Annual Operating Plans

Niobrara, Lower Platte, and Kansas River Basin

Calendar Year 1996 Summary of Actual Operations

and

Calendar Year 1997 Annual Operating Plans

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

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SYNOPSIS

General

This year is the 44th 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 Operations Group, McCook, Nebraska for the 17 dams and reservoirs that are located in Colorado, Nebraska, and Kansas. These reservoirs, together with 11 diversion dams, 11 pumping plants, and 23 canal systems, serve approximately 325,600 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.

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. 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 (PMSC) located at McCook is used to assist in operational management of all 11 dams under Reclamation's jurisdiction that are located in the Kansas River Basin. A Hydromet system collects and stores near real-time data at established stations in the Nebraska-Kansas Projects. The data includes water levels in streams, canals, and reservoirs and also gate openings. This data is transmitted to a satellite and downloaded to a Reclamation receiver in Boise, Idaho. The data can then be accessed by anyone interested in monitoring water usage in an irrigation system. The Nebraska-Kansas Projects currently has 23 Hydromet stations in operation and will be installing 22 more in 1997. When fully implemented, the projects will have a Hydromet station installed to provide real-time data on all reservoirs, diversion dams, and most of the measuring structures in the irrigation system.

The Headlines 96 that follows this synopsis is indicative of the awareness that the local people have of the natural resource development and conservation in the Niobrara, Lower Platte, and Kansas River Basins.

1996 Summary

Climatic Conditions

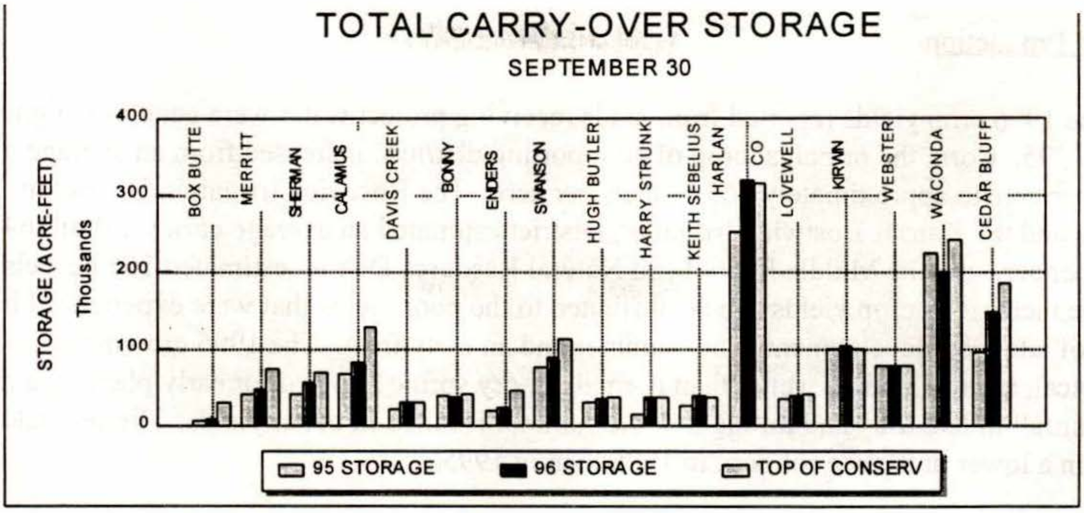
Precipitation at the project dams during 1996 ranged from 95 percent of normal at Lovewell Dam to 142 percent of normal at both Norton and Harlan County Dams. Precipitation during the first four months of 1996 was well below normal throughout the projects area. Precipitation totals varied from 46 to 85 percent of normal and averaged only 59 percent. Temperatures fluctuated widely during the months of January and April, were well above normal in February and generally below normal in March. Even with the persistent dry weather, reservoir storage remained near or above normal because of the generous carry-over storage the previous season. The month of May was generally cool and very wet throughout the Nebraska-Kansas Projects. A storm system moved across the area from May 25th through May 27th resulting in 3 to 3.5 inches of rainfall in southwest Nebraska, with as much as 5 inches being reported at Bonny Dam. Southcentral Nebraska and northcentral Kansas averaged 2 to 3 inches during this period. Precipitation during June varied greatly throughout the projects with 9.12 inches recorded at Norton Dam and only .61 inches at Lovewell Dam. Computed inflows at reservoirs in northwestern Kansas ranked near the highest ever recorded for the month of June. Abundant rainfall during July and August reduced project water demands, resulting in well above normal reservoir storage at the end of the irrigation season. August precipitation ranked at record or near record amounts for several project dams. September continued where August left off with southwest Nebraska experiencing the wettest September in 23 years. The extremely wet season resulted in reservoir inflows well above normal and near record highs at some reservoirs. Kansas project dams received well above normal precipitation amounts again during November. Four of these dams recorded record rainfall totals and corresponding record inflows for the month since construction. December ended the year, departing from the excessive rainfall, with little or no precipitation recorded at the project dams. All totaled, Norton Dam recorded the second greatest annual precipitation amount, Trenton Dam the third greatest and Harlan County Dam the fourth greatest since construction of the respective dams.

<u>Storage Reservoirs</u>

1. Conservation Operations. The 1996 inflow was above the dry-year forecast at all of the project reservoirs. Box Butte, Davis Creek, Bonny and Enders Reservoirs had inflows between the dry- and normal-year forecasts. Swanson, Hugh Butler, Harry Strunk and Waconda Lakes along with Calamus, Sherman, Merritt, Kirwin, Webster, and Lovewell Reservoirs had inflows between the normal- and wet-year forecasts. Keith Sebelius and Harlan County Lakes and Cedar Bluff Reservoir had inflows above the wet-year forecasts.

Well above normal reservoir storage prior to the 1995 irrigation season combined with an extremely wet month of May to offset 1995 summer demands, resulting in 12 of the 17 project reservoirs beginning 1996 with above normal storage. Just prior to the 1996 irrigation season, only Enders and Box Butte Reservoirs did not have sufficient storage to provide water users with a full water supply. Sargent and Farwell Districts would receive their usual supply. Reservoir releases were being made from several of the project dams to either reduce or maintain reservoir levels. Seven of the twelve facilities which have flood control capability utilized flood pool storage. Excessive rainfall from July through September significantly reduced demands. Reservoir storage remained well above normal at the end of the season.

The summarized graph on the following page shows a comparison of 1995 and 1996 carry-over storage conditions as compared to the top of conservation storage for all reservoirs in the Niobrara, Lower Platte, and Kansas River Basins as of September 30th.



2. Flood Control Operations. Harry Strunk, Keith Sebelius and Harlan County Lakes along with Kirwin and Webster Reservoirs had water stored in the flood pool at the end of September. With the exception of Keith Sebelius Lake, releases were made from the other four reservoirs to reduce or maintain pool levels through the end of the year. Flood releases were also required from Waconda Lake and Lovewell Reservoir prior to the end of 1996. The total 1996 flood control benefits accrued by the operation of the Nebraska-Kansas Projects facilities was $96,403,000. The accumulative total of flood control benefits for the years 1951 through 1996 by facilities in this report total $1,766,034,000 (see table 5). To date no benefits have been accrued by the operation of Box Butte, Merritt, Sherman, Calamus, or Davis Creek Reservoirs.

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

Water Service

There was 462,956 AF of water diverted to irrigate approximately 303,150 acres of project lands in the 14 irrigation districts (see tables 3 and 6). The project water supply was either inadequate or limited for 32,752 acres of the total project lands. This includes lands in Mirage Flats, Frenchman Valley and H&RW Irrigation Districts. The project water supplies for the other units mentioned in this report were more than adequate in 1996.

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

Under a long-term contract with Reclamation for the use of Arcadia Diversion Dam, the Middle Loup Public Power and Irrigation District diverted 33,602 AF to irrigate 14,290 acres of non-project lands. This use of Arcadia Diversion Dam is provided as a replacement for MLPP&ID's diversion dam which was destroyed when Arcadia Division Dam was built by Reclamation. These diversions were made under natural-flow water rights granted by the state of Nebraska.

Irrigation Production

The 1996 crop yields reported from lands receiving project water were generally higher than those in 1995. Corn, the principal crop of all reporting districts, increased from an average of 133 bushels per acre to approximately 165 bushels per acre. The Bostwick Irrigation District in Nebraska and the Kansas Bostwick Irrigation District estimated an average corn yield of 164 bushels per acre and the Middle Republican Natural Resource District estimated 166 bushels per acre. The increase in crop yields can be attributed to the poor yields that were experienced in 1995 because of late crop development, a hot summer and an early frost. The 1996 growing season was more typical, although much wetter than normal. A dry spring allowed for early planting and timely rainfall in late May and throughout the summer resulted in better yields. Higher yields resulted in a lower unit price for corn in 1996 than in 1995.

Fish and Wildlife and Recreation Benefits

The National Recreational Fisheries Policy declares that the Governments vested stewardship responsibilities must work in concert with the state managing agency's recreational fisheries constituency and the general public to conserve, restore, and enhance recreational fisheries and their habitats. As a result of this policy, Reclamation has developed fishery management guidelines for reservoirs within the Nebraska-Kansas Projects. These guidelines outline a program which considers public use, fisheries, fish habitat, and improved communication and coordination. The Nebraska-Kansas Area Office 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 1996 season, normal reservoir operations were favorable for recreation and fish and wildlife uses. Considerable carry-over storage from the 1995 season resulted in most reservoirs storing water above normal pool levels early in the year. Several reservoirs encroached into the flood pool during the late spring and maintained above normal levels throughout the summer because of excessive rainfall. Normal summer drawdown due to irrigation releases allowed for late summer shoreline revegetation.

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

Water supply is provided by natural flows passed through Virginia Smith Dam and from Calamus Reservoir storage through an agreement dated July 28, 1988, between the Commission and the Twin Loups Reclamation District.

1997 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 17. The municipal and rural water district water supply requirements will be met under all three inflow forecast conditions for all units.

Under reasonable minimum inflow forecast conditions, irrigation districts receiving storage water from the following lakes and reservoirs are expected to receive less than a full supply: Box Butte, Sherman, Enders, Harlan County and Lovewell. The irrigation districts affected are Mirage Flats; Sargent and Farwell; Frenchman Valley and H&RW; and Nebraska and Kansas Bostwick; respectively. If 1997 is a dry year, 155,650 of the total 311,650 acres estimated to be irrigated (50 percent) will have an inadequate water supply.

Under most probable inflow conditions, it is also expected that Frenchman Valley, H&RW, and Mirage Flats Irrigation Districts would experience some shortages to irrigation demands from Enders and Box Butte Reservoirs. Irrigators in several districts (Mirage Flats, Almena, Frenchman Valley, and H&RW) plan to use water from private wells to supplement the project water supply.

During 1997, under all inflow forecast conditions, storage water will be in excess of project needs at Bonny Reservoir and Waconda Lake. The state of Colorado will make Bonny storage water available to downstream water right appropriators.

Even under reasonable minimum inflow conditions, the conservation pools at Merritt, Sherman, Calamus, Davis Creek, Lovewell, Kirwin, and Webster Reservoirs along with Swanson, Hugh Butler, Harry Strunk, Keith Sebelius, and Harlan County Lakes would fill during 1997.

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 '96

Canal lining aids water conservation

Project part of CNPPID work

Republican River IRRIGATION WATER CONTRACT RENEWAL OPEN HOUSE

Bureau extending irrigation contracts

Irrigation's Importance Stressed

"The proposed amendments will not change any of the existing contract provisions..." Gil Gyllenborg

Groundwater levels rise

Water use bill gets initial OK

Reservoir helped prevent flood damage

Republican River Users Take Action

Farm Bill Called Environment-Friendly

Farmers weigh ways to save on irrigation

McCOOK DAILY GAZETTE

Hail takes over 60 sections of Hitchcock County crops

Bureau officials plan public meetings on service contracts

Water Resources Tour to kick off July 22

Devastation East of Palisade Thursday, Sunday barrage takes crops East of Trenton

Reservoirs Full Or Close to It In Midlands

So Far, Outlook For Irrigators Termed Good

Water releases reduced at Harlan

Weather Forecasters See Drought Signals

Dry Fall, Winter Taking Area Toll

Report: Chemicals Flow in Rivers

Poll says most rural Nebraskans support environmental efforts

Court upholds denial of water transfer

Transfer of reservoirs becomes hot issue

Some irrigators willing to risk Kansas lawsuit

Omaha World-Herald

Storms Hammer Away at Parts of Midlands

Missouri Valley Flooding Eases

Flood advisories still in effect

Three States Negotiate Platte Water Supply

Water is more precious than gold

Recharging helps maintain clean water supply

Kansas, Nebraska officials talk of options for Republican River

From Kansas' standpoint, we want our water and it is up to Nebraska and the federal government to come up with it.

David Pope, chief engineer and director of the Division of Water Resources of the Kansas Dept. of Agriculture

Flooding not likely with slow snow melt

State Agency to Lend Funds to Fix Dam

Platte River has hidden impact to replace aging city wells with high nitrate levels

'Water is owned by all'

Environmentalists, farmers clash over Platte River

Kansas-Nebraska irrigation proposal alive

Opponents worry about future water availability if reservoirs are sold

Interior Secretary Sees Turnaround for Wildlife

Irrigators seek title transfer

CHAPTER I - INTRODUCTION

Purpose of This Report

This AOP advises water users, cooperating agencies, and other interested groups or persons of the actual operations during 1996 and serves as a guideline for the 1997 operations. This report also describes the responsibilities of Reclamation, Corps of Engineers, and the irrigation and reclamation districts in the Niobrara, Lower Platte, and Kansas River Basins.

Operational Responsibilities

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

By contractual arrangements with Reclamation, the irrigation or reclamation districts in the Niobrara, Lower Platte, and Kansas River Basins are responsible for the O&M of the canals and irrigation distribution facilities constructed or rehabilitated by Reclamation. In addition, the appropriate irrigation or reclamation districts are responsible for operating and maintaining Box Butte, Merritt, Sherman, Virginia Smith and Davis Creek Dams. The operation and maintenance of Virginia Smith and Davis Creek Dams was transferred to the Twin Loups Reclamation District on January 1, 1997. The Corps of Engineers operates and maintains Harlan County Dam and Lake. The state of Colorado provides operational guidelines for Bonny Reservoir. Operational guidelines for Cedar Bluff Reservoir will be provided by the State of Kansas. Reclamation operates and maintains 11 dams and reservoirs in the Republican, Solomon, and Smoky Hill River Basins. Under a contract with Reclamation, Kirwin Irrigation District performs certain operational and maintenance functions at Kirwin Dam.

The states of Nebraska, Colorado, and Kansas are responsible for the administration and enforcement of their state laws pertaining to the water rights and priorities of all parties concerned with the use of water. The states are also responsible for administering the water surface activities and the federal lands around the reservoir. The U.S. Fish and Wildlife Service administers the water surface activities and most of the federal lands at Kirwin Reservoir.

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

Tables and Exhibits

Records for the facilities reported in the AOP are included as tables and exhibits and are located in the appendix.

Water Supply

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

Inflow records from 1965 through 1995 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 1995 were used to better represent present inflows. Inflow records from 1967 through 1995 were used for the analysis of the reservoirs located in the Niobrara and Lower Platte Basins, except for Calamus Reservoir where the more recent available record of 1986 through 1995 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 carry-over storage and estimated inflow at each reservoir to determine whether excess water is anticipated. If excess inflow is apparent, controlled releases will be made to maximize the downstream benefits, including flood control.

Major Features

The Mirage Flats Project was constructed under the Water Conservation and Utilization Act and includes an irrigation storage reservoir, diversion dam, and canal system. The other features discussed in this report are all a part of the Pick-Sloan Missouri Basin Program and include single and multipurpose reservoirs, diversion dams, pump stations, and canal systems. The 17 storage facilities now in operation are listed below.

Constructed by Reclamation

1. Operated by irrigation or reclamation districts--Box Butte and Merritt Dams in the Niobrara River Basin and Sherman, Virginia Smith and Davis Creek Dams in the Lower Platte River Basin. Following completion of the North Loup Project distribution works the responsibility for the operation and maintenance of Virginia Smith Dam, Davis Creek Dam and Kent Diversion Dam was transferred to the Twin Loups Reclamation District on January 1, 1997.

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. 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. Bostwick Irrigation District in Nebraska has contracted their O&M responsibilities for Courtland Canal between the headgates and the Nebraska-Kansas state line to Kansas Bostwick Irrigation District.

The contracted irrigation season for the Mirage Flats Irrigation District is April through September. The contracted irrigation season for Frenchman Valley, H&RW and Frenchman-Cambridge Irrigation Districts is from May 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.

The water service contracts for nine irrigation districts in the Nebraska-Kansas Projects will expire between 1996 and 2007. The Frenchman-Cambridge, Kansas Bostwick and Bostwick in Nebraska Irrigation Districts have water service contracts that were to expire on December 31, 1996. The water service contract for Frenchman Valley Irrigation District was to expire December 31, 1997; the contract with Loup Basin Reclamation District for Sargent and Farwell Irrigation Districts expires in 1998; Kirwin Irrigation District in 1999; Webster Irrigation District in 2001; and Almena Irrigation District on December 31, 2007.

Renewal of the contracts constitutes an action requiring preparation of a National Environmental Protection Act (NEPA) compliance document. Also, because of the extent and complexity of the resource management issues in the Basins, a resource management assessment (RMA) is needed. Both processes are required for the renewal of the contracts. The Irrigation Projects Reauthorization Council was formed by the irrigation districts involved in contract renewal for negotiating with Reclamation. Environmental and economic data collection, as well as hydrologic studies are being conducted in the Republican, Solomon, and Middle Loup River Basins.

President Clinton signed Public Law 104-326 on October 19, 1996. To comply with this law, Reclamation was required to amend the existing water service contracts with the Frenchman Valley, Frenchman-Cambridge, Bostwick in Nebraska, and Kansas Bostwick Irrigation Districts by extending the contract term for four years. Because extending the contracts was a significant federal action, Reclamation was required by law to evaluate the environmental effects of the four-year contract extension. A draft environmental assessment (EA) was prepared and distributed to the public for review and comments. Based on the information and analysis in the final EA, Reclamation determined that an environmental impact statement (EIS) was not required to extend the contracts for four years.

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 to rear Canadian geese. The Calamus Fish Hatchery located below Calamus Reservoir is operated by the State of Nebraska for fish production.

State of Colorado Division of Wildlife

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

State of Kansas Department of Wildlife and Parks

The State of Kansas has acquired the use and control of portions of the conservation capacity at Cedar Bluff Reservoir. The City of Russell's existing water storage right and contract with the United States will remain unchanged.

Power Interference Considerations

A Power Interference Agreement exists between Reclamation, the Twin Loups Reclamation District, and the Loup River Public Power District. Provisions of this agreement will be incorporated into the 1997 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.

Emergency Operation Plans

The Nebraska-Kansas Area Office is developing emergency plans which include incorporating the response level/expected actions systems. Reclamation continues to meet with downstream local emergency management officials to discuss assistance that Reclamation will provide in the development of Local Warning and Evacuation Plans. The local officials were provided with a copy of Reclamation's draft Local Warning and Evacuation Plan to use in the development of their Local Emergency Operation Plans. These meetings will continue in 1997 and orientation meetings will be held with agencies involved in the warning and evacuation process (National Weather Service, State, County, and City Emergency Management Agencies, State water resource personnel, United States Geological Service, local law enforcement, etc.). The Nebraska-Kansas Area Office is currently assisting the local emergency officials in developing the Box Butte Dam Early Warning System. The Nebraska-Kansas Area Office also continues to participate in the Bonny Dam Early Warning System, which was exercised with a tabletop exercise in May of 1995.

Radios to contact local emergency management's 24-hour warning points from each of the Nebraska-Kansas Area Office dams have been acquired and will be installed in 1997. Agreements to allow Reclamation to operate these radios on the local's frequency have been signed and will be posted at the installation site. These radios will be used as a backup means (telephone is primary) of notifying the local emergency management officials in the event of an emergency at the dam.

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 1987 to 1996, the project water supply averaged 13,640 AF, which is about 1.17 acre-foot per irrigable acre. This amount is 1.15 acre-foot per acre short of the average diversion requirement of 2.32 AF per acre estimated for a full water supply in a March 1965 report. Many irrigators supplement their water supply with 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. A 30-year agreement was made in 1990 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 (2,819 acre-feet). In return the district received an up-front payment which is being used to improve the efficiency of the project's delivery system.

Reclamation continues to finalize the Box Butte Dam Emergency Action Plan as part of the Box Butte Dam Early Warning System. Reclamation has met with and provided the Region 23 Emergency Management Agency with Reclamation's draft Local Warning and Evacuation Plan. Reclamation has completed a draft Emergency Action Plan for Box Butte Dam and provided copies of this plan to the Mirage Flats Irrigation District and Region 23 Emergency Management Agency. The District has reviewed and provided comments on the Emergency Action Plan, which includes expected actions for the District for each Response Level. Region 23 is continuing to develop their Local Warning and Evacuation Plan. When Region 23 completes a draft plan, it will be coordinated with the Reclamation's Emergency Action Plan and an orientation meeting and a tabletop exercise will be scheduled. A data collection platform (DCP) was installed in May of 1992 to monitor the reservoir elevation and outflow. A telephone (primary communication system) and a radio (backup communication system) have been installed at the outlet works for contacting Region 23 Emergency Management Agency.

1996 Summary

The flows of the Niobrara River plus the carry-over storage in Box Butte Reservoir were not adequate to provide a full water supply for the project lands. Precipitation at the Mirage Flats Irrigation District Office totaled 22.70 inches, which is 135 percent of normal. The total inflow (16,843 AF) was between the dry- and normal-year forecasts.

From July through September, diversions of 13,315 AF to the Mirage Flats Canal provided irrigation water for 10,426 acres, 89 percent of the service available acreage. The farm deliveries from the project water supply were 6,641 AF (0.57 acre-foot per irrigable acre), which is a delivery efficiency of 50 percent. The reservoir contained only 8,150 AF of water at the end of the irrigation season. Privately owned irrigation wells supplemented the project water supply.

1997 Outlook

The project water supply is expected to be inadequate in 1997 as it has been since the early 1960's. In the spring, the district will inform their water users of the amount of water that will be available from storage in Box Butte Reservoir. The district plans for the irrigators to continue the use of water from privately owned irrigation wells as a supplemental supply. In 1997, 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 face of 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 district has a basic water supply. If available, additional water can be purchased by the district as a supplemental supply.

1996 Summary

Precipitation, as recorded near Merritt Dam, totaled 23.02 inches, which was 116 percent of normal. The water supply was more than adequate to meet the project's irrigation requirement. There were 71,339 AF diverted from Merritt Reservoir into the Ainsworth Canal, with 48,850 AF delivered to the farm headgates (delivery efficiency of 68 percent). There were 34,463 acres of land irrigated in 1996.

The district executed several temporary water service contracts which provided a total of 324.5 AF of irrigation water from holding ponds located within the district's service area.

1997 Outlook

During the winter months, the reservoir will be regulated to maintain elevation 2944.0 feet (2.0 feet below the top of conservation capacity). This elevation is within the repaired area of soil cement on the upstream face of the dam. Maintaining 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 1997 for the irrigation of 34,500 acres.

Sargent Unit, Middle Loup Division in Nebraska

General

With financial support from the Loup Basin Reclamation District, the Sargent Irrigation District performs the O&M of Milburn Diversion Dam and the Sargent Canal system which serves 13,922 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.

1996 Summary

The precipitation over the Sargent Unit (22.99 inches at district headquarters) was 98 percent of normal. The irrigation diversions into the Sargent Canal totaled 21,154 AF (12,196 AF were delivered to the farm headgates for a delivery efficiency of 58 percent). The diversions exceeded the direct-flow water right for 12 days. Approximately 13,922 acres were irrigated. The irrigators grow corn as the principal crop, creating very high water demands in July and August. Normally these high demands cannot be met within canal capacity, so the district institutes a rationing process through the peak period, as necessary.

1997 Outlook

The Sargent Irrigation District estimates that 13,900 acres in the Sargent Unit will be irrigated in 1997. Under 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 Farwell Irrigation District operates and maintains, with financial support from the Loup Basin Reclamation District, the Arcadia Diversion Dam, Sherman Feeder Canal, Sherman Dam and Reservoir, and the Farwell Canal system, which serves 50,051 acres of land. Diversions are also made through the Arcadia Diversion Dam to 15,000 acres of non-project lands in the Middle Loup Public Power and Irrigation District under their appropriated natural-flow water rights.

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

During the winter months, Sherman Reservoir is normally regulated to 5 feet or more below the top of the conservation capacity. Doing so minimizes seepage from the reservoir into the groundwater table. Maintaining the pool below the top of conservation provides time for seeding of exposed shore areas to prevent wind erosion. The seedings also provide winter food and cover for wildlife, and spawning habitat for fish in the spring when these areas are inundated. Each spring, diversions into Sherman Feeder Canal from the Middle Loup River are regulated to fill the conservation capacity of Sherman Reservoir by late May. The gradually rising water surface in the spring is desirable for fish spawning.

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.

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

1996 Summary

The diversions from the Middle Loup River at Arcadia Diversion Dam were 33,602 AF to the Middle Loup Public Power and Irrigation District and 96,788 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 109 AF and the losses charged as a result of these deliveries totaled 11 AF.

Sherman Feeder Canal diversions into Sherman Reservoir were started on April 23rd, and the conservation capacity was filled on May 31st. The precipitation at Sherman Dam was 25.72 inches, which is 114 percent of normal. Releases into the Farwell Canals totaled 67,899 AF (36,766 AF were delivered to the farm headgates for a delivery efficiency of 54 percent). The Farwell Irrigation District reported that 49,600 acres of land were irrigated in 1996. Sherman Feeder Canal was shut off September 25th.

Under an ongoing program the Farwell Irrigation District has installed a total of about 158 miles of pipe to replace open laterals including approximately 3.2 miles this past year. Also, approximately 4.5 miles of plastic lining has been installed in canal reaches on the Farwell Canal system.

1997 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 dry-year inflow conditions, irrigation shortages are expected in 1997. 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. Water is diverted from both the Calamus and North Loup Rivers for the irrigation of approximately 53,000 acres of project lands. Operation of the division will also provide a sustained groundwater supply for an additional 17,000 acres. Principal features of the division include Virginia Smith Dam and Calamus Reservoir, Calamus Fish Hatchery, Kent Diversion Dam, Davis Creek Dam and Reservoir, five principal canals, one major and one small pumping plant and numerous open ditch and buried pipe laterals.

Calamus Reservoir is normally regulated at 3 to 4 feet below the top of conservation capacity during the winter months. Maintaining the reservoir at this elevation during the winter will help avoid ice damage to the soil cement on the upstream face of the dam. After the ice clears in the spring, the reservoir will be filled to conservation capacity. The North Loup Division project operation is restricted to no water diversion from the Calamus and the North Loup Rivers during the months of July and August ; and during the month of September whenever sufficient water is available in storage reservoirs to deliver canal design capacity. During this time, inflows to Calamus Reservoir are required to be bypassed under the Power Interference Agreement between Reclamation, the Twin Loups Reclamation District, and the Loup River Public Power District and as required in the authorizing legislation.

Davis Creek Reservoir is normally regulated at elevation 2040.0 feet following the irrigation season and throughout the winter months. This carry-over elevation provides a minimal recreational pool while reducing increases in groundwater storage due to reservoir seepage. The reservoir is filled in the spring via Mirdan Canal, starting in April and reaching full content by the end of June. A 160-acre recreation area adjoining the reservoir was constructed and is managed by the Lower Loup Natural Resources District. The area includes a boat ramp, a handicapped fishing pier, a day-use area, a primitive camping area, shelter and a hiking path. Kent Diversion Dam is also open to day-use fishing with handicapped accessibility provided.

1996 Summary

Precipitation at Virginia Smith Dam was 25.77 inches which is 109 percent of normal. The inflow was 290,737 AF which was between the normal- and wet-year forecasts. There were

79,642 AF of water released to Mirdan Canal with 28,338 AF diverted for use above Davis Creek Reservoir. The farm headgate delivery was 14,673 AF which is a delivery efficiency of 52 percent. Land irrigated in 1996 totaled 27,897 acres above Davis Creek Reservoir. Reservoir inflows were bypassed during July, August, and September as required. The Calamus Fish Hatchery used approximately 3,942 AF of bypassed natural flow and storage from Calamus Reservoir during 1996.

The precipitation of 25.82 inches at Davis Creek Dam was 112 percent of normal. Inflow diverted into Davis Creek Reservoir totaled 46,506 AF during 1996. Construction of the canal and distribution system below Davis Creek Reservoir was completed in 1995. A release of 22,933 AF was made from Davis Creek Dam into Fullerton Canal, with 13,229 AF delivered to the farm headgates (58 percent delivery efficiency). There were 18,907 acres irrigated below Davis Creek Reservoir. Based on special circumstances involving the construction of a Mirdan Canal Wasteway and spring canal maintenance, Davis Creek Reservoir was filled during the fall of 1996. The carry-over elevation was maintained through the winter.

<u>1997 Outlook</u>

Calamus Reservoir will be held at the present elevation of about 2241.6 feet until ice-out, at which time the reservoir will be rapidly filled to an elevation of 2244.0 feet (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 would normally be filled to an elevation of 2240.0 feet. Construction of wetland enhancement facilities in the Gracie Creek area on the upper reach of Calamus Reservoir will require restricting the reservoir level this fall. The reservoir level will be maintained no higher than elevation 2229.0 feet from October 1, 1997 through November 1, 1997. The reservoir will then be allowed to fill at a rate of no more than .1 foot per day, reaching elevation 2235.0 feet no sooner than January 1, 1998.

Water will be available for all irrigable acres with service from the Mirdan, Geranium and Scotia Canals and Lateral Systems. It is estimated that approximately 30,100 acres will be irrigated from these canals. Water supplies will be sufficient to meet the full dry-year requirements.

Filling of Davis Creek Reservoir will take place this spring with flows diverted from the North Loup River at Kent Division Dam and transported through Kent and Mirdan Canals. Storage water can also be transferred from Calamus Reservoir into Davis Creek Reservoir during the summer months via Mirdan Canal. Water will be sufficient to irrigate an estimated 19,000 acres from Elba and Fullerton Canals under all inflow forecast conditions. The reservoir will be wintered at elevation 2040.0 feet. The low carry-over elevation will minimize groundwater increases due to reservoir seepage.

The fish hatchery demand for 1997 is expected to be similar to that of last year with approximately 4,000 AF passing through the hatchery.

CHAPTER III - REPUBLICAN RIVER BASIN

Armel Unit, Upper Republican Division in Colorado

General

Normal reservoir operations for Bonny Reservoir are primarily for recreation and fish and wildlife support, although water will be available for water right administration and irrigation purposes.

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

The normal operation pattern of Bonny Reservoir, with a slowly rising or stable pool, enhances fish spawning in the spring and provides excellent fishing opportunities during the summer and hunting conditions each fall.

1996 Summary

The precipitation of 20.47 inches at Bonny Dam was 120 percent of normal. The inflow (13,733 AF) to Bonny Reservoir was between the dry- and normal-year forecasts. The reservoir level was 2.5 feet below the top of conservation at the first of the year. Due to dry conditions during late winter and early spring, the reservoir level increased only one foot by May 25th. Bonny Dam recorded 4.92 inches of precipitation from May 25th through May 27th, resulting in some minor localized flooding. The reservoir level increased .6 foot from the storm runoff. Bonny Dam received over five inches of rainfall during August and another 2.41 inches on September 17th, with unofficial reports of more than four inches reported in the area. This latest storm resulted in the South Fork Republican River exceeding bank full both above and below the reservoir causing roadways to be inundated. The reservoir level increased only .7 foot as a result of the September storm. Canal releases were discontinued at this time. Bonny Reservoir prevented $1,000 in flood damages during 1996, as computed by the Corps of Engineers. Storage remained within the active conservation pool throughout the year. On December 31, 1996, the reservoir elevation was 2.3 feet below the top of conservation.

As directed by the Colorado Water Commissioner, 67 AF of reservoir inflows from the South Fork of the Republican River and Landsman Creek passed through Bonny Reservoir into Hale Ditch. In addition, the Colorado Department of Natural Resources requested storage releases of 639 AF for irrigation purposes into Hale Ditch.

Safety of Dams evaluations in 1986 and 1987 confirmed two deficiencies at Bonny Dam, the potential for piping failure and that floods greater than 55 percent of the probable maximum flood

(PMF) will overtop and fail the dam. An interim toe drain completed in December of 1988 provided protection up to elevation 3691.0 feet. A foundation toe drain completed in 1994 will minimize the potential for dam failure due to piping when the reservoir goes above elevation 3691.0 feet. An Early Warning System (EWS) was selected as the preferred hydrologic alternative for the danger of the dam overtopping. The EWS will greatly reduce the threat to downstream populations if the dam were to overtop and fail due to large floods.

Reclamation continued development of the Bonny Dam Early Warning System in cooperation with the National Weather Service, Colorado Department of Wildlife and Parks, emergency management officials from the states of Colorado, Kansas, and Nebraska, and emergency officials from Yuma County in Colorado, Cheyenne County in Kansas, and Dundy and Hitchcock Counties in Nebraska. An Emergency Action Plan for Bonny Dam was developed and the local officials developed Local Warning and Evacuation Plans. A Tabletop Exercise was held on May 22, 1995 in Yuma, Colorado, with participation from the above agencies. The dam operator at Bonny Dam retired at the end of 1995 and discussions with the Parks Department began concerning having a state parks employee reside at the dam operator's quarters. These discussions continued throughout 1996 and ended with the decision that Reclamation will continue to provide a dam operator at Bonny Dam. A new dam operator reported for duty in February of 1997. The Emergency Action Plan will need to be reviewed with the new dam operator. An Orientation Meeting with involved agencies is planned in the spring of 1997 to review the Emergency Action Plan and the Local Warning and Evacuation Plans.

1997 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 installation of guardrail is scheduled for the Bonny Dam spillway bridge in 1997. Remodeling of the reservoir superintendent house at Bonny Dam began last year and will be completed this spring.

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.

1996 Summary

The precipitation of 24.98 inches at Enders Dam was well above normal (132 percent). The 1996 inflow into Enders Reservoir (20,069 AF) was between the dry- and normal-year forecasts. Due to extensive groundwater pumping above the reservoir, the inflow was only 33 percent of the average historical preconstruction runoff at the Enders Dam site (60,700 AF from 1929-1947). This year was the 29th consecutive year with below-normal inflows in which the conservation pool did not fill. A total of 3,190 AF of water was conserved between the 1995 and 1996 irrigation seasons by pumping seepage back into the reservoir. Reservoir releases for irrigation began June 29th and were stopped on August 25th.

The farm delivery averaged about 0.46 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 approximately 8,697 acres received water in 1996, and the H&RW Irrigation District reports approximately 10,898 acres, which are 91 and 95 percent, respectively, of the lands with service available. Farm delivery efficiency was 43 and 39 percent respectively for the two districts.

Enders Reservoir on the Frenchman Creek, a tributary of the Republican River in southwest Nebraska, prevented $2,255,100 in flood damages (determined by the Corps of Engineers). Enders Dam received nearly 6 inches of rainfall during the last week of May with 3.49 inches recorded overnight on May 27th. Storm runoff overflowed the banks of the Frenchman Creek below the dam. May precipitation at Enders Dam was the second greatest recorded since construction. August was another wet month as Enders Dam recorded 6.47 inches of precipitation, the greatest for the month since dam construction. Flood releases were not required from the reservoir as total storage remained below the top of conservation. The carry-over storage in Enders Reservoir was the greatest since 1966.

Construction of a supplemental filtered toe drain system is expected to begin during the fall of this year. This Safety of Dams modification at Enders Dam was determined to be necessary to control seepage and improve the level of safety, ensuring the continuation of project benefits and public safety downstream from the dam.

1997 Outlook

The fall and early winter inflows into Enders Reservoir were slightly below the dry-year forecast. If reasonable minimum inflow conditions prevail, the project water supply is expected to experience a shortage of about 62,100 AF. Most probable inflow conditions are expected to be inadequate by 16,900 AF, to irrigate the 8,750 acres in the Frenchman Valley Irrigation District and 11,000 acres in the H&RW Irrigation District. Approximately 3,000 AF are expected to be conserved by pumping seepage water back into 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. The Frenchman-Cambridge Irrigation District has replaced all of the open laterals which were physically or economically feasible with pipe laterals which has significantly increased both system and on-farm efficiencies.

1996 Summary

The precipitation of 27.97 inches at Trenton Dam was the third highest ever recorded at the dam and 140 percent of normal. The inflow of 70,375 AF to Swanson Lake was between the normal- and wet-year forecasts. The reservoir level began the year approximately 6.9 feet below the top of conservation pool. The conservation pool filled on June 16th (elevation of 2752.00 feet), largely due to the 5 inches of rainfall received during the last week in May. The reservoir level peaked at 2752.10 feet on June 23rd. An irrigation release was started on June 18th. Trenton Dam recorded 12.35 inches of precipitation during August and September, exceeding the previous record by 4 inches and the average by 8.7 inches. The maximum 24-hour total during this period was 2.38 inches on September 7th. A peak average daily inflow of approximately 1,000 cfs resulted from this storm increasing the reservoir level by almost .5 foot overnight. At the end of the year the reservoir level was only 2.7 feet below the top of conservation. It was determined by the Corps of Engineers that the reservoir prevented $5,953,100 in flood damages during 1996. Swanson Lake storage, along with inflows and river pickup flows were sufficient in furnishing a full water supply to each irrigable acre of the project lands served by the Meeker-Driftwood and Bartley Canal systems. The Frenchman-Cambridge Irrigation District diverted 26,998 AF into Meeker-Driftwood Canal to irrigate 16,533 acres and 6,250 AF into Bartley Canal for 6,467 acres. Delivery efficiency was 53 and 66 percent respectively for the two canals.

The precipitation of 22.50 inches at Red Willow Dam was 113 percent of normal, while the inflow of 18,859 AF into Hugh Butler Lake was between the normal- and wet-year forecasts. The reservoir level at the first of the year was 4.1 feet below the top of conservation. Inflows gradually increased the level of the reservoir to 2581.56 feet (.2 foot below the flood pool) on June 19th. Irrigation releases began at this time and ended on September 6th. Generous rainfall during August and September (5 inches above normal) resulted in the greatest carry-over storage since 1967 at Hugh Butler Lake. The largest increase in storage occurred from September 17th through the 20th when the lake level rose nearly 1.0 foot due to 3.4 inches of rainfall. The level of Hugh Butler Lake was only 1.2 feet below the top of conservation at the end of the year. Storage did not encroach into the flood pool during the year. Hugh Butler Lake was estimated to have prevented $1,848,100 in flood damages by the Corps of Engineers. The water supply was adequate to meet the diversion requirements for Red Willow Canal. The district diverted 5,217 AF of water to irrigate 4,867 acres of land served by Red Willow Canal. The farm headgate delivery was 3,525 AF for a delivery efficiency of 68 percent.

The precipitation of 25.30 inches was 123 percent of normal at Medicine Creek Dam, while the inflow of 44,196 AF was between the normal- and wet-year forecast. The reservoir level at the beginning of 1996 was 9.4 feet below the top of conservation. The reservoir level gradually increased to an elevation of 2368.33 feet on June 23rd, at which time the uncontrolled spillway release began to exceed the inflows. Irrigation releases began on June 30th. Medicine Creek Dam recorded five consecutive months of above normal precipitation from May through September. The excessive rainfall reduced irrigation demands allowing for reservoir levels to remain high throughout the summer. The reservoir level did not drop back into the conservation pool (2366.1 feet) until October 2nd. Flood pool storage was regulated in cooperation with the Nebraska Game and Parks Commission. A release continued throughout the fall and winter to offset inflows and maintain the pool level. Harry Strunk Lake was just .5 feet below the top of conservation at the end of the year. The reservoir was estimated to have prevented $2,255,600 in flood damages by the Corps of Engineers. The water supply was more than adequate with 14,542 AF of water diverted to irrigate 17,317 acres of land served by the Cambridge Canal (farm delivery efficiency was 38 percent).

1997 Outlook

Forecasts show that carry-over storage, streamflow gains, plus reasonable minimum inflows for the three lakes supplying the Frenchman-Cambridge Irrigation District will be adequate to meet the full dry-year irrigation requirement.

It is estimated that 16,400 acres will be served from the Meeker-Driftwood Canal; 17,000 acres will be served from the Cambridge Canal; 4,900 acres will be served from the Red Willow Canal; and 6,500 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.

1996 Summary

The precipitation at Norton Dam was 34.83 inches, which is 142 percent of normal. The total inflow was 27,022 AF, which was above the wet-year forecast. The reservoir level was approximately 6.0 feet below the top of conservation on December 31, 1995 (2298.32 feet). The level slowly increased to 2299.17 feet on May 23rd. Norton Dam received a record high May-June precipitation total of 16.22 inches, exceeding the two-month average by 8.41 inches. Keith Sebelius Lake began the month of June nearly 4.4 feet below full. Rainfall totaled 3.61 inches at Norton Dam on June 15th with most of the basin receiving two to three inches. The reservoir level rose to elevation 2302.9 feet by June 22nd as a result of this storm (1.4 feet below top of conservation). Norton Dam received another 1.70 inches of rainfall on the 22nd and 1.38 inches on the 24th. Unofficial reports of three to five inches of rain were reported in the basin. The reservoir level reached the top of conservation on June 24th (2304.3 feet) and continued to rise to elevation 2306.18 feet by the end of the month. June precipitation totaled 9.12 inches resulting in the greatest computed inflow for the month since dam construction. This is the first time Keith Sebelius Lake has filled since 1967. The end of the month elevation of 2306.18 feet was a record high exceeding the previous mark of 2304.63 feet set on June 27, 1967. Storage increased 13,100 AF during the month. Irrigation releases began on June 30th, reducing the reservoir level to 2305.22 feet by August 3rd. Above normal precipitation during August, September, and November again increased the level of the reservoir. The annual precipitation total of 34.83 inches was the second highest ever recorded at Norton Dam and the computed annual inflow was the greatest since 1965. On December 31, 1996, the water surface level exceeded the previous recorded high by reaching 2306.19 feet (1.9 feet into the flood pool). The Corps of Engineers determined that Keith Sebelius Lake prevented $1,848,600 in flood damages.

The district delivered 1,719 AF to approximately 4,865 acres of farmland. Two separate hail storms moved through the valley during the season reducing total acreage irrigated. Farm delivery averaged about .35 acre-foot per irrigated acre from the project water supply. Water was being supplied from privately owned irrigation wells to conserve reservoir water storage for future use. The excessive amount of rain during the season also reduced district demands. The city of Norton used 426 AF of municipal water during 1996.

1997 Outlook

The district expects to deliver water to 5,700 acres. Even if 1997 is a dry year without significant run-off producing storms above Keith Sebelius Lake, it is anticipated that the water supply will be adequate.

Requirements for the city of Norton will be met in full in 1997.

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 downstream of the Kansas state line are in the Kansas-Bostwick Irrigation District.

In accordance with the off-season flow alternative outlined in Reclamation's final environmental assessment dated December 16, 1983, releases will be 10 cfs during the months of December, January, and February, except when the reservoir is at low levels. During water-short years releases for these three months will be either zero or 5 cfs depending on reservoir levels. At the request of the state of Nebraska, releases of 30 cfs for a maximum 5-day period may be made to relieve icing conditions in the river.

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

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

<u>1996 Summary</u> - <u>Bostwick Division - Harlan County Lake Operations</u>

The precipitation at Harlan County Dam totaled 32.15 inches of rainfall, which is 142 percent of normal. The inflow of 361,796 AF was above the wet-year forecasts. A 10 cfs release was required during January, February and December in accordance to the environmental assessment and the annual operating plan.

Harlan County Lake began 1996 approximately 4.2 feet below the top of conservation pool at 1941.82 feet and gradually filled to 1945.41 feet on May 22nd. Harlan County Dam recorded 5.18 inches of precipitation during the last nine days of May, 6.30 inches in June, 5.98 inches in July, and 6.15 inches in August. Rainfall totals for the May through August period exceeded the average by 10.82 inches. The computed inflow of nearly 220,000 acre-feet from June through September was the greatest since 1967. The reservoir level peaked at 1949.21 feet on June 29th, and again on August 10th at 1950.57 feet (4.57 feet into the flood pool). A flood release of 1,000 cfs was started on July 30th, and continued until September 20th, when it was increased to 1,500 cfs. The reservoir storage dropped from the flood pool on October 3rd, and the river release was decreased to 1,200 cfs. Releases from the reservoir were staged down to a minimum outflow of 10 cfs by October 26th. In anticipation of maintenance work downstream of Harlan County Dam at Milford Dam, Kansas, and to prepare for the coming winter-spring runoff season, releases were made from Harlan County Dam during the fourth week of November and the last half of December. The yearly precipitation total of 33.79 inches at Harlan County Dam was the fourth greatest recorded since construction. Annual computed inflow to the lake was the second highest since 1967. The level of Harlan County Lake at the end of 1996 was .7 foot below the top of conservation. Harlan County Lake prevented $14,579,000 of downstream flood damages during 1996.

Approximately 33,948 irrigated acres of the Bostwick District in Nebraska and the Kansas-Bostwick District above Lovewell Dam were furnished a full water supply. A total of 38,849 AF (approximately 51 percent of total inflow) was delivered to Lovewell Reservoir through the Courtland Canal.

<u>1996 Summary</u> - <u>Bostwick Division - Nebraska</u>

The Bostwick Irrigation District in Nebraska diverted 46,764 AF for the irrigation of 22,787 acres. Farm delivery efficiency averaged 30 percent in the district.

<u>1996 Summary</u> - <u>Bostwick Division - Kansas</u>

The 1996 precipitation at Lovewell Dam totaled 26.66 inches, which was 95 percent of normal. Lovewell Reservoir began 1996 with a water surface elevation approximately 1.5 feet below the top of conservation. The conservation pool filled on May 1st (elevation 1582.60 feet). Natural flow was diverted from the Republican River into Lovewell Reservoir during May. This inflow allowed the reservoir level to increase three feet into the flood pool. The additional storage was to be utilized in alleviating any irrigation shortages in the Bostwick Division. The reservoir level peaked at 1585.58 feet on June 3rd. Canal releases from Lovewell Dam began on May 29th, and continued throughout the irrigation season dropping the reservoir from the flood pool on June 28th. Lovewell Reservoir began the month of November approximately 1.2 feet below the top of active conservation. A late fall storm system moved through northcentral Kansas and southcentral Nebraska during the evening of November 15th and most of the following day. Lovewell Dam recorded 5.41 inches of rainfall during this period causing the lake level to increase 4.7 feet by the 19th. A release of 250 cfs was started on the 18th and was increased to 500 cfs early on the 19th. The reservoir level peaked at 1586.10 feet (3.5 feet into the flood pool) before reservoir outflow exceeded the inflow. A peak average daily computed inflow of about 4,200 cfs was recorded from November 16th through the 17th. November precipitation was 2.62 inches greater than previously recorded for the month, and the resulting inflow was the greatest November total recorded at the site. The 500 cfs flood release was staged down from December 5th through 6th. The water surface level at Lovewell Reservoir was just .2 foot below the top of active conservation on December 31, 1996. The Corps of Engineers estimated the reservoir reduced local and downstream damages by $1,223,400. Off-season diversion of natural flow from the Republican River into Lovewell Reservoir through Courtland Canal was not required in 1996.

The Kansas-Bostwick Irrigation District diverted a total of 71,942 AF to serve approximately 11,200 acres above Lovewell Dam and about 24,300 acres below Lovewell Dam. Farm delivery efficiency averaged 57 percent in the district.

<u>1997 Outlook</u> - <u>Bostwick Division</u>

The Bostwick Irrigation District in Nebraska and the Kansas-Bostwick Irrigation District No. 2 expect to deliver water to 22,500 and 39,000 acres, respectively. The storage in Harlan County Lake and Lovewell Reservoir and flows of the Republican River and White Rock Creek may be inadequate to meet the full dry-year irrigation requirement for the Bostwick lands. An operation plan will not be required in 1997 because both reservoirs are expected to be full prior to the irrigation season. If a shortage should develop due to extremely dry conditions, an interim operation plan may become necessary.

Up to two feet of flood pool storage will be utilized at Lovewell Reservoir prior to the irrigation season. This additional storage will help alleviate any irrigation shortages in the Bostwick Division. Natural flow in the Republican River will be diverted into Lovewell Reservoir via Courtland Canal as necessary, filling the reservoir to target levels.

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.

1996 Summary

The precipitation total of 29.70 inches at Kirwin Dam was 126 percent of normal. The inflow of 57,722 AF was between the normal- and wet-year forecasts. Kirwin Reservoir was nearly one foot above the top of conservation pool at the first of the year. A release of 40 to 50 cfs began on January 5th, and continued through February 27th, offsetting inflows and maintaining the reservoir level. The reservoir level gradually increased from February 27th through May 10th to an elevation of 1731.38 feet (2.1 feet into the flood pool). A river release resumed on May 7th and continued through the 20th to maintain the reservoir level. Canal releases ran from May 20th through August 30th. Abundant rainfall (6.47 inches in July) during the irrigation season reduced reservoir demands and resulted in a reservoir level about .5 foot above active conservation pool at season's end. A river release of 36 cfs was started on August 30th and continued through the end of the year to offset inflows and maintain the reservoir level. Kirwin Dam received a record 3.87 inches of rainfall and a corresponding record inflow during the month of November. The reservoir level was 1730.49 feet (1.2 feet into the flood pool) at the end of the year. The reservoir prevented $2,264,400 in flood damages as determined by the Corps of Engineers.

Demands for project water were met in full during the irrigation season. A total of 9,246 acres received project water during 1996 with 9,134 AF delivered to farms. Farm delivery efficiency was 39 percent.

1997 Outlook

The district estimates that 10,000 acres may be irrigated in 1997. Even with below normal precipitation and dry-year forecasted inflows from the North Fork of the Solomon River the water supply will be more than adequate to irrigate these lands. Kirwin Reservoir will begin the irrigation season with a full active conservation pool for the fourth year in a row. Releases will be made early in 1997 to regulate flood storage.

Construction of a ramp flume is scheduled for Kirwin Canal prior to the irrigation season.

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.

1996 Summary

In 1996, the precipitation at Webster Dam was 130 percent of normal (30.71 inches). The inflow of 51,239 AF was between the normal- and wet-year forecasts. Webster Reservoir began 1996 with 1.3 feet of flood pool storage occupied (1893.78 feet). A 50 cfs release was started on January 4th, and continued through February 27th, to maintain the reservoir level at approximately 1.4 feet above active conservation. The level then gradually increased to 1894.74 feet by April 5th when a river release of 50 cfs resumed. The flood release continued through May 27th when the district began diverting water into the canal. The reservoir level peaked at elevation 1895.16 feet on June 25th. Timely precipitation (7.79 inches in August) reduced irrigation demands on the reservoir. By the end of the irrigation season the reservoir had been drawn down to 1892.54 feet (.1 foot above active conservation). This reservoir level was maintained through October 22nd by a 30 cfs river release. Webster Dam received 4.50 inches of precipitation from November 15th through 16th increasing the reservoir level by nearly a foot. Precipitation and inflow exceeded the previous records for the month of November at Webster Dam. The level gradually increased to 1894.18 feet by December 4th when a river release of 40 cfs resumed to offset inflows and maintain reservoir storage. On December 31, 1996, the water surface level of Webster Reservoir was 1894.14 feet (1.7 feet above active conservation). The Corps of Engineers determined that the reservoir prevented $4,918,100 in flood damages.

The district diverted 15,499 acre-feet for irrigation of 5,426 acres. Project water demands were met in full.

1997 Outlook

Flood releases will resume early in 1997 to regulate flood storage.

The carry-over storage and the flows in the South Fork of the Solomon River will be more than adequate under dry-year forecasts to irrigate 6,500 acres in the district in 1997. This will be the fourth consecutive year that Webster Reservoir will begin the irrigation season with a full active conservation pool.

Installation of guardrails on the Webster Dam spillway bridge is scheduled to be completed in 1997.

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.

The water service contract with the Glen Elder Irrigation District provides for the use of up to 18,000 AF of storage water each year. Water is released and measured through the river outlet works.

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

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. Renovation of the upstream recreational areas that were damaged during the 1993 and 1995 flooding continues.

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 also provides both wildlife with winter food and cover, and fish with spawning habitat in the spring when these areas are inundated.

1996 Summary

The annual precipitation total of 29.77 inches at Glen Elder Dam was 114 percent of normal. The inflow of 317,161 AF was between the normal- and wet-year forecasts. Waconda Lake began 1996 approximately .1 foot above the top of conservation. A 200 cfs release was being made to drop the reservoir level to elevation 1453.6 feet (2 feet below conservation). The release was increased to 400 cfs on January 23rd and remained near this rate until April 5th when the reservoir level reached two feet below full. Reservoir releases were adjusted to maintain the reservoir level until the end of May, when Glen Elder Dam received 4.07 inches of rainfall within a week. The reservoir elevation of Waconda Lake increased to 1455.34 feet on June 10th. Reservoir discharge was staged up to 750 cfs by June 18th dropping the reservoir level to 1451.86 feet on July 19th. The reservoir level was maintained at nearly four feet below full pool throughout the summer to accommodate the Kansas Department of Wildlife and Parks in the construction of a boat ramp. The reservoir level gradually increased from September 20th through November 15th to 1452.77 feet. Rainfall from the mid-November storm totaled 6.14 inches at Glen Elder Dam. The recorded rainfall was more than double the previous maximum recorded for the month at this site. Waconda Lake level rose over six feet from the resultant inflow. The peak average daily computed inflow was nearly 16,700 cfs from November 16th through 17th. A 500 cfs release began on November 21st and was increased to 1,000 cfs on the 25th. The reservoir elevation peaked at 1458.92 feet on November 23rd, approximately 3.3 feet into the flood pool. Waconda Lake dropped from the flood pool on December 26th. The release to the river was gradually decreased to 300 cfs by December 30th with a reservoir level of 1455.42 feet (.18 foot below top of conservation) on December 31, 1996. The Corps of Engineers determined that the reservoir reduced local and downstream damages by $51,981,100.

No storage releases were made for the City of Beloit, however, 1,272 AF was bypassed for quality control as directed by the State Water Commissioner. Storage releases were not required for irrigation during the season because releases made in maintaining the reservoir level at four feet below full were more than sufficient in meeting demands. Controlled releases totaled 276,012 AF during 1996. Releases of 745 AF were made to the Mitchell County Rural Water District No. 2.

Four of the twelve spillway radial gates were sandblasted and painted in 1996.

1997 Outlook

The municipal requirement of Beloit and the requirements of the Mitchell County Rural Water District No. 2 will be met in full with releases as required from Waconda Lake. It is expected that the Kansas Water Commissioner will request that inflows be passed through the lake for water right administration. The Glen Elder Irrigation District estimates that 5,400 acres will be irrigated in 1997. The storage in Waconda Lake and flows in the North and South Forks of the Solomon River will furnish an adequate water supply to the district. River releases will continue during the first couple months of 1997 to maintain the reservoir level. After ice out, the release will be increased to reduce the level of Waconda Lake to 1453.60 feet (two feet below top of conservation). Maintaining the reservoir level at this elevation will provide storage space for spring runoff. The active conservation pool will be allowed to fill prior to the irrigation season. To minimize ice damage, the reservoir will be regulated to maintain a constant level during the late winter months when the reservoir is ice-covered. Under normal-year conditions, the lake is expected to be maintained at about three feet below the top of the conservation pool for next winter.

The remaining eight spillway radial gates are scheduled to be sandblasted and painted in 1997.

Cedar Bluff Unit, Smoky Hill Division in Kansas

General

Cedar Bluff storage furnishes a maximum of 2,000 AF each year for the city of Russell, Kansas when required. Prior to 1993, Cedar Bluff Reservoir storage and Smoky Hill River flows had provided a water supply for 6,800 acres in the Cedar Bluff Irrigation District. No water had been available for delivery to the district since 1978. Reformulation of the Cedar Bluff Unit in October of 1992 allowed the Cedar Bluff Irrigation District to begin the proceedings to disband, and the Kansas Water Office and Kansas Department of Wildlife and Parks to acquire the use and control of portions of the reservoir conservation capacity. The district completed all activities necessary to accomplish disbandment in 1994. A "designated operating pool" has been established for Cedar Bluff Reservoir and includes the following suballocation pools: The City of Russell's existing water storage right which remained unchanged; an artificial recharge pool under control of the Kansas Water Office; and a fish, wildlife and recreation pool under control of the Kansas Department of Wildlife and Parks. The "designated operating pool" consists of water stored between the dead pool and elevation 2109.05 feet. A "joint-use pool" has been established between the operating pool and the flood control pool for water supply, flood control, environmental and fish, wildlife and recreation purposes. Water rights for the "joint-use pool" will be held jointly between the Kansas Department of Wildlife and Parks and the Kansas Water Office. A decision on how the rights will be maintained by the state will be made after consultation between the agencies.

1996 Summary

The precipitation at Cedar Bluff Dam was 26.01 inches which is 125 percent of normal. The inflow (80,871 AF) was above the wet-year forecast. At the beginning of the year, the level of Cedar Bluff Reservoir was 2126.78 feet (17.2 feet below the top of active conservation). Inflow to the reservoir equaled outflow from the reservoir through May 24th (Elev. 2126.77 feet). Cedar Bluff Dam received 4.19 inches of precipitation from May 24th through the 27th, and above normal precipitation during June, July, and August. Unofficial reports of up to eight inches of rainfall in the basin above Cedar Bluff Dam on June 24th and 25th increased the reservoir level 1.11 feet in one day. The peak average daily computed inflow was nearly 2,500 cfs. The reservoir level increased throughout the summer with a 3.14 feet increase in June, .92 foot in July, 3.64 feet in August, and 2.70 feet in September. The annual computed inflow was the greatest recorded since 1961 at Cedar Bluff Reservoir. Storage in Cedar Bluff Reservoir increased 62,620 AF in 1996 and ended the year with the greatest storage since 1966. On December 31st the reservoir level was 4.75 feet below the top of active conservation. Cedar Bluff Reservoir was estimated to have prevented $7,276,200 in flood damages in 1996 by the Corps of Engineers.

The State of Kansas used the fish hatchery facility for Canadian geese with approximately 6 AF released to the facility. No releases were made for the city of Russell.

1997 Outlook

The reservoir content of 154,300 AF on December 31, 1996 is in the joint use pool, with 116,310 AF of storage above the designated operating pool. The Kansas Department of Wildlife and Parks estimates up to 400 acre-feet of water may be used in the operations of the fish hatchery facility. The Kansas Water Office is expected to request a minimal release to the river for recharge in 1997.

TABLE 2
SUMMARY OF 1996 OPERATIONS
MIRAGE FLATS PROJECT

Month	BOX BUTTE RESERVOIR Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	Month Content (AF)	MIRAGE FLATS CANAL Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	1,348	61	88	0.63	13,807	0	0
Feb.	1,744	51	116	0.00	15,384	0	0
Mar.	2,031	61	218	0.45	17,136	0	0
Apr.	2,201	63	375	1.45	18,899	0	0
May	1,470	76	289	4.64	20,004	0	0
June	816	79	573	2.45	20,168	0	0
July	618	7,182	585	2.66	13,019	7,122	3,526
Aug.	680	4,647	404	5.81	8,648	5,726	2,949
Sep.	1,290	361	278	2.06	9,299	467	166
Oct.	1,573	56	218	1.65	10,598	0	0
Nov.	1,662	60	128	0.36	12,072	0	0
Dec.	1,410	59	78	0.54	13,345	0	0
TOTAL	16,843	12,756	3,350	22.70	--	13,315	6,641

NOTE -- Acres irrigated 1996: Mirage Flats Canal - 10,426 acres.

SANDHILLS DIVISION
AINSWORTH UNIT

Month	MERRITT RESERVOIR Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	AINSWORTH CANAL Release To Canal (AF)	Delivered To Farms (AF)
Jan.	14,573	14,876	240	0.86	68,288	0	0
Feb.	16,219	15,372	304	0.21	68,831	0	0
Mar.	15,181	14,757	424	0.45	68,831	0	0
Apr.	16,271	9,890	726	1.41	74,486	0	0
May	18,246	16,429	638	6.52	75,665	1,216	0
June	17,079	17,782	1,336	2.75	73,626	4,510	622
July	15,025	36,498	1,147	3.44	51,006	33,795	24,542
Aug.	15,835	28,344	843	1.61	37,654	26,137	19,857
Sep.	17,479	7,636	487	4.24	47,010	5,681	3,829
Oct.	15,250	2,690	655	0.63	58,915	0	0
Nov.	16,207	5,296	437	0.79	69,389	0	0
Dec.	15,501	15,180	321	0.11	69,389	0	0
TOTAL	192,866	184,750	7,558	23.02	--	71,339	48,850

NOTE -- Acres irrigated 1996: Ainsworth Canal - 34,463 acres.

MIDDLE LOUP DIVISION

Month	SARGENT UNIT SARGENT CANAL Diversions To Canal (AF)	Delivered To Farms (AF)	MIDDLE LOUP UNIT MIDDLE LOUP PUBLIC POWER CANALS Diversions To Canals (AF)	Diversions To Sherman Feeder Canal (AF)
Jan.	0	0	0	0
Feb.	0	0	0	0
Mar.	0	0	0	0
Apr.	0	0	0	4,512
May	0	0	2,642	22,328
June	1,991	253	5,970	17,988
July	11,770	8,085	13,367	16,663
Aug.	4,582	2,324	6,900	18,630
Sep.	2,811	1,534	4,723	16,667
Oct.	0	0	0	0
Nov.	0	0	0	0
Dec.	0	0	0	0
TOTAL	21,154	12,196	33,602	96,788

FARWELL UNIT

Month	SHERMAN RESERVOIR Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	FARWELL CANALS Release To Canals (AF)	Delivered To Farms (AF)
Jan.	617	1,309	255	0.89	50,584	0	0
Feb.	902	1,291	315	0.00	49,880	0	0
Mar.	709	1,309	549	0.33	48,731	0	0
Apr.	3,813	1,303	894	1.64	50,347	0	0
May	20,819	1,533	557	5.70	69,076	168	0
June	15,008	13,690	1,029	3.12	69,365	11,980	62
July	15,990	30,569	1,088	3.55	53,698	29,251	18,743
Aug.	17,414	17,357	789	5.81	52,966	16,362	9,655
Sep.	14,430	10,897	578	1.66	55,921	10,138	8,306
Oct.	0	1,083	897	0.02	53,941	0	0
Nov.	988	1,303	416	2.89	53,210	0	0
Dec.	578	1,309	238	0.11	52,241	0	0
TOTAL	91,268	82,953	7,605	25.72	--	67,899	36,766

NOTE--Acres irrigated 1996: Sargent Canal 13,922 acres; Middle Loup P.P. Canals - 14,290 acres; Farwell Canals - 49,600 acres.

NORTH LOUP DIVISION

Month	CALAMUS RESERVOIR Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release to Calamus Fish Hatch. (AF)	ABOVE DAVIS CREEK MIRDAN CANAL Release to Cana (AF)	Canal Use (AF)	Delivered To Farms (AF)
Jan.	16,896	17,230	448	0.81	107,784	427	0	0	0
Feb.	21,470	21,281	556	0.05	107,417	458	0	0	0
Mar.	19,924	8,422	1,014	0.28	117,905	384	0	0	0
Apr.	20,954	9,203	1,743	1.74	127,913	291	0	0	0
May	37,713	35,244	1,232	7.61	129,150	206	15,725	2,188	8
June	30,585	29,290	1,863	0.81	128,582	433	12,171	2,033	140
July	25,269	47,829	1,778	2.49	104,244	363	27,297	14,814	10,176
Aug	24,397	35,534	1,928	5.30	91,179	337	14,803	5,057	1,962
Sep.	26,572	33,953	1,512	5.52	82,286	310	9,646	4,246	2,387
Oct.	19,086	5,853	1,141	0.44	94,378	324	0	0	0
Nov.	21,685	3,552	686	0.59	111,825	202	0	0	0
Dec.	26,186	22,245	424	0.13	115,342	207	0	0	0
TOTAL	290,737	269,636	14,325	25.77	--	3,942	79,642	28,338	14,673

NOTE -- Acres irrigated 1996: Mirdan Canal 27,897 acres.

NORTH LOUP DIVISION (Continued)

Month	DAVIS CREEK RESERVOIR Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Mo. Content (AF)	BELOW DAVIS CREEK FULLERTON CANAL Release To Canal (AF)	Delivered To Farms (AF)
Jan.	55	591	76	0.86	17,673	0	0
Feb.	6	403	93	0.10	17,183	0	0
Mar.	38	438	160	0.63	16,623	0	0
Apr.	1,749	1,073	259	1.68	17,040	0	0
May	14,620	3,802	313	5.17	27,545	2,101	4
June	6,874	2,775	498	3.32	31,146	1,870	0
July	10,338	13,043	463	2.99	27,978	11,488	9,227
Aug.	7,777	5,859	317	5.13	29,579	4,897	2,552
Sep.	4,769	4,330	296	2.74	29,722	2,577	1,446
Oct.	9	1,232	308	0.10	28,191	0	0
Nov.	255	958	163	2.90	27,325	0	0
Dec.	16	938	92	0.20	26,311	0	0
TOTAL	46,506	35,442	3,038	25.82	--	22,933	13,229

NOTE - Acres irrigated 1996: Fullerton Canal 18,907 acres.

TABLE 2
SUMMARY OF 1996 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.	1,421	492	170	0.40	37,219	0
Feb.	1,290	460	202	0.05	37,847	0
Mar.	1,267	492	311	0.07	38,311	0
Apr.	1,330	476	720	1.05	38,445	0
May	2,120	492	582	5.59	39,491	0
June	869	476	1,067	1.12	38,817	0
July	421	665	1,012	3.88	37,561	175
Aug.	597	838	898	5.09	36,422	346
Sep.	1,510	664	637	3.10	36,631	185
Oct.	717	492	624	0.04	36,232	0
Nov.	1,036	476	351	0.03	36,441	0
Dec.	1,155	492	212	0.05	36,892	0
TOTAL	13,733	6,515	6,786	20.47	--	706

TABLE 2
SUMMARY OF 1996 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.	1,552	61	83	0.29	24,742	0	0	0	0
Feb.	1,310	58	98	0.00	25,896	0	0	0	0
Mar.	1,513	61	178	0.61	27,170	0	0	0	0
Apr.	1,621	60	472	1.65	28,259	2,392	155	0	0
May	2,179	61	377	6.33	30,000	2,627	478	0	0
June	1,794	153	674	2.39	30,967	970	496	1,736	0
July	1,703	7,704	558	4.12	24,408	2,096	1,576	6,084	2,542
Aug.	1,727	4,005	498	6.47	21,632	2,094	1,678	4,196	2,158
Sep.	1,822	60	360	2.27	23,034	0	0	0	0
Oct.	1,867	61	287	0.56	24,553	0	0	0	0
Nov.	1,504	60	197	0.17	25,800	0	0	0	0
Dec.	1,477	61	111	0.12	27,105	0	0	0	0
TOTAL	20,069	12,405	3,893	24.98	--	10,179	4,383	12,016	4,700

NOTE: Acres irrigated 1996: Culbertson Canal 8,697 acres; Culbertson Extension Canal - 10,898 acres.

