SYNOPSIS

General

This year is the 50th 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 17 dams and reservoirs that are located in Colorado, Nebraska, and Kansas. These reservoirs, together with 11 diversion dams, 11 pumping plants, and 23 canal systems, serve approximately 327,700 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. Sherman Dam and Reservoir, two diversion dams and two canal systems were transferred to the Loup Basin Reclamation District in November of 2002 and will not be included in future AOP's.

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 the Bureau of Reclamation (Reclamation), or the 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 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 has 95 Hydromet stations that can be accessed. The McCook Field Office has installed and maintains 30 Hydromet stations with plans to install more as time permits. When fully implemented, the projects will have a Hydromet station installed to provide real-time data on all reservoirs, most diversion dams, and most of the measuring structures in the irrigation systems. These stations can be found on the Internet by accessing Reclamation's home page at http://www.usbr.gov/gp/. From the home page, select "Water Supply Management" followed by selecting Hydromet Data System.

The Headlines 02 that follows this synopsis is indicative of the awareness that the local people have of the natural resource development and conservation in the Niobrara, Lower Platte, and Kansas River Basins.

2002 Summary

Climatic Conditions

Precipitation at the project dams during 2002 ranged from 49 percent of normal at Norton Dam to 102 percent of normal at Sherman Dam. With very few exceptions, the first nine months of the year were much drier than normal throughout the projects. January and February were generally drier than normal with temperatures well above normal. March brought weather that continued much drier than normal throughout the projects with temperatures averaging well below normal.

Total precipitation during April, May and June was well below normal across the projects while temperatures varied considerably. April precipitation was below normal at all projects dams. Only two project dams recorded above normal precipitation during May and only one during June, resulting in one of the driest springs on record. Temperatures averaged near normal during April, averaged below normal in May, and averaged well above normal in June.

Temperatures averaged well above normal in July while precipitation continued well below normal throughout the projects. Record low monthly precipitation was recorded at six project dams. A few isolated thunderstorms did produce some localized short term runoff. August brought some relief with temperatures averaging below normal and eight project dams receiving above normal precipitation. Most irrigation districts had discontinued irrigation releases by the end of August, some as a result of limited water supplies. Temperatures during September averaged slightly above normal while precipitation was once again generally below normal throughout the projects.

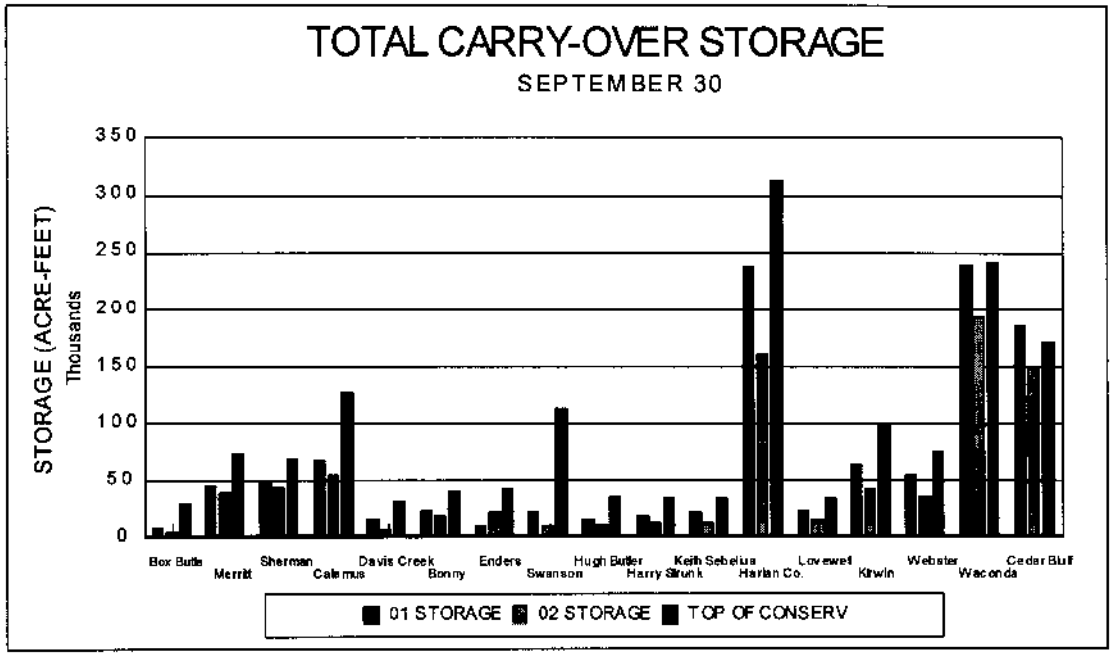
Precipitation during October was well above normal throughout most of the projects. Six project dams recorded monthly rainfall totals that ranked within the top four ever recorded. Temperatures averaged well below normal in October. All project dams recorded below normal precipitation amounts during November. December precipitation was nearly non-existent with the exception of those projects located in northern Nebraska. Six project dams recorded no precipitation during the month. Temperatures averaged well above normal during both November and December.

Storage Reservoirs

1. Conservation Operations. The 2002 inflow was below the dry-year forecast at Bonny and Enders Reservoirs, and Swanson, Hugh Butler, Harry Strunk and Harlan County Lakes in the Republican River Basin. Waconda Lake also recorded inflows below the dry-year forecast. Box Butte, Merritt, Sherman, Calamus, Davis Creek, Lovewell, Kirwin, Webster and Cedar Bluff Reservoirs along with Keith Sebelius Lake had inflows between the dry- and normal-year forecasts. None of the project reservoirs had inflows above the normal-year forecast.

Project reservoirs had below average carryover storage from the 2001 water year with the exception of Keith Sebelius Lake and Cedar Bluff Reservoir. Of the 12 project reservoirs in the Kansas River Basin, only Keith Sebelius Lake and Lovewell Reservoir did not record below average inflows during at least 11 months of 2002. Reservoir releases were made from Merritt and Virginia Smith Dams to maintain reservoir levels prior to the 2002 irrigation season. Just prior to the irrigation season, Enders and Box Butte Reservoirs, along with Keith Sebelius, Swanson, Hugh Butler, Harry Strunk and Harlan County Lakes, did not have sufficient storage to provide water users with a full water supply. Sargent and Farwell Irrigation Districts received their usual supply. Only Harry Strunk Lake and Lovewell Reservoir had some flood storage occupied prior to the irrigation season. The high irrigation demand months of July and August significantly reduced storage in most project reservoirs. Precipitation during July and August was of little help in reducing the demands on project reservoirs. Storage in the Kansas River Basin project reservoirs was below normal at the end of the irrigation season with the exception of Keith Sebelius Lake, and Webster and Cedar Bluff Reservoirs.

The following summarized graph shows a comparison of 2001 and 2002 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 30th.



2. Flood Control Operations. Harry Strunk Lake along with Lovewell Reservoir utilized flood pool storage in 2002. Releases were not required from Harry Strunk Lake or Lovewell Reservoir to reduce or maintain pool levels. The fiscal year 2002 flood control benefits accrued by the operation of Reclamation's Nebraska-Kansas Projects facilities was $78,000 as determined by the Corps of Engineers. An additional benefit of $50,000 was credited to Harlan County Lake. The accumulative total of flood control benefits for the years 1951 through 2002 by facilities in this report total $1,871,610,000 (see table 5). To date no benefits have been accrued by the operation of Box Butte, Merritt, Sherman, Calamus, or Davis Creek Reservoirs.

A summary of precipitation, reservoir storage and inflows at Nebraska-Kansas Projects facilities can be found in table 7.

Water Service

There were 534,207 acre-feet (AF) of water diverted to irrigate approximately 291,821 acres of project lands in the 14 irrigation districts (see tables 3 and 6). The project water supply was either inadequate or limited for 149,022 acres of the total project lands. This includes lands in Mirage Flats, Frenchman Valley, H&RW, Frenchman-Cambridge, Almena, Bostwick in Nebraska and Kansas Bostwick Irrigation Districts. The project water supplies for the other units mentioned in this report were more than adequate in 2002.

The water requirements of three municipalities, one rural water district, and two fish hatchery facilities were furnished from storage releases or natural flows.

Under a long-term contract with Reclamation for the use of Arcadia Diversion Dam, the Middle Loup Public Power and Irrigation District diverted 43,425 AF to irrigate 14,177 acres of

non-project lands. This use of Arcadia Diversion Dam was provided as a replacement for MLPP&ID's diversion dam which was destroyed when Arcadia Diversion Dam was built by Reclamation. These diversions were made under natural-flow water rights granted by the state of Nebraska.

Irrigation Production

The 2002 crop yields on lands receiving project water in the Kansas River Basin were lower than 2001 for all reporting districts. Crop yields reported by districts in the Niobrara and Lower Platte River Basins were higher than 2001. The average corn yield, the principal crop of all reporting districts, was 147 bushels per acre. This was approximately 13 bushels per acre less than in 2001. The average unit price of corn is slightly higher than the previous year at approximately $2.20/bu. Reservoir releases for irrigation began during the third and fourth week of June. Much of the growing season was warmer and drier than normal. Most districts experienced some relief from the hot and dry conditions during August. Crop maturity progressed near or slightly ahead of normal during the growing season. Several irrigation districts had finished making irrigation releases by mid to late August, with some as early as late July as a result of limited water supplies. Nearly all irrigation districts had finished delivering water by Labor Day with corn harvest commencing by the end of September.

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. As a result of this policy, Reclamation has developed fishery management guidelines for reservoirs within the Nebraska-Kansas Projects. These guidelines outline a program which considers public use, fisheries, fish habitat, and improved communication and coordination. The Nebraska-Kansas Area Office is available for meetings if requested with Nebraska, Colorado, and Kansas state management agencies to discuss the Annual Operating Plans (AOP). Information is solicited that will allow Reclamation the flexibility to enhance fisheries resources while still meeting contractual obligations with the various irrigation districts.

During the early part of the 2002 season, normal reservoir operations were favorable for recreation and fish and wildlife uses. Late in the season, irrigation operations substantially lowered the water levels of reservoirs in the Republican River Basin, limiting the recreation benefits. Normal summer drawdown due to irrigation releases did allow for late summer shoreline revegetation.

Re-authorization of the North Loup Project by the Act of October 18, 1986 [Public Law 99-591, Section 101(e)] authorized the construction of a fish hatchery below Virginia Smith Dam and Calamus Reservoir. The hatchery was constructed under Public Law 89-72 and a cost-sharing agreement with the Nebraska Game and Parks Commission (Commission) with 75 percent federal and 25 percent state funds. Administration of construction was accomplished by the Commission; construction began in July 1989, and was completed in September 1991. The hatchery consists of an office/visitor center, laboratory, 2 residences, a shop and feed storage building, 51 rearing ponds lined with VLDPE and covering 45.5 acres, 24 concrete raceways, 2 lined effluent ponds, 8 groundwater wells, a 36-inch diameter buried pipeline from Virginia Smith Dam, a groundwater degassing tank, and a computerized monitoring and alarm system. The hatchery is operated and maintained by the Commission and in full operation should produce about 53 million fish per year.

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.

2003 Outlook

Three detailed studies have been developed for each of the reservoirs in the Niobrara, Lower Platte, and Kansas River Basins conforming with established operating criteria under various reservoir inflow conditions. These operation studies are included in table 4, sheets 1 through 17. 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, Hugh Butler, Harry Strunk, Keith Sebelius, Harlan County, Lovewell, Kirwin and Webster. The irrigation districts affected are Mirage Flats; Frenchman Valley and H&RW; Frenchman Cambridge; Almena; Bostwick in Nebraska and Kansas Bostwick; Kirwin; and Webster; respectively. If 2003 is a dry year, 169,000 of the total 263,700 acres with service available to be irrigated (64 percent) will have an inadequate water supply.

Under most probable inflow conditions, it is also expected that Frenchman Valley, H&RW, Frenchman Cambridge, Almena and Mirage Flats Irrigation Districts would experience some shortages to irrigation demands from Enders Reservoir, Swanson Lake, Hugh Butler Lake, Harry Strunk Lake, Keith Sebelius Lake and Box Butte Reservoir. Most irrigators in these districts plan to use water from private wells to supplement the project water supply. In an effort to conserve reservoir storage, Almena Irrigation District will continue limiting farm deliveries to approximately three to five inches.

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

During 2003, under all inflow forecast conditions, storage water will be in excess of project needs at Bonny Reservoir and Waconda Lake. The state of Colorado will make Bonny storage water available to downstream water right appropriators.

Under reasonable minimum inflow conditions, the conservation pools at Merritt, Calamus, Davis Creek and Lovewell Reservoirs are expected to fill during 2003.

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.

HEADLINES 2002

Celebrating 100 Years of Water to the West

Reclamation plays vital role in our region

■ An exhibit on the Bureau of Reclamation visits next week.

States reach river settlement

■ *Nebraska will pay no money damages to Kansas as a result of the agreement.*

Annual water conference set for March 11

2002 third driest year on record

Drought losses mount in Kansas

Irrigation district ownership transferred

Keys to Middle Loup projects go from federal to local hands

Irrigation: Limited water supply

Using Cedar Bluff's water

As Hays, Russell look west for water, opposition lines up

Drought takes wildlife toll

Fishing dries up, too

Success is good at Enders and Red Willow, but low water levels have diminished shoreline spawning habitat.

Rain, snow offer a break

The Editorial Viewpoint of the McCook Daily Gazette

The devastating drought of 2002

Omaha World-Herald

Nebraska official wins one water war, still has one issue to resolve

Dry spell also drains economies nationwide

Water worries

Municipal use is legitimate and wouldn't drain Cedar Bluff Reservoir

McCOOK DAILY GAZETTE

Area lakes show all-time December low in acre-feet

NRD sets meetings on groundwater controls

Company wants to ship water to Colorado

Excavation of site at reservoir done

By JAN KATE ACKERSTAN

Attorney: Progress continues in talks over river dispute

Water levels approaching all-time lows

Limited irrigation means trouble

AREA LAKE LEVELS

The following are area lake levels for Thursday, June 6. Information provided by the Great Plains Division of the U.S. Bureau of Reclamation at www.gp.usbr.gov/

	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Enders	14,497	3,090.56	15,034	3,090.61	17,456	3,093.48	34,029	48.38
Harry Strunk	36,116	2,366.34	36,053	2,366.39	37,028	2,366.81	37,208	97.45
Hugh Butler	20,425	2,570.46	20,621	2,570.63	27,861	2,576.30	35,708	54.89
Swanson	33,762	2,730.03	33,677	2,730.41	44,861	2,734.89	101,205	31.38

Rain and snow help recharge moisture in soil

Reservoir release 'inefficient' for Russell

Three states looking in the right direction

■ *Water officials are finally talking about issues.*

Senators express doubts about sale of Sandhills water

LAKE: Experts say dry spells, water releases won't doom reservoir

Rivers down to barest of levels

57 waterways at historic low flows in drought, analysis shows

Harlan County Reservoir

Irrigation to stop for first time in history of dam

Bringing water issues down to the farm

Ripple effects feared from drought

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 2002 and serves as a guideline for the 2003 operations. This report also describes the responsibilities of Reclamation, 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 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, Sherman, 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 will be provided by the State of Kansas. Reclamation operates and maintains 11 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 latest sediment survey (2000) 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. The states are also responsible for administering the water surface activities and the federal lands around the reservoir. The U.S. Fish and Wildlife Service administers 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.

Tables and Exhibits

Records for the facilities reported in the AOP are included as tables and exhibits and are located following page 36.

Water Supply

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

Inflow records from 1983 through 2002 were used for the analysis of reservoirs in the Niobrara, Lower Platte and Kansas River Basins, with the exception of Calamus and Davis Creek Reservoirs. The more recent available record of 1986 through 2002 was used for Calamus Reservoir. Davis Creek Reservoir is an off-stream storage facility with only 6.3 square miles of drainage area. Inflow to Davis Creek Reservoir is supplied by diversions from Calamus Reservoir and the North Loup River.

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, including flood control.

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 17 storage facilities now in operation are listed below.

Constructed by Reclamation

1. 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. On November 22, 2002, the title of Sherman Dam was transferred from the federal government to the Loup Basin Reclamation district.

2. 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

1. Harlan County Dam in the Kansas River Basin.

Irrigation and Reclamation Districts

Thirteen 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 Courtland Canal between the headgates and the Nebraska-Kansas state line to Kansas Bostwick Irrigation District.

The contracted irrigation season for the Mirage Flats Irrigation District is April through September. The contracted irrigation season for Frenchman Valley, H&RW and Frenchman-Cambridge Irrigation Districts is from May 1 st through October 15th or such additional period from April 1 st through May 1 st of each year as determined between the District and Reclamation. The contracted irrigation season for Almena, Bostwick in Nebraska, Kansas-Bostwick and Twin Loups Reclamation District is May 1 st through September 30th or such additional period from April 1st through November 15 th of each year as determined between the District and Reclamation. For all other districts, the contracted irrigation season is from May 1 st through September 30th.

Long Term Water Service Contract Renewal

The renewal of the long term water service contracts with Frenchman-Cambridge, Kansas Bostwick, Nebraska Bostwick, and Almena Irrigation Districts was completed in 2000. The districts negotiated the conversion of their water service contracts to repayment contracts with a 40 year repayment period. These contracts were signed July 25, 2000 and confirmed in District Court. These contracts became effective January 1, 2001. These contracts include provisions that provide for water supply and distribution works reserve funds, water conservation commitments to improve efficiencies, environmental commitments, and provisions for irrigation policies/deliveries to help preserve lake levels.

The renewal of the long term water service contract with Frenchman Valley Irrigation District was completed in 2000. The district negotiated the renewal of their water service contract that includes a 40 year term. The contract was signed July 25, 2000 and was confirmed in District Court. The contract became effective January 1, 2001. This contract includes provisions that provide for a water supply reserve fund, water conservation commitments to improve efficiencies, environmental commitments, and provisions for irrigation policies/deliveries to help preserve lake levels.

The new contracts require that Reclamation meet with the districts listed above prior to March 1 st of each year for an annual water operations meeting. Discussions include the previous year's water operations season, the upcoming year's water supplies, historic water supplies and delivery efficiencies and potential water conservation measures.

The renewal of the long term water service contracts with Kirwin Irrigation District No. 1 and Webster Irrigation District No. 4 was completed in 2002. The process for renewing long term water service contracts with the Kirwin and Webster Irrigation Districts began in 1997. In March 2001, Reclamation initiated contract negotiations with the districts. On August 3, the remaining outstanding issues were resolved which allowed for the assembly of the final draft contracts. The draft Environmental Assessment and draft contracts were made available to the public for review in December, 2001. The final Environmental Assessment was completed after receiving a

Biological Opinion from the U.S. Fish and Wildlife Service, which allowed the completion of the NEPA process. The repayment contracts were signed on June 20, 2002 and became effective January 1, 2003.

Transfer of title of the assets of the Middle Loup Division to the Farwell Irrigation District, Sargent Irrigation District, and the Loup Basin Reclamation District was approved by Congress and signed into law on October 27, 2000 (Public Law 106-366). The transfer legislation directed the Secretary of Interior to convey all right, title, and interest in and to the property comprising the assets of the Middle Loup Division in accordance with the Memorandum of Understanding dated July, 2000. The draft Environmental Assessment was made available to the public for review. The final Environmental Assessment was completed after receiving a Biological Opinion from the U.S. Fish and Wildlife Service, which allowed the completion of the NEPA process. Reclamation transferred ownership and responsibilities for the Middle Loup Division, including Sherman Dam and Reservoir, to the Loup Basin Reclamation District on November 22, 2002. The contract with the Loup Basin Reclamation District which supplied water to the Sargent and Farwell Irrigation Districts was terminated.

The long term water service contract with the Ainsworth Irrigation District will expire in 2006. Meetings have been held with the district to present information concerning the contract renewal process. Resource data collection within the Niobrara Basin has been initiated. Ainsworth Irrigation District has stated its intent to seek Congressional authority to transfer title of the Ainsworth Unit from the United States to the district.

Municipal Water

Three municipalities and one rural water district have executed water service contracts for full or supplemental water supplies.

Fish and Wildlife

The State of Kansas is presently using the fish hatchery facility below Cedar Bluff Reservoir for waterfowl habitat. The Calamus Fish Hatchery located below Calamus Reservoir is operated by the State of Nebraska for fish production.

State of Colorado Division of Wildlife

The Colorado Division of Wildlife 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 and Parks

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. Provisions of this agreement will be incorporated into the 2003 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 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 will also benefit farmers, ranchers, cities, and other interests below the reservoirs.

Republican River Compact - Kansas v. Nebraska

On May 26, 1998, the State of Kansas filed suit in the U.S. Supreme Court complaining that the State of Nebraska had violated the Republican River Compact by allowing the development of thousands of wells hydraulically connected to the Republican River and its tributaries, by failure to protect surface flows from unauthorized appropriation, and by other acts and omissions. Kansas claimed that through these acts and omissions Nebraska was using more water than its allocated share and had deprived Kansas of its full entitlement under the Compact. Since the Republican River headwaters are in Colorado, Colorado is also a party in this case. The United States, acting as *amicus curiae,* filed a brief with the Supreme Court on December 18, 1998. In our brief we generally supported Kansas' position and stated that the Compact is not working as the states intended when they negotiated it. On January 19, 1999, the Supreme Court accepted Kansas' lawsuit. On August 2, 1999, Nebraska filed a motion to dismiss the case on the grounds that the Compact does not include groundwater. The Special Master held a hearing on January 4, 2000, and thereafter recommended that the Court deny Nebraska's motion to dismiss. On June 29, 2000, the Court entered an order denying Nebraska's motion to dismiss and recommitted the case to the Master. The Special Master has ruled that the Compact restricts a compacting state's consumption of groundwater to the extent that the consumption depletes streamflow in the Republican River Basin.

At the unanimous request of the parties and the concurrence of the United States, and in order to allow the full development of settlement talks, the schedule for the court case was delayed by three and one-half months or from mid-December through the end of March. Two-day meetings were held at approximate two-week intervals throughout the delay period. Reclamation participated in each meeting presenting operational data and information on several occasions.

On April 3, 2002 an Agreement in Principle was signed by the states. The United States was in concurrence with the Agreement.

The parties requested and the Special Master granted a stay of the case through December 15, 2002 to allow for development of a final settlement document. A proposed settlement was announced by the governors of Colorado, Nebraska and Kansas on December 16, 2002. The settlement was then presented to the Special Master and an informational hearing was held in Denver on January 6, 2003. The Special Master will make his recommendation to the U.S. Supreme Court.

Emergency Management

The Nebraska-Kansas Area Office (NKAO) continued to coordinate with local jurisdictions that could potentially be impacted by flooding from large operational releases and/or dam failure. During calendar year 2002, three functional exercises were conducted and all facilities received credit for a functional exercise for the activities following Sept 11, 2001. Orientation meetings were held for all of the NKAO dams. Functional exercises were held for the Box Butte Dam Emergency Action Plan (EAP),the Norton Dam EAP, and the Merritt Dam EAP. Emergency radios have been installed at all dams. These radios will be used as a backup means of communication when notifying the local emergency management officials in the event of an emergency at the dam. Satellite phones have been purchased for both the Nebraska-Kansas Area Office and the McCook Field Office. Management and the dam operators have been trained on the use of these phones.

There was an Internal Alert declared at Davis Creek Dam on June 20, 2002, due to a magnitude 3.5 earthquake within 10 miles of the dam. The irrigation district completed the visual inspection and read the instrumentation. After no damage was found and all instruments were found to be within normal range, the internal alert was terminated.

Four functional exercises and one table top are planned in 2003. EAP Orientation meetings will be held at all NKAO dams. A program of annual meetings with local law enforcement and the facility managers has been established. Site Security Plans are scheduled to be completed by the end of 2004.

Public Safety Reviews

The Nebraska-Kansas Area Office is involved in an ongoing safety review of project facilities to identify potential safety hazards to the public and operating personnel. Safety and security reviews performed at NKAO facilities have prompted initiation of several fencing projects to control public access to facilities, especially to spillway operating decks where there are gated spillways.

The Nebraska-Kansas Area Office will be involved with emergency personnel at all NKAO facilities. A tour of our facilities will be initiated to familiarize EMT's and rescue groups to the location and hazards involved with our daily work routines as well as our inspections. Inspections can involve many people and hazards do exist. If an accident was to happen then the rescue team and EMT's can respond to the accident site informed of our location and the hazards involved.

Another safety issue is the training that takes place at different times during the year. Safety training is always a priority for NKAO employees. Training that will be emphasized this year includes Defensive Driving, Confined Space Entry, Personnel Protective Equipment, First Aid and CPR. This training will also include purchasing of protective equipment each employee needs to make their workplace environment safe.

This year, Hazardous Energy Control training is the main emphasis at each dam to train workers against the hazards of releasing stored energy; conduct annual inspections of proper procedures and to ensure implementation of the Hazardous Energy Control Program.

General Maintenance

Comprehensive Facility Reviews were conducted at Bonny, Norton, Kirwin, Webster and Cedar Bluff Dams.

Annual Site Inspections were conducted at the other 11 NKAO dams in 2002.

Technical surveys were completed at Box Butte, Cedar Bluff, Webster and Davis Creek Dams in 2002.

Escape windows were placed in basements of the dam operator residents at Cedar Bluff, Webster, Medicine Creek, Trenton and Norton Dams.

The dam operator residence at Cedar Bluff Dam was resided and reshingled. Windows were also replaced in 2002.

A program has been initiated to develop baseline air quality readings in all identified permit and non-permit required confined spaces. Readings in the piezometer wells at Bonny and Cedar Bluff Dams indicated potential problems with lack of oxygen and hazardous atmosphere.

Security enhancements continue at NKAO dams.

Video inspections of the toe drains at Sherman and Davis Creek Dams have been conducted. A program was initiated in 2001 to examine all of our toe drain systems over the next few years.

Classroom dam operator training was conducted in February of 2002 for Reclamation dam operators. On site dam operator training was conducted at Davis Creek and Box Butte Dams in 2002.

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. From 1993 to 2002, the project water supply averaged 13,700 AF, which is about 1.17 acre-foot per irrigable acre. Many irrigators supplement their water supply with private wells.

The Mirage Flats Irrigation District cooperates with the Nebraska Game and Parks Commission (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 (2,819 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 increasing the minimum reservoir level by one additional foot to elevation 3979.00 feet (3,244 AF). In return the district received an additional payment from the Commission for the 20 years left on the original agreement.

A data collection platform (DCP) 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.

The Mirage Flats Irrigation District updated their Water Management Plan in 1997, and in 1999 the district developed a Long Range Plan that outlined the mission, operation and maintenance guidelines, and future direction of the district. Past water conservation measures implemented by the district include canal lining projects, replacement of open ditch laterals with buried pipe, increased water measurement program, canal automation, remote monitoring and on-farm efficiency improvement programs. The district continues to modify and update their computer software to improve system operations, scheduling, and accounting and continued development of their web page that allows irrigators to place water orders, review water accounts, and keep updated on district operations.

2002 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 at the Mirage Flats Irrigation District Office totaled 9.71 inches, which is 57 percent of normal and the lowest ever recorded at the site. No precipitation was recorded during the first two months of the year and only 4.74 inches was recorded through July (39 percent of normal). The total inflow (15,715 AF) was between the dry- and normal-year forecasts.

From late June through late August, diversions of 12,467 AF to the Mirage Flats Canal provided irrigation water for approximately 11,092 acres, 95 percent of the service available acreage. The farm deliveries from the project water supply totaled 6,973 AF (0.60 acre-foot per irrigable acre), which is a delivery efficiency of 56 percent. The reservoir contained only 3,652

AF of water at the end of the irrigation season. Privately owned irrigation wells supplemented the project water supply.

A functional exercise of the Box Butte Dam EAP took place in April 2002 and the Annual Site Inspection of Box Butte Dam was conducted in December. On-site dam operator training took place in 2002.

New embankment measurement points were installed and surveyed along the crest of Box Butte Dam in September 2001. Another survey of the points was completed in 2002 with future surveys to be conducted every six years.

The Mirage Flats Irrigation District continued to implement water conservation measures as outlined in their Water Management Plan and their Long Range Plan. The district continued to assist irrigators with delivery improvements that provide on-farm efficiency improvements, such as relocation of turnouts, burying pipe for better access, and on-farm efficiency incentives. In 2002 the district purchased an ultrasonic flow meter which will provide an accuracy check on all the district water deliveries. The district will also use this meter to check local groundwater wells.

2003 Outlook

The project water supply is expected to be inadequate in 2003 as it has been since the early 1960's. 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. The district plans for the irrigators to continue the use of water from privately-owned irrigation wells as a supplemental supply.

The Standing Operating Procedures (SOP) for Box Butte Dam is scheduled to be updated and republished this year.

The district is currently pursuing the installation of an Automated Weather Data Network station that will assist district irrigators with irrigation scheduling. This station would provide real time weather data, soil moisture data and crop ET data.

Ainsworth Unit, Sandhills Division in Nebraska

General

Within the Ainsworth Irrigation District, there are 34,539 acres with service available. The project water supply is provided by storage of Snake River flows in Merritt Reservoir. The reservoir is filled each fall after the irrigation season to elevation 2944.0 feet. 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 will then be rapidly filled to elevation 2946.0 feet to reduce shoreline erosion around the reservoir and minimize sand accumulations on the face of the dam. This reservoir level is maintained until irrigation releases begin to draw on the pool. A minimum release of 75 cubic feet per second (cfs) should be made to the river during spring filling operations. This operation also enhances the spring fish spawn. Seepage, pickup and toe drain flow normally result in flows of up to 15 cfs below Merritt Dam. Whenever

possible, daily changes in releases to the river should be made in no more than 50 cfs increments. This will minimize adverse impacts on the Snake River trout fishery downstream of the dam.

The district has a basic water supply. If available, additional water can be purchased by the district as a supplemental supply.

2002 Summary

Precipitation, as recorded near Merritt Dam, totaled 15.50 inches, which was 77 percent of normal. November precipitation was the lowest ever recorded for the month. The inflow for the year totaled 181,594 AF. This inflow was between the dry- and normal-year forecasts. The water supply was more than adequate to meet the project's irrigation requirement. There were 90,133 AF diverted from Merritt Reservoir into Ainsworth Canal, with 61,668 AF delivered to the farm headgates (delivery efficiency of 68 percent). This was the second highest annual diversion ever into Ainsworth Canal. There were 33,740 acres of land irrigated in 2002.

The district executed several temporary water service contracts which provided a total of 619 AF of irrigation water from holding ponds located within the district's service area.

A functional exercise of the Merritt Dam EAP took place in May 2002 and the Annual Site Inspection of Merritt Dam was conducted in December.

2003 Outlook

During the winter months, the reservoir will be regulated to maintain elevation 2944.0 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. The reservoir level will be maintained from the end of April until irrigation releases begin in late June. If weather conditions or irrigation demands dictate, it may be necessary to begin filling the reservoir prior to this time. The water supply is expected to be adequate in 2003 for the irrigation of 34,500 acres.

A Comprehensive Facility Review of Merritt Dam is scheduled for 2003.

The process of renewing the long term water service contract with Ainsworth Irrigation District is beginning. The existing contract will expire in 2006. The district has stated its intent to seek Congressional authority to transfer title of the Ainsworth Unit from the United States to the district.

Sargent Unit, Middle Loup Division in Nebraska

General

With financial support from the Loup Basin Reclamation District, the Sargent Irrigation District performs the O&M of Milburn Diversion Dam and the Sargent Canal system which serves 13,939 acres. The water supply is diverted from the Middle Loup River into the Sargent Canal. under an appropriated natural-flow water right from the State of Nebraska. These diversions may exceed the natural-flow water appropriation of 202 cfs by an exchange of storage from Sherman

Reservoir, provided that water is available after all senior appropriations are satisfied, and the excess is not greater than the compensating storage releases from Sherman Reservoir.

2002 Summary

The irrigation diversions into the Sargent Canal totaled 28,611 AF (18,394 AF were delivered to the farm headgates for a delivery efficiency of 64 percent). The diversions exceeded the direct-flow water right for 34 days. Approximately 13,939 acres were irrigated. The irrigators grow corn as the principal crop, creating very high water demands in July and August. Normally these high demands cannot be met within canal capacity, so the district institutes a rationing process through the peak period, as necessary.

2003 Outlook

The Sargent Unit (Milburn Diversion Dam and Sargent Canal) is part of the Middle Loup Division, Pick-Sloan Missouri Basin Program that was transferred from the United States to the Loup Basin Reclamation District on November 22, 2002.

Farwell Unit, Middle Loup Division in Nebraska

General

With financial support from the Loup Basin Reclamation District, the Farwell Irrigation District operates and maintains the Arcadia Diversion Dam, Sherman Feeder Canal, Sherman Dam and Reservoir, and the Farwell Canal system, which serves 50,051 acres of land. Diversions are also made through the Arcadia Diversion Dam to 15,000 acres of non-project lands in the Middle Loup Public Power and Irrigation District under their appropriated natural-flow water rights.

Middle Loup Public Power and Irrigation District, Loup Basin Reclamation District, Farwell Irrigation District and Sargent Irrigation District have executed an agreement to temporarily cease diversions from the Middle Loup River when conservation storage space in Sherman Reservoir has been evacuated. The agreement was executed December 10, 1984.

During the winter months, Sherman Reservoir is normally regulated to five feet or more below the top of the conservation capacity. Doing so minimizes seepage from the reservoir into the groundwater table. Maintaining the pool below the top of conservation provides time for seeding of exposed shore areas to prevent wind erosion. The seedings also provide winter food and cover for wildlife, and spawning habitat for fish in the spring when these areas are inundated. Each spring, diversions into Sherman Feeder Canal from the Middle Loup River are regulated to fill the conservation capacity of Sherman Reservoir by late May. The gradually rising water surface in the spring is desirable for fish spawning.

Reclamation developed two wetland sites through mitigation of the Middle Loup Valley during 1995. Phase I involved construction of a 25 acre wetland near Sherman Feeder Canal. Water is diverted into the wetland via the Feeder Canal. Also, a 110 acre wetland tract was developed near Fullerton, Nebraska as Phase II of the mitigation.

2002 Summary

Diversions from the Middle Loup River at Arcadia Diversion Dam totaled 43,425 AF to the Middle Loup Public Power and Irrigation District and 117,898 AF into the Sherman Feeder Canal. During the fall of 1985 the Middle Loup Public Power and Irrigation District constructed a turnout in the Sherman Feeder Canal near mile post 11.4. The turnout diverts water directly to the Number 4 Canal. Releases to the turnout amounted to 309 AF and the losses charged as a result of these deliveries totaled 31 AF.

Sherman Feeder Canal diversions into Sherman Reservoir were started on April 15th, and the conservation capacity was filled on June 3rd. The annual precipitation at Sherman Dam totaled 23.10 inches, which is 102 percent of normal. Precipitation recorded during the first seven months of the year totaled 10.00 inches and was well below normal (65 percent). Releases into the Farwell Canals totaled 88,937 AF (54,146 AF were delivered to the farm headgates for a delivery efficiency of 61 percent). The Farwell Irrigation District reported that 48,422 acres of land were irrigated in 2002. Sherman Feeder Canal was shut off October 17th.

The Standing Operating Procedures (SOP) for Sherman Dam has been updated and was republished in September 2002.

An orientation meeting to review the Sherman Dam EAP took place in November 2002.

The Farwell Irrigation District has implemented an extensive buried pipe program to replace high loss sections of open ditch laterals. The district provides on-farm benefits with this buried pipe program by relocating turnouts and increasing the delivery water surface. The district has also taken advantage of Reclamation training opportunities by attending the Water Management Workshop and the Modern Methods of Canal Operation Course. The district is investigating canal automation opportunities for the future.

2003 Outlook

The Farwell Unit (Arcadia Diversion Dam, Sherman Feeder Canal, Sherman Dam and Reservoir, and the Farwell Canal system) is part of the Middle Loup Division, Pick-Sloan Missouri Basin Program that was transferred from the United States to the Loup Basin Reclamation District on November 22, 2002.

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 53,000 acres of project lands. Operation of the division will also provide 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

will help avoid ice damage to the soil cement on the upstream face of the dam. After the ice clears in the spring, the reservoir will be filled to conservation capacity. The North Loup Division project operation is restricted to no 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 storage reservoirs to deliver canal design capacity. 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 is normally regulated at elevation 2040.0 feet following the irrigation season and throughout the winter months. This carry-over elevation provides a minimal recreational pool while reducing increases in groundwater storage due to reservoir seepage. The reservoir is filled via Mirdan Canal, starting in April and reaching full content by the end of June. A 160-acre recreation area adjoining the reservoir was constructed and is managed by the Lower Loup Natural Resources District. The area includes a boat ramp, a handicapped fishing pier, a day-use area, a primitive camping area, shelter and a hiking path. Kent Diversion Dam is also open to day-use fishing with handicapped accessibility provided.

2002 Summary

Precipitation at Virginia Smith Dam was 15.63 inches which is 66 percent of normal and the lowest on record at the site. The inflow totaled 256,492 AF which was between the dry- and normal-year forecasts. There were 97,030 AF of water released into Mirdan Canal and 7,713 AF diverted through Kent Canal from the North Loup River. A total of 51,371 AF was diverted for district use above Davis Creek Reservoir. The farm headgate delivery was 29,446 AF which is a delivery efficiency of 57 percent. Land irrigated in 2002 totaled 32,583 acres above Davis Creek Reservoir. Reservoir inflows were bypassed during July, August, and September as required. The reservoir elevation at the end of the year was at 2239.03 feet. The Calamus Fish Hatchery used bypassed natural flows and storage from Calamus Reservoir totaling 6,780 AF during 2002.

The precipitation of 14.79 inches near Davis Creek Dam was 63 percent of normal and the lowest on record at the site. Inflow to Davis Creek Reservoir totaled 46,265 AF during 2002. Beginning in late April, Davis Creek Reservoir was filled from an elevation of approximately 2055.26 feet to a peak elevation of 2075.72 feet on June 24th using diversions from the North Loup River and Calamus Reservoir. Davis Creek Reservoir had been wintered over 15 feet above normal due to Mirdan Canal construction activities in 2001. A release of 47,928 AF was made from Davis Creek Dam into Fullerton Canal, with 28,088 AF delivered to the farm headgates (59 percent delivery efficiency). There were 20,425 acres irrigated below Davis Creek Reservoir. The reservoir elevation at the end of 2002 was near the normal wintering level at 2041.81 feet.

An orientation meeting to review the Virginia Smith Dam and Davis Creek Dam EAPs took place in November 2002 and the Annual Site Inspections for Virginia Smith and Davis Creek Dams were conducted in December.

On-site dam operator training was conducted at Davis Creek Dam in 2002.

A video examination of the toe drain system for Davis Creek Dam was completed in November 2000. It revealed several locations where the drain has collapsed. Plans and specifications have been completed for the toe drain repairs with a contract award expected early in 2003.

In December of 2002, the irrigation district reported a small depression along the right side of the river outlet works stilling basin wall at Virginia Smith Dam. Safety of Dams personnel in both Denver and Billings were notified and discussions are being conducted with the Technical Service Center.

The Twin Loups Irrigation District and Reclamation entered into an agreement in 1997 to improve the canal operations of the Fullerton Canal system. This agreement provided cost share opportunities for the installation of three pneumatic bladder overflow check structures which will improve the operational flexibility of Fullerton Canal by reducing the need for operational spills and reducing the downstream seepage. The installations were completed in the fall of 1999. In 2001 the district entered into an agreement with Reclamation for an increased measurement program in which Reclamation provided cost share funds for the purchase of an ultrasonic meter and other approved water conservation measures. The ultrasonic meter will allow the district to verify the accuracy of the district's 750+ propeller meters and to spot check problem deliveries.

2003 Outlook

Filling of Calamus Reservoir will continue through late winter and early spring. The reservoir will be allowed to fill to an elevation of 2244.0 feet (top of conservation capacity) by late March or April. This reservoir level will be maintained in order to minimize shoreline erosion until demands begin to draw on the reservoir. Bypasses of inflows will be made during July, August and September. In the fall the reservoir will be filled to an elevation of approximately 2240.0 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 32,600 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 via Mirdan Canal. Water will be sufficient to irrigate an estimated 20,400 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 this season.

The fish hatchery demand for 2003 is expected to be similar to that of the last few years with approximately 6,000 AF passing through the hatchery.

A Comprehensive Facility Review of Virginia Smith Dam is scheduled for 2003 as well as a Periodic Facility Review of Davis Creek Dam.

The district has expressed an interest in pursuing some automatic water control devices along the Mirdan Canal system to improve operations. Remote monitoring equipment will be installed at key system sites to improve operations, scheduling, and accounting. Planned remote monitoring sites include Kent Canal, Mirdan Canal below Virginia Smith Dam, Mirdan Canal at the Davis Creek inflow, and Fullerton Canal below Davis Creek Dam.

CHAPTER III - REPUBLICAN RIVER BASIN

Armel Unit, Upper Republican Division in Colorado

General

Normal reservoir operations for Bonny Reservoir are primarily for recreation and fish and wildlife support, although water will be 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 will make Bonny storage water available to 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 normal operation pattern of Bonny Reservoir, with a slowly rising or stable pool, enhances fish spawning in the spring and provides excellent fishing opportunities during the summer and hunting conditions each fall.

2002 Summary

The annual precipitation total of 9.17 inches at Bonny Dam was only 53 percent of normal and the second lowest on record. The annual computed inflow of 6,996 AF to Bonny Reservoir was below the dry-year forecast and the lowest ever recorded at this site. Below normal inflows were recorded during every month of the year. January, February, April, May, June, October, November and December inflows were the lowest on record for the respective months since first filling. The reservoir level was 10.3 feet below the top of conservation at the first of the year. Due to dry conditions during the first four months of the year, the reservoir level increased only 1.0 foot to a maximum reservoir level of 3662.79 feet on April 16 th. Dry conditions continued throughout the year with Bonny Dam recording a maximum one day precipitation total of 1.01 inches overnight on September 12 th. Precipitation during the month of May was the second lowest ever recorded at the site. July precipitation was the lowest ever recorded for the month (.04 inches) and no precipitation was recorded in December. The reservoir level gradually decreased throughout the year. The minimum pool elevation of 3658.64 feet was recorded on December 31st and was an historical low for the reservoir. The reservoir elevation at the end of the year was 13.4 feet below the top of conservation.

The Colorado Water Commissioner did not direct reservoir inflows from the South Fork of the Republican River and Landsman Creek passed through Bonny Reservoir into Hale Ditch. Likewise, the Colorado Department of Natural Resources did not request storage releases for irrigation purposes into Hale Ditch.

Toe drains were added at Bonny Dam in 1988 and 1994 to address Safety of Dams concerns. These drains were constructed to minimize the potential for dam failure due to piping when the reservoir elevation exceeds 3691.0 feet. An Early Warning System (EWS) was selected as the preferred hydrologic alternative for the danger of the darn overtopping. The EWS will greatly reduce the threat to downstream populations if the dam were to overtop and fail due to large floods.

An orientation meeting to review the Bonny Dam EAP took place in July 2002 and a Comprehensive Facility Review of Bonny Dam was conducted in August.

The Standing Operating Procedures (SOP) for Bonny Dam was republished in 2002.

The Technical Service Center conducted an investigation of a series of holes located on the downstream side of Bonny Dam in November of 2001 to determine whether or not these were sinkholes. Preliminary indications from the investigation indicate that these were not sinkholes and not a threat to the integrity of the dam. A final report is expected in early 2003.

2003 Outlook

Water stored in Bonny Reservoir will be available for sale to Hale Ditch and other private irrigators under short-term water service contracts executed with the state.

Inflows will be stored during the winter until filling of the conservation pool is certain. Releases can be made during this period to maintain a constant reservoir elevation when filling of the reservoir is imminent or if icing were to become a problem.

A tabletop exercise of the Bonny Dam EAP is scheduled for 2003. On-site dam operator training is also scheduled at Bonny Dam this year.

Frenchman Unit, Frenchman-Cambridge Division in Nebraska

General

The Culbertson Canal and the Culbertson Extension Canal systems serve 9,295 acres in the Frenchman Valley Irrigation District and 11,695 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.

The normal operation of Enders Reservoir, with the gradual rise in water surface during the spring months, provides desirable fish spawning conditions. Irrigation releases will normally deplete the conservation storage by late summer, thereby limiting the fishing and recreational usage.

2002 Summary

The annual precipitation total of 10.82 inches at Enders Dam was well below normal (57 percent) and the lowest ever recorded. The 2002 inflow into Enders Reservoir of 7,432 AF was below the dry-year forecast. This inflow was the lowest ever recorded at the site. All twelve months recorded record low inflows during 2002. Due to extensive groundwater pumping above the reservoir, the inflow was only 12 percent of the average historical preconstruction runoff at the Enders Dam site (60,700 AF from 1929-1947). This year was the 35th consecutive year with below-normal inflows in which the conservation pool did not fill. A total of 2,040 AF of water was conserved between the 2001 and 2002 irrigation seasons by pumping seepage back into the reservoir. The reservoir level was 25.6 feet below the top of conservation at the first of the year. The reservoir pool gradually increased with late winter and spring inflows peaking at 3090.74 feet (21.6 feet below the top of conservation) on June 5th. **This was the lowest annual peak since initial**

filling of the reservoir. Reservoir releases for irrigation began on June 28 th and were discontinued on July 22nd. Reservoir inflows were bypassed from July 23rd through August ll th as directed by the Nebraska Department of Natural Resources. Approximately 4,145 AF of water was released from Enders Reservoir for irrigation and by the end of the season the reservoir level had reached 3084.62 feet. The greatest 24-hour precipitation total recorded during the year at Enders Dam was 1.56 inches overnight on August 26th. The end of the year reservoir level was 26.2 feet below the top of conservation, the lowest ever recorded for December 31 st since initial reservoir filling. The Corps of Engineers determined that $9,000 in flood prevention benefits were realized from the operation of Enders Reservoir during 2002.

Farm delivery averaged about 0.34 foot per irrigated acre in the Frenchman Valley Irrigation District. Some farmers were able to supplement their project water supply from private irrigation wells. The Frenchman Valley Irrigation District reports that approximately 8,571 acres received water in 2002. Farm delivery efficiency was 32 percent for the district. The H&RW Irrigation District did not divert water into Culbertson Extension Canal in 2002 due to the extremely low water supply. This was the first time since deliveries began in 1961 that the district did not deliver water. H&RW Irrigation District storage water in Enders Reservoir was carried over into 2003.

Construction of a filtered drainage collection pipe and monitoring system in the existing open drain below Enders Dam was completed in the spring of 2002. This Safety of Dams modification was deemed necessary to control seepage and improve the level of safety, ensuring the continuation of project benefits and public safety downstream from the dam. The installation of additional piezometer wells was completed in 1999 and data collection was initiated. Several years of data collection will likely be necessary to better evaluate the need for additional modifications. The need for additional corrective measures will be evaluated in conjunction with the next Comprehensive Facility Review (CFR), which is scheduled in 2004. With the possibility of reservoir level restrictions and/or additional modifications, Enders Dam emergency planning has been given a higher priority.

Wire rope and attachment hardware for the spillway gates were replaced by Reclamation personnel in 2002.

An orientation meeting to review the Enders Dam EAP took place in April and the Annual Site Inspection of Enders Dam was conducted in October.

The Frenchman Valley and H&RW Irrigation Districts updated their water conservation plans in 1999 with technical assistance provided by Reclamation. Conservation measures implemented by the district include the replacement of open ditch laterals with buried pipe, on-farm efficiency ¡mprovements, the installation of a new type of automatic water level control gate, and a remote monitoring program.

In 2002, the district (along with Reclamation) provided support for a Limited Irrigation Demonstration Project with the University of Nebraska Extension Service. The demonstration site was located just east of Culbertson and demonstrated various irrigation strategies with a short water supply. The districts have expressed an interest in other lateral **pipe projects that will be investigated in 2003.**

2003 Outlook

The fall and early winter inflows into Enders Reservoir were below the dry-year forecast. If reasonable minimum inflow conditions prevail, the project water supply is expected to experience a shortage of about 74,800 AF. Most probable inflow conditions are expected to be inadequate by 47,000 AF and reasonable maximum inflow conditions by 15,700 AF, to irrigate the 9,295 acres in the Frenchman Valley Irrigation District and 11,695 acres in the H&RW Irrigation District. Approximately 2,000 AF are expected to be conserved by pumping seepage water back into Enders Reservoir.

The Standing Operating Procedures (SOP) for Enders Dam is being updated and is expected to be republished in 2003.

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

General

During the spring months, Swanson, Hugh Butler, and Harry Strunk Lakes normally have a rising or stable pool which enhances the spawning of northern pike and walleye. These lakes provide excellent opportunities for fishing, water sports, and recreation.

Service is provided for Frenchman-Cambridge Irrigation District by Meeker-Driftwood Canal to 16,562 acres; Red Willow Canal to 4,877 acres; Bartley Canal to 6,435 acres; and Cambridge Canal to 17,297 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 laterals which were physically or economically feasible with pipe laterals which has significantly increased both system and on-farm efficiencies.

2002 Summary

The annual precipitation total of 10.17 inches at Trenton Dam was 51 percent of normal and the second lowest on record. No precipitation was recorded during the months of July and December. The inflow of 17,491 AF to Swanson Lake was well below the dry-year forecast. This was the lowest annual computed inflow ever recorded at the lake exceeding the previous low by nearly 11,000 AF. The inflow was below normal for eleven of the twelve months. The computed inflows for the months of February, March, April, May, June, September, November and December were the lowest ever recorded for the respective months at Swanson Lake. The reservoir level began the year approximately 25.5 feet below the top of conservation pool. The reservoir level gradually increased during the spring and peaked at 2730.75 feet on May 8th (approximately 21.2 feet below full). This was the lowest annual peak since first filling of the reservoir. Irrigation releases began on June 24th into Meeker-Driftwood Canal. No release was made to the river for irrigation in Bartley Canal. Due to the limited water supply, irrigation releases were shut off on July 24th , the earliest ever. The reservoir shut off elevation of 2725.0 feet was reached at this time. Less than 10,000 AF of water was released from Swanson Lake for irrigation. On August 26, 2002, the water surface level of Swanson Lake reached an historical low of 2724.30 feet. Over five inches of rain was reported directly upstream of Swanson Lake on the evening of August 26th . The storm runoff increased the level of the lake two feet (4,040 AF in storage). The peak average daily inflow was approximately 1,350 cfs. At the end of the year the

reservoir level was 26.5 feet below the top of conservation at 2725.51 feet. This was the lowest end of year storage ever recorded at Swanson Lake.

Swanson Lake storage, along with inflows and river pickup flows were not sufficient in furnishing a full water supply to each irrigable acre of the project lands served by the Meeker-Driftwood and Bartley Canal systems. The Frenchman-Cambridge Irrigation District diverted 9,894 AF into Meeker-Driftwood Canal to irrigate 11,715 acres. Water deliveries were the lowest ever recorded. The farm headgate delivery was 5,755 AF for a delivery efficiency of 58 percent.

The annual precipitation total of 11.67 inches at Red Willow Dam was 59 percent of normal and the lowest on record. Precipitation during July totaled .07 inch, the lowest ever recorded for the month. The inflow of 10,980 AF into Hugh Butler Lake was below the dry-year forecast and the lowest ever recorded at the site. The computed inflow was below normal during all twelve months. November and December computed inflows were the lowest ever recorded for the respective month. The reservoir level at the first of the year was 13.6 feet below the top of conservation. Inflows gradually increased the level of the reservoir to a peak of 2570.73 feet (11.1 feet below full) on June 4th. Irrigation releases began on June 23rd and due to the limited water supply were discontinued on July 23td, the earliest ever. The reservoir shut off elevation of 2561.0 feet was reached at this time. Approximately 9,300 AF was released from the reservoir for irrigation in Red Willow and Bartley Canals. Reservoir inflows were bypassed on July 24th and 25th as directed by the Nebraska Department of Natural Resources. On August 8, 2002 the water surface level of Hugh Butler Lake reached an historical low of 2560.72 feet. The greatest precipitation event recorded at Red Willow Dam in 2002 was 2.33 inches overnight on September 12th. The level of Hugh Butler Lake at the end of the year was 19.1 feet below the top of conservation, the lowest end of year storage ever recorded. The Corps of Engineers determined that $9,000 of flood damages were prevented by the operation of Hugh Butler Lake.

The water supply was inadequate to meet the diversion requirements for Red Willow and Bartley Canals. The district diverted an historic low 3,429 AF of water to irrigate 4,235 acres of land served by Red Willow Canal and 3,584 AF into Bartley Canal for 2,505 acres. Delivery efficiency was 57 and 62 percent respectively for the two canals.

The annual precipitation total of 10.52 inches at Medicine Creek Dam was 51 percent of normal and the lowest on record. July precipitation totaled .21 inch, the lowest on record for the month. The inflow of 29,038 AF was below the dry-year forecast and the lowest annual total ever recorded. The computed inflow was below normal during all twelve months with record lows recorded during May, September, October, November and December. The reservoir level at the beginning of 2002 was 6.5 feet below the top of conservation. The reservoir pool gradually increased, filling the conservation pool on May 8th (2366.1 feet). The reservoir level continued to increase into early June peaking at 2366.55 feet on June 7th (.5 foot into the flood pool). Irrigation releases began on June 18th dropping the reservoir level from the flood pool on June 22nd. The greatest 24-hour precipitation event recorded at Medicine Creek Dam was .99 inches on June 17th. High irrigation demands during July and August reduced reservoir storage significantly. Irrigation releases were shut off on August 21St with nearly 29,300 AF of water released from the reservoir for irrigation. A total of 159 acre-feet was bypassed through Cambridge Canal from July 18th through August 5th for senior water right appropriation at the direction of the Nebraska Department of Natural Resources. The Nebraska Department of Natural Resources also directed that some reservoir inflow be bypassed into Medicine Creek for livestock watering following the irrigation season. Releases began on September 3td and ended on October 30th. **Harry Strunk**

Lake was 12.4 feet below the top of conservation at the end of the year. The Corps of Engineers determined that the reservoir prevented $20,000 in flood damages.

The water supply was limited with 20,993 AF of water diverted to irrigate 15,533 acres of land served by the Cambridge Canal (farm delivery efficiency was 62 percent).

Replacement of an existing open drainage ditch with pipe to enhance seepage collection at Red Willow Dam was completed in 2002. Low lake levels at Swanson Lake permitted the construction of a small dike across the intake channel to the canal intake structure and the inspection of the canal outlet works conduit upstream of the emergency gate. A significant amount of debris and sediment were also removed from the intake structure and intake channel.

An EAP orientation meeting took place in August of 2002 for Red Willow, Medicine Creek and Trenton Dams. Annual Site Inspections were conducted in March at Red Willow and Medicine Creek Dams, and April at Trenton Dam.

The Frenchman-Cambridge Irrigation District is providing on-farm efficiency incentives by the relocation of turnouts, assisting with burying pipe for improved service, participating in a surge valve loaner program, assisting with water right transfers, and sponsoring various water management seminars and field days. The district purchased an ultrasonic meter in 2000 through an agreement with Reclamation that permits the district to verify the accuracy of the propeller meters (over 450 in the district) and check other problem delivery sites.

In 2002, the district (along with Reclamation) provided support for a Limited Irrigation Demonstration Project with the University of Nebraska Extension Service. The demonstration site was located just north of Holbrook and demonstrated various irrigation strategies with a short water supply. The project received water from the Cambridge Canal and a field day was well attended. The district plans to again support this demonstration in 2003.

2003 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 48,400 AF. Minimal shortages of 1,400 AF may be expected under most probable inflow conditions.

The Standing Operating Procedures (SOPs) for both Red Willow and Medicine Creek Dams are being updated and are expected to be republished in 2003.

Periodic Facility Reviews of Red Willow and Medicine Creek Dams are also scheduled for 2003.

The district will continue working with Reclamation on a remote monitoring program. This program will allow the district to remotely monitor wasteways and other key system measurement sites that will improve system operations and accounting. In 2002 the district and Reclamation completed installations on four wasteways and one parshall flume. Additional sites will be added in 2003. The district is also investigating the opportunities for replacing some of the smaller sections of main canals with buried pipe.

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.

New Area-Capacity Tables for Keith Sebelius Lake became effective on January 1, 2002. The revised tables are a result of a sedimentation survey conducted in September 2000.

