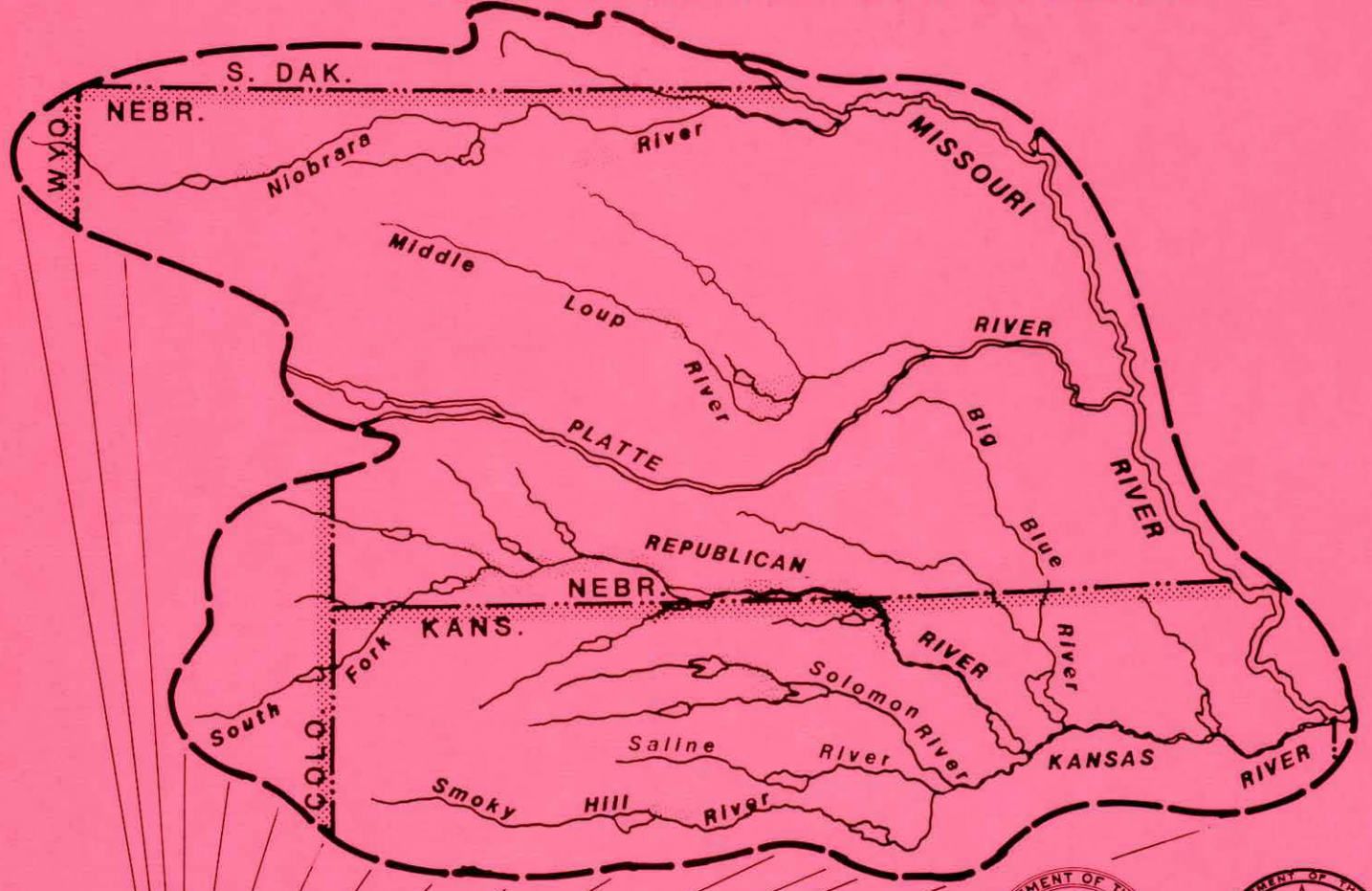
ANNUAL OPERATING PLANS

CALENDAR YEARS
1991-1992

NIOBRARA, LOWER PLATTE, AND KANSAS RIVER BASINS



U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
GREAT PLAINS REGION

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BILLINGS, MONTANA

ANNUAL OPERATING PLANS

NIOBRARA, LOWER PLATTE, AND KANSAS RIVER BASINS

CALENDAR YEAR--1991-1992
OPERATIONS

CALENDAR YEAR--1991-1992
OUTLOOK

CONTENTS

LIST OF TABLES (all following page 27)

LIST OF EXHIBITS (all following Table 6)

Name of Reservoir	Historical Operation	1991 Actual Operation	1992 Operation Plan
Box Butte Reservoir	1A	1B	1C
Merritt Reservoir	2A	2B	2C
Sherman Reservoir	3A	3B	3C
Calamus Reservoir	4A	4B	4C
Bonny Reservoir	5A	5B	5C
Enders Reservoir	6A	6B	6C
Swanson Lake	7A	7B	7C
Hugh Butler Lake	8A	8B	8C
Harry Strunk Lake	9A	9B	9C
Keith Sebelius Lake	10A	10B	10C
Harlan County Lake	11A	11B	11C
Lovewell Reservoir	12A	12B	12C
Kirwin Reservoir	13A	13B	13C
Webster Reservoir	14A	14B	14C
Waconda Lake	15A	15B	15C
Cedar Bluff Reservoir	16A	16B	16C

Canal Diversions and Acres Irrigated

17 - Mirage Flats Irrigation District
18 - Ainsworth Irrigation District
19 - Sargent Irrigation District
20 - Farwell Irrigation District
21 - Twin Loups Irrigation District
22 - Frenchman Valley Irrigation District
23 - H&RW Irrigation District
24 - Frenchman-Cambridge Irrigation District
25 - Almena Irrigation District
26 - Bostwick Irrigation District in Nebraska
27 - Kansas-Bostwick Irrigation District
28 - Kirwin Irrigation District
29 - Webster Irrigation District
30 - Cedar Bluff Irrigation District

Map - Irrigation and Flood Control Facilities

SYNOPSIS

General

This year is the 39th consecutive year that an Annual Operating Plan (AOP) has been prepared for the Federally owned dams and reservoirs serving an irrigation function in the Niobrara, Lower Platte, and Kansas River Basins. The plan has been developed by the Water Control Field Branch, McCook, Nebraska for the 17 dams and reservoirs that are located in Colorado, Nebraska, and Kansas. These reservoirs, together with 10 diversion dams, 11 pumping plants, and 25 canal systems, serve approximately 307,500 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 in the appendix of this report shows the location of these features. Davis Creek Dam, a feature of the North Loup Division, was completed in December of 1990. The initial filling of Davis Creek Reservoir is scheduled to be completed in the spring of 1993.

The reservoirs in the Niobrara and Lower Platte River Basins are operated by either irrigation or reclamation districts, and the reservoirs in the Kansas River Basin are operated by either the Bureau of Reclamation (Reclamation), or the Corps of Engineers. Virginia Smith and Davis Creek Dams are operated and maintained by the Twin Loups Reclamation District under an agreement with Reclamation. 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 Programmable Master-Station Supervisory Control System 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.

The Headlines 91 that follows this synopsis is indicative of the awareness of the local people of the natural resource development and conservation in the Niobrara, Lower Platte, and Kansas River Basins.

1991 Summary

Climatic Conditions

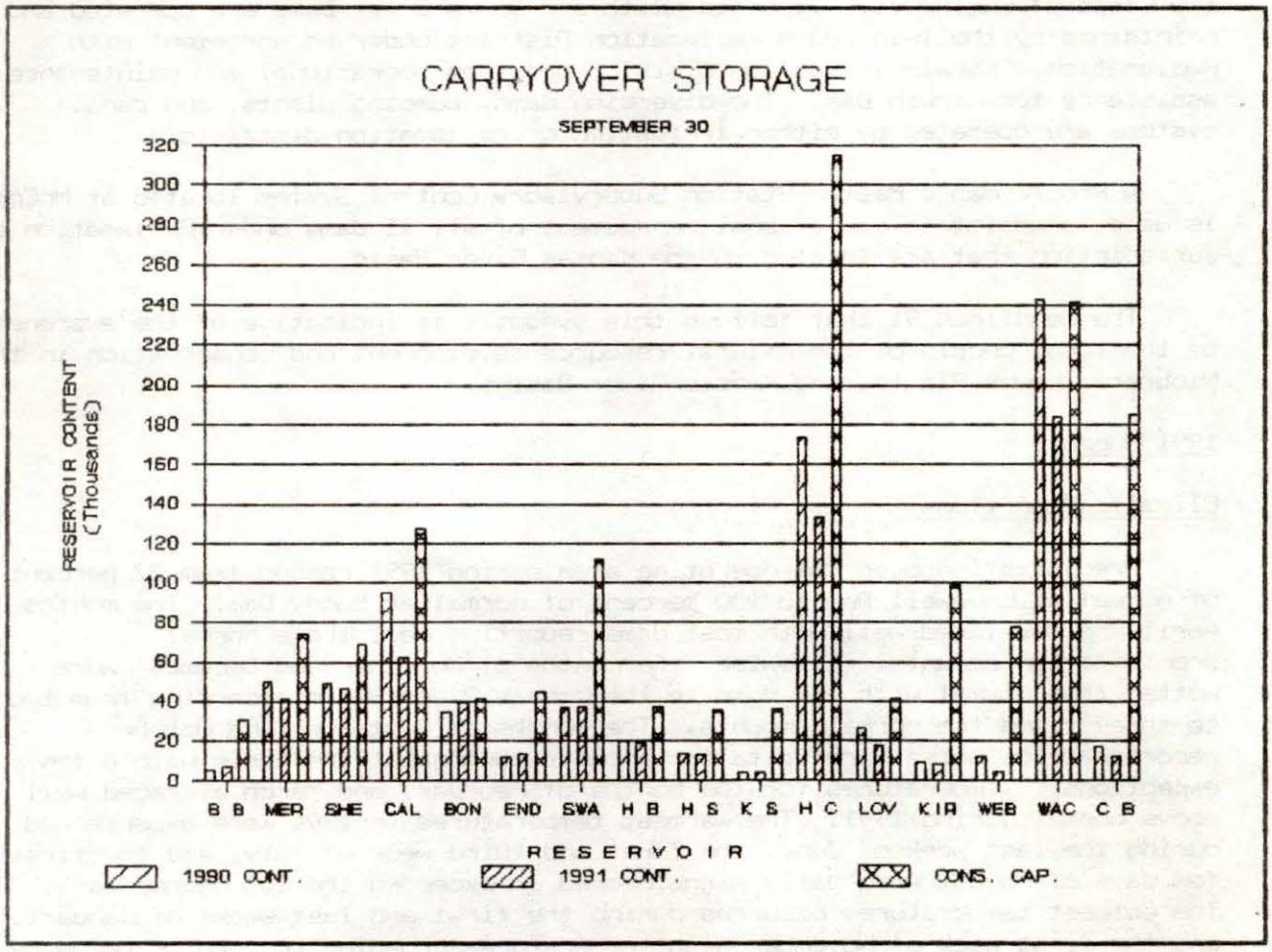
Precipitation over the operating area during 1991 ranged from 77 percent of normal at Lovewell Dam to 150 percent of normal at Bonny Dam. The months of April and May fared well with most dams reporting well above normal precipitation amounts. Likewise, the months of November and December were wetter than normal with all dams in the Kansas River Basin recording from two to three times the normal amounts. The months of September and October recorded below normal precipitation amounts throughout the basin with a few exceptions. Temperatures for the months of February and March averaged well above normal during 1991. The warmest temperatures in 1991 were experienced during the last week of June, the first and third week of July, and the first few days of August when daily highs neared or exceeded the 100 degree mark. The coldest temperatures occurred during the first and last weeks of January, and the first week of November with temperatures dropping to zero or below over much of the projects area. The planting of crops was that of a typical year and fall harvest conditions were excellent.

Storage Reservoirs

1. Conservation Operations. The 1991 inflows were below the dry-year forecast at Enders Reservoir and Harlan County Lake. Swanson, Hugh Butler, Harry Strunk, Keith Sebelius and Waconda Lakes and Lovewell, Kirwin, Webster, and Cedar Bluff Reservoirs had inflows between the dry- and normal-year forecasts. Bonny, Box Butte, Sherman, Merritt, and Calamus Reservoirs had inflows between the normal- and wet-year forecasts.

Carryover storage in the Nebraska-Kansas Projects reservoirs at the end of September was approximately 150,000 acre-feet (AF) less than it was in 1990. Several reservoirs were at or near an historical low in reservoir storage at the end of September. Storage in Harlan County Lake and Cedar Bluff Reservoir were at historical lows. Lovewell and Kirwin Reservoirs recorded their lowest end of September storage since initial filling. Hugh Butler Lake and Webster Reservoir were at their second lowest end of September storage since initial filling. The Republican River Basin reservoir storage was at its lowest level since 1954, and the combined reservoir storage in the Kansas River Basin was at its lowest level since 1956.

The following summarized graph shows a comparison of 1990 and 1991 carryover storage and total conservation storage for all reservoirs in the Niobrara, Lower Platte, and Kansas River Basins.



2. Flood Control Operations. The total 1991 flood control benefits accrued by the operation of the Nebraska-Kansas Projects dams was $31,000. The accumulative total of flood control benefits for the years 1951 through 1991 by facilities in this report total $76,840,000 (see table 5). To date no benefits have been accrued by the operation of Box Butte, Merritt, Sherman, or Virginia Smith Dams.

Water Service

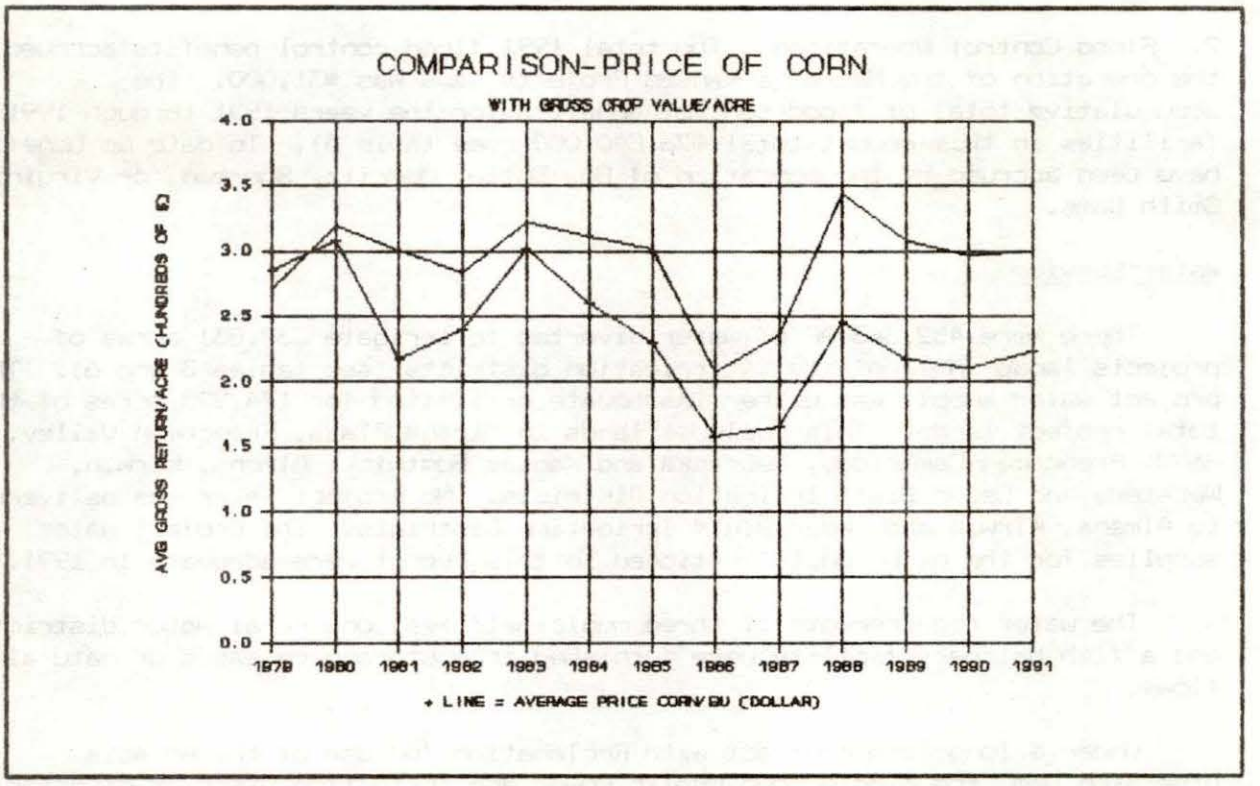
There were 452,343 AF of water diverted to irrigate 237,831 acres of projects lands in 11 of the 14 irrigation districts (see tables 3 and 6). The project water supply was either inadequate or limited for 174,925 acres of the total project lands. This includes lands in Mirage Flats, Frenchman Valley, H&RW, Frenchman-Cambridge, Nebraska and Kansas Bostwick, Almena, Kirwin, Webster, and Cedar Bluff Irrigation Districts. No project water was delivered to Almena, Kirwin and Cedar Bluff Irrigation Districts. The project water supplies for the other units mentioned in this report were adequate in 1991.

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

Under a long-term contract with Reclamation for use of the Arcadia Diversion Dam, the Middle Loup Public Power and Irrigation District diverted 39,865 AF to irrigate 14,319 acres of non-project lands. These diversions were made under natural-flow water rights granted by the state of Nebraska.

Irrigation Production

The 1991 crop yields from lands receiving project water were lower than 1990 for all districts except Sargent, Farwell, and Webster. Corn, the principal crop, decreased from an average of 138 bushels per acre to 135 bushels per acre. The unit price for corn was slightly higher than in 1990 while the unit price for soybeans was slightly lower than 1990. The total gross crop value for districts receiving project water was $71,230,253. The average gross crop value per acre increased from $296.26 to $299.50 during 1991. The graph on the following page compares corn prices with the gross crop value per acre.



The following summary shows the comparison of corn yields for each irrigation district.

Irrigation District	Corn Yield (bu/acre) 1990	1991	Percent Change
Mirage Flats	133	125	-6.0
Ainsworth	144	141	-2.1
Sargent	130	132	+1.5
Farwell	132	137	+3.8
Twin Loups	136	134	-1.5
Frenchman Valley	154	144	-6.5
H&RW	139	138	-0.7
Frenchman-Cambridge	145	142	-2.1
Almena	155	*	---
Bostwick in Nebraska	141	135	-4.3
Kansas-Bostwick	139	111	-20.1
Kirwin	133	*	---
Webster	113	145	+28.3
Cedar Bluff	*	*	---
Average of Districts Reporting	138	135	-2.2

*No project water supplied; not included in averages.

Fish and Wildlife and Recreation Benefits

The National Recreational Fisheries Policy declares that the Governments vested with stewardship responsibilities must work in concert with the state managing agencies 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 area. These guidelines outline a program which considers public use, fisheries, fish habitat, and improved communication and coordination. The Nebraska-Kansas Projects Office conducts yearly meetings 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 1991 season, normal reservoir operations were favorable for recreation and fish and wildlife uses. Late in the season, irrigation operations lowered reservoir levels at some reservoirs, thereby limiting the recreation benefits.

1992 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, sheet 1 through 16.

Under reasonable minimum inflow forecast conditions, irrigation districts receiving storage water from the following reservoirs are expected to receive less than a full supply: Box Butte, Sherman, Enders, Swanson, Hugh Butler, Harry Strunk, Keith Sebelius, Harlan County, Lovewell, Kirwin, Webster and Cedar Bluff. The irrigation districts affected are Mirage Flats; Sargent and Farwell; Frenchman Valley and H&RW; Frenchman-Cambridge; Almena; Nebraska and Kansas Bostwick; Kirwin and Webster; and Cedar Bluff, respectively. If 1992 is a dry year, 197,200 of the total 257,200 acres estimated to be irrigated (77 percent) will have an inadequate water supply.

Under most probable inflow conditions, it is also expected that Almena, Frenchman Valley, H&RW, Kirwin, Webster, Cedar Bluff, Mirage Flats, Sargent, and Farwell Irrigation Districts would experience some shortages to irrigation demands from Keith Sebelius Lake and Enders, Kirwin, Webster, Cedar Bluff, Box Butte, and Sherman Reservoirs. Irrigators in several districts (Mirage Flats, Kirwin, Webster, Almena, Frenchman Valley, and H&RW) plan to use water from private wells to supplement the project water supply. The municipal and rural water district water supply requirements will be met under all three inflow forecast conditions for all units except Cedar Bluff. Under a share-shortage procedure adopted for the extremely low storage conditions presently occurring at Cedar Bluff, the city of Russell could experience shortages in dry-year inflow forecast conditions.

During 1992, under all inflow forecast conditions, storage water will be in excess of project needs at Bonny Reservoir. The state of Colorado will make Bonny storage water available to downstream water right appropriators. Reclamation will sign a long term contract with the Glen Elder Irrigation District prior to the 1992 irrigation season for Waconda Lake storage water.

Even under reasonable minimum inflow conditions, the conservation pools at Merritt, Sherman, Calamus, Bonny and Lovewell Reservoirs would fill during 1992. Harry Strunk Lake will fill under most probable inflow conditions.

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 '91

Calamus state-of-the-art hatchery to be dedicated

Irrigators dig for answers

Harlan Dam riprap plan might jeopardize flows

Republican Valley Group Forms To Guard Water, Land Rights

Irrigation well registrations up

■ State has more than 1,000 new well registrations despite recession talk

Best in Four Years

Fishing at Swanson Still Tops in State

Harlan users looking for compromise

Irrigation may change Harlan reservoir forever

Increased precipitation helps recharge area lakes

By ROBERT PORE
Regional Editor

Reservoirs too low for usual irrigating

Irrigation district shuts off water

Resources District votes for cloud seeding study

By ROBERT PORE
Regional Editor

Water rules may change

Declining groundwater may mean more restrictions

By Robert Pore
Regional Editor

Nebraskan Defends Irrigation Subsidies

By Paul Goodsell

Farmers and government go head-to-head over wetlands

Rep River water users may face meter mandate

Corps: Reservoir level will be lowered

Recent rains haven't helped southwest reservoir woes

Rains soak Golden Plains

Low-water conditions at reservoirs prompt warning to state irrigators

Farwell Irrigation District buries pipes to save water

Lakes get 'temporary relief'

McCOOK DAILY GAZETTE

Governor to give address for Calamus dedication

Cooperation Urged On Reservoir Woes

Protection area declared

By ROBERT PORE
Regional Editor

Deal made to lower Harlan

■ Kansas congressional delegation goes to bat for farmers

"... we need public support and we are open for any suggestions that will make this plan work."

-- Jerry Vap, NRD president

Lawsuit filed over water release from Harlan County Reservoir

Merritt Reservoir at lowest level since '80

Harlan County Reservoir irrigation season is over

All water sources should be guarded

■ Natural Resources Committee hears comments on LR145

Water Battle Grows Heated At Reservoir

By Henry J. Cordes

Purpose of This Report

This AOP advises water users, cooperating agencies, and other interested groups or persons of the actual operations during 1991 and serves as a guideline for the 1992 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 area. 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. 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, and Sherman Dams and Reservoirs. Under a contract with Reclamation, the Twin Loups Reclamation District will operate and maintain Virginia Smith and Davis Creek Dams during 1992. The Corps of Engineers operates and maintains Harlan County Dam and Lake. The state of Colorado provides operational guidelines for Bonny Reservoir. 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.

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 and the larger portion of the Kirwin Reservoir lands.

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 in the appendix.

Water Supply

For forecasting purposes, values of annual inflows that will be statistically equalled 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 1965 through 1990 were used for the analysis of those reservoirs in the Kansas River Basin with the exception of Harlan County Lake in which records from 1976 through 1990 were used to better represent present inflows. Inflow records from 1967 through 1990 were used for the analysis of the reservoirs located in the Niobrara and Lower Platte Basins, except for Calamus Reservoir where the more recent record of 1986 through 1990 was used.

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 carryover 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 a part of the Pick-Sloan Missouri Basin Program and include 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 Sherman Dam in the Lower Platte River Basin. Under a contract with Reclamation, the Twin Loups Reclamation District will operate and maintain Virginia Smith and Davis Creek Dams during 1992. Following completion of the North Loup Project distribution works the responsibility for the operation and maintenance of Virginia Smith Dam and Davis Creek Dam will be transferred to the 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

Fourteen irrigation districts and two reclamation districts in the Niobrara, Lower Platte, and Kansas River Basins have contracted with Reclamation for water supply and irrigation facilities. In addition, Glen Elder Irrigation District will sign a contract with Reclamation prior to the 1992 irrigation season for a water supply from Waconda Lake. The Sargent and Farwell Irrigation Districts have contracted their O&M responsibilities to the Loup Basin Reclamation District. The Twin Loups Irrigation District has contracted their O&M responsibilities to the Twin Loups Reclamation District.

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

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. Construction of the Calamus Fish Hatchery was completed in 1991 with dedication of the hatchery on September 28, 1991. The fish hatchery is now in operation with the first fish produced during the summer and stocked in Calamus Reservoir.

State of Colorado Division of Wildlife

The 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.

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 1992 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 reservoirs in the Kansas River Basin, Merritt and Box Butte Reservoirs in the Niobrara River Basin, and Sherman, Calamus and Davis Creek Reservoirs in the Lower Platte River Basin. The regulated outflow will also benefit farmers, ranchers, cities, and other interests below the reservoirs.

Mirage Flats Project in Nebraska

General

The flow of the Niobrara River and Box Butte Reservoir storage provide a water supply for the 11,662-acre Mirage Flats Project. From 1982 to 1991, the project water supply averaged 14,432 AF, which is about 1.24 acre-foot per irrigable acre. This amount is 1.08 acre-foot per acre short of the average diversion requirement of 2.32 AF per acre. The March 1965 report on the project estimated this amount to be necessary for a full water supply. Many irrigators supplement their water supply by private wells.

The Mirage Flats Irrigation District cooperates with the Nebraska Game and Parks Commission by operating the Box Butte Dam outlet works gates and the Dunlap Diversion Dam gates in a manner to avoid sudden large changes in the flows of the Niobrara River. An agreement has been made between the district and the Nebraska Game and Parks Commission whereby the district will not draw the reservoir water level below elevation 3978.00 feet. In return the district received an upfront payment which is being used to improve the efficiency of the project's delivery system.

1991 Summary

The flows of the Niobrara River plus the carryover storage in Box Butte Reservoir were not adequate to provide a full water supply for the project lands. The total precipitation in the Mirage Flats area was 18.46 inches, which is 117 percent of normal. The total inflow (21,275 AF) was between the normal- and wet-year forecasts.

The above normal inflow during 1991 can be attributed to an early May storm system. On May 9th a storm produced as much as 7 inches of rain in some areas of extreme northwest Nebraska. The White River flooded as a result of this storm causing extensive damage to the town of Crawford and the surrounding area. May inflow to Box Butte Reservoir was approximately three times the average and the highest recorded since initial reservoir filling.

From July through August, diversions of 13,333 AF to the Mirage Flats Canal provided irrigation water for 10,496 acres, 90 percent of the service available acreage. The farm deliveries from the project water supply were 5,841 AF (0.50 acre-foot per irrigable acre), which is a delivery efficiency of 44 percent. The reservoir contained only 5,925 AF of water at the end of the irrigation season. Privately owned irrigation wells supplemented the project water supply. The gross crop value was $2,503,915 which is $291,652 less than the 1990 value.

1992 Outlook

The project water supply is expected to be inadequate in 1992 like it has been since the early 1960's. In the spring, the district will announce to their water users the amount of water that will be available from storage in Box Butte Reservoir. However, the district plans for the irrigators to continue the use of water from privately owned irrigation wells as a supplemental supply. In 1992, 11,000 acres are expected to be irrigated.

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 2 feet below the top of conservation capacity. The reservoir is regulated to maintain this level until the ice clears each spring. Upon ice-out the outlet pipe is drained, inspected, and repaired as necessary. The reservoir will then be rapidly filled to elevation 2945.00 feet to reduce shoreline erosion around the reservoir and minimize sand accumulations on the dam. This reservoir level is maintained until May at which time the reservoir is slowly filled. A minimum release of 75 cubic feet per second (cfs) will 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 basic water supply for the district is 63,712 AF. If available, additional water can be purchased by the district as a supplemental supply.

1991 Summary

Precipitation, as recorded near Merritt Dam, totaled 19.93 inches of rainfall, which was 103 percent of normal. The water supply was more than adequate to meet the project's irrigation requirement. There were 75,012 AF diverted from Merritt Reservoir into the Ainsworth Canal, with 52,252 AF delivered to the farm headgates (delivery efficiency of 70 percent). There were 33,400 acres of land irrigated in 1991. The gross crop value was $12,831,783, which is $547,921 more than the previous year.

The district executed several temporary water service contracts which provided a total of 263 AF of irrigation water from holding ponds located within the district's service area.

1992 Outlook

In 1991-92 winter months and future years, the reservoir will be regulated to maintain elevation 2944.0 feet (2.0 feet below the top of conservation capacity). This elevation is within the repaired area of soil cement on the upstream face of the dam. Holding the reservoir at this elevation during the winter will help avoid ice damage to the older existing soil cement at lower elevations.

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 in two stages during the spring months. As is the normal practice after ice-out in the spring, the outlet pipe will be drained, inspected, and repaired as necessary. Once inspections and repairs have been made the reservoir will be rapidly filled to elevation 2945.00 feet. A minimum river release of 75 cfs will be made during this filling operation. The reservoir level will be maintained

through the end of April and then slowly filled to the top of conservation pool by late May. 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 1992 for the irrigation of 34,000 acres.

Sargent Unit, Middle Loup Division in Nebraska

General

The Sargent Irrigation District has contracted with the Loup Basin Reclamation District for the O&M of the Milburn Diversion Dam and the Sargent Canal system which serves 13,922 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.

1991 Summary

The precipitation over the Sargent Unit (20.84 inches at district headquarters) was 89 percent of normal. The irrigation diversions into the Sargent Canal totaled 27,470 AF (18,525 AF were delivered to the farm headgates--delivery efficiency 67 percent). The diversions exceeded the direct-flow water right for 25 days. There were 13,189 acres irrigated, and the gross crop value totaled $3,499,626, which is $287,880 more than in 1990. The irrigators grow corn as the principal crop, creating very high water demands in July and August. The demands cannot be met within canal capacity, so the district institutes a rationing process through the peak period, when necessary.

1992 Outlook

The Loup Basin Reclamation District estimates that 13,000 acres in the Sargent Unit will be irrigated in 1992. Under normal- and dry-year conditions, some shortages could occur. The Farwell and Sargent Irrigation Districts are required to share shortages in accordance with their contract.

Farwell Unit, Middle Loup Division in Nebraska

General

The Loup Basin Reclamation 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 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 5 feet or more below the top of the conservation capacity. Doing so minimizes seepage from the reservoir into the groundwater table. Maintenance of 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.

Whenever the flows in the Middle Loup River at Arcadia, Nebraska, exceed 6,000 cfs, flows will be diverted through Sherman Feeder Canal into Sherman Reservoir. Flood control benefits can be accrued to Sherman Reservoir by such operations.

1991 Summary

The diversions from the Middle Loup River at Arcadia Diversion Dam were 39,865 AF to the Middle Loup Public Power and Irrigation District and 114,889 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 1,093 AF and the losses charged as a result of these deliveries totaled 109 AF.

Sherman Feeder Canal diversions into Sherman Reservoir were started on April 15th, and the conservation capacity was filled on May 30th. The precipitation at Sherman Dam was 22.39 inches, which is 101 percent of normal. Releases into the Farwell Canals totaled 84,828 AF (50,864 AF were delivered to the farm headgates--delivery efficiency 60 percent). The Farwell Irrigation District reported that 46,942 acres of land were irrigated in 1991. The gross crop value was $13,809,615, which is $1,404,053 more than in 1990. Sherman Feeder Canal was shut off October 10th.

Under an ongoing program the Farwell Irrigation District has installed a total of about 125 miles of pipe to replace open laterals.

1992 Outlook

Diversions from the Middle Loup River into the Sherman Feeder Canal are expected to start in the spring for the normal filling of the conservation capacity of Sherman Reservoir prior to the irrigation season.

Under normal- and dry-year inflow conditions, irrigation shortages are expected in 1992. These shortages are attributable to large irrigation requirements for corn production during the months of July and August. Farwell and Sargent Irrigation Districts are required to share shortages in accordance with their contract.

North Loup Division in Nebraska

General

The North Loup Division is located in the Loup River drainage basin. When completed, water will be diverted from the Calamus and North Loup Rivers. The plan provides for direct surface water service to 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 will include Virginia Smith Dam and Calamus Reservoir, Kent Diversion Dam, Davis Creek Dam and Reservoir, five principal canals, one major and one small pumping plant and numerous laterals.

Calamus Reservoir is normally regulated at 3 to 4 feet below the top of conservation capacity during the winter months. Holding 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. North Loup Division project operation is restricted to no water diversion from the Calamus and the North Loup Rivers during the months of July and August each year; and during the month of September each year whenever sufficient water is available in storage reservoirs to deliver to the canals their design capacity. Inflows to the 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 during this time.

Initial filling of Davis Creek Reservoir continues and the reservoir is scheduled to be at full pool (top of active conservation) in the spring of 1993. Irrigation releases from Davis Creek Dam are not anticipated until 1993; however, some water may be released during late summer depending on canal construction progress and water demands.

1991 Summary

Precipitation at Virginia Smith Dam was 25.63 inches which is 113 percent of normal. The inflow was 239,984 AF which was between the normal- and wet-year forecasts. There were 53,672 AF diverted from Calamus Reservoir into the Mirdan Canal, with 24,448 AF delivered to the farm headgates. Land irrigated in 1991 totaled 19,098 acres. The gross crop value was $5,422,984 which is $825,777 more than the 1990 value. As required, bypasses of the inflows were made during July, August, and September. The Calamus Fish Hatchery used approximately 3,840 AF from Calamus Reservoir during 1991.

Filling of Davis Creek Reservoir was initiated in late April, and construction of the first section of Fullerton Canal was nearly complete by late October.

1992 Outlook

Calamus Reservoir will be held at the present elevation of approximately 2240.00 feet until ice-out, at which time the reservoir will be rapidly filled to an elevation of 2243.50 feet (six inches below the top of conservation capacity). 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 about elevation 2240.00 feet.

Water has been declared available to serve all irrigable acres with service from the Mirdan, Geranium and Scotia Canals and Lateral Systems. It is estimated that approximately 21,500 acres will be irrigated from Mirdan, Geranium, and Scotia Canals. Water supplies will be sufficient to meet the full dry-year requirements.

Filling of Davis Creek Reservoir will continue after the surfacing of the relocated county road is completed, the existing county road is abandoned, and the existing culverts under the road are removed by the county. Following this activity, scheduled for August, water can be released from storage in Calamus Reservoir to fill Davis Creek Reservoir as far as possible (possibly elevation 2056 feet). Releases from Virginia Smith Dam will need to be coordinated with the construction of the wave suppressor in the outlet works stilling basin which is scheduled for October through December. Final filling of Davis Creek Reservoir will take place in the spring of 1993. Construction of the Fullerton Canal system below Davis Creek Reservoir will continue in 1992, and construction will begin on the Kent Canal and Diversion Structure.

The fish hatchery has been completed and will be in full operation this year.

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 hunting conditions each fall.

1991 Summary

The 25.12 inches of precipitation during 1991 was 150 percent of normal, which is the highest total recorded at Bonny Dam since records began in 1950. Both the months of July and November recorded record high precipitation amounts. The inflow (21,367 AF) to Bonny Reservoir was between the normal- and wet-year forecasts. A storm system that moved through the Projects area from July 22nd (pm) to July 24th (am) produced 2.87 inches of precipitation at Bonny Dam with unofficial reports of up to six inches above the dam. Inflow to Bonny Reservoir peaked at approximately 2,200 cfs, increasing the reservoir storage by about 3,800 AF to .67 feet into the flood pool. A river release of 100 cfs from July 30th through August 5th dropped the reservoir from the flood pool.

As directed by the Colorado Water Commissioner, 1,446 AF of reservoir inflows from the South Fork of the Republican River and Landsman Creek were passed through Bonny Reservoir into Hale Ditch. In addition, the Colorado Department of Natural Resources requested storage releases of 442 AF for irrigation purposes into Hale Ditch.

1992 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. The river outlet pipe at Bonny Dam is scheduled for repair sometime between October 1992 and April 1993. Operation of the river outlet works will be impeded during the repair.

Frenchman Unit, Frenchman-Cambridge Division in Nebraska

General

The Culbertson Canal and the Culbertson Extension Canal systems serve 9,600 acres in the Frenchman Valley Irrigation District and 11,490 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.

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.

1991 Summary

The 18.10 inches of precipitation at Enders Dam was 98 percent of normal. The 1991 inflow into Enders Reservoir (18,299 AF) was below the dry-year forecast and an historical low for this site. Due to extensive groundwater pumping above the reservoir, the inflow was only 30 percent of the average historical preconstruction runoff at the Enders Dam site (60,700 AF from 1929-1947). This year was the 24th consecutive year with below-normal inflows in which the conservation pool did not fill. A total of 2,647 AF of water was conserved between the 1990 and 1991 irrigation seasons by pumping seepage back into the reservoir. Irrigation releases began June 26th and were stopped on August 7th.

The farm delivery averaged about 0.48 feet per irrigated acre for the two districts. Some farmers were able to supplement their project water supply from private irrigation wells. The Frenchman Valley Irrigation District reports that 7,970 acres received water in 1991, and the H&RW Irrigation District reports 10,156 acres, which are 83 and 88 percent, respectively, of the lands with service available. The gross crop value for Frenchman Valley Irrigation District was $2,309,494 which is a decrease of $202,589 from the previous year. The gross crop value for the H&RW Irrigation District was $2,931,756, which is a decrease of $4,388 from the previous year.

1992 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 46,000 AF. Most probable inflow conditions are expected to be inadequate by 14,200 AF, to irrigate the 8,000 acres in the Frenchman Valley Irrigation District and 10,000 acres in the H&RW Irrigation District. Approximately 3,000 AF are expected to be conserved by pumping seepage water back into the Enders Reservoir.

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 16,476 acres; Red Willow Canal to 4,932 acres; Bartley Canal to 6,539 acres; and Cambridge Canal to 17,053 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.

1991 Summary

The precipitation of 22.11 inches at Trenton Dam was 112 percent of normal. The inflow of 58,885 AF to Swanson Lake was between the dry- and normal-year forecasts. The reservoir's conservation pool did not fill in 1991, with the maximum water surface elevation of 2742.91 feet reached on June 22nd. At the beginning of the 1991 irrigation season (June 18th), there was 72,009 AF of water stored in Swanson Lake, which is 40,205 AF below the top of conservation capacity. This storage, along with inflows and river pickup flows was sufficient in furnishing a limited 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 25,903 AF into Meeker-Driftwood Canal to irrigate 15,588 acres and 8,134 AF into Bartley Canal for 6,229 acres.

The precipitation of 23.49 inches at Red Willow Dam was 120 percent of normal, while the inflow of 16,197 AF into Hugh Butler Lake was between the dry- and normal-year forecasts. The reservoir's maximum water surface elevation for the year was 2575.54 feet, reached on June 13th (6.26 feet below top of conservation). The water supply was adequate to meet the limited supply designated for Red Willow Canal. The district diverted 7,019 AF of water to irrigate 4,749 acres of land served by Red Willow Canal.

The precipitation of 23.08 inches was 113 percent of normal at Medicine Creek Dam, while the inflow of 35,258 AF was between the dry- and normal-year forecasts. The reservoir's conservation pool was filled on May 27th with the maximum water surface elevation for the year of 2367.12 feet reached on June 13th. Spring releases were not required to defer flows from overtopping the uncontrolled spillway until after the walleye spawning period. Early spring releases had been made in cooperation with the Nebraska Game and Parks Commission in four of the previous five years. The water supply was adequate for the limited supply and 25,803 AF of water was diverted to irrigate 16,227 acres of land served by the Cambridge Canal.

The 1991 gross crop value from the lands served by Meeker-Driftwood, Bartley, Red Willow, and Cambridge Canals was $12,888,819 which is $49,375 less than in 1990. The discontinuation of irrigation releases on August 25th was the earliest ever recorded for the Frenchman-Cambridge Irrigation District.

1992 Outlook

Forecasts show that carryover 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. In an effort to conserve water, the District management has elected to provide each irrigable acre with a limited water supply.

It is estimated that 15,600 acres will be served from the Meeker-Driftwood Canal; 16,300 acres will be served from the Cambridge Canal; 4,700 acres will be served from the Red Willow Canal; and 6,200 acres will be served from the Bartley Canal.

Almena Unit, Kanaska Division in Kansas

General

Service is available to 5,763 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.

1991 Summary

The precipitation at Norton Dam was 24.36 inches, which is 102 percent of normal. The total inflow was 2,653 AF, which was between dry- and normal-year forecasts. Due to low water levels, no irrigation releases were made in 1991. Privately owned irrigation wells were utilized for the 21st consecutive year to meet irrigation demands.

The city of Norton used 456 AF of municipal water during 1991.

The maximum content of Keith Sebelius Lake for the year was 5,456 AF, which was reached on June 13, 1991. This maximum content was only 172 AF above the bottom of active storage. By the end of the summer no water remained in the active pool.

1992 Outlook

The district expects to deliver water to 5,100 acres if an adequate water supply is available. If 1992 is a dry year without significant run-off producing storms above Keith Sebelius Lake, it is anticipated that significant irrigation shortages of 19,100 AF would occur. If normal inflow into the lake and normal rainfall over the irrigated area occur in 1992, a shortage of 8,300 AF may be experienced.

Requirements for the city of Norton are expected to be met in full in 1992.

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 22,787 acres in the Bostwick Irrigation District in Nebraska, and 13,550 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 28,338 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 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, 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 5 cfs or zero. 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.

1991 Summary - Bostwick Division - Harlan County Lake Operations

The precipitation at Harlan County Dam totaled 19.33 inches of rainfall, which is 87 percent of normal. The inflow (67,293 AF) was below the dry-year forecast and an historical low at this site. No release was required during January, February, or December in accordance to the environmental assessment and the annual operating plan because of the low reservoir level. The highest water surface elevation for the year was 1937.40 feet which was reached on June 17th (8.60 feet below the top of conservation). At the end of irrigation season (August 23rd) 139,118 AF of storage remained in Harlan County Lake.

Early in 1991 the Corps of Engineers (Corps) designated a minimum water level elevation of 1931.0 feet for Harlan County Lake. This restriction was invoked to protect the upstream face of the dam since the riprap only extended down to elevation 1928.0. In late July, crops became seriously stressed from below normal rainfall and 100 degree heat. Using emergency authorities, Reclamation and the Corps signed an Interagency Agreement to transfer up to $3.5 million of funds to the Corps for extending the riprap to a lower elevation on the face of the dam. Because of the emergency, work on the environmental aspects of the riprap project could be accelerated and

construction started in the fall. This allowed the Corps to revise the drawdown level to elevation 1929.0 feet. Placing of the riprap began in the fall and is ongoing.

Harlan County Lake recorded an historical low reservoir level since initial filling of 1928.22 feet on October 27th.

The 26,380 irrigated acres of the Bostwick District in Nebraska and the Kansas-Bostwick District above Lovewell Dam could not be furnished a full water supply so the irrigators operated with a limited supply. A total of 32,081 AF (approximately 78 percent of total inflow) was delivered to Lovewell Reservoir through the Courtland Canal.

1991 Summary - Bostwick Division - Nebraska

The Bostwick Irrigation District in Nebraska diverted 39,993 AF for the irrigation of 18,700 acres. Irrigators operated with a limited supply as a full water supply could not be delivered to these acreages. The gross crop value was $5,836,745, which is $206,060 less than in 1990.

Irrigation releases from Harlan County Dam were discontinued on August 22nd. This was the earliest shut off date on record.

1991 Summary - Bostwick Division - Kansas

The 1991 precipitation at Lovewell Dam totaled 21.25 inches, which was 77 percent of normal. The reservoir's conservation space filled on March 27th. Flood pool storage was utilized because of the limited water supply within the Bostwick Division. The maximum elevation of the water surface was 1585.51 feet, which was reached on June 3rd. Irrigation demands dropped the reservoir from the flood pool on June 29th. Anticipating the possibility of water shortages in 1992, natural flow from the Republican River was diverted into Lovewell Reservoir through Courtland Canal from the end of irrigation season through the end of the year.

The Kansas-Bostwick Irrigation District diverted a total of 64,110 AF to serve 7,680 acres above Lovewell Dam and 23,201 acres below Lovewell Dam. Irrigators operated with a limited supply since a full water supply could not be furnished to these acreages. The gross crop value was $7,712,560, which is $2,687,438 less than the previous year.

The discontinuation of irrigation releases from Lovewell Dam on August 23rd was the earliest ever. Lovewell Reservoir recorded an historical low reservoir level of 1570.20 feet on August 22nd.

1992 Outlook - Bostwick Division

The Bostwick Irrigation District in Nebraska and the Kansas-Bostwick Irrigation District No. 2 expect to deliver water to 18,000 and 25,000 acres, respectively. The Kansas-Bostwick acreage is substantially less than previous years and can be attributed to the anticipation of water shortages and few alternative water sources. The storage in Harlan County Lake and Lovewell Reservoir and flows of the Republican River and White Rock Creek will be inadequate to meet the full dry-year irrigation requirement for the Bostwick

lands. District management will again be operating with a limited water supply to each irrigable acre.

The Corps of Engineers, in conjunction with Reclamation, developed a 1992 operation plan that designated a minimum Harlan County Lake elevation of 1927.0 feet. However, the plan provides for sharing increased inflows among all beneficiaries of the lake should they occur, by both raising the minimum pool elevation and increasing irrigation releases as indicated by the following table.

1927 minimum. Depending on inflow, up to 70,000 AF can be released for irrigation.

1928 minimum if inflows allow 78,000 AF to be released for irrigation.

1929 minimum if inflows allow 85,000 AF to be released for irrigation.

1930 minimum if inflows allow 93,000 AF to be released for irrigation.

1931 minimum if inflows allow 100,000 AF to be released for irrigation.

1932 minimum if inflows allow 108,000 AF to be released for irrigation.

1932.8 minimum if inflows allow 115,000 AF to be released for irrigation.

Inflow to Lovewell Reservoir from the Courtland Canal will continue as necessary to allow for filling the reservoir from natural flow in the Republican River without storage releases from Harlan County Lake. Up to three feet of flood pool storage will be utilized at Lovewell Reservoir prior to the irrigation season. This additional storage will help alleviate the expected irrigation shortages in the Bostwick Division. The lining of a section of Upper Courtland Canal will prevent the diversion of Republican River natural flow into Lovewell Reservoir from September 12th through November 12th.

Kirwin Unit, Solomon Division in Kansas

General

The water supply for the 11,435 acres of land in the Kirwin Irrigation District is furnished by storage from Kirwin Reservoir and inflows from the North Fork of the 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.

1991 Summary

The precipitation totaled 18.88 inches, which was 82 percent of normal. The inflow (3,839 AF) was slightly greater than the dry-year forecast and an historical low for this site. Due to low reservoir conditions no project water was released for irrigation. Irrigators in the district continued to pump water from private wells to enable irrigation of some project lands.

1992 Outlook

The district estimates that 7,000 acres may be irrigated in 1992. Normal precipitation and normal forecasted inflows from the North Fork of the Solomon River would be inadequate to irrigate these lands. A shortage of 2,700 AF may be experienced with normal-year forecasts. Under dry-year forecasts, a shortage of about 18,700 AF may be experienced.

Webster Unit, Solomon Division in Kansas

General

The Webster Irrigation District has service available to 8,500 acres. The project water supply is provided by Webster Reservoir storage and flows of the South Fork of the Solomon River.

1991 Summary

In 1991, the precipitation at Webster Dam was 87 percent of normal (20.03 inches). The inflow of 4,502 AF was slightly greater than the dry-year forecast and an historical low for this site.

The district diverted 4,916 AF for irrigation of 4,206 acres. Irrigators with private wells provided water for part of the project lands as a supplemental supply. The district reported a gross crop value of $1,482,956, which is $504,023 more than the previous year.

1992 Outlook

The carryover storage and the flows in the South Fork of the Solomon River are expected to be inadequate under dry- or normal-year forecasts to irrigate 4,500 acres in the district in 1992. Under dry-year inflows a

shortage of 20,700 AF (total dry-year release requirement) may be experienced. A shortage of 6,200 AF may be experienced with normal-year forecasts.

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 long-term water service contract with Glen Elder Irrigation District, and 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 water 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 use of storage water as available from Waconda Lake. Water usage is not to exceed 1,009 AF per calendar year.

To lessen ice damage to the upstream face of Glen Elder Dam during winter months, releases from Waconda Lake will be regulated each year to maintain a constant water surface level while the lake is ice-covered. This level will be varied from 0 to 5 feet below the top of conservation capacity.

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, drawdowns will be scheduled for late summer and early fall so that exposed shore areas can be seeded. This seeding prevents wind erosion and provides winter food and cover for wildlife and fish with spawning habitat in the spring when these areas are inundated.

1991 Summary

The precipitation at Glen Elder Dam was 80 percent of normal (20.04 inches). The inflow (45,475 AF) was between dry- and normal-year forecasts and the lowest since the dam was completed in 1967. Storage releases of 728 AF were made for the City of Beloit and 4,543 AF was bypassed for quality control as directed by the State Water Commissioner. Other controlled releases were 24,287 AF. This amount includes 5,616 AF purchased by irrigators under temporary contracts. Releases of 737 AF were made to the Mitchell County Rural Water District No. 2.

1992 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 a Kansas Water Commissioner will

request that inflows be passed through the lake for water right administration. It is anticipated that the Glen Elder Irrigation District will sign a long term contract with Reclamation prior to the 1992 irrigation season for Waconda Lake storage water. To minimize ice damage, the reservoir will be regulated to maintain a constant level during the months the reservoir is ice-covered. Waconda Lake will be operated with a stable or slowly rising pool early in the year and refilled with available inflows starting in late spring of 1992. Under normal-year conditions, the lake will be maintained at about three feet below the top of the conservation pool for next winter.

Cedar Bluff Unit, Smoky Hill Division in Kansas

General

Cedar Bluff Reservoir storage and Smoky Hill River flows provide a water supply for the 6,800 acres in the Cedar Bluff Irrigation District. If required Cedar Bluff storage also furnishes a maximum of 2,000 AF each year for the city of Russell, Kansas. No water has been available for delivery to the district since 1978.

Following several years of below-normal inflows, a share-shortage procedure was adopted July 31, 1981. Separate pools were established for each user with inflow, outflow, and evaporation allocated on a monthly basis. Inflow and initial pool allocations were made on the basis of perfected maximum annual usage with the maximum accumulated storage being that allowed by each user's water right.

A memorandum of understanding between Reclamation, Fish and Wildlife Service, the State of Kansas and Cedar Bluff Irrigation District No. 6 concerning the reformulation and operation of the Cedar Bluff Unit was executed on December 17, 1987. Implementation of the memorandum of understanding awaits appropriate legislative action by the Congress.

1991 Summary

The precipitation was 17.85 inches which is 88 percent of normal. The inflow (2,183 AF) was slightly greater than the dry-year forecast and the second lowest on record at this site. This year's high content of 16,052 AF was reached on January 14th and was 19,268 AF below the bottom of active storage. Cedar Bluff Reservoir recorded an historical low reservoir level of 2093.42 feet on October 30th. Due to continuing low water levels, no irrigation releases were made in 1991 (13th consecutive year). The state of Kansas used the fish hatchery facility with 54 AF released to the facility. No releases were made for the city of Russell.

1992 Outlook

The reservoir elevation of 2093.55 feet on December 31, 1991, remains in the inactive pool. Due to pending legislation, no irrigation releases are anticipated during 1992. The Kansas Department of Wildlife and Parks estimates that 400 AF will be used in the operations of the fish hatchery facility during 1992.

TABLE 1
RESERVOIR DATA - NIOBRARA, LOWER PLATTE AND KANSAS RIVER BASINS

RESERVOIR		CAPACITY ALLOCATIONS 1/ DEAD	LIVE CONSERVATION Inactive	LIVE CONSERVATION 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	131	280	32,459	---
	Net Acre-feet	131	149	32,179	---
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	8,467	9,968	44,480	74,520
	Net Acre-feet	8,467	1,501	34,512	30,040
Swanson Lake	- Elevation Ft.	2710.0	2720.0	2752.0	2773.0
	Total Acre-feet	2,118	12,430	112,214	246,291
	Net Acre-feet	2,118	10,312	99,784	134,077
Hugh Butler Lake	- Elevation Ft.	2552.0	2558.0	2581.8	2604.9
	Total Acre-feet	6,313	10,450	37,776	86,627
	Net Acre-feet	6,313	4,137	27,326	48,851
Harry Strunk Lake	- Elevation Ft.	2335.0	2343.0	2366.1	2386.2
	Total Acre-feet	4,160	8,859	35,705	88,420
	Net Acre-feet	4,160	4,699	26,846	52,715
Keith Sebelius Lake	- Elevation Ft.	2275.0	2280.4	2304.3	2331.4
	Total Acre-feet	2,718	5,284	35,935	134,738
	Net Acre-feet	2,718	2,566	30,651	98,803
Harlan County Lake 3/	- Elevation Ft.	1885.0	1927.0	1946.0	1973.5
	Total Acre-feet	0	120,790	315,090	811,808
	Net Acre-feet	0	120,790	194,300	496,718
Lovewell	- Elevation Ft.	1562.0	1571.7	1582.6	1595.3
	Total Acre-feet	5,054	16,760	41,690	92,150
	Net Acre-feet	5,054	11,706	24,930	50,460
Kirwin	- Elevation Ft.	1693.0	1697.0	1729.25	1757.3
	Total Acre-feet	6,385	9,785	99,435	314,550
	Net Acre-feet	6,385	3,400	89,650	215,115
Webster	- Elevation Ft.	1855.5	1860.0	1892.45	1923.7
	Total Acre-feet	2,184	5,300	77,371	260,740
	Net Acre-feet	2,184	3,116	72,071	183,369
Waconda Lake	- Elevation Ft.	1407.8	1428.0	1455.6	1488.3
	Total Acre-feet	1,236	36,671	241,460	963,775
	Net Acre-feet	1,236	35,435	204,789	722,315
Cedar Bluff	- Elevation Ft.	2090.0	2107.8	2144.0	2166.0
	Total Acre-feet	8,261	35,320	185,090	376,950
	Net Acre-feet	8,261	27,059	149,770	191,860
Total Storage (A.F.)		55,355	318,248	1,602,067	3,955,210 2/
Total Net Acre-feet		55,355	262,893	1,283,819	2,353,143

1/ Includes space for sediment storage.
2/ Includes total active storage for Box Butte, Merritt, Sherman, Calamus, and Davis Creek Reservoirs.
3/ Harlan County Lake data revised and placed in use January 1, 1990.

TABLE 2
SUMMARY OF 1991 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)	MIRAGE FLATS CANAL Delivered To Farms (AF)
Jan.	969	46	68	0.08	8,901	0	0
Feb.	1,415	42	91	0.38	10,183	0	0
Mar.	1,610	53	174	0.13	11,566	0	0
Apr.	1,745	50	301	1.61	12,960	0	0
May	4,609	66	390	4.08	17,113	0	0
June	2,589	68	576	4.30	19,058	0	0
July	0	7,829	809	1.91	10,420	7,854	2,696
Aug.	1,638	5,778	355	2.06	5,925	5,479	2,945
Sep.	1,535	52	238	2.25	7,170	0	0
Oct.	1,598	50	187	1.31	8,531	0	0
Nov.	1,905	52	114	0.35	10,270	0	0
Dec.	1,662	60	73	0.00	11,799	0	0
TOTAL	21,275	14,146	3,376	18.46	--	13,333	5,641

NOTE.--Mirage Flats Canal: Acres irrigated 1991 -- 10,496

SANDHILLS DIVISION
AINSWORTH UNIT
MERRITT RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	AINSWORTH CANAL Release To Canal (AF)	AINSWORTH CANAL Delivered To Farms (AF)
Jan.	14,929	14,688	241	0.20	68,831	0	0
Feb.	15,429	15,124	305	0.61	68,831	0	0
Mar.	16,686	12,893	431	2.25	72,193	0	0
Apr.	13,652	10,909	737	1.55	74,199	0	0
May	16,251	14,063	1,312	6.14	75,075	2,082	0
June	15,272	14,965	1,183	2.87	74,199	4,814	762
July	14,640	37,636	1,275	0.99	49,928	34,799	26,399
Aug.	15,121	30,060	824	2.11	34,165	28,121	21,680
Sep.	15,699	7,676	546	0.53	41,642	5,196	3,411
Oct.	16,199	984	611	1.35	56,246	0	0
Nov.	15,435	2,422	428	1.33	68,831	0	0
Dec.	12,004	11,956	319	0.00	68,560	0	0
TOTAL	181,317	173,376	8,212	19.93	--	75,012	52,252

NOTE.--Ainsworth Canal: Acres irrigated 1991 -- 33,400

MIDDLE LOUP DIVISION

Month	SARGENT UNIT SARGENT CANAL Diversions To Canal (AF)	SARGENT UNIT SARGENT CANAL Delivered To Farms (AF)	MIDDLE LOUP UNIT 1/ MIDDLE LOUP PUBLIC POWER CANALS Diversions To Canals (AF)	FARWELL UNIT SHERMAN RESERVOIR Diversions To Sherman Feeder Canal (AF)	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	FARWELL CANALS Release To Canals (AF)	FARWELL CANALS Delivered To Farms (AF)
Jan.	0	0	0	0	627	1,309	252	0.60	49,650	0	0
Feb.	0	0	0	0	913	1,291	311	0.43	48,961	0	0
Mar.	0	0	0	0	928	1,303	544	1.10	48,042	0	0
Apr.	0	0	0	10,031	8,849	1,303	915	3.00	54,673	0	0
May	0	0	2,741	18,634	17,570	1,533	1,345	4.92	69,365	0	0
June	2,795	943	6,690	17,302	15,681	18,157	1,204	3.89	65,685	16,523	3,475
July	13,956	9,665	13,728	14,739	13,620	37,801	1,185	2.63	40,319	36,488	24,891
Aug.	9,281	7,064	13,050	19,532	16,572	32,934	807	0.17	23,150	31,817	22,498
Sep.	1,438	853	3,656	26,273	25,479	992	717	1.33	46,920	0	0
Oct.	0	0	0	8,378	7,615	1,083	730	1.65	52,722	0	0
Nov.	0	0	0	0	521	1,303	409	1.72	51,531	0	0
Dec.	0	0	0	0	595	1,309	233	0.95	50,584	0	0
TOTAL	27,470	18,525	39,865	114,889	108,970	100,318	8,652	22.39	--	84,828	50,864

1/ Non-Project. Includes 1,093 a.f. diverted from Sherman Feeder Canal and 109 a.f. loss.

NOTE.--Sargent Canal: Acres irrigated 1991 -- 13,189

Middle Loup P.P. Canals: Acres irrigated 1991 -- 14,319

Farwell Canals: Acres irrigated 1991 -- 46,942

NORTH LOUP DIVISION
CALAMUS RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	MIRDAN CANAL Release To Canal (AF)	MIRDAN CANAL Delivered To Farms (AF)
Jan.	18,054	16,647	446	0.79	107,784	0	0
Feb.	17,907	17,443	556	0.58	107,692	0	0
Mar.	19,807	10,038	1,011	0.92	116,450	0	0
Apr.	20,620	9,933	1,725	3.89	125,412	1,263	0
May	26,262	22,417	2,266	3.89	126,991	5,111	24
June	23,235	27,398	2,471	2.91	120,357	6,815	1,672
July	17,010	40,403	2,502	0.93	94,462	21,521	11,516
Aug.	18,188	35,933	3,249	1.20	73,468	16,015	9,511
Sep.	19,968	29,345	1,755	5.13	62,336	2,947	1,725
Oct.	19,104	3,263	987	2.53	77,190	0	0
Nov.	20,622	2,150	610	2.24	95,052	0	0
Dec.	19,207	5,391	394	0.62	108,474	0	0
TOTAL	239,984	220,361	17,972	25.63	--	53,672	24,448

NOTE.--Mirdan, Geranium & Scotia Canals: Acres irrigated 1991 -- 19,098

TABLE 2
SUMMARY OF 1991 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.	1.551	461	169	0.20	36.460	0
Feb.	1.360	417	203	0.22	37.200	0
Mar.	1.665	461	310	1.51	38.094	0
Apr.	1.604	446	692	1.64	38.560	0
May	2.264	454	1.000	4.61	39.370	0
June	1.784	375	1.211	4.07	39.568	0
July	5.536	1.365	1.269	5.47	42.470	775
Aug.	1.683	1.884	1.097	2.76	41.172	488
Sep.	34	704	972	0.91	39.530	360
Oct.	601	573	703	0.12	38.855	265
Nov.	1.732	298	369	2.53	39.920	0
Dec.	1.553	307	235	1.08	40.931	0
TOTAL	21.367	7.745	8.230	25.12	--	1.888

TABLE 2
SUMMARY OF 1991 OPERATIONS

FRENCHMAN-CAMBRIDGE DIVISION
FRENCHMAN UNIT

	ENDERS RESERVOIR					CULBERTSON CANAL		CULBERTSON EXT.CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	1,618	63	67	0.09	17,850	0	0	0	0
Feb.	1,494	56	78	0.07	19,210	0	0	0	0
Mar.	1,677	61	153	1.02	20,673	441	0	0	0
Apr.	1,617	60	324	1.95	21,908	3,018	422	0	0
May	2,276	61	461	4.88	23,660	2,202	481	533	0
June	1,308	712	585	1.51	23,671	1,269	827	1,718	0
July	1,420	10,098	487	3.31	14,506	2,701	1,932	6,953	3,074
Aug.	1,327	2,348	438	0.39	13,047	1,341	1,049	1,974	816
Sep.	1,120	67	318	1.76	13,782	0	0	0	0
Oct.	1,205	69	234	1.22	14,684	0	0	0	0
Nov.	1,659	60	143	1.06	16,140	0	0	0	0
Dec.	1,578	61	87	0.84	17,570	0	0	0	0
TOTAL	18,299	13,716	3,375	18.10	--	10,972	4,711	11,178	3,890

NOTE.--Culbertson Canal: Acres irrigated 1991 -- 7,970
Culbertson Extension Canal: Acres irrigated 1991 -- 10,156

FRENCHMAN-CAMBRIDGE DIVISION (Continued)
MEEKER-DRIFTWOOD UNIT

	SWANSON LAKE					MEEKER-DRIFTWOOD		BARTLEY CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release To Canal (AF)	Delivered To Farms (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	2,512	61	204	0.21	42,128	0	0	0	0
Feb.	5,972	56	251	0.02	47,793	0	0	0	0
Mar.	6,657	61	470	1.61	53,919	0	0	0	0
Apr.	7,458	60	952	3.36	60,365	0	0	0	0
May	8,474	61	1,286	5.26	67,492	0	0	0	0
June	7,466	4,187	1,818	2.13	68,953	3,308	825	929	460
July	4,673	20,739	2,027	4.04	50,860	12,812	7,999	4,376	3,166
Aug.	2,575	13,607	1,435	1.01	38,393	9,783	7,274	2,829	2,290
Sep.	45	60	1,117	1.05	37,261	0	0	0	0
Oct.	850	61	736	0.96	37,314	0	0	0	0
Nov.	5,544	60	467	1.51	42,331	0	0	0	0
Dec.	6,659	61	291	0.95	48,638	0	0	0	0
TOTAL	58,885	39,074	11,054	22.11	--	25,903	16,098	8,134	5,916

NOTE.--Meeker-Driftwood Canal: Acres irrigated 1991 -- 15,588
Bartley Canal: Acres irrigated 1991 -- 8,229

FRENCHMAN-CAMBRIDGE DIVISION (Continued)
RED WILLOW UNIT

	HUGH BUTLER LAKE					RED WILLOW 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.	1,065	246	73	0.16	22,692	0	0
Feb.	1,270	222	88	0.29	23,652	0	0
Mar.	1,499	246	164	1.04	24,741	0	0
Apr.	1,796	238	413	3.24	25,886	0	0
May	2,612	246	516	5.87	27,736	0	0
June	1,708	1,486	667	3.97	27,291	926	286
July	1,213	4,046	736	4.21	23,722	3,346	2,505
Aug.	692	4,673	599	0.29	19,142	2,747	2,435
Sep.	672	238	486	0.94	19,090	0	0
Oct.	820	246	347	0.86	19,317	0	0
Nov.	1,483	238	170	1.65	20,392	0	0
Dec.	1,367	246	98	0.97	21,415	0	0
TOTAL	16,197	12,371	4,357	23.49	--	7,019	5,226

NOTE.--Red Willow Canal: Acres irrigated 1991 -- 4,749

FRENCHMAN-CAMBRIDGE DIVISION (Continued)
CAMBRIDGE UNIT

	HARRY STRUNK LAKE					CAMBRIDGE CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	2,351	14	78	0.35	22,490	0	0
Feb.	2,774	17	96	0.57	25,151	0	0
Mar.	3,007	47	190	0.85	27,921	0	0
Apr.	3,345	48	526	3.19	30,692	0	0
May	6,471	77	714	5.29	36,372	0	0
June	3,886	4,566	1,095	3.85	34,597	3,465	1,590
July	1,946	13,006	1,035	1.68	22,502	12,936	9,402
Aug.	2,053	10,466	616	2.36	13,473	9,402	7,210
Sep.	1,803	1,553	459	1.09	13,264	0	0
Oct.	2,016	159	289	0.64	14,832	0	0
Nov.	2,807	31	156	2.17	17,452	0	0
Dec.	2,799	25	88	1.04	20,138	0	0
TOTAL	35,258	30,009	5,342	23.08	--	25,803	18,202

NOTE.--Cambridge Canal: Acres irrigated 1991 -- 16,227

TABLE 2
SUMMARY OF 1991 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.	157	26	32	0.34	4,230	26	0	0
Feb.	190	22	40	0.13	4,358	22	0	0
Mar.	213	27	72	0.60	4,472	27	0	0
Apr.	287	36	217	3.31	4,506	36	0	0
May	603	34	228	5.41	4,847	34	0	0
June	800	55	379	2.52	5,213	55	0	0
July	0	69	443	2.80	4,701	69	0	0
Aug.	29	54	318	2.38	4,358	54	0	0
Sep.	46	46	246	3.21	4,112	46	0	0
Oct.	0	39	179	0.76	3,894	39	0	0
Nov.	196	24	76	2.02	3,990	24	0	0
Dec.	132	24	41	0.90	4,057	24	0	0
TOTAL	2,653	456	2,271	24.36	--	456	0	0

NOTE.--Almena Canal: Due to the shortage of storage water in Keith Sebelius Lake, Almena Canal was not in operation during the 1991 irrigation season.

BOSTWICK DIVISION
FRANKLIN UNIT
HARLAN COUNTY LAKE

Month	Data from Corps of Engineers: 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.	3,174	0	738	0.23	177,075	0	0	0	0
Feb.	8,890	0	555	0.00	185,410	0	0	0	0
Mar.	9,164	0	1,101	0.97	193,473	0	0	0	0
Apr.	8,027	0	1,908	2.66	199,592	0	0	0	0
May	13,783	0	2,664	4.70	210,711	0	0	0	0
June	8,394	10,549	5,046	1.42	203,510	2,065	553	187	93
July	2,866	37,807	6,058	2.15	162,511	11,587	4,729	1,061	560
Aug.	2,041	21,783	5,028	2.69	137,741	7,156	2,266	846	508
Sep.	198	0	4,893	0.94	133,046	0	0	0	0
Oct.	704	0	3,568	0.81	130,182	0	0	0	0
Nov.	4,024	0	1,785	1.85	132,421	0	0	0	0
Dec.	6,028	0	869	0.91	137,580	0	0	0	0
TOTAL	67,293	70,139	34,213	19.33	--	20,808	7,548	2,094	1,161

NOTE.--Franklin Canal: Acres irrigated 1991 - 9,009 Naponee Canal: Acres irrigated 1991 - 1,371

BOSTWICK DIVISION (Continued)
SUPERIOR-COURTLAND UNIT

Month	FRANKLIN PUMP CANAL: Div. To Canal (AF)	FRANKLIN PUMP CANAL: Del. To Farms (AF)	SUPERIOR CANAL: Div. To Canal (AF)	SUPERIOR CANAL: Div. To Farms (AF)	Total Div. (AF)	COURTLAND CANAL - ABOVE LOVEWELL: 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	5,229	0	0	0	0
Apr.	0	0	0	0	6,467	0	0	0	0
May	0	0	0	0	7,557	0	0	0	0
June	499	198	2,365	677	7,529	372	235	5,441	1,677
July	1,419	883	6,554	2,859	15,027	1,059	720	9,878	5,605
Aug.	866	537	3,316	1,093	12,288	641	459	5,531	2,902
Sep.	0	0	0	0	2,922	0	0	0	0
Oct.	0	0	0	0	3,396	0	0	0	0
Nov.	0	0	0	0	4,826	0	0	0	0
Dec.	0	0	0	0	5,849	0	0	0	0
	2,784	1,618	12,235	4,629	71,090	2,072	1,414	20,850	10,184

NOTE.--Franklin Pump Canal:
Acres irrigated 1991 -- 2,014
Superior Canal:
Acres irrigated 1991 -- 5,071

NOTE.--Courtland Canal--Nebraska Use:
Acres irrigated 1991 -- 1,235
Courtland Canal--Kansas Use:
Acres irrigated 1991 -- 7,680

BOSTWICK DIVISION (Continued)
COURTLAND UNIT
LOVEWELL RESERVOIR

Month	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.	361	6	155	0.39	37,630	0	0
Feb.	427	11	196	0.02	37,850	0	0
Mar.	4,796	12	374	2.43	42,260	0	0
Apr.	4,928	18	700	1.80	46,470	0	0
May	6,054	911	923	5.00	50,690	867	0
June	1,043	9,695	1,498	2.26	40,540	10,772	4,726
July	4,717	22,128	1,399	2.04	21,730	22,348	12,803
Aug.	5,309	10,067	732	1.84	16,240	9,273	4,639
Sep.	1,880	18	562	1.11	17,540	0	0
Oct.	2,476	12	464	0.72	19,540	0	0
Nov.	4,228	12	296	2.15	23,460	0	0
Dec.	4,724	6	158	1.49	28,020	0	0
TOTAL	40,943	42,896	7,457	21.25	--	43,260	22,168

NOTE.--Courtland Canal below Lovewell: Acres irrigated 1991 -- 23,201

TABLE 2
SUMMARY OF 1991 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.	86	0	57	0.19	8,773	0	0
Feb.	368	0	79	0.00	9,062	0	0
Mar.	628	0	135	1.79	9,555	0	0
Apr.	601	0	351	2.11	9,805	0	0
May	1,208	0	404	3.42	10,609	0	0
June	271	0	668	1.07	10,212	0	0
July	30	0	747	1.13	9,495	0	0
Aug.	301	0	535	4.59	9,261	0	0
Sep.	0	0	517	0.59	8,744	0	0
Oct.	0	0	366	0.53	8,378	0	0
Nov.	227	0	141	2.11	8,464	0	0
Dec.	119	0	74	1.35	8,509	0	0
TOTAL	3,839	0	4,074	18.88	--	0	0

NOTE.--Kirwin Canal: Due to the shortage of storage water in Kirwin Reservoir, Kirwin Canal was not in operation during the 1991 irrigation season.

