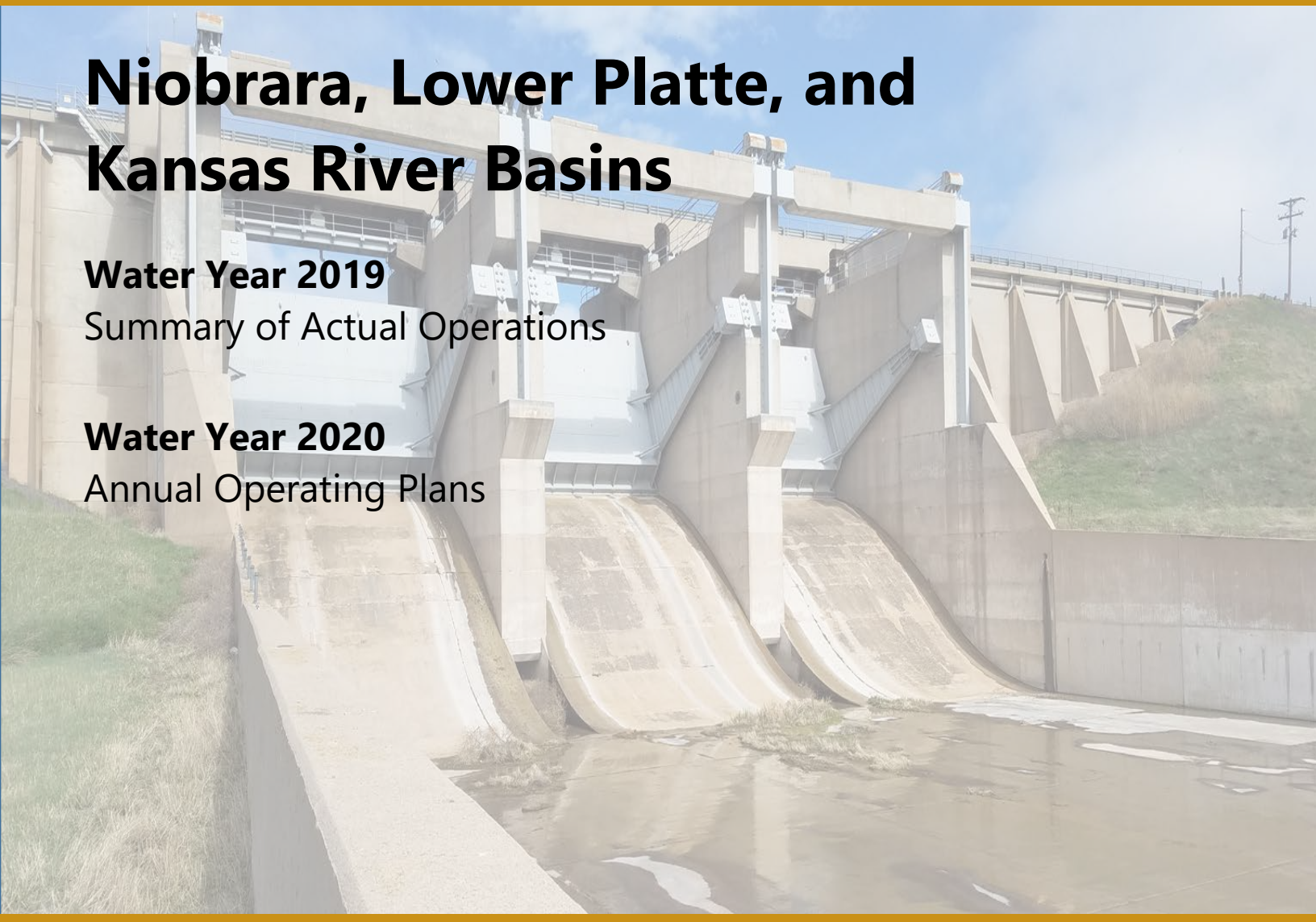
BUREAU OF RECLAMATION

Annual Operating Plans



Niobrara, Lower Platte, and Kansas River Basins

Water Year 2019
Summary of Actual Operations

Water Year 2020
Annual Operating Plans

U.S. Department of the Interior
Bureau of Reclamation
Missouri Basin Region

Mission Statements

The Department of the Interior (DOI) conserves and manages the Nation's natural resources and cultural heritage for the benefit and enjoyment of the American people, provides scientific and other information about natural resources and natural hazards to address societal challenges and create opportunities for the American people, and honors the Nation's trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities to help them prosper.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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Overview

General

This year is the 67th consecutive year that an Annual Operating Plan (AOP) has been prepared for the federally owned dams and reservoirs in the Niobrara, Lower Platte, and Kansas River Basins. The plan has been developed by the Water Operations Group in McCook, Nebraska for the 16 dams and reservoirs that are located in Colorado, Nebraska, and Kansas. These reservoirs, together with nine diversion dams, nine pumping plants, and 20 canal systems, serve approximately 270,078 acres of project lands in Nebraska and Kansas. In addition to irrigation and municipal water, these features serve flood control, recreation, and fish and wildlife purposes. A map at the end of this report shows the location of these features.

The reservoirs in the Niobrara and Lower Platte River Basins are operated by either irrigation or Reclamation districts. The reservoirs in the Kansas River Basin are operated by either Reclamation or the Army Corps of Engineers. Kirwin Irrigation District provides operational and maintenance assistance for Kirwin Dam. The diversion dams, pumping plants, and canal systems are operated by either irrigation or Reclamation districts.

A Supervisory Control and Data Acquisition System (SCADA) located at McCook, Nebraska is used to assist in operational management of all 11 dams under Reclamation's jurisdiction that are located in the Kansas River Basin. A Hydromet system collects and stores near real-time data at selected stations in the Nebraska-Kansas Projects. The data includes water levels in streams, canals, and reservoirs and also gate openings. This data is transmitted to a satellite and downloaded to a Reclamation receiver in Boise, Idaho. The data can then be accessed by anyone interested in monitoring water levels or water usage in an irrigation system. The Nebraska-Kansas projects currently have 60 Hydromet stations that can be accessed. The Nebraska-Kansas Area Office (NKAO) has installed and maintains 41 of these Hydromet stations. These stations can be found on the Internet by accessing Reclamation's Great Plains Region Hydromet station codes page at https://www.usbr.gov/gp/hydromet/stationcodes.html.

2019 Summary

Climatic Conditions

Precipitation at the project dams during 2019 ranged from 97 percent of normal at Kirwin Dam to 159 percent of normal at Merritt Dam. Annual precipitation was above normal for 15 of the 16 project dams.

Temperatures in January were generally above normal, while temperatures in February were typically much below normal throughout the project area. Precipitation in January varied from 195 percent of average to 20 percent of average. February precipitation was above average at 11 of the project dams.

March temperature was typically below average, while precipitation was well above normal at most of the dams with thirteen of the project dams above 100 percent of the average precipitation with five dams reporting more than 200 percent of average.

Temperatures in April were generally above normal while in May they were generally much below normal. Precipitation during April was generally well below average with only one project dam above average and nine below 50 percent of average. May precipitation was above normal at all of the dams ranging from Bonny Dam at 109 percent to Norton Dam at 239 percent of average with nine dams above 7 inches recorded.

Temperatures in July and August were generally below normal, while temperatures in June were typically around normal throughout the project area. Total precipitation for June was above average at all project dams but one. July was typically well above average at all the project dams with nine dams recording above 4 inches of rain as well as six dams recording over 6 inches. August precipitation was well above normal at all of the project dams.

Precipitation recorded in September ranged from 26 percent to 236 percent of normal. September, October, and November temperatures were generally above normal. October precipitation was generally well below average with 12 of the dams below average. November precipitation ranged from zero to 226 percent of normal with 10 project dams recording below normal precipitation. In December, precipitation was generally well above average for the project with 12 of the project dams above 200 percent of average.

Storage Reservoirs

Conservation Operations: The 2019 inflows at Bonny Reservoir and Enders Reservoir were between the dry-year and normal-year forecasts. The inflows for Davis Creek Reservoir, Swanson Lake, and Hugh Butler Lake were between the normal-year and wet-year forecast. The remaining reservoirs had inflows above wet-year forecasts.

Seven of the sixteen reservoirs had below average carryover storage from the 2018 water year. Box Butte and Enders Reservoirs, along with Swanson, Hugh Butler, Keith Sebelius, and Harlan County Lakes did not have sufficient storage to provide water users with a full water supply. Webster, Kirwin, and Lovewell Reservoirs, and Harry Strunk, Harlan County and Waconda Lakes utilized some flood pool storage during the year. Irrigation demands greatly reduced the storage in several project reservoirs throughout the summer. Reservoir storage was below average at five of the sixteen reservoirs at the end of the 2019 water year.

On September 20, 2011, the State of Colorado ordered that Bonny Reservoir be drained for Republican River Compact compliance. All of the water in Bonny Reservoir was evacuated by the end of May 2012 and no storage has been recorded since. The State of Colorado order remains in effect and inflows continue to be bypassed.

Table 1 shows a comparison of 2018 and 2019 carry-over storage conditions as compared to the top of conservation storage for all reservoirs in the Niobrara, Lower Platte, and Kansas River Basins as of September 30, 2019.

Table 1 Summary of Carry-over Storage at NKAO Facilities.

Reservoir/Lake	September 30, 2019 Storage (AF)	September 30, 2018 Storage (AF)	Change (AF)
Bonny	0	0	0
Swanson	58,703	52,671	6,032
Enders	9,674	8,917	757
Hugh Butler	21,499	18,161	3,338
Harry Strunk	31,822	27,835	3,987
Keith Sebelius	25,245	15,296	9,949
Harlan County	442,997	224,024	218,973
Lovewell	11,421	34,688	-23,267
Kirwin	117,278	98,560	18,718
Webster	104,186	78,208	25,978
Cedar Bluff	109,085	60,805	48,280
Waconda	264,143	241,319	22,824
Box Butte	17,705	5,650	12,055
Merritt	61,100	61,641	-541
Calamus	86,211	92,186	-5,975
Davis Creek	13,148	13,617	-469

Flood Control Operations: Lovewell Reservoir, Kirwin Reservoir, Webster Reservoir, and Waconda, Harry Strunk, and Harlan County Lake utilized flood pool storage in 2019. Flood releases from Lovewell Reservoir totaled approximately 7,500 AF from mid-March through the beginning of May and 36,300 AF from mid-June through mid-October. Flood releases from Webster Reservoir totaled nearly 127,400 AF and occurred throughout the extent of the year. Waconda Lake flood releases totaled nearly 742,500 AF and occurred throughout the extent of the year. Flood releases from Kirwin Reservoir totaled almost 57,400 AF for the year. Approximately 17,700 AF was evacuated from the flood pool at Medicine Creek Dam from mid-March through mid-August. Harlan County Dam made flood releases from mid-March throughout the rest of the year which totaled 121,800 AF.

The water year 2019 flood damages prevented by the operation of Reclamation's Nebraska-Kansas Projects facilities was $637,920,300 as determined by the Corps of Engineers. An additional benefit of $155,082,500 was credited to Harlan County Lake. The accumulative total of flood control benefits for the years 1951 through 2019 by facilities in this report total $2,997,169,000. Box Butte, Merritt, Calamus, and Davis Creek Reservoirs do not have a designated flood pool and have not accrued any flood benefits to date. Flood control benefits attributed to each project are shown in Table 2 on the following page.

Table 2 Flood damages prevented by Nebraska-Kansas Project Reservoirs.

RESERVOIR	DURING FY 2019	PRIOR TO 2019	ACCUMULATED TOTAL
BONNY	$1,000	$2,869,800	$2,870,800
ENDERS	$5,000	$3,613,500	$3,618,500
SWANSON	$7,221,300	$44,259,000	$51,480,300
HUGH BUTLER	$7,065,200	$6,424,300	$13,489,500
HARRY STRUNK	$7,572,300	$19,395,500	$26,967,800
KEITH SEBELIUS	$7,415,700	$4,181,800	$11,597,500
HARLAN COUNTY	$155,082,500	$241,196,800	$396,279,300
LOVEWELL	$77,727,000	$159,068,500	$236,795,500
KIRWIN	$91,598,000	$104,231,800	$195,829,800
WEBSTER	$42,498,700	$122,105,900	$164,604,600
WACONDA	$352,930,300	$1,356,287,700	$1,709,218,000
CEDAR BLUFF	$43,885,800	$140,531,700	$184,417,500
TOTAL	$793,002,800	$2,204,166,300	$2,997,169,100

Note: Accumulated totals from 1951 through 2019. The reservoirs upstream of Harlan County Lake did not receive benefits for damages prevented from 1972 to 1993. Total construction costs of storage dams were $208,954,130.

A summary of precipitation, reservoir storage and inflows at the facilities of the Nebraska-Kansas Projects during 2019 can be found in Table 4.

Water Service

There was 275,546 AF of water diverted to irrigate approximately 201,527 acres of project lands in the 12 irrigation districts. The project water supply was either inadequate or limited for 84,320 acres of the total project lands. This includes lands in Mirage Flats, Frenchman Valley, H&RW, Frenchman-Cambridge, and Almena Irrigation Districts. The project water supplies for the other units mentioned in this report were adequate in 2019.

The water requirements of three municipalities, one rural water district, and two fish hatchery facilities were met in 2019. Both storage releases and natural flows are utilized in meeting these demands.

Fish and Wildlife and Recreation Benefits

The National Recreational Fisheries Policy declares that the Government's vested stewardship responsibilities must work in concert with the state managing agency's recreational fisheries constituency and the general public to conserve, restore, and enhance recreational fisheries and their habitats. The NKAO is available for meetings if requested with Nebraska, Colorado, and Kansas state management agencies to discuss the AOP. Information is solicited from the agencies to enhance fisheries resources within the flexibility allowed while still meeting contractual obligations with the various irrigation districts.

Reservoir operations were favorable for recreation and fish and wildlife uses in 2019 at those project reservoirs with full or nearly full conservation pools prior to the irrigation season. The higher water levels experienced early in the year submerged existing shoreline vegetation. Normal irrigation demands and the lack of precipitation during the summer greatly reduced the pool levels at several reservoirs allowing for late summer shoreline revegetation. The draining of Bonny Reservoir and the State administration of storage rights in southwest Nebraska reservoirs in previous years diminished recreation benefits at these facilities.

2020 Outlook

Three forecast conditions have been developed for each of the reservoirs in the Niobrara, Lower Platte, and Kansas River Basins conforming to an established operating criteria under various reservoir inflow conditions. These operation studies are included starting in Table 7. The municipal and rural water district water supply requirements will be met under all three inflow forecast conditions for all units.

Under reasonable minimum inflow forecast conditions, irrigation districts receiving storage water from the following lakes and reservoirs are expected to receive less than a full supply: Box Butte, Enders, Swanson, Harry Strunk, and Keith Sebelius. The irrigation districts affected are Mirage Flats; Frenchman Valley and H&RW; Frenchman - Cambridge; and Almena; respectively. If 2020 is a dry year, 84,302 acres of the total 270,078 acres with service available to be irrigated (31 percent) will have an inadequate water supply.

Under most probable inflow conditions, it is expected that Mirage Flats, Frenchman Valley, H&RW, and Almena Irrigation Districts would experience some shortages to irrigation demands from Box Butte Reservoir, Enders Reservoir, and Keith Sebelius Lake. Most irrigators in these districts plan to use water from private wells to supplement the project water supply.

Even under reasonable maximum inflow conditions, Frenchman Valley and H&RW Irrigation Districts are expected to experience irrigation demand shortages from Enders Reservoir.

Under reasonable minimum inflow conditions, the conservation pools at Merritt, Calamus, Davis Creek, Kirwin, Webster, and Lovewell Reservoirs, and Waconda, Harlan County, and Harry Strunk Lakes are expected to fill during 2020.

Even with low reservoir levels and inadequate water supplies for some project lands, the recommendations of various state agencies will be considered. As in the past, irrigation and

Reclamation Districts will advise state agencies regarding aquatic weed control and canal operations. Reclamation will continue to operate the reservoirs and other facilities under its jurisdiction in the best interests of all project functions and for the optimum public benefit.

Water is not expected to be stored in Bonny Reservoir during 2020 as the State of Colorado's order to bypass all inflows remains in effect. Bonny Reservoir was drained in 2012 by order of the State of Colorado to assist in meeting Republican River Compact compliance.

Chapter I – Introduction

Purpose of This Report

This AOP advises water users, cooperating agencies, and other interested groups or persons of the actual operations during 2019 and serves as a guideline for the 2020 operations. This report also describes the responsibilities of Reclamation, the Army Corps of Engineers (Corps of Engineers), and the irrigation and Reclamation districts in the Niobrara, Lower Platte, and Kansas River Basins.

Operational Responsibilities

Reclamation is responsible for irrigation operations at all federal reservoirs in the Nebraska-Kansas Projects. Reclamation is also responsible for the operation and maintenance (O&M), safety of the structure, and reservoir operations not specifically associated with regulation of the flood control storage at the reservoirs constructed by Reclamation. Regulation of the flood control storage is the responsibility of the Corps of Engineers. In addition to irrigation and flood control, these reservoirs provide recreation, fish and wildlife, and municipal water supply benefits.

By contractual arrangements with Reclamation, the irrigation or Reclamation districts in the Niobrara, Lower Platte, and Kansas River Basins are responsible for the O&M of the canals and irrigation distribution facilities constructed or rehabilitated by Reclamation. In addition, the appropriate irrigation or Reclamation districts are responsible for operating and maintaining Box Butte, Merritt, Virginia Smith and Davis Creek Dams. The Corps of Engineers operates and maintains Harlan County Dam and Lake. The State of Colorado provides operational guidelines for Bonny Reservoir. Operational guidelines for Cedar Bluff Reservoir are provided by the State of Kansas. Reclamation operates and maintains eleven dams and reservoirs in the Republican, Solomon, and Smoky Hill River Basins. Under a contract with Reclamation, Kirwin Irrigation District performs certain operational and maintenance functions at Kirwin Dam.

An updated Field Working Agreement was executed on July 17, 2001 between the Corps of Engineers and Reclamation regarding operation of Harlan County Dam and Lake. The agreement provides for a sharing of the decreasing water supply into Harlan County Lake. Storage capacity allocations were redefined based on the 2000 sediment survey and a procedure was established for sharing the reduced inflow and summer evaporation among the various lake uses.

The States of Nebraska, Colorado, and Kansas are responsible for the administration and enforcement of their state laws pertaining to the water rights and priorities of all parties concerned with the use of water. As provided by the lease agreement between Reclamation and the states, the states are responsible for administering the water surface activities and the federal lands around the reservoirs. The U.S. Fish and Wildlife Service administer the water surface activities and most of the federal lands at Kirwin Reservoir.

Reclamation cooperates with all state agencies and compact commissions to ensure that all operations are in compliance with state laws and compact requirements.

Water Supply

For forecasting purposes, values of annual inflows were selected that statistically should be met or exceeded 10, 50, and 90 percent of the time to represent the reasonable maximum (wet-year), most probable (normal-year), and reasonable minimum (dry-year) inflow conditions, respectively.

Inflow records from 2000 through 2019 were used for the analysis of reservoirs in the Niobrara, Lower Platte and Kansas River Basins.

Reservoir Operations

All operations are scheduled for optimum benefits of the authorized project functions. Monthly, or as often as runoff and weather conditions dictate, Reclamation evaluates the carry-over storage and estimated inflow at each reservoir to determine whether excess water is anticipated. If excess inflow is apparent, controlled releases will be made to maximize the downstream benefits.

Major Features

The Mirage Flats Project was constructed under the Water Conservation and Utilization Act and includes an irrigation storage reservoir, diversion dam, and canal system. The other features discussed in this report are all a part of the Pick-Sloan Missouri Basin Program and include single and multipurpose reservoirs, diversion dams, pump stations and canal systems. The sixteen storage facilities now in operation are listed below.

Constructed by Reclamation

Operated by irrigation or Reclamation districts: Box Butte and Merritt Dams in the Niobrara River Basin and Virginia Smith and Davis Creek Dams in the Lower Platte River Basin.

Operated by Reclamation: Bonny, Trenton, Enders, Red Willow, Medicine Creek, Norton, Lovewell, Kirwin, Webster, Glen Elder, and Cedar Bluff Dams in the Kansas River Basin. A contract provides for Kirwin Irrigation District to perform certain operational and maintenance functions at Kirwin Dam.

Constructed and Operated by the Corps of Engineers

Harlan County Dam in the Kansas River Basin.

Irrigation and Reclamation Districts

Twelve irrigation districts and one Reclamation district in the Niobrara, Lower Platte, and Kansas River Basins have contracted with Reclamation for water supply and irrigation facilities. The Twin Loups Irrigation District has contracted their O&M responsibilities to the Twin Loups Reclamation District. Bostwick Irrigation District in Nebraska has contracted their O&M responsibilities for Superior-Courtland Diversion Dam and the Courtland Canal between the head gates and the Nebraska-Kansas state line to Kansas Bostwick Irrigation District.

The contracted irrigation season for Mirage Flats Irrigation District is April through September. The contracted irrigation season for Frenchman-Cambridge Irrigation District is April 15 through October 15 or such additional period from April 1 to April 15 of each year as may be agreed upon between the District and Reclamation. The contracted irrigation season for Frenchman Valley and H&RW Irrigation Districts is from May 1 through October 15 or such additional period from April 1 through May 1 of each year as determined between the district and Reclamation. The contracted irrigation season for Twin Loups Reclamation District, Bostwick in Nebraska, and Kansas Bostwick Irrigation Districts is May 1 through September 30 or such additional period from April 1 through November 15 of each year as determined between the district and Reclamation. For Ainsworth, Kirwin and Webster Irrigation Districts, the contracted irrigation season is from May 1 through September 30. The Almena Irrigation District the contracted irrigation season is from February 1 through September 30.

Municipal Water

Three municipalities in Kansas (Norton, Russell, and Beloit) and one rural water district in Kansas (Mitchell County Rural Water District No. 2) have executed water service contracts or repayment contracts for full or supplemental water supplies.

Fish and Wildlife

The Calamus Fish Hatchery is located below Virginia Smith Dam and Calamus Reservoir. The hatchery is operated and maintained by the Nebraska Game and Parks Commission (Commission). The water supply is provided by natural flows passed through Virginia Smith Dam and from Calamus Reservoir storage through an agreement dated July 28, 1988, between the Commission and the Twin Loups Reclamation District.

The State of Kansas operates and maintains the fish hatchery facility below Cedar Bluff Reservoir.

State of Colorado Division of Wildlife

The State of Colorado provides operational guidelines for Bonny Reservoir. The entire conservation pool storage was purchased by the State of Colorado on June 24, 1982.

State of Kansas Department of Wildlife, Parks and Tourism (KDWPT)

The State of Kansas acquired the use and control of portions of the conservation capacity at Cedar Bluff Reservoir following the reformulation of the Cedar Bluff Unit in October of 1992. The City of Russell's existing water storage right and contract with the United States remained unchanged.

Power Interference Considerations

A Power Interference Agreement exists between Reclamation, the Twin Loups Reclamation District, and the Loup River Public Power District. Subordination Agreements also exist between Reclamation, the Ainsworth Irrigation District, and the Nebraska Public Power District and between Reclamation, the Mirage Flats Irrigation District and the Nebraska Public Power District. Provisions of these agreements will be incorporated into the 2020 operations.

Environmental Considerations

A "Statement of Operational Objectives" for Harlan County Lake sets forth the general operational objectives and the specific reservoir uses that are desirable. The operational objectives indicate that fish and wildlife interests are best served by high reservoir levels with minimum fluctuations, and regulation of the outflow in excess of the minimum desired flows. Although the statement recognizes flood control and irrigation as primary purposes, it indicates that comprehensive operational plans should be developed for maximum integration of the secondary uses.

These operational objectives are also considered in the operation of all Reclamation reservoirs in the Kansas River Basin, Niobrara River Basin, and the Lower Platte River Basin. The regulated outflow can also benefit farmers, ranchers, cities, and other interests below the reservoirs.

Republican River Compact – Kansas v. Nebraska

On May 26, 1998, Kansas filed a petition with the U. S. Supreme Court stating that Nebraska had violated the Republican River Compact by using more than its share of the Republican River water supply. The three original parties to the Compact; Kansas, Nebraska and Colorado, became parties

to the case. Because the major water development structures in the Republican River Basin were constructed by the Bureau of Reclamation and the Corps of Engineers, the United States was allowed to participate as *amicus curiae.* After seventeen months of negotiations, the Final Settlement Stipulation (Stipulation) was signed by each respective governor and attorney general and was filed with the Special Master on December 16, 2002. The United States Supreme Court approved the settlement and dismissed the case on May 19, 2003.

In the dry period 2005-2006, Nebraska overused its Compact-allotted share of the Republican River. In 2010, Kansas again filed suit in the U.S. Supreme Court. In 2015 the Supreme Court found that Nebraska had violated the Compact and required it to pay Kansas $5.5 Million in damages and to take additional action to ensure compliance.

After Kansas's 2010 filing, Nebraska took additional actions to achieve compliance including developing two augmentation projects to enhance flows in the River; offsetting overuse. Colorado also developed an augmentation project during this period to offset its overuse.

After more than two years of negotiations among the States, the RRCA approved two resolutions on August 24, 2016 establishing long-term agreements among Kansas, Colorado and Nebraska related to Colorado's and Nebraska's compliance activities in the Republican River basin.

Water-Short Year Administration will be in effect in those years in which the projected or actual irrigation supply is less than 119,000 AF of storage available for use from Harlan County Lake as determined by Reclamation. It was determined that Water Short Year Administration would not be in effect in 2019.

Chapter II - Niobrara and Lower Platte River Basins

Mirage Flats Project in Nebraska

General

Flows in the Niobrara River along with Box Butte Reservoir storage provide a water supply for the 11,662 acre Mirage Flats Project. Many irrigators supplement their water supply with private wells.

The Mirage Flats Irrigation District cooperates with the Commission by operating the Box Butte Dam outlet works gate and the Dunlap Diversion Dam gates in a manner to avoid sudden large changes in the flows of the Niobrara River. A 30-year agreement was made in 1990 between the district and the Commission whereby the district would not draw the reservoir water level below elevation 3978.00 feet (2,026 AF). In return, the district received an up-front payment which was used to improve the efficiency of the project's delivery system. On March 17, 2000, the district agreed to increase the minimum reservoir level by one additional foot to elevation 3979.00 feet (2,392 AF). In return, the district received an additional payment from the Commission for the 20 years left on the original agreement. The agreement expires in 2020.

A data collection platform was installed in May of 1992 to monitor the reservoir elevation and outflow at Box Butte Dam. A telephone (primary communication system) and a radio (backup communication system) have been installed at the outlet works for contacting the Region 23 Emergency Management Agency.

2019 Summary

The flows of the Niobrara River plus the carry-over storage in Box Butte Reservoir were not adequate to provide a full water supply for the project lands. Precipitation in the Mirage Flats Irrigation District totaled 23.88 inches, which is 140 percent of normal. The 2019 total inflow of 29,379 AF was above the wet-year forecast (20,200 AF) and was the highest yearly inflow on record. March inflow of 6,900 AF was the largest on record for any month. For comparison, the last three years of inflow is shown by month in Figure 1.

