River, Sow Belly Creek, Squaw Creek, and Whitney Reservoir. Measurements were also taken at various diversions, including: Andrews Supply Canal, Armstrong Pump, Cook Pump, Delsing Pump, Enterprise Pump, Harris-Cooper Canal, Montague Canal Pump, Pioneer Pump #2, Rasher-Forbes Canal, White River Canal, and Wilkins Pump. Streamflow measurements for gaged streams may be found at: <https://waterdata.usgs.gov/ne/nwis/current/?type=flow>.

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Current Studies

The WaterSMART program, a conjunctive water management study that evaluated potential water management strategies while incorporating climate and economic components, was completed in 2015 by NeDNR and the United States Bureau of Reclamation. While the Bureau has completed a report and sent it to its Washington, D.C. office for review before publishing, the report has not yet been reviewed.

The Upper Niobrara White NRD and the Department are currently working to prepare a refined hydrogeologic and hydrostratigraphic framework along the Niobrara River between Agate, Nebraska, and the Dunlap diversion for the Mirage Flats irrigation project. The Department has contracted with the University of Nebraska-Lincoln's Conservation and Survey Division to conduct this study, the purpose of which is to gain additional information regarding groundwater resources in areas presumed, according to geologic maps, to be without aquifers – yet, well registration records indicate that water wells have been drilled and are producing in these areas. The study is nearly complete, and the resulting information will be used in considering the extent of groundwater resources and hydrologic connection with surface water in these areas.

APPENDIX A SURFACE WATER DIVERSIONS IN 2016

Nebraska Department of Natural Resources

13000 Bennett-Kay Canal from Niobrara River Q, WATER YEAR OCT 2015 TO SEP 2016 Daily Mean Values												
Day	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16
1	---	---	---	---	---	---	0.00	0.02	0.00	0.78	1.1	0.00
2	---	---	---	---	---	---	0.00	0.01	0.01	1.2	1.4	0.00
3	---	---	---	---	---	---	0.00	0.01	0.30	1.6	1.5	0.00
4	---	---	---	---	---	---	0.00	0.00	1.3	1.3	1.3	0.00
5	---	---	---	---	---	---	0.00	0.00	0.89	1.3	0.00	0.00
6	---	---	---	---	---	---	0.00	0.00	0.68	1.3	0.00	1.6
7	---	---	---	---	---	---	0.00	0.00	0.61	1.3	0.00	2.2
8	---	---	---	---	---	---	0.00	0.00	1.1	1.2	0.00	2.3
9	---	---	---	---	---	---	0.00	0.00	1.4	1.1	0.00	2.3
10	---	---	---	---	---	---	0.00	0.00	1.3	0.99	0.00	2.3
11	---	---	---	---	---	---	0.00	0.00	0.95	0.00	0.00	2.4
12	---	---	---	---	---	---	0.00	0.00	0.73	0.00	0.00	2.4
13	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	2.4
14	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	2.5
15	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	2.6
16	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	2.6
17	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	2.6
18	---	---	---	---	---	0.00	0.00	0.01	0.00	0.00	0.00	2.7
19	---	---	---	---	---	0.00	0.00	0.01	0.00	0.00	0.00	2.7
20	---	---	---	---	---	0.00	0.00	0.01	0.00	0.00	0.00	2.7
21	---	---	---	---	---	0.00	0.00	0.01	0.00	0.00	0.00	2.6
22	---	---	---	---	---	0.00	0.00	0.01	0.00	0.00	0.00	2.6
23	---	---	---	---	---	0.00	0.00	0.02	0.00	0.83	0.00	2.7
24	---	---	---	---	---	0.00	0.01	0.02	0.00	1.3	0.00	2.4
25	---	---	---	---	---	0.00	0.00	0.03	0.00	1.3	0.00	2.3
26	---	---	---	---	---	0.00	0.00	0.03	0.00	1.1	0.00	2.1
27	---	---	---	---	---	0.00	0.00	0.03	0.00	1.1	0.00	2.1
28	---	---	---	---	---	0.00	0.00	---	0.00	1.4	0.00	2.1
29	---	---	---	---	---	0.00	0.00	---	0.50	1.6	0.00	1.8
30	---	---	---	---	---	0.00	0.00	---	0.70	1.4	0.00	1.7
31	---	---	---	---	---	0.00	---	0.04	---	1.2	0.00	---
Total	---	---	---	---	---	0	0.01	0.26	10.47	23.3	5.3	58.7
Mean	---	---	---	---	---	0.000	0.001	0.009	0.35	0.75	0.17	1.95
Max	---	---	---	---	---	0.00	0.01	0.04	1.4	1.6	1.5	2.7
Min	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AC-FT	---	---	---	---	---	0	0.02	0.5	21	46	11	116
CAL YEAR	2015	TOTAL	132	MEAN	0.82	MAX	4.0	MIN	0.00	AC-FT	262	
WTR YEAR	2016	TOTAL	98	MEAN	0.51	MAX	3.0	MIN	0.00	AC-FT	194	
Legend: 'e' Estimated												
Created on 04/12/17 07:36 by J A MARBURGER												

NIORARA RIVER BASIN

BENNETT-KAY CANAL from Niobrara River, 00013000

LOCATION.--SE1/4SE1/4 Sec. 1-28-54 W. near Agate

GAGE.--Continuous stage recorder and concrete flume

PERIOD OF RECORD.--1958 - present

APPENDIX A SURFACE WATER DIVERSIONS IN 2016

Nebraska Department of Natural Resources

38100 Earnest Canal (South) from Niobrara Rive Q, WATER YEAR OCT 2015 TO SEP 2016 Daily Mean Values

Day	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16
1	---	---	---	---	---	---	---	---	-0.00	-0.00	-0.00	-0.00
2	---	---	---	---	---	---	---	---	-0.00	-0.00	-0.00	-0.00
3	---	---	---	---	---	---	---	---	-0.00	-0.00	-0.00	-0.00
4	---	---	---	---	---	---	---	---	-0.00	-0.00	-0.00	-0.00
5	---	---	---	---	---	---	---	---	-0.00	-0.00	-0.00	-0.00
6	---	---	---	---	---	---	---	---	-0.00	-0.00	-0.00	-0.00
7	---	---	---	---	---	---	---	---	-0.00	-0.00	-0.00	-0.00
8	---	---	---	---	---	---	---	---	-0.00	-0.00	-0.00	-0.00
9	---	---	---	---	---	---	---	---	-0.00	-0.00	-0.00	-0.00
10	---	---	---	---	---	---	---	---	-0.00	-0.00	-0.00	-0.00
11	---	---	---	---	---	---	---	-0.00	-0.00	-0.00	-0.00	-0.00
12	---	---	---	---	---	---	0.00	-0.00	-0.00	-0.00	-0.00	-0.00
13	---	---	---	---	---	---	---	-0.00	-0.00	-0.00	-0.00	-0.00
14	---	---	---	---	---	---	---	-0.00	-0.00	-0.00	-0.00	-0.00
15	---	---	---	---	---	---	---	-0.00	-0.00	-0.00	-0.00	-0.00
16	---	---	---	---	---	---	---	0.88	-0.00	-0.00	-0.00	-0.00
17	---	---	---	---	---	---	---	3.6	-0.00	-0.00	-0.00	-0.00
18	---	---	---	---	---	---	---	3.4	-0.00	-0.00	-0.00	-0.00
19	---	---	---	---	---	---	---	3.2	-0.00	-0.00	-0.00	-0.00
20	---	---	---	---	---	---	---	1.5	-0.00	-0.00	-0.00	-0.00
21	---	---	---	---	---	---	---	0.66	-0.00	-0.00	-0.00	-0.00
22	---	---	---	---	---	---	---	0.29	-0.00	-0.00	-0.00	-0.00
23	---	---	---	---	---	---	---	0.12	-0.00	-0.00	-0.00	-0.00
24	---	---	---	---	---	---	---	0.04	-0.00	-0.00	-0.00	-0.00
25	---	---	---	---	---	---	---	0.16	-0.00	-0.00	-0.00	-0.00
26	---	---	---	---	---	---	---	0.07	-0.00	-0.00	-0.00	-0.00
27	---	---	---	---	---	---	---	-0.00	-0.00	-0.00	-0.00	-0.00
28	---	---	---	---	---	---	---	-0.00	-0.00	-0.00	-0.00	-0.00
29	---	---	---	---	---	---	---	-0.00	-0.00	-0.00	-0.00	-0.00
30	---	---	---	---	---	---	---	-0.00	-0.00	-0.00	-0.00	-0.00
31	---	---	---	---	---	---	---	-0.00	---	-0.00	-0.00	---
Total	---	---	---	---	---	---	0	13.92	0	0	0	0
Mean	---	---	---	---	---	---	0.000	0.66	-0.000	-0.000	-0.000	-0.000
Max	---	---	---	---	---	---	0.00	3.6	0.00	0.00	0.00	0.00
Min	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
AC-FT	---	---	---	---	---	---	0	28	0	0	0	0
CAL YEAR	2015	TOTAL	0	MEAN		MAX		MIN		AC-FT	0.00	
WTR YEAR	2016	TOTAL	14	MEAN	0.097	MAX	4.0	MIN	0.00	AC-FT	28	
Legend:	'e' Estimated											
	Created on						04/27/17 08:39			by J A MARBURGER		

