

**2024 ANNUAL REPORT**  
BY THE DEPARTMENT OF NATURAL RESOURCES  
OF 2023 DATA TO MEET THE REQUIREMENTS OF THE UPPER NIOBRARA WHITE  
NATURAL RESOURCES DISTRICT'S INTEGRATED MANAGEMENT PLAN

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# **2024 ANNUAL INTEGRATED MANAGEMENT PLAN REPORT:**

## **NEBRASKA DEPARTMENT OF NATURAL RESOURCES**

**&**

## **UPPER NIOBRARA WHITE NATURAL RESOURCES DISTRICT**

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REPORTING ON 2023 DATA

ANNUAL MEETING HELD ON DECEMBER 10, 2024

## **Purpose**

This report fulfills 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 provides updates on ongoing projects and studies in the area.

Reporting and exchanging information gathered from monitoring projects, streamflow data, and other studies contribute to a basis for increased understanding of the hydrologically connected surface water and groundwater system. In areas where surface water and groundwater are interconnected, the quantity of either cannot be evaluated separately. Data collected through the IMP's monitoring plan and presented in this report, will help assess the success of the IMP's objectives. This exchange of information also serves to validate the conclusions and data upon which the IMP is based.

## **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 orders of cancellation issued pursuant to Neb. Rev. Stat. § 46-229.04(5) or assignment of rights to use that portion of an appropriation which was relinquished.
- b. Variances granted by the Department, including facts offered as justification for the variance to be granted and the reasons for the action taken. See **Appendix D** for full text of the Department of Natural Resources Rules of Surface Water, Title 457, Neb. Admin. Code, Chapter 23, concerning variances.
- c. Surface water pump site inspections completed by field staff during 2023.

### **2. Streamflow**

- a. Records of streamflow measurements from non-gaged streams within the District.

### **3. Diversions**

- a. Records of surface water diversions collected by the Department upstream of Box Butte Reservoir.

Additionally, the Department reports on other actions that are not required by the IMP but will be covered in this report.

## 1. Surface Water Use

**Table 1** below provides a breakdown of active surface water permits within the UNWNRD, categorized by the type and purpose of the permit. It includes the total number of permits, as well as the totals for associated acres, and allowable grants (cfs or af).

*Table 1. Active surface water permits in Upper Niobrara White NRD as of December 31, 2023.*

<b>ACTIVE SURFACE WATER PERMITS IN THE UPPER NIOBRARA NRD</b>				
as of December 31, 2023				
<b>Purpose of Permit</b>	<b>Number of Permits</b>	<b>Acres Approved for Irrigation</b>	<b>Grant (cfs)</b>	<b>Grant (af)</b>
(IR) Diversion from naturally flowing source for irrigation	378	55,165.28	691.98	937.5
(SI) Diversion from a reservoir for irrigation of land that is also approved to receive water from a naturally flowing source	44	22,479.06*	7.86	60,555.63
(SO) Diversion only from a reservoir for irrigation	77	7,124.5	10.51	9,313.26
<b>Total Irrigation Permits</b>	<b>499</b>	<b>62,289.78</b>	<b>710.35</b>	<b>70,806.39</b>
(DO) Domestic Use	5	5	0.5	N/A
(ST) Storage of water in a reservoir	157	N/A	65	45,617.54
(SS) Supplemental storage	18	35,383.15	N/A	N/A
<b>Total Storage Permits</b>	<b>180</b>	<b>35,388.15</b>	<b>65.5</b>	<b>45,617.54</b>
Fish culture	6	N/A	5.06	N/A
Public Water Supply	4	N/A	9.14	N/A
<b>Total Permits</b>	<b>689</b>	<b>97,677.93</b>	<b>790.05</b>	<b>116,423.93</b>

\* SI approved acres are accounted for under IR permits.

## 2. 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.

In 2023, the Department issued a total of 10 cancellations pursuant *Neb. Rev. Stat. § 46-229.04(50)*. Six of the cancellations were for temporary manufacturing (MF) permits that expired in 2023. Because these permits were located within the surface water control

area, and therefore subject to a moratorium, they were issued under variances, which were reported in the Department's 2023 report.

Additionally, four irrigation (IR) permits had partial cancellations completed in 2023. **Figure 1** shows the surface water control area and the location of all surface water permitting actions in 2023. **Table 2** provides a summary of all cancelled and expired permitting and their associated variances.

**b. Variances granted by the Department, facts offered as justification for the variance to be granted and the reasons for the action taken.**

In 2023, the Department granted variances for surface water permits within the surface water control area. This process consists of two steps. First, a petitioner must file a request for leave. If a variance is granted, the petitioner then has one year from NeDNR's order to file an application for a permit to appropriate water.

Six variances were granted (VAR-9983 through VAR-9988), allowing temporary MF permits to be issued for road construction. These temporary permits automatically expire one year from the date of issuance. **Table 3** summarizes all new permitting actions and any associated variances granted in 2023 within the Upper Niobrara White NRD.

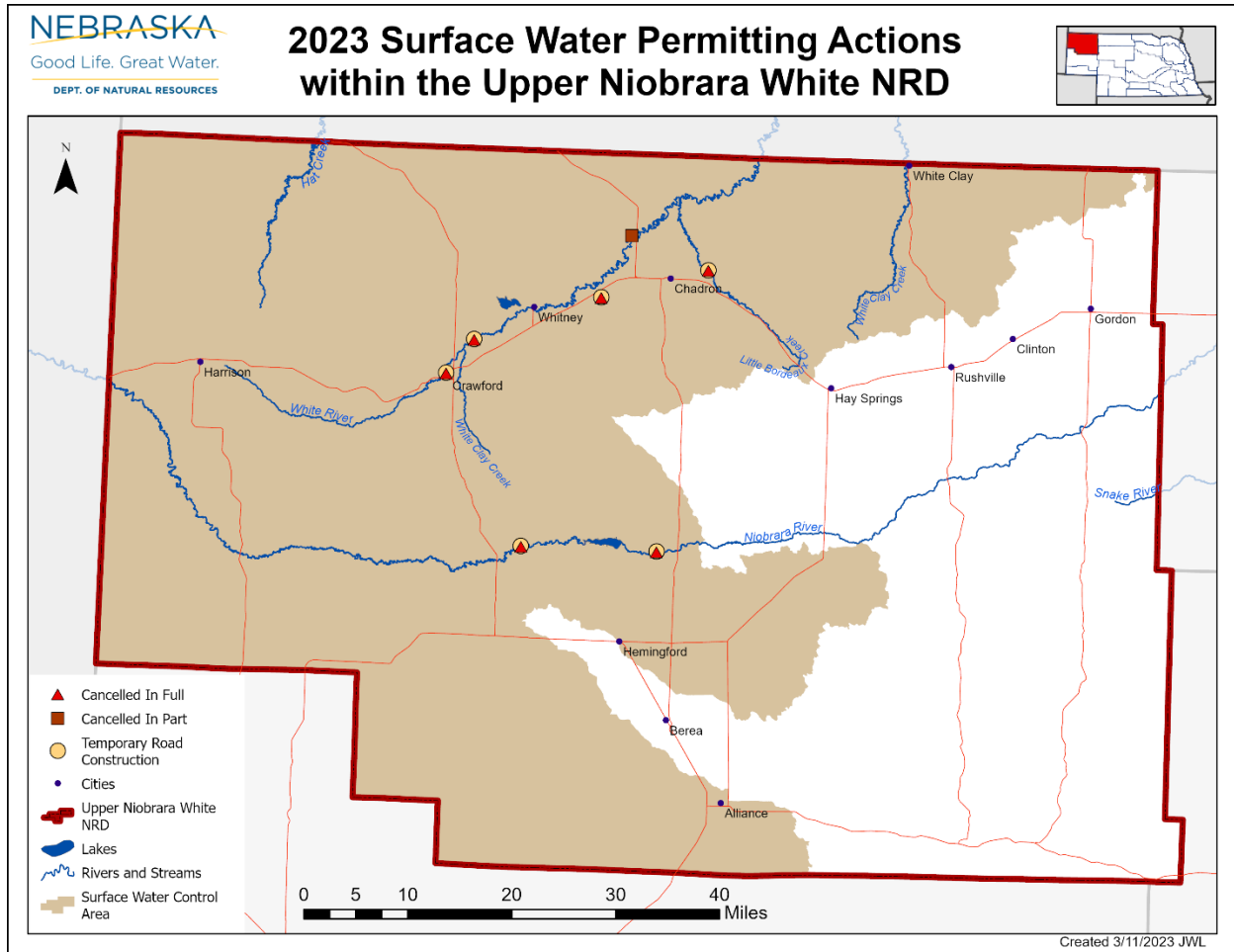


Figure 1: 2023 surface water permitting actions within Upper Niobrara White NRD<sup>1</sup>

<sup>1</sup> All four cancelled in part permits are shown with a single square symbol in the map. New permits are shown as temporary road construction.

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*Table 2: Summary of surface water permits that expired or were cancelled in 2023.*

<b>Appropriation Number</b>	<b>Approval Date</b>	<b>Cancelled Date</b>	<b>Status</b>	<b>Point of Diversion Location</b>	<b>Use</b>	<b>Source</b>	<b>Begin Acres</b>	<b>Cancelled Acres</b>	<b>Cancelled Grant in CFS</b>	<b>Cancelled Grant in AF</b>	<b>Modification</b>	<b>Associated Variance<sup>2</sup></b>
A-19833	4/25/2022	4/25/2023	Cancelled in Full	S36 T29-R49W	MF	Niobrara River	N/A	N/A	N/A	10	N/A	VAR-9592
A-19834	4/25/2022	4/25/2023	Cancelled in Full	S24 T32-R52W	MF	White River	N/A	N/A	N/A	10	N/A	VAR-9593
A-19835	4/25/2022	4/25/2023	Cancelled in Full	S3 T31-R52W	MF	White River	N/A	N/A	N/A	10	N/A	VAR-9594
A-19836	4/25/2022	4/25/2023	Cancelled in Full	S30 T33-R49W	MF	Dead Horse Creek	N/A	N/A	N/A	10	N/A	VAR-9595
A-19837	4/25/2022	4/25/2023	Cancelled in Full	S35 T29-R51W	MF	Niobrara River	N/A	N/A	N/A	10	N/A	VAR-9596
A-19838	4/25/2022	4/25/2023	Cancelled in Full	S13 T33-R48W	MF	Bordeaux Creek, Little	N/A	N/A	N/A	10	N/A	VAR-9597
A-4420AR	10/17/1949	7/17/2023	Cancelled in Part	S27 T34-R49W	IR	White River	236.6	18.7	0.27	56.1	PDNU-9976	N/A <sup>3</sup>
A-4420BR	11/20/1989	7/17/2023	Cancelled in Part	S27 T34-R49W	IR	White River	91.5	56.3	0.8	168.9	PDNU-9976	N/A
A-4420CR	11/20/1989	7/17/2023	Cancelled in Part	S26 T34-R49W	IR	White River	56.8	6.4	0.09	19.2	PDNU-9777	N/A
A-4420DR	11/20/1989	4/17/1990	Cancelled in Part	S26 T34-R49W	IR	White River	50.9	11	0.16	33	PDNU-9977	N/A

<sup>2</sup> Variance granted pursuant to 457 Neb Admin. Code Ch. 23 § 001.04.

<sup>3</sup> Permits A-4420AR through A-4420DR have no associated variance as their approval date is before the moratorium date.

*Table 3: New surface water permitting actions and associated variances granted in 2023.*

<i>Appropriation Number</i>	<i>Approval Date</i>	<i>Point of Diversion Location</i>	<i>Use</i>	<i>Source</i>	<i>Acres</i>	<i>Grant</i>	<i>Associated Variance<sup>4</sup></i>
A-19928	8/3/2023	S24 T21-R52W	MF	White River	N/A	0.67 cfs	VAR-9983
A-19929	8/3/2023	S3 T31-R52W	MF	White River	N/A	0.67 cfs	VAR-9987
A-19930	8/3/2023	S26 T29-R49W	MF	Niobrara River	N/A	0.67 cfs	VAR-9986
A-19931	8/3/2023	S30 T33-R49W	MF	Dead Horse Creek	N/A	0.67 cfs	VAR-9985
A-19932	8/3/2023	S30 T35-R48W	MF	Niobrara River	N/A	0.67 cfs	VAR-9984
A-19933	8/3/2023	S13 T33-R48W	MF <sup>5</sup>	Bordeaux Creek, Little	N/A	0.67 cfs	VAR-9983

### **c. Modifications**

Modifications are actions taken on a surface water permit, these actions include expedited and non-expedited transfers, relinquishments, provisional relinquishments, and reassignments of irrigated acres. These actions may involve the White River Irrigation District and the U.S. Bureau of Reclamation. Modifications apply to irrigation and storage permits and do not authorize new irrigation or withdrawals from any streams or reservoirs in the District. A District has up to five years after a provisional relinquishment to reassign acres within that District. **Table 4** summarizes any modifications made to affected permits. Figures showing the location of any provisional relinquishment and reassignment of acres can be found in **Appendix A**.

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<sup>4</sup> Variance granted pursuant to 457 Neb Admin. Code Ch. 23 § 001.04.

<sup>5</sup> Permits A-19928 through A-19933 are temporary permits. Use is for Dawes County Road construction. Will expire one year from approval date.

*Table 4. Modifications to surface water permits in the UNWNRD from January 1, 2023 to December 31, 2023*

<b>MODIFICATIONS TO SURFACE WATER PERMITS</b>									
January 1, 2023 to December 31, 2023									
<b>Mod Number</b>	<b>Order Date</b>	<b>Permit ID</b>	<b>Use</b>	<b>Source</b>	<b>Acres Relinquished</b>	<b>Grant Relinquished</b>	<b>Mod Number</b>	<b>Acres Reassigned</b>	<b>Grant Reassigned</b>
PREL-9840	3/31/2023	D-464A	IR	White River	56.5	0.81cfs	REA-9841	56.5	0.81cfs
PREL-9811	4/17/2023	D-477	IR	White River	11.9	0.14 cfs	REA-9813	11.9	0.14 cfs
PREL-9812	4/17/2023	D-477R	IR	White River	11.9	0.03 cfs	REA-9814	11.9	0.03 cfs
EXT-9758	4/5/2023	A-627	IR	West Branch Squaw Creek	N/A	N/A	N/A	32.5	0.47 cfs
EXT-9759	4/5/2023	A-4779	IR	South Squaw Creek	N/A	N/A	N/A	32.5	0.47 cfs



**d. Surface water pump site inspections conducted in 2023.**

The NeDNR field office staff regularly inspects pump sites at surface water diversion points as conditions allow. Not all pump sites are inspected every irrigation season, and some sites may be visited more than once per season. In 2023, field office staff conducted 21 pump site inspections (**Table 5**) (**Figure 2**), 16 of which were set up for irrigation. As part of these inspections, field staff collect the following data:

- Evidence of pump site
- Pumps that are running
- Crops in field
- Irrigation method

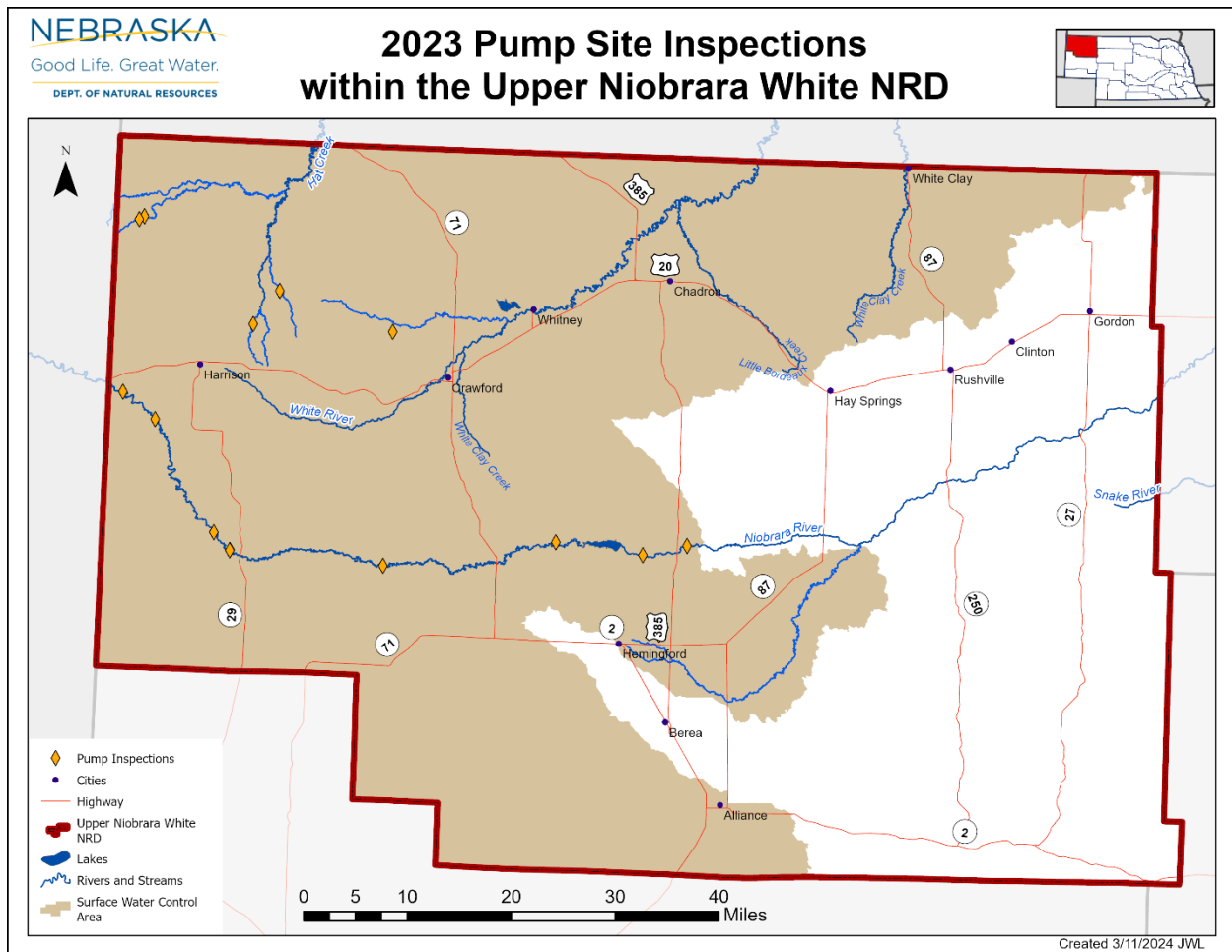
*Table 5. Surface water pump site inspections in the Upper Niobrara White NRD in 2023.*

<b>2023 Surface Water Pump Site Inspections</b>			
<b>Total Number of Irrigation Permits</b>	<b>Number of Pump Sites Inspected</b>	<b>Number of Pump Sites Set up for Irrigation</b>	<b>Total Observations Made<sup>6</sup></b>
486	21	16	31

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<sup>6</sup> Can include multiple visits to the same pump site location.