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.	4,155	61	299	0.27	85,033	0	0	0	0
Feb.	5,558	58	355	0.00	90,178	0	0	0	0
Mar.	6,371	61	643	0.35	95,845	0	0	0	0
Apr.	6,325	60	1,801	1.24	100,309	0	0	0	0
May	8,838	61	1,490	6.14	107,596	0	0	0	0
June	8,554	2,289	2,383	3.96	111,478	1,951	0	680	8
July	4,190	20,777	2,256	2.91	92,635	12,876	6,633	3,173	2,394
Aug.	4,760	12,704	1,755	6.12	82,936	10,648	6,643	2,146	1,562
Sep.	8,408	1,831	1,068	6.23	88,445	1,523	1,086	251	155
Oct.	3,918	61	1,075	0.29	91,227	0	0	0	0
Nov.	5,017	60	743	0.30	95,441	0	0	0	0
Dec.	4,281	61	410	0.16	99,251	0	0	0	0
TOTAL	70,375	38,084	14,278	27.97	--	26,998	14,362	6,250	4,119

NOTE: Acres irrigated 1996: Meeker-Driftwood Canal - 16,533 acres; Bartley Canal - 6,467 acres.

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.	651	246	93	0.22	31,777	0	0
Feb.	1,035	230	117	0.00	32,465	0	0
Mar.	1,275	246	204	0.60	33,290	0	0
Apr.	1,387	238	572	1.07	33,867	0	0
May	2,355	246	550	4.89	35,426	0	0
June	2,969	639	773	3.39	36,983	467	24
July	1,287	3,733	731	2.11	33,806	2,716	2,099
Aug.	2,306	2,580	611	4.17	32,921	1,714	1,145
Sep.	2,731	670	397	5.12	34,585	320	257
Oct.	828	246	444	0.37	34,723	0	0
Nov.	1,121	238	259	0.53	35,347	0	0
Dec.	914	246	132	0.03	35,883	0	0
TOTAL	18,859	9,558	4,883	22.50	--	5,217	3,525

NOTE -- Acres irrigated 1996: Red Willow Canal - 4,867 acres.

FRENCHMAN-CAMBRIDGE DIVISION (Continued)
CAMBRIDGE UNIT

	HARRY STRUNK LAKE					CAMBRIDGE CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	2,725	61	83	0.43	24,194	0	0
Feb.	2,787	58	104	0.00	26,819	0	0
Mar.	3,146	61	200	0.84	29,704	0	0
Apr.	3,509	60	704	0.65	32,449	0	0
May	4,376	61	596	4.91	36,168	0	0
June	5,486	889	966	5.55	39,799	2,002	9
July	5,221	5,167	968	4.86	38,885	7,166	3,086
Aug.	3,076	3,273	777	2.89	37,911	4,657	2,228
Sep.	4,486	5,816	618	4.17	35,963	717	254
Oct.	3,123	3,511	545	0.05	35,030	0	0
Nov.	3,313	2,791	286	0.93	35,266	0	0
Dec.	2,948	3,308	147	0.02	34,759	0	0
TOTAL	44,196	25,056	5,994	25.30	--	14,542	5,577

NOTE -- Acres irrigated 1996: Cambridge Canal - 17,317 acres.

TABLE 2
SUMMARY OF 1996 OPERATIONS

KANASKA DIVISION
ALMENA UNIT

	KEITH SEBELIUS LAKE						ALMENA CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release To City Of Norton (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	489	26	111	0.59	24,865	26	0	0
Feb.	361	26	134	0.02	25,066	26	0	0
Mar.	566	27	238	0.66	25,367	27	0	0
Apr.	1,015	43	738	1.47	25,601	43	0	0
May	2,174	41	637	7.10	27,097	41	525	0
June	14,036	41	888	9.12	40,204	41	728	0
July	2,058	3,142	1,164	4.50	37,956	42	2,706	1,416
Aug.	2,714	801	994	4.43	38,875	51	890	303
Sep.	1,773	42	810	4.46	39,796	42	11	0
Oct.	537	39	729	0.44	39,565	39	0	0
Nov.	762	26	385	1.96	39,916	26	0	0
Dec.	537	23	202	0.08	40,228	22	0	0
TOTAL	27,022	4,277	7,030	34.83	--	426	4,860	1,719

NOTE: Acres irrigated 1996: Almena Canal - 4,865 acres.

BOSTWICK DIVISION
FRANKLIN UNIT

	HARLAN COUNTY LAKE — Data from Corps of Engineers					FRANKLIN CANAL		NAPONEE CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release To Canal (AF)	Delivered To Farms (AF)	Release To Canal (AF)	Delivered To Farms (AF)
Jan.	8,450	0	688	0.37	271,342	0	0	0	0
Feb.	9,749	0	518	0.00	280,573	0	0	0	0
Mar.	11,405	0	516	0.53	291,462	0	0	0	0
Apr.	12,655	0	3,620	0.95	300,497	0	0	0	0
May	24,615	0	3,644	4.63	321,468	0	0	0	0
June	57,828	14,292	5,687	6.30	359,317	2,216	52	0	0
July	44,767	42,417	6,256	5.98	355,411	12,142	2,279	811	234
Aug.	75,233	70,269	5,978	6.15	354,397	10,546	3,118	651	290
Sep.	41,336	71,046	4,742	3.83	319,945	2,536	621	0	0
Oct.	29,474	51,585	4,552	1.06	293,282	0	0	0	0
Nov.	25,686	16,568	1,948	2.35	300,452	0	0	0	0
Dec.	20,598	13,586	1,230	0.00	306,234	0	0	0	0
TOTAL	361,796	279,763	39,379	32.15	--	27,440	6,070	1,462	524

NOTE: Acres irrigated 1996: Franklin Canal - 11,196 acres; Naponee Canal - 1,618 acres.

BOSTWICK DIVISION (Continued)
SUPERIOR-COURTLAND UNIT

	FRANKLIN PUMP CANAL		SUPERIOR CANAL			COURTLAND CANAL - ABOVE LOVEWELL — NEBRASKA USE		KANSAS USE	
Month	Diverted To Canal (AF)	Delivered To Farms (AF)	Diverted To Canal (AF)	Delivered To Farms (AF)	Total Diversion (AF)	Total (AF)	Delivered To Farms (AF)	Diversion To Canal (AF)	Delivered To Farms (AF)
Jan.	0	0	0	0	0	0	0	0	0
Feb.	0	0	0	0	0	0	0	0	0
Mar.	0	0	0	0	0	0	0	0	0
Apr.	0	0	0	0	1,248	0	0	0	0
May	0	0	0	0	6,901	0	0	0	0
June	0	0	2,973	828	11,540	252	201	7,976	3,331
July	912	514	6,207	2,445	26,531	591	480	9,385	5,870
Aug.	1,064	585	4,761	1,676	22,966	561	435	7,288	4,517
Sep.	248	111	293	14	3,763	0	0	347	214
Oct.	0	0	0	0	0	0	0	0	0
Nov.	0	0	0	0	0	0	0	0	0
Dec.	0	0	0	0	0	0	0	0	0
TOTAL	2,224	1,210	14,234	4,963	72,949	1,404	1,116	24,996	13,932

NOTE: Acres irrigated 1996: Franklin Pump Canal - 2,106 acres; Superior Canal - 5,800 acres.
Courtland Canal-Nebraska use - 2,067 acres.
Courtland Canal-Kansas use - 11,161 acres.

BOSTWICK DIVISION (Continued)
COURTLAND UNIT

	LOVEWELL RESERVOIR							COURTLAND (Below)	
Month	Est. Flow from White Rock Creek (AF)	Inflow from Courtland 34.8 (AF)	Total Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release To Canal (AF)	Delivered To Farms (AF)
Jan.	1,192	0	1,192	6	156	0.42	38,350	0	0
Feb.	1,186	0	1,186	12	204	0.00	39,320	0	0
Mar.	1,421	0	1,421	12	369	0.67	40,360	0	0
Apr.	1,994	105	2,099	18	841	2.40	41,600	0	0
May	5,616	4,875	10,491	425	736	5.19	50,930	424	0
June	889	2,207	3,096	12,742	1,214	0.61	40,070	13,049	7,793
July	3,784	14,724	18,508	17,850	1,208	5.14	39,520	17,219	10,725
Aug.	881	13,192	14,073	15,811	572	2.35	37,210	14,737	8,252
Sep.	574	3,746	4,320	1,740	590	3.18	39,200	1,517	547
Oct.	0	0	0	12	868	0.77	38,320	0	0
Nov.	17,349	0	17,349	11,281	448	5.89	43,940	0	0
Dec.	2,126	0	2,126	4,640	216	0.04	41,210	0	0
TOTAL	37,012	38,849	75,861	64,549	7,422	26.66	--	46,946	27,317

NOTE: Acres irrigated 1996: Courtland Canal below Lovewell - 24,270 acres.

TABLE 2
SUMMARY OF 1996 OPERATIONS

SOLOMON DIVISION
KIRWIN UNIT

Month	KIRWIN RESERVOIR Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	KIRWIN CANAL Release To Canal (AF)	Delivered To Farms (AF)
Jan.	2,640	2,571	329	0.56	104,070	0	0
Feb.	2,900	2,323	427	0.02	104,220	0	0
Mar.	3,328	0	738	0.55	106,810	0	0
Apr.	4,703	0	1,913	2.03	109,600	0	0
May	5,419	2,608	1,731	3.59	110,680	710	0
June	6,648	5,568	2,650	3.78	109,110	5,578	430
July	7,462	9,689	2,763	6.47	104,120	9,683	4,677
Aug.	8,252	8,001	1,861	3.84	102,510	7,740	4,027
Sep.	5,169	2,142	1,527	3.93	104,010	0	0
Oct.	2,921	2,261	1,390	0.97	103,280	0	0
Nov.	5,285	2,202	833	3.87	105,530	0	0
Dec.	2,995	2,253	422	0.09	105,850	0	0
TOTAL	57,722	39,618	16,584	29.70	--	23,711	9,134

NOTE: Acres irrigated 1996: Kirwin Canal - 9,246 acres.

SOLOMON DIVISION (Continued)
WEBSTER UNIT

Month	WEBSTER RESERVOIR Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	OSBORNE CANAL Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	2,721	2,648	267	0.70	82,288	0	0
Feb.	3,239	2,567	322	0.05	82,638	0	0
Mar.	3,755	0	583	0.65	85,810	0	0
Apr.	4,548	2,642	1,586	1.68	86,130	0	0
May	5,733	3,386	1,417	3.64	87,060	38	0
June	5,870	3,834	2,075	4.03	87,021	3,124	237
July	4,516	8,892	2,149	4.03	80,496	6,950	2,996
Aug.	6,710	6,847	1,545	7.79	78,814	5,387	2,550
Sep.	2,526	1,876	1,219	3.03	78,245	0	0
Oct.	2,068	1,363	1,085	0.39	77,865	0	0
Nov.	6,351	0	631	4.65	83,585	0	0
Dec.	3,202	2,541	346	0.07	83,900	0	0
TOTAL	51,239	36,596	13,225	30.71	--	15,499	5,783

NOTE: Acres irrigated 1996: Osborne Canal - 5,426 acres.

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)	Irrigation District (AF)	Other Controlled Releases (AF)	Release To Mitchell Co. RWD No. 2 (AF)
Jan.	16,782	22,961	730	0.50	235,430	0	0	0	22,898	63
Feb.	17,735	23,068	911	0.00	229,186	0	0	0	23,006	62
Mar.	14,846	23,526	1,652	0.79	218,854	0	0	0	23,464	62
Apr.	16,030	12,228	5,558	1.67	217,098	0	0	0	12,161	67
May	29,819	15,241	4,918	4.74	226,758	0	0	0	15,179	62
June	29,354	29,032	6,588	1.72	220,492	0	0	0	28,967	65
July	20,779	33,923	6,957	5.41	200,391	0	0	0	33,850	73
Aug.	25,677	26,162	4,342	3.82	195,564	0	0	0	26,087	75
Sep.	22,662	14,300	3,986	3.76	199,940	0	0	0	14,248	52
Oct.	13,906	6,070	3,668	0.64	204,108	0	648	0	5,370	52
Nov.	91,398	13,954	1,972	6.72	279,580	0	624	0	13,277	53
Dec.	18,173	57,564	990	0.00	239,199	0	0	0	57,505	59
TOTAL	317,161	278,029	42,272	29.77	--	0	1,272	0	276,012	745

SMOKY HILL DIVISION
ELLIS UNIT
CEDAR BLUFF RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release To Fish Hatchery (AF)
Jan.	481	0	321	0.42	91,840	0
Feb.	442	0	362	0.08	91,920	0
Mar.	818	0	648	0.84	92,090	0
Apr.	1,546	4	2,282	0.76	91,350	4
May	3,608	1	1,757	6.24	93,200	1
June	16,192	0	2,362	4.85	107,030	0
July	7,287	0	2,747	3.61	111,570	0
Aug.	22,223	1	2,362	3.98	131,430	1
Sep.	17,428	0	1,878	1.49	146,980	0
Oct.	3,329	0	1,909	1.00	148,400	0
Nov.	5,642	0	1,032	2.74	153,010	0
Dec.	1,875	0	585	0.00	154,300	0
TOTAL	80,871	6	18,245	26.01	--	6

No releases were made for the City of Russell, Kansas.

TABLE 3

ACRES IRRIGATED IN 1996 AND ESTIMATES FOR 1997

Irrigation District and Canal	Acres With Service Available	Acres Irrigated in 1996	Estimated Acres to be Irrigated in 1997
Mirage Flats Irrigation District			
Mirage Flats Canal	11,662	10,426	11,000
Ainsworth Irrigation District			
Ainsworth Canal	34,539	34,463	34,500
Sargent Irrigation District			
Sargent Canal	13,922	13,922 *	13,900
Farwell Irrigation District			
Farwell Canal	50,051	49,600	49,500
Twin Loups Irrigation District			
Above Davis Creek	31,817	27,897	30,100
Below Davis Creek	21,183	18,907	19,000
Total Twin Loups Irrigation District	53,000	46,804	49,100
Frenchman Valley Irrigation District			
Culbertson Canal	9,600	8,697	8,750
H & RW Irrigation District			
Culbertson Extension Canal	11,490	10,898	11,000
Frenchman-Cambridge Irrigation District			
Meeker-Driftwood Canal	16,476	16,533	16,400
Red Willow Canal	4,932	4,867	4,900
Bartley Canal	6,539	6,467	6,500
Cambridge Canal	17,053	17,317	17,000
Total Frenchman-Cambridge Irrigation District	45,000	45,184	44,800
Almena Irrigation District			
Almena Canal	5,763	4,865	5,700
Bostwick Irrigation District in Nebraska			
Franklin Canal	11,116	11,196	11,100
Naponee Canal	1,737	1,618	1,700
Franklin Pump Canal	2,091	2,106	2,000
Superior Canal	5,863	5,800	5,800
Courtland Canal (Nebraska)	1,980	2,067	1,900
Total Bostwick Irrigation Dist. in Nebraska	22,787	22,787	22,500
Kansas-Bostwick Irrigation District			
Courtland Canal above Lovewell	13,550	11,161	12,200
Courtland Canal below Lovewell	28,338	24,270	26,800
Total Kansas-Bostwick Irrigation District	41,888	35,431	39,000
Kirwin Irrigation District			
Kirwin Canal	11,435	9,246	10,000
Webster Irrigation District			
Osborne Canal	8,500	5,426	6,500
Glen Elder Irrigation District	6,000	5,400 *	5,400
TOTAL PROJECT USES	325,637	303,149	311,650
Non-Project Uses			
Middle Loup Public Power & Irrig. Dist. Canals	15,000	14,290	14,260
Hale Ditch	700	700	700
TOTAL NON-PROJECT USES	15,700	14,990	14,960
TOTAL PROJECT AND NON-PROJECT	341,337	318,139	326,610

*Acres not recorded in 1996 - estimated by irrigation districts.

BOX BUTTE RESERVOIR OPERATION ESTIMATES - 1997

	INFLOW		EVAPORATION		RELEASE REQUIREMENT		RESERVOIR SPILL	REQUIREMENT SHORTAGE	END OF MONTH		RESERVOIR CHANGE
	MEAN	1000		1000	MEAN	1000	1000	1000	ELEV	CONT 1000	1000
MONTH	CFS	AF	INCHES	AF	CFS	AF	AF	AF	FT	AF	AF
					REASONABLE MINIMUM INFLOW CONDITIONS						
JAN	18.	1.1	1.06	.1	2.	.1	.0	.0	3994.1	14.2	.9
FEB	25.	1.4	1.32	.1	2.	.1	.0	.0	3995.3	15.4	1.2
MAR	33.	2.0	2.33	.2	2.	.1	.0	.0	3996.8	17.1	1.7
APR	25.	1.5	3.79	.4	2.	.1	.0	.0	3997.6	18.1	1.0
MAY	11.	.7	5.79	.6	2.	.1	.0	.0	3997.6	18.1	.0
JUN	0.	.0	7.12	.6	173.	10.3	.0	.0	3986.0	7.2	-10.9
JUL	0.	.0	7.68	.4	226.	13.9	.0	9.9	3978.0	2.8	-4.4
AUG	10.	.6	6.67	.2	226.	13.9	.0	13.5	3978.0	2.8	.0
SEP	8.	.5	5.80	.2	64.	3.8	.0	3.5	3978.0	2.8	.0
OCT	11.	.7	3.08	.1	2.	.1	.0	.0	3979.1	3.3	.5
NOV	22.	1.3	1.67	.1	2.	.1	.0	.0	3981.3	4.4	1.1
DEC	21.	1.3	.97	.0	2.	.1	.0	.0	3983.5	5.6	1.2
TOTAL		11.1	47.28	3.0		42.7	.0	26.9			-7.7
					MOST PROBABLE INFLOW CONDITIONS						
JAN	24.	1.5	1.06	.1	2.	.1	.0	.0	3994.5	14.6	1.3
FEB	32.	1.8	1.32	.1	2.	.1	.0	.0	3996.0	16.2	1.6
MAR	44.	2.7	2.33	.2	2.	.1	.0	.0	3998.1	18.6	2.4
APR	37.	2.2	3.79	.4	2.	.1	.0	.0	3999.4	20.3	1.7
MAY	29.	1.8	4.63	.5	2.	.1	.0	.0	4000.4	21.5	1.2
JUN	5.	.3	5.69	.6	34.	2.0	.0	.0	3998.6	19.2	-2.3
JUL	2.	.1	6.40	.5	221.	13.6	.0	.0	3982.8	5.2	-14.0
AUG	21.	1.3	5.75	.2	216.	13.3	.0	9.8	3978.0	2.8	-2.4
SEP	24.	1.4	4.17	.1	35.	2.1	.0	.8	3978.0	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	40.86	3.0		31.8	.0	10.6			-5.9
					REASONABLE MAXIMUM INFLOW CONDITIONS						
JAN	33.	2.0	1.06	.1	2.	.1	.0	.0	3995.0	15.1	1.8
FEB	43.	2.4	1.32	.1	2.	.1	.0	.0	3997.0	17.3	2.2
MAR	55.	3.4	2.33	.2	2.	.1	.0	.0	3999.5	20.4	3.1
APR	50.	3.0	3.79	.4	2.	.1	.0	.0	4001.4	22.9	2.5
MAY	44.	2.7	3.02	.3	2.	.1	.0	.0	4003.1	25.2	2.3
JUN	101.	6.0	4.19	.5	18.	1.1	.0	.0	4006.0	29.6	4.4
JUL	54.	3.3	4.94	.6	185.	11.4	.0	.0	3999.9	20.9	-8.7
AUG	36.	2.2	4.37	.4	177.	10.9	.0	.0	3991.7	11.8	-9.1
SEP	32.	1.9	2.67	.2	20.	1.2	.0	.0	3992.2	12.3	.5
OCT	33.	2.0	3.08	.3	2.	.1	.0	.0	3993.8	13.9	1.6
NOV	42.	2.5	1.67	.1	2.	.1	.0	.0	3996.0	16.2	2.3
DEC	33.	2.0	.97	.1	2.	.1	.0	.0	3997.6	18.0	1.8
TOTAL		33.4	33.41	3.3		25.4	.0	.0			4.7

MERRITT RESERVOIR OPERATION ESTIMATES - 1997

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	200.	12.3	1.05	.2	.0	1.0	16.	1.0	11.7	.0	2944.0	68.8	-.6
FEB	218.	12.1	1.33	.3	.0	1.0	18.	1.0	10.8	.0	2944.0	68.8	.0
MAR	229.	14.1	1.85	.4	.0	4.6	75.	4.6	6.3	.0	2945.0	71.6	2.8
APR	224.	13.3	3.08	.7	.0	4.5	76.	4.5	8.1	.0	2945.0	71.6	.0
MAY	213.	13.1	5.45	1.3	5.2	4.6	159.	9.8	.0	.0	2945.7	73.6	2.0
JUN	213.	12.7	6.22	1.5	6.9	1.0	133.	7.9	2.4	.0	2946.0	74.5	.9
JUL	213.	13.1	7.11	1.5	36.6	1.0	612.	37.6	.0	.0	2935.6	48.5	-26.0
AUG	210.	12.9	6.27	.8	35.9	1.0	600.	36.9	.0	.0	2919.6	23.7	-24.8
SEP	208.	12.4	5.22	.5	9.0	1.0	168.	10.0	.0	.0	2921.2	25.6	1.9
OCT	221.	13.6	3.50	.4	.0	1.0	16.	1.0	.0	.0	2929.9	37.8	12.2
NOV	215.	12.8	2.00	.3	.0	1.0	17.	1.0	.0	.0	2936.0	49.3	11.5
DEC	207.	12.7	1.39	.3	.0	1.0	16.	1.0	.0	.0	2940.9	60.7	11.4
TOTAL		155.1	44.47	8.2	93.6	22.7		116.3	39.3	.0			-8.7
MOST PROBABLE INFLOW CONDITIONS													
JAN	228.	14.0	1.05	.2	.0	1.0	16.	1.0	13.4	.0	2944.0	68.8	-.6
FEB	243.	13.5	1.33	.3	.0	1.0	18.	1.0	12.2	.0	2944.0	68.8	.0
MAR	262.	16.1	1.85	.4	.0	4.6	75.	4.6	8.3	.0	2945.0	71.6	2.8
APR	266.	15.8	3.08	.7	.0	4.5	76.	4.5	10.6	.0	2945.0	71.6	.0
MAY	249.	15.3	4.19	1.0	2.8	4.6	120.	7.4	4.0	.0	2946.0	74.5	2.9
JUN	240.	14.3	5.29	1.3	5.9	1.0	116.	6.9	6.1	.0	2946.0	74.5	.0
JUL	239.	14.7	6.13	1.4	26.9	1.0	454.	27.9	.0	.0	2940.6	59.9	-14.6
AUG	246.	15.1	5.16	1.0	27.3	1.0	460.	28.3	.0	.0	2934.2	45.7	-14.2
SEP	249.	14.8	4.19	.7	9.3	1.0	173.	10.3	.0	.0	2936.1	49.5	3.8
OCT	252.	15.5	3.50	.7	.0	1.0	16.	1.0	.0	.0	2941.9	63.3	13.8
NOV	237.	14.1	2.00	.4	.0	1.0	17.	1.0	7.2	.0	2944.0	68.8	5.5
DEC	229.	14.1	1.39	.3	.0	1.0	16.	1.0	12.8	.0	2944.0	68.8	.0
TOTAL		177.3	39.16	8.4	72.2	22.7		94.9	74.6	.0			-.6
REASONABLE MAXIMUM INFLOW CONDITIONS													
JAN	263.	16.2	1.05	.2	.0	1.0	16.	1.0	15.6	.0	2944.0	68.8	-.6
FEB	283.	15.7	1.33	.3	.0	1.0	18.	1.0	14.4	.0	2944.0	68.8	.0
MAR	296.	18.2	1.85	.4	.0	4.6	75.	4.6	10.4	.0	2945.0	71.6	2.8
APR	311.	18.5	3.08	.7	.0	4.5	76.	4.5	13.3	.0	2945.0	71.6	.0
MAY	309.	19.0	3.11	.7	1.7	4.6	102.	6.3	9.1	.0	2946.0	74.5	2.9
JUN	286.	17.0	4.38	1.1	6.6	1.0	128.	7.6	8.3	.0	2946.0	74.5	.0
JUL	289.	17.8	4.90	1.1	23.5	1.0	398.	24.5	.0	.0	2943.2	66.7	-7.8
AUG	307.	18.9	4.14	.9	21.0	1.0	358.	22.0	.0	.0	2941.7	62.7	-4.0
SEP	286.	17.0	3.12	.7	4.8	1.0	97.	5.8	4.4	.0	2944.0	68.8	6.1
OCT	283.	17.4	3.50	.8	.0	1.0	16.	1.0	15.6	.0	2944.0	68.8	.0
NOV	262.	15.6	2.00	.5	.0	1.0	17.	1.0	14.1	.0	2944.0	68.8	.0
DEC	250.	15.4	1.39	.3	.0	1.0	16.	1.0	14.1	.0	2944.0	68.8	.0
TOTAL		206.7	33.85	7.7	57.6	22.7		80.3	119.3	.0			-.6

SHERMAN RESERVOIR OPERATION ESTIMATES - 1997

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	2155.2	50.6	-1.6
FEB	0.	.0	1.62	.3	23.	1.3	.0	.0	2154.5	49.0	-1.6
MAR	0.	.0	2.86	.5	21.	1.3	.0	.0	2153.7	47.2	-1.8
APR	165.	9.8	4.63	.9	22.	1.3	.0	.0	2156.9	54.8	7.6
MAY	317.	19.5	5.43	1.2	65.	4.0	.0	.0	2162.3	69.1	14.3
JUN	319.	19.0	6.26	1.5	294.	17.5	.0	.0	2162.3	69.1	.0
JUL	153.	9.4	7.29	1.3	901.	55.4	.0	.0	2139.4	21.8	-47.3
AUG	246.	15.1	6.41	.6	646.	39.7	.0	13.9	2129.0	10.5	-11.3
SEP	501.	29.8	4.80	.5	138.	8.2	.0	.0	2145.8	31.6	21.1
OCT	369.	22.7	3.77	.7	18.	1.1	.0	.0	2156.0	52.5	20.9
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		125.3	47.60	8.4		133.7	.0	13.9			-2.9
MOST PROBABLE INFLOW CONDITIONS											
JAN	0.	.0	1.30	.3	21.	1.3	.0	.0	2155.2	50.6	-1.6
FEB	0.	.0	1.62	.3	23.	1.3	.0	.0	2154.5	49.0	-1.6
MAR	3.	.2	2.86	.5	21.	1.3	.0	.0	2153.8	47.4	-1.6
APR	148.	8.8	4.63	.9	22.	1.3	.0	.0	2156.6	54.0	6.6
MAY	286.	17.6	4.35	1.0	24.	1.5	.0	.0	2162.3	69.1	15.1
JUN	299.	17.8	4.92	1.2	279.	16.6	.0	.0	2162.3	69.1	.0
JUL	376.	23.1	5.68	1.3	587.	36.1	.0	.0	2156.9	54.8	-14.3
AUG	449.	27.6	4.87	1.0	566.	34.8	.0	.0	2153.4	46.6	-8.2
SEP	269.	16.0	3.68	.7	104.	6.2	.0	.0	2157.3	55.7	9.1
OCT	31.	1.9	3.77	.8	18.	1.1	.0	.0	2157.3	55.7	.0
NOV	0.	.0	2.05	.4	22.	1.3	.0	.0	2156.6	54.0	-1.7
DEC	0.	.0	1.18	.2	21.	1.3	.0	.0	2156.0	52.5	-1.5
TOTAL		113.0	40.91	8.6		104.1	.0	.0			.3
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	23.	1.4	1.30	.3	21.	1.3	.0	.0	2155.8	52.0	-.2
FEB	43.	2.4	1.62	.3	23.	1.3	.0	.0	2156.1	52.8	.8
MAR	96.	5.9	2.86	.6	21.	1.3	.0	.0	2157.7	56.8	4.0
APR	99.	5.9	4.63	1.0	22.	1.3	.0	.0	2159.1	60.4	3.6
MAY	177.	10.9	3.10	.7	24.	1.5	.0	.0	2162.3	69.1	8.7
JUN	202.	12.0	3.89	.9	187.	11.1	.0	.0	2162.3	69.1	.0
JUL	210.	12.9	4.42	1.0	457.	28.1	.0	.0	2156.2	52.9	-16.2
AUG	210.	12.9	3.75	.7	275.	16.9	.0	.0	2154.2	48.2	-4.7
SEP	215.	12.8	2.56	.5	81.	4.8	.0	.0	2157.3	55.7	7.5
OCT	31.	1.9	3.77	.8	18.	1.1	.0	.0	2157.3	55.7	.0
NOV	24.	1.4	2.05	.4	22.	1.3	.0	.0	2157.2	55.4	-.3
DEC	24.	1.5	1.18	.2	21.	1.3	.0	.0	2157.2	55.4	.0
TOTAL		81.9	35.13	7.4		71.3	.0	.0			3.2

CALAMUS RESERVOIR OPERATION ESTIMATES - 1997

	INFLOW		EVAPORATION		RELEASE REQUIREMENT				RES	REQUIREMENT	END OF MONTH		RESERVOIR
					CANAL	RIVER	TOTAL		SPILL	SHORTAGE	ELEV	CONT	CHANGE
	MEAN	1000		1000	1000	1000	MEAN	1000	1000	1000		1000	1000
MONTH	CFS	AF	INCHES	AF	AF	AF	CFS	AF	AF	AF	FT	AF	AF
					REASONABLE MINIMUM INFLOW CONDITIONS								
JAN	298.	18.3	1.17	.5	.7	3.1	62.	3.8	14.0	.0	2241.6	115.3	.0
FEB	292.	16.2	1.46	.6	.7	2.8	63.	3.5	12.1	.0	2241.6	115.3	.0
MAR	329.	20.2	2.58	1.0	.7	3.1	62.	3.8	12.2	.0	2242.2	118.5	3.2
APR	308.	18.3	4.18	1.7	.7	3.0	62.	3.7	6.5	.0	2243.5	124.9	6.4
MAY	298.	18.3	5.69	2.4	1.9	3.1	81.	5.0	9.5	.0	2243.8	126.3	1.4
JUN	304.	18.1	7.04	3.0	11.0	3.0	235.	14.0	.0	.0	2244.0	127.4	1.1
JUL	272.	16.7	7.83	3.1	26.0	16.7	694.	42.7	.0	.0	2237.8	98.3	-29.1
AUG	291.	17.9	8.18	2.5	42.4	17.9	981.	60.3	.0	.0	2225.4	53.4	-44.9
SEP	282.	16.8	6.35	1.3	34.2	10.1	744.	44.3	.0	.0	2213.3	24.6	-28.8
OCT	273.	16.8	3.40	.6	.7	3.1	62.	3.8	.0	.0	2219.2	37.0	12.4
NOV	277.	16.5	1.85	.4	.7	3.0	62.	3.7	.0	.0	2224.0	49.4	12.4
DEC	272.	16.7	1.07	.3	.7	3.1	62.	3.8	.0	.0	2228.2	62.0	12.6
TOTAL		210.8	50.80	17.4	120.4	72.0		192.4	54.3	.0			-53.3
					MOST PROBABLE INFLOW CONDITIONS								
JAN	327.	20.1	1.17	.5	.7	3.1	62.	3.8	15.8	.0	2241.6	115.3	.0
FEB	333.	18.5	1.46	.6	.7	2.8	63.	3.5	14.4	.0	2241.6	115.3	.0
MAR	374.	23.0	2.58	1.0	.7	3.1	62.	3.8	15.0	.0	2242.2	118.5	3.2
APR	375.	22.3	4.18	1.7	.7	3.0	62.	3.7	10.5	.0	2243.5	124.9	6.4
MAY	377.	23.2	4.19	1.8	.7	3.1	62.	3.8	17.6	.0	2243.5	124.9	.0
JUN	345.	20.5	4.77	2.0	1.9	3.0	82.	4.9	11.1	.0	2244.0	127.4	2.5
JUL	348.	21.4	5.88	2.4	17.4	21.4	631.	38.8	.0	.0	2239.9	107.6	-19.8
AUG	337.	20.7	5.89	2.1	20.9	20.7	677.	41.6	.0	.0	2234.5	84.6	-23.0
SEP	323.	19.2	4.78	1.4	22.2	19.2	696.	41.4	.0	.0	2227.9	61.0	-23.6
OCT	320.	19.7	3.40	.9	.7	3.1	62.	3.8	11.3	.0	2229.0	64.7	3.7
NOV	329.	19.6	1.85	.5	.7	3.0	62.	3.7	4.9	.0	2232.0	75.2	10.5
DEC	317.	19.5	1.07	.3	.7	3.1	62.	3.8	4.0	.0	2235.0	86.6	11.4
TOTAL		247.7	41.22	15.2	68.0	88.6		156.6	104.6	.0			-28.7
					REASONABLE MAXIMUM INFLOW CONDITIONS								
JAN	356.	21.9	1.17	.5	.7	3.1	62.	3.8	17.6	.0	2241.6	115.3	.0
FEB	366.	20.3	1.46	.6	.7	2.8	63.	3.5	16.2	.0	2241.6	115.3	.0
MAR	473.	29.1	2.58	1.0	.7	3.1	62.	3.8	21.1	.0	2242.2	118.5	3.2
APR	489.	29.1	4.18	1.7	.7	3.0	62.	3.7	17.3	.0	2243.5	124.9	6.4
MAY	610.	37.5	3.07	1.3	.7	3.1	62.	3.8	32.4	.0	2243.5	124.9	.0
JUN	466.	27.7	3.25	1.4	.7	3.0	62.	3.7	20.1	.0	2244.0	127.4	2.5
JUL	465.	28.6	4.28	1.8	9.0	28.6	612.	37.6	.0	.0	2241.8	116.6	-10.8
AUG	397.	24.4	4.98	1.9	10.6	24.4	569.	35.0	.0	.0	2239.1	104.1	-12.5
SEP	380.	22.6	3.43	1.1	1.8	22.6	410.	24.4	36.5	.0	2229.0	64.7	-39.4
OCT	369.	22.7	3.40	.9	.7	3.1	62.	3.8	18.0	.0	2229.0	64.7	.0
NOV	358.	21.3	1.85	.5	.7	3.0	62.	3.7	6.6	.0	2232.0	75.2	10.5
DEC	356.	21.9	1.07	.3	.7	3.1	62.	3.8	6.4	.0	2235.0	86.6	11.4
TOTAL		307.1	34.72	13.0	27.7	102.9		130.6	192.2	.0			-28.7

DAVIS CREEK RESERVOIR OPERATION ESTIMATES - 1997

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	.1	5.	.3	.0	.0	2071.1	25.9	-.4
FEB	0.	.0	1.62	.1	5.	.3	.0	.0	2070.7	25.5	-.4
MAR	0.	.0	2.86	.2	10.	.6	.0	.0	2069.9	24.7	-.8
APR	101.	6.0	4.63	.4	25.	1.5	.0	.0	2073.9	28.8	4.1
MAY	98.	6.0	5.43	.5	50.	3.1	.0	.0	2076.0	31.2	2.4
JUN	190.	11.3	6.26	.6	180.	10.7	.0	.0	2076.0	31.2	.0
JUL	0.	.0	7.29	.5	291.	17.9	.0	.0	2054.8	12.8	-18.4
AUG	239.	14.7	6.41	.3	320.	19.7	.0	.0	2044.6	7.5	-5.3
SEP	240.	14.3	4.80	.2	257.	15.3	.0	.0	2041.7	6.3	-1.2
OCT	11.	.7	3.77	.1	5.	.3	.0	.0	2042.5	6.6	.3
NOV	0.	.0	2.05	.1	5.	.3	.0	.0	2041.4	6.2	-.4
DEC	0.	.0	1.18	.0	5.	.3	.0	.0	2040.6	5.9	-.3
TOTAL		53.0	47.60	3.1		70.3	.0	.0			-20.4
MOST PROBABLE INFLOW CONDITIONS											
JAN	0.	.0	1.30	.1	5.	.3	.0	.0	2071.1	25.9	-.4
FEB	0.	.0	1.62	.1	5.	.3	.0	.0	2070.7	25.5	-.4
MAR	0.	.0	2.86	.2	10.	.6	.0	.0	2069.9	24.7	-.8
APR	91.	5.4	4.63	.4	25.	1.5	.0	.0	2073.3	28.2	3.5
MAY	89.	5.5	4.35	.4	34.	2.1	.0	.0	2076.0	31.2	3.0
JUN	62.	3.7	4.92	.5	54.	3.2	.0	.0	2076.0	31.2	.0
JUL	0.	.0	5.68	.5	194.	11.9	.0	.0	2063.2	18.8	-12.4
AUG	29.	1.8	4.87	.2	224.	13.8	.0	.0	2042.5	6.6	-12.2
SEP	160.	9.5	3.68	.1	158.	9.4	.0	.0	2042.5	6.6	.0
OCT	0.	.0	3.77	.1	5.	.3	.0	.0	2041.4	6.2	-.4
NOV	0.	.0	2.05	.1	5.	.3	.0	.0	2040.3	5.8	-.4
DEC	0.	.0	1.18	.0	5.	.3	.0	.0	2039.5	5.5	-.3
TOTAL		25.9	40.91	2.7		44.0	.0	.0			-20.8
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	0.	.0	1.30	.1	5.	.3	.0	.0	2071.1	25.9	-.4
FEB	0.	.0	1.62	.1	5.	.3	.0	.0	2070.7	25.5	-.4
MAR	0.	.0	2.86	.2	10.	.6	.0	.0	2069.9	24.7	-.8
APR	91.	5.4	4.63	.4	25.	1.5	.0	.0	2073.3	28.2	3.5
MAY	88.	5.4	3.10	.3	34.	2.1	.0	.0	2076.0	31.2	3.0
JUN	42.	2.5	3.89	.4	35.	2.1	.0	.0	2076.0	31.2	.0
JUL	0.	.0	4.42	.4	128.	7.9	.0	.0	2067.9	22.9	-8.3
AUG	0.	.0	3.75	.2	143.	8.8	.0	.0	2056.5	13.9	-9.0
SEP	0.	.0	2.56	.1	121.	7.2	.0	.0	2042.5	6.6	-7.3
OCT	0.	.0	3.77	.1	5.	.3	.0	.0	2041.4	6.2	-.4
NOV	0.	.0	2.05	.1	5.	.3	.0	.0	2040.3	5.8	-.4
DEC	0.	.0	1.18	.0	5.	.3	.0	.0	2039.5	5.5	-.3
TOTAL		13.3	35.13	2.4		31.7	.0	.0			-20.8

BONNY RESERVOIR OPERATION ESTIMATES - 1997

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	1.15	.2	.0	.5	8.	.5	.0	.0	3670.1	37.6	.7
FEB	22.	1.2	1.37	.2	.0	.4	7.	.4	.0	.0	3670.4	38.2	.6
MAR	21.	1.3	1.95	.3	.0	.5	8.	.5	.0	.0	3670.7	38.7	.5
APR	24.	1.4	5.56	.9	.0	.4	7.	.4	.0	.0	3670.7	38.8	.1
MAY	21.	1.3	7.04	1.1	.4	.5	15.	.9	.0	.0	3670.4	38.1	-.7
JUN	12.	.7	8.43	1.3	.3	.4	12.	.7	.0	.0	3669.7	36.8	-1.3
JUL	5.	.3	9.09	1.4	1.0	.5	24.	1.5	.0	.0	3668.3	34.2	-2.6
AUG	0.	.0	8.07	1.2	.6	.5	18.	1.1	.0	.0	3667.0	31.9	-2.3
SEP	0.	.0	7.18	1.0	.3	.4	12.	.7	.0	.0	3666.0	30.2	-1.7
OCT	7.	.4	5.03	.7	.2	.5	11.	.7	.0	.0	3665.4	29.2	-1.0
NOV	17.	1.0	2.24	.3	.0	.4	7.	.4	.0	.0	3665.6	29.5	.3
DEC	20.	1.2	1.42	.2	.0	.5	8.	.5	.0	.0	3665.9	30.0	.5
TOTAL		10.2	58.53	8.8	2.8	5.5		8.3	.0	.0			-6.9
MOST PROBABLE INFLOW CONDITIONS													
JAN	28.	1.7	1.10	.2	.0	.5	8.	.5	.0	.0	3670.3	37.9	1.0
FEB	31.	1.7	1.26	.2	.0	.4	7.	.4	.0	.0	3670.8	39.0	1.1
MAR	31.	1.9	1.93	.3	.0	.5	8.	.5	.0	.0	3671.4	40.1	1.1
APR	35.	2.1	4.40	.7	.0	.4	7.	.4	.0	.0	3671.9	41.1	1.0
MAY	39.	2.4	5.84	1.0	.1	.5	10.	.6	.6	.0	3672.0	41.3	.2
JUN	25.	1.5	6.85	1.2	.3	.4	12.	.7	.0	.0	3671.8	40.9	-.4
JUL	16.	1.0	8.16	1.4	.7	.5	20.	1.2	.0	.0	3671.0	39.3	-1.6
AUG	8.	.5	6.83	1.1	.6	.5	18.	1.1	.0	.0	3670.1	37.6	-1.7
SEP	3.	.2	5.35	.8	.3	.4	12.	.7	.0	.0	3669.4	36.3	-1.3
OCT	15.	.9	3.61	.6	.1	.5	10.	.6	.0	.0	3669.3	36.0	-.3
NOV	25.	1.5	2.24	.4	.0	.4	7.	.4	.0	.0	3669.6	36.7	.7
DEC	24.	1.5	1.34	.2	.0	.5	8.	.5	.0	.0	3670.1	37.5	.8
TOTAL		16.9	48.91	8.1	2.1	5.5		7.6	.6	.0			.6
REASONABLE MAXIMUM INFLOW CONDITIONS													
JAN	36.	2.2	1.08	.2	.0	.5	8.	.5	.0	.0	3670.5	38.4	1.5
FEB	40.	2.2	1.19	.2	.0	.4	7.	.4	.0	.0	3671.3	40.0	1.6
MAR	42.	2.6	1.87	.3	.0	.5	8.	.5	.5	.0	3672.0	41.3	1.3
APR	52.	3.1	3.14	.5	.0	.4	7.	.4	2.2	.0	3672.0	41.3	.0
MAY	60.	3.7	4.30	.7	.2	.5	11.	.7	2.3	.0	3672.0	41.3	.0
JUN	84.	5.0	5.33	.9	.2	.4	10.	.6	3.5	.0	3672.0	41.3	.0
JUL	46.	2.8	6.22	1.1	.4	.5	15.	.9	.8	.0	3672.0	41.3	.0
AUG	63.	3.9	5.70	1.0	.4	.5	15.	.9	2.0	.0	3672.0	41.3	.0
SEP	50.	3.0	4.23	.7	.2	.4	10.	.6	1.7	.0	3672.0	41.3	.0
OCT	33.	2.0	3.61	.6	.2	.5	11.	.7	.7	.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	34.	2.1	1.24	.2	.0	.5	8.	.5	1.4	.0	3672.0	41.3	.0
TOTAL		34.9	40.15	6.8	1.6	5.5		7.1	16.6	.0			4.4

ENDERS RESERVOIR OPERATION ESTIMATES - 1997

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	28.	1.7	.93	.1	0.	.0	.0	.0	3101.7	28.7	1.6
FEB	27.	1.5	1.05	.1	0.	.0	.0	.0	3102.8	30.1	1.4
MAR	26.	1.6	1.78	.2	0.	.0	.0	.0	3103.8	31.5	1.4
APR	27.	1.6	5.29	.6	0.	.0	.0	.0	3104.5	32.5	1.0
MAY	24.	1.5	6.52	.7	68.	4.2	.0	.0	3102.0	29.1	-3.4
JUN	25.	1.5	7.75	.7	306.	18.2	.0	.0	3084.9	11.7	-17.4
JUL	26.	1.6	8.48	.5	533.	32.8	.0	30.0	3082.4	10.0	-1.7
AUG	24.	1.5	7.55	.4	540.	33.2	.0	32.1	3082.4	10.0	.0
SEP	22.	1.3	5.60	.3	3.	.2	.0	.0	3083.6	10.8	.8
OCT	24.	1.5	4.19	.3	0.	.0	.0	.0	3085.3	12.0	1.2
NOV	27.	1.6	1.96	.1	0.	.0	.0	.0	3087.2	13.5	1.5
DEC	26.	1.6	1.16	.1	0.	.0	.0	.0	3089.0	15.0	1.5
TOTAL		18.5	52.26	4.1		88.6	.0	62.1			-12.1
MOST PROBABLE INFLOW CONDITIONS											
JAN	44.	2.7	.88	.1	0.	.0	.0	.0	3102.5	29.7	2.6
FEB	41.	2.3	.95	.1	0.	.0	.0	.0	3104.1	31.9	2.2
MAR	37.	2.3	1.73	.2	0.	.0	.0	.0	3105.6	34.0	2.1
APR	40.	2.4	4.28	.5	0.	.0	.0	.0	3106.9	35.9	1.9
MAY	42.	2.6	5.38	.7	16.	1.0	.0	.0	3107.5	36.8	.9
JUN	39.	2.3	6.46	.8	79.	4.7	.0	.0	3105.3	33.6	-3.2
JUL	52.	3.2	7.23	.7	371.	22.8	.0	.0	3087.0	13.3	-20.3
AUG	42.	2.6	6.22	.4	363.	22.3	.0	16.8	3082.4	10.0	-3.3
SEP	44.	2.6	4.51	.2	42.	2.5	.0	.1	3082.4	10.0	.0
OCT	41.	2.5	2.97	.2	0.	.0	.0	.0	3085.7	12.3	2.3
NOV	42.	2.5	1.96	.1	0.	.0	.0	.0	3088.7	14.7	2.4
DEC	42.	2.6	1.07	.1	0.	.0	.0	.0	3091.5	17.2	2.5
TOTAL		30.6	43.64	4.1		53.3	.0	16.9			-9.9
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	70.	4.3	.82	.1	0.	.0	.0	.0	3103.7	31.3	4.2
FEB	67.	3.7	.90	.1	0.	.0	.0	.0	3106.2	34.9	3.6
MAR	57.	3.5	1.65	.2	0.	.0	.0	.0	3108.4	38.2	3.3
APR	61.	3.6	3.16	.4	0.	.0	.0	.0	3110.4	41.4	3.2
MAY	63.	3.9	4.14	.6	0.	.0	.2	.0	3112.3	44.5	3.1
JUN	84.	5.0	5.29	.8	0.	.0	4.2	.0	3112.3	44.5	.0
JUL	98.	6.0	5.98	.8	207.	12.7	.0	.0	3107.6	37.0	-7.5
AUG	80.	4.9	5.05	.6	213.	13.1	.0	.0	3101.3	28.2	-8.8
SEP	86.	5.1	3.38	.4	0.	.0	.0	.0	3104.8	32.9	4.7
OCT	72.	4.4	2.08	.3	0.	.0	.0	.0	3107.6	37.0	4.1
NOV	71.	4.2	1.96	.3	0.	.0	.0	.0	3110.1	40.9	3.9
DEC	72.	4.4	.97	.1	0.	.0	.7	.0	3112.3	44.5	3.6
TOTAL		53.0	35.38	4.7		25.8	5.1	.0			17.4

SWANSON LAKE OPERATION ESTIMATES - 1997

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	.91	.4	.0	.1	2.	.1	.0	.0	2749.8	101.9	2.6
FEB	94.	5.2	1.09	.4	.0	.1	2.	.1	.0	.0	2750.8	106.6	4.7
MAR	109.	6.7	1.76	.7	.0	.1	2.	.1	.3	.0	2752.0	112.2	5.6
APR	99.	5.9	5.43	2.2	.0	.1	2.	.1	3.6	.0	2752.0	112.2	.0
MAY	70.	4.3	6.57	2.7	.0	.1	2.	.1	1.5	.0	2752.0	112.2	.0
JUN	55.	3.3	7.53	3.0	8.9	1.5	175.	10.4	.0	.0	2749.9	102.1	-10.1
JUL	13.	.8	8.84	3.1	19.2	9.6	468.	28.8	.0	.0	2742.5	71.0	-31.1
AUG	2.	.1	7.84	2.1	14.6	27.2	680.	41.8	.0	.0	2728.0	27.2	-43.8
SEP	0.	.0	5.83	1.0	2.0	2.6	77.	4.6	.0	.0	2725.4	21.6	-5.6
OCT	0.	.0	3.84	.6	.0	.1	2.	.1	.0	.0	2725.0	20.9	-.7
NOV	24.	1.4	2.01	.3	.0	.1	2.	.1	.0	.0	2725.5	21.9	1.0
DEC	46.	2.8	1.17	.2	.0	.1	2.	.1	.0	.0	2726.7	24.4	2.5
TOTAL		33.6	52.82	16.7	44.7	41.7		86.4	5.4	.0			-74.9
MOST PROBABLE INFLOW CONDITIONS													
JAN	94.	5.8	.88	.3	.0	.1	2.	.1	.0	.0	2750.4	104.7	5.4
FEB	140.	7.8	.98	.4	.0	.1	2.	.1	.0	.0	2752.0	112.0	7.3
MAR	153.	9.4	1.73	.7	.0	.1	2.	.1	8.4	.0	2752.0	112.2	.2
APR	155.	9.2	4.34	1.8	.0	.1	2.	.1	7.3	.0	2752.0	112.2	.0
MAY	153.	9.4	5.17	2.1	.0	.1	2.	.1	7.2	.0	2752.0	112.2	.0
JUN	116.	6.9	6.39	2.6	3.9	.1	67.	4.0	.3	.0	2752.0	112.2	.0
JUL	59.	3.6	7.40	2.9	12.8	4.9	288.	17.7	.0	.0	2748.4	95.2	-17.0
AUG	36.	2.2	6.50	2.3	13.3	5.3	303.	18.6	.0	.0	2744.0	76.5	-18.7
SEP	5.	.3	4.84	1.6	2.5	1.4	66.	3.9	.0	.0	2742.6	71.3	-5.2
OCT	21.	1.3	3.07	1.0	.0	.1	2.	.1	.0	.0	2742.7	71.5	.2
NOV	72.	4.3	2.01	.7	.0	.1	2.	.1	.0	.0	2743.6	75.0	3.5
DEC	75.	4.6	1.10	.4	.0	.1	2.	.1	.0	.0	2744.6	79.1	4.1
TOTAL		64.8	44.41	16.8	32.5	12.5		45.0	23.2	.0			-20.2
REASONABLE MAXIMUM INFLOW CONDITIONS													
JAN	122.	7.5	.85	.3	.0	.1	2.	.1	.0	.0	2750.8	106.4	7.1
FEB	184.	10.2	.92	.4	.0	.1	2.	.1	3.9	.0	2752.0	112.2	5.8
MAR	216.	13.3	1.65	.7	.0	.1	2.	.1	12.5	.0	2752.0	112.2	.0
APR	260.	15.5	3.20	1.3	.0	.1	2.	.1	14.1	.0	2752.0	112.2	.0
MAY	280.	17.2	3.86	1.6	.0	.1	2.	.1	15.5	.0	2752.0	112.2	.0
JUN	237.	14.1	5.15	2.1	3.3	.1	57.	3.4	8.6	.0	2752.0	112.2	.0
JUL	187.	11.5	6.17	2.5	9.7	3.5	215.	13.2	.0	.0	2751.1	108.0	-4.2
AUG	85.	5.2	5.32	2.1	8.4	3.5	194.	11.9	.0	.0	2749.2	99.2	-8.8
SEP	104.	6.2	3.76	1.4	1.5	.1	27.	1.6	.0	.0	2749.9	102.4	3.2
OCT	117.	7.2	2.24	.9	.0	.1	2.	.1	.0	.0	2751.2	108.6	6.2
NOV	134.	8.0	2.01	.8	.0	.1	2.	.1	3.5	.0	2752.0	112.2	3.6
DEC	111.	6.8	1.00	.4	.0	.1	2.	.1	6.3	.0	2752.0	112.2	.0
TOTAL		122.7	36.13	14.5	22.9	8.0		30.9	64.4	.0			12.9

HUGH BUTLER LAKE OPERATION ESTIMATES - 1997

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	.84	.1	5.	.3	.0	.0	2581.0	36.5	.6
FEB	22.	1.2	1.01	.1	5.	.3	.0	.0	2581.5	37.3	.8
MAR	23.	1.4	1.68	.2	5.	.3	.4	.0	2581.8	37.8	.5
APR	22.	1.3	5.66	.8	5.	.3	.2	.0	2581.8	37.8	.0
MAY	21.	1.3	6.85	.9	5.	.3	.1	.0	2581.8	37.8	.0
JUN	20.	1.2	8.27	1.1	40.	2.4	.0	.0	2580.4	35.5	-2.3
JUL	15.	.9	9.18	1.1	104.	6.4	.0	.0	2575.8	28.9	-6.6
AUG	11.	.7	8.04	.8	73.	4.5	.0	.0	2572.2	24.3	-4.6
SEP	7.	.4	6.01	.6	18.	1.1	.0	.0	2571.0	23.0	-1.3
OCT	13.	.8	4.50	.4	5.	.3	.0	.0	2571.1	23.1	.1
NOV	17.	1.0	1.93	.2	5.	.3	.0	.0	2571.6	23.6	.5
DEC	18.	1.1	1.09	.1	5.	.3	.0	.0	2572.2	24.3	.7
TOTAL		12.3	55.06	6.4		16.8	.7	.0			-11.6
MOST PROBABLE INFLOW CONDITIONS											
JAN	21.	1.3	.78	.1	5.	.3	.0	.0	2581.2	36.8	.9
FEB	27.	1.5	.90	.1	5.	.3	.1	.0	2581.8	37.8	1.0
MAR	31.	1.9	1.64	.2	5.	.3	1.4	.0	2581.8	37.8	.0
APR	32.	1.9	4.78	.6	5.	.3	1.0	.0	2581.8	37.8	.0
MAY	33.	2.0	5.83	.8	5.	.3	.9	.0	2581.8	37.8	.0
JUN	32.	1.9	6.76	.9	27.	1.6	.0	.0	2581.4	37.2	-.6
JUL	26.	1.6	7.52	1.0	62.	3.8	.0	.0	2579.4	34.0	-3.2
AUG	24.	1.5	6.64	.8	63.	3.9	.0	.0	2577.2	30.8	-3.2
SEP	18.	1.1	5.04	.6	18.	1.1	.0	.0	2576.8	30.2	-.6
OCT	20.	1.2	3.33	.4	5.	.3	.0	.0	2577.1	30.7	.5
NOV	22.	1.3	1.93	.2	5.	.3	.0	.0	2577.7	31.5	.8
DEC	21.	1.3	1.01	.1	5.	.3	.0	.0	2578.3	32.4	.9
TOTAL		18.5	46.16	5.8		12.8	3.4	.0			-3.5
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	29.	1.8	.76	.1	5.	.3	.0	.0	2581.5	37.3	1.4
FEB	38.	2.1	.83	.1	5.	.3	1.2	.0	2581.8	37.8	.5
MAR	49.	3.0	1.55	.2	5.	.3	2.5	.0	2581.8	37.8	.0
APR	47.	2.8	3.40	.5	5.	.3	2.0	.0	2581.8	37.8	.0
MAY	50.	3.1	4.29	.6	5.	.3	2.2	.0	2581.8	37.8	.0
JUN	61.	3.6	5.24	.7	18.	1.1	1.8	.0	2581.8	37.8	.0
JUL	59.	3.6	6.26	.8	42.	2.6	.2	.0	2581.8	37.8	.0
AUG	44.	2.7	5.53	.7	42.	2.6	.0	.0	2581.4	37.2	-.6
SEP	35.	2.1	3.93	.5	15.	.9	.1	.0	2581.8	37.8	.6
OCT	29.	1.8	2.22	.3	5.	.3	1.2	.0	2581.8	37.8	.0
NOV	29.	1.7	1.93	.3	5.	.3	1.1	.0	2581.8	37.8	.0
DEC	28.	1.7	.90	.1	5.	.3	1.3	.0	2581.8	37.8	.0
TOTAL		30.0	36.84	4.9		9.6	13.6	.0			1.9

HARRY STRUNK LAKE OPERATION ESTIMATES - 1997

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	.89	.1	2.	.1	2.3	.0	2365.6	34.8	.0
FEB	47.	2.6	.99	.1	2.	.1	2.4	.0	2365.6	34.8	.0
MAR	49.	3.0	1.63	.2	2.	.1	2.7	.0	2365.6	34.8	.0
APR	54.	3.2	5.57	.8	2.	.1	1.4	.0	2366.1	35.7	.9
MAY	50.	3.1	6.84	1.0	2.	.1	2.0	.0	2366.1	35.7	.0
JUN	45.	2.7	8.04	1.2	76.	4.5	.0	.0	2364.4	32.7	-3.0
JUL	21.	1.3	8.94	.9	372.	22.9	.0	.0	2344.9	10.2	-22.5
AUG	31.	1.9	7.98	.5	46.	2.8	.0	.0	2342.8	8.8	-1.4
SEP	24.	1.4	6.11	.4	5.	.3	.0	.0	2343.9	9.5	.7
OCT	34.	2.1	4.33	.3	2.	.1	.0	.0	2346.1	11.2	1.7
NOV	40.	2.4	1.89	.1	2.	.1	.0	.0	2348.8	13.4	2.2
DEC	41.	2.5	1.04	.1	2.	.1	.0	.0	2351.3	15.7	2.3
TOTAL		28.7	54.25	5.7		31.3	10.8	.0			-19.1
					MOST PROBABLE INFLOW CONDITIONS						
JAN	52.	3.2	.81	.1	2.	.1	3.0	.0	2365.6	34.8	.0
FEB	63.	3.5	.87	.1	2.	.1	3.3	.0	2365.6	34.8	.0
MAR	62.	3.8	1.58	.2	2.	.1	3.5	.0	2365.6	34.8	.0
APR	69.	4.1	4.62	.7	2.	.1	2.4	.0	2366.1	35.7	.9
MAY	72.	4.4	5.60	.9	2.	.1	3.4	.0	2366.1	35.7	.0
JUN	69.	4.1	6.74	1.0	54.	3.2	.0	.0	2366.0	35.6	-.1
JUL	73.	4.5	7.67	1.0	220.	13.5	.0	.0	2359.7	25.6	-10.0
AUG	52.	3.2	6.57	.6	220.	13.5	.0	.0	2350.2	14.7	-10.9
SEP	35.	2.1	4.93	.4	12.	.7	.0	.0	2351.3	15.7	1.0
OCT	44.	2.7	3.29	.3	2.	.1	.0	.0	2353.5	18.0	2.3
NOV	49.	2.9	1.89	.2	2.	.1	.0	.0	2355.8	20.6	2.6
DEC	47.	2.9	.97	.1	2.	.1	.0	.0	2358.0	23.3	2.7
TOTAL		41.4	45.54	5.6		31.7	15.6	.0			-11.5
					REASONABLE MAXIMUM INFLOW CONDITIONS						
JAN	63.	3.9	.76	.1	2.	.1	3.7	.0	2365.6	34.8	.0
FEB	92.	5.1	.81	.1	2.	.1	4.9	.0	2365.6	34.8	.0
MAR	101.	6.2	1.51	.2	2.	.1	5.9	.0	2365.6	34.8	.0
APR	86.	5.1	3.57	.5	2.	.1	3.6	.0	2366.1	35.7	.9
MAY	104.	6.4	4.24	.7	2.	.1	5.6	.0	2366.1	35.7	.0
JUN	156.	9.3	5.34	.8	20.	1.2	7.3	.0	2366.1	35.7	.0
JUL	146.	9.0	6.24	.9	145.	8.9	.0	.0	2365.7	34.9	-.8
AUG	94.	5.8	5.38	.8	137.	8.4	.0	.0	2363.7	31.5	-3.4
SEP	61.	3.6	3.72	.5	2.	.1	.0	.0	2365.4	34.5	3.0
OCT	60.	3.7	2.50	.4	2.	.1	2.9	.0	2365.6	34.8	.3
NOV	64.	3.8	1.89	.3	2.	.1	3.4	.0	2365.6	34.8	.0
DEC	59.	3.6	.86	.1	2.	.1	3.4	.0	2365.6	34.8	.0
TOTAL		65.5	36.82	5.4		19.4	40.7	.0			.0

KEITH SEBELIUS OPERATIONS ESTIMATES - 1997

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	2.	.1	.85	.2	2.	.1	.0	.0	2306.1	40.0	-.2
FEB	2.	.1	1.02	.2	2.	.1	.0	.0	2306.0	39.8	-.2
MAR	3.	.2	1.71	.3	2.	.1	.0	.0	2305.9	39.6	-.2
APR	3.	.2	5.68	1.1	2.	.1	.0	.0	2305.5	38.6	-1.0
MAY	7.	.4	7.37	1.4	2.	.1	.0	.0	2305.0	37.5	-1.1
JUN	3.	.2	8.62	1.5	114.	6.8	.0	.0	2301.1	29.4	-8.1
JUL	0.	.0	9.86	1.4	148.	9.1	.0	.0	2294.7	18.9	-10.5
AUG	0.	.0	8.65	.8	148.	9.1	.0	.0	2285.6	9.0	-9.9
SEP	0.	.0	6.20	.4	17.	1.0	.0	.0	2283.8	7.6	-1.4
OCT	0.	.0	5.00	.3	2.	.1	.0	.0	2283.3	7.2	-.4
NOV	0.	.0	1.96	.1	2.	.1	.0	.0	2283.0	7.0	-.2
DEC	2.	.1	1.06	.1	2.	.1	.0	.0	2282.9	6.9	-.1
TOTAL		1.3	57.98	7.8		26.8	.0	.0			-33.3
MOST PROBABLE INFLOW CONDITIONS											
JAN	5.	.3	.81	.2	2.	.1	.0	.0	2306.2	40.2	.0
FEB	5.	.3	.95	.2	2.	.1	.0	.0	2306.2	40.2	.0
MAR	5.	.3	1.69	.3	2.	.1	.0	.0	2306.1	40.1	-.1
APR	10.	.6	4.95	1.0	2.	.1	.0	.0	2305.9	39.6	-.5
MAY	13.	.8	5.75	1.1	2.	.1	.0	.0	2305.7	39.2	-.4
JUN	10.	.6	7.09	1.3	35.	2.1	.0	.0	2304.5	36.4	-2.8
JUL	13.	.8	8.18	1.4	125.	7.7	.0	.0	2300.4	28.1	-8.3
AUG	5.	.3	7.06	1.0	101.	6.2	.0	.0	2296.2	21.2	-6.9
SEP	0.	.0	5.26	.7	2.	.1	.0	.0	2295.7	20.4	-.8
OCT	2.	.1	3.59	.4	2.	.1	.0	.0	2295.4	20.0	-.4
NOV	5.	.3	1.96	.2	2.	.1	.0	.0	2295.4	20.0	.0
DEC	3.	.2	1.02	.1	2.	.1	.0	.0	2295.4	20.0	.0
TOTAL		4.6	48.31	7.9		16.9	.0	.0			-20.2
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	5.	.3	.79	.2	2.	.1	.0	.0	2306.2	40.2	.0
FEB	13.	.7	.91	.2	2.	.1	.0	.0	2306.3	40.6	.4
MAR	21.	1.3	1.66	.3	2.	.1	.6	.0	2306.5	40.9	.3
APR	20.	1.2	4.10	.8	2.	.1	.3	.0	2306.5	40.9	.0
MAY	36.	2.2	4.43	.9	2.	.1	1.2	.0	2306.5	40.9	.0
JUN	39.	2.3	5.53	1.1	15.	.9	.3	.0	2306.5	40.9	.0
JUL	80.	4.9	6.57	1.3	55.	3.4	.2	.0	2306.5	40.9	.0
AUG	65.	4.0	5.78	1.1	54.	3.3	4.6	.0	2304.3	35.9	-5.0
SEP	32.	1.9	4.15	.8	2.	.1	1.0	.0	2304.3	35.9	.0
OCT	24.	1.5	2.63	.5	2.	.1	.9	.0	2304.3	35.9	.0
NOV	7.	.4	1.96	.4	2.	.1	.0	.0	2304.3	35.8	-.1
DEC	7.	.4	.97	.2	2.	.1	.0	.0	2304.3	35.9	.1
TOTAL		21.1	39.48	7.8		8.5	9.1	.0			-4.3