NIOBARA RIVER BASIN

EARNEST CANAL (SOUTH) from Niobrara River, 00038100

LOCATION.—SW1/4SE1/4 Sec. 9-29-56 W. near Harrison

GAGE.—Continuous stage recorder and concrete flume

PERIOD OF RECORD.—1956 - present

APPENDIX A SURFACE WATER DIVERSIONS IN 2016

Nebraska Department of Natural Resources

29000 Cook Canal No. 1 from Niobrara River Q, WATER YEAR OCT 2015 TO SEP 2016 Daily Mean Values												
Day	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16
1	---	---	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	---	---
6	0.00	---	---	---	---	---	---	---	---	---	---	---
7	---	---	---	---	---	---	---	---	---	---	---	---
8	---	---	---	---	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	---	---	---	---
12	---	---	---	---	---	---	0.00	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	---	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	---	---	---	---	---
20	---	---	---	---	---	---	---	---	---	---	---	---
21	---	---	---	---	---	0.00	---	---	---	---	---	---
22	---	---	---	---	---	---	---	---	---	---	---	---
23	---	---	---	---	---	---	---	---	---	---	---	---
24	---	---	---	---	---	---	---	0.00	---	---	---	---
25	---	---	---	---	---	---	---	---	---	---	---	---
26	---	---	---	---	---	---	---	---	---	---	---	---
27	---	---	---	---	---	---	---	---	---	---	---	---
28	---	---	---	---	---	---	---	---	---	---	---	---
29	---	---	---	---	---	0.00	---	---	---	---	---	---
30	---	---	---	---	---	---	---	---	---	---	0.00	---
31	---	---	---	---	---	---	---	---	---	---	---	---
Total	0	---	---	---	---	0	0	0	---	---	0	---
Mean	0.000	---	---	---	---	0.000	0.000	0.000	---	---	0.000	---
Max	0.00	---	---	---	---	0.00	0.00	0.00	---	---	0.00	---
Min	0.00	---	---	---	---	0.00	0.00	0.00	---	---	0.00	---
AC-FT	0	---	---	---	---	0	0	0	---	---	0	---
CAL YEAR	2015	TOTAL	0	MEAN	0.000	MAX	0.0	MIN	0.00	AC-FT	0.00	---
WTR YEAR	2016	TOTAL	0	MEAN	0.000	MAX	0.0	MIN	0.00	AC-FT	0.00	---
Legend:	'e' Estimated											
Created on					04/27/17 12:27							
by J A MARBURGER												

NIOBRARA RIVER BASIN

COOK CANAL NO. 1 from Niobrara River, 00029000

LOCATION.--SE1/4NE1/4 Sec. 2-28-56 W.

GAGE.--Continuous stage recorder and concrete flume

PERIOD OF RECORD.--1956 - 1982, 1985 - present

October 6, 2017

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APPENDIX A SURFACE WATER DIVERSIONS IN 2016

Nebraska Department of Natural Resources

38200 Earnest Canal (North) from Niobrara Rive Q, WATER YEAR OCT 2015 TO SEP 2016 Daily Mean Values												
Day	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16
1	---	---	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---	---	---	0.00	---	---
7	---	---	---	---	---	---	---	---	---	---	---	---
8	---	---	---	---	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	0.00	---	---	---	---
12	---	---	---	---	---	---	0.00	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	0.00	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	---	---	---	---	---
20	---	---	---	---	---	---	---	---	---	---	---	---
21	---	---	---	---	---	---	---	---	0.00	---	---	---
22	---	---	---	---	---	---	---	---	---	---	---	---
23	---	---	---	---	---	---	---	---	---	---	---	---
24	---	---	---	---	---	---	---	0.00	---	---	---	---
25	---	---	---	---	---	---	---	0.00	---	---	---	---
26	---	---	---	---	---	---	---	---	---	0.00	---	---
27	---	---	---	---	---	---	---	---	---	---	---	---
28	---	---	---	---	---	---	---	---	0.00	---	---	---
29	---	---	---	---	---	---	---	---	---	---	---	---
30	---	---	---	---	---	---	---	---	---	---	---	---
31	---	---	---	---	---	---	---	0.00	---	---	---	---
Total	---	---	---	---	---	---	0	0	0	0	---	---
Mean	---	---	---	---	---	---	0.000	0.000	0.000	0.000	---	---
Max	---	---	---	---	---	---	0.00	0.00	0.00	0.00	---	---
Min	---	---	---	---	---	---	0.00	0.00	0.00	0.00	---	---
AC-FT	---	---	---	---	---	---	0	0	0	0	---	---
CAL YEAR	2015	TOTAL	0	MEAN		MAX		MIN		AC-FT	0.00	
WTR YEAR	2016	TOTAL	0	MEAN	0.000	MAX	0.0	MIN	0.00	AC-FT	0.00	
Legend:	'e' Estimated											
Created on							04/27/17 13:36			by J A MARBURGER		

