SYNOPSIS

General

This year is the 58th consecutive year that an Annual Operating Plans (AOP) has been prepared for the Federally-owned dams and reservoirs in the Niobrara, Lower Platte, and Kansas River Basins. The plan has been developed by the Water Operations Group in McCook, Nebraska for the 16 dams and reservoirs that are located in Colorado, Nebraska, and Kansas. These reservoirs, together with 9 diversion dams, 9 pumping plants, and 20 canal systems, serve approximately 269,744 acres of project lands in Nebraska and Kansas. In addition to irrigation and municipal water, these features serve flood control, recreation, fish and wildlife purposes. A map at the end of this report shows the location of these features.

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

A Supervisory Control and Data Acquisition System (SCADA) located at McCook are used to assist in operational management of all 11 dams under Reclamation's jurisdiction that are located in the Kansas River Basin. A Hydromet system collects and stores near real-time data at selected stations in the Nebraska-Kansas Projects. The data includes water levels in streams, canals, reservoirs, and also gate openings. This data is transmitted to a satellite and downloaded to a Reclamation receiver in Boise, Idaho. The data can then be accessed by anyone interested in monitoring water levels or water usage in an irrigation system. The Nebraska-Kansas Projects currently have 66 Hydromet stations that can be accessed. The McCook Field Office has installed and maintains 39 Hydromet stations. When fully implemented, the projects will have a Hydromet station installed to provide real-time data on all reservoirs, most diversion dams, and most of the measuring structures in the irrigation systems. These stations can be found on the Internet by accessing Reclamation's home page at http://www.usbr.gov/gp. From the home page, select "Hydromet Data Center" under the Water Operations heading.

The Headlines 2010 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.

2010 Summary

Climatic Conditions

Precipitation at the project dams during 2010 ranged from 72 percent of normal at Cedar Bluff Dam to 143 percent of normal at Bonny Dam. Temperatures and precipitation during the first 3 months of the year were near normal throughout the projects area. Precipitation totals varied from 59 percent to 168 percent during January through March with January precipitation below normal, February precipitation near normal, and March precipitation above normal.

Temperatures were slightly below normal during the spring. Precipitation during April was generally above normal throughout the basin, while May precipitation varied across the basin.

Average temperatures were near normal through June, July, and August. Total precipitation for June was above normal project wide. July and August precipitation was generally below normal in the project with the exception of northern Nebraska in July and southwestern Nebraska in August.

September precipitation varied considerably throughout the projects while precipitation in October was well below normal. September precipitation varied from 200 percent of normal at Bonny Dam to 24 percent of normal at Medicine Creek Dam. None of the project dams recorded above normal precipitation during October. Temperatures in September and October were above normal throughout the projects area.

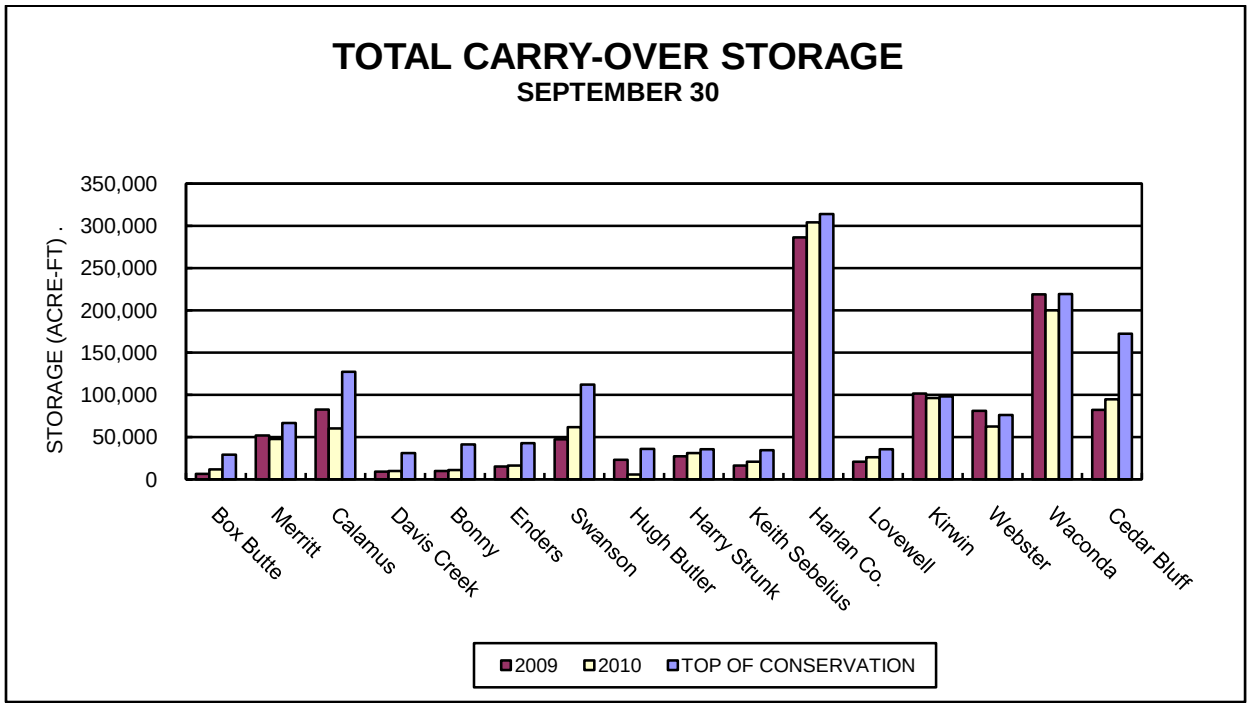
Precipitation during November continued below normal over much of the project with Davis Creek Dam recording only 9 percent of normal precipitation. December precipitation was varied among project reservoirs with Bonny Dam recording 189 percent of normal while Lovewell Dam recorded zero precipitation. Temperatures were above normal in November and December.

Storage Reservoirs

1. Conservation Operations. The 2010 inflow was above the dry-year forecast at all 16 of the project reservoirs. Enders and Lovewell Reservoirs had inflows between the dry- and normal-year forecasts. Box Butte, Merritt, Davis Creek, Bonny, Webster, and Cedar Bluff Reservoirs along with Swanson, Harry Strunk, Keith Sebelius, Waconda, and Harlan County Lakes had inflows between the normal- and wet-year forecasts. Calamus and Kirwin Reservoirs along with Hugh Butler Lake had inflows above the wet-year forecast.

Eight of the 16 project reservoirs had below average carryover storage from the 2009 water year. Reservoir releases were made from Merritt, Virginia Smith, Medicine Creek, Harlan County, Kirwin, Webster, and Glen Elder Dams to maintain or reduce reservoir levels prior to the 2010 irrigation season. Just prior to the irrigation season, Enders and Box Butte Reservoirs, along with Keith Sebelius, Swanson, and Hugh Butler Lakes, did not have sufficient storage to provide water users with a full water supply. Harry Strunk, Harlan County, and Waconda Lakes and Lovewell, Kirwin, and Webster Reservoirs had some flood storage occupied prior to the irrigation season. The irrigation demand months of July and August did little to reduce storage in those project reservoirs that had storage available for full irrigation as inflows maintained reservoir pools. Precipitation during June also helped in reducing the demands on project reservoirs. Reservoir storage was below normal at nine project reservoirs at the end of 2010.

The following summarized graph shows a comparison of 2009 and 2010 carry-over storage conditions as compared to the top of conservation storage for all reservoirs in the Niobrara, Lower Platte, and Kansas River Basins as of September 30.



2. Flood Control Operations. Harry Strunk, Harlan County, Waconda Lakes, Lovewell, Kirwin, and Webster Reservoirs utilized flood pool storage and made flood releases in 2010. The water year 2010 flood damages prevented by the operation of Reclamation's Nebraska-Kansas Projects facilities was $42,127,300 as determined by the Corps of Engineers. An additional benefit of $27,035,400 was credited to Harlan County Lake. The accumulative total of flood control benefits for the years 1951 through 2010 by facilities in this report total $2,015,704,900 (see Table 5). Box Butte, Merritt, Calamus, and Davis Creek Reservoirs do not have a designated flood pool and have not accrued any flood benefits to date.

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

Water Service

There was 329,570 acre-feet (AF) of water diverted to irrigate approximately 201,652 acres of project lands in the 12 irrigation districts (see Tables 3 and 6). The project water supply was either inadequate or limited for 84,302 acres of the total project lands. This includes lands in Mirage Flats, Frenchman Valley, H&RW, Frenchman-Cambridge, and Almena Irrigation Districts. The project water supplies for the other units mentioned in this report were more than adequate in 2010.

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

Irrigation Production

The 2010 crop yields on lands receiving project water in the Nebraska-Kansas Projects were lower than 2009. The average corn yield, the principal crop of all reporting districts, was 163 bushels per acre. This was approximately 35 bushels per acre less than in 2009. The start of irrigation releases from project reservoirs varied considerably but was generally later than normal due to abundant rainfall in June. Below normal rainfall was experienced during much of the growing season with a few exceptions. Temperatures were near normal during the season. Crop maturity progressed near normal during the growing season. Most irrigation districts had finished making irrigation releases by early September and all irrigation districts had finished delivering water by the end of September. Corn harvest generally commenced in late October and concluded in November. Only two canals did not divert water in 2010 as a result of short water supplies.

Fish and Wildlife and Recreation Benefits

The National Recreational Fisheries Policy declares that the Government's vested stewardship responsibilities must work in concert with the state managing agency's recreational fisheries constituency and the general public to conserve, restore, and enhance recreational fisheries and their habitats. The Nebraska-Kansas Area Office is available for meetings if requested with Nebraska, Colorado, and Kansas State Management Agencies to discuss the Annual Operating Plans (AOP). Information is solicited that will allow Reclamation the flexibility to enhance fisheries resources while still meeting contractual obligations with the various irrigation districts.

During the 2010 season, normal reservoir operations were favorable for recreation and fish and wildlife uses at project reservoirs with full or nearly full conservation pool levels. Higher water levels during 2010 were experienced at most reservoirs in the Kansas River Basin providing increased recreation benefits. Higher than normal inflows prevented summer drawdown from irrigation releases and thus did not allow for some late summer shoreline revegetation. Increased water levels did however submerge existing shoreline vegetation.

The Calamus Fish Hatchery is located below Virginia Smith Dam and Calamus Reservoir. The hatchery consists of an office/visitor center, laboratory, two residences, a shop and feed storage building, 51 rearing ponds lined with VLDPE and covering 45.5 acres, 24 concrete raceways, two lined effluent ponds, eight groundwater wells, a 36-inch diameter buried pipeline from Virginia Smith Dam, a groundwater degassing tank, and a computerized monitoring and alarm system. The hatchery is operated and maintained by the Nebraska Game and Parks Commission (Commission) and produces approximately 53 million fish per year. The water supply is provided by natural flows passed through Virginia Smith Dam and from Calamus Reservoir storage through an agreement dated July 28, 1988, between the Commission and the Twin Loups Reclamation District.

2011 Outlook

Three forecast conditions have been developed for each of the reservoirs in the Niobrara, Lower Platte, and Kansas River Basins conforming with established operating criteria under various reservoir inflow conditions. These operation studies are included in Table 4, sheets 1 through 16. The municipal and rural water district water supply requirements will be met under all three inflow forecast conditions for all units.

Under reasonable minimum inflow forecast conditions, irrigation districts receiving storage water from the following lakes and reservoirs are expected to receive less than a full supply: Box Butte, Enders, Swanson, Hugh Butler, Harry Strunk, and Keith Sebelius. The irrigation districts affected are Mirage Flats; Frenchman Valley, and H&RW; Frenchman-Cambridge; and Almena respectively. If 2011 is a dry year, 84,302 of the total 269,744 acres with service available to be irrigated (31 percent) will have an inadequate water supply.

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

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

Under reasonable minimum inflow conditions, the conservation pools at Merritt, Calamus, Davis Creek, Kirwin, and Lovewell Reservoirs, and Harry Strunk and Harlan County Lakes are expected to fill during 2011.

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.

2010 HEADLINES

Kansas official says Nebraska Hasn't done enough to comply

Red Willow Dam meeting Set next week

Upper, Middle NRDs both Revise management plans

Five more C&D orders expected

High court To hear suit On water tax

2010 won't be a Water-short year

Compact ruling favors Kansas

Republican River tools seek to minimize Economic harm, keep state in compliance

Dam repairs cheaper than deconstruction

Dam repair Contract a Year away

Lower NRD "will not tolerate cheating"

Irrigators want com- pensation during shut-

River crests just below top Of Nebraska town's levee

Red Willow Fishing good Despite levels

Aerial seeding Planned for lake

NRD considers revising plan

Road across Red Willow Dam reopened

Reclamation outlines plans for dam

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 2010 and serves as a guideline for the 2011 operations. This report also describes the responsibilities of Reclamation, Corps of Engineers, and the irrigation and reclamation districts in the Niobrara, Lower Platte, and Kansas River Basins.

Operational Responsibilities

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

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

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

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

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

Tables and Exhibits

Records for the facilities reported in the AOP are included as tables and exhibits and are located following page 35.

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 1991 through 2010 were used for the analysis of reservoirs in the Niobrara, Lower Platte, and Kansas River Basins.

Reservoir Operations

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

Major Features

The Mirage Flats Project was constructed under the Water Conservation and Utilization Act and includes an irrigation storage reservoir, diversion dam, and canal system. The other features discussed in this report are all a part of the Pick-Sloan Missouri Basin Program and include single and multipurpose reservoirs, diversion dams, pump stations, and canal systems. The 16 storage facilities now in operation are listed below.

Constructed by Reclamation

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

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

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

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

Municipal Water

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

Fish and Wildlife

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

State of Colorado Division of Wildlife

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

State of Kansas Department of Wildlife and Parks

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

Power Interference Considerations

A Power Interference Agreement exists between Reclamation, the Twin Loups Reclamation District, and the Loup River Public Power District. A Subordination Agreement also exists between Reclamation, the Ainsworth Irrigation District and the Nebraska Public Power District. Provisions of these agreements will be incorporated into the 2011 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. T he operational objectives indicate that fish and wildlife interests are best served by high reservoir levels with minimum fluctuations, and regulation of the outflow in excess of the minimum desired flows. Although the statement recognizes flood control and irrigation as primary purposes, it indicates that comprehensive operational plans should be developed for maximum integration of the secondary uses.

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

Republican River Compact – Kansas v. Nebraska

On May 26, 1998, Kansas filed a petition with the U. S. Supreme Court complaining that Nebraska had violated the Republican River Compact (Compact) by using more than its share of the Republican River water supply. T he three original parties to the Compact; Kansas, Nebraska, and Colorado, became parties to the case. Because the major water development structures in the Republican River Basin were constructed by the Bureau of Reclamation and the Corps of Engineers, the United States was allowed to participate as *amicus curiae.* After 17 months of negotiations the Final Settlement Stipulation (Stipulation) was signed by each respective governor and attorney general and was filed with the Special Master on December 16, 2002. The United States Supreme Court approved the settlement and dismissed the case on May 19, 2003.

The settlement provides for a moratorium on new groundwater wells, special rules for administration of water during water-short years, protection of storage releases, minimized flood flow effects on the accounting, recognition by Nebraska of a 1948 priority date for the Kansas-Bostwick Irrigation District, inclusion of the impacts of groundwater pumping from tableland wells in the accounting, and accounting for all reservoirs 15 acre-feet and larger within the river basin.

The Stipulation also required that the States, in cooperation with the United States, form a Conservation Committee to develop a proposed study plan to determine the quantitative effects of non-federal reservoirs and land terracing practices on water supplies in the Republican River Basin above Hardy, Nebraska.

The Study Plan supported by the three States, the Natural Resources Conservation Service, and Reclamation was completed and signed on April 28, 2004. Cooperative agreements for completing the 5 year study were developed between Reclamation, the University of Nebraska-Lincoln (UNL), and Kansas State University (KSU). Installation of data loggers on 35 reservoirs throughout the basin was completed in 2004. Advanced monitoring equipment for terraces and additional reservoirs was installed by UNL in 2006. Data collection and model development continued through 2009. The Conservation Committee provided an update on the study and presented initial preliminary study results, at the 2010 Republican River Compact Annual Meeting held in Burlington, Colorado on August 12, 2010. The Conservation Committee is currently working with UNL and KSU to incorporate field data, land use, and mapping data into models in order to present study results on a basin wide format. The Conservation Committee will present final study results in a summary document to the Republican River Compact Administration (RRCA) in 2011. Upon review of the summary document, the RRCA will determine if a formal study report is needed. If the RRCA requests a formal study report, the Conservation Committee will complete the report within 6 months of the RRCA's request.

"Water-Short Year Administration" will be in effect in those years in which the projected or actual irrigation supply is less than 119,000 acre feet of storage available for use from Harlan County Lake as determined by Reclamation. It was determined in 2010 that a "Water-Short Year Administration" was not in effect.

Lower Republican River Basin Appraisal Study / Feasibility Study

With the support of Kansas and Nebraska, Reclamation completed the Lower Republican River Basin Appraisal Report in January 2005. This study analyzed system improvement alternatives in the lower portion of the Republican River Basin that would provide for more efficient use of the water supply. The study met requirements of the Stipulation by investigating system improvements in the Basin, including measures to improve the ability to utilize the water supply below Hardy, Nebraska. This study also met the responsibilities of the Compact by investigating the most efficient use of the water of the Republican River Basin for multiple purposes.

Nine alternatives were formulated using the recommended proposals provided by the Compact Commissioners. Three other alternatives were investigated for supplying water in meeting Minimum Desirable Streamflow (MDS) related needs in Kansas. The appraisal report concluded that additional water can be made available for storage in Lovewell Reservoir. The appraisal report recommends further Federal participation in a feasibility study and that such a study be undertaken to investigate solutions. Specific congressional authorization is required for Reclamation to perform a feasibility study. The purpose of a feasibility study is to identify, evaluate, and recommend to decision makers an appropriate, viable solution to the identified problems and opportunities. The States have indicated they would provide in-kind support and/or funding for the feasibility study.

Legislation authorizing a feasibility study was introduced in 2003 but was not advanced. Congressmen from both Nebraska and Kansas reintroduced legislation authorizing the feasibility study in 2007, but again it was not advanced. Language authorizing the feasibility study was included in Senate bill S2739, which was passed by the Senate and the House of Representatives in April of 2008. On May 8, 2008, the President signed the Consolidated Natural Resources Act of 2008 (P.L. 110-229). S ection 510 of Title V of the Act authorizes the Secretary of the Interior, acting through the Bureau of Reclamation and in consultation and cooperation with the states of Nebraska, Kansas, and Colorado, to conduct a study to determine the feasibility of implementing a water supply and conservation project that will:

1. Improve water supply reliability in the Republican River Basin between Harlan County Lake in Nebraska and Milford Lake in Kansas.
2. Increase the capacity of water storage through modification of existing projects or through new projects that serve areas in the Republican River Basin.
3. Improve water management efficiency in the Republican River Basin through conservation and other available means where appropriate, and evaluate integrated water resource management and supply needs in the Republican River Basin.
   Funds must be appropriated before Reclamation can begin the feasibility study.

Both states have expressed support of the feasibility study. At the 2009 Republican River Compact Annual Meeting, the Compact Commissioners re-affirmed their support of the feasibility study by passing a resolution of support. In late 2009, Reclamation, the Kansas Department of Agriculture (KDA), and the Nebraska Department of Natural Resources (NDNR) began discussions of ways to take advantage of other state and federal programs to complete feasibility study tasks while awaiting appropriations. Initial tasks included detailed topography of the Lovewell Dam embankment, recreation areas, and initial surface water model scoping activities.

Frenchman Valley Appraisal Study

In 2004, the NDNR requested Reclamation prepare an Appraisal Study (AS) to examine opportunities for more efficient management of water supplies in the Frenchman River Valley including Reclamation's Enders Reservoir, a feature of the Frenchman-Cambridge Division in Nebraska. The study focused on p roblems and opportunities in an area that has experienced dramatically reduced ground and surface water supplies, including reduced reservoir inflows. Study activities have been ongoing since 2005. Agencies participating in the study include Reclamation, NDNR, Frenchman Valley, H&RW, Riverside Irrigation Districts, Nebraska Game and Parks Commission, and the Upper and Middle Republican Natural Resources Districts. Agencies have submitted final comments and following Reclamation’s review and incorporation of these comments, the report will be finalized.

Niobrara Basin Study

In 2010, t he Nebraska Department of Natural Resources (NDNR) was selected for a Reclamation WaterSMART (Sustain and Manage America’s Resources for Tomorrow) Basin Study for the Niobrara River Basin.

Reclamation will provide $350,000 of federal funding and staff resources for the estimated $850,000 Niobrara Basin Study.

The Niobrara Basin Study will determine current and future water demands of the basin, assist in the development and implementation of Integrated Management Plans (IMPs) for the basin, identify opportunities for meeting water supply needs through structural and nonstructural means, and analyze the potential effects of climate variability on water supply. Reclamation and NDNR will work collaborative in the development of a groundwater model and a surface water operations model to test the effects and potential viability of various management strategies under both current and potential future conditions. A Plan of Study and Memorandum of Understanding will be developed in early 2011 to outline the scope of work for each agency and the study should be completed in 2 years.

Northeast Nebraska Rural Water Supply Appraisal Investigation

The Lower Niobrara Natural Resource District (LNNRD) was selected to complete an appraisal investigation through Reclamation's Rural Water Supply Program for a Regional Water Supply System Study in Northeast Nebraska. Entities included in the study area include the West Knox Rural Water System, the Cedar-Knox Rural Water System, the Santee Sioux Nation, the Villages of Creighton, Center, and Niobrara. The purpose of the Study is to identify a feasible alternative that will allow the communities to join together and develop a regional water supply system. The main goals of the study are to provide each entity with a quality and reliable water source and to identify internal issues with each community. A number of water quality and supply studies have been completed in this area, which will be used for the appraisal investigation. The LNNRD is hopeful that the appraisal investigation can be completed in early 2011 so that they can submit a proposal for a feasibility study under the next Rural Water Program Funding Opportunity Announcement.

Emergency Management

The Nebraska-Kansas Area Office (NKAO) continues to coordinate with local jurisdictions that could potentially be impacted by flooding from large operational releases and/or dam failure.

Emergency radios have been installed at all dams. These radios will be used as a backup means of communication when notifying the local emergency management officials in the event of an emergency at the dam. Both the NKAO and the McCook Field Office have a satellite phone that can be used in an emergency. Management and dam operators have been trained on the use of these phones.

Public Safety Reviews

The Annual Safety Training for field personnel, and open to any other NKAO personnel finding the training relevant to their duties, was held at the McCook Field Office and the Mid Plains Center for Enterprise in McCook, Nebraska in March 2010. This training held in conjunction with the Dam Operator training required every 3 years, provided personnel the opportunity to update their training in Back Injury Prevention, Confined Space, Fall Protection,

Welding, Cutting, Chainsaw Safety, First Aid, CPR, AED, Fire Extinguisher Use, Forklift Operator Safety, and Respirator Training and Fit Testing.