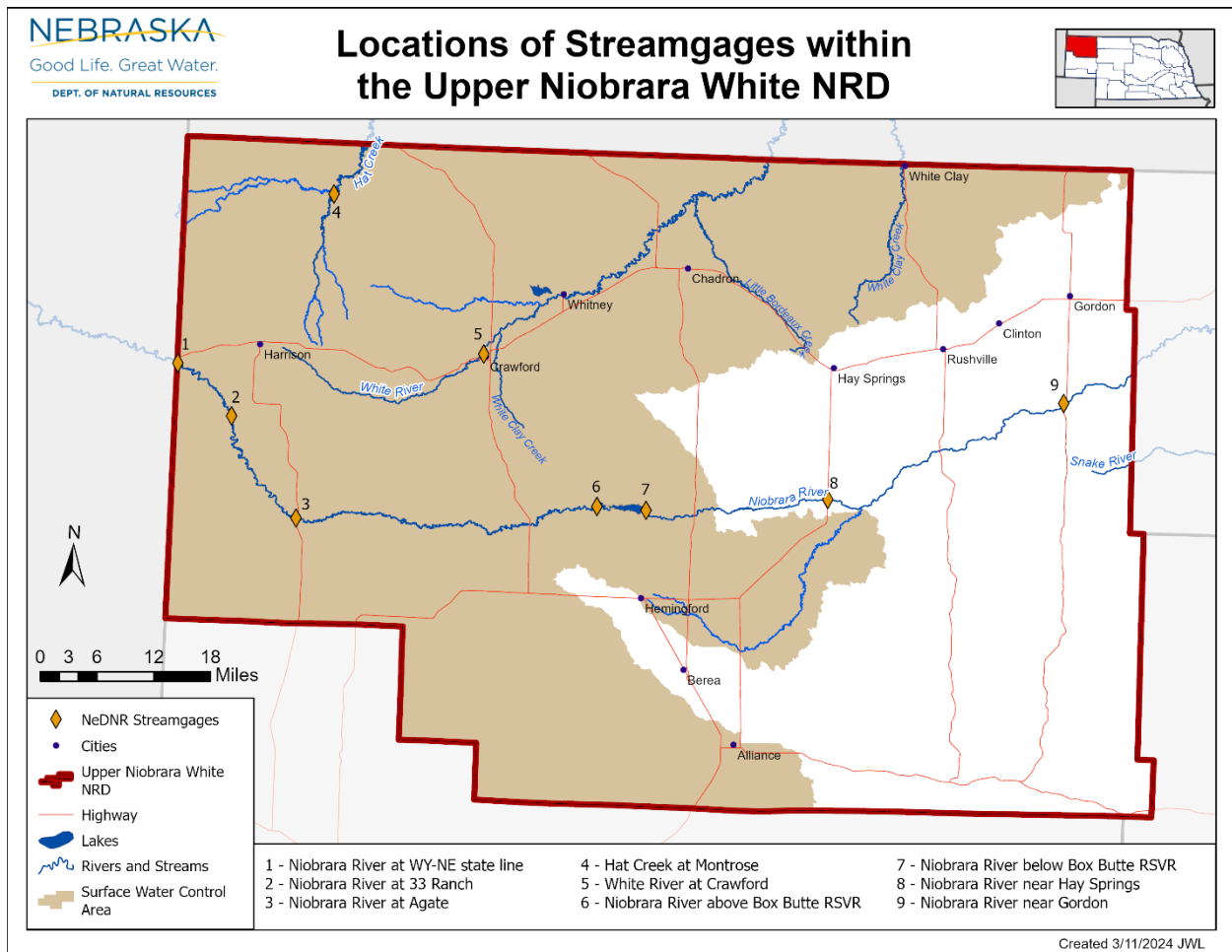
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*Figure 2: Pump site inspections within the Upper Niobrara White NRD in 2023.*

### **3. Stream Gage Measurements**

Streamflow measurements for gaged streams can be found in **Appendix B** or at: <https://nednr.aquaticinformatics.net/>. Measurements from non-gaged stream locations, pump site, and reservoirs for the 2023 calendar year are included in **Appendix B1**. The locations of streamgages operated by the Department are shown in **Figure 3** below.



*Figure 3: Locations of streamgages in the Upper Niobrara White NRD.*

## 4. Diversions

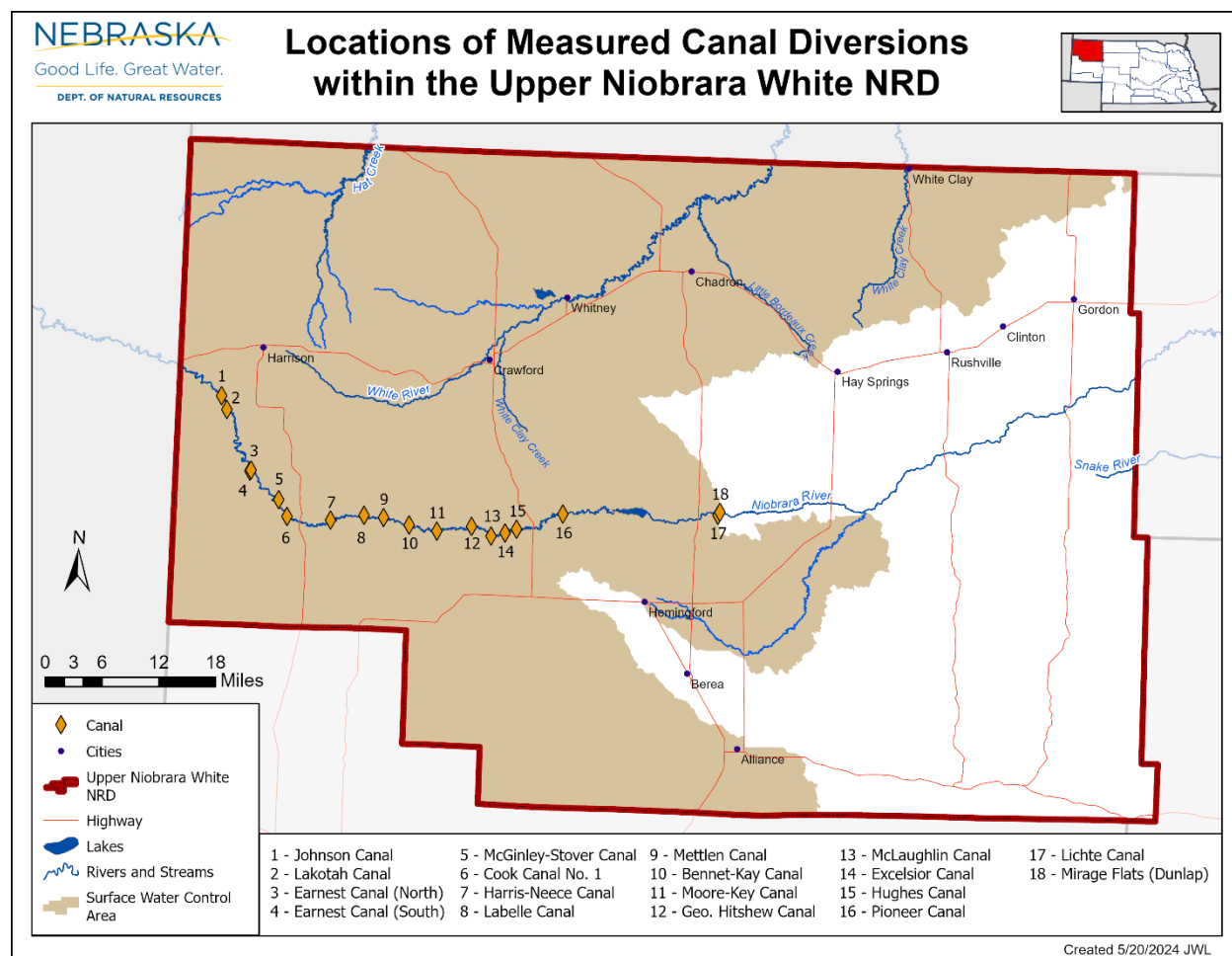
### a. Records of surface water canal diversions collected by the Department

Historical record graphs (1956-2023) of annual total diversions from the Niobrara River (excluding Mirage Flats) and the Mirage Flats (Dunlap)<sup>7</sup> diversion are included in **Appendix C**. Surface water diversion records for the 2023 calendar year are also included in **Appendix C**, and their locations are shown in **Figure 4**. The canals measured include the following: Johnson Canal, Lakotah Canal, Earnest Canal (North), Earnest Canal (South), McGinley-Stover Canal, Cook Canal No. 1, Harris-Neece Canal, Labelle Canal, Mettlen Canal, Bennett-Kay Canal, Moore-Kay Canal, Geo. Hitshew Canal, McLaughlin

<sup>7</sup> Mirage Flats is known as the Dunlap Diversion to the United States Bureau of Reclamation.

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Canal, Excelsior Canal, Hughes Canal, Pioneer Canal, Lichte Canal and Mirage Flats (Dunlap Diversion). Although Lichte Canal does not have any measuring equipment installed, it is checked during the summer irrigation season by NeDNR staff. Mirage Flats data is provided by the United States Bureau of Reclamation (USBR). **Appendix C1** includes an additional figure with insets of the canals and diversions in UNWNRD above and including Mirage Flats.



**Figure 4:** Locations of canal diversions in the Upper Niobrara White NRD.

### 5. Voluntary Water Use Reporting

NeDNR requests water use data through its voluntary water use reporting program. Surveys are sent to irrigation (IR) permit holders requesting information such as use or non-use, acres irrigated, estimated amount of water applied, types of crops grown and reasons for non-use. See **Table 6** below for data on SW irrigated acres and SW inches per acre.

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*Table 6. Voluntary surface water reporting within the Upper Niobrara White NRD in 2023.*

Natural Resources District	No. of Water Rights	No. of Reports	No. of Reports SW Irrigated	No. of Reports Not Used	No. of GW Irrigated Reports*	SW Irrigated Acres	SW Inches Per Acre
Upper Niobrara-White	485	89	48	41	5	2,938	8.0

**6. Surface Water Administration**

Within the Niobrara Basin, administrative closure notices are generally issued at the request senior water right holders who are unable to divert adequate water to satisfy their permits due to insufficient supplies in the river. There are no issues in the Niobrara Compact that would require water rights to be shut off for Compact compliance.

*Table 7. Surface water administration within the Upper Niobrara White NRD in 2023.*

Water Division	Date of Close 2023	Date Reopened 2023	Permit Type	No. Permits Affected	Reason for Closure	Reason for Reopening
2C - Niobrara River	6/21	6/24	Natural Flow	2	To protect D-554 Lakotah Canal.	Natural flow limit increased
	7/18	8/11	Natural Flow	16	To protect Mirage Flats A-2683	Mirage Flatts canal has turned off.
			Storage	4		
	8/17	9/14	Natural Flow	18	To protect Mirage Flats A-2683	Mirage Flatts canal has turned off.
			Storage	4		
	2E - Hat Creek		2/8	Natural Flow	42	Riparian Administration
Storage				19		
		2/12	Storage	1	Localized Administration	Natural flow limit - open to store water.
9/21			Storage	1	Localized Administration	To protect A-1675 Turner Reservoir
12/13				1	Localized Administration	

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### **7. Groundwater Permitting**

There were no groundwater transfers or permits within UNWNRD in 2023.

### **8. Current Studies and Modeling**

#### **USGS Niobrara Basin Model**

The Department began working with the National Park Service and U.S. Geological Survey in 2020 to develop and calibrate a numerical groundwater model for most of the Niobrara basin in Nebraska, including a portion of the District. Model calibration has been completed, and the USGS is currently working on final documentation. The modeling project and final report are expected to be complete in 2025.

#### **UNWNRD Groundwater Modeling (Upper Niobrara White Groundwater Model)**

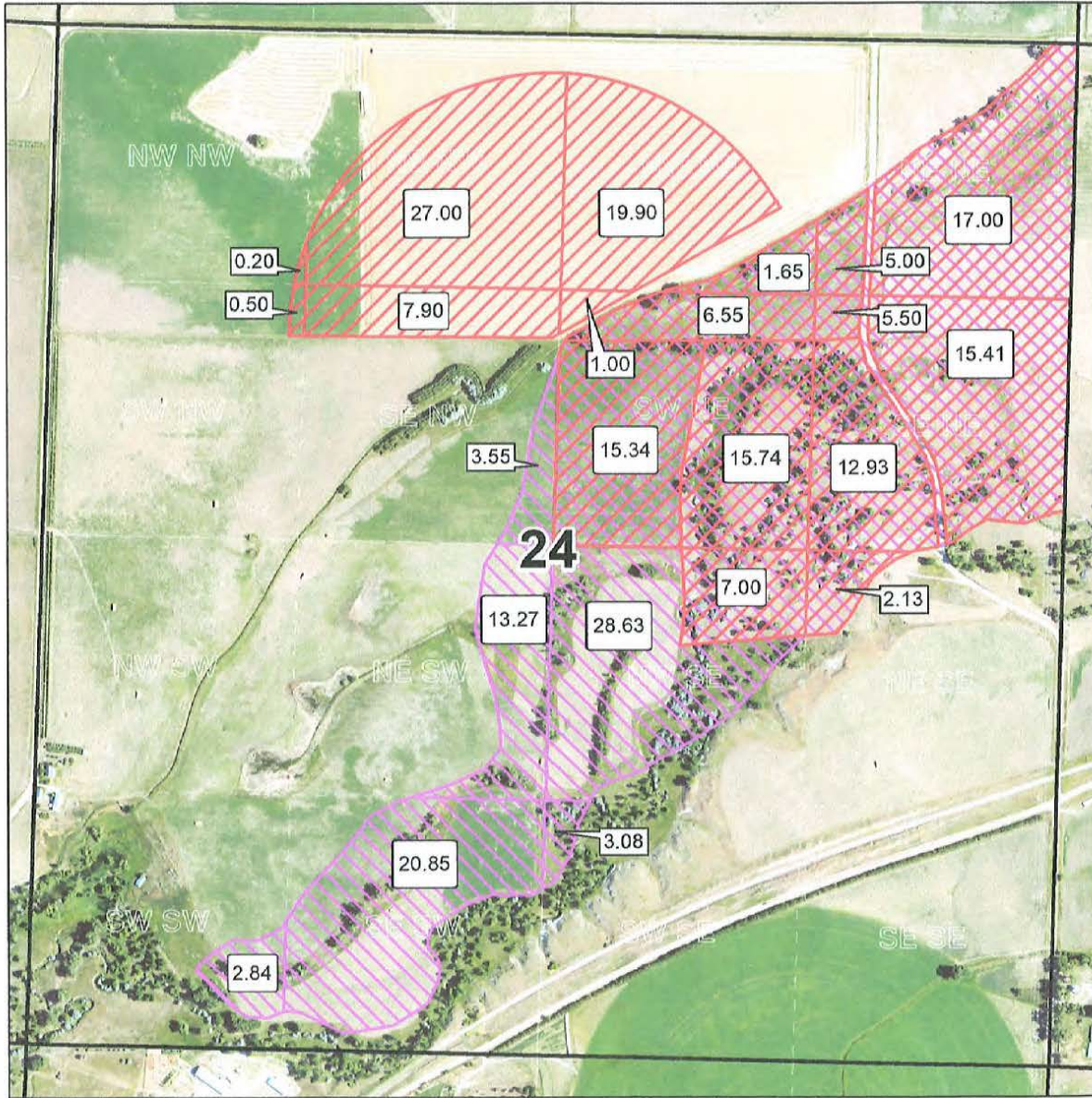
At the 2022 Nebraska Association of Resources Districts (NARD) Annual Conference, NeDNR and UNWNRD staff met to discuss progress on a study to better understand surface water and groundwater interaction in the District. At the meeting, the Department shared preliminary findings of the study, which used the Upper Niobrara White groundwater model and INSIGHT data, to answer the following questions.

- How has surface and groundwater irrigation impacted streamflow in the Niobrara River?
- What portion of that impact is attributed to groundwater irrigation?
- What is the long terms flow trend for the Niobrara River based on the current level of surface and ground water irrigation? Specifically, based on 2021 (under 2011, 2012, and 2015 climate conditions) developed acres and average water use.
- Would an allocation result in increased stream flow in the Niobrara River and if so, what would the impact be?
- Would surface water adjudication result in an increase in stream baseflow and if so, what would the impact be? (This could not be modeled)
- What would it take to cause a 6-foot drawdown in Subarea 5?

The Department recognized that there are limitations to the study due to the age of the model, which was last updated in 2018. These questions could be answered more completely by updating the model to use MODFLOW 6 and input data through 2021. To address this issue, UNWNRD applied for and was awarded a Water Sustainability Fund grant to help fund these updates. Work on this project began in 2023 and continues into 2024.



**Possible Transfer of D-464A (8744)  
Harris-Cooper Mutual Irrigation Company  
Section 24 Township 32 North-Range 52 West  
Dawes County, Nebraska**



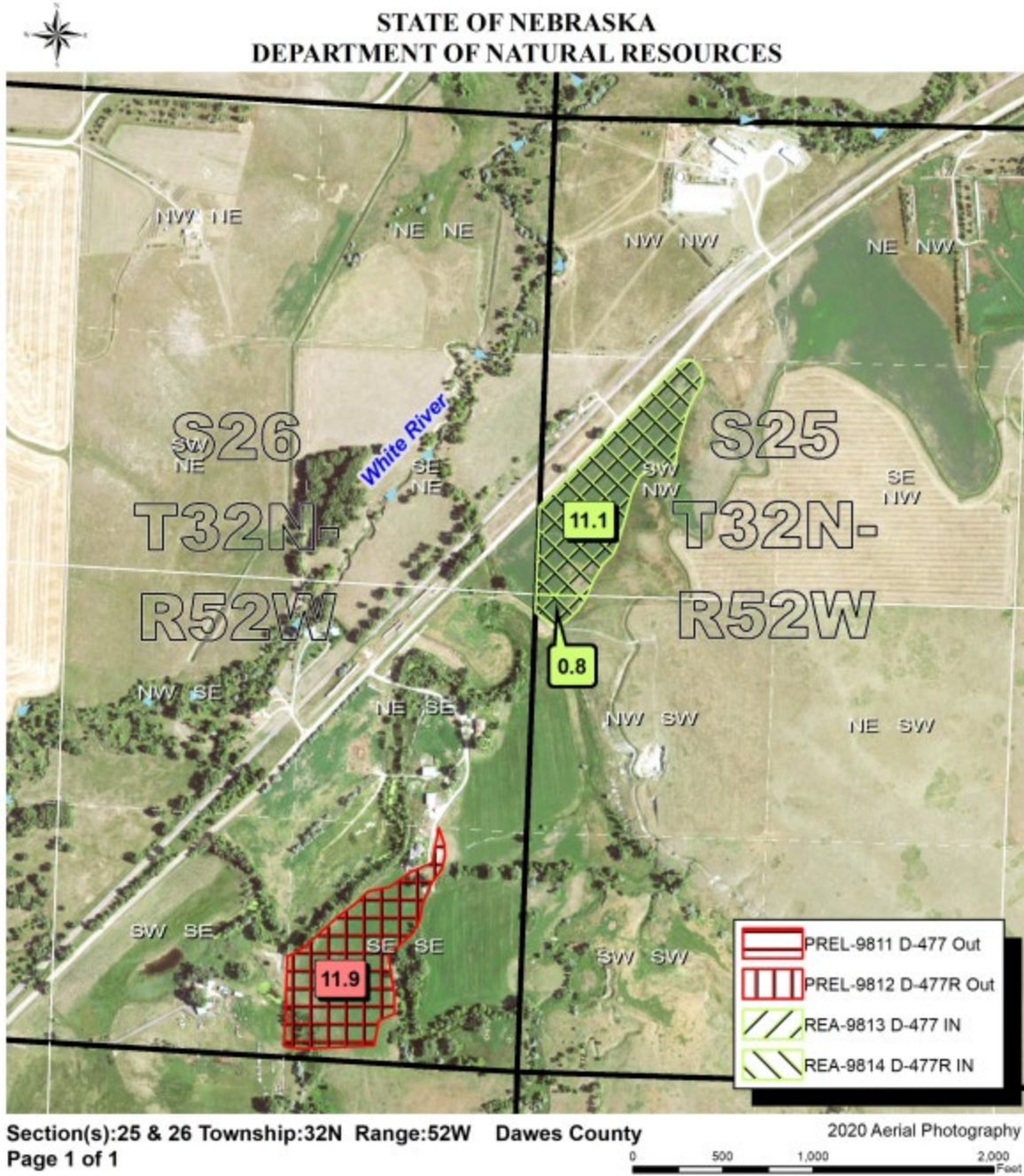
2020 Aerial Photography



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APPENDIX A PROVISIONAL RELINQUISHMENTS AND REASSIGNMENTS



Section(s):25 & 26 Township:32N Range:52W Dawes County  
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2020 Aerial Photography

0 500 1,000 2,000 Feet

Land appurtenant to D-477 & through modification(s): PREL-9811, PREL-9812, D-477R REA-9813 & REA-9814

