US Army Corps of Engineers ®
Northwestern Division

Missouri River Basin
Water Management Division

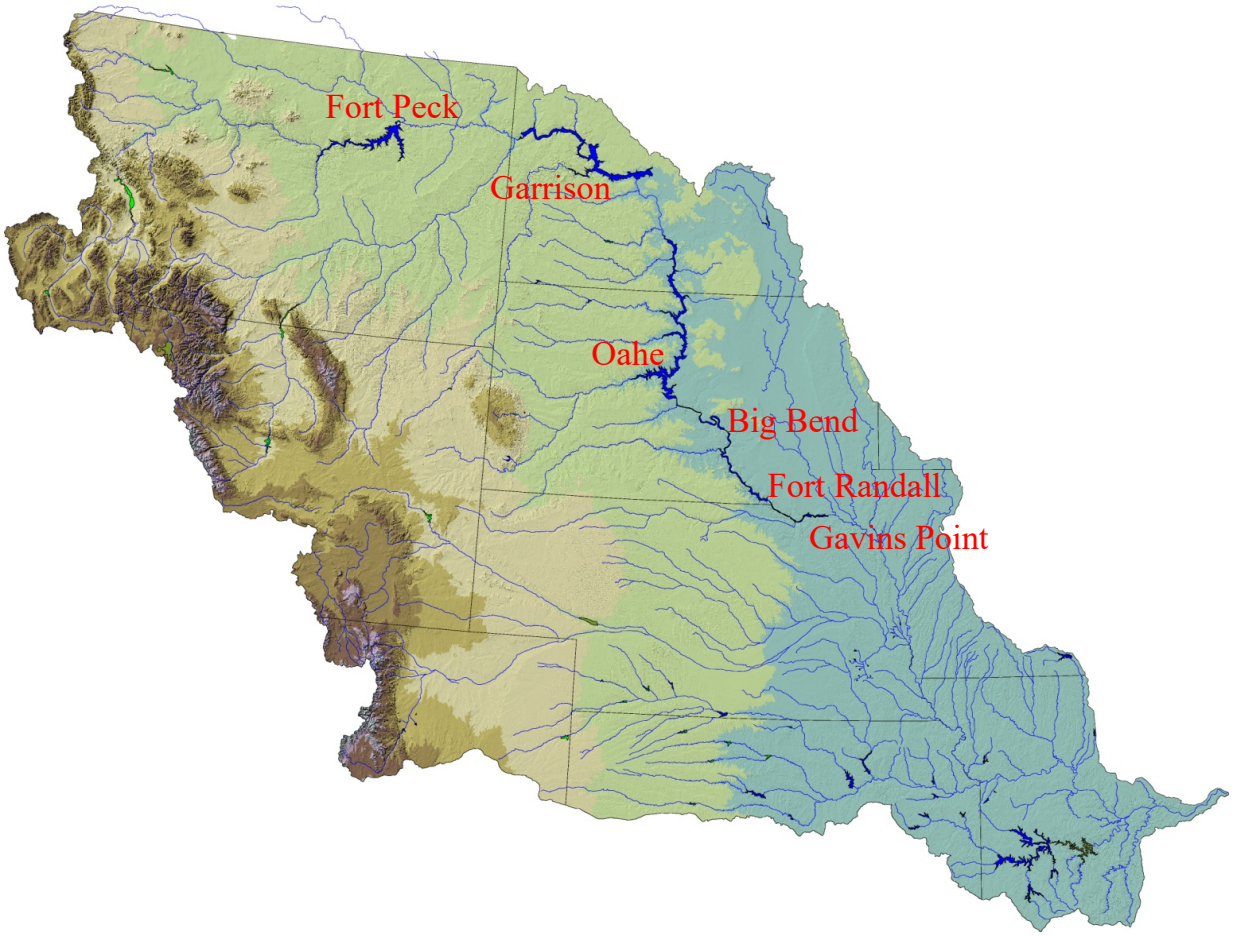
Final

AOP

2019-2020

Missouri River Mainstem System

2019-2020 Annual Operating Plan



Annual Operating Plan Process
67 Years Serving the Missouri River Basin

December 2019

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, NORTHWESTERN DIVISION
PO BOX 2870
PORTLAND, OR 97208-2870

January 10th, 2020

Division Commander

Dear Stakeholders and Concerned Citizens,

Flooding in the Missouri River basin during 2019 has severely impacted many communities, homeowners, farmers and businesses. As we move forward in 2020, the Corps of Engineers is committed to working with other agencies and stakeholders to be prepare the system for the 2020 runoff season and reduce flood risk throughout the basin. This Annual Operating Plan (AOP) presents the Corps' regulation of the Missouri River Mainstem Reservoir System through December 2020. The information in this AOP is based upon water management guidelines designed to meet the reservoir regulation objectives of the 2018 Missouri River Master Water Control Manual (Master Manual).

The AOP presents plans for the regulation of the reservoir system under widely varying water supply conditions. The AOP is not intended to be a forecast for the coming year; rather the guidelines included in the Master Manual are applied to computer simulations of the reservoir system regulation assuming five statistically derived inflow scenarios based on an analysis of water supply records from 1898 to 2011. This approach provides a good range of water management simulation for dry, average, and wet conditions. The AOP provides a framework for the development of detailed monthly, weekly, and daily regulation schedules for the mainstem reservoir system's six individual dams during the upcoming year to serve its Congressionally-authorized project purposes. Actual real-time regulation is done using the best information and tools available and is adjusted to respond to changing conditions on the ground.

A draft of this AOP was made available to the public in September 2019. Seven public meetings were held across the basin in late October. As part of continued communication, monthly conference calls will be conducted by the Corps in 2020 with Federal, state, county and local officials, Tribes, emergency management officials, independent experts and the press to discuss conditions on the ground and current Corps' reservoir release plans and forecasts.

Runoff into the Missouri River basin in 2019 was 60.9 million acre feet. This makes 2019 the second highest runoff in 121 years of record. Higher than average releases through the summer and fall, and higher-than-average winter releases are planned as part of our effort to evacuate the 2019 runoff before the start of the 2020 runoff season. With consideration of ongoing critical levee repairs, we are committed to an aggressive release schedule throughout the winter and early spring as it appears that 2020 has the potential to be another high runoff year. We realize that the benefits provided by the reservoir system are vitally important to the Nation and the people that live and work in the Basin. We believe that the continued implementation of the Master Manual, and more specifically this AOP, will result in an appropriate balance of benefits provided to all of the people who rely on the reservoir system. Thank you for your interest in the regulation of the mainstem reservoir system.

Sincerely,

D. Peter Helmlinger, P.E.
Brigadier General, USA
Division Commander

MISSOURI RIVER MAINSTEM RESERVOIR SYSTEM

Annual Operating Plan
2019 - 2020

List of Tables ii
List of Plates ii
List of Abbreviations iii
Definition of Terms iv

I. FOREWORD 1

II. BACKGROUND AND AOP PROCESS 2

III. MAINSTEM MASTER MANUAL AND ESA CONSULTATIONS 3

IV. ON-GOING COORDINATION, STUDIES AND REPORTS 5

V. FUTURE RUNOFF: AUGUST 2019 – DECEMBER 2020 6

VI. ANNUAL OPERATING PLAN FOR 2019-2020 9

A. General 9
B. 2019-2020 AOP Simulations 9
C. Regulation for the Balance of 2019 Nav. Season and Fall of 2019 12
D. Regulation Plan for Winter 2019-2020 13
E. Regulation During the 2020 Navigation Season 15
F. Regulation Activities for T&E Species and Fish Propagation 17
G. Regulation Activities for Historical and Cultural Properties 20

VII. SUMMARY OF RESULTS EXPECTED IN 2020 22

A. Flood Control 22
B. Water Supply and Water Quality Control 24
C. Irrigation 25
D. Navigation 26
E. Power 26
F. Recreation, Fish and Wildlife 28
G. Historic and Cultural Properties 28
H. System Storage 29
I. Summary of Water Use by Functions 30

VIII. TENTATIVE PROJECTION OF REGULATION THROUGH FEBRUARY 2026 32

A. Median Runoff 32

B. Lower Quartile Runoff 37
C. Lower Decile Runoff 37

TABLES

I Upper Basic Runoff Percentages 6
II Lower Basic Runoff Percentages 7
III Natural and Net Runoff at Sioux City 8
IV Navigation Service Support for the 2020 Season 16
V Summary of 2019-2020 AOP Studies 22
VI Peaking Capability and Sales 27
VII Energy Generation and Sales 27
VIII Anticipated December 31, 2020 System Storage 30
IX Missouri River Mainstem System Water Use for Calendar Years 2018, 2019, and 2020 Above Sioux City, Iowa 31
X Navigation Service Support, Winter Releases – AOP Extension Studies 33
XI Median Extension Studies – Criteria Considered in the Modeling Process 34
XII Lower Quartile Extension Studies – Criteria Considered in the Modeling Process 35
XIII Lower Decile Extension Studies – Criteria Considered in the Modeling Process 36

PLATES

1 Missouri River Basin Map
2 Summary of Engineering Data
3 Summary of Master Manual Technical Criteria
4 System Storage and Fort Peck Elevations 2019-2020 AOP Simulation
5 Garrison and Oahe Elevations 2019-2020 AOP Simulation
6 System Storage 1953-2020
7 Gavins Point Releases 1953-2020
8 Fort Peck Elevations and Releases 1953-2020
9 Garrison Elevations and Releases 1953-2020
10 Oahe Elevations and Releases 1953-2020
11 Fort Randall Elevations and Releases 1953-2020
12 Reservoir Release and Unregulated Flow
13 System Gross Capability and Average Monthly Generation
14 Tentative Five Year Extensions of 2019-2020 AOP – System Storage, Gavins Point Regulated Flows, and System Peaking Capability
15 Tentative Five Year Extensions of 2019-2020 AOP – Fort Peck, Garrison, Oahe and Fort Randall
16 American Indian Reservations

ABBREVIATIONS

AOP	-	annual operating plan
ACHP	-	Advisory Council on Historic Preservation
AF	-	acre-feet
B	-	Billion
BiOp	-	Biological Opinion
BOR	-	Bureau of Reclamation
cfs	-	cubic feet per second
Corps	-	Corps of Engineers
CY	-	calendar year (January 1 to December 31)
elev	-	elevation
ESA	-	Endangered Species Act
ft	-	feet
FTT	-	Flow-to-Target
FY	-	fiscal year (October 1 to September 30)
GWh	-	gigawatt hour
ISAP	-	Independent Science Advisory Panel
KAF	-	1,000 acre-feet
kcfs	-	1,000 cubic feet per second
kW	-	kilowatt
kWh	-	kilowatt hour
MAF	-	million acre-feet
MRNRC	-	Missouri River Natural Resources Committee
MRBWMD	-	Missouri River Basin Water Management Division
msl	-	mean sea level
MW	-	megawatt
MWh	-	megawatt hour
NEPA	-	National Environmental Policy Act
plover	-	piping plover
PA	-	Programmatic Agreement
P-S MBP	-	Pick-Sloan Missouri Basin Program
RCC	-	Reservoir Control Center
RM	-	river mile
RPA	-	Reasonable and Prudent Alternative
SHPO	-	State Historic Preservation Officers
SR	-	Steady Release
System	-	Missouri River Mainstem System
tern	-	interior least tern
T&E	-	Threatened and Endangered
THPO	-	Tribal Historic Preservation Officers
USFWS	-	United States Fish and Wildlife Service
WY	-	water year
yr	-	year

DEFINITION OF TERMS

Acre-foot (AF, ac-ft) is the quantity of water required to cover 1 acre to a depth of 1 foot and is equivalent to 43,560 cubic feet or 325,850 gallons.

Cubic foot per second (cfs) is the rate of discharge representing a volume of 1 cubic foot passing a given point during 1 second and is equivalent to approximately 7.48 gallons per second or 448.8 gallons per minute. The volume of water represented by a flow of 1 cubic foot per second for 24 hours is equivalent to 86,400 cubic feet, approximately 1.983 acre-feet, or 646,272 gallons.

Discharge is the volume of water (or more broadly, volume of fluid plus suspended sediment) that passes a given point within a given period of time.

Drainage area of a stream at a specific location is that area, measured in a horizontal plane, enclosed by a topographic divide from which direct surface runoff from precipitation normally drains by gravity into the river above the specified point. Figures of drainage area given herein include all closed basins, or noncontributing areas, within the area unless otherwise noted.

Drainage basin is a part of the surface of the earth that is occupied by drainage system, which consists of a surface stream or body of impounded surface water together with all tributary surface streams and bodies of impounded water.

Gaging station is a particular site on a stream, canal, lake, or reservoir where systematic observations of hydrologic data are obtained.

Runoff in inches shows the depth to which the drainage area would be covered if all the runoff for a given time period were uniformly distributed on it.

Streamflow is the discharge that occurs in a natural channel. Although the term "discharge" can be applied to the flow of a canal, the word "streamflow" uniquely describes the discharge in a surface stream course. The term "streamflow" is more general than "runoff" as streamflow may be applied to discharge whether or not it is affected by diversion or regulation.

MISSOURI RIVER MAINSTEM RESERVOIR SYSTEM

Annual Operating Plan
2019 – 2020

I. FOREWORD

This Annual Operating Plan (AOP) presents pertinent information and plans for regulating the Missouri River Mainstem Reservoir System (System) through December 2020 under widely varying water supply conditions. It provides a framework for the development of detailed monthly, weekly, and daily regulation schedules for the System's six individual projects during the coming year to serve the Congressionally authorized project purposes; to fulfill the Corps' responsibilities to Native American Tribes; and to comply with environmental laws, including the Endangered Species Act (ESA). Regulation of the System is directed by the Missouri River Basin Water Management Division (MRBWMD), Northwestern Division, U. S. Army Corps of Engineers (Corps) located in Omaha, Nebraska. A map of the Missouri River basin is shown on ***Plate 1*** and the summary of engineering data for the six individual mainstem projects and System is shown on ***Plate 2***.

It is important to note that the AOP is not intended to be a forecast for the coming year; rather it examines a range of potential runoff scenarios which span 80 percent of the historic record. There is still a 10 percent chance that runoff will be higher than shown in the AOP and a 10 percent chance that it will be lower. The studies included in the AOP provide an array of reservoir levels and releases that may be expected under the various runoff scenarios. Actual real-time regulation of the System is accomplished using the best information and tools available and is adjusted to respond to changing conditions on the ground. As the runoff season unfolds, there is a possibility that real-time regulation plans will indicate runoff volumes, reservoir levels and releases outside those anticipated in this report. Should that occur, the Corps will appreciably increase its communication and outreach efforts to convey that information to stakeholders throughout the basin so that other Federal, state and local agencies, Tribes, communities, and local residents can take appropriate actions.

This plan may require adjustments such as when substantial departures from expected runoff occur; to meet emergencies including short-term intrasystem adjustments to protect human health and safety, to maintain minimum river or reservoir levels to keep intakes operational during periods of extended drought, and to prevent loss of historic and cultural properties; or to meet the provisions of applicable laws, including the ESA. These adjustments would be made to the extent possible after evaluating impacts to all System uses, would generally be short-term in nature, and would continue only until the issue is resolved.

This document provides the plan for future regulation of the System. Other documents that may be of interest include the "System Description and Regulation" report dated November 2007 or the "Summary of Actual 2018 Regulation," dated July 2019. Both reports are currently available at the "Reports and Publications" link on our website at: **www.nwd-mr.usace.army.mil/rcc**, or you may contact the Missouri River Basin Water Management Division at 1616 Capitol Avenue, Suite 365, Omaha, Nebraska 68102-4909, phone (402) 996-3841 for copies. The "Summary of Actual 2019 Regulation" will be available at the same site in late spring or early summer of 2020.

II. BACKGROUND AND AOP PROCESS

Beginning in 1953, projected System reservoir regulation for the year ahead was developed annually as a basis for advance coordination with the various interested Federal, state, and local agencies and private citizens. Also beginning in 1953, a coordinating committee was organized to make recommendations on each upcoming year's System regulation. The Coordinating Committee on Missouri River Mainstem Reservoir Operations held meetings semiannually until 1981 and provided recommendations to the Corps. In 1982, the Committee was dissolved because it did not conform to the provisions of the Federal Advisory Committee Act. Since 1982, to continue providing a forum for public participation, one or more open public meetings are held semiannually in the spring and fall. The fall public meetings are conducted to take public input on the draft AOP, which typically is published in mid-September each year. The spring meetings are conducted to update the public on the current hydrologic conditions and projected System regulation for the remainder of the year as it relates to implementing the final AOP.

Under the terms of Stipulation 18 of the March 2004 "Programmatic Agreement for the Operation and Management of the Missouri River Main Stem System for Compliance with the National Historic Preservation Act, as amended" (PA) the Corps has agreed to consult/meet with the affected Tribes and Tribal Historic Preservation Officers (THPOs), State Historic Preservation Officers (SHPOs), the Advisory Council on Historic Preservation (ACHP) and other parties on the draft AOP. The purpose of this consultation/meeting is to determine whether operational changes are likely to cause changes to the nature, location or severity of adverse effects to historic properties or to the types of historic properties affected and whether amendments to the Corps Cultural Resources Management Plans and Five-Year Plan are warranted in order to better address such effects to historic properties. During 2006 the Corps worked with the affected Tribes to establish processes for consultation on AOPs under 36 CFR Part 800, the PA, and Executive Order 13175. The process consists of a series of informational meetings with the Tribes and/or government-to-government consultation with Tribes, as requested. A letter dated September 18, 2019 was sent to the Tribes offering consultation on the 2019-2020 AOP. Meeting times and locations of

the seven fall public meetings were also provided. Separate meetings will be scheduled for all Tribes requesting government-to-government consultation. All tribes, whether signatory to the PA or not, may request government-to-government consultation on this and all future AOPs. In addition, the Tribes have reserved water rights to the Missouri River and its major tributaries. In no way does this AOP attempt to define, regulate or quantify water rights or any other rights that the Tribes are entitled to by law or treaty.

The 2019 spring public meetings were held at the following locations and dates: April 9 at Fort Peck, Montana and Bismarck, ND; April 10 at Fort Pierre, South Dakota and Sioux City, Iowa; and April 11 at Smithville, Missouri and Nebraska City, Nebraska. The attendees were given an update regarding the outlook for 2019 runoff and projected System regulation for the remainder of 2019. Seven fall public meetings on the draft 2019-2020 AOP were held at the following locations: October 22 in Fort Peck, Montana and Bismarck, North Dakota; October 23 in Fort Pierre, South Dakota and Sioux City, Iowa; October 24 in Smithville, Missouri and Nebraska City, Nebraska and October 25 in Jefferson City, Missouri. In the spring of 2020, public meetings will be held to discuss the basin's hydrologic conditions and the effects those conditions are expected to have on the implementation of the final 2019-2020 AOP.

III. MAINSTEM MASTER MANUAL AND ESA CONSULTATIONS

The System is comprised of six dam and reservoir projects authorized by the Rivers and Harbors Act of 1935 and the Flood Control Act of 1944. Section 9 of the 1944 Flood Control Act authorized the System to be operated for the purposes of flood control, navigation, irrigation, hydropower, water supply, water quality control, recreation and fish and wildlife. In addition, operation of the System must also comply with other applicable Federal statutory and regulatory requirements, including the ESA. The System is regulated using guidelines published in the Master Manual. The Master Manual presents the water control plan and operational objectives for the integrated regulation of the System. Annual water management plans (Annual Operating Plans) are prepared each year, based on the water control criteria contained in the Master Manual, in order to describe potential reservoir regulation of the System for the current operating year under a variety of runoff conditions.

First published in 1960 and subsequently revised during the 1970s, the Master Manual was again revised in March 2004, primarily to include more stringent drought conservation measures. In March 2006 the Master Manual was again revised to include technical criteria for a spring pulse to comply with a 2003 USFWS Amended Biological Opinion. Neither the 2004 Master Manual, nor the 2006 revisions to the Master Manual, changed the volume of storage in the System reserved for flood risk reduction or the basic principles of how that storage is regulated.

On November 30, 2011 the MRRP Independent Science Advisory Panel (ISAP) released its Final Report on Spring Pulses and Adaptive Management. This report, commissioned by the Missouri River Recovery Implementation Committee (MRRIC), evaluated the Gavins Point spring pulses that were implemented in regards to the biological outcomes the USFWS sought in the 2003 Amended BiOp. The ISAP concluded that spring pulses as implemented were not accomplishing their intended outcomes and provided recommendations towards achieving a new management paradigm for achieving compliance with the Endangered Species Act along the Missouri River.

Following the release of that report, the Corps and USFWS, in coordination with MRRIC, aggressively pursued completion of the recommendations laid out by the ISAP. At the center of this effort was the development of a Missouri River Recovery Management Plan and Environmental Impact Statement (MRRMP-EIS). The Record of Decision (ROD) for the MRRMP-EIS was signed on 20 November 2018. The MRRMP-EIS established an overarching adaptive management process for implementation of actions required to avoid jeopardizing the listed species in the Missouri River basin as a result of Corps projects. The preferred alternative selected no longer called for the spring pulse and reservoir unbalancing criteria in the 2006 Master Manual, therefore following the ROD, in 2018 the Master Manual was revised to remove these provisions.

Concurrent with the MRRMP-EIS process, the Corps conducted consultation with the USFWS, as required by Section 7 of the Endangered Species Act, resulting in a new BiOp being issued in April 2018. Current regulation of the System in accordance with the Master Manual to serve authorized project purposes is dependent on successful implementation of the 2018 BiOp. The Missouri River Recovery Program (MRRP), together with the MRBWMD, works to ensure implementation of the BiOp elements as described in the preferred alternative. Simply put, the Corps must comply with environmental laws including the ESA, and the MRRP is the vehicle used to accomplish this. This AOP identifies flow operations at Garrison, Fort Randall and Gavins Point for the benefit of the endangered interior least tern (tern) and the threatened piping plover (plover) while maintaining flood control and navigation as primary authorized purposes.

Additional information on other efforts undertaken through the MRRP to meet the requirements of the 2018 BiOp can be found on the MRRP website at: https://www.nwo.usace.army.mil/MRRP/.

IV. ONGOING COORDINATION, STUDIES AND REPORTS

As committed to following the 2011 Flood, the Corps communicated more broadly and frequently in 2019 by holding monthly conference calls from January to May with Federal, state, county and local officials, Tribes, emergency management officials, independent experts and the media to discuss conditions on the ground and the current release plans and forecasts. In addition, ad-hoc and daily calls were held in mid-March, and weekly calls were held from June to August. Monthly calls resumed in September and were held through the fall. Recordings of the conference calls were made available to the public. Monthly outreach calls will continue in January 2020 or as needed if basin and/or weather conditions change dramatically.

The Corps continues to collaborate with other Federal, state and local agencies and our field offices to improve runoff forecasts, particularly as it relates to soil moisture and plains snowpack. This will require a collaborative effort to improve both data collection (i.e. plains snowpack water equivalent, soil moisture and frost depth) and hydrologic modeling. Refer to previous AOPs for details regarding the history of the Upper Missouri Basin Monitoring Network for Soil Moisture and Plains Snow (UMB MN). In 2018 the Corps allocated $100,000 to update the proposal with new equipment and costs, as well as to develop interagency agreements with partner federal, state and research/extension agencies regarding the purchase, installation and ongoing maintenance of equipment, retrieval, QA/QC, storage and dissemination of data, and development of soil moisture and plains snow products that could be integrated into runoff and water supply models and forecasting techniques. Those 2018 funds were primarily used to fund a study by South Dakota State University (SDSU), specifically the South Dakota Mesonet office, to establish an instrumentation test bed at the SDSU site, install and analyze equipment performance, and provide a recommendation for equipment to be purchased and installed at each UMB MN site. Funding was made available in 2019 for the purchase of some equipment. Effort is also continuing regarding other aspects of the UMB MN: 1) leveraging existing soil moisture networks to outfit them with plains snow monitoring equipment and possible upgrading of existing soil moisture and hydro-meteorological instrumentation; 2) identifying locations for new sites; 3) establishing interagency agreement with partners regarding installation and maintenance of the UMB MN; and 4) data management of the acquired data so it can accessed and utilized by partner agencies. The establishment of the UMB MN, which is expected to include up to 600 sites in the 270,000-square mile plains area of the Upper Missouri River basin, will likely take five to seven more years beyond 2019 to be fully implemented.

The Water Management office continues to participate in a variety of regional and national climate change teams. The National Oceanic and Atmospheric Administration (NOAA) also collaborated with the Corps and other agencies on a three-part study. The

first part was a climate attribution effort focusing on the 2011 event. The second part of the study was an assessment of the skill and reliability of predictions of seasonal climate and the ability to predict rapid transitions of cycles from wet to dry and dry to wet. The third part was a climate assessment of the causes for hydrologic extremes in the upper Missouri River basin which was completed by NOAA and the University of Colorado's Cooperative Institute of Research in Environmental Sciences. All three reports are available at https://www.drought.gov/drought/dews/missouri-river-basin/reports-assessments-and-outlooks.

V. FUTURE RUNOFF: AUGUST 2019 - DECEMBER 2020

Runoff into the six System reservoirs is typically low and relatively stable during the August through February period. The August 1 calendar year runoff forecast is used as input to the basic reservoir regulation simulation (Basic) in the AOP studies for the period August 2019 through February 2020. The August 1 runoff forecast for 2019 was 52.9 million acre-feet (MAF). Two other runoff scenarios based on the August 1 runoff forecast were developed for the same period. These are the Upper Basic (wetter than forecast) and Lower Basic (drier than forecast) simulations. The Upper and Lower Basic simulations are based on a percentage of the Basic runoff. The adjusted Upper and Lower Basic values for each month and reach are shown as percentages in ***Tables I*** and ***II***. The percentages shown are used for the August through February period in the AOP simulations. These percentages are also used in the regularly updated monthly reservoir simulations. The report detailing the computation of these runoff factors was posted to the Corps' website in January 2015.

TABLE I
UPPER BASIC RUNOFF PERCENTAGES

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Fort Peck	120	120	135	145	135	145	145	130	120	120	120	120
Garrison	120	120	135	145	135	145	145	130	120	120	120	120
Oahe	140	140	150	155	155	145	140	135	135	135	135	135
Fort Randall	140	140	150	155	155	145	140	135	135	135	135	135
Gavins Point	140	140	150	155	155	145	140	135	135	135	135	135
Sioux City	140	140	150	155	155	145	140	135	135	135	135	135

TABLE II
LOWER BASIC RUNOFF PERCENTAGES

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Fort Peck	80	75	65	65	70	65	65	70	75	80	80	80
Garrison	80	75	65	65	70	65	65	70	75	80	80	80
Oahe	75	75	55	50	50	50	55	65	75	75	75	75
Fort Randall	75	75	55	50	50	50	55	65	75	75	75	75
Gavins Point	75	75	55	50	50	50	55	65	75	75	75	75
Sioux City	75	75	55	50	50	50	55	65	75	75	75	75

Simulations for the March 1, 2020 to February 28, 2021 time period use five statistically derived runoff scenarios based on an analysis of historic water supply. The report detailing the development of these runoff scenarios, "Runoff Volumes for Annual Operating Plan Studies", was updated in August 2013 to include five additional years of runoff data that now extends from 1898 to 2011. In addition to the five runoff scenarios, the updated analysis added two runoff scenarios, one each at the upper and lower end, to span 96 percent of the historic record. Using statistically derived runoff scenarios for the AOP provides a good range of simulation for dry, average, and wet conditions, and eliminates the need to forecast future precipitation months in advance. As noted in the second NOAA study (see Chapter IV), for the lead times (one to six months) and times of year of interest (January-February-March and April-May-June) in the Missouri River basin, there is no useful skill and reliability of precipitation forecasts. Real-time regulation of the System is based on all available and relevant hydrometerological information including, but not limited to, observed runoff volumes, National Weather Service short- and long-range outlooks, plains and mountain snow water equivalent data, observed base flows, soil moisture, and soil frost depths.

The five statistically derived runoffs used in the AOP are identified as the Upper Decile, Upper Quartile, Median, Lower Quartile and Lower Decile runoff conditions. Upper Decile runoff (34.5 MAF) has a 1 in 10 chance of being exceeded, Upper Quartile runoff (30.6 MAF) has a 1 in 4 chance of being exceeded, and Median runoff (24.6 MAF) has a 1 in 2 chance of being exceeded. Lower Quartile runoff (19.3 MAF) has a 1 in 4 chance of the occurrence of less runoff, and Lower Decile runoff (16.1 MAF) has a 1 in 10 chance of the occurrence of less runoff. There is still a 20 percent chance that a runoff condition may occur that has not been simulated; i.e., a 10 percent chance runoff could be lower than Lower Decile and a 10 percent chance runoff could be greater than Upper Decile.

The two additional runoff volumes included in the updated "Runoff Volumes for Annual Operating Plan Studies" report are the 2 percent and 98 percent exceedance levels. Annual runoff at the 2 percent exceedance (40.1 MAF) has a 1 in 50 chance of being exceeded; the 98 percent exceedance (11.4 MAF) has a 1 in 50 chance of the occurrence of less runoff. Although these runoff volumes were not included as

scenarios in this year's AOP, additional monthly studies could be performed based on these runoff volumes, or any prior year's runoff volume and distribution, as the 2019 runoff season unfolds should the runoff forecast exceed the Upper Decile runoff scenario or be lower than the Lower Decile runoff.

The Upper Decile and Upper Quartile simulations extend from the end of the Upper Basic simulation through February 2021. Likewise, the Median simulation extends from the end of the Basic simulation, and the Lower Quartile and Lower Decile simulations extend from the end of the Lower Basic simulation through February 2021.

The estimated natural flow at Sioux City, the corresponding post-1949 water use effects, and the net flow available above Sioux City are shown in ***Table III,*** where water supply conditions are quantified for the period August 2019 through February 2021. The natural water supply for calendar year (CY) 2018 totaled 42.1 MAF.

TABLE III
NATURAL AND NET RUNOFF AT SIOUX CITY
(Volumes in 1,000 Acre-Feet)

	Natural 1/	Post-1949 Depletions	Net 2/
August 2019 through February 2020 (Basic Runoff Scenario)			
Basic	9,500	1,000	10,500
Upper Basic	12,100	1,000	13,100
Lower Basic	7,100	400	7,500
Runoff Year March 2020 through February 2021 (Statistical Analysis of Past Records)			
Upper Decile	34,500	-3,000	31,500
Upper Quartile	30,600	-3,000	27,600
Median	24,600	-3,000	21,600
Lower Quartile	19,300	-3,100	16,200
Lower Decile	16,100	-3,000	13,100

1/ The word "Natural" is used to designate runoff adjusted to the 1949 level of basin development, except that regulation and evaporation effects of the Fort Peck reservoir have also been eliminated during its period of regulation prior to 1949.

2/ The word "Net" represents the total runoff after deduction of the post-1949 irrigation, upstream storage, and other use effects.

VI. ANNUAL OPERATING PLAN FOR 2019-2020

A. General. The anticipated regulation described in this AOP is designed to meet the regulation objectives presented in the current Master Manual. While some aspects of System and individual project regulation are clearly defined by technical criteria in the Master Manual, for example navigation service level and season length, others such as minimum releases for irrigation and water supply in the reaches between the reservoirs are based on regulation experience and may be adjusted as needed to respond to changing conditions. Consideration has been given to all of the authorized project purposes, to historic and cultural resources and to the needs of threatened and endangered (T&E) species. The "System Description and Regulation" report provides a concise summary of the primary aspects of System regulation and should be referred to for further information. For ease of use, a summary of the frequently used technical criteria included in the Master Manual is presented on ***Plate 3.***

The plan relies on a wealth of regulation experience. Reservoir regulation experience available for preparation of the 2019-2020 AOP includes 13 years of regulation at Fort Peck (1940) as the sole Mainstem project, plus 66 years of System experience as Fort Randall (1953), Garrison (1955), Gavins Point (1955), Oahe (1962), and Big Bend (1964) were brought progressively into System regulation. This regulation experience includes lessons learned during two major droughts of six and eight years (1987-1992 and 2000–2007) that have occurred since the System filled in 1967. It also includes the high runoff period 1993–1999 during which five of the seven years experienced runoff greater than Upper Quartile including the previous record runoff of 49.0 MAF in 1997, and the record runoff of 61.0 MAF in 2011. In addition to the long period of actual System reservoir regulation experience, many background regulation studies for the completed System are available for reference.

B. 2019-2020 AOP Simulations. Reservoir simulations for the Upper Basic, Basic, and Lower Basic runoff scenarios, which span the period of August 2019 through February 2020, are shown in the final section of this AOP as studies 1 through 3. AOP simulations for the five statistically derived runoff scenarios, which span the period of March 2020 through February 2021 are shown in the final section of this AOP as studies 4 through 8. As previously stated, the simulations use five statistically derived runoff scenarios and reflect 80 percent of the historic annual runoff volumes (between Upper Decile and Lower Decile). The simulations provide information for planning purposes on a range of future reservoir levels and release rates, and are not meant to represent a particular forecast. The simulations shown use a monthly time-step, and thus do not provide the level of detail necessary to address specific flood control regulations. Detailed routing of specific flood flows is accomplished using daily and hourly time-step models which incorporate real-time information including observed precipitation, and these situations are handled individually during real-time regulation.

The AOP studies, in summary, provide the following: the full flood control capacity of the reservoir system will be available at the start of the runoff season; use of the Exclusive Flood Control Zone is not anticipated under any of the five runoff scenarios covered in the AOP; full service flow support for all runoff scenarios to start the navigation season; full service flow support for Lower Quartile and above runoff scenarios after the July 1 System storage check and reduced flow support for Lower Decile runoff; a full length navigation season for all runoff scenarios; near normal winter releases for Median runoff, minimum winter releases for Lower Quartile and Lower Decile runoff, and above normal winter releases for Upper Decile and Upper Quartile runoff; a steady release-flow to target regulation during the tern and plover nesting season for Median and below runoff and nearly steady releases for Upper Decile and Upper Quartile runoff with flood water evacuation; emphasis on Garrison for steady to rising reservoir levels during the forage fish spawn; and reservoir releases and pool levels sufficient to keep all intakes operational under all runoff scenarios. Water conservation measures may be implemented if runoff conditions indicate that it would be appropriate including cycling releases from Gavins Point during the early part of the nesting season, only supporting flow targets in reaches being used by commercial navigation, and utilization of the Kansas River projects authorized for Missouri River navigation flow support. Additional details about the studies are provided in the following paragraphs. Results of the simulations are shown in ***Plate 4*** and ***Plate 5*** for the System storage and the Fort Peck, Garrison and Oahe pool elevations.

Under all runoff scenarios modeled for the AOP, the full flood control capacity of the System is available at the start of the 2020 runoff season. All scenarios begin the runoff season at the base of the Annual Flood Control and Multiple Use Zone.

The March 15 and July 1 System storage checks were used to determine the level of flow support for navigation and other downstream purposes as well as the navigation season length in 2020. Full service navigation flows or more are provided for Lower Quartile and above runoff throughout the navigation season. Service levels for Lower Decile start the season at full service, and drop slightly following the July 1 System storage check (see ***Plate 3***). Application of the July 1 System storage check indicated that a full length navigation season would be provided for all five runoff conditions, with the upper two runoff scenarios including a 10-day extension to the navigation season. Upper Quartile and Upper Decile simulations reach the desired 56.1 MAF System storage level on March 1, 2021. Storage is below the base of the Annual Flood Control and Multiple Use Zone for Median and lower runoff conditions.

For modeling purposes in this AOP, the Steady Release – Flow-to-Target (SR-FTT) regulation scenario for Gavins Point is shown during the 2020 tern and plover nesting season for Median and lower runoff conditions. For these simulations, the monthly average May release used in the simulations was determined by using the long-term

average May release (see ***Plate 3***), based on the service level, for the first third of the month, followed by the July table values for the remainder of the month to reflect a steady release regulation at the start of the nesting season. The modeled June release was set equal to the long-term average release for July (see ***Plate 3***) based on the service level for the first half of the navigation season. The long-term average releases (see ***Plate 3***) were used for July and August to indicate flowing to target. The Upper Decile and Upper Quartile runoff simulations follow the Master Manual, with much above normal runoff requiring release increases mid-year to evacuate flood water from the reservoirs. Although these modeled Gavins Point releases represent the best estimate of required releases during 2020, actual releases will be based on hydrologic conditions and the availability of habitat at that time. To the extent reasonably possible, measures to minimize incidental take of the protected species will be utilized. These may include not meeting flow targets in reaches without commercial navigation and utilizing the Kansas River tributary reservoirs for navigation flow support when appropriate. It may also be necessary to cycle releases for flood control regulation during the T&E species' nesting season or for water conservation if drought conditions develop.

The long-term average Gavins Point releases to meet target flows were used in the AOP studies for navigation support during the spring and fall months with the exception of Upper Decile and Upper Quartile. Under these runoff scenarios, releases were based on flood water evacuation. Based on the September 1 storage checks and flood evacuation criteria, modeled Gavins Point winter releases range from 20,000 cfs to 22,000 cfs during the 2019-2020 winter season and range from 12,500 cfs to 20,000 cfs during the 2020-2021 winter season depending on the runoff scenario. Gavins Point releases will be increased to meet downstream water supply requirements in critical reaches, to the extent reasonably possible, if downstream incremental runoff is low.

The Gavins Point releases shown in this and previous AOPs are estimates based on historic averages and experience. Adjustments are made as necessary in real-time based on hydrologic conditions.

Intrasystem releases are adjusted to best serve the multiple purposes of the projects with special emphasis placed on regulation for non-listed fisheries starting in early April and for T&E bird species beginning in early May and continuing through August. As part of the overall plan to rotate emphasis among the upper three reservoirs during low runoff years, Garrison is scheduled to be favored during the 2020 forage fish spawn while also attempting to maintain rising water levels at Fort Peck and Oahe. The Median, Upper Quartile, and Upper Decile simulations show that it is possible to provide steady-to-rising pool levels in each of the three large upper reservoirs during the spring forage fish spawn period. Insufficient runoff is available in the Lower Quartile and Lower Decile simulations to keep all three reservoirs rising. In the Lower Quartile and Lower Decile simulations, the Garrison reservoir levels decline

in April but rise in May. The Oahe reservoir level declines in April and May in the Lower Quartile and Lower Decile simulations.

Intrasystem releases are also adjusted so that the upper three reservoirs are shown in a balanced condition each year on March 1, the approximate start of the runoff season. This balancing is computed based on the percent of storage in the respective Carryover Multiple Use Zones.

Actual System regulation from January 1 through July 31, 2019 and the simulated regulating plans for each project through CY 2020 using the five runoff scenarios described on Page 4 are presented on ***Plate 6*** through ***Plate 11***, inclusive. Big Bend regulation is omitted since storage at that project is relatively constant and average monthly releases are essentially the same as those at Oahe. These plates also show, on a condensed scale, actual regulation since 1953.

Plate 12 illustrates Fort Peck, Garrison, Oahe, and Gavins Point actual releases (Regulated Flow) as well as the Missouri River flows that would have resulted if the reservoirs were not in place (Unregulated Flow) during the period January 2018 through July 2019. ***Plate 13*** presents past and simulated gross average monthly power generation and gross peaking capability for the System.

C. <u>Actual Regulation for the Balance of the 2019 Navigation Season and Fall of 2019.</u> The regulation of the System for the period of August through November 2019 is presented in the following paragraphs.

<u>Fort Peck</u>. Releases were held steady near 15,000 cfs from August through the end of November. The Fort Peck pool declined through the fall, ending the month of November at 2238.8 feet or 7.4 feet below the August 1 elevation of 2246.2 feet.

<u>Garrison</u>. Releases were maintained near 46,000 cfs through mid-October, and then increased to 48,000 cfs. Releases remained at that rate until mid-November when they were reduced to 24,000 cfs and held steady through the end of the month. The Garrison pool steadily dropped through the fall and ended the month of November at 1839.1 feet or 12.6 feet below the August 1 elevation of 1851.7 feet.

<u>Oahe</u>. The reservoir started the month of August at the base of the Exclusive Flood Control Pool, elevation 1617.0 feet. Releases averaged 57,000 cfs in August, 55,600 cfs in September, 62,200 cfs in October, and 64,900 cfs in November to evacuate the flood waters from the annual flood control pool. At the end of November, the Oahe pool was at elevation 1610.1 feet or 6.9 feet below the August 1 elevation.

Big Bend. Releases generally parallel those from Oahe. The Big Bend pool generally fluctuates between 1420.0 feet msl and 1421.0 feet msl for weekly cycling during high power load periods.

Fort Randall. Releases averaged 65,300 cfs in August, 63,800 cfs in September, 75,000 cfs in October, and 74,200 cfs in November to back up the releases from Gavins Point. High runoff in September delayed the start of the fall pool drawdown of Fort Randall until mid-September. The reservoir drawdown was completed near the end of November. Releases will be reduced after the navigation season ends to the level required to back up Gavins Point winter releases.

Gavins Point. Releases were scheduled above full service flows to evacuate water from the reservoir system through early December. A full length navigation season, plus a 10-day extension, were provided in accordance with the technical criteria for the July 1 System storage check presented in the Master Manual. In accordance with the Master Manual, during years of greater than normal water supply, the navigation season is extended as both an additional evacuation measure and to provide an increased benefit to navigation while striving to reach the base of the Annual Flood Control and Multiple Use Zone by March 1 the following season. The closing dates for the commercial navigation season ranged from December 2 at Sioux City, Iowa to December 11 at the mouth near St. Louis, Missouri. Releases were reduced from 80,000 cfs to 70,000 cfs in late November to slow the drawdown of the Fort Randall reservoir. Releases were then reduced, initially 5,000 cfs per day beginning on December 3, and then by 3,000 cfs per day, working toward the target winter release. The Gavins Point pool level was raised 1.5 feet to elevation 1207.5 feet msl in the late fall. The pool level will remain near that elevation during the winter months.

D. Regulation Plan for Winter 2019-2020. The regulation of the System presented in the following paragraphs is based on the previously discussed AOP simulations. Actual real-time regulation of the System is adjusted to respond to changing conditions on the ground. The latest long-term reservoir regulation forecasts, which are updated monthly, can be found on the Corps' website. The September 1 System storage check is used to determine the winter release rate from Gavins Point. A winter release of 12,000 cfs is scheduled if System storage is less than 55.0 MAF on September 1; 17,000 cfs is scheduled when System storage is above 58.0 MAF; and the release is prorated for System storages between 55.0 and 58.0 MAF. A modification to the winter release rate from Gavins Point dam may occur when the evacuation of System flood control storage cannot be accomplished by providing a full-service navigation season with a 10-day extension of the navigation season. With an excess annual water supply, the winter season Gavins Point release may be scheduled at a rate of up to 25,000 cfs to continue to evacuate the remaining excess water in System flood control storage. Based on the studies included in this AOP, the scheduled winter System release for 2019-2020 will range from 20,000 to 22,000 cfs. It is anticipated that this year's winter release will be

adequate to complete evacuation of stored flood waters and serve all downstream water intakes. Water supply is discussed in more detail in Chapter VII, Section B.

Fort Peck. Releases are expected to average 12,000 cfs in December, January and February to serve winter power loads and to help balance System storage. The Fort Peck pool level is expected to decline about 4.3 feet from December through February to near elevation 2234.0 feet by March 1. At the beginning of March, the Fort Peck pool will be at the base of its Annual Flood Control and Multiple Use Zone.

Garrison. Releases are scheduled to average 20,000 cfs in December increasing to 24,000 cfs for January and February to serve winter power loads and to help balance System storage. Releases will be held steady or lowered, most likely in December, to prevent ice-induced flooding at the time of freeze-in and then gradually increased as river conditions permit. These temporary reductions in the releases may be scheduled to prevent exceedance of a 13-foot stage at the Missouri River at Bismarck streamgaging station. The Bismarck flood stage is 14.5 feet. Water Management staff will coordinate closely with other Federal, state and local agencies during periods of freeze-in and ice-out to reduce flood risk and ensure communities and local residents are aware of the rapidly changing conditions and are prepared to take appropriate actions. The Garrison pool level will decline 2.5 feet from elevation 1840.0 feet at the end of November to near elevation 1837.5 feet by March 1, the base of its Annual Flood Control and Multiple Use Zone.

Oahe. Releases for the winter season will provide backup for the Fort Randall and Gavins Point releases as well as refill the recapture space available in the Fort Randall reservoir consistent with anticipated winter power loads. Monthly average releases may vary substantially with fluctuations in power loads occasioned by weather conditions but, in general, are expected to average between 22,400 cfs and 25,700 cfs. Daily and hourly releases will vary widely to best meet power loads. Peak hourly and minimum hourly releases, as well as daily energy generation, will be constrained to prevent urban flooding in the Pierre and Fort Pierre areas if severe ice conditions develop downstream of Oahe Dam. This potential reduction is coordinated with the Western Area Power Administration (Western). The Oahe pool level is expected to decline from 1608.3 feet at the end of November to 1606.8 feet at the end of December, hold steady through January before rising to near elevation 1607.5 feet by the end of February, the base of its Annual Flood Control and Multiple Use Zone.

Big Bend. The Big Bend pool level will be maintained in the normal 1420.0 feet to 1421.0 feet range during the winter.

Fort Randall. Releases will average about 20,200 cfs during the winter season to support Gavins Point winter releases. The Fort Randall pool level is expected to rise from its fall drawdown elevation of near 1337.5 feet near the end of November or early

December to near elevation 1350.0 feet, the seasonal base of flood control, by March 1. However, if the plains snowpack flood potential downstream of Oahe Dam is lower than normal, the Fort Randall pool level will be raised to near 1353.0 feet by March 1. It is likely that a pool level as high as 1355.0 feet could be reached by the end of March if spring runoff has commenced. The Fort Randall pool level above the White River delta near Chamberlain, South Dakota will remain at a higher elevation than the pool level below the delta from early October through December, due to the damming effect of this delta area.

Gavins Point. Gavins Point winter releases are discussed in the first paragraph of this section. The Gavins Point pool level will be near elevation 1207.5 feet until late February when it will be lowered to elevation 1206.0 feet to create additional capacity to store spring runoff.

System storage for all runoff conditions will be at the base of the annual flood control zone of 56.1 MAF by the beginning of next year's runoff season, approximately March 1, 2020.

E. Regulation During the 2020 Navigation Season. All five runoff scenarios modeled for this year's AOP follow the technical criteria presented in the current Master Manual for downstream flow support. Beginning in mid-March, Gavins Point releases will be gradually increased to provide navigation flow support at the mouth of the Missouri near St. Louis, Missouri by April 1, 2020, the normal navigation season opening date. The corresponding dates at upstream locations are Sioux City, March 23; Omaha, March 25; Nebraska City, March 26; and Kansas City, March 28. However, if during the 2020 navigation season there is no commercial navigation scheduled to use the upper reaches of the navigation channel, MRBWMD will consider not providing navigation flow support in those reaches to conserve water in the System, reduce flood risk, and/or minimize incidental take of the protected species during the nesting season.

Navigation flow support for the 2020 season will be determined by actual System storage on March 15 and July 1. Runoff scenarios modeled indicate full service flow support at the start of the 2020 navigation season for all runoff conditions. Following the July 1 System storage check, full service would be provided for Lower Quartile and above runoff scenarios. The service level would be 600 cfs below full service for Lower Decile runoff. The normal 8-month navigation season is provided for Median runoff scenarios and below as shown in ***Table IV***. A 10-day extension to the navigation season is provided for the upper two runoff scenarios.

TABLE IV
NAVIGATION SERVICE SUPPORT
FOR THE 2020 SEASON

	Runoff Scenario (MAF)	System Storage March 15 (MAF)	System Storage July 1 (MAF)	Flow Level Above or Below Full Service (cfs) Spring	Flow Level Above or Below Full Service (cfs) Summer/Fall	Season Shortening (Days)
U.D.	34.5	57.5	63.9	0	+19,000	0*
U.Q.	30.6	57.2	63.1	0	+12,000	0*
Med.	24.6	56.9	60.6	0	0	0
L.Q.	19.3	56.7	57.3	0	0	0
L.D.	16.1	56.6	56.3	0	-600	0

*Includes 10-day extension for Upper Quartile and Upper Decile.

As previously stated, the modeled regulation for the 2020 nesting season below Gavins Point is SR-FTT. When the SR-FTT release scenario is used, the initial steady release, which has ranged from 24,000 cfs to 33,000 cfs in the several years just prior to recent high runoff years, will be based on hydrologic conditions and the availability of habitat at that time. Model runs included in this AOP have a Gavins Point release which is higher during the last 20 days of May to keep birds from nesting at low elevations. Gavins Point releases will be adjusted to meet downstream targets as tributary flows recede, but ideally the initial steady release will be sufficient to meet downstream targets until the majority of the birds have nested. The purpose of this regulation is to continue to meet the project purposes while minimizing the loss of nesting T&E species. A Gavins Point peaking cycle of two days down and one day up may be used for flood control regulation or to conserve water in the upper three reservoirs, if required. Gavins Point releases for the Upper Decile and Upper Quartile runoff simulations are much above normal to evacuate flood water from the reservoirs. Releases from Garrison and Fort Randall will follow repetitive daily patterns from early May, at the beginning of the T&E species' nesting season, to the end of the nesting season in late August. In addition to the intra-day pattern, Fort Randall releases may also be cycled with two days of lower releases and one day of higher releases during the early part of the nesting season to maintain release flexibility in that reach while minimizing the potential for take. If higher daily releases are required later in the nesting season, the daily peaking pattern may be adjusted, reduced or eliminated resulting in a steady release to avoid increased stages at downstream nesting sites.

Gavins Point releases may be quite variable during the 2020 navigation season but are expected to range from 26,000 to 51,000 cfs under the five modeled runoff scenarios. Release reductions necessary to minimize downstream flooding are not reflected in the

monthly averages shown in the simulations but will be implemented as conditions warrant. Reductions in System releases to integrate the use of downstream Missouri River flow support from the designated Kansas River projects (Milford, Tuttle Creek and Perry) authorized to provide Missouri River navigation flow support have not been modeled since they are based on downstream hydrologic conditions. However, this storage will be utilized to the extent possible as a water conservation measure, or to minimize incidental take of protected species during the nesting season if conditions indicate it is prudent to do so. Simulated storages and releases for the System and individual reservoirs within the System are shown on ***Plate 6*** through ***Plate 11.*** As experienced in 2011 and 2019, runoff above or below simulated levels can occur and result in releases beyond those modeled for the AOP. As previously stated, should that occur, the Corps will increase its efforts to convey that information throughout the basin so that state, Tribal, and local agencies, communities, and local residents can take appropriate action.

F. Regulation Activities for T&E Species and Fish Propagation Enhancement. The ability to provide steady-to-rising pool levels in the upper three reservoirs in low runoff years is very dependent on the volume, timing, and distribution of runoff. The reservoir regulation simulations presented in this AOP for the Upper Decile, Upper Quartile, and Median runoff scenarios show that steady-to-rising pool levels would occur during the spring fish spawn period for the upper three reservoirs. As part of the overall plan to rotate emphasis among the upper three reservoirs during low runoff years, Garrison is scheduled to be favored during the 2020 forage fish spawn if runoff is below the Median runoff scenario. This will be accomplished by setting releases at Fort Peck and Garrison at a level that would attempt to maintain a rising Garrison pool, but no less than the minimum required for downstream water supply requirements, including irrigation. These adjustments may be restricted when the terns and plovers begin nesting in May. The studies show that Garrison pool levels drop in April for both the Lower Quartile and Lower Decile runoff scenarios but then rise from May through June for both runoff scenarios. The studies show that inflows are sufficient to maintain a steady to rising pool at Fort Peck from April through June for the Lower Quartile runoff scenario. Fort Peck pool levels drop in April for the Lower Decile runoff scenario then rise in May before dropping again in June. The Oahe pool falls during the April to June period for both, the Lower Quartile and Lower Decile runoff scenarios. If drought conditions develop, emphasis during the fish spawn will be rotated among the upper three reservoirs and may also be adjusted to be opportunistic in regard to runoff potential. The upper three reservoirs will be managed to benefit forage fish to the extent reasonably possible, while continuing to serve the other Congressionally authorized project purposes.