NIOBRARA RIVER BASIN

EARNEST CANAL (NORTH) from Niobrara River, 00038200

LOCATION.—NE1/4SE1/4 Sec. 9-29-56 W. near Harrison

GAGE.—Continuous stage recorder and concrete flume

PERIOD OF RECORD.—1956 - present

APPENDIX A SURFACE WATER DIVERSIONS IN 2016

Nebraska Department of Natural Resources

62000 Harris-Neece Canal from Niobrara River Q, WATER YEAR OCT 2015 TO SEP 2016 Daily Mean Values

Day	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16
1	11	---	---	---	---	---	0.00	0.00	0.00	4.8	2.9	0.00
2	11	---	---	---	---	---	0.00	0.00	4.8	5.2	4.6	0.00
3	11	---	---	---	---	---	0.00	0.00	8.4	5.2	5.4	0.00
4	11	---	---	---	---	---	0.00	0.00	e8.2	5.2	5.6	0.00
5	11	---	---	---	---	---	0.00	0.00	e8.3	4.9	5.8	0.00
6	11	---	---	---	---	---	0.00	0.00	e8.3	4.9	6.0	0.00
7	11	---	---	---	---	---	0.00	0.00	8.4	5.6	6.2	0.00
8	11	---	---	---	---	---	0.00	0.00	8.6	5.5	6.4	0.00
9	11	---	---	---	---	---	0.00	0.00	8.7	5.9	6.6	0.00
10	11	---	---	---	---	---	0.00	0.00	8.9	6.2	6.6	0.00
11	11	---	---	---	---	---	0.00	0.00	9.1	6.1	6.6	0.00
12	11	---	---	---	---	---	0.00	0.00	9.2	5.9	6.6	0.00
13	10	---	---	---	---	---	0.00	0.00	9.7	5.3	7.1	0.00
14	4.4	---	---	---	---	---	0.00	0.00	9.4	4.7	8.2	0.00
15	1.3	---	---	---	---	---	0.00	0.00	8.2	4.9	8.5	0.00
16	1.3	---	---	---	---	0.00	0.00	0.00	2.4	3.8	8.3	---
17	1.3	---	---	---	---	0.00	0.00	0.00	2.3	1.7	8.4	---
18	1.3	---	---	---	---	0.00	0.00	0.00	2.3	1.7	8.3	---
19	1.2	---	---	---	---	0.00	0.00	0.00	2.2	1.7	8.2	---
20	1.2	---	---	---	---	0.00	0.00	0.00	3.0	1.7	8.0	---
21	1.2	---	---	---	---	0.00	0.00	0.00	4.5	1.6	7.8	---
22	1.2	---	---	---	---	0.00	0.00	0.00	4.1	1.6	7.7	---
23	---	---	---	---	---	0.00	0.00	0.00	4.0	1.6	7.4	---
24	---	---	---	---	---	0.00	0.00	0.00	3.7	2.4	5.1	---
25	---	---	---	---	---	0.00	0.00	0.00	4.0	2.9	0.00	---
26	---	---	---	---	---	0.00	0.00	0.00	4.0	2.7	0.00	---
27	---	---	---	---	---	0.00	0.00	0.00	4.0	2.8	0.00	---
28	---	---	---	---	---	0.00	0.00	0.00	4.2	3.5	0.00	---
29	---	---	---	---	---	0.00	0.00	0.00	4.4	4.1	0.00	---
30	---	---	---	---	---	0.00	0.00	0.00	4.6	4.6	0.00	---
31	---	---	---	---	---	0.00	---	0.00	---	3.6	0.00	---
Total	156.4	---	---	---	---	0	0	0	171.9	122.3	162.3	0
Mean	7.23	---	---	---	---	0.000	0.000	0.000	5.72	3.95	5.24	0.000
Max	11	---	---	---	---	0.00	0.00	0.00	9.7	6.2	8.5	0.00
Min	1.2	---	---	---	---	0.00	0.00	0.00	0.00	1.6	0.00	0.00
AC-FT	310	---	---	---	---	0	0	0	341	243	322	0
CAL YEAR	2015	TOTAL	744	MEAN	5.02	MAX	11.0	MIN	0.00	AC-FT	1470	
WTR YEAR	2016	TOTAL	613	MEAN	2.98	MAX	11.0	MIN	0.00	AC-FT	1220	
Legend: 'e' Estimated												
Created on 04/26/17 08:28 by J A MARBURGER												

NIORARA RIVER BASIN

HARRIS-NEECE CANAL from Niobrara River, 00062000

LOCATION.--NW1/4SE1/4 Sec. 3-28-55 W. near Agate

GAGE.--Continuous stage recorder and 30 inch cutthroat flume

PERIOD OF RECORD.--1956 - present

October 6, 2017

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APPENDIX A SURFACE WATER DIVERSIONS IN 2016

Nebraska Department of Natural Resources
Nebraska Department of Natural Resources

63000 Geo. Hitsheew Canal from Niobrara River Q, WATER YEAR OCT 2015 TO SEP 2016 Daily Mean Values

Day	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16
1	---	---	---	---	---	---	0.00	---	---	---	---	0.00
2	---	---	---	---	---	---	0.00	---	---	---	---	---
3	---	---	---	---	---	---	0.00	---	---	---	---	---
4	---	---	---	---	---	---	0.00	---	---	---	---	---
5	---	---	---	---	---	---	0.00	---	---	---	---	---
6	---	---	---	---	---	---	0.00	---	---	---	---	---
7	---	---	---	---	---	---	0.00	---	---	---	---	---
8	---	---	---	---	---	---	0.00	---	---	---	---	---
9	---	---	---	---	---	---	0.00	---	---	---	---	---
10	---	---	---	---	---	---	0.00	---	---	---	---	---
11	---	---	---	---	---	---	0.00	---	---	---	---	---
12	---	---	---	---	---	---	0.00	---	---	---	---	---
13	---	---	---	---	---	---	0.00	---	---	---	---	---
14	---	---	---	---	---	---	---	---	---	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	---	---	---	---	---
20	---	---	---	---	---	---	---	---	---	---	---	---
21	---	---	---	---	---	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---	---	---	---	---	---
23	---	---	---	---	---	---	---	---	---	---	---	---
24	---	---	---	---	---	---	---	---	---	---	---	---
25	---	---	---	---	---	---	---	---	---	---	---	---
26	---	---	---	---	---	---	---	---	---	---	---	---
27	---	---	---	---	---	---	---	---	---	---	---	---
28	---	---	---	---	---	0.00	---	---	---	---	---	---
29	---	---	---	---	---	0.00	---	---	---	---	---	---
30	---	---	---	---	---	0.00	---	---	---	---	---	---
31	---	---	---	---	---	0.00	---	---	---	---	---	---
Total	---	---	---	---	---	0.000	0.000	---	---	---	---	0.000
Mean	---	---	---	---	---	0.000	0.000	---	---	---	---	0.000
Max	---	---	---	---	---	0.00	0.00	---	---	---	---	0.00
Min	---	---	---	---	---	0.00	0.00	---	---	---	---	0.00
AC-FT	---	---	---	---	---	0.00	0.00	---	---	---	---	0.00
CAL YEAR	2015	TOTAL	0.0	MEAN	0.000	MAX	0.0	MIN	0.00	AC-FT	0.00	
WTR YEAR	2016	TOTAL	0.0	MEAN	0.000	MAX	0.0	MIN	0.00	AC-FT	0.00	
Legend:	'e' Estimated											
Created on						07/31/17 13:53			by J A MARBURGER			

NIOBRARA RIVER BASIN

GEO. HITSHEW CANAL from Niobrara River, 00063000

LOCATION.--NE1/4SE1/4 Sec. 6-28-52 W. near Marsland

GAGE.--Continuous stage recorder and 30 inch cutthroat flume

PERIOD OF RECORD.--1956 - present

APPENDIX A SURFACE WATER DIVERSIONS IN 2016

Nebraska Department of Natural Resources

69000 Hughes Canal from Niobrara River Q, WATER YEAR OCT 2015 TO SEP 2016 Daily Mean Values												
Day	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16
1	---	---	---	---	---	---	0.42	0.57	---	---	---	---
2	---	---	---	---	---	---	0.44	0.82	-0.00	---	---	---
3	---	---	---	---	---	---	0.46	0.70	-0.00	---	---	---
4	---	---	---	---	---	---	0.41	0.73	-0.00	---	---	---
5	---	---	---	---	---	---	0.35	0.78	-0.00	---	---	---
6	---	---	---	---	---	---	0.29	0.79	-0.00	---	---	---
7	---	---	---	---	---	---	0.24	0.66	-0.00	---	---	---
8	---	---	---	---	---	---	0.20	0.61	-0.00	---	---	---
9	---	---	---	---	---	---	0.18	0.71	-0.00	---	---	---
10	---	---	---	---	---	---	0.19	0.66	-0.00	---	---	---
11	---	---	---	---	---	---	0.20	0.61	-0.00	---	---	---
12	---	---	---	---	---	---	0.17	0.66	-0.00	---	---	---
13	---	---	---	---	---	---	0.16	0.45	-0.00	---	---	---
14	---	---	---	---	---	---	0.16	0.47	-0.00	---	---	---
15	---	---	---	---	---	---	0.16	0.31	-0.00	---	---	---
16	---	---	---	---	---	---	0.21	0.27	-0.00	---	---	---
17	---	---	---	---	---	---	0.27	0.43	-0.00	---	---	---
18	---	---	---	---	---	---	0.29	0.39	-0.00	---	---	---
19	---	---	---	---	---	---	0.25	0.30	-0.00	---	---	---
20	---	---	---	---	---	---	0.19	---	-0.00	---	---	---
21	---	---	---	---	---	---	0.17	---	-0.00	---	---	---
22	---	---	---	---	---	0.25	0.15	---	-0.00	---	---	---
23	---	---	---	---	---	0.22	0.11	---	-0.00	---	---	---
24	---	---	---	---	---	0.27	0.1	---	---	---	---	---
25	---	---	---	---	---	0.31	0.11	---	---	---	---	---
26	---	---	---	---	---	0.31	0.15	---	---	---	---	---
27	---	---	---	---	---	0.30	0.21	---	---	---	---	---
28	---	---	---	---	---	0.30	0.24	---	---	---	---	---
29	---	---	---	---	---	0.28	0.23	---	---	---	---	---
30	---	---	---	---	---	0.34	0.30	---	---	---	---	---
31	---	---	---	---	---	0.36	---	---	---	---	---	---
Total	---	---	---	---	---	2.94	7.01	10.92	0	---	---	---
Mean	---	---	---	---	---	0.29	0.23	0.57	-0.000	---	---	---
Max	---	---	---	---	---	0.36	0.46	0.82	0.00	---	---	---
Min	---	---	---	---	---	0.22	0.10	0.27	0.00	---	---	---
AC-FT	---	---	---	---	---	5.8	14	22	0	---	---	---
CAL YEAR	2015	TOTAL	0	MEAN		MAX		MIN		AC-FT	0.00	
WTR YEAR	2016	TOTAL	21	MEAN	0.26	MAX	1.0	MIN	0.00	AC-FT	41	
Legend:	'e' Estimated											
	Created on						04/27/17 11:20			by J A MARBURGER		