2002 Summary

The annual precipitation at Norton Dam totaled 12.13 inches, which is only 49 percent of normal and the lowest on record. Precipitation during July totaled .42 inch, the lowest ever record for the month. The total inflow of 5,751 AF, was between the dry- and normal-year forecasts. The reservoir level was 7.5 feet below the top of conservation on December 31, 2001. Norton Dam received only 1.11 inches of precipitation during the first four months of the year. Inflows gradually increased the reservoir level to a peak elevation of 2297.33 feet on April 12th (7.0 feet below full pool). Irrigation releases began on June 26th with demands reducing the level of Keith Sebelius Lake to 2292.25 feet by the end of the season on August 9th. Norton Dam recorded 4.53 inches of precipitation during October, the second highest ever recorded for the month with overnight totals of 1.42 inches on the 1st and 1.58 inches on the 22". Only 4,715 AF was released from the reservoir for irrigation during 2002. Keith Sebelius Lake was 12.7 feet below the top of conservation (2291.65 feet) at the end of the year.

The district delivered 1,889 AF to approximately 5,558 acres of farmland. Farm delivery averaged 0.46 acre-foot per irrigated acre from the project water supply. Water was being supplied from privately-owned irrigation wells to conserve reservoir water storage for future use. The city of Norton used 616 AF of municipal water during 2002.

A Comprehensive Facility Review was conducted at Norton Dam in May and a functional exercise of the Norton Dam EAP took place in November 2002.

A Safety of Dams recommendation was made in 2000 concerning the seepage through the left abutment and around the outlet works house at Norton Dam. Technical Service Center personnel inspected the seepage areas in June 2001 and recommended consideration of monitoring improvement and additional instrumentation.

The Almena Irrigation District completed a Water Conservation Plan with technical assistance from Reclamation in 2000. Past conservation implementation activities included replacing high loss sections of open ditch lateral with buried pipe and an updated computer system. The district provides on-farm efficiency improvements by the relocation and/or improvement of delivery service and participates in a surge valve loaner program. The district and Reclamation installed remote monitoring equipment in the spring of 2002 on one of the district's main wasteways which will improve system operations, scheduling, and accounting. The district also purchased an ultrasonic flow meter that will provide a means to check district deliveries and also will be used to check groundwater wells in the area.

2003 Outlook

The district expects to deliver water to approximately 5,000 acres. If 2003 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 13,800 AF. If normal inflow into the lake and normal rainfall over the irrigated area occur in 2003, a shortage of 6,500 AF may be experienced. Requirements for the city of Norton will be met in full in 2003.

The Standing Operating Procedures (SOP) for Norton Dam has been updated and is scheduled to be republished in 2003. On-site dam operator training is also scheduled for Norton Dam this year.

The surge valve program will continue in 2003. Replacing open ditch laterals with buried pipe that will reduce seepage losses, lessen maintenance requirements, and provide improvements in on-farm efficiencies will continue.

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 22,935 acres in the Bostwick Irrigation District in Nebraska, and 13,378 acres in the Kansas-Bostwick Irrigation District No. 2 above Lovewell Reservoir. These flows, together with White Rock Creek flows and Lovewell Reservoir storage, furnish a water supply for 29,122 acres below Lovewell Reservoir in the Kansas-Bostwick Irrigation District.

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 Kansas-Bostwick Irrigation District.

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. At the request of the State of Nebraska, releases of 30 cfs for a maximum 5-day period may be made to relieve icing conditions in the river.

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

The Kansas Department of Wildlife and Parks has requested that the Kansas-Bostwick Irrigation District 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.

2002 Summary - Bostwick Division - Harlan County Lake Operations

The annual precipitation at Harlan County Dam totaled 16.86 inches of rainfall, which is 74 percent of normal. The 2002 inflow of 60,094 AF was below the dry-year forecast and the lowest ever recorded. The inflow was below normal for all twelve months with record lows recorded during June, July, August, November and December. A 10 cfs release was required during January and February in accordance to the environmental assessment and the annual operating plan.

Harlan County Lake began 2002 approximately 5.7 feet below the top of conservation pool, at 1940.03 feet. Inflows during the first six months of the year gradually filled the reservoir pool to a peak of 1942.88 feet on June 16th (top of conservation pool is elevation 1945.73 feet). Harlan County Dam recorded 1.39 inches of rain overnight on June 15th with a peak average daily inflow of approximately 1,500 cfs. Irrigation releases began on June 8 th and continued through August 21st. High irrigation demands during the season reduced reservoir storage significantly lowering the pool level to 1932.84 feet. The reservoir level continued to decline reaching a minimum of 1932.08 feet on October 22thi. The dam recorded 1.88 inches of precipitation overnight on October 22nd (greatest one day total in 2002) and a record high of 5.36 inches for the month. The level of Harlan County Lake at the end of 2002 was 13.6 feet below the top of conservation. Harlan County Lake prevented $50,000 of downstream flood damages during 2002 according to the Corps of Engineers.

Approximately 35,393 irrigated acres of the Bostwick District in Nebraska and the Kansas-Bostwick District above Lovewell Dam were furnished a full water supply. A total of 44,153 AF (approximately 77 percent of total inflow) was delivered to Lovewell Reservoir through the Courtland Canal.

2002 Summary - Bostwick Division - Nebraska

The Bostwick Irrigation District in Nebraska diverted 43,863 AF for the irrigation of 22,935 acres. Farm delivery efficiency averaged 50 percent in the district.

The district finalized their Water Conservation Plan in 2002. The district continued to replace open ditch laterals with buried pipe to reduce losses and improve system operations. In 2002 the district also expanded the use of a canal sealant on the Franklin and Superior Canals to reduce seepage losses. Increased remote monitoring sites on the Republican River between Harlan County Dam and the Superior-Courtland Diversion Dam will assist in water scheduling for storage releases. The district has also implemented new, stricter water ordering policies as a water conservation measure and purchased an ultrasonic meter that will be used to check district deliveries.

2002 Summary - Bostwick Division - Kansas

The 2002 precipitation at Lovewell Dam totaled 21.16 inches, which was 78 percent of normal. Lovewell Reservoir began 2002 with a water surface elevation only 2.0 feet below the top of conservation. Inflows from White Rock Creek slowly increased the reservoir level to within 1.0 foot of full pool in early April. Diversion of Republican River flows into Lovewell Reservoir began at this time and continued into early June. The diversions combined with inflows from White Rock Creek to fill the reservoir conservation pool on April 30th **(elevation 1582.6 feet), and**

in filling the reservoir to an elevation of 1584.94 feet on June 3 lll. Releases were made into the lower Courtland Canal at this time and the reservoir level began to decline. Lovewell Dam received 2.77 inches of rainfall from June 10th through June 13th. Runoff from these storms increased the level of Lovewell Reservoir approximately .4 foot reaching a peak reservoir level of 1585.10 feet on June 13th (2.5 feet into the flood pool). Irrigation releases dropped the reservoir pool from the flood pool on June 30th. Well below normal precipitation resulted in heavy irrigation demands during both July and August. The reservoir pool decreased to 1572.74 feet by the end of the season on August 22nd. Diversions of Republican River natural flows into Lovewell Reservoir continued after irrigation releases had ended. These diversions via Courtland Canal were maintained through December. The water surface elevation gradually increased to 1580.04 feet on December 31, 2002 (2.6 feet below the top of active conservation).

The Kansas-Bostwick Irrigation District diverted a total of 72,634 AF to serve 12,458 acres above Lovewell Dam and 26,991 acres below Lovewell Dam. Farm delivery efficiency averaged 61 percent in the district.

An orientation meeting to review the Lovewell Dam EAP took place in July and the Annual Site Inspection of Lovewell Dam was conducted in March.

In 2002 the district continued to replace open ditch laterals with buried pipe. The district and Reclamation also provided assistance to Kansas State University for a sprinkler irrigation demonstration located northeast of Courtland, Kansas. Courtland Canal supplies water for this demonstration and a field day was held at the site in the fall. The district is also providing support to KSU for the installation of a sub-surface drip irrigation project.

2003 Outlook - Bostwick Division

The storage in Harlan County Lake and Lovewell Reservoir and flows of the Republican River and White Rock Creek may be inadequate by as much as 80,500 AF in meeting the full dry-year irrigation requirement for the Bostwick lands.

Diversions from the Republican River via Courtland Canal will continue through the winter and again in early spring to insure that Lovewell Reservoir is filled prior to the irrigation season.

The Bostwick Irrigation District in Nebraska will continue replacing open ditch laterals with buried pipe, canal lining projects, and providing on-farm efficiency improvements. Remote monitoring equipment is scheduled to be installed in 2003 on two of the operational wasteways on Franklin Canal, which will also provide water scheduling improvements.

The Kansas Bostwick Irrigation District submitted an updated Water Conservation Plan in 1999. The main implementation activity of the district is the replacement of open ditch laterals with buried pipe. The district will replace high loss sections of open ditch with buried pipe by utilizing district funds and cost share funds with irrigators. The district will also cost share on improvements initiated by irrigators that provide benefits to the district and to the irrigator. The district also assists irrigators with the relocation of turnouts and placement of pipe for on-farm improvements. The district has policies in place concerning cost share programs, water ordering policies, and water right transfers.

A new ramp flume will be constructed early in 2003 on Courtland Canal just downstream of Lovewell Dam which will improve water scheduling and accounting.

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, water sports, fish spawning, and preservation of waterfowl species.

2002 Summary

The annual precipitation total of 15.05 inches at Kirwin Dam was 64 percent of normal. The inflow of 11,398 AF was between the dry- and normal-year forecasts. Kirwin Reservoir was 7.5 feet below the top of conservation pool at the first of the year. The late winter and spring inflows increased the reservoir level to a peak elevation of 1722.74 feet (6.5 feet below full) on April 16th. Irrigation releases began on June 24th and continued through August 23rd reducing the pool level 6.8 feet. During 2002, 19,452 AF was released into Kirwin Canal. The reservoir level continued to gradually decrease after the irrigation season and at the end of the year was at 1715.23 feet (14.0 feet below the top of conservation). The greatest 24-hour precipitation event occurred overnight on October 1st with 1.30 inches recorded. The reservoir prevented $9,000 in flood damages as determined by the Corps of Engineers.

Demands for project water were met in full during the irrigation season. A total of 8,573 acres received project water during 2002 with 10,892 AF delivered to farms. Farm delivery efficiency was 56 percent.

A new prefabricated generator building has been placed next to the spillway control house. Installation of a new generator and removal of the old generator was completed in early 2002.

A Comprehensive Facility Review of Kirwin Dam was conducted in July and an orientation meeting to review the Kirwin Dam EAP took place in October 2002.

The Kirwin Irrigation District completed a Water Conservation Plan with technical assistance from Reclamation in 2001. The Kirwin Irrigation District continues to focus its implementation activities on replacing high loss section of open ditch lateral with buried pipe. The district has funded these projects using districts' funds, Reclamation funds, and individual landowner contributions. Projects have not only eliminated seepage loss, but improved district operations and provided on-farm efficiency improvements. The district continues to explore other funding sources for conservation measures. The district has also notified irrigators that there may be cost share opportunities for projects that will improve on-farm efficiencies, such as relocating turnouts or piping laterals. The district currently has a list of potential pipe projects that are awaiting funding opportunities.

2003 Outlook

Carry-over storage along with most probable inflow forecast from the North Fork of the Solomon River will be adequate to irrigate district lands. However, under dry-year forecasted inflows, a shortage of about 3,200 AF may be experienced.

A functional exercise of the Kirwin Dam EAP is scheduled for 2003. On-site dam operator training is also scheduled for Kirwin Dam this year.

In 2003 the district has scheduled to replace a number of smaller laterals that will eliminate the need for lateral maintenance in these areas, will provide on-farm improvements with improved and relocated deliveries, and will improve water accounting with the use of flowmeters.

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.

2002 Summary

In 2002, the precipitation at Webster Dam was 74 percent of normal (17.47 inches). The inflow of 11,214 AF was between the dry- and normal-year forecasts. Webster Reservoir began 2002, 5.8 feet (elevation 1886.69 feet) below the top of conservation pool. The reservoir pool gradually increased with late winter and early spring inflows to a peak of 1888.27 feet (4.2 feet below full) on May 8th. Irrigation releases began on June 23rd and continued through August 22nd reducing the pool level to 1879.98 feet. Webster Dam received 1.51 inches of rainfall overnight on August 8th and another 1.10 inches overnight on August 12th. Approximately 20,192 AF was released for irrigation. The reservoir level was 13.3 feet below the top of conservation on December 31, 2002. The Corps of Engineers determined that the reservoir prevented $10,000 in flood damages.

The district diverted 14,768 AF for irrigation of 5,454 acres. Farm deliveries totaled 6,650 AF for an efficiency of 45 percent. Project water demands were met in full.

A new prefabricated generator building was placed at the spillway and a new generator was installed in 2002.

A Comprehensive Facility Review of Webster Dam was conducted in July and an orientation meeting to review the Webster Dam EAP took place in December.

The Webster Irrigation District completed a Water Conservation Plan with technical assistance from Reclamation in 2001. Open ditch Osborne Lateral 16.3 was placed in buried pipe in the spring of 2002. These projects were funded with district funds, funds provided by an **agreement with Reclamation, and individual landowner contributions.**

2003 Outlook

The carry-over storage and the flows in the South Fork Solomon River are expected to be inadequate under the dry-year forecast to irrigate the district lands in 2003. Under dry-year inflows a shortage of 7,800 AF may be experienced. No shortage is expected under normal-year inflows.

The Standing Operating Procedures (SOP) for Webster Dam is scheduled to be updated and republished this year. On-site dam operator training is also scheduled for Webster Dam in 2003.

A functional exercise of the Webster Dam EAP is scheduled for 2003.

The district will continue to explore opportunities to cost share with Reclamation and district irrigators for the replacement of open ditch laterals with buried pipe. Osborne Lateral 19.8 is scheduled to be placed in buried pipe in the spring of 2003. The district is also investigating the possibility of installing some remote monitoring equipment to improve water scheduling and accounting.

Glen Elder Unit, Solomon Division in Kansas

General

Releases from Waconda Lake will be 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.

The water service contract with Beloit, Kansas, provides for the annual use of up to 2,000 AF of Waconda Lake storage. Water is measured at the Glen Elder Dam river outlet works. In any year that the city's water supply is insufficient and there is surplus water in Waconda Lake, such additional water may be released for the city at a rate of $15.00 per acre-foot.

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. Based on the current State of Kansas Certificate of Appropriation, water usage is not to exceed 737 AF per calendar year.

The water service contract with the Glen Elder Irrigation District provides for the use of up to 18,000 AF of storage water each year. Based on the current State of Kansas Certificate of Appropriation, water usage is not to exceed 15,170 AF per calendar year. Water is released and measured through the river outlet works.

The available facilities along the shores of Waconda Lake and the large water surface area afford opportunities to thousands of people for picnics, sightseeing, recreation, water sports, hunting, and fishing.

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

2002 Summary

The annual precipitation total of 20.45 inches at Glen Elder Dam was 79 percent of normal. The inflow of 63,467 AF was below the dry-year forecast. Waconda Lake began the year only 1.1 feet below the top of conservation. River releases varying from 20 to 250 cfs were made during the first six months of the year to maintain the reservoir pool near this level. Glen Elder Dam received 2.86 inches of rainfall from May 22" through the 27th. Runoff from the event increased the storage in Waconda Lake approximately 7,000 AF (.56 foot in elevation), with a peak average daily inflow of nearly 1,000 cfs. The reservoir level remained within the conservation capacity and a flood release was not required. The lake level peaked at elevation 1454.60 feet on June 1st (1.0 foot below the top of conservation). Irrigation releases began in earnest on June 5th and continued through September 13th reducing the lake level to 1451.93 feet. Glen Elder Dam recorded a record 6.22 inches of precipitation during October including 2.69 inches of rainfall during the first three days of the month. Runoff from the early October rainfall increased the storage in Waconda Lake approximately 2,600 AF (.24 foot), with a peak average daily inflow of 1,100 cfs. On December 31, 2002 the lake level was 1451.73 feet (3.9 feet below full). The Corps of Engineers determined that Waconda Lake operations prevented $20,000 in flood damages during 2002.

Approximately 47,900 AF of water was released from Glen Elder Dam in 2002. Storage releases of 13,114 AF combined with natural flow releases of 7,168 AF for the irrigation of 7,092 acres in the Glen Elder Irrigation District. Storage releases totaling 348 AF were made for the City of Beloit, with an additional 6,098 AF bypassed for quality control as directed by the State Water Commissioner. Releases to the Mitchell County Rural Water District No. 2 totaled 790 AF.

An orientation meeting to review the Glen Elder Dam EAP took place in July 2002 and the Annual Site Inspection of Glen Elder Dam was conducted in March.

A new pump for the Cawker City pump station was installed in the spring of 2002.

2003 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 Glen Elder Irrigation District estimates that approximately 7,000 acres will be irrigated in 2003. The storage in Waconda Lake and flows in the North and South Forks of the Solomon River will furnish an adequate water supply to the district. The active conservation pool will be allowed to fill prior to the irrigation season. 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 at about two feet below the top of the conservation pool during the winter.

New Area-Capacity Tables for Waconda Lake will become effective on January 1, 2003. These revised tables resulted from a sedimentation survey conducted in July 2001.

The Standing Operating Procedures (SOP) for Glen Elder Dam is scheduled to be updated and republished this year.

A functional exercise of the Glen Elder Dam EAP is scheduled for 2003.

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. No water had been available for delivery to the district since 1978. Reformulation of the Cedar Bluff Unit in October of 1992 allowed the Cedar Bluff Irrigation District to begin the proceedings to disband, and the Kansas Water Office and Kansas Department of Wildlife and Parks to acquire the use and control of portions of the reservoir conservation capacity. The district completed all activities necessary to accomplish disbandment in 1994. A "designated operating pool" has been established for Cedar Bluff Reservoir and includes the following sub allocation pools: The City of Russell's existing water storage right which remained unchanged; an artificial recharge pool under control of the Kansas Water Office; and a fish, wildlife and recreation pool under control of the Kansas Department of Wildlife and Parks. The "designated operating pool" consists of water stored between the dead pool and elevation 2109.05 feet. 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 Kansas Department of Wildlife and Parks and the Kansas Water Office.

New Area-Capacity Tables for Cedar Bluff Reservoir became effective on January 1, 2002. These revised tables resulted from a sedimentation survey conducted in September 2000.

2002 Summary

The annual precipitation total at Cedar Bluff Dam was 13.38 inches which is 63 percent of normal. The inflow (9,288 AF) was between the dry- and normal-year forecasts. At the beginning of the year, the level of Cedar Bluff Reservoir was 2143.62 feet (top of active conservation is 2144.00 feet). Dry conditions and minimal inflows prevailed throughout most of the year. The peak reservoir level recorded during the year was 2143.68 feet on February ll th. The greatest 24-hour precipitation event occurred overnight on July 21 st with 1.66 inches of rainfall. The peak average daily inflow resulting from the storm was approximately 400 cfs. Another 2.17 inches of rain was recorded during the first three days of October which again resulted in a peak average daily inflow of nearly 400 cfs. By December 31, 2002 the reservoir level had decreased to 2139.94 feet (4.1 feet below the top of active conservation). Cedar Bluff Reservoir was estimated to have prevented $1,000 in flood damages by the Corps of Engineers.

The State of Kansas used the fish hatchery facility located below Cedar Bluff Dam for waterfowl habitat with 522 AF released to the facility. A total of 1,170 AF of water was released from Cedar Bluff Reservoir during 2002 for the City of Russell.

A Comprehensive Facility Review of Cedar Bluff Dam was conducted in May and an orientation meeting to review the Cedar Bluff Dam EAP took place in July 2002.

The Standing Operating Procedures (SOP) for Cedar Bluff Dam was republished in 2002.

2003 Outlook

Storage in Cedar Bluff Reservoir on December 31, 2002 was in the joint use pool. The Kansas Department of Wildlife and Parks estimates up to 400 AF of water could be used in the operations of the fish hatchery facility.

On-site dam operator training is scheduled at Cedar Bluff Dam in 2003. A functional exercise of the Cedar Bluff Dam EAP is also scheduled this year.

TABLE 1

RESERVOIR DATA - NIOBRARA, LOWER PLATTE AND KANSAS RIVER BASINS

RESERVOIR		CAPACITY ALLOCATIONS 1/ DEAD	LIVE CONSERVATION Inactive	Active	FLOOD CONTROL
Box Butte	- Elevation Ft.	3969.0	3976.5	4007.0	---
	Total Acre-feet	640	2,275	31,060	---
	Net Acre-feet	640	1,635	28,785	---
Merritt	- Elevation Ft.	2875.0	2896.0	2946.0	---
	Total Acre-feet	1,614	6,800	74,486	---
	Net Acre-feet	1,614	5,186	67,686	---
Sherman	- Elevation Ft.	2118.5	2129.0	2162.3	---
	Total Acre-feet	3,839	10,496	69,076	---
	Net Acre-feet	3,839	6,657	58,580	---
Calamus	- Elevation Ft.	2185.0	2213.3	2244.0	---
	Total Acre-feet	817	24,646	127,400	---
	Net Acre-feet	817	23,829	102,754	---
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	1,418	2,134	41,340	170,160
	Net Acre-feet	1,418	716	39,206	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	- Elevation Ft.	2710.0	2720.0	2752.0	2773.0
Lake	Total Acre-feet	2,118	12,430	112,214	246,291
	Net Acre-feet	2,118	10,312	99,784	134,077
Hugh Butler	- Elevation Ft.	2552.0	2558.0	2581.8	2604.9
Lake	Total Acre-feet	5,185	8,921	36,224	85,070
	Net Acre-feet	5,185	3,736	27,303	48,846
Harry Strunk	- Elevation Ft.	2335.0	2343.0	2366.1	2386.2
Lake	Total Acre-feet	4,160	8,859	35,705	88,420
	Net Acre-feet	4,160	4,699	26,846	52,715
Keith Sebelius	- Elevation Ft.	2275.0	2280.4	2304.3	2331.4
Lake	Total Acre-feet	1,636	3,993	34,510	133,740
	Net Acre-feet	1,636	2,357	30,517	99,230
Harlan County	- Elevation Ft.	1885.0	1927.0 3/	1945.73	1973.5
Lake	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	- Elevation Ft.	1407.8	1428.0	1455.6	1488.3
Lake 4/	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.)		41,553	286,974	1,552,043	3,909,611
Total Net Acre-feet		41,553	245,421	1,265,069	2,357,568

1/ Includes space for sediment storage.

2/ Includes total active storage for Box Butte, Merritt, Sherman, Calamus, and Davis Creek Reservoirs.

3/ Bottom of irrigation pool for Harlan County Lake is 1932.5 feet.

4/ New Area-Capacity Tables in effect 1-1-03. Sedimentation surveys conducted in July 2001.

SUMMARY OF 2002 OPERATIONS

MIRAGE FLATS PROJECT
BOX BUTTE RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	MIRAGE FLATS CANAL Diversions To Canal (AF)	Delivered To Farms. (AF)
Jan.	1,274	61	84	0.00	12,843	0	0
Feb.	1,307	61	110	0.00	13,979	0	0
Mar.	1,964	81	206	0.53	15,676	0	0
Apr.	2,060	71	356	0.44	17,309	0	0
May	1,261	80	514	2.07	17,976	0	0
June	265	841	707	0.89	16,893	1,014	365
July	26	7,347	685	0.81	8,687	7,645	4,158
Aug.	2,932	7,498	318	2.51	3,803	3,808	2,450
Sep.	1,454	80	177	1.48	5,020	0	0
Oct.	1,008	61	149	0.40	5,818	0	0
Nov.	1,120	60	88	0.19	6,790	0	0
Dec.	1,044	61	56	0.39	7,717	0	0
TOTAL	15,715	16,262	3,450	9.71	–	12,467	6,973

NOTE - Acres irrigated 2002: Mirage Flats Canal - 11,092 acres.

SANDHILLS DIVISION
AINSWORTH UNIT
MERRITT RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (lathes)	End of Month Content (AF)	AINSWORTH CANAL Release To Canal (AF)	Delivered To Farms (AF)
Jan.	14,275	13,492	240	0.04	88,831	0	0
Feb.	14,062	13,757	305	0.14	68,831	0	0
Mar.	16,870	15,608	425	1.07	69,668	0	0
Apr.	15,246	9,699	729	1.87	74,486	0	0
May	13,889	12,284	1,310	2.59	74,781	2,993	157
June	12,159	16,106	1,724	0.92	89,110	13,204	4,733
July	13,978	38,192	1,595	1.28	43,301	38,295	29,133
Aug.	16,730	30,403	955	3.13	28,673	29,778	23,817
Sep.	17,573	6,589	653	2.49	39,004	5,863	3,828
Oct.	17,349	922	589	1.58	54,842	0	0
Nov.	14,761	893	422	0.03	68,288	0	0
Dec.	14,702	14,112	318	0.36	68,560	0	0
TOTAL	181,594	172,057	9,265	15.50	–	90,133	61,668

NOTE - Acres irrigated 2002: Ainsworth Canal - 33,740 acres.

MIDDLE LOUP DIVISION
MIDDLE LOUP UNIT
SARGENT UNIT

Month	SARGENT CANAL Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	0	0
Feb.	0	0
Mar.	0	0
Apr.	0	0
May	0	0
June	4,009	1,321
July	14,335	10,681
Aug.	8,549	5,666
Sep.	1,718	726
Oct.	0	0
Nov.	0	0
Dec.	0	0
TOTAL	28,611	18,394

NOTE-Acres irrigated 2002: Sargent Canal - 13,939 acres.

MIDDLE LOUP PUBLIC POWER CANALS

Month	Diversions To Canals (AF)	Diversions To Sherman Feeder Canal (AF)
Jan.	0	0
Feb.	0	0
Mar.	0	0
Apr.	496	9,005
May	4,629	20,033
June	6,872	20,386
July	16,092	9,697
Aug.	12,161	21,953
Sep.	3,175	24,657
Oct.	0	12,187
Nov.	0	0
Dec.	0	0
TOTAL	43,425	117,898

Middle Loup P.P. Canals - 14,177 acres.

FARWELL UNIT
SHERMAN RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	FARWELL CANALS Release To Canals (AF)	Delivered To Farms (AF)
Jan.	382	1,309	257	0.36	51,057	0	0
Feb.	660	1,291	316	0.01	50,110	0	0
Mar.	942	1,309	552	0.87	49,191	0	0
Apr.	8,204	1,303	924	1.26	55,188	0	0
May	16,322	1,533	1,169	4.07	68,788	1,140	0
June	17,073	18,538	1,838	1.90	65,685	17,994	3,610
July	9,818	41,897	1,556	1.53	32,050	40,758	29,852
Aug.	21,442	27,673	802	8.44	25,017	26,572	19,184
Sep.	23,848	3,273	857	1.08	44,935	2,473	1,500
Oct.	11,796	1,083	731	3.45	54,917	0	0
Nov.	504	1,303	420	0.08	53,698	0	0
Dec.	0	1,309	385	0.07	52,004	0	0
TOTAL	110,991	101,821	9,407	23.10	–	88,937	54,146

Farwell Canals - 48,422 acres.

NORTH LOUP DIVISION
CALAMUS RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (lathes)	End of Month Content (AF)	Release to Calamus Fish Hatch. (AF)	ABOVE DAVIS CREEK MIRDAN CANAL Release to Canal (AF)	Canal Use (AF)	Delivered To Farms (AF)
Jan.	21,609	18,926	453	0.11	110,934	324	0	0	0
Feb.	19,012	19,099	566	0.14	110,281	293	0	0	0
Mar.	23,377	22,003	1,001	1.62	110,654	315	0	0	0
Apr.	22,972	9,350	1,683	1.37	122,593	529	0	0	0
May	23,932	15,981	2,219	1.86	128,325	477	13,509	1,331	380
June	20,747	20,658	2,951	2.23	125,463	760	17,240	4,720	2,399
July	20,977	55,269	3,718	1.18	87,455	780	36,329	25,834	15,772
Aug	21,077	43,985	1,722	3.59	62,825	889	24,436	16,623	9,465
Sep.	19,030	26,071	909	0.11	54,875	738	5,516	2,863	1,430
Oct.	22,217	6,105	922	3.08	70,065	773	0	0	0
Nov.	21,057	1,966	579	0.18	88,577	516	0	0	0
Dec.	20,485	5,111	379	0.16	103,572	586	0	0	0

NOTE - Acres irrigated 2002: Mirdan Canal - 32,583 acres.

NORTH LOUP DIVISION (Continued)
DAVIS CREEK RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (lathes)	End of Mo. Content (AF)	BELOW DAVIS CREEK FULLERTON CANAL Release To Canal (AF)	Delivered To Farms (AF)
Jan.	0	399	66	0.00	14,421	0	0
Feb.	30	353	80	0.56	14,018	0	0
Mar.	6	282	139	0.12	13,803	0	0
Apr.	1,932	1,067	227	1.35	14,241	443	0
May	14,235	3,977	345	3.05	24,154	3,074	1,372
June	12,858	7,692	591	1.64	28,729	6,534	2,523
July	8,739	21,243	576	0.45	15,649	20,327	14,646
Aug.	5,730	13,240	258	2.87	7,881	13,785	7,863
Sep.	2,412	3,675	151	1.49	6,467	3,765	1,684
Oct.	194	0	111	3.19	6,550	0	0
Nov.	128	0	61	0.02	8,617	0	0
Dec.	1	244	35	0.05	6,339	0	0
TOTAL	46,265	52,172	2,640	14.79	–	47,928	28,088

NOTE - Acres irrigated 2002: Fullerton Canal - 20,425 acres.

TABLE 2
SUMMARY OF 2002 OPERATIONS

UPPER REPUBLICAN DIVISION
ARMEL UNIT

BONNY RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Outflow To Hale Ditch (AF)
Jan.	992	430	142	0.29	23,710	0
Feb.	1,049	389	165	0.13	24,205	0
Mar.	1,154	397	237	0.49	24,725	0
Apr.	1,080	357	630	0.51	24,818	0
May	612	369	826	0.38	24,235	0
June	286	357	1,024	1.21	23,140	0
July	189	369	1,324	0.04	21,636	0
Aug.	585	369	1,042	3.02	20,810	0
Sep.	177	357	678	1.18	19,952	0
Oct.	259	369	370	1.68	19,472	0
Nov.	437	357	252	0.24	19,300	0
Dec.	176	369	155	0.00	18,952	0
TOTAL	6,996	4,489	6,845	9.17	--	0

TABLE 2
SUMMARY OF 2002 OPERATIONS

FRENCHMAN-CAMBRIDGE DIVISION
FRENCHMAN UNIT

ENDERS RESERVOIR — End of CULBERTSON CANAL — CULBERTSON EXT.CANAL

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	Month Content (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	821	61	56	0.09	12,624	0	0	0	0
Feb.	1,037	56	69	0.12	13,536	0	0	0	0
Mar.	922	61	114	0.32	14,283	0	0	0	0
Apr.	888	60	293	0.94	14,818	2,151	129	0	0
May	703	61	356	0.71	15,104	1,917	325	0	0
June	254	286	485	1.82	14,587	1,119	208	0	0
July	199	4,032	504	1.69	10,250	3,679	2,142	0	0
Aug.	638	204	359	2.77	10,325	98	88	0	0
Sep.	312	60	259	0.39	10,318	0	0	0	0
Oct.	610	61	126	1.79	10,741	0	0	0	0
Nov.	559	60	116	0.17	11,124	0	0	0	0
Dec.	489	61	67	0.01	11,485	0	0	0	0
TOTAL	7,432	5,C63	2,804	10.82	–	8,964	2,892	0	0

NOTE: Acres irrigated 2002: Culbertson Canal - 8,571 acres; Culbertson Extension Canal - 0 acres.

FRENCHMAN-CAMBRIDGE DIVISION (Continued)
MEEKER-DRIFTWOOD UNIT

SWANSON LAKE — End of MEEKER-DRIFTWOOD — BARTLEY CANAL

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	Month Content (AF)	Release To Canal (AF)	Delivered To Farms (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	2,024	61	157	0.21	25,817	0	0	0	0
Feb.	2,581	56	189	0.10	28,153	0	0	0	0
Mar.	3,990	61	321	0.56	31,761	0	0	0	0
Apr.	2,521	60	862	1.23	33,360	0	0	0	0
May	201	61	1,092	0.91	32,408	0	0	0	0
June	665	875	1,616	2.22	30,582	932	38	321	48
July	517	9,253	1,593	0.00	20,253	8,962	5,717	3,263	2,168
Aug.	4,500	61	1,180	2.70	23,512	0	0	0	0
Sep.	0	60	984	0.32	22,468	0	0	0	0
Oct.	68	61	390	1.74	22,085	0	0	0	0
Nov.	215	60	336	0.18	21,904	0	0	0	0
Dec.	209	61	188	0.00	21 864	0	0	0	0
TOTAL	17,491	10,730	8,908	10.17	–	9,894	5,755	3,584	2,216

NOTE: Acres irrigated 2002: Meeker-Driftwood Canal - 11,715 acres; Bartley Canal - 2,505 acres.

FRENCHMAN-CAMBRIDGE DIVISION (Continued)
RED WILLOW UNIT

HUGH BUTLER LAKE — End of — RED WILLOW CANAL

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	Month Content (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	989	246	76	0.20	18,625	0	0
Feb.	931	222	94	0.15	19,240	0	0
Mar.	1,226	246	149	0.23	20,071	0	0
Apr.	1,152	238	468	1.12	.20,517	0	0
May	1,003	246	583	1.22	20,691	0	0
June	687	1,490	891	2.53	18,997	441	53
July	839	8,023	746	0.07	11,067	2,988	1,907
Aug.	895	246	568	1.08	11,148	0	0
Sep.	805	238	421	2.60	11,294	0	0
Oct.	822	246	165	2.30	11,705	0	0
Nov.	827	238	135	0.17	12,159	0	0
Dec.	804	246	77	0.00	12,640	0	0
TOTAL	10,980	11,925	4,373	11.67	–	3,429	1,960

NOTE - Acres irrigated 2002: Red Willow Canal - 4,235 acres.

FRENCHMAN-CAMBRIDGE DIVISION (Continued)
CAMBRIDGE UNIT

HARRY STRUNK LAKE — End of — CAMBRIDGE CANAL

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	Month Content (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	2,649	61	102	0.30	27,921	0	0
Feb.	2,447	56	117	0.15	30,195	0	0
Mar.	3,020	61	209	0.25	32,945	0	0
Apr.	2,925	60	671	0.89	35,139	0	0
May	2,426	264	854	1.52	36,447	0	0
June	2,678	5,345	1,177	2.54	32,603	3,392	1,256
July	3,732	16,219	1,016	0.21	19,100	11,403	7,822
Aug.	2,226	8,313	646	0.99	12,367	6,198	3,931
Sep.	999	125	417	0.43	12,824	0	0
Oct.	1,808	61	188	2.91	14,383	0	0
Nov.	2,087	60	150	0.31	16,260	0	0
Dec.	2,041	61	85	0.02	18,155	0	0
TOTAL	29,038	30,686	5,632	10.52	–	20,993	13,009

NOTE - Acres irrigated 2002: Cambridge Canal - 15,533 acres.

TABLE 2
SUMMARY OF 2002 OPERATIONS

KANASKA DIVISION
ALMENA UNIT

KEITH SEBELIUS LAKE

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release To City Of Norton (AF)	ALMENA CANAL Diversions To Canal (AF)	ALMENA CANAL Delivered To Farms (AF)
Jan.	453	62	110	0.25	20,881	31	0	0
Feb.	450	54	128	0.21	21,149	26	0	0
Mar.	523	64	220	0.15	21,388	33	0	0
Apr.	749	81	795	0.50	21,261	51	194	0
May	829	91	881	2.46	21,118	60	148	0
June	491	809	1,394	1.13	19,406	81	586	144
July	434	2,752	1,295	0.42	15,793	88	2,004	1,222
Aug.	498	1,459	999	1.42	13,833	71	1,133	523
Sep.	252	94	694	0.68	13,297	65	0	0
Oct.	640	79	360	4.53	13,498	48	0	0
Nov.	242	60	194	0.38	13,486	30	0	0
Dec.	190	63	103	0.00	13,510	32	0	0
TOTAL	5,751	5,668	7,173	12.13	--	616	4,065	1,889

NOTE: Acres irrigated 2002: Almena Canal - 5,558 acres.

BOSTWICK DIVISION
FRANKLIN UNIT

HARLAN COUNTY LAKE
Data from Corps of Engineers

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	FRANKLIN CANAL Release To Canal (AF)	FRANKLIN CANAL Delivered To Farms (AF)	NAPONEE CANAL Release To Canal (AF)	NAPONEE CANAL Delivered To Farms (AF)
Jan.	6,555	615	705	0.21	248,110	0	0	0	0
Feb.	8,529	555	815	0.16	255,269	0	0	0	0
Mar.	9,600	24	1,161	0.09	263,684	0	0	0	0
Apr.	9,342	0	3,444	0.77	269,582	0	0	0	0
May	10,334	0	3,760	3.54	276,156	0	0	0	0
June	5,464	16,766	6,287	1.83	258,567	4,746	1,424	342	175
July	458	56,302	6,772	0.60	195,951	14,782	6,694	1,550	874
Aug.	1,265	24,256	6,561	2.66	166,399	5,103	2,931	552	356
Sep.	1,845	0	6,948	1.27	161,296	0	0	0	0
Oct.	5,135	0	3,928	5.36	162,503	0	0	0	0
Nov.	1,329	0	2,163	0.37	161,669	0	0	0	0
Dec.	238	0	1,444	0.00	160,463	0	0	0	0
TOTAL	60,094	98,518	43,988	16.86	–	24,631	11,049	2,444	1,405

NOTE: Acres irrigated 2002: Franklin Canal - 11,254 acres; Naponee Canal - 1,628 acres.

BOSTWICK DIVISION (Continued)
SUPERIOR-COURTLAND UNIT

Month	FRANKLIN PUMP CANAL Diverted To Canal (AF)	FRANKLIN PUMP CANAL Delivered To Farms (AF)	SUPERIOR CANAL Diverted To Canal (AF)	SUPERIOR CANAL Delivered To Farms (AF)	COURTLAND CANAL - ABOVE LOVEWELL Total Diversion (AF)	NEBRASKA USE Total (AF)	NEBRASKA USE Delivered To Farms (AF)	KANSAS USE Diversion To Canal (AF)	KANSAS USE Delivered To Farms (AF)
Jan.	0	0	0	0	0	0	0	0	0
Feb.	0	0	0	0	0	0	0	0	0
Mar.	0	0	0	0	0	0	0	0	0
Apr.	0	0	0	0	4,693	0	0	0	0
May	0	0	0	0	7,355	0	0	0	0
June	503	324	2,748	769	8,974	434	341	5,850	1,854
July	2,011	1,316	6,419	3,560	28,299	1,388	1,234	13,543	7,944
Aug.	759	496	2,085	1,206	17,999	441	379	6,684	3,588
Sep.	0	0	0	0	3,749	0	0	0	0
Oct.	0	0	0	0	5,714	0	0	0	0
Nov.	0	0	0	0	5,526	0	0	0	0
Dec.	0	0	0	0	5,433	0	0	0	0
TOTAL	3,273	2,136	11,252	5,535	87,742	2,263	1,954	26,077	13,386

NOTE: Acres irrigated 2002: Franklin Pump Canal - 2,106 acres; Superior Canal - 5,979 acres.
Courtland Canal-Nebraska use - 1,968 acres.
Courtland Canal-Kansas use - 12,458 acres.

BOSTWICK DIVISION (Continued)
COURTLAND UNIT

LOVEWELL RESERVOIR

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)	COURTLAND (Below) Release To Canal (AF)	COURTLAND (Below) Delivered To Farms (AF)
Jan.	546	0	546	6	161	0.40	30,453	0	0
Feb.	1,072	0	1,072	6	191	0.53	31,328	0	0
Mar.	1,250	0	1,250	12	348	0.56	32,218	0	0
Apr.	1,283	3,043	4,326	17	741	2.41	35,786	0	0
May	2,516	5,470	7,986	25	944	4.09	42,803	0	0
June	822	1,686	2,508	8,366	1,339	3.36	35,606	9,697	4,529
July	1,158	11,412	12,570	27,585	1,354	0.57	19,237	24,676	18,064
Aug.	2,738	9,023	11,761	15,400	798	1.71	14,800	12,184	7,973
Sep.	68	2,488	2,556	24	588	1.99	16,744	0	0
Oct.	679	3,572	4,251	13	244	5.13	20,738	0	0
Nov.	750	3,878	4,628	12	344	0.39	25,010	0	0
Dec.	123	3,581	3,704	12	188	0.02	28,514	0	0
TOTAL	13,005	44,153	57,158	51,478	7,240	21.16	--	46,557	30,566

NOTE: Acres irrigated 2002: Courtland Canal below Lovewell - 26,991 acres.

TABLE 2
SUMMARY OF 2002 OPERATIONS

SOLOMON DIVISION
KIRWIN UNIT

	KIRWIN RESERVOIR					KIRWIN CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release To Canal (AF)	Delivered To Farms (AF)
Jan.	1,089	0	264	0.50	65,318	0	0
Feb.	1,495	0	345	0.38	66,468	0	0
Mar.	1,872	0	548	0.69	67,792	0	0
Apr.	2,062	0	1,536	1.00	68,318	0	0
May	1,891	0	1,850	2.82	68,359	0	0
June	694	1,460	2,511	2.16	65,082	1,699	373
July	738	11,201	2,798	0.92	51,821	11,156	6,564
Aug.	446	6,768	1,972	1.19	43,527	6,597	3,955
Sep.	167	0	1,652	1.15	42,042	0	0
Oct.	718	0	593	4.02	42,167	0	0
Nov.	215	0	497	0.22	41,885	0	0
Dec.	11	0	259	0.00	41,637	0	0
TOTAL	11,398	19,429	14,825	15.05	–	19,452	10,892

NOTE: Acres irrigated 2002: Kirwin Canal - 8,573 acres.

SOLOMON DIVISION (Continued)
WEBSTER UNIT

	WEBSTER RESERVOIR					OSBORNE CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	1,470	0	235	0.52	57,493	0	0
Feb.	1,523	0	273	0.41	58,743	0	0
Mar.	1,933	0	470	0.59	60,206	0	0
Apr.	2,166	0	1,246	1.29	61,126	0	0
May	1,624	0	1,558	1.77	61,192	0	0
June	959	2,043	2,072	3.64	58,036	1,017	25
July	327	11,455	2,304	1.72	44,604	8,822	4,046
Aug.	682	6,694	1,356	3.26	37,236	4,929	2,579
Sep.	0	0	1,213	0.70	36,023	0	0
Oct.	381	0	453	3.48	35,951	0	0
Nov	128	0	391	0.08	35,688	0	0
Dec.	21	0	212	0.01	35,497	0	0
TOTAL	11,214	20,192	11,783	17.47	--	14,768	6,650

NOTE: Acres irrigated 2002: Osborne Canal - 5,454 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 (AF)	Storage Release (AF)	Quality Bypass (AF)	Storage Release (AF)	Controlled Releases (AF)	Mitchell Co. RWD No. 2 (AF)
Jan.	6,955	14,362	**784**	0.77	220,024	0	0	0	14,305	57
Feb.	5,957	4,217	921	0.69	220,843	0	0	0	4,166	51
Mar.	4,363	2,513	1,616	0.61	221,077	0	500	0	1,949	64
Apr.	8,104	1,594	4,594	2.05	222,993	0	919	311	300	64
May	13,147	1,906	5,290	3.33	228,944	0	827	419	599	61
June	8,673	4,051	8,751	2.03	224,815	0	208	1,301	2,467	75
July	3,130	8,675	8,959	1.39	210,311	0	0	6,559	2,022	94
Aug.	2,904	5,192	5,830	2.11	202,193	24	16	3,598	1,470	84
Sep.	401	1,972	6,358	1.05	194,264	324	336	926	311	75
Oct.	5,393	1,165	2,169	6.22	196,323	0	1,107	0	0	58
Nov.	2,090	1,127	1,722	0.13	195,564	0	1,073	0	0	54
Dec.	2,350	1,165	860	0.07	195,889	0	1,112	0	0	53
TOTAL	63,467	47,939	47,854	20.45	–	348	6,098	13,114	27,589	790

NOTE: Acres irrigated 2002: Glen Elder District - 7,092 acres.

SMOKY HILL DIVISION
ELLIS UNIT

	CEDAR BLUFF RESERVOIR						
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release to City of Russell (AF)	Release To Fish Hatchery (AF)
Jan.	680	0	612	0.50	169,921	0	0
Feb.	719	0	651	0.13	169,989	0	0
Mar.	247	4	1,059	0.01	169,173	0	4
Apr.	2,091	21	3,155	1.76	168,088	0	21
May	1,352	0	3,441	1.42	165,999	0	0
June	800	3	4,930	1.55	161,866	0	3
July	2,514	391	5,215	1.86	158,774	435	0
Aug.	0	780	4,337	1.58	153,657	735	0
Sep.	0	60	3,569	0.62	150,028	0	60
Oct.	884	205	1,311	3.74	149,396	0	205
Nov.	0	176	1,144	0.09	148,076	0	176
Dec.	1	53	2,134	0.12	145,890	0	53
TOTAL	9,288	1,693	31,558	13.38	–	1,170	522

TABLE 3

ACRES IRRIGATED IN 2002 AND ESTIMATES FOR 2003

Irrigation District and Canal	Acres With Service Available	Acres Irrigated in 2002	Estimated Acres to be Irrigated in 2003
Mirage Flats Irrigation District			
Mirage Flats Canal	11,662	11,092	9,500
Ainsworth Irrigation District			
Ainsworth Canal	34,539	33,740	34,000
Sargent Irrigation District			
Sargent Canal	13,939	13,939	- - -
Farwell Irrigation District			
Farwell Canal	50,051	48,422	- - -
Twin Loups Irrigation District			
Above Davis Creek	32,583	32,583	32,600
Below Davis Creek	20,425	20,425	20,400
Total Twin Loups Irrigation District	53,008	53,008	53,000
Frenchman Valley Irrigation District			
Culbertson Canal	9,295	8,571	8,500
H & RW Irrigation District			
Culbertson Extension Canal	11,695	0	0
Frenchman-Cambridge Irrigation District			
Meeker-Driftwood Canal	16,562	11,715	5,000
Red Willow Canal	4,877	4,235	1,500
Bartley Canal	6,435	2,505	1,500
Cambridge Canal	17,297	15,533	15,500
Total Frenchman-Cambridge Irrigation District	45,171	33,988	23,500
Almena Irrigation District			
Almena Canal	5,764	5,558	5,000
Bostwick Irrigation District in Nebraska			
Franklin Canal	11,262	11,254	9,200
Naponee Canal	1,628	1,628	1,400
Franklin Pump Canal	2,106	2,106	1,900
Superior Canal	5,972	5,979	4,700
Courtland Canal (Nebraska)	1,967	1,968	1,100
Total Bostwick Irrigation Dist. in Nebraska	22,935	22,935	18,300
Kansas-Bostwick Irrigation District			
Courtland Canal above Lovewell	13,378	12,458	9,500
Courtland Canal below Lovewell	29,122	26,991	20,500
Total Kansas-Bostwick Irrigation District	42,500	39,449	30,000
Kirwin Irrigation District			
Kirwin Canal	11,465	8,573	8,500
Webster Irrigation District			
Osborne Canal	8,537	5,454	5,300
Glen Elder Irrigation District	7,092	7,092	7,100
TOTAL PROJECT USES	327,653	291,821	202,700
Non-Project Uses			
Middle Loup Public Power & Irrig. Dist. Canals	15,000	14,177	- - -
Hale Ditch	700	0	700
TOTAL NON-PROJECT USES	15,700	14,177	700
TOTAL PROJECT AND NON-PROJECT	343,353	305,998	203,400

BOX BUTTE RESERVOIR OPERATION ESTIMATES - 2003

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIREMENT MEAN CFS	RELEASE REQUIREMENT 1000 AF	RESERVOIR SPILL 1000 AF	RESERVOIR SHORTAGE 1000 AF	END OF MONTH ELEV FT	END OF MONTH CONT 1000 AF	RESERVOIR CHANGE 1000 AF
REASONABLE MINIMUM INFLOW CONDITIONS											
JAN	20	1.2	1.2	0.1	2	0.1	0.0	0.0	3988.1	8.7	1.0
FEB	25	1.4	1.5	0.1	2	0.1	0.0	0.0	3989.6	9.9	1.2
MAR	33	2.0	2.5	0.2	2	0.1	0.0	0.0	3991.5	11.6	1.7
APR	29	1.7	4.1	0.3	2	0.1	0.0	0.0	3992.8	12.9	1.3
MAY	21	1.3	4.9	0.4	5	0.3	0.0	0.0	3993.4	13.5	0.6
JUN	12	0.7	6.1	0.4	119	7.1	0.0	0.0	3985.3	6.7	-6.8
JUL	7	0.4	7.0	0.3	226	13.9	0.0	10.3	3978.9	3.2	-3.5
AUG	15	0.9	6.3	02	226	13.9	0.0	13.2	3978.9	3.2	0.0
SEP	17	1.0	4.6	0.2	40	2.4	0.0	1.6	3978.9	3.2	0.0
OCT	20	1.2	3.4	0.1	2	0.1	0.0	0.0	3981.0	4.2	1.0
NOV	24	1.4	1.8	0.1	2	0.1	0.0	0.0	3983.2	5.4	1.2
DEC	20	1.2	1.1	0.1	2	0.1	0.0	0.0	3984.8	6.4	1.0
TOTAL		14.4	44.4	2.5		38.3	0.0	25.1			-1.3
MOST PROBABLE INFLOW CONDITIONS											
JAN	23	1.4	1.1	0.1	2	0.1	0.0	0.0	3988.3	8.9	1.2
FEB	31	1.7	1.3	0.1	2	0.1	0.0	0.0	3990.1	10.4	1.5
MAR	39	2.4	2.3	02	2	0.1	0.0	0.0	3992.4	12.5	2.1
APR	35	2.1	3.8	0.3	2	0.1	0.0	0.0	3994.1	14.2	1.7
MAY	26	1.6	4.5	0.4	3	0.2	0.0	0.0	3995.1	15.2	1.0
JUN	13	0.8	5.6	0.5	71	4.2	0.0	0.0	3991.1	11.3	-3.9
JUL	8	0.5	6.4	0.4	210	12.9	0.0	4.7	3978.9	3.2	-8.1
AUG	20	1.2	5.7	0.2	164	10.1	0.0	9.1	3978.9	3.2	0.0
SEP	20	1.2	4.2	0.1	29	1.7	0.0	0.6	3978.9	3.2	0.0
OCT	24	1.5	3.1	0.1	2	0.1	0.0	0.0	3981.5	4.5	1.3
NOV	29	1.7	1.7	0.1	2	0.1	0.0	0.0	3984.2	6.0	1.5
DEC	24	1.5	1.0	0.1	2	0.1	0.0	0.0	3986.2	7.3	1.3
TOTAL		17.6	40.6	2.6		29.8	0.0	14.4			-0.4
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	28	1.7	1.0	0.1	2	0.1	0.0	0.0	3988.7	9.2	1.5
FEB	38	2.1	1.2	0.1	2	0.1	0.0	0.0	3990.9	11.1	1.9
MAR	49	3.0	2.1	0.2	2	0.1	0.0	0.0	3993.7	13.8	2.7
APR	44	2.6	3.4	0.3	2	0.1	0.0	0.0	3995.8	16.0	2.2
MAY	34	2.1	4.1	0.4	3	0.2	0.0	0.0	3997.1	17.5	1.5
JUN	18	1.1	5.1	0.5	47	2.8	0.0	0.0	3995.2	15.3	-22
JUL	8	0.5	5.8	0.4	135	8.3	0.0	0.0	3985.9	7.1	-8.2
AUG	24	1.5	5.2	0.2	104	6.4	0.0	1.2	3978.9	3.2	-3.9
SEP	25	1.5	3.8	0.1	18	1.1	0.0	0.0	3979.5	3.5	0.3
OCT	29	1.8	2.8	0.1	2	0.1	0.0	0.0	3982.6	5.1	1.6
NOV	37	2.2	1.5	0.1	2	0.1	0.0	0.0	3985.9	7.1	2.0
DEC	31	1.9	0.9	0.1	2	0.1	0.0	0.0	3988.2	8.8	1.7
TOTAL		22.0	36.9	2.6		19.5	0.0	1.2			1.1

MERRITT RESERVOIR OPERATION ESTIMATES - 2003

	INFLOW		EVAPORATION		RELEASE REQUIREMENT CANAL	RIVER	TOTAL		RESERVOIR REQUIREMENT SPILL	SHORTAGE	END OF MONTH RESERVOIR 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	228	14.0	1.2	0.3	0.0	1.0	16	1.0	12.5	0.0	2944.0	68.8	0.2
FEB	248	13.8	1.5	0.3	0.0	1.0	18	1.0	12.5	0.0	2944.0	68.8	0.0
MAR	255	15.7	2.1	0.5	0.0	4.6	75	4.6	7.8	0.0	2945.0	71.6	2.8
APR	262	15.6	3.4	0.8	0.0	4.5	76	4.5	7.4	0.0	2946.0	74.5	2.9
MAY	254	15.6	4.7	1.1	3.3	4.6	128	7.9	6.6	0.0	2946.0	74.5	0.0
JUN	240	14.3	5.9	1.4	7.5	3.0	176	10.5	2.4	0.0	2946.0	74.5	0.0
JUL	241	14.8	6.7	1.4	32.9	3.0	584	35.9	0.0	0.0	2937.2	52.0	-22.5
AUG	250	15.4	5.9	0.9	30.6	3.0	546	33.6	0.0	0.0	2926.7	32.9	-19.1
SEP	244	14.5	4.7	0.6	8.4	3.0	192	11.4	0.0	0.0	2928.4	35.4	2.5
OCT	247	15.2	3.9	0.6	0.0	1.0	16	1.0	0.0	0.0	2935.9	49.0	13.6
NOV	237	14.1	2.2	0.4	0.0	1.0	17	1.0	0.0	0.0	2941.3	61.7	12.7
DEC	224	13.8	1.5	0.3	0.0	1.0	16	1.0	5.4	0.0	2944.0	68.8	7.1
TOTAL		176.8	43.5	8.6	82.7	30.7		113.4	54.6	0.0			0.2
MOST PROBABLE INFLOW CONDITIONS													
JAN	246	15.1	1.1	0.2	0.0	1.0	16	1.0	13.7	0.0	2944.0	68.8	0.2
FEB	268	14.9	1.3	0.3	0.0	1.0	18	1.0	13.6	0.0	2944.0	68.8	0.0
MAR	276	17.0	1.9	0.4	0.0	4.6	75	4.6	9.2	0.0	2945.0	71.6	2.8
APR	282	16.8	3.1	0.7	0.0	4.5	76	4.5	8.7	0.0	2946.0	74.5	2.9
MAY	273	16.8	4.2	1.0	2.9	4.6	122	7.5	8.3	0.0	2946.0	74.5	0.0
JUN	260	15.5	5.3	1.3	6.4	3.0	158	9.4	4.8	0.0	2946.0	74.5	0.0
JUL	262	16.1	6.1	1.4	28.1	3.0	506	31.1	0.0	0.0	2939.9	58.1	-16.4
AUG	270	16.6	5.3	1.0	26.3	3.0	477	29.3	0.0	0.0	2933.6	44.4	-13.7
SEP	264	15.7	4.2	0.7	7.2	3.0	171	10.2	0.0	0.0	2936.0	49.2	4.8
OCT	268	16.5	3.5	0.7	0.0	1.0	16	1.0	0.0	0.0	2942.2	64.0	14.8
NOV	257	15.3	2.0	0.4	0.0	1.0	17	1.0	9.1	0.0	2944.0	68.8	4.8
DEC	242	14.9	1.4	0.3	0.0	1.0	16	1.0	13.6	0.0	2944.0	68.8	0.0
TOTAL		191.2	39.3	8.4	70.9	30.7		101.6	81.0	0.0			0.2
REASONABLE MAXIMUM INFLOW CONDITIONS													
JAN	259	15.9	1.0	0.2	0.0	1.0	16	1.0	14.5	0.0	2944.0	68.8	0.2
FEB	283	15.7	1.2	0.3	0.0	1.0	18	1.0	14.4	0.0	2944.0	68.8	0.0
MAR	293	18.0	1.7	0.4	0.0	4.6	75	4.6	10.2	0.0	2945.0	71.6	2.8
APR	299	17.8	2.8	0.7	0.0	4.5	76	4.5	9.7	0.0	2946.0	74.5	2.9
MAY	289	17.8	3.8	0.9	2.3	4.6	112	6.9	10.0	0.0	2946.0	74.5	0.0
JUN	274	16.3	4.8	1.2	5.2	3.0	138	8.2	6.9	0.0	2946.0	74.5	0.0
JUL	276	17.0	5.4	1.2	23.0	3.0	423	26.0	0.0	0.0	2942.3	64.3	-10.2
AUG	285	17.5	4.8	1.0	21.6	3.0	400	24.6	0.0	0.0	2939.1	56.2	-8.1
SEP	277	16.5	3.8	0.8	5.8	3.0	148	8.8	0.0	0.0	2941.9	63.1	6.9
OCT	281	17.3	3.1	0.7	0.0	1.0	16	1.0	9.9	0.0	2944.0	68.8	5.7
NOV	271	16.1	1.8	0.4	0.0	1.0	17	1.0	14.7	0.0	2944.0	68.8	0.0
DEC	255	15.7	1.2	0.3	0.0	1.0	16	1.0	14.4	0.0	2944.0	68.8	0.0
TOTAL		201.6	35.2	8.1	57.9	30.7		88.6	104.7	0.0			0.2