HARLAN COUNTY LAKE OPERATION ESTIMATES - 1997

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	80.	4.9	1.02	1.1	10.	.6	.0	.0	1945.6	309.5	3.2
FEB	146.	8.1	.95	1.0	11.	.6	.9	.0	1946.0	315.1	5.6
MAR	195.	12.0	1.82	2.0	0.	.0	10.0	.0	1946.0	315.1	.0
APR	182.	10.8	5.23	5.8	0.	.0	5.0	.0	1946.0	315.1	.0
MAY	166.	10.2	6.38	7.1	8.	.5	2.6	.0	1946.0	315.1	.0
JUN	131.	7.8	7.88	8.3	568.	33.8	.0	.0	1943.3	280.8	-34.3
JUL	88.	5.4	8.92	8.3	1121.	68.9	.0	.0	1936.8	209.0	-71.8
AUG	78.	4.8	7.83	6.4	950.	58.4	.0	20.4	1932.8	169.4	-39.6
SEP	18.	1.1	5.61	4.4	79.	4.7	.0	4.7	1932.4	166.1	-3.3
OCT	20.	1.2	4.19	3.2	0.	.0	.0	.0	1932.2	164.1	-2.0
NOV	71.	4.2	1.94	1.5	0.	.0	.0	.0	1932.5	166.8	2.7
DEC	80.	4.9	1.51	1.2	0.	.0	.0	.0	1932.9	170.5	3.7
TOTAL		75.4	53.28	50.3		167.5	18.5	25.1			-135.8
					MOST PROBABLE INFLOW CONDITIONS						
JAN	137.	8.4	.83	.9	10.	.6	.0	.0	1945.9	313.2	6.9
FEB	218.	12.1	.85	.9	11.	.6	8.7	.0	1946.0	315.1	1.9
MAR	291.	17.9	1.52	1.7	0.	.0	16.2	.0	1946.0	315.1	.0
APR	297.	17.7	4.15	4.6	0.	.0	13.1	.0	1946.0	315.1	.0
MAY	364.	22.4	5.15	5.7	0.	.0	16.7	.0	1946.0	315.1	.0
JUN	212.	12.6	6.34	7.0	49.	2.9	2.7	.0	1946.0	315.1	.0
JUL	198.	12.2	7.18	7.6	579.	35.6	.0	.0	1943.5	284.1	-31.0
AUG	164.	10.1	6.12	5.9	748.	46.0	.0	.0	1939.9	242.3	-41.8
SEP	86.	5.1	4.66	4.3	71.	4.2	.0	.0	1939.6	238.9	-3.4
OCT	88.	5.4	3.15	2.9	0.	.0	.0	.0	1939.8	241.4	2.5
NOV	111.	6.6	1.85	1.7	0.	.0	.0	.0	1940.3	246.3	4.9
DEC	119.	7.3	1.04	1.0	10.	.6	.0	.0	1940.8	252.0	5.7
TOTAL		137.8	42.84	44.2		90.5	57.4	.0			-54.3
					REASONABLE MAXIMUM INFLOW CONDITIONS						
JAN	220.	13.5	.67	.7	10.	.6	3.4	.0	1946.0	315.1	8.8
FEB	364.	20.2	.60	.7	11.	.6	18.9	.0	1946.0	315.1	.0
MAR	615.	37.8	1.23	1.4	0.	.0	36.4	.0	1946.0	315.1	.0
APR	504.	30.0	3.20	3.5	0.	.0	26.5	.0	1946.0	315.1	.0
MAY	727.	44.7	4.00	4.4	0.	.0	40.3	.0	1946.0	315.1	.0
JUN	491.	29.2	4.80	5.3	42.	2.5	21.4	.0	1946.0	315.1	.0
JUL	556.	34.2	5.38	5.9	158.	9.7	18.6	.0	1946.0	315.1	.0
AUG	397.	24.4	4.84	5.3	122.	7.5	11.6	.0	1946.0	315.1	.0
SEP	262.	15.6	3.70	4.1	5.	.3	11.2	.0	1946.0	315.1	.0
OCT	187.	11.5	2.31	2.6	0.	.0	8.9	.0	1946.0	315.1	.0
NOV	215.	12.8	1.62	1.8	0.	.0	11.0	.0	1946.0	315.1	.0
DEC	220.	13.5	.87	1.0	10.	.6	11.9	.0	1946.0	315.1	.0
TOTAL		287.4	33.22	36.7		21.8	220.1	.0			8.8

LOVEWELL RESERVOIR OPERATION ESTIMATES - 1997

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	.0	0.	.0	.71	.2	0.	.0	.0	.0	1582.4	35.0	-.2
FEB	.2	2.0	40.	2.2	.90	.2	0.	.0	.0	.0	1583.0	37.0	2.0
MAR	.4	3.3	60.	3.7	1.56	.4	0.	.0	.0	.0	1584.1	40.3	3.3
APR	.5	2.3	47.	2.8	4.54	1.2	0.	.0	.0	.0	1584.6	41.9	1.6
MAY	.3	2.6	47.	2.9	5.71	1.6	21.	1.3	.0	.0	1584.6	41.9	.0
JUN	.3	11.5	198.	11.8	6.96	1.9	166.	9.9	.0	.0	1584.6	41.9	.0
JUL	.1	14.3	234.	14.4	8.30	1.7	698.	42.9	.0	.0	1571.7	11.7	-30.2
AUG	.0	15.8	257.	15.8	7.16	.9	470.	28.9	.0	13.9	1571.7	11.6	-.1
SEP	.0	.0	0.	.0	4.93	.6	49.	2.9	.0	2.9	1571.3	11.0	-.6
OCT	.0	1.9	31.	1.9	3.53	.4	0.	.0	.0	.0	1572.3	12.5	1.5
NOV	.0	2.5	42.	2.5	1.82	.2	0.	.0	.0	.0	1573.7	14.8	2.3
DEC	.0	2.6	42.	2.6	.90	.1	0.	.0	.0	.0	1575.1	17.3	2.5
TOTAL	1.8	58.8		60.6	47.02	9.4		85.9	.0	16.8			-17.9
MOST PROBABLE INFLOW CONDITIONS													
JAN	.7	.0	11.	.7	.68	.2	0.	.0	.0	.0	1582.6	35.7	.5
FEB	1.4	.0	25.	1.4	.84	.2	0.	.0	1.2	.0	1582.6	35.7	.0
MAR	2.2	.0	36.	2.2	1.53	.4	0.	.0	1.8	.0	1582.6	35.7	.0
APR	2.0	.0	34.	2.0	3.70	.9	0.	.0	1.1	.0	1582.6	35.7	.0
MAY	5.4	2.5	128.	7.9	4.61	1.2	8.	.5	.0	.0	1584.6	41.9	6.2
JUN	4.7	2.8	126.	7.5	5.68	1.6	99.	5.9	.0	.0	1584.6	41.9	.0
JUL	4.1	1.2	86.	5.3	6.54	1.4	527.	32.4	.0	.0	1572.8	13.4	-28.5
AUG	.9	18.6	317.	19.5	5.41	.7	335.	20.6	.0	.0	1571.7	11.6	-1.8
SEP	.5	2.1	44.	2.6	3.75	.5	35.	2.1	.0	.0	1571.7	11.6	.0
OCT	.6	4.7	86.	5.3	2.51	.3	0.	.0	.0	.0	1574.7	16.6	5.0
NOV	.6	4.1	79.	4.7	1.82	.3	0.	.0	.0	.0	1576.9	21.0	4.4
DEC	.8	4.6	88.	5.4	.85	.2	0.	.0	.0	.0	1579.1	26.2	5.2
TOTAL	23.9	40.6		64.5	37.92	7.9		61.5	4.1	.0			-9.0
REASONABLE MAXIMUM INFLOW CONDITIONS													
JAN	4.0	.0	65.	4.0	.67	.2	0.	.0	3.3	.0	1582.6	35.7	.5
FEB	6.1	.0	110.	6.1	.80	.2	0.	.0	5.9	.0	1582.6	35.7	.0
MAR	12.8	.0	208.	12.8	1.49	.4	0.	.0	12.4	.0	1582.6	35.7	.0
APR	8.8	.0	148.	8.8	2.71	.7	0.	.0	8.1	.0	1582.6	35.7	.0
MAY	10.5	.0	171.	10.5	3.35	.9	8.	.5	2.9	.0	1584.6	41.9	6.2
JUN	8.0	1.2	155.	9.2	4.45	1.2	49.	2.9	5.1	.0	1584.6	41.9	.0
JUL	14.0	1.2	247.	15.2	4.80	1.3	213.	13.1	.8	.0	1584.6	41.9	.0
AUG	11.8	1.2	211.	13.0	4.00	1.0	161.	9.9	8.3	.0	1582.6	35.7	-6.2
SEP	11.1	.6	197.	11.7	2.77	.7	18.	1.1	15.6	.0	1580.6	30.0	-5.7
OCT	9.3	.0	151.	9.3	1.73	.4	0.	.0	8.9	.0	1580.6	30.0	.0
NOV	4.9	.0	82.	4.9	1.82	.4	0.	.0	4.5	.0	1580.6	30.0	.0
DEC	4.3	.0	70.	4.3	.81	.2	0.	.0	4.1	.0	1580.6	30.0	.0
TOTAL	105.6	4.2		109.8	29.40	7.6		27.5	79.9	.0			-5.2

KIRWIN RESERVOIR OPERATION ESTIMATES - 1997

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	.81	.4	0.	.0	.0	.0	1730.4	105.4	-.4
FEB	4.	.2	1.05	.5	0.	.0	.0	.0	1730.3	105.1	-.3
MAR	8.	.5	1.69	.7	0.	.0	.0	.0	1730.3	104.9	-.2
APR	5.	.3	4.68	2.0	0.	.0	.0	.0	1730.0	103.2	-1.7
MAY	15.	.9	5.93	2.6	0.	.0	.0	.0	1729.6	101.5	-1.7
JUN	7.	.4	7.15	3.0	76.	4.5	.0	.0	1728.2	94.4	-7.1
JUL	2.	.1	8.39	3.3	192.	11.8	.0	.0	1725.0	79.4	-15.0
AUG	0.	.0	7.49	2.6	169.	10.4	.0	.0	1721.9	66.4	-13.0
SEP	0.	.0	5.25	1.7	0.	.0	.0	.0	1721.5	64.7	-1.7
OCT	0.	.0	3.97	1.3	0.	.0	.0	.0	1721.2	63.4	-1.3
NOV	0.	.0	1.91	.6	0.	.0	.0	.0	1721.0	62.8	-.6
DEC	0.	.0	1.02	.3	0.	.0	.0	.0	1720.9	62.5	-.3
TOTAL		2.4	49.34	19.0		26.7	.0	.0			-43.3
MOST PROBABLE INFLOW CONDITIONS											
JAN	10.	.6	.77	.3	0.	.0	.0	.0	1730.5	106.1	.3
FEB	18.	1.0	.99	.4	0.	.0	.0	.0	1730.6	106.7	.6
MAR	29.	1.8	1.67	.7	0.	.0	.0	.0	1730.9	107.8	1.1
APR	50.	3.0	3.94	1.8	0.	.0	.0	.0	1731.1	109.0	1.2
MAY	50.	3.1	4.87	2.2	0.	.0	.0	.0	1731.2	109.9	.9
JUN	40.	2.4	6.10	2.7	50.	3.0	.0	.0	1730.6	106.6	-3.3
JUL	42.	2.6	6.86	3.0	138.	8.5	.0	.0	1728.9	97.7	-8.9
AUG	16.	1.0	5.97	2.4	106.	6.5	.0	.0	1727.3	89.8	-7.9
SEP	5.	.3	4.24	1.7	0.	.0	.0	.0	1727.0	88.4	-1.4
OCT	2.	.1	2.94	1.2	0.	.0	.0	.0	1726.8	87.3	-1.1
NOV	7.	.4	1.91	.7	0.	.0	.0	.0	1726.7	87.0	-.3
DEC	8.	.5	.97	.4	0.	.0	.0	.0	1726.7	87.1	.1
TOTAL		16.8	41.23	17.5		18.0	.0	.0			-18.7
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	29.	1.8	.74	.3	0.	.0	.0	.0	1730.8	107.3	1.5
FEB	67.	3.7	.94	.4	0.	.0	.4	.0	1731.3	110.2	2.9
MAR	96.	5.9	1.64	.7	0.	.0	5.2	.0	1731.3	110.2	.0
APR	77.	4.6	3.15	1.4	0.	.0	3.2	.0	1731.3	110.2	.0
MAY	190.	11.7	3.81	1.7	0.	.0	10.0	.0	1731.3	110.2	.0
JUN	197.	11.7	4.83	2.2	32.	1.9	7.6	.0	1731.3	110.2	.0
JUL	171.	10.5	5.62	2.5	86.	5.3	2.7	.0	1731.3	110.2	.0
AUG	231.	14.2	4.70	2.1	65.	4.0	18.9	.0	1729.2	99.4	-10.8
SEP	158.	9.4	3.33	1.4	0.	.0	8.0	.0	1729.2	99.4	.0
OCT	93.	5.7	2.14	.9	0.	.0	4.8	.0	1729.2	99.4	.0
NOV	61.	3.6	1.91	.8	0.	.0	2.8	.0	1729.2	99.4	.0
DEC	46.	2.8	.91	.4	0.	.0	2.4	.0	1729.2	99.4	.0
TOTAL		85.6	33.72	14.8		11.2	66.0	.0			-6.4

WEBSTER RESERVOIR OPERATION ESTIMATES - 1997

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	.89	.3	0.	.0	.0	.0	1894.1	83.6	-.3
FEB	2.	.1	1.04	.3	0.	.0	.0	.0	1894.0	83.4	-.2
MAR	2.	.1	1.77	.6	0.	.0	.0	.0	1893.9	82.9	-.5
APR	8.	.5	5.20	1.7	0.	.0	.0	.0	1893.6	81.7	-1.2
MAY	13.	.8	6.41	2.1	0.	.0	.0	.0	1893.2	80.4	-1.3
JUN	2.	.1	8.04	2.5	99.	5.9	.0	.0	1891.0	72.1	-8.3
JUL	0.	.0	9.14	2.5	236.	14.5	.0	.0	1885.9	55.1	-17.0
AUG	0.	.0	8.16	1.9	177.	10.9	.0	.0	1881.4	42.3	-12.8
SEP	0.	.0	5.80	1.3	0.	.0	.0	.0	1880.9	41.0	-1.3
OCT	0.	.0	4.44	.9	0.	.0	.0	.0	1880.5	40.1	-.9
NOV	0.	.0	1.96	.4	0.	.0	.0	.0	1880.3	39.7	-.4
DEC	0.	.0	1.08	.2	0.	.0	.0	.0	1880.3	39.5	-.2
TOTAL		1.6	53.93	14.7		31.3	.0	.0			-44.4
MOST PROBABLE INFLOW CONDITIONS											
JAN	5.	.3	.85	.3	0.	.0	.0	.0	1894.1	83.9	.0
FEB	18.	1.0	.98	.3	0.	.0	.0	.0	1894.3	84.6	.7
MAR	31.	1.9	1.76	.6	0.	.0	.0	.0	1894.6	85.9	1.3
APR	39.	2.3	4.17	1.4	0.	.0	.3	.0	1894.8	86.5	.6
MAY	44.	2.7	5.26	1.8	0.	.0	.9	.0	1894.8	86.5	.0
JUN	35.	2.1	6.72	2.2	62.	3.7	.0	.0	1893.8	82.7	-3.8
JUL	10.	.6	7.58	2.4	163.	10.0	.0	.0	1890.7	70.9	-11.8
AUG	15.	.9	6.55	1.9	117.	7.2	.0	.0	1888.3	62.7	-8.2
SEP	2.	.1	4.87	1.3	0.	.0	.0	.0	1887.9	61.5	-1.2
OCT	2.	.1	3.35	.9	0.	.0	.0	.0	1887.7	60.7	-.8
NOV	2.	.1	1.96	.5	0.	.0	.0	.0	1887.5	60.3	-.4
DEC	8.	.5	1.05	.3	0.	.0	.0	.0	1887.6	60.5	.2
TOTAL		12.6	45.10	13.9		20.9	1.2	.0			-23.4
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	34.	2.1	.80	.3	0.	.0	.0	.0	1894.6	85.7	1.8
FEB	54.	3.0	.93	.3	0.	.0	1.9	.0	1894.8	86.5	.8
MAR	85.	5.2	1.73	.6	0.	.0	4.6	.0	1894.8	86.5	.0
APR	121.	7.2	3.41	1.1	0.	.0	6.1	.0	1894.8	86.5	.0
MAY	181.	11.1	4.22	1.4	0.	.0	9.7	.0	1894.8	86.5	.0
JUN	111.	6.6	5.24	1.8	15.	.9	3.9	.0	1894.8	86.5	.0
JUL	246.	15.1	6.21	2.1	76.	4.7	8.3	.0	1894.8	86.5	.0
AUG	104.	6.4	5.36	1.7	59.	3.6	10.2	.0	1892.4	77.4	-9.1
SEP	69.	4.1	3.68	1.2	0.	.0	2.9	.0	1892.4	77.4	.0
OCT	47.	2.9	2.37	.7	0.	.0	2.2	.0	1892.4	77.4	.0
NOV	49.	2.9	1.96	.6	0.	.0	2.3	.0	1892.4	77.4	.0
DEC	31.	1.9	1.01	.3	0.	.0	1.6	.0	1892.4	77.4	.0
TOTAL		68.5	36.92	12.1		9.2	53.7	.0			-6.5

WACONDA LAKE OPERATION ESTIMATES - 1997

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	.8	11.	.7	.1	.0	1455.4	239.2	.0
FEB	38.	2.1	.95	1.0	13.	.7	.4	.0	1455.4	239.2	.0
MAR	44.	2.7	1.67	1.7	11.	.7	22.4	.0	1453.6	217.1	-22.1
APR	54.	3.2	5.57	5.4	2.	.1	.0	.0	1453.4	214.8	-2.3
MAY	83.	5.1	6.76	6.5	2.	.1	.0	.0	1453.3	213.3	-1.5
JUN	81.	4.8	8.59	8.2	35.	2.1	.0	.0	1452.8	207.8	-5.5
JUL	36.	2.2	10.40	9.6	99.	6.1	.0	.0	1451.6	194.3	-13.5
AUG	36.	2.2	8.96	7.9	99.	6.1	.0	.0	1450.5	182.5	-11.8
SEP	3.	.2	6.50	5.6	35.	2.1	.0	.0	1449.7	175.0	-7.5
OCT	2.	.1	4.64	3.9	2.	.1	.0	.0	1449.3	171.1	-3.9
NOV	22.	1.3	1.89	1.6	2.	.1	.0	.0	1449.3	170.7	-.4
DEC	20.	1.2	.95	.8	11.	.7	.0	.0	1449.3	170.4	-.3
TOTAL		26.7	57.66	53.0		19.6	22.9	.0			-68.8
MOST PROBABLE INFLOW CONDITIONS											
JAN	57.	3.5	.72	.8	11.	.7	2.0	.0	1455.4	239.2	.0
FEB	113.	6.3	.89	.9	13.	.7	4.7	.0	1455.4	239.2	.0
MAR	159.	9.8	1.69	1.7	11.	.7	29.5	.0	1453.6	217.1	-22.1
APR	171.	10.2	4.54	4.5	2.	.1	.0	.0	1454.1	222.7	5.6
MAY	246.	15.1	5.45	5.5	2.	.1	.0	.0	1454.9	232.2	9.5
JUN	235.	14.0	7.06	7.3	25.	1.5	.0	.0	1455.3	237.4	5.2
JUL	168.	10.3	8.30	8.6	70.	4.3	.0	.0	1455.1	234.8	-2.6
AUG	138.	8.5	7.08	7.3	70.	4.3	.0	.0	1454.8	231.7	-3.1
SEP	133.	7.9	5.29	5.4	25.	1.5	.0	.0	1454.9	232.7	1.0
OCT	85.	5.2	3.51	3.6	2.	.1	.0	.0	1455.0	234.2	1.5
NOV	55.	3.3	1.89	1.9	2.	.1	18.4	.0	1453.6	217.1	-17.1
DEC	63.	3.9	.94	.9	11.	.7	2.3	.0	1453.6	217.1	.0
TOTAL		98.0	47.36	48.4		14.8	56.9	.0			-22.1
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	223.	13.7	.69	.7	2.	.1	12.9	.0	1455.4	239.2	.0
FEB	439.	24.4	.84	.9	2.	.1	23.4	.0	1455.4	239.2	.0
MAR	865.	53.2	1.60	1.6	2.	.1	73.6	.0	1453.6	217.1	-22.1
APR	785.	46.7	3.61	3.7	2.	.1	18.5	.0	1455.6	241.5	24.4
MAY	932.	57.3	4.31	4.5	2.	.1	52.7	.0	1455.6	241.5	.0
JUN	938.	55.8	5.52	5.8	2.	.1	49.9	.0	1455.6	241.5	.0
JUL	1285.	79.0	6.39	6.7	2.	.1	72.2	.0	1455.6	241.5	.0
AUG	532.	32.7	5.79	6.1	2.	.1	26.5	.0	1455.6	241.5	.0
SEP	418.	24.9	4.20	4.4	2.	.1	20.4	.0	1455.6	241.5	.0
OCT	377.	23.2	2.60	2.7	2.	.1	20.4	.0	1455.6	241.5	.0
NOV	218.	13.0	1.89	1.9	2.	.1	35.4	.0	1453.6	217.1	-24.4
DEC	247.	15.2	.89	.9	2.	.1	14.2	.0	1453.6	217.1	.0
TOTAL		439.1	38.33	39.9		1.2	420.1	.0			-22.1

CEDAR BLUFF RESERVOIR OPERATION ESTIMATES - 1997

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	1.07	.5	0.	.0	.0	.0	2139.2	153.8	-.5
FEB	0.	.0	1.30	.7	0.	.0	.0	.0	2139.1	153.1	-.7
MAR	0.	.0	1.92	1.0	2.	.1	.0	.0	2138.9	152.0	-1.1
APR	5.	.3	6.37	3.2	2.	.1	.0	.0	2138.4	149.0	-3.0
MAY	8.	.5	7.69	3.8	7.	.4	.0	.0	2137.7	145.3	-3.7
JUN	5.	.3	9.32	4.5	7.	.4	.0	.0	2136.9	140.7	-4.6
JUL	0.	.0	11.00	5.1	13.	.8	.0	.0	2135.9	134.8	-5.9
AUG	0.	.0	9.60	4.3	11.	.7	.0	.0	2135.0	129.8	-5.0
SEP	0.	.0	7.57	3.3	3.	.2	.0	.0	2134.3	126.3	-3.5
OCT	0.	.0	6.14	2.6	0.	.0	.0	.0	2133.8	123.7	-2.6
NOV	0.	.0	2.07	.9	0.	.0	.0	.0	2133.6	122.8	-.9
DEC	0.	.0	1.20	.5	0.	.0	.0	.0	2133.5	122.3	-.5
TOTAL		1.1	65.25	30.4		2.7	.0	.0			-32.0
MOST PROBABLE INFLOW CONDITIONS											
JAN	3.	.2	.95	.5	0.	.0	.0	.0	2139.2	154.0	-.3
FEB	7.	.4	1.04	.5	0.	.0	.0	.0	2139.2	153.9	-.1
MAR	8.	.5	1.90	1.0	2.	.1	.0	.0	2139.1	153.3	-.6
APR	22.	1.3	5.13	2.6	2.	.1	.0	.0	2138.9	151.9	-1.4
MAY	29.	1.8	6.24	3.1	5.	.3	.0	.0	2138.6	150.3	-1.6
JUN	27.	1.6	7.73	3.8	5.	.3	.0	.0	2138.2	147.8	-2.5
JUL	21.	1.3	8.84	4.3	11.	.7	.0	.0	2137.5	144.1	-3.7
AUG	16.	1.0	7.71	3.7	7.	.4	.0	.0	2137.0	141.0	-3.1
SEP	2.	.1	6.12	2.9	2.	.1	.0	.0	2136.5	138.1	-2.9
OCT	0.	.0	4.47	2.1	0.	.0	.0	.0	2136.1	136.0	-2.1
NOV	0.	.0	2.07	1.0	0.	.0	.0	.0	2135.9	135.0	-1.0
DEC	2.	.1	1.12	.5	0.	.0	.0	.0	2135.8	134.6	-.4
TOTAL		8.3	53.32	26.0		2.0	.0	.0			-19.7
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	18.	1.1	.85	.4	0.	.0	.0	.0	2139.4	155.0	.7
FEB	38.	2.1	.97	.5	0.	.0	.0	.0	2139.6	156.6	1.6
MAR	72.	4.4	1.84	1.0	2.	.1	.0	.0	2140.1	159.9	3.3
APR	86.	5.1	4.05	2.1	2.	.1	.0	.0	2140.6	162.8	2.9
MAY	112.	6.9	4.50	2.4	5.	.3	.0	.0	2141.3	167.0	4.2
JUN	146.	8.7	5.89	3.2	5.	.3	.0	.0	2142.1	172.2	5.2
JUL	263.	16.2	7.09	4.0	3.	.2	.0	.0	2143.9	184.2	12.0
AUG	112.	6.9	6.20	3.5	0.	.0	2.5	.0	2144.0	185.1	.9
SEP	61.	3.6	4.72	2.7	0.	.0	.9	.0	2144.0	185.1	.0
OCT	50.	3.1	3.11	1.8	0.	.0	1.3	.0	2144.0	185.1	.0
NOV	32.	1.9	2.07	1.2	0.	.0	.7	.0	2144.0	185.1	.0
DEC	24.	1.5	1.02	.6	0.	.0	.9	.0	2144.0	185.1	.0
TOTAL		61.5	42.31	23.4		1.0	6.3	.0			30.8

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
1995	496,000	2,658,000
1996	1,000	2,659,000

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
1995	29,000	982,000
1996	2,255,000	3,237,000

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
1994	1,135,000	3,104,000
1995	5,391,000	8,495,000
1996	5,953,000	14,448,000

HUGH BUTLER

Year	$ Damages Prevented	Cumulative Total
1962	2,000	2,000
1965	137,000	139,000
1967	42,000	181,000
1995	496,000	677,000
1996	1,848,000	2,525,000

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
1994	24,000	405,000
1995	540,000	945,000
1996	2,256,000	3,201,000

KEITH SEBELIUS

Year	$ Damages Prevented	Cumulative Total
1966	132,000	132,000
1967	885,000	1,017,000
1972	498,000	1,515,000
1995	563,000	2,078,000
1996	1,849,000	3,927,000

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
1991	105,000	27,401,000
1992	1,159,000	28,560,000
1993	55,261,000	83,821,000
1994	1,233,000	85,054,000
1995	28,182,000	113,236,000
1996	14,579,000	127,815,000

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
1992	3,252,000	10,650,000
1993	124,769,000	135,419,000
1994	24,000	135,443,000
1995	7,098,000	142,541,000
1996	1,223,000	143,764,000

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
1992	591,000	3,797,000
1993	54,794,000	58,591,000
1994	1,126,000	59,717,000
1995	13,514,000	73,231,000
1996	2,264,000	75,495,000

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
1992	303,000	3,976,000
1993	68,390,000	72,366,000
1994	1,160,000	73,526,000
1995	26,867,000	100,393,000
1996	4,918,000	105,311,000

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
1992	17,535,000	36,613,000
1993	889,702,000	926,315,000
1994	8,952,000	935,267,000
1995	171,843,000	1,107,110,000
1996	51,981,000	1,159,091,000

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
1992	3,000	9,031,000
1993	101,444,000	110,475,000
1995	6,810,000	117,285,000
1996	7,276,000	124,561,000

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	136,000	76,945,000
1992	22,843,000	99,788,000
1993	1,294,360,000	1,394,148,000
1994	13,654,000	1,407,802,000
1995	261,829,000	1,669,631,000
1996	96,403,000	1,766,034,000

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

TABLE 6
WATER DIVERTED IN 1996 AND THE
ESTIMATED DIVERSION FOR 1997
(Units - Acre-Feet)

Irrigation District and Canal	1996 Irrigation Operations From	To	10-Year Average Diversion (1986-95)	1996 Diversion	Estimated Diversion in 1997
Mirage Flats Irrigation District					
Mirage Flats Canal	7/01	9/04	14,018	13,315	15,000
Ainsworth Irrigation District					
Ainsworth Canal	5/19	9/16	66,665	71,339	71,000
Sargent Irrigation District					
Sargent Canal	6/16	9/16	22,593	21,154	25,000
Farwell Irrigation District					
Farwell Canal	5/31	9/12	69,358	67,899	80,000
Twin Loups Irrigation District					
Above Davis Creek	4/26	9/30	--	28,338	40,000
Below Davis Creek	5/01	9/19	--	22,933	30,000
Total Twin Loups Irrigation District			--	51,271	70,000
Frenchman Valley Irrigation District					
Culbertson Canal	4/02	8/30	10,750	10,179	11,000
H & RW Irrigation District					
Culbertson Extension Canal	6/03	8/29	12,626	12,016	13,000
Frenchman-Cambridge Irrigation District					
Meeker-Driftwood Canal	6/18	9/06	29,560	26,998	32,000
Red Willow Canal	6/20	9/06	7,731	5,217	8,000
Bartley Canal	6/18	9/06	8,510	6,250	10,000
Cambridge Canal	6/19	9/06	26,820	14,542	29,000
Total Frenchman-Cambridge Irrigation District			72,621	53,007	79,000
Almena Irrigation District					
Almena Canal	5/06	9/01	1,861	4,860	5,000
Bostwick Irrigation District in Nebraska					
Franklin Canal	6/19	9/11	25,218	27,440	30,000
Naponee Canal	7/01	8/31	2,469	1,462	3,000
Franklin Pump Canal	7/01	9/07	2,939	2,224	3,000
Superior Canal	6/17	9/04	13,633	14,234	16,000
Courtland Canal (Nebraska)	4/25	9/09	1,673	1,404	2,000
Total Bostwick Irrigation District in Nebraska			45,932	46,764	54,000
Kansas-Bostwick Irrigation District					
Courtland Canal above Lovewell	4/29	9/14	24,038	24,996	31,000
Courtland Canal below Lovewell	5/28	9/09	40,110	46,946	46,000
Total Kansas-Bostwick Irrigation District			64,148	71,942	77,000
Kirwin Irrigation District					
Kirwin Canal	5/21	8/30	11,861	23,711	20,000
Webster Irrigation District					
Osborne Canal	5/31	8/30	7,500	15,499	16,000
Glen Elder Irrigation District	No project water in 1996.		--	--	5,400
TOTAL			399,933	462,956	541,400

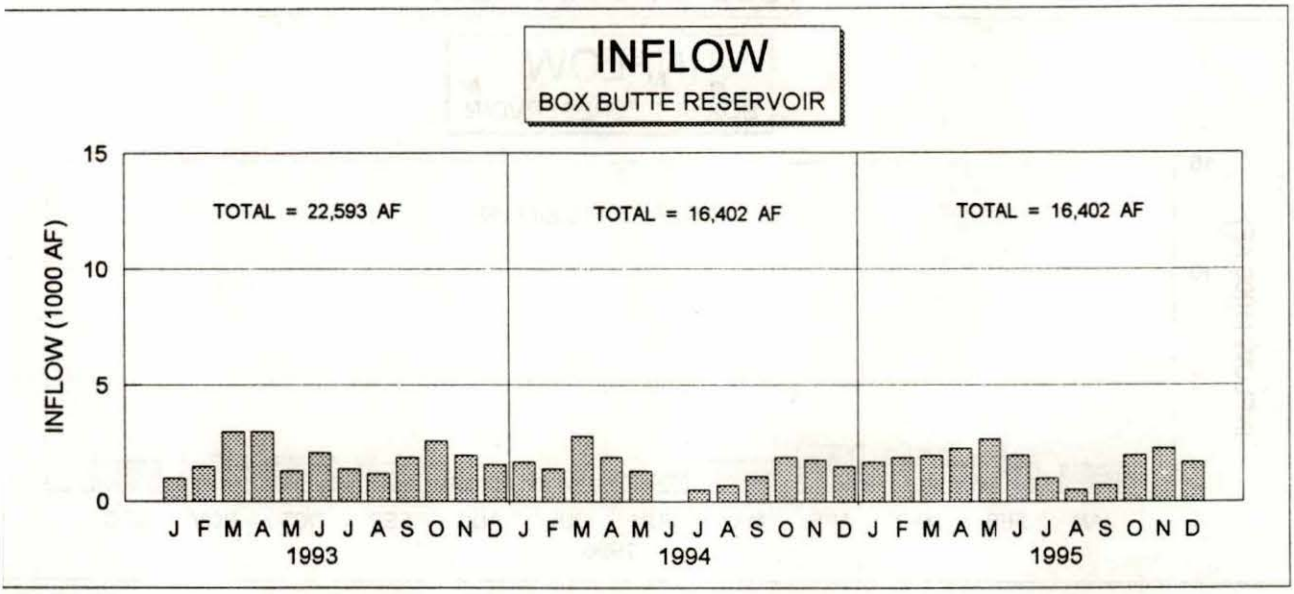
TABLE 7
NEBRASKA-KANSAS AREA OFFICE
Summary of Precipitation, Reservoir Storage and Inflows

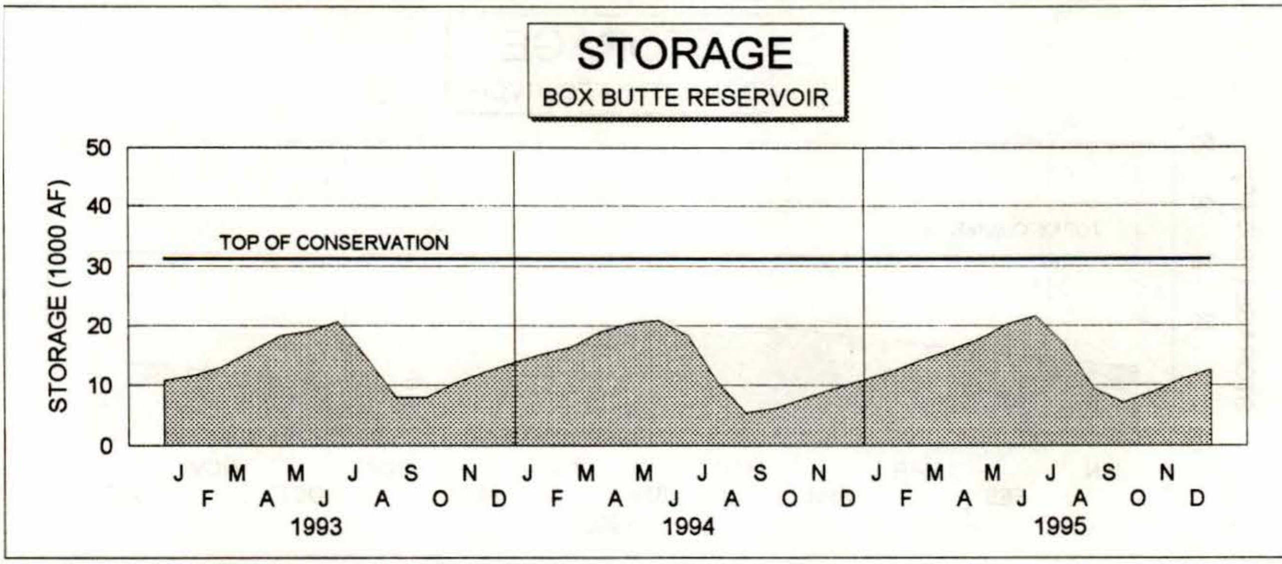
CALENDAR YEAR 1996

Reservoir	Total Precip. Inches	Percent Of Average %	Storage 12-31-95 AF	Storage 12-31-96 AF	Gain or Loss AF	Maximum Storage Content AF	Maximum Storage Date	Minimum Storage Content AF	Minimum Storage Date	Total Inflow AF	Percent Of Most Probable %
Box Butte	22.70	135	12,608	13,345	737	20,320	JUN 16	8,150	AUG 28	16,843	92
Merritt	23.02	116	68,831	69,389	558	75,665	MAY 30	35,872	SEP 7	192,866	109
Sherman	25.72	114	51,531	52,241	710	69,653	JUN 2	48,042	APR 18	91,268	81
Calamus	25.77	109	108,566	115,342	6,776	129,253	JUN 1	81,825	SEP 18	290,737	117
Davis Creek	25.82	112	18,285	26,311	8,026	31,192	JUN 27	16,077	APR 26	46,506	136
Bonny	20.47	120	36,460	36,892	432	39,511	JUN 1	35,577	SEP 17	13,733	81
Enders	24.98	132	23,334	27,105	3,771	31,098	JUN 25	21,331	AUG 25	20,069	66
Swanson	27.97	140	81,238	99,251	18,013	112,707	JUN 23	81,403	JAN 1	70,375	109
Hugh Butler	22.50	113	31,465	35,883	4,418	37,388	JUN 19	31,493	JAN 1	18,859	102
Harry Strunk	25.30	123	21,613	34,759	13,146	40,000	JUN 23	21,711	JAN 1	44,196	107
Keith Sebelius	34.83	142	24,513	40,228	15,715	40,228	DEC 31	24,530	JAN 1	27,022	587
Harlan County	32.15	142	263,580	306,234	42,654	379,716	AUG 10	263,814	JAN 1	361,796	263
Lovewell	26.66	95	37,320	41,210	3,890	52,970	NOV 19	33,200	JUL 8	47,018	74
Kirwin	29.70	126	104,330	105,850	1,520	111,170	JUN 6	101,740	SEP 15	57,722	344
Webster	30.71	130	82,482	83,900	1,418	87,996	JUN 25	77,523	OCT 22	51,239	407
Waconda	29.77	114	242,339	239,199	(3,140)	285,235	NOV 23	193,940	SEP 14	317,161	324
Cedar Bluff	26.01	125	91,680	154,300	62,620	154,300	DEC 31	91,230	MAY 3	80,871	974

EXHIBIT 1A

BOX BUTTE RESERVOIR
OPERATION





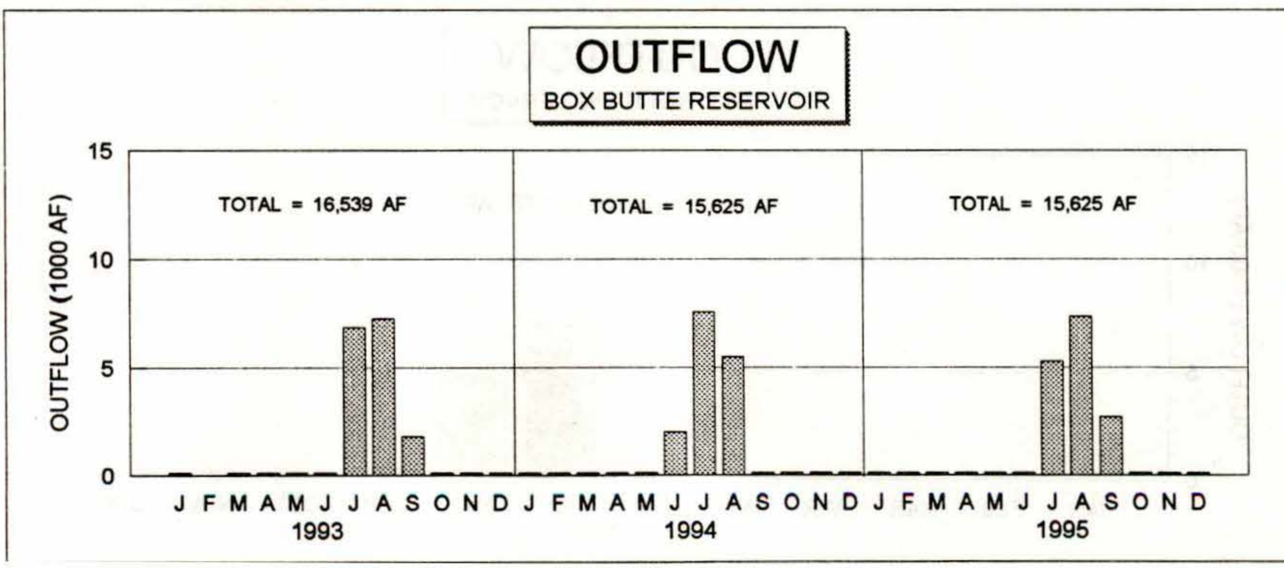
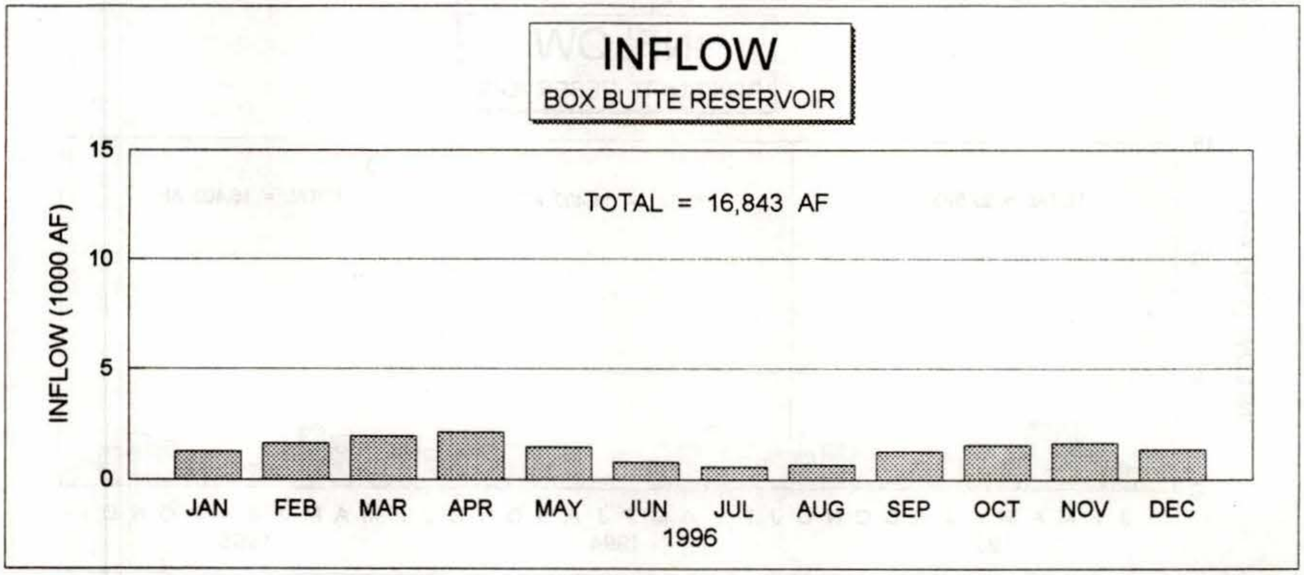
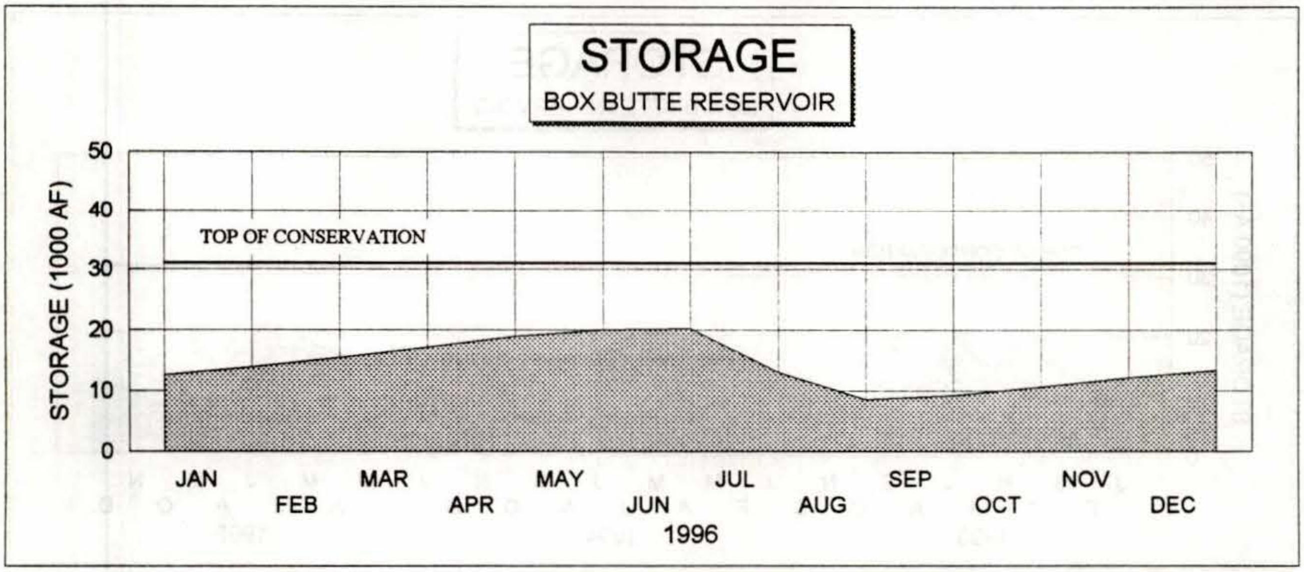


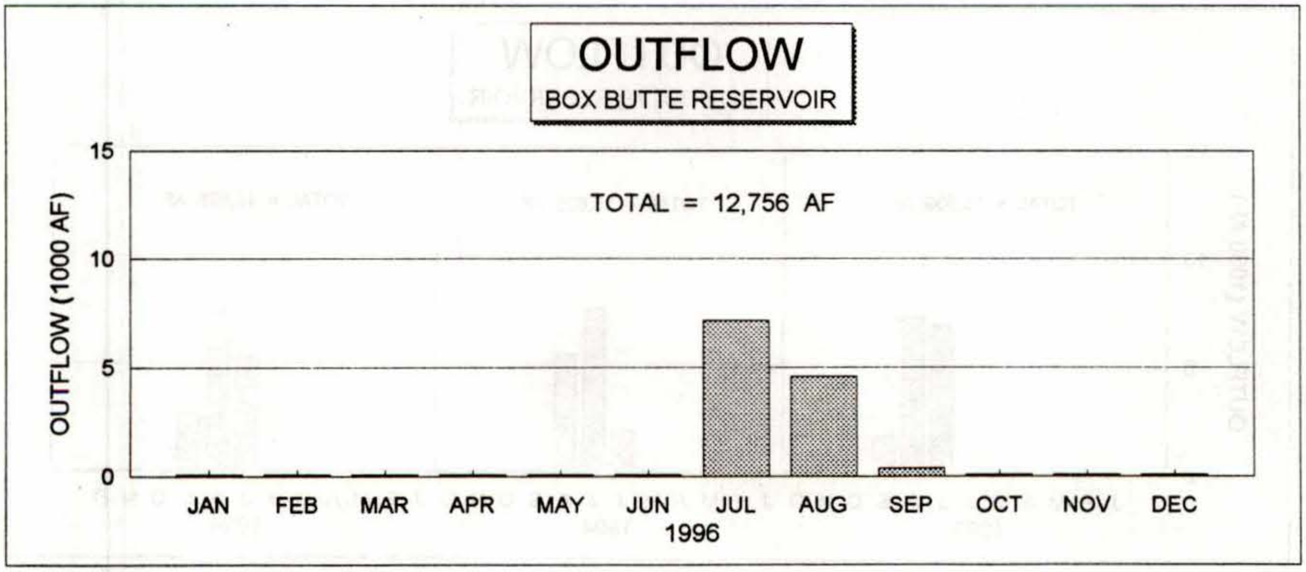
EXHIBIT 1B

BOX BUTTE RESERVOIR

1996 OPERATION

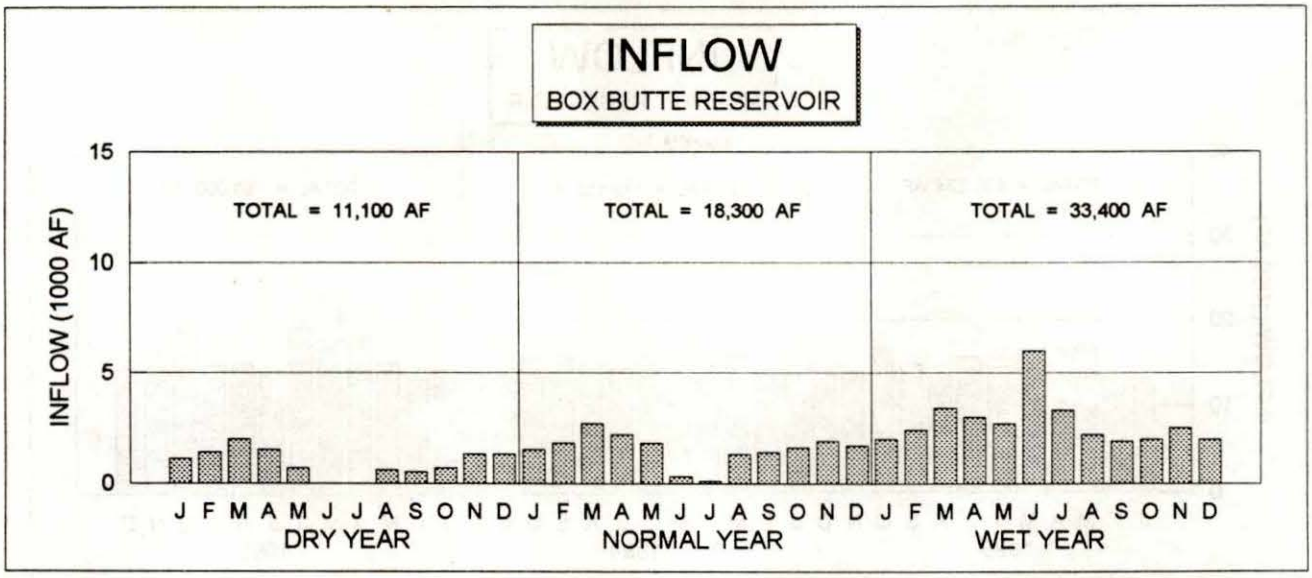


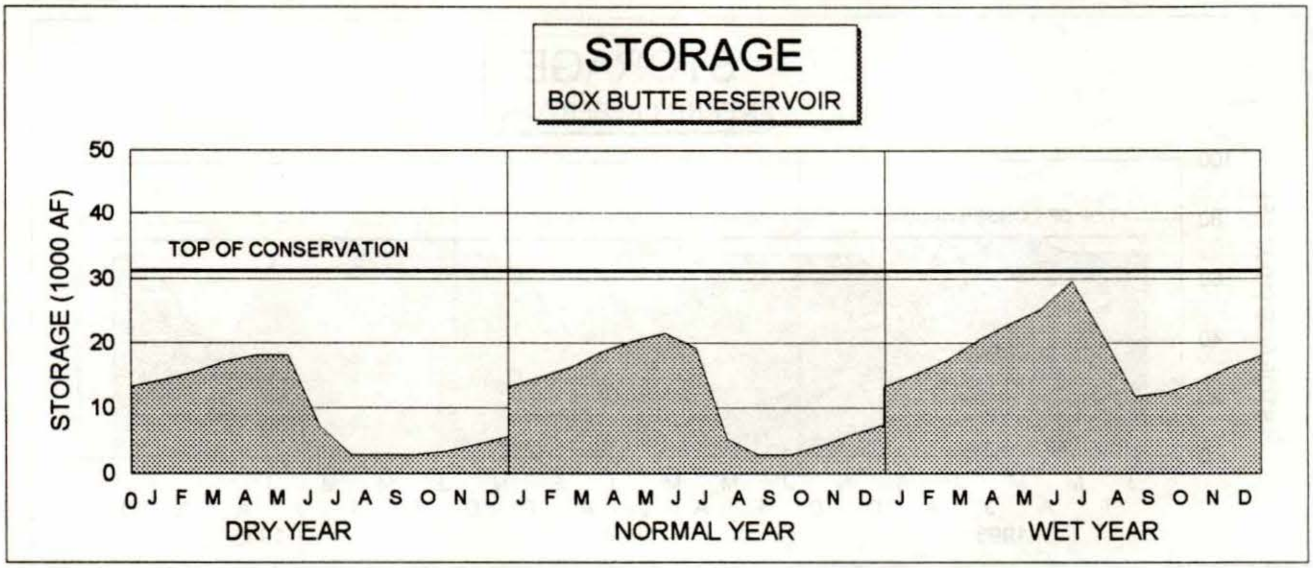




BOX BUTTE RESERVOIR

1997 OPERATION PLAN





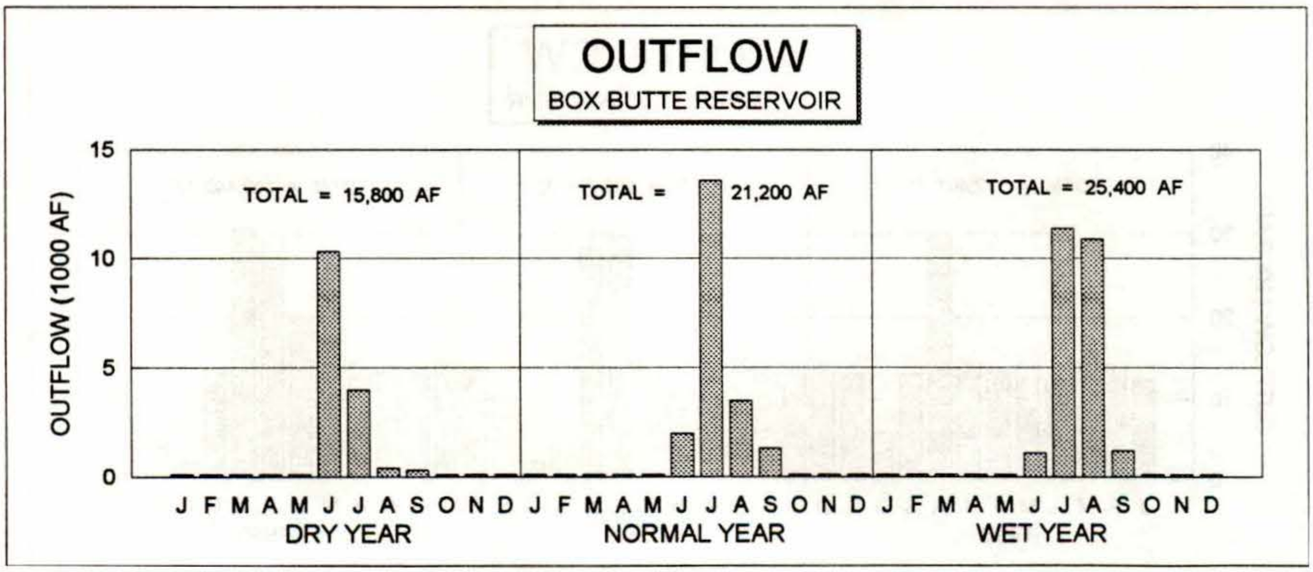
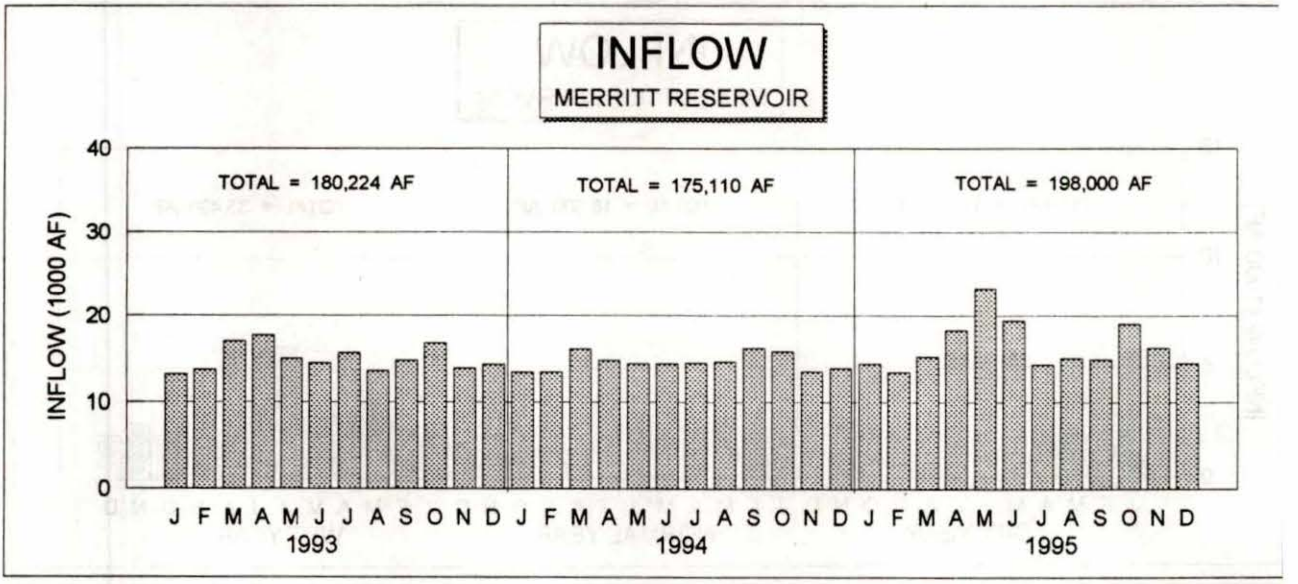
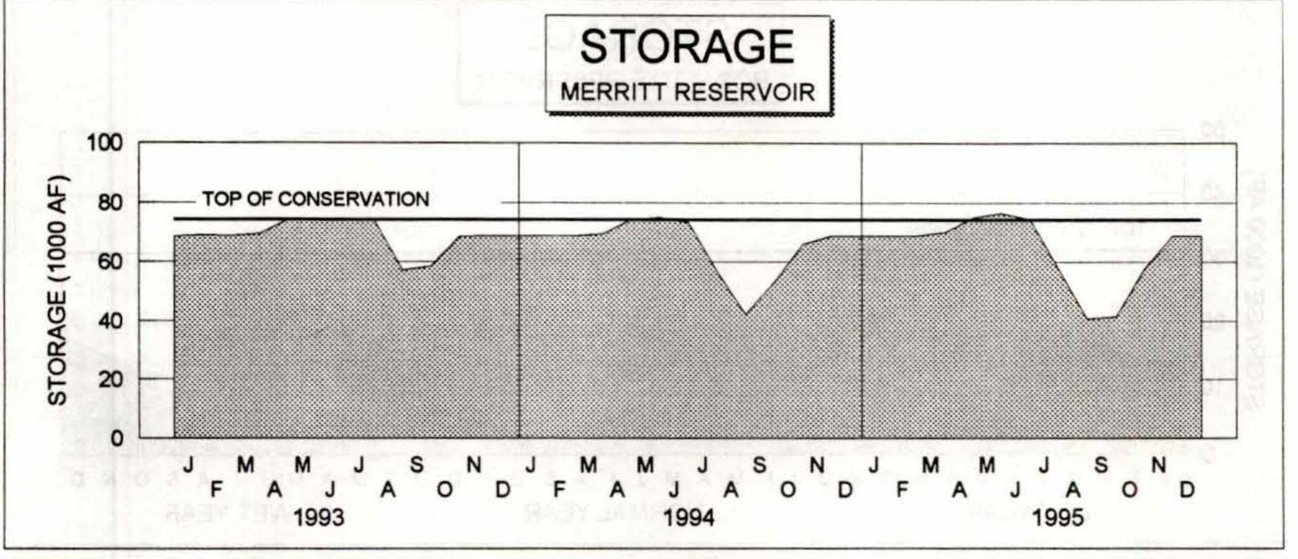


EXHIBIT 2A

MERRITT RESERVOIR

OPERATION





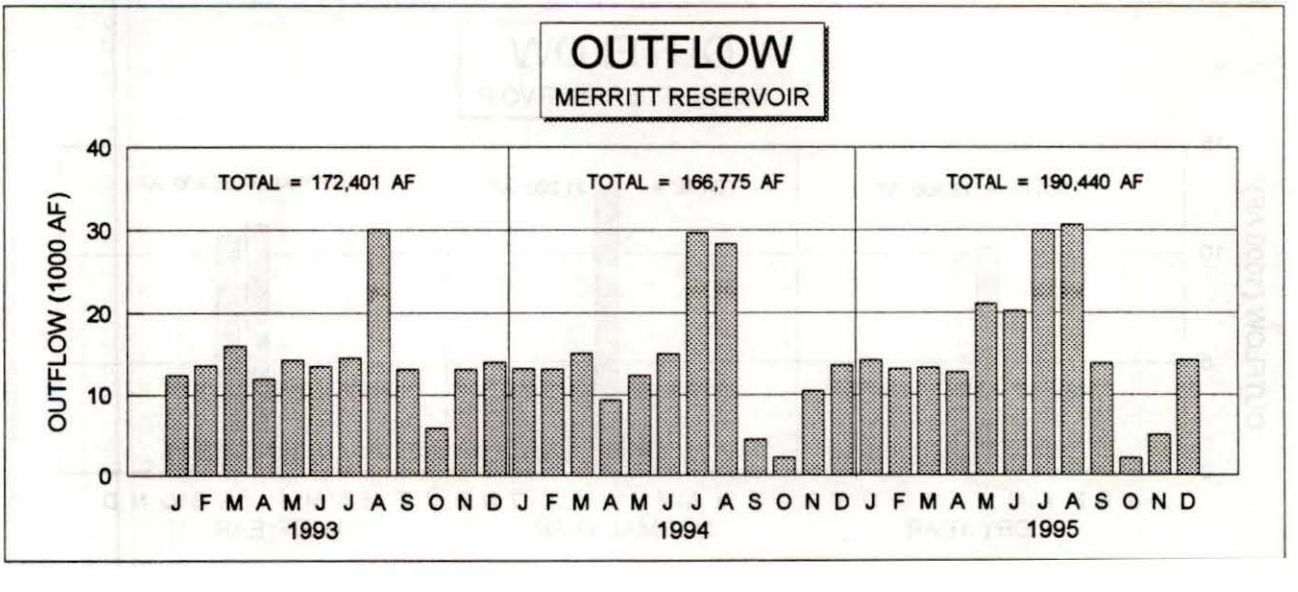
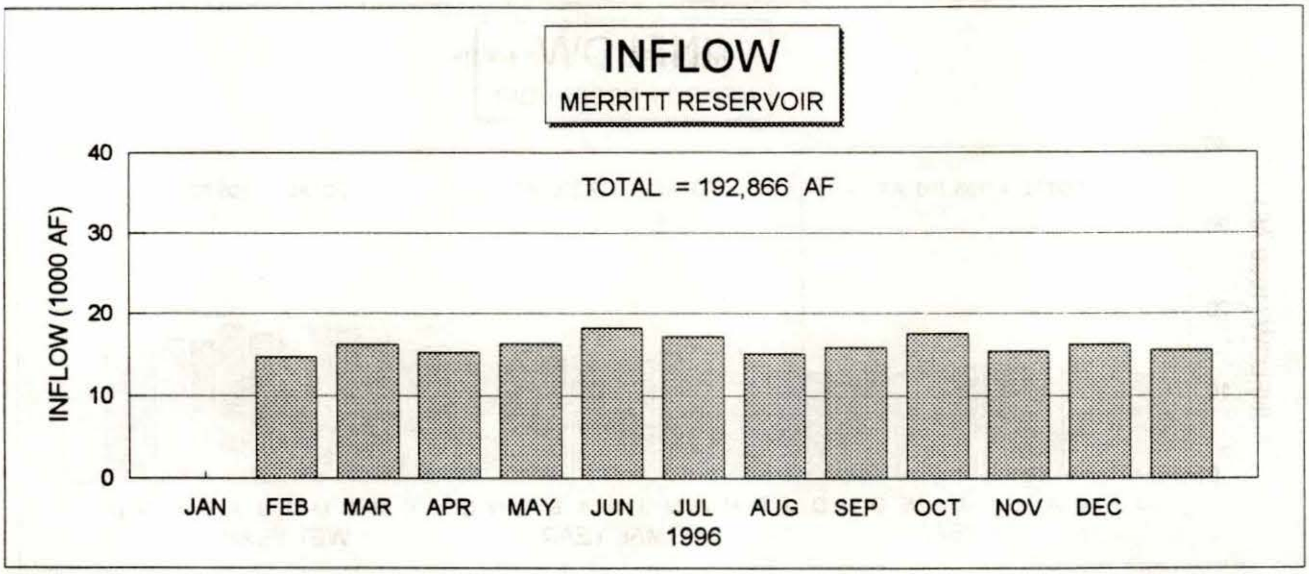
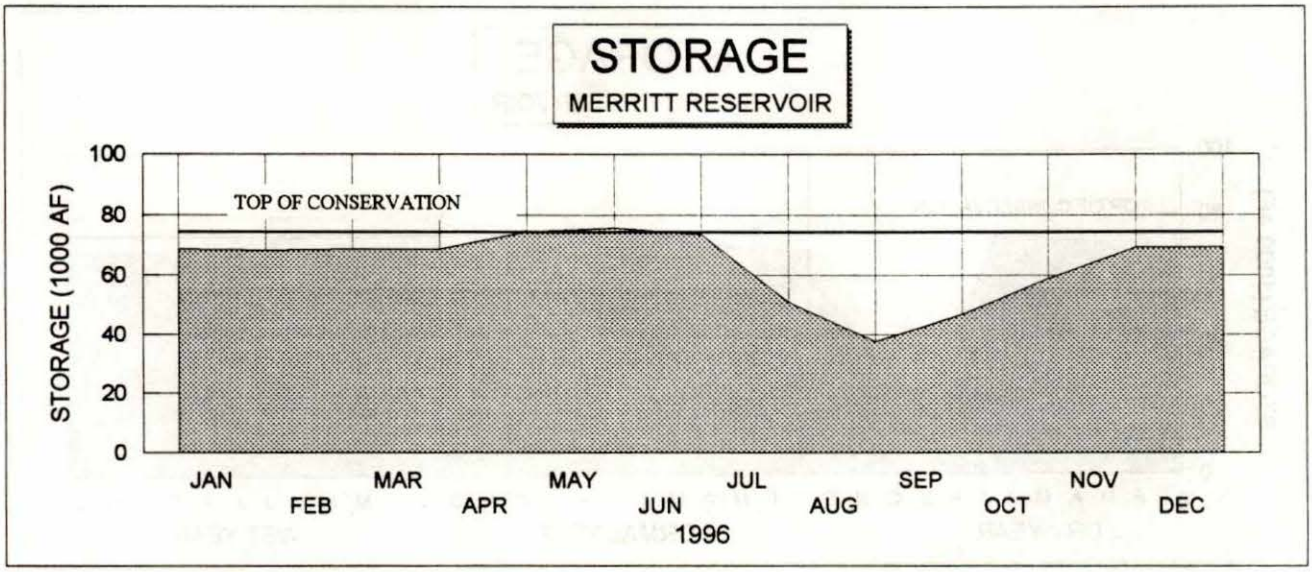