**DEPARTMENT USE ONLY**

ModID(s): 9811, 9812, 9813 & 9814  
Map No. 21125 Map ID No. 20345

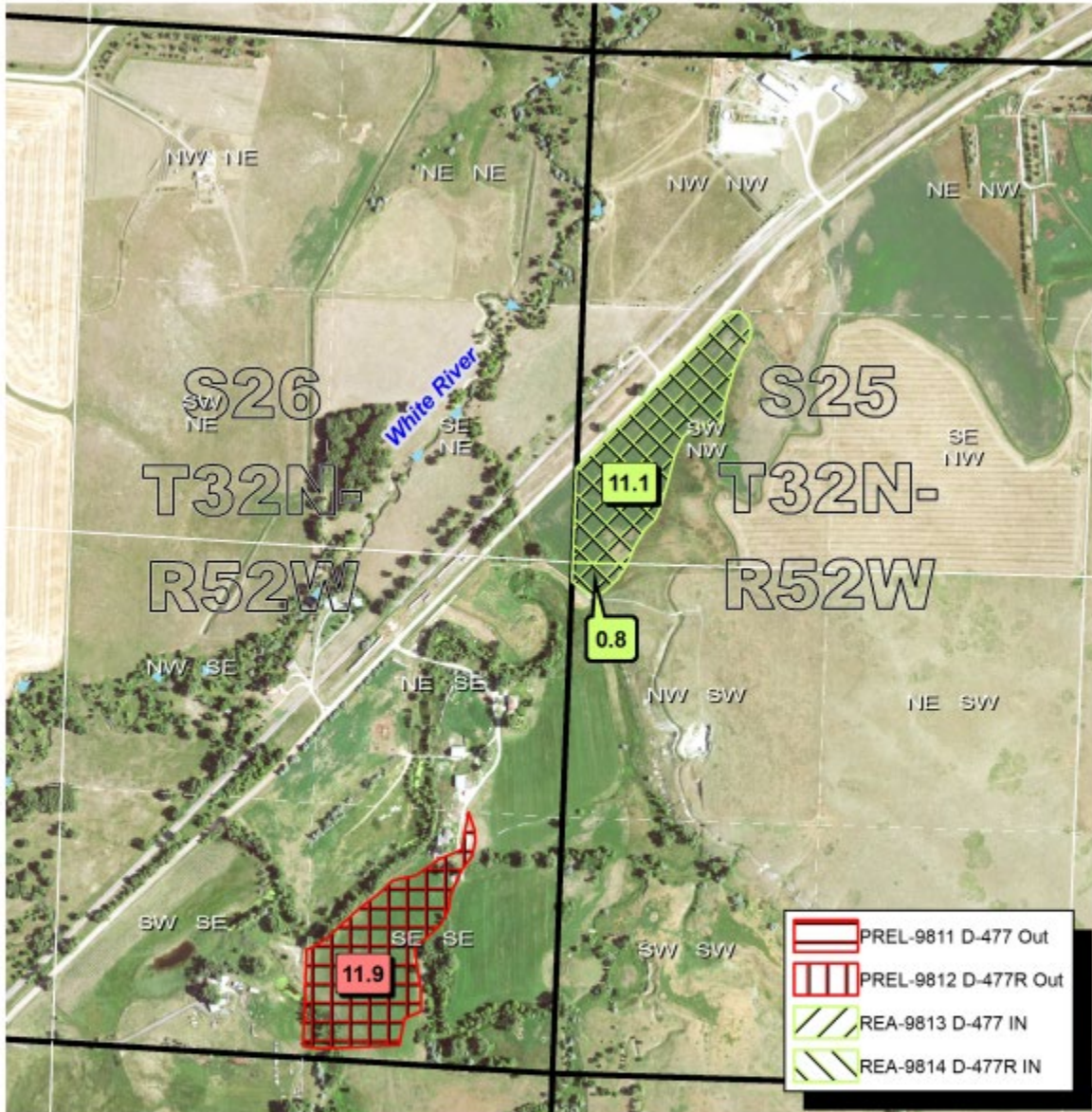
Approved by Order Dated: April 17, 2023



APPENDIX A PROVISIONAL RELINQUISHMENTS AND REASSIGNMENTS



STATE OF NEBRASKA  
DEPARTMENT OF NATURAL RESOURCES



Section(s):25 & 26 Township:32N Range:52W Dawes County  
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2020 Aerial Photography



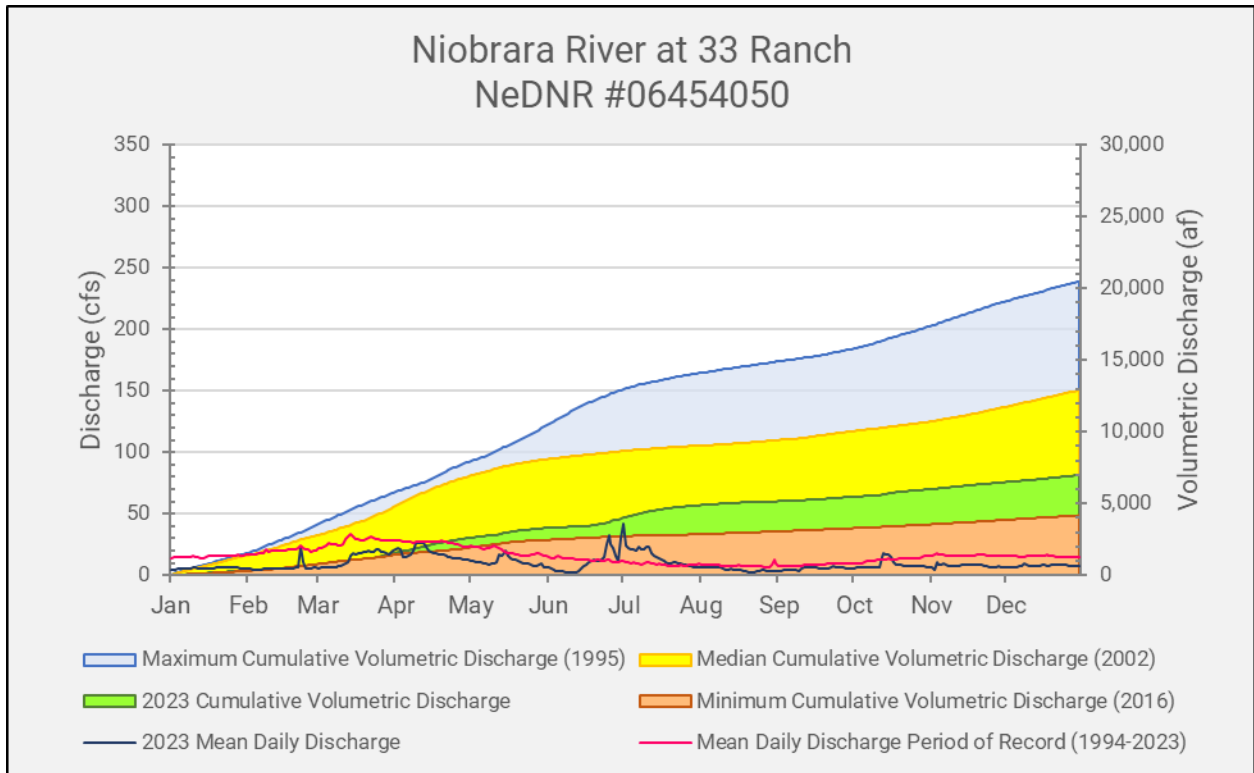
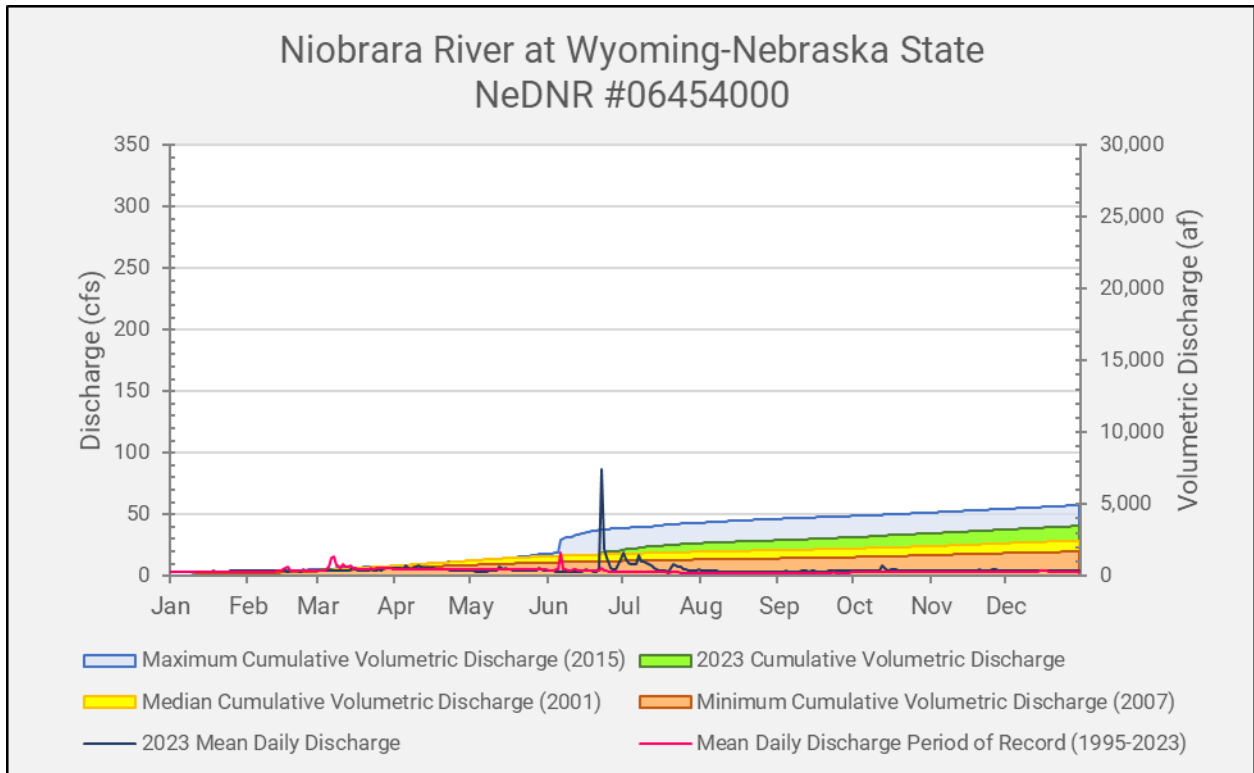
Land appurtenant to **D-477 &** through modification(s): **PREL-9811, PREL-9812, D-477R, REA-9813 & REA-9814**

**DEPARTMENT USE ONLY**

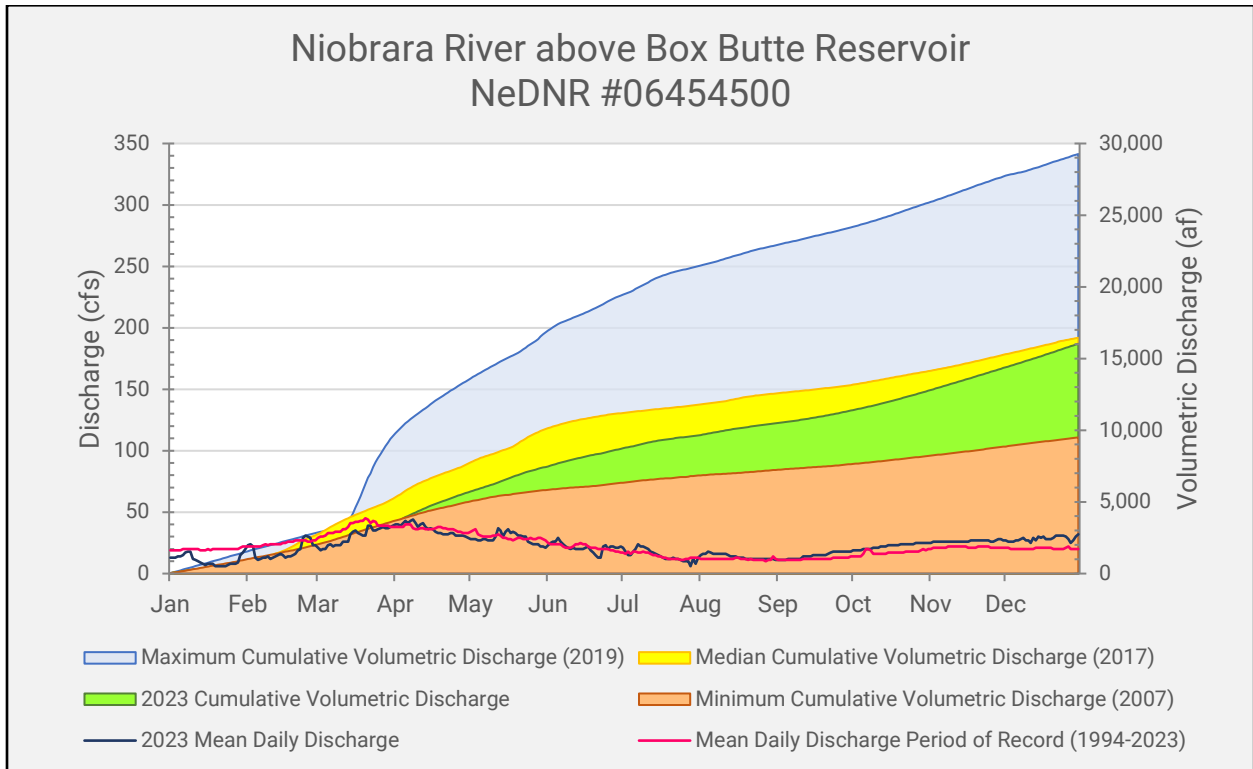
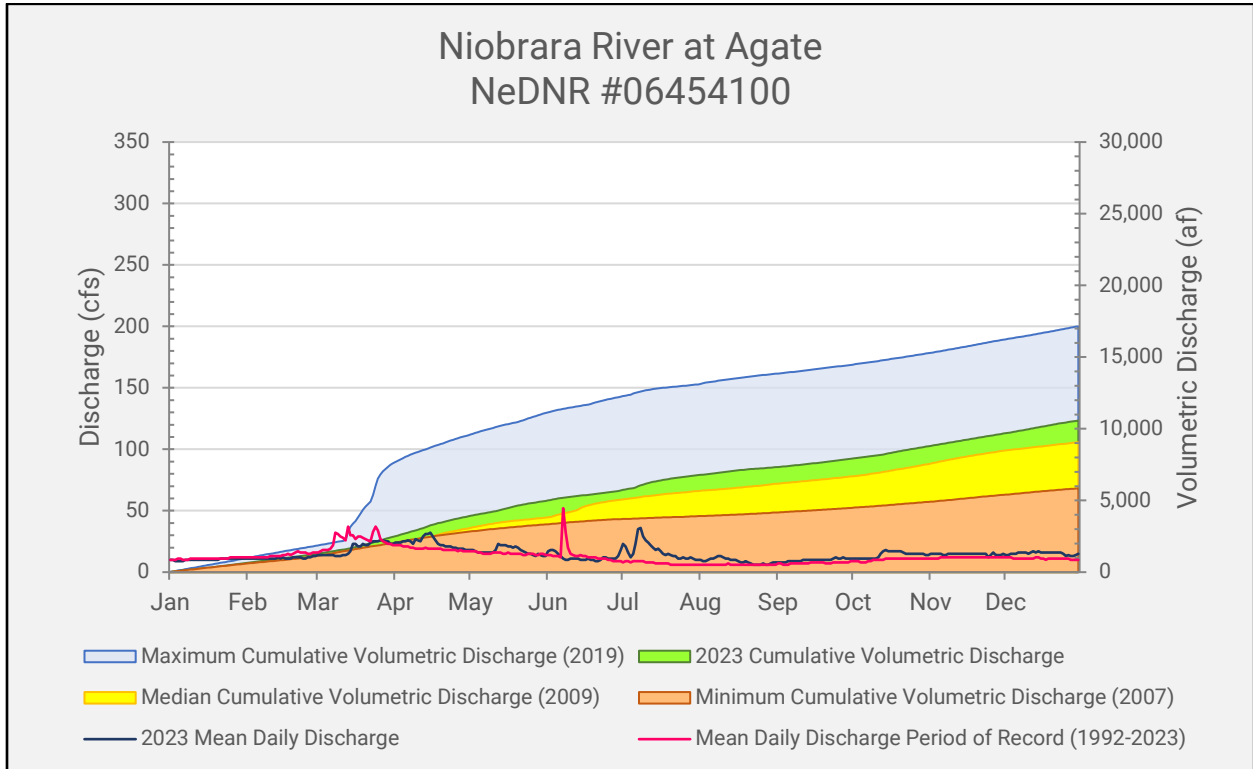
ModID(s): **9811, 9812, 9813 & 9814**  
Map No. **21125** Map ID No. **20345**

Approved by Order Dated: **April 17, 2023**

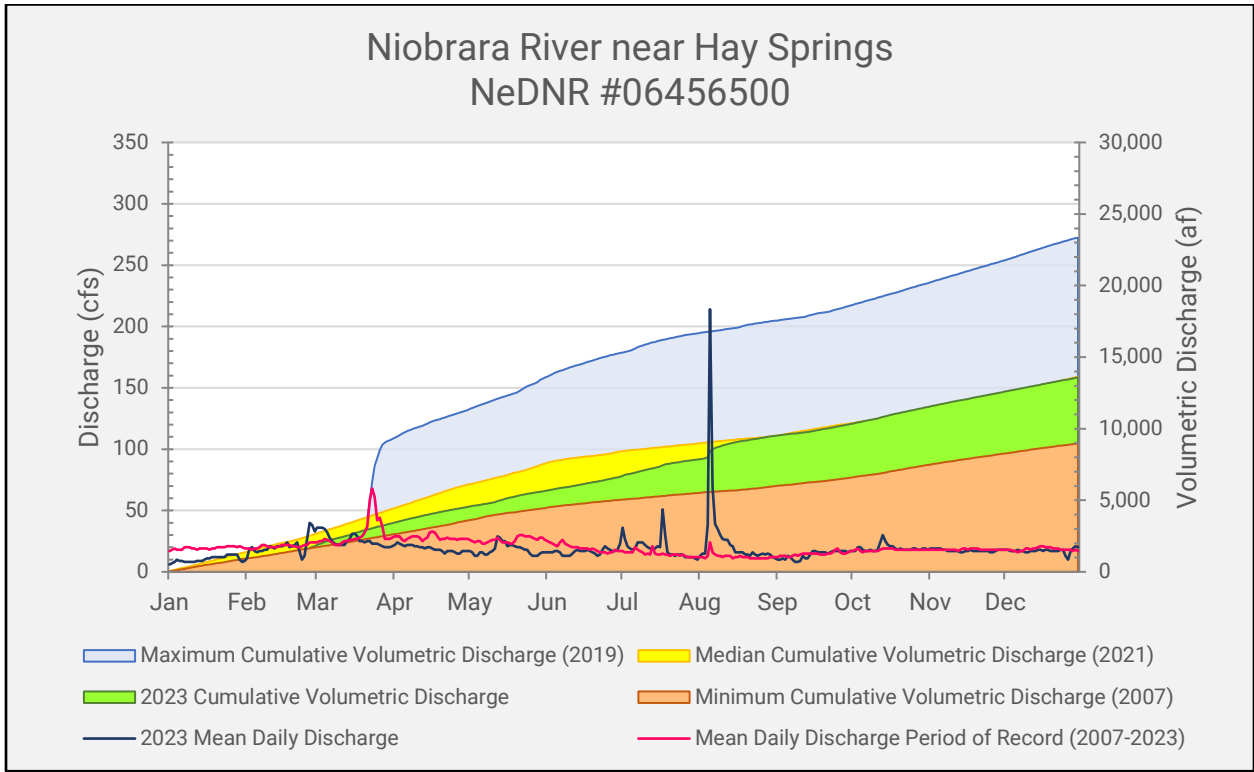
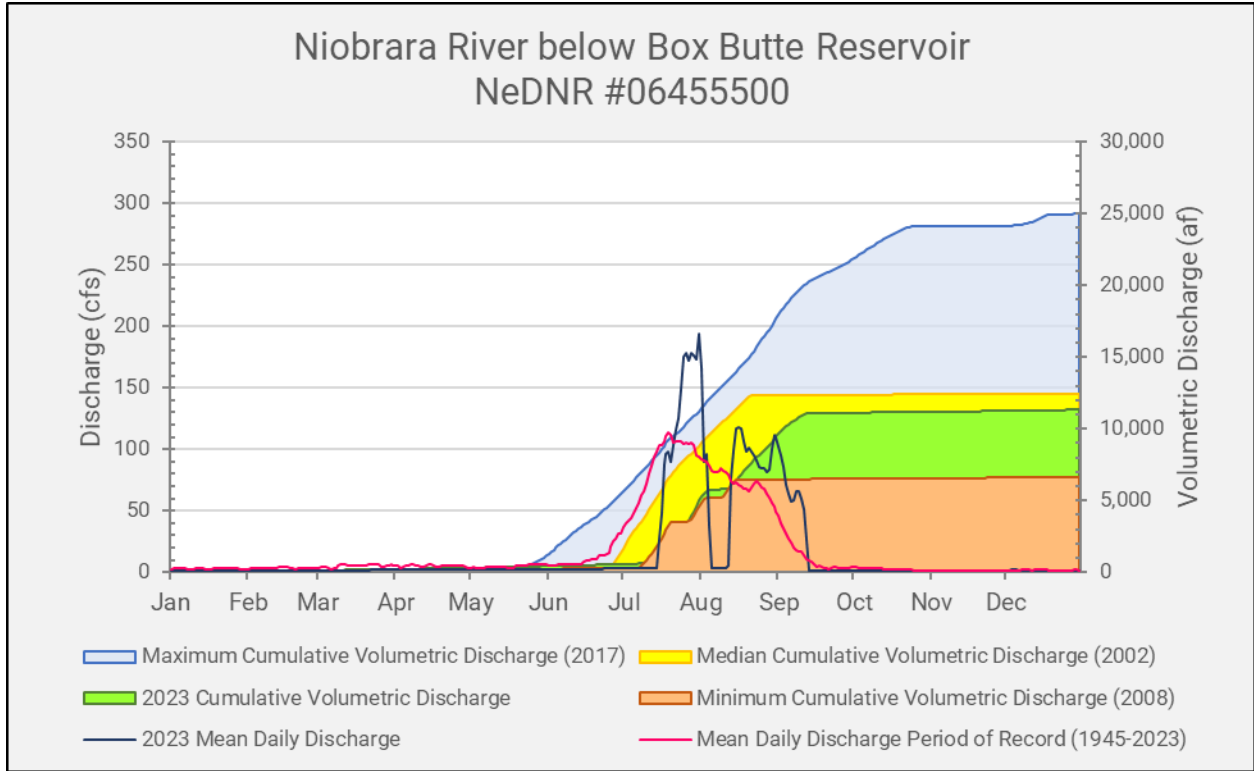
APPENDIX B 2023 STREAMGAGE MEASUREMENTS