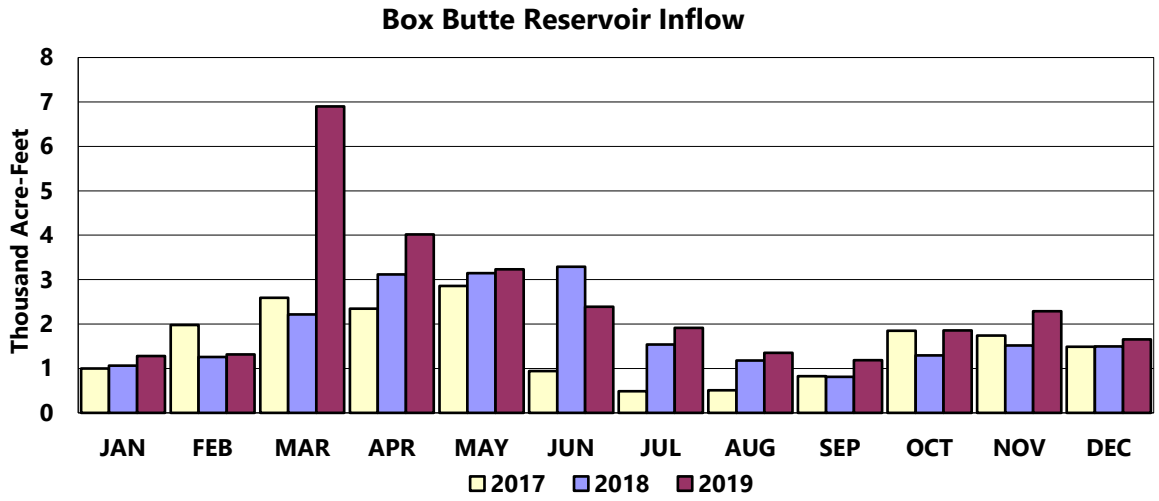

Figure 1 Box Butte Inflow.

The reservoir level began the year at elevation 3,990.96 feet (16.0 feet below the top of conservation). Irrigation releases began on July 13, 2019 and ended on August 20, 2019. Diversions of 10,641 AF to the Mirage Flats Canal provided irrigation water for approximately 10,300 acres, 88 percent of the service available acreage. The farm deliveries from the project water supply totaled 5,746 AF (0.56 acre-foot per irrigated acre), which is a delivery efficiency of 54 percent. Total reservoir storage was 18,442 AF at the end of the irrigation season. Privately owned irrigation wells supplemented the project water supply. The reservoir level at the end of the year was 4002.15 feet (4.5 feet below the top of conservation). This was the highest year end content since 1948. A daily plot of the reservoir elevation is shown in Figure 2.

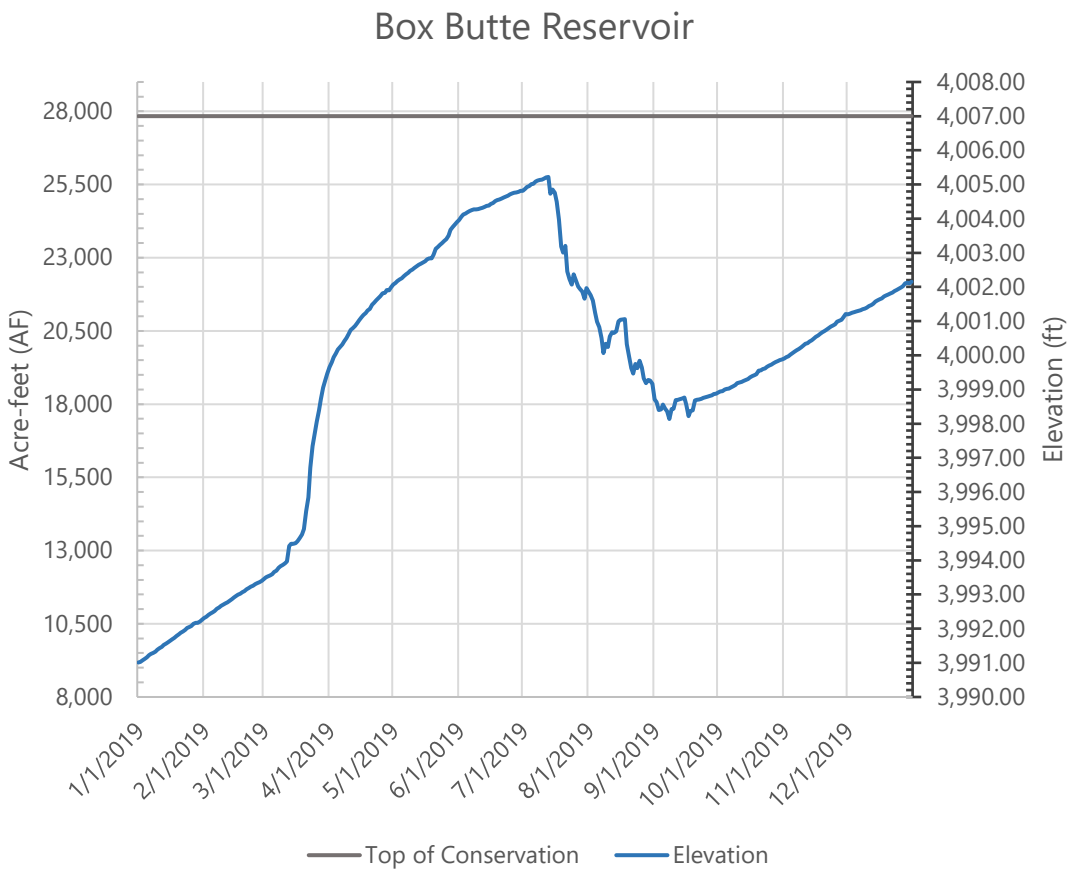

Figure 2 Box Butte Reservoir Elevation and Content.

2020 Outlook

The project water supply is expected to be inadequate in 2020 as it has been since the early 1960's based on statistical reasonable maximum inflow, though if 2019 conditions prevail supplies will be adequate. In the spring, the district will inform their water users of the amount of water that will be available from storage in Box Butte Reservoir. It is anticipated that district irrigators will continue to use their privately-owned irrigation wells as a supplemental supply.

Ainsworth Unit, Sandhills Division in Nebraska

General

Within the Ainsworth Irrigation District, there are approximately 35,000 acres with available service. The project water supply is provided by Snake River flows and Merritt Reservoir storage. The reservoir is filled to elevation 2,944.0 feet each fall after the irrigation season. This level is approximately two feet below the top of conservation capacity and within the repaired area of soil cement on the upstream face of the dam. The reservoir is regulated to maintain this level until the ice clears each spring. Maintaining the reservoir at this elevation during the winter will help avoid ice damage to the older existing soil cement at lower elevations. Upon ice-out, the outlet pipe is drained, inspected, and repaired as necessary. The reservoir is then rapidly filled to elevation 2,946.0 feet to

reduce shoreline erosion around the reservoir and minimize sand accumulations on the face of the dam. This filling process generally takes place in April. The reservoir level is maintained until irrigation releases begin to draw on the pool around mid-May. Seepage, pickup and toe drain flow normally result in flows of up to 15 cubic feet per second (cfs) below Merritt Dam.

Reclamation has executed a Memorandum of Agreement (MOA) between Reclamation, the Commission and the Ainsworth Irrigation District for Snake River releases below Merritt Dam. The purpose of this MOA is to establish the protocol that will be used to make future releases of water from Merritt Dam to the lower Snake River. The development of the MOA was an environmental commitment outlined in the Ainsworth Irrigation District Final Environmental Assessment for the conversion of a Long-Term Water Service Contract to a Repayment Contract (December 2006). Release criteria will be based on the best available scientific data to determine when local conditions warrant releases to the Snake River. When it becomes necessary to release water from Merritt Reservoir, Reclamation will direct the Ainsworth Irrigation District to make the necessary releases to the river. Changes to the river will be staged to allow fish and other aquatic organisms time to acclimate to the changing environment.

2019 Summary

Precipitation, as recorded near Merritt Dam, totaled 33.56 inches, which was 159 percent of normal and the highest yearly total since dam construction. The total yearly inflow of 246,759 AF was above the wet-year forecast and was the greatest annual total since dam construction. The reservoir level at the beginning of the year was at elevation 2944.40 feet. The water supply was more than adequate to meet the project's irrigation requirement. There were 46,328 AF diverted from Merritt Reservoir into Ainsworth Canal, with 15,012 AF delivered to the farm head gates (delivery efficiency of 32 percent). There were 34,626 acres of land irrigated in 2019. The reservoir elevation at the end of 2019 was 2943.70 feet.

The district provided a total of 141 AF of irrigation water from holding ponds located within the district's service area.

In early 2018, the Great Plains Regional Drill crew, the Technical Service Center, and Nebraska Kansas Area Office personnel completed grouting of the spillway and river outlet works underdrain systems. The post grouting monitoring of the facility noted sand emanating from the right drain outfall for the spillway chute drain system. Weir plates were installed on both outfalls to monitor the sand accumulation. Six well points were also installed around the basin to provide additional ground water level monitoring. Subsequently, a Risk Reduction Verification Decision Document was completed and indicated that there is justification for further action to evaluate the migration of material through the right spillway chute drain outfall.

2020 Outlook

During the winter months, the reservoir will be regulated to maintain elevation 2,944.0 feet (2.0 feet below the top of conservation capacity). In order to alleviate erosive action to the lands around the reservoir and to maximize all benefits associated with the reservoir, releases from Merritt Reservoir will be regulated to fill the conservation capacity during the early spring. This filling generally takes place during April. If weather conditions or irrigation demands dictate, it may be necessary to begin

filling the reservoir prior to this time. This reservoir level will be maintained until irrigation releases begin dropping the pool level. Following the irrigation season the reservoir will begin to refill to elevation 2,944.0 feet. A release of 50 cfs will be made to the Snake River beginning around the second week of October and will continue until the reservoir reaches the desired winter elevation. The water supply is expected to be adequate in 2020 for the irrigation of 35,000 acres.

North Loup Division in Nebraska

General

The North Loup Division is located in the Loup River drainage basin. Water is diverted from both the Calamus and North Loup Rivers for the irrigation of approximately 55,100 acres of project lands. Operation of the division also provides a sustained groundwater supply for an additional 17,000 acres. Principal features of the division include Virginia Smith Dam and Calamus Reservoir, Calamus Fish Hatchery, Kent Diversion Dam, Davis Creek Dam and Reservoir, five principal canals, one major and one small pumping plant and numerous open ditch and buried pipe laterals.

Calamus Reservoir is normally regulated at three to four feet below the top of conservation capacity during the winter months. Maintaining the reservoir at this elevation during the winter helps avoid ice damage to the soil cement on the upstream face of the dam. After the ice clears in the spring, the reservoir is filled to conservation capacity. The North Loup Division project operation is restricted to zero water diversions from the Calamus and North Loup Rivers during the months of July and August, and also during the month of September whenever sufficient water is available in the storage reservoirs to deliver full water demands. During this time, inflows to Calamus Reservoir are required to be bypassed under the Power Interference Agreement between Reclamation, the Twin Loups Reclamation District, and the Loup River Public Power District and as required in the authorizing legislation.

Davis Creek Reservoir level is typically maintained at an average elevation of 2,048.0 feet from the end of the irrigation season through the winter months. Off season seepage and evaporation has historically resulted in a reservoir drawdown of 2.5 to 3.0 feet requiring an end of September reservoir level of 2050.0 feet or less. This carry-over elevation provides a minimal recreational pool while reducing increases in groundwater storage due to reservoir seepage. The reservoir is filled by the Mirdan Canal starting in April and will generally reach full content by the end of June. A 160-acre recreation area adjoining the reservoir continues to be managed by the Lower Loup Natural Resources District. The area includes a boat ramp, a handicapped accessible fishing pier, a day-use area, a primitive camping area, shelter and a hiking path. Public lands adjoining Kent Diversion Dam are managed by the Commission and are also open to day-use fishing with handicapped accessibility provided.

2019 Summary

Precipitation at Virginia Smith Dam was 37.33 inches which is 152 percent of normal for the year and the largest since completion of the dam. The inflow totaled 414,592 AF which was above the wet-year forecast as well as the largest since dam completion (70,100 AF more than previous high.) The reservoir level at the first of the year was elevation 2,239.81 feet (4.2 feet below the top of conservation). The conservation pool filled on April 29, 2019. The water supply was more than

adequate for the district's needs. There were 62,107 AF of water released into Mirdan Canal for district use and 2,171 AF diverted through Kent Canal from the North Loup River. A total of 15,865 AF was diverted for district use above Davis Creek Reservoir. The farm head gate delivery was 1,141 AF which is a delivery efficiency of 7 percent. Land irrigated in 2019 totaled 34,110 acres above Davis Creek Reservoir. The Calamus Fish Hatchery used bypassed natural flows and storage from the reservoir totaling 2,564 AF. Calamus Reservoir inflows were bypassed during July, August, and September as required. The elevation at the end of the year was 2,235.51 feet.

The precipitation total of 38.37 inches near Davis Creek Dam was 151 percent of normal and also the highest since dam completion. Inflow to Davis Creek Reservoir totaled 43,365 AF during 2019. The reservoir elevation at the first of the year was 2,055.52 feet, 20.5 feet below the top of conservation. Beginning in mid-April, Davis Creek Reservoir was filled to a peak elevation of 2,076.04 feet on June 19, 2019 using diversions from Calamus Reservoir and the North Loup River. A release of 33,896 AF was made from Davis Creek Dam into Fullerton Canal, with 2,662 AF delivered to the farm head gates which is an 8 percent delivery efficiency. There were 21,016 acres irrigated below Davis Creek Reservoir. Following the irrigation season, the reservoir level was maintained and wintered approximately eight feet higher than normal at the request of the district for a three-year study period. The reservoir elevation at the end of 2019 was 2,054.52 feet, 21.5 feet below the top of conservation.

2020 Outlook

Filling of Calamus Reservoir will continue through late winter and early spring. The reservoir will be allowed to fill to an elevation of 2,244.0 feet (top of conservation capacity) in late March or April. This reservoir level will be maintained in order to minimize shoreline erosion until demands begin to draw on the reservoir. Bypassing of inflows will be made during July, August and September under all inflow forecast conditions. In the fall the reservoir will be filled to an elevation of approximately 2,240.0 feet, if possible.

Water will be available for all irrigable acres with service from the Mirdan, Geranium and Scotia Canals and Lateral Systems. It is estimated that approximately 34,000 acres will be irrigated from these canals. Water supplies will be sufficient to meet the full dry-year requirements.

Filling of Davis Creek Reservoir will take place this spring with flows diverted from the North Loup River at Kent Division Dam and transported through Kent and Mirdan Canals. Storage water can also be transferred from Calamus Reservoir into Davis Creek Reservoir during the summer months through the Mirdan Canal. Water will be sufficient to irrigate an estimated 21,000 acres from Elba and Fullerton Canals under all inflow forecast conditions. The reservoir level will be regulated to normal winter levels at the end of the season.

The fish hatchery demand for 2020 is expected to be similar to that of the last few years with approximately 5,000 AF required for the hatchery.

Chapter III - Republican River Basin

Armel Unit, Upper Republican Division in Colorado

General

Normal reservoir operations for Bonny Reservoir have historically been for recreation and fish and wildlife support, although water has been available for water right administration and irrigation purposes.

Bonny Reservoir inflows from the South Fork of the Republican River and Landsman Creek are released into Hale Ditch as requested by the Colorado State Engineer. The state can utilize Bonny Reservoir storage water for Hale Ditch and other natural flow appropriators under short-term water service contracts. Most of the 700 acres served by Hale Ditch are now owned and operated by the Division of Wildlife, Colorado Department of Natural Resources.

The historic operation pattern of Bonny Reservoir enhanced the spring fish spawn and provided excellent fishing opportunities during the summer and hunting conditions each fall. In September of 2011, the State of Colorado ordered all storage water evacuated from Bonny Reservoir for Republican River Compact compliance. As a result, the reservoir fishery was decimated and future operations are unlikely to provide fishing opportunities unless water is returned to the reservoir.

2019 Summary

The annual precipitation total of 21.09 inches at Bonny Dam was 121 percent of average. The annual computed inflow of 3,990 AF to Bonny Reservoir was between the dry-year and normal-year forecasts. Bonny Reservoir remains drained, and inflows continue to be bypassed for the purpose of compact compliance.

As directed by the Colorado State Water Commissioner, water was bypassed through the reservoir into the South Fork Republican River as ordered by the Colorado State Engineer for compact compliance. No water was diverted into Hale Ditch in 2019.

2020 Outlook

The State of Colorado's order to release all of the storage in Bonny Reservoir for Republican River Compact compliance remains in effect. If the order continues throughout 2020, water will not be available in the reservoir for irrigation or fishery purposes.

The Colorado State Water Commissioner is expected to direct that water be bypassed into the South Fork Republican River again in 2020.

Frenchman Unit, Frenchman-Cambridge Division in Nebraska

General

The Culbertson Canal and the Culbertson Extension Canal systems serve 9,292 acres in the Frenchman Valley Irrigation District and 11,915 acres in the H&RW Irrigation District. The water supply for these lands is furnished by flows from Frenchman and Stinking Water Creeks and off-season storage in Enders Reservoir located on Frenchman Creek, a tributary of the Republican River in southwest Nebraska. Irrigation releases are conveyed via Frenchman Creek from Enders Reservoir to Culbertson Diversion Dam. Reclamation maintains and clears this section of Frenchman Creek prior to irrigation releases each spring.

The normal operation of Enders Reservoir, with the gradual rise in water surface during the spring months, provides desirable fish spawning conditions. Irrigation releases normally deplete the conservation storage by late summer, thereby limiting the fishing and recreational usage. Due to extremely low storage levels, irrigation releases have not been made from Enders Reservoir since 2003.

Annual reservoir inflows have steadily declined from around 61,000 AF when Enders Dam was constructed to only 5,000 AF in recent years. Extensive groundwater pumping from upstream well development along with various conservation practices have resulted in the depletion of inflows. The conservation pool has not filled since 1968.

2019 Summary

The annual precipitation total of 24.50 inches at Enders Dam was 127 percent of normal. The 2019 inflow into Enders Reservoir of 5,180 AF was between the dry-year and normal-year forecasts. The reservoir level began the year at a level of 29.3 feet (3,083.05 feet) below the top of conservation. This was the third lowest level ever recorded on the first of January since initial filling. The reservoir level increased gradually during the spring to a peak elevation of 3,084.90 feet on June 9, 2019.

Evaporation decreased the reservoir level from June through early-October reaching elevation 3,083.20 feet on October 28, 2019. Due to the extremely low water supply available, no water was released from Enders Reservoir during the irrigation season. The end of the year reservoir level was 28.6 feet (3,083.70 feet) below the top of conservation. This was the fourth lowest end of year level recorded since initial filling. A daily plot of the reservoir elevation is shown in Figure 3.

The Frenchman Valley Irrigation District diverted 11,598 AF of natural flow from Frenchman Creek in 2019. The district reports that approximately 414 acres received 279 AF of water. Farm delivery averaged about 8 inches per irrigated acre in the irrigation district. Several farmers supplemented their water supply with private irrigation wells. The H&RW Irrigation District did not divert water into Culbertson Extension Canal in 2019. This was the seventeenth consecutive year that the district did not deliver water.

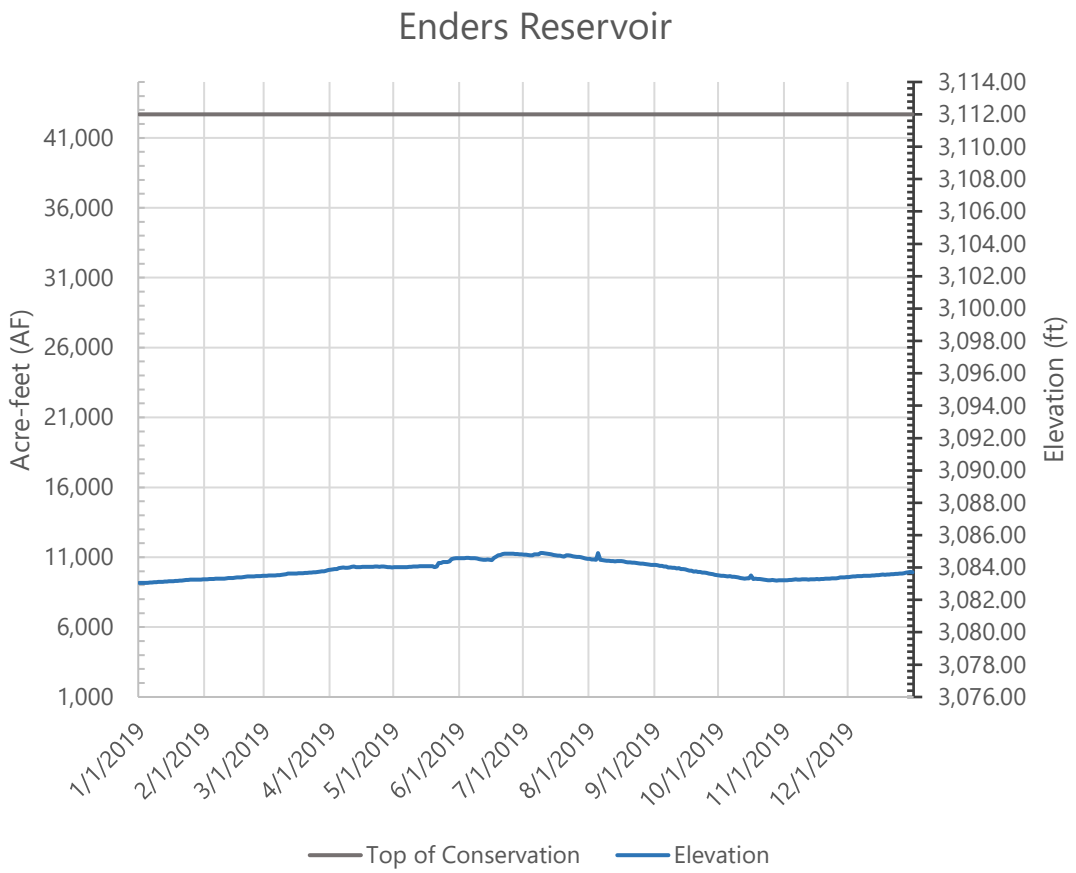

Figure 3 Enders Reservoir Elevation and Content.

2020 Outlook

The fall and early winter inflows into Enders Reservoir were near the dry-year forecast. If dry-year conditions prevail, the project water supply is expected to experience a shortage of about 77,600 AF. Normal-year conditions are expected to be inadequate by 60,700 AF and wet-year conditions by 29,600 AF, to irrigate the 9,292 acres in the Frenchman Valley Irrigation District and 11,915 acres in the H&RW Irrigation District.

The Frenchman Valley Irrigation District and the H&RW Irrigation District are investigating possible alternatives for the most efficient use of the declining water supply in the basin.

Meeker-Driftwood, Red Willow, and Cambridge Units, Frenchman-Cambridge Division in Nebraska

General

Service is provided for Frenchman-Cambridge Irrigation District by Meeker-Driftwood Canal to 16,691 acres; Red Willow Canal to 4,643 acres; Bartley Canal to 6,130 acres; and Cambridge Canal to 18,205 acres. The water supply for these lands is provided by storage in Swanson, Hugh Butler, and

Harry Strunk Lakes, and inflows of the Republican River and Red Willow and Medicine Creeks. The Frenchman-Cambridge Irrigation District has replaced all of the open ditch laterals that were economically feasible with buried pipe which has significantly increased both system and on-farm efficiencies.

2019 Summary

The annual precipitation total of 22.86 inches at Trenton Dam was 114 percent of normal. The inflow of 30,954 AF to Swanson Lake was between the normal-year and wet-year forecasts. The lake level began the year at elevation 2,739.74 feet (12.3 feet below the top of conservation) and gradually increased throughout the late winter and spring. The peak elevation on June 21, 2019 was 2,744.78 feet (7.2 feet below the top of conservation). This was the highest elevation observed since 2011. The reservoir level decreased throughout the irrigation season and reached an elevation of 2,739.01 feet on November 18, 2019. The district diverted 16,468 AF and delivered 4,511 AF to the farms, which is a delivery efficiency of 27 percent. At the end of the year, the reservoir level was 12.0 feet below the top of conservation at 2,740.00 feet. The Corps of Engineers determined that Swanson Lake prevented $7,221,300 in flood damages in 2019. A daily plot of the reservoir elevation is shown in Figure 4.

In late February 2013, the Upper Republican Natural Resources District (URNRD) began operating the Rock Creek Augmentation Project. The augmentation water is pumped from the ground and diverted into Rock Creek. The water flows from Rock Creek into the North Fork of the Republican River at Parks, Nebraska. From there the water travels approximately 35 miles to Swanson Lake. The URNRD did not pump water into Rock Creek in 2019.

The Republican River Water Conservation District (RRWCD) built and completed the Colorado Compliance Pipeline in April 2014. The augmentation water is pumped from the ground and flows approximately 8 to 15 miles south to the North Fork of the Republican River just above the Colorado-Nebraska state line. The water then travels approximately 55 miles to Swanson Lake. The RRWCD pumped water from January through April of 2019 and again from October through December for compact compliance.

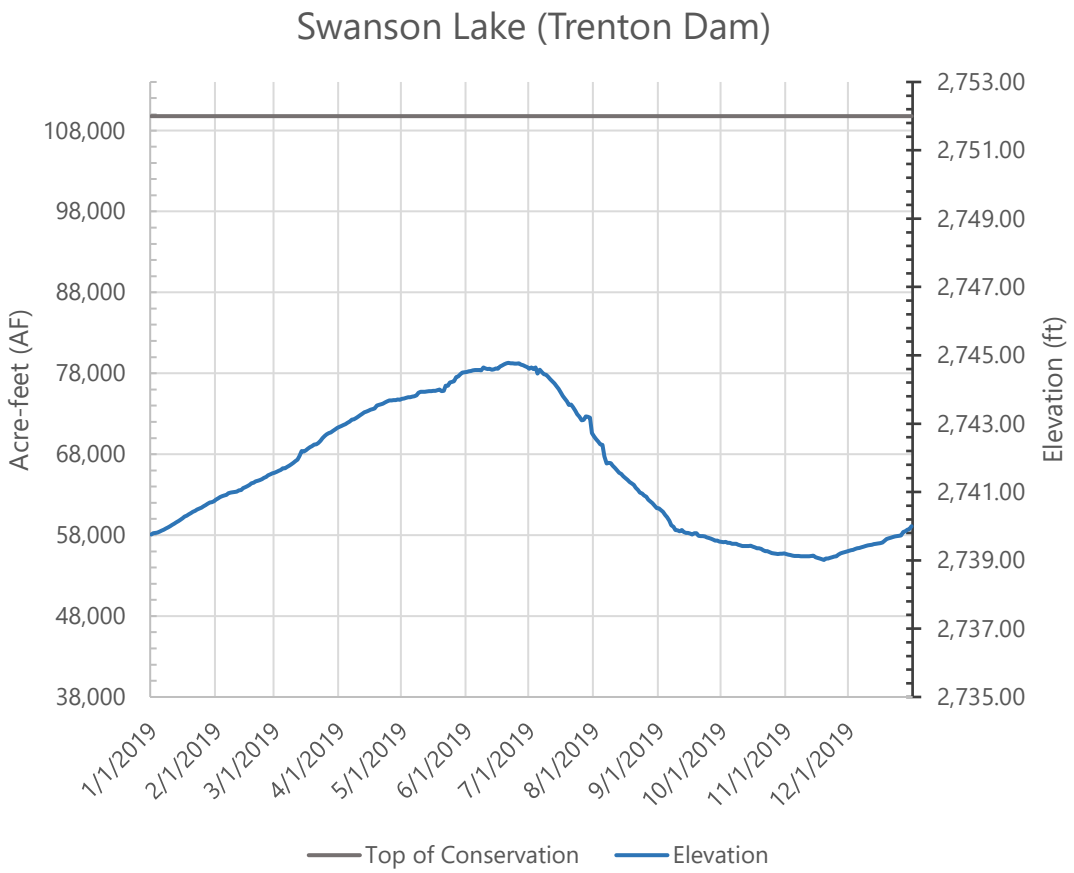

Figure 4 Swanson Lake Elevation and Content.