The ongoing safety reviews of project facilities continue to identify potential safety hazards to the public and operating personnel. NKAO combines elements of the Annual Safety Inspections of the major facilities with the Dam Safety Facility Reviews when possible, and conducts follow up inspections when deficiencies aren't on-the-spot correctible. This format provides for enhanced communication and coordination between both the Area Safety Specialist and Staff, and teams of Dam Safety Specialists.

Formal training for the Automated External Defibrillators (AEDs) was provided, as part of the CPR Certification Training in March 2010, and will be taught again as a refresher in 2012. AEDs are located at the McCook Field Office and the Grand Island Office, along with an additional field ready AED at each location for employees to take to the field when activities are being conducted. NKAO continues to involve Great Plains Region Occupational Health in Billings, Montana and the Federal Occupational and Health Services Center in Denver, Colorado when maintenance and operational items, such as replacing AED batteries, pads, and reprogramming CPR protocol, is required.

Attention continues with regards to issues concerning contractor safety, defensive driving, NFPA 70E Electrical Safety/Arc Flash, construction equipment safety, lock out/tag out, personal protective equipment (PPE), welding, cutting, coating safety procedures, confined space, pesticide, and herbicide use (MSDS), fall protection/slips, trips, falls, working alone, near-miss accident reporting, and completing job hazard analyses (JHAs), with emphasis from managers, supervisors, employees, and the NKAO Safety Committee. Employees were provided safety and health training, and given information related to these and several other issues throughout the year.

CHAPTER II - NIOBRARA AND LOWER PLATTE RIVER BASINS

Mirage Flats Project in Nebraska

General

Flows in the Niobrara River along with Box Butte Reservoir storage provide a water supply for the 11,662 acre Mirage Flats Project. From 2001 to 2010, the project water supply averaged 9,494 AF, which is about 0.814 AF per irrigable acre. Many irrigators supplement their water supply with private wells.

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

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

2010 Summary

The flows of the Niobrara River plus the carry-over storage in Box Butte Reservoir were not adequate to provide a full water supply for the project lands. Precipitation in the Mirage Flats Irrigation District totaled 18.96 inches, which is 112 percent of normal. The 2010 total inflow of 17,984 AF was between the normal-year and wet-year forecasts.

From mid July through late August, diversions of 9,365 AF to the Mirage Flats Canal provided irrigation water for approximately 6,857 acres, 59 percent of the service available acreage. The farm deliveries from the project water supply totaled 3,546 AF (0.52 acre-foot per irrigated acre), which is a delivery efficiency of 38 percent. Total reservoir storage was 11,560 AF at the end of the irrigation season. Privately owned irrigation wells supplemented the project water supply.

The District continued to implement water conservation measures as outlined in their Water Management Plan and their Long Range Plan. Assistance to project irrigators provided by the District include delivery system improvements that provide on-farm efficiency improvements, such as relocation of turnouts, burying pipe for better access, and on-farm efficiency incentives.

The District continues to modify and update their computer software to improve system operations, scheduling, accounting, and continued development of their web page that allows irrigators to place water orders, review water accounts, and keep updated on district operations.

2011 Outlook

The project water supply is expected to be inadequate in 2011 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. It is anticipated that district irrigators will continue to use their privately-owned irrigation wells as a supplemental supply.

The district's future water conservation plans include the automation of Dunlap Diversion Dam and the outlet works gate at Box Butte Dam. The district will again seek assistance from Reclamation's WRRL to assist in installing equipment to meet those needs as well as to fine tune the automation and remote monitoring system already in place.

Ainsworth Unit, Sandhills Division in Nebraska

General

Within the Ainsworth Irrigation District, there are approximately 35,000 acres with available service. The project water supply is provided by storage of Snake River flows in Merritt Reservoir. The reservoir is filled to elevation 2944.0 feet each fall after the irrigation season. This level is approximately 2 feet below the top of conservation capacity and within the repaired area of soil cement on the upstream face of the dam. The reservoir is regulated to maintain this level until the ice clears each spring. Maintaining the reservoir at this elevation during the winter will help avoid ice damage to the older existing soil cement at lower elevations. Upon ice-out the outlet pipe is drained, inspected, and repaired as necessary. The reservoir is then rapidly filled to elevation 2946.0 feet to reduce shoreline erosion around the reservoir and minimize sand accumulations on the face of the dam. This filling process generally takes place in April. The reservoir level is maintained until irrigation releases begin to draw on the pool around mid May. Seepage, pickup and toe drain flow normally result in flows of up to 15 cfs below Merritt Dam.

Reclamation has executed a Memorandum of Agreement (MOA) between Reclamation, the Nebraska Game and Parks Commission and the Ainsworth Irrigation District for Snake River Releases below Merritt Dam. The purpose of this MOA is to establish the protocol that will be used to make future releases of water from Merritt Dam to the lower Snake River. The development of the MOA was an environmental commitment outlined in the Ainsworth Irrigation District Final Environmental Assessment (FEA) for the Conversion of a Long-Term water Service Contract to a Repayment Contract (December 2006).

Release criteria will be based on the best available scientific data to determine when local conditions warrant releases to the Snake River. When it becomes necessary to release water from Merritt Reservoir, Reclamation will direct the Ainsworth Irrigation District to make the necessary releases to the river.

2010 Summary

Precipitation, as recorded near Merritt Dam, totaled 24.14 inches, which was 118 percent of normal. The inflow for the year totaled 185,740 AF. This inflow was between the normal- and wet-year forecasts. The water supply was more than adequate to meet the project's irrigation requirement. There were 70,341 AF diverted from Merritt Reservoir into Ainsworth Canal, with 40,655 AF delivered to the farm headgates (delivery efficiency of 58 percent). There were 34,589 acres of land irrigated in 2010.

The district provided a total of 368 AF of irrigation water from holding ponds located within the district's service area.

The Ainsworth Irrigation District, along with Reclamation and the local Natural Resource District, continued to provide support to the University of Nebraska Extension Service for an irrigation scheduling/nitrogen management demonstration that will educate and improve irrigation management in the area. The first demonstration site included a center pivot in the district and a field day was held in the fall of 2005. Field days were subsequently held in 2006 through 2010.

Working with Reclamation's technical and financial assistance through a cooperative agreement, the district installed automation on the Sand Draw and Airport Lateral. Additionally, burial of lateral B-7.2, B-10.3, and A-16.2 were completed through the Water Conservation Field Services Program. In addition to these current projects, the district has plans for additional lateral burial and automation efforts.

2011 Outlook

During the winter months, the reservoir will be regulated to maintain elevation 2944.0 feet (2.0 feet below the top of conservation capacity). In order to alleviate erosive action to the lands around the reservoir and to maximize all benefits associated with the reservoir, releases from Merritt Reservoir will be regulated to fill the conservation capacity during the early spring. This filling generally takes place during April. If weather conditions or irrigation demands dictate, it may be necessary to begin filling the reservoir prior to this time. The reservoir level will be maintained from the end of April until irrigation releases begin. A 50 cfs release to the Snake River will begin when irrigation releases drop the reservoir pool below elevation 2946.0 feet. This release will be made for approximately 20 days and then terminated until the end of the irrigation season. Once the reservoir begins to refill following the irrigation season, a release of 50 cfs to the Snake River will resume until the reservoir reaches the desired winter elevation. The water supply is expected to be adequate in 2011 for the irrigation of 35,000 acres.

In accordance with the Ainsworth Irrigation District's water conservation plan, improved water measurement opportunities were identified as one of the main objectives of the district. The district is working with Reclamation to investigate the possibility of installing some new ramp flumes to improve delivery system operations. The district continues to evaluate measurement and automation opportunities on a number of laterals and turnouts.

North Loup Division in Nebraska

General

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

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

Davis Creek Reservoir level is maintained at an average elevation of 2048.0 feet from the end of the irrigation season through the winter months. Off season seepage and evaporation has historically resulted in a reservoir drawdown of 2.5 to 3.0 feet requiring an end of September reservoir level of 2050.0 feet or less. This carry-over elevation provides a minimal recreational pool while reducing increases in groundwater storage due to reservoir seepage. The reservoir is filled via Mirdan Canal, starting in April and reaching full content by the end of June. A 160-acre recreation area adjoining the reservoir continues to be managed by the Lower Loup Natural Resources District. The area includes a boat ramp, a handicapped accessible fishing pier, a day-use area, a primitive camping area, shelter and a hiking path. Public lands adjoining Kent Diversion Dam are managed by the Commission and is also open to day-use fishing with handicapped accessibility provided.

2010 Summary

Precipitation at Virginia Smith Dam was 27.59 inches which is 114 percent of normal for the year. The inflow totaled 340,094 AF which was above the wet-year forecasts. A storm system stalled out over central Nebraska the night of June 11 resulting in 4 to 6 inches of rainfall in the Loup River Basin. There were reports of 8 inches of rainfall above Virginia Smith Dam on the Calamus River. Runoff from the storms increased the level of Calamus Reservoir approximately 3 feet to a new historic high elevation of 2246.03 feet (2.03 feet above the top of conservation) on June 15. The peak average daily inflow exceeded 3,000 cfs. Reservoir releases were staged up as the flooding subsided downstream of the dam.

The reservoir level gradually decreased, reaching the top of conservation on June 25. Flooding from these storms destroyed or damaged several bridges and numerous other structures throughout the area.

There were 100,113 AF of water released into Mirdan Canal and 707 AF diverted through Kent Canal from the North Loup River. A total of 42,645 AF was diverted for district use above Davis Creek Reservoir. The farm headgate delivery was 18,157 AF which is a delivery efficiency of 43 percent. Land irrigated in 2010 totaled 33,751 acres above Davis Creek Reservoir. Calamus Reservoir inflows were bypassed during July, August, and September as required. Virginia Smith Dam recorded 10.28 inches of precipitation during June, the most ever recorded for the month. The reservoir elevation at the end of the year was at 2240.22 feet. The Calamus Fish Hatchery used bypassed natural flows and storage from Calamus Reservoir totaling 5,072 AF during 2010.

The precipitation total of 27.09 inches near Davis Creek Dam was 109 percent of normal. The site recorded 10.33 inches of precipitation during June, 240 percent of average and the highest ever recorded for the month. Inflow to Davis Creek Reservoir totaled 45,405 AF during 2010. Beginning in late April, Davis Creek Reservoir was filled from an elevation of approximately 2046.40 feet to a peak elevation of 2074.40 feet on July 18 using diversions from the North Loup River and Calamus Reservoir. A release of 38,785 AF was made from Davis Creek Dam into Fullerton Canal, with 18,647 AF delivered to the farm headgates (48 percent delivery efficiency). There were 20,646 acres irrigated below Davis Creek Reservoir. The reservoir elevation at the end of 2010 was near the normal wintering level at 2048.64 feet.

Through a cooperative agreement with Reclamation, the district began installing remote monitoring equipment at key canal sites to improve delivery system operations. In 2008 equipment was placed at the Parshall flume located below Virginia Smith Dam, at the 9.5 check structure, and at the 13.4 check structure. Further work is anticipated to equip each of the sites with remote control capabilities.

2011 Outlook

Filling of Calamus Reservoir will continue through late winter and early spring. The reservoir will be allowed to fill to an elevation of 2244.0 feet (top of conservation capacity) in late March or April. This reservoir level will be maintained in order to minimize shoreline erosion until demands begin to draw on the reservoir. Bypassing of inflows will be made during July, August, and September. In the fall the reservoir will be filled to an elevation of approximately 2240.0 feet, if possible.

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

Filling of Davis Creek Reservoir will take place this spring with flows diverted from the North Loup River at Kent Division Dam and transported through Kent and Mirdan Canals.

Storage water can also be transferred from Calamus Reservoir into Davis Creek Reservoir during the summer months via Mirdan Canal. Water will be sufficient to irrigate an estimated 21,000 acres from Elba and Fullerton Canals under all inflow forecast conditions. The reservoir level will be regulated to normal winter levels at the end of the season.

The fish hatchery demand for 2011 is expected to be similar to that of the last few years with approximately 6,000 AF required for the hatchery.

The district plans to expand their remote monitoring capabilities by installing equipment at additional wasteways and key canal measurement sites throughout their delivery system. In addition to further remote monitoring capabilities, the district will continue to expand the radio control network. Additionally, the district intends to further integrate an alarm and monitoring system into their existing infrastructure to reduce the risk of operational failure. Finally, in order to improve operational efficiency the district plans to install a section of lined canal to reduce canal seepage and reduce maintenance requirements.

CHAPTER III - REPUBLICAN RIVER BASIN

Armel Unit, Upper Republican Division in Colorado

General

Normal reservoir operations for Bonny Reservoir are primarily for recreation, fish and wildlife support, although water is 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 Reservoir 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, when inflows are allowed to be stored, enhances fish spawning in the spring and provides excellent fishing opportunities during the summer and hunting conditions each fall.

2010 Summary

The annual precipitation total of 24.57 inches at Bonny Dam was 143 percent of average. The annual computed inflow of 15,989 AF to Bonny Reservoir was between the normal-year and wet-year forecasts. The reservoir level began the year at elevation 3651.00 feet and gradually increased to elevation 3654.58 feet on May 22. Runoff from storms in early July increased the reservoir level 4.2 feet to a peak elevation of 3657.87 feet on July 8 (14.1 feet below full pool). Bonny Dam received 4.92 inches of precipitation in July and 4.84 inches in August, 196 percent of average for the 2 month period. Reservoir inflows totaled 5,536 AF during July (275 percent of average), the highest monthly inflow since July 1991. River releases were made during the months of July and August in accordance with orders of the State of Colorado for Republican River Compact compliance. A total of 5,007 AF of river outflow was recorded for this purpose. The reservoir elevation at the end of the year was 19.7 feet below the top of conservation at 3652.27 feet. The Corps of Engineers determined that $8,100 of flood prevention benefits was realized from the operation of Bonny Reservoir during 2010.

The Colorado State Water Commissioner directed inflows from the South Fork of the Republican River and Landsman Creek be passed through Bonny Reservoir into Hale Ditch from April 1 through November 1. A total of 2,422 AF was released into Hale Ditch during 2010.

2011 Outlook

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

It is expected that the State of Colorado will continue to request periodic river releases from Bonny Reservoir for Republican River Compact compliance.

Frenchman Unit, Frenchman-Cambridge Division in Nebraska

General

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

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

2010 Summary

The annual precipitation total of 24.40 inches at Enders Dam was well above normal (128 percent). The 2010 inflow into Enders Reservoir of 7,752 AF was between the dry-year and normal-year forecasts. This was the 43rd consecutive year with below-normal inflows in which the conservation pool did not fill. The reservoir level began the year at elevation 3091.32 feet (20.98 feet below top of conservation). The reservoir level increased slightly during the spring to a peak elevation of 3092.87 feet on June 24 and then gradually decreased through mid October reaching elevation 3091.87 feet on October 13. Due to the extremely low water supply available, no water was released from Enders Reservoir. The end of the year reservoir level was 19.81 feet (3092.49 feet) below the top of conservation. The Corps of Engineers determined that the reservoir prevented $8,100 in flood damages in 2010.

The Frenchman Valley Irrigation District reports that approximately 1,426 acres received 771 AF of water in 2010 from natural flow diversions from Frenchman Creek. Farm delivery averaged about 0.54 foot per irrigated acre in the irrigation district. Some farmers were able to supplement their project water supply from private irrigation wells. The H&RW Irrigation District did not divert water into Culbertson Extension Canal in 2010 due to the extremely low water supply. This was the eighth consecutive year that the district did not deliver water.

In August 2004, a small depression was discovered near the outlet works stilling basin at Enders Dam. An Internal Alert remains in effect until investigation of the stability of the outlet works stilling basin and risk assessment are complete. A Safety of Dams recommendation in 2006 recommended filling the stilling basin under drain system and potential voids with low-pressure grout and backfilling the existing sinkhole with compacted material after completion of the grouting program.

A rapid increase in reservoir elevation in June 2007 prompted the addition of 50,000 pounds of concrete weights to be placed on the outlet works to counter any uplift on the structure.

In 2010, the Frenchman Valley Irrigation District (along with Reclamation) again provided support for a Limited Irrigation Demonstration project with the University of Nebraska Extension Service.

2011 Outlook

The fall and early winter inflows into Enders Reservoir were below the normal-year forecast. If reasonable minimum inflow conditions prevail, the project water supply is expected to experience a shortage of about 70,700 AF. Most probable inflow conditions are expected to be inadequate by 50,100 AF and reasonable maximum inflow conditions by 15,300 AF, to irrigate the 9,292 acres in the Frenchman Valley Irrigation District and 11,915 acres in the H&RW Irrigation District.

The Frenchman Valley Irrigation District has expressed an interest in replacement of additional open ditch laterals with buried pipe. Future piping projects are somewhat limited due to the water supply shortage. The district is also investigating remote monitoring opportunities to improve the delivery system operations. The district has identified two additional operational wasteways sites that would improve delivery systems with remote monitoring.

The Frenchman Valley Irrigation District and the H&RW Irrigation District are cooperating with Reclamation, the NDNR, the Upper and Middle Republican Natural Resource Districts (NRDs), and the Commission on the Frenchman Valley Appraisal Study which will investigate possible alternatives to identify the most efficient use of the declining water supply in the basin. The districts have also participated in discussions with NDNR on the water supply issues as they relate to the Republican River Compact and the settlement.

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

General

Service is provided for Frenchman-Cambridge Irrigation District by Meeker-Driftwood Canal to 16,855 acres; Red Willow Canal to 4,797 acres; Bartley Canal to 6,353 acres; and Cambridge Canal to 17,664 acres. The water supply for these lands is provided by storage in Swanson, Hugh Butler, and Harry Strunk Lakes, and inflows of the Republican River and Red Willow and Medicine Creeks. The Frenchman-Cambridge Irrigation District has replaced all of the open ditch laterals which were economically feasible with buried pipe which has significantly increased both system and on-farm efficiencies.

2010 Summary

The annual precipitation total of 23.01 inches at Trenton Dam was 115 percent of normal. The inflow of 41,512 AF to Swanson Lake was between the normal-year and wet-year forecasts.

The lake level began the year at elevation 2738.17 feet and gradually increased to a peak elevation of 2745.59 feet (6.41 feet below the top of conservation) on June 22. The reservoir level decreased during the irrigation season and reached a minimum elevation of 2739.54 feet on November 11. The district diverted 19,469 AF from June 23 through September 3 and delivered 6,705 AF to the farms. At the end of the year the reservoir level was 11.86 feet below the top of conservation at 2740.14 feet. The Corps of Engineers determined that Swanson Lake prevented $2,478,500 in flood damages.

The annual precipitation total of 21.73 inches at Red Willow Dam was 111 percent of normal. The annual inflow of 20,120 AF into Hugh Butler Lake was slightly above the wet-year forecast. The reservoir level at the first of the year was 2554.07 feet, 27.7 feet below the top of conservation. Due to dam safety concerns, releases were made throughout the year to maintain the reservoir elevation between 2552.00 and 2554.00 feet. June precipitation totaled 7.46 inches, the greatest June total recorded at the site. June inflow, 4,874 AF, was the greatest June inflow since 1972. Runoff from the June storms increased the reservoir level to a peak of 2556.03 feet on June 23. Releases were increased to 190 cfs and the pool level was drawn down to 2554.00 feet by the end of the month. No irrigation releases were made from Hugh Butler Lake in 2010. The end of year storage at Hugh Butler Lake was the lowest end of December storage ever recorded at the site (elevation 2553.52 feet), 28.28 feet below the top of conservation. The Corps of Engineers determined that Hugh Butler Lake prevented $8,800 of flood damages during 2010.

During an inspection at Red Willow Dam in July 2005, a small quantity of fine sand was discovered near the river outlet works stilling basin drain outlet. Five piezometers were installed in April 2006 adjacent to the outlet works and spillway stilling basins, and temporary plugs were placed in the under-drain outlets in May. An Internal Alert was issued and remains in effect. Grouting of the under-drain system was scheduled for the fall of 2009. On October 21, 2009 a small hole was observed on the face of the downstream embankment in a location 130 feet upstream of the outlet works gatehouse on the alignment of the outlet works conduit. Dye was introduced into the hole and subsequent excavation revealed cracks in the embankment material. Reclamation geotechnical engineers and geologists were onsite to conduct the investigations in coordination with the NKAO staff. A Response Level I was declared and remain in effect. A Dam Safety decision document was signed calling for a reduction of the reservoir water surface elevation to a range within 2552 to 2554 feet msl. Releases will continue as necessary to maintain the reservoir level within the operating level of 2552.00 to 2554.00 feet until permanent corrective actions are made to the dam.

The annual precipitation total of 21.46 inches at Medicine Creek Dam was 104 percent of normal. The inflow of 49,407 AF was between the normal-year and wet-year forecasts. The reservoir level at the beginning of 2010 was only .5 foot below the top of conservation. Releases were made during the first 4 months of 2010 to maintain the reservoir elevation approximately .5 foot below the flood pool. The reservoir was allowed to fill on April 16 and the reservoir level gradually increased to elevation 2368.76 feet (2.66 feet into flood pool) on June 23. Medicine Creek Dam recorded 5.74 inches of precipitation during June, 159 percent of average. Uncontrolled spills reached approximately 90 cfs from the dam during the month. Irrigation releases began on July 14 and ran through September 7 reducing the reservoir level to 2363.15 feet.

The district diverted 24,280 AF into Cambridge Canal and delivered 8,487 AF to 15,384 acres of district lands. Late fall and early winter inflows increased the level of Harry Strunk Lake to only 0.4 foot below the top of conservation at the end of the year (2365.71 feet). A release of 40 cfs was made during November and December to maintain the pool level. The Corps of Engineers determined that Harry Strunk Lake prevented $2,457,400 in flood damages.

In 2008, the district began making water measurement improvement upgrades on Meeker, Red Willow, and Cambridge Canals, including improving farm turnouts, lateral turnouts, and canal measurement structures. Reclamation provided financial assistance for this project through a cooperative agreement with the district.

2011 Outlook

Forecasts show that carry-over storage, streamflow gains, plus reasonable minimum inflows for the three lakes supplying the Frenchman-Cambridge Irrigation District will be inadequate to meet the full dry-year irrigation requirement by 23,800 AF.

A Corrective Action Study (CAS) to evaluate the various alternatives for risk reduction at Red Willow Dam is scheduled for 2011 with the necessary repairs taking place during 2012.

The district is exploring the possibility of constructing a pipeline to serve a portion of Bartley canal from Medicine Creek Dam.

Almena Unit, Kanaska Division in Kansas

General

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

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

2010 Summary

The annual precipitation at Norton Dam totaled 27.48 inches, which is 112 percent of normal. The total inflow of 12,245 AF was between the normal-year and wet-year forecasts. The reservoir was 9.7 feet below the top of conservation pool at the first of the year (2294.64 feet). The reservoir level slowly increased to elevation 2296.33 feet on June 11 when Norton Dam received 3.86 inches of rain overnight. Runoff from the storm increased the level of Keith Sebelius Lake approximately 2.5 feet. An additional 3 inches of rain over the following 2 weeks increased the lake level to a peak of 2299.48 feet on June 24. Norton Dam recorded 7.81 inches of precipitation during June. Irrigation releases were made during July and August reducing the lake level by 1.4 feet. The lake level ended the year at elevation 2296.81 feet (7.49 feet below the top of conservation). The Corps of Engineers determined that Keith Sebelius Lake prevented $20,800 in flood damages.