Fort Peck. The repetitive daily pattern of releases from Fort Peck has not been implemented since the 2004 tern and plover nesting season. This adaptive management decision was made based on data collected during previous nesting seasons. In recent

years, birds in this reach have nested on available high elevation habitat, and thus were not expected to be impacted by the potential range of releases from Fort Peck during the summer. Releases during the 2020 nesting season will not be restricted by the repetitive daily pattern unless habitat conditions or nesting patterns warrant a change.

If high tributary flows enter the Missouri River below the project during the nesting season, hourly releases will generally be lowered to no less than 3,000 cfs in order to keep traditional riverine fish-rearing areas continuously inundated, while helping to lower river stages at downstream nesting sites. In rare instances releases below 3,000 cfs may be scheduled for flood damage reduction. April releases are expected to be adequate for trout spawning below the project.

Maintaining a rising Fort Peck pool level will be dependent upon the daily inflow pattern to the reservoir. The reservoir rises in April and May for Median and above runoff scenarios, but holds steady or declines slightly in April for the Lower Quartile and Decile runoff scenarios, respectively.

Garrison. As in previous years, releases from Garrison will follow a repetitive daily pattern during the T&E nesting season to limit peak stages below the project for nesting birds. Releases are scheduled to be 1,000 cfs lower in July and early August than the June releases to enhance conditions for the fledging of chicks. High elevation nesting habitat is expected to be sufficient below Garrison Dam during the 2020 nesting season for all runoff scenarios.

During 2020, coldwater habitat in Garrison should be adequate for all runoff scenarios. Coldwater habitat will continue to be monitored during the year and adjustments will be considered if conditions warrant.

A steady-to-rising pool at Garrison during the fish spawn in April and May will be dependent upon the daily inflow pattern to the reservoir. The reservoir rises in April and May for Median and above runoff scenarios, but declines in April before holding steady or rising in May under both lower runoff scenarios.

Oahe. Releases in the spring and summer will back up those from Gavins Point. The pool level should be steady to rising in the spring during the fish spawn for Median and above runoff scenarios. Under the Lower Quartile and Lower Decile runoff scenarios, the Oahe pool would decline in the April through May period, dropping 1.6 and 3.2 feet, respectively.

Fort Randall. To the extent reasonably possible, Fort Randall will be regulated to provide for a pool elevation near 1355.0 feet during the fish spawn period, provided water can be supplied from other reservoirs for downstream uses. The pool will not be drawn down below elevation 1337.5 feet in the fall to ensure adequate supply for water

intakes. As a measure to minimize take while maintaining the flexibility to increase releases during the nesting season, hourly releases from Fort Randall will follow a repetitive daily pattern to limit peak stages below the project for nesting birds. Daily average flows may be increased every third day to preserve the capability of increasing releases later in the summer with little or no incidental take if drier downstream conditions occur. If higher daily releases are required later in the nesting season, the daily peaking pattern may be adjusted, reduced or eliminated resulting in a steady release to avoid increased stages at downstream nesting sites. Periods of zero release will be minimized to the extent reasonably possible during the nesting season given daily average releases, real-time hydrologic conditions, and System generating constraints as defined in coordination with Western.

Gavins Point. It is anticipated that a sufficient amount of habitat to provide for successful nesting will be available at elevations above the planned release rates for all runoff conditions. This expectation is based on the high elevation habitat resulting from the record releases in 2011 and the resultant habitat from flows experienced in 2018 and 2019. Releases from Gavins Point may follow the flow-to-target (FTT) release scenario or the SR-FTT scenario. The FTT scenario limits releases from Gavins Point to those needed to meet downstream targets. The actual release scenario will be evaluated when birds begin nesting in early May. If monitoring determines that nests are likely to be initiated at a lower elevation which would be inundated later in the summer, a SR-FTT release scenario may be implemented. A full description of these release scenarios can be found in the Master Manual. Actual releases will be based on hydrologic conditions and the availability of habitat at that time.

All reasonable measures to minimize the loss of nesting T&E bird species will be used. While not anticipated because of the quantity of high elevation habitat available, these measures include, but are not limited to, a relatively high initial steady release during the peak of nest initiation, the use of the three designated Kansas River basin reservoirs for Missouri River navigation flow support, moving nests to higher ground, and monitoring nest fledge dates to determine if delaying an increase a few days might allow threatened chicks to fledge. The location of navigation tows and river conditions at intakes would also be monitored to determine if an increase could be temporarily delayed without impact. Cycling releases every third day may be used to conserve water early in the nesting season if extremely dry conditions develop. In addition, cycling may be used during downstream flood control regulation.

The Gavins Point pool will be regulated near 1206.0 feet in the spring and early summer, with minor day-to-day variations due to incremental inflows between Fort Randall and Gavins Point resulting from rainfall runoff. Several factors can limit the ability to protect nests from inundation in the upper end of the Gavins Point pool. First, because there are greater numbers of T&E bird species nesting below Gavins Point, regulation to minimize incidental take usually involves restricting Gavins Point

releases, which means that the Gavins Point pool can fluctuate significantly due to increased runoff from rainfall events. Second, rainfall runoff between Fort Randall and Gavins Point can result in relatively rapid pool rises because the Gavins Point project has a smaller storage capacity than the other System reservoirs. And third, the regulation of Gavins Point for downstream flood control may necessitate immediate release reductions to reduce downstream damage. When combined, all these factors make it difficult, and sometimes impossible, to prevent inundation of nests in the upper end of the Gavins Point reservoir. However, because of the quantity of habitat expected we do not anticipate a large number of nests being inundated. The pool will be increased to elevation 1207.5 feet late in August or early September when it is determined that there are no terns or plovers nesting along the reservoir.

G. Regulation Activities for Historic and Cultural Properties. As acknowledged in the 2004 Programmatic Agreement (PA) for the Operation and Management of the Missouri River Main Stem System, wave action and fluctuation in the level of the reservoirs results in erosion along the banks of the reservoirs. The Corps will work with the Tribes utilizing 36 CFR Part 800 and the PA to address the exposure of historic and cultural sites. The objective of a programmatic agreement is to deal "…with the potential adverse effects of complex projects or multiple undertakings…" The PA objective was to collaboratively develop a preservation program that would avoid, minimize and/or mitigate adverse effects along the System reservoirs. All tribes, whether signatory to the PA or not, may request government-to-government consultation on the regulation of the System and the resulting effect on historic and cultural properties and other resources.

Pool levels at the upper three reservoirs will likely be near normal in 2020 but will vary depending on runoff conditions. Continuing exposure of cultural sites along the shoreline is still possible. Actions to avoid, minimize or mitigate adverse impacts and expected results of the actions are covered under Chapter VII of this AOP. ***Plate 16*** shows the locations of the Tribal Reservations.

Fort Peck. Depending on runoff in the Missouri River basin, System regulation during 2020 could result in a Fort Peck pool elevation variation from a high of 2243 feet msl to a low of 2222 feet msl. This is based on the Upper and Lower Decile runoff scenarios (see ***Plate 8*** and the studies included at the end of this report). Based on a review of existing information, approximately 13 known sites could be affected during this period.

Garrison. Based on the Upper and Lower Decile runoff scenarios (see ***Plate 9*** and the studies included at the end of this report), Garrison pool elevations could range between 1847 and 1827 feet msl during 2020. Based on a review of existing information, approximately 49 known sites could be affected during this period.

Oahe. At the Oahe reservoir, the System regulation under the Upper and Lower Decile runoff scenarios could result in pool elevations ranging from 1616 to 1594 feet msl (see ***Plate 10*** and the studies included at the end of this report). Based on a review of existing information, approximately 201 known sites could be affected during this period.

Big Bend. System regulation will be adjusted to maintain the Big Bend pool level in the normal 1420 to 1421 feet msl range during 2020. Short-term increases above 1421 due to local rainfall may also occur. Based on a review of existing information, no known sites will be affected during this period.

Fort Randall. As part of the normal System regulation, the Fort Randall pool elevations will vary between 1350 and 1355 feet msl during the spring and summer of 2020 (see ***Plate 11*** and the studies included at the end of this report). Short-term increases above 1355 feet msl due to local rainfall may occur. The annual fall drawdown of the reservoir to elevation 1337.5 feet msl will begin prior to the close of the navigation season and will be accomplished by early December. The reservoir will then be refilled during the winter to elevation 1350 feet msl. Based on a review of existing information, approximately 22 known sites could be affected during this period.

Gavins Point. System regulation will be adjusted to maintain the Gavins Point pool level in the normal 1206 to 1207.5 feet msl range during 2020. Short-term increases above 1207.5 feet msl may occur due to local rainfall. Based on a review of existing information, one known site could be affected during this period.

VII. SUMMARY OF RESULTS EXPECTED IN 2020

With regulation of the System in accordance with the 2019-2020 AOP outlined in the preceding pages, the following results can be expected. ***Table V*** summarizes the critical decision points throughout the year for all runoff conditions.

Table V
Summary of 2019-2020 AOP Studies

Decision Points	2020 Runoff Condition				
	Upper Decile	Upper Quartile	Median	Lower Quartile	Lower Decile
March 15 System Storage Spring Service Level	57.4 MAF Full service	57.2 MAF Full service	56.9 MAF Full service	56.7 MAF Full service	56.6 MAF Full service
May Releases May Early/Late May Avg GP Release	Not applicable 36.0 kcfs	28.0/31.6 kcfs 29.9 kcfs	28.0/31.6 kcfs 29.9 kcfs	31.3/34.3 kcfs 32.8 kcfs	31.3/34.3 kcfs 32.8 kcfs
Fish Spawn Rise (Apr-Jun) FTPK Pool Elev Change GARR Pool Elev Change OAHE Pool Elev Change	+6.9 feet +6.2 feet +5.0 feet	+6.2 feet +5.4 feet +5.6 feet	+4.4 feet +4.3 feet +2.6 feet	+1.9 feet +1.9 feet -1.6 feet	-0.7 feet +2.2 feet -3.2 feet
July 1 System Storage Sum-Fall Service Level (kcfs) Nav Season Length	63.9 MAF Full Service 10 Day extension	63.1 MAF Full Service 10 Day extension	60.6 MAF Full Service 0 Days shortening	57.3 MAF Full Service 0 Days shortening	56.3 MAF 0.6 kcfs blw Full Service 0 Days shortening
September 1 System Storage Winter 2020-21 GP Release	61.8 MAF 20.0 kcfs	61.2 MAF 20.0 kcfs	58.8 MAF 17.0 kcfs	54.4 MAF 12.5 kcfs	52.4 MAF 12.5 kcfs
February 29 System Storage End-Year Pool Balance Percent Pool	56.1 MAF Balanced 100%	56.1 MAF Balanced 100%	55.3 MAF Balanced 99%	50.3 MAF Balanced 90%	47.8 MAF Balanced 85%

A. <u>Flood Control</u>. Flood control is the only authorized project purpose that requires the availability of empty storage space rather than impounded water. Actual flood events, especially those that are a result of rainfall runoff, are difficult to predict with much advance notice; therefore, detailed routing of specific major flood flows is accomplished when floods occur. There is a recurring pattern of high-risk flood periods during each year: a season when snowmelt, ice jams, and protracted heavy rains will almost surely occur with or without generating consequent floods; and a season when

these situations are less likely and the flood threat is correspondingly low. The high-risk flood season begins about March 1 and extends through the summer. As a consequence, regulation of the System throughout the fall and winter months is predicated on the achievement of a March 1 System storage level at or below the base of the Annual Flood Control and Multiple Use Zone. All runoff scenarios studied for this AOP will begin the March 1, 2020 runoff season with System storage at or below the desired 56.1 MAF base of the Annual Flood Control and Multiple Use Zone. Therefore, the entire System flood control storage of 16.3 MAF, (11.6 MAF in the Annual Flood Control and Multiple Use Zone and 4.7 MAF in the Exclusive Flood Control Zone) will be available to store runoff.

To the extent practical, the System is regulated to prevent damaging flows in the river reaches between and below the Mainstem dams. In 2020, the full capacity of the System will be available to capture a significant volume of runoff originating from the upper basin and meter it out over an extended period of time at a rate that does not contribute to flooding in the river reaches between and below the reservoirs. Additionally, the reservoir system will have the capacity to reduce releases and hold back water during periods of high runoff below the System to reduce peak stages and discharges on the lower river. The ability to significantly reduce peak stages on the lower river diminishes at locations further downstream due to the large uncontrolled drainage area and travel time from the dam.

The base of the Exclusive Flood Control Zone defines the maximum level of storage that will be accumulated for purposes other than flood control. When the Exclusive Flood Control Zone at a particular reservoir is encroached upon, the control of subsequent flood inflows becomes the dominant factor. During such periods, releases may substantially exceed the powerplant release capacity with the evacuation rate of any project dependent upon existing flood conditions, the potential for further inflows, and conditions of other reservoirs in the System. Maximum release rates at such times are based upon the Master Manual flood control criteria, the flood control status of the System, and the critical need to preserve the integrity of the dams. Detailed information regarding the adjustments of releases for flood control evacuation and downstream flood control constraints can be found in Chapter 7 of the Master Manual.

Due to release limitations imposed by the formation of downstream ice cover, a major portion of the required flood control space must be evacuated prior to the winter season. Higher releases may be made on occasions when the downstream channel conditions permit. If plains and/or mountain snowpack accumulations are much above normal during the winter of 2019-2020, and studies indicate that available storage in the Carryover Multiple Use Zone as well as the Annual Flood Control and Multiple Use Zone will be fully utilized, releases may be adjusted to the extent reasonably possible to evacuate water from the reservoir system early in the runoff season. High releases

during the late winter and early spring periods may exacerbate localized flooding if coincident with plains snowmelt or spring rains, and may also contribute to significant ice jam flooding. Therefore, if higher than normal releases are indicated, local conditions will need to be closely monitored. In addition, all 2020 runoff that is stored in the flood control zones will be evacuated prior to the start of the 2021 runoff season.

B. Water Supply and Water Quality Control. Water supply problems at intakes located in the river reaches both between and below the Mainstem dams and in the reservoirs are related primarily to intake elevations or river access rather than inadequate water supply. In emergency situations, short-term adjustments to protect human health and safety would be considered to keep intakes operational.

Low reservoir levels during the 2000-2007 drought contributed to both intake access and water quality problems for intakes on Garrison and Oahe reservoirs, including several Tribal intakes. A return to more normal reservoir elevations has eliminated concern over many of these intakes. If the drought conditions return, reservoir pool levels and releases may decline renewing the potential for intake access and water quality problems at both river and reservoir intakes. Under the Lower Decile runoff scenario, minimum reservoir levels in 2020 would be at least 22 feet higher than the record lows set in the 2000-2007 drought. Although not below the critical shut-down elevations for any intake, a return to lower reservoir levels would require extra monitoring to ensure the continued operation of the intakes.

Winter releases are determined based on the September 1 System storage check. The winter season extends from December through February and flows are provided during this time to support the Congressionally authorized project purposes of hydropower production and downstream water supply and water quality. Per the Master Manual, if September 1 System storage is 55.0 MAF or less, the winter release from Gavins Point will be 12,000 cfs. Planned winter release rates of 12,000 cfs may be less than required for downstream water supply intakes without sufficient incremental tributary flows below the System. Should that occur, releases may need to be set higher to ensure that downstream water supply intakes are operable. In 2012-2013, winter releases were set at 14,000 cfs rather than 12,000 cfs due to channel degradation and low incremental tributary flows below the System. Improved tributary flows in future winters would facilitate releases reaching the target level of 12,000 cfs. While the Master Manual indicates that the water control plan's purpose is to meet water supply requirements in river reaches downstream of the reservoirs to the extent reasonably possible, the Corps believes the minimum winter release of 12,000 cfs presented in the Master Manual represents a reasonable long-term goal for water intake operability and for owners to strive for as they make improvements to their facilities. A letter was sent to intake owners in the spring of 2013 informing them of the Master Manual criteria and encouraging them to take necessary action to ensure their intakes are able to operate at reduced release rates. Coordination with intake owners will continue prior to and

during the low release periods. In addition, it may be necessary at times to temporarily increase Gavins Point releases to provide adequate downstream flows during periods when excessive river ice formation is forecast or if ice jams or blockages form which temporarily restrict flow. Based on past experiences, these events are expected to occur infrequently and be of short duration.

Based on the studies included in this AOP, the scheduled winter System release for 2019-2020 will range from 20,000 cfs to 22,000 cfs. As shown in ***Table V***, 2020-2021 winter releases of 20,000 cfs would be made for the Upper Decile and Upper Quartile runoff scenarios, 17,000 cfs for Median, and 12,500 cfs under Lower Quartile and Lower Decile runoff scenarios. The additional 500 cfs on Lower Quartile and Lower Decile reflects how the Corps, when conditions warrant, temporarily increases Gavins Point releases during extreme cold periods to inhibit the formation of ice jams in the lower river reach.

During non-navigation open water periods in the spring and fall the Master Manual includes System releases as low as 9,000 cfs as a water conservation measure provided that enough downstream tributary flow exists to allow for continued operation of downstream water intakes. If a non-navigation year would occur in the future, summer releases (May through August) could average around 18,000 cfs from the System. However, it should be noted that System releases will be set at levels that meet the operational requirements of water intakes to the extent reasonably possible. Problems have occurred at several downstream intakes in the past, however in all cases the problems have been associated with access to the river or reservoir rather than insufficient water supply. In addition, the low summer release rate would likely result in higher water temperatures in the river, which could impact a powerplant's ability to meet their thermal discharge permits. Again, it should be noted that System releases will be set at levels that allow the downstream powerplant to meet their thermal discharge permit requirements to the extent reasonably possible. This may mean that actual System releases in the hottest part of the summer period may be set well above the 18,000 cfs level. The Corps continues to encourage intake operators between and below the mainstem dams to make necessary modifications to their intakes to allow efficient operation over the widest possible range of hydrologic conditions. While the current level of System storage should allow adequate access for all intakes during the coming year, intake operators that have experienced difficulty with access during the past drought years should continue to make adjustments to improve access and flexibility when drought returns to the basin.

C. <u>Irrigation</u>. Scheduled releases from the System reservoirs will be sufficient to meet the volumes of flow required for irrigation diversions from the Missouri River. Some access problems may be experienced, however, if Lower Quartile or Lower Decile runoff conditions return. Below Fort Peck, localized dredging may once again be required in the vicinity of irrigation intakes in order to maintain access to the water if

releases are low next summer. Intake access problems are the responsibility of the intake owner and the Corps will not guarantee access, only that the supply of water in the Missouri River is adequate to meet this project purpose. Fort Peck releases may be adjusted during the irrigation season to provide more consistent flows at downstream locations as tributary flows vary. Tributary irrigation water usage is fully accounted for in the estimates of water supply.

D. Navigation. The anticipated service level and season length for all runoff conditions simulated are shown in ***Table V***. Service to navigation in 2020 from the beginning of the navigation season through the July 1 storage check will be at full service for all runoff scenarios. After the July 1 storage check, Lower Quartile and higher runoff scenarios indicate at least full service to navigation. The July 1 storage check indicates 600 cfs below full service for the Lower Decile runoff scenario. In addition, the Upper Decile and Upper Quartile runoff scenarios indicate a 10-day extension to the navigation season based on the July 1 storage check. Median and below runoff indicates a full length navigation season. Although the AOP simulations provide a comparison of typical flow support under varying runoff conditions, the actual rate of flow support for the 2020 navigation season will be based on actual System storage on March 15 and July 1, 2020.

E. Power. ***Table VI*** and ***Table VII*** indicate the estimated monthly System load requirements and hydropower supply of the Eastern Division, Pick-Sloan Missouri Basin Program (P-S MBP), from August 2019 through December 2020. Estimates of monthly peak demands and energy include customer requirements for firm, short-term firm, summer firm, peaking, and various other types of power sales, System losses, and the effects of diversity. Also included in the estimated requirements are deliveries of power to the Western Division, P-S MBP, to help meet its firm power commitments. Under the Median runoff scenario, annual generation in 2020 is estimated to be 9.9 million MWh, 105 percent of the 1967-2018 average.

TABLE VI
PEAKING CAPABILITY AND SALES
(1,000 kW at plant)

	Estimated Committed Sales*	Expected C of E Capability					Expected Bureau Capability**					Expected Total System Capability				
2019			U.B.	Basic	L.B.			U.B.	Basic	L.B.			U.B.	Basic	L.B.	
Aug	2209		2428	2425	2422			201	199	199			2629	2624	2621	
Sep	2016		2398	2398	2404			201	199	198			2599	2597	2602	
Oct	1876		2360	2366	2376			200	199	198			2560	2565	2574	
Nov	1982		2310	2314	2329			199	198	197			2509	2512	2526	
Dec	2111		2286	2293	2309			196	195	195			2482	2488	2504	
2020																
Jan	2123		2295	2300	2309			192	192	192			2487	2492	2501	
Feb	2106		2312	2315	2316			189	190	191			2501	2505	2507	
		U.D.	U.Q.	Med	L.Q.	L.D.	U.D.	U.Q.	Med	L.Q.	L.D.	U.D.	U.Q.	Med	L.Q.	L.D.
Mar	2041	2429	2422	2413	2407	2406	188	188	189	190	190	2617	2610	2602	2597	2596
Apr	1910	2451	2441	2419	2399	2396	180	180	187	190	190	2631	2621	2606	2589	2586
May	1879	2468	2457	2424	2394	2390	182	182	191	193	193	2650	2639	2615	2587	2583
Jun	2084	2485	2479	2450	2406	2396	198	198	195	194	194	2683	2677	2645	2600	2590
Jul	2194	2479	2475	2448	2394	2372	201	201	201	190	190	2680	2676	2649	2584	2562
Aug	2222	2459	2457	2431	2369	2345	199	199	199	190	188	2658	2656	2630	2559	2533
Sep	2017	2445	2445	2422	2354	2327	200	199	199	191	189	2645	2644	2621	2545	2516
Oct	1875	2419	2422	2404	2331	2303	200	199	199	193	192	2619	2621	2603	2524	2495
Nov	1979	2378	2383	2369	2293	2265	198	198	199	193	192	2576	2581	2568	2486	2457
Dec	2107	2335	2339	2331	2257	2226	191	192	196	192	191	2526	2531	2527	2449	2417

* Estimated sales, including system reserves. Power in addition to hydro production needed for these load requirements will be obtained from other power systems by interchange or purchase.
** Total output of Canyon Ferry and 1/2 of the output of Yellowtail powerplant.

TABLE VII
ENERGY GENERATION AND SALES
(Million kWh at plant)

	Estimated Committed Sales*	Expected C of E Generation					Expected Bureau Generation **					Expected Total System Generation				
2019			U.B.	Basic	L.B.			U.B.	Basic	L.B.			U.B.	Basic	L.B.	
Aug	858		1568	1552	1523			96	87	76			1664	1639	1599	
Sep	745		1531	1470	1243			86	75	60			1617	1545	1303	
Oct	741		1543	1393	1154			83	68	57			1626	1461	1211	
Nov	808		1429	1305	1094			75	63	53			1504	1368	1147	
Dec	913		877	818	741			77	69	55			954	887	796	
2020																
Jan	929		834	795	772			76	68	49			910	863	821	
Feb	897		757	728	711			70	59	45			827	787	756	
		U.D.	U.Q.	Med	L.Q.	L.D.	U.D.	U.Q.	Med	L.Q.	L.D.	U.D.	U.Q.	Med	L.Q.	L.D.
Mar	814	647	656	653	657	669	77	77	64	48	48	724	733	717	705	717
Apr	767	769	717	758	832	837	95	95	65	43	43	864	812	823	875	880
May	718	1067	913	893	980	972	99	99	88	46	46	1166	1012	981	1026	1018
Jun	778	1263	1093	961	1008	992	97	97	96	46	46	1360	1190	1057	1054	1038
Jul	846	1469	1326	1037	1080	1043	100	100	78	56	54	1569	1426	1115	1136	1097
Aug	859	1470	1328	1074	1077	1039	97	90	75	54	52	1567	1418	1149	1131	1091
Sep	748	1350	1197	925	935	907	89	82	70	51	49	1439	1279	995	986	956
Oct	743	1241	1065	752	770	755	89	81	71	50	49	1330	1146	823	820	804
Nov	809	1217	1043	661	656	638	90	84	69	48	45	1307	1127	730	704	683
Dec	914	838	804	640	557	550	91	86	71	49	47	929	890	711	606	597
CY TOT		12922	11733	9877	10035	9885	1072	1039	873	584	573	13994	12772	10750	10619	10458

* Estimated sales including system reserves and losses. Power in addition to hydro production needed for these load requirements will be obtained from other systems by interchange or purchase.
** Total output Canyon Ferry and 1/2 output of Yellowtail powerplant.

F. Recreation, Fish and Wildlife. The regulation of the System will continue to provide recreation and fish and wildlife opportunities in the project areas and along the Missouri River as well as other benefits of a managed system. Recreation access is expected to be near normal levels in 2020. If Lower Quartile or Lower Decile runoff were to occur in 2020, boat ramps that were lowered and low water ramps that were constructed during the two recent drought periods will provide adequate reservoir access. Special regulation adjustments incorporating specific objectives for these purposes will be made to the extent reasonably possible. Overall conditions should be favorable for the many visitors who enjoy the camping, boating, fishing, hunting, swimming, picnicking, and other recreational activities associated with the System reservoirs.

The effects of the simulated System regulation during 2020 on fish and wildlife are included in Chapter VI, Section F, entitled, "Regulation Activities for T&E Species and Fish Propagation Enhancement."

G. Historic and Cultural Properties. As mentioned in Chapter VI of this AOP, the regulation of the System during 2019 and 2020 will expose cultural sites due to erosion from the normal fluctuation of pool elevations. The Corps will work with the Tribes utilizing 36 CFR Part 800 and the PA to address the exposure of these sites. The objective of a programmatic agreement is to deal "…with the potential adverse effects of complex projects or multiple undertakings…" The PA objective was to collaboratively develop a preservation program that would avoid, minimize and/or mitigate the adverse effects of the System operation. All tribes, whether signatory to the PA or not, may request government-to-government consultation on the regulation of the System and the resulting effect on historic and cultural properties and other resources.

The planned preservation program for this AOP is outlined by multiple stipulations in the PA. One of the stipulations, or program components, is the Five-Year Plan. This plan outlines how the Corps will accomplish its responsibilities under the PA and the National Historic Preservation Act. The "Cultural Resource Program Final Five Year Plan, dated February 2012" (see http://www.nwo.usace.army.mil/Missions/CivilWorks/CulturalResources.aspx) is currently being implemented. The plan includes inventory, testing and evaluation, mitigation and other specific activities that will allow the Corps to avoid, minimize and/or mitigate the adverse effects to cultural sites on Corps lands within the System. Many of the actions listed in the plan are within the elevation ranges that will occur with the implementation of the Master Manual criteria in 2019 and 2020. Two critical components of the Five-Year Plan that are applicable to this AOP are monitoring and mitigation, which will be briefly discussed in the following paragraphs.

First, a collaboratively developed plan, entitled "Final Cultural Resource Monitoring Plan, dated June 2014" (see http://www.nwo.usace.army.mil/Missions/CivilWorks/CulturalResources.aspx) is in place. This monitoring plan outlines the sites that require monitoring and specifies a frequency for monitoring. The Corps is strategically monitoring sites, including those sites within the potential operating pool elevations, to document the effects of the implementation of the 2019-2020 AOP. Specific sites are identified in the draft Monitoring and Enforcement Plan for the monitoring team, comprised of Corps rangers and Tribal monitors, to visit and document impacts. This focused monitoring is resulting in more accurate data on the current impacts to sites along the river plus it is assisting with the identification of sites for mitigation. The most recent training for the monitoring teams was held in July 2019, and the most recent Archeological Resources Protection Act training was held in April of 2018.

Second, mitigation or protection of sites that are being adversely impacted continues. During the reporting period for the 2018 Annual Report by the Corps on the implementation of the Programmatic Agreement, 8 sites were either completed, started, or in the design phase. The annual report is available at http://www.nwo.usace.army.mil/Missions/CivilWorks/CulturalResources.aspx.

Results expected from the proposed monitoring and mitigation actions include more accurate horizontal and vertical data on existing cultural sites, detailed impact data, proactive protection and preservation of sites. The effects of the simulated System regulation during 2019-2020 on cultural sites are included in the Chapter VI, section G., entitled, "Regulation Activities for Historic and Cultural Properties."

H. System Storage. If the August 1, 2019 Basic runoff forecast verifies, System storage will decline to 56.5 MAF by the end of 2019. This would be 22.6 MAF higher than the record low System storage of 33.9 MAF set on February 9, 2007 and 0.3 MAF less than the 2018 end-of-year storage. This end-of-year storage is 3.5 MAF more than the 1967-2018 average. The lowest storage during the 1988-1992 drought was 40.8 MAF in January 1991, and the record low storage was set during the 2000-2007 drought at 33.9 MAF in February 2007. The end-of-year System storages have ranged from a maximum of 60.9 MAF in 1975 to the 2006 minimum of 34.4 MAF. Forecasted System storage on December 31, 2020 is presented in ***Table VIII*** for the runoff scenarios simulated.

TABLE VIII
ANTICIPATED DECEMBER 31, 2020 SYSTEM STORAGE

Water Supply Condition	Total (12/31/20)	Carryover Storage Remaining 1/	Unfilled Carryover Storage 2/	Total Change CY 2020
	(Volumes in 1,000 Acre-Feet)			
Upper Decile	56,200	38,500	0	0
Upper Quartile	56,400	38,500	0	200
Median	55,500	37,900	600	-600
Lower Quartile	50,200	32,600	5,900	-6,800
Lower Decile	47,900	30,300	8,200	-9,100

1/ Net usable storage above 17.6 MAF System minimum pool level established for power, recreation, irrigation diversions, and other purposes.

2/ System base of Annual Flood Control and Multiple Use Zone containing 56.1 MAF.

I. Summary of Water Use by Functions. Anticipated water use in CY 2019, under the regulation plan with the Basic forecast of water supply is shown in ***Table IX***. Under the reservoir regulation simulations in this AOP, estimated water use in CY 2020 also is shown in ***Table IX.*** Actual water use data for CY 2018 are included for information and comparison.

TABLE IX
MISSOURI RIVER MAINSTEM SYSTEM
WATER USE FOR CALENDAR YEARS 2018, 2019, AND 2020 ABOVE SIOUX CITY, IOWA
in Million Acre-Feet (MAF)

		CY 2018 Actual	CY 2019 Basic Simulation	Simulations for Calendar Year 2020 Upper Decile	Upper Quartile	Median	Lower Quartile	Lower Decile
Upstream Depletions	(1)							
Irrigation, Tributary Reservoir Evaporation & Other Uses		2.9	2.0					
Tributary Reservoir Storage Change		0.1	-0.1					
Total Upstream Depletions		3.0	1.9	3.0	2.9	3.1	3.2	3.0
System Reservoir Evaporation	(2)	3.0	2.7	1.2	1.2	1.8	2.1	2.0
Sioux City Flows								
Navigation Season								
Unregulated Flood Inflows Between Gavins Point & Sioux City	(3)	0.5	2.0					
Navigation Service Requirement	(4)	15.2	15.2	16.7	16.3	15.9	16.3	15.8
Supplementary Releases								
T&E Species	(5)	0.0	0.0	0.3	0.3	0.3	0.3	0.3
Flood Evacuation	(6)	14.3	24.9	8.1	4.7	0.0	0.0	0.0
Non-navigation Season Flows		4.3	4.3	4.7	4.6	4.5	4.2	4.1
Flood Evacuation Releases	(7)	1.5	2.2	0.5	0.4	0.0	0.0	0.0
System Storage Change		0.3	-0.3	0.0	0.2	-1.0	-6.8	-9.1
Total		42.1	52.9	34.5	30.6	24.6	19.3	16.1
Project Releases								
Fort Peck		9.3	8.2	8.6	7.9	6.7	6.5	6.5
Garrison		24.6	21.5	20.9	19.0	16.2	15.8	15.1
Oahe		25.3	27.9	23.9	21.2	17.5	18.8	19.5
Big Bend		23.1	27.8	23.9	21.1	17.4	18.7	18.7
Fort Randall		26.2	32.3	25.2	22.2	18.9	18.9	18.9
Gavins Point		28.6	36.5	27.4	24.1	19.5	20.1	19.9

(1) Tributary uses above the 1949 level of development including agricultural depletions and tributary storage effects.
(2) Net evaporation is shown for 2020.
(3) Incremental inflows to reach which exceed those usable in support of navigation at the target level, even if Gavins Point releases were held to as low as 6,000 cfs.
(4) Estimated requirement for downstream water supply and water quality is approximately 6.0 MAF.
(5) Increased releases required for threatened and endangered species regulation.
(6) Includes flood control releases for flood control storage evacuation and releases used to extend the navigation season beyond the normal December 1 closing date at the mouth of the Missouri River.
(7) Releases for flood control storage evacuation in excess of a 17,000 cfs Gavins Point release.

VIII. TENTATIVE PROJECTION OF REGULATION THROUGH FEBRUARY 2026

The 5-year extensions to the AOP (March 2021 to February 2026) have been prepared to serve as a guide for the Western Area Power Administration's marketing activities and to provide data to allow basin interests to conduct long-term planning. Three runoff conditions are modeled in the extension studies: Median, Lower Quartile, and Lower Decile.

The full 16.3 MAF of flood control capacity or more would be available at the start of each runoff season. The navigation service level and season length criteria described in ***Plate 3*** were applied to the extensions. The March 15 and July 1 System storage checks shown in ***Plate 3*** were used to determine the flow support for navigation and other downstream uses and the navigation season length. A steady release – flow-to-target (SR-FTT) regulation with cycling in May was modeled during the T&E bird species' nesting season. The Gavins Point releases to meet navigation target flows, as shown in ***Plate 3*** and as computed by the March 15 and July 1 System storage checks, were used prior to and following the nesting season. The September 1 System storage check was used to determine the winter System release. Navigation service support and season length, end of year System storage, and the winter release rate for the extensions are shown on ***Table X***. The criteria considered as each year of the extensions was modeled are listed, along with the results, in ***Tables XI through XIII*** for the Median, Lower Quartile, and Lower Decile extension studies, respectively.

A. Median Runoff. Studies 9 through 13 present the results of simulating Median runoff (24.6 MAF) from March 2021 through February 2026. The March 1, 2021 System storage would be 55.3 MAF and would decrease to 53.2 MAF by March 1, 2026, 2.9 MAF below the desired March 1 storage of 56.1 MAF, the base of the annual flood control and multiple use pool. The navigation service level would range between full service to 200 cfs below full service for the study period of 2021 to 2025. Winter releases would range from 17,000 cfs in the winter of 2021-2022 to 13,800 cfs in winter 2025-2026. For the entire study period, the carryover multiple use storage in Fort Peck, Garrison, and Oahe was balanced on March 1 of each year.

TABLE X
NAVIGATION SERVICE SUPPORT, WINTER RELEASES
AOP EXTENSION STUDIES

	2021	2022	2023	2024	2025
MEDIAN					
Annual Runoff Volume (MAF)	24.6	24.6	24.6	24.6	24.6
Flow Level Below Full Service					
Spring (kcfs)	Full	Full	Full	Full	Full-0.2
Summer/Fall (kcfs)	Full	Full	Full	Full	Full
Season Length	8 months	8 months	8 months	8 months	8 months
Dec 31 Storage (MAF)	54.8	54.2	53.6	53.3	53.0
Winter Release (kcfs)	17.0	16.0	15.0	14.2	13.8
LOWER QUARTILE					
Annual Runoff Volume (MAF)	19.9	20.2	21.8	22.8	24.4
Flow Level Below Full Service					
Spring (kcfs)	Full-3.8	Full-6.0	Full-6.0	Full-6.0	Full-6.0
Summer/Fall (kcfs)	Full-4.0	Full-6.0	Full-6.0	Full-6.0	Full-4.8
Season Length	8 mnths	8 mnths-8days	8 mnths-12days	8 mnths-9days	8 mnths
Dec 31 Storage (MAF)	47.1	45.6	45.5	46.2	47.5
Winter Release (kcfs)	12.5	12.5	12.5	12.5	12.5
LOWER DECILE					
Annual Runoff Volume (MAF)	17.1	17.5	18.5	19.3	19.5
Flow Level Below Full Service					
Spring (kcfs)	Full-6.0	Full-6.0	Full-6.0	Full-6.0	Full-6.0
Summer/Fall (kcfs)	Full-6.0	Full-6.0	Full-6.0	Full-6.0	Full-6.0
Season Length	8 mnths-13days	8 mnths-30days	8 mnths-30days	8 mnths-30 days	8 mnths-36days
Dec 31 Storage (MAF)	43.7	40.6	38.4	37.0	36.1
Winter Release (kcfs)	12.5	12.5	12.5	12.5	12.5

Table XI

Median Extension Studies - Criteria Considered in the Modeling Process

Study Number			9	10	11	12	13
	Units	Criteria	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026
March 15 Storage	MAF	31/49/54.5	56.2	55.5	54.9	54.5	54.3
- Service Level	N/A or kcfs	No Sea/Min/Full Thresholds	Full	Full	Full	Full	Full - 0.2
- 3rd Period March GP Q	kcfs		26.7	26.7	26.7	26.7	26.5
- April Gavins Point Q	kcfs		26.7	26.7	26.7	26.7	26.5
- Gavins Point Cycling Qs	kcfs		28.0/31.6	28.0/31.6	28.0/31.6	28.0/31.6	27.8/31.4
- May Gavins Point Q	kcfs		29.9	29.9	29.9	29.9	29.6
- June Gavins Point Q	kcfs		31.6	31.6	31.6	31.6	31.4
July 1 Storage	MAF	50.5/57	59.9	59.2	58.6	58.2	58.0
- Service Level	N/A	Min/Full Thresholds	Full	Full	Full	Full	Full
- July Gavins Point Q	kcfs		31.6	31.6	31.6	31.6	31.6
- Aug Gavins Point Q	kcfs		33.2	33.2	33.2	33.2	33.2
- Sept Gavins Point Q	kcfs		32.6	32.6	32.6	32.6	32.6
July 1 Storage	MAF	36.5/41&46.8/51.5	59.9	59.2	58.6	58.2	57.9
- Season Length Shortening	days	61/31&31/0 Thresholds	0	0	0	0	0
- Oct Gavins Point Q	kcfs		32.0	32.0	32.0	32.0	32.0
- Nov Gavins Point Q	kcfs		27.7	27.7	27.7	27.7	27.7
September 1 Storage	MAF	55/58	58.1	57.4	56.8	56.3	56.1
- Winter Gavins Point Q	kcfs	12/17 Thresholds	17.0	16.0	15.0	14.2	13.8
End-of-Year Reservoir Storage (12/31)	MAF		54.8	54.2	53.6	53.3	53.0
- Percent Full	N/A		98%	97%	96%	95%	94%
Fort Peck Rise 3/31-5/31	N/A		Yes	Yes	Yes	Yes	Yes
Garrison Rise 3/31-5/31	N/A		Yes	Yes	Yes	Yes	Yes
Oahe Rise 3/31-5/31	N/A		Yes	Yes	Yes	Yes	Yes
Favored Reservoir - Fish Spawn	N/A		FP/OA	GA	FP/OA	GA	FP/OA
End of Water Year Storage (2/28)	MAF		54.6	54.1	53.7	53.4	53.2

Table XII

Lower Quartile Extension Studies - Criteria Considered in the Modeling Process

Study Number			***14***	***15***	***16***	***17***	***18***
	Units	*Criteria*	***2021-2022***	***2022-2023***	***2023-2024***	***2024-2025***	***2025-2026***
March 15 Storage	*MAF*	*31/49/54.5*	51.0	47.9	46.6	46.6	47.4
- Service Level	*N/A or kcfs*	*No Sea/Min/Full Thresholds*	Full - 3.8	Min Service	Min Service	Min Service	Min Service
- 3rd Period March GP Q	*kcfs*		26.0	23.8	23.8	23.8	23.8
- April Gavins Point Q	*kcfs*		26.0	23.8	23.8	23.8	23.8
- Gavins Point Cycling Qs	*kcfs*		27.5/30.5	25.3/28.3	25.3/28.3	25.3/28.3	25.3/28.3
- May Gavins Point Q	*kcfs*		28.9	26.8	26.8	26.8	26.8
- June Gavins Point Q	*kcfs*		30.5	28.3	28.3	28.3	28.3
July 1 Storage	*MAF*	*50.5/57*	52.7	50.2	49.6	50.1	51.8
- Service Level	*N/A*	*Min/Full Thresholds*	Full - 4.0	Min Service	Min Service	Min Service	Full - 4.8
- July Gavins Point Q	*kcfs*		30.3	28.3	28.3	28.3	29.5
- Aug Gavins Point Q	*kcfs*		30.0	28.0	28.0	28.0	29.2
- Sept Gavins Point Q	*kcfs*		29.5	27.5	27.5	27.5	28.7
July 1 Storage	*MAF*	*36.5/41&46.8/51.5*	52.7	50.3	49.6	50.1	51.8
- Season Length Shortening	*days*	*61/31&31/0 Thresholds*	0	8	12	9	0
- Oct Gavins Point Q	*kcfs*		29.1	27.1	27.1	27.1	28.3
- Nov Gavins Point Q	*kcfs*		24.2	17.8	15.6	17.2	23.5
September 1 Storage	*MAF*	*55/58*	50.4	48.2	47.8	48.4	50.1
- Winter Gavins Point Q	*kcfs*	*12/17 Thresholds*	12.5	12.5	12.5	12.5	12.5
End-of-Year Reservoir Storage (12/31)	*MAF*		47.1	45.6	45.5	46.2	47.5
- Percent Full	*N/A*		84%	81%	81%	82%	85%
Fort Peck Rise 3/31-5/31	*N/A*		Yes	Yes	Yes	Yes	Yes
Garrison Rise 3/31-5/31	*N/A*		Yes	Yes	Yes	Yes	Yes
Oahe Rise 3/31-5/31	*N/A*		No	No	No	Yes	Yes
Favored Reservoir - Fish Spawn	*N/A*		FP/OA	GA	FP/OA	GA	FP/OA
End of Water Year Storage (2/28)	*MAF*		47.2	45.8	45.8	46.5	47.9

Table XIII

Lower Decile Extension Studies - Criteria Considered in the Modeling Process

Study Number			19	20	21	22	23
	Units	Criteria	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026
March 15 Storage	MAF	31/49/54.5	48.4	44.3	41.4	39.4	38.0
- Service Level	N/A or kcfs	No Sea/Min/Full Thresholds	Min Service	Min Service	Min Service	Min Service	Min Service
- 3rd Period March GP Q	kcfs		23.8	23.8	23.8	23.8	23.8
- April Gavins Point Q	kcfs		23.8	23.8	23.8	23.8	23.8
- Gavins Point Cycling Qs	kcfs		25.3/28.3	25.3/28.3	25.3/28.3	25.3/28.3	25.3/28.3
- May Gavins Point Q	kcfs		26.8	26.8	26.8	26.8	26.8
- June Gavins Point Q	kcfs		28.3	28.3	28.3	28.3	28.3
July 1 Storage	MAF	50.5/57	49.5	45.6	43.2	41.5	40.2
- Service Level	N/A	Min/Full Thresholds	Min Service	Min Service	Min Service	Min Service	Min Service
- July Gavins Point Q	kcfs		28.3	28.3	28.3	28.3	28.3
- Aug Gavins Point Q	kcfs		28.0	28.0	28.0	28.0	28.0
- Sept Gavins Point Q	kcfs		27.5	27.5	27.5	27.5	27.5
July 1 Storage	MAF	36.5/41&46.8/51.5	49.5	45.6	43.2	41.5	40.2
- Season Length Shortening	days	61/31&31/0 Thresholds	13	30	30	30	36
- Oct Gavins Point Q	kcfs		27.1	23.9	23.9	23.9	20.4
- Nov Gavins Point Q	kcfs		15.1	9.0	9.0	9.0	9.0
September 1 Storage	MAF	55/58	46.5	42.7	40.3	38.7	37.5
- Winter Gavins Point Q	kcfs	12/17 Thresholds	12.5	12.5	12.5	12.5	12.5
End-of-Year Reservoir Storage (12/31)	MAF		43.7	40.6	38.4	37.0	36.1
- Percent Full	N/A		78%	72%	68%	66%	64%
Fort Peck Rise 3/31-5/31	N/A		Yes	No	Yes	Yes	Yes
Garrison Rise 3/31-5/31	N/A		No	Yes	No	Yes	Yes
Oahe Rise 3/31-5/31	N/A		No	No	No	No	No
Favored Reservoir - Fish Spawn	N/A		FP/OA	GA	FP/OA	GA	FP/OA
End of Water Year Storage (2/28)	MAF		43.7	40.7	38.6	37.2	36.3

B. <u>Lower Quartile Runoff</u>. Studies 14 through 18 show the results of Lower Quartile runoff extensions. System storage on March 1, 2021 would be 50.3 MAF and decrease to 47.9 MAF by March 1, 2026. Navigation service levels would range between 4,800 cfs below full service to minimum service for the simulation period 2021 to 2025. The navigation season is shortened 0 days in 2021, 8 days in 2022, 12 days in 2023, 9 days in 2024, and 0 days in 2025. A 12,500-cfs average winter release is shown for the entire study period. Under Lower Quartile runoff, the carryover multiple use storage in the upper three reservoirs would be balanced each March 1.

C. <u>Lower Decile Runoff</u>. Studies 19 through 23 show the results of Lower Decile runoff extensions. System storage would be 47.8 MAF on March 1, 2021 and gradually decrease to 36.3 MAF on March 1, 2026. Navigation service levels would be at minimum navigation service levels throughout the season for all extension years. The navigation season would be shortened 13 days in 2021, 30 days in 2022 through 2024, and 36 days in 2025. The intrasystem storage is balanced each March 1 for the entire study period.

Plate 14 presents System storage, Gavins Point releases, and System peaking capability for Median, Lower Quartile, and Lower Decile runoff for the period 2021 through February 2026 Peak power, or peaking capability, is the amount of power available when all powerplants are operating at maximum.

Plate 15 presents reservoir pool elevations for Fort Peck, Garrison, Oahe, and Fort Randall for Median, Lower Quartile, and Lower Decile runoff for the period 2021 through February 2026.

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Missouri River Basin

U.S. ARMY ENGINEERS, NORTHWESTERN DIVISION
CORPS OF ENGINEERS, OMAHA, NEBRASKA
AUGUST 2011

PLATE 1. Missouri River Basin Map.

