US Army Corps
of Engineers

Northwestern Division
Missouri River Basin
Water Management Division

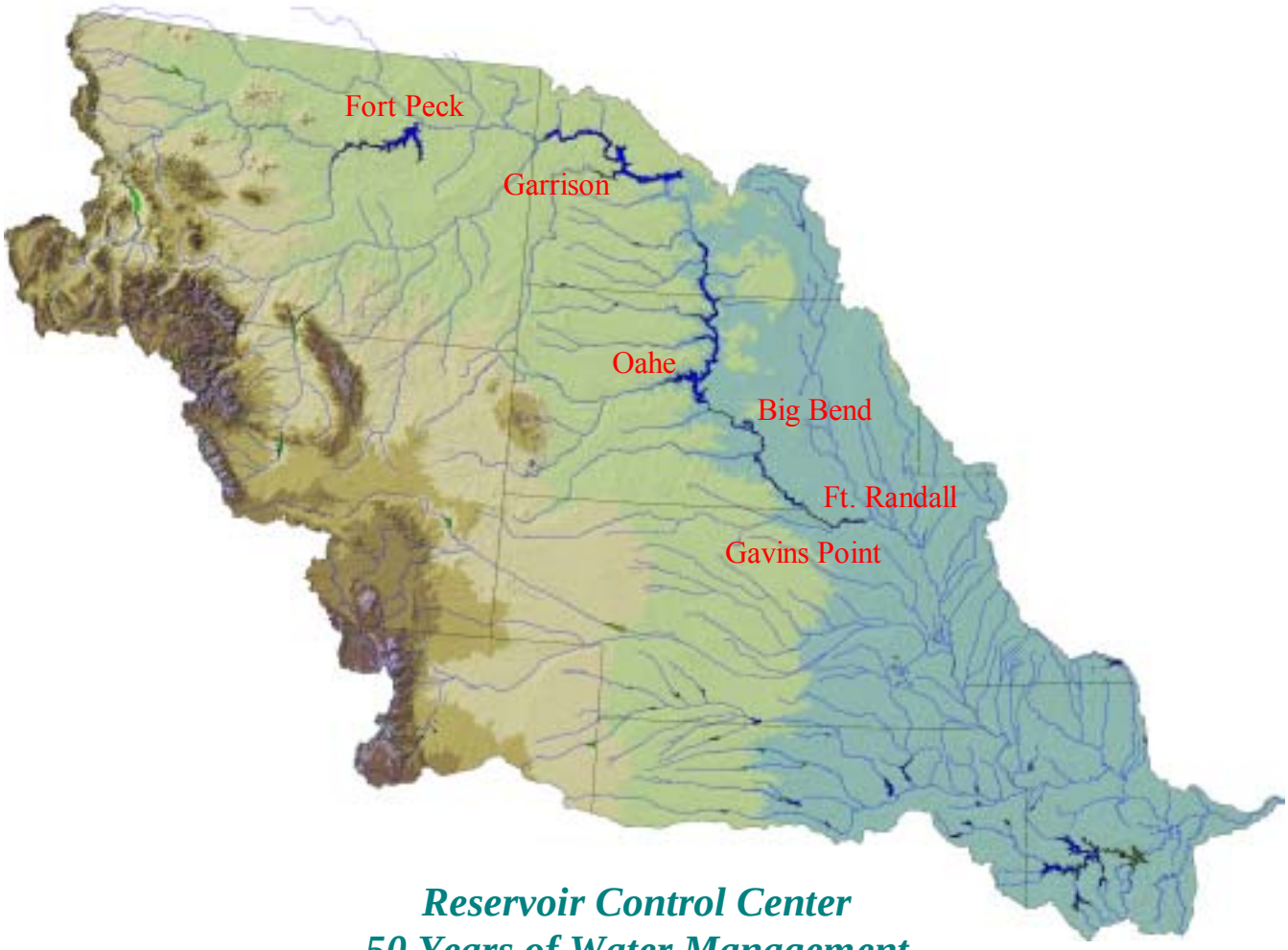
Final

AOP

2004

Missouri River Mainstem System

2004 Annual Operating Plan



Reservoir Control Center
50 Years of Water Management
Missouri River Mainstem System

Annual Operating Plan Process
51 Years Serving the Misssouri River Basin

March 2004

DEPARTMENT OF THE ARMY
NORTHWESTERN DIVISION, CORPS OF ENGINEERS
12565 WEST CENTER ROAD
OMAHA, NEBRASKA 68144-3869

REPLY TO
ATTENTION OF:

March 19, 2004

This Annual Operating Plan (AOP) presents information regarding the Corps of Engineers' operation of the Missouri River Mainstem Reservoir System (System) through December 2004. The information provided in this AOP is based on the new Missouri River Master Water Control Manual dated March 19, 2004. The reservoir regulation simulation data presented in this AOP are based on inflow scenarios from our March 1, 2004 runoff forecasts. This approach provides a good range of water management simulations for dry, average, and wet conditions.

The AOP provides a framework for the development of detailed monthly, weekly, and daily regulation schedules for the System's six individual dams during the upcoming year to serve its Congressionally authorized project purposes. In addition, 5-year extensions to the AOP water management simulations, through March 2010, are presented to serve as guides for longer range planning. System water management is provided by my staff at the Missouri River Basin Water Management Division, Northwestern Division, U.S. Army Corps of Engineers located in Omaha, Nebraska.

On December 16, 2003, and in response to the Corps' request for the reinitiation of consultation, the U.S. Fish and Wildlife Service (USFWS) issued an amendment to its 2000 Biological Opinion (2003 Amended BiOp). The 2003 Amended BiOp includes a "reasonable and prudent alternative" (RPA) that calls for a low summer release from the Mainstem Reservoir System of 25,000 cfs each year beginning no later than July 1 and lasting for a minimum of 30 days. The 2003 Amended BiOp includes a provision that this low summer release may be modified, in consultation with the USFWS, if 1200 acres of shallow water habitat (SWH) for the endangered pallid sturgeon is constructed in the river reach between Sioux City, Iowa and Omaha, Nebraska.

Since receipt of the 2003 Amended BiOp, the Corps has been working with the USFWS on plans for near-term SWH development sufficient to meet the intent of the 2003 Amended BiOp; therefore allowing the Corps to operate for all Congressionally authorized purposes this summer. In a letter dated February 13, 2004, the Corps provided new information to support a request that the 1200 acres of new SWH development be applied from Ponca State Park to the mouth of the Osage River, and not be limited to the Sioux City to Platte River reach identified in the 2003 Amended BiOp. The USFWS evaluated this request and concurred in a letter dated March 5, 2004.

The March 5, 2004 USFWS letter also responded to our March 2, 2004 letter containing a list of potential sites suitable for SWH development. The USFWS agreed that the list provided identified a sufficient number of sites that could satisfy the RPA element by July 1, 2004. However, if this condition is not met, summer releases would be reduced to 25,000 cfs in July and would be held at that level for a minimum of 30 days to comply with the provisions of the 2003 Amended BiOp.

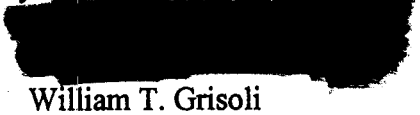
The 2003 Amended BiOp also calls for a "spring pulse" from the System, but allows a two-year period of study to establish an acceptable flow management plan, which will likely avoid jeopardy to the continued existence of the pallid sturgeon and will not result in the destruction or adverse modification of critical habitat in the Missouri River. In their March 5, 2004 letter, the USFWS confirmed that a spring rise is not required in 2004.

The AOP presents a "steady release – flow-to-target" schedule during the nesting season of the interior least tern and piping plover, which are listed for protection under the Endangered Species Act. Under a steady release – flow-to-target schedule, Gavins Point releases are set at an initial steady rate, and then adjusted upward during the nesting season to meet downstream flow targets, if necessary. This operation makes a larger amount of habitat available early in the nesting season, saves additional water in the upper three reservoirs when compared to a steady release scenario and minimizes the potential for flooding nests. It also provided certainty for downstream users that releases could be increased if needed to meet flow targets. To the extent reasonably possible, we will attempt to provide rising pools during the forage fish spawn.

A draft of this AOP was made available to the public in October 2003. Three fall public meetings on the Draft 2003-2004 AOP were held on October 28, 2003 in Pierre, South Dakota; October 29, 2003 in Omaha, Nebraska; and October 30, 2003 in Columbia, Missouri. The primary purposes of these meetings were to present a synopsis of the Draft AOP and to allow those in attendance to make comments in person to Corps of Engineers staff. Attendees included representatives from the Tribes, Missouri River Basin states, public and industry interest groups and private citizens. Copies of the comment letters received on the Draft AOP and a report on the comments received at the three meetings are available upon request, as outlined below.

In addition to the AOP, two separate documents are also available entitled, "System Description and Operation" and "Summary of Actual Calendar Year 2003 Operations." To receive copies of those documents, you may contact the Missouri River Basin Water Management Division at 12565 West Center Road, Omaha, Nebraska 68144-3869, phone (402) 697-2676. Both documents are also available at the "Reports and Publications" link on our web site at **www.nwd-mr.usace.army.mil/rcc**.

I thank you for your interest in the operation of the System. With your help, I trust we can ensure the improvement of the survival of the species, lessen the impact of severe drought by retaining more water in the reservoirs, and move towards providing predictability to the people of the basin. The basin must work together as a team – Federal, Tribes, State and local agencies, as well as the diverse stakeholders – and remain committed to preserving the Missouri River as a National treasure, allowing everyone to enjoy its beauty and many resources.



William T. Grisoli
Brigadier General, U.S. Army
Division Engineer

MISSOURI RIVER MAINSTEM RESERVOIR SYSTEM

Annual Operating Plan
2004

TABLES

PLATES

ABBREVIATIONS

AOP	-	annual operating plan
ac.ft.	-	acre-feet
AF	-	acre-feet
B	-	Billion
cfs	-	cubic feet per second
COE	-	Corps of Engineers
CY	-	calendar year (January 1 to December 31)
elev	-	elevation
ft	-	feet
FY	-	fiscal year (October 1 to September 30)
GIS	-	Geographic Information System
GWh	-	gigawatt hour
KAF	-	1,000 acre-feet
Kcfs	-	1,000 cubic feet per second
kW	-	kilowatt
kWh	-	kilowatt hour
M	-	million
MAF	-	million acre-feet
MRBA	-	Missouri River Basin Association
MRNRC	-	Missouri River Natural Resources Committee
msl	-	mean sea level
MW	-	megawatt
MWh	-	megawatt hour
plover	-	piping plover
pp	-	powerplant
RCC	-	Reservoir Control Center
RM	-	river mile
tern	-	interior least tern
tw	-	tailwater
USFWS	-	United States Fish and Wildlife Service
USGS	-	United States Geological Survey
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
2004

I. FOREWORD

This Annual Operating Plan (AOP) presents pertinent information and plans for regulating the Missouri River Mainstem Reservoir System (System) through December 2004 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 dams during the coming year to serve the Congressionally authorized project purposes. Regulation is directed by the Reservoir Control Center in the Missouri River Basin Water Management Division, Northwestern Division, U.S. Army Corps of Engineers (Corps). A map of the Missouri River basin is shown on ***Plate 1*** and the summary of engineering data for the six System projects is shown on ***Plate 2***.

This plan may require adjustments when substantial departures from expected runoff occur, to meet emergencies, or to meet the provisions of applicable laws, including the Endangered Species Act (ESA). Results of a 5-year extension to the AOP studies (March 2005 to March 2010) are presented to serve as a guide for Western Area Power Administration's power marketing activities and those other interests that require information on reservoir conditions for long term planning.

Prior to the 1998-1999 AOP, a System description and discussion of the typical operation, a historic summary of the previous year's regulation, and the plan for future operation was included in one document. Since the 1998-1999 AOP this information has been published in separate reports available upon request. This document provides the plan for future regulation of the System. To receive a copy of either the updated version of the "System Description and Operation," dated Spring 2002, or the "Summary of Actual Calendar Year 2002 Operations," dated May 2003, contact the Missouri River Basin Water Management Division at 12565 West Center Road, Omaha, Nebraska 68144-3869, phone (402) 697-2676. Both reports are currently available at the "Reports and Publications" link on our web site at: **www.nwd-mr.usace.army.mil/rcc**. The "Summary of Actual Calendar Year 2003 Operations" will be available at the same site in the spring of 2004.

II. PURPOSE AND SCOPE

Beginning in 1953, projected System operation 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 meeting is conducted to take public input on a draft of the AOP, which typically is published in early October 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.

Last spring's public meetings were held at the following locations: Kansas City, Missouri on April 7, 2003; Yankton, South Dakota on April 8, 2003; and Nebraska City, Nebraska on April 10, 2003. The attendees were given an update regarding the outlook for 2003 runoff and projected operation for the remainder of 2003. Three fall public meetings on the Draft 2003-2004 AOP were held on October 28, 2003 in Pierre, South Dakota; October 29, 2003 in Omaha, Nebraska; and October 30, 2003 in Columbia, Missouri. The spring 2004 AOP meetings are scheduled for April 5 in Omaha; April 6 in Lewistown, Montana; April 7 in Bismarck, North Dakota; and April 8 in Kansas City.

Preliminary Draft AOP data was presented to the Missouri River Basin Association (MRBA) on July 28, 2003.

III. MAINSTEM MASTER MANUAL REVIEW AND UPDATE AND ESA CONSULTATIONS

The Missouri River Master Water Control Manual (Master Manual), first published in 1960 and subsequently revised during the 1970's and again in March 2004, presents the water control plan and operational objectives for the integrated operation of the Mainstem Reservoir System. In 1989, the Corps initiated a review of the Master Manual in consideration of other laws and regulations, including the Endangered Species Act (ESA), National Environmental Policy Act (NEPA), and the President's Council on Environmental Quality (CEQ) regulations pertaining to NEPA.

In accordance with ESA, the Corps must insure, in consultation with the U.S. Fish and Wildlife Service (USFWS), that any action carried out by the Corps is not likely to jeopardize the continued existence of any Federally listed endangered or threatened species, or result in the destruction or adverse modification of their critical habitat. The species of interest in regard to these projects are the pallid sturgeon (endangered), the interior least tern (endangered), and the piping plover (threatened).

The Corps entered into formal consultation with the USFWS which culminated in the USFWS Missouri River Biological Opinion issued November 2000 (2000 BiOp). The 2000 BiOp concluded the Corps' proposed action jeopardized the continued existence of the listed pallid sturgeon, piping plover, and the interior least tern, and recommended a Reasonable and Prudent Alternative (RPA) to avoid jeopardy.

On November 3, 2003, the Corps requested reinitiation of formal ESA consultation. The request for reinitiation was based on the existence of new information regarding effects of the Mainstem Reservoir System operations on the Federally listed species as well as a new critical habitat designation for one of the listed species. The Corps' description of this information and of the proposed action was set forth in a detailed biological assessment accompanying the request to reinitiate consultation.

On December 16, 2003, and in response to the Corps' request for the reinitiation of consultation, the USFWS issued an amendment to its 2000 BiOp. The 2003 Amended BiOp includes a "reasonable and prudent alternative" (RPA) for the Corps' proposed operations that, according to USFWS, if implemented, will avoid jeopardizing the continued existence of the endangered pallid sturgeon. That RPA recommends operations that were not proposed in the Corps' biological assessment.

The RPA presented in the 2003 Amended BiOp calls for a low summer release from the Mainstem Reservoir System of 25,000 cfs each year beginning no later than July 1 and lasting for a minimum of 30 days. The 2003 Amended BiOp includes a provision that this low summer release may be modified, in consultation with the USFWS, if 1200 acres of shallow water habitat (SWH) for the endangered pallid sturgeon is constructed in the river reach between Sioux City, Iowa and Omaha, Nebraska.

Since receipt of the 2003 Amended BiOp, the Corps has been working with the USFWS on plans for near-term SWH development sufficient to meet the intent of the 2003 Amended BiOp; therefore allowing the Corps to operate for all Congressionally authorized purposes this summer. In a letter dated February 13, 2004, the Corps provided new information to support a request that the 1200 acres of new SWH development be applied from Ponca State Park to the mouth of the Osage River, and not be limited to the Sioux City to Platte River reach identified in the 2003 Amended BiOp. The USFWS evaluated this request and concurred in a letter dated March 5, 2004.

The USFWS's March 5, 2004 letter also responded to the Corps' March 2, 2004 letter containing a list of potential sites suitable for SWH development. The USFWS agreed that the list provided identified a sufficient number of sites that could satisfy the RPA element by July 1, 2004. However, if this condition is not met, summer releases would be reduced to 25,000 cfs in July and would be held at that level for a minimum of 30 days to comply with the provisions of the 2003 Amended BiOp. Any water conservation achieved as the result of these low summer flows would be credited as drought conservation and reduce the duration of navigation season shortening in the fall.

The 2003 Amended BiOp also calls for a "spring pulse" from the System, but allows a two-year period of study to establish an acceptable flow management plan, which will likely avoid jeopardy to the continued existence of the pallid sturgeon and will not result in the destruction or adverse modification of critical habitat in the Missouri River. In their March 5, 2004 letter, the USFWS confirmed that a spring rise is not required in 2004.

On February 27, 2004 the Corps released the Final Environmental Impact Statement (FEIS) on the Missouri River Master Water Control Manual Review and Update. Following a review period on the FEIS, a Record of Decision (ROD) was signed by NWD Division Engineer, BG William T. Grisoli, on March 19, 2004. The revised Master Manual, based on the water management plan identified in the ROD, has been approved and forms the basis for the development of this AOP.

IV. FUTURE WATER SUPPLY: MARCH - DECEMBER 2004

Under normal circumstances, when the Draft AOP is prepared in August, and the Final AOP in late fall, a statistical representation of potential runoff is used because accurate long-range forecasts aren't available at that time. However, due to the delay in issuing this Final 2004 AOP, the studies presented herein have been updated with our latest runoff forecast based on current snowpack and soil moisture data.

The March 1, 2004 "Most Likely" runoff scenario was used as input for the reservoir regulation simulations presented in this AOP. Two other runoff scenarios based on the March 1 forecast were developed for the same period. Factors were applied to the Most Likely runoff forecast to obtain the "Adjusted Lower Decile" and "Adjusted Upper Decile" runoff. This provides a good range of simulations in addition to the Most Likely runoff forecast and eliminates the need to forecast future precipitation, which is very difficult.

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 I,*** where water supply conditions are quantified for the period March 2004 through February 2005. The natural water supply for calendar year (CY) 2003 totaled 17.6 MAF.

TABLE I
NATURAL AND GROSS WATER SUPPLY AT SIOUX CITY
(Volumes in 1,000 Acre-Feet)

	Natural 1/	Post-1949 Depletions	Net 2/
Runoff Year March 2004 through February 2005 (Based on March 1, 2004 runoff forecast.)			
Adjusted Upper Decile	27,900	-2,100	25,800
Most Likely	20,600	-2,400	18,200
Adjusted Lower Decile	14,100	-2,600	11,500

1/ The word "Natural" is used to designate flows 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 operation prior to 1949. 2/ The word "Net" represents the total streamflow after deduction of the post-1949 irrigation, upstream storage, and other use effects.

V. ANNUAL OPERATING PLAN FOR 2004

A. General. The anticipated operation described in this AOP is designed to meet the operational objectives presented in the March 2004 Master Manual. Consideration has been given to all of the authorized project purposes, and to the needs of threatened and endangered (T&E) species. The plan relies on a wealth of operational experience. Operational experience available for preparation of the 2004 AOP includes 13 years of operation at Fort Peck Reservoir (1940) by itself, plus 50 years of System experience as Fort Randall (1953), Garrison (1955), Gavins Point (1955), Oahe (1962), and Big Bend (1964) have been brought progressively into System operation. This operational experience includes lessons learned during the 6 consecutive years of drought from 1987 through 1992, the high runoff period that followed and the current 4-year drought that began in 2000. Runoff during the period 1993 to 1999 was greater than the Upper Quartile level in 5 of those 7 years, including the record 49.0 MAF of runoff in 1997. In addition to the long period of actual operational experience, many background operational studies for the completed System are available for reference.

As described in the Master Manual, flow support for navigation and other downstream purposes is defined based on service level. A "full-service" level of 35,000 cfs results in target flows of 31,000 cfs at Sioux City and Omaha, 37,000 cfs at Nebraska City and 41,000 cfs at Kansas City. Similarly, a "minimum service" level of 29,000 cfs results in target values of 6,000 cfs less than the full service levels. Selection of the appropriate service level is based on the actual volume of water in storage in the System on March 15 and July 1.

The relation of System storage to navigation service level is presented in ***Table II***. The volumes presented in ***Table II*** were derived from long-range model simulations that allow the System to meet authorized purposes during significant multi-year droughts. Straight-line interpolation defines intermediate service levels between full and minimum service. These service level determinations are for conservation and normal System regulation. During years when flood evacuation is required, the service level is calculated monthly to facilitate a smooth transition in System release.

As shown in ***Table II***, the water control plan calls for suspension of navigation service if System storage is at or below 31 million-acre-feet (MAF) on March 15 of any year. It should be noted that the occurrence of System storage at or below 31 MAF would most likely coincide with a national drought emergency. If any of the reservoir regulation studies performed for the development of an AOP indicate that System storage will be at or below 31 MAF by the upcoming March 15, the Corps of Engineers will notify the Secretary of the Army. Per the revised Master Manual, the Corps will obtain approval from the Secretary of the Army prior to implementation of back-to-back non-navigation years.

TABLE II
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)

The System storage check for navigation season length is made on July 1 of each year. Assuming the System storage is above 31 MAF on March 15, a navigation season will be supported. A full 8-month navigation season will be provided if System storage is 51.5 MAF or above on July 1, unless the navigation season is extended to evacuate flood control storage. However, if System storage falls below 51.5 MAF on July 1, a shortened navigation season will be provided to conserve water. The specific technical criteria for season length are shown in the ***Table III***. Straight-line interpolation between 51.5 and 46.8 MAF of storage on July 1 provides the closure date for a season length between 8 and 7 months. If System storage on July 1 is between 46.8 and 41.0 MAF a 7-month navigation season is provided. A straight-line interpolation is again used between 41.0 and 36.5 MAF, providing season lengths between 7 and 6 months. For System storage on July 1 below 36.5 MAF a 6-month season is provided.

TABLE III
RELATION OF SYSTEM STORAGE TO NAVIGATION SEASON LENGTH

Date	System Storage (MAF)	Season Closure Date at Mouth of the Missouri River
July 1	51.5 or more	December 1 (8-month season)
July 1	46.8 through 41.0	November 1 (7-month season)
July 1	36.5 or less	October 1 (6-month season)

The System release required to meet minimum and full service target flows varies by month in response to downstream tributary flow. An analysis of the average monthly Gavins Point Dam release needed to meet flow targets was completed in 1999. As part of that study, the relationship between annual runoff upstream of Sioux City and the average Gavins Point Dam release required for the navigation season was analyzed. The study showed that generally more water was needed downstream to meet flow targets during years with below normal upper basin runoff than during years with higher upper basin runoff. Therefore, regulation studies performed since 1999 use two levels of System release requirements: one for Median, Upper Quartile, and

Upper Decile runoff scenarios, and another for Lower Quartile and Lower Decile scenarios. The updated release requirements for full and minimum service flow support are given in ***Table IV***. Releases required for minimum service flow support are 6,000 cfs less than full service support. A final report detailing the procedures used in this study is available on our web site.

An examination of the data presented in ***Table IV*** reflects that, early in the season, the target location is generally at Sioux City with adequate downstream tributary flows to meet the other flow targets. As the runoff season progresses, tributary flows normally recede during the summer, and the target location moves from Sioux City to Nebraska City and eventually to Kansas City. This requires higher flow support from the System as the season progresses through summer. Often the target moves upstream during the fall when higher downstream tributary flows return. This seasonal tributary flow pattern is reflected in the Gavins Point Dam release data presented below.

The releases presented in ***Table IV*** are average monthly values during the period studied for various runoff conditions and do not reflect the range of daily releases that may be required during any given month to meet flow targets. Actual regulation, therefore, requires daily adjustments to fully serve the Congressionally authorized project purpose of navigation. An additional analysis was conducted in the spring of 2003 that concluded a 30,000 cfs would be needed to provide a 90 percent assurance of meeting minimum service flow targets in July and August. That study was based on runoff data from the period of record 1898 through 1997.

TABLE IV
GAVINS POINT RELEASES NEEDED TO MEET TARGET FLOWS
FOR INDICATED SERVICE LEVEL
1950 to 1996 Data
(Discharges in 1,000 cfs)

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

In general, releases from Gavins Point Dam are adjusted as needed to meet target flow levels on the lower river. However, during the nesting season of the endangered interior least tern (tern) and the threatened piping plover (plover) care must be taken to avoid impacts to nesting areas. These two bird species are listed as Threatened and Endangered (T&E) under the ESA and are protected under that Act. Several scenarios have been used in past years to operate the System during the nesting season. Under the Steady-Release (SR) scenario, when the birds begin to initiate nesting activities in early- to mid-May, the release from Gavins Point Dam is set to the level expected to be required to meet downstream flow targets through August and maintained at that level until the end of the nesting season. This operation results in releases that exceed the amount necessary to meet downstream flow targets during the early portion of the nesting season, and may result in targets being missed if basin conditions are drier than expected during the summer.

Gavins Point releases, under the Flow-to-Target (FTT) scenario, are adjusted as needed throughout the nesting season to meet downstream flow targets and would typically result in increased releases as the nesting season progresses. This is due to reduced tributary inflows downstream as the summer heat builds, evaporation increases, and precipitation wanes. Increasing releases as the nesting season progresses can inundate nests and chicks on low-lying habitat. Compared to the SR Scenario, this scenario conserves more water in the System, which keeps the lake levels at the upper three System projects at relatively higher levels. The FTT scenario also ensures that targets on the lower river are met throughout the nesting season.

A third scenario for Gavins Point releases, which combines features of the other two options, was used during the 2003 nesting season. This scenario, called the Steady Release – Flow-to-Target (SR-FTT) scenario, sets Gavins Point releases at an initial steady rate, and then allows releases to be adjusted upward during the nesting season to meet downstream flow targets, if necessary. This operation makes a larger amount of habitat available early in the nesting season and saves additional water in the upper three reservoirs when compared to the SR scenario. The SR-FTT scenario also reduces the potential for flooding nests when compared to the FTT scenario. The SR-FTT operation also provided certainty for downstream users that releases could be increased if needed to meet flow targets.

B. <u>2004 AOP Simulations</u>. AOP simulations for 2004 for the three runoff scenarios are shown as studies 1 through 3. The March 15 and July 1 System storage checks from ***Tables II*** and ***III*** were used to determine the level of flow support and the navigation season length. The Steady Release – Flow-to-Target operating scenario was selected for implementation during the 2004 nesting season to reduce the likelihood of flooding nests while conserving water in the upper three reservoirs and ensuring that minimum service flow targets could be met. For modeling purposes, an initial steady release of 28,000 cfs was used in May and June. This initial steady release was based on an estimate of the flow required to inundate numerous small low-lying sandbars below Gavins Point that would likely be flooded if higher releases were needed later in the season. The actual initial steady releases during the 2004 nesting season will be determined by a field survey of nesting sites and the hydrologic conditions at that time.

A 30,000 cfs System release in July and August was used in all 2004 AOP simulations to reflect the increased release requirements for minimum service flow support as tributary flows decline during the summer. The 30,000 cfs release modeled for July and August is an estimate of the flow required to meet minimum service flows 90 percent of the time during that period. Actual releases to meet minimum service flow targets will be based on the hydrologic conditions at the time.

Table IV values were used in all the AOP studies for navigation support during the spring and fall months. The higher releases shown for Lower Quartile and Lower Decile were used for the Most Likely simulation since the forecasted runoff is closer to Lower Quartile than Median. Winter 2004-2005 releases of 12,500 cfs are shown in the simulations. This is lower than recent actual winter releases required for downstream powerplants and water supply intakes, but on-going modification of intakes will permit lower winter releases as a conservation measure when System storage is low. Non-winter, non-navigation releases were set at 11,000 cfs as a further conservation measure.

The Gavins Point releases shown in this and previous AOPs are not absolute. Adjustments are made as necessary based on hydrologic conditions to meet the target flows as determined by the March 15 and July 1 storage checks.

Application of the July 1 storage check shown on ***Table III*** indicates the navigation season will be shortened 31 days for Adjusted Upper Decile, 33 days for Most Likely and 56 days for Adjusted Lower Decile runoff. Minimum service navigation flows are provided for all runoff conditions due to low System storage. None of the simulations reach the desired 57.1 MAF System storage level on March 1, 2005.

Intrasystem releases are adjusted to best serve the multiple-purpose functions 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. During the late 1980's to early 1990's drought years, a two-day-down, one-day-up peaking cycle from Gavins Point was utilized during the nesting season. This regulation provided for lower flows for two out of three days to conserve water in the System while ensuring that T&E bird species did not nest on low-lying habitat. A peaking cycle has not been included in any of the simulations because of concerns voiced by the USFWS regarding negative impacts to river fish. However, it may be necessary to cycle releases for flood control operations during the T&E species-nesting season.

The Most Likely and Adjusted Upper Decile simulations include releases that provide a steady to rising lake level in the three large upper reservoirs during the spring fish spawn period. Similar regulation in the past has resulted in a higher fish reproduction success.

Actual System operation from January 1, 2003 through February 29, 2004 and the operating plans for each project for CY 2004 using the three runoff scenarios described on page 5 are presented on ***Plates 3 through 8***, inclusive. An exception is the omission of Big Bend,

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 operations since 1953.

Plate 9 illustrates for Fort Peck, Garrison, Oahe, and Gavins Point Dams the actual reservoir releases (Regulated Flow) as well as the Missouri River flows (Unregulated Flow) that would have resulted if the reservoirs were not in place during the period January 2002 through July 2003. ***Plate 10*** presents past and simulated gross average monthly power generation, and gross peaking capability for the System.

C. Regulation Plan for January-March 2004. The operating plan for the System for the period of January though March 2004 is presented in the following paragraphs.

Fort Peck Dam releases averaged 8,900 and 8,800 cfs in January and February, more than 2,000 cfs below average. Fort Peck Lake fell below its previous record low elevation in November 2003 and continued to decline, reaching elevation 2204 feet msl on February 29. The previous record low was 2208.7 feet msl set in April 1991. The reservoir is expected to remain near elevation 2204 feet msl during March, nearly 28.0 feet below normal.

Garrison Dam releases during the winter of 2003-2004 could not be increased as needed to balance System storage on March 1 due to construction on the intake at Fort Yates and ice constraints at Bismarck. Releases were adjusted to not exceed the target 13-foot stage at the Bismarck gage. Flood stage is 16 feet. Releases were scheduled no higher than 24,000 cfs in February. Lake Sakakawea reached a record low elevation of 1814.3 feet msl in February, about 20.0 feet below normal. The previous record low was 1815.0 feet msl set in May 1991.

Oahe Dam releases during the winter season provide backup for the Fort Randall and Gavins Point Dam releases plus refill the recapture space available in Lake Francis Case consistent with anticipated winter power loads. Monthly average releases vary substantially with fluctuations in power loads occasioned by weather conditions but, in general, averaged 15,000 to 20,000 cfs. Daily releases vary widely to best meet power loads. Peak hourly releases, as well as daily energy generation, are constrained to prevent urban flooding in the Pierre and Fort Pierre areas when severe ice problems develop downstream of Oahe Dam. This potential reduction has been coordinated with the Western Area Power Administration. The Lake Oahe level rose 2.3 feet in January and February, reaching elevation 1579.2 feet msl. A further rise of 2.0 feet is expected in March. Lake Oahe dropped below its previous record low pool in October 2003 and continued to decline until Garrison releases were increased in January 2004. The reservoir set a new low of 1576.2 feet msl on December 17, 2003. The previous record low was 1580.7 feet msl set in November 1989.

Lake Sharpe at Big Bend Dam will be maintained in the normal 1420.0 to 1421.0 feet msl range during the winter.

Fort Randall Dam releases averaged 14,600 and 10,600 cfs in January and February and were as low as 2,000 cfs in early March before the come-up for navigation support. Lake Francis Case refilled during the period from 1337.5 feet msl at the end of the 2003 navigation

season to slightly above elevation 1350.0 feet msl, the seasonal base of flood control, on March 1. It is likely that a Lake Francis Case level above elevation 1353.0 feet msl, to as high as 1355.2, will be reached by the end of the winter period on March 31, if runoff conditions permit. The level of Lake Francis Case above the White River delta near Chamberlain, South Dakota usually remains at a higher elevation than the lake below the delta from mid-October through December, due to the damming effect of this delta area.

Gavins Point Dam releases averaged 16,100 cfs in January and 13,700 cfs in February. Releases were lowered to 8,000 cfs in early March and will be increased to support navigation flows beginning mid-month. The Lewis and Clark Lake target elevation was 1207.5 feet msl during the winter with periods at lower elevations as ice formed upstream. The reservoir will be lowered to elevation 1206.0 feet msl on March 1 for controlling spring floods, primarily from the Niobrara River and Ponca Creek along the Fort Randall Dam to Gavins Point Dam reach.

System storage was 38.3 MAF at the beginning of the runoff season on March 1, 2004, substantially below the base of the annual flood control zone.

D. Regulation During the 2004 Navigation Season. The Adjusted Upper Decile (Adj U.D), Most Likely (M.L.), and Adjusted Lower Decile (Adj L.D.) runoff scenarios simulated for this year's AOP follow the specific technical criteria presented in the new Master Manual for navigation service flow support. The normal 8-month navigation season length is shortened for all runoff scenarios as shown in ***Table V.***

Releases from Fort Peck, Garrison, and Fort Randall Dams will follow repetitive daily patterns from early May, at the beginning of the T&E species nesting season, to the end of the nesting in late August. As previously stated, a Steady Release – Flow-to-Target operation is planned for Gavins Point releases for all three runoff scenarios. Gavins Point releases during the nesting season were modeled with initial steady 28,000 cfs in May and June to keep birds from nesting at low elevations, and 30,000 cfs in July and August to meet flow targets as downstream tributary flow declines. Actual releases will be dependent on the hydrologic conditions at the time. The March 15 and July 1 System storage checks are used in the Simulations.

TABLE V
NAVIGATION SERVICE SUPPORT
FOR THE 2004 SEASON
Based on March 1, 2004 Forecast

Runoff Mar 04-Feb 05 (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)
Adj U.D. 27.9	39.5	45.7	-6,000	-6,000	31
M.L. 20.6	39.1	40.7	-6,000	-6,000	33
Adj L.D. 14.1	38.7	37.1	-6,000	-6,000	56

The Adjusted Upper Decile and Most Likely runoff scenarios would likely provide steady to rising pool levels during the spring fish spawn period. Releases from Fort Peck and Garrison during April and May for the Most Likely simulation were adjusted to provide steady to rising pool levels. The ability to provide steady to rising pool levels in the upper three reservoirs in low water years is very dependent on the volume, timing, and distribution of runoff. If runoff is not sufficient to keep all the reservoirs rising during the fish spawn, the Corps will initiate a plan to rotate the emphasis during the fish spawn among the upper three reservoirs to the extent reasonably possible. In 2004, the emphasis will be to provide a rising pool at Garrison during the fish spawn in May. Garrison is given top priority in 2004 because the reservoir is approaching a level that jeopardizes the volume of cold-water fishery habitat available later in the year. In 2004, Oahe will be given the second level of emphasis, and Fort Peck the third level. If the drought continues, the emphasis would rotate each year.

Even though the first level emphasis is at Garrison in 2004, the most critical time period for forage fish spawning is different at each of the upper three System reservoirs. Therefore, we will attempt to provide a steady to rising pool at each reservoir during its most critical period. For example, the critical fish spawn period for Oahe is early April through early May. We will attempt to provide a steady pool at Oahe in April, and for as long as reasonably possible into May, without interfering with the spawn at Garrison. The spawn at Garrison generally begins in late April, so we will give the greatest emphasis to providing a rising pool at Garrison during the period from late April through May. The spawn at Fort Peck generally occurs in June, when inflows from the melt of the mountain snowpack are occurring, so the pool should rise during its most critical period. Any unbalancing that occurs as a result of this operation will be adjusted later in the year so that the reservoirs are balanced on March 1, 2005 in accordance with the Master Manual for the anticipated storage levels this year.

All three runoff scenarios studied for this year's AOP provide gradually increasing Gavins Point releases to meet navigation season flow rates at the mouth of the Missouri near St. Louis by April 1, 2004, 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 there is no commercial navigation scheduled to use the navigation channel reach above the Platte River outside the tern and plover nesting season, we will give consideration to modifying the target flows above that point to conserve water in the System. The studies illustrated on ***Plates 3 through 8*** and summarized in ***Table V*** are based on providing minimum service flows (except May through August when flows may exceed minimum service due to the SR-FTT operation) and a shortened navigation season for all runoff scenarios. Navigation season shortening is shown as 31 days from the normal 8-month season for Adjusted Upper Decile, 33 days for Most Likely, and 56 days for Adjusted Lower Decile.

Navigation flow support for the 2004 season will be determined by actual System storage on March 15 and July 1. Although all runoff scenarios modeled indicate minimum service flow support throughout the navigation season, if the July 1 System storage check indicates an increase in service level, any increase greater than 2,000 cfs will be delayed until the end of the T&E bird species nesting season. Gavins Point Dam releases may be quite variable during the

2004 navigation season but are expected to range from 21,000 to 30,000 cfs. Release reductions necessary to minimize downstream flooding are not reflected in these monthly averages but will be instituted as conditions warrant. Simulated storages and releases for the System and individual reservoirs within the System are shown on ***Plates 3 through 8.*** Ample storage space exists in the System to control flood inflows under all conditions studied.

Two modified reservoir operations shown in previous AOPs, the Fort Peck "mini-test" and unbalancing the upper three reservoirs, will not be implemented in 2004 due to low System storage. When System storage recovers sufficiently, the Corps anticipates that both these operations will be implemented.

The first of these two modified operations is a test of flow modifications for the endangered pallid sturgeon. When Fort Peck Lake has adequate water above the spillway crest by mid- to late-May of any year, a flow modification "mini-test" will be conducted in early June to monitor effects of higher spring releases and warmer water released from the spillway. The purposes of the mini-test are to allow for an evaluation of the integrity of the spillway structure, to test data collection methodology, and to gather information on river temperatures with various combinations of flow from the spillway and powerhouse. Streambank erosion and fishing impacts will also be monitored. Stop protocol for the mini-test are identified in the Fort Peck Flow Modification Mini-Test Environmental Assessment, dated March 2004. Before either test is run, the Corps will fully coordinate with the Tribes of the Fort Peck Reservation, the State of Montana, and any other potentially affected stakeholders.

During the Fort Peck "mini-test," which will last about 4 weeks, flows will vary from 8,000 to 15,000 cfs as various combinations of spillway and powerplant releases are monitored. The maximum spillway release of 11,000 cfs will combine with a minimum powerplant release of 4,000 cfs for 6 days. This operation will be timed to avoid lowering the lake during the forage fish spawn. The "mini-test" will not be conducted if sufficient flows will not pass over the spillway crest (elevation 2225 feet msl). A minimum reservoir elevation of about 2229 feet msl is needed during the test to avoid unstable flows over the spillway. Results of the AOP simulations show that this elevation will not be achieved in 2004 for any of the three runoff scenarios. A more extensive test with a combined 23,000 cfs release from Fort Peck is scheduled to be conducted beginning in early June in the year following the "mini-test" to allow further tests of the integrity of the spillway and to determine if warm water releases will benefit the native river fishery. Peak outflows during the full test would be maintained for 2 weeks within the 4-week test period.

The second modified operation involves unbalancing the three large upper reservoirs as shown on ***Table VI*** to benefit reservoir fishery and the three protected species. Reservoir unbalancing is computed based on the percentage of the carryover multiple purpose pool that remains in Fort Peck Lake, Lake Sakakawea, and Lake Oahe. The unbalancing would alternate at each project; high one year, float (normal operation) the next year, and low the third year, as shown on ***Table VI***. ***Table VII*** shows the lake elevations proposed by the MRNRC at which the unbalancing would be terminated. ***Table VII*** indicates that no reservoir unbalancing should occur for any of the three runoff scenarios in 2004.

TABLE VI
RESERVOIR UNBALANCING SCHEDULE

	Fort Peck		**Garrison**		**Oahe**	
Year	***March 1***	***Rest of Year***	***March 1***	***Rest of Year***	***March 1***	***Rest of year***
1	High	Float	Low	Hold Peak	Raise & hold during spawn	Float
2	Raise & hold during spawn	Float	High	Float	Low	Hold peak
3	Low	Hold peak	Raise & hold during spawn	Float	High	Float

Notes:

Float year: Normal operation, then unbalance 1 foot during low pool years or 3 feet when System storage is near 57.1 MAF on March 1.

Low year: Begin low, then hold peak the remainder of the year.

High year: Begin high, raise and hold pool during spawn, then float.

TABLE VII
MRNRC RECOMMENDED
RESERVOIR ELEVATION GUIDELINES
FOR UNBALANCING

	Fort Peck	**Garrison**	**Oahe**
Implement unbalancing if March 1 reservoir elevation is above this level.	2234 feet msl	1837.5 feet msl	1607.5 feet msl
Implement unbalancing if March 1 reservoir elevation is in this range **and** the pool is expected to raise more than 3 feet after March 1.	2227-2234 feet msl	1827-1837.5 feet msl	1600-1607.5 feet msl
Scheduling Criteria	Avoid lake level decline during spawn period which ranges from April 15 – May 30	Schedule after spawn period of April 20 – May 20	Schedule after spawn period of April 8 – May 15

Summary of Reservoir Regulation Activities for T&E Species and Fish Propagation Enhancement

As discussed in the previous section, the 2004 AOP includes no provisions for unbalancing the Fort Peck, Garrison, and Oahe reservoirs for any of the runoff scenarios. The criteria for unbalancing are based on recommendations provided by the MRNRC and the USFWS. Under all simulations, System storage will be below the minimum levels under which unbalancing is recommended by either the MRNRC or the USFWS.

Fort Peck Dam releases during the tern and plover nesting season will range from a daily average of 8,000 cfs to 9,000 cfs depending on runoff, and will follow a repetitive daily pattern from early May to the end of the nesting in late August. This regulation should result in habitat conditions for nesting terns and plovers similar to what was available in 2003.

If flood flows enter the Missouri River below the project during the nesting season, hourly releases will 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. April releases should be adequate for trout spawning below the project. A rising pool in the June forage fish spawning season will be dependent upon the ever-changing daily inflow pattern to the reservoir but appears possible with all but Adjusted Lower Decile runoff simulations. The T&E flow modification "mini-test" will not be run under any runoff scenario. Fort Peck Lake must be at elevation 2229 msl to allow releases required for the mini-test through the spillway.

Garrison Dam daily average releases will be much less than full powerplant capacity during the tern and plover-nesting season under all runoff scenarios. Monthly average releases will decline 500 to 1,000 cfs during the summer nesting season. Hourly peaking will be limited to no more than 30,000 cfs for six hours if the daily average release is lower than 28,000 cfs. This will limit peak stages below the project for nesting birds.