The Almena Irrigation District reports that approximately 1,700 acres received 877 AF of water in 2010. There were 3,330 AF of water diverted into the Almena Canal. Farm delivery averaged about .52 foot per irrigated acre with a farm delivery efficiency of 26 percent in the district.

The city of Norton used 347 AF of municipal water during 2010.

A Safety of Dams recommendation was made in 2000 concerning the seepage through the left abutment and around the outlet works house at Norton Dam. Technical Service Center personnel inspected the seepage areas in June 2001 and recommended consideration of monitoring improvement and additional instrumentation. A final issue evaluation report of findings (Technical Memorandum ND-8312-2) in 2003 concluded that the assessed risks for seepage and piping through the foundation in the left abutment falls in the range of "justification to take action to reduce risk." Topographic surveys and additional instrumentation were installed near the outlet works in 2004. In December 2005, a Corrective Action Study Technical Memorandum evaluated various alternatives for risk reduction and produced two new recommendations. Design of a weighted filter drain system and a seepage stability berm was completed in 2006. Construction of the drain was completed in 2007.

2011 Outlook

In July of 2007, the Kansas Department of Wildlife and Parks and the Almena Irrigation District entered into a Memorandum of Agreement (MOA) to maintain a minimum pool elevation in the reservoir for 10 years. The MOA was approved by the irrigators within the district and provided that no water would be released for irrigation below elevation 2288.5 feet.

If 2011 is a dry year without significant runoff producing storms above Keith Sebelius Lake, it is anticipated that the water supply may be inadequate by as much as 13,200 AF. If normal inflow into the lake and normal rainfall over the irrigated area occur in 2011, a shortage of 7,100 AF may be experienced. Requirements for the city of Norton will be met in full in 2011.

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

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

General

Harlan County Lake storage and Republican River flows provide a project water supply for 22,454 acres in the Bostwick Irrigation District in Nebraska, and 13,378 acres in the Kansas-Bostwick Irrigation District No. 2 above Lovewell Reservoir. This storage and natural flows, together with White Rock Creek flows and Lovewell Reservoir storage, furnish a water supply for 29,122 acres below Lovewell Reservoir in the Kansas-Bostwick Irrigation District.

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

In accordance with the off-season flow alternative outlined in Reclamation's final environmental assessment dated December 16, 1983, and amended on November 21, 2002, Harlan County Lake releases will be 10 cfs during the months of December, January, and February, except when the reservoir is at low levels. During water-short years releases for these 3 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 have 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.

Harlan County Dam is currently operating under an Interim Operating Plan (IOP) initiated in 2003. The IOP resulted from a “Dam Safety Assurance Study” that evaluated the adequacy of the dam as required by Corps of Engineers dam safety regulations. There were three primary findings from this study: 1) Tainter gate bearings may experience significant bearing friction when operated under increasing water load; 2) concerns of spillway stability due to water pressure in the foundation of the dam; 3) spillway was found to be hydrologically deficient when modern hydrologic criteria were applied to the dam. The IOP has resulted in a decrease of flood protection capability.

The “Lovewell Reservoir Regulation Manual” was revised in 2010 to allow for a 2 foot raise in the conservation pool for water storage during drought years. Storing additional water during drought periods increases the project’s irrigation beneficial purpose, without adversely affecting the ability to protect for the project design storm.

A calculation of available water supply will be made at the end of March to determine if additional water can be stored in Lovewell Reservoir.

Bostwick Division - Harlan County Lake Operations

2010 Summary

The annual precipitation at Harlan County Dam totaled 31.66 inches of rainfall, which is 139 percent of normal. The 2010 inflow of 239,054 AF was between the normal- and wet-year forecasts. Harlan County Lake began 2010 approximately 0.46 foot above the top of conservation pool, at 1946.19 feet. The lake level was maintained during January and allowed to fill to elevation 1947.89 feet by March 5. The additional water was temporarily stored into the flood pool so that releases could be made to verify the downstream channel capacity. River releases were staged up from 300 to 1,000 cfs from March 5 through March 9 and maintained at 1,000 cfs through March 22. It was determined that this flow was near the current channel capacity below Harlan County Dam. Flood releases resumed following the channel capacity exercise and the lake level was maintained near elevation 1947.0 feet through early June. Precipitation during June totaled 9.69 inches at the dam, the most ever recorded for the month. Runoff increased the reservoir level to a peak elevation of 1949.66 feet on June 30. River releases were staged up to 900 cfs and maintained through July 28 to evacuate flood storage. Irrigation releases started June 26 and continued through mid September. The lake level decreased to elevation 1944.85 feet on October 5. Lake levels increased through the fall and early winter. The reservoir elevation was 1946.05 feet (0.32 foot in the flood pool) on December 31, 2010. Harlan County Lake prevented $27,035,400 of downstream flood damages during 2010 according to the Corps of Engineers.

A total of 18,030 AF (approximately 28 percent of total inflow) was delivered to Lovewell Reservoir through the Courtland Canal.

Bostwick Division - Nebraska

2010 Summary

Irrigation diversions were made into Franklin, Naponee, Franklin Pump, Superior, and Courtland Canals in Nebraska in 2010. The district diverted 22,011 AF of water and delivered 7,046 AF to the farm headgates (32 percent delivery efficiency).

The district continued to replace open ditch laterals with buried pipe to reduce losses and improve system operations. In 2009, the district was selected for, Water for America Challenge Grant for the replacement of approximately 4 miles of open ditch laterals with buried pipe. Indentified laterals on the Franklin Canal include: 16.3, 21.1, 21.6, 23.2, 24.0, and a portion of 30.9. These pipe projects provide delivery system improvements by eliminating seepage losses, eliminating operational wasteways, improve water measurement and accounting by utilizing water meters, and provide on-farm benefits by allowing land owners the opportunity to convert to sprinkler irrigation

Bostwick Division - Kansas

2010 Summary

The 2010 precipitation at Lovewell Dam totaled 26.39 inches, which was 96 percent of normal. The reservoir elevation at the beginning of 2010 was 1579.26 feet (3.34 feet below the top of conservation pool). The pool level gradually increased, filling the conservation capacity on May 16 (1582.6 feet). June precipitation totaled 6.31 inches, 158 percent of average. Lovewell Dam received over 3 inches of rainfall on June 19 and 20. The reservoir level increased 2.8 feet peaking at 1587.58 feet on June 27. A 500 cfs flood release was made from July 1 through July 16. The flood release combined with canal releases to decrease the reservoir level 4.2 feet and the flood pool was evacuated on July 25. Irrigation releases to the canal began in earnest on June 23 and continued through September 14. The reservoir level at the end of the year was 1579.47 feet (3.13 feet below top of conservation). Lovewell Reservoir prevented $2,478,100 of downstream flood damages during 2010 according to the Corps of Engineers.

The Kansas-Bostwick Irrigation District diverted a total of 58,233 AF to serve 9,872 acres above Lovewell Dam and 26,886 acres below Lovewell Dam. Farm delivery efficiency averaged 56 percent in the district.

Bostwick Division

2011 Outlook

The storage in Harlan County Lake and Lovewell Reservoir and flows of the Republican River and White Rock Creek is expected to be fully adequate in meeting the full dry-year irrigation requirement for the Bostwick lands.

The Corps of Engineers plan on making a river release from Harlan County Dam this spring similar to the March 2010 release in a continuing effort to reestablish the channel capacity below the dam.

Both districts will continue to investigate remote monitoring site installation that will provide system operations improvements. In 2008 the Bostwick Irrigation District in Nebraska was awarded a Water Conservation Field Services grant to begin installing canal automation equipment on a number of check structures along Franklin Canal. The district continues to explore opportunities to increase this radio automated network. Kansas Bostwick Irrigation District will continue to replace open ditch laterals with pipe.

CHAPTER IV - SMOKY HILL RIVER BASIN

Kirwin Unit, Solomon Division in Kansas

General

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

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

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

2010 Summary

The annual precipitation total of 31.42 inches at Kirwin Dam was 133 percent of normal. The inflow of 100,264 AF was above the wet-year forecast. The reservoir level was 0.1 foot above the top of conservation pool at the first of the year (elevation 1729.35 feet). A flood release was made from January 1 through mid April maintaining the pool level near the top of conservation. Flood releases continued throughout the spring and early summer as runoff gradually increased the reservoir level to 1730.37 feet on June 11. June precipitation of 8.85 inches was the highest June total on record at Kirwin Dam. Runoff from the June storms increased the reservoir level to a peak elevation of 1734.52 feet (5.27 feet into the flood pool) on June 23. Flood releases were increased to 500 cfs on June 23 through July 23 and decreased to 250 cfs for the remainder of July. Flood releases combined with canal releases in dropping the reservoir level out of the flood pool on July 30. Irrigation releases began on June 28 and continued through August 31 decreasing the reservoir level to 1728.42 feet. The reservoir level continued to increase after irrigation releases ended. Additional flood releases started on December 15 and continued through the remainder of the year. The reservoir elevation was 1729.40 feet on December 31 (0.15 foot above the top of conservation). The Corps of Engineers determined that Kirwin Reservoir prevented $7,441,200 in flood damages.

A total of 6,905 acres received project water during 2010 with 4,242 AF delivered to farms. Farm delivery efficiency was 33 percent.

2011 Outlook

Carry-over storage and the forecasted inflows in the North Fork of the Solomon River are expected to be adequate to irrigate all district lands even with below normal precipitation and dry-year forecasted inflows.

The district continues to investigate opportunities to replace problem sections of open ditch laterals with buried pipe. The district is also assisting landowners with on-farm improvements such as the installation of sprinklers through assisting with burying lines to pivots and through the relocation of turnouts. Future conservation projects include the possibility of installing remote monitoring equipment at the wasteways and at the Kirwin North/South Canal split. Future conservation projects may be delayed due to the declining water supply and availability of cost-share funding.

The district and Reclamation continue to participate in the Solomon Basin Working Group meetings as part of the State of Kansas' Sub-basin Water Resources Management Program. This group is designed to take a proactive approach in developing water management strategies that address declines in stream flows and groundwater levels.

Webster Unit, Solomon Division in Kansas

General

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

2010 Summary

In 2010, the precipitation at Webster Dam was 88 percent of normal (20.86 inches). The inflow of 50,038 AF was between the normal-year and wet-year forecasts. The reservoir level was approximately 0.6 foot above the top of conservation pool at the first of the year (elevation 1983.07 feet). A flood release was made from January 1 through mid April maintaining the pool level near the top of conservation. A late April storm system produced over 2 inches of rainfall at Webster Dam and increased the reservoir level to 1895.00 feet on April 25 (2.55 feet into the flood pool). Flood releases were increased to 450 cfs from April 25 through May 6 decreasing the pool level to 1893.30 feet. Flood releases continued into June maintaining this reservoir level. Irrigation releases began July 10 and continued through August 30 decreasing the reservoir level to 1889.00 feet. The pool level remained steady ending the year at elevation 1888.85 feet on December 31 (3.6 feet below the top of conservation). The COE determined that the reservoir prevented $2,520,400 in flood damages.

A total of 4,329 acres received project water during 2010 with 3,421 AF delivered to farms. Farm delivery efficiency was 37 percent.

Concrete repairs in the spillway chute were completed in 2008. Approximately 2,500 ft^2 of concrete was repaired in the flat portion of the spillway by NKAO personnel. Repairs to the other areas of the spillway were contracted to Vieco Development and Construction Company, Inc. Vieco repaired approximately 15,000 ft^2 of spillway.

The district continued to explore opportunities to cost share with Reclamation and district irrigators for the replacement of open ditch laterals with buried pipe. Future conservation projects include the possibility of installing remote monitoring equipment at the key canal measurement sites on Osborne Canal. Future conservation projects may be delayed due to the declining water supply and availability of cost-share funding.

2011 Outlook

The carry-over storage and the flows in the South Fork Solomon River are expected to be adequate to irrigate all district lands in 2011 even under dry-year forecasted inflows and below normal precipitation.

Due to the uncertainty of future water supplies and limited available funding, the district is not planning to install any large lateral pipe projects but will continue to solicit interest from project irrigators. Interest in investing in delivery system improvements has been hampered by the uncertainty of future water supplies. The district is investigating improvements to the water measurement structure between the second and third sections of Osborne Canal. Future conservation projects include the possibility of installing remote monitoring equipment at the wasteways and at the beginning of the second and third sections of Osborne Canal.

The district and Reclamation continue to participate in the Solomon Basin Working Group meetings as part of the State of Kansas' Sub-basin Water Resources Management Program. This group is designed to take a proactive approach in developing water management strategies that address declines in stream flows and groundwater levels.

Glen Elder Unit, Solomon Division in Kansas

General

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

Renewal of the long term water service contract with the city of Beloit, Kansas was completed in 2008. The new repayment contract became effective on January 1, 2009. The repayment contract with Beloit, Kansas, provides for the annual use of up to 2,000 AF of Waconda Lake storage. Water is measured at the Glen Elder Dam river outlet works.

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

The water service contract with the Glen Elder Irrigation District provides for the use of up to 18,000 AF of storage water each year. Based on the current State of Kansas Certificate of

Appropriation, water usage is not to exceed 15,170 AF per calendar year. Water is released and measured through the river outlet works.

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

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

Waconda Lake is normally regulated at 1 to 2 feet below the top of conservation capacity during the winter months. Maintaining the lake at this level reduces shoreline erosion, provides a buffer for spring runoff and lessens ice damage to the upstream face of Glen Elder Dam. Releases from Waconda Lake are regulated each year to maintain a constant water surface level while the lake is ice-covered.

2010 Summary

The annual precipitation total of 28.09 inches at Glen Elder Dam was 110 percent of normal. The inflow of 492,406 AF was between the normal-year and wet-year forecasts. The lake level at the beginning of the year was 0.5 foot below the top of conservation. A 500 cfs release was made during the first 2 months of the year decreasing the pool level to a target elevation of approximately 2 feet below top of conservation. This level was to be maintained throughout the year to assist with two construction projects that were scheduled to take place at Glen Elder Dam. One project was to repair the spillway concrete apron upstream of the gates beginning in the spring and the other project was to repair areas of soil cement on the face of the dam beginning in the fall. Flood releases varied from 250 to 1,100 cfs from March through mid June maintaining the lake level between 1 to 2 feet below the top of conservation. The North Fork of the Solomon River above Waconda Lake received 5 to 7 inches of rainfall from June 19 through the 23. The resulting runoff increased the level of Waconda Lake nearly 4 feet by June 24, a gain of 52,000 AF. The lake level peaked at 3.3 feet into the flood pool and releases were staged up to 1,700 cfs by the end of June. The pool level was drawn down to approximately 1 foot into the flood pool by mid July when another storm system dumped 4 to 6 inches of rainfall in the same area upstream of Waconda Lake. Runoff from this storm increased the level of Waconda Lake 3.8 feet with a gain of over 53,000 AF. Waconda Lake level peaked at 5.22 feet into the flood pool. The peak reservoir level recorded during the year was 1460.82 feet on July 24 (71,566 AF in the flood pool). The flood release of 1,700 cfs continued through July and August. The lake level dropped from the flood pool on August 20 and reached elevation 1452.92 feet on September 11. The reservoir level was maintained near elevation 1453.60 during the fall to allow access to crews doing work on the face of the dam as well as work on the spillway approach apron. The level of Waconda Lake at the end of the year was 1.75 foot (elevation 1453.85 feet) below the top of conservation. Waconda Lake prevented $22,275,500 of downstream flood damages during 2010 according to the Corps of Engineers.

A total of 460,458 AF of water was released from Glen Elder Dam in 2010. Storage releases of 744 AF combined with natural flow releases of 6,570 AF for the irrigation of 5,434

acres in the Glen Elder Irrigation District. The district delivered 3,657 AF to the farms resulting in a delivery efficiency of 50 percent. No storage releases were made for the city of Beloit and no water was bypassed for water quality as directed by the State Water Commissioner. Releases to the Mitchell County Rural Water District No. 2 totaled 714 AF.

2011 Outlook

The municipal requirement of Beloit and the requirements of the Mitchell County Rural Water District No. 2 will be met in full with releases as required from Waconda Lake. It is expected that the Kansas Water Commissioner will request that inflows be passed through the lake for water right administration. The storage in Waconda Lake and flows in the North and South Forks of the Solomon River will furnish an adequate water supply to the Glen Elder Irrigation District. The reservoir will be regulated to maintain a constant level during the winter months when the reservoir is ice-covered to minimize ice damage. Under normal-year conditions, the lake is expected to be maintained at about 2 feet below the top of the conservation pool during the winter.

The two construction projects will continue at Glen Elder Dam this year and will require the reservoir level be maintained no higher than elevation 1453.6 feet (2 feet below the top of conservation). One of the construction projects is the repair of soil cement at various locations along the upstream face of Glen Elder Dam. This project will require the lake level to be drawn down to elevation 1452.6 feet and is expected to be completed by the end of May. The second project involves the repair of the spillway apron upstream of the spillway gates and will require that the lake level be maintained at approximately 1453.6 feet until completed this summer.

The Glen Elder Irrigation District continues to try to adjust water ordering policies by adjusting the advance water ordering times in order to improve water releases, making more efficient use of the district's water supply. Some district pumping sites present problems due to river conditions at the sites. In order to minimize required reservoir releases, the district is investigating potential improvements to water pumping sites.

Cedar Bluff Unit, Smoky Hill Division in Kansas

General

Cedar Bluff Reservoir storage furnishes a maximum of 2,000 AF each year for the city of Russell, Kansas when required. Prior to 1993, Cedar Bluff Reservoir storage and Smoky Hill River flows had provided a water supply for 6,800 acres in the Cedar Bluff Irrigation District. Reformulation of the Cedar Bluff Unit in October of 1992 resulted in the dissolution of the Cedar Bluff Irrigation District with the Kansas Water Office and Kansas Department of Wildlife and Parks acquiring the use and control of portions of the reservoir conservation capacity. A "designated operating pool" was established for Cedar Bluff Reservoir and includes the following sub allocation pools: The City of Russell's existing water storage right which remained unchanged (2,700 AF); an artificial recharge pool under control of the Kansas Water Office (5,110 AF); and a fish, wildlife, and recreation pool under control of the Kansas Department of Wildlife and Parks (21,061 AF). A "joint-use pool" has been established between

the operating pool and the flood control pool for water supply, flood control, environmental, and fish, wildlife and recreation purposes.
Water rights for the "joint-use pool" are held jointly between the Kansas Department of Wildlife and Parks and the Kansas Water Office. A Contract Administration Memorandum between the United States of America, represented by Reclamation, the state of Kansas and the city of Russell was signed in November/December of 2003, establishing an accounting procedure for water storage in Cedar Bluff Reservoir. In January, 2006 a Memorandum of Understanding was signed by the state of Kansas agencies, Kansas Water Office, and Kansas Department of Wildlife and Parks. Kansas Department of Wildlife and Parks will be responsible for the joint pool releases and for the water rights.

2010 Summary

The annual precipitation total at Cedar Bluff Dam was 15.12 inches which is 72 percent of normal. The 2010 inflow of 26,202 AF was between the normal-year and wet-year forecasts. The reservoir level at the beginning of the year was 2127.54 feet (16.46 feet below top of conservation). Inflows during the spring and early summer gradually increased the reservoir level to a peak of 2131.87 feet on June 26. The reservoir level gradually decreased through the remainder of the year. No release was made from the dam in 2010. The reservoir level at the end of the year was 2127.37 feet (16.63 feet below the top of conservation). Cedar Bluff Reservoir prevented $2,430,400 of downstream flood damages during 2010 according to the Corps of Engineers.

The state of Kansas utilized the fish hatchery facility located below Cedar Bluff Dam. There were no releases to the facility. No water was released from Cedar Bluff Reservoir during 2010 for the city of Russell.

2011 Outlook

Storage in Cedar Bluff Reservoir on December 31, 2010, was within the joint use pool. The Kansas Department of Wildlife and Parks is expected to use up to 20 AF of water in the operations of the fish hatchery facility. The Kansas Water Office may request a minimal release to the river for recharge in 2011.

TABLE 1

RESERVOIR DATA - NIOBRARA, LOWER PLATTE AND KANSAS RIVER BASINS

		CAPACITY ALLOCATIONS 1/			
			LIVE CONSERVATION		
RESERVOIR		DEAD	Inactive	A ctive	FLOOD CONTROL
Box Butte	- Elevation Ft.	3969.0	3979.0	4007.0	---
	Total Acre-feet	188	2,392	29,161	---
	Net Acre-feet	188	2,204	26,769	---
Merritt	- Elevation Ft.	2875.0	2896.0	2946.0	---
	Total Acre-feet	774	4,662	66,726	---
	Net Acre-feet	774	3,888	62,064	---
Calamus	- Elevation Ft.	2185.0	2213.3	2244.0	---
	Total Acre-feet	817	24,646	127,400	---
	Net Acre-feet	817	23,829	102,754	---
Davis Creek	- Elevation Ft.	1998.5	2003.0	2076.0	---
	Total Acre-feet	76	172	31,158	---
	Net Acre-feet	76	96	30,986	---
Bonny 4/	- Elevation Ft.	3635.5	3638.0	3672.0	3710.0
	Total Acre-feet	0	0	36,508	165,328
	Net Acre-feet	0	0	36,508	128,820
Enders	- Elevation Ft.	3080.0	3082.4	3112.3	3127.0
	Total Acre-feet	7,516	8,948	42,910	72,958
	Net Acre-feet	7,516	1,432	33,962	30,048
Swanson	- Elevation Ft.	2710.0	2720.0	2752.0	2773.0
La ke	Total Acre-feet	2,118	12,430	112,214	246,291
	Net Acre-feet	2,118	10,312	99,784	134,077
Hugh Butler	- Elevation Ft.	2552.0	2558.0	2581.8	2604.9
La ke	Total Acre-feet	5,185	8,921	36,224	85,070
	Net Acre-feet	5,185	3,736	27,303	48,846
Harry Strunk	- Elevation Ft.	2335.0	2343.0	2366.1	2386.2
Lake	Total Acre-feet	3,408	7,897	34,647	87,361
	Net Acre-feet	3,408	4,489	26,750	52,714
Keith Sebelius	- Elevation Ft.	2275.0	2280.4	2304.3	2331.4
La ke	Total Acre-feet	1,636	3,993	34,510	133,740
	Net Acre-feet	1,636	2,357	30,517	99,230
Harlan County	- Elevation Ft.	1885.0	1927.0	1945.73	1973.5
Lake 3/	Total Acre-feet	0	118,099	314,111	814,111
	Net Acre-feet	0	118,099	196,012	500,000
Lovewell	- Elevation Ft.	1562.07	1571.7	1582.6	1595.3
	Total Acre-feet	1,674	11,644	35,666	86,131
	Net Acre-feet	1,674	9,970	24,022	50,465
Kirwin	- Elevation Ft.	1693.0	1697.0	1729.25	1757.3
	Total Acre-feet	4,969	8,515	98,154	313,290
	Net Acre-feet	4,969	3,546	89,639	215,136
Webster	- Elevation Ft.	1855.5	1860.0	1892.45	1923.7
	Total Acre-feet	1,256	4,231	76,157	259,510
	Net Acre-feet	1,256	2,975	71,926	183,353
Waconda	- Elevation Ft.	1407.8	1428.0	1455.6	1488.3
La ke	Total Acre-feet	248	26,237	219,420	942,408
	Net Acre-feet	248	25,989	193,183	722,988
Cedar Bluff	- Elevation Ft.	2090.0	2107.8	2144.0	2166.0
	Total Acre-feet	4,402	28,574	172,452	364,342
	Net Acre-feet	4,402	24,172	143,878	191,890
Total Storage (A.F.)		34,267	271,361	1,467,418	3,824,985 2/
Total Net Acre-feet		34,267	237,094	1,196,057	2,357,567

1/ Includes space for sediment storage.
2/ Includes total active storage for Box Butte, Merritt, Calamus, and Davis Creek Reservoirs.
3/ Bottom of irrigation pool for Harlan County Lake is 1932.5 feet, 164,111 AF.
4/ New area-capacity table Effective Jan 1, 2011

TABLE 2
SUMMARY OF 2010 OPERATIONS

MIRAGE FLATS PROJECT

	BOX BUTTE RESERVOIR					MIRAGE FLATS 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.	971	36	80	0.10	11,068	0	0
Feb.	1,345	34	106	0.27	12,273	0	0
Mar.	3,155	42	206	0.45	15,180	0	0
Apr.	2,882	46	372	3.98	17,644	0	0
May	2,337	50	491	2.20	19,440	0	0
June	2,666	53	648	6.25	21,405	0	0
July	446	2,563	708	2.77	18,580	2,423	489
Aug.	222	6,708	534	0.85	11,560	6,942	3,057
Sep.	607	42	343	0.54	11,782	0	0
Oct.	888	44	253	0.70	12,373	0	0
Nov.	1,156	42	143	0.45	13,344	0	0
Dec.	1,309	44	86	0.40	14,523	0	0
TOTAL	17,984	9,704	3,970	18.96	--	9,365	3,546

NOTE -- Acres irrigated 2010: Mirage Flats Canal 6,857 acres.