The annual precipitation total at Red Willow Dam was 29.73 inches (151 percent of normal). The annual inflow of 12,904 AF into Hugh Butler Lake was between the normal-year and wet-year forecasts. The reservoir level at the first of the year was 2,569.75 feet, 12.1 feet below the top of conservation. Late winter, spring and summer inflows gradually increased the lake level to a summer peak of 2,573.57 feet on July 12, 2019. This was the highest elevation observed since 2009. For the first time in ten years the district diverted 5,772 AF into Red Willow Canal and delivered 1,094 AF to the farms, which is a delivery efficiency of 19 percent. Late summer evaporation exceeded inflows, decreasing the lake level to 2,570.02 feet on September 20, 2019. The end of year elevation was 2,572.31 feet, 9.5 feet below the top of conservation. The Corps of Engineers determined that Hugh Butler Lake prevented $7,065,200 in flood damages in 2019. A daily plot of the reservoir elevation is shown in Figure 5.

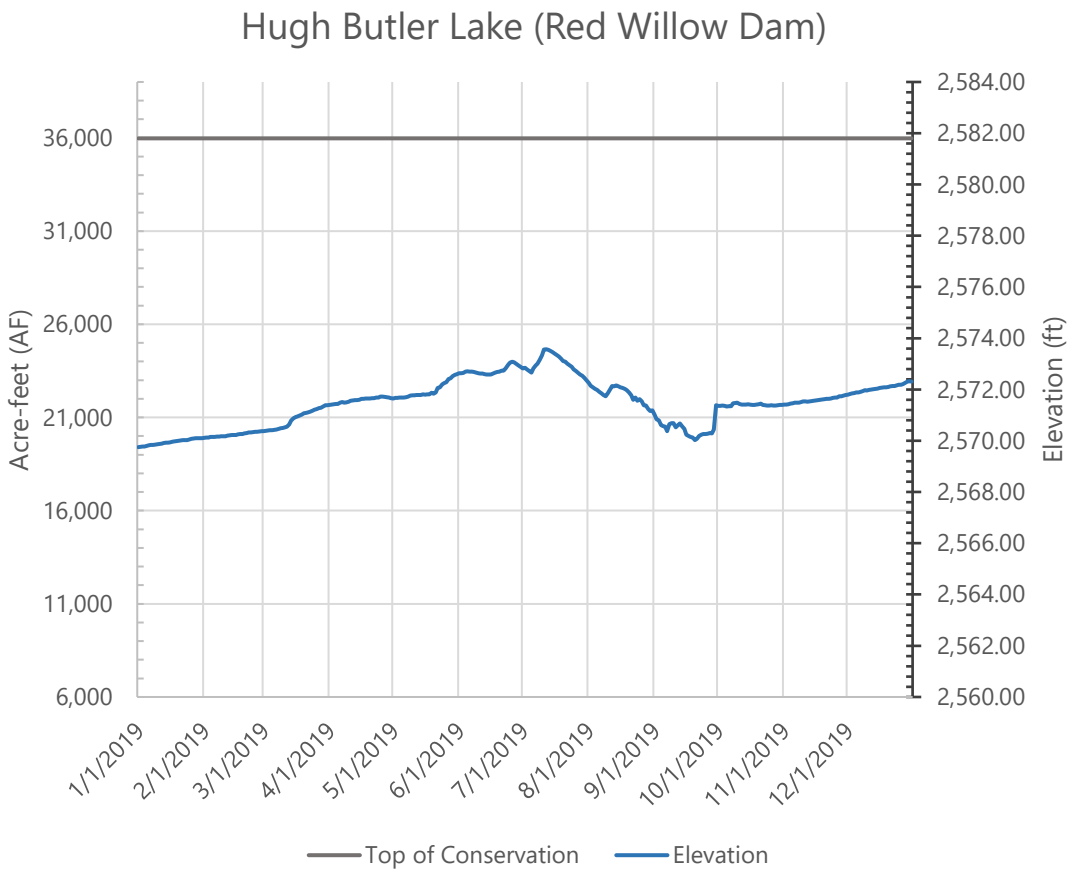

Figure 5 Hugh Butler Lake Elevation and Content.

The annual precipitation total of 31.01 inches at Medicine Creek Dam was 148 percent of normal. The inflow of 61,478 AF was above the wet-year forecast. The reservoir level at the beginning of 2019 was 3.4 feet below the top of conservation at 2,362.74 feet. The reservoir filled to top of conservation on March 13, 2019 and began spilling over the uncontrolled spillway notch.

Winter Storm Ulmer brought rain on snow throughout Nebraska and Kansas from March 12th and 13th. Runoff from this storm increased the reservoir elevation 3.2 feet in 6 days to a peak elevation of 2,368.50 feet on March 17th. This is 2.4 feet above the top of conservation with 4,600 AF stored in the flood pool (8.7%). No releases were made through the outlet works in March, although releases through the uncontrolled spillway peaked at 150 cfs on March 17, 2019. Another storm in early July caused the elevation to increase 3.2 feet in 6 days to the yearly peak of 2,370.46 feet. This is 4.4 feet above the top of conservation with approximately 8,800 AF stored in the flood pool (16.6%). This is the highest reservoir elevation since 2008. Releases over the uncontrolled spillway peaked at 390 cfs on July 11, 2019. Approximately 17,700 AF was released before top of conservation was reached on August 22nd. Releases through the outlet works for additional irrigation demand began on July 28, 2019, and continued through September 20, 2019, reducing the reservoir level to 2,363.94 feet. A daily plot of the reservoir elevation is shown in Figure 6.

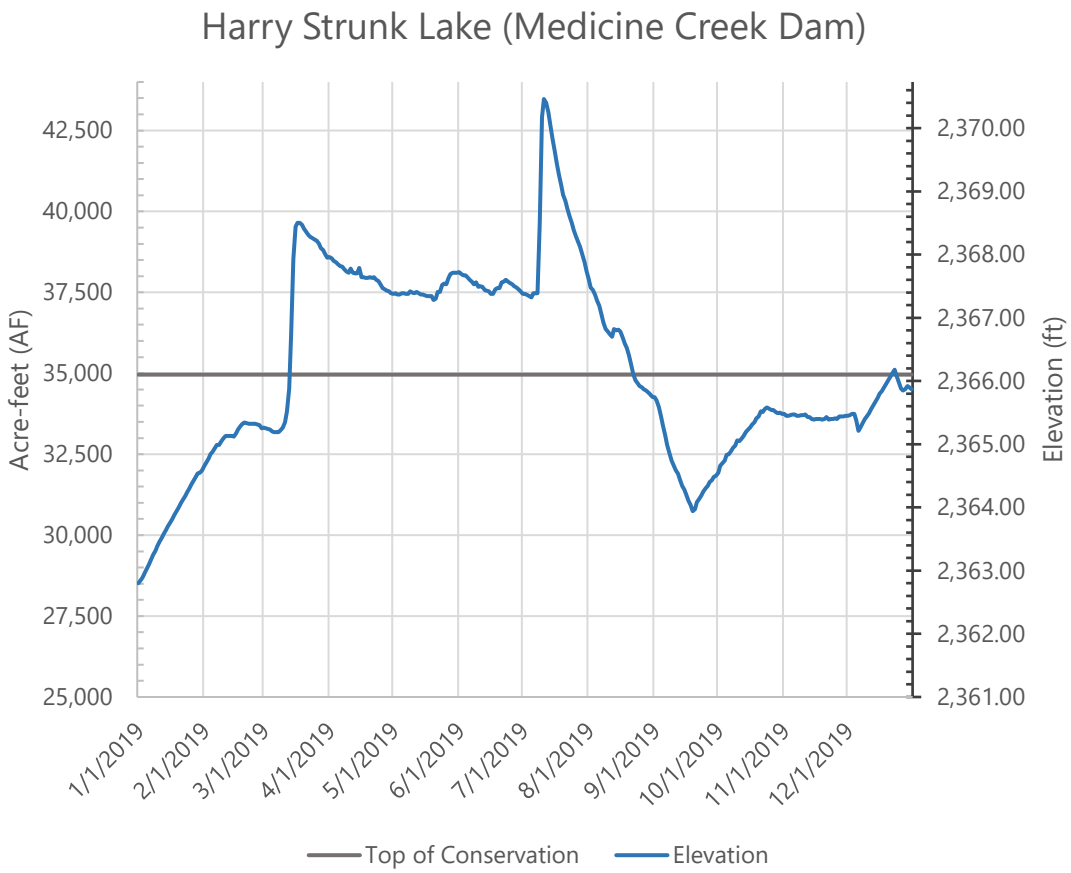

Figure 6 Harry Strunk Lake Elevation and Content.

The district diverted 24,399 AF into Cambridge Canal and delivered 8,157 AF to 12,562 acres of district lands which is a delivery efficiency of 33 percent. Releases were made for most of the fall and winter to maintain a target of a half foot below top of conservation. The end of year elevation was 2,365.87 feet at the end of the year (0.2 feet below the top of conservation). The Corps of Engineers determined that Harry Strunk Lake prevented $7,572,300 in flood damages in 2019.

The Nebraska Cooperative Republican Platte Enhancement Project (N-CORPE) is an interlocal agency formed by the Upper Republican Natural Resources District (URNRD), the Middle Republican Natural Resources District (MRNRD), the Lower Republican Natural Resources District (LRNRD), and the Twin Platte Natural Resources District. N-CORPE has constructed an augmentation project that pumps groundwater from Lincoln County into Medicine Creek. The delivery system consists of a 42-inch diameter pipe approximately six miles long. The pumped water enters at the source of Medicine Creek and travels approximately 57 stream miles to Harry Strunk Lake. The capacity of the project is approximately 87 cfs (63,000 AF annually). The augmentation project was not operated in 2019.

2020 Outlook

Forecasts show that carry-over storage, streamflow gains, plus reasonable minimum inflows for the three lakes supplying the Frenchman-Cambridge Irrigation District will be inadequate to meet the full dry-year irrigation requirement by 9,000 AF. The water supply will be adequate under normal-year and wet-year conditions.

Almena Unit, Kanaska Division in Kansas

General

Service is available to 5,764 acres in the Almena Irrigation District. The project water supply is provided by Prairie Dog Creek flows and Keith Sebelius Lake storage.

The water service contract for the City of Norton, Kansas, provides for a maximum annual use of 1,600 AF from Keith Sebelius Lake.

In 2017, the Almena Irrigation District and the Norton County Community Foundation, Inc. entered into a Memorandum of Agreement (MOA) to maintain a minimum pool elevation in Keith Sebelius Lake through December 31, 2027. The MOA was approved by the irrigators within the district and provided that no water would be released for irrigation below elevation 2,288.5 feet.

On November 22, 2019 the district executed an amendment to their contract which changed the irrigation season start date from May 1 to February 1.

2019 Summary

The annual precipitation at Norton Dam totaled 29.57 inches, which is 119 percent of normal. The total inflow of 18,547 AF was above the wet-year forecast (11,700 AF). The reservoir was 10.3 feet below the top of conservation pool at the first of the year (2,294.05 feet). Norton Dam recorded 9.56 inches of precipitation during the month of May, the second greatest ever recorded for the month. Late winter, spring and summer inflows gradually increased the lake level to a summer peak of 2,300.82 feet on June 24, 2019. This was the highest elevation observed since 2000. Irrigation releases began August 3, 2019 and finished on August 24, 2019. Approximately 1,718 AF was released from Norton Dam for irrigation of which 1,320 AF was diverted into the Almena Canal of which 584 AF was delivered to farms for an efficiency of 44 percent. Inflows exceeded evaporation for much of the fall and winter gradually increasing the elevation to the end of year elevation of 2,299.94 feet, 4.4 feet below the top of conservation. The Corps of Engineers determined that Norton Reservoir prevented $7,415,700 in flood damages in 2019. A daily plot of the reservoir elevation is shown in Figure 7.

The city of Norton used 288 AF of municipal water during 2019.

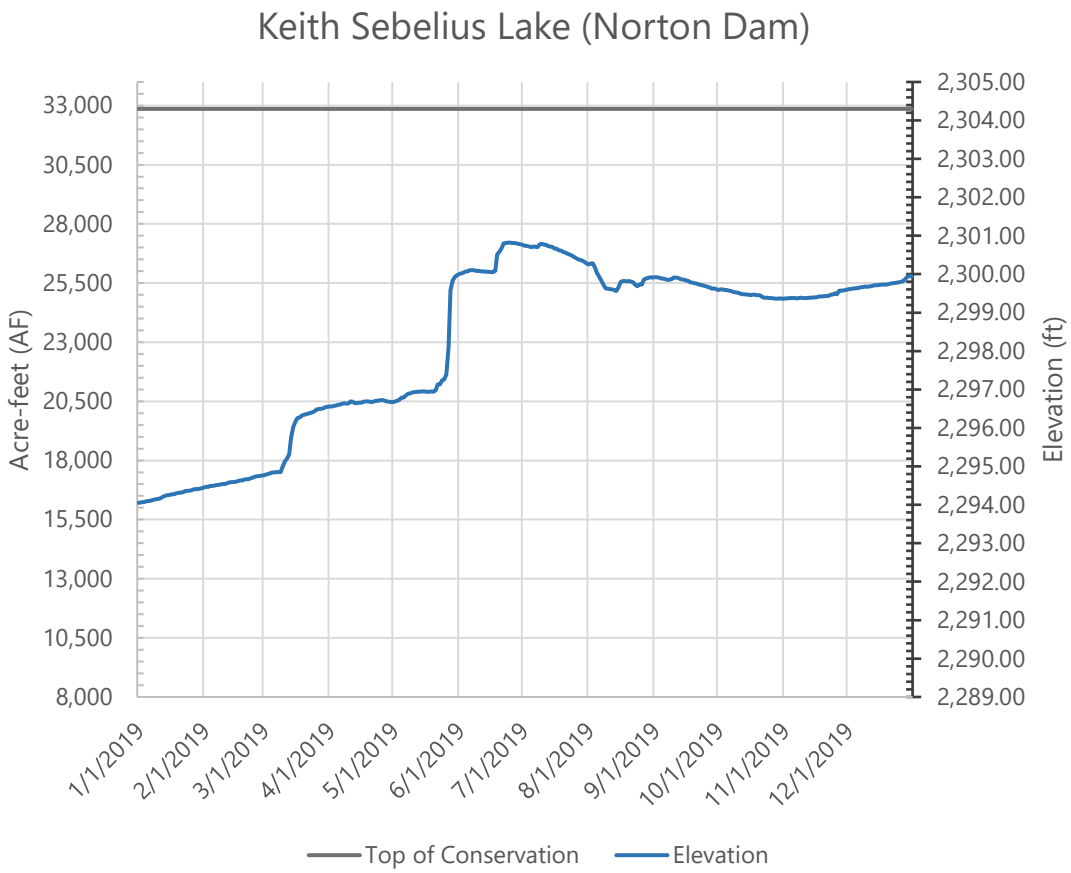

Figure 7 Keith Sebelius Lake Elevation and Content.

2020 Outlook

If 2020 is a dry year without significant runoff producing storms above Keith Sebelius Lake, it is anticipated that the water supply may be inadequate by as much as 12,000 AF. If normal inflow into the lake and normal rainfall over the irrigated area occur in 2019, a shortage of 7,500 AF may be experienced. The water supply will be adequate under wet-year conditions. Requirements for the city of Norton will be met in full in 2020.

The district continues to plan projects to replace open ditch laterals with buried pipe that will reduce seepage losses, lessen maintenance requirements, and provide improvements in on-farm efficiencies. However, due to uncertainty of the district's water supply in the past and the temporary agreements with the State to forgo irrigation releases, the district may delay some identified delivery system improvement projects.

Franklin, Superior-Courtland, and Courtland Units, Bostwick Division in Nebraska and Kansas

General

Harlan County Lake storage and Republican River flows provide a project water supply for 22,455 acres in the Bostwick Irrigation District in Nebraska, and 13,378 acres in the Kansas Bostwick Irrigation District No. 2 (KBID) above Lovewell Reservoir. This storage and natural flows, together with White Rock Creek flows and Lovewell Reservoir storage, furnish a water supply for 29,122 acres below Lovewell Reservoir in the KBID.

The lands in the Franklin and Superior-Courtland Units are in the Bostwick Irrigation District in Nebraska. The lands in the Courtland Unit downstream of the Kansas state line are in the KBID.

In accordance with the off-season flow alternative outlined in Reclamation's final environmental assessment dated December 16, 1983, and amended on November 21, 2002, Harlan County Lake releases will be 10 cfs during the months of December, January, and February, except when the reservoir is at low levels. During water-short years releases for these three months will be either zero or 5 cfs depending on reservoir levels.

Natural gain in streamflow, plus irrigation return flows, and operational bypass at Superior-Courtland Diversion Dam will provide some flow downstream.

The KDWPT has requested that the KBID and Reclamation maintain, when possible, a flow of 20 cfs into Lovewell Reservoir when the Courtland Canal is in operation and the conservation pool is below capacity. This recommended inflow provides excellent fishing around the canal inlet to the reservoir. The seepage below Lovewell Dam into White Rock Creek maintains a small live stream throughout the year.

Bostwick Division - Harlan County Lake Operations - 2019 Summary

The annual precipitation at Harlan County Dam totaled 30.94 inches of rainfall, which is 134 percent of normal. The 2019 inflow of 402,546 AF was far above the wet-year forecast of 214,800 AF and was the largest yearly inflow since 1967. Harlan County Lake began 2019 approximately 4.7 feet below the top of conservation pool, at 1941.05 feet.

Winter Storm Ulmer brought rain on snow throughout Nebraska and Kansas from March 12th and 13th increased the reservoir levels of many NKAO reservoirs. Storm runoff/snowmelt increased Harlan County Lake 3.1 feet in 9 days. Harlan County filled the conservation pool on March 16, 2019 for the first time since 2012. Corps flood releases began March 19, 2019 as the pool approached 0.5 feet in the flood pool. A release of 100 cfs to the river was started March 23, 2019 and continued until July 23, 2019. Storage of flood waters helped to alleviate downstream flooding.

A series of storms between July 6, 2019 and July 10, 2019 dropped between 5 to 9 inches of rain in the middle stretch of the Republican River basin. Inflows into Harlan County Lake peaked on July 10,

2019 at approximately 10,000 cfs on the Republican River, 700 cfs on Sappa Creek, and 1,800 cfs on Prairie Dog Creek. Storm runoff increased Harlan County Lake 5.4 feet in 10 days. The lake peaked at elevation 1,958.17 feet on July 23, 2019. This is 12.44 feet above the top of conservation (160% of full) with 189,551 AF stored in the flood pool (37.9%). This surpassed the previous all-time high set in 1960 by 2.51 feet. The Corps staged up releases to 1,100 cfs which continued for most of August before releases were staged back to zero to dewater the stilling basin for inspection. Releases were again staged up in late October to 1,100 cfs and continued throughout the end of the year. A plot of the reservoir elevation during 2019 is shown in Figure 8

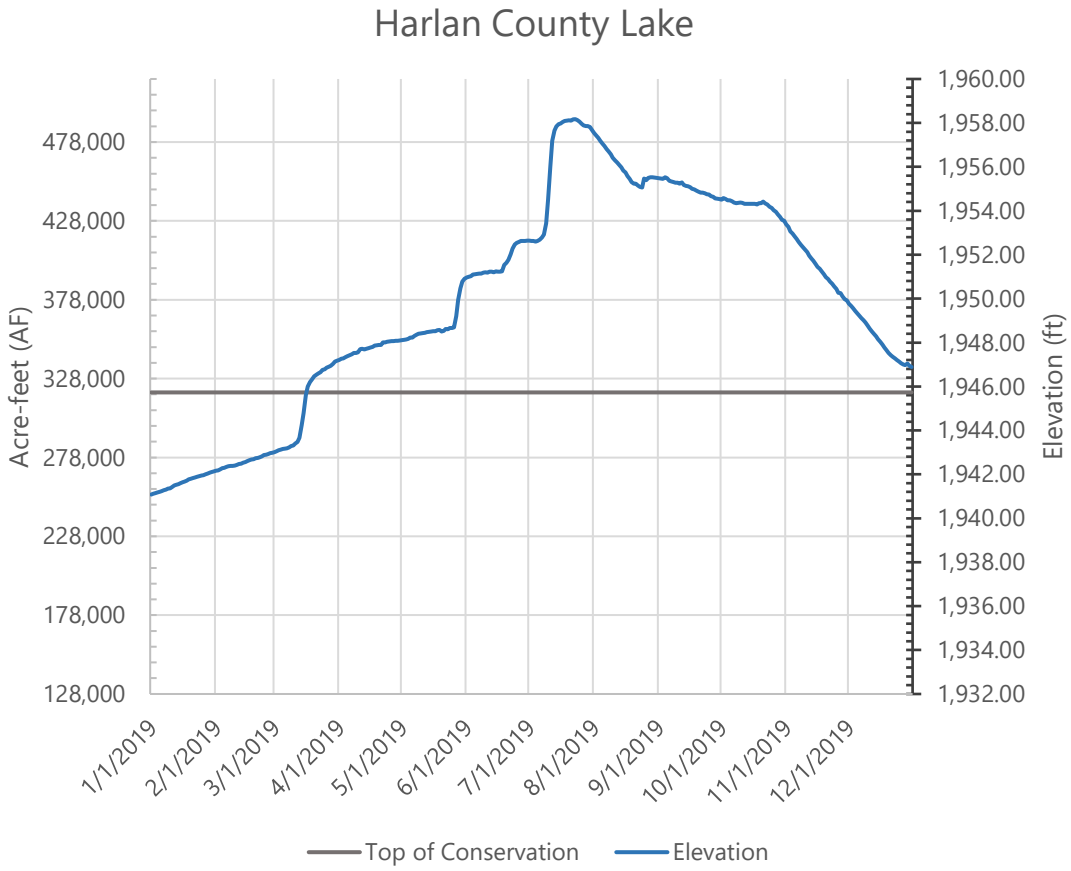

Figure 8 Harlan County Lake Elevation and Content.

Irrigation releases from Harlan County Lake into Franklin and Naponee Canals totaled 31,040 AF in 2019. The end of year elevation was 1,946.89 feet, 1.2 feet above the top of conservation. This was the highest year end content since dam completion (1952.)

On December 21, 2018, Bostwick Irrigation District in Nebraska and KBID amended their original "Memorandum of Agreement" dated October 4, 2000, to modify Harlan County Lake accounting procedures. In the agreement, account balances of the districts carry-over from year to year and inflows are apportioned based on target account balances.

Harlan County Lake prevented $155,082,500 of downstream flood damages during 2019 according to the Corps of Engineers.

There was 30,995 AF delivered to Lovewell Reservoir via the Courtland Canal during 2019. This was approximately 23 percent of the total Lovewell Reservoir inflow.

Bostwick Division – Nebraska - 2019 Summary

Irrigation diversions were made into Franklin, Naponee, Franklin Pump, Superior, and Courtland Canals in Nebraska in 2019. The district diverted 39,508 AF of water and delivered 4,094 AF to the farm head gates (10 percent delivery efficiency).

The district continues to explore opportunities for replacing sections of open ditch lateral with buried pipe. These pipe projects provide delivery system improvements by eliminating seepage losses, eliminating operational wasteways, improving water measurement and accounting by utilizing water meters, and providing on-farm benefits by allowing land-owners the opportunity to convert to sprinkler irrigation. The district also automated several gates on the Franklin Canal and one on Franklin Pump Canal in 2019.

Bostwick Division – Kansas – 2019 Summary

The 2019 precipitation at Lovewell Dam totaled 38.12 inches, which was 138 percent of normal and the third highest yearly total since 1950. The total annual inflow recorded at Lovewell Reservoir was 132,470 AF, the largest yearly inflow since 1993. Approximately 101,475 AF of the inflow was from White Rock Creek which was far above wet-year forecast of 54,600 AF. The reservoir elevation at the beginning of 2019 was 1,583.44 feet (0.8 feet above the top of conservation). The reservoir was drawn down to elevation 1,577.59 feet during January to perform repairs to the north spillway gate cables.

Winter Storm Ulmer brought rain on snow from March 12th and 13th increased Lovewell Reservoir 4.4 feet in 9 days to a peak elevation of 1,585.56 feet on March 18, 2019. This is 3.0 feet above the top of conservation with 9,500 AF stored in the flood pool (18.8%). Inflows from White Rock Creek peaked at approximately 1,200 cfs on March 14, 2019. Storage of flood waters helped to alleviate downstream flooding. Releases were started March 18th of 600 cfs through the spillway. Releases were slowly staged down as the reservoir reached its operating target of approximately top of conservation, 1,582.60 feet on May 1, 2019. Between March 18th and May 1, 2019 approximately 14,900 AF was released from Lovewell Dam. March inflow of 19,100 AF was the fourth highest for the month on record.

A series of storms between July 6, 2019, and July 10, 2019, dropped between 5 to 9 inches of rain in the White Rock Creek drainage basin. Inflows from White Rock Creek peaked at approximately 2,000 cfs on July 9, 2019. On July 15, 2019, Lovewell Reservoir peaked at 10.39 feet above top of conservation which is 2.31 feet below the top of the spillway gates (surcharge pool) with nearly 80% of the flood pool filled. This is the third highest elevation since closure and highest it has been since 1993. No river releases were made until July 15, 2019, due to flooding downstream and high elevation at Milford Dam Corps of Engineers downstream. Canal releases from Lovewell Reservoir began on May 28, 2019, with irrigation releases beginning in earnest on June 11, 2019. Irrigation releases continued through September 19, 2019. Releases to the river continued to draw down the reservoir

to a target of 1,572.00 feet. This elevation allowed maintenance crews to clean out the canal intake channel. Maintenance crews also worked on the south spillway gate while it was exposed.

Republican River flow was diverted via the Courtland Canal into Lovewell Reservoir after the irrigation season to refill after the drawdown for dam maintenance. The pool level at the end of the year was 1,582.68 feet (0.08 foot above top of conservation). Lovewell Reservoir prevented $77,727,000 of downstream flood damages during 2019 according to the Corps of Engineers.

KBID diverted a total of 32,989 AF to serve 12,508 acres above Lovewell Dam and 27,014 acres below Lovewell Dam. District farm delivery totaled 12,426 AF for an efficiency of 38 percent.

Bostwick Division - 2020 Outlook

The storage in Harlan County Lake is expected to be inadequate in meeting the full dry-year irrigation requirement though Lovewell Reservoir and flows of the Republican River and White Rock Creek are expected to be adequate in meeting the full dry-year irrigation requirement. The water supply will be adequate under normal-year and wet-year conditions.

Chapter IV - Smoky Hill River Basin

Kirwin Unit, Solomon Division in Kansas

General

The water supply for the 11,465 acres of land in the Kirwin Irrigation District is furnished by Kirwin Reservoir storage and inflows from the North Fork Solomon River and Bow Creek.

The operation of Kirwin Dam and Reservoir affords many opportunities for recreation, fishing, hunting, fish spawning, and preservation of waterfowl species.

The U.S. Fish and Wildlife Service (Service) has completed the Kirwin National Wildlife Refuge Comprehensive Conservation Plan (CCP). The 1997 National Refuge System Improvement Act required the Service to develop a CCP for each of its refuges. The Kirwin Refuge CCP will guide the refuge management activities through 2025.

2019 Summary

The annual precipitation total of 23.23 inches at Kirwin Dam was 97 percent of normal. The inflow of 88,928 AF was above the wet-year forecast (79,700 AF). The reservoir level was 1.3 feet above the top of conservation pool at the first of the year (elevation 1,730.54 feet). Inflows were bypassed throughout the spring. In April, releases were reduced to minimum gate due to flooding downstream. Irrigation releases began on June 24, 2019 and continued through August 25, 2019.