Lake Sakakawea elevations will not reach levels considered necessary for optimum fish spawning during the month of May for any of the runoff scenarios. The reservoir may approach a level that jeopardizes the volume of cold water habitat in 2004. In 2004 the emphasis will be to provide a rising pool at Garrison during the fish spawn in May. Given Most Likely or higher runoff the reservoir should rise during the fish spawn season, however, the actual timing of the rise in reservoir elevation will be dependent upon the pattern of inflow at that time.

Oahe Dam releases in the spring and summer will back up those from Gavins Point Dam. An attempt will be made to provide a steady pool in April and for as long in May as possible without interfering with the spawn at Garrison. Given Most Likely or higher runoff the reservoir should be steady to rising in the spring. Under all AOP simulations, the Oahe pool will fall during the summer.

Fort Randall Dam will be operated to provide for a pool elevation near 1355 feet msl during the fish spawn period, provided water can be supplied from other reservoirs for downstream uses, and the lake will not be drawn down below elevation 1337.5 feet msl in the fall to ensure adequate supply for water intakes. Hourly releases from Fort Randall Dam during

the 2004 nesting season will be limited to 37,000 cfs for six hours. Daily average flows may be increased every third day to preserve the capability of increasing releases later in the summer if conditions turn dry.

Just prior to publication of this Final AOP, the Water Management office became aware of the Lewis and Clark Bicentennial Commemoration Signature Event planned in South Dakota between August 27 and September 26, 2004. Due to the shortening of the navigation season, this could coincide with the planned annual fall drawdown of Lake Francis Case. The Water Management office intends to work closely with event organizers and project personnel to minimize impacts the of the fall drawdown by delaying or modifying it to the extent practical. This adjustment is not shown in the studies presented.

Gavins Point Dam. Based on 2003 nesting season results with the Steady Release – Flow-to-Target operation and planned habitat development activities, it is anticipated that sufficient habitat will be available above the planned release rates to provide for successful nesting. All reasonable measures to minimize take will be used if a release increase is required above the 28,000 cfs initial steady flow. These measures include, but are not limited to, such things as the use of the Kansas River basin reservoirs, moving nests to higher ground when possible, and monitoring nest fledge dates to determine if delaying an increase a few days might allow threatened chicks to fledge. The location of tows and river conditions at intakes would also be monitored to determine if an increase could be temporarily delayed with little or no impact. Cycling releases every third day is not planned during the 2004 nesting season except during downstream flood control operations.

The Gavins Point pool will be operated near 1206.0 feet msl in the spring and early summer with variations day to day due to rainfall runoff. Greater fluctuations occur in the river, increasing the risk of nest inundation in the upper end of the Gavins Point pool. Several factors contribute to the increased risk of nest inundation in the upper end of the Gavins Point pool. First, because there are greater numbers of T&E species nesting below the Gavins Point Dam project that must be preserved, Gavins Point Dam releases are restricted during the nesting season. Second, rainfall runoff between Fort Randall Dam and Gavins Point Dam can result in sudden pool rises because the Gavins Point project has a smaller storage capacity than the other System reservoirs. Third, the regulation of Gavins Point for downstream flood control may necessitate sudden release reductions to prevent downstream bird losses. And finally, high releases required in wet years make nest inundation more likely. When combined, all these factors make it difficult and sometimes impossible to prevent inundation of nests in the upper end of Lewis and Clark Lake. The pool will be increased to elevation 1207.5 feet msl following the nesting season.

VI. SUMMARY OF RESULTS EXPECTED IN 2004

With System operations in accordance with the 2004 AOP outlined in the preceding pages, the following results can be expected.

A. Flood Control. All runoff scenarios studied will begin the March 1, 2004 runoff season substantially below the desired 57.1 MAF base of annual flood control and multiple use zone. Therefore, the entire System flood control zone plus an additional 12.1 to 24.3 MAF of the carryover multiple use zone will be available to store runoff. The System will be available to significantly reduce peak discharges and store a significant volume of water for all floods that may originate above the System.

Remaining storage in the carryover multiple use zone will be adequate to provide support for all of the other multiple purposes of the System, though at reduced levels.

B. Water Supply and Water Quality Control. Although below normal winter releases are being provided for all three runoff scenarios, all water supply and water quality requirements on the Missouri River both below Gavins Point Dam and between System reservoirs should be met for all flow conditions studied. It is possible with the low winter releases that ice formation or ice jams may temporarily reduce river stages to levels below which some intakes can draw water. Therefore, during severe cold spells, experience has shown that for brief periods it may be necessary to increase Gavins Point releases to help alleviate water supply problems along the lower river.

If the drought continues, reservoir levels and releases may continue to fall below their previous historic lows creating the potential for water supply problems at intakes, particularly those located on the upper three reservoirs. These intakes are primarily for the purposes of municipal and rural water supplies, nuclear and thermal powerplant cooling, and irrigation supplies. Historically, water access problems have been associated with several of these intakes; however, in most cases the problems have been a matter of restricted access to the river or reservoir rather than insufficient water supply. The Corps continues to encourage intake operators throughout the System and along the lower river to make necessary modifications to their intakes to allow efficient operation over the widest possible range of hydrologic conditions.

C. Irrigation. Scheduled releases from the System reservoirs will be ample to meet the volumes of flow required for irrigation diversions from the Missouri River. Some access problems may be experienced, however, if drought conditions persist. Tributary irrigation water usage is fully accounted for in the estimates of water supply.

D. Navigation. Service to navigation in 2004 will be scheduled at minimum service flow support for all runoff scenarios. Although the AOP simulations provide a comparison of typical flow support under varying runoff conditions, the actual rate of flow support for the 2004 navigation season will be based on actual System storage on March 15 and July 1, 2004.

All simulations have a shortened navigation season. The anticipated service level and season length for all runoff conditions simulated are shown in ***Table V***.

E. Power. ***Tables VIII and IX*** give the estimated monthly System load requirements and hydropower supply of the Eastern Division, Pick-Sloan Missouri Basin Program (P-S MBP), from March through December 2004. 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.

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. As a result of the drought, reservoir levels will remain well below normal and recreation access will be limited at several locations. Special operational adjustments incorporating specific objectives for these purposes will be accomplished whenever possible. Conditions in the lower three reservoirs 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 and for increasing usage of the regulated reaches of the Missouri River downstream of the reservoirs.

Boat ramps that were lowered and low water ramps that were constructed during the drought of the late 1980's to early 1990's and the further improvements made in 2003 should provide adequate lake access this year even under the Lower Decile runoff scenario. However, boat ramps in a few areas where the ramps cannot be extended may become unusable. This will affect the normal use patterns, as visitors will have to seek out areas with usable boat ramps. Boat ramp elevations for Fort Peck, Garrison, Oahe and Fort Randall reservoirs are available on the Missouri River Basin Water Management Division web site at: www.nwd-mr.usace.army.mil/rcc.

The effects of the simulated System regulation during 2004 on fish and wildlife are included in the section entitled, "Summary of Reservoir Regulation Activities for T&E Species and Fish Propagation Enhancement."

G. System Storage. System storage was 38.7 MAF at the close of CY 2003, breaking the previous record low end-of-year storage of 40.9 MAF set in 1990. This end-of-year storage is 4.0 MAF less than the 42.7 MAF experienced on December 31, 2002, and 16.3 MAF less than the 1967 to 2002 average. The previous lowest storage prior to the 1988-1992 drought was 50.9 MAF in 1981. The end-of-year System storages have ranged from a maximum of 60.9 MAF, which occurred in 1975, to the 2003 minimum of 38.7 MAF. Forecasted System storage on December 31, 2004 is presented in ***Table X*** for the runoff scenarios simulated.

H. Summary of Water Use by Functions. Actual water use data for CY 2002 and CY 2003 is shown in ***Table XI***. Under the simulated operations, estimated water use in CY 2004 also is shown in ***Table XI.***

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

	Estimated Committed Sales*	Expected C of E Capability			Expected Bureau Capability			Expected Total System Capability		
2003										
Aug	2153									
Sep	1566									
Oct	1527									
Nov	1753									
Dec	1834									
2004										
Jan	2209									
Feb	1970									
		Adj U.D.	ML	Adj L.D.	U.D.	Med	L.D.	Adj U.D.	ML	Adj L.D.
Mar	1694	2017	2000	1988	190	191	178	2207	2191	2166
Apr	1439	2038	2007	1982	191	193	179	2229	2200	2161
May	1376	2050	2008	1967	199	199	189	2249	2207	2156
Jun	1822	2126	2058	1998	213	208	199	2339	2266	2197
Jul	2264	2120	2039	1967	213	211	198	2333	2250	2165
Aug	2148	2114	2026	1944	209	208	195	2323	2234	2139
Sep	1566	2109	1998	1907	208	207	196	2317	2205	2103
Oct	1528	2078	1980	1908	207	207	196	2285	2187	2104
Nov	1753	2090	1987	1909	206	204	196	2296	2191	2105
Dec	1819	2078	1965	1881	200	199	194	2278	2164	2075

* Estimated sales, including system reserves. Power in addition to hydro production needed for these load requirements wil be obtained other power systems by interchange or purchas

** Total output of Canyon Ferry and 1/2 of the output of Yellowtail powerpla

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

	Estimated Committed Sales*	Expected C of E Generation			Expected Bureau Generation *			Expected Total System Generation		
2003										
Aug	667									
Sep	575									
Oct	568									
Nov	621									
Dec	730									
2004										
Jan	901		538		61	48	45	599	586	583
Feb	857		536		56	44	41	592	580	577
		Adj U.D.	ML	Adj L.D.	U.D.	Med	L.D.	Adj U.D.	ML	Adj L.D.
Mar	786	387	449	480	59	47	43	446	496	523
Apr	734	522	613	605	83	54	30	605	667	635
May	681	720	748	729	122	67	35	842	815	764
Jun	739	717	729	729	143	77	37	860	806	766
Jul	639	842	818	799	151	77	41	993	895	840
Aug	834	822	781	754	99	78	41	921	859	795
Sep	716	553	498	456	95	74	40	648	572	496
Oct	709	488	526	306	93	74	50	581	600	356
Nov	774	350	346	338	89	79	47	439	425	385
Dec	902	554	515	465	91	81	49	645	596	514
CY TOT	9272	7029	7097	6735	1144	799	500	6982	7896	6075

* Estimated sales including system reserves and losses. Power in addition to hydro production needed for these load requirements w obtained from other systems by interchange or purchas

** Total output Canyon Ferry and 1/2 output of Yellowtail powerpla

TABLE X
ANTICIPATED DECEMBER 31, 2004 SYSTEM STORAGE

Water Supply Condition	Total (12/31/04)	Carryover Storage Remaining 1/	Unfilled Carryover Storage 2/	Total Change CY 2004
		(Volumes in 1,000 Acre-Feet)		
Adj Upper Decile	45,000	26,900	12,100	6,300
Most Likely	37,800	19,700	19,300	-900
Adj Lower Decile	32,800	14,700	24,300	-5,900

1/ Net usable storage above 18.1 MAF System minimum pool level established for power, recreation, irrigation diversions, and other purposes.
2/ System base of annual flood control zone containing 57.1 MAF.

VII. TENTATIVE PROJECTION OF OPERATIONS THROUGH MARCH 2010

The 5-year extensions to the AOP (March 2005 to March 2010) 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. The extensions were not updated between the Draft Final AOP and this document. Therefore, the initial year (March 2004 through March 2005) is modeled using the February 1, 2004 starting conditions and three statistically derived inflows used in the Draft Final AOP. These inflows are identified as the Median, Lower Quartile and Lower Decile runoff conditions. Median (24.6 MAF) has a 1 in 2 chance of being exceeded, Lower Quartile runoff (19.5 MAF) has a 1 in 4 chance of the occurrence of less runoff, and Lower Decile (15.5 MAF) has a 1 in 10 chance of the occurrence of less runoff.

The extension studies, which cover the period from March 2005 to March 2010, use Median, Lower Quartile, and Lower Decile runoff. The March 15 and July 1 System storage checks from the new Master Manual were used to determine the flow support for navigation and other downstream uses, and the navigation season length. Table IV releases, as computed by the March 15 and July 1 System storage checks, were used in the extension studies. Releases closer to those shown in Table IV are expected to be utilized in future years during the tern and plover nesting season as additional emergent sandbar habitat becomes available. The September 1 System storage check was used to determine the winter System release.

System storage recovers sufficiently in the Median extension simulations to provide greater than the minimum winter release of 12,500 cfs by winter 2007-2008, reaching 16,300 cfs in winter 2009-2010. The extensions utilize the releases shown in ***Table IV*** with no additional water released for T&E species during the nesting season. Navigation service support and season length, end of year System storage, and the winter release rate for the extensions are shown on ***Table XII***.

TABLE XI
MISSOURI RIVER MAINSTEM SYSTEM
WATER USE FOR CALENDAR YEARS 2002, 2003, AND 2004 ABOVE SIOUX CITY, IOWA
in Million Acre-Feet (MAF)

		CY 2002	CY 2003	Simulations for Calendar Year 2004		
		Actual	Actual	Adj Upper Decile	Most Likely	Adj Lower Decile
Upstream Depletions	(1)					
Irrigation, Tributary Reservoir Evaporation & Other Uses		2.0	2.0			
Tributary Reservoir Storage Change		0.2	0.0			
Total Upstream Depletions		2.2	2.0	2.4	2.4	2.6
System Reservoir Evaporation	(2)	2.6	2.6	1.1	1.1	1.5
Sioux City Flows						
Navigation Season						
Unregulated Flood Inflows Between Gavins Point & Sioux City	(3)	0.0	0.0			
Navigation Service Requirement		14.3	12.7	13.4	13.9	11.4
Supplementary Releases						
T&E Species	(4)	-0.4	0.5	1.2	0.6	0.6
Flood Evacuation	(5)	0.0	0.0	0.0	0.0	0.0
Non-navigation Season						
Flows		3.4	3.8	3.5	3.2	3.2
Flood Evacuation Releases	(6)	0.0	0.0	0.0	0.0	0.0
System Storage Change		-6.1	-4.0	6.4	-0.9	-5.6
Total		16.0	17.6	28.0	20.3	13.7
Project Releases						
Fort Peck		4.8	5.4	5.2	5.3	5.0
Garrison		11.7	12.9	13.5	13.0	11.9
Oahe		14.9	14.9	12.5	13.5	13.5
Big Bend		13.9	13.8	12.3	13.3	13.2
Fort Randall		15.2	14.9	13.4	14.2	13.9
Gavins Point		16.0	16.0	15.3	15.7	14.9

(1) Tributary uses, above the 1949 level of development including agricultural depletions and tributary storage effects.
(2) Net evaporation is shown for 2004.
(3) Incremental inflows to reach which exceed those usable in support of navigation at the target level, even if Gavins Point Dam releases were held to as low as 6,000 cfs.
(4) Increased releases required to maintain navigation release flexibility during the T&E species nesting season. During 2002, releases fell below those required to maintain minimum service support flows during T&E nesting season (-0.4 MAF). In 2003 releases in excess of minimum service were made prior to mid-August (0.7 MAF), then releases fell below minimum service support flows due to a Federal Court Injunction from mid-August through 1 Sept (-0.2 MAF). Net excess for T&E species was 0.5 MAF.
(5) 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.
(6) Releases for flood control storage evacuation in excess of a 15,000 cfs Fort Randall Dam release.

TABLE XII
NAVIGATION SERVICE SUPPORT, AOP EXTENSIONS

	2005	2006	2007	2008	2009
MEDIAN					
Flow Level Below Full Service					
Spring (kcfs)	-6.0	-6.0	-2.5	-0.8	0
Summer/Fall (kcfs)	-6.0	-2.5	0	0	0
Season Length (Months)	8-15 days	8	8	8	8
Dec 31 Storage (MAF)	47.3	50.9	52.7	53.8	54.2
Winter Release (kcfs)	12.5	12.5	13.5	15.4	16.3
LOWER QUARTILE					
Flow Level Below Full Service					
Spring (kcfs)	-6.0	-6.0	-6.0	-6.0	-6.0
Summer/Fall (kcfs)	-6.0	-6.0	-6.0	-6.0	-6.0
Season Length (Months)	8-31 days	8-31 days	8-31 days	8-28 days	8-12 days
Dec 31 Storage (MAF)	38.5	40.3	42.3	44.2	47.0
Winter Release (kcfs)	12.5	12.5	12.5	12.5	12.5
LOWER DECILE					
Flow Level Below Full Service					
Spring (kcfs)	-6.0	-6.0	-6.0	-6.0	-6.0
Summer/Fall (kcfs)	-6.0	-6.0	-6.0	-6.0	-6.0
Season Length (Months)	8-61 days	8-61 days	8-61 days	8-61 days	8-61 days
Dec 31 Storage (MAF)	32.5	31.8	31.7	32.2	32.9
Winter Release (kcfs)	12.5	12.5	12.5	12.5	12.5

A. <u>Median Runoff</u>. Studies 4 through 9 present the results of simulating median runoff (24.6 MAF) in 2004, followed by 5 additional years of median runoff. The March 1, 2005 System storage would be 42.5 MAF and would rise to 53.9 MAF by March 1, 2010, as shown on studies 4 through 9. Winter system releases would increase from the minimum 12,500 cfs to 13,500 cfs beginning winter 2007-2008. Winter 2008-2009 and winter 2009-2010 releases would be 15,400 and 16,300 cfs, respectively. Fort Peck Lake, Lake Sakakawea, and Lake Oahe rise to the elevations described in ***Table VII*** that permit unbalancing by March 1, 2007. The Fort Peck "mini-test' could be conducted in 2007 by unbalancing the upper three reservoirs as shown in ***Table XIII***. The Fort Peck release would average 12,800 cfs in June 2007. Fort Peck Lake would be favored again in 2008 to accommodate the full test in which up to 19,000 cfs would be spilled for 5 days in June 2008. Beginning in 2008, the pattern of "high", "float", "low" as described in ***Table VI*** would be followed. The amount of unbalancing was generally 4 feet at Fort Peck Lake and 3 feet at Lakes Sakakawea and Oahe.

TABLE XIII
MARCH 1 RESERVOIR UNBALANCING, AOP EXTENSIONS
(Feet)

Year	Fort Peck	Garrison	Oahe
2007	+4.1	-3.0	+0.1
2008	+4.2	-3.0	+0.1
2009	0.0	+3.0	-3.0
2010	-3.9	-0.4	+2.9

B. Lower Quartile Runoff. Studies 10 through 15 show the results of lower quartile runoff in 2004 (19.5 MAF) followed by a 5-year period of lower quartile runoff. System storage on March 1, 2005 is 37.2 MAF and rises to 47.1 MAF by March 2010 with navigation service levels remaining at minimum service during the simulation period. The navigation season is shortened 31 days from 2005 through 2007, 28 days in 2008 and 12 days in 2009 as System storage increases. A 12,500 cfs winter release is shown for the entire study period. Since the upper three reservoirs do not refill under Lower Quartile runoff, their percent of remaining carryover multiple use storage is balanced each March 1.

C. Lower Decile Runoff. Studies 16 through 21 show the results of lower decile runoff in 2004 (15.5 MAF) followed by a 5-year period of lower decile runoff. System storage is at 33.9 MAF on March 1, 2005 and falls to 33.0 MAF by March 2010. System storage remains fairly constant due to a 61 day navigation season shortening each year. March 15 System storage in 2007 and 2008 is only 1.5 MAF greater than the 31 MAF navigation preclude described in the new Master Manual. Service level is minimum service, 2005 through 2009. A 12,500 cfs winter release is shown for the entire study period.

Plate 11 presents System storage, Gavins Point, and System peaking capability for Median, Lower Quartile, and Lower Decile runoff for the period 2005 through March 2010. Peak power, or peaking capability, is the amount of power available when all powerplants are operating at maximum.

Plate 12 present reservoir elevations for Fort Peck, Garrison, Oahe, and Fort Randall for Median, Lower Quartile, and Lower Decile runoff for the period 2005 through March 2010.

MISSOURI RIVER BASIN

PLATE 1

Summary of Engineering Data -- Missouri River Mainstem System

Item No.	Subject	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 246,000 acres	1854 msl 380,000 acres	1620 msl 374,000 acres
27	Max. normal op. pool elev. & area	2246 msl 240,000 acres	1850 msl 364,000 acres	1617 msl 360,000 acres
28	Base flood control elev & area	2234 msl 212,000 acres	1837.5 msl 307,000 acres	1607.5 msl 312,000 acres
29	Min. operating pool elev. & area	2160 msl 90,000 acres	1775 msl 128,000 acres	1540 msl 117,000 acres
	Storage allocation & capacity			
30	Exclusive flood control	2250-2246 975,000 a.f.	1854-1850 1,489,000 a.f.	1620-1617 1,102,000 a.f.
31	Flood control & multiple use	2246-2234 2,717,000 a.f.	1850-1837.5 4,222,000 a.f.	1617-1607.5 3,201,000 a.f.
32	Carryover multiple use	2234-2160 10,785,000 a.f.	1837.5-1775 13,130,000 a.f.	1607.5-1540 13,461,000 a.f.
33	Permanent	2160-2030 4,211,000 a.f.	1775-1673 4,980,000 a.f.	1540-1415 5,373,000 a.f.
34	Gross	2250-2030 18,688,000 a.f.	1854-1673 23,821,000 a.f.	1620-1415 23,137,000 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	18,100 a.f. 1030 yrs.	25,900 a.f. 920 yrs.	19,800 a.f. 1170 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	1670-1680 15,000- 60,000 cfs	1423-1428 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., 25' 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 - 109,250, 2 - 95,000	112,290
52	Plant capacity in kW	185,250	517,750	786,030
53	Dependable capacity in kW (9)	181,000	388,000	534,000
54	Avg. annual energy, million kWh (12)	1,142	2,429	2,867
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.	Remarks
21 miles upstream Chamberlain, SD	Near Lake Andes, SD	Near Yankton, SD		1	(1) Includes 4,280 square miles of non-contributing areas.
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	(2) Includes 1,350 square miles of non-contributing areas.
200 (elevation 1420)	540 (elevation 1350)	90 (elevation 1204.5)	5,940 miles	5	(3) With pool at base of flood control.
28,900	30,000 1,100	32,000 2,000		6	
440,000 (April 1952)	447,000 (April 1952)	480,000 (April 1952)		7	(4) Storage first available for regulation of flows.
1959	1946	1952		8	(5) Damming height is height from low water to maximum operating pool. Maximum height is from average streambed to top of dam.
1964	1953	1955		9	
1440	1395	1234		10	
10,570 (including spillway)	10,700 (including spillway)	8,700 (including spillway)	71,596	11	(6) Based on latest available storage data.
78	140	45	863 feet	12	
95	165	74		13	(7) River regulation is attained by flows over low-crested spillway and through turbines.
1200, 700	4300, 1250	850, 450		14	
Pierre shale & Niobrara chalk	Niobrara chalk	Niobrara chalk & Carlile shale		15	(8) Length from upstream face of outlet or to spiral case.
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	(9) Based on 8th year (1961) of drought drawdown (From study 8-83-1985).
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	(10) Affected by level of Lake Francis case. Applicable to pool at elevation 1350.
1385	1346	1180		21	
376 gated	1000 gated	664 gated		22	(11) Spillway crest.
8 - 40' x 38' Tainter	21 - 40' x 29' Tainter	14 - 40' x 30' Tainter		23	(12) 1967-2001 Average
390,000 at elev 1433.6	620,000 at elev 1379.3	584,000 at elev 1221.4		24	(13) Source: Annual Report on Civil Works Activities of the Corps of Engineers. Extract Report Fiscal Year 1999.
270,000	508,000	345,000		25	
1423 msl 61,000 acres	1375 msl 102,000 acres	1210 msl 31,000 acres	1,194,000 acres	26	(14) Based on Study 8-83-1985
1422 msl 60,000 acres	1365 msl 95,000 acres	1208 msl 28,000 acres	1,147,000 acres	27	
1420 msl 57,000 acres	1350 msl 77,000 acres	1204.5 msl 24,000 acres	989,000 acres	28	
1415 msl 51,000 acres	1320 msl 38,000 acres	1204.5 msl 24,000 acres	450,000 acres	29	
1423-1422 60,000 a.f.	1375-1365 985,000 a.f.	1210-1208 59,000 a.f.	4,670,000 a.f.	30	
1422-1420 117,000 a.f.	1365-1350 1,309,000 a.f.	1208-1204.5 90,000 a.f.	11,656,000 a.f.	31	
	1350-1320 1,607,000 a.f.		38,983,000 a.f.	32	
1420-1345 1,682,000 a.f.	1320-1240 1,517,000 a.f.	1204.5-1160 321,000 a.f.	18,084,000 a.f.	33	
1423-1345 1,859,000 a.f.	1375-1240 5,418,000 a.f.	1210-1160 470,000 a.f.	73,393,000 a.f.	34	
November 1963	January 1953	August 1955		35	
25 March 1964	24 November 1953	22 December 1955		36	
4,300 a.f. 430 yrs.	18,300 a.f. 250 yrs.	2,600 a.f. 180 yrs.	92,500 a.f.	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	
	32,000 cfs - 128,000 cfs				
1351-1355(10) 25,000-100,000 cfs	1228-1239 5,000-60,000 cfs	1155-1163 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	
3 - 67,276, 5 - 58,500	40,000	44,100		51	
494,320	320,000	132,300	2,435,650 kw	52	
497,000	293,000	74,000	1,967,000 kw	53	Corps of Engineers, U.S. Army
1,041	1,843	754	10,077 million kWh	54	Compiled by
October 1964 - July 1966	March 1954 - January 1956	September 1956 - January 1957	July 1943 - July 1966	55	Northwestern Division
				56	Missouri River Region
$107,498,000	$199,066,000	$49,617,000	$1,166,404,000		May 2001

System Storage

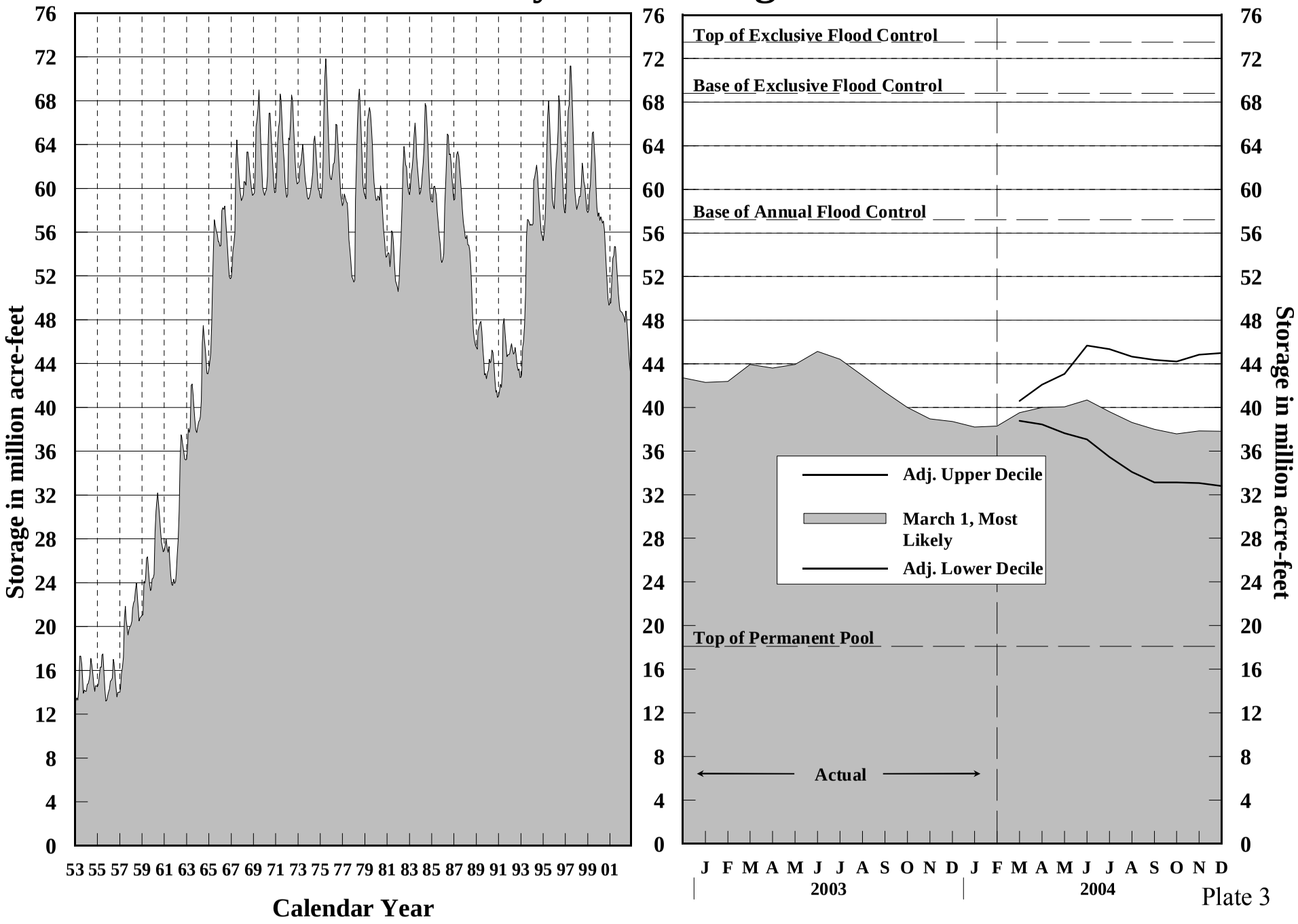


Plate 3

Gavins Point Releases

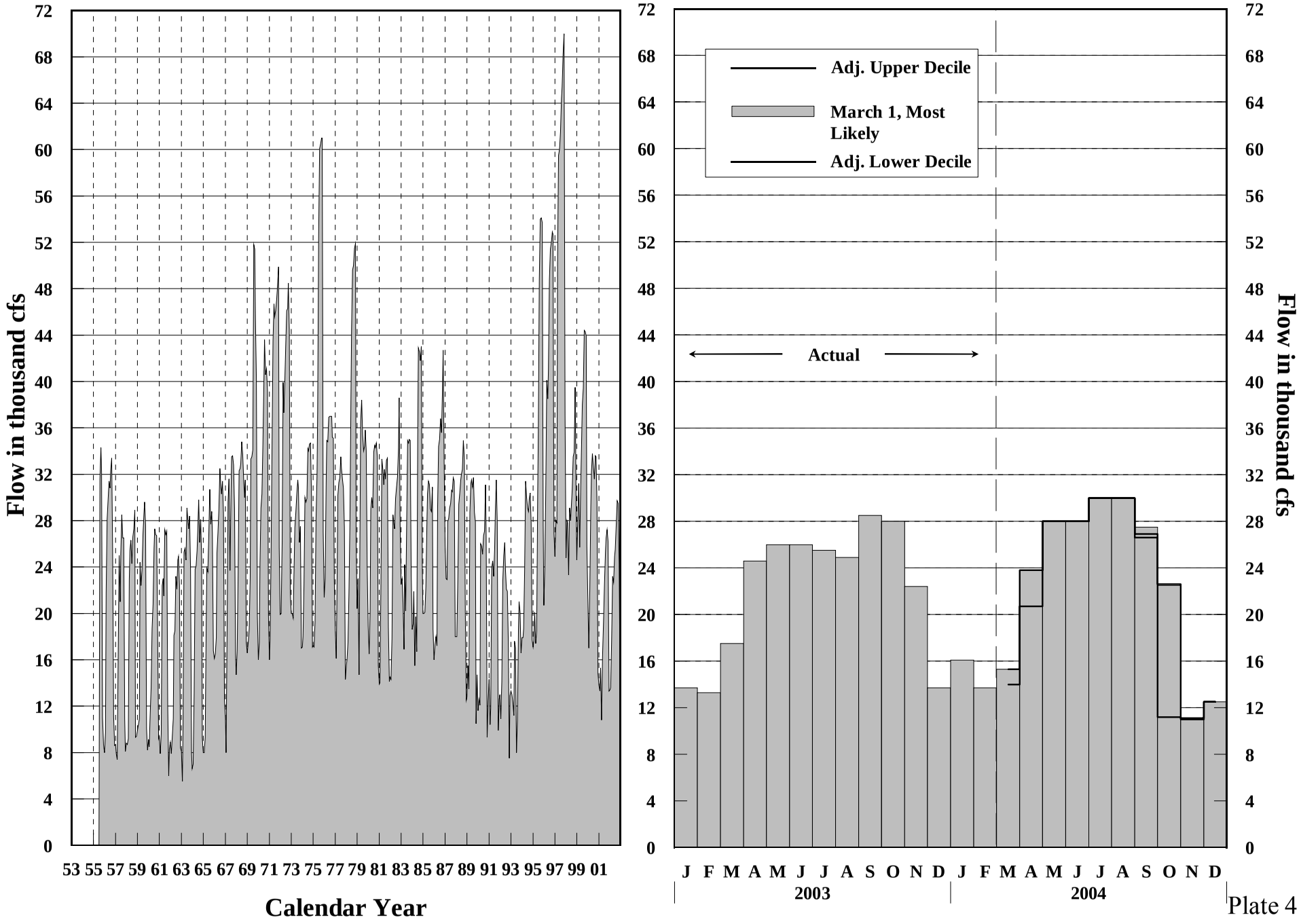
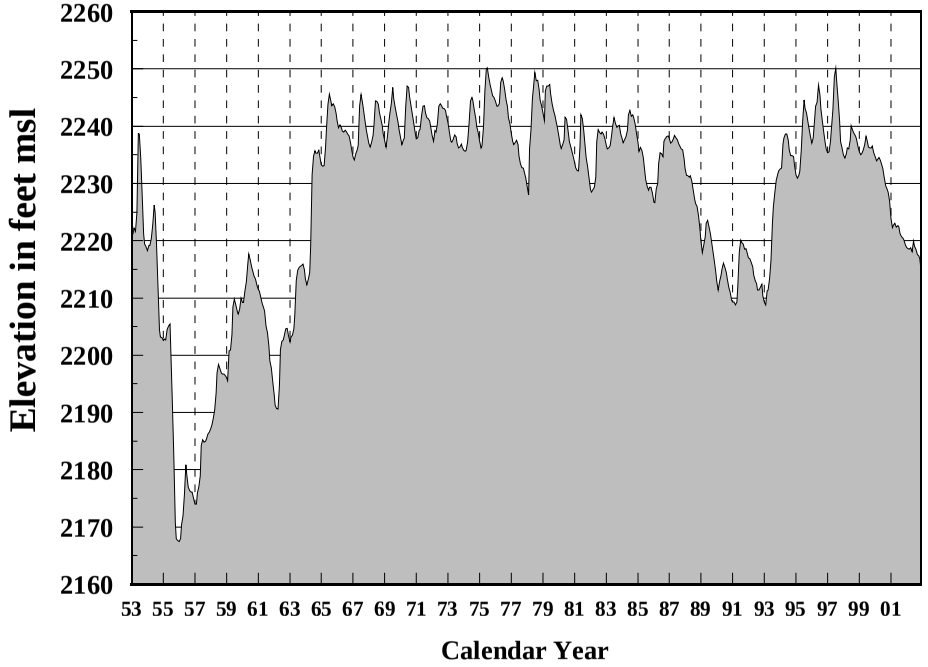
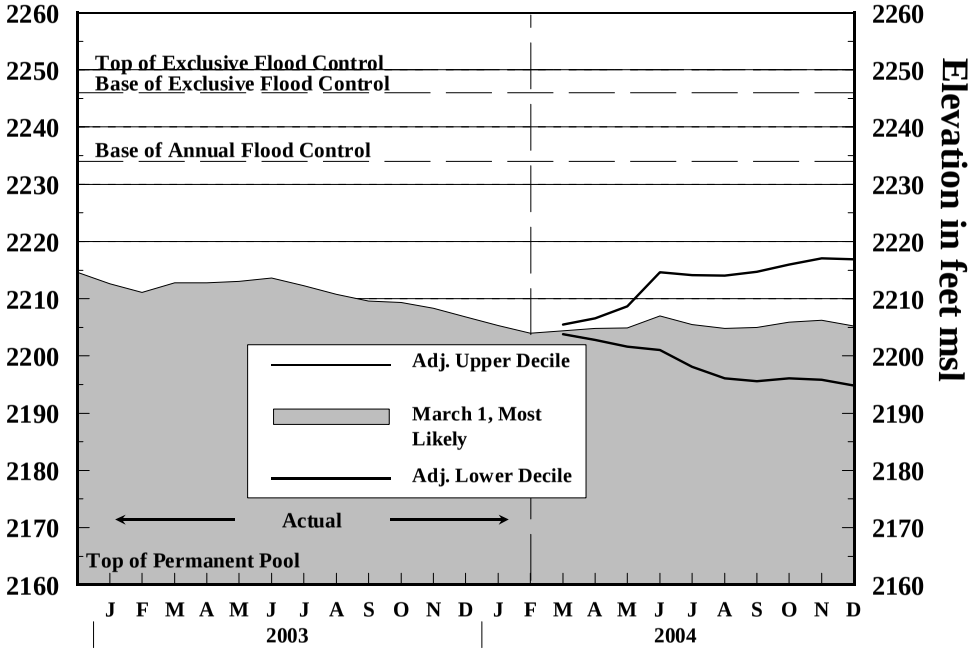
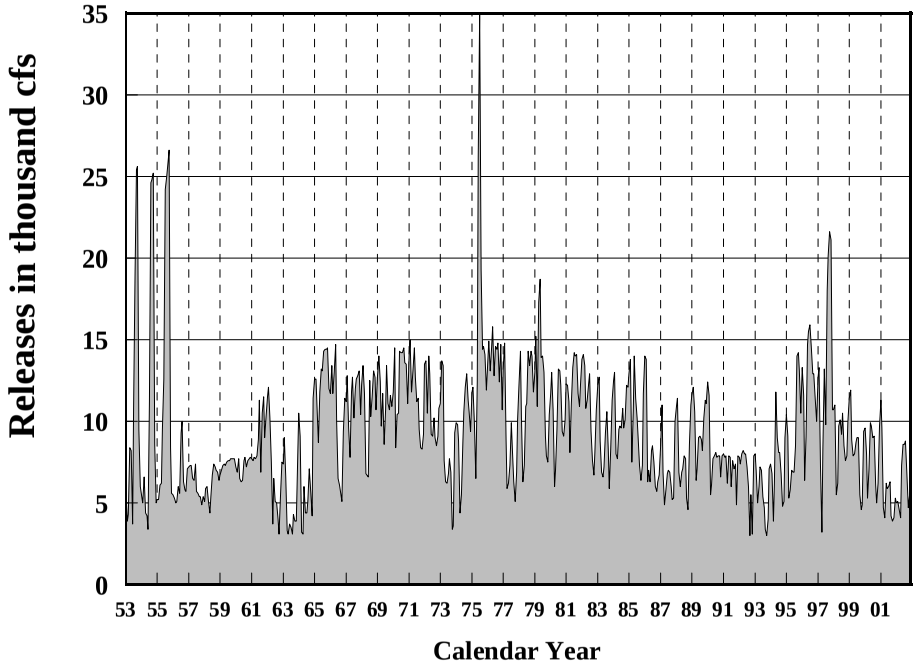


Plate 4

Fort Peck
Elevations and Releases







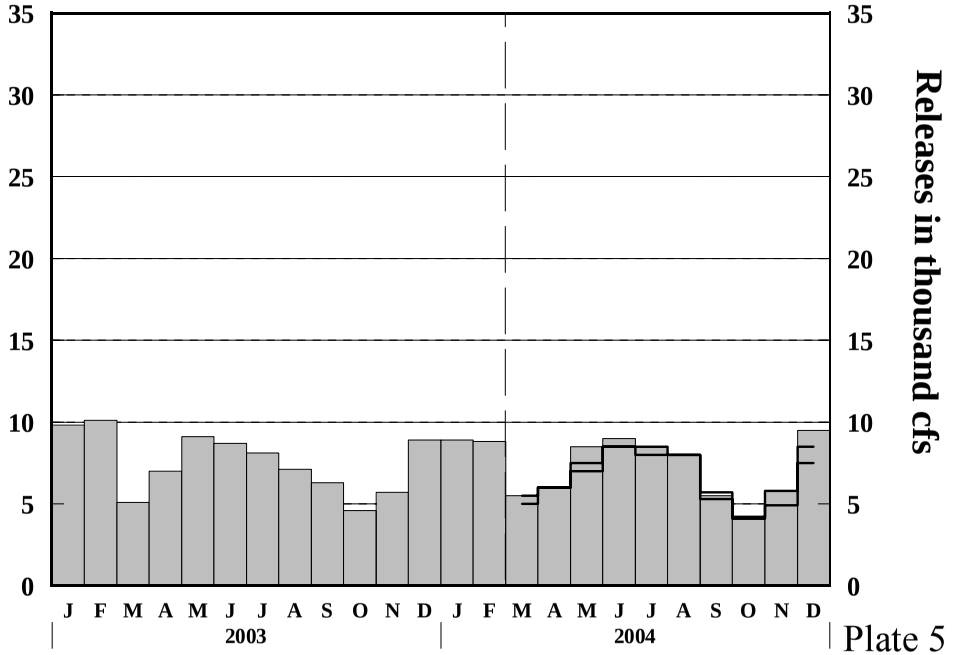
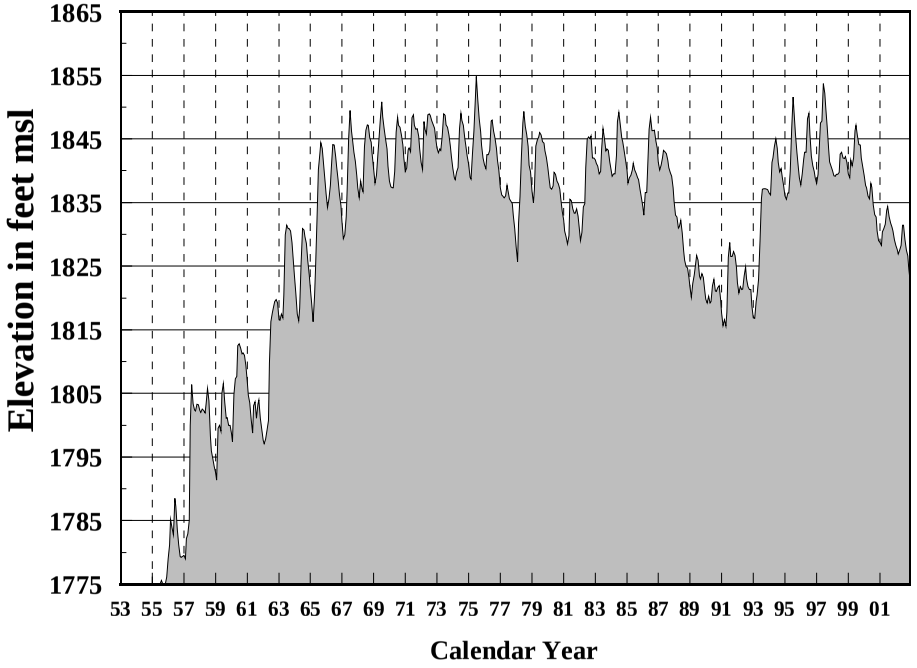
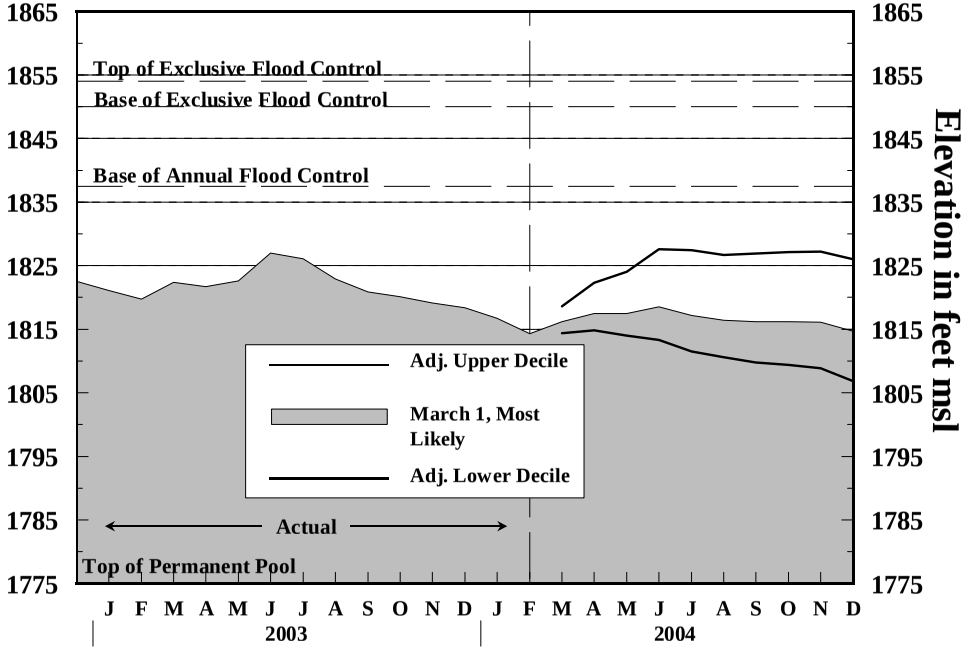
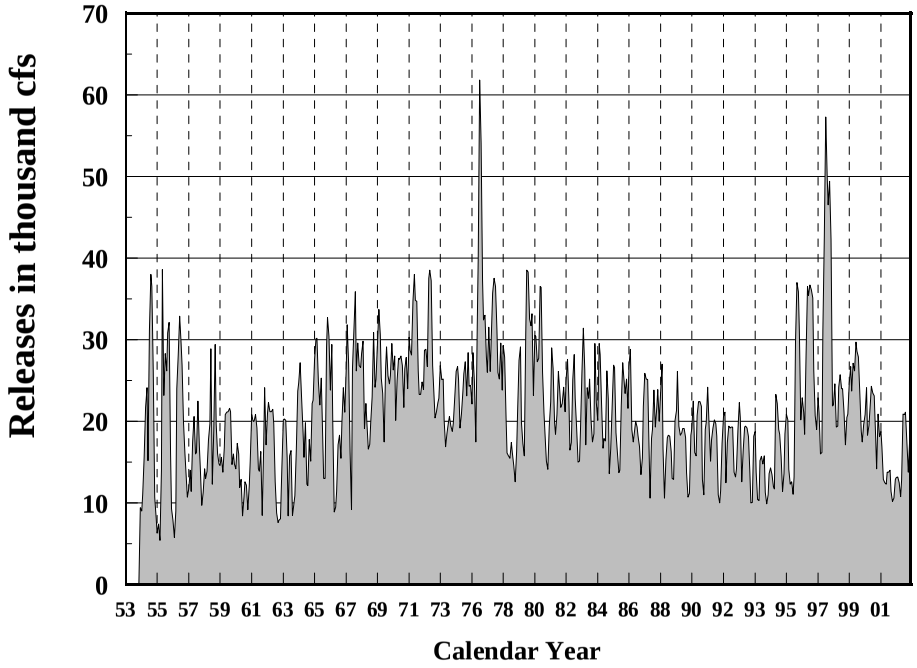