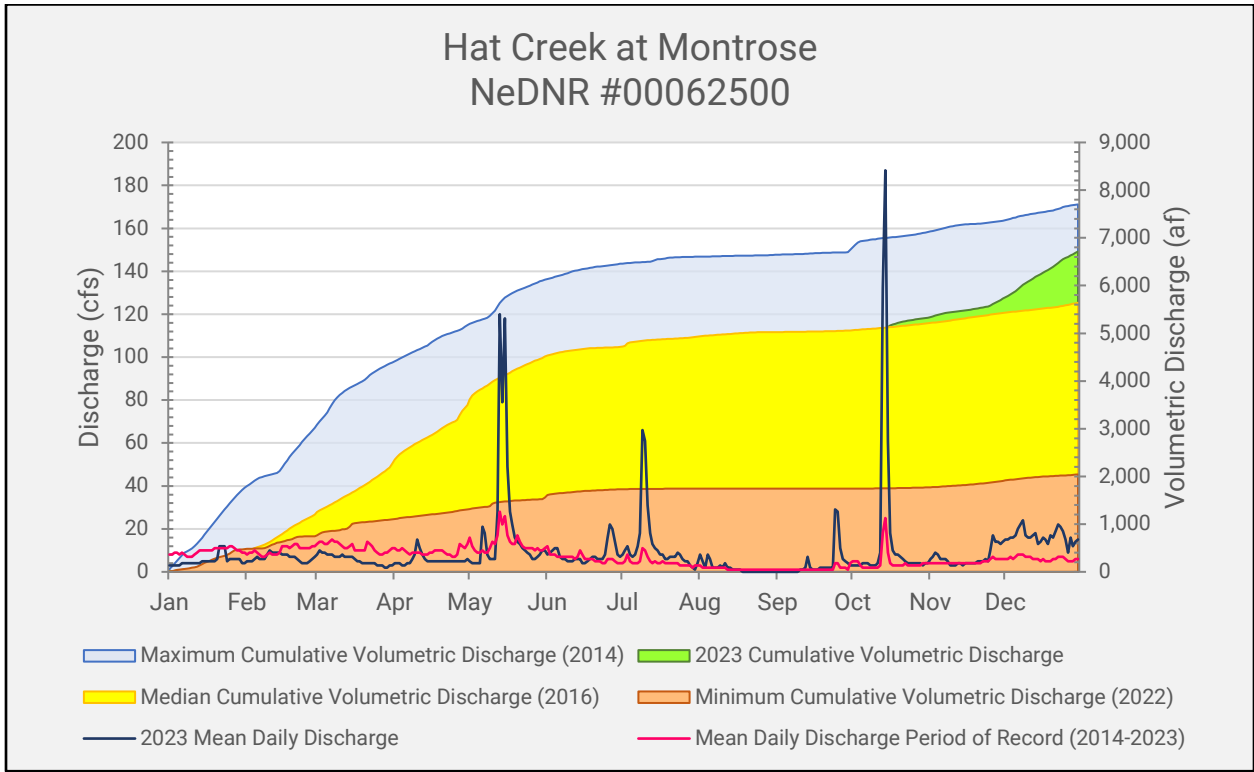
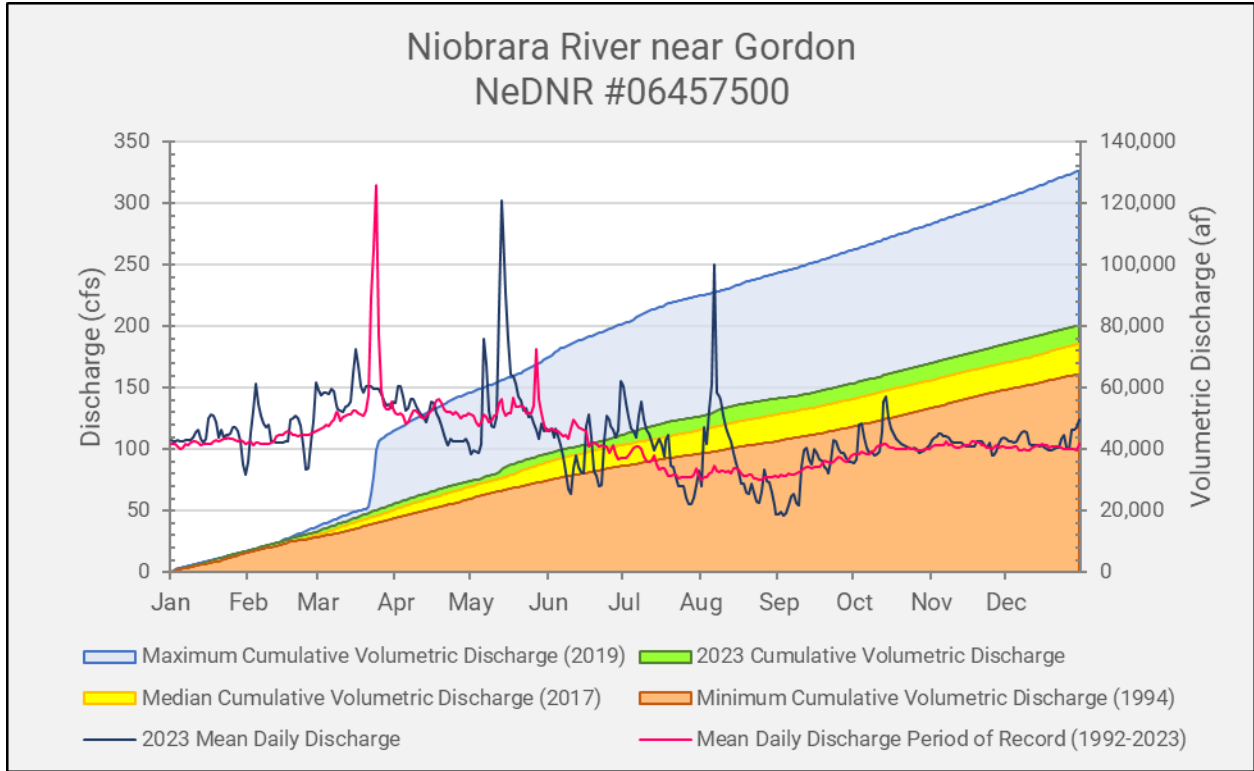
APPENDIX B 2023 Streamgage Measurements



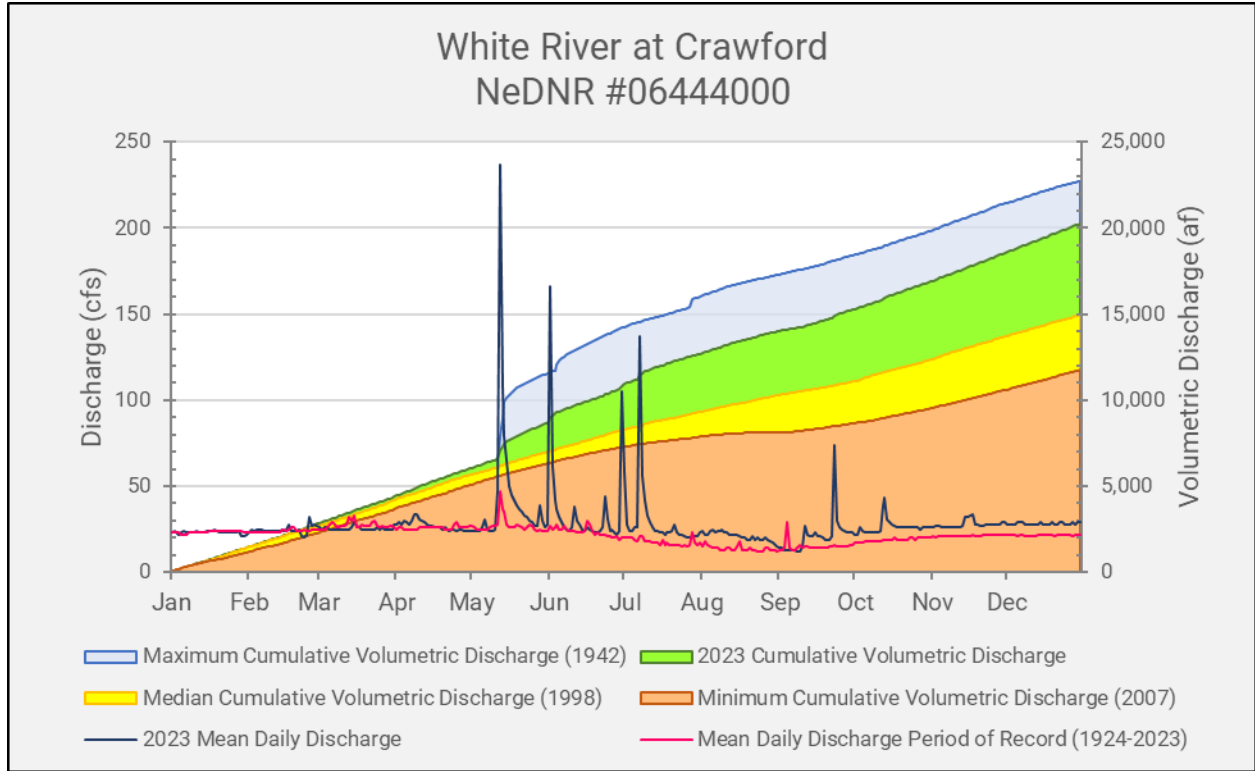
APPENDIX B 2023 Streamgauge Measurements



APPENDIX B 2023 Streamgage Measurements



# APPENDIX B 2023 Streamgage Measurements





APPENDIX B1 2023 Streamgauge Measurements

Date	Site Name	Discharge/Volume	Unit
10/18/2023	Armstrong Pump fr Niobrara River	0	CFS
8/22/2023	Armstrong Pump fr Niobrara River	0	CFS
5/31/2023	Armstrong Pump fr Niobrara River	0	CFS
8/28/2023	Clark Pump fr Box Butte Creek	0	CFS
10/3/2023	Cook Pump fr Niobrara River	0	CFS
8/15/2023	Cook Pump fr Niobrara River		CFS
5/26/2023	Cook Pump fr Niobrara River		CFS
8/28/2023	Delsing Pump fr Niobrara River	0	CFS
7/20/2023	Delsing Pump fr Niobrara River	0	CFS
5/9/2023	Dunlap Pump from Dunlap Reservoir		CFS
9/29/2023	Gieser's Pump		CFS
6/26/2023	Hoover Pump fr Niobrara River	0	CFS
8/28/2023	Montague Canal Pump fr Niobrara River	0	CFS
7/20/2023	Montague Canal Pump fr Niobrara River	0	CFS
12/14/2023	Niobrara River 33 Ranch (Rd blw Grote's)(4' clvt)	8.2	CFS
10/24/2023	Niobrara River 33 Ranch (Rd blw Grote's)(4' clvt)	8.02	CFS
9/5/2023	Niobrara River 33 Ranch (Rd blw Grote's)(4' clvt)	4.22	CFS
7/31/2023	Niobrara River 33 Ranch (Rd blw Grote's)(4' clvt)	6.83	CFS
6/13/2023	Niobrara River 33 Ranch (Rd blw Grote's)(4' clvt)	2.75	CFS
5/11/2023	Niobrara River 33 Ranch (Rd blw Grote's)(4' clvt)	10.22	CFS
4/6/2023	Niobrara River 33 Ranch (Rd blw Grote's)(4' clvt)	15.79	CFS
3/15/2023	Niobrara River 33 Ranch (Rd blw Grote's)(4' clvt)	15.57	CFS
2/21/2023	Niobrara River 33 Ranch (Rd blw Grote's)(4' clvt)	5.46	CFS
1/4/2023	Niobrara River 33 Ranch (Rd blw Grote's)(4' clvt)	4.69	CFS
9/27/2023	Whitney Reservoir	3520	CFS
8/14/2023	Whitney Reservoir	6070	CFS
7/20/2023	Wilkins Pump fr Niobrara River	0	CFS
10/18/2023	Armstrong Pump fr Niobrara River	0	CFS
8/22/2023	Armstrong Pump fr Niobrara River	0	CFS
5/31/2023	Armstrong Pump fr Niobrara River	0	CFS
8/28/2023	Clark Pump fr Box Butte Creek	0	CFS
10/3/2023	Cook Pump fr Niobrara River	0	CFS
8/15/2023	Cook Pump fr Niobrara River		CFS
5/26/2023	Cook Pump fr Niobrara River		CFS
8/28/2023	Delsing Pump fr Niobrara River	0	CFS
7/20/2023	Delsing Pump fr Niobrara River	0	CFS
5/9/2023	Dunlap Pump from Dunlap Reservoir		CFS
9/29/2023	Gieser's Pump		CFS
6/26/2023	Hoover Pump fr Niobrara River	0	CFS
8/28/2023	Montague Canal Pump fr Niobrara River	0	CFS

APPENDIX B1 2023 Streamgauge Measurements

Date	Site Name	Discharge/Volume	Unit
11/2/2023	Hat Creek at Montrose	3.02	CFS
9/20/2023	Hat Creek at Montrose	1.75	CFS
8/10/2023	Hat Creek at Montrose	2.25	CFS
7/11/2023	Hat Creek at Montrose	28.81	CFS
5/17/2023	Hat Creek at Montrose	28.1	CFS
3/29/2023	Hat Creek at Montrose	2.84	CFS
12/14/2023	Niobrara River at Agate	16.64	CFS
10/25/2023	Niobrara River at Agate	14.94	CFS
9/7/2023	Niobrara River at Agate	8.99	CFS
7/31/2023	Niobrara River at Agate	8.96	CFS
6/28/2023	Niobrara River at Agate	10.6	CFS
5/16/2023	Niobrara River at Agate	21.8	CFS
4/5/2023	Niobrara River at Agate	24.4	CFS
3/10/2023	Niobrara River at Agate	13.45	CFS
2/17/2023	Niobrara River at Agate	11.29	CFS
1/4/2023	Niobrara River at Agate	9.29	CFS
12/1/2023	Niobrara River near Gordon	115.83	CFS
11/1/2023	Niobrara River near Gordon	108.57	CFS
9/28/2023	Niobrara River near Gordon	92.74	CFS
8/7/2023	Niobrara River near Gordon	148	CFS
7/6/2023	Niobrara River near Gordon	111	CFS
5/10/2023	Niobrara River near Gordon	118	CFS
3/27/2023	Niobrara River near Gordon	140	CFS
2/28/2023	Niobrara River near Gordon	169	CFS
1/11/2023	Niobrara River near Gordon	111	CFS
10/16/2023	South Antelope Creek at Eitel-Oldaker Line	0.25	CFS
6/15/2023	South Antelope Creek at Eitel-Oldaker Line	0.23	CFS
6/7/2023	South Antelope Creek at Eitel-Oldaker Line	0.12	CFS
3/6/2023	South Antelope Creek at Eitel-Oldaker Line	0.2	CFS
12/8/2023	South Antelope Creek at Oldaker Culvert	0.25	CFS
12/7/2023	South Antelope Creek at Oldaker Culvert	0.33	CFS
12/7/2023	South Antelope Creek at Oldaker Culvert	0.27	CFS
9/13/2023	South Antelope Creek at Oldaker Culvert	0.08	CFS
1/27/2023	South Antelope Creek at Oldaker Culvert	0.04	CFS
12/7/2023	South Antelope Creek at Schnurr Rd	0.22	CFS
10/16/2023	South Antelope Creek at Schnurr Rd	0.12	CFS
9/13/2023	South Antelope Creek at Schnurr Rd	0.08	CFS
6/15/2023	South Antelope Creek at Schnurr Rd	0.11	CFS
6/7/2023	South Antelope Creek at Schnurr Rd	0.06	CFS
3/6/2023	South Antelope Creek at Schnurr Rd	0.09	CFS

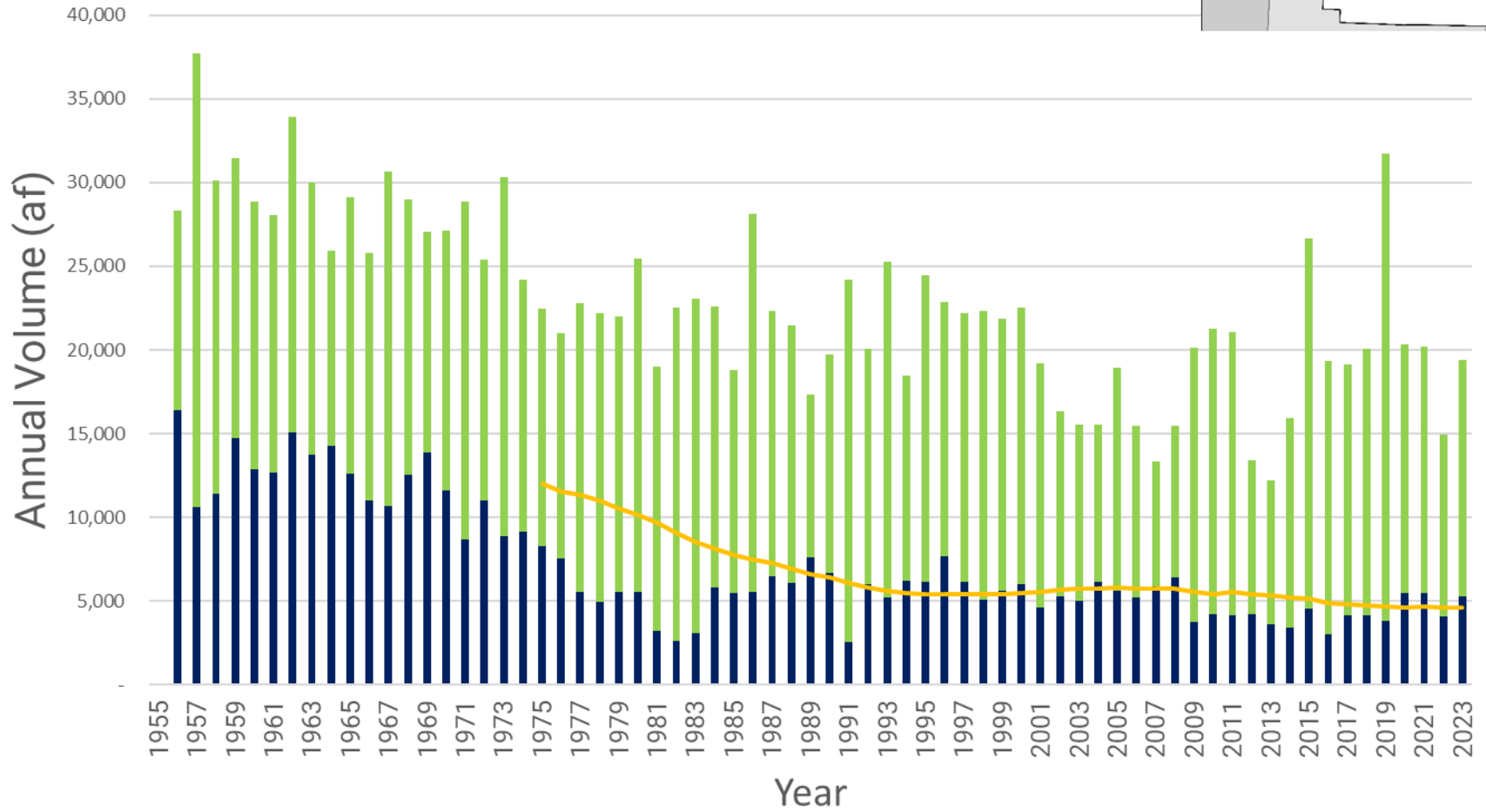
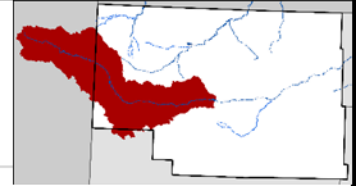