Summary of Engineering Data -- Missouri River Mainstem System

Item No.	Subject	Fort Peck Dam - Fort Peck Lake	Garrison Dam - Lake Sakakawea	Oahe Dam - Lake Oahe
1	Location of Dam	Near Glasgow, Montana	Near Garrison, ND	Near Pierre, SD
2	River Mile - 1960 Mileage	Mile 1771.5	Mile 1389.9	Mile 1072.3
3	Total & incremental drainage areas in square miles	57,500	181,400 (2) 123,900	243,490 (1) 62,090
4	Approximate length of full reservoir (in valley miles)	134, ending near Zortman, MT	178, ending near Trenton, ND	231, ending near Bismarck, ND
5	Shoreline in miles (3)	1520 (elevation 2234)	1340 (elevation 1837.5)	2250 (elevation 1607.5)
6	Average total & incremental inflow in cfs	10,200	25,600 15,400	28,900 3,300
7	Max. discharge of record near damsite in cfs	137,000 (June 1953)	348,000 (April 1952)	440,000 (April 1952)
8	Construction started - calendar yr.	1933	1946	1948
9	In operation (4) calendar yr.	1940	1955	1962
	Dam and Embankment			
10	Top of dam, elevation in feet msl	2280.5	1875	1660
11	Length of dam in feet	21,026 (excluding spillway)	11,300 (including spillway)	9,300 (excluding spillway)
12	Damming height in feet (5)	220	180	200
13	Maximum height in feet (5)	250.5	210	245
14	Max. base width, total & w/o berms in feet	3500, 2700	3400, 2050	3500, 1500
15	Abutment formations (under dam & embankment)	Bearpaw shale and glacial fill	Fort Union clay shale	Pierre shale
16	Type of fill	Hydraulic & rolled earth fill	Rolled earth filled	Rolled earth fill & shale berms
17	Fill quantity, cubic yards	125,628,000	66,500,000	55,000,000 & 37,000,000
18	Volume of concrete, cubic yards	1,200,000	1,500,000	1,045,000
19	Date of closure	24 June 1937	15 April 1953	3 August 1958
	Spillway Data			
20	Location	Right bank - remote	Left bank - adjacent	Right bank - remote
21	Crest elevation in feet msl	2225	1825	1596.5
22	Width (including piers) in feet	820 gated	1336 gated	456 gated
23	No., size and type of gates	16 - 40' x 25' vertical lift gates	28 - 40' x 29' Tainter	8 - 50' x 23.5' Tainter
24	Design discharge capacity, cfs	275,000 at elev 2253.3	827,000 at elev 1858.5	304,000 at elev 1644.4
25	Discharge capacity at maximum operating pool in cfs	230,000	660,000	80,000
	Reservoir Data (6)			
26	Max. operating pool elev. & area	2250 msl 245,000 acres	1854 msl 383,000 acres	1620 msl 386,000 acres
27	Max. normal op. pool elev. & area	2246 msl 240,000 acres	1850 msl 365,000 acres	1617 msl 362,000 acres
28	Base flood control elev & area	2234 msl 211,000 acres	1837.5 msl 308,000 acres	1607.5 msl 311,000 acres
29	Min. operating pool elev. & area	2160 msl 89,000 acres	1775 msl 125,000 acres	1540 msl 115,000 acres
	Storage allocation & capacity			
30	Exclusive flood control	2250-2246 971,000 a.f.	1854-1850 1,495,000 a.f.	1620-1617 1,107,000 a.f.
31	Flood control & multiple use	2246-2234 2,704,000 a.f.	1850-1837.5 4,211,000 a.f.	1617-1607.5 3,208,000 a.f.
32	Carryover multiple use	2234-2160 10,700,000 a.f.	1837.5-1775 12,951,000 a.f.	1607.5-1540 13,353,000 a.f.
33	Permanent	2160-2030 4,088,000 a.f.	1775-1673 4,794,000 a.f.	1540-1415 5,315,000 a.f.
34	Gross	2250-2030 18,463,000 a.f.	1854-1673 23,451,000 a.f.	1620-1415 22,983,000 a.f.
35	Reservoir filling initiated	November 1937	December 1953	August 1958
36	Initially reached min. operating pool	27 May 1942	7 August 1955	3 April 1962
37	Estimated annual sediment inflow	17,200 a.f./year 1073 yrs.	21,600 a.f./year 1,086 yrs.	14,800 a.f./year 1553 yrs.
	Outlet Works Data			
38	Location	Right bank	Right Bank	Right Bank
39	Number and size of conduits	2 - 24' 8" diameter (nos. 3 & 4)	1 - 26' dia. and 2 - 22' dia.	6 - 19.75' dia. upstream, 18.25' dia. downstream
40	Length of conduits in feet (8)	No. 3 - 6,615, No. 4 - 7,240	1529	3496 to 3659
41	No., size, and type of service gates	1 - 28' dia. cylindrical gate 6 ports, 7.6' x 8.5' high (net opening) in each control shaft	1 - 18' x 24.5' Tainter gate per conduit for fine regulation	1 - 13' x 22' per conduit, vertical lift, 4 cable suspension and 2 hydraulic suspension (fine regulation)
42	Entrance invert elevation (msl)	2095	1672	1425
43	Avg. discharge capacity per conduit & total	Elev. 2250 22,500 cfs - 45,000 cfs	Elev. 1854 30,400 cfs - 98,000 cfs	Elev. 1620 18,500 cfs - 111,000 cfs
44	Present tailwater elevation (ft msl)	2032-2036 5,000 - 35,000 cfs	1669-1677 15,000- 60,000 cfs	1422-1427 20,000-55,000 cfs
	Power Facilities and Data			
45	Avg. gross head available in feet (14)	194	161	174
46	Number and size of conduits	No. 1-24'8" dia., No. 2-22'4" dia.	5 - 29' dia., 24' penstocks	7 - 24' dia., imbedded penstocks
47	Length of conduits in feet (8)	No. 1 - 5,653, No. 2 - 6,355	1829	From 3,280 to 4,005
48	Surge tanks	PH#1: 3-40' dia., PH#2: 2-65' dia.	65' dia. - 2 per penstock	70' dia., 2 per penstock
49	No., type and speed of turbines	5 Francis, PH#1-2: 128.5 rpm, 1-164 rpm , PH#2-2: 128.6 rpm	5 Francis, 90 rpm	7 Francis, 100 rpm
50	Discharge cap. at rated head in cfs	PH#1, units 1&3 170', 2-140' 8,800 cfs, PH#2-4&5 170'-7,200 cfs	150' 41,000 cfs	185' 54,000 cfs
51	Generator nameplate rating in kW	1&3: 43,500; 2: 18,250; 4&5: 40,000	3 - 121,600, 2 - 109,250	112,290
52	Plant capacity in kW	185,250	583,300	786,030
53	Dependable capacity in kW (9)	181,000	388,000	534,000
54	Avg. annual energy, million kWh (12)	1,031	2,279	2,632
55	Initial generation, first and last unit	July 1943 - June 1961	January 1956 - October 1960	April 1962 - June 1963
56	Estimated cost September 1999 completed project (13)	$158,428,000	$305,274,000	$346,521,000

Summary of Engineering Data -- Missouri River Mainstem System

Big Bend Dam - Lake Sharpe	Fort Randall Dam - Lake Francis Case	Gavins Point Dam - Lewis & Clark Lake	Total	Item No.
21 miles upstream Chamberlain, SD	Near Lake Andes, SD	Near Yankton, SD		1
Mile 987.4	Mile 880.0	Mile 811.1		2
249,330 (1) 5,840	263,480 (1) 14,150	279,480 (1) 16,000		3
80, ending near Pierre, SD	107, ending at Big Bend Dam	25, ending near Niobrara, NE	755 miles	4
200 (elevation 1420)	540 (elevation 1350)	90 (elevation 1204.5)	5,940 miles	5
28,900	30,000 1,100	32,000 2,000		6
440,000 (April 1952)	447,000 (April 1952)	480,000 (April 1952)		7
1959	1946	1952		8
1964	1953	1955		9
1440	1395	1234		10
10,570 (including spillway)	10,700 (including spillway)	8,700 (including spillway)	71,596	11
78	140	45	863 feet	12
95	165	74		13
1200, 700	4300, 1250	850, 450		14
Pierre shale & Niobrara chalk	Niobrara chalk	Niobrara chalk & Carlile shale		15
Rolled earth, shale, chalk fill	Rolled earth fill & chalk berms	Rolled earth & chalk fill		16
17,000,000	28,000,000 & 22,000,000	7,000,000	358,128,000 cu. yds	17
540,000	961,000	308,000	5,554,000 cu. yds.	18
24 July 1963	20 July 1952	31 July 1955		19
Left bank - adjacent	Left bank - adjacent	Right bank - adjacent		20
1385	1346	1180		21
376 gated	1000 gated	664 gated		22
8 - 40' x 38' Tainter	21 - 40' x 29' Tainter	14 - 40' x 30' Tainter		23
390,000 at elev 1433.6	620,000 at elev 1379.3	584,000 at elev 1221.4		24
270,000	508,000	345,000		25
1423 msl 62,000 acres	1375 msl 102,000 acres	1210 msl 29,000 acres	1,206,000 acres	26
1422 msl 60,000 acres	1365 msl 94,000 acres	1208 msl 25,000 acres	1,146,000 acres	27
1420 msl 58,000 acres	1350 msl 76,000 acres	1204.5 msl 21,000 acres	984,000 acres	28
1415 msl 51,000 acres	1320 msl 36,000 acres	1204.5 msl 21,000 acres	437,000 acres	29
1423-1422 61,000 a.f.	1375-1365 986,000 a.f.	1210-1208 54,000 a.f.	4,674,000 a.f.	30
1422-1420 118,000 a.f.	1365-1350 1,306,000 a.f.	1208-1204.5 79,000 a.f.	11,626,000 a.f.	31
	1350-1320 1,532,000 a.f.		38,536,000 a.f.	32
1420-1345 1,631,000 a.f.	1320-1240 1,469,000 a.f.	1204.5-1160 295,000 a.f.	17,592,000 a.f.	33
1423-1345 1,810,000 a.f.	1375-1240 5,293,000 a.f.	1210-1160 428,000 a.f.	72,428,000 a.f.	34
November 1963	January 1953	August 1955		35
25 March 1964	24 November 1953	22 December 1955		36
3,445 a.f./year 525 yrs.	15,800 a.f./year 334 yrs.	2,700 a.f./year 159 yrs.	75,545	37
	Left Bank			38
None (7)	4 - 22' diameter	None (7)		39
	1013			40
	2 - 11' x 23' per conduit, vertical lift, cable suspension			41
1385 (11)	1229	1180 (11)		42
	Elev 1375			43
1351-1355(10) 25,000-100,000 cfs	32,000 cfs - 128,000 cfs 1228-1237 10,000-60,000 cfs	1153-1161 15,000-60,000 cfs		44
70	117	48	764 feet	45
None: direct intake	8 - 28' dia., 22' penstocks	None: direct intake		46
	1,074		55,083	47
None	59' dia, 2 per alternate penstock	None		48
8 Fixed blade, 81.8 rpm	8 Francis, 85.7 rpm	3 Kaplan, 75 rpm	36 units	49
67' 103,000 cfs	112' 44,500 cfs	48' 36,000 cfs		50
67,275 (15)	40,000	44,100		51
517,470	320,000	132,300	2,524,350 kw	52
497,000	293,000	74,000	1,967,000 kw	53
982	1,720	726	9,369 million kWh	54
October 1964 - July 1966	March 1954 - January 1956	September 1956 - January 1957	July 1943 - July 1966	55
$107,498,000	$199,066,000	$49,617,000	$1,166,404,000	56

(1) Includes 4,280 square miles of non-contributing areas.
(2) Includes 1,350 square miles of non-contributing areas.
(3) With pool at base of flood control.
(4) Storage first available for regulation of flows.
(5) Damming height is height from low water to maximum operating pool. Maximum height is from average streambed to top of dam.
(6) Based on latest available storage data.
(7) River regulation is attained by flows over low-crested spillway and through turbines.
(8) Length from upstream face of outlet or to spiral case.
(9) Based on 8th year (1961) of drought drawdown (From study 8-83-1985).
(10) Affected by level of Lake Francis case. Applicable to pool at elevation 1350.
(11) Spillway crest.
(12) 1967-2017 Average
(13) Source: Annual Report on Civil Works Activities of the Corps of Engineers. Extract Report Fiscal Year 1999.
(14) Based on Study 8-83-1985
(15) 67,275 kW on per unit basis 64,684 kW on facility basis

Corps of Engineers, U.S. Army
Compiled by
Northwestern Division
Missouri River Region
August 2019

Plate 3
Summary of Master Manual Technical Criteria

NAVIGATION TARGET FLOWS

Location	Minimum Service (kcfs)	Full Service (kcfs)
Sioux City	25	31
Omaha	25	31
Nebraska City	31	37
Kansas City	35	41

RELATION OF SYSTEM STORAGE TO NAVIGATION SERVICE LEVEL

Date	System Storage (MAF)	Navigation Service Level
March 15	54.5 or more	35,000 cfs (full-service)
March 15	49.0 to 31	29,000 cfs (minimum-service)
March 15	31.0 or less	No navigation service
July 1	57.0 or more	35,000 cfs (full-service)
July 1	50.5 or less	29,000 cfs (minimum-service)

RELATION OF SYSTEM STORAGE TO NAVIGATION SEASON LENGTH

Date	System Storage (MAF)	Final Day of Navigation Support at Mouth of the Missouri River
July 1	51.5 or more	November 30 (8-month season)
July 1	46.8 through 41.0	October 31 (7-month season)
July 1	36.5 or less	September 30 (6-month season)

RELATION OF SYSTEM WINTER RELEASE TO SYSTEM STORAGE

September 1 System Storage (MAF)	Average Winter Release for Gavins Point
58.0 or more	17,000 cfs
55.0 or less	12,000 cfs

Plate 3 (cont'd)
Summary of Master Manual Technical Criteria

GAVINS POINT RELEASES NEEDED TO MEET TARGET FLOWS
1950 to 1996 Data (kcfs)

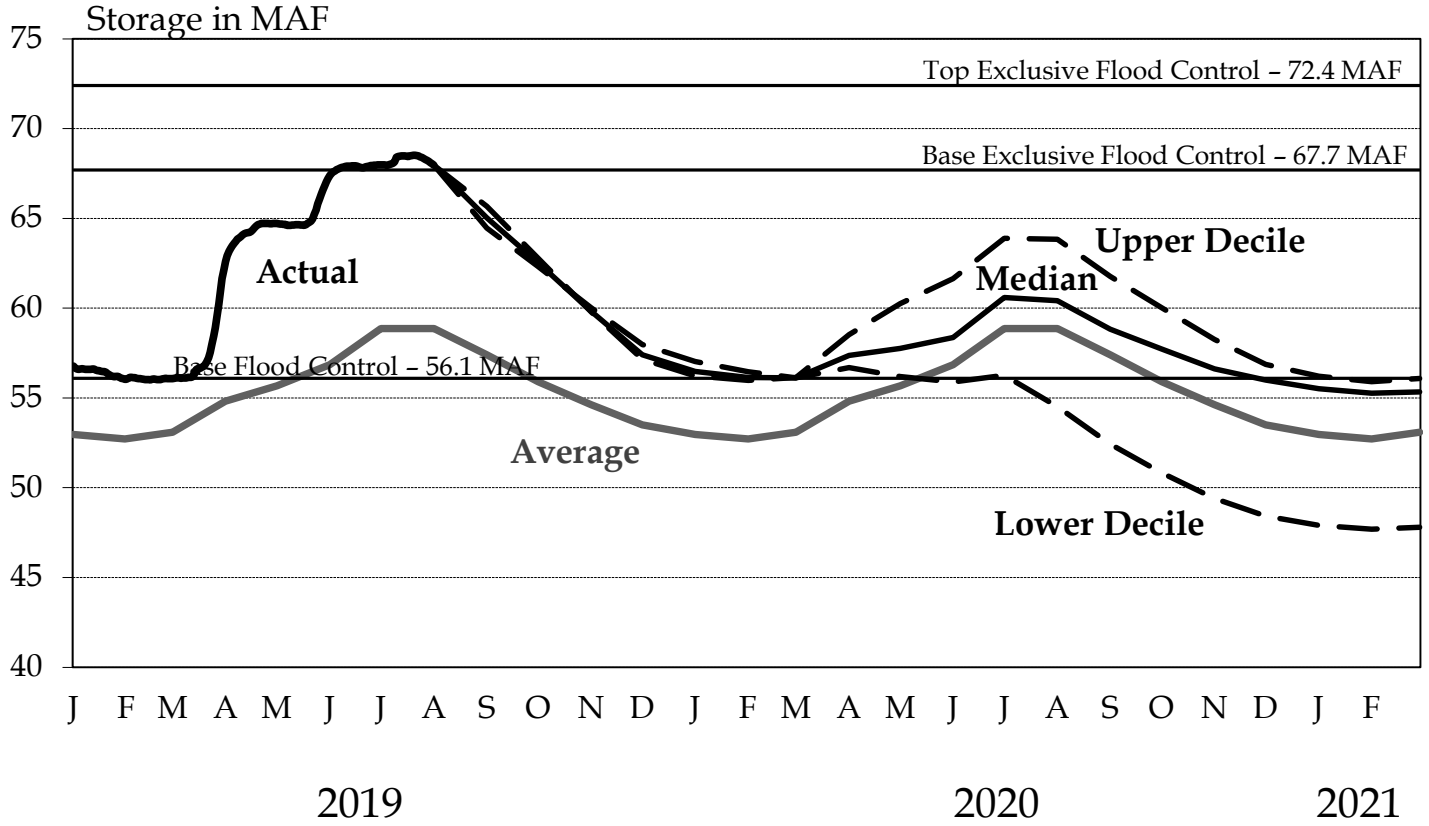
Median, Upper Quartile, Upper Decile Runoff

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
Full Service	26.7	28.0	27.9	31.6	33.2	32.6	32.0	31.1
Minimum Service	20.7	22.0	21.9	25.6	27.2	26.6	26.0	25.1

Lower Quartile, Lower Decile Runoff

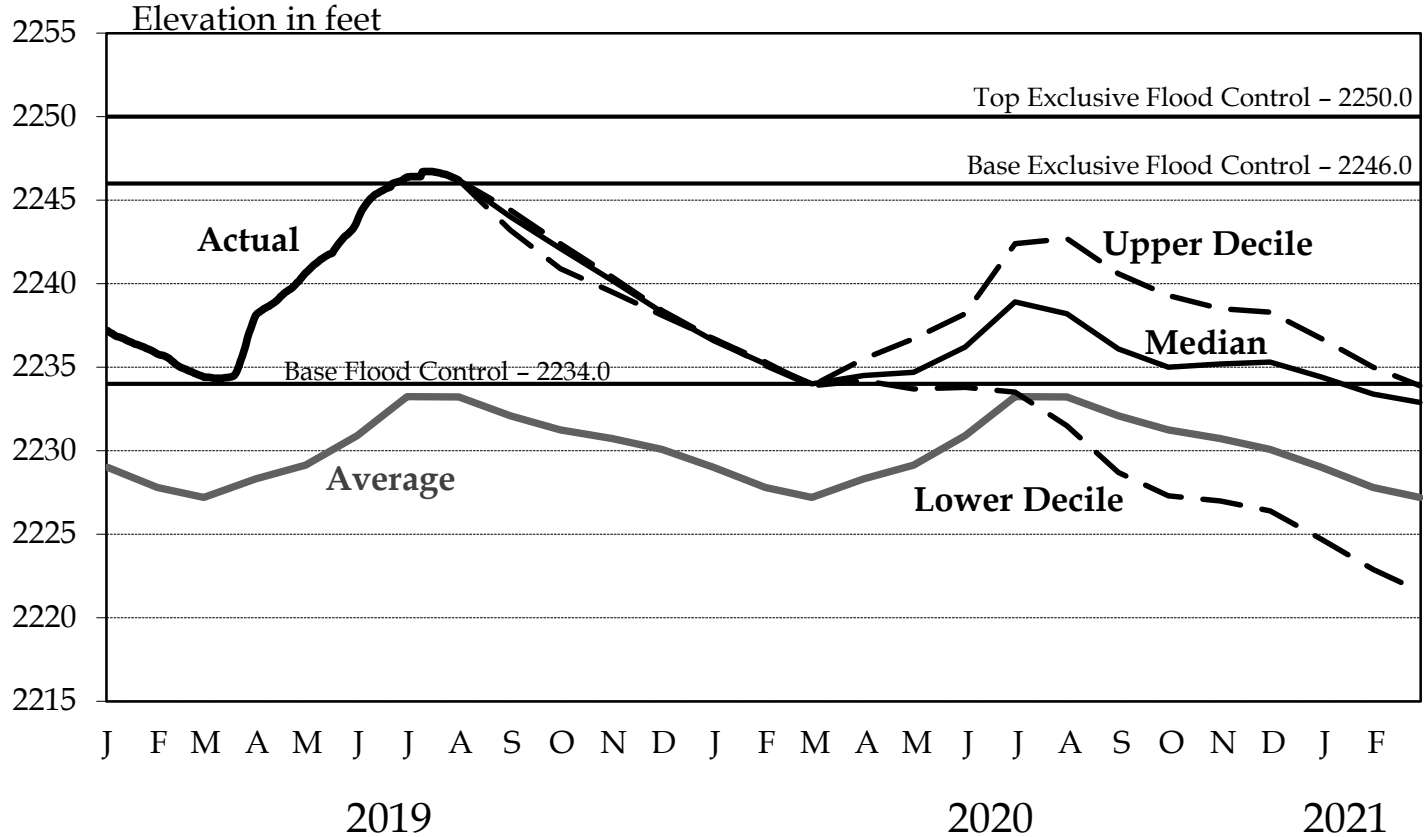
	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
Full Service	29.8	31.3	31.2	34.3	34.0	33.5	33.1	31.2
Minimum Service	23.8	25.3	25.2	28.3	28.0	27.5	27.1	25.2

System Storage
2019-2020 AOP



Average 1967-2018

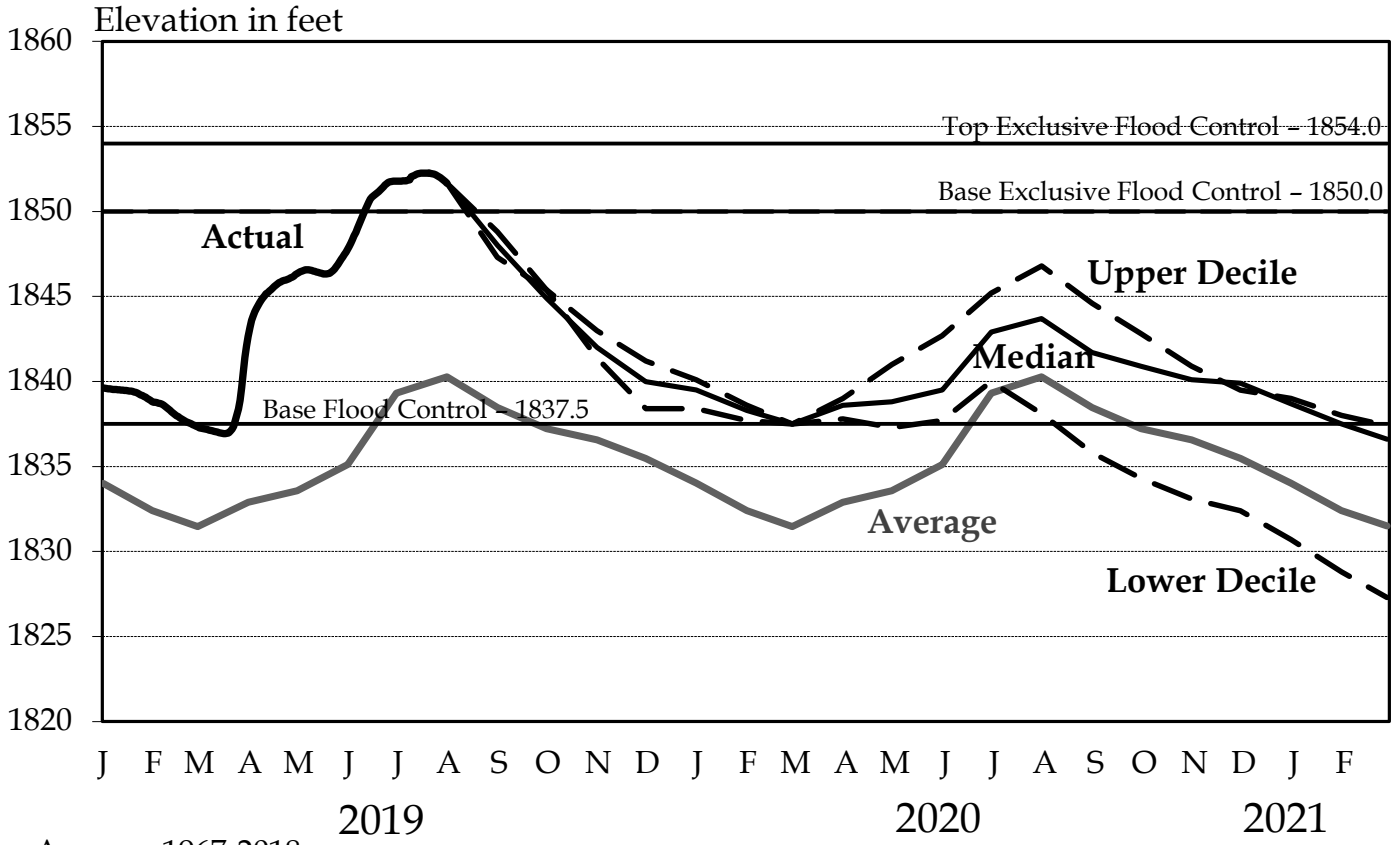
Fort Peck
2019-2020 AOP



Average 1967-2018

Garrison

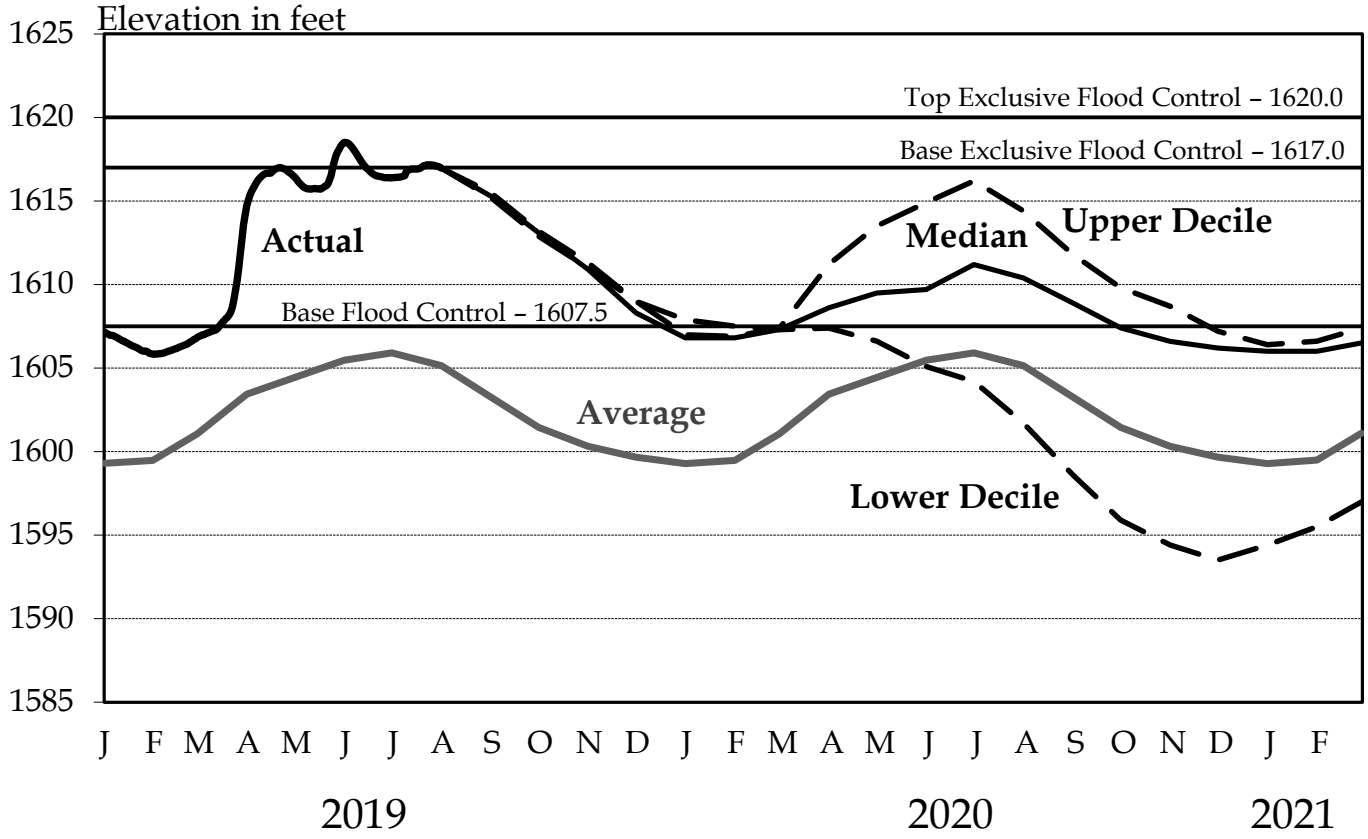
2019-2020 AOP



Average 1967-2018

Oahe

2019-2020 AOP



Average 1967-2018

System Storage

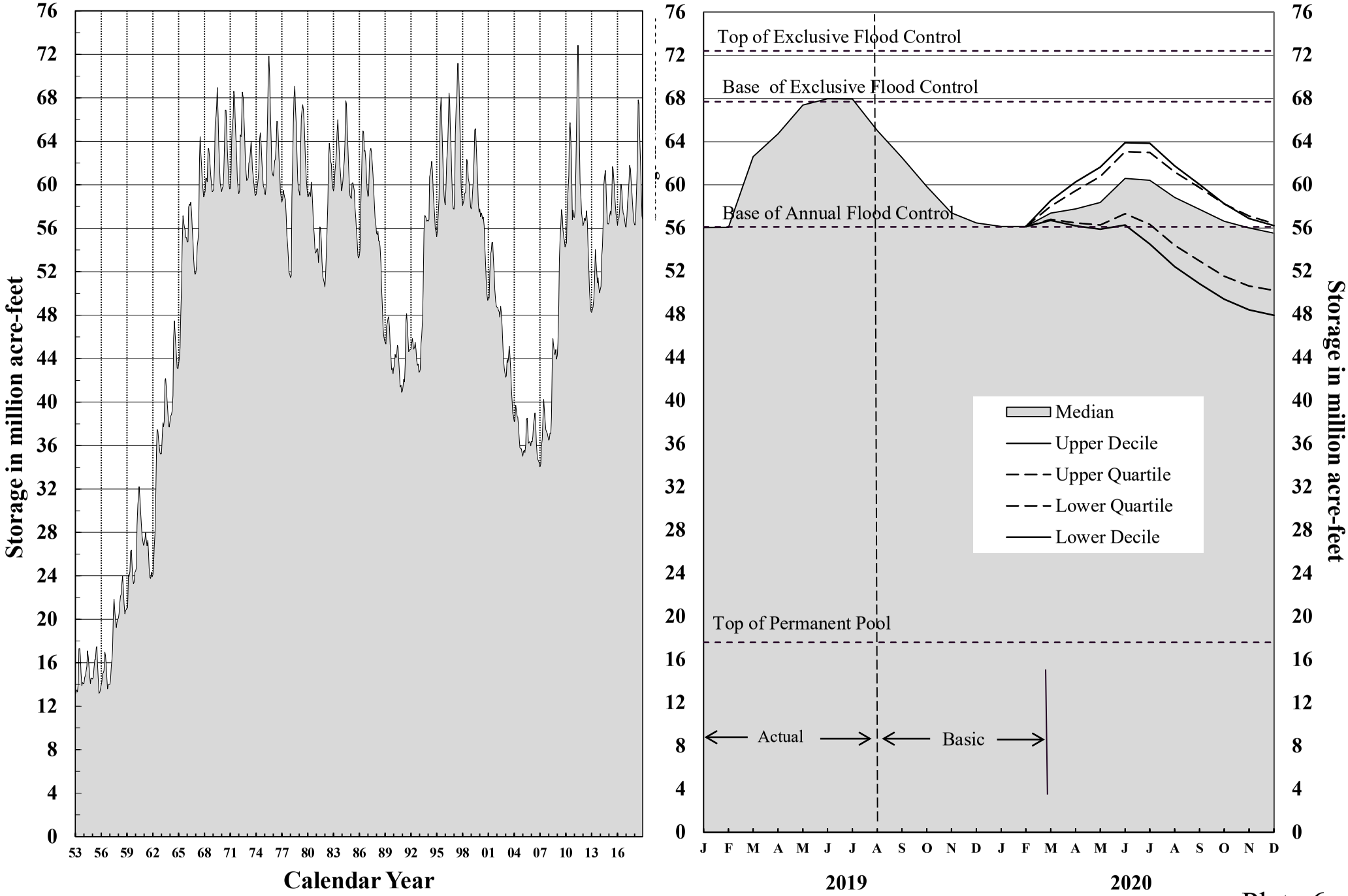


Plate 6

Gavins Point Releases

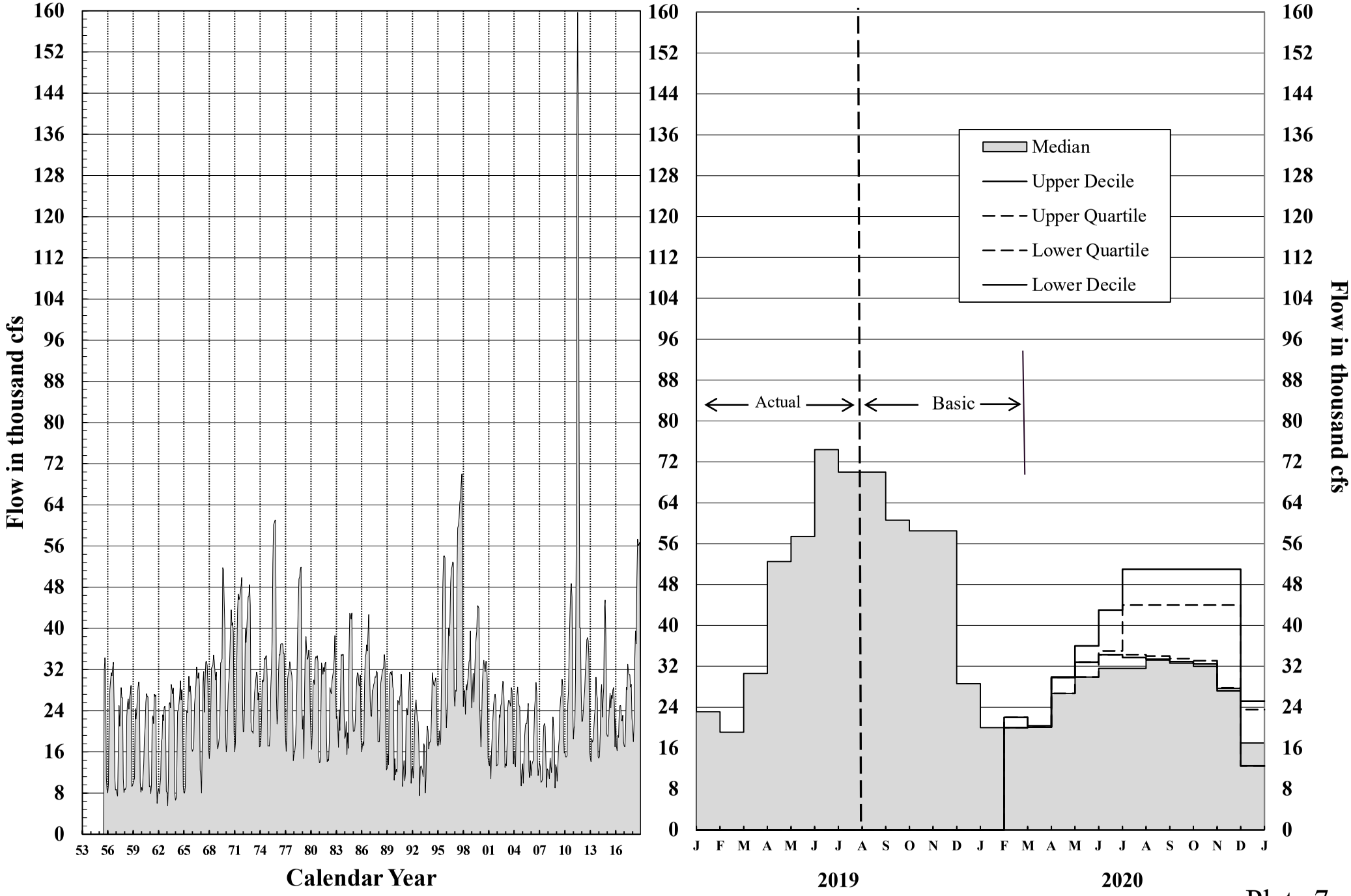
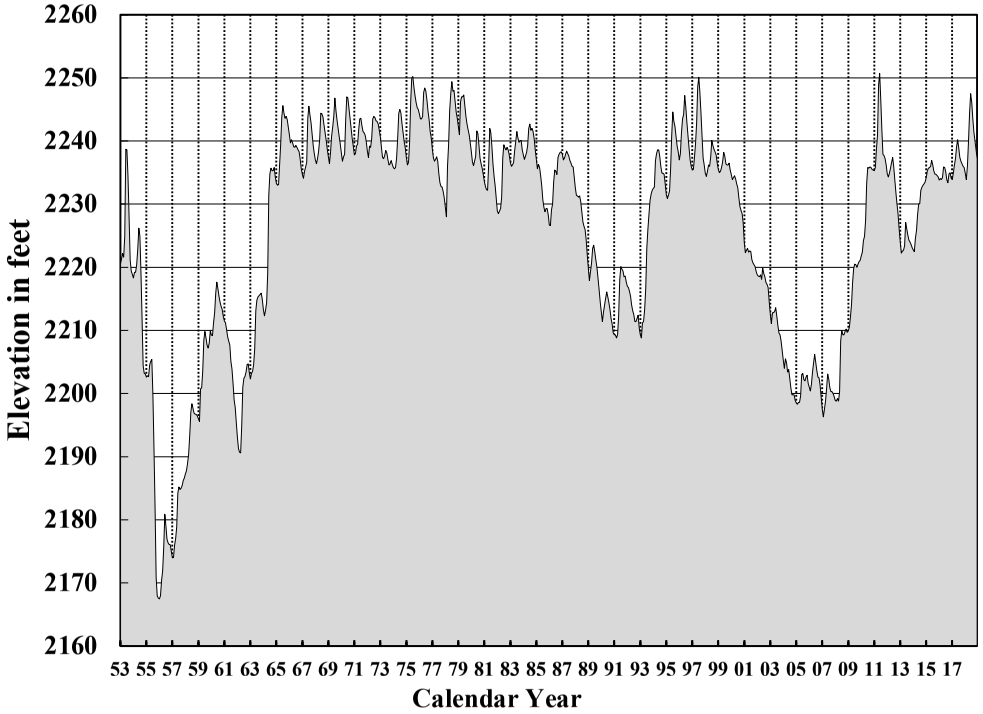
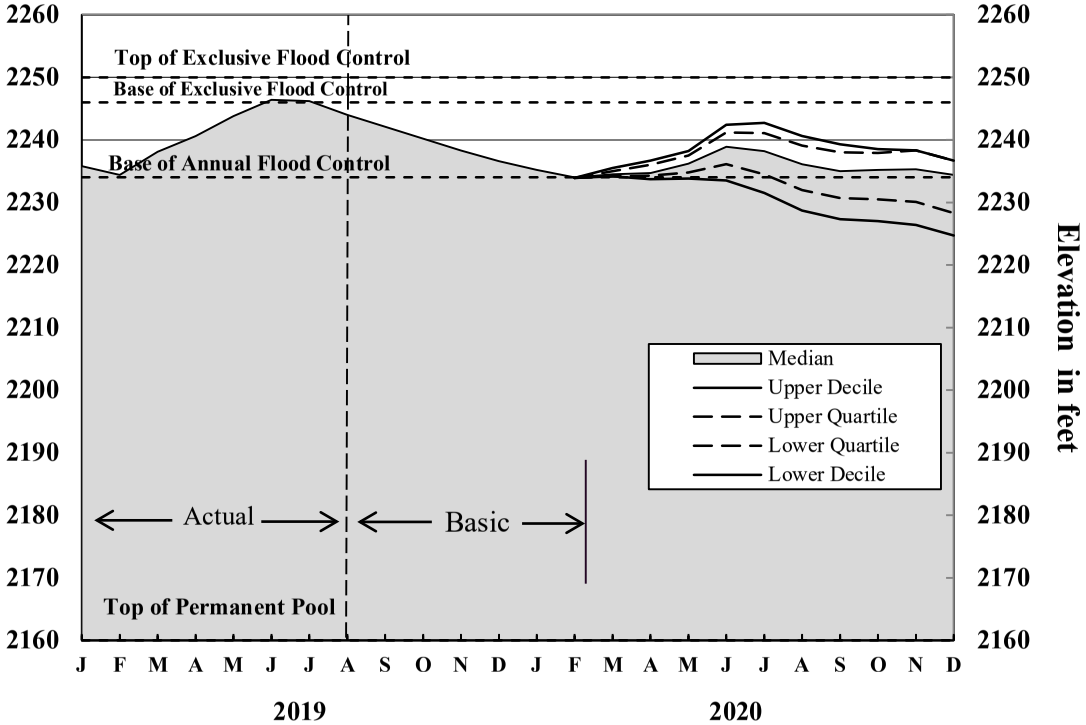
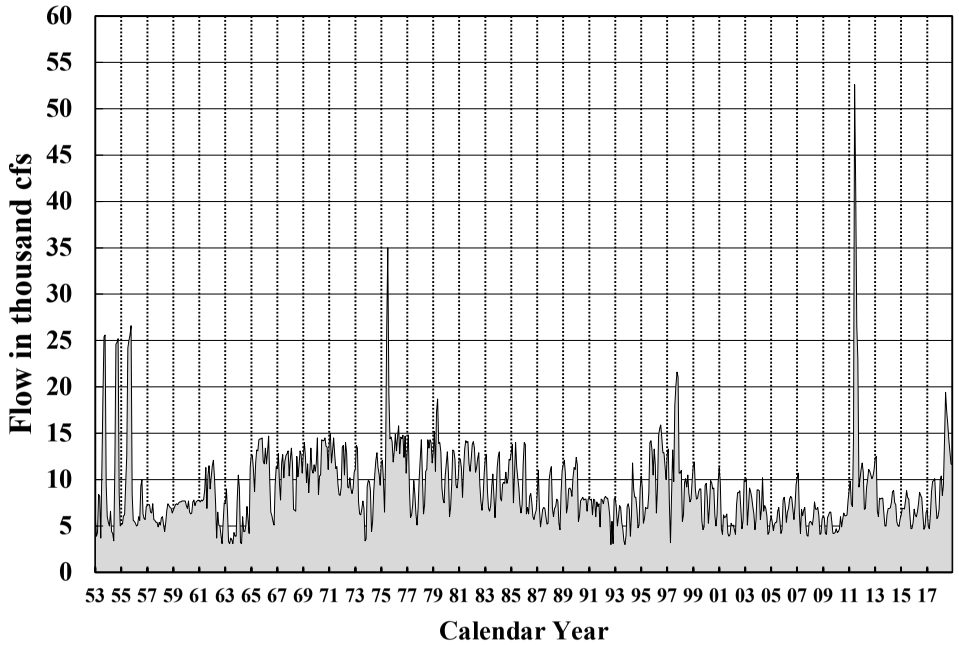


Plate 7

Fort Peck
Elevations and Releases







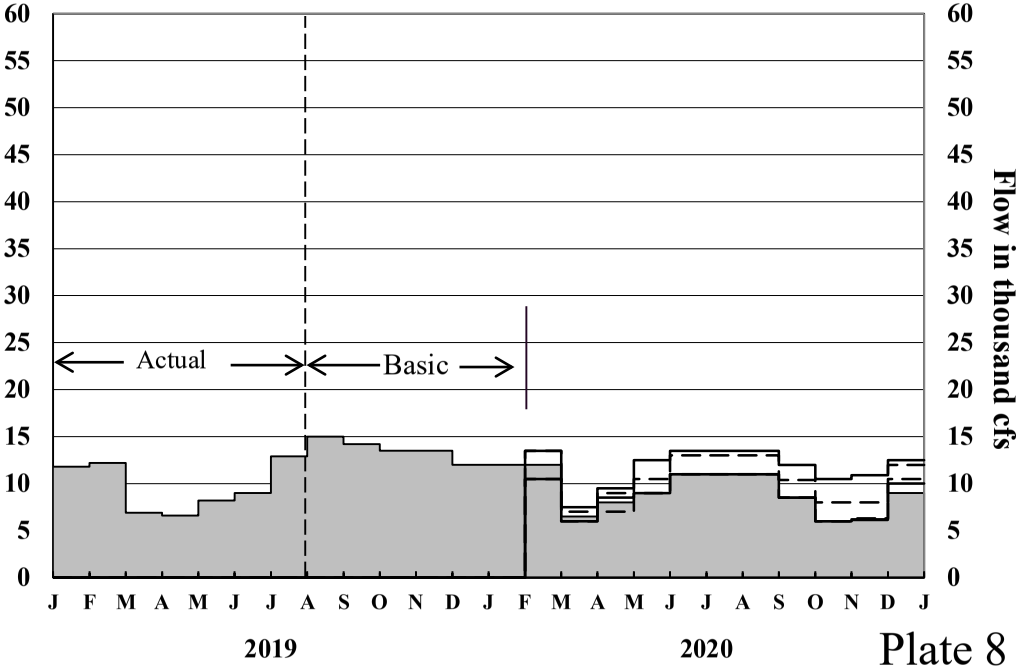
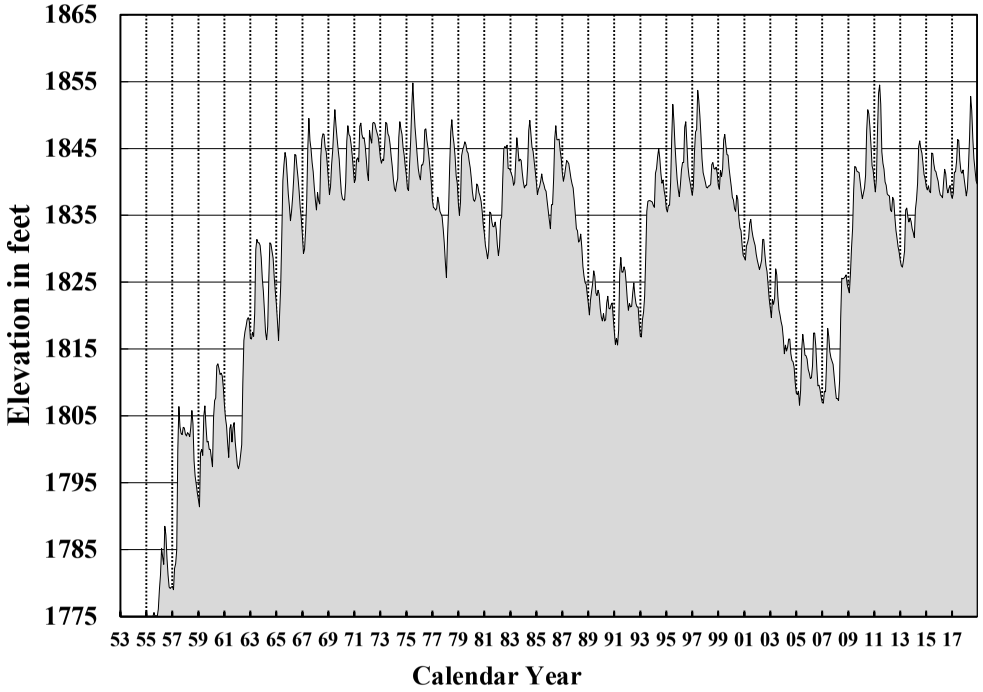
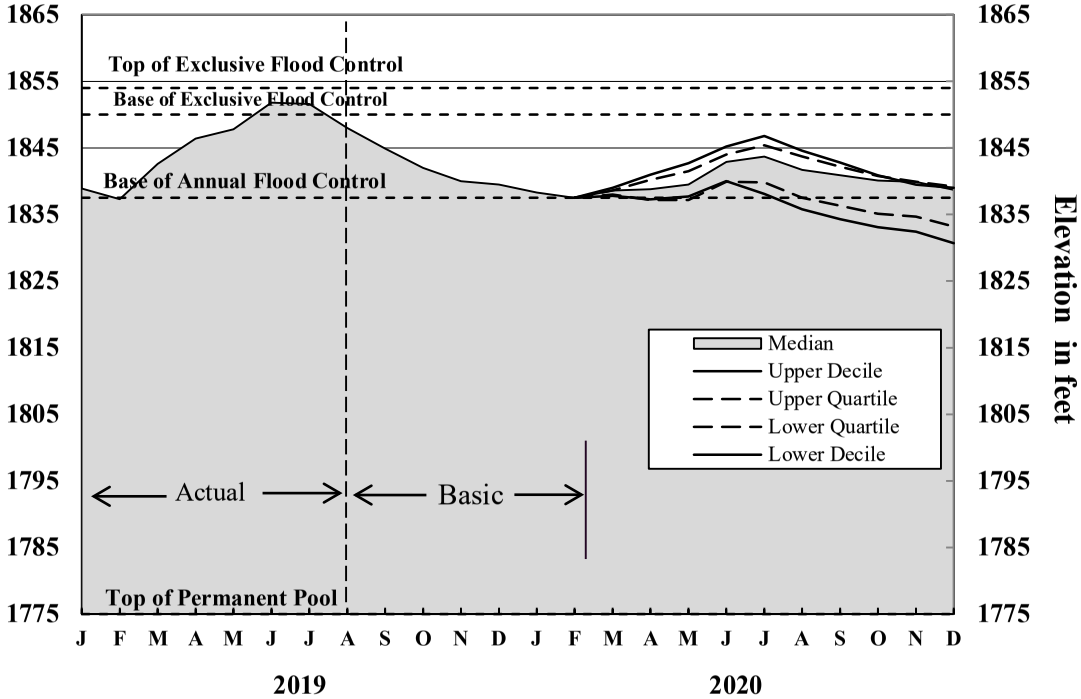
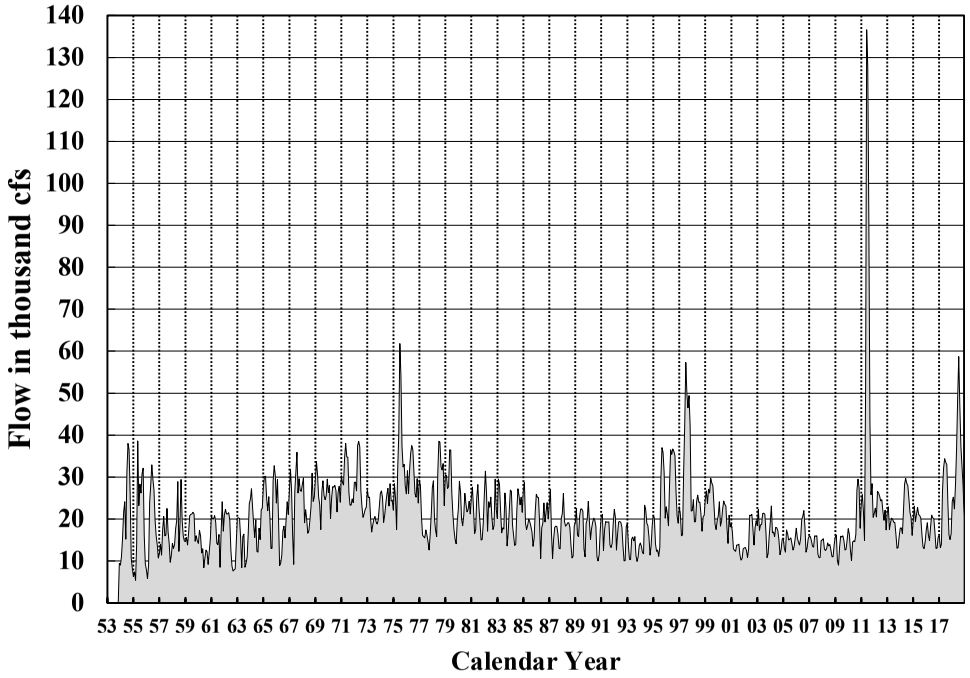