EXHIBIT 2B

MERRITT RESERVOIR

1996 OPERATION





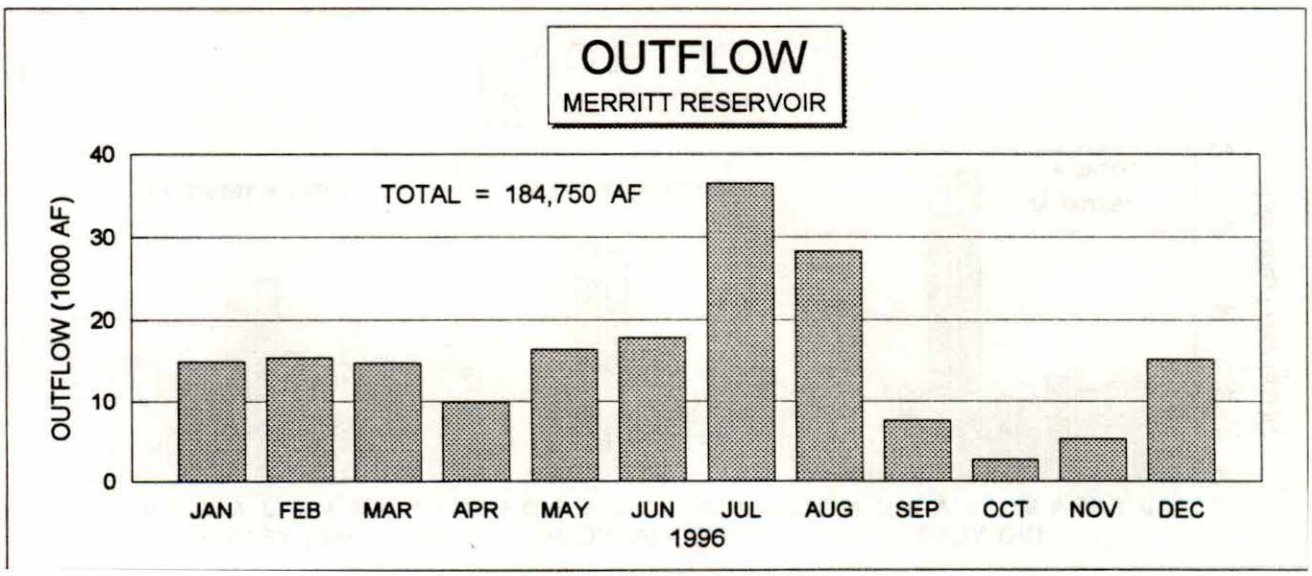
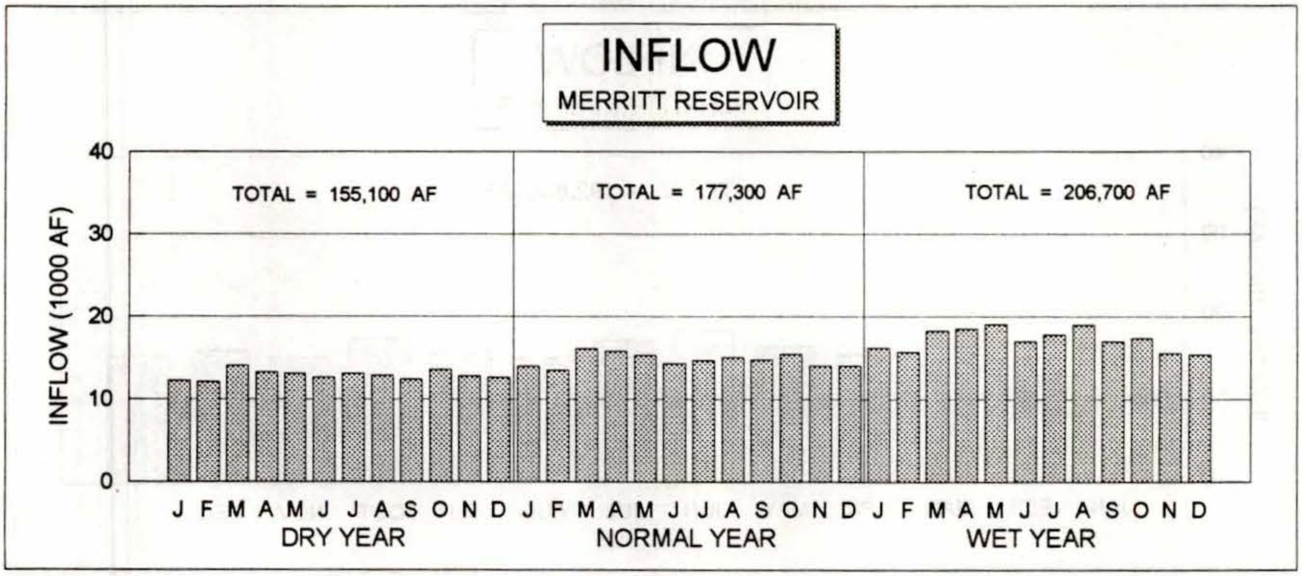
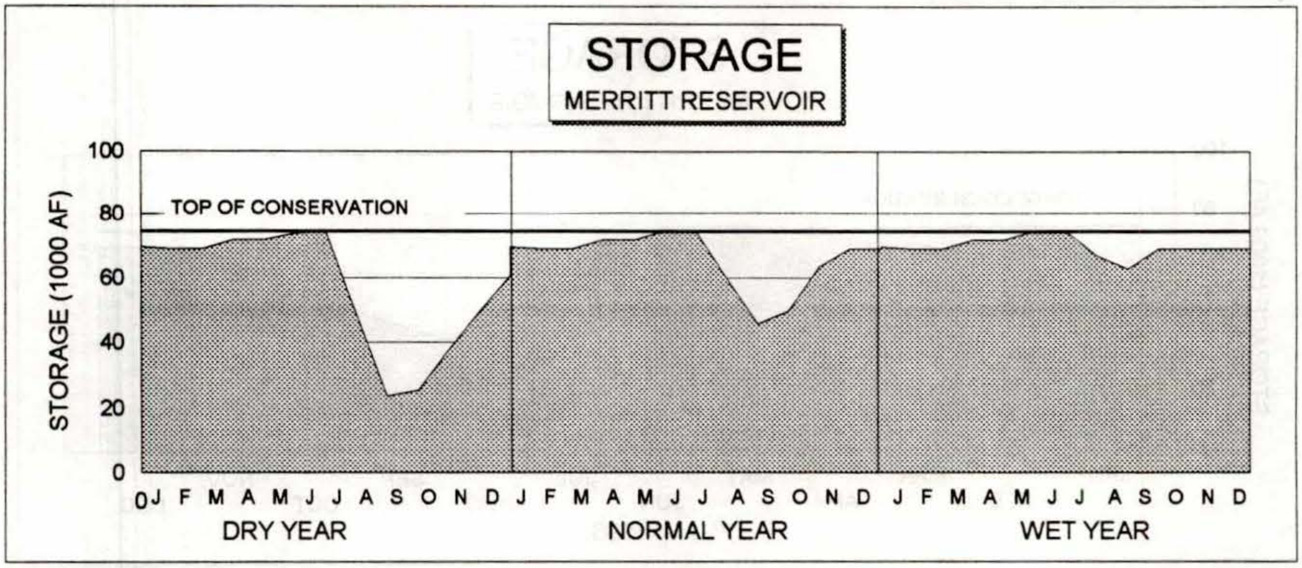
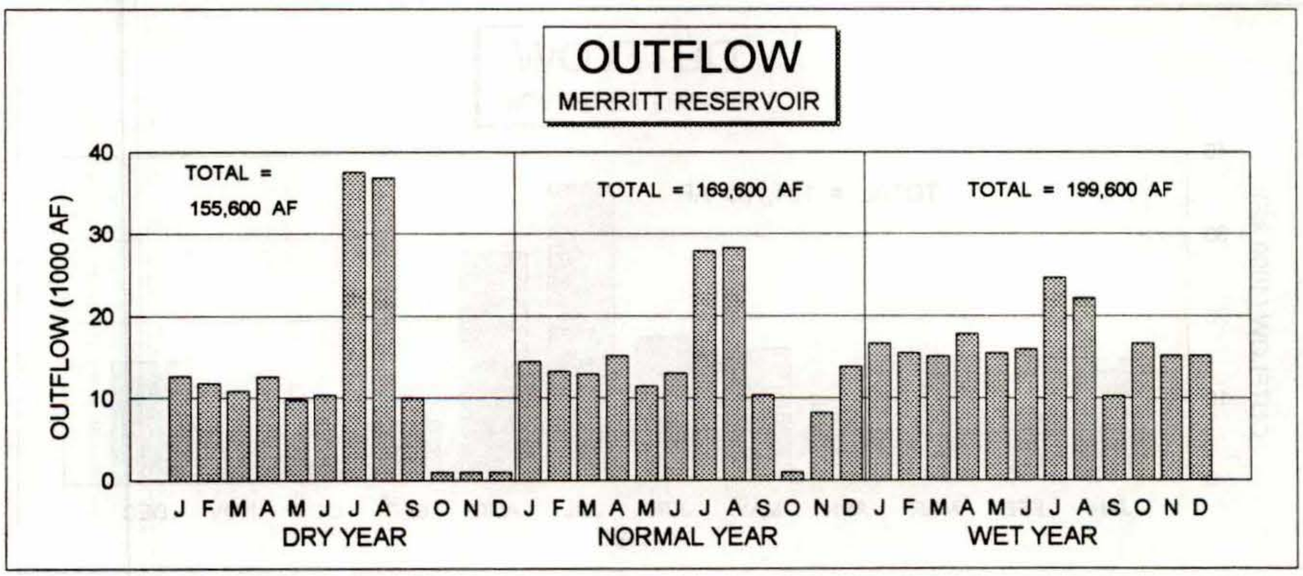


EXHIBIT 2C

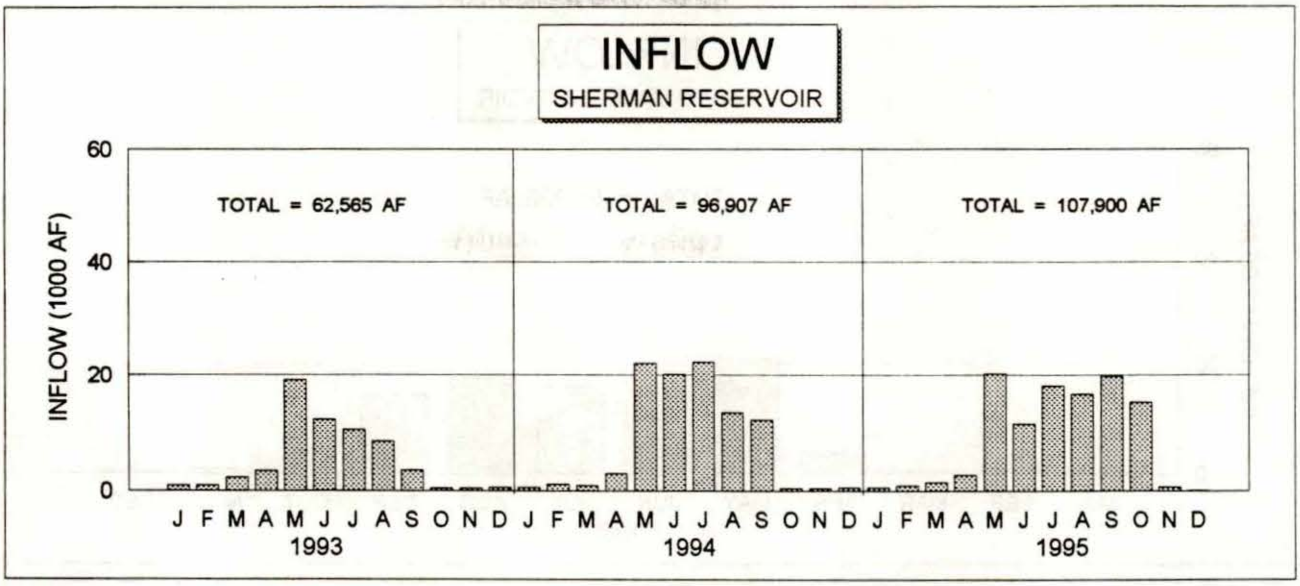
MERRITT RESERVOIR
1997 OPERATION PLAN

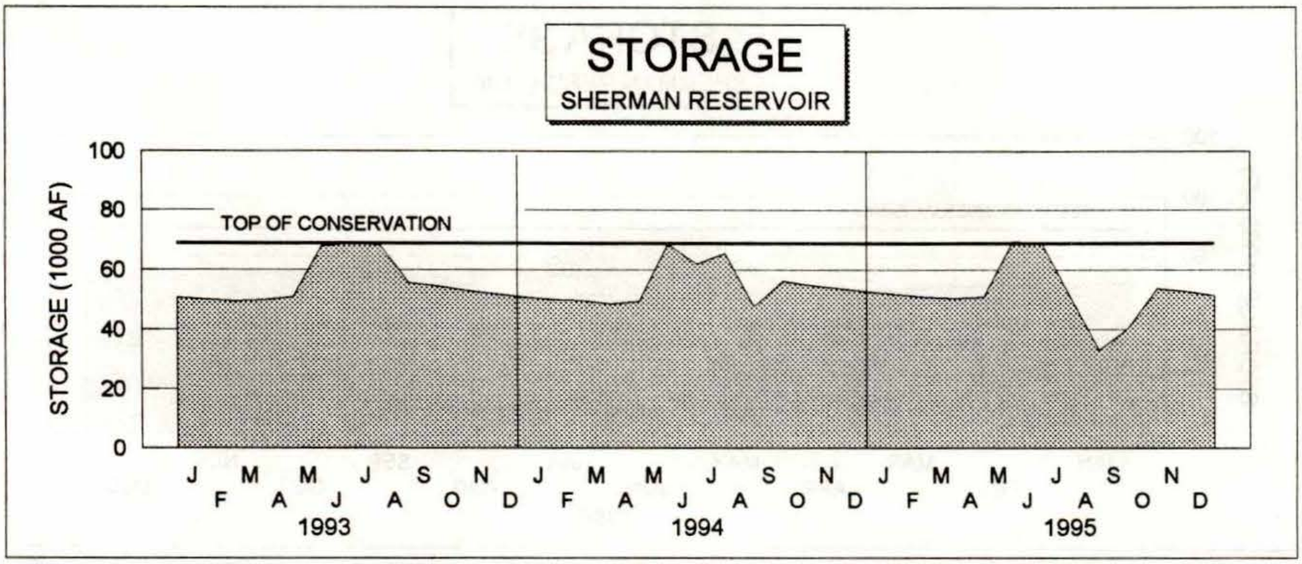






SHERMAN RESERVOIR
OPERATION





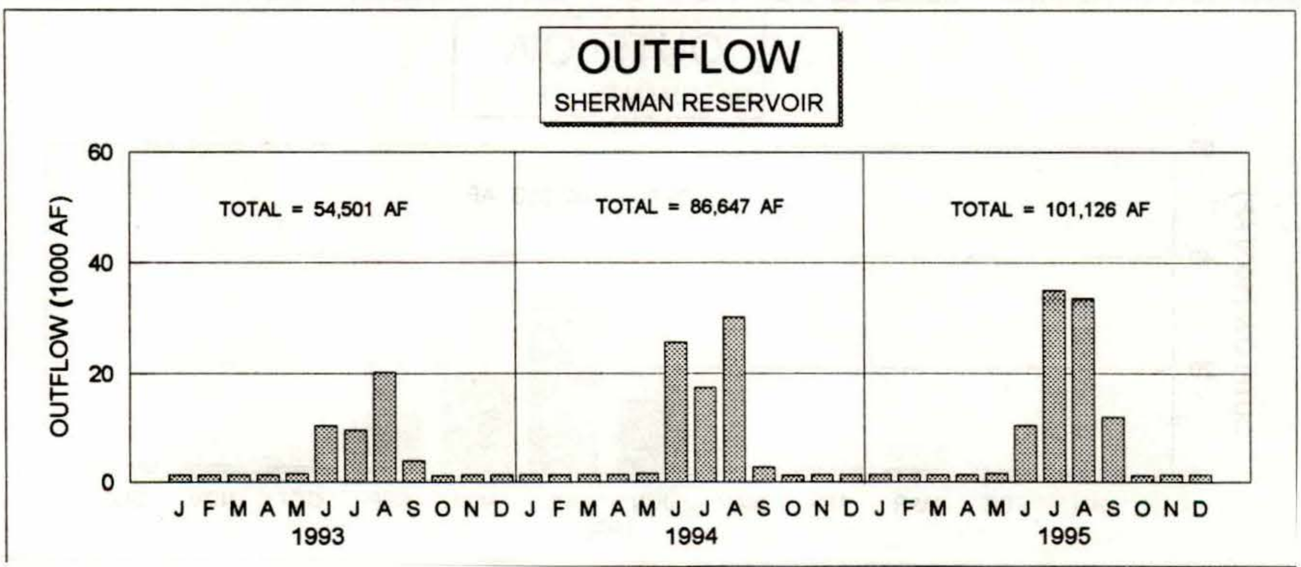
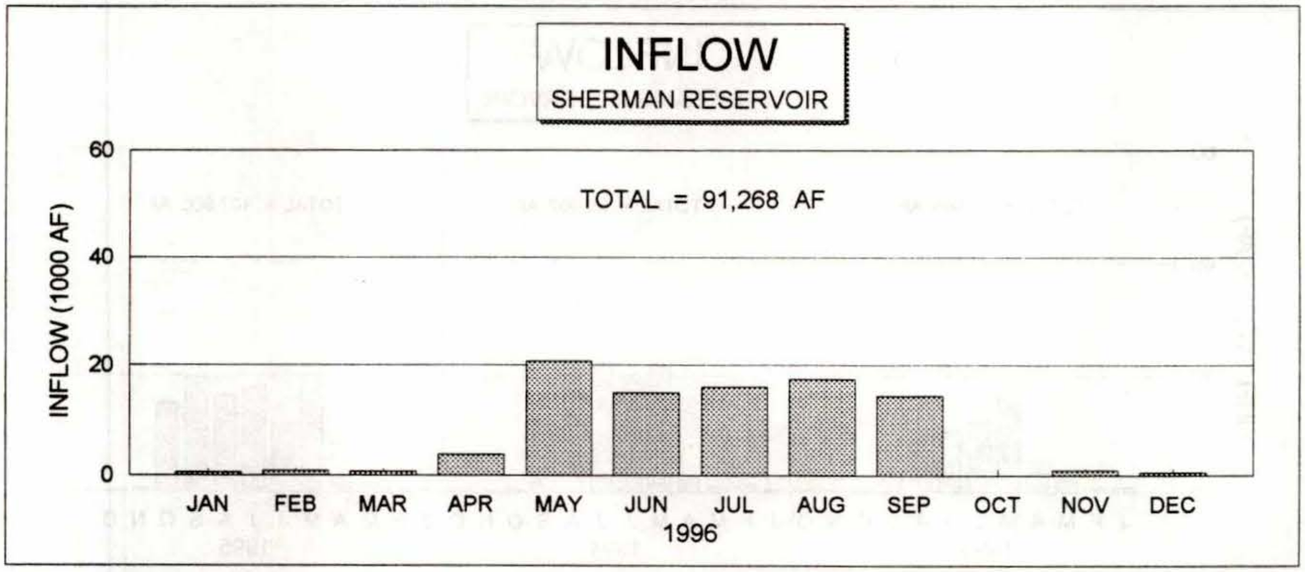
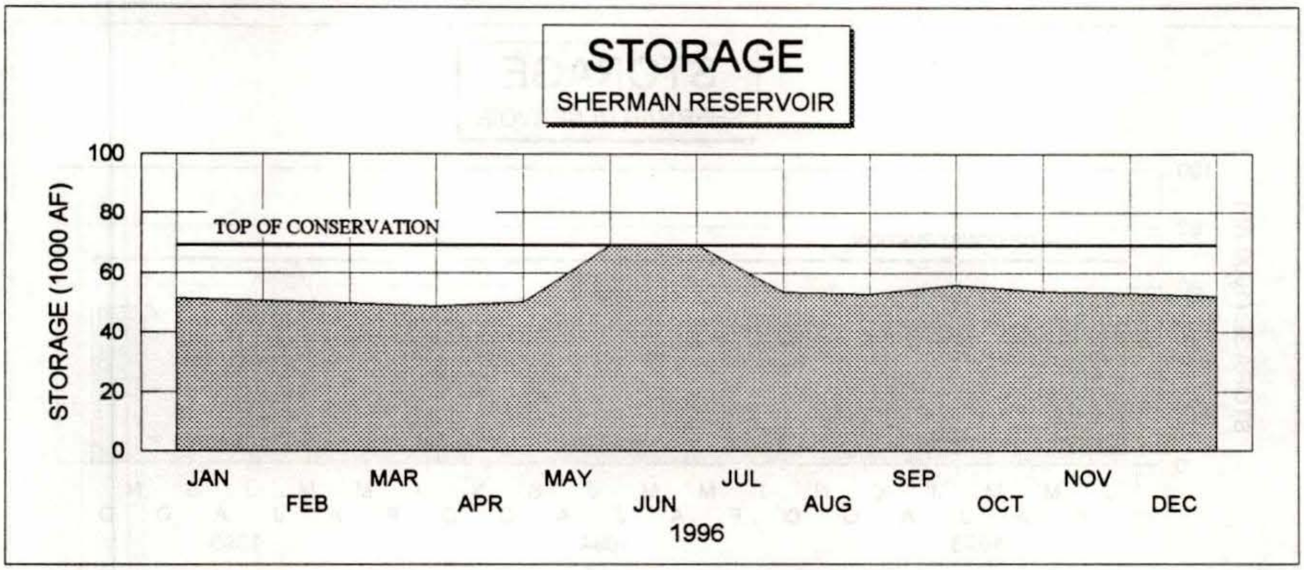


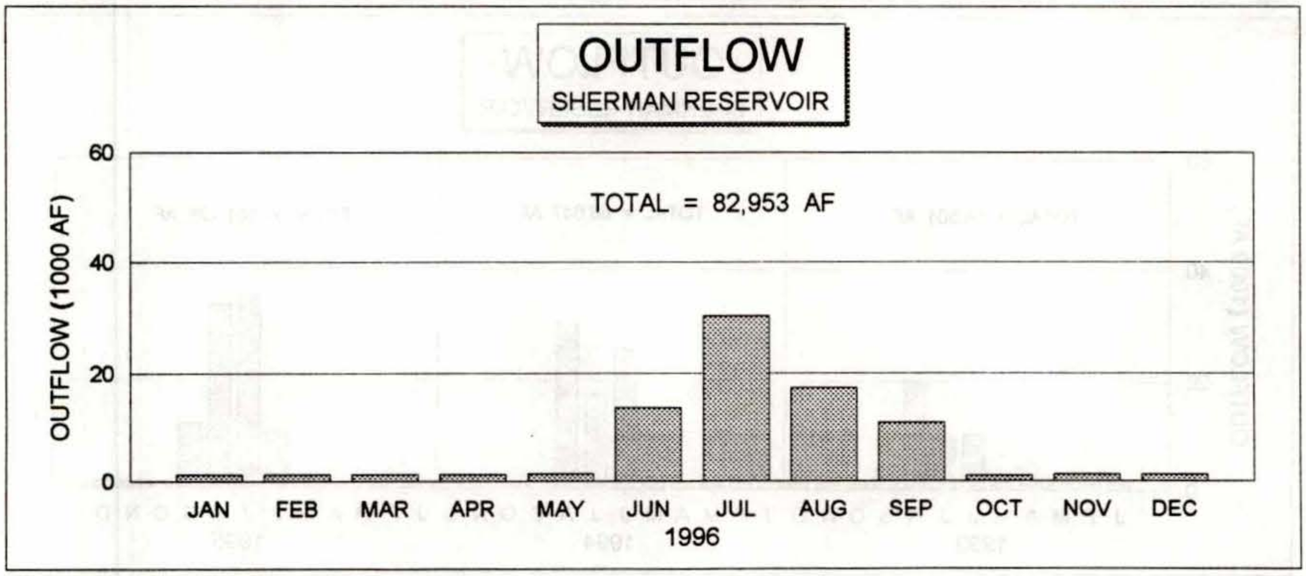
EXHIBIT 3B

SHERMAN RESERVOIR

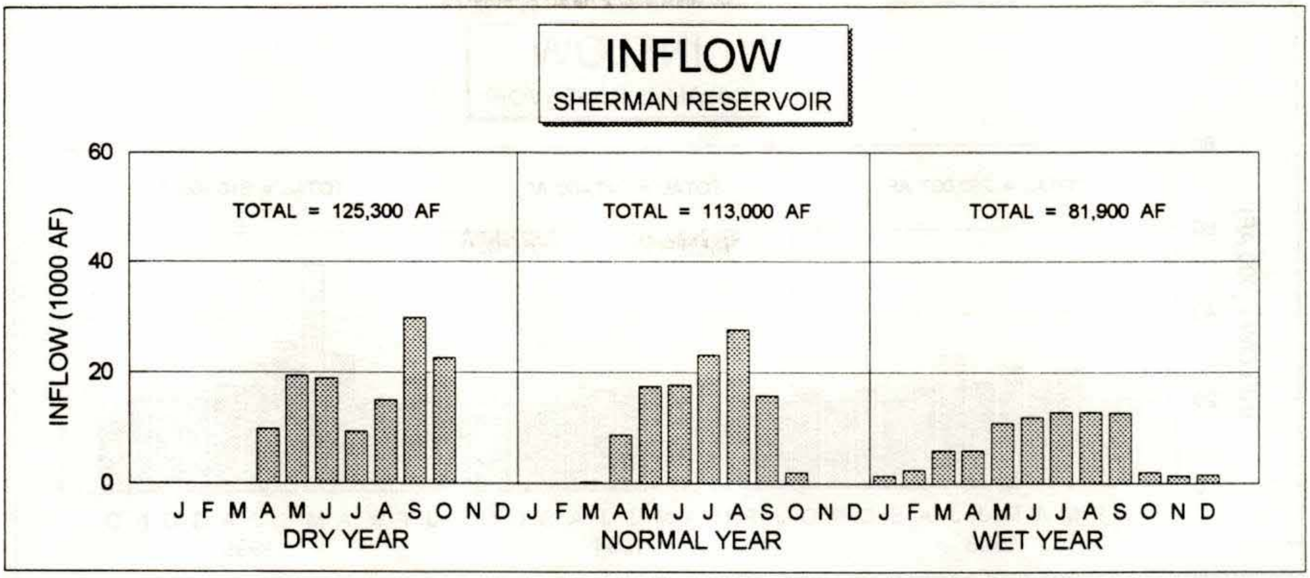
1996 OPERATION

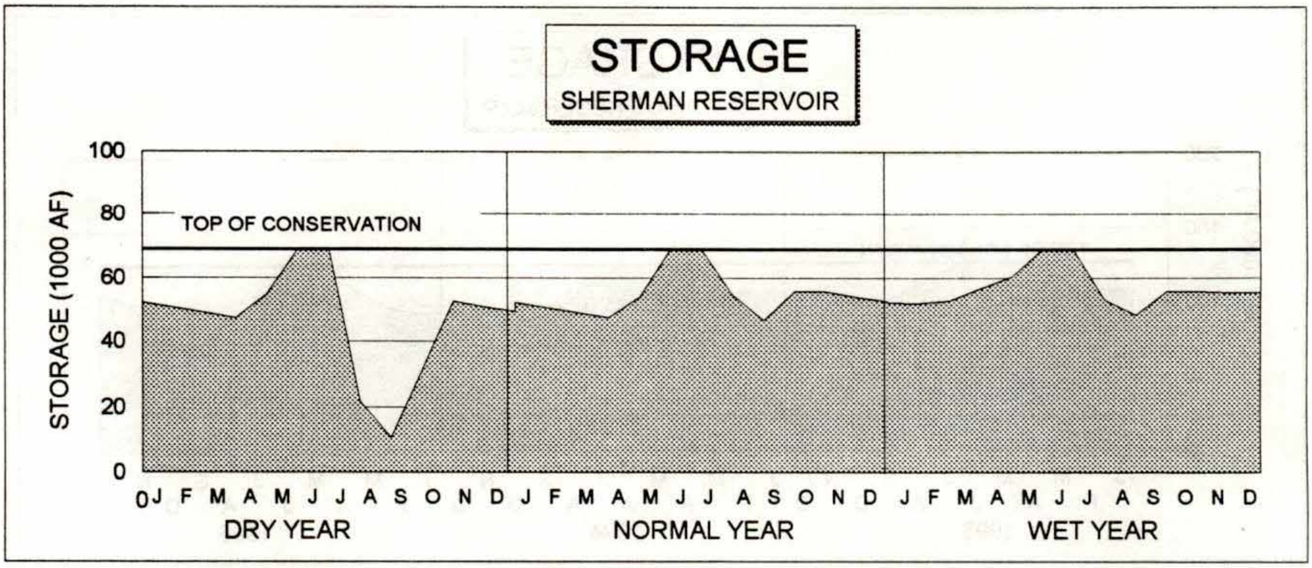






SHERMAN RESERVOIR
1997 OPERATION PLAN





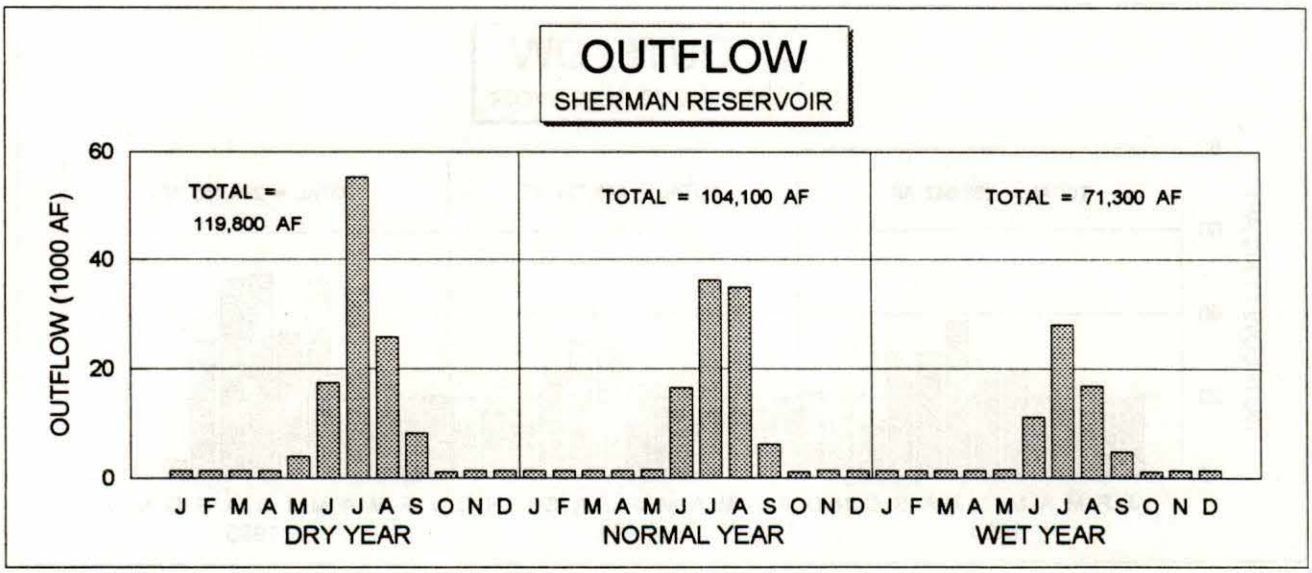
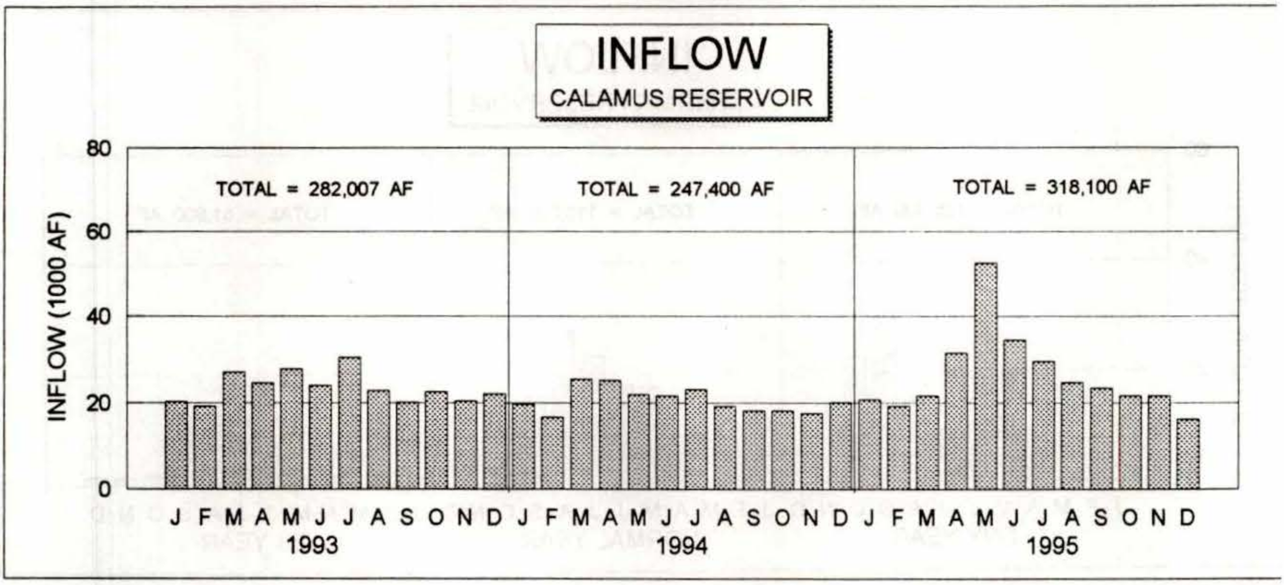
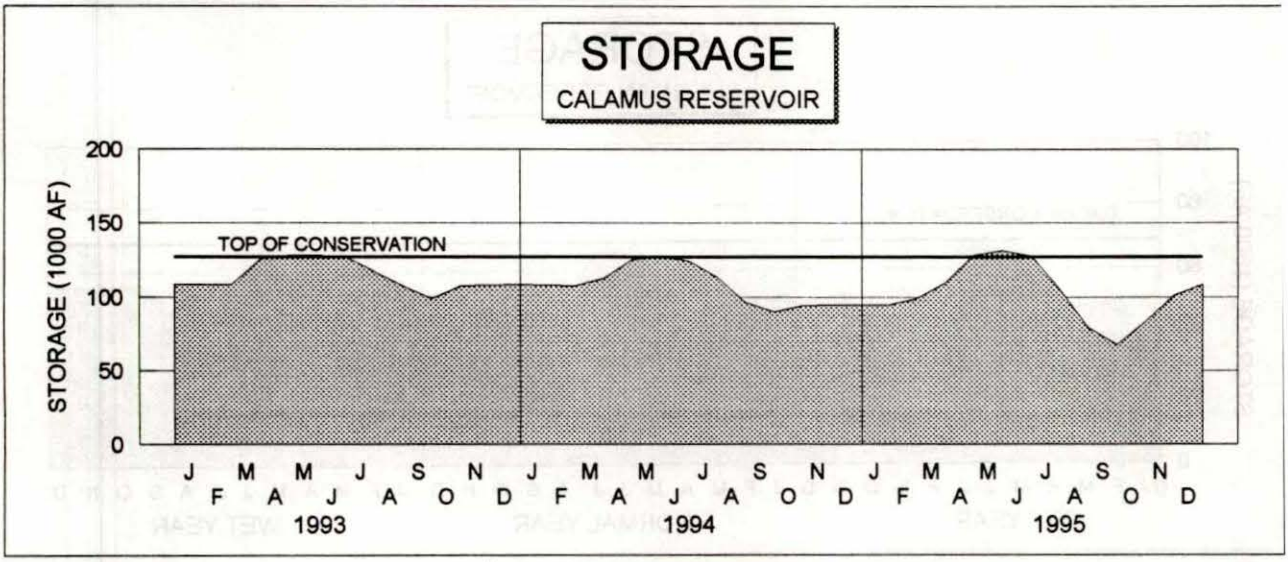
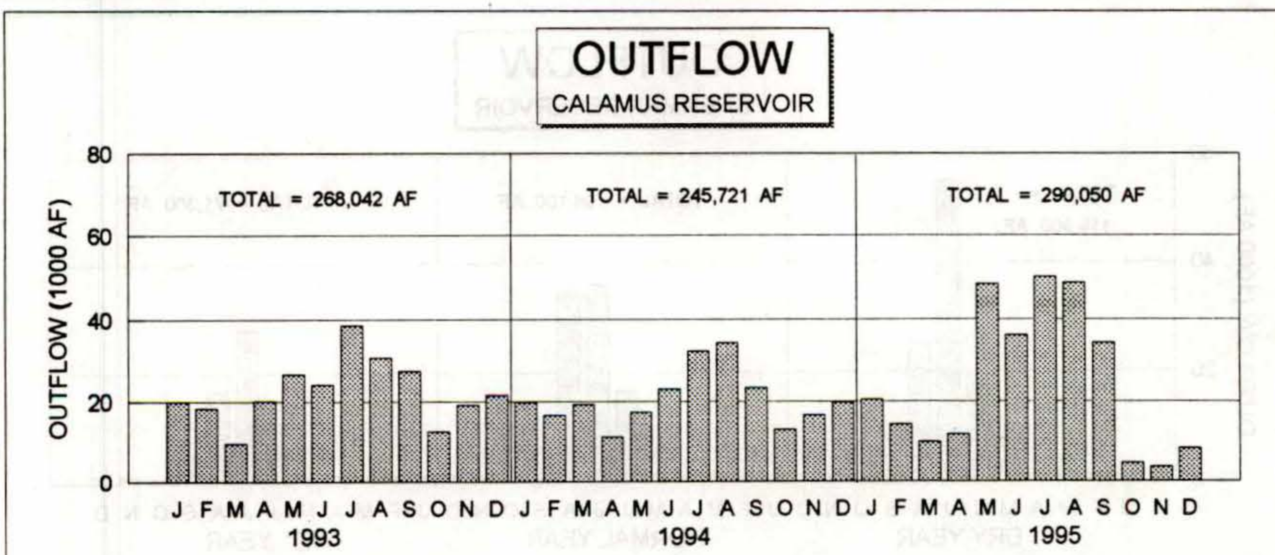


EXHIBIT 4A

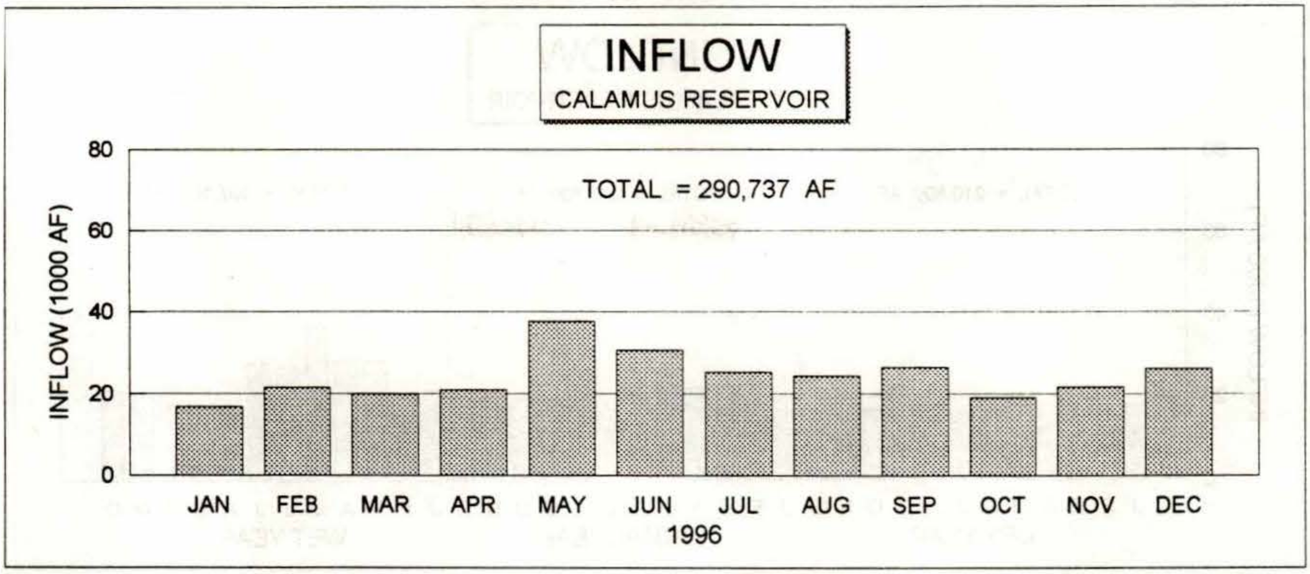
CALAMUS RESERVOIR
OPERATION

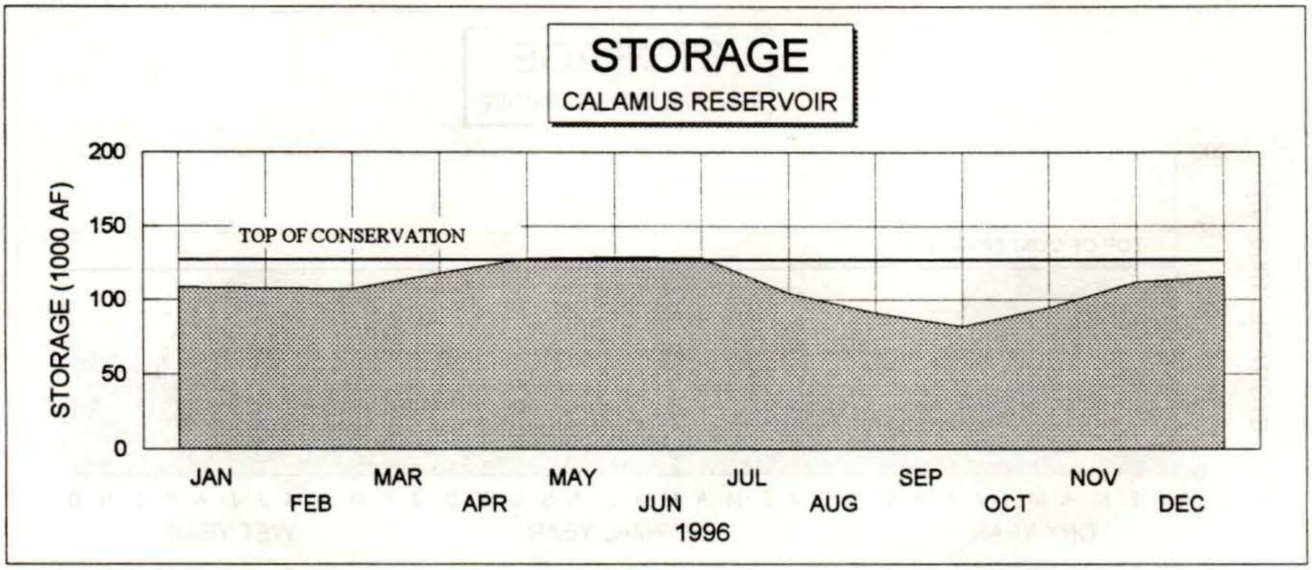






CALAMUS RESERVOIR
1996 OPERATION





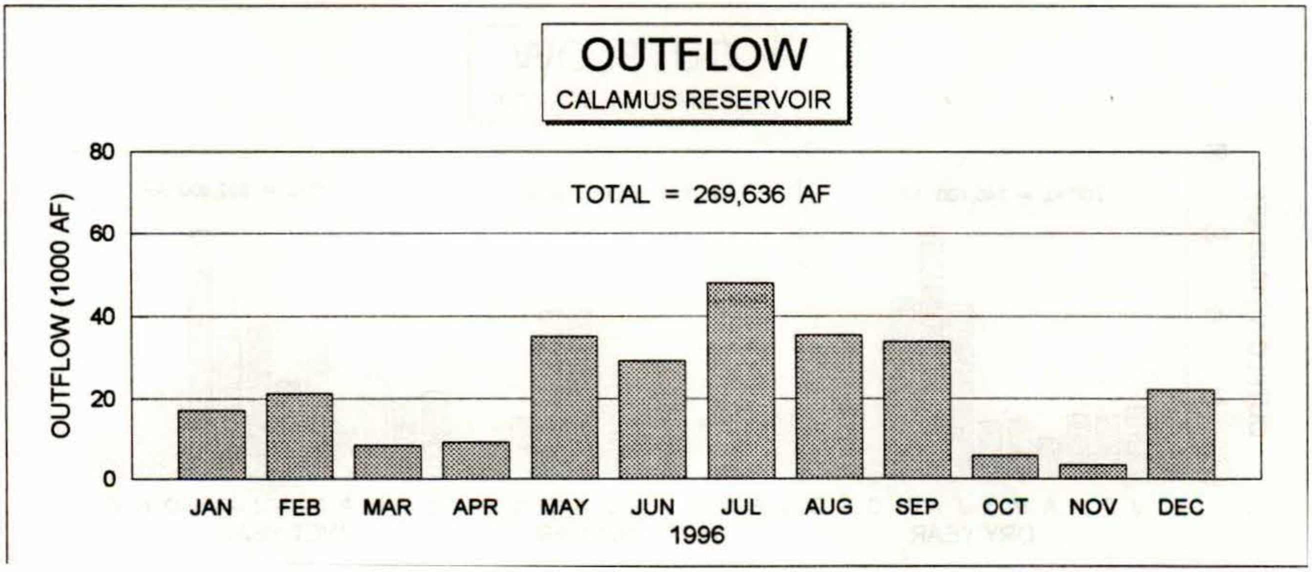
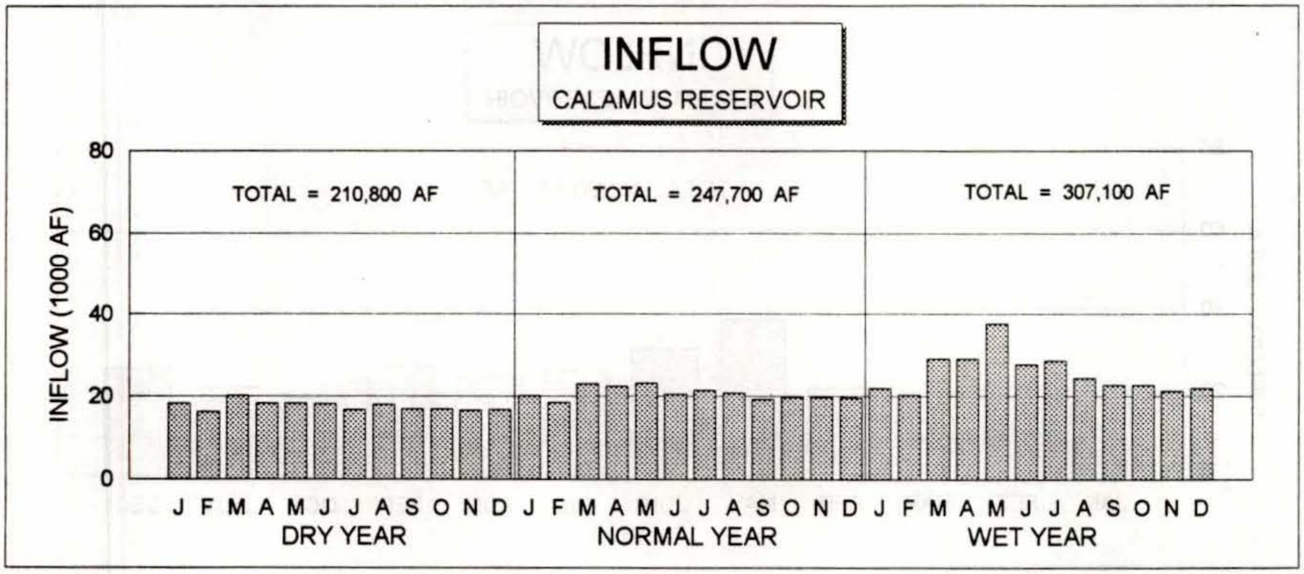
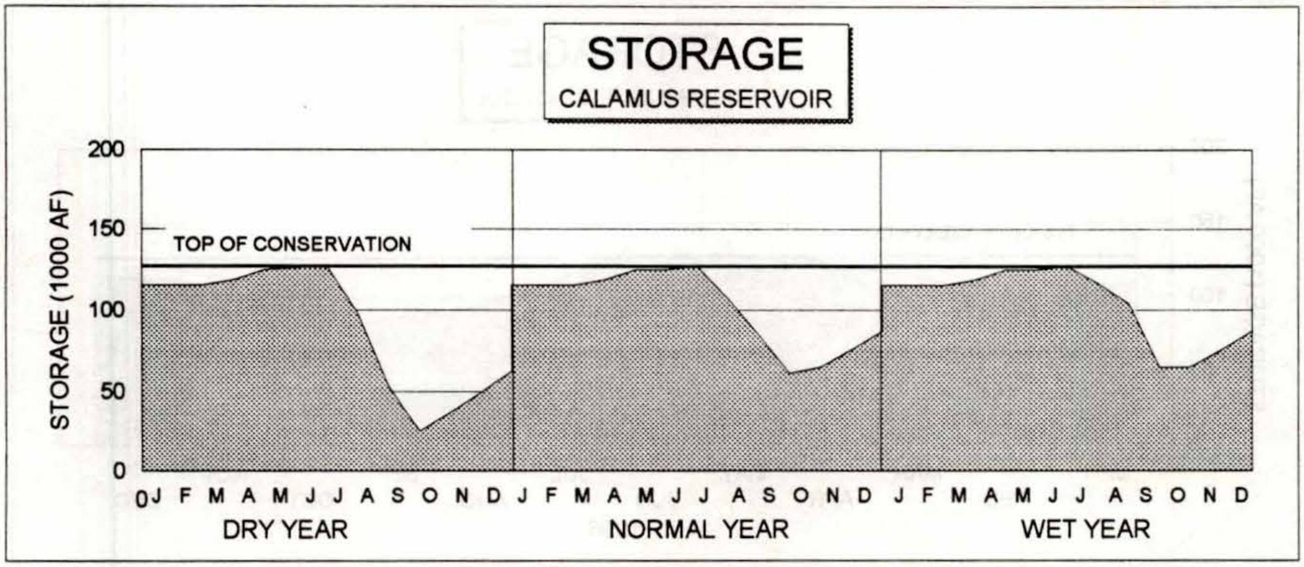


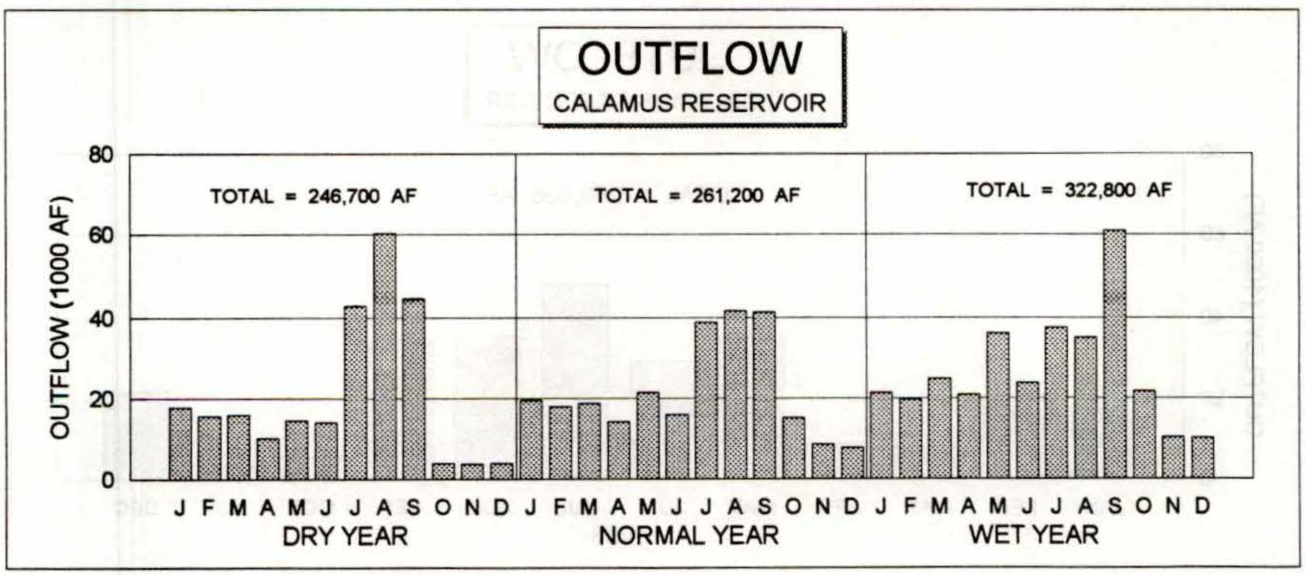
EXHIBIT 4C

CALAMUS RESERVOIR

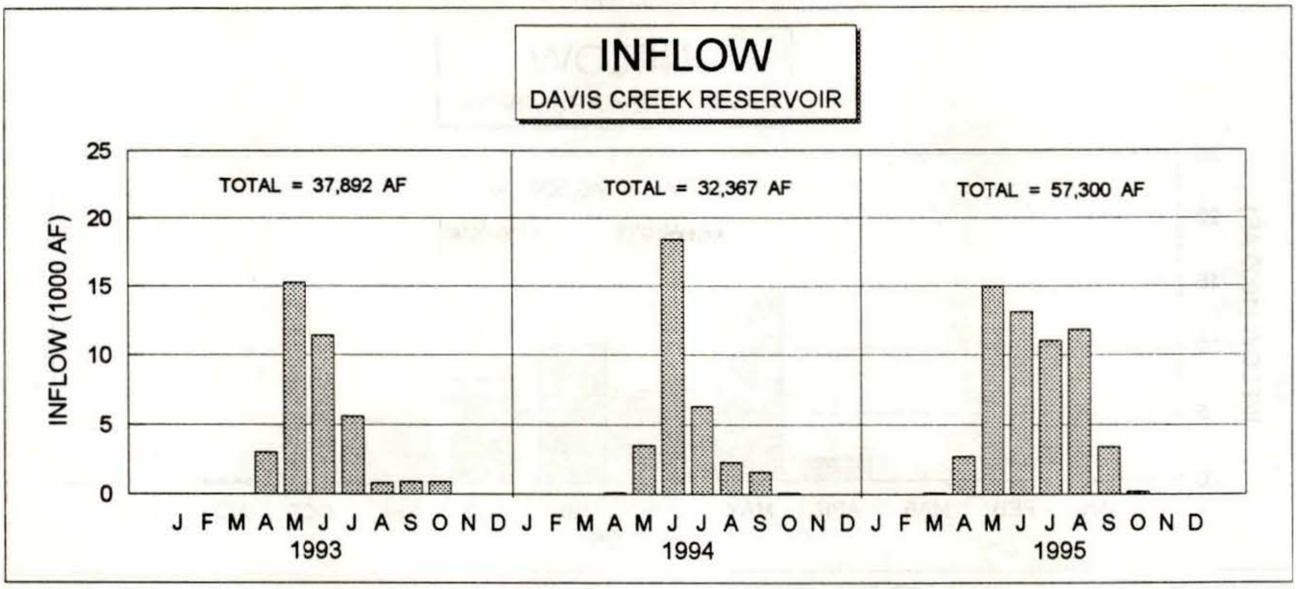
1997 OPERATION PLAN

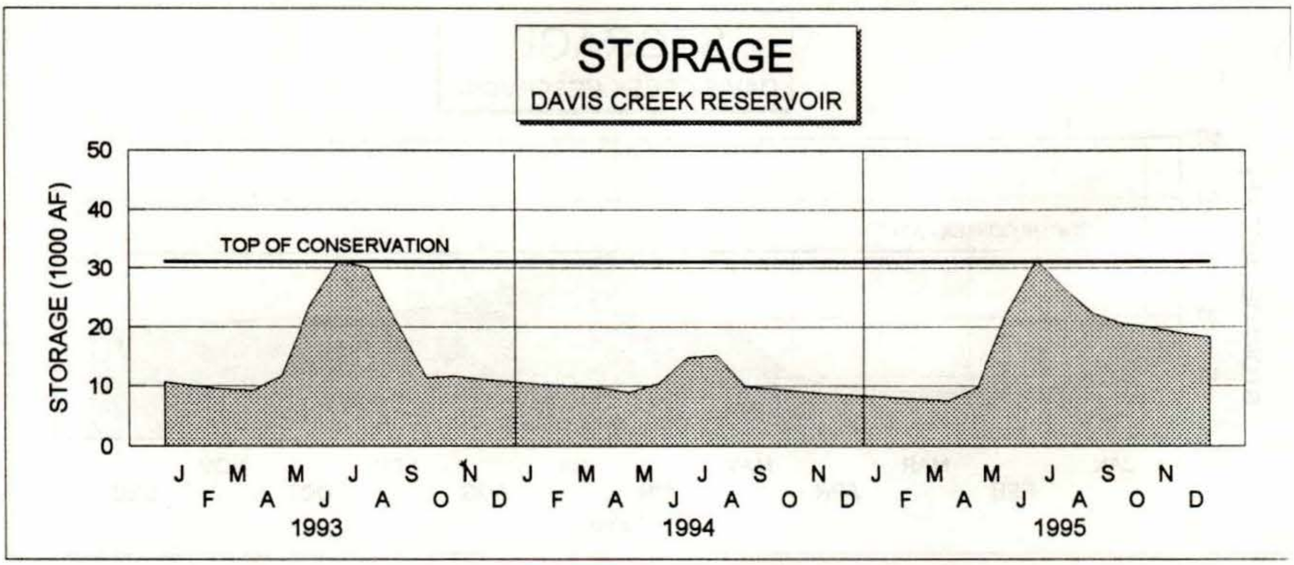






DAVIS CREEK RESERVOIR
OPERATION





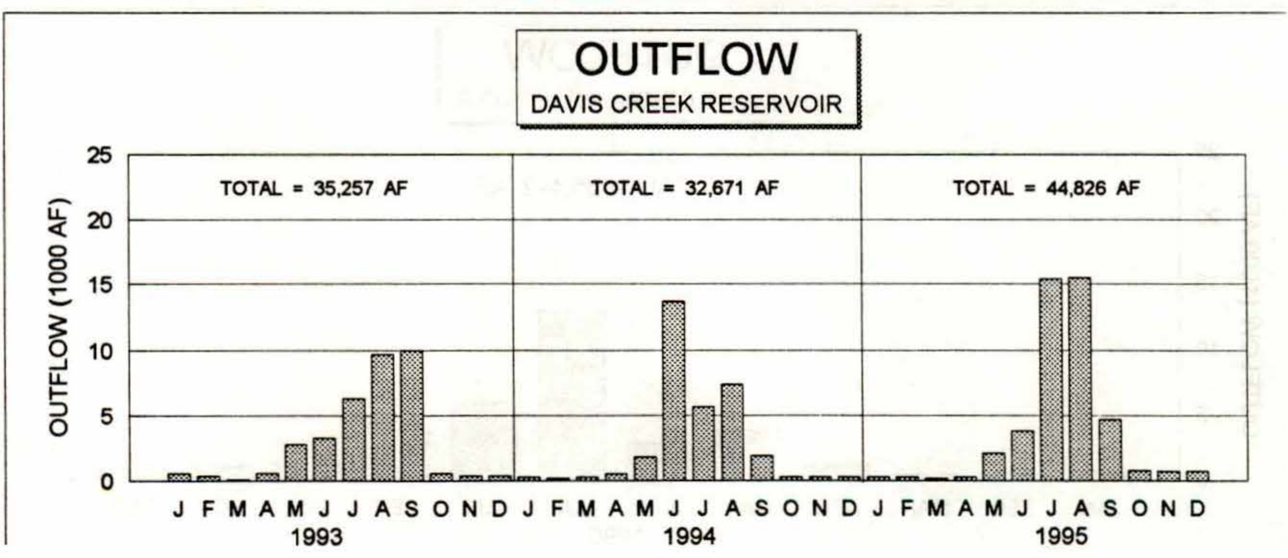
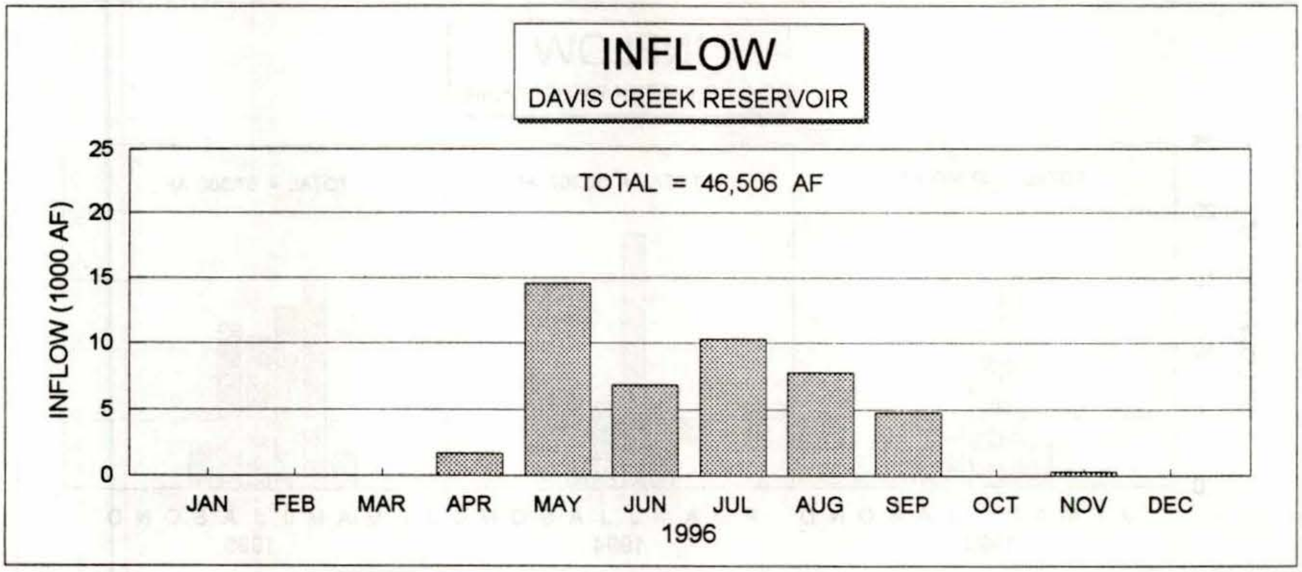
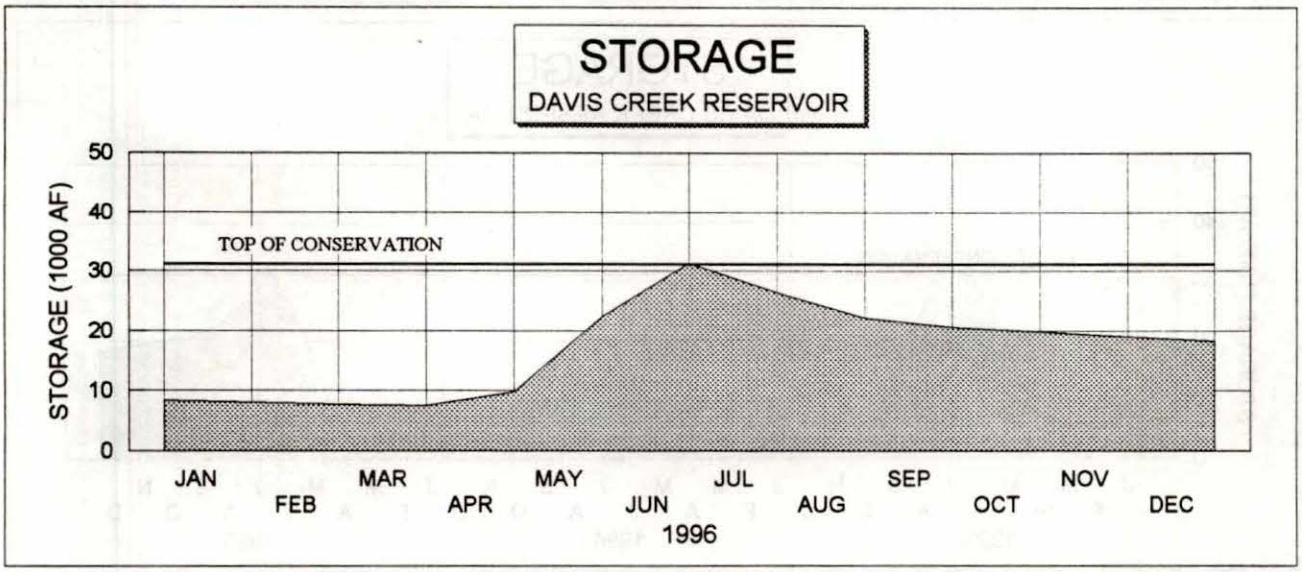


EXHIBIT 5B

DAVIS CREEK RESERVOIR

1996 OPERATION





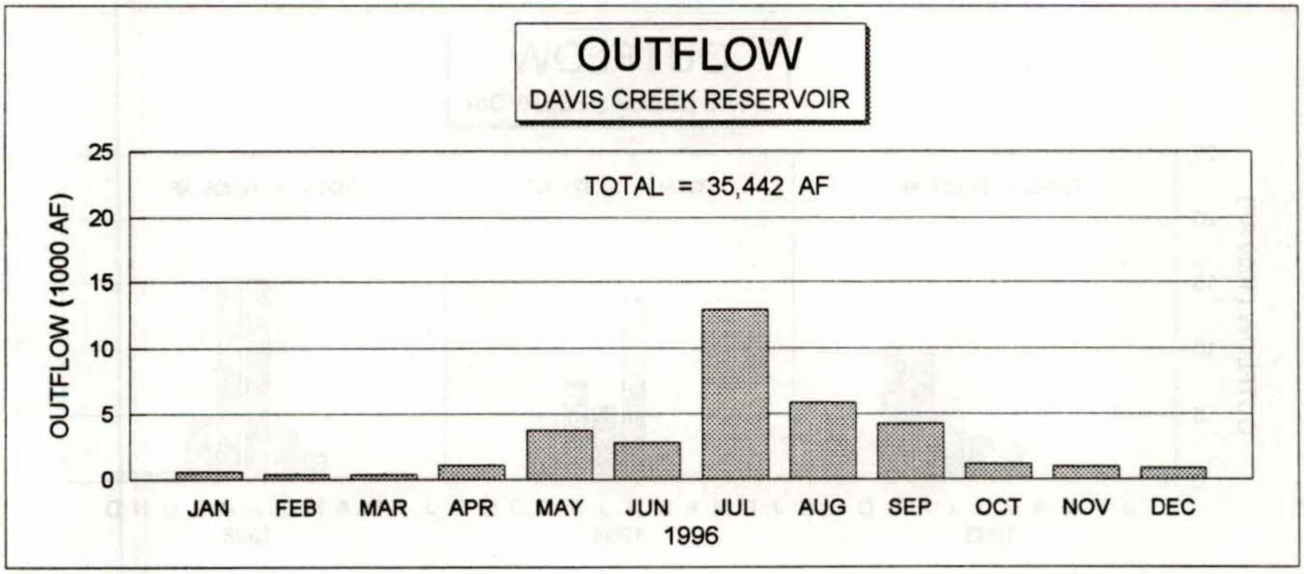
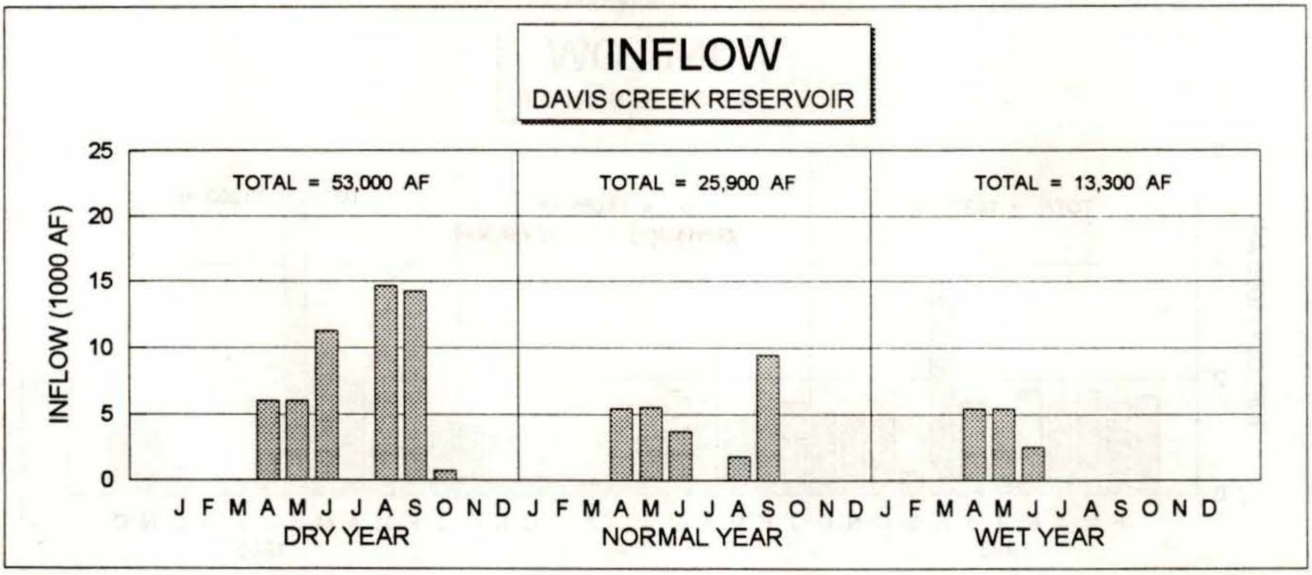
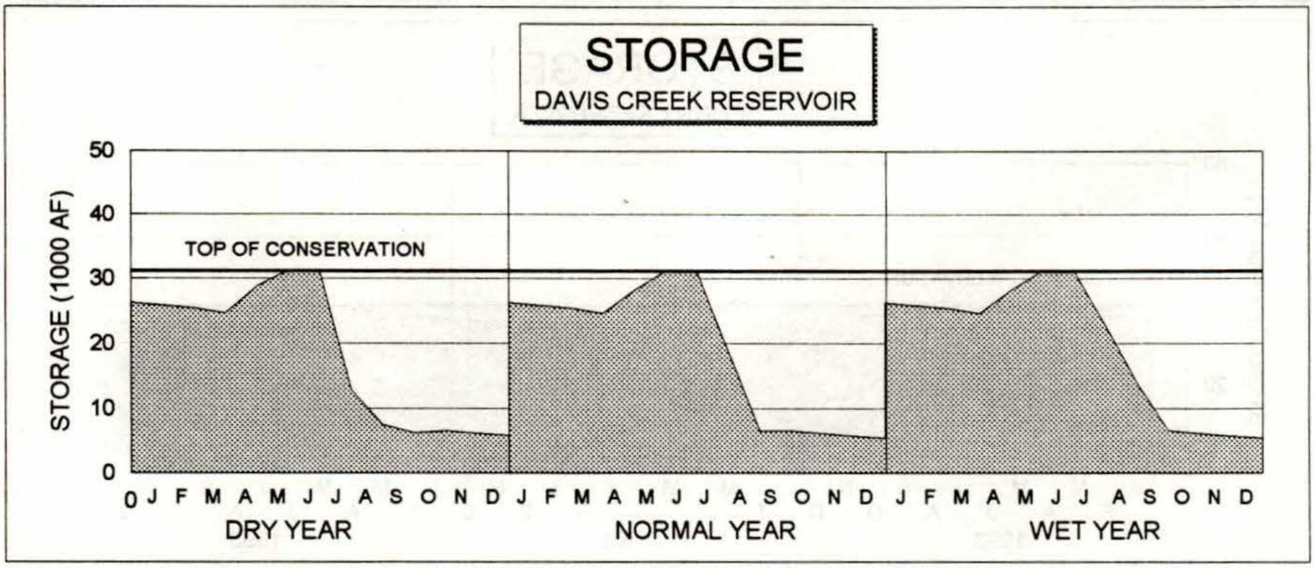