SANDHILLS DIVISION
AINSWORTH UNIT

	MERRITT RESERVOIR					AINSWORTH CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release To Canal (AF)	Delivered To Farms (AF)
Jan.	14,616	14,380	236	0.31	61,100	0	0
Feb.	12,893	12,595	298	0.43	61,100	0	0
Mar.	17,976	17,018	417	1.39	61,641	0	0
Apr.	16,830	10,731	723	3.92	67,017	0	0
May	14,604	13,547	1,057	4.27	67,017	3,433	94
June	17,436	16,790	1,227	7.43	66,436	4,088	92
July	15,860	26,093	1,413	2.61	54,790	24,436	14,633
Aug.	18,167	32,619	1,044	1.20	39,294	32,176	22,822
Sep.	14,891	5,881	670	0.70	47,634	6,208	3,014
Oct.	15,034	1,686	684	1.11	60,298	0	0
Nov.	13,605	12,357	446	0.24	61,100	0	0
Dec.	13,828	13,785	312	0.53	60,831	0	0
TOTAL	185,740	177,482	8,527	24.14	--	70,341	40,655

NOTE -- Acres irrigated 2010: Ainsworth Canal 34,589 acres.

NORTH LOUP DIVISION

	CALAMUS RESERVOIR						ABOVE DAVIS CREEK MIRDAN CANAL		
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release to Calamus Fish Hatch. (AF)	Release to Canal (AF)	Canal Use (AF)	Delivered To Farms (AF)
Jan.	22,078	20,621	447	0.08	108,427	0	0	0	0
Feb.	16,489	15,699	559	0.77	108,658	0	0	0	0
Mar.	28,522	18,012	1,019	1.48	118,149	446	0	0	0
Apr.	26,529	20,107	1,428	2.43	123,143	636	1,761	0	0
May	26,602	29,649	1,801	2.71	118,295	436	19,825	2,013	150
June	71,788	62,605	2,269	10.28	125,209	610	18,784	3,987	174
July	33,308	49,014	2,360	3.75	107,143	774	23,025	9,705	4,235
Aug	25,136	53,160	1,966	3.16	77,153	685	30,482	22,782	11,399
Sep.	21,906	37,964	951	2.27	60,144	753	6,236	4,158	2,199
Oct.	23,682	3,787	984	0.17	79,055	240	0	0	0
Nov.	22,337	4,023	618	0.16	96,751	163	0	0	0
Dec.	21,717	9,090	397	0.33	108,981	330	0	0	0
TOTAL	340,094	323,731	14,799	27.59	--	5,072	100,113	42,645	18,157

NOTE -- Acres irrigated 2010: Mirdan Canal 33,751 acres.

NORTH LOUP DIVISION (Continued)

	DAVIS CREEK RESERVOIR					BELOW DAVIS CREEK FULLERTON CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Mo. Content (AF)	Release To Canal (AF)	Delivered To Farms (AF)
Jan.	11	147	47	0.31	8,739	0	0
Feb.	33	127	58	0.54	8,587	0	0
Mar.	185	141	101	1.56	8,530	0	0
Apr.	420	137	165	2.12	8,648	0	0
May	12,483	3,342	224	5.04	17,565	2,926	12
June	13,857	4,401	433	10.33	26,588	3,671	4
July	10,422	9,533	476	3.52	27,001	8,527	4,888
Aug.	5,872	19,002	389	1.34	13,482	18,631	11,944
Sep.	1,986	5,213	186	0.76	10,069	5,030	1,799
Oct.	135	202	148	1.25	9,854	0	0
Nov.	1	179	104	0.09	9,572	0	0
Dec.	0	173	49	0.23	9,350	0	0
TOTAL	45,405	42,597	2,380	27.09	--	38,785	18,647

NOTE - Acres irrigated 2010: Fullerton Canal 20,646 acres.

TABLE 2
SUMMARY OF 2010 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.	1,113	246	87	0.08	11,000	0
Feb.	928	222	105	0.38	11,601	0
Mar.	1,432	246	169	2.02	12,618	0
Apr.	2,096	595	444	4.08	13,675	357
May	1,019	505	481	1.27	13,708	259
June	717	723	665	3.31	13,037	485
July	5,536	3,122	670	4.92	14,781	445
Aug.	783	3,323	541	4.84	11,700	490
Sep.	445	499	486	2.68	11,160	233
Oct.	272	455	267	0.08	10,710	148
Nov.	711	303	182	0.21	10,936	5
Dec.	937	307	106	0.70	11,460	0
TOTAL	15,989	10,546	4,203	24.57	--	2,422

TABLE 2
SUMMARY OF 2010 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.	534	307	64	0.03	15,825	0	0	0	0
Feb.	566	278	78	0.66	16,035	0	0	0	0
Mar.	906	307	136	2.18	16,498	0	0	0	0
Apr.	986	298	320	3.57	16,866	521	0	0	0
May	674	307	329	1.85	16,904	2,754	37	0	0
June	936	298	504	4.60	17,038	2,203	136	0	0
July	359	307	470	2.20	16,620	2,067	174	0	0
Aug.	623	307	457	6.13	16,479	1,760	352	0	0
Sep.	339	298	283	1.50	16,237	304	72	0	0
Oct.	420	307	178	0.42	16,172	0	0	0	0
Nov.	729	298	152	0.66	16,451	0	0	0	0
Dec.	680	307	81	0.60	16,743	0	0	0	0
TOTAL	7,752	3,619	3,052	24.40	--	9,609	771	0	0

NOTE: Acres irrigated 2009: Culbertson Canal - 1,426 acres; Culbertson Extension Canal - 0 acres.

FRENCHMAN-CAMBRIDGE DIVISION (Continued)
MEEKER-DRIFTWOOD UNIT

	SWANSON LAKE					MEEKER-DRIFTWOOD	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release To Canal (AF)	Delivered To Farms (AF)
Jan.	3,797	61	243	0.09	58,807	0	0
Feb.	4,855	56	311	0.43	63,295	0	0
Mar.	7,970	61	542	1.94	70,662	0	0
Apr.	7,811	60	1,360	3.95	77,053	0	0
May	5,968	61	1,639	2.41	81,321	0	0
June	3,497	1,095	2,031	3.47	81,692	1,273	34
July	1,922	9,630	2,129	3.62	71,855	9,553	3,001
Aug.	2,921	8,331	1,926	5.29	64,519	7,912	3,272
Sep.	0	1,093	1,764	0.33	61,662	731	398
Oct.	0	61	1,270	0.78	60,331	0	0
Nov.	573	60	583	0.38	60,261	0	0
Dec.	2,198	61	313	0.32	62,085	0	0
TOTAL	41,512	20,630	14,111	23.01	--	19,469	6,705

NOTE: Acres irrigated 2010: Meeker-Driftwood Canal - 13,446 acres.

FRENCHMAN-CAMBRIDGE DIVISION (Continued)
RED WILLOW UNIT

	HUGH BUTLER LAKE					RED WILLOW CANAL		BARTLEY CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	1,676	1,845	38	0.03	6,150	0	0	0	0
Feb.	1,419	1,666	42	0.58	5,861	0	0	0	0
Mar.	3,257	3,326	79	2.36	5,713	0	0	0	0
Apr.	1,795	1,190	221	2.85	6,097	0	0	0	0
May	1,351	1,230	190	2.13	6,028	0	0	1,727	0
June	4,874	4,130	331	7.46	6,441	0	0	2,145	49
July	1,369	1,266	323	2.55	6,221	0	0	2,448	1,435
Aug.	871	696	322	1.90	6,074	0	0	1,994	906
Sep.	714	631	256	0.62	5,901	0	0	275	85
Oct.	896	484	186	0.72	6,127	0	0	0	0
Nov.	897	978	94	0.35	5,952	0	0	0	0
Dec.	1,001	875	44	0.18	6,034	0	0	0	0
TOTAL	20,120	18,317	2,126	21.73	--	0	0	8,589	2,475

NOTE -- Acres irrigated 2010: Red Willow Canal - 0 acres; Bartley Canal 5,039 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.	3,352	3,074	116	0.10	33,792	0	0
Feb.	3,411	2,777	127	0.80	34,299	0	0
Mar.	7,364	7,950	243	2.61	33,470	0	0
Apr.	4,327	960	675	2.51	36,162	0	0
May	3,602	2,747	626	2.47	36,391	2,172	0
June	7,705	3,673	1,099	5.74	39,324	4,939	55
July	4,355	7,577	1,012	1.59	35,090	8,348	4,452
Aug.	4,666	8,063	950	4.10	30,743	7,649	3,539
Sep.	2,429	1,549	651	0.42	30,972	1,172	441
Oct.	2,650	62	550	0.56	33,010	0	0
Nov.	2,746	1,738	280	0.41	33,738	0	0
Dec.	2,800	2,460	142	0.15	33,936	0	0
TOTAL	49,407	42,630	6,471	21.46	--	24,280	8,487

NOTE -- Acres irrigated 2010: Cambridge Canal 15,384 acres.

TABLE 2
SUMMARY OF 2010 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.	555	51	94	0.06	17,796	20	0	0
Feb.	616	45	111	0.46	18,256	17	0	0
Mar.	916	51	207	1.83	18,914	20	0	0
Apr.	1,298	51	499	5.18	19,662	21	0	0
May	1,059	55	714	3.66	19,952	24	0	0
June	5,913	63	890	7.81	24,912	33	518	0
July	591	1,245	972	2.45	23,286	46	1,978	673
Aug.	166	854	1,162	1.82	21,436	50	834	204
Sep.	316	70	801	3.22	20,881	40	0	0
Oct.	33	66	543	0.23	20,305	35	0	0
Nov.	335	51	253	0.61	20,336	21	0	0
Dec.	447	51	132	0.15	20,600	20	0	0
TOTAL	12,245	2,653	6,378	27.48	--	347	3,330	877

NOTE: Acres irrigated 2010: Almena Canal - 1,700 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.	14,464	8,944	785	0.00	324,993	0	0	0	0
Feb.	17,238	555	919	0.50	340,757	0	0	0	0
Mar.	30,603	33,743	1,423	1.50	336,194	0	0	0	0
Apr.	30,740	25,803	3,554	5.72	337,577	0	0	0	0
May	26,385	24,530	4,620	5.74	334,812	0	0	0	0
June	54,487	15,108	5,496	9.69	368,695	0	0	0	0
July	19,051	51,290	6,998	1.93	329,458	5,285	1,105	308	81
Aug.	15,558	27,219	7,127	4.00	310,670	8,330	2,653	375	90
Sep.	6,142	6,863	5,888	1.24	304,061	264	17	7	0
Oct.	5,048	0	5,692	0.78	303,417	0	0	0	0
Nov.	9,069	0	3,008	0.53	309,478	0	0	0	0
Dec.	10,269	0	1,383	0.03	318,364	0	0	0	0
TOTAL	239,054	194,055	46,893	31.66	--	13,879	3,775	690	171

NOTE: Acres irrigated 2010: Franklin Canal - 7,357 acres; Naponee Canal - 660 acres.

BOSTWICK DIVISION (Continued)
SUPERIOR-COURTLAND UNIT

	FRANKLIN PUMP CANAL		SUPERIOR CANAL			COURTLAND CANAL - ABOVE LOVEWELL: NEBRASKA USE		COURTLAND CANAL - ABOVE LOVEWELL: 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	0	0	0	0	0
May	0	0	0	0	0	0	0	0	0
June	0	0	0	0	3,793	0	0	1,474	11
July	381	89	3,086	1,275	14,978	107	89	10,232	4,159
Aug.	370	83	3,403	1,494	18,675	95	70	7,508	4,254
Sep.	0	0	0	0	9,844	0	0	976	444
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	751	172	6,489	2,769	47,290	202	159	20,190	8,868

NOTE: Acres irrigated 2010: Franklin Pump Canal - 679 acres; Superior Canal - 5,595 acres.
Courtland Canal-Nebraska use - 1,097 acres.
Courtland Canal-Kansas use - 9,872 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.	1,161	0	1,161	12	141	0.15	27,536	0	0
Feb.	1,266	0	1,266	11	173	0.54	28,618	0	0
Mar.	4,499	0	4,499	12	351	3.71	32,754	0	0
Apr.	3,326	0	3,326	12	967	2.23	35,101	0	0
May	3,590	0	3,590	12	823	4.87	37,856	0	0
June	17,063	250	17,313	1,581	1,505	6.31	52,083	1,866	36
July	10,121	2,575	12,696	31,873	1,412	1.85	31,494	16,466	10,959
Aug.	1,355	7,668	9,023	16,406	1,345	2.00	22,766	15,331	10,294
Sep.	1,957	7,537	9,494	5,149	806	3.00	26,305	4,380	2,406
Oct.	112	0	112	12	691	0.26	25,714	0	0
Nov.	1,126	0	1,126	12	374	1.47	26,454	0	0
Dec.	780	0	780	12	168	0.00	27,054	0	0
TOTAL	46,356	18,030	64,386	55,104	8,756	26.39	--	38,043	23,695

NOTE: Acres irrigated 2010: Courtland Canal below Lovewell 26,886 acres.

TABLE 2
SUMMARY OF 2010 OPERATIONS

SOLOMON DIVISION
KIRWIN UNIT

	KIRWIN RESERVOIR					KIRWIN CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release To Canal (AF)	Delivered To Farms (AF)
Jan.	2,307	1,888	318	0.00	98,763	0	0
Feb.	2,904	2,380	422	0.36	98,865	0	0
Mar.	4,862	3,074	715	2.15	99,938	0	0
Apr.	14,154	5,506	1,890	2.84	106,696	0	0
May	13,946	13,770	1,828	4.18	105,044	0	0
June	34,165	13,581	3,064	8.85	122,564	343	0
July	10,597	32,172	3,190	2.74	97,799	5,833	1,250
Aug.	6,260	6,984	3,075	5.49	94,000	6,729	2,992
Sep.	4,364	8	2,067	3.46	96,289	0	0
Oct.	1,796	0	1,545	0.32	96,540	0	0
Nov.	2,468	0	804	0.95	98,204	0	0
Dec.	2,441	1,329	400	0.08	98,916	0	0
TOTAL	100,264	80,692	19,318	31.42	--	12,905	4,242

NOTE: Acres irrigated 2010: Kirwin Canal - 6,905 acres.

SOLOMON DIVISION (Continued)
WEBSTER UNIT

	WEBSTER RESERVOIR					OSBORNE CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	4,505	6,149	260	0.09	76,610	0	0
Feb.	4,151	3,570	316	0.53	76,875	0	0
Mar.	6,471	3,074	563	2.58	79,709	0	0
Apr.	13,491	7,414	1,513	3.67	84,273	0	0
May	9,591	13,153	1,312	3.48	79,399	0	0
June	7,221	5,526	2,388	3.40	78,706	282	0
July	1,572	4,772	2,400	1.19	73,106	4,021	1,021
Aug.	155	7,149	2,379	2.07	63,733	4,961	2,400
Sep.	488	0	1,498	2.14	62,723	0	0
Oct.	208	0	943	1.10	61,988	0	0
Nov	743	0	544	0.58	62,187	0	0
Dec.	1,442	0	301	0.03	63,328	0	0
TOTAL	50,038	50,807	14,417	20.86	--	9,264	3,421

NOTE: Acres irrigated 2010: Osborne Canal - 4,329 acres.

SOLOMON DIVISION (Continued)
GLEN ELDER UNIT

	WACONDA LAKE					OUTFLOW TO RIVER				
						City of Beloit		Irrig.District	Other	Release To
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Storage Release (AF)	Quality Bypass (AF)	Storage Release (AF)	Controlled Releases (AF)	Mitchell Co. RWD No. 2 (AF)
Jan.	21,030	30,809	726	0.12	203,285	0	0	0	30,744	65
Feb.	19,800	26,339	911	0.50	195,835	0	0	0	26,282	57
Mar.	26,994	26,549	1,609	2.47	194,671	0	0	0	26,494	55
Apr.	38,734	23,770	4,545	2.90	205,090	0	0	0	23,707	63
May	52,048	52,284	4,551	5.62	200,303	0	0	0	52,231	53
June	116,199	49,643	7,737	4.76	259,122	0	0	0	49,587	56
July	126,256	100,736	8,002	5.57	276,640	0	0	188	100,483	65
Aug.	23,275	100,287	7,959	1.72	191,669	0	0	510	99,705	72
Sep.	35,672	22,243	4,913	3.75	200,185	0	0	46	22,131	66
Oct.	9,451	13,639	3,983	0.11	192,014	0	0	0	13,587	52
Nov.	11,942	7,000	1,821	0.42	195,135	0	0	0	6,942	58
Dec.	11,005	7,159	921	0.15	198,060	0	0	0	7,107	52
TOTAL	492,406	460,458	47,678	28.09	--	0	0	744	459,000	714

NOTE: Acres irrigated 2010: Glen Elder District 5,434 acres.

SMOKY HILL DIVISION
ELLIS UNIT

	CEDAR BLUFF RESERVOIR							
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release to City of Russell (AF)	Release To Fish Hatchery (AF)	Release to Kansas Water Office (AF)
Jan.	1,084	0	298	0.18	84,485	0	0	0
Feb.	1,076	0	363	0.37	85,198	0	0	0
Mar.	2,033	0	634	1.85	86,597	0	0	0
Apr.	7,121	0	1,474	1.91	92,244	0	0	0
May	9,489	0	1,239	3.69	100,494	0	0	0
June	4,270	0	2,844	1.93	101,920	0	0	0
July	1,128	0	2,600	1.89	100,448	0	0	0
Aug.	1	0	3,106	1.86	97,343	0	0	0
Sep.	0	0	2,625	0.56	94,718	0	0	0
Oct.	0	0	2,136	0.08	92,582	0	0	0
Nov.	0	0	969	0.64	91,613	0	0	0
Dec.	0	0	503	0.16	91,110	0	0	0
TOTAL	26,202	0	18,791	15.12	--	0	0	0

TABLE 3

ACRES IRRIGATED IN 2010 AND ESTIMATES FOR 2011

Irrigation District and Canal	Acres With Service Available	Acres Irrigated in 2010	Estimated Acres to be Irrigated in 2011
Mirage Flats Irrigation District			
Mirage Flats Canal	11,662	6,857	7,000
Ainsworth Irrigation District			
A insworth Canal	35,000	34,589	34,500
Twin Loups Irrigation District			
Above Davis Creek	34,053	33,751	34,000
Below Davis Creek	21,063	20,646	21,000
Total Twin Loups Irrigation District	55,116	54,397	55,000
Frenchman Valley Irrigation District			
C ulbertson Canal	9,292	1,426	1,500
H & RW Irrigation District			
C ulbertson Extension Canal	11,915	0	0
Frenchman-Cambridge Irrigation District			
Meeker-Driftwood Canal	16,855	13,446	14,000
Red Willow Canal	4,797	0	0
Bartley Canal	6,353	5,039	6,000
Cambridge Canal	17,664	15,384	16,000
Total Frenchman-Cambridge Irrigation District	45,669	33,869	36,000
Almena Irrigation District			
Almena Canal	5,764	1,700	2,000
Bostwick Irrigation District in Nebraska			
F ranklin Canal	10,920	7,357	7,500
Naponee Canal	1,650	660	1,000
F ranklin Pump Canal	2,090	679	1,000
Superior Canal	5,848	5,595	5,500
Courtland Canal (Nebraska)	1,946	1,097	1,000
Total Bostwick Irrigation Dist. in Nebraska	22,454	15,388	16,000
Kansas-Bostwick Irrigation District			
Courtland Canal above Lovewell	13,378	9,872	10,000
Courtland Canal below Lovewell	29,122	26,886	27,000
Total Kansas-Bostwick Irrigation District	42,500	36,758	37,000
Kirwin Irrigation District			
K irwin Canal	11,465	6,905	7,000
Webster Irrigation District			
Osborne Canal	8,537	4,329	4,500
Glen Elder Irrigation District	10,370	5,434	6,500
TOTAL PROJECT USES	269,744	201,652	207,000
Non-Project Uses			
Hale Ditch	700	350	300
TOTAL PROJECT AND NON-PROJECT	270,444	202,002	207,300