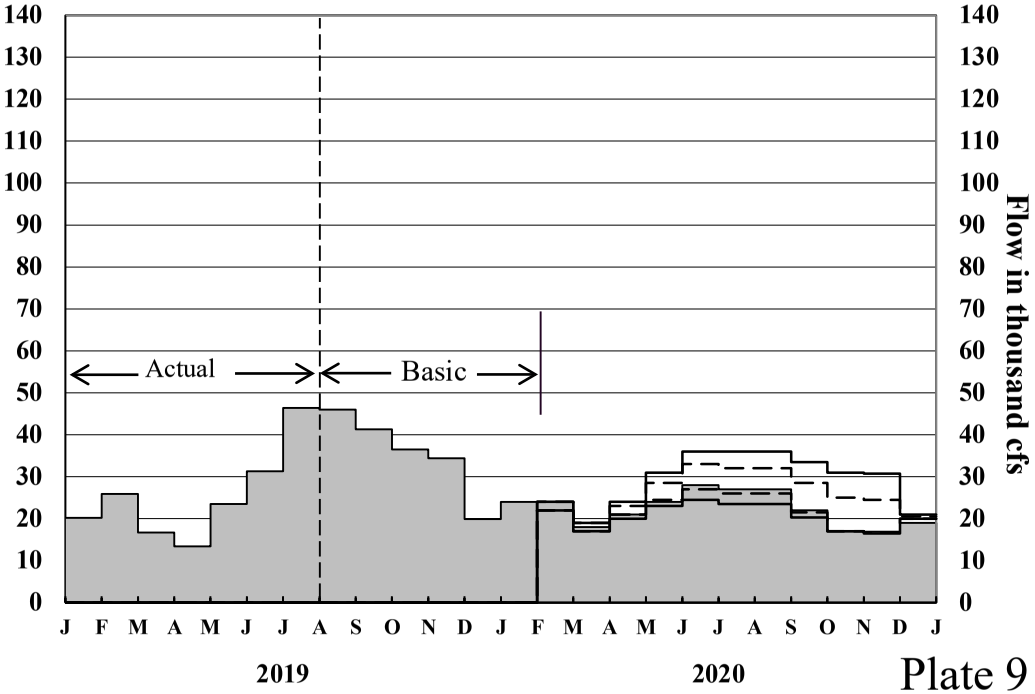
Plate 8

Garrison
Elevations and Releases



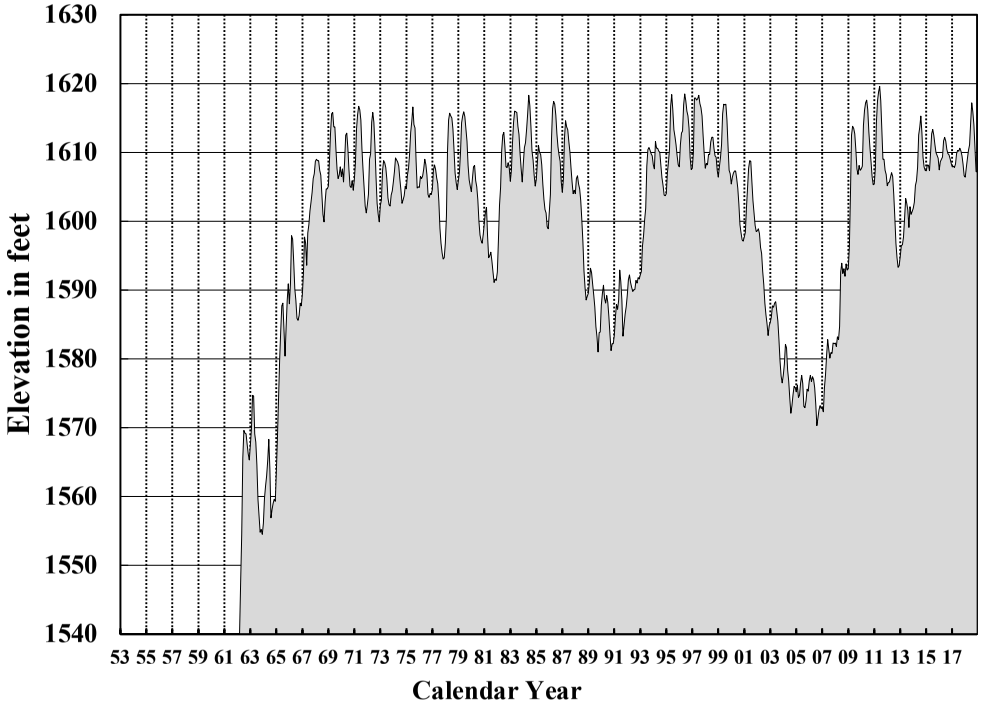


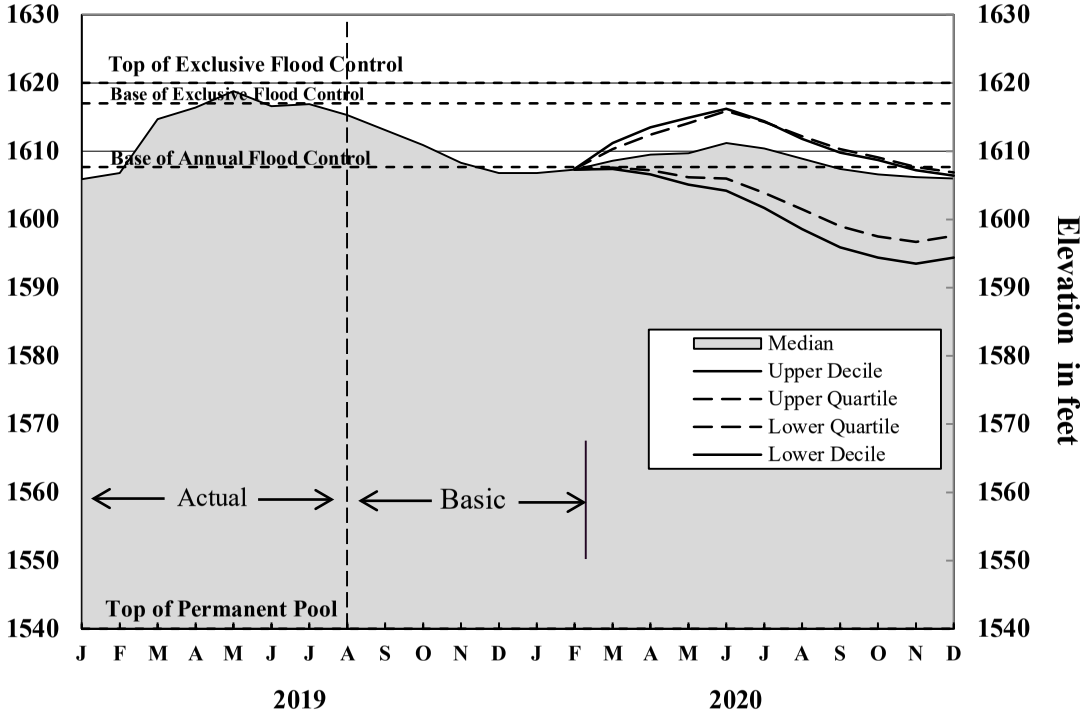


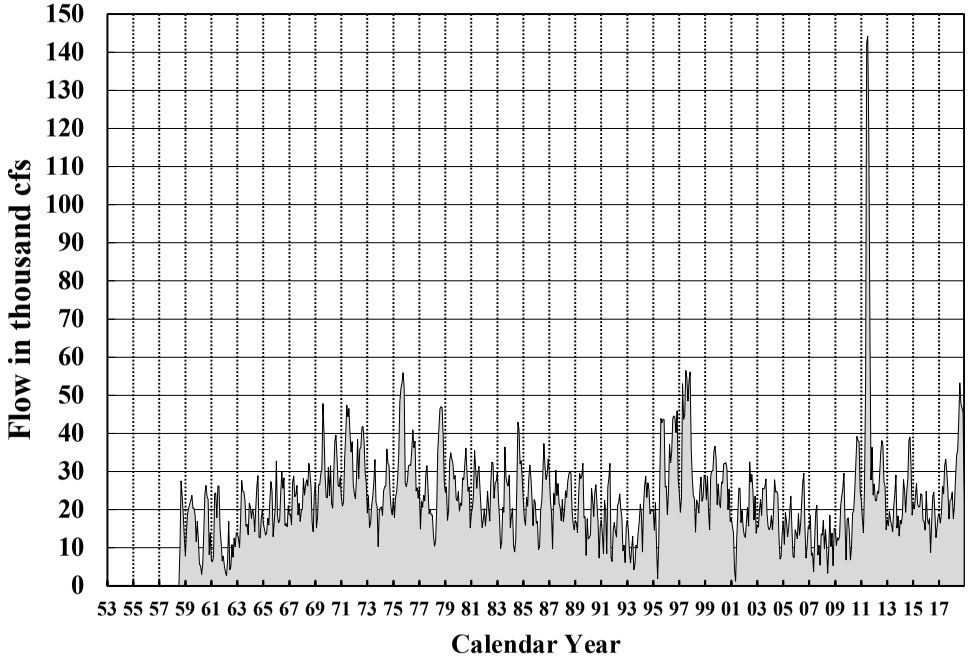


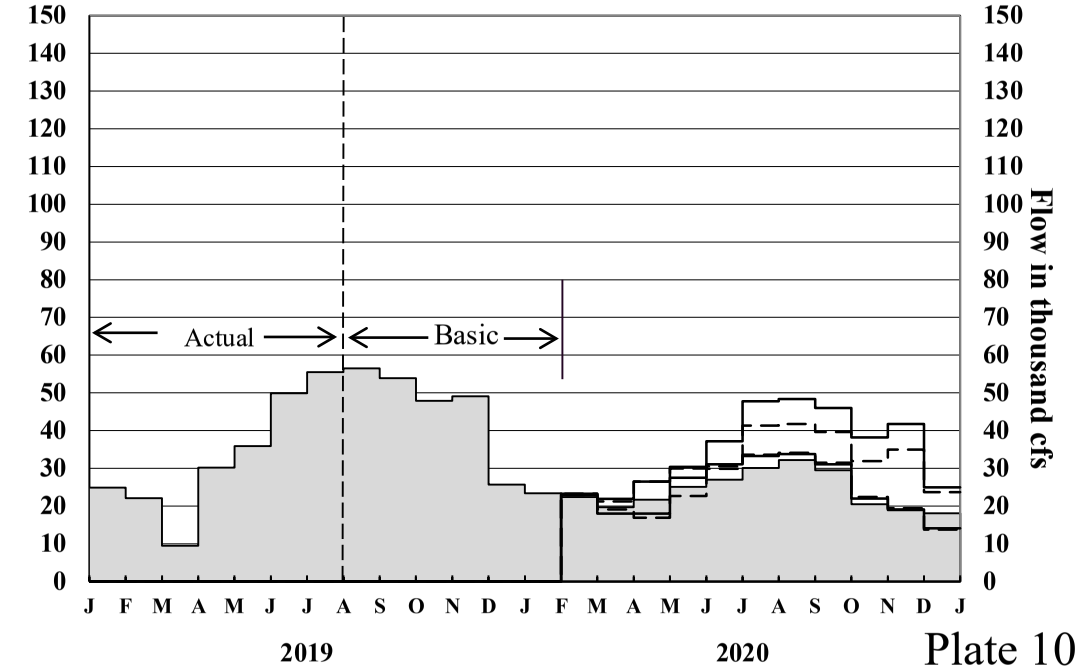
Oahe

Elevations and Releases

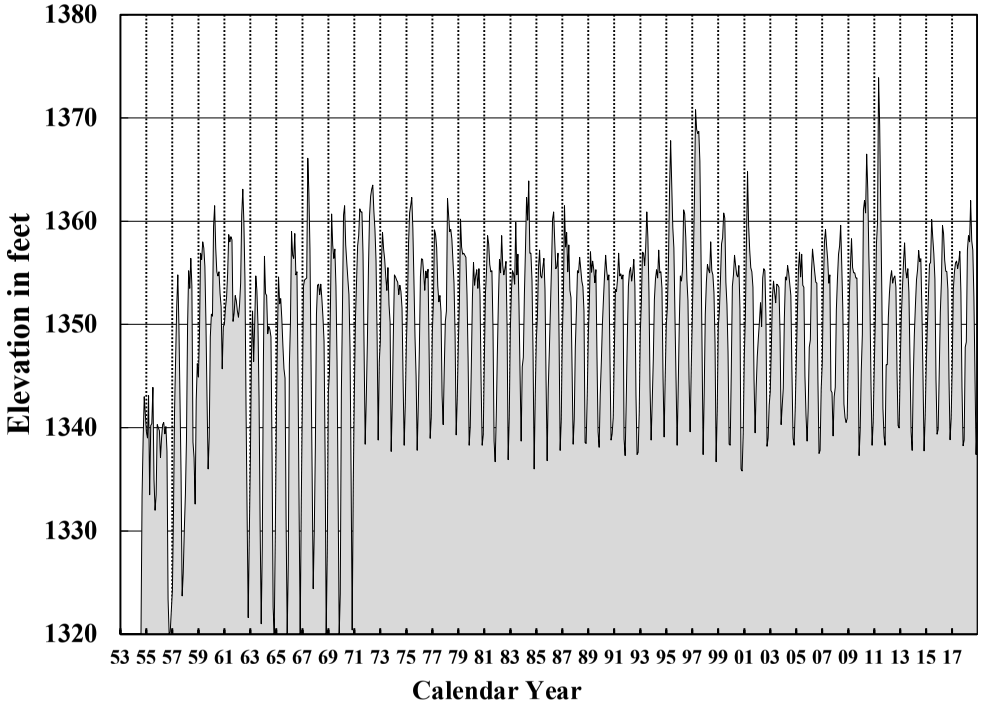


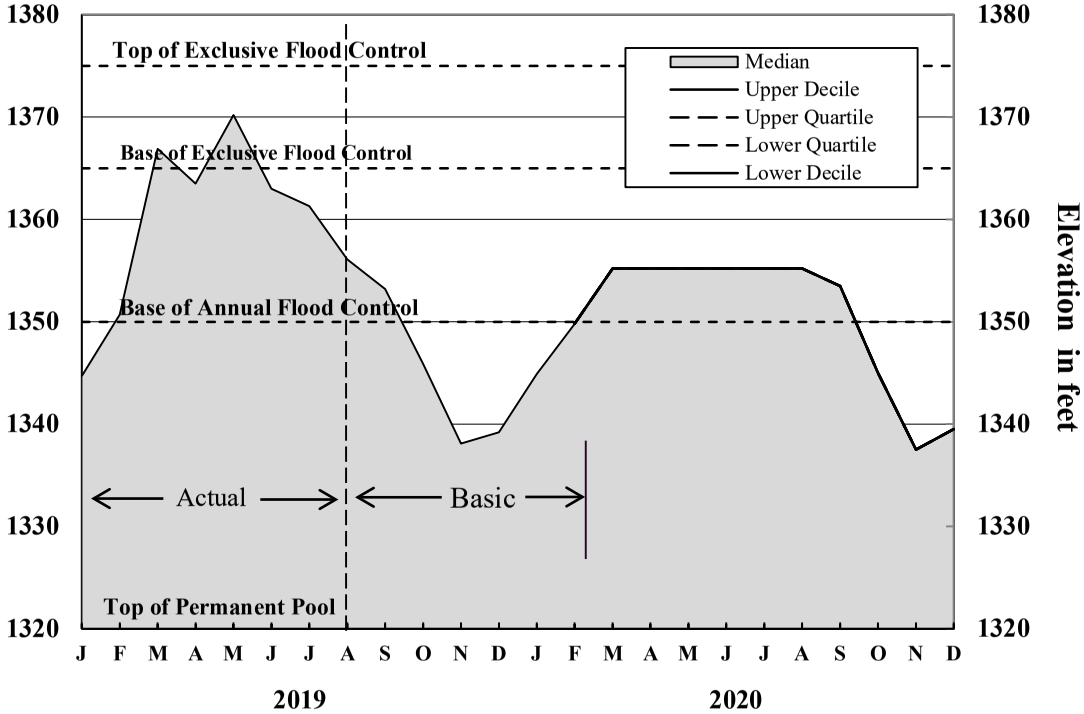


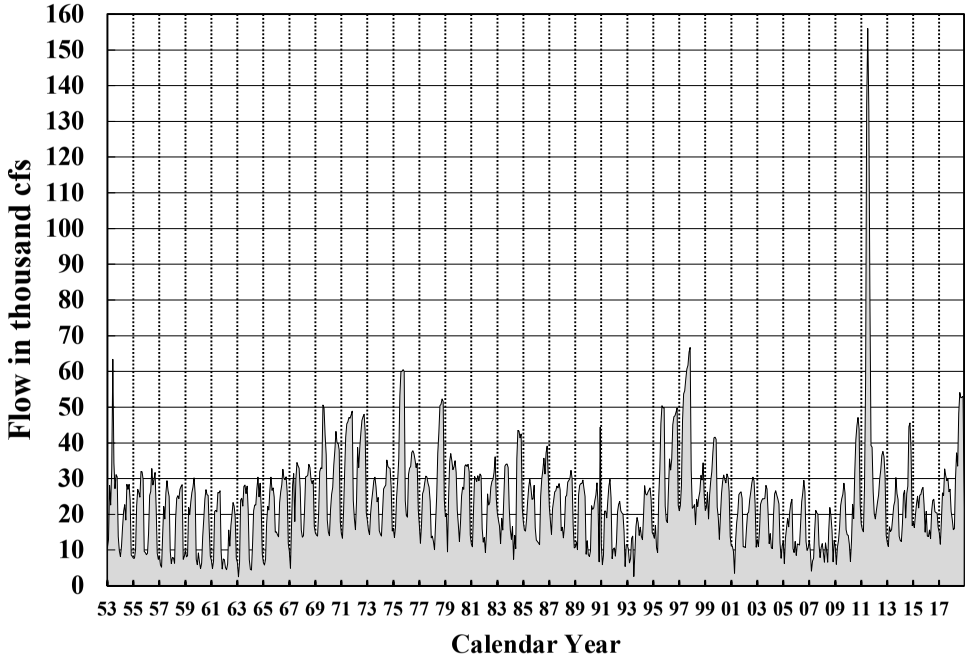


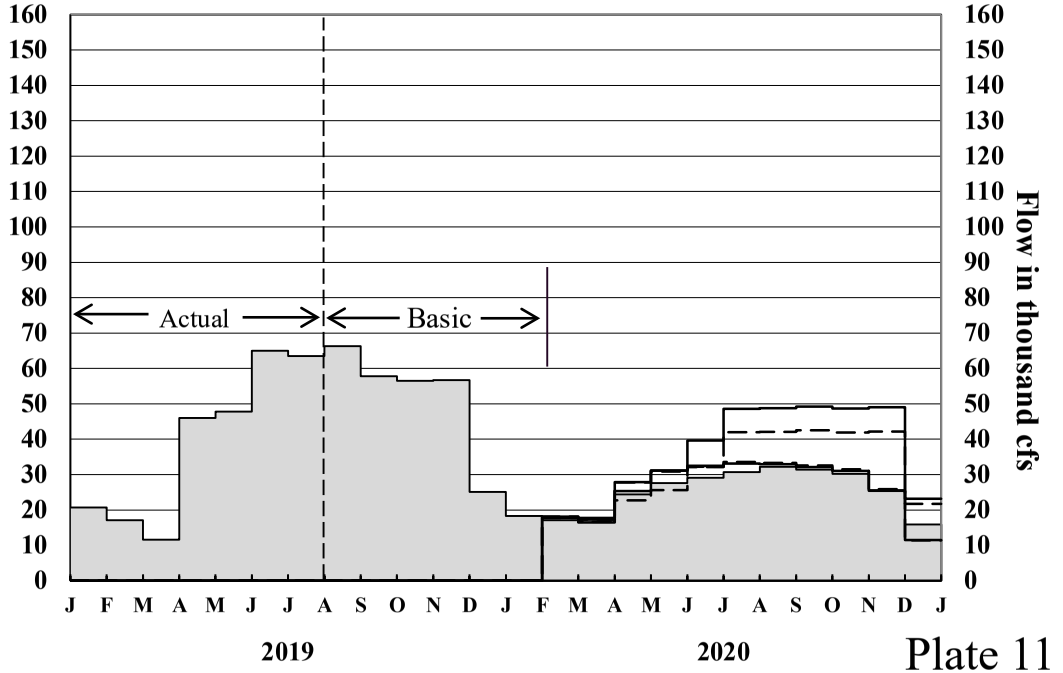


Fort Randall
Elevations and Releases

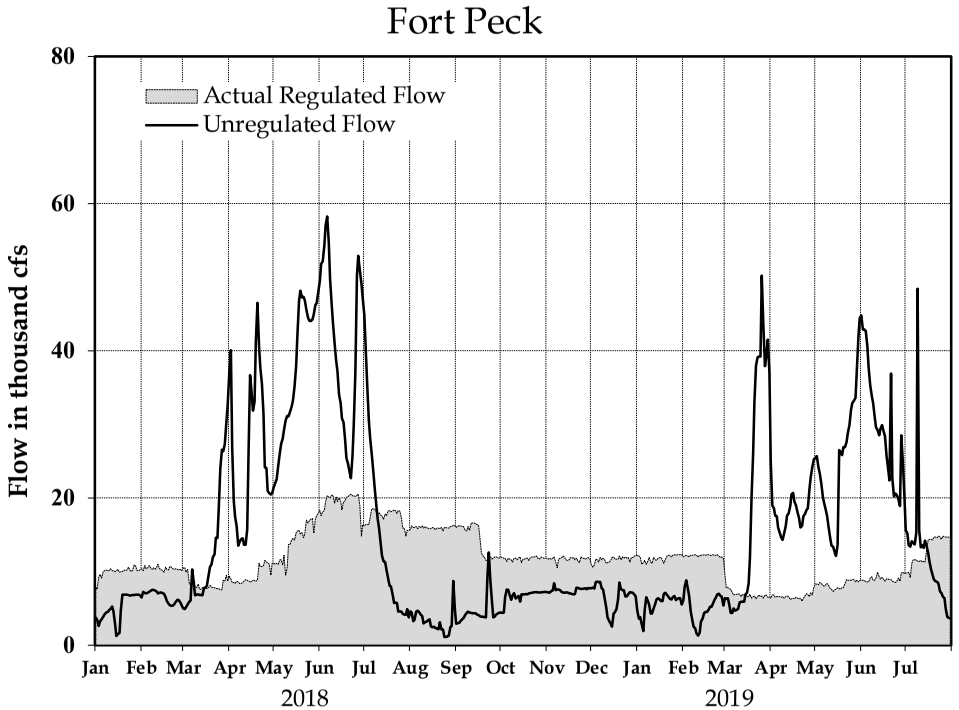


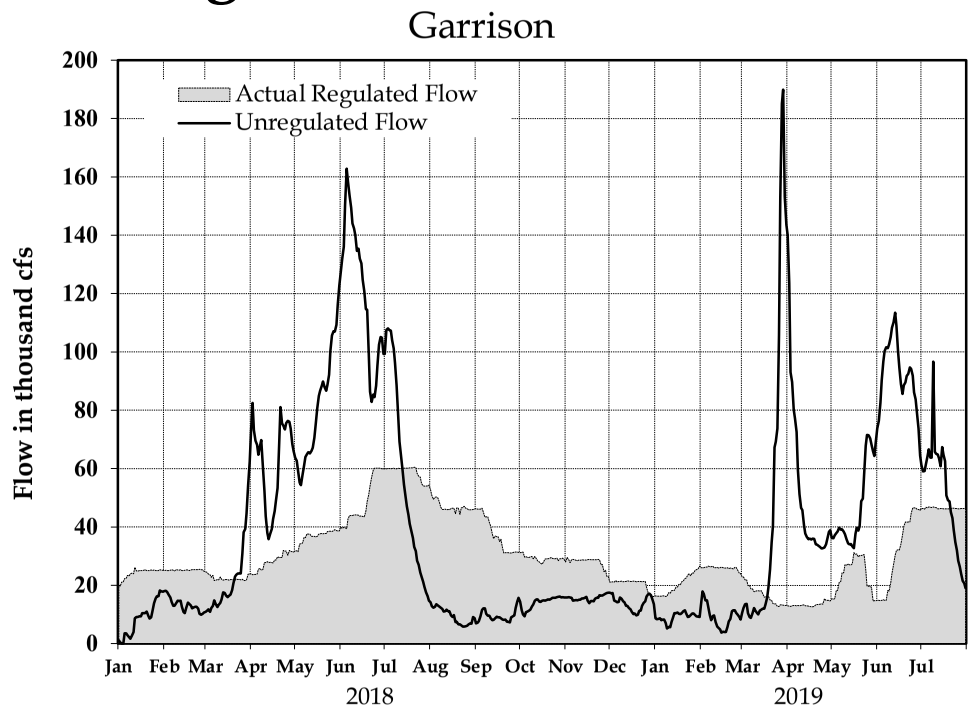


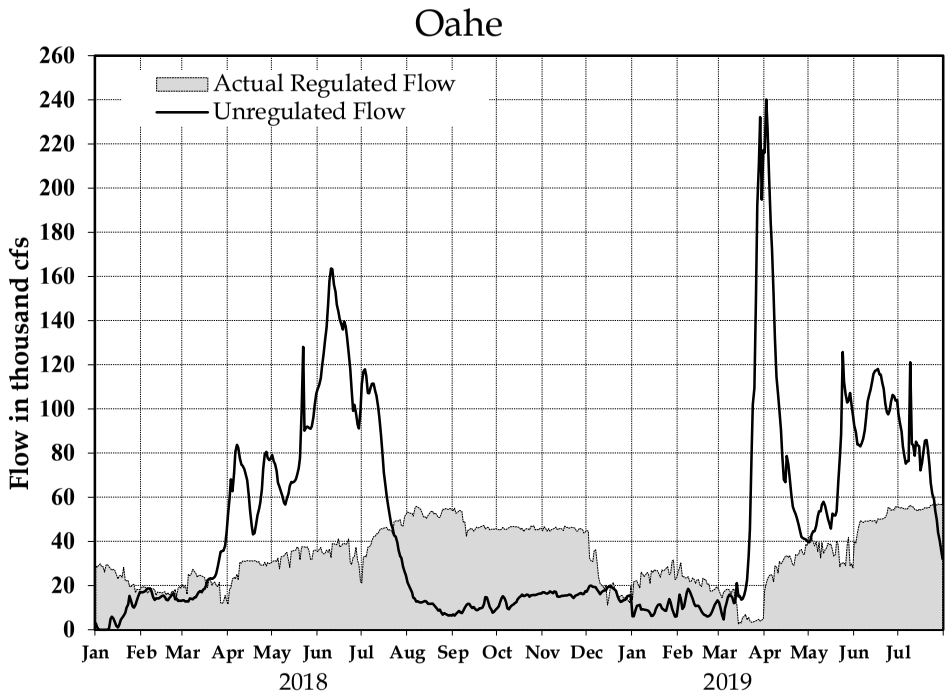


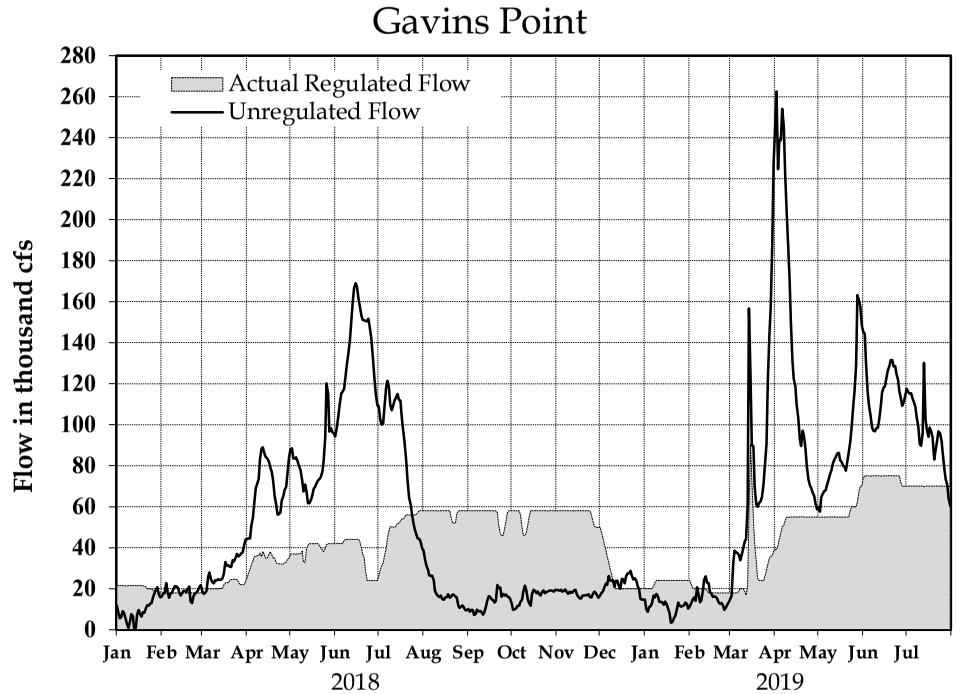


Reservoir Release and Unregulated Flow









System Gross Capability and Average Monthly Generation

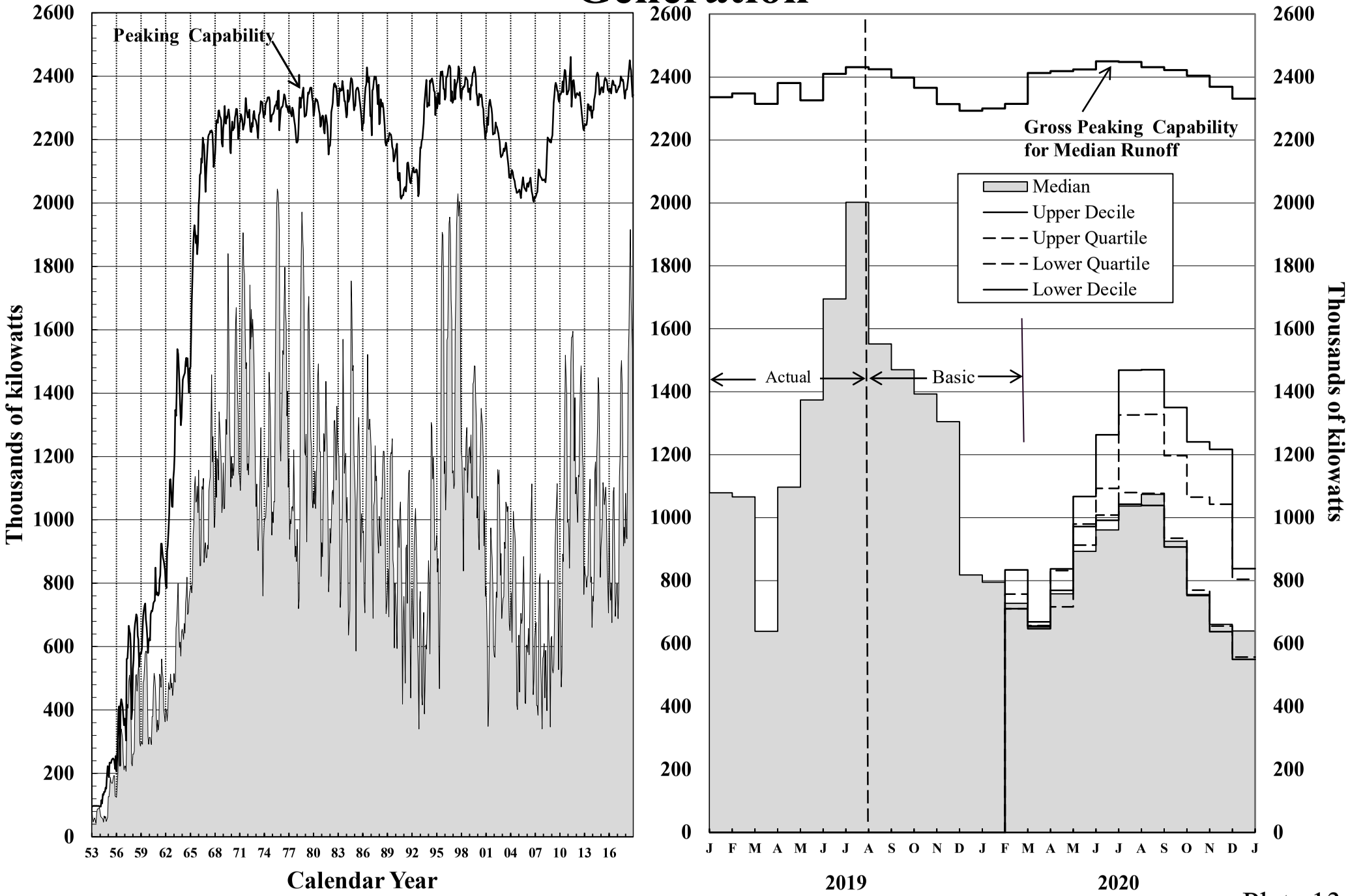


Plate 13

Tentative Five Year Extensions of 2019-2020 AOP

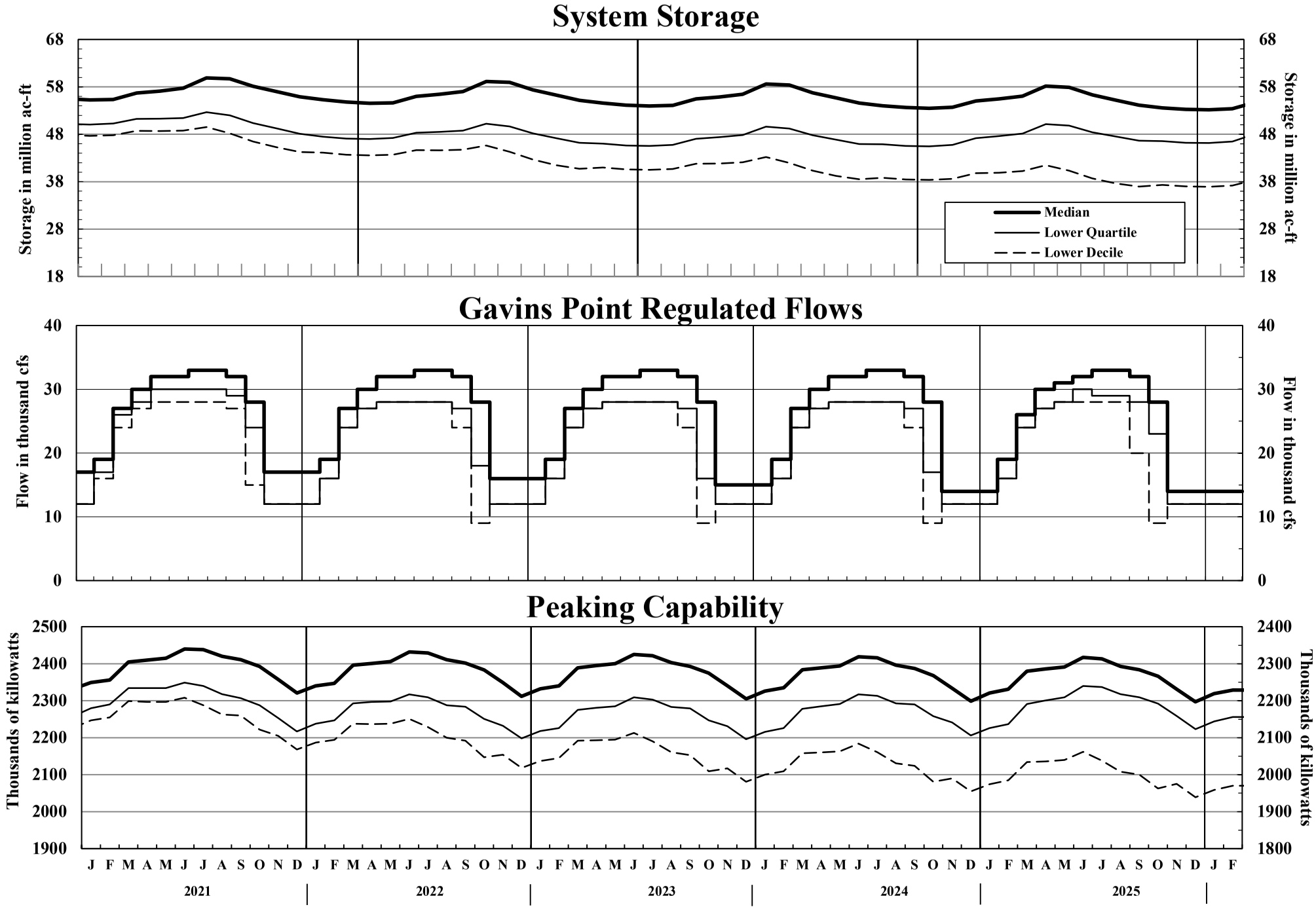


Plate 14

Tentative Five Year Extensions of 2019-2020 AOP

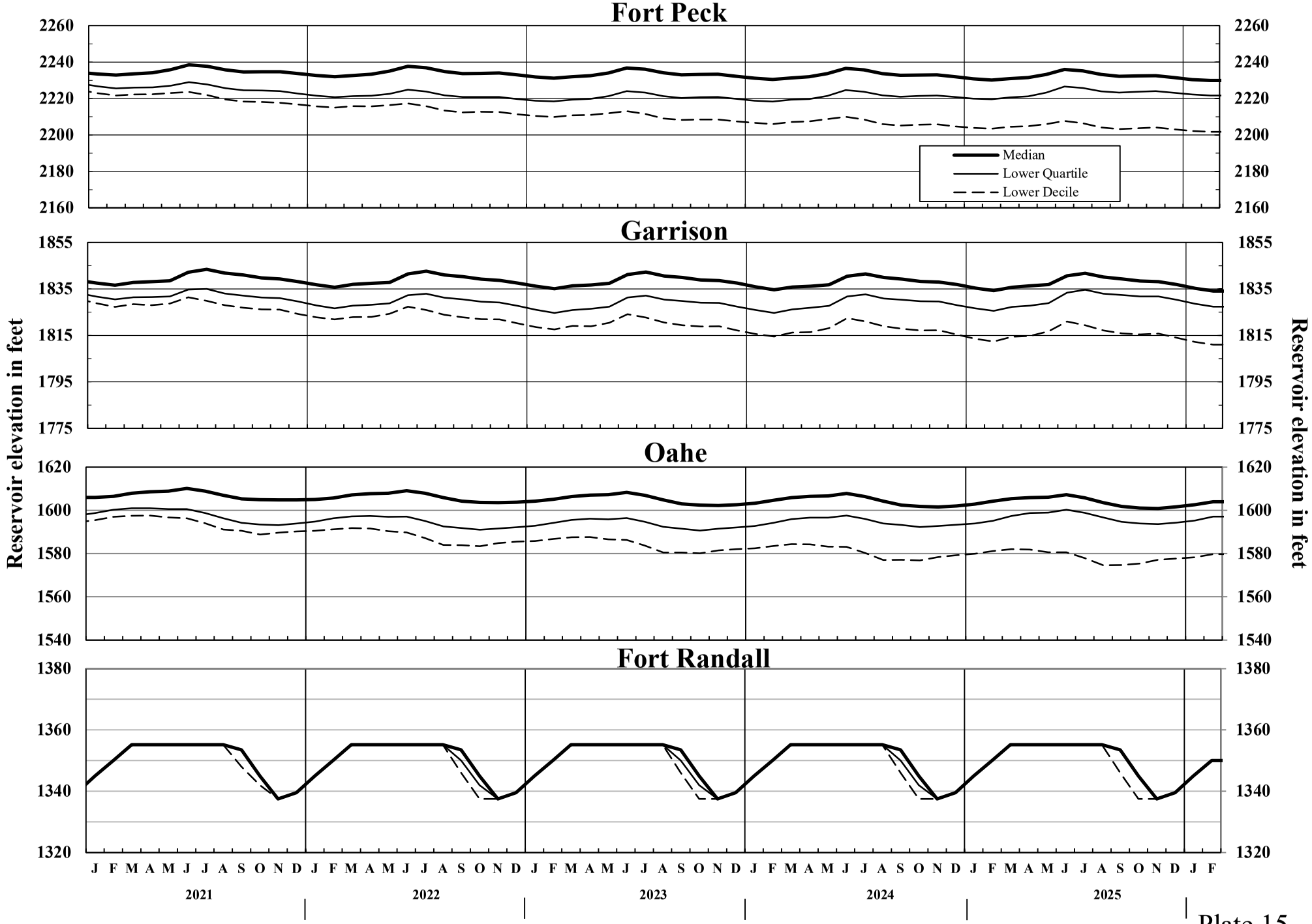


Plate 15

Tribal Lands of the Missouri River Basin

US Army Corps of Engineers ®

RESERVATIONS
1. Rocky Boy
2. Fort Belknap
3. Fort Peck
4. Fort Berthold
5. Turtle Mountain
6. Fort Totten
7. Red Lake
8. Nett Lake
9. White Earth
10. Leech Lake
11. Fond du Lac
12. Bad River
13. Lac Courte Oreilles
14. Lac du Flambeau
15. Crow
16. Northern Cheyenne
17. Standing Rock
18. Cheyenne River
19. Sisseton
20. Wind River
21. Pine RIdge
22. Rosebud
23. Lower Brule
24. Crow Creek
25. Yankton
26. Winnebago
27. Omaha
28. Potawatomi
29. Ute Mountain
30. Southern Ute
31. Flathead
32. Blackfeet
33. Santee
34. Flandreau
35. Iowa
36. Sac and Fox
37. Kickapoo

Plate 16

Date of Study: 22Nov2019 **01Aug2019 / Basic Condition / 52.9 MAF / Balanced**
Values in 1000 acre-ft Except as Indicated
F-Sum: Sum of Forecasted Values. *: Previous Month's Data

	2019 *31Jul F-Sum	31Aug	30Sep	31Oct	30Nov	31Dec	2020 31Jan	29Feb
Fort Peck								
Reach Inflow	2533	440	330	380	380	327	312	364
Depletion	-715	-56	-186	-110	-59	-103	-119	-82
Reg Inflow	3248	496	516	490	439	430	430	446
Evap	428	94	111	81	78	53	7	4
Release	5570	922	848	830	803	738	738	690
Stor Change	-2753	-523	-443	-421	-442	-361	-314	-248
Storage	*17538	17015	16572	16151	15709	15348	15033	14785
Elev NGVD29	*2246.2	2244.0	2242.1	2240.2	2238.3	2236.6	2235.2	2234.0
Disch kcfs	*12.9	15.0	14.2	13.5	13.5	12.0	12.0	12.0
Ave Power MW		188	183	179	177	156	155	154
Ave Cap MW		231	228	226	224	222	220	219
Energy GWh	656.5	140.0	132.1	133.1	127.7	116.4	115.6	107.5
Garrison								
Reach Inflow	3133	830	500	533	391	253	264	362
Depletion	-680	145	-157	-55	-305	-134	-97	-77
Reg Inflow	9405	1604	1517	1418	1499	1138	1099	1130
Evap	569	109	140	132	113	76	-2	0
Release	13656	2828	2457	2244	2047	1224	1476	1380
Stor Change	-4824	-1337	-1079	-958	-661	-162	-375	-251
Storage	*22568	21232	20152	19194	18533	18371	17996	17745
Elev NGVD29	*1851.7	1848.0	1844.9	1842.0	1840.0	1839.5	1838.3	1837.5
Disch kcfs	*46.4	46.0	41.3	36.5	34.4	19.9	24.0	24.0
Ave Power MW		567	521	474	441	258	308	306
Ave Cap MW		567	562	557	552	551	545	539
Energy GWh	1589.5	421.5	375.5	352.3	317.6	191.9	229.2	213.3
Oahe								
Reach Inflow	682	300	125	71	68	5	13	100
Depletion	226	141	33	-14	1	14	20	31
Reg Inflow	14191	2989	2582	2329	2171	1202	1469	1450
Evap	579	94	144	129	111	87	9	5
Release	16854	3474	3207	2942	2924	1578	1441	1287
Stor Change	-3245	-583	-769	-742	-864	-463	19	157
Storage	*21858	21275	20506	19764	18900	18437	18456	18614
Elev NGVD29	*1617.0	1615.3	1613.1	1610.9	1608.3	1606.8	1606.8	1607.3
Disch kcfs	*55.5	56.5	53.9	47.9	49.1	25.7	23.4	22.4
Ave Power MW		721	683	601	607	318	291	279
Ave Cap MW		773	761	745	727	698	697	699
Energy GWh	2124.6	536.7	492.0	447.3	437.2	236.2	216.5	194.0
Big Bend								
Reg Inflow	16867	3474	3210	2943	2924	1588	1440	1288
Evap	76	23	21	15	10	5	1	0
Release	16791	3460	3171	2948	2903	1580	1457	1272
Storage	*1674	1664	1682	1661	1672	1675	1658	1674
Elev NGVD29	*1420.7	1420.6	1420.9	1420.5	1420.7	1420.8	1420.5	1420.7
Disch kcfs	*51.9	56.3	53.3	48.0	48.8	25.7	23.7	22.1
Ave Power MW		220	209	190	193	107	99	93
Ave Cap MW		375	378	383	382	409	410	412
Energy GWh	659.7	163.6	150.8	141.5	139.1	79.5	74.0	64.9
Fort Randall								
Reach Inflow	369	200	60	4	4	12	31	58
Depletion	35	15	7	1	2	3	3	3
Reg Inflow	17153	3642	3228	2950	2911	1604	1484	1334
Evap	114	28	34	30	15	6	1	1
Release	18020	4075	3441	3475	3373	1543	1127	986
Stor Change	-982	-461	-247	-555	-476	55	356	347
Storage	*3966	3504	3257	2702	2226	2281	2637	2984
Elev NGVD29	*1361.3	1356.1	1353.2	1345.9	1338.1	1339.2	1344.9	1349.8
Disch kcfs	*63.5	66.3	57.8	56.5	56.7	25.1	18.3	17.1
Ave Power MW		292	340	322	287	175	144	142
Ave Cap MW		354	342	327	301	286	301	319
Energy GWh	1173.2	217.5	244.7	239.6	206.8	130.4	107.2	99.0
Gavins Point								
Reach Inflow	984	250	150	130	120	100	100	134
Depletion	27	10	-5	1	10	10	1	-0
Reg Inflow	19134	4307	3633	3603	3485	1760	1230	1115
Evap	23	5	6	6	4	2	0	0
Release	19126	4304	3605	3597	3481	1758	1230	1150
Stor Change	-15	-2	22	-0	0	-1	-0	-35
Storage	*342	340	362	362	363	362	362	327
Elev NGVD29	*1206.6	1206.6	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
Disch kcfs	*70.0	70.0	60.6	58.5	58.5	28.6	20.0	20.0
Ave Power MW		98	104	107	107	86	71	71
Ave Cap MW		126	127	127	127	127	127	126
Energy GWh	345.6	73.1	75.2	79.5	77.0	63.6	52.8	49.1
Sioux City								
Reach Inflow	1775	590	400	300	200	125	55	105
Depletion	138	40	26	12	14	15	16	16
Reg Flow	20872	4854	4004	3885	3667	1954	1269	1239
Reg Flow kcfs		78.9	67.3	63.2	61.6	31.8	20.6	21.5
Total								
Reach Inflow	9476	2610	1565	1418	1163	822	775	1123
Depletion	-969	294	-281	-164	-337	-196	-176	-109
Evap	1789	354	456	393	330	228	16	11
Storage	*67946	65030	62532	59834	57402	56474	56142	56128
Ave Power MW		2087	2042	1873	1813	1100	1069	1045
Ave Cap MW		2425	2398	2366	2314	2293	2300	2315
Energy GWh	6548.9	1552.4	1470.1	1393.3	1305.3	818.1	795.2	727.6
Daily GWh		50.1	49.0	44.9	43.5	26.4	25.7	25.1

Date of Study: 22Nov2019 **01Aug2019 / Lower Basic Condition / 50.9 MAF / Balanced**
Values in 1000 acre-ft Except as Indicated
F-Sum: Sum of Forecasted Values. *: Previous Month's Data

	2019 *31Jul F-Sum	31Aug	30Sep	31Oct	30Nov	31Dec	2020 31Jan	29Feb
Fort Peck								
Reach Inflow	1948	308	248	304	304	262	250	273
Depletion	-397	2	-46	-89	-40	-77	-90	-57
Reg Inflow	2345	306	294	393	344	339	340	330
Evap	425	94	110	80	77	53	7	4
Release	4678	922	712	615	595	584	646	604
Stor Change	-2761	-713	-528	-302	-329	-298	-313	-278
Storage	*17538	16824	16296	15994	15666	15367	15054	14776
Elev NGVD29	*2246.2	2243.2	2240.9	2239.5	2238.1	2236.7	2235.3	2233.9
Disch kcfs	*12.9	15.0	12.0	10.0	10.0	9.5	10.5	10.5
Ave Power MW		188	155	132	131	124	136	135
Ave Cap MW		230	227	225	224	222	221	219
Energy GWh	652.5	139.8	111.7	98.3	94.5	92.2	101.2	94.1
Garrison								
Reach Inflow	2380	581	375	426	313	202	211	271
Depletion	-413	143	-128	-13	-258	-83	-44	-29
Reg Inflow	7506	1358	1257	1054	1166	874	893	904
Evap	573	109	140	134	115	77	-2	0
Release	11758	2828	1791	1722	1631	1168	1353	1265
Stor Change	-4829	-1583	-674	-801	-580	-371	-458	-361
Storage	*22568	20985	20311	19510	18930	18559	18100	17739
Elev NGVD29	*1851.7	1847.3	1845.4	1843.0	1841.2	1840.1	1838.6	1837.5
Disch kcfs	*46.4	46.0	30.1	28.0	27.4	19.0	22.0	22.0
Ave Power MW		566	397	367	356	248	284	282
Ave Cap MW		566	562	558	555	552	547	540
Energy GWh	1587.2	421.1	285.5	273.3	256.4	184.2	211.2	196.2
Oahe								
Reach Inflow	481	195	94	53	51	4	10	75
Depletion	226	141	33	-14	1	14	20	31
Reg Inflow	12100	2884	1915	1789	1709	1151	1342	1310
Evap	581	95	143	129	111	89	9	5
Release	14755	3416	2591	2270	2271	1399	1470	1338
Stor Change	-3239	-630	-820	-610	-673	-337	-136	-33
Storage	*21858	21228	20409	19799	19125	18788	18652	18619
Elev NGVD29	*1617.0	1615.2	1612.9	1611.0	1609.0	1607.9	1607.5	1607.3
Disch kcfs	*55.5	55.5	43.5	36.9	38.2	22.8	23.9	23.3
Ave Power MW		690	553	467	477	285	298	290
Ave Cap MW		774	760	745	731	709	704	701
Energy GWh	2127.5	513.5	398.0	347.6	343.6	212.2	222.0	201.8
Big Bend								
Reg Inflow	14769	3412	2602	2270	2271	1405	1469	1339
Evap	76	23	21	15	10	5	1	0
Release	14693	3394	2567	2276	2250	1397	1486	1323
Storage	*1674	1669	1682	1661	1672	1675	1658	1673
Elev NGVD29	*1420.7	1420.6	1420.9	1420.5	1420.7	1420.8	1420.5	1420.7
Disch kcfs	*51.9	55.2	43.1	37.0	37.8	22.7	24.2	23.0
Ave Power MW		216	173	150	153	96	101	97
Ave Cap MW		377	387	393	392	412	409	411
Energy GWh	656.8	160.6	124.4	111.6	110.2	71.2	75.4	67.3
Fort Randall								
Reach Inflow	257	130	45	3	3	9	23	44
Depletion	35	15	7	1	2	3	3	3
Reg Inflow	14941	3503	2620	2276	2258	1409	1504	1371
Evap	113	27	33	30	15	6	1	1
Release	15806	4018	2755	2800	2717	1346	1153	1017
Stor Change	-979	-543	-168	-554	-474	58	350	352
Storage	*3966	3423	3255	2701	2226	2284	2634	2986
Elev NGVD29	*1361.3	1355.2	1353.2	1345.9	1338.2	1339.2	1344.9	1349.8
Disch kcfs	*63.5	65.3	46.3	45.5	45.7	21.9	18.7	17.7
Ave Power MW		288	341	324	292	162	147	147
Ave Cap MW		350	341	327	301	286	301	319
Energy GWh	1173.8	214.3	245.7	241.2	210.3	120.7	109.6	102.0
Gavins Point								
Reach Inflow	713	163	112	97	90	75	75	100
Depletion	27	10	-5	1	10	10	1	-0
Reg Inflow	16648	4180	2928	2896	2801	1499	1230	1115
Evap	23	5	6	6	4	2	0	0
Release	16641	4181	2896	2890	2797	1498	1230	1150
Stor Change	-16	-6	27	0	0	-0	-0	-36
Storage	*342	336	362	362	362	362	362	326
Elev NGVD29	*1206.6	1206.4	1207.5	1207.5	1207.5	1207.5	1207.5	1205.9
Disch kcfs	*70.0	68.0	48.7	47.0	47.0	24.4	20.0	20.0
Ave Power MW		99	108	110	110	81	71	71
Ave Cap MW		126	127	127	127	127	127	126
Energy GWh	351.8	73.4	77.6	81.7	79.1	60.2	52.8	49.1
Sioux City								
Reach Inflow	1272	384	300	225	150	94	41	79
Depletion	138	40	26	12	14	15	16	16
Reg Flow	17885	4529	3216	3103	2933	1636	1255	1213
Reg Flow kcfs		73.7	54.0	50.5	49.3	26.6	20.4	21.1
Total								
Reach Inflow	7052	1760	1174	1109	911	646	610	842
Depletion	-384	350	-112	-100	-271	-119	-95	-36
Evap	1791	353	454	393	332	231	16	11
Storage	*67946	64466	62315	60027	57982	57035	56461	56119
Ave Power MW		2047	1726	1551	1520	995	1038	1021
Ave Cap MW		2422	2404	2376	2329	2309	2309	2316
Energy GWh	6549.6	1522.7	1242.8	1153.8	1094.1	740.6	772.1	710.5
Daily GWh		49.1	41.4	37.2	36.5	23.9	24.9	24.5

Date of Study: 22Nov2019 **01Aug2019 / Upper Basic Condition / 55.0 MAF / Balanced**
Values in 1000 acre-ft Except as Indicated
F-Sum: Sum of Forecasted Values. *: Previous Month's Data