In the last three weeks of May, Kirwin Dam recorded 5.56 inches of precipitation with runoff increasing the reservoir to a peak elevation of 1,734.57 feet on June 24, 2019. This is 5.32 feet above the top of conservation with 29,550 AF stored in the flood pool and is the highest elevation observed since 1995. Flood releases were again delayed due to downstream flooding on the Solomon, Kansas, and Missouri River basins. Releases of up to 500 cfs were made through the spillway sluice gates from October 16, 2019 through November 7, 2019 when top of conservation was reached. Approximately 21,400 AF was released during this period. Inflows were bypassed through the outlet works for the rest of the year to maintain top of conservation. The year-end elevation was 1,729.27 feet (0.02 feet above the top of conservation). The Corps of Engineers determined that Kirwin Reservoir prevented $91,598,000 in flood damages in 2019. A daily plot of the reservoir elevation is shown in Figure 9 on the following page.

A total of 15,896 AF was released into Kirwin Canal to irrigate 9,085 acres of project lands during 2019. Farm delivery efficiency was 36 percent with 5,713 AF delivered to farms.

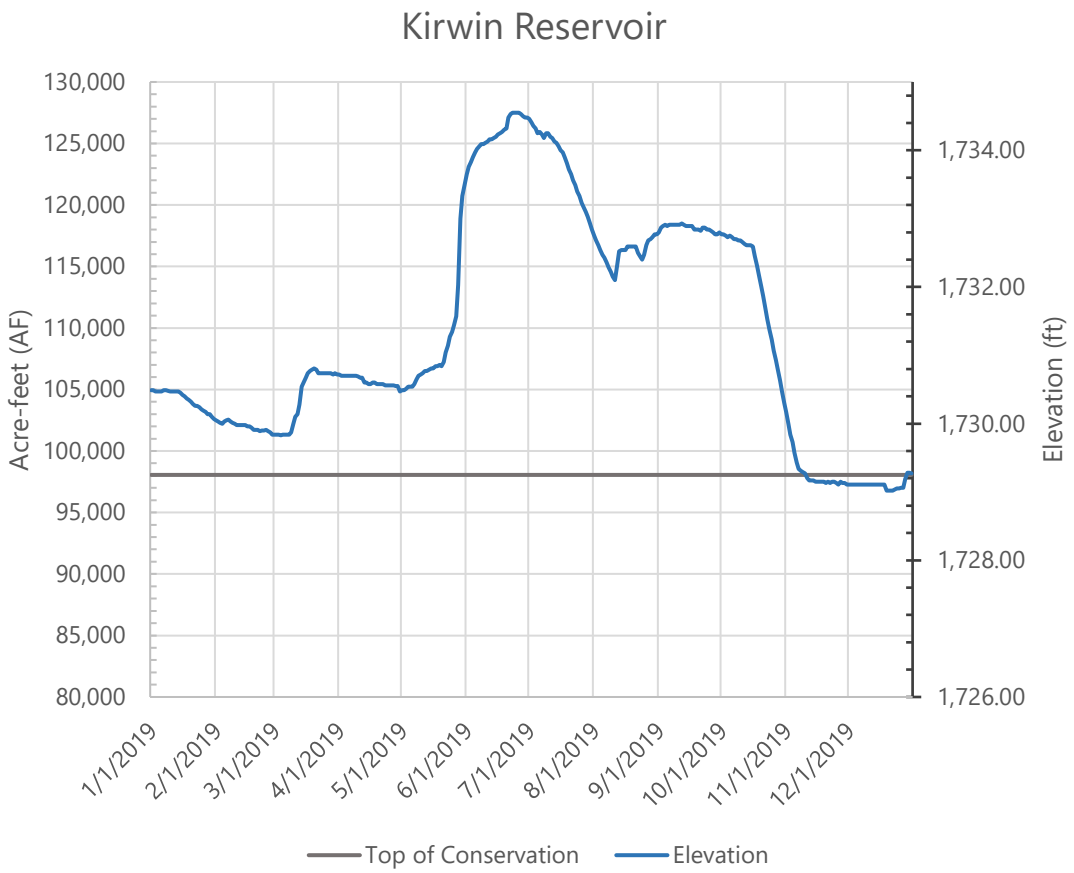

Figure 9 Kirwin Reservoir Elevation and Content.

2020 Outlook

Carry-over storage and the forecasted inflows in the North Fork of the Solomon River are expected to be adequate to irrigate all district lands under all forecasted conditions.

Webster Unit, Solomon Division in Kansas

General

The Webster Irrigation District has service available to 8,537 acres. The project water supply is provided by Webster Reservoir storage and flows of the South Fork Solomon River.

2019 Summary

In 2019, the precipitation at Webster Dam was 157 percent of normal (26.41 inches). The inflow of 135,470 AF was 200 percent of the wet-year forecast (68,700 AF). The reservoir level was 0.6 feet above the top of conservation pool at the first of the year (elevation 1,893.07 feet). Flood releases were made throughout the winter to maintain top of conservation. Rain on snow in March caused the reservoir to come up 1.0 feet in two weeks. Releases were staged up to 200 cfs through the outlet works. Releases continued through early May to maintain the reservoir elevation.

On May 8, 2019 the Corps requested Webster Dam to go to minimum gate due to flooding downstream. In addition, Webster Dam received 7.48 inches of precipitation in the month of May, raising the reservoir elevation to 1,896.98 feet on June 12, 2019. This is 4.5 feet above the top of conservation with 18,200 AF stored in the flood pool. River releases from Webster Dam were staged up to 200 cfs through the outlet works and switched the center spillway gate on June 19, 2019. Releases were diverted into Osborne Canal on June 19, 2019 and continued until August 25, 2019. Flood releases continued throughout the month of July. Releases were staged down to zero on August 25, 2019 at the request of the Corps due to the high elevation of Waconda Lake downstream. Inflows were again bypassed on August 25, 2019.

Additional heavy rains in the South Fork Solomon River Basin above Webster Reservoir throughout the month of August increased the reservoir level to a peak elevation of 1,899.56 feet on September 12, 2019. This is 7.11 feet above the top of conservation with 29,700 AF stored in the flood pool and the highest elevation observed since 1995. On October 7, 2019, Webster Reservoir became in tandem with Waconda Lake and river releases were staged up to 745 cfs through the spillway. Releases were staged down at the end of October as the flood pool evacuated. Releases were regulated the rest of the year to maintain the pool near top of conservation. Webster Dam flood releases totaled approximately 120,843 AF during 2019, the second highest yearly total since dam completion. The year-end elevation was 1,893.07 feet (0.6 foot above the top of conservation). The Corps of Engineers determined that Webster Reservoir prevented $42,498,700 in flood damages in 2019. A daily plot of the reservoir elevation is shown in Figure 10 on the following page.

A total of 10,327 AF was diverted into Osborne Canal to irrigate 5,696 acres of project lands during 2019. Farm delivery efficiency was 41 percent with 4,245 AF delivered to farms.

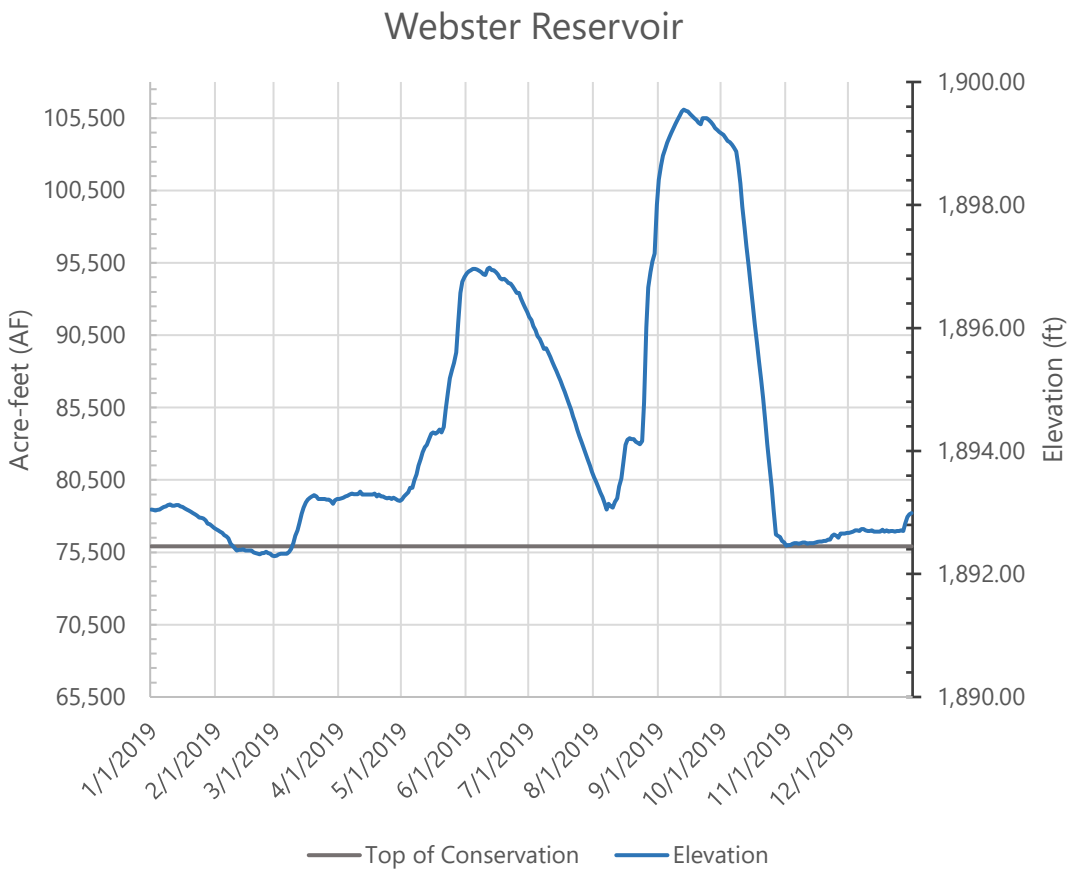

Figure 10 Webster Reservoir Elevation and Content.

2020 Outlook

The carry-over storage and the flows in the South Fork Solomon River are expected to be adequate to irrigate all district lands under all forecasted conditions.

Glen Elder Unit, Solomon Division in Kansas

General

Releases from Waconda Lake are regulated as outlined in two memorandums of understanding between the State of Kansas and Reclamation. Releases are made for the city of Beloit, the Mitchell County Rural Water District, the long-term water service contract with Glen Elder Irrigation District, and for water right administration.

Renewal of the long-term water service contract with the City of Beloit, Kansas was completed in 2008. The new repayment contract became effective on January 1, 2009. The repayment contract

with Beloit, Kansas, provides for the annual use of up to 2,000 AF from Waconda Lake storage. Water is measured at the Glen Elder Dam river outlet works.

The water service contract with the Mitchell County Rural Water District No. 2 provides for 1,009 AF of storage water as available from Waconda Lake.

The long-term water service contract with the Glen Elder Irrigation District was to expire in June 2017. A one-year extension was signed May 18, 2018. Renewal of a long-term water service contract was completed in March of 2019. The new service contract has an upfront fee for a base 2000 AF of water. They can request an additional 1,500 AF firm supply as needed. Additional water is available up to a total release of 15,170 AF at Reclamation discretion. The contract's expiration date is March 12, 2059. Water is released and measured through the river outlet works.

When compatible with flood control operations, the operating criteria for Waconda Lake provide for a stable or rising pool level during the fish spawning period each spring.

When possible, Waconda Lake is allowed to fill during the late summer and early fall to flood exposed shoreline vegetation. This flooded aquatic vegetation is very beneficial to waterfowl management.

Waconda Lake is normally regulated at one to two feet below the top of conservation capacity during the winter months. Maintaining the lake at this level reduces shoreline erosion, provides a buffer for spring runoff and lessens ice damage to the upstream face of Glen Elder Dam. Releases from Waconda Lake are regulated each year to maintain a constant water surface level while the lake is ice-covered.

2019 Summary

The annual precipitation total of 31.85 inches at Glen Elder Dam was 125 percent of normal. The inflow of 776,754 AF was above the wet-year forecast of 360,600 AF. The lake level at the beginning of the year was 1.2 feet above the top of conservation at 1,456.79 feet. Releases were made throughout the late winter and spring to reduce the level of Waconda Lake to one foot below top of conservation. Releases were staged down to zero on March 12, 2019, at the request of the Corps due to flooding downstream. Later that month releases were staged up to 2,500 cfs on March 21, 2019.

On May 8, 2019 releases were reduced to minimum gate opening due to flooding downstream, this, in addition to Waconda Dam receiving 8.41 inches of precipitation in the month of May, raised the reservoir elevation to 1465.96 feet on June 7, 2019. This is 10.36 feet above the top of conservation with 155,468 AF stored in the flood pool. Releases were staged up to 2,500 cfs by June 13, 2019. Flood releases were again staged down to zero due to downstream flooding on the Solomon, Kansas, and Missouri River basins on June 23, 2019. Releases were resumed June 27, 2019 and were staged up to 2,000 cfs on July 25, 2019. On August 2, 2019, releases were reduced to minimum gate due to flooding downstream. Flood releases were staged up throughout August to a peak of 1,500 cfs on August 16, 2019, and again on August 20, 2019. Yet again, releases were reduced to minimum gate opening due to flooding downstream on August 25, 2019. This resulted in Waconda Lake increasing 4.1 feet in 5 days to the yearly peak of 1,466.06 feet. This is 10.46 feet into the flood pool with approximately 157,200 AF stored in the flood pool. Releases were staged up on August 28, 2019 eventually getting to 2,500 cfs on September 9, 2019. Releases were reduced as the target of 1.0 foot

above conservation was reached and bypass of inflow commenced. Flood releases varied to hold the target until December when the lake level was reduced to the wintering elevation target of 1.0 foot below top of conservation.

Waconda Lake ended the year 0.53 feet (elevation 1,455.07 feet) below the top of conservation. Waconda Lake prevented $352,930,300 of downstream flood damages during 2019 according to the Corps of Engineers.

Glen Elder Dam flood releases totaled approximately 744,493 AF during 2019, the second highest yearly total since dam completion. Glen Elder Irrigation District irrigated 5,000 acres with natural flow diversion of 3,413 AF. No releases were required from the district's storage account. The district delivered 1,473 AF to the farms resulting in a delivery efficiency of 43 percent. Due to all the flood operations, no storage releases were necessary for the City of Beloit. Releases to the Mitchell County Rural Water District No. 2 totaled 901 AF. A daily plot of the reservoir elevation is shown in Figure 11.

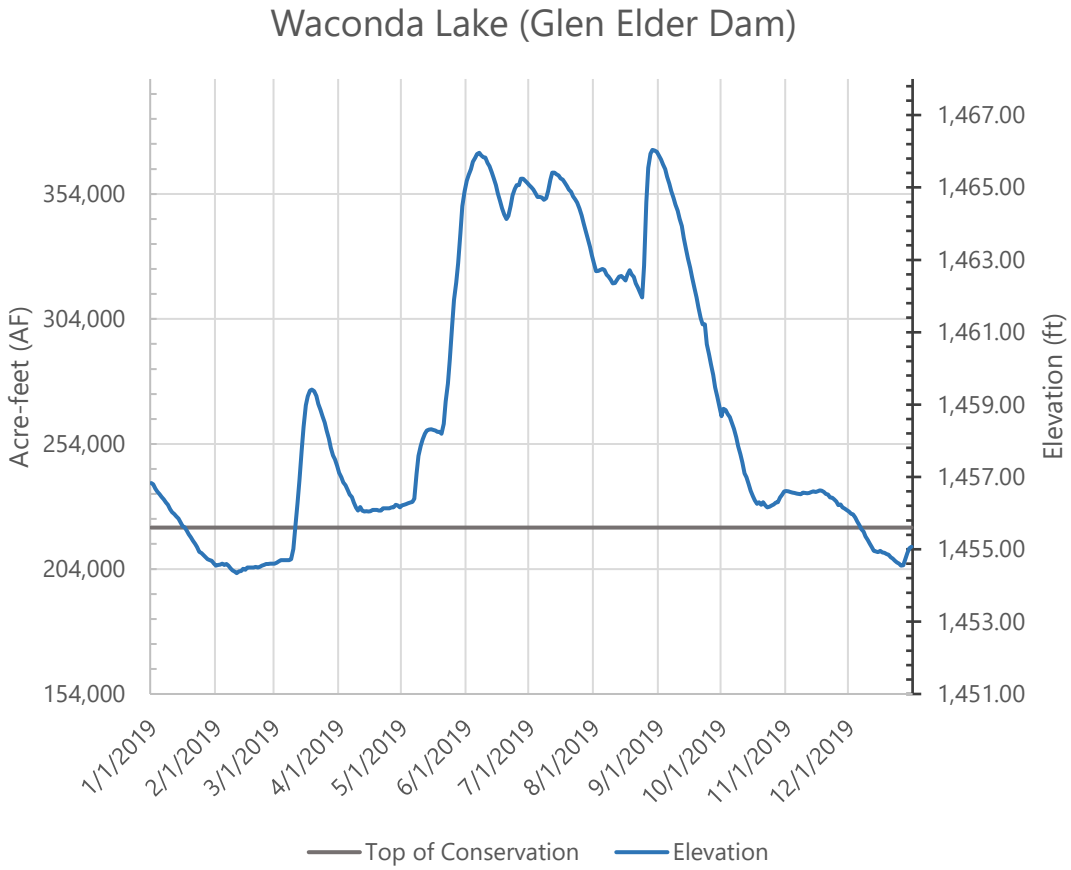

Figure 11 Waconda Lake Elevation and Content.

2020 Outlook

The municipal requirement of Beloit and the requirements of the Mitchell County Rural Water District No. 2 will be met in full with releases as required from Waconda Lake. It is expected that the Kansas

Water Commissioner will request that inflows be passed through the lake for water right administration. The storage in Waconda Lake and flows in the North and South Forks of the Solomon River will furnish a full water supply to the Glen Elder Irrigation District. The reservoir will be regulated to maintain a constant level during the winter months when the reservoir is ice-covered to minimize ice damage. Under normal-year conditions, the lake is expected to be maintained between one and two feet below the top of the conservation pool during the winter.

Cedar Bluff Unit, Smoky Hill Division in Kansas

General

Cedar Bluff Reservoir storage furnishes a maximum of 2,000 AF each year for the City of Russell, Kansas when required. Prior to 1993, Cedar Bluff Reservoir storage and Smoky Hill River flows had provided a water supply for 6,800 acres in the Cedar Bluff Irrigation District. Reformulation of the Cedar Bluff Unit in October of 1992 resulted in the dissolution of the Cedar Bluff Irrigation District with the Kansas Water Office and Kansas Department of Wildlife and Parks acquiring the use and control of portions of the reservoir conservation capacity. A "designated operating pool" was established for Cedar Bluff Reservoir and includes the following sub allocation pools: The City of Russell's existing water storage right which remained unchanged (2,700 AF); an artificial recharge pool under control of the Kansas Water Office (5,110 AF); and a fish, wildlife and recreation pool under control of the KDWPT (21,061 AF). A "joint-use pool" has been established between the operating pool and the flood control pool for water supply, flood control, environmental and fish, wildlife and recreation purposes. Water rights for the "joint-use pool" are held jointly between the KDWPT and the Kansas Water Office. A Contract Administration Memorandum between the United States of America, represented by Reclamation, the State of Kansas and the City of Russell was signed in November/December of 2003, establishing an accounting procedure for water storage in Cedar Bluff Reservoir. In January 2006 a Memorandum of Understanding was signed by the State of Kansas agencies, Kansas Water Office, and Kansas Department of Wildlife and Parks. The KDWPT will be responsible for the joint pool releases and for the water rights.

2019 Summary

The annual precipitation total at Cedar Bluff Dam was 30.03 inches which is 143 percent of normal and was the third highest since 1950 and the highest since 1993. The 2019 inflow of 62,296 AF was far above the wet-year forecast (30,000 AF), and was the highest since 1998. The reservoir level at the beginning of the year was 2,122.68 feet (21.3 feet below top of conservation). The level of Cedar Bluff Reservoir slowly increased during the winter and spring months. Cedar Bluff Dam recorded 7.30 inches of precipitation in May, the third highest on record for the month. This resulted in a May inflow of 18,186 AF, which is higher than 14 of the previous 17 yearly inflow totals. This combined with 4.13 inches in June raised the lake almost 7 feet in two months to a peak elevation of 2132.55 on July 9, 2019. This is 12.0 feet higher than the lake was the year before at the same time. August precipitation at Cedar Bluff Dam totaled 9.70 inches and was the greatest ever recorded for the month (since 1950). Elevated inflows as well as continued rainfall throughout the summer and fall slowly increased the reservoir elevation to a year end peak of 2,133.67 feet on December 31, 2019 (10.33 feet below the top of conservation). This was nearly 11.0 feet above the level at the end of 2018 and 16.0 feet above 2017. This was the highest elevation observed since 2005. Water was not released from the reservoir for the City of Russell or the Kansas Water Office in 2019. The Corps of Engineers determined that the reservoir prevented $43,885,800 in flood damages in 2019. A plot of Cedar Bluff Reservoir elevation and content during 2019 is shown in Figure 12.

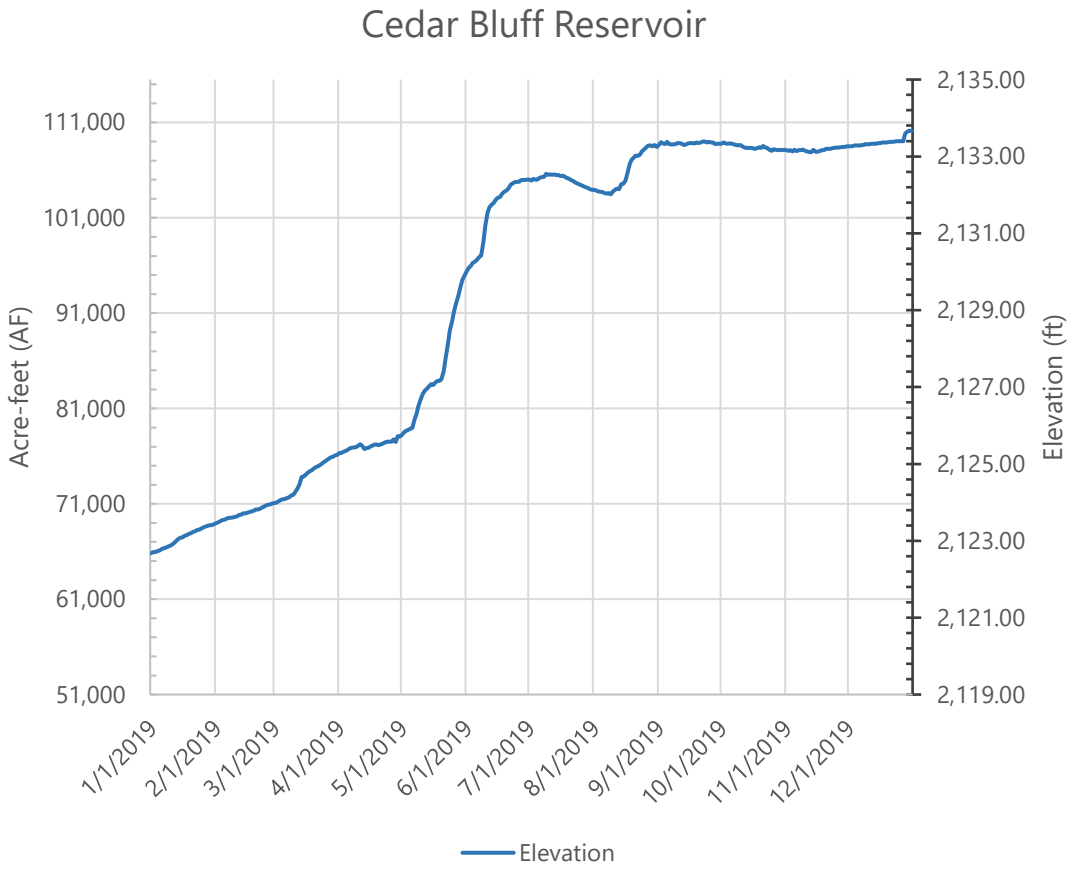

Figure 12 Cedar Bluff Reservoir Elevation and Content.

The State of Kansas operates and maintains the fish hatchery facility located below Cedar Bluff Dam. There were no releases to the facility in 2019.

2020 Outlook

Storage in Cedar Bluff Reservoir on December 31, 2019 was within the joint use pool. The KDWPT is expected to use very little if any water in the operations of the fish hatchery facility. If conditions are dry, the City of Russell and the Kansas Water Office may request a release to the river for recharge in 2020.

TABLE 3

RESERVOIR DATA - NIOBRARA, LOWER PLATTE AND KANSAS RIVER BASINS

RESERVOIR		CAPACITY ALLOCATIONS*			
			LIVE CONSERVATION		
		DEAD	Inactive	Active	FLOOD CONTROL
Box Butte	- Elevation Ft.	3969.0	3979.0	4007.0	---
	Total Acre-feet	188	2,392	29,161	---
	Net Acre-feet	188	2,204	26,769	---
Merritt	- Elevation Ft.	2875.0	2896.0	2946.0	---
	Total Acre-feet	774	4,662	66,726	---
	Net Acre-feet	774	3,888	62,064	---
Calamus	- Elevation Ft.	2185.0	2213.3	2244.0	---
	Total Acre-feet	35	20,150	119,469	---
	Net Acre-feet	35	20,115	99,319	---
Davis Creek	- Elevation Ft.	1998.5	2003.0	2076.0	---
	Total Acre-feet	76	172	31,158	---
	Net Acre-feet	76	96	30,986	---
Bonny	- Elevation Ft.	3635.5	3638.0	3672.0	3710.0
	Total Acre-feet	0	0	36,508	165,328
	Net Acre-feet	0	0	36,508	128,820
Enders	- Elevation Ft.	3080.0	3082.4	3112.3	3127.0
	Total Acre-feet	7,516	8,948	42,910	72,958
	Net Acre-feet	7,516	1,432	33,962	30,048
Swanson Lake	- Elevation Ft.	2710.0	2720.0	2752.0	2773.0
	Total Acre-feet	1,027	10,329	110,175	244,362
	Net Acre-feet	1,027	9,302	99,846	134,187
Hugh Butler Lake	- Elevation Ft.	2552.0	2558.0	2581.8	2604.9
	Total Acre-feet	5,185	8,921	36,224	85,070
	Net Acre-feet	5,185	3,736	27,303	48,846
Harry Strunk Lake	- Elevation Ft.	2335.0	2343.0	2366.1	2386.2
	Total Acre-feet	3,408	7,897	34,647	87,361
	Net Acre-feet	3,408	4,489	26,750	52,714
Keith Sebelius Lake	- Elevation Ft.	2275.0	2280.4	2304.3	2331.4
	Total Acre-feet	1,636	3,993	34,510	133,740
	Net Acre-feet	1,636	2,357	30,517	99,230
Harlan County Lake***	- Elevation Ft.	1885.0	1927.0	1945.73	1973.5
	Total Acre-feet	0	118,099	314,111	814,111
	Net Acre-feet	0	118,099	196,012	500,000
Lovewell	- Elevation Ft.	1562.07	1571.7	1582.6	1595.3
	Total Acre-feet	1,659	11,644	35,666	86,131
	Net Acre-feet	1,659	9,985	24,022	50,465
Kirwin	- Elevation Ft.	1693.0	1697.0	1729.25	1757.3
	Total Acre-feet	4,969	8,515	98,154	313,290
	Net Acre-feet	4,969	3,546	89,639	215,136
Webster	- Elevation Ft.	1855.5	1860.0	1892.45	1923.7
	Total Acre-feet	1,256	4,231	76,157	259,510
	Net Acre-feet	1,256	2,975	71,926	183,353
Waconda Lake	- Elevation Ft.	1407.8	1428.0	1455.6	1488.3
	Total Acre-feet	248	26,237	219,420	942,408
	Net Acre-feet	248	25,989	193,183	722,988
Cedar Bluff	- Elevation Ft.	2090.0	2107.8	2144.0	2166.0
	Total Acre-feet	4,402	28,574	172,452	364,342
	Net Acre-feet	4,402	24,172	143,878	191,890
Total Storage (A.F.)		32,379	264,764	1,457,448	3,815,125 **
Total Net Acre-feet		32,379	232,385	1,192,684	2,357,677

* Includes space for sediment storage.