BOX BUTTE RESERVOIR OPERATION ESTIMATES - 2011

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	1.2	0.1	2	0.1	0.0	0.0	3996.8	15.3	0.8
FEB	20	1.1	1.5	0.1	2	0.1	0.0	0.0	3997.6	16.2	0.9
MAR	26	1.6	2.5	0.2	2	0.1	0.0	0.0	3998.7	17.5	1.3
APR	24	1.4	4.1	0.4	2	0.1	0.0	0.0	3999.4	18.4	0.9
MAY	18	1.1	4.9	0.5	2	0.1	0.0	0.0	3999.8	18.9	0.5
JUN	12	0.7	6.0	0.6	89	5.3	0.0	0.0	3995.4	13.7	-5.2
JUL	8	0.5	6.9	0.4	226	13.9	0.0	2.5	3979.0	2.4	-11.3
AUG	11	0.7	6.3	0.2	213	13.1	0.0	12.6	3979.0	2.4	0.0
SEP	13	0.8	4.6	0.1	40	2.4	0.0	1.7	3979.0	2.4	0.0
OCT	15	0.9	3.4	0.1	2	0.1	0.0	0.0	3980.7	3.1	0.7
NOV	18	1.1	1.8	0.1	2	0.1	0.0	0.0	3982.6	4.0	0.9
DEC	16	1.0	1.1	0.0	2	0.1	0.0	0.0	3984.2	4.9	0.9
TOTAL		11.9	44.3	2.8		35.5	0.0	16.8			-9.6
MOST PROBABLE INFLOW CONDITIONS											
JAN	21	1.3	1.1	0.1	2	0.1	0.0	0.0	3997.1	15.6	1.1
FEB	27	1.5	1.3	0.1	2	0.1	0.0	0.0	3998.2	16.9	1.3
MAR	36	2.2	2.3	0.2	2	0.1	0.0	0.0	3999.7	18.8	1.9
APR	32	1.9	3.8	0.4	2	0.1	0.0	0.0	4000.8	20.2	1.4
MAY	24	1.5	4.5	0.5	2	0.1	0.0	0.0	4001.5	21.1	0.9
JUN	13	0.8	5.7	0.6	71	4.2	0.0	0.0	3998.4	17.1	-4.0
JUL	11	0.7	6.5	0.5	210	12.9	0.0	0.0	3983.3	4.4	-12.7
AUG	16	1.0	5.8	0.2	164	10.1	0.0	7.3	3979.0	2.4	-2.0
SEP	17	1.0	4.2	0.1	29	1.7	0.0	0.8	3979.0	2.4	0.0
OCT	21	1.3	3.1	0.1	2	0.1	0.0	0.0	3981.5	3.5	1.1
NOV	25	1.5	1.7	0.1	2	0.1	0.0	0.0	3984.1	4.8	1.3
DEC	21	1.3	1.0	0.0	2	0.1	0.0	0.0	3986.1	6.0	1.2
TOTAL		16.0	41.0	2.9		29.7	0.0	8.1			-8.5
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	28	1.7	1.0	0.1	2	0.1	0.0	0.0	3997.4	16.0	1.5
FEB	36	2.0	1.2	0.1	2	0.1	0.0	0.0	3999.0	17.8	1.8
MAR	47	2.9	2.1	0.2	2	0.1	0.0	0.0	4001.0	20.4	2.6
APR	40	2.4	3.4	0.4	2	0.1	0.0	0.0	4002.4	22.3	1.9
MAY	31	1.9	4.1	0.5	2	0.1	0.0	0.0	4003.3	23.6	1.3
JUN	18	1.1	5.3	0.6	47	2.8	0.0	0.0	4001.6	21.3	-2.3
JUL	13	0.8	5.9	0.6	135	8.3	0.0	0.0	3994.9	13.2	-8.1
AUG	21	1.3	5.4	0.4	104	6.4	0.0	0.0	3988.7	7.7	-5.5
SEP	22	1.3	3.9	0.2	18	1.1	0.0	0.0	3988.7	7.7	0.0
OCT	28	1.7	2.8	0.2	2	0.1	0.0	0.0	3990.5	9.1	1.4
NOV	34	2.0	1.5	0.1	2	0.1	0.0	0.0	3992.5	10.9	1.8
DEC	28	1.7	0.9	0.1	2	0.1	0.0	0.0	3994.1	12.4	1.5
TOTAL		20.8	37.5	3.5		19.4	0.0	0.0			-2.1

MERRITT RESERVOIR OPERATION ESTIMATES - 2011

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 CFS	RELEASE REQUIREMENT TOTAL 1000 AF	RESERVOIR SPILL 1000 AF	REQUIREMENT SHORTAGE 1000 AF	END OF MONTH ELEV FT	END OF MONTH CONT 1000 AF	RESERVOIR CHANGE 1000 AF
REASONABLE MINIMUM INFLOW CONDITIONS													
JAN	223	13.7	1.3	0.3	0.0	1.0	16	1.0	12.1	0.0	2944.0	61.1	0.3
FEB	243	13.5	1.6	0.4	0.0	1.0	18	1.0	12.1	0.0	2944.0	61.1	0.0
MAR	247	15.2	2.2	0.5	0.0	1.0	16	1.0	10.9	0.0	2945.0	63.9	2.8
APR	255	15.2	3.5	0.8	0.0	1.0	17	1.0	10.6	0.0	2946.0	66.7	2.8
MAY	247	15.2	4.8	1.2	3.4	1.0	72	4.4	9.6	0.0	2946.0	66.7	0.0
JUN	235	14.0	6.0	1.5	7.6	1.0	145	8.6	3.9	0.0	2946.0	66.7	0.0
JUL	236	14.5	6.8	1.3	33.4	3.0	592	36.4	0.0	0.0	2936.1	43.5	-23.2
AUG	242	14.9	6.0	0.8	31.0	1.0	520	32.0	0.0	0.0	2924.5	25.6	-17.9
SEP	239	14.2	4.8	0.5	8.5	1.0	160	9.5	0.0	0.0	2927.7	29.8	4.2
OCT	242	14.9	4.0	0.5	0.0	3.0	49	3.0	0.0	0.0	2934.8	41.2	11.4
NOV	235	14.0	2.3	0.4	0.0	3.0	50	3.0	0.0	0.0	2940.2	51.8	10.6
DEC	220	13.5	1.5	0.3	0.0	1.0	16	1.0	2.9	0.0	2944.0	61.1	9.3
TOTAL		172.8	44.8	8.5	83.9	18.0		101.9	62.1	0.0			0.3
MOST PROBABLE INFLOW CONDITIONS													
JAN	236	14.5	1.1	0.2	0.0	1.0	16	1.0	13.0	0.0	2944.0	61.1	0.3
FEB	257	14.3	1.3	0.3	0.0	1.0	18	1.0	13.0	0.0	2944.0	61.1	0.0
MAR	267	16.4	1.9	0.4	0.0	1.0	16	1.0	12.2	0.0	2945.0	63.9	2.8
APR	272	16.2	3.2	0.8	0.0	1.0	17	1.0	11.6	0.0	2946.0	66.7	2.8
MAY	263	16.2	4.3	1.0	2.9	1.0	63	3.9	11.3	0.0	2946.0	66.7	0.0
JUN	252	15.0	5.4	1.3	6.5	1.0	126	7.5	6.2	0.0	2946.0	66.7	0.0
JUL	250	15.4	6.3	1.3	28.5	3.0	512	31.5	0.0	0.0	2939.0	49.3	-17.4
AUG	257	15.8	5.4	0.8	26.6	1.0	449	27.6	0.0	0.0	2932.3	36.7	-12.6
SEP	254	15.1	4.3	0.6	7.3	1.0	139	8.3	0.0	0.0	2935.8	42.9	6.2
OCT	257	15.8	3.6	0.6	0.0	3.0	49	3.0	0.0	0.0	2941.6	55.1	12.2
NOV	250	14.9	2.0	0.4	0.0	1.0	17	1.0	7.5	0.0	2944.0	61.1	6.0
DEC	233	14.3	1.4	0.3	0.0	1.0	16	1.0	13.0	0.0	2944.0	61.1	0.0
TOTAL		183.9	40.2	8.0	71.8	16.0		87.8	87.8	0.0			0.3
REASONABLE MAXIMUM INFLOW CONDITIONS													
JAN	254	15.6	1.0	0.2	0.0	1.0	16	1.0	14.1	0.0	2944.0	61.1	0.3
FEB	277	15.4	1.2	0.3	0.0	1.0	18	1.0	14.1	0.0	2944.0	61.1	0.0
MAR	285	17.5	1.7	0.4	0.0	1.0	16	1.0	13.3	0.0	2945.0	63.9	2.8
APR	291	17.3	2.8	0.7	0.0	1.0	17	1.0	12.8	0.0	2946.0	66.7	2.8
MAY	281	17.3	3.8	0.9	2.4	1.0	55	3.4	13.0	0.0	2946.0	66.7	0.0
JUN	269	16.0	4.9	1.2	5.3	1.0	106	6.3	8.5	0.0	2946.0	66.7	0.0
JUL	268	16.5	5.5	1.2	23.3	3.0	428	26.3	0.0	0.0	2941.9	55.7	-11.0
AUG	275	16.9	4.9	0.9	21.8	1.0	371	22.8	0.0	0.0	2938.8	48.9	-6.8
SEP	271	16.1	3.8	0.7	5.9	1.0	116	6.9	0.0	0.0	2942.6	57.4	8.5
OCT	275	16.9	3.1	0.7	0.0	1.0	16	1.0	11.5	0.0	2944.0	61.1	3.7
NOV	267	15.9	1.8	0.4	0.0	1.0	17	1.0	14.5	0.0	2944.0	61.1	0.0
DEC	252	15.5	1.2	0.3	0.0	1.0	16	1.0	14.2	0.0	2944.0	61.1	0.0
TOTAL		196.9	35.7	7.9	58.7	14.0		72.7	116.0	0.0			0.3

CALAMUS RESERVOIR OPERATION ESTIMATES - 2011

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 CFS	RELEASE REQUIREMENT TOTAL 1000 AF	RESERVOIR SPILL 1000 AF	REQUIREMENT SHORTAGE 1000 AF	END OF MONTH ELEV FT	END OF MONTH CONT 1000 AF	RESERVOIR CHANGE 1000 AF
REASONABLE MINIMUM INFLOW CONDITIONS													
JAN	296	18.2	1.3	0.5	0.5	3.1	59	3.6	14.1	0.0	2240.2	109.0	0.0
FEB	313	17.4	1.6	0.6	0.5	2.8	59	3.3	13.5	0.0	2240.2	109.0	0.0
MAR	350	21.5	2.9	1.1	0.5	3.1	59	3.6	8.4	0.0	2242.0	117.4	8.4
APR	361	21.5	4.6	1.9	0.5	3.0	59	3.5	6.1	0.0	2244.0	127.4	10.0
MAY	402	24.7	4.8	2.0	2.7	3.1	94	5.8	16.9	0.0	2244.0	127.4	0.0
JUN	366	21.8	5.8	2.5	5.6	3.0	145	8.6	10.7	0.0	2244.0	127.4	0.0
JUL	343	21.1	6.6	2.6	33.0	21.1	880	54.1	0.0	0.0	2236.3	91.8	-35.6
AUG	322	19.8	6.6	2.0	30.0	19.8	810	49.8	0.0	0.0	2227.5	59.8	-32.0
SEP	306	18.2	5.1	1.3	8.3	18.2	445	26.5	0.0	0.0	2224.2	50.2	-9.6
OCT	303	18.6	3.9	1.0	0.5	3.1	59	3.6	0.0	0.0	2228.8	64.2	14.0
NOV	329	19.6	2.1	0.6	0.5	3.0	59	3.5	0.0	0.0	2233.2	79.7	15.5
DEC	319	19.6	1.2	0.4	0.5	3.1	59	3.6	0.0	0.0	2237.1	95.3	15.6
TOTAL		242.0	46.5	16.5	83.1	86.4		169.5	69.7	0.0			-13.7
MOST PROBABLE INFLOW CONDITIONS													
JAN	330	20.3	1.2	0.5	0.5	3.1	59	3.6	16.2	0.0	2240.2	109.0	0.0
FEB	351	19.5	1.4	0.5	0.5	2.8	59	3.3	15.7	0.0	2240.2	109.0	0.0
MAR	392	24.1	2.5	1.0	0.5	3.1	59	3.6	11.1	0.0	2242.0	117.4	8.4
APR	405	24.1	4.1	1.7	0.5	3.0	59	3.5	8.9	0.0	2244.0	127.4	10.0
MAY	449	27.6	4.2	1.8	2.3	3.1	88	5.4	20.4	0.0	2244.0	127.4	0.0
JUN	410	24.4	5.2	2.2	4.7	3.0	129	7.7	14.5	0.0	2244.0	127.4	0.0
JUL	384	23.6	5.9	2.3	25.0	23.6	790	48.6	0.0	0.0	2238.2	100.1	-27.3
AUG	361	22.2	5.9	2.0	22.6	22.2	729	44.8	0.0	0.0	2232.1	75.5	-24.6
SEP	341	20.3	4.6	1.4	5.5	20.3	434	25.8	0.0	0.0	2230.1	68.6	-6.9
OCT	340	20.9	3.3	1.0	0.5	3.1	59	3.6	0.0	0.0	2234.6	84.9	16.3
NOV	370	22.0	1.8	0.6	0.5	3.0	59	3.5	0.0	0.0	2238.8	102.8	17.9
DEC	358	22.0	1.0	0.4	0.5	3.1	59	3.6	12.8	0.0	2240.0	108.0	5.2
TOTAL		271.0	41.1	15.4	63.6	93.4		157.0	99.6	0.0			-1.0
REASONABLE MAXIMUM INFLOW CONDITIONS													
JAN	381	23.4	1.0	0.4	0.5	3.1	59	3.6	19.4	0.0	2240.2	109.0	0.0
FEB	405	22.5	1.3	0.5	0.5	2.8	59	3.3	18.7	0.0	2240.2	109.0	0.0
MAR	452	27.8	2.3	0.9	0.5	3.1	59	3.6	14.9	0.0	2242.0	117.4	8.4
APR	467	27.8	3.6	1.5	0.5	3.0	59	3.5	12.8	0.0	2244.0	127.4	10.0
MAY	514	31.6	3.8	1.6	1.9	3.1	81	5.0	25.0	0.0	2244.0	127.4	0.0
JUN	472	28.1	4.6	2.0	3.8	3.0	114	6.8	19.3	0.0	2244.0	127.4	0.0
JUL	441	27.1	5.3	2.2	16.7	27.1	712	43.8	0.0	0.0	2240.1	108.5	-18.9
AUG	416	25.6	5.3	1.9	14.3	25.6	649	39.9	0.0	0.0	2236.4	92.3	-16.2
SEP	393	23.4	4.1	1.4	4.6	23.4	471	28.0	0.0	0.0	2234.9	86.3	-6.0
OCT	390	24.0	2.9	1.0	0.5	3.1	59	3.6	0.0	0.0	2239.5	105.7	19.4
NOV	425	25.3	1.6	0.6	0.5	3.0	59	3.5	18.9	0.0	2240.0	108.0	2.3
DEC	411	25.3	0.9	0.3	0.5	3.1	59	3.6	21.4	0.0	2240.0	108.0	0.0
TOTAL		311.9	36.7	14.3	44.8	103.4		148.2	150.4	0.0			-1.0

DAVIS CREEK RESERVOIR OPERATION ESTIMATES - 2011

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	0.0	1.3	0.1	5	0.3	0.0	0.0	2047.9	9.0	-0.4
FEB	0	0.0	1.6	0.1	5	0.3	0.0	0.0	2047.0	8.6	-0.4
MAR	0	0.0	2.9	0.1	10	0.6	0.0	0.0	2045.5	7.9	-0.7
APR	168	10.0	4.6	0.2	25	1.5	0.0	0.0	2059.9	16.2	8.3
MAY	239	14.7	4.9	0.4	78	4.8	0.0	0.0	2070.9	25.7	9.5
JUN	240	14.3	5.9	0.5	139	8.3	0.0	0.0	2076.0	31.2	5.5
JUL	169	10.4	6.3	0.5	289	17.8	0.0	0.0	2068.4	23.3	-7.9
AUG	156	9.6	4.9	0.3	270	16.6	0.0	0.0	2059.6	16.0	-7.3
SEP	37	2.2	4.3	0.2	131	7.8	0.0	0.0	2050.1	10.2	-5.8
OCT	0	0.0	3.8	0.2	5	0.3	0.0	0.0	2049.2	9.7	-0.5
NOV	0	0.0	2.0	0.1	5	0.3	0.0	0.0	2048.5	9.3	-0.4
DEC	0	0.0	1.2	0.0	5	0.3	0.0	0.0	2047.9	9.0	-0.3
TOTAL		61.2	43.7	2.7		58.9	0.0	0.0			-0.4
MOST PROBABLE INFLOW CONDITIONS											
JAN	0	0.0	1.3	0.1	5	0.3	0.0	0.0	2047.9	9.0	-0.4
FEB	0	0.0	1.5	0.1	5	0.3	0.0	0.0	2047.0	8.6	-0.4
MAR	0	0.0	2.7	0.1	10	0.6	0.0	0.0	2045.5	7.9	-0.7
APR	129	7.7	4.2	0.2	25	1.5	0.0	0.0	2056.5	13.9	6.0
MAY	239	14.7	4.5	0.3	67	4.1	0.0	0.0	2069.4	24.2	10.3
JUN	240	14.3	5.5	0.5	114	6.8	0.0	0.0	2076.0	31.2	7.0
JUL	102	6.3	5.9	0.5	223	13.7	0.0	0.0	2068.4	23.3	-7.9
AUG	94	5.8	4.6	0.3	208	12.8	0.0	0.0	2059.6	16.0	-7.3
SEP	7	0.4	4.0	0.2	101	6.0	0.0	0.0	2050.1	10.2	-5.8
OCT	0	0.0	3.5	0.2	5	0.3	0.0	0.0	2049.2	9.7	-0.5
NOV	0	0.0	1.9	0.1	5	0.3	0.0	0.0	2048.5	9.3	-0.4
DEC	0	0.0	1.2	0.0	5	0.3	0.0	0.0	2047.9	9.0	-0.3
TOTAL		49.2	40.8	2.6		47.0	0.0	0.0			-0.4
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	0	0.0	1.1	0.0	5	0.3	0.0	0.0	2048.1	9.1	-0.3
FEB	0	0.0	1.4	0.1	5	0.3	0.0	0.0	2047.3	8.7	-0.4
MAR	0	0.0	2.4	0.1	10	0.6	0.0	0.0	2045.7	8.0	-0.7
APR	96	5.7	4.0	0.2	25	1.5	0.0	0.0	2053.4	12.0	4.0
MAY	239	14.7	4.3	0.3	59	3.6	0.0	0.0	2067.8	22.8	10.8
JUN	240	14.3	5.3	0.5	91	5.4	0.0	0.0	2076.0	31.2	8.4
JUL	36	2.2	5.7	0.5	164	10.1	0.0	0.0	2067.8	22.8	-8.4
AUG	20	1.2	4.3	0.3	153	9.4	0.0	0.0	2057.1	14.3	-8.5
SEP	7	0.4	3.8	0.2	74	4.4	0.0	0.0	2049.9	10.1	-4.2
OCT	0	0.0	3.3	0.1	5	0.3	0.0	0.0	2049.2	9.7	-0.4
NOV	0	0.0	1.7	0.1	5	0.3	0.0	0.0	2048.5	9.3	-0.4
DEC	0	0.0	1.0	0.0	5	0.3	0.0	0.0	2047.9	9.0	-0.3
TOTAL		38.5	38.3	2.4		36.5	0.0	0.0			-0.4

BONNY RESERVOIR OPERATION ESTIMATES - 2011

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 CFS	RELEASE REQUIREMENT TOTAL 1000 AF	RESERVOIR SPILL 1000 AF	REQUIREMENT SHORTAGE 1000 AF	END OF MONTH ELEV FT	END OF MONTH CONT 1000 AF	RESERVOIR CHANGE 1000 AF
REASONABLE MINIMUM INFLOW CONDITIONS													
JAN	10	0.6	1.4	0.1	0.0	0.3	5	0.3	0.0	0.0	3652.4	7.1	0.2
FEB	11	0.6	1.5	0.1	0.0	0.3	5	0.3	0.0	0.0	3652.6	7.3	0.2
MAR	11	0.7	2.3	0.2	0.0	0.3	5	0.3	0.0	0.0	3652.8	7.5	0.2
APR	13	0.8	4.7	0.4	0.1	0.3	7	0.4	0.0	0.0	3652.8	7.5	0.0
MAY	15	0.9	6.0	0.5	0.4	0.3	11	0.7	0.0	0.0	3652.5	7.2	-0.3
JUN	13	0.8	7.6	0.6	0.5	0.3	13	0.8	0.0	0.0	3651.9	6.6	-0.6
JUL	7	0.4	8.4	0.6	0.8	0.3	18	1.1	0.0	0.0	3650.4	5.3	-1.3
AUG	5	0.3	7.4	0.5	0.6	0.3	15	0.9	0.0	0.0	3648.9	4.2	-1.1
SEP	5	0.3	6.2	0.4	0.5	0.3	13	0.8	0.0	0.0	3647.7	3.3	-0.9
OCT	5	0.3	3.9	0.2	0.5	0.3	13	0.8	0.0	0.0	3646.5	2.6	-0.7
NOV	8	0.5	2.6	0.1	0.0	0.3	5	0.3	0.0	0.0	3646.7	2.7	0.1
DEC	10	0.6	1.6	0.1	0.0	0.3	5	0.3	0.0	0.0	3647.0	2.9	0.2
TOTAL		6.8	53.6	3.8	3.4	3.6		7.0	0.0	0.0			-4.0
MOST PROBABLE INFLOW CONDITIONS													
JAN	18	1.1	1.1	0.1	0.0	0.3	5	0.3	0.0	0.0	3652.9	7.6	0.7
FEB	18	1.0	1.3	0.1	0.0	0.3	5	0.3	0.0	0.0	3653.5	8.2	0.6
MAR	20	1.2	2.0	0.2	0.0	0.3	5	0.3	0.0	0.0	3654.2	8.9	0.7
APR	24	1.4	4.3	0.4	0.1	0.3	7	0.4	0.0	0.0	3654.8	9.5	0.6
MAY	24	1.5	5.4	0.5	0.3	0.3	10	0.6	0.0	0.0	3655.1	9.9	0.4
JUN	24	1.4	6.8	0.6	0.3	0.3	10	0.6	0.0	0.0	3655.3	10.1	0.2
JUL	11	0.7	7.6	0.7	0.5	0.3	13	0.8	0.0	0.0	3654.6	9.3	-0.8
AUG	8	0.5	6.7	0.6	0.4	0.3	11	0.7	0.0	0.0	3653.8	8.5	-0.8
SEP	5	0.3	5.6	0.5	0.3	0.3	10	0.6	0.0	0.0	3653.0	7.7	-0.8
OCT	10	0.6	3.5	0.3	0.3	0.3	10	0.6	0.0	0.0	3652.7	7.4	-0.3
NOV	15	0.9	2.3	0.2	0.0	0.3	5	0.3	0.0	0.0	3653.1	7.8	0.4
DEC	16	1.0	1.4	0.1	0.0	0.3	5	0.3	0.0	0.0	3653.7	8.4	0.6
TOTAL		11.6	48.0	4.3	2.2	3.6		5.8	0.0	0.0			1.5
REASONABLE MAXIMUM INFLOW CONDITIONS													
JAN	28	1.7	1.0	0.1	0.0	0.3	5	0.3	0.0	0.0	3653.5	8.2	1.3
FEB	31	1.7	1.1	0.1	0.0	0.3	5	0.3	0.0	0.0	3654.8	9.5	1.3
MAR	31	1.9	1.7	0.2	0.0	0.3	5	0.3	0.0	0.0	3656.0	10.9	1.4
APR	37	2.2	3.7	0.4	0.0	0.3	5	0.3	0.0	0.0	3657.3	12.4	1.5
MAY	41	2.5	4.9	0.5	0.1	0.3	7	0.4	0.0	0.0	3658.5	14.0	1.6
JUN	37	2.2	6.1	0.7	0.1	0.3	7	0.4	0.0	0.0	3659.3	15.1	1.1
JUL	20	1.2	6.7	0.7	0.1	0.3	7	0.4	0.0	0.0	3659.4	15.2	0.1
AUG	11	0.7	6.0	0.6	0.1	0.3	7	0.4	0.0	0.0	3659.2	14.9	-0.3
SEP	8	0.5	5.0	0.5	0.1	0.3	7	0.4	0.0	0.0	3658.9	14.5	-0.4
OCT	15	0.9	3.1	0.3	0.0	0.3	5	0.3	0.0	0.0	3659.1	14.8	0.3
NOV	24	1.4	2.0	0.2	0.0	0.3	5	0.3	0.0	0.0	3659.8	15.7	0.9
DEC	24	1.5	1.2	0.1	0.0	0.3	5	0.3	0.0	0.0	3660.6	16.8	1.1
TOTAL		18.4	42.5	4.4	0.5	3.6		4.1	0.0	0.0			9.9