APPENDIX B1 2023 Streamgauge Measurements

Date	Site Name	Discharge/Volume	Unit
12/8/2023	South Antelope Creek at Whitman Rd	0.28	CFS
12/7/2023	South Antelope Creek at Whitman Rd	0.28	CFS
10/16/2023	South Antelope Creek at Whitman Rd	0.23	CFS
9/13/2023	South Antelope Creek at Whitman Rd	0.16	CFS
6/15/2023	South Antelope Creek at Whitman Rd	0.21	CFS
6/7/2023	South Antelope Creek at Whitman Rd	0.16	CFS
3/6/2023	South Antelope Creek at Whitman Rd	0.19	CFS
1/27/2023	South Antelope Creek at Whitman Rd	0.26	CFS
1/10/2023	South Antelope Creek at Whitman Rd	0.46	CFS
10/16/2023	South Antelope Creek below D-537	0	CFS
12/8/2023	South Antelope Creek below Eitel Ponds	0.28	CFS
1/10/2023	South Squaw Creek at Whitman Rd	0.42	CFS
12/8/2023	Trib to South Antelope Creek at Whitman Rd	0.18	CFS
12/7/2023	Trib to South Antelope Creek at Whitman Rd	0.12	CFS
10/16/2023	Trib to South Antelope Creek at Whitman Rd	0.07	CFS
9/13/2023	Trib to South Antelope Creek at Whitman Rd	0.02	CFS
6/15/2023	Trib to South Antelope Creek at Whitman Rd	0.03	CFS
6/7/2023	Trib to South Antelope Creek at Whitman Rd	0.01	CFS
3/6/2023	Trib to South Antelope Creek at Whitman Rd	0.12	CFS
1/27/2023	Trib to South Antelope Creek at Whitman Rd	0.06	CFS
10/16/2023	Turner Canal from South Antelope Creek	0.06	CFS
9/13/2023	Turner Canal from South Antelope Creek	0	CFS
8/8/2023	Turner Canal from South Antelope Creek	0	CFS
6/15/2023	Turner Canal from South Antelope Creek	0	CFS
8/8/2023	Turner Pump from South Antelope Creek	0	CFS
8/31/2023	Wickersham Pump fr Wickersham Reservoir No. 2	0	CFS

# APPENDIX C ANNUAL CANAL DISCHARGE

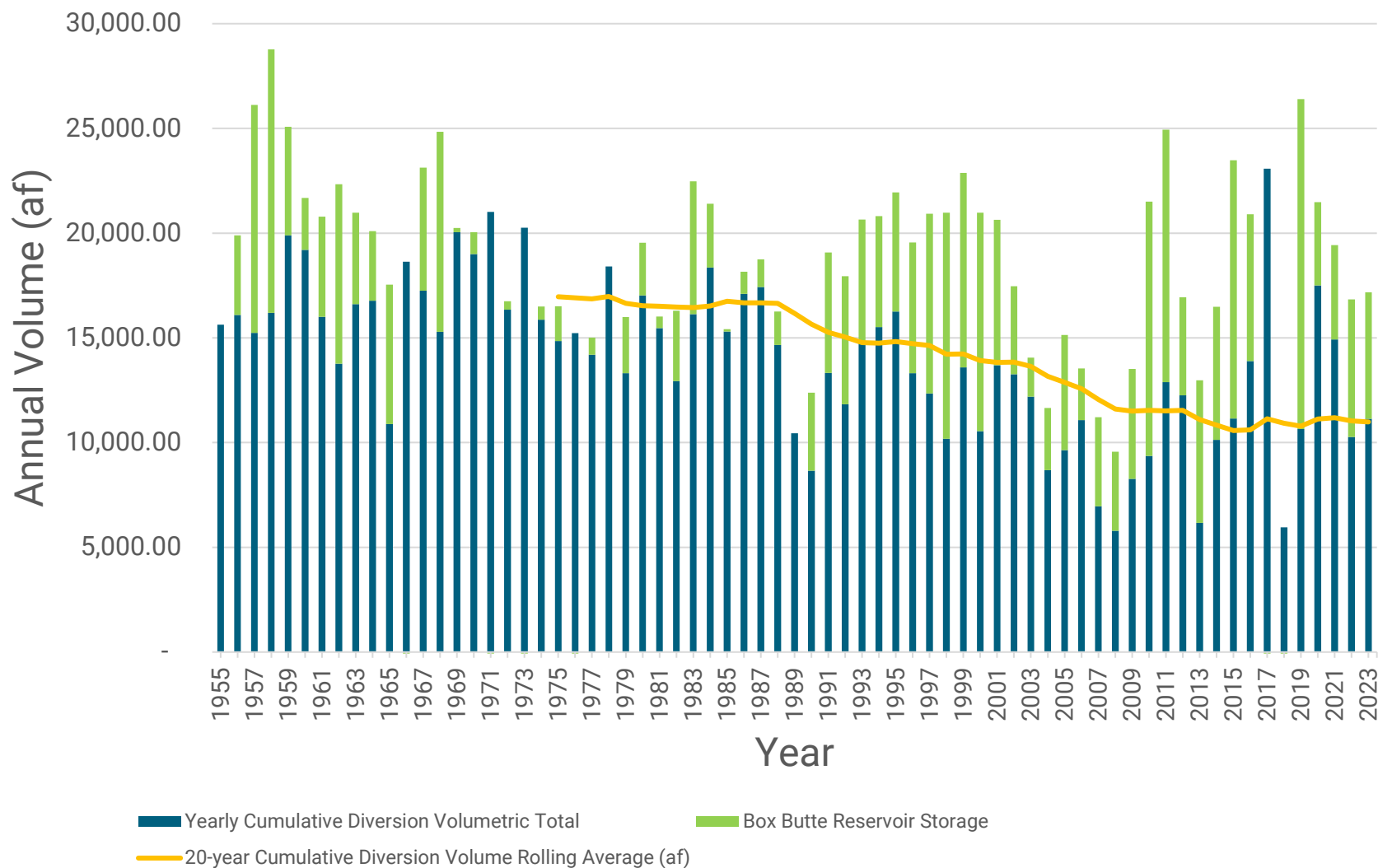
## Canal Diversions from the Niobrara River (excluding Mirage Flats)



- Yearly Cumulative Diversion Volumetric Total
- Niobrara Virgin Water Supply above Box Butte
- 20-year Cumulative Diversion Volume Rolling Average (af)

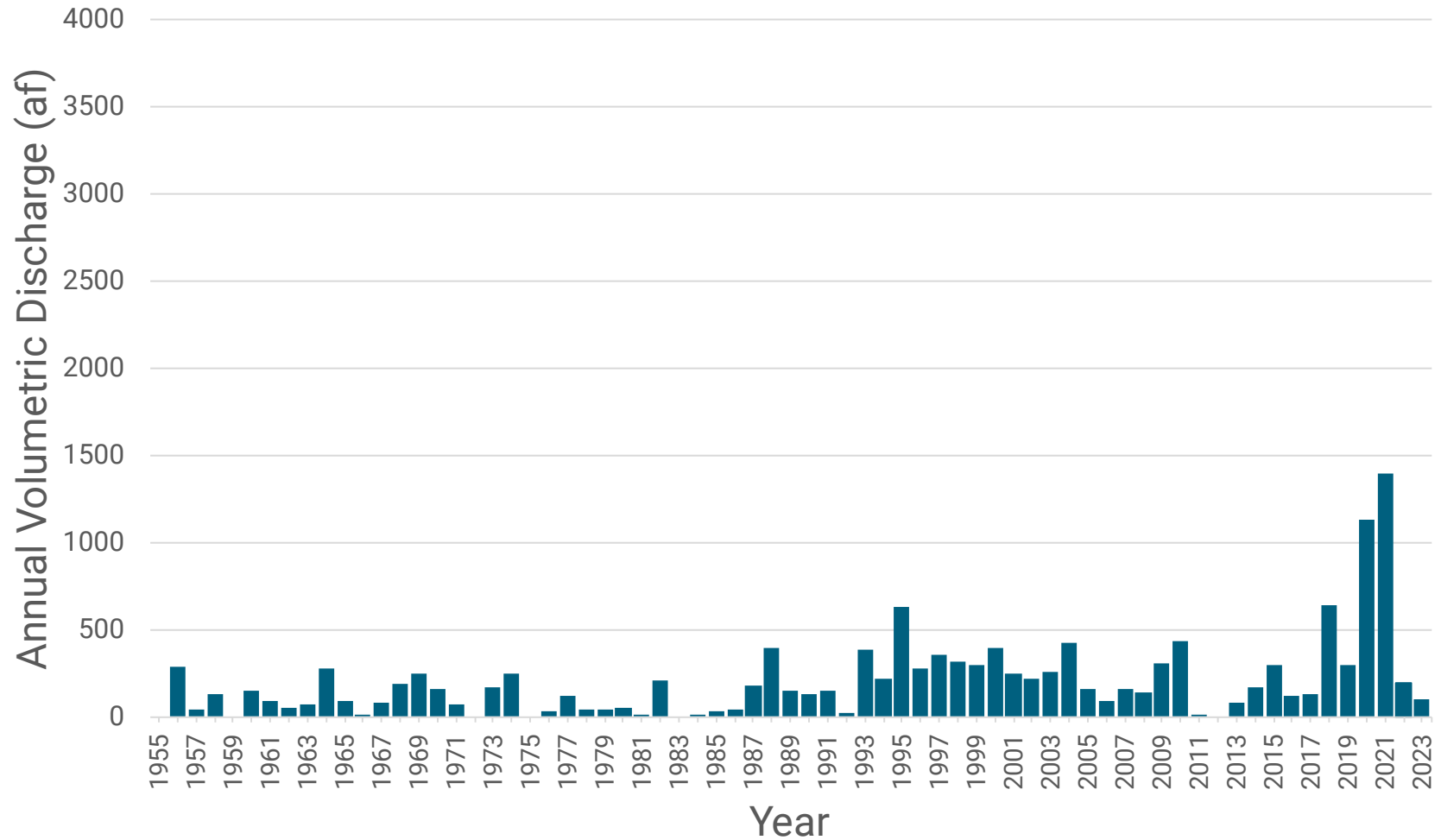
APPENDIX C ANNUAL CANAL DISCHARGE

Annual Volumetric Diversion Recorded at Mirage Flats (Dunlap) Canal from the Niobrara River



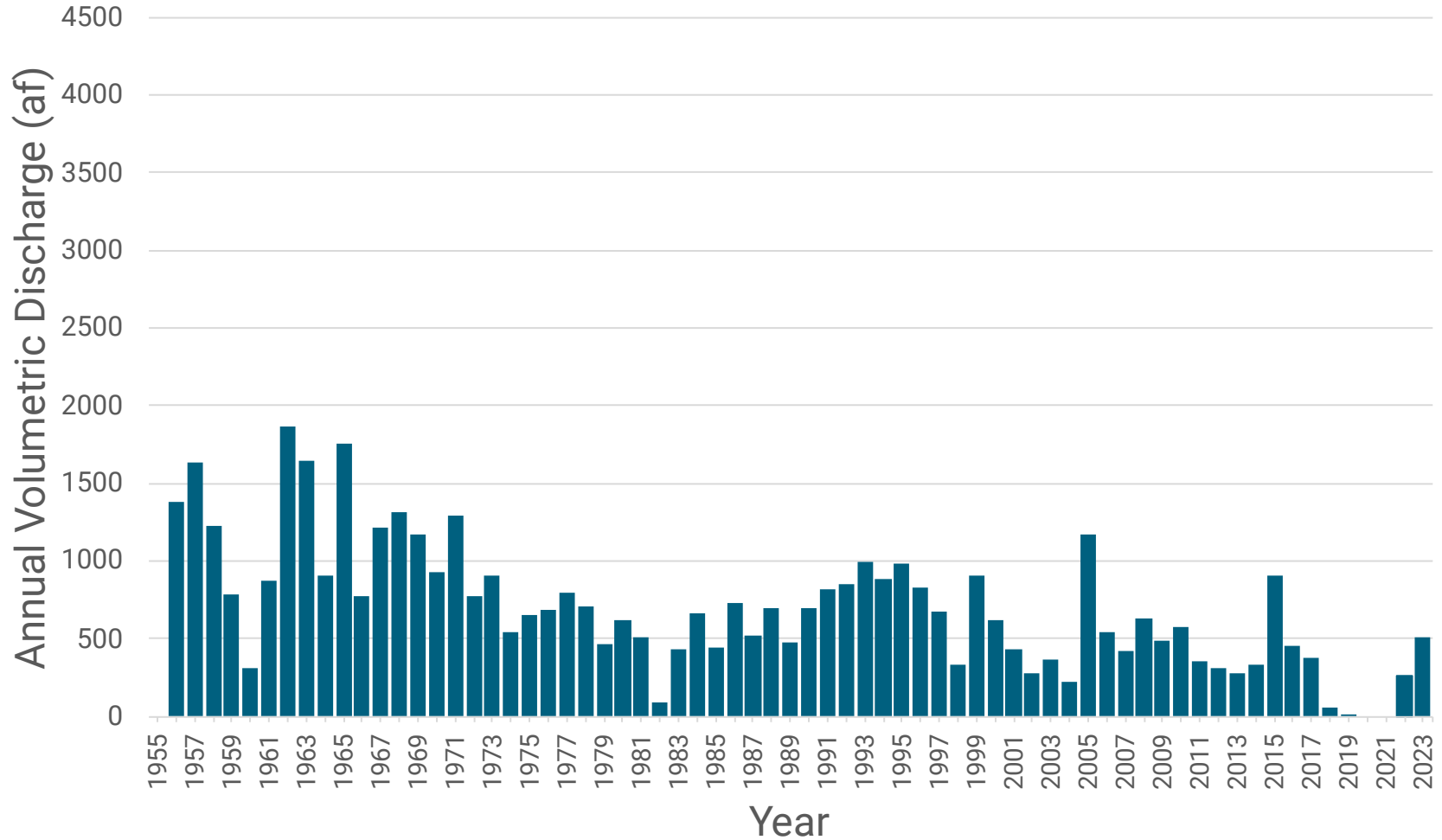
APPENDIX C ANNUAL CANAL DISCHARGE

Annual Volumetric Discharge  
Recorded at Johnson Canal from Niobrara River  
Gage #72000



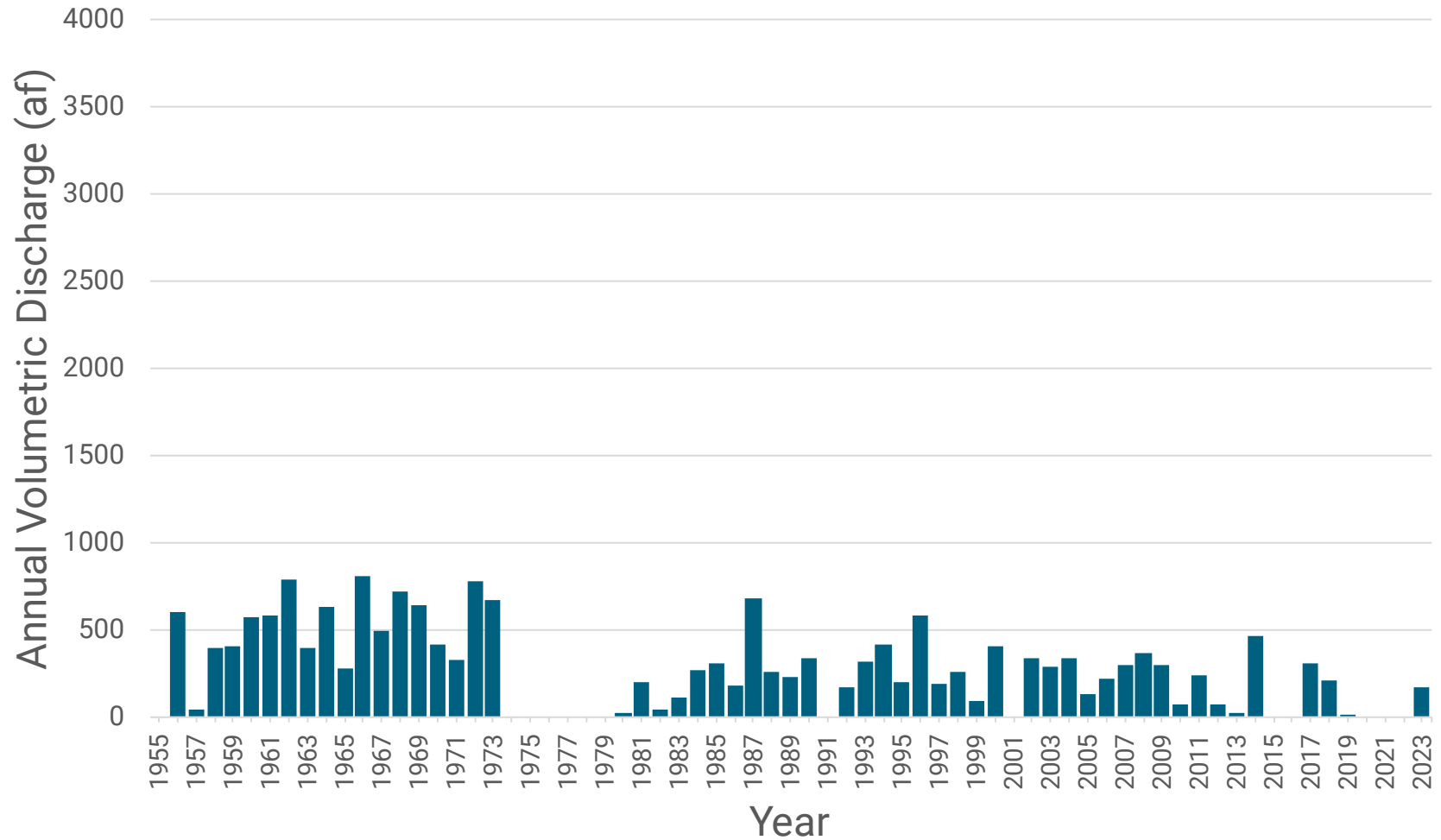
APPENDIX C ANNUAL CANAL DISCHARGE

Annual Volumetric Discharge  
Recorded at Lakotah Canal from Niobrara River  
Gage #79000



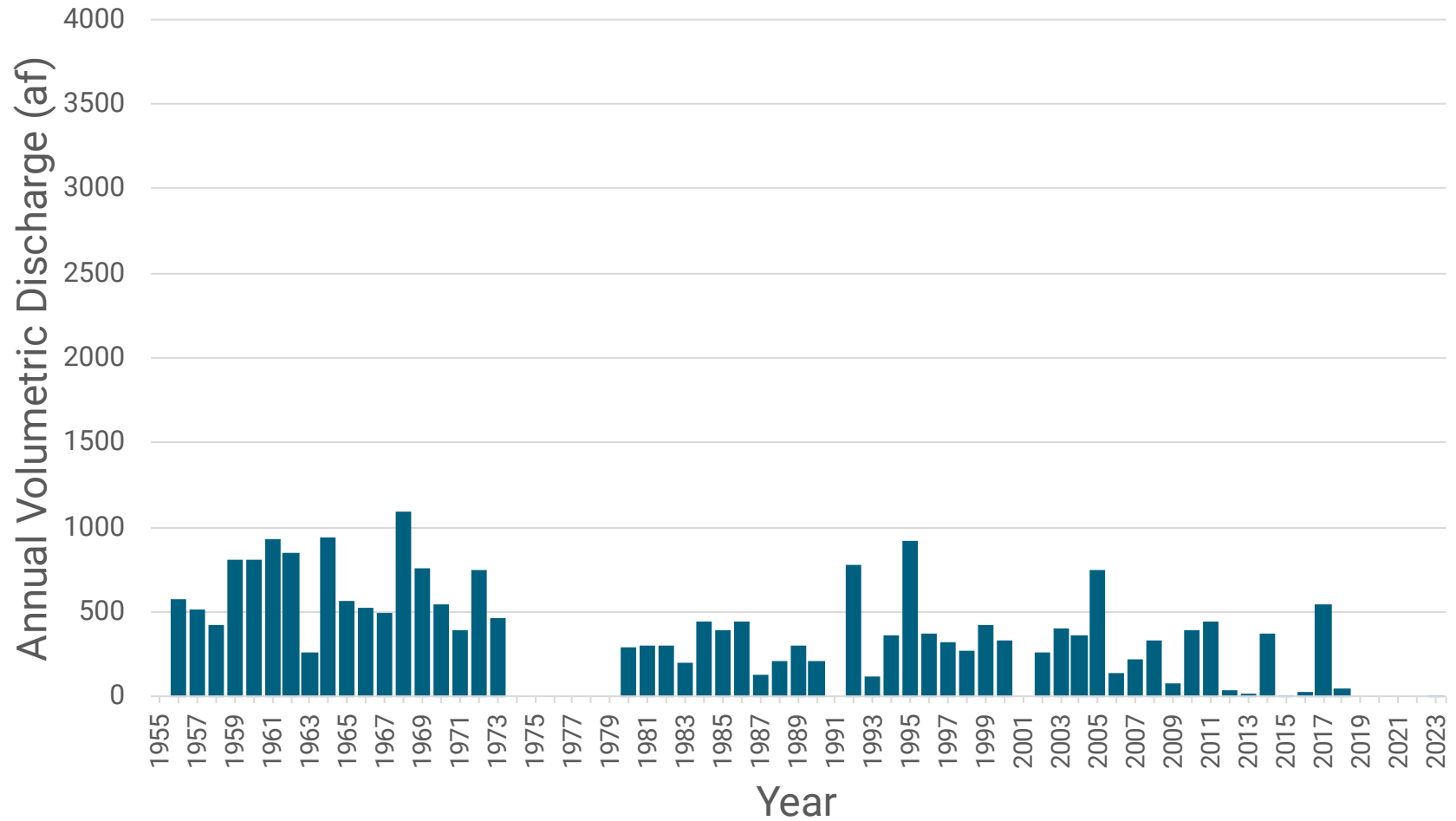
APPENDIX C ANNUAL CANAL DISCHARGE

Annual Volumetric Discharge  
Recorded at Earnest Canal (North) from Niobrara River  
Gage #382000