** Includes total active storage for Box Butte, Merritt, Calamus, and Davis Creek Reservoirs.

*** Bottom of irrigation pool for Harlan County Lake is 1934.58 feet, 184,111 AF.

TABLE 4
NEBRASKA-KANSAS PROJECTS
Summary of Precipitation, Reservoir Storage and Inflows
CALENDAR YEAR 2019

Reservoir	Total Precip. Inches	Percent Of Average %	Storage 12-31-18 AF	Storage 12-31-19 AF	Gain or Loss AF	Maximum Content AF	Storage Date	Minimum Content AF	Storage Date	Total Inflow AF	Percent Of Most Probable %
Box Butte	23.88	138	9,478	21,979	12,501	26,424	JUL 14	9,521	JAN 1	29,379	191
Merritt	33.56	157	61,723	60,298	-1,425	68,368	JUL 9	58,322	AUG 2	246,759	132
Calamus	37.33	148	99,655	81,765	-17,890	125,237	MAY 24	75,147	OCT 13	411,224	154
Davis Creek	38.37	147	13,223	12,606	-617	31,204	JUN 19	12,395	MAR 11	43,365	90
Bonny	21.09	119	0	0	0	0	N/A	0	N/A	3,990	60
Enders	24.50	127	9,362	9,786	424	10,601	JUL 9	9,362	JAN 1	5,180	85
Swanson	22.86	113	59,359	60,264	905	78,152	JUN 21	56,858	NOV 19	30,954	119
Hugh Butler	29.73	149	19,619	22,620	3,001	24,201	JUL 12	19,619	JAN 1	12,904	114
Harry Strunk	31.01	146	28,994	34,226	5,232	43,400	JUL 11	29,085	JAN 1	61,478	155
Keith Sebelius	29.57	118	16,570	25,829	9,259	27,435	JUN 24	16,570	JAN 1	18,547	281
Harlan County	30.94	132	255,028	329,729	74,701	503,662	JUL 23	255,393	JAN 1	402,546	385
Lovewell	38.12	137	38,229	35,905	-2,324	74,979	JUL 15	11,406	OCT 1	132,470	239
Kirwin	23.23	97	104,832	98,255	-6,577	127,704	JUN 25	96,992	DEC 19	88,928	343
Webster	26.41	110	78,514	78,208	-306	105,877	MAY 31	75,556	MAR 1	135,053	785
Waconda	31.85	125	234,715	212,798	-21,917	376,669	AUG 29	203,886	FEB 11	776,754	638
Cedar Bluff	30.03	141	66,266	110,720	44,454	110,770	DEC 31	66,266	JAN 1	62,296	494

TABLE 5

ACRES IRRIGATED IN 2019 AND ESTIMATES FOR 2020

Irrigation District and Canal	Acres With Service Available	Acres Irrigated in 2019	Estimated Acres to be Irrigated in 2020
Mirage Flats Irrigation District			
Mirage Flats Canal	11,662	10,268	10,000
Ainsworth Irrigation District			
Ainsworth Canal	35,000	34,626	34,500
Twin Loups Irrigation District			
Above Davis Creek	34,453	34,110	34,000
Below Davis Creek	20,996	21,016	21,000
Total Twin Loups Irrigation District	55,449	55,126	55,000
Frenchman Valley Irrigation District			
Culbertson Canal	9,292	414	500
H & RW Irrigation District			
Culbertson Extension Canal	11,915	0	0
Frenchman-Cambridge Irrigation District			
Meeker-Driftwood Canal	16,691	7,078	7,000
Red Willow Canal	4,643	1,511	3,000
Bartley Canal	6,130	3,433	3,500
Cambridge Canal	18,205	12,562	13,000
Total Frenchman-Cambridge Irrigation District	45,669	24,584	26,500
Almena Irrigation District			
Almena Canal	5,764	5,763	2,500
Bostwick Irrigation District in Nebraska			
Franklin Canal	11,031	6,652	11,000
Naponee Canal	1,607	284	500
Franklin Pump Canal	2,026	690	1,500
Superior Canal	6,056	3,304	6,500
Courtland Canal (Nebraska)	1,735	513	1,500
Total Bostwick Irrigation Dist. in Nebraska	22,455	11,443	21,000
Kansas-Bostwick Irrigation District			
Courtland Canal above Lovewell	13,378	12,508	12,500
Courtland Canal below Lovewell	29,122	27,014	28,000
Total Kansas-Bostwick Irrigation District	42,500	39,522	40,500
Kirwin Irrigation District			
Kirwin Canal	11,465	9,085	9,000
Webster Irrigation District			
Osborne Canal	8,537	5,696	6,000
Glen Elder Irrigation District	10,370	5,000	6,000
TOTAL PROJECT USES	270,078	201,527	211,500
Non-Project Uses			
Hale Ditch	700	0	0
TOTAL PROJECT AND NON-PROJECT	270,778	201,527	211,500

TABLE 6
WATER DIVERTED IN 2019 AND THE ESTIMATED DIVERSION FOR 2020
(Units - Acre-Feet)

Irrigation District and Canal	2019 Irrigation Operations From	To	10-Year Average Diversion (2009-2018)	2019 Diversion	Estimated Diversion in 2020
Mirage Flats Irrigation District					
Mirage Flats Canal	7/13	09/20	11,308	10,641	11,000
Ainsworth Irrigation District					
Ainsworth Canal	5/13	9/27	69,375	46,328	75,000
Twin Loups Irrigation District					
Above Davis Creek	5/10	9/20	44,446	15,865	46,000
Below Davis Creek	5/16	09/20	42,505	33,896	44,000
Total Twin Loups Irrigation District			86,951	49,761	90,000
Frenchman Valley Irrigation District					
Culbertson Canal	4/16	10/15	5,850	11,598	8,000
H & RW Irrigation District					
Culbertson Extension Canal	Did not run.		0	0	0
Frenchman-Cambridge Irrigation District					
Meeker-Driftwood Canal	6/27	9/09	17,828	16,468	18,000
Red Willow Canal	4/27	9/07	517	5,772	5,000
Bartley Canal	4/08	9/20	7,167	10,539	9,000
Cambridge Canal	5/10	9/20	23,543	24,399	28,000
Total Frenchman-Cambridge Irrigation District			49,055	57,178	60,000
Almena Irrigation District					
Almena Canal	8/05	8/26	1,476	1,320	3,000
Bostwick Irrigation District in Nebraska					
Franklin Canal	5/21	9/21	16,903	28,473	18,000
Naponee Canal	4/23	9/14	921	2,567	1,000
Franklin Pump Canal	7/22	9/11	921	584	1,000
Superior Canal	4/17	9/13	6,429	7,741	8,000
Courtland Canal (Nebraska)	5/27	9/19	483	143	1,000
Total Bostwick Irrigation District in Nebraska			25,657	39,508	29,000
Kansas-Bostwick Irrigation District					
Courtland Canal above Lovewell	6/21	9/28	20,061	13,714	22,000
Courtland Canal below Lovewell	6/11	9/19	36,121	19,275	36,000
Total Kansas-Bostwick Irrigation District			56,182	32,989	58,000
Kirwin Irrigation District					
Kirwin Canal	6/24	8/25	16,361	15,896	18,000
Webster Irrigation District					
Osborne Canal	6/19	8/25	8,071	10,327	12,000
Glen Elder Irrigation District	6/20	09/11	3,264	0	5,000
TOTAL			333,550	275,546	369,000

TABLE 7
SUMMARY OF 2019 OPERATIONS

MIRAGE FLATS PROJECT

	BOX BUTTE RESERVOIR					MIRAGE FLATS CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	1,277	97	77	0.29	10,581	0	0
Feb.	1,316	109	103	0.42	11,685	0	0
Mar.	6,898	89	216	4.45	18,278	0	0
Apr.	4,017	204	414	1.81	21,677	0	0
May	3,230	173	344	4.50	24,390	0	0
June	2,387	365	630	1.92	25,782	0	0
July	1,910	3,961	696	2.92	23,035	3,559	1,467
Aug.	1,354	4,985	646	1.53	18,758	4,961	2,741
Sep.	1,189	1,799	443	2.61	17,705	2,121	1,538
Oct.	1,856	276	323	1.44	18,962	0	0
Nov.	2,291	367	182	1.04	20,704	0	0
Dec.	1,654	270	109	0.95	21,979	0	0
TOTAL	29,379	12,695	4,183	23.88	--	10,641	5,746

NOTE: Acres irrigated 2019: Mirage Flats Canal 10,268 acres.

SANDHILLS DIVISION

AINSWORTH UNIT

	MERRITT RESERVOIR					AINSWORTH CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content	Release To Canal (AF)	Delivered To Farms (AF)
Jan.	17,305	16,602	239	0.27	62,187	0	0
Feb.	14,113	14,083	304	0.59	61,913	0	0
Mar.	22,780	22,632	420	2.47	61,641	0	0
Apr.	22,910	20,827	707	2.15	63,017	0	0
May	28,716	25,026	850	7.37	65,857	2,067	0
June	18,548	16,999	1,260	3.52	66,146	4,389	55
July	22,788	28,523	1,421	6.40	58,990	22,326	10,526
Aug.	20,315	14,251	912	2.83	64,142	12,099	3,970
Sep.	19,730	21,947	825	4.01	61,100	5,447	461
Oct.	18,756	17,971	785	1.45	61,100	0	0
Nov.	20,175	19,726	449	1.46	61,100	0	0
Dec.	20,623	21,210	215	1.04	60,298	0	0
TOTAL	246,759	239,797	8,387	33.56	--	46,328	15,012

NOTE: Acres irrigated 2019: Ainsworth Canal 34,626 acres.

NORTH LOUP DIVISION

	CALAMUS RESERVOIR					ABOVE DAVIS CREEK MIRDAN CANAL		
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content	Release to Calamus Fish Hatch. (AF)	Release to Canal (AF)	Canal Use (AF)	Delivered To Farms (AF)
Jan.	23,575	21,418	431	0.18	101,381	0	0	0	0
Feb.	20,079	15,686	549	0.76	105,225	0	0	0	0
Mar.	39,433	34,618	999	1.71	109,041	24	0	0	0
Apr.	30,972	18,532	1,707	1.82	119,774	482	0	0	0
May	44,091	40,053	965	7.84	122,847	166	13,216	1,806	3
June	42,113	42,863	2,069	3.25	120,028	262	20,658	4,003	58
July	38,446	43,558	2,386	4.70	112,530	345	16,013	4,262	680
Aug	46,080	52,130	1,896	12.36	104,584	466	9,999	4,765	280
Sep.	37,230	54,146	1,457	0.87	86,211	567	2,221	1,029	120
Oct.	30,715	39,503	1,111	1.54	76,312	252	0	0	0
Nov.	28,354	20,795	598	0.77	83,273	0	0	0	0
Dec.	30,136	31,290	354	1.53	81,765	0	0	0	0
TOTAL	411,224	414,592	14,522	37.33	--	2,564	62,107	15,865	1,141

NOTE: Acres irrigated 2019: Mirdan Canal 34,110 acres.

NORTH LOUP DIVISION (Continued)

	DAVIS CREEK RESERVOIR					BELOW DAVIS CREEK FULLERTON CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content	Release To Canal (AF)	Delivered To Farms (AF)
Jan.	125	387	61	0.08	12,900	0	0
Feb.	211	333	74	0.77	12,704	0	0
Mar.	817	377	132	3.71	13,012	0	0
Apr.	695	373	217	1.91	13,117	0	0
May	8,838	2,220	178	6.37	19,557	1,775	0
June	14,030	4,901	409	4.37	28,277	3,777	8
July	10,591	8,086	505	6.77	30,277	6,488	1,596
Aug.	5,227	14,357	333	10.16	20,814	13,063	995
Sep.	1,910	9,309	267	0.62	13,148	8,793	63
Oct.	279	419	176	1.56	12,832	0	0
Nov.	464	357	95	1.08	12,844	0	0
Dec.	178	361	55	0.97	12,606	0	0
TOTAL	43,365	41,480	2,502	38.37	--	33,896	2,662

NOTE: Acres irrigated 2019: Fullerton Canal 21,016 acres.

TABLE 7
SUMMARY OF 2019 OPERATIONS

UPPER REPUBLICAN DIVISION
ARMEL UNIT

	BONNY RESERVOIR					HALE DITCH
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content	Outflow (AF)
Jan.	264	264	0	0.21	0	0
Feb.	278	278	0	0.46	0	0
Mar.	740	740	0	1.57	0	0
Apr.	714	714	0	1.11	0	0
May	621	621	0	3.25	0	0
June	377	377	0	2.15	0	0
July	149	149	0	2.89	0	0
Aug.	242	242	0	6.63	0	0
Sep.	135	135	0	2.04	0	0
Oct.	123	123	0	0.16	0	0
Nov.	198	198	0	0.24	0	0
Dec.	149	149	0	0.38	0	0
TOTAL	3,990	3,990	0	21.09	--	0

TABLE 7
SUMMARY OF 2019 OPERATIONS

FRENCHMAN-CAMBRIDGE DIVISION
FRENCHMAN UNIT

	ENDERS RESERVOIR					CULBERTSON CANAL		CULBERTSON EXT.CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content	Diversions To Canal (AF)	Delivered To Farms (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	376	184	49	0.09	9,505	0	0	0	0
Feb.	355	167	52	0.16	9,641	0	0	0	0
Mar.	521	184	92	1.70	9,886	0	0	0	0
Apr.	562	179	283	1.15	9,986	1,107	0	0	0
May	824	184	246	4.76	10,380	2,219	0	0	0
June	712	179	374	5.04	10,539	2,404	0	0	0
July	396	184	398	6.64	10,353	2,008	208	0	0
Aug.	290	184	365	2.98	10,094	1,656	71	0	0
Sep.	73	179	314	0.96	9,674	1,447	0	0	0
Oct.	232	184	250	0.28	9,472	757	0	0	0
Nov.	402	179	106	0.45	9,589	0	0	0	0
Dec.	437	184	56	0.29	9,786	0	0	0	0
TOTAL	5,180	2,171	2,585	24.50	--	11,598	279	0	0

NOTE: Acres irrigated 2019: Culbertson Canal - 414 acres; Culbertson Extension Canal - 0 acres.

FRENCHMAN-CAMBRIDGE DIVISION (Continued)
MEEKER-DRIFTWOOD UNIT

	SWANSON LAKE					MEEKER-DRIFTWOOD	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content	Release To Canal (AF)	Delivered To Farms (AF)
Jan.	3,803	61	257	0.08	62,844	0	0
Feb.	3,289	56	292	0.40	65,785	0	0
Mar.	5,559	61	515	1.75	70,768	0	0
Apr.	4,338	60	1,101	0.59	73,945	0	0
May	4,378	61	1,208	6.11	77,054	0	0
June	2,763	284	1,891	3.52	77,642	426	0
July	2,214	7,593	2,063	4.75	70,200	7,652	1,374
Aug.	587	6,641	2,051	2.63	62,095	6,481	2,315
Sep.	106	2,051	1,447	1.55	58,703	1,909	822
Oct.	157	61	1,295	0.36	57,504	0	0
Nov.	836	60	571	0.83	57,709	0	0
Dec.	2,924	61	308	0.29	60,264	0	0
TOTAL	30,954	17,050	12,999	22.86	--	16,468	4,511

NOTE: Acres irrigated 2019: Meeker-Driftwood Canal - 7,078 acres.

FRENCHMAN-CAMBRIDGE DIVISION (Continued)
RED WILLOW UNIT

	HUGH BUTLER LAKE					RED WILLOW CANAL		BARTLEY CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content	Diversions To Canal (AF)	Delivered To Farms (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	593	123	75	0.11	20,014	0	0	0	0
Feb.	505	111	86	0.33	20,322	0	0	0	0
Mar.	1,454	123	154	2.26	21,499	0	0	0	0
Apr.	799	119	346	0.72	21,833	44	0	2,353	0
May	1,654	123	387	5.87	22,977	393	0	2,204	6
June	1,387	389	649	4.22	23,326	570	0	1,622	7
July	2,274	2,237	681	7.13	22,682	2,452	242	1,604	336
Aug.	915	1,916	418	6.02	21,263	1,922	680	1,712	876
Sep.	1,174	426	512	1.15	21,499	391	172	1,044	688
Oct.	518	123	371	0.70	21,523	0	0	0	0
Nov.	765	119	192	0.62	21,977	0	0	0	0
Dec.	866	123	100	0.60	22,620	0	0	0	0
TOTAL	12,904	5,932	3,971	29.73	--	5,772	1,094	10,539	1,913

NOTE: Acres irrigated 2019: Red Willow Canal - 1,511 acres; Bartley Canal 3,433 acres.

FRENCHMAN-CAMBRIDGE DIVISION (Continued)
CAMBRIDGE UNIT

	HARRY STRUNK LAKE					CAMBRIDGE CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	3,148	61	107	0.17	31,974	0	0
Feb.	2,584	1,309	133	0.63	33,116	0	0
Mar.	11,111	5,810	235	3.30	38,182	0	0
Apr.	4,398	4,897	599	0.60	37,084	0	0
May	4,662	3,509	528	7.00	37,709	2,545	4
June	4,584	4,086	1,065	4.61	37,142	4,110	65
July	12,872	11,344	903	8.50	37,767	5,652	1,683
Aug.	5,454	8,422	790	2.75	34,009	8,034	4,766
Sep.	3,019	4,629	577	0.86	31,822	4,058	1,639
Oct.	2,912	781	430	0.93	33,523	0	0
Nov.	3,203	2,975	281	0.88	33,470	0	0
Dec.	3,531	2,616	159	0.78	34,226	0	0
TOTAL	61,478	50,439	5,807	31.01	--	24,399	8,157

NOTE: Acres irrigated 2019: Cambridge Canal 12,562 acres.

TABLE 7
SUMMARY OF 2019 OPERATIONS

KANASKA DIVISION
ALMENA UNIT

	KEITH SEBELIUS LAKE						ALMENA CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content	Release to City of Norton (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	662	47	92	0.36	17,093	17	0	0
Feb.	606	43	101	0.65	17,555	15	0	0
Mar.	2,895	50	203	2.33	20,197	19	0	0
Apr.	911	48	677	0.80	20,383	18	0	0
May	6,236	52	684	9.56	25,883	21	0	0
June	2,795	59	1,258	3.64	27,361	29	0	0
July	346	74	1,192	2.79	26,441	43	0	0
Aug.	2,015	1,775	905	5.52	25,776	38	1,320	584
Sep.	372	62	841	1.33	25,245	34	0	0
Oct.	151	53	536	0.65	24,807	22	0	0
Nov.	735	47	286	0.78	25,209	17	0	0
Dec.	823	45	158	1.16	25,829	15	0	0
TOTAL	18,547	2,355	6,933	29.57	--	288	1,320	584

NOTE: Acres irrigated 2019: Almena Canal 5,763 acres.

BOSTWICK DIVISION
FRANKLIN UNIT

	HARLAN COUNTY LAKE					FRANKLIN CANAL		NAPONEE CANAL	
	Data from Corps of Engineers								
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content	Release To Canal (AF)	Delivered To Farms (AF)	Release To Canal (AF)	Delivered To Farms (AF)
Jan.	13,934	0	743	0.32	268,219	0	0	0	0
Feb.	11,314	0	779	0.84	278,754	0	0	0	0
Mar.	58,884	2,672	1,399	2.12	333,567	0	0	0	0
Apr.	22,866	5,940	4,037	0.70	346,456	0	0	168	0
May	53,507	8,543	4,547	7.45	386,873	1,820	0	566	0
June	46,408	13,910	6,120	5.49	413,251	7,657	0	532	0
July	112,278	20,922	9,367	6.09	495,240	8,060	156	510	26
Aug.	28,902	56,381	9,200	3.85	458,561	6,222	1,622	507	162
Sep.	15,604	22,921	8,247	1.22	442,997	4,714	574	284	48
Oct.	5,693	15,668	5,594	0.97	427,428	0	0	0	0
Nov.	13,928	65,456	3,596	0.87	372,304	0	0	0	0
Dec.	19,228	60,058	1,745	1.02	329,729	0	0	0	0
TOTAL	402,546	272,471	55,374	30.94	--	28,473	2,352	2,567	236

NOTE: Acres irrigated 2019: Franklin Canal - 6,652 acres; Naponee Canal - 284 acres.

BOSTWICK DIVISION (Continued)
SUPERIOR-COURTLAND UNIT

	FRANKLIN PUMP CANAL		SUPERIOR CANAL		COURTLAND CANAL - ABOVE LOVEWELL				
					NEBRASKA USE			KANSAS USE	
Month	Diverted To Canal (AF)	Delivered To Farms (AF)	Diverted To Canal (AF)	Delivered To Farms (AF)	Total Diversion (AF)	Total (AF)	Delivered To Farms (AF)	Diversion To Canal (AF)	Delivered To Farms (AF)
Jan.	0	0	0	0	1,376	0	0	0	0
Feb.	0	0	0	0	4,630	0	0	0	0
Mar.	0	0	0	0	2,793	0	0	0	0
Apr.	0	0	1,033	0	0	0	0	0	0
May	0	0	0	0	737	0	0	0	0
June	0	0	579	0	3,042	0	0	1,204	0
July	227	34	3,015	220	7,853	52	46	5,631	1,313
Aug.	220	126	2,302	808	9,314	85	78	5,051	1,845
Sep.	137	0	812	188	4,076	6	6	1,828	655
Oct.	0	0	0	0	7,262	0	0	0	0
Nov.	0	0	0	0	14,037	0	0	0	0
Dec.	0	0	0	0	0	0	0	0	0
TOTAL	584	160	7,741	1,216	55,120	143	130	13,714	3,813

NOTE: Acres irrigated 2019: Franklin Pump Canal - 690 acres; Superior Canal - 3,304 acres.
Courtland Canal-Nebraska use - 513 acres.
Courtland Canal-Kansas use - 12,508 acres.

BOSTWICK DIVISION (Continued)
COURTLAND UNIT

	LOVEWELL RESERVOIR							COURTLAND (Below)	
Month	Est. Flow from White Rock Creek (AF)	Inflow from Courtland 34.8 (AF)	Total Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release To Canal (AF)	Delivered To Farms (AF)
Jan.	4,235	658	4,893	19,183	160	0.76	23,779	0	0
Feb.	3,154	3,026	6,180	11	169	1.39	29,779	0	0
Mar.	16,868	2,241	19,109	11,047	356	2.56	37,485	0	0
Apr.	2,937	0	2,937	3,794	1,022	0.68	35,606	0	0
May	19,792	0	19,792	343	1,393	8.53	53,662	313	0
June	11,395	409	11,804	2,013	1,370	6.35	62,083	2,114	40
July	17,381	1,302	18,683	36,532	2,094	5.51	42,140	7,573	4,084
Aug.	11,561	2,802	14,363	27,168	1,054	6.20	28,281	5,247	2,084
Sep.	4,219	1,698	5,917	22,043	734	1.01	11,421	4,028	2,405
Oct.	3,689	5,519	9,208	3,289	371	3.07	16,969	0	0
Nov.	2,240	13,340	15,580	12	431	0.22	32,106	0	0
Dec.	4,004	0	4,004	12	193	1.84	35,905	0	0
TOTAL	101,475	30,995	132,470	125,447	9,347	38.12	--	19,275	8,613

NOTE: Acres irrigated 2019: Courtland Canal below Lovewell 27,014 acres.

TABLE 7
SUMMARY OF 2019 OPERATIONS

SOLOMON DIVISION
KIRWIN UNIT

	KIRWIN RESERVOIR					KIRWIN CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content	Release To Canal (AF)	Delivered To Farms (AF)
Jan.	2,411	4,538	340	0.78	102,365	0	0
Feb.	2,857	3,632	417	1.01	101,173	0	0
Mar.	9,786	4,461	710	1.72	105,788	0	0
Apr.	5,668	4,602	2,392	0.50	104,462	0	0
May	21,600	2,767	2,023	5.90	121,272	0	0
June	13,505	3,535	4,083	2.29	127,159	944	14
July	5,128	11,048	3,732	1.88	117,507	8,436	2,593
Aug.	12,112	9,481	3,031	4.46	117,107	6,516	3,106
Sep.	5,444	2,678	2,595	1.38	117,278	0	0
Oct.	4,190	16,189	1,712	0.89	103,567	0	0
Nov.	3,424	8,725	820	0.57	97,446	0	0
Dec.	2,803	1,619	375	1.85	98,255	0	0
TOTAL	88,928	73,275	22,230	23.23	--	15,896	5,713

NOTE: Acres irrigated 2019: Kirwin Canal - 9,085 acres.

SOLOMON DIVISION (Continued)
WEBSTER UNIT

	WEBSTER RESERVOIR					OSBORNE CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	9,323	10,271	274	0.72	77,292	0	0
Feb.	6,880	8,279	300	0.99	75,593	0	0
Mar.	11,497	7,458	541	1.11	79,091	0	0
Apr.	7,008	5,732	1,391	0.35	78,976	0	0
May	22,819	6,591	1,453	7.48	93,751	0	0
June	12,631	12,794	2,255	1.84	91,333	923	8
July	4,487	12,246	2,777	1.18	80,797	5,691	2,359
Aug.	28,885	9,122	1,717	7.02	98,843	3,713	1,878
Sep.	12,572	5,276	1,953	2.47	104,186	0	0
Oct.	4,758	31,627	933	0.70	76,384	0	0
Nov	6,520	5,298	618	0.49	76,988	0	0
Dec.	7,673	6,149	304	2.06	78,208	0	0
TOTAL	135,053	120,843	14,516	26.41	--	10,327	4,245

NOTE: Acres irrigated 2019: Osborne Canal - 5,696 acres.

SOLOMON DIVISION (Continued)
GLEN ELDER UNIT

	WACONDA LAKE					OUTFLOW TO RIVER				
						City of Beloit		Irrig.District	Other	Release To
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content	Storage Release (AF)	Quality Bypass (AF)	Storage Release (AF)	Controlled Releases (AF)	Mitchell Co. RWD No. 2 (AF)
Jan.	45,418	72,281	825	0.27	207,027	0	0	0	72,213	68
Feb.	34,248	33,376	872	0.30	207,027	0	0	0	33,311	65
Mar.	105,491	69,380	1,686	1.17	241,452	0	0	0	69,308	72
Apr.	37,318	47,237	4,989	0.54	226,544	0	0	0	47,156	81
May	148,003	14,009	4,329	8.41	356,209	0	0	0	13,944	65
June	81,271	67,308	8,795	5.30	361,377	0	0	0	67,233	75
July	49,545	73,999	10,197	1.34	326,726	0	0	0	73,905	94
Aug.	116,977	59,763	8,519	8.02	375,421	0	0	0	59,679	84
Sep.	32,525	136,556	7,247	1.43	264,143	0	0	0	136,473	83
Oct.	60,816	88,916	3,810	3.07	232,233	0	0	0	88,849	67
Nov.	33,336	38,017	2,034	0.00	225,518	0	0	0	37,944	73
Dec.	31,806	43,651	875	2.00	212,798	0	0	0	43,577	74
TOTAL	776,754	744,493	54,178	31.85	--	0	0	0	743,592	901

NOTE: Acres irrigated 2019: Glen Elder District 5,000 acres.