CALAMUS **RESERVOIR OPERATION ESTIMATES** - 2003

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIREMENT CANAL 1000 AF	RELEASE REQUIREMENT RIVER 1000 AF	RELEASE REQUIREMENT TOTAL MEAN CFS	RELEASE REQUIREMENT 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	286	17.6	1.3	0.5	0.5	3.1	59	3.6	0.0	0.0	2241.9	117.1	13.5
FEB	304	16.9	1.6	0.7	0.5	2.8	59	3.3	12.6	0.0	2242.0	117.4	0.3
MAR	340	20.9	2.9	1.2	0.5	3.1	59	3.6	16.1	0.0	2242.0	117.4	0.0
APR	351	20.9	4.7	2.0	0.5	3.0	59	3.5	5.4	0.0	2244.0	127.4	10.0
MAY	389	23.9	4.9	2.1	2.6	3.1	93	5.7	16.1	0.0	2244.0	127.4	0.0
JUN	351	20.9	6.0	2.5	5.4	3.0	141	8.4	10.0	0.0	2244.0	127.4	0.0
JUL	332	20.4	6.8	2.6	34.4	20.4	891	54.8	0.0	0.0	2235.9	90.4	-37.0
AUG	314	19.3	7.0	2.2	23.9	19.3	703	43.2	0.0	0.0	2228.9	64.3	-26.1
SEP	296	17.6	5.3	1.4	6.4	17.6	403	24.0	0.0	0.0	2226.4	56.5	-7.8
OCT	294	18.1	3.9	1.1	0.5	3.1	59	3.6	0.0	0.0	2230.5	69.9	13.4
NOV	296	17.6	2.1	0.6	0.5	3.0	59	3.5	0.0	0.0	2234.2	83.4	13.5
DEC	291	17.9	1.2	0.4	0.5	3.1	59	3.6	0.0	0.0	2237.6	97.3	13.9
TOTAL		232.0	47.7	17.3	76.2	84.6		160.8	60.2	0.0			-6.3
MOST PROBABLE INFLOW CONDITIONS													
JAN	330	20.3	1.2	0.5	0.5	3.1	59	3.6	2.4	0.0	2242.0	117.4	13.8
FEB	351	19.5	1.4	0.6	0.5	2.8	59	3.3	15.6	0.0	2242.0	117.4	0.0
MAR	390	24.0	2.6	1.0	0.5	3.1	59	3.6	19.4	0.0	2242.0	117.4	0.0
APR	403	24.0	4.2	1.7	0.5	3.0	59	3.5	8.8	0.0	2244.0	127.4	10.0
MAY	447	27.5	4.3	1.8	2.3	3.1	88	5.4	20.3	0.0	2244.0	127.4	0.0
JUN	403	24.0	5.3	2.2	4.5	3.0	126	7.5	14.3	0.0	2244.0	127.4	0.0
JUL	381	23.4	6.0	2.4	24.4	23.4	777	47.8	0.0	0.0	2238.4	100.6	-26.8
AUG	359	22.1	6.2	2.1	16.8	22.1	633	38.9	0.0	0.0	2233.7	81.7	-18.9
SEP	339	202	4.7	1.5	5.5	20.2	432	25.7	0.0	0.0	2231.9	74.7	-7.0
OCT	338	20.8	3.4	1.1	0.5	3.1	59	3.6	0.0	0.0	2236.0	90.8	16.1
NOV	339	20.2	1.9	0.7	0.5	3.0	59	3.5	0.0	0.0	2239.7	106.8	16.0
DEC	333	20.5	1.1	0.4	0.5	3.1	59	3.6	15.3	0.0	2240.0	108.0	1.2
TOTAL		266.5	42.1	16.0	57.0	93.0		150.0	96.1	0.0			4.4
REASONABLE MAXIMUM INFLOW CONDITIONS													
JAN	379	23.3	1.0	0.4	0.5	3.1	59	3.6	5.5	0.0	2242.0	117.4	13.8
FEB	402	22.3	1.3	0.5	0.5	2.8	59	3.3	18.5	0.0	2242.0	117.4	0.0
MAR	447	27.5	2.3	0.9	0.5	3.1	59	3.6	23.0	0.0	2242.0	117.4	0.0
APR	462	27.5	3.7	1.5	0.5	3.0	59	3.5	12.5	0.0	2244.0	127.4	10.0
MAY	512	31.5	3.8	1.6	1.8	3.1	80	4.9	25.0	0.0	2244.0	127.4	0.0
JUN	462	27.5	4.6	2.0	3.7	3.0	113	6.7	18.8	0.0	2244.0	127.4	0.0
JUL	437	26.9	5.3	2.2	15.0	26.9	681	41.9	0.0	0.0	2240.5	110.2	-17.2
AUG	415	25.5	5.4	2.0	13.7	25.5	638	39.2	0.0	0.0	2236.9	94.5	-15.7
SEP	392	233	4.1	1.4	4.6	23.3	469	27.9	0.0	0.0	2235.5	88.5	-6.0
OCT	389	23.9	3.0	1.1	0.5	3.1	59	3.6	0.0	0.0	2239.9	107.7	19.2
NOV	392	23.3	1.6	0.6	0.5	3.0	59	3.5	18.9	0.0	2240.0	108.0	0.3
DEC	384	23.6	0.9	0.4	0.5	3.1	59	3.6	19.6	0.0	2240.0	108.0	0.0
[TOTAL		306.1	37.0	14.6	42.3	103.0		145.3	141.8	0.0			4.4

DAVIS CREEK RESERVOIR OPERATION ESTIMATES - 2003

	INFLOW		EVAPORATION		RELEASE REQUIREMENT		RESERVOIR REQUIREMENT SPILL	RESERVOIR REQUIREMENT SHORTAGE	END OF MONTH RESERVOIR ELEV	END OF MONTH RESERVOIR CONT	END OF MONTH RESERVOIR CHANGE
	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	0	0.0	1.2	0.0	5	0.3	0.0	0.0	2040.9	6.0	-0.3
FEB	0	0.0	1.5	0.0	5	0.3	0.0	0.0	2040.1	5.7	-0.3
MAR	0	0.0	2.8	0.1	10	0.6	0.0	0.0	2038.0	5.0	-0.7
APR	210	12.5	4.5	0.2	25	1.5	0.0	0.0	2059.3	15.8	10.8
MAY	239	14.7	4.8	0.3	76	4.7	0.0	0.0	2070.7	25.5	9.7
JUN	240	14.3	5.9	0.5	136	8.1	0.0	0.0	2076.0	31.2	5.7
JUL	200	12.3	6.4	0.6	281	17.3	0.0	0.0	2070.8	25.6	-5.6
AUG	78	4.8	4.9	0.3	262	16.1	0.0	0.0	2056.6	14.0	-11.6
SEP	10	0.6	4.2	0.2	128	7.6	0.0	0.0	2043.0	6.8	-7.2
OCT	0	0.0	3.7	0.1	5	0.3	0.0	0.0	2041.9	6.4	-0.4
NOV	0	0.0	•2.0	0.1	5	0.3	0.0	0.0	2040.9	6.0	-0.4
DEC	0	0.0	1.2	0.0	5	0.3	0.0	0.0	2040.1	5.7	-0.3
TOTAL		59.2	42.9	2.4		57.4	0.0	0.0			-0.6
MOST PROBABLE INFLOW CONDITIONS											
JAN	0	0	1.2	0	5	0.3	0.0	0.0	2040.9	6.0	-0.3
FEB	0	0	1.4	0	5	0.3	0.0	0.0	2040.1	5.7	-0.3
MAR	0	0	2.6	0.1	10	0.6	0.0	0.0	2038.0	5.0	-0.7
APR	175	10.4	4.1	0.2	25	1.5	0.0	0.0	2056.2	13.7	8.7
MAY	239	14.7	4.4	0.3	65	4	0.0	0.0	2069.2	24.1	10.4
JUN	240	14.3	5.5	0.5	113	6.7	0.0	0.0	2076.0	31.2	7.1
JUL	104	6.4	6.0	0.5	218	13.4	0.0	0.0	2068.8	23.7	-7.5
AUG	20	1.2	4.5	0.3	202	12.4	0.0	0.0	2053.7	12.2	-11.5
SEP	10	0.6	3.9	0.2	97	5.8	0.0	0.0	2043.0	6.8	-5.4
OCT	0	0	3.4	0.1	5	0.3	0.0	0.0	2041.9	6.4	-0.4
NOV	0	0	1.8	0.1	5	0.3	0.0	0.0	2040.9	6.0	-0.4
DEC	0	0	1.1	0	5	0.3	0.0	0.0	2040.1	5.7	-0.3
TOTAL		47.6	39.9	2.3		45.9	0.0	0.0			-0.6
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	0	0.0	1.1	0.0	5	0.3	0.0	0.0	2040.9	6.0	-0.3
FEB	0	0.0	1.4	0.0	5	0.3	0.0	0.0	2040.1	5.7	-0.3
MAR	0	0.0	2.4	0.1	10	0.6	0.0	0.0	2038.0	5.0	-0.7
APR	141	8.4	3.9	0.2	25	1.5	0.0	0.0	2052.8	11.7	6.7
MAY	239	14.7	4.2	0.3	57	3.5	0.0	0.0	2067.6	22.6	10.9
JUN	240	14.3	5.2	0.4	89	5.3	0.0	0.0	2076.0	31.2	8.6
JUL	20	1.2	5.6	0.5	159	9.8	0.0	0.0	2067.1	22.1	-9.1
AUG	20	1.2	4.3	0.3	150	9.2	0.0	0.0	2056.3	13.8	-8.3
SEP	10	0.6	3.7	0.2	72	4.3	0.0	0.0	2049.6	9.9	-3.9
OCT	0	0.0	3.2	0.1	5	0.3	0.0	0.0	2048.8	9.5	-0.4
NOV	0	0.0	1.7	0.1	5	0.3	0.0	0.0	2048.1	9.1	-0.4
DEC	0	0.0	1.0	0.0	5	0.3	0.0	0.0	2047.5	8.8	-0.3
TOTAL		40.4	37.6	2.2		35.7	0.0	0.0			2.5

BONNY RESERVOIR OPERATION ESTIMATES - 2003

	INFLOW		EVAPORATION		RELEASE REQUIREMENT CANAL	RIVER	TOTAL		RESERVOIR REQUIREMENT SPILL	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	15	0.9	L3	0.1	0.0	0.5	8	0.5	0.0	0.0	3658.9	19.3	0.3
FEB	16	0.9	1.4	0.2	0.0	0.4	7	0.4	0.0	0.0	3659.1	19.6	0.3
MAR	16	1.0	2.2	0.2	0.0	0.5	8	0.5	0.0	0.0	3659.3	19.9	0.3
APR	20	1.2	4.6	0.5	0.0	0.4	7	0.4	0.0	0.0	3659.5	20.2	0.3
MAY	23	1.4	5.9	0.7	0.4	0.5	15	0.9	0.0	0.0	3659.4	20.0	-0.2
JUN	20	1.2	7.5	0.9	0.3	0.4	12	0.7	0.0	0.0	3659.1	19.6	-0.4
JUL	*11*	0.7	8.5	0.9	1.0	0.5	24	*1.5*	0.0	0.0	3657.8	17.9	-1.7
AUG	7	0.4	7.3	0.8	0.6	0.5	18	1.1	0.0	0.0	3656.6	16.4	-1.5
SEP	5	0.3	6.1	0.6	0.3	0.4	12	0.7	0.0	0.0	3655.8	15.4	-1.0
OCT	8	0.5	3.8	0.4	0.2	0.5	11	0.7	0.0	0.0	3655.3	14.8	-0.6
NOV	13	0.8	2.5	0.2	0.0	0.4	7	0.4	0.0	0.0	3655.5	15.0	0.2
DEC	13	0.8	1.5	0.1	0.0	0.5	8	0.5	0.0	0.0	3655.7	15.2	0.2
TOTAL		10.1	52.6	5.6	2.8	5.5		8.3	0.0	0.0			-3.8
MOST PROBABLE INFLOW CONDITIONS													
JAN	23	1.4	1.1	0.1	0.0	0.5	8	0.5	0.0	0.0	3659.3	19.8	0.8
FEB	25	1.4	1.3	0.1	0.0	0.4	7	0.4	0.0	0.0	3659.9	20.7	0.9
MAR	24	1.5	1.9	0.2	0.0	0.5	8	0.5	0.0	0.0	3660.5	21.5	0.8
APR	30	1.8	4.2	0.5	0.0	0.4	7	0.4	0.0	0.0	3661.1	22.4	0.9
MAY	33	2.0	5.3	0.7	0.1	0.5	10	0.6	0.0	0.0	3661.6	23.1	0.7
JUN	30	1.8	6.7	0.8	0.3	0.4	12	0.7	0.0	0.0	3661.8	23.4	0.3
JUL	16	1.0	7.6	0.9	0.7	0.5	20	1.2	0.0	0.0	3661.0	22.3	-1.1
AUG	10	0.6	6.6	0.8	0.6	0.5	18	1.1	0.0	0.0	3660.1	21.0	-1.3
SEP	7	0.4	5.5	0.6	0.3	0.4	12	0.7	0.0	0.0	3659.5	20.1	-0.9
OCT	11	0.7	3.4	0.4	0.1	0.5	10	0.6	0.0	0.0	3659.3	19.8	-0.3
NOV	20	1.2	2.2	0.3	0.0	0.4	7	0.4	0.0	0.0	3659.6	20.3	0.5
DEC	20	1.2	1.3	0.2	0.0	0.5	8	0.5	0.0	0.0	3660.0	20.8	0.5
TOTAL		15.0	47.2	5.6	2.1	5.5		7.6	0.0	0.0			1.8
REASONABLE MAXIMUM INFLOW CONDITIONS													
JAN	31	1.9	1.0	0.1	0.0	0.5	8	0.5	0.0	0.0	3659.6	20.3	1.3
FEB	32	1.8	1.1	0.1	0.0	0.4	7	0.4	0.0	0.0	3660.5	21.6	1.3
MAR	34	2.1	1.7	0.2	0.0	0.5	8	0.5	0.0	0.0	3661.5	23.0	1.4
APR	40	2.4	3.7	0.5	0.0	0.4	7	0.4	0.0	0.0	3662.5	24.5	1.5
MAY	44	2.7	4.8	0.6	0.2	0.5	11	0.7	0.0	0.0	3663.4	25.9	1.4
JUN	40	2.4	6.0	0.8	0.2	0.4	10	0.6	0.0	0.0	3664.0	26.9	1.0
JUL	21	1.3	6.8	0.9	0.4	0.5	15	0.9	0.0	0.0	3663.7	26.4	-0.5
AUG	13	0.8	5.9	0.8	0.4	0.5	15	0.9	0.0	0.0	3663.2	25.5	-0.9
SEP	8	0.5	4.9	0.6	0.2	0.4	10	0.6	0.0	0.0	3662.7	24.8	-0.7
OCT	15	0.9	3.1	0.4	0.2	0.5	11	0.7	0.0	0.0	3662.6	24.6	-0.2
NOV	27	1.6	2.0	0.3	0.0	0.4	7	0.4	0.0	0.0	3663.2	25.5	0.9
DEC	28	1.7	1.2	0.2	0.0	0.5	8	0.5	0.0	0.0	3663.8	26.5	1.0
TOTAL		20.1	42.2	5.5	1.6	5.5		7.1	0.0	0.0			7.5

ENDERS RESERVOIR OPERATION ESTIMATES - 2003

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIREMENT MEAN CFS	RELEASE REQUIREMENT 1000 AF	RESERVOIR REQUIREMENT SPILL 1000 AF	RESERVOIR REQUIREMENT SHORTAGE 1000 AF	END OF MONTH RESERVOIR ELEV FT	END OF MONTH RESERVOIR CONT 1000 AF	END OF MONTH RESERVOIR CHANGE 1000 AF
REASONABLE MINIMUM INFLOW CONDITIONS											
JAN	16	1.0	1.0	0.1	0	0.0	0.0	0.0	3087.4	12.4	0.9
FEB	16	0.9	1.1	0.1	0	0.0	0.0	0.0	3088.4	13.2	0.8
MAR	16	1.0	1.9	0.1	0	0.0	0.0	0.0	3089.5	14.1	0.9
APR	17	1.0	4.1	0.3	0	0.0	0.0	0.0	3090.3	14.8	0.7
MAY	16	1.0	5.3	0.4	0	0.0	0.0	0.0	3091.0	15.4	0.6
JUN	17	1.0	6.7	0.4	234	13.9	0.0	6.8	3082.3	8.9	-6.5
JUL	20	1.2	7.3	0.4	533	32.8	0.0	32.0	3082.3	8.9	0.0
AUG	18	1.1	6.1	0.3	540	33.2	0.0	32.4	3082.3	8.9	0.0
SEP	15	0.9	4.5	0.2	72	4.3	0.0	3.6	3082.3	8.9	0.0
OCT	16	1.0	2.9	0.2	0	0.0	0.0	0.0	3083.6	9.7	0.8
NOV	17	1.0	2.1	0.1	0	0.0	0.0	0.0	3084.9	10.6	0.9
DEC	16	1.0	1.2	0.1	0	0.0	0.0	0.0	3086.2	11.5	0.9
TOTAL		12.1	44.0	2.7		84.2	0.0	74.8			0.0
MOST PROBABLE INFLOW CONDITIONS											
JAN	28	1.7	0.9	0.1	0	0.0	0.0	0.0	3088.3	13.1	1.6
FEB	27	1.5	1.0	0.1	0	0.0	0.0	0.0	3090.0	14.5	1.4
MAR	26	1.6	1.7	0.1	0	0.0	0.0	0.0	3091.7	16.0	1.5
APR	29	1.7	3.9	0.3	0	0.0	0.0	0.0	3093.2	17.4	1.4
MAY	28	1.7	4.9	0.4	0	0.0	0.0	0.0	3094.5	18.7	1.3
JUN	29	1.7	6.2	0.5	116	6.9	0.0	0.0	3088.1	13.0	-5.7
JUL	33	2.0	6.8	0.4	483	29.7	0.0	24.0	3082.3	8.9	-4.1
AUG	29	1.8	5.7	0.3	384	23.6	0.0	22.1	3082.3	8.9	0.0
SEP	25	1.5	4.2	0.2	37	2.2	0.0	0.9	3082.3	8.9	0.0
OCT	26	1.6	2.7	0.1	0	0.0	0.0	0.0	3084.6	10.4	1.5
NOV	27	1.6	2.0	0.1	0	0.0	0.0	0.0	3086.7	11.9	1.5
DEC	26	1.6	1.1	0.1	0	0.0	0.0	0.0	3088.6	13.4	1.5
TOTAL		20.0	41.0	2.7		62.4	0.0	47.0			1.9
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	37	2.3	0.8	0.1	0	0.0	0.0	0.0	3089.0	13.7	2.2
FEB	36	2.0	0.9	0.1	0	0.0	0.0	0.0	3091.2	15.6	1.9
MAR	36	2.2	1.6	0.1	0	0.0	0.0	0.0	3093.5	17.7	2.1
APR	37	2.2	3.5	0.3	0	0.0	0.0	0.0	3095.3	19.6	1.9
MAY	37	2.3	4.4	0.4	0	0.0	0.0	0.0	3097.0	21.5	1.9
JUN	37	2.2	5.6	0.5	37	2.2	0.0	0.0	3096.6	21.0	-0.5
JUL	42	2.6	6.1	0.4	296	18.2	0.0	3.9	3082.3	8.9	-12.1
AUG	39	2.4	5.1	0.3	226	13.9	0.0	11.8	3082.3	8.9	0.0
SEP	35	2.1	3.8	0.2	0	0.0	0.0	0.0	3085.2	10.8	1.9
OCT	36	2.2	2.4	0.1	0	0.0	0.0	0.0	3088.0	12.9	2.1
NOV	37	2.2	1.8	0.1	0	0.0	0.0	0.0	3090.6	15.0	2.1
DEC	34	2.1	1.0	0.1	0	0.0	0.0	0.0	3092.7	17.0	2.0
TOTAL		26.8	36.9	2.7		34.3	0.0	15.7			5.5

SWANSON LAKE OPERATION ESTIMATES- 2003

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIREMENT CANAL 1000 AF	RELEASE REQUIREMENT RIVER 1000 AF	RELEASE REQUIREMENT TOTAL MEAN CFS	RELEASE REQUIREMENT 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	41	2.5	1.0	0.2	0.0	0.1	2	0.1	0.0	0.0	2726.6	24.1	2.2
FEB	65	3.6	1.1	0.2	0.0	0.1	2	0.1	0.0	0.0	2728.1	27.4	3.3
MAR	72	4.4	1.9	0.4	0.0	0.1	2	0.1	0.0	0.0	2729.8	31.3	3.9
APR	79	4.7	4.3	0.9	0.0	0.1	2	0.1	0.0	0.0	2731.3	35.0	3.7
MAY	72	4.4	5.1	1.1	0.1	0.1	3	0.2	0.0	0.0	2732.5	38.1	3.1
JUN	57	3.4	6.6	1.4	4.3	1.0	89	5.3	0.0	0.0	2731.2	34.8	-3.3
JUL	31	1.9	7.6	1.4	16.0	**5.8**	355	21.8	0.0	7.4	2725.0	20.9	-13.9
AUG	16	1.0	6.6	1.1	13.4	6.3	320	19.7	0.0	19.6	2724.9	20.7	-0.2
SEP	8	0.5	5.1	0.8	2.0	2.1	69	4.1	0.0	4.0	2724.7	20.3	-0.4
OCT	11	0.7	3.1	0.5	0.0	0.1	2	0.1	0.0	0.0	2724.8	20.4	0.1
NOV	30	1.8	2.2	0.4	0.0	0.1	2	0.1	0.0	0.0	2725.4	21.7	1.3
DEC	33	2.0	1.2	0.2	0.0	0.1	2	0.1	0.0	0.0	2726.3	23.4	1.7
TOTAL		30.9	45.8	8.6	35.8	16.0		51.8	0.0	31.0			1.5
MOST PROBABLE INFLOW CONDITIONS													
JAN	75	4.6	0.9	0.2	0.0	0.1	2	0.1	0.0	0.0	2727.6	26.2	4.3
FEB	115	6.4	1.0	0.2	0.0	0.1	2	0.1	0.0	0.0	2730.2	32.3	6.1
MAR	130	8.0	1.7	0.4	0.0	0.1	2	0.1	0.0	0.0	2733.1	39.8	7.5
APR	141	8.4	4.0	1.0	0.0	0.1	2	0.1	0.0	0.0	2735.6	47.1	7.3
MAY	127	7.8	4.7	1.3	0.1	0.1	3	0.2	0.0	0.0	2737.6	53.4	6.3
JUN	103	6.1	6.1	1.7	3.8	0.1	66	3.9	0.0	0.0	2737.7	53.9	0.5
JUL	55	3.4	7.0	1.8	13.9	4.2	294	18.1	0.0	0.0	2732.3	37.4	-16.5
AUG	29	1.8	6.1	1.2	11.5	4.1	254	15.6	0.0	0.0	2725.8	22.4	-15.0
SEP	13	0.8	4.7	0.8	1.7	0.1	30	1.8	0.0	0.3	2725.0	20.9	-1.5
OCT	21	1.3	2.8	0.5	0.0	0.1	2	0.1	0.0	0.0	2725.4	21.6	0.7
NOV	54	3.2	2.0	0.3	0.0	0.1	2	0.1	0.0	0.0	2726.7	24.4	2.8
DEC	60	3.7	1.1	0.2	0.0	0.1	2	0.1	0.0	0.0	2728.3	27.8	3.4
TOTAL		55.5	42.1	9.6	31.0	9.3		40.3	0.0	0.3			5.9
REASONABLE MAXIMUM INFLOW CONDITIONS													
JAN	102	6.3	0.8	0.1	0.0	0.1	2	0.1	0.0	0.0	2728.4	28.0	6.1
FEB	158	8.8	0.9	0.2	0.0	0.1	2	0.1	0.0	0.0	2731.9	36.5	**8.5**
MAR	177	10.9	1.6	0.4	0.0	0.1	2	0.1	0.0	0.0	2735.5	46.9	10.4
APR	195	11.6	3.7	1.0	0.0	0.1	2	0.1	0.0	0.0	2738.8	57.4	10.5
MAY	176	10.8	4.3	1.3	0.1	0.1	3	0.2	0.0	0.0	2741.4	66.7	9.3
JUN	139	8.3	5.6	1.8	3.0	0.1	52	3.1	0.0	0.0	2742.3	70.1	3.4
JUL	76	4.7	6.5	2.0	11.4	1.2	205	12.6	0.0	0.0	2739.6	60.2	-9.9
AUG	41	2.5	5.6	1.5	9.4	1.8	182	11.2	0.0	0.0	2736.5	50.0	-10.2
SEP	20	1.2	4.3	1.1	1.4	0.1	25	1.5	0.0	0.0	2736.1	48.6	-1.4
OCT	29	1.8	2.6	0.7	0.0	0.1	2	0.1	0.0	0.0	2736.4	49.6	1.0
NOV	76	**4.5**	1.9	0.5	0.0	0.1	2	0.1	0.0	0.0	2737.6	53.5	3.9
DEC	83	5.1	1.0	0.3	0.0	0.1	2	0.1	0.0	0.0	2739.0	58.2	4.7
TOTAL		76.5	38.7	10.9	25.3	4.0		29.3	0.0	0.0			36.3

HUGH BUTLER LAKE OPERATION ESTIMATES - 2003

	INFLOW		EVAPORATION		RELEASE REQUIREMENT		RESERVOIR REQUIREMENT SPILL	RESERVOIR REQUIREMENT SHORTAGE	END OF MONTH RESERVOIR ELEV	END OF MONTH RESERVOIR CONT	END OF MONTH RESERVOIR CHANGE
	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	15	0.9	0.9	0.1	5	0.3	0.0	0.0	2563.2	13.1	0.5
FEB	20	1.1	1.0	0.1	5	0.3	0.0	0.0	2564.0	13.8	0.7
MAR	23	1.4	1.8	0.1	5	0.3	0.0	0.0	2565.1	14.8	1.0
APR	22	1.3	4.9	0.4	5	0.3	0.0	0.0	2565.7	15.4	0.6
MAY	23	1.4	5.8	0.5	5	0.3	0.0	0.0	2566.3	16.0	0.6
JUN	24	1.4	7.2	0.6	32	1.9	0.0	0.0	2565.2	14.9	-1.1
JUL	18	1.1	8.0	0.6	101	6.2	0.0	2.0	2561.0	11.2	-3.7
AUG	20	1.2	7.1	0.5	67	4.1	0.0	3.4	2561.0	11.2	0.0
SEP	13	0.8	5.4	0.4	17	1.0	0.0	0.6	2561.0	11.2	0.0
OCT	13	0.8	3.5	0.2	5	0.3	0.0	0.0	2561.3	11.5	0.3
NOV	15	0.9	2.1	0.1	5	0.3	0.0	0.0	2561.9	12.0	0.5
DEC	15	0.9	1.1	0.1	5	0.3	0.0	0.0	2562.5	12.5	0.5
TOTAL		13.2	48.7	3.7		15.6	0.0	6.0			-0.1
MOST PROBABLE INFLOW CONDITIONS											
JAN	20	1.2	0.8	0.1	5	0.3	0.0	0.0	2563.5	13.4	0.8
FEB	25	1.4	0.9	0.1	5	0.3	0.0	0.0	2564.6	14.4	1.0
MAR	28	1.7	1.6	0.1	5	0.3	0.0	0.0	2566.0	15.7	1.3
APR	29	1.7	4.4	0.4	5	0.3	0.0	0.0	2567.0	16.7	1.0
MAY	29	1.8	5.3	0.5	5	0.3	0.0	0.0	2568.0	17.7	1.0
JUN	30	1.8	6.5	0.6	25	1.5	0.0	0.0	2567.7	17.4	-0.3
JUL	23	1.4	7.2	0.6	67	4.1	0.0	0.0	2564.3	14.1	-3.3
AUG	24	1.5	6.4	0.5	60	3.7	0.0	0.0	2561.2	11.4	-2.7
SEP	15	0.9	4.9	0.3	15	0.9	0.0	0.1	2561.0	11.2	-0.2
OCT	16	1.0	3.1	0.2	5	0.3	0.0	0.0	2561.6	11.7	0.5
NOV	18	1.1	1.9	0.1	5	0.3	0.0	0.0	2562.4	12.4	0.7
DEC	18	1.1	1.0	0.1	5	0.3	0.0	0.0	2563.2	13.1	0.7
TOTAL		16.6	44.1	3.6		12.6	0.0	0.1			0.5
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	23	1.4	0.7	0.1	5	0.3	0.0	0.0	2563.8	13.6	1.0
FEB	31	1.7	0.8	0.1	5	0.3	0.0	0.0	2565.2	14.9	1.3
MAR	34	2.1	1.5	0.1	5	0.3	0.0	0.0	2566.9	16.6	1.7
APR	35	2.1	4.0	0.3	5	0.3	0.0	0.0	2568.4	18.1	1.5
MAY	36	2.2	4.8	0.4	5	0.3	0.0	0.0	2569.7	19.6	1.5
JUN	37	2.2	5.9	0.6	20	1.2	0.0	0.0	2570.1	20.0	0.4
JUL	28	1.7	6.6	0.6	50	3.1	0.0	0.0	2568.3	18.0	-2.0
AUG	29	1.8	5.8	0.5	41	2.5	0.0	0.0	2567.1	16.8	-1.2
SEP	18	1.1	4.5	0.4	10	0.6	0.0	0.0	2567.2	16.9	0.1
OCT	21	1.3	2.8	0.2	5	0.3	0.0	0.0	2568.0	17.7	0.8
NOV	24	1.4	1.8	0.2	5	0.3	0.0	0.0	2568.8	18.6	0.9
DEC	23	1.4	0.9	0.1	5	0.3	0.0	0.0	2569.7	19.6	1.0
TOTAL		20.4	40.1	3.6		9.8	0.0	0.0			7.0

HARRY STRUNK LAKE OPERATON ESTIMATES - 2003

	INFLOW		EVAPORATION		RELEASE REQUIREMENT		RESERVOIR REQUIREMENT SPILL	RESERVOIR REQUIREMENT SHORTAGE	END OF MONTH RESERVOIR ELEV	END OF MONTH RESERVOIR CONT	END OF MONTH RESERVOIR CHANGE
	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	39	2.4	0.9	0.1	2	0.1	0.0	0.0	2355.7	20.4	2.2
FEB	50	2.8	1.0	0.1	2	0.1	0.0	0.0	2357.8	23.0	2.6
MAR	52	3.2	1.8	0.2	2	0.1	0.0	0.0	2360.0	25.9	2.9
APR	52	3.1	4.9	0.6	2	0.1	0.0	0.0	2361.6	28.3	2.4
MAY	55	3.4	5.7	0.7	2	0.1	0.0	0.0	2363.3	30.9	2.6
JUN	57	3.4	7.2	0.9	87	5.2	0.0	0.0	2361.6	28.2	-2.7
JUL	54	3.3	8.1	0.8	311	19.1	0.0	0.0	2346.6	11.6	-16.6
AUG	42	2.6	7.0	0.4	262	16.1	0.0	11.2	2343.0	8.9	-2.7
SEP	29	1.7	5.4	0.3	27	1.6	0.0	0.2	2343.0	8.9	0.0
OCT	34	2.1	3.5	0.2	2	0.1	0.0	0.0	2345.5	10.7	1.8
NOV	39	2.3	2.1	0.1	2	0.1	0.0	0.0	2348.1	12.8	2.1
DEC	36	2.2	1.1	0.1	2	0.1	0.0	0.0	2350.3	14.8	2.0
TOTAL		32.5	48.6	4.5		42.8	0.0	11.4			-3.4
MOST PROBABLE INFLOW CONDITIONS											
JAN	44	2.7	0.8	0.1	2	0.1	0.0	0.0	2355.9	20.7	2.5
FEB	56	3.1	0.9	0.1	2	0.1	0.0	0.0	2358.2	23.6	2.9
MAR	60	3.7	1.6	0.2	2	0.1	0.0	0.0	2360.8	27.0	3.4
APR	59	3.5	4.4	0.6	2	0.1	0.0	0.0	2362.6	29.8	2.8
MAY	63	3.9	5.2	0.7	2	0.1	0.0	0.0	2364.5	32.9	3.1
JUN	66	3.9	6.6	0.9	72	4.3	0.0	0.0	2363.7	31.6	-1.3
JUL	60	3.7	7.4	0.8	259	15.9	0.0	0.0	2354.1	18.6	-13.0
AUG	49	3.0	6.4	0.5	215	13.2	0.0	1.0	2343.0	8.9	-9.7
SEP	32	1.9	4.9	0.3	20	1.2	0.0	0.0	2343.6	9.3	0.4
OCT	39	2.4	3.2	0.2	2	0.1	0.0	0.0	2346.4	11.4	2.1
NOV	44	2.6	1.9	0.1	2	0.1	0.0	0.0	2349.2	13.8	2.4
DEC	42	2.6	1.0	0.1	2	0.1	0.0	0.0	2351.8	16.2	2.4
TOTAL		37.0	44.4	4.6		35.4	0.0	1.0			-2.0
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	60	3.7	0.7	0.1	2	0.1	0.0	0.0	2356.8	21.7	3.5
FEB	77	4.3	0.8	0.1	2	0.1	0.0	0.0	2359.9	25.8	4.1
MAR	81	5.0	1.4	0.2	2	0.1	0.0	0.0	2363.1	30.5	4.7
APR	81	4.8	4.0	0.6	2	0.1	0.0	0.0	2365.5	34.6	4.1
MAY	86	5.3	4.7	0.7	2	0.1	3.4	0.0	2366.1	35.7	1.1
JUN	89	5.3	5.9	0.9	45	2.7	1.7	0.0	2366.1	35.7	0.0
JUL	83	5.1	6.7	0.9	177	10.9	0.0	0.0	2362.1	29.0	-6.7
AUG	65	4.0	5.8	0.7	150	9.2	0.0	0.0	2357.8	23.1	-5.9
SEP	44	2.6	4.4	0.5	2	0.1	0.0	0.0	2359.4	25.1	2.0
OCT	54	3.3	2.9	0.3	2	0.1	0.0	0.0	2361.5	28.0	2.9
NOV	59	3.5	1.7	0.2	2	0.1	0.0	0.0	2363.5	31.2	3.2
DEC	57	3.5	0.9	0.1	2	0.1	0.0	0.0	2365.4	34.5	3.3
TOTAL		50.4	40.0	5.3		23.7	5.1	0.0			16.3

KEITH SEBELIUS LAKE OPERATION ESTIMATES - **2003**

	INFLOW		EVAPORATION		RELEASE REQUIREMENT		RESERVOIR REQUIREMENT SPILL	RESERVOIR REQUIREMENT SHORTAGE	END OF MONTH RESERVOIR ELEV	END OF MONTH RESERVOIR CONT	END OF MONTH RESERVOIR CHANGE
	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	2	0.1	0.9	0.1	2	0.1	0.0	0.0	2291.5	13.4	-0.1
FEB	4	0.2	1.1	0.1	2	0.1	0.0	0.0	2291.5	13.4	0.0
MAR	5	0.3	1.9	0.2	2	0.1	0.0	0.0	2291.5	13.4	0.0
APR	5	0.3	5.3	0.5	2	0.1	0.0	0.0	2291.3	13.1	-0.3
MAY	8	0.5	6.0	0.6	5	0.3	0.0	0.0	2290.9	12.7	-0.4
JUN	10	0.6	7.5	0.6	69	4.1	0.0	0.0	2286.8	8.6	-4.1
JUL	8	0.5	8.6	0.5	130	8.0	0.0	4.6	2282.3	5.2	-3.4
AUG	7	0.4	7.6	0.4	130	8.0	0.0	7.9	2282.2	5.1	-0.1
SEP	3	0.2	5.9	0.3	24	1.4	0.0	1.3	2281.9	4.9	-0.2
OCT	2	0.1	4.0	0.2	2	0.1	0.0	0.0	2281.6	4.7	-0.2
NOV	2	0.1	2.2	0.1	2	0.1	0.0	0.0	2281.4	4.6	-0.1
DEC	2	0.1	1.1	0.1	2	0.1	0.0	0.0	2281.2	4.5	-0.1
TOTAL		3.4	52.1	3.7		22.5	0.0	13.8			-9.0
MOST PROBABLE INFLOW CONDITIONS											
JAN	5	0.3	0.8	0.1	2	0.1	0.0	0.0	2291.7	13.6	0.1
FEB	5	0.3	1.0	0.1	2	0.1	0.0	0.0	2291.8	13.7	0.1
MAR	10	0.6	1.7	0.2	2	0.1	0.0	0.0	2292.1	14.0	0.3
APR	12	0.7	4.7	0.5	2	0.1	0.0	0.0	2292.1	14.1	0.1
MAY	18	1.1	5.4	0.6	3	0.2	0.0	0.0	2292.4	14.4	0.3
JUN	22	1.3	6.7	0.7	42	2.5	0.0	0.0	2290.7	12.5	-1.9
JUL	16	1.0	7.7	0.6	122	7.5	0.0	0.0	2282.6	5.4	-7.1
AUG	15	0.9	6.7	0.4	99	6.1	0.0	5.4	2282.3	5.2	-0.2
SEP	7	0.4	5.3	0.3	20	1.2	0.0	1.1	2282.3	5.2	0.0
OCT	3	0.2	3.5	0.2	2	0.1	0.0	0.0	2282.2	5.1	-0.1
NOV	5	0.3	2.0	0.1	2	0.1	0.0	0.0	2282.3	5.2	0.1
DEC	3	0.2	1.0	0.1	2	0.1	0.0	0.0	2282.3	5.2	0.0
TOTAL		7.3	46.5	3.9		18.2	0.0	6.5			-8.3
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	10	0.6	0.8	0.1	2	0.1	0.0	0.0	2292.0	13.9	0.4
FEB	14	0.8	0.9	0.1	2	0.1	0.0	0.0	2292.4	14.5	0.6
MAR	24	1.5	1.5	0.2	2	0.1	0.0	0.0	2293.4	15.7	1.2
APR	27	1.6	4.2	0.5	2	0.1	0.0	0.0	2294.1	16.7	1.0
MAY	39	2.4	4.8	0.6	3	0.2	0.0	0.0	2295.3	18.3	1.6
JUN	50	3.0	6.1	0.7	22	1.3	0.0	0.0	2296.0	19.3	1.0
JUL	36	2.2	6.9	0.8	62	3.8	0.0	0.0	2294.3	16.9	-2.4
AUG	33	2.0	6.1	0.7	60	3.7	0.0	0.0	2292.4	14.5	-2.4
SEP	15	0.9	4.8	0.5	13	0.8	0.0	0.0	2292.1	14.1	-0.4
OCT	7	0.4	.3.2	0.3	2	0.1	0.0	0.0	2292.1	14.1	0.0
NOV	10	0.6	1.8	0.2	2	0.1	0.0	0.0	2292.4	14.4	0.3
DEC	8	0.5	0.9	0.1	2	0.1	0.0	0.0	2292.6	14.7	0.3
TOTAL		16.5	41.8	4.8		10.5	0.0	0.0			1.2

HARLAN COUNTY **LAKE OPERATION ESTIMATES - 2003**

	INFLOW		EVAPORATION		RELEASE REQUIREMENT		RESERVOIR REQUIREMENT SPILL	RESERVOIR REQUIREMENT SHORTAGE	END OF MONTH RESERVOIR ELEV	END OF MONTH RESERVOIR CONT	END OF MONTH RESERVOIR CHANGE
	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	80	4.9	0.9	0.7	0	0.0	0.0	0.0	1932.6	164.7	4.2
FEB	124	6.9	0.9	0.7	0	0.0	0.0	0.0	1933.2	170.9	6.2
MAR	168	10.3	1.7	1.3	0	0.0	0.0	0.0	1934.2	179.9	9.0
APR	145	8.6	4.3	3.6	0	0.0	0.0	0.0	1934.7	184.9	5.0
MAY	182	11.2	5.3	4.4	70	4.3	0.0	0.0	1934.9	187.4	2.5
JUN	151	9.0	6.5	5.2	432	25.7	0.0	0.0	1932.6	165.5	-21.9
JUL	153	9.4	7.3	5.3	828	50.9	0.0	15.1	1929.0	133.8	-31.7
AUG	124	7.6	6.3	4.3	610	37.5	0.0	34.2	1929.0	133.8	0.0
SEP	59	3.5	5.0	3.4	61	3.6	0.0	3.5	1929.0	133.8	0.0
OCT	59	3.6	3.3	2.2	0	0.0	0.0	0.0	1929.2	135.2	1.4
NOV	77	4.6	2.0	1.3	0	0.0	0.0	0.0	1929.6	138.5	3.3
DEC	75	4.6	1.3	0.9	0	0.0	0.0	0.0	1930.0	142.2	3.7
TOTAL		84.2	44.7	33.3		122.0	0.0	52.8			-18.3
MOST PROBABLE INFLOW CONDITIONS											
JAN	146	9.0	0.8	0.6	0	0.0	0.0	0.0	1933.0	168.9	8.4
FEB	229	12.7	0.8	0.6	0	0.0	0.0	0.0	1934.3	181.0	12.1
MAR	309	19.0	1.5	1.3	0	0.0	0.0	0.0	1936.0	198.7	17.7
APR	267	15.9	3.9	3.4	0	0.0	0.0	0.0	1937.2	211.2	12.5
MAY	337	20.7	4.8	4.3	0	0.0	0.0	0.0	1938.7	227.6	16.4
JUN	279	16.6	5.8	5.5	96	5.7	0.0	0.0	1939.2	233.0	5.4
JUL	283	17.4	6.6	6.0	701	43.1	0.0	0.0	1936.3	201.3	-31.7
AUG	228	14.0	5.7	4.8	603	37.1	0.0	0.0	1933.5	173.4	-27.9
SEP	109	6.5	4.6	3.6	37	2.2	0.0	0.0	1933.6	174.1	0.7
OCT	107	6.6	3.0	2.4	0	0.0	0.0	0.0	1934.0	178.3	4.2
NOV	141	8.4	1.8	1.5	0	0.0	0.0	0.0	1934.7	185.2	6.9
DEC	140	8.6	1.1	1.0	0	0.0	0.0	0.0	1935.4	192.8	7.6
TOTAL		155.4	40.2	35.0		88.1	0.0	0.0			32.3
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	268	16.5	0.7	0.6	0	0.0	0.0	0.0	1933.8	176.4	15.9
FEB	420	23.3	0.7	0.6	0	0.0	0.0	0.0	1936.1	199.1	22.7
MAR	563	34.6	1.3	1.2	0	0.0	0.0	0.0	1939.1	232.5	33.4
APR	486	28.9	3.5	3.4	0	0.0	0.0	0.0	1941.3	258.0	25.5
MAY	613	37.7	4.2	4.3	0	0.0	0.0	0.0	1944.0	291.4	33.4
JUN	509	30.3	5.2	5.6	39	2.3	0.0	0.0	1945.7	313.8	22.4
JUL	517	31.8	5.8	6.4	161	9.9	11.6	0.0	1946.0	317.7	3.9
AUG	415	25.5	5.0	5.6	161	9.9	10.0	0.0	1946.0	317.7	0.0
SEP	200	11.9	4.0	4.5	20	1.2	6.2	0.0	1946.0	317.7	0.0
OCT	194	11.9	2.6	2.9	0	0.0	9.0	0.0	1946.0	317.7	0.0
NOV	257	15.3	1.6	1.7	0	0.0	13.6	0.0	1946.0	317.7	0.0
DEC	254	15.6	1.0	1.1	0	0.0	14.5	0.0	1946.0	317.7	0.0
TOTAL		283.3	35.6	37.9		23.3	64.9	0.0			157.2

TABLE 4

LOVEWELL **RESERVOIR OPERATION ESTIMATES** - 2003

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 REQUIREMENT MEAN CFS	RELEASE REQUIREMENT 1000 AF	RES SPILL 1000 AF	REQ SHORT 1000 AF	END OF MONTH ELEV FT	END OF MONTH CONT 1000 AF	RESERVOIR CHANGE 1000 AF
REASONABLE MINIMUM INFLOW CONDITIONS													
JAN	0.5	2.2	44	2.7	0.8	0.2	0	0.0	0.0	0.0	1581.0	31.0	2.5
FEB	0.7	2.5	58	3.2	1.0	0.2	0	0.0	0.0	0.0	1582.0	34.0	3.0
MAR	1.6	0.0	26	1.6	1.8	0.4	0	0.0	0.0	0.0	1582.4	35.2	1.2
APR	1.5	0.0	25	1.5	3.7	0.9	0	0.0	0.0	0.0	1582.6	35.8	0.6
MAY	1.8	6.5	135	8.3	4.7	1.2	16	1.0	0.0	0.0	1584.6	41.9	6.1
JUN	2.0	10.8	215	12.8	6.0	1.6	188	11.2	0.0	0.0	1584.6	41.9	0.0
JUL	1.3	4.3	91	5.6	6.7	1.4	566	34.8	0.0	0.3	1571.7	11.6	-30.3
AUG	0.2	0.0	3	0.2	5.4	0.7	389	23.9	0.0	23.9	1571.3	11.1	-0.5
SEP	1.1	0.0	18	1.1	4.1	0.5	52	3.1	0.0	3.0	1571.7	11.6	0.5
OCT	0.7	1.9	42	2.6	2.8	0.4	0	0.0	0.0	0.0	1573.1	13.8	2.2
NOV	0.6	2.5	52	3.1	2.1	0.3	0	0.0	0.0	0.0	1574.7	16.6	2.8
DEC	0.4	2.6	49	3.0	1.0	0.2	0	0.0	0.0	0.0	1576.1	19.4	2.8
TOTAL	12.4	33.3		45.7	40.2	8.0		74.0	0.0	27.2			-9.1
MOST PROBABLE INFLOW CONDITIONS													
JAN	1.2	0.0	20	1.2	0.7	0.1	0	0.0	0.0	0.0	1580.4	29.6	1.1
FEB	1.8	0.0	32	1.8	0.8	0.2	0	0.0	0.0	0.0	1581.0	31.2	1.6
MAR	4	0.0	65	4.0	1.5	0.4	0	0.0	0.0	0.0	1582.3	34.8	3.6
APR	3.6	0.0	61	3.6	3.1	0.8	0	0.0	0.0	0.0	1583.2	37.6	2.8
MAY	4.6	1.7	102	6.3	4.0	1.1	15	0.9	0.0	0.0	1584.6	41.9	4.3
JUN	5	5.6	178	10.6	5.0	1.4	155	9.2	0.0	0.0	1584.6	41.9	0.0
JUL	3.4	11.0	234	14.4	5.6	1.4	472	29.0	0.0	0.0	1579.0	25.9	-16.0
AUG	0.3	11.7	195	12.0	4.6	0.8	324	19.9	0.0	0.0	1575.0	17.2	-8.7
SEP	2.6	0.6	54	3.2	3.4	0.5	44	2.6	0.0	0.0	1575.1	17.3	0.1
OCT	1.8	4.7	106	6.5	2.3	0.4	0	0.0	0.0	0.0	1578.0	23.4	6.1
NOV	1.5	4.1	94	5.6	1.8	0.4	0	0.0	0.0	0.0	1580.1	28.6	5.2
DEC	1	0.6	26	1.6	0.8	0.2	0	0.0	0.0	0.0	1580.6	30.0	1.4
TOTAL	30.8	40.0		70.8	33.8	7.7		61.6	0.0	0.0			1.5
REASONABLE MAXIMUM INFLOW CONDITIONS													
JAN	3.2	0.0	52	3.2	0.6	0.1	0	0.0	0.0	0.0	1581.2	31.6	3.1
FEB	4.8	0.0	86	4.8	0.7	0.2	0	0.0	0.5	0.0	1582.6	35.7	4.1
MAR	11.1	0.0	181	11.1	1.3	0.3	0	0.0	10.8	0.0	1582.6	35.7	0.0
APR	10	0.0	168	10.0	2.7	0.7	0	0.0	6.8	0.0	1583.4	38.2	2.5
MAY	12.6	0.0	205	12.6	3.4	0.9	8	0.5	7.5	0.0	1584.6	41.9	3.7
JUN	13.7	1.2	250	14.9	4.3	1.2	87	5.2	8.5	0.0	1584.6	41.9	0.0
JUL	9.3	1.2	171	10.5	4.8	1.3	265	16.3	0.0	0.0	1582.3	34.8	-7.1
AUG	0.9	1.2	34	2.1	3.9	0.9	179	11.0	0.0	0.0	1578.6	25.0	-9.8
SEP	7.3	0.6	133	7.9	2.9	0.6	24	1.4	0.9	0.0	1580.6	30.0	5.0
OCT	4.9	0.0	80	4.9	2.0	0.4	0	0.0	4.5	0.0	1580.6	30.0	0.0
NOV	4.3	0.0	72	4.3	1.5	0.3	0	0.0	4.0	0.0	1580.6	30.0	0.0
DEC	2.9	0.0	47	2.9	0.7	0.2	0	0.0	2.7	0.0	1580.6	30.0	0.0
TOTAL	85	4.2		89.2	28.8	7.1		34.4	46.2	0.0			1.5

KIRWIN RESERVOIR OPERATION ESTIMATES - 2003

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIREMENT MEAN CFS	RELEASE REQUIREMENT 1000 AF	RESERVOIR REQUIREMENT SPILL 1000 AF	RESERVOIR REQUIREMENT SHORTAGE 1000 AF	END OF MONTH RESERVOIR ELEV FT	END OF MONTH RESERVOIR CONT 1000 AF	END OF MONTH RESERVOIR CHANGE 1000 AF
REASONABLE MINIMUM INFLOW CONDITIONS											
JAN	5	0.3	0.9	0.2	0	0.0	0.0	0.0	1715.2	41.7	0.1
FEB	7	0.4	1.1	0.3	0	0.0	0.0	0.0	1715.3	41.8	0.1
MAR	13	0.8	1.9	0.5	0	0.0	0.0	0.0	1715.4	42.1	0.3
APR	15	0.9	4.3	1.1	0	0.0	0.0	0.0	1715.3	41.9	-0.2
MAY	23	1.4	5.3	1.4	8	0.5	0.0	0.0	1715.1	41.4	-0.5
JUN	18	1.1	6.6	1.6	87	5.2	0.0	0.0	1713.2	35.7	-5.7
JUL	18	1.1	7.5	1.5	192	11.8	0.0	0.0	1707.9	23.5	-12.2
AUG	13	0.8	6.6	0.8	192	11.8	0.0	0.1	1700.0	11.8	-11.7
SEP	7	0.4	5.0	0.5	52	3.1	0.0	3.1	1699.9	11.7	-0.1
OCT	3	0.2	3.4	0.3	0	0.0	0.0	0.0	1699.8	11.6	-0.1
NOV	5	0.3	2.1	0.2	0	0.0	0.0	0.0	1699.9	11.7	0.1
DEC	5	0.3	1.1	0.1	0	0.0	0.0	0.0	1700.0	11.9	0.2
TOTAL		8.0	45.6	8.5		32.4	0.0	3.2			-29.7
MOST PROBABLE INFLOW CONDITIONS											
JAN	15	0.9	0.8	0.2	0	0.0	0.0	0.0	1715.4	42.3	0.7
FEB	23	1.3	1.0	0.3	0	0.0	0.0	0.0	1715.7	43.3	1.0
MAR	39	2.4	1.7	0.4	0	0.0	0.0	0.0	1716.4	45.3	2.0
APR	44	2.6	3.8	1.1	0	0.0	0.0	0.0	1716.8	46.8	1.5
MAY	68	4.2	4.7	1.3	7	0.4	0.0	0.0	1717.6	49.3	2.5
JUN	55	3.3	5.9	1.7	74	4.4	0.0	0.0	1716.7	46.5	-2.8
JUL	52	3.2	6.7	1.7	192	11.8	0.0	0.0	1713.4	36.2	-10.3
AUG	37	2.3	5.9	1.2	166	10.2	0.0	0.0	1709.7	27.1	-9.1
SEP	18	1.1	4.5	0.8	8	0.5	0.0	0.0	1709.6	26.9	-0.2
OCT	11	0.7	3.0	0.5	0	0.0	0.0	0.0	1709.7	27.1	0.2
NOV	17	1.0	1.9	0.3	0	0.0	0.0	0.0	1710.0	27.8	0.7
DEC	13	0.8	1.0	0.2	0	0.0	0.0	0.0	1710.3	28.4	0.6
TOTAL		23.8	40.9	9.7		27.3	0.0	0.0			-13.2
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	44	2.7	0.7	0.2	0	0.0	0.0	0.0	1716.0	44.1	2.5
FEB	74	4.1	0.9	0.2	0	0.0	0.0	0.0	1717.2	48.0	3.9
MAR	117	7.2	1.5	0.4	0	0.0	0.0	0.0	1719.1	54.8	6.8
APR	131	7.8	3.5	1.1	0	0.0	0.0	0.0	1721.0	61.5	6.7
MAY	205	12.6	4.3	1.4	5	0.3	0.0	0.0	1723.7	72.4	10.9
JUN	170	10.1	5.3	1.9	59	3.5	0.0	0.0	1724.8	77.1	4.7
JUL	161	9.9	6.0	2.2	168	10.3	0.0	0.0	1724.2	74.5	-2.6
AUG	112	6.9	5.3	1.9	119	7.3	0.0	0.0	1723.6	72.2	-2.3
SEP	59	3.5	4.0	1.4	7	0.4	0.0	0.0	1724.0	73.9	1.7
OCT	36	2.2	2.7	1.0	0	0.0	0.0	0.0	1724.3	75.1	1.2
NOV	50	3.0	1.7	0.6	0	0.0	0.0	0.0	1724.9	77.5	2.4
DEC	41	2.5	0.9	0.3	0	0.0	0.0	0.0	1725.4	79.7	2.2
TOTAL		72.5	36.8	12.6		21.8	0.0	0.0			38.1