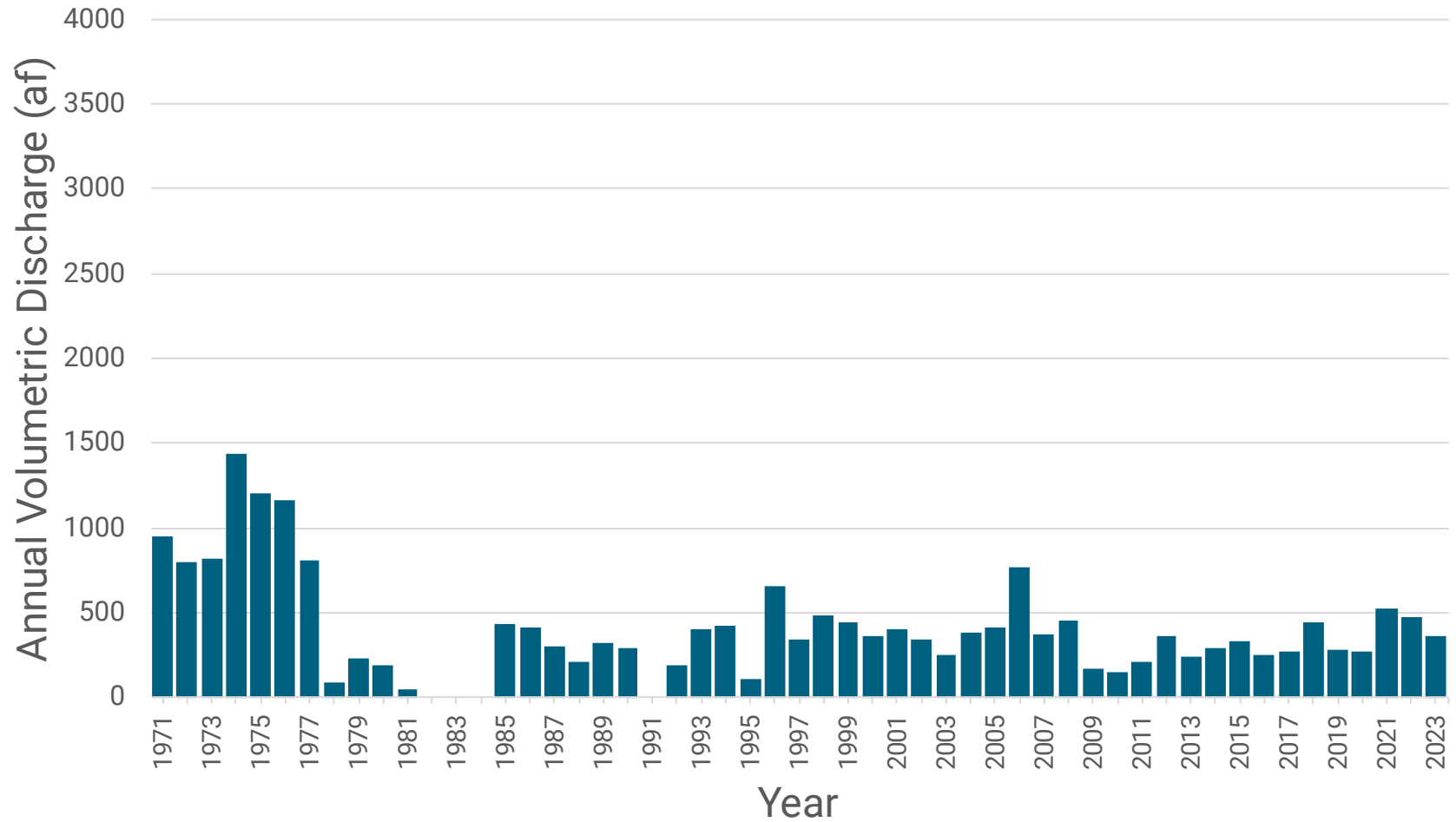
APPENDIX C ANNUAL CANAL DISCHARGE

Annual Volumetric Discharge  
Recorded at Earnest Canal (South) from Niobrara  
River Gage #381000



APPENDIX C ANNUAL CANAL DISCHARGE

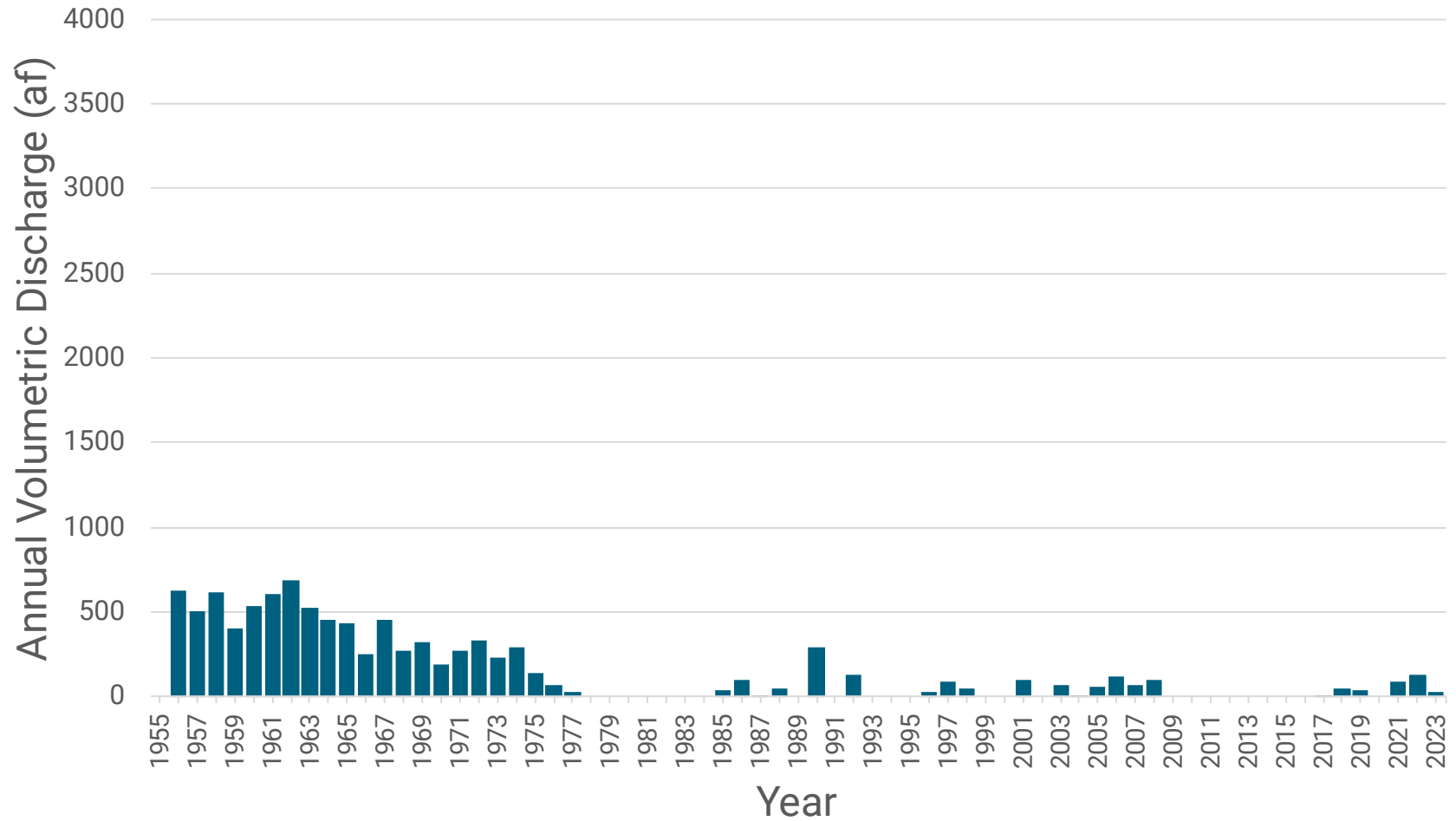
Annual Volumetric Discharge  
Recorded at McGinley-Stover Canal from Niobrara River  
Gage #84000





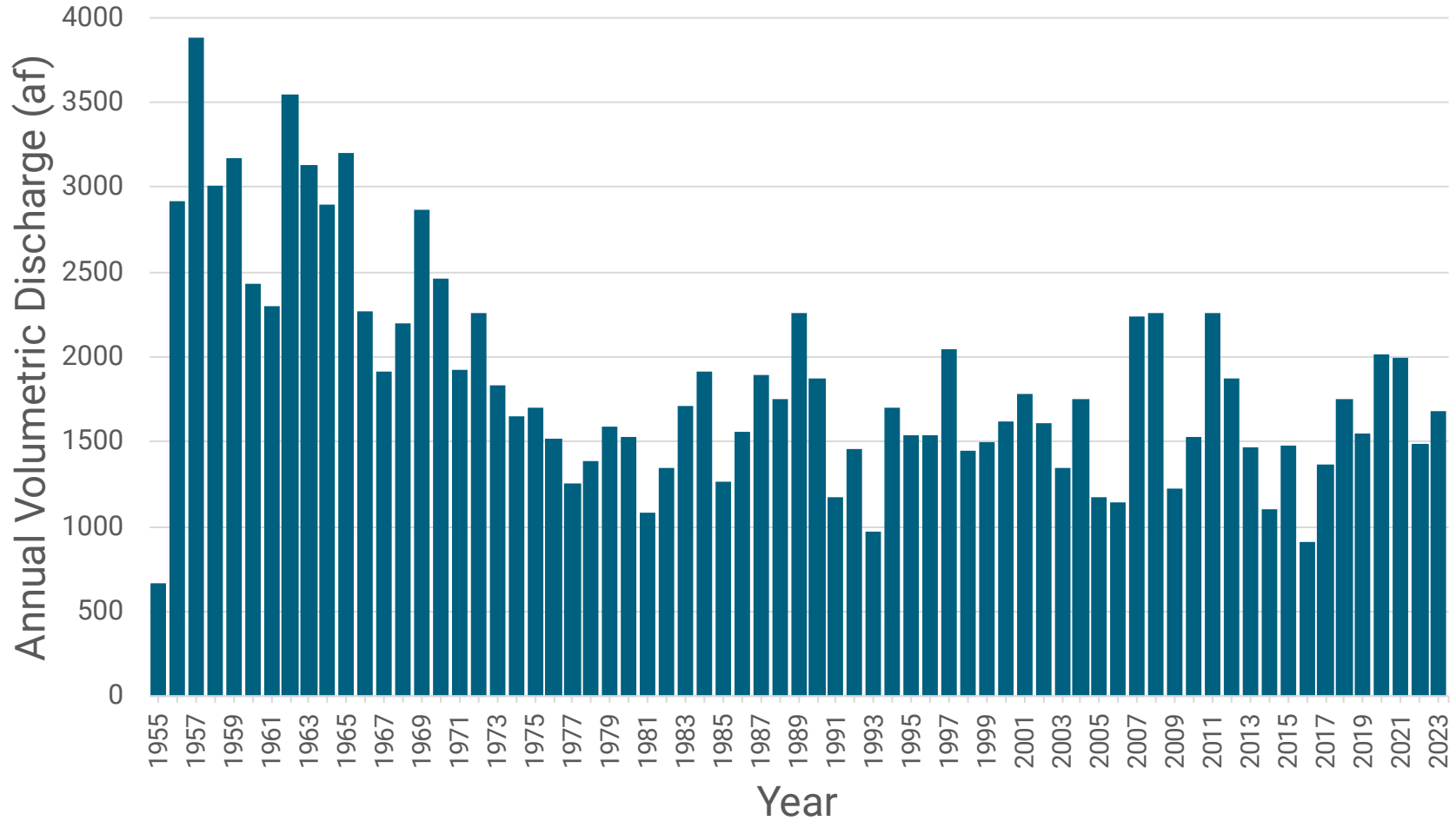
APPENDIX C ANNUAL CANAL DISCHARGE

Annual Volumetric Discharge  
Recorded at Cook Canal No. 1 from Niobrara River  
Gage #29000



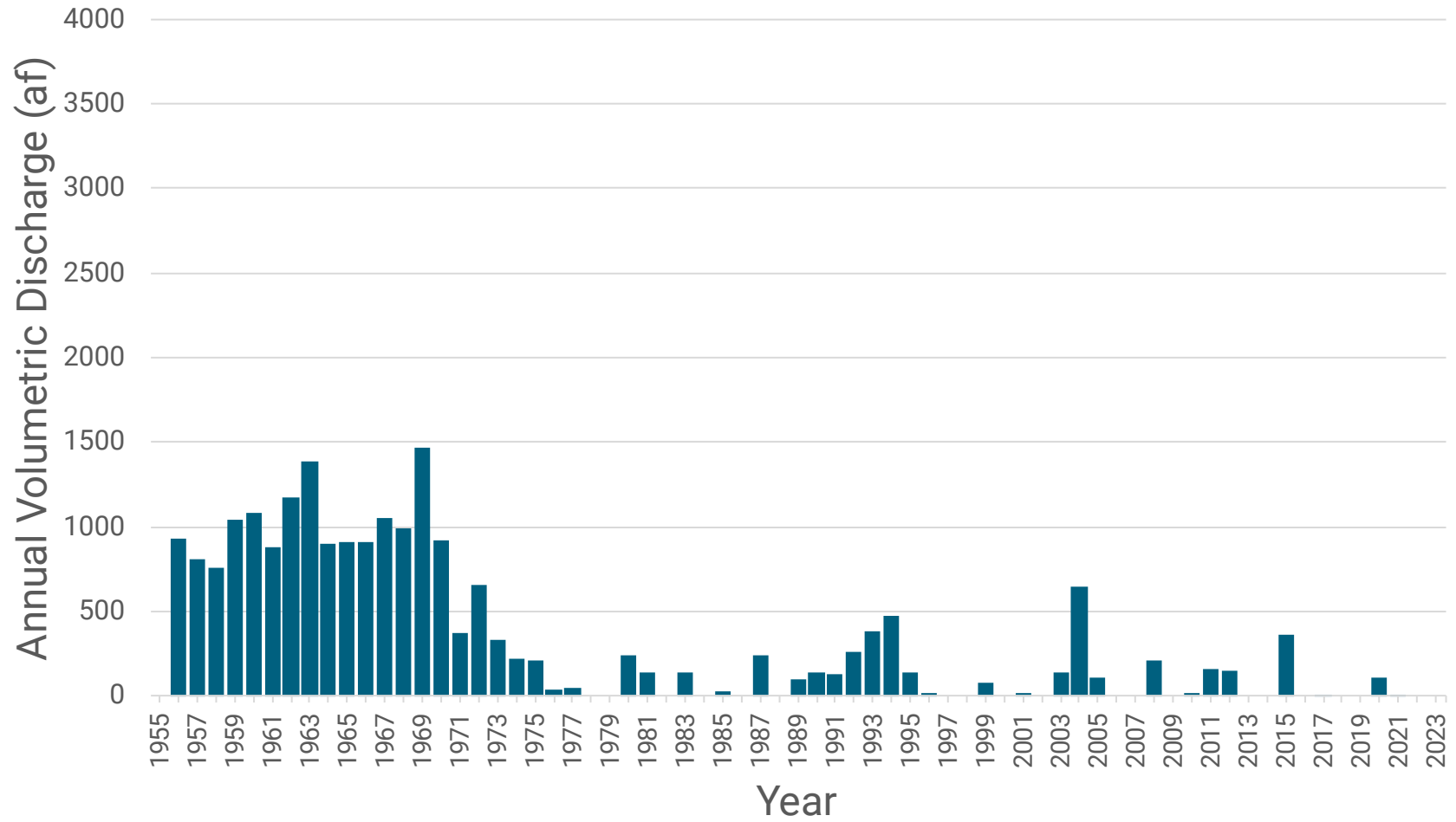
APPENDIX C ANNUAL CANAL DISCHARGE

Annual Volumetric Discharge  
Recorded at Harris-Neece Canal from Niobrara River  
Gage #62000



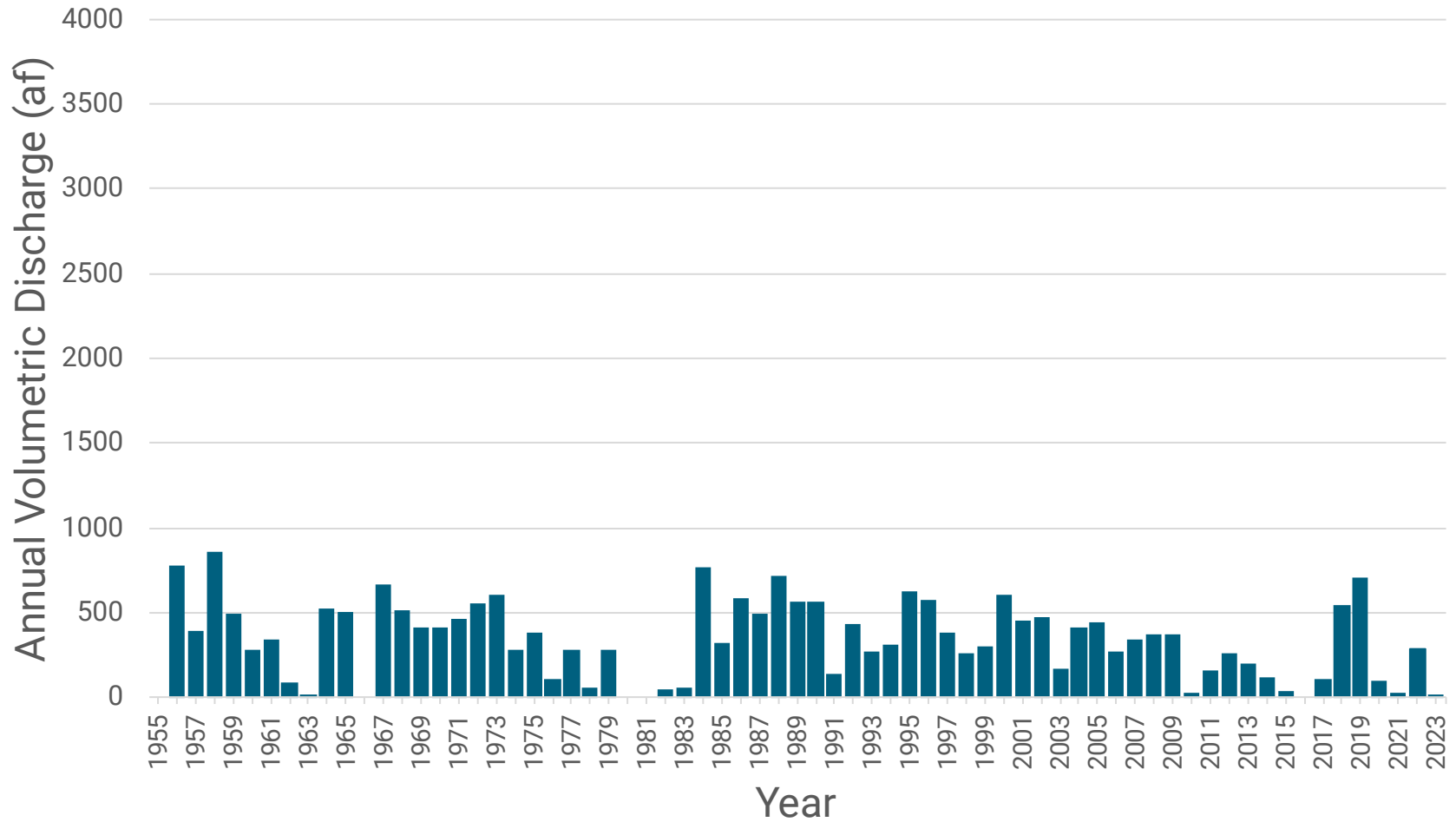
APPENDIX C ANNUAL CANAL DISCHARGE

Annual Volumetric Discharge  
Recorded at Labelle Canal from Niobrara River  
Gage #78000