ENDERS RESERVOIR OPERATION ESTIMATES - 2011

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIREMENT M EAN 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	7	0.4	1.0	0.1	3	0.2	0.0	0.0	3092.5	16.8	0.1
FEB	7	0.4	1.1	0.1	4	0.2	0.0	0.0	3092.6	16.9	0.1
MAR	7	0.4	1.9	0.2	3	0.2	0.0	0.0	3092.6	16.9	0.0
APR	7	0.4	4.1	0.3	3	0.2	0.0	0.0	3092.5	16.8	-0.1
MAY	7	0.4	5.2	0.4	3	0.2	0.0	0.0	3092.3	16.6	-0.2
JUN	8	0.5	6.6	0.4	176	10.5	0.0	2.7	3082.3	8.9	-7.7
JUL	8	0.5	7.2	0.4	533	32.8	0.0	32.7	3082.3	8.9	0.0
AUG	7	0.4	6.1	0.3	506	31.1	0.0	31.0	3082.3	8.9	0.0
SEP	7	0.4	4.5	0.2	76	4.5	0.0	4.3	3082.3	8.9	0.0
OCT	7	0.4	2.9	0.2	3	0.2	0.0	0.0	3082.3	8.9	0.0
NOV	7	0.4	2.1	0.1	3	0.2	0.0	0.0	3082.5	9.0	0.1
DEC	7	0.4	1.2	0.1	3	0.2	0.0	0.0	3082.6	9.1	0.1
TOTAL		5.0	43.9	2.8		80.5	0.0	70.7			-7.6
MOST PROBABLE INFLOW CONDITIONS											
JAN	16	1.0	0.9	0.1	3	0.2	0.0	0.0	3093.2	17.4	0.7
FEB	16	0.9	1.0	0.1	4	0.2	0.0	0.0	3093.8	18.0	0.6
MAR	15	0.9	1.7	0.1	3	0.2	0.0	0.0	3094.4	18.6	0.6
APR	15	0.9	3.9	0.3	3	0.2	0.0	0.0	3094.7	19.0	0.4
MAY	16	1.0	4.9	0.4	3	0.2	0.0	0.0	3095.1	19.4	0.4
JUN	15	0.9	6.0	0.5	118	7.0	0.0	0.0	3087.9	12.8	-6.6
JUL	18	1.1	6.6	0.4	488	30.0	0.0	25.4	3082.3	8.9	-3.9
AUG	16	1.0	5.6	0.3	389	23.9	0.0	23.2	3082.3	8.9	0.0
SEP	15	0.9	4.2	0.2	37	2.2	0.0	1.5	3082.3	8.9	0.0
OCT	15	0.9	2.7	0.1	3	0.2	0.0	0.0	3083.2	9.5	0.6
NOV	15	0.9	2.0	0.1	3	0.2	0.0	0.0	3084.2	10.1	0.6
DEC	15	0.9	1.1	0.1	3	0.2	0.0	0.0	3085.0	10.7	0.6
TOTAL		11.3	40.6	2.7		64.7	0.0	50.1			-6.0
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	31	1.9	0.8	0.1	3	0.2	0.0	0.0	3094.1	18.3	1.6
FEB	31	1.7	0.9	0.1	4	0.2	0.0	0.0	3095.4	19.7	1.4
MAR	29	1.8	1.6	0.1	3	0.2	0.0	0.0	3096.8	21.2	1.5
APR	30	1.8	3.5	0.3	3	0.2	0.0	0.0	3097.9	22.5	1.3
MAY	31	1.9	4.4	0.4	3	0.2	0.0	0.0	3099.0	23.8	1.3
JUN	30	1.8	5.5	0.5	40	2.4	0.0	0.0	3098.1	22.7	-1.1
JUL	36	2.2	6.0	0.5	298	18.3	0.0	2.8	3082.3	8.9	-13.8
AUG	31	1.9	5.0	0.3	229	14.1	0.0	12.5	3082.3	8.9	0.0
SEP	29	1.7	3.8	0.2	3	0.2	0.0	0.0	3084.3	10.2	1.3
OCT	29	1.8	2.4	0.1	3	0.2	0.0	0.0	3086.4	11.7	1.5
NOV	30	1.8	1.8	0.1	3	0.2	0.0	0.0	3088.4	13.2	1.5
DEC	29	1.8	1.0	0.1	3	0.2	0.0	0.0	3090.2	14.7	1.5
TOTAL		22.1	36.7	2.8		36.6	0.0	15.3			-2.0

SWANSON LAKE OPERATION ESTIMATES- 2011

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 CFS	RELEASE REQUIREMENT TOTAL 1000 AF	RESERVOIR SPILL 1000 AF	REQUIREMENT SHORTAGE 1000 AF	END OF MONTH ELEV FT	END OF MONTH CONT 1000 AF	RESERVOIR CHANGE 1000 AF
REASONABLE MINIMUM INFLOW CONDITIONS													
JAN	20	1.2	1.0	0.3	0.0	0.1	2	0.1	0.0	0.0	2740.4	62.9	0.8
FEB	31	1.7	1.1	0.3	0.0	0.1	2	0.1	0.0	0.0	2740.7	64.2	1.3
MAR	34	2.1	2.0	0.6	0.0	0.1	2	0.1	0.0	0.0	2741.1	65.6	1.4
APR	35	2.1	4.4	1.3	0.0	0.1	2	0.1	0.0	0.0	2741.3	66.3	0.7
MAY	34	2.1	5.2	1.6	0.1	0.1	3	0.2	0.0	0.0	2741.4	66.6	0.3
JUN	27	1.6	6.7	2.0	4.4	0.4	81	4.8	0.0	0.0	2739.9	61.4	-5.2
JUL	15	0.9	6.7	1.8	16.3	5.6	356	21.9	0.0	0.0	2732.7	38.6	-22.8
AUG	8	0.5	6.7	1.3	13.6	5.9	317	19.5	0.0	2.6	2725.0	20.9	-17.7
SEP	3	0.2	5.2	0.8	2.0	1.9	66	3.9	0.0	3.8	2724.6	20.2	-0.7
OCT	7	0.4	3.2	0.5	0.0	0.1	2	0.1	0.0	0.0	2724.5	20.0	-0.2
NOV	15	0.9	2.2	0.4	0.0	0.1	2	0.1	0.0	0.0	2724.8	20.4	0.4
DEC	16	1.0	1.2	0.2	0.0	0.1	2	0.1	0.0	0.0	2725.1	21.1	0.7
TOTAL		14.7	45.6	11.1	36.4	14.6		51.0	0.0	6.4			-41.0
MOST PROBABLE INFLOW CONDITIONS													
JAN	46	2.8	0.9	0.3	0.0	0.1	2	0.1	0.0	0.0	2740.8	64.5	2.4
FEB	70	3.9	1.0	0.3	0.0	0.1	2	0.1	0.0	0.0	2741.8	68.0	3.5
MAR	80	4.9	1.7	0.5	0.0	0.1	2	0.1	0.0	0.0	2742.9	72.3	4.3
APR	87	5.2	4.1	1.3	0.0	0.1	2	0.1	0.0	0.0	2743.9	76.1	3.8
MAY	78	4.8	4.8	1.6	0.1	0.1	3	0.2	0.0	0.0	2744.6	79.1	3.0
JUN	62	3.7	6.2	2.1	3.8	0.1	66	3.9	0.0	0.0	2744.0	76.8	-2.3
JUL	34	2.1	7.0	2.2	14.2	2.7	275	16.9	0.0	0.0	2739.5	59.8	-17.0
AUG	18	1.1	6.2	1.7	11.7	3.3	244	15.0	0.0	0.0	2734.6	44.2	-15.6
SEP	8	0.5	4.8	1.2	1.7	0.1	30	1.8	0.0	0.0	2733.8	41.7	-2.5
OCT	13	0.8	2.8	0.7	0.0	0.1	2	0.1	0.0	0.0	2733.8	41.7	0.0
NOV	34	2.0	2.0	0.5	0.0	0.1	2	0.1	0.0	0.0	2734.3	43.1	1.4
DEC	37	2.3	1.1	0.3	0.0	0.1	2	0.1	0.0	0.0	2734.9	45.0	1.9
TOTAL		34.1	42.6	12.7	31.5	7.0		38.5	0.0	0.0			-17.1
REASONABLE MAXIMUM INFLOW CONDITIONS													
JAN	96	5.9	0.8	0.2	0.0	0.1	2	0.1	0.0	0.0	2741.7	67.7	5.6
FEB	148	8.2	0.9	0.3	0.0	0.1	2	0.1	0.0	0.0	2743.7	75.5	7.8
MAR	166	10.2	1.6	0.5	0.0	0.1	2	0.1	0.0	0.0	2746.1	85.1	9.6
APR	182	10.8	3.7	1.3	0.0	0.1	2	0.1	0.0	0.0	2748.2	94.5	9.4
MAY	164	10.1	4.3	1.6	0.1	0.1	3	0.2	0.0	0.0	2750.0	102.8	8.3
JUN	131	7.8	5.6	2.2	3.1	0.1	54	3.2	0.0	0.0	2750.5	105.2	2.4
JUL	72	4.4	6.4	2.5	11.6	0.1	190	11.7	0.0	0.0	2748.4	95.4	-9.8
AUG	39	2.4	5.6	2.0	9.6	0.1	158	9.7	0.0	0.0	2746.3	86.1	-9.3
SEP	18	1.1	4.3	1.5	1.4	0.1	25	1.5	0.0	0.0	2745.8	84.2	-1.9
OCT	28	1.7	2.6	0.9	0.0	0.1	2	0.1	0.0	0.0	2746.0	84.9	0.7
NOV	69	4.1	1.9	0.7	0.0	0.1	2	0.1	0.0	0.0	2746.8	88.2	3.3
DEC	78	4.8	1.0	0.4	0.0	0.1	2	0.1	0.0	0.0	2747.8	92.5	4.3
TOTAL		71.5	38.7	14.1	25.8	1.2		27.0	0.0	0.0			30.4

HUGH BUTLER LAKE OPERATION ESTIMATES - 2011

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	11	0.7	0.9	0.0	5	0.3	0.1	0.0	2554.0	6.3	0.3
FEB	14	0.8	1.0	0.0	5	0.3	0.5	0.0	2554.0	6.3	0.0
MAR	16	1.0	1.8	0.1	5	0.3	0.6	0.0	2554.0	6.3	0.0
APR	17	1.0	5.0	0.2	5	0.3	0.5	0.0	2554.0	6.3	0.0
MAY	18	1.1	5.9	0.3	5	0.3	0.5	0.0	2554.0	6.3	0.0
JUN	17	1.0	7.2	0.3	32	1.9	0.0	0.1	2552.0	5.2	-1.1
JUL	15	0.9	8.0	0.4	75	4.6	0.0	4.1	2552.0	5.2	0.0
AUG	15	0.9	7.1	0.3	63	3.9	0.0	3.3	2552.0	5.2	0.0
SEP	8	0.5	5.5	0.2	17	1.0	0.0	0.7	2552.0	5.2	0.0
OCT	10	0.6	3.5	0.2	5	0.3	0.0	0.0	2552.2	5.3	0.1
NOV	12	0.7	2.1	0.1	5	0.3	0.0	0.0	2552.7	5.6	0.3
DEC	11	0.7	1.1	0.1	5	0.3	0.0	0.0	2553.3	5.9	0.3
TOTAL		9.9	49.1	2.2		13.8	2.2	8.2			-0.1
MOST PROBABLE INFLOW CONDITIONS											
JAN	16	1.0	0.8	0.0	5	0.3	0.4	0.0	2554.0	6.3	0.3
FEB	22	1.2	0.9	0.0	5	0.3	0.9	0.0	2554.0	6.3	0.0
MAR	24	1.5	1.6	0.1	5	0.3	1.1	0.0	2554.0	6.3	0.0
APR	25	1.5	4.5	0.2	5	0.3	1.0	0.0	2554.0	6.3	0.0
MAY	26	1.6	5.4	0.3	5	0.3	1.0	0.0	2554.0	6.3	0.0
JUN	27	1.6	6.5	0.3	25	1.5	0.0	0.0	2553.6	6.1	-0.2
JUL	20	1.2	7.1	0.3	63	3.9	0.0	2.1	2552.0	5.2	-0.9
AUG	21	1.3	6.4	0.3	54	3.3	0.0	2.3	2552.0	5.2	0.0
SEP	13	0.8	5.0	0.2	15	0.9	0.0	0.3	2552.0	5.2	0.0
OCT	15	0.9	3.1	0.1	5	0.3	0.0	0.0	2552.9	5.7	0.5
NOV	17	1.0	1.9	0.1	5	0.3	0.0	0.0	2554.0	6.3	0.6
DEC	16	1.0	1.0	0.0	5	0.3	0.7	0.0	2554.0	6.3	0.0
TOTAL		14.6	44.2	1.9		12.0	5.1	4.7			0.3
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	23	1.4	0.7	0.0	5	0.3	0.8	0.0	2554.0	6.3	0.3
FEB	31	1.7	0.8	0.0	5	0.3	1.4	0.0	2554.0	6.3	0.0
MAR	36	2.2	1.5	0.1	5	0.3	1.8	0.0	2554.0	6.3	0.0
APR	35	2.1	4.0	0.2	5	0.3	1.6	0.0	2554.0	6.3	0.0
MAY	36	2.2	4.8	0.2	5	0.3	1.7	0.0	2554.0	6.3	0.0
JUN	37	2.2	5.9	0.3	20	1.2	0.7	0.0	2554.0	6.3	0.0
JUL	29	1.8	6.5	0.3	49	3.0	0.0	0.4	2552.0	5.2	-1.1
AUG	29	1.8	5.8	0.3	41	2.5	0.0	1.0	2552.0	5.2	0.0
SEP	20	1.2	4.5	0.2	10	0.6	0.0	0.0	2552.7	5.6	0.4
OCT	20	1.2	2.8	0.1	5	0.3	0.1	0.0	2554.0	6.3	0.7
NOV	24	1.4	1.8	0.1	5	0.3	1.0	0.0	2554.0	6.3	0.0
DEC	23	1.4	0.9	0.0	5	0.3	1.1	0.0	2554.0	6.3	0.0
TOTAL		20.6	40.0	1.8		9.7	10.2	1.4			0.3

HARRY STRUNK LAKE OPERATON ESTIMATES - 2011

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	34	2.1	0.9	0.1	2	0.1	2.1	0.0	2365.6	33.7	-0.2
FEB	43	2.4	1.0	0.1	2	0.1	2.2	0.0	2365.6	33.7	0.0
MAR	46	2.8	1.8	0.3	2	0.1	2.4	0.0	2365.6	33.7	0.0
APR	45	2.7	4.9	0.7	2	0.1	1.0	0.0	2366.1	34.6	0.9
MAY	49	3.0	5.7	0.9	2	0.1	2.0	0.0	2366.1	34.6	0.0
JUN	50	3.0	7.1	1.0	89	5.3	0.0	0.0	2364.2	31.3	-3.3
JUL	47	2.9	7.8	0.8	319	19.6	0.0	0.0	2350.3	13.8	-17.5
AUG	37	2.3	6.9	0.5	268	16.5	0.0	8.8	2343.0	7.9	-5.9
SEP	25	1.5	5.4	0.3	27	1.6	0.0	0.4	2343.0	7.9	0.0
OCT	31	1.9	3.5	0.2	2	0.1	0.0	0.0	2345.2	9.5	1.6
NOV	34	2.0	2.1	0.1	2	0.1	0.0	0.0	2347.5	11.3	1.8
DEC	33	2.0	1.1	0.1	2	0.1	0.0	0.0	2349.5	13.1	1.8
TOTAL		28.6	48.2	5.1		43.8	9.7	9.2			-20.8
MOST PROBABLE INFLOW CONDITIONS											
JAN	46	2.8	0.8	0.1	2	0.1	2.8	0.0	2365.6	33.7	-0.2
FEB	59	3.3	0.9	0.1	2	0.1	3.1	0.0	2365.6	33.7	0.0
MAR	62	3.8	1.6	0.2	2	0.1	3.5	0.0	2365.6	33.7	0.0
APR	61	3.6	4.3	0.7	2	0.1	1.9	0.0	2366.1	34.6	0.9
MAY	65	4.0	5.1	0.8	2	0.1	3.1	0.0	2366.1	34.6	0.0
JUN	67	4.0	6.6	1.0	55	3.3	0.0	0.0	2365.9	34.3	-0.3
JUL	63	3.9	7.3	0.9	265	16.3	0.0	0.0	2356.8	21.0	-13.3
AUG	50	3.1	6.4	0.5	223	13.7	0.0	0.0	2345.7	9.9	-11.1
SEP	34	2.0	4.8	0.3	12	0.7	0.0	0.0	2347.0	10.9	1.0
OCT	41	2.5	3.2	0.2	2	0.1	0.0	0.0	2349.5	13.1	2.2
NOV	45	2.7	1.9	0.2	2	0.1	0.0	0.0	2352.0	15.5	2.4
DEC	42	2.6	1.0	0.1	2	0.1	0.0	0.0	2354.2	17.9	2.4
TOTAL		38.3	43.9	5.1		34.8	14.4	0.0			-16.0
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	72	4.4	0.7	0.1	2	0.1	4.4	0.0	2365.6	33.7	-0.2
FEB	90	5.0	0.8	0.1	2	0.1	4.8	0.0	2365.6	33.7	0.0
MAR	96	5.9	1.3	0.2	2	0.1	5.6	0.0	2365.6	33.7	0.0
APR	96	5.7	4.0	0.6	2	0.1	4.1	0.0	2366.1	34.6	0.9
MAY	102	6.3	4.7	0.7	2	0.1	5.5	0.0	2366.1	34.6	0.0
JUN	104	6.2	5.9	0.9	20	1.2	4.1	0.0	2366.1	34.6	0.0
JUL	98	6.0	6.5	0.9	182	11.2	0.0	0.0	2362.4	28.5	-6.1
AUG	76	4.7	5.8	0.7	150	9.2	0.0	0.0	2358.7	23.3	-5.2
SEP	50	3.0	4.4	0.5	2	0.1	0.0	0.0	2360.4	25.7	2.4
OCT	62	3.8	2.8	0.3	2	0.1	0.0	0.0	2362.8	29.1	3.4
NOV	69	4.1	1.6	0.2	2	0.1	0.0	0.0	2365.1	32.9	3.8
DEC	67	4.1	0.9	0.1	2	0.1	3.1	0.0	2365.6	33.7	0.8
TOTAL		59.2	39.4	5.3		22.5	31.6	0.0			-0.2

KEITH SEBELIUS LAKE OPERATION ESTIMATES - 2011

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	0.1	1.1	0.1	2	0.1	0.0	0.0	2296.7	20.5	-0.1
FEB	4	0.2	1.3	0.2	2	0.1	0.0	0.0	2296.7	20.4	-0.1
MAR	7	0.4	2.1	0.3	2	0.1	0.0	0.0	2296.7	20.4	0.0
APR	7	0.4	5.5	0.7	2	0.1	0.0	0.0	2296.4	20.0	-0.4
MAY	10	0.6	6.1	0.8	7	0.4	0.0	0.0	2296.0	19.4	-0.6
JUN	13	0.8	7.7	0.9	57	3.4	0.0	0.0	2293.5	15.9	-3.5
JUL	10	0.6	8.6	0.7	146	9.0	0.0	3.3	2288.5	10.1	-5.8
AUG	8	0.5	7.7	0.4	138	8.5	0.0	8.4	2288.5	10.1	0.0
SEP	3	0.2	6.1	0.3	27	1.6	0.0	1.5	2288.3	9.9	-0.2
OCT	2	0.1	4.2	0.2	2	0.1	0.0	0.0	2288.0	9.7	-0.2
NOV	2	0.1	2.3	0.1	2	0.1	0.0	0.0	2287.9	9.6	-0.1
DEC	2	0.1	1.2	0.1	2	0.1	0.0	0.0	2287.8	9.5	-0.1
TOTAL		4.1	53.9	4.8		23.6	0.0	13.2			-11.1
MOST PROBABLE INFLOW CONDITIONS											
JAN	5	0.3	0.9	0.1	2	0.1	0.0	0.0	2296.9	20.7	0.1
FEB	7	0.4	1.1	0.1	2	0.1	0.0	0.0	2297.0	20.9	0.2
MAR	13	0.8	1.8	0.2	2	0.1	0.0	0.0	2297.3	21.4	0.5
APR	13	0.8	4.8	0.6	2	0.1	0.0	0.0	2297.4	21.5	0.1
MAY	20	1.2	5.5	0.7	3	0.2	0.0	0.0	2297.6	21.8	0.3
JUN	27	1.6	6.7	0.9	47	2.8	0.0	0.0	2296.2	19.7	-2.1
JUL	20	1.2	7.7	0.8	138	8.5	0.0	0.0	2290.0	11.6	-8.1
AUG	16	1.0	6.7	0.5	112	6.9	0.0	6.0	2289.6	11.2	-0.4
SEP	8	0.5	5.4	0.3	22	1.3	0.0	1.1	2289.6	11.2	0.0
OCT	3	0.2	3.6	0.2	2	0.1	0.0	0.0	2289.5	11.1	-0.1
NOV	5	0.3	2.1	0.1	2	0.1	0.0	0.0	2289.6	11.2	0.1
DEC	5	0.3	1.1	0.1	2	0.1	0.0	0.0	2289.7	11.3	0.1
TOTAL		8.6	47.4	4.6		20.4	0.0	7.1			-9.3
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	10	0.6	0.8	0.1	2	0.1	0.0	0.0	2297.0	21.0	0
FEB	14	0.8	0.9	0.1	2	0.1	0.0	0.0	2297.4	21.6	1
MAR	24	1.5	1.5	0.2	2	0.1	0.0	0.0	2298.2	22.8	1
APR	27	1.6	4.2	0.6	2	0.1	0.0	0.0	2298.7	23.7	1
MAY	42	2.6	4.8	0.7	3	0.2	0.0	0.0	2299.7	25.4	2
JUN	54	3.2	6.2	0.9	27	1.6	0.0	0.0	2300.1	26.1	1
JUL	37	2.3	6.8	1.0	72	4.4	0.0	0.0	2298.3	23.0	-3
AUG	34	2.1	6.2	0.8	68	4.2	0.0	0.0	2296.5	20.1	-3
SEP	17	1.0	4.8	0.6	15	0.9	0.0	0.0	2296.2	19.6	-1
OCT	8	0.5	3.2	0.4	2	0.1	0.0	0.0	2296.2	19.6	0
NOV	10	0.6	1.8	0.2	2	0.1	0.0	0.0	2296.3	19.9	0
DEC	10	0.6	0.9	0.1	2	0.1	0.0	0.0	2296.6	20.3	0
TOTAL		17.4	42.1	5.7		12.0	0.0	0.0			-0.3