WEBSTER RESERVOIR OPERATION ESTIMATES - 2003

	INFLOW		EVAPORATION		RELEASE REQUIREMENT		RESERVOIR REQUIREMENT SPILL	RESERVOIR REQUIREMENT SHORTAGE	END OF MONTH RESERVOIR ELEV	END OF MONTH RESERVOIR CONT	END OF MONTH RESERVOIR CHANGE
	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	3	0.2	0.9	0.2	0	0.0	0.0	0.0	1879.2	35.5	0.0
FEB	5	0.3	1.1	0.2	0	0.0	0.0	0.0	1879.2	35.6	0.1
MAR	10	0.6	2.0	0.4	0	0.0	0.0	0.0	1879.3	35.8	0.2
APR	13	0.8	4.4	0.9	0	0.0	0.0	0.0	1879.2	35.7	-0.1
MAY	20	1.2	5.7	1.1	15	0.9	0.0	0.0	1878.9	34.9	-0.8
JUN	15	0.9	7.2	1.3	94	5.6	0.0	0.0	1876.2	28.9	-6.0
JUL	13	0.8	7.9	1.2	221	13.6	0.0	0.0	1868.5	14.9	-14.0
AUG	8	0.5	7.2	0.8	221	13.6	0.0	6.4	1863.0	7.4	-7.5
SEP	5	0.3	5.4	0.5	24	1.4	0.0	1.4	1862.9	7.2	-0.2
OCT	3	0.2	3.6	0.3	0	0.0	0.0	0.0	1862.8	7.1	-0.1
NOV	3	0.2	2.2	0.2	0	0.0	0.0	0.0	1862.8	7.1	0.0
DEC	3	0.2	1.2	0.1	0	0.0	0.0	0.0	1862.9	7.2	0.1
TOTAL		6.2	48.7	7.2		35.1	0.0	7.8			-28.3
MOST PROBABLE INFLOW CONDITIONS											
JAN	13	0.8	0.8	0.2	0	0.0	0.0	0.0	1879.4	36.1	0.6
FEB	18	1.0	1.0	0.2	0	0.0	0.0	0.0	1879.7	36.9	0.8
MAR	29	1.8	1.7	0.4	0	0.0	0.0	0.0	1880.3	38.3	1.4
APR	42	2.5	4.0	0.8	0	0.0	0.0	0.0	1881.0	40.0	1.7
MAY	63	3.9	5.1	1.1	13	0.8	0.0	0.0	1881.7	42.0	2.0
JUN	45	2.7	6.4	1.4	71	4.2	0.0	0.0	1880.6	39.1	-2.9
JUL	42	2.6	7.1	1.4	195	12.0	0.0	0.0	1875.9	28.3	-10.8
AUG	24	1.5	6.4	1.0	151	9.3	0.0	0.0	1871.3	19.5	-8.8
SEP	15	0.9	4.8	0.7	5	0.3	0.0	0.0	1871.3	19.4	-0.1
OCT	8	0.5	3.2	0.5	0	0.0	0.0	0.0	1871.3	19.4	0.0
NOV	12	0.7	2.0	0.3	0	0.0	0.0	0.0	1871.5	19.8	0.4
DEC	11	0.7	1.1	0.2	0	0.0	0.0	0.0	1871.8	20.3	0.5
TOTAL		19.6	43.6	8.2		26.6	0.0	0.0			-15.2
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	50	3.1	0.8	0.2	0	0.0	0.0	0.0	1880.3	38.4	2.9
FEB	77	4.3	0.9	0.2	0	0.0	0.0	0.0	1881.9	42.5	4.1
MAR	120	7.4	1.6	0.4	0	0.0	0.0	0.0	1884.4	49.5	7.0
APR	173	10.3	3.6	0.9	0	0.0	0.0	0.0	1887.5	58.9	9.4
MAY	260	16.0	4.6	1.3	7	0.4	0.0	0.0	1891.6	73.2	14.3
JUN	187	11.1	5.8	1.8	39	2.3	0.0	0.0	1893.5	80.2	7.0
JUL	176	10.8	6.5	2.1	117	7.2	5.5	0.0	1892.4	76.2	-4.0
AUG	104	6.4	5.8	1.8	93	5.7	0.0	0.0	1892.2	75.1	-1.1
SEP	62	3.7	4.4	1.4	2	0.1	1.1	0.0	1892.4	76.2	1.1
OCT	34	2.1	2.9	0.9	0	0.0	1.2	0.0	1892.4	76.2	0.0
NOV	47	2.8	1.8	0.6	0	0.0	2.2	0.0	1892.4	76.2	0.0
DEC	44	2.7	1.0	0.3	0	0.0	2.4	0.0	1892.4	76.2	0.0
TOTAL		80.7	39.6	11.9		15.7	12.4	0.0			40.7

WACONDA LAKE OPERATION ESTIMATES - **2003**

	INFLOW		EVAPORATION		RELEASE REQUIREMENT		RESERVOIR REQUIREMENT SPILL	RESERVOIR REQUIREMENT SHORTAGE	END OF MONTH RESERVOIR ELEV	END OF MONTH RESERVOIR CONT	END OF MONTH RESERVOIR CHANGE
	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	42	2.6	0.8	0.7	10	0.6	0.0	0.0	1451.8	175.6	1.3
FEB	63	3.5	1.0	0.9	9	0.5	0.0	0.0	1452.0	177.7	2.1
MAR	120	7.4	1.9	1.7	3	0.2	0.0	0.0	1452.5	183.2	5.5
APR	126	7.5	4.8	4.5	3	0.2	0.0	0.0	1452.8	186.0	2.8
MAY	145	8.9	5.9	5.5	7	0.4	0.0	0.0	1453.1	189.0	3.0
JUN	121	7.2	7.5	7.1	42	2.5	0.0	0.0	1452.8	186.6	-2.4
JUL	200	12.3	8.9	8.2	159	9.8	0.0	0.0	1452.3	180.9	-5.7
AUG	73	4.5	7.6	6.8	125	7.7	0.0	0.0	1451.4	170.9	-10.0
SEP	55	3.3	6.0	5.2	24	1.4	0.0	0.0	1451.1	167.6	-3.3
OCT	44	2.7	3.9	3.4	5	0.3	0.0	0.0	1451.0	166.6	-1.0
NOV	50	3.0	2.1	1.8	7	0.4	0.0	0.0	1451.1	167.4	0.8
DEC	39	2.4	1.0	0.9	10	0.6	0.0	0.0	1451.2	168.3	0.9
TOTAL		65.3	51.5	46.7		24.6	0.0	0.0			-6.0
MOST PROBABLE INFLOW CONDITIONS											
JAN	104	6.4	0.7	0.7	5	0.3	0.0	0.0	1452.2	179.7	5.4
FEB	155	8.6	0.9	0.8	5	0.3	0.0	0.0	1452.9	187.2	7.5
MAR	291	17.9	1.7	1.6	2	0.1	0.0	0.0	1454.3	203.4	16.2
APR	304	18.1	4.3	4.4	2	0.1	0.0	0.0	1455.4	217.0	13.6
MAY	351	21.6	5.2	5.5	3	0.2	13.5	0.0	1455.6	219.4	2.4
JUN	292	17.4	6.7	7.0	32	1.9	8.5	0.0	1455.6	219.4	0.0
JUL	485	29.8	7.9	8.3	115	7.1	14.4	0.0	1455.6	219.4	0.0
AUG	177	10.9	6.7	7.0	91	5.6	0.0	0.0	1455.5	217.7	-1.7
SEP	136	8.1	5.4	5.6	18	1.1	0.0	0.0	1455.6	219.1	1.4
OCT	106	6.5	3.5	3.6	2	0.1	2.5	0.0	1455.6	219.4	0.3
NOV	119	7.1	1.9	1.9	3	0.2	29.3	0.0	1453.6	195.1	-24.3
DEC	96	5.9	0.9	0.9	5	0.3	4.7	0.0	1453.6	195.1	0.0
TOTAL		158.3	45.7	47.3		17.3	72.9	0.0			20.8
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	355	21.8	0.7	0.6	2	0.1	0.3	0.0	1453.6	195.1	20.8
FEB	529	29.4	0.8	0.8	2	0.1	28.5	0.0	1453.6	195.1	0.0
MAR	999	61.4	1.5	1.5	2	0.1	35.5	0.0	1455.6	219.4	24.3
APR	1042	62.0	3.9	4.0	2	0.1	57.9	0.0	1455.6	219.4	0.0
MAY	1202	73.9	4.7	4.9	3	0.2	68.8	0.0	1455.6	219.4	0.0
JUN	1007	59.9	6.0	6.3	20	1.2	52.4	0.0	1455.6	219.4	0.0
JUL	1662	102.2	7.1	7.4	73	4.5	90.3	0.0	1455.6	219.4	0.0
AUG	612	37.6	6.0	6.3	57	3.5	27.8	0.0	1455.6	219.4	0.0
SEP	467	27.8	4.8	5.0	10	0.6	22.2	0.0	1455.6	219.4	0.0
OCT	364	22.4	3.1	3.3	2	0.1	19.0	0.0	1455.6	219.4	0.0
NOV	413	24.6	1.7	1.7	2	0.1	47.1	0.0	1453.6	195.1	-24.3
DEC	329	20.2	0.8	0.8	2	0.1	19.3	0.0	1453.6	195.1	0.0
TOTAL		543.2	40.9	42.6		10.7	469.1	0.0			20.8

CEDAR BLUFF RESERVOIR OPERATION ESTIMATES - 2003

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIREMENT MEAN CFS	RELEASE REQUIREMENT 1000 AF	RESERVOIR REQUIREMENT SPILL 1000 AF	RESERVOIR REQUIREMENT SHORTAGE 1000 AF	END OF MONTH RESERVOIR ELEV FT	END OF MONTH RESERVOIR CONT 1000 AF	END OF MONTH RESERVOIR CHANGE 1000 AF
REASONABLE MINIMUM INFLOW CONDITIONS											
JAN	2	0.1	1.1	0.6	0	0.0	0.0	0.0	2139.8	145.4	-0.5
FEB	2	0.1	1.3	0.6	0	0.0	0.0	0.0	2139.8	144.9	-0.5
MAR	2	0.1	2.1	1.1	0	0.0	0.0	0.0	2139.6	143.9	-1.0
APR	3	0.2	5.4	2.8	0	0.0	0.0	0.0	2139.2	141.3	-2.6
MAY	5	0.3	6.4	3.2	5	0.3	0.0	0.0	2138.7	138.1	-3.2
JUN	5	0.3	7.9	3.9	5	0.3	0.0	0.0	2138.0	134.2	-3.9
JUL	7	0.4	9.6	4.6	13	0.8	0.0	0.0	2137.1	129.2	-5.0
AUG	5	0.3	8.2	3.8	11	0.7	0.0	0.0	2136.4	125.0	-4.2
SEP	2	0.1	7.0	3.2	5	0.3	0.0	0.0	2135.7	121.6	-3.4
OCT	2	0.1	4.9	2.2	2	0.1	0.0	0.0	2135.3	119.4	-2.2
NOV	2	0.1	2.3	1.0	2	0.1	0.0	0.0	21352	118.4	-1.0
DEC	2	0.1	1.3	0.5	2	0.1	0.0	0.0	2135.1	117.9	-0.5
TOTAL		2.2	57.3	27.5		2.7	0.0	0.0			-28.0
MOST PROBABLE INFLOW CONDITIONS											
JAN	5	0.3	1.0	0.5	0	0.0	0.0	0.0	2139.9	145.7	-0.2
FEB	7	0.4	1.1	0.6	0	0.0	0.0	0.0	2139.9	145.5	-0.2
MAR	11	0.7	1.9	1.0	0	0.0	0.0	0.0	2139.8	145.2	-0.3
APR	20	1.2	4.9	2.5	0	0.0	0.0	0.0	2139.6	143.9	-1.3
MAY	28	1.7	5.7	2.9	3	0.2	0.0	0.0	2139.4	142.5	-1.4
JUN	30	1.8	7.1	3.6	3	0.2	0.0	0.0	2139.1	140.5	-2.0
JUL	39	2.4	8.6	4.3	11	0.7	0.0	0.0	2138.6	137.9	-2.6
AUG	28	1.7	7.4	3.6	7	0.4	0.0	0.0	2138.2	135.6	-2.3
SEP	12	0.7	6.3	3.1	3	0.2	0.0	0.0	2137.8	133.0	-2.6
OCT	5	0.3	4.4	2.1	2	0.1	0.0	0.0	2137.5	131.1	-1.9
NOV	5	0.3	2.1	1.0	2	0.1	0.0	0.0	2137.3	130.3	-0.8
DEC	3	0.2	1.1	0.5	2	0.1	0.0	0.0	2137.2	129.9	-0.4
TOTAL		11.7	51.7	25.7		2.0	0.0	0.0			-16.0
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	28	1.7	0.9	0.5	0	0.0	0.0	0.0	2140.1	147.1	1.2
FEB	36	2.0	1.0	0.5	0	0.0	0.0	0.0	2140.4	148.6	1.5
MAR	63	3.9	1.7	0.9	0	0.0	0.0	0.0	2140.8	151.6	3.0
APR	106	6.3	4.4	2.3	0	0.0	0.0	0.0	2141.5	155.6	4.0
MAY	153	9.4	5.1	2.8	3	0.2	0.0	0.0	2142.4	162.0	6.4
JUN	165	9.8	6.4	3.5	3	0.2	0.0	0.0	2143.4	168.1	6.1
JUL	211	13.0	7.7	4.4	3	0.2	4.0	0.0	2144.0	172.5	4.4
AUG	148	9.1	6.6	3.8	0	0.0	5.3	0.0	2144.0	172.5	0.0
SEP	61	3.6	5.6	3.2	2	0.1	0.3	0.0	2144.0	172.5	0.0
OCT	24	1.5	4.0	2.3	2	0.1	0.0	0.0	2143.9	171.6	-0.9
NOV	34	2.0	1.8	1.0	2	0.1	0.0	0.0	2144.0	172.5	0.9
DEC	23	1.4	1.0	0.6	2	0.1	0.7	0.0	2144.0	172.5	0.0
TOTAL		63.7	46.1	25.8		1.0	10.3	0.0			26.6

TABLE 5

FLOOD DAMAGES PREVENTED BY NEBRASKA-KANSAS PROJECTS RESERVOIRS

RESERVOIR	DURING FY 2002	PRIOR TO 2002	ACCUMULATED TOTAL
BONNY	$0	$2,682,000	$2,682,000
ENDERS	$9,000	$3,265,000	$3,274,000
SWANSON	$0	$19,063,000	$19,063,000
HUGH BUTLER	$9,000	$2,546,000	$2,555,000
HARRY STRUNK	$20,000	$4,845,000	$4,865,000
KEITH SEBELIUS	$0	$3,952,000	$3,952,000
HARLAN COUNTY	$50,000	$150,014,000	$150,064,000
LOVEWELL	$0	$146,057,000	$146,057,000
KIRWIN	$9,000	$86,841,000	$86,850,000
WEBSTER	$10,000	$110,298,000	$110,308,000
WACONDA	$20,000	$1,213,033,000	$1,213,053,000
CEDAR BLUFF	$1,000	$128,886,000	$128,887,000
TOTAL	$128,000	$1,871,482,000	$1,871,610,000

Estimates of damages prevented are received from the Army Corps of Engineer's Kansas City District Office. The Accumulated Totals date from 1951 through 2002. Cumulative totals are revised by the Corps of Engineers in some cases to reflect data not previously included in the reporting and may not match previous cumulative totals.

Construction Cost of storage dams was $208,954,130.
The reservoirs upstream of Harlan County Lake did not receive benefits for damages prevented from 1972 to 1993.

TABLE 6
WATER DIVERTED IN 2002 AND THE
ESTIMATED DIVERSION FOR 2003
(Units - Acre-Feet)

Irrigation District and Canal	2002 Irrigation Operations From	To	10-Year Average Diversion (1992-01)	2002 Diversion	Estimated Diversion in 2003
Mirage Flats Irrigation District					
Mirage Flats Canal	6/26	8/21	13,653	12,467	9,000
Ainsworth Irrigation District					
Ainsworth Canal	5/13	9/15	66,468	90,133	75,000
Sargent Irrigation District					
Sargent Canal	6/15	9/11	21,009	28,611	- - -
Farwell Irrigation District					
Farwell Canal	5/28	9/06	68,490	88,937	- - -
Twin Loups Irrigation District					
Above Davis Creek	5/01	9/13	37,983	51,371	45,000
Below Davis Creek	4/22	9/13	35,483	47,928	45,000
Total Twin Loups Irrigation District			73,466	99,299	90,000
Frenchman Valley Irrigation District					
Culbertson Canal	4/01	8/05	9,304	8,964	7,000
H & RW Irrigation District					
Culbertson Extension Canal	Did not run.		11,301	0	0
Frenchman-Cambridge Irrigation District					
Meeker-Driftwood Canal	6/24	7/24	27,400	9,894	5,500
Red Willow Canal	6/24	7/26	6,850	3,429	1,500
Bartley Canal	6/27	7/25	7,968	3,584	2,000
Cambridge Canal	6/19	8/21	23,678	20,993	18,000
Total Frenchman-Cambridge Irrigation District			65,896	37,900	27,000
Almena Irrigation District					
Almena Canal	4/01	8/16	4,238	4,065	4,000
Bostwick Irrigation District in Nebraska					
Franklin Canal	6/18	8/14	28,223	24,631	16,000
Naponee Canal	6/11	8/13	2,413	**2,444**	1,500
Franklin Pump Canal	6/13	8/12	2,802	3,273	2,000
Superior Canal	6/06	8/13	13,313	11,252	8,000
Courtland Canal (Nebraska)	6/20	8/14	1,813	2,263	1,500
Total Bostwick Irrigation District in Nebraska			48,564	43,863	29,000
Kansas-Bostwick Irrigation District					
Courtland Canal above Lovewell	6/19	8/28	25,146	26,077	18,000
Courtland Canal below Lovewell	6/03	8/22	41,993	46,557	35,000
Total Kansas-Bostwick Irrigation District			67,139	72,634	53,000
Kirwin Irrigation District					
Kirwin Canal	6/24	8/23	18,457	19,452	15,000
Webster Irrigation District					
Osborne Canal	6/25	8/23	12,290	14,768	12,500
Glen Elder Irrigation District	4/19	9/14	5,149	13,114	7,000
TOTAL			485,424	534,207	328,500

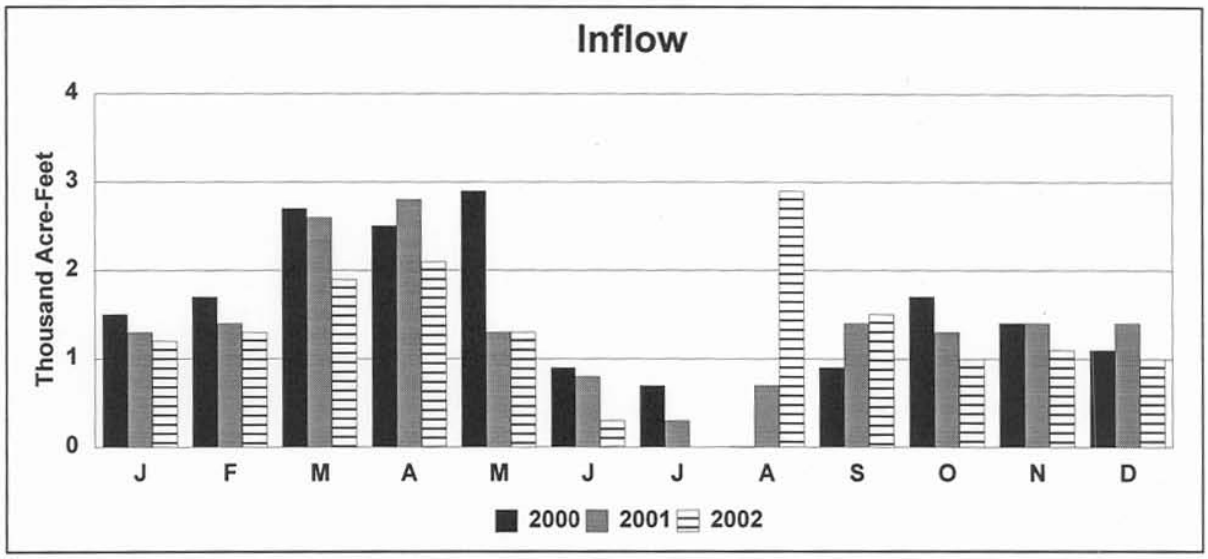
*Average diversion is from 1995 through 2002 for Twin Loups and Glen Elder Irrigation Districts.

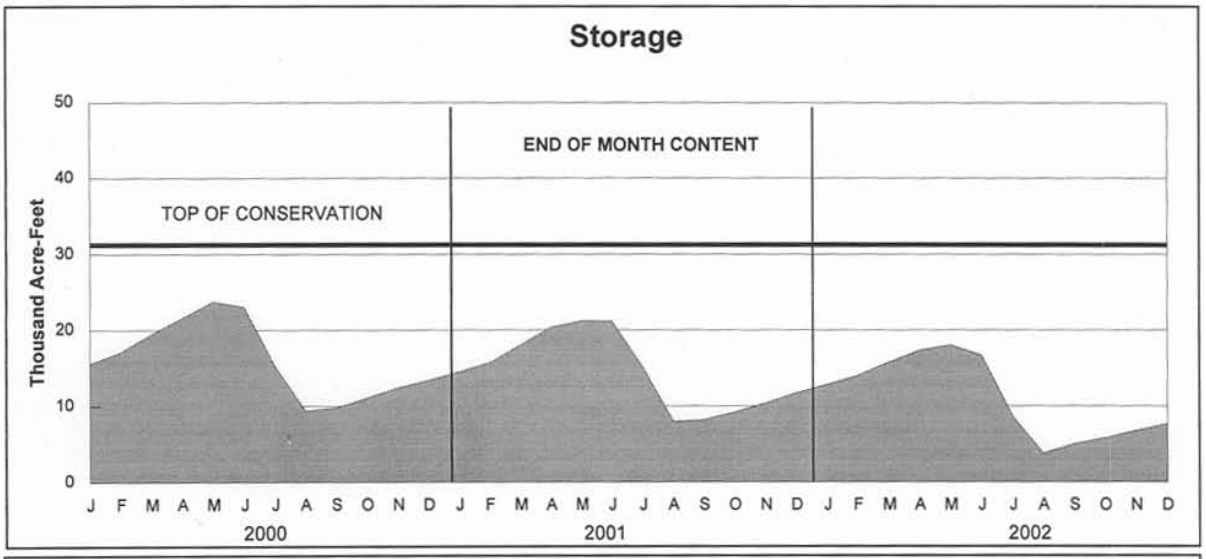
TABLE 7
NEBRASKA-KANSAS PROJECTS
Summary of Precipitation, Reservoir Storage and Inflows
CALENDAR YEAR 2002

Reservoir	Total Precip. Inches	Percent Of Average %	Storage 12-31-01 AF	Storage 12-31-02 AF	Gain or Loss AF	Maximum Content AF	Storage Date	Minimum Content AF	Storage Date	Total Inflow AF	Percent Of Most Probable %
Box Butte	9.71	57	11,714	7,717	-3,997	17,976	MAY 31	3,652	AUG 21	15,715	84
Merritt	15.50	77	68,288	68,560	272	74,781	MAY 30	28,415	SEP 6	181,594	99
Sherman	23.10	102	52,241	52,004	-237	69,653	JUN 5	23,150	AUG 27	110,991	108
Calamus	15.63	66	108,704	103,572	-5,132	128,376	JUN 8	54,694	SEP 28	256,492	97
Davis Creek	14.79	63	14,886	6,339	-8,547	30,840	JUN 24	5,732	SEP 10	46,265	117
Bonny	9.17	53	23,290	18,952	-4,338	24,914	APR 16	18,952	DEC 30	6,996	**42**
Enders	10.82	57	11,920	11,485	-435	15,148	JUN 5	10,216	AUG 21	7,432	35
Swanson	10.17	51	24,011	21,864	-2,147	33,509	MAY 8	19,511	AUG 26	17,491	28
Hugh Butler	11.67	59	17,958	12,640	-5,318	20,737	JUN 4	10,986	AUG 8	10,980	60
Harry Strunk	10.52	51	25,435	18,155	-7,280	36,541	JUN 7	12,101	AUG 21	29,038	74
Keith Sebelius	12.13	49	20,600	13,510	-7,090	21,420	APR 12	13,249	OCT 22	5,751	83
Harlan County	16.86	74	242,875	160,463	-82,412	277,515	JUN 16	160,363	OCT 22	60,094	38
Lovewell	21.16	78	30,074	28,514	-1,560	43,606	JUN 13	13,254	AUG 22	57,158	81
Kirwin	15.05	64	**64,493**	41,637	-22,856	68,480	APR 16	41,637	DEC 26	11,398	54
Webster	17.47	74	56,258	35,497	-20,761	61,391	MAY 8	35,497	DEC 25	11,214	66
Waconda	20.45	79	228,215	195,889	-32,326	229,065	JUN 1	194,048	OCT 1	63,467	46
Cedar Bluff	13.38	63	169,853	145,890	-23,963	170,262	FEB 11	145,890	DEC 31	9,288	68

EXHIBIT 1A

BOX BUTTE RESERVOIR
ACTUAL OPERATION





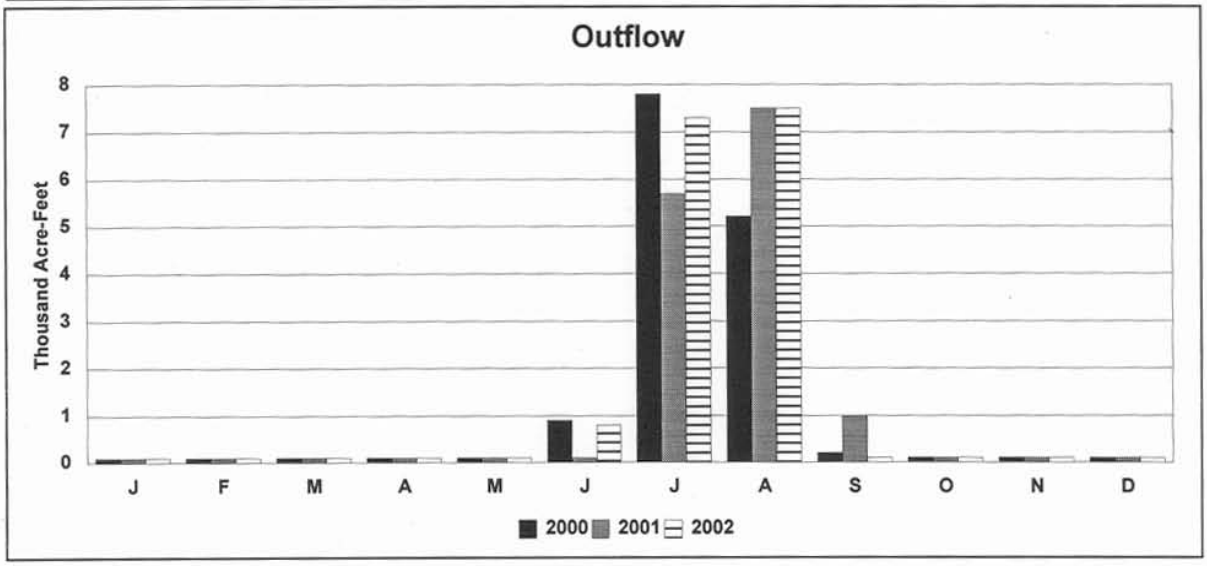
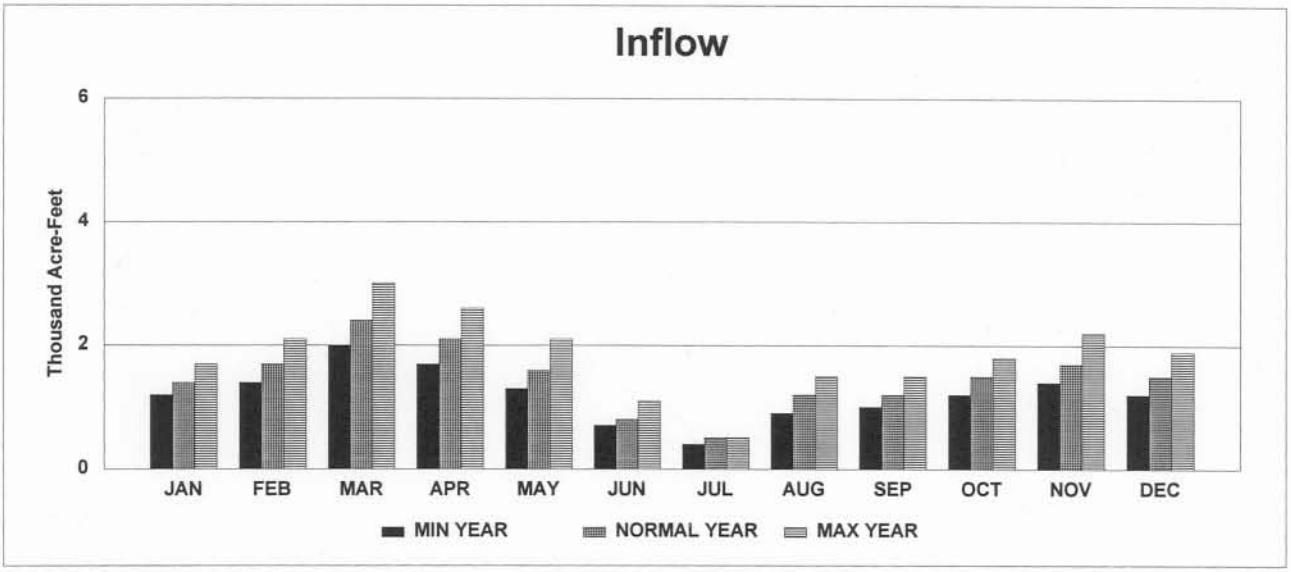
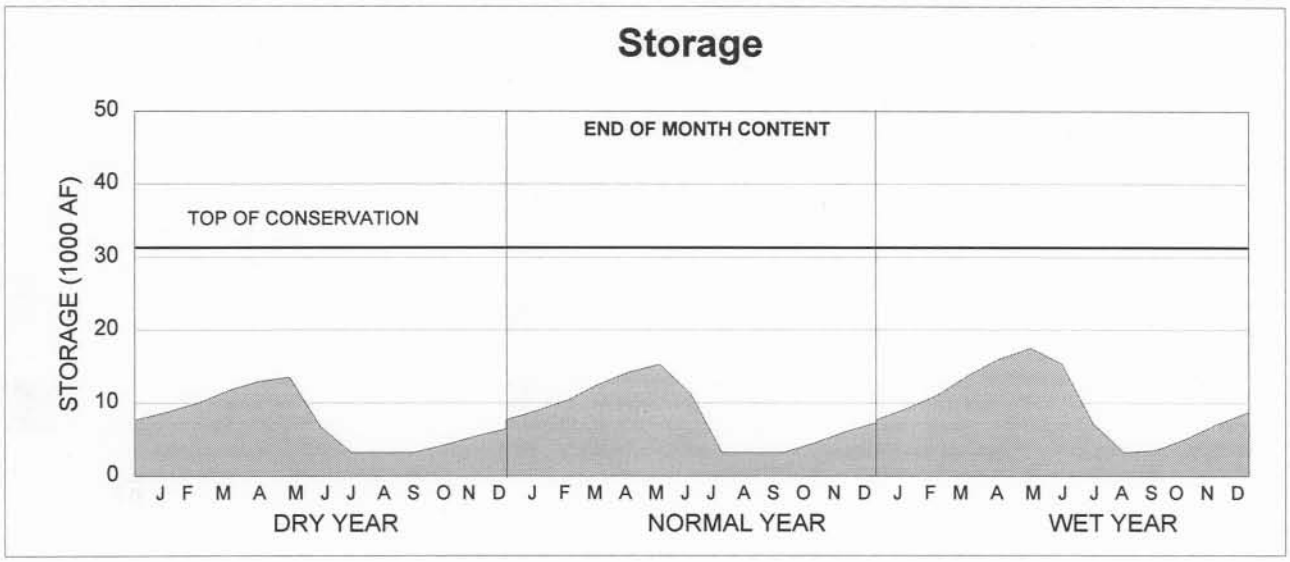


EXHIBIT 1B

BOX BUTTE RESERVOIR
2003 OPERATION PLAN





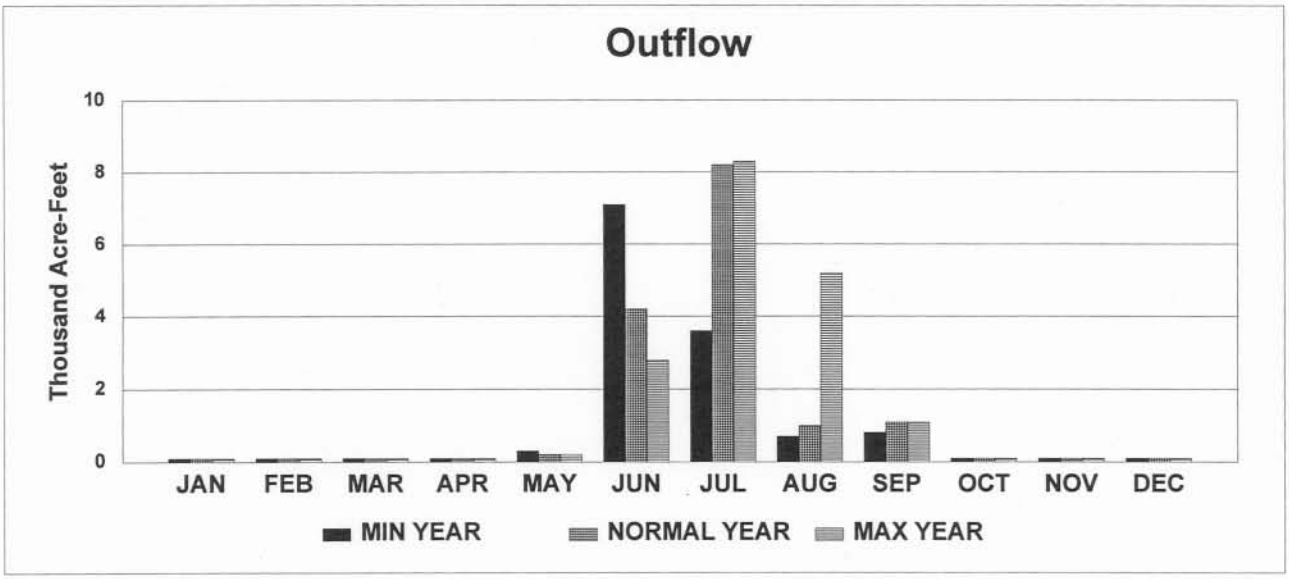
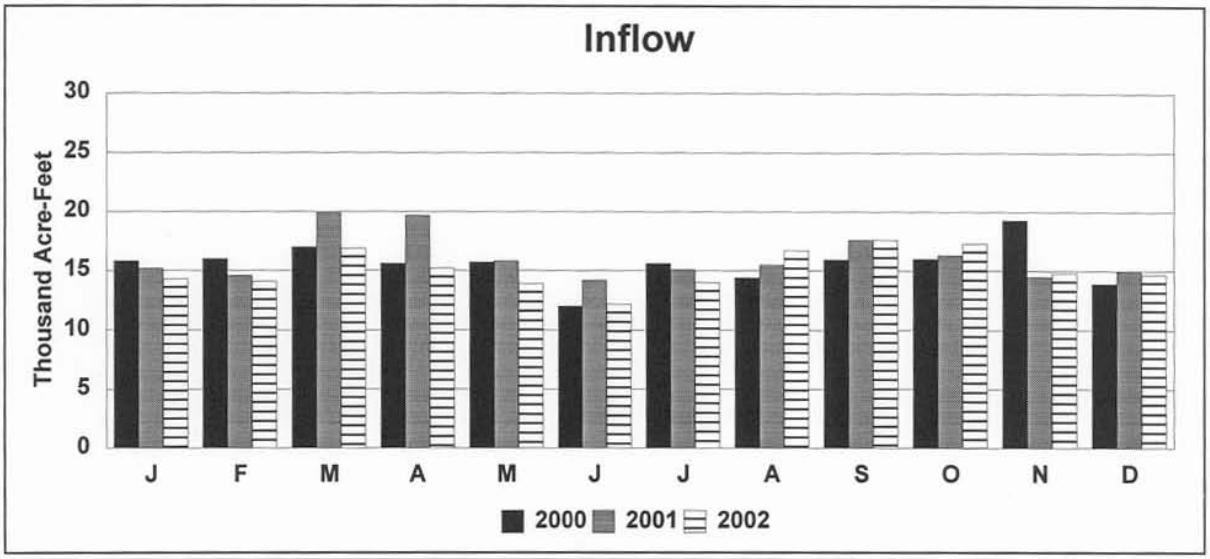
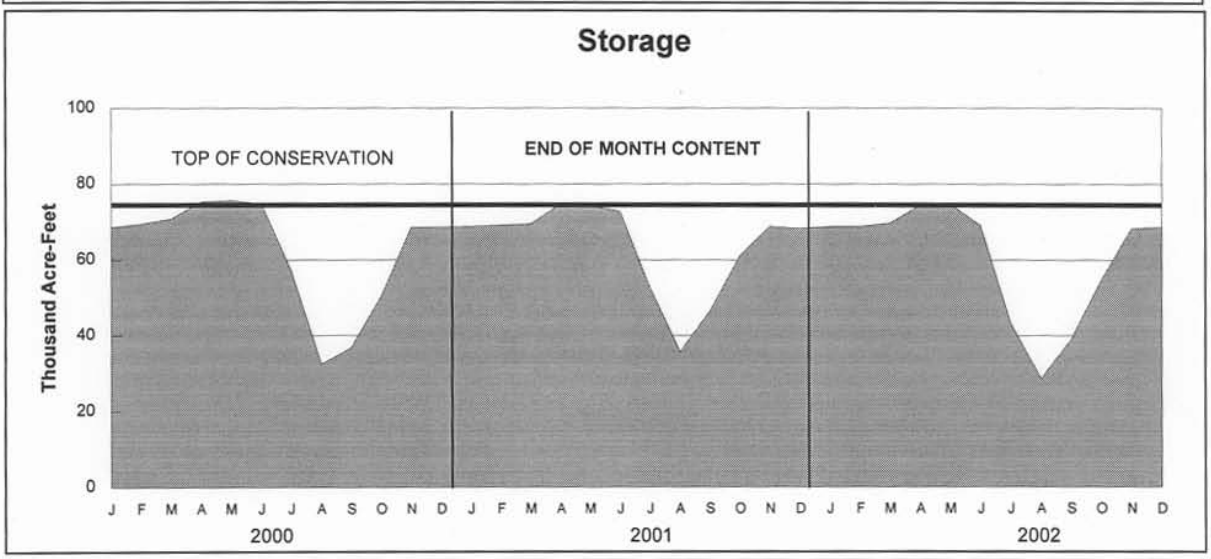


EXHIBIT 2A

MERRITT RESERVOIR
ACTUAL OPERATION





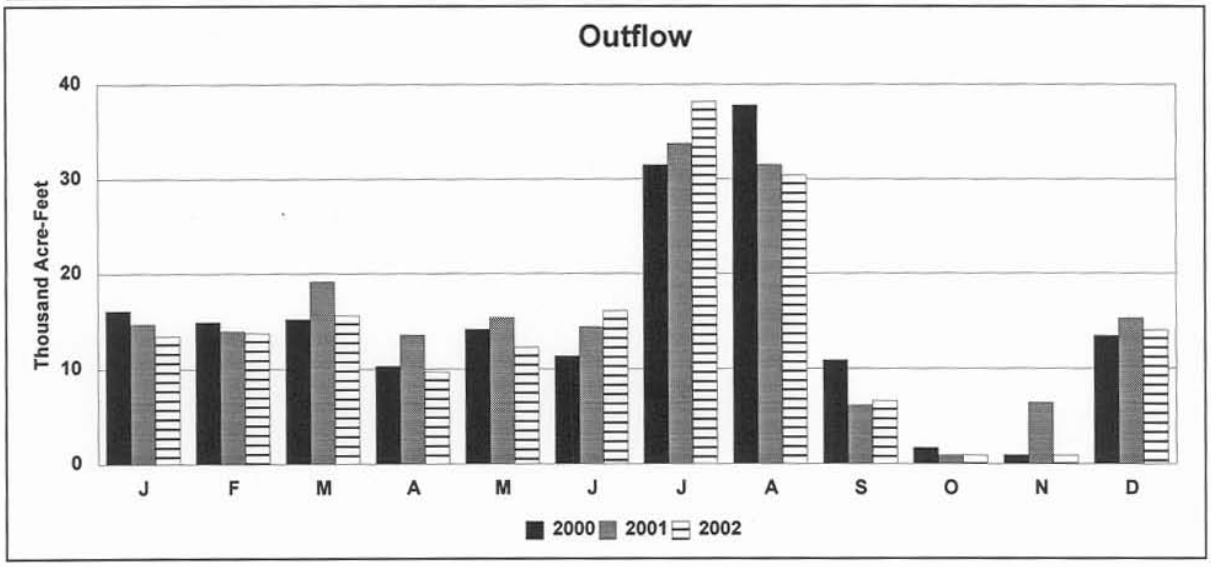
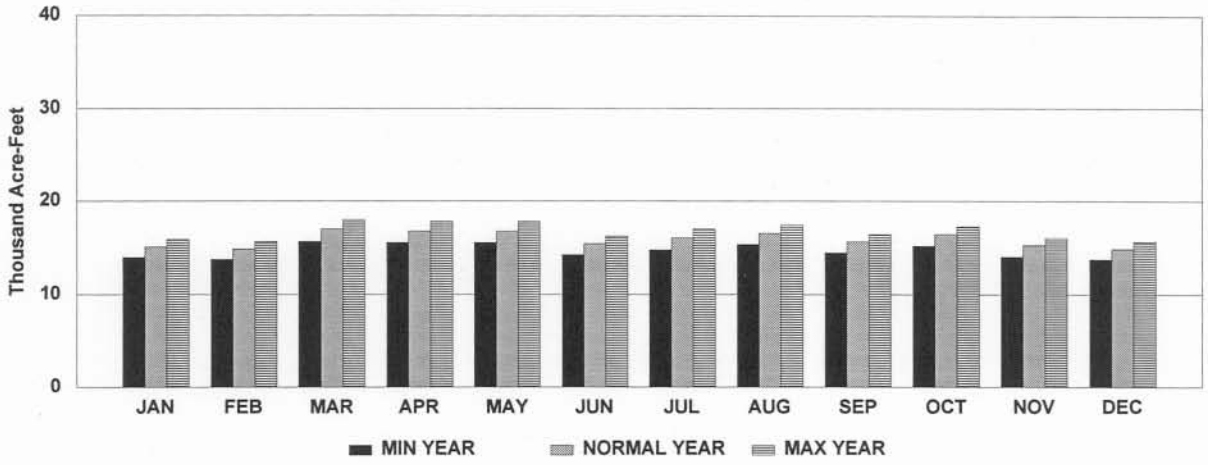


EXHIBIT 2B

MERRITT RESERVOIR

2003 OPERATION PLAN

Inflow



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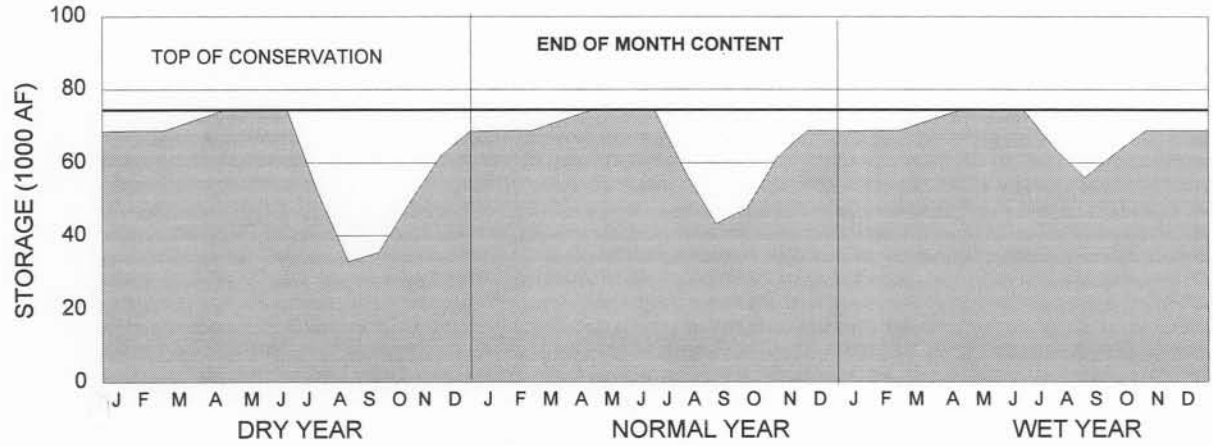

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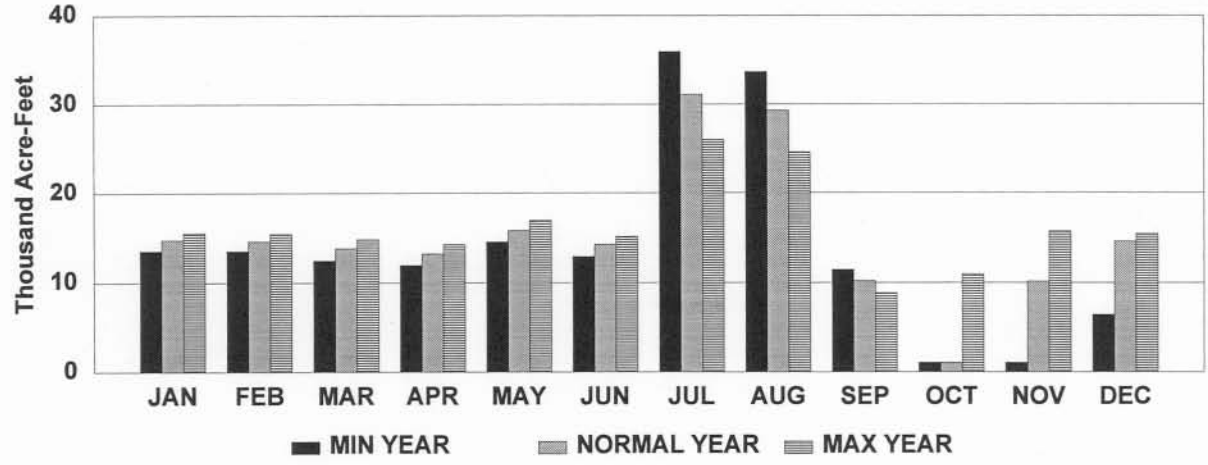
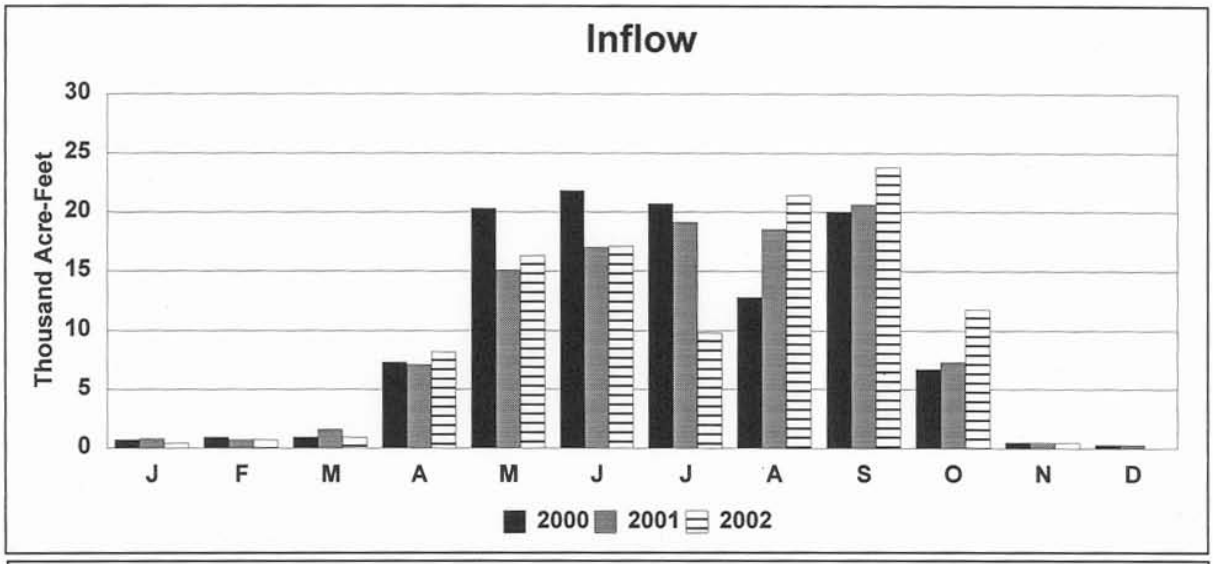
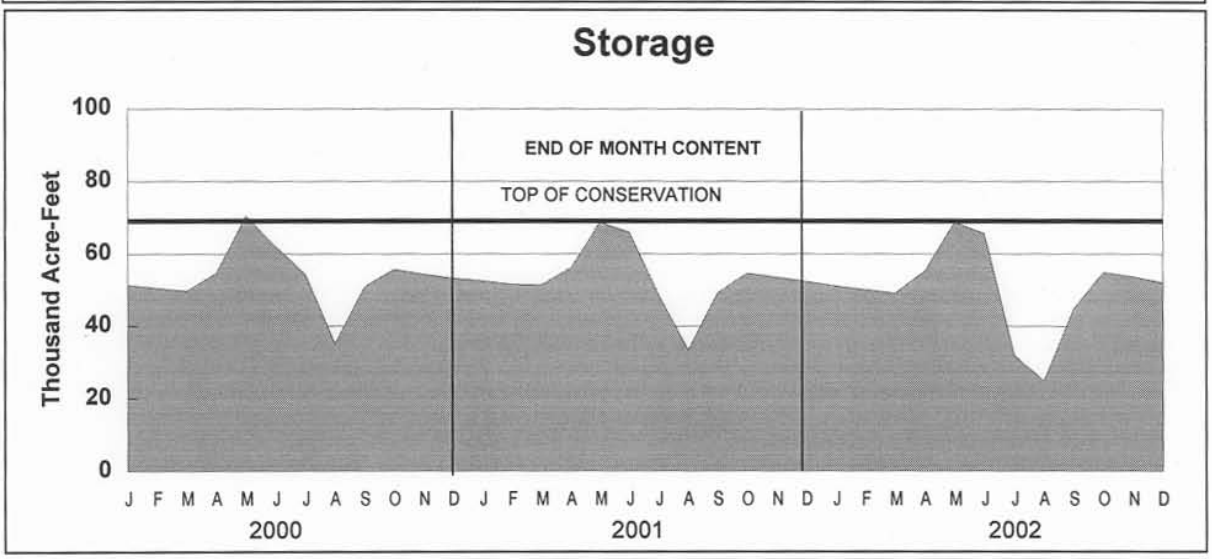


EXHIBIT 3A

SHERMAN RESERVOIR
ACTUAL OPERATION





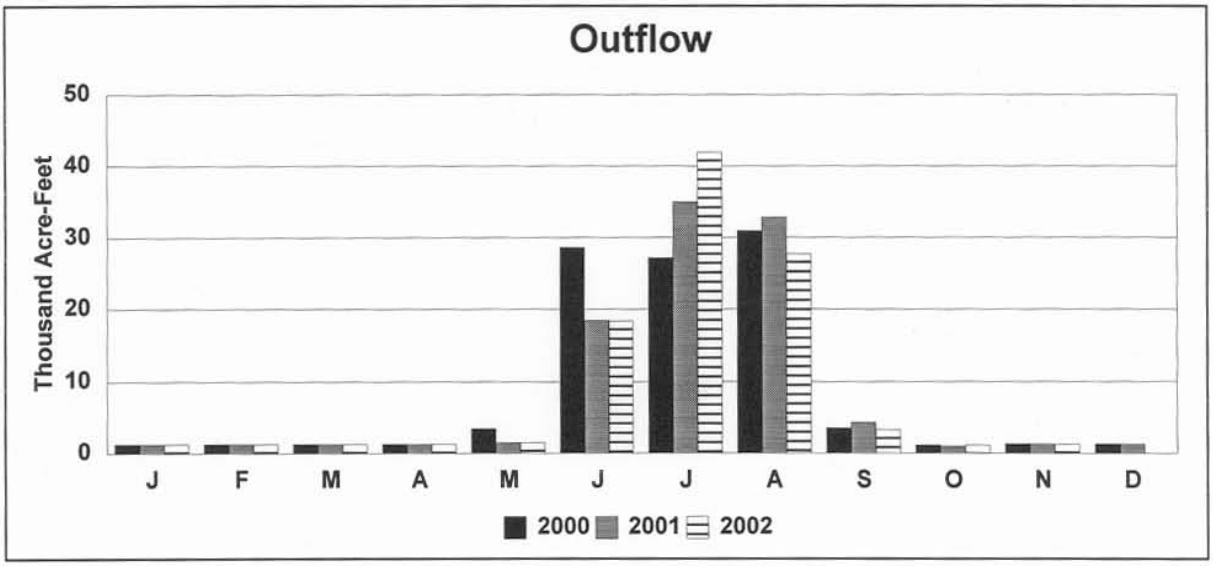
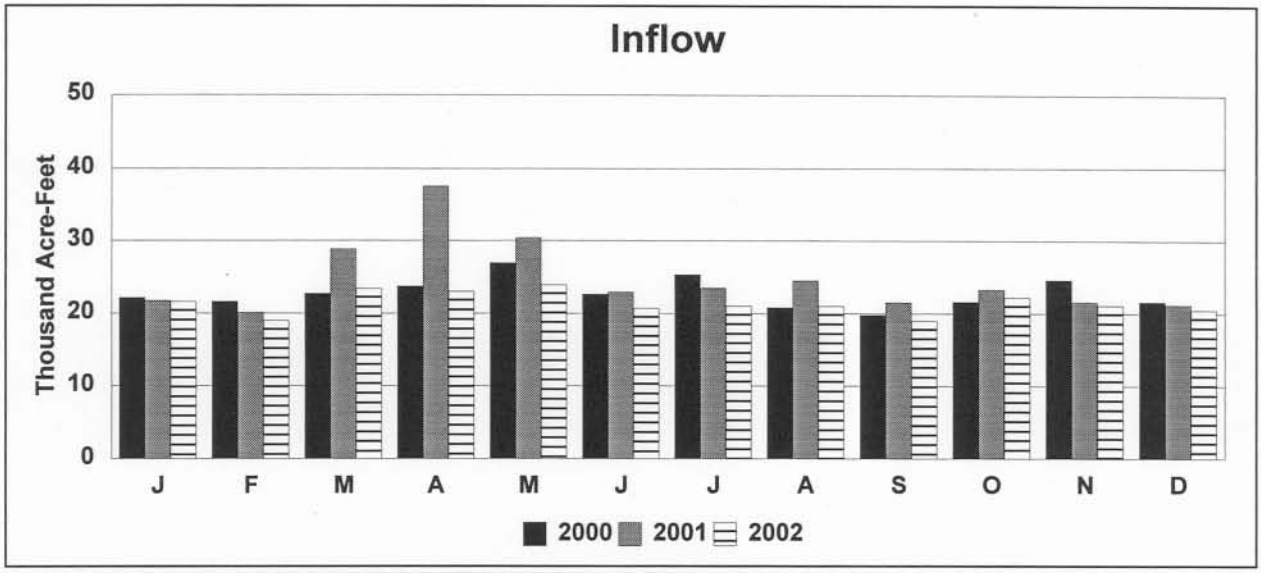
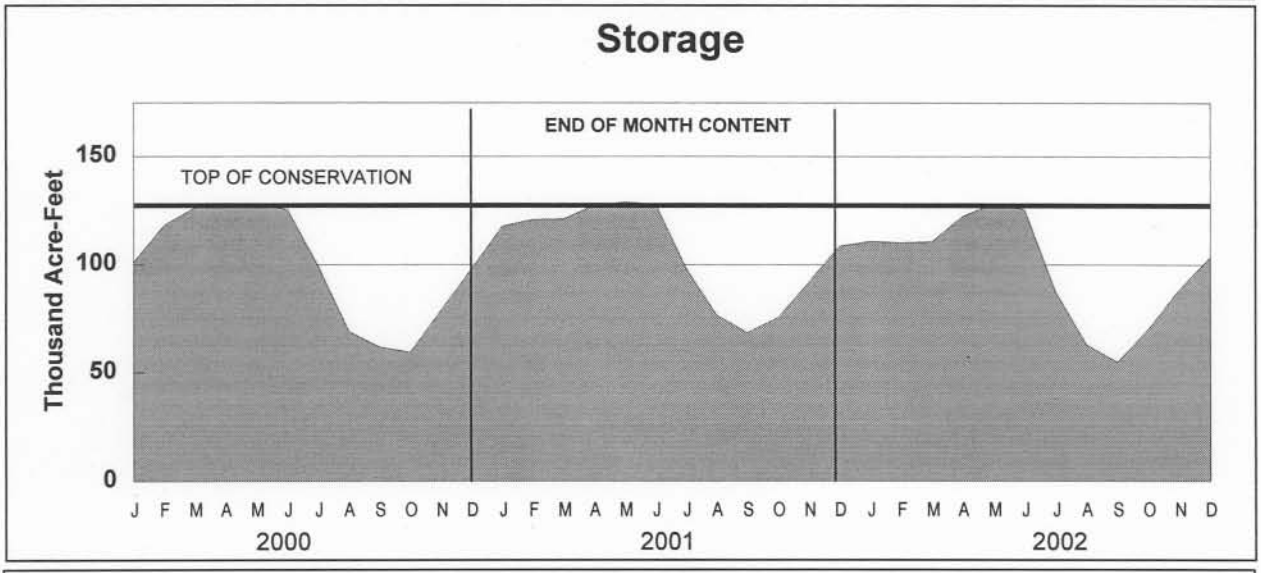