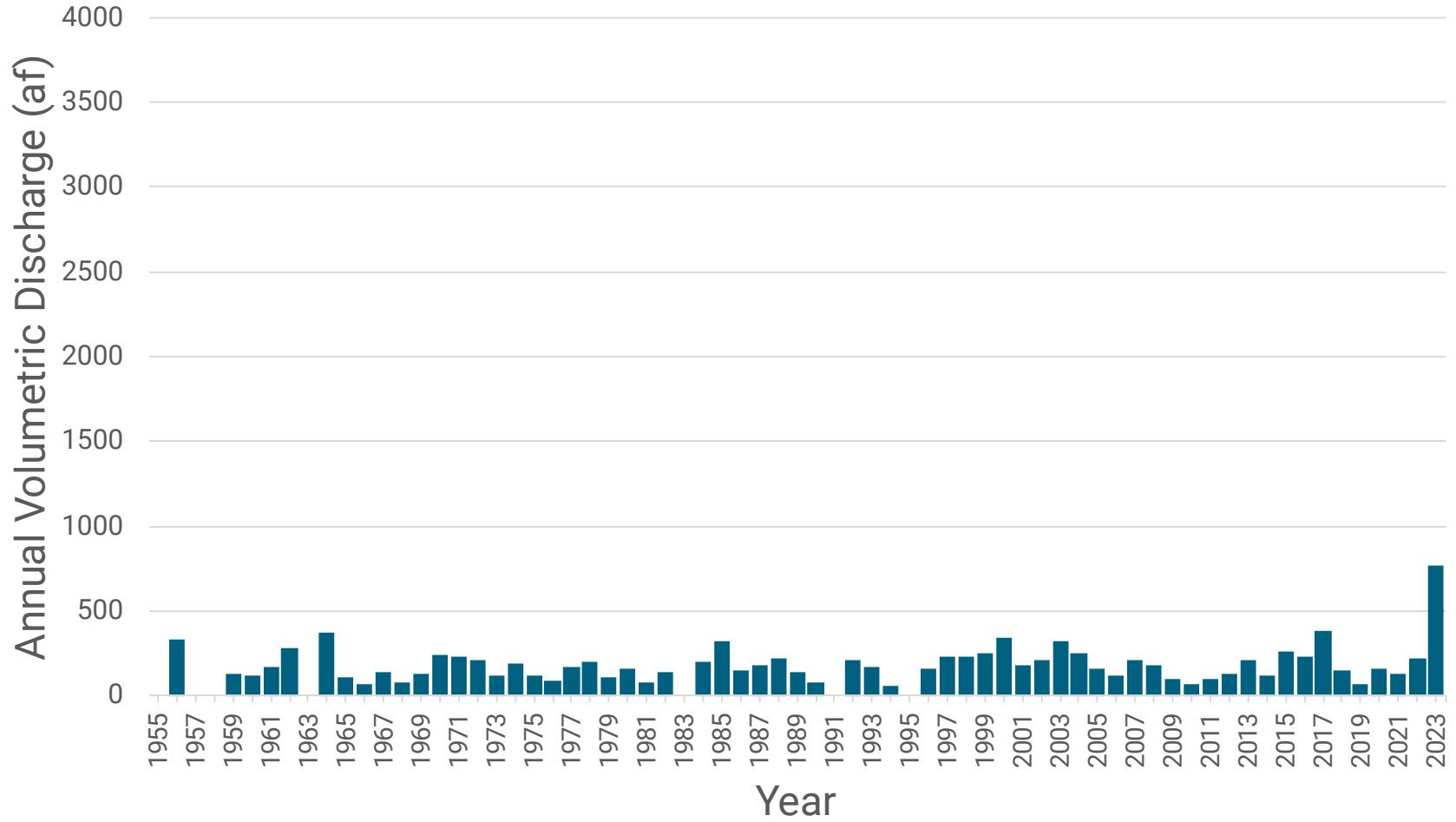
APPENDIX C ANNUAL CANAL DISCHARGE

Annual Volumetric Discharge  
Recorded at Mettlen Canal from Niobrara River  
Gage #89000



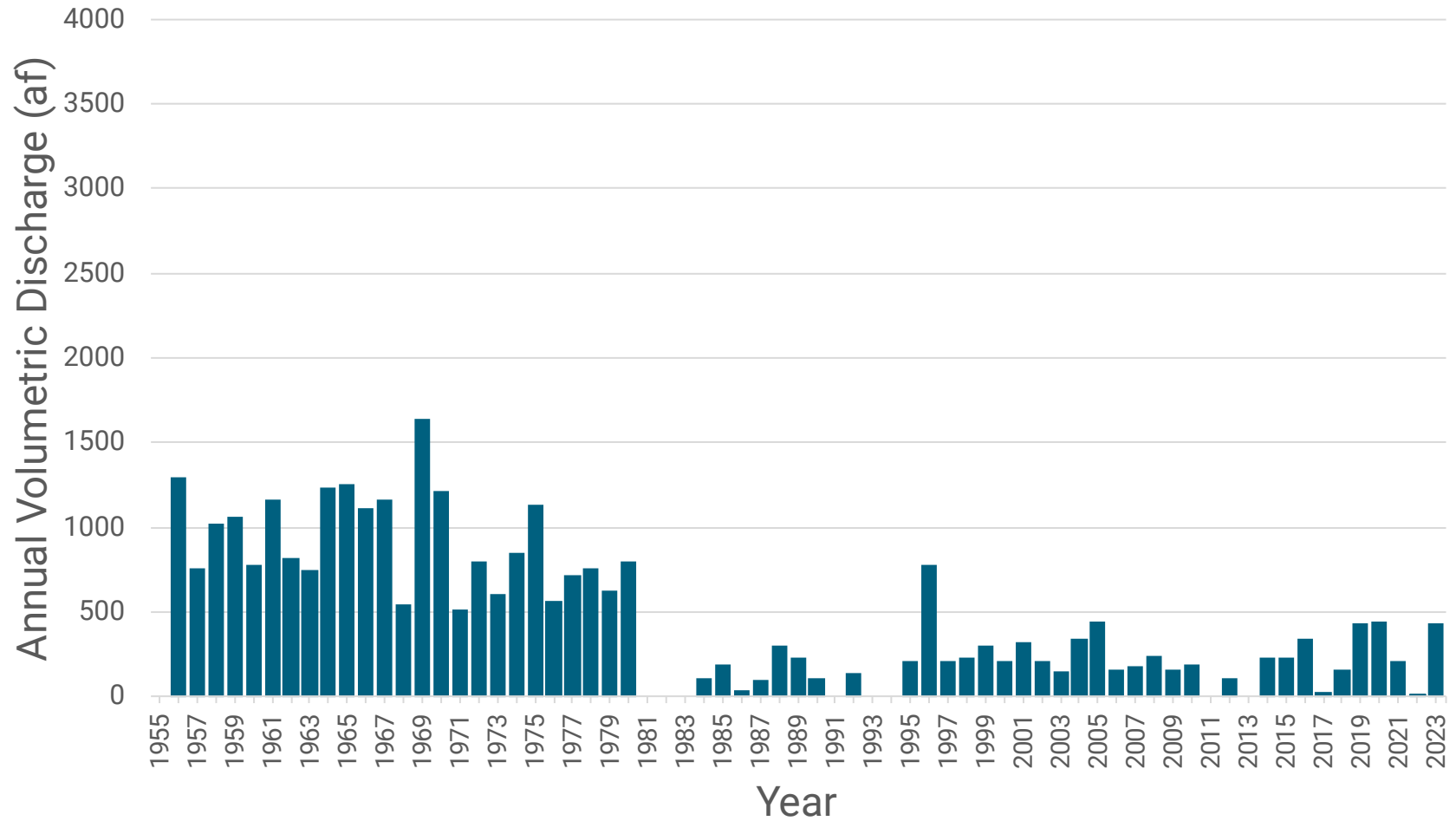
APPENDIX C ANNUAL CANAL DISCHARGE

Annual Volumetric Discharge  
Recorded at Bennett-Kay Canal from Niobrara River  
Gage #13000



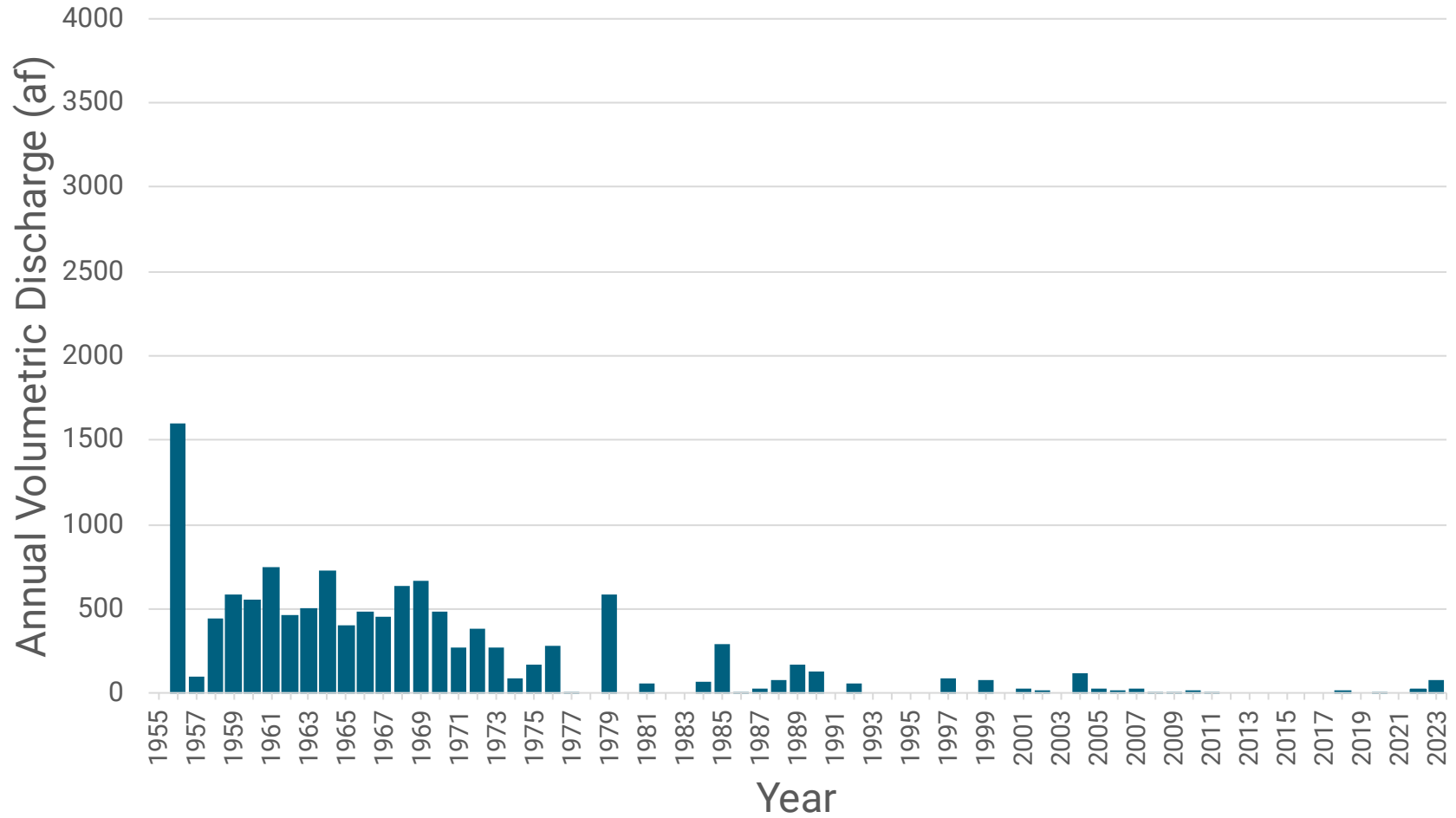
APPENDIX C ANNUAL CANAL DISCHARGE

Annual Volumetric Discharge  
Recorded at Moore-Kay Canal from Niobrara River  
Gage #104000



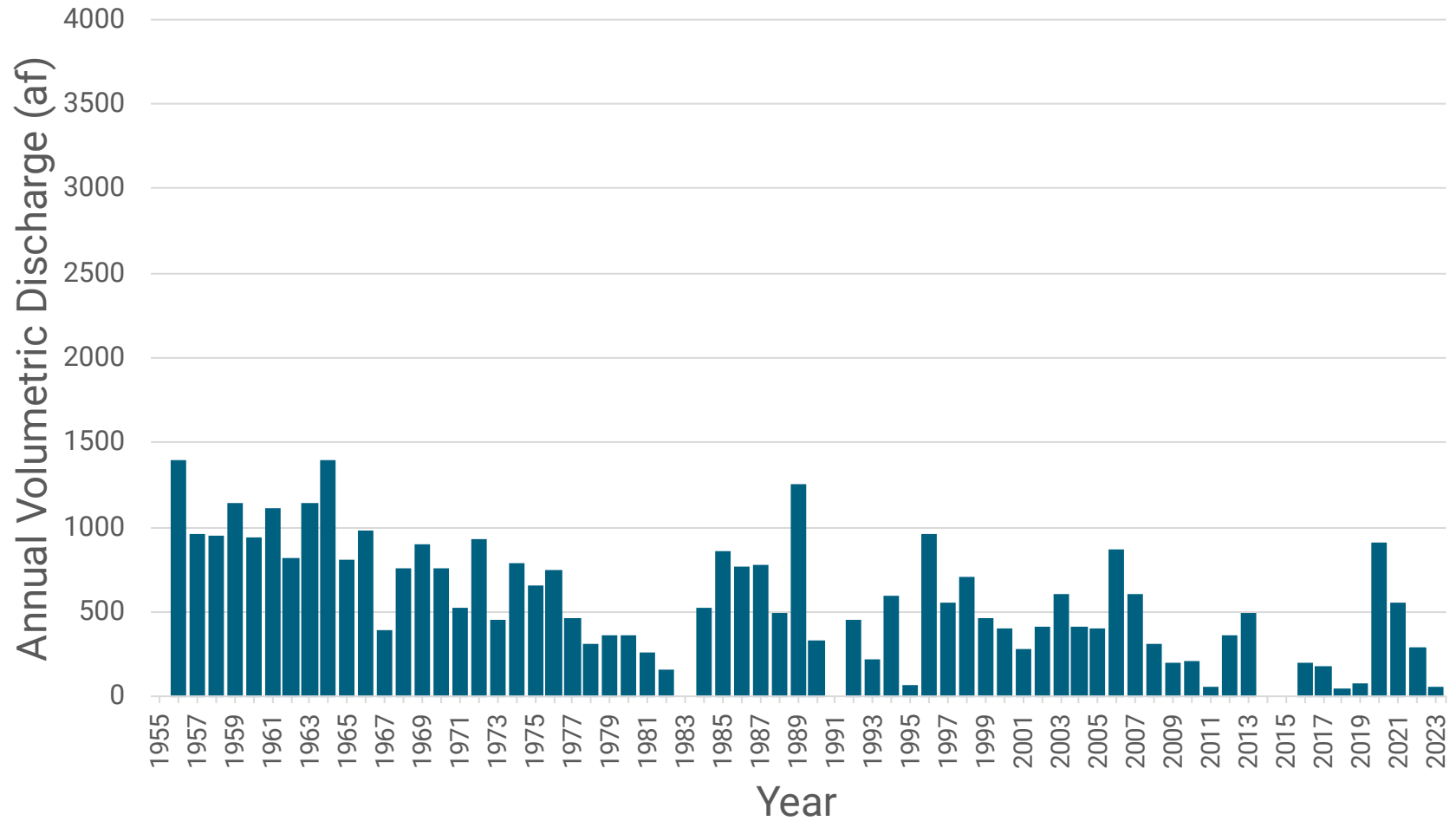
APPENDIX C ANNUAL CANAL DISCHARGE

Annual Volumetric Discharge  
Recorded at Geo. Hitshew Canal from Niobrara River  
Gage #63000



APPENDIX C ANNUAL CANAL DISCHARGE

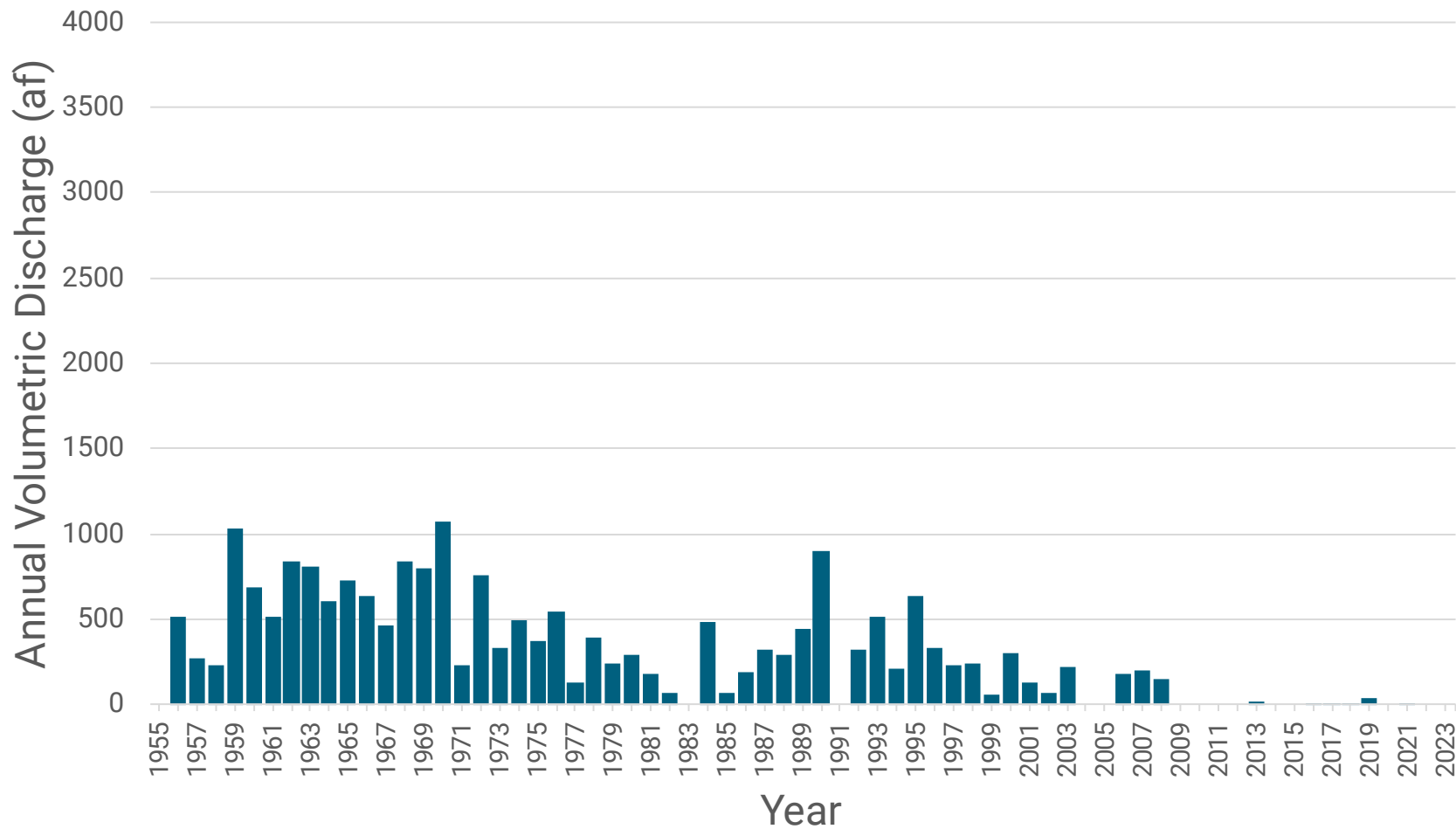
Annual Volumetric Discharge  
Recorded at McLaughlin Canal from Niobrara  
River Gage #86000