SMOKY HILL DIVISION
ELLIS UNIT

	CEDAR BLUFF RESERVOIR					Release to:		
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content	City of Russell (AF)	Fish Hatchery (AF)	Kansas Water Office (AF)
Jan.	2,798	0	291	0.51	68,773	0	0	0
Feb.	2,132	0	289	0.33	70,616	0	0	0
Mar.	4,985	0	529	0.95	75,072	0	0	0
Apr.	3,187	0	1,486	1.28	76,773	0	0	0
May	18,186	0	1,613	7.30	93,346	0	0	0
June	13,739	0	2,494	4.13	104,591	0	0	0
July	2,083	0	3,356	1.47	103,318	0	0	0
Aug.	7,770	0	2,396	9.70	108,692	0	0	0
Sep.	3,031	0	2,638	1.28	109,085	0	0	0
Oct.	732	0	1,517	0.75	108,300	0	0	0
Nov.	1,284	0	843	0.30	108,741	0	0	0
Dec.	2,369	0	390	2.03	110,720	0	0	0
TOTAL	62,296	0	17,842	30.03	--	0	0	0

BOX BUTTE RESERVOIR OPERATION ESTIMATES - 2020

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIRMENT MEAN CFS	RELEASE REQUIRMENT 1000 AF	RESERVOIR SPILL 1000 AF	REQUIREMENT SHORTAGE 1000 AF	END OF MONTH ELEV FT	END OF MONTH CONT 1000 AF	RESERVOIR CHANGE 1000 AF
REASONABLE MINIMUM INFLOW CONDITIONS											
JAN	15	0.9	1.6	0.1	2	0.1	0.0	0.0	4002.6	22.7	0.7
FEB	18	1.0	1.9	0.2	2	0.1	0.0	0.0	4003.1	23.4	0.7
MAR	24	1.5	3.8	0.3	2	0.1	0.0	0.0	4003.9	24.5	1.1
APR	20	1.2	5.3	0.4	2	0.1	0.0	0.0	4004.4	25.2	0.7
MAY	16	1.0	6.6	0.6	2	0.1	0.0	0.0	4004.6	25.5	0.3
JUN	10	0.6	8.8	0.8	89	5.3	0.0	0.0	4000.6	20.0	-5.5
JUL	6	0.4	10.0	0.8	226	13.9	0.0	0.0	3985.6	5.7	-14.3
AUG	11	0.7	8.8	0.3	213	13.1	0.0	9.4	3979.0	2.4	-3.3
SEP	12	0.7	6.6	0.1	40	2.4	0.0	1.8	3979.0	2.4	0.0
OCT	15	0.9	5.0	0.1	2	0.1	0.0	0.0	3980.9	3.1	0.7
NOV	18	1.1	2.5	0.1	2	0.1	0.0	0.0	3982.5	4.0	0.9
DEC	15	0.9	1.9	0.1	2	0.1	0.0	0.0	3983.9	4.7	0.7
TOTAL		10.9	62.8	3.9		35.5	0.0	11.2			-17.3
MOST PROBABLE INFLOW CONDITIONS											
JAN	19	1.2	1.5	0.1	2	0.1	0.0	0.0	4002.8	23.0	1.0
FEB	27	1.5	1.7	0.1	2	0.1	0.0	0.0	4003.7	24.3	1.3
MAR	34	2.1	3.5	0.3	2	0.1	0.0	0.0	4004.9	26.0	1.7
APR	30	1.8	4.9	0.4	2	0.1	0.0	0.0	4005.8	27.3	1.3
MAY	23	1.4	6.1	0.5	2	0.1	0.0	0.0	4006.3	28.1	0.8
JUN	13	0.8	8.1	0.7	70	4.2	0.0	0.0	4003.5	24.0	-4.1
JUL	10	0.6	9.3	0.8	209	12.9	0.0	0.0	3992.5	10.9	-13.1
AUG	16	1.0	8.1	0.4	164	10.1	0.0	1.0	3979.0	2.4	-8.5
SEP	17	1.0	6.1	0.1	29	1.7	0.0	0.8	3979.0	2.4	0.0
OCT	19	1.2	4.6	0.1	2	0.1	0.0	0.0	3981.3	3.4	1.0
NOV	25	1.5	2.3	0.1	2	0.1	0.0	0.0	3983.9	4.7	1.3
DEC	21	1.3	1.7	0.1	2	0.1	0.0	0.0	3985.8	5.8	1.1
TOTAL		15.4	57.9	3.7		29.7	0.0	1.8			-16.2
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	29	1.8	1.3	0.1	2	0.1	0.0	0.0	4003.3	23.6	1.6
FEB	38	2.1	1.6	0.1	2	0.1	0.0	0.0	4004.6	25.5	1.9
MAR	50	3.1	3.2	0.3	2	0.1	0.0	0.0	4006.3	28.2	2.7
APR	44	2.6	4.5	0.4	2	0.1	1.1	0.0	4007.0	29.2	1.0
MAY	32	2.0	5.6	0.5	2	0.1	1.4	0.0	4007.0	29.2	0.0
JUN	20	1.2	7.5	0.7	47	2.8	0.0	0.0	4005.5	26.9	-2.3
JUL	13	0.8	8.6	0.8	135	8.3	0.0	0.0	3999.5	18.6	-8.3
AUG	23	1.4	7.5	0.6	104	6.4	0.0	0.0	3994.5	13.0	-5.6
SEP	23	1.4	5.6	0.3	18	1.1	0.0	0.0	3994.5	13.0	0.0
OCT	29	1.8	4.3	0.3	2	0.1	0.0	0.0	3996.0	14.4	1.4
NOV	37	2.2	2.1	0.1	2	0.1	0.0	0.0	3997.7	16.4	2.0
DEC	29	1.8	1.6	0.1	2	0.1	0.0	0.0	3999.1	18.0	1.6
TOTAL		22.2	53.4	4.3		19.4	2.5	0.0			-4.0

MERRITT RESERVOIR OPERATION ESTIMATES - 2020

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIRMENT CANAL 1000 AF	RELEASE REQUIRMENT RIVER 1000 AF	RELEASE REQUIRMENT TOTAL MEAN CFS	RELEASE REQUIRMENT TOTAL 1000 AF	RESERVOIR SPILL 1000 AF	REQUIREMENT SHORTAGE 1000 AF	END OF MONTH ELEV FT	END OF MONTH CONT 1000 AF	RESERVOIR CHANGE 1000 AF
REASONABLE MINIMUM INFLOW CONDITIONS													
JAN	226	13.9	1.9	0.3	0.0	1.0	16	1.0	11.8	0.0	2944.0	61.1	0.8
FEB	246	13.7	2.6	0.4	0.0	1.0	18	1.0	12.3	0.0	2944.0	61.1	0.0
MAR	255	15.7	3.2	0.5	0.0	1.0	16	1.0	11.4	0.0	2945.0	63.9	2.8
APR	260	15.5	5.1	0.8	0.0	1.0	17	1.0	10.9	0.0	2946.0	66.7	2.8
MAY	252	15.5	6.4	1.1	3.4	1.0	71	4.4	10.0	0.0	2946.0	66.7	0.0
JUN	240	14.3	8.3	1.4	7.6	1.0	144	8.6	4.3	0.0	2946.0	66.7	0.0
JUL	240	14.8	9.6	1.6	33.4	1.0	558	34.4	0.0	0.0	2937.1	45.5	-21.2
AUG	247	15.2	8.3	1.0	31.0	1.0	519	32.0	0.0	0.0	2926.1	27.7	-17.8
SEP	243	14.5	7.1	0.5	8.5	1.0	159	9.5	0.0	0.0	2929.3	32.2	4.5
OCT	247	15.2	6.4	0.5	0.0	2.5	41	2.5	0.0	0.0	2936.5	44.4	12.2
NOV	240	14.3	3.2	0.4	0.0	4.0	67	4.0	0.0	0.0	2941.2	54.3	9.9
DEC	222	13.7	1.9	0.3	0.0	1.0	16	1.0	5.6	0.0	2944.0	61.1	6.8
TOTAL		176.3	64.0	8.8	83.9	16.5		100.4	66.3	0.0			0.8
MOST PROBABLE INFLOW CONDITIONS													
JAN	239	14.7	1.7	0.3	0.0	1.0	16	1.0	12.6	0.0	2944.0	61.1	0.8
FEB	261	14.5	2.3	0.4	0.0	1.0	18	1.0	13.1	0.0	2944.0	61.1	0.0
MAR	269	16.6	2.8	0.4	0.0	1.0	16	1.0	12.4	0.0	2945.0	63.9	2.8
APR	275	16.4	4.5	0.7	0.0	1.0	17	1.0	11.9	0.0	2946.0	66.7	2.8
MAY	266	16.4	5.6	1.0	2.9	1.0	63	3.9	11.5	0.0	2946.0	66.7	0.0
JUN	253	15.1	7.3	1.2	6.5	1.0	126	7.5	6.4	0.0	2946.0	66.7	0.0
JUL	255	15.7	8.5	1.4	28.5	1.0	479	29.5	0.0	0.0	2940.0	51.5	-15.2
AUG	260	16.0	7.3	0.9	26.6	1.0	448	27.6	0.0	0.0	2933.6	39.0	-12.5
SEP	257	15.3	6.2	0.6	7.3	1.0	139	8.3	0.0	0.0	2937.0	45.4	6.4
OCT	260	16.0	5.6	0.6	0.0	2.5	41	2.5	0.0	0.0	2942.9	58.3	12.9
NOV	253	15.1	2.8	0.4	0.0	4.0	67	4.0	7.9	0.0	2944.0	61.1	2.8
DEC	235	14.5	1.7	0.3	0.0	1.0	16	1.0	13.2	0.0	2944.0	61.1	0.0
TOTAL		186.3	56.3	8.2	71.8	16.5		88.3	89.0	0.0			0.8
REASONABLE MAXIMUM INFLOW CONDITIONS													
JAN	273	16.8	1.5	0.2	0.0	1.0	16	1.0	14.8	0.0	2944.0	61.1	0.8
FEB	298	16.6	2.0	0.3	0.0	1.0	18	1.0	15.3	0.0	2944.0	61.1	0.0
MAR	307	18.9	2.5	0.4	0.0	1.0	16	1.0	14.7	0.0	2945.0	63.9	2.8
APR	314	18.7	4.0	0.7	0.0	1.0	17	1.0	14.2	0.0	2946.0	66.7	2.8
MAY	304	18.7	5.0	0.8	2.4	1.0	55	3.4	14.5	0.0	2946.0	66.7	0.0
JUN	289	17.2	6.5	1.1	5.3	1.0	106	6.3	9.8	0.0	2946.0	66.7	0.0
JUL	289	17.8	7.5	1.3	23.3	1.0	394	24.3	0.0	0.0	2943.1	58.9	-7.8
AUG	297	18.3	6.5	1.0	21.8	1.0	370	22.8	0.0	0.0	2940.9	53.4	-5.5
SEP	292	17.4	5.5	0.7	5.9	1.0	116	6.9	0.0	0.0	2944.7	63.2	9.8
OCT	297	18.3	5.0	0.8	0.0	2.5	41	2.5	17.1	0.0	2944.0	61.1	-2.1
NOV	289	17.2	2.5	0.4	0.0	4.0	67	4.0	12.8	0.0	2944.0	61.1	0.0
DEC	269	16.6	1.5	0.2	0.0	1.0	16	1.0	15.4	0.0	2944.0	61.1	0.0
TOTAL		212.5	50.0	7.9	58.7	16.5		75.2	128.6	0.0			0.8

CALAMUS RESERVOIR OPERATION ESTIMATES - 2020

	INFLOW		EVAPORATION		RELEASE REQUIRMENT CANAL	RIVER	TOTAL		RESERVOIR SPILL	REQUIREMENT SHORTAGE	END OF MONTH ELEV	CONT	RESERVOIR CHANGE
	MEAN	1000		1000	1000	1000	MEAN	1000	1000	1000		1000	1000
MONTH	CFS	AF	INCHES	AF	AF	AF	CFS	AF	AF	AF	FT	AF	AF
REASONABLE MINIMUM INFLOW CONDITIONS													
JAN	297	18.3	1.9	0.4	0.5	3.1	58	3.6	0.0	0.0	2238.9	96.1	14.3
FEB	316	17.6	2.3	0.6	0.5	2.8	59	3.3	9.3	0.0	2240.0	100.5	4.4
MAR	352	21.7	4.2	1.1	0.5	3.1	58	3.6	7.8	0.0	2242.0	109.7	9.2
APR	364	21.7	6.6	1.8	0.5	3.0	59	3.5	6.6	0.0	2244.0	119.5	9.8
MAY	404	24.9	6.9	2.0	2.7	3.1	94	5.8	17.1	0.0	2244.0	119.5	0.0
JUN	369	22.0	8.4	2.5	5.6	3.0	144	8.6	10.9	0.0	2244.0	119.5	0.0
JUL	344	21.2	9.5	2.8	37.8	21.2	958	59.0	0.0	0.0	2234.7	78.9	-40.6
AUG	325	20.0	9.5	2.1	30.4	20.0	818	50.4	0.0	0.0	2224.9	46.4	-32.5
SEP	307	18.3	7.4	1.2	9.9	18.3	473	28.2	0.0	0.0	2220.6	35.3	-11.1
OCT	305	18.8	5.6	0.8	0.5	3.1	58	3.6	0.0	0.0	2226.1	49.7	14.4
NOV	332	19.8	3.0	0.5	0.5	3.0	59	3.5	0.0	0.0	2231.0	65.5	15.8
DEC	321	19.8	1.7	0.3	0.5	3.1	58	3.6	0.0	0.0	2235.4	81.4	15.9
TOTAL		244.1	67.0	16.1	89.9	86.8		176.7	51.7	0.0			-0.4
MOST PROBABLE INFLOW CONDITIONS													
JAN	323	19.9	1.7	0.4	0.5	3.1	58	3.6	0.0	0.0	2239.3	97.7	15.9
FEB	343	19.1	2.0	0.5	0.5	2.8	54	3.3	12.5	0.0	2240.0	100.5	2.8
MAR	383	23.6	3.7	1.0	0.5	3.1	58	3.6	9.8	0.0	2242.0	109.7	9.2
APR	396	23.6	5.9	1.6	0.5	3.0	57	3.5	8.7	0.0	2244.0	119.5	9.8
MAY	438	27.0	6.1	1.8	2.3	3.1	88	5.4	19.8	0.0	2244.0	119.5	0.0
JUN	399	23.8	7.4	2.2	4.7	3.0	125	7.7	13.9	0.0	2244.0	119.5	0.0
JUL	373	23.0	8.4	2.5	30.2	23.0	864	53.2	0.0	0.0	2236.7	86.8	-32.7
AUG	352	21.7	8.4	2.0	23.8	21.7	739	45.5	0.0	0.0	2229.7	61.0	-25.8
SEP	334	19.9	6.5	1.2	5.7	19.9	416	25.6	0.0	0.0	2227.5	54.1	-6.9
OCT	331	20.4	5.0	0.9	0.5	3.1	58	3.6	0.0	0.0	2232.3	70.0	15.9
NOV	359	21.4	2.7	0.6	0.5	3.0	57	3.5	0.0	0.0	2236.9	87.3	17.3
DEC	347	21.4	1.5	0.4	0.5	3.1	58	3.6	4.2	0.0	2240.0	100.5	13.2
TOTAL		264.8	59.3	15.1	70.2	91.9		162.1	68.9	0.0			18.7
REASONABLE MAXIMUM INFLOW CONDITIONS													
JAN	396	24.4	1.5	0.3	0.5	3.1	58	3.6	1.8	0.0	2240.0	100.5	18.7
FEB	421	23.4	1.8	0.5	0.5	2.8	59	3.3	19.6	0.0	2240.0	100.5	0.0
MAR	469	28.9	3.3	0.9	0.5	3.1	58	3.6	15.2	0.0	2242.0	109.7	9.2
APR	485	28.9	5.2	1.4	0.5	3.0	59	3.5	14.2	0.0	2244.0	119.5	9.8
MAY	537	33.1	5.4	1.6	1.9	3.1	81	5.0	26.5	0.0	2244.0	119.5	0.0
JUN	490	29.2	6.6	2.0	3.8	3.0	114	6.8	20.4	0.0	2244.0	119.5	0.0
JUL	459	28.3	7.5	2.2	22.0	28.3	817	50.3	0.0	0.0	2238.8	95.3	-24.2
AUG	432	26.6	7.5	1.9	17.5	26.6	716	44.1	0.0	0.0	2233.9	75.9	-19.4
SEP	409	24.4	5.8	1.3	4.1	24.4	478	28.5	0.0	0.0	2232.5	70.5	-5.4
OCT	406	25.0	4.4	0.9	0.5	3.1	58	3.6	0.0	0.0	2237.7	91.0	20.5
NOV	441	26.3	2.4	0.6	0.5	3.0	59	3.5	12.7	0.0	2240.0	100.5	9.5
DEC	427	26.3	1.4	0.4	0.5	3.1	58	3.6	22.3	0.0	2240.0	100.5	0.0
TOTAL		324.8	52.8	14.0	52.8	106.6		159.4	132.7	0.0			18.7

DAVIS CREEK RESERVOIR OPERATION ESTIMATES - 2020

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIRMENT MEAN CFS	RELEASE REQUIRMENT 1000 AF	RESERVOIR SPILL 1000 AF	REQUIREMENT SHORTAGE 1000 AF	END OF MONTH ELEV FT	MONTH CONT 1000 AF	RESERVOIR CHANGE 1000 AF
REASONABLE MINIMUM INFLOW CONDITIONS											
JAN	0	0.0	1.9	0.1	6	0.4	0.0	0.0	2053.6	12.1	-0.5
FEB	0	0.0	2.3	0.1	7	0.4	0.0	0.0	2052.8	11.6	-0.5
MAR	0	0.0	4.1	0.1	6	0.4	0.0	0.0	2051.9	11.1	-0.5
APR	60	3.6	6.6	0.2	7	0.4	0.0	0.0	2056.8	14.1	3.0
MAY	239	14.7	7.0	0.3	57	3.5	0.0	0.0	2070.2	25.0	10.9
JUN	240	14.3	8.4	0.5	127	7.6	0.0	0.0	2076.0	31.2	6.2
JUL	239	14.7	9.0	0.6	297	18.3	0.0	0.0	2072.1	27.0	-4.2
AUG	162	10.0	7.0	0.4	273	16.8	0.0	0.0	2064.5	19.8	-7.2
SEP	59	3.5	6.1	0.3	133	7.9	0.0	0.0	2058.3	15.1	-4.7
OCT	0	0.0	5.4	0.2	6	0.4	0.0	0.0	2057.4	14.5	-0.6
NOV	0	0.0	2.9	0.1	7	0.4	0.0	0.0	2056.7	14.0	-0.5
DEC	0	0.0	1.7	0.1	6	0.4	0.0	0.0	2055.9	13.5	-0.5
TOTAL		60.8	62.4	3.0		56.9	0.0	0.0			0.9
MOST PROBABLE INFLOW CONDITIONS											
JAN	0	0.0	1.7	0.1	6	0.4	0.0	0.0	2053.6	12.1	-0.5
FEB	0	0.0	2.2	0.1	7	0.4	0.0	0.0	2052.8	11.6	-0.5
MAR	0	0.0	3.8	0.1	6	0.4	0.0	0.0	2051.9	11.1	-0.5
APR	60	3.6	6.1	0.2	6	0.4	0.0	0.0	2056.8	14.1	3.0
MAY	239	14.7	6.5	0.2	42	2.6	0.0	0.0	2071.2	26.0	11.9
JUN	198	11.8	7.9	0.5	99	6.1	0.0	0.0	2076.0	31.2	5.2
JUL	179	11.0	8.4	0.6	231	14.2	0.0	0.0	2072.5	27.4	-3.8
AUG	112	6.9	6.5	0.4	211	13.0	0.0	0.0	2065.8	20.9	-6.5
SEP	10	0.6	5.7	0.3	99	6.1	0.0	0.0	2058.3	15.1	-5.8
OCT	0	0.0	5.1	0.2	6	0.4	0.0	0.0	2057.4	14.5	-0.6
NOV	0	0.0	2.7	0.1	6	0.4	0.0	0.0	2056.7	14.0	-0.5
DEC	0	0.0	1.6	0.1	6	0.4	0.0	0.0	2055.9	13.5	-0.5
TOTAL		48.6	58.2	2.9		44.8	0.0	0.0			0.9
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	0	0.0	1.6	0.1	6	0.4	0.0	0.0	2053.6	12.1	-0.5
FEB	0	0.0	2.0	0.1	7	0.4	0.0	0.0	2052.8	11.6	-0.5
MAR	0	0.0	3.6	0.1	6	0.4	0.0	0.0	2051.9	11.1	-0.5
APR	15	0.9	5.8	0.2	7	0.4	0.0	0.0	2052.4	11.4	0.3
MAY	239	14.7	6.1	0.2	32	2.0	0.0	0.0	2069.0	23.9	12.5
JUN	206	12.3	7.4	0.4	77	4.6	0.0	0.0	2076.0	31.2	7.3
JUL	114	7.0	7.9	0.5	172	10.6	0.0	0.0	2072.2	27.1	-4.1
AUG	67	4.1	6.1	0.4	156	9.6	0.0	0.0	2066.1	21.2	-5.9
SEP	0	0.0	5.4	0.3	97	5.8	0.0	0.0	2058.3	15.1	-6.1
OCT	0	0.0	4.8	0.2	6	0.4	0.0	0.0	2057.4	14.5	-0.6
NOV	0	0.0	2.5	0.1	7	0.4	0.0	0.0	2056.7	14.0	-0.5
DEC	0	0.0	1.5	0.1	6	0.4	0.0	0.0	2055.9	13.5	-0.5
TOTAL		39.0	54.7	2.7		35.4	0.0	0.0			0.9

BONNY RESERVOIR OPERATION ESTIMATES - 2020

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIRMENT CANAL 1000 AF	RELEASE REQUIRMENT RIVER 1000 AF	TOTAL MEAN CFS	TOTAL 1000 AF	RESERVOIR SPILL 1000 AF	REQUIREMENT SHORTAGE 1000 AF	END OF MONTH ELEV FT	END OF MONTH CONT 1000 AF	RESERVOIR CHANGE 1000 AF
REASONABLE MINIMUM INFLOW CONDITIONS													
JAN	5	0.3	2.3	0.0	0.0	0.1	2	0.1	0.2	0.0	3638.0	0.0	0.0
FEB	5	0.3	3.1	0.0	0.0	0.1	2	0.1	0.2	0.0	3638.0	0.0	0.0
MAR	5	0.3	3.9	0.0	0.0	0.1	2	0.1	0.2	0.0	3638.0	0.0	0.0
APR	7	0.4	6.2	0.0	0.1	0.1	3	0.2	0.2	0.0	3638.0	0.0	0.0
MAY	6	0.4	7.7	0.0	0.4	0.1	8	0.5	0.0	0.1	3638.0	0.0	0.0
JUN	7	0.4	10.0	0.0	0.5	0.1	10	0.6	0.0	0.2	3638.0	0.0	0.0
JUL	3	0.2	11.6	0.0	0.8	0.1	15	0.9	0.0	0.7	3638.0	0.0	0.0
AUG	2	0.1	10.0	0.0	0.6	0.1	11	0.7	0.0	0.6	3638.0	0.0	0.0
SEP	2	0.1	8.5	0.0	0.5	0.1	10	0.6	0.0	0.5	3638.0	0.0	0.0
OCT	2	0.1	7.7	0.0	0.5	0.1	10	0.6	0.0	0.5	3638.0	0.0	0.0
NOV	3	0.2	3.9	0.0	0.0	0.1	2	0.1	0.1	0.0	3638.0	0.0	0.0
DEC	5	0.3	2.3	0.0	0.0	0.1	2	0.1	0.2	0.0	3638.0	0.0	0.0
TOTAL		3.1	77.2	0.0	3.4	1.2		4.6	1.1	2.6			0.0
MOST PROBABLE INFLOW CONDITIONS													
JAN	10	0.6	2.1	0.0	0.0	0.1	2	0.1	0.5	0.0	3638.0	0.0	0.0
FEB	10	0.6	2.7	0.0	0.0	0.1	2	0.1	0.5	0.0	3638.0	0.0	0.0
MAR	11	0.7	3.4	0.0	0.0	0.1	2	0.1	0.6	0.0	3638.0	0.0	0.0
APR	13	0.8	5.5	0.0	0.1	0.1	3	0.2	0.6	0.0	3638.0	0.0	0.0
MAY	15	0.9	6.9	0.0	0.3	0.1	6	0.4	0.5	0.0	3638.0	0.0	0.0
JUN	13	0.8	8.9	0.0	0.3	0.1	7	0.4	0.4	0.0	3638.0	0.0	0.0
JUL	6	0.4	10.3	0.0	0.5	0.1	10	0.6	0.0	0.2	3638.0	0.0	0.0
AUG	5	0.3	8.9	0.0	0.4	0.1	8	0.5	0.0	0.2	3638.0	0.0	0.0
SEP	3	0.2	7.5	0.0	0.3	0.1	7	0.4	0.0	0.2	3638.0	0.0	0.0
OCT	5	0.3	6.9	0.0	0.3	0.1	6	0.4	0.0	0.1	3638.0	0.0	0.0
NOV	8	0.5	3.4	0.0	0.0	0.1	2	0.1	0.4	0.0	3638.0	0.0	0.0
DEC	10	0.6	2.1	0.0	0.0	0.1	2	0.1	0.5	0.0	3638.0	0.0	0.0
TOTAL		6.7	68.6	0.0	2.2	1.2		3.4	4.0	0.7			0.0
REASONABLE MAXIMUM INFLOW CONDITIONS													
JAN	21	1.3	1.8	0.0	0.0	0.1	2	0.1	1.2	0.0	3638.0	0.0	0.0
FEB	21	1.2	2.4	0.0	0.0	0.1	2	0.1	1.1	0.0	3638.0	0.0	0.0
MAR	23	1.4	3.1	0.0	0.0	0.1	2	0.1	1.3	0.0	3638.0	0.0	0.0
APR	27	1.6	4.9	0.0	0.0	0.1	2	0.1	1.5	0.0	3638.0	0.0	0.0
MAY	29	1.8	6.1	0.0	0.1	0.1	3	0.2	1.6	0.0	3638.0	0.0	0.0
JUN	27	1.6	7.9	0.0	0.1	0.1	3	0.2	1.4	0.0	3638.0	0.0	0.0
JUL	13	0.8	9.2	0.0	0.1	0.1	3	0.2	0.6	0.0	3638.0	0.0	0.0
AUG	8	0.5	7.9	0.0	0.1	0.1	3	0.2	0.3	0.0	3638.0	0.0	0.0
SEP	5	0.3	6.7	0.0	0.1	0.1	3	0.2	0.1	0.0	3638.0	0.0	0.0
OCT	10	0.6	6.1	0.0	0.0	0.1	2	0.1	0.5	0.0	3638.0	0.0	0.0
NOV	18	1.1	3.1	0.0	0.0	0.1	2	0.1	1.0	0.0	3638.0	0.0	0.0
DEC	18	1.1	1.8	0.0	0.0	0.1	2	0.1	1.0	0.0	3638.0	0.0	0.0
TOTAL		13.3	61.0	0.0	0.5	1.2		1.7	11.6	0.0			0.0