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.	78	0	92	0.19	11,979	0	0
Feb.	482	0	115	0.00	12,346	0	0
Mar.	8	0	203	1.26	12,151	0	0
Apr.	268	0	455	2.11	11,964	0	0
May	1,662	0	537	5.40	13,089	0	0
June	980	377	814	1.77	12,878	0	0
July	0	7,148	757	1.56	4,973	4,812	1,926
Aug.	163	119	436	2.64	4,581	104	28
Sep.	324	0	357	0.99	4,548	0	0
Oct.	0	0	292	0.66	4,256	0	0
Nov.	332	0	131	2.06	4,457	0	0
Dec.	205	0	73	1.39	4,589	0	0
TOTAL	4,502	7,644	4,262	20.03	--	4,916	1,954

NOTE.--Osborne Canal: Acres irrigated 1991 -- 4,206

SOLOMON DIVISION (Continued)
GLEN ELDER UNIT

	WACONDA LAKE					OUTFLOW TO RIVER			
						City of Beloit			
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Storage Release (AF)	Quality Bypass (AF)	Other Controlled Releases 1/ (AF)	Release To Mitchell Co. RWD No.2 (AF)
Jan.	3,321	5,111	668	0.29	211,013	0	0	5,058	53
Feb.	3,329	2,827	853	0.02	210,662	0	0	2,777	50
Mar.	4,125	2,183	1,591	1.75	211,013	0	639	1,487	57
Apr.	4,785	1,166	4,321	1.02	210,311	0	1,107	0	59
May	13,280	1,287	4,855	3.22	217,449	0	1,230	0	57
June	4,289	2,837	8,122	1.60	210,779	57	0	2,710	70
July	1,178	6,659	9,300	0.66	195,998	256	0	6,321	82
Aug.	4,449	3,303	6,237	5.92	190,907	177	0	3,059	67
Sep.	343	1,550	5,050	1.31	184,650	117	0	1,369	64
Oct.	0	1,298	4,428	0.49	178,924	88	0	1,142	68
Nov.	3,131	1,098	1,617	1.94	179,340	33	645	364	56
Dec.	3,245	976	811	1.82	180,798	0	922	0	54
TOTAL	45,475	30,295	47,853	20.04	--	728	4,543	24,287	737

1/ Includes releases for water right administration and 5,616 acre-feet delivered under Temporary Contracts for irrigation of 5,351 acres.

SMOKY HILL DIVISION
ELLIS UNIT
CEDAR BLUFF RESERVOIR

						STORAGES 1/			
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Fish & Wildlife (AF)	City of Russell (AF)	Irrigation (AF)	Release To Fish Hatchery (AF)
Jan.	74	0	100	0.09	15,971	1,052	632	6,026	0
Feb.	8	5	122	0.00	15,852	1,031	623	5,937	5
Mar.	6	0	216	1.30	15,642	1,003	605	5,773	0
Apr.	253	3	562	2.21	15,330	964	579	5,526	2
May	634	9	651	3.89	15,304	967	577	5,499	9
June	291	14	963	2.22	14,618	868	521	4,968	14
July	156	8	1,048	1.58	13,718	742	447	4,268	8
Aug.	270	3	858	2.33	13,127	665	399	3,802	3
Sep.	40	3	776	0.34	12,388	562	338	3,227	3
Oct.	34	7	531	0.79	11,884	488	298	2,837	7
Nov.	228	1	203	1.75	11,908	496	299	2,852	1
Dec.	189	2	115	1.35	11,980	508	305	2,906	2
TOTAL	2,183	55	6,145	17.85	--	--	--	--	54

1/ Total Storage = 8,261 A.F. + Fish & Wildlife + City of Russell + Irrigation.

NOTE.--Cedar Bluff Canal: Due to the shortage of storage water in Cedar Bluff Reservoir, Cedar Bluff Canal was not in operation during the 1991 irrigation season.
No releases were made for the City of Russell, Kansas.

TABLE 3
ACRES IRRIGATED IN 1991 AND ESTIMATES FOR 1992

Irrigation District and Canal	Acres With Service Available	Acres Irrigated in 1991	Estimated Acres to be Irrigated in 1992
Mirage Flats Irrigation District			
Mirage Flats Canal	11,662	10,496	11,000
Ainsworth Irrigation District			
Ainsworth Canal	34,539	33,400	34,000
Sargent Irrigation District			
Sargent Canal	13,922	13,189	13,000
Farwell Irrigation District			
Farwell Canal	50,051	46,942	46,000
Twin Loups Irrigation District			
Above Davis Creek	34,012	19,098	21,500
Below Davis Creek	0	0	4,500
Total Twin Loups Irrigation District	34,012	19,098	26,000
Frenchman Valley Irrigation District			
Culbertson Canal	9,600	7,970	8,000
H & HW Irrigation District			
Culbertson Extension Canal	11,490	10,156	10,000
Frenchman-Cambridge Irrigation District			
Meeker-Driftwood Canal	16,476	15,588	15,600
Red Willow Canal	4,932	4,749	4,700
Bartley Canal	6,539	6,229	6,200
Cambridge Canal	17,053	16,227	16,300
Total Frenchman-Cambridge Irrigation District	45,000	42,793	42,800
Almena Irrigation District			
Almena Canal	5,763	0	5,100
Bostwick Irrigation District in Nebraska			
Franklin Canal	11,116	9,009	8,800
Naponee Canal	1,737	1,371	1,300
Franklin Pump Canal	2,091	2,014	1,900
Superior Canal	5,863	5,071	4,800
Courtland Canal (Nebraska)	1,980	1,235	1,200
Total Bostwick Irrigation Dist. in Nebraska	22,787	18,700	18,000
Kansas-Bostwick Irrigation District			
Courtland Canal above Lovewell	13,550	7,680	5,700
Courtland Canal below Lovewell	28,338	23,201	19,300
Total Kansas-Bostwick Irrigation District	41,888	30,881	25,000
Kirwin Irrigation District			
Kirwin Canal	11,435	0	7,000
Webster Irrigation District			
Osborne Canal	8,500	4,206	4,500
Cedar Bluff Irrigation District			
Cedar Bluff Canal	6,800	0	6,800
TOTAL PROJECT USES	307,449	237,831	257,200
Non-Project Uses			
Middle Loup Public Power & Irrig. Dist. Canals	15,000	14,319	14,400
Hale Ditch	700	700	700
TOTAL NON-PROJECT USES	15,700	15,019	15,100
TOTAL PROJECT AND NON-PROJECT	323,149	252,850	272,300

BOX BUTTE RESERVOIR OPERATION ESTIMATES - 1992

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIREMENT MEAN CFS	RELEASE REQUIREMENT 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	18.	1.1	1.06	.1	2.	.1	.0	.0	3992.6	12.7	.9
FEB	25.	1.4	1.32	.1	2.	.1	.0	.0	3993.8	13.9	1.2
MAR	34.	2.1	2.33	.2	2.	.1	.0	.0	3995.5	15.7	1.8
APR	25.	1.5	3.79	.4	2.	.1	.0	.0	3996.4	16.7	1.0
MAY	16.	1.0	5.85	.6	2.	.1	.0	.0	3996.7	17.0	.3
JUN	0.	.0	7.15	.6	168.	10.0	.0	.0	3984.8	6.4	-10.6
JUL	0.	.0	7.83	.3	216.	13.3	.0	10.0	3977.9	2.8	-3.6
AUG	10.	.6	6.19	.2	218.	13.4	.0	13.0	3977.9	2.8	.0
SEP	12.	.7	5.39	.2	59.	3.5	.0	3.0	3977.9	2.8	.0
OCT	10.	.6	3.08	.1	2.	.1	.0	.0	3978.9	3.2	.4
NOV	22.	1.3	1.67	.1	2.	.1	.0	.0	3981.2	4.3	1.1
DEC	20.	1.2	.97	.0	2.	.1	.0	.0	3983.2	5.4	1.1
TOTAL		11.5	46.63	2.9		41.0	.0	26.0			-6.4
					MOST PROBABLE INFLOW CONDITIONS						
JAN	26.	1.6	1.06	.1	2.	.1	.0	.0	3993.1	13.2	1.4
FEB	34.	1.9	1.32	.1	2.	.1	.0	.0	3994.8	14.9	1.7
MAR	46.	2.8	2.33	.2	2.	.1	.0	.0	3997.1	17.4	2.5
APR	37.	2.2	3.79	.4	2.	.1	.0	.0	3998.5	19.1	1.7
MAY	26.	1.6	4.73	.5	2.	.1	.0	.0	3999.3	20.1	1.0
JUN	5.	.3	6.01	.6	29.	1.7	.0	.0	3997.6	18.1	-2.0
JUL	2.	.1	6.55	.5	210.	12.9	.0	.0	3982.1	4.8	-13.3
AUG	21.	1.3	5.75	.2	211.	13.0	.0	9.9	3977.9	2.8	-2.0
SEP	22.	1.3	4.21	.1	32.	1.9	.0	.7	3977.9	2.8	.0
OCT	26.	1.6	3.08	.1	2.	.1	.0	.0	3981.0	4.2	1.4
NOV	32.	1.9	1.67	.1	2.	.1	.0	.0	3984.0	5.9	1.7
DEC	28.	1.7	.97	.1	2.	.1	.0	.0	3986.3	7.4	1.5
TOTAL		18.3	41.47	3.0		30.3	.0	10.6			-4.4
					REASONABLE MAXIMUM INFLOW CONDITIONS						
JAN	33.	2.0	1.06	.1	2.	.1	.0	.0	3993.5	13.6	1.8
FEB	45.	2.5	1.32	.1	2.	.1	.0	.0	3995.7	15.9	2.3
MAR	55.	3.4	2.33	.2	2.	.1	.0	.0	3998.4	19.0	3.1
APR	52.	3.1	3.79	.4	2.	.1	.0	.0	4000.4	21.6	2.6
MAY	41.	2.5	3.49	.4	2.	.1	.0	.0	4001.9	23.6	2.0
JUN	89.	5.3	4.48	.5	8.	.5	.0	.0	4005.0	27.9	4.3
JUL	54.	3.3	5.40	.6	176.	10.8	.0	.0	3999.0	19.8	-8.1
AUG	37.	2.3	4.40	.4	168.	10.3	.0	.0	3991.2	11.4	-8.4
SEP	34.	2.0	2.84	.2	13.	.8	.0	.0	3992.3	12.4	1.0
OCT	33.	2.0	3.08	.3	2.	.1	.0	.0	3993.9	14.0	1.6
NOV	42.	2.5	1.67	.1	2.	.1	.0	.0	3996.1	16.3	2.3
DEC	34.	2.1	.97	.1	2.	.1	.0	.0	3997.7	18.2	1.9
TOTAL		33.0	34.83	3.4		23.2	.0	.0			6.4

MERRITT RESERVOIR OPERATION ESTIMATES - 1992

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	RES 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	198.	12.2	1.05	.2	.0	11.8	192.	11.8	.0	.0	2944.0	68.8	.2
FEB	216.	12.0	1.33	.3	.0	11.7	211.	11.7	.0	.0	2944.0	68.8	.0
MAR	228.	14.0	1.85	.4	.0	10.8	176.	10.8	.0	.0	2945.0	71.6	2.8
APR	224.	13.3	3.08	.7	.0	10.8	182.	10.8	.0	.0	2945.6	73.4	1.8
MAY	213.	13.1	5.36	1.3	6.1	4.6	174.	10.7	.0	.0	2946.0	74.5	1.1
JUN	210.	12.5	6.29	1.5	15.0	1.0	269.	16.0	.0	.0	2944.2	69.5	-5.0
JUL	211.	13.0	7.20	1.4	35.7	1.0	597.	36.7	.0	.0	2933.6	44.4	-25.1
AUG	208.	12.8	6.36	.8	35.7	1.0	597.	36.7	.0	.0	2915.7	19.7	-24.7
SEP	205.	12.2	5.29	.4	15.6	1.0	279.	16.6	.0	.0	2910.2	14.9	-4.8
OCT	220.	13.5	3.50	.3	.0	1.0	16.	1.0	.0	.0	2922.5	27.1	12.2
NOV	215.	12.8	2.00	.2	.0	1.0	17.	1.0	.0	.0	2930.4	38.7	11.6
DEC	210.	12.9	1.39	.2	.0	1.0	16.	1.0	.0	.0	2936.5	50.4	11.7
TOTAL		154.3	44.70	7.7	108.1	56.7		164.8	.0	.0			-18.2
MOST PROBABLE INFLOW CONDITIONS													
JAN	231.	14.2	1.05	.2	.0	13.8	224.	13.8	.0	.0	2944.0	68.8	.2
FEB	243.	13.5	1.33	.3	.0	13.2	238.	13.2	.0	.0	2944.0	68.8	.0
MAR	262.	16.1	1.85	.4	.0	12.9	210.	12.9	.0	.0	2945.0	71.6	2.8
APR	267.	15.9	3.08	.7	.0	15.2	255.	15.2	.0	.0	2945.0	71.6	.0
MAY	250.	15.4	4.17	1.0	3.1	8.4	187.	11.5	.0	.0	2946.0	74.5	2.9
JUN	237.	14.1	5.52	1.3	6.5	1.0	126.	7.5	5.3	.0	2946.0	74.5	.0
JUL	241.	14.8	6.20	1.4	29.6	1.0	498.	30.6	.0	.0	2939.5	57.3	-17.2
AUG	249.	15.3	5.32	.9	30.3	1.0	509.	31.3	.0	.0	2931.4	40.4	-16.9
SEP	247.	14.7	4.26	.6	10.2	1.0	188.	11.2	.0	.0	2933.0	43.3	2.9
OCT	250.	15.4	3.50	.6	.0	1.0	16.	1.0	.0	.0	2939.4	57.1	13.8
NOV	237.	14.1	2.00	.4	.0	2.0	34.	2.0	.0	.0	2944.0	68.8	11.7
DEC	231.	14.2	1.39	.3	.0	13.9	226.	13.9	.0	.0	2944.0	68.8	.0
TOTAL		177.7	39.67	8.1	79.7	84.4		164.1	5.3	.0			.2
REASONABLE MAXIMUM INFLOW CONDITIONS													
JAN	267.	16.4	1.05	.2	.0	16.0	260.	16.0	.0	.0	2944.0	68.8	.2
FEB	286.	15.9	1.33	.3	.0	15.6	281.	15.6	.0	.0	2944.0	68.8	.0
MAR	299.	18.4	1.85	.4	.0	15.2	247.	15.2	.0	.0	2945.0	71.6	2.8
APR	313.	18.6	3.08	.7	.0	17.9	301.	17.9	.0	.0	2945.0	71.6	.0
MAY	299.	18.4	3.47	.8	1.4	13.3	239.	14.7	.0	.0	2946.0	74.5	2.9
JUN	279.	16.6	4.59	1.1	5.8	1.0	114.	6.8	8.7	.0	2946.0	74.5	.0
JUL	294.	18.1	5.41	1.3	20.7	1.0	353.	21.7	.0	.0	2944.3	69.6	-4.9
AUG	316.	19.4	4.36	1.0	18.4	1.0	316.	19.4	.0	.0	2943.9	68.6	-1.0
SEP	287.	17.1	3.48	.8	4.4	11.7	271.	16.1	.0	.0	2944.0	68.8	.2
OCT	278.	17.1	3.50	.8	.0	16.3	265.	16.3	.0	.0	2944.0	68.8	.0
NOV	260.	15.5	2.00	.5	.0	15.0	252.	15.0	.0	.0	2944.0	68.8	.0
DEC	252.	15.5	1.39	.3	.0	15.2	247.	15.2	.0	.0	2944.0	68.8	.0
TOTAL		207.0	35.51	8.2	50.7	139.2		189.9	8.7	.0			.2

SHERMAN RESERVOIR OPERATION ESTIMATES - 1992

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIREMENT MEAN CFS	RELEASE REQUIREMENT 1000 AF	RESERVOIR SPILL 1000 AF	REQUIREMENT SHORTAGE 1000 AF	END OF MONTH ELEV FT	END OF MONTH CONT 1000 AF	RESERVOIR CHANGE 1000 AF
REASONABLE MINIMUM INFLOW CONDITIONS											
JAN	0.	.0	1.30	.3	21.	1.3	.0	.0	2154.5	49.0	-1.6
FEB	0.	.0	1.62	.3	23.	1.3	.0	.0	2153.8	47.4	-1.6
MAR	0.	.0	2.86	.5	21.	1.3	.0	.0	2153.0	45.6	-1.8
APR	254.	15.1	4.63	.9	22.	1.3	.0	.0	2158.4	58.5	12.9
MAY	499.	30.7	5.19	1.2	307.	18.9	.0	.0	2162.3	69.1	10.6
JUN	524.	31.2	6.44	1.3	1030.	61.3	.0	.0	2149.2	37.7	-31.4
JUL	153.	9.4	7.45	.9	992.	61.0	.0	25.3	2129.0	10.5	-27.2
AUG	246.	15.1	6.59	.5	987.	60.7	.0	46.1	2129.0	10.5	.0
SEP	523.	31.1	4.88	.4	466.	27.7	.0	.0	2132.3	13.5	3.0
OCT	582.	35.8	3.77	.5	18.	1.1	.0	.0	2153.9	47.7	34.2
NOV	0.	.0	2.05	.4	22.	1.3	.0	.0	2153.2	46.0	-1.7
DEC	0.	.0	1.18	.2	21.	1.3	.0	.0	2152.5	44.5	-1.5
TOTAL		168.4	47.96	7.4		238.5	.0	71.4			-6.1
MOST PROBABLE INFLOW CONDITIONS											
JAN	0.	.0	1.30	.3	21.	1.3	.0	.0	2154.5	49.0	-1.6
FEB	0.	.0	1.62	.3	23.	1.3	.0	.0	2153.8	47.4	-1.6
MAR	2.	.1	2.86	.5	21.	1.3	.0	.0	2153.0	45.7	-1.7
APR	168.	10.0	4.63	.9	22.	1.3	.0	.0	2156.4	53.5	7.8
MAY	293.	18.0	4.25	.9	24.	1.5	.0	.0	2162.3	69.1	15.6
JUN	474.	28.2	4.97	1.2	454.	27.0	.0	.0	2162.3	69.1	.0
JUL	376.	23.1	5.84	1.1	987.	60.7	.0	.0	2145.1	30.4	-38.7
AUG	449.	27.6	4.99	.5	945.	58.1	.0	11.1	2129.0	10.5	-19.9
SEP	499.	29.7	3.69	.4	176.	10.5	.0	.0	2144.5	29.3	18.8
OCT	405.	24.9	3.77	.6	18.	1.1	.0	.0	2156.0	52.5	23.2
NOV	0.	.0	2.05	.4	22.	1.3	.0	.0	2155.3	50.8	-1.7
DEC	0.	.0	1.18	.2	21.	1.3	.0	.0	2154.6	49.3	-1.5
TOTAL		161.6	41.15	7.3		166.7	.0	11.1			-1.3
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	11.	.7	1.30	.3	21.	1.3	.0	.0	2154.8	49.7	-.9
FEB	23.	1.3	1.62	.3	23.	1.3	.0	.0	2154.7	49.4	-.3
MAR	83.	5.1	2.86	.6	21.	1.3	.0	.0	2156.0	52.6	3.2
APR	118.	7.0	4.63	1.0	22.	1.3	.0	.0	2157.9	57.3	4.7
MAY	252.	15.5	3.45	.8	47.	2.9	.0	.0	2162.3	69.1	11.8
JUN	314.	18.7	3.84	.9	299.	17.8	.0	.0	2162.3	69.1	.0
JUL	359.	22.1	4.54	.9	823.	50.6	.0	.0	2150.2	39.7	-29.4
AUG	397.	24.4	3.77	.6	481.	29.6	.0	.0	2147.1	33.9	-5.8
SEP	240.	14.3	2.49	.4	129.	7.7	.0	.0	2150.4	40.1	6.2
OCT	231.	14.2	3.77	.7	18.	1.1	.0	.0	2156.0	52.5	12.4
NOV	13.	.8	2.05	.4	22.	1.3	.0	.0	2155.6	51.6	-.9
DEC	16.	1.0	1.18	.2	21.	1.3	.0	.0	2155.4	51.1	-.5
TOTAL		125.1	35.50	7.1		117.5	.0	.0			.5

CALAMUS RESERVOIR OPERATION ESTIMATES - 1992

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	RES SPILL 1000 AF	REQUIREMENT SHORTAGE 1000 AF	END OF MONTH ELEV FT	MONTH CONT 1000 AF	RESERVOIR CHANGE 1000 AF
						REASONABLE MINIMUM INFLOW CONDITIONS							
JAN	293.	18.0	1.17	.4	.0	17.6	286.	17.6	.0	.0	2240.1	108.5	.0
FEB	277.	15.4	1.46	.6	.0	14.8	266.	14.8	.0	.0	2240.1	108.5	.0
MAR	330.	20.3	2.58	1.0	.0	13.8	224.	13.8	.0	.0	2241.3	114.0	5.5
APR	297.	17.7	4.18	1.7	.0	5.1	86.	5.1	.0	.0	2243.5	124.9	10.9
MAY	311.	19.1	5.43	2.3	.0	16.8	273.	16.8	.0	.0	2243.5	124.9	.0
JUN	308.	18.3	8.41	3.5	8.4	6.4	249.	14.8	.0	.0	2243.5	124.9	.0
JUL	268.	16.5	8.54	3.4	18.9	16.5	576.	35.4	.0	.0	2238.8	102.6	-22.3
AUG	291.	17.9	6.97	2.4	19.0	17.9	600.	36.9	.0	.0	2233.6	81.2	-21.4
SEP	274.	16.3	6.31	1.9	13.1	16.3	494.	29.4	.0	.0	2229.4	66.2	-15.0
OCT	260.	16.0	3.40	1.0	.0	3.1	50.	3.1	.0	.0	2232.8	78.1	11.9
NOV	262.	15.6	1.85	.6	.0	3.0	50.	3.0	.0	.0	2235.9	90.1	12.0
DEC	268.	16.5	1.07	.4	.0	3.1	50.	3.1	.0	.0	2238.9	103.1	13.0
TOTAL		207.6	51.37	19.2	59.4	134.4		193.8	.0	.0			-5.4
						MOST PROBABLE INFLOW CONDITIONS							
JAN	329.	20.2	1.17	.4	.0	19.8	322.	19.8	.0	.0	2240.1	108.5	.0
FEB	331.	18.4	1.46	.6	.0	17.8	321.	17.8	.0	.0	2240.1	108.5	.0
MAR	369.	22.7	2.58	1.0	.0	16.2	263.	16.2	.0	.0	2241.3	114.0	5.5
APR	345.	20.5	4.18	1.7	.0	7.9	133.	7.9	.0	.0	2243.5	124.9	10.9
MAY	384.	23.6	3.45	1.5	.0	22.1	359.	22.1	.0	.0	2243.5	124.9	.0
JUN	328.	19.5	5.52	2.3	.0	17.2	289.	17.2	.0	.0	2243.5	124.9	.0
JUL	327.	20.1	6.47	2.6	13.0	20.1	538.	33.1	.0	.0	2240.3	109.3	-15.6
AUG	324.	19.9	6.06	2.2	13.9	19.9	550.	33.8	.0	.0	2236.6	93.2	-16.1
SEP	299.	17.8	5.01	1.7	8.8	17.8	447.	26.6	.0	.0	2234.0	82.7	-10.5
OCT	299.	18.4	3.40	1.1	.0	4.6	75.	4.6	.0	.0	2237.1	95.4	12.7
NOV	319.	19.0	1.85	.7	.0	5.7	96.	5.7	.0	.0	2240.0	108.0	12.6
DEC	317.	19.5	1.07	.4	.0	19.1	311.	19.1	.0	.0	2240.0	108.0	.0
TOTAL		239.6	42.22	16.2	35.7	188.2		223.9	.0	.0			-.5
						REASONABLE MAXIMUM INFLOW CONDITIONS							
JAN	366.	22.5	1.17	.4	.0	22.1	359.	22.1	.0	.0	2240.1	108.5	.0
FEB	380.	21.1	1.46	.6	.0	20.5	369.	20.5	.0	.0	2240.1	108.5	.0
MAR	499.	30.7	2.58	1.0	.0	24.2	394.	24.2	.0	.0	2241.3	114.0	5.5
APR	462.	27.5	4.18	1.7	.0	14.9	250.	14.9	.0	.0	2243.5	124.9	10.9
MAY	441.	27.1	2.82	1.2	.0	25.9	421.	25.9	.0	.0	2243.5	124.9	.0
JUN	355.	21.1	4.32	1.8	.0	19.3	324.	19.3	.0	.0	2243.5	124.9	.0
JUL	376.	23.1	5.57	2.3	6.1	23.1	475.	29.2	.0	.0	2241.8	116.5	-8.4
AUG	356.	21.9	5.47	2.1	8.0	21.9	486.	29.9	.0	.0	2239.6	106.4	-10.1
SEP	366.	21.8	3.58	1.4	.0	21.8	366.	21.8	.0	.0	2239.3	105.0	-1.4
OCT	361.	22.2	3.40	1.3	.0	19.4	316.	19.4	.0	.0	2239.7	106.5	1.5
NOV	351.	20.9	1.85	.7	.0	18.7	314.	18.7	.0	.0	2240.0	108.0	1.5
DEC	358.	22.0	1.07	.4	.0	21.6	351.	21.6	.0	.0	2240.0	108.0	.0
TOTAL		281.9	37.47	14.9	14.1	253.4		267.5	.0	.0			-.5

BONNY RESERVOIR OPERATION ESTIMATES - 1992

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	RES 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	23.	1.4	1.16	.2	.0	.8	13.	.8	.0	.0	3672.0	41.3	.4
FEB	23.	1.3	1.35	.2	.0	1.1	20.	1.1	.0	.0	3672.0	41.3	.0
MAR	21.	1.3	1.95	.3	.0	1.0	16.	1.0	.0	.0	3672.0	41.3	.0
APR	24.	1.4	5.64	1.0	.0	.4	7.	.4	.0	.0	3672.0	41.3	.0
MAY	26.	1.6	7.10	1.2	.4	.5	15.	.9	.0	.0	3671.7	40.8	-.5
JUN	12.	.7	8.51	1.4	.3	.4	12.	.7	.0	.0	3671.0	39.4	-1.4
JUL	5.	.3	9.21	1.5	1.0	.5	24.	1.5	.0	.0	3669.6	36.7	-2.7
AUG	0.	.0	8.13	1.3	.6	.5	18.	1.1	.0	.0	3668.3	34.3	-2.4
SEP	0.	.0	7.30	1.1	.3	.4	12.	.7	.0	.0	3667.3	32.5	-1.8
OCT	7.	.4	5.17	.8	.2	.5	11.	.7	.0	.0	3666.7	31.4	-1.1
NOV	17.	1.0	2.24	.3	.0	.4	7.	.4	.0	.0	3666.9	31.7	.3
DEC	20.	1.2	1.41	.2	.0	.5	8.	.5	.0	.0	3667.2	32.2	.5
TOTAL		10.6	59.17	9.5	2.8	7.0		9.8	.0	.0			-8.7
					MOST PROBABLE INFLOW CONDITIONS								
JAN	28.	1.7	1.11	.2	.0	1.1	18.	1.1	.0	.0	3672.0	41.3	.4
FEB	31.	1.7	1.25	.2	.0	1.5	27.	1.5	.0	.0	3672.0	41.3	.0
MAR	33.	2.0	1.93	.3	.0	1.7	28.	1.7	.0	.0	3672.0	41.3	.0
APR	35.	2.1	4.53	.8	.0	.4	7.	.4	.9	.0	3672.0	41.3	.0
MAY	37.	2.3	5.73	1.0	.1	.5	10.	.6	.7	.0	3672.0	41.3	.0
JUN	25.	1.5	6.92	1.2	.3	.4	12.	.7	.0	.0	3671.8	40.9	-.4
JUL	16.	1.0	8.27	1.4	.7	.5	20.	1.2	.0	.0	3671.0	39.3	-1.6
AUG	7.	.4	6.92	1.1	.6	.5	18.	1.1	.0	.0	3670.1	37.5	-1.8
SEP	5.	.3	5.34	.8	.3	.4	12.	.7	.0	.0	3669.4	36.3	-1.2
OCT	15.	.9	3.64	.6	.1	.5	10.	.6	.0	.0	3669.3	36.0	-.3
NOV	27.	1.6	2.24	.4	.0	.4	7.	.4	.0	.0	3669.7	36.8	.8
DEC	26.	1.6	1.33	.2	.0	.5	8.	.5	.0	.0	3670.2	37.7	.9
TOTAL		17.1	49.21	8.2	2.1	8.4		10.5	1.6	.0			-3.2
					REASONABLE MAXIMUM INFLOW CONDITIONS								
JAN	36.	2.2	1.08	.2	.0	1.6	26.	1.6	.0	.0	3672.0	41.3	.4
FEB	40.	2.2	1.18	.2	.0	2.0	36.	2.0	.0	.0	3672.0	41.3	.0
MAR	44.	2.7	1.88	.3	.0	2.4	39.	2.4	.0	.0	3672.0	41.3	.0
APR	55.	3.3	3.26	.6	.0	.4	7.	.4	2.3	.0	3672.0	41.3	.0
MAY	63.	3.9	4.63	.8	.2	.5	11.	.7	2.4	.0	3672.0	41.3	.0
JUN	89.	5.3	5.38	.9	.2	.4	10.	.6	3.8	.0	3672.0	41.3	.0
JUL	42.	2.6	6.20	1.1	.4	.5	15.	.9	.6	.0	3672.0	41.3	.0
AUG	65.	4.0	5.78	1.0	.4	.5	15.	.9	2.1	.0	3672.0	41.3	.0
SEP	49.	2.9	4.19	.7	.2	.4	10.	.6	1.6	.0	3672.0	41.3	.0
OCT	34.	2.1	2.42	.4	.2	.5	11.	.7	1.0	.0	3672.0	41.3	.0
NOV	39.	2.3	2.24	.4	.0	.4	7.	.4	1.5	.0	3672.0	41.3	.0
DEC	36.	2.2	1.23	.2	.0	.5	8.	.5	1.5	.0	3672.0	41.3	.0
TOTAL		35.7	39.47	6.8	1.6	10.1		11.7	16.8	.0			.4

ENDERS RESERVOIR OPERATION ESTIMATES - 1992

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIREMENT MEAN CFS	RELEASE REQUIREMENT 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	33.	2.0	.95	.1	0.	.0	.0	.0	3093.8	19.5	1.9
FEB	32.	1.8	1.03	.1	0.	.0	.0	.0	3095.4	21.2	1.7
MAR	29.	1.8	1.77	.2	0.	.0	.0	.0	3096.8	22.8	1.6
APR	30.	1.8	5.29	.5	0.	.0	.0	.0	3098.0	24.1	1.3
MAY	31.	1.9	6.55	.6	60.	3.7	.0	.0	3095.9	21.7	-2.4
JUN	27.	1.6	7.86	.6	148.	8.8	.0	.0	3087.7	13.9	-7.8
JUL	28.	1.7	8.51	.5	437.	26.9	.0	21.8	3082.4	10.0	-3.9
AUG	28.	1.7	7.65	.4	415.	25.5	.0	24.2	3082.4	10.0	.0
SEP	29.	1.7	5.61	.3	15.	.9	.0	.0	3083.2	10.5	.5
OCT	29.	1.8	4.26	.3	0.	.0	.0	.0	3085.3	12.0	1.5
NOV	30.	1.8	1.96	.1	0.	.0	.0	.0	3087.5	13.7	1.7
DEC	29.	1.8	1.16	.1	0.	.0	.0	.0	3089.5	15.4	1.7
TOTAL		21.4	52.60	3.8		65.8	.0	46.0			-2.2
					MOST PROBABLE INFLOW CONDITIONS						
JAN	47.	2.9	.88	.1	0.	.0	.0	.0	3094.7	20.4	2.8
FEB	45.	2.5	.95	.1	0.	.0	.0	.0	3096.8	22.8	2.4
MAR	41.	2.5	1.73	.2	0.	.0	.0	.0	3098.8	25.1	2.3
APR	44.	2.6	4.50	.5	0.	.0	.0	.0	3100.5	27.2	2.1
MAY	44.	2.7	5.31	.6	34.	2.1	.0	.0	3100.5	27.2	.0
JUN	42.	2.5	6.62	.7	71.	4.2	.0	.0	3098.6	24.8	-2.4
JUL	59.	3.6	7.47	.6	286.	17.6	.0	.0	3082.7	10.2	-14.6
AUG	46.	2.8	6.40	.4	273.	16.8	.0	14.2	3082.4	10.0	-.2
SEP	50.	3.0	4.57	.3	39.	2.3	.0	.0	3083.0	10.4	.4
OCT	46.	2.8	3.03	.2	0.	.0	.0	.0	3086.6	13.0	2.6
NOV	45.	2.7	1.96	.1	0.	.0	.0	.0	3089.7	15.6	2.6
DEC	47.	2.9	1.06	.1	0.	.0	.0	.0	3092.7	18.4	2.8
TOTAL		33.5	44.48	3.9		43.0	.0	14.2			.8
					REASONABLE MAXIMUM INFLOW CONDITIONS						
JAN	72.	4.4	.81	.1	0.	.0	.0	.0	3096.1	21.9	4.3
FEB	68.	3.8	.90	.1	0.	.0	.0	.0	3099.2	25.6	3.7
MAR	60.	3.7	1.67	.2	0.	.0	.0	.0	3102.0	29.1	3.5
APR	62.	3.7	3.44	.4	0.	.0	.0	.0	3104.5	32.4	3.3
MAY	67.	4.1	4.50	.5	15.	.9	.0	.0	3106.4	35.1	2.7
JUN	91.	5.4	5.52	.7	22.	1.3	.0	.0	3108.6	38.5	3.4
JUL	104.	6.4	6.57	.8	172.	10.6	.0	.0	3105.2	33.5	-5.0
AUG	83.	5.1	5.24	.6	176.	10.8	.0	.0	3100.5	27.2	-6.3
SEP	89.	5.3	3.47	.4	2.	.1	.0	.0	3104.2	32.0	4.8
OCT	75.	4.6	2.23	.3	0.	.0	.0	.0	3107.2	36.3	4.3
NOV	74.	4.4	1.96	.3	0.	.0	.0	.0	3109.8	40.4	4.1
DEC	73.	4.5	.97	.1	0.	.0	.3	.0	3112.3	44.5	4.1
TOTAL		55.4	37.28	4.5		23.7	.3	.0			26.9

SWANSON LAKE OPERATION ESTIMATES - 1992

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	RES 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	50.	3.1	.92	.2	.0	.1	2.	.1	.0	.0	2737.0	51.4	2.8
FEB	95.	5.3	1.06	.3	.0	.1	2.	.1	.0	.0	2738.5	56.3	4.9
MAR	111.	6.8	1.76	.5	.0	.1	2.	.1	.0	.0	2740.2	62.5	6.2
APR	97.	5.8	5.47	1.7	.0	.1	2.	.1	.0	.0	2741.3	66.5	4.0
MAY	80.	4.9	6.60	2.1	.0	.1	2.	.1	.0	.0	2742.1	69.2	2.7
JUN	54.	3.2	7.60	2.3	9.8	1.9	197.	11.7	.0	.0	2739.1	58.4	-10.8
JUL	11.	.7	8.96	2.1	19.2	17.1	590.	36.3	.0	.0	2724.9	20.7	-37.7
AUG	2.	.1	7.90	1.1	18.7	9.8	464.	28.5	.0	21.2	2720.0	12.4	-8.3
SEP	0.	.0	5.92	.7	2.2	2.7	82.	4.9	.0	4.8	2719.4	11.6	-.8
OCT	0.	.0	3.93	.4	.0	.1	2.	.1	.0	.0	2719.0	11.1	-.5
NOV	20.	1.2	2.01	.2	.0	.1	2.	.1	.0	.0	2719.7	12.0	.9
DEC	44.	2.7	1.16	.1	.0	.1	2.	.1	.0	.0	2721.4	14.5	2.5
TOTAL		33.8	53.29	11.7	49.9	32.3		82.2	.0	26.0			-34.1
MOST PROBABLE INFLOW CONDITIONS													
JAN	96.	5.9	.88	.2	.0	.1	2.	.1	.0	.0	2737.8	54.2	5.6
FEB	142.	7.9	.97	.3	.0	.1	2.	.1	.0	.0	2740.0	61.7	7.5
MAR	155.	9.5	1.73	.5	.0	.1	2.	.1	.0	.0	2742.4	70.6	8.9
APR	163.	9.7	4.59	1.5	.0	.1	2.	.1	.0	.0	2744.5	78.7	8.1
MAY	158.	9.7	5.16	1.8	.0	.1	2.	.1	.0	.0	2746.4	86.5	7.8
JUN	119.	7.1	6.50	2.3	4.2	.1	72.	4.3	.0	.0	2746.5	87.0	.5
JUL	54.	3.3	7.58	2.5	13.7	5.7	316.	19.4	.0	.0	2741.9	68.4	-18.6
AUG	31.	1.9	6.62	1.9	14.4	6.2	335.	20.6	.0	.0	2735.8	47.8	-20.6
SEP	5.	.3	4.90	1.2	2.8	1.5	72.	4.3	.0	.0	2734.1	42.6	-5.2
OCT	18.	1.1	3.06	.7	.0	.1	2.	.1	.0	.0	2734.2	42.9	.3
NOV	69.	4.1	2.01	.5	.0	.1	2.	.1	.0	.0	2735.4	46.4	3.5
DEC	73.	4.5	1.09	.3	.0	.1	2.	.1	.0	.0	2736.7	50.5	4.1
TOTAL		65.0	45.09	13.7	35.1	14.3		49.4	.0	.0			1.9
REASONABLE MAXIMUM INFLOW CONDITIONS													
JAN	120.	7.4	.85	.2	.0	.1	2.	.1	.0	.0	2738.3	55.7	7.1
FEB	184.	10.2	.92	.3	.0	.1	2.	.1	.0	.0	2741.1	65.5	9.8
MAR	220.	13.5	1.68	.5	.0	.1	2.	.1	.0	.0	2744.4	78.4	12.9
APR	276.	16.4	3.44	1.2	.0	.1	2.	.1	.0	.0	2748.0	93.5	15.1
MAY	291.	17.9	4.23	1.6	.0	.1	2.	.1	.0	.0	2751.5	109.7	16.2
JUN	250.	14.9	5.33	2.2	3.0	.1	52.	3.1	7.1	.0	2752.0	112.2	2.5
JUL	200.	12.3	6.52	2.7	8.9	3.6	203.	12.5	.0	.0	2751.4	109.3	-2.9
AUG	81.	5.0	5.52	2.2	7.5	3.5	179.	11.0	.0	.0	2749.7	101.1	-8.2
SEP	104.	6.2	3.77	1.5	1.4	.1	25.	1.5	.0	.0	2750.3	104.3	3.2
OCT	133.	8.2	2.18	.9	.0	.1	2.	.1	.0	.0	2751.9	111.5	7.2
NOV	143.	8.5	2.01	.8	.0	.1	2.	.1	6.9	.0	2752.0	112.2	.7
DEC	112.	6.9	.99	.4	.0	.1	2.	.1	6.4	.0	2752.0	112.2	.0
TOTAL		127.4	37.44	14.5	20.8	8.1		28.9	20.4	.0			63.6

HUGH BUTLER LAKE OPERATION ESTIMATES - 1992

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIREMENT MEAN CFS	RELEASE REQUIREMENT 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	16.	1.0	.83	.1	5.	.3	.0	.0	2570.2	22.0	.6
FEB	22.	1.2	.97	.1	5.	.3	.0	.0	2570.9	22.8	.8
MAR	23.	1.4	1.67	.2	5.	.3	.0	.0	2571.7	23.7	.9
APR	22.	1.3	5.64	.6	5.	.3	.0	.0	2572.0	24.1	.4
MAY	23.	1.4	7.01	.7	5.	.3	.0	.0	2572.3	24.5	.4
JUN	20.	1.2	8.39	.8	44.	2.6	.0	.0	2570.4	22.3	-2.2
JUL	15.	.9	9.38	.8	153.	9.4	.0	.0	2561.0	13.0	-9.3
AUG	11.	.7	8.02	.6	109.	6.7	.0	4.0	2557.9	10.4	-2.6
SEP	7.	.4	6.08	.4	20.	1.2	.0	.9	2557.5	10.1	-.3
OCT	15.	.9	4.62	.3	5.	.3	.0	.0	2557.9	10.4	.3
NOV	17.	1.0	1.93	.1	5.	.3	.0	.0	2558.7	11.0	.6
DEC	18.	1.1	1.09	.1	5.	.3	.0	.0	2559.5	11.7	.7
TOTAL		12.5	55.63	4.8		22.3	.0	4.9			-9.7
MOST PROBABLE INFLOW CONDITIONS											
JAN	21.	1.3	.78	.1	5.	.3	.0	.0	2570.4	22.3	.9
FEB	29.	1.6	.88	.1	5.	.3	.0	.0	2571.5	23.5	1.2
MAR	31.	1.9	1.64	.2	5.	.3	.0	.0	2572.7	24.9	1.4
APR	34.	2.0	4.99	.5	5.	.3	.0	.0	2573.6	26.1	1.2
MAY	34.	2.1	5.72	.6	5.	.3	.0	.0	2574.6	27.3	1.2
JUN	34.	2.0	6.90	.7	29.	1.7	.0	.0	2574.3	26.9	-.4
JUL	24.	1.5	7.72	.8	70.	4.3	.0	.0	2571.3	23.3	-3.6
AUG	24.	1.5	6.70	.6	70.	4.3	.0	.0	2568.2	19.9	-3.4
SEP	20.	1.2	5.10	.4	20.	1.2	.0	.0	2567.9	19.5	-.4
OCT	21.	1.3	3.35	.3	5.	.3	.0	.0	2568.5	20.2	.7
NOV	22.	1.3	1.93	.2	5.	.3	.0	.0	2569.3	21.0	.8
DEC	23.	1.4	.99	.1	5.	.3	.0	.0	2570.2	22.0	1.0
TOTAL		19.1	46.70	4.6		13.9	.0	.0			.6
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	29.	1.8	.76	.1	5.	.3	.0	.0	2570.9	22.8	1.4
FEB	40.	2.2	.84	.1	5.	.3	.0	.0	2572.4	24.6	1.8
MAR	49.	3.0	1.58	.2	5.	.3	.0	.0	2574.4	27.1	2.5
APR	49.	2.9	3.62	.4	5.	.3	.0	.0	2576.1	29.3	2.2
MAY	50.	3.1	4.78	.6	5.	.3	.0	.0	2577.7	31.5	2.2
JUN	66.	3.9	5.32	.7	18.	1.1	.0	.0	2579.1	33.6	2.1
JUL	55.	3.4	6.33	.8	42.	2.6	.0	.0	2579.1	33.6	.0
AUG	42.	2.6	5.68	.7	42.	2.6	.0	.0	2578.7	32.9	-.7
SEP	37.	2.2	3.91	.5	15.	.9	.0	.0	2579.2	33.7	.8
OCT	31.	1.9	2.17	.3	5.	.3	.0	.0	2580.1	35.0	1.3
NOV	30.	1.8	1.93	.3	5.	.3	.0	.0	2580.8	36.2	1.2
DEC	28.	1.7	.89	.1	5.	.3	.0	.0	2581.6	37.5	1.3
TOTAL		30.5	37.81	4.8		9.6	.0	.0			16.1

HARRY STRUNK LAKE OPERATION ESTIMATES - 1992

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIREMENT MEAN CFS	RELEASE REQUIREMENT 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	.88	.1	2.	.1	.0	.0	2357.3	22.4	2.3
FEB	47.	2.6	.95	.1	2.	.1	.0	.0	2359.1	24.8	2.4
MAR	50.	3.1	1.63	.2	2.	.1	.0	.0	2361.2	27.6	2.8
APR	55.	3.3	5.64	.7	2.	.1	.0	.0	2362.8	30.1	2.5
MAY	52.	3.2	6.86	.9	2.	.1	.0	.0	2364.2	32.3	2.2
JUN	45.	2.7	8.11	1.0	203.	12.1	.0	.0	2356.9	21.9	-10.4
JUL	24.	1.5	9.00	.7	223.	13.7	.0	.0	2343.1	9.0	-12.9
AUG	33.	2.0	7.85	.5	272.	16.7	.0	15.1	2343.0	8.9	-.1
SEP	24.	1.4	6.05	.4	17.	1.0	.0	.0	2343.0	8.9	.0
OCT	34.	2.1	4.35	.3	2.	.1	.0	.0	2345.4	10.6	1.7
NOV	40.	2.4	1.89	.1	2.	.1	.0	.0	2348.1	12.8	2.2
DEC	41.	2.5	1.05	.1	2.	.1	.0	.0	2350.7	15.1	2.3
TOTAL		29.3	54.26	5.1		44.3	.0	15.1			-5.0
					MOST PROBABLE INFLOW CONDITIONS						
JAN	52.	3.2	.81	.1	2.	.1	.0	.0	2357.8	23.1	3.0
FEB	63.	3.5	.85	.1	2.	.1	.0	.0	2360.3	26.4	3.3
MAR	60.	3.7	1.59	.2	2.	.1	.0	.0	2362.6	29.8	3.4
APR	69.	4.1	4.78	.7	2.	.1	.0	.0	2364.6	33.1	3.3
MAY	70.	4.3	5.46	.8	2.	.1	.8	.0	2366.1	35.7	2.6
JUN	71.	4.2	6.79	1.0	64.	3.8	.0	.0	2365.8	35.1	-.6
JUL	80.	4.9	7.77	1.0	233.	14.3	.0	.0	2359.1	24.7	-10.4
AUG	52.	3.2	6.57	.6	228.	14.0	.0	.0	2348.6	13.3	-11.4
SEP	35.	2.1	4.89	.4	24.	1.4	.0	.0	2349.0	13.6	.3
OCT	44.	2.7	3.22	.2	2.	.1	.0	.0	2351.6	16.0	2.4
NOV	49.	2.9	1.89	.2	2.	.1	.0	.0	2354.1	18.6	2.6
DEC	47.	2.9	.95	.1	2.	.1	.0	.0	2356.4	21.3	2.7
TOTAL		41.7	45.57	5.4		34.3	.8	.0			1.2
					REASONABLE MAXIMUM INFLOW CONDITIONS						
JAN	65.	4.0	.76	.1	2.	.1	.0	.0	2358.5	23.9	3.8
FEB	94.	5.2	.82	.1	2.	.1	.0	.0	2362.0	28.9	5.0
MAR	93.	5.7	1.52	.2	2.	.1	.0	.0	2365.3	34.3	5.4
APR	87.	5.2	3.65	.6	54.	3.2	.0	.0	2366.1	35.7	1.4
MAY	104.	6.4	4.66	.7	2.	.1	5.6	.0	2366.1	35.7	.0
JUN	168.	10.0	5.52	.8	24.	1.4	7.8	.0	2366.1	35.7	.0
JUL	124.	7.6	6.55	1.0	135.	8.3	.0	.0	2365.2	34.0	-1.7
AUG	96.	5.9	5.59	.8	124.	7.6	.0	.0	2363.7	31.5	-2.5
SEP	59.	3.5	3.70	.5	2.	.1	.0	.0	2365.4	34.4	2.9
OCT	62.	3.8	2.44	.4	2.	.1	2.0	.0	2366.1	35.7	1.3
NOV	66.	3.9	1.89	.3	2.	.1	3.5	.0	2366.1	35.7	.0
DEC	59.	3.6	.85	.1	2.	.1	3.4	.0	2366.1	35.7	.0
TOTAL		64.8	37.95	5.6		21.3	22.3	.0			15.6

KEITH SEBELIUS OPERATIONS ESTIMATES - 1992

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIREMENT MEAN CFS	RELEASE REQUIREMENT 1000 AF	RESERVOIR SPILL 1000 AF	REQUIREMENT SHORTAGE 1000 AF	END OF MONTH ELEV FT	END OF MONTH CONT 1000 AF	RESERVOIR CHANGE 1000 AF
					REASONABLE MINIMUM INFLOW CONDITIONS						
JAN	0.	.0	.85	.0	2.	.1	.0	.0	2278.0	4.0	-.1
FEB	2.	.1	.99	.0	2.	.1	.0	.0	2278.0	4.0	.0
MAR	3.	.2	1.71	.1	2.	.1	.0	.0	2278.0	4.0	.0
APR	3.	.2	5.73	.2	2.	.1	.0	.0	2277.7	3.9	-.1
MAY	7.	.4	7.38	.3	2.	.1	.0	.0	2277.7	3.9	.0
JUN	3.	.2	8.70	.3	45.	4.9	.0	4.8	2277.3	3.7	-.2
JUL	0.	.0	9.98	.3	145.	6.7	.0	6.5	2276.2	3.2	-.5
AUG	0.	.0	8.66	.3	117.	6.7	.0	6.5	2274.9	2.7	-.5
SEP	0.	.0	6.22	.2	2.	1.0	.0	1.0	2274.4	2.5	-.2
OCT	0.	.0	5.12	.1	2.	.1	.0	.1	2274.2	2.4	-.1
NOV	0.	.0	1.96	.1	2.	.1	.0	.1	2273.9	2.3	-.1
DEC	2.	.1	1.06	.0	2.	.1	.0	.1	2274.2	2.4	.1
TOTAL		1.2	58.36	1.9		20.1	.0	19.1			-1.7
					MOST PROBABLE INFLOW CONDITIONS						
JAN	3.	.2	.82	.0	2.	.1	.0	.0	2278.4	4.2	.1
FEB	5.	.3	.95	.0	2.	.1	.0	.0	2278.7	4.4	.2
MAR	5.	.3	1.69	.1	2.	.1	.0	.0	2278.9	4.5	.1
APR	8.	.5	5.06	.2	2.	.1	.0	.0	2279.3	4.7	.2
MAY	15.	.9	5.73	.3	2.	.1	.0	.0	2280.2	5.2	.5
JUN	10.	.6	7.24	.3	8.	.5	.0	.0	2279.9	5.0	-.2
JUL	13.	.8	8.38	.3	86.	5.3	.0	4.1	2278.6	4.3	-.7
AUG	5.	.3	7.11	.2	70.	4.3	.0	4.2	2278.6	4.3	.0
SEP	2.	.1	5.26	.2	2.	.1	.0	.0	2278.2	4.1	-.2
OCT	2.	.1	3.60	.1	2.	.1	.0	.0	2278.0	4.0	-.1
NOV	3.	.2	1.96	.1	2.	.1	.0	.0	2278.0	4.0	.0
DEC	3.	.2	1.02	.0	2.	.1	.0	.0	2278.2	4.1	.1
TOTAL		4.5	48.82	1.8		11.0	.0	8.3			.0
					REASONABLE MAXIMUM INFLOW CONDITIONS						
JAN	5.	.3	.79	.0	2.	.1	.0	.0	2278.6	4.3	.2
FEB	11.	.6	.91	.0	2.	.1	.0	.0	2279.5	4.8	.5
MAR	15.	.9	1.67	.1	2.	.1	.0	.0	2280.7	5.5	.7
APR	20.	1.2	4.31	.2	2.	.1	.0	.0	2282.2	6.4	.9
MAY	31.	1.9	4.80	.3	2.	.1	.0	.0	2284.2	7.9	1.5
JUN	42.	2.5	5.63	.4	2.	.1	.0	.0	2286.6	9.9	2.0
JUL	63.	3.9	6.76	.5	26.	1.6	.0	.0	2288.6	11.7	1.8
AUG	57.	3.5	5.85	.5	28.	1.7	.0	.0	2289.8	13.0	1.3
SEP	39.	2.3	4.11	.4	2.	.1	.0	.0	2291.4	14.8	1.8
OCT	24.	1.5	2.58	.2	2.	.1	.0	.0	2292.4	16.0	1.2
NOV	7.	.4	1.96	.2	2.	.1	.0	.0	2292.5	16.1	.1
DEC	7.	.4	.96	.1	2.	.1	.0	.0	2292.7	16.3	.2
TOTAL		19.4	40.33	2.9		4.3	.0	.0			12.2

HARLAN COUNTY LAKE OPERATION ESTIMATES - 1992

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIREMENT MEAN CFS	RELEASE REQUIREMENT 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	75.	4.6	.74	.5	0.	.0	.0	.0	1929.7	141.7	4.1
FEB	130.	7.2	.94	.7	0.	.0	.0	.0	1930.4	148.2	6.5
MAR	200.	12.3	1.63	1.2	0.	.0	.0	.0	1931.7	159.3	11.1
APR	187.	11.1	5.36	4.1	0.	.0	.0	.0	1932.5	166.3	7.0
MAY	207.	12.7	6.43	5.0	0.	.0	.0	.0	1933.3	174.0	7.7
JUN	138.	8.2	7.90	6.1	345.	20.5	.0	.0	1931.3	155.6	-18.4
JUL	85.	5.2	9.05	6.1	690.	42.4	.0	8.5	1927.0	120.8	-34.8
AUG	89.	5.5	7.95	4.9	603.	37.1	.0	36.5	1927.0	120.8	.0
SEP	3.	.2	5.57	3.4	91.	5.4	.0	5.4	1926.6	117.6	-3.2
OCT	5.	.3	4.31	2.6	0.	.0	.0	.0	1926.2	115.3	-2.3
NOV	57.	3.4	1.89	1.1	0.	.0	.0	.0	1926.6	117.6	2.3
DEC	67.	4.1	.97	.6	0.	.0	.0	.0	1927.0	121.1	3.5
TOTAL		74.8	52.74	36.3		105.4	.0	50.4			-16.5
					MOST PROBABLE INFLOW CONDITIONS						
JAN	135.	8.3	.71	.5	0.	.0	.0	.0	1930.1	145.4	7.8
FEB	218.	12.1	.88	.6	0.	.0	.0	.0	1931.4	156.9	11.5
MAR	289.	17.8	1.60	1.2	0.	.0	.0	.0	1933.2	173.5	16.6
APR	311.	18.5	4.40	3.6	0.	.0	.0	.0	1934.8	188.4	14.9
MAY	359.	22.1	5.22	4.4	0.	.0	.0	.0	1936.5	206.1	17.7
JUN	218.	13.0	6.45	5.5	52.	3.1	.0	.0	1936.9	210.5	4.4
JUL	203.	12.5	7.36	6.2	449.	27.6	.0	.0	1934.8	189.2	-21.3
AUG	153.	9.4	6.20	5.0	398.	24.5	.0	.0	1932.8	169.1	-20.1
SEP	119.	7.1	4.73	3.7	45.	2.7	.0	.0	1932.8	169.8	.7
OCT	109.	6.7	3.23	2.5	0.	.0	.0	.0	1933.3	174.0	4.2
NOV	109.	6.5	1.89	1.5	0.	.0	.0	.0	1933.8	179.0	5.0
DEC	117.	7.2	.92	.7	0.	.0	.0	.0	1934.5	185.5	6.5
TOTAL		141.2	43.59	35.4		57.9	.0	.0			47.9
					REASONABLE MAXIMUM INFLOW CONDITIONS						
JAN	185.	11.4	.69	.5	0.	.0	.0	.0	1930.5	148.5	10.9
FEB	367.	20.4	.85	.6	0.	.0	.0	.0	1932.7	168.3	19.8
MAR	504.	31.0	1.55	1.3	0.	.0	.0	.0	1935.7	198.0	29.7
APR	516.	30.7	3.47	3.0	0.	.0	.0	.0	1938.4	225.7	27.7
MAY	696.	42.8	4.32	4.0	0.	.0	.0	.0	1941.9	264.5	38.8
JUN	508.	30.2	5.08	5.0	42.	2.5	.0	.0	1943.8	287.2	22.7
JUL	384.	23.6	5.71	5.9	156.	9.6	.0	.0	1944.5	295.3	8.1
AUG	306.	18.8	4.85	5.1	122.	7.5	.0	.0	1944.9	301.5	6.2
SEP	207.	12.3	3.82	4.1	5.	.3	.0	.0	1945.6	309.4	7.9
OCT	156.	9.6	2.32	2.5	0.	.0	1.4	.0	1946.0	315.1	5.7
NOV	168.	10.0	1.89	2.1	0.	.0	7.9	.0	1946.0	315.1	.0
DEC	184.	11.3	.87	1.0	10.	.6	9.7	.0	1946.0	315.1	.0
TOTAL		252.1	35.42	35.1		20.5	19.0	.0			177.5

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	RES CHANGE 1000 AF
					REASONABLE MINIMUM INFLOW CONDITIONS								
JAN	.0	4.6	75.	4.6	.71	.1	0.	.0	.0	.0	1579.2	32.5	4.5
FEB	.2	4.2	79.	4.4	.89	.2	0.	.0	.0	.0	1580.8	36.7	4.2
MAR	.4	4.6	81.	5.0	1.56	.4	0.	.0	.0	.0	1582.5	41.3	4.6
APR	.6	3.9	76.	4.5	4.59	1.2	0.	.0	.0	.0	1583.5	44.6	3.3
MAY	.8	4.0	78.	4.8	5.78	1.5	13.	.8	.0	.0	1584.3	47.1	2.5
JUN	.3	1.2	25.	1.5	7.05	1.8	116.	6.9	.0	.0	1582.0	39.9	-7.2
JUL	.1	1.2	21.	1.3	8.37	1.6	517.	31.8	.0	9.0	1571.7	16.8	-23.1
AUG	.0	1.2	20.	1.2	7.33	1.0	307.	18.9	.0	18.7	1571.7	16.8	.0
SEP	.0	.6	10.	.6	5.03	.7	35.	2.1	.0	2.1	1571.7	16.7	-.1
OCT	.0	.0	0.	.0	3.61	.5	0.	.0	.0	.0	1571.4	16.2	-.5
NOV	.0	1.6	27.	1.6	1.82	.3	0.	.0	.0	.0	1572.1	17.5	1.3
DEC	.0	3.7	60.	3.7	.90	.1	0.	.0	.0	.0	1574.1	21.1	3.6
TOTAL	2.4	30.8		33.2	47.64	9.4		60.5	.0	29.8			-6.9
					MOST PROBABLE INFLOW CONDITIONS								
JAN	.5	4.6	83.	5.1	.69	.1	0.	.0	.0	.0	1579.4	33.0	5.0
FEB	1.4	4.2	101.	5.6	.83	.2	0.	.0	.0	.0	1581.5	38.4	5.4
MAR	2.2	4.6	111.	6.8	1.53	.4	0.	.0	.0	.0	1583.6	44.8	6.4
APR	2.1	2.1	71.	4.2	3.84	1.0	0.	.0	.0	.0	1584.6	48.0	3.2
MAY	3.3	1.7	81.	5.0	4.75	1.3	7.	.4	.0	.0	1585.6	51.3	3.3
JUN	5.2	1.2	108.	6.4	5.87	1.7	69.	4.1	.6	.0	1585.6	51.3	.0
JUL	3.5	1.2	76.	4.7	6.73	1.7	377.	23.2	.0	.0	1578.7	31.1	-20.2
AUG	.7	1.2	31.	1.9	5.71	1.0	239.	14.7	.0	.0	1572.0	17.3	-13.8
SEP	.3	1.3	27.	1.6	3.91	.6	25.	1.5	.0	.0	1571.7	16.8	-.5
OCT	.5	.0	8.	.5	2.62	.4	0.	.0	.0	.0	1571.8	16.9	.1
NOV	.5	1.6	35.	2.1	1.82	.3	0.	.0	.0	.0	1572.8	18.7	1.8
DEC	.6	3.7	70.	4.3	.85	.1	0.	.0	.0	.0	1575.0	22.9	4.2
TOTAL	20.8	27.4		48.2	39.15	8.8		43.9	.6	.0			-5.1
					REASONABLE MAXIMUM INFLOW CONDITIONS								
JAN	3.5	.0	57.	3.5	.67	.1	0.	.0	.0	.0	1578.8	31.4	3.4
FEB	5.3	.0	95.	5.3	.81	.2	0.	.0	.0	.0	1580.8	36.5	5.1
MAR	12.4	.0	202.	12.4	1.50	.4	0.	.0	.5	.0	1584.6	48.0	11.5
APR	9.2	.0	155.	9.2	3.13	.9	0.	.0	8.3	.0	1584.6	48.0	.0
MAY	14.3	.0	233.	14.3	3.72	1.0	7.	.4	9.6	.0	1585.6	51.3	3.3
JUN	7.9	1.2	153.	9.1	4.75	1.4	39.	2.3	5.4	.0	1585.6	51.3	.0
JUL	11.3	1.2	203.	12.5	5.49	1.5	163.	10.0	10.6	.0	1582.6	41.7	-9.6
AUG	11.2	1.2	202.	12.4	4.19	1.0	125.	7.7	3.7	.0	1582.6	41.7	.0
SEP	10.7	.6	190.	11.3	2.91	.7	13.	.8	9.8	.0	1582.6	41.7	.0
OCT	11.3	.0	184.	11.3	1.77	.4	0.	.0	10.9	.0	1582.6	41.7	.0
NOV	5.8	.0	97.	5.8	1.82	.5	0.	.0	5.3	.0	1582.6	41.7	.0
DEC	4.7	.0	76.	4.7	.81	.2	0.	.0	4.5	.0	1582.6	41.7	.0
TOTAL	107.6	4.2		111.8	31.57	8.3		21.2	68.6	.0			13.7

KIRWIN RESERVOIR OPERATION ESTIMATES - 1992

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIREMENT MEAN CFS	RELEASE REQUIREMENT 1000 AF	RESERVOIR SPILL 1000 AF	REQUIREMENT SHORTAGE 1000 AF	END OF MONTH ELEV FT	MONTH CONT 1000 AF	RESERVOIR CHANGE 1000 AF
					REASONABLE MINIMUM INFLOW CONDITIONS						
JAN	0.	.0	.81	.1	0.	.0	.0	.0	1695.4	8.4	-.1
FEB	4.	.2	1.04	.1	0.	.0	.0	.0	1695.5	8.5	.1
MAR	10.	.6	1.69	.1	0.	.0	.0	.0	1696.1	9.0	.5
APR	3.	.2	4.73	.4	0.	.0	.0	.0	1695.8	8.8	-.2
MAY	20.	1.2	5.93	.5	0.	.0	.0	.0	1696.6	9.5	.7
JUN	7.	.4	7.08	.6	54.	3.2	.0	3.2	1696.4	9.3	-.2
JUL	2.	.1	8.37	.7	143.	8.8	.0	8.8	1695.7	8.7	-.6
AUG	0.	.0	7.57	.6	109.	6.7	.0	6.7	1695.0	8.1	-.6
SEP	0.	.0	5.24	.4	0.	.0	.0	.0	1694.5	7.7	-.4
OCT	0.	.0	4.00	.3	0.	.0	.0	.0	1694.2	7.4	-.3
NOV	0.	.0	1.91	.1	0.	.0	.0	.0	1694.1	7.3	-.1
DEC	0.	.0	1.00	.1	0.	.0	.0	.0	1693.9	7.2	-.1
TOTAL		2.7	49.37	4.0		18.7	.0	18.7			-1.3
					MOST PROBABLE INFLOW CONDITIONS						
JAN	10.	.6	.76	.1	0.	.0	.0	.0	1696.1	9.0	.5
FEB	18.	1.0	.98	.1	0.	.0	.0	.0	1697.1	9.9	.9
MAR	29.	1.8	1.67	.2	0.	.0	.0	.0	1698.6	11.5	1.6
APR	49.	2.9	4.00	.4	0.	.0	.0	.0	1700.6	14.0	2.5
MAY	50.	3.1	4.84	.6	0.	.0	.0	.0	1702.4	16.5	2.5
JUN	35.	2.1	6.11	.7	35.	2.1	.0	.0	1701.9	15.8	-.7
JUL	39.	2.4	6.93	.7	98.	6.0	.0	.0	1698.6	11.5	-4.3
AUG	11.	.7	6.01	.5	75.	4.6	.0	2.7	1697.0	9.8	-1.7
SEP	3.	.2	4.21	.4	0.	.0	.0	.0	1696.8	9.6	-.2
OCT	2.	.1	2.92	.2	0.	.0	.0	.0	1696.6	9.5	-.1
NOV	5.	.3	1.91	.2	0.	.0	.0	.0	1696.8	9.6	.1
DEC	7.	.4	.96	.1	0.	.0	.0	.0	1697.1	9.9	.3
TOTAL		15.6	41.30	4.2		12.7	.0	2.7			1.4
					REASONABLE MAXIMUM INFLOW CONDITIONS						
JAN	23.	1.4	.74	.1	0.	.0	.0	.0	1697.0	9.8	1.3
FEB	58.	3.2	.95	.1	0.	.0	.0	.0	1699.7	12.9	3.1
MAR	68.	4.2	1.65	.2	0.	.0	.0	.0	1702.7	16.9	4.0
APR	74.	4.4	3.36	.4	0.	.0	.0	.0	1705.3	20.9	4.0
MAY	133.	8.2	4.12	.6	0.	.0	.0	.0	1709.5	28.5	7.6
JUN	183.	10.9	4.91	1.0	22.	1.3	.0	.0	1713.2	37.1	8.6
JUL	99.	6.1	5.75	1.3	60.	3.7	.0	.0	1713.6	38.2	1.1
AUG	220.	13.5	4.70	1.2	46.	2.8	.0	.0	1716.8	47.7	9.5
SEP	133.	7.9	3.29	.9	0.	.0	.0	.0	1718.8	54.7	7.0
OCT	76.	4.7	2.09	.6	0.	.0	.0	.0	1719.9	58.8	4.1
NOV	49.	2.9	1.91	.6	0.	.0	.0	.0	1720.6	61.1	2.3
DEC	39.	2.4	.90	.3	0.	.0	.0	.0	1721.1	63.2	2.1
TOTAL		69.8	34.37	7.3		7.8	.0	.0			54.7

WEBSTER RESERVOIR OPERATION ESTIMATES - 1992

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIREMENT MEAN CFS	RELEASE REQUIREMENT 1000 AF	RESERVOIR SPILL 1000 AF	REQUIREMENT SHORTAGE 1000 AF	END OF MONTH ELEV FT	END OF MONTH CONT 1000 AF	RESERVOIR CHANGE 1000 AF
REASONABLE MINIMUM INFLOW CONDITIONS											
JAN	0.	.0	.88	.1	0.	.0	.0	.0	1859.1	4.5	-.1
FEB	2.	.1	1.03	.1	0.	.0	.0	.0	1859.1	4.5	.0
MAR	2.	.1	1.77	.1	0.	.0	.0	.0	1859.1	4.5	.0
APR	8.	.5	5.31	.4	0.	.0	.0	.0	1859.2	4.6	.1
MAY	20.	1.2	6.48	.5	0.	.0	.0	.0	1860.0	5.3	.7
JUN	2.	.1	8.11	.6	77.	4.6	.0	4.6	1859.4	4.8	-.5
JUL	0.	.0	9.26	.6	148.	9.1	.0	9.1	1858.7	4.2	-.6
AUG	0.	.0	8.30	.5	114.	7.0	.0	7.0	1858.0	3.7	-.5
SEP	0.	.0	5.88	.3	0.	.0	.0	.0	1857.6	3.4	-.3
OCT	0.	.0	4.54	.3	0.	.0	.0	.0	1857.2	3.1	-.3
NOV	0.	.0	1.96	.1	0.	.0	.0	.0	1857.0	3.0	-.1
DEC	0.	.0	1.08	.1	0.	.0	.0	.0	1856.8	2.9	-.1
TOTAL		2.0	54.60	3.7		20.7	.0	20.7			-1.7
MOST PROBABLE INFLOW CONDITIONS											
JAN	5.	.3	.84	.1	0.	.0	.0	.0	1859.4	4.8	.2
FEB	16.	.9	.97	.1	0.	.0	.0	.0	1860.3	5.6	.8
MAR	31.	1.9	1.76	.1	0.	.0	.0	.0	1862.1	7.4	1.8
APR	39.	2.3	4.31	.4	0.	.0	.0	.0	1863.8	9.3	1.9
MAY	44.	2.7	5.28	.5	0.	.0	.0	.0	1865.6	11.5	2.2
JUN	34.	2.0	6.83	.7	37.	2.2	.0	.0	1864.9	10.6	-.9
JUL	8.	.5	7.71	.7	106.	6.5	.0	1.4	1860.0	5.3	-5.3
AUG	11.	.7	6.66	.5	81.	5.0	.0	4.8	1860.0	5.3	.0
SEP	0.	.0	4.92	.4	0.	.0	.0	.0	1859.5	4.9	-.4
OCT	2.	.1	3.37	.2	0.	.0	.0	.0	1859.4	4.8	-.1
NOV	2.	.1	1.96	.1	0.	.0	.0	.0	1859.4	4.8	.0
DEC	5.	.3	1.04	.1	0.	.0	.0	.0	1859.6	5.0	.2
TOTAL		11.8	45.65	3.9		13.7	.0	6.2			.4
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	24.	1.5	.81	.1	0.	.0	.0	.0	1860.7	6.0	1.4
FEB	41.	2.3	.93	.1	0.	.0	.0	.0	1862.9	8.2	2.2
MAR	50.	3.1	1.74	.2	0.	.0	.0	.0	1865.3	11.1	2.9
APR	106.	6.3	3.52	.4	0.	.0	.0	.0	1869.3	17.0	5.9
MAY	102.	6.3	4.45	.7	0.	.0	.0	.0	1872.5	22.6	5.6
JUN	77.	4.6	5.45	.9	0.	.0	.0	.0	1874.4	26.3	3.7
JUL	124.	7.6	6.50	1.1	52.	3.2	.0	.0	1876.0	29.6	3.3
AUG	88.	5.4	5.43	1.0	36.	2.2	.0	.0	1877.0	31.8	2.2
SEP	37.	2.2	3.65	.7	0.	.0	.0	.0	1877.7	33.3	1.5
OCT	39.	2.4	2.33	.5	0.	.0	.0	.0	1878.5	35.2	1.9
NOV	27.	1.6	1.96	.4	0.	.0	.0	.0	1879.0	36.4	1.2
DEC	20.	1.2	1.00	.2	0.	.0	.0	.0	1879.4	37.4	1.0
TOTAL		44.5	37.77	6.3		5.4	.0	.0			32.8