EXHIBIT 4A

CALAMUS RESERVOIR
ACTUAL OPERATION





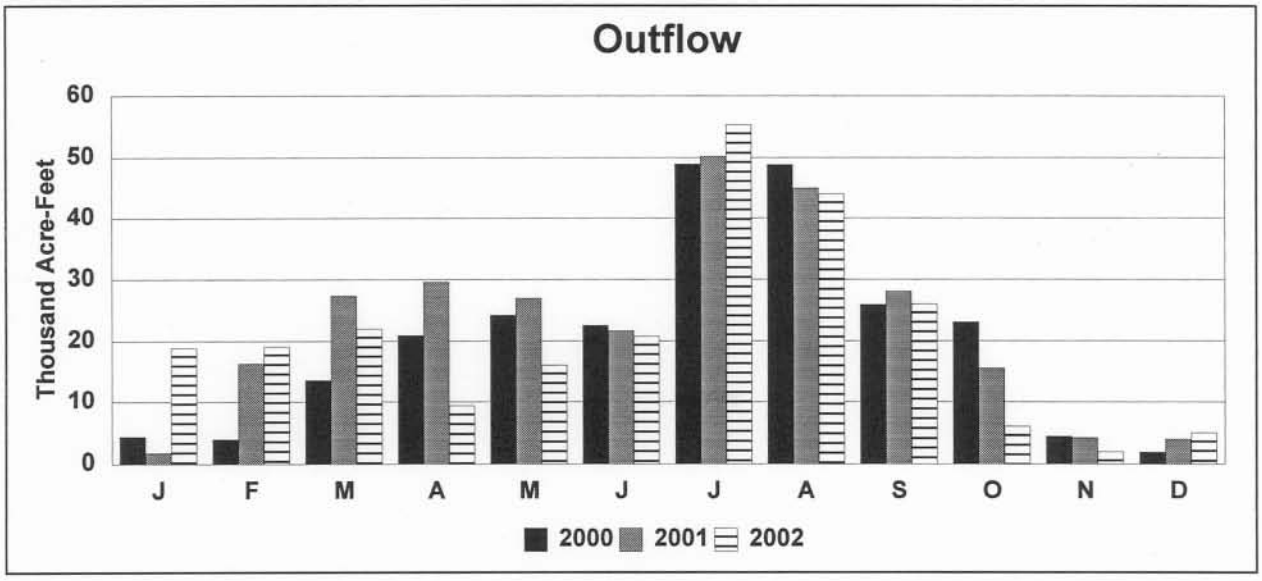
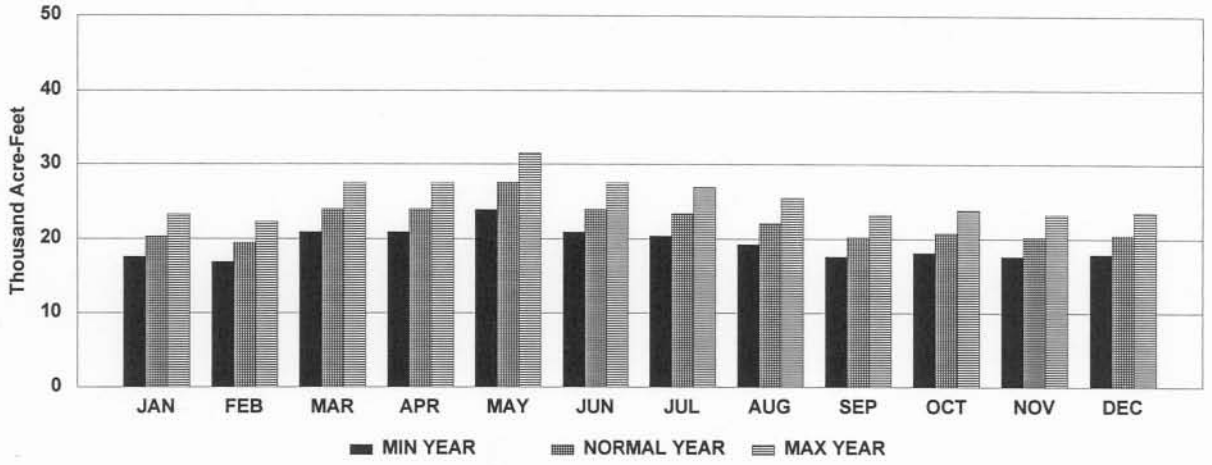


EXHIBIT 4B

CALAMUS RESERVOIR

2003 OPERATION PLAN

Inflow



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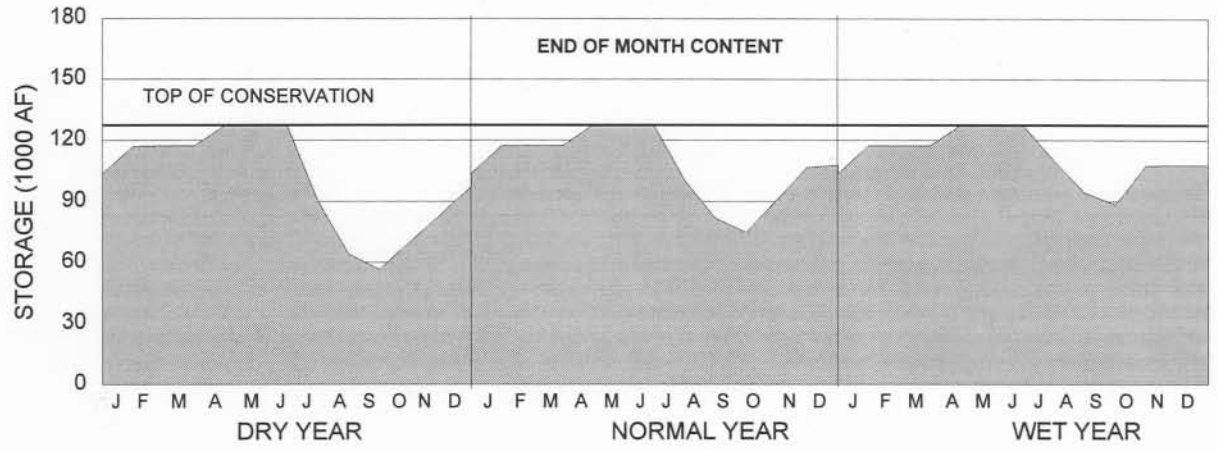

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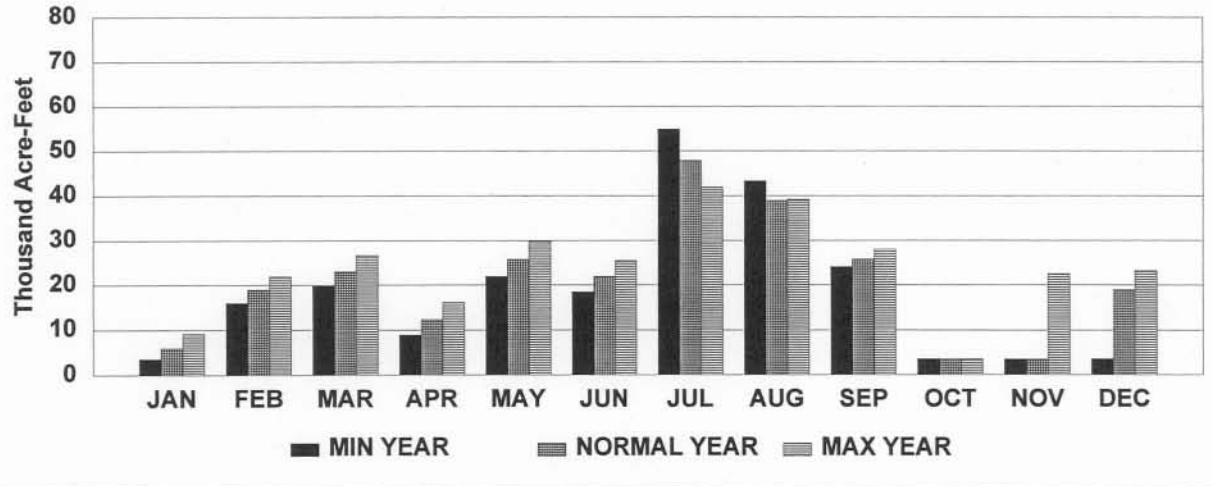
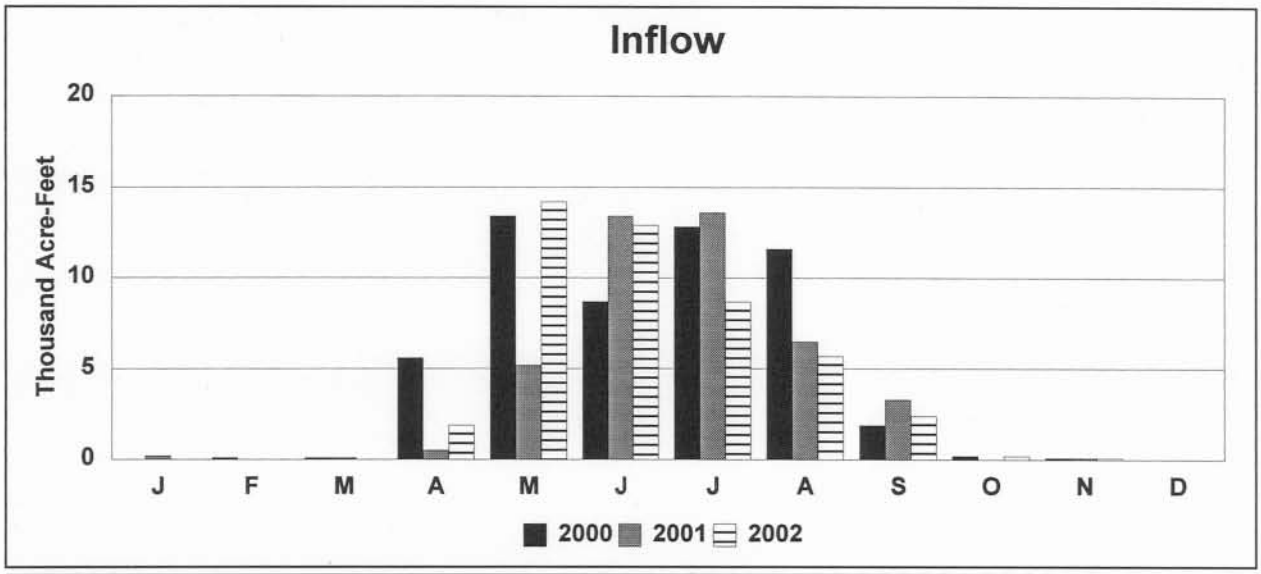
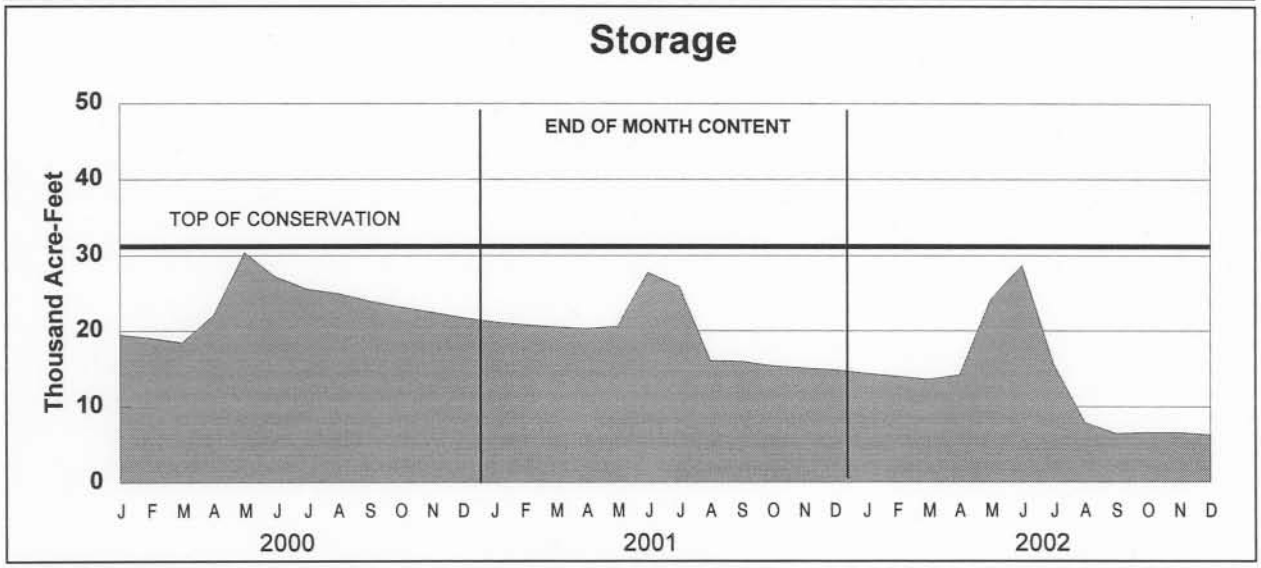


EXHIBIT 5A

DAVIS CREEK RESERVOIR
ACTUAL OPERATION





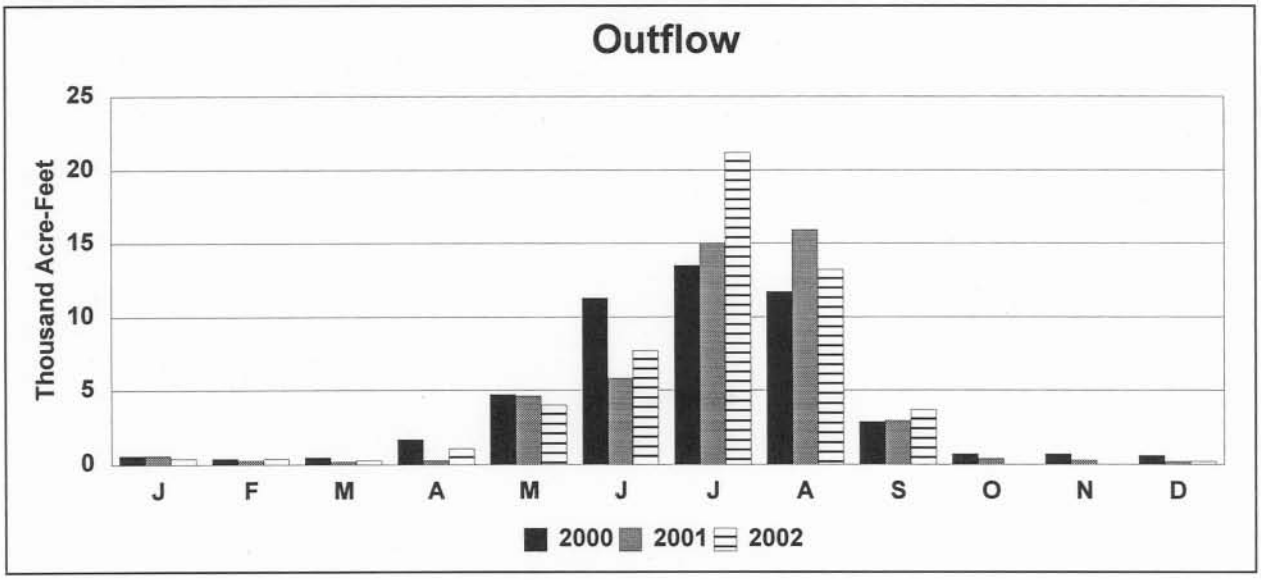
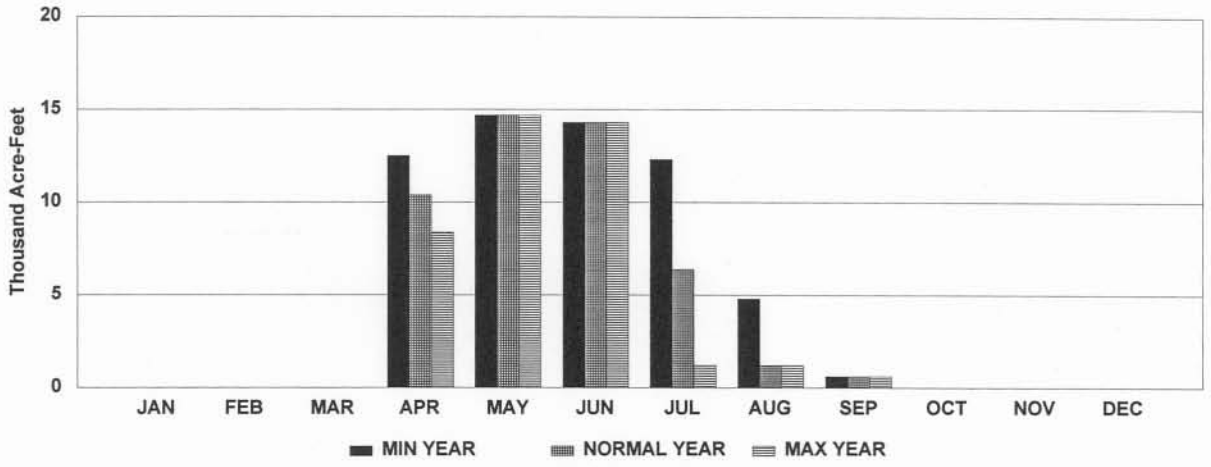


EXHIBIT 5B

DAVIS CREEK RESERVOIR

2003 OPERATION PLAN

Inflow



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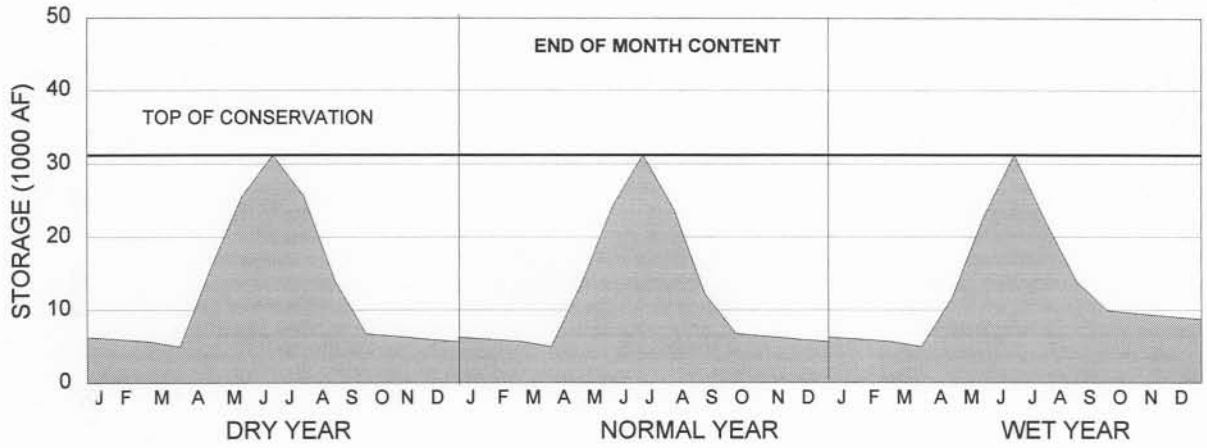

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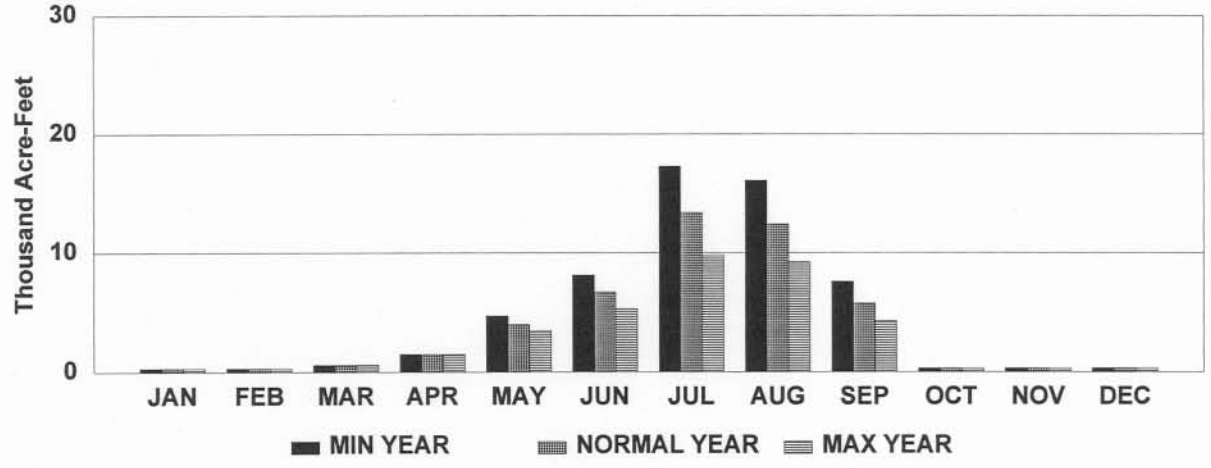
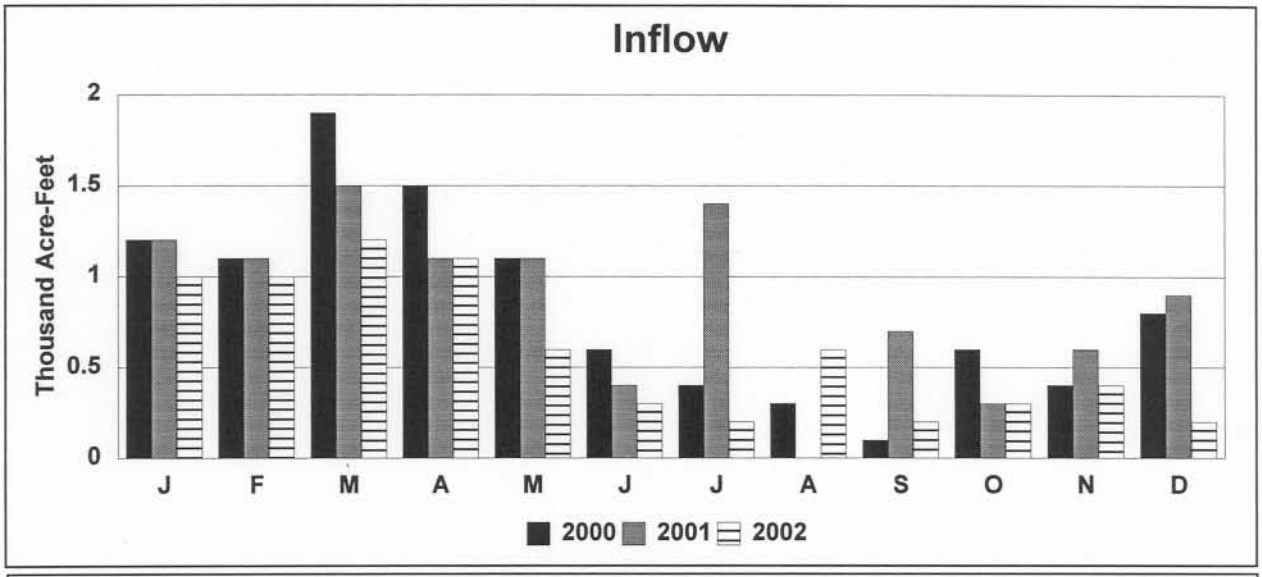
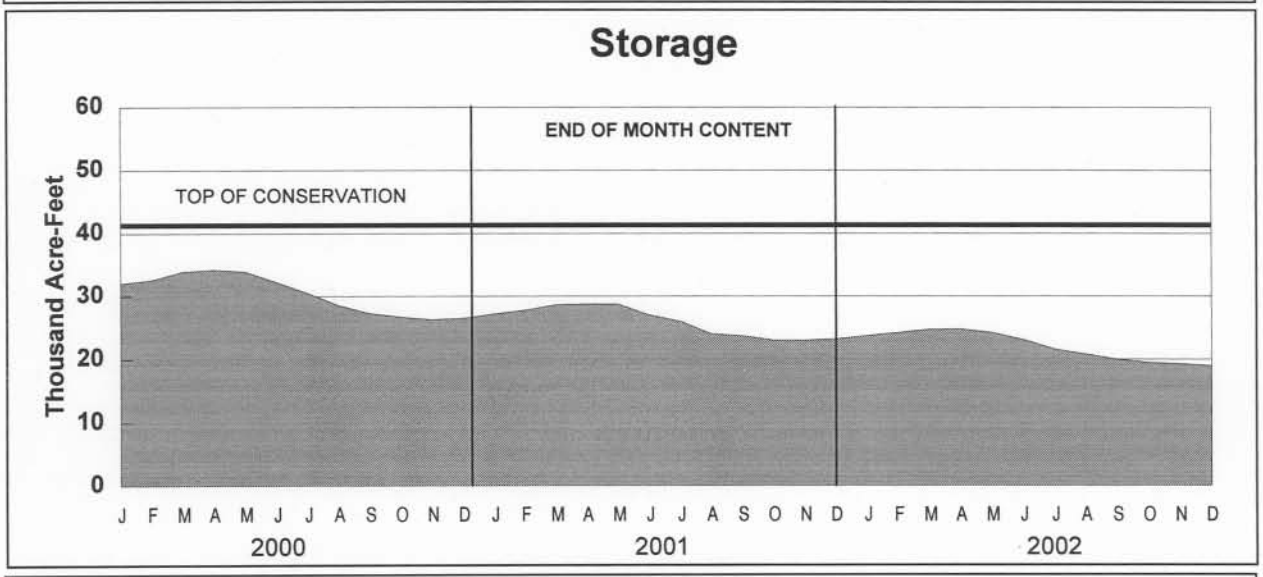


EXHIBIT 6A

BONNY RESERVOIR
ACTUAL OPERATION





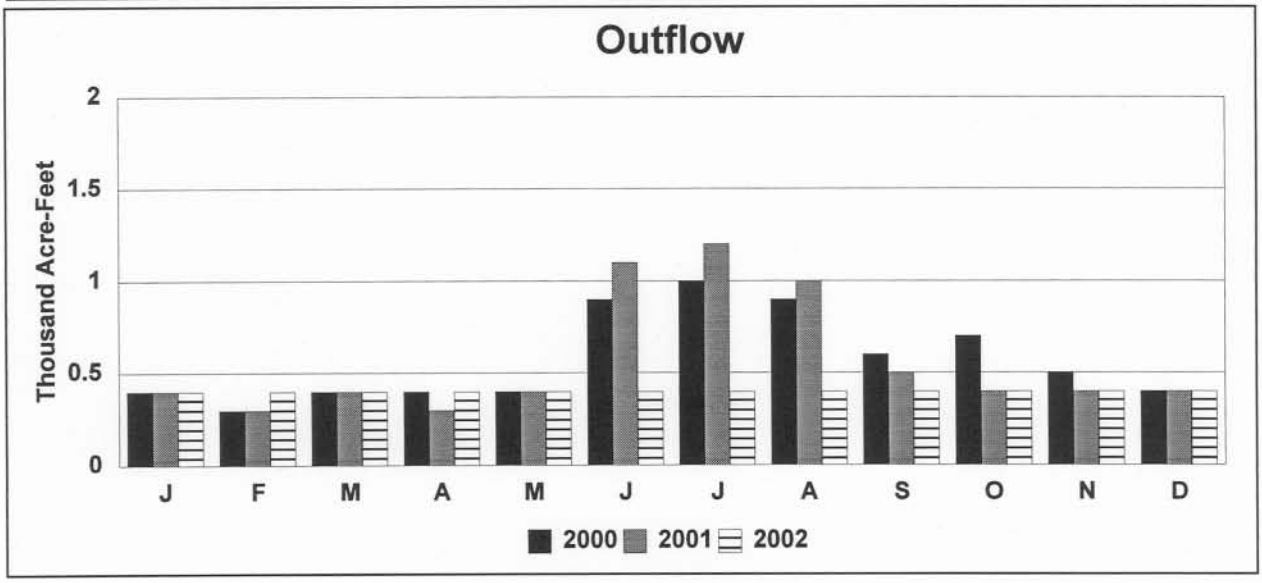
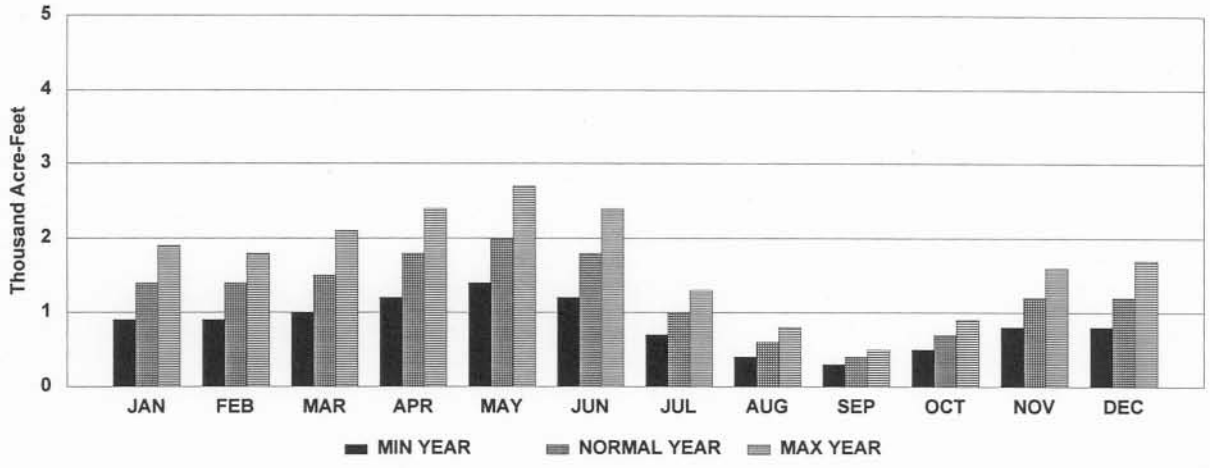


EXHIBIT 6B

BONNY RESERVOIR

2003 OPERATION PLAN

Inflow



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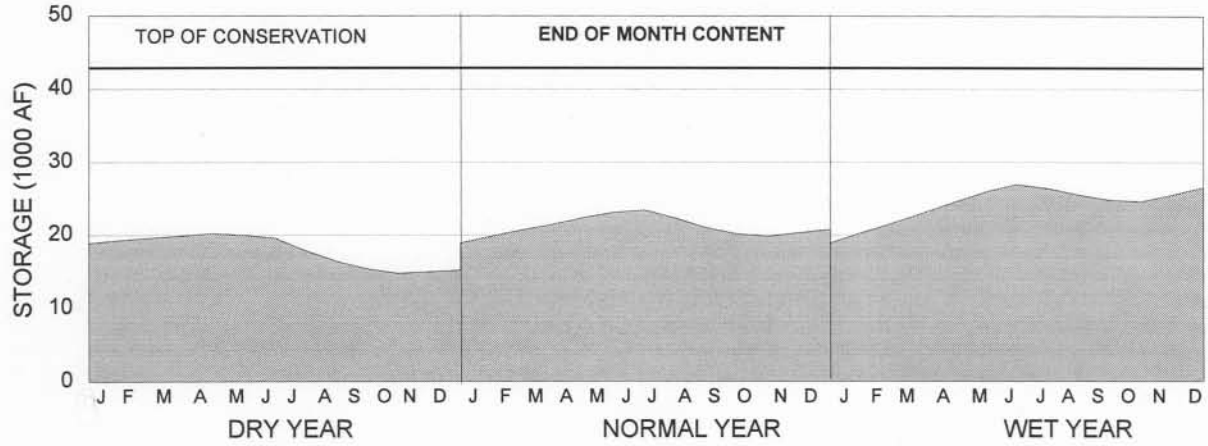

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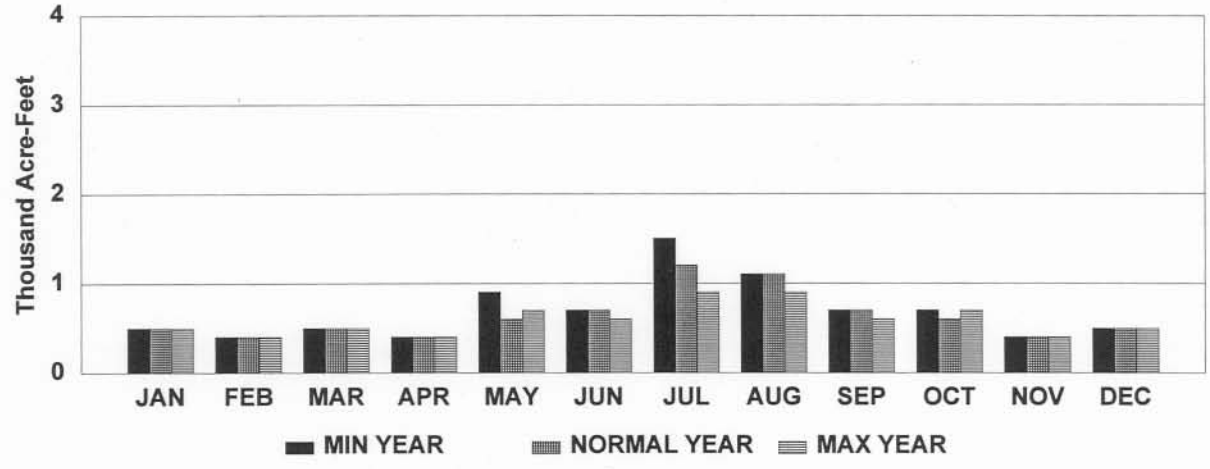
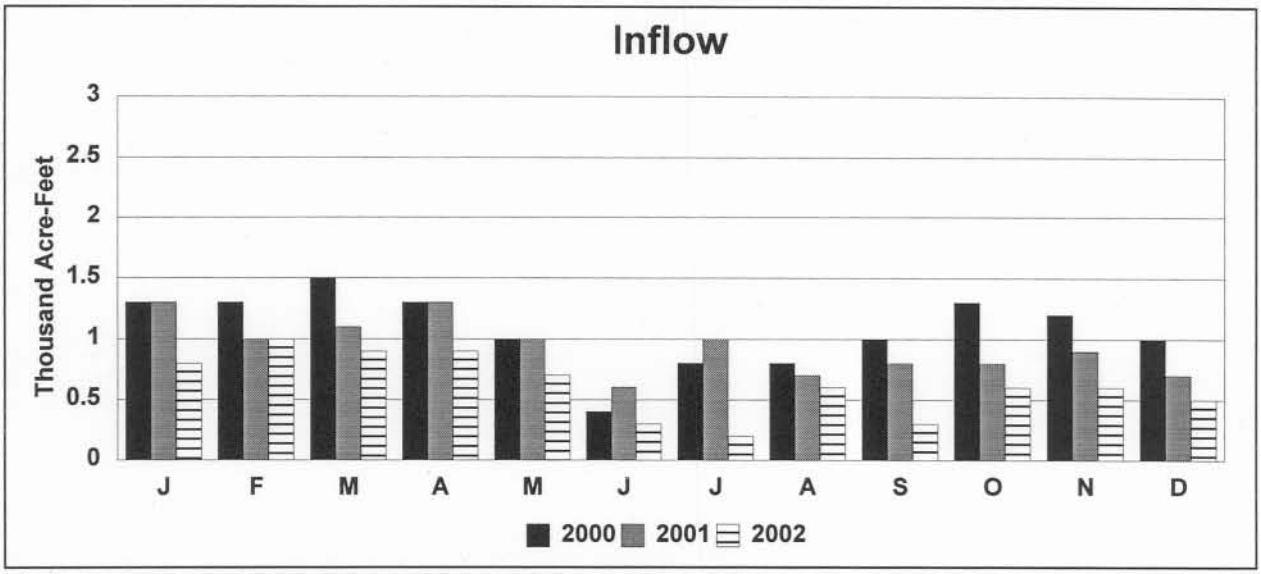
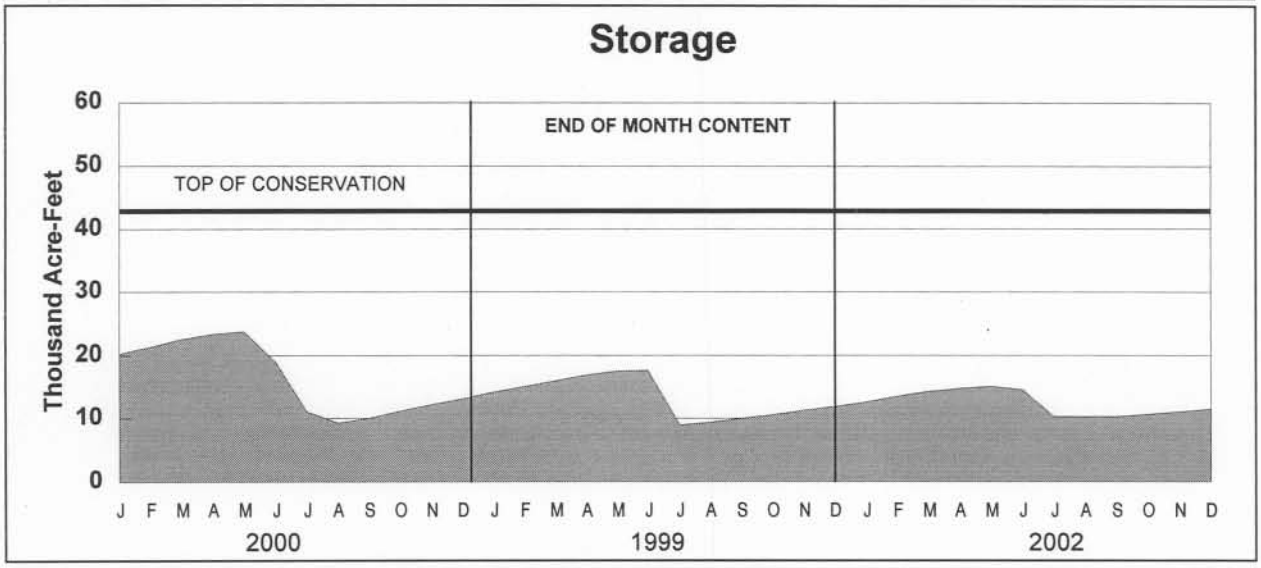


EXHIBIT 7A

ENDERS RESERVOIR
ACTUAL OPERATION





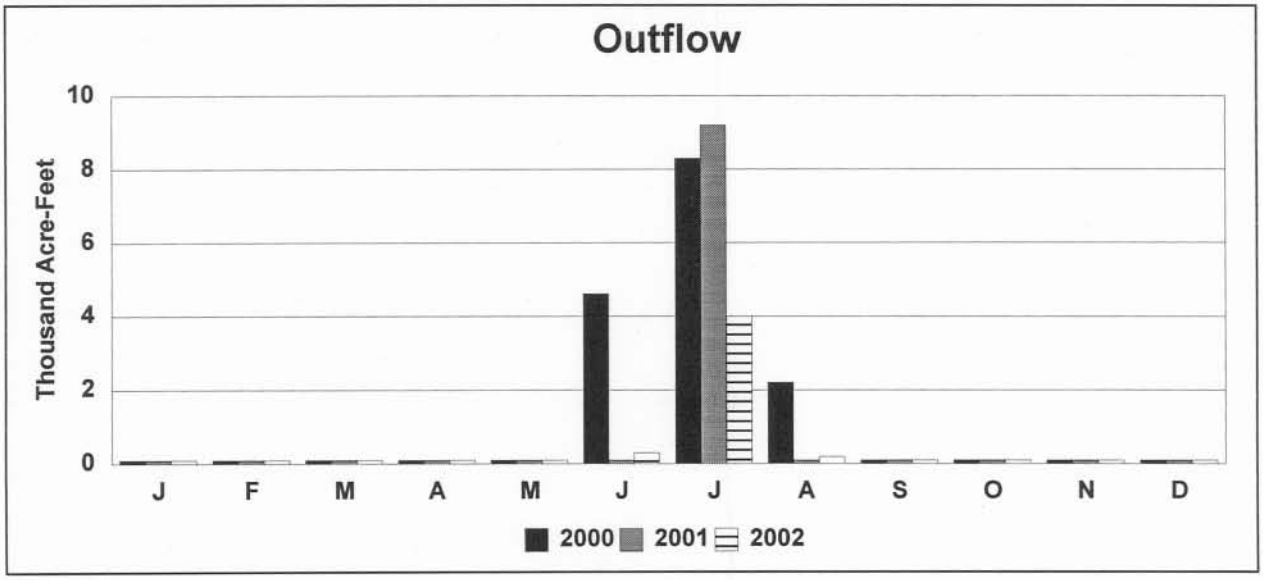
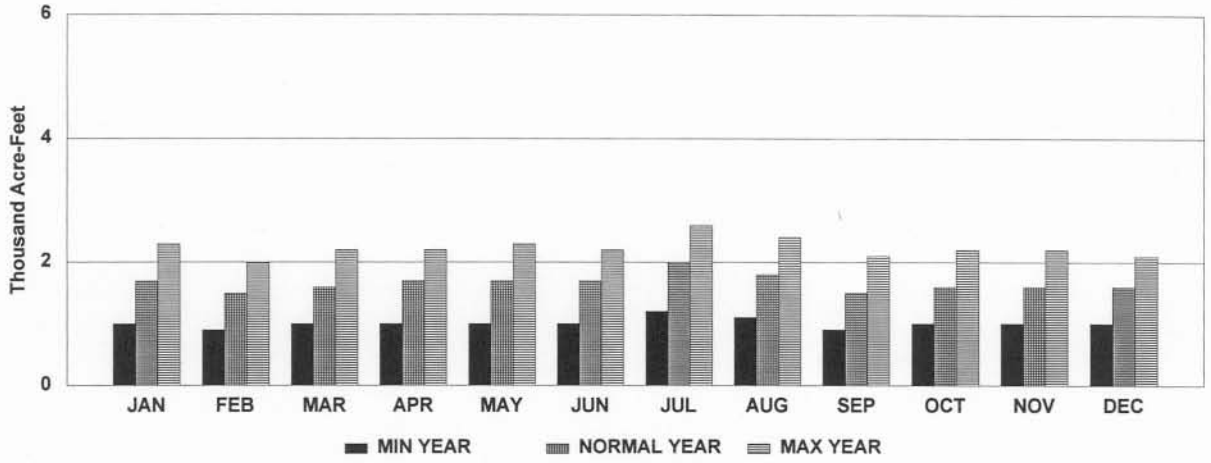


EXHIBIT 7B

ENDERS RESERVOIR

2003 OPERATION PLAN

Inflow



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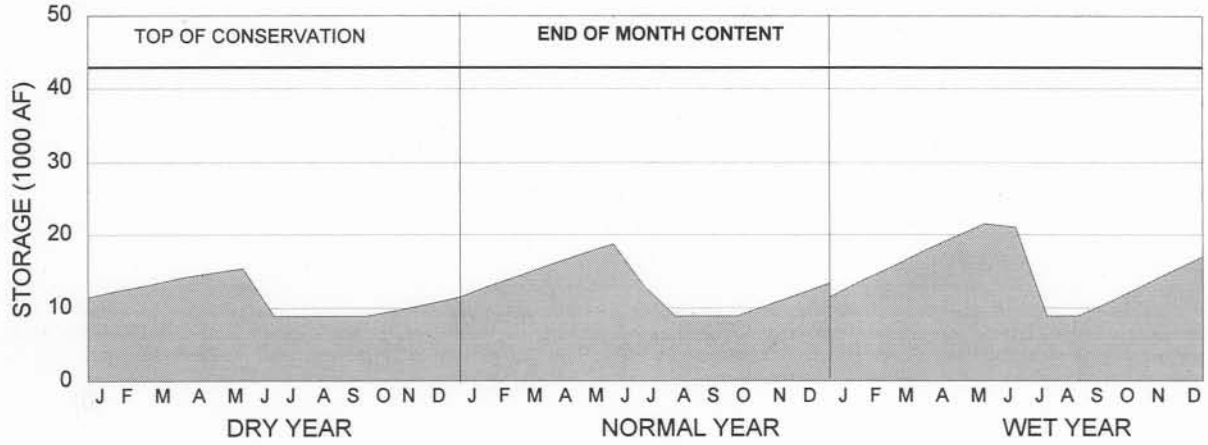

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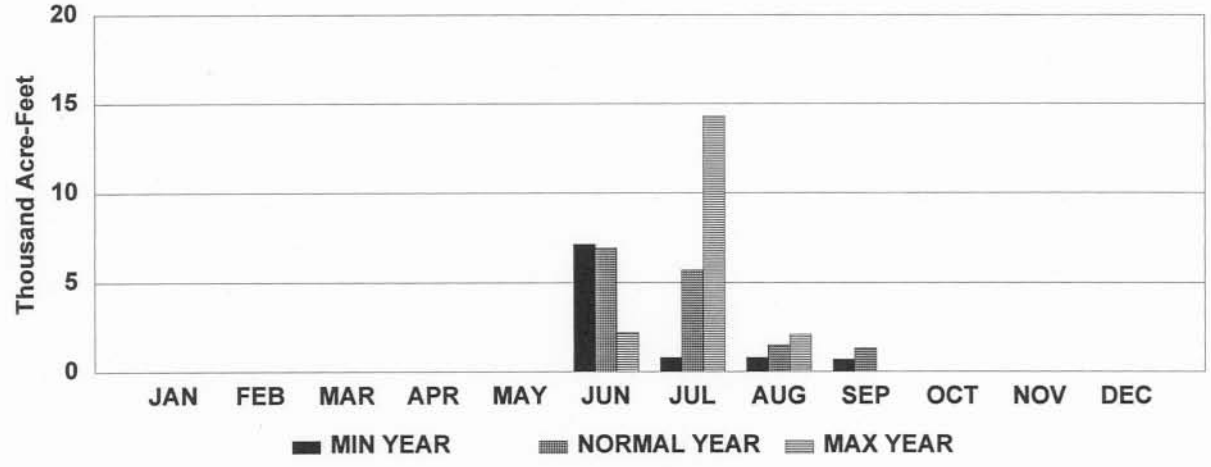
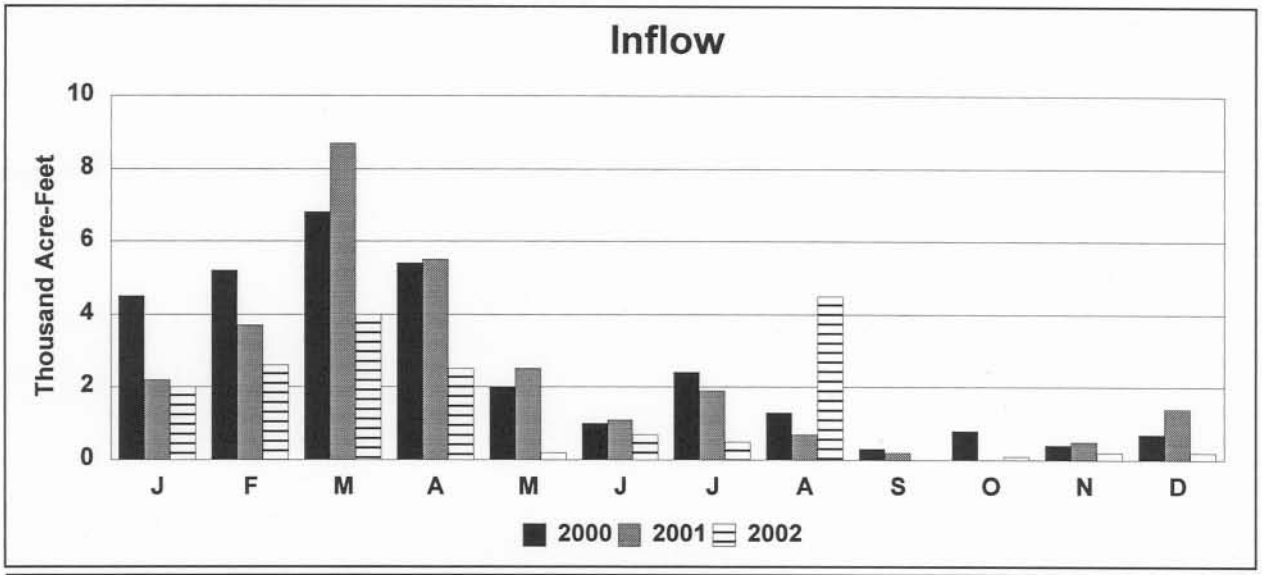
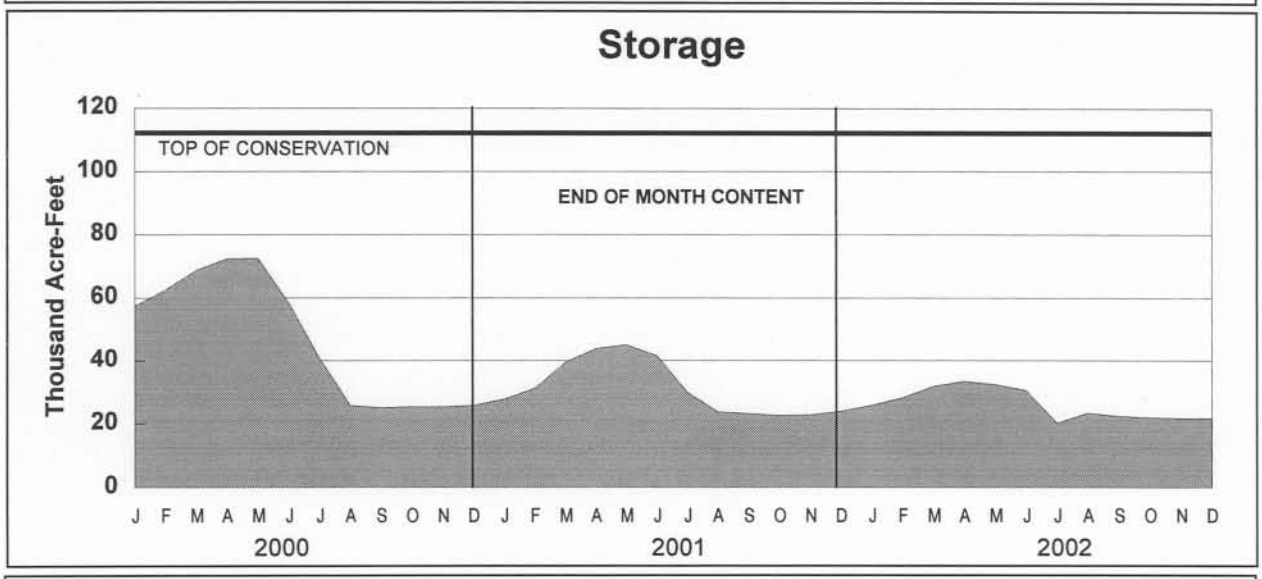


SWANSON LAKE
ACTUAL OPERATION





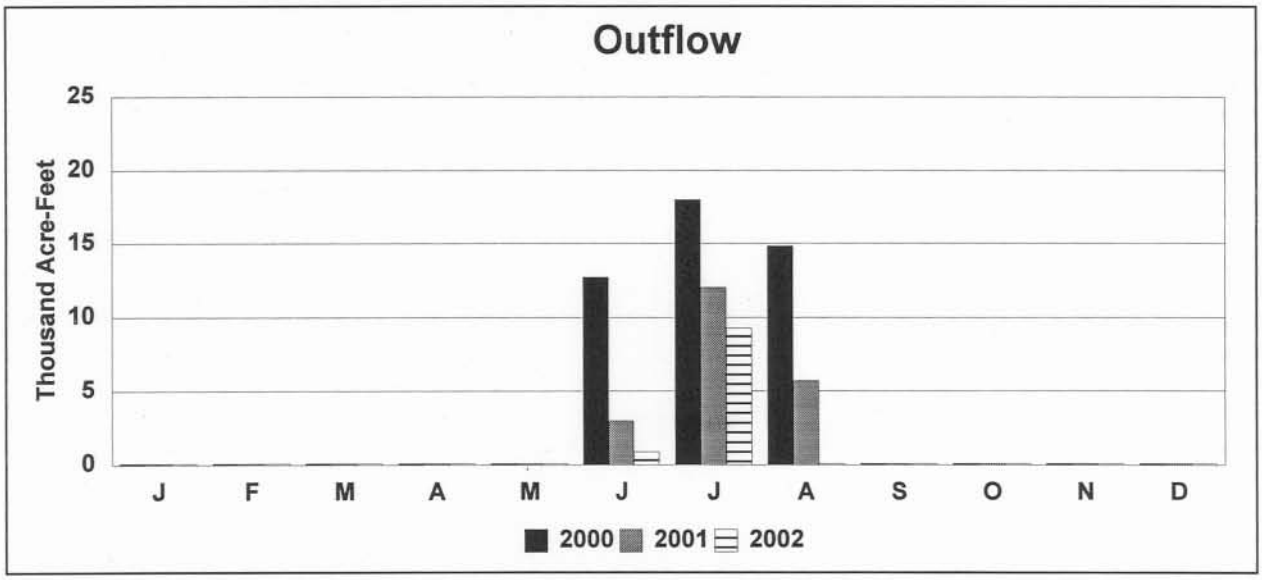
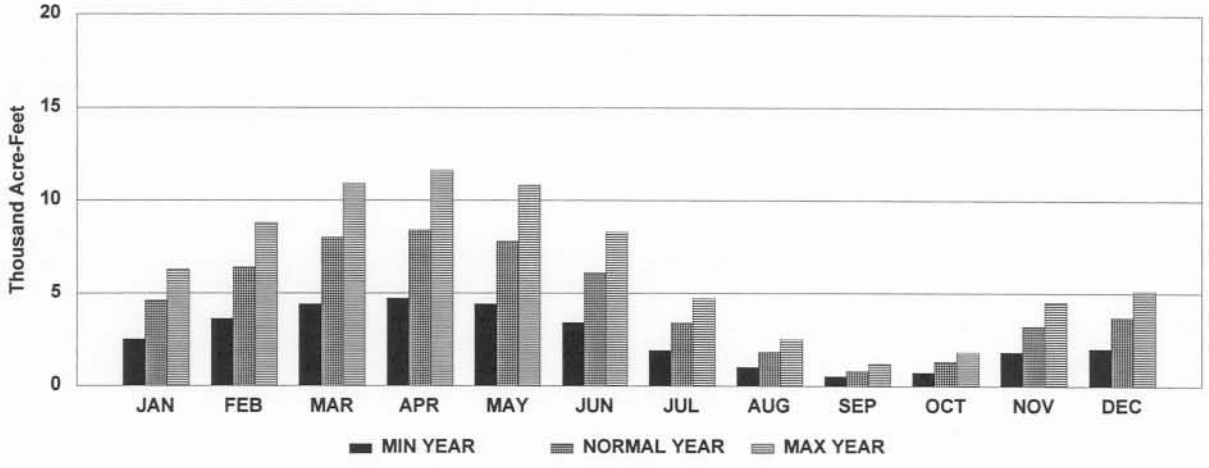


EXHIBIT 8B

SWANSON LAKE

2003 OPERATION PLAN

Inflow



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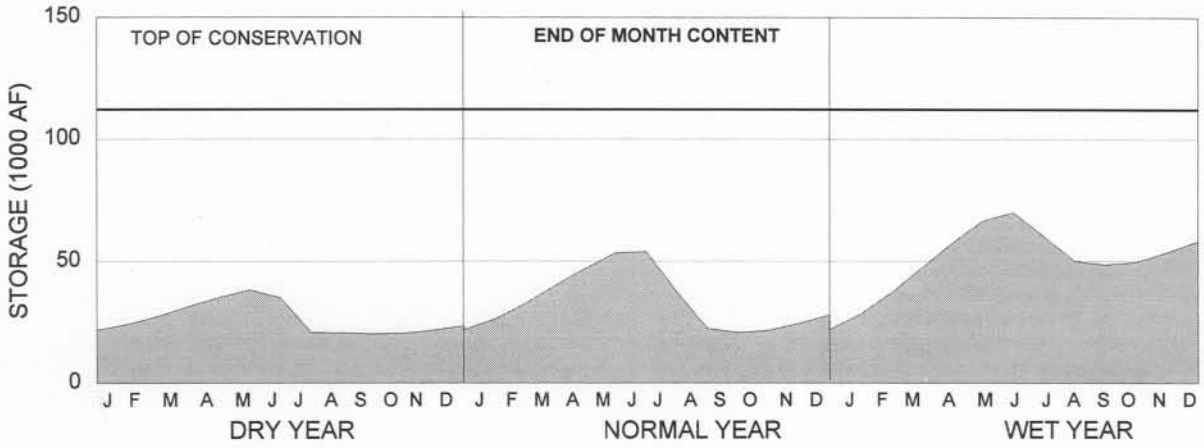