ENDERS RESERVOIR OPERATION ESTIMATES - 2020

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIRMENT MEAN CFS	RELEASE REQUIRMENT 1000 AF	RESERVOIR SPILL 1000 AF	REQUIREMENT SHORTAGE 1000 AF	END OF MONTH ELEV FT	END OF MONTH CONT 1000 AF	RESERVOIR CHANGE 1000 AF
REASONABLE MINIMUM INFLOW CONDITIONS											
JAN	6	0.4	1.5	0.1	3	0.2	0.0	0.0	3083.9	9.9	0.1
FEB	5	0.3	1.6	0.1	4	0.2	0.0	0.0	3083.9	9.9	0.0
MAR	5	0.3	2.7	0.1	3	0.2	0.0	0.0	3083.9	9.9	0.0
APR	5	0.3	5.9	0.2	3	0.2	0.0	0.0	3083.7	9.8	-0.1
MAY	6	0.4	7.5	0.3	3	0.2	0.0	0.0	3083.6	9.7	-0.1
JUN	5	0.3	9.5	0.4	176	10.5	0.0	9.8	3082.4	8.9	-0.8
JUL	6	0.4	10.4	0.4	532	32.8	0.0	32.6	3082.0	8.7	-0.2
AUG	6	0.4	8.8	0.3	505	31.1	0.0	30.9	3081.8	8.6	-0.1
SEP	5	0.3	6.6	0.2	75	4.5	0.0	4.3	3081.7	8.5	-0.1
OCT	5	0.3	4.2	0.1	3	0.2	0.0	0.0	3081.7	8.5	0.0
NOV	5	0.3	3.1	0.1	3	0.2	0.0	0.0	3081.7	8.5	0.0
DEC	5	0.3	1.7	0.1	3	0.2	0.0	0.0	3081.7	8.5	0.0
TOTAL		4.0	63.5	2.4		80.5	0.0	77.6			-1.3
MOST PROBABLE INFLOW CONDITIONS											
JAN	8	0.5	1.3	0.1	3	0.2	0.0	0.0	3084.0	10.0	0.2
FEB	7	0.4	1.5	0.1	3	0.2	0.0	0.0	3084.2	10.1	0.1
MAR	8	0.5	2.5	0.1	3	0.2	0.0	0.0	3084.4	10.3	0.2
APR	8	0.5	5.4	0.2	3	0.2	0.0	0.0	3084.6	10.4	0.1
MAY	8	0.5	6.9	0.3	3	0.2	0.0	0.0	3084.6	10.4	0.0
JUN	8	0.5	8.7	0.3	114	7.0	0.0	5.3	3082.4	8.9	-1.5
JUL	10	0.6	9.5	0.3	487	30.0	0.0	29.7	3082.4	8.9	0.0
AUG	8	0.5	8.1	0.3	388	23.9	0.0	23.7	3082.4	8.9	0.0
SEP	7	0.4	6.0	0.2	36	2.2	0.0	2.0	3082.4	8.9	0.0
OCT	8	0.5	3.8	0.1	3	0.2	0.0	0.0	3082.6	9.1	0.2
NOV	8	0.5	2.8	0.1	3	0.2	0.0	0.0	3082.9	9.3	0.2
DEC	8	0.5	1.6	0.1	3	0.2	0.0	0.0	3083.2	9.5	0.2
TOTAL		5.9	58.1	2.2		64.7	0.0	60.7			-0.3
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	15	0.9	1.2	0.0	3	0.2	0.0	0.0	3084.7	10.5	0.7
FEB	14	0.8	1.3	0.1	4	0.2	0.0	0.0	3085.4	11.0	0.5
MAR	13	0.8	2.3	0.1	3	0.2	0.0	0.0	3086.1	11.5	0.5
APR	13	0.8	4.9	0.2	3	0.2	0.0	0.0	3086.7	11.9	0.4
MAY	15	0.9	6.2	0.3	3	0.2	0.0	0.0	3087.2	12.3	0.4
JUN	13	0.8	7.9	0.3	40	2.4	0.0	0.0	3084.6	10.4	-1.9
JUL	16	1.0	8.7	0.3	297	18.3	0.0	16.1	3082.4	8.9	-1.5
AUG	15	0.9	7.4	0.3	229	14.1	0.0	13.5	3082.4	8.9	0.0
SEP	13	0.8	5.4	0.2	3	0.2	0.0	0.0	3083.0	9.3	0.4
OCT	13	0.8	3.5	0.1	3	0.2	0.0	0.0	3083.7	9.8	0.5
NOV	13	0.8	2.5	0.1	3	0.2	0.0	0.0	3084.4	10.3	0.5
DEC	13	0.8	1.4	0.1	3	0.2	0.0	0.0	3085.1	10.8	0.5
TOTAL		10.1	52.7	2.1		36.6	0.0	29.6			1.0

SWANSON LAKE OPERATION ESTIMATES - 2020

					RELEASE REQUIRMENT				RESERVOIR	REQUIREMENT	END OF MONTH		RESERVOIR
	INFLOW		EVAPORATION		CANAL	RIVER	TOTAL		SPILL	SHORTAGE	ELEV	CONT	CHANGE
	MEAN	1000		1000	1000	1000	MEAN	1000	1000	1000		1000	1000
MONTH	CFS	AF	INCHES	AF	AF	AF	CFS	AF	AF	AF	FT	AF	AF
REASONABLE MINIMUM INFLOW CONDITIONS													
JAN	19	1.2	1.5	0.3	0.0	0.1	2	0.1	0.0	0.0	2740.2	61.1	0.8
FEB	31	1.7	1.6	0.3	0.0	0.1	2	0.1	0.0	0.0	2740.6	62.4	1.3
MAR	34	2.1	2.9	0.6	0.0	0.1	2	0.1	0.0	0.0	2740.9	63.8	1.4
APR	39	2.3	6.3	1.3	0.0	0.1	2	0.1	0.0	0.0	2741.2	64.7	0.9
MAY	34	2.1	7.5	1.6	0.1	0.1	3	0.2	0.0	0.0	2741.3	65.0	0.3
JUN	27	1.6	9.7	2.1	4.4	0.9	89	5.3	0.0	0.0	2739.6	59.2	-5.8
JUL	15	0.9	9.7	2.0	16.3	6.9	377	23.2	0.0	0.0	2731.7	34.9	-24.3
AUG	8	0.5	9.7	1.5	13.6	6.3	323	19.9	0.0	5.0	2725.0	19.0	-15.9
SEP	3	0.2	7.5	0.9	2.0	2.1	69	4.1	0.0	4.0	2724.6	18.2	-0.8
OCT	6	0.4	4.6	0.5	0.0	0.1	2	0.1	0.0	0.0	2724.5	18.0	-0.2
NOV	15	0.9	3.2	0.4	0.0	0.1	2	0.1	0.0	0.0	2724.7	18.4	0.4
DEC	16	1.0	1.7	0.2	0.0	0.1	2	0.1	0.0	0.0	2725.0	19.1	0.7
TOTAL		14.9	65.9	11.7	36.4	17.0		53.4	0.0	9.0			-41.2
MOST PROBABLE INFLOW CONDITIONS													
JAN	34	2.1	1.3	0.3	0.0	0.1	2	0.1	0.0	0.0	2740.4	62.0	1.7
FEB	54	3.0	1.4	0.3	0.0	0.1	2	0.1	0.0	0.0	2741.2	64.6	2.6
MAR	60	3.7	2.6	0.6	0.0	0.1	2	0.1	0.0	0.0	2742.0	67.6	3.0
APR	65	3.9	5.8	1.3	0.0	0.1	2	0.1	0.0	0.0	2742.6	70.1	2.5
MAY	58	3.6	6.9	1.5	0.1	0.1	3	0.2	0.0	0.0	2743.1	72.0	1.9
JUN	47	2.8	8.8	2.0	3.8	0.1	63	3.9	0.0	0.0	2742.3	68.9	-3.1
JUL	26	1.6	8.8	1.9	14.2	4.2	299	18.4	0.0	0.0	2736.9	50.2	-18.7
AUG	13	0.8	8.8	1.6	11.7	4.1	256	15.8	0.0	0.0	2731.3	33.6	-16.6
SEP	7	0.4	6.9	1.1	1.7	0.1	29	1.8	0.0	0.0	2730.3	31.1	-2.5
OCT	10	0.6	4.2	0.6	0.0	0.1	2	0.1	0.0	0.0	2730.3	31.0	-0.1
NOV	25	1.5	2.9	0.4	0.0	0.1	2	0.1	0.0	0.0	2730.6	32.0	1.0
DEC	28	1.7	1.6	0.2	0.0	0.1	2	0.1	0.0	0.0	2731.2	33.4	1.4
TOTAL		25.7	60.0	11.8	31.5	9.3		40.8	0.0	0.0			-26.9
REASONABLE MAXIMUM INFLOW CONDITIONS													
JAN	54	3.3	1.2	0.2	0.0	0.1	2	0.1	0.0	0.0	2740.8	63.3	3.0
FEB	83	4.6	1.3	0.3	0.0	0.1	2	0.1	0.0	0.0	2742.0	67.5	4.2
MAR	94	5.8	2.4	0.5	0.0	0.1	2	0.1	0.0	0.0	2743.3	72.7	5.2
APR	102	6.1	5.3	1.2	0.0	0.1	2	0.1	0.0	0.0	2744.6	77.5	4.8
MAY	93	5.7	6.3	1.4	0.1	0.1	3	0.2	0.0	0.0	2745.6	81.6	4.1
JUN	74	4.4	8.1	1.9	3.1	0.1	54	3.2	0.0	0.0	2745.4	80.9	-0.7
JUL	41	2.5	8.1	1.9	11.6	1.2	208	12.8	0.0	0.0	2742.3	68.7	-12.2
AUG	21	1.3	8.1	1.8	9.6	1.7	183	11.3	0.0	0.0	2739.0	56.9	-11.8
SEP	10	0.6	6.3	1.2	1.4	0.1	25	1.5	0.0	0.0	2738.3	54.8	-2.1
OCT	16	1.0	3.9	0.8	0.0	0.1	2	0.1	0.0	0.0	2738.4	54.9	0.1
NOV	39	2.3	2.6	0.5	0.0	0.1	2	0.1	0.0	0.0	2738.9	56.6	1.7
DEC	44	2.7	1.4	0.3	0.0	0.1	2	0.1	0.0	0.0	2739.6	58.9	2.3
TOTAL		40.3	55.0	12.0	25.8	3.9		29.7	0.0	0.0			-1.4

HUGH BUTLER LAKE OPERATION ESTIMATES - 2020

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIRMENT MEAN CFS	RELEASE REQUIRMENT 1000 AF	RESERVOIR SPILL 1000 AF	REQUIREMENT SHORTAGE 1000 AF	END OF MONTH ELEV FT	END OF MONTH CONT 1000 AF	RESERVOIR CHANGE 1000 AF
REASONABLE MINIMUM INFLOW CONDITIONS											
JAN	8	0.5	1.3	0.1	3	0.2	0.0	0.0	2572.4	22.8	0.2
FEB	11	0.6	1.4	0.1	4	0.2	0.0	0.0	2572.7	23.1	0.3
MAR	13	0.8	2.6	0.2	3	0.2	0.0	0.0	2573.0	23.5	0.4
APR	13	0.8	7.2	0.5	3	0.2	0.0	0.0	2573.1	23.6	0.1
MAY	13	0.8	8.4	0.6	3	0.2	0.0	0.0	2573.1	23.6	0.0
JUN	13	0.8	10.3	0.8	29	1.7	0.0	0.0	2571.7	21.9	-1.7
JUL	11	0.7	11.4	0.8	73	4.5	0.0	0.0	2567.6	17.3	-4.6
AUG	11	0.7	10.2	0.6	62	3.8	0.0	0.0	2563.7	13.6	-3.7
SEP	7	0.4	7.9	0.4	15	0.9	0.0	0.0	2562.7	12.7	-0.9
OCT	8	0.5	5.0	0.3	3	0.2	0.0	0.0	2562.7	12.7	0.0
NOV	8	0.5	3.0	0.2	3	0.2	0.0	0.0	2562.8	12.8	0.1
DEC	8	0.5	1.5	0.1	3	0.2	0.0	0.0	2563.1	13.0	0.2
TOTAL		7.6	70.2	4.7		12.5	0.0	0.0			-9.6
MOST PROBABLE INFLOW CONDITIONS											
JAN	13	0.8	1.1	0.1	3	0.2	0.0	0.0	2572.6	23.1	0.5
FEB	16	0.9	1.2	0.1	4	0.2	0.0	0.0	2573.1	23.7	0.6
MAR	18	1.1	2.3	0.2	3	0.2	0.0	0.0	2573.7	24.4	0.7
APR	18	1.1	6.3	0.5	3	0.2	0.0	0.0	2574.0	24.8	0.4
MAY	19	1.2	7.5	0.6	3	0.2	0.0	0.0	2574.3	25.2	0.4
JUN	20	1.2	9.1	0.7	23	1.4	0.0	0.0	2573.6	24.3	-0.9
JUL	15	0.9	10.1	0.8	62	3.8	0.0	0.0	2570.6	20.6	-3.7
AUG	16	1.0	9.0	0.6	52	3.2	0.0	0.0	2568.0	17.8	-2.8
SEP	10	0.6	7.0	0.4	13	0.8	0.0	0.0	2567.5	17.2	-0.6
OCT	11	0.7	4.4	0.3	3	0.2	0.0	0.0	2567.7	17.4	0.2
NOV	13	0.8	2.7	0.2	3	0.2	0.0	0.0	2568.0	17.8	0.4
DEC	11	0.7	1.4	0.1	3	0.2	0.0	0.0	2568.4	18.2	0.4
TOTAL		11.0	62.1	4.6		10.8	0.0	0.0			-4.4
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	19	1.2	1.0	0.1	3	0.2	0.0	0.0	2573.0	23.5	0.9
FEB	25	1.4	1.1	0.1	4	0.2	0.0	0.0	2573.8	24.6	1.1
MAR	29	1.8	2.1	0.2	3	0.2	0.0	0.0	2574.9	26.0	1.4
APR	29	1.7	5.8	0.5	3	0.2	0.0	0.0	2575.6	27.0	1.0
MAY	29	1.8	6.9	0.6	3	0.2	0.0	0.0	2576.3	28.0	1.0
JUN	30	1.8	8.4	0.7	18	1.1	0.0	0.0	2576.3	28.0	0.0
JUL	24	1.5	9.3	0.8	45	2.8	0.0	0.0	2574.8	25.9	-2.1
AUG	24	1.5	8.3	0.6	39	2.4	0.0	0.0	2573.7	24.4	-1.5
SEP	15	0.9	6.4	0.5	8	0.5	0.0	0.0	2573.6	24.3	-0.1
OCT	16	1.0	4.1	0.3	3	0.2	0.0	0.0	2574.0	24.8	0.5
NOV	20	1.2	2.5	0.2	3	0.2	0.0	0.0	2574.6	25.6	0.8
DEC	18	1.1	1.3	0.1	3	0.2	0.0	0.0	2575.2	26.4	0.8
TOTAL		16.9	57.2	4.7		8.4	0.0	0.0			3.8

HARRY STRUNK LAKE OPERATION ESTIMATES - 2020

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIRMENT MEAN CFS	RELEASE REQUIRMENT 1000 AF	RESERVOIR SPILL 1000 AF	REQUIREMENT SHORTAGE 1000 AF	END OF MONTH ELEV FT	END OF MONTH CONT 1000 AF	RESERVOIR CHANGE 1000 AF
REASONABLE MINIMUM INFLOW CONDITIONS											
JAN	34	2.1	1.3	0.1	2	0.1	1.5	0.0	2366.1	34.6	0.4
FEB	43	2.4	1.4	0.2	2	0.1	2.1	0.0	2366.1	34.6	0.0
MAR	45	2.8	2.6	0.3	2	0.1	2.4	0.0	2366.1	34.6	0.0
APR	45	2.7	7.0	0.8	2	0.1	1.8	0.0	2366.1	34.6	0.0
MAY	49	3.0	8.1	0.9	2	0.1	2.0	0.0	2366.1	34.6	0.0
JUN	50	3.0	10.1	1.1	89	5.3	0.0	0.0	2364.1	31.2	-3.4
JUL	45	2.8	11.2	1.1	318	19.6	0.0	0.0	2349.7	13.3	-17.9
AUG	37	2.3	9.9	0.5	268	16.5	0.0	9.3	2343.0	7.9	-5.4
SEP	23	1.4	7.7	0.3	27	1.6	0.0	0.5	2343.0	7.9	0.0
OCT	29	1.8	5.0	0.2	2	0.1	0.0	0.0	2345.1	9.4	1.5
NOV	34	2.0	3.0	0.1	2	0.1	0.0	0.0	2347.3	11.2	1.8
DEC	31	1.9	1.6	0.1	2	0.1	0.0	0.0	2349.2	12.9	1.7
TOTAL		28.2	68.9	5.7		43.8	9.8	9.8			-21.3
MOST PROBABLE INFLOW CONDITIONS											
JAN	49	3.0	1.2	0.1	2	0.1	2.4	0.0	2366.1	34.6	0.4
FEB	63	3.5	1.2	0.1	2	0.1	3.3	0.0	2366.1	34.6	0.0
MAR	67	4.1	2.3	0.2	2	0.1	3.8	0.0	2366.1	34.6	0.0
APR	65	3.9	6.3	0.7	2	0.1	3.1	0.0	2366.1	34.6	0.0
MAY	70	4.3	7.3	0.8	2	0.1	3.4	0.0	2366.1	34.6	0.0
JUN	72	4.3	9.1	1.0	74	4.4	0.0	0.0	2365.4	33.5	-1.1
JUL	67	4.1	10.0	1.0	265	16.3	0.0	0.0	2356.2	20.3	-13.2
AUG	54	3.3	8.8	0.6	222	13.7	0.0	0.0	2344.9	9.3	-11.0
SEP	35	2.1	6.9	0.3	20	1.2	0.0	0.0	2345.7	9.9	0.6
OCT	44	2.7	4.5	0.2	2	0.1	0.0	0.0	2348.6	12.3	2.4
NOV	49	2.9	2.7	0.1	2	0.1	0.0	0.0	2351.4	15.0	2.7
DEC	45	2.8	1.4	0.1	2	0.1	0.0	0.0	2353.9	17.6	2.6
TOTAL		41.0	61.7	5.2		36.4	16.0	0.0			-16.6
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	76	4.7	1.1	0.1	2	0.1	4.1	0.0	2366.1	34.6	0.4
FEB	97	5.4	1.1	0.1	2	0.1	5.2	0.0	2366.1	34.6	0.0
MAR	102	6.3	2.0	0.2	2	0.1	6.0	0.0	2366.1	34.6	0.0
APR	102	6.1	5.6	0.6	2	0.1	5.4	0.0	2366.1	34.6	0.0
MAY	110	6.8	6.5	0.7	2	0.1	6.0	0.0	2366.1	34.6	0.0
JUN	112	6.7	8.1	0.9	47	2.8	3.0	0.0	2366.1	34.6	0.0
JUL	104	6.4	9.0	1.0	182	11.2	0.0	0.0	2362.6	28.8	-5.8
AUG	83	5.1	7.9	0.7	154	9.5	0.0	0.0	2358.9	23.7	-5.1
SEP	54	3.2	6.2	0.5	2	0.1	0.0	0.0	2360.8	26.3	2.6
OCT	67	4.1	4.0	0.3	2	0.1	0.0	0.0	2363.3	30.0	3.7
NOV	75	4.5	2.4	0.2	2	0.1	0.0	0.0	2365.8	34.2	4.2
DEC	71	4.4	1.3	0.1	2	0.1	3.8	0.0	2366.1	34.6	0.4
TOTAL		63.7	55.2	5.4		24.4	33.5	0.0			0.4

KEITH SEBELIUS LAKE OPERATION ESTIMATES - 2020

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIRMENT MEAN CFS	RELEASE REQUIRMENT 1000 AF	RESERVOIR SPILL 1000 AF	REQUIREMENT SHORTAGE 1000 AF	END OF MONTH ELEV FT	END OF MONTH CONT 1000 AF	RESERVOIR CHANGE 1000 AF
REASONABLE MINIMUM INFLOW CONDITIONS											
JAN	2	0.1	1.5	0.2	2	0.1	0.0	0.0	2299.8	25.6	-0.2
FEB	4	0.2	1.8	0.2	2	0.1	0.0	0.0	2299.7	25.5	-0.1
MAR	6	0.4	3.0	0.3	2	0.1	0.0	0.0	2299.7	25.5	0.0
APR	7	0.4	7.8	0.8	2	0.1	0.0	0.0	2299.4	25.0	-0.5
MAY	10	0.6	8.7	0.9	6	0.4	0.0	0.0	2299.0	24.3	-0.7
JUN	12	0.7	11.0	1.1	57	3.4	0.0	0.0	2296.7	20.5	-3.8
JUL	8	0.5	12.3	1.1	146	9.0	0.0	2.1	2291.2	13.0	-7.5
AUG	8	0.5	11.0	0.7	138	8.5	0.0	8.4	2290.9	12.7	-0.3
SEP	3	0.2	8.7	0.6	27	1.6	0.0	1.5	2290.5	12.2	-0.5
OCT	2	0.1	6.0	0.4	2	0.1	0.0	0.0	2290.1	11.8	-0.4
NOV	2	0.1	3.3	0.2	2	0.1	0.0	0.0	2289.9	11.6	-0.2
DEC	2	0.1	1.7	0.1	2	0.1	0.0	0.0	2289.9	11.5	-0.1
TOTAL		3.9	76.8	6.6		23.6	0.0	12.0			-14.3
MOST PROBABLE INFLOW CONDITIONS											
JAN	3	0.2	1.4	0.1	2	0.1	0.0	0.0	2299.9	25.8	0.0
FEB	5	0.3	1.6	0.2	2	0.1	0.0	0.0	2299.9	25.8	0.0
MAR	10	0.6	2.6	0.3	2	0.1	0.0	0.0	2300.0	26.0	0.2
APR	10	0.6	6.9	0.7	2	0.1	0.0	0.0	2299.9	25.8	-0.2
MAY	16	1.0	7.7	0.8	3	0.2	0.0	0.0	2299.9	25.8	0.0
JUN	20	1.2	9.7	1.0	45	2.8	0.0	0.0	2298.4	23.2	-2.6
JUL	15	0.9	10.9	1.1	138	8.5	0.0	0.0	2292.4	14.5	-8.7
AUG	13	0.8	9.7	0.7	112	6.9	0.0	6.3	2292.0	14.0	-0.5
SEP	7	0.4	7.7	0.5	21	1.3	0.0	1.2	2291.8	13.8	-0.2
OCT	3	0.2	5.3	0.4	2	0.1	0.0	0.0	2291.6	13.5	-0.3
NOV	3	0.2	2.9	0.2	2	0.1	0.0	0.0	2291.5	13.4	-0.1
DEC	3	0.2	1.5	0.1	2	0.1	0.0	0.0	2291.5	13.4	0.0
TOTAL		6.6	67.9	6.1		20.4	0.0	7.5			-12.4
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	8	0.5	1.2	0.1	2	0.1	0.0	0.0	2300.0	26.1	0.3
FEB	11	0.6	1.5	0.2	2	0.1	0.0	0.0	2300.2	26.4	0.3
MAR	18	1.1	2.4	0.3	2	0.1	0.0	0.0	2300.6	27.1	0.7
APR	20	1.2	6.2	0.7	2	0.1	0.0	0.0	2300.8	27.5	0.4
MAY	31	1.9	6.9	0.8	3	0.2	0.0	0.0	2301.3	28.4	0.9
JUN	40	2.4	8.7	1.0	27	1.6	0.0	0.0	2301.2	28.2	-0.2
JUL	29	1.8	9.8	1.1	71	4.4	0.0	0.0	2299.1	24.5	-3.7
AUG	26	1.6	8.7	0.9	68	4.2	0.0	0.0	2297.0	21.0	-3.5
SEP	12	0.7	6.9	0.6	15	0.9	0.0	0.0	2296.5	20.2	-0.8
OCT	6	0.4	4.8	0.4	2	0.1	0.0	0.0	2296.4	20.1	-0.1
NOV	8	0.5	2.6	0.2	2	0.1	0.0	0.0	2296.6	20.3	0.2
DEC	6	0.4	1.3	0.1	2	0.1	0.0	0.0	2296.7	20.5	0.2
TOTAL		13.1	61.0	6.4		12.0	0.0	0.0			-5.3

HARLAN COUNTY LAKE OPERATION ESTIMATES - 2020

	INFLOW		EVAPORATION		RELEASE REQUIREMENT		RESERVOIR SPILL	REQUIREMENT SHORTAGE	END OF MONTH		RESERVOIR CHANGE
	MEAN	1000		1000	MEAN	1000	1000	1000	ELEV	CONT 1000	1000
MONTH	CFS	AF	INCHES	AF	CFS	AF	AF	AF	FT	AF	AF
REASONABLE MINIMUM INFLOW CONDITIONS											
JAN	37	2.3	1.4	1.6	0	0.0	16.3	0.0	1945.7	314.1	-15.6
FEB	59	3.3	1.6	1.8	0	0.0	1.5	0.0	1945.7	314.1	0.0
MAR	80	4.9	2.8	3.1	0	0.0	1.8	0.0	1945.7	314.1	0.0
APR	69	4.1	6.5	7.2	0	0.0	0.0	0.0	1945.5	311.0	-3.1
MAY	88	5.4	8.0	8.8	0	0.0	0.0	0.0	1945.2	307.6	-3.4
JUN	72	4.3	9.5	10.4	376	22.4	0.0	0.0	1943.0	279.1	-28.5
JUL	73	4.5	10.7	11.1	971	59.8	0.0	0.0	1937.3	212.7	-66.4
AUG	58	3.6	9.4	8.4	852	52.5	0.0	22.2	1933.9	177.6	-35.1
SEP	29	1.7	7.4	6.0	102	6.1	0.0	6.1	1933.4	173.3	-4.3
OCT	28	1.7	5.1	4.1	0	0.0	0.0	0.0	1933.2	170.9	-2.4
NOV	37	2.2	3.2	2.5	0	0.0	0.0	0.0	1933.1	170.6	-0.3
DEC	36	2.2	2.0	1.6	0	0.0	0.0	0.0	1933.2	171.2	0.6
TOTAL		40.2	67.6	66.6		140.8	19.6	28.3			-158.5
MOST PROBABLE INFLOW CONDITIONS											
JAN	99	6.1	1.2	1.4	0	0.0	20.3	0.0	1945.7	314.1	-15.6
FEB	155	8.6	1.4	1.6	0	0.0	7.0	0.0	1945.7	314.1	0.0
MAR	209	12.9	2.4	2.7	0	0.0	10.2	0.0	1945.7	314.1	0.0
APR	179	10.7	5.7	6.3	0	0.0	4.4	0.0	1945.7	314.1	0.0
MAY	227	14.0	7.0	7.8	0	0.0	6.2	0.0	1945.7	314.1	0.0
JUN	190	11.3	8.3	9.2	149	8.9	0.0	0.0	1945.2	307.3	-6.8
JUL	192	11.8	9.4	10.3	700	43.1	0.0	0.0	1941.9	265.7	-41.6
AUG	154	9.5	8.2	8.4	480	29.6	0.0	0.0	1939.5	237.2	-28.5
SEP	75	4.5	6.5	6.2	47	2.8	0.0	0.0	1939.1	232.7	-4.5
OCT	71	4.4	4.4	4.1	0	0.0	0.0	0.0	1939.1	233.0	0.3
NOV	96	5.7	2.8	2.6	0	0.0	0.0	0.0	1939.4	236.1	3.1
DEC	94	5.8	1.8	1.7	0	0.0	0.0	0.0	1939.7	240.2	4.1
TOTAL		105.3	59.1	62.3		84.4	48.1	0.0			-89.5
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	239	14.7	1.1	1.2	0	0.0	29.1	0.0	1945.7	314.1	-15.6
FEB	372	20.7	1.3	1.4	0	0.0	19.3	0.0	1945.7	314.1	0.0
MAR	500	30.8	2.1	2.3	0	0.0	28.5	0.0	1945.7	314.1	0.0
APR	433	25.8	5.0	5.5	0	0.0	20.3	0.0	1945.7	314.1	0.0
MAY	545	33.6	6.2	6.9	0	0.0	26.7	0.0	1945.7	314.1	0.0
JUN	453	27.0	7.4	8.2	37	2.2	16.6	0.0	1945.7	314.1	0.0
JUL	459	28.3	8.3	9.2	143	8.8	10.3	0.0	1945.7	314.1	0.0
AUG	368	22.7	7.3	8.1	136	8.4	6.2	0.0	1945.7	314.1	0.0
SEP	183	10.9	5.7	6.3	20	1.2	3.4	0.0	1945.7	314.1	0.0
OCT	172	10.6	3.9	4.3	0	0.0	6.3	0.0	1945.7	314.1	0.0
NOV	228	13.6	2.5	2.8	0	0.0	10.8	0.0	1945.7	314.1	0.0
DEC	226	13.9	1.6	1.8	0	0.0	12.1	0.0	1945.7	314.1	0.0
TOTAL		252.6	52.4	58.0		20.6	189.6	0.0			-15.6