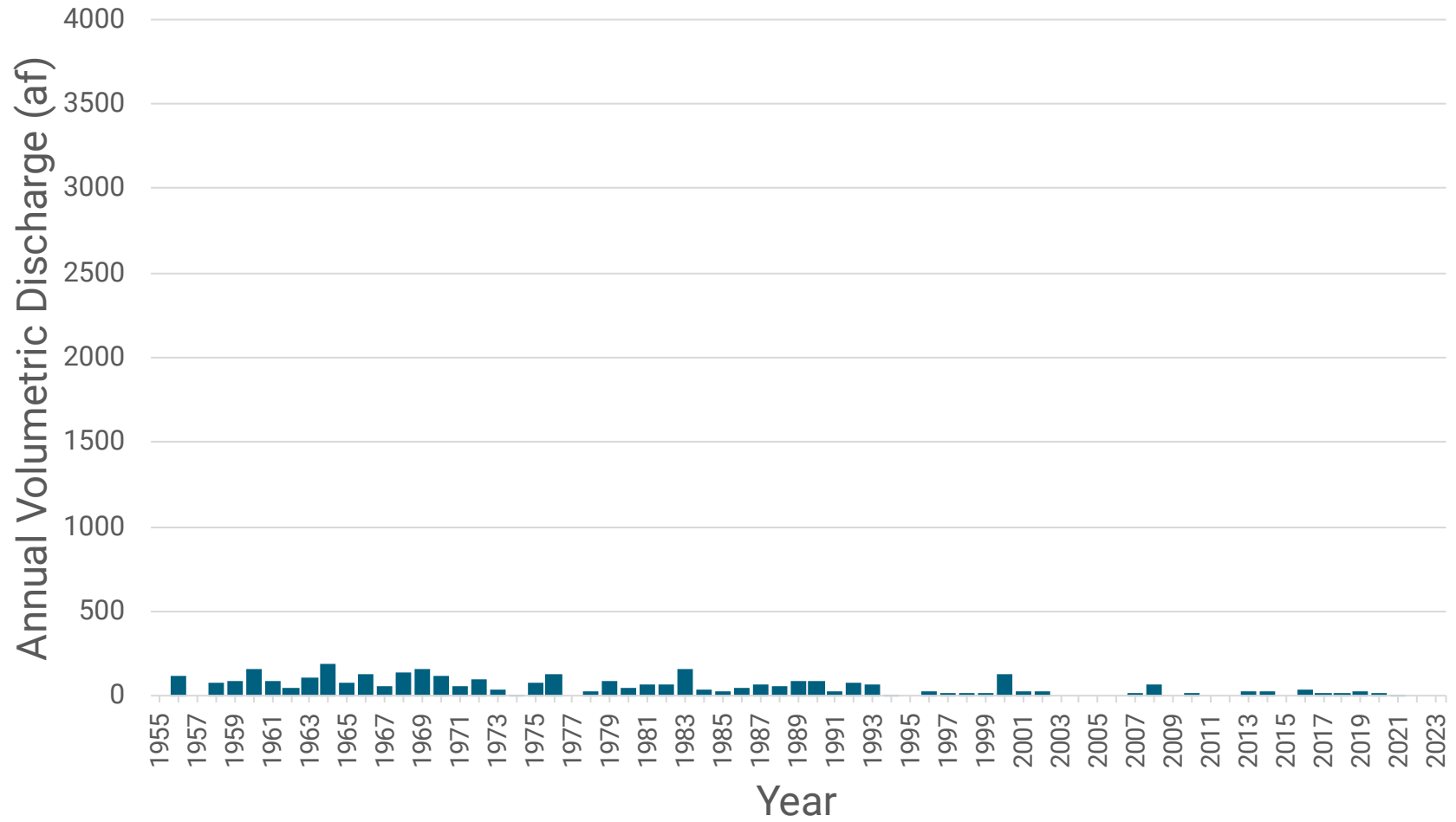
APPENDIX C ANNUAL CANAL DISCHARGE

Annual Volumetric Discharge  
Recorded at Excelsior Canal from Niobrara River  
Gage #46000



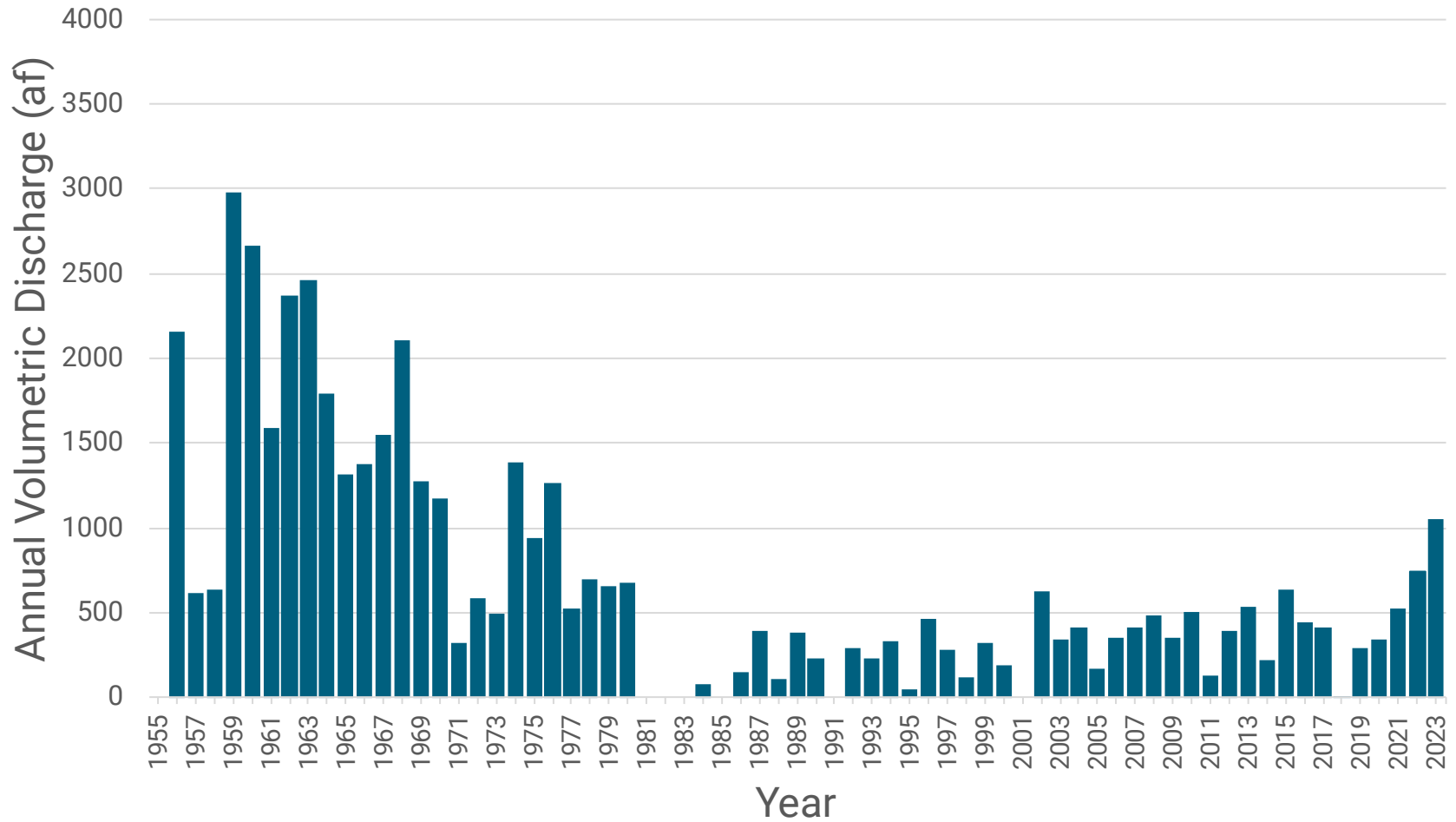
APPENDIX C ANNUAL CANAL DISCHARGE

Annual Volumetric Discharge  
Recorded at Hughes Canal from Niobrara River  
Gage #69000



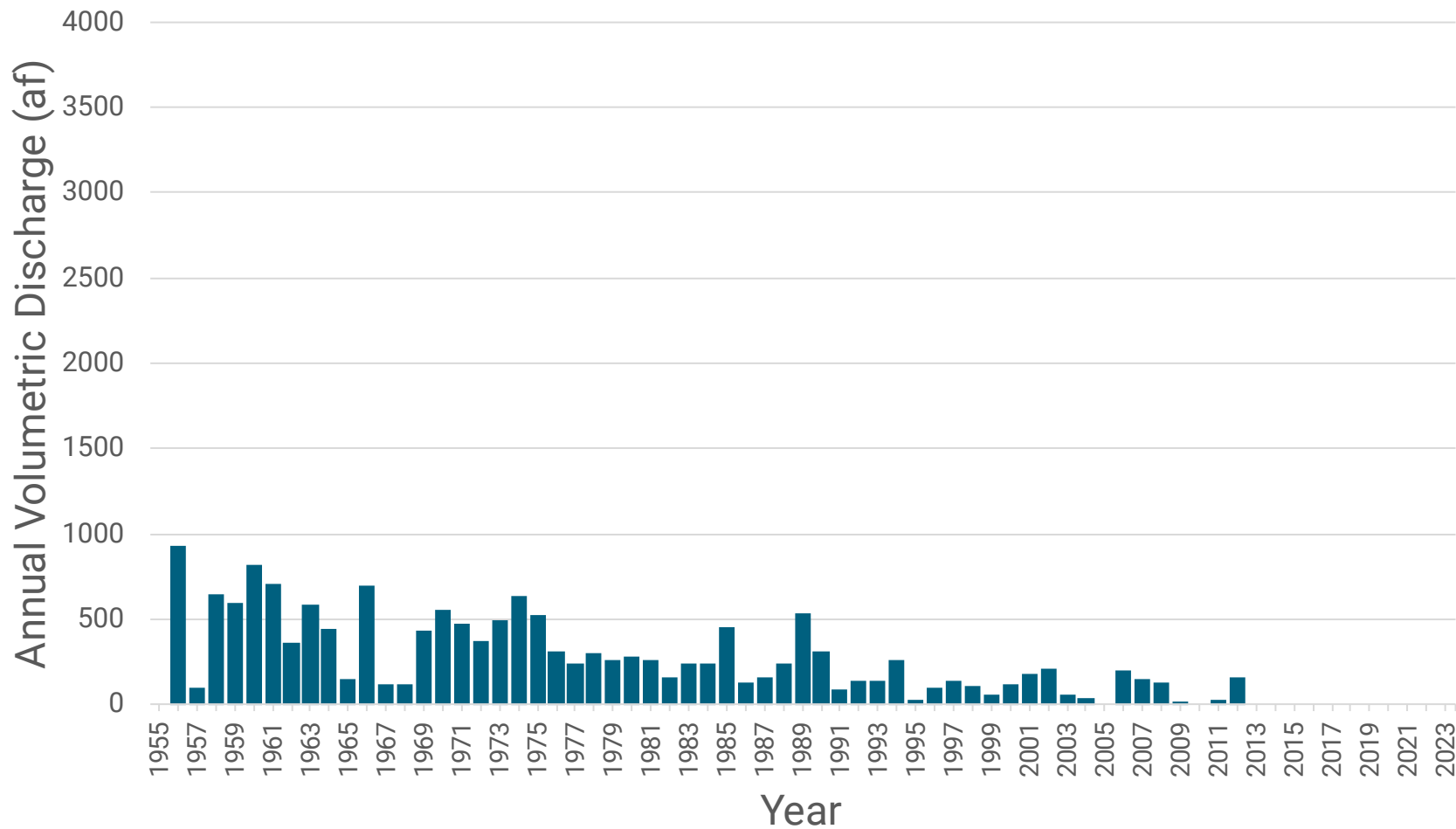
APPENDIX C ANNUAL CANAL DISCHARGE

Annual Volumetric Discharge  
Recorded at Pioneer Canal from Niobrara River  
Gage #12300



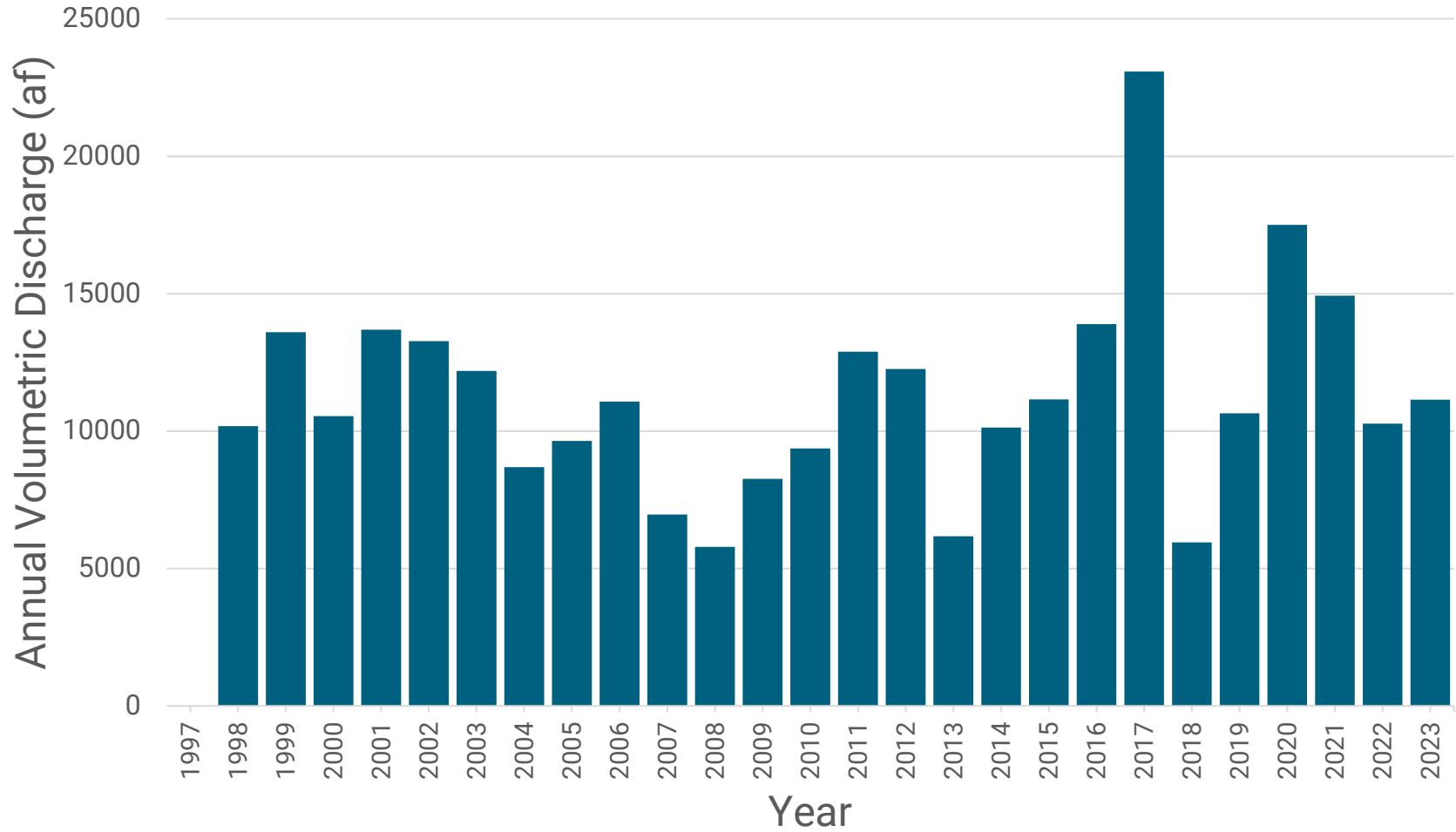
APPENDIX C ANNUAL CANAL DISCHARGE

Annual Volumetric Discharge Recorded at Lichte Canal  
from Niobrara River  
Gage #81000



APPENDIX C ANNUAL CANAL DISCHARGE

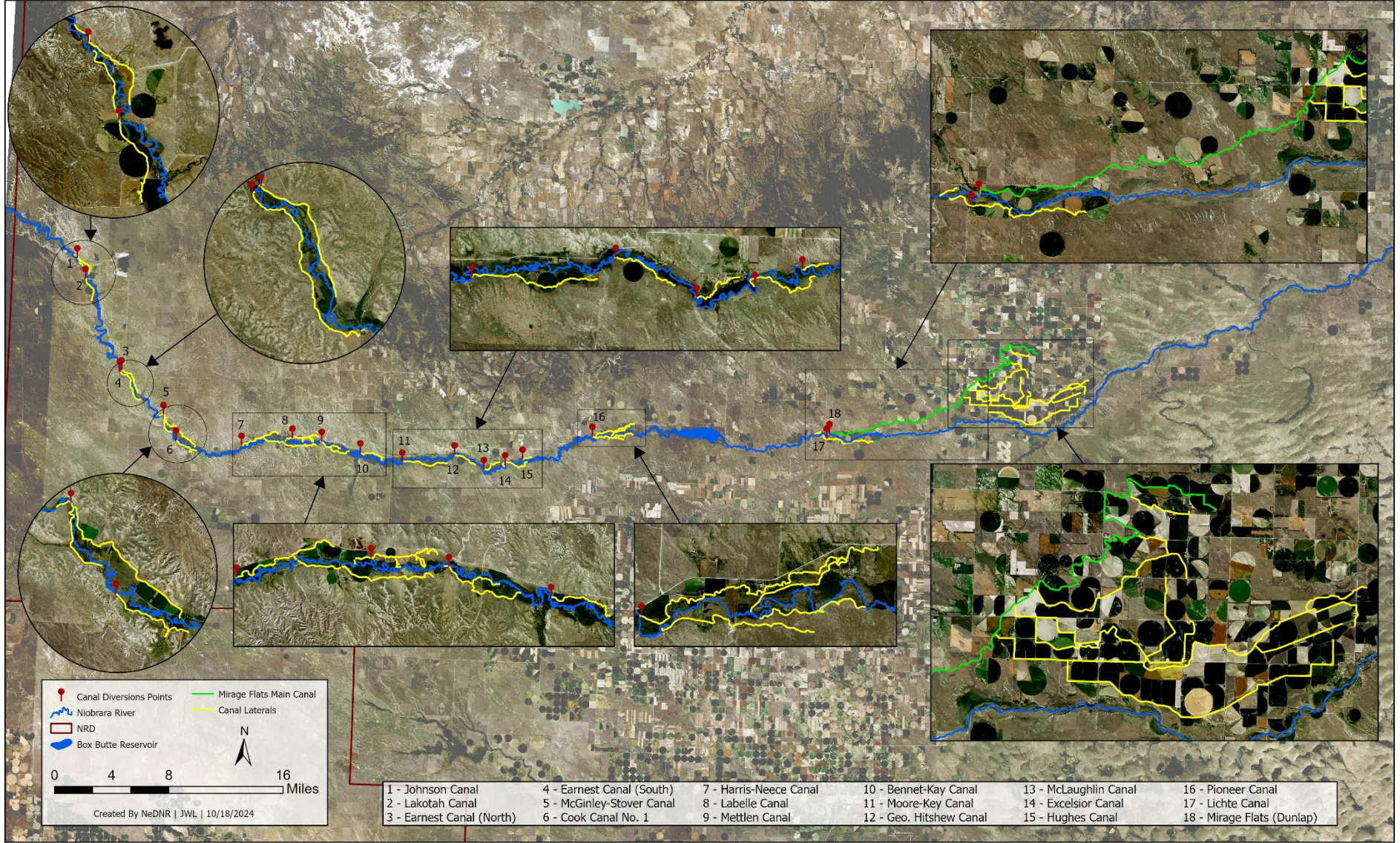
Annual Volumetric Discharge Recorded at Mirage Flats  
(Dunlap) Canal from Niobrara River  
Gage #100000





# APPENDIX C1 ANNUAL CANAL DISCHARGE

## Canals and Diversions within Upper Niobrara White Natural Resources District







## APPENDIX D

### NEBRASKA ADMINISTRATIVE CODE

#### Title 457 - DEPARTMENT OF NATURAL RESOURCES RULES FOR SURFACE WATER

#### Chapter 23 - MORATORIUM AREA VARIANCES FOR SURFACE WATER APPROPRIATIONS

001 PETITION FOR LEAVE TO FILE OR CONSIDER AN APPLICATION. Any person wanting to apply for a new surface water appropriation within a moratorium or stay area must file a petition in the Department requesting leave to file an application. The petition must be accompanied by a copy of the completed proposed application. The application shall not be considered filed at the time it is submitted with the petition. Anyone who currently has an unapproved application on file in the Department for a new appropriation for a project that is within a moratorium or stay area must file a petition requesting a variance to the moratorium or stay. The fee for filing the petitions shall be that described in § 33-105(8) R.R.S. 1943, as amended.

The petition shall include sufficient information to indicate:

001.01 The proposed project is for a non-consumptive use; or

001.02 The applicant has a credible proposal for replacing any consumptive use that will occur in a manner such that the project will not harm other users; or

001.03 The applicant has credible information that indicates there **may be** unappropriated water available at the proposed location at the time the depletion is likely to occur; or

001.04 The project existed prior to any informal moratorium, formal moratorium or stay.

001.05 There is a public safety issue that must be addressed and the proposed project addresses such issue.

001.06 The proposed use is a temporary use for public construction and the total volume requested is less than ten (10) acre-feet.

002 REVIEW. The Department shall review the information provided with the petition and shall make a determination as to whether it is sufficient to indicate good cause for allowing further consideration of the application.

003 DECISION. A written decision shall be issued. The decision shall either deny the petition and state the reasons for such denial, or grant the petition and state either (a) the



## APPENDIX D

petitioner may file the application and supporting documentation, or (b) the Department will proceed to process the existing filed application. Any decision approving a petition shall not bind the Director to approve any application to which it relates, or in any way be used as evidence of prejudice for the Director's future decisions concerning the specific approval requirements of such application. Allowance of a leave to file does not negate the necessity to meet the specific approval requirements for an appropriation.

004 APPEAL. If the petitioner wishes to appeal the decision of the Department, he or she may request a hearing before the Department within 15 days of the date the decision is rendered in accordance with the Department's Rules of Practice and Procedure, Title 454.