	2019 *31Jul F-Sum	31Aug	30Sep	31Oct	30Nov	31Dec	2020 31Jan	29Feb
Fort Peck								
Reach Inflow	3084	572	396	456	456	392	374	437
Depletion	-708	-50	-172	-97	-64	-116	-120	-89
Reg Inflow	3792	622	568	553	520	509	494	526
Evap	429	94	112	81	78	53	7	4
Release	6130	954	924	922	893	830	830	777
Stor Change	-2770	-430	-467	-451	-450	-375	-343	-255
Storage	*17538	17108	16641	16190	15740	15365	15022	14768
Elev NGVD29	*2246.2	2244.4	2242.4	2240.4	2238.4	2236.7	2235.1	2233.9
Disch kcfs	*12.9	15.5	15.5	15.0	15.0	13.5	13.5	13.5
Ave Power MW		188	187	185	184	176	175	174
Ave Cap MW		231	229	227	224	222	220	219
Energy GWh	652.8	140.1	134.5	137.9	132.3	131.0	130.0	120.8
Garrison								
Reach Inflow	3843	1079	600	640	469	304	317	434
Depletion	-764	132	-162	-62	-315	-152	-116	-89
Reg Inflow	10746	1890	1694	1624	1677	1298	1262	1300
Evap	568	110	141	132	111	74	-2	0
Release	15003	2828	2737	2828	2523	1230	1476	1380
Stor Change	-4828	-1052	-1184	-1336	-957	-6	-211	-81
Storage	*22568	21516	20332	18996	18039	18033	17821	17740
Elev NGVD29	*1851.7	1848.8	1845.4	1841.4	1838.4	1838.4	1837.7	1837.5
Disch kcfs	*46.4	46.0	46.0	46.0	42.4	20.0	24.0	24.0
Ave Power MW		567	561	549	500	257	307	306
Ave Cap MW		567	563	557	548	543	540	538
Energy GWh	1587.7	421.7	404.2	408.4	360.1	191.5	228.2	212.9
Oahe								
Reach Inflow	926	405	169	96	92	7	18	140
Depletion	226	141	33	-14	1	14	20	31
Reg Inflow	15782	3094	2873	2938	2692	1222	1474	1490
Evap	581	94	144	129	112	88	9	5
Release	18414	3536	3520	3452	3344	1736	1507	1319
Stor Change	-3216	-540	-791	-643	-764	-601	-42	166
Storage	*21858	21319	20527	19884	19120	18519	18477	18642
Elev NGVD29	*1617.0	1615.5	1613.2	1611.3	1609.0	1607.0	1606.9	1607.4
Disch kcfs	*55.5	57.5	59.1	56.1	56.2	28.2	24.5	22.9
Ave Power MW		734	709	697	691	349	304	286
Ave Cap MW		773	762	746	733	701	698	699
Energy GWh	2127.9	546.1	510.4	518.3	497.7	260.0	226.5	198.7
Big Bend								
Reg Inflow	18427	3535	3518	3454	3345	1748	1507	1320
Evap	76	23	21	15	10	5	1	0
Release	18351	3525	3476	3459	3323	1740	1522	1305
Storage	*1674	1661	1682	1661	1672	1675	1659	1674
Elev NGVD29	*1420.7	1420.5	1420.9	1420.5	1420.7	1420.7	1420.5	1420.7
Disch kcfs	*51.9	57.3	58.4	56.3	55.9	28.3	24.8	22.7
Ave Power MW		223	227	220	219	117	104	96
Ave Cap MW		374	373	376	376	405	408	411
Energy GWh	656.8	166.2	163.3	163.7	157.4	87.0	77.1	66.5
Fort Randall								
Reach Inflow	503	270	81	5	5	16	43	81
Depletion	35	15	7	1	2	3	3	3
Reg Inflow	18847	3776	3547	3464	3334	1772	1562	1391
Evap	114	28	34	30	15	6	1	1
Release	19713	3985	3989	3986	3797	1709	1209	1038
Stor Change	-982	-238	-476	-551	-478	58	352	351
Storage	*3966	3728	3252	2701	2223	2281	2633	2984
Elev NGVD29	*1361.3	1358.6	1353.2	1345.9	1338.1	1339.2	1344.9	1349.8
Disch kcfs	*63.5	64.8	67.0	64.8	63.8	27.8	19.7	18.1
Ave Power MW		296	341	319	286	187	154	149
Ave Cap MW		358	344	327	301	286	301	319
Energy GWh	1173.8	220.3	245.4	237.4	205.9	139.5	114.7	104.0
Gavins Point								
Reach Inflow	1340	337	202	176	162	135	140	188
Depletion	27	10	-5	1	10	10	1	-0
Reg Inflow	21189	4307	4194	4171	3959	1973	1353	1232
Evap	23	5	6	6	4	2	0	0
Release	21180	4304	4165	4165	3957	1970	1353	1265
Stor Change	-13	-2	23	0	-2	2	-0	-33
Storage	*342	340	362	362	360	362	362	329
Elev NGVD29	*1206.6	1206.5	1207.5	1207.5	1207.4	1207.5	1207.5	1206.1
Disch kcfs	*70.0	70.0	70.0	67.7	66.5	32.0	22.0	22.0
Ave Power MW		99	102	105	105	91	78	77
Ave Cap MW		126	127	127	127	127	127	126
Energy GWh	351.8	73.6	73.3	77.8	75.5	67.9	57.9	53.8
Sioux City								
Reach Inflow	2404	797	540	405	270	169	77	147
Depletion	138	40	26	12	14	15	16	16
Reg Flow	23551	5060	4679	4566	4213	2222	1414	1396
Reg Flow kcfs		82.3	78.6	74.3	70.8	36.1	23.0	24.3
Total								
Reach Inflow	12099	3460	1988	1777	1454	1023	970	1427
Depletion	-1046	288	-272	-158	-353	-227	-196	-128
Evap	1791	355	458	394	330	227	16	11
Storage	*67946	65672	62796	59794	57154	56234	55974	56137
Ave Power MW		2108	2127	2075	1985	1178	1121	1087
Ave Cap MW		2428	2398	2360	2310	2286	2295	2312
Energy GWh	6550.7	1568.0	1531.1	1543.5	1428.9	876.8	834.2	756.7
Daily GWh		50.6	51.0	49.8	47.6	28.3	26.9	26.1

TIME OF STUDY: 09:34:37 STUDY NO 4

VALUES IN 1000 AF EXCEPT AS INDICATED

29FEB20	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
			2020											2021			
--FORT PECK--																	
NAT INFLOW	9450	341	159	205	825	1400	2355	1205	440	385	480	288	134	153	350	310	420
DEPLETION	568	-42	-19	-25	-16	312	591	293	17	-110	-78	-28	-13	-15	-110	-112	-77
EVAPORATION	327							22	70	86	75	18	8	9	39		
MOD INFLOW	8555	383	179	230	841	1088	1764	890	353	409	483	298	139	159	421	422	497
RELEASE	8556	223	104	134	565	769	803	830	830	713	646	312	146	190	769	799	722
STOR CHANGE	-1	160	74	96	276	319	961	60	-477	-305	-162	-15	-7	-32	-347	-377	-225
STORAGE	14768.	14928	15002	15098	15374	15693	16654	16713	16236	15932	15769	15755	15748	15716	15369	14992	14767
ELEV FTMSL	2233.9	2234.7	2235.0	2235.5	2236.7	2238.2	2242.4	2242.7	2240.6	2239.3	2238.5	2238.5	2238.4	2238.3	2236.7	2235.0	2233.9
DISCH KCFS	13.500	7.5	7.5	7.5	9.5	12.5	13.5	13.5	13.5	12.0	10.5	10.5	10.5	12.0	12.5	13.0	13.0
POWER																	
AVE POWER MW		102	102	103	130	170	184	186	185	165	145	145	145	164	170	175	174
PEAK POW MW		188	189	189	190	191	194	194	192	191	191	191	191	191	190	189	188
ENERGY GWH	1411.9	36.8	17.2	22.1	93.6	126.4	132.4	138.1	137.6	118.8	107.8	52.1	24.3	31.6	126.4	130.0	116.8
--GARRISON--																	
NAT INFLOW	14000	530	247	318	1355	1840	3460	2715	835	570	645	248	116	132	260	315	415
DEPLETION	1192	-9	-4	-6	-189	112	1266	767	127	-169	-62	-158	-74	-84	-144	-108	-73
CHAN STOR	5	60		0	-20	-29	-10			15	14			-15	-5	-5	0
EVAPORATION	370							25	80	99	84	20	9	10	42		
REG INFLOW	20999	822	356	457	2090	2467	2988	2753	1458	1368	1283	698	326	382	1125	1217	1210
RELEASE	21017	565	264	339	1428	1906	2142	2214	2214	1994	1906	922	430	476	1291	1537	1388
STOR CHANGE	-18	257	92	118	661	561	845	539	-756	-625	-623	-224	-105	-94	-166	-320	-178
STORAGE	17740.	17997	18088	18206	18868	19429	20275	20814	20058	19433	18809	18585	18481	18386	18220	17900	17722
ELEV FTMSL	1837.5	1838.3	1838.6	1839.0	1841.0	1842.7	1845.2	1846.8	1844.6	1842.8	1840.9	1840.2	1839.8	1839.5	1839.0	1838.0	1837.4
DISCH KCFS	24.000	19.0	19.0	19.0	24.0	31.0	36.0	36.0	36.0	33.5	31.0	31.0	31.0	30.0	21.0	25.0	25.0
POWER																	
AVE POWER MW		236	237	237	301	392	460	465	464	427	392	389	387	374	263	310	309
PEAK POW MW		530	531	533	543	551	560	565	557	551	542	539	537	536	533	529	526
ENERGY GWH	3215.9	84.9	39.8	51.2	216.7	291.7	330.9	345.6	345.0	307.7	291.5	139.9	65.1	71.9	195.4	231.0	207.6
--OAHE--																	
NAT INFLOW	3900	569	265	341	510	390	710	310	125	185	145	118	55	63	15	10	90
DEPLETION	802	26	12	16	53	81	172	212	144	34	-14	1	0	0	14	20	31
CHAN STOR	0	20			-19	-26	-18			9	10			4	36	-16	
EVAPORATION	367							26	80	98	83	19	9	10	42		
REG INFLOW	23748	1128	517	665	1866	2189	2662	2285	2114	2056	1992	1020	476	532	1286	1511	1447
RELEASE	23745	487	282	338	1071	1693	2211	2937	2977	2735	2349	1155	574	757	1535	1460	1184
STOR CHANGE	3	640	235	327	795	496	451	-652	-862	-679	-358	-135	-98	-225	-248	51	264
STORAGE	18642.	19282	19517	19844	20639	21136	21587	20935	20073	19394	19036	18901	18803	18579	18330	18381	18645
ELEV FTMSL	1607.4	1609.4	1610.2	1611.2	1613.5	1614.9	1616.2	1614.4	1611.8	1609.8	1608.7	1608.2	1607.9	1607.2	1606.4	1606.6	1607.4
DISCH KCFS	22.900	16.4	20.3	18.9	18.0	27.5	37.2	47.8	48.4	46.0	38.2	38.8	41.3	47.7	25.0	23.8	21.3
POWER																	
AVE POWER MW		213	266	249	238	367	497	634	634	599	495	501	531	608	321	305	274
PEAK POW MW		718	722	727	739	747	753	744	731	720	714	712	710	706	702	703	707
ENERGY GWH	3757.1	76.6	44.6	53.7	171.6	273.1	358.0	471.8	471.8	431.3	368.3	180.3	89.3	116.7	238.6	226.8	184.4
--BIG BEND--																	
EVAPORATION	72							5	15	19	17	4	2	2	9		
REG INFLOW	23673	487	282	338	1071	1693	2211	2933	2962	2716	2333	1151	572	755	1526	1460	1184
RELEASE	23715	530	282	338	1071	1693	2211	2933	2962	2716	2333	1151	572	755	1526	1460	1184
STORAGE	1674.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1632	1632	1632	1632	1632	1632	1632
ELEV FTMSL	1420.7	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	22.700	17.8	20.3	18.9	18.0	27.5	37.2	47.7	48.2	45.6	37.9	38.7	41.2	47.6	24.8	23.8	21.3
POWER																	
AVE POWER MW		84	95	89	84	129	174	223	225	216	184	192	204	235	124	116	102
PEAK POW MW		517	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
ENERGY GWH	1369.1	30.3	16.0	19.1	60.7	95.9	125.2	165.9	167.5	155.4	137.2	69.0	34.2	45.0	92.4	86.5	68.7
--FORT RANDALL--																	
NAT INFLOW	1500	150	70	90	440	230	155	80	70	100	40				15		60
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	80							6	19	24	18	4	2	2	7		
REG INFLOW	25057	679	351	427	1507	1914	2354	2989	2998	2786	2353	1146	570	752	1534	1457	1241
RELEASE	25040	382	207	427	1507	1914	2354	2989	2998	2930	2992	1459	681	778	1424	1116	882
STOR CHANGE	17	297	144	0			0	0	0	-144	-639	-313	-111	-26	109	341	359
STORAGE	2984.	3281	3425	3425	3425	3425	3425	3425	3425	3281	2642	2329	2218	2192	2301	2642	3001
ELEV FTMSL	1349.8	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1340.0	1338.0	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	18.100	12.8	14.9	23.9	25.3	31.1	39.6	48.6	48.8	49.2	48.7	49.1	49.0	49.0	23.2	18.2	15.9
POWER																	
AVE POWER MW		106	126	202	214	262	326	356	356	353	336	307	291	286	169	138	126
PEAK POW MW		350	356	356	356	356	356	356	356	350	319	296	287	284	294	320	339
ENERGY GWH	2248.4	38.2	21.2	43.6	153.9	194.8	234.8	264.8	264.8	254.2	250.1	110.7	48.9	54.8	126.0	102.5	84.9
--GAVINS POINT--																	
NAT INFLOW	2250	111	52	67	280	330	245	205	165	130	150	65	30	35	90	105	190
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	2	10	-4	-17	-3	-11	-16	-17	0	-1	1	-1	0	0	48	9	4
EVAPORATION	23							1	5	6	5	1	1	1	3		
REG INFLOW	27155	504	256	477	1779	2214	2559	3136	3148	3058	3136	1517	708	809	1550	1230	1076
RELEASE	27157	506	256	477	1779	2214	2559	3136	3136	3035	3136	1517	708	809	1550	1230	1111
STOR CHANGE	-2	-2							12	23							-35
STORAGE	329.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.1	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	22.000	17.0	18.4	26.7	29.9	36.0	43.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0	25.2	20.0	20.0
POWER																	
AVE POWER MW		59	64	91	101	114	113	112	113	115	115	115	115	115	79	70	69
PEAK POW MW		114	114	114	114	114	113	112	113	115	115	115	115	115	78	78	76
ENERGY GWH	865.8	21.3	10.7	19.7	72.5	84.8	81.6	83.1	83.7	82.5	85.8	41.5	19.4	22.1	58.6	52.0	46.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	3400	189	88	113	470	890	550	290	225	165	85	50	23	27	60	35	140
DEPLETION	293	8	4	5	25	37	33	41	40	27	13	7	3	4	15	16	16
REGULATED FLOW AT SIOUX CITY																	
KAF	30264	687	340	585	2224	3067	3076	3385	3321	3173	3208	1560	728	832	1595	1249	1235
KCFS		23.1	24.5	32.8	37.4	49.9	51.7	55.0	54.0	53.3	52.2	52.4	52.4	52.4	25.9	20.3	22.2
--TOTAL--																	
NAT INFLOW	34500	1890	882	1133	3880	5080	7475	4805	1860	1535	1545	768	358	409	790	775	1315
DEPLETION	3049	-16	-7	-10	-118	570	2098	1370	353	-216	-138	-173	-81	-92	-212	-180	-100
CHAN STOR	9	89	-4	-17	-41	-66	-44	-17	0	23	25	-1	0	-11	81	-12	4
EVAPORATION	1239							86	269	331	282	66	30	34	141		
STORAGE	56137.	57446	57991	58531	60264	61641	63898	63845	61762	60032	58251	57564	57244	56867	56215	55909	56094
SYSTEM POWER																	
AVE POWER MW		800	889	970	1068	1434	1754	1975	1976	1875	1668	1649	1674	1782	1126	1114	1055
PEAK POW MW		2418	2422	2429	2451	2468	2485	2479	2459	2445	2419	2390	2378	2371	2335	2356	2365
ENERGY GWH	12868.2	288.1	149.4	209.5	769.0	1066.6	1262.7	1469.3	1470.4	1349.9	1240.8	593.6	281.3	342.1	837.5	828.8	709.0
DAILY GWH		19.2	21.3	23.3	25.6	34.4	42.1	47.4	47.4	45.0	40.0	39.6	40.2	42.8	27.0	26.7	25.3
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

TIME OF STUDY: 09:22:29 STUDY NO 5

VALUES IN 1000 AF EXCEPT AS INDICATED

	29FEB20	2020												2021			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	8650	310	144	186	755	1285	2155	1105	405	350	440	263	123	140	320	285	385
DEPLETION	552	-13	-6	-8	14	317	555	291	3	-125	-99	-33	-15	-18	-116	-119	-76
EVAPORATION	323							22	69	85	74	18	8	9	38		
MOD INFLOW	7775	323	151	194	741	968	1600	792	333	390	465	278	130	148	398	404	461
RELEASE	7774	208	97	125	536	646	774	799	799	622	492	238	111	127	738	769	694
STOR CHANGE	1	115	53	69	205	322	826	-7	-466	-232	-27	40	19	21	-340	-365	-233
STORAGE	14768.	14883	14936	15005	15210	15532	16359	16352	15886	15654	15627	15667	15686	15707	15367	15002	14769
ELEV FTMSL	2233.9	2234.4	2234.7	2235.0	2236.0	2237.5	2241.2	2241.1	2239.1	2238.0	2237.9	2238.1	2238.2	2238.3	2236.7	2235.0	2233.9
DISCH KCFS	13.500	7.0	7.0	7.0	9.0	10.5	13.0	13.0	13.0	10.4	8.0	8.0	8.0	8.0	12.0	12.5	12.5
POWER																	
AVE POWER MW		95	96	96	123	144	177	178	178	144	110	110	110	110	164	169	168
PEAK POW MW		188	188	189	189	190	193	193	191	191	191	191	191	191	190	189	188
ENERGY GWH	1284.6	34.3	16.0	20.6	88.6	107.1	127.5	132.7	132.1	103.7	82.0	39.7	18.5	21.2	121.9	125.7	112.9
--GARRISON--																	
NAT INFLOW	12750	482	225	289	1230	1675	3200	2475	760	520	555	215	100	115	235	295	380
DEPLETION	1176	-9	-4	-6	-133	125	1142	808	119	-156	-65	-159	-74	-85	-145	-108	-75
CHAN STOR	10	64			-20	-15	-24			25	24		0	0	-39	-5	
EVAPORATION	367							25	79	98	84	20	9	10	43		
REG INFLOW	18991	764	326	419	1879	2181	2807	2441	1361	1225	1052	592	276	316	1036	1167	1149
RELEASE	19005	565	264	339	1369	1752	1964	1968	1968	1696	1537	744	347	365	1261	1506	1361
STOR CHANGE	-14	198	62	80	510	429	844	474	-606	-471	-485	-152	-71	-49	-225	-340	-211
STORAGE	17740.	17938	18001	18081	18591	19019	19863	20337	19730	19259	18774	18622	18551	18502	18277	17937	17726
ELEV FTMSL	1837.5	1838.1	1838.3	1838.6	1840.2	1841.5	1844.0	1845.4	1843.7	1842.2	1840.8	1840.3	1840.1	1839.9	1839.2	1838.1	1837.4
DISCH KCFS	24.000	19.0	19.0	19.0	23.0	28.5	33.0	32.0	32.0	28.5	25.0	25.0	25.0	23.0	20.5	24.5	24.5
POWER																	
AVE POWER MW		236	236	237	287	359	419	411	410	363	316	314	314	289	257	305	303
PEAK POW MW		529	530	531	539	545	555	560	554	548	541	539	538	537	534	529	526
ENERGY GWH	2901.1	84.8	39.7	51.1	207.0	266.7	301.7	305.6	305.3	261.3	235.3	113.2	52.7	55.4	191.1	226.7	203.6
--OAHE--																	
NAT INFLOW	3200	457	213	274	430	310	640	250	95	150	120	95	44	51	-10		80
DEPLETION	803	27	12	16	53	81	172	212	144	34	-14	1	0	0	14	20	31
CHAN STOR	-1	20			-15	-21	-17	4		13	13			8	10	-16	0
EVAPORATION	369							26	80	98	84	20	9	10	42		
REG INFLOW	21032	1016	465	598	1730	1961	2415	1983	1838	1727	1601	819	382	413	1204	1470	1410
RELEASE	21025	519	297	357	1005	1397	1781	2539	2571	2359	1964	954	480	650	1456	1479	1219
STOR CHANGE	7	497	168	241	725	564	634	-556	-733	-632	-363	-135	-98	-237	-251	-8	191
STORAGE	18642.	19139	19307	19548	20273	20837	21471	20915	20182	19550	19187	19052	18954	18717	18466	18458	18649
ELEV FTMSL	1607.4	1609.0	1609.5	1610.3	1612.4	1614.1	1615.9	1614.3	1612.2	1610.3	1609.1	1608.7	1608.4	1607.7	1606.9	1606.8	1607.4
DISCH KCFS	22.900	17.4	21.4	20.0	16.9	22.7	29.9	41.3	41.8	39.6	31.9	32.1	34.6	40.9	23.7	24.0	21.9
POWER																	
AVE POWER MW		226	279	261	223	302	400	550	552	519	416	416	447	527	305	309	283
PEAK POW MW		716	719	722	734	742	751	743	732	723	717	714	713	709	704	704	707
ENERGY GWH	3334.1	81.5	46.8	56.5	160.4	224.7	288.2	409.6	410.9	373.4	309.3	149.7	75.1	101.1	227.0	230.0	190.1
--BIG BEND--																	
EVAPORATION	72							5	15	19	17	4	2	2	9		
REG INFLOW	20953	519	297	357	1005	1397	1781	2534	2556	2340	1947	950	478	648	1447	1479	1219
RELEASE	20996	562	297	357	1005	1397	1781	2534	2556	2340	1947	950	478	648	1447	1479	1219
STORAGE	1674.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1632	1632	1632	1632	1632	1632	1632
ELEV FTMSL	1420.7	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	22.700	18.9	21.4	20.0	16.9	22.7	29.9	41.2	41.6	39.3	31.7	31.9	34.4	40.8	23.5	24.0	21.9
POWER																	
AVE POWER MW		89	100	94	79	106	140	193	194	186	154	159	171	202	118	118	105
PEAK POW MW		517	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
ENERGY GWH	1213.9	32.1	16.8	20.2	56.9	79.1	100.9	143.4	144.7	134.0	114.9	57.3	28.8	38.8	87.7	87.6	70.7
--FORT RANDALL--																	
NAT INFLOW	1200	123	58	74	350	185	140	75	65	75	10	-3	-1	-1	5	-5	50
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	80							6	19	24	18	4	2	2	7		
REG INFLOW	22037	684	354	430	1351	1573	1909	2585	2587	2384	1938	943	475	644	1444	1471	1266
RELEASE	22020	387	210	430	1351	1573	1909	2585	2587	2528	2577	1256	586	670	1335	1130	907
STOR CHANGE	17	297	144		0			0	0	-144	-639	-313	-111	-26	109	341	359
STORAGE	2984.	3281	3425	3425	3425	3425	3425	3425	3425	3281	2642	2329	2218	2192	2301	2642	3001
ELEV FTMSL	1349.8	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1340.0	1338.0	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	18.100	13.0	15.1	24.1	22.7	25.6	32.1	42.0	42.1	42.5	41.9	42.2	42.2	42.2	21.7	18.4	16.3
POWER																	
AVE POWER MW		108	127	203	192	216	270	337	337	336	319	297	284	280	159	139	130
PEAK POW MW		350	356	356	356	356	356	356	356	350	319	296	288	285	294	320	339
ENERGY GWH	2094.6	38.7	21.4	43.9	138.2	160.6	194.3	250.4	250.5	241.8	237.0	106.9	47.8	53.7	118.2	103.7	87.4
--GAVINS POINT--																	
NAT INFLOW	2000	106	50	64	240	290	210	180	145	115	135	60	28	32	85	95	165
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	2	10	-4	-17	3	-6	-12	-19	0	-1	1	-1	0	0	38	6	4
EVAPORATION	23							1	5	6	5	1	1	1	3		
REG INFLOW	23884	504	256	477	1589	1839	2083	2705	2717	2641	2705	1309	611	698	1445	1230	1076
RELEASE	23886	506	256	477	1589	1839	2083	2705	2705	2618	2705	1309	611	698	1445	1230	1111
STOR CHANGE	-2	-2							12	23							-35
STORAGE	329.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.1	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	22.000	17.0	18.4	26.7	26.7	29.9	35.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	23.5	20.0	20.0
POWER																	
AVE POWER MW		59	64	91	91	101	112	113	114	115	116	116	116	116	78	70	69
PEAK POW MW		114	114	114	114	114	114	113	114	116	116	116	116	116	78	78	76
ENERGY GWH	851.4	21.3	10.7	19.7	65.6	74.9	80.6	84.1	84.8	82.9	86.3	41.8	19.5	22.3	58.4	52.0	46.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	2800	165	77	99	390	730	435	240	180	135	70	43	20	23	50	30	115
DEPLETION	293	8	4	5	25	37	33	41	40	27	13	7	3	4	15	16	16
REGULATED FLOW AT SIOUX CITY																	
KAF	26393	663	329	571	1954	2532	2485	2904	2845	2726	2762	1345	627	717	1480	1244	1210
KCFS		22.3	23.7	32.0	32.8	41.2	41.8	47.2	46.3	45.8	44.9	45.2	45.2	45.2	24.1	20.2	21.8
--TOTAL--																	
NAT INFLOW	30600	1643	766	985	3395	4475	6780	4325	1650	1345	1330	673	314	359	685	700	1175
DEPLETION	3018	13	6	8	-32	588	1938	1409	331	-218	-162	-178	-83	-95	-219	-187	-101
CHAN STOR	12	94	-4	-17	-32	-41	-53	-15	0	37	38	-1	0	7	10	-15	4
EVAPORATION	1235							85	266	329	282	66	30	35	142		
STORAGE	56137.	57199	57626	58016	59457	60771	63075	62986	61193	59738	58224	57664	57403	57112	56405	56033	56103
SYSTEM POWER																	
AVE POWER MW		813	901	982	995	1227	1518	1782	1785	1663	1431	1412	1442	1524	1081	1110	1058
PEAK POW MW		2415	2417	2422	2441	2457	2479	2475	2457	2445	2422	2395	2383	2376	2339	2358	2365
ENERGY GWH	11679.7	292.8	151.4	212.0	716.6	913.2	1093.1	1325.8	1328.3	1197.1	1064.9	508.4	242.3	292.5	804.3	825.7	711.3
DAILY GWH		19.5	21.6	23.6	23.9	29.5	36.4	42.8	42.8	39.9	34.4	33.9	34.6	36.6	25.9	26.6	25.4
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

TIME OF STUDY: 09:12:33 STUDY NO 6

VALUES IN 1000 AF EXCEPT AS INDICATED

	29FEB20	2020												2021			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	7200	227	106	136	560	1145	1830	840	365	290	385	205	96	109	295	260	350
DEPLETION	575	-15	-7	-9	42	270	577	298	43	-90	-112	-31	-14	-16	-127	-142	-92
EVAPORATION	458							28	88	109	95	43	20	23	50		
MOD INFLOW	6167	242	113	145	518	875	1253	514	234	271	402	192	90	103	372	402	442
RELEASE	6399	193	90	116	476	553	655	676	676	505	369	179	83	103	553	615	555
STOR CHANGE	-232	49	23	29	42	322	598	-163	-443	-235	33	14	6	-1	-181	-213	-113
STORAGE	14785.	14834	14857	14886	14928	15250	15848	15686	15243	15009	15041	15055	15061	15061	14880	14667	14553
ELEV FTMSL	2234.0	2234.2	2234.3	2234.5	2234.7	2236.2	2238.9	2238.2	2236.1	2235.0	2235.2	2235.3	2235.3	2235.3	2234.4	2233.4	2232.9
DISCH KCFS	12.000	6.5	6.5	6.5	8.0	9.0	11.0	11.0	11.0	8.5	6.0	6.0	6.0	6.5	9.0	10.0	10.0
POWER																	
AVE POWER MW		89	89	89	109	123	151	152	151	116	82	82	82	89	123	136	136
PEAK POW MW		188	188	188	188	189	191	191	189	189	189	189	189	189	188	188	187
ENERGY GWH	1058.6	31.9	14.9	19.2	78.5	91.5	108.8	112.8	112.3	83.6	61.0	29.5	13.8	17.1	91.4	101.2	91.2
--GARRISON--																	
NAT INFLOW	10900	479	223	287	780	1300	3120	2100	580	480	445	180	84	96	180	255	310
DEPLETION	1156	-2	-1	-1	-58	148	959	826	152	-159	-62	-159	-74	-85	-145	-107	-76
CHAN STOR	20	55	0	0	-15	-10	-20			24	24			-5	-25	-10	0
EVAPORATION	526							33	102	127	110	49	23	26	56		
REG INFLOW	15637	730	315	405	1299	1696	2796	1918	1002	1042	791	468	218	253	797	967	941
RELEASE	15921	536	250	321	1250	1476	1666	1660	1660	1311	1045	506	236	262	1168	1353	1222
STOR CHANGE	-285	194	65	84	50	220	1130	258	-658	-269	-255	-38	-18	-9	-371	-386	-280
STORAGE	17745.	17939	18004	18087	18137	18357	19487	19744	19086	18817	18562	18524	18507	18497	18127	17741	17460
ELEV FTMSL	1837.5	1838.1	1838.3	1838.6	1838.8	1839.5	1842.9	1843.7	1841.7	1840.9	1840.1	1840.0	1839.9	1839.9	1838.7	1837.5	1836.6
DISCH KCFS	24.000	18.0	18.0	18.0	21.0	24.0	28.0	27.0	27.0	22.0	17.0	17.0	17.0	16.5	19.0	22.0	22.0
POWER																	
AVE POWER MW		223	224	224	262	299	353	345	344	279	215	214	214	208	238	273	271
PEAK POW MW		529	530	531	532	535	551	554	546	542	538	538	537	537	532	526	522
ENERGY GWH	2419.3	80.4	37.6	48.5	188.4	222.7	254.2	256.4	255.6	200.7	159.7	77.1	35.9	39.9	177.0	203.1	182.2
--OAHE--																	
NAT INFLOW	2300	259	121	155	405	220	625	170	70	95	45	45	21	24	-15	-10	70
DEPLETION	801	26	12	16	53	81	172	212	144	33	-14	1	0	0	14	20	31
CHAN STOR	8	24			-12	-12	-15	4		19	20			2	-10	-12	
EVAPORATION	511							32	100	123	106	47	22	25	55		
REG INFLOW	16917	792	359	461	1590	1603	2104	1590	1486	1269	1019	503	235	262	1075	1311	1261
RELEASE	17158	531	321	358	1293	1543	1609	1849	1983	1754	1263	586	309	227	1113	1315	1103
STOR CHANGE	-241	261	38	103	297	60	494	-260	-497	-485	-245	-83	-74	35	-39	-4	157
STORAGE	18614.	18875	18913	19016	19313	19373	19868	19608	19111	18626	18381	18298	18223	18259	18220	18216	18373
ELEV FTMSL	1607.3	1608.2	1608.3	1608.6	1609.5	1609.7	1611.2	1610.4	1608.9	1607.4	1606.6	1606.3	1606.1	1606.2	1606.0	1606.0	1606.5
DISCH KCFS	22.400	17.8	23.1	20.1	21.7	25.1	27.0	30.1	32.2	29.5	20.5	19.7	22.3	14.3	18.1	21.4	19.9
POWER																	
AVE POWER MW		231	299	260	283	327	354	394	420	381	265	253	286	184	232	274	255
PEAK POW MW		711	712	714	719	720	727	723	715	707	703	701	700	701	700	700	703
ENERGY GWH	2690.5	83.2	50.3	56.2	203.7	243.4	254.8	293.1	312.2	274.3	196.9	91.1	48.0	35.3	172.8	203.8	171.4
--BIG BEND--																	
EVAPORATION	105							6	20	25	22	10	5	5	12		
REG INFLOW	17053	531	321	358	1293	1543	1609	1843	1963	1729	1241	576	305	222	1102	1315	1103
RELEASE	17096	574	321	358	1293	1543	1609	1843	1963	1729	1241	577	305	222	1101	1315	1103
STORAGE	1674.	1631	1631	1631	1631	1631	1631	1631	1631	1632	1632	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.7	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	22.100	19.3	23.1	20.1	21.7	25.1	27.0	30.0	31.9	29.1	20.2	19.4	21.9	14.0	17.9	21.4	19.9
POWER																	
AVE POWER MW		91	108	94	102	117	127	140	149	138	99	97	110	70	90	105	95
PEAK POW MW		517	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
ENERGY GWH	987.5	32.8	18.2	20.3	73.2	87.4	91.1	104.4	111.1	99.1	73.7	35.1	18.5	13.5	67.0	78.0	64.0
--FORT RANDALL--																	
NAT INFLOW	900	121	56	73	160	165	135	70	60	35		-5	-2	-3		-10	45
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	116							8	25	31	24	9	4	4	9		
REG INFLOW	17800	693	376	430	1449	1699	1732	1887	1982	1725	1216	562	298	215	1089	1302	1145
RELEASE	17784	396	232	430	1449	1699	1732	1887	1982	1869	1855	875	409	241	980	961	786
STOR CHANGE	16	297	144					0	0	-144	-639	-313	-111	-26	108	341	359
STORAGE	2984.	3281	3425	3425	3425	3425	3425	3425	3425	3281	2642	2329	2218	2192	2300	2641	3000
ELEV FTMSL	1349.8	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1340.0	1338.0	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	17.100	13.3	16.7	24.1	24.4	27.6	29.1	30.7	32.2	31.4	30.2	29.4	29.5	15.2	15.9	15.6	14.2
POWER																	
AVE POWER MW		110	141	203	206	233	245	258	271	262	242	222	215	111	117	119	113
PEAK POW MW		350	356	356	356	356	356	356	356	350	319	296	287	285	294	320	339
ENERGY GWH	1756.5	39.6	23.7	43.9	148.1	173.3	176.5	192.1	201.7	188.9	179.7	79.9	36.2	21.3	87.2	88.4	75.9
--GAVINS POINT--																	
NAT INFLOW	1500	102	47	61	145	165	175	100	90	95	120	58	27	31	80	85	120
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	4	7	-7	-14	-1	-6	-3	-3	-3	2	2	1	0	26	-1	1	3
EVAPORATION	34							2	6	8	7	3	2	2	4		
REG INFLOW	19141	506	274	477	1588	1839	1880	1943	2053	1963	1968	925	432	294	1045	1045	909
RELEASE	19141	506	274	477	1588	1839	1880	1943	2041	1940	1968	925	432	294	1045	1045	944
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	20.000	17.0	19.7	26.7	26.7	29.9	31.6	31.6	33.2	32.6	32.0	31.1	31.1	18.5	17.0	17.0	17.0
POWER																	
AVE POWER MW		59	68	91	91	101	105	105	109	109	108	106	106	65	60	60	60
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	784.0	21.2	11.4	19.7	65.6	74.9	75.3	77.8	80.9	78.3	80.6	38.3	17.9	12.5	44.7	44.7	40.1
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1800	162	76	97	280	345	190	165	130	110	60	30	14	16	25	25	75
DEPLETION	293	8	4	5	25	37	33	41	40	27	13	7	3	4	15	16	16
REGULATED FLOW AT SIOUX CITY																	
KAF	20648	660	346	570	1843	2147	2037	2067	2131	2023	2015	948	443	306	1055	1054	1003
KCFS		22.2	24.9	31.9	31.0	34.9	34.2	33.6	34.7	34.0	32.8	31.9	31.9	19.3	17.2	17.1	18.1
--TOTAL--																	
NAT INFLOW	24600	1350	630	810	2330	3340	6075	3445	1295	1105	1055	513	239	273	565	605	970
DEPLETION	3019	17	8	10	71	564	1777	1434	404	-187	-172	-176	-82	-94	-230	-209	-118
CHAN STOR	32	86	-7	-14	-27	-28	-38	1	-3	45	47	1	0	24	-36	-21	3
EVAPORATION	1749							109	342	424	364	162	75	86	185		
STORAGE	56129.	56887	57157	57373	57761	58363	60586	60421	58836	57726	56620	56199	56002	56002	55520	55258	55346
SYSTEM POWER																	
AVE POWER MW		803	929	962	1052	1201	1335	1393	1443	1285	1010	975	1013	727	860	967	930
PEAK POW MW		2410	2410	2413	2419	2424	2450	2448	2431	2422	2404	2379	2369	2367	2331	2349	2356
ENERGY GWH	9696.4	289.2	156.1	207.7	757.5	893.2	960.9	1036.6	1073.8	925.0	751.7	351.0	170.2	139.6	640.1	719.2	624.7
DAILY GWH		19.3	22.3	23.1	25.2	28.8	32.0	33.4	34.6	30.8	24.2	23.4	24.3	17.5	20.6	23.2	22.3
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

TIME OF STUDY: 09:12:58 STUDY NO 7

VALUES IN 1000 AF EXCEPT AS INDICATED

	29FEB20	2020												2021			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	5950	201	94	120	460	945	1510	645	290	240	320	168	78	89	240	240	310
DEPLETION	571	0	0	0	18	272	589	284	13	-127	-116	-33	-15	-18	-106	-115	-74
EVAPORATION	544							34	106	131	113	51	24	27	58		
MOD INFLOW	4835	201	94	121	442	673	921	327	171	236	323	149	70	80	288	355	384
RELEASE	6530	179	83	107	417	553	655	676	676	506	369	179	83	114	646	676	611
STOR CHANGE	-1695	23	11	14	25	120	266	-349	-505	-270	-46	-29	-14	-34	-358	-321	-227
STORAGE	14776.	14799	14809	14823	14849	14968	15235	14885	14380	14111	14065	14035	14022	13987	13630	13308	13081
ELEV FTMSL	2233.9	2234.1	2234.1	2234.2	2234.3	2234.8	2236.1	2234.5	2232.0	2230.7	2230.5	2230.3	2230.3	2230.1	2228.3	2226.7	2225.5
DISCH KCFS	10.500	6.0	6.0	6.0	7.0	9.0	11.0	11.0	11.0	8.5	6.0	6.0	6.0	7.2	10.5	11.0	11.0
POWER																	
AVE POWER MW		82	82	82	95	123	150	150	149	115	81	81	81	97	141	146	146
PEAK POW MW		188	188	188	188	189	189	188	187	186	186	186	186	186	184	183	182
ENERGY GWH	1067.4	29.4	13.7	17.7	68.7	91.3	108.2	111.7	111.0	82.7	60.2	29.1	13.6	18.6	104.6	109.0	98.0
--GARRISON--																	
NAT INFLOW	9150	404	189	242	640	1150	2600	1700	475	395	395	160	75	85	150	210	280
DEPLETION	1270	21	10	12	39	181	777	777	158	-135	-44	-145	-67	-77	-113	-75	-49
CHAN STOR	-5	45			-10	-20	-20			25	25			-12	-33	-5	
EVAPORATION	619							39	121	149	128	58	27	31	66		
REG INFLOW	13786	606	262	337	1008	1503	2458	1560	872	911	704	425	199	234	810	956	940
RELEASE	15845	506	236	303	1250	1506	1607	1599	1599	1277	1045	506	236	254	1230	1414	1277
STOR CHANGE	-2060	101	26	34	-242	-4	851	-38	-727	-366	-341	-80	-37	-20	-420	-458	-337
STORAGE	17739.	17840	17866	17899	17657	17653	18504	18466	17739	17373	17032	16952	16915	16895	16475	16017	15679
ELEV FTMSL	1837.5	1837.8	1837.9	1838.0	1837.2	1837.2	1839.9	1839.8	1837.5	1836.3	1835.1	1834.9	1834.7	1834.7	1833.2	1831.7	1830.5
DISCH KCFS	22.000	17.0	17.0	17.0	21.0	24.5	27.0	26.0	26.0	21.5	17.0	17.0	17.0	16.0	20.0	23.0	23.0
POWER																	
AVE POWER MW		211	211	211	260	302	335	325	323	264	208	207	207	195	242	275	273
PEAK POW MW		528	528	529	525	525	538	537	526	520	515	514	513	513	506	499	493
ENERGY GWH	2352.9	75.9	35.5	45.6	187.1	224.6	241.3	242.2	240.3	190.4	155.0	74.7	34.8	37.4	180.0	204.7	183.3
--OAHE--																	
NAT INFLOW	1350	177	82	106	285	130	315	110	50	55	15	13	6	7	-35	-15	50
DEPLETION	802	26	12	16	53	81	172	212	144	34	-14	1	0	0	14	20	31
CHAN STOR	-4	20			-16	-14	-10	4		19	19			4	-18	-13	0
EVAPORATION	569							37	113	138	117	52	24	28	60		
REG INFLOW	15821	676	306	394	1466	1542	1740	1464	1392	1180	976	466	218	237	1103	1366	1296
RELEASE	17901	488	365	449	1577	1846	1820	2069	2096	1874	1379	663	259	235	849	1058	874
STOR CHANGE	-2081	188	-59	-56	-111	-304	-80	-605	-704	-695	-402	-197	-42	2	254	308	423
STORAGE	18619.	18807	18748	18692	18581	18277	18197	17592	16887	16193	15791	15594	15552	15554	15808	16116	16538
ELEV FTMSL	1607.3	1607.9	1607.8	1607.6	1607.2	1606.2	1606.0	1603.9	1601.5	1599.0	1597.5	1596.8	1596.7	1596.7	1597.6	1598.7	1600.3
DISCH KCFS	23.300	16.4	26.3	25.2	26.5	30.0	30.6	33.6	34.1	31.5	22.4	22.3	18.7	14.8	13.8	17.2	15.7
POWER																	
AVE POWER MW		212	340	325	341	385	391	427	427	390	275	272	227	181	169	212	195
PEAK POW MW		710	709	708	706	701	700	689	676	663	656	652	651	651	656	662	670
ENERGY GWH	2722.4	76.5	57.1	70.2	245.8	286.4	281.3	317.5	317.8	280.5	204.7	97.8	38.2	34.7	125.6	157.4	130.9
--BIG BEND--																	
EVAPORATION	131							8	25	31	28	12	6	7	14		
REG INFLOW	17770	488	365	449	1577	1846	1820	2061	2071	1843	1351	650	253	229	834	1058	874
RELEASE	17812	530	365	449	1577	1846	1820	2061	2071	1842	1352	650	253	229	834	1058	874
STORAGE	1673.	1631	1631	1631	1631	1631	1631	1631	1631	1632	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.7	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	23.000	17.8	26.3	25.2	26.5	30.0	30.6	33.5	33.7	31.0	22.0	21.9	18.2	14.4	13.6	17.2	15.7
POWER																	
AVE POWER MW		84	123	118	124	140	143	157	158	147	108	109	92	73	68	85	75
PEAK POW MW		517	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
ENERGY GWH	1026.3	30.3	20.7	25.4	89.3	104.5	103.0	116.7	117.3	105.6	80.2	39.3	15.4	14.0	51.0	62.9	50.7
--FORT RANDALL--																	
NAT INFLOW	450	77	36	46	80	65	110	35	25		-20	-8	-4	-4	-10	-20	40
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	145							10	32	39	31	12	5	5	12		
REG INFLOW	18037	606	401	495	1653	1902	1918	2068	2050	1796	1300	630	244	219	810	1035	911
RELEASE	18023	311	257	495	1653	1902	1918	2068	2050	1940	1939	884	414	245	701	694	552
STOR CHANGE	15	295	144	0				0	0	-144	-639	-254	-170	-26	109	341	359
STORAGE	2986.	3281	3425	3425	3425	3425	3425	3425	3425	3281	2642	2388	2218	2192	2301	2642	3001
ELEV FTMSL	1349.8	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1341.0	1338.0	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	17.700	10.5	18.5	27.7	27.8	30.9	32.2	33.6	33.3	32.6	31.5	29.7	29.8	15.4	11.4	11.3	9.9
POWER																	
AVE POWER MW		87	156	234	234	260	271	283	280	272	252	225	219	113	84	86	79
PEAK POW MW		350	356	356	356	356	356	356	356	350	319	301	287	285	294	319	339
ENERGY GWH	1787.2	31.2	26.1	50.5	168.6	193.6	195.1	210.3	208.4	196.0	187.8	81.1	36.8	21.7	62.5	64.1	53.4
--GAVINS POINT--																	
NAT INFLOW	1300	92	43	55	125	140	150	85	70	80	105	50	23	27	75	75	105
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	13	14	-15	-18	0	-6	-2	-3	1	1	2	3	0	27	8	0	3
EVAPORATION	42							2	8	10	9	4	2	2	5		
REG INFLOW	19180	418	284	533	1773	2017	2041	2109	2103	2016	2035	928	433	294	769	769	659
RELEASE	19179	417	284	533	1773	2017	2041	2109	2091	1993	2035	928	433	294	769	769	694
STOR CHANGE	1	1							12	23							-35
STORAGE	326.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	20.000	14.0	20.5	29.8	29.8	32.8	34.3	34.3	34.0	33.5	33.1	31.2	31.2	18.5	12.5	12.5	12.5
POWER																	
AVE POWER MW		49	71	100	100	107	111	111	110	111	111	107	107	65	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	773.9	17.6	11.9	21.7	72.3	79.8	79.6	82.2	82.1	79.8	82.5	38.3	17.9	12.5	33.0	33.0	29.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1100	121	56	73	145	185	115	100	80	65	35	23	11	12	10	20	50
DEPLETION	293	8	4	5	25	37	33	41	40	27	13	7	3	4	15	16	16
REGULATED FLOW AT SIOUX CITY																	
KAF	19986	530	337	600	1893	2165	2123	2168	2131	2031	2057	944	440	302	764	773	728
KCFS		17.8	24.3	33.6	31.8	35.2	35.7	35.3	34.7	34.1	33.5	31.7	31.7	19.0	12.4	12.6	13.1
--TOTAL--																	
NAT INFLOW	19300	1072	500	643	1735	2615	4800	2675	990	835	850	405	189	216	430	510	835
DEPLETION	3130	55	26	33	144	599	1607	1371	380	-199	-158	-164	-77	-87	-177	-150	-73
CHAN STOR	4	78	-15	-18	-26	-40	-32	1	1	45	46	3	0	19	-43	-18	3
EVAPORATION	2049							130	404	499	426	189	87	99	215		
STORAGE	56119.	56685	56806	56798	56470	56281	57319	56326	54402	52951	51523	50962	50700	50621	50207	50076	50258
SYSTEM POWER																	
AVE POWER MW		725	982	1070	1155	1318	1401	1452	1447	1298	1035	1001	933	724	748	848	812
PEAK POW MW		2407	2405	2404	2399	2394	2406	2394	2369	2354	2331	2308	2293	2290	2257	2280	2290
ENERGY GWH	9730.1	260.9	165.0	231.1	831.8	980.2	1008.4	1080.5	1076.9	934.9	770.4	360.3	156.7	138.9	556.8	631.2	546.0
DAILY GWH		17.4	23.6	25.7	27.7	31.6	33.6	34.9	34.7	31.2	24.9	24.0	22.4	17.4	18.0	20.4	19.5
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

TIME OF STUDY: 09:13:18 STUDY NO 8

VALUES IN 1000 AF EXCEPT AS INDICATED

29FEB20	2020											2021				
INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																
NAT INFLOW 5300	194	90	116	440	850	1180	595	260	230	310	145	68	77	220	230	295
DEPLETION 606	-12	-5	-7	33	288	583	296	39	-118	-110	-32	-15	-17	-114	-120	-84
EVAPORATION 521							33	102	125	108	49	23	26	56		
MOD INFLOW 4173	205	96	123	407	562	597	266	119	223	312	128	60	68	278	350	379
RELEASE 6580	179	83	107	506	553	655	676	676	506	369	179	83	106	615	676	611
STOR CHANGE -2408	27	12	16	-99	9	-58	-410	-557	-283	-57	-51	-24	-38	-337	-326	-232
STORAGE 14776.	14803	14815	14831	14732	14741	14683	14273	13716	13433	13376	13325	13301	13263	12927	12600	12368
ELEV FTMSL 2233.9	2234.1	2234.1	2234.2	2233.7	2233.8	2233.5	2231.5	2228.7	2227.3	2227.0	2226.7	2226.6	2226.4	2224.7	2222.9	2221.6
DISCH KCFS 10.500	6.0	6.0	6.0	8.5	9.0	11.0	11.0	11.0	8.5	6.0	6.0	6.0	6.7	10.0	11.0	11.0
POWER																
AVE POWER MW	82	82	82	116	122	149	149	148	113	80	80	80	89	132	144	143
PEAK POW MW	188	188	188	188	188	188	186	185	184	183	183	183	183	182	180	179
ENERGY GWH 1066.3	29.4	13.7	17.7	83.3	91.0	107.5	110.7	109.9	81.7	59.5	28.8	13.4	17.1	98.5	107.4	96.4
--GARRISON--																
NAT INFLOW 7400	382	178	229	580	1100	2165	935	325	215	385	150	70	80	140	195	270
DEPLETION 1141	22	10	13	27	110	631	735	134	-156	-44	-123	-57	-65	-64	-26	-7
CHAN STOR -6	45			-25	-5	-20			25	25			-7	-33	-10	
EVAPORATION 603							39	118	145	125	56	26	30	64		
REG INFLOW 12231	583	251	323	1034	1538	2169	838	749	756	698	395	184	215	722	887	888
RELEASE 15152	506	236	303	1190	1414	1458	1445	1445	1206	1045	506	222	254	1230	1414	1277
STOR CHANGE -2922	77	15	20	-156	124	711	-607	-696	-450	-347	-111	-38	-39	-508	-527	-389
STORAGE 17739.	17816	17832	17851	17695	17819	18530	17923	17227	16777	16430	16319	16281	16242	15734	15207	14817
ELEV FTMSL 1837.5	1837.7	1837.8	1837.8	1837.3	1837.7	1840.0	1838.1	1835.8	1834.3	1833.1	1832.7	1832.6	1832.4	1830.7	1828.8	1827.3
DISCH KCFS 22.000	17.0	17.0	17.0	20.0	23.0	24.5	23.5	23.5	20.3	17.0	17.0	16.0	16.0	20.0	23.0	23.0
POWER																
AVE POWER MW	211	211	211	248	284	305	293	289	247	206	205	192	192	238	270	267
PEAK POW MW	527	527	528	525	527	538	529	518	511	506	504	503	503	494	486	479
ENERGY GWH 2231.4	75.9	35.5	45.6	178.3	211.4	219.6	218.0	215.2	177.8	153.0	73.7	32.3	36.9	177.3	201.1	179.7
--OAHE--																
NAT INFLOW 1150	169	79	102	200	110	305	105	40	45	5	8	4	4	-45	-20	40
DEPLETION 802	26	12	16	53	81	172	212	144	34	-14	1	0	0	14	20	31
CHAN STOR -5	20			-12	-12	-6	4		14	15		5	0	-18	-14	0
EVAPORATION 545							36	109	132	111	50	23	26	57		
REG INFLOW 14951	669	303	389	1325	1431	1585	1306	1232	1100	968	463	207	231	1095	1361	1286
RELEASE 17921	511	375	462	1576	1871	1850	2046	2080	1848	1352	591	312	230	865	1068	884
STOR CHANGE -2970	158	-73	-73	-251	-440	-265	-739	-848	-749	-384	-128	-105	1	230	292	403
STORAGE 18619.	18777	18705	18632	18381	17941	17676	16937	16089	15340	14956	14828	14723	14724	14954	15247	15649
ELEV FTMSL 1607.3	1607.9	1607.6	1607.4	1606.6	1605.1	1604.2	1601.7	1598.6	1595.9	1594.4	1593.9	1593.5	1593.5	1594.4	1595.5	1597.0
DISCH KCFS 23.300	17.2	27.0	25.9	26.5	30.4	31.1	33.3	33.8	31.1	22.0	19.9	22.5	14.5	14.1	17.4	15.9
POWER																
AVE POWER MW	222	349	334	341	388	394	417	418	378	265	238	269	174	169	210	194
PEAK POW MW	710	708	707	703	695	691	677	661	647	640	638	636	636	640	646	653
ENERGY GWH 2695.2	80.0	58.6	72.1	245.2	288.9	283.7	310.6	310.8	272.0	197.3	85.9	45.2	33.3	125.7	156.0	130.0
--BIG BEND--																
EVAPORATION 131							8	25	31	28	12	6	7	14		
REG INFLOW 17790	511	375	462	1576	1871	1850	2038	2055	1817	1324	579	306	223	850	1068	884
RELEASE 17831	553	375	462	1576	1871	1850	2038	2054	1817	1325	579	306	223	850	1068	884
STORAGE 1673.	1631	1631	1631	1631	1631	1631	1631	1631	1632	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL 1420.7	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS 23.000	18.6	27.0	25.9	26.5	30.4	31.1	33.1	33.4	30.5	21.5	19.4	22.0	14.1	13.8	17.4	15.9
POWER																
AVE POWER MW	88	127	121	124	142	145	155	156	145	106	98	111	71	70	85	76
PEAK POW MW	517	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
ENERGY GWH 1027.5	31.6	21.3	26.2	89.3	106.0	104.7	115.4	116.3	104.1	78.6	35.2	18.6	13.6	51.9	63.5	51.3
--FORT RANDALL--																
NAT INFLOW 350	68	32	41	85	50	95	25	15	-5	-25	-10	-5	-5	-20	-25	35
DEPLETION 80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION 145							10	32	39	31	12	5	5	12		
REG INFLOW 17957	619	406	502	1657	1912	1933	2035	2023	1765	1268	556	296	213	816	1040	916
RELEASE 17942	324	262	502	1657	1912	1933	2035	2023	1909	1907	869	407	239	707	699	557
STOR CHANGE 15	295	144			0	0	0	0	-144	-639	-313	-111	-26	109	341	359
STORAGE 2986.	3281	3425	3425	3425	3425	3425	3425	3425	3281	2642	2329	2218	2192	2301	2642	3001
ELEV FTMSL 1349.8	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1340.0	1338.0	1337.5	1339.5	1345.0	1350.0
DISCH KCFS 17.700	10.9	18.9	28.1	27.9	31.1	32.5	33.1	32.9	32.1	31.0	29.2	29.3	15.0	11.5	11.4	10.0
POWER																
AVE POWER MW	90	159	237	235	262	273	278	277	268	248	220	215	110	85	87	80
PEAK POW MW	350	356	356	356	356	356	356	356	350	319	296	287	285	294	319	339
ENERGY GWH 1779.0	32.5	26.7	51.2	169.0	194.7	196.6	206.9	205.7	192.9	184.7	79.4	36.0	21.1	63.1	64.6	53.9
--GAVINS POINT--																
NAT INFLOW 1200	80	37	48	120	130	135	80	60	75	100	48	22	25	70	70	100
DEPLETION 114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR 13	13	-15	-18	1	-6	-3	-1	0	2	2	3	0	26	7	0	2
EVAPORATION 42							2	8	10	9	4	2	2	5		
REG INFLOW 19000	418	284	533	1773	2017	2041	2072	2066	1981	1998	910	425	286	769	769	659
RELEASE 18999	417	284	533	1773	2017	2041	2072	2054	1958	1998	910	425	286	769	769	694
STOR CHANGE 1	1							12	23							-35
STORAGE 326.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL 1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS 20.000	14.0	20.5	29.8	29.8	32.8	34.3	33.7	33.4	32.9	32.5	30.6	30.6	18.0	12.5	12.5	12.5
POWER																
AVE POWER MW	49	71	100	100	107	111	109	109	109	110	105	105	64	44	44	44
PEAK POW MW	114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH 769.0	17.6	11.9	21.7	72.3	79.8	79.6	81.3	81.2	78.8	81.5	37.8	17.7	12.2	33.0	33.0	29.6
--GAVINS POINT - SIOUX CITY--																
NAT INFLOW 700	87	41	52	90	120	65	70	40	30	30	18	8	9	5	15	20
DEPLETION 293	8	4	5	25	37	33	41	40	27	13	7	3	4	15	16	16
REGULATED FLOW AT SIOUX CITY																
KAF 19406	496	321	580	1838	2100	2073	2101	2054	1961	2015	921	430	291	759	768	698
KCFS	16.7	23.2	32.5	30.9	34.2	34.8	34.2	33.4	33.0	32.8	31.0	31.0	18.4	12.3	12.5	12.6
--TOTAL--																
NAT INFLOW 16100	980	457	588	1515	2360	3945	1810	740	590	805	358	167	191	370	465	760
DEPLETION 3036	45	21	27	147	544	1455	1341	382	-211	-152	-141	-66	-75	-136	-106	-41
CHAN STOR 3	78	-15	-18	-36	-23	-29	3	0	41	42	3	4	20	-45	-24	2
EVAPORATION 1987							128	393	483	412	183	84	96	208		
STORAGE 56119.	56635	56734	56697	56191	55884	56272	54516	52427	50825	49396	48793	48516	48414	47909	47689	47794
SYSTEM POWER																
AVE POWER MW	742	998	1086	1163	1306	1377	1402	1397	1260	1014	946	971	700	739	841	805
PEAK POW MW	2406	2404	2403	2396	2390	2396	2372	2345	2327	2303	2276	2265	2262	2226	2247	2255
ENERGY GWH 9568.4	267.0	167.7	234.5	837.3	971.8	991.8	1042.9	1039.2	907.4	754.7	340.7	163.2	134.3	549.5	625.7	541.0
DAILY GWH	17.8	24.0	26.1	27.9	31.3	33.1	33.6	33.5	30.2	24.3	22.7	23.3	16.8	17.7	20.2	19.3
INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