WACONDA LAKE OPERATION ESTIMATES - 1992

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIREMENT MEAN CFS	RELEASE REQUIREMENT 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	26.	1.6	.78	.7	15.	.9	.0	.0	1450.3	180.8	.0
FEB	40.	2.2	.95	.8	25.	1.4	.0	.0	1450.3	180.8	.0
MAR	44.	2.7	1.67	1.4	11.	.7	.0	.0	1450.4	181.4	.6
APR	52.	3.1	5.65	4.9	2.	.1	.0	.0	1450.2	179.5	-1.9
MAY	86.	5.3	6.78	5.8	2.	.1	.0	.0	1450.1	178.9	-.6
JUN	84.	5.0	8.62	7.3	35.	2.1	.0	.0	1449.7	174.5	-4.4
JUL	41.	2.5	10.50	8.6	99.	6.1	.0	.0	1448.4	162.3	-12.2
AUG	33.	2.0	9.14	7.2	99.	6.1	.0	.0	1447.3	151.0	-11.3
SEP	2.	.1	6.59	5.0	35.	2.1	.0	.0	1446.5	144.0	-7.0
OCT	2.	.1	4.70	3.5	2.	.1	.0	.0	1446.1	140.5	-3.5
NOV	22.	1.3	1.89	1.4	2.	.1	.0	.0	1446.1	140.3	-.2
DEC	18.	1.1	.95	.7	11.	.7	.0	.0	1446.0	140.0	-.3
TOTAL		27.0	58.22	47.3		20.5	.0	.0			-40.8
					MOST PROBABLE INFLOW CONDITIONS						
JAN	50.	3.1	.73	.6	41.	2.5	.0	.0	1450.3	180.8	.0
FEB	106.	5.9	.88	.8	92.	5.1	.0	.0	1450.3	180.8	.0
MAR	148.	9.1	1.65	1.4	11.	.7	.0	.0	1451.0	187.8	7.0
APR	155.	9.2	4.70	4.2	2.	.1	.0	.0	1451.4	192.7	4.9
MAY	233.	14.3	5.44	5.0	2.	.1	.0	.0	1452.3	201.9	9.2
JUN	200.	11.9	7.15	6.7	25.	1.5	.0	.0	1452.6	205.6	3.7
JUL	143.	8.8	8.52	8.0	70.	4.3	.0	.0	1452.3	202.1	-3.5
AUG	125.	7.7	7.20	6.7	70.	4.3	.0	.0	1452.0	198.8	-3.3
SEP	124.	7.4	5.33	4.9	25.	1.5	.0	.0	1452.1	199.8	1.0
OCT	85.	5.2	3.51	3.3	2.	.1	.0	.0	1452.2	201.6	1.8
NOV	45.	2.7	1.89	1.8	2.	.1	.0	.0	1452.3	202.4	.8
DEC	55.	3.4	.93	.9	41.	2.5	.0	.0	1452.3	202.4	.0
TOTAL		88.7	47.93	44.3		22.8	.0	.0			21.6
					REASONABLE MAXIMUM INFLOW CONDITIONS						
JAN	168.	10.3	.69	.6	158.	9.7	.0	.0	1450.3	180.8	.0
FEB	319.	17.7	.84	.7	306.	17.0	.0	.0	1450.3	180.8	.0
MAR	677.	41.6	1.61	1.5	2.	.1	.0	.0	1453.9	220.8	40.0
APR	716.	42.6	3.80	3.9	2.	.1	17.9	.0	1455.6	241.5	20.7
MAY	620.	38.1	4.63	4.9	2.	.1	33.1	.0	1455.6	241.5	.0
JUN	654.	38.9	5.73	6.0	2.	.1	32.8	.0	1455.6	241.5	.0
JUL	652.	40.1	6.52	6.8	2.	.1	33.2	.0	1455.6	241.5	.0
AUG	346.	21.3	5.82	6.1	2.	.1	15.1	.0	1455.6	241.5	.0
SEP	412.	24.5	4.18	4.4	2.	.1	20.0	.0	1455.6	241.5	.0
OCT	259.	15.9	2.55	2.7	299.	18.4	.0	.0	1455.2	236.3	-5.2
NOV	158.	9.4	1.89	1.9	301.	17.9	.0	.0	1454.3	225.9	-10.4
DEC	151.	9.3	.88	.9	137.	8.4	.0	.0	1454.3	225.9	.0
TOTAL		309.7	39.14	40.4		72.1	152.1	.0			45.1

CEDAR BLUFF RESERVOIR OPERATION ESTIMATES - 1992

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIREMENT MEAN CFS	RELEASE REQUIREMENT 1000 AF	RESERVOIR SPILL 1000 AF	REQUIREMENT SHORTAGE 1000 AF	END OF MONTH ELEV FT	END OF MONTH CONT 1000 AF	RESERVOIR CHANGE 1000 AF
					REASONABLE MINIMUM INFLOW CONDITIONS						
JAN	0.	.0	1.06	.1	0.	.0	.0	.0	2093.5	11.9	-.1
FEB	0.	.0	1.18	.1	0.	.0	.0	.0	2093.4	11.8	-.1
MAR	0.	.0	1.92	.2	2.	.1	.0	.0	2093.1	11.5	-.3
APR	5.	.3	6.51	.6	2.	.1	.0	.0	2092.8	11.1	-.4
MAY	10.	.6	7.87	.7	7.	.4	.0	.0	2092.3	10.6	-.5
JUN	5.	.3	9.39	.8	87.	5.2	.0	4.8	2091.5	9.7	-.9
JUL	0.	.0	11.13	.8	138.	8.5	.0	7.9	2090.0	8.3	-1.4
AUG	0.	.0	9.68	.6	137.	8.4	.0	8.4	2089.4	7.7	-.6
SEP	0.	.0	7.57	.4	18.	1.1	.0	1.1	2088.9	7.3	-.4
OCT	0.	.0	6.25	.4	0.	.0	.0	.0	2088.4	6.9	-.4
NOV	0.	.0	2.07	.1	0.	.0	.0	.0	2088.3	6.8	-.1
DEC	0.	.0	1.19	.1	0.	.0	.0	.0	2088.1	6.7	-.1
TOTAL		1.2	65.82	4.9		23.8	.0	22.2			-5.3
					MOST PROBABLE INFLOW CONDITIONS						
JAN	2.	.1	.95	.1	0.	.0	.0	.0	2093.5	12.0	.0
FEB	9.	.5	1.06	.1	0.	.0	.0	.0	2093.9	12.4	.4
MAR	10.	.6	1.90	.2	2.	.1	.0	.0	2094.1	12.7	.3
APR	24.	1.4	5.29	.5	2.	.1	.0	.0	2094.8	13.5	.8
MAY	31.	1.9	6.29	.7	3.	.2	.0	.0	2095.5	14.5	1.0
JUN	27.	1.6	7.84	.8	59.	3.5	.0	3.3	2096.0	15.1	.6
JUL	20.	1.2	9.12	.8	99.	6.1	.0	5.5	2095.9	14.9	-.2
AUG	16.	1.0	7.76	.6	106.	6.5	.0	6.1	2095.9	14.9	.0
SEP	2.	.1	6.17	.4	2.	.1	.0	.0	2095.5	14.5	-.4
OCT	2.	.1	4.44	.3	0.	.0	.0	.0	2095.4	14.3	-.2
NOV	0.	.0	2.07	.1	0.	.0	.0	.0	2095.3	14.2	-.1
DEC	0.	.0	1.11	.1	0.	.0	.0	.0	2095.2	14.1	-.1
TOTAL		8.5	54.00	4.7		16.6	.0	14.9			2.1
					REASONABLE MAXIMUM INFLOW CONDITIONS						
JAN	18.	1.1	.86	.1	0.	.0	.0	.0	2094.4	13.0	1.0
FEB	29.	1.6	.97	.1	0.	.0	.0	.0	2095.5	14.5	1.5
MAR	68.	4.2	1.86	.2	2.	.1	.0	.0	2098.3	18.4	3.9
APR	91.	5.4	4.10	.5	2.	.1	.0	.0	2101.4	23.2	4.8
MAY	91.	5.6	4.93	.7	3.	.2	.0	.0	2104.0	27.9	4.7
JUN	153.	9.1	6.21	1.0	39.	2.3	.0	1.6	2107.8	35.3	7.4
JUL	250.	15.4	7.55	1.4	59.	3.6	.0	.0	2112.4	45.7	10.4
AUG	127.	7.8	6.36	1.3	63.	3.9	.0	.0	2113.4	48.3	2.6
SEP	61.	3.6	4.78	1.0	0.	.0	.0	.0	2114.4	50.9	2.6
OCT	62.	3.8	3.05	.7	0.	.0	.0	.0	2115.6	54.0	3.1
NOV	27.	1.6	2.07	.5	0.	.0	.0	.0	2116.0	55.1	1.1
DEC	21.	1.3	1.00	.2	0.	.0	.0	.0	2116.4	56.2	1.1
TOTAL		60.5	43.74	7.7		10.2	.0	1.6			44.2

TABLE 5
FLOOD DAMAGES PREVENTED BY NEBRASKA-KANSAS PROJECTS RESERVOIRS

BONNY

Year	$ Damages Prevented	Cumulative Total
1951	293,000	293,000
1953	135,000	428,000
1957	1,050,000	1,478,000
1960	169,000	1,647,000
1965	273,000	1,920,000
1967	42,000	1,962,000
1969	200,000	2,162,000

ENDERS

Year	$ Damages Prevented	Cumulative Total
1951	220,000	220,000
1956	104,000	324,000
1960	412,000	736,000
1962	37,000	773,000
1965	137,000	910,000
1967	42,000	952,000
1969	1,000	953,000

SWANSON

Year	$ Damages Prevented	Cumulative Total
1957	233,000	233,000
1960	900,000	1,133,000
1962	126,000	1,259,000
1964	50,000	1,309,000
1965	477,000	1,786,000
1967	182,000	1,968,000
1969	1,000	1,969,000

HUGH BUTLER

Year	$ Damages Prevented	Cumulative Total
1962	2,000	2,000
1965	137,000	139,000
1967	42,000	181,000

HARRY STRUNK

Year	$ Damages Prevented	Cumulative Total
1951	14,000	14,000
1957	5,000	19,000
1960	198,000	217,000
1962	29,000	246,000
1967	129,000	375,000
1969	6,000	381,000

KEITH SEBELIUS

Year	$ Damages Prevented	Cumulative Total
1966	132,000	132,000
1967	885,000	1,017,000
1972	498,000	1,515,000

HARLAN COUNTY

Year	$ Damages Prevented	Cumulative Total
1957	1,045,000	1,045,000
1960	4,853,000	5,898,000
1961	255,000	6,153,000
1962	45,000	6,198,000
1964	182,000	6,380,000
1965	60,000	6,440,000
1966	1,658,000	8,098,000
1967	3,539,000	11,637,000
1969	14,000	11,651,000
1971	64,000	11,715,000
1973	1,310,000	13,025,000
1974	1,000	13,026,000
1975	200,000	13,226,000
1976	1,000	13,227,000
1978	100,000	13,327,000
1979	21,000	13,348,000
1981	21,000	13,369,000
1982	465,000	13,834,000
1983	1,874,000	15,708,000
1984	1,639,000	17,347,000
1986	6,756,000	24,103,000
1987	2,336,000	26,439,000
1989	674,000	27,113,000
1990	183,000	27,296,000

LOVEWELL

Year	$ Damages Prevented	Cumulative Total
1957	349,000	349,000
1960	178,000	527,000
1961	165,000	692,000
1962	5,000	697,000
1971	9,000	706,000
1973	1,728,000	2,434,000
1975	98,000	2,532,000
1978	25,000	2,557,000
1979	13,000	2,570,000
1981	8,000	2,578,000
1982	18,000	2,596,000
1983	511,000	3,107,000
1984	276,000	3,383,000
1985	140,000	3,523,000
1986	354,000	3,877,000
1987	1,185,000	5,062,000
1989	2,259,000	7,321,000
1990	77,000	7,398,000

KIRWIN

Year	$ Damages Prevented	Cumulative Total
1957	522,000	522,000
1958	10,000	532,000
1960	499,000	1,031,000
1961	1,000	1,032,000
1962	1,000	1,033,000
1964	34,000	1,067,000
1965	325,000	1,392,000
1967	191,000	1,583,000
1968	44,000	1,627,000
1969	2,000	1,629,000
1971	3,000	1,632,000
1973	40,000	1,672,000
1975	618,000	2,290,000
1978	4,000	2,294,000
1979	35,000	2,329,000
1982	25,000	2,354,000
1983	1,000	2,355,000
1985	60,000	2,415,000
1986	60,000	2,475,000
1987	441,000	2,916,000
1989	236,000	3,152,000
1990	54,000	3,206,000

WEBSTER

Year	$ Damages Prevented	Cumulative Total
1957	326,000	326,000
1958	114,000	440,000
1960	1,018,000	1,458,000
1961	1,000	1,459,000
1962	1,000	1,460,000
1964	17,000	1,477,000
1965	325,000	1,802,000
1967	85,000	1,887,000
1968	2,000	1,889,000
1969	1,000	1,890,000
1971	3,000	1,893,000
1973	54,000	1,947,000
1975	885,000	2,832,000
1978	2,000	2,834,000
1979	16,000	2,850,000
1982	36,000	2,886,000
1987	447,000	3,333,000
1989	286,000	3,619,000
1990	54,000	3,673,000

WACONDA

Year	$ Damages Prevented	Cumulative Total
1968	280,000	280,000
1969	606,000	886,000
1971	9,000	895,000
1973	3,797,000	4,692,000
1974	1,000	4,693,000
1975	967,000	5,660,000
1978	11,000	5,671,000
1979	959,000	6,630,000
1981	24,000	6,654,000
1982	1,398,000	8,052,000
1983	360,000	8,412,000
1984	1,363,000	9,775,000
1985	331,000	10,106,000
1986	1,269,000	11,375,000
1987	5,699,000	17,074,000
1989	1,779,000	18,853,000
1990	194,000	19,047,000
1991	31,000	19,078,000

CEDAR BLUFF

Year	$ Damages Prevented	Cumulative Total
1951	597,000	597,000
1955	357,000	954,000
1956	19,000	973,000
1957	4,812,000	5,785,000
1958	829,000	6,614,000
1960	1,573,000	8,187,000
1961	101,000	8,288,000
1962	1,000	8,289,000
1964	17,000	8,306,000
1965	38,000	8,344,000
1967	42,000	8,386,000
1969	1,000	8,387,000
1971	8,000	8,395,000
1973	536,000	8,931,000
1975	11,000	8,942,000
1979	2,000	8,944,000
1981	1,000	8,945,000
1982	48,000	8,993,000
1983	1,000	8,994,000
1985	3,000	8,997,000
1987	31,000	9,028,000

PROJECT TOTALS

Year	$ Damages Prevented	Cumulative Total
1951	1,124,000	1,124,000
1953	135,000	1,259,000
1955	357,000	1,616,000
1956	123,000	1,739,000
1957	8,342,000	10,081,000
1958	953,000	11,034,000
1960	9,800,000	20,834,000
1961	523,000	21,357,000
1962	247,000	21,604,000
1964	300,000	21,904,000
1965	1,772,000	23,676,000
1966	1,790,000	25,466,000
1967	5,179,000	30,645,000
1968	326,000	30,971,000
1969	832,000	31,803,000
1971	96,000	31,899,000
1972	498,000	32,397,000
1973	7,465,000	39,862,000
1974	2,000	39,864,000
1975	2,779,000	42,643,000
1976	1,000	42,644,000
1978	142,000	42,786,000
1979	1,046,000	43,832,000
1981	54,000	43,886,000
1982	1,990,000	45,876,000
1983	2,747,000	48,623,000
1984	3,278,000	51,901,000
1985	534,000	52,435,000
1986	8,439,000	60,874,000
1987	10,139,000	71,013,000
1989	5,234,000	76,247,000
1990	562,000	76,809,000
1991	31,000	76,840,000

NOTE: Construction cost of storage dams -- $208,954,130
The reservoirs upstream from Harlan County Lake have not received benefits for damages prevented since 1972.

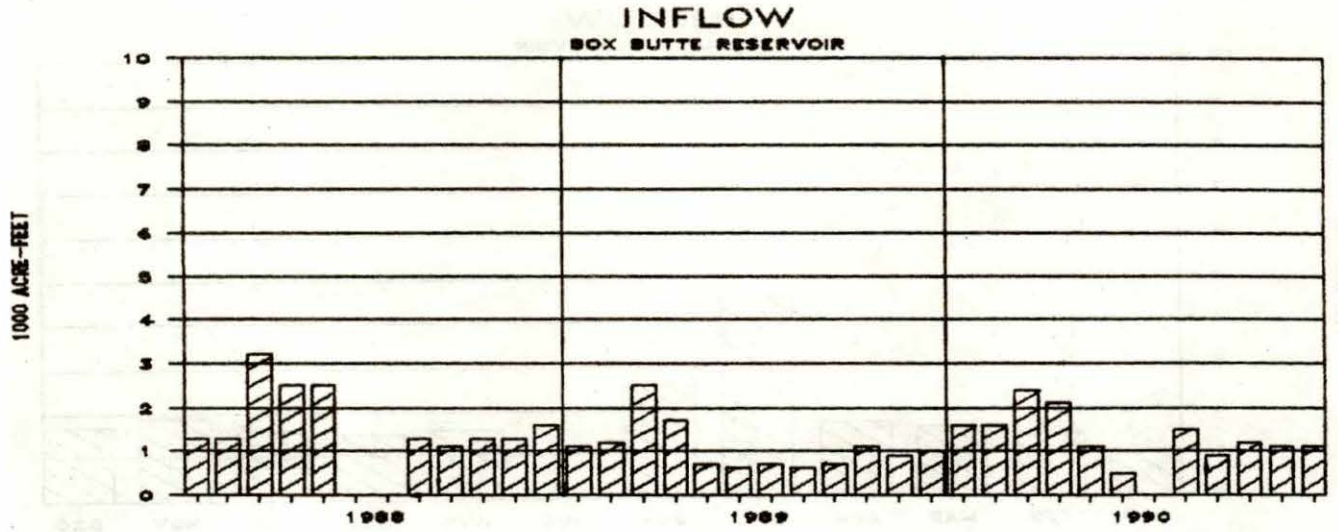
TABLE 6
WATER DIVERTED IN 1991 AND THE
ESTIMATED DIVERSION FOR 1992
(Units - Acre-Feet)

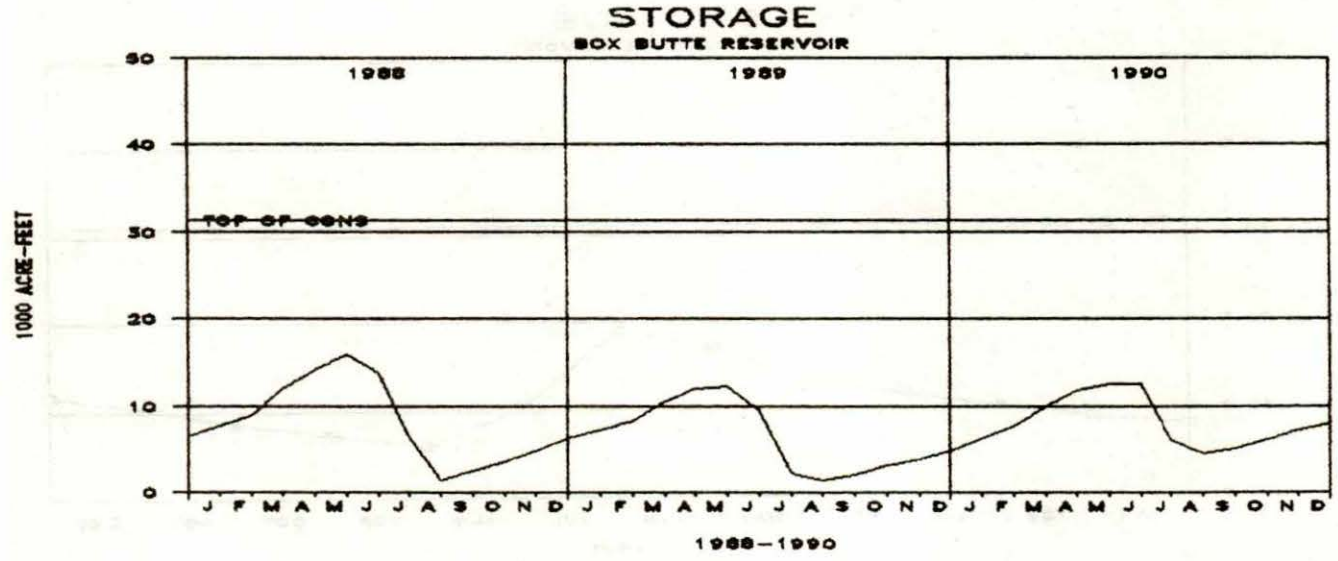
Irrigation District and Canal	1991 Irrigation Operations From	To	10-Year Average Diversion (1981-90)	1991 Diversion	Estimated Diversion in 1992
Mirage Flats Irrigation District					
Mirage Flats Canal	7/03	8/31	14,646	13,333	15,000
Ainsworth Irrigation District					
Ainsworth Canal	5/14	9/15	66,507	75,012	80,000
Sargent Irrigation District					
Sargent Canal	6/18	9/09	24,690	27,470	25,000
Farwell Irrigation District					
Farwell Canal	6/05	8/31	72,674	84,828	78,000
Twin Loups Irrigation District					
Above Davis Creek	4/23	9/09	--	53,672	60,000
Below Davis Creek	--	--	--	0	0
Total Twin Loups Irrigation District			--	53,672	60,000
Frenchman Valley Irrigation District					
Culbertson Canal	3/25	8/16	11,841	10,972	11,000
H & RW Irrigation District					
Culbertson Extension Canal	5/22	8/20	16,583	11,178	10,000
Frenchman-Cambridge Irrigation District					
Meeker-Driftwood Canal	6/17	8/25	30,432	25,903	27,000
Red Willow Canal	6/19	8/23	8,204	7,019	8,000
Bartley Canal	6/21	8/23	9,008	8,134	9,000
Cambridge Canal	6/20	8/23	27,431	25,803	26,000
Total Frenchman-Cambridge Irrigation District			75,075	66,859	70,000
Almena Irrigation District					
Almena Canal	No irrigation in 1991		987	0	0
Bostwick Irrigation District in Nebraska					
Franklin Canal	6/24	8/24	26,993	20,808	15,000
Naponee Canal	6/22	8/22	2,932	2,094	1,600
Franklin Pump Canal	6/21	8/22	2,996	2,784	1,800
Superior Canal	6/17	8/22	14,306	12,235	8,000
Courtland Canal (Nebraska)	3/05	12/31	1,680	2,072	1,400
Total Bostwick Irrigation District in Nebraska			48,907	39,993	27,800
Kansas-Bostwick Irrigation District					
Courtland Canal above Lovewell	3/06	12/31	25,744	20,850	14,000
Courtland Canal below Lovewell	5/16	8/23	46,604	43,260	37,000
Total Kansas-Bostwick Irrigation District			72,348	64,110	51,000
Kirwin Irrigation District					
Kirwin Canal	No irrigation in 1991		8,405	0	0
Webster Irrigation District					
Osborne Canal	7/03	8/02	5,099	4,916	0
Cedar Bluff Irrigation District					
Cedar Bluff Canal	No irrigation in 1991		0	0	0
TOTAL			417,762	452,343	427,800

EXHIBIT 1A

BOX BUTTE RESERVOIR

OPERATION





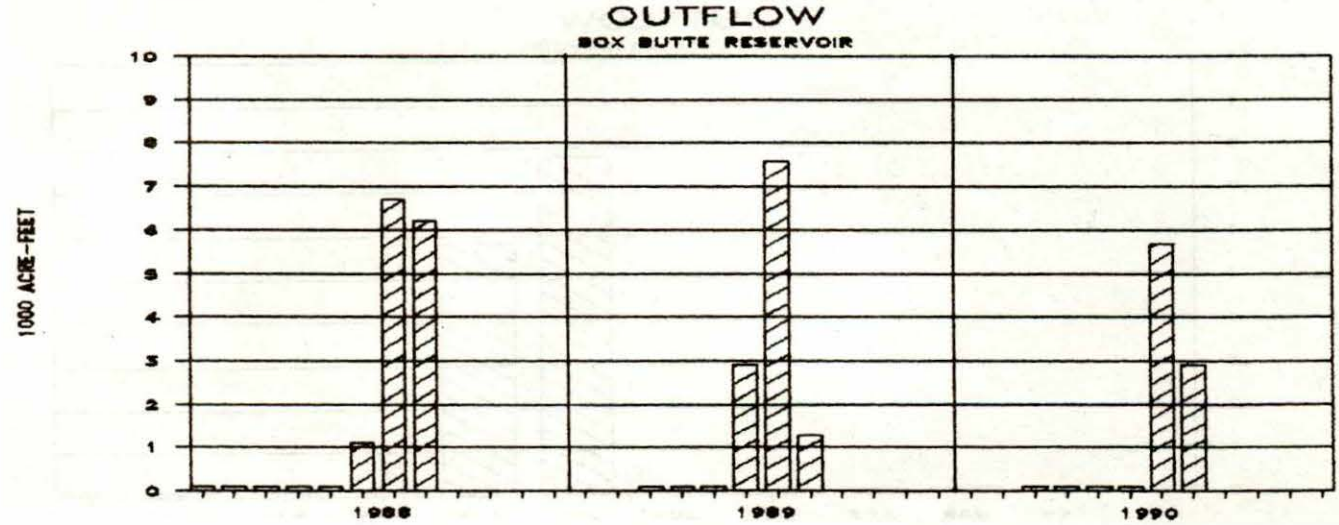
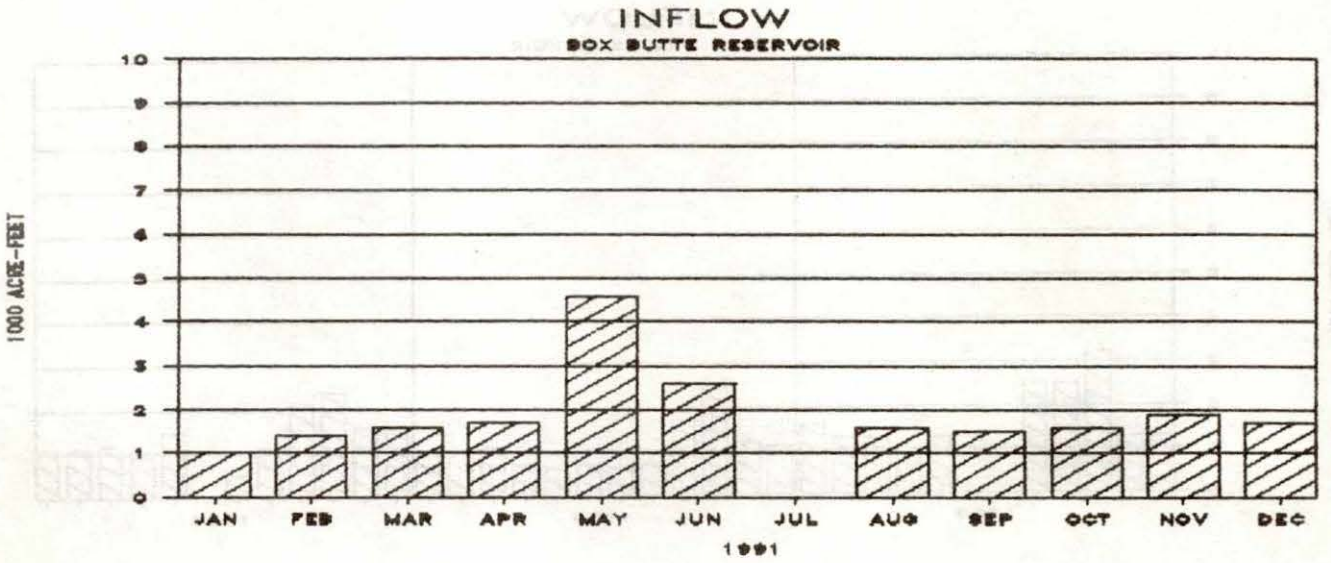
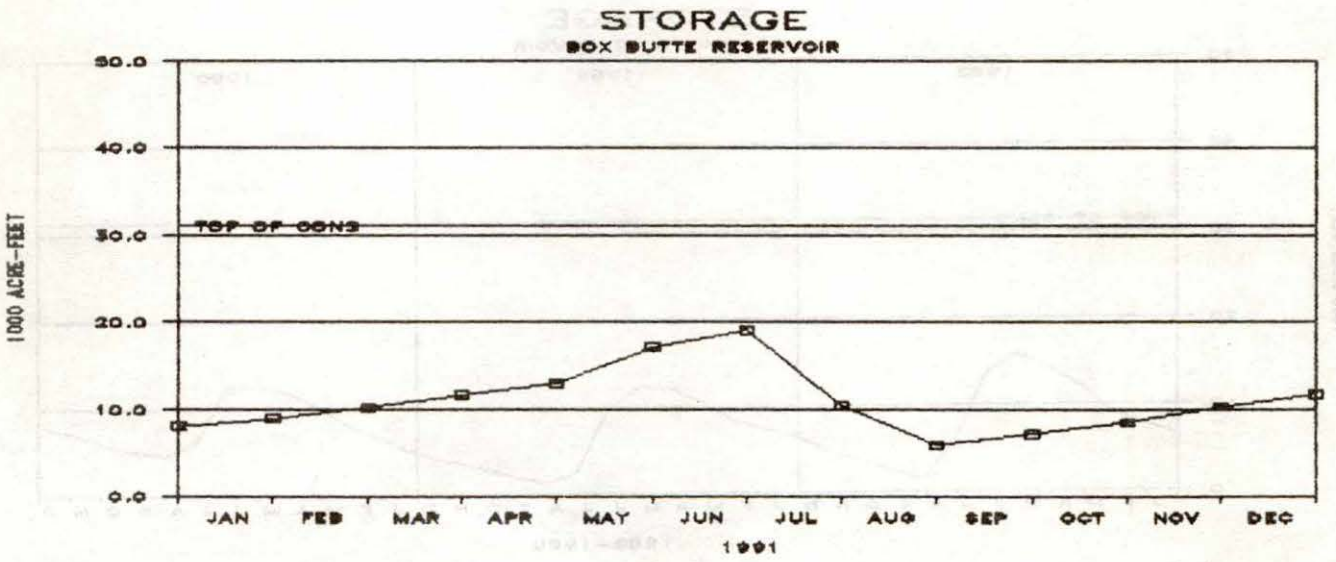


EXHIBIT 1B

BOX BUTTE RESERVOIR

1991 OPERATION





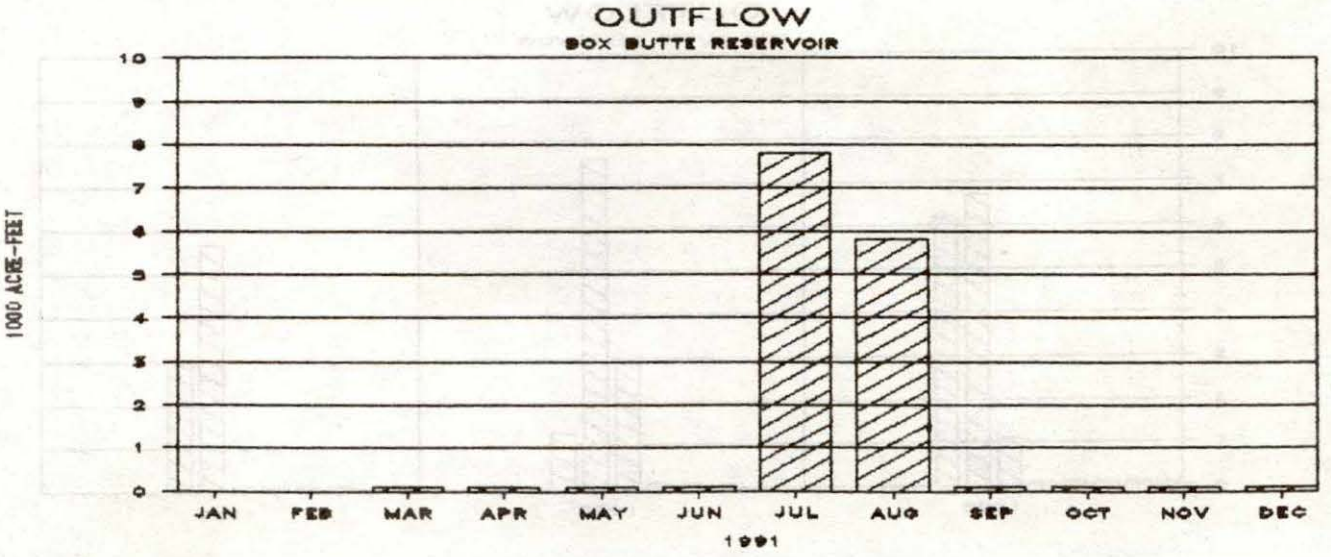
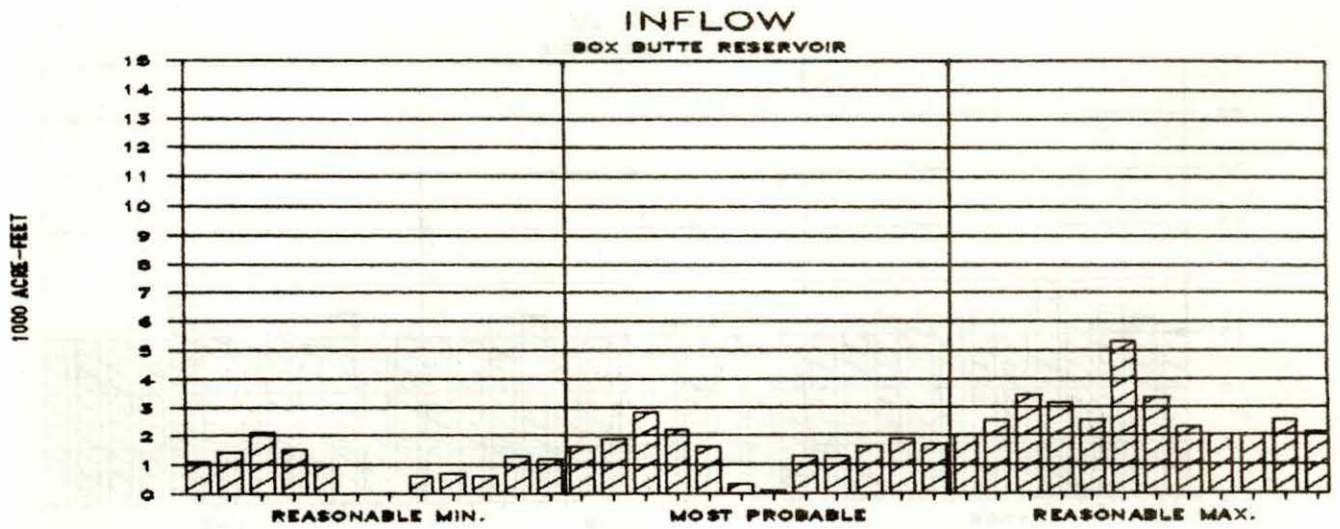
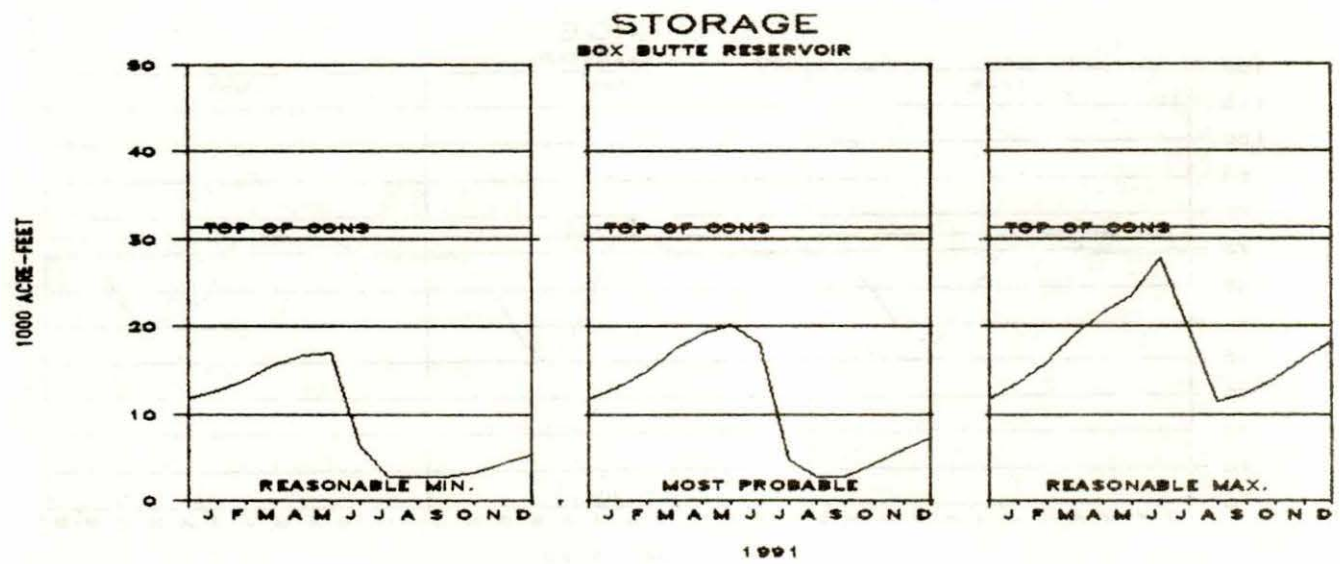


EXHIBIT 1C

BOX BUTTE RESERVOIR

1992 OPERATION PLAN





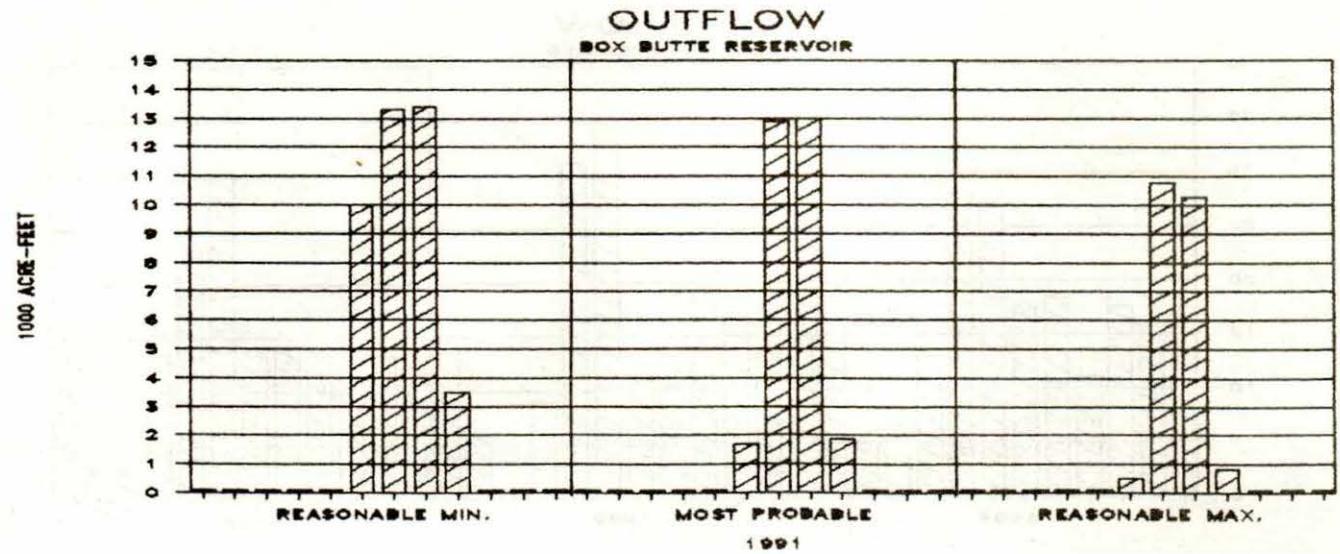
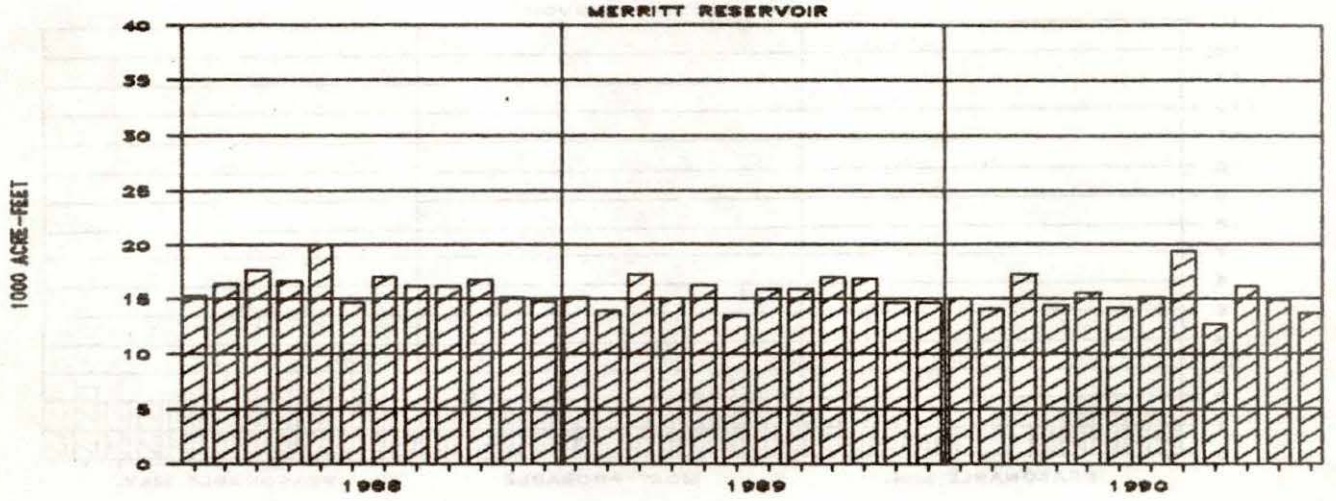


EXHIBIT 2A

MERRITT RESERVOIR
OPERATION

INFLOW
MERRITT RESERVOIR



STORAGE
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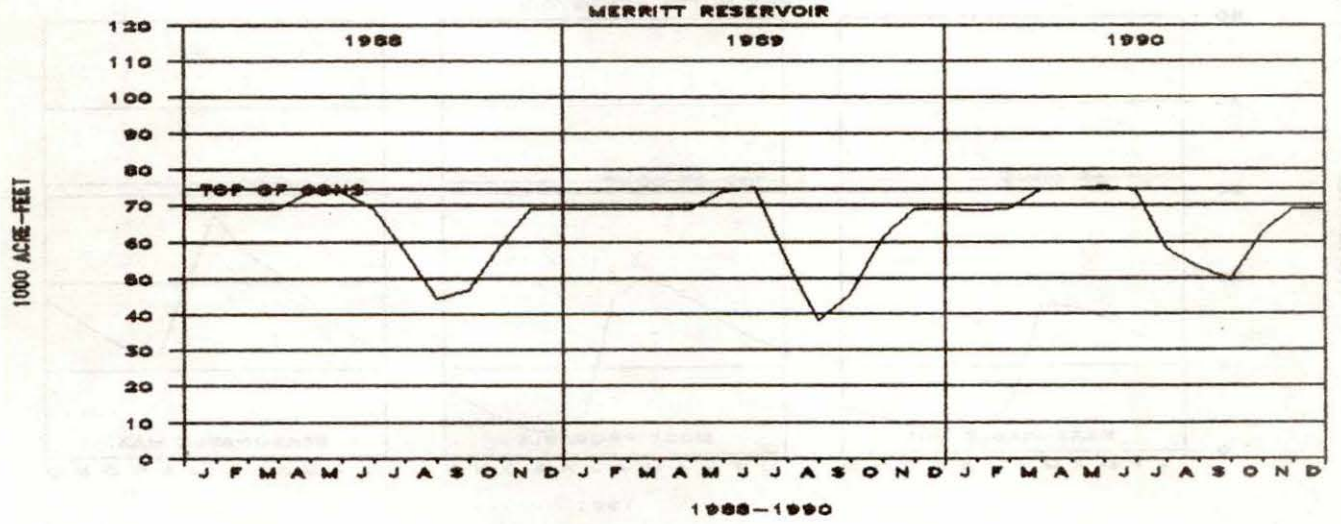

OUTFLOW
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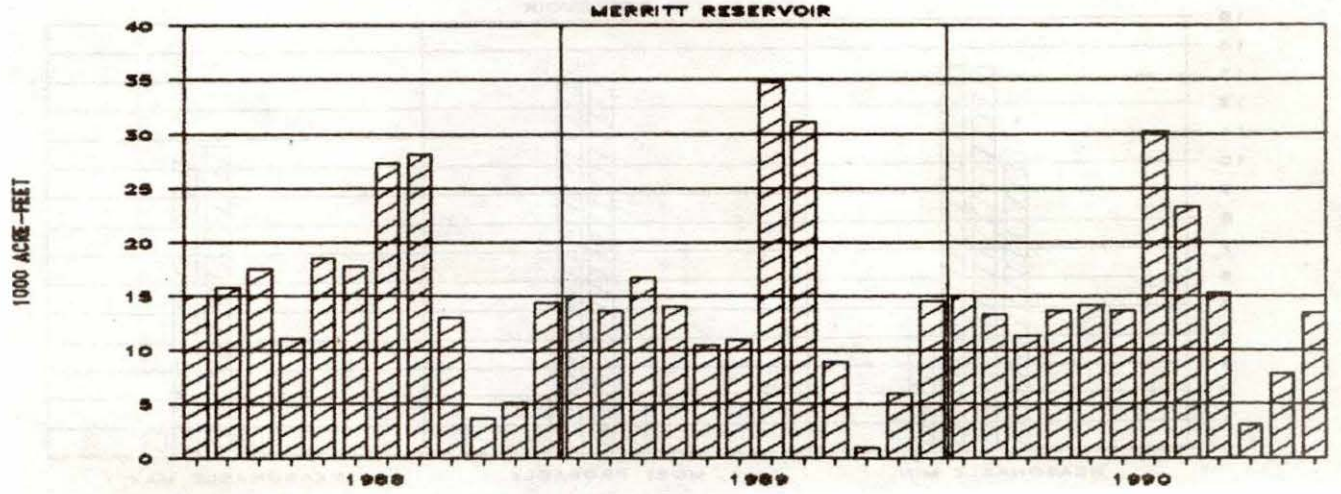
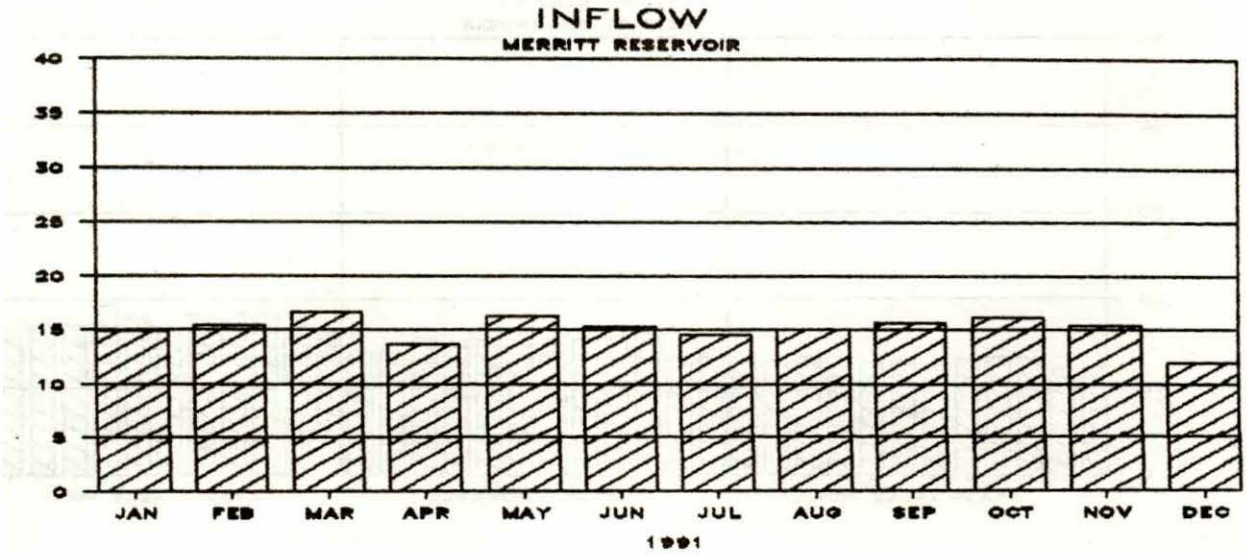
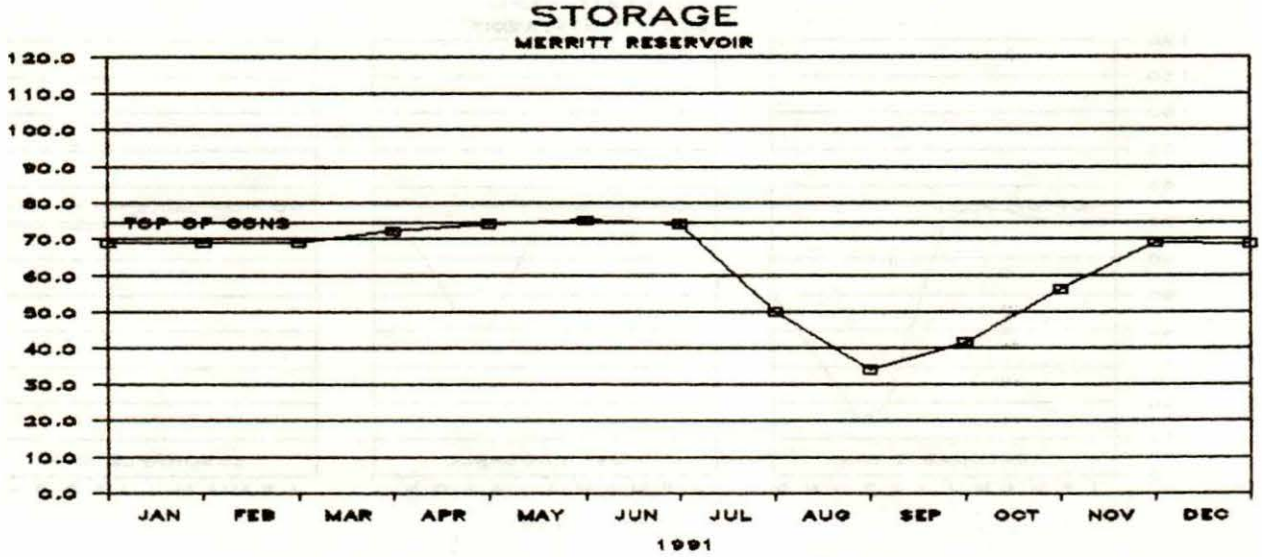


EXHIBIT 2B

MERRITT RESERVOIR

1991 OPERATION





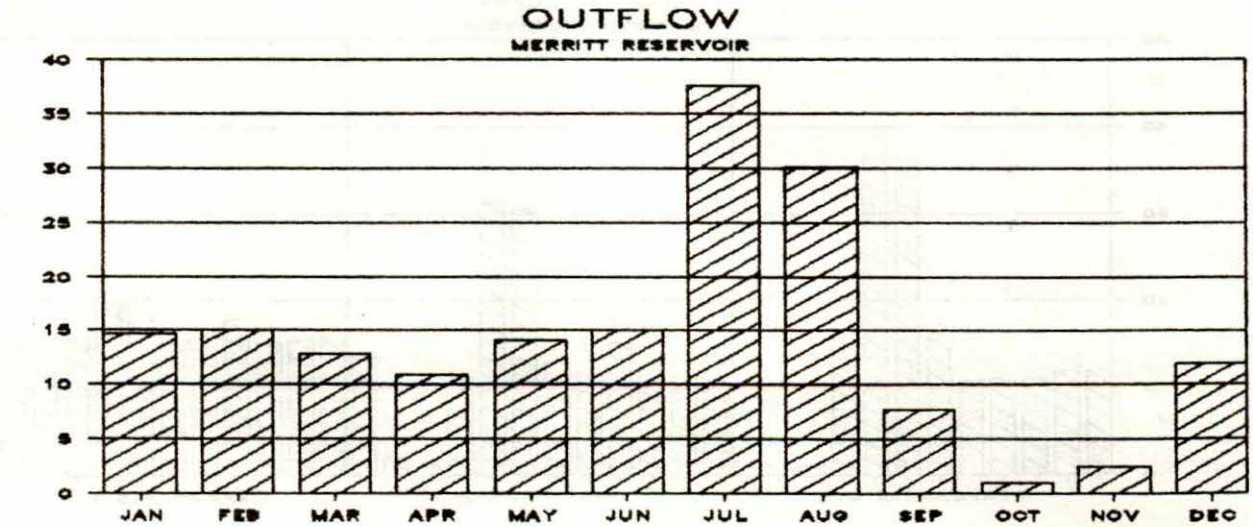
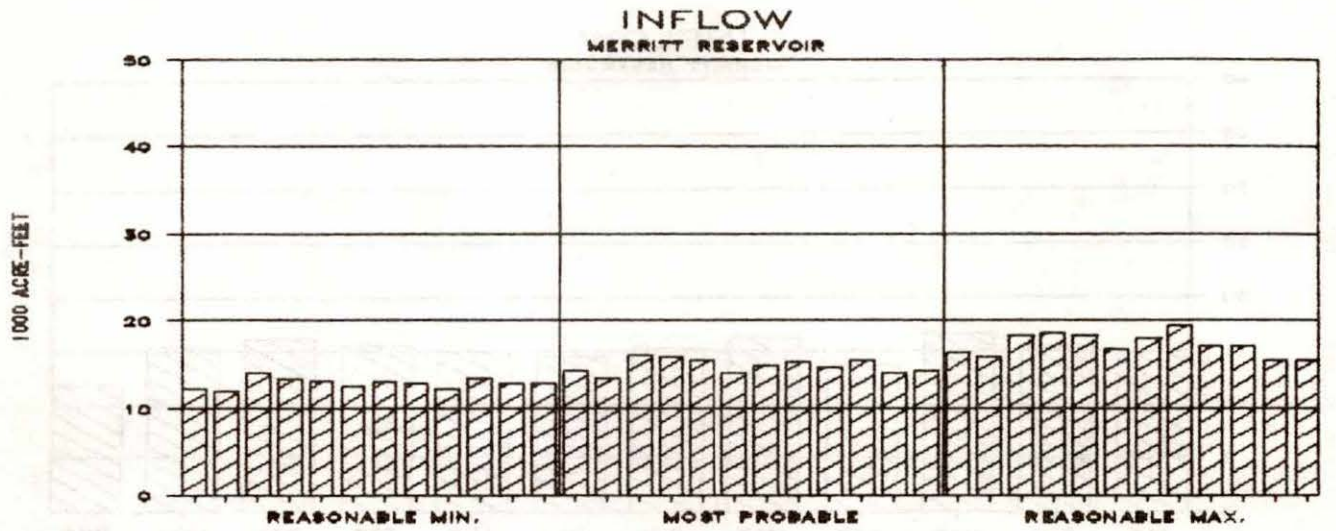
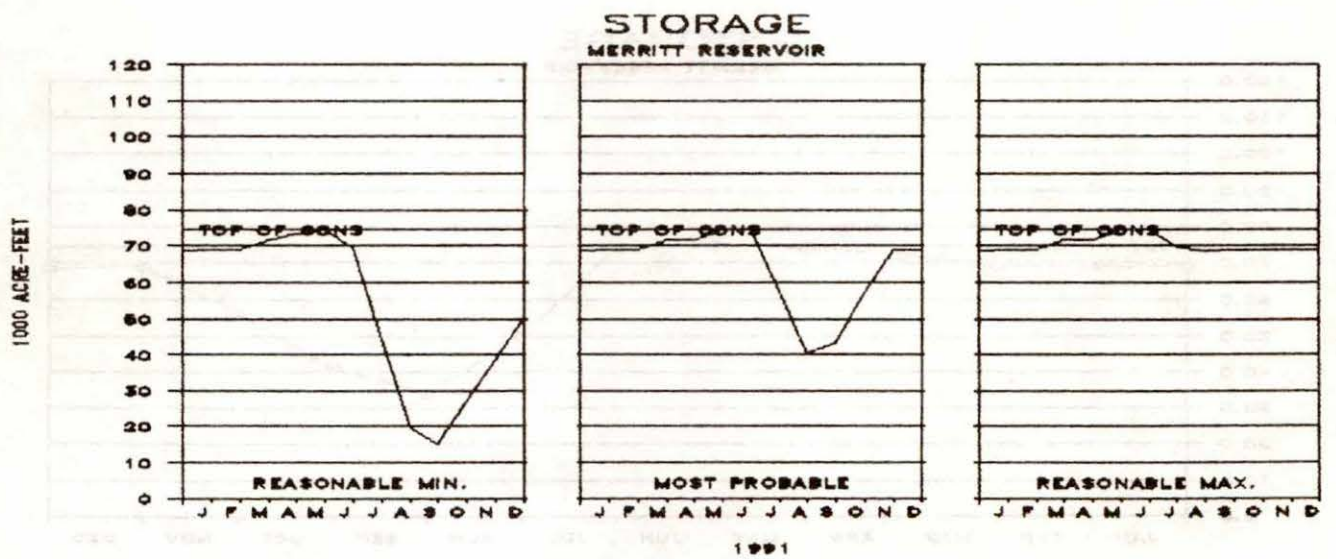


EXHIBIT 2C

MERRITT RESERVOIR

1992 OPERATION PLAN





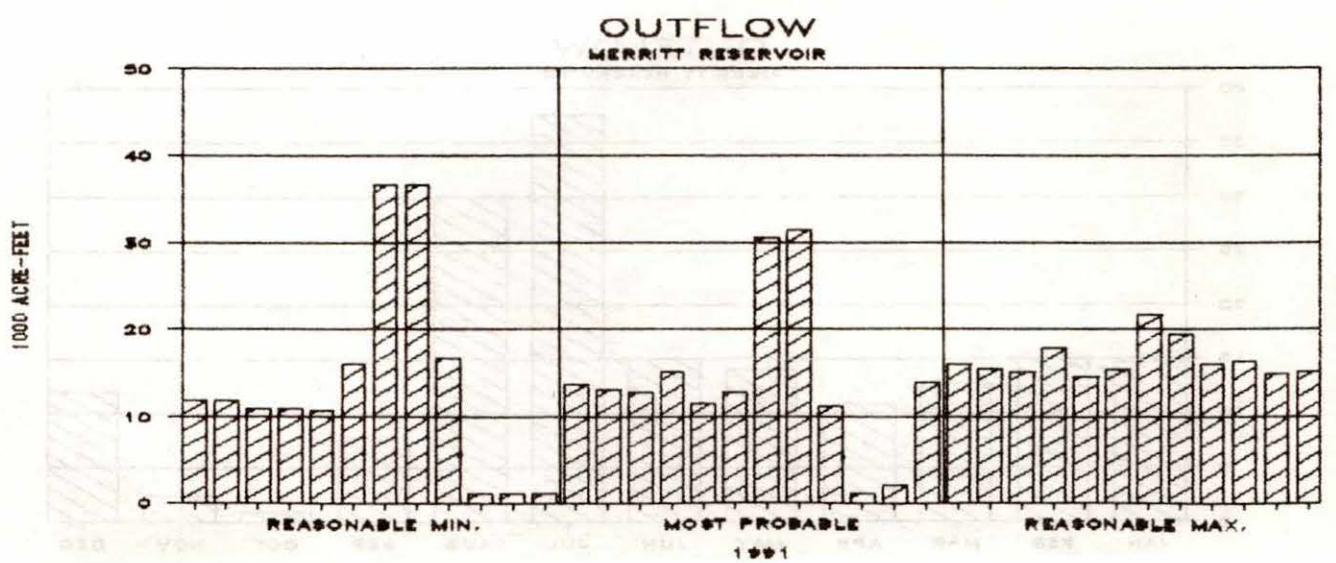
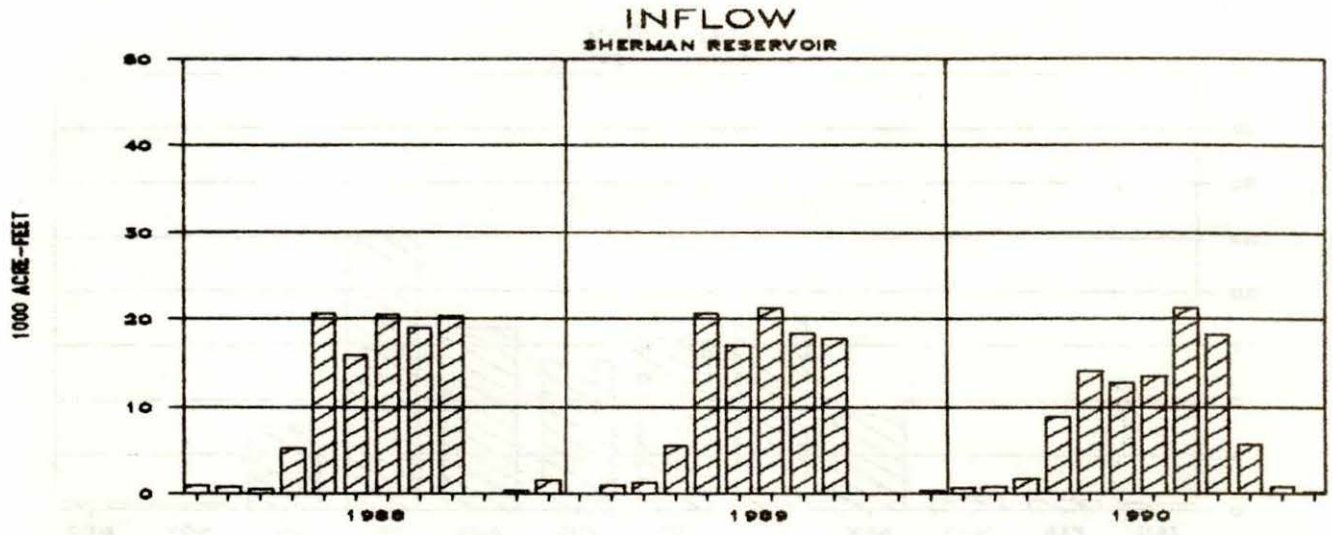
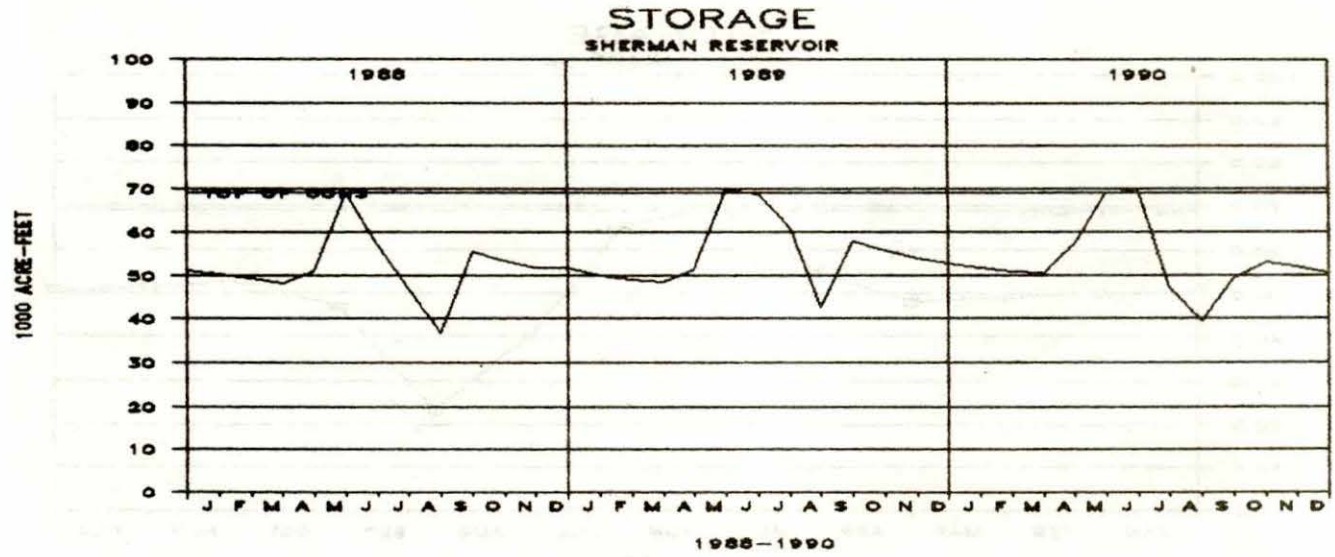


EXHIBIT 3A

SHERMAN RESERVOIR

OPERATION





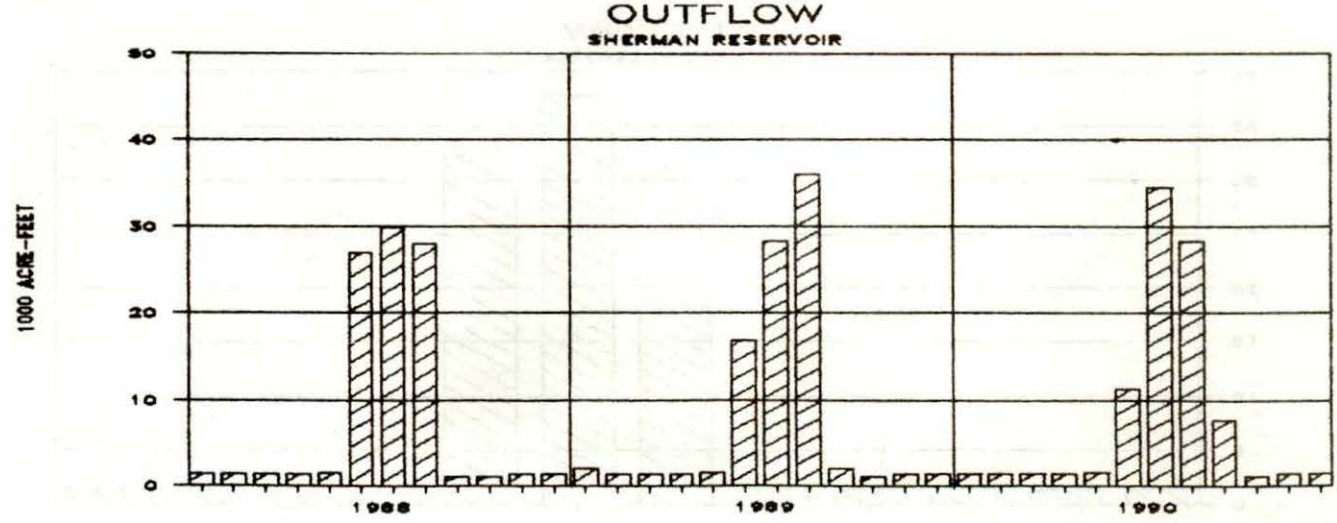
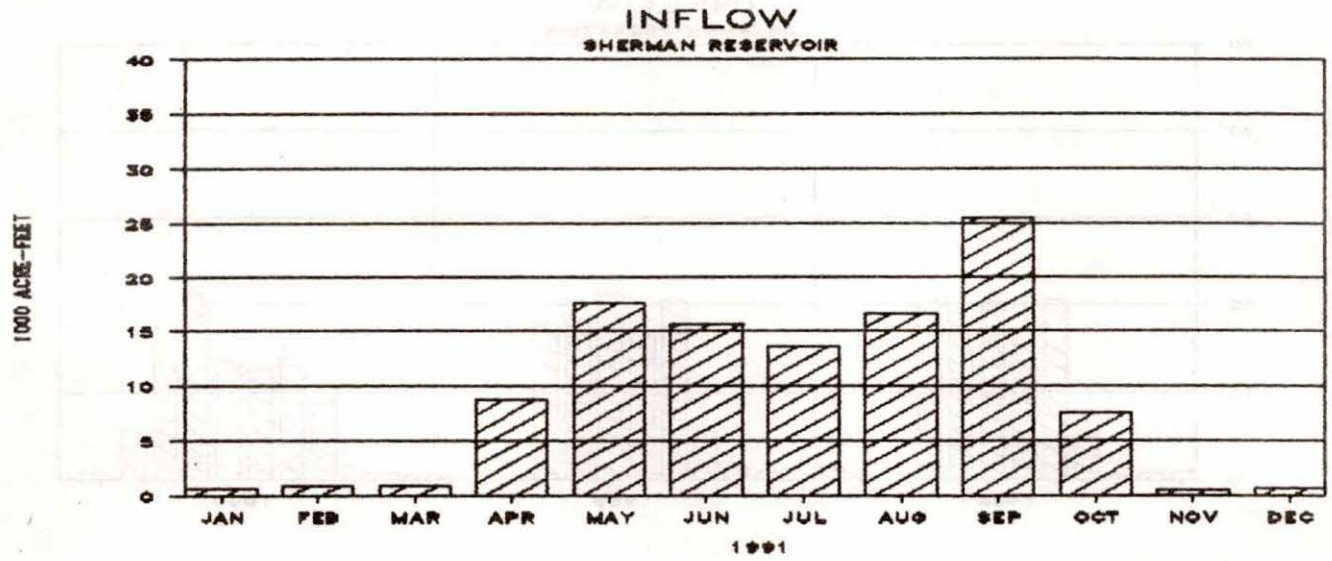
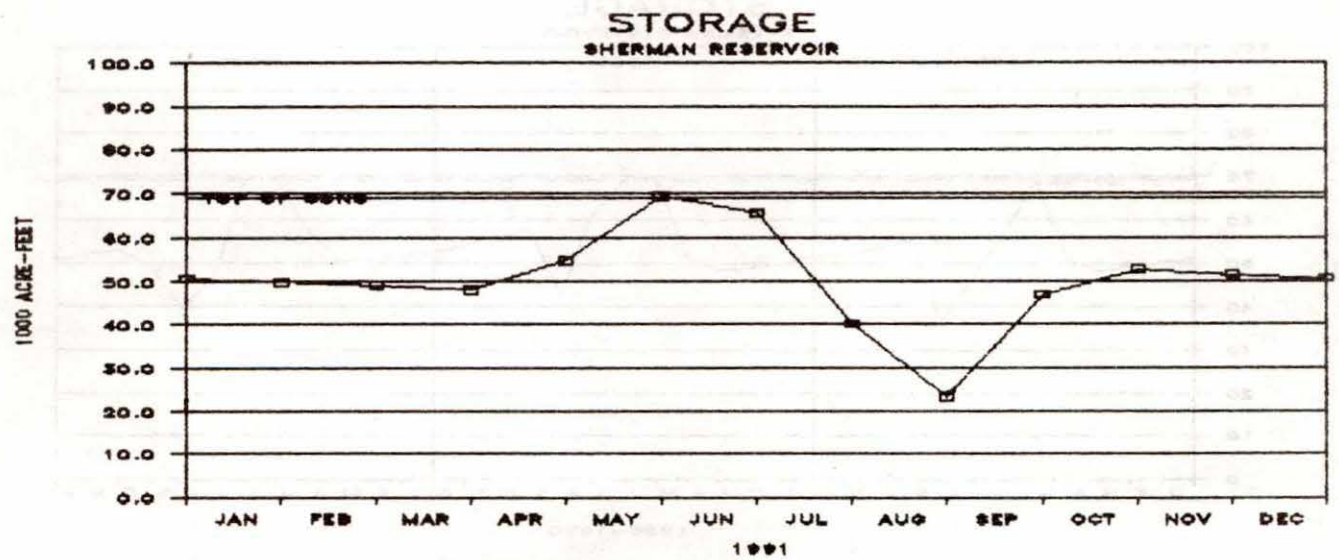