EXHIBIT 5C

DAVIS CREEK RESERVOIR

1997 OPERATION PLAN





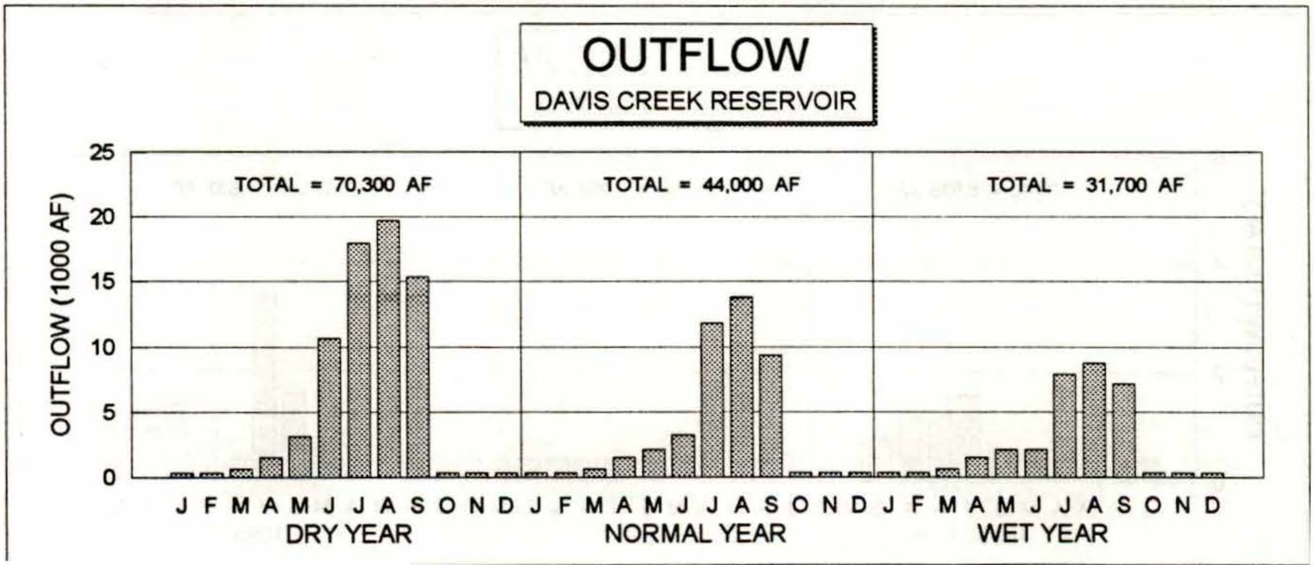
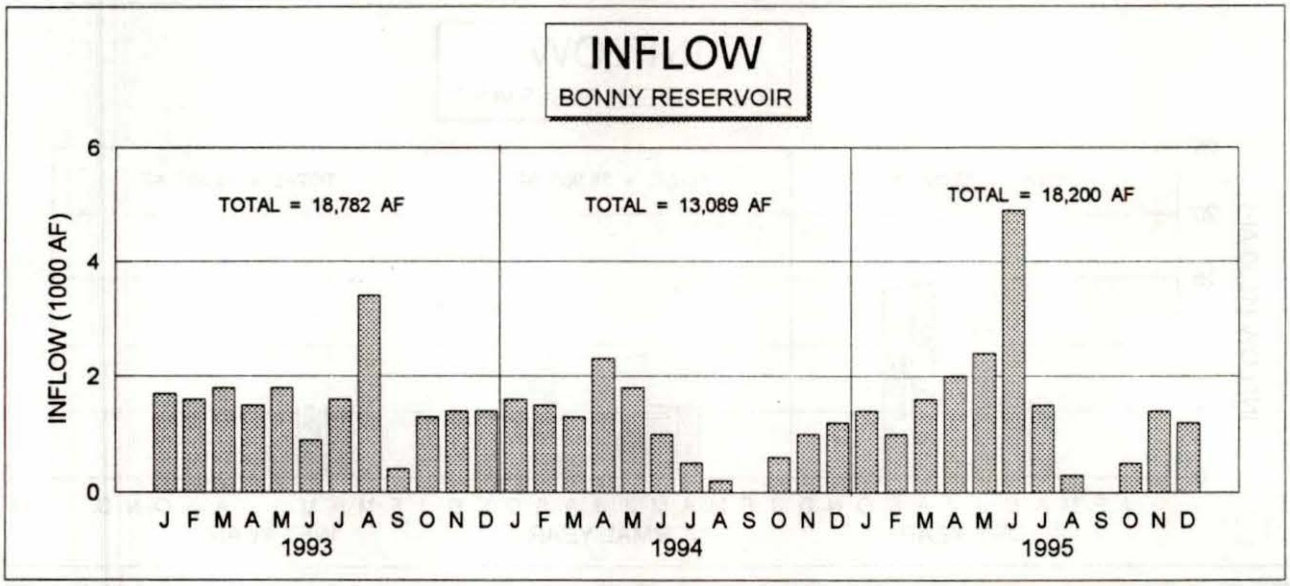
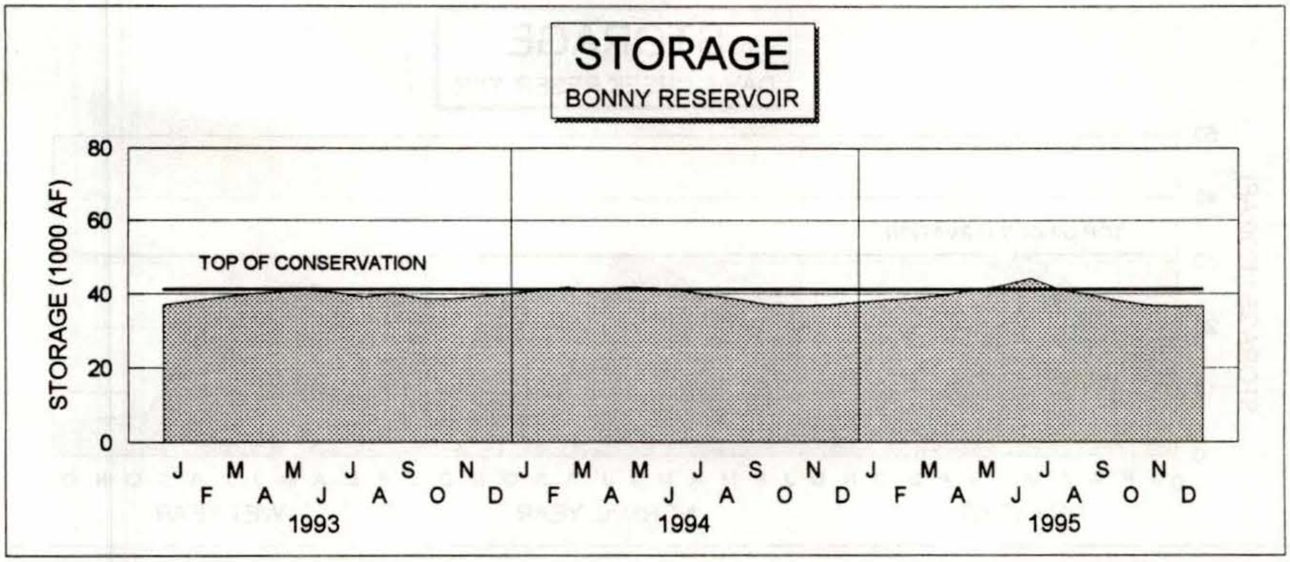
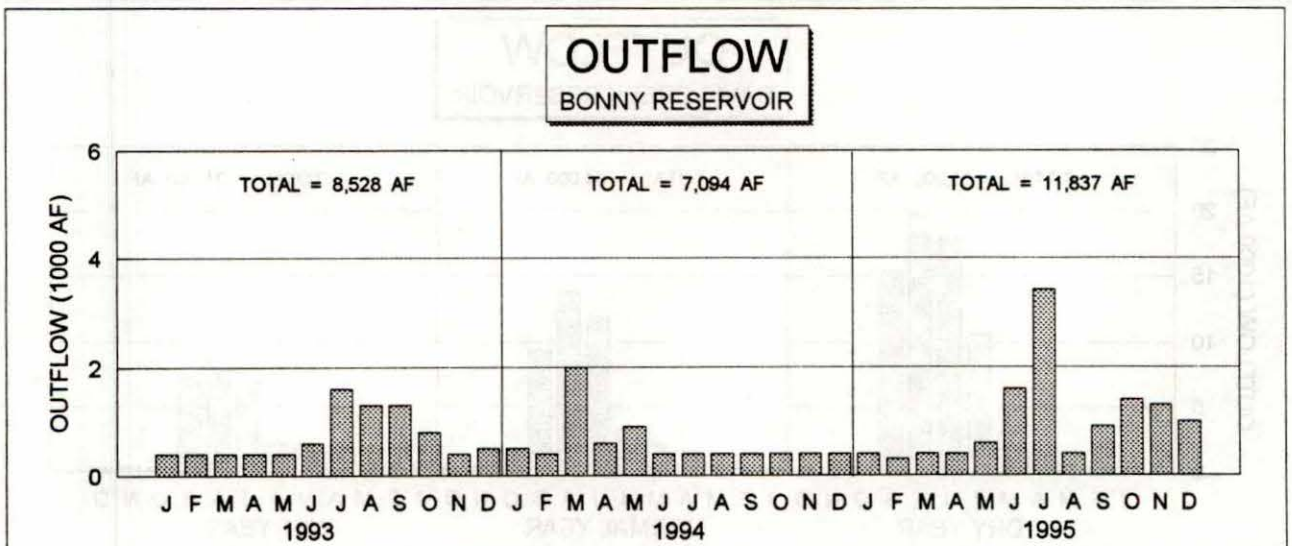


EXHIBIT 6A

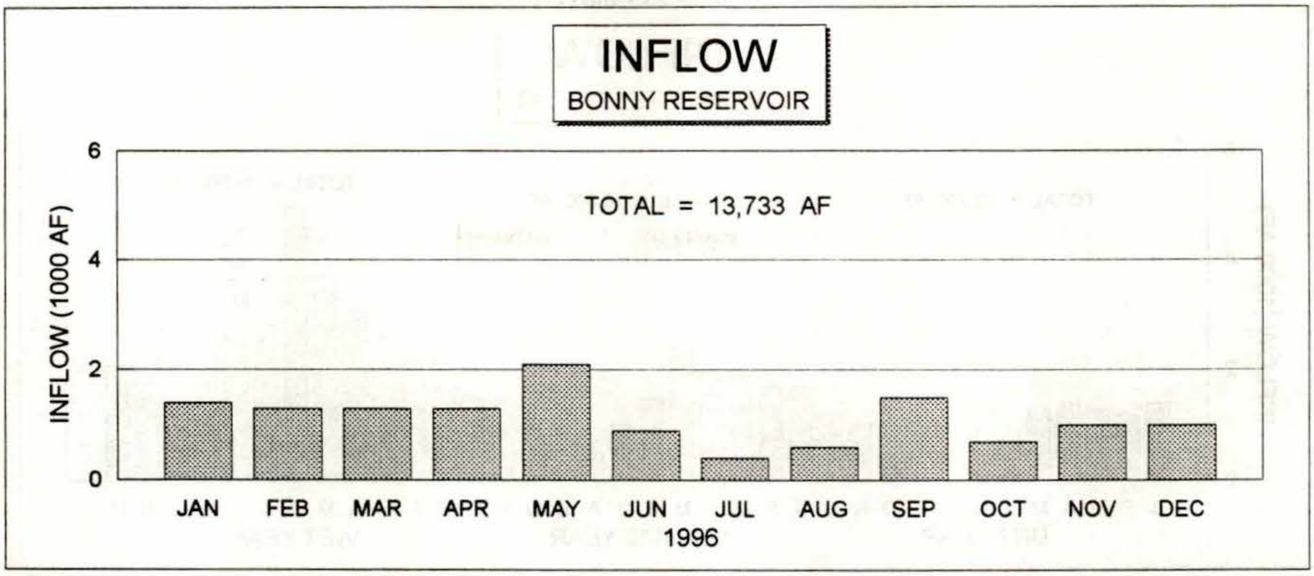
BONNY RESERVOIR
OPERATION

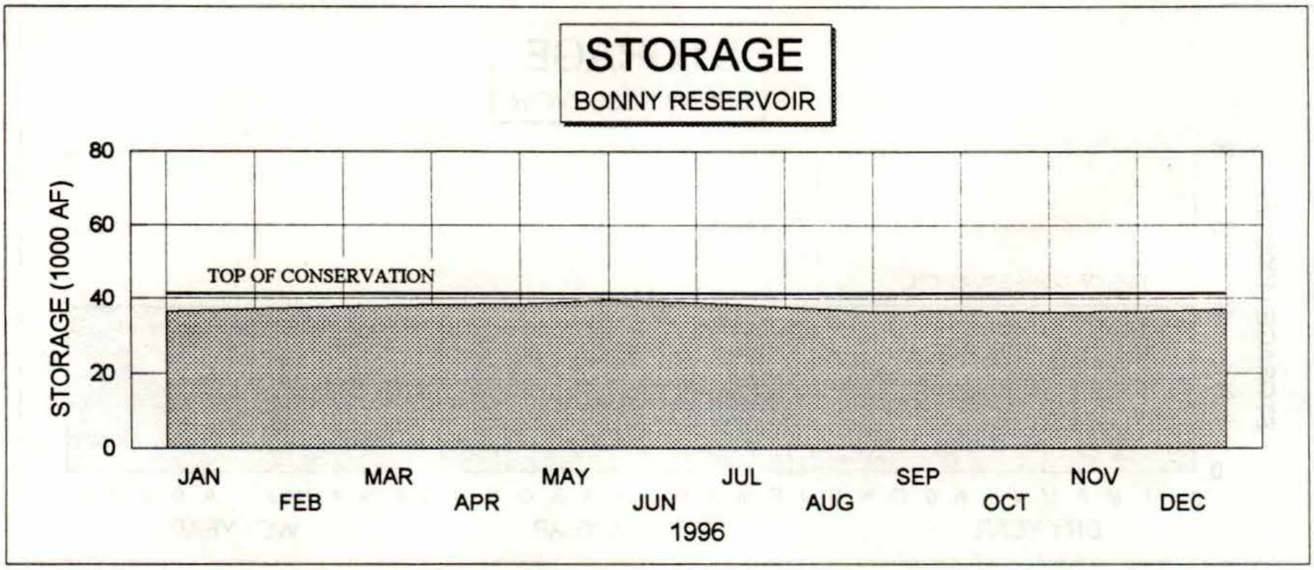






BONNY RESERVOIR
1996 OPERATION





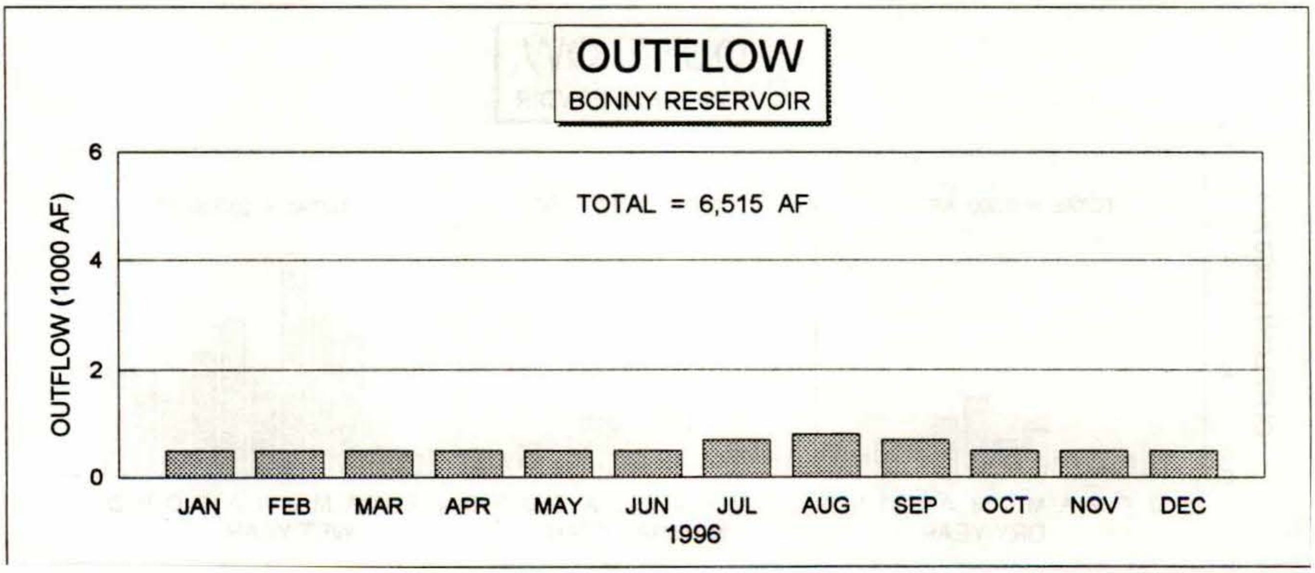
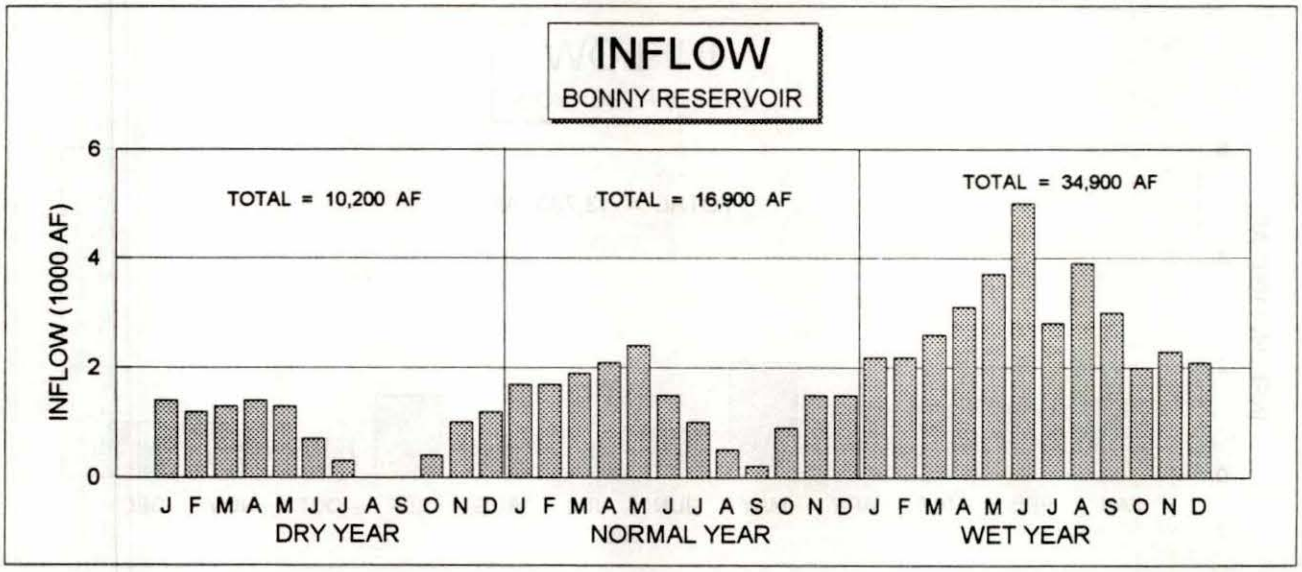
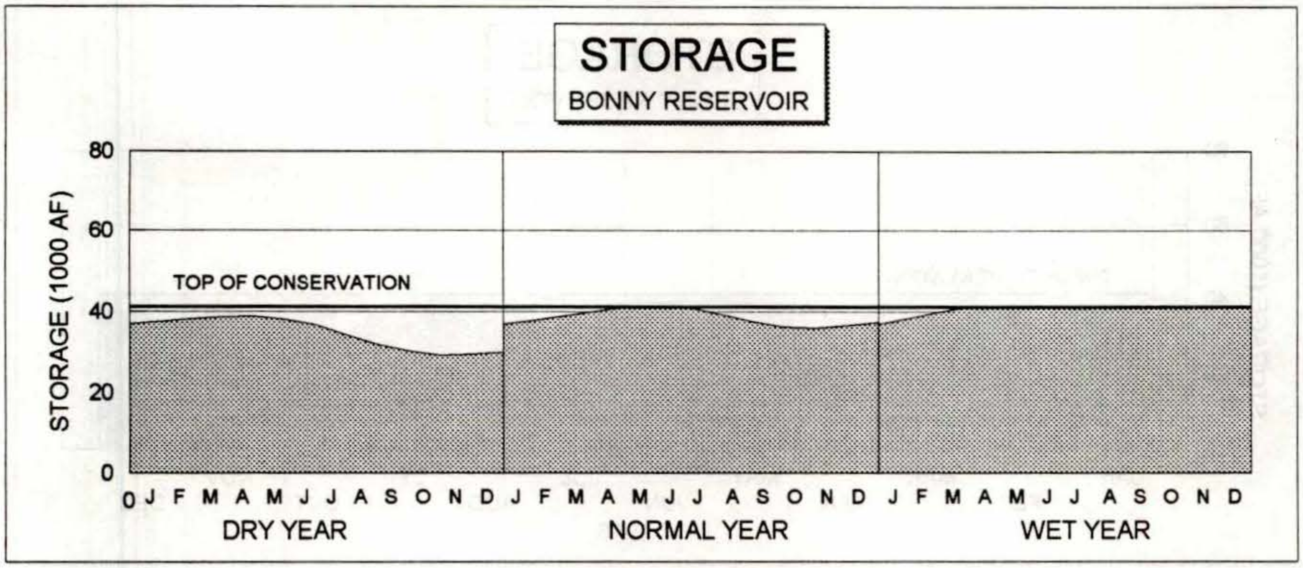


EXHIBIT 6C

BONNY RESERVOIR
1997 OPERATION PLAN





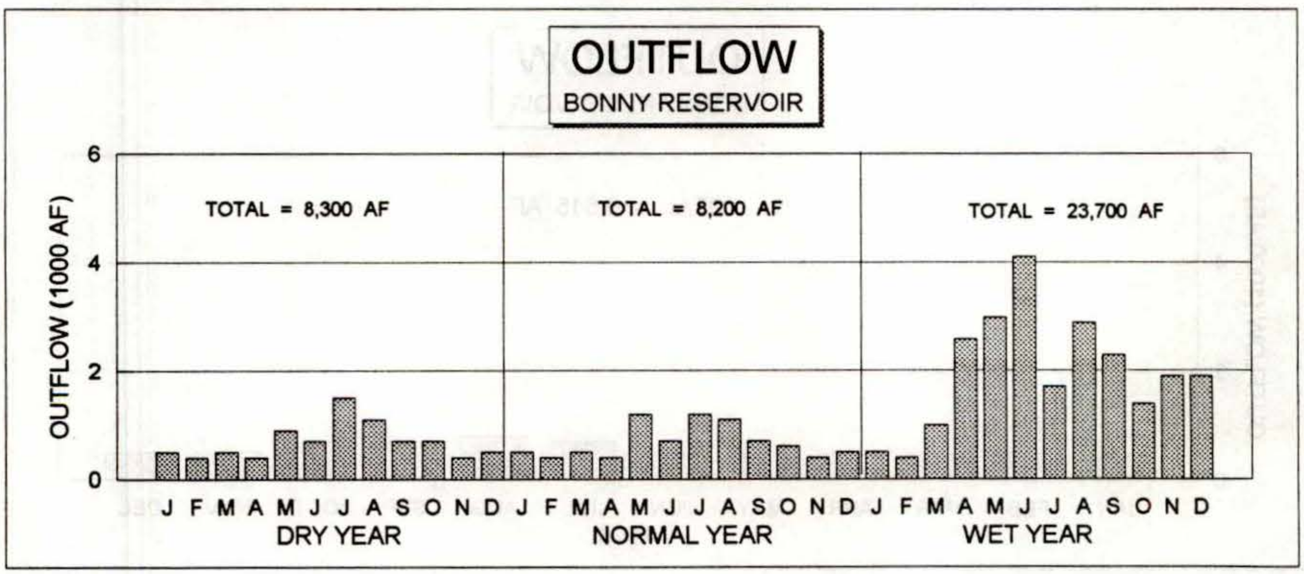
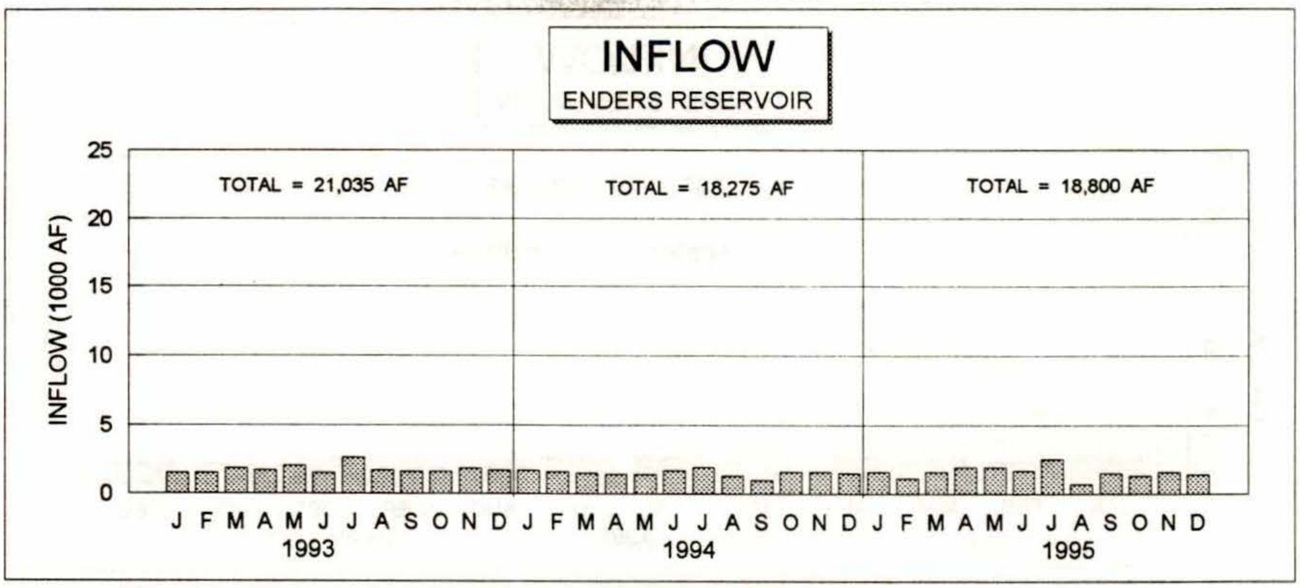
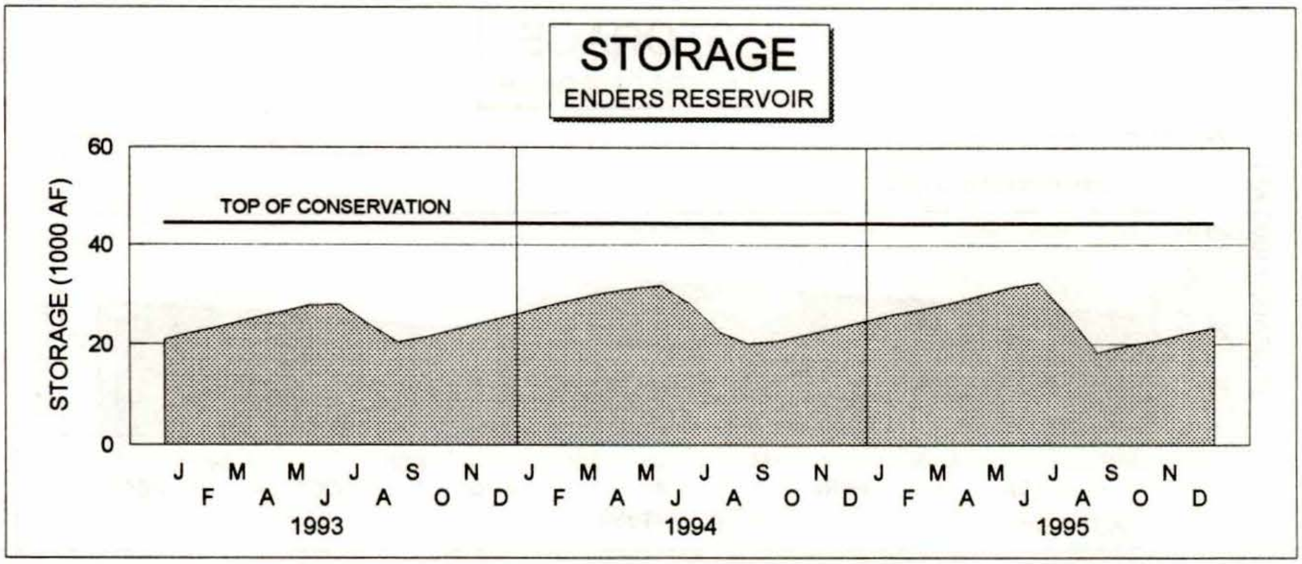


EXHIBIT 7A

ENDERS RESERVOIR
OPERATION





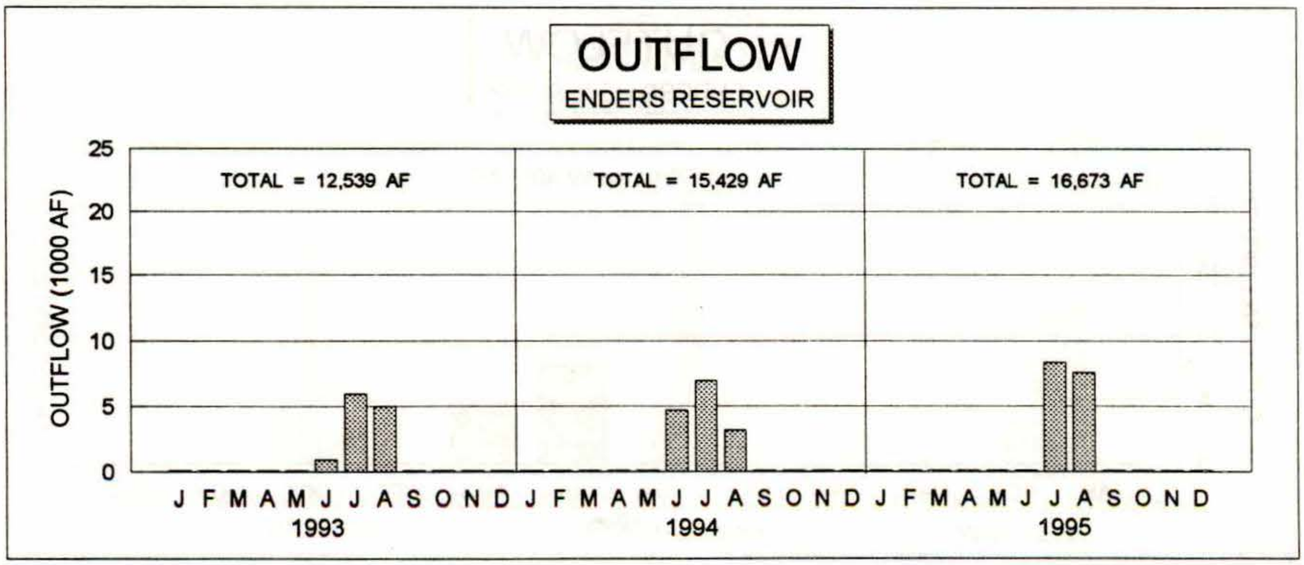
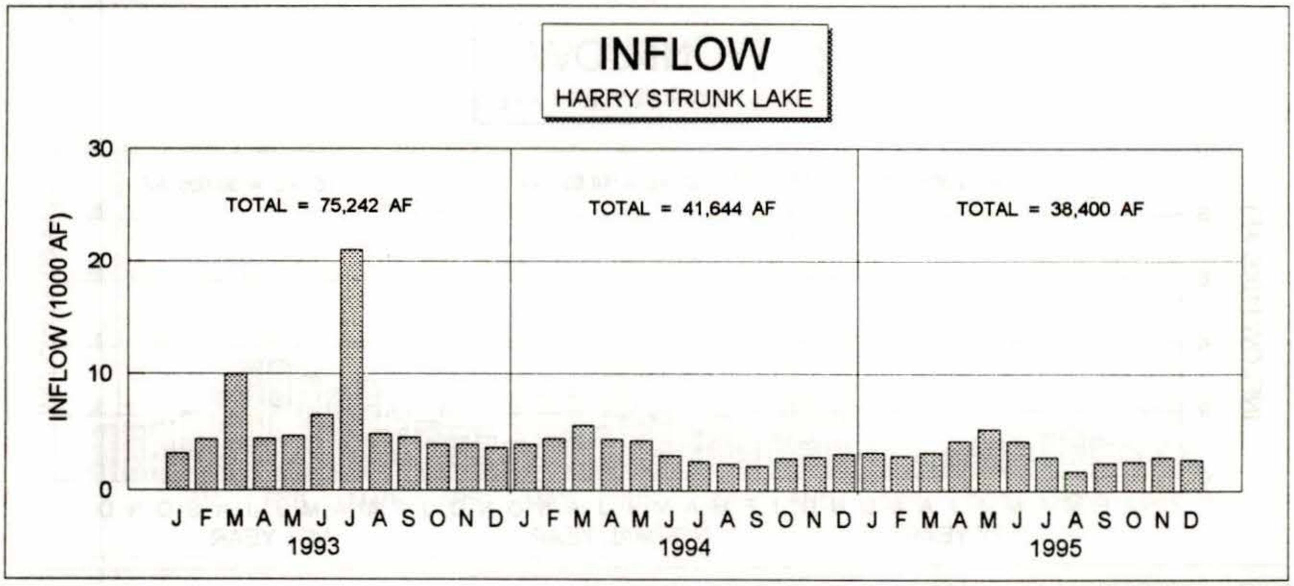
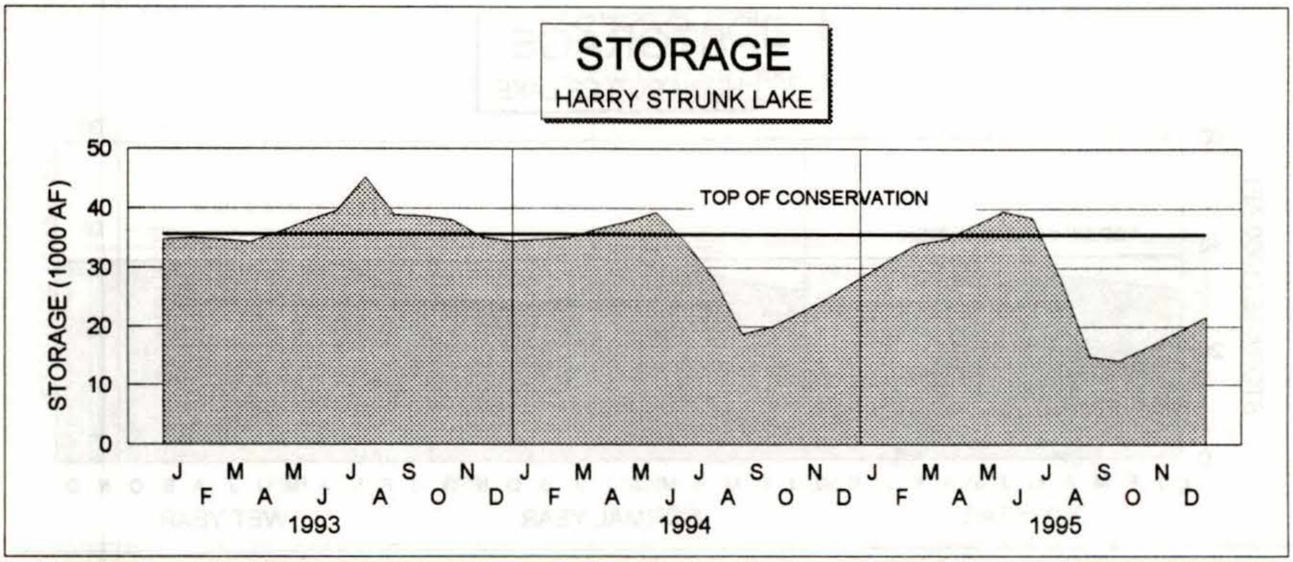
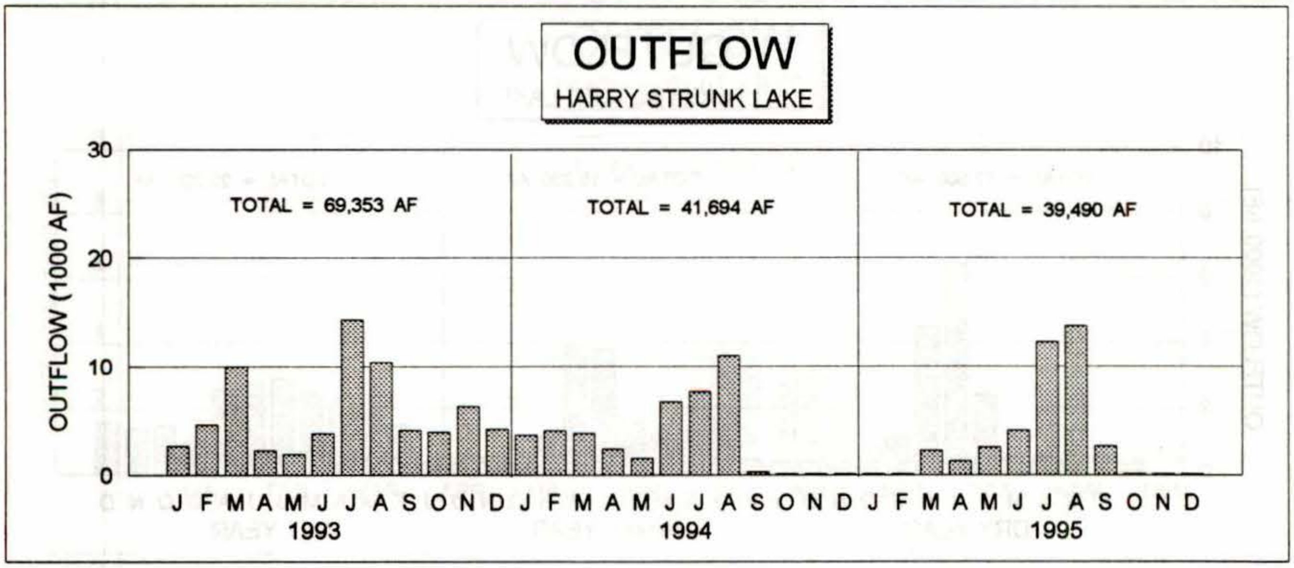


EXHIBIT 10A

HARRY STRUNK LAKE
OPERATION

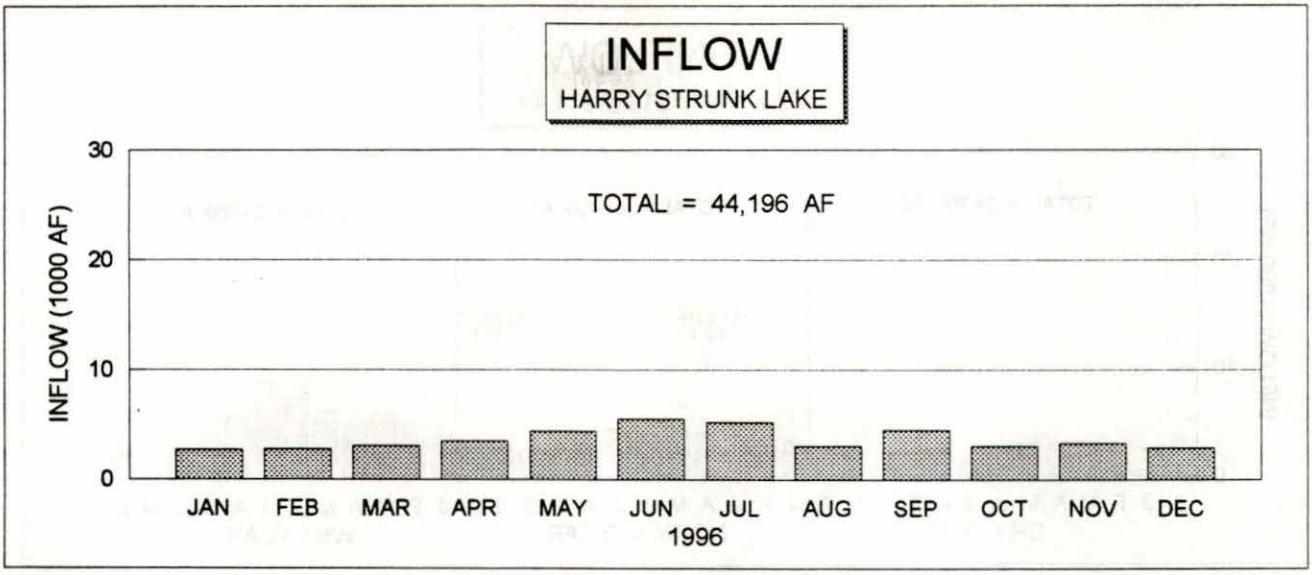


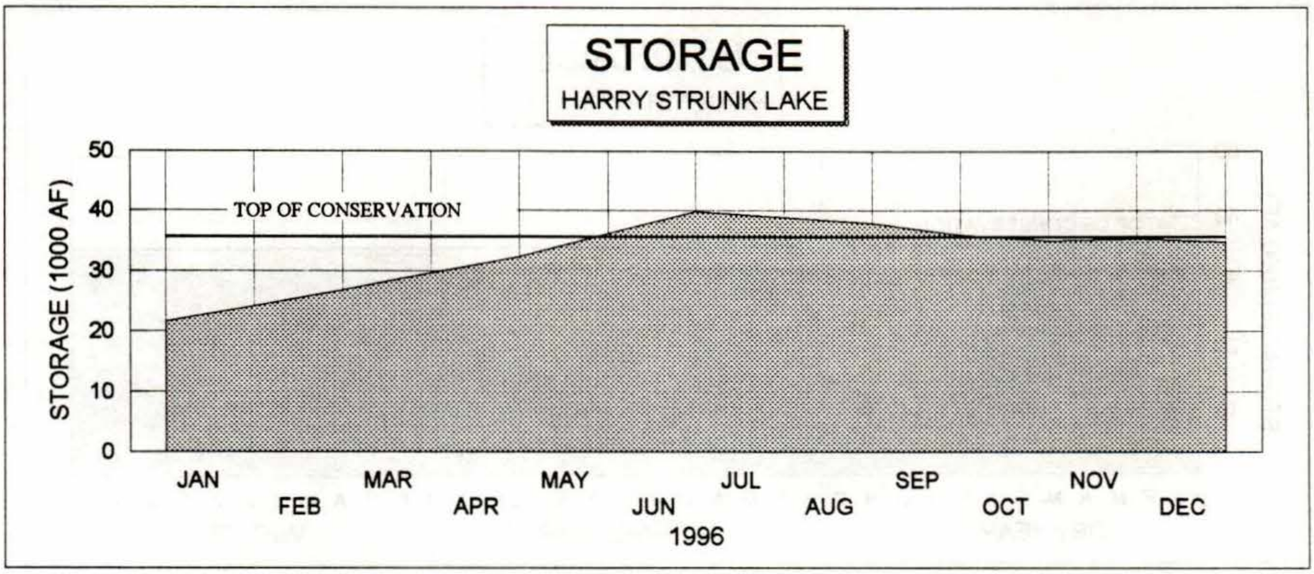




HARRY STRUNK LAKE

1996 OPERATION





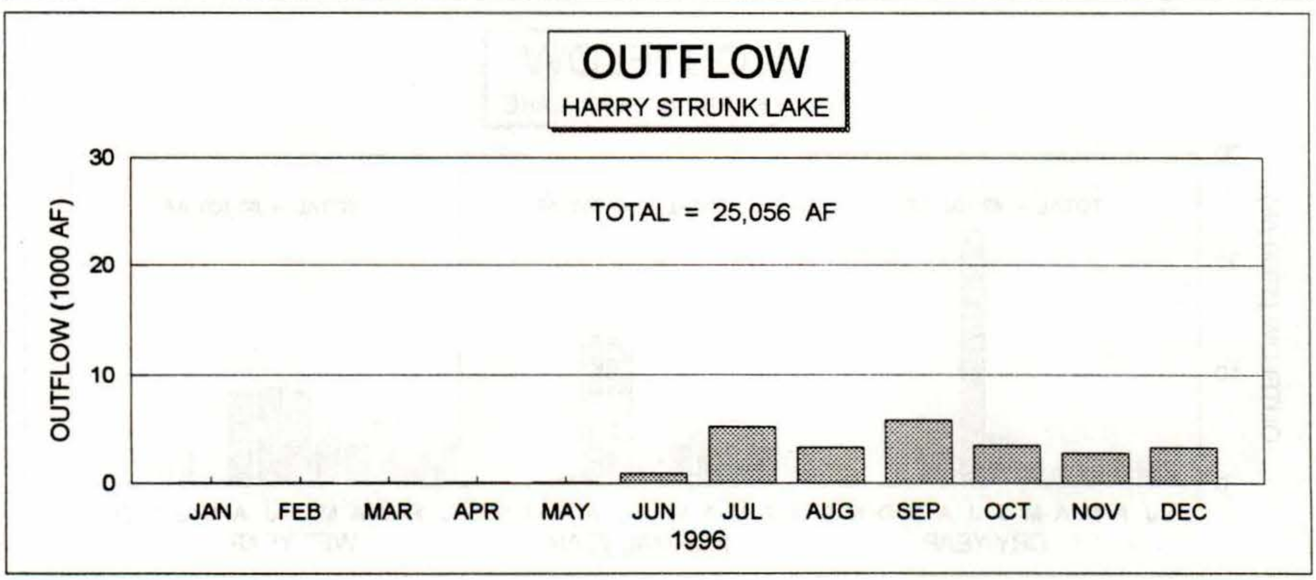
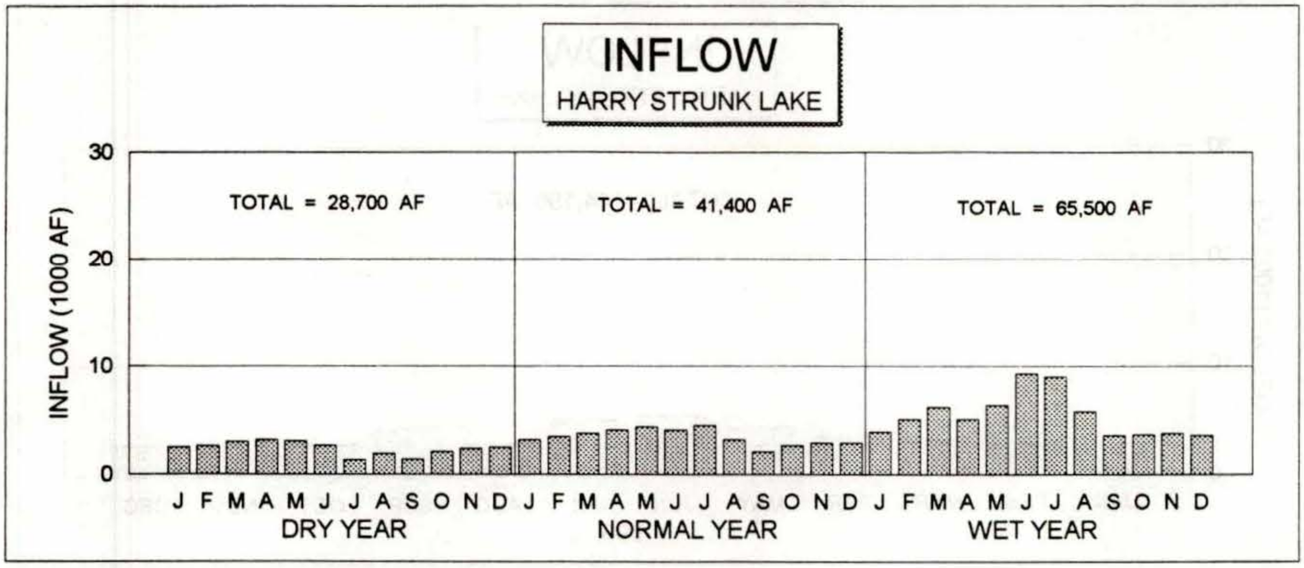
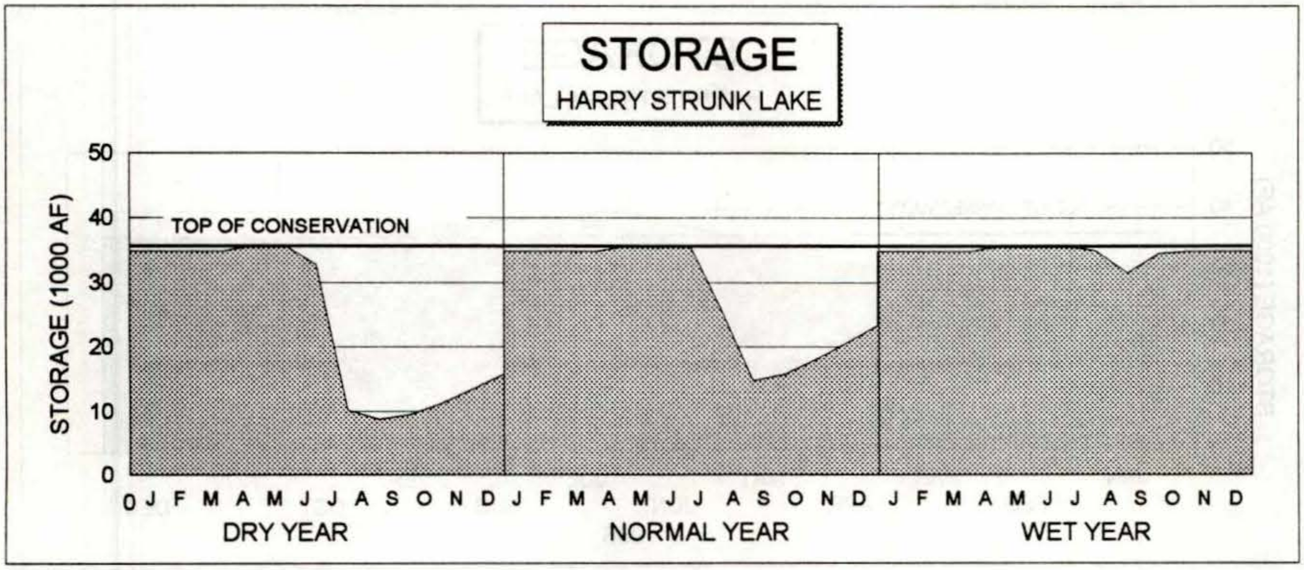


EXHIBIT 10C

HARRY STRUNK LAKE

1997 OPERATION PLAN





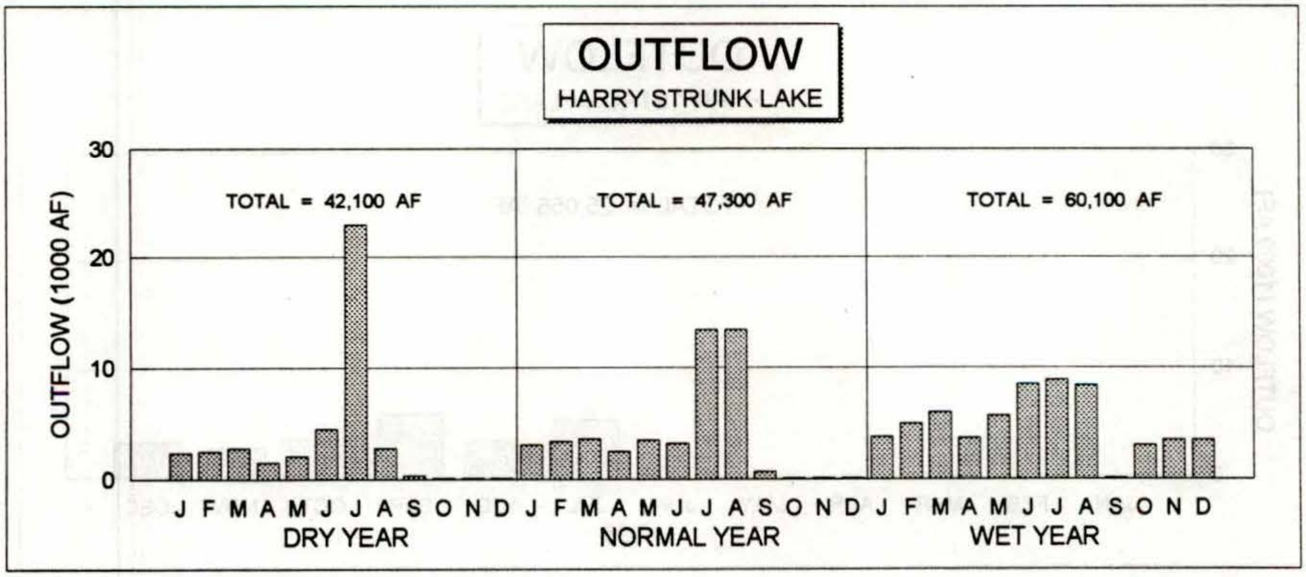
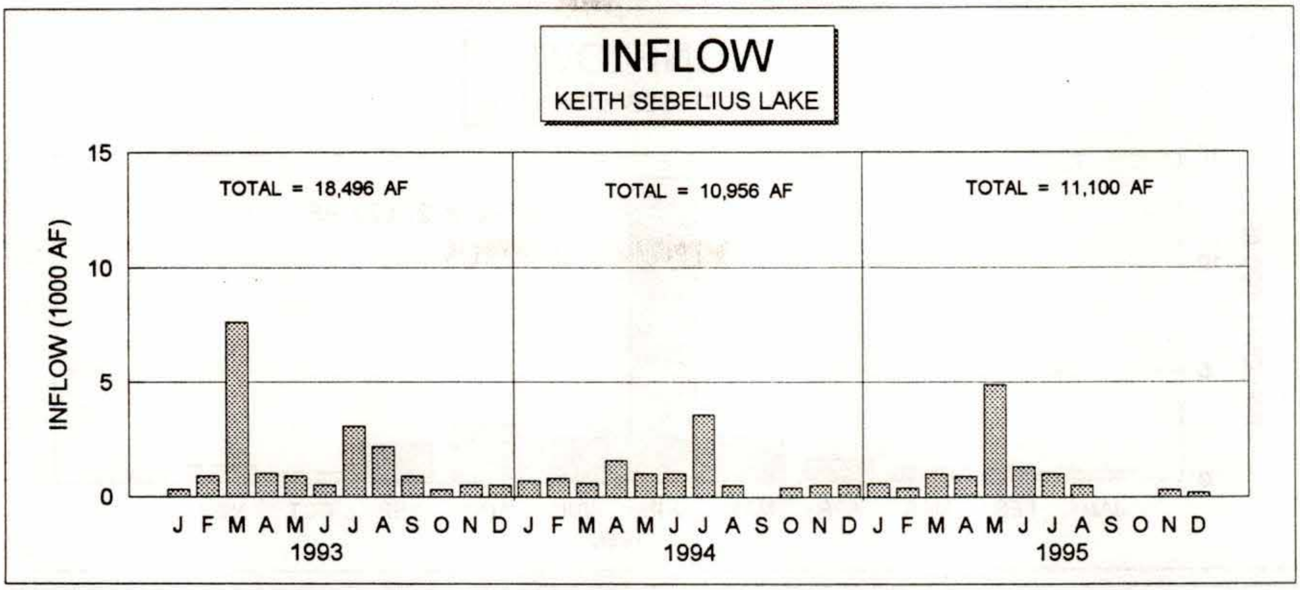
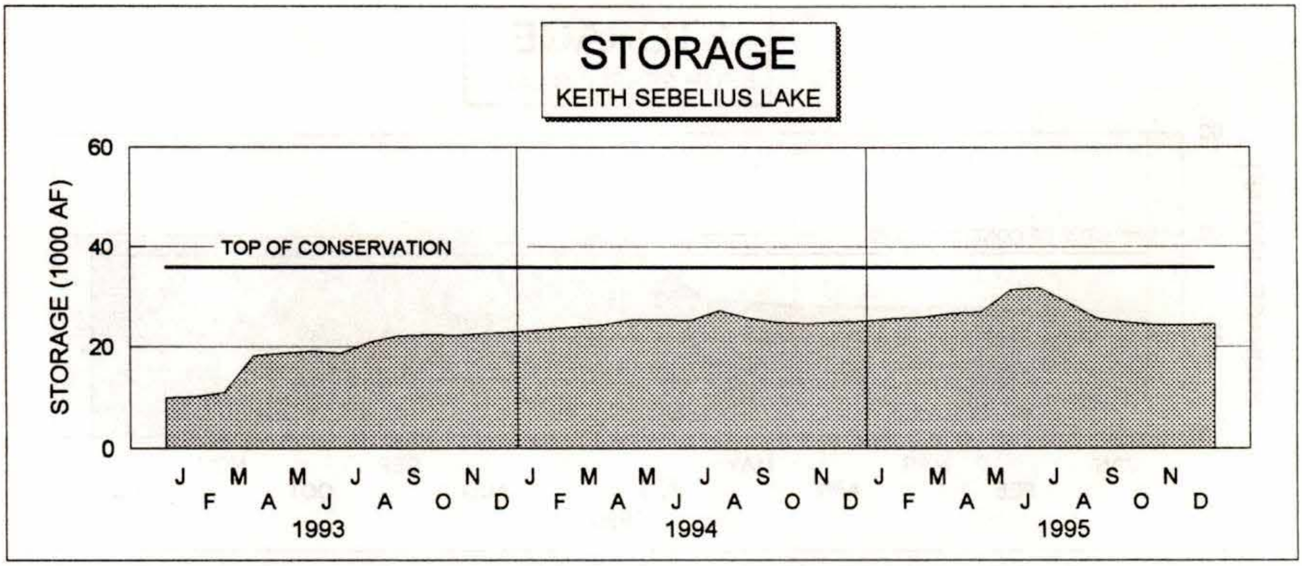


EXHIBIT 11A

KEITH SEBELIUS LAKE

OPERATION





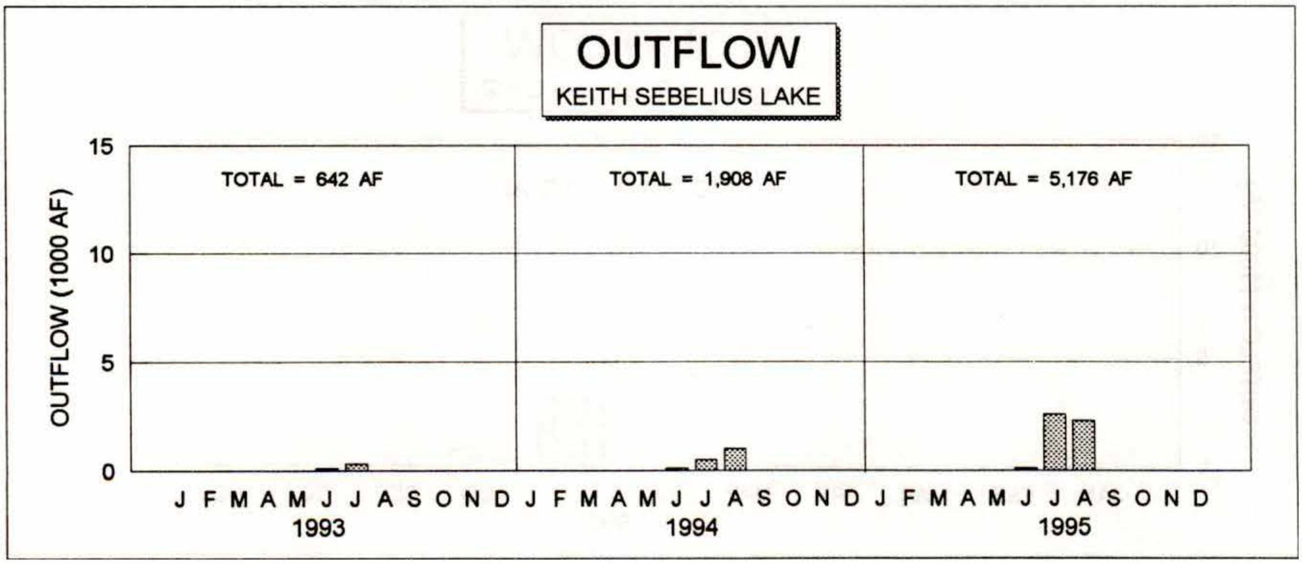


EXHIBIT 11B

KEITH SEBELIUS LAKE

1996 OPERATION

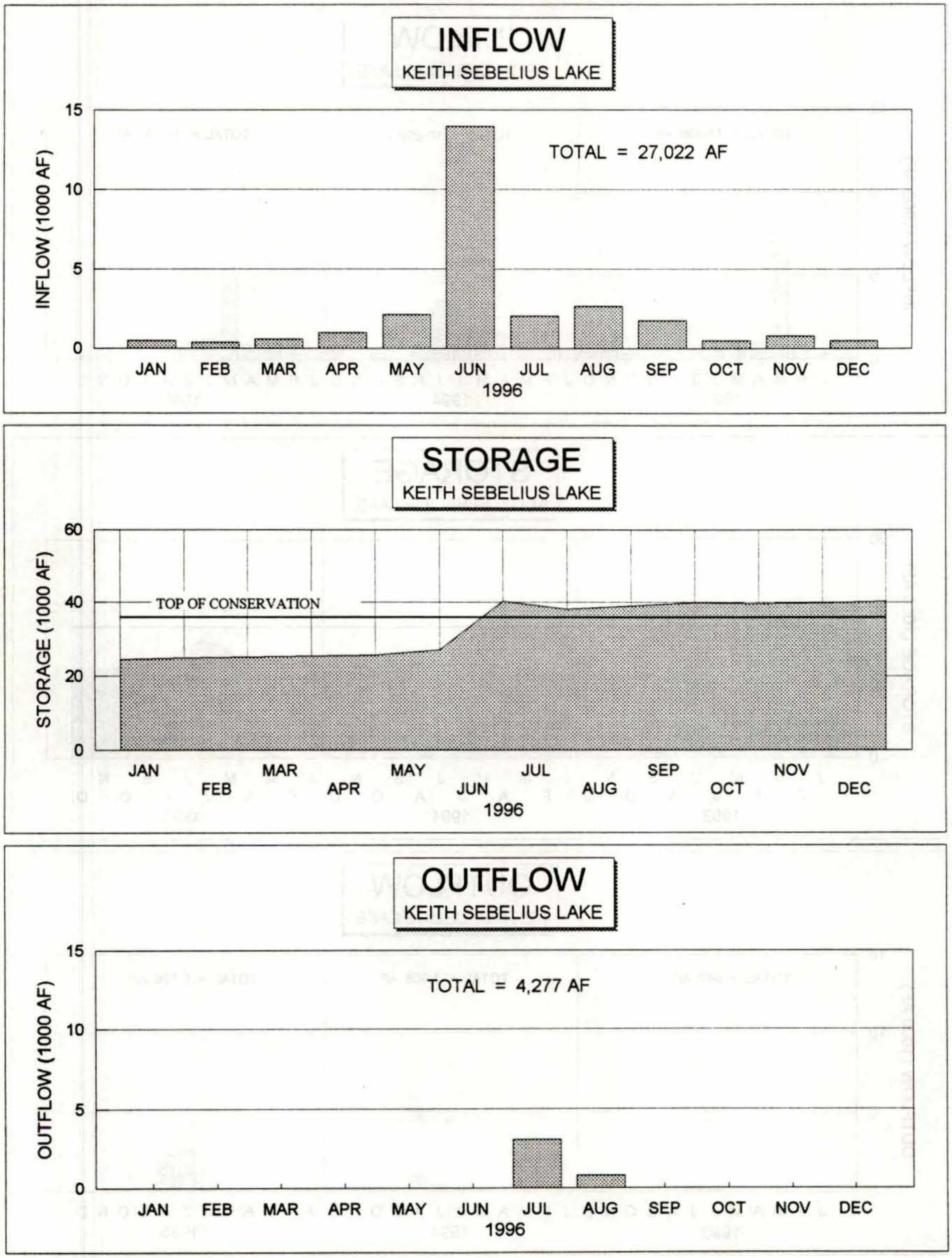
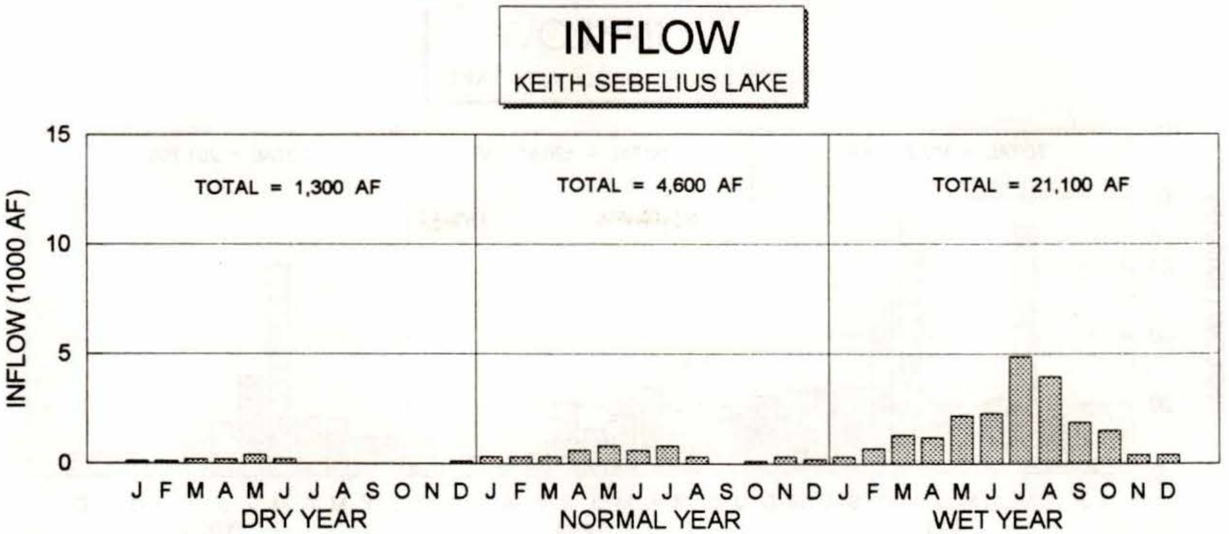
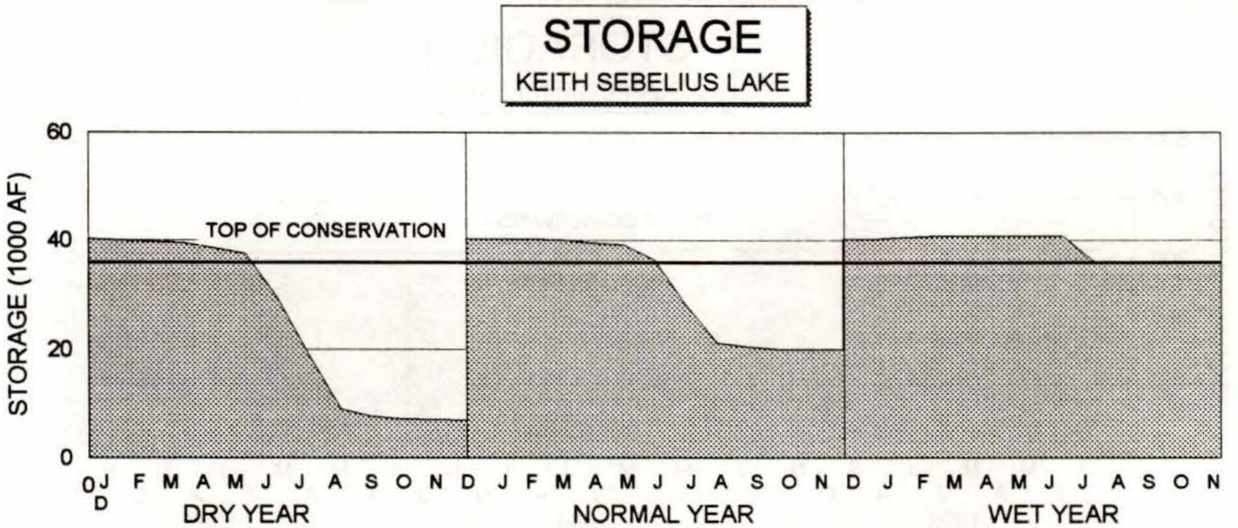


EXHIBIT 11C

KEITH SEBELIUS LAKE

1997 OPERATION PLAN





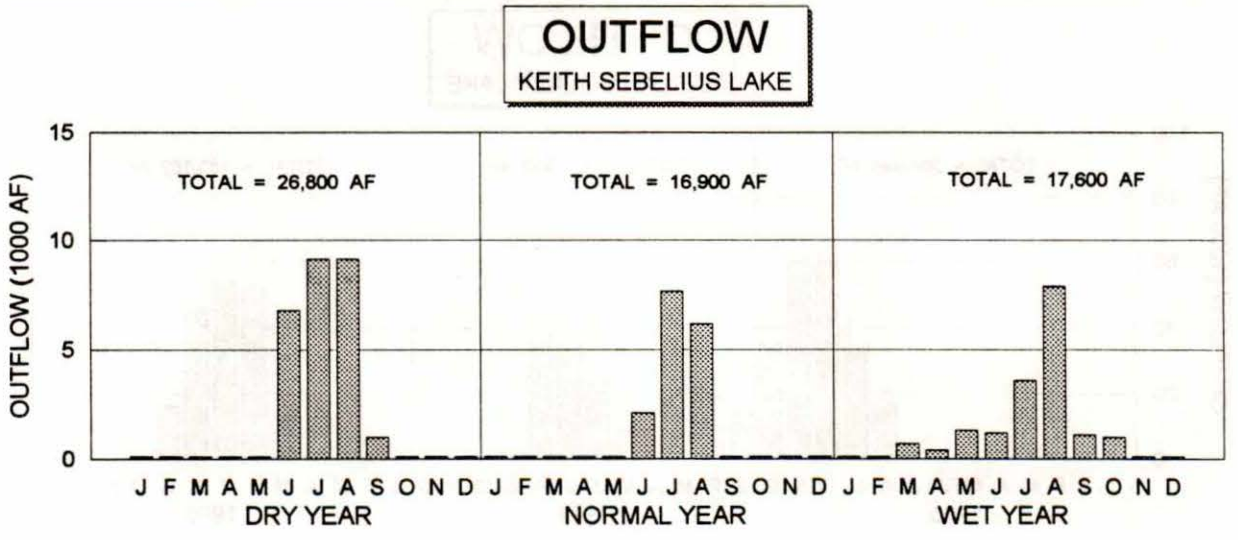
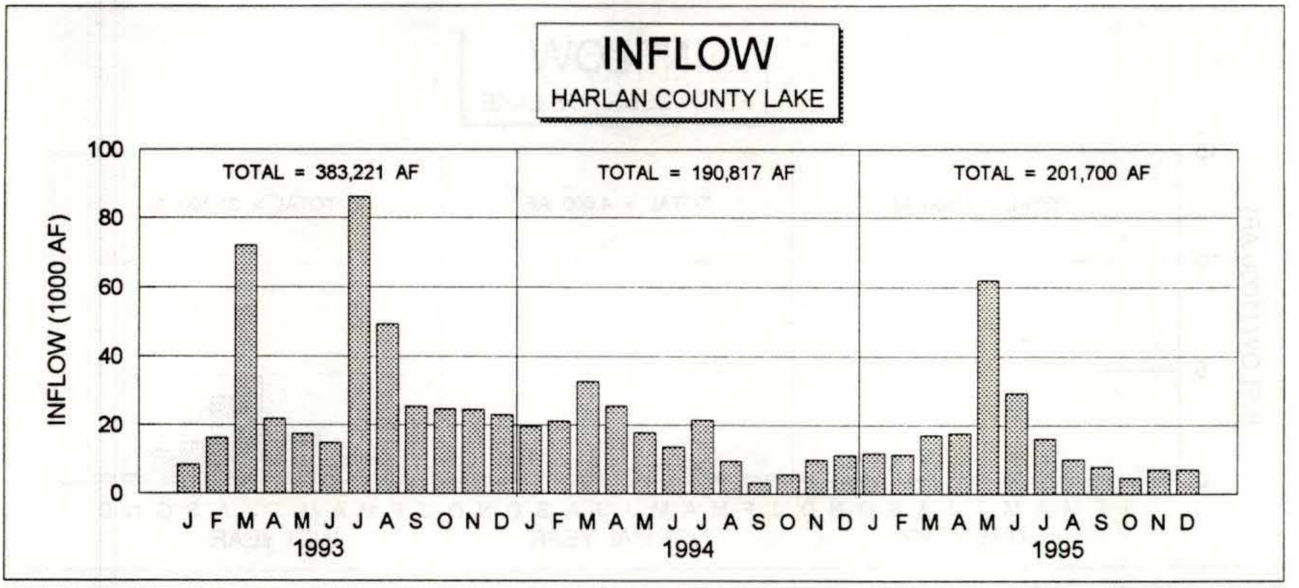
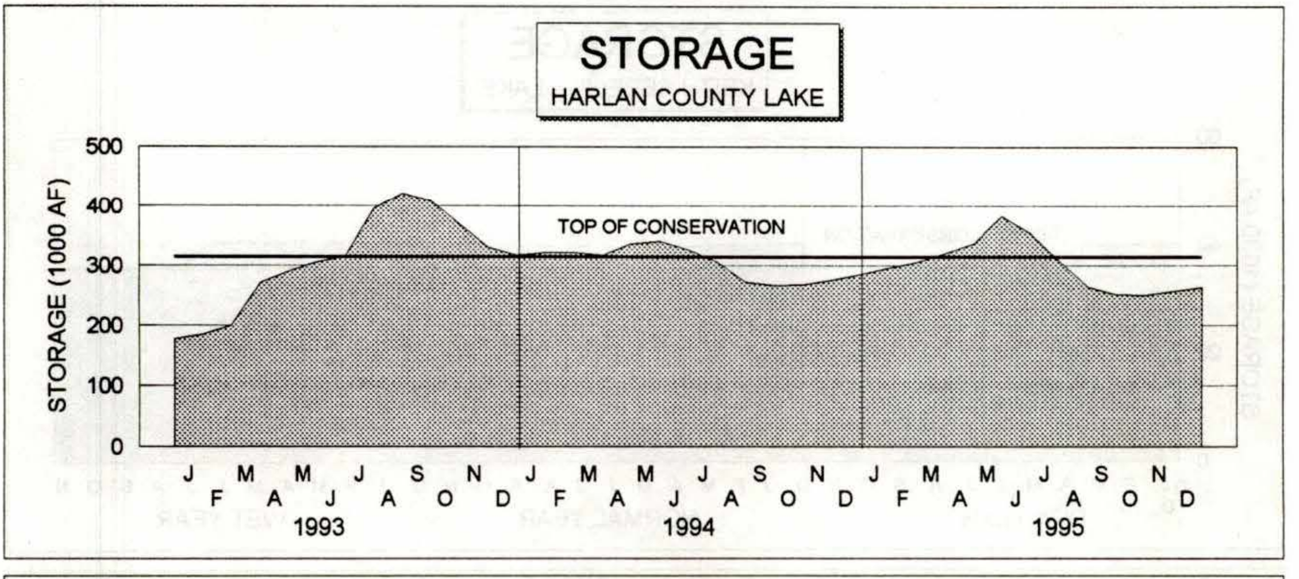
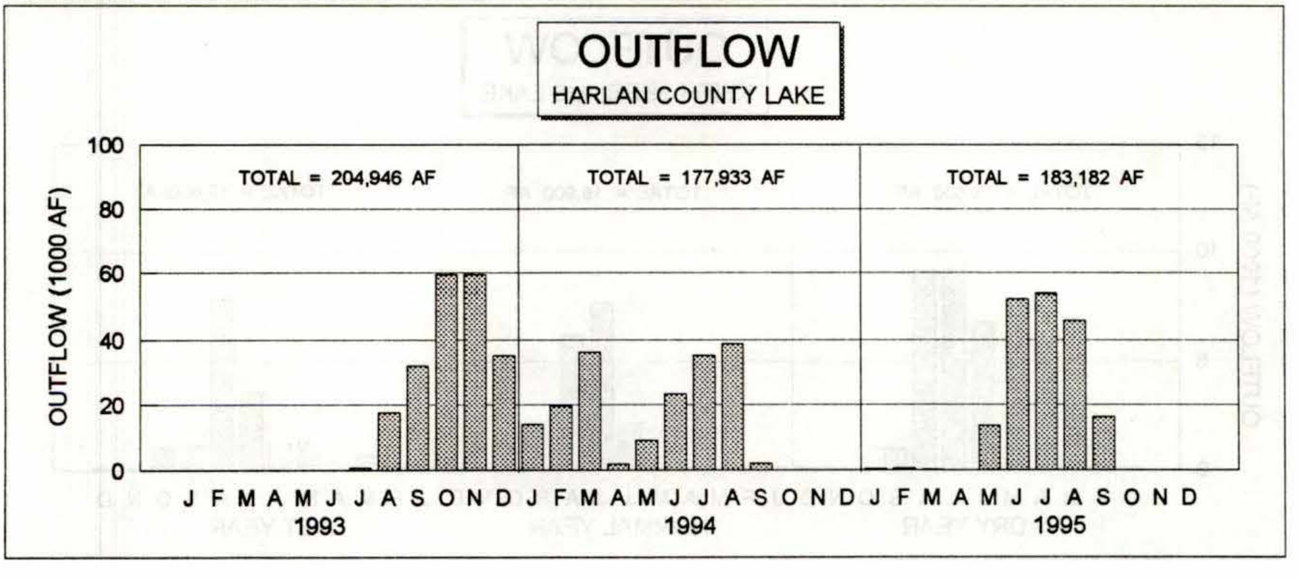


EXHIBIT 12A

HARLAN COUNTY LAKE
OPERATION

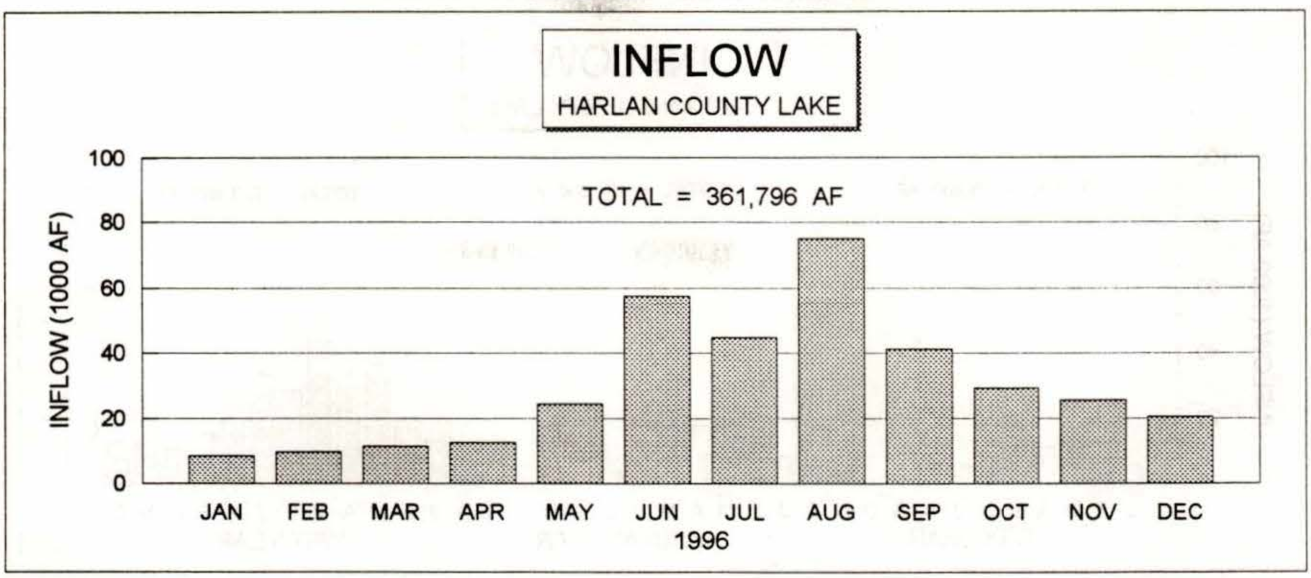


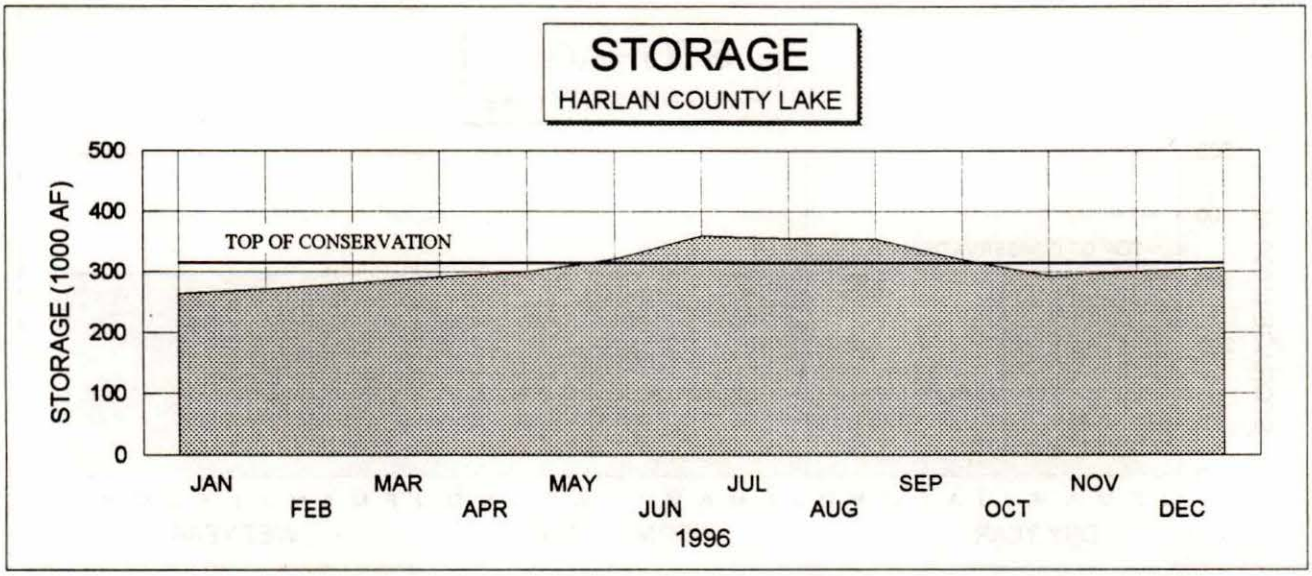




HARLAN COUNTY LAKE

1995 OPERATION





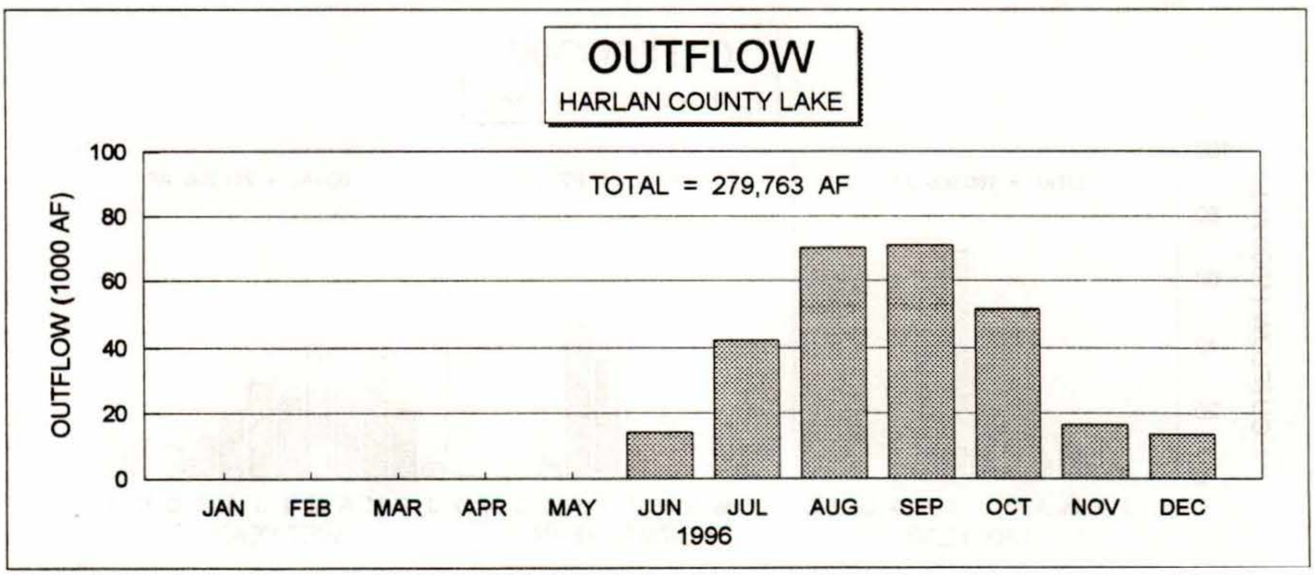
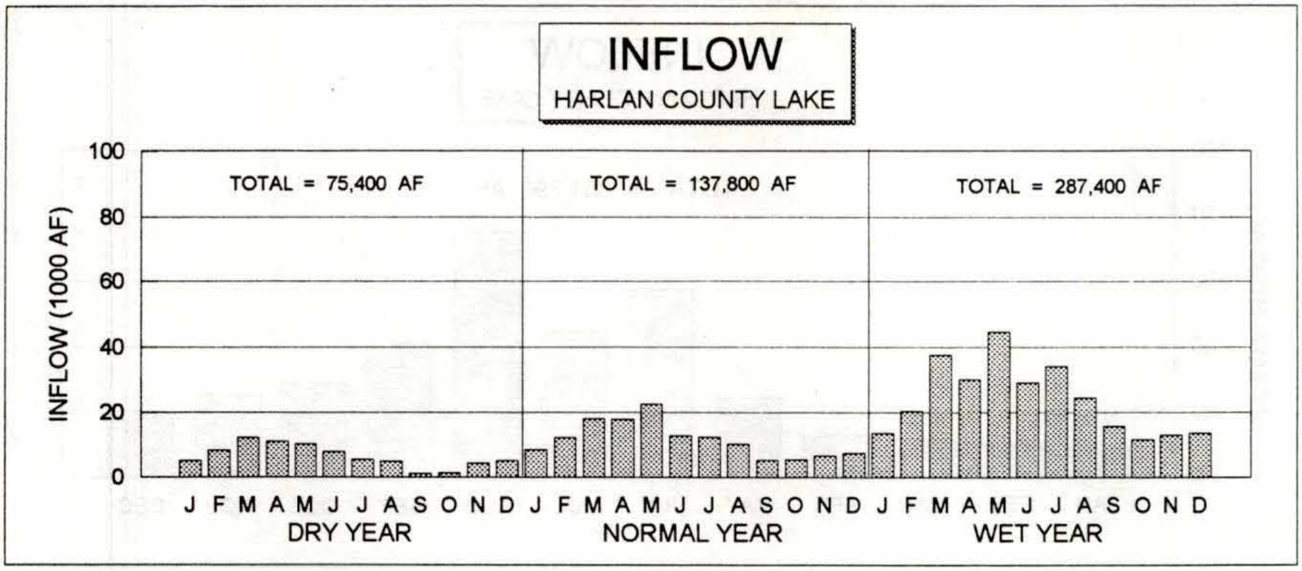
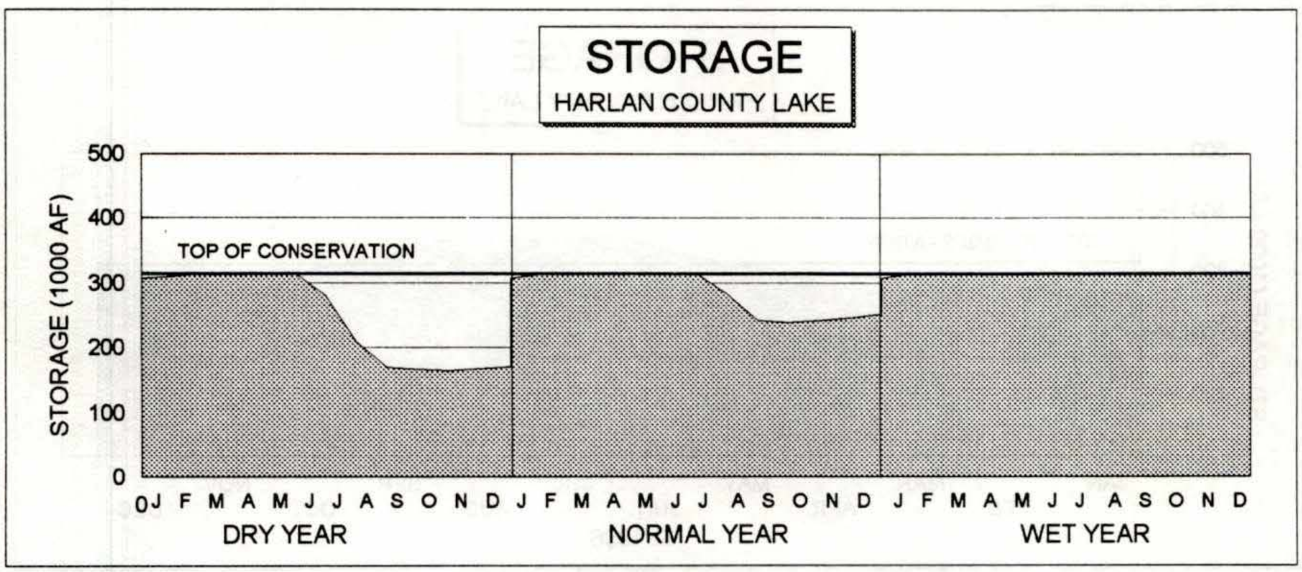


EXHIBIT 12C

HARLAN COUNTY LAKE
1997 OPERATION PLAN





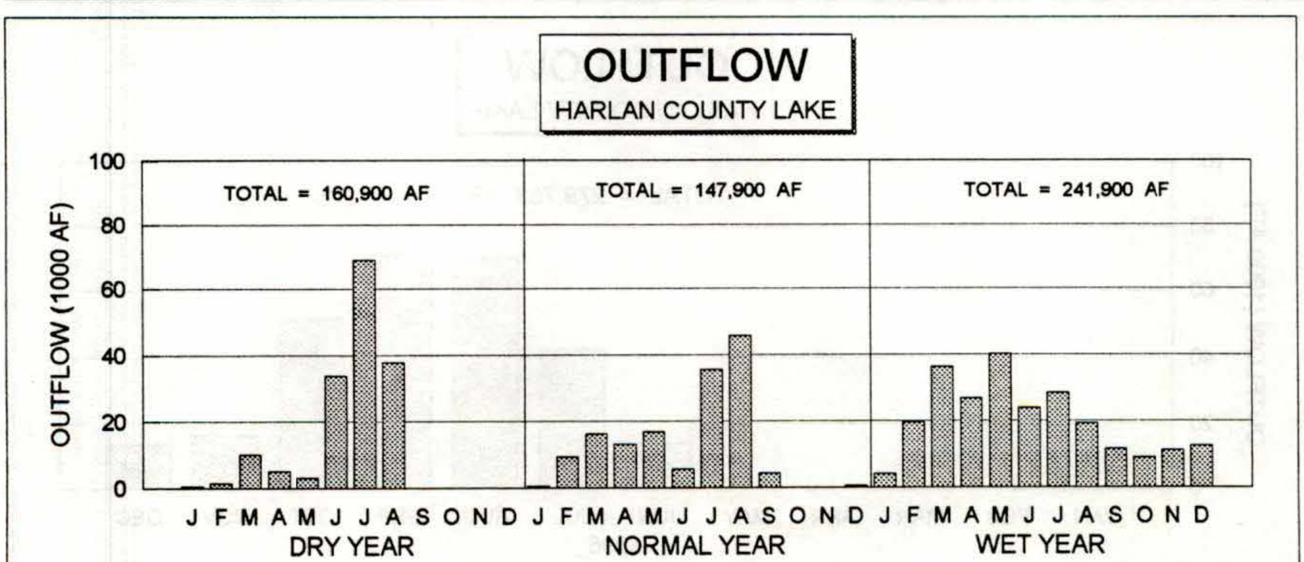
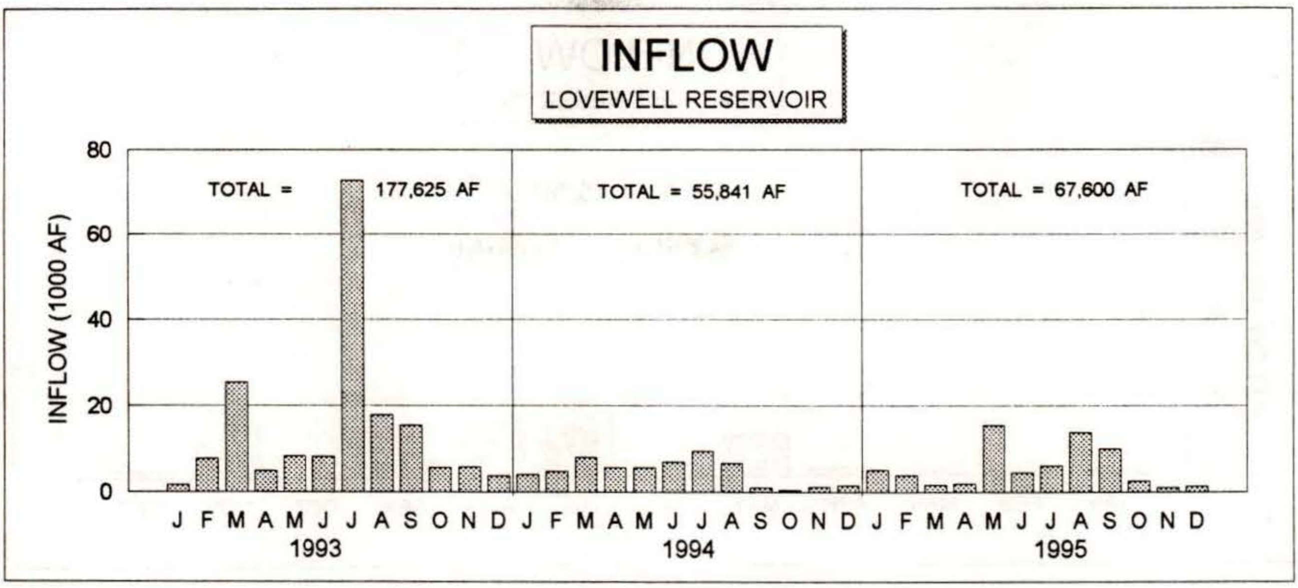
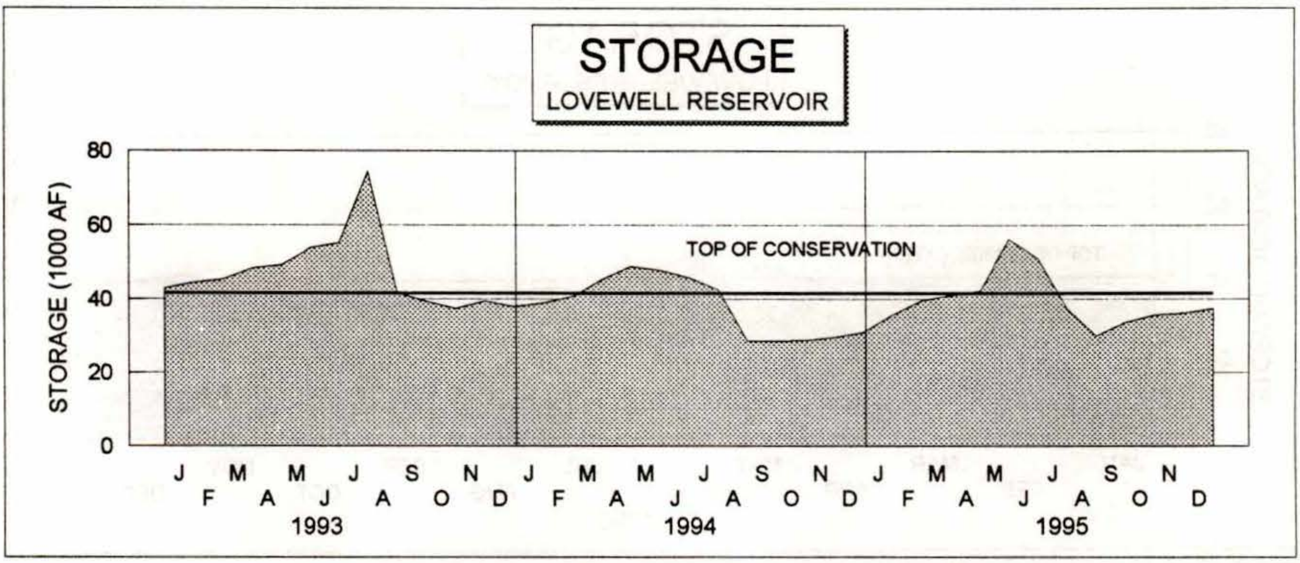


EXHIBIT 13A

LOVEWELL RESERVOIR

OPERATION





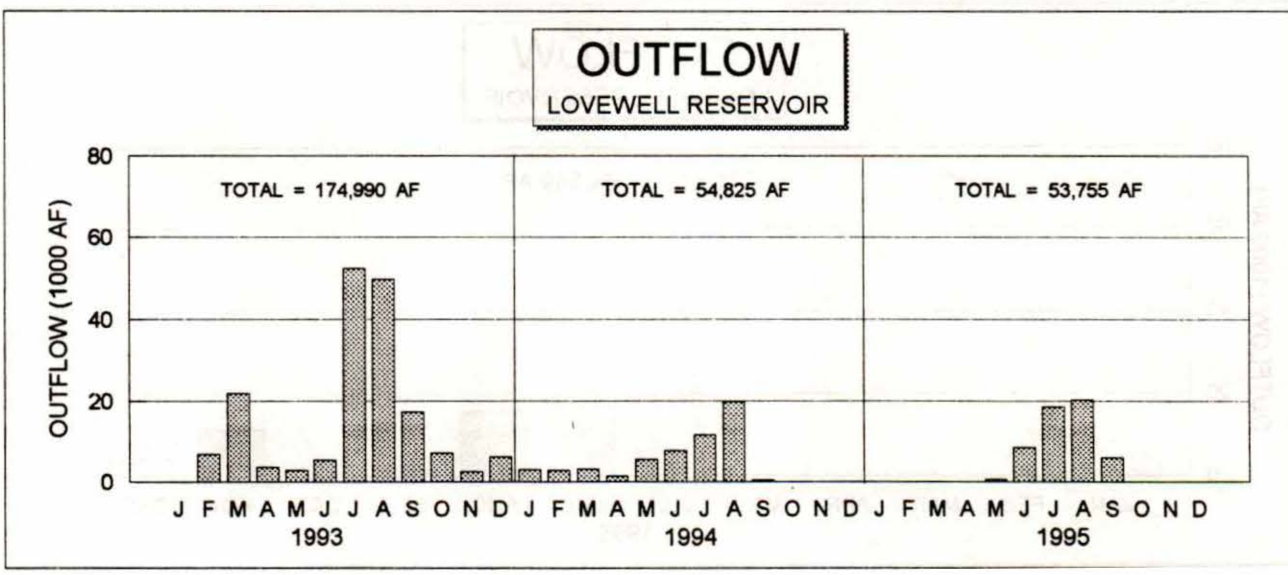
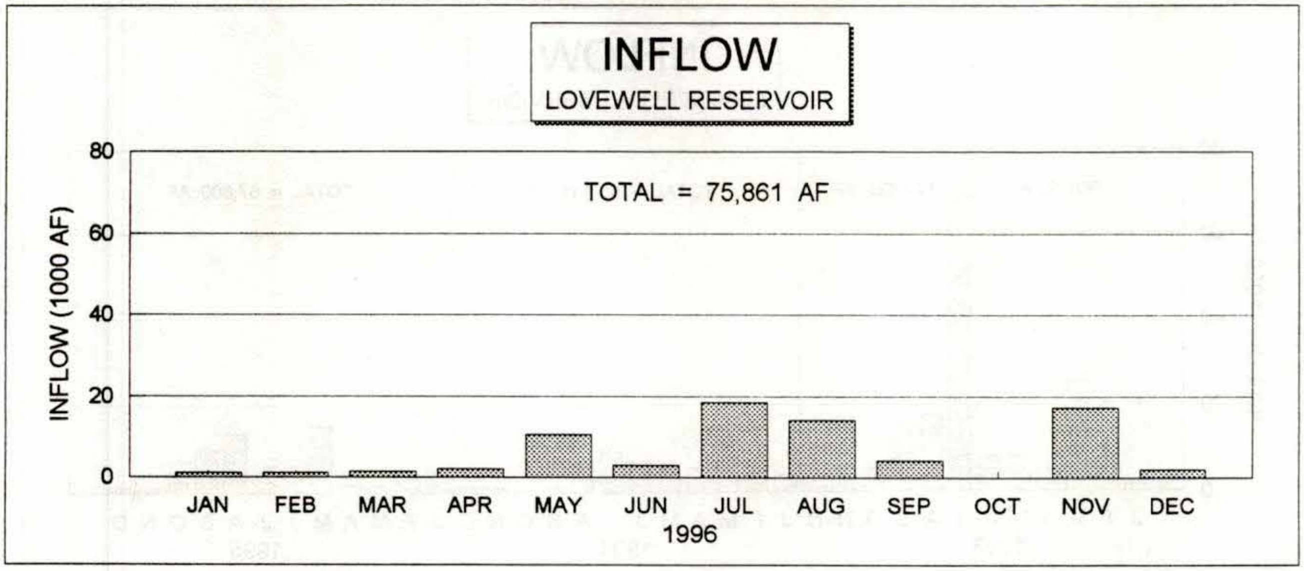
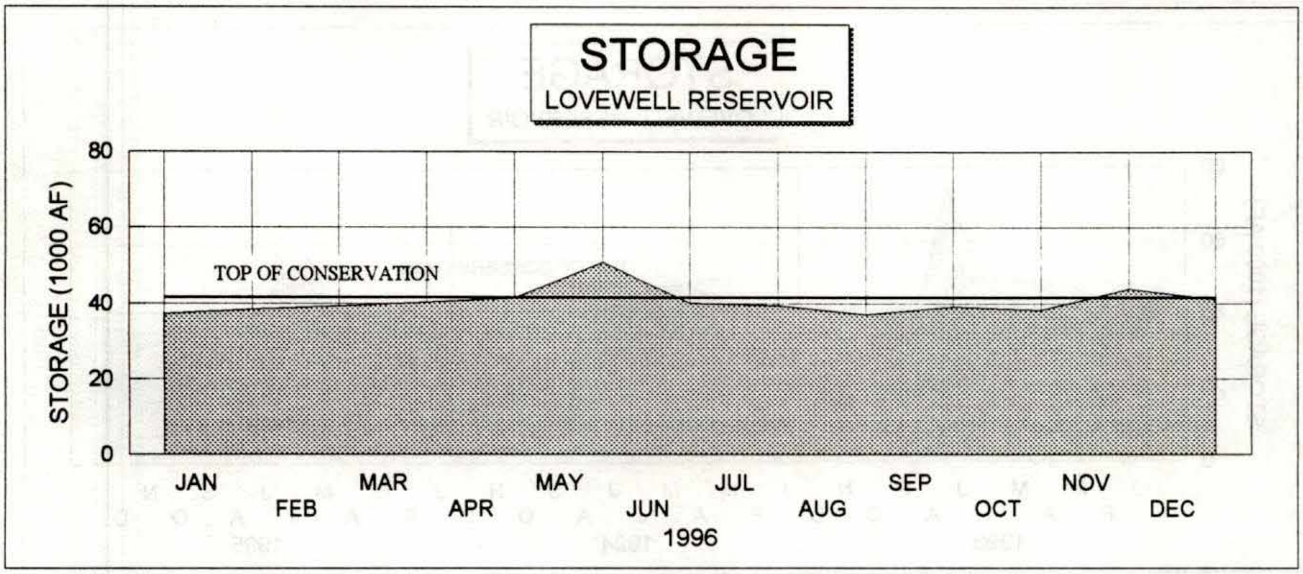


EXHIBIT 13B

LOVEWELL RESERVOIR

1996 OPERATION





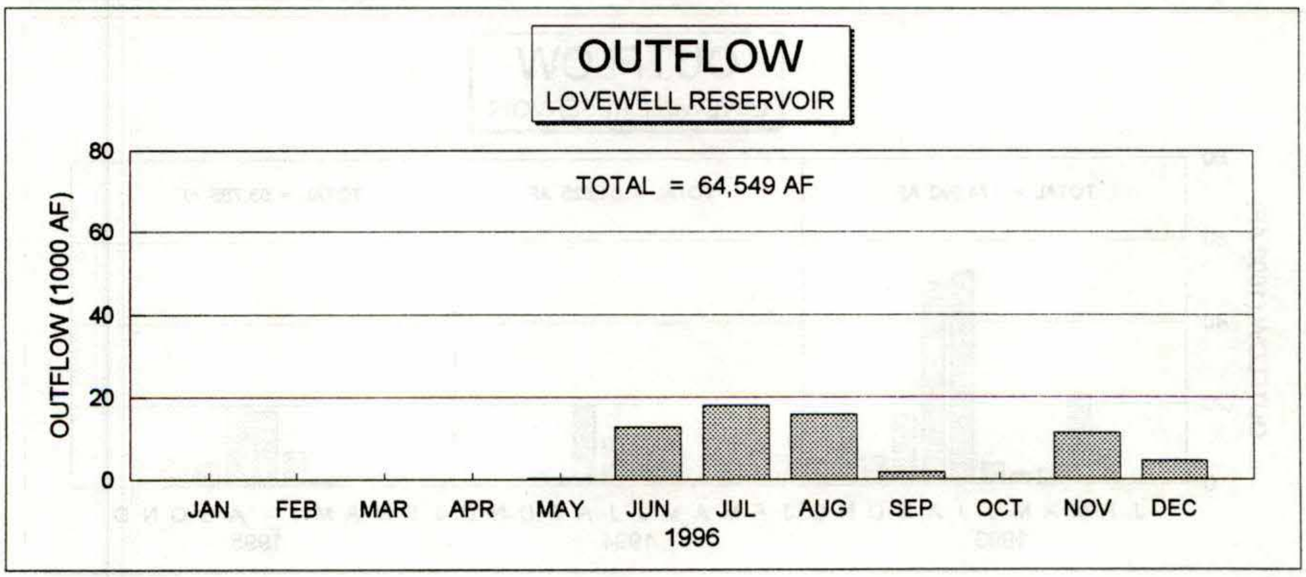
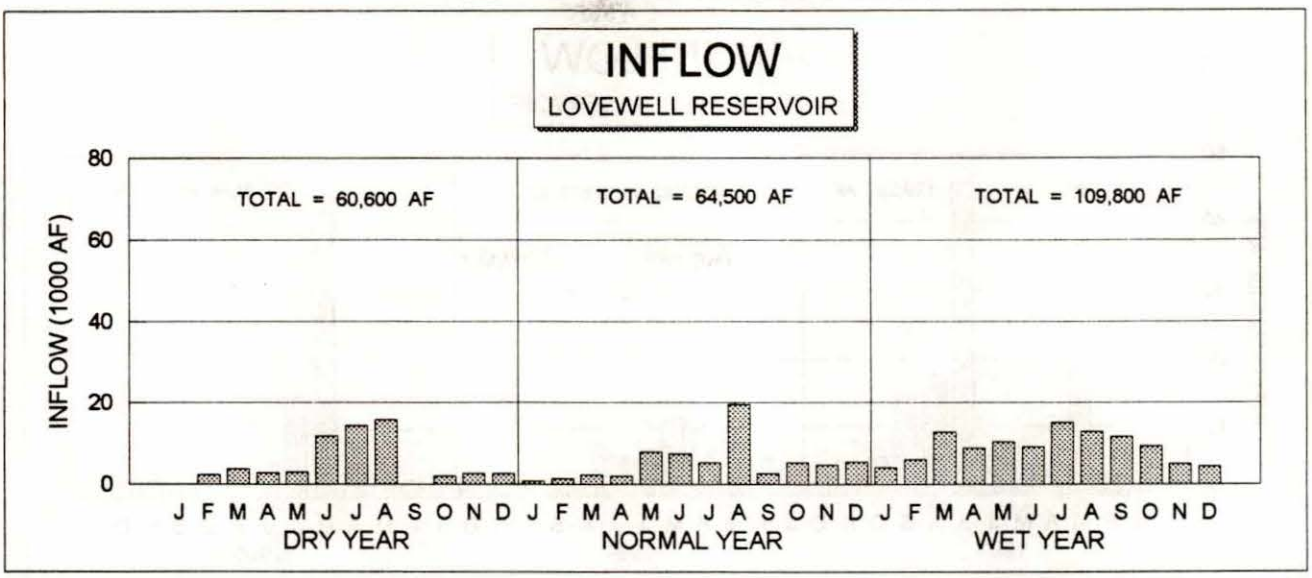
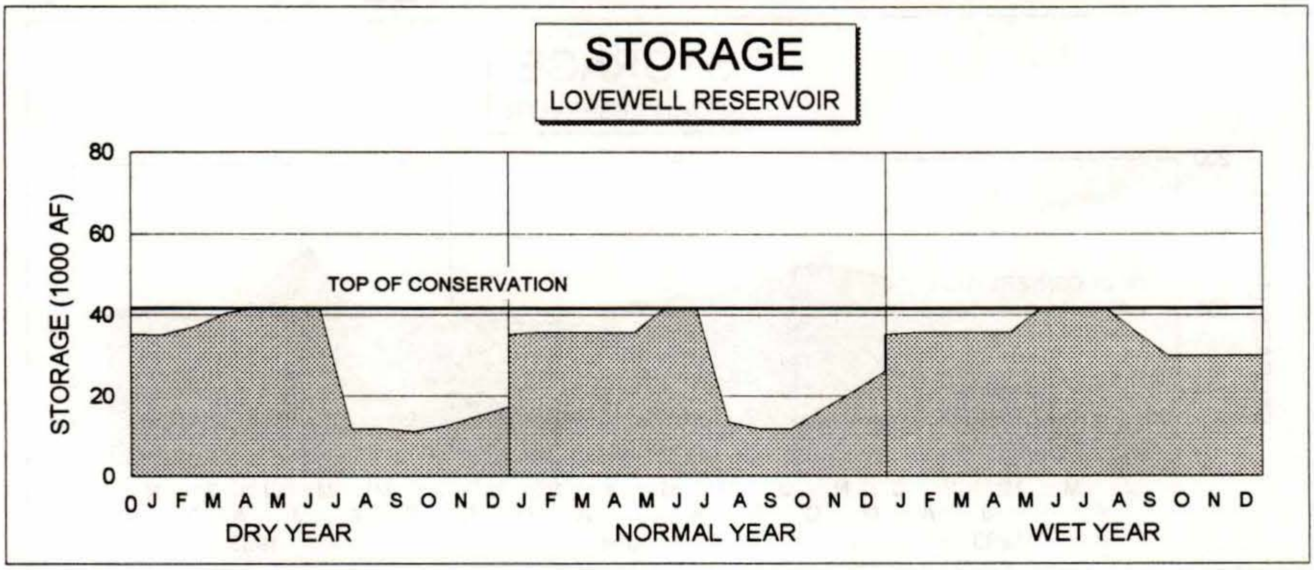


EXHIBIT 13C

LOVEWELL RESERVOIR

1997 OPERATION PLAN





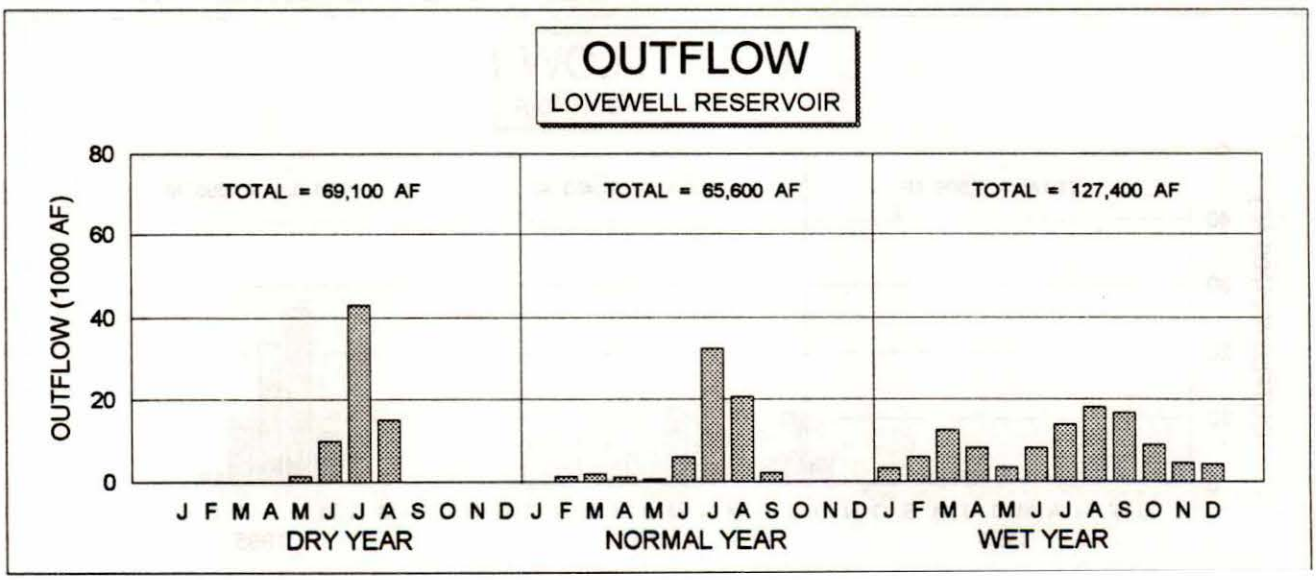
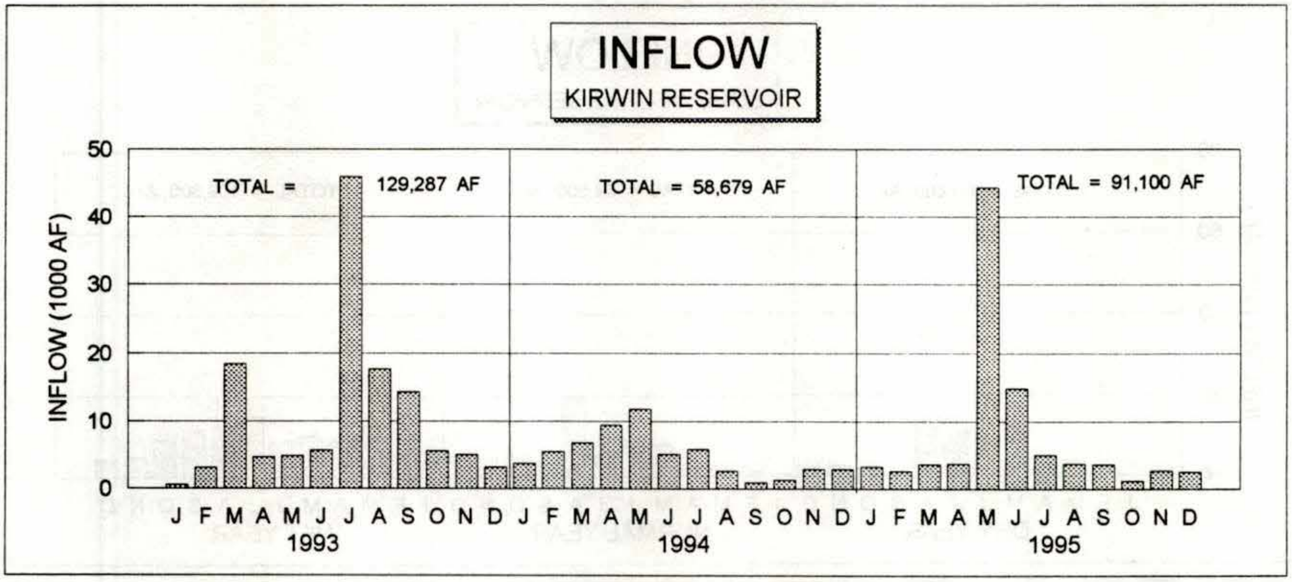
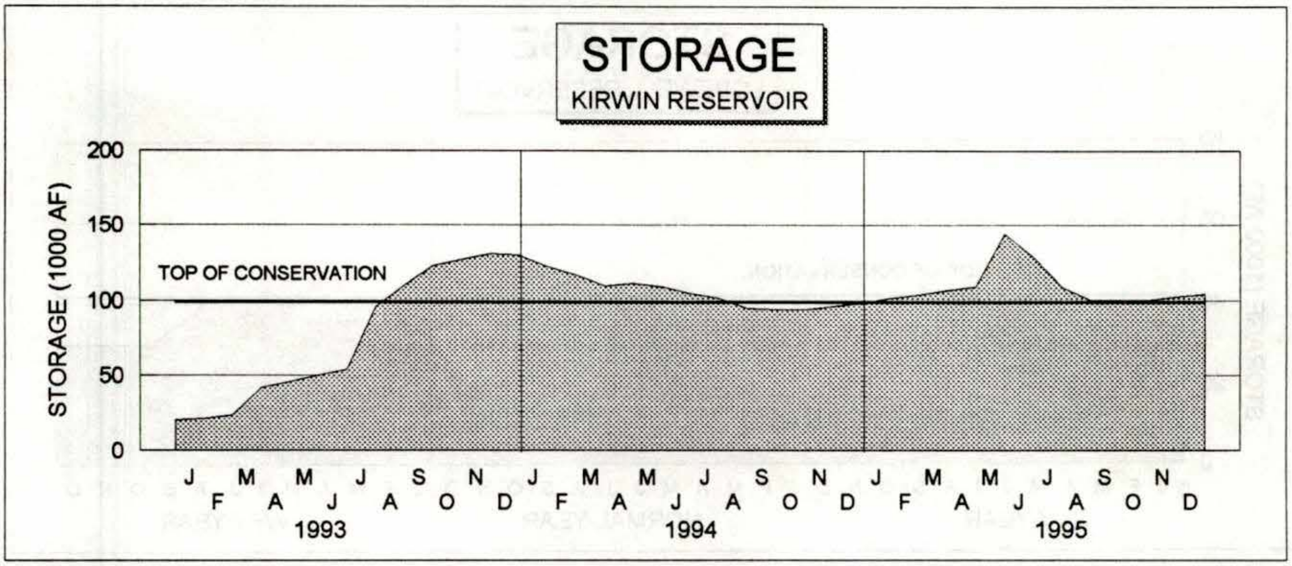
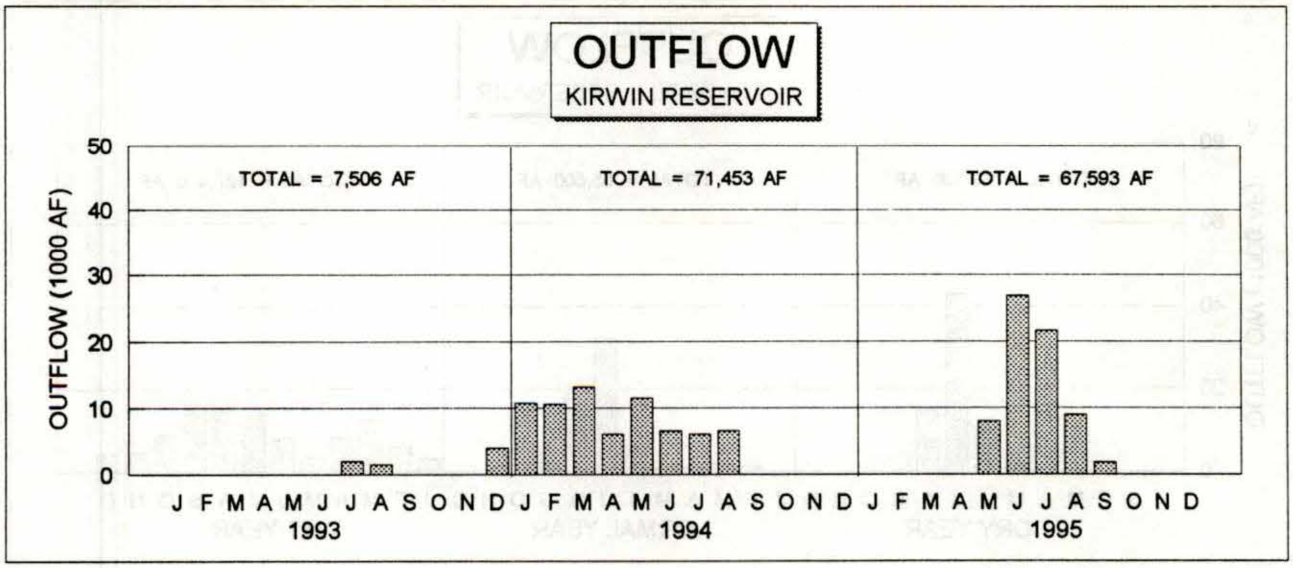


EXHIBIT 14A

KIRWIN RESERVOIR
OPERATION

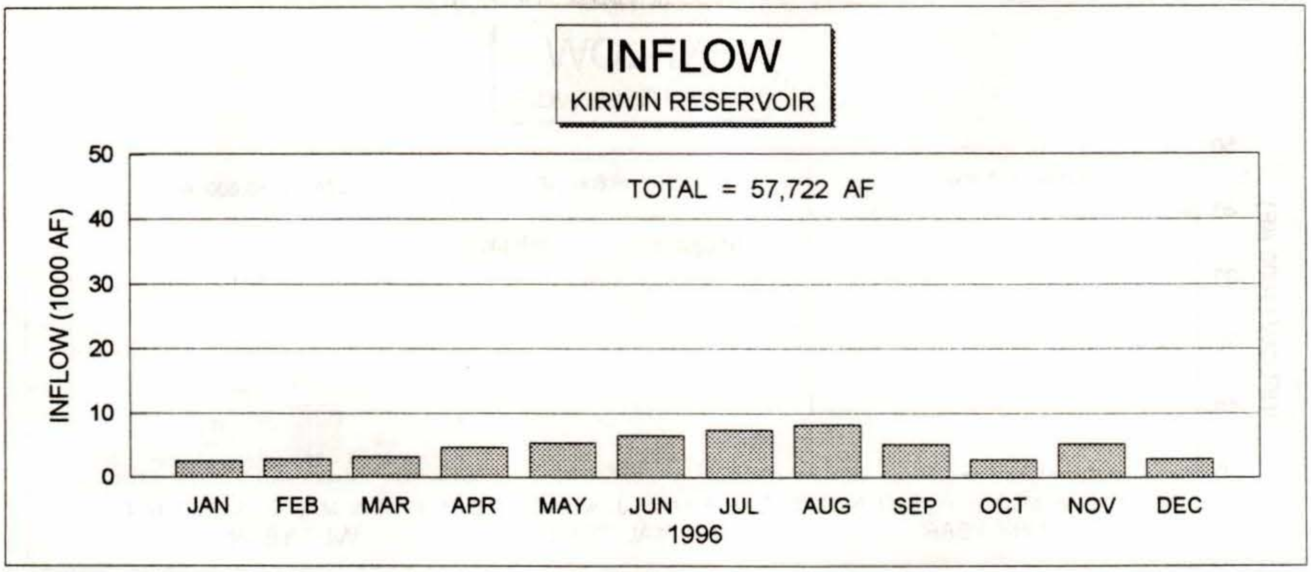


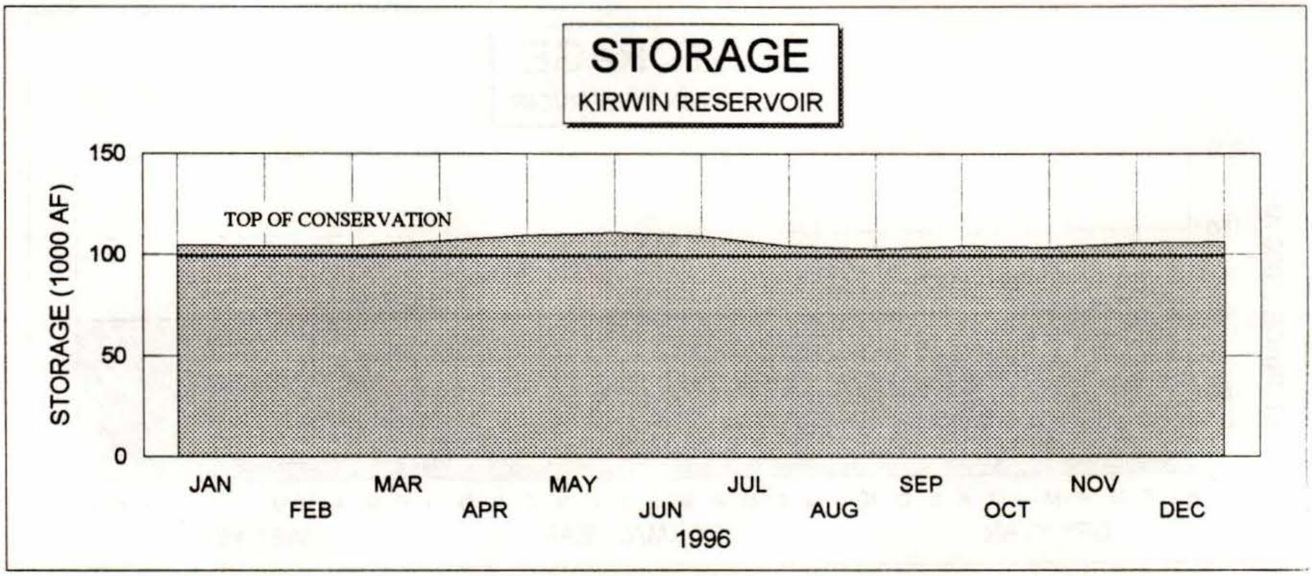




KIRWIN RESERVOIR

1996 OPERATION





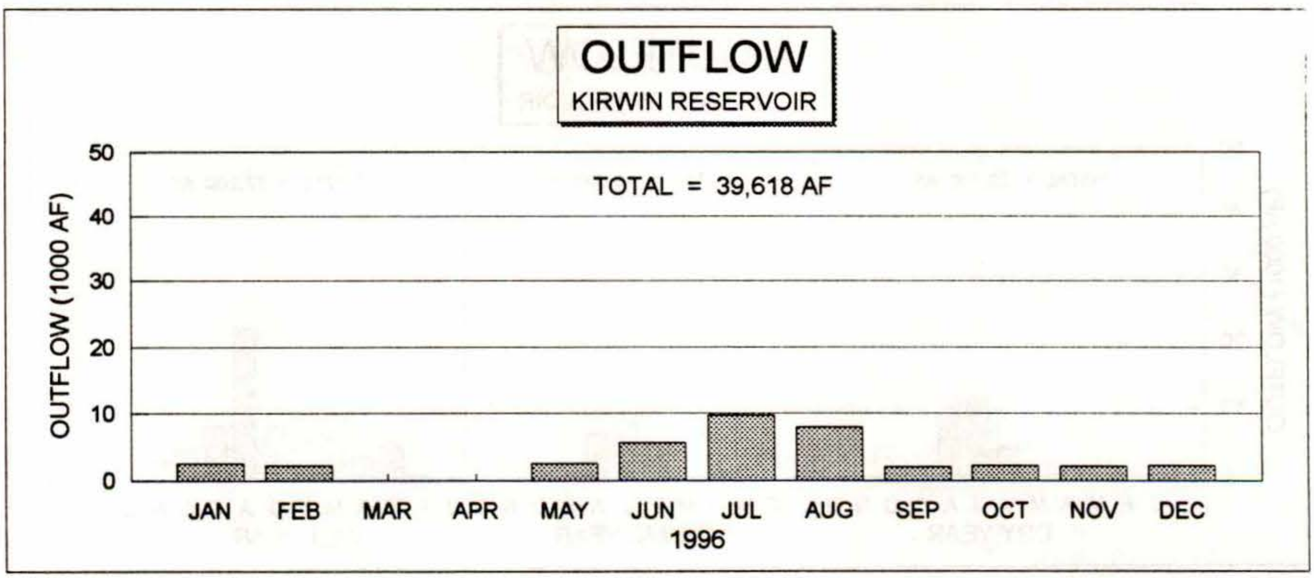
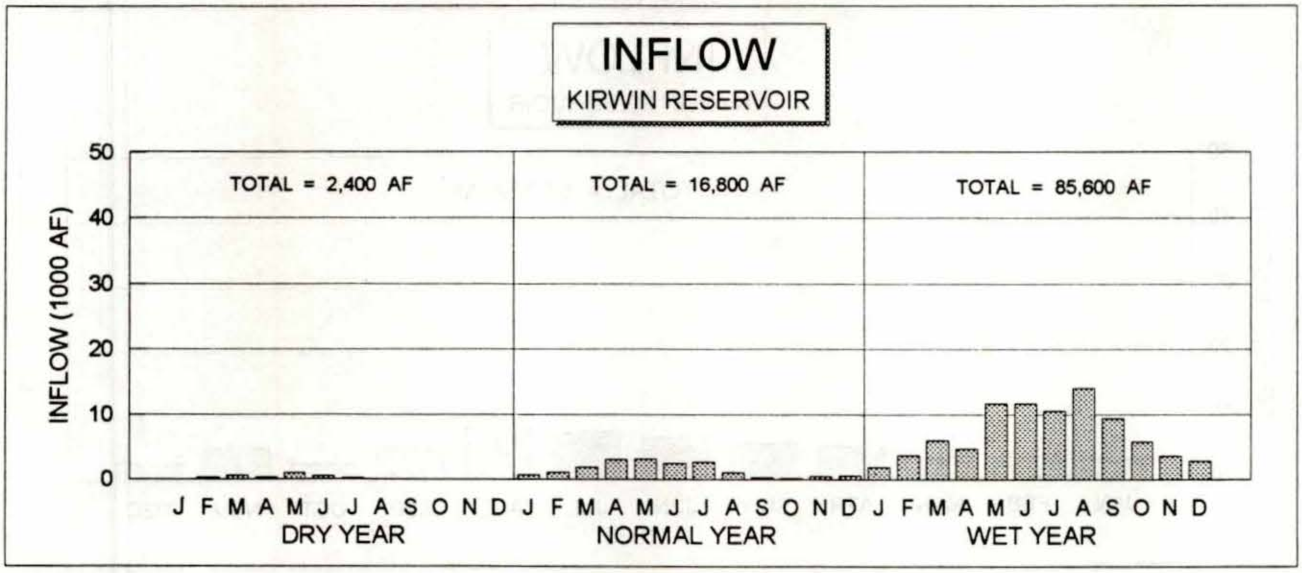
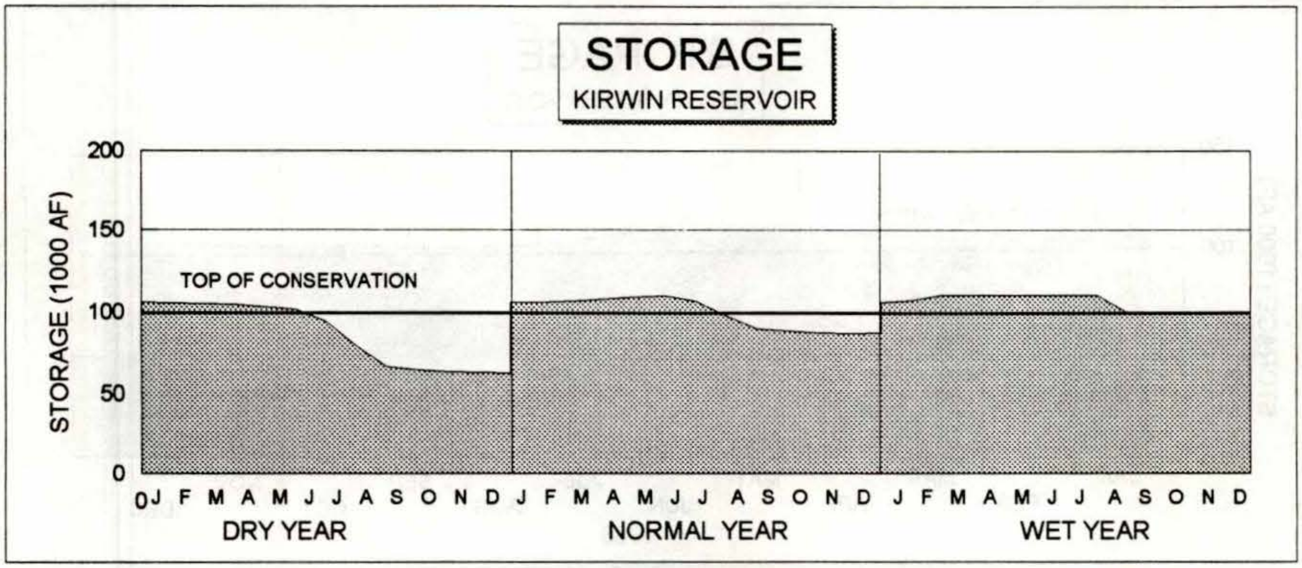