HARLAN COUNTY LAKE OPERATION ESTIMATES - 2011

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIREMENT M EAN 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	1.0	1.1	0	0.0	5.7	0.0	1945.7	314.1	-4.3
FEB	63	3.5	1.1	1.2	0	0.0	2.3	0.0	1945.7	314.1	0.0
MAR	85	5.2	1.9	2.1	0	0.0	3.1	0.0	1945.7	314.1	0.0
APR	74	4.4	4.5	5.0	0	0.0	0.0	0.0	1945.7	313.5	-0.6
MAY	93	5.7	5.5	6.1	0	0.0	0.0	0.0	1945.6	313.1	-0.4
JUN	77	4.6	6.6	7.1	341	20.3	0.0	0.0	1943.9	290.3	-22.8
JUL	78	4.8	7.4	7.5	893	54.9	0.0	0.0	1939.1	232.7	-57.6
AUG	63	3.9	6.5	5.8	737	45.3	0.0	0.0	1934.7	185.5	-47.2
SEP	30	1.8	5.2	4.3	40	2.4	0.0	0.0	1934.2	180.6	-4.9
OCT	29	1.8	3.5	2.9	0	0.0	0.0	0.0	1934.1	179.5	-1.1
NOV	39	2.3	2.2	1.8	0	0.0	0.0	0.0	1934.2	180.0	0.5
DEC	37	2.3	1.4	1.2	0	0.0	0.0	0.0	1934.3	181.1	1.1
TOTAL		42.8	46.8	46.1		122.9	11.1	0.0			-137.3
MOST PROBABLE INFLOW CONDITIONS											
JAN	125	7.7	0.8	0.9	0	0.0	11.1	0.0	1945.7	314.1	-4.3
FEB	196	10.9	0.9	1.0	0	0.0	9.9	0.0	1945.7	314.1	0.0
MAR	263	16.2	1.6	1.8	0	0.0	14.4	0.0	1945.7	314.1	0.0
APR	230	13.7	4.0	4.4	0	0.0	9.3	0.0	1945.7	314.1	0.0
MAY	288	17.7	4.9	5.4	0	0.0	12.3	0.0	1945.7	314.1	0.0
JUN	239	14.2	5.9	6.5	64	3.8	3.9	0.0	1945.7	314.1	0.0
JUL	242	14.9	6.7	7.2	680	41.8	0.0	0.0	1943.1	280.0	-34.1
AUG	195	12.0	5.8	6.0	446	27.4	0.0	0.0	1941.3	258.6	-21.4
SEP	96	5.7	4.7	4.7	34	2.0	0.0	0.0	1941.3	257.6	-1.0
OCT	91	5.6	3.1	3.1	0	0.0	0.0	0.0	1941.5	260.1	2.5
NOV	121	7.2	1.9	1.9	0	0.0	0.0	0.0	1941.9	265.4	5.3
DEC	119	7.3	1.1	1.1	10	0.6	0.0	0.0	1942.4	271.0	5.6
TOTAL		133.1	41.4	44.0		75.6	60.9	0.0			-47.4
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	293	18.0	0.7	0.8	0	0.0	21.5	0.0	1945.7	314.1	-4.3
FEB	459	25.5	0.7	0.8	0	0.0	24.7	0.0	1945.7	314.1	0.0
MAR	616	37.9	1.3	1.4	0	0.0	36.5	0.0	1945.7	314.1	0.0
APR	533	31.7	3.5	3.9	0	0.0	27.8	0.0	1945.7	314.1	0.0
MAY	673	41.4	4.2	4.6	0	0.0	36.8	0.0	1945.7	314.1	0.0
JUN	560	33.3	5.4	6.0	37	2.2	25.1	0.0	1945.7	314.1	0.0
JUL	566	34.8	5.9	6.5	156	9.6	18.7	0.0	1945.7	314.1	0.0
AUG	455	28.0	5.2	5.8	156	9.6	12.6	0.0	1945.7	314.1	0.0
SEP	225	13.4	4.1	4.5	20	1.2	7.7	0.0	1945.7	314.1	0.0
OCT	213	13.1	2.6	2.9	0	0.0	10.2	0.0	1945.7	314.1	0.0
NOV	282	16.8	1.6	1.8	0	0.0	15.0	0.0	1945.7	314.1	0.0
DEC	278	17.1	1.0	1.1	0	0.0	16.0	0.0	1945.7	314.1	0.0
TOTAL		311.0	36.2	40.1		22.6	252.6	0.0			-4.3

LOVEWELL RESERVOIR OPERATION ESTIMATES - 2011

MONTH	WHITE ROCK CREEK INFLOW 1000 AF	COURTLAND CANAL INFLOW 1000 AF	TOTAL INFLOW MEAN CFS	TOTAL INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIREMENT MEAN CFS	RELEASE REQUIREMENT 1000 AF	RES SPILL 1000 AF	REQ SHORT 1000 AF	END OF MONTH ELEV FT	END OF MONTH CONT 1000 AF	RESERVOIR CHANGE 1000 AF
REASONABLE MINIMUM INFLOW CONDITIONS													
JAN	0.4	0.0	7.0	0.4	0.8	0.2	0	0.0	0.0	0.0	1579.6	27.3	0.2
FEB	0.6	0.0	11.0	0.6	1.0	0.2	0	0.0	0.0	0.0	1579.7	27.7	0.4
MAR	1.4	2.1	57.0	3.5	1.8	0.4	0	0.0	0.0	0.0	1580.9	30.8	3.1
APR	1.4	2.3	62.0	3.7	3.7	0.9	0	0.0	0.0	0.0	1581.9	33.6	2.8
MAY	1.6	2.5	67.0	4.1	4.7	1.1	15	0.9	0.0	0.0	1582.6	35.7	2.1
JUN	1.8	9.7	193.0	11.5	6.1	1.5	168	10.0	0.0	0.0	1582.6	35.7	0.0
JUL	1.2	15.4	270.0	16.6	6.6	1.4	506	31.1	0.0	0.0	1576.3	19.8	-15.9
AUG	0.1	13.9	228.0	14.0	5.4	0.8	348	21.4	0.0	0.0	1571.7	11.6	-8.2
SEP	1.0	2.3	55.0	3.3	4.1	0.5	47	2.8	0.0	0.0	1571.7	11.6	0.0
OCT	0.6	1.9	41.0	2.5	2.8	0.4	0	0.0	0.0	0.0	1573.0	13.7	2.1
NOV	0.6	2.5	52.0	3.1	2.1	0.3	0	0.0	0.0	0.0	1574.6	16.5	2.8
DEC	0.4	2.6	49.0	3.0	1.0	0.2	0	0.0	0.0	0.0	1576.1	19.3	2.8
TOTAL	11.1	55.2		66.3	40.1	7.9		66.2	0.0	0.0			-7.8
MOST PROBABLE INFLOW CONDITIONS													
JAN	1.0	0.0	16.0	1.0	0.7	0.1	0	0.0	0.0	0.0	1579.8	28.0	0.9
FEB	1.4	0.0	25.0	1.4	0.9	0.2	0	0.0	0.0	0.0	1580.3	29.2	1.2
MAR	3.3	0.0	54.0	3.3	1.6	0.4	0	0.0	0.0	0.0	1581.4	32.1	2.9
APR	3.0	0.0	50.0	3.0	3.2	0.8	0	0.0	0.0	0.0	1582.1	34.3	2.2
MAY	3.7	0.0	60.0	3.7	4.1	1.0	13	0.8	0.5	0.0	1582.6	35.7	1.4
JUN	4.0	5.2	155.0	9.2	5.1	1.3	133	7.9	0.0	0.0	1582.6	35.7	0.0
JUL	2.7	13.8	268.0	16.5	5.9	1.3	405	24.9	0.0	0.0	1579.0	26.0	-9.7
AUG	0.3	5.2	89.0	5.5	4.7	0.8	278	17.1	0.0	0.0	1572.9	13.6	-12.4
SEP	2.0	0.9	49.0	2.9	3.5	0.5	37	2.2	0.0	0.0	1573.1	13.8	0.2
OCT	1.5	4.7	101.0	6.2	2.4	0.4	0	0.0	0.0	0.0	1576.2	19.6	5.8
NOV	1.3	4.1	91.0	5.4	1.8	0.3	0	0.0	0.0	0.0	1578.5	24.7	5.1
DEC	0.9	4.6	89.0	5.5	0.8	0.2	0	0.0	0.0	0.0	1580.6	30.0	5.3
TOTAL	25.1	38.5		63.6	34.7	7.3		52.9	0.5	0.0			2.9
REASONABLE MAXIMUM INFLOW CONDITIONS													
JAN	2.7	0.0	44.0	2.7	0.6	0.1	0	0.0	0.0	0.0	1580.5	29.7	2.6
FEB	4.1	0.0	74.0	4.1	0.7	0.2	0	0.0	0.0	0.0	1581.9	33.6	3.9
MAR	9.4	0.0	153.0	9.4	1.3	0.3	0	0.0	7.0	0.0	1582.6	35.7	2.1
APR	8.5	0.0	143.0	8.5	2.8	0.7	0	0.0	7.8	0.0	1582.6	35.7	0.0
MAY	10.7	0.0	174.0	10.7	3.5	0.9	8	0.5	9.3	0.0	1582.6	35.7	0.0
JUN	11.6	1.2	215.0	12.8	4.5	1.1	87	5.2	6.5	0.0	1582.6	35.7	0.0
JUL	7.8	1.2	146.0	9.0	5.1	1.2	265	16.3	0.0	0.0	1579.5	27.2	-8.5
AUG	0.8	1.2	33.0	2.0	4.1	0.8	179	11.0	0.0	0.0	1575.1	17.4	-9.8
SEP	6.2	0.6	114.0	6.8	3.0	0.5	24	1.4	0.0	0.0	1577.5	22.3	4.9
OCT	4.2	0.0	68.0	4.2	2.0	0.4	0	0.0	0.0	0.0	1579.1	26.1	3.8
NOV	3.6	0.0	61.0	3.6	1.5	0.3	0	0.0	0.0	0.0	1580.4	29.4	3.3
DEC	2.4	0.0	39.0	2.4	0.7	0.2	0	0.0	1.6	0.0	1580.6	30.0	0.6
TOTAL	72.0	4.2		76.2	29.8	6.7		34.4	32.2	0.0			2.9

TABLE 4

KIRWIN RESERVOIR OPERATION ESTIMATES - 2011

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	3	0.2	0.9	0.4	0	0.0	0.5	0.0	1729.3	98.2	-0.7
FEB	5	0.3	1.1	0.5	0	0.0	0.0	0.0	1729.2	98.0	-0.2
MAR	10	0.6	2.0	0.8	0	0.0	0.0	0.0	1729.2	97.8	-0.2
APR	12	0.7	4.4	1.8	0	0.0	0.0	0.0	1729.0	96.7	-1.1
MAY	18	1.1	5.4	2.2	8	0.5	0.0	0.0	1728.6	95.1	-1.6
JUN	15	0.9	6.6	2.7	87	5.2	0.0	0.0	1727.2	88.1	-7.0
JUL	13	0.8	7.5	2.8	194	11.9	0.0	0.0	1724.1	74.2	-13.9
AUG	11	0.7	6.6	2.2	179	11.0	0.0	0.0	1721.0	61.7	-12.5
SEP	5	0.3	5.1	1.6	8	0.5	0.0	0.0	1720.5	59.9	-1.8
OCT	3	0.2	3.5	1.1	0	0.0	0.0	0.0	1720.3	59.0	-0.9
NOV	3	0.2	2.1	0.6	0	0.0	0.0	0.0	1720.2	58.6	-0.4
DEC	3	0.2	1.1	0.3	0	0.0	0.0	0.0	1720.1	58.5	-0.1
TOTAL		6.2	46.3	17.0		29.1	0.5	0.0			-40.4
MOST PROBABLE INFLOW CONDITIONS											
JAN	18	1.1	0.8	0.3	0	0.0	1.5	0.0	1729.3	98.2	-0.7
FEB	29	1.6	1.1	0.5	0	0.0	1.1	0.0	1729.3	98.2	0.0
MAR	46	2.8	1.8	0.8	0	0.0	2.0	0.0	1729.3	98.2	0.0
APR	52	3.1	3.9	1.6	0	0.0	1.5	0.0	1729.3	98.2	0.0
MAY	81	5.0	4.8	2.0	7	0.4	2.6	0.0	1729.3	98.2	0.0
JUN	67	4.0	6.0	2.5	74	4.4	0.0	0.0	1728.7	95.3	-2.9
JUL	63	3.9	6.8	2.7	194	11.9	0.0	0.0	1726.4	84.6	-10.7
AUG	44	2.7	6.0	2.2	150	9.2	0.0	0.0	1724.5	75.9	-8.7
SEP	24	1.4	4.6	1.7	8	0.5	0.0	0.0	1724.3	75.1	-0.8
OCT	15	0.9	3.1	1.1	0	0.0	0.0	0.0	1724.3	74.9	-0.2
NOV	18	1.1	2.0	0.7	0	0.0	0.0	0.0	1724.4	75.3	0.4
DEC	16	1.0	1.0	0.4	0	0.0	0.0	0.0	1724.5	75.9	0.6
TOTAL		28.6	41.9	16.5		26.4	8.7	0.0			-23.0
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	65	4.0	0.7	0.3	0	0.0	4.4	0.0	1729.3	98.2	-0.7
FEB	104	5.8	0.9	0.4	0	0.0	5.4	0.0	1729.3	98.2	0.0
MAR	168	10.3	1.5	0.6	0	0.0	9.7	0.0	1729.3	98.2	0.0
APR	188	11.2	3.6	1.5	0	0.0	9.7	0.0	1729.3	98.2	0.0
MAY	294	18.1	4.4	1.9	5	0.3	15.9	0.0	1729.3	98.2	0.0
JUN	244	14.5	5.4	2.3	59	3.5	8.7	0.0	1729.3	98.2	0.0
JUL	231	14.2	6.2	2.6	168	10.3	1.3	0.0	1729.3	98.2	0.0
AUG	161	9.9	5.4	2.3	119	7.3	0.3	0.0	1729.3	98.2	0.0
SEP	84	5.0	4.1	1.7	7	0.4	2.9	0.0	1729.3	98.2	0.0
OCT	55	3.4	2.7	1.1	0	0.0	2.3	0.0	1729.3	98.2	0.0
NOV	74	4.4	1.7	0.7	0	0.0	3.7	0.0	1729.3	98.2	0.0
DEC	57	3.5	0.9	0.4	0	0.0	3.1	0.0	1729.3	98.2	0.0
TOTAL		104.3	37.5	15.8		21.8	67.4	0.0			-0.7

WEBSTER RESERVOIR OPERATION ESTIMATES - 2011

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	3	0.2	0.9	0.3	0	0.0	0.0	0.0	1888.8	63.2	-0.1
FEB	4	0.2	1.1	0.3	0	0.0	0.0	0.0	1888.8	63.1	-0.1
MAR	7	0.4	2.0	0.6	0	0.0	0.0	0.0	1888.7	62.9	-0.2
APR	10	0.6	4.5	1.3	0	0.0	0.0	0.0	1888.5	62.2	-0.7
MAY	15	0.9	5.7	1.6	15	0.9	0.0	0.0	1888.0	60.6	-1.6
JUN	12	0.7	7.2	1.9	101	6.0	0.0	0.0	1885.7	53.4	-7.2
JUL	11	0.7	7.9	1.8	236	14.5	0.0	0.0	1880.1	37.8	-15.6
AUG	7	0.4	7.3	1.3	213	13.1	0.0	0.0	1873.7	23.8	-14.0
SEP	3	0.2	5.4	0.8	8	0.5	0.0	0.0	1873.1	22.7	-1.1
OCT	3	0.2	3.6	0.6	0	0.0	0.0	0.0	1872.9	22.3	-0.4
NOV	2	0.1	2.2	0.3	0	0.0	0.0	0.0	1872.8	22.1	-0.2
DEC	2	0.1	1.2	0.2	0	0.0	0.0	0.0	1872.7	22.0	-0.1
TOTAL		4.7	49.0	11.0		35.0	0.0	0.0			-41.3
MOST PROBABLE INFLOW CONDITIONS											
JAN	15	0.9	0.8	0.2	0	0.0	0.0	0.0	1889.0	64.0	0.7
FEB	23	1.3	1.0	0.3	0	0.0	0.0	0.0	1889.3	65.0	1.0
MAR	36	2.2	1.8	0.5	0	0.0	0.0	0.0	1889.8	66.7	1.7
APR	50	3.0	4.1	1.2	0	0.0	0.0	0.0	1890.3	68.5	1.8
MAY	76	4.7	5.2	1.5	13	0.8	0.0	0.0	1891.0	70.9	2.4
JUN	55	3.3	6.5	1.9	74	4.4	0.0	0.0	1890.2	67.9	-3.0
JUL	52	3.2	7.1	2.0	208	12.8	0.0	0.0	1886.7	56.3	-11.6
AUG	31	1.9	6.5	1.6	161	9.9	0.0	0.0	1883.5	46.7	-9.6
SEP	18	1.1	4.9	1.1	5	0.3	0.0	0.0	1883.4	46.4	-0.3
OCT	10	0.6	3.3	0.8	0	0.0	0.0	0.0	1883.3	46.2	-0.2
NOV	12	0.7	2.0	0.5	0	0.0	0.0	0.0	1883.4	46.4	0.2
DEC	13	0.8	1.1	0.3	0	0.0	0.0	0.0	1883.5	46.9	0.5
TOTAL		23.7	44.3	11.9		28.2	0.0	0.0			-16.4
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	65	4.0	0.8	0.2	0	0.0	0.0	0.0	1889.9	67.1	3.8
FEB	99	5.5	0.9	0.3	0	0.0	0.0	0.0	1891.4	72.3	5.2
MAR	155	9.5	1.6	0.5	0	0.0	5.1	0.0	1892.4	76.2	3.9
APR	222	13.2	3.6	1.1	0	0.0	12.1	0.0	1892.4	76.2	0.0
MAY	330	20.3	4.7	1.5	7	0.4	18.4	0.0	1892.4	76.2	0.0
JUN	239	14.2	5.9	1.9	42	2.5	9.8	0.0	1892.4	76.2	0.0
JUL	224	13.8	6.5	2.0	125	7.7	4.1	0.0	1892.4	76.2	0.0
AUG	133	8.2	5.9	1.9	101	6.2	0.1	0.0	1892.4	76.2	0.0
SEP	79	4.7	4.5	1.4	2	0.1	3.2	0.0	1892.4	76.2	0.0
OCT	46	2.8	2.9	0.9	0	0.0	1.9	0.0	1892.4	76.2	0.0
NOV	61	3.6	1.8	0.6	0	0.0	3.0	0.0	1892.4	76.2	0.0
DEC	55	3.4	1.0	0.3	0	0.0	3.1	0.0	1892.4	76.2	0.0
TOTAL		103.2	40.1	12.6		16.9	60.8	0.0			12.9

WACONDA LAKE OPERATION ESTIMATES - 2011

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	0.8	0.8	20	1.2	2.7	0.0	1453.6	195.1	-3.0
FEB	43	2.4	1.0	0.9	20	1.1	11.7	0.0	1452.6	183.8	-11.3
MAR	80	4.9	1.9	1.8	18	1.1	2.0	0.0	1452.6	183.8	0.0
APR	84	5.0	4.8	4.4	17	1.0	0.0	0.0	1452.6	183.4	-0.4
MAY	96	5.9	5.9	5.4	18	1.1	0.0	0.0	1452.5	182.8	-0.6
JUN	82	4.9	7.4	6.7	45	2.7	0.0	0.0	1452.1	178.3	-4.5
JUL	133	8.2	8.7	7.7	156	9.6	0.0	0.0	1451.2	169.2	-9.1
AUG	49	3.0	7.5	6.3	125	7.7	0.0	0.0	1450.1	158.2	-11.0
SEP	37	2.2	6.0	4.8	35	2.1	0.0	0.0	1449.6	153.5	-4.7
OCT	29	1.8	3.9	3.1	21	1.3	0.0	0.0	1449.4	150.9	-2.6
NOV	34	2.0	2.1	1.6	27	1.6	0.0	0.0	1449.3	149.7	-1.2
DEC	26	1.6	1.0	0.8	24	1.5	0.0	0.0	1449.2	149.0	-0.7
TOTAL		43.6	51.0	44.3		32.0	16.4	0.0			-49.1
MOST PROBABLE INFLOW CONDITIONS											
JAN	102	6.3	0.7	0.7	10	0.6	8.0	0.0	1453.6	195.1	-3.0
FEB	151	8.4	0.9	0.9	11	0.6	18.2	0.0	1452.6	183.8	-11.3
MAR	288	17.7	1.7	1.6	10	0.6	15.5	0.0	1452.6	183.8	0.0
APR	299	17.8	4.3	4.1	8	0.5	1.9	0.0	1453.6	195.1	11.3
MAY	346	21.3	5.2	5.2	10	0.6	0.0	0.0	1454.9	210.6	15.5
JUN	294	17.5	6.7	7.0	34	2.0	0.0	0.0	1455.6	219.1	8.5
JUL	478	29.4	7.9	8.3	112	6.9	13.9	0.0	1455.6	219.4	0.3
AUG	176	10.8	6.8	7.1	89	5.5	0.0	0.0	1455.5	217.6	-1.8
SEP	134	8.0	5.4	5.7	22	1.3	0.0	0.0	1455.5	218.6	1.0
OCT	104	6.4	3.5	3.7	10	0.6	1.3	0.0	1455.6	219.4	0.8
NOV	118	7.0	1.9	1.9	15	0.9	28.5	0.0	1453.6	195.1	-24.3
DEC	94	5.8	0.9	0.9	13	0.8	4.1	0.0	1453.6	195.1	0.0
TOTAL		156.4	45.9	47.1		20.9	91.4	0.0			-3.0
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	400	24.6	0.7	0.7	3	0.2	26.7	0.0	1453.6	195.1	-3.0
FEB	600	33.3	0.8	0.8	4	0.2	43.6	0.0	1452.6	183.8	-11.3
MAR	1132	69.6	1.5	1.4	5	0.3	67.9	0.0	1452.6	183.8	0.0
APR	1180	70.2	3.9	3.7	5	0.3	54.9	0.0	1453.6	195.1	11.3
MAY	1363	83.8	4.7	4.8	5	0.3	54.4	0.0	1455.6	219.4	24.3
JUN	1160	69.0	6.0	6.3	22	1.3	61.4	0.0	1455.6	219.4	0.0
JUL	1883	115.8	7.0	7.4	70	4.3	104.1	0.0	1455.6	219.4	0.0
AUG	691	42.5	6.1	6.4	57	3.5	32.6	0.0	1455.6	219.4	0.0
SEP	528	31.4	4.8	5.0	12	0.7	25.7	0.0	1455.6	219.4	0.0
OCT	411	25.3	3.1	3.3	7	0.4	21.6	0.0	1455.6	219.4	0.0
NOV	466	27.7	1.7	1.7	5	0.3	50.0	0.0	1453.6	195.1	-24.3
DEC	374	23.0	0.8	0.8	5	0.3	21.9	0.0	1453.6	195.1	0.0
TOTAL		616.2	41.1	42.3		12.1	564.8	0.0			-3.0

CEDAR BLUFF RESERVOIR OPERATION ESTIMATES - 2011

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	0.1	1.1	0.4	0	0.0	0.0	0.0	2129.3	90.8	-0.3
FEB	4	0.2	1.2	0.4	0	0.0	0.0	0.0	2129.2	90.6	-0.2
MAR	5	0.3	2.1	0.7	0	0.0	0.0	0.0	2129.1	90.2	-0.4
APR	8	0.5	5.4	1.9	0	0.0	0.0	0.0	2128.8	88.8	-1.4
MAY	11	0.7	6.4	2.2	5	0.3	0.0	0.0	2128.4	87.0	-1.8
JUN	12	0.7	7.9	2.6	5	0.3	0.0	0.0	2127.8	84.8	-2.2
JUL	16	1.0	9.5	3.1	13	0.8	0.0	0.0	2127.1	81.9	-2.9
AUG	11	0.7	8.1	2.6	11	0.7	0.0	0.0	2126.4	79.3	-2.6
SEP	3	0.2	7.0	2.2	3	0.2	0.0	0.0	2125.8	77.1	-2.2
OCT	2	0.1	4.9	1.5	0	0.0	0.0	0.0	2125.4	75.7	-1.4
NOV	2	0.1	2.3	0.7	0	0.0	0.0	0.0	2125.2	75.1	-0.6
DEC	2	0.1	1.3	0.4	0	0.0	0.0	0.0	2125.2	74.8	-0.3
TOTAL		4.7	57.2	18.7		2.3	0.0	0.0			-16.3
MOST PROBABLE INFLOW CONDITIONS											
JAN	8	0.5	1.0	0.3	0	0.0	0.0	0.0	2129.4	91.3	0.2
FEB	11	0.6	1.1	0.4	0	0.0	0.0	0.0	2129.5	91.5	0.2
MAR	21	1.3	2.0	0.7	0	0.0	0.0	0.0	2129.6	92.1	0.6
APR	32	1.9	4.9	1.7	0	0.0	0.0	0.0	2129.6	92.3	0.2
MAY	47	2.9	5.7	2.0	3	0.2	0.0	0.0	2129.8	93.0	0.7
JUN	50	3.0	7.1	2.5	3	0.2	0.0	0.0	2129.9	93.3	0.3
JUL	63	3.9	8.5	3.0	11	0.7	0.0	0.0	2129.9	93.5	0.2
AUG	44	2.7	7.3	2.6	7	0.4	0.0	0.0	2129.8	93.2	-0.3
SEP	18	1.1	6.3	2.2	2	0.1	0.0	0.0	2129.6	92.0	-1.2
OCT	7	0.4	4.5	1.6	0	0.0	0.0	0.0	2129.3	90.8	-1.2
NOV	10	0.6	2.2	0.8	0	0.0	0.0	0.0	2129.2	90.6	-0.2
DEC	7	0.4	1.1	0.4	0	0.0	0.0	0.0	2129.2	90.6	0.0
TOTAL		19.3	51.7	18.2		1.6	0.0	0.0			-0.5
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	26	1.6	0.9	0.3	0	0.0	0.0	0.0	2129.7	92.4	1.3
FEB	34	1.9	1.0	0.4	0	0.0	0.0	0.0	2130.0	93.9	1.5
MAR	60	3.7	1.7	0.6	0	0.0	0.0	0.0	2130.7	97.0	3.1
APR	99	5.9	4.3	1.6	0	0.0	0.0	0.0	2131.7	101.3	4.3
MAY	145	8.9	5.1	2.0	3	0.2	0.0	0.0	2133.1	108.0	6.7
JUN	155	9.2	6.4	2.7	3	0.2	0.0	0.0	2134.4	114.3	6.3
JUL	198	12.2	7.6	3.3	3	0.2	0.0	0.0	2136.0	123.0	8.7
AUG	138	8.5	6.5	3.0	0	0.0	0.0	0.0	2137.0	128.5	5.5
SEP	55	3.3	5.6	2.6	0	0.0	0.0	0.0	2137.1	129.2	0.7
OCT	23	1.4	4.1	1.9	0	0.0	0.0	0.0	2137.0	128.7	-0.5
NOV	32	1.9	1.8	0.8	0	0.0	0.0	0.0	2137.2	129.8	1.1
DEC	23	1.4	1.0	0.5	0	0.0	0.0	0.0	2137.4	130.7	0.9
TOTAL		59.9	46.0	19.7		0.6	0.0	0.0			39.6

TABLE 5

FLOOD DAMAGES PREVENTED BY NEBRASKA-KANSAS PROJECTS RESERVOIRS

RESERVOIR	DURING FY 2010	PRIOR TO 2010	ACCUMULATED TOTAL
BONNY	$8,100	$2,805,700	$2,813,800
ENDERS	$8,100	$3,565,600	$3,573,700
SWANSON	$2,478,500	$27,101,900	$29,580,400
HUGH BUTLER	$8,800	$3,017,900	$3,026,700
HARRY STRUNK	$2,457,400	$10,195,600	$12,653,000
KEITH SEBELIUS	$20,800	$3,990,700	$4,011,500
HARLAN COUNTY	$27,035,400	$191,092,100	$218,127,500
LOVEWELL	$2,478,100	$149,828,500	$152,306,600
KIRWIN	$7,441,200	$87,045,400	$94,486,600
WEBSTER	$2,520,400	$110,383,300	$112,903,700
WACONDA	$22,275,500	$1,225,013,100	$1,247,288,600
CEDAR BLUFF	$2,430,400	$132,502,400	$134,932,800
TOTAL	$69,162,700	$1,946,542,200	$2,015,704,900

Estimates of damages prevented are received from the Army Corps of Engineer's Kansas City District Office. The Accumulated Totals date from 1951 through 2010. Cumulative totals are revised by the Corps of Engineers in some cases to reflect data not previously included in the reporting and may not match previous cumulative totals.

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

TABLE 6
WATER DIVERTED IN 2010 AND THE
ESTIMATED DIVERSION FOR 2011
(Units - Acre-Feet)

Irrigation District and Canal	2010 Irrigation Operations From	To	10-Year Average Diversion (2000-2009)	2010 Diversion	Estimated Diversion in 2011
Mirage Flats Irrigation District					
Mirage Flats Canal	7/18	8/31	9,972	9,365	10,000
Ainsworth Irrigation District					
Ainsworth Canal	5/8	9/14	76,316	70,341	75,000
Twin Loups Irrigation District					
Above Davis Creek	4/26	9/22	44,655	42,645	43,000
Below Davis Creek	5/5	9/13	42,720	38,785	42,000
Total Twin Loups Irrigation District			87,375	81,430	85,000
Frenchman Valley Irrigation District					
Culbertson Canal	4/21	9/7	5,813	9,609	9,000
H & RW Irrigation District					
Culbertson Extension Canal	Did not run.		1,710	0	0
Frenchman-Cambridge Irrigation District					
Meeker-Driftwood Canal	6/23	9/3	7,851	19,469	25,000
Red Willow Canal	Did not run.		2,582	0	0
Bartley Canal	5/3	9/7	3,461	8,589	10,000
Cambridge Canal	5/17	9/3	18,998	24,280	22,000
Total Frenchman-Cambridge Irrigation District			32,892	52,338	57,000
Almena Irrigation District					
Almena Canal	6/14	8/19	2,215	3,330	4,000
Bostwick Irrigation District in Nebraska					
Franklin Canal	7/13	9/2	14,625	13,879	24,000
Naponee Canal	7/12	9/1	1,264	690	1,500
Franklin Pump Canal	7/13	8/18	1,380	751	1,500
Superior Canal	7/9	8/31	7,171	6,489	7,000
Courtland Canal (Nebraska)	6/1	9/14	1,023	202	1,000
Total Bostwick Irrigation District in Nebraska			25,463	22,011	35,000
Kansas-Bostwick Irrigation District					
Courtland Canal above Lovewell	6/10	9/27	16,579	20,190	20,000
Courtland Canal below Lovewell	6/2	9/14	37,680	38,043	38,000
Total Kansas-Bostwick Irrigation District			54,259	58,233	58,000
Kirwin Irrigation District					
Kirwin Canal	6/28	9/1	12,548	12,905	18,000
Webster Irrigation District					
Osborne Canal	6/28	8/31	7,411	9,264	14,000
Glen Elder Irrigation District	7/10	9/3	7,101	744	5,000
TOTAL			323,075	329,570	370,000

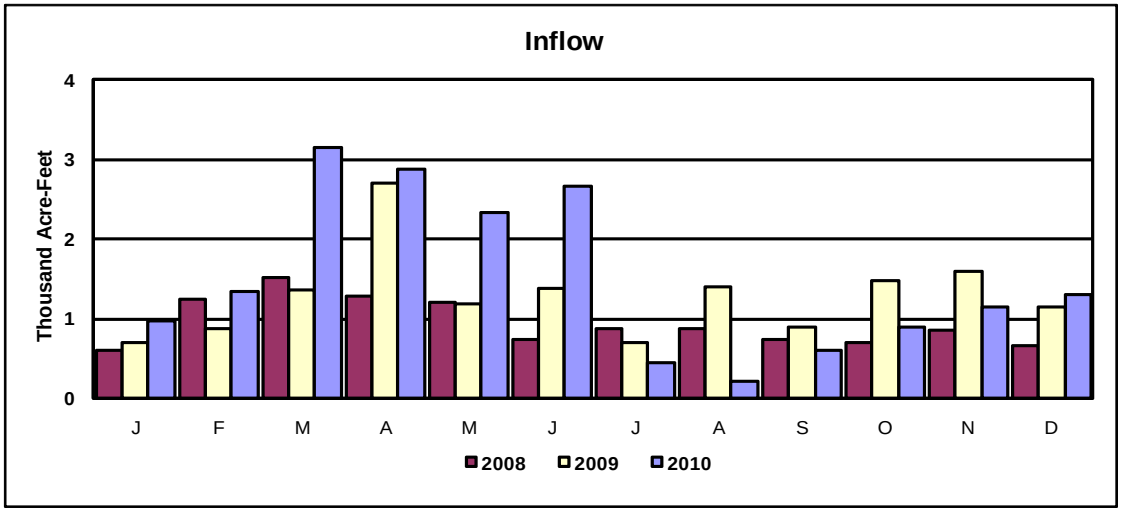
TABLE 7
NEBRASKA-KANSAS PROJECTS
Summary of Precipitation, Reservoir Storage and Inflows
CALENDAR YEAR 2010

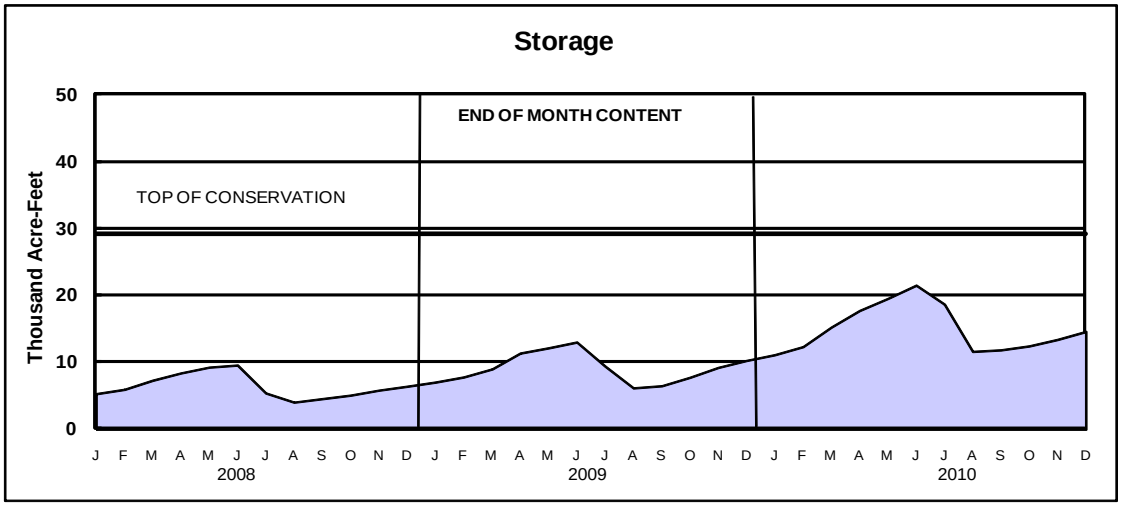
Reservoir	Total Precip. Inches	Percent Of Average %	Storage 12-31-09 AF	Storage 12-31-10 AF	Gain or Loss AF	Maximum Storage Content AF	Maximum Storage Date	Minimum Storage Content AF	Minimum Storage Date	Total Inflow AF	Percent Of Most Probable %	AVERAGE PREC.	MOST PROBABLE INFLOW
Box Butte	18.96	112	10,213	14,523	4,310	21500	JUL 4	10213	JAN 1	17,984	115	**16.95**	15,700
Merritt	24.14	118	61,100	60,831	-269	67896	JUN 14	39294	AUG 31	185,740	101	**20.47**	183,600
Calamus	27.59	114	107,417	108,981	1,564	137964	JUN 16	59224	SEP 20	340,094	127	**24.14**	267,200
Davis Creek	27.09	109	8,922	9,350	428	29349	JUL 19	8274	APR 28	45,405	92	**24.79**	49,600
Bonny	24.57	143	10,220	11,460	1,240	17941	JUL 8	10270	JAN 1	15,989	139	**17.13**	11,500
Enders	24.40	128	15,662	16,743	1,081	17105	JUN 24	15662	JAN 1	7,752	65	**19.02**	12,000
Swanson	23.01	115	55,314	62,085	6,771	83144	JUN 22	55414	JAN 1	41,512	121	**19.97**	34,400
Hugh Butler	21.73	111	6,357	6,034	-323	7578	JUN 23	5673	OCT 8	20,120	141	**19.63**	14,300
Harry Strunk	21.46	104	33,630	33,936	306	39813	JUN 23	29626	SEP 7	49,407	134	**20.7**	37,000
Keith Sebelius	27.48	112	17,386	20,600	3,214	25016	JUN 24	17400	JAN 1	12,245	153	**24.49**	8,000
Harlan County	31.66	139	320,258	318,364	-1,894	369129	JUL 1	303015	OCT 5	239,054	192	**22.76**	124,700
Lovewell	26.39	96	26,528	27,054	526	52419	JUN 27	22450	AUG 24	64,386	96	**27.47**	67,100
Kirwin	31.42	133	98,662	98,916	254	127401	JUN 23	93457	AUG 23	100,264	401	**23.57**	25,000
Webster	20.86	88	78,514	63,328	-15,186	86127	APR 25	61821	NOV 11	50,038	235	**23.66**	21,300
Waconda	28.09	110	213,790	198,060	-15,730	290986	JUL 24	187347	SEP 11	492,406	352	**25.53**	140,000
Cedar Bluff	15.12	72	83,699	91,110	7,411	102105	JUN 26	83738	JAN 1	26,202	154	**20.98**	17,000

EXHIBIT 1A

BOX BUTTE RESERVOIR

ACTUAL OPERATION





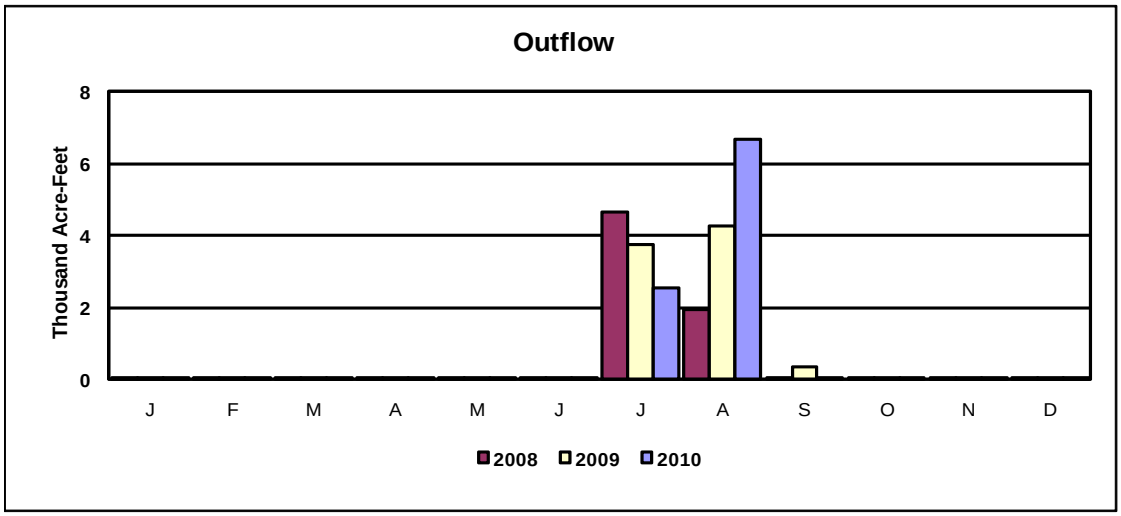
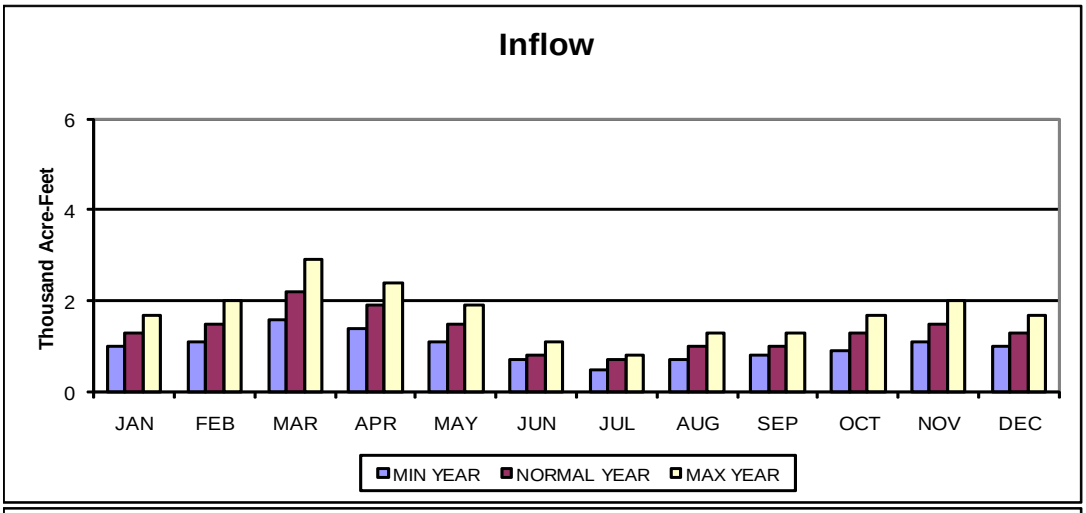
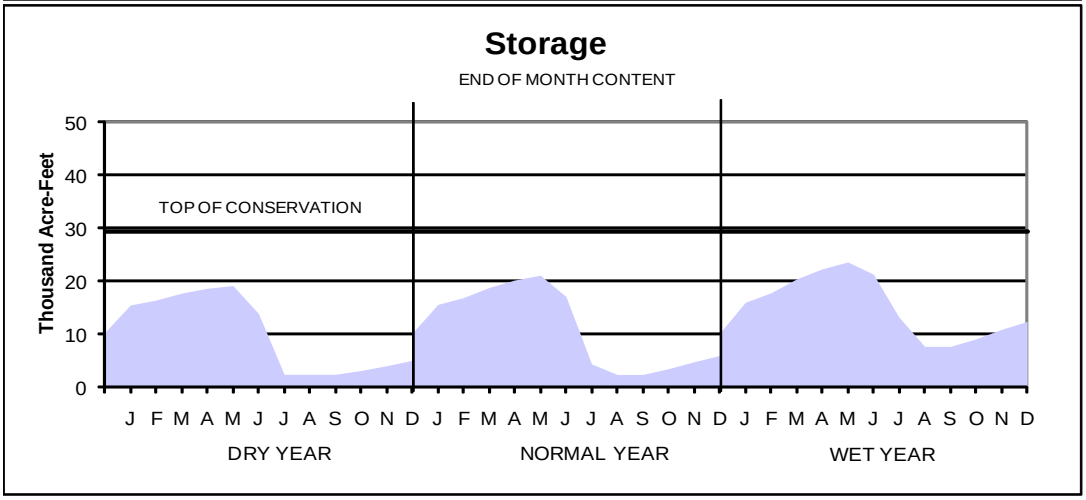


EXHIBIT 1B

BOX BUTTE RESERVOIR

2011 OPERATION PLAN





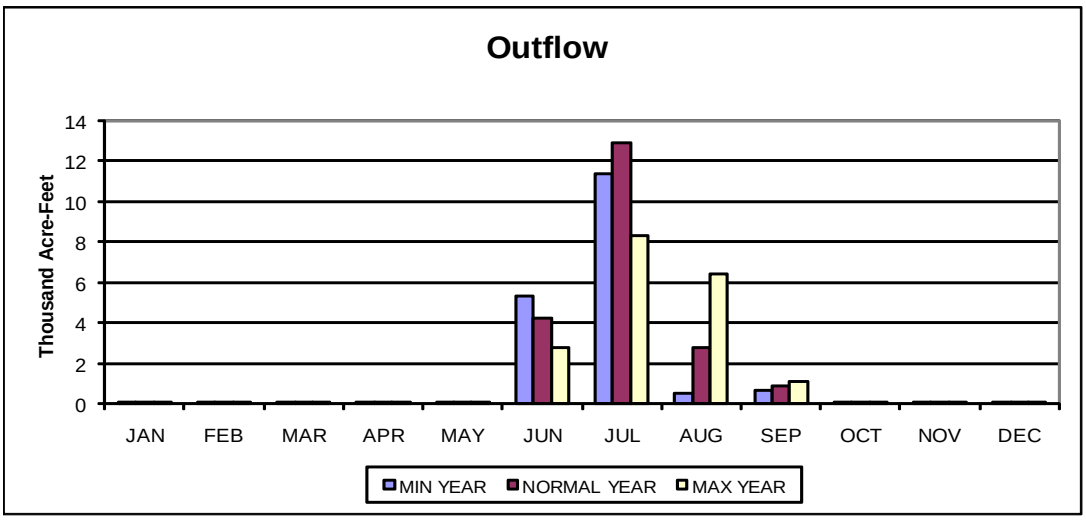