EXHIBIT 3B

SHERMAN RESERVOIR

1991 OPERATION





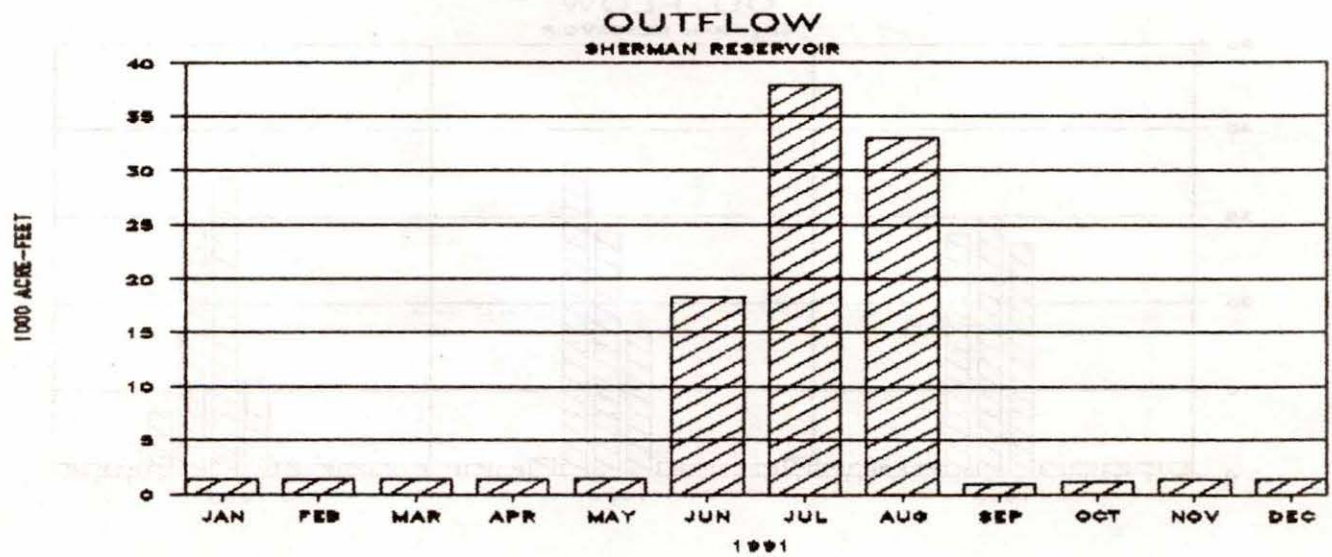
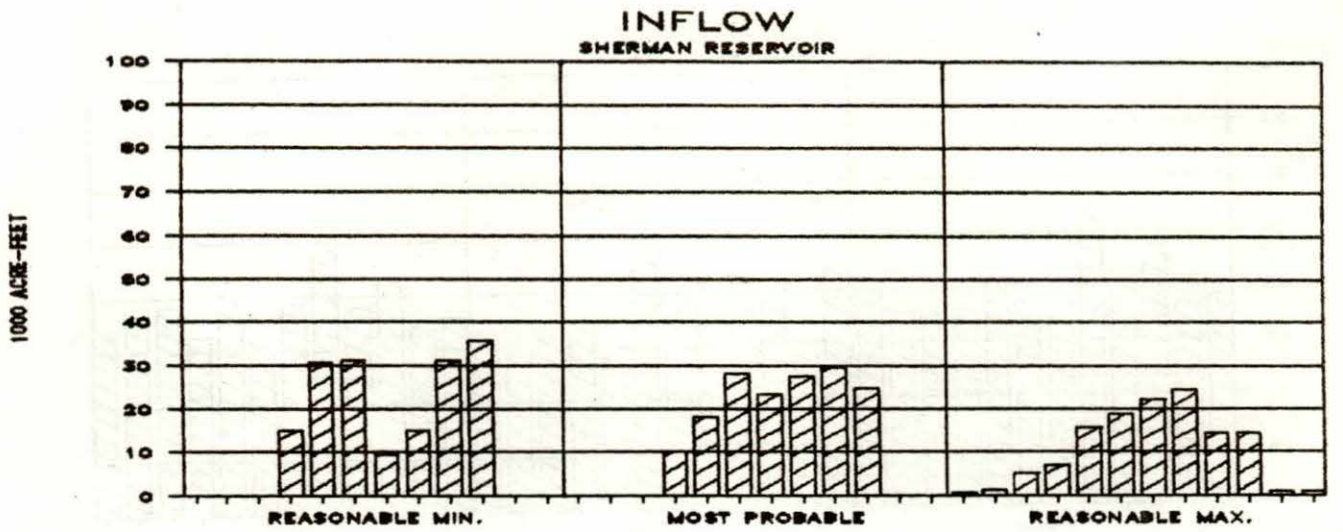
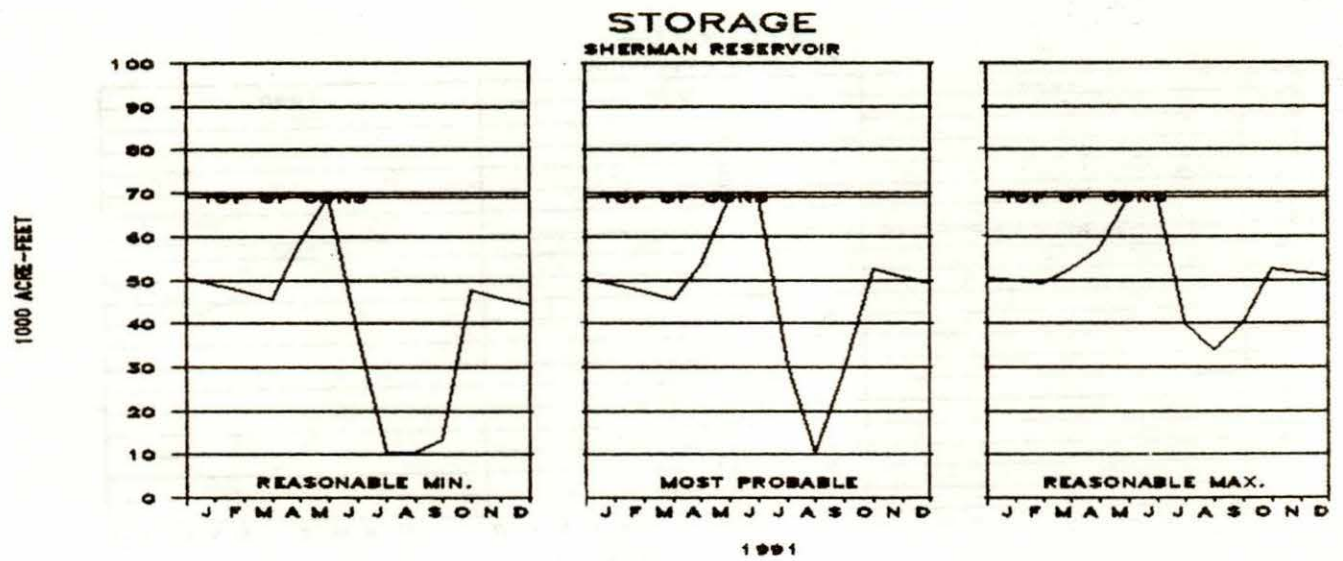


EXHIBIT 3C

SHERMAN RESERVOIR

1992 OPERATION PLAN





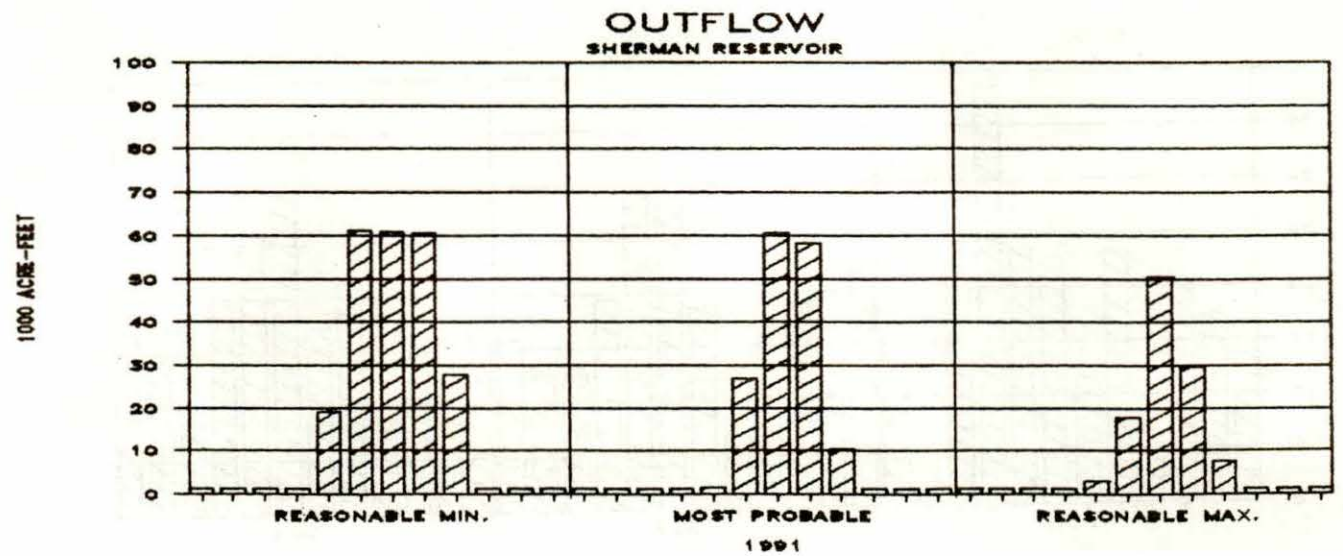
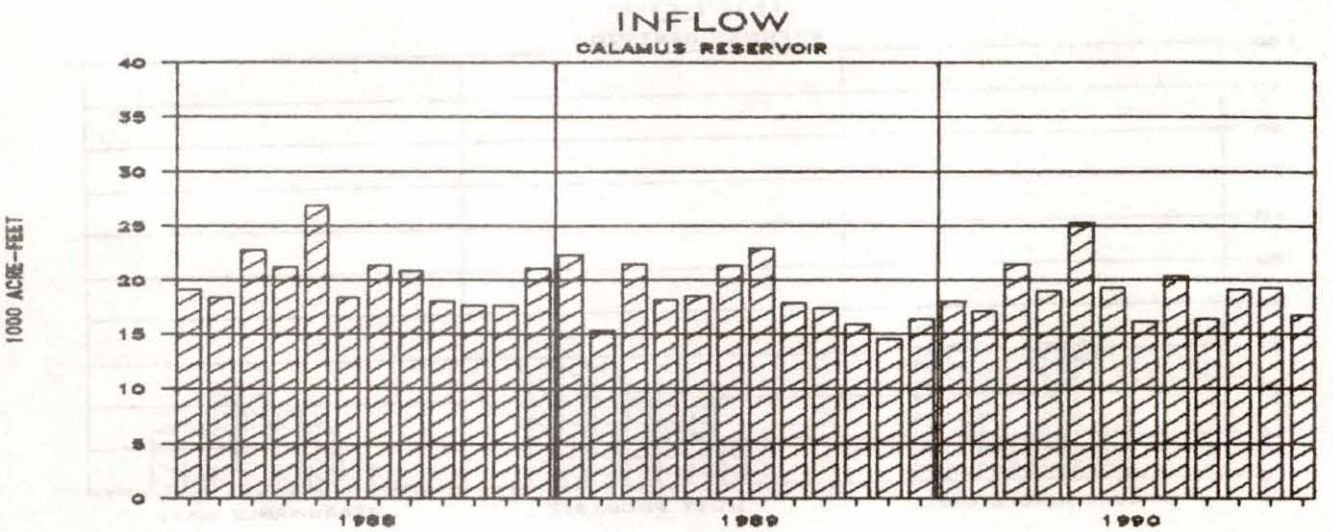
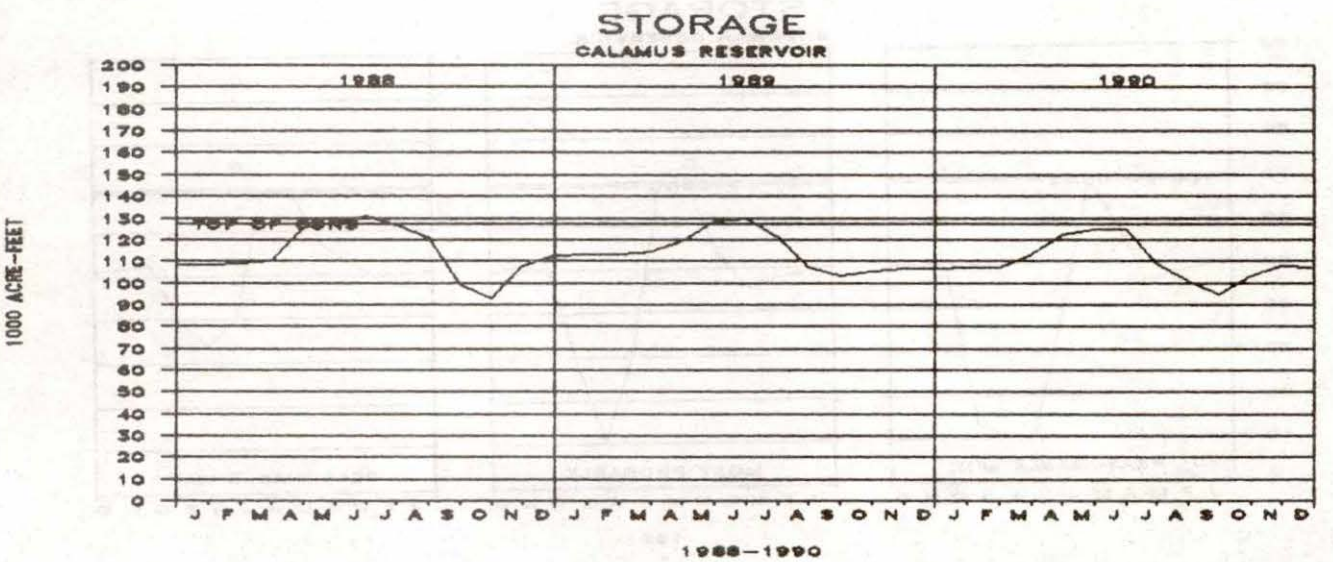


EXHIBIT 4A

CALAMUS RESERVOIR
OPERATION





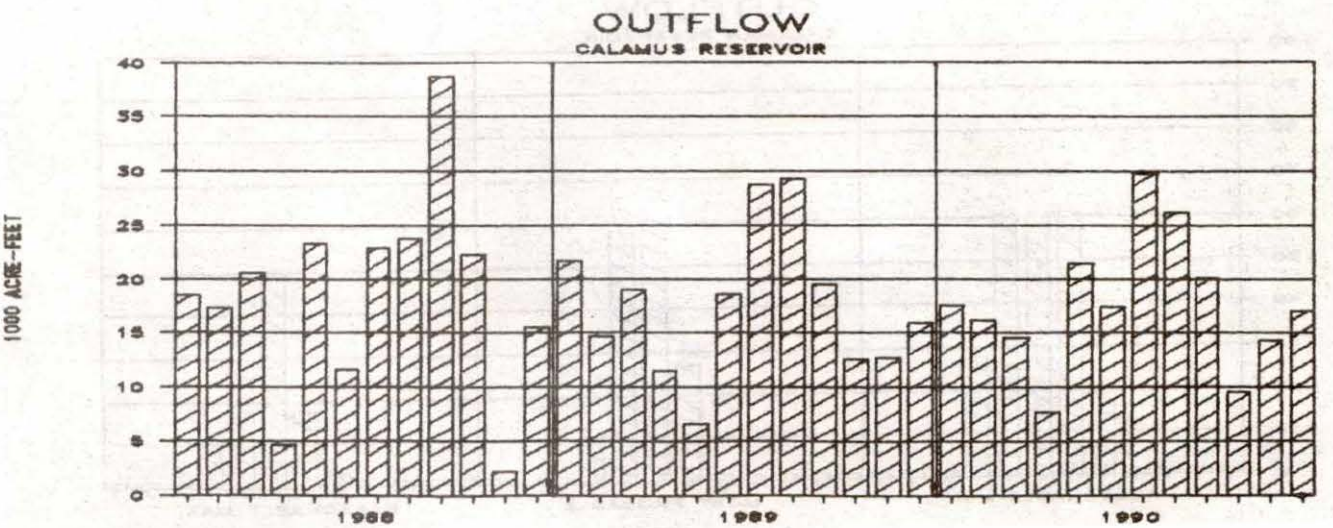
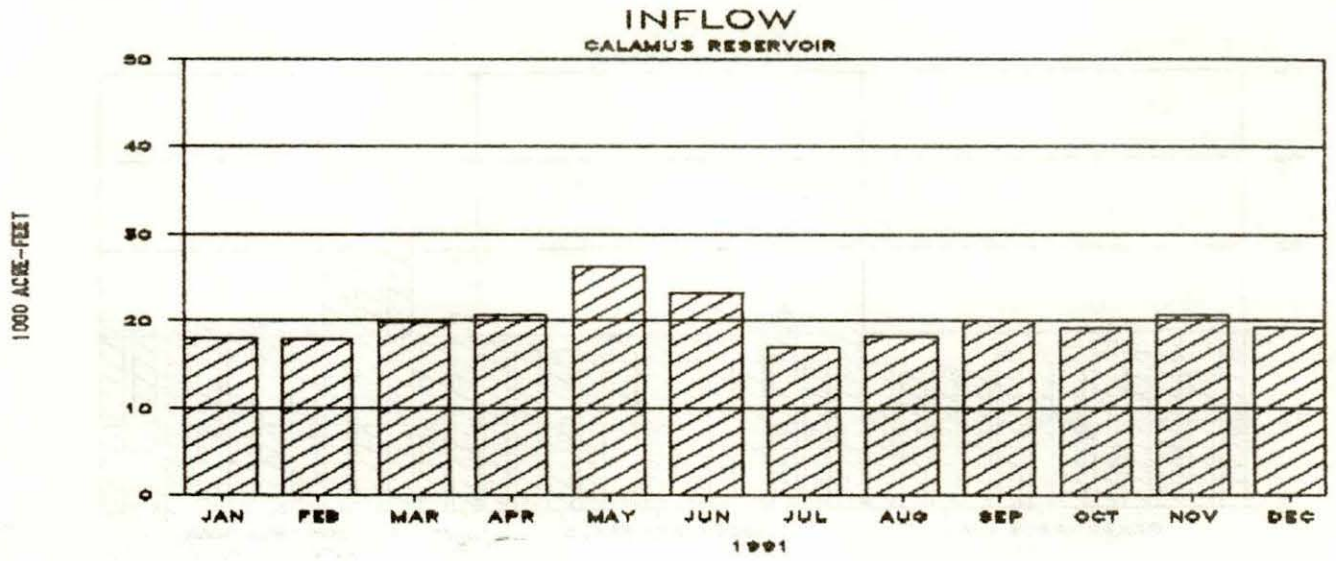
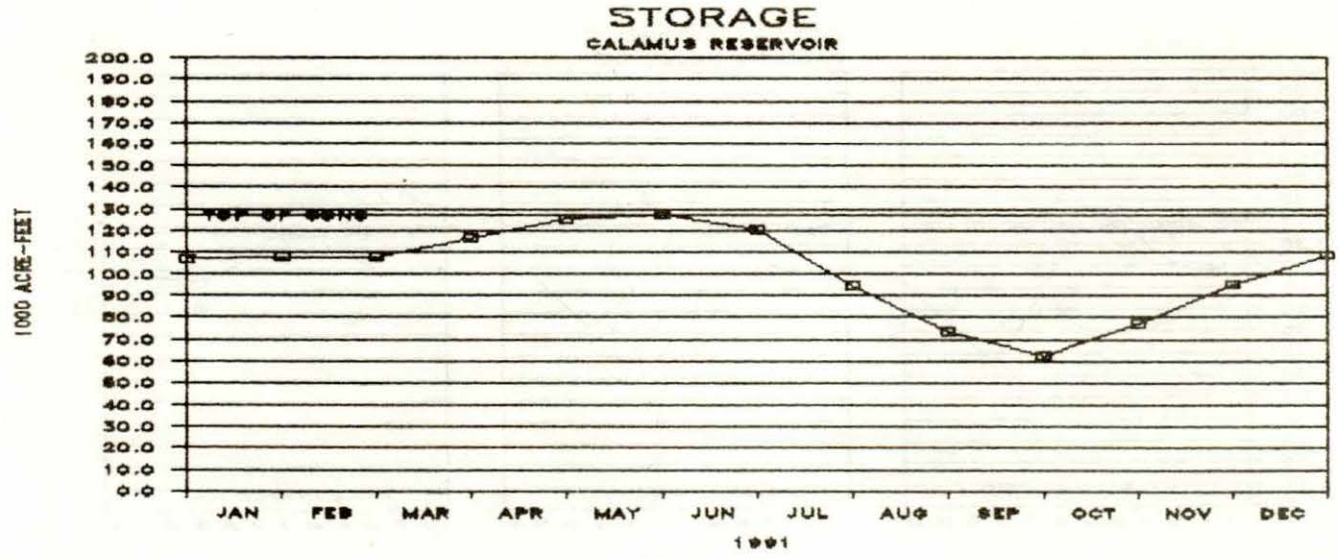


EXHIBIT 4B

CALAMUS RESERVOIR

1991 OPERATION





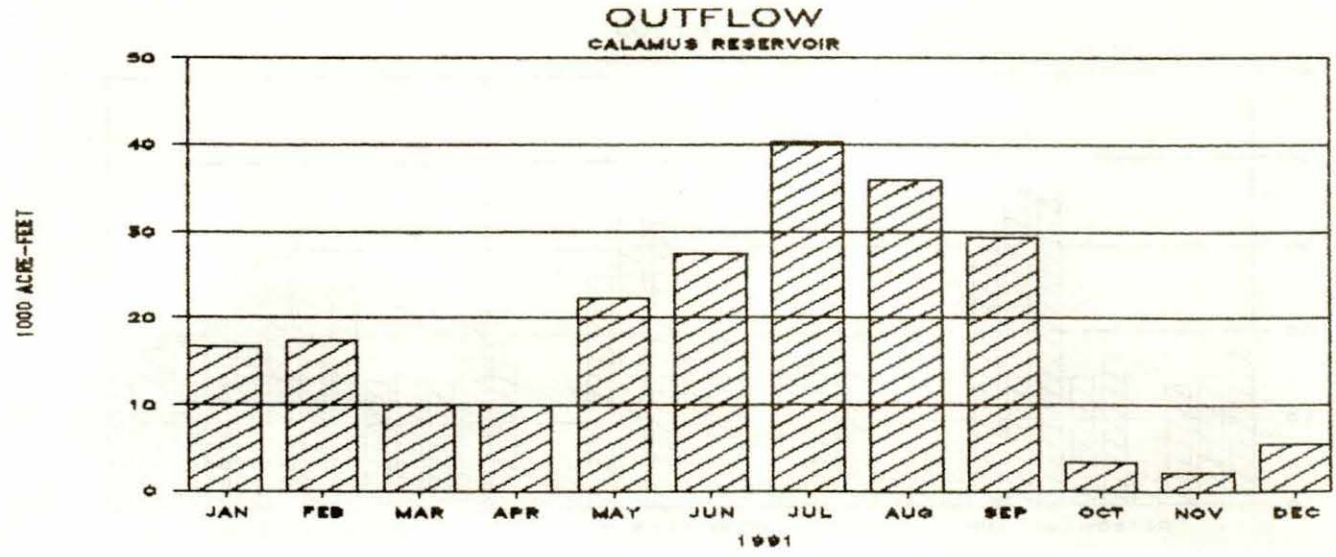
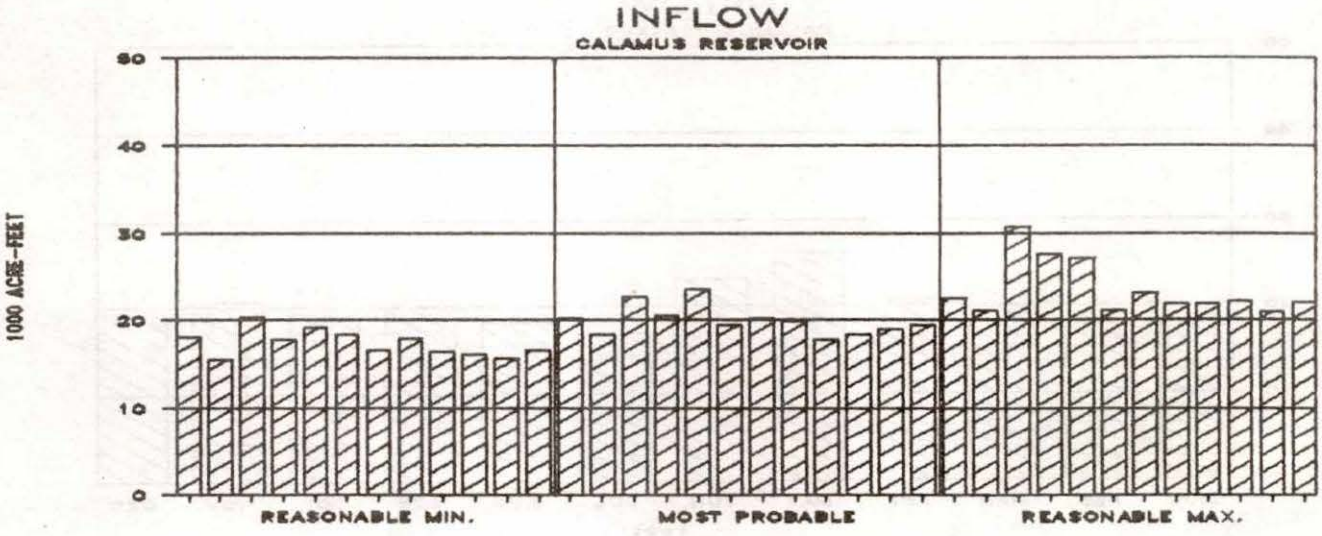
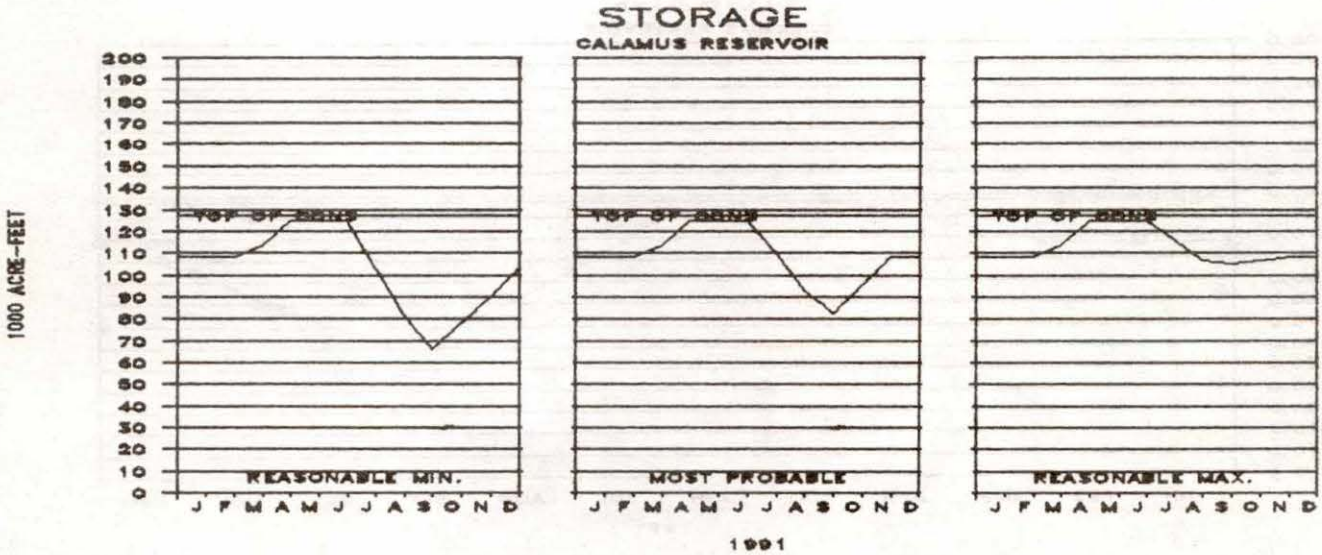


EXHIBIT 4C

CALAMUS RESERVOIR

1992 OPERATION PLAN





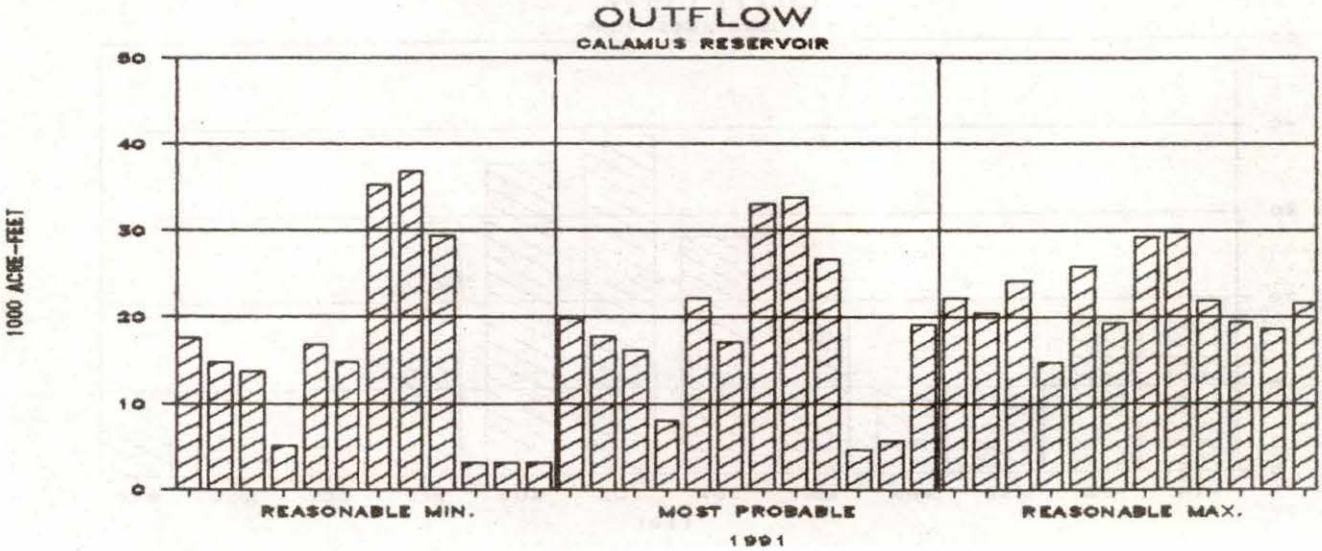
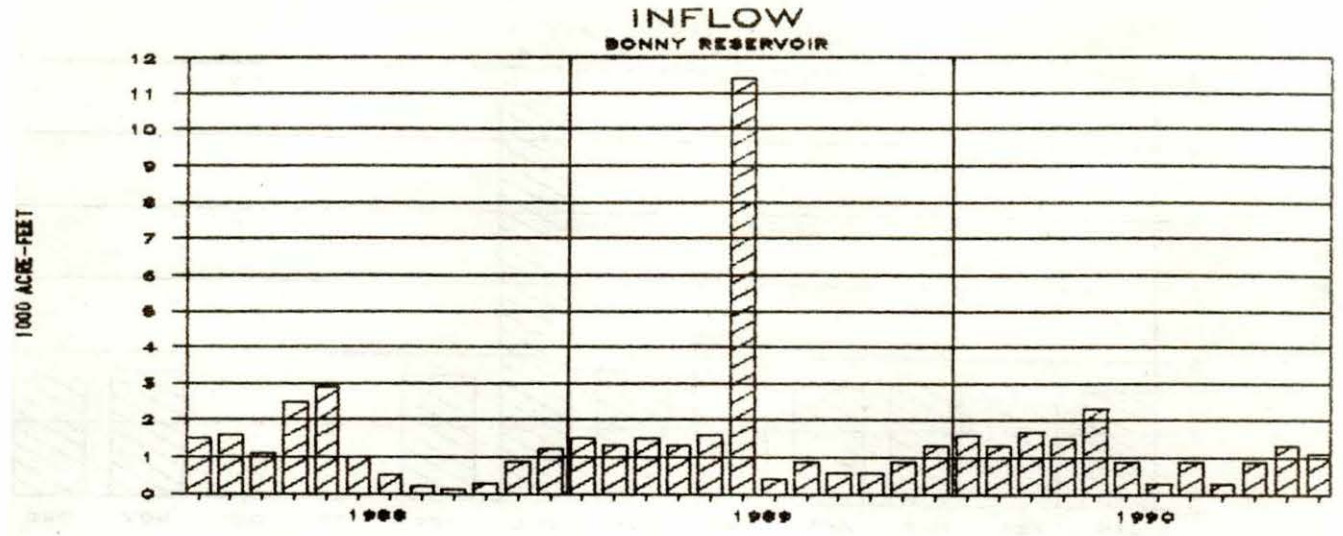
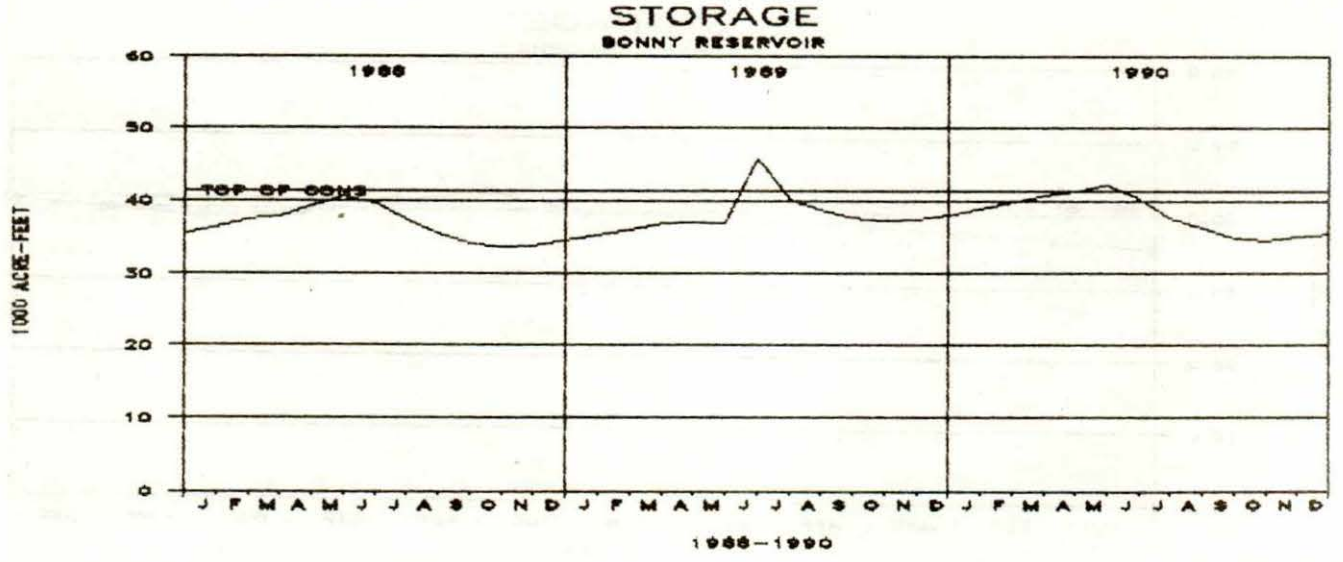


EXHIBIT 5A

BONNY RESERVOIR
OPERATION





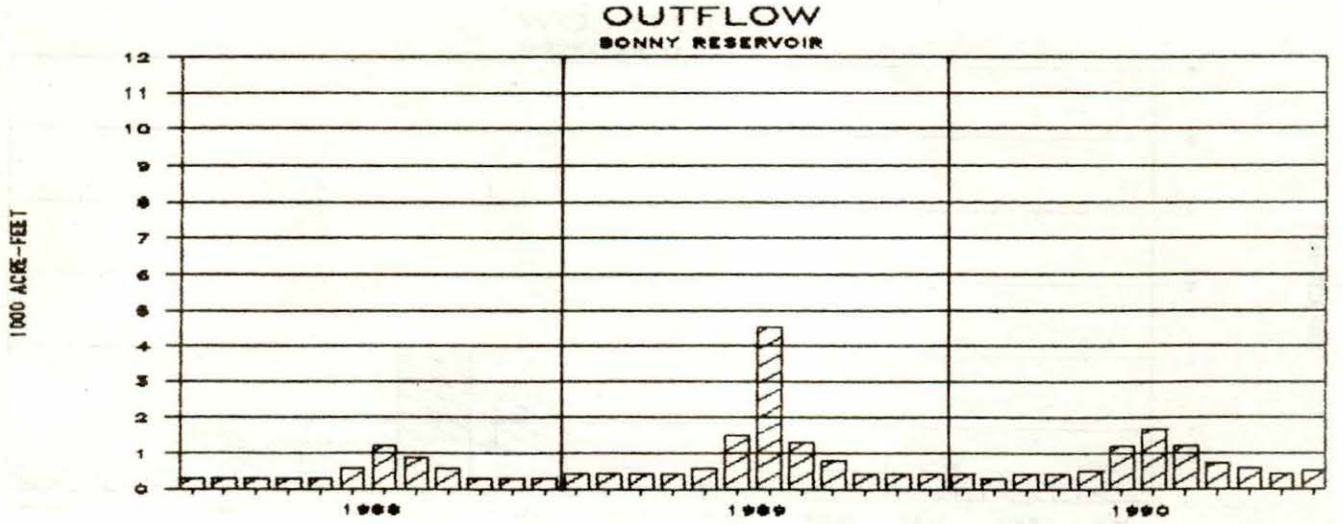
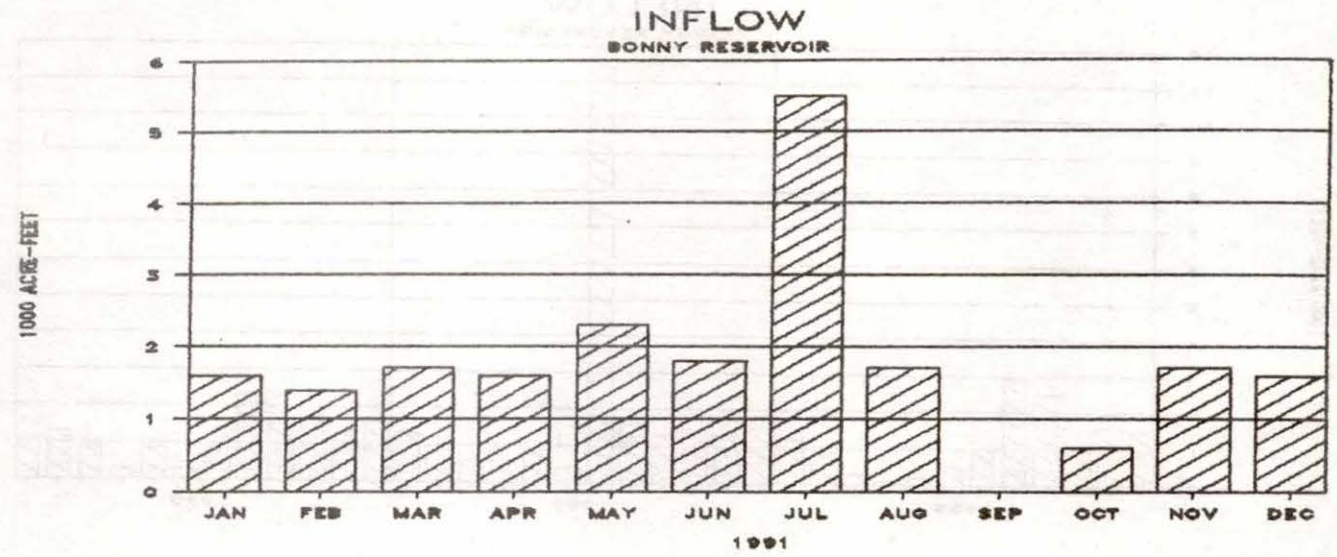
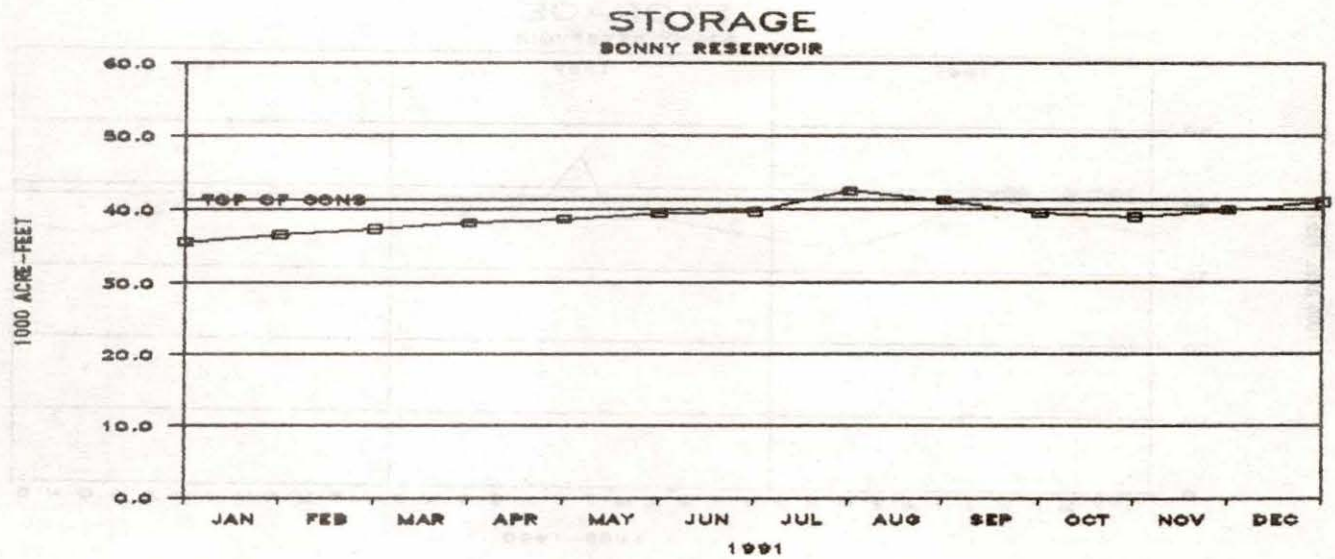


EXHIBIT 5B

BONNY RESERVOIR

1991 OPERATION





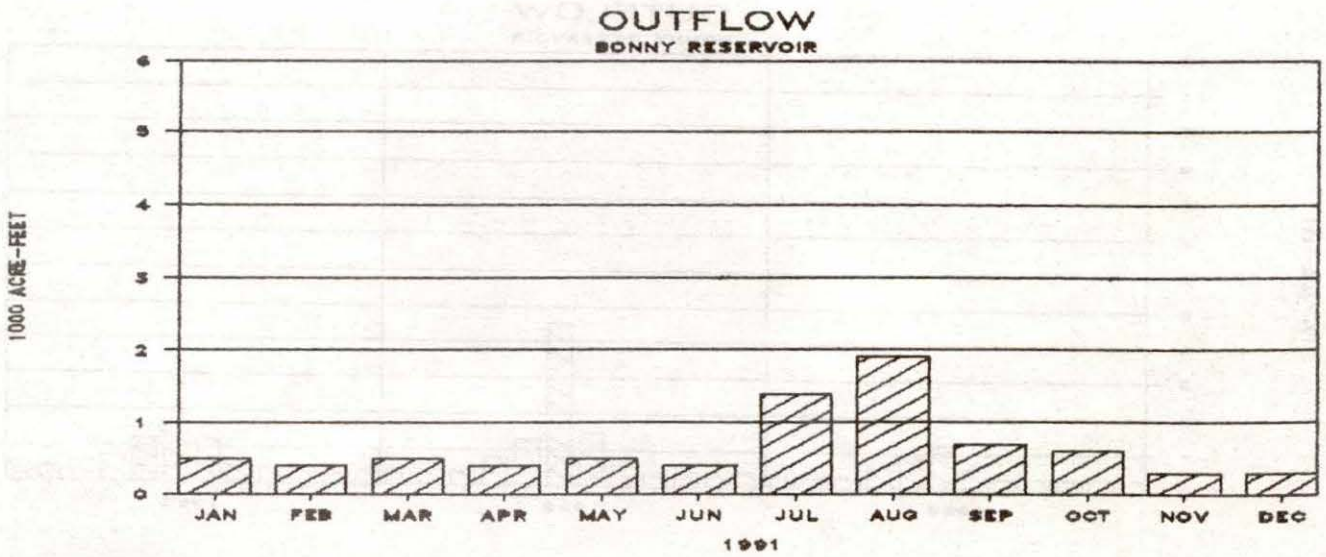
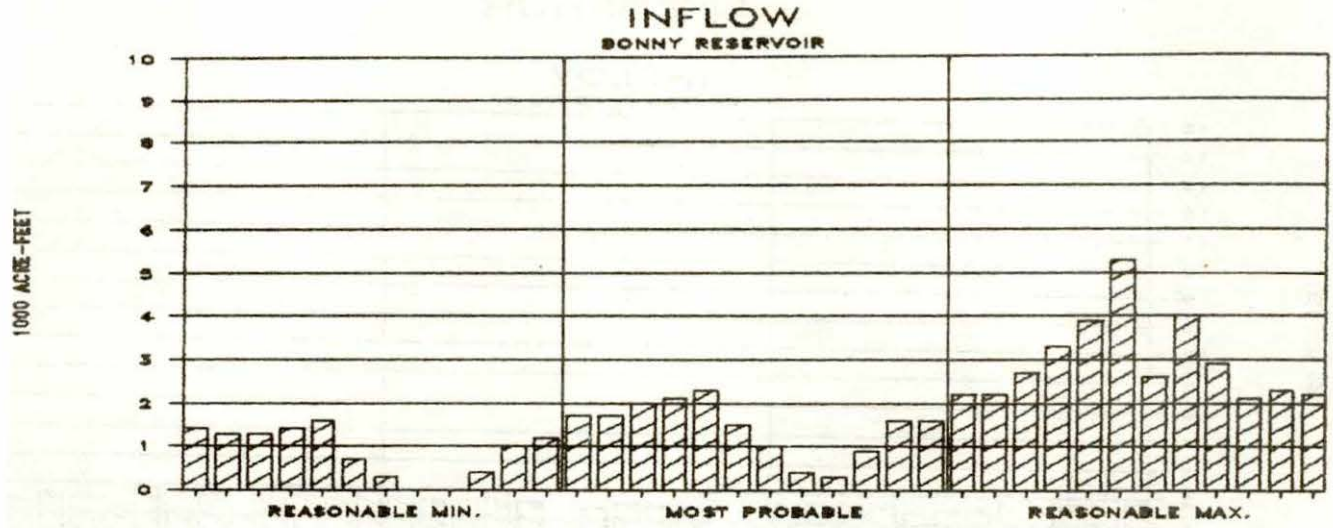
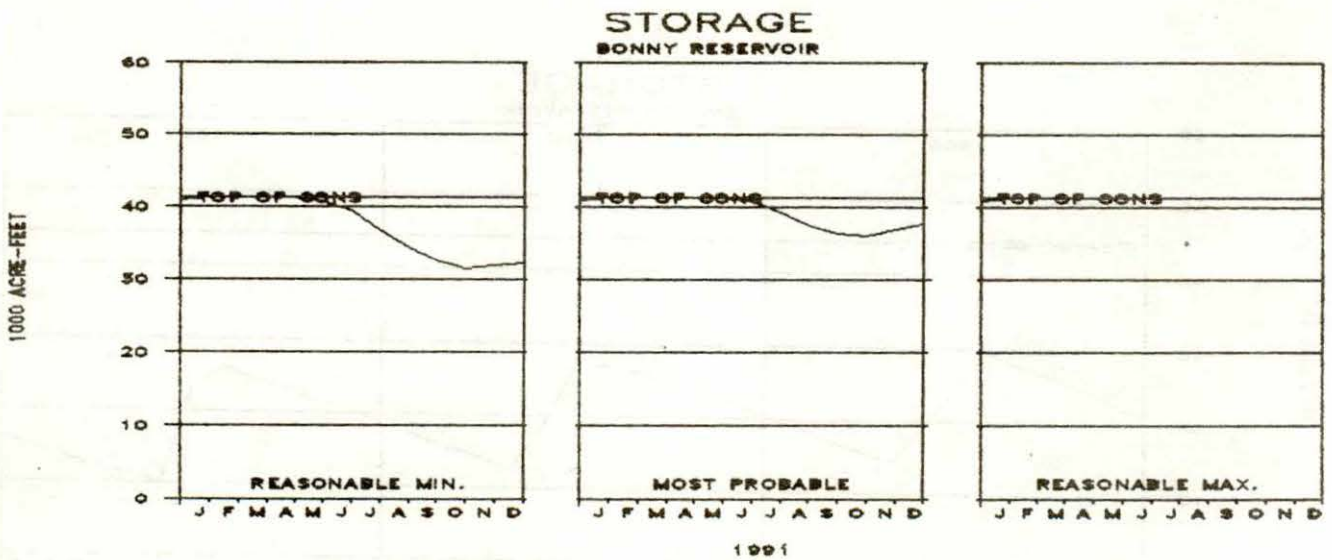


EXHIBIT 5C

BONNY RESERVOIR

1992 OPERATION PLAN





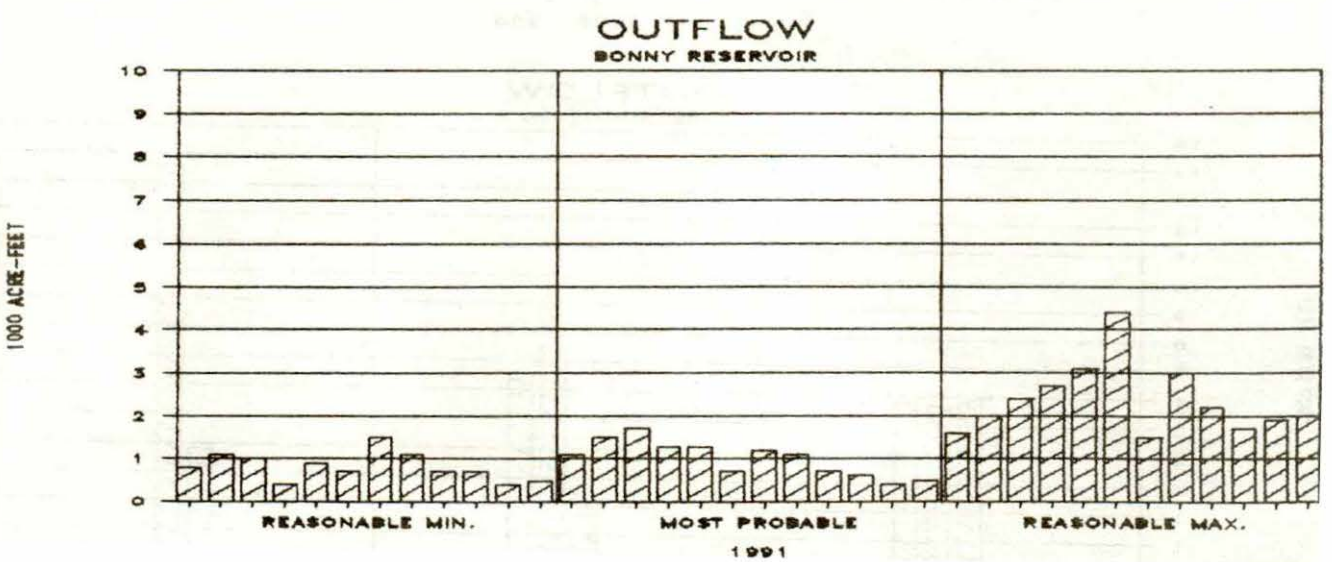
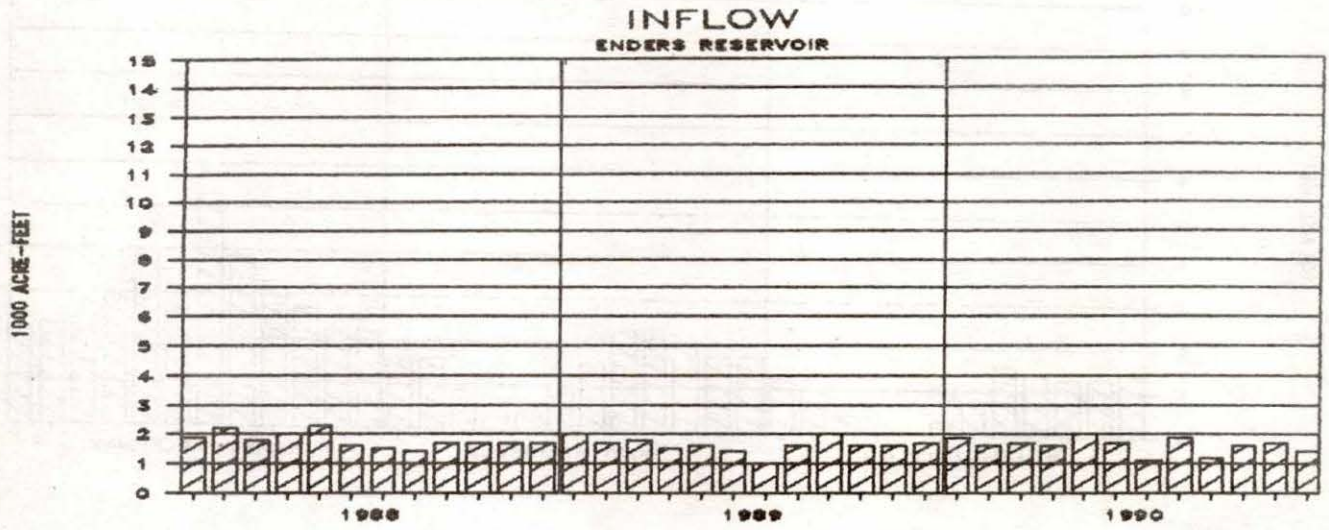
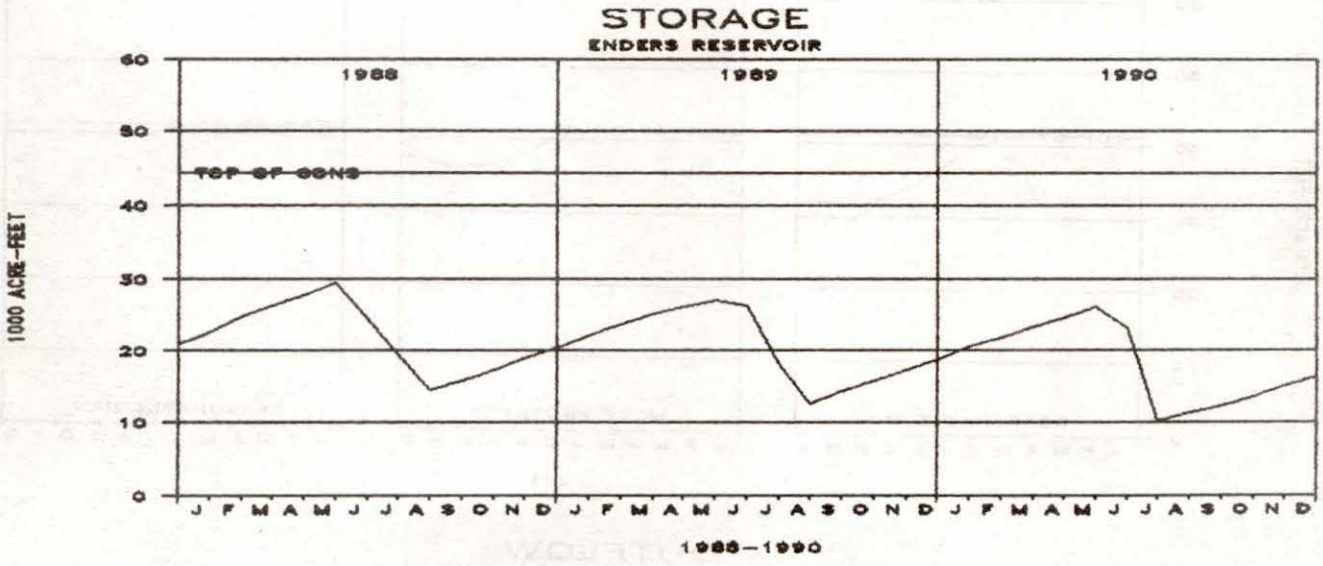


EXHIBIT 6A

ENDERS RESERVOIR

OPERATION





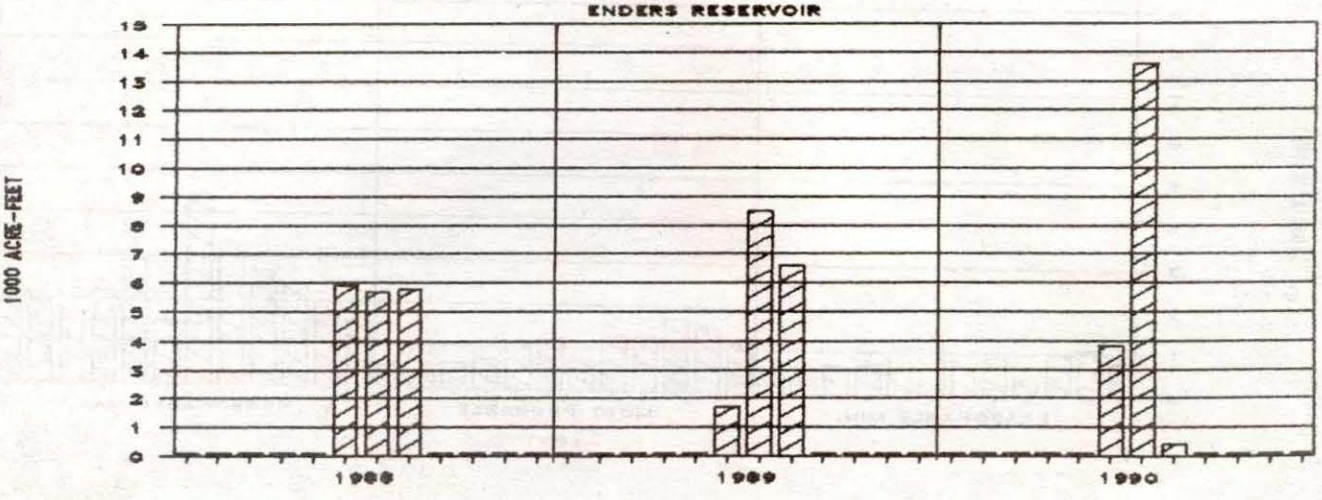
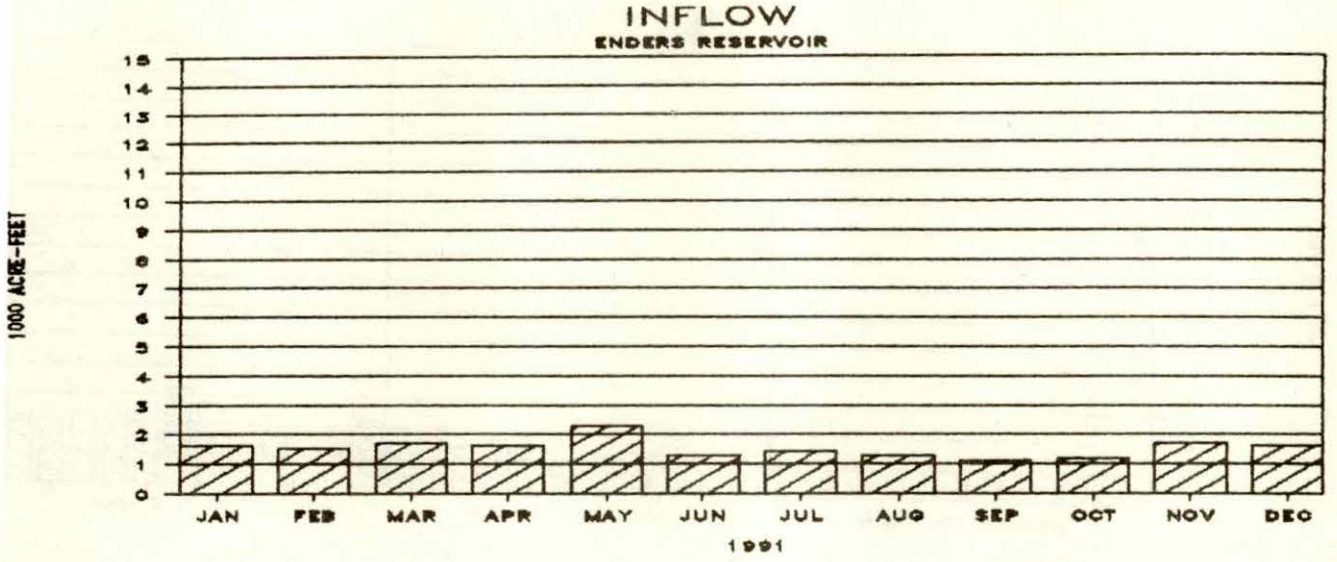
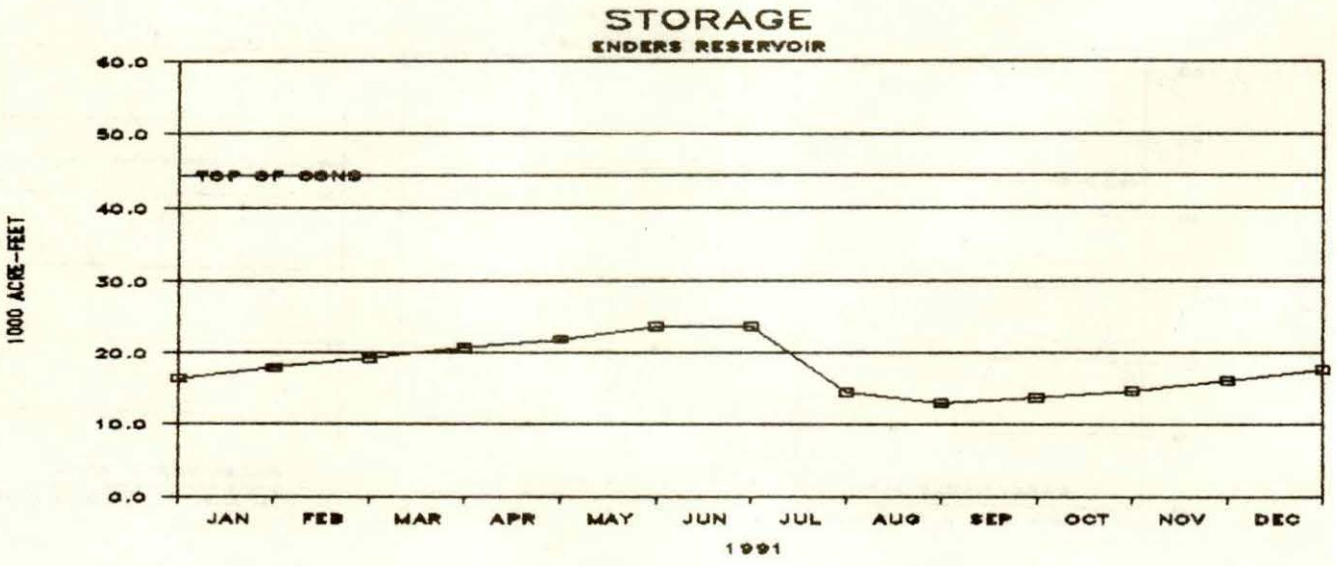


EXHIBIT 6B

ENDERS RESERVOIR

1991 OPERATION





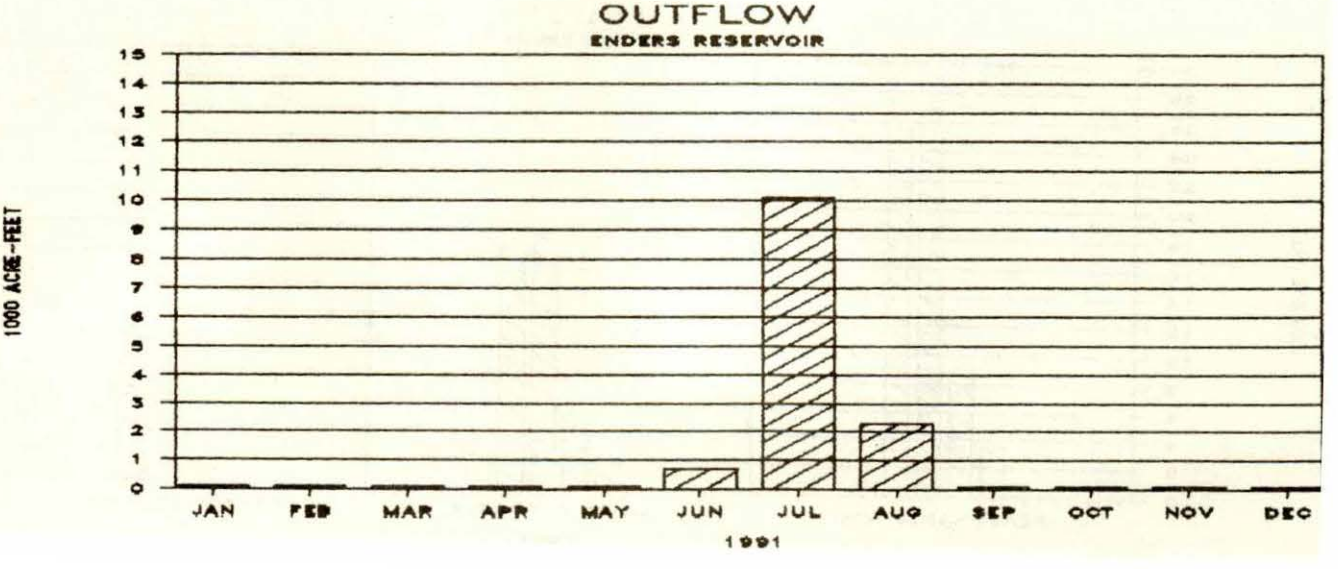
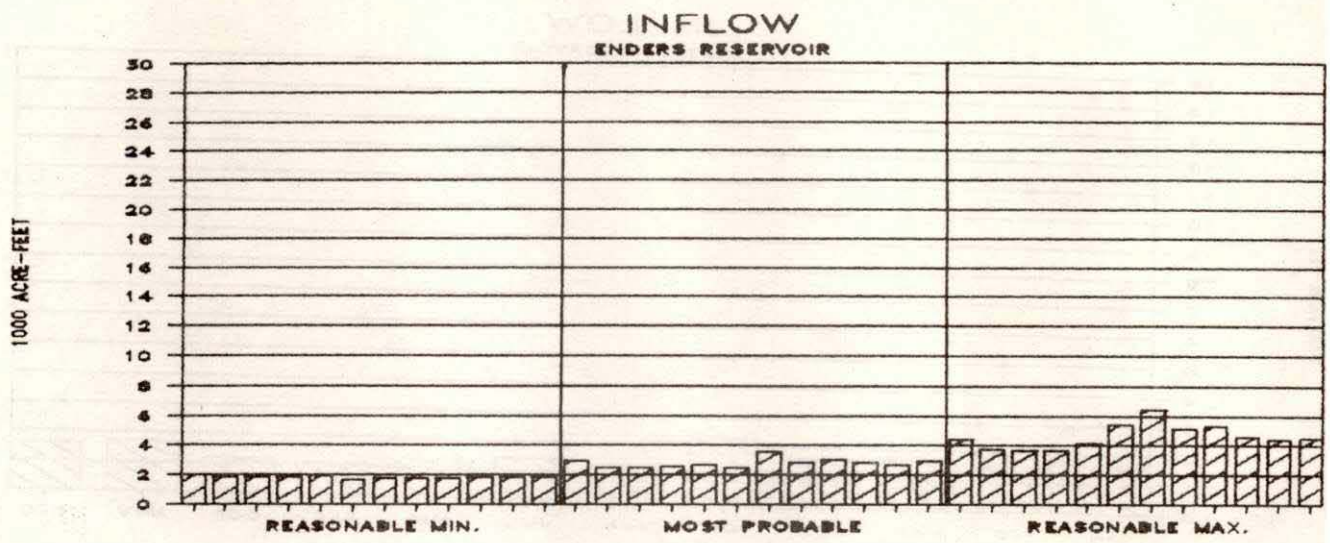
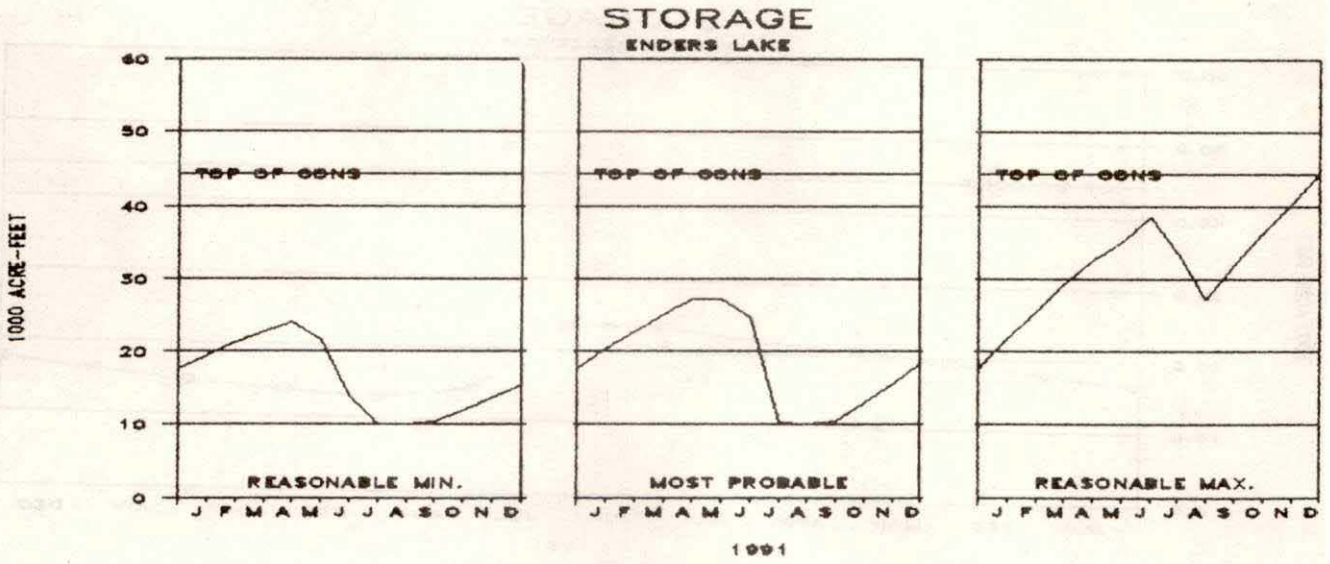