TIME OF STUDY: 09:12:33 STUDY NO 9

VALUES IN 1000 AF EXCEPT AS INDICATED

	28FEB21	2021												2022			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	7200	227	106	136	560	1145	1830	840	365	290	385	205	96	109	295	260	350
DEPLETION	563	-26	-12	-16	13	280	602	305	46	-92	-113	-31	-14	-17	-127	-142	-93
EVAPORATION	455							28	88	109	95	43	20	23	50		
MOD INFLOW	6182	254	118	152	547	865	1228	507	231	273	403	193	90	103	372	402	443
RELEASE	6386	179	83	107	446	492	655	676	676	503	369	179	97	111	584	646	583
STOR CHANGE	-204	75	35	45	101	373	573	-170	-445	-230	34	14	-7	-8	-212	-244	-140
STORAGE	14553.	14628	14663	14708	14809	15182	15756	15586	15141	14911	14945	14960	14953	14944	14733	14489	14349
ELEV FTMSL	2232.9	2233.2	2233.4	2233.6	2234.1	2235.9	2238.5	2237.7	2235.7	2234.6	2234.7	2234.8	2234.8	2234.7	2233.7	2232.6	2231.9
DISCH KCFS	10.000	6.0	6.0	6.0	7.5	8.0	11.0	11.0	11.0	8.5	6.0	6.0	7.0	7.0	9.5	10.5	10.5
POWER																	
AVE POWER MW		82	82	82	102	109	151	151	151	115	82	82	96	96	129	142	142
PEAK POW MW		188	188	188	188	189	191	190	189	188	189	189	189	189	188	187	187
ENERGY GWH	1054.6	29.4	13.7	17.6	73.5	81.3	108.7	112.6	112.2	83.1	61.0	29.5	16.1	18.3	96.2	105.9	95.4
--GARRISON--																	
NAT INFLOW	10900	479	223	287	780	1300	3120	2100	580	480	445	180	84	96	180	255	310
DEPLETION	1158	-7	-3	-4	-68	146	995	827	143	-162	-67	-161	-75	-86	-143	-105	-73
CHAN STOR	-5	40			-15	-5	-30			25	24		-10		-25	-10	
EVAPORATION	524							32	102	127	109	49	23	26	56		
REG INFLOW	15599	704	310	399	1279	1641	2750	1917	1011	1043	795	470	223	267	827	996	966
RELEASE	15846	506	236	303	1190	1506	1547	1537	1537	1309	1168	565	264	286	1199	1414	1277
STOR CHANGE	-247	198	74	95	89	134	1203	380	-526	-266	-373	-95	-40	-19	-372	-418	-311
STORAGE	17460.	17659	17733	17828	17917	18052	19254	19634	19108	18842	18470	18374	18334	18315	17943	17524	17213
ELEV FTMSL	1836.6	1837.2	1837.5	1837.8	1838.1	1838.5	1842.2	1843.4	1841.8	1841.0	1839.8	1839.5	1839.4	1839.3	1838.1	1836.8	1835.7
DISCH KCFS	22.000	17.0	17.0	17.0	20.0	24.5	26.0	25.0	25.0	22.0	19.0	19.0	19.0	18.0	19.5	23.0	23.0
POWER																	
AVE POWER MW		210	210	211	248	304	326	318	318	278	239	238	238	226	243	284	282
PEAK POW MW		525	526	527	529	531	548	553	546	542	537	536	535	535	529	523	518
ENERGY GWH	2399.4	75.6	35.4	45.5	178.6	226.1	235.1	237.0	236.7	200.5	178.2	85.8	40.0	43.3	180.9	211.3	189.5
--OAHE--																	
NAT INFLOW	2300	259	121	155	405	220	625	170	70	95	45	45	21	24	-15	-10	70
DEPLETION	817	26	12	16	54	82	175	217	147	35	-15	1	0	0	14	21	32
CHAN STOR	-4	20			-12	-18	-6	4		12	12			4	-6	-14	0
EVAPORATION	496							32	97	119	102	46	22	25	53		
REG INFLOW	16829	759	345	443	1529	1627	1991	1462	1363	1262	1138	564	263	289	1110	1369	1315
RELEASE	17083	468	306	360	1293	1543	1609	1849	1983	1754	1263	587	309	227	1113	1315	1103
STOR CHANGE	-253	290	38	83	236	84	382	-387	-620	-492	-125	-23	-46	62	-3	54	212
STORAGE	18373.	18664	18702	18785	19021	19105	19487	19101	18481	17989	17864	17841	17795	17856	17854	17908	18120
ELEV FTMSL	1606.5	1607.5	1607.6	1607.9	1608.6	1608.9	1610.1	1608.9	1606.9	1605.3	1604.9	1604.8	1604.6	1604.8	1604.8	1605.0	1605.7
DISCH KCFS	19.868	15.7	22.1	20.2	21.7	25.1	27.0	30.1	32.2	29.5	20.5	19.7	22.3	14.3	18.1	21.4	19.9
POWER																	
AVE POWER MW		203	285	261	282	326	352	391	416	377	262	251	283	182	231	272	254
PEAK POW MW		708	708	710	714	715	722	715	705	696	694	693	693	694	694	695	698
ENERGY GWH	2660.2	73.1	47.9	56.4	202.8	242.4	253.6	291.1	309.3	271.2	194.8	90.4	47.6	35.0	171.6	202.6	170.5
--BIG BEND--																	
EVAPORATION	105							6	20	25	22	10	5	5	12		
REG INFLOW	16978	468	306	360	1293	1543	1609	1843	1963	1729	1241	577	305	222	1101	1315	1103
RELEASE	16978	468	306	360	1293	1543	1609	1843	1963	1729	1241	577	305	222	1101	1315	1103
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	19.868	15.7	22.1	20.2	21.7	25.1	27.0	30.0	31.9	29.1	20.2	19.4	21.9	14.0	17.9	21.4	19.9
POWER																	
AVE POWER MW		75	103	95	102	117	127	140	149	138	99	97	110	71	90	105	95
PEAK POW MW		517	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
ENERGY GWH	980.8	26.8	17.4	20.4	73.2	87.4	91.1	104.4	111.1	99.1	73.7	35.1	18.5	13.5	67.0	78.0	64.0
--FORT RANDALL--																	
NAT INFLOW	900	121	56	73	160	165	135	70	60	35		-5	-2	-3		-10	45
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	116							8	25	31	24	9	4	4	9		
REG INFLOW	17682	588	362	432	1449	1699	1732	1887	1982	1725	1216	562	298	215	1089	1302	1145
RELEASE	17682	307	218	432	1449	1699	1732	1887	1982	1869	1855	875	409	241	980	961	786
STOR CHANGE	0	281	144					0	0	-144	-639	-313	-111	-26	108	341	359
STORAGE	3000.	3281	3425	3425	3425	3425	3425	3425	3425	3281	2642	2329	2218	2192	2300	2641	3000
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1340.0	1338.0	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	14.160	10.3	15.7	24.2	24.3	27.6	29.1	30.7	32.2	31.4	30.2	29.4	29.5	15.2	15.9	15.6	14.2
POWER																	
AVE POWER MW		86	132	204	206	233	245	258	271	262	242	222	215	111	117	119	113
PEAK POW MW		350	356	356	356	356	356	356	356	350	319	296	287	285	294	320	339
ENERGY GWH	1746.4	30.8	22.3	44.2	148.1	173.3	176.5	192.1	201.7	188.9	179.7	79.9	36.2	21.3	87.2	88.4	75.9
--GAVINS POINT--																	
NAT INFLOW	1500	102	47	61	145	165	175	100	90	95	120	58	27	31	80	85	120
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	7	-10	-16	0	-6	-3	-3	-3	2	2	1	0	26	-1	1	3
EVAPORATION	34							2	6	8	7	3	2	2	4		
REG INFLOW	19034	417	255	477	1588	1839	1880	1943	2053	1963	1968	925	432	294	1045	1045	909
RELEASE	19034	417	255	477	1588	1839	1880	1943	2041	1940	1968	925	432	294	1045	1045	944
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	17.000	14.0	18.4	26.7	26.7	29.9	31.6	31.6	33.2	32.6	32.0	31.1	31.1	18.5	17.0	17.0	17.0
POWER																	
AVE POWER MW		49	64	91	91	101	105	105	109	109	108	106	106	65	60	60	60
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	779.7	17.6	10.7	19.7	65.6	74.9	75.3	77.8	80.9	78.3	80.6	38.3	17.9	12.5	44.7	44.7	40.1
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1800	162	76	97	280	345	190	165	130	110	60	30	14	16	25	25	75
DEPLETION	295	8	4	5	25	38	33	42	40	27	13	7	3	4	15	16	16
REGULATED FLOW AT SIOUX CITY																	
KAF	20539	571	327	570	1843	2146	2037	2066	2131	2023	2015	948	443	306	1055	1054	1003
KCFS		19.2	23.6	31.9	31.0	34.9	34.2	33.6	34.7	34.0	32.8	31.9	31.9	19.3	17.2	17.1	18.1
--TOTAL--																	
NAT INFLOW	24600	1350	630	810	2330	3340	6075	3445	1295	1105	1055	513	239	273	565	605	970
DEPLETION	3027	2	1	1	33	574	1841	1448	401	-190	-179	-178	-83	-95	-228	-206	-115
CHAN STOR	-10	67	-10	-16	-27	-29	-38	1	-3	38	38	1	-10	31	-33	-24	3
EVAPORATION	1730							108	338	420	361	161	74	85	183		
STORAGE	55346.	56190	56482	56704	57131	57723	59881	59705	58126	57017	55914	55497	55292	55301	54823	54556	54640
SYSTEM POWER																	
AVE POWER MW		704	876	944	1030	1190	1306	1364	1414	1279	1032	997	1049	750	871	983	946
PEAK POW MW		2402	2402	2405	2410	2415	2440	2438	2420	2411	2393	2369	2358	2357	2321	2340	2347
ENERGY GWH	9621.1	253.3	147.2	203.9	741.8	885.3	940.3	1015.0	1051.8	921.2	768.0	359.0	176.2	144.1	647.7	731.0	635.4
DAILY GWH		16.9	21.0	22.7	24.7	28.6	31.3	32.7	33.9	30.7	24.8	23.9	25.2	18.0	20.9	23.6	22.7
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

TIME OF STUDY: 09:12:33 STUDY NO 10

VALUES IN 1000 AF EXCEPT AS INDICATED

	28FEB22	2022												2023			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	7200	227	106	136	560	1145	1830	840	365	290	385	205	96	109	295	260	350
DEPLETION	575	-26	-12	-16	13	281	606	312	51	-92	-115	-32	-15	-17	-128	-143	-93
EVAPORATION	451							28	87	108	94	43	20	23	49		
MOD INFLOW	6174	254	118	152	547	864	1224	500	227	274	406	194	90	103	374	403	443
RELEASE	6331	179	83	107	417	492	655	676	676	507	369	179	83	95	584	646	583
STOR CHANGE	-157	75	35	45	130	372	569	-176	-449	-233	37	15	7	8	-210	-243	-140
STORAGE	14349.	14424	14459	14504	14634	15007	15576	15400	14950	14717	14754	14770	14777	14785	14575	14332	14192
ELEV FTMSL	2231.9	2232.3	2232.4	2232.6	2233.3	2235.0	2237.7	2236.9	2234.8	2233.7	2233.8	2233.9	2233.9	2234.0	2233.0	2231.8	2231.1
DISCH KCFS	10.500	6.0	6.0	6.0	7.0	8.0	11.0	11.0	11.0	8.5	6.0	6.0	6.0	6.0	9.5	10.5	10.5
POWER																	
AVE POWER MW		81	81	81	95	109	151	151	150	116	82	82	82	82	129	142	142
PEAK POW MW		187	187	187	188	189	190	190	189	188	188	188	188	188	187	187	186
ENERGY GWH	1042.8	29.3	13.7	17.6	68.4	81.1	108.4	112.4	111.9	83.6	60.8	29.4	13.7	15.7	96.0	105.7	95.2
--GARRISON--																	
NAT INFLOW	10900	479	223	287	780	1300	3120	2100	580	480	445	180	84	96	180	255	310
DEPLETION	1176	-5	-2	-3	-67	146	1005	843	148	-165	-71	-164	-77	-87	-145	-106	-74
CHAN STOR	0	45			-10	-10	-30			24	25				-35	-10	
EVAPORATION	519							32	101	126	108	49	23	26	55		
REG INFLOW	15535	707	309	397	1254	1636	2740	1901	1007	1051	801	474	221	253	819	997	967
RELEASE	15724	506	236	303	1131	1506	1547	1537	1537	1296	1138	550	257	289	1199	1414	1277
STOR CHANGE	-189	202	73	94	123	130	1193	364	-530	-245	-336	-76	-36	-36	-380	-418	-310
STORAGE	17213.	17415	17488	17582	17705	17834	19027	19391	18861	18616	18279	18203	18167	18131	17752	17334	17024
ELEV FTMSL	1835.7	1836.4	1836.7	1837.0	1837.4	1837.8	1841.5	1842.6	1841.0	1840.3	1839.2	1839.0	1838.9	1838.7	1837.5	1836.2	1835.1
DISCH KCFS	23.000	17.0	17.0	17.0	19.0	24.5	26.0	25.0	25.0	21.8	18.5	18.5	18.5	18.2	19.5	23.0	23.0
POWER																	
AVE POWER MW		209	209	210	235	303	325	317	317	275	232	231	231	227	242	283	281
PEAK POW MW		521	522	524	526	528	545	550	543	539	534	533	532	532	526	520	515
ENERGY GWH	2371.4	75.2	35.2	45.3	169.0	225.1	234.1	236.0	235.7	197.7	172.8	83.3	38.8	43.6	180.3	210.5	188.7
--OAHE--																	
NAT INFLOW	2300	259	121	155	405	220	625	170	70	95	45	45	21	24	-15	-10	70
DEPLETION	830	27	12	16	54	83	178	221	150	35	-15	1	0	0	15	21	32
CHAN STOR	0	24			-8	-22	-6	4		13	13			1	-5	-14	0
EVAPORATION	487							31	95	117	101	45	21	24	53		
REG INFLOW	16707	762	344	443	1474	1622	1988	1459	1362	1252	1110	550	257	290	1111	1369	1315
RELEASE	16902	468	306	360	1293	1543	1609	1849	1983	1754	1263	587	309	227	1050	1253	1048
STOR CHANGE	-195	294	38	82	181	79	379	-390	-621	-502	-153	-37	-53	63	62	115	267
STORAGE	18120.	18414	18452	18535	18716	18794	19173	18783	18162	17660	17508	17471	17418	17480	17542	17657	17925
ELEV FTMSL	1605.7	1606.7	1606.8	1607.1	1607.7	1607.9	1609.1	1607.9	1605.9	1604.2	1603.7	1603.5	1603.3	1603.6	1603.8	1604.2	1605.1
DISCH KCFS	19.868	15.7	22.1	20.2	21.7	25.1	27.0	30.1	32.2	29.5	20.5	19.7	22.3	14.3	17.1	20.4	18.9
POWER																	
AVE POWER MW		202	284	260	280	324	350	389	413	375	260	250	281	181	216	258	240
PEAK POW MW		703	704	706	709	710	716	710	699	690	687	687	686	687	688	690	695
ENERGY GWH	2618.6	72.8	47.7	56.2	201.8	241.1	252.3	289.6	307.6	269.6	193.6	89.8	47.2	34.8	160.9	192.2	161.3
--BIG BEND--																	
EVAPORATION	105							6	20	25	22	10	5	5	12		
REG INFLOW	16797	468	306	360	1293	1543	1609	1843	1963	1729	1241	577	305	222	1038	1253	1048
RELEASE	16797	468	306	360	1293	1543	1609	1843	1963	1729	1241	577	305	222	1038	1253	1048
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	19.868	15.7	22.1	20.2	21.7	25.1	27.0	30.0	31.9	29.1	20.2	19.4	21.9	14.0	16.9	20.4	18.9
POWER																	
AVE POWER MW		75	103	95	102	117	127	140	149	138	99	97	110	71	85	100	90
PEAK POW MW		517	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
ENERGY GWH	970.2	26.8	17.4	20.4	73.2	87.4	91.1	104.4	111.1	99.1	73.7	35.1	18.5	13.5	63.2	74.4	60.8
--FORT RANDALL--																	
NAT INFLOW	900	121	56	73	160	165	135	70	60	35		-5	-2	-3		-10	45
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	116							8	25	31	24	9	4	4	9		
REG INFLOW	17502	588	362	432	1449	1699	1732	1887	1982	1725	1216	562	298	215	1025	1240	1090
RELEASE	17502	307	218	432	1449	1699	1732	1887	1982	1869	1855	875	409	241	917	899	731
STOR CHANGE	0	281	144					0	0	-144	-639	-313	-111	-26	108	341	359
STORAGE	3000.	3281	3425	3425	3425	3425	3425	3425	3425	3281	2642	2329	2218	2192	2300	2641	3000
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1340.0	1338.0	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	14.160	10.3	15.7	24.2	24.3	27.6	29.1	30.7	32.2	31.4	30.2	29.4	29.5	15.2	14.9	14.6	13.2
POWER																	
AVE POWER MW		86	132	204	206	233	245	258	271	262	242	222	215	111	110	111	105
PEAK POW MW		350	356	356	356	356	356	356	356	350	319	296	287	285	294	320	339
ENERGY GWH	1729.9	30.8	22.3	44.2	148.1	173.3	176.5	192.1	201.7	188.9	179.7	79.9	36.2	21.3	81.6	82.8	70.6
--GAVINS POINT--																	
NAT INFLOW	1500	102	47	61	145	165	175	100	90	95	120	58	27	31	80	85	120
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	1	7	-10	-16	0	-6	-3	-3	-3	2	2	1	0	26	0	1	3
EVAPORATION	34							2	6	8	7	3	2	2	4		
REG INFLOW	18855	417	255	477	1588	1839	1880	1943	2053	1963	1968	925	432	294	984	984	854
RELEASE	18855	417	255	477	1588	1839	1880	1943	2041	1940	1968	925	432	294	984	984	889
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	17.000	14.0	18.4	26.7	26.7	29.9	31.6	31.6	33.2	32.6	32.0	31.1	31.1	18.5	16.0	16.0	16.0
POWER																	
AVE POWER MW		49	64	91	91	101	105	105	109	109	108	106	106	65	57	57	56
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	772.2	17.6	10.7	19.7	65.6	74.9	75.3	77.8	80.9	78.3	80.6	38.3	17.9	12.5	42.1	42.2	37.8
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1800	162	76	97	280	345	190	165	130	110	60	30	14	16	25	25	75
DEPLETION	297	8	4	5	25	38	33	42	41	27	13	7	3	4	15	16	17
REGULATED FLOW AT SIOUX CITY																	
KAF	20358	571	327	570	1843	2146	2037	2066	2130	2023	2015	948	443	306	994	993	947
KCFS		19.2	23.6	31.9	31.0	34.9	34.2	33.6	34.6	34.0	32.8	31.9	31.9	19.3	16.2	16.1	17.0
--TOTAL--																	
NAT INFLOW	24600	1350	630	810	2330	3340	6075	3445	1295	1105	1055	513	239	273	565	605	970
DEPLETION	3072	4	2	3	34	576	1858	1475	415	-193	-185	-182	-85	-97	-230	-208	-115
CHAN STOR	1	77	-10	-16	-18	-38	-38	1	-3	39	41	1	0	28	-40	-24	3
EVAPORATION	1712							107	335	415	357	159	74	84	182		
STORAGE	54640.	55492	55782	56003	56438	57018	59159	58957	57369	56268	55177	54765	54573	54582	54162	53958	54100
SYSTEM POWER																	
AVE POWER MW		701	874	941	1009	1187	1302	1361	1410	1274	1023	988	1026	737	839	951	914
PEAK POW MW		2394	2393	2396	2401	2406	2432	2429	2411	2402	2383	2359	2349	2347	2312	2332	2340
ENERGY GWH	9505.0	252.5	146.8	203.3	726.1	882.9	937.8	1012.3	1048.9	917.3	761.2	355.8	172.3	141.5	624.1	707.7	614.4
DAILY GWH		16.8	21.0	22.6	24.2	28.5	31.3	32.7	33.8	30.6	24.6	23.7	24.6	17.7	20.1	22.8	21.9
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

TIME OF STUDY: 09:12:33 STUDY NO 11

VALUES IN 1000 AF EXCEPT AS INDICATED

	28FEB23	2023												2024			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB
--FORT PECK--																	
NAT INFLOW	7200	227	106	136	560	1145	1830	840	365	290	385	205	96	109	295	260	350
DEPLETION	586	-26	-12	-16	13	282	610	319	56	-91	-115	-32	-15	-17	-127	-141	-103
EVAPORATION	448							28	86	107	93	42	20	23	49		
MOD INFLOW	6166	254	118	152	547	863	1220	493	223	274	407	194	91	104	373	401	453
RELEASE	6285	179	83	107	417	553	625	646	646	492	369	179	83	103	615	615	575
STOR CHANGE	-119	75	35	45	130	310	595	-152	-423	-218	38	16	7	0	-242	-214	-122
STORAGE	14192.	14267	14302	14347	14478	14787	15382	15230	14807	14589	14627	14643	14650	14650	14409	14195	14073
ELEV FTMSL	2231.1	2231.5	2231.7	2231.9	2232.5	2234.0	2236.8	2236.1	2234.1	2233.0	2233.2	2233.3	2233.3	2233.3	2232.2	2231.1	2230.5
DISCH KCFS	10.500	6.0	6.0	6.0	7.0	9.0	10.5	10.5	10.5	8.3	6.0	6.0	6.0	6.5	10.0	10.0	10.0
POWER																	
AVE POWER MW		81	81	81	95	122	143	144	143	112	82	82	82	88	135	135	135
PEAK POW MW		186	187	187	187	188	190	189	188	187	188	188	188	188	187	186	186
ENERGY GWH	1032.9	29.2	13.6	17.5	68.3	90.9	103.2	107.0	106.6	80.8	60.7	29.4	13.7	17.0	100.8	100.5	93.7
--GARRISON--																	
NAT INFLOW	10900	479	223	287	780	1300	3120	2100	580	480	445	180	84	96	180	255	310
DEPLETION	1188	-4	-2	-3	-67	146	1015	859	154	-168	-76	-168	-78	-89	-145	-106	-80
CHAN STOR	5	45			-10	-20	-15			22	22			-5	-35		
EVAPORATION	517							32	101	125	108	48	23	26	55		
REG INFLOW	15485	707	309	397	1254	1687	2715	1855	971	1037	804	478	223	258	850	976	965
RELEASE	15631	506	236	303	1131	1476	1517	1506	1506	1275	1107	536	250	286	1199	1445	1352
STOR CHANGE	-145	201	73	94	123	212	1198	348	-535	-238	-303	-58	-27	-28	-349	-469	-387
STORAGE	17024.	17225	17298	17392	17515	17726	18924	19272	18737	18498	18196	18138	18111	18083	17734	17265	16879
ELEV FTMSL	1835.1	1835.8	1836.0	1836.3	1836.7	1837.4	1841.2	1842.3	1840.6	1839.9	1838.9	1838.8	1838.7	1838.6	1837.5	1835.9	1834.6
DISCH KCFS	23.000	17.0	17.0	17.0	19.0	24.0	25.5	24.5	24.5	21.4	18.0	18.0	18.0	18.0	19.5	23.5	23.5
POWER																	
AVE POWER MW		208	209	209	234	296	318	310	310	270	226	225	225	225	242	289	286
PEAK POW MW		518	519	521	523	526	544	549	541	537	533	532	532	531	526	519	513
ENERGY GWH	2352.0	74.9	35.0	45.1	168.3	219.9	229.1	231.0	230.6	194.1	167.9	81.0	37.7	43.1	180.1	214.9	199.2
--OAHE--																	
NAT INFLOW	2300	259	121	155	405	220	625	170	70	95	45	45	21	24	-15	-10	70
DEPLETION	845	27	12	16	55	84	181	226	153	36	-15	1	0	0	15	21	33
CHAN STOR	-2	24			-8	-20	-6	4		13	14				-6	-17	
EVAPORATION	479							31	94	115	99	45	21	24	52		
REG INFLOW	16605	763	344	443	1473	1592	1955	1424	1330	1232	1082	535	250	286	1111	1397	1389
RELEASE	16754	470	306	360	1293	1543	1609	1849	1983	1754	1263	587	309	227	986	1192	1022
STOR CHANGE	-149	292	38	82	180	49	346	-425	-653	-522	-181	-52	-59	59	125	205	366
STORAGE	17925.	18217	18256	18338	18518	18567	18913	18488	17835	17312	17131	17080	17020	17079	17204	17409	17776
ELEV FTMSL	1605.1	1606.0	1606.2	1606.4	1607.0	1607.2	1608.3	1606.9	1604.8	1603.0	1602.4	1602.2	1602.0	1602.2	1602.6	1603.3	1604.6
DISCH KCFS	18.868	15.8	22.0	20.2	21.7	25.1	27.0	30.1	32.2	29.5	20.5	19.7	22.3	14.3	16.0	19.4	17.8
POWER																	
AVE POWER MW		202	283	259	279	323	349	387	411	372	258	248	279	180	202	244	225
PEAK POW MW		700	701	702	705	706	712	705	693	684	681	680	679	680	682	686	692
ENERGY GWH	2582.8	72.8	47.5	56.0	201.1	240.3	251.3	288.2	305.9	268.0	192.3	89.2	46.9	34.5	150.2	181.8	156.9
--BIG BEND--																	
EVAPORATION	105							6	20	25	22	10	5	5	12		
REG INFLOW	16649	470	306	360	1293	1543	1609	1843	1963	1729	1241	577	305	222	975	1192	1022
RELEASE	16649	470	306	360	1293	1543	1609	1843	1963	1729	1241	577	305	222	975	1192	1022
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	18.868	15.8	22.0	20.2	21.7	25.1	27.0	30.0	31.9	29.1	20.2	19.4	21.9	14.0	15.9	19.4	17.8
POWER																	
AVE POWER MW		75	103	95	102	117	127	140	149	138	99	97	110	71	80	95	85
PEAK POW MW		517	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
ENERGY GWH	961.4	27.0	17.3	20.4	73.2	87.4	91.1	104.4	111.1	99.1	73.7	35.1	18.5	13.5	59.4	70.8	59.3
--FORT RANDALL--																	
NAT INFLOW	900	121	56	73	160	165	135	70	60	35		-5	-2	-3		-10	45
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	116							8	25	31	24	9	4	4	9		
REG INFLOW	17354	590	362	432	1449	1699	1732	1887	1982	1725	1216	562	298	215	962	1179	1064
RELEASE	17354	309	218	432	1449	1699	1732	1887	1982	1869	1855	875	409	241	854	838	705
STOR CHANGE	0	281	144		0			0	0	-144	-639	-313	-111	-26	109	341	359
STORAGE	3000.	3281	3425	3425	3425	3425	3425	3425	3425	3281	2642	2329	2218	2192	2301	2642	3001
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1340.0	1338.0	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	13.160	10.4	15.7	24.2	24.3	27.6	29.1	30.7	32.2	31.4	30.2	29.4	29.5	15.2	13.9	13.6	12.3
POWER																	
AVE POWER MW		86	132	204	206	233	245	258	271	262	242	222	215	111	102	104	98
PEAK POW MW		350	356	356	356	356	356	356	356	350	319	296	287	285	294	319	339
ENERGY GWH	1716.5	31.0	22.2	44.2	148.1	173.3	176.5	192.1	201.7	188.9	179.7	79.9	36.2	21.3	76.0	77.2	68.1
--GAVINS POINT--																	
NAT INFLOW	1500	102	47	61	145	165	175	100	90	95	120	58	27	31	80	85	120
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	0	5	-10	-16	0	-6	-3	-3	-3	2	2	1	0	26	2	0	3
EVAPORATION	34							2	6	8	7	3	2	2	4		
REG INFLOW	18706	417	255	477	1588	1839	1880	1943	2053	1963	1968	925	432	294	922	922	828
RELEASE	18706	417	255	477	1588	1839	1880	1943	2041	1940	1968	925	432	294	922	922	863
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	16.000	14.0	18.4	26.7	26.7	29.9	31.6	31.6	33.2	32.6	32.0	31.1	31.1	18.5	15.0	15.0	15.0
POWER																	
AVE POWER MW		49	64	91	91	101	105	105	109	109	108	106	106	65	53	53	53
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	765.9	17.6	10.7	19.7	65.6	74.9	75.3	77.8	80.9	78.3	80.6	38.3	17.9	12.5	39.6	39.6	36.7
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1800	162	76	97	280	345	190	165	130	110	60	30	14	16	25	25	75
DEPLETION	301	8	4	5	26	38	33	42	41	28	13	8	4	4	16	16	17
REGULATED FLOW AT SIOUX CITY																	
KAF	20205	571	327	570	1842	2146	2037	2066	2130	2022	2015	948	442	306	931	931	921
KCFS		19.2	23.6	31.9	31.0	34.9	34.2	33.6	34.6	34.0	32.8	31.9	31.9	19.3	15.1	15.1	16.0
--TOTAL--																	
NAT INFLOW	24600	1350	630	810	2330	3340	6075	3445	1295	1105	1055	513	239	273	565	605	970
DEPLETION	3114	5	2	3	36	578	1875	1503	429	-193	-190	-185	-86	-99	-228	-206	-130
CHAN STOR	4	75	-10	-16	-18	-46	-24	1	-3	36	39	1	0	22	-39	-16	3
EVAPORATION	1698							106	332	412	354	158	73	83	180		
STORAGE	54100.	54949	55239	55460	55893	56464	58603	58373	56774	55674	54589	54182	53992	53998	53641	53504	53686
SYSTEM POWER																	
AVE POWER MW		701	872	939	1006	1192	1287	1345	1393	1263	1015	980	1017	739	815	920	882
PEAK POW MW		2387	2386	2389	2395	2400	2425	2422	2403	2393	2375	2351	2340	2339	2305	2326	2335
ENERGY GWH	9411.5	252.5	146.4	202.9	724.6	886.6	926.6	1000.5	1036.7	909.3	754.9	352.8	170.9	142.0	606.1	684.7	614.0
DAILY GWH		16.8	20.9	22.5	24.2	28.6	30.9	32.3	33.4	30.3	24.4	23.5	24.4	17.7	19.6	22.1	21.2
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB

TIME OF STUDY: 09:12:33 STUDY NO 12

VALUES IN 1000 AF EXCEPT AS INDICATED

29FEB24		2024											2025			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	7200	227	106	136	560	1145	1830	840	365	290	385	205	96	109	295	260	350
DEPLETION	597	-26	-12	-15	13	283	614	326	59	-92	-119	-33	-15	-18	-130	-144	-94
EVAPORATION	446							28	86	107	93	42	20	23	49		
MOD INFLOW	6157	253	118	152	547	862	1216	486	220	275	411	196	91	104	376	404	444
RELEASE	6239	179	83	107	417	492	625	646	646	491	369	179	83	111	584	646	583
STOR CHANGE	-83	75	35	45	130	370	591	-159	-426	-216	42	17	8	-7	-208	-242	-139
STORAGE	14073.	14147	14182	14227	14357	14727	15318	15159	14734	14518	14560	14577	14585	14578	14371	14129	13990
ELEV FTMSL	2230.5	2230.9	2231.1	2231.3	2231.9	2233.7	2236.5	2235.7	2233.7	2232.7	2232.9	2233.0	2233.0	2233.0	2232.0	2230.8	2230.1
DISCH KCFS	10.000	6.0	6.0	6.0	7.0	8.0	10.5	10.5	10.5	8.3	6.0	6.0	6.0	7.0	9.5	10.5	10.5
POWER																	
AVE POWER MW		81	81	81	95	109	143	144	143	112	81	82	82	95	129	142	141
PEAK POW MW		186	186	186	187	188	190	189	188	187	187	187	187	187	187	186	186
ENERGY GWH	1024.3	29.1	13.6	17.5	68.1	80.7	103.1	106.9	106.5	80.7	60.6	29.3	13.7	18.3	95.7	105.4	94.9
--GARRISON--																	
NAT INFLOW	10900	479	223	287	780	1300	3120	2100	580	480	445	180	84	96	180	255	310
DEPLETION	1210	-4	-2	-2	-66	147	1026	876	159	-171	-80	-172	-80	-91	-148	-107	-75
CHAN STOR	-5	40			-10	-10	-25			22	22			-10	-25	-10	
EVAPORATION	511							32	99	123	107	48	22	25	55		
REG INFLOW	15413	702	309	397	1253	1635	2694	1838	967	1041	810	482	225	263	833	998	968
RELEASE	15513	506	236	303	1131	1476	1517	1506	1506	1266	1107	536	250	254	1168	1445	1305
STOR CHANGE	-100	196	73	93	122	159	1177	332	-539	-225	-297	-53	-25	9	-336	-447	-337
STORAGE	16879.	17075	17147	17240	17362	17522	18698	19030	18490	18265	17968	17914	17890	17899	17563	17116	16779
ELEV FTMSL	1834.6	1835.3	1835.5	1835.8	1836.2	1836.8	1840.5	1841.5	1839.9	1839.2	1838.2	1838.1	1838.0	1838.0	1836.9	1835.4	1834.3
DISCH KCFS	23.500	17.0	17.0	17.0	19.0	24.0	25.5	24.5	24.5	21.3	18.0	18.0	18.0	16.0	19.0	23.5	23.5
POWER																	
AVE POWER MW		207	208	208	233	295	317	309	309	266	225	224	224	199	235	288	285
PEAK POW MW		516	517	518	520	523	540	545	537	534	529	529	528	528	523	516	511
ENERGY GWH	2325.5	74.7	34.9	45.0	167.8	219.1	228.2	230.0	229.6	191.8	167.1	80.6	37.6	38.2	174.9	214.1	191.8
--OAHE--																	
NAT INFLOW	2300	259	121	155	405	220	625	170	70	95	45	45	21	24	-15	-10	70
DEPLETION	860	27	13	16	55	85	185	230	157	37	-16	1	0	0	15	22	33
CHAN STOR	0	27			-8	-20	-6	4		13	14			8	-13	-19	
EVAPORATION	476							30	93	114	98	44	21	24	51		
REG INFLOW	16478	764	344	443	1473	1591	1951	1420	1326	1223	1083	536	250	263	1074	1394	1342
RELEASE	16581	472	306	360	1293	1543	1609	1849	1983	1754	1263	587	309	227	936	1143	948
STOR CHANGE	-104	292	38	82	180	48	342	-429	-656	-531	-180	-51	-59	36	139	251	394
STORAGE	17776.	18068	18106	18188	18368	18416	18758	18329	17673	17142	16962	16911	16852	16888	17026	17278	17672
ELEV FTMSL	1604.6	1605.5	1605.7	1605.9	1606.5	1606.7	1607.8	1606.4	1604.2	1602.4	1601.8	1601.6	1601.4	1601.5	1602.0	1602.9	1604.2
DISCH KCFS	17.772	15.9	22.0	20.2	21.7	25.1	27.0	30.1	32.2	29.5	20.5	19.7	22.3	14.3	15.2	18.6	17.1
POWER																	
AVE POWER MW		203	282	258	279	322	348	386	410	371	258	247	278	179	191	234	216
PEAK POW MW		697	698	700	703	704	709	702	690	681	678	677	676	676	679	683	690
ENERGY GWH	2549.2	72.9	47.3	55.8	200.6	239.6	250.6	287.5	305.0	267.1	191.7	88.9	46.7	34.4	142.0	173.9	145.2
--BIG BEND--																	
EVAPORATION	105							6	20	25	22	10	5	5	12		
REG INFLOW	16476	472	306	360	1293	1543	1609	1843	1963	1729	1241	577	305	222	924	1143	948
RELEASE	16476	472	306	360	1293	1543	1609	1843	1963	1729	1241	577	305	222	924	1143	948
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	17.772	15.9	22.0	20.2	21.7	25.1	27.0	30.0	31.9	29.1	20.2	19.4	21.9	14.0	15.0	18.6	17.1
POWER																	
AVE POWER MW		75	103	95	102	117	127	140	149	138	99	97	110	71	76	91	82
PEAK POW MW		517	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
ENERGY GWH	951.2	27.0	17.3	20.4	73.2	87.4	91.1	104.4	111.1	99.1	73.7	35.1	18.5	13.5	56.4	67.9	55.0
--FORT RANDALL--																	
NAT INFLOW	900	121	56	73	160	165	135	70	60	35		-5	-2	-3		-10	45
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	116							8	25	31	24	9	4	4	9		
REG INFLOW	17181	591	362	432	1449	1699	1732	1887	1982	1725	1216	562	298	215	912	1130	990
RELEASE	17181	311	218	432	1449	1699	1732	1887	1982	1869	1855	875	409	241	803	789	631
STOR CHANGE	0	280	144	0				0	0	-144	-639	-313	-111	-26	109	341	359
STORAGE	3001.	3281	3425	3425	3425	3425	3425	3425	3425	3281	2642	2329	2218	2192	2301	2642	3001
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1340.0	1338.0	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	12.261	10.5	15.7	24.2	24.3	27.6	29.1	30.7	32.2	31.4	30.2	29.4	29.5	15.2	13.1	12.8	11.4
POWER																	
AVE POWER MW		87	132	204	206	233	245	258	271	262	242	222	215	111	96	98	91
PEAK POW MW		350	356	356	356	356	356	356	356	350	319	296	287	285	294	319	339
ENERGY GWH	1700.6	31.2	22.2	44.2	148.1	173.3	176.5	192.1	201.7	188.9	179.7	79.9	36.2	21.3	71.6	72.7	61.0
--GAVINS POINT--																	
NAT INFLOW	1500	102	47	61	145	165	175	100	90	95	120	58	27	31	80	85	120
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	0	3	-10	-16	0	-6	-3	-3	-3	2	2	1	0	26	4	0	3
EVAPORATION	34							2	6	8	7	3	2	2	4		
REG INFLOW	18534	417	255	477	1588	1839	1880	1943	2053	1963	1968	925	432	294	873	873	754
RELEASE	18534	417	255	477	1588	1839	1880	1943	2041	1940	1968	925	432	294	873	873	789
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	15.000	14.0	18.4	26.7	26.7	29.9	31.6	31.6	33.2	32.6	32.0	31.1	31.1	18.5	14.2	14.2	14.2
POWER																	
AVE POWER MW		49	64	91	91	101	105	105	109	109	108	106	106	65	50	50	50
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	758.6	17.6	10.7	19.7	65.6	74.9	75.3	77.8	80.9	78.3	80.6	38.3	17.9	12.5	37.5	37.5	33.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1800	162	76	97	280	345	190	165	130	110	60	30	14	16	25	25	75
DEPLETION	305	8	4	5	26	38	34	42	42	28	13	8	4	4	16	17	17
REGULATED FLOW AT SIOUX CITY																	
KAF	20029	570	327	569	1842	2146	2036	2066	2129	2022	2015	948	442	306	882	881	847
KCFS		19.2	23.6	31.9	31.0	34.9	34.2	33.6	34.6	34.0	32.8	31.9	31.9	19.3	14.3	14.3	15.2
--TOTAL--																	
NAT INFLOW	24600	1350	630	810	2330	3340	6075	3445	1295	1105	1055	513	239	273	565	605	970
DEPLETION	3166	7	3	4	37	581	1895	1531	442	-196	-199	-191	-89	-102	-234	-208	-116
CHAN STOR	-4	70	-10	-16	-18	-36	-34	1	-3	37	38	1	0	26	-34	-28	3
EVAPORATION	1687							105	330	409	352	157	73	83	179		
STORAGE	53686.	54529	54819	55039	55471	56048	58158	57901	56292	55199	54125	53725	53538	53550	53254	53158	53400
SYSTEM POWER																	
AVE POWER MW		701	870	938	1005	1176	1285	1342	1391	1258	1013	978	1015	720	777	902	865
PEAK POW MW		2381	2381	2384	2389	2394	2419	2416	2396	2387	2368	2344	2334	2332	2299	2321	2331
ENERGY GWH	9309.5	252.5	146.1	202.6	723.4	875.0	924.9	998.7	1034.7	906.1	753.4	352.1	170.6	138.2	578.1	671.5	581.5
DAILY GWH		16.8	20.9	22.5	24.1	28.2	30.8	32.2	33.4	30.2	24.3	23.5	24.4	17.3	18.6	21.7	20.8
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

TIME OF STUDY: 09:12:33 STUDY NO 13

VALUES IN 1000 AF EXCEPT AS INDICATED

	28FEB25	2025												2026			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	7200	227	106	136	560	1145	1830	840	365	290	385	205	96	109	295	260	350
DEPLETION	597	-26	-12	-15	13	283	614	326	59	-92	-119	-33	-15	-18	-130	-144	-94
EVAPORATION	444							27	85	106	92	42	20	22	48		
MOD INFLOW	6159	253	118	152	547	862	1216	487	221	276	412	196	92	105	377	404	444
RELEASE	6204	179	83	107	417	523	625	646	646	492	369	179	83	103	584	615	555
STOR CHANGE	-45	75	35	45	130	339	591	-159	-425	-216	43	18	8	1	-207	-211	-111
STORAGE	13990.	14064	14099	14144	14274	14614	15205	15046	14621	14405	14447	14465	14473	14475	14267	14056	13945
ELEV FTMSL	2230.1	2230.5	2230.7	2230.9	2231.5	2233.2	2236.0	2235.2	2233.2	2232.2	2232.4	2232.4	2232.5	2232.5	2231.5	2230.4	2229.9
DISCH KCFS	10.500	6.0	6.0	6.0	7.0	8.5	10.5	10.5	10.5	8.3	6.0	6.0	6.0	6.5	9.5	10.0	10.0
POWER																	
AVE POWER MW		81	81	81	95	115	143	143	143	112	81	81	81	88	128	135	134
PEAK POW MW		186	186	186	186	187	189	189	188	187	187	187	187	187	186	186	185
ENERGY GWH	1017.1	29.1	13.6	17.5	68.1	85.6	103.0	106.7	106.3	80.7	60.5	29.3	13.7	16.9	95.6	100.2	90.3
--GARRISON--																	
NAT INFLOW	10900	479	223	287	780	1300	3120	2100	580	480	445	180	84	96	180	255	310
DEPLETION	1210	-4	-2	-2	-66	147	1026	876	159	-171	-80	-172	-80	-91	-148	-107	-75
CHAN STOR	5	45			-10	-15	-20			22	22			-5	-30	-5	0
EVAPORATION	513							32	100	124	107	48	22	25	55		
REG INFLOW	15387	707	309	397	1253	1661	2699	1838	967	1041	809	482	225	260	828	972	940
RELEASE	15440	476	222	286	1071	1476	1517	1506	1506	1268	1107	536	250	270	1199	1445	1305
STOR CHANGE	-54	231	86	111	181	185	1182	332	-540	-227	-298	-53	-25	-10	-371	-473	-365
STORAGE	16779.	17010	17096	17207	17389	17574	18755	19087	18547	18320	18022	17969	17944	17934	17563	17090	16725
ELEV FTMSL	1834.3	1835.1	1835.4	1835.7	1836.3	1836.9	1840.7	1841.7	1840.1	1839.3	1838.4	1838.2	1838.1	1838.1	1836.9	1835.3	1834.1
DISCH KCFS	23.500	16.0	16.0	16.0	18.0	24.0	25.5	24.5	24.5	21.3	18.0	18.0	18.0	17.0	19.5	23.5	23.5
POWER																	
AVE POWER MW		195	196	196	221	295	317	309	309	267	225	224	224	212	241	288	285
PEAK POW MW		515	516	518	521	524	541	546	538	535	530	530	529	529	523	516	510
ENERGY GWH	2316.1	70.2	32.9	42.3	159.1	219.3	228.4	230.3	229.8	192.4	167.3	80.7	37.6	40.6	179.6	214.1	191.7
--OAHE--																	
NAT INFLOW	2300	259	121	155	405	220	625	170	70	95	45	45	21	24	-15	-10	70
DEPLETION	860	27	13	16	55	85	185	230	157	37	-16	1	0	0	15	22	33
CHAN STOR	0	31	0	0	-8	-24	-6	4		13	14			4	-11	-17	
EVAPORATION	472							30	92	113	98	44	20	23	51		
REG INFLOW	16409	739	330	425	1413	1586	1951	1420	1327	1226	1084	536	250	274	1107	1396	1342
RELEASE	16465	474	306	356	1281	1524	1598	1850	1983	1754	1263	587	309	227	910	1118	926
STOR CHANGE	-56	265	24	68	132	62	354	-429	-655	-528	-179	-51	-59	47	197	278	416
STORAGE	17672.	17937	17961	18030	18162	18224	18578	18149	17493	16966	16787	16736	16677	16724	16922	17200	17616
ELEV FTMSL	1604.2	1605.1	1605.2	1605.4	1605.9	1606.1	1607.2	1605.8	1603.6	1601.8	1601.1	1601.0	1600.8	1600.9	1601.6	1602.6	1604.0
DISCH KCFS	17.068	15.9	22.0	20.0	21.5	24.8	26.8	30.1	32.2	29.5	20.5	19.7	22.3	14.3	14.8	18.2	16.7
POWER																	
AVE POWER MW		203	281	255	275	317	344	385	409	370	257	246	277	179	185	228	211
PEAK POW MW		695	696	697	699	700	706	699	687	678	674	673	672	673	677	682	690
ENERGY GWH	2523.9	73.0	47.2	55.1	198.1	235.9	248.0	286.6	304.0	266.2	191.0	88.6	46.6	34.3	137.8	169.9	141.6
--BIG BEND--																	
EVAPORATION	105							6	20	25	22	10	5	5	12		
REG INFLOW	16360	474	306	356	1281	1524	1598	1843	1963	1729	1241	577	305	222	899	1118	926
RELEASE	16360	474	306	356	1281	1524	1598	1843	1963	1729	1241	577	305	222	899	1118	926
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	17.068	15.9	22.0	20.0	21.5	24.8	26.8	30.0	31.9	29.1	20.2	19.4	21.9	14.0	14.6	18.2	16.7
POWER																	
AVE POWER MW		75	103	93	101	116	126	140	149	138	99	97	110	71	74	89	80
PEAK POW MW		517	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
ENERGY GWH	944.5	27.1	17.3	20.2	72.6	86.3	90.5	104.4	111.1	99.1	73.7	35.1	18.5	13.5	54.8	66.4	53.7
--FORT RANDALL--																	
NAT INFLOW	900	121	56	73	160	165	135	70	60	35		-5	-2	-3		-10	45
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	116							8	25	31	24	9	4	4	9		
REG INFLOW	17065	593	362	428	1437	1680	1721	1887	1982	1725	1216	562	298	215	886	1105	968
RELEASE	17065	313	218	428	1437	1680	1721	1887	1982	1869	1855	875	409	241	778	764	609
STOR CHANGE	0	280	144	0			0	0	0	-144	-639	-313	-111	-26	109	341	359
STORAGE	3001.	3281	3425	3425	3425	3425	3425	3425	3425	3281	2642	2329	2218	2192	2301	2642	3001
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1340.0	1338.0	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	11.360	10.5	15.7	24.0	24.1	27.3	28.9	30.7	32.2	31.4	30.2	29.4	29.5	15.2	12.6	12.4	11.0
POWER																	
AVE POWER MW		87	132	203	204	230	244	258	271	262	242	222	215	111	93	95	88
PEAK POW MW		350	356	356	356	356	356	356	356	350	319	296	287	285	294	319	339
ENERGY GWH	1689.6	31.4	22.2	43.8	146.9	171.4	175.4	192.2	201.7	188.9	179.7	79.9	36.2	21.3	69.3	70.5	58.9
--GAVINS POINT--																	
NAT INFLOW	1500	102	47	61	145	165	175	100	90	95	120	58	27	31	80	85	120
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	2	-10	-16	0	-6	-3	-3	-3	2	2	1	0	26	5	0	3
EVAPORATION	34							2	6	8	7	3	2	2	4		
REG INFLOW	18417	417	255	473	1577	1820	1868	1943	2053	1963	1968	925	432	294	848	849	731
RELEASE	18417	417	255	473	1577	1820	1868	1943	2041	1940	1968	925	432	294	848	849	766
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	14.200	14.0	18.4	26.5	26.5	29.6	31.4	31.6	33.2	32.6	32.0	31.1	31.1	18.5	13.8	13.8	13.8
POWER																	
AVE POWER MW		49	64	91	90	100	104	105	109	109	108	106	106	65	49	49	49
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	754.1	17.6	10.7	19.5	65.1	74.4	75.0	77.8	80.9	78.3	80.6	38.3	17.9	12.5	36.4	36.4	32.7
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1800	162	76	97	280	345	190	165	130	110	60	30	14	16	25	25	75
DEPLETION	305	8	4	5	26	38	34	42	42	28	13	8	4	4	16	17	17
REGULATED FLOW AT SIOUX CITY																	
KAF	19912	570	327	566	1831	2127	2024	2066	2129	2022	2015	948	442	306	857	857	824
KCFS		19.2	23.6	31.7	30.8	34.6	34.0	33.6	34.6	34.0	32.8	31.9	31.9	19.3	13.9	13.9	14.8
--TOTAL--																	
NAT INFLOW	24600	1350	630	810	2330	3340	6075	3445	1295	1105	1055	513	239	273	565	605	970
DEPLETION	3166	7	3	4	37	581	1895	1531	442	-196	-199	-191	-89	-102	-234	-208	-116
CHAN STOR	5	78	-10	-16	-18	-45	-29	1	-3	37	39	1	0	26	-36	-21	3
EVAPORATION	1682							105	329	408	351	156	72	82	179		
STORAGE	53400.	54250	54540	54764	55208	55795	57921	57665	56057	54965	53892	53492	53305	53319	53046	52981	53245
SYSTEM POWER																	
AVE POWER MW		690	856	919	986	1173	1278	1341	1389	1258	1012	977	1014	725	771	884	847
PEAK POW MW		2378	2377	2380	2386	2391	2417	2413	2393	2384	2366	2341	2331	2329	2297	2319	2329
ENERGY GWH	9245.2	248.4	143.9	198.4	709.8	872.9	920.2	998.0	1033.8	905.7	752.8	351.8	170.4	139.2	573.5	657.5	568.9
DAILY GWH		16.6	20.6	22.0	23.7	28.2	30.7	32.2	33.3	30.2	24.3	23.5	24.3	17.4	18.5	21.2	20.3
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