NIOBRARA RIVER BASIN

HUGHES CANAL from Niobrara River, 00069000

LOCATION.--SW1/4SE1/4 Sec. 1-28-52 W. near Marsland

GAGE.--Continuous stage recorder and concrete flume

PERIOD OF RECORD.--1956 - present

APPENDIX A SURFACE WATER DIVERSIONS IN 2016

Nebraska Department of Natural Resources

81000 Lichte Canal from Niobrara River Q, WATER YEAR OCT 2015 TO SEP 2016 Daily Mean Values												
Day	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16
1	---	---	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---	---	---	---	---	---
7	---	---	---	---	---	---	---	---	---	---	---	---
8	---	---	---	---	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	---	---	---	---
12	---	---	---	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	---	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	---	---	---	---	---
20	---	---	---	---	---	---	---	---	---	---	---	---
21	---	---	---	---	---	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---	---	---	---	---	---
23	---	---	---	---	---	---	---	---	---	---	---	---
24	---	---	---	---	---	---	---	---	---	---	---	---
25	---	---	---	---	---	---	---	---	---	---	---	---
26	---	---	---	---	---	---	---	---	---	---	---	---
27	---	---	---	---	---	---	---	---	---	---	---	---
28	---	---	---	---	---	---	---	---	---	---	---	---
29	---	---	---	---	---	---	---	---	---	---	---	---
30	---	---	---	---	---	---	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
Total	---	---	---	---	---	---	---	---	---	---	---	---
Mean	---	---	---	---	---	---	---	---	---	---	---	---
Max	---	---	---	---	---	---	---	---	---	---	---	---
Min	---	---	---	---	---	---	---	---	---	---	---	---
AC-FT	---	---	---	---	---	---	---	---	---	---	---	---
CAL YEAR	2015	TOTAL	0	MEAN		MAX		MIN		AC-FT	0.00	
WTR YEAR	2016	TOTAL	0	MEAN		MAX		MIN		AC-FT	0.00	
Legend:	'e' Estimated				Created on				04/27/17 13:01			
									by J A MARBURGER			

NIORARA RIVER BASIN

LICHTE CANAL from Niobrara River, 00081000

LOCATION.--NW1/4SW1/4 Sec. 26-29-48 W. near Dunlap

GAGE.--Continuous stage recorder and 3 ft. Parshall flume

PERIOD OF RECORD.--1956 -2013

SITE WAS NOT VISITED IN THE WATER YEAR 2016

APPENDIX A SURFACE WATER DIVERSIONS IN 2016

Nebraska Department of Natural Resources

72000 Johnson Canal from Niobrara River Q, WATER YEAR OCT 2015 TO SEP 2016 Daily Mean Values												
Day	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16
1	---	---	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---	---	---	0.00	---	---
7	---	---	---	---	---	---	---	---	---	---	---	---
8	---	---	---	---	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	3.2	0.00	---	---	---	---
12	---	---	---	---	---	---	2.7	---	---	---	---	---
13	---	---	---	---	---	---	6.6	---	---	---	---	---
14	---	---	---	---	---	---	17	---	---	---	---	---
15	---	---	---	---	---	---	17	---	---	---	---	---
16	---	---	---	---	---	---	13	---	---	---	---	---
17	---	---	---	---	---	0.00	2.2	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	---	---	---	---	---
20	---	---	---	---	---	---	---	---	---	---	---	---
21	---	---	---	---	---	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---	---	---	---	---	---
23	---	---	---	---	---	---	---	---	---	---	---	---
24	---	---	---	---	---	---	---	0.00	---	---	---	---
25	---	---	---	---	---	---	---	---	---	---	---	---
26	---	---	---	---	---	---	---	---	---	---	---	---
27	---	---	---	---	---	---	---	---	---	---	---	---
28	---	---	---	---	---	---	---	---	0.00	---	---	---
29	---	---	---	---	---	0.00	---	---	---	---	---	---
30	---	---	---	---	---	---	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
Total	---	---	---	---	---	0	61.7	0	0	0	---	---
Mean	---	---	---	---	---	0.000	8.91	0.000	0.000	0.000	---	---
Max	---	---	---	---	---	0.00	17	0.00	0.00	0.00	---	---
Min	---	---	---	---	---	0.00	2.2	0.00	0.00	0.00	---	---
AC-FT	---	---	---	---	---	0	122	0	0	0	---	---
CAL YEAR	2015	TOTAL	150	MEAN	1.05	MAX	11.0	MIN	0.00	AC-FT	298	---
WTR YEAR	2016	TOTAL	62	MEAN	4.75	MAX	17.0	MIN	0.00	AC-FT	122	---
Legend: 'e' Estimated Created on 04/27/17 07:41 by J A MARBURGER												

NIOBRARA RIVER BASIN

JOHNSON CANAL from Niobrara River, 00072000

LOCATION.--NE1/4NE1/4 Sec. 1-30-57 W. near Harrison

GAGE.--Continuous stage recorder and 1.5 ft. Parshall flume

PERIOD OF RECORD.--1956 - present

APPENDIX A SURFACE WATER DIVERSIONS IN 2016

Nebraska Department of Natural Resources

78000 Labelle Canal from Niobrara River Q, WATER YEAR OCT 2015 TO SEP 2016 Daily Mean Values												
Day	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16
1	---	---	---	---	---	---	0.00	---	---	---	---	---
2	---	---	---	---	---	---	0.00	---	---	---	---	---
3	---	---	---	---	---	---	0.00	---	---	---	---	---
4	---	---	---	---	---	---	0.00	---	---	---	---	---
5	---	---	---	---	---	---	0.00	---	---	---	---	---
6	---	---	---	---	---	---	0.00	---	---	0.00	---	---
7	---	---	---	---	---	---	0.00	---	0.00	---	---	---
8	---	---	---	---	---	---	0.00	---	---	---	---	---
9	---	---	---	---	---	---	0.00	---	---	---	0.00	---
10	---	---	---	---	---	---	0.00	---	---	---	---	---
11	---	---	---	---	---	---	0.00	0.00	---	---	---	---
12	---	---	---	---	---	---	0.00	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	0.00	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	---
16	---	---	---	---	---	0.00	---	---	---	---	0.00	---
17	---	---	---	---	---	0.00	---	---	---	---	---	---
18	---	---	---	---	---	0.00	---	---	---	---	---	---
19	---	---	---	---	---	0.00	---	---	---	0.00	---	---
20	---	---	---	---	---	0.00	---	---	---	---	---	---
21	---	---	---	---	---	0.00	---	---	0.00	---	---	---
22	---	---	---	---	---	0.00	---	---	---	---	---	---
23	---	---	---	---	---	0.00	---	---	---	---	---	---
24	---	---	---	---	---	0.00	---	0.00	---	---	---	---
25	---	---	---	---	---	0.00	---	---	---	---	---	---
26	---	---	---	---	---	0.00	---	---	---	0.00	---	---
27	---	---	---	---	---	0.00	---	---	---	---	---	---
28	---	---	---	---	---	0.00	---	---	0.00	---	---	---
29	---	---	---	---	---	0.00	---	---	---	---	---	---
30	---	---	---	---	---	0.00	---	---	---	---	0.00	---
31	---	---	---	---	---	0.00	---	0.00	---	---	---	---
Total	---	---	---	---	---	0.000	0.000	0.000	0.000	0.000	0.000	---
Mean	---	---	---	---	---	0.000	0.000	0.000	0.000	0.000	0.000	---
Max	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00	---
Min	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00	---
AC-FT	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00	---
CAL YEAR	2015	TOTAL	180.0	MEAN	1.11	MAX	7.0	MIN	0.00	AC-FT	358	---
WTR YEAR	2016	TOTAL	0.0	MEAN	0.000	MAX	0.0	MIN	0.00	AC-FT	0.00	---
Legend: 'e' Estimated												
Created on 07/31/17 14:03 by J A MARBURGER												