EXHIBIT 6C

ENDERS RESERVOIR

1992 OPERATION PLAN





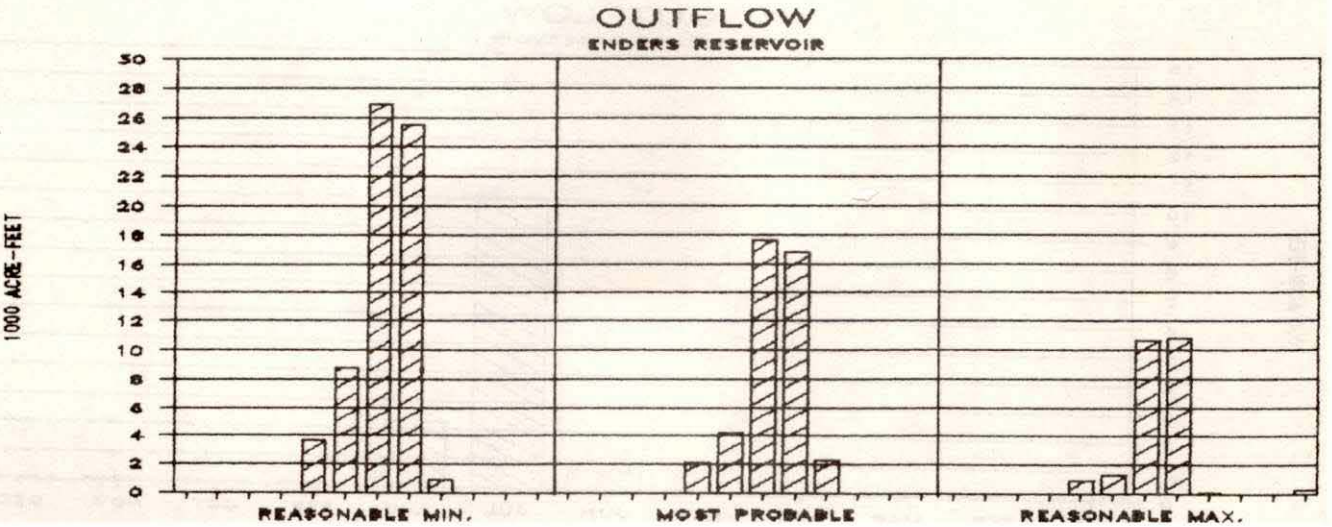
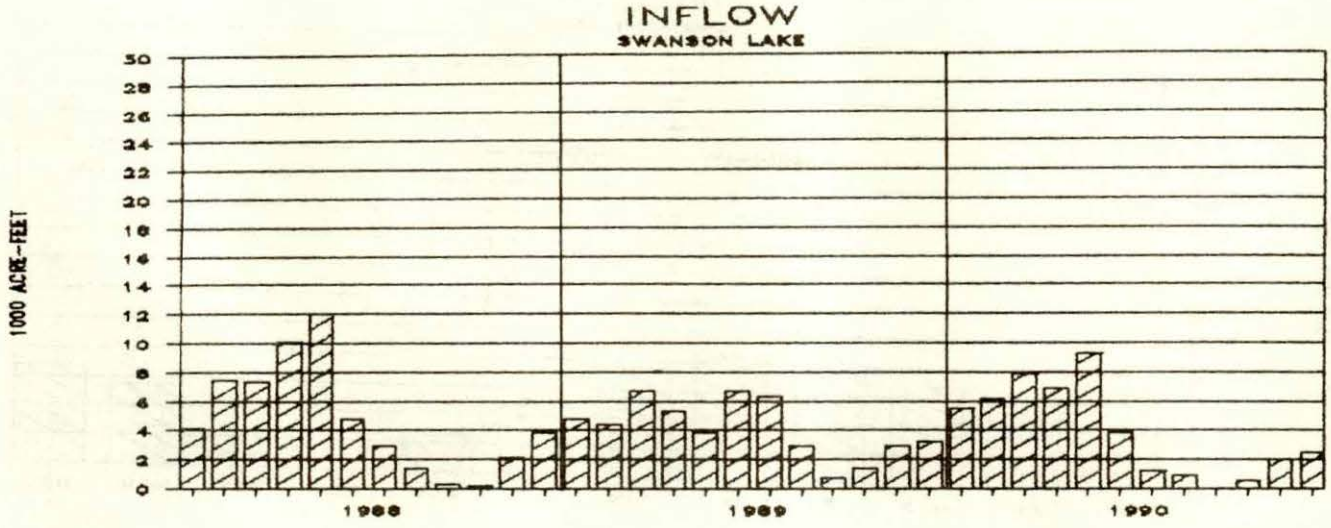
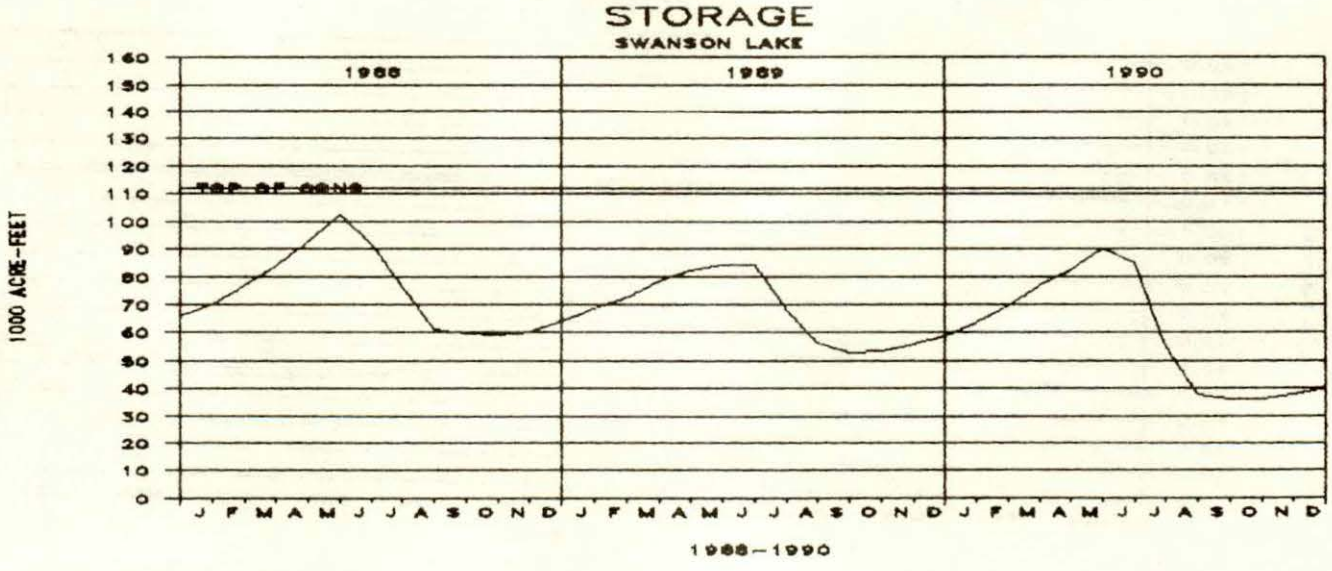


EXHIBIT 7A

SWANSON LAKE
OPERATION





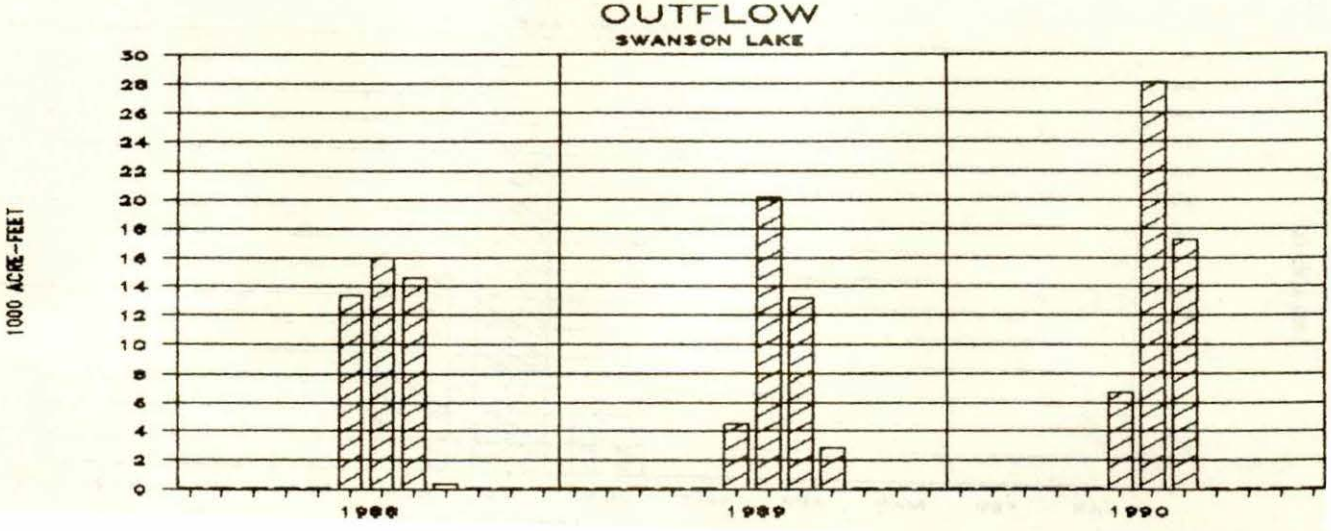
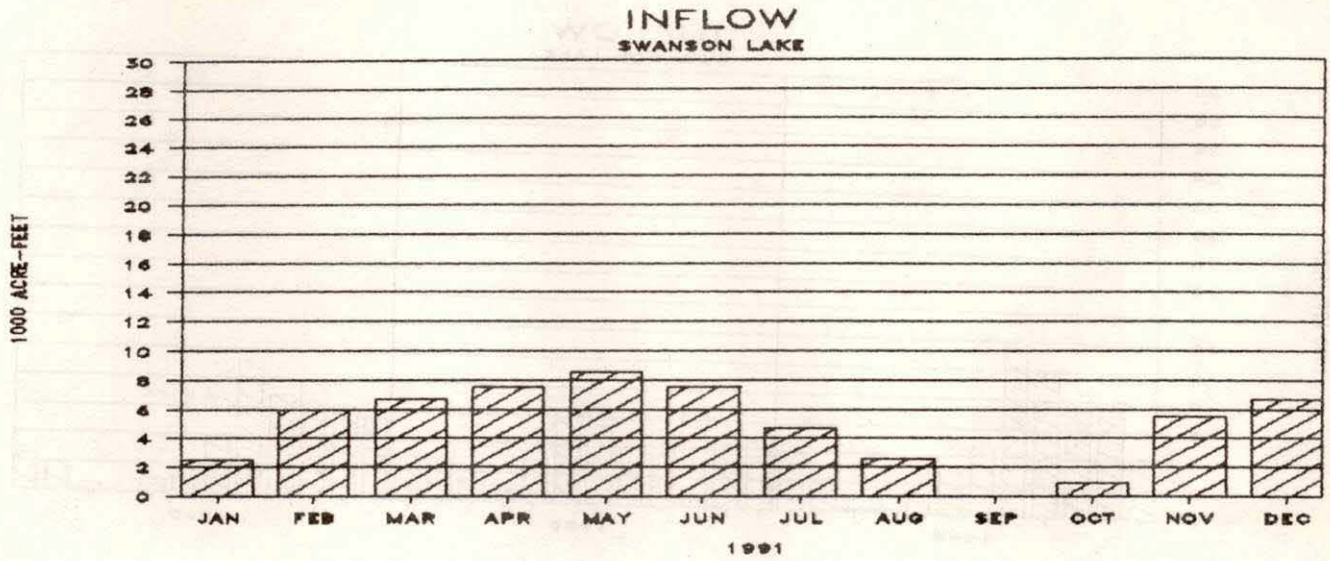
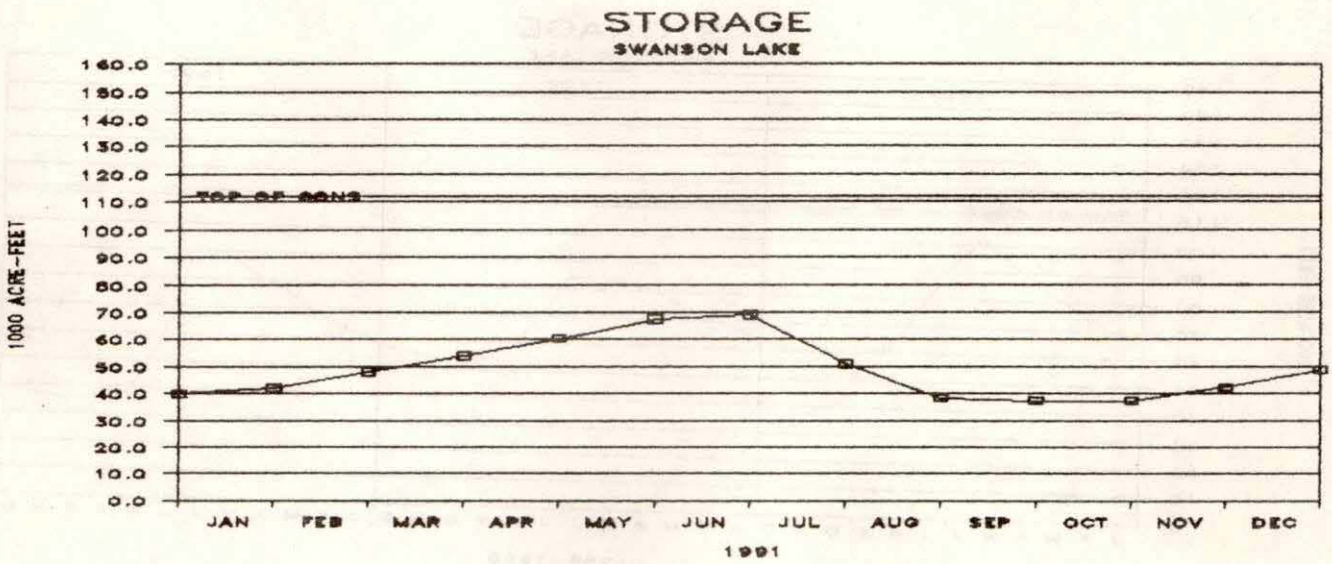


EXHIBIT 7B

SWANSON LAKE

1991 OPERATION





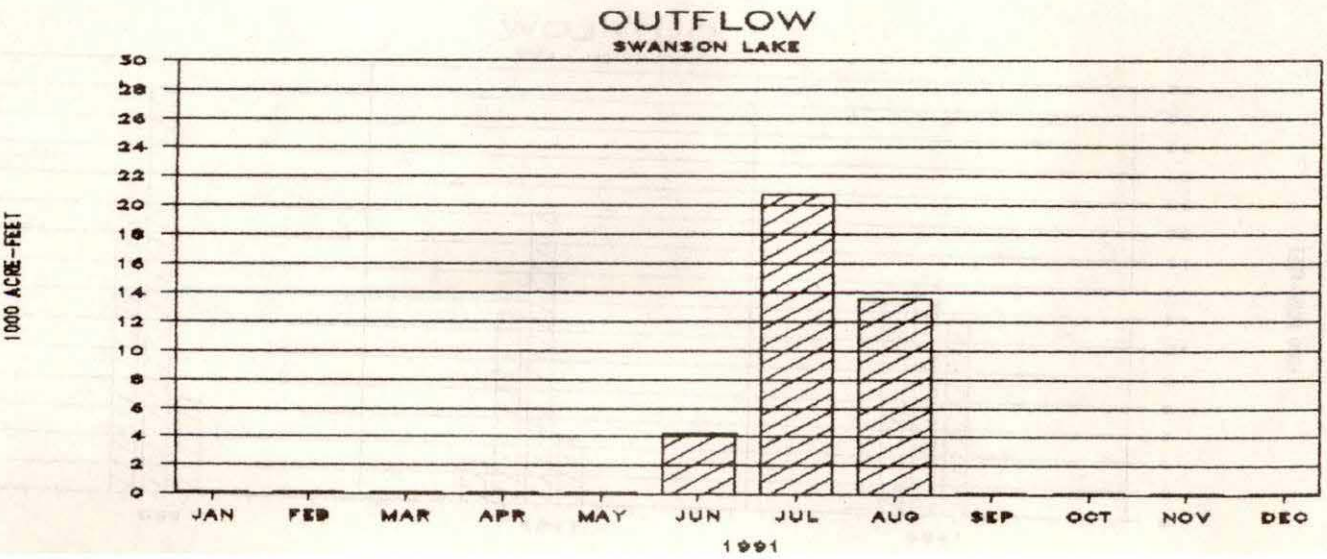
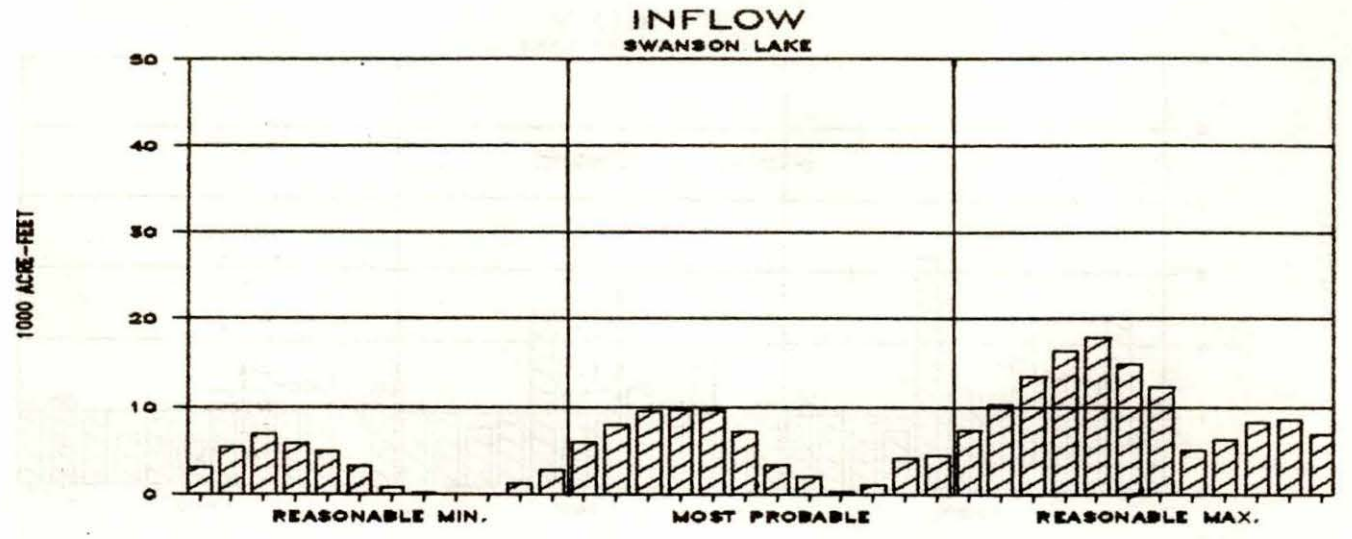
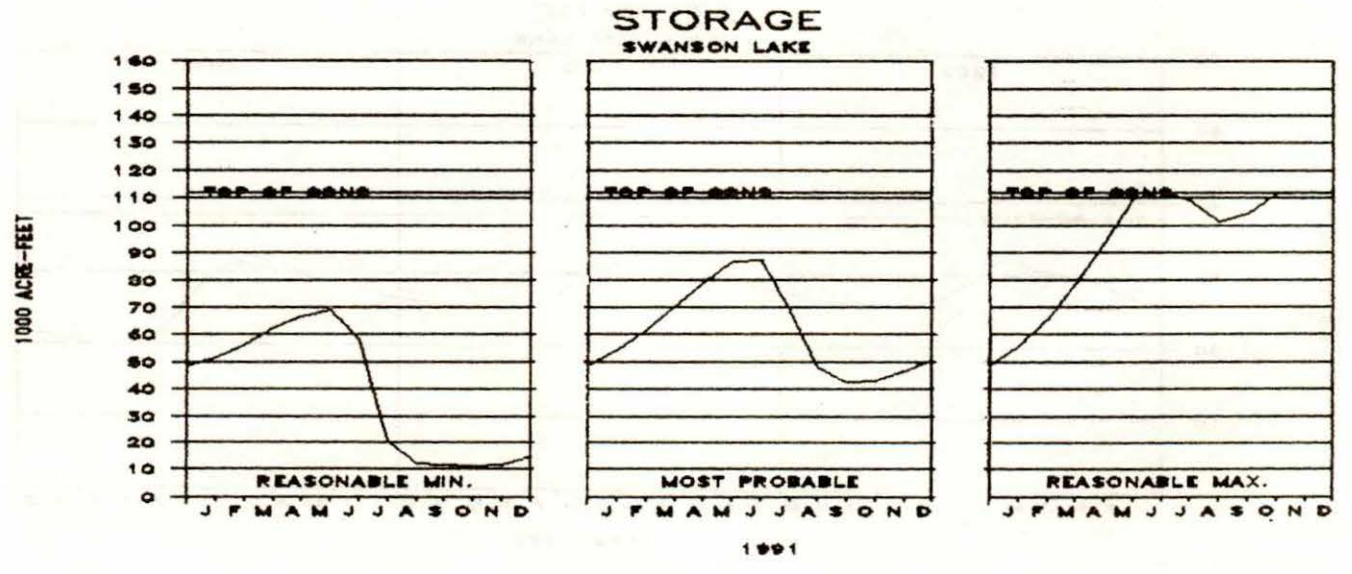


EXHIBIT 7C

SWANSON LAKE

1992 OPERATION PLAN





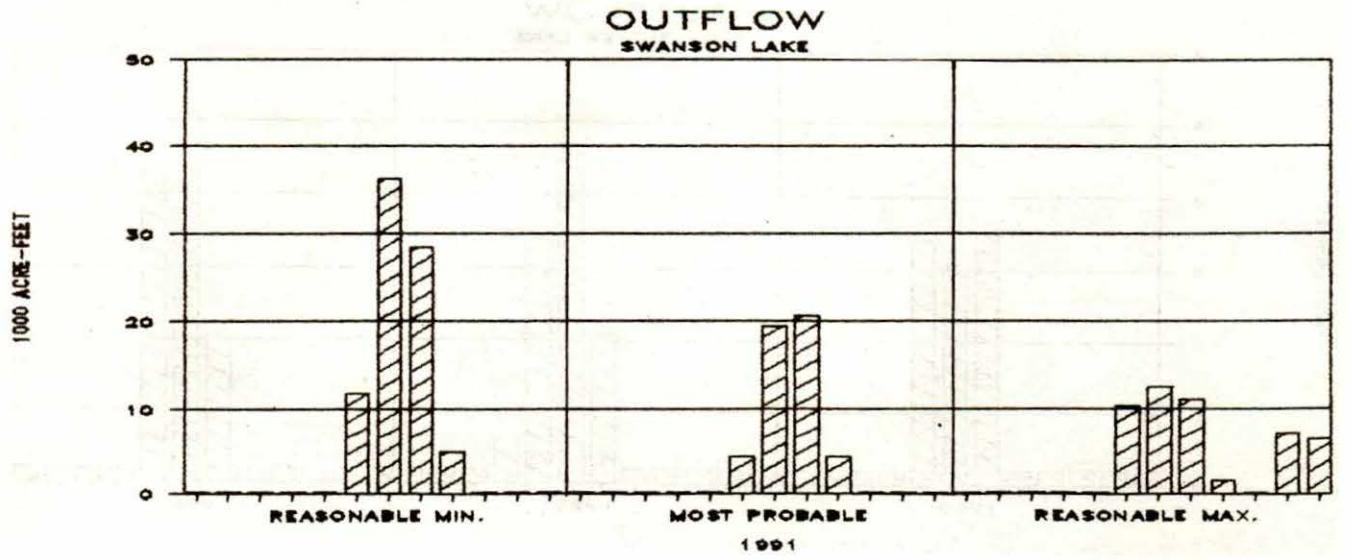
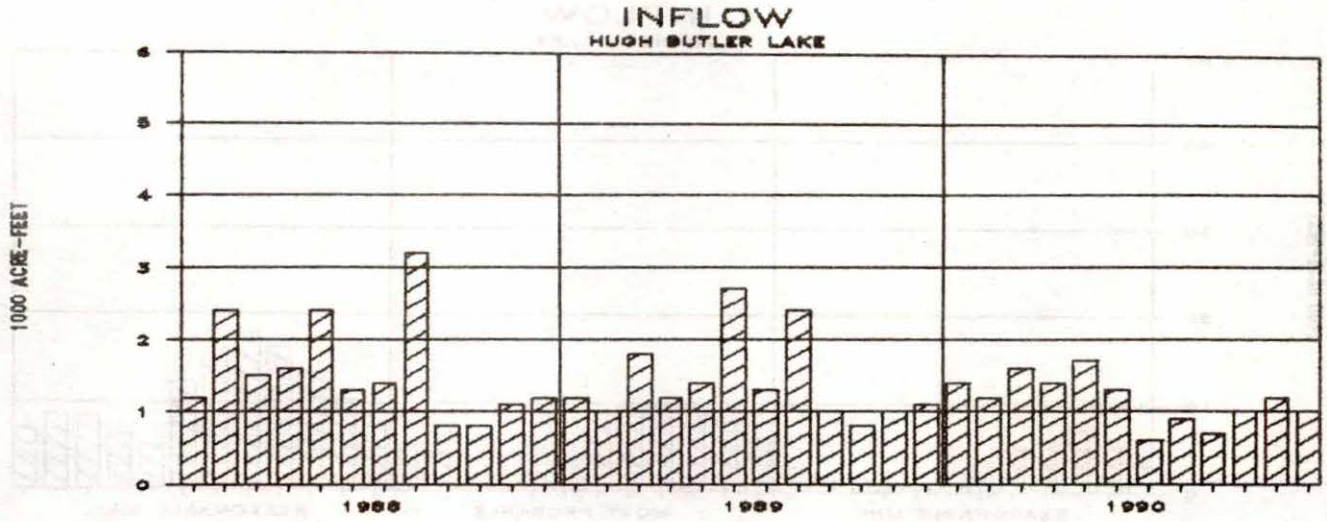
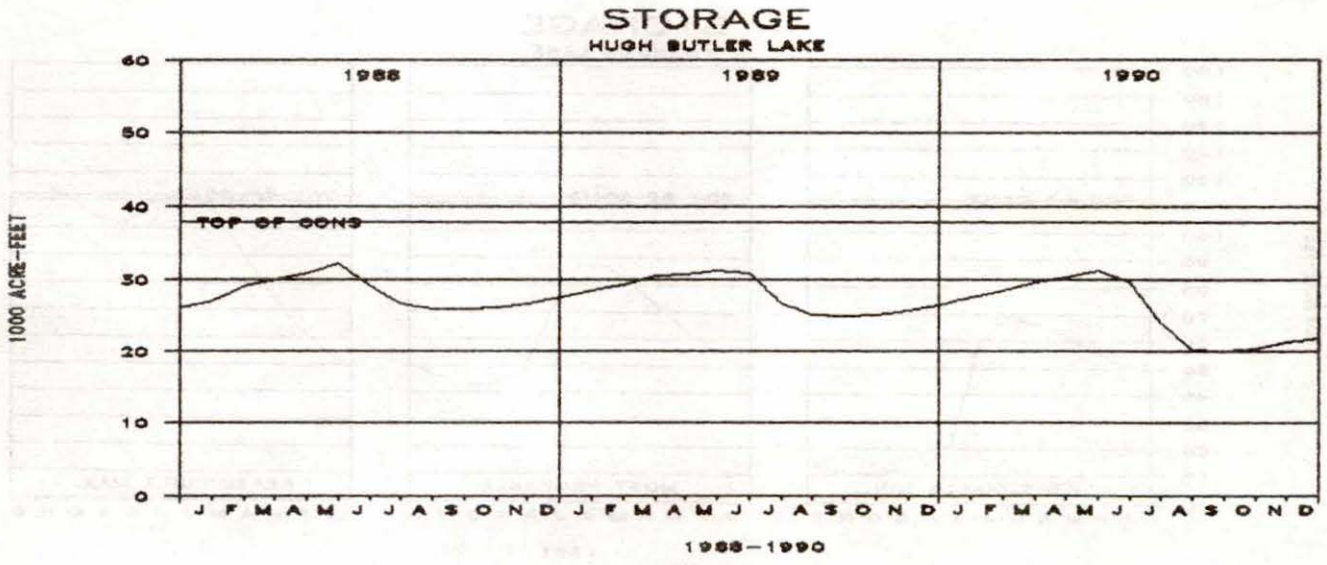


EXHIBIT 8A

HUGH BUTLER LAKE

OPERATION





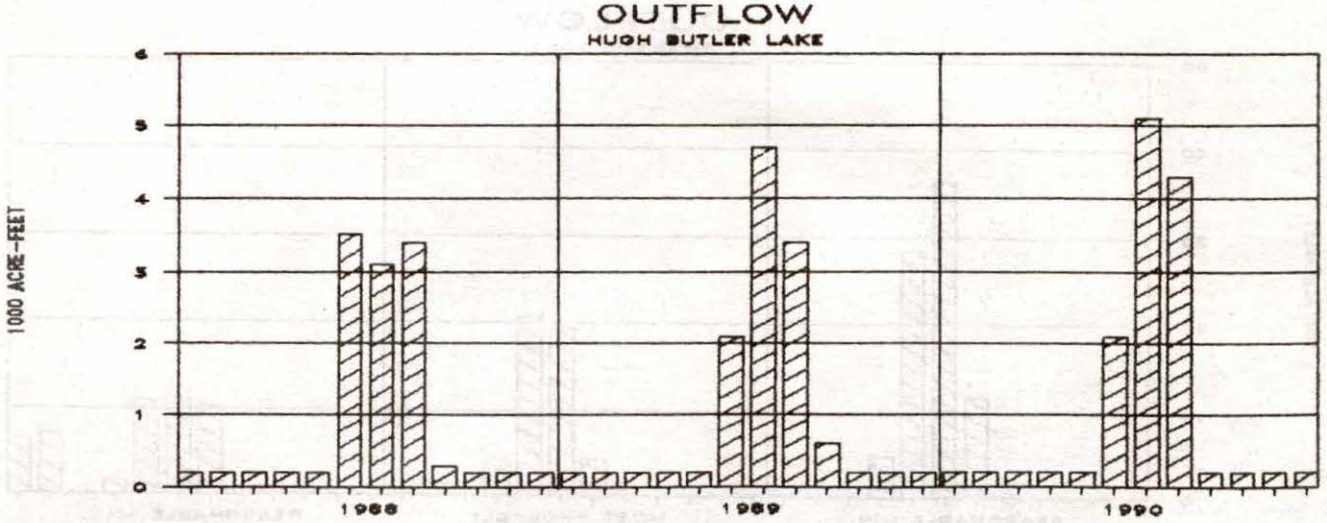
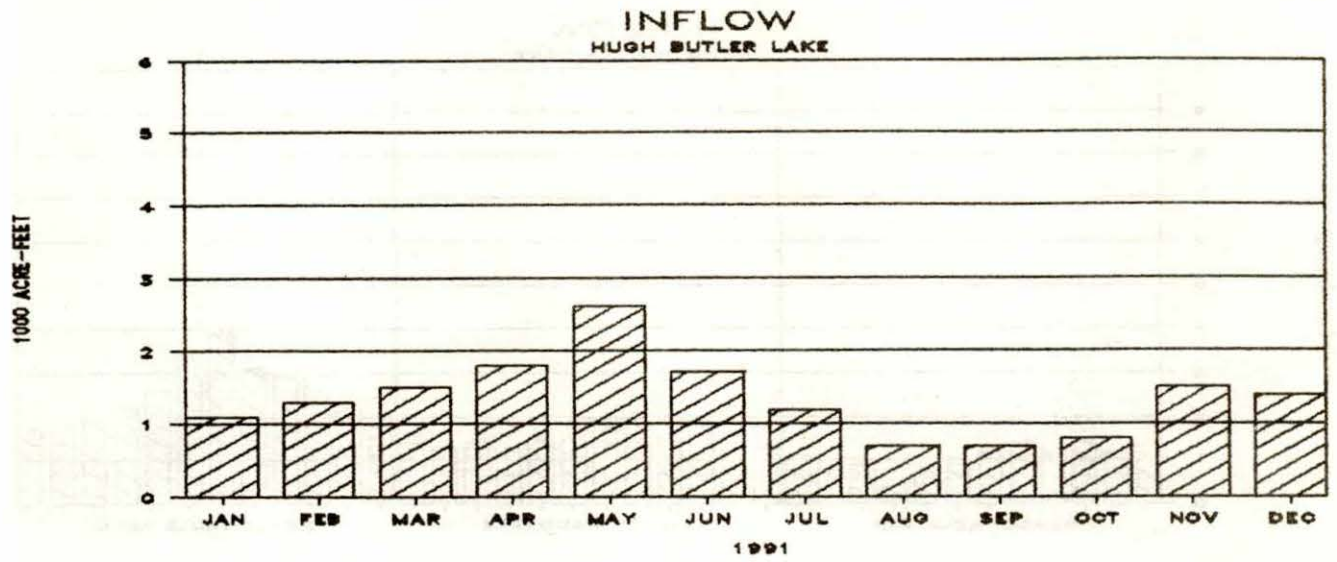
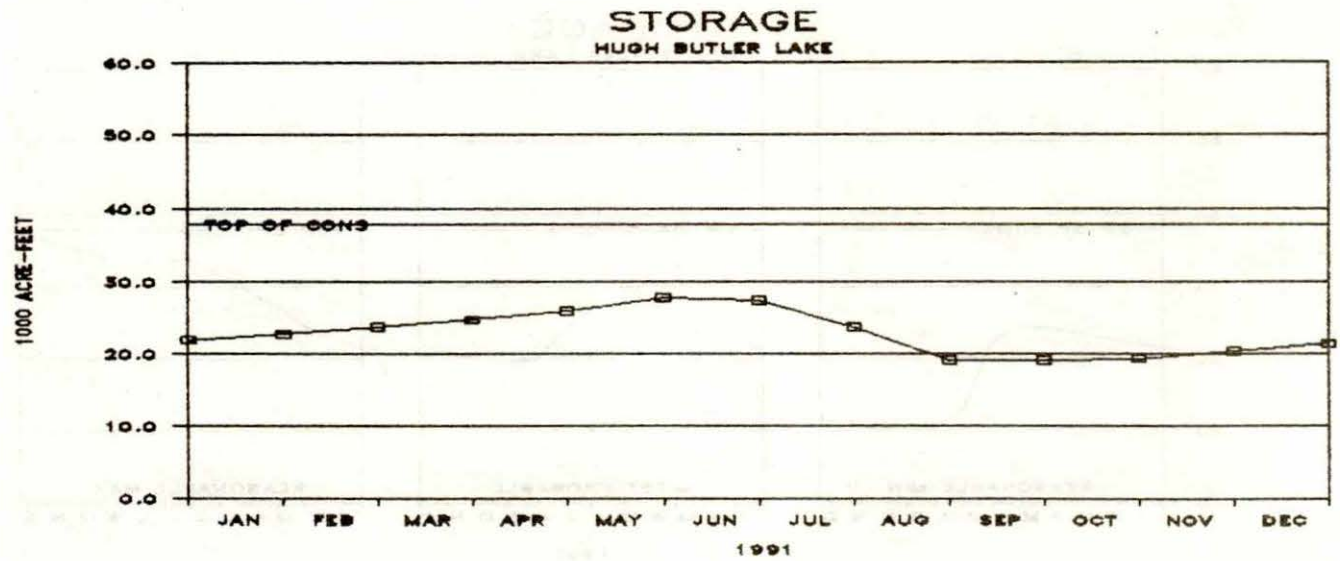


EXHIBIT 8B

HUGH BUTLER LAKE

1991 OPERATION





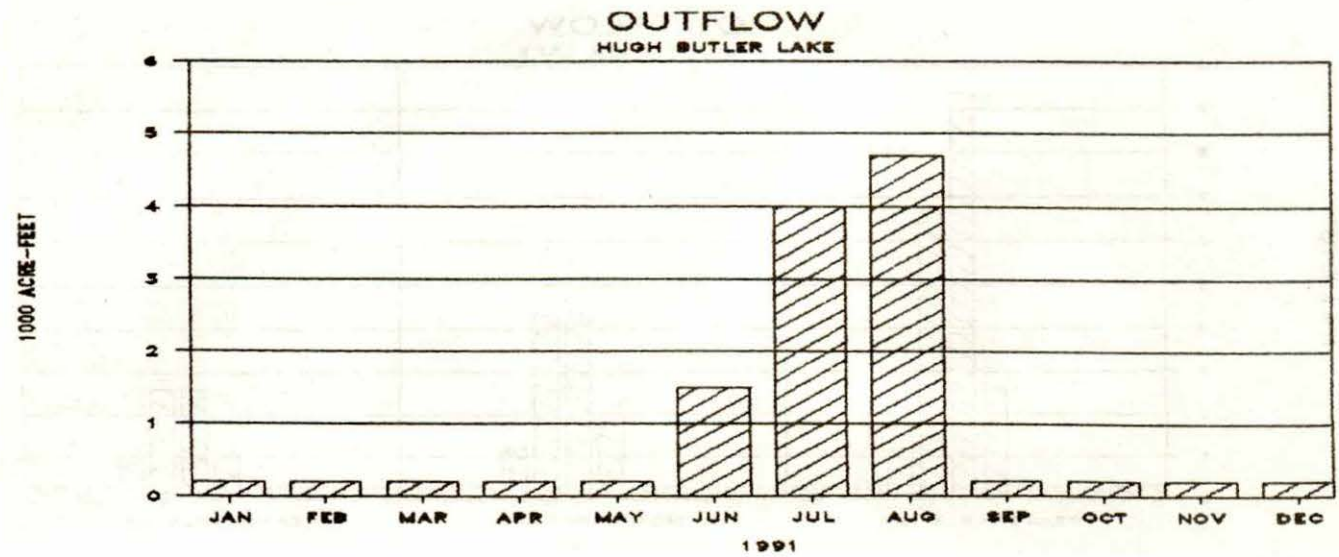
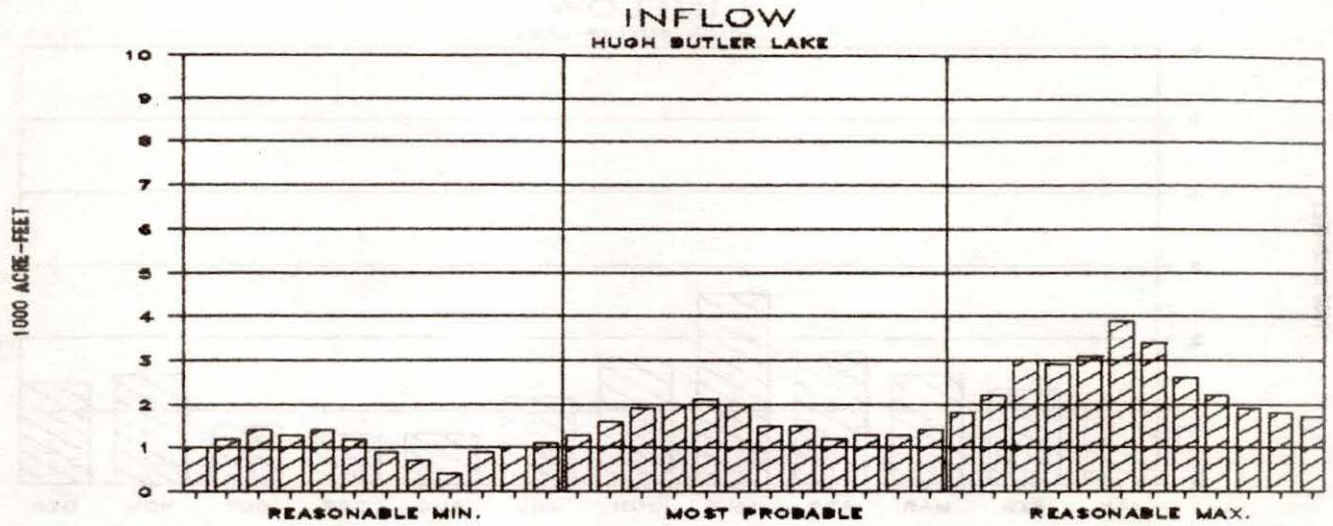
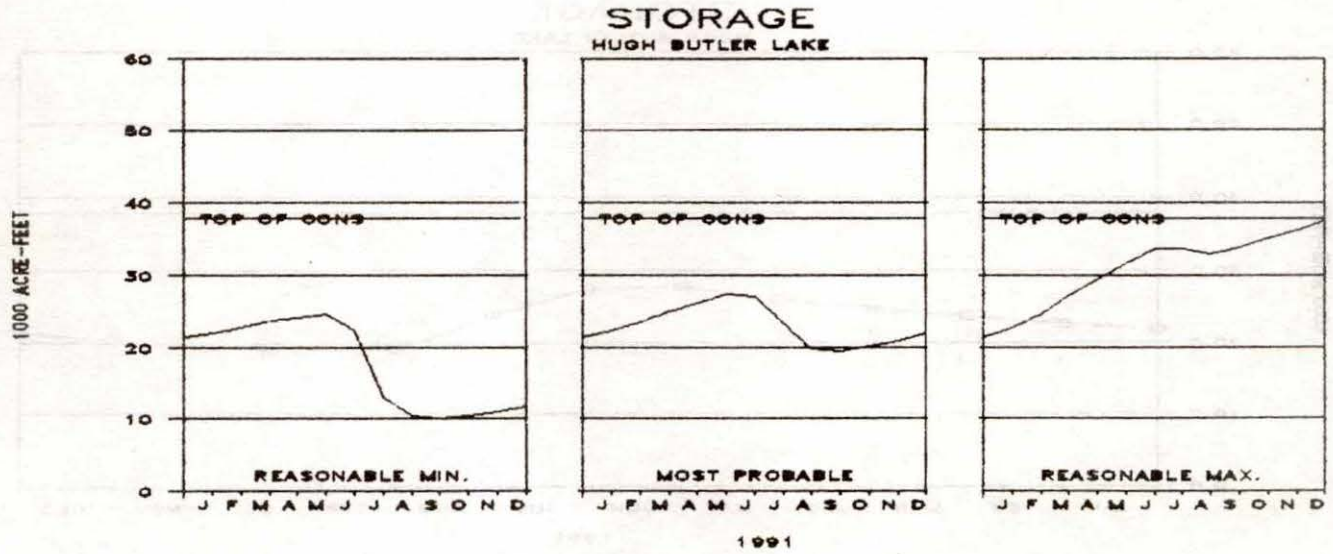


EXHIBIT 8C

HUGH BUTLER LAKE

1992 OPERATION PLAN





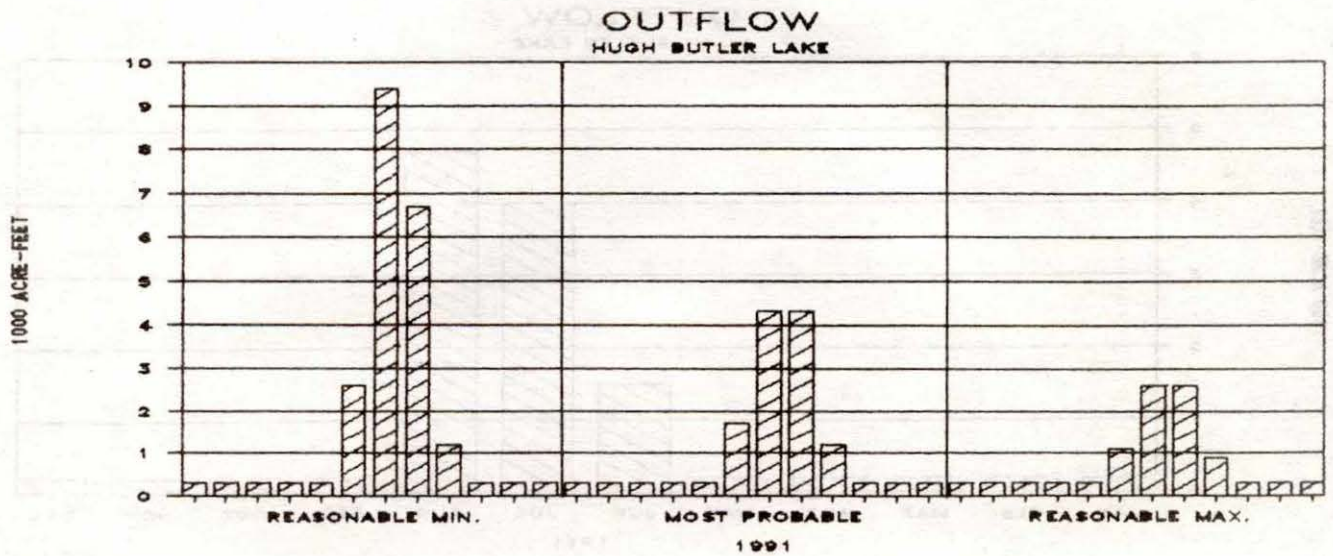
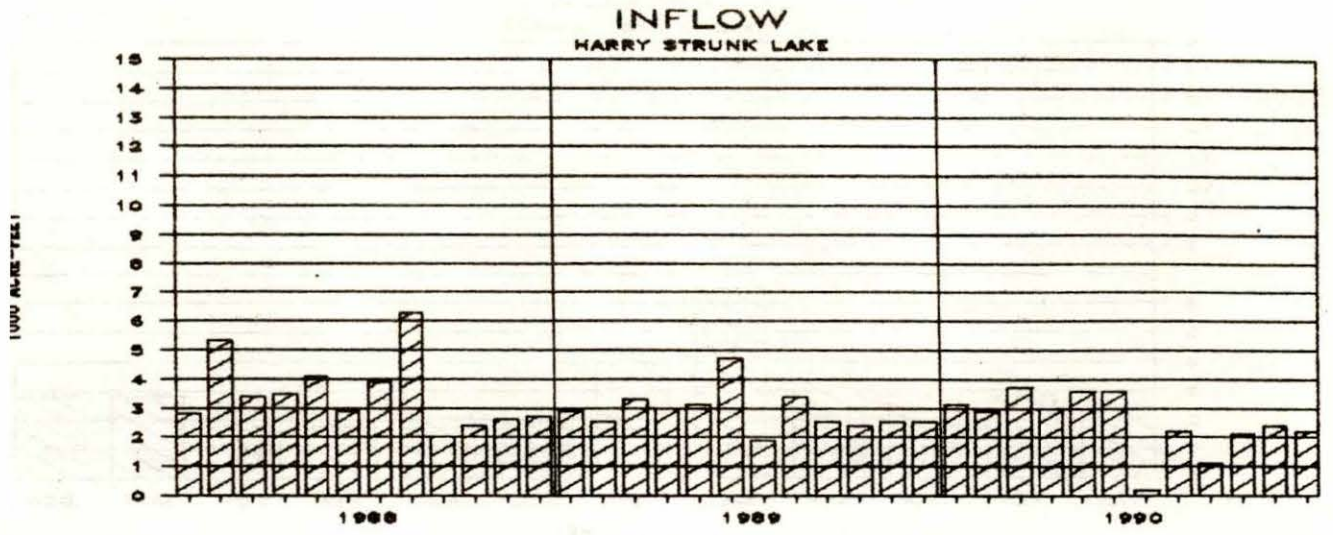
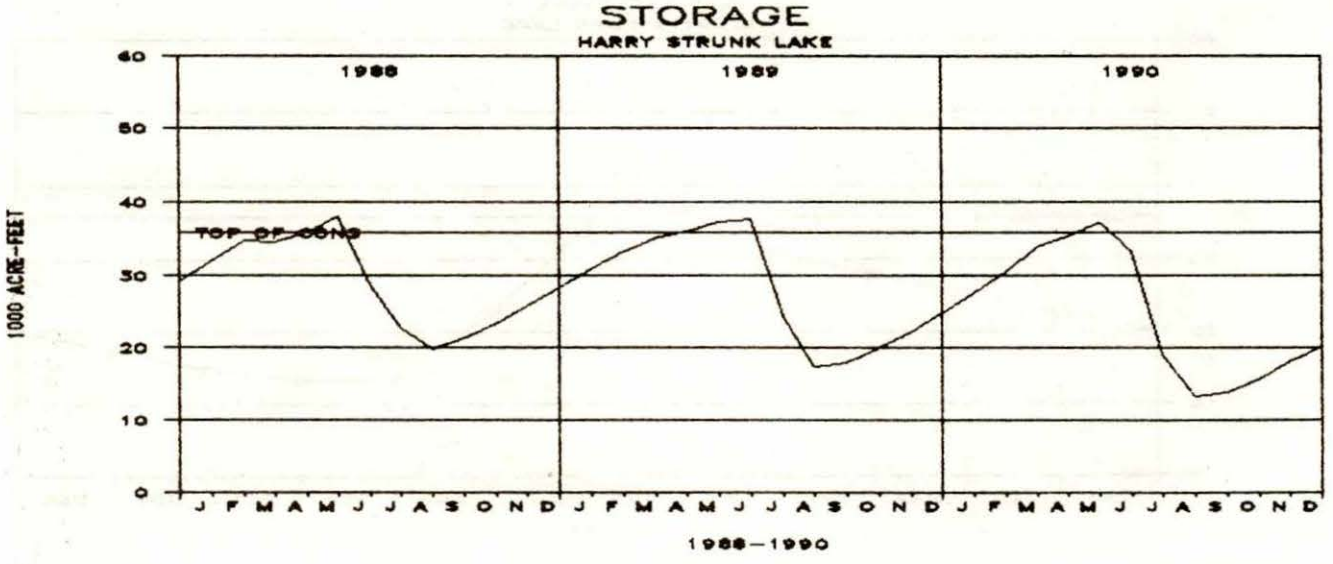


EXHIBIT 9A

HARRY STRUNK LAKE

OPERATION





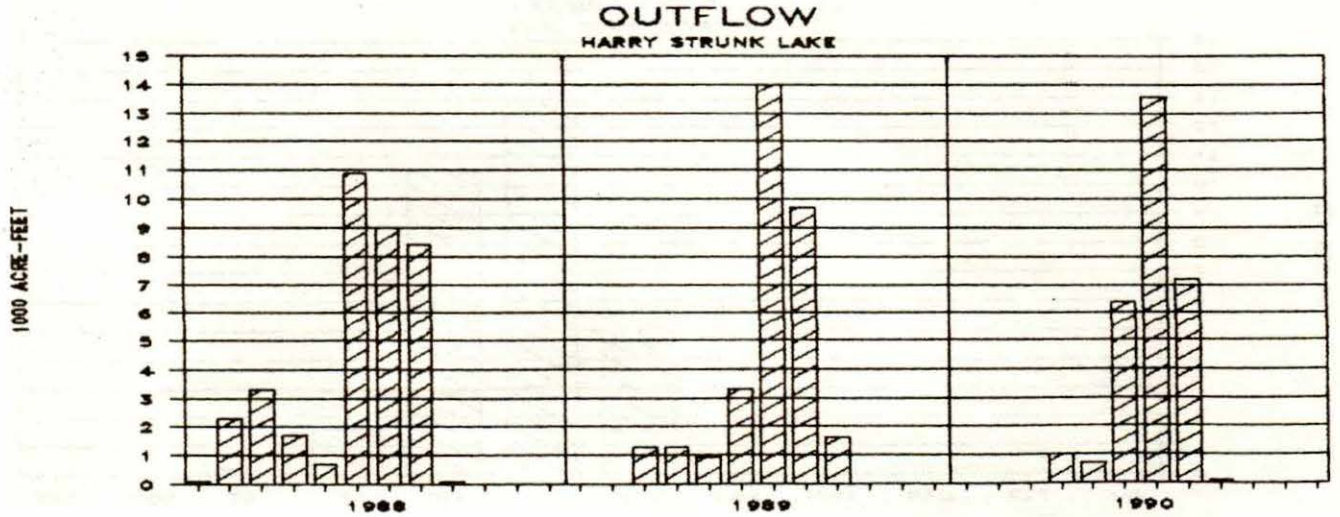
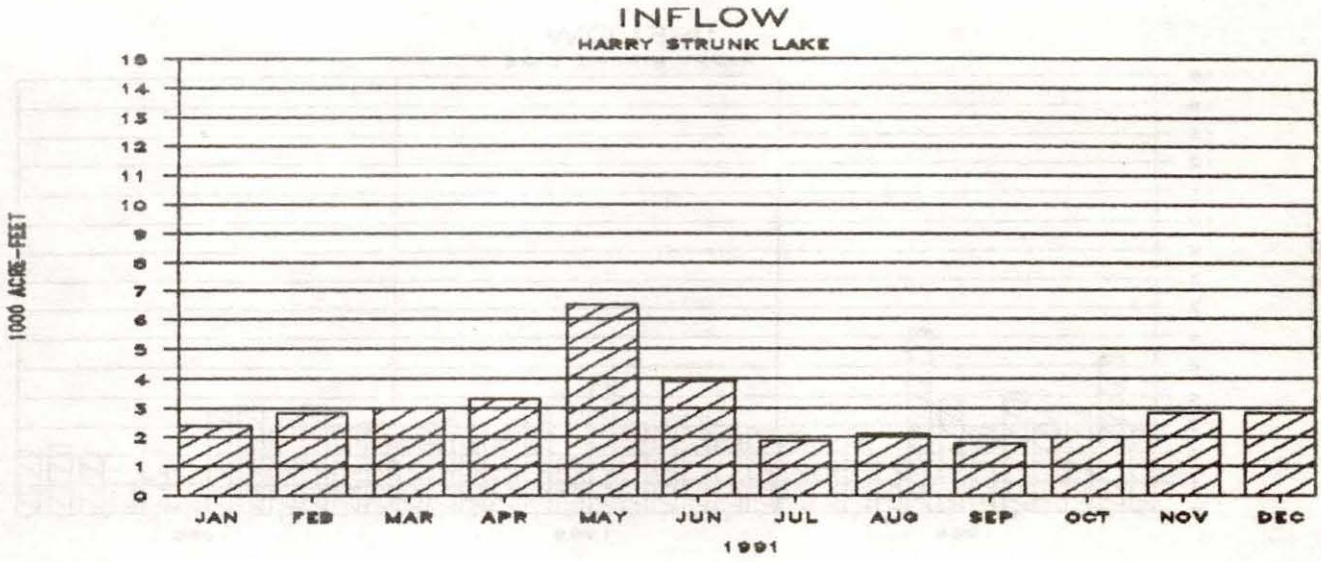
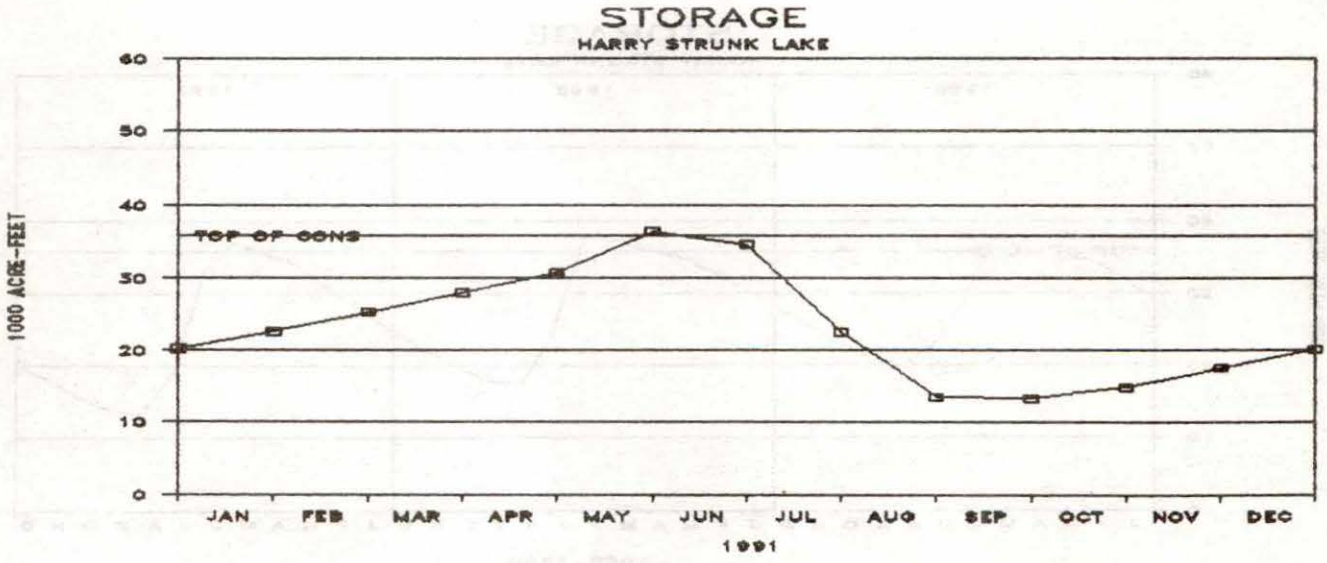


EXHIBIT 9B

HARRY STRUNK LAKE

1991 OPERATION





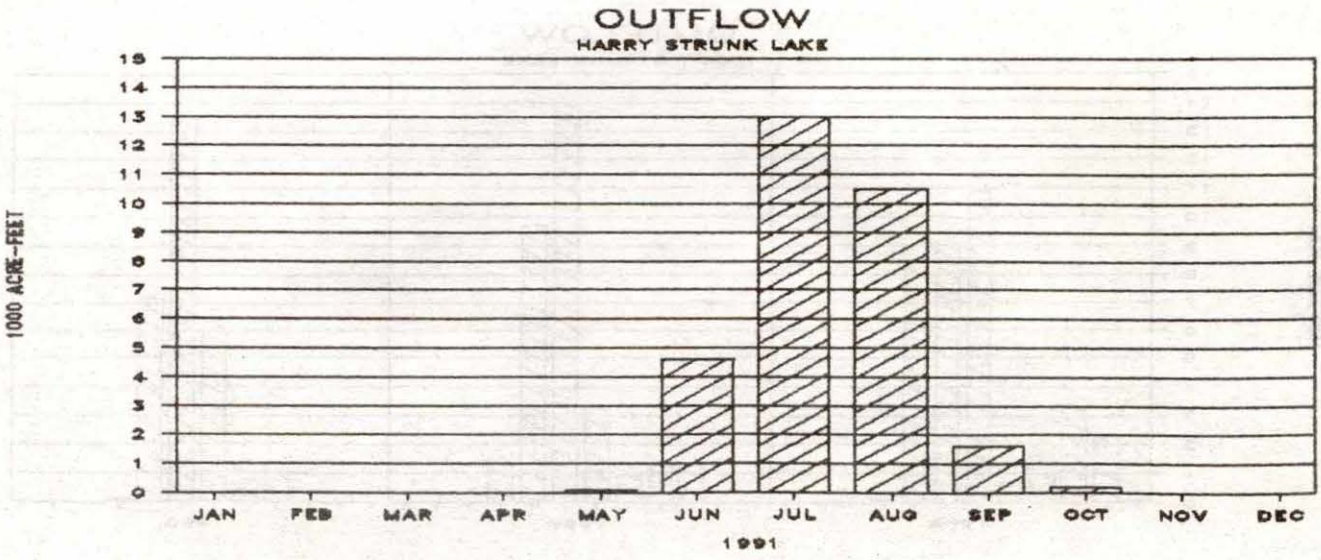
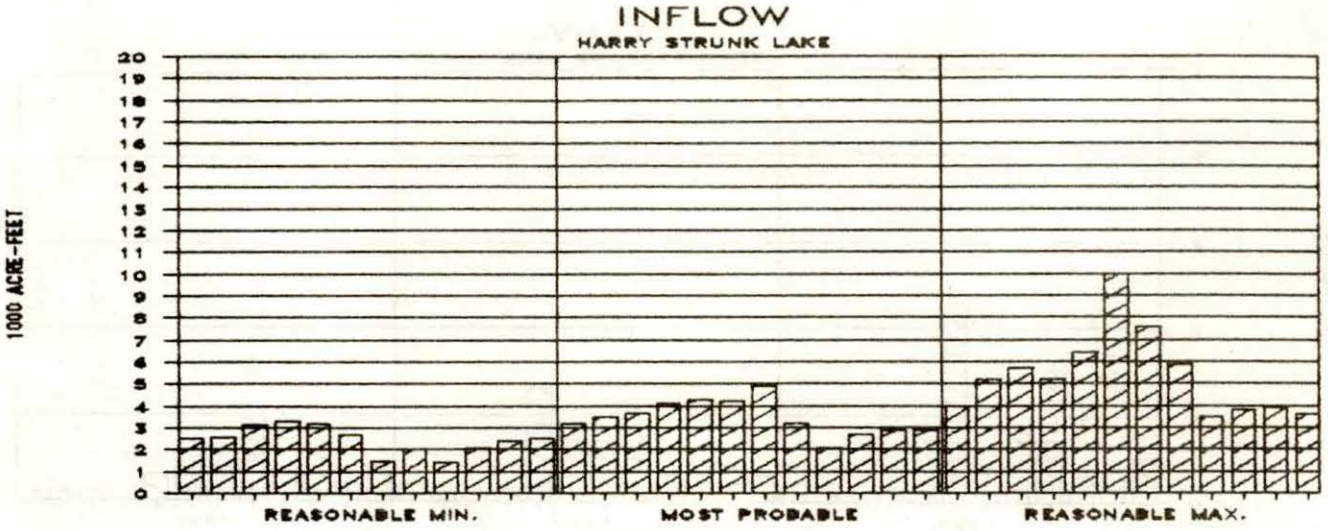
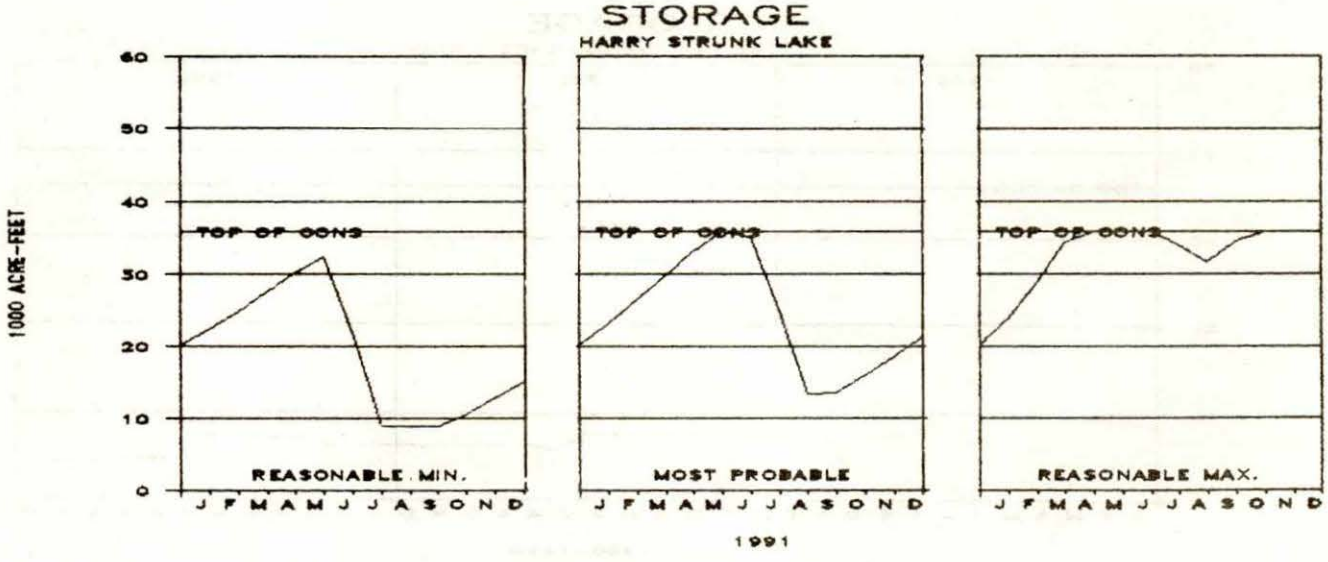