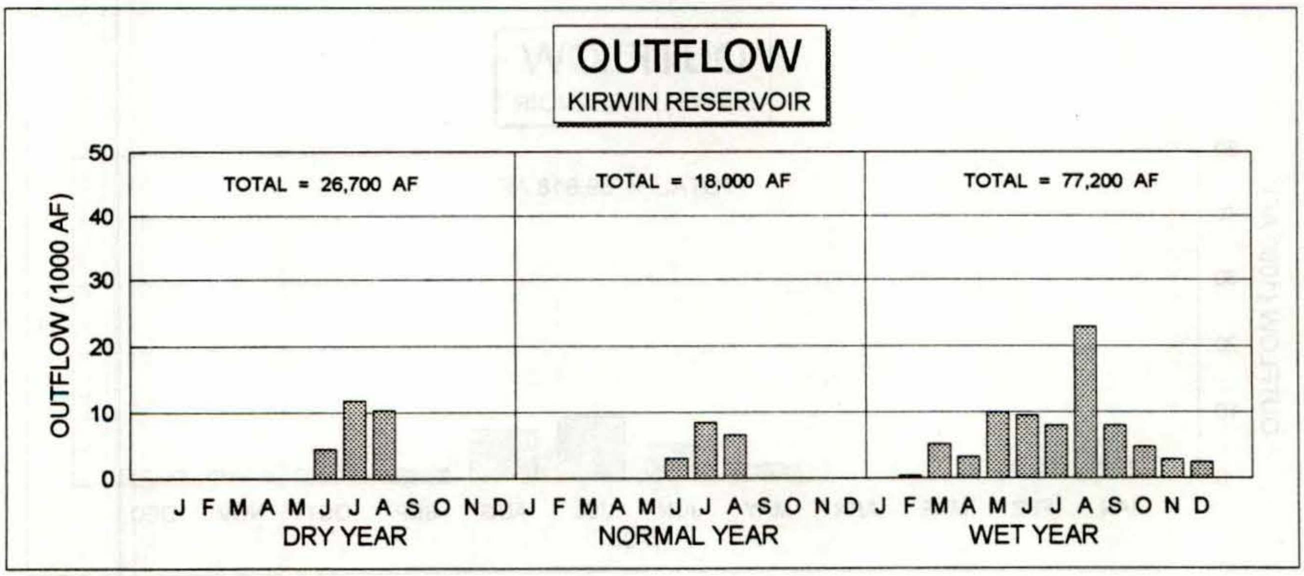
EXHIBIT 14C

KIRWIN RESERVOIR

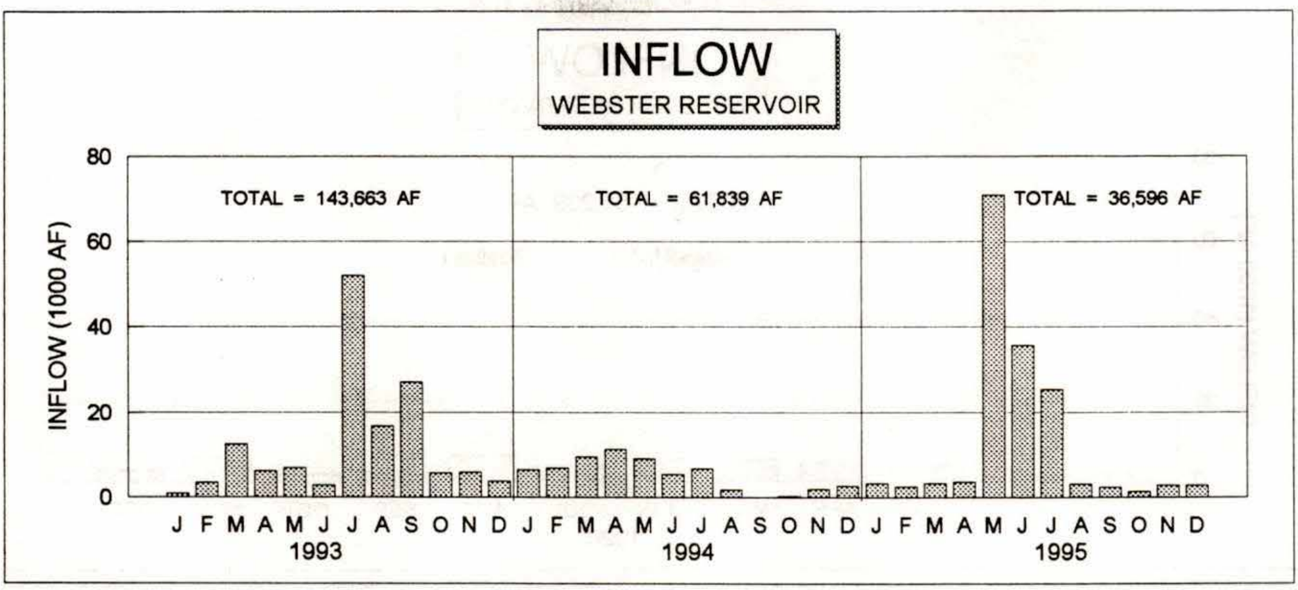
1997 OPERATION PLAN

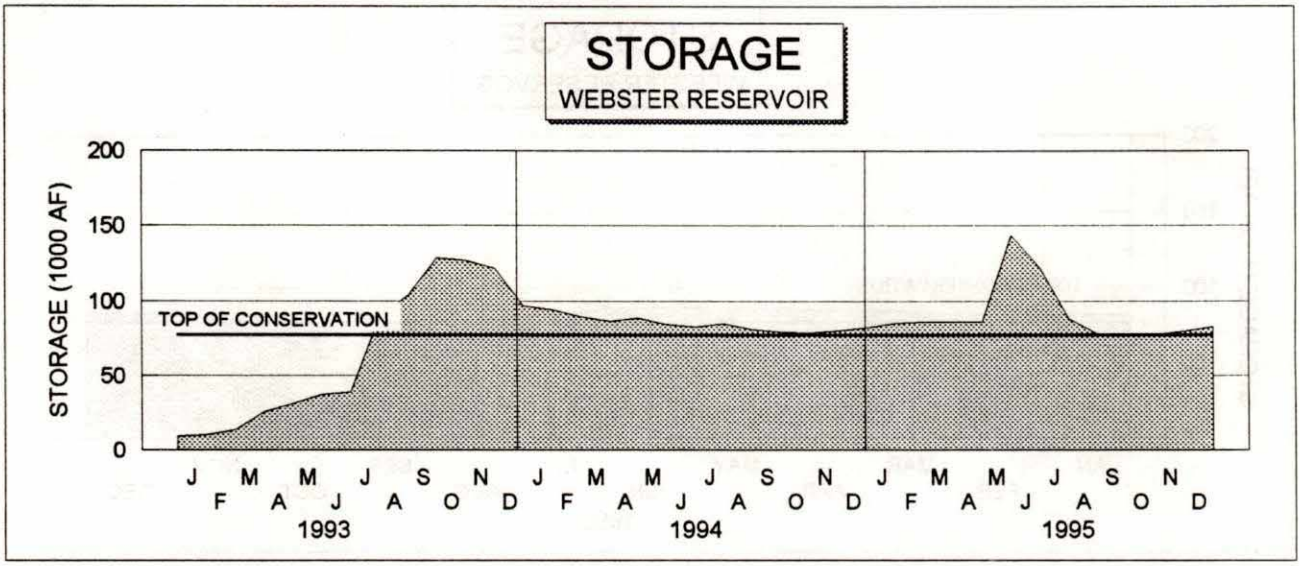






WEBSTER RESERVOIR
OPERATION





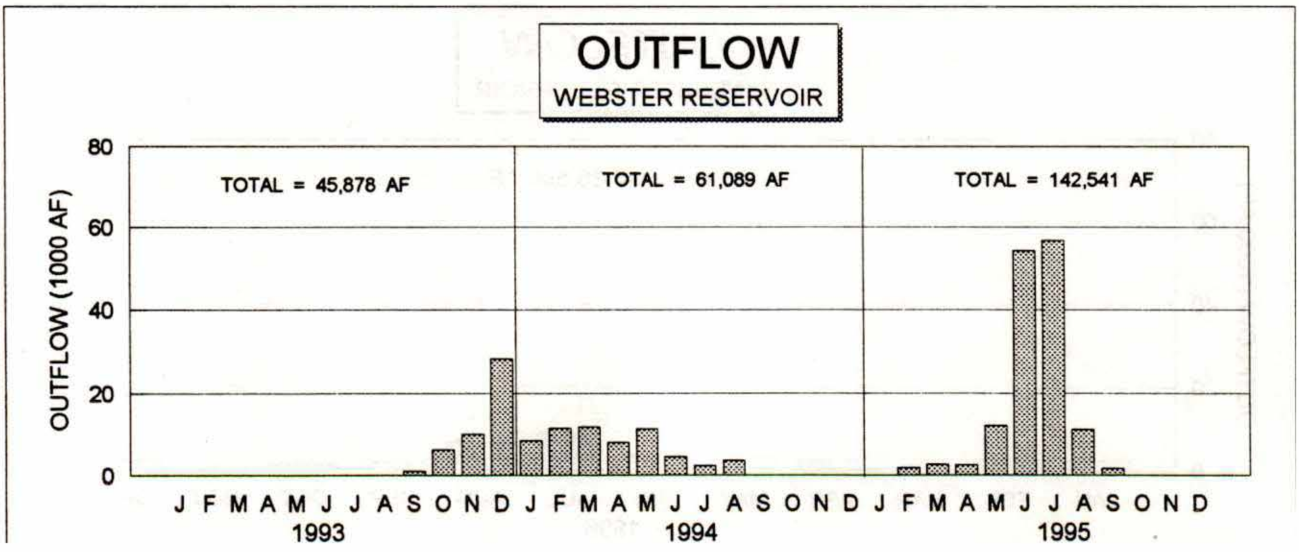
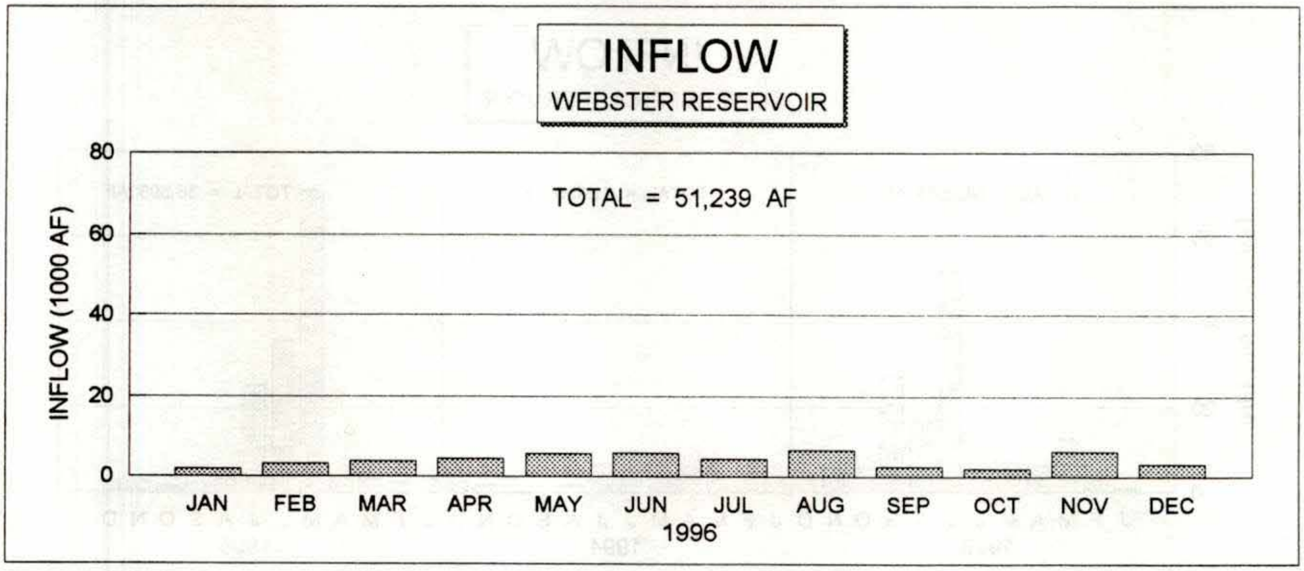
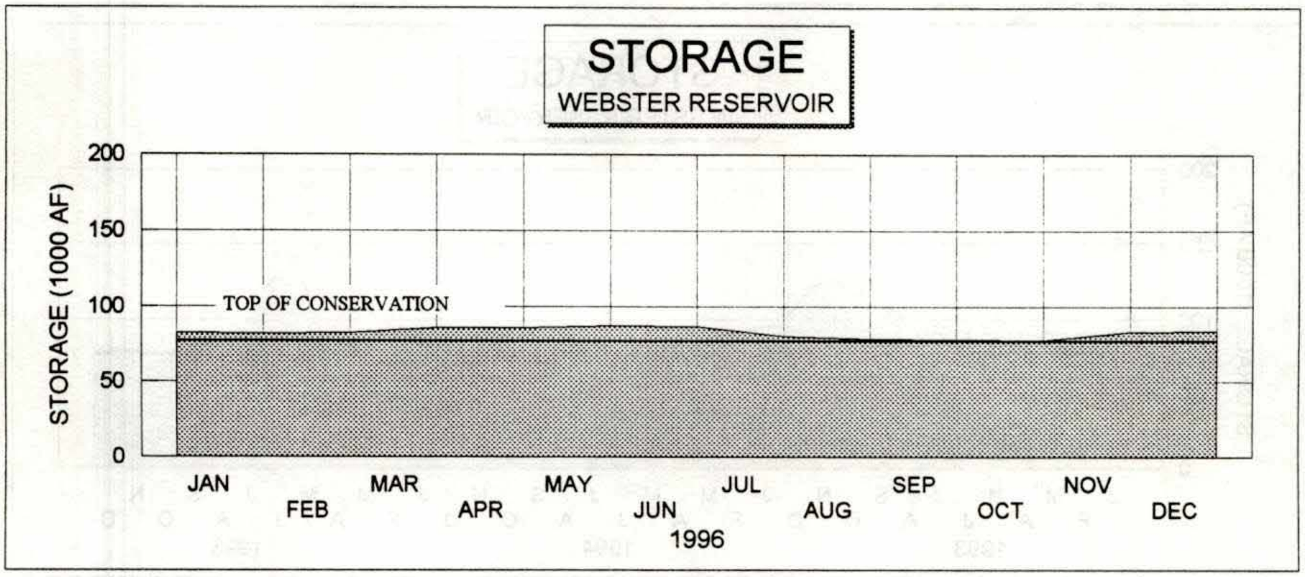


EXHIBIT 15B

WEBSTER RESERVOIR

1996 OPERATION





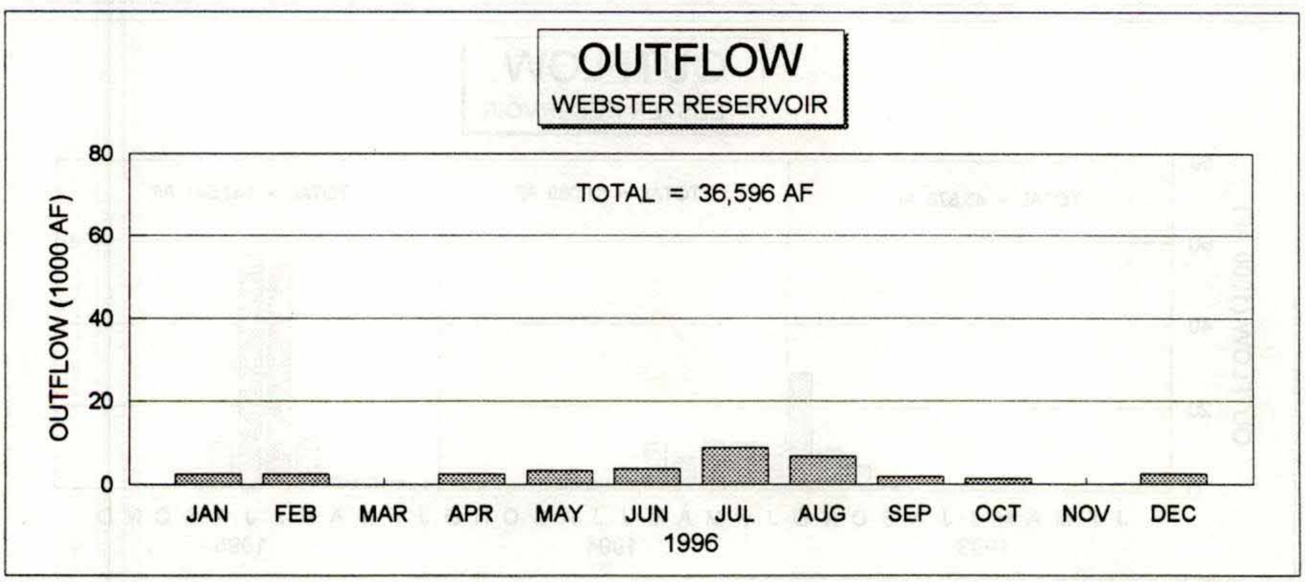
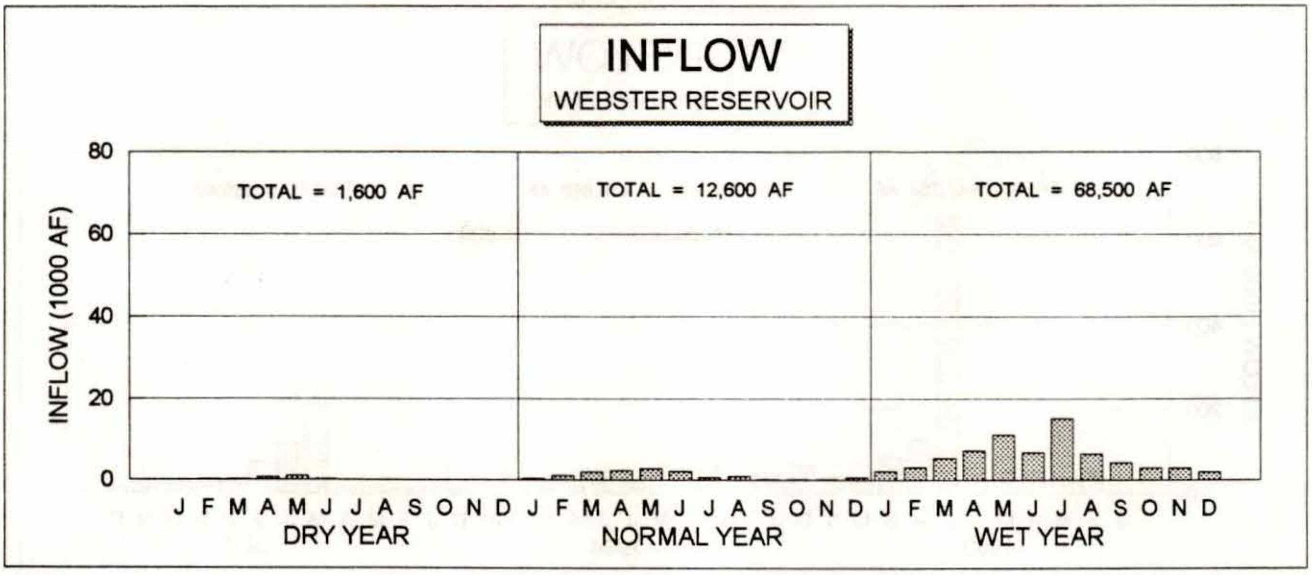
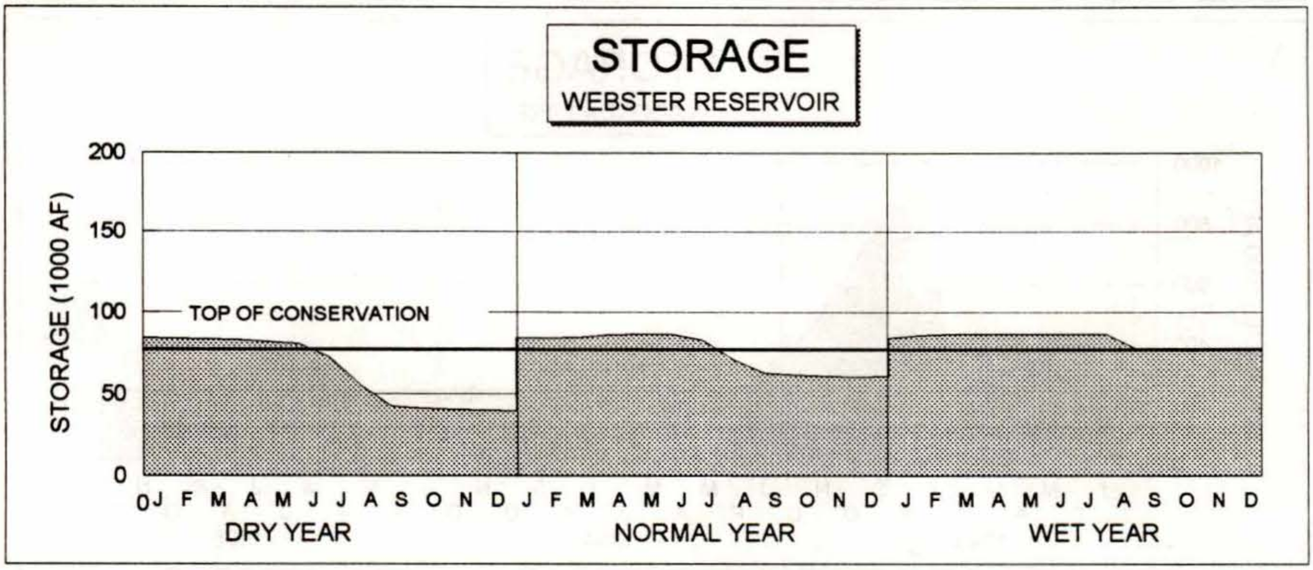


EXHIBIT 15C

WEBSTER RESERVOIR
1997 OPERATION PLAN





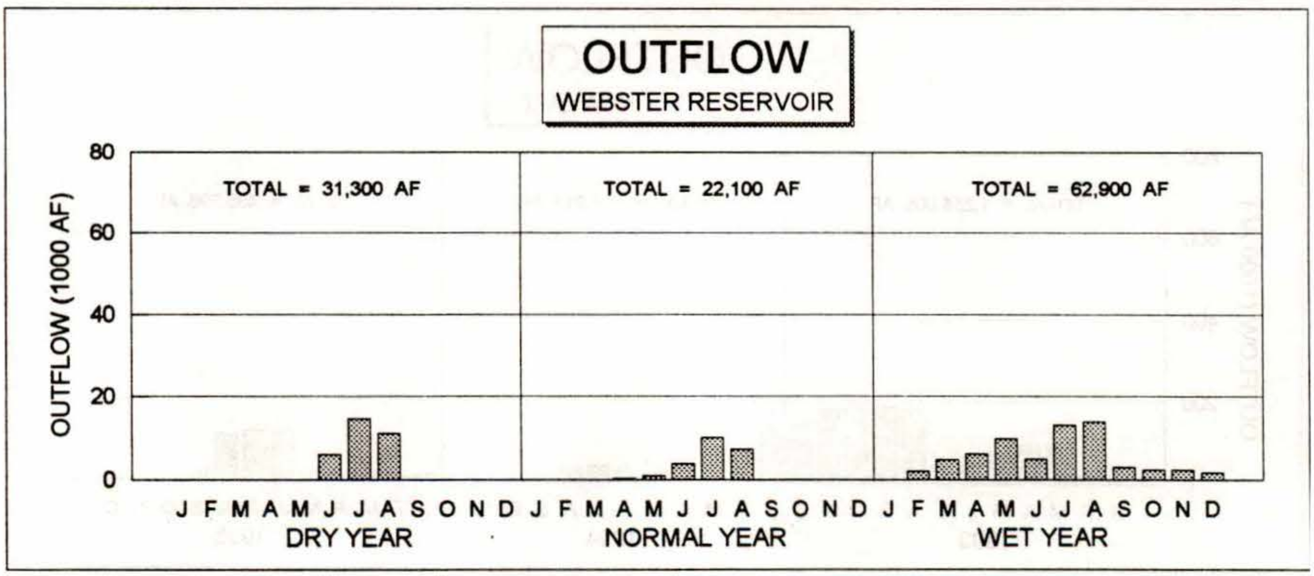
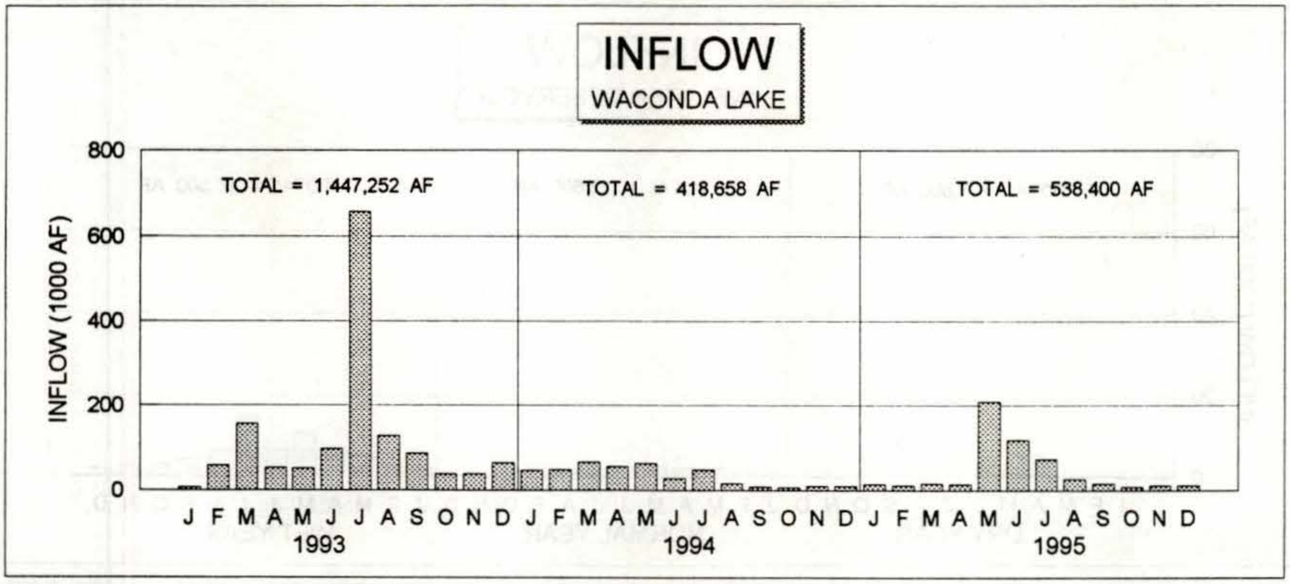
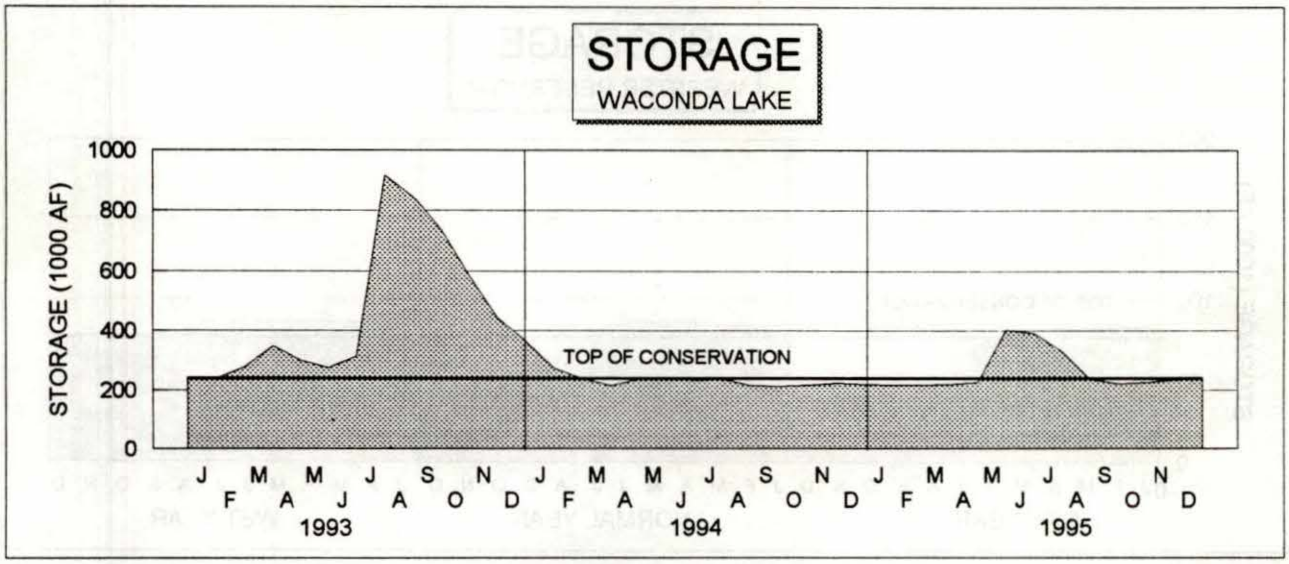


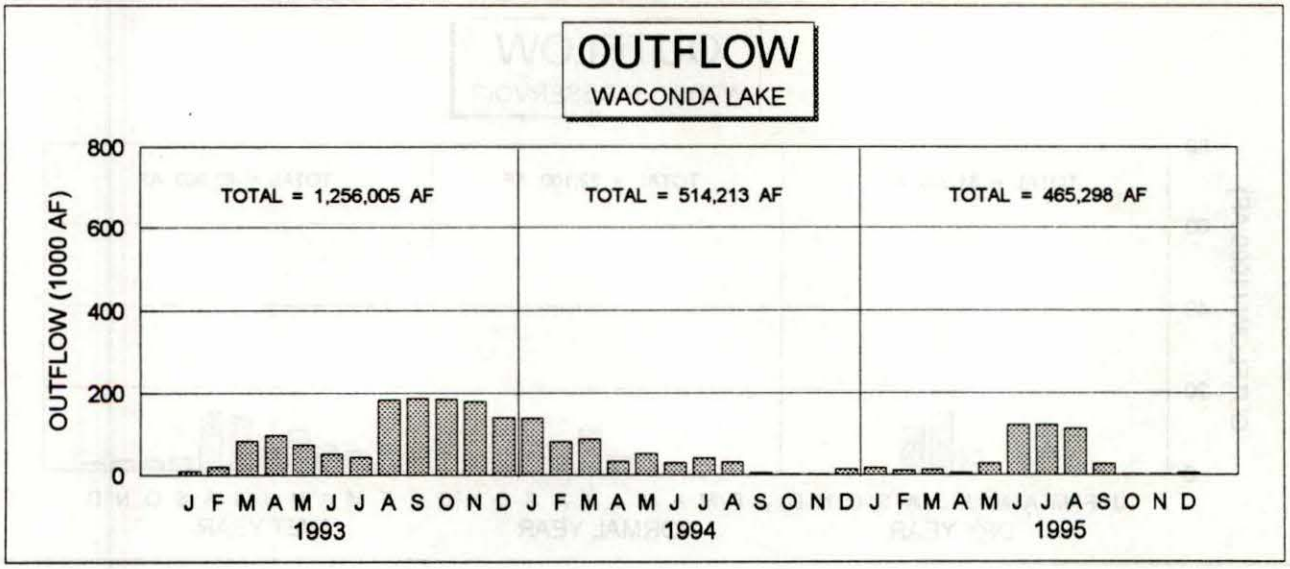
EXHIBIT 16A

WACONDA LAKE

OPERATION

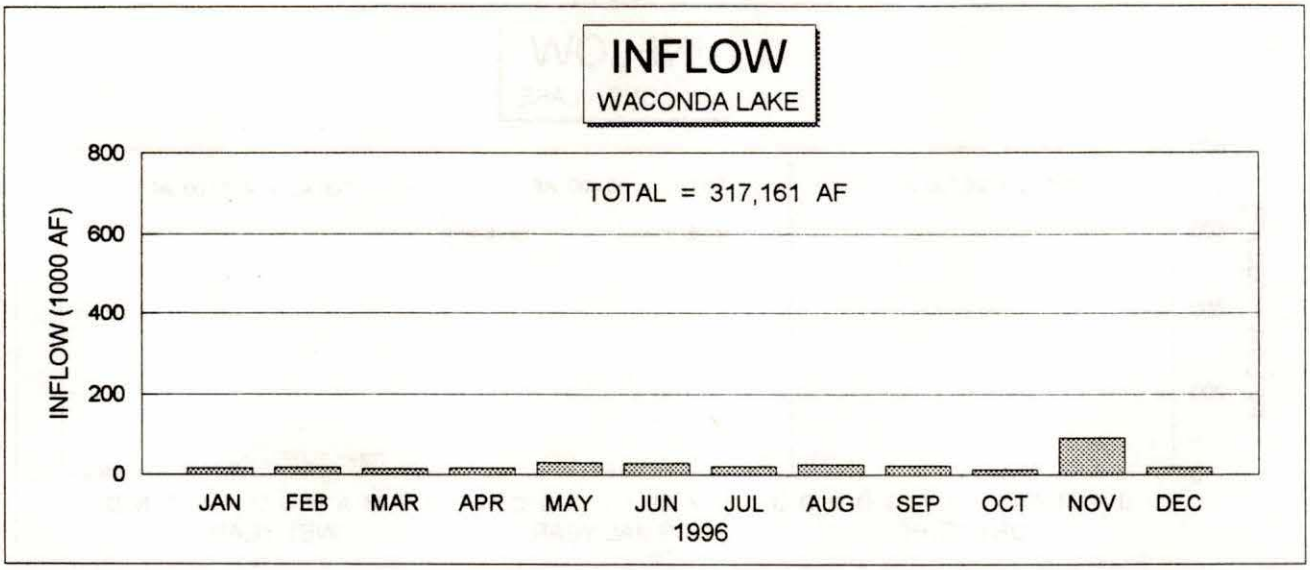


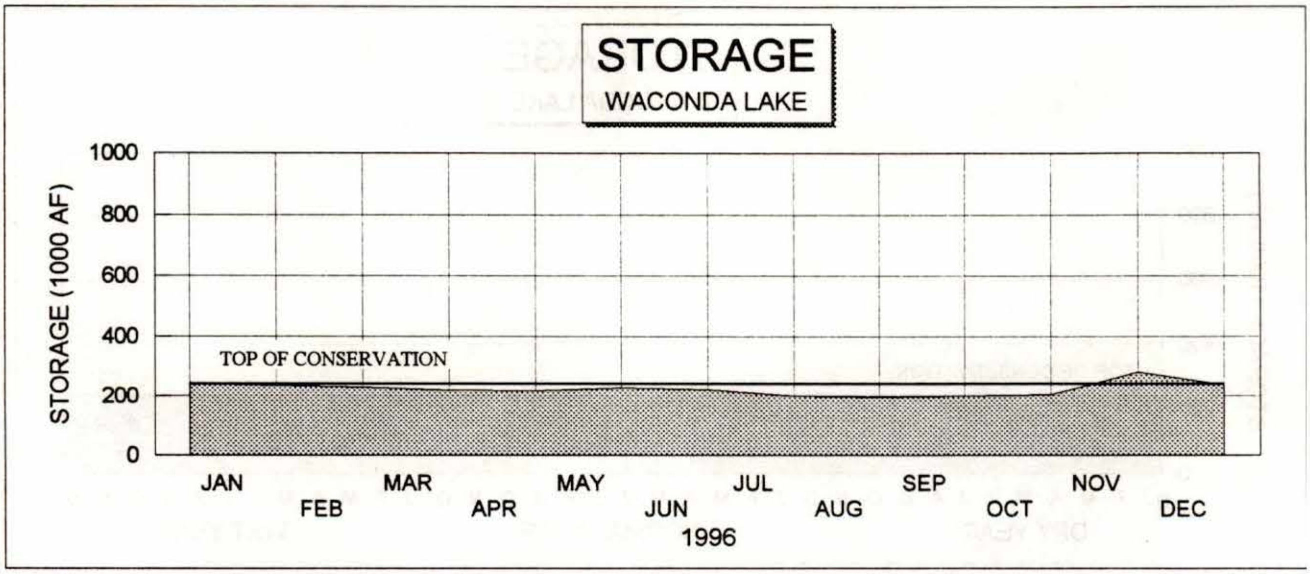




WACONDA LAKE

1996 OPERATION





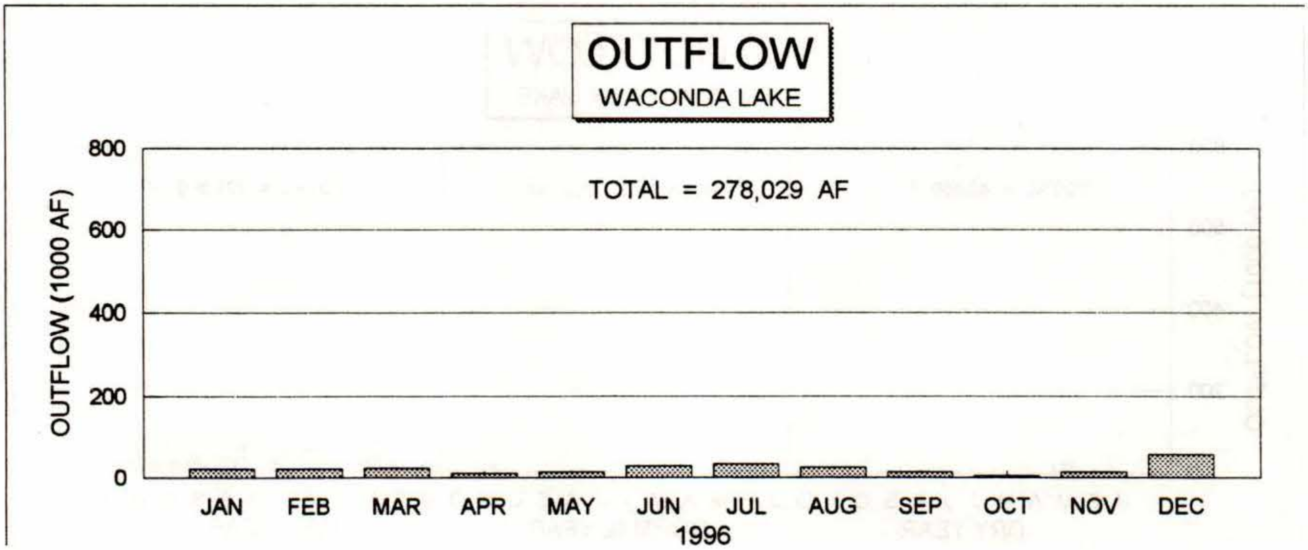
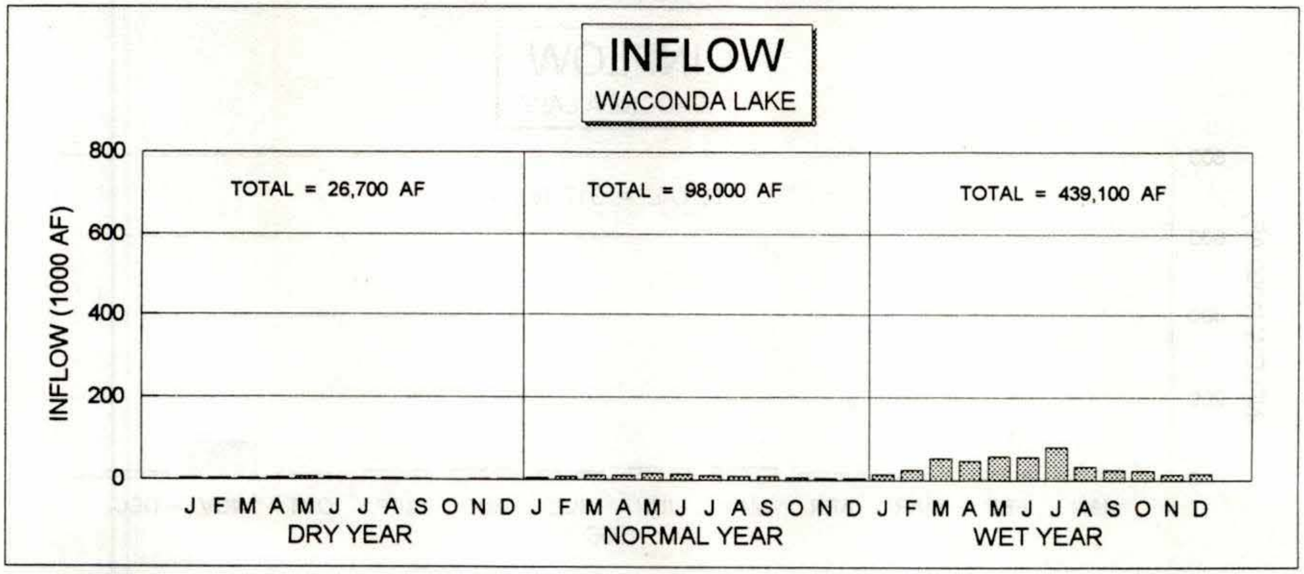
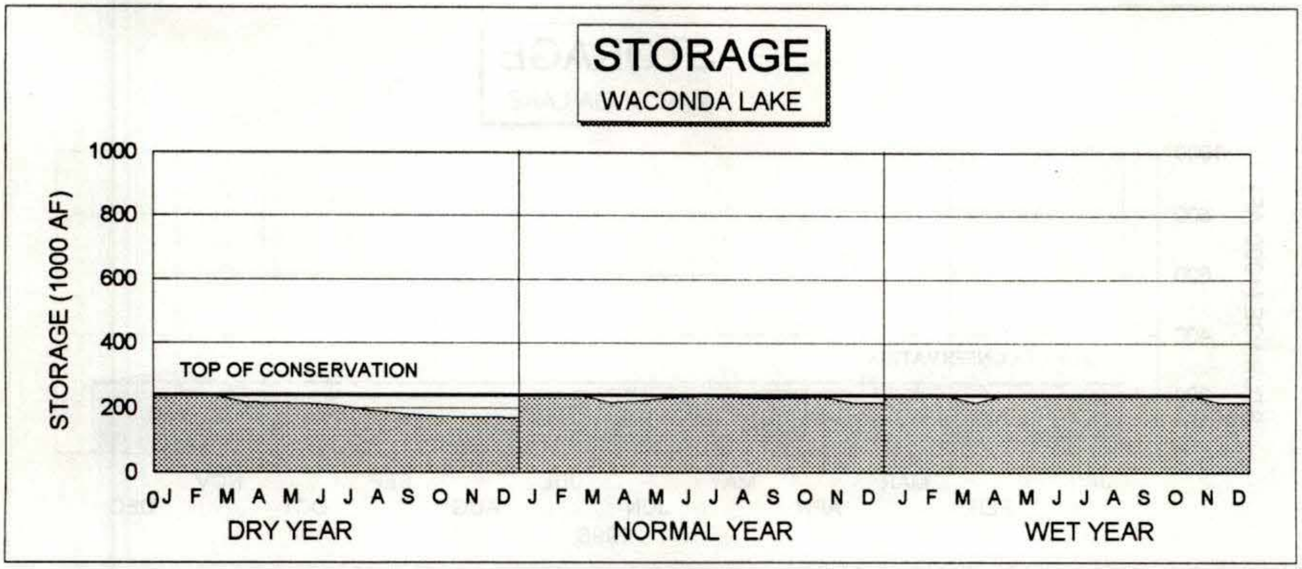


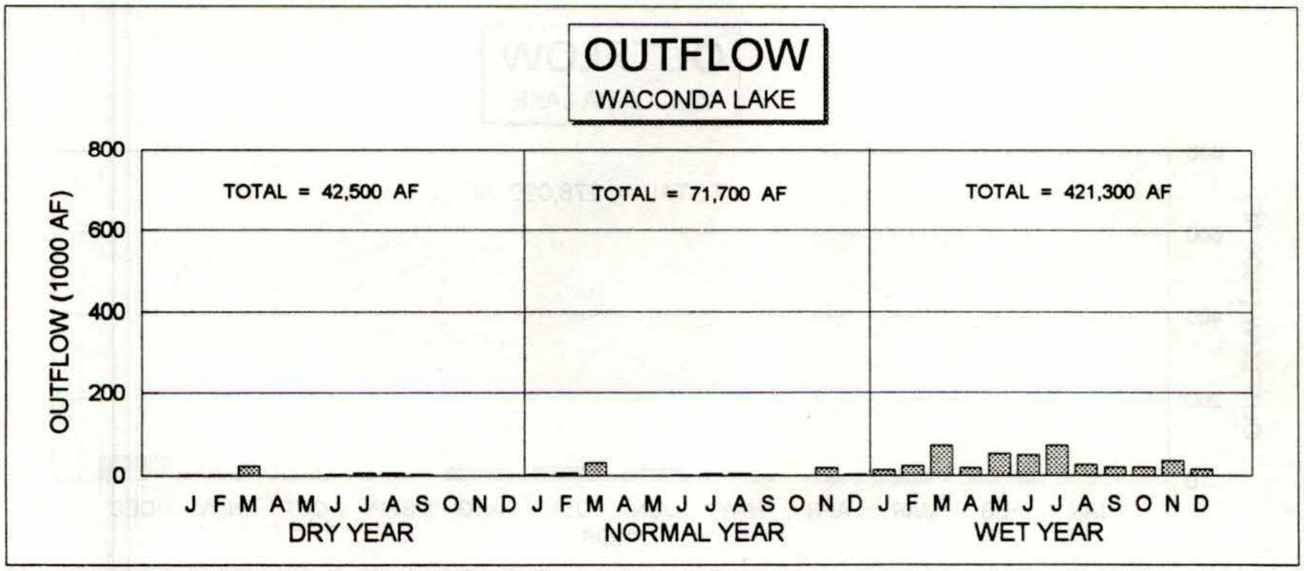
EXHIBIT 16C

WACONDA LAKE

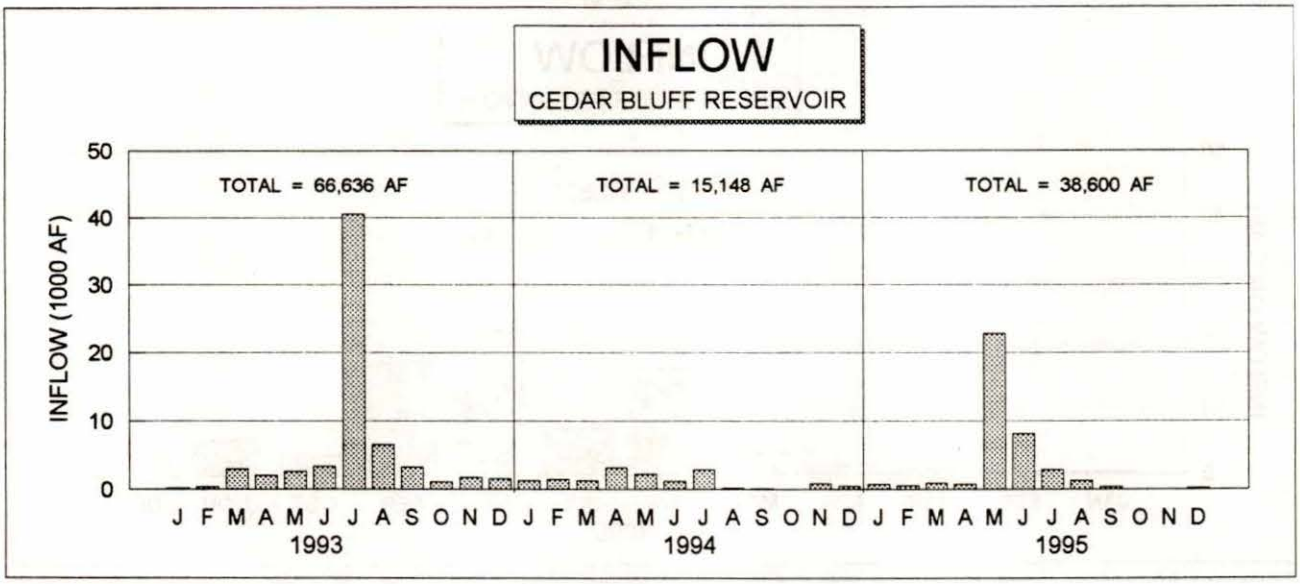
1997 OPERATION PLAN

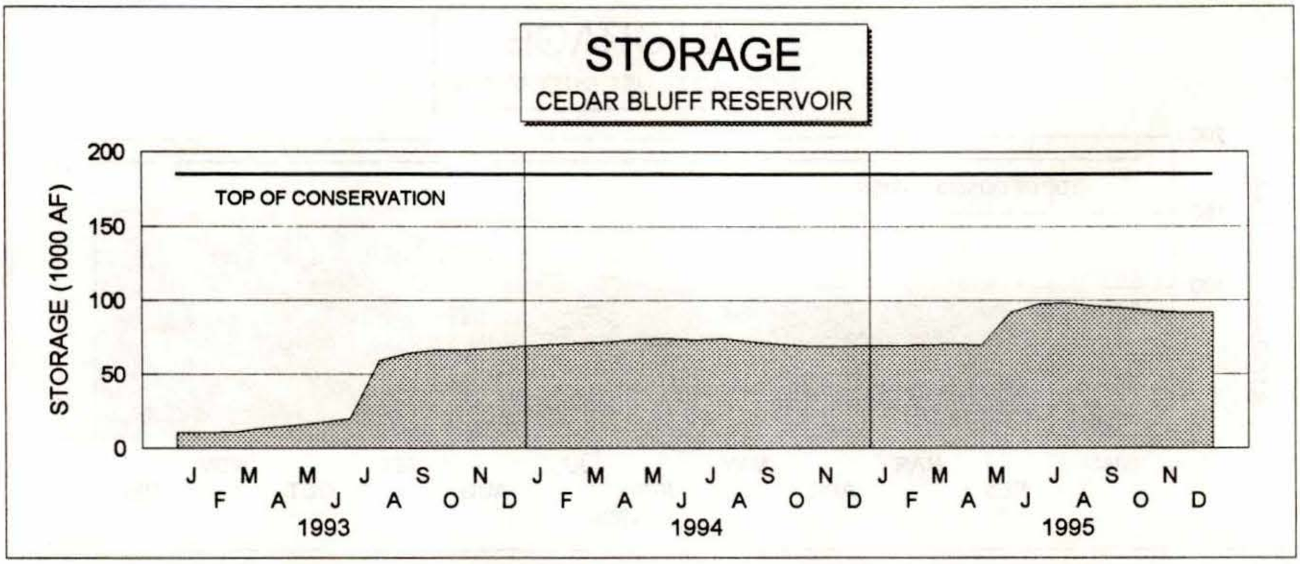






CEDAR BLUFF RESERVOIR
OPERATION





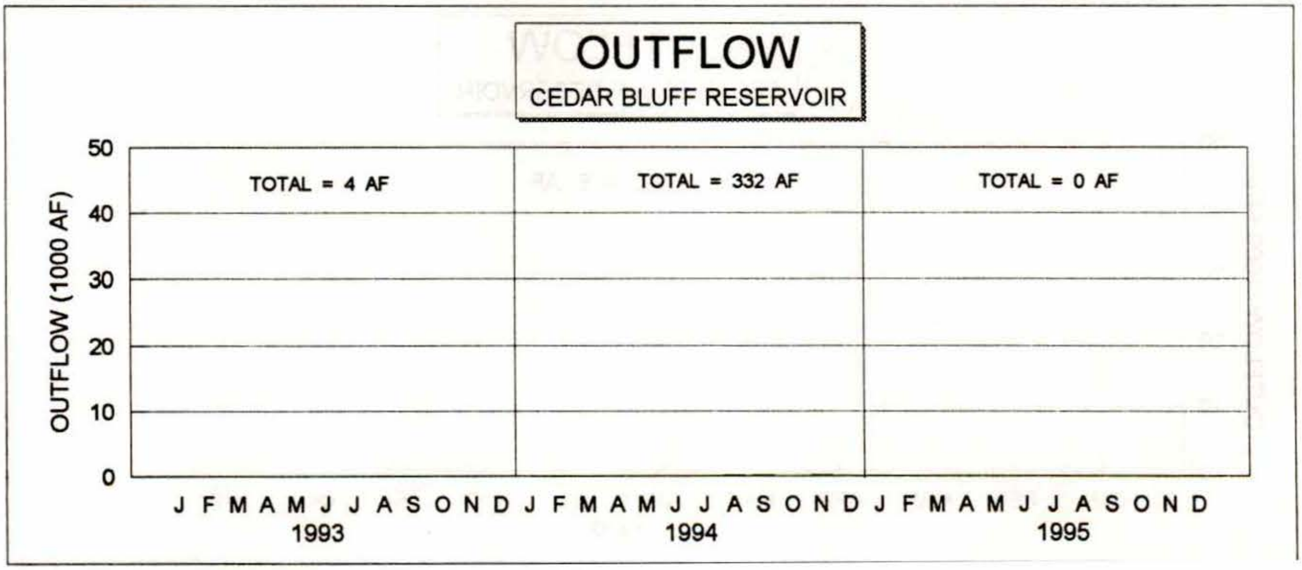
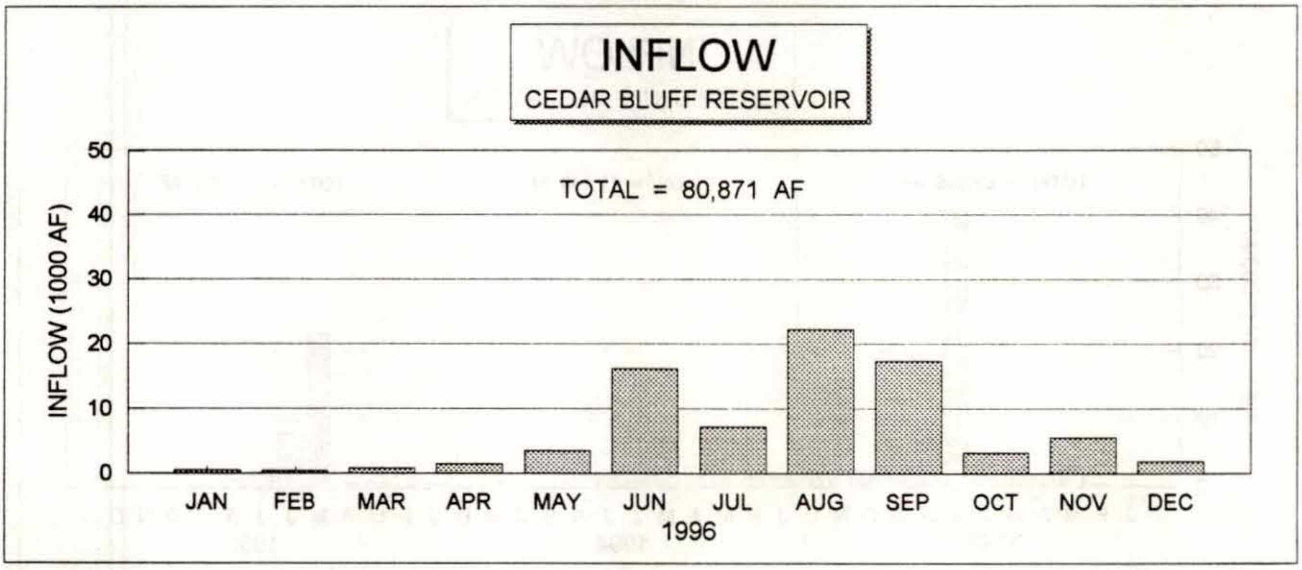
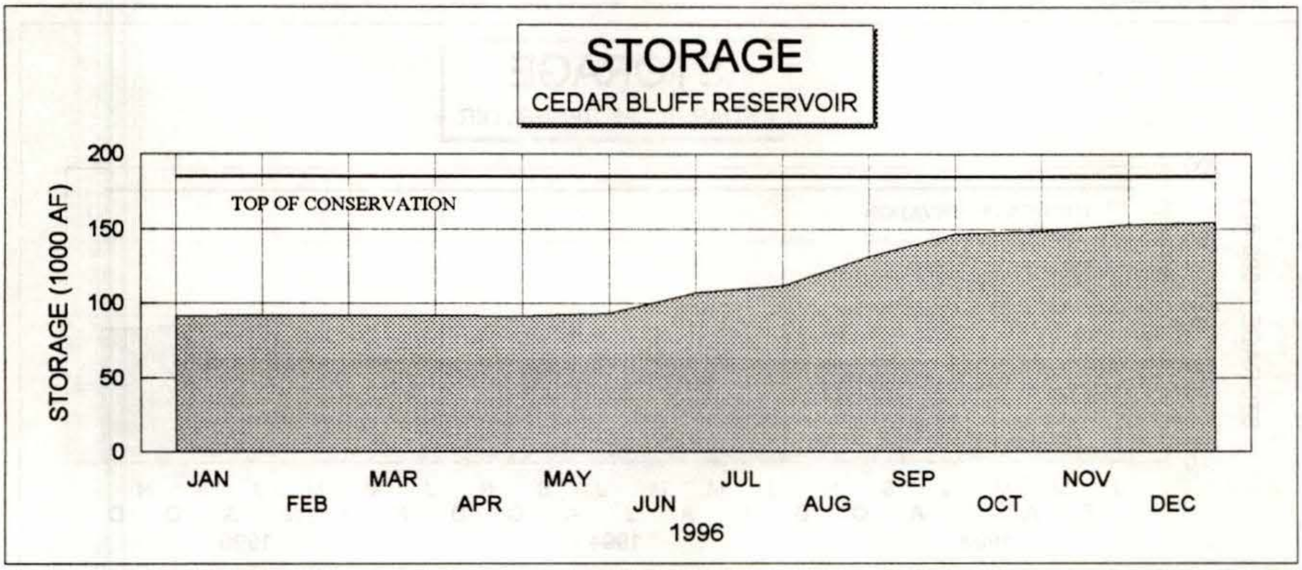


EXHIBIT 17B

CEDAR BLUFF RESERVOIR

1996 OPERATION





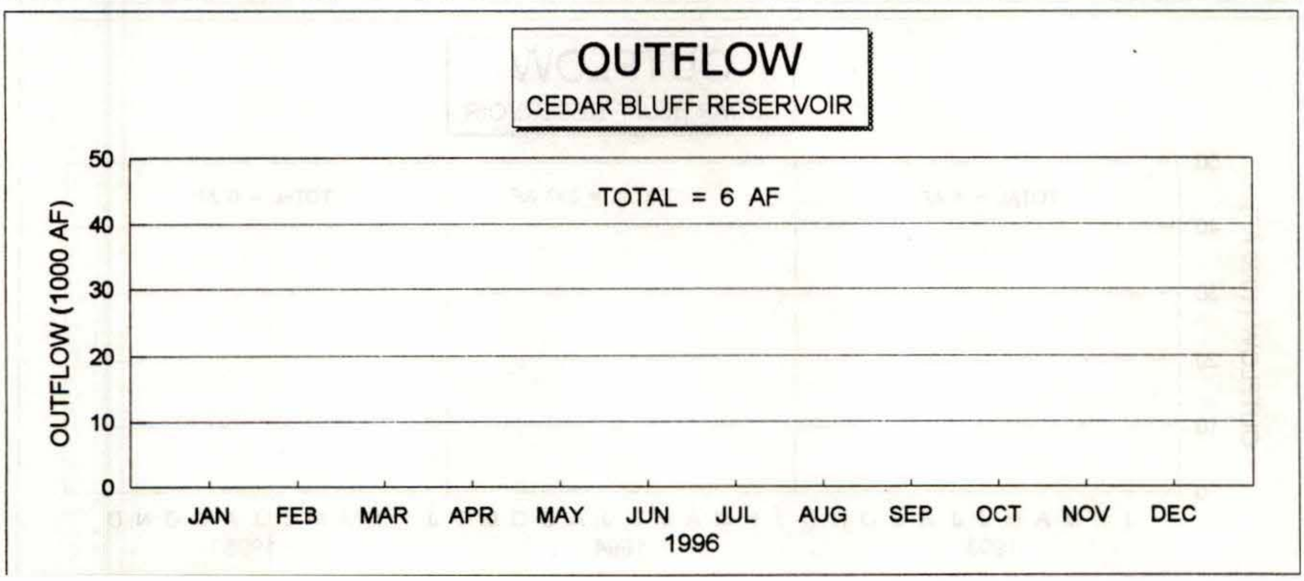
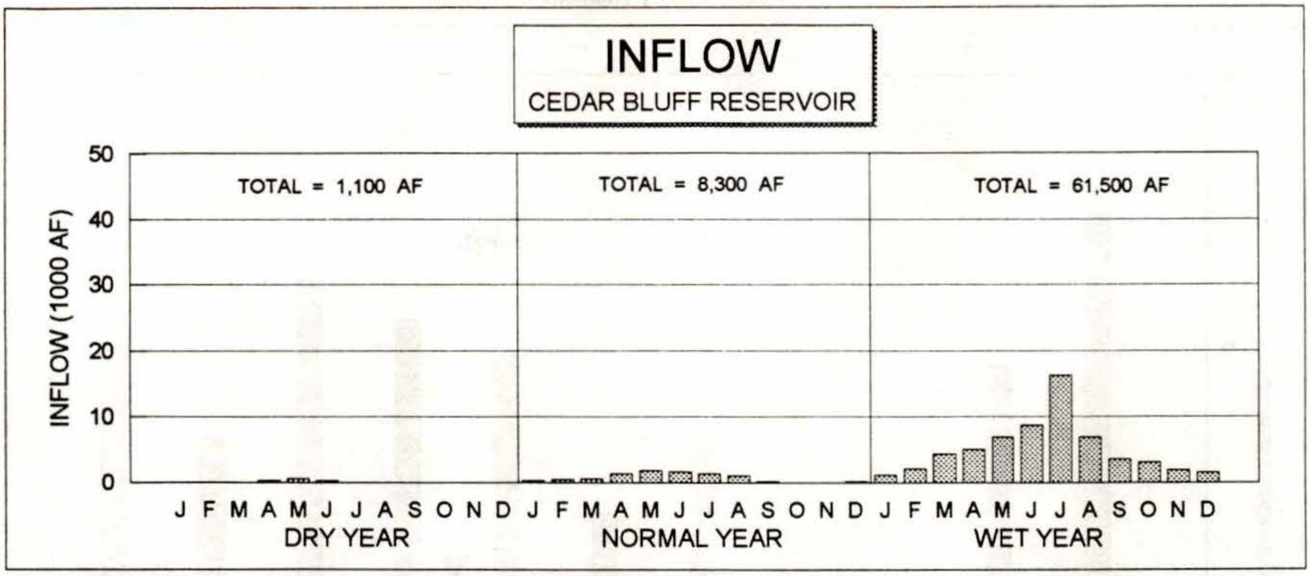
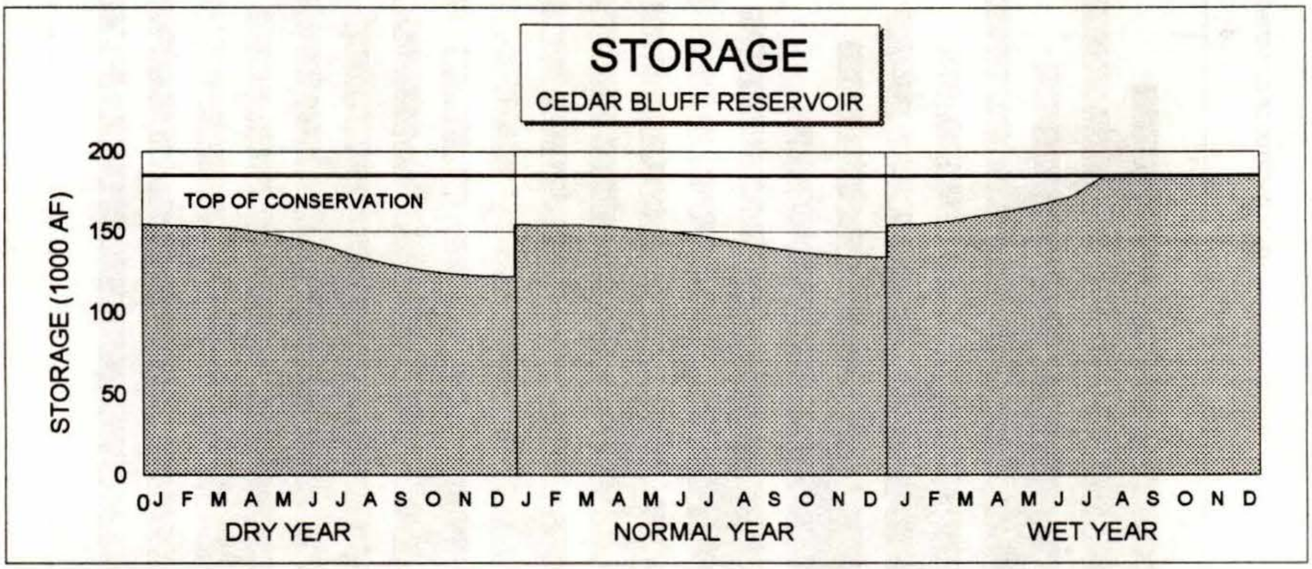


EXHIBIT 17C

CEDAR BLUFF RESERVOIR

1997 OPERATION PLAN





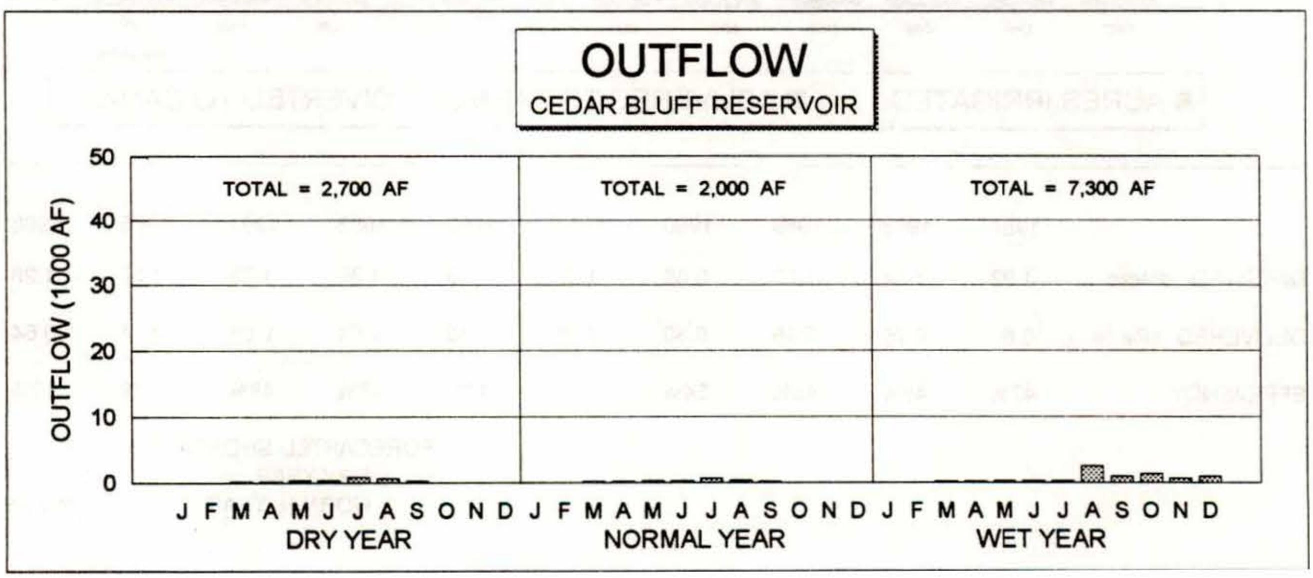
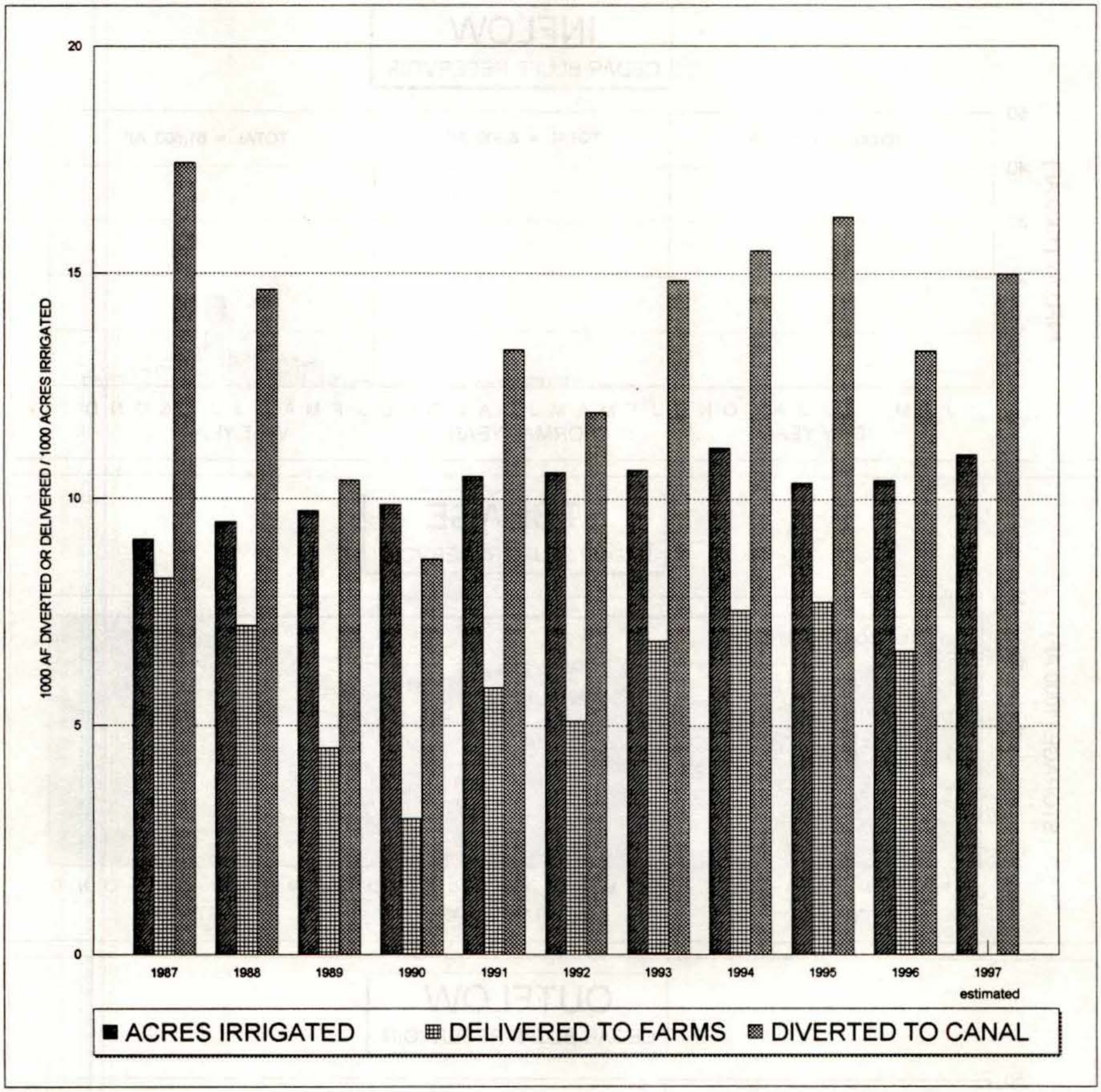


EXHIBIT 18

MIRAGE FLATS IRRIGATION DISTRICT

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



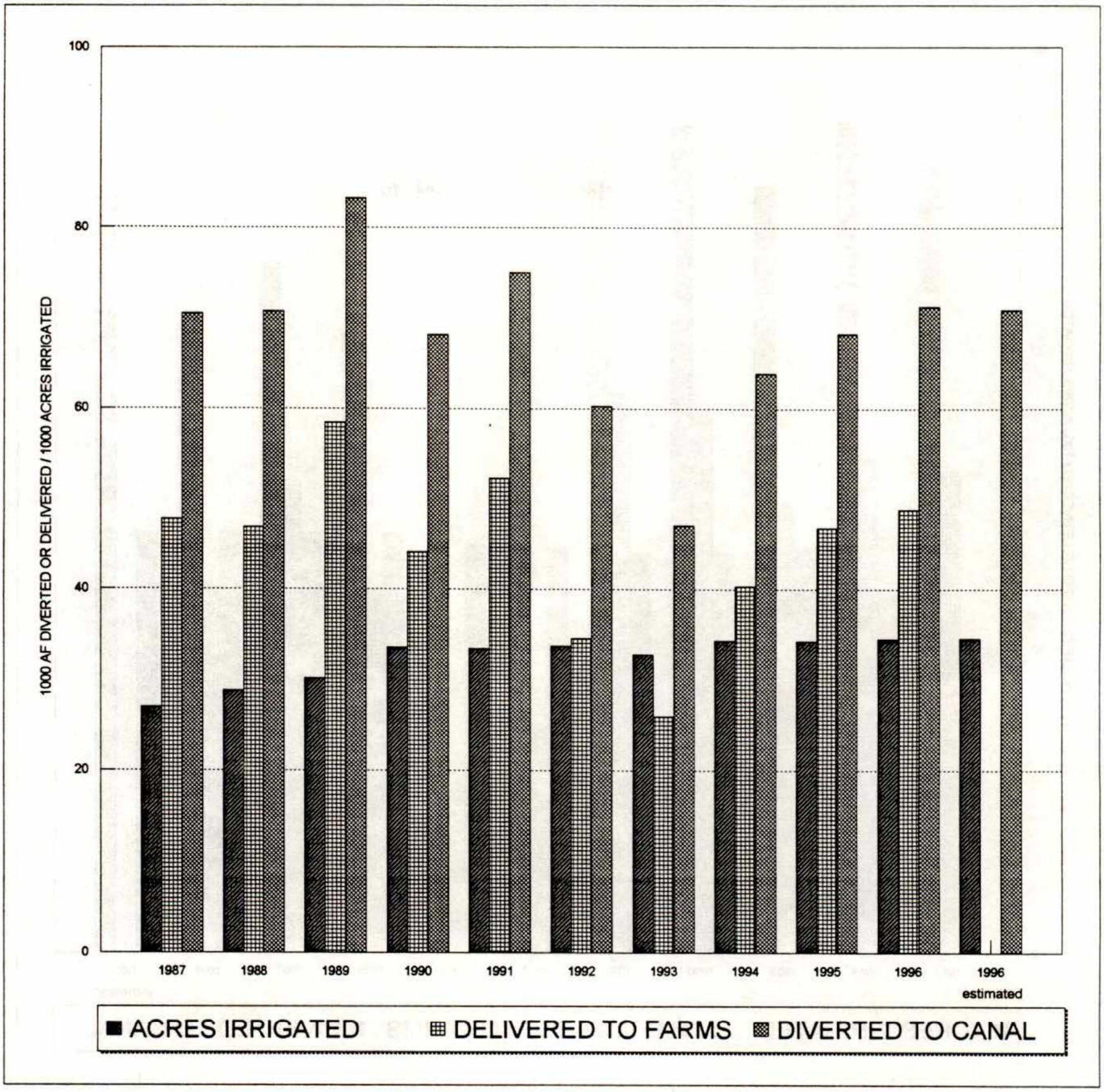
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
DIVERTED af/acre	1.92	1.54	1.07	0.88	1.27	1.13	1.39	1.39	1.57	1.28
DELIVERED af/acre	0.90	0.76	0.46	0.30	0.56	0.48	0.64	0.68	0.74	0.64
EFFICIENCY	47%	49%	43%	34%	44%	43%	46%	49%	48%	50%

FORECASTED SHORTAGES (1997)

DRY YEAR	26,900 AF
NORMAL YEAR	10,600 AF

AINSWORTH IRRIGATION DISTRICT

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



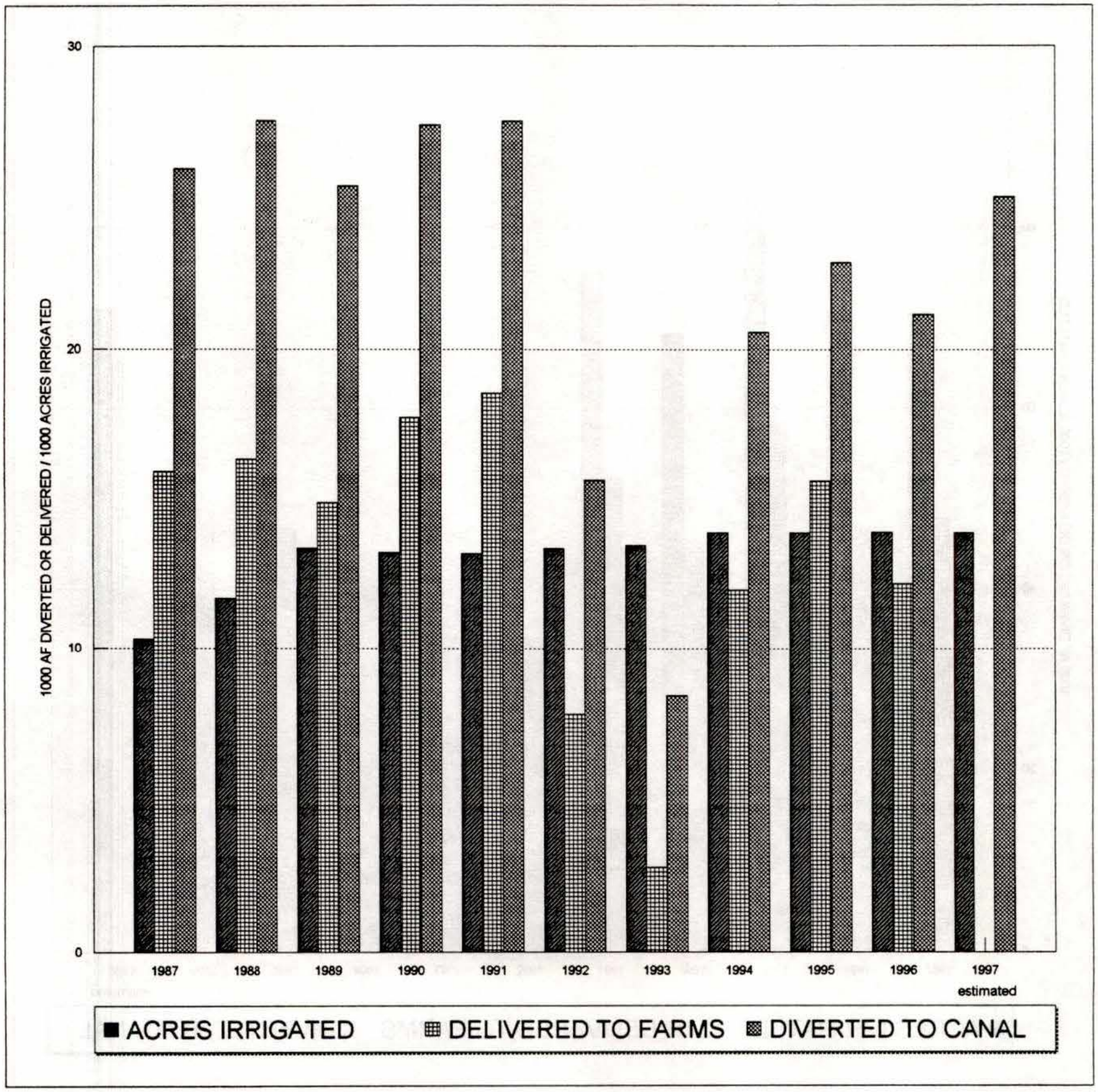
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
DIVERTED af/acre	2.62	2.47	2.77	2.04	2.25	1.79	1.44	1.87	2.00	2.07
DELIVERED af/acre	1.77	1.63	1.94	1.31	1.56	1.02	0.79	1.18	1.37	1.42
EFFICIENCY	68%	66%	70%	65%	70%	57%	55%	63%	68%	68%

FORECASTED SHORTAGES (1997)	
DRY YEAR	0 AF
NORMAL YEAR	0 AF

EXHIBIT 20

SARGENT IRRIGATION DISTRICT

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



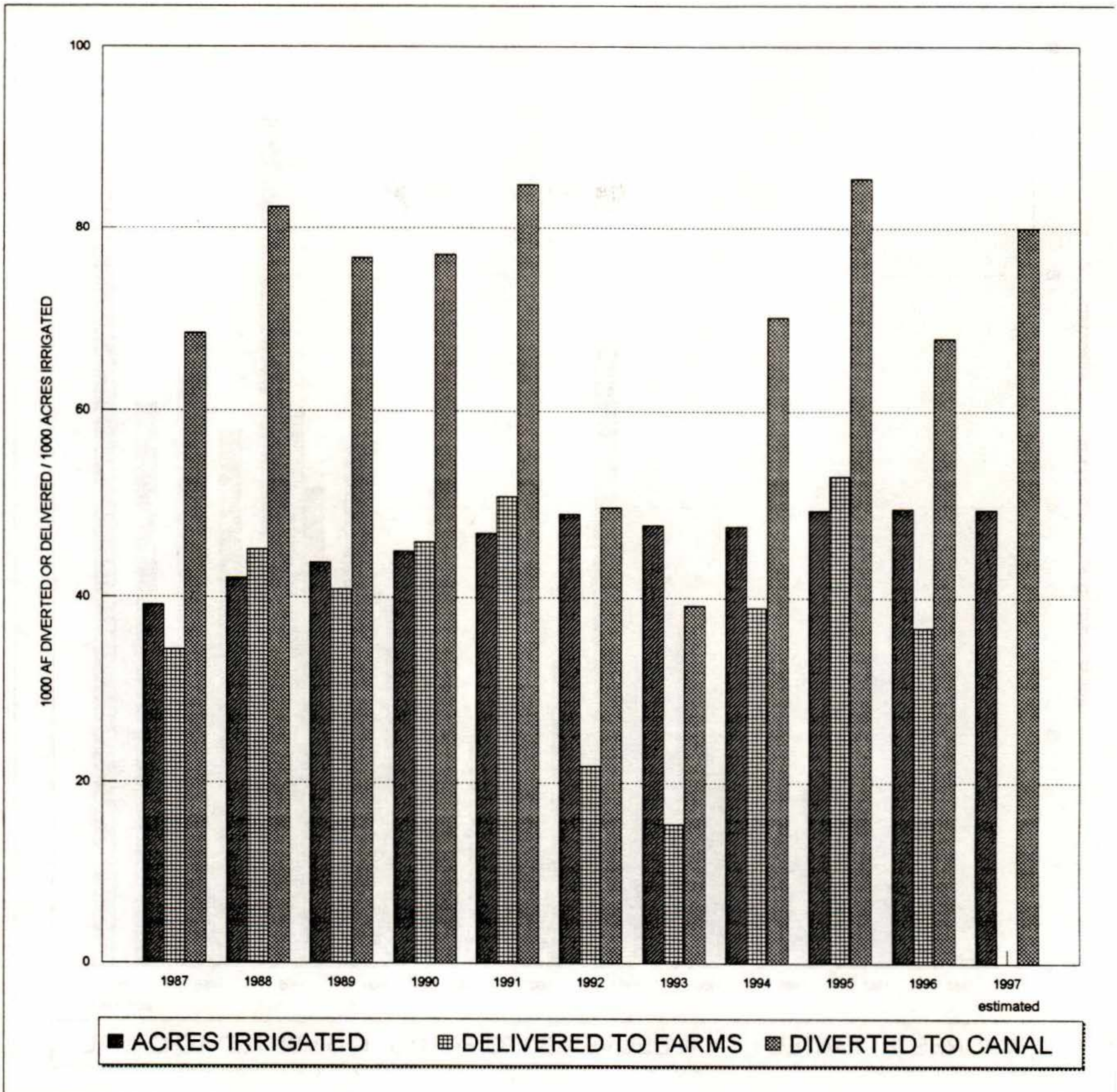
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
DIVERTED af/acre	2.52	2.35	1.90	2.07	2.08	1.17	0.62	1.48	1.64	1.52
DELIVERED af/acre	1.54	1.40	1.12	1.34	1.40	0.58	0.21	0.86	1.13	0.88
EFFICIENCY	61%	59%	59%	65%	67%	50%	33%	58%	68%	58%

FORECASTED SHORTAGES (1997)

DRY YEAR	3,600 AF
NORMAL YEAR	0 AF

FARWELL IRRIGATION DISTRICT

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



	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
DIVERTED af/acre	1.75	1.96	1.75	1.71	1.81	1.01	0.82	1.47	1.73	1.37
DELIVERED af/acre	0.88	1.07	0.93	1.02	1.08	0.44	0.32	0.82	1.08	0.74
EFFICIENCY	50%	55%	53%	60%	60%	44%	39%	55%	62%	54%

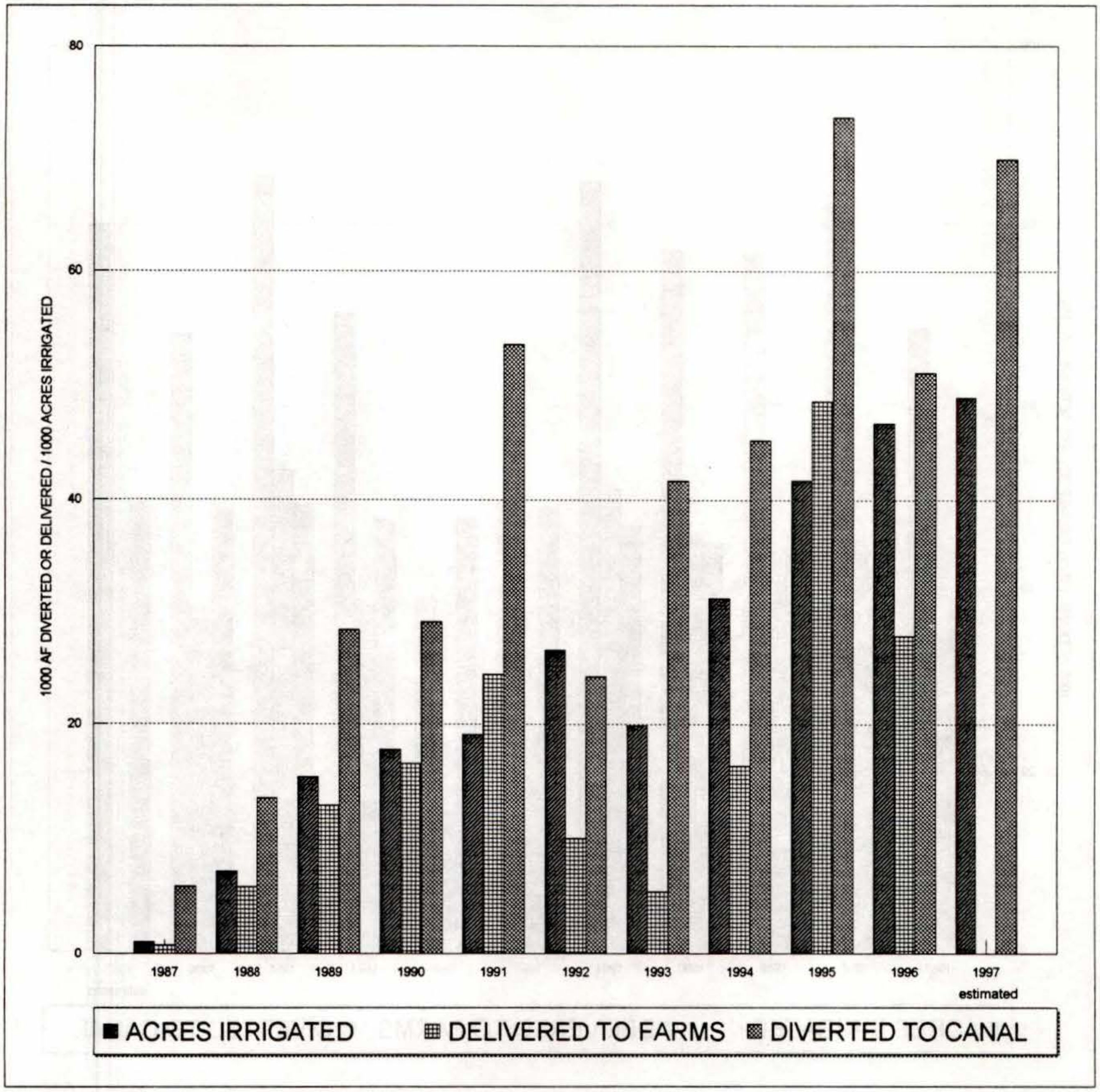
FORECASTED SHORTAGES (1997)

DRY YEAR	13,900 AF
NORMAL YEAR	0 AF

EXHIBIT 22

TWIN LOUPS IRRIGATION DISTRICT

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



	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
DIVERTED af/acre	5.63	1.90	1.85	1.64	2.81	0.91	2.10	1.45	1.76	1.10
DELIVERED af/acre	0.73	0.82	0.84	0.93	1.28	0.38	0.27	0.52	1.17	0.60
EFFICIENCY	13%	43%	45%	57%	46%	41%	13%	36%	66%	54%

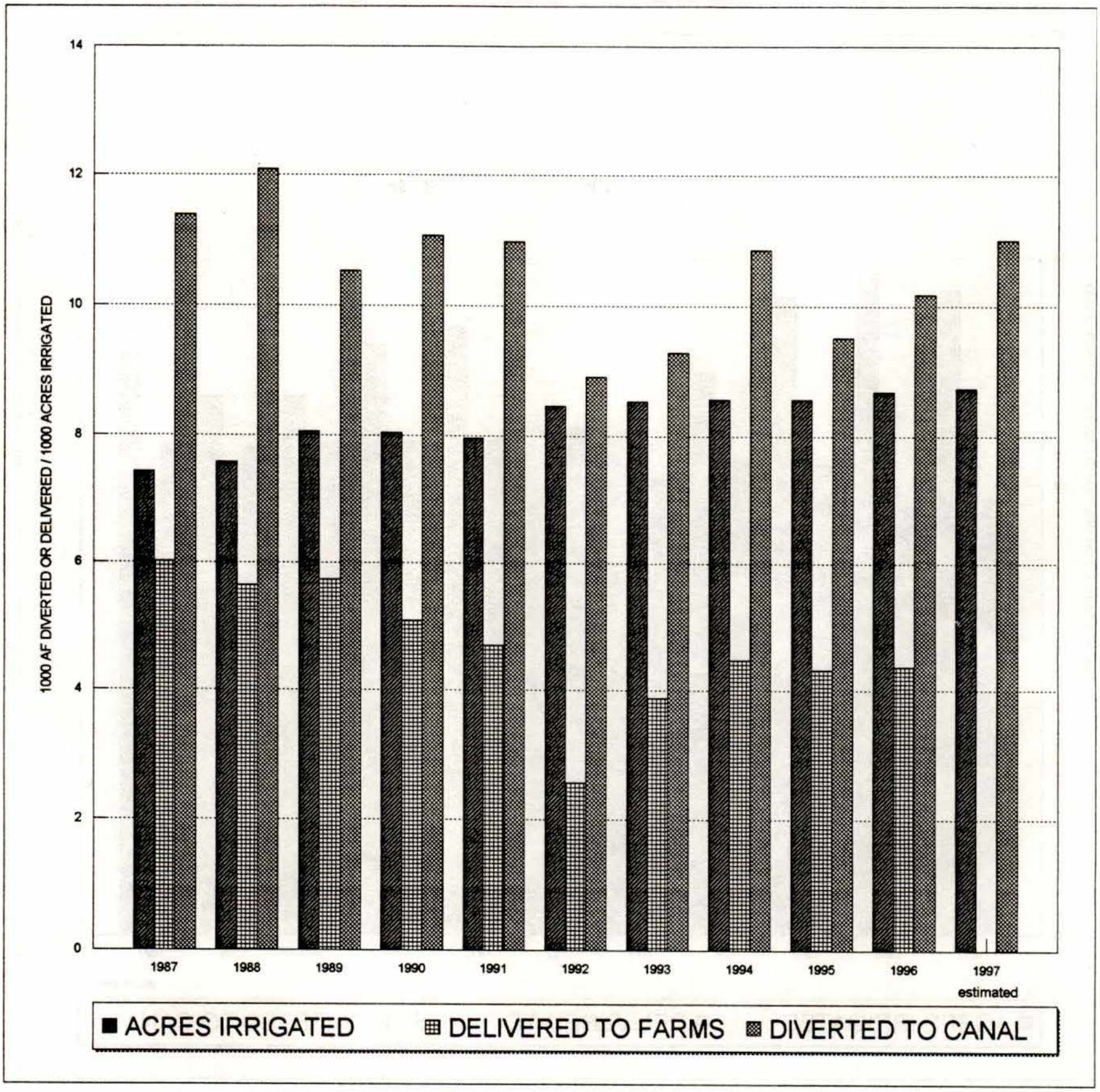
FORECASTED SHORTAGES (1997)

DRY YEAR	0 AF
NORMAL YEAR	0 AF

EXHIBIT 23

FRENCHMAN VALLEY IRRIGATION DISTRICT

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



	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
DIVERTED af/acre	1.53	1.60	1.30	1.38	1.38	1.05	1.09	1.26	1.11	1.17
DELIVERED af/acre	0.81	0.75	0.71	0.63	0.59	0.30	0.45	0.52	0.50	0.50
EFFICIENCY	53%	47%	55%	46%	43%	29%	42%	41%	45%	43%

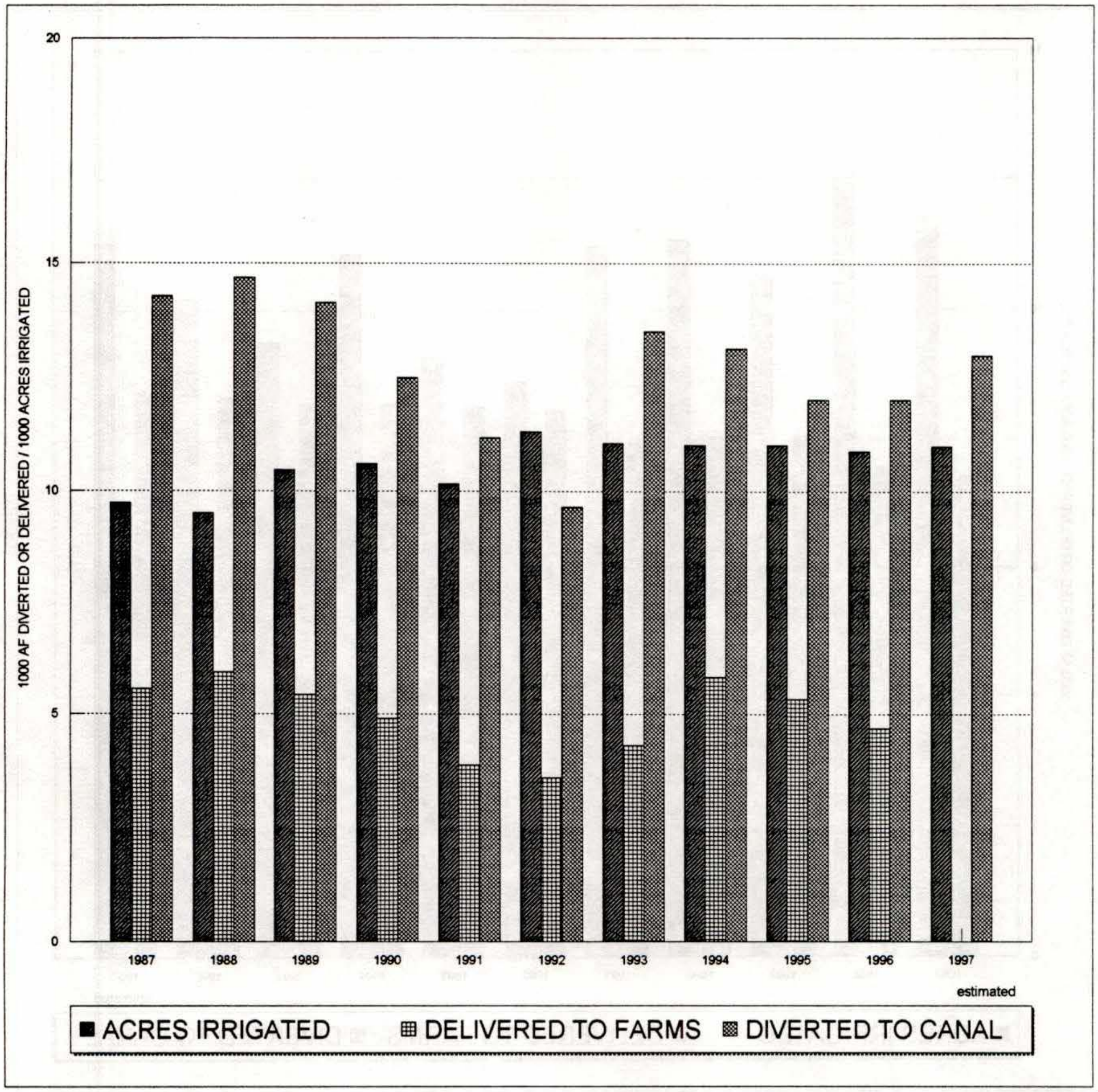
FORECASTED SHORTAGES (1997)

DRY YEAR	27,500 AF
NORMAL YEAR	7,500 AF

EXHIBIT 24

H AND RW IRRIGATION DISTRICT

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



	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
DIVERTED af/acre	1.47	1.55	1.35	1.18	1.10	0.85	1.22	1.19	1.09	1.10
DELIVERED af/acre	0.57	0.63	0.52	0.46	0.38	0.32	0.39	0.53	0.48	0.43
EFFICIENCY	39%	41%	38%	39%	35%	37%	32%	44%	44%	39%

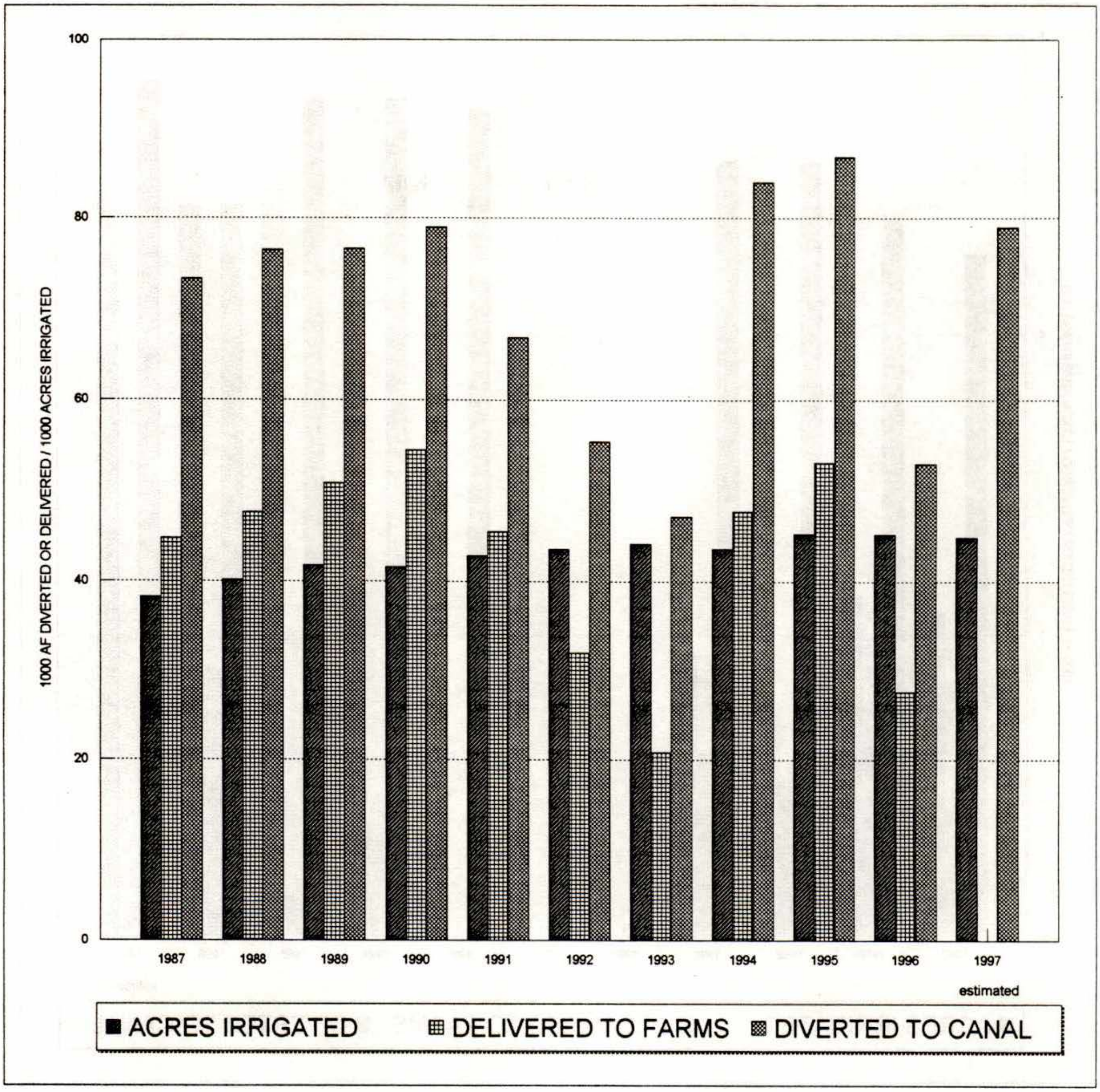
FORECASTED SHORTAGES (1997)

DRY YEAR	34,600 AF
NORMAL YEAR	9,400 AF

EXHIBIT 25

FRENCHMAN-CAMBRIDGE IRRIGATION DISTRIC

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



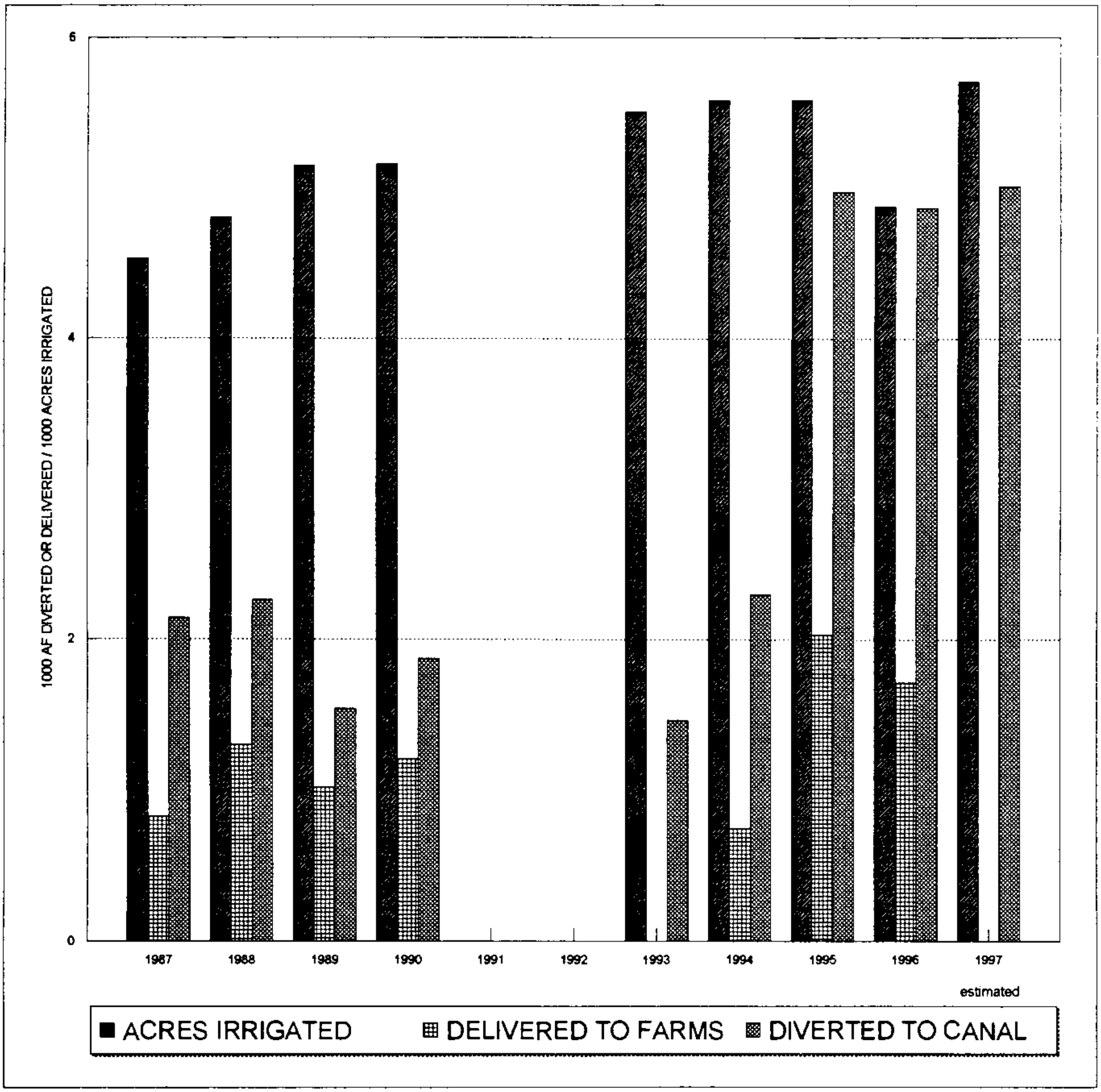
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
DIVERTED af/acre	1.92	1.90	1.83	1.90	1.56	1.27	1.07	1.93	1.92	1.17
DELIVERED af/acre	1.17	1.19	1.22	1.31	1.06	0.73	0.47	1.09	1.17	0.61
EFFICIENCY	61%	62%	66%	69%	68%	58%	44%	57%	61%	52%

FORECASTED SHORTAGES (1997)	
DRY YEAR	0 AF
NORMAL YEAR	0 AF

EXHIBIT 26

ALMENA IRRIGATION DISTRICT

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



	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
DIVERTED af/acre	0.48	0.47	0.30	0.36	0.00	0.00	0.00	0.41	0.89	1.00
DELIVERED af/acre	0.18	0.27	0.20	0.23	0.00	0.00	0.00	0.13	0.37	0.35
EFFICIENCY	39%	57%	66%	64%	0%	0%	0%	32%	41%	35%

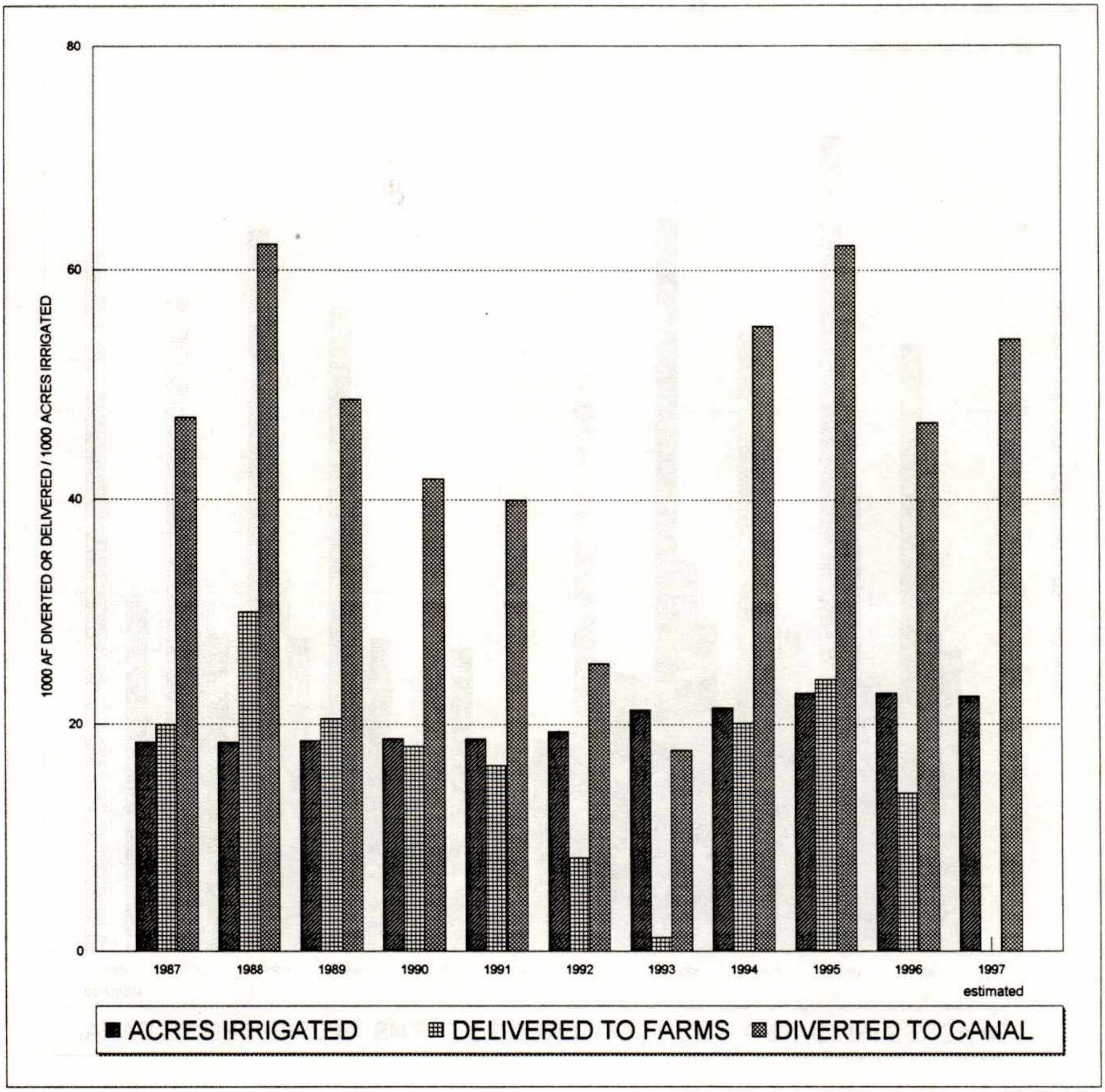
FORECASTED SHORTAGES (1997)

DRY YEAR	0 AF
NORMAL YEAR	0 AF

EXHIBIT 27

BOSTWICK IRRIGATION DISTRICT - NEBRASKA

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



	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
DIVERTED af/acre	2.56	3.38	2.63	2.23	2.14	1.32	0.83	2.57	2.73	2.05
DELIVERED af/acre	1.08	1.63	1.11	0.97	0.88	0.43	0.06	0.94	1.05	0.61
EFFICIENCY	42%	48%	42%	43%	41%	32%	7%	36%	39%	30%

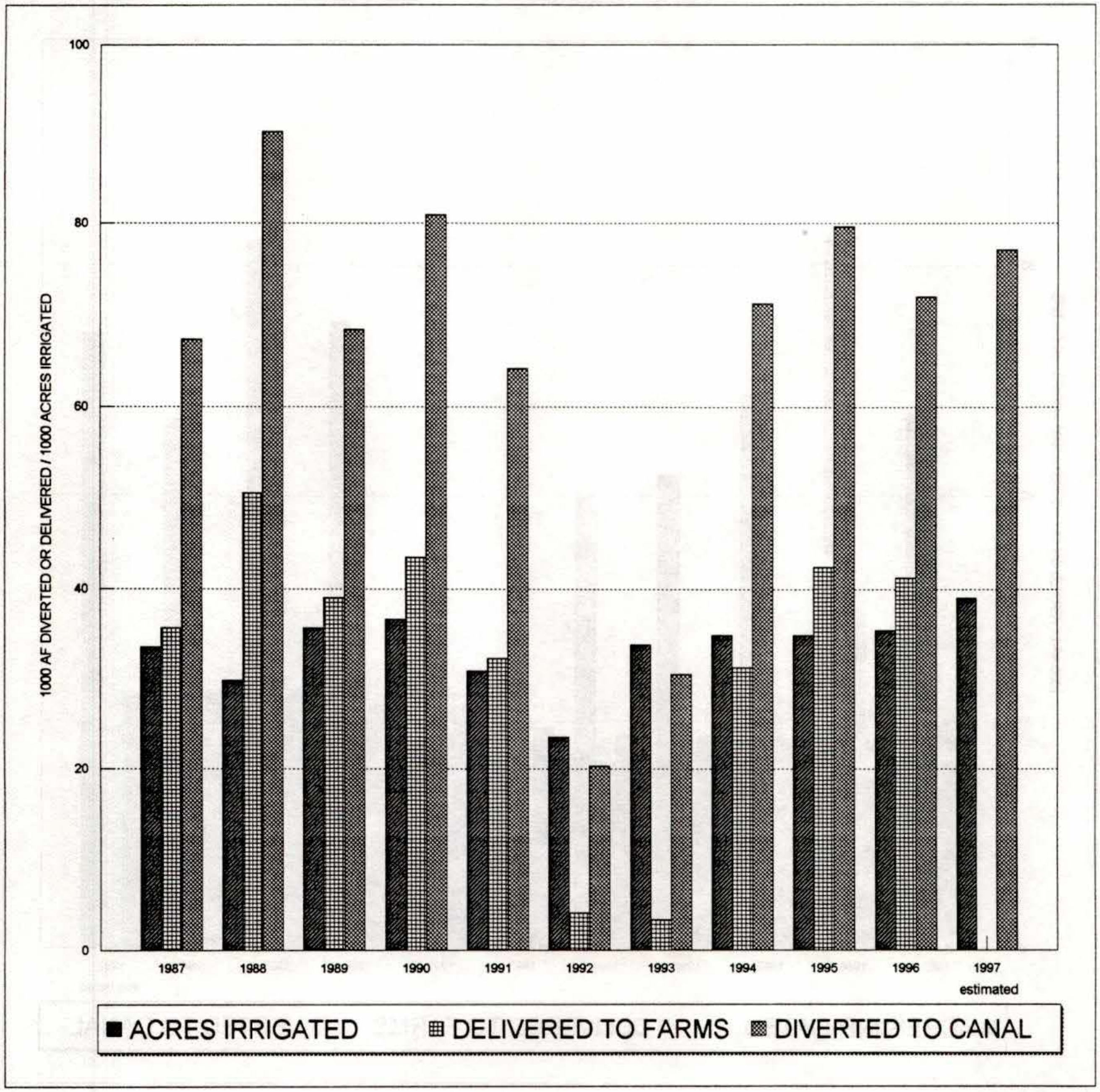
FORECASTED SHORTAGES (1997)

DRY YEAR	16,300 AF
NORMAL YEAR	0 AF

EXHIBIT 28

KANSAS-BOSTWICK IRRIGATION DISTRICT

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



	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
DIVERTED af/acre	2.00	3.02	1.92	2.21	2.08	0.86	0.90	2.04	2.28	2.03
DELIVERED af/acre	1.06	1.69	1.09	1.19	1.05	0.17	0.10	0.90	1.22	1.16
EFFICIENCY	53%	56%	57%	54%	50%	20%	11%	44%	53%	57%

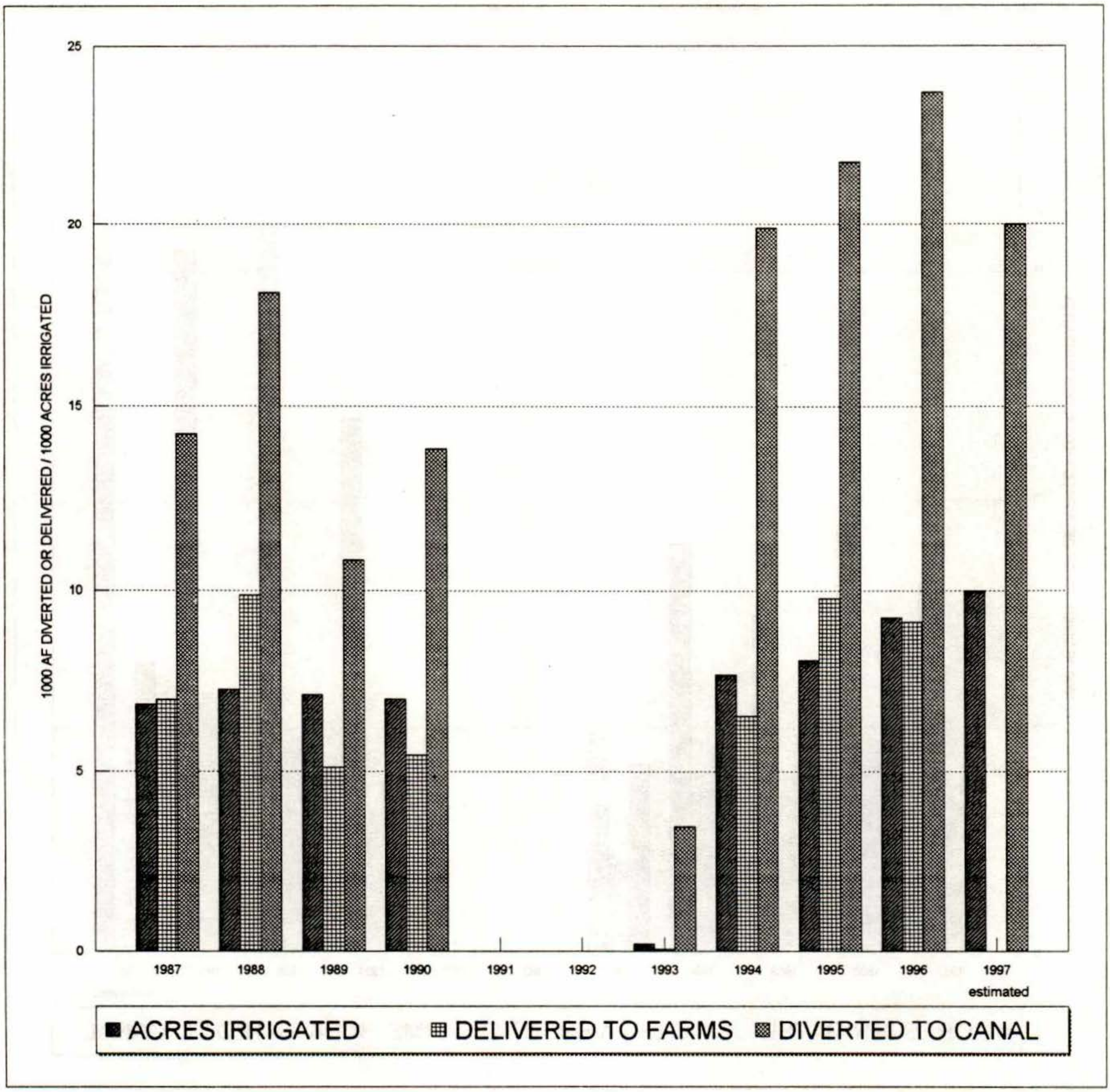
FORECASTED SHORTAGES (1997)

DRY YEAR	25,600 AF
NORMAL YEAR	0 AF

EXHIBIT 29

KIRWIN IRRIGATION DISTRICT

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



	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
DIVERTED af/acre	2.08	2.49	1.52	1.98	0.00	0.00	0.00	2.59	2.69	2.56
DELIVERED af/acre	1.02	1.36	0.72	0.78	0.00	0.00	0.00	0.85	1.21	0.99
EFFICIENCY	49%	55%	47%	39%	0%	0%	0%	33%	45%	39%

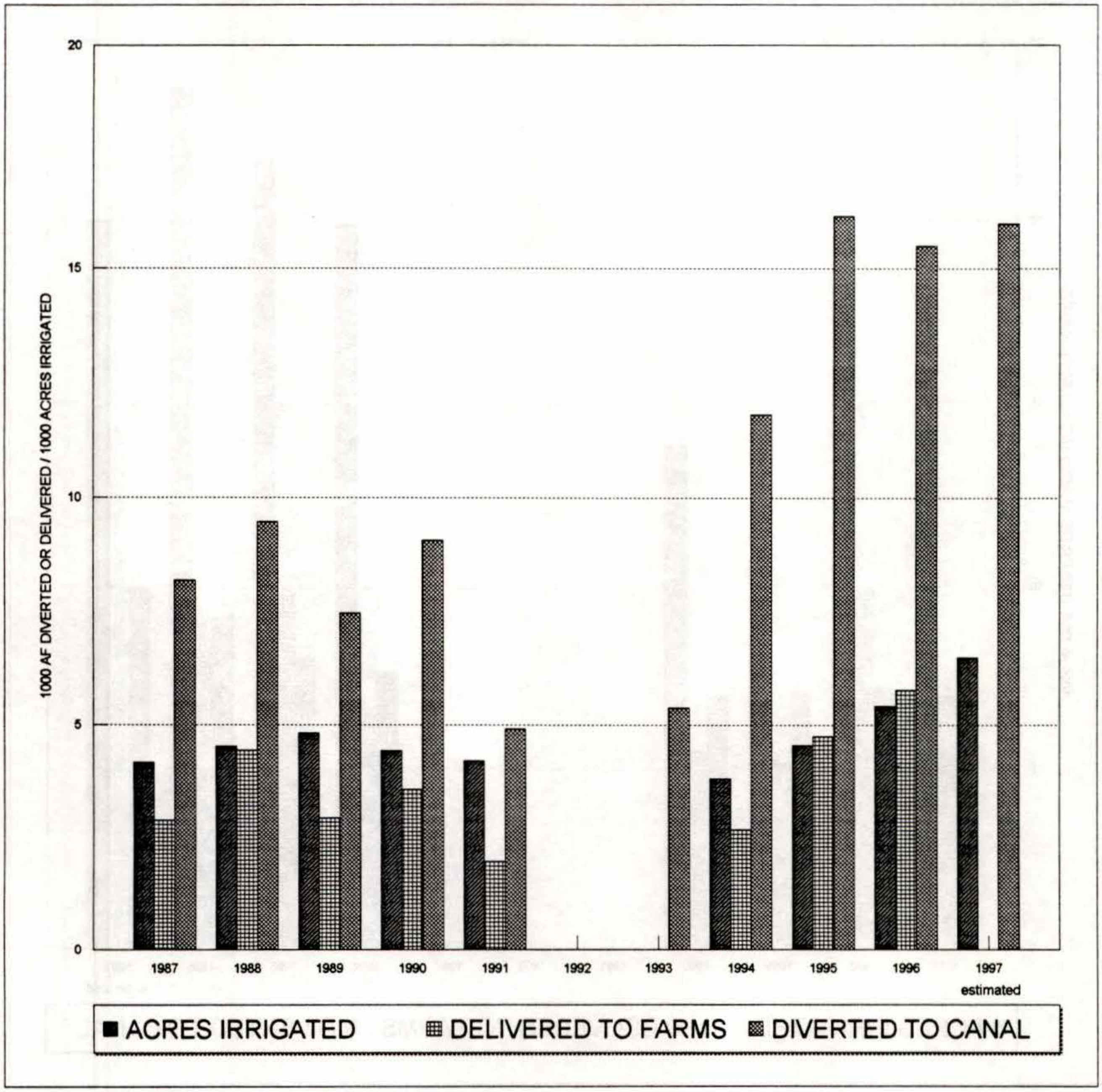
FORECASTED SHORTAGES (1997)

DRY YEAR	0 AF
NORMAL YEAR	0 AF

EXHIBIT 30

WEBSTER IRRIGATION DISTRICT

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



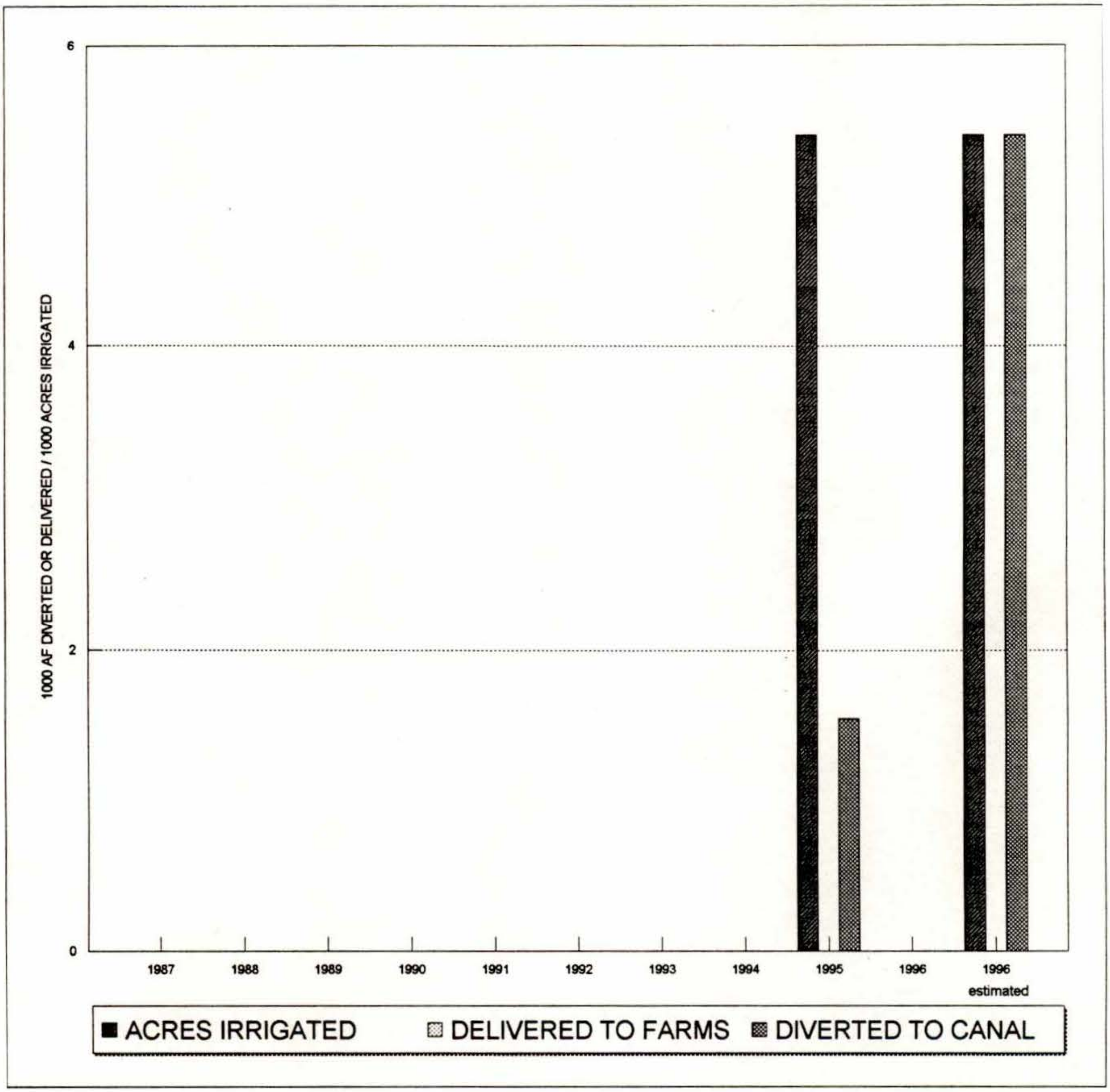
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
DIVERTED af/acre	1.97	2.09	1.55	2.04	1.17	0.00	0.00	0.00	3.55	2.86
DELIVERED af/acre	0.69	0.98	0.61	0.81	0.46	0.00	0.00	0.00	1.04	1.07
EFFICIENCY	35%	47%	39%	39%	40%	0%	0%	23%	29%	37%

FORECASTED SHORTAGES (1997)

DRY YEAR	0 AF
NORMAL YEAR	0 AF

GLEN ELDER IRRIGATION DISTRICT

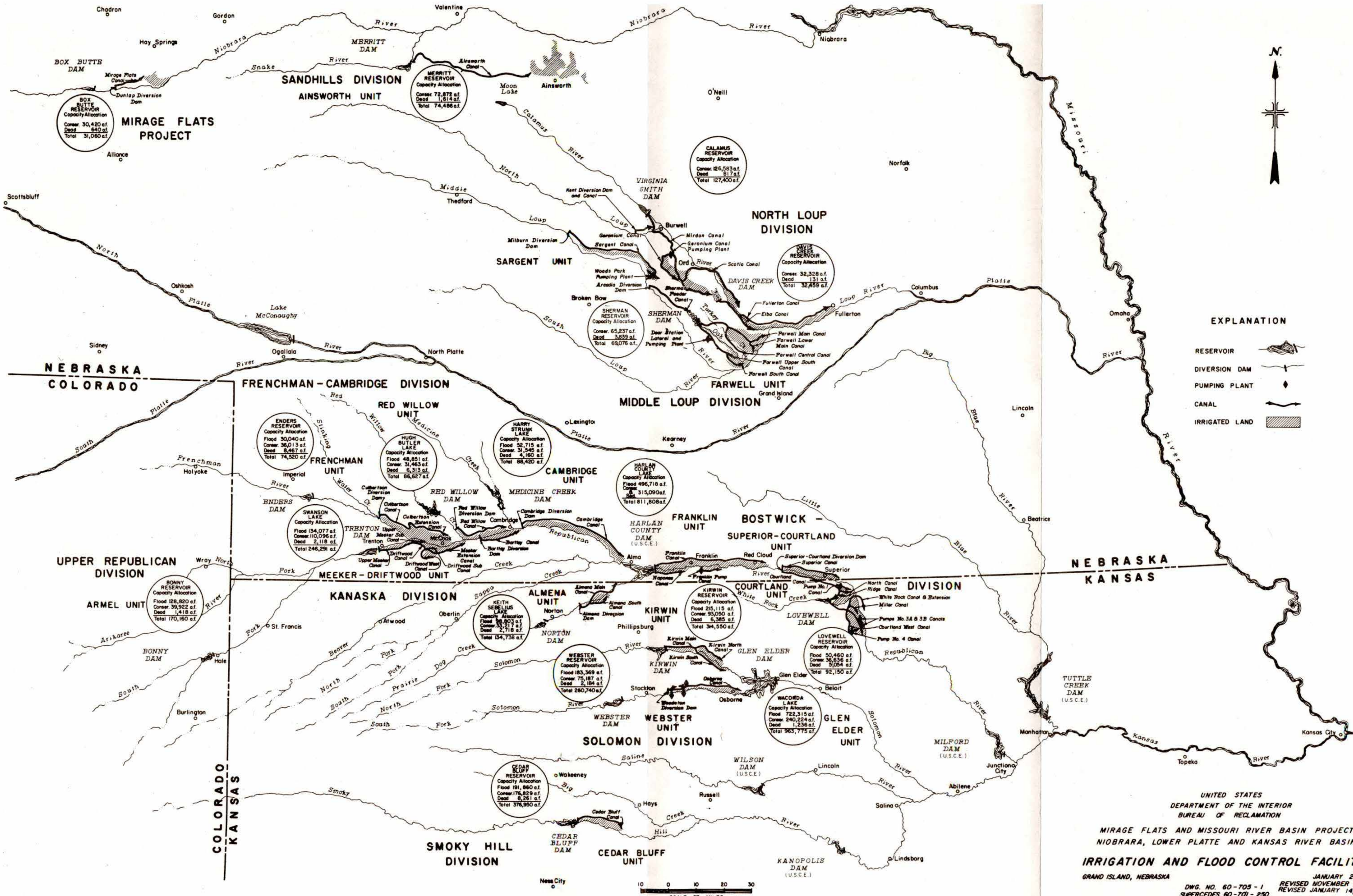
CANAL DIV., FARM DEL., AND ACRES IRRIG.



	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
DIVERTED af/acre	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.00
DELIVERED af/acre	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EFFICIENCY	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

FORECASTED SHORTAGES (1997)

DRY YEAR	0 AF
NORMAL YEAR	0 AF



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

JANUARY 20, 1984
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REVISED JANUARY 14, 1991

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