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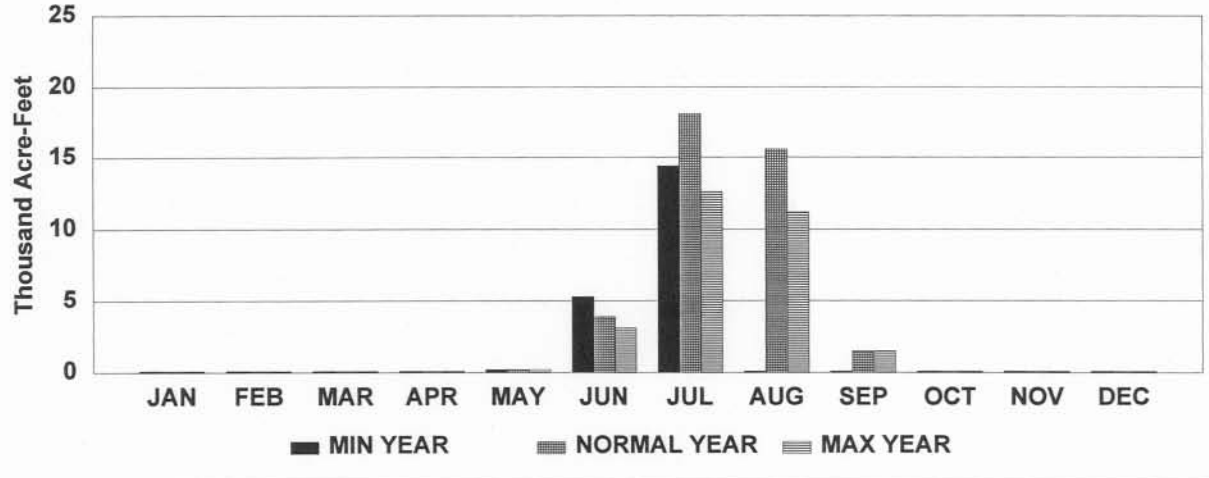
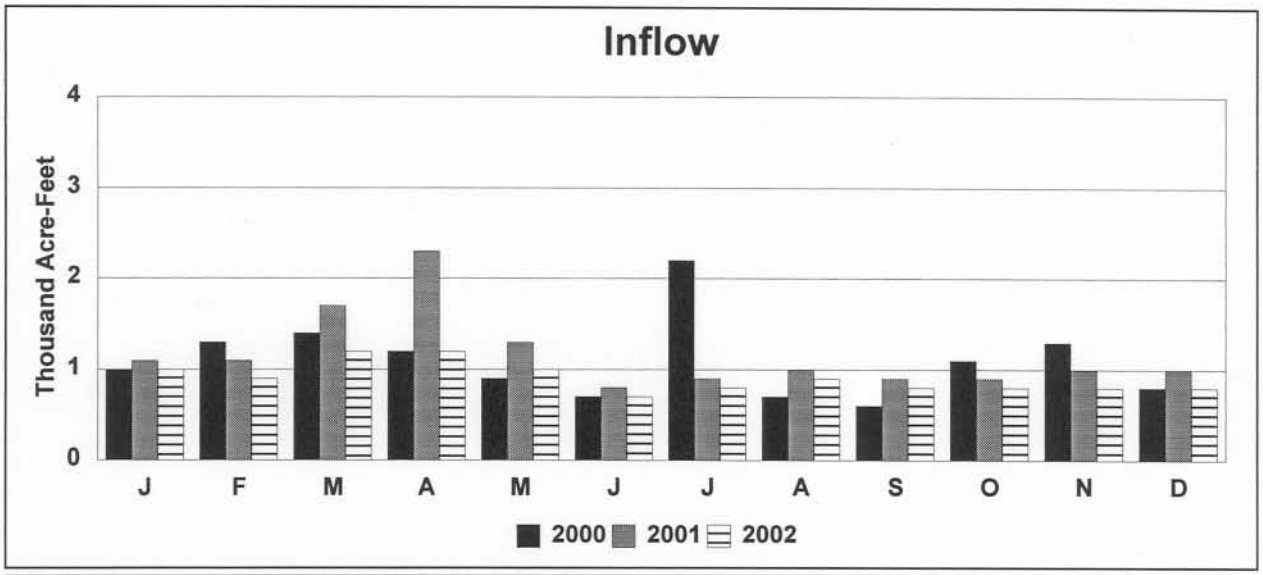
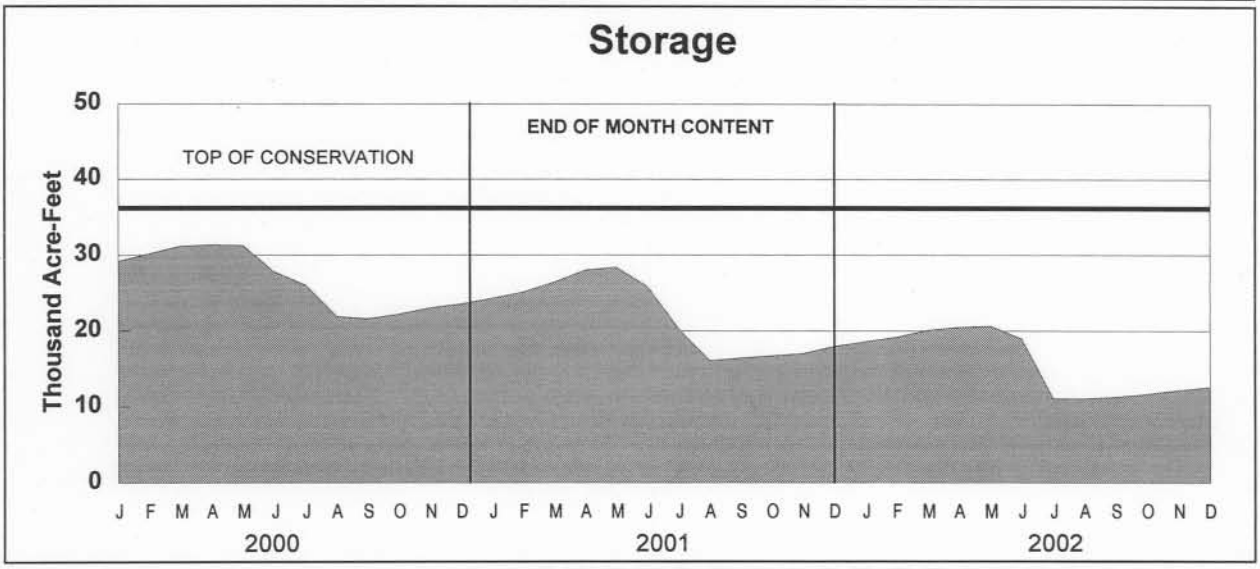


EXHIBIT 9A

HUGH BUTLER LAKE
ACTUAL OPERATION





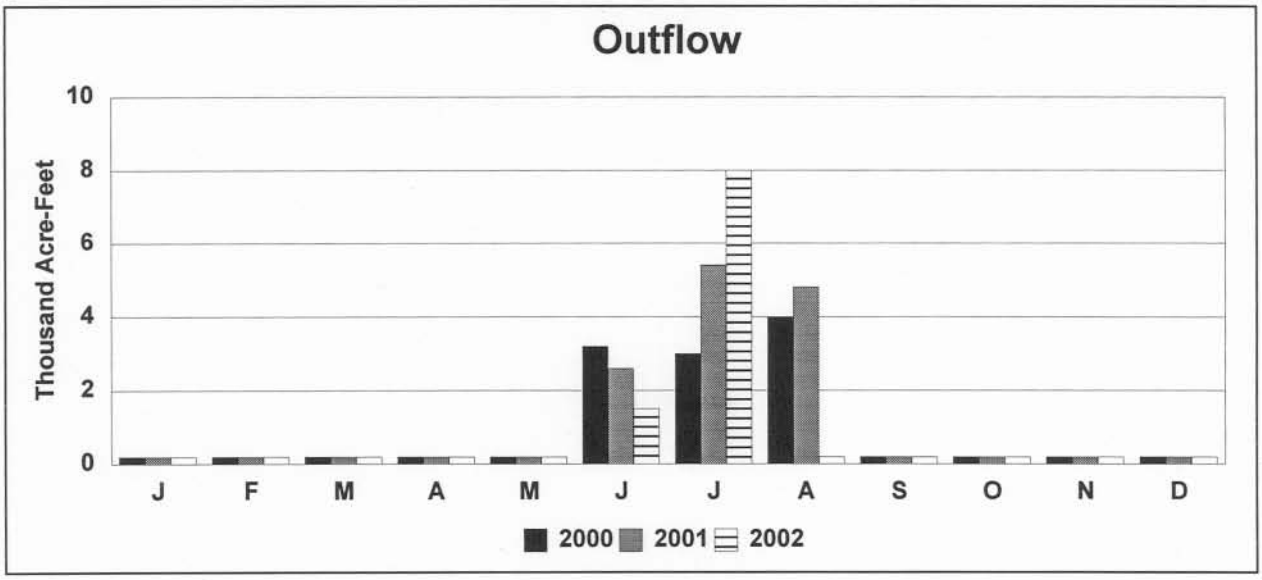
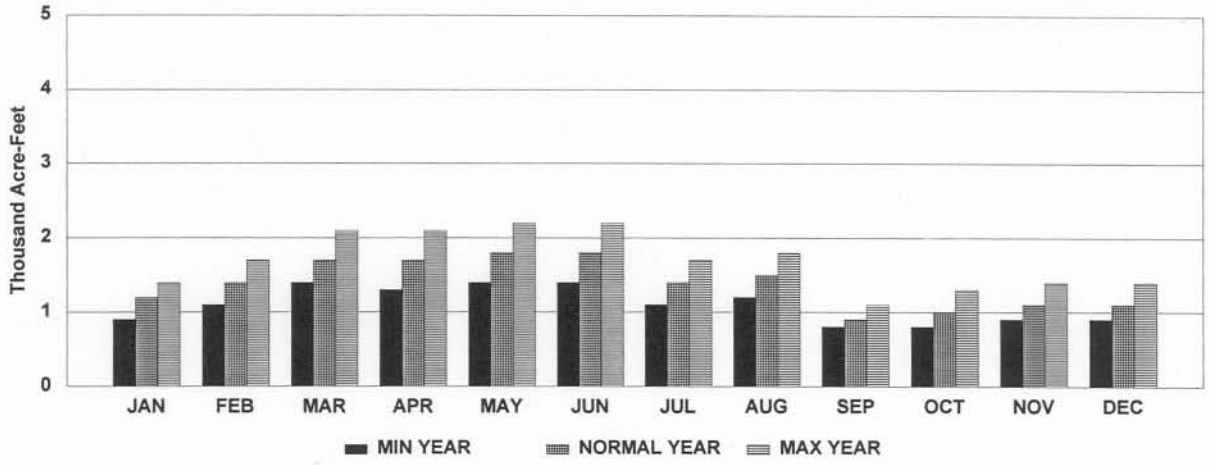


EXHIBIT 9B

HUGH BUTLER LAKE

2003 OPERATION PLAN

Inflow



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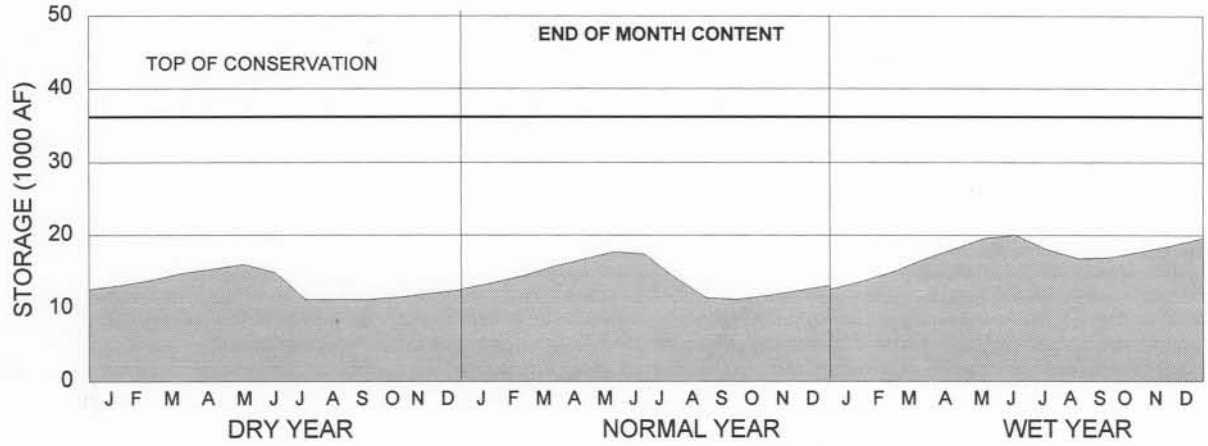

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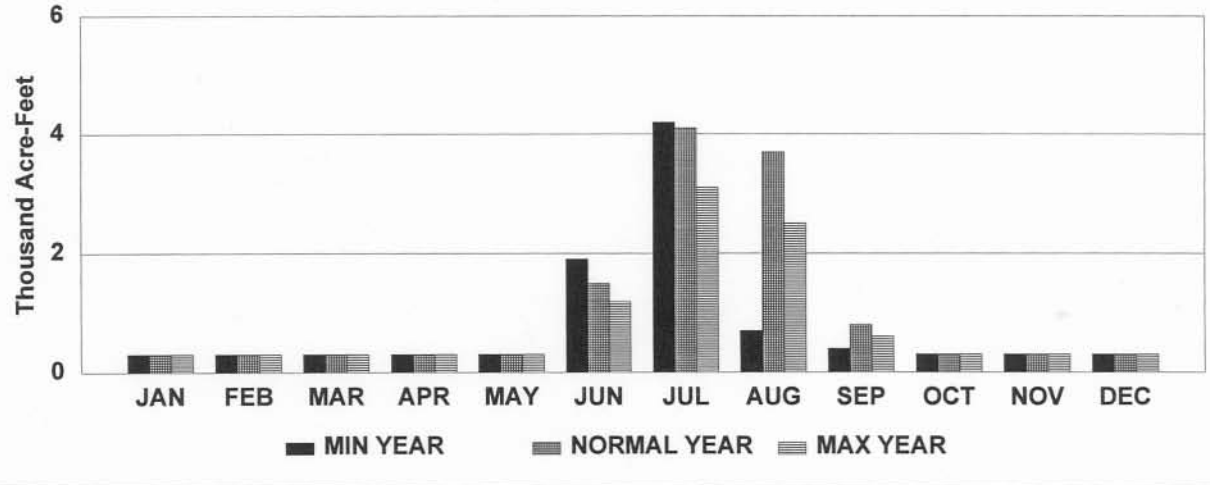
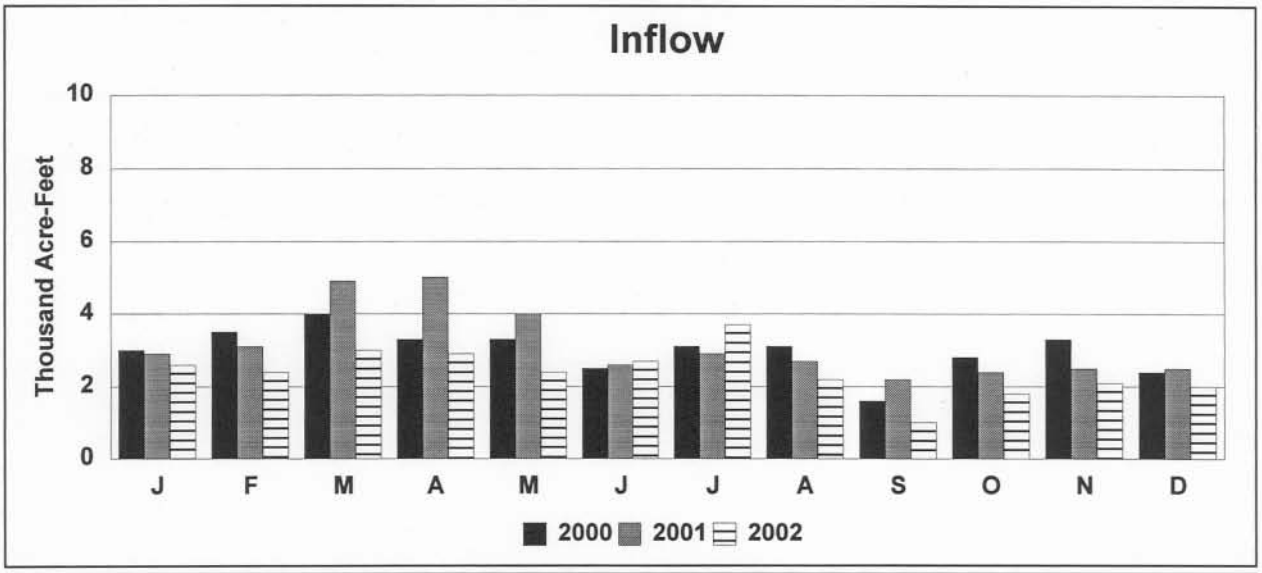
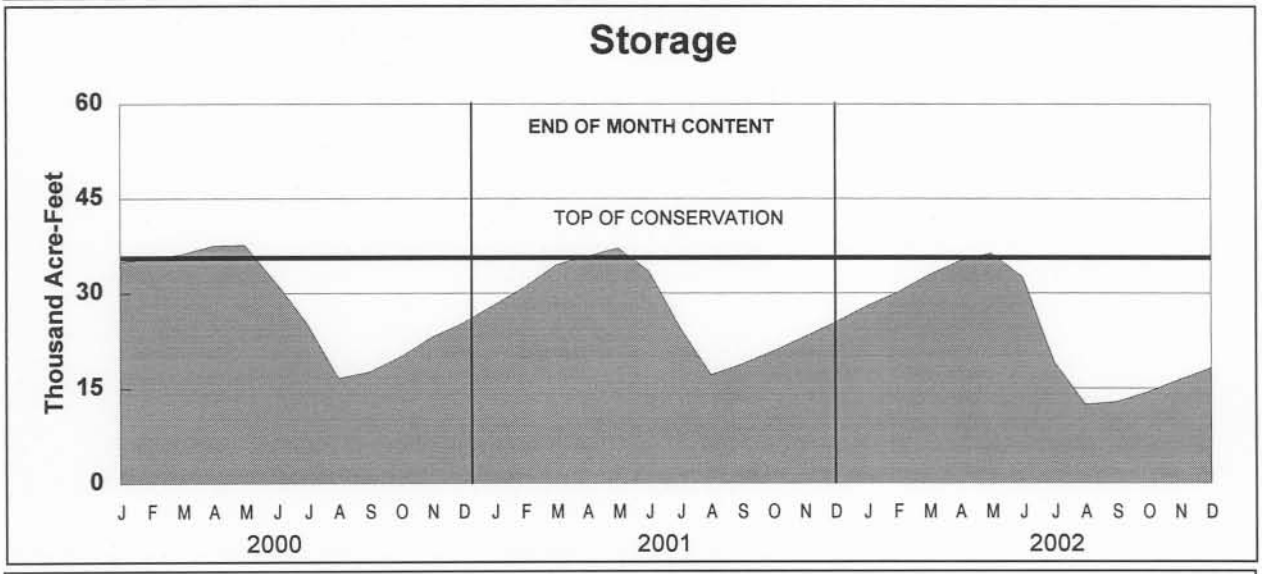


EXHIBIT 10A

HARRY STRUNK LAKE
ACTUAL OPERATION





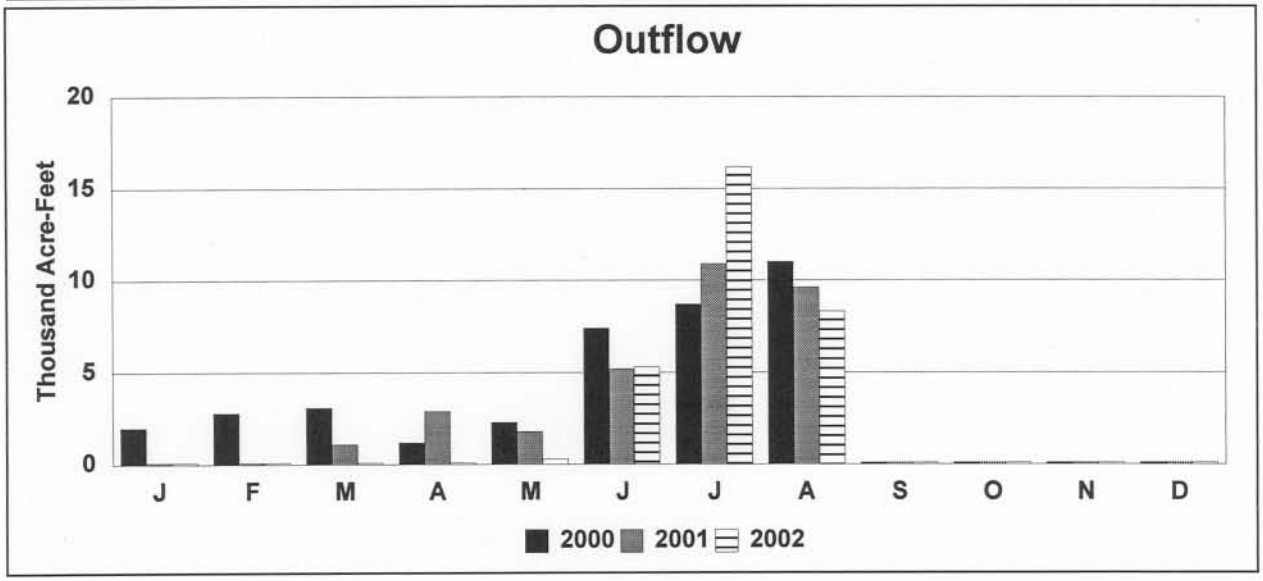
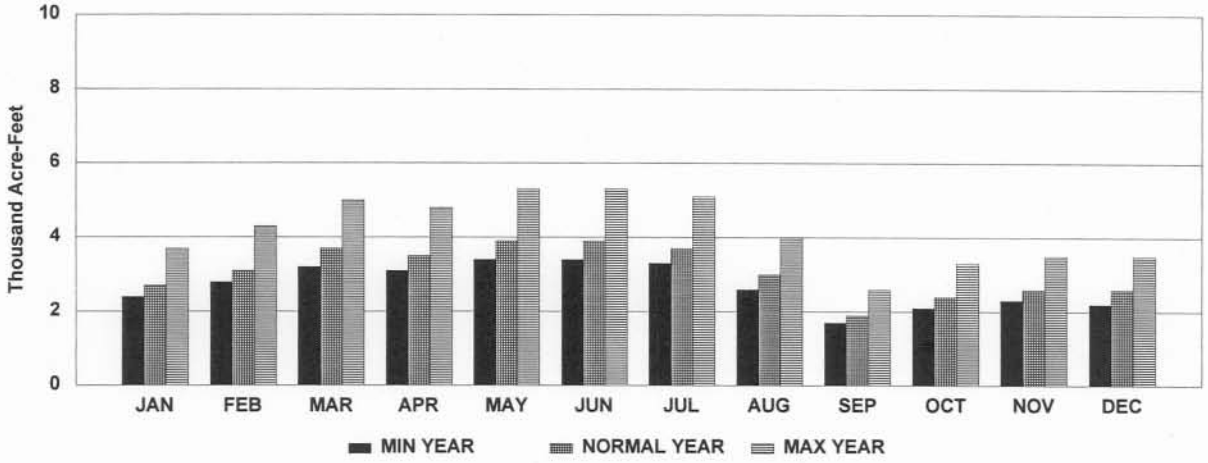


EXHIBIT 10B

HARRY STRUNK LAKE

2003 OPERATION PLAN

Inflow



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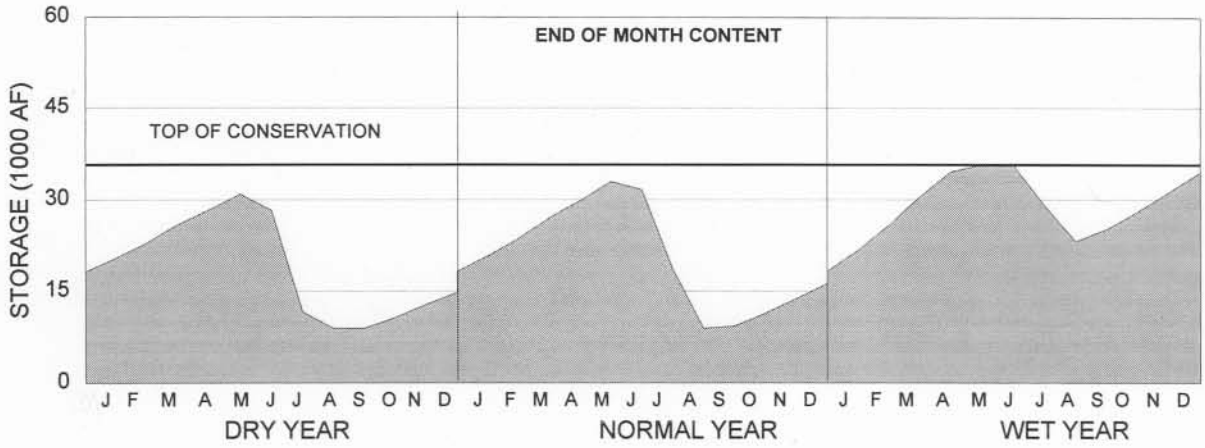

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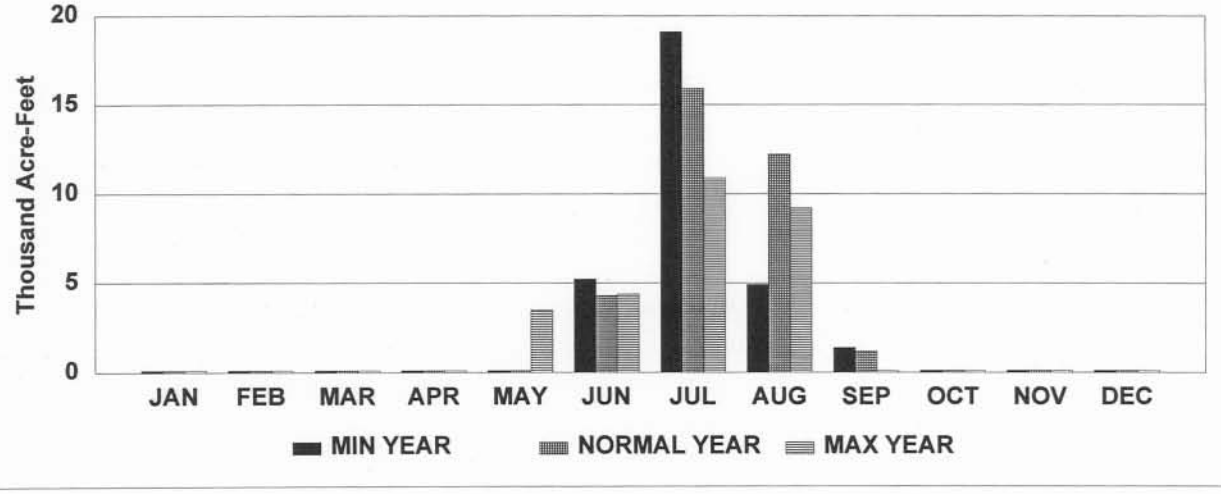
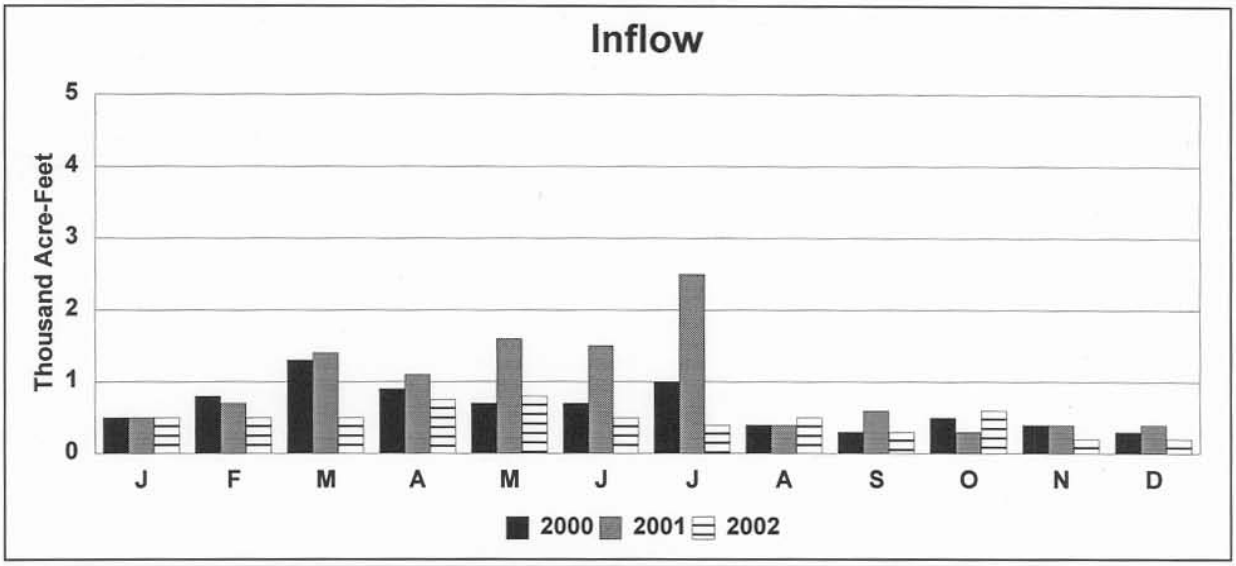
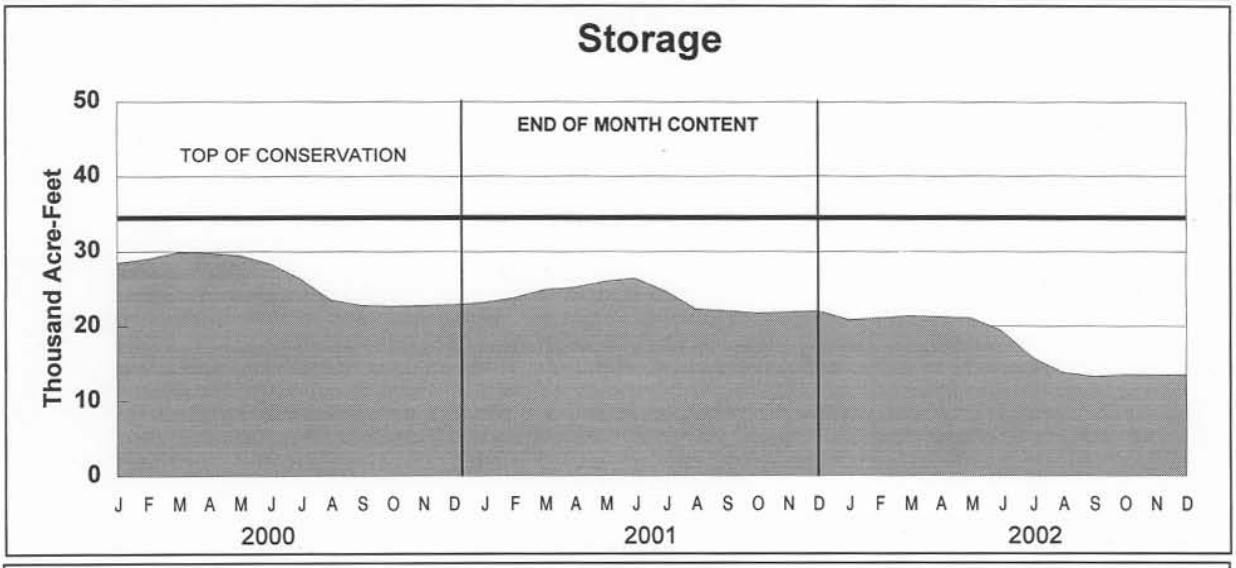


EXHIBIT 11A

KEITH SEBELIUS LAKE
ACTUAL OPERATION





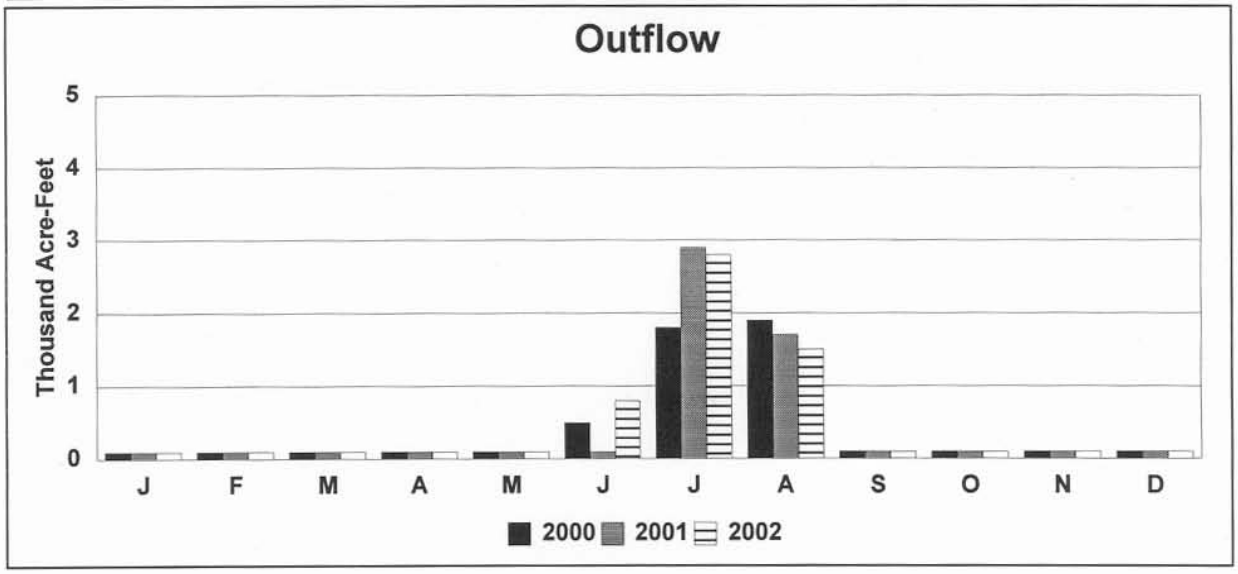
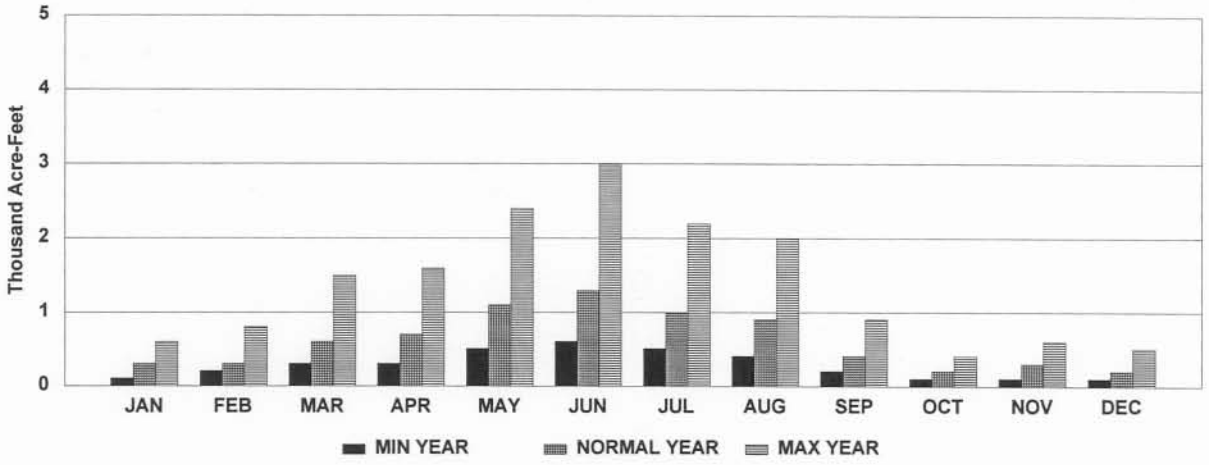


EXHIBIT 11B

KEITH SEBELIUS LAKE

2003 OPERATION PLAN

Inflow



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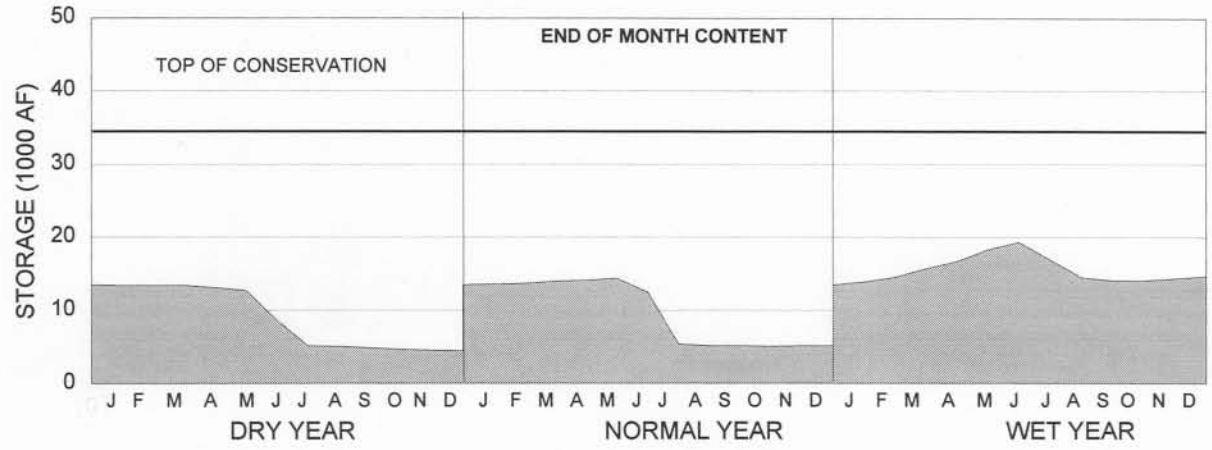

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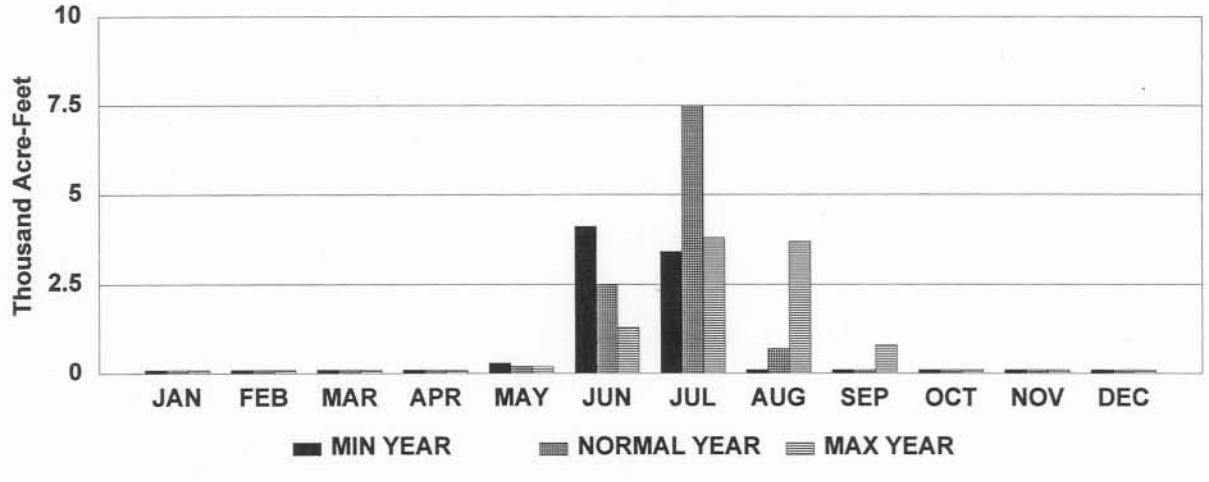
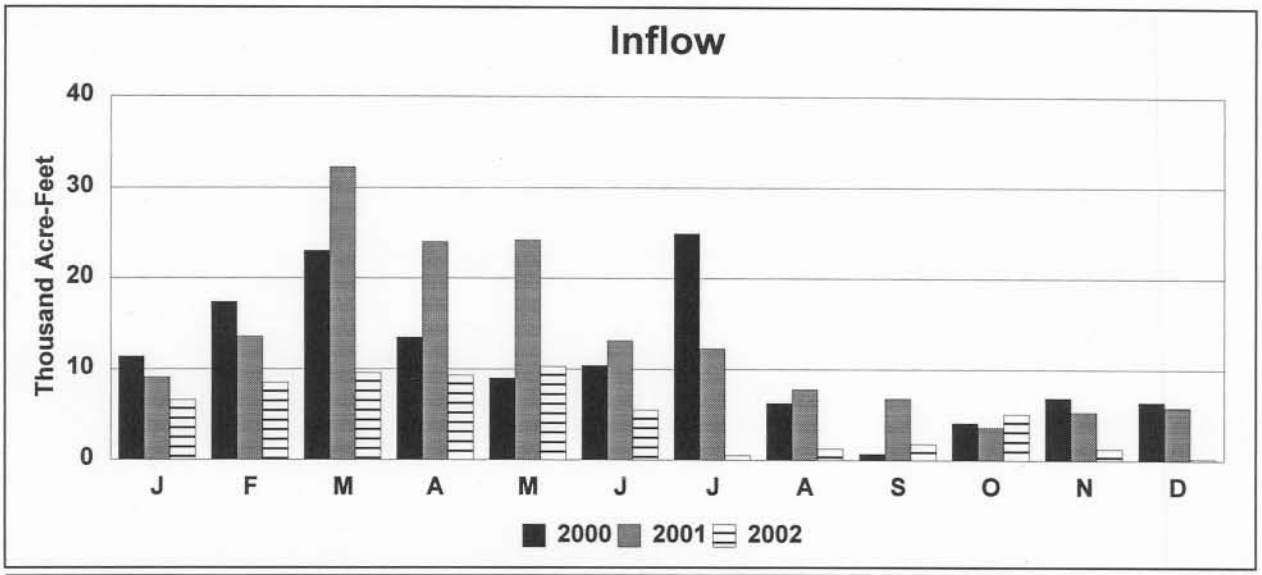
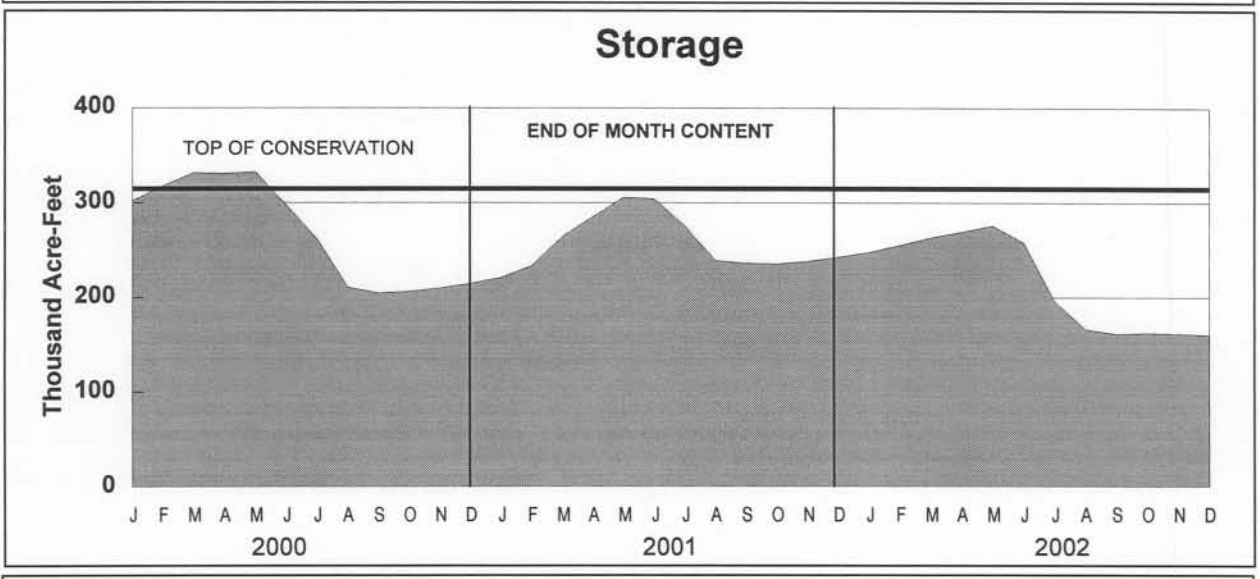


EXHIBIT 12A

HARLAN COUNTY LAKE
ACTUAL OPERATION





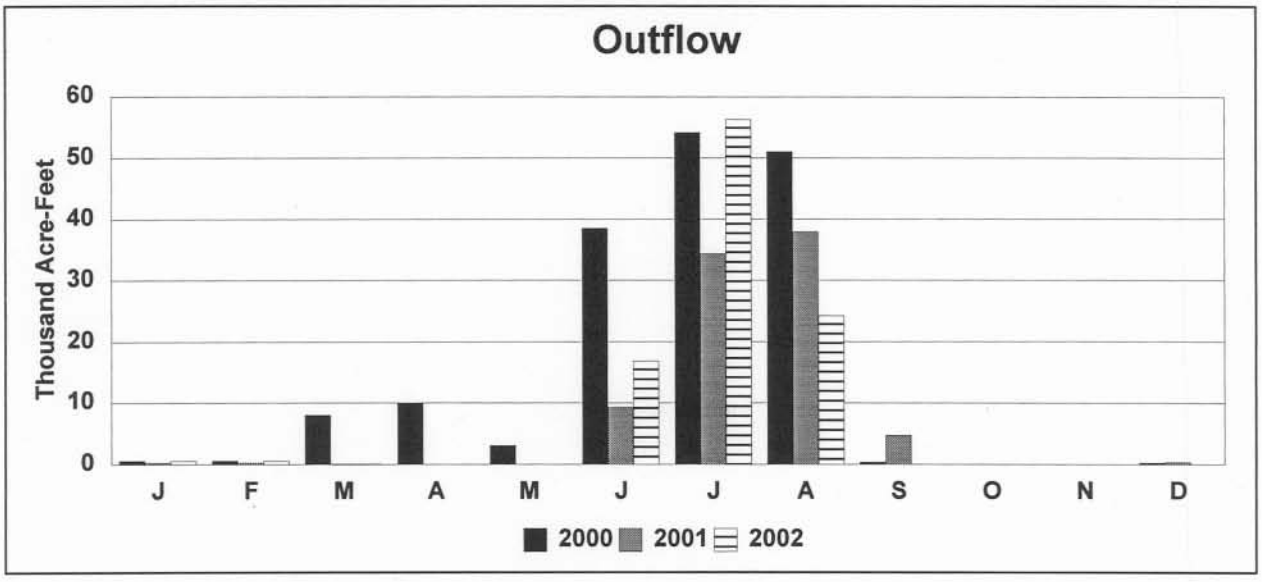
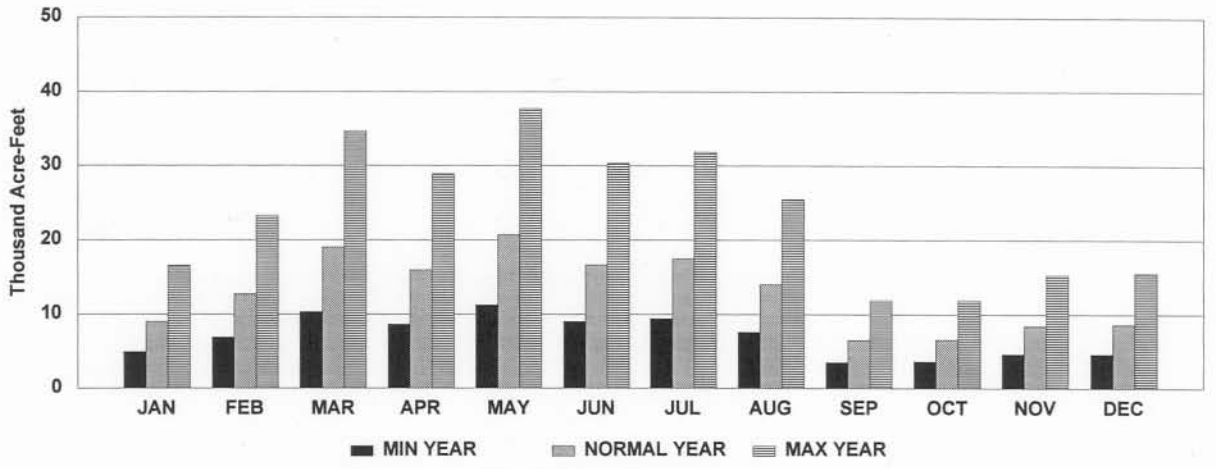


EXHIBIT 12B

HARLAN COUNTY LAKE

2003 OPERATION PLAN

Inflow



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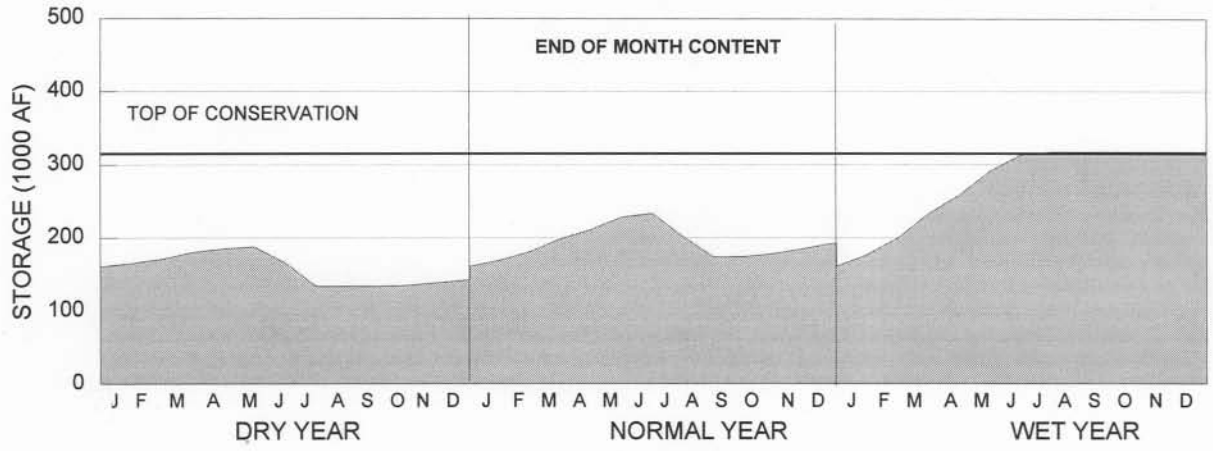

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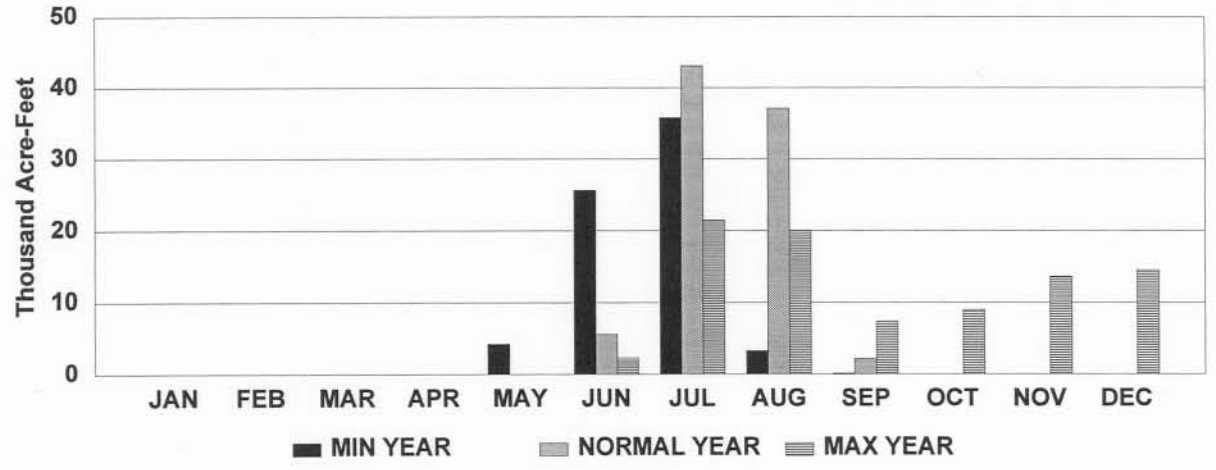
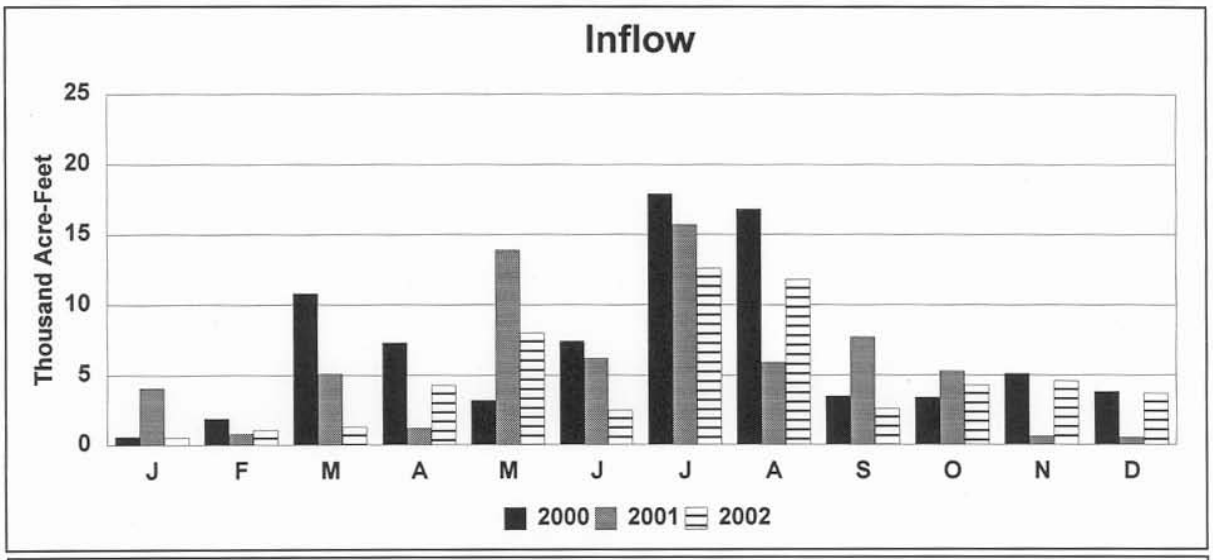
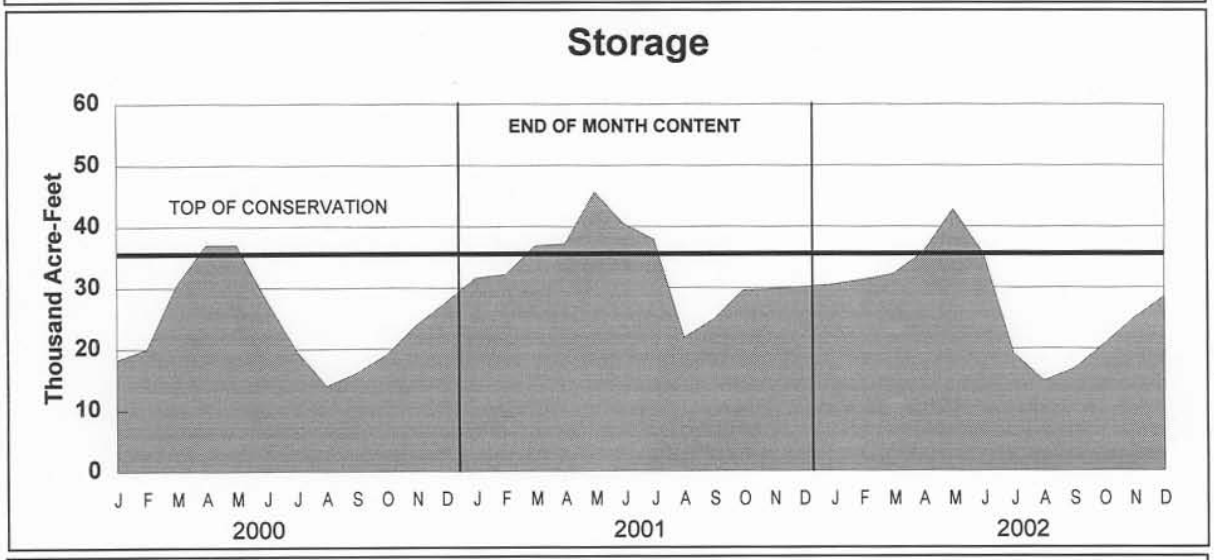