EXHIBIT 9C

HARRY STRUNK LAKE

1992 OPERATION PLAN





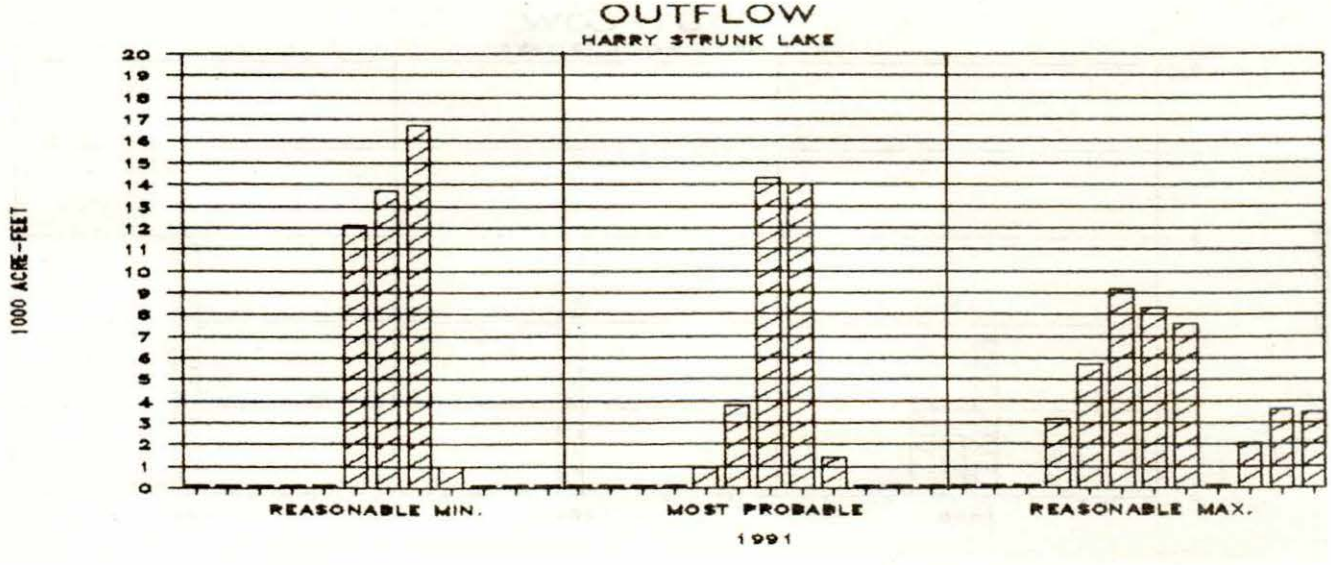
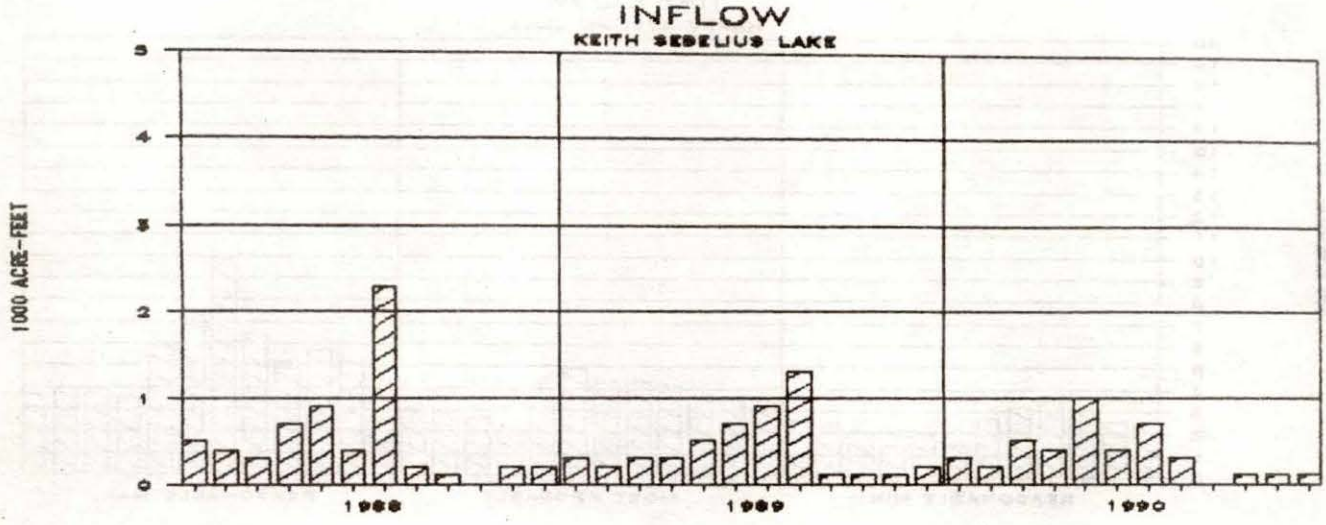
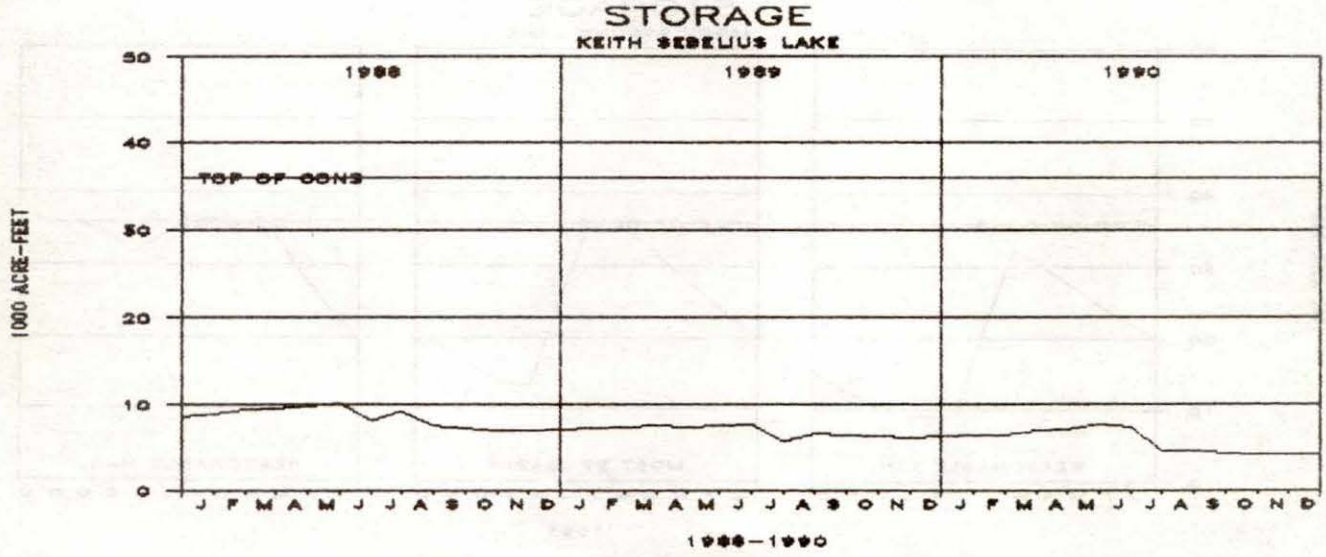


EXHIBIT 10A

KEITH SEBELIUS LAKE
OPERATION





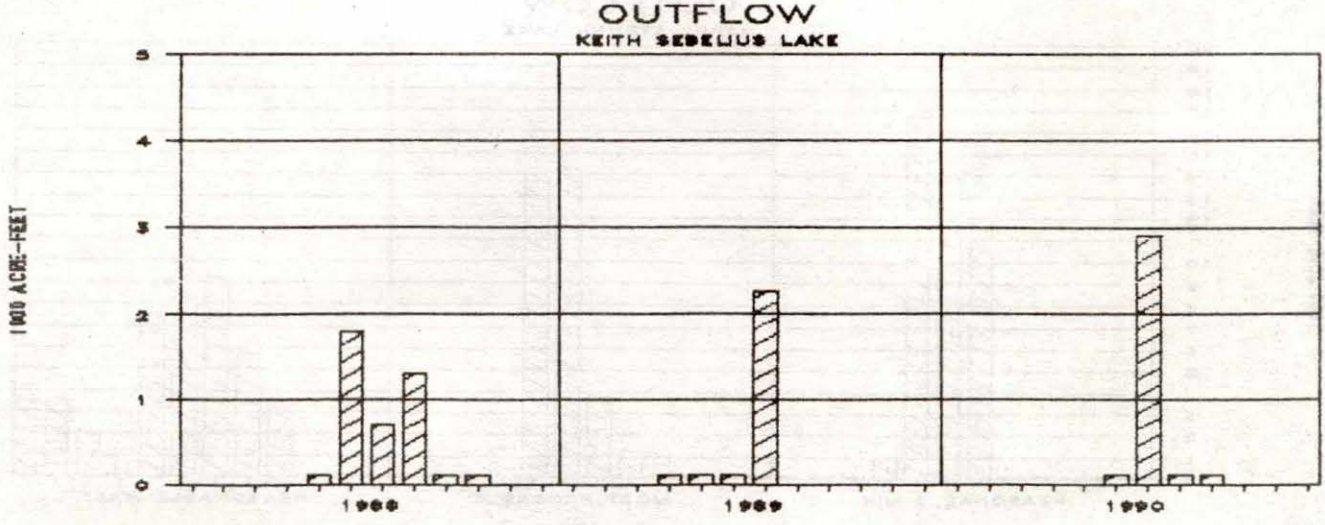
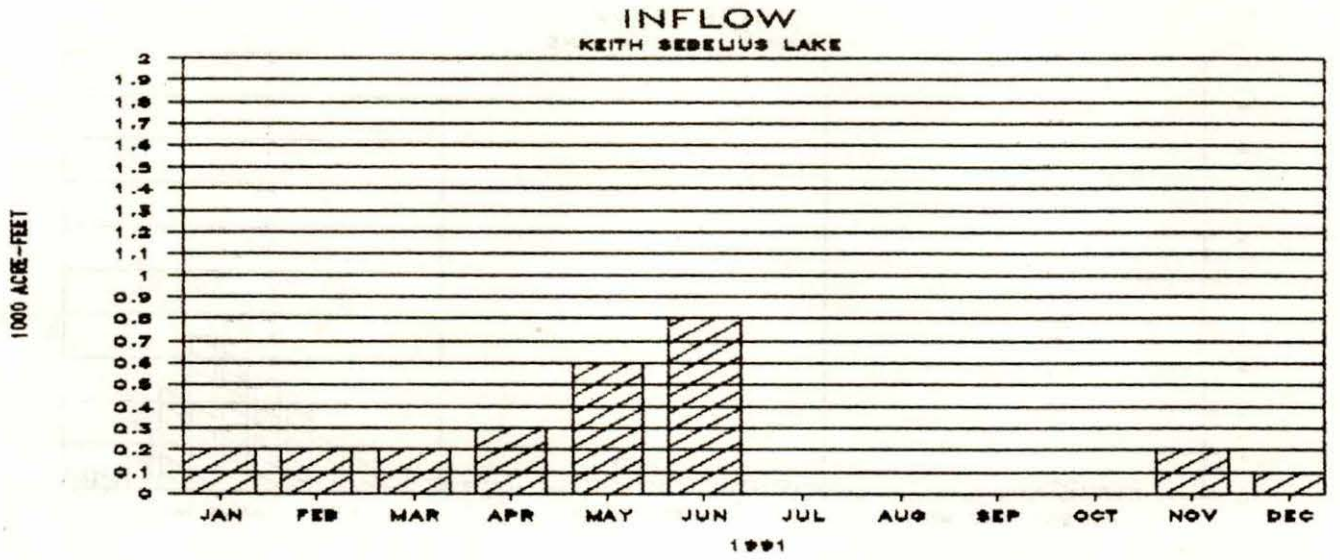
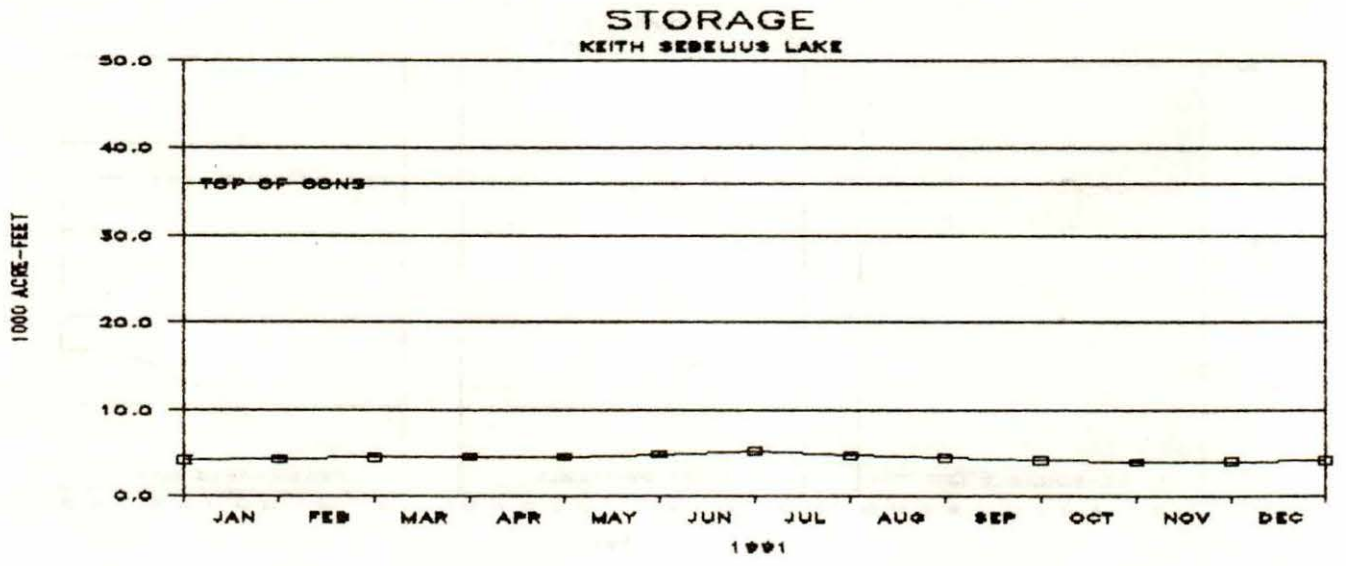


EXHIBIT 10B

KEITH SEBELIUS LAKE

1991 OPERATION





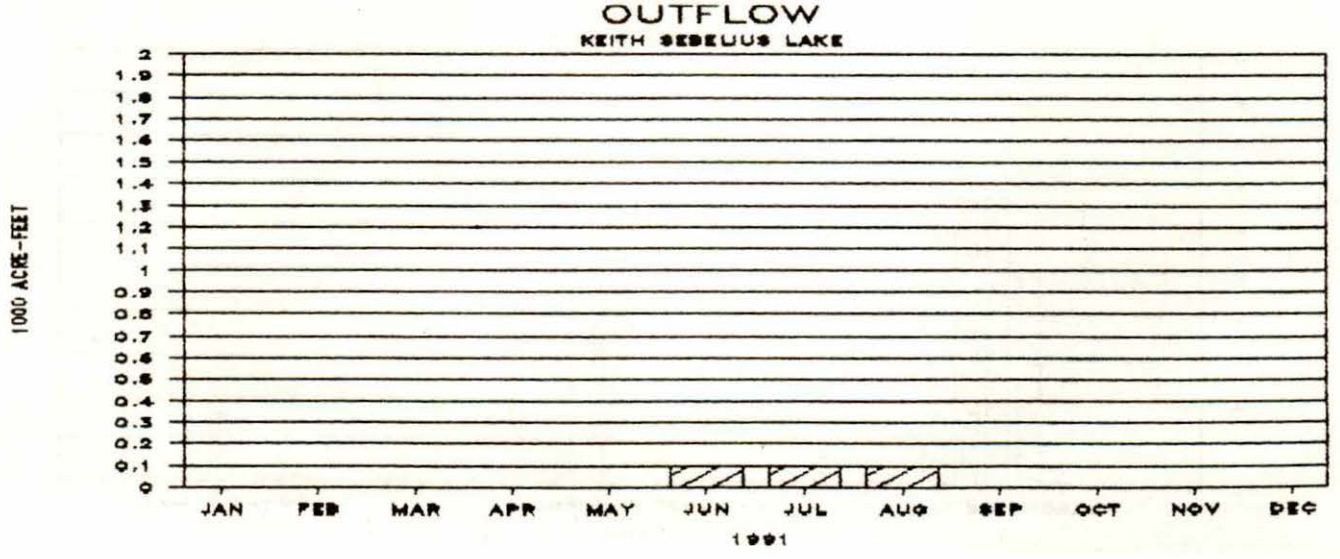
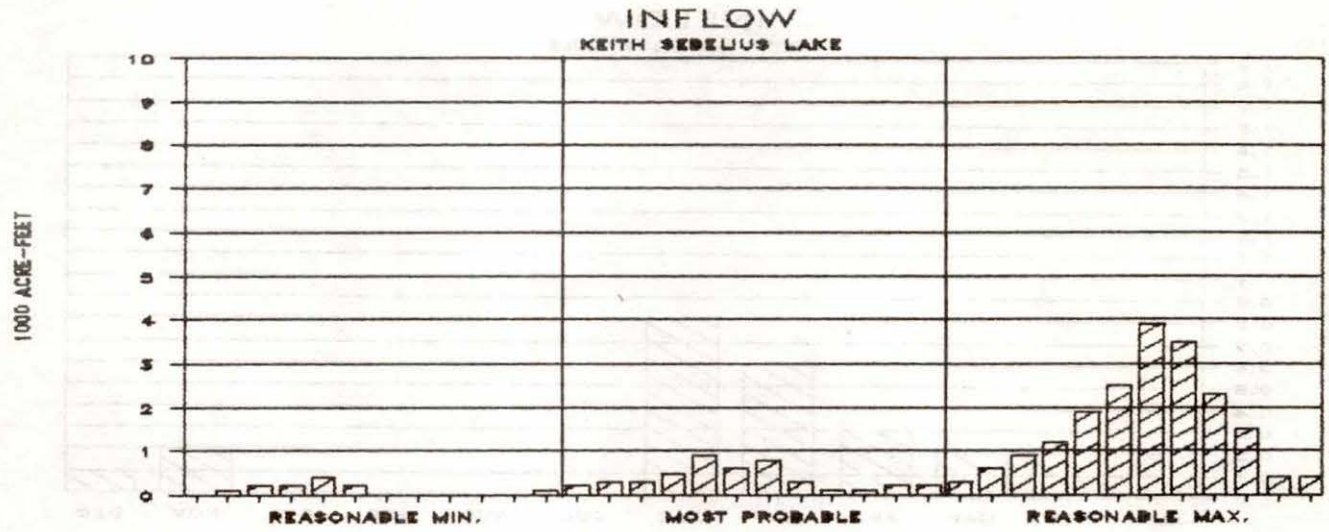
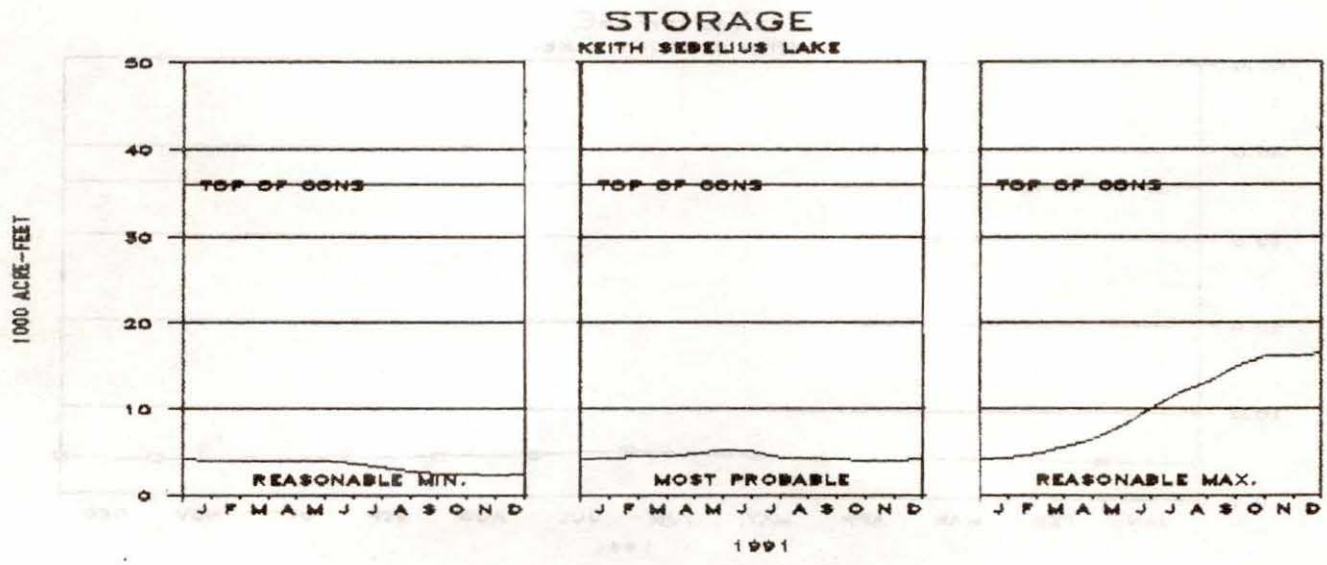


EXHIBIT 10C

KEITH SEBELIUS LAKE

1992 OPERATION PLAN





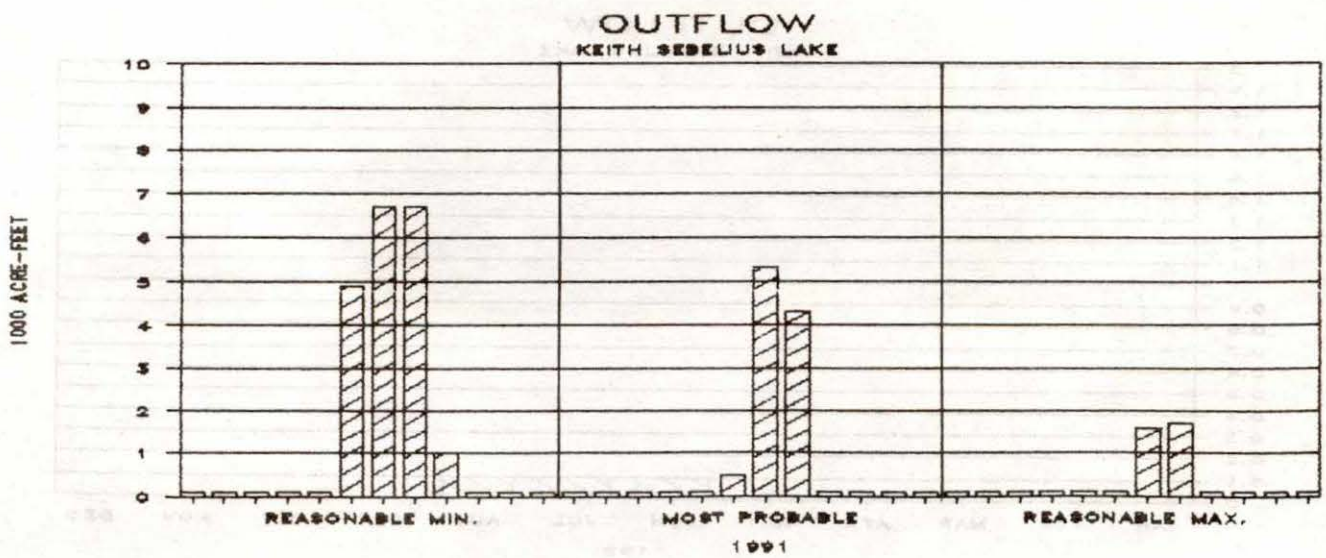
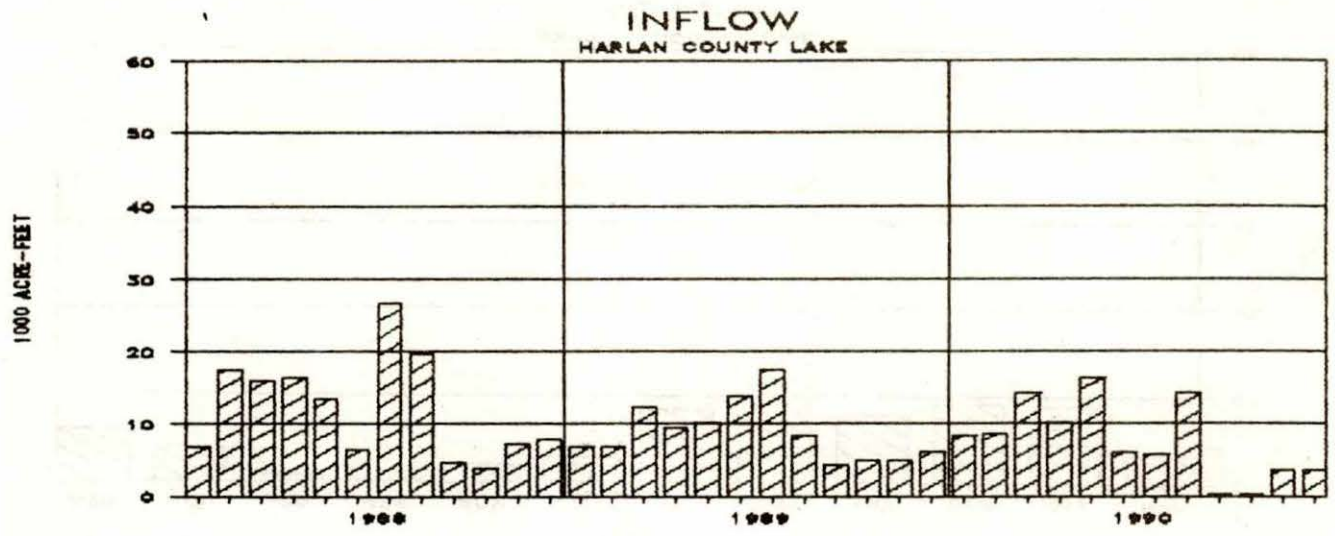
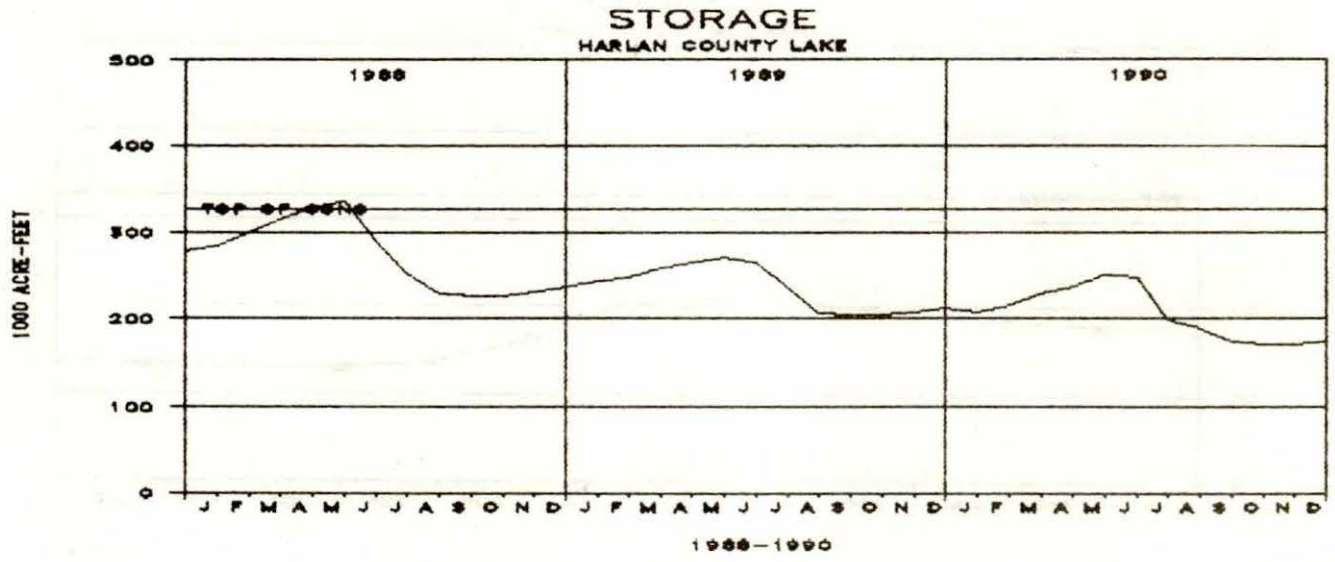


EXHIBIT 11A

HARLAN COUNTY LAKE

OPERATION





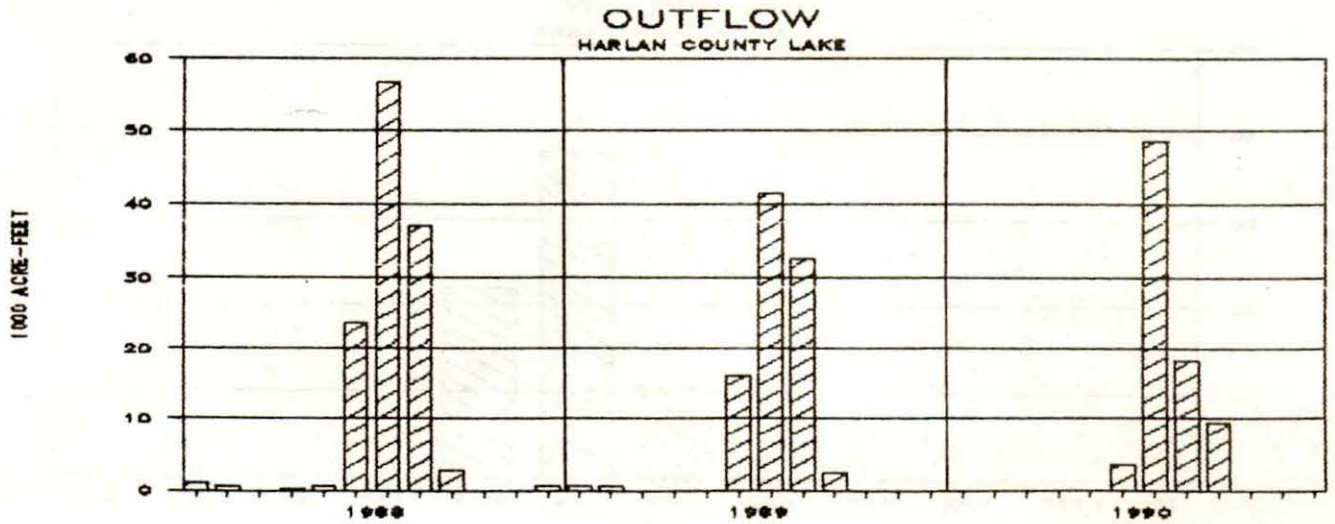
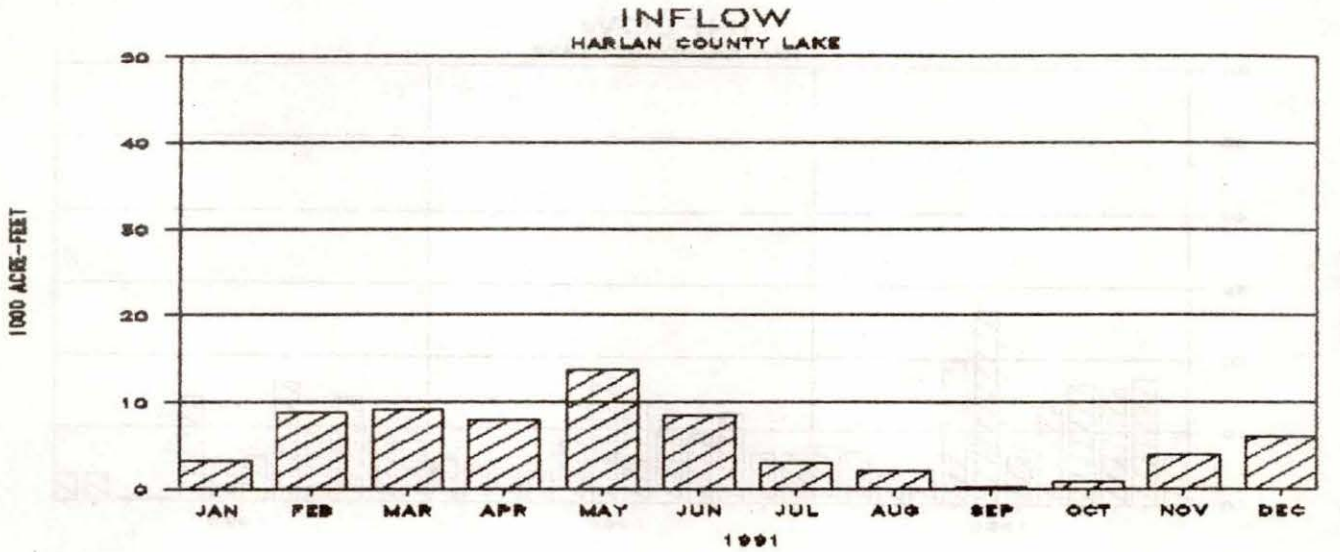
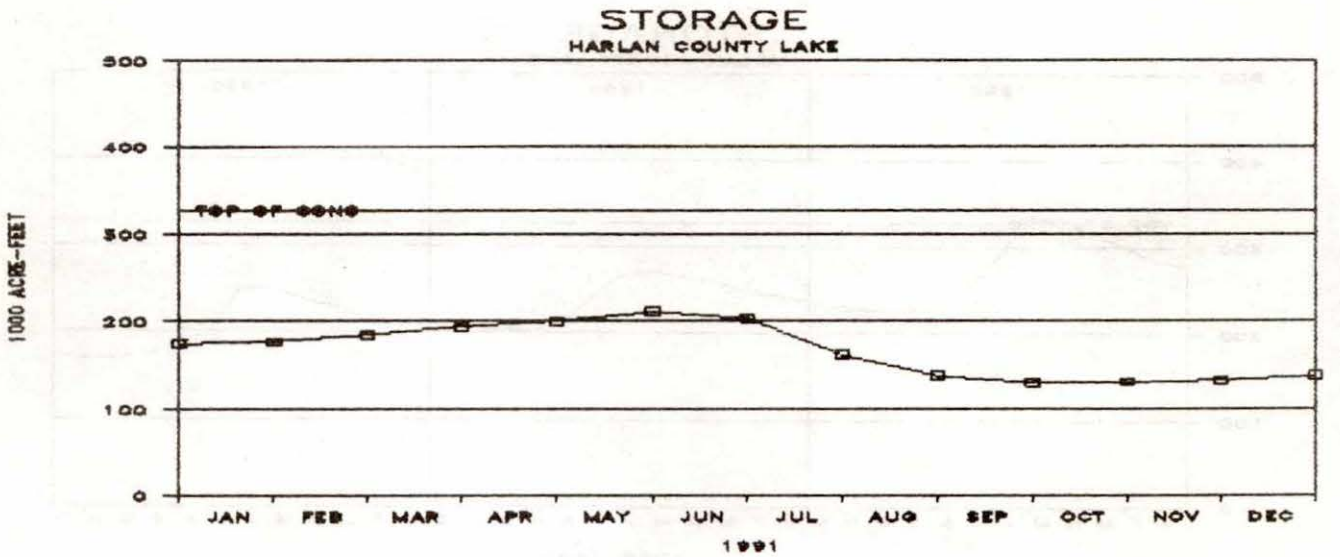


EXHIBIT 11B

HARLAN COUNTY LAKE

1991 OPERATION





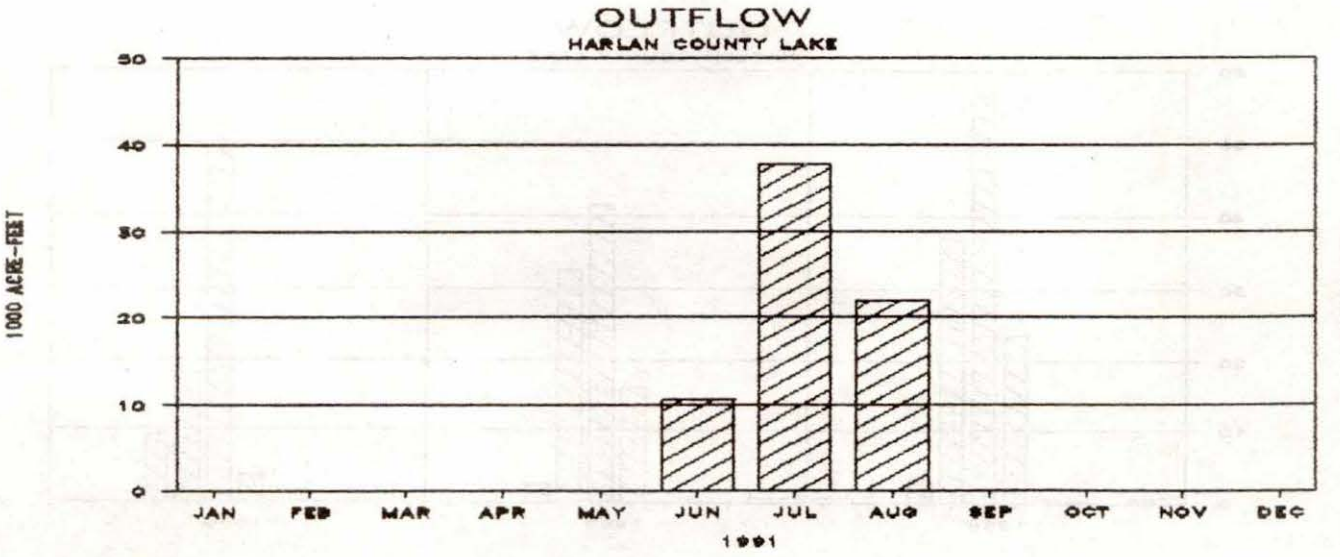
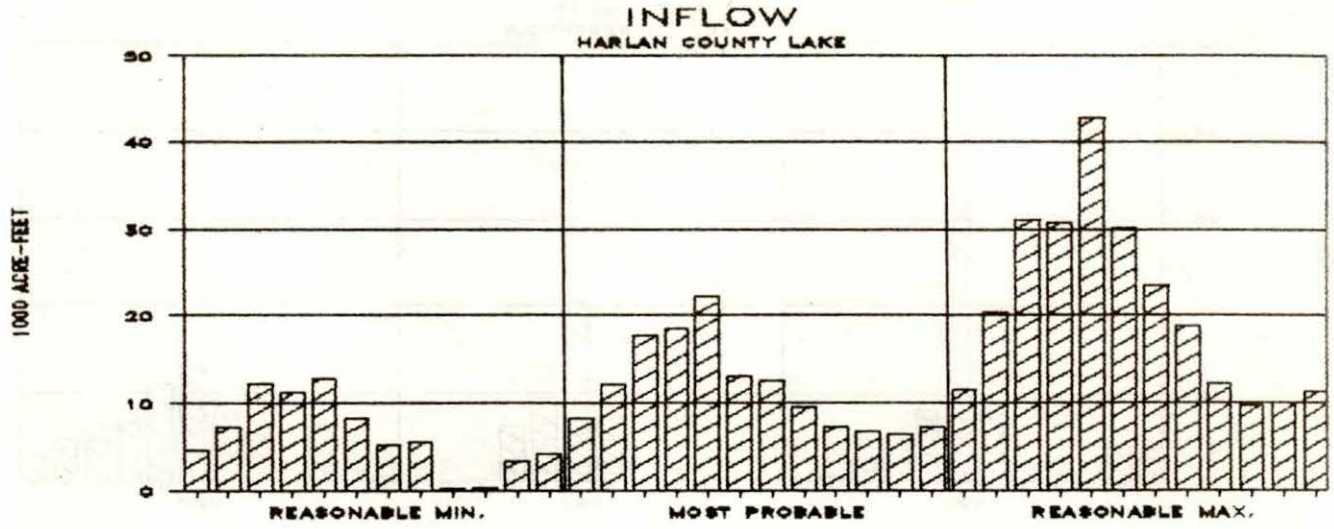
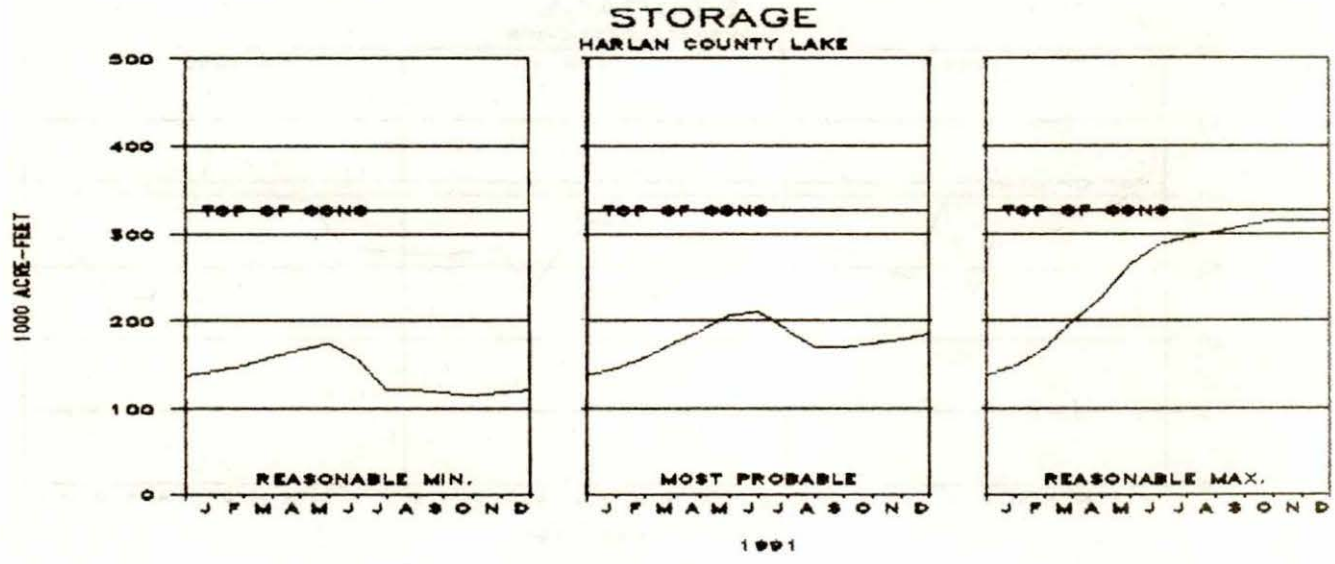


EXHIBIT 11C

HARLAN COUNTY LAKE

1992 OPERATION PLAN





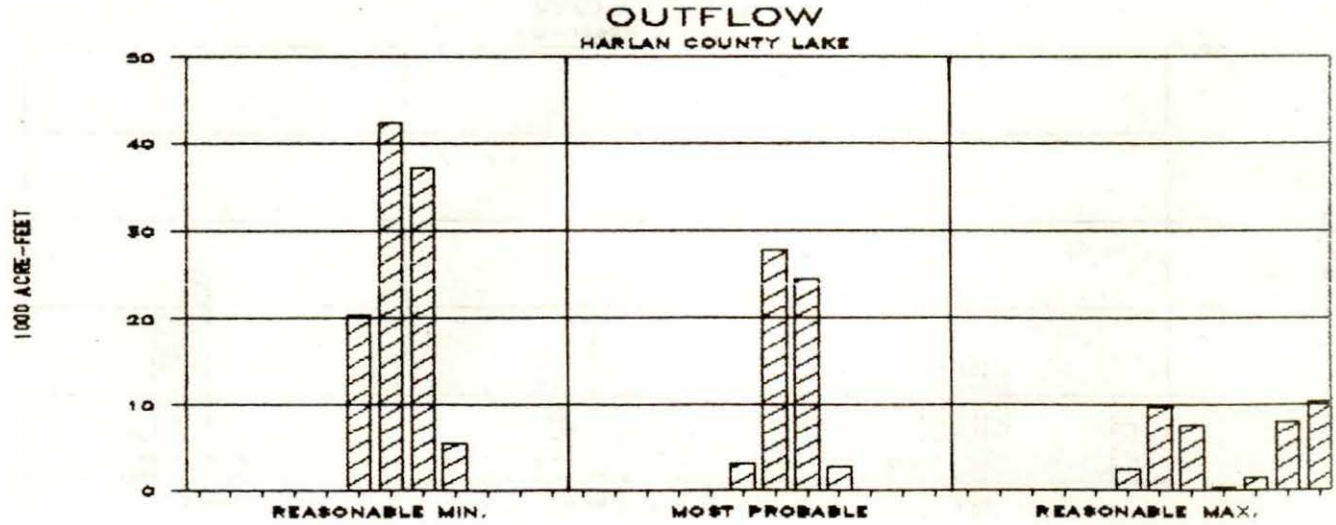
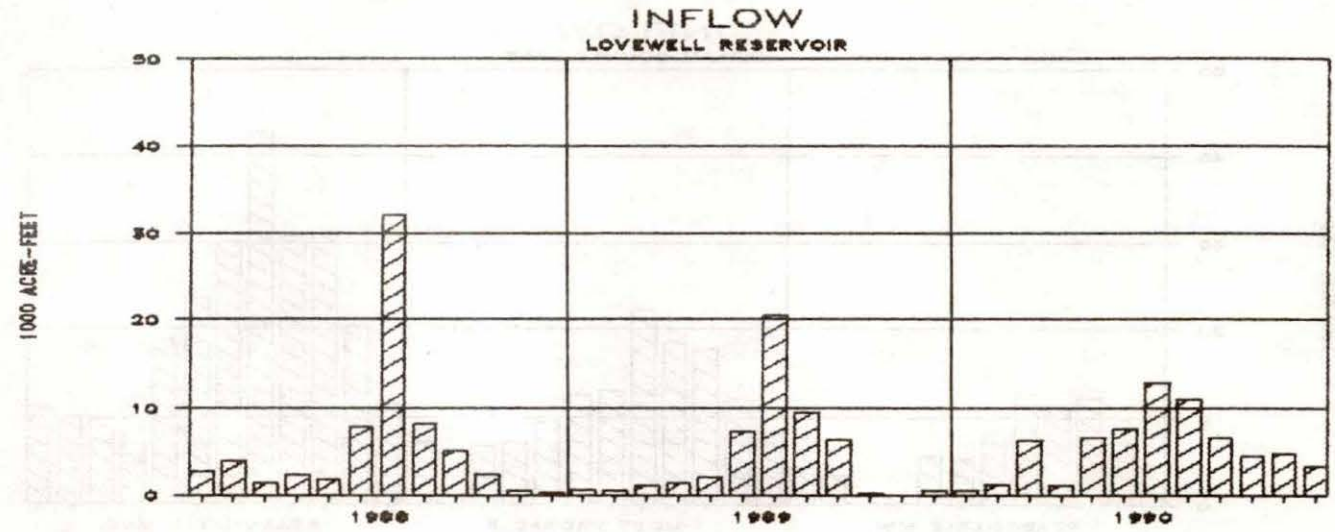
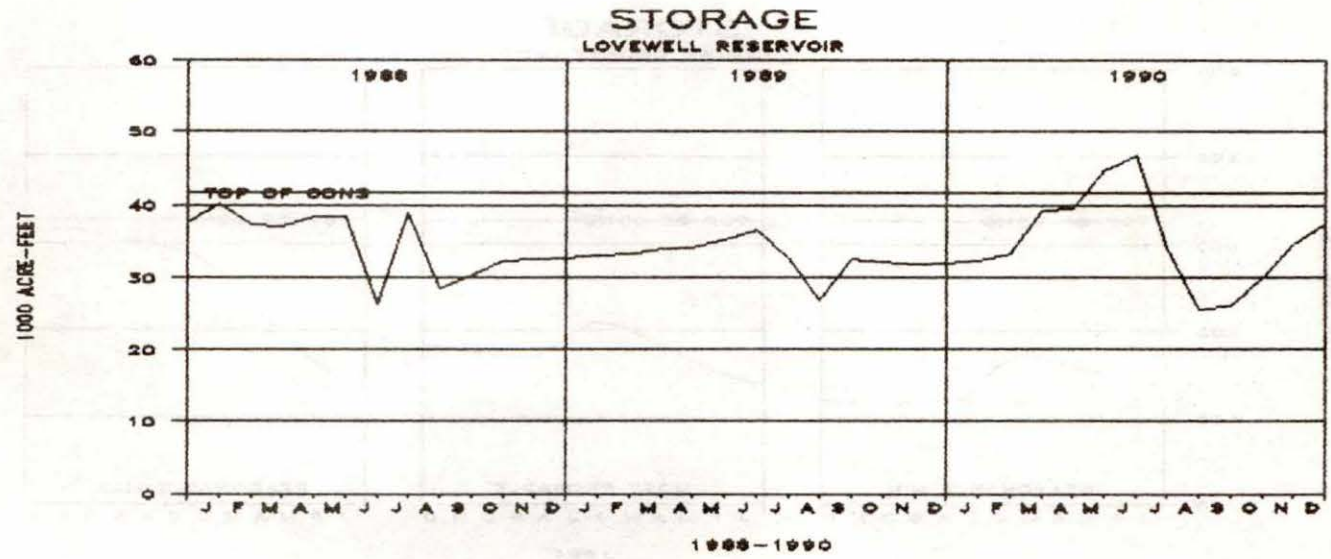


EXHIBIT 12A

LOVEWELL RESERVOIR
OPERATION





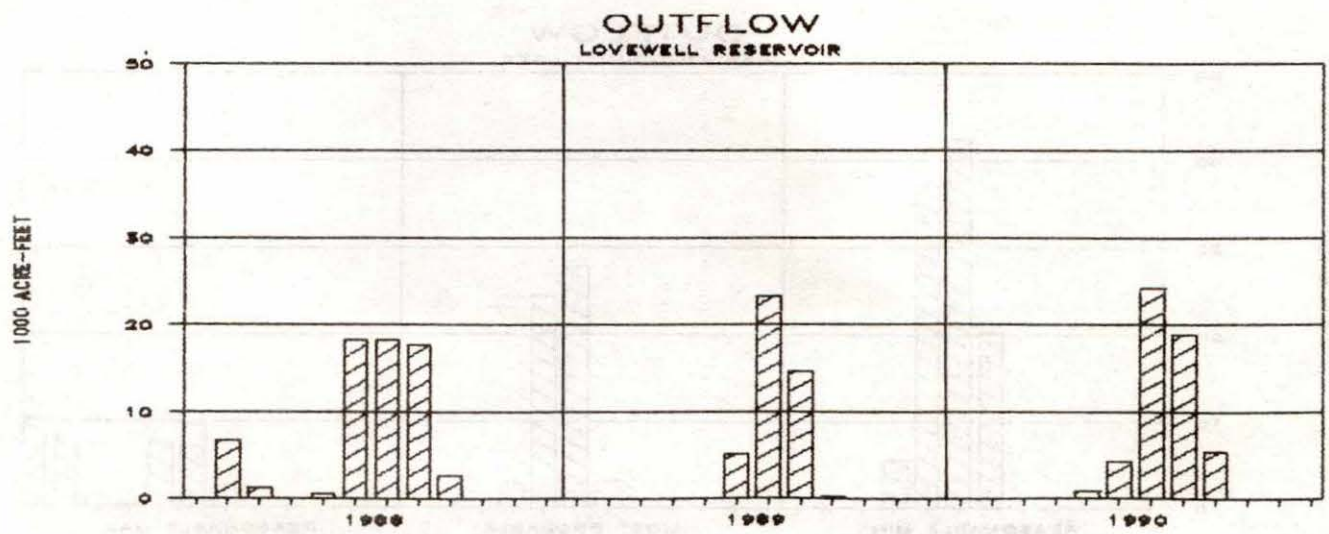
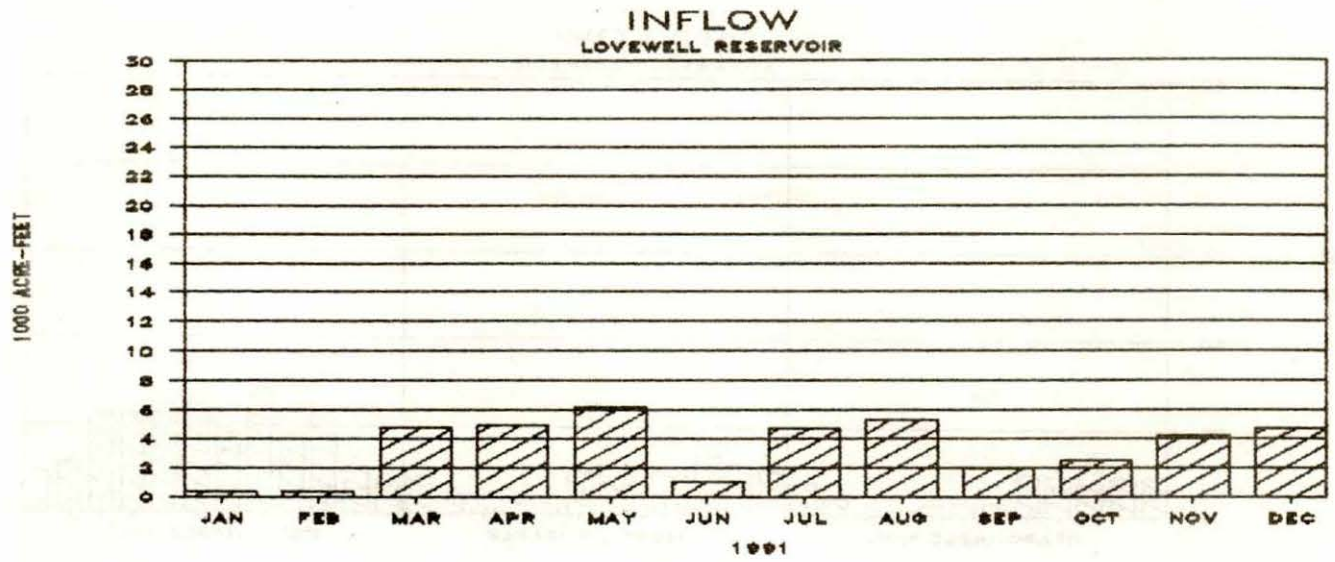
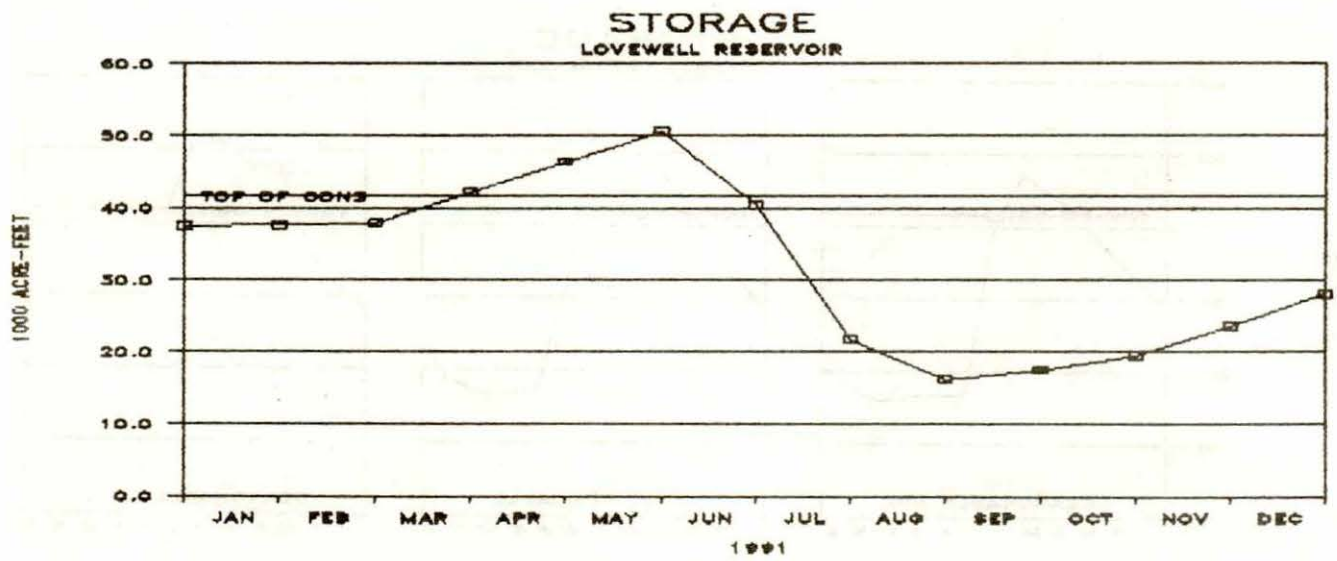


EXHIBIT 12B

LOVEWELL RESERVOIR

1991 OPERATION





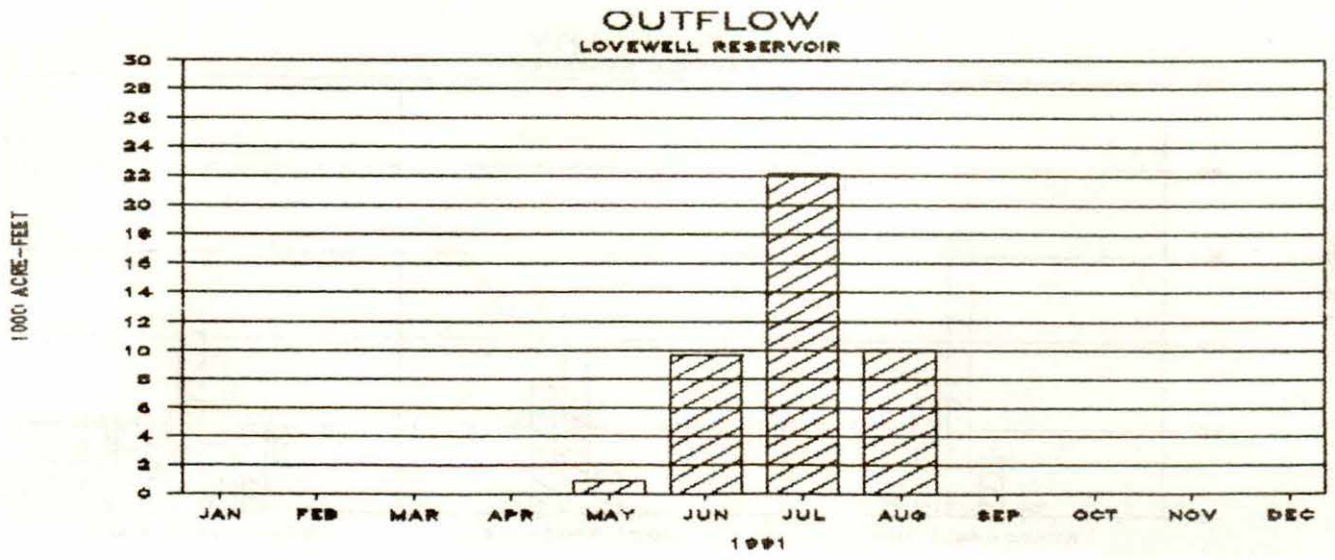
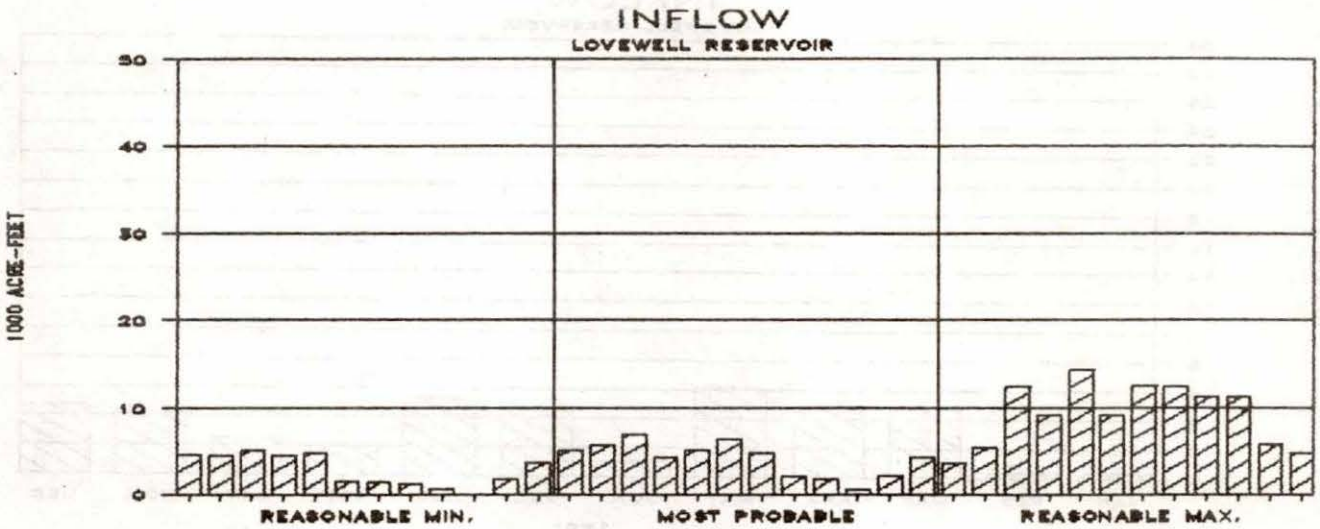
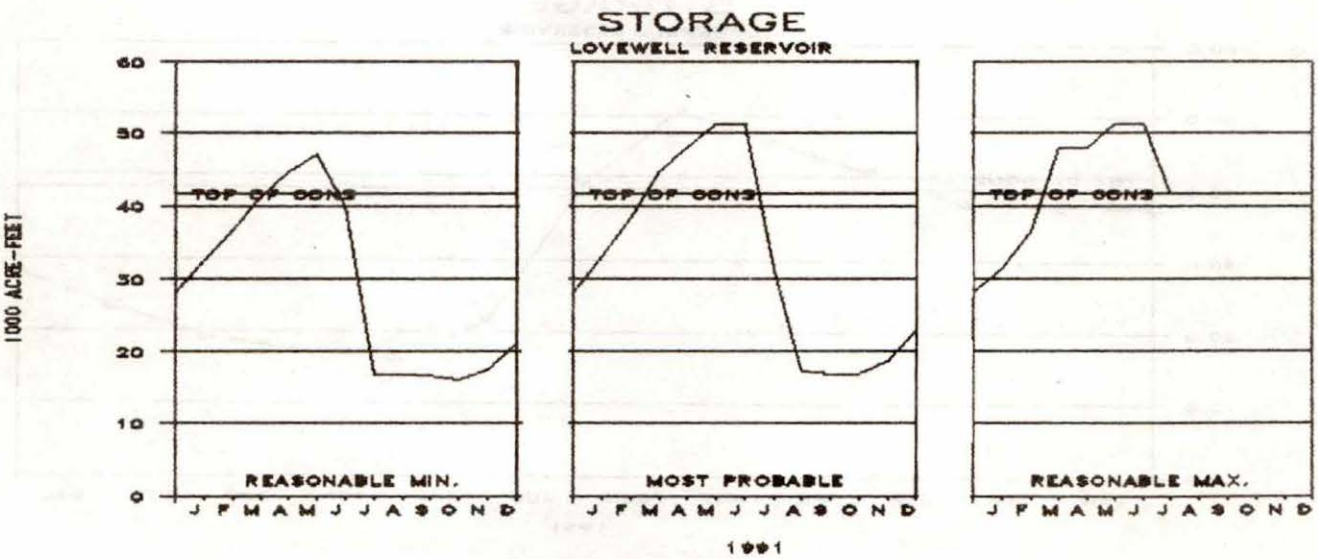


EXHIBIT 12C

LOVEWELL RESERVOIR

1992 OPERATION PLAN





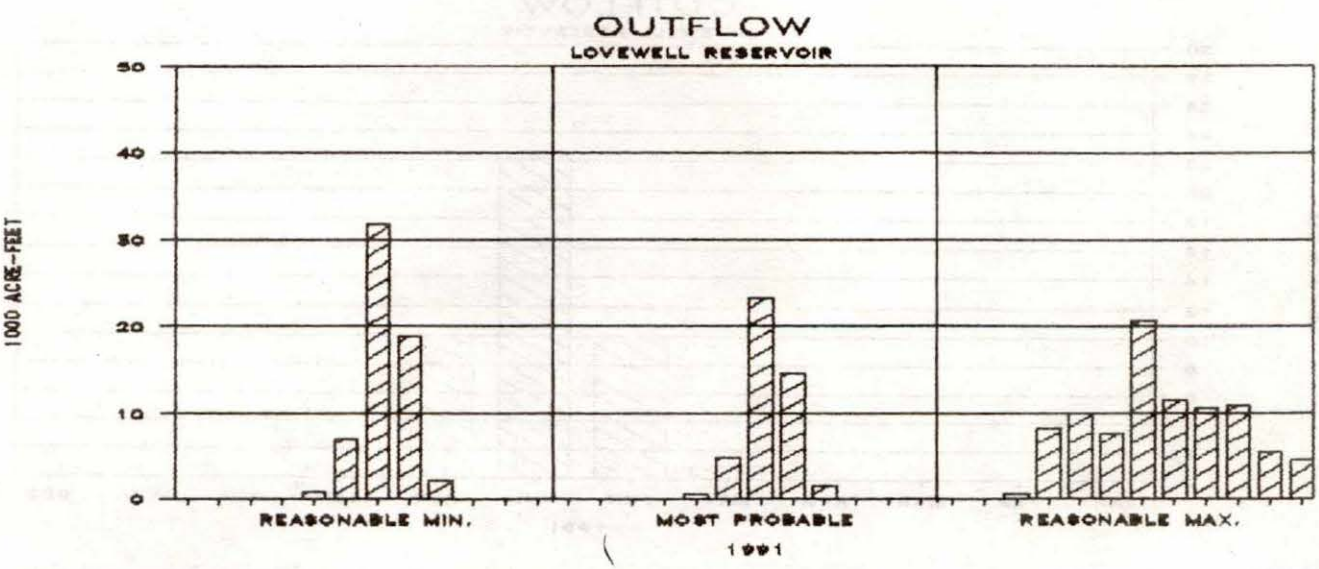
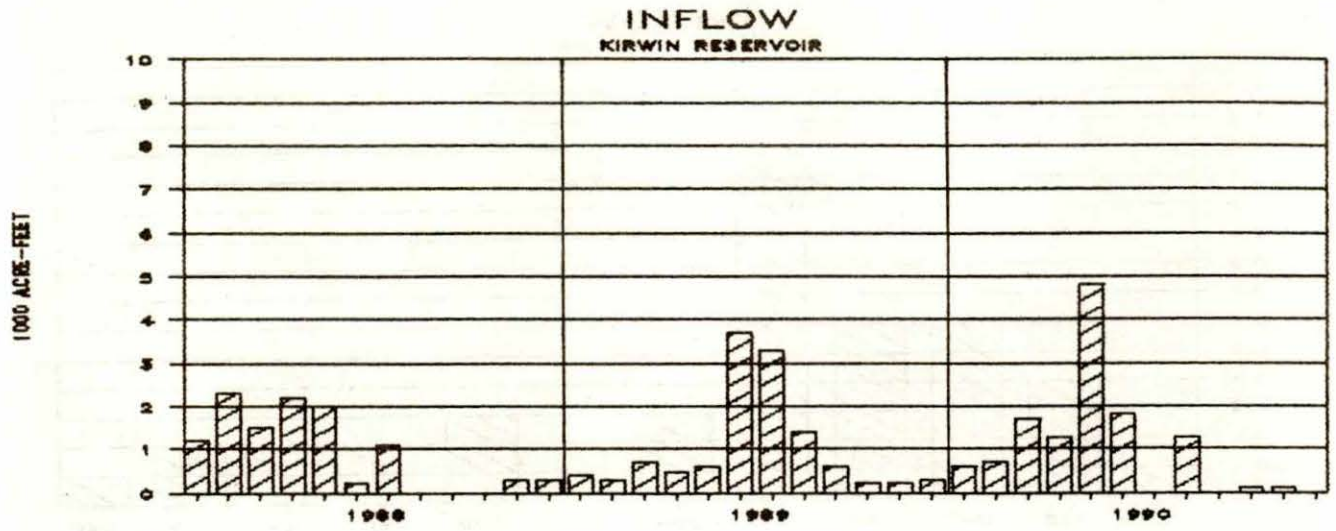
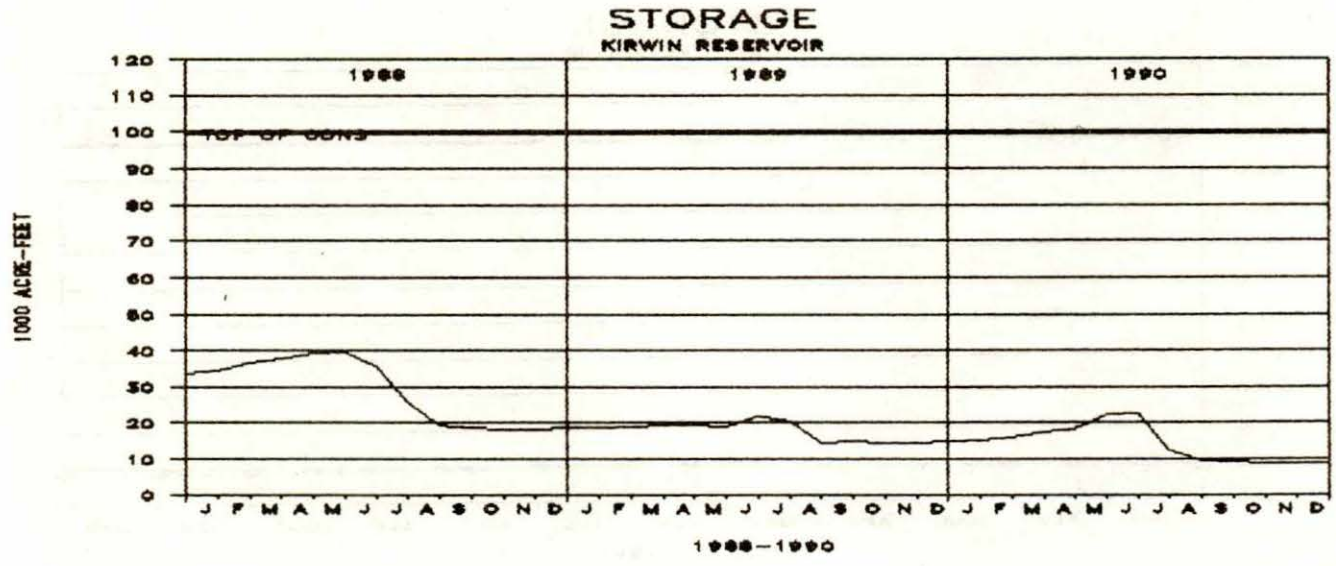