Plate 5

Garrison
Elevations and Releases







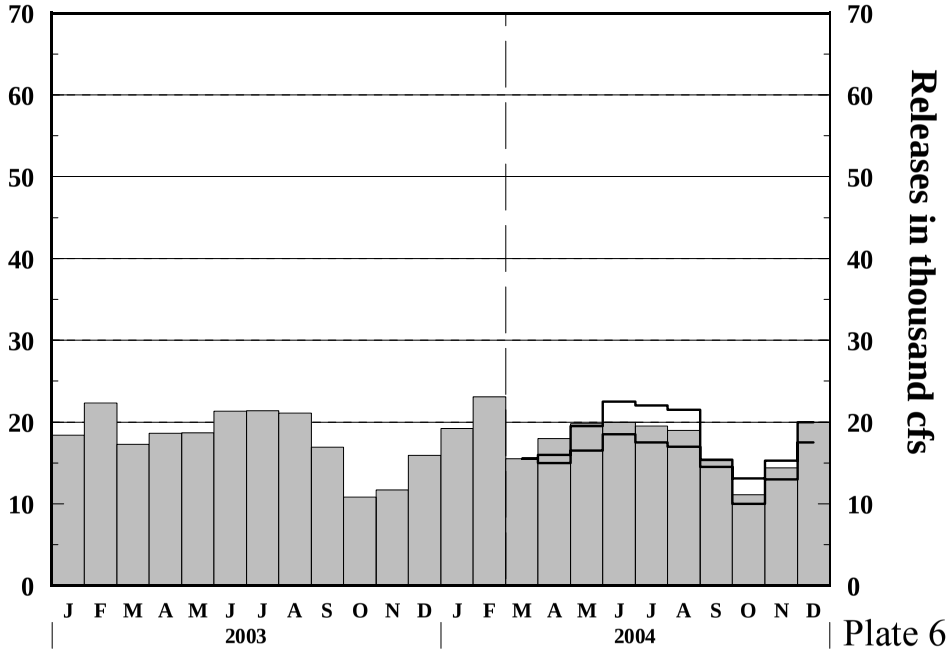
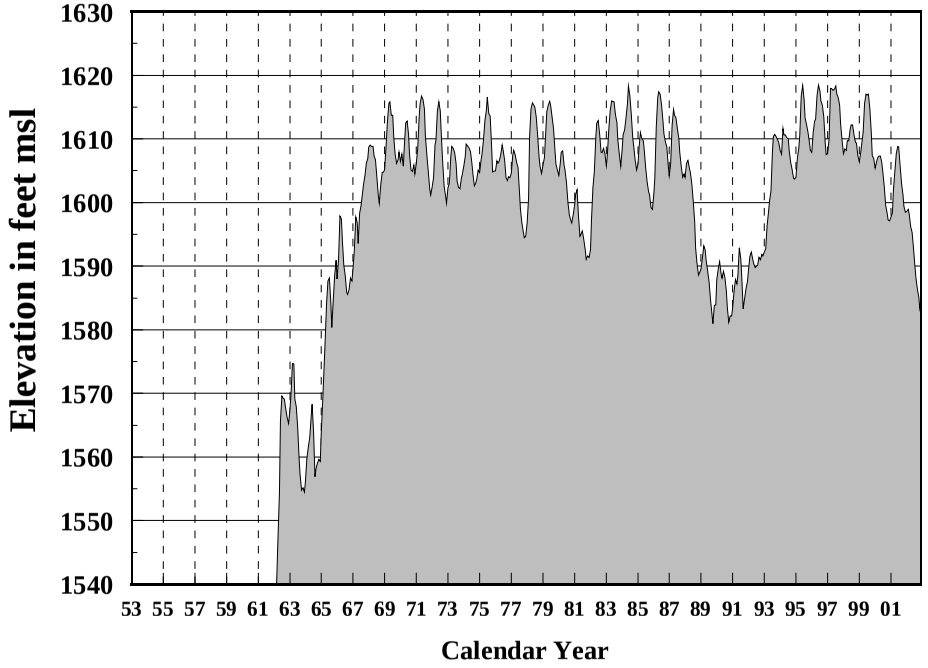
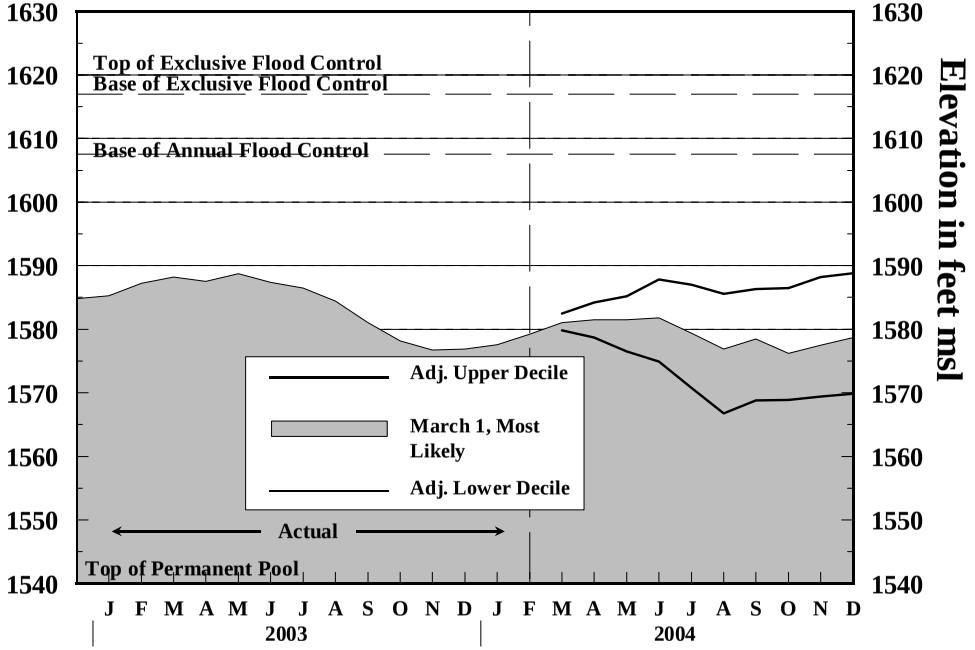


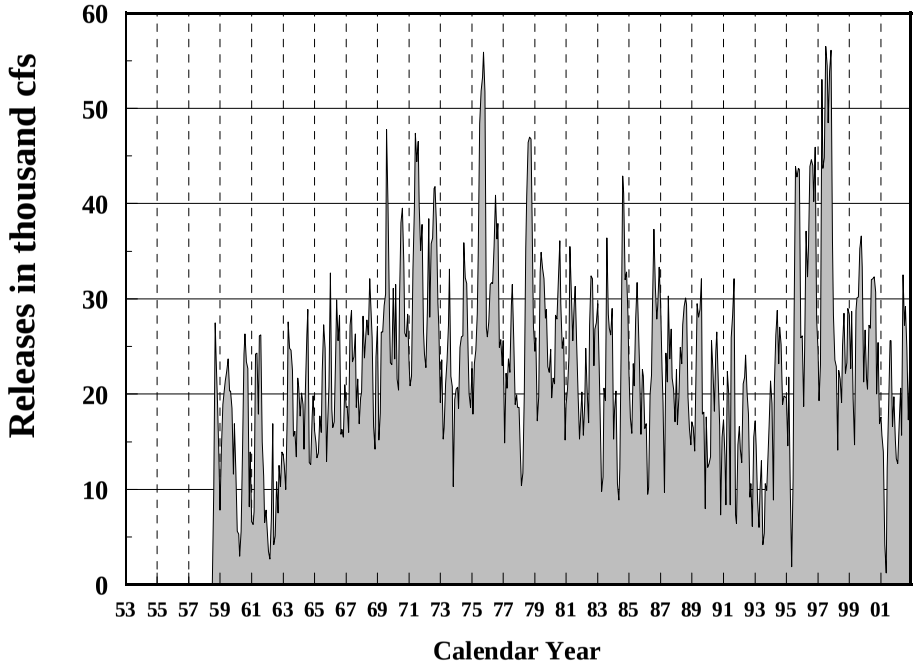
Plate 6

Oahe

Elevations and Releases







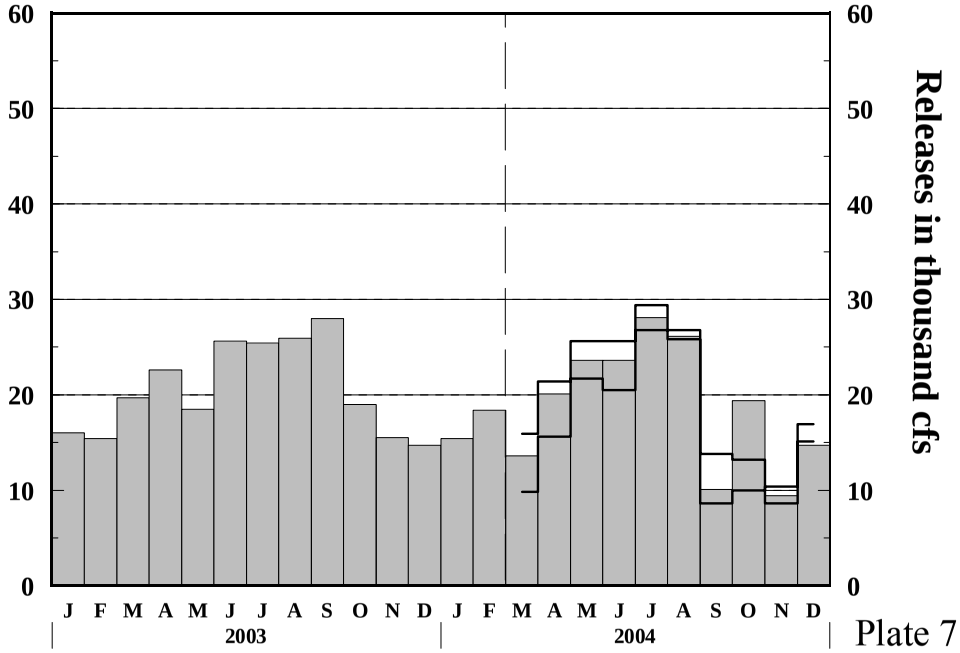
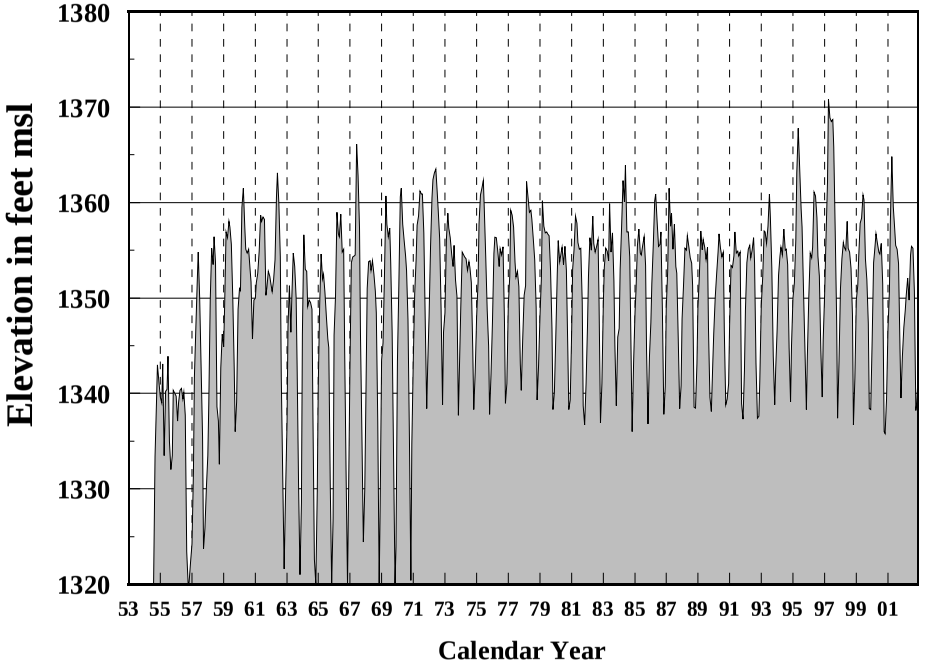
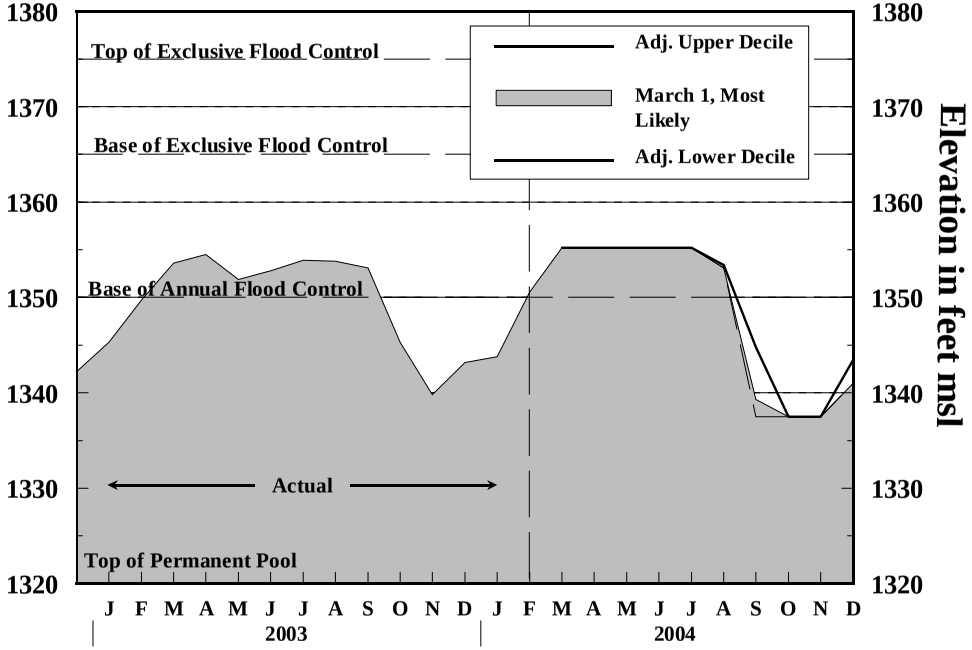
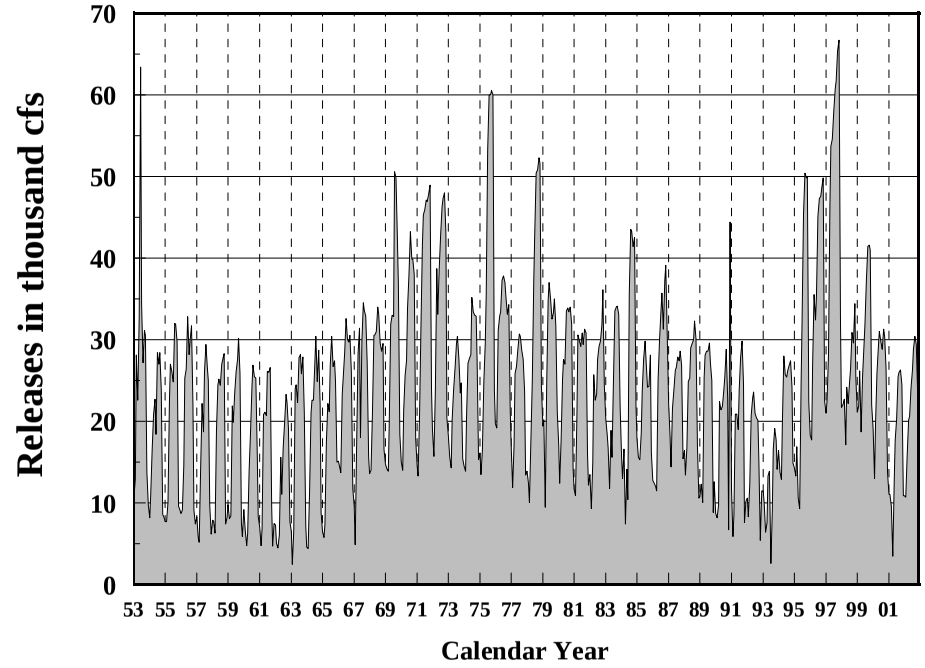


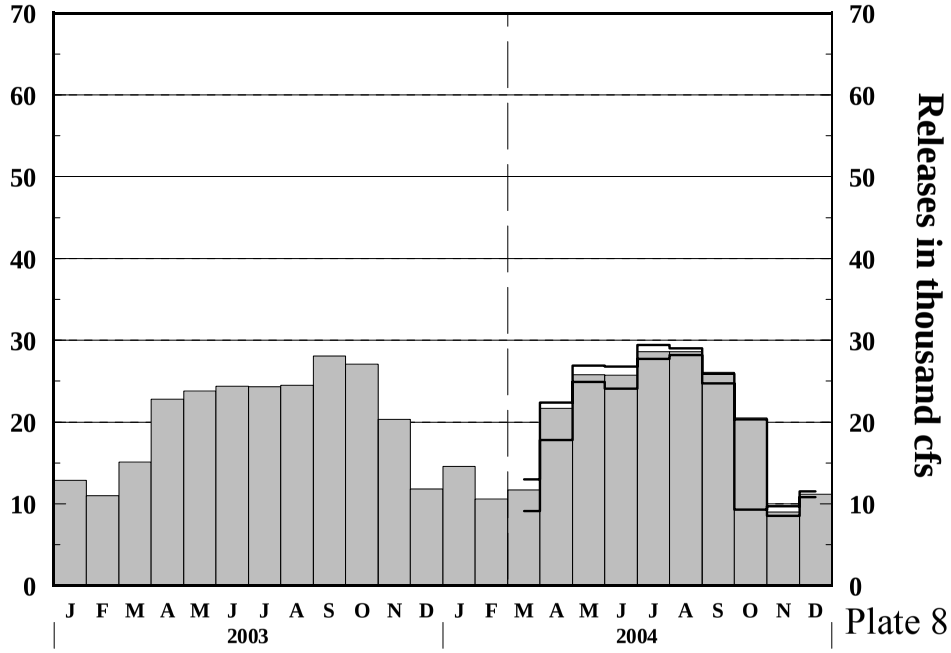
Plate 7

Fort Randall
Elevations and Releases



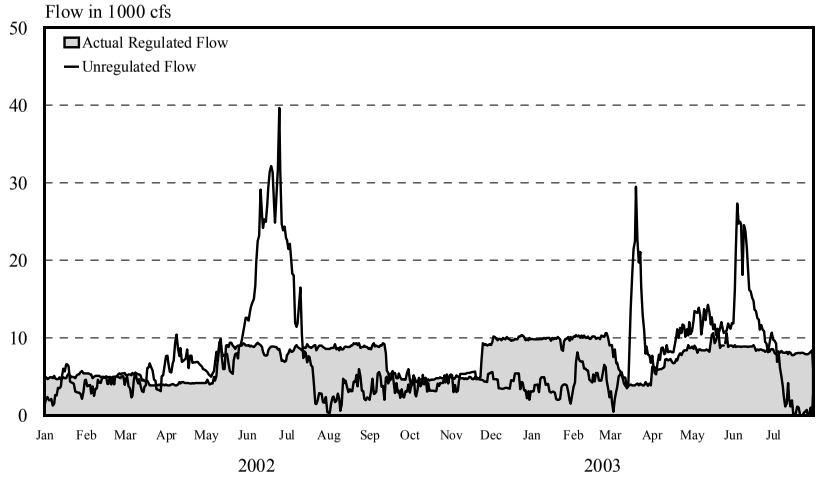




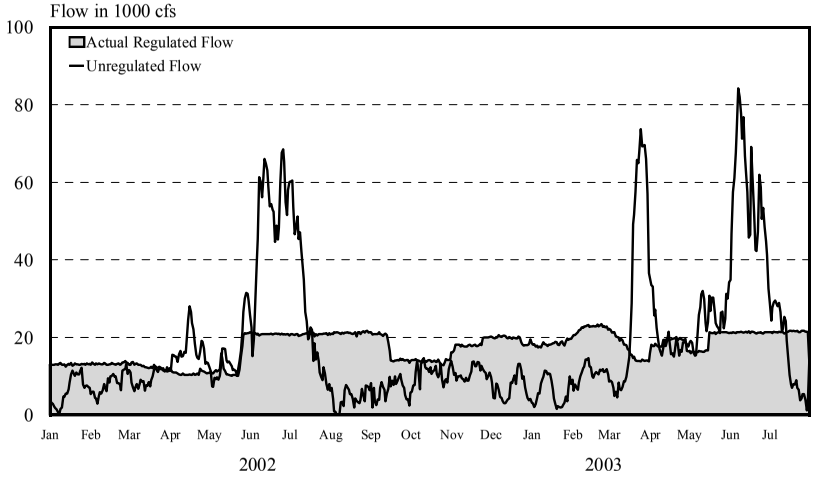


Reservoir Release and Unregulated Flow

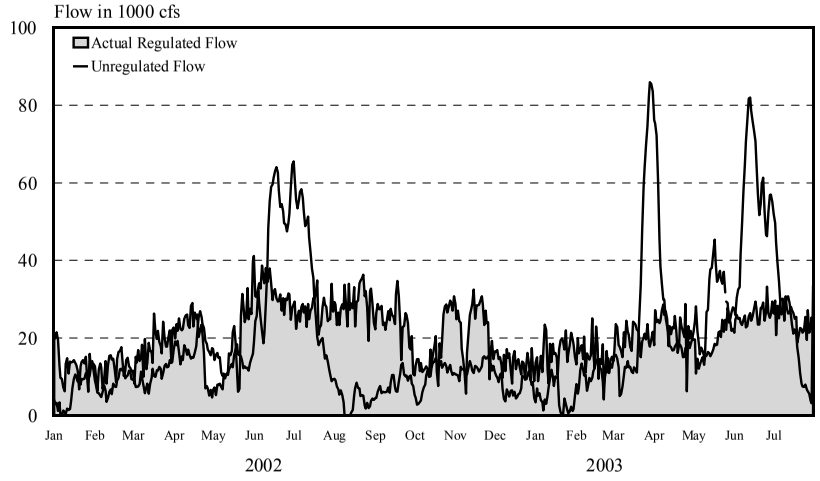
Fort Peck



Garrison



Oahe



Gavins Point

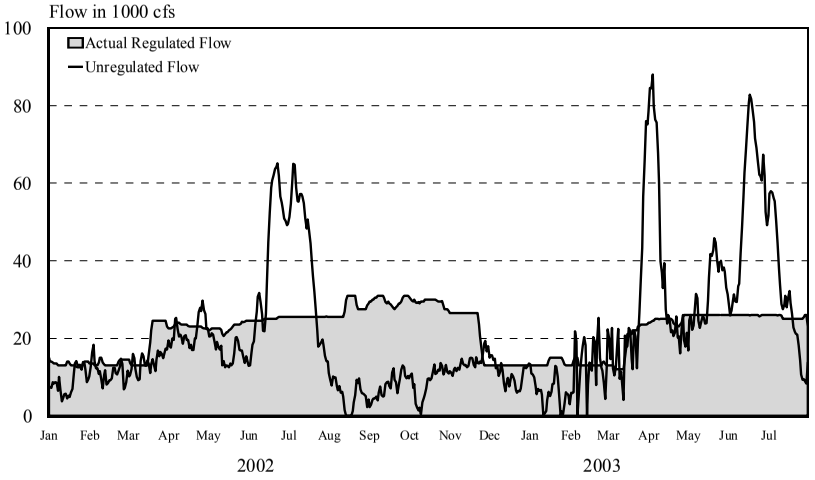


Plate 9

System Gross Capability and Average Monthly Generation

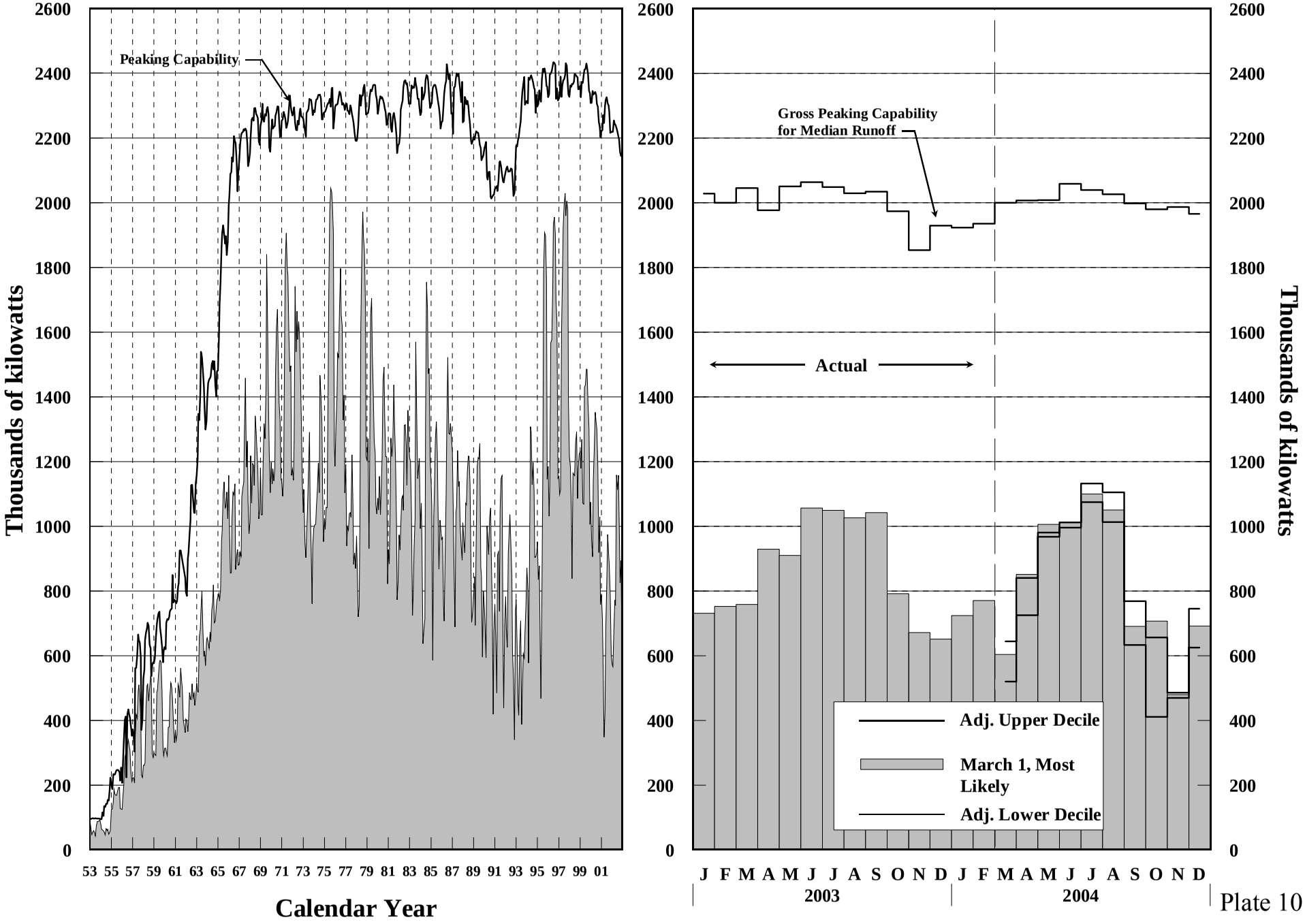


Plate 10

Tentative Five Year Extensions of 2004 AOP

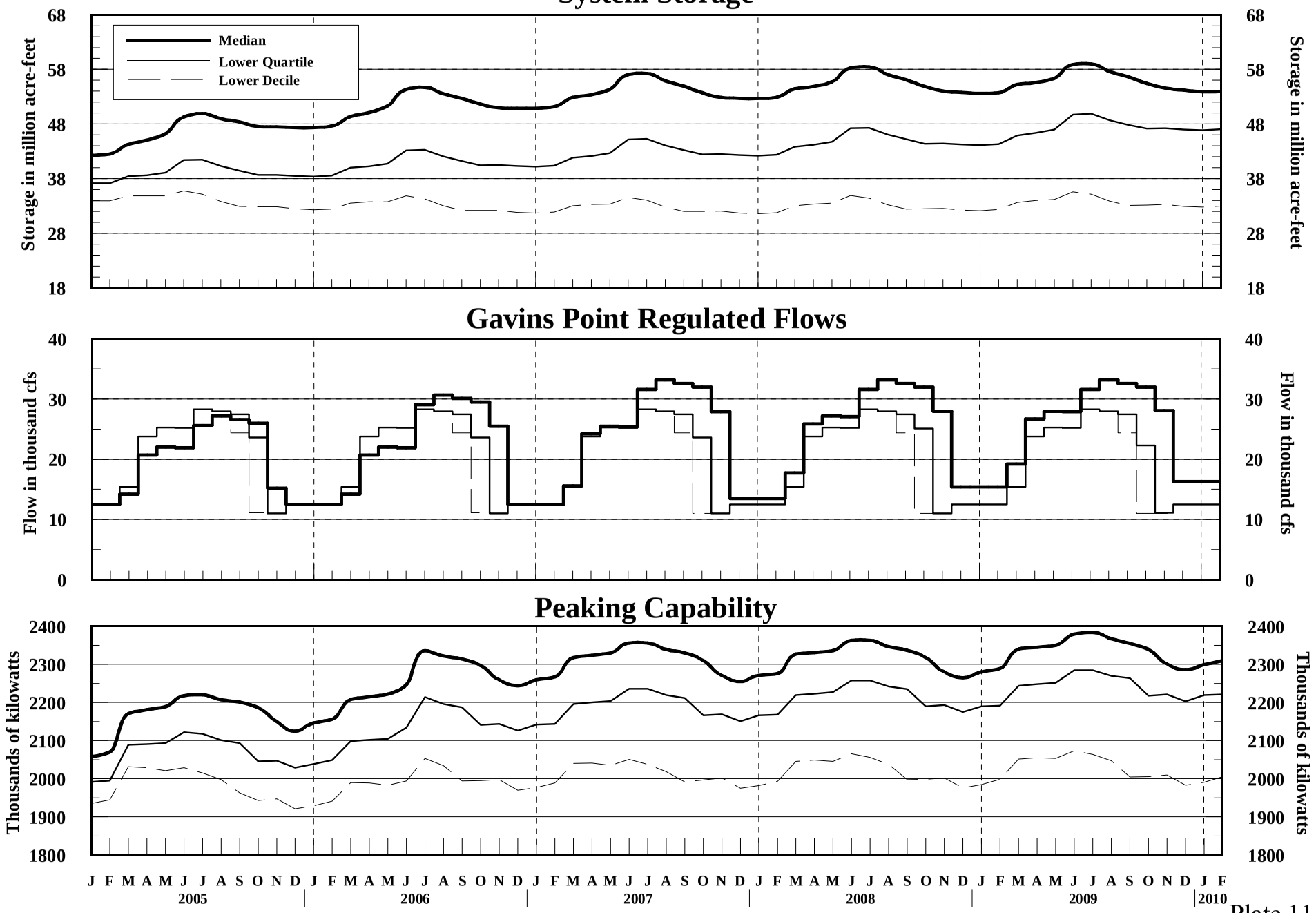


Plate 11

Tentative Five Year Extensions of 2004 AOP

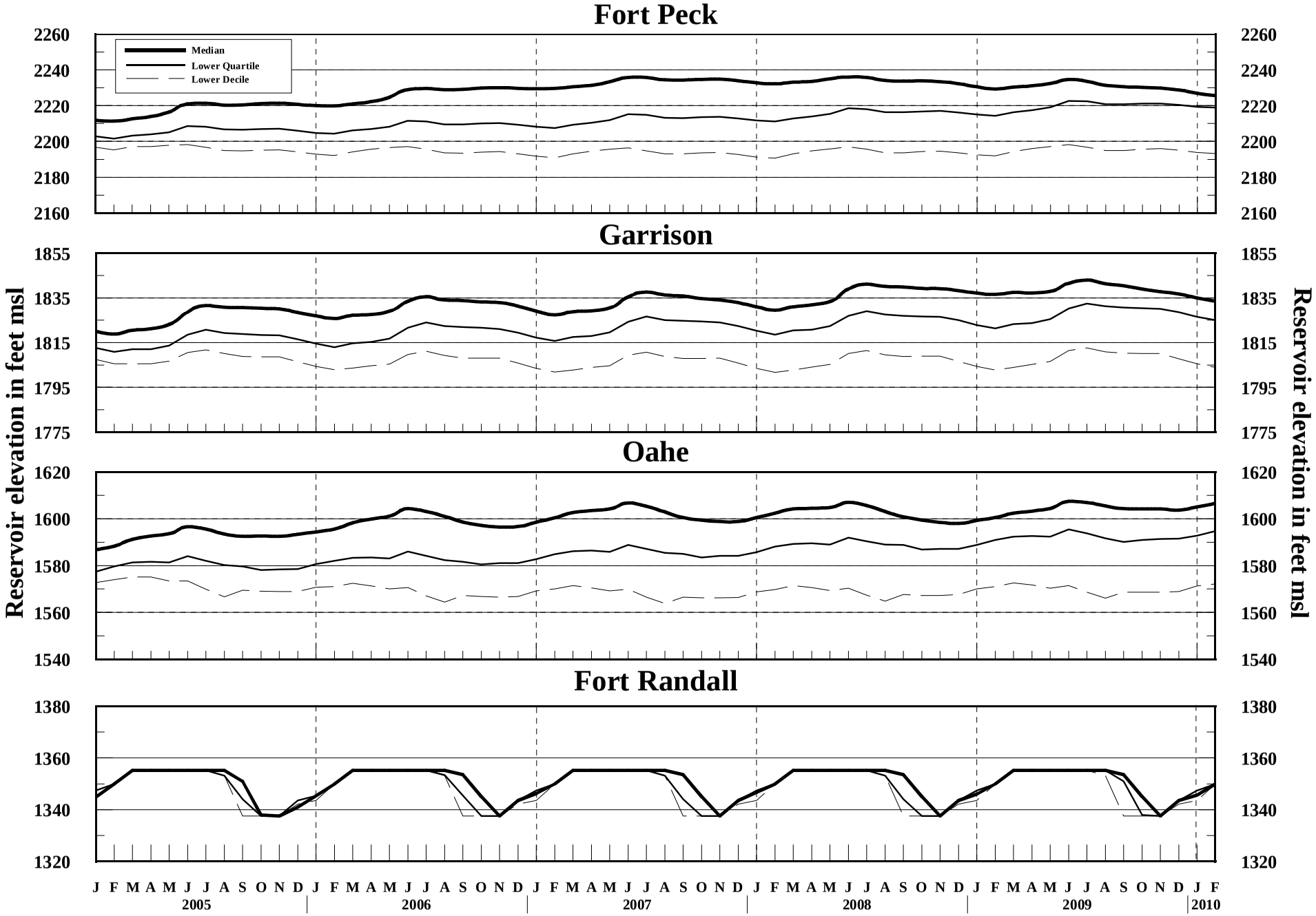


Plate 12

	29FEB04	2004												2005			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	5860	194	90	116	450	800	1250	450	360	345	400	195	91	104	335	315	365
DEPLETION	121	1	1	1	29	259	386	145	-83	-99	-68	-35	-16	-18	-125	-152	-105
EVAPORATION	337							20	64	80	71	32	15	17	37		
MOD INFLOW	5402	192	90	115	421	541	864	285	379	364	397	197	92	105	423	467	470
RELEASE	5415	179	69	89	357	523	536	523	492	326	252	122	97	127	584	584	555
STOR CHANGE	-13	14	20	26	64	18	328	-238	-113	38	145	75	-5	-22	-161	-117	-85
STORAGE	9603	9617	9637	9663	9727	9745	10074	9836	9723	9761	9906	9981	9976	9954	9793	9675	9590
ELEV FTMSL	2204.0	2204.1	2204.2	2204.4	2204.8	2204.9	2207.0	2205.5	2204.8	2205.0	2205.9	2206.4	2206.4	2206.2	2205.2	2204.5	2203.9
DISCH KCFS	8.8	6.0	5.0	5.0	6.0	8.5	9.0	8.5	8.0	5.5	4.1	4.1	7.0	8.0	9.5	9.5	10.0
POWER																	
AVE POWER MW		72	60	60	72	102	108	103	96	66	50	50	85	97	115	114	118
PEAK POW MW		132	133	133	133	133	179	177	176	176	177	178	178	178	176	175	174
ENERGY GWH	788.1	26.0	10.1	13.0	52.1	76.1	78.1	76.3	71.5	47.4	36.9	17.9	14.2	18.6	85.0	84.7	80.2
--GARRISON--																	
NAT INFLOW	8655	532	248	319	1100	950	1650	950	625	470	525	205	96	109	255	260	360
DEPLETION	1212	41	19	24	56	213	750	574	66	-111	8	-97	-45	-51	-105	-83	-47
CHAN STOR	-13	31	11		-11	-27	-5	5	5	27	15	0	-31	-11	-16		-5
EVAPORATION	389							24	74	93	81	37	17	20	42		
REG INFLOW	12457	701	310	384	1390	1233	1430	880	982	841	703	387	189	257	886	927	957
RELEASE	12814	506	194	250	1071	1217	1190	1199	1168	911	683	333	236	286	1230	1230	1111
STOR CHANGE	-358	195	115	134	319	15	240	-319	-186	-70	20	53	-47	-28	-344	-303	-154
STORAGE	11891	12086	12201	12336	12655	12670	12910	12591	12405	12335	12356	12409	12362	12334	11990	11687	11533
ELEV FTMSL	1814.3	1815.1	1815.6	1816.2	1817.5	1817.5	1818.5	1817.2	1816.4	1816.2	1816.2	1816.5	1816.3	1816.1	1814.7	1813.4	1812.7
DISCH KCFS	23.1	17.0	14.0	14.0	18.0	19.8	20.0	19.5	19.0	15.3	11.1	11.2	17.0	18.0	20.0	20.0	20.0
POWER																	
AVE POWER MW		182	151	152	196	216	219	214	207	166	121	122	185	195	215	213	212
PEAK POW MW		312	313	315	319	319	322	318	316	315	315	316	315	315	311	307	305
ENERGY GWH	1679.5	65.7	25.4	32.8	141.1	160.9	157.9	158.9	153.8	119.7	90.0	44.0	31.0	37.5	160.1	158.6	142.2
--OAHE--																	
NAT INFLOW	1915	145	68	87	300	320	400	180	65	115	70	33	15	17		10	90
DEPLETION	585	22	10	13	46	64	123	143	93	23	-8	2	1	1	11	16	25
CHAN STOR	16	32	15		-21	-9	-1	3	3	20	22	-1	-31	-5	-11		
EVAPORATION	335							21	64	80	70	31	15	17	37		
REG INFLOW	13825	661	267	324	1305	1464	1466	1218	1079	942	713	333	205	280	1171	1224	1176
RELEASE	13237	269	237	328	1195	1453	1402	1728	1605	603	1193	269	137	155	906	903	855
STOR CHANGE	588	391	30	-4	109	12	64	-511	-526	339	-480	64	68	125	265	321	321
STORAGE	11504	11895	11925	11921	12031	12042	12106	11595	11069	11409	10928	10992	11060	11186	11450	11771	12092
ELEV FTMSL	1579.0	1580.9	1581.0	1581.0	1581.5	1581.5	1581.8	1579.4	1576.9	1578.5	1576.2	1576.5	1576.9	1577.5	1578.7	1580.3	1581.8
DISCH KCFS	18.4	9.0	17.1	18.4	20.1	23.6	23.6	28.1	26.1	10.1	19.4	9.0	9.8	9.8	14.7	14.7	15.4
POWER																	
AVE POWER MW		101	191	205	224	264	263	311	285	111	211	98	107	107	162	162	172
PEAK POW MW		573	574	574	577	577	579	566	553	561	549	551	552	556	562	570	578
ENERGY GWH	1770.7	36.2	32.0	44.2	161.3	196.1	189.5	231.7	212.1	79.9	157.3	35.4	18.0	20.5	120.3	120.9	115.4
--BIG BEND--																	
EVAPORATION	103							6	20	25	22	10	5	5	11		
REG INFLOW	13134	269	237	328	1195	1453	1402	1722	1585	578	1171	259	132	150	895	903	855
RELEASE	13200	335	237	328	1195	1453	1402	1722	1585	578	1171	260	132	149	895	903	855
STORAGE	1748	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1681	1681	1682	1682	1682	1682
ELEV FTMSL	1421.2	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	16.9	11.3	17.1	18.4	20.1	23.6	23.6	28.0	25.8	9.7	19.0	8.7	9.5	9.4	14.5	14.7	15.4
POWER																	
AVE POWER MW		53	80	86	94	111	110	131	122	49	96	44	48	48	73	72	74
PEAK POW MW		516	509	509	509	509	509	509	518	538	538	538	538	538	538	538	529
ENERGY GWH	766.4	19.1	13.4	18.6	67.7	82.3	79.4	97.5	90.8	35.4	71.2	15.9	8.1	9.2	54.3	53.8	49.6
--FORT RANDALL--																	
NAT INFLOW	825	97	45	58	100	145	140	60	40	40	10	5	2	3	10	20	50
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	104							8	25	26	18	8	4	4	10		
REG INFLOW	13833	430	282	385	1291	1589	1530	1756	1586	575	1161	257	130	147	892	920	902
RELEASE	13882	187	148	385	1291	1589	1530	1756	1760	1552	1263	257	130	147	689	670	528
STOR CHANGE	-49	243	134					0	-174	-976	-102	0	0	0	203	250	374
STORAGE	3172	3415	3549	3549	3549	3549	3549	3549	3375	2399	2297	2296	2296	2297	2499	2749	3123
ELEV FTMSL	1350.6	1353.6	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.1	1339.3	1337.5	1337.5	1337.5	1337.5	1341.0	1344.8	1350.0
DISCH KCFS	10.6	6.3	10.6	21.6	21.7	25.8	25.7	28.6	28.6	26.1	20.5	8.6	9.4	9.3	11.2	10.9	9.5
POWER																	
AVE POWER MW		52	90	182	183	218	217	240	239	203	150	63	68	68	83	84	76
PEAK POW MW		350	355	355	355	355	355	355	348	291	283	283	283	283	300	317	338
ENERGY GWH	1359.4	18.9	15.1	39.3	131.9	161.9	155.9	178.6	177.5	146.5	111.6	22.7	11.5	13.0	61.8	62.1	51.0
--GAVINS POINT--																	
NAT INFLOW	1585	102	47	61	130	160	160	135	115	110	120	60	28	32	100	100	125
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	1	8	-8	-21	0	-8	0	-5	0	5	10	22	-1	0	-4	1	3
EVAPORATION	38							2	7	9	8	4	2	2	4		
REG INFLOW	15316	298	187	425	1416	1722	1666	1845	1858	1662	1383	330	153	175	771	770	655
RELEASE	15346	328	187	425	1416	1722	1666	1845	1845	1636	1383	330	153	175	771	770	694
STOR CHANGE	-30	-30							13	26							-39
STORAGE	388	358	358	358	358	358	358	358	371	397	397	397	397	397	397	397	358
ELEV FTMSL	1207.1	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	13.7	11.0	13.5	23.8	23.8	28.0	28.0	30.0	30.0	27.5	22.5	11.1	11.0	11.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		39	47	82	82	95	95	101	101	95	79	40	39	39	45	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	640.1	14.0	7.9	17.6	58.7	70.9	68.6	75.1	75.4	68.7	58.9	14.2	6.6	7.5	33.1	33.1	29.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1750	121	56	73	200	275	270	215	130	95	75	38	18	20	45	35	85
DEPLETION	247	6	3	4	20	34	30	36	34	22	9	6	3	3	12	13	13
REGULATED FLOW AT SIOUX CITY																	
KAF	16849	442	241	494	1596	1963	1906	2024	1941	1709	1449	362	168	192	804	792	766
KCFS		14.9	17.3	27.7	26.8	31.9	32.0	32.9	31.6	28.7	23.6	12.2	12.1	12.1	13.1	12.9	13.8
--TOTAL--																	
NAT INFLOW	20590	1191	555	714	2280	2650	3870	1990	1335	1175	1200	535	250	285	745	740	1075
DEPLETION	2359	72	33	43	160	598	1325	955	135	-163	-56	-118	-55	-63	-194	-202	-111
CHAN STOR	-4	71	18	-21	-32	-44	-6	2	8	43	47	23	-64	-16	-30	1	-3
EVAPORATION	1305							81	253	314	270	122	57	65	142		
STORAGE	38306	39053	39353	39509	40001	40046	40679	39611	38625	37982	37565	37757	37773	37848	37811	37962	38379
SYSTEM POWER																	
AVE POWER MW		499	619	766	851	1006	1013	1100	1050	691	707	417	532	553	692	690	696
PEAK POW MW		1998	1998	2000	2007	2008	2058	2039	2026	1998	1980	1983	1984	1987	1965	1986	2000
ENERGY GWH	7004.1	179.8	104.0	165.5	612.9	748.2	729.4	818.2	781.0	497.7	525.9	150.1	89.4	106.2	514.7	513.1	468.0
DAILY GWH		12.0	14.9	18.4	20.4	24.1	24.3	26.4	25.2	16.6	17.0	10.0	12.8	13.3	16.6	16.6	16.7