EXHIBIT 13A

LOVEWELL RESERVOIR
ACTUAL OPERATION





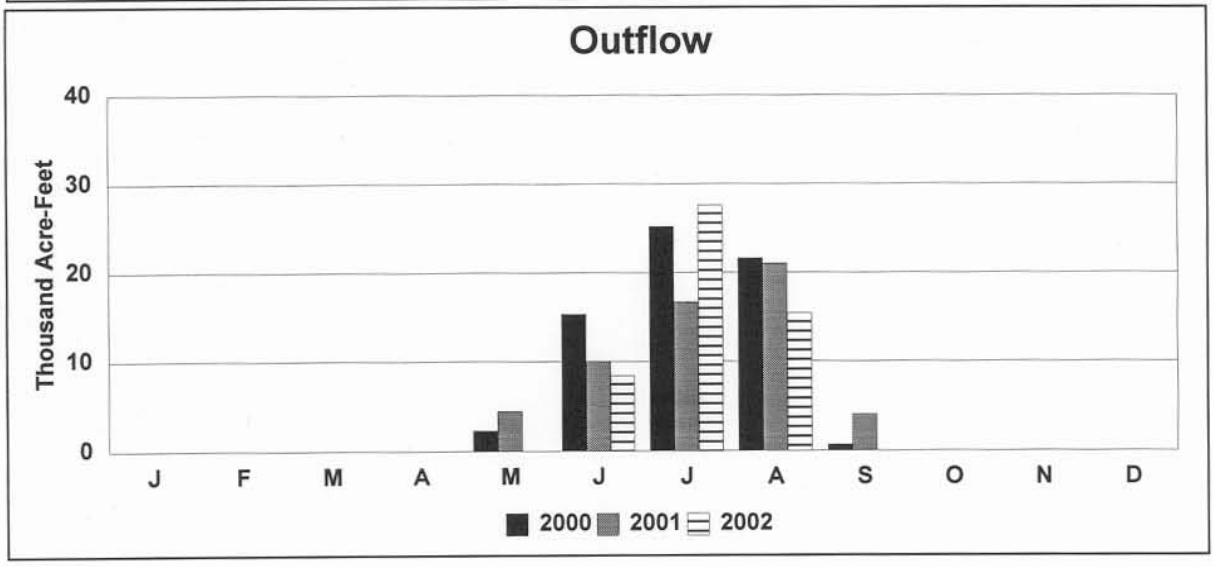
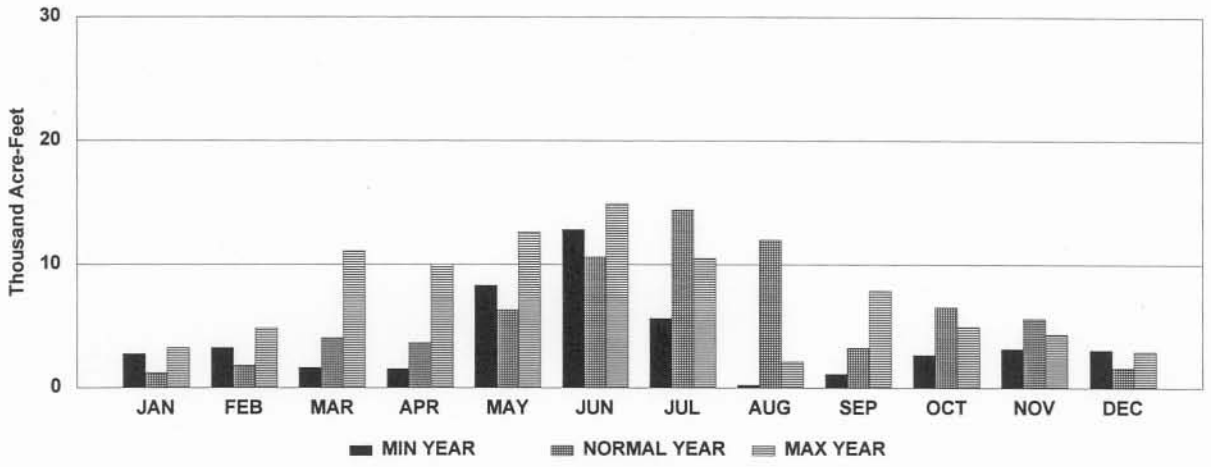


EXHIBIT 13B

LOVEWELL RESERVOIR

2003 OPERATION PLAN

Inflow



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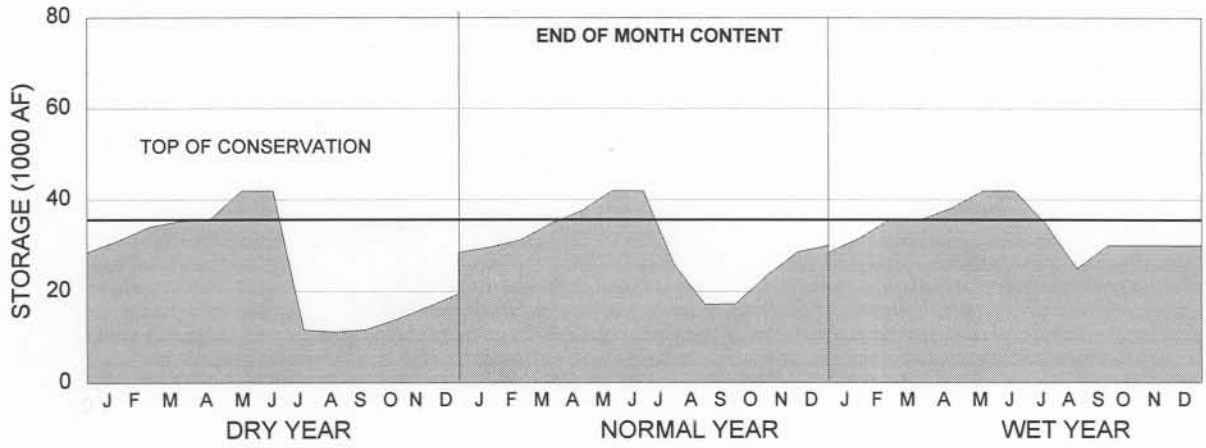

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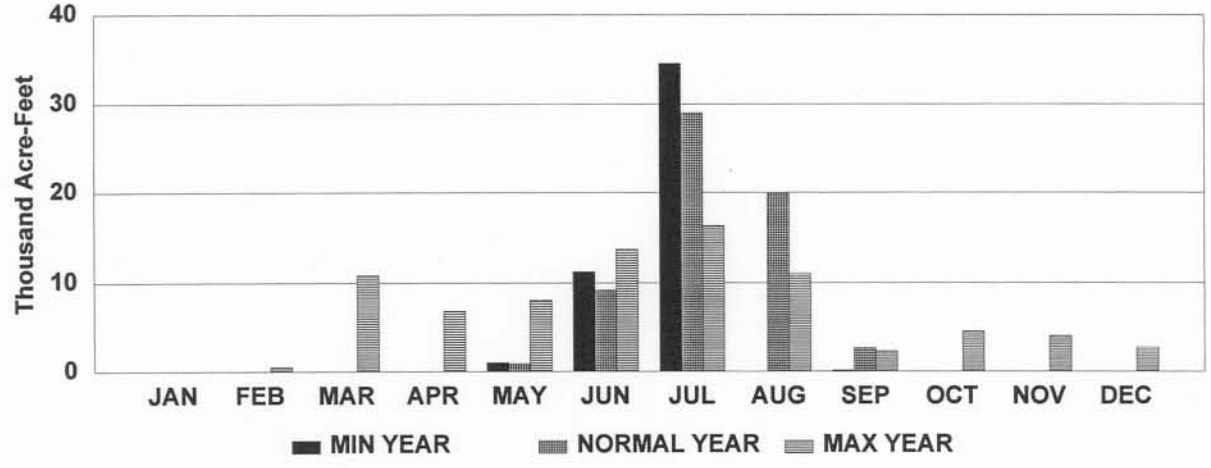
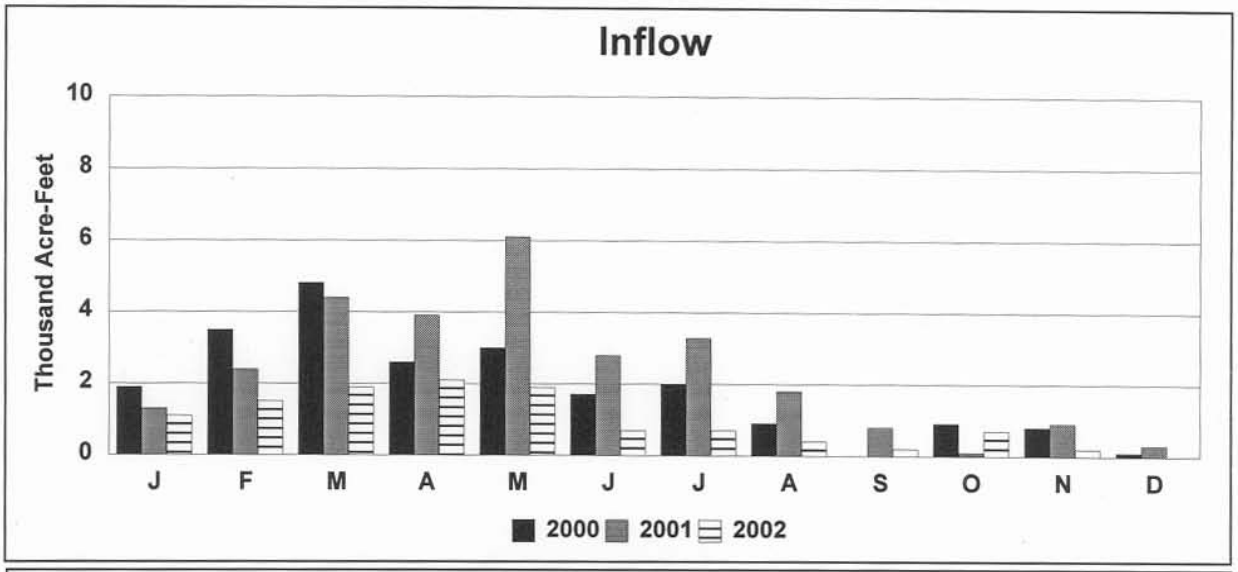
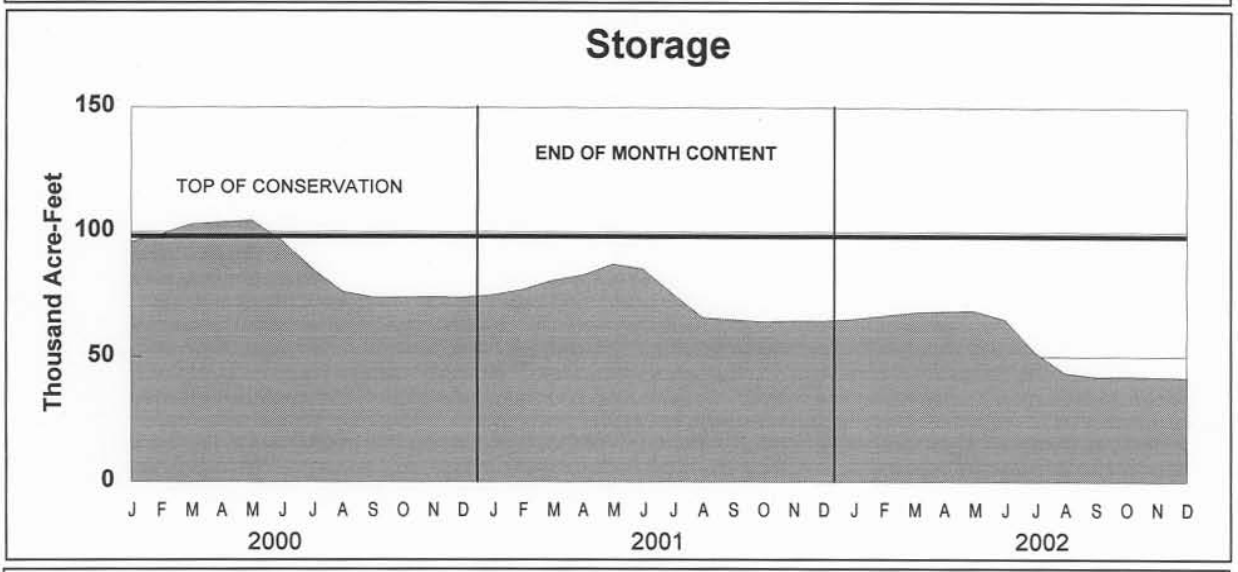


EXHIBIT 14A

KIRWIN RESERVOIR
ACTUAL OPERATION





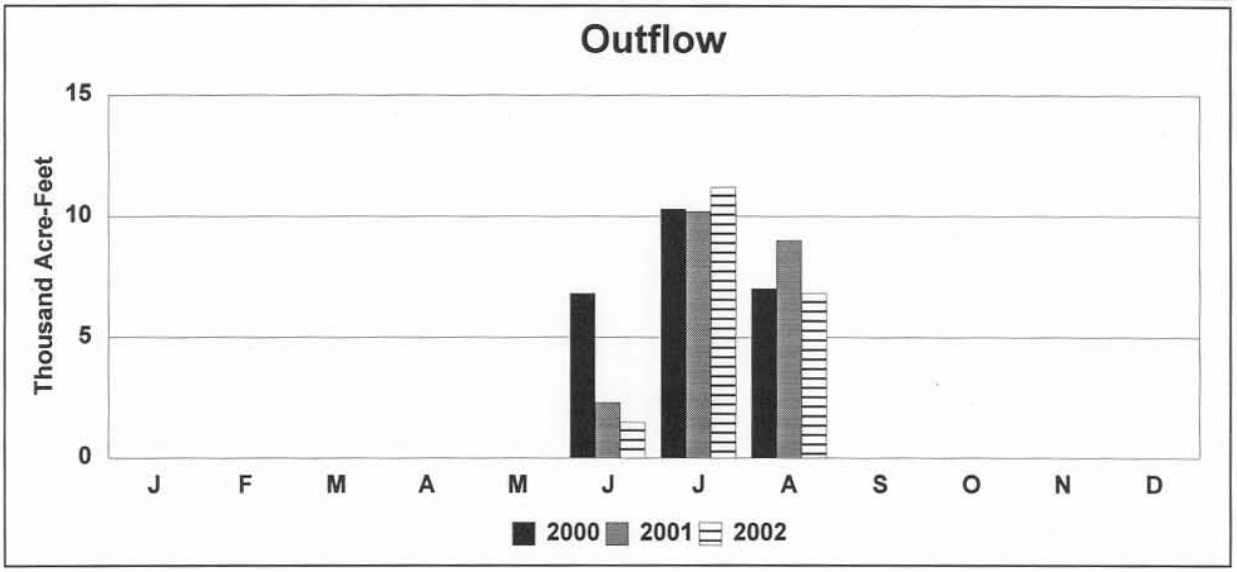
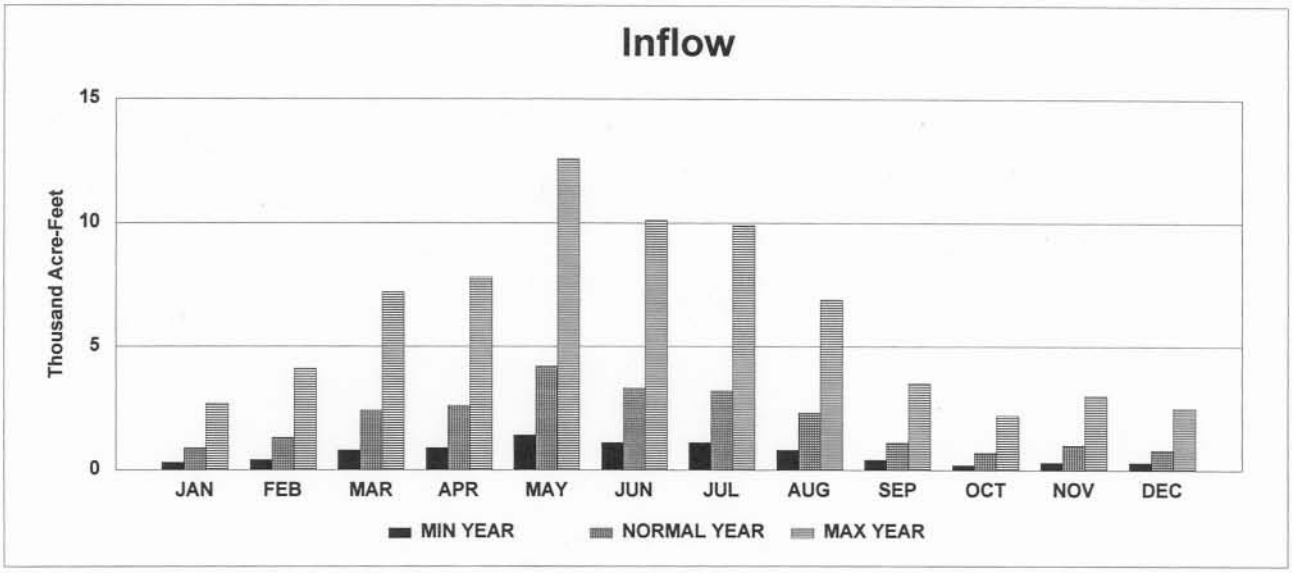
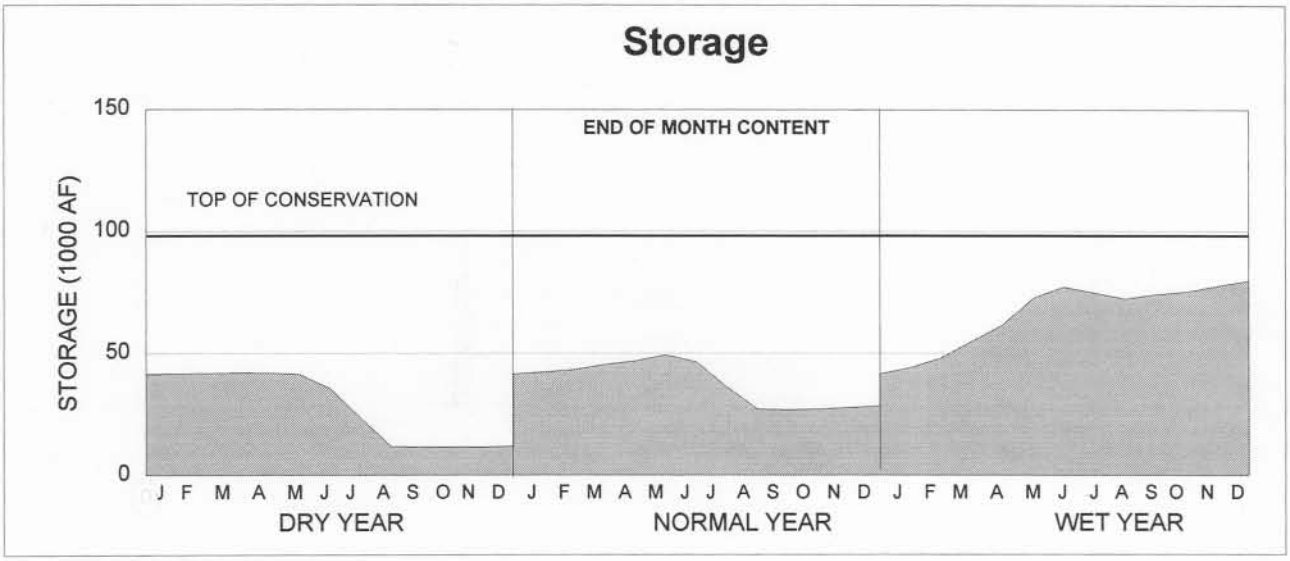


EXHIBIT 14B

KIRWIN RESERVOIR

2003 OPERATION PLAN





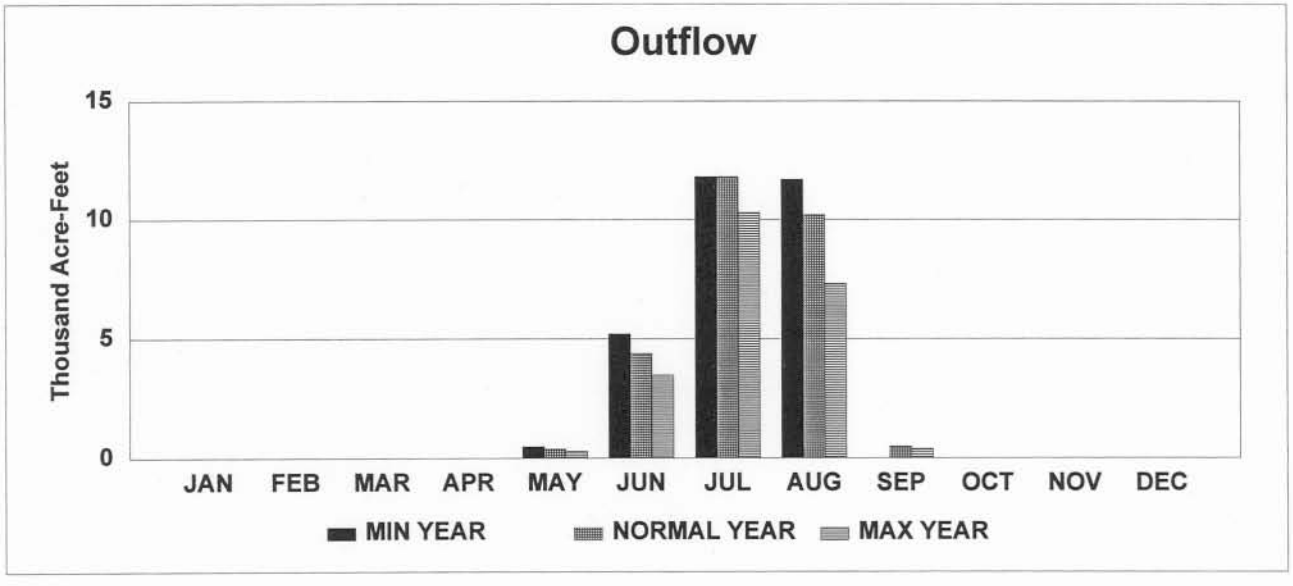
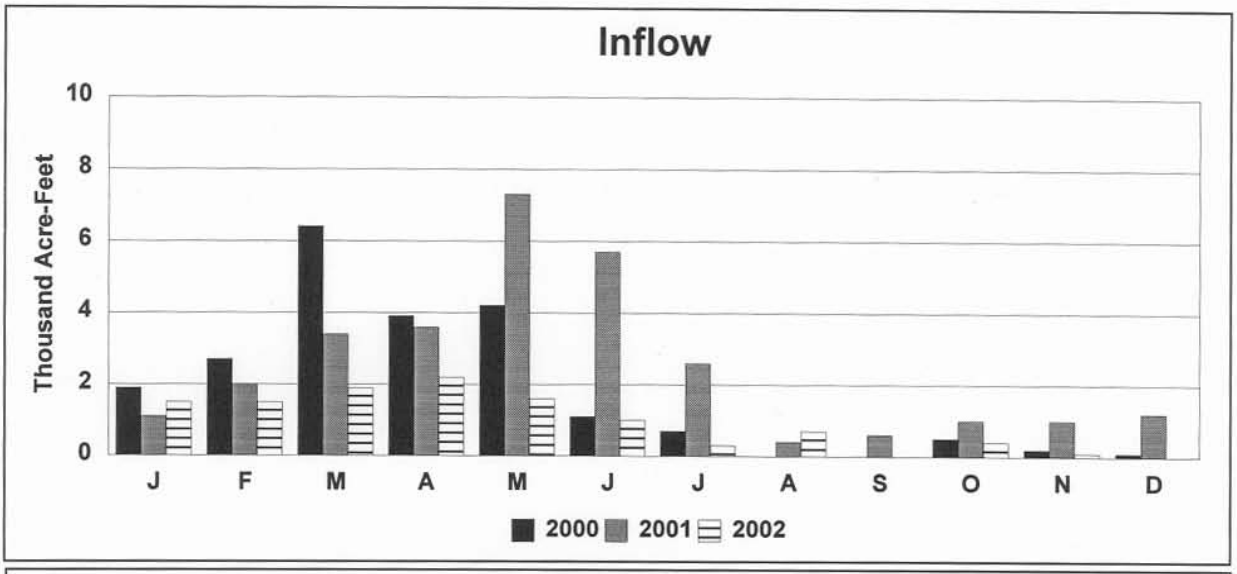
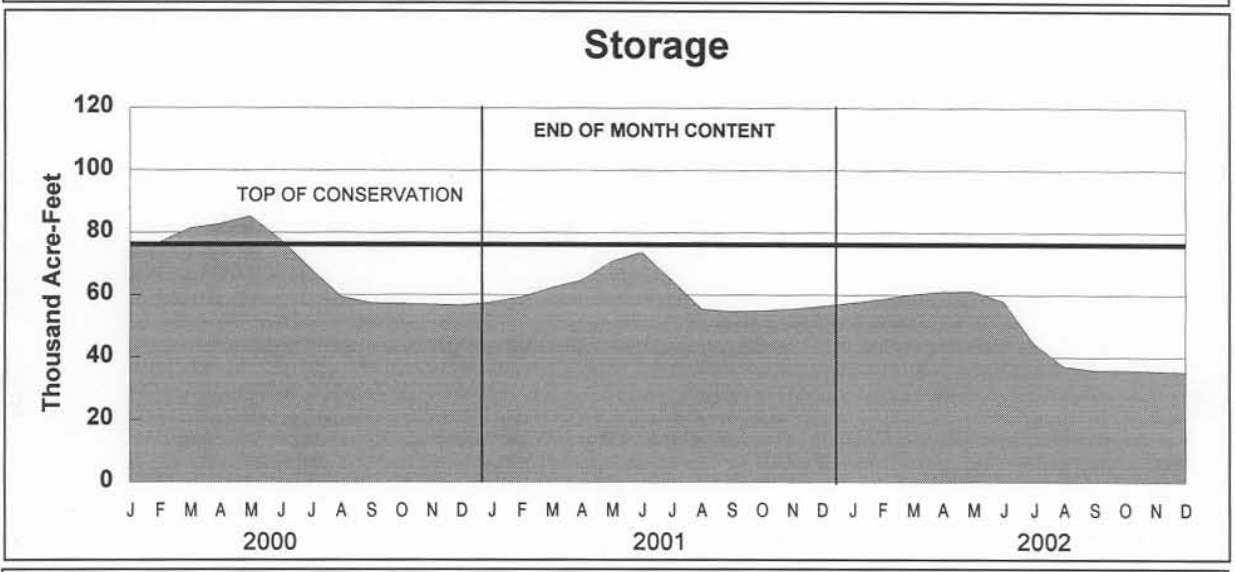


EXHIBIT 15A

WEBSTER RESERVOIR
ACTUAL OPERATION





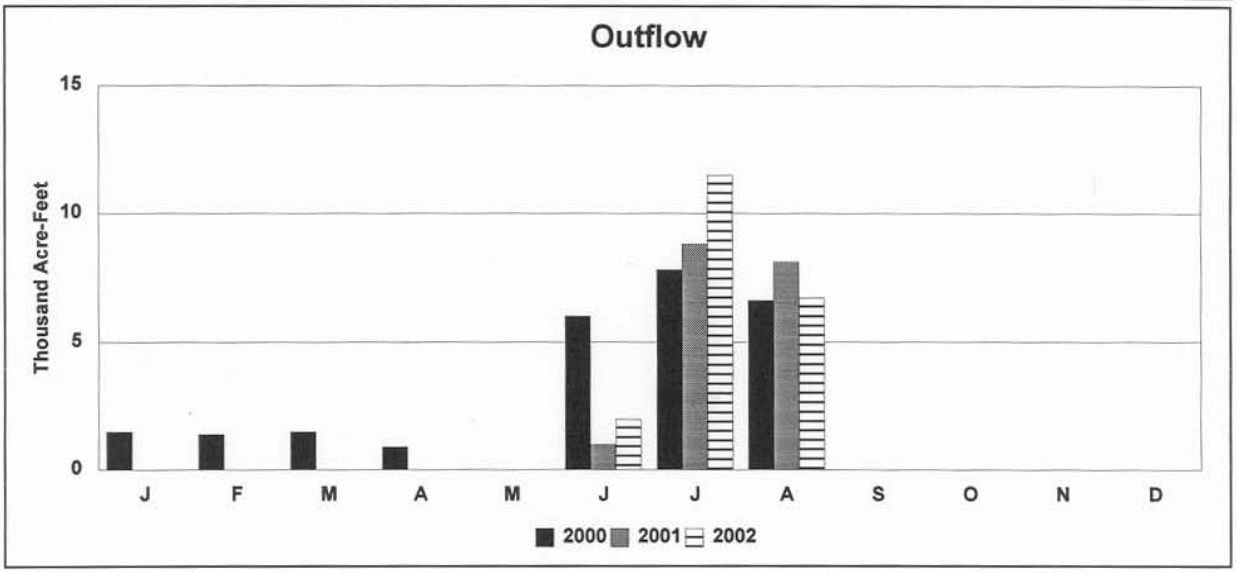
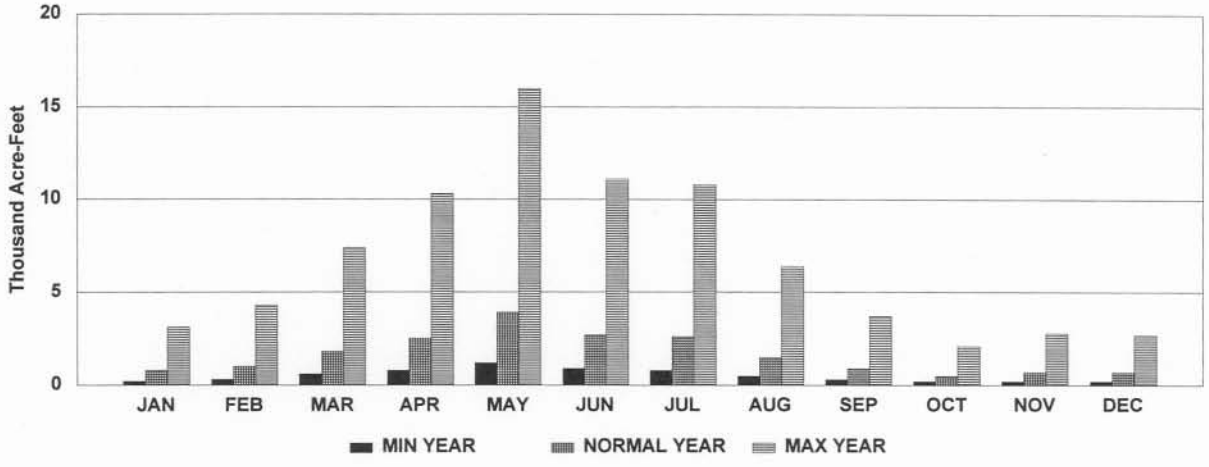


EXHIBIT 15B

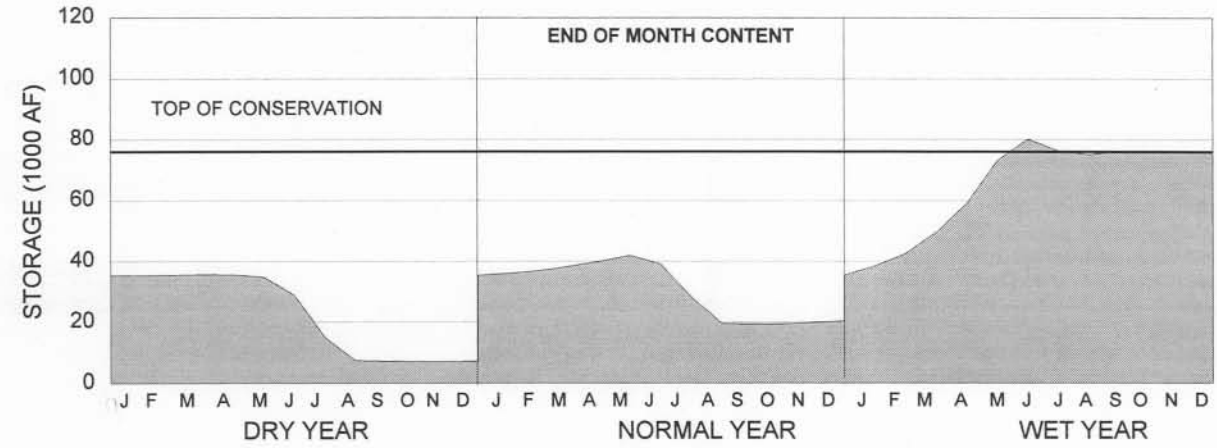
WEBSTER RESERVOIR

2003 OPERATION PLAN

Inflow



Storage



Outflow

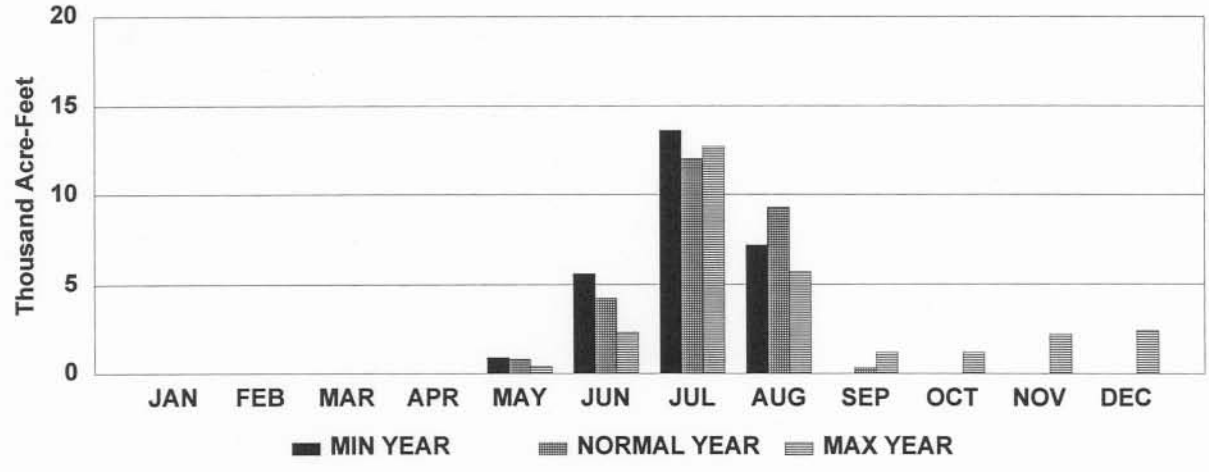
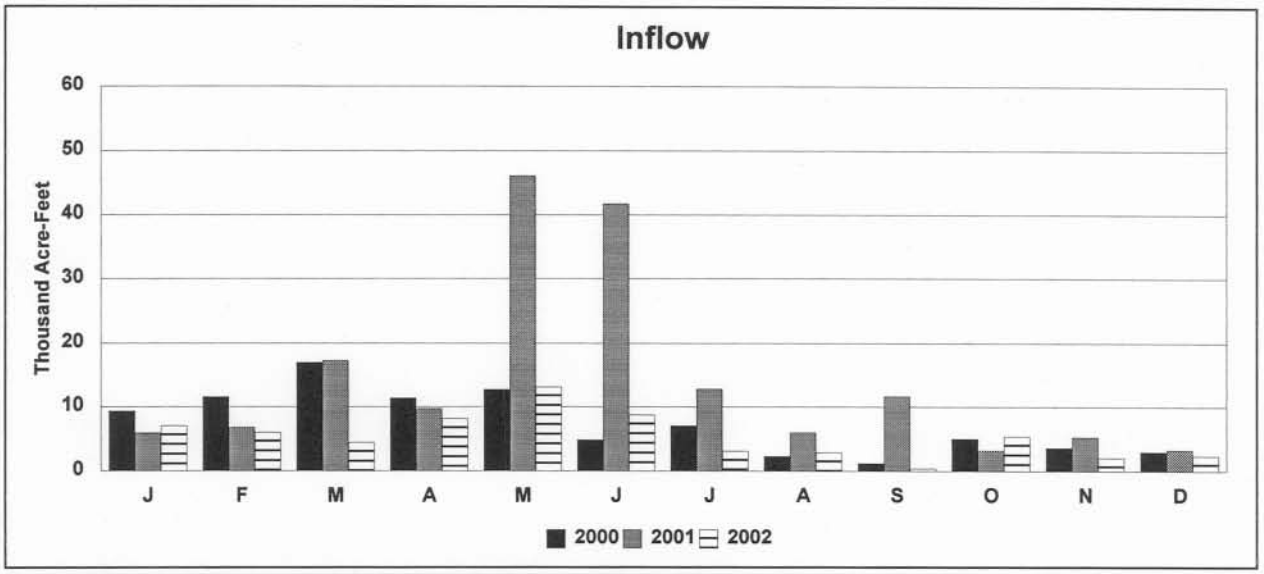
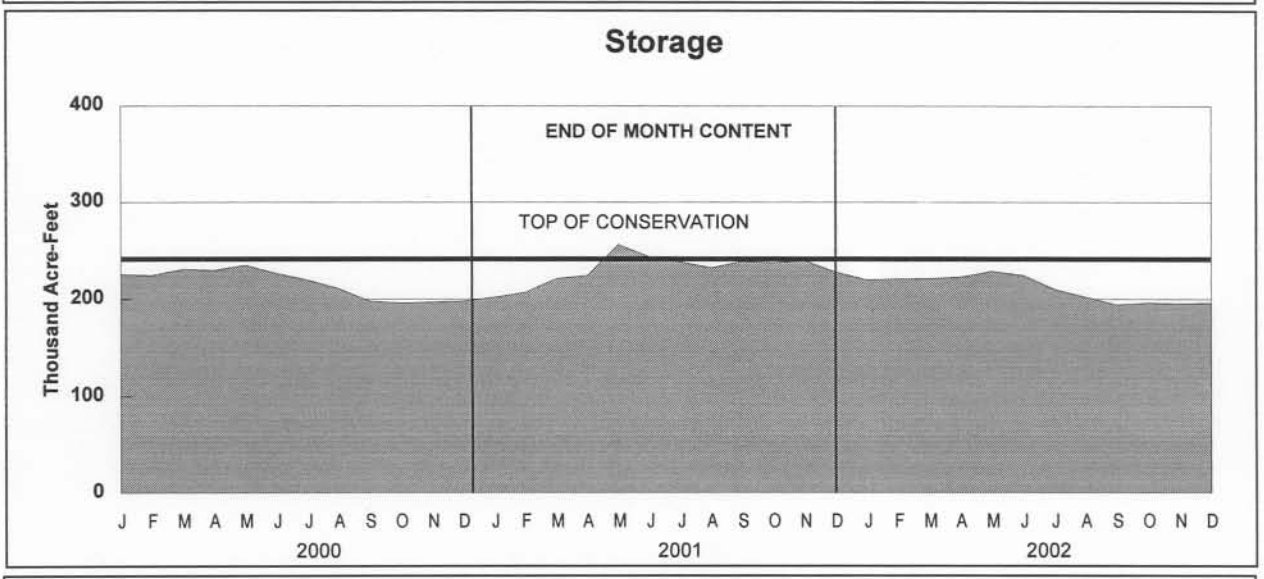


EXHIBIT 16A

WACONDA LAKE
ACTUAL OPERATION





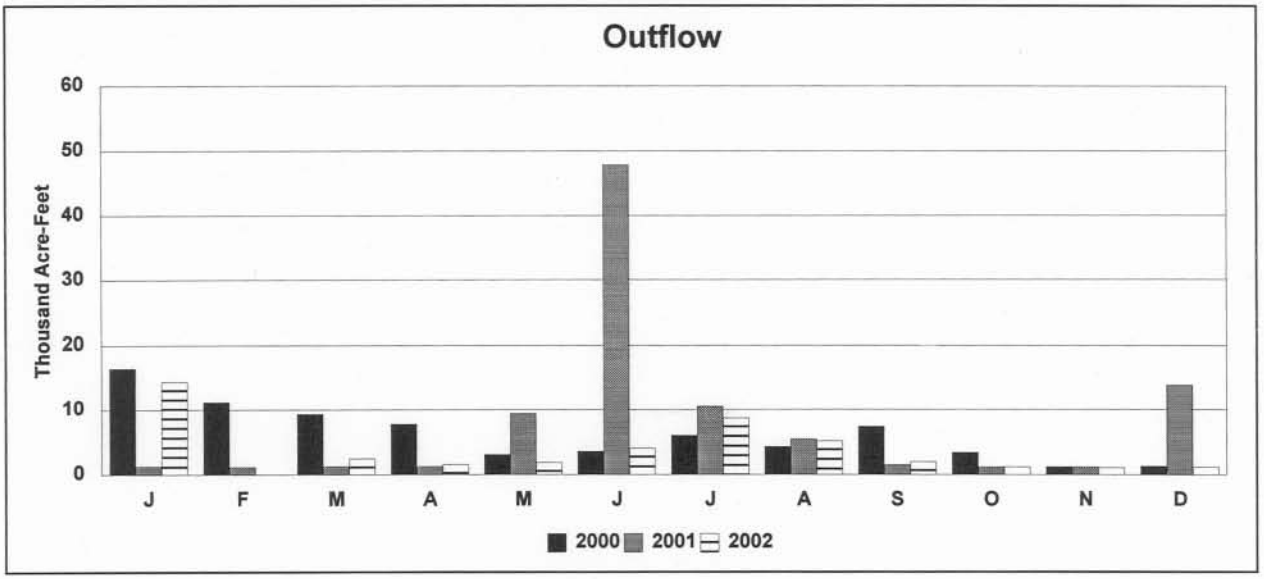
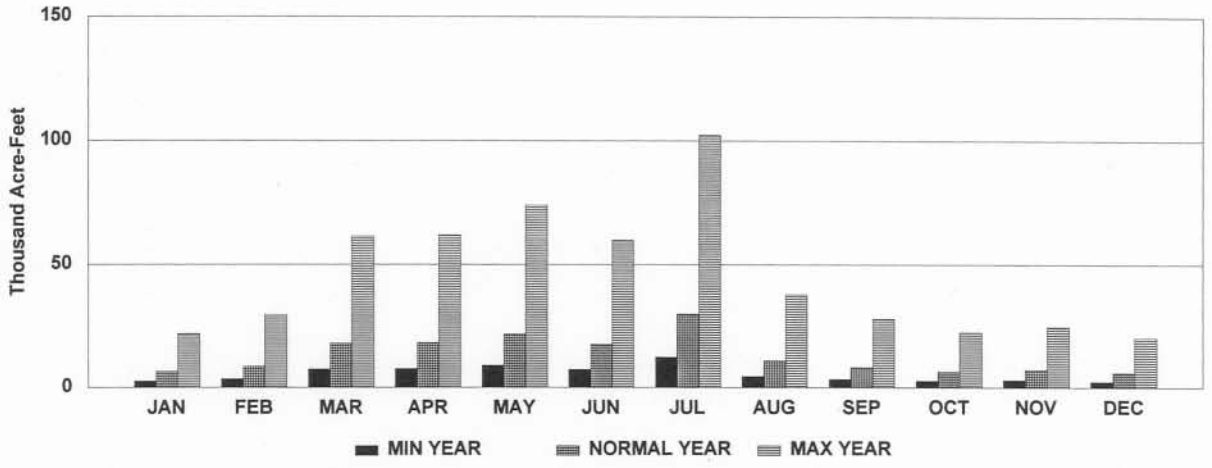


EXHIBIT 16B

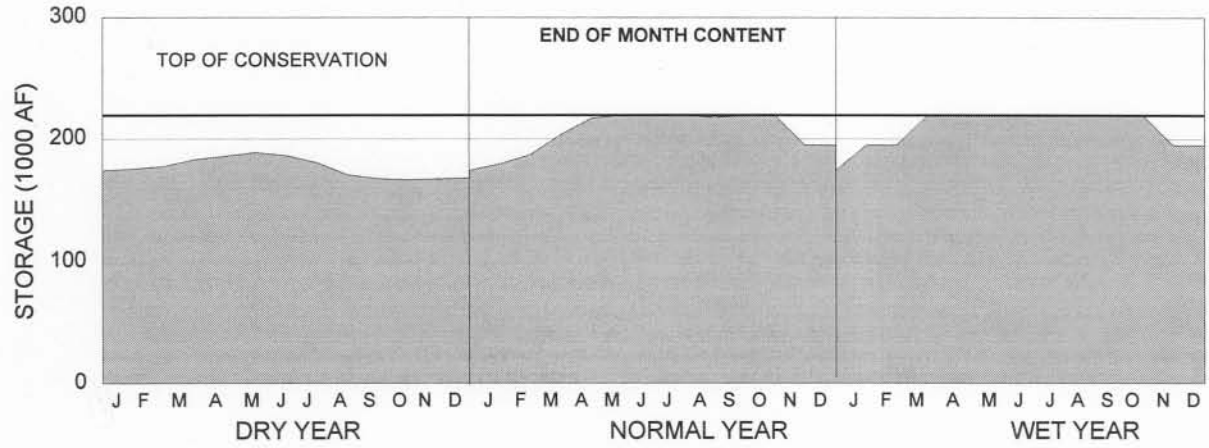
WACONDA LAKE

2003 OPERATION PLAN

Inflow



Storage



Outflow

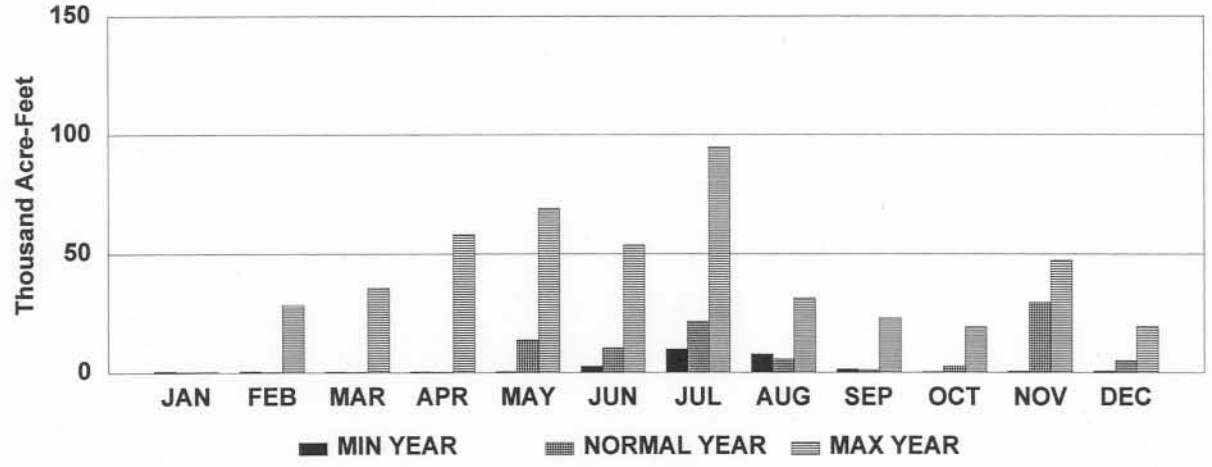
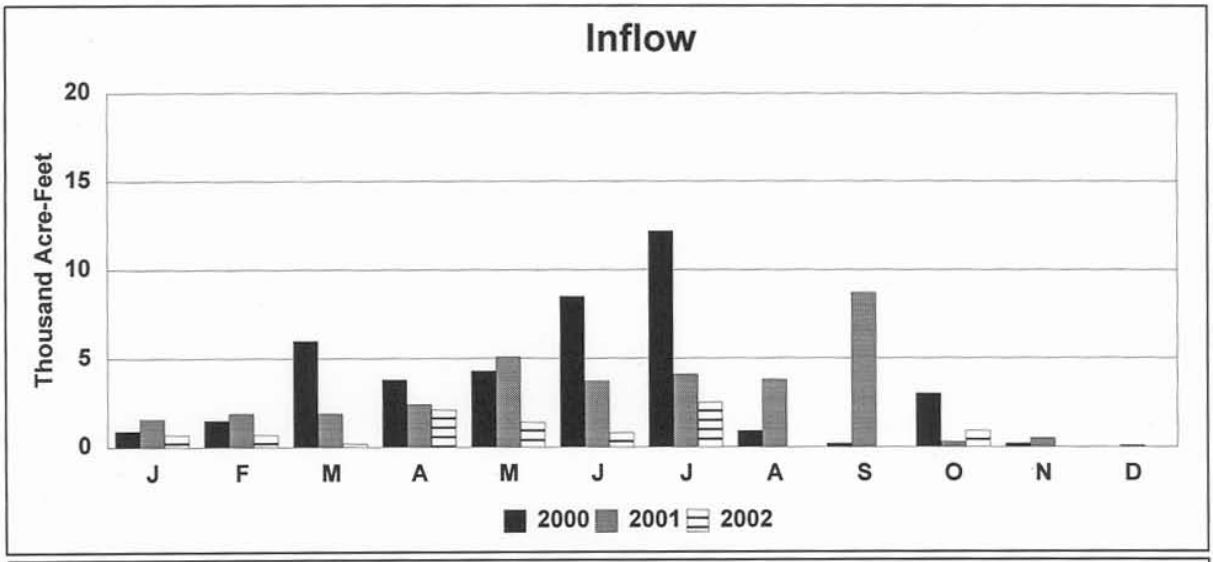
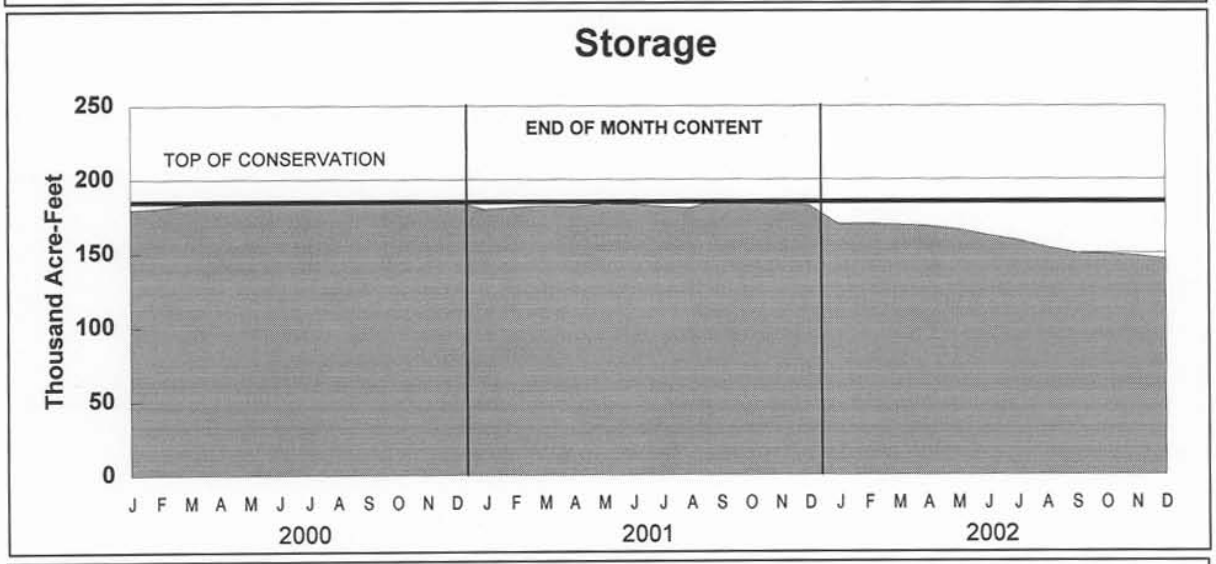


EXHIBIT 17A

CEDAR BLUFF RESERVOIR
ACTUAL OPERATION





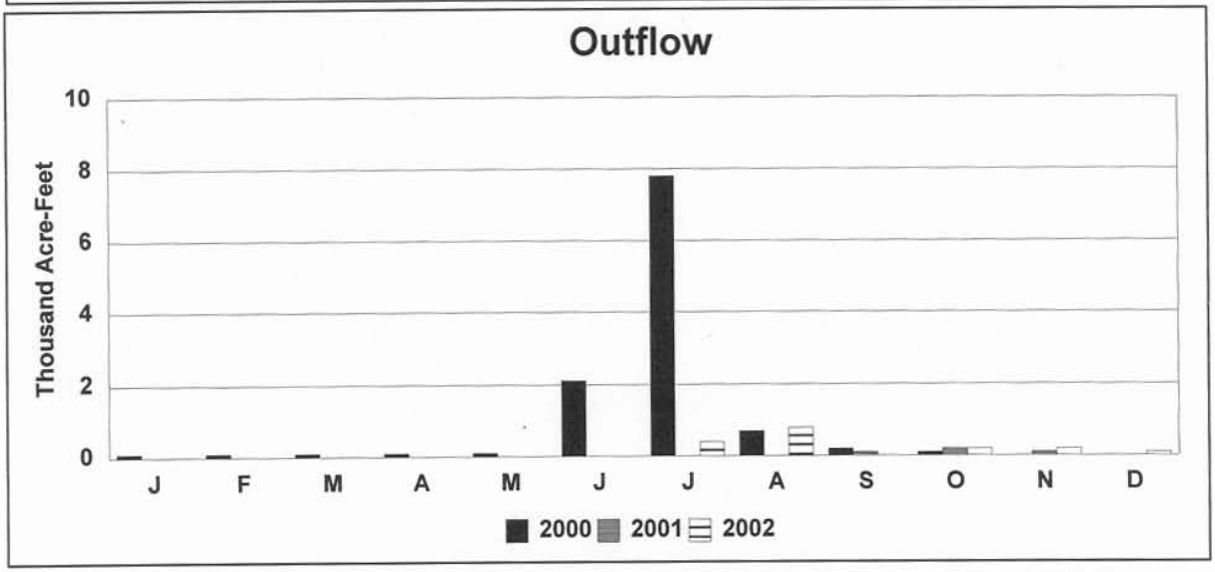
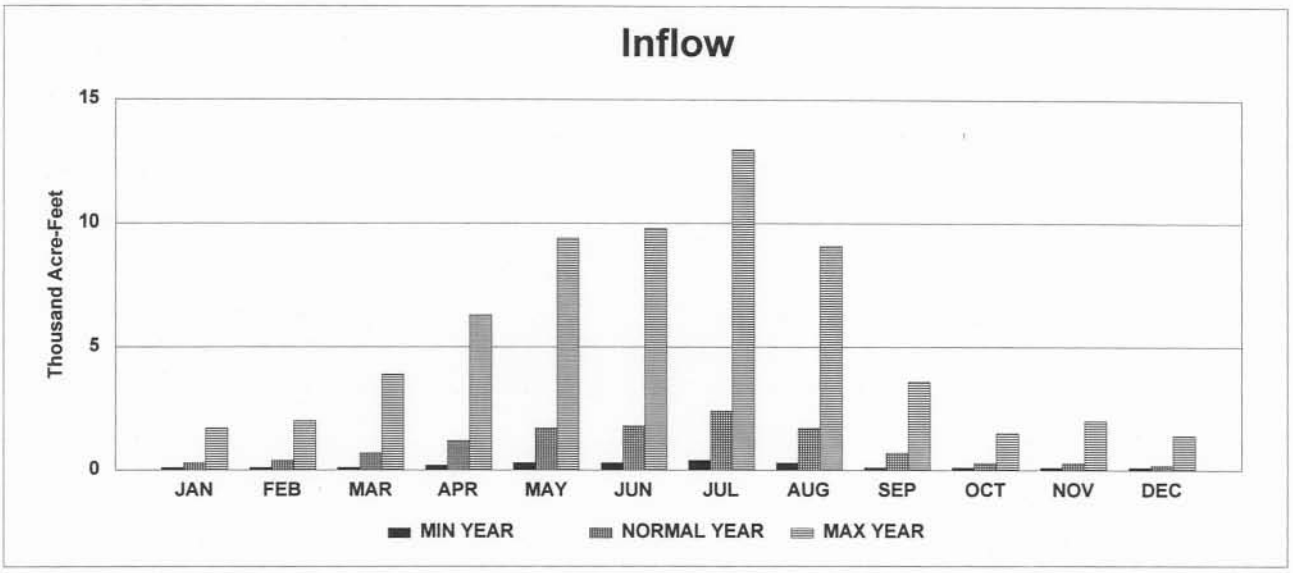
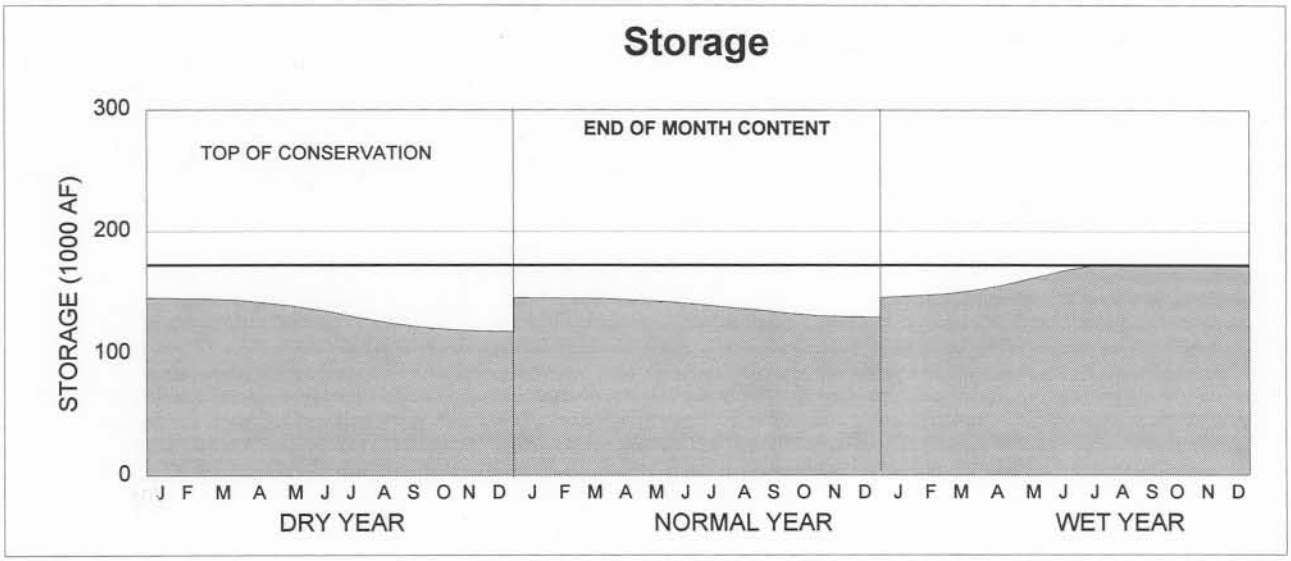