EXHIBIT 13A

KIRWIN RESERVOIR

OPERATION





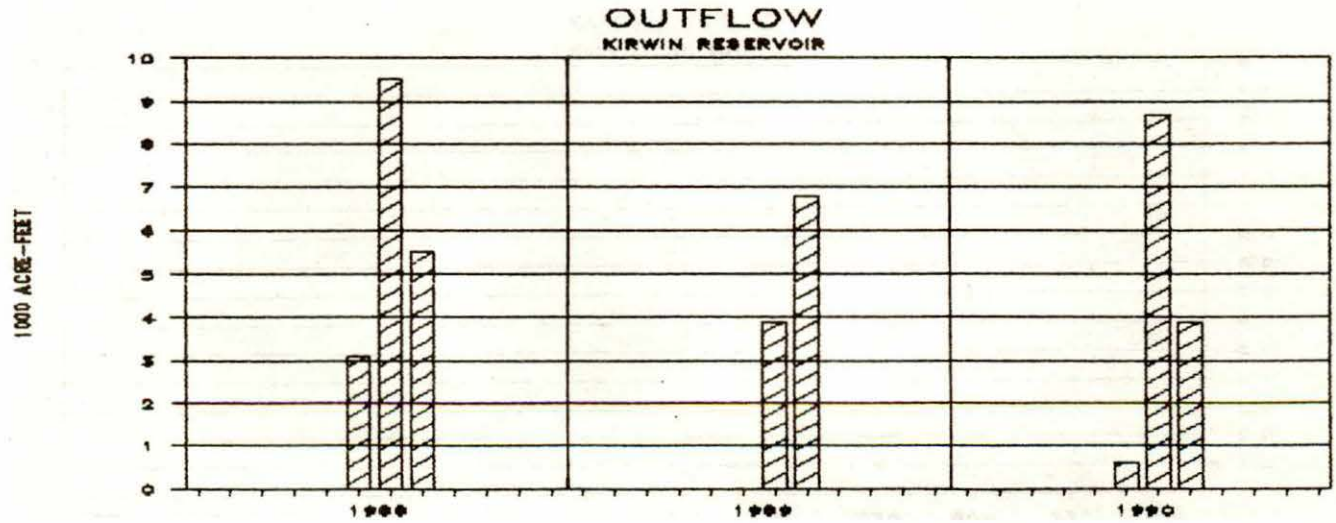
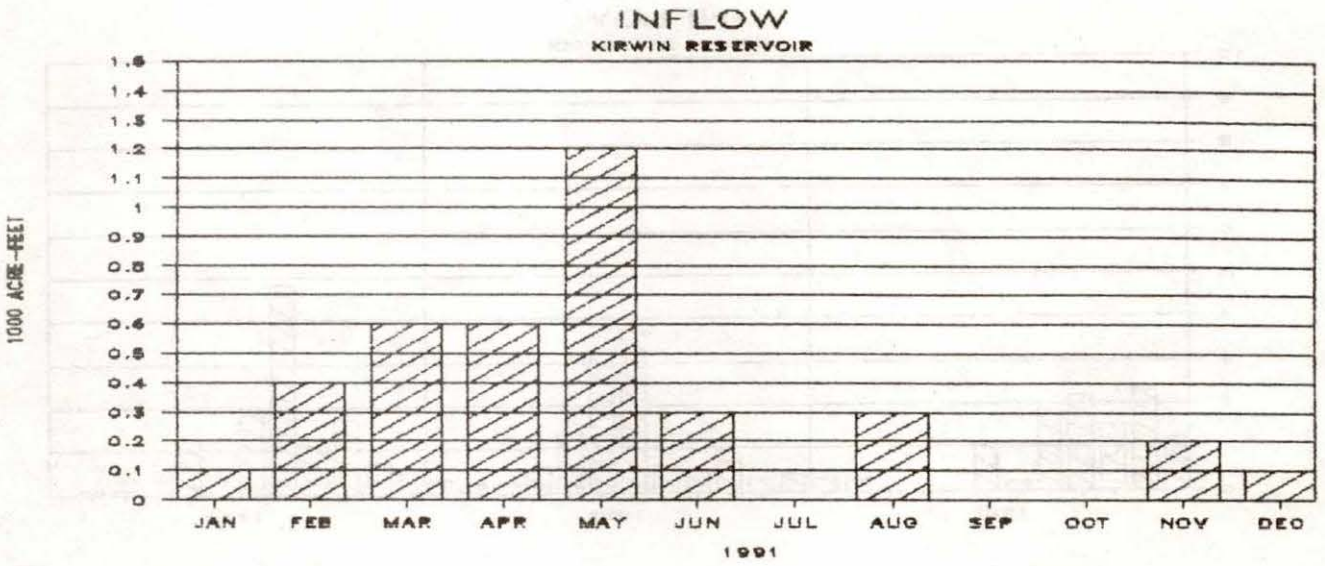
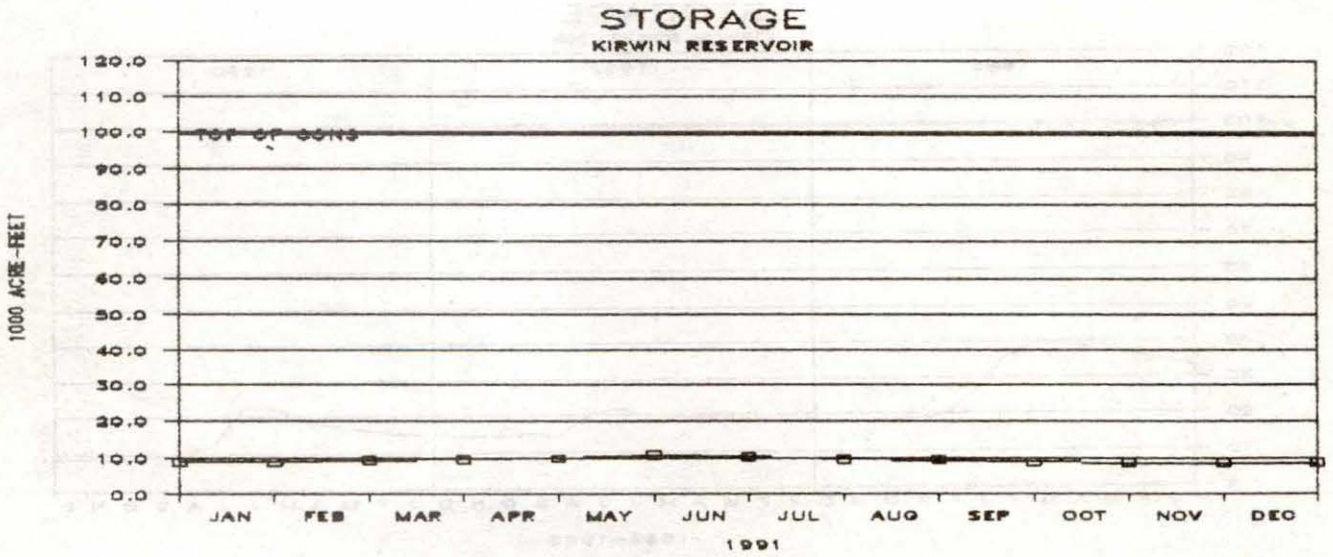


EXHIBIT 13B

KIRWIN RESERVOIR

1991 OPERATION





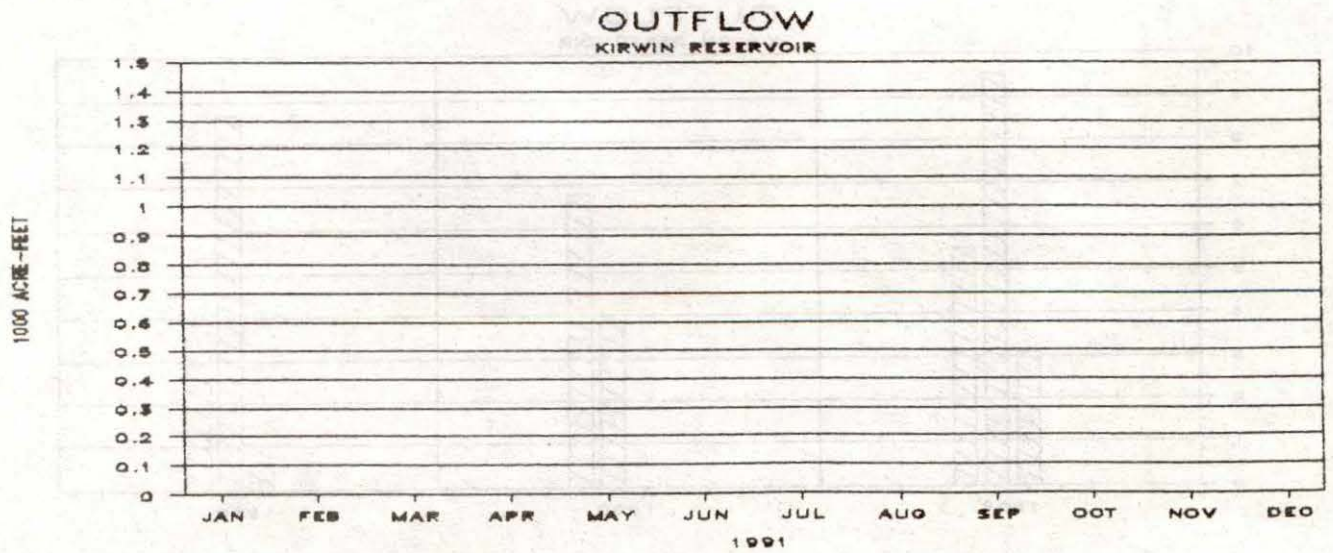
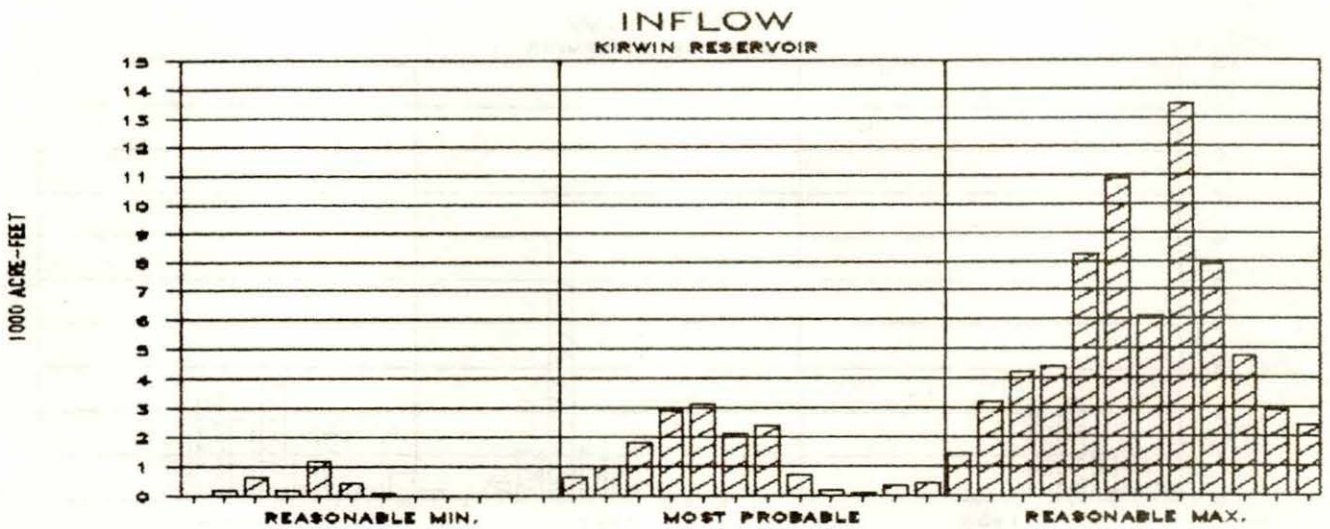
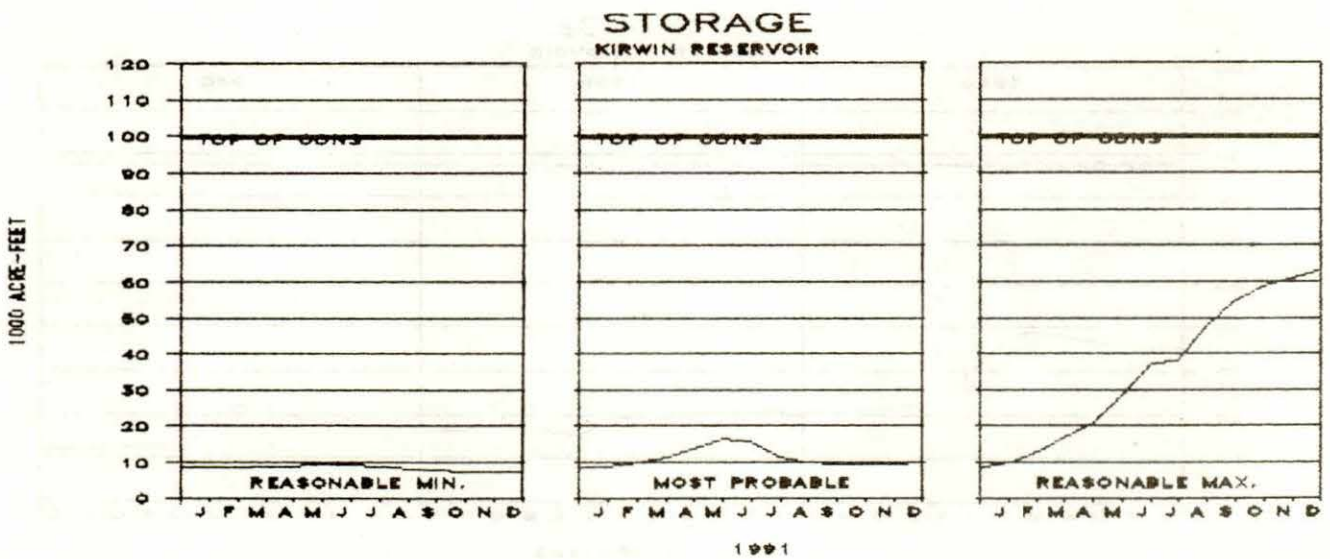


EXHIBIT 13C

KIRWIN RESERVOIR

1992 OPERATION PLAN





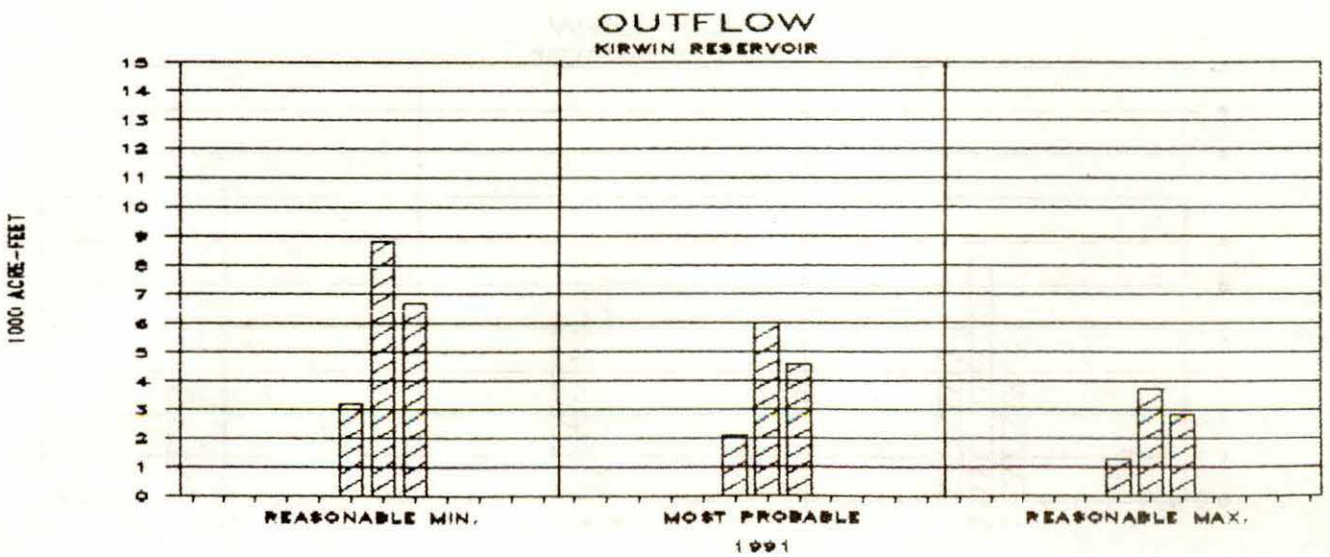


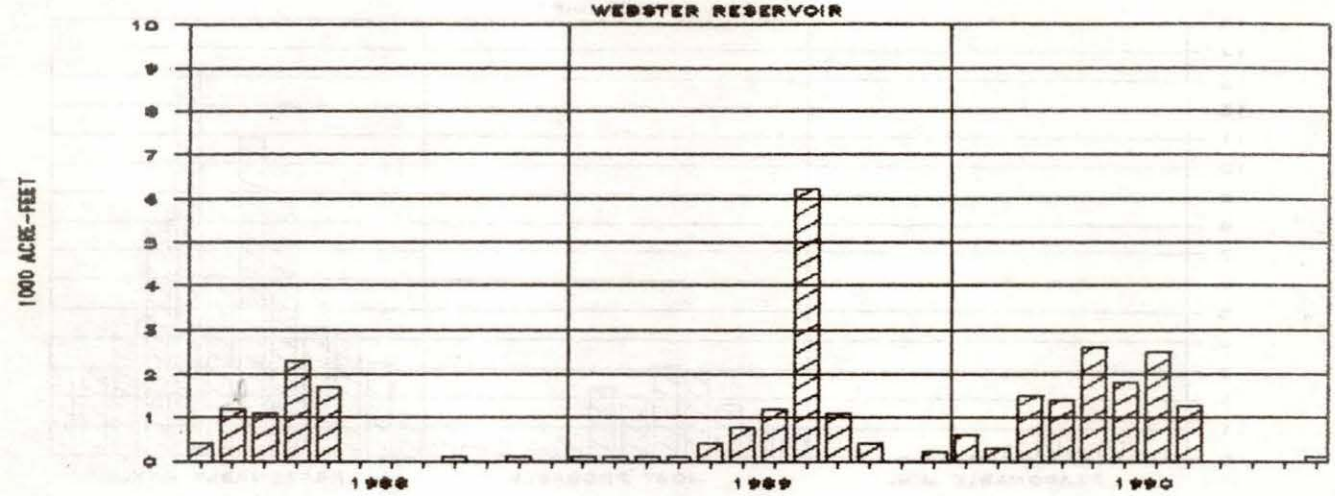
EXHIBIT 14A

WEBSTER RESERVOIR

OPERATION

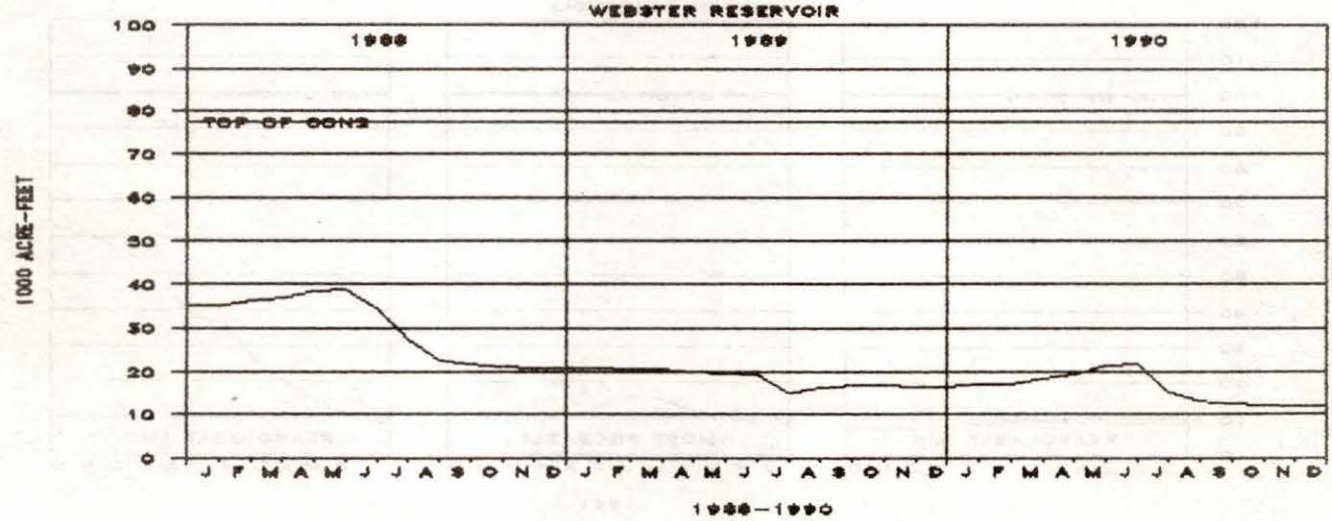
INFLOW

WEBSTER RESERVOIR



STORAGE

WEBSTER RESERVOIR



OUTFLOW

WEBSTER RESERVOIR

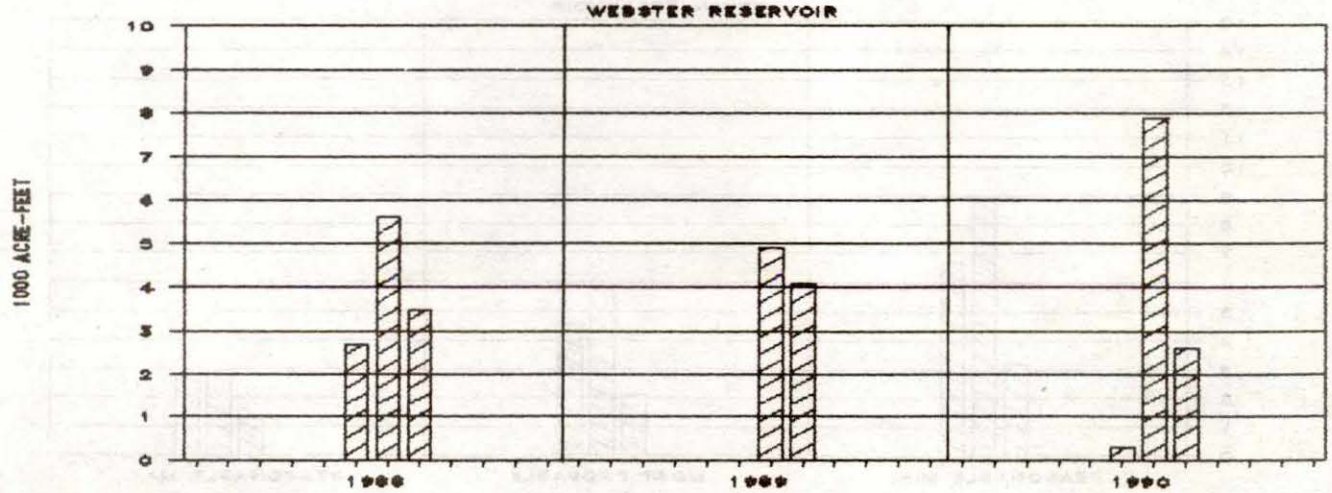
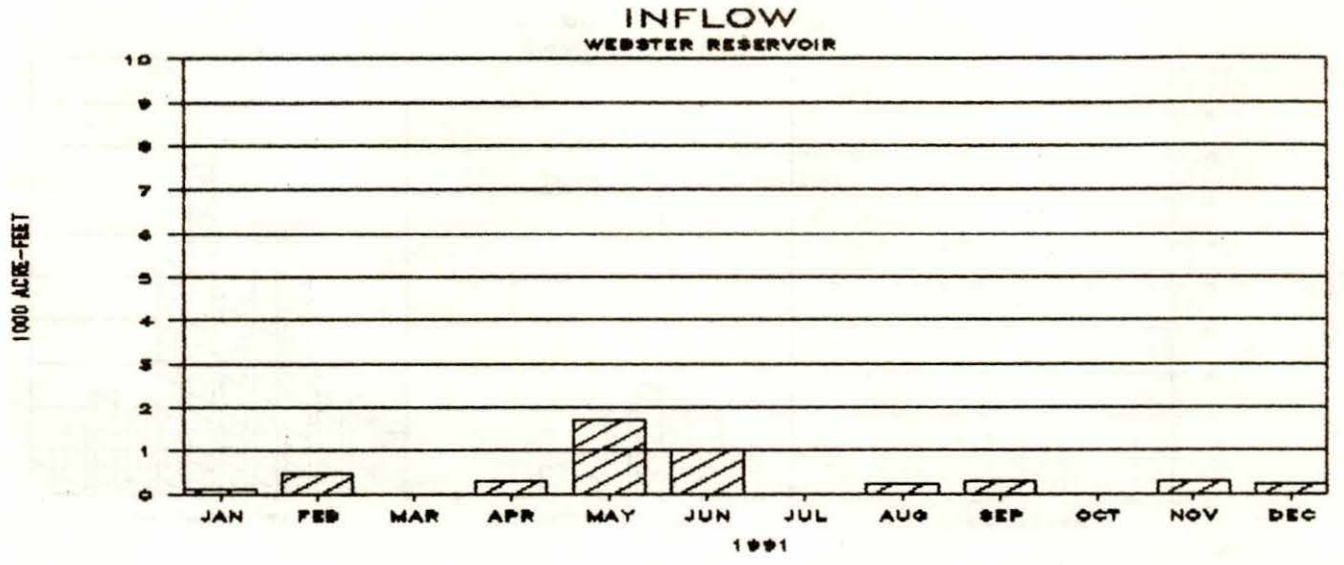
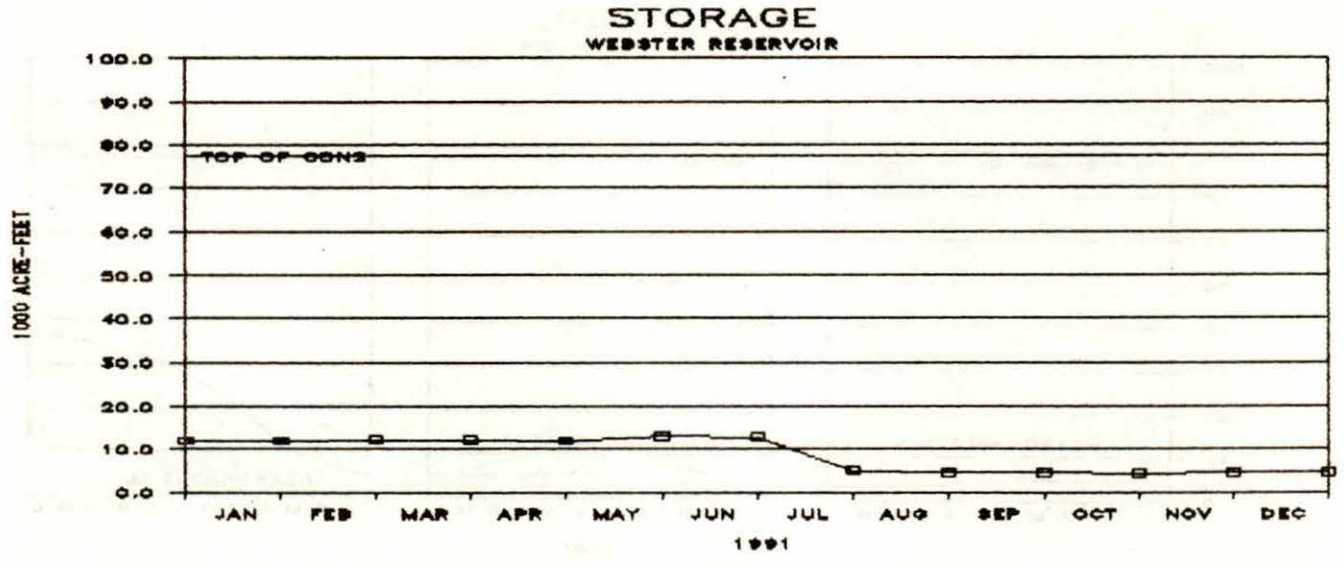


EXHIBIT 14B

WEBSTER RESERVOIR

1991 OPERATION





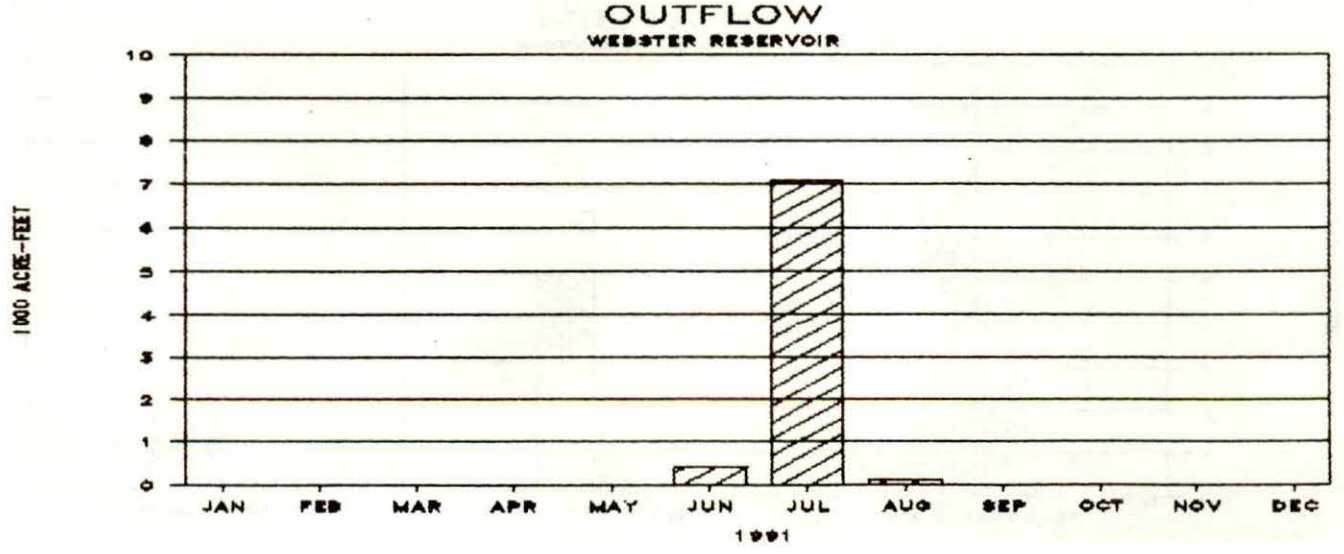
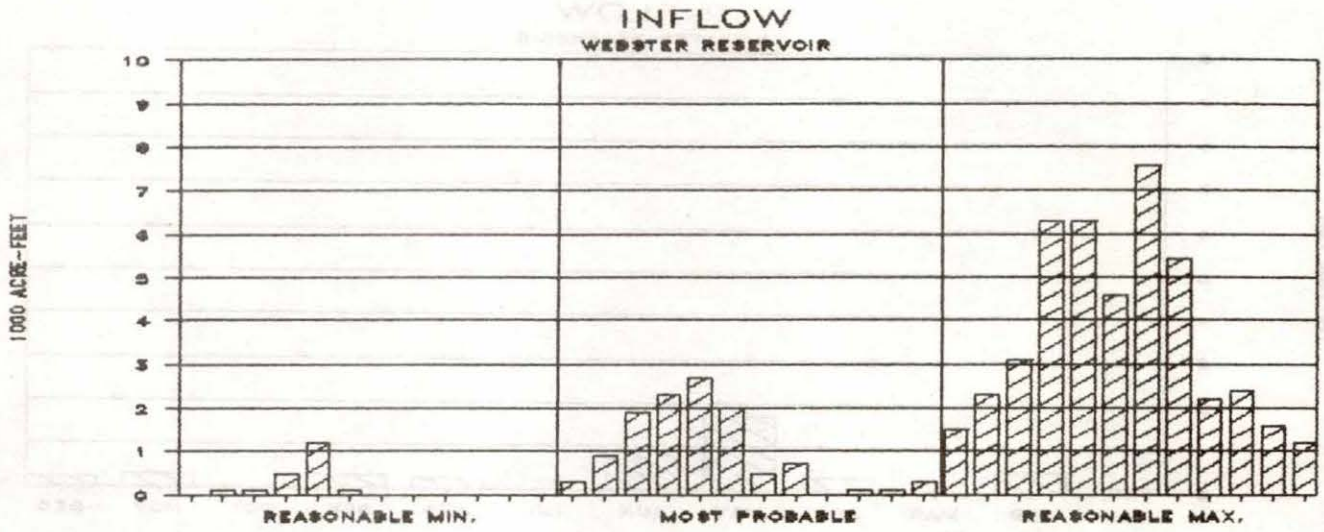
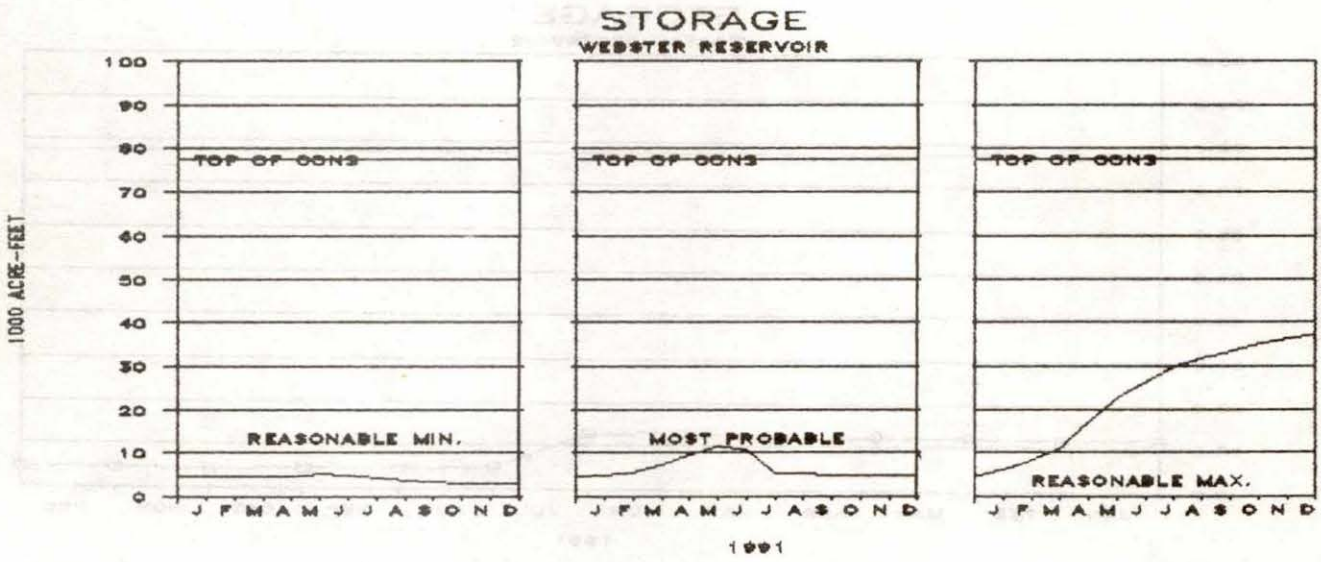


EXHIBIT 14C

WEBSTER RESERVOIR

1992 OPERATION PLAN





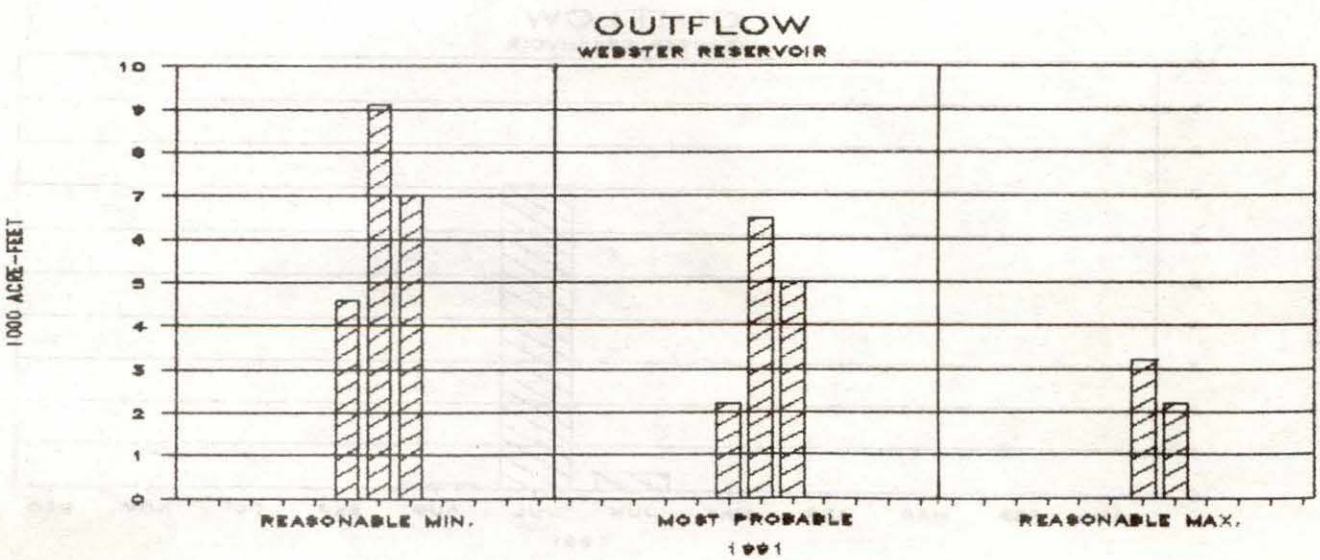
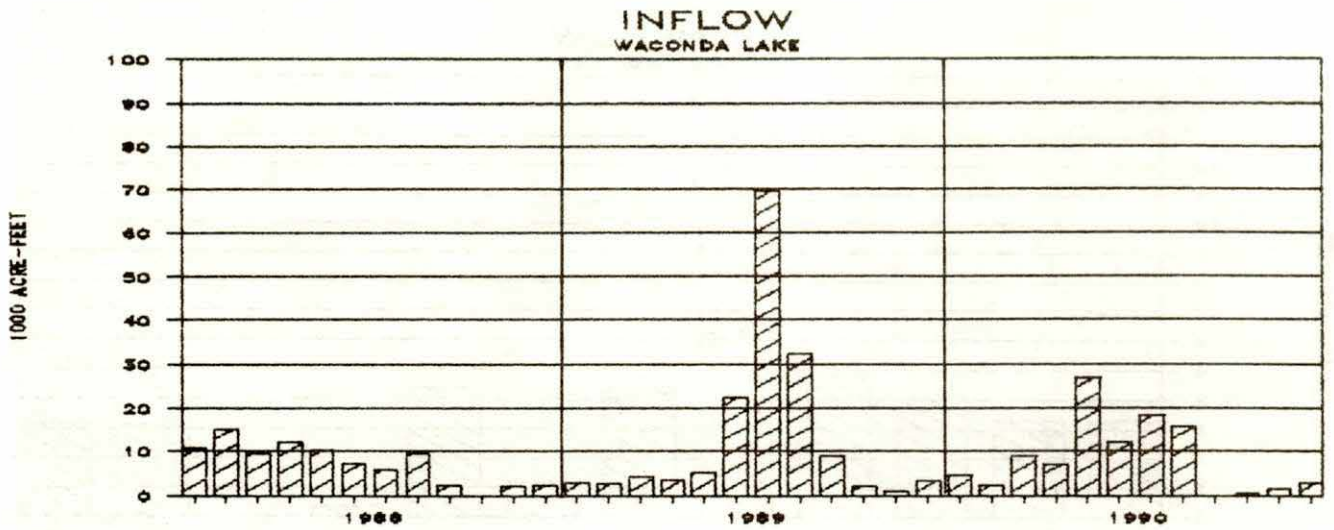
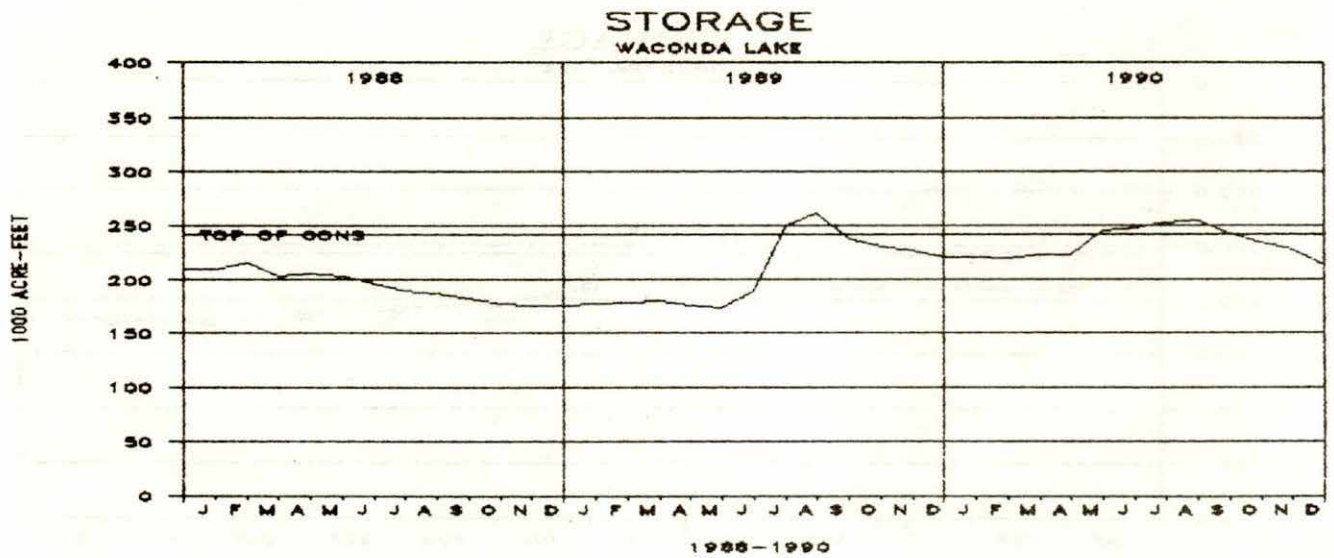


EXHIBIT 15A

WACONDA LAKE
OPERATION





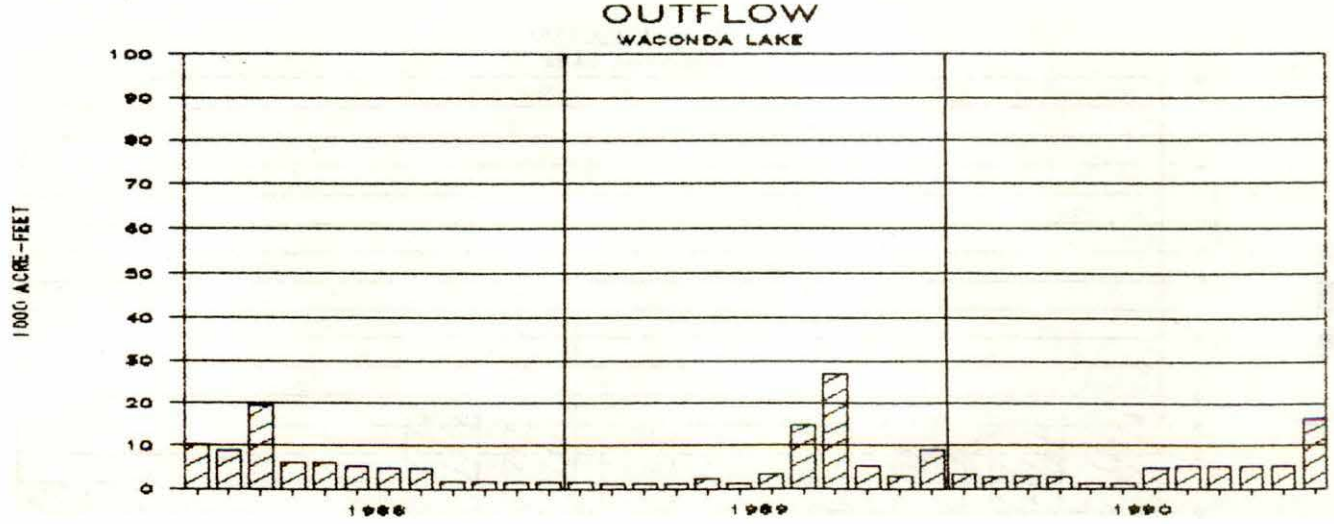
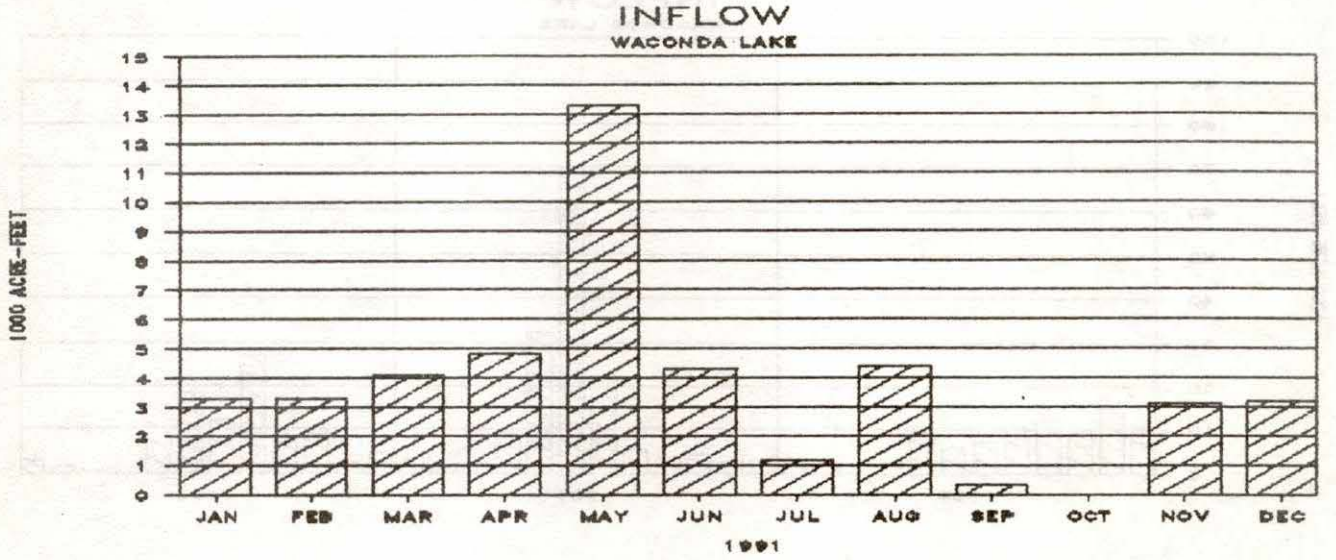
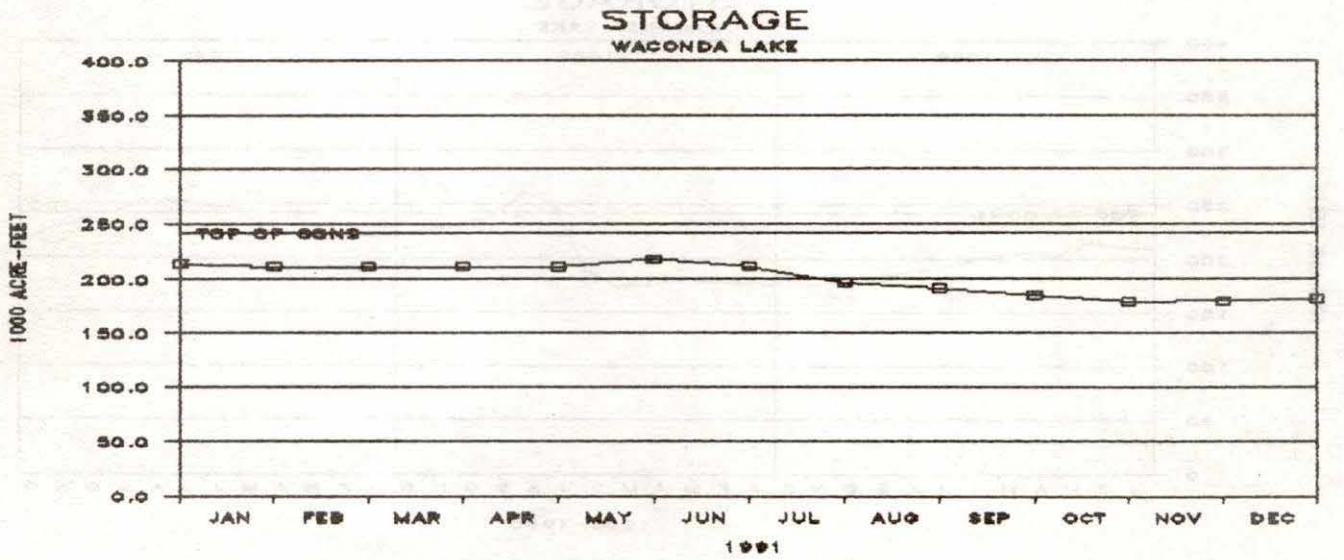


EXHIBIT 15B

WACONDA LAKE

1991 OPERATION





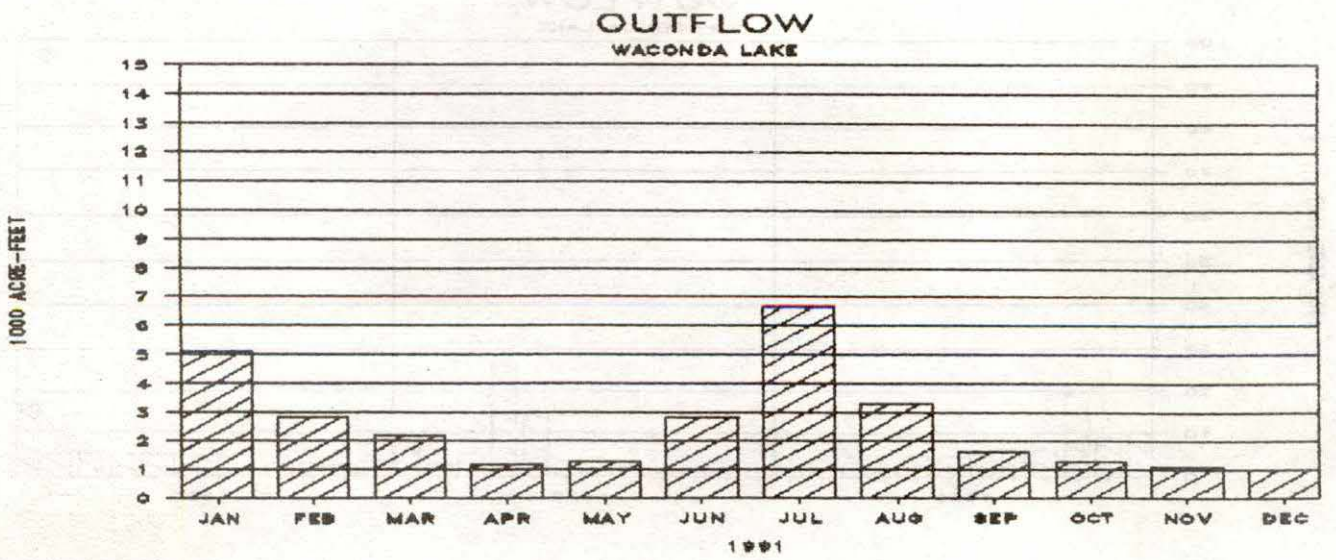
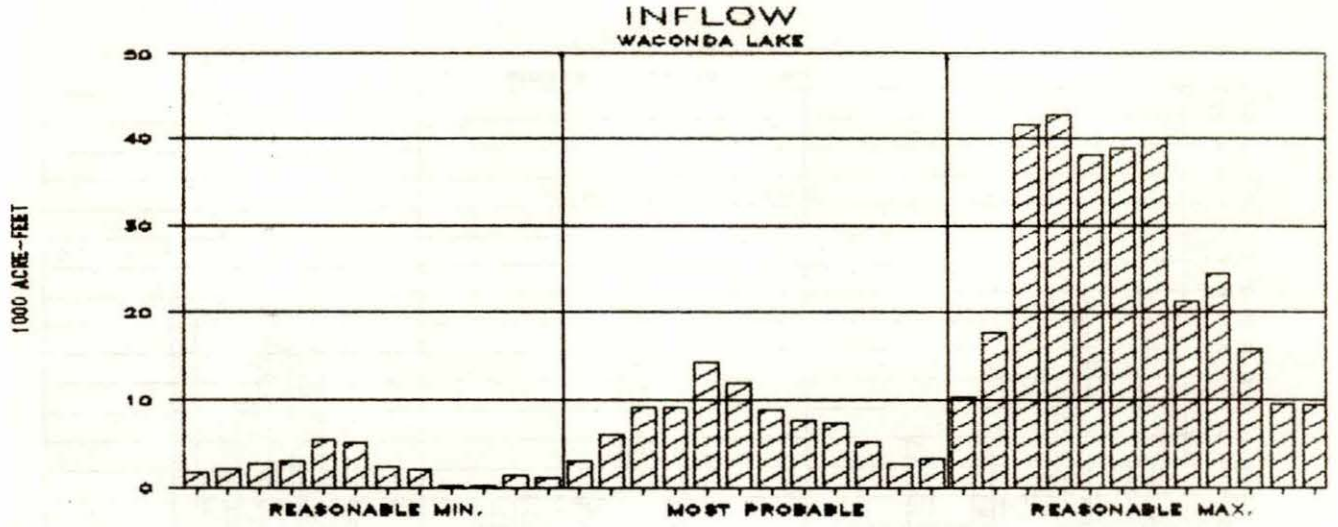
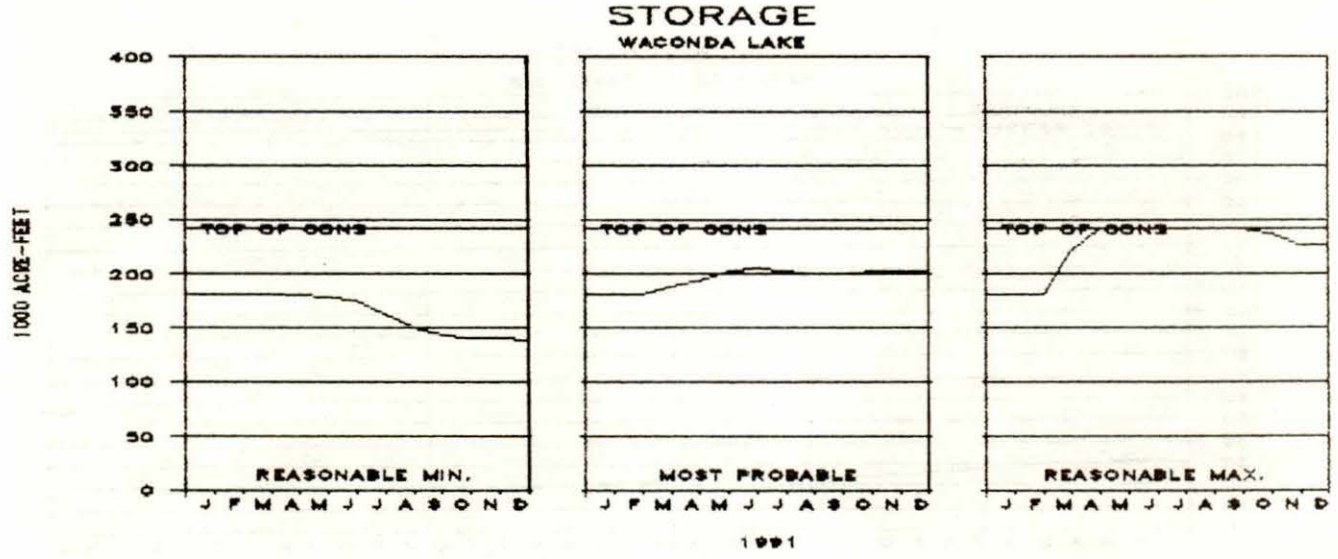


EXHIBIT 15C

WACONDA LAKE

1992 OPERATION PLAN





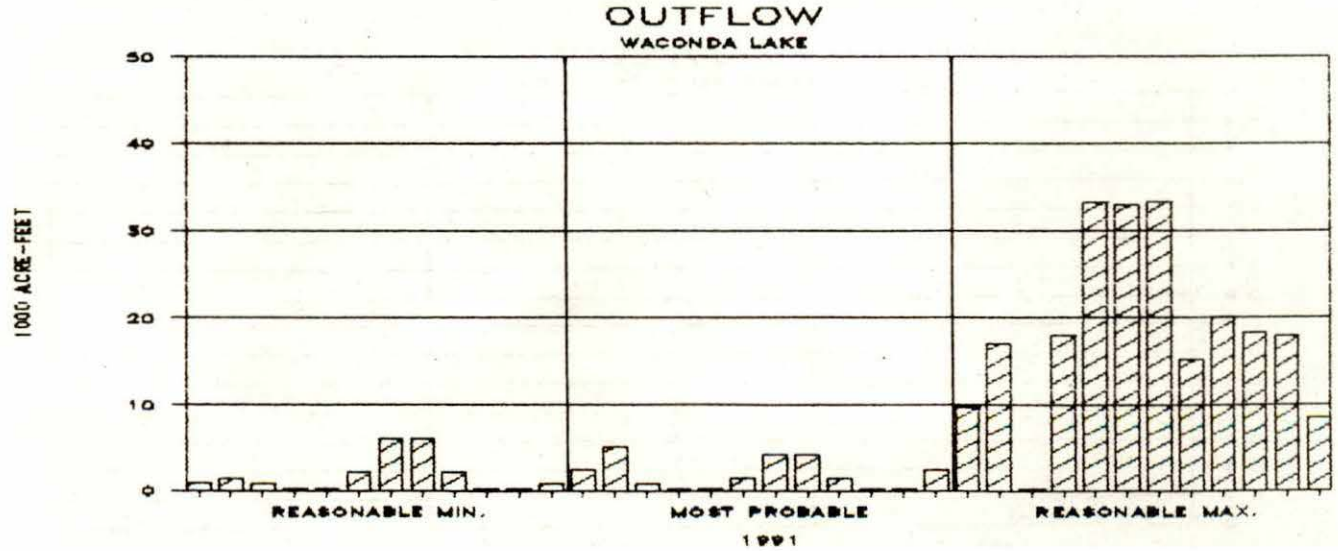
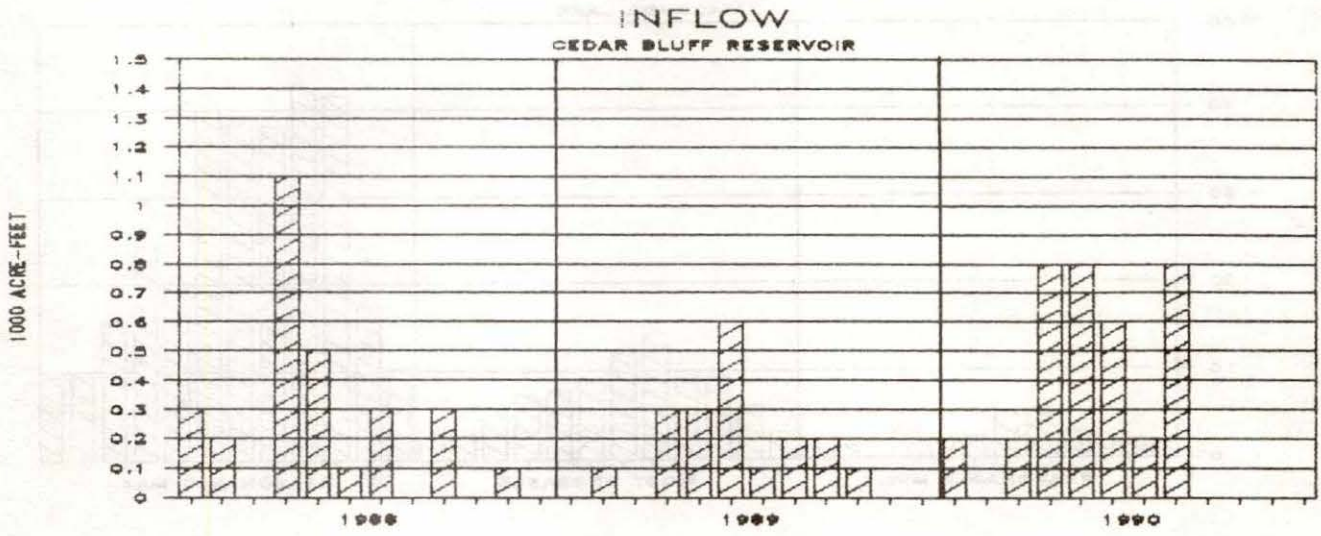
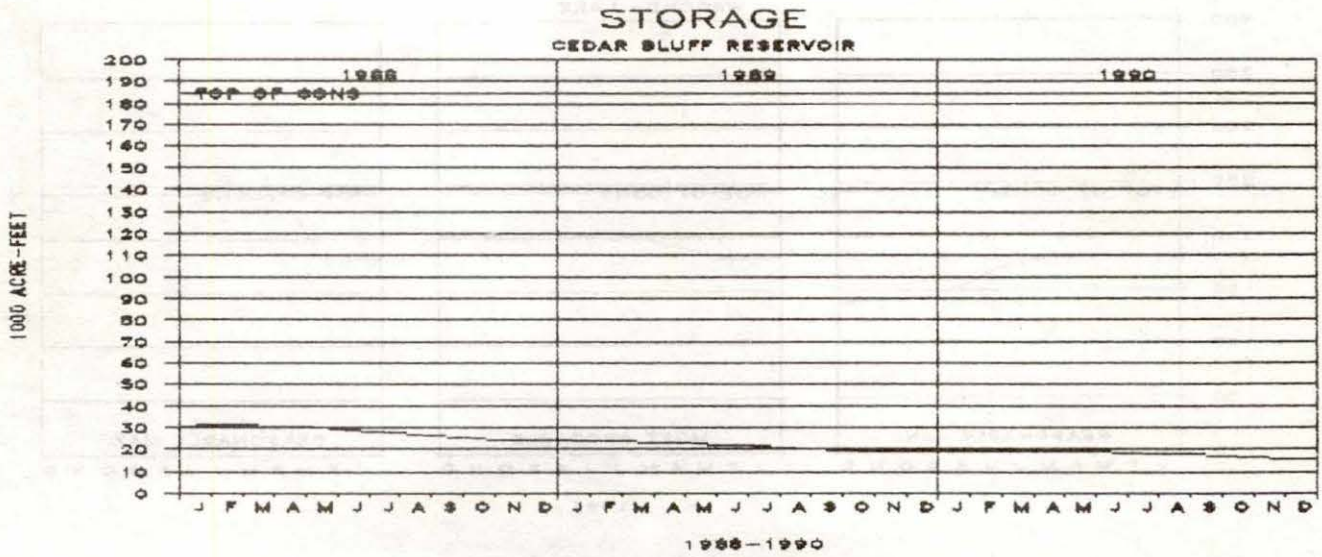


EXHIBIT 16A

CEDAR BLUFF RESERVOIR

OPERATION





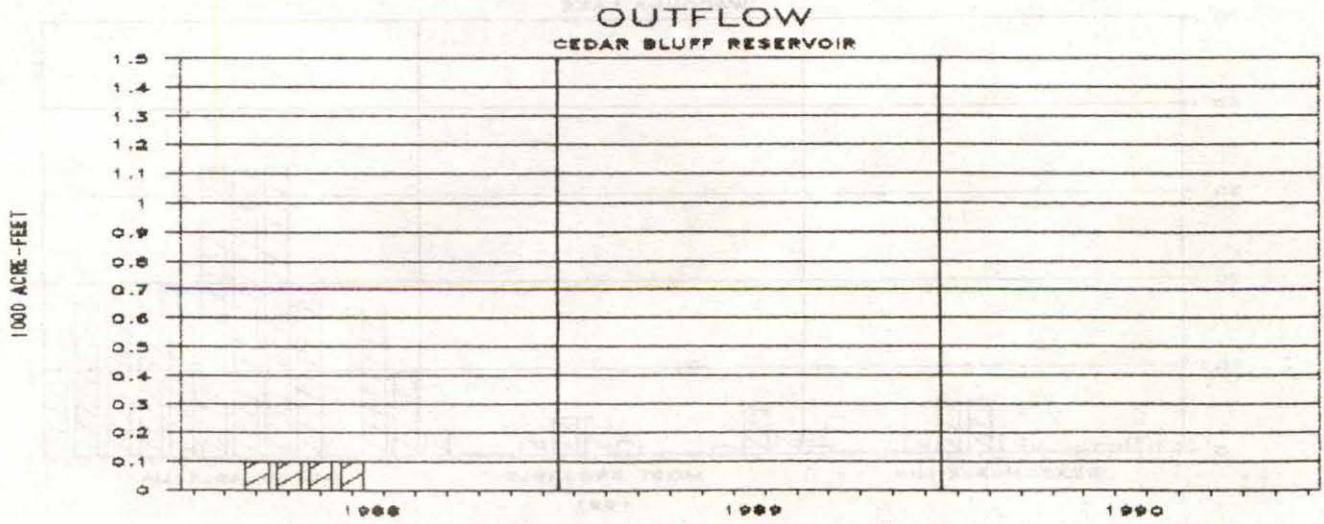
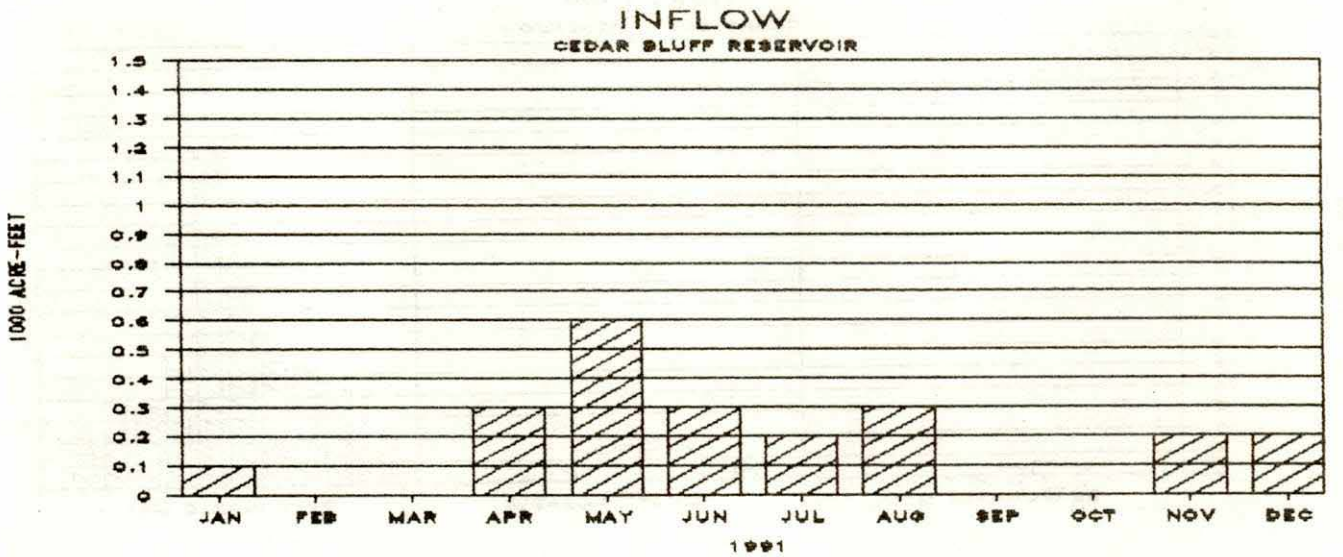
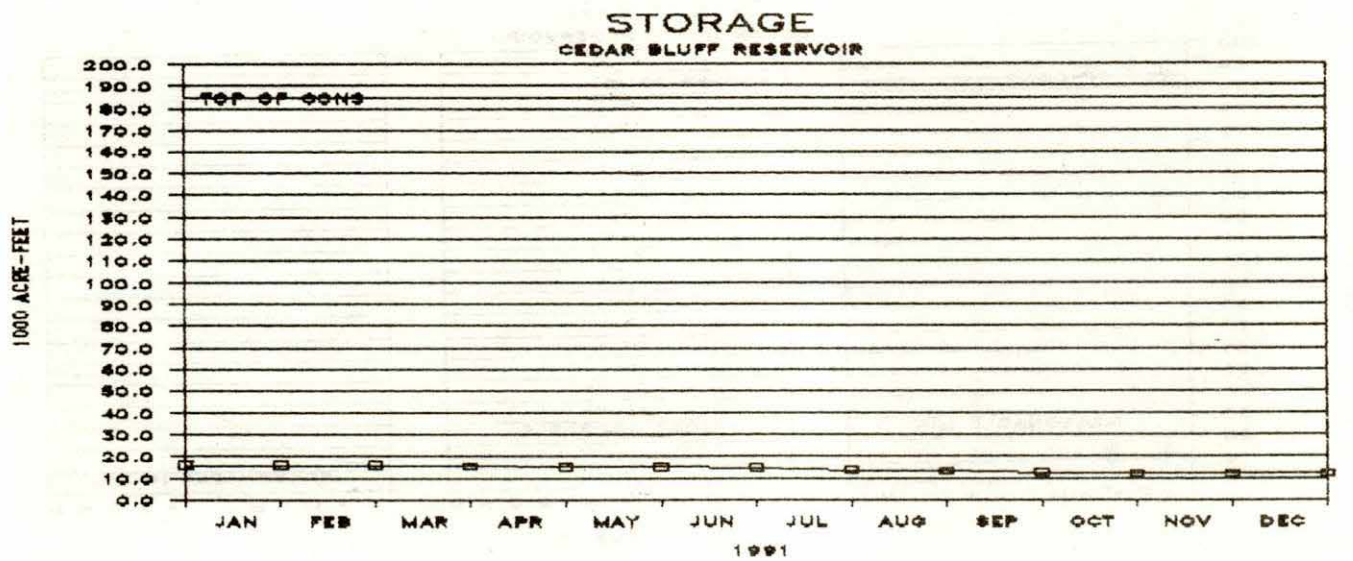


EXHIBIT 16B

CEDAR BLUFF RESERVOIR

1991 OPERATION





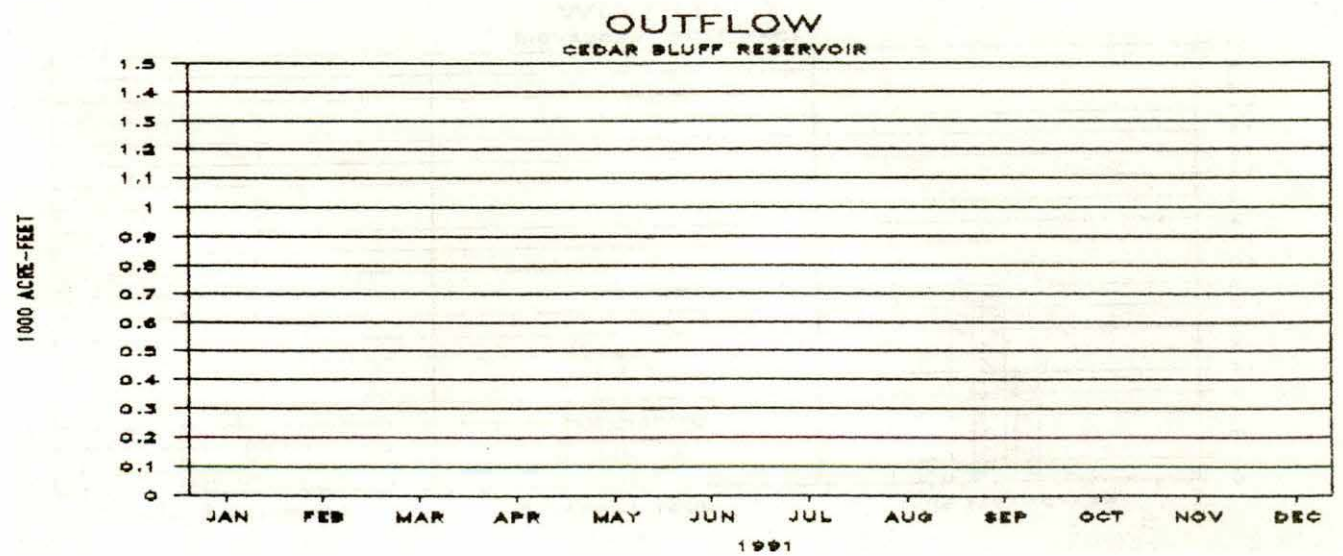
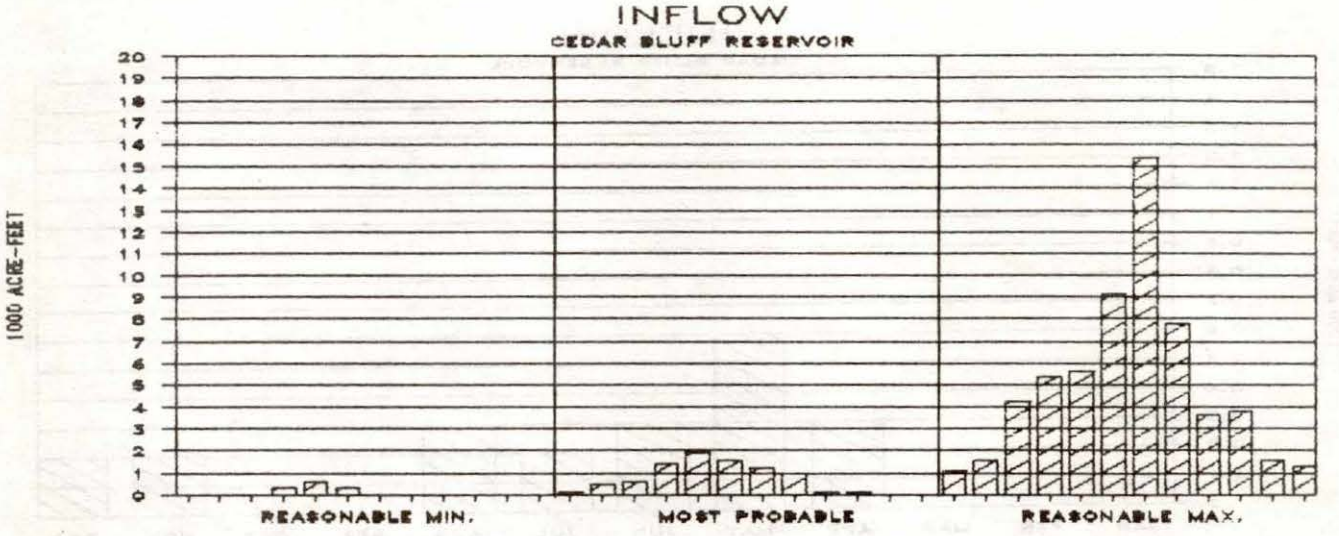
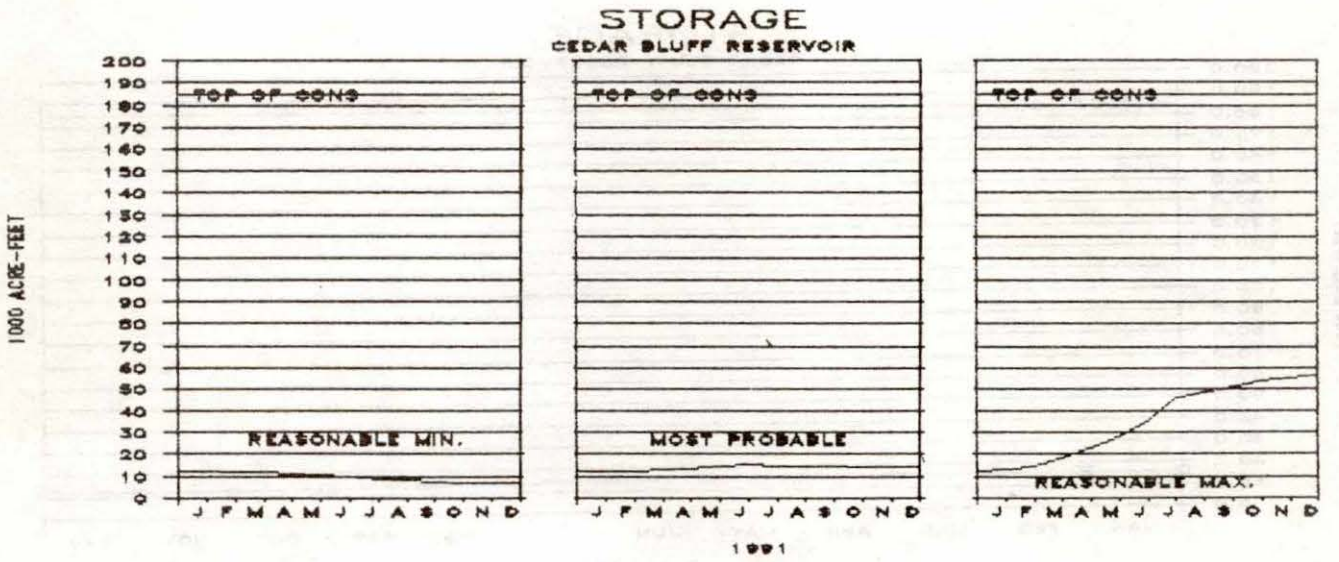


EXHIBIT 16C

CEDAR BLUFF RESERVOIR

1992 OPERATION PLAN





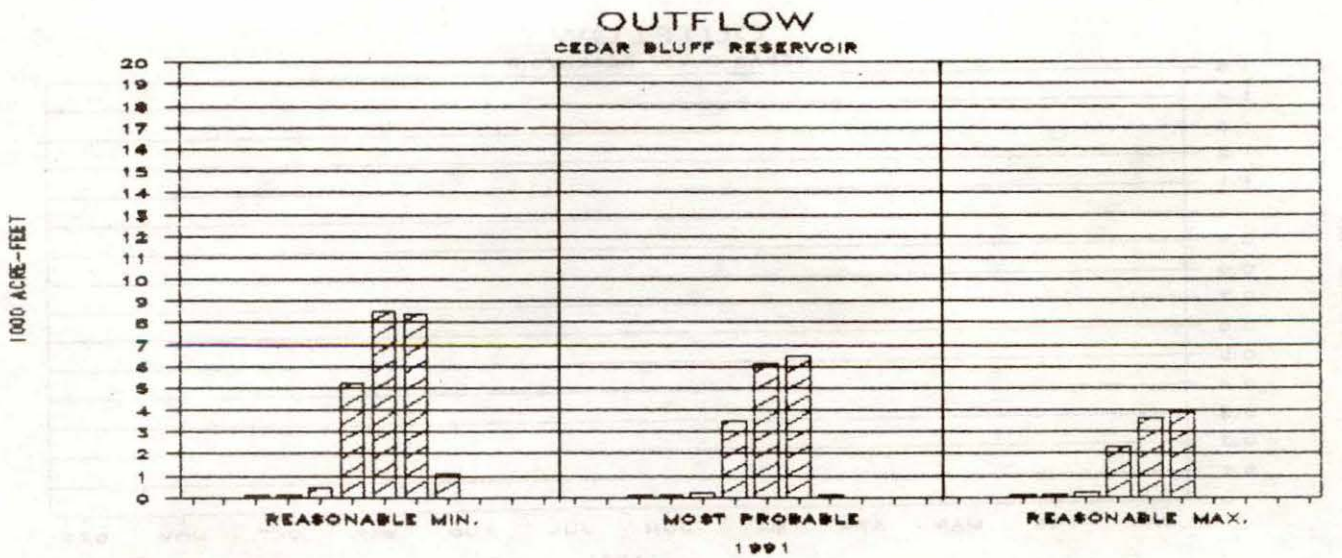
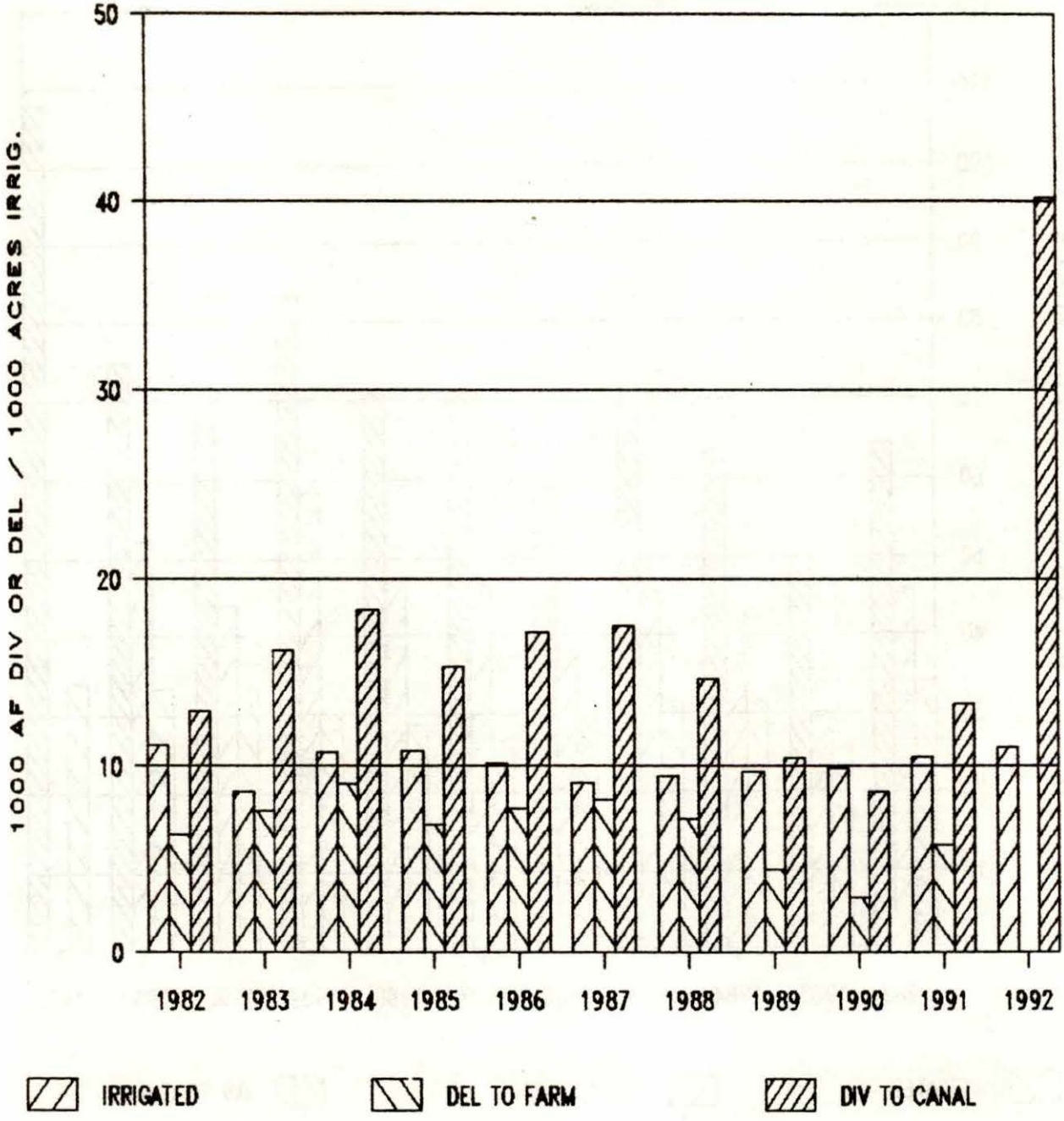


EXHIBIT 17

MIRAGE FLATS IRRIGATION DISTRICT

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



	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
AF/ACRE										
DIV	1.16	1.87	1.71	1.41	1.68	1.92	1.54	1.07	0.88	1.27
DEL	0.57	0.88	0.84	0.64	0.76	0.90	0.76	0.46	0.30	0.56
EFF(%)	49	47	49	45	45	47	49	43	34	44

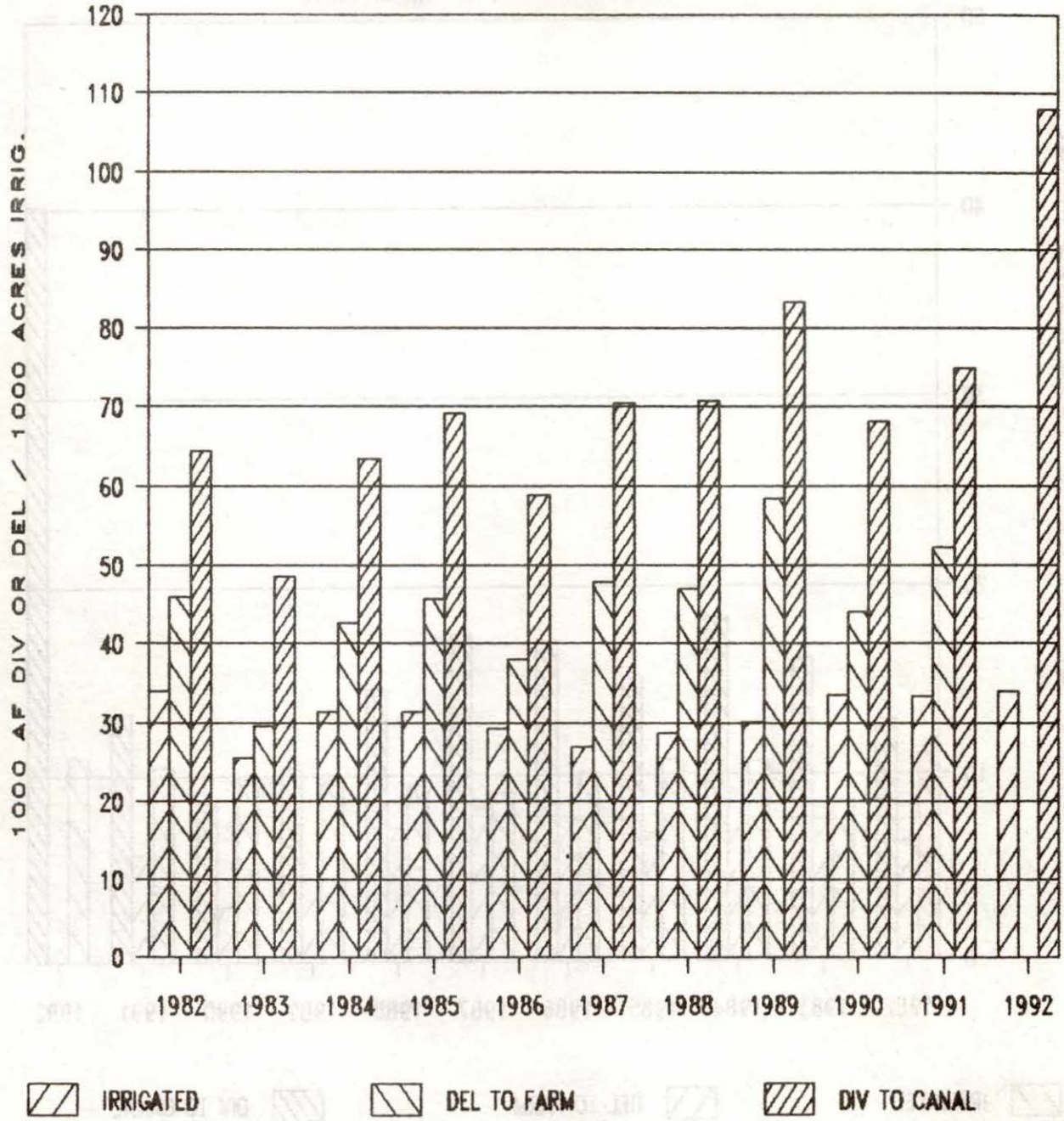
FORCASTED SHORTAGES (SUBTRACT FROM DIV REQ)

DRY YEAR	26.00
NORMAL YEAR	10.60

EXHIBIT 18

AINSWORTH IRRIGATION DISTRICT

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



	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
AF/ACRE										
DIV	1.90	1.90	2.03	2.20	2.01	2.62	2.47	2.77	2.04	2.25
DEL	1.35	1.16	1.36	1.45	1.30	1.77	1.63	1.94	1.31	1.56
EFF(%)	71	61	67	66	65	68	66	70	65	70

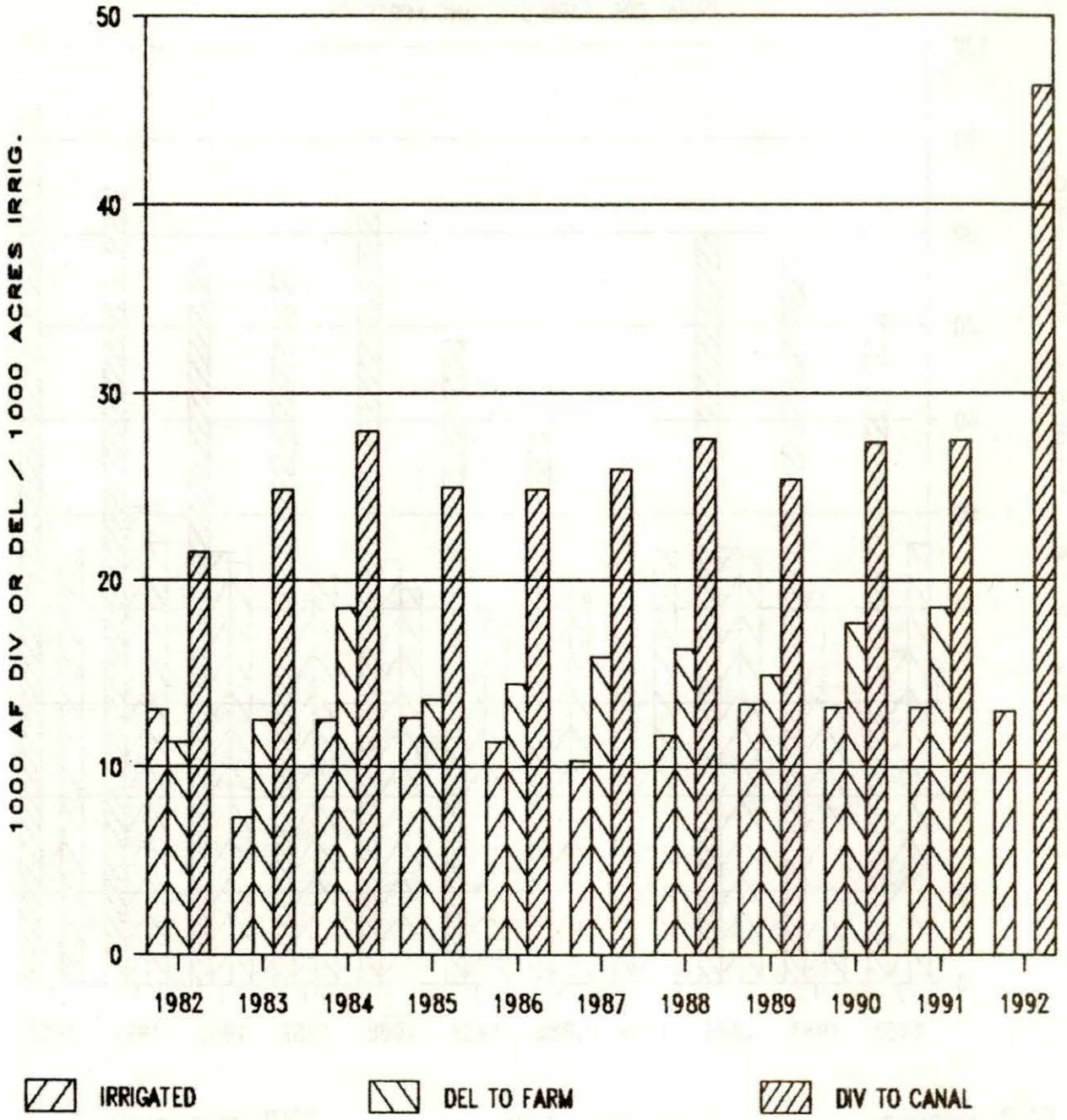
FORCASTED SHORTAGES (SUBTRACT FROM DIV REQ)

DRY YEAR	0.00
NORMAL YEAR	0.00

EXHIBIT 19

SARGENT IRRIGATION DISTRICT

CANAL DIV., FARM DEL, AND ACRES IRRIG.



	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
AF/ACRE										
DIV	1.64	3.37	2.22	1.98	2.18	2.52	2.35	1.90	2.07	2.08
DEL	0.87	1.70	1.47	1.08	1.27	1.54	1.40	1.12	1.34	1.40
EFF(%)	53	51	66	54	58	61	59	59	65	67

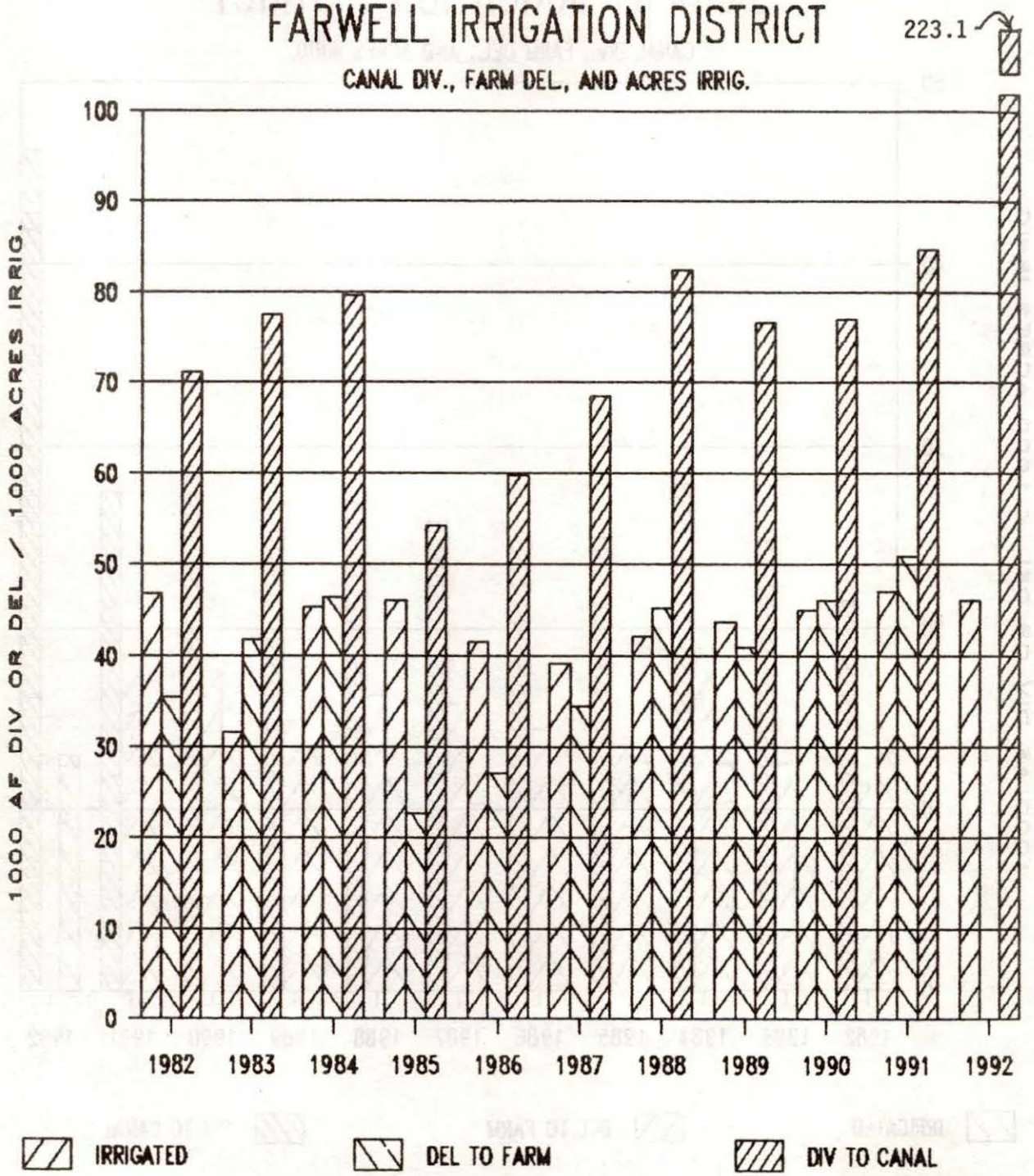
FORCASTED SHORTAGES (SUBTRACT FROM DIV REQ)

DRY YEAR	20.20
NORMAL YEAR	3.10

EXHIBIT 20

FARWELL IRRIGATION DISTRICT

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



	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
AF/ACRE										
DIV	1.52	2.45	1.76	1.18	1.44	1.75	1.96	1.75	1.71	1.81
DEL	0.76	1.32	1.03	0.49	0.65	0.88	1.07	0.93	1.02	1.08
EFF(%)	50	54	58	42	45	50	55	53	60	60

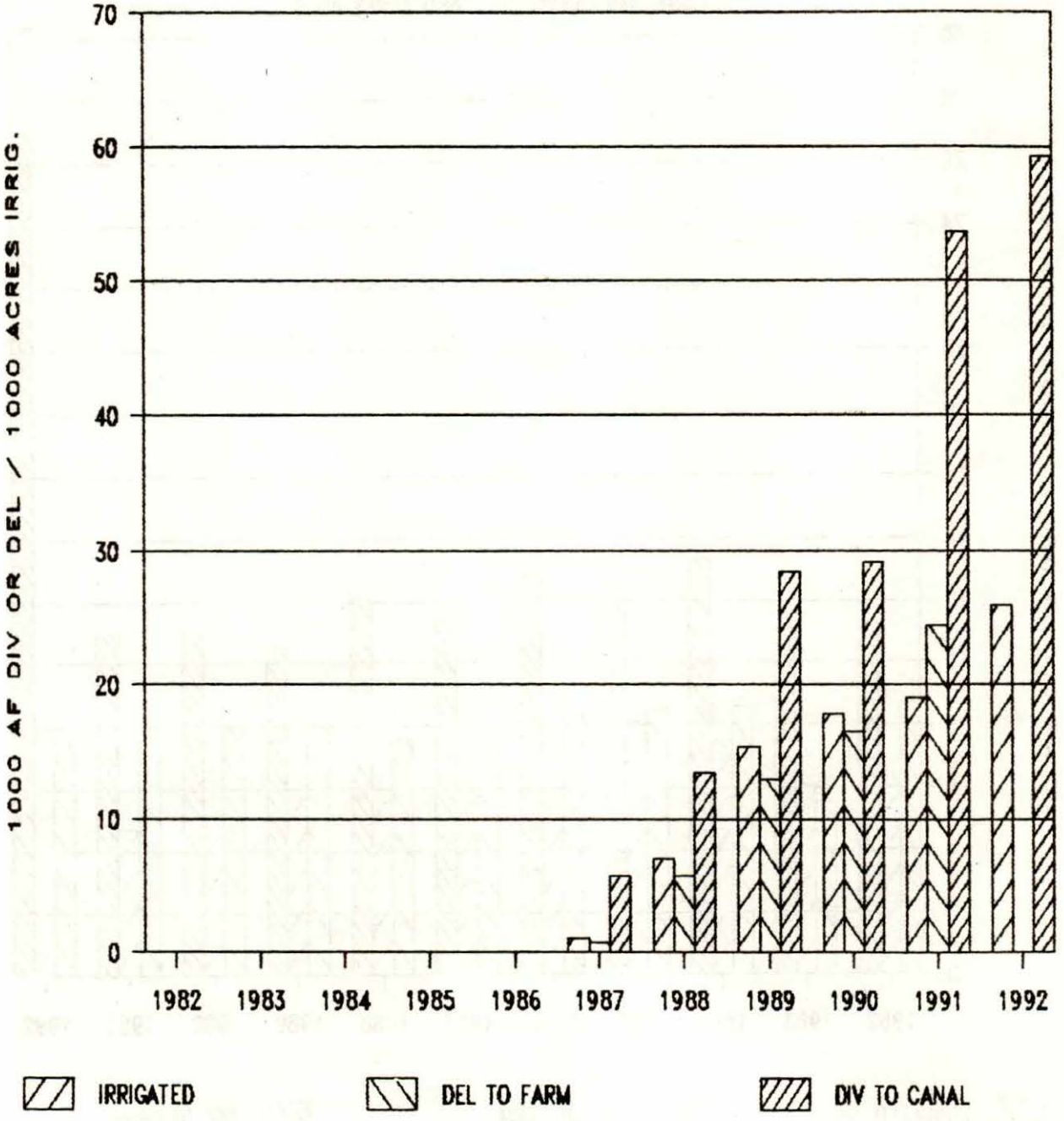
FORCASTED SHORTAGES (SUBTRACT FROM DIV REQ)

DRY YEAR	71.40
NORMAL YEAR	11.10

EXHIBIT 21

TWIN LOUPS IRRIGATION DISTRICT

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



AF/ACRE	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
DIV	0.00	0.00	0.00	0.00	0.00	5.63	1.90	1.85	1.64	2.81
DEL	0.00	0.00	0.00	0.00	0.00	0.73	0.82	0.84	0.93	1.28
EFF(%)	0	0	0	0	0	13	43	45	57	46

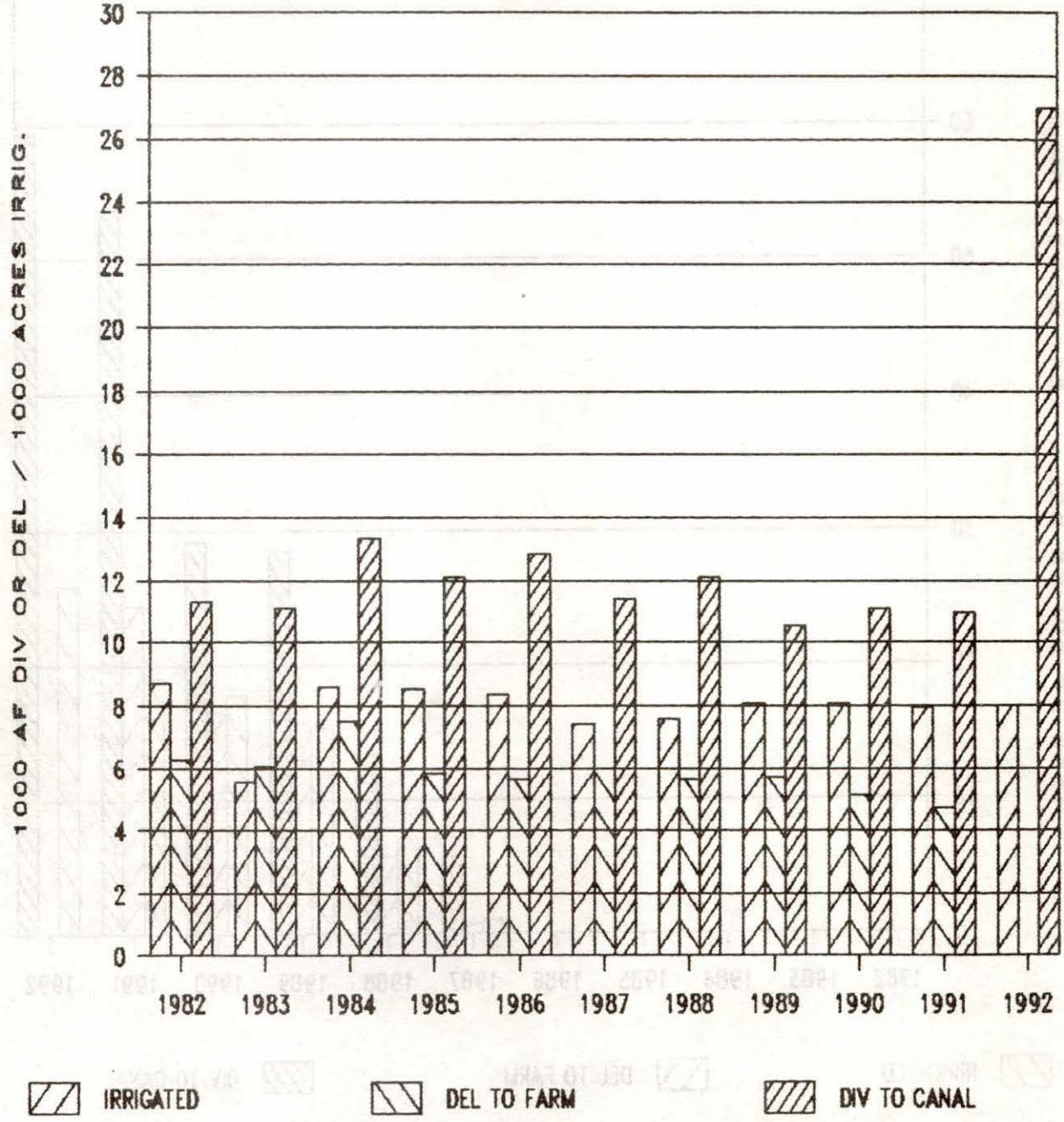
FORCASTED SHORTAGES (SUBTRACT FROM DIV REQ)

DRY YEAR	0.00
NORMAL YEAR	0.00

EXHIBIT 22

FRENCHMAN VALLEY IRRIGATION DISTRICT

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



	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
AF/ACRE										
DIV	1.30	2.00	1.55	1.42	1.54	1.53	1.60	1.30	1.38	1.38
DEL	0.73	1.09	0.87	0.68	0.68	0.81	0.75	0.71	0.63	0.59
EFF(%)	56	55	56	48	44	53	47	55	46	43

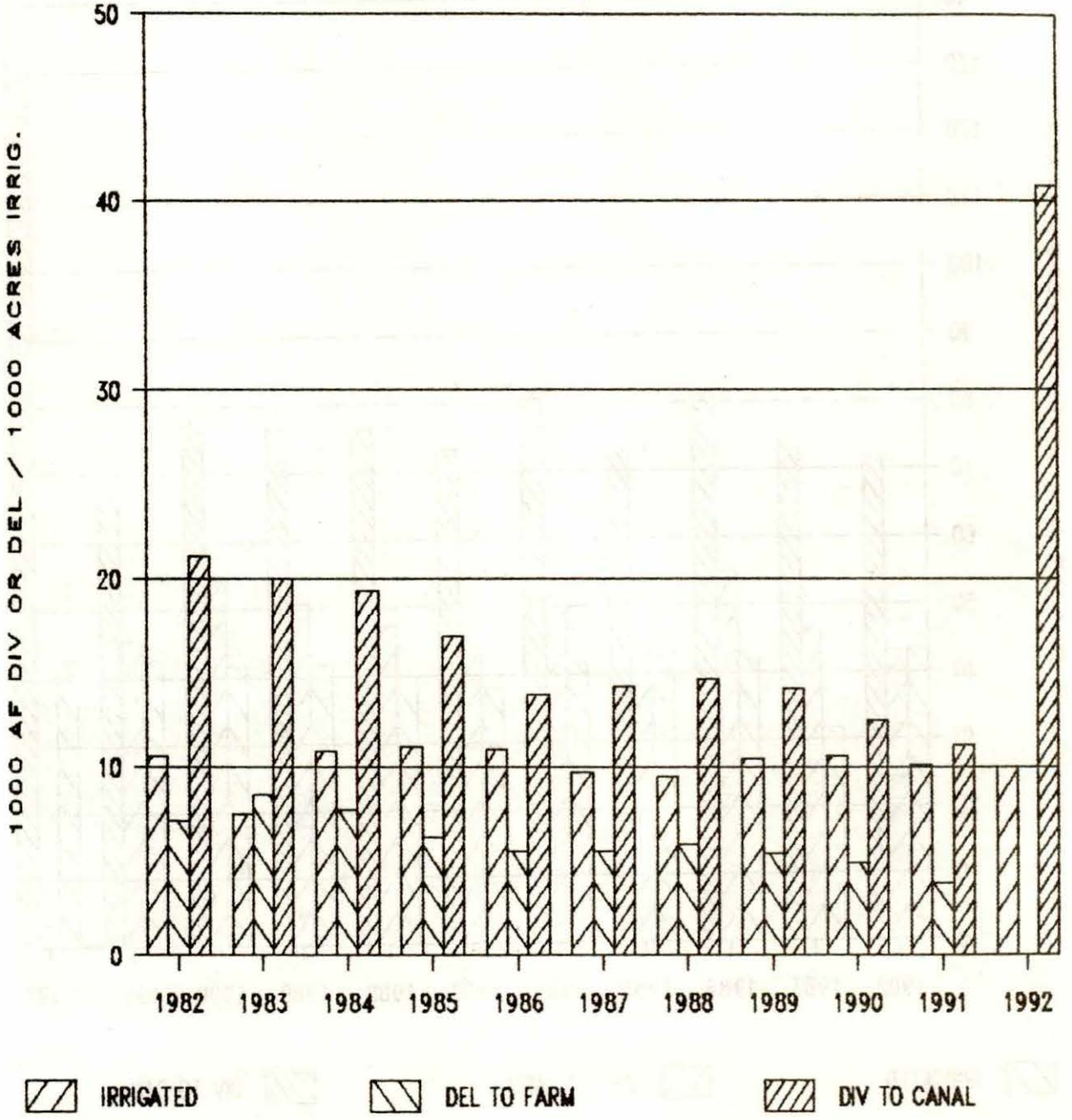
FORCASTED SHORTAGES (SUBTRACT FROM DIV REQ)

DRY YEAR	18.40
NORMAL YEAR	5.70

EXHIBIT 23

H AND RW IRRIGATION DISTRICT

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



	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
AF/ACRE										
DIV	2.00	2.66	1.78	1.52	1.27	1.47	1.55	1.35	1.18	1.10
DEL	0.68	1.14	0.71	0.57	0.50	0.57	0.63	0.52	0.46	0.38
EFF(%)	34	43	40	37	40	39	41	38	39	35

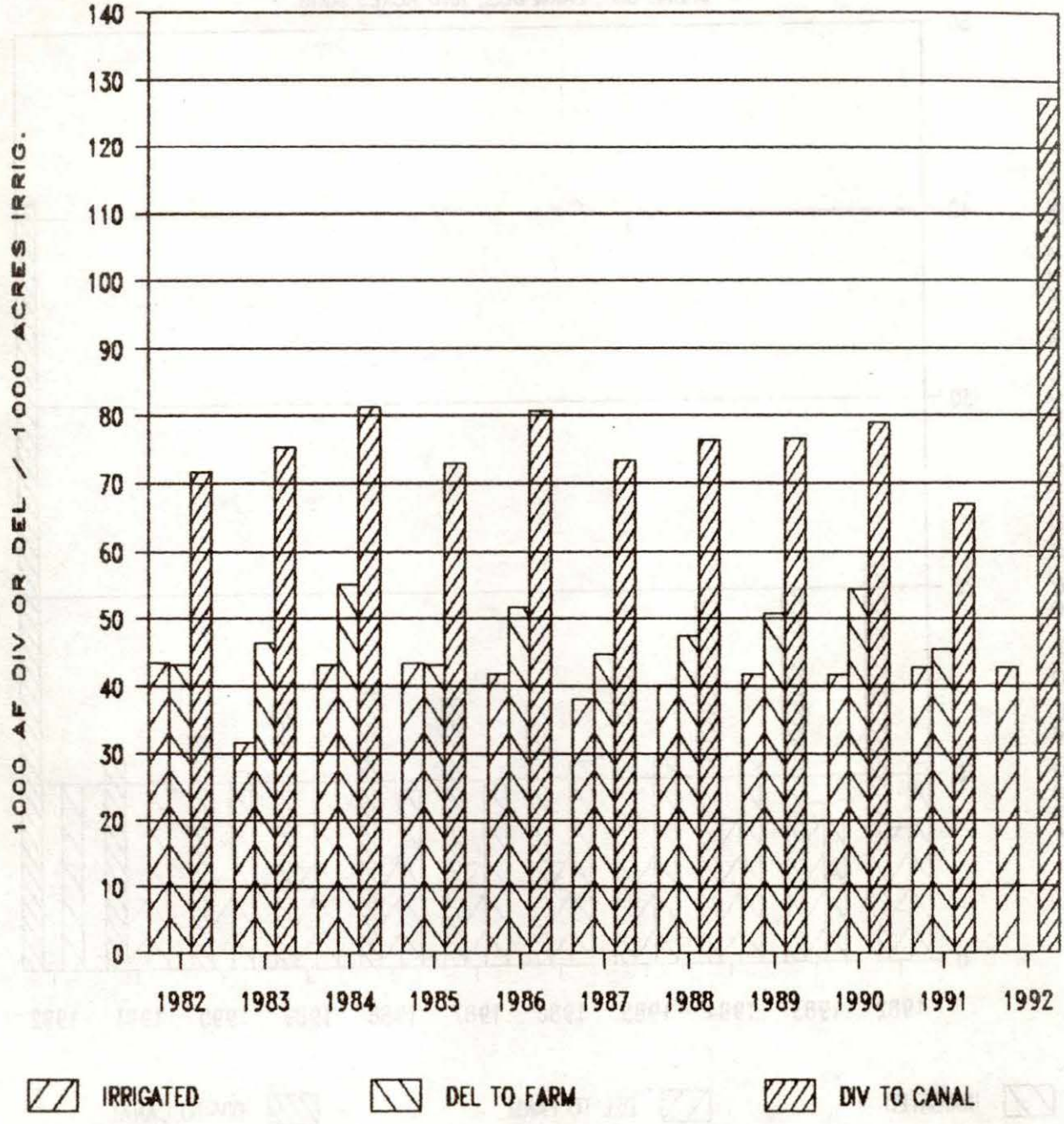
FORCASTED SHORTAGES (SUBTRACT FROM DIV REQ)

DRY YEAR	27.60
NORMAL YEAR	8.50

EXHIBIT 24

FRENCHMAN CAMBRIDGE IRRIGATION DISTRICT

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



AF/ACRE	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
DIV	1.64	2.39	1.89	1.68	1.93	1.92	1.90	1.83	1.90	1.56
DEL	0.99	1.47	1.28	1.00	1.24	1.17	1.19	1.22	1.31	1.06
EFF(%)	60	61	68	59	64	61	62	66	69	68

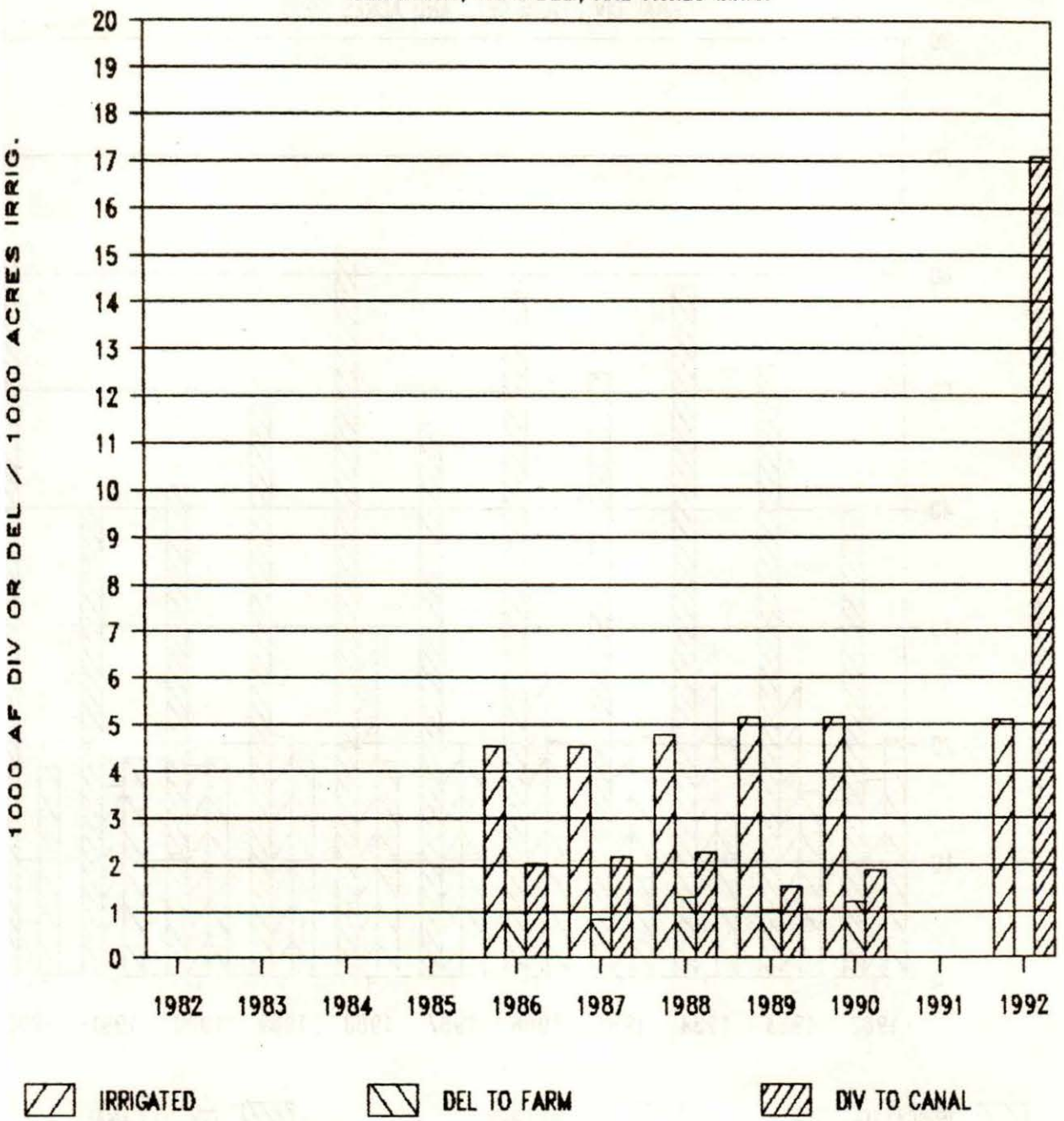
FORCASTED SHORTAGES (SUBTRACT FROM DIV REQ)

DRY YEAR	46.00
NORMAL YEAR	0.00

EXHIBIT 25

ALMENA IRRIGATION DISTRICT

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



	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
AF/ACRE										
DIV	0.00	0.00	0.00	0.00	0.45	0.48	0.47	0.30	0.36	0.00
DEL	0.00	0.00	0.00	0.00	0.21	0.18	0.27	0.20	0.23	0.00
EFF(%)	0	0	0	0	48	39	57	66	64	0

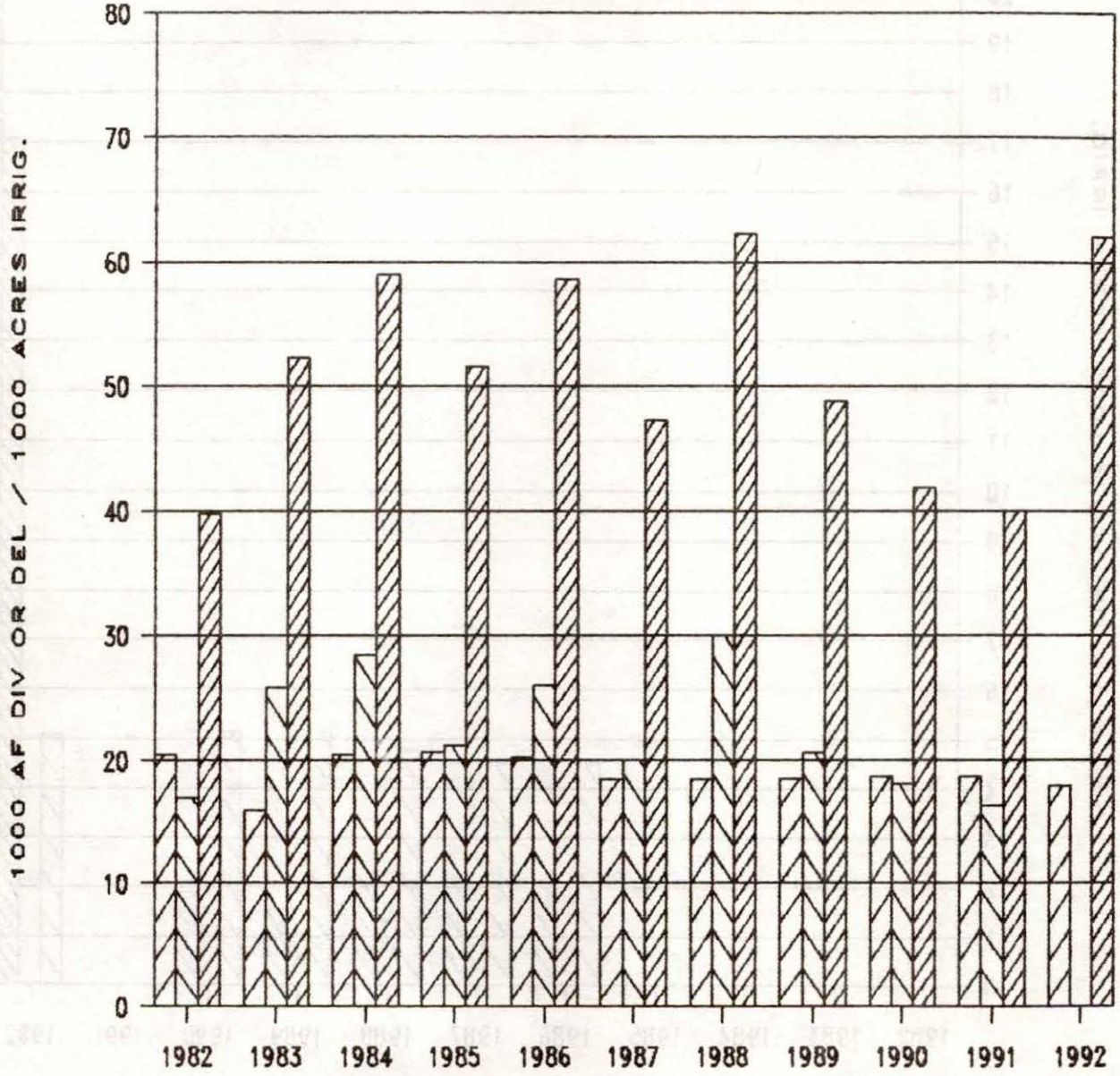
FORCASTED SHORTAGES (SUBTRACT FROM DIV REQ)

DRY YEAR	19.10
NORMAL YEAR	8.30

EXHIBIT 26

BOSTWICK IRRIGATION DISTRICT – NEBRASKA

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



	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
AF/ACRE										
DIV	1.94	3.27	2.88	2.50	2.90	2.56	3.38	2.63	2.23	2.14
DEL	0.83	1.62	1.39	1.02	1.29	1.08	1.63	1.11	0.97	0.88
EFF(%)	43	49	48	41	44	42	48	42	43	41

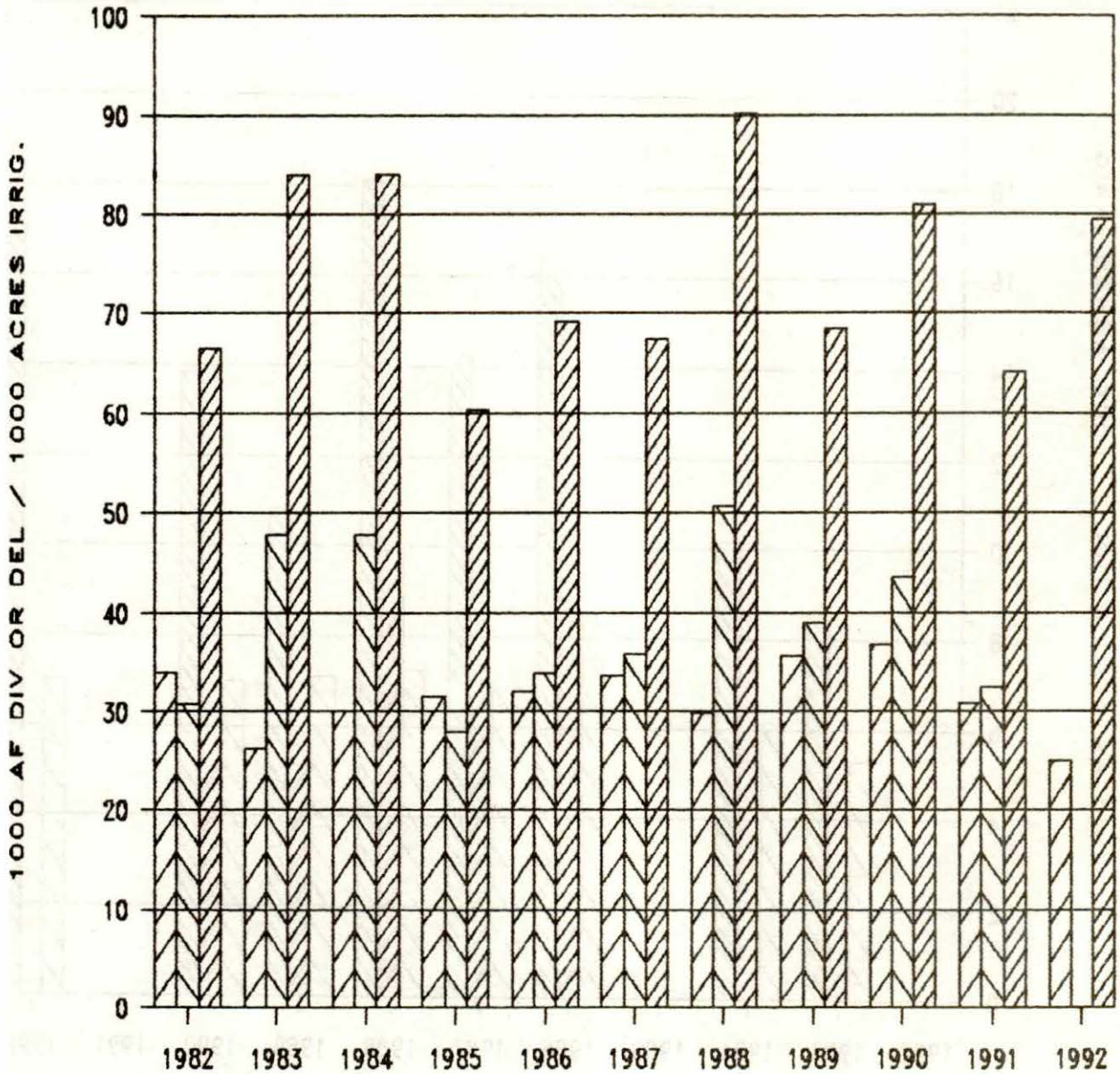
FORCASTED SHORTAGES (SUBTRACT FROM DIV REQ)

DRY YEAR	35.20
NORMAL YEAR	0.00

EXHIBIT 27

KANSAS-BOSTWICK IRRIGATION DISTRICT

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



	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
AF/ACRE										
DIV	1.96	3.20	2.80	1.92	2.15	2.00	3.02	1.92	2.21	2.08
DEL	0.90	1.82	1.59	0.89	1.05	1.06	1.69	1.09	1.19	1.05
EFF(%)	46	57	57	46	49	53	56	57	54	50

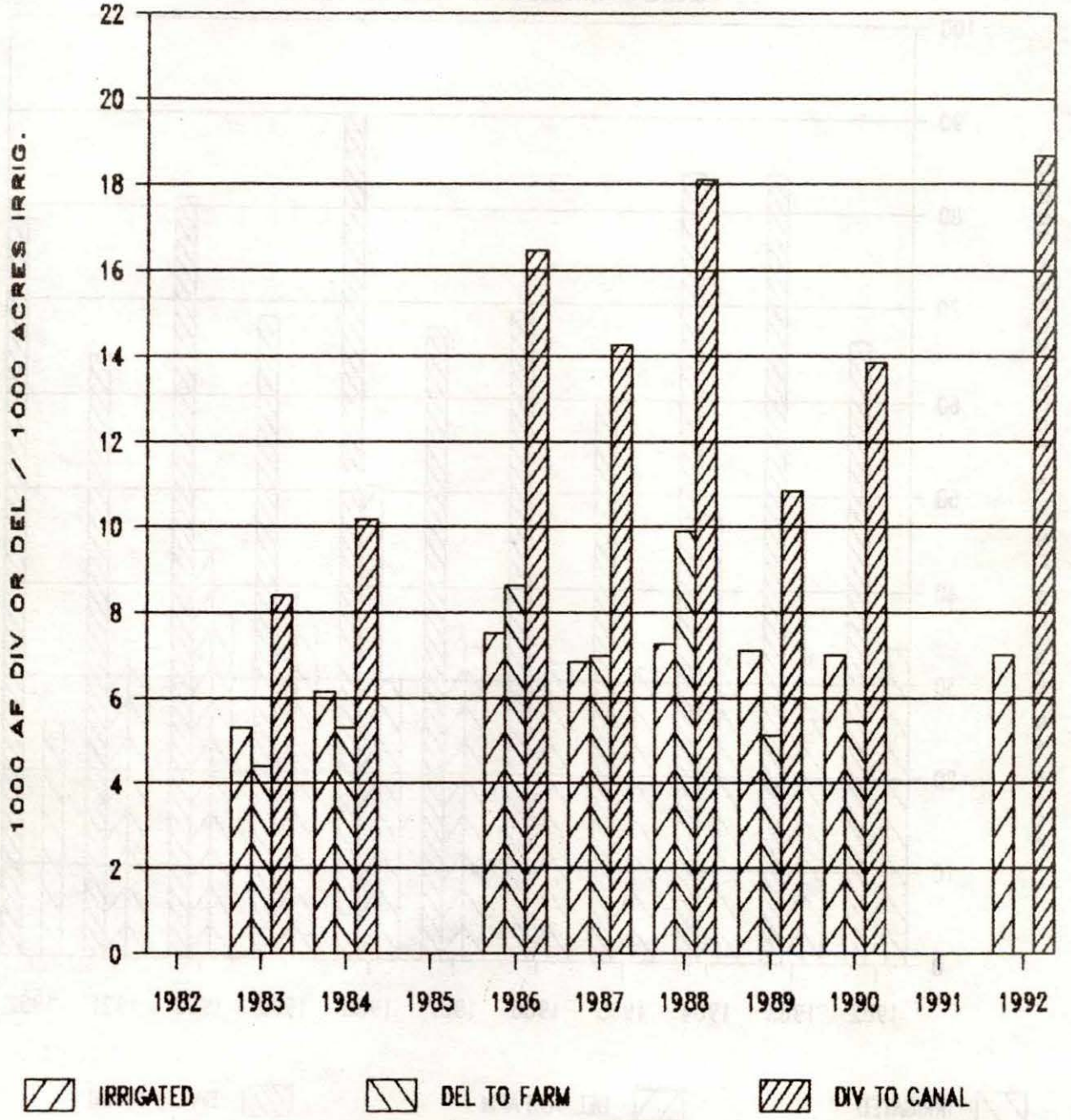
FORCASTED SHORTAGES (SUBTRACT FROM DIV REQ)

DRY YEAR	45.00
NORMAL YEAR	0.00

EXHIBIT 28

KIRWIN IRRIGATION DISTRICT

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



	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
AF/ACRE										
DIV	0.00	1.58	1.66	0.00	2.20	2.08	2.49	1.52	1.98	0.00
DEL	0.00	0.83	0.87	0.00	1.15	1.02	1.36	0.72	0.78	0.00
EFF(%)	0	53	52	0	52	49	55	47	39	0

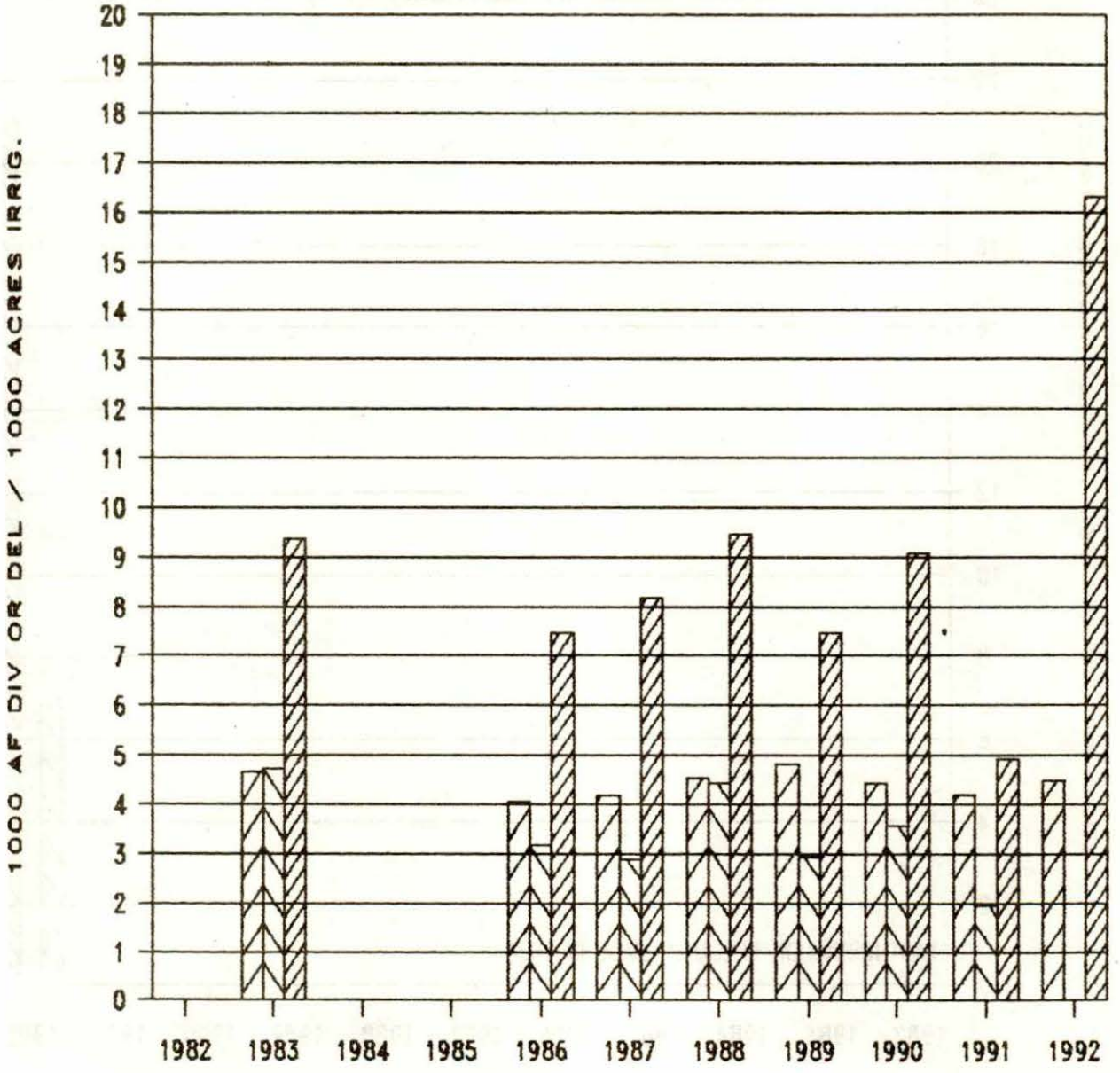
FORCASTED SHORTAGES (SUBTRACT FROM DIV REQ)

DRY YEAR	18.70
NORMAL YEAR	2.70

EXHIBIT 29

WEBSTER IRRIGATION DISTRICT

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



	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
AF/ACRE										
DIV	0.00	2.01	0.00	0.00	1.83	1.97	2.09	1.55	2.04	1.17
DEL	0.00	1.02	0.00	0.00	0.78	0.69	0.98	0.61	0.81	0.46
EFF(%)	0	51	0	0	43	35	47	39	39	40

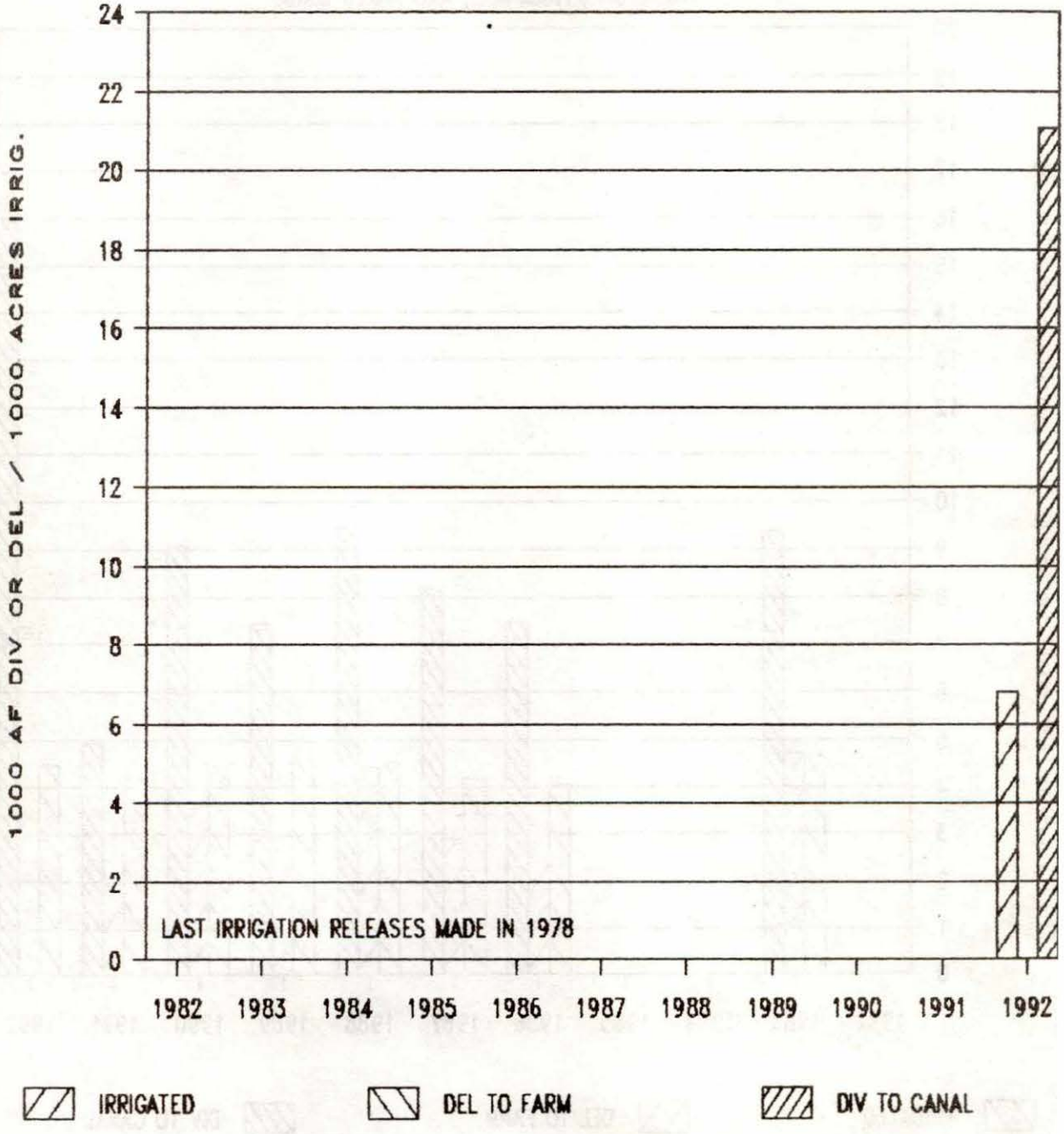
FORCASTED SHORTAGES (SUBTRACT FROM DIV REQ)

DRY YEAR	20.70
NORMAL YEAR	6.20

EXHIBIT 30

CEDAR BLUFF IRRIGATION DISTRICT

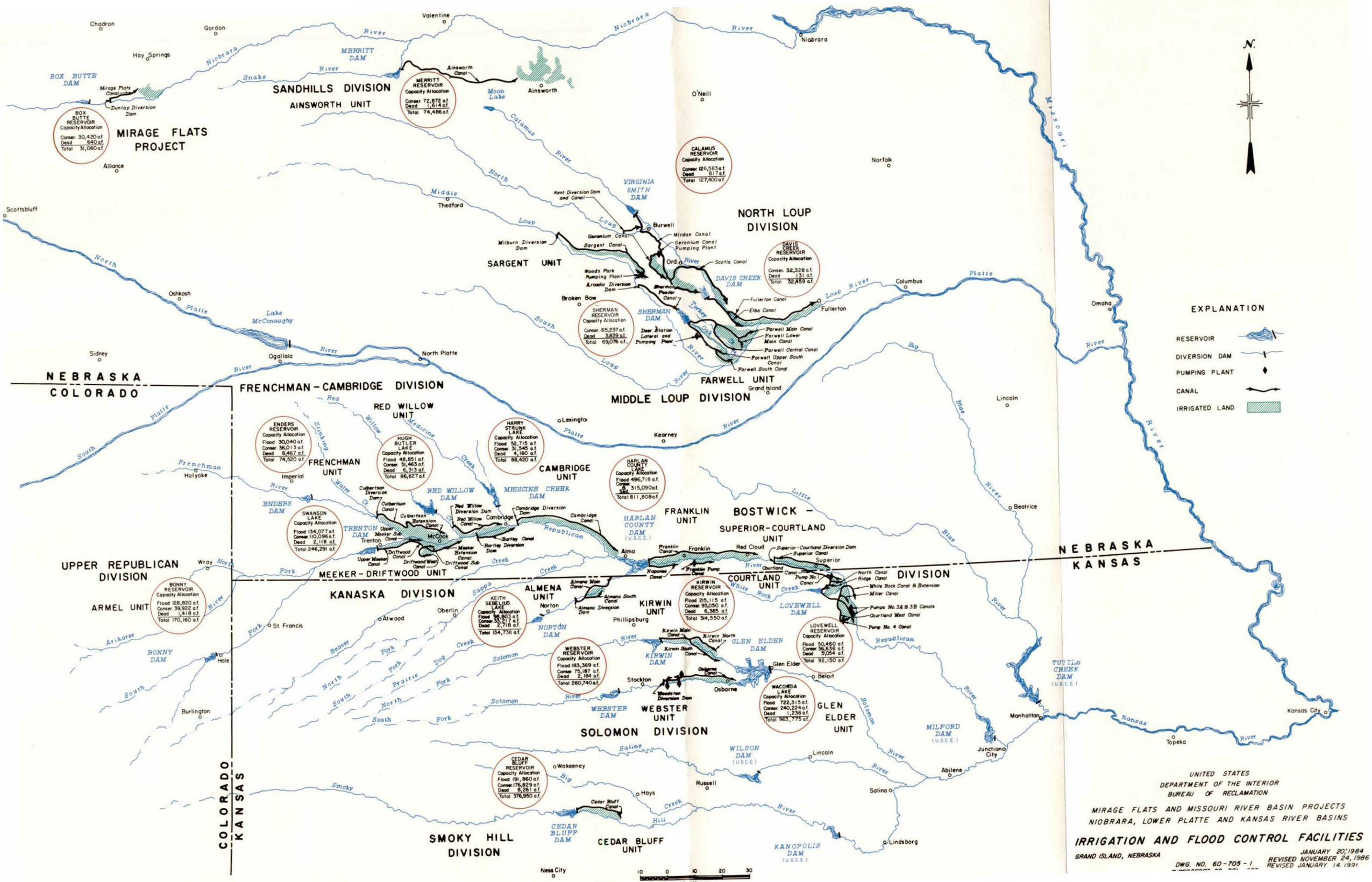
CANAL DIV., FARM DEL., AND ACRES IRRIG.



	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
AF/ACRE										
DIV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DEL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EFF(%)	0	0	0	0	0	0	0	0	0	0

FORCASTED SHORTAGES (SUBTRACT FROM DIV REQ)

DRY YEAR	22.20
NORMAL YEAR	14.90



UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

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

IRRIGATION AND FLOOD CONTROL FACILITIES

GRAND ISLAND, NEBRASKA

DWG. NO. 60-705-1

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REVISED JANUARY 14, 1991