	29FEB04	2004											2005			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	7910	261	122	157	608	1120	2000	630	432	414	480	234	109	125	402	378	438
DEPLETION	358	-17	-8	-10	79	325	501	170	-92	-106	-55	-22	-10	-12	-119	-153	-112
EVAPORATION	251							16	52	66	58	14	7	7	31		
MOD INFLOW	7301	279	130	167	529	795	1499	444	472	454	477	242	113	129	490	531	550
RELEASE	5116	179	69	89	357	461	506	523	492	339	261	128	69	95	523	553	472
STOR CHANGE	2185	100	61	78	172	334	993	-79	-20	115	216	114	44	34	-33	-22	78
STORAGE	9603	9703	9764	9842	10014	10348	11341	11262	11242	11358	11574	11688	11731	11765	11732	11710	11788
ELEV FTMSL	2204.0	2204.6	2205.0	2205.5	2206.6	2208.7	2214.6	2214.1	2214.0	2214.7	2216.0	2216.6	2216.9	2217.1	2216.9	2216.7	2217.2
DISCH KCFS	8.8	6.0	5.0	5.0	6.0	7.5	8.5	8.5	8.0	5.7	4.2	4.3	5.0	6.0	8.5	9.0	8.5
POWER																	
AVE POWER MW		72	60	61	73	92	105	107	100	72	54	55	64	77	108	114	108
PEAK POW MW		133	133	134	135	138	189	188	188	189	191	191	192	192	192	192	192
ENERGY GWH	775.1	26.0	10.1	13.1	52.4	68.2	75.9	79.5	74.8	51.7	40.0	19.7	10.7	14.7	80.5	85.1	72.7
--GARRISON--																	
NAT INFLOW	11756	719	335	431	1485	1330	2640	1330	750	564	630	246	115	131	306	312	432
DEPLETION	710	-55	-26	-33	-69	150	830	527	58	-124	-8	-103	-48	-55	-137	-120	-79
CHAN STOR	4	31	11		-11	-16	-11	0	5	24	15	-1	-7	-10	-26	-5	5
EVAPORATION	300							20	63	79	69	17	8	9	36		
REG INFLOW	15867	983	441	553	1900	1625	2305	1306	1126	972	845	459	217	262	904	980	988
RELEASE	13555	506	194	250	952	1199	1339	1353	1322	918	806	390	236	286	1230	1353	1222
STOR CHANGE	2312	477	247	303	948	426	966	-47	-196	54	39	70	-19	-24	-326	-373	-234
STORAGE	11891	12368	12614	12918	13866	14292	15258	15211	15016	15070	15108	15178	15159	15135	14809	14437	14203
ELEV FTMSL	1814.3	1816.3	1817.3	1818.6	1822.3	1824.0	1827.6	1827.4	1826.7	1826.9	1827.1	1827.3	1827.2	1827.2	1826.0	1824.5	1823.6
DISCH KCFS	23.1	17.0	14.0	14.0	16.0	19.5	22.5	22.0	21.5	15.4	13.1	13.1	17.0	18.0	20.0	22.0	22.0
POWER																	
AVE POWER MW		183	153	154	179	222	260	257	250	180	154	154	199	210	232	253	251
PEAK POW MW		316	318	322	333	338	349	348	346	347	347	348	348	347	344	340	337
ENERGY GWH	1886.1	65.9	25.7	33.3	128.8	164.8	187.0	191.2	186.3	129.7	114.2	55.3	33.4	40.4	172.9	188.3	168.8
--OAHE--																	
NAT INFLOW	2648	196	91	118	405	448	640	252	78	138	84	39	18	21		12	108
DEPLETION	585	22	10	13	46	64	123	143	93	23	-8	2	1	1	11	16	25
CHAN STOR	8	32	15		-10	-17	-15	2	2	30	11	0	-19	-5	-10	-10	0
EVAPORATION	262							17	54	68	60	14	7	8	33		
REG INFLOW	15363	711	291	354	1301	1566	1841	1447	1255	994	849	413	228	293	1177	1339	1305
RELEASE	12039	197	178	228	931	1336	1221	1648	1587	821	813	244	124	141	1036	888	647
STOR CHANGE	3324	515	113	126	370	229	620	-201	-332	174	36	168	103	152	140	451	658
STORAGE	11504	12019	12132	12258	12628	12857	13478	13276	12944	13118	13154	13323	13426	13578	13719	14170	14828
ELEV FTMSL	1579.0	1581.4	1581.9	1582.5	1584.2	1585.2	1587.8	1587.0	1585.6	1586.3	1586.5	1587.2	1587.6	1588.2	1588.8	1590.7	1593.3
DISCH KCFS	18.4	6.6	12.8	12.8	15.6	21.7	20.5	26.8	25.8	13.8	13.2	8.2	9.0	8.9	16.9	14.4	11.6
POWER																	
AVE POWER MW		74	144	144	177	247	236	309	296	159	152	95	104	103	197	170	139
PEAK POW MW		576	579	582	591	596	610	606	598	602	603	607	609	612	615	624	637
ENERGY GWH	1678.4	26.5	24.2	31.0	127.5	184.0	170.0	230.1	220.3	114.2	113.4	34.3	17.5	19.8	146.2	126.2	93.2
--BIG BEND--																	
EVAPORATION	71							5	15	19	16	4	2	2	9		
REG INFLOW	11969	197	178	228	931	1336	1221	1643	1572	802	797	241	123	139	1028	888	647
RELEASE	12035	263	178	228	931	1336	1221	1643	1572	802	797	240	123	138	1029	888	647
STORAGE	1748	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1681	1681	1681
ELEV FTMSL	1421.2	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	16.9	8.8	12.8	12.8	15.6	21.7	20.5	26.7	25.6	13.5	13.0	8.1	8.8	8.7	16.7	14.4	11.6
POWER																	
AVE POWER MW		42	60	60	73	102	96	125	121	66	65	41	45	44	83	70	56
PEAK POW MW		516	509	509	509	509	509	509	517	538	538	538	538	538	538	538	529
ENERGY GWH	697.5	15.0	10.1	12.9	52.7	75.7	69.1	93.1	90.2	47.8	48.7	14.8	7.5	8.5	61.5	52.3	37.6
--FORT RANDALL--																	
NAT INFLOW	1132	131	61	78	135	203	224	84	48	48	12	6	3	3	12	24	60
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	75							6	19	21	15	3	1	2	8		
REG INFLOW	13013	392	238	305	1062	1530	1433	1703	1587	822	792	243	123	139	1030	909	704
RELEASE	13061	149	104	305	1062	1530	1433	1703	1736	1472	1245	243	123	139	664	652	500
STOR CHANGE	-48	243	134		0	0	0	0	-149	-650	-453	0	0	0	366	257	204
STORAGE	3172	3415	3549	3549	3549	3549	3549	3549	3400	2750	2297	2297	2297	2297	2663	2920	3124
ELEV FTMSL	1350.6	1353.6	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.4	1344.8	1337.5	1337.5	1337.5	1337.5	1343.5	1347.2	1350.0
DISCH KCFS	10.6	5.0	7.5	17.1	17.8	24.9	24.1	27.7	28.2	24.7	20.3	8.2	8.9	8.8	10.8	10.6	9.0
POWER																	
AVE POWER MW		42	64	145	151	210	203	233	236	198	152	60	65	64	81	83	73
PEAK POW MW		350	355	355	355	355	355	355	349	317	283	283	283	283	311	328	338
ENERGY GWH	1287.8	15.0	10.7	31.3	108.8	156.0	146.1	173.3	175.3	142.7	112.9	21.5	10.9	12.3	60.3	61.8	48.8
--GAVINS POINT--																	
NAT INFLOW	2077	137	64	82	176	224	256	189	138	132	144	72	34	38	120	120	150
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	2	10	-5	-18	-1	-13	2	-7	-1	7	8	22	-1	0	-4	0	3
EVAPORATION	26							2	5	7	6	1	1	1	3		
REG INFLOW	15000	297	164	370	1232	1722	1666	1845	1858	1609	1390	331	153	175	767	771	653
RELEASE	15030	327	164	370	1232	1722	1666	1845	1845	1583	1390	331	153	175	767	771	692
STOR CHANGE	-30	-30							13	26							-39
STORAGE	388	358	358	358	358	358	358	358	371	397	397	397	397	397	397	397	358
ELEV FTMSL	1207.1	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	13.7	11.0	11.8	20.7	20.7	28.0	28.0	30.0	30.0	26.6	22.6	11.1	11.0	11.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		39	41	71	71	95	95	101	101	92	79	40	39	39	44	45	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	627.4	14.0	6.9	15.4	51.4	70.9	68.6	75.1	75.4	66.6	59.1	14.2	6.6	7.5	33.0	33.1	29.5
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	2374	164	76	98	270	385	432	301	156	114	90	45	21	24	54	42	102
DEPLETION	247	6	3	4	20	34	30	36	34	22	9	6	3	3	12	13	13
REGULATED FLOW AT SIOUX CITY																	
KAF	17157	484	237	464	1482	2073	2068	2110	1967	1675	1471	370	171	196	809	800	781
KCFS		16.3	17.1	26.0	24.9	33.7	34.8	34.3	32.0	28.1	23.9	12.4	12.3	12.3	13.2	13.0	14.1
--TOTAL--																	
NAT INFLOW	27897	1608	750	964	3079	3710	6192	2786	1602	1410	1440	642	300	342	894	888	1290
DEPLETION	2094	-43	-20	-26	85	601	1520	933	118	-183	-59	-112	-52	-59	-220	-240	-150
CHAN STOR	14	73	21	-18	-22	-47	-24	-5	7	61	35	22	-28	-15	-39	-14	8
EVAPORATION	984							66	207	260	225	53	25	29	119		
STORAGE	38306	39545	40099	40606	42096	43086	45666	45339	44655	44374	44212	44565	44692	44855	45001	45315	45982
SYSTEM POWER																	
AVE POWER MW		451	522	634	725	967	996	1132	1105	768	656	444	516	538	745	735	671
PEAK POW MW		2005	2009	2017	2038	2050	2126	2120	2114	2109	2078	2084	2087	2090	2078	2100	2109
ENERGY GWH	6952.4	162.4	87.7	137.0	521.7	719.6	716.8	842.3	822.3	552.6	488.4	159.7	86.6	103.3	554.4	547.0	450.6
DAILY GWH		10.8	12.5	15.2	17.4	23.2	23.9	27.2	26.5	18.4	15.8	10.6	12.4	12.9	17.9	17.6	16.1
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

	29FEB04		2004										2005			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	4061	126	59	75	293	480	750	270	288	276	320	156	73	83	268	252	292
DEPLETION	401	-12	-5	-7	94	232	344	175	20	-57	-93	-28	-13	-15	-93	-88	-54
EVAPORATION	384							24	74	92	80	36	17	19	42		
MOD INFLOW	3276	137	64	82	199	248	406	71	194	241	333	147	69	78	319	340	346
RELEASE	4894	149	69	89	357	430	506	492	492	314	252	122	97	127	461	492	444
STOR CHANGE	-1619	-11	-5	-7	-158	-182	-100	-421	-298	-73	81	25	-29	-48	-142	-152	-98
STORAGE	9603	9592	9586	9580	9422	9239	9139	8719	8421	8348	8429	8454	8425	8377	8235	8083	7984
ELEV FTMSL	2204.0	2203.9	2203.9	2203.8	2202.8	2201.6	2201.0	2198.1	2196.1	2195.6	2196.1	2196.3	2196.1	2195.8	2194.8	2193.7	2193.0
DISCH KCFS	8.8	5.0	5.0	5.0	6.0	7.0	8.5	8.0	8.0	5.3	4.1	4.1	7.0	8.0	7.5	8.0	8.0
POWER																	
AVE POWER MW		60	60	60	72	83	100	93	92	60	47	47	80	91	85	90	89
PEAK POW MW		132	132	132	131	130	171	166	163	163	164	164	164	163	162	160	159
ENERGY GWH	684.4	21.6	10.1	13.0	51.7	61.9	72.0	69.4	68.3	43.4	34.9	16.9	13.4	17.5	63.3	66.9	60.1
--GARRISON--																	
NAT INFLOW	5884	346	161	208	715	570	990	570	500	376	420	164	77	87	204	208	288
DEPLETION	1165	36	17	21	85	172	525	379	70	-82	57	-57	-26	-30	-16		14
CHAN STOR	9	42			-11	-11	-16	5		30	13	0	-32	-11	6	-6	
EVAPORATION	448							28	86	108	94	42	20	22	48		
REG INFLOW	9174	501	214	275	976	818	954	661	835	695	534	300	148	211	639	694	718
RELEASE	11513	506	194	250	893	1015	1101	1076	1045	860	615	298	208	270	1076	1107	1000
STOR CHANGE	-2339	-5	20	25	84	-197	-146	-416	-210	-166	-80	3	-60	-59	-437	-413	-281
STORAGE	11891	11886	11906	11931	12014	11817	11671	11255	11046	10880	10799	10802	10742	10683	10246	9833	9552
ELEV FTMSL	1814.3	1814.2	1814.3	1814.4	1814.8	1814.0	1813.3	1811.5	1810.6	1809.8	1809.4	1809.4	1809.2	1808.9	1806.8	1804.9	1803.5
DISCH KCFS	23.1	17.0	14.0	14.0	15.0	16.5	18.5	17.5	17.0	14.5	10.0	10.0	15.0	17.0	17.5	18.0	18.0
POWER																	
AVE POWER MW		182	150	150	161	177	197	185	178	150	104	104	155	175	178	180	178
PEAK POW MW		310	310	310	311	309	307	301	299	297	295	295	295	294	288	282	278
ENERGY GWH	1450.5	65.5	25.2	32.5	116.0	131.5	141.7	137.4	132.2	108.3	77.3	37.4	26.0	33.6	132.6	134.1	119.4
--OAHE--																	
NAT INFLOW	1262	94	44	57	195	192	240	108	52	92	56	26	12	14		8	72
DEPLETION	585	22	10	13	46	64	123	143	93	23	-8	2	1	1	11	16	25
CHAN STOR	26	32	15		-5	-8	-11	5	3	15	25		-28	-11	-3	-3	
EVAPORATION	369							24	70	87	77	35	16	19	41		
REG INFLOW	11847	610	244	293	1036	1135	1207	1023	937	857	627	287	175	253	1021	1096	1047
RELEASE	13302	328	267	386	1274	1575	1522	1810	1648	509	616	309	144	165	931	926	892
STOR CHANGE	-1455	282	-23	-93	-238	-441	-315	-787	-711	348	11	-22	31	88	90	170	154
STORAGE	11504	11786	11763	11670	11431	10991	10676	9889	9178	9527	9537	9515	9546	9634	9724	9895	10049
ELEV FTMSL	1579.0	1580.3	1580.2	1579.8	1578.7	1576.5	1574.9	1570.8	1566.8	1568.8	1568.9	1568.8	1568.9	1569.4	1569.9	1570.8	1571.7
DISCH KCFS	18.4	11.0	19.2	21.6	21.4	25.6	25.6	29.4	26.8	8.6	10.0	10.4	10.4	10.4	15.1	15.1	16.1
POWER																	
AVE POWER MW		122	213	239	236	279	275	311	276	88	104	108	107	108	157	157	169
PEAK POW MW		571	570	568	562	551	542	521	500	510	510	511	513	516	521	525	
ENERGY GWH	1708.5	44.0	35.8	51.7	169.8	207.5	198.1	231.0	205.1	63.4	77.3	38.8	18.0	20.7	117.0	116.9	113.3
--BIG BEND--																	
EVAPORATION	129							8	24	31	27	12	6	7	14		
REG INFLOW	13174	328	267	386	1274	1575	1522	1802	1623	478	589	297	138	158	917	926	892
RELEASE	13240	394	267	386	1274	1575	1522	1802	1623	478	589	297	138	158	917	926	892
STORAGE	1748	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1683	1683	1682	1682	1682
ELEV FTMSL	1421.2	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	16.9	13.2	19.2	21.6	21.4	25.6	25.6	29.3	26.4	8.0	9.6	10.0	9.9	9.9	14.9	15.1	16.1
POWER																	
AVE POWER MW		63	90	101	100	120	120	137	125	41	49	50	50	50	75	74	77
PEAK POW MW		517	510	509	509	509	509	509	518	538	538	538	538	538	538	538	529
ENERGY GWH	766.5	22.5	15.1	21.9	72.2	89.2	86.2	102.1	93.0	29.3	36.1	18.2	8.5	9.7	55.7	55.1	51.8
--FORT RANDALL--																	
NAT INFLOW	546	63	29	38	65	87	84	36	32	32	8	4	2	2	8	16	40
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	128							10	31	32	22	10	5	5	12		
REG INFLOW	13567	456	295	423	1335	1653	1594	1810	1609	460	574	289	135	154	910	939	929
RELEASE	13616	226	165	406	1335	1653	1594	1810	1783	1539	574	290	135	154	707	689	555
STOR CHANGE	-49	229	131	17				0	-174	-1079	0	0	0	0	203	250	374
STORAGE	3172	3401	3532	3549	3549	3549	3549	3549	3375	2296	2296	2296	2296	2296	2499	2749	3123
ELEV FTMSL	1350.6	1353.4	1355.0	1355.2	1355.2	1355.2	1355.2	1355.2	1353.1	1337.5	1337.5	1337.5	1337.5	1337.5	1341.0	1344.8	1350.0
DISCH KCFS	10.6	7.6	11.9	22.7	22.4	26.9	26.8	29.4	29.0	25.9	9.3	9.7	9.7	9.7	11.5	11.2	10.0
POWER																	
AVE POWER MW		63	100	192	189	226	225	247	242	200	68	71	71	71	85	86	80
PEAK POW MW		349	354	355	355	355	355	355	348	282	283	283	283	283	300	317	338
ENERGY GWH	1338.8	22.7	16.8	41.4	136.4	168.3	162.3	184.0	179.8	144.2	50.7	25.6	11.9	13.6	63.4	63.8	53.6
--GAVINS POINT--																	
NAT INFLOW	1127	66	31	40	85	96	96	81	92	88	96	48	22	26	80	80	100
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	0	6	-8	-21	1	-9	0	-5	1	6	31	-1	0	0	-3	1	2
EVAPORATION	47							3	9	11	10	5	2	2	5		
REG INFLOW	14582	299	188	425	1416	1722	1666	1845	1858	1627	688	327	153	175	768	768	658
RELEASE	14612	329	188	425	1416	1722	1666	1845	1845	1601	688	327	153	175	768	768	697
STOR CHANGE	-30	-30							13	26							-39
STORAGE	388	358	358	358	358	358	358	358	371	397	397	397	397	397	397	397	358
ELEV FTMSL	1207.1	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	13.7	11.0	13.5	23.8	23.8	28.0	28.0	30.0	30.0	26.9	11.2	11.0	11.0	11.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		39	47	82	82	95	95	101	101	93	40	39	39	39	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	609.2	14.0	7.9	17.6	58.7	70.9	68.6	75.1	75.4	67.3	29.6	14.1	6.6	7.5	33.0	33.0	29.7
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1181	79	37	47	130	165	162	129	104	76	60	30	14	16	36	28	68
DEPLETION	247	6	3	4	20	34	30	36	34	22	9	6	3	3	12	13	13
REGULATED FLOW AT SIOUX CITY																	
KAF	15546	401	222	469	1526	1853	1798	1938	1915	1655	739	352	164	188	792	783	752
KCFS		13.5	16.0	26.3	25.6	30.1	30.2	31.5	31.1	27.8	12.0	11.8	11.8	11.8	12.9	12.7	13.5
--TOTAL--																	
NAT INFLOW	14061	774	361	464	1483	1590	2322	1194	1068	940	960	428	200	228	596	592	860
DEPLETION	2592	54	25	32	254	530	1058	790	242	-92	-32	-71	-33	-38	-73	-55	1
CHAN STOR	24	79	7	-21	-16	-27	-27	6	4	40	69	-1	-61	-23	-1	-8	2
EVAPORATION	1506							96	294	361	311	141	66	75	163		
STORAGE	38306	38705	38826	38769	38456	37636	37075	35452	34073	33129	33140	33146	33088	33069	32782	32638	32748
SYSTEM POWER																	
AVE POWER MW		529	661	824	840	980	1012	1074	1013	633	411	419	503	534	625	632	637
PEAK POW MW		1993	1991	1988	1982	1967	1998	1967	1944	1907	1908	1908	1907	1909	1881	1896	1905
ENERGY GWH	6558.0	190.4	111.0	178.1	604.9	729.4	729.0	799.0	753.7	456.0	305.9	150.9	84.4	102.5	465.0	469.9	427.9
DAILY GWH		12.7	15.9	19.8	20.2	23.5	24.3	25.8	24.3	15.2	9.9	10.1	12.1	12.8	15.0	15.2	15.3

DATE OF STUDY 02/09/04

2004 MEDIAN RUNOFF

TIME OF STUDY 10:51:43

SHORTEN NAVIGATION SEASON 31-DAYS
VALUES IN 1000 AF EXCEPT AS INDICATED

STUDY NO 4

	29FEB04		2004										2005			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	7400	264	123	158	628	1210	1851	829	324	319	398	188	88	100	310	261	349
DEPLETION	121	1	1	1	29	259	386	145	-83	-99	-68	-35	-16	-18	-125	-152	-105
EVAPORATION	364							22	69	87	76	35	16	18	40		
MOD INFLOW	6915	263	123	158	599	951	1465	662	338	331	390	187	87	100	395	413	454
RELEASE	5719	179	69	89	357	430	595	584	584	383	297	143	97	127	615	615	555
STOR CHANGE	1196	84	53	68	242	521	870	78	-247	-52	93	45	-10	-27	-220	-202	-101
STORAGE	9590	9675	9728	9796	10038	10559	11429	11506	11260	11208	11302	11346	11336	11309	11090	10888	10786
ELEV FTMSL	2203.9	2204.4	2204.8	2205.2	2206.7	2210.0	2215.1	2215.6	2214.1	2213.8	2214.4	2214.6	2214.6	2214.4	2213.1	2211.9	2211.3
DISCH KCFS	9.0	6.0	5.0	5.0	6.0	7.0	10.0	9.5	9.5	6.4	4.8	4.8	7.0	8.0	10.0	10.0	10.0
POWER																	
AVE POWER MW		72	60	60	73	86	124	120	120	81	61	61	88	101	125	124	124
PEAK POW MW		133	133	134	135	139	189	190	188	188	188	189	189	188	187	185	184
ENERGY GWH	861.7	26.0	10.1	13.1	52.4	63.9	89.6	89.2	89.0	58.2	45.2	21.8	14.8	19.3	93.2	92.6	83.3
--GARRISON--																	
NAT INFLOW	11001	469	219	282	853	1423	2958	2066	581	497	454	192	89	102	253	237	326
DEPLETION	1212	41	19	24	56	213	750	574	66	-111	8	-97	-45	-51	-105	-83	-47
CHAN STOR	-11	33	11		-11	-11	-33	5		32	17	0	-23	-11	-21		
EVAPORATION	420							25	81	101	88	40	19	21	46		
REG INFLOW	15078	640	280	346	1143	1630	2771	2056	1018	922	671	391	190	249	906	935	928
RELEASE	13882	506	194	250	1012	1476	1309	1322	1291	1039	779	378	236	286	1230	1353	1222
STOR CHANGE	1195	134	86	96	132	154	1461	734	-273	-118	-108	13	-46	-37	-324	-418	-293
STORAGE	11790	11925	12011	12107	12239	12392	13854	14588	14315	14198	14090	14103	14057	14020	13697	13279	12985
ELEV FTMSL	1813.8	1814.4	1814.8	1815.2	1815.7	1816.4	1822.3	1825.1	1824.1	1823.6	1823.2	1823.3	1823.1	1822.9	1821.7	1820.0	1818.8
DISCH KCFS	24.0	17.0	14.0	14.0	17.0	24.0	22.0	21.5	21.0	17.5	12.7	12.7	17.0	18.0	20.0	22.0	22.0
POWER																	
AVE POWER MW		182	150	151	183	259	243	245	241	200	145	145	194	205	226	246	243
PEAK POW MW		310	311	312	314	316	333	341	338	337	336	336	335	335	331	326	323
ENERGY GWH	1874.0	65.4	25.3	32.6	132.1	192.6	175.0	182.2	179.1	143.8	107.8	52.2	32.5	39.3	168.0	182.8	163.5
--OAHE--																	
NAT INFLOW	2300	317	148	190	364	236	689	162	33	118	14	5	2	3	-20		40
DEPLETION	585	22	10	13	46	64	123	143	93	23	-8	2	1	1	11	16	25
CHAN STOR	12	37	15		-15	-35	10	2	2	18	24	0	-22	-5	-10	-10	0
EVAPORATION	368							23	70	88	77	35	16	19	41		
REG INFLOW	15242	837	347	426	1314	1613	1885	1321	1164	1065	748	347	200	264	1148	1327	1237
RELEASE	13126	396	210	259	977	1450	1351	1765	1599	873	906	285	143	162	924	942	886
STOR CHANGE	2115	441	137	168	337	163	534	-444	-435	192	-157	62	57	102	224	385	351
STORAGE	11465	11906	12043	12210	12548	12710	13244	12800	12365	12557	12400	12461	12518	12621	12844	13229	13580
ELEV FTMSL	1578.8	1580.9	1581.5	1582.3	1583.8	1584.5	1586.8	1584.9	1583.0	1583.9	1583.1	1583.4	1583.7	1584.1	1585.1	1586.8	1588.3
DISCH KCFS	19.2	13.3	15.2	14.5	16.4	23.6	22.7	28.7	26.0	14.7	14.7	9.6	10.3	10.2	15.0	15.3	15.9
POWER																	
AVE POWER MW		148	169	163	185	267	260	328	294	166	167	109	117	116	171	176	185
PEAK POW MW		574	577	581	589	593	605	595	585	589	585	587	588	591	596	605	612
ENERGY GWH	1806.8	53.2	28.5	35.1	133.5	198.9	187.1	244.2	218.9	119.6	124.2	39.1	19.6	22.3	127.6	131.0	124.3
--BIG BEND--																	
EVAPORATION	103							6	20	25	22	10	5	5	11		
REG INFLOW	13023	396	210	259	977	1450	1351	1759	1579	848	884	275	138	156	913	942	886
RELEASE	13023	396	210	259	977	1450	1351	1759	1579	848	884	275	138	156	913	942	886
STORAGE	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682
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	19.8	13.3	15.2	14.5	16.4	23.6	22.7	28.6	25.7	14.2	14.4	9.2	10.0	9.9	14.8	15.3	15.9
POWER																	
AVE POWER MW		63	71	68	77	110	106	134	122	70	73	47	50	50	75	75	77
PEAK POW MW		517	509	509	509	509	509	509	518	538	538	538	538	538	538	538	529
ENERGY GWH	755.8	22.7	11.9	14.6	55.4	82.1	76.5	99.6	90.4	50.6	54.0	16.9	8.5	9.6	55.4	56.1	51.4
--FORT RANDALL--																	
NAT INFLOW	900	122	57	73	115	140	185	74	57	42	2	2	1	1	10		19
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	107							8	25	28	20	8	4	4	10		
REG INFLOW	13737	517	267	331	1088	1581	1524	1807	1596	855	865	268	135	152	910	939	902
RELEASE	13738	226	133	331	1088	1581	1524	1807	1770	1530	1268	268	135	152	707	689	528
STOR CHANGE	0	291	134			0		0	-174	-675	-403	0	0	0	203	250	374
STORAGE	3124	3415	3549	3549	3549	3549	3549	3549	3375	2700	2297	2297	2297	2297	2500	2750	3124
ELEV FTMSL	1350.0	1353.6	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.1	1344.1	1337.5	1337.5	1337.5	1337.5	1341.0	1344.8	1350.0
DISCH KCFS	12.2	7.6	9.6	18.5	18.3	25.7	25.6	29.4	28.8	25.7	20.6	9.0	9.7	9.6	11.5	11.2	9.5
POWER																	
AVE POWER MW		63	81	157	155	217	216	247	240	205	154	66	71	70	85	86	76
PEAK POW MW		350	355	355	355	355	355	355	348	313	283	283	283	283	300	317	338
ENERGY GWH	1349.7	22.7	13.6	33.9	111.4	161.1	155.3	183.7	178.5	147.6	114.6	23.7	11.9	13.5	63.4	63.8	51.0
--GAVINS POINT--																	
NAT INFLOW	1450	92	43	55	148	174	166	86	103	77	122	50	23	27	77	79	127
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	4	9	-4	-17	1	-14	0	-7	1	6	9	22	-1	0	-4	1	3
EVAPORATION	38							2	7	9	8	4	2	2	4		
REG INFLOW	15040	328	172	370	1232	1722	1666	1845	1858	1609	1390	331	153	175	766	767	658
RELEASE	15040	328	172	370	1232	1722	1666	1845	1845	1583	1390	331	153	175	766	767	697
STOR CHANGE									13	26							-39
STORAGE	358	358	358	358	358	358	358	358	371	397	397	397	397	397	397	397	358
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	13.5	11.0	12.4	20.7	20.7	28.0	28.0	30.0	30.0	26.6	22.6	11.1	11.0	11.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		39	43	71	71	95	95	101	101	92	79	40	39	39	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	627.7	13.9	7.3	15.4	51.4	70.9	68.6	75.1	75.4	66.6	59.1	14.2	6.6	7.5	32.9	33.0	29.7
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1550	169	79	102	199	310	224	129	96	60	42	16	7	9	21	5	82
DEPLETION	247	6	3	4	20	34	30	36	34	22	9	6	3	3	12	13	13
REGULATED FLOW AT SIOUX CITY																	
KAF	16343	491	249	467	1411	1998	1860	1938	1907	1621	1423	342	158	180	775	759	766
KCFS		16.5	17.9	26.2	23.7	32.5	31.3	31.5	31.0	27.2	23.1	11.5	11.4	11.4	12.6	12.3	13.8
--TOTAL--																	
NAT INFLOW	24601	1435	669	860	2307	3493	6073	3346	1194	1113	1032	452	211	241	651	582	943
DEPLETION	2359	72	33	43	160	598	1325	955	135	-163	-56	-118	-55	-63	-194	-202	-111
CHAN STOR	6	78	23	-17	-26	-60	-22	0	4	56	50	22	-46	-15	-35	-9	3
EVAPORATION	1399							86	271	337	291	131	61	70	152		
STORAGE	38010	38960	39370	39702	40413	41250	44116	44483	43368	42742	42167	42286	42287	42326	42209	42225	42516
SYSTEM POWER																	
AVE POWER MW		566	576	670	745	1034	1045	1175	1117	814	679	467	559	581	727	752	749
PEAK POW MW		1997	2000	2005	2017	2026	2106	2105	2092	2082	2048	2050	2051	2052	2029	2049	2062
ENERGY GWH	7275.7	203.9	96.7	144.7	536.2	769.5	752.2	873.9	831.3	586.3	504.9	168.0	93.9	111.4	540.5	559.2	503.1
DAILY GWH		13.6	13.8	16.1	17.9	24.8	25.1	28.2	26.8	19.5	16.3	11.2	13.4	13.9	17.4	18.0	18.0
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

DATE OF STUDY 02/09/04 — 2004 AOP EXTENSIONS, MEDIAN RUNOFF SIMULATION

TIME OF STUDY 10:51:43 — SHORTEN NAVIGATION SEASON 15-DAYS — STUDY NO 5

VALUES IN 1000 AF EXCEPT AS INDICATED

	28FEB05	2005											2006			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	7400	264	123	158	628	1210	1851	829	324	319	398	188	88	100	310	261	349
DEPLETION	388	-2	-1	-1	54	338	551	190	-75	-143	-76	-40	-18	-21	-134	-140	-94
EVAPORATION	384							23	73	92	81	37	17	20	42		
MOD INFLOW	6628	266	124	160	574	872	1300	616	326	370	393	190	89	102	402	401	443
RELEASE	5151	179	69	89	357	430	506	523	523	357	274	133	83	111	523	523	472
STOR CHANGE	1477	88	55	70	217	442	794	93	-197	13	119	58	6	-10	-121	-122	-29
STORAGE	10786	10874	10929	10999	11216	11658	12452	12545	12349	12362	12481	12539	12545	12535	12414	12292	12263
ELEV FTMSL	2211.3	2211.9	2212.2	2212.6	2213.9	2216.4	2220.9	2221.4	2220.3	2220.4	2221.1	2221.4	2221.4	2221.4	2221.4	2220.7	2220.0	2219.9
DISCH KCFS	10.0	6.0	5.0	5.0	6.0	7.0	8.5	8.5	8.5	6.0	4.5	4.5	6.0	7.0	8.5	8.5	8.5
POWER																	
AVE POWER MW		75	62	62	75	88	109	110	110	78	58	58	78	91	110	110	110
PEAK POW MW		185	185	186	188	191	197	197	196	196	197	197	197	197	197	196	196
ENERGY GWH	801.5	26.8	10.5	13.5	54.1	65.8	78.5	82.1	82.0	56.0	43.1	20.9	13.1	17.5	82.0	81.8	73.7
--GARRISON--																	
NAT INFLOW	11001	469	219	282	853	1423	2958	2066	581	497	454	192	89	102	253	237	326
DEPLETION	948	1	1	1	5	185	759	511	29	-132	-3	-93	-43	-49	-96	-80	-48
CHAN STOR	16	43	11		-11	-11	-16	0		26	16		-16	-10	-15		0
EVAPORATION	457							27	87	110	96	43	20	23	50		
REG INFLOW	14764	690	298	370	1194	1658	2689	2050	987	902	651	373	180	229	807	840	846
RELEASE	12968	476	208	268	1012	1168	1220	1230	1199	952	754	365	201	286	1230	1261	1139
STOR CHANGE	1796	213	90	102	183	490	1469	821	-212	-50	-104	8	-22	-56	-423	-421	-292
STORAGE	12985	13199	13289	13391	13574	14064	15533	16353	16141	16091	15987	15996	15974	15918	15495	15074	14781
ELEV FTMSL	1818.8	1819.7	1820.1	1820.5	1821.2	1823.1	1828.6	1831.5	1830.8	1830.6	1830.3	1830.3	1830.2	1830.0	1828.5	1826.9	1825.8
DISCH KCFS	22.0	16.0	15.0	15.0	17.0	19.0	20.5	20.0	19.5	16.0	12.3	12.3	14.5	18.0	20.0	20.5	20.5
POWER																	
AVE POWER MW		177	167	168	190	214	237	236	232	190	146	146	172	213	235	238	236
PEAK POW MW		325	326	328	330	335	352	445	442	441	440	440	440	439	433	428	424
ENERGY GWH	1823.3	63.9	28.1	36.2	137.1	159.6	170.7	175.8	172.7	137.1	108.7	52.5	28.9	40.9	174.9	177.4	158.8
--OAHE--																	
NAT INFLOW	2300	317	148	190	364	236	689	162	33	118	14	5	2	3	-20		40
DEPLETION	597	22	10	13	46	65	126	147	96	24	-8	2	1	1	11	16	25
CHAN STOR	8	29	5	0	-9	-9	-7	2	2	16	17		-10	-16	-9	-2	
EVAPORATION	415							26	80	99	87	39	18	21	46		
REG INFLOW	14263	799	350	444	1320	1330	1776	1221	1058	963	707	330	174	250	1144	1242	1154
RELEASE	12422	520	95	258	977	1069	988	1498	1604	1209	654	511	124	164	924	972	856
STOR CHANGE	1841	280	255	186	343	261	788	-277	-546	-246	53	-181	51	86	220	271	298
STORAGE	13580	13860	14116	14301	14644	14905	15693	15416	14870	14624	14678	14496	14547	14633	14853	15123	15421
ELEV FTMSL	1588.3	1589.4	1590.5	1591.2	1592.6	1593.6	1596.6	1595.6	1593.5	1592.5	1592.7	1592.0	1592.2	1592.5	1593.4	1594.4	1595.6
DISCH KCFS	15.9	17.5	6.8	14.5	16.4	17.4	16.6	24.4	26.1	20.3	10.6	17.2	8.9	10.4	15.0	15.8	15.4
POWER																	
AVE POWER MW		204	81	171	195	208	201	296	314	243	127	204	106	124	180	190	186
PEAK POW MW		618	623	627	634	639	654	648	638	633	634	631	632	633	638	643	649
ENERGY GWH	1801.9	73.4	13.5	37.0	140.5	154.7	144.7	219.9	233.3	174.7	94.6	73.6	17.9	23.7	133.8	141.4	125.2
--BIG BEND--																	
EVAPORATION	103							6	20	25	22	10	5	5	11		
REG INFLOW	12319	520	95	258	977	1069	988	1492	1584	1184	632	501	119	159	913	972	856
RELEASE	12319	520	95	258	977	1069	988	1492	1584	1184	632	501	119	159	913	972	856
STORAGE	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682
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	15.9	17.5	6.8	14.5	16.4	17.4	16.6	24.3	25.8	19.9	10.3	16.8	8.6	10.0	14.8	15.8	15.4
POWER																	
AVE POWER MW		82	32	68	77	81	78	114	121	95	52	85	44	51	75	78	74
PEAK POW MW		510	509	509	509	509	509	509	509	525	538	538	538	538	538	538	529
ENERGY GWH	713.0	29.5	5.4	14.6	55.4	60.6	56.0	84.5	89.7	68.3	38.7	30.5	7.3	9.7	55.4	57.7	49.7
--FORT RANDALL--																	
NAT INFLOW	900	122	57	73	115	140	185	74	57	42	2	2	1	1	10		19
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	112							8	25	31	22	8	4	4	10		
REG INFLOW	13023	641	151	331	1088	1200	1161	1540	1601	1188	607	493	117	155	910	969	872
RELEASE	13023	232	134	331	1088	1200	1161	1540	1601	1535	1484	521	117	155	707	689	528
STOR CHANGE	0	408	17					0	0	-347	-877	-28	0	0	203	280	344
STORAGE	3124	3532	3549	3549	3549	3549	3549	3549	3549	3202	2325	2297	2297	2297	2500	2780	3124
ELEV FTMSL	1350.0	1355.0	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1351.0	1338.0	1337.5	1337.5	1337.5	1341.0	1345.3	1350.0
DISCH KCFS	9.5	7.8	9.7	18.5	18.3	19.5	19.5	25.0	26.0	25.8	24.1	17.5	8.4	9.8	11.5	11.2	9.5
POWER																	
AVE POWER MW		65	82	157	155	165	165	211	219	214	186	127	61	71	85	86	76
PEAK POW MW		354	355	355	355	355	355	355	355	341	285	284	283	284	300	319	338
ENERGY GWH	1284.6	23.4	13.8	33.9	111.4	122.8	118.8	157.0	163.1	153.8	138.2	45.8	10.3	13.7	63.4	64.0	51.1
--GAVINS POINT--																	
NAT INFLOW	1450	92	43	55	148	174	166	86	103	77	122	50	23	27	77	79	127
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	3	-4	-17	0	-2	0	-11	-2	0	3	12	17	-3	-3	1	3
EVAPORATION	38							2	7	9	8	4	2	2	4		
REG INFLOW	14320	328	174	370	1232	1353	1303	1574	1685	1609	1599	574	153	174	767	767	658
RELEASE	14320	328	174	370	1232	1353	1303	1574	1672	1583	1599	574	153	174	767	767	697
STOR CHANGE									13	26							-39
STORAGE	358	358	358	358	358	358	358	358	371	397	397	397	397	397	397	397	358
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	12.5	11.0	12.5	20.7	20.7	22.0	21.9	25.6	27.2	26.6	26.0	19.3	11.0	11.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		39	44	71	71	76	75	88	93	92	91	68	39	39	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	601.7	13.9	7.4	15.4	51.4	56.3	54.2	65.1	69.3	66.6	67.8	24.5	6.6	7.5	33.0	33.0	29.7
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1550	169	79	102	199	310	224	129	96	60	42	16	7	9	21	5	82
DEPLETION	248	6	3	4	20	34	30	37	34	22	9	6	3	3	12	13	13
REGULATED FLOW AT SIOUX CITY																	
KAF	15622	491	250	467	1411	1629	1497	1666	1734	1621	1632	585	158	180	776	759	766
KCFS		16.5	18.0	26.2	23.7	26.5	25.2	27.1	28.2	27.2	26.5	19.7	11.4	11.3	12.6	12.3	13.8
--TOTAL--																	
NAT INFLOW	24601	1435	669	860	2307	3493	6073	3346	1194	1113	1032	452	211	241	651	582	943
DEPLETION	2375	29	14	17	134	650	1502	942	109	-227	-75	-119	-56	-63	-194	-187	-101
CHAN STOR	19	75	12	-17	-20	-22	-23	-8	0	42	31	12	-8	-29	-28	-2	3
EVAPORATION	1509							93	292	366	315	141	66	75	163		
STORAGE	42516	43505	43923	44281	45024	46216	49267	49904	48962	48358	47550	47407	47442	47462	47340	47348	47630
SYSTEM POWER																	
AVE POWER MW		642	468	697	764	833	865	1054	1089	912	660	689	501	589	729	746	727
PEAK POW MW		2108	2114	2119	2130	2144	2181	2269	2255	2254	2211	2207	2207	2208	2183	2202	2211
ENERGY GWH	7026.1	231.0	78.7	150.6	550.0	619.7	622.9	784.4	810.2	656.4	491.1	247.9	84.1	113.1	542.5	555.2	488.3
DAILY GWH		15.4	11.2	16.7	18.3	20.0	20.8	25.3	26.1	21.9	15.8	16.5	12.0	14.1	17.5	17.9	17.4

INI-SUM 15MAR 22MAR 31MAR 30APR 31MAY 30JUN 31JUL 31AUG 30SEP 31OCT 15NOV 22NOV 30NOV 31DEC 31JAN 28FEB

DATE OF STUDY 02/09/04

2004 AOP EXTENSIONS, MEDIAN RUNOFF SIMULATION

TIME OF STUDY 10:51:43

NO SHORTENED SEASON
VALUES IN 1000 AF EXCEPT AS INDICATED

STUDY NO 6

	28FEB06	2006											2007			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	7400	264	123	158	628	1210	1851	829	324	319	398	188	88	100	310	261	349
DEPLETION	397	-2	-1	-1	55	331	561	197	-71	-144	-80	-40	-19	-21	-134	-140	-94
EVAPORATION	424							25	80	101	89	41	19	22	47		
MOD INFLOW	6579	266	124	160	573	879	1290	607	315	362	389	187	87	100	397	401	443
RELEASE	4756	179	69	89	357	430	476	461	461	327	251	122	83	111	461	461	417
STOR CHANGE	1823	88	55	70	216	449	814	145	-146	35	138	65	4	-11	-64	-60	26
STORAGE	12263	12351	12406	12476	12692	13141	13955	14100	13954	13988	14126	14191	14195	14184	14120	14060	14086
ELEV FTMSL	2219.9	2220.4	2220.7	2221.0	2222.2	2224.7	2228.9	2229.6	2228.9	2229.1	2229.8	2230.1	2230.1	2230.1	2229.7	2229.4	2229.6
DISCH KCFS	8.5	6.0	5.0	5.0	6.0	7.0	8.0	7.5	7.5	5.5	4.1	4.1	6.0	7.0	7.5	7.5	7.5
POWER																	
AVE POWER MW		78	65	65	78	92	106	101	101	74	55	55	81	94	101	101	101
PEAK POW MW		196	197	197	198	201	205	205	205	205	205	205	205	205	205	205	205
ENERGY GWH	766.5	28.0	10.9	14.0	56.3	68.4	76.6	74.8	74.8	53.1	40.8	19.8	13.6	18.1	74.9	74.9	67.6
--GARRISON--																	
NAT INFLOW	11001	469	219	282	853	1423	2958	2066	581	497	454	192	89	102	253	237	326
DEPLETION	886	3	2	2	12	173	785	518	35	-135	-8	-107	-50	-57	-119	-102	-67
CHAN STOR	10	26	10		-10	-10	-10	5		20	14		-19	-10	-5		
EVAPORATION	472							29	91	113	99	45	21	24	51		
REG INFLOW	14410	671	297	369	1188	1670	2639	1986	916	866	629	375	182	236	777	800	810
RELEASE	13981	476	222	286	1101	1261	1369	1383	1353	932	788	381	222	286	1230	1414	1277
STOR CHANGE	429	195	75	83	87	410	1270	602	-436	-66	-160	-6	-40	-49	-453	-614	-468
STORAGE	14781	14976	15051	15134	15221	15631	16901	17503	17066	17000	16840	16834	16794	16745	16292	15678	15210
ELEV FTMSL	1825.8	1826.6	1826.8	1827.2	1827.5	1829.0	1833.4	1835.5	1834.0	1833.8	1833.2	1833.2	1833.1	1832.9	1831.3	1829.1	1827.4
DISCH KCFS	20.5	16.0	16.0	16.0	18.5	20.5	23.0	22.5	22.0	15.7	12.8	12.8	16.0	18.0	20.0	23.0	23.0
POWER																	
AVE POWER MW		185	185	186	215	239	273	273	268	190	156	155	193	217	240	272	268
PEAK POW MW		426	427	428	430	435	452	459	454	453	451	451	450	449	444	436	429
ENERGY GWH	2013.2	66.5	31.2	40.1	154.7	178.0	196.8	203.2	199.1	137.1	115.8	55.9	32.5	41.7	178.2	202.1	180.2
--OAHE--																	
NAT INFLOW	2300	317	148	190	364	236	689	162	33	118	14	5	2	3	-20		40
DEPLETION	613	23	11	14	47	66	129	151	100	25	-8	2	1	1	11	16	26
CHAN STOR	-12	20			-11	-9	-11	2	2	27	12	0	-14	-9	-9	-13	
EVAPORATION	451							29	89	109	93	41	19	22	48		
REG INFLOW	15206	790	359	462	1407	1422	1918	1368	1198	943	730	344	190	257	1142	1385	1291
RELEASE	13894	519	95	258	977	1069	988	1720	1819	1621	1107	524	241	209	1082	879	786
STOR CHANGE	1312	271	264	203	430	353	930	-352	-621	-678	-378	-180	-51	48	60	506	506
STORAGE	15421	15692	15956	16160	16589	16942	17872	17520	16899	16221	15843	15663	15613	15661	15721	16227	16733
ELEV FTMSL	1595.6	1596.6	1597.6	1598.3	1599.9	1601.1	1604.3	1603.1	1601.0	1598.6	1597.2	1596.5	1596.3	1596.5	1596.7	1598.6	1600.4
DISCH KCFS	15.4	17.5	6.8	14.5	16.4	17.4	16.6	28.0	29.6	27.2	18.0	17.6	17.4	13.2	17.6	14.3	14.1
POWER																	
AVE POWER MW		212	84	178	203	217	210	354	370	337	221	215	212	160	215	175	176
PEAK POW MW		654	658	662	670	677	694	687	676	663	656	653	652	653	654	663	673
ENERGY GWH	2085.0	76.4	14.1	38.5	146.3	161.2	150.9	263.1	275.5	242.6	164.5	77.4	35.6	30.8	159.6	130.6	118.0
--BIG BEND--																	
EVAPORATION	103							6	20	25	22	10	5	5	11		
REG INFLOW	13791	519	95	258	977	1069	988	1714	1799	1596	1086	514	237	203	1070	879	786
RELEASE	13791	519	95	258	977	1069	988	1714	1799	1596	1086	514	237	203	1070	879	786
STORAGE	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682
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	15.4	17.5	6.8	14.5	16.4	17.4	16.6	27.9	29.3	26.8	17.7	17.3	17.0	12.8	17.4	14.3	14.1
POWER																	
AVE POWER MW		82	32	68	77	81	78	130	137	127	87	87	86	65	86	70	68
PEAK POW MW		510	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
ENERGY GWH	796.1	29.5	5.4	14.6	55.4	60.6	56.0	97.1	101.9	91.5	64.5	31.2	14.4	12.4	64.0	52.0	45.6
--FORT RANDALL--																	
NAT INFLOW	900	122	57	73	115	140	185	74	57	42	2	2	1	1	10		19
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	118							8	25	31	25	10	4	4	10		
REG INFLOW	14494	640	151	331	1088	1200	1161	1762	1816	1600	1062	505	233	200	1067	876	802
RELEASE	14493	232	134	331	1088	1200	1161	1762	1816	1744	1699	809	378	222	701	689	528
STOR CHANGE	0	408	17					0	0	-144	-637	-304	-145	-22	366	187	274
STORAGE	3124	3532	3549	3549	3549	3549	3549	3549	3549	3405	2768	2464	2319	2297	2663	2850	3124
ELEV FTMSL	1350.0	1355.0	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.1	1340.4	1337.9	1337.5	1343.5	1346.3	1350.0
DISCH KCFS	9.5	7.8	9.7	18.5	18.3	19.5	19.5	28.7	29.5	29.3	27.6	27.2	27.2	14.0	11.4	11.2	9.5
POWER																	
AVE POWER MW		65	82	157	155	165	165	241	248	245	221	206	199	102	85	87	76
PEAK POW MW		354	355	355	355	355	355	355	355	349	318	296	285	284	311	324	338
ENERGY GWH	1435.5	23.4	13.8	33.9	111.4	122.8	118.8	179.2	184.6	176.0	164.6	74.0	33.5	19.6	63.6	65.0	51.3
--GAVINS POINT--																	
NAT INFLOW	1450	92	43	55	148	174	166	86	103	77	122	50	23	27	77	79	127
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	3	-4	-17	0	-2	0	-18	-2	0	3	1	0	25	5	0	3
EVAPORATION	38							2	7	9	8	4	2	2	4		
REG INFLOW	15790	328	174	370	1232	1353	1303	1789	1901	1817	1814	851	397	268	768	767	658
RELEASE	15790	328	174	370	1232	1353	1303	1789	1888	1791	1814	851	397	268	768	767	697
STOR CHANGE									13	26							-39
STORAGE	358	358	358	358	358	358	358	358	371	397	397	397	397	397	397	397	358
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	12.5	11.0	12.5	20.7	20.7	22.0	21.9	29.1	30.7	30.1	29.5	28.6	28.6	16.9	12.5	12.5	12.5
POWER																	
AVE POWER MW		39	44	71	71	76	75	99	103	103	102	100	100	60	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	659.1	13.9	7.4	15.4	51.4	56.3	54.2	73.5	76.6	74.1	76.2	36.0	16.8	11.5	33.0	33.0	29.7
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1550	169	79	102	199	310	224	129	96	60	42	16	7	9	21	5	82
DEPLETION	251	6	3	4	21	35	30	37	34	22	10	6	3	3	12	13	13
REGULATED FLOW AT SIOUX CITY																	
KAF	17089	491	250	467	1410	1628	1497	1881	1950	1829	1846	861	402	274	777	759	766
KCFS		16.5	18.0	26.2	23.7	26.5	25.2	30.6	31.7	30.7	30.0	29.0	29.0	17.3	12.6	12.3	13.8
--TOTAL--																	
NAT INFLOW	24601	1435	669	860	2307	3493	6073	3346	1194	1113	1032	452	211	241	651	582	943
DEPLETION	2341	31	15	19	144	633	1541	960	123	-230	-83	-134	-62	-71	-217	-209	-119
CHAN STOR	-2	50	7	-17	-21	-21	-21	-10	0	48	30	1	-34	6	-9	-13	3
EVAPORATION	1605							99	312	389	335	150	69	79	172		
STORAGE	47630	48591	49002	49359	50091	51302	54316	54711	53521	52693	51657	51232	51000	50965	50875	50894	51193
SYSTEM POWER																	
AVE POWER MW		660	492	725	799	870	907	1197	1227	1076	842	818	871	698	771	749	733
PEAK POW MW		2255	2261	2266	2277	2291	2328	2330	2313	2304	2285	2261	2248	2246	2230	2244	2250
ENERGY GWH	7755.4	237.8	82.7	156.6	575.5	647.3	653.3	890.9	912.6	774.5	626.4	294.3	146.3	134.0	573.4	557.5	492.4
DAILY GWH		15.9	11.8	17.4	19.2	20.9	21.8	28.7	29.4	25.8	20.2	19.6	20.9	16.8	18.5	18.0	17.6
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

DATE OF STUDY 02/09/04

2004 AOP EXTENSIONS, MEDIAN RUNOFF SIMULATION

TIME OF STUDY 10:51:43

STUDY NO 7

VALUES IN 1000 AF EXCEPT AS INDICATED

	28FEB07	2007											2008			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB
--FORT PECK--																	
NAT INFLOW	7400	264	123	158	628	1210	1851	829	324	319	398	188	88	100	310	261	349
DEPLETION	397	-2	-1	-1	55	331	561	197	-71	-144	-80	-40	-19	-21	-134	-140	-94
EVAPORATION	455							28	87	109	95	43	20	23	50		
MOD INFLOW	6548	266	124	160	573	879	1290	604	308	354	383	184	86	98	394	401	443
RELEASE	6012	179	69	89	417	492	762	615	584	372	300	149	83	127	584	615	575
STOR CHANGE	537	88	55	70	156	387	528	-10	-276	-18	83	36	3	-29	-190	-214	-132
STORAGE	14086	14174	14228	14299	14455	14842	15371	15360	15084	15066	15149	15185	15187	15159	14969	14755	14623
ELEV FTMSL	2229.6	2230.0	2230.3	2230.6	2231.4	2233.3	2235.8	2235.7	2234.4	2234.3	2234.7	2234.9	2234.9	2234.8	2233.9	2232.8	2232.2
DISCH KCFS	7.5	6.0	5.0	5.0	7.0	8.0	12.8	10.0	9.5	6.3	4.9	5.0	6.0	8.0	9.5	10.0	10.0
POWER																	
AVE POWER MW		81	67	67	94	108	99	130	130	85	67	68	82	109	129	136	135
PEAK POW MW		205	206	206	206	208	210	210	209	209	209	209	209	209	208	207	207
ENERGY GWH	928.9	29.0	11.3	14.6	67.9	80.5	71.2	96.6	96.4	61.4	49.5	24.6	13.8	20.9	96.1	100.9	94.1
--GARRISON--																	
NAT INFLOW	11001	469	219	282	853	1423	2958	2066	581	497	454	192	89	102	253	237	326
DEPLETION	980	-7	-3	-4	-8	214	826	587	40	-138	-12	-110	-51	-59	-120	-101	-74
CHAN STOR	-27	16	10		-21	-10	-49	28	5	32	14	-1	-10	-20	-15	-5	
EVAPORATION	483							29	94	117	101	45	21	24	52		
REG INFLOW	15523	670	302	375	1257	1691	2845	2092	1036	923	679	404	193	244	890	948	975
RELEASE	14946	476	222	286	1131	1322	1428	1445	1414	1088	1012	490	229	317	1230	1476	1381
STOR CHANGE	578	194	80	89	126	369	1416	647	-378	-165	-333	-86	-36	-74	-339	-528	-405
STORAGE	15210	15404	15484	15573	15700	16068	17485	18132	17754	17589	17256	17170	17134	17060	16721	16193	15788
ELEV FTMSL	1827.4	1828.2	1828.4	1828.8	1829.2	1830.5	1835.4	1837.6	1836.3	1835.8	1834.7	1834.4	1834.2	1834.0	1832.8	1831.0	1829.5
DISCH KCFS	23.0	16.0	16.0	16.0	19.0	21.5	24.0	23.5	23.0	18.3	16.5	16.5	16.5	20.0	20.0	24.0	24.0
POWER																	
AVE POWER MW		187	187	188	223	254	288	289	284	225	202	201	200	243	242	286	283
PEAK POW MW		432	433	434	436	441	459	467	462	460	456	455	454	453	449	442	437
ENERGY GWH	2176.3	67.2	31.5	40.6	160.6	188.6	207.6	214.9	211.0	161.9	149.9	72.2	33.7	46.6	179.7	213.1	197.2
--OAHE--																	
NAT INFLOW	2300	317	148	190	364	236	689	162	33	118	14	5	2	3	-20		40
DEPLETION	626	23	11	14	47	67	132	156	103	25	-9	2	1	1	12	17	26
CHAN STOR	-5	30			-13	-10	-10	2	2	20	8	0		-15	0	-17	
EVAPORATION	465							30	92	112	96	43	20	23	49		
REG INFLOW	16150	800	359	462	1435	1481	1975	1423	1254	1089	947	450	210	281	1148	1441	1395
RELEASE	15571	519	122	324	1185	1284	1196	1872	1973	1770	1261	598	276	240	1143	970	838
STOR CHANGE	579	281	237	137	250	196	778	-449	-718	-681	-314	-148	-66	41	5	471	557
STORAGE	16733	17014	17251	17389	17639	17835	18613	18165	17446	16765	16451	16303	16238	16278	16284	16755	17312
ELEV FTMSL	1600.4	1601.4	1602.2	1602.7	1603.5	1604.2	1606.8	1605.3	1602.9	1600.5	1599.4	1598.9	1598.6	1598.8	1598.8	1600.5	1602.4
DISCH KCFS	14.1	17.4	8.8	18.2	19.9	20.9	20.1	30.4	32.1	29.7	20.5	20.1	19.9	15.1	18.6	15.8	14.6
POWER																	
AVE POWER MW		218	111	229	252	265	257	389	406	372	255	248	245	187	229	196	183
PEAK POW MW		678	682	685	689	693	707	699	686	673	667	665	663	664	664	673	684
ENERGY GWH	2368.5	78.4	18.6	49.4	181.1	197.1	185.3	289.7	302.0	267.5	189.4	89.4	41.2	35.9	170.7	145.7	127.1
--BIG BEND--																	
EVAPORATION	103							6	20	25	22	10	5	5	11		
REG INFLOW	15468	519	122	324	1185	1284	1196	1866	1953	1745	1239	588	271	235	1132	970	838
RELEASE	15468	519	122	324	1185	1284	1196	1866	1953	1745	1239	588	271	235	1132	970	838
STORAGE	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682
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	14.1	17.4	8.8	18.2	19.9	20.9	20.1	30.3	31.8	29.3	20.2	19.8	19.5	14.8	18.4	15.8	14.6
POWER																	
AVE POWER MW		82	41	85	93	98	94	142	149	139	99	99	98	75	91	77	70
PEAK POW MW		510	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
ENERGY GWH	892.3	29.4	6.9	18.4	67.1	72.8	67.8	105.6	110.6	100.0	73.5	35.7	16.5	14.3	67.6	57.3	48.6
--FORT RANDALL--																	
NAT INFLOW	900	122	57	73	115	140	185	74	57	42	2	2	1	1	10		19
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	118							8	25	31	25	10	4	4	10		
REG INFLOW	16171	640	178	397	1296	1415	1369	1914	1970	1748	1216	579	268	231	1128	967	854
RELEASE	16171	232	161	397	1296	1415	1369	1914	1970	1892	1853	883	413	253	762	750	610
STOR CHANGE	0	408	17	0	0			0	0	-144	-637	-304	-145	-22	366	217	244
STORAGE	3124	3532	3549	3549	3549	3549	3549	3549	3549	3405	2768	2464	2319	2297	2663	2880	3124
ELEV FTMSL	1350.0	1355.0	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.1	1340.4	1337.9	1337.5	1343.5	1346.7	1350.0
DISCH KCFS	9.5	7.8	11.6	22.2	21.8	23.0	23.0	31.1	32.0	31.8	30.1	29.7	29.7	16.0	12.4	12.2	10.6
POWER																	
AVE POWER MW		65	99	188	184	194	194	261	269	265	241	224	217	116	93	95	85
PEAK POW MW		354	355	355	355	355	355	355	355	349	318	297	285	284	311	326	338
ENERGY GWH	1600.3	23.4	16.6	40.5	132.4	144.5	139.8	194.4	200.0	190.8	179.2	80.7	36.5	22.3	69.1	70.9	59.3
--GAVINS POINT--																	
NAT INFLOW	1450	92	43	55	148	174	166	86	103	77	122	50	23	27	77	79	127
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-3	3	-7	-20	1	-2	0	-16	-2	0	3	1	0	25	7	0	3
EVAPORATION	38							2	7	9	8	4	2	2	4		
REG INFLOW	17466	328	197	432	1440	1568	1511	1943	2054	1966	1968	925	432	301	832	829	740
RELEASE	17466	328	197	432	1440	1568	1511	1943	2041	1940	1968	925	432	301	832	829	779
STOR CHANGE									13	26							-39
STORAGE	358	358	358	358	358	358	358	358	371	397	397	397	397	397	397	397	358
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	12.5	11.0	14.2	24.2	24.2	25.5	25.4	31.6	33.2	32.6	32.0	31.1	31.1	19.0	13.5	13.5	13.5
POWER																	
AVE POWER MW		39	50	83	83	87	87	105	109	109	108	106	106	67	48	48	48
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	718.3	13.9	8.3	17.9	59.7	64.9	62.5	77.8	80.8	78.3	80.6	38.2	17.8	12.8	35.7	35.6	33.2
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1550	169	79	102	199	310	224	129	96	60	42	16	7	9	21	5	82
DEPLETION	254	6	3	4	21	35	30	37	35	23	10	6	3	3	12	13	14
REGULATED FLOW AT SIOUX CITY																	
KAF	18762	491	273	530	1618	1843	1705	2035	2102	1977	2000	936	437	306	841	821	847
KCFS		16.5	19.7	29.7	27.2	30.0	28.7	33.1	34.2	33.2	32.5	31.5	31.5	19.3	13.7	13.3	14.7
--TOTAL--																	
NAT INFLOW	24601	1435	669	860	2307	3493	6073	3346	1194	1113	1032	452	211	241	651	582	943
DEPLETION	2451	21	10	13	124	675	1585	1034	132	-232	-88	-137	-64	-73	-217	-207	-125
CHAN STOR	-34	49	3	-20	-32	-23	-59	14	5	52	25	0	-10	-10	-9	-22	3
EVAPORATION	1661							103	324	403	347	154	71	81	177		
STORAGE	51193	52164	52553	52850	53382	54334	57058	57246	55887	54904	53703	53200	52957	52873	52715	52662	52886
SYSTEM POWER																	
AVE POWER MW		671	555	840	929	1006	1020	1316	1345	1194	971	947	949	796	832	838	804
PEAK POW MW		2295	2300	2304	2310	2320	2354	2353	2336	2325	2305	2280	2267	2265	2249	2265	2270
ENERGY GWH	8684.5	241.5	93.2	181.4	669.0	748.3	734.2	979.1	1000.7	859.9	722.1	340.8	159.4	152.9	619.0	623.4	559.6
DAILY GWH		16.1	13.3	20.2	22.3	24.1	26.3	31.7	32.3	28.7	23.3	22.7	22.8	19.1	20.0	20.1	19.3
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB

DATE OF STUDY 02/09/04

2004 AOP EXTENSIONS, MEDIAN RUNOFF SIMULATION

TIME OF STUDY 10:51:43

STUDY NO 8

VALUES IN 1000 AF EXCEPT AS INDICATED

	29FEB08		2008										2009			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	7400	264	123	158	628	1210	1851	829	324	319	398	188	88	100	310	261	349
DEPLETION	422	-2	-1	-1	55	333	569	212	-62	-144	-82	-42	-19	-22	-136	-141	-95
EVAPORATION	451							28	87	108	95	43	20	23	49		
MOD INFLOW	6527	266	124	160	573	877	1282	589	299	355	385	186	87	99	397	402	444
RELEASE	7121	179	83	107	476	553	1083	646	646	439	354	208	111	159	615	769	694
STOR CHANGE	-595	88	41	53	97	324	199	-56	-346	-84	32	-22	-24	-59	-218	-367	-250
STORAGE	14623	14710	14751	14804	14901	15224	15423	15367	15021	14937	14968	14946	14922	14863	14645	14278	14028
ELEV FTMSL	2232.2	2232.6	2232.8	2233.1	2233.5	2235.1	2236.0	2235.7	2234.1	2233.7	2233.9	2233.8	2233.6	2233.4	2232.3	2230.5	2229.3
DISCH KCFS	10.0	6.0	6.0	6.0	8.0	9.0	18.2	10.5	10.5	7.4	5.8	7.0	8.0	10.0	10.0	12.5	12.5
POWER																	
AVE POWER MW		81	81	81	109	122	57	143	143	100	78	95	109	136	135	168	167
PEAK POW MW		207	207	208	208	209	210	210	208	208	208	208	208	208	207	206	205
ENERGY GWH	1031.8	29.3	13.7	17.6	78.2	91.1	41.3	106.7	106.4	72.3	58.2	34.3	18.3	26.0	100.7	125.2	112.5
--GARRISON--																	
NAT INFLOW	11001	469	219	282	853	1423	2958	2066	581	497	454	192	89	102	253	237	326
DEPLETION	1002	-6	-3	-3	-6	215	836	603	46	-141	-17	-114	-53	-61	-122	-103	-69
CHAN STOR	-27	41			-20	-10	-93	76		31	16	-12	-10	-20	0	-25	
EVAPORATION	517							31	100	125	108	49	23	26	56		
REG INFLOW	16577	695	305	392	1315	1751	3112	2153	1081	983	732	453	221	276	934	1084	1089
RELEASE	14569	476	222	286	1071	1322	1428	1445	1414	1092	923	447	236	286	1230	1414	1277
STOR CHANGE	2007	219	83	107	244	429	1684	708	-333	-109	-191	6	-15	-10	-296	-330	-188
STORAGE	15788	16006	16089	16196	16439	16869	18553	19261	18928	18819	18628	18634	18619	18609	18314	17983	17795
ELEV FTMSL	1829.5	1830.3	1830.6	1831.0	1831.8	1833.3	1838.9	1841.1	1840.1	1839.8	1839.2	1839.2	1839.1	1839.1	1838.2	1837.1	1836.5
DISCH KCFS	24.0	16.0	16.0	16.0	18.0	21.5	24.0	23.5	23.0	18.4	15.0	15.0	17.0	18.0	20.0	23.0	23.0
POWER																	
AVE POWER MW		189	190	191	215	258	294	295	290	231	189	189	213	225	250	285	283
PEAK POW MW		440	441	442	446	451	472	480	476	475	472	472	472	472	469	465	463
ENERGY GWH	2176.8	68.2	31.9	41.1	154.7	192.0	211.8	219.5	215.8	166.4	140.6	67.9	35.8	43.3	185.6	211.9	190.3
--OAHE--																	
NAT INFLOW	2300	317	148	190	364	236	689	162	33	118	14	5	2	3	-20		40
DEPLETION	641	23	11	14	48	68	135	160	106	26	-9	2	1	1	12	17	27
CHAN STOR	3	34			-8	-14	-10	2	2	19	14	0	-9	-4	-9	-13	
EVAPORATION	465							30	92	113	96	43	20	23	49		
REG INFLOW	15766	803	359	462	1379	1476	1972	1419	1251	1091	864	407	209	260	1140	1384	1290
RELEASE	16331	480	250	371	1286	1389	1298	1869	1973	1770	1261	598	276	248	1260	1037	967
STOR CHANGE	-565	323	109	91	93	87	674	-450	-722	-679	-397	-191	-67	12	-120	347	324
STORAGE	17312	17635	17744	17835	17927	18014	18689	18239	17517	16838	16441	16251	16184	16196	16076	16423	16747
ELEV FTMSL	1602.4	1603.5	1603.9	1604.2	1604.5	1604.8	1607.0	1605.6	1603.1	1600.8	1599.4	1598.7	1598.4	1598.5	1598.0	1599.3	1600.5
DISCH KCFS	14.6	16.1	18.0	20.8	21.6	22.6	21.8	30.4	32.1	29.7	20.5	20.1	19.9	15.7	20.5	16.9	17.4
POWER																	
AVE POWER MW		204	228	264	275	288	280	389	406	372	255	248	245	193	252	208	216
PEAK POW MW		689	691	693	695	696	708	700	687	675	667	664	662	663	661	667	673
ENERGY GWH	2486.1	73.3	38.3	57.0	197.9	213.9	201.3	289.6	302.4	267.9	189.5	89.4	41.1	37.1	187.4	154.8	145.3
--BIG BEND--																	
EVAPORATION	103							6	20	25	22	10	5	5	11		
REG INFLOW	16228	480	250	371	1286	1389	1298	1862	1953	1745	1239	588	271	243	1249	1037	967
RELEASE	16228	480	250	371	1286	1389	1298	1862	1953	1745	1239	588	271	243	1249	1037	967
STORAGE	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682
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	14.6	16.1	18.0	20.8	21.6	22.6	21.8	30.3	31.8	29.3	20.2	19.8	19.5	15.3	20.3	16.9	17.4
POWER																	
AVE POWER MW		76	84	97	101	106	102	142	149	139	99	99	98	77	100	83	83
PEAK POW MW		517	510	509	509	509	509	509	509	517	538	538	538	538	538	538	529
ENERGY GWH	936.4	27.5	14.2	21.0	72.9	78.7	73.5	105.5	110.6	100.0	73.5	35.7	16.5	14.8	74.5	61.4	56.1
--FORT RANDALL--																	
NAT INFLOW	900	122	57	73	115	140	185	74	57	42	2	2	1	1	10		19
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	118							8	25	31	25	10	4	4	10		
REG INFLOW	16930	601	306	444	1397	1520	1471	1910	1970	1748	1216	579	268	239	1245	1034	983
RELEASE	16930	309	189	427	1397	1520	1471	1910	1970	1892	1853	883	413	261	879	867	689
STOR CHANGE	0	291	117	17	0		0	0	0	-144	-637	-304	-145	-22	366	167	294
STORAGE	3124	3415	3532	3549	3549	3549	3549	3549	3549	3405	2768	2464	2319	2297	2663	2830	3124
ELEV FTMSL	1350.0	1353.6	1355.0	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.1	1340.4	1337.9	1337.5	1343.5	1346.0	1350.0
DISCH KCFS	10.6	10.4	13.6	23.9	23.5	24.7	24.7	31.1	32.0	31.8	30.1	29.7	29.7	16.5	14.3	14.1	12.4
POWER																	
AVE POWER MW		86	115	201	198	208	208	261	269	265	241	224	217	120	107	110	99
PEAK POW MW		350	354	355	355	355	355	355	355	349	318	297	285	284	311	322	338
ENERGY GWH	1673.2	31.0	19.3	43.5	142.6	155.0	150.0	194.0	200.0	190.8	179.2	80.7	36.5	23.0	79.6	81.5	66.7
--GAVINS POINT--																	
NAT INFLOW	1450	92	43	55	148	174	166	86	103	77	122	50	23	27	77	79	127
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-5	0	-6	-20	1	-2	0	-12	-2	0	3	1	0	25	4	0	3
EVAPORATION	38							2	7	9	8	4	2	2	4		
REG INFLOW	18224	403	226	463	1541	1672	1613	1943	2054	1966	1968	925	432	308	946	945	819
RELEASE	18224	403	226	463	1541	1672	1613	1943	2041	1940	1968	925	432	308	946	945	858
STOR CHANGE									13	26							-39
STORAGE	358	358	358	358	358	358	358	358	371	397	397	397	397	397	397	397	358
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	13.5	13.5	16.3	25.9	25.9	27.2	27.1	31.6	33.2	32.6	32.0	31.1	31.1	19.4	15.4	15.4	15.4
POWER																	
AVE POWER MW		47	57	89	88	93	92	105	109	109	108	106	106	68	55	54	54
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	749.3	17.0	9.5	19.1	63.7	69.0	66.5	77.8	80.8	78.3	80.6	38.2	17.8	13.1	40.5	40.5	36.5
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1550	169	79	102	199	310	224	129	96	60	42	16	7	9	21	5	82
DEPLETION	255	6	3	4	21	35	30	38	35	23	10	6	3	3	12	13	14
REGULATED FLOW AT SIOUX CITY																	
KAF	19519	566	302	560	1719	1947	1807	2034	2102	1977	2000	936	437	313	955	937	926
KCFS		19.0	21.8	31.4	28.9	31.7	30.4	33.1	34.2	33.2	32.5	31.5	31.5	19.8	15.5	15.2	16.7
--TOTAL--																	
NAT INFLOW	24601	1435	669	860	2307	3493	6073	3346	1194	1113	1032	452	211	241	651	582	943
DEPLETION	2514	23	11	14	127	679	1606	1070	150	-234	-95	-143	-67	-76	-221	-210	-120
CHAN STOR	-27	75	-6	-20	-28	-27	-103	66	0	50	33	-11	-19	1	-5	-38	3
EVAPORATION	1692							105	330	411	353	157	73	83	180		
STORAGE	52886	53807	54157	54423	54856	55696	58253	58456	57068	56077	54884	54374	54123	54044	53777	53594	53734
SYSTEM POWER																	
AVE POWER MW		684	755	923	986	1075	1034	1335	1366	1216	970	961	988	820	899	908	904
PEAK POW MW		2318	2319	2322	2327	2335	2368	2368	2351	2341	2321	2296	2283	2281	2264	2276	2283
ENERGY GWH	9053.7	246.3	126.9	199.3	709.9	799.6	744.4	993.1	1026.0	875.6	721.6	346.1	166.0	157.4	668.5	675.4	607.5
DAILY GWH		16.4	18.1	22.1	23.7	25.8	28.5	32.0	32.8	29.2	23.3	23.1	23.7	19.7	21.6	21.8	21.7

INI-SUM 15MAR 22MAR 31MAR 30APR 31MAY 30JUN 31JUL 31AUG 30SEP 31OCT 15NOV 22NOV 30NOV 31DEC 31JAN 28FEB

DATE OF STUDY 02/09/04 — 2004 AOP EXTENSIONS, MEDIAN RUNOFF SIMULATION

TIME OF STUDY 10:51:44 — VALUES IN 1000 AF EXCEPT AS INDICATED — STUDY NO 9

	28FEB09	2009											2010			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	7400	264	123	158	628	1210	1851	829	324	319	398	188	88	100	310	261	349
DEPLETION	431	-2	-1	-1	55	334	573	219	-58	-145	-83	-42	-20	-22	-137	-142	-96
EVAPORATION	434							27	84	104	90	41	19	22	47		
MOD INFLOW	6535	267	124	160	573	876	1278	583	298	360	391	189	88	101	400	403	445
RELEASE	7254	179	69	89	417	615	803	799	769	536	434	210	98	159	615	769	694
STOR CHANGE	-719	88	55	71	156	261	475	-216	-471	-176	-44	-21	-10	-58	-214	-366	-249
STORAGE	14028	14116	14171	14242	14398	14659	15134	14918	14447	14271	14228	14206	14196	14138	13924	13558	13309
ELEV FTMSL	2229.3	2229.7	2230.0	2230.4	2231.1	2232.4	2234.6	2233.6	2231.4	2230.5	2230.3	2230.2	2230.1	2229.8	2228.8	2226.9	2225.6
DISCH KCFS	12.5	6.0	5.0	5.0	7.0	10.0	13.5	13.0	12.5	9.0	7.1	7.1	7.1	10.0	10.0	12.5	12.5
POWER																	
AVE POWER MW		81	67	67	94	135	181	176	169	121	95	95	95	134	134	166	165
PEAK POW MW		205	205	206	206	207	209	208	206	206	206	205	205	205	204	203	202
ENERGY GWH	1178.6	29.0	11.3	14.5	67.9	100.4	130.6	130.9	125.6	87.2	70.7	34.2	15.9	25.8	99.6	123.7	111.2
--GARRISON--																	
NAT INFLOW	11001	469	219	282	853	1423	2958	2066	581	497	454	192	89	102	253	237	326
DEPLETION	1218	-6	-3	-3	-7	214	845	619	51	-144	-20	-92	-43	-49	-71	-51	-22
CHAN STOR	-1	65	10		-20	-30	-35	5	5	34	19	0	0	-29	0	-25	
EVAPORATION	520							32	102	126	108	48	22	25	55		
REG INFLOW	16517	719	301	374	1257	1794	2882	2219	1201	1084	819	445	208	255	884	1032	1042
RELEASE	17412	536	250	321	1309	1599	1726	1752	1722	1396	1298	628	292	317	1230	1537	1500
STOR CHANGE	-895	183	51	53	-52	195	1156	467	-520	-312	-479	-183	-84	-62	-345	-505	-457
STORAGE	17795	17978	18029	18082	18030	18225	19381	19848	19328	19016	18537	18354	18270	18208	17863	17357	16900
ELEV FTMSL	1836.5	1837.1	1837.2	1837.4	1837.2	1837.9	1841.5	1842.9	1841.3	1840.4	1838.9	1838.3	1838.0	1837.8	1836.7	1835.0	1833.4
DISCH KCFS	23.0	18.0	18.0	18.0	22.0	26.0	29.0	28.5	28.0	23.5	21.1	21.1	21.0	20.0	20.0	25.0	27.0
POWER																	
AVE POWER MW		222	223	223	272	321	363	361	354	296	265	263	261	248	247	306	326
PEAK POW MW		465	465	466	465	468	481	491	480	477	471	469	468	467	463	457	451
ENERGY GWH	2620.7	80.0	37.4	48.2	195.9	239.0	261.0	268.2	263.5	213.2	197.0	94.7	43.9	47.7	184.1	227.5	219.4
--OAHE--																	
NAT INFLOW	2300	317	148	190	364	236	689	162	33	118	14	5	2	3	-20		40
DEPLETION	652	23	11	14	48	69	138	165	109	27	-10	1	0	1	12	17	27
CHAN STOR	-17	21			-17	-17	-12	2	2	18	10		0	4	0	-21	-8
EVAPORATION	489							30	95	117	102	46	21	25	53		
REG INFLOW	18554	850	387	497	1608	1749	2264	1721	1553	1388	1230	586	272	299	1145	1500	1504
RELEASE	16732	559	244	384	1334	1438	1345	1867	1973	1770	1261	598	276	259	1317	1064	1044
STOR CHANGE	1822	291	143	113	274	311	919	-146	-420	-382	-31	-12	-3	40	-172	436	460
STORAGE	16747	17039	17181	17295	17569	17880	18799	18653	18233	17851	17820	17808	17805	17845	17673	18109	18569
ELEV FTMSL	1600.5	1601.5	1602.0	1602.4	1603.3	1604.4	1607.4	1606.9	1605.5	1604.3	1604.2	1604.1	1604.1	1604.2	1603.7	1605.1	1606.6
DISCH KCFS	17.4	18.8	17.6	21.5	22.4	23.4	22.6	30.4	32.1	29.7	20.5	20.1	19.9	16.3	21.4	17.3	18.8
POWER																	
AVE POWER MW		235	220	270	283	296	290	391	411	378	261	255	252	208	272	220	241
PEAK POW MW		679	681	683	688	694	710	707	700	693	693	693	692	693	690	698	706
ENERGY GWH	2576.9	84.5	37.0	58.4	203.5	220.4	208.6	290.7	305.5	272.2	193.9	91.9	42.4	39.9	202.1	163.9	162.1
--BIG BEND--																	
EVAPORATION	103							6	20	25	22	10	5	5	11		
REG INFLOW	16629	559	244	384	1334	1438	1345	1861	1953	1745	1239	588	271	254	1305	1064	1044
RELEASE	16629	559	244	384	1334	1438	1345	1861	1953	1745	1239	588	271	254	1305	1064	1044
STORAGE	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682
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	17.4	18.8	17.6	21.5	22.4	23.4	22.6	30.3	31.8	29.3	20.2	19.8	19.5	16.0	21.2	17.3	18.8
POWER																	
AVE POWER MW		89	82	101	105	109	106	142	149	139	99	99	98	81	105	85	90
PEAK POW MW		516	510	509	509	509	509	509	509	517	538	538	538	538	538	538	529
ENERGY GWH	959.5	32.0	13.8	21.8	75.6	81.5	76.2	105.4	110.6	100.0	73.5	35.7	16.5	15.5	77.9	63.1	60.6
--FORT RANDALL--																	
NAT INFLOW	900	122	57	73	115	140	185	74	57	42	2	2	1	1	10		19
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	118							8	25	31	25	10	4	4	10		
REG INFLOW	17332	680	300	457	1445	1569	1518	1909	1970	1748	1216	579	268	250	1302	1061	1060
RELEASE	17332	365	207	440	1445	1569	1518	1909	1970	1892	1853	883	413	272	936	924	736
STOR CHANGE	0	315	93	17				0	0	-144	-637	-304	-145	-22	366	137	324
STORAGE	3124	3439	3532	3549	3549	3549	3549	3549	3549	3405	2768	2464	2319	2297	2663	2800	3124
ELEV FTMSL	1350.0	1353.9	1355.0	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.1	1340.4	1337.9	1337.5	1343.5	1345.6	1350.0
DISCH KCFS	12.4	12.3	14.9	24.6	24.3	25.5	25.5	31.0	32.0	31.8	30.1	29.7	29.7	17.1	15.2	15.0	13.3
POWER																	
AVE POWER MW		102	126	207	205	215	215	261	269	265	241	224	217	125	114	116	106
PEAK POW MW		351	354	355	355	355	355	355	355	349	318	297	285	284	311	320	338
ENERGY GWH	1711.8	36.6	21.1	44.8	147.4	159.9	154.7	193.9	200.0	190.8	179.2	80.7	36.5	24.0	84.7	86.7	71.1
--GAVINS POINT--																	
NAT INFLOW	1450	92	43	55	148	174	166	86	103	77	122	50	23	27	77	79	127
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-3	0	-5	-19	1	-2	0	-11	-2	0	3	1	0	23	4	0	3
EVAPORATION	38							2	7	9	8	4	2	2	4		
REG INFLOW	18627	458	245	477	1589	1722	1660	1943	2054	1966	1968	925	432	317	1002	1002	866
RELEASE	18627	458	245	477	1589	1722	1660	1943	2041	1940	1968	925	432	317	1002	1002	905
STOR CHANGE									13	26							-39
STORAGE	358	358	358	358	358	358	358	358	371	397	397	397	397	397	397	397	358
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	15.4	15.4	17.7	26.7	26.7	28.0	27.9	31.6	33.2	32.6	32.0	31.1	31.1	20.0	16.3	16.3	16.3
POWER																	
AVE POWER MW		54	61	91	91	95	95	105	109	109	108	106	106	71	58	58	57
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	765.7	19.3	10.3	19.7	65.6	70.9	68.4	77.8	80.8	78.3	80.6	38.2	17.8	13.5	42.9	42.9	38.5
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1550	169	79	102	199	310	224	129	96	60	42	16	7	9	21	5	82
DEPLETION	262	7	3	4	22	35	31	38	36	23	10	6	3	3	13	14	14
REGULATED FLOW AT SIOUX CITY																	
KAF	19915	621	321	574	1766	1997	1853	2034	2101	1977	2000	935	436	323	1010	993	973
KCFS		20.9	23.1	32.2	29.7	32.5	31.1	33.1	34.2	33.2	32.5	31.4	31.4	20.3	16.4	16.2	17.5
--TOTAL--																	
NAT INFLOW	24601	1435	669	860	2307	3493	6073	3346	1194	1113	1032	452	211	241	651	582	943
DEPLETION	2757	23	11	14	127	680	1623	1098	163	-237	-100	-121	-56	-65	-170	-158	-74
CHAN STOR	-20	86	5	-19	-36	-49	-47	-4	5	53	32	1	0	-1	4	-45	-5
EVAPORATION	1701							106	333	413	355	158	73	83	180		
STORAGE	53734	54612	54954	55208	55586	56354	58903	59008	57609	56622	55431	54911	54669	54568	54202	53903	53942
SYSTEM POWER																	
AVE POWER MW		781	780	960	1050	1172	1249	1434	1460	1308	1068	1043	1030	866	929	951	986
PEAK POW MW		2329	2331	2333	2338	2347	2378	2384	2366	2359	2342	2319	2307	2304	2285	2294	2302
ENERGY GWH	9813.2	281.3	131.0	207.3	755.8	872.1	899.5	1066.9	1086.1	941.8	794.8	375.4	173.0	166.3	691.2	707.8	662.8
DAILY GWH		18.8	18.7	23.0	25.2	28.1	30.0	34.4	35.0	31.4	25.6	25.0	24.7	20.8	22.3	22.8	23.7

INI-SUM 15MAR 22MAR 31MAR 30APR 31MAY 30JUN 31JUL 31AUG 30SEP 31OCT 15NOV 22NOV 30NOV 31DEC 31JAN 28FEB

DATE OF STUDY 02/09/04

TIME OF STUDY 10:52:05

2004 LOWER QUARTILE RUNOFF

SHORTEN NAVIGATION SEASON 31-DAYS
VALUES IN 1000 AF EXCEPT AS INDICATED

STUDY NO 10

	29FEB04	2004											2005			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	6000	242	113	145	525	925	1454	633	263	252	324	167	78	89	295	212	283
DEPLETION	266	-12	-5	-7	28	165	279	184	-19	-89	-59	-10	-4	-5	-61	-79	-40
EVAPORATION	426							26	82	102	89	40	19	21	46		
MOD INFLOW	5308	254	118	152	497	760	1175	423	200	239	294	136	64	73	310	291	323
RELEASE	5622	149	69	89	494	646	536	553	523	372	263	127	97	127	523	553	500
STOR CHANGE	-314	105	49	63	3	114	639	-131	-322	-134	31	9	-34	-54	-213	-262	-177
STORAGE	9553	9658	9707	9770	9773	9887	10527	10396	10074	9940	9971	9980	9946	9892	9679	9417	9240
ELEV FTMSL	2203.7	2204.3	2204.7	2205.1	2205.1	2205.8	2209.8	2209.0	2207.0	2206.1	2206.3	2206.4	2206.2	2205.8	2204.5	2202.8	2201.6
DISCH KCFS	9.0	5.0	5.0	5.0	8.3	10.5	9.0	9.0	8.5	6.3	4.3	4.3	7.0	8.0	8.5	9.0	9.0
POWER																	
AVE POWER MW		60	60	60	100	123	109	110	104	76	52	52	85	97	102	107	106
PEAK POW MW		133	133	133	134	134	182	181	179	177	178	178	177	177	175	173	171
ENERGY GWH	818.1	21.6	10.1	13.0	72.0	91.8	78.8	82.1	77.0	54.6	38.6	18.7	14.2	18.5	75.9	79.7	71.5
--GARRISON--																	
NAT INFLOW	9400	443	207	266	712	1197	2521	1765	496	417	400	164	76	87	222	165	262
DEPLETION	1263	36	17	21	85	172	625	464	99	-64	69	-76	-35	-41	-57	-37	-15
CHAN STOR	0	44			-36	-24	16		5	24	21	0	-29	-11	-5	-5	
EVAPORATION	503							31	98	122	105	47	22	25	54		
REG INFLOW	13255	600	260	334	1085	1647	2448	1824	827	756	510	320	158	219	743	750	777
RELEASE	13910	446	208	268	1083	1586	1309	1322	1291	974	778	376	236	286	1230	1322	1194
STOR CHANGE	-655	154	51	66	2	60	1139	502	-464	-219	-268	-57	-78	-67	-487	-572	-417
STORAGE	11759	11913	11964	12030	12032	12092	13231	13733	13268	13050	12782	12725	12647	12580	12093	11521	11104
ELEV FTMSL	1813.7	1814.4	1814.6	1814.9	1814.9	1815.1	1819.8	1821.8	1820.0	1819.1	1818.0	1817.8	1817.4	1817.2	1815.1	1812.7	1810.8
DISCH KCFS	24.0	15.0	15.0	15.0	18.2	25.8	22.0	21.5	21.0	16.4	12.7	12.7	17.0	18.0	20.0	21.5	21.5
POWER																	
AVE POWER MW		160	161	161	195	273	240	240	235	182	140	139	186	197	216	229	225
PEAK POW MW		310	310	311	311	312	326	332	326	324	320	320	319	318	312	305	299
ENERGY GWH	1826.2	57.8	27.0	34.8	140.7	203.3	172.8	178.6	174.6	130.9	104.1	50.2	31.3	37.8	161.0	170.1	151.3
--OAHE--																	
NAT INFLOW	1449	154	72	92	229	130	577	102	24	65	9				-35	-6	36
DEPLETION	585	22	10	13	46	64	123	143	93	23	-8	2	1	1	11	16	25
CHAN STOR	13	47		0	-17	-39	20	3	3	25	20	0	-23	-5	-11	-8	
EVAPORATION	412							26	80	99	85	38	18	21	45		
REG INFLOW	14375	625	270	347	1249	1613	1783	1257	1145	942	729	337	194	259	1128	1292	1205
RELEASE	14160	432	261	367	1237	1569	1429	1822	1643	981	998	288	148	167	1110	981	727
STOR CHANGE	215	193	9	-20	12	44	354	-564	-498	-39	-268	48	46	92	18	311	478
STORAGE	11436	11629	11638	11617	11630	11673	12027	11463	10965	10926	10658	10706	10752	10844	10861	11172	11651
ELEV FTMSL	1578.7	1579.6	1579.6	1579.5	1579.6	1579.8	1581.5	1578.8	1576.4	1576.2	1574.8	1575.1	1575.3	1575.8	1575.9	1577.4	1579.7
DISCH KCFS	19.6	14.5	18.8	20.6	20.8	25.5	24.0	29.6	26.7	16.5	16.2	9.7	10.6	10.5	18.1	16.0	13.1
POWER																	
AVE POWER MW		160	208	227	229	281	266	327	291	179	175	104	115	114	195	173	144
PEAK POW MW		567	567	567	567	568	577	563	550	549	542	543	544	547	547	555	567
ENERGY GWH	1876.2	57.7	34.9	49.1	165.2	209.4	191.9	243.3	216.3	128.6	130.2	37.6	19.3	21.8	145.1	128.9	96.8
--BIG BEND--																	
EVAPORATION	129							8	24	31	27	12	6	7	14		
REG INFLOW	14032	432	261	367	1237	1569	1429	1814	1619	950	971	276	142	161	1096	981	727
RELEASE	14032	432	261	367	1237	1569	1429	1814	1619	950	971	276	142	161	1096	981	727
STORAGE	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682
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	20.2	14.5	18.8	20.6	20.8	25.5	24.0	29.5	26.3	16.0	15.8	9.3	10.2	10.1	17.8	16.0	13.1
POWER																	
AVE POWER MW		69	88	96	97	119	112	138	125	79	80	47	52	51	88	78	63
PEAK POW MW		517	510	509	509	509	509	509	518	538	538	538	538	538	538	538	529
ENERGY GWH	812.5	24.8	14.8	20.8	70.1	88.9	80.9	102.7	92.7	56.7	59.2	16.9	8.7	9.8	65.5	57.8	42.2
--FORT RANDALL--																	
NAT INFLOW	500	68	32	41	64	51	130	26	49	23	1				5	-5	15
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	134							10	31	35	25	10	5	5	13		
REG INFLOW	14318	499	292	407	1297	1611	1547	1812	1622	931	946	266	137	155	1085	973	739
RELEASE	14319	226	157	390	1297	1611	1547	1812	1796	1607	1349	266	137	154	719	701	550
STOR CHANGE	0	273	135	17				0	-174	-675	-403	0	0	0	366	272	189
STORAGE	3124	3397	3532	3549	3549	3549	3549	3549	3375	2700	2297	2297	2296	2297	2663	2935	3124
ELEV FTMSL	1350.0	1353.4	1355.0	1355.2	1355.2	1355.2	1355.2	1355.2	1353.1	1344.1	1337.5	1337.5	1337.5	1337.5	1343.5	1347.4	1350.0
DISCH KCFS	12.5	7.6	11.3	21.9	21.8	26.2	26.0	29.5	29.2	27.0	21.9	8.9	9.9	9.7	11.7	11.4	9.9
POWER																	
AVE POWER MW		63	95	184	184	221	219	248	243	215	164	65	72	71	88	89	80
PEAK POW MW		349	354	355	355	355	355	355	348	313	283	283	283	283	311	329	338
ENERGY GWH	1409.2	22.7	16.0	39.8	132.5	164.1	157.6	184.2	181.0	154.8	121.7	23.5	12.1	13.6	65.3	66.5	53.7
--GAVINS POINT--																	
NAT INFLOW	1251	91	43	55	124	138	143	81	80	58	105	47	22	25	70	68	101
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	4	9	-7	-20	0	-8	0	-7	1	4	9	24	-2	0	-4	1	3
EVAPORATION	47							3	9	11	10	5	2	2	5		
REG INFLOW	15412	327	193	425	1416	1722	1666	1845	1858	1662	1451	327	153	175	770	769	654
RELEASE	15412	327	193	425	1416	1722	1666	1845	1845	1636	1451	327	153	175	770	769	693
STOR CHANGE									13	26							-39
STORAGE	358	358	358	358	358	358	358	358	371	397	397	397	397	397	397	397	358
ELEV FTMSL	1206.0	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	1206.0
DISCH KCFS	13.5	11.0	13.9	23.8	23.8	28.0	28.0	30.0	30.0	27.5	23.6	11.0	11.0	11.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		39	49	82	82	95	95	101	101	95	83	39	39	39	45	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	642.8	13.9	8.1	17.6	58.7	70.9	68.6	75.1	75.4	68.7	61.7	14.1	6.6	7.5	33.1	33.0	29.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	900	115	54	69	90	174	125	75	56	35	24	13	6	7	13	-3	48
DEPLETION	247	6	3	4	20	34	30	36	34	22	9	6	3	3	12	13	13
REGULATED FLOW AT SIOUX CITY																	
KAF	16065	436	244	490	1486	1862	1761	1884	1867	1649	1466	334	156	178	771	753	728
KCFS		14.7	17.5	27.5	25.0	30.3	29.6	30.6	30.4	27.7	23.8	11.2	11.2	11.2	12.5	12.2	13.1
--TOTAL--																	
NAT INFLOW	19500	1114	520	668	1744	2615	4950	2682	968	850	863	390	182	208	570	431	745
DEPLETION	2555	54	25	32	188	463	1093	884	232	-106	14	-73	-34	-39	-82	-83	-14
CHAN STOR	17	100	-7	-20	-53	-72	36	-4	8	53	50	25	-55	-16	-20	-13	3
EVAPORATION	1651							104	324	400	342	153	71	81	177		
STORAGE	37913	38637	38881	39006	39024	39242	41374	41181	39735	38695	37786	37787	37721	37691	37375	37123	37158
SYSTEM POWER																	
AVE POWER MW		551	661	811	888	1113	1042	1164	1098	826	693	447	549	568	734	721	662
PEAK POW MW		1990	1990	1990	1990	1993	2063	2054	2036	2018	1978	1979	1979	1980	1962	1978	1981
ENERGY GWH	7385.4	198.5	111.1	175.2	639.3	828.4	750.9	866.0	817.1	594.4	515.5	161.0	92.2	109.1	545.9	536.1	445.0
DAILY GWH		13.2	15.9	19.5	21.3	26.7	25.0	27.9	26.4	19.8	16.6	10.7	13.2	13.6	17.6	17.3	15.9
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

DATE OF STUDY 02/09/04

2004 AOP EXTENSIONS, LOWER QUARTILE RUNOFF

TIME OF STUDY 10:52:05

SHORTEN NAVIGATION SEASON 31-DAYS
VALUES IN 1000 AF EXCEPT AS INDICATED

STUDY NO 11

	28FEB05	2005											2006			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	6556	264	123	158	574	1011	1589	692	287	275	354	183	85	98	322	231	309
DEPLETION	546	15	7	9	112	355	511	174	-56	-131	-69	-33	-15	-18	-111	-121	-83
EVAPORATION	427							26	81	102	90	41	19	22	47		
MOD INFLOW	5583	249	116	149	462	656	1078	492	262	304	333	175	82	94	386	352	392
RELEASE	5175	134	62	80	357	461	536	523	523	315	265	128	69	143	553	553	472
STOR CHANGE	408	115	54	69	105	195	542	-31	-261	-11	69	47	12	-49	-167	-201	-80
STORAGE	9240	9355	9409	9478	9583	9778	10320	10290	10029	10017	10086	10133	10146	10096	9929	9728	9648
ELEV FTMSL	2201.6	2202.4	2202.7	2203.2	2203.9	2205.1	2208.5	2208.3	2206.7	2206.6	2207.0	2207.3	2207.4	2207.1	2206.1	2204.8	2204.3
DISCH KCFS	9.0	4.5	4.5	4.5	6.0	7.5	9.0	8.5	8.5	5.3	4.3	4.3	5.0	9.0	9.0	9.0	8.5
POWER																	
AVE POWER MW		53	54	54	72	90	109	104	103	64	52	52	61	109	109	108	102
PEAK POW MW		172	173	173	174	176	181	180	178	178	179	179	179	179	177	176	175
ENERGY GWH	755.8	19.2	9.0	11.6	51.6	66.8	78.4	77.2	76.8	46.3	38.9	18.9	10.2	21.0	81.0	80.5	68.4
--GARRISON--																	
NAT INFLOW	10069	475	221	285	763	1282	2701	1891	532	446	428	175	82	93	238	177	280
DEPLETION	1100	21	10	13	37	182	760	551	59	-112	17	-98	-46	-52	-102	-84	-56
CHAN STOR	6	50			-17	-17	-16	5		34	11		-7	-43			5
EVAPORATION	503							30	97	121	105	48	22	25	54		
REG INFLOW	13647	637	274	352	1066	1545	2460	1838	899	787	581	354	167	220	839	814	814
RELEASE	13152	476	222	286	1071	1199	1279	1291	1261	893	697	337	167	286	1230	1291	1166
STOR CHANGE	495	161	52	67	-5	346	1181	546	-362	-106	-116	16	1	-66	-391	-477	-353
STORAGE	11104	11265	11317	11384	11379	11724	12905	13452	13090	12984	12868	12884	12885	12819	12428	11951	11599
ELEV FTMSL	1810.8	1811.5	1811.8	1812.1	1812.0	1813.6	1818.5	1820.7	1819.3	1818.8	1818.4	1818.4	1818.4	1818.2	1816.5	1814.5	1813.0
DISCH KCFS	21.5	16.0	16.0	16.0	18.0	19.5	21.5	21.0	20.5	15.0	11.3	11.3	12.0	18.0	20.0	21.0	21.0
POWER																	
AVE POWER MW		168	168	168	189	206	232	231	226	165	125	125	132	197	217	225	222
PEAK POW MW		302	302	303	303	308	322	405	400	398	396	396	396	396	390	382	377
ENERGY GWH	1715.8	60.3	28.2	36.4	136.3	153.3	167.2	171.9	168.3	118.9	92.8	44.9	22.1	37.8	161.3	167.1	149.0
--OAHE--																	
NAT INFLOW	1761	187	87	112	278	158	701	124	29	79	11				-42	-7	44
DEPLETION	597	22	10	13	46	65	126	147	96	24	-8	2	1	1	11	16	25
CHAN STOR	2	29			-10	-8	-10	2	3	28	19	0	-3	-32	-10	-5	
EVAPORATION	434							27	84	105	90	40	19	22	47		
REG INFLOW	13884	669	299	384	1293	1284	1844	1243	1112	871	645	296	144	232	1119	1263	1185
RELEASE	13376	410	249	352	1211	1374	1215	1706	1501	974	989	285	146	165	1103	821	872
STOR CHANGE	508	259	49	33	82	-89	629	-463	-389	-103	-344	10	-3	66	16	442	313
STORAGE	11651	11909	11959	11992	12073	11984	12613	12150	11761	11658	11314	11324	11321	11387	11403	11846	12159
ELEV FTMSL	1579.7	1580.9	1581.1	1581.3	1581.7	1581.3	1584.1	1582.0	1580.2	1579.7	1578.1	1578.1	1578.1	1578.4	1578.5	1580.6	1582.1
DISCH KCFS	13.1	13.8	18.0	19.7	20.4	22.3	20.4	27.8	24.4	16.4	16.1	9.6	10.5	10.4	17.9	13.3	15.7
POWER																	
AVE POWER MW		153	200	220	227	249	230	312	272	181	177	105	116	115	197	148	176
PEAK POW MW		574	575	576	578	575	591	579	570	567	559	559	559	561	561	572	580
ENERGY GWH	1801.7	55.2	33.7	47.5	163.7	185.5	165.4	232.2	202.1	130.7	131.9	38.0	19.5	22.0	146.6	110.0	118.0
--BIG BEND--																	
EVAPORATION	129							8	24	31	27	12	6	7	14		
REG INFLOW	13247	410	249	352	1211	1374	1215	1699	1476	943	962	273	141	159	1089	821	872
RELEASE	13247	410	249	352	1211	1374	1215	1699	1476	943	962	273	141	159	1089	821	872
STORAGE	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682
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	13.1	13.8	18.0	19.7	20.4	22.3	20.4	27.6	24.0	15.9	15.7	9.2	10.1	10.0	17.7	13.3	15.7
POWER																	
AVE POWER MW		65	84	92	95	105	96	129	114	78	79	47	51	51	88	66	75
PEAK POW MW		517	510	509	509	509	509	509	518	538	538	538	538	538	538	538	529
ENERGY GWH	768.2	23.5	14.2	19.9	68.6	77.8	68.8	96.2	84.5	56.3	58.7	16.7	8.6	9.7	65.1	48.8	50.6
--FORT RANDALL--																	
NAT INFLOW	643	88	41	53	82	66	167	33	63	30	2				6	-6	19
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	134							10	31	35	25	10	5	5	13		
REG INFLOW	13676	497	290	403	1289	1431	1370	1704	1493	931	938	263	135	153	1079	812	888
RELEASE	13677	223	155	386	1289	1431	1370	1704	1667	1606	1342	263	136	153	713	695	544
STOR CHANGE	0	273	135	17				0	-174	-675	-403	0	0	0	366	117	344
STORAGE	3124	3397	3532	3549	3549	3549	3549	3549	3375	2700	2297	2296	2296	2296	2662	2779	3123
ELEV FTMSL	1350.0	1353.4	1355.0	1355.2	1355.2	1355.2	1355.2	1355.2	1353.1	1344.1	1337.5	1337.5	1337.5	1337.5	1343.5	1345.3	1350.0
DISCH KCFS	9.9	7.5	11.1	21.6	21.7	23.3	23.0	27.7	27.1	27.0	21.8	8.8	9.8	9.6	11.6	11.3	9.8
POWER																	
AVE POWER MW		62	94	183	183	196	194	233	226	215	163	65	71	70	87	88	78
PEAK POW MW		349	354	355	355	355	355	355	348	313	283	283	283	283	311	319	338
ENERGY GWH	1344.1	22.4	15.8	39.4	131.7	146.0	139.9	173.4	168.3	154.8	121.1	23.2	12.0	13.5	64.7	65.3	52.7
--GAVINS POINT--																	
NAT INFLOW	1335	98	46	59	132	147	153	87	85	62	112	50	23	27	75	73	107
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	5	-7	-20	0	-3	0	-9	1	0	10	24	-2	0	-4	1	3
EVAPORATION	47							3	9	11	10	5	2	2	5		
REG INFLOW	14849	326	193	425	1416	1556	1500	1740	1735	1662	1451	327	153	175	769	767	654
RELEASE	14849	326	193	425	1416	1556	1500	1740	1722	1636	1451	327	153	175	769	767	693
STOR CHANGE									13	26							-39
STORAGE	358	358	358	358	358	358	358	358	371	397	397	397	397	397	397	397	358
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	12.5	11.0	13.9	23.8	23.8	25.3	25.2	28.3	28.0	27.5	23.6	11.0	11.0	11.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		38	49	82	82	87	86	96	96	95	83	39	39	39	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	622.0	13.8	8.2	17.6	58.7	64.4	62.1	71.6	71.3	68.7	61.7	14.1	6.6	7.5	33.1	33.0	29.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1135	145	68	87	113	219	158	95	70	44	31	16	7	9	16	-3	60
DEPLETION	248	6	3	4	20	34	30	37	34	22	9	6	3	3	12	13	13
REGULATED FLOW AT SIOUX CITY																	
KAF	15736	465	258	508	1509	1741	1628	1798	1758	1658	1473	338	158	180	773	751	740
KCFS		15.6	18.6	28.5	25.4	28.3	27.4	29.2	28.6	27.9	24.0	11.4	11.4	11.4	12.6	12.2	13.3
--TOTAL--																	
NAT INFLOW	21499	1256	586	753	1942	2883	5469	2922	1066	936	938	424	198	226	615	465	819
DEPLETION	2685	66	31	39	224	664	1463	966	158	-195	-48	-118	-55	-63	-177	-172	-98
CHAN STOR	7	83	-7	-20	-27	-27	-26	-1	4	63	39	25	-13	-74	-14	-5	8
EVAPORATION	1674							104	327	405	347	155	73	83	180		
STORAGE	37158	37966	38257	38442	38624	39075	41427	41480	40307	39438	38643	38716	38726	38678	38502	38383	38568
SYSTEM POWER																	
AVE POWER MW		540	649	798	848	933	947	1106	1037	800	679	433	470	581	742	678	697
PEAK POW MW		2029	2029	2031	2034	2037	2072	2143	2129	2112	2072	2073	2073	2073	2055	2065	2074
ENERGY GWH	7015.1	194.5	109.0	172.4	610.7	693.8	681.8	822.6	771.3	575.7	505.1	155.8	79.0	111.5	551.7	504.6	468.2
DAILY GWH		13.0	15.6	19.2	20.4	22.4	22.7	26.5	24.9	19.2	16.3	10.4	11.3	13.9	17.8	16.3	16.7

	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

DATE OF STUDY 02/09/04

TIME OF STUDY 10:52:06

2004 AOP EXTENSIONS, LOWER QUARTILE RUNOFF

SHORTEN NAVIGATION SEASON 31-DAYS
VALUES IN 1000 AF EXCEPT AS INDICATED

STUDY NO 12

	28FEB06	2006											2007			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	6613	267	124	160	579	1019	1603	698	289	278	357	185	86	98	325	233	312
DEPLETION	402	-11	-5	-6	50	312	517	182	-52	-131	-73	-33	-15	-18	-111	-121	-83
EVAPORATION	439							27	84	105	92	42	19	22	48		
MOD INFLOW	5772	277	129	166	529	707	1086	489	257	304	338	176	82	94	388	354	395
RELEASE	5257	134	62	80	417	492	536	553	523	320	253	122	62	127	523	553	500
STOR CHANGE	515	143	67	86	112	215	550	-64	-265	-16	85	53	20	-33	-135	-199	-105
STORAGE	9648	9791	9858	9944	10056	10271	10822	10758	10493	10477	10562	10615	10635	10602	10467	10267	10163
ELEV FTMSL	2204.3	2205.2	2205.6	2206.2	2206.9	2208.2	2211.5	2211.2	2209.6	2209.5	2210.0	2210.3	2210.4	2210.2	2209.4	2208.2	2207.5
DISCH KCFS	8.5	4.5	4.5	4.5	7.0	8.0	9.0	9.0	8.5	5.4	4.1	4.1	4.5	8.0	8.5	9.0	9.0
POWER																	
AVE POWER MW		54	54	54	85	97	111	111	105	66	51	51	56	99	104	110	110
PEAK POW MW		176	177	177	178	180	185	184	182	182	183	183	183	183	182	180	179
ENERGY GWH	779.5	19.5	9.1	11.8	61.0	72.4	79.7	82.9	78.0	47.7	37.8	18.3	9.4	18.9	77.7	81.9	73.6
--GARRISON--																	
NAT INFLOW	10134	478	223	287	768	1290	2718	1903	535	449	431	176	82	94	240	178	282
DEPLETION	968	0	0	0	-1	204	743	511	64	-105	3	-102	-48	-54	-104	-85	-57
CHAN STOR	-5	44			-27	-11	-11		5	33	13		-4	-37	-5	-5	
EVAPORATION	520							31	100	125	109	49	23	26	56		
REG INFLOW	13898	657	286	367	1158	1567	2500	1914	899	782	585	351	165	212	805	811	839
RELEASE	13271	476	194	250	1012	1199	1309	1322	1291	909	680	329	222	301	1230	1353	1194
STOR CHANGE	627	181	91	117	147	368	1191	592	-392	-127	-95	22	-57	-90	-425	-542	-355
STORAGE	11599	11779	11871	11988	12135	12503	13693	14285	13893	13766	13672	13694	13637	13547	13123	12581	12226
ELEV FTMSL	1813.0	1813.8	1814.2	1814.7	1815.3	1816.8	1821.7	1824.0	1822.4	1821.9	1821.6	1821.7	1821.4	1821.1	1819.4	1817.2	1815.7
DISCH KCFS	21.0	16.0	14.0	14.0	17.0	19.5	22.0	21.5	21.0	15.3	11.1	11.1	16.0	19.0	20.0	22.0	21.5
POWER																	
AVE POWER MW		169	149	149	182	210	241	242	237	172	124	124	179	212	221	240	231
PEAK POW MW		380	381	383	385	391	409	417	411	409	408	408	408	406	400	392	387
ENERGY GWH	1764.8	60.9	25.0	32.2	130.8	155.9	173.8	179.9	176.3	123.7	92.6	44.7	30.1	40.7	164.6	178.4	155.4
--OAHE--																	
NAT INFLOW	1794	190	89	114	283	161	714	127	30	80	11				-43	-7	45
DEPLETION	613	23	11	14	47	66	129	151	100	25	-8	2	1	1	11	16	26
CHAN STOR	-3	25	10		-15	-13	-13	2	2	29	22	0	-25	-15	-5	-10	3
EVAPORATION	450							28	87	108	93	42	20	22	49		
REG INFLOW	13999	669	283	350	1232	1281	1882	1272	1137	884	627	286	176	263	1122	1319	1216
RELEASE	13356	409	248	350	1208	1372	1210	1705	1523	1049	891	285	146	165	1102	977	716
STOR CHANGE	643	260	34	0	24	-90	671	-433	-386	-164	-263	1	30	98	19	343	499
STORAGE	12159	12419	12453	12453	12478	12387	13059	12626	12240	12075	11812	11842	11940	11960	12302	12802	
ELEV FTMSL	1582.1	1583.2	1583.4	1583.4	1583.5	1583.1	1586.0	1584.2	1582.4	1581.7	1580.5	1580.5	1580.6	1581.1	1581.1	1582.7	1584.9
DISCH KCFS	15.7	13.7	17.9	19.6	20.3	22.3	20.3	27.7	24.8	17.6	14.5	9.6	10.5	10.4	17.9	15.9	12.9
POWER																	
AVE POWER MW		155	202	222	229	252	231	316	279	198	162	107	117	116	200	178	147
PEAK POW MW		586	587	587	587	585	601	591	582	578	571	571	572	574	575	583	595
ENERGY GWH	1822.5	55.8	34.0	47.9	165.2	187.3	166.6	234.9	207.7	142.4	120.3	38.5	19.7	22.3	148.8	132.6	98.5
--BIG BEND--																	
EVAPORATION	129							8	24	31	27	12	6	7	14		
REG INFLOW	13228	409	248	350	1208	1372	1210	1698	1498	1018	864	273	141	158	1088	977	716
RELEASE	13228	409	248	350	1208	1372	1210	1698	1498	1018	864	273	141	158	1088	977	716
STORAGE	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682
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	15.7	13.7	17.9	19.6	20.3	22.3	20.3	27.6	24.4	17.1	14.0	9.2	10.1	10.0	17.7	15.9	12.9
POWER																	
AVE POWER MW		65	84	92	95	104	95	129	115	84	71	46	51	51	87	77	62
PEAK POW MW		517	510	509	509	509	509	509	517	538	538	538	538	538	538	538	529
ENERGY GWH	766.4	23.4	14.1	19.8	68.4	77.7	68.6	96.1	85.9	60.4	52.7	16.7	8.6	9.7	65.1	57.5	41.6
--FORT RANDALL--																	
NAT INFLOW	659	90	42	54	84	67	171	34	65	31	2				7	-7	20
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	135							10	31	35	25	10	5	5	13		
REG INFLOW	13671	497	290	403	1288	1430	1369	1704	1517	1006	838	262	135	153	1079	967	733
RELEASE	13671	223	154	386	1288	1430	1369	1704	1666	1606	1342	262	135	153	713	695	544
STOR CHANGE	0	274	135	17	0			0	-149	-600	-503	0	0	0	366	272	189
STORAGE	3123	3397	3532	3549	3549	3549	3549	3549	3400	2800	2297	2297	2296	2296	2662	2934	3123
ELEV FTMSL	1350.0	1353.4	1355.0	1355.2	1355.2	1355.2	1355.2	1355.2	1353.4	1345.5	1337.5	1337.5	1337.5	1337.5	1343.5	1347.4	1350.0
DISCH KCFS	9.8	7.5	11.1	21.6	21.6	23.3	23.0	27.7	27.1	27.0	21.8	8.8	9.7	9.6	11.6	11.3	9.8
POWER																	
AVE POWER MW		62	94	182	183	196	194	233	226	217	164	64	71	70	87	89	79
PEAK POW MW		349	354	355	355	355	355	355	349	320	283	283	283	283	311	329	338
ENERGY GWH	1346.9	22.4	15.8	39.4	131.6	145.9	139.8	173.4	168.4	156.0	121.9	23.2	12.0	13.5	64.7	65.9	53.1
--GAVINS POINT--																	
NAT INFLOW	1342	98	46	59	133	148	154	87	86	62	112	51	24	27	75	73	108
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	4	-7	-20	0	-3	0	-9	1	0	10	24	-2	0	-4	1	3
EVAPORATION	47							3	9	11	10	5	2	2	5		
REG INFLOW	14851	326	194	425	1416	1556	1500	1740	1735	1662	1451	327	153	175	769	767	655
RELEASE	14851	326	194	425	1416	1556	1500	1740	1722	1636	1451	327	153	175	769	767	694
STOR CHANGE									13	26							-39
STORAGE	358	358	358	358	358	358	358	358	371	397	397	397	397	397	397	397	358
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	12.5	11.0	13.9	23.8	23.8	25.3	25.2	28.3	28.0	27.5	23.6	11.0	11.0	11.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		38	49	82	82	87	86	96	96	95	83	39	39	39	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	622.0	13.8	8.2	17.6	58.7	64.4	62.1	71.6	71.3	68.7	61.7	14.1	6.6	7.5	33.1	33.0	29.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1160	149	69	89	116	224	161	97	72	45	31	16	7	9	17	-3	61
DEPLETION	251	6	3	4	21	35	30	37	34	22	10	6	3	3	12	13	13
REGULATED FLOW AT SIOUX CITY																	
KAF	15760	469	260	510	1511	1745	1631	1800	1760	1659	1472	338	158	180	774	751	742
KCFS		15.7	18.7	28.6	25.4	28.4	27.4	29.3	28.6	27.9	23.9	11.4	11.4	11.4	12.6	12.2	13.4
--TOTAL--																	
NAT INFLOW	21702	1271	593	762	1963	2909	5521	2946	1077	945	944	427	199	228	621	467	828
DEPLETION	2428	19	9	11	126	645	1455	938	171	-187	-65	-122	-57	-65	-179	-173	-98
CHAN STOR	-10	74	3	-20	-42	-27	-23	-7	9	62	44	25	-31	-52	-14	-15	5
EVAPORATION	1719							107	335	416	357	160	75	85	186		
STORAGE	38568	39426	39754	39974	40258	40750	43163	43258	42078	41197	40421	40497	40490	40465	40291	40164	40353
SYSTEM POWER																	
AVE POWER MW		544	632	781	855	946	959	1128	1058	832	654	432	514	586	745	738	672
PEAK POW MW		2028	2029	2031	2034	2038	2072	2170	2156	2144	2100	2101	2101	2102	2084	2100	2103
ENERGY GWH	7102.1	195.8	106.2	168.8	615.8	703.6	690.4	838.9	787.5	598.8	486.9	155.5	86.3	112.6	553.9	549.2	451.9
DAILY GWH		13.1	15.2	18.8	20.5	22.7	23.0	27.1	25.4	20.0	15.7	10.4	12.3	14.1	17.9	17.7	16.1
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

DATE OF STUDY 02/09/04

2004 AOP EXTENSIONS, LOWER QUARTILE RUNOFF

TIME OF STUDY 10:52:06

SHORTEN NAVIGATION SEASON 31-DAYS
VALUES IN 1000 AF EXCEPT AS INDICATED

STUDY NO 13

	28FEB07	2007											2008			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB
--FORT PECK--																	
NAT INFLOW	6720	271	126	163	588	1036	1629	709	294	282	363	188	88	100	330	237	317
DEPLETION	409	-11	-5	-6	50	312	521	189	-48	-132	-72	-33	-15	-18	-110	-120	-93
EVAPORATION	451							27	86	108	94	43	20	23	49		
MOD INFLOW	5860	282	131	169	538	724	1108	493	256	306	341	178	83	95	391	357	410
RELEASE	5274	134	62	80	357	492	536	553	523	357	258	125	76	127	523	553	518
STOR CHANGE	586	148	69	89	181	232	572	-61	-267	-51	83	53	7	-32	-132	-196	-108
STORAGE	10163	10310	10379	10468	10649	10881	11453	11393	11126	11075	11158	11210	11217	11185	11053	10856	10748
ELEV FTMSL	2207.5	2208.4	2208.9	2209.4	2210.5	2211.9	2215.3	2214.9	2213.3	2213.0	2213.5	2213.8	2213.9	2213.7	2212.9	2211.7	2211.1
DISCH KCFS	9.0	4.5	4.5	4.5	6.0	8.0	9.0	9.0	8.5	6.0	4.2	4.2	5.5	8.0	8.5	9.0	9.0
POWER																	
AVE POWER MW		55	55	55	74	99	113	114	107	75	53	53	69	100	106	112	111
PEAK POW MW		180	181	182	183	185	190	189	187	187	187	188	188	188	186	185	184
ENERGY GWH	796.2	19.8	9.3	12.0	53.3	73.7	81.1	84.4	79.4	54.1	39.2	19.0	11.6	19.3	79.1	83.3	77.6
--GARRISON--																	
NAT INFLOW	10262	484	226	290	777	1306	2752	1927	542	455	437	179	83	95	243	180	286
DEPLETION	981	0	0	0	-1	205	754	527	70	-108	-2	-105	-49	-56	-105	-85	-63
CHAN STOR	0	49			-16	-22	-11		5	26	19		-14	-26	-5	-5	
EVAPORATION	536							32	103	129	112	51	24	27	58		
REG INFLOW	14019	667	288	371	1119	1571	2523	1921	897	817	604	358	171	225	807	813	867
RELEASE	13306	446	194	250	1012	1168	1309	1322	1291	893	697	337	236	301	1230	1353	1265
STOR CHANGE	714	221	94	121	107	403	1214	599	-395	-75	-94	20	-65	-77	-422	-540	-399
STORAGE	12226	12447	12541	12662	12769	13172	14386	14985	14590	14515	14421	14441	14377	14300	13878	13338	12939
ELEV FTMSL	1815.7	1816.6	1817.0	1817.5	1818.0	1819.6	1824.3	1826.6	1825.1	1824.8	1824.5	1824.6	1824.3	1824.0	1822.4	1820.3	1818.6
DISCH KCFS	21.5	15.0	14.0	14.0	17.0	19.0	22.0	21.5	21.0	15.0	11.3	11.3	17.0	19.0	20.0	22.0	22.0
POWER																	
AVE POWER MW		162	152	152	185	208	246	246	241	172	130	130	194	216	226	245	242
PEAK POW MW		390	391	393	395	401	418	427	421	420	419	419	418	417	411	403	397
ENERGY GWH	1804.4	58.3	25.5	32.9	133.3	154.9	177.1	183.2	179.5	123.8	96.8	46.8	32.6	41.5	168.0	182.2	168.2
--OAHE--																	
NAT INFLOW	1860	197	92	118	294	167	740	131	31	83	12				-45	-7	46
DEPLETION	626	23	11	14	47	67	132	156	103	25	-9	2	1	1	12	17	26
CHAN STOR	-3	32	5		-15	-10	-15	2	2	30	18		-28	-10	-5	-10	
EVAPORATION	470							29	91	113	98	44	20	23	51		
REG INFLOW	14067	653	281	355	1244	1258	1902	1270	1131	867	639	292	186	267	1117	1319	1285
RELEASE	13336	404	246	347	1202	1367	1201	1702	1493	971	987	284	146	165	1102	977	740
STOR CHANGE	731	249	35	8	42	-108	701	-432	-363	-104	-349	8	40	102	14	342	545
STORAGE	12802	13051	13085	13094	13135	13027	13728	13296	12933	12829	12481	12488	12529	12631	12645	12987	13532
ELEV FTMSL	1584.9	1586.0	1586.2	1586.2	1586.4	1585.9	1588.9	1587.1	1585.5	1585.0	1583.5	1583.5	1583.7	1584.2	1584.2	1585.7	1588.1
DISCH KCFS	12.9	13.6	17.7	19.4	20.2	22.2	20.2	27.7	24.3	16.3	16.1	9.6	10.5	10.4	17.9	15.9	12.9
POWER																	
AVE POWER MW		156	204	223	232	255	234	321	279	187	183	109	119	118	204	182	149
PEAK POW MW		601	601	601	602	600	615	606	598	595	587	587	588	591	591	599	611
ENERGY GWH	1852.1	56.1	34.2	48.2	167.2	189.8	168.1	238.5	207.4	134.5	135.9	39.1	20.1	22.7	151.6	135.1	103.6
--BIG BEND--																	
EVAPORATION	129							8	24	31	27	12	6	7	14		
REG INFLOW	13207	404	246	347	1202	1367	1201	1695	1469	940	960	272	140	158	1088	977	740
RELEASE	13207	404	246	347	1202	1367	1201	1695	1469	940	960	272	140	158	1088	977	740
STORAGE	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682
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	12.9	13.6	17.7	19.4	20.2	22.2	20.2	27.6	23.9	15.8	15.6	9.1	10.1	10.0	17.7	15.9	12.9
POWER																	
AVE POWER MW		64	83	91	95	104	95	129	113	78	79	46	51	50	87	77	62
PEAK POW MW		517	510	509	509	509	509	509	518	538	538	538	538	538	538	538	529
ENERGY GWH	765.6	23.2	14.0	19.6	68.1	77.4	68.0	96.0	84.1	56.1	58.6	16.7	8.6	9.7	65.1	57.5	43.0
--FORT RANDALL--																	
NAT INFLOW	690	94	44	56	88	70	179	36	68	32	2				7	-7	21
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	134							10	31	35	25	10	5	5	13		
REG INFLOW	13684	497	289	402	1286	1428	1368	1703	1491	930	936	262	135	152	1079	967	758
RELEASE	13684	223	154	385	1286	1428	1368	1703	1665	1605	1340	262	135	152	713	695	569
STOR CHANGE	0	274	135	17				0	-174	-675	-403	0	0	0	366	272	189
STORAGE	3123	3397	3532	3549	3549	3549	3549	3549	3375	2700	2297	2296	2296	2296	2662	2934	3123
ELEV FTMSL	1350.0	1353.4	1355.0	1355.2	1355.2	1355.2	1355.2	1355.2	1353.1	1344.1	1337.5	1337.5	1337.5	1337.5	1343.5	1347.4	1350.0
DISCH KCFS	9.8	7.5	11.1	21.6	21.6	23.2	23.0	27.7	27.1	27.0	21.8	8.8	9.7	9.6	11.6	11.3	9.9
POWER																	
AVE POWER MW		62	94	182	183	196	194	233	226	215	162	64	71	70	87	89	80
PEAK POW MW		349	354	355	355	355	355	355	348	313	283	283	283	283	311	329	338
ENERGY GWH	1346.0	22.4	15.7	39.3	131.4	145.7	139.7	173.3	168.1	154.7	120.9	23.2	11.9	13.5	64.7	65.9	55.6
--GAVINS POINT--																	
NAT INFLOW	1359	100	47	60	135	150	155	88	87	63	114	51	24	27	76	74	109
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	4	-7	-20	0	-3	0	-9	1	0	10	24	-2	0	-4	1	3
EVAPORATION	47							3	9	11	10	5	2	2	5		
REG INFLOW	14881	328	194	425	1416	1556	1500	1740	1735	1662	1451	327	153	175	770	768	681
RELEASE	14881	328	194	425	1416	1556	1500	1740	1722	1636	1451	327	153	175	770	768	720
STOR CHANGE									13	26							-39
STORAGE	358	358	358	358	358	358	358	358	371	397	397	397	397	397	397	397	358
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	12.5	11.0	14.0	23.8	23.8	25.3	25.2	28.3	28.0	27.5	23.6	11.0	11.0	11.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		39	49	82	82	87	86	96	96	95	83	39	39	39	45	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	623.3	13.9	8.2	17.6	58.7	64.4	62.1	71.6	71.3	68.7	61.7	14.1	6.6	7.5	33.1	33.0	30.7
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1211	155	72	93	121	234	168	101	75	47	33	17	8	9	17	-3	64
DEPLETION	254	6	3	4	21	35	30	37	35	23	10	6	3	3	12	13	14
REGULATED FLOW AT SIOUX CITY																	
KAF	15838	476	263	514	1516	1755	1638	1804	1762	1660	1474	339	158	181	775	752	770
KCFS		16.0	19.0	28.8	25.5	28.5	27.5	29.3	28.7	27.9	24.0	11.4	11.4	11.4	12.6	12.2	13.4
--TOTAL--																	
NAT INFLOW	22102	1301	607	780	2003	2963	5623	2992	1097	962	961	434	203	231	628	474	843
DEPLETION	2464	19	9	11	126	647	1473	966	185	-190	-70	-125	-58	-67	-178	-171	-113
CHAN STOR	-3	86	-2	-20	-31	-34	-25	-7	9	56	47	25	-44	-36	-14	-15	3
EVAPORATION	1767							110	344	427	366	164	77	88	191		
STORAGE	40353	41245	41578	41812	42142	42669	45156	45262	44077	43198	42435	42515	42498	42491	42317	42195	42384
SYSTEM POWER																	
AVE POWER MW		538	636	785	850	949	967	1138	1061	822	690	441	544	594	755	749	688
PEAK POW MW		2152	2153	2155	2159	2164	2202	2200	2187	2170	2131	2133	2133	2134	2116	2132	2135
ENERGY GWH	7187.6	193.6	106.8	169.7	612.1	705.9	696.1	847.0	789.7	592.0	513.1	158.8	91.4	114.1	561.5	557.0	478.8
DAILY GWH		12.9	15.3	18.9	20.4	22.8	23.2	27.3	25.5	19.7	16.6	10.6	13.1	14.3	18.1	18.0	16.5
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB

DATE OF STUDY 02/09/04

TIME OF STUDY 10:52:06

2004 AOP EXTENSIONS, LOWER QUARTILE RUNOFF

SHORTEN NAVIGATION SEASON 28-DAYS
VALUES IN 1000 AF EXCEPT AS INDICATED

STUDY NO 14

	29FEB08			2008										2009			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	6751	272	127	163	591	1041	1636	712	295	284	365	188	88	100	332	238	318
DEPLETION	422	-11	-5	-6	50	313	525	196	-44	-132	-75	-35	-16	-18	-113	-123	-84
EVAPORATION	466							28	89	111	98	44	21	24	51		
MOD INFLOW	5863	283	132	170	541	728	1111	488	250	305	342	178	83	95	394	361	402
RELEASE	5301	134	62	80	357	492	565	553	553	327	258	125	59	127	553	553	500
STOR CHANGE	562	149	70	89	184	236	546	-66	-303	-22	84	53	24	-32	-160	-192	-98
STORAGE	10748	10898	10967	11057	11241	11477	12022	11957	11654	11631	11715	11768	11792	11760	11601	11408	11311
ELEV FTMSL	2211.1	2212.0	2212.4	2212.9	2214.0	2215.4	2218.5	2218.1	2216.4	2216.3	2216.8	2217.1	2217.2	2217.0	2216.1	2215.0	2214.4
DISCH KCFS	9.0	4.5	4.5	4.5	6.0	8.0	9.5	9.0	9.0	5.5	4.2	4.2	4.3	8.0	9.0	9.0	9.0
POWER																	
AVE POWER MW		56	56	56	75	101	121	115	115	70	54	54	55	102	114	114	113
PEAK POW MW		185	186	186	188	190	194	193	191	191	192	192	192	192	191	189	188
ENERGY GWH	813.1	20.2	9.4	12.2	54.2	75.0	87.0	85.8	85.3	50.3	39.9	19.3	9.2	19.6	85.0	84.6	76.1
--GARRISON--																	
NAT INFLOW	10290	485	226	291	779	1310	2760	1932	543	456	438	179	84	95	243	181	287
DEPLETION	999				1	205	764	544	75	-111	-7	-110	-51	-58	-107	-87	-59
CHAN STOR	0	48			-16	-21	-16	5		36	13		-1	-39	-10		
EVAPORATION	553							34	107	133	116	52	24	28	60		
REG INFLOW	14039	668	289	371	1119	1576	2545	1913	915	797	601	361	169	214	833	821	846
RELEASE	13355	446	194	250	1012	1168	1339	1353	1322	952	700	339	159	286	1230	1383	1222
STOR CHANGE	684	221	95	122	107	407	1207	560	-407	-155	-99	23	10	-71	-397	-562	-376
STORAGE	12939	13161	13255	13377	13484	13892	15098	15659	15251	15096	14997	15020	15030	14958	14562	14000	13624
ELEV FTMSL	1818.6	1819.5	1819.9	1820.4	1820.8	1822.4	1827.0	1829.1	1827.6	1827.0	1826.6	1826.7	1826.8	1826.5	1825.0	1822.9	1821.4
DISCH KCFS	22.0	15.0	14.0	14.0	17.0	19.0	22.5	22.0	21.5	16.0	11.4	11.4	11.5	18.0	20.0	22.5	22.0
POWER																	
AVE POWER MW		165	155	155	189	212	256	256	251	186	132	132	133	208	230	255	246
PEAK POW MW		401	402	404	405	411	428	436	430	428	427	427	427	426	421	413	407
ENERGY GWH	1843.6	59.5	26.0	33.6	136.0	158.0	184.5	190.6	186.7	134.1	98.6	47.7	22.4	40.0	170.9	189.6	165.5
--OAHE--																	
NAT INFLOW	1877	199	93	119	297	168	747	132	31	84	12				-45	-7	47
DEPLETION	641	23	11	14	48	68	135	160	106	26	-9	2	1	1	12	17	27
CHAN STOR	-1	34	5		-14	-10	-17	2	2	26	22		0	-32	-10	-12	2
EVAPORATION	492							31	95	119	103	46	21	24	53		
REG INFLOW	14098	656	281	355	1246	1259	1934	1296	1154	917	641	291	137	228	1110	1347	1244
RELEASE	13396	403	245	346	1201	1366	1198	1703	1493	971	1082	281	146	165	1102	977	715
STOR CHANGE	702	252	36	9	45	-107	736	-406	-339	-54	-442	10	-10	64	7	371	529
STORAGE	13532	13785	13820	13830	13875	13768	14504	14098	13759	13705	13263	13274	13264	13328	13335	13706	14235
ELEV FTMSL	1588.1	1589.1	1589.2	1589.3	1589.5	1589.0	1592.0	1590.4	1589.0	1588.8	1586.9	1587.0	1586.9	1587.2	1587.2	1588.8	1590.9
DISCH KCFS	12.9	13.6	17.7	19.4	20.2	22.2	20.1	27.7	24.3	16.3	17.6	9.5	10.5	10.4	17.9	15.9	12.9
POWER																	
AVE POWER MW		158	207	227	236	260	237	327	284	191	204	110	122	120	207	185	152
PEAK POW MW		617	617	617	618	616	631	623	616	615	605	605	607	607	607	615	626
ENERGY GWH	1895.0	57.0	34.7	49.0	170.1	193.1	170.8	242.9	211.5	137.3	152.0	39.4	20.5	23.1	154.3	137.4	101.8
--BIG BEND--																	
EVAPORATION	129							8	24	31	27	12	6	7	14		
REG INFLOW	13267	403	245	346	1201	1366	1198	1695	1469	940	1055	269	140	158	1088	977	715
RELEASE	13267	403	245	346	1201	1366	1198	1695	1469	940	1055	269	140	158	1088	977	715
STORAGE	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682
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	12.9	13.6	17.7	19.4	20.2	22.2	20.1	27.6	23.9	15.8	17.2	9.0	10.1	10.0	17.7	15.9	12.9
POWER																	
AVE POWER MW		64	83	91	95	104	94	129	113	78	86	46	51	50	87	77	62
PEAK POW MW		517	510	509	509	509	509	509	518	538	538	538	538	538	538	538	529
ENERGY GWH	769.3	23.1	13.9	19.6	68.0	77.4	67.9	96.0	84.1	56.1	64.3	16.5	8.6	9.7	65.1	57.5	41.5
--FORT RANDALL--																	
NAT INFLOW	696	95	44	57	89	71	181	36	68	32	2				7	-7	21
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	134							10	31	35	25	10	5	5	13		
REG INFLOW	13750	497	289	402	1286	1428	1367	1703	1491	930	1032	259	135	152	1079	967	733
RELEASE	13750	223	154	385	1286	1428	1367	1703	1665	1605	1435	259	135	152	713	695	544
STOR CHANGE	0	274	135	17		0		0	-174	-675	-403	0	0	0	366	272	189
STORAGE	3123	3397	3532	3549	3549	3549	3549	3549	3375	2700	2297	2297	2296	2296	2662	2934	3123
ELEV FTMSL	1350.0	1353.4	1355.0	1355.2	1355.2	1355.2	1355.2	1355.2	1353.1	1344.1	1337.5	1337.5	1337.5	1337.5	1343.5	1347.4	1350.0
DISCH KCFS	9.9	7.5	11.1	21.6	21.6	23.2	23.0	27.7	27.1	27.0	23.3	8.7	9.7	9.6	11.6	11.3	9.8
POWER																	
AVE POWER MW		62	94	182	183	196	194	233	226	215	174	64	71	70	87	89	79
PEAK POW MW		349	354	355	355	355	355	355	348	313	283	283	283	283	311	329	338
ENERGY GWH	1351.6	22.4	15.7	39.3	131.4	145.7	139.6	173.3	168.1	154.7	129.3	22.9	12.0	13.5	64.7	65.9	53.1
--GAVINS POINT--																	
NAT INFLOW	1362	100	47	60	135	150	156	88	87	63	114	51	24	27	76	75	110
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	5	-7	-20	0	-3	0	-9	1	0	7	27	-2	0	-4	1	3
EVAPORATION	47							3	9	11	10	5	2	2	5		
REG INFLOW	14950	328	194	425	1416	1556	1500	1740	1735	1662	1543	327	153	175	770	769	657
RELEASE	14950	328	194	425	1416	1556	1500	1740	1722	1636	1543	327	153	175	770	769	696
STOR CHANGE									13	26							-39
STORAGE	358	358	358	358	358	358	358	358	371	397	397	397	397	397	397	397	358
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	12.5	11.0	14.0	23.8	23.8	25.3	25.2	28.3	28.0	27.5	25.1	11.0	11.0	11.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		39	49	82	82	87	86	96	96	95	88	39	39	39	45	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	626.1	13.9	8.2	17.6	58.7	64.4	62.1	71.6	71.3	68.7	65.5	14.1	6.6	7.5	33.1	33.1	29.7
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1223	157	73	94	122	236	170	102	75	47	33	17	8	9	18	-3	65
DEPLETION	255	6	3	4	21	35	30	38	35	23	10	6	3	3	12	13	14
REGULATED FLOW AT SIOUX CITY																	
KAF	15918	478	264	515	1517	1757	1640	1804	1762	1660	1566	339	158	181	776	753	747
KCFS		16.1	19.0	28.9	25.5	28.6	27.6	29.3	28.7	27.9	25.5	11.4	11.4	11.4	12.6	12.3	13.5
--TOTAL--																	
NAT INFLOW	22199	1308	610	785	2013	2976	5650	3002	1099	966	964	435	203	232	631	477	848
DEPLETION	2511	20	9	12	129	649	1490	995	197	-192	-78	-131	-61	-70	-183	-176	-99
CHAN STOR	0	87	-2	-20	-30	-34	-32	-2	4	63	43	28	-3	-70	-24	-12	5
EVAPORATION	1821							113	355	440	378	169	79	90	197		
STORAGE	42384	43280	43615	43852	44189	44725	47214	47302	46091	45211	44352	44438	44461	44422	44239	44127	44332
SYSTEM POWER																	
AVE POWER MW		545	643	793	859	959	989	1156	1085	835	739	444	471	590	770	764	696
PEAK POW MW		2183	2184	2186	2190	2196	2232	2230	2219	2202	2161	2163	2163	2163	2146	2162	2164
ENERGY GWH	7298.8	196.0	108.1	171.3	618.5	713.5	711.7	860.3	807.0	601.2	549.6	159.9	79.2	113.3	573.1	568.2	467.8
DAILY GWH		13.1	15.4	19.0	20.6	23.0	23.7	27.8	26.0	20.0	17.7	10.7	11.3	14.2	18.5	18.3	16.7
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

DATE OF STUDY 02/09/04

TIME OF STUDY 10:52:06

2004 AOP EXTENSIONS, LOWER QUARTILE RUNOFF

SHORTEN NAVIGATION SEASON 12-DAYS
VALUES IN 1000 AF EXCEPT AS INDICATED

STUDY NO 15

	28FEB09		2009										2010			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	7022	283	132	170	615	1083	1702	741	307	295	379	196	91	104	345	248	331
DEPLETION	432	-11	-5	-6	49	314	529	203	-39	-132	-77	-36	-17	-19	-114	-123	-85
EVAPORATION	481							29	92	115	101	46	21	24	53		
MOD INFLOW	6109	294	137	176	566	769	1173	509	254	312	355	185	86	99	406	371	416
RELEASE	5321	134	62	80	357	492	536	553	553	318	288	137	76	127	553	553	500
STOR CHANGE	788	160	75	96	209	277	637	-45	-299	-6	67	49	10	-28	-147	-182	-84
STORAGE	11311	11471	11545	11641	11850	12127	12764	12720	12421	12414	12482	12530	12541	12512	12365	12183	12099
ELEV FTMSL	2214.4	2215.4	2215.8	2216.3	2217.5	2219.1	2222.6	2222.4	2220.7	2220.7	2221.1	2221.3	2221.4	2221.2	2220.4	2219.4	2218.9
DISCH KCFS	9.0	4.5	4.5	4.5	6.0	8.0	9.0	9.0	9.0	5.4	4.7	4.6	5.5	8.0	9.0	9.0	9.0
POWER																	
AVE POWER MW		57	57	57	77	103	117	117	117	69	61	60	72	104	117	116	116
PEAK POW MW		190	190	191	193	195	199	198	197	197	197	197	197	197	196	195	195
ENERGY GWH	832.0	20.5	9.6	12.4	55.1	76.3	84.0	87.4	87.0	50.0	45.3	21.5	12.0	20.0	86.8	86.4	77.8
--GARRISON--																	
NAT INFLOW	10598	500	233	300	803	1349	2842	1990	559	470	451	185	86	98	251	186	295
DEPLETION	1173					206	774	560	71	-123	8	-94	-44	-50	-68	-46	-22
CHAN STOR	0	48			-16	-21	-10			37	7	1	-9	-26	-10		
EVAPORATION	577							35	111	139	121	55	26	29	63		
REG INFLOW	14169	682	296	380	1144	1614	2593	1949	931	810	617	361	171	221	800	785	817
RELEASE	13213	446	194	250	1012	1138	1309	1322	1291	952	693	335	208	286	1230	1353	1194
STOR CHANGE	956	235	101	130	133	476	1284	627	-361	-142	-77	26	-37	-65	-430	-567	-377
STORAGE	13624	13859	13960	14091	14223	14700	15984	16610	16250	16107	16031	16056	16019	15954	15524	14957	14579
ELEV FTMSL	1821.4	1822.3	1822.7	1823.2	1823.7	1825.5	1830.2	1832.4	1831.2	1830.7	1830.4	1830.5	1830.4	1830.1	1828.6	1826.5	1825.1
DISCH KCFS	22.0	15.0	14.0	14.0	17.0	18.5	22.0	21.5	21.0	16.0	11.3	11.3	15.0	18.0	20.0	22.0	21.5
POWER																	
AVE POWER MW		168	158	158	193	211	256	256	251	191	134	134	178	213	235	255	247
PEAK POW MW		411	412	414	416	423	440	448	443	441	440	441	440	439	434	426	421
ENERGY GWH	1865.9	60.6	26.5	34.2	138.7	157.0	184.3	190.4	186.6	137.3	100.1	48.4	30.0	40.9	175.0	190.0	165.8
--OAHE--																	
NAT INFLOW	2048	217	101	130	324	183	815	144	34	92	13				-49	-8	51
DEPLETION	652	23	11	14	48	69	138	165	109	27	-10	1	0	1	12	17	27
CHAN STOR	3	33	5		-14	-7	-16	2	2	23	22	0	-17	-14	-9	-9	2
EVAPORATION	511							32	99	122	106	48	23	26	56		
REG INFLOW	14101	673	290	366	1274	1245	1970	1271	1120	919	633	286	168	245	1103	1318	1220
RELEASE	13115	524	121	321	1186	1353	1172	1695	1658	1297	438	262	145	164	1095	978	708
STOR CHANGE	986	149	169	46	87	-108	798	-423	-538	-378	195	25	23	81	8	341	513
STORAGE	14235	14384	14552	14598	14685	14577	15375	14952	14414	14036	14231	14255	14278	14359	14367	14708	15220
ELEV FTMSL	1590.9	1591.5	1592.2	1592.4	1592.7	1592.3	1595.4	1593.8	1591.7	1590.1	1590.9	1591.0	1591.1	1591.4	1591.5	1592.8	1594.8
DISCH KCFS	12.9	17.6	8.7	18.0	19.9	22.0	19.7	27.6	27.0	21.8	7.1	8.8	10.4	10.3	17.8	15.9	12.7
POWER																	
AVE POWER MW		209	104	214	238	262	236	331	321	257	84	104	124	123	211	189	153
PEAK POW MW		629	632	633	634	632	648	640	629	622	625	626	626	628	628	635	645
ENERGY GWH	1890.5	75.1	17.4	46.2	171.0	194.8	170.2	246.4	238.7	185.1	62.7	37.5	20.8	23.6	157.0	140.9	103.0
--BIG BEND--																	
EVAPORATION	129							8	24	31	27	12	6	7	14		
REG INFLOW	12986	524	121	321	1186	1353	1172	1687	1634	1266	411	249	139	157	1081	978	708
RELEASE	12986	524	121	321	1186	1353	1172	1687	1634	1266	411	249	139	157	1081	978	708
STORAGE	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682
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	12.9	17.6	8.7	18.0	19.9	22.0	19.7	27.4	26.6	21.3	6.7	8.4	10.0	9.9	17.6	15.9	12.7
POWER																	
AVE POWER MW		83	41	84	93	103	92	128	124	101	34	42	51	50	87	77	61
PEAK POW MW		510	509	509	509	509	509	509	509	525	538	538	538	538	538	538	529
ENERGY GWH	748.0	29.7	6.8	18.2	67.2	76.6	66.4	95.5	92.5	73.0	25.2	15.3	8.5	9.6	64.6	57.6	41.1
--FORT RANDALL--																	
NAT INFLOW	779	106	49	64	100	79	203	41	76	36	2				8	-8	23
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	141							10	32	38	27	10	5	5	13		
REG INFLOW	13537	629	170	383	1282	1423	1363	1700	1663	1256	377	238	134	152	1073	967	728
RELEASE	13537	220	153	383	1282	1423	1363	1700	1663	1603	1254	266	134	152	707	695	539
STOR CHANGE	0	409	17					0	0	-347	-877	-28	0	0	366	272	189
STORAGE	3123	3532	3549	3549	3549	3549	3549	3549	3549	3202	2325	2297	2297	2297	2663	2935	3124
ELEV FTMSL	1350.0	1355.0	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1351.0	1338.0	1337.5	1337.5	1337.5	1343.5	1347.4	1350.0
DISCH KCFS	9.8	7.4	11.0	21.5	21.5	23.1	22.9	27.6	27.0	26.9	20.4	8.9	9.7	9.5	11.5	11.3	9.7
POWER																	
AVE POWER MW		62	93	181	182	195	193	233	228	223	157	65	70	70	86	89	78
PEAK POW MW		354	355	355	355	355	355	355	355	341	285	283	283	283	311	329	338
ENERGY GWH	1343.9	22.2	15.7	39.2	131.0	145.2	139.2	173.0	169.3	160.5	117.1	23.6	11.8	13.4	64.1	65.9	52.6
--GAVINS POINT--																	
NAT INFLOW	1401	103	48	62	139	155	160	91	89	65	117	53	25	28	78	77	113
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	5	-7	-20	0	-3	0	-9	1	0	12	21	-1	0	-4	0	3
EVAPORATION	47							3	9	11	10	5	2	2	5		
REG INFLOW	14776	328	194	425	1416	1556	1500	1740	1735	1662	1371	330	153	175	766	771	655
RELEASE	14776	328	194	425	1416	1556	1500	1740	1722	1636	1371	330	153	175	766	771	694
STOR CHANGE									13	26							-39
STORAGE	358	358	358	358	358	358	358	358	371	397	397	397	397	397	397	397	358
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	12.5	11.0	14.0	23.8	23.8	25.3	25.2	28.3	28.0	27.5	22.3	11.1	11.0	11.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		39	49	82	82	87	86	96	96	95	78	39	39	39	44	45	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	618.9	13.9	8.2	17.6	58.7	64.4	62.1	71.6	71.3	68.7	58.4	14.2	6.6	7.5	32.9	33.2	29.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1356	174	81	104	135	262	188	113	84	52	37	19	9	10	20	-4	72
DEPLETION	262	7	3	4	22	35	31	38	36	23	10	6	3	3	13	14	14
REGULATED FLOW AT SIOUX CITY																	
KAF	15870	495	272	525	1529	1783	1657	1815	1770	1665	1398	343	159	182	773	753	752
KCFS		16.6	19.6	29.4	25.7	29.0	27.8	29.5	28.8	28.0	22.7	11.5	11.4	11.4	12.6	12.2	13.5
--TOTAL--																	
NAT INFLOW	23204	1383	645	829	2116	3111	5910	3120	1149	1010	999	452	211	241	653	491	885
DEPLETION	2713	20	9	12	128	652	1508	1023	202	-203	-66	-116	-54	-62	-144	-134	-63
CHAN STOR	-5	85	-2	-20	-30	-31	-26	-7	3	61	34	22	-28	-39	-23	-9	5
EVAPORATION	1886							116	366	456	393	176	82	94	204		
STORAGE	44332	45285	45647	45918	46348	46993	49712	49871	48686	47838	47147	47217	47213	47201	46998	46861	47062
SYSTEM POWER																	
AVE POWER MW		617	502	777	864	960	981	1162	1136	937	549	446	534	599	780	771	699
PEAK POW MW		2208	2213	2216	2221	2228	2265	2264	2248	2242	2203	2202	2202	2203	2186	2201	2203
ENERGY GWH	7299.3	222.1	84.3	167.8	621.8	714.4	706.1	864.4	845.4	674.6	408.7	160.5	89.7	115.0	580.5	573.9	469.9
DAILY GWH		14.8	12.0	18.6	20.7	23.0	23.5	27.9	27.3	22.5	13.2	10.7	12.8	14.4	18.7	18.5	16.8
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

DATE OF STUDY 02/09/04

2004 LOWER DECILE RUNOFF

TIME OF STUDY 10:51:57

SHORTEN NAVIGATION SEASON 43-DAYS
VALUES IN 1000 AF EXCEPT AS INDICATED

STUDY NO 16

	29FEB04	2004											2005			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	5100	234	109	140	515	783	996	439	253	242	320	159	74	85	271	205	275
DEPLETION	401	-12	-5	-7	94	232	344	175	20	-57	-93	-28	-13	-15	-93	-88	-54
EVAPORATION	404							25	78	97	84	38	18	20	44		
MOD INFLOW	4295	246	115	147	421	551	652	239	155	202	329	148	69	79	320	293	329
RELEASE	5539	149	69	89	464	523	536	523	492	393	278	134	97	127	553	584	528
STOR CHANGE	-1244	97	45	58	-43	28	116	-284	-337	-191	51	14	-28	-48	-233	-291	-199
STORAGE	9553	9650	9696	9754	9711	9739	9856	9572	9235	9044	9095	9109	9080	9032	8799	8508	8309
ELEV FTMSL	2203.7	2204.3	2204.6	2205.0	2204.7	2204.9	2205.6	2203.8	2201.6	2200.3	2200.7	2200.8	2200.6	2200.3	2198.7	2196.7	2195.3
DISCH KCFS	9.0	5.0	5.0	5.0	7.8	8.5	9.0	8.5	8.0	6.6	4.5	4.5	7.0	8.0	9.0	9.5	9.5
POWER																	
AVE POWER MW		60	60	60	94	102	108	102	95	78	53	53	82	94	105	109	108
PEAK POW MW		133	133	133	133	133	177	174	171	170	170	170	170	170	167	164	162
ENERGY GWH	791.0	21.6	10.1	13.0	67.6	76.1	77.8	75.8	70.6	56.0	39.6	19.1	13.8	18.0	78.0	81.3	72.6
--GARRISON--																	
NAT INFLOW	7299	270	126	162	700	903	2020	1277	361	277	390	161	75	86	108	160	223
DEPLETION	1165	36	17	21	85	172	525	379	70	-82	57	-57	-26	-30	-16		14
CHAN STOR	-6	44			-31	-8	-5	5	5	15	23	0	-27	-11	-11	-6	
EVAPORATION	476							30	93	115	99	45	21	24	50		
REG INFLOW	11191	427	179	230	1048	1246	2025	1396	695	653	535	307	150	208	616	739	737
RELEASE	12980	506	194	250	1101	1168	1220	1230	1199	1001	677	327	208	270	1230	1261	1139
STOR CHANGE	-1789	-79	-16	-20	-52	78	805	167	-504	-349	-142	-20	-58	-61	-614	-522	-402
STORAGE	11759	11680	11664	11644	11592	11670	12475	12641	12138	11789	11647	11627	11569	11508	10894	10372	9970
ELEV FTMSL	1813.7	1813.4	1813.3	1813.2	1813.0	1813.3	1816.7	1817.4	1815.3	1813.8	1813.2	1813.1	1812.9	1812.6	1809.9	1807.5	1805.5
DISCH KCFS	24.0	17.0	14.0	14.0	18.5	19.0	20.5	20.0	19.5	16.8	11.0	11.0	15.0	17.0	20.0	20.5	20.5
POWER																	
AVE POWER MW		181	149	149	196	201	220	218	211	180	118	117	159	180	209	210	206
PEAK POW MW		307	307	306	306	307	317	319	313	308	306	306	305	305	297	290	284
ENERGY GWH	1661.5	65.1	25.1	32.2	141.1	149.8	158.3	162.0	157.3	129.9	87.5	42.2	26.8	34.5	155.4	155.9	138.3
--OAHE--																	
NAT INFLOW	1049	197	92	118	183	100	215	82	21	64	5	-5	-2	-3	-48	-12	41
DEPLETION	585	22	10	13	46	64	123	143	93	23	-8	2	1	1	11	16	25
CHAN STOR	18	37	16		-23	-3	-8	3	3	15	33	0	-22	-11	-17	-3	
EVAPORATION	382							24	74	91	79	36	17	19	42		
REG INFLOW	13080	718	292	355	1215	1202	1304	1147	1056	966	643	285	166	236	1112	1230	1155
RELEASE	14027	439	282	378	1262	1592	1444	1840	1660	916	752	306	149	169	952	966	920
STOR CHANGE	-947	279	10	-23	-47	-391	-140	-693	-604	50	-109	-21	17	67	160	264	234
STORAGE	11436	11715	11725	11702	11655	11264	11125	10432	9828	9878	9769	9748	9765	9832	9992	10255	10489
ELEV FTMSL	1578.7	1580.0	1580.1	1580.0	1579.7	1577.9	1577.2	1573.7	1570.5	1570.8	1570.2	1570.0	1570.1	1570.5	1571.4	1572.8	1574.0
DISCH KCFS	19.6	14.7	20.3	21.1	21.2	25.9	24.3	29.9	27.0	15.4	12.2	10.3	10.7	10.7	15.5	15.7	16.6
POWER																	
AVE POWER MW		163	225	234	234	284	264	321	284	161	128	108	112	112	162	166	176
PEAK POW MW		569	569	569	567	558	554	536	519	520	517	517	517	519	524	531	537
ENERGY GWH	1819.4	58.7	37.8	50.6	168.8	211.2	190.2	238.6	211.0	115.9	95.1	38.7	18.8	21.4	120.7	123.4	118.5
--BIG BEND--																	
EVAPORATION	129							8	24	31	27	12	6	7	14		
REG INFLOW	13898	439	282	378	1262	1592	1444	1832	1636	885	725	294	143	163	938	966	920
RELEASE	13898	439	282	378	1262	1592	1444	1832	1636	885	725	294	143	163	938	966	920
STORAGE	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682
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	20.2	14.7	20.3	21.1	21.2	25.9	24.3	29.8	26.6	14.9	11.8	9.9	10.3	10.3	15.3	15.7	16.6
POWER																	
AVE POWER MW		70	95	99	99	121	114	139	126	74	60	50	52	52	77	77	80
PEAK POW MW		518	510	509	509	509	509	509	518	538	538	538	538	538	538	538	529
ENERGY GWH	805.6	25.1	16.0	21.4	71.5	90.2	81.8	103.7	93.7	53.3	44.3	18.0	8.8	10.0	56.9	57.5	53.4
--FORT RANDALL--																	
NAT INFLOW	300	55	26	33	43	35	120	13	36	-10	-52	-3	-1	-1		-6	12
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	132							10	31	34	24	10	5	5	12		
REG INFLOW	13986	492	307	410	1301	1618	1552	1817	1626	834	647	281	137	156	922	957	929
RELEASE	13987	232	159	393	1301	1618	1552	1817	1800	1609	950	281	137	156	719	707	555
STOR CHANGE	-1	260	148	17		0	0	0	-174	-775	-303	0	0	0	203	250	374
STORAGE	3124	3384	3532	3549	3549	3549	3549	3549	3375	2600	2296	2296	2296	2296	2499	2749	3123
ELEV FTMSL	1350.0	1353.2	1355.0	1355.2	1355.2	1355.2	1355.2	1355.2	1353.1	1342.6	1337.5	1337.5	1337.5	1337.5	1341.0	1344.8	1350.0
DISCH KCFS	12.5	7.8	11.5	22.0	21.9	26.3	26.1	29.5	29.3	27.0	15.5	9.4	9.9	9.8	11.7	11.5	10.0
POWER																	
AVE POWER MW		65	97	186	185	222	220	248	244	214	115	69	72	72	87	88	80
PEAK POW MW		349	354	355	355	355	355	355	348	306	283	283	283	283	300	317	338
ENERGY GWH	1375.5	23.3	16.3	40.1	132.9	164.8	158.1	184.7	181.4	154.0	85.6	24.8	12.1	13.7	64.5	65.5	53.6
--GAVINS POINT--																	
NAT INFLOW	1200	87	41	52	120	131	138	76	76	55	104	45	21	24	67	65	98
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	4	9	-7	-20	0	-9	0	-7	1	4	21	11	-1	0	-4	0	3
EVAPORATION	47							3	9	11	10	5	2	2	5		
REG INFLOW	15029	329	193	425	1416	1722	1666	1845	1858	1662	1064	327	153	175	768	771	656
RELEASE	15029	329	193	425	1416	1722	1666	1845	1845	1636	1064	327	153	175	768	771	695
STOR CHANGE									13	26							-39
STORAGE	358	358	358	358	358	358	358	358	371	397	397	397	397	397	397	397	358
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	13.5	11.0	13.9	23.8	23.8	28.0	28.0	30.0	30.0	27.5	17.3	11.0	11.0	11.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		39	49	82	82	95	95	101	101	95	61	39	39	39	44	45	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	626.7	13.9	8.2	17.6	58.7	70.9	68.6	75.1	75.4	68.7	45.5	14.1	6.6	7.5	33.0	33.2	29.7
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	550	36	17	22	77	144	106	47	22	15	14	10	4	5	10	-5	26
DEPLETION	247	6	3	4	20	34	30	36	34	22	9	6	3	3	12	13	13
REGULATED FLOW AT SIOUX CITY																	
KAF	15332	359	207	443	1473	1832	1742	1856	1833	1629	1069	331	155	177	766	753	708
KCFS		12.1	14.9	24.8	24.8	29.8	29.3	30.2	29.8	27.4	17.4	11.1	11.1	11.1	12.5	12.3	12.8
--TOTAL--																	
NAT INFLOW	15498	880	411	528	1638	2096	3595	1934	769	643	781	367	171	195	408	407	675
DEPLETION	2592	54	25	32	254	530	1058	790	242	-92	-32	-71	-33	-38	-73	-55	1
CHAN STOR	15	90	8	-20	-54	-19	-13	1	9	34	77	12	-51	-22	-31	-8	3
EVAPORATION	1569							99	308	379	324	145	68	77	168		
STORAGE	37913	38470	38657	38689	38547	38262	39044	38234	36629	35390	34887	34859	34790	34747	34263	33964	33933
SYSTEM POWER																	
AVE POWER MW		577	675	810	890	1026	1021	1129	1061	803	534	436	517	548	683	695	694
PEAK POW MW		1989	1988	1987	1985	1976	2026	2007	1984	1959	1932	1931	1931	1932	1903	1918	1927
ENERGY GWH	7080.1	207.8	113.4	174.9	640.7	763.1	734.8	839.9	789.4	578.0	397.7	156.9	86.9	105.2	508.5	516.8	466.1
DAILY GWH		13.9	16.2	19.4	21.4	24.6	24.5	27.1	25.5	19.3	12.8	10.5	12.4	13.1	16.4	16.7	16.6

INI-SUM 15MAR 22MAR 31MAR 30APR 31MAY 30JUN 31JUL 31AUG 30SEP 31OCT 15NOV 22NOV 30NOV 31DEC 31JAN 28FEB

DATE OF STUDY 02/09/04
TIME OF STUDY 10:51:57

2004 AOP EXTENSIONS, LOWER DECILE RUNOFF
SHORTEN NAVIGATION SEASON 61-DAYS
VALUES IN 1000 AF EXCEPT AS INDICATED

STUDY NO 17

	28FEB05	2005											2006			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	5435	250	116	150	549	834	1061	468	270	258	341	169	79	90	289	218	293
DEPLETION	408	-1	0	-1	79	314	479	152	-46	-123	-57	-33	-15	-18	-107	-125	-90
EVAPORATION	380							23	73	91	80	36	17	19	42		
MOD INFLOW	4647	251	117	150	470	520	582	293	243	290	318	166	77	88	354	343	383
RELEASE	5081	119	56	71	476	430	506	523	492	327	258	125	69	111	523	523	472
STOR CHANGE	-434	132	61	79	-6	90	76	-230	-249	-37	60	41	8	-23	-168	-180	-89
STORAGE	8309	8441	8503	8582	8575	8665	8741	8511	8263	8226	8286	8327	8335	8312	8144	7964	7875
ELEV FTMSL	2195.3	2196.2	2196.7	2197.2	2197.2	2197.8	2198.3	2196.7	2195.0	2194.7	2195.1	2195.4	2195.5	2195.3	2194.1	2192.9	2192.2
DISCH KCFS	9.5	4.0	4.0	4.0	8.0	7.0	8.5	8.5	8.0	5.5	4.2	4.2	5.0	7.0	8.5	8.5	8.5
POWER																	
AVE POWER MW		46	46	46	92	81	98	98	91	62	48	48	57	79	96	95	94
PEAK POW MW		164	164	165	165	166	167	164	162	161	162	162	163	162	161	159	158
ENERGY GWH	699.4	16.5	7.7	10.0	66.2	60.0	70.7	72.8	67.7	44.9	35.5	17.2	9.6	15.3	71.3	70.7	63.4
--GARRISON--																	
NAT INFLOW	8026	297	138	178	770	993	2221	1404	397	305	429	177	83	94	119	176	245
DEPLETION	1166	37	17	22	67	167	760	495	66	-116	9	-90	-42	-48	-78	-53	-48
CHAN STOR	11	62			-45	11	-17	0	6	28	15		-9	-22	-17		0
EVAPORATION	445							27	86	107	93	42	20	22	48		
REG INFLOW	11508	441	177	227	1134	1268	1950	1404	742	669	600	350	165	208	655	752	765
RELEASE	12039	446	167	214	1131	1045	1131	1138	1107	952	631	305	142	270	1138	1168	1055
STOR CHANGE	-531	-5	10	13	3	222	819	267	-365	-283	-30	44	23	-61	-482	-417	-290
STORAGE	9970	9965	9976	9989	9992	10214	11033	11300	10936	10653	10623	10667	10690	10629	10146	9730	9439
ELEV FTMSL	1805.5	1805.5	1805.6	1805.6	1805.6	1806.7	1810.5	1811.7	1810.1	1808.8	1808.6	1808.8	1808.9	1808.6	1806.4	1804.4	1802.9
DISCH KCFS	20.5	15.0	12.0	12.0	19.0	17.0	19.0	18.5	18.0	16.0	10.3	10.3	10.3	17.0	18.5	19.0	19.0
POWER																	
AVE POWER MW		150	120	120	190	171	194	192	186	164	105	105	105	173	186	188	185
PEAK POW MW		284	284	284	284	288	299	372	366	361	361	362	362	361	353	345	340
ENERGY GWH	1469.0	54.0	20.2	26.0	136.6	127.1	139.9	142.7	138.6	118.1	78.1	37.8	17.7	33.3	138.6	139.8	124.4
--OAHE--																	
NAT INFLOW	1184	223	104	134	206	113	242	92	24	72	6	-6	-3	-3	-54	-13	47
DEPLETION	597	22	10	13	46	65	126	147	96	24	-8	2	1	1	11	16	25
CHAN STOR	8	30	16		-38	11	-11	3	3	12	32	0	0	-38	-9	-3	
EVAPORATION	368							23	69	87	78	35	16	19	40		
REG INFLOW	12266	677	276	334	1253	1104	1236	1062	968	924	599	263	123	209	1024	1136	1077
RELEASE	12810	428	276	369	1250	1411	1248	1732	1526	435	673	318	148	169	1022	801	1002
STOR CHANGE	-544	249	1	-35	3	-307	-12	-670	-558	489	-74	-55	-25	40	1	335	75
STORAGE	10489	10738	10739	10704	10707	10400	10387	9717	9159	9648	9574	9518	9493	9533	9535	9870	9946
ELEV FTMSL	1574.0	1575.2	1575.2	1575.1	1575.1	1573.5	1573.5	1569.9	1566.7	1569.5	1569.1	1568.8	1568.6	1568.9	1568.9	1570.7	1571.1
DISCH KCFS	16.6	14.4	19.9	20.7	21.0	22.9	21.0	28.2	24.8	7.3	11.0	10.7	10.7	10.7	16.6	13.0	18.0
POWER																	
AVE POWER MW		154	213	222	225	245	223	295	255	76	114	111	110	110	172	136	189
PEAK POW MW		544	544	543	543	535	535	516	499	514	511	510	509	510	510	520	522
ENERGY GWH	1627.5	55.6	35.9	48.0	162.3	182.2	160.5	219.5	189.5	54.4	84.6	39.9	18.5	21.2	127.8	100.9	126.9
--BIG BEND--																	
EVAPORATION	129							8	24	31	27	12	6	7	14		
REG INFLOW	12681	428	276	369	1250	1411	1248	1725	1502	405	646	306	142	163	1008	801	1002
RELEASE	12681	428	276	369	1250	1411	1248	1725	1502	405	646	306	142	163	1008	801	1002
STORAGE	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682
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	16.6	14.4	19.9	20.7	21.0	22.9	21.0	28.0	24.4	6.8	10.5	10.3	10.2	10.2	16.4	13.0	18.0
POWER																	
AVE POWER MW		68	93	97	98	107	98	131	116	35	53	52	52	52	82	65	87
PEAK POW MW		518	510	509	509	509	509	509	518	538	538	538	538	538	538	538	529
ENERGY GWH	735.0	24.5	15.6	20.9	70.8	79.9	70.7	97.7	86.0	24.9	39.6	18.7	8.7	10.0	60.8	48.0	58.1
--FORT RANDALL--																	
NAT INFLOW	366	67	31	40	52	42	146	16	44	-12	-62	-3	-1	-2		-7	15
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	128							10	31	32	22	10	5	5	13		
REG INFLOW	12828	493	306	409	1298	1444	1382	1713	1500	343	561	292	136	155	992	791	1014
RELEASE	12829	232	159	392	1298	1444	1382	1713	1674	1422	561	292	136	155	719	701	550
STOR CHANGE	-1	261	147	17				0	-174	-1079	0	0	0	0	273	90	464
STORAGE	3123	3385	3532	3549	3549	3549	3549	3549	3375	2296	2296	2296	2296	2296	2569	2659	3123
ELEV FTMSL	1350.0	1353.2	1355.0	1355.2	1355.2	1355.2	1355.2	1355.2	1353.1	1337.5	1337.5	1337.5	1337.5	1337.5	1342.1	1343.5	1350.0
DISCH KCFS	10.0	7.8	11.4	21.9	21.8	23.5	23.2	27.9	27.2	23.9	9.1	9.8	9.8	9.8	11.7	11.4	9.9
POWER																	
AVE POWER MW		65	96	185	184	198	196	234	227	185	67	72	71	71	87	87	79
PEAK POW MW		349	354	355	355	355	355	355	348	282	283	283	283	283	305	311	338
ENERGY GWH	1260.7	23.3	16.2	40.0	132.6	147.4	141.1	174.3	169.0	133.4	49.6	25.8	12.0	13.7	64.8	64.9	52.8
--GAVINS POINT--																	
NAT INFLOW	1229	89	42	53	123	134	141	78	78	56	107	46	21	25	69	67	100
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	4	-7	-20	0	-3	0	-9	1	6	27	-1	0	0	-4	1	3
EVAPORATION	47							3	9	11	10	5	2	2	5		
REG INFLOW	13896	326	194	425	1416	1556	1500	1740	1735	1478	683	327	153	175	770	768	653
RELEASE	13896	326	194	425	1416	1556	1500	1740	1722	1452	683	327	153	175	770	768	692
STOR CHANGE									13	26							-39
STORAGE	358	358	358	358	358	358	358	358	371	397	397	397	397	397	397	397	358
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	12.5	11.0	13.9	23.8	23.8	25.3	25.2	28.3	28.0	24.4	11.1	11.0	11.0	11.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		38	49	82	82	87	86	96	96	85	40	39	39	39	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	582.2	13.8	8.2	17.6	58.7	64.4	62.1	71.6	71.3	61.3	29.4	14.1	6.6	7.5	33.1	33.0	29.5
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	664	44	21	26	93	173	128	57	26	18	17	12	5	6	12	-6	32
DEPLETION	248	6	3	4	20	34	30	37	34	22	9	6	3	3	12	13	13
REGULATED FLOW AT SIOUX CITY																	
KAF	14312	364	211	448	1489	1695	1598	1760	1714	1448	691	333	156	178	770	749	711
KCFS		12.2	15.2	25.1	25.0	27.6	26.8	28.6	27.9	24.3	11.2	11.2	11.2	11.2	12.5	12.2	12.8
--TOTAL--																	
NAT INFLOW	16904	969	452	581	1793	2289	3939	2115	839	697	838	395	184	211	435	435	732
DEPLETION	2613	65	30	39	221	608	1431	888	175	-191	-44	-110	-51	-58	-149	-145	-97
CHAN STOR	8	96	9	-20	-83	19	-27	-6	10	35	74	-1	-9	-61	-29	-2	3
EVAPORATION	1497							94	292	359	310	140	65	75	162		
STORAGE	33933	34569	34789	34863	34863	34868	35751	35118	33785	32902	32857	32887	32893	32849	32472	32302	32423
SYSTEM POWER																	
AVE POWER MW		521	618	752	871	888	896	1046	970	607	426	427	435	525	667	615	677
PEAK POW MW		1972	1971	1971	1971	1967	1978	2031	2009	1974	1973	1972	1972	1972	1944	1951	1963
ENERGY GWH	6373.7	187.7	103.8	162.5	627.2	660.9	644.9	778.5	722.0	436.9	316.8	153.6	73.0	100.9	496.4	457.3	455.1
DAILY GWH		12.5	14.8	18.1	20.9	21.3	21.5	25.1	23.3	14.6	10.2	10.2	10.4	12.6	16.0	14.8	16.3