LOVEWELL RESERVOIR OPERATION ESTIMATES - 2020

MONTH	WHITE ROCK CREEK INFLOW 1000 AF	COURTLAND CANAL INFLOW 1000 AF	TOTAL INFLOW MEAN CFS	TOTAL INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIRMENT MEAN CFS	RELEASE REQUIRMENT 1000 AF	RESERVOIR SPILL 1000 AF	REQUIREMENT SHORTAGE 1000 AF	END OF MONTH ELEV FT	END OF MONTH CONT 1000 AF	RESERVOIR CHANGE 1000 AF
REASONABLE MINIMUM INFLOW CONDITIONS													
JAN	0.4	0.0	6	0.4	1.2	0.3	0	0.0	0.1	0.0	1582.6	35.9	0.0
FEB	0.6	0.0	11	0.6	1.5	0.4	0	0.0	0.4	0.0	1582.6	35.7	-0.2
MAR	1.3	0.0	21	1.3	2.6	0.6	0	0.0	0.7	0.0	1582.6	35.7	0.0
APR	1.2	0.1	22	1.3	5.4	1.3	0	0.0	0.0	0.0	1582.6	35.7	0.0
MAY	1.5	1.1	42	2.6	6.8	1.7	15	0.9	0.0	0.0	1582.6	35.7	0.0
JUN	1.6	9.5	186	11.1	8.9	2.2	168	10.0	0.0	0.0	1582.2	34.6	-1.1
JUL	1.1	15.4	268	16.5	9.6	2.3	505	31.1	0.0	0.0	1575.2	17.7	-16.9
AUG	0.1	16.6	271	16.7	7.9	1.3	347	21.4	0.0	0.0	1571.7	11.7	-6.0
SEP	0.9	2.6	59	3.5	5.9	0.7	47	2.8	0.0	0.0	1571.7	11.7	0.0
OCT	0.6	1.9	41	2.5	4.1	0.5	0	0.0	0.0	0.0	1573.0	13.7	2.0
NOV	0.5	2.5	50	3.0	3.0	0.4	0	0.0	0.0	0.0	1574.5	16.3	2.6
DEC	0.3	2.6	47	2.9	1.5	0.2	0	0.0	0.0	0.0	1575.9	19.0	2.7
TOTAL	10.1	52.3		62.4	58.4	11.9		66.2	1.2	0.0			-16.9
MOST PROBABLE INFLOW CONDITIONS													
JAN	0.9	0.0	15	0.9	1.0	0.2	0	0.0	0.7	0.0	1582.6	35.9	0.0
FEB	1.3	0.0	23	1.3	1.3	0.3	0	0.0	1.2	0.0	1582.6	35.7	-0.2
MAR	3.1	0.0	50	3.1	2.3	0.6	0	0.0	2.5	0.0	1582.6	35.7	0.0
APR	2.8	0.0	47	2.8	4.7	1.2	0	0.0	1.6	0.0	1582.6	35.7	0.0
MAY	3.5	0.0	57	3.5	5.9	1.5	13	0.8	1.2	0.0	1582.6	35.7	0.0
JUN	3.8	4.6	141	8.4	7.7	1.9	133	7.9	0.0	0.0	1582.1	34.3	-1.4
JUL	2.6	13.5	261	16.1	8.3	2.0	404	24.9	0.0	0.0	1578.0	23.5	-10.8
AUG	0.3	6.5	110	6.8	6.8	1.3	278	17.1	0.0	0.0	1571.8	11.9	-11.6
SEP	2.0	0.7	45	2.7	5.2	0.7	37	2.2	0.0	0.0	1571.7	11.7	-0.2
OCT	1.4	4.7	99	6.1	3.5	0.4	0	0.0	0.0	0.0	1575.1	17.4	5.7
NOV	1.2	4.1	89	5.3	2.6	0.4	0	0.0	0.0	0.0	1577.4	22.3	4.9
DEC	0.8	4.6	88	5.4	1.3	0.2	0	0.0	0.0	0.0	1579.6	27.5	5.2
TOTAL	23.7	38.7		62.4	50.6	10.7		52.9	7.2	0.0			-8.4
REASONABLE MAXIMUM INFLOW CONDITIONS													
JAN	2.5	0.0	41	2.5	0.9	0.2	0	0.0	2.3	0.0	1582.6	35.9	0.0
FEB	3.7	0.0	66	3.7	1.1	0.3	0	0.0	3.6	0.0	1582.6	35.7	-0.2
MAR	8.5	0.0	138	8.5	2.0	0.5	0	0.0	8.0	0.0	1582.6	35.7	0.0
APR	7.7	0.0	129	7.7	4.0	1.0	0	0.0	6.7	0.0	1582.6	35.7	0.0
MAY	9.7	0.0	157	9.7	5.1	1.3	8	0.5	7.9	0.0	1582.6	35.7	0.0
JUN	10.5	0.0	176	10.5	6.6	1.6	87	5.2	3.7	0.0	1582.6	35.7	0.0
JUL	7.1	0.0	115	7.1	7.2	1.8	265	16.3	0.0	0.0	1578.5	24.7	-11.0
AUG	0.7	0.0	11	0.7	5.9	1.2	179	11.0	0.0	0.0	1572.7	13.2	-11.5
SEP	5.6	0.0	94	5.6	4.4	0.6	23	1.4	0.0	0.0	1574.7	16.8	3.6
OCT	3.8	0.0	62	3.8	3.0	0.5	0	0.0	0.0	0.0	1576.4	20.1	3.3
NOV	3.3	0.0	55	3.3	2.3	0.4	0	0.0	0.0	0.0	1577.7	23.0	2.9
DEC	2.2	0.0	36	2.2	1.1	0.2	0	0.0	0.0	0.0	1578.6	25.0	2.0
TOTAL	65.3	0.0		65.3	43.6	9.6		34.4	32.2	0.0			-10.9

KIRWIN RESERVOIR OPERATION ESTIMATES - 2020

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIRMENT MEAN CFS	RELEASE REQUIRMENT 1000 AF	RESERVOIR SPILL 1000 AF	REQUIREMENT SHORTAGE 1000 AF	END OF MONTH ELEV FT	END OF MONTH CONT 1000 AF	RESERVOIR CHANGE 1000 AF
REASONABLE MINIMUM INFLOW CONDITIONS											
JAN	5	0.3	1.3	0.4	0	0.0	0.0	0.0	1729.3	98.2	-0.1
FEB	7	0.4	1.6	0.5	0	0.0	0.0	0.0	1729.2	98.1	-0.1
MAR	13	0.8	2.8	0.8	0	0.0	0.0	0.0	1729.2	98.1	0.0
APR	13	0.8	6.4	1.9	0	0.0	0.0	0.0	1729.0	97.0	-1.1
MAY	21	1.3	7.9	2.3	8	0.5	0.0	0.0	1728.7	95.5	-1.5
JUN	18	1.1	9.6	2.8	87	5.2	0.0	0.0	1727.3	88.6	-6.9
JUL	16	1.0	10.9	3.0	193	11.9	0.0	0.0	1724.2	74.7	-13.9
AUG	11	0.7	9.6	2.4	179	11.0	0.0	0.0	1721.0	62.0	-12.7
SEP	7	0.4	7.4	1.6	8	0.5	0.0	0.0	1720.6	60.3	-1.7
OCT	3	0.2	5.1	1.1	0	0.0	0.0	0.0	1720.4	59.4	-0.9
NOV	5	0.3	3.0	0.7	0	0.0	0.0	0.0	1720.2	59.0	-0.4
DEC	5	0.3	1.6	0.3	0	0.0	0.0	0.0	1720.2	59.0	0.0
TOTAL		7.6	67.2	17.8		29.1	0.0	0.0			-39.3
MOST PROBABLE INFLOW CONDITIONS											
JAN	16	1.0	1.2	0.4	0	0.0	0.7	0.0	1729.3	98.2	-0.1
FEB	27	1.5	1.5	0.4	0	0.0	1.1	0.0	1729.3	98.2	0.0
MAR	42	2.6	2.5	0.7	0	0.0	1.9	0.0	1729.3	98.2	0.0
APR	49	2.9	5.8	1.7	0	0.0	1.2	0.0	1729.3	98.2	0.0
MAY	75	4.6	7.1	2.1	6	0.4	2.1	0.0	1729.3	98.2	0.0
JUN	62	3.7	8.7	2.6	71	4.4	0.0	0.0	1728.6	94.9	-3.3
JUL	58	3.6	9.8	2.8	193	11.9	0.0	0.0	1726.2	83.8	-11.1
AUG	41	2.5	8.7	2.3	149	9.2	0.0	0.0	1724.2	74.8	-9.0
SEP	22	1.3	6.7	1.7	8	0.5	0.0	0.0	1724.0	73.9	-0.9
OCT	15	0.9	4.6	1.1	0	0.0	0.0	0.0	1723.9	73.7	-0.2
NOV	18	1.1	2.7	0.7	0	0.0	0.0	0.0	1724.0	74.1	0.4
DEC	15	0.9	1.5	0.4	0	0.0	0.0	0.0	1724.2	74.6	0.5
TOTAL		26.6	60.8	16.9		26.4	7.0	0.0			-23.7
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	54	3.3	1.0	0.3	0	0.0	3.1	0.0	1729.3	98.2	-0.1
FEB	88	4.9	1.3	0.4	0	0.0	4.5	0.0	1729.3	98.2	0.0
MAR	140	8.6	2.3	0.7	0	0.0	7.9	0.0	1729.3	98.2	0.0
APR	156	9.3	5.2	1.5	0	0.0	7.8	0.0	1729.3	98.2	0.0
MAY	245	15.1	6.3	1.9	5	0.3	12.9	0.0	1729.3	98.2	0.0
JUN	201	12.0	7.8	2.3	59	3.5	6.2	0.0	1729.3	98.2	0.0
JUL	192	11.8	8.8	2.6	167	10.3	0.0	0.0	1729.0	97.1	-1.1
AUG	133	8.2	7.8	2.3	119	7.3	0.0	0.0	1728.7	95.7	-1.4
SEP	70	4.2	6.0	1.7	7	0.4	0.0	0.0	1729.1	97.8	2.1
OCT	45	2.8	4.1	1.2	0	0.0	1.2	0.0	1729.3	98.2	0.4
NOV	60	3.6	2.4	0.7	0	0.0	2.9	0.0	1729.3	98.2	0.0
DEC	47	2.9	1.3	0.4	0	0.0	2.5	0.0	1729.3	98.2	0.0
TOTAL		86.7	54.3	16.0		21.8	49.0	0.0			-0.1

WEBSTER RESERVOIR OPERATION ESTIMATES - 2020

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIRMENT MEAN CFS	RELEASE REQUIRMENT 1000 AF	RESERVOIR SPILL 1000 AF	REQUIREMENT SHORTAGE 1000 AF	END OF MONTH ELEV FT	END OF MONTH CONT 1000 AF	RESERVOIR CHANGE 1000 AF
REASONABLE MINIMUM INFLOW CONDITIONS											
JAN	3	0.2	1.3	0.3	0	0.0	1.9	0.0	1892.4	76.2	-2.0
FEB	4	0.2	1.5	0.3	0	0.0	0.0	0.0	1892.3	76.1	-0.1
MAR	6	0.4	2.9	0.6	0	0.0	0.0	0.0	1892.3	75.9	-0.2
APR	10	0.6	6.5	1.4	0	0.0	0.0	0.0	1892.1	75.1	-0.8
MAY	13	0.8	8.1	1.8	16	1.0	0.0	0.0	1891.6	73.1	-2.0
JUN	10	0.6	10.3	2.2	107	6.4	0.0	0.0	1889.3	65.1	-8.0
JUL	10	0.6	11.4	2.3	253	15.6	0.0	0.0	1883.8	47.8	-17.3
AUG	5	0.3	10.5	1.7	227	14.0	0.0	0.0	1877.8	32.4	-15.4
SEP	3	0.2	7.7	1.0	10	0.6	0.0	0.0	1877.1	31.0	-1.4
OCT	2	0.1	5.1	0.7	0	0.0	0.0	0.0	1876.9	30.4	-0.6
NOV	3	0.2	3.2	0.4	0	0.0	0.0	0.0	1876.8	30.2	-0.2
DEC	2	0.1	1.7	0.2	0	0.0	0.0	0.0	1876.7	30.1	-0.1
TOTAL		4.3	70.2	12.9		37.6	1.9	0.0			-48.1
MOST PROBABLE INFLOW CONDITIONS											
JAN	11	0.7	1.1	0.2	0	0.0	2.5	0.0	1892.4	76.2	-2.0
FEB	16	0.9	1.4	0.3	0	0.0	0.6	0.0	1892.4	76.2	0.0
MAR	26	1.6	2.6	0.6	0	0.0	1.0	0.0	1892.4	76.2	0.0
APR	39	2.3	5.8	1.3	0	0.0	1.0	0.0	1892.4	76.2	0.0
MAY	57	3.5	7.3	1.6	13	0.8	1.1	0.0	1892.4	76.2	0.0
JUN	42	2.5	9.3	2.0	71	4.4	0.0	0.0	1891.4	72.3	-3.9
JUL	39	2.4	10.2	2.2	208	12.8	0.0	0.0	1887.7	59.7	-12.6
AUG	23	1.4	9.5	1.8	161	9.9	0.0	0.0	1884.4	49.4	-10.3
SEP	13	0.8	6.9	1.2	5	0.3	0.0	0.0	1884.1	48.7	-0.7
OCT	8	0.5	4.6	0.8	0	0.0	0.0	0.0	1884.0	48.4	-0.3
NOV	10	0.6	2.8	0.5	0	0.0	0.0	0.0	1884.1	48.5	0.1
DEC	10	0.6	1.5	0.3	0	0.0	0.0	0.0	1884.2	48.8	0.3
TOTAL		17.8	63.0	12.8		28.2	6.2	0.0			-29.4
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	52	3.2	1.0	0.2	0	0.0	5.0	0.0	1892.4	76.2	-2.0
FEB	79	4.4	1.3	0.3	0	0.0	4.1	0.0	1892.4	76.2	0.0
MAR	125	7.7	2.4	0.5	0	0.0	7.2	0.0	1892.4	76.2	0.0
APR	178	10.6	5.3	1.2	0	0.0	9.4	0.0	1892.4	76.2	0.0
MAY	266	16.4	6.7	1.5	6	0.4	14.5	0.0	1892.4	76.2	0.0
JUN	193	11.5	8.5	1.9	42	2.5	7.1	0.0	1892.4	76.2	0.0
JUL	180	11.1	9.3	2.0	125	7.7	1.4	0.0	1892.4	76.2	0.0
AUG	107	6.6	8.6	1.9	101	6.2	0.0	0.0	1892.0	74.7	-1.5
SEP	64	3.8	6.3	1.4	2	0.1	0.8	0.0	1892.4	76.2	1.5
OCT	36	2.2	4.2	0.9	0	0.0	1.3	0.0	1892.4	76.2	0.0
NOV	49	2.9	2.6	0.6	0	0.0	2.3	0.0	1892.4	76.2	0.0
DEC	44	2.7	1.4	0.3	0	0.0	2.4	0.0	1892.4	76.2	0.0
TOTAL		83.1	57.6	12.7		16.9	55.5	0.0			-2.0

WACONDA LAKE OPERATION ESTIMATES - 2020

	INFLOW		EVAPORATION		RELEASE REQUIRMENT		RESERVOIR SPILL	REQUIREMENT SHORTAGE	END OF MONTH	RESERVOIR	
	MEAN	1000		1000	MEAN	1000	1000	1000		1000	1000
MONTH	CFS	AF	INCHES	AF	CFS	AF	AF	AF	FT	AF	AF
REASONABLE MINIMUM INFLOW CONDITIONS											
JAN	29	1.8	1.1	0.8	19	1.2	5.5	0.0	1454.6	207.1	-5.7
FEB	43	2.4	1.4	1.0	20	1.1	0.3	0.0	1454.6	207.1	0.0
MAR	81	5.0	2.7	1.9	18	1.1	0.0	0.0	1454.7	209.1	2.0
APR	84	5.0	6.7	4.8	17	1.0	0.0	0.0	1454.7	208.3	-0.8
MAY	97	6.0	8.3	5.9	18	1.1	0.0	0.0	1454.6	207.3	-1.0
JUN	82	4.9	10.4	7.4	45	2.7	0.0	0.0	1454.1	202.1	-5.2
JUL	133	8.2	12.3	8.5	156	9.6	0.0	0.0	1453.3	192.2	-9.9
AUG	49	3.0	10.6	7.1	125	7.7	0.0	0.0	1452.2	180.4	-11.8
SEP	37	2.2	8.5	5.4	35	2.1	0.0	0.0	1451.8	175.1	-5.3
OCT	29	1.8	5.5	3.4	21	1.3	0.0	0.0	1451.5	172.2	-2.9
NOV	34	2.0	2.9	1.8	27	1.6	0.0	0.0	1451.3	170.8	-1.4
DEC	26	1.6	1.4	0.9	24	1.5	0.0	0.0	1451.3	170.0	-0.8
TOTAL		43.9	71.8	48.9		32.0	5.8	0.0			-42.8
MOST PROBABLE INFLOW CONDITIONS											
JAN	81	5.0	1.0	0.7	10	0.6	9.4	0.0	1454.6	207.1	-5.7
FEB	122	6.8	1.3	0.9	10	0.6	5.3	0.0	1454.6	207.1	0.0
MAR	229	14.1	2.4	1.7	10	0.6	9.3	0.0	1454.8	209.6	2.5
APR	240	14.3	6.1	4.4	8	0.5	0.0	0.0	1455.5	219.0	9.4
MAY	276	17.0	7.5	5.5	10	0.6	10.5	0.0	1455.6	219.4	0.4
JUN	235	14.0	9.3	6.8	32	2.0	5.2	0.0	1455.6	219.4	0.0
JUL	381	23.5	11.0	8.1	112	6.9	8.5	0.0	1455.6	219.4	0.0
AUG	140	8.6	9.5	7.0	89	5.5	0.0	0.0	1455.2	215.5	-3.9
SEP	107	6.4	7.6	5.5	21	1.3	0.0	0.0	1455.2	215.1	-0.4
OCT	83	5.1	4.9	3.6	10	0.6	0.0	0.0	1455.3	216.0	0.9
NOV	94	5.6	2.6	1.9	15	0.9	0.0	0.0	1455.5	218.8	2.8
DEC	75	4.6	1.3	1.0	13	0.8	14.5	0.0	1454.6	207.1	-11.7
TOTAL		125.0	64.5	47.1		20.9	62.7	0.0			-5.7
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	284	17.5	0.9	0.6	3	0.2	22.4	0.0	1454.6	207.1	-5.7
FEB	424	23.6	1.2	0.9	4	0.2	22.5	0.0	1454.6	207.1	0.0
MAR	800	49.3	2.2	1.6	5	0.3	44.9	0.0	1454.8	209.6	2.5
APR	834	49.7	5.6	4.0	5	0.3	35.6	0.0	1455.6	219.4	9.8
MAY	963	59.3	6.9	5.1	5	0.3	53.9	0.0	1455.6	219.4	0.0
JUN	820	48.9	8.6	6.3	22	1.3	41.3	0.0	1455.6	219.4	0.0
JUL	1331	82.0	10.1	7.4	70	4.3	70.3	0.0	1455.6	219.4	0.0
AUG	489	30.1	8.7	6.4	57	3.5	20.2	0.0	1455.6	219.4	0.0
SEP	374	22.3	7.0	5.1	12	0.7	3.7	0.0	1456.5	232.2	12.8
OCT	291	17.9	4.5	3.4	6	0.4	14.1	0.0	1456.5	232.2	0.0
NOV	329	19.6	2.4	1.8	5	0.3	17.5	0.0	1456.5	232.2	0.0
DEC	261	16.1	1.2	0.9	5	0.3	40.0	0.0	1454.6	207.1	-25.1
TOTAL		436.3	59.3	43.5		12.1	386.4	0.0			-5.7

CEDAR BLUFF RESERVOIR OPERATION ESTIMATES - 2020

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIRMENT MEAN CFS	RELEASE REQUIRMENT 1000 AF	RESERVOIR SPILL 1000 AF	REQUIREMENT SHORTAGE 1000 AF	END OF MONTH ELEV FT	END OF MONTH CONT 1000 AF	RESERVOIR CHANGE 1000 AF
REASONABLE MINIMUM INFLOW CONDITIONS											
JAN	3	0.2	1.6	0.5	0	0.0	0.0	0.0	2133.6	110.4	-0.3
FEB	4	0.2	1.7	0.5	0	0.0	0.0	0.0	2133.5	110.1	-0.3
MAR	6	0.4	3.0	0.9	0	0.0	0.0	0.0	2133.4	109.6	-0.5
APR	10	0.6	7.7	2.2	0	0.0	0.0	0.0	2133.1	108.0	-1.6
MAY	15	0.9	9.2	2.6	3	0.2	0.0	0.0	2132.7	106.1	-1.9
JUN	15	0.9	11.3	3.2	3	0.2	0.0	0.0	2132.1	103.6	-2.5
JUL	21	1.3	13.7	3.7	11	0.7	0.0	0.0	2131.5	100.5	-3.1
AUG	15	0.9	11.7	3.1	11	0.7	0.0	0.0	2130.8	97.6	-2.9
SEP	5	0.3	10.0	2.6	3	0.2	0.0	0.0	2130.3	95.1	-2.5
OCT	2	0.1	7.1	1.8	0	0.0	0.0	0.0	2129.9	93.4	-1.7
NOV	3	0.2	3.3	0.8	0	0.0	0.0	0.0	2129.7	92.8	-0.6
DEC	2	0.1	1.9	0.5	0	0.0	0.0	0.0	2129.6	92.4	-0.4
TOTAL		6.1	82.2	22.4		2.0	0.0	0.0			-18.3
MOST PROBABLE INFLOW CONDITIONS											
JAN	5	0.3	1.4	0.4	0	0.0	0.0	0.0	2133.6	110.6	-0.1
FEB	7	0.4	1.5	0.4	0	0.0	0.0	0.0	2133.6	110.6	0.0
MAR	13	0.8	2.7	0.8	0	0.0	0.0	0.0	2133.6	110.6	0.0
APR	20	1.2	6.9	2.0	0	0.0	0.0	0.0	2133.4	109.8	-0.8
MAY	31	1.9	8.3	2.4	2	0.1	0.0	0.0	2133.3	109.2	-0.6
JUN	32	1.9	10.2	2.9	2	0.1	0.0	0.0	2133.1	108.1	-1.1
JUL	42	2.6	12.2	3.5	10	0.6	0.0	0.0	2132.8	106.6	-1.5
AUG	29	1.8	10.5	3.0	6	0.4	0.0	0.0	2132.4	105.0	-1.6
SEP	12	0.7	9.0	2.5	2	0.1	0.0	0.0	2132.0	103.1	-1.9
OCT	5	0.3	6.3	1.7	0	0.0	0.0	0.0	2131.7	101.7	-1.4
NOV	7	0.4	3.0	0.8	0	0.0	0.0	0.0	2131.6	101.3	-0.4
DEC	5	0.3	1.7	0.5	0	0.0	0.0	0.0	2131.6	101.1	-0.2
TOTAL		12.6	73.7	20.9		1.3	0.0	0.0			-9.6
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	15	0.9	1.3	0.4	0	0.0	0.0	0.0	2133.7	111.2	0.5
FEB	20	1.1	1.4	0.4	0	0.0	0.0	0.0	2133.8	111.9	0.7
MAR	34	2.1	2.4	0.7	0	0.0	0.0	0.0	2134.1	113.3	1.4
APR	55	3.3	6.2	1.8	0	0.0	0.0	0.0	2134.4	114.8	1.5
MAY	81	5.0	7.4	2.2	3	0.2	0.0	0.0	2134.9	117.4	2.6
JUN	87	5.2	9.1	2.8	3	0.2	0.0	0.0	2135.3	119.6	2.2
JUL	112	6.9	10.9	3.4	3	0.2	0.0	0.0	2135.9	122.9	3.3
AUG	78	4.8	9.3	2.9	0	0.0	0.0	0.0	2136.3	124.8	1.9
SEP	32	1.9	8.0	2.6	0	0.0	0.0	0.0	2136.2	124.1	-0.7
OCT	13	0.8	5.7	1.8	0	0.0	0.0	0.0	2136.0	123.1	-1.0
NOV	17	1.0	2.6	0.8	0	0.0	0.0	0.0	2136.0	123.3	0.2
DEC	13	0.8	1.5	0.5	0	0.0	0.0	0.0	2136.1	123.6	0.3
TOTAL		33.8	65.8	20.3		0.6	0.0	0.0			12.9

— BUREAU OF —
RECLAMATION

MISSOURI BASIN REGION
NEBRASKA-KANSAS AREA OFFICE
McCOOK, NEBRASKA

MIRAGE FLATS AND MISSOURI RIVER BASIN PROJECTS
NIOBRARA, LOWER PLATTE AND KANSAS RIVER BASIN

IRRIGATION AND FLOOD CONTROL FACILITIES

NKAO: RESERVOIR ALLOCATION LEVELS (Acre Feet)

DAM	RESERVOIR	FLOOD	CONSER.	DEAD	TOTAL
Bonny Dam	Bonny Reservoir	128,820	36,508	0	165,328
Box Butte Dam	Box Butte Reservoir	n/a	28,973	188	29,161
Cedar Bluff Dam	Cedar Bluff Reservoir	191,890	168,050	4,402	364,342
Davis Creek Dam	Davis Creek Reservoir	n/a	31,082	76	31,158
Enders Dam	Enders Reservoir	30,048	35,394	7,516	72,958
Glen Elder Dam	Waconda Lake	722,988	219,172	248	942,408
Harlan County Dam	Harlan County Lake	500,000	314,111	0	814,111
Kirwin Dam	Kirwin Reservoir	215,136	93,185	4,969	313,290
Lovewell Dam	Lovewell Reservoir	50,465	34,007	1,659	86,131
Medicine Creek Dam	Harry Strunk Lake	52,714	31,239	3,408	87,361
Merritt Dam	Merritt Reservoir	n/a	65,952	774	66,726
Norton Dam	Keith Sebelius Lake	99,230	32,874	1,636	133,740
Red Willow Dam	Hugh Butler Lake	48,846	31,039	5,185	85,070
Trenton Dam	Swanson Lake	134,187	109,148	1,027	244,362
Virginia Smith Dam	Calamus Reservoir	n/a	119,434	35	119,469
Webster Dam	Webster Reservoir	183,353	74,901	1,256	259,510

EXPLANATION

- NKAO JURISDICTION
- NKAO RESERVOIR
- IRRIGATION DISTRICT
- LAKE
- CANAL
- RIVER / STREAM
- STATE LINE
- McCOOK, NEBRASKA
- STATE CAPITALS
- CITY

Map Revised: 01/23/2020
McCook, Nebraska

N W E S

Map Scale: 1:2,200,000

0 50 100 200 Miles
0 75 150 300 Kilometers