EXHIBIT 17B

CEDAR BLUFF RESERVOIR

2003 OPERATION PLAN





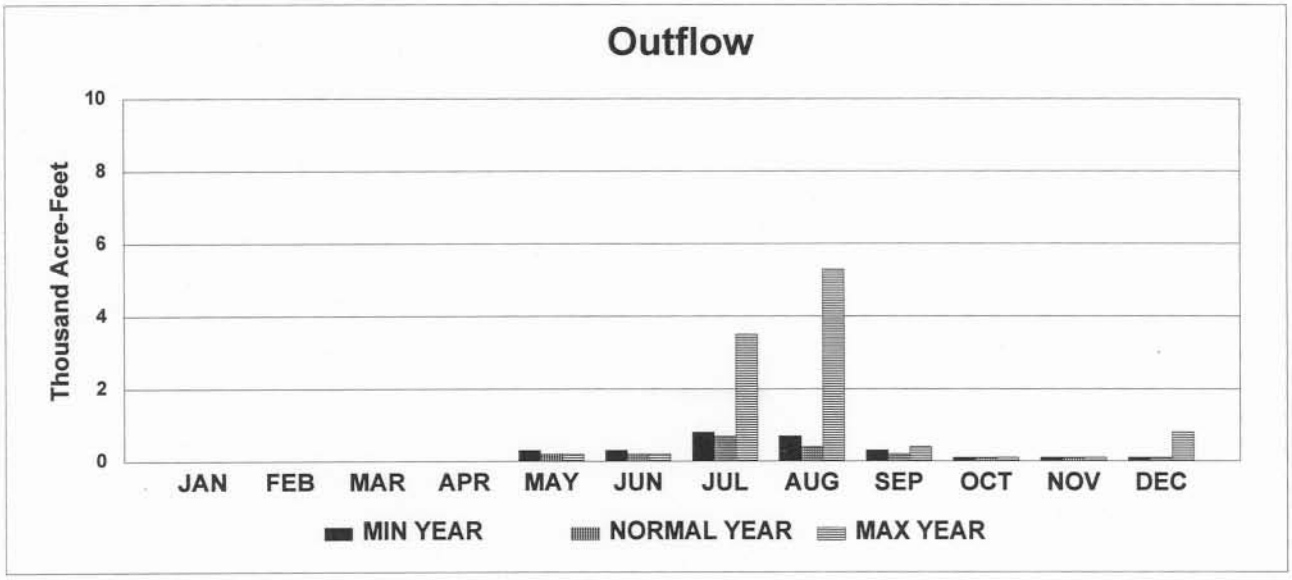
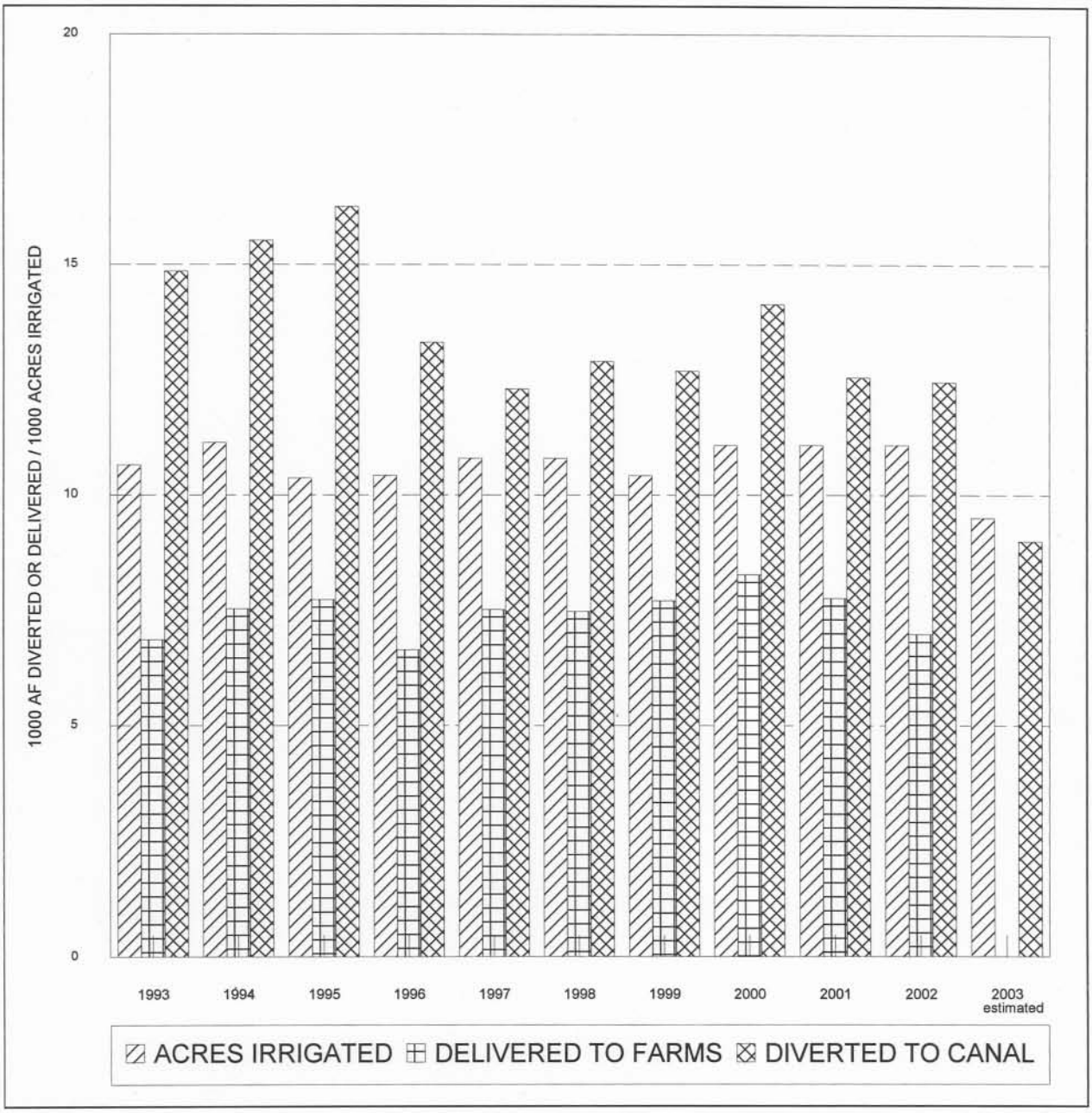


EXHIBIT 18

MIRAGE FLATS IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
DIVERTED af/acre	1.39	1.39	1.57	1.28	1.14	1.20	1.22	1.28	1.13	1.12
DELIVERED af/acre	0.64	0.68	0.74	0.64	0.70	0.69	0.74	0.75	0.70	0.63
EFFICIENCY	46%	49%	48%	50%	61%	58%	61%	58%	62%	56%

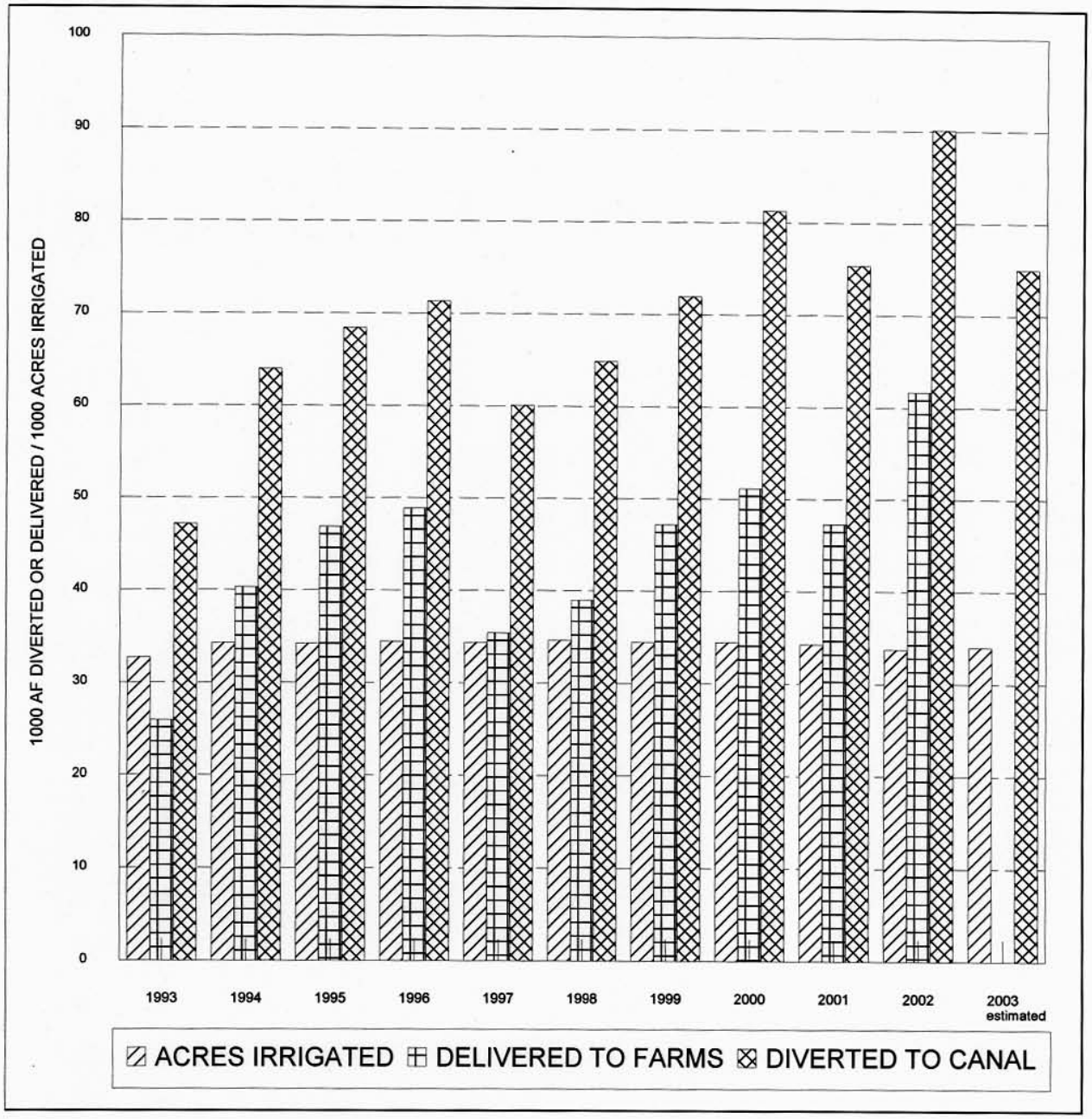
FORECASTED SHORTAGES (2003)

DRY YEAR	25,100 AF
NORMAL YEAR	4,400 AF
WET YEAR	1,200 AF

EXHIBIT 19

AINSWORTH IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
DIVERTED af/acre	1.44	1.87	2.00	2.07	1.75	1.87	2.09	2.36	2.20	2.67
DELIVERED af/acre	0.79	1.18	1.37	1.42	1.03	1.13	1.37	1.49	1.38	1.83
EFFICIENCY	55%	63%	68%	68%	59%	60%	66%	63%	63%	68%

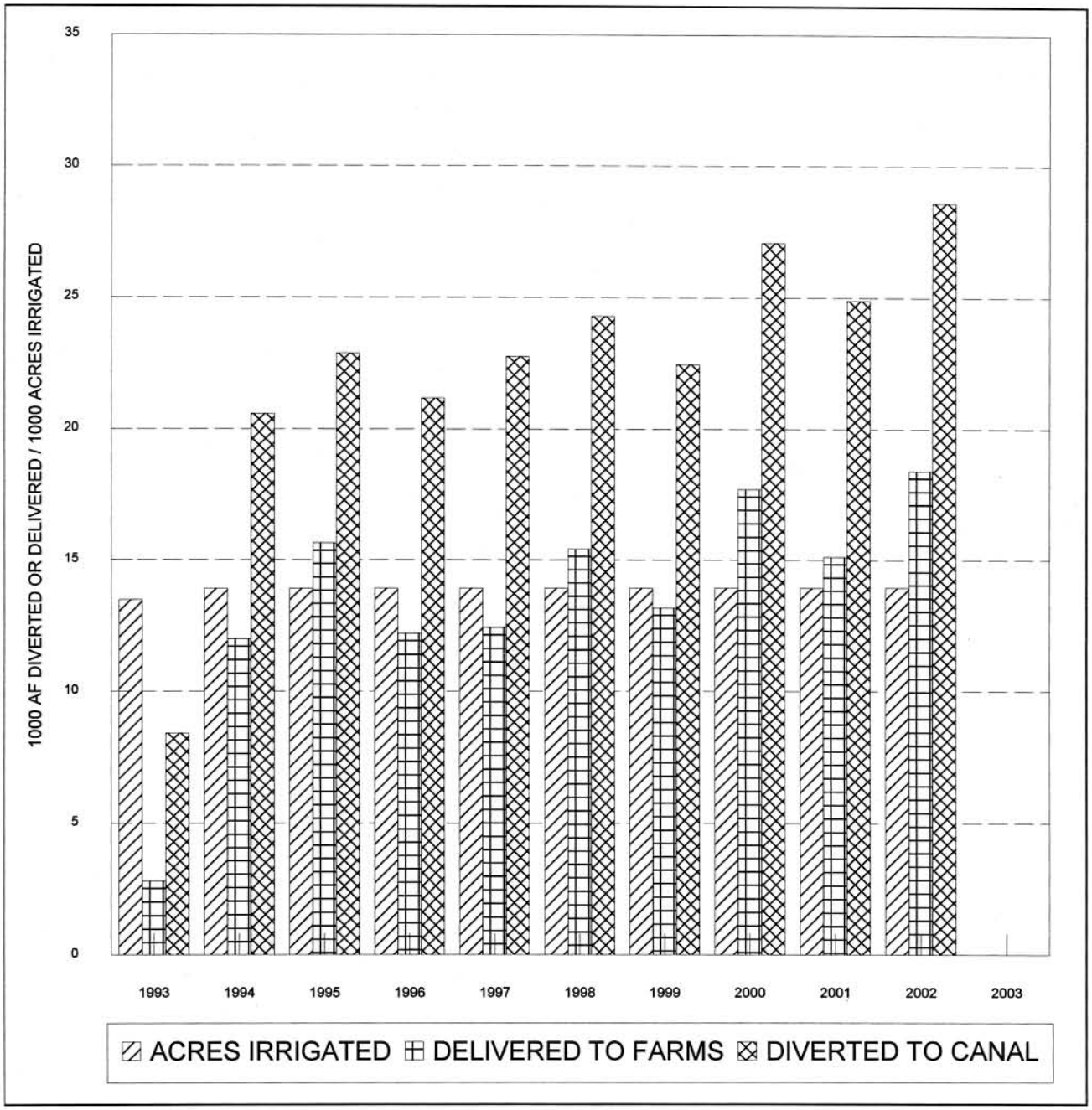
FORECASTED SHORTAGES (2003)

DRY YEAR	0 AF
NORMAL YEAR	0 AF

EXHIBIT 20

SARGENT IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

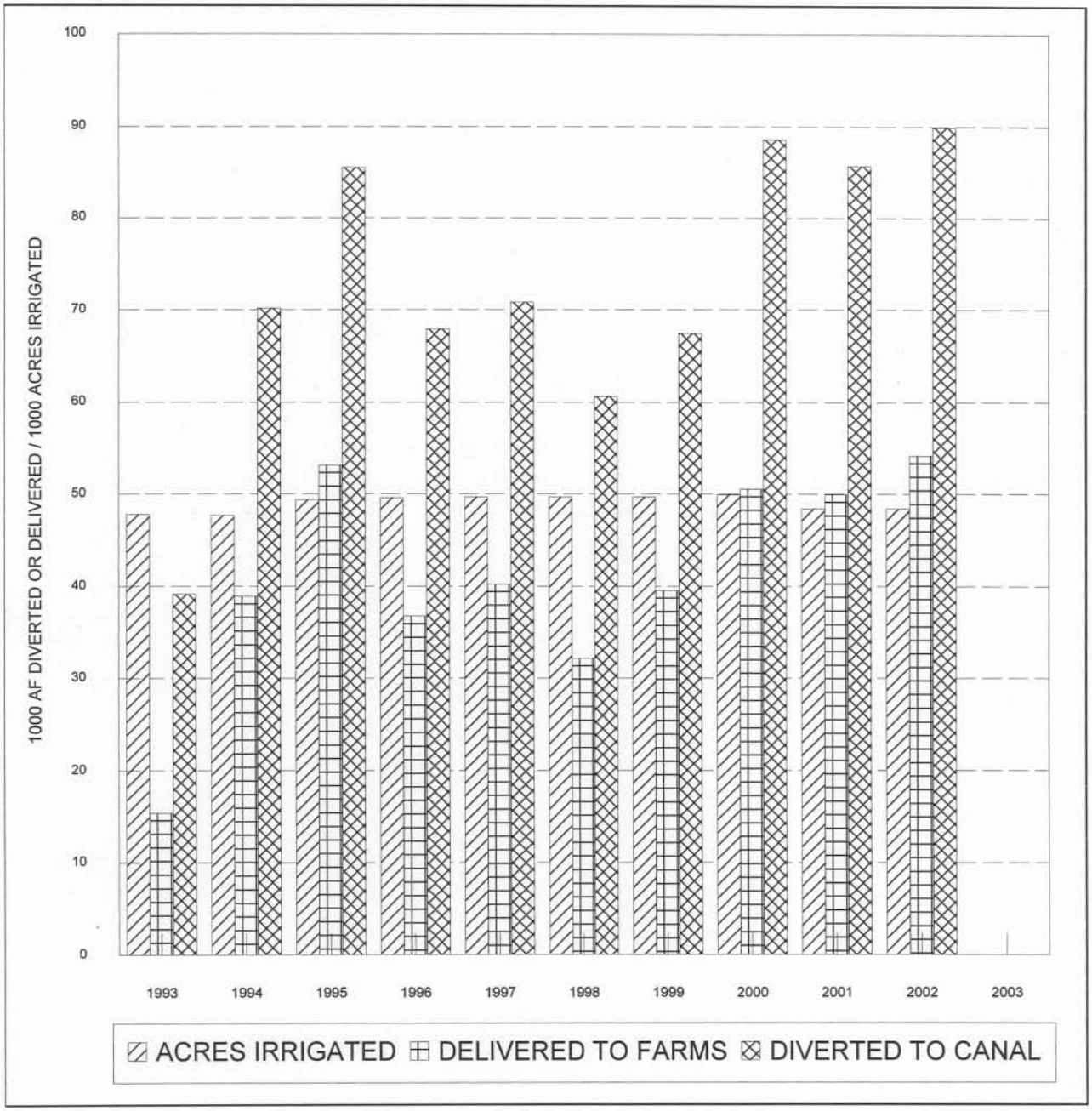


	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
DIVERTED af/acre	0.62	1.48	1.64	1.52	1.63	1.74	1.61	1.94	1.79	2.05
DELIVERED af/acre	0.21	0.86	1.13	0.88	0.89	1.11	0.95	1.27	1.09	1.32
EFFICIENCY	33%	58%	68%	58%	55%	63%	59%	65%	61%	64%

EXHIBIT 21

FARWELL IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

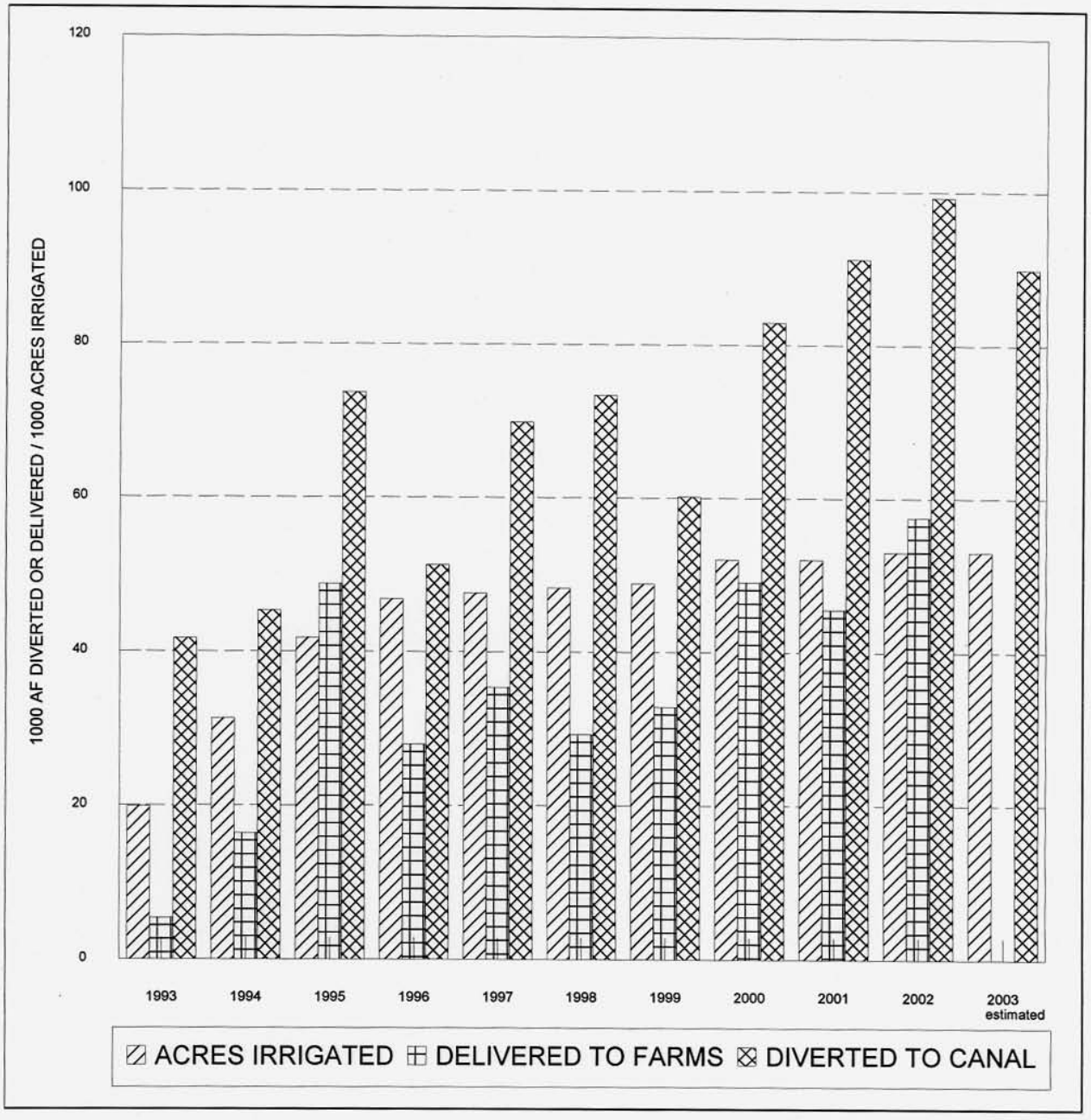


	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
DIVERTED af/acre	0.82	1.47	1.73	1.37	1.43	1.22	1.36	1.77	1.77	1.86
DELIVERED af/acre	0.32	0.82	1.08	0.74	0.81	0.65	0.80	1.01	1.03	1.12
EFFICIENCY	39%	55%	62%	54%	57%	53%	59%	57%	58%	60%

EXHIBIT 22

TWIN LOUPS IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
DIVERTED af/acre	2.10	1.45	1.76	1.10	1.47	1.52	1.23	1.60	1.76	1.87
DELIVERED af/acre	0.27	0.52	1.17	0.60	0.74	0.60	0.67	0.94	0.88	1.09
EFFICIENCY	13%	36%	66%	54%	51%	40%	55%	59%	50%	58%

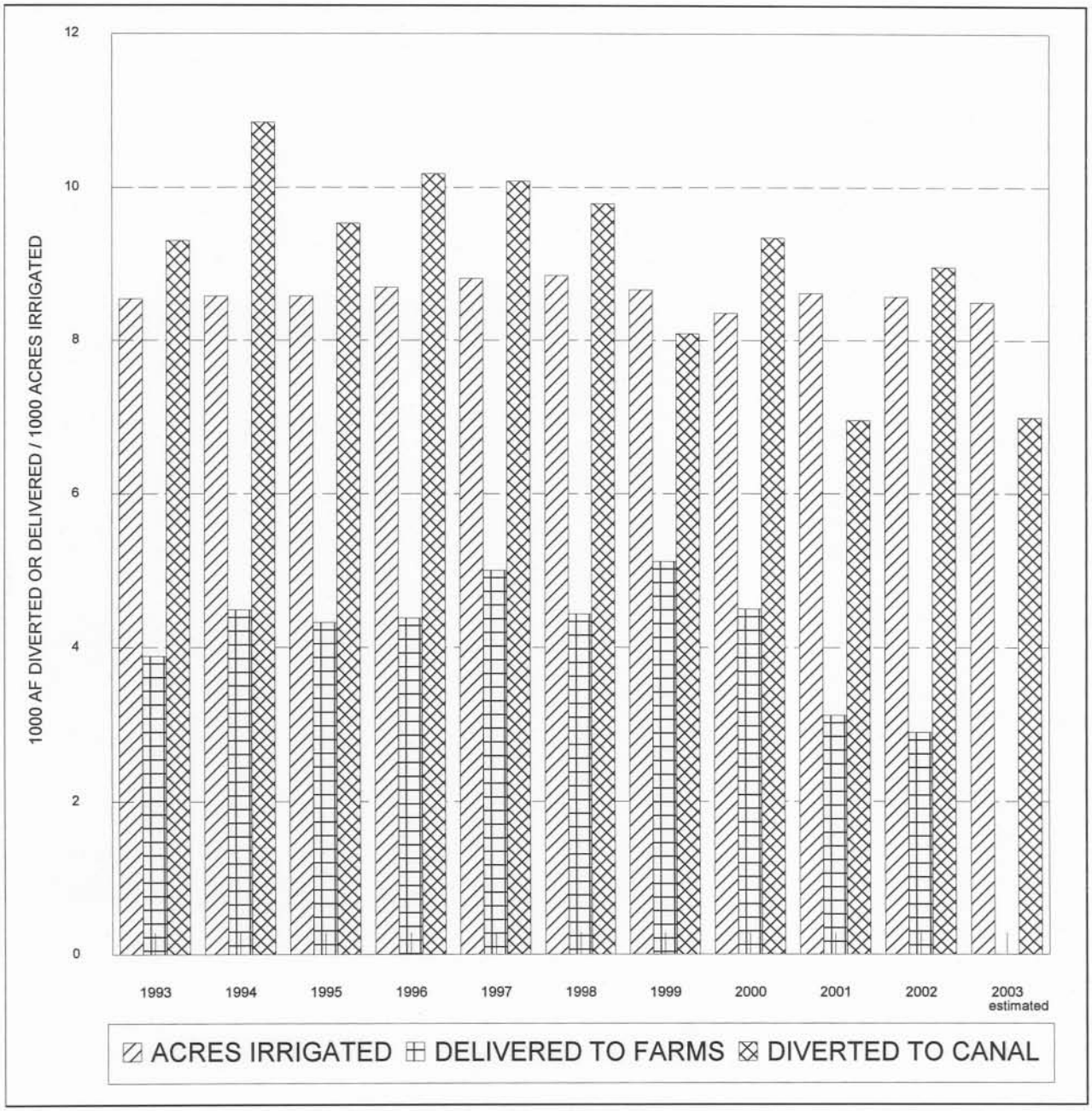
FORECASTED SHORTAGES (2003)

DRY YEAR	0 AF
NORMAL YEAR	0 AF

EXHIBIT 23

FRENCHMAN VALLEY IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
DIVERTED af/acre	1.09	1.26	1.11	1.17	1.14	1.11	0.93	1.12	0.81	1.05
DELIVERED af/acre	0.45	0.52	0.50	0.50	0.57	0.50	0.59	0.54	0.36	0.34
EFFICIENCY	42%	41%	45%	43%	50%	45%	63%	48%	45%	32%

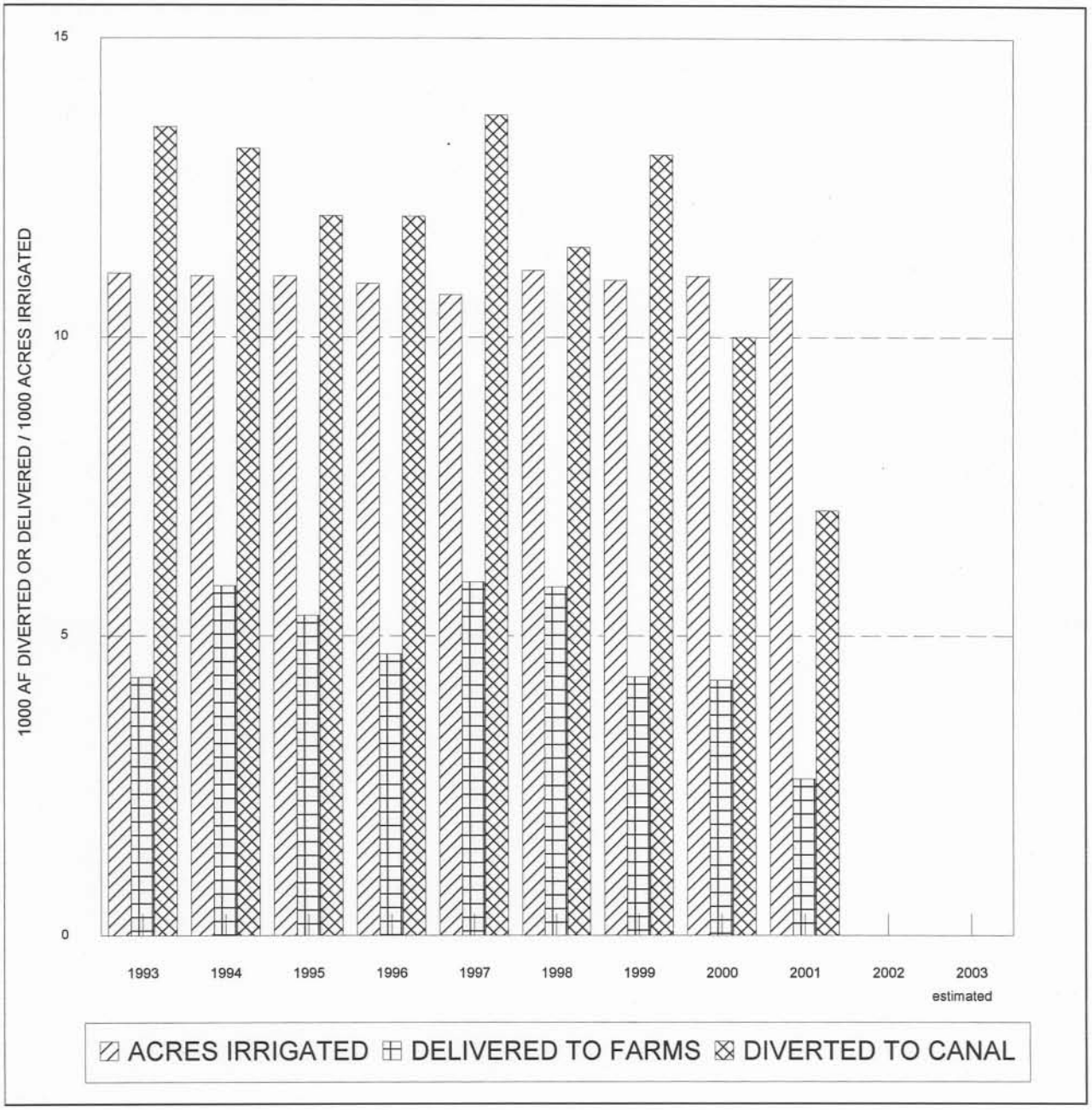
FORECASTED SHORTAGES (2003)

DRY YEAR	32,900 AF
NORMAL YEAR	20,700 AF
WET YEAR	2,800 AF

EXHIBIT 24

H AND RW IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
DIVERTED af/acre	1.22	1.19	1.09	1.10	1.28	1.03	1.19	0.91	0.65	0.00
DELIVERED af/acre	0.39	0.53	0.48	0.43	0.55	0.52	0.39	0.39	0.24	0.00
EFFICIENCY	32%	44%	44%	39%	43%	51%	33%	43%	37%	0%

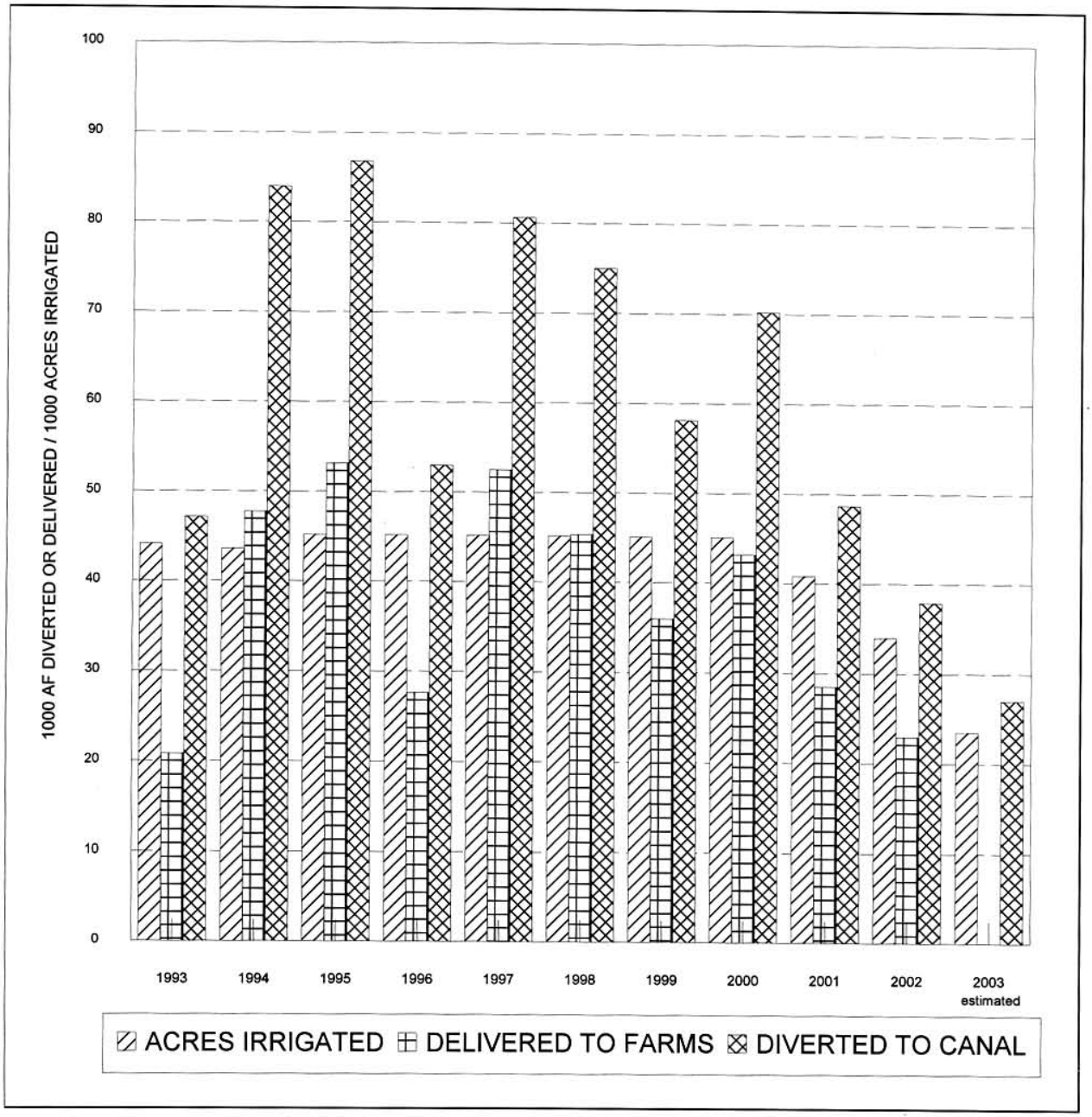
FORECASTED SHORTAGES (2003)

DRY YEAR	41,900 AF
NORMAL YEAR	26,300 AF
WET YEAR	8,800 AF

EXHIBIT 25

FRENCHMAN-CAMBRIDGE IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
DIVERTED af/acre	1.07	1.93	1.92	1.17	1.79	1.66	1.29	1.56	1.19	1.12
DELIVERED af/acre	0.47	1.09	1.17	0.61	1.16	1.00	0.80	0.96	0.70	0.67
EFFICIENCY	44%	57%	61%	52%	65%	60%	62%	61%	58%	61%

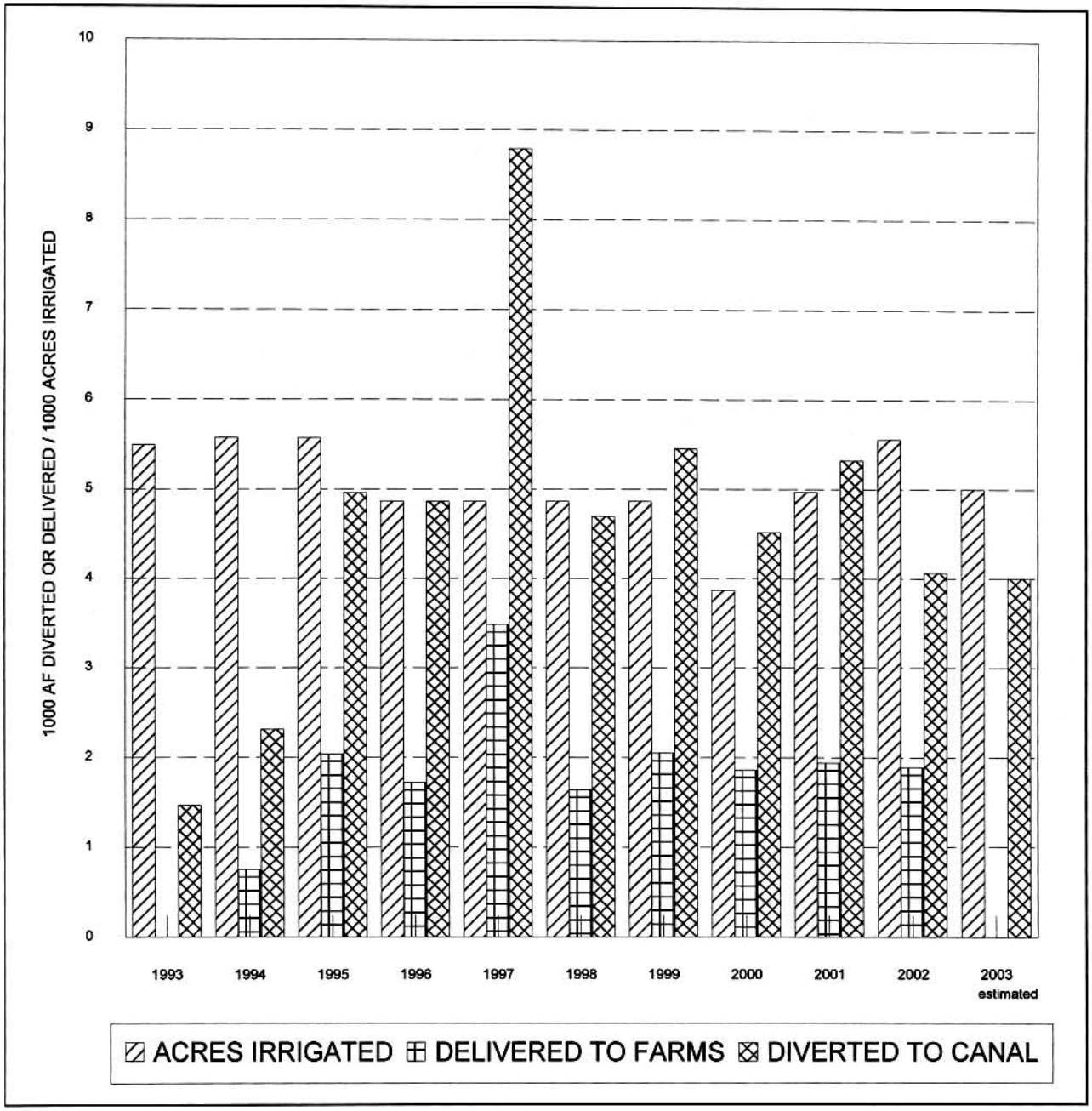
FORECASTED SHORTAGES (2003)

DRY YEAR	48,400 AF
NORMAL YEAR	1,400 AF

EXHIBIT 26

ALMENA IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
DIVERTED af/acre	0.27	0.41	0.89	1.00	1.81	0.97	1.12	1.17	1.07	0.73
DELIVERED af/acre	0.00	0.13	0.37	0.35	0.72	0.34	0.42	0.48	0.39	0.34
EFFICIENCY	0%	32%	41%	35%	40%	35%	38%	41%	36%	46%

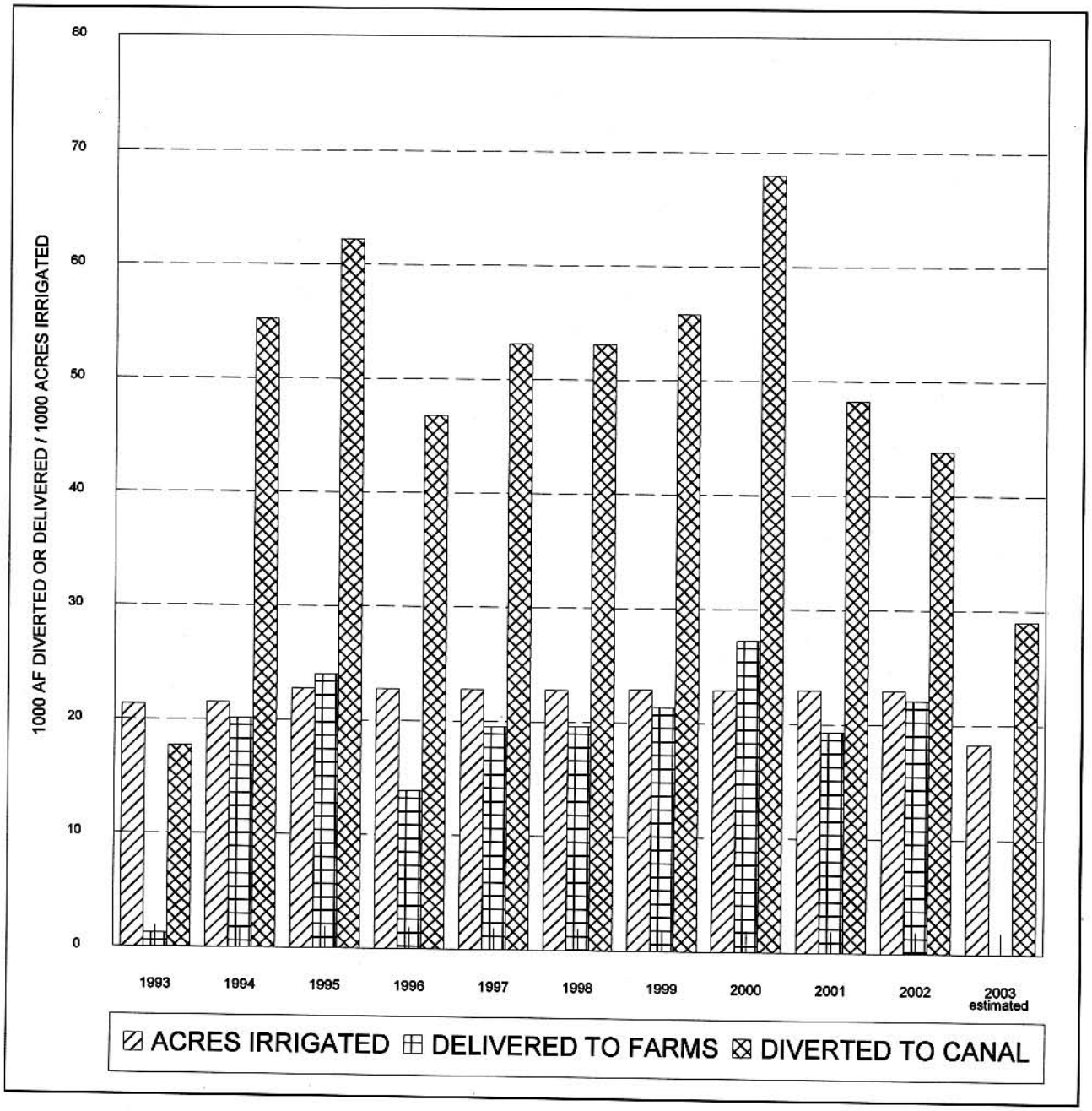
FORECASTED SHORTAGES (2003)

DRY YEAR	13,800 AF
NORMAL YEAR	6,500 AF

EXHIBIT 27

BOSTWICK IRRIGATION DISTRICT - NEBRASKA

CANAL DIV., FARM DEL., AND ACRES IRRIG.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
DIVERTED af/acre	0.83	2.57	2.73	2.05	2.33	2.33	2.44	2.97	2.10	1.91
DELIVERED af/acre	0.06	0.94	1.05	0.61	0.86	0.86	0.93	1.19	0.84	0.96
EFFICIENCY	7%	36%	39%	30%	37%	37%	38%	40%	40%	50%

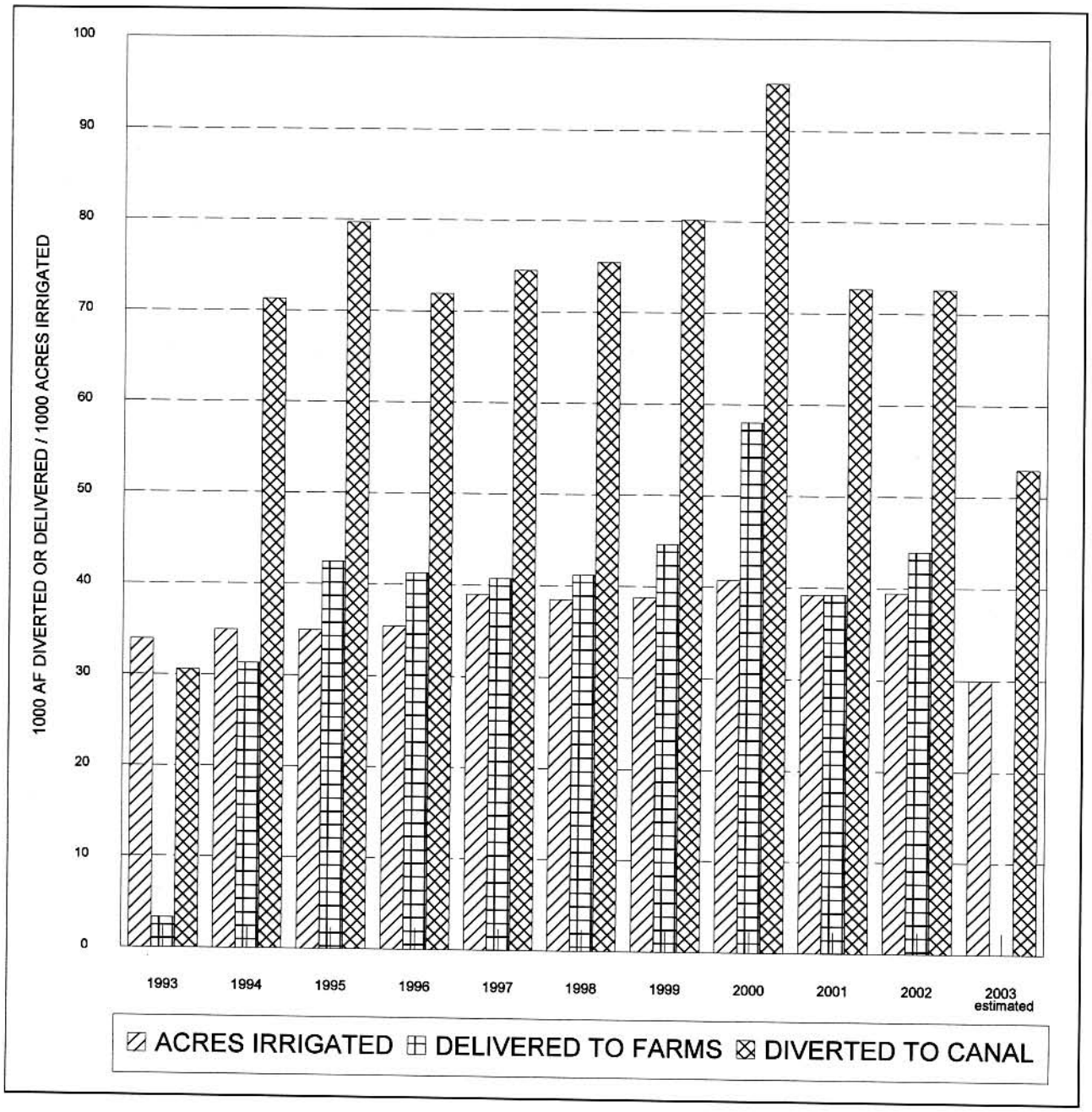
FORECASTED SHORTAGES (2003)

DRY YEAR	36,300 AF
NORMAL YEAR	0 AF

EXHIBIT 28

KANSAS-BOSTWICK IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
DIVERTED af/acre	0.90	2.04	2.28	2.03	1.91	1.96	2.07	2.33	1.86	1.84
DELIVERED af/acre	0.10	0.90	1.22	1.16	1.04	1.07	1.15	1.42	1.00	1.11
EFFICIENCY	11%	44%	53%	57%	55%	55%	56%	61%	54%	61%

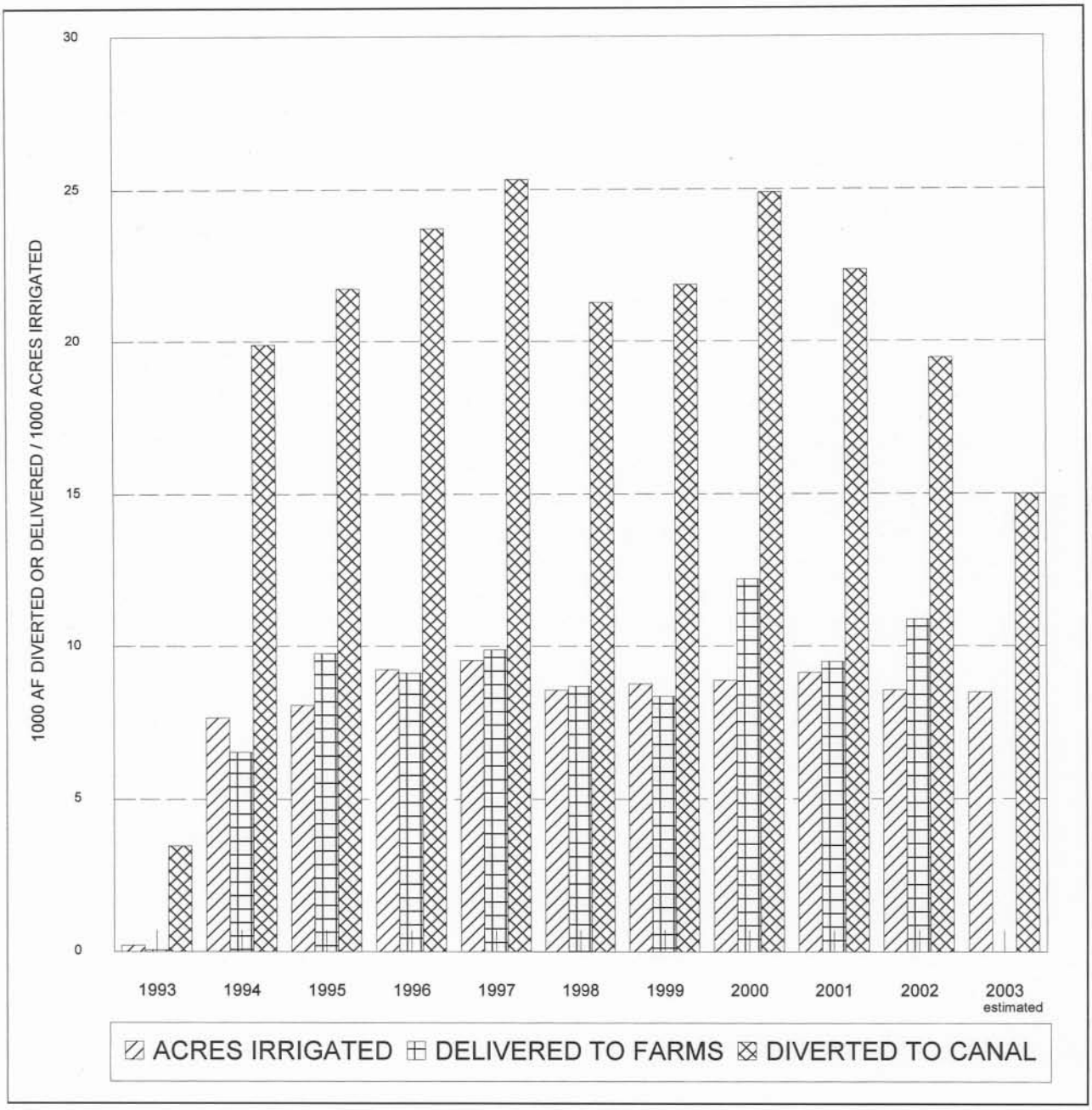
FORECASTED SHORTAGES (2003)

DRY YEAR	45,300 AF
NORMAL YEAR	0 AF

EXHIBIT 29

KIRWIN IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
DIVERTED af/acre	0.00	2.59	2.69	2.56	2.65	2.48	2.49	2.80	2.44	2.27
DELIVERED af/acre	0.26	0.85	1.21	0.99	1.04	1.01	0.95	1.37	1.04	1.27
EFFICIENCY	2%	33%	45%	39%	39%	41%	38%	49%	43%	56%

FORECASTED SHORTAGES (2003)

DRY YEAR	3,200 AF
NORMAL YEAR	0 AF