INI-SUM 15MAR 22MAR 31MAR 30APR 31MAY 30JUN 31JUL 31AUG 30SEP 31OCT 15NOV 22NOV 30NOV 31DEC 31JAN 28FEB

DATE OF STUDY 02/09/04

2004 AOP EXTENSIONS, LOWER DECILE RUNOFF

TIME OF STUDY 10:51:57

SHORTEN NAVIGATION SEASON 61-DAYS
VALUES IN 1000 AF EXCEPT AS INDICATED

STUDY NO 18

	28FEB06			2006									2007			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	5615	258	120	155	567	862	1097	483	279	266	352	175	81	93	298	226	303
DEPLETION	400	2	1	1	73	305	474	159	-42	-124	-58	-34	-16	-18	-108	-126	-91
EVAPORATION	375							23	72	89	78	36	17	19	41		
MOD INFLOW	4840	256	119	153	494	557	623	301	249	301	332	172	80	92	365	352	394
RELEASE	5017	119	56	71	298	430	536	523	523	327	253	122	57	127	523	553	500
STOR CHANGE	-178	137	64	82	196	127	87	-222	-273	-27	79	50	23	-35	-158	-201	-106
STORAGE	7875	8012	8075	8157	8354	8480	8568	8346	8073	8046	8124	8174	8197	8162	8005	7803	7697
ELEV FTMSL	2192.2	2193.2	2193.7	2194.2	2195.6	2196.5	2197.1	2195.6	2193.6	2193.4	2194.0	2194.4	2194.5	2194.3	2193.1	2191.7	2190.9
DISCH KCFS	8.5	4.0	4.0	4.0	5.0	7.0	9.0	8.5	8.5	5.5	4.1	4.1	4.1	8.0	8.5	9.0	9.0
POWER																	
AVE POWER MW		45	45	45	57	80	103	97	96	62	46	47	47	90	95	100	99
PEAK POW MW		159	160	161	163	164	165	163	160	160	160	161	161	161	159	157	156
ENERGY GWH	683.6	16.1	7.6	9.7	40.9	59.4	74.2	72.2	71.3	44.5	34.5	16.7	7.8	17.3	70.8	74.2	66.5
--GARRISON--																	
NAT INFLOW	8444	312	146	187	810	1045	2337	1477	418	320	451	187	87	99	125	185	258
DEPLETION	946	-12	-5	-7	-24	211	724	500	68	-123	1	-87	-41	-46	-93	-72	-48
CHAN STOR	-5	51			-11	-23	-23	6		33	16	0		-44	-6	-6	
EVAPORATION	440							27	85	106	92	42	19	22	47		
REG INFLOW	12070	494	207	266	1120	1242	2126	1478	787	698	627	354	165	207	688	805	806
RELEASE	12279	446	167	214	893	1107	1220	1168	1199	932	641	310	145	270	1168	1261	1139
STOR CHANGE	-209	48	40	51	228	135	906	310	-412	-234	-14	44	21	-63	-481	-456	-333
STORAGE	9439	9487	9527	9579	9806	9941	10847	11157	10745	10511	10497	10541	10562	10499	10019	9563	9230
ELEV FTMSL	1802.9	1803.1	1803.3	1803.6	1804.7	1805.4	1809.7	1811.1	1809.2	1808.1	1808.0	1808.2	1808.3	1808.1	1805.8	1803.5	1801.8
DISCH KCFS	19.0	15.0	12.0	12.0	15.0	18.0	20.5	19.0	19.5	15.7	10.4	10.4	10.4	17.0	19.0	20.5	20.5
POWER																	
AVE POWER MW		146	117	118	147	178	206	196	200	160	106	106	106	172	190	201	198
PEAK POW MW		341	342	343	347	349	365	370	363	359	359	359	360	359	350	342	336
ENERGY GWH	1486.2	52.5	19.7	25.4	106.1	132.2	148.4	145.6	149.1	114.9	79.0	38.2	17.9	33.1	141.6	149.7	133.0
--OAHE--																	
NAT INFLOW	1263	238	111	143	220	120	259	99	25	77	6	-6	-3	-3	-58	-14	50
DEPLETION	613	23	11	14	47	66	129	151	100	25	-8	2	1	1	11	16	26
CHAN STOR	-9	22	17		-17	-17	-14	8	-3	22	30		0	-38	-12	-9	
EVAPORATION	355							22	67	84	75	34	16	18	39		
REG INFLOW	12566	683	283	343	1049	1144	1336	1103	1055	923	610	269	125	210	1049	1222	1163
RELEASE	12762	421	272	364	1243	1404	1231	1729	1521	436	680	318	148	169	1022	802	1001
STOR CHANGE	-196	262	11	-21	-194	-260	105	-627	-467	487	-70	-50	-22	41	26	420	162
STORAGE	9946	10208	10219	10198	10004	9744	9849	9222	8755	9242	9173	9123	9101	9141	9168	9588	9749
ELEV FTMSL	1571.1	1572.5	1572.6	1572.5	1571.4	1570.0	1570.6	1567.1	1564.4	1567.2	1566.8	1566.5	1566.4	1566.6	1566.8	1569.2	1570.0
DISCH KCFS	18.0	14.2	19.6	20.4	20.9	22.8	20.7	28.1	24.7	7.3	11.1	10.7	10.7	10.7	16.6	13.0	18.0
POWER																	
AVE POWER MW		149	207	216	220	238	215	289	249	74	113	109	109	109	169	134	187
PEAK POW MW		530	530	529	524	516	520	501	488	502	500	498	498	499	500	512	517
ENERGY GWH	1593.8	53.8	34.8	46.6	158.2	177.2	155.1	215.1	185.5	53.6	84.1	39.3	18.2	20.9	126.0	99.8	125.6
--BIG BEND--																	
EVAPORATION	129							8	24	31	27	12	6	7	14		
REG INFLOW	12633	421	272	364	1243	1404	1231	1722	1497	405	653	306	142	163	1008	802	1001
RELEASE	12633	421	272	364	1243	1404	1231	1722	1497	405	653	306	142	163	1008	802	1001
STORAGE	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682
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	18.0	14.2	19.6	20.4	20.9	22.8	20.7	28.0	24.3	6.8	10.6	10.3	10.2	10.3	16.4	13.0	18.0
POWER																	
AVE POWER MW		67	92	96	98	107	97	131	115	35	54	52	52	52	82	65	86
PEAK POW MW		518	510	509	509	509	509	509	518	538	538	538	538	538	538	538	529
ENERGY GWH	732.3	24.1	15.4	20.6	70.4	79.5	69.7	97.5	85.7	24.9	40.0	18.7	8.7	10.0	60.8	48.1	58.1
--FORT RANDALL--																	
NAT INFLOW	404	74	35	44	58	47	161	18	48	-13	-69	-4	-2	-2		-8	16
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	128							10	31	32	22	10	5	5	13		
REG INFLOW	12818	494	306	408	1297	1442	1380	1712	1499	343	560	292	135	155	992	791	1014
RELEASE	12818	232	158	391	1297	1442	1380	1712	1673	1421	560	292	135	155	719	701	550
STOR CHANGE	1	262	147	17				0	-174	-1078	0	0	0	0	273	90	464
STORAGE	3123	3385	3532	3549	3549	3549	3549	3549	3375	2297	2296	2296	2296	2296	2569	2659	3123
ELEV FTMSL	1350.0	1353.2	1355.0	1355.2	1355.2	1355.2	1355.2	1355.2	1353.1	1337.5	1337.5	1337.5	1337.5	1337.5	1342.1	1343.5	1350.0
DISCH KCFS	9.9	7.8	11.4	21.9	21.8	23.4	23.2	27.8	27.2	23.9	9.1	9.8	9.8	9.8	11.7	11.4	9.9
POWER																	
AVE POWER MW		65	96	185	184	198	196	234	227	185	67	72	71	71	87	87	79
PEAK POW MW		349	354	355	355	355	355	355	348	282	283	283	283	283	305	311	338
ENERGY GWH	1259.7	23.3	16.2	39.9	132.5	147.1	140.9	174.2	168.9	133.3	49.5	25.8	12.0	13.7	64.8	64.9	52.8
--GAVINS POINT--																	
NAT INFLOW	1242	90	42	54	124	136	143	79	79	57	108	47	22	25	69	67	101
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	4	-7	-20	0	-3	0	-9	1	6	27	-1	0	0	-4	1	3
EVAPORATION	47							3	9	11	10	5	2	2	5		
REG INFLOW	13898	327	194	425	1416	1556	1500	1740	1735	1478	683	327	153	175	770	768	654
RELEASE	13898	327	194	425	1416	1556	1500	1740	1722	1452	683	327	153	175	770	768	693
STOR CHANGE									13	26							-39
STORAGE	358	358	358	358	358	358	358	358	371	397	397	397	397	397	397	397	358
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	12.5	11.0	14.0	23.8	23.8	25.3	25.2	28.3	28.0	24.4	11.1	11.0	11.0	11.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		38	49	82	82	87	86	96	96	85	40	39	39	39	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	582.3	13.9	8.2	17.6	58.7	64.4	62.1	71.6	71.3	61.3	29.4	14.1	6.6	7.5	33.1	33.0	29.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	730	48	23	29	102	191	141	63	29	20	18	13	6	7	13	-7	35
DEPLETION	251	6	3	4	21	35	30	37	34	22	10	6	3	3	12	13	13
REGULATED FLOW AT SIOUX CITY																	
KAF	14377	369	213	450	1497	1712	1611	1766	1717	1450	691	334	156	178	771	748	715
KCFS		12.4	15.4	25.2	25.2	27.8	27.1	28.7	27.9	24.4	11.2	11.2	11.2	11.2	12.5	12.2	12.9
--TOTAL--																	
NAT INFLOW	17698	1020	476	612	1881	2401	4138	2219	878	727	866	411	192	219	447	449	763
DEPLETION	2404	21	10	12	126	645	1393	904	185	-198	-52	-108	-50	-57	-165	-165	-97
CHAN STOR	-26	78	10	-20	-28	-43	-36	5	-2	52	73	-1	0	-82	-21	-14	3
EVAPORATION	1474							93	288	354	305	138	64	74	160		
STORAGE	32423	33131	33394	33523	33753	33755	34853	34314	33001	32175	32169	32214	32235	32178	31839	31692	31840
SYSTEM POWER																	
AVE POWER MW		510	606	740	787	887	903	1043	984	601	425	425	424	533	668	631	693
PEAK POW MW		2010	2010	2011	2012	2008	2028	2012	1992	1958	1958	1957	1957	1957	1930	1938	1951
ENERGY GWH	6337.8	183.6	101.8	159.9	566.8	659.8	650.3	776.2	731.7	432.4	316.4	152.9	71.2	102.4	497.0	469.7	465.5
DAILY GWH		12.2	14.5	17.8	18.9	21.3	21.7	25.0	23.6	14.4	10.2	10.2	10.2	12.8	16.0	15.2	16.6
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

DATE OF STUDY 02/09/04

2004 AOP EXTENSIONS, LOWER DECILE RUNOFF

TIME OF STUDY 10:51:57

SHORTEN NAVIGATION SEASON 61-DAYS
VALUES IN 1000 AF EXCEPT AS INDICATED

STUDY NO 19

	28FEB07			2007									2008			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB
--FORT PECK--																	
NAT INFLOW	5748	264	123	158	580	882	1123	495	285	273	361	179	83	95	305	231	310
DEPLETION	410	-3	-1	-2	76	309	482	166	-38	-124	-60	-33	-15	-18	-106	-124	-99
EVAPORATION	373							23	71	89	78	36	17	19	41		
MOD INFLOW	4965	267	125	160	504	573	641	306	252	308	343	176	82	94	370	355	409
RELEASE	4987	119	56	71	298	430	536	523	492	327	256	122	83	127	523	535	489
STOR CHANGE	-21	148	69	89	206	143	105	-217	-240	-19	87	54	-1	-33	-152	-180	-80
STORAGE	7697	7846	7915	8003	8210	8352	8458	8241	8001	7982	8069	8123	8122	8088	7936	7756	7676
ELEV FTMSL	2190.9	2192.0	2192.5	2193.1	2194.6	2195.6	2196.4	2194.8	2193.1	2193.0	2193.6	2194.0	2194.0	2193.8	2192.7	2191.3	2190.7
DISCH KCFS	9.0	4.0	4.0	4.0	5.0	7.0	9.0	8.5	8.0	5.5	4.2	4.1	6.0	8.0	8.5	8.7	8.5
POWER																	
AVE POWER MW		44	45	45	56	79	102	96	90	62	47	46	68	90	95	96	93
PEAK POW MW		157	158	159	161	163	164	162	159	159	160	160	160	160	158	156	156
ENERGY GWH	676.4	16.0	7.5	9.7	40.5	59.0	73.7	71.8	66.8	44.3	34.8	16.7	11.3	17.2	70.5	71.6	65.0
--GARRISON--																	
NAT INFLOW	8762	324	151	194	840	1084	2425	1533	433	332	468	194	90	103	130	192	268
DEPLETION	992	3	1	2	5	211	728	516	74	-126	-4	-91	-42	-49	-99	-78	-59
CHAN STOR	6	57			-11	-23	-23	6	6	28	15	1	-21	-22	-6	-2	2
EVAPORATION	439							27	85	105	92	41	19	22	47		
REG INFLOW	12323	498	205	264	1121	1281	2210	1518	771	708	652	366	176	234	699	803	818
RELEASE	12355	417	167	214	893	1107	1220	1230	1199	893	654	320	149	286	1168	1261	1179
STOR CHANGE	-31	81	39	50	228	174	990	289	-428	-185	-2	46	26	-52	-469	-458	-361
STORAGE	9230	9312	9350	9400	9629	9803	10793	11081	10654	10468	10466	10512	10539	10487	10018	9560	9199
ELEV FTMSL	1801.8	1802.3	1802.4	1802.7	1803.9	1804.7	1809.4	1810.7	1808.8	1807.9	1807.9	1808.1	1808.2	1808.0	1805.8	1803.5	1801.7
DISCH KCFS	20.5	14.0	12.0	12.0	15.0	18.0	20.5	20.0	19.5	15.0	10.6	10.7	10.7	18.0	19.0	20.5	20.5
POWER																	
AVE POWER MW		135	116	117	146	177	205	205	200	153	108	109	110	182	190	201	198
PEAK POW MW		338	338	339	344	347	364	369	361	358	358	359	359	359	350	342	336
ENERGY GWH	1491.1	48.7	19.6	25.2	105.3	131.3	147.8	152.8	148.6	109.9	80.4	39.4	18.4	35.0	141.5	149.7	137.6
--OAHE--																	
NAT INFLOW	1323	249	116	149	231	126	271	103	26	81	7	-7	-3	-3	-61	-15	52
DEPLETION	626	23	11	14	47	67	132	156	103	25	-9	2	1	1	12	17	26
CHAN STOR	0	37	11		-17	-17	-14	3	3	26	25	-1	0	-42	-6	-9	
EVAPORATION	352							22	66	84	74	34	16	18	39		
REG INFLOW	12700	680	283	350	1060	1149	1345	1158	1059	892	620	278	130	221	1051	1220	1205
RELEASE	12750	415	269	361	1238	1401	1218	1728	1517	438	679	319	148	169	1021	804	1025
STOR CHANGE	-49	264	15	-11	-178	-252	127	-571	-459	455	-58	-41	-18	52	29	416	180
STORAGE	9749	10013	10028	10018	9840	9588	9714	9144	8685	9140	9081	9040	9022	9074	9104	9520	9700
ELEV FTMSL	1570.0	1571.5	1571.6	1571.5	1570.5	1569.2	1569.9	1566.6	1563.9	1566.6	1566.3	1566.0	1565.9	1566.2	1566.4	1568.8	1569.8
DISCH KCFS	18.0	14.0	19.3	20.2	20.8	22.8	20.5	28.1	24.7	7.4	11.0	10.7	10.7	10.7	16.6	13.1	17.8
POWER																	
AVE POWER MW		146	203	212	218	236	212	288	248	74	112	109	108	108	169	134	185
PEAK POW MW		524	525	524	519	512	516	499	485	499	497	496	496	497	498	510	515
ENERGY GWH	1585.6	52.6	34.1	45.8	156.7	175.8	152.7	214.2	184.5	53.6	83.7	39.2	18.2	20.8	125.5	99.8	128.4
--BIG BEND--																	
EVAPORATION	129							8	24	31	27	12	6	7	14		
REG INFLOW	12621	415	269	361	1238	1401	1218	1721	1493	407	652	306	142	163	1007	804	1025
RELEASE	12621	415	269	361	1238	1401	1218	1721	1493	407	652	306	142	163	1007	804	1025
STORAGE	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682
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	18.0	14.0	19.3	20.2	20.8	22.8	20.5	28.0	24.3	6.8	10.6	10.3	10.2	10.3	16.4	13.1	17.8
POWER																	
AVE POWER MW		66	91	95	97	107	96	131	115	35	54	52	52	52	82	65	85
PEAK POW MW		518	510	509	509	509	509	509	518	538	538	538	538	538	538	538	529
ENERGY GWH	731.6	23.8	15.2	20.4	70.1	79.4	69.0	97.4	85.5	25.0	39.9	18.8	8.7	10.0	60.7	48.2	59.5
--FORT RANDALL--																	
NAT INFLOW	433	80	37	48	62	50	174	19	52	-15	-75	-4	-2	-2		-9	17
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	128							10	31	32	22	10	5	5	13		
REG INFLOW	12835	494	305	408	1296	1442	1380	1712	1499	343	553	292	135	155	991	792	1039
RELEASE	12835	232	158	391	1296	1442	1380	1712	1673	1421	553	292	135	155	719	701	575
STOR CHANGE	0	262	147	17				0	-174	-1078	0	0	0	0	272	91	464
STORAGE	3123	3385	3532	3549	3549	3549	3549	3549	3375	2297	2296	2296	2296	2296	2568	2659	3123
ELEV FTMSL	1350.0	1353.2	1355.0	1355.2	1355.2	1355.2	1355.2	1355.2	1353.1	1337.5	1337.5	1337.5	1337.5	1337.5	1342.1	1343.5	1350.0
DISCH KCFS	9.9	7.8	11.4	21.9	21.8	23.4	23.2	27.8	27.2	23.9	9.0	9.8	9.8	9.8	11.7	11.4	10.0
POWER																	
AVE POWER MW		65	96	185	184	198	196	234	227	185	66	72	71	71	87	87	79
PEAK POW MW		349	354	355	355	355	355	355	348	282	283	283	283	283	305	311	338
ENERGY GWH	1261.4	23.3	16.1	39.9	132.4	147.2	140.9	174.2	168.9	133.3	48.9	25.8	12.0	13.7	64.8	64.9	55.2
--GAVINS POINT--																	
NAT INFLOW	1246	91	42	54	125	136	143	79	79	57	108	47	22	25	70	68	101
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	4	-7	-20	0	-3	0	-9	1	6	28	-2	0	0	-4	1	3
EVAPORATION	47							3	9	11	10	5	2	2	5		
REG INFLOW	13919	327	194	425	1416	1556	1500	1740	1735	1478	676	327	153	175	771	769	679
RELEASE	13919	327	194	425	1416	1556	1500	1740	1722	1452	676	327	153	175	771	769	718
STOR CHANGE									13	26							-39
STORAGE	358	358	358	358	358	358	358	358	371	397	397	397	397	397	397	397	358
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	12.5	11.0	14.0	23.8	23.8	25.3	25.2	28.3	28.0	24.4	11.0	11.0	11.0	11.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		39	49	82	82	87	86	96	96	85	39	39	39	39	45	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	583.2	13.9	8.2	17.6	58.7	64.4	62.1	71.6	71.3	61.3	29.1	14.1	6.6	7.5	33.1	33.0	30.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	785	52	24	31	110	205	151	68	31	21	20	14	6	7	14	-7	38
DEPLETION	254	6	3	4	21	35	30	37	35	23	10	6	3	3	12	13	14
REGULATED FLOW AT SIOUX CITY																	
KAF	14450	373	215	452	1505	1726	1621	1771	1718	1450	686	335	156	179	773	749	742
KCFS		12.5	15.5	25.3	25.3	28.1	27.2	28.8	27.9	24.4	11.2	11.3	11.3	11.3	12.6	12.2	12.9
--TOTAL--																	
NAT INFLOW	18297	1060	494	636	1948	2483	4287	2297	906	749	889	422	197	225	458	460	786
DEPLETION	2476	30	14	18	158	650	1408	932	199	-200	-60	-111	-52	-59	-168	-168	-115
CHAN STOR	-5	98	4	-20	-28	-43	-36	-1	10	51	67	-2	-21	-64	-15	-10	5
EVAPORATION	1468							92	286	352	304	137	64	73	159		
STORAGE	31840	32596	32865	33010	33267	33332	34554	34055	32768	31966	31992	32051	32058	32026	31705	31574	31738
SYSTEM POWER																	
AVE POWER MW		495	600	734	783	883	897	1051	975	594	426	428	448	543	667	628	684
PEAK POW MW		2000	2000	2001	2003	2000	2022	2008	1987	1954	1954	1954	1954	1954	1928	1936	1949
ENERGY GWH	6329.2	178.2	100.7	158.6	563.8	657.0	646.1	782.0	725.5	427.4	316.8	153.9	75.2	104.2	496.2	467.2	476.4
DAILY GWH		11.9	14.4	17.6	18.8	21.2	21.5	25.2	23.4	14.2	10.2	10.3	10.7	13.0	16.0	15.1	16.4
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB

DATE OF STUDY 02/09/04

2004 AOP EXTENSIONS, LOWER DECILE RUNOFF

TIME OF STUDY 10:51:57

SHORTEN NAVIGATION SEASON 61-DAYS
VALUES IN 1000 AF EXCEPT AS INDICATED

STUDY NO 20

	29FEB08	2008											2009			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	5919	272	127	163	598	909	1156	509	294	281	371	184	86	98	314	238	319
DEPLETION	419	-3	-1	-2	76	310	486	173	-34	-125	-62	-35	-16	-19	-110	-127	-92
EVAPORATION	376							23	72	90	79	36	17	19	41		
MOD INFLOW	5124	275	128	165	522	599	670	313	256	316	354	183	85	98	383	365	411
RELEASE	4953	119	56	71	298	430	506	523	523	327	261	126	69	127	523	523	472
STOR CHANGE	172	156	73	93	224	169	164	-210	-266	-11	94	57	16	-29	-140	-158	-61
STORAGE	7676	7832	7905	7998	8223	8391	8555	8346	8079	8069	8162	8220	8236	8206	8066	7909	7848
ELEV FTMSL	2190.7	2191.9	2192.4	2193.1	2194.7	2195.9	2197.0	2195.6	2193.7	2193.6	2194.3	2194.7	2194.8	2194.6	2193.6	2192.5	2192.0
DISCH KCFS	8.5	4.0	4.0	4.0	5.0	7.0	8.5	8.5	8.5	5.5	4.2	4.2	5.0	8.0	8.5	8.5	8.5
POWER																	
AVE POWER MW		44	45	45	56	79	97	97	96	62	48	48	57	90	95	95	94
PEAK POW MW		157	158	159	161	163	165	163	160	160	161	161	162	161	160	158	157
ENERGY GWH	674.9	15.9	7.5	9.7	40.5	59.1	69.9	72.1	71.3	44.5	35.6	17.2	9.5	17.3	71.0	70.5	63.3
--GARRISON--																	
NAT INFLOW	9185	340	158	204	881	1136	2542	1607	454	349	491	203	95	108	136	201	281
DEPLETION	1004	0	0	0	1	212	744	532	79	-128	-8	-95	-44	-50	-103	-81	-56
CHAN STOR	0	52			-11	-23	-17	0		33	14	0	-9	-33	-6		0
EVAPORATION	444							27	86	107	93	42	20	22	48		
REG INFLOW	12690	510	214	275	1166	1332	2287	1570	812	731	681	381	180	229	708	805	809
RELEASE	12486	417	167	214	893	1107	1250	1261	1230	893	672	321	150	286	1230	1261	1139
STOR CHANGE	204	93	47	61	273	225	1037	310	-418	-161	9	60	30	-56	-522	-456	-329
STORAGE	9199	9292	9340	9400	9674	9899	10936	11246	10828	10666	10676	10736	10766	10710	10188	9732	9403
ELEV FTMSL	1801.7	1802.2	1802.4	1802.7	1804.1	1805.2	1810.1	1811.5	1809.6	1808.8	1808.9	1809.1	1809.3	1809.0	1806.6	1804.4	1802.7
DISCH KCFS	20.5	14.0	12.0	12.0	15.0	18.0	21.0	20.5	20.0	15.0	10.9	10.8	10.8	18.0	20.0	20.5	20.5
POWER																	
AVE POWER MW		135	116	117	146	177	211	212	206	154	112	111	111	184	202	203	199
PEAK POW MW		337	338	339	344	348	366	371	364	362	362	363	363	362	353	345	339
ENERGY GWH	1515.4	48.6	19.5	25.2	105.4	131.7	152.1	157.4	153.3	110.6	83.3	39.8	18.6	35.3	150.0	150.7	134.0
--OAHE--																	
NAT INFLOW	1408	265	123	159	245	134	288	110	28	86	7	-7	-3	-3	-64	-16	56
DEPLETION	641	23	11	14	48	68	135	160	106	26	-9	2	1	1	12	17	27
CHAN STOR	1	37	11		-17	-17	-17	3	3	29	23	1	0	-42	-11	-3	
EVAPORATION	357							22	67	85	76	34	16	18	40		
REG INFLOW	12896	695	290	359	1073	1156	1386	1191	1088	897	636	280	130	222	1103	1225	1168
RELEASE	12677	408	265	356	1232	1395	1200	1726	1512	439	685	319	148	169	1022	804	998
STOR CHANGE	219	287	26	3	-159	-239	186	-535	-425	458	-49	-39	-18	52	80	421	170
STORAGE	9700	9986	10012	10016	9857	9618	9803	9268	8843	9302	9253	9214	9196	9248	9329	9750	9919
ELEV FTMSL	1569.8	1571.3	1571.5	1571.5	1570.6	1569.3	1570.3	1567.4	1564.9	1567.6	1567.3	1567.0	1566.9	1567.2	1567.7	1570.0	1571.0
DISCH KCFS	17.8	13.7	19.1	19.9	20.7	22.7	20.2	28.1	24.6	7.4	11.1	10.7	10.7	10.7	16.6	13.1	18.0
POWER																	
AVE POWER MW		143	200	209	217	235	209	289	249	75	114	110	109	109	170	135	188
PEAK POW MW		523	524	524	520	513	518	503	490	504	502	501	502	505	517	517	522
ENERGY GWH	1583.2	51.6	33.6	45.2	156.0	175.2	150.7	214.8	185.0	54.1	85.0	39.5	18.3	21.0	126.6	100.7	126.0
--BIG BEND--																	
EVAPORATION	129							8	24	31	27	12	6	7	14		
REG INFLOW	12548	408	265	356	1232	1395	1200	1719	1488	408	658	306	142	163	1008	804	998
RELEASE	12548	408	265	356	1232	1395	1200	1719	1488	408	658	306	142	163	1008	804	998
STORAGE	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682
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	17.8	13.7	19.1	19.9	20.7	22.7	20.2	28.0	24.2	6.9	10.7	10.3	10.2	10.3	16.4	13.1	18.0
POWER																	
AVE POWER MW		65	89	93	97	106	94	131	115	35	54	52	52	52	82	65	86
PEAK POW MW		518	510	509	509	509	509	509	518	538	538	538	538	538	538	538	529
ENERGY GWH	727.5	23.4	15.0	20.1	69.8	79.0	68.0	97.3	85.2	25.0	40.3	18.8	8.7	10.0	60.8	48.2	57.9
--FORT RANDALL--																	
NAT INFLOW	476	88	41	53	68	55	191	21	57	-16	-82	-4	-2	-2		-10	19
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	128							10	31	32	22	10	5	5	13		
REG INFLOW	12805	494	305	407	1296	1441	1379	1712	1499	343	552	291	135	155	992	791	1014
RELEASE	12805	232	158	390	1296	1441	1379	1712	1673	1421	552	291	135	155	719	701	550
STOR CHANGE	0	262	147	17				0	-174	-1078	0	0	0	0	273	90	464
STORAGE	3123	3385	3532	3549	3549	3549	3549	3549	3375	2297	2296	2296	2296	2296	2569	2659	3123
ELEV FTMSL	1350.0	1353.3	1355.0	1355.2	1355.2	1355.2	1355.2	1355.2	1353.1	1337.5	1337.5	1337.5	1337.5	1337.5	1342.1	1343.5	1350.0
DISCH KCFS	10.0	7.8	11.4	21.9	21.8	23.4	23.2	27.8	27.2	23.9	9.0	9.8	9.7	9.7	11.7	11.4	9.9
POWER																	
AVE POWER MW		65	96	184	184	198	196	234	227	185	66	72	71	71	87	87	79
PEAK POW MW		349	354	355	355	355	355	355	348	282	283	283	283	283	305	311	338
ENERGY GWH	1258.5	23.3	16.1	39.8	132.4	147.0	140.8	174.2	168.9	133.3	48.8	25.7	11.9	13.7	64.8	64.9	52.8
--GAVINS POINT--																	
NAT INFLOW	1252	91	42	55	125	137	144	79	79	57	109	47	22	25	70	68	102
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	4	-7	-20	0	-3	0	-9	1	6	28	-2	0	0	-4	1	3
EVAPORATION	47							3	9	11	10	5	2	2	5		
REG INFLOW	13895	328	194	425	1416	1556	1500	1740	1735	1478	676	327	153	175	770	769	655
RELEASE	13895	328	194	425	1416	1556	1500	1740	1722	1452	676	327	153	175	770	769	694
STOR CHANGE									13	26							-39
STORAGE	358	358	358	358	358	358	358	358	371	397	397	397	397	397	397	397	358
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	12.5	11.0	14.0	23.8	23.8	25.3	25.2	28.3	28.0	24.4	11.0	11.0	11.0	11.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		39	49	82	82	87	86	96	96	85	39	39	39	39	45	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	582.2	13.9	8.2	17.6	58.7	64.4	62.1	71.6	71.3	61.3	29.1	14.1	6.6	7.5	33.1	33.0	29.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	862	57	27	34	121	225	166	74	34	23	22	15	7	8	16	-8	41
DEPLETION	255	6	3	4	21	35	30	38	35	23	10	6	3	3	12	13	14
REGULATED FLOW AT SIOUX CITY																	
KAF	14502	379	218	456	1516	1746	1636	1776	1721	1452	688	337	157	180	774	748	721
KCFS		12.7	15.7	25.5	25.5	28.4	27.5	28.9	28.0	24.4	11.2	11.3	11.3	11.3	12.6	12.2	13.0
--TOTAL--																	
NAT INFLOW	19102	1112	519	667	2038	2596	4487	2400	946	780	918	438	204	234	472	473	818
DEPLETION	2513	28	13	17	155	653	1431	960	211	-202	-66	-117	-54	-62	-176	-174	-104
CHAN STOR	-10	93	4	-20	-28	-43	-33	-6	4	59	65	-1	-8	-75	-21	-2	3
EVAPORATION	1482							93	289	355	307	139	65	74	161		
STORAGE	31738	32536	32829	33003	33342	33497	34884	34449	33178	32412	32466	32544	32573	32540	32232	32129	32333
SYSTEM POWER																	
AVE POWER MW		491	595	730	782	882	894	1058	988	596	433	431	439	545	681	629	690
PEAK POW MW		1999	1999	2001	2004	2003	2028	2015	1996	1963	1963	1964	1964	1964	1938	1947	1961
ENERGY GWH	6341.6	176.7	100.0	157.6	562.8	656.4	643.5	787.5	734.9	428.8	322.0	155.1	73.7	104.7	506.3	468.0	463.5
DAILY GWH		11.8	14.3	17.5	18.8	21.2	21.5	25.4	23.7	14.3	10.4	10.3	10.5	13.1	16.3	15.1	16.6
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

DATE OF STUDY 02/09/04

2004 AOP EXTENSIONS, LOWER DECILE RUNOFF

TIME OF STUDY 10:51:57

SHORTEN NAVIGATION SEASON 61-DAYS
VALUES IN 1000 AF EXCEPT AS INDICATED

STUDY NO 21

	28FEB09	2009											2010			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	5961	274	128	164	602	915	1164	513	296	283	374	185	86	99	317	240	321
DEPLETION	433	-3	-1	-2	76	311	491	180	-29	-125	-64	-36	-17	-19	-110	-128	-92
EVAPORATION	382							23	73	91	80	36	17	19	42		
MOD INFLOW	5146	277	129	166	526	604	673	310	252	317	358	184	86	98	385	368	413
RELEASE	4963	119	56	71	298	430	506	523	523	325	250	119	69	127	523	553	472
STOR CHANGE	184	158	74	95	228	174	167	-213	-270	-7	109	65	16	-29	-138	-185	-59
STORAGE	7848	8005	8079	8174	8402	8576	8743	8530	8260	8252	8361	8426	8442	8413	8276	8090	8031
ELEV FTMSL	2192.0	2193.2	2193.7	2194.4	2196.0	2197.2	2198.3	2196.8	2195.0	2194.9	2195.7	2196.1	2196.2	2196.0	2195.1	2193.8	2193.3
DISCH KCFS	8.5	4.0	4.0	4.0	5.0	7.0	8.5	8.5	8.5	5.5	4.1	4.0	5.0	8.0	8.5	9.0	8.5
POWER																	
AVE POWER MW		45	45	45	57	80	98	98	97	62	46	46	57	91	96	101	95
PEAK POW MW		159	160	161	163	165	167	165	162	162	163	164	164	163	162	160	159
ENERGY GWH	682.8	16.1	7.6	9.8	40.9	59.6	70.5	72.8	71.9	44.5	34.4	16.5	9.6	17.5	71.8	75.3	63.9
--GARRISON--																	
NAT INFLOW	9293	344	160	206	891	1150	2572	1626	460	353	496	205	96	109	137	204	284
DEPLETION	1101				-1	212	754	548	85	-131	-13	-98	-46	-52	-75	-52	-30
CHAN STOR	1	52			-11	-23	-17	0		34	16	1	-11	-33	-6	-6	6
EVAPORATION	452							28	87	108	94	43	20	23	49		
REG INFLOW	12703	514	216	277	1178	1346	2307	1573	810	734	680	380	180	232	680	804	792
RELEASE	12475	387	167	214	893	1076	1279	1291	1199	893	698	338	158	286	1199	1261	1139
STOR CHANGE	228	127	49	63	286	270	1028	282	-389	-159	-18	42	22	-53	-519	-457	-347
STORAGE	9403	9530	9579	9643	9928	10198	11225	11507	11118	10960	10941	10984	11006	10953	10434	9977	9631
ELEV FTMSL	1802.7	1803.4	1803.6	1803.9	1805.3	1806.6	1811.4	1812.6	1810.9	1810.2	1810.1	1810.3	1810.4	1810.1	1807.7	1805.6	1803.9
DISCH KCFS	20.5	13.0	12.0	12.0	15.0	17.5	21.5	21.0	19.5	15.0	11.3	11.4	11.4	18.0	19.5	20.5	20.5
POWER																	
AVE POWER MW		127	118	118	148	174	219	219	203	155	117	118	118	185	198	205	201
PEAK POW MW		342	343	344	349	354	371	375	369	366	366	367	367	366	358	350	344
ENERGY GWH	1530.0	45.6	19.7	25.4	106.5	129.5	157.4	162.8	151.0	111.8	87.4	42.3	19.8	35.6	147.7	152.2	135.3
--OAHE--																	
NAT INFLOW	1429	269	125	161	249	136	293	112	29	87	7	-7	-3	-4	-65	-16	56
DEPLETION	652	23	11	14	48	69	138	165	109	27	-10	1	0	1	12	17	27
CHAN STOR	1	42	6		-17	-14	-22	3	9	26	21	0	0	-38	-9	-6	
EVAPORATION	364							23	68	86	77	35	16	19	40		
REG INFLOW	12889	674	287	361	1077	1129	1412	1218	1059	892	659	295	138	225	1073	1222	1168
RELEASE	12664	406	263	354	1230	1394	1196	1726	1510	439	687	319	148	169	1022	804	997
STOR CHANGE	225	268	23	7	-153	-265	216	-508	-451	454	-28	-24	-10	56	51	418	171
STORAGE	9919	10188	10211	10218	10065	9800	10016	9508	9057	9511	9483	9459	9449	9505	9555	9973	10144
ELEV FTMSL	1571.0	1572.4	1572.5	1572.6	1571.8	1570.3	1571.5	1568.7	1566.1	1568.7	1568.6	1568.4	1568.4	1568.7	1569.0	1571.3	1572.2
DISCH KCFS	18.0	13.6	19.0	19.8	20.7	22.7	20.1	28.1	24.6	7.4	11.2	10.7	10.7	10.7	16.6	13.1	17.9
POWER																	
AVE POWER MW		144	200	210	218	237	210	291	251	76	115	111	110	110	172	136	189
PEAK POW MW		529	530	530	526	518	524	510	497	510	509	508	508	510	511	523	528
ENERGY GWH	1594.1	51.7	33.7	45.3	156.8	176.3	151.3	216.6	186.4	54.5	85.9	39.8	18.5	21.2	127.8	101.5	126.9
--BIG BEND--																	
EVAPORATION	129							8	24	31	27	12	6	7	14		
REG INFLOW	12535	406	263	354	1230	1394	1196	1719	1486	408	660	306	142	163	1008	804	997
RELEASE	12535	406	263	354	1230	1394	1196	1719	1486	408	660	306	142	163	1008	804	997
STORAGE	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682
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	18.0	13.6	19.0	19.8	20.7	22.7	20.1	28.0	24.2	6.9	10.7	10.3	10.2	10.3	16.4	13.1	17.9
POWER																	
AVE POWER MW		65	89	93	97	106	94	131	114	35	54	52	52	52	82	65	86
PEAK POW MW		518	510	509	509	509	509	509	518	538	538	538	538	538	538	538	529
ENERGY GWH	726.7	23.2	14.9	20.1	69.7	79.0	67.8	97.3	85.1	25.0	40.4	18.8	8.7	10.0	60.8	48.2	57.9
--FORT RANDALL--																	
NAT INFLOW	489	90	42	54	70	56	195	21	59	-16	-84	-4	-2	-2		-10	20
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	128							10	31	32	22	10	5	5	13		
REG INFLOW	12805	494	305	407	1296	1441	1379	1712	1499	343	552	291	135	155	992	791	1014
RELEASE	12805	232	158	390	1296	1441	1379	1712	1673	1421	552	291	135	155	719	701	550
STOR CHANGE	0	262	147	17		0	0	0	-174	-1078	0	0	0	0	273	90	464
STORAGE	3123	3385	3532	3549	3549	3549	3549	3549	3375	2297	2296	2296	2296	2296	2569	2659	3123
ELEV FTMSL	1350.0	1353.3	1355.0	1355.2	1355.2	1355.2	1355.2	1355.2	1353.1	1337.5	1337.5	1337.5	1337.5	1337.5	1342.1	1343.5	1350.0
DISCH KCFS	9.9	7.8	11.4	21.9	21.8	23.4	23.2	27.8	27.2	23.9	9.0	9.8	9.7	9.7	11.7	11.4	9.9
POWER																	
AVE POWER MW		65	96	184	184	198	196	234	227	185	66	72	71	71	87	87	79
PEAK POW MW		349	354	355	355	355	355	355	348	282	283	283	283	283	305	311	338
ENERGY GWH	1258.5	23.3	16.1	39.8	132.4	147.0	140.8	174.2	168.9	133.3	48.8	25.7	11.9	13.7	64.8	64.9	52.8
--GAVINS POINT--																	
NAT INFLOW	1252	91	42	55	125	137	144	79	79	57	109	47	22	25	70	68	102
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	4	-7	-20	0	-3	0	-9	1	6	28	-2	0	0	-4	1	3
EVAPORATION	47							3	9	11	10	5	2	2	5		
REG INFLOW	13895	328	194	425	1416	1556	1500	1740	1735	1478	676	327	153	175	770	769	655
RELEASE	13895	328	194	425	1416	1556	1500	1740	1722	1452	676	327	153	175	770	769	694
STOR CHANGE									13	26							-39
STORAGE	358	358	358	358	358	358	358	358	371	397	397	397	397	397	397	397	358
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	12.5	11.0	14.0	23.8	23.8	25.3	25.2	28.3	28.0	24.4	11.0	11.0	11.0	11.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		39	49	82	82	87	86	96	96	85	39	39	39	39	45	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	582.2	13.9	8.2	17.6	58.7	64.4	62.1	71.6	71.3	61.3	29.1	14.1	6.6	7.5	33.1	33.0	29.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	879	58	27	35	123	230	169	76	35	24	22	15	7	8	16	-8	42
DEPLETION	262	7	3	4	22	35	31	38	36	23	10	6	3	3	13	14	14
REGULATED FLOW AT SIOUX CITY																	
KAF	14512	379	218	456	1517	1751	1638	1778	1721	1453	688	336	157	179	773	747	722
KCFS		12.7	15.7	25.5	25.5	28.5	27.5	28.9	28.0	24.4	11.2	11.3	11.3	11.3	12.6	12.1	13.0
--TOTAL--																	
NAT INFLOW	19303	1125	525	675	2060	2624	4537	2427	958	788	924	441	206	235	475	478	825
DEPLETION	2642	28	13	17	154	655	1450	988	226	-204	-74	-121	-56	-64	-147	-145	-78
CHAN STOR	-10	97	-1	-20	-28	-40	-39	-6	10	56	63	-1	-11	-71	-18	-11	8
EVAPORATION	1502							94	293	360	311	141	66	75	163		
STORAGE	32333	33149	33441	33623	33984	34163	35574	35134	33863	33098	33160	33244	33272	33246	32914	32779	32969
SYSTEM POWER																	
AVE POWER MW		483	597	732	785	882	903	1069	987	598	438	437	447	549	680	639	694
PEAK POW MW		2011	2011	2013	2016	2015	2040	2028	2009	1975	1976	1977	1977	1978	1951	1960	1974
ENERGY GWH	6374.2	173.8	100.2	158.0	565.0	655.8	649.8	795.3	734.6	430.5	326.0	157.2	75.1	105.4	505.9	475.2	466.3
DAILY GWH		11.6	14.3	17.6	18.8	21.2	21.7	25.7	23.7	14.3	10.5	10.5	10.7	13.2	16.3	15.3	16.7

INI-SUM 15MAR 22MAR 31MAR 30APR 31MAY 30JUN 31JUL 31AUG 30SEP 31OCT 15NOV 22NOV 30NOV 31DEC 31JAN 28FEB