TIME OF STUDY: 09:12:58 STUDY NO 14

VALUES IN 1000 AF EXCEPT AS INDICATED

28FEB21		2021											2022			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	6100	206	96	123	472	969	1548	661	297	246	329	172	80	91	246	246	318
DEPLETION	562	-17	-8	-10	27	279	594	291	17	-127	-118	-34	-16	-18	-107	-116	-75
EVAPORATION	504							31	97	121	105	47	22	25	54		
MOD INFLOW	5034	223	104	134	445	690	954	339	183	252	342	158	74	84	299	362	393
RELEASE	5910	179	83	107	417	523	565	584	584	461	369	179	83	111	553	584	528
STOR CHANGE	-875	44	21	26	28	167	389	-246	-402	-209	-27	-20	-10	-27	-255	-222	-135
STORAGE	13081.	13125	13146	13172	13201	13368	13757	13511	13110	12901	12874	12854	12844	12818	12563	12341	12206
ELEV FTMSL	2225.5	2225.7	2225.8	2226.0	2226.1	2227.0	2229.0	2227.7	2225.6	2224.5	2224.4	2224.3	2224.2	2224.1	2222.7	2221.5	2220.7
DISCH KCFS	11.000	6.0	6.0	6.0	7.0	8.5	9.5	9.5	9.5	7.7	6.0	6.0	6.0	7.0	9.0	9.5	9.5
POWER																	
AVE POWER MW		80	80	80	93	113	127	127	126	102	79	79	79	92	118	124	123
PEAK POW MW		182	183	183	183	183	185	184	182	181	181	181	181	181	180	179	178
ENERGY GWH	945.2	28.7	13.4	17.2	66.9	84.1	91.3	94.4	93.9	73.8	59.0	28.5	13.3	17.7	87.9	92.2	82.9
--GARRISON--																	
NAT INFLOW	9365	414	193	248	655	1177	2661	1740	486	403	404	164	77	87	154	215	287
DEPLETION	1161	9	4	6	-65	197	930	778	133	-168	-64	-156	-73	-83	-131	-92	-64
CHAN STOR	15	51			-10	-15	-10			18	18			-10	-20	-5	
EVAPORATION	586							36	114	141	122	55	26	29	63		
REG INFLOW	13543	634	272	350	1126	1487	2286	1510	823	909	733	444	207	242	755	886	879
RELEASE	14602	476	222	286	1101	1414	1428	1414	1414	1168	984	476	222	254	1168	1353	1222
STOR CHANGE	-1059	158	50	64	26	73	858	96	-591	-259	-251	-32	-15	-12	-413	-467	-343
STORAGE	15679.	15838	15887	15952	15977	16050	16908	17004	16413	16154	15903	15870	15855	15843	15430	14963	14620
ELEV FTMSL	1830.5	1831.0	1831.2	1831.4	1831.5	1831.8	1834.7	1835.0	1833.0	1832.1	1831.3	1831.1	1831.1	1831.0	1829.6	1827.9	1826.6
DISCH KCFS	23.000	16.0	16.0	16.0	18.5	23.0	24.0	23.0	23.0	19.6	16.0	16.0	16.0	16.0	19.0	22.0	22.0
POWER																	
AVE POWER MW		190	191	191	220	274	288	279	278	235	191	191	191	191	225	257	255
PEAK POW MW		496	497	498	498	500	513	515	505	501	497	497	496	496	489	482	476
ENERGY GWH	2105.2	68.4	32.0	41.2	158.8	203.7	207.7	207.9	206.8	169.5	142.3	68.6	32.0	36.6	167.2	191.3	171.1
--OAHE--																	
NAT INFLOW	1445	189	88	113	305	139	337	118	54	58	15	14	6	7	-37	-16	54
DEPLETION	817	26	12	16	54	82	175	217	147	35	-15	1	0	0	14	21	32
CHAN STOR	4	30	0	0	-11	-19	-4	4		15	17		0	0	-14	-14	
EVAPORATION	532							34	105	128	110	49	23	26	57		
REG INFLOW	14703	669	298	383	1341	1452	1586	1285	1217	1078	921	440	205	235	1046	1302	1244
RELEASE	15795	457	329	372	1340	1559	1581	1818	1847	1635	1133	484	263	198	852	1058	868
STOR CHANGE	-1092	212	-31	11	1	-107	5	-532	-631	-557	-213	-44	-58	36	194	244	376
STORAGE	16538.	16751	16720	16731	16732	16625	16630	16098	15467	14911	14698	14654	14596	14632	14826	15070	15446
ELEV FTMSL	1600.3	1601.0	1600.9	1601.0	1601.0	1600.6	1600.6	1598.7	1596.3	1594.2	1593.4	1593.2	1592.9	1593.1	1593.9	1594.8	1596.3
DISCH KCFS	15.732	15.4	23.7	20.9	22.5	25.4	26.6	29.6	30.0	27.5	18.4	16.3	19.0	12.5	13.9	17.2	15.6
POWER																	
AVE POWER MW		191	295	260	281	315	330	365	366	331	221	195	226	149	166	207	189
PEAK POW MW		674	673	673	673	671	671	661	650	639	635	634	633	634	638	642	650
ENERGY GWH	2336.5	68.9	49.6	56.1	202.0	234.5	237.4	271.3	272.3	238.3	164.4	70.1	38.0	28.7	123.6	154.0	127.2
--BIG BEND--																	
EVAPORATION	131							8	25	31	28	12	6	7	14		
REG INFLOW	15664	457	329	372	1340	1559	1581	1810	1822	1603	1106	472	257	192	838	1058	868
RELEASE	15664	457	329	372	1340	1559	1581	1810	1822	1603	1106	472	257	192	838	1058	868
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	15.732	15.4	23.7	20.9	22.5	25.4	26.6	29.4	29.6	26.9	18.0	15.9	18.5	12.1	13.6	17.2	15.6
POWER																	
AVE POWER MW		73	111	98	105	119	124	138	139	128	88	80	93	61	69	85	75
PEAK POW MW		517	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
ENERGY GWH	903.7	26.2	18.6	21.1	75.9	88.3	89.5	102.5	103.2	92.0	65.7	28.8	15.7	11.7	51.2	62.9	50.4
--FORT RANDALL--																	
NAT INFLOW	494	85	40	51	88	71	121	38	27		-22	-8	-4	-4	-11	-22	44
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	145							10	32	39	31	12	5	5	12		
REG INFLOW	15933	541	368	423	1424	1621	1690	1820	1803	1557	1052	451	248	182	812	1033	909
RELEASE	15933	260	224	423	1424	1621	1690	1820	1803	1701	1692	764	358	208	703	692	550
STOR CHANGE	0	280	144				0	0	0	-144	-640	-313	-110	-26	109	341	359
STORAGE	3001.	3281	3425	3425	3425	3425	3425	3425	3425	3281	2641	2328	2218	2192	2301	2642	3001
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1340.0	1338.0	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	9.934	8.8	16.1	23.7	23.9	26.4	28.4	29.6	29.3	28.6	27.5	25.7	25.8	13.1	11.4	11.3	9.9
POWER																	
AVE POWER MW		73	136	200	202	222	239	249	247	239	221	194	189	96	84	86	79
PEAK POW MW		350	356	356	356	356	356	356	356	350	319	296	287	285	294	319	339
ENERGY GWH	1581.1	26.2	22.9	43.2	145.6	165.4	172.3	185.4	183.7	172.2	164.2	70.0	31.8	18.4	62.8	63.9	53.2
--GAVINS POINT--																	
NAT INFLOW	1326	94	44	56	128	143	153	87	71	81	106	51	24	27	77	77	107
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	2	-14	-14	-1	-5	-4	-2	1	1	2	3	0	24	3	0	3
EVAPORATION	42							2	8	10	9	4	2	2	5		
REG INFLOW	17102	357	254	465	1547	1740	1815	1863	1857	1778	1789	809	378	254	769	769	659
RELEASE	17102	357	254	465	1547	1740	1815	1863	1845	1755	1789	809	378	254	769	769	694
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	12.500	12.0	18.3	26.0	26.0	28.3	30.5	30.3	30.0	29.5	29.1	27.2	27.2	16.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		42	63	89	89	96	102	102	101	102	101	95	95	57	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	710.5	15.1	10.6	19.2	63.9	71.6	73.5	75.6	75.4	73.1	75.5	34.3	16.0	10.9	33.0	33.0	29.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1170	129	60	77	154	197	122	106	85	70	37	24	11	13	11	21	53
DEPLETION	295	8	4	5	25	38	33	42	40	27	13	7	3	4	15	16	16
REGULATED FLOW AT SIOUX CITY																	
KAF	17977	478	310	537	1676	1899	1904	1927	1890	1798	1813	826	386	263	765	774	731
KCFS		16.1	22.3	30.1	28.2	30.9	32.0	31.3	30.7	30.2	29.5	27.8	27.8	16.6	12.4	12.6	13.2
--TOTAL--																	
NAT INFLOW	19900	1117	521	670	1802	2696	4942	2750	1020	858	869	416	194	222	440	521	863
DEPLETION	3029	27	13	16	50	624	1768	1385	362	-231	-181	-177	-82	-94	-196	-167	-88
CHAN STOR	18	83	-14	-14	-21	-39	-18	2	1	34	36	3	0	14	-31	-19	3
EVAPORATION	1939							122	380	470	404	180	83	95	205		
STORAGE	50258.	50953	51137	51238	51293	51427	52679	51997	50386	49240	48109	47699	47506	47478	47113	47009	47231
SYSTEM POWER																	
AVE POWER MW		649	876	917	990	1139	1211	1260	1257	1137	902	834	874	646	706	803	765
PEAK POW MW		2334	2332	2334	2334	2334	2349	2340	2318	2307	2288	2263	2253	2251	2217	2238	2247
ENERGY GWH	8582.1	233.5	147.1	198.1	713.1	847.6	871.7	937.1	935.4	818.9	671.1	300.3	146.8	124.0	525.6	597.4	514.4
DAILY GWH		15.6	21.0	22.0	23.8	27.3	29.1	30.2	30.2	27.3	21.6	20.0	21.0	15.5	17.0	19.3	18.4
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

TIME OF STUDY: 09:12:58 STUDY NO 15

VALUES IN 1000 AF EXCEPT AS INDICATED

	28FEB22	2022												2023			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	6174	209	97	125	477	981	1567	669	301	249	331	174	81	93	249	249	322
DEPLETION	574	-17	-8	-10	26	280	598	298	21	-127	-120	-35	-16	-18	-107	-116	-75
EVAPORATION	486							30	93	116	102	46	21	25	53		
MOD INFLOW	5114	226	105	135	451	701	969	341	187	260	349	163	76	87	303	365	397
RELEASE	5535	179	83	107	417	492	536	553	553	432	338	164	76	87	523	523	472
STOR CHANGE	-421	47	22	28	34	209	433	-212	-367	-173	11	-1	-1	-1	-220	-158	-75
STORAGE	12206.	12253	12275	12303	12338	12547	12980	12768	12401	12228	12240	12238	12238	12237	12018	11860	11785
ELEV FTMSL	2220.7	2221.0	2221.1	2221.3	2221.5	2222.6	2224.9	2223.8	2221.8	2220.9	2220.9	2220.9	2220.9	2220.9	2219.7	2218.8	2218.4
DISCH KCFS	9.500	6.0	6.0	6.0	7.0	8.0	9.0	9.0	9.0	7.3	5.5	5.5	5.5	5.5	8.5	8.5	8.5
POWER																	
AVE POWER MW		78	78	78	91	104	118	119	118	95	72	72	72	72	110	110	109
PEAK POW MW		178	178	179	179	180	182	181	179	178	178	178	178	178	177	176	176
ENERGY GWH	872.2	28.1	13.1	16.9	65.6	77.7	85.2	88.2	87.6	68.1	53.3	25.8	12.0	13.7	81.9	81.5	73.4
--GARRISON--																	
NAT INFLOW	9470	418	195	251	662	1190	2691	1760	492	409	409	166	77	88	155	217	290
DEPLETION	1175	1	1	1	-53	198	940	794	138	-171	-68	-160	-74	-85	-131	-92	-64
CHAN STOR	10	36			-10	-10	-10			18	18				-31		
EVAPORATION	574							35	111	138	120	54	25	29	62		
REG INFLOW	13266	632	278	357	1121	1474	2276	1484	796	892	713	435	203	232	716	832	826
RELEASE	13778	461	215	277	1012	1291	1309	1291	1291	1100	984	476	222	254	1138	1291	1166
STOR CHANGE	-512	170	62	80	110	182	967	193	-495	-208	-270	-41	-19	-22	-421	-460	-340
STORAGE	14620.	14791	14853	14933	15043	15225	16192	16385	15890	15682	15412	15370	15351	15329	14908	14448	14108
ELEV FTMSL	1826.6	1827.2	1827.5	1827.8	1828.2	1828.8	1832.3	1832.9	1831.2	1830.5	1829.5	1829.4	1829.3	1829.2	1827.7	1826.0	1824.7
DISCH KCFS	22.000	15.5	15.5	15.5	17.0	21.0	22.0	21.0	21.0	18.5	16.0	16.0	16.0	16.0	18.5	21.0	21.0
POWER																	
AVE POWER MW		180	180	181	198	245	260	252	251	219	189	189	188	188	216	242	240
PEAK POW MW		479	480	481	483	486	502	505	497	494	489	488	488	488	481	473	467
ENERGY GWH	1957.3	64.7	30.3	39.0	142.7	182.4	187.3	187.3	186.7	158.0	140.8	67.9	31.6	36.1	160.9	180.4	161.3
--OAHE--																	
NAT INFLOW	1494	196	91	117	315	144	349	122	55	61	17	14	7	7	-39	-17	55
DEPLETION	830	27	12	16	54	83	178	221	150	35	-15	1	0	0	15	21	32
CHAN STOR	5	29			-7	-18	-4	4		12	12		0	0	-12	-12	
EVAPORATION	513							32	99	123	107	48	22	26	56		
REG INFLOW	13934	659	294	378	1266	1335	1476	1164	1097	1015	921	442	206	235	1016	1242	1189
RELEASE	14462	452	295	330	1205	1463	1442	1692	1721	1233	1096	473	138	134	864	1059	865
STOR CHANGE	-528	207	-1	48	61	-128	33	-528	-624	-218	-175	-32	68	102	152	183	325
STORAGE	15446.	15653	15652	15700	15762	15633	15667	15139	14515	14296	14121	14090	14157	14259	14411	14593	14918
ELEV FTMSL	1596.3	1597.0	1597.0	1597.2	1597.4	1597.0	1597.1	1595.1	1592.6	1591.8	1591.0	1590.9	1591.2	1591.6	1592.2	1592.9	1594.2
DISCH KCFS	15.624	15.2	21.2	18.5	20.2	23.8	24.2	27.5	28.0	20.7	17.8	15.9	10.0	8.4	14.1	17.2	15.6
POWER																	
AVE POWER MW		185	259	226	247	290	295	333	335	246	211	188	118	100	167	205	187
PEAK POW MW		653	653	654	655	653	654	644	632	627	624	623	625	627	630	633	640
ENERGY GWH	2104.9	66.7	43.5	48.8	178.0	215.8	212.5	247.8	248.9	177.1	156.9	67.6	19.8	19.2	124.2	152.6	125.4
--BIG BEND--																	
EVAPORATION	131							8	25	31	28	12	6	7	14		
REG INFLOW	14331	452	295	330	1205	1463	1442	1684	1696	1202	1068	461	133	127	850	1059	865
RELEASE	14331	452	295	330	1205	1463	1442	1684	1696	1202	1068	461	133	127	850	1059	865
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	15.624	15.2	21.2	18.5	20.2	23.8	24.2	27.4	27.6	20.2	17.4	15.5	9.6	8.0	13.8	17.2	15.6
POWER																	
AVE POWER MW		72	99	87	95	111	113	128	129	97	87	78	48	41	70	85	75
PEAK POW MW		517	509	509	509	509	509	509	509	529	538	538	538	538	538	538	529
ENERGY GWH	828.8	25.9	16.7	18.7	68.2	82.9	81.7	95.4	96.1	69.7	64.4	28.1	8.1	7.8	51.9	62.9	50.2
--FORT RANDALL--																	
NAT INFLOW	517	89	42	53	92	75	126	40	29		-24	-9	-4	-5	-11	-23	46
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	139							10	32	38	28	11	4	5	12		
REG INFLOW	14629	540	335	383	1293	1529	1556	1696	1679	1157	1015	441	124	117	823	1033	908
RELEASE	14629	259	191	383	1293	1529	1556	1696	1679	1581	1567	698	124	117	714	692	549
STOR CHANGE	0	280	144			0		0	0	-424	-552	-257	0	0	109	341	359
STORAGE	3001.	3281	3425	3425	3425	3425	3425	3425	3425	3001	2449	2192	2192	2192	2301	2642	3001
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1350.0	1342.0	1337.5	1337.5	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	9.898	8.7	13.8	21.4	21.7	24.9	26.2	27.6	27.3	26.6	25.5	23.4	8.9	7.4	11.6	11.3	9.9
POWER																	
AVE POWER MW		72	116	181	184	210	221	233	230	219	199	173	66	54	86	86	79
PEAK POW MW		350	356	356	356	356	356	356	356	339	305	285	285	285	294	319	339
ENERGY GWH	1447.1	26.1	19.6	39.2	132.3	156.2	158.9	173.0	171.3	158.0	148.1	62.4	11.0	10.4	63.7	63.9	53.1
--GAVINS POINT--																	
NAT INFLOW	1338	95	44	57	129	144	154	88	72	82	108	52	24	27	77	77	108
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	2	-10	-15	-1	-6	-2	-3	1	1	2	4	27	3	-8	1	3
EVAPORATION	42							2	8	10	9	4	2	2	5		
REG INFLOW	15810	357	226	425	1416	1648	1684	1740	1734	1659	1666	744	171	143	769	769	659
RELEASE	15810	357	226	425	1416	1648	1684	1740	1722	1636	1666	744	171	143	769	769	694
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	12.500	12.0	16.3	23.8	23.8	26.8	28.3	28.3	28.0	27.5	27.1	25.0	12.3	9.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		42	57	82	82	91	96	96	96	96	95	88	44	32	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	661.5	15.1	9.5	17.6	58.7	68.0	69.3	71.6	71.3	68.8	70.6	31.6	7.3	6.2	33.1	33.0	29.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1207	133	62	80	159	203	126	110	88	71	39	25	11	13	11	22	55
DEPLETION	297	8	4	5	25	38	33	42	41	27	13	7	3	4	15	16	17
REGULATED FLOW AT SIOUX CITY																	
KAF	16720	482	284	500	1550	1813	1777	1808	1769	1680	1692	761	179	152	765	775	732
KCFS		16.2	20.5	28.0	26.0	29.5	29.9	29.4	28.8	28.2	27.5	25.6	12.9	9.6	12.4	12.6	13.2
--TOTAL--																	
NAT INFLOW	20200	1139	531	683	1834	2737	5013	2789	1037	872	880	421	196	225	442	525	876
DEPLETION	3070	20	9	12	61	627	1785	1412	375	-234	-187	-181	-84	-96	-195	-167	-87
CHAN STOR	14	68	-10	-15	-18	-34	-17	2	1	31	32	4	28	3	-51	-11	3
EVAPORATION	1885							118	368	457	393	175	81	93	201		
STORAGE	47231.	47936	48164	48320	48526	48789	50223	49675	48202	47201	46215	45884	45932	46011	45631	45537	45770
SYSTEM POWER																	
AVE POWER MW		629	789	834	897	1052	1104	1160	1158	972	852	787	536	487	693	772	734
PEAK POW MW		2292	2291	2293	2297	2298	2317	2309	2288	2284	2251	2230	2231	2232	2198	2218	2226
ENERGY GWH	7871.8	226.6	132.6	180.2	645.7	783.0	794.9	863.3	861.8	699.6	634.1	283.4	90.0	93.4	515.6	574.4	493.1
DAILY GWH		15.1	18.9	20.0	21.5	25.3	26.5	27.8	27.8	23.3	20.5	18.9	12.9	11.7	16.6	18.5	17.6
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

TIME OF STUDY: 09:12:58 STUDY NO 16

VALUES IN 1000 AF EXCEPT AS INDICATED

28FEB23		2023												2024			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB
--FORT PECK--																	
NAT INFLOW	6560	222	103	133	507	1042	1665	711	320	264	353	184	86	98	265	265	342
DEPLETION	586	-17	-8	-10	26	281	602	307	27	-127	-120	-35	-16	-18	-107	-115	-84
EVAPORATION	485							30	93	116	101	46	21	25	53		
MOD INFLOW	5489	239	111	143	481	761	1063	374	200	275	372	173	81	92	319	380	426
RELEASE	5502	149	69	89	417	492	536	553	553	445	307	149	69	79	523	553	518
STOR CHANGE	-13	90	42	54	64	269	527	-179	-353	-170	64	24	11	13	-204	-173	-92
STORAGE	11785.	11875	11917	11971	12035	12304	12832	12652	12299	12129	12193	12217	12228	12241	12037	11864	11772
ELEV FTMSL	2218.4	2218.9	2219.1	2219.4	2219.8	2221.3	2224.1	2223.2	2221.3	2220.3	2220.7	2220.8	2220.9	2220.9	2219.8	2218.8	2218.3
DISCH KCFS	8.500	5.0	5.0	5.0	7.0	8.0	9.0	9.0	9.0	7.5	5.0	5.0	5.0	5.0	8.5	9.0	9.0
POWER																	
AVE POWER MW		64	65	65	90	104	118	118	117	97	65	65	65	65	110	116	116
PEAK POW MW		176	177	177	177	179	181	180	179	178	178	178	178	178	177	176	176
ENERGY GWH	864.3	23.2	10.8	14.0	65.1	77.2	84.8	88.0	87.4	69.9	48.3	23.4	10.9	12.5	81.9	86.3	80.5
--GARRISON--																	
NAT INFLOW	10016	442	206	265	701	1259	2846	1861	520	432	432	175	82	93	164	230	307
DEPLETION	1189	2	1	1	-52	198	950	810	144	-174	-73	-163	-76	-87	-132	-91	-70
CHAN STOR	-5	37	0	0	-21	-10	-10			16	25		0	0	-36	-5	
EVAPORATION	570							35	110	137	119	54	25	29	61		
REG INFLOW	13754	626	275	353	1149	1543	2421	1569	819	929	719	433	202	231	721	869	895
RELEASE	13755	446	208	268	1012	1291	1339	1322	1322	1087	922	446	208	246	1138	1291	1208
STOR CHANGE	-1	180	67	86	137	251	1082	247	-503	-158	-204	-14	-6	-15	-416	-422	-313
STORAGE	14108.	14288	14354	14440	14577	14828	15910	16158	15655	15497	15294	15280	15274	15259	14842	14420	14107
ELEV FTMSL	1824.7	1825.4	1825.6	1825.9	1826.5	1827.4	1831.3	1832.1	1830.4	1829.8	1829.1	1829.0	1829.0	1829.0	1827.4	1825.9	1824.7
DISCH KCFS	21.000	15.0	15.0	15.0	17.0	21.0	22.5	21.5	21.5	18.3	15.0	15.0	15.0	15.5	18.5	21.0	21.0
POWER																	
AVE POWER MW		172	172	173	196	243	264	256	255	216	177	176	176	182	216	242	240
PEAK POW MW		470	471	473	475	479	498	501	493	490	487	487	487	486	479	472	467
ENERGY GWH	1943.3	61.8	28.9	37.3	141.1	180.5	190.0	190.6	190.1	155.4	131.6	63.5	29.6	35.0	160.6	180.2	167.0
--OAHE--																	
NAT INFLOW	1767	231	108	139	373	170	412	144	65	72	21	17	8	9	-46	-20	65
DEPLETION	845	27	12	16	55	84	181	226	153	36	-15	1	0	0	15	21	33
CHAN STOR	0	27		0	-9	-18	-7	4		15	15			-2	-14	-12	
EVAPORATION	512							32	99	123	106	48	22	26	56		
REG INFLOW	14166	678	304	391	1321	1359	1563	1212	1135	1016	867	414	193	226	1006	1239	1240
RELEASE	14165	426	282	315	1176	1438	1402	1678	1710	1229	1096	384	92	141	862	1061	874
STOR CHANGE	1	253	21	76	145	-79	161	-466	-575	-213	-229	30	102	86	144	178	366
STORAGE	14918.	15171	15192	15268	15413	15335	15495	15030	14455	14241	14013	14043	14145	14230	14375	14552	14919
ELEV FTMSL	1594.2	1595.2	1595.3	1595.6	1596.1	1595.8	1596.4	1594.7	1592.4	1591.5	1590.6	1590.7	1591.1	1591.5	1592.1	1592.8	1594.2
DISCH KCFS	15.569	14.3	20.3	17.6	19.8	23.4	23.6	27.3	27.8	20.7	17.8	12.9	6.6	8.9	14.0	17.3	15.2
POWER																	
AVE POWER MW		173	246	213	239	283	286	329	332	245	210	152	78	105	166	205	182
PEAK POW MW		644	645	646	649	647	650	642	630	626	622	622	624	626	629	632	640
ENERGY GWH	2054.6	62.1	41.3	46.0	172.4	210.7	205.7	245.0	246.9	176.3	156.6	54.9	13.1	20.2	123.9	152.8	126.7
--BIG BEND--																	
EVAPORATION	131							8	25	31	28	12	6	7	14		
REG INFLOW	14034	426	282	315	1176	1438	1402	1670	1685	1198	1068	372	86	134	848	1061	874
RELEASE	14034	426	282	315	1176	1438	1402	1670	1685	1198	1068	372	86	134	848	1061	874
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	15.569	14.3	20.3	17.6	19.8	23.4	23.6	27.2	27.4	20.1	17.4	12.5	6.2	8.5	13.8	17.3	15.2
POWER																	
AVE POWER MW		68	95	82	93	109	110	127	128	97	87	63	31	43	70	85	73
PEAK POW MW		517	509	509	509	509	509	509	509	529	538	538	538	538	538	538	529
ENERGY GWH	811.5	24.4	16.0	17.8	66.6	81.5	79.4	94.6	95.5	69.5	64.4	22.7	5.3	8.2	51.8	63.1	50.7
--FORT RANDALL--																	
NAT INFLOW	645	111	52	66	115	93	158	50	36		-29	-11	-5	-6	-14	-29	57
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	139							10	32	38	28	11	4	5	12		
REG INFLOW	14459	535	333	380	1287	1522	1548	1692	1675	1153	1010	349	77	123	819	1029	928
RELEASE	14459	255	189	380	1287	1522	1548	1692	1675	1577	1562	606	77	123	709	688	569
STOR CHANGE	0	280	144		0		0	0	0	-424	-552	-257	0	0	109	341	359
STORAGE	3001.	3281	3425	3425	3425	3425	3425	3425	3425	3001	2449	2192	2192	2192	2301	2642	3001
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1350.0	1342.0	1337.5	1337.5	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	9.879	8.6	13.6	21.3	21.6	24.8	26.0	27.5	27.2	26.5	25.4	20.4	5.5	7.7	11.5	11.2	9.9
POWER																	
AVE POWER MW		71	115	180	183	209	220	232	230	219	198	151	41	57	85	85	79
PEAK POW MW		350	356	356	356	356	356	356	356	339	305	285	285	285	294	319	339
ENERGY GWH	1431.7	25.6	19.4	38.9	131.7	155.5	158.1	172.6	170.9	157.6	147.6	54.3	6.8	10.9	63.3	63.5	55.0
--GAVINS POINT--																	
NAT INFLOW	1403	99	46	60	135	151	162	92	76	86	113	54	25	29	81	81	113
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	3	-10	-15	-1	-6	-2	-3	1	1	2	9	28	-4	-7	1	2
EVAPORATION	42							2	8	10	9	4	2	2	5		
REG INFLOW	15705	357	226	425	1416	1648	1684	1740	1734	1659	1666	661	125	143	769	769	684
RELEASE	15705	357	226	425	1416	1648	1684	1740	1722	1636	1666	661	125	143	769	769	719
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	12.500	12.0	16.3	23.8	23.8	26.8	28.3	28.3	28.0	27.5	27.1	22.2	9.0	9.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		42	57	82	82	91	96	96	96	96	95	78	32	32	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	657.1	15.1	9.5	17.6	58.7	68.0	69.3	71.6	71.3	68.8	70.6	28.1	5.4	6.2	33.1	33.0	30.7
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1409	155	72	93	186	237	147	128	102	83	45	29	14	15	13	26	64
DEPLETION	301	8	4	5	26	38	33	42	41	28	13	8	4	4	16	16	17
REGULATED FLOW AT SIOUX CITY																	
KAF	16813	504	295	513	1576	1847	1798	1826	1783	1691	1698	682	135	154	766	779	766
KCFS		16.9	21.2	28.8	26.5	30.0	30.2	29.7	29.0	28.4	27.6	22.9	9.7	9.7	12.5	12.7	13.3
--TOTAL--																	
NAT INFLOW	21800	1260	588	756	2017	2952	5390	2986	1119	937	935	448	209	239	463	553	948
DEPLETION	3115	20	9	12	64	629	1802	1442	390	-235	-192	-183	-85	-98	-195	-165	-101
CHAN STOR	-6	67	-10	-15	-30	-34	-20	2	1	32	43	9	28	-7	-58	-16	2
EVAPORATION	1878							117	366	455	391	174	81	93	201		
STORAGE	45770.	46573	46847	47062	47409	47850	49621	49223	47805	46862	45942	45726	45832	45915	45548	45472	45757
SYSTEM POWER																	
AVE POWER MW		590	750	795	883	1039	1094	1159	1159	969	832	686	424	484	692	778	734
PEAK POW MW		2273	2272	2275	2281	2285	2309	2303	2283	2279	2247	2227	2229	2231	2196	2216	2226
ENERGY GWH	7762.5	212.3	125.9	171.7	635.6	773.4	787.3	862.5	861.9	697.5	619.2	247.0	71.2	93.0	514.5	578.9	510.6
DAILY GWH		14.2	18.0	19.1	21.2	24.9	26.2	27.8	27.8	23.3	20.0	16.5	10.2	11.6	16.6	18.7	17.6
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB

TIME OF STUDY: 09:12:58 STUDY NO 17

VALUES IN 1000 AF EXCEPT AS INDICATED

29FEB24		2024											2025			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	6794	229	107	138	525	1079	1724	736	331	275	365	192	89	102	274	274	354
DEPLETION	599	-16	-8	-10	26	282	606	313	30	-128	-123	-36	-17	-19	-109	-117	-76
EVAPORATION	487							30	93	116	102	46	22	25	53		
MOD INFLOW	5708	246	115	147	499	797	1118	393	208	287	386	181	84	96	330	391	430
RELEASE	5489	164	76	98	417	492	536	553	553	447	307	149	69	83	492	553	500
STOR CHANGE	219	82	38	49	82	305	582	-160	-346	-161	79	32	15	14	-162	-162	-70
STORAGE	11772.	11854	11893	11942	12024	12329	12912	12752	12406	12245	12324	12356	12371	12385	12223	12060	11991
ELEV FTMSL	2218.3	2218.8	2219.0	2219.3	2219.7	2221.4	2224.6	2223.7	2221.8	2221.0	2221.4	2221.6	2221.7	2221.7	2220.8	2219.9	2219.6
DISCH KCFS	9.000	5.5	5.5	5.5	7.0	8.0	9.0	9.0	9.0	7.5	5.0	5.0	5.0	5.2	8.0	9.0	9.0
POWER																	
AVE POWER MW		71	71	71	90	104	118	118	118	98	65	65	65	68	104	117	116
PEAK POW MW		176	176	177	177	179	181	181	179	178	179	179	179	179	178	177	177
ENERGY GWH	864.4	25.5	11.9	15.3	65.1	77.2	84.9	88.2	87.6	70.5	48.5	23.5	11.0	13.0	77.4	86.7	78.1
--GARRISON--																	
NAT INFLOW	10343	457	213	274	723	1300	2939	1922	537	447	446	181	84	97	170	237	316
DEPLETION	1210	2	1	1	-51	199	961	826	149	-177	-77	-167	-78	-89	-134	-93	-65
CHAN STOR	0	37			-16	-10	-10			15	26		0	-2	-29	-10	
EVAPORATION	574							35	111	138	120	54	25	29	62		
REG INFLOW	14049	655	288	371	1175	1583	2503	1614	831	948	736	442	206	237	705	873	881
RELEASE	13798	446	208	268	982	1353	1369	1353	1353	1100	922	446	208	254	1138	1261	1139
STOR CHANGE	251	209	80	103	193	230	1135	262	-522	-152	-186	-4	-2	-17	-432	-387	-258
STORAGE	14107.	14316	14396	14499	14692	14921	16056	16318	15795	15644	15458	15454	15452	15435	15003	14615	14358
ELEV FTMSL	1824.7	1825.5	1825.8	1826.2	1826.9	1827.7	1831.8	1832.7	1830.9	1830.3	1829.7	1829.7	1829.7	1829.6	1828.0	1826.6	1825.6
DISCH KCFS	21.000	15.0	15.0	15.0	16.5	22.0	23.0	22.0	22.0	18.5	15.0	15.0	15.0	16.0	18.5	20.5	20.5
POWER																	
AVE POWER MW		172	172	173	191	255	270	263	262	219	177	177	177	189	217	238	236
PEAK POW MW		470	472	474	477	481	500	504	495	493	490	490	490	489	482	476	471
ENERGY GWH	1956.2	61.9	29.0	37.3	137.3	189.5	194.7	195.7	195.1	157.7	132.1	63.8	29.8	36.2	161.2	176.7	158.3
--OAHE--																	
NAT INFLOW	1949	255	119	153	412	188	455	159	72	79	22	18	8	10	-51	-22	72
DEPLETION	860	27	13	16	55	85	185	230	157	37	-16	1	0	0	15	22	33
CHAN STOR	3	27		0	-7	-24	-4	4		16	16			-5	-12	-9	
EVAPORATION	520							33	101	125	108	49	23	26	57		
REG INFLOW	14370	702	315	404	1332	1431	1634	1253	1167	1033	868	415	194	233	1003	1207	1178
RELEASE	14113	408	274	304	1158	1421	1377	1669	1703	1227	1096	460	115	137	863	1063	838
STOR CHANGE	257	294	40	100	174	10	257	-416	-536	-194	-228	-45	79	96	141	144	340
STORAGE	14919.	15212	15253	15353	15528	15538	15795	15379	14843	14649	14421	14376	14455	14551	14691	14836	15176
ELEV FTMSL	1594.2	1595.4	1595.5	1595.9	1596.6	1596.6	1597.6	1596.0	1593.9	1593.2	1592.3	1592.1	1592.4	1592.8	1593.3	1593.9	1595.2
DISCH KCFS	15.187	13.7	19.8	17.0	19.5	23.1	23.1	27.1	27.7	20.6	17.8	15.5	8.3	8.6	14.0	17.3	15.1
POWER																	
AVE POWER MW		166	239	206	236	281	282	330	333	247	212	184	99	103	168	207	182
PEAK POW MW		645	646	648	651	651	656	648	638	634	630	629	630	632	635	638	644
ENERGY GWH	2059.1	59.6	40.1	44.6	170.1	208.9	203.1	245.4	247.9	177.6	158.1	66.2	16.6	19.8	124.8	154.1	122.2
--BIG BEND--																	
EVAPORATION	131							8	25	31	28	12	6	7	14		
REG INFLOW	13982	408	274	304	1158	1421	1377	1661	1678	1196	1068	448	109	130	848	1063	838
RELEASE	13982	408	274	304	1158	1421	1377	1661	1678	1196	1068	448	109	130	848	1063	838
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	15.187	13.7	19.8	17.0	19.5	23.1	23.1	27.0	27.3	20.1	17.4	15.0	7.9	8.2	13.8	17.3	15.1
POWER																	
AVE POWER MW		65	92	80	91	108	108	126	128	96	87	76	40	42	70	85	72
PEAK POW MW		517	509	509	509	509	509	509	509	529	538	538	538	538	538	538	529
ENERGY GWH	808.8	23.4	15.5	17.2	65.6	80.5	78.0	94.1	95.1	69.4	64.4	27.3	6.7	8.0	51.8	63.2	48.6
--FORT RANDALL--																	
NAT INFLOW	731	126	59	75	130	106	179	57	41	-1	-33	-12	-6	-6	-16	-33	65
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	139							10	32	38	28	11	4	5	12		
REG INFLOW	14494	532	332	379	1284	1518	1544	1690	1673	1150	1006	424	99	118	817	1027	900
RELEASE	14494	252	188	379	1284	1518	1544	1690	1673	1574	1558	681	99	119	708	686	541
STOR CHANGE	0	280	144					0	0	-424	-552	-257	0	0	109	341	359
STORAGE	3001.	3281	3425	3425	3425	3425	3425	3425	3425	3001	2449	2192	2192	2192	2301	2642	3001
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1350.0	1342.0	1337.5	1337.5	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	9.885	8.5	13.6	21.2	21.6	24.7	26.0	27.5	27.2	26.5	25.3	22.9	7.1	7.5	11.5	11.2	9.7
POWER																	
AVE POWER MW		70	115	179	182	208	219	232	229	218	198	169	52	55	85	85	78
PEAK POW MW		350	356	356	356	356	356	356	356	339	305	285	285	285	294	319	339
ENERGY GWH	1434.2	25.3	19.2	38.8	131.4	155.1	157.7	172.4	170.7	157.3	147.3	60.9	8.8	10.5	63.2	63.3	52.3
--GAVINS POINT--																	
NAT INFLOW	1440	102	47	61	138	155	166	94	78	89	117	56	26	30	83	83	116
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	3	-10	-15	-1	-6	-2	-3	1	1	2	5	29	-1	-7	1	3
EVAPORATION	42							2	8	10	9	4	2	2	5		
REG INFLOW	15777	357	226	425	1416	1648	1684	1740	1734	1659	1666	732	150	143	769	769	659
RELEASE	15777	357	226	425	1416	1648	1684	1740	1722	1636	1666	732	150	143	769	769	694
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	12.500	12.0	16.3	23.8	23.8	26.8	28.3	28.3	28.0	27.5	27.1	24.6	10.8	9.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		42	57	82	82	91	96	96	96	96	95	86	38	32	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	660.1	15.1	9.5	17.6	58.7	68.0	69.3	71.6	71.3	68.8	70.6	31.1	6.5	6.2	33.1	33.0	29.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1543	170	79	102	203	260	161	140	112	91	50	32	15	17	14	28	70
DEPLETION	305	8	4	5	26	38	34	42	42	28	13	8	4	4	16	17	17
REGULATED FLOW AT SIOUX CITY																	
KAF	17015	519	302	522	1593	1870	1811	1838	1792	1699	1703	756	161	155	767	780	747
KCFS		17.4	21.7	29.3	26.8	30.4	30.4	29.9	29.1	28.6	27.7	25.4	11.6	9.8	12.5	12.7	13.5
--TOTAL--																	
NAT INFLOW	22800	1339	624	803	2131	3088	5624	3108	1171	980	967	466	217	248	474	567	993
DEPLETION	3168	22	10	13	65	632	1822	1468	403	-238	-200	-188	-88	-100	-199	-167	-88
CHAN STOR	2	67	-10	-15	-23	-41	-17	1	1	33	44	4	30	-7	-48	-19	3
EVAPORATION	1893							118	369	458	394	176	82	93	203		
STORAGE	45757.	46622	46924	47177	47627	48172	50146	49832	48440	47533	46646	46372	46464	46556	46211	46147	46483
SYSTEM POWER																	
AVE POWER MW		586	746	791	873	1047	1094	1166	1166	974	835	758	472	488	688	776	728
PEAK POW MW		2274	2274	2278	2285	2291	2317	2313	2293	2290	2258	2237	2239	2241	2206	2226	2237
ENERGY GWH	7782.9	210.8	125.3	170.9	628.2	779.2	787.7	867.4	867.6	701.2	620.9	272.8	79.3	93.8	511.5	577.1	489.2
DAILY GWH		14.1	17.9	19.0	20.9	25.1	26.3	28.0	28.0	23.4	20.0	18.2	11.3	11.7	16.5	18.6	17.5
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

TIME OF STUDY: 09:12:58 STUDY NO 18

VALUES IN 1000 AF EXCEPT AS INDICATED

	28FEB25	2025												2026			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	7156	242	113	145	553	1137	1816	776	349	289	384	201	94	107	289	289	373
DEPLETION	599	-16	-8	-10	26	282	606	313	30	-128	-123	-36	-17	-19	-109	-117	-76
EVAPORATION	498							31	95	119	104	47	22	25	54		
MOD INFLOW	6059	258	120	155	527	855	1210	432	224	298	403	189	88	101	344	406	449
RELEASE	5663	164	76	98	417	492	565	584	584	435	307	149	69	87	523	584	528
STOR CHANGE	397	94	44	57	110	363	645	-152	-361	-137	96	41	19	14	-179	-178	-79
STORAGE	11991.	12085	12129	12185	12296	12659	13304	13152	12791	12654	12750	12791	12810	12823	12644	12466	12387
ELEV FTMSL	2219.6	2220.1	2220.3	2220.6	2221.2	2223.2	2226.6	2225.8	2223.9	2223.2	2223.7	2223.9	2224.0	2224.1	2223.1	2222.2	2221.7
DISCH KCFS	9.000	5.5	5.5	5.5	7.0	8.0	9.5	9.5	9.5	7.3	5.0	5.0	5.0	5.5	8.5	9.5	9.5
POWER																	
AVE POWER MW		71	71	71	91	105	125	126	125	96	66	66	66	73	112	124	124
PEAK POW MW		178	178	178	179	180	183	183	181	180	181	181	181	181	180	179	179
ENERGY GWH	899.5	25.6	12.0	15.4	65.5	77.8	90.3	93.8	93.3	69.2	49.0	23.7	11.1	13.9	83.1	92.4	83.2
--GARRISON--																	
NAT INFLOW	10840	479	223	287	758	1362	3080	2014	563	468	468	190	88	101	178	249	332
DEPLETION	1210	2	1	1	-51	199	961	826	149	-177	-77	-167	-78	-89	-134	-93	-65
CHAN STOR	-5	37			-16	-10	-15			22	23		0	-5	-31	-10	
EVAPORATION	587							36	113	141	123	55	26	30	64		
REG INFLOW	14701	676	299	384	1210	1645	2669	1736	885	961	753	449	210	243	741	916	925
RELEASE	14220	446	208	268	1071	1322	1398	1383	1383	1115	922	446	208	246	1168	1383	1250
STOR CHANGE	481	230	90	116	139	323	1270	353	-499	-154	-169	3	1	-3	-428	-468	-325
STORAGE	14358.	14588	14678	14794	14933	15255	16526	16879	16380	16226	16057	16060	16062	16059	15631	15163	14838
ELEV FTMSL	1825.6	1826.5	1826.8	1827.3	1827.8	1828.9	1833.4	1834.6	1832.9	1832.4	1831.8	1831.8	1831.8	1831.8	1830.3	1828.6	1827.4
DISCH KCFS	20.500	15.0	15.0	15.0	18.0	21.5	23.5	22.5	22.5	18.7	15.0	15.0	15.0	15.5	19.0	22.5	22.5
POWER																	
AVE POWER MW		173	174	174	209	251	279	272	272	225	180	180	180	185	226	264	262
PEAK POW MW		475	477	479	481	487	508	513	505	502	500	500	500	500	493	485	479
ENERGY GWH	2037.8	62.3	29.2	37.6	150.6	186.5	200.7	202.4	202.0	162.0	133.8	64.6	30.2	35.6	168.0	196.5	175.8
--OAHE--																	
NAT INFLOW	2260	296	138	177	477	218	527	184	84	92	25	21	10	11	-59	-25	84
DEPLETION	860	27	13	16	55	85	185	230	157	37	-16	1	0	0	15	22	33
CHAN STOR	-9	25		0	-13	-15	-9	4		17	17			-2	-16	-16	
EVAPORATION	534							34	105	129	110	49	23	26	57		
REG INFLOW	15077	740	334	429	1480	1440	1732	1308	1205	1058	870	417	195	228	1021	1321	1301
RELEASE	14582	378	261	286	1125	1394	1335	1730	1767	1576	1087	519	192	191	853	1066	820
STOR CHANGE	495	361	73	143	355	46	396	-423	-562	-518	-217	-102	3	37	167	254	481
STORAGE	15176.	15537	15610	15752	16108	16153	16550	16127	15565	15047	14830	14728	14731	14767	14935	15189	15670
ELEV FTMSL	1595.2	1596.6	1596.9	1597.4	1598.7	1598.9	1600.3	1598.8	1596.7	1594.7	1593.9	1593.5	1593.5	1593.6	1594.3	1595.3	1597.1
DISCH KCFS	15.081	12.7	18.8	16.0	18.9	22.7	22.4	28.1	28.7	26.5	17.7	17.5	13.8	12.1	13.9	17.3	14.8
POWER																	
AVE POWER MW		155	229	196	232	279	277	347	351	320	213	209	166	145	167	209	179
PEAK POW MW		651	653	655	662	662	670	662	652	642	638	636	636	637	640	645	654
ENERGY GWH	2149.8	55.7	38.4	42.3	167.0	207.6	199.8	258.3	261.0	230.4	158.2	75.3	27.9	27.8	124.1	155.6	120.6
--BIG BEND--																	
EVAPORATION	131							8	25	31	28	12	6	7	14		
REG INFLOW	14451	378	261	286	1125	1394	1335	1723	1742	1545	1060	507	186	185	839	1066	820
RELEASE	14451	378	261	286	1125	1394	1335	1723	1742	1545	1060	507	186	185	839	1066	820
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	15.081	12.7	18.8	16.0	18.9	22.7	22.4	28.0	28.3	26.0	17.2	17.0	13.4	11.6	13.6	17.3	14.8
POWER																	
AVE POWER MW		60	88	75	89	106	105	131	133	123	85	85	68	59	69	85	71
PEAK POW MW		517	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
ENERGY GWH	834.5	21.7	14.8	16.2	63.7	79.0	75.7	97.6	98.7	88.6	63.0	30.7	11.4	11.3	51.2	63.4	47.6
--FORT RANDALL--																	
NAT INFLOW	880	151	71	91	157	127	215	68	49		-39	-15	-7	-8	-20	-39	78
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	145							10	32	39	31	12	5	5	12		
REG INFLOW	15106	529	330	376	1278	1512	1538	1763	1744	1498	989	480	174	171	804	1024	895
RELEASE	15106	248	186	376	1278	1512	1538	1763	1744	1642	1628	734	344	197	695	683	536
STOR CHANGE	0	280	144	0				0	0	-144	-639	-254	-170	-26	109	341	359
STORAGE	3001.	3281	3425	3425	3425	3425	3425	3425	3425	3281	2642	2388	2218	2192	2301	2642	3001
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1341.0	1338.0	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	9.734	8.3	13.4	21.1	21.5	24.6	25.9	28.7	28.4	27.6	26.5	24.7	24.8	12.4	11.3	11.1	9.6
POWER																	
AVE POWER MW		69	113	178	182	208	218	242	239	231	213	188	183	91	83	85	77
PEAK POW MW		350	356	356	356	356	356	356	356	350	319	301	287	285	294	319	339
ENERGY GWH	1499.6	25.0	19.1	38.5	130.8	154.5	157.1	179.7	177.9	166.4	158.1	67.5	30.7	17.5	62.0	63.1	51.8
--GAVINS POINT--																	
NAT INFLOW	1494	106	49	63	144	161	172	98	80	92	121	58	27	31	86	86	121
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	3	-10	-15	-1	-6	-2	-5	1	1	2	3	0	23	2	0	3
EVAPORATION	42							2	8	10	9	4	2	2	5		
REG INFLOW	16443	357	226	425	1416	1648	1684	1814	1807	1731	1740	785	367	246	769	769	659
RELEASE	16443	357	226	425	1416	1648	1684	1814	1795	1708	1740	785	367	246	769	769	694
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	12.500	12.0	16.3	23.8	23.8	26.8	28.3	29.5	29.2	28.7	28.3	26.4	26.4	15.5	12.5	12.5	12.5
POWER																	
AVE POWER MW		42	57	82	82	91	96	100	99	99	99	93	93	55	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	687.0	15.1	9.5	17.6	58.7	68.0	69.3	74.2	74.0	71.6	73.7	33.3	15.5	10.5	33.0	33.0	29.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1770	195	91	117	233	298	185	161	129	105	57	36	17	19	16	32	80
DEPLETION	305	8	4	5	26	38	34	42	42	28	13	8	4	4	16	17	17
REGULATED FLOW AT SIOUX CITY																	
KAF	17908	543	313	537	1623	1908	1835	1933	1882	1785	1784	814	380	261	769	784	757
KCFS		18.3	22.5	30.1	27.3	31.0	30.8	31.4	30.6	30.0	29.0	27.4	27.4	16.5	12.5	12.7	13.6
--TOTAL--																	
NAT INFLOW	24400	1467	684	880	2322	3303	5995	3301	1254	1046	1016	491	229	262	490	592	1068
DEPLETION	3168	22	10	13	65	632	1822	1468	403	-238	-200	-188	-88	-100	-199	-167	-88
CHAN STOR	-15	64	-10	-15	-30	-32	-27	-1	1	40	42	3	0	16	-45	-26	3
EVAPORATION	1937							121	378	469	404	180	83	95	206		
STORAGE	46483.	47449	47800	48115	48720	49451	51763	51541	50132	49202	48273	47960	47813	47834	47504	47454	47855
SYSTEM POWER																	
AVE POWER MW		570	731	777	884	1039	1101	1218	1219	1095	855	820	755	608	701	812	757
PEAK POW MW		2286	2287	2291	2301	2309	2340	2337	2318	2309	2292	2272	2259	2257	2223	2244	2256
ENERGY GWH	8108.1	205.3	122.9	167.8	636.4	773.3	792.9	905.9	906.9	788.2	635.8	295.3	126.8	116.7	521.5	604.0	508.7
DAILY GWH		13.7	17.6	18.6	21.2	24.9	26.4	29.2	29.3	26.3	20.5	19.7	18.1	14.6	16.8	19.5	18.2
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