NIORARA RIVER BASIN

LABELLE CANAL from Niobrara River, 00078000

LOCATION.--NW1/4NW1/4 Sec. 6-28-54 W. near Agate

GAGE.--Continuous stage recorder and concrete flume

PERIOD OF RECORD.--1956 - present

APPENDIX A SURFACE WATER DIVERSIONS IN 2016

Nebraska Department of Natural Resources

79000 Lakotah Canal from Niobrara River Q, WATER YEAR OCT 2015 TO SEP 2016 Daily Mean Values

Day	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16
1	---	---	---	---	---	---	0.00	0.00	4.8	1.9	0.96	0.87
2	---	---	---	---	---	---	0.00	0.00	4.3	5.3	0.76	0.87
3	---	---	---	---	---	---	0.00	0.00	3.9	3.8	0.79	0.94
4	---	---	---	---	---	---	0.00	0.00	3.5	3.7	0.99	0.99
5	---	---	---	---	---	---	0.00	0.00	3.2	2.3	1.0	1.0
6	---	---	---	---	---	---	0.00	0.01	2.9	1.5	1.0	1.0
7	---	---	---	---	---	---	0.00	0.01	2.6	1.2	1.3	1.0
8	---	---	---	---	---	---	0.00	0.00	2.5	1.0	1.4	1.0
9	---	---	---	---	---	---	0.00	0.00	3.4	0.90	1.2	1.0
10	---	---	---	---	---	---	0.00	0.00	2.5	0.77	1.1	1.0
11	---	---	---	---	---	---	0.00	0.00	2.3	0.61	1.1	1.1
12	---	---	---	---	---	---	0.00	0.00	2.1	0.52	0.97	1.1
13	---	---	---	---	---	---	0.00	0.02	2.0	0.46	0.84	1.2
14	---	---	---	---	---	---	0.00	0.03	2.0	0.41	0.75	1.3
15	---	---	---	---	---	---	0.01	0.04	1.9	0.37	0.74	1.4
16	---	---	---	---	---	---	0.01	1.9	1.8	0.38	0.74	---
17	---	---	---	---	---	---	0.01	6.8	1.6	0.39	0.74	---
18	---	---	---	---	---	---	0.00	7.1	1.4	0.39	0.78	---
19	---	---	---	---	---	---	0.00	6.9	1.1	0.37	0.76	---
20	---	---	---	---	---	---	0.00	6.3	0.99	0.34	0.82	---
21	---	---	---	---	---	---	0.00	5.9	0.83	0.30	0.84	---
22	---	---	---	---	---	---	0.00	5.7	0.70	0.28	0.83	---
23	---	---	---	---	---	---	0.00	5.5	0.66	0.29	0.79	---
24	---	---	---	---	---	---	0.00	5.7	0.60	0.27	0.96	---
25	---	---	---	---	---	---	0.02	6.1	0.55	0.25	1.1	---
26	---	---	---	---	---	---	0.03	5.8	0.53	0.27	1.1	---
27	---	---	---	---	---	---	0.00	5.7	0.50	0.29	1.1	---
28	---	---	---	---	---	0.00	0.00	5.5	0.54	0.54	0.97	---
29	---	---	---	---	---	0.00	0.00	5.3	0.56	1.5	0.90	---
30	---	---	---	---	---	0.00	0.02	5.5	0.86	1.8	0.86	---
31	---	---	---	---	---	0.00	---	5.7	---	1.3	0.85	---
Total	---	---	---	---	---	0	0.1	91.51	57.12	33.7	29.04	15.77
Mean	---	---	---	---	---	0.000	0.003	2.95	1.91	1.09	0.94	1.06
Max	---	---	---	---	---	0.00	0.03	7.1	4.8	5.3	1.4	1.4
Min	---	---	---	---	---	0.00	0.00	0.00	0.50	0.25	0.74	0.87
AC-FT	---	---	---	---	---	0	0.2	182	113	67	58	31
CAL YEAR	2015	TOTAL	458	MEAN	2.72	MAX	11.0	MIN	0.21	AC-FT	908	
WTR YEAR	2016	TOTAL	227	MEAN	1.32	MAX	7.0	MIN	0.00	AC-FT	451	
Legend: 'e' Estimated Created on 04/11/17 12:51 by J A MARBURGER												

NIOBRARA RIVER BASIN

LAKOTAH CANAL from Niobrara River, 00079000

LOCATION.--NE1/4NE1/4 Sec. 12-30-57 W. near Harrison

GAGE.--Continuous stage recorder and 2 ft. Parshall flume

PERIOD OF RECORD.--1956 - present

APPENDIX A SURFACE WATER DIVERSIONS IN 2016

Nebraska Department of Natural Resources

84000 McGinley-Stover Canal from Niobrara Rive Q, WATER YEAR OCT 2015 TO SEP 2016 Daily Mean Values

Day	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16
1	---	---	---	---	---	---	0.00	0.00	9.6	2.4	1.6	0.00
2	---	---	---	---	---	---	0.00	0.00	9.1	3.5	1.2	0.00
3	---	---	---	---	---	---	0.00	0.00	7.1	3.5	1.0	0.00
4	---	---	---	---	---	---	0.00	0.00	5.4	2.9	0.93	0.00
5	---	---	---	---	---	---	0.00	0.00	4.6	2.5	0.88	0.00
6	---	---	---	---	---	---	0.00	0.00	3.8	2.0	0.78	0.00
7	---	---	---	---	---	---	0.00	0.00	3.3	0.84	0.02	0.00
8	---	---	---	---	---	---	0.00	0.00	2.6	0.00	0.01	0.00
9	---	---	---	---	---	---	0.00	0.00	2.3	0.00	0.00	0.00
10	---	---	---	---	---	---	0.00	0.00	1.8	0.00	0.00	0.00
11	---	---	---	---	---	---	0.00	0.00	0.31	0.00	0.00	0.00
12	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
13	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
14	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
15	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
16	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	---	---	---	---	---	0.00	0.00	e0.00	0.00	0.00	0.00	0.00
18	---	---	---	---	---	0.00	0.00	e0.00	1.1	0.00	0.00	0.00
19	---	---	---	---	---	0.00	0.00	e0.00	3.5	0.95	0.00	0.00
20	---	---	---	---	---	0.00	0.00	e0.00	3.3	1.9	0.00	0.00
21	---	---	---	---	---	0.00	0.00	e0.00	2.9	1.1	0.00	0.00
22	---	---	---	---	---	0.00	0.00	e0.00	2.3	0.65	0.00	0.00
23	---	---	---	---	---	0.00	0.00	e0.00	2.2	1.1	0.00	0.00
24	---	---	---	---	---	0.00	0.00	e0.00	2.1	0.77	0.00	0.00
25	---	---	---	---	---	0.00	0.00	0.00	2.0	0.67	0.00	0.00
26	---	---	---	---	---	0.00	0.00	0.00	1.8	2.0	0.00	0.00
27	---	---	---	---	---	0.00	0.00	0.00	1.8	1.5	0.00	0.00
28	---	---	---	---	---	0.00	0.00	0.00	1.6	2.7	0.00	0.00
29	---	---	---	---	---	0.00	0.00	0.00	1.6	2.9	0.00	0.00
30	---	---	---	---	---	0.00	0.00	0.00	1.7	2.5	0.00	0.00
31	---	---	---	---	---	0.00	---	1.9	---	2.3	0.00	---
Total	---	---	---	---	---	0	0	1.9	77.81	38.68	6.42	0
Mean	---	---	---	---	---	0.000	0.000	0.061	2.59	1.25	0.20	0.000
Max	---	---	---	---	---	0.00	0.00	1.9	9.6	3.5	1.6	0.00
Min	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AC-FT	---	---	---	---	---	0	0	3.8	154	77	13	0
CAL YEAR	2015	TOTAL	169	MEAN	1.07	MAX	22.0	MIN	0.00	AC-FT	336	
WTR YEAR	2016	TOTAL	125	MEAN	0.63	MAX	10.0	MIN	0.00	AC-FT	248	
Legend:	'e' Estimated											
Created on						04/26/17 12:03			by Author			

NIORARA RIVER BASIN

McGINLEY-STOVER CANAL from Niobrara River, 00084000

LOCATION.--NE1/4SE1/4 Sec. 25-29-56 W. near Agate

GAGE.--Continuous stage recorder and 3 ft. Parshall flume

PERIOD OF RECORD.--1956 - present

October 6, 2017

17 of 24

APPENDIX A SURFACE WATER DIVERSIONS IN 2016

Nebraska Department of Natural Resources

86000 McLaughlin Canal from Niobrara River Q, WATER YEAR OCT 2015 TO SEP 2016 Daily Mean Values

Day	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16
1	---	---	---	---	---	---	0.00	0.48	---	0.1	0.03	0.00
2	---	---	---	---	---	---	0.00	0.53	5.1	0.17	0.00	---
3	---	---	---	---	---	---	0.00	0.33	5.3	0.1	0.00	---
4	---	---	---	---	---	---	0.00	0.18	5.3	0.01	0.00	---
5	---	---	---	---	---	---	0.00	0.18	5.3	0.00	0.01	---
6	---	---	---	---	---	---	0.00	0.20	5.0	0.00	0.00	---
7	---	---	---	---	---	---	0.00	0.23	4.4	0.00	0.01	---
8	---	---	---	---	---	---	0.00	0.24	4.3	0.00	0.04	---
9	---	---	---	---	---	---	0.00	0.24	4.3	0.00	0.03	---
10	---	---	---	---	---	---	0.00	0.22	3.9	0.00	0.00	---
11	---	---	---	---	---	---	0.00	0.22	3.5	0.00	0.01	---
12	---	---	---	---	---	---	0.00	0.22	3.0	0.00	0.12	---
13	---	---	---	---	---	---	0.06	0.26	2.9	0.00	0.01	---
14	---	---	---	---	---	---	0.01	0.19	3.0	0.00	0.00	---
15	---	---	---	---	---	---	0.10	0.18	2.6	0.00	0.00	---
16	---	---	---	---	---	---	0.36	0.14	2.2	0.00	0.00	---
17	---	---	---	---	---	---	0.35	0.07	2.5	0.00	0.00	---
18	---	---	---	---	---	---	0.30	0.08	5.0	0.00	0.00	---
19	---	---	---	---	---	---	0.28	---	5.0	0.00	0.00	---
20	---	---	---	---	---	---	0.27	---	5.0	0.04	0.00	---
21	---	---	---	---	---	---	0.26	---	4.9	0.09	0.00	---
22	---	---	---	---	---	---	0.34	---	4.6	0.13	0.00	---
23	---	---	---	---	---	---	0.33	---	3.1	0.17	0.00	---
24	---	---	---	---	---	---	0.15	---	0.16	0.11	0.00	---
25	---	---	---	---	---	---	0.01	---	0.00	0.03	0.00	---
26	---	---	---	---	---	---	0.29	---	0.00	0.00	0.00	---
27	---	---	---	---	---	---	0.33	---	0.00	0.00	0.00	---
28	---	---	---	---	---	---	0.27	---	0.00	0.17	0.00	---
29	---	---	---	---	---	0.00	0.30	---	0.07	0.20	0.00	---
30	---	---	---	---	---	0.00	0.34	---	0.15	0.10	0.00	---
31	---	---	---	---	---	0.00	---	---	---	0.06	0.00	---
Total	---	---	---	---	---	0	4.35	4.19	90.58	1.48	0.26	0
Mean	---	---	---	---	---	0.001	0.15	0.23	3.12	0.048	0.008	0.000
Max	---	---	---	---	---	0.00	0.36	0.53	5.3	0.20	0.12	0.00
Min	---	---	---	---	---	0.00	0.00	0.07	0.00	0.00	0.00	0.00
AC-FT	---	---	---	---	---	0	8.6	8.3	180	2.9	0.5	0
CAL YEAR	2015	TOTAL	0	MEAN		MAX		MIN		AC-FT	0.00	
WTR YEAR	2016	TOTAL	101	MEAN	0.71	MAX	5.0	MIN	0.00	AC-FT	200	
Legend:	'e' Estimated											
	Created on 05/09/17 07:55 by J A MARBURGER											

NIORARA RIVER BASIN

McLAUGHLIN CANAL from Niobrara River, 00086000

LOCATION.--NW1/4SE1/4 Sec. 9-28-52 W. near Marsland

GAGE.--Continuous stage recorder and 30 inch cutthroat flume

PERIOD OF RECORD.--1956 - present

APPENDIX A SURFACE WATER DIVERSIONS IN 2016

Nebraska Department of Natural Resources

89000 Mettlen Canal from Niobrara River Q, WATER YEAR OCT 2015 TO SEP 2016 Daily Mean Values												
Day	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16
1	---	---	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---	---	0.00	0.00	---	---
7	---	---	---	---	---	---	---	---	---	---	---	---
8	---	---	---	---	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---	---	0.00	---
11	---	---	---	---	---	---	---	0.00	---	---	---	---
12	---	---	---	---	---	---	---	---	---	0.00	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	0.00	---	0.00	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	0.00
16	---	---	---	---	---	---	---	---	---	---	0.00	---
17	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	---	---	0.00	---	---
20	---	---	---	---	---	---	---	---	---	---	---	---
21	---	---	---	---	---	---	---	---	0.00	---	---	---
22	---	---	---	---	---	---	---	---	---	---	---	---
23	---	---	---	---	---	---	---	---	---	---	0.00	---
24	---	---	---	---	---	---	---	0.00	---	---	---	---
25	---	---	---	---	---	---	---	---	---	---	---	---
26	---	---	---	---	---	---	---	---	---	0.00	---	---
27	---	---	---	---	---	---	---	---	---	---	---	---
28	---	---	---	---	---	---	---	---	0.00	---	---	---
29	---	---	---	---	---	---	---	---	---	---	---	---
30	---	---	---	---	---	---	---	---	---	---	0.00	---
31	---	---	---	---	---	---	---	0.00	---	---	---	---
Total	---	---	---	---	---	---	0	0	0	0	0	0
Mean	---	---	---	---	---	---	0.000	0.000	0.000	0.000	0.000	0.000
Max	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Min	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
AC-FT	---	---	---	---	---	---	0	0	0	0	0	0
CAL YEAR	2015	TOTAL	21	MEAN	0.13	MAX	1.0	MIN	0.00	AC-FT	41	
WTR YEAR	2016	TOTAL	0	MEAN	0.000	MAX	0.0	MIN	0.00	AC-FT	0.00	
Legend:	'e' Estimated					Created on	04/26/17 12:32			by Author		

NIOBRARA RIVER BASIN

METTLEN CANAL from Niobrara River, 00089000

LOCATION.--NW1/4NE1/4 Sec. 4-28-54 W. near Agate

GAGE.--Continuous stage recorder and concrete flume

PERIOD OF RECORD.--1956 - present

APPENDIX A SURFACE WATER DIVERSIONS IN 2016

Nebraska Department of Natural Resources

123000 Pioneer Canal from Niobrara River Q, WATER YEAR OCT 2015 TO SEP 2016 Daily Mean Values												
Day	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16
1	---	---	---	---	---	---	---	0.00	4.5	0.19	1.7	1.2
2	---	---	---	---	---	---	---	0.00	3.9	0.17	1.6	1.2
3	---	---	---	---	---	---	---	0.00	4.2	0.15	1.6	1.2
4	---	---	---	---	---	---	---	0.00	4.2	0.13	1.5	1.3
5	---	---	---	---	---	---	---	0.00	4.3	0.10	1.5	1.2
6	---	---	---	---	---	---	0.00	0.00	4.3	0.08	1.5	1.2
7	---	---	---	---	---	---	0.00	0.00	4.3	0.06	1.5	1.2
8	---	---	---	---	---	---	0.00	0.00	4.2	0.04	1.6	1.2
9	---	---	---	---	---	---	0.00	0.00	4.1	0.02	1.6	1.1
10	---	---	---	---	---	---	0.00	0.00	3.9	0.00	1.5	1.0
11	---	---	---	---	---	---	0.00	0.00	3.9	0.00	1.5	0.98
12	---	---	---	---	---	---	0.00	0.00	3.9	0.00	2.1	0.94
13	---	---	---	---	---	---	0.00	0.00	3.9	0.00	1.8	0.98
14	---	---	---	---	---	---	0.00	0.00	4.0	0.00	1.7	0.99
15	---	---	---	---	---	---	0.00	0.05	4.0	0.00	1.7	1.0
16	---	---	---	---	---	---	0.00	0.08	4.0	0.00	2.1	0.92
17	---	---	---	---	---	---	0.00	0.08	4.0	0.00	1.7	0.88
18	---	---	---	---	---	---	0.00	0.08	3.8	0.31	1.6	0.85
19	---	---	---	---	---	---	0.00	0.08	3.4	1.4	1.6	0.79
20	---	---	---	---	---	---	0.00	0.08	3.0	1.4	1.7	0.74
21	---	---	---	---	---	---	0.00	0.08	0.47	1.4	1.6	0.72
22	---	---	---	---	---	---	0.00	0.08	0.44	1.6	1.6	0.71
23	---	---	---	---	---	---	0.00	2.6	0.40	1.7	1.5	0.76
24	---	---	---	---	---	---	0.00	5.8	0.37	1.7	1.4	0.88
25	---	---	---	---	---	---	0.00	4.9	0.34	1.7	1.5	0.85
26	---	---	---	---	---	---	0.00	4.3	0.31	1.6	1.4	0.83
27	---	---	---	---	---	---	0.00	4.3	0.28	1.5	1.5	0.77
28	---	---	---	---	---	---	0.00	4.5	0.26	1.8	1.4	0.73
29	---	---	---	---	---	---	0.00	4.5	0.24	1.9	1.3	0.69
30	---	---	---	---	---	---	0.00	4.5	0.22	2.0	1.3	0.70
31	---	---	---	---	---	---	---	4.5	---	1.8	1.2	---
Total	---	---	---	---	---	---	0.000	40.5	83.1	22.8	48.8	28.5
Mean	---	---	---	---	---	---	0.000	1.31	2.76	0.73	1.58	0.96
Max	---	---	---	---	---	---	0.00	5.8	4.5	2.0	2.1	1.3
Min	---	---	---	---	---	---	0.00	0.00	0.22	0.00	1.2	0.69
AC-FT	---	---	---	---	---	---	0.00	80	165	45	97	57
CAL YEAR	2015	TOTAL	323.0	MEAN	3.79	MAX	10.0	MIN	0.00	AC-FT	640	
WTR YEAR	2016	TOTAL	224.0	MEAN	1.26	MAX	6.0	MIN	0.00	AC-FT	444	
Legend: 'e' Estimated Created on 07/28/17 07:36 by J A MARBURGER												

NIORARA RIVER BASIN

PIONEER CANAL from Niobrara River, 00123000

LOCATION.--NE1/4NE1/4 Sec. 36-29-51 W. near Marsland

GAGE.--Continuous stage recorder and concrete flume

PERIOD OF RECORD.--1956 - 1982, 1986 - present

APPENDIX A SURFACE WATER DIVERSIONS IN 2016

Nebraska Department of Natural Resources

123000 Pioneer Canal from Niobrara River Q, WATER YEAR OCT 2015 TO SEP 2016 Daily Mean Values

Day	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16
1	---	---	---	---	---	---	---	0.00	4.5	0.19	1.7	1.2
2	---	---	---	---	---	---	---	0.00	3.9	0.17	1.6	1.2
3	---	---	---	---	---	---	---	0.00	4.2	0.15	1.6	1.2
4	---	---	---	---	---	---	---	0.00	4.2	0.13	1.5	1.3
5	---	---	---	---	---	---	---	0.00	4.3	0.10	1.5	1.2
6	---	---	---	---	---	---	0.00	0.00	4.3	0.08	1.5	1.2
7	---	---	---	---	---	---	0.00	0.00	4.3	0.06	1.5	1.2
8	---	---	---	---	---	---	0.00	0.00	4.2	0.04	1.6	1.2
9	---	---	---	---	---	---	0.00	0.00	4.1	0.02	1.6	1.1
10	---	---	---	---	---	---	0.00	0.00	3.9	0.00	1.5	1.0
11	---	---	---	---	---	---	0.00	0.00	3.9	0.00	1.5	0.98
12	---	---	---	---	---	---	0.00	0.00	3.9	0.00	2.1	0.94
13	---	---	---	---	---	---	0.00	0.00	3.9	0.00	1.8	0.98
14	---	---	---	---	---	---	0.00	0.00	4.0	0.00	1.7	0.99
15	---	---	---	---	---	---	0.00	0.05	4.0	0.00	1.7	1.0
16	---	---	---	---	---	---	0.00	0.08	4.0	0.00	2.1	0.92
17	---	---	---	---	---	---	0.00	0.08	4.0	0.00	1.7	0.88
18	---	---	---	---	---	---	0.00	0.08	3.8	0.31	1.6	0.85
19	---	---	---	---	---	---	0.00	0.08	3.4	1.4	1.6	0.79
20	---	---	---	---	---	---	0.00	0.08	3.0	1.4	1.7	0.74
21	---	---	---	---	---	---	0.00	0.08	0.47	1.4	1.6	0.72
22	---	---	---	---	---	---	0.00	0.08	0.44	1.6	1.6	0.71
23	---	---	---	---	---	---	0.00	2.6	0.40	1.7	1.5	0.76
24	---	---	---	---	---	---	0.00	5.8	0.37	1.7	1.4	0.88
25	---	---	---	---	---	---	0.00	4.9	0.34	1.7	1.5	0.85
26	---	---	---	---	---	---	0.00	4.3	0.31	1.6	1.4	0.83
27	---	---	---	---	---	---	0.00	4.3	0.28	1.5	1.5	0.77
28	---	---	---	---	---	---	0.00	4.5	0.26	1.8	1.4	0.73
29	---	---	---	---	---	---	0.00	4.5	0.24	1.9	1.3	0.69
30	---	---	---	---	---	---	0.00	4.5	0.22	2.0	1.3	0.70
31	---	---	---	---	---	---	---	4.5	---	1.8	1.2	---
Total	---	---	---	---	---	---	0.000	40.5	83.1	22.8	48.8	28.5
Mean	---	---	---	---	---	---	0.000	1.31	2.76	0.73	1.58	0.96
Max	---	---	---	---	---	---	0.00	5.8	4.5	2.0	2.1	1.3
Min	---	---	---	---	---	---	0.00	0.00	0.22	0.00	1.2	0.69
AC-FT	---	---	---	---	---	---	0.00	80	165	45	97	57
CAL YEAR	2015	TOTAL	323.0	MEAN	3.79	MAX	10.0	MIN	0.00	AC-FT	640	
WTR YEAR	2016	TOTAL	224.0	MEAN	1.26	MAX	6.0	MIN	0.00	AC-FT	444	
Legend: 'e' Estimated												
Created on 07/28/17 07:36 by J A MARBURGER												

NIORARA RIVER BASIN

PIONEER CANAL from Niobrara River, 00123000

LOCATION.--NE1/4NE1/4 Sec. 36-29-51 W. near Marsland

GAGE.--Continuous stage recorder and concrete flume

PERIOD OF RECORD.--1956 - 1982, 1986 - present

APPENDIX A SURFACE WATER DIVERSIONS IN 2016

Nebraska Department of Natural Resources

104000 Moore-Kay Canal from Niobrara River Q, WATER YEAR OCT 2015 TO SEP 2016 Daily Mean Values

Day	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16
1	---	---	---	---	---	---	4.4	6.6	0.00	0.00	0.00	---
2	---	---	---	---	---	---	3.7	6.6	0.00	0.00	0.00	---
3	---	---	---	---	---	---	3.2	6.1	0.00	0.00	0.00	---
4	---	---	---	---	---	---	2.8	4.7	0.00	0.00	0.00	---
5	---	---	---	---	---	---	2.5	3.5	0.00	0.00	0.00	---
6	---	---	---	---	---	---	2.1	2.8	0.00	0.00	0.00	---
7	---	---	---	---	---	---	1.8	2.9	0.00	0.00	0.00	---
8	---	---	---	---	---	---	1.8	4.3	0.00	0.00	0.00	---
9	---	---	---	---	---	---	1.7	4.5	0.00	0.00	0.00	---
10	---	---	---	---	---	---	1.5	4.4	0.00	0.00	0.00	---
11	---	---	---	---	---	---	1.3	3.5	0.00	0.00	0.00	---
12	---	---	---	---	---	---	1.2	2.4	0.00	0.00	0.00	---
13	---	---	---	---	---	---	1.1	1.9	0.00	0.00	0.00	---
14	---	---	---	---	---	---	0.88	1.6	0.00	0.00	0.00	---
15	---	---	---	---	---	---	0.96	1.4	0.00	0.00	0.00	---
16	---	---	---	---	---	---	1.8	1.6	0.00	0.00	0.00	---
17	---	---	---	---	---	---	2.2	1.8	0.00	0.00	0.00	---
18	---	---	---	---	---	---	2.1	1.8	0.00	0.00	0.00	---
19	---	---	---	---	---	---	1.9	1.8	0.00	0.00	0.00	---
20	---	---	---	---	---	---	1.6	1.9	0.00	0.00	0.00	---
21	---	---	---	---	---	2.3	1.3	1.9	0.00	0.00	0.00	---
22	---	---	---	---	---	2.3	1.1	1.9	0.00	0.00	0.00	---
23	---	---	---	---	---	2.3	0.93	1.8	0.00	0.00	0.00	---
24	---	---	---	---	---	2.4	0.81	1.8	0.00	0.00	0.00	---
25	---	---	---	---	---	2.4	0.64	1.8	0.00	0.00	0.00	---
26	---	---	---	---	---	2.3	2.5	1.8	0.00	0.00	0.00	---
27	---	---	---	---	---	2.3	3.0	1.8	0.00	0.00	0.00	---
28	---	---	---	---	---	2.0	3.0	1.8	0.00	0.00	0.00	---
29	---	---	---	---	---	1.9	2.7	1.8	0.00	0.00	0.00	---
30	---	---	---	---	---	3.6	3.9	1.8	0.00	0.00	0.00	---
31	---	---	---	---	---	4.5	---	0.00	---	0.00	---	---
Total	---	---	---	---	---	28.3	60.4	84.3	0.000	0.000	0.000	---
Mean	---	---	---	---	---	2.57	2.01	2.72	0.000	0.000	0.000	---
Max	---	---	---	---	---	4.5	4.4	6.6	0.00	0.00	0.00	---
Min	---	---	---	---	---	1.9	0.64	0.00	0.00	0.00	0.00	---
AC-FT	---	---	---	---	---	56	120	167	0.00	0.00	0.00	---
CAL YEAR	2015	TOTAL	115.0	MEAN	1.67	MAX	9.0	MIN	0.00	AC-FT	228	---
WTR YEAR	2016	TOTAL	173.0	MEAN	1.06	MAX	7.0	MIN	0.00	AC-FT	343	---
Legend: 'e' Estimated												
Created on 07/31/17 14:09 by J A MARBURGER												

NIOBARRA RIVER BASIN

MOORE-KAY CANAL from Niobrara River, 00104000

LOCATION.—SE1/4NE1/4 Sec. 9-28-53 W. near Marsland

GAGE.—Continuous stage recorder and 2 ft. flume

PERIOD OF RECORD.—1956 - present

APPENDIX B NON-GAGED STREAMFLOW MEASUREMENT IN 2016

Date	Site number	Site Name	Discharge in cfs
8/29/2016	6025	Andrews Supply Canal fr Sow Belly Creek	0
6/14/2016	6400	Armstrong Pump fr Niobrara River	0
6/21/2016	6400	Armstrong Pump fr Niobrara River	0
6/28/2016	6400	Armstrong Pump fr Niobrara River	0
7/6/2016	6400	Armstrong Pump fr Niobrara River	0
7/12/2016	6400	Armstrong Pump fr Niobrara River	0
7/19/2016	6400	Armstrong Pump fr Niobrara River	0
7/26/2016	6400	Armstrong Pump fr Niobrara River	0
8/9/2016	6400	Armstrong Pump fr Niobrara River	0
8/16/2016	6400	Armstrong Pump fr Niobrara River	0
8/30/2016	6400	Armstrong Pump fr Niobrara River	0
5/24/2016	6380	Cook Pump fr Niobrara River	0
5/31/2016	6380	Cook Pump fr Niobrara River	0
6/8/2016	6380	Cook Pump fr Niobrara River	1.22
6/14/2016	6380	Cook Pump fr Niobrara River	0
6/21/2016	6380	Cook Pump fr Niobrara River	1.22
6/28/2016	6380	Cook Pump fr Niobrara River	0
7/6/2016	6380	Cook Pump fr Niobrara River	0
7/12/2016	6380	Cook Pump fr Niobrara River	0
7/19/2016	6380	Cook Pump fr Niobrara River	0
7/26/2016	6380	Cook Pump fr Niobrara River	1.33
8/9/2016	6380	Cook Pump fr Niobrara River	0
8/16/2016	6380	Cook Pump fr Niobrara River	0
8/23/2016	6380	Cook Pump fr Niobrara River	0
8/30/2016	6380	Cook Pump fr Niobrara River	0
6/2/2016	6440	Delsing Pump fr Niobrara River	0.99
6/9/2016	6440	Delsing Pump fr Niobrara River	0.99
6/17/2016	6440	Delsing Pump fr Niobrara River	0
6/28/2016	6440	Delsing Pump fr Niobrara River	0
7/14/2016	6440	Delsing Pump fr Niobrara River	0
7/21/2016	6440	Delsing Pump fr Niobrara River	0
7/28/2016	6440	Delsing Pump fr Niobrara River	0
8/18/2016	6440	Delsing Pump fr Niobrara River	0
9/27/2016	6440	Delsing Pump fr Niobrara River	0
6/24/2016	6435	Enterprise Pump fr Niobrara River	1.34
6/20/2016	6130	Harris-Cooper Canal fr White River	0
7/11/2016	6130	Harris-Cooper Canal fr White River	7.82
7/21/2016	6445	Montague Canal Pump fr Niobrara River	0

APPENDIX B NON-GAGED STREAMFLOW MEASUREMENT IN 2016

Date	Site number	Site Name	Discharge in cfs
7/28/2016	6445	Montague Canal Pump fr Niobrara River	0
8/18/2016	6445	Montague Canal Pump fr Niobrara River	1.21
9/1/2016	6445	Montague Canal Pump fr Niobrara River	0
9/27/2016	6445	Montague Canal Pump fr Niobrara River	0
3/14/2016	3750	Niobrara River at old Dunlap Bridge	13.7
9/27/2016	3750	Niobrara River at old Dunlap Bridge	11.2
3/14/2016	1221	Niobrara River blw Box Butte at Road	5.55
4/4/2016	1221	Niobrara River blw Box Butte at Road	4.13
9/27/2016	1221	Niobrara River blw Box Butte at Road	2.33
7/26/2016	6381	Niobrara River Road into Sandoz house(4' culvert)	0.38
8/11/2016	6425	Pioneer Pump #2 fr Niobrara River	0
9/1/2016	6425	Pioneer Pump #2 fr Niobrara River	0
6/20/2016	6160	Rasher-Forbes Canal fr White River	0
8/29/2016	3072	Sow Belly Creek below Staudenmair	0
10/16/2015	3390	Squaw Creek above Squaw Creek Reservoir	0.22
2/23/2016	3390	Squaw Creek above Squaw Creek Reservoir	0.51
10/16/2015	3400	Squaw Creek below Squaw Creek Reservoir	0.17
2/23/2016	3400	Squaw Creek below Squaw Creek Reservoir	0.28
3/8/2016	3400	Squaw Creek below Squaw Creek Reservoir	1.21
6/22/2016	6105	White River Canal fr White River	8.58
7/11/2016	6105	White River Canal fr White River	8.22
8/8/2016	6105	White River Canal fr White River	0
9/20/2016	6105	White River Canal fr White River	0
6/9/2016	6430	Wilkins Pump fr Niobrara River	0.44
7/21/2016	6430	Wilkins Pump fr Niobrara River	0
8/29/2016	6035	Zimmerman Canal fr Sow Belly Canal	0

Date	Site Number	Site Name	Storage in acre- feet
5/5/2016	6149	Whitney Reservoir	10916 af
6/1/2016	6149	Whitney Reservoir	10727 af
6/20/2016	6149	Whitney Reservoir	10070 af
8/22/2016	6149	Whitney Reservoir	5583 af
9/20/2016	6149	Whitney Reservoir	4729 af