TIME OF STUDY: 09:13:18 STUDY NO 19

VALUES IN 1000 AF EXCEPT AS INDICATED

	28FEB21	2021												2022			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	5518	202	94	121	458	885	1228	619	271	240	323	151	70	81	229	239	307
DEPLETION	545	-23	-11	-14	20	281	569	303	43	-117	-111	-37	-17	-19	-125	-130	-68
EVAPORATION	475							29	92	114	99	45	21	24	51		
MOD INFLOW	4498	225	105	135	438	604	659	287	136	243	335	143	67	76	303	369	375
RELEASE	5684	179	83	107	417	461	565	584	584	459	369	179	83	100	461	553	500
STOR CHANGE	-1186	46	21	28	21	143	94	-298	-448	-216	-34	-36	-17	-24	-159	-184	-125
STORAGE	12368.	12414	12436	12463	12485	12628	12721	12424	11976	11760	11726	11690	11674	11650	11491	11307	11182
ELEV FTMSL	2221.6	2221.9	2222.0	2222.2	2222.3	2223.0	2223.6	2221.9	2219.5	2218.3	2218.1	2217.9	2217.8	2217.6	2216.7	2215.7	2215.0
DISCH KCFS	11.000	6.0	6.0	6.0	7.0	7.5	9.5	9.5	9.5	7.7	6.0	6.0	6.0	6.3	7.5	9.0	9.0
POWER																	
AVE POWER MW		78	78	78	92	98	125	124	123	99	77	77	77	81	96	114	114
PEAK POW MW		179	179	179	179	180	181	179	177	175	175	175	175	175	174	172	171
ENERGY GWH	888.8	28.2	13.2	16.9	65.9	73.1	89.7	92.5	91.6	71.4	57.4	27.7	12.9	15.5	71.3	85.0	76.5
--GARRISON--																	
NAT INFLOW	7937	410	191	246	622	1180	2322	1003	349	230	413	161	75	86	150	209	290
DEPLETION	1379	32	15	19	45	221	871	741	131	-168	-58	-141	-66	-75	-97	-57	-35
CHAN STOR	21	52			-10	-5	-21			19	18			-3	-13	-16	
EVAPORATION	551							35	107	133	115	52	24	28	59		
REG INFLOW	11711	608	259	334	983	1415	1996	812	695	742	743	429	200	230	637	804	825
RELEASE	13148	446	208	268	1071	1230	1250	1230	1230	1040	922	446	208	238	1138	1168	1055
STOR CHANGE	-1437	162	51	66	-88	185	746	-418	-535	-297	-179	-17	-8	-8	-501	-365	-230
STORAGE	14817.	14979	15030	15096	15008	15193	15939	15521	14986	14689	14509	14492	14484	14476	13975	13611	13380
ELEV FTMSL	1827.3	1827.9	1828.1	1828.4	1828.0	1828.7	1831.4	1829.9	1828.0	1826.9	1826.2	1826.1	1826.1	1826.1	1824.2	1822.8	1821.9
DISCH KCFS	23.000	15.0	15.0	15.0	18.0	20.0	21.0	20.0	20.0	17.5	15.0	15.0	15.0	15.0	18.5	19.0	19.0
POWER																	
AVE POWER MW		175	175	175	210	233	248	237	234	203	174	173	173	173	212	215	213
PEAK POW MW		482	483	484	482	485	498	491	482	477	474	473	473	473	464	458	454
ENERGY GWH	1844.2	62.9	29.4	37.9	151.3	173.7	178.3	176.2	174.3	146.2	129.1	62.3	29.1	33.2	157.4	159.8	143.2
--OAHE--																	
NAT INFLOW	1213	179	83	107	211	116	322	111	42	47	5	8	4	4	-47	-21	42
DEPLETION	817	26	12	16	54	82	175	217	147	35	-15	1	0	0	14	21	32
CHAN STOR	18	35		0	-13	-9	-4	4		12	12				-17	-2	
EVAPORATION	505							32	98	121	105	47	22	25	55		
REG INFLOW	13058	634	279	359	1215	1255	1392	1096	1027	943	849	407	190	217	1005	1124	1065
RELEASE	14539	481	308	347	1209	1494	1481	1711	1744	1093	1252	355	97	143	879	1068	878
STOR CHANGE	-1481	153	-28	12	6	-239	-88	-614	-717	-150	-403	52	93	74	126	56	188
STORAGE	15649.	15803	15774	15787	15793	15553	15465	14851	14133	13983	13580	13632	13725	13799	13925	13981	14168
ELEV FTMSL	1597.0	1597.6	1597.5	1597.5	1597.6	1596.7	1596.3	1594.0	1591.1	1590.5	1588.8	1589.0	1589.4	1589.7	1590.2	1590.5	1591.2
DISCH KCFS	15.912	16.2	22.2	19.4	20.3	24.3	24.9	27.8	28.4	18.4	20.4	11.9	7.0	9.0	14.3	17.4	15.8
POWER																	
AVE POWER MW		198	271	238	248	296	302	335	337	217	238	139	82	106	168	204	187
PEAK POW MW		656	656	656	656	652	650	638	624	621	613	614	616	617	620	621	625
ENERGY GWH	2104.1	71.2	45.5	51.4	178.9	220.2	217.5	249.2	250.4	155.9	177.4	50.2	13.7	20.3	125.0	152.0	125.4
--BIG BEND--																	
EVAPORATION	131							8	25	31	28	12	6	7	14		
REG INFLOW	14408	481	308	347	1209	1494	1481	1703	1719	1062	1225	342	91	136	865	1068	878
RELEASE	14408	481	308	347	1209	1494	1481	1703	1719	1062	1225	342	91	136	865	1068	878
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	15.912	16.2	22.2	19.4	20.3	24.3	24.9	27.7	28.0	17.8	19.9	11.5	6.5	8.6	14.1	17.4	15.8
POWER																	
AVE POWER MW		77	104	91	95	114	116	130	131	87	99	58	33	44	71	85	76
PEAK POW MW		517	509	509	509	509	509	509	509	537	538	538	538	538	538	538	529
ENERGY GWH	833.7	27.6	17.4	19.7	68.5	84.6	83.9	96.4	97.4	62.4	73.7	20.9	5.6	8.4	52.8	63.5	51.0
--FORT RANDALL--																	
NAT INFLOW	380	74	34	44	92	54	103	27	16	-5	-27	-11	-5	-6	-22	-27	38
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	138							10	32	37	27	11	4	5	12		
REG INFLOW	14569	553	341	390	1297	1539	1572	1702	1689	1013	1169	319	82	125	828	1038	913
RELEASE	14569	273	197	390	1297	1539	1572	1702	1689	1586	1572	576	81	125	718	697	554
STOR CHANGE	0	280	144	0	0			0	0	-573	-403	-257	0	0	109	341	359
STORAGE	3001.	3281	3425	3425	3425	3425	3425	3425	3425	2852	2449	2192	2192	2192	2301	2642	3001
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1348.0	1342.0	1337.5	1337.5	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	10.024	9.2	14.2	21.9	21.8	25.0	26.4	27.7	27.5	26.7	25.6	19.4	5.9	7.9	11.7	11.3	10.0
POWER																	
AVE POWER MW		76	120	185	184	211	223	233	232	218	198	144	43	58	86	86	80
PEAK POW MW		350	356	356	356	356	356	356	356	332	305	285	285	285	294	319	339
ENERGY GWH	1440.1	27.4	20.2	39.9	132.7	157.2	160.4	173.6	172.3	157.1	147.3	51.7	7.2	11.1	64.1	64.3	53.6
--GAVINS POINT--																	
NAT INFLOW	1236	82	38	49	124	134	139	82	62	77	103	49	23	26	72	72	103
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	2	-10	-15	0	-6	-3	-2	0	2	2	11	25	-4	-7	1	3
EVAPORATION	42							2	8	10	9	4	2	2	5		
REG INFLOW	15648	357	226	425	1416	1648	1684	1740	1734	1659	1666	628	125	143	769	769	659
RELEASE	15648	357	226	425	1416	1648	1684	1740	1722	1636	1666	628	125	143	769	769	694
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	12.500	12.0	16.3	23.8	23.8	26.8	28.3	28.3	28.0	27.5	27.1	21.1	9.0	9.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		42	57	82	82	91	96	96	96	96	95	74	32	32	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	654.7	15.1	9.5	17.6	58.7	68.0	69.3	71.6	71.3	68.8	70.6	26.8	5.4	6.2	33.1	33.0	29.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	816	102	47	61	105	140	76	82	46	35	35	21	10	11	6	17	23
DEPLETION	295	8	4	5	25	38	33	42	40	27	13	7	3	4	15	16	16
REGULATED FLOW AT SIOUX CITY																	
KAF	16169	451	270	482	1496	1750	1727	1780	1728	1644	1688	641	131	150	760	770	701
KCFS		15.2	19.4	27.0	25.1	28.5	29.0	29.0	28.1	27.6	27.5	21.6	9.5	9.4	12.4	12.5	12.6
--TOTAL--																	
NAT INFLOW	17100	1048	489	628	1612	2509	4190	1924	786	624	852	379	177	202	388	489	803
DEPLETION	3230	45	21	27	153	650	1684	1360	386	-221	-168	-164	-77	-87	-180	-146	-52
CHAN STOR	37	89	-10	-15	-23	-20	-28	2	0	32	31	11	26	-7	-37	-17	3
EVAPORATION	1842							116	361	446	383	170	79	90	196		
STORAGE	47794.	48435	48624	48729	48669	48758	49509	48179	46491	45277	44258	44000	44068	44110	43686	43534	43690
SYSTEM POWER																	
AVE POWER MW		645	805	849	911	1044	1110	1155	1152	919	881	666	440	493	677	750	713
PEAK POW MW		2299	2297	2299	2297	2297	2308	2288	2263	2260	2222	2202	2204	2205	2168	2187	2194
ENERGY GWH	7765.6	232.3	135.2	183.5	656.0	776.8	799.1	859.5	857.2	661.8	655.4	239.6	73.9	94.7	503.6	557.7	479.2
DAILY GWH		15.5	19.3	20.4	21.9	25.1	26.6	27.7	27.7	22.1	21.1	16.0	10.6	11.8	16.2	18.0	17.1
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

TIME OF STUDY: 09:13:18 STUDY NO 20

VALUES IN 1000 AF EXCEPT AS INDICATED

	28FEB22	2022												2023			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	5601	205	95	123	465	898	1247	629	275	243	328	153	71	82	232	243	312
DEPLETION	575	-15	-7	-9	35	280	561	310	47	-118	-112	-38	-18	-20	-125	-130	-68
EVAPORATION	449							28	87	107	94	42	20	23	49		
MOD INFLOW	4577	219	102	131	430	618	686	291	141	254	346	148	69	79	308	373	380
RELEASE	5441	149	69	89	446	492	536	553	553	415	307	149	69	95	523	523	472
STOR CHANGE	-865	70	33	42	-16	126	150	-262	-412	-162	39	-1	0	-16	-214	-150	-92
STORAGE	11182.	11253	11286	11328	11311	11438	11588	11326	10914	10752	10791	10790	10790	10774	10559	10409	10317
ELEV FTMSL	2215.0	2215.4	2215.6	2215.8	2215.7	2216.4	2217.3	2215.8	2213.4	2212.4	2212.7	2212.7	2212.7	2212.6	2211.3	2210.4	2209.8
DISCH KCFS	9.000	5.0	5.0	5.0	7.5	8.0	9.0	9.0	9.0	7.0	5.0	5.0	5.0	6.0	8.5	8.5	8.5
POWER																	
AVE POWER MW		63	63	64	95	102	115	114	113	87	63	63	63	75	106	105	105
PEAK POW MW		172	172	172	172	173	174	172	169	168	169	169	169	168	167	166	165
ENERGY GWH	827.7	22.8	10.7	13.7	68.5	75.6	82.5	85.2	84.4	62.9	46.6	22.5	10.5	14.4	78.7	78.3	70.4
--GARRISON--																	
NAT INFLOW	8154	422	197	253	639	1212	2386	1030	358	236	424	166	77	88	154	215	298
DEPLETION	1191	18	8	11	30	206	866	754	139	-171	-62	-161	-75	-86	-131	-91	-65
CHAN STOR	5	42	0	0	-26	-5	-10			21	21		0	-11	-27		
EVAPORATION	525							33	102	126	109	49	23	26	56		
REG INFLOW	11885	595	258	331	1029	1493	2045	797	671	717	705	426	199	232	725	829	835
RELEASE	12931	446	208	268	1012	1138	1220	1199	1199	1013	892	431	201	254	1168	1199	1083
STOR CHANGE	-1047	149	49	64	17	355	825	-402	-528	-296	-187	-6	-3	-22	-443	-370	-248
STORAGE	13380.	13529	13578	13642	13659	14014	14839	14437	13908	13612	13425	13420	13417	13395	12952	12581	12333
ELEV FTMSL	1821.9	1822.4	1822.6	1822.9	1823.0	1824.3	1827.4	1825.9	1823.9	1822.8	1822.0	1822.0	1822.0	1821.9	1820.2	1818.6	1817.6
DISCH KCFS	19.000	15.0	15.0	15.0	17.0	18.5	20.5	19.5	19.5	17.0	14.5	14.5	14.5	16.0	19.0	19.5	19.5
POWER																	
AVE POWER MW		168	169	169	192	209	235	225	222	193	163	163	163	179	211	214	212
PEAK POW MW		456	457	458	459	465	480	472	463	458	454	454	454	454	446	439	434
ENERGY GWH	1761.4	60.6	28.4	36.5	138.0	155.8	169.4	167.5	165.5	138.6	121.4	58.6	27.3	34.4	157.1	159.4	142.7
--OAHE--																	
NAT INFLOW	1239	182	85	109	215	118	329	113	44	49	5	8	4	4	-48	-22	43
DEPLETION	830	27	12	16	54	83	178	221	150	35	-15	1	0	0	15	21	32
CHAN STOR	-2	19		0	-9	-7	-9	5		12	13		0	-7	-15	-2	
EVAPORATION	467							30	90	111	97	44	21	24	52		
REG INFLOW	12871	621	281	361	1163	1166	1361	1066	1003	929	827	395	184	227	1039	1154	1094
RELEASE	13950	477	306	345	1205	1491	1475	1709	1743	950	932	232	124	139	879	1068	876
STOR CHANGE	-1080	144	-25	17	-42	-326	-113	-643	-740	-22	-104	163	60	88	160	86	218
STORAGE	14168.	14312	14287	14303	14261	13936	13822	13180	12440	12418	12314	12477	12537	12625	12785	12870	13088
ELEV FTMSL	1591.2	1591.8	1591.7	1591.8	1591.6	1590.3	1589.8	1587.2	1584.0	1583.9	1583.4	1584.1	1584.4	1584.8	1585.5	1585.8	1586.8
DISCH KCFS	15.804	16.0	22.1	19.3	20.3	24.3	24.8	27.8	28.4	16.0	15.2	7.8	8.9	8.8	14.3	17.4	15.8
POWER																	
AVE POWER MW		190	261	229	240	286	290	322	323	181	172	89	102	100	163	199	181
PEAK POW MW		628	627	627	627	620	618	604	587	587	584	588	589	591	595	597	602
ENERGY GWH	1953.4	68.4	43.9	49.4	172.7	212.4	209.0	239.7	240.4	130.4	127.7	31.9	17.1	19.2	121.5	148.0	121.9
--BIG BEND--																	
EVAPORATION	131							8	25	31	28	12	6	7	14		
REG INFLOW	13819	477	306	345	1205	1491	1475	1701	1718	919	904	219	118	133	864	1068	876
RELEASE	13819	477	306	345	1205	1491	1475	1701	1718	919	904	219	118	133	864	1068	876
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	15.804	16.0	22.1	19.3	20.3	24.3	24.8	27.7	27.9	15.4	14.7	7.4	8.5	8.4	14.1	17.4	15.8
POWER																	
AVE POWER MW		76	103	90	95	114	116	129	131	76	74	37	43	42	71	85	76
PEAK POW MW		517	509	509	509	509	509	509	509	538	538	538	538	538	538	538	529
ENERGY GWH	799.8	27.4	17.3	19.5	68.3	84.5	83.5	96.3	97.3	54.5	55.2	13.5	7.3	8.1	52.8	63.5	50.8
--FORT RANDALL--																	
NAT INFLOW	393	76	35	46	95	56	107	28	17	-6	-28	-11	-5	-6	-22	-28	39
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	133							10	32	36	25	10	4	5	12		
REG INFLOW	13999	552	341	389	1296	1538	1570	1701	1689	870	850	199	108	121	827	1037	912
RELEASE	13999	272	197	389	1296	1538	1570	1701	1689	1585	1369	199	108	121	718	696	553
STOR CHANGE	0	280	144		0	0		0	0	-715	-518	0	0	0	109	341	359
STORAGE	3001.	3281	3425	3425	3425	3425	3425	3425	3425	2710	2192	2192	2192	2192	2301	2642	3001
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1346.0	1337.5	1337.5	1337.5	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	9.970	9.1	14.2	21.8	21.8	25.0	26.4	27.7	27.5	26.6	22.3	6.7	7.8	7.6	11.7	11.3	10.0
POWER																	
AVE POWER MW		76	120	184	184	211	223	233	232	216	168	49	57	56	86	86	80
PEAK POW MW		350	356	356	356	356	356	356	356	324	284	285	285	285	294	319	339
ENERGY GWH	1383.2	27.3	20.1	39.9	132.7	157.1	160.2	173.5	172.3	155.7	124.8	17.6	9.6	10.7	64.0	64.3	53.5
--GAVINS POINT--																	
NAT INFLOW	1249	83	39	50	125	135	141	83	62	78	104	50	23	26	73	73	104
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	2	-10	-15	0	-6	-3	-2	0	2	8	29	-2	0	-7	1	3
EVAPORATION	42							2	8	10	9	4	2	2	5		
REG INFLOW	15091	357	226	425	1416	1648	1684	1740	1734	1659	1470	268	125	143	769	769	659
RELEASE	15091	357	226	425	1416	1648	1684	1740	1722	1636	1470	268	125	143	769	769	694
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	12.500	12.0	16.3	23.8	23.8	26.8	28.3	28.3	28.0	27.5	23.9	9.0	9.0	9.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		42	57	82	82	91	96	96	96	96	84	32	32	32	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	631.3	15.1	9.5	17.6	58.7	68.0	69.3	71.6	71.3	68.8	62.5	11.6	5.4	6.2	33.0	33.0	29.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	864	107	50	64	111	148	80	86	49	38	37	22	10	11	6	19	25
DEPLETION	297	8	4	5	25	38	33	42	41	27	13	7	3	4	15	16	17
REGULATED FLOW AT SIOUX CITY																	
KAF	15658	457	273	485	1502	1758	1731	1784	1730	1647	1494	282	132	151	760	772	702
KCFS		15.4	19.6	27.2	25.2	28.6	29.1	29.0	28.1	27.7	24.3	9.5	9.5	9.5	12.4	12.5	12.6
--TOTAL--																	
NAT INFLOW	17500	1075	502	645	1650	2567	4290	1969	805	638	870	387	180	206	395	500	821
DEPLETION	3087	39	18	23	153	635	1674	1384	402	-225	-173	-185	-86	-98	-213	-180	-81
CHAN STOR	2	63	-10	-15	-36	-18	-23	2	0	35	41	30	-2	-18	-50	-2	3
EVAPORATION	1748							110	343	422	361	162	76	86	188		
STORAGE	43690.	44333	44534	44656	44615	44771	45633	44326	42657	41486	40715	40872	40929	40979	40590	40496	40699
SYSTEM POWER																	
AVE POWER MW		616	773	818	887	1013	1075	1121	1117	848	723	432	460	485	682	734	698
PEAK POW MW		2238	2236	2238	2237	2238	2251	2229	2200	2192	2147	2151	2152	2154	2118	2137	2145
ENERGY GWH	7357.0	221.7	129.9	176.7	638.8	753.4	774.0	833.9	831.2	610.8	538.1	155.7	77.2	93.1	507.1	546.4	469.0
DAILY GWH		14.8	18.6	19.6	21.3	24.3	25.8	26.9	26.8	20.4	17.4	10.4	11.0	11.6	16.4	17.6	16.7
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

TIME OF STUDY: 09:13:18 STUDY NO 21

VALUES IN 1000 AF EXCEPT AS INDICATED

28FEB23		2023												2024			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB
--FORT PECK--																	
NAT INFLOW	5800	212	99	127	482	930	1291	651	285	251	339	159	74	85	241	252	323
DEPLETION	579	-15	-7	-9	35	281	565	318	52	-118	-114	-37	-17	-20	-126	-131	-78
EVAPORATION	430							27	83	103	90	41	19	22	47		
MOD INFLOW	4791	227	106	136	447	649	726	306	150	266	363	155	72	83	320	383	401
RELEASE	5398	149	69	89	417	492	536	553	553	416	307	149	69	95	492	523	489
STOR CHANGE	-607	78	36	47	30	157	190	-247	-403	-149	56	6	3	-13	-172	-140	-88
STORAGE	10317.	10396	10432	10479	10509	10667	10857	10610	10207	10057	10113	10119	10122	10109	9938	9798	9710
ELEV FTMSL	2209.8	2210.3	2210.5	2210.8	2211.0	2211.9	2213.1	2211.6	2209.1	2208.2	2208.5	2208.6	2208.6	2208.5	2207.4	2206.6	2206.0
DISCH KCFS	8.500	5.0	5.0	5.0	7.0	8.0	9.0	9.0	9.0	7.0	5.0	5.0	5.0	6.0	8.0	8.5	8.5
POWER																	
AVE POWER MW		62	62	62	87	99	112	112	111	86	61	61	61	74	98	103	103
PEAK POW MW		166	166	166	166	168	169	167	164	163	163	163	163	163	162	161	160
ENERGY GWH	804.2	22.3	10.4	13.4	62.5	73.9	80.8	83.4	82.6	61.7	45.6	22.1	10.3	14.1	72.6	76.8	71.6
--GARRISON--																	
NAT INFLOW	8704	450	210	270	682	1294	2546	1100	382	253	453	177	82	94	165	229	318
DEPLETION	1188	2	1	1	34	209	879	771	145	-174	-67	-163	-76	-87	-130	-89	-69
CHAN STOR	0	38	0	0	-21	-11	-11			21	21		0	-11	-21	-5	
EVAPORATION	505							32	98	121	105	47	22	25	54		
REG INFLOW	12409	634	278	357	1043	1566	2192	851	692	743	744	441	206	240	711	835	876
RELEASE	13145	446	208	268	1071	1199	1250	1230	1230	1030	892	431	201	230	1138	1199	1122
STOR CHANGE	-735	187	70	90	-28	367	942	-379	-537	-288	-148	9	4	10	-426	-364	-246
STORAGE	12333.	12521	12591	12680	12652	13019	13962	13583	13045	12758	12610	12619	12624	12634	12208	11844	11598
ELEV FTMSL	1817.6	1818.4	1818.7	1819.1	1818.9	1820.4	1824.1	1822.7	1820.5	1819.4	1818.8	1818.8	1818.8	1818.9	1817.1	1815.6	1814.5
DISCH KCFS	19.500	15.0	15.0	15.0	18.0	19.5	21.0	20.0	20.0	17.3	14.5	14.5	14.5	14.5	18.5	19.5	19.5
POWER																	
AVE POWER MW		164	164	165	197	215	235	226	223	191	159	159	159	159	201	210	208
PEAK POW MW		438	439	441	440	447	464	457	447	442	439	439	440	440	432	425	420
ENERGY GWH	1748.7	58.9	27.6	35.6	142.1	159.7	169.3	168.0	165.9	137.7	118.7	57.3	26.7	30.6	149.8	156.0	144.6
--OAHE--																	
NAT INFLOW	1301	192	89	115	226	124	345	119	45	52	6	9	4	5	-51	-23	45
DEPLETION	845	27	12	16	55	84	181	226	153	36	-15	1	0	0	15	21	33
CHAN STOR	1	22		0	-15	-7	-7	5		14	15		0	0	-20	-5	
EVAPORATION	445							28	86	106	92	42	20	23	49		
REG INFLOW	13156	633	285	367	1228	1232	1406	1099	1036	955	835	398	185	212	1002	1150	1134
RELEASE	13914	469	302	340	1194	1482	1464	1705	1740	949	932	232	124	139	878	1068	895
STOR CHANGE	-758	164	-17	27	34	-250	-57	-605	-704	5	-97	165	61	72	123	82	239
STORAGE	13088.	13253	13236	13263	13296	13046	12989	12383	11679	11684	11587	11753	11814	11886	12009	12091	12330
ELEV FTMSL	1586.8	1587.5	1587.4	1587.5	1587.6	1586.6	1586.3	1583.7	1580.5	1580.5	1580.1	1580.8	1581.1	1581.5	1582.0	1582.4	1583.5
DISCH KCFS	15.768	15.8	21.8	19.0	20.1	24.1	24.6	27.7	28.3	16.0	15.2	7.8	8.9	8.8	14.3	17.4	15.6
POWER																	
AVE POWER MW		182	251	220	232	278	282	315	316	177	168	87	100	98	160	195	175
PEAK POW MW		606	605	606	607	601	600	586	569	569	567	571	572	574	577	579	585
ENERGY GWH	1907.5	65.6	42.2	47.6	167.1	206.6	203.2	234.4	235.1	127.6	125.1	31.3	16.8	18.9	119.1	145.0	122.0
--BIG BEND--																	
EVAPORATION	131							8	25	31	28	12	6	7	14		
REG INFLOW	13783	469	302	340	1194	1482	1464	1697	1715	918	904	220	118	133	864	1068	895
RELEASE	13783	469	302	340	1194	1482	1464	1697	1715	918	904	220	118	133	864	1068	895
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	15.768	15.8	21.8	19.0	20.1	24.1	24.6	27.6	27.9	15.4	14.7	7.4	8.5	8.4	14.1	17.4	15.6
POWER																	
AVE POWER MW		75	102	89	94	113	115	129	131	76	74	38	43	42	71	85	75
PEAK POW MW		517	509	509	509	509	509	509	509	538	538	538	538	538	538	538	529
ENERGY GWH	797.7	26.9	17.1	19.3	67.6	84.0	82.9	96.1	97.2	54.4	55.2	13.5	7.3	8.2	52.8	63.5	51.9
--FORT RANDALL--																	
NAT INFLOW	424	82	38	49	103	61	115	30	18	-7	-30	-12	-6	-6	-24	-30	42
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	133							10	32	36	25	10	4	5	12		
REG INFLOW	13994	550	340	389	1293	1534	1567	1699	1687	868	848	198	108	121	825	1035	934
RELEASE	13994	270	196	389	1293	1534	1567	1699	1687	1583	1367	198	108	121	716	694	575
STOR CHANGE	0	280	144	0		0		0	0	-715	-518	0	0	0	109	341	359
STORAGE	3001.	3281	3425	3425	3425	3425	3425	3425	3425	2710	2192	2192	2192	2192	2301	2642	3001
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1346.0	1337.5	1337.5	1337.5	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	9.952	9.1	14.1	21.8	21.7	24.9	26.3	27.6	27.4	26.6	22.2	6.7	7.8	7.6	11.6	11.3	10.0
POWER																	
AVE POWER MW		75	119	184	184	211	222	233	231	216	167	49	57	56	86	86	80
PEAK POW MW		350	356	356	356	356	356	356	356	324	284	285	285	285	294	319	339
ENERGY GWH	1382.7	27.1	20.0	39.8	132.3	156.7	159.9	173.3	172.1	155.5	124.6	17.6	9.6	10.7	63.9	64.1	55.6
--GAVINS POINT--																	
NAT INFLOW	1279	85	40	51	128	139	144	85	64	80	106	50	23	27	75	75	107
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	2	-10	-15	0	-6	-3	-2	0	2	8	29	-2	0	-7	1	2
EVAPORATION	42							2	8	10	9	4	2	2	5		
REG INFLOW	15116	357	226	425	1416	1648	1684	1740	1734	1659	1470	268	125	143	769	769	684
RELEASE	15116	357	226	425	1416	1648	1684	1740	1722	1636	1470	268	125	143	769	769	719
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	12.500	12.0	16.3	23.8	23.8	26.8	28.3	28.3	28.0	27.5	23.9	9.0	9.0	9.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		42	57	82	82	91	96	96	96	96	84	32	32	32	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	632.4	15.1	9.5	17.6	58.7	68.0	69.3	71.6	71.3	68.8	62.5	11.6	5.4	6.2	33.0	33.0	30.7
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	992	123	58	74	128	170	92	99	57	42	43	25	12	13	7	21	28
DEPLETION	301	8	4	5	26	38	33	42	41	28	13	8	4	4	16	16	17
REGULATED FLOW AT SIOUX CITY																	
KAF	15807	473	280	495	1518	1780	1743	1797	1738	1650	1500	285	133	152	760	774	730
KCFS		15.9	20.2	27.7	25.5	28.9	29.3	29.2	28.3	27.7	24.4	9.6	9.6	9.6	12.4	12.6	12.7
--TOTAL--																	
NAT INFLOW	18500	1144	534	686	1749	2718	4533	2084	851	671	917	407	190	217	413	524	863
DEPLETION	3107	23	11	14	159	640	1694	1414	416	-226	-180	-186	-87	-99	-212	-179	-94
CHAN STOR	-1	61	-10	-15	-36	-24	-21	2	0	37	44	30	-2	-10	-50	-10	2
EVAPORATION	1686							107	331	407	348	156	73	83	181		
STORAGE	40699.	41409	41642	41805	41841	42115	43191	41959	40326	39203	38496	38677	38745	38815	38449	38369	38598
SYSTEM POWER																	
AVE POWER MW		600	755	802	876	1007	1063	1111	1108	841	715	426	453	462	660	724	685
PEAK POW MW		2191	2190	2192	2193	2195	2213	2190	2161	2153	2109	2114	2115	2117	2081	2100	2109
ENERGY GWH	7273.2	215.8	126.9	173.2	630.4	748.9	765.5	826.8	824.1	605.6	531.7	153.4	76.1	88.6	491.2	538.3	476.5
DAILY GWH		14.4	18.1	19.2	21.0	24.2	25.5	26.7	26.6	20.2	17.2	10.2	10.9	11.1	15.8	17.4	16.4
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB

TIME OF STUDY: 09:13:18 STUDY NO 22

VALUES IN 1000 AF EXCEPT AS INDICATED

	29FEB24	2024												2025			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	5950	217	101	130	494	954	1325	668	292	258	348	163	76	87	247	258	331
DEPLETION	603	-15	-7	-9	36	284	572	325	56	-119	-116	-39	-18	-21	-127	-131	-69
EVAPORATION	416							26	80	99	87	39	18	21	45		
MOD INFLOW	4931	232	108	139	458	670	753	317	156	278	377	162	76	86	329	389	400
RELEASE	5335	149	69	89	417	461	536	553	553	416	307	149	69	79	492	523	472
STOR CHANGE	-403	84	39	50	41	209	217	-236	-397	-138	70	13	6	7	-163	-134	-72
STORAGE	9710.	9794	9833	9883	9924	10133	10350	10114	9717	9579	9649	9662	9669	9676	9512	9379	9307
ELEV FTMSL	2206.0	2206.5	2206.8	2207.1	2207.4	2208.7	2210.0	2208.5	2206.0	2205.2	2205.6	2205.7	2205.7	2205.8	2204.7	2203.9	2203.4
DISCH KCFS	8.500	5.0	5.0	5.0	7.0	7.5	9.0	9.0	9.0	7.0	5.0	5.0	5.0	5.0	8.0	8.5	8.5
POWER																	
AVE POWER MW		61	61	61	85	92	111	110	109	84	60	60	61	61	96	102	101
PEAK POW MW		161	161	162	162	164	165	163	160	159	160	160	160	160	159	158	157
ENERGY GWH	782.6	21.8	10.2	13.2	61.3	68.1	79.6	82.2	81.4	60.7	44.9	21.8	10.2	11.6	71.6	75.7	68.2
--GARRISON--																	
NAT INFLOW	9150	473	221	284	717	1360	2677	1156	402	266	476	186	87	99	173	241	334
DEPLETION	1204	4	2	2	39	214	894	787	150	-177	-72	-169	-79	-90	-137	-95	-69
CHAN STOR	0	38	0	0	-22	-5	-16			22	21		0	0	-32	-5	
EVAPORATION	495							31	96	119	103	46	22	25	53		
REG INFLOW	12786	656	288	371	1073	1602	2302	891	709	761	774	457	213	244	716	853	875
RELEASE	13274	446	208	268	1012	1199	1250	1230	1230	1042	922	446	208	246	1168	1261	1139
STOR CHANGE	-488	210	80	103	61	403	1053	-338	-520	-281	-148	11	5	-2	-452	-407	-263
STORAGE	11598.	11808	11888	11991	12052	12454	13507	13169	12648	12368	12219	12230	12235	12232	11781	11373	11110
ELEV FTMSL	1814.5	1815.4	1815.8	1816.2	1816.4	1818.1	1822.4	1821.0	1818.9	1817.8	1817.1	1817.2	1817.2	1817.2	1815.3	1813.5	1812.4
DISCH KCFS	19.500	15.0	15.0	15.0	17.0	19.5	21.0	20.0	20.0	17.5	15.0	15.0	15.0	15.5	19.0	20.5	20.5
POWER																	
AVE POWER MW		160	161	161	183	211	232	223	221	191	163	163	163	168	204	217	215
PEAK POW MW		424	425	427	429	437	456	450	440	435	432	432	432	432	423	415	411
ENERGY GWH	1741.1	57.7	27.0	34.9	131.8	157.1	167.0	166.0	164.1	137.7	121.3	58.6	27.4	32.3	152.0	161.7	144.5
--OAHE--																	
NAT INFLOW	1350	199	93	119	235	129	358	123	47	52	6	9	4	5	-53	-23	47
DEPLETION	860	27	13	16	55	85	185	230	157	37	-16	1	0	0	15	22	33
CHAN STOR	-5	23		0	-10	-12	-8	5		13	13			-3	-18	-8	
EVAPORATION	421							27	81	99	87	40	19	21	47		
REG INFLOW	13339	641	288	371	1182	1231	1415	1101	1039	971	871	415	194	226	1035	1208	1153
RELEASE	13842	462	299	336	1186	1477	1455	1701	1738	947	931	232	124	139	880	1069	866
STOR CHANGE	-503	178	-11	35	-4	-247	-40	-600	-700	23	-60	183	70	87	155	139	287
STORAGE	12330.	12509	12498	12532	12528	12281	12242	11642	10942	10966	10906	11089	11159	11246	11401	11540	11827
ELEV FTMSL	1583.5	1584.3	1584.2	1584.4	1584.3	1583.2	1583.1	1580.3	1577.0	1577.1	1576.8	1577.7	1578.0	1578.4	1579.2	1579.9	1581.2
DISCH KCFS	15.553	15.5	21.6	18.8	19.9	24.0	24.4	27.7	28.3	15.9	15.1	7.8	8.9	8.8	14.3	17.4	15.6
POWER																	
AVE POWER MW		176	244	214	226	271	275	308	309	173	165	85	98	96	157	192	173
PEAK POW MW		589	589	589	589	584	583	568	551	551	550	554	556	558	562	566	573
ENERGY GWH	1861.4	63.4	41.1	46.2	162.9	201.9	198.0	229.2	229.9	124.6	122.4	30.6	16.4	18.5	117.1	142.7	116.4
--BIG BEND--																	
EVAPORATION	131							8	25	31	28	12	6	7	14		
REG INFLOW	13711	462	299	336	1186	1477	1455	1693	1713	916	903	219	118	133	865	1069	866
RELEASE	13711	462	299	336	1186	1477	1455	1693	1713	916	903	219	118	133	865	1069	866
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	15.553	15.5	21.6	18.8	19.9	24.0	24.4	27.5	27.9	15.4	14.7	7.4	8.5	8.4	14.1	17.4	15.6
POWER																	
AVE POWER MW		74	101	88	93	112	114	129	130	75	74	37	43	42	71	85	75
PEAK POW MW		517	509	509	509	509	509	509	509	538	538	538	538	538	538	538	529
ENERGY GWH	793.6	26.5	17.0	19.1	67.2	83.7	82.4	95.9	97.0	54.3	55.1	13.5	7.3	8.1	52.8	63.5	50.3
--FORT RANDALL--																	
NAT INFLOW	450	87	41	52	109	64	122	32	19	-6	-31	-13	-6	-7	-26	-32	45
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	133							10	32	36	25	10	4	5	12		
REG INFLOW	13948	548	339	388	1291	1532	1565	1697	1686	867	846	197	107	120	824	1034	908
RELEASE	13948	268	195	388	1291	1532	1565	1697	1686	1582	1364	197	107	120	715	693	549
STOR CHANGE	0	280	144					0	0	-715	-518	0	0	0	109	341	359
STORAGE	3001.	3281	3425	3425	3425	3425	3425	3425	3425	2710	2192	2192	2192	2192	2301	2642	3001
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1346.0	1337.5	1337.5	1337.5	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	9.990	9.0	14.1	21.7	21.7	24.9	26.3	27.6	27.4	26.6	22.2	6.6	7.7	7.6	11.6	11.3	9.9
POWER																	
AVE POWER MW		75	119	184	184	210	222	233	231	216	167	49	57	55	86	86	79
PEAK POW MW		350	356	356	356	356	356	356	356	324	284	285	285	285	294	319	339
ENERGY GWH	1378.3	26.9	20.0	39.7	132.1	156.5	159.7	173.1	172.0	155.4	124.4	17.5	9.5	10.6	63.8	64.0	53.1
--GAVINS POINT--																	
NAT INFLOW	1300	87	40	52	130	141	146	87	65	81	108	52	24	27	76	76	108
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	2	-10	-15	0	-6	-3	-2	0	2	8	29	-2	0	-8	1	3
EVAPORATION	42							2	8	10	9	4	2	2	5		
REG INFLOW	15091	357	226	425	1416	1648	1684	1740	1734	1659	1470	268	125	143	769	769	659
RELEASE	15091	357	226	425	1416	1648	1684	1740	1722	1636	1470	268	125	143	769	769	694
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	12.500	12.0	16.3	23.8	23.8	26.8	28.3	28.3	28.0	27.5	23.9	9.0	9.0	9.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		42	57	82	82	91	96	96	96	96	84	32	32	32	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	631.3	15.1	9.5	17.6	58.7	68.0	69.3	71.6	71.3	68.8	62.5	11.6	5.4	6.2	33.0	33.0	29.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1100	137	64	82	141	189	102	110	63	55	39	28	13	15	8	24	31
DEPLETION	305	8	4	5	26	38	34	42	42	28	13	8	4	4	16	17	17
REGULATED FLOW AT SIOUX CITY																	
KAF	15886	486	286	502	1531	1799	1752	1808	1743	1663	1496	288	134	154	761	776	708
KCFS		16.3	20.6	28.1	25.7	29.3	29.4	29.4	28.3	28.0	24.3	9.7	9.7	9.7	12.4	12.6	12.8
--TOTAL--																	
NAT INFLOW	19300	1200	560	720	1826	2837	4730	2176	888	706	946	424	198	226	425	544	896
DEPLETION	3166	25	12	15	165	649	1721	1441	430	-229	-188	-194	-90	-103	-220	-183	-85
CHAN STOR	-6	63	-10	-15	-32	-24	-26	3	0	36	43	30	-2	-2	-59	-13	3
EVAPORATION	1638							104	321	395	338	151	71	81	176		
STORAGE	38598.	39350	39601	39789	39887	40252	41483	40308	38703	37616	36959	37167	37247	37339	36989	36927	37203
SYSTEM POWER																	
AVE POWER MW		588	742	790	853	988	1050	1100	1096	835	713	426	453	455	659	727	688
PEAK POW MW		2156	2155	2158	2160	2163	2184	2161	2131	2124	2081	2086	2088	2090	2055	2074	2085
ENERGY GWH	7188.3	211.5	124.7	170.6	614.1	735.3	756.0	818.1	815.7	601.5	530.7	153.5	76.1	87.4	490.4	540.7	462.1
DAILY GWH		14.1	17.8	19.0	20.5	23.7	25.2	26.4	26.3	20.0	17.1	10.2	10.9	10.9	15.8	17.4	16.5
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

TIME OF STUDY: 09:13:18 STUDY NO 23

VALUES IN 1000 AF EXCEPT AS INDICATED

28FEB25		2025												2026		
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	6000	219	102	131	498	962	1336	674	294	260	352	164	77	87	249	260	334
DEPLETION	603	-15	-7	-9	36	284	572	325	56	-119	-116	-39	-18	-21	-127	-131	-69
EVAPORATION	379							25	78	97	85	24	11	13	45		
MOD INFLOW	5018	234	109	140	462	678	764	324	160	282	383	178	83	95	331	391	403
RELEASE	5266	149	69	89	417	492	506	523	523	407	307	149	69	79	492	523	472
STOR CHANGE	-248	85	40	51	45	186	258	-199	-363	-126	76	29	14	16	-160	-132	-69
STORAGE	9307.	9392	9432	9483	9529	9715	9973	9774	9411	9285	9361	9390	9404	9420	9259	9127	9058
ELEV FTMSL	2203.4	2203.9	2204.2	2204.5	2204.8	2206.0	2207.7	2206.4	2204.1	2203.2	2203.7	2203.9	2204.0	2204.1	2203.1	2202.2	2201.7
DISCH KCFS	8.500	5.0	5.0	5.0	7.0	8.0	8.5	8.5	8.5	6.8	5.0	5.0	5.0	5.0	8.0	8.5	8.5
POWER																	
AVE POWER MW		60	60	60	84	96	103	103	102	82	60	60	60	60	95	101	101
PEAK POW MW		158	158	158	159	160	162	161	158	157	157	158	158	158	157	156	155
ENERGY GWH	764.3	21.6	10.1	13.0	60.6	71.7	74.2	76.8	76.1	58.9	44.5	21.6	10.1	11.5	71.0	75.1	67.6
--GARRISON--																	
NAT INFLOW	9222	477	222	286	723	1371	2698	1165	405	268	480	187	87	100	174	243	336
DEPLETION	1204	4	2	2	39	214	894	787	150	-177	-72	-169	-79	-90	-137	-95	-69
CHAN STOR	0	39	0	0	-22	-11	-5			18	20		0	0	-33	-5	
EVAPORATION	451							30	94	116	101	29	13	15	52		
REG INFLOW	12833	660	290	373	1079	1638	2304	870	684	754	779	476	222	254	718	855	877
RELEASE	13133	417	194	250	982	1168	1279	1261	1261	1031	892	431	201	230	1138	1261	1139
STOR CHANGE	-299	244	96	123	97	470	1025	-390	-577	-276	-113	45	21	24	-419	-405	-261
STORAGE	11110.	11353	11449	11572	11669	12138	13164	12773	12196	11920	11807	11852	11873	11897	11477	11072	10810
ELEV FTMSL	1812.4	1813.4	1813.9	1814.4	1814.8	1816.8	1821.0	1819.4	1817.1	1815.9	1815.4	1815.6	1815.7	1815.8	1814.0	1812.2	1811.0
DISCH KCFS	20.500	14.0	14.0	14.0	16.5	19.0	21.5	20.5	20.5	17.3	14.5	14.5	14.5	14.5	18.5	20.5	20.5
POWER																	
AVE POWER MW		147	148	149	176	204	235	226	223	187	156	156	156	156	197	215	213
PEAK POW MW		415	417	419	421	430	450	442	431	426	424	425	425	426	417	410	405
ENERGY GWH	1704.1	53.1	24.9	32.1	126.5	151.5	169.3	168.4	166.1	134.4	115.9	56.0	26.2	29.9	146.6	160.2	143.0
--OAHE--																	
NAT INFLOW	1381	203	95	122	240	132	366	126	48	55	6	9	4	5	-54	-24	48
DEPLETION	860	27	13	16	55	85	185	230	157	37	-16	1	0	0	15	22	33
CHAN STOR	1	33			-13	-13	-13	5		17	15		0	0	-21	-11	
EVAPORATION	379							26	78	96	84	24	12	13	46		
REG INFLOW	13276	626	277	356	1154	1203	1447	1136	1074	970	844	415	194	221	1001	1204	1154
RELEASE	13585	459	298	334	1181	1474	1450	1700	1737	946	710	229	119	134	881	1070	864
STOR CHANGE	-309	167	-21	21	-27	-272	-2	-564	-664	24	135	186	75	88	121	134	290
STORAGE	11827.	11994	11972	11994	11967	11695	11693	11129	10466	10489	10624	10810	10885	10973	11093	11227	11517
ELEV FTMSL	1581.2	1582.0	1581.9	1582.0	1581.8	1580.6	1580.6	1577.9	1574.6	1574.7	1575.4	1576.3	1576.7	1577.1	1577.7	1578.3	1579.7
DISCH KCFS	15.587	15.4	21.4	18.7	19.8	24.0	24.4	27.6	28.3	15.9	11.5	7.7	8.6	8.4	14.3	17.4	15.5
POWER																	
AVE POWER MW		173	240	210	222	267	270	303	304	170	124	83	93	92	156	190	171
PEAK POW MW		577	576	577	576	570	570	555	538	539	542	547	549	551	554	558	565
ENERGY GWH	1803.3	62.1	40.3	45.3	159.8	198.4	194.3	225.7	226.3	122.6	92.4	30.0	15.6	17.7	116.2	141.6	115.1
--BIG BEND--																	
EVAPORATION	122							8	25	31	28	8	4	4	14		
REG INFLOW	13463	459	298	334	1181	1474	1450	1692	1712	915	682	221	115	130	866	1070	864
RELEASE	13463	459	298	334	1181	1474	1450	1692	1712	915	682	221	115	130	866	1070	864
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	15.587	15.4	21.4	18.7	19.8	24.0	24.4	27.5	27.9	15.4	11.1	7.4	8.3	8.2	14.1	17.4	15.5
POWER																	
AVE POWER MW		73	100	88	93	112	114	129	130	75	56	38	42	41	71	85	75
PEAK POW MW		517	509	509	509	509	509	509	509	538	538	538	538	538	538	538	529
ENERGY GWH	778.7	26.3	16.9	18.9	66.9	83.5	82.1	95.8	97.0	54.2	41.8	13.6	7.1	8.0	52.9	63.6	50.1
--FORT RANDALL--																	
NAT INFLOW	465	90	42	54	113	66	126	33	20	-6	-32	-14	-6	-7	-27	-33	46
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	126							10	32	36	25	6	3	3	12		
REG INFLOW	13721	548	339	387	1290	1531	1564	1697	1686	866	623	201	105	119	824	1034	907
RELEASE	13721	268	195	387	1290	1531	1564	1697	1686	1581	1142	201	106	119	715	693	548
STOR CHANGE	0	280	144		0	0		0	0	-715	-518	0	0	0	109	341	359
STORAGE	3001.	3281	3425	3425	3425	3425	3425	3425	3425	2710	2192	2192	2192	2192	2301	2642	3001
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1346.0	1337.5	1337.5	1337.5	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	9.879	9.0	14.0	21.7	21.7	24.9	26.3	27.6	27.4	26.6	18.6	6.8	7.6	7.5	11.6	11.3	9.9
POWER																	
AVE POWER MW		75	119	184	183	210	222	233	231	216	140	50	56	55	86	86	79
PEAK POW MW		350	356	356	356	356	356	356	356	324	284	285	285	285	294	319	339
ENERGY GWH	1357.8	26.9	19.9	39.6	132.0	156.4	159.6	173.1	172.0	155.3	104.3	17.9	9.4	10.5	63.8	64.0	53.0
--GAVINS POINT--																	
NAT INFLOW	1309	87	41	52	131	142	147	87	65	82	109	53	25	28	76	76	109
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	2	-10	-15	0	-6	-3	-3	0	2	15	22	-2	0	-8	1	3
EVAPORATION	39							2	8	10	9	3	1	1	5		
REG INFLOW	14876	357	226	425	1416	1648	1684	1740	1734	1659	1254	268	125	143	769	769	659
RELEASE	14876	357	226	425	1416	1648	1684	1740	1722	1636	1254	268	125	143	769	769	694
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	12.500	12.0	16.3	23.8	23.8	26.8	28.3	28.3	28.0	27.5	20.4	9.0	9.0	9.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		42	57	82	82	91	96	96	96	96	72	32	32	32	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	622.4	15.1	9.5	17.6	58.7	68.0	69.3	71.6	71.3	68.8	53.5	11.6	5.4	6.2	33.0	33.0	29.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1123	140	65	84	144	193	104	112	64	49	48	28	13	15	8	24	32
DEPLETION	305	8	4	5	26	38	34	42	42	28	13	8	4	4	16	17	17
REGULATED FLOW AT SIOUX CITY																	
KAF	15694	489	288	504	1534	1803	1754	1810	1744	1657	1289	288	134	154	761	776	709
KCFS		16.4	20.7	28.2	25.8	29.3	29.5	29.4	28.4	27.9	21.0	9.7	9.7	9.7	12.4	12.6	12.8
--TOTAL--																	
NAT INFLOW	19500	1216	567	729	1849	2866	4777	2197	896	708	963	427	199	228	426	546	905
DEPLETION	3166	25	12	15	165	649	1721	1441	430	-229	-188	-194	-90	-103	-220	-183	-85
CHAN STOR	-1	74	-10	-15	-35	-30	-21	3	0	37	49	22	-2	0	-62	-15	3
EVAPORATION	1496							102	314	387	331	94	44	50	173		
STORAGE	37203.	37979	38237	38433	38548	38932	40213	39060	37468	36398	35977	36238	36347	36474	36124	36062	36345
SYSTEM POWER																	
AVE POWER MW		570	724	771	840	981	1040	1091	1087	825	608	418	439	436	650	722	682
PEAK POW MW		2132	2131	2134	2136	2140	2162	2138	2108	2100	2063	2070	2072	2075	2039	2059	2070
ENERGY GWH	7030.5	205.1	121.6	166.6	604.5	729.5	748.9	811.4	808.8	594.3	452.3	150.6	73.7	83.7	483.6	537.4	458.4
DAILY GWH		13.7	17.4	18.5	20.2	23.5	25.0	26.2	26.1	19.8	14.6	10.0	10.5	10.5	15.6	17.3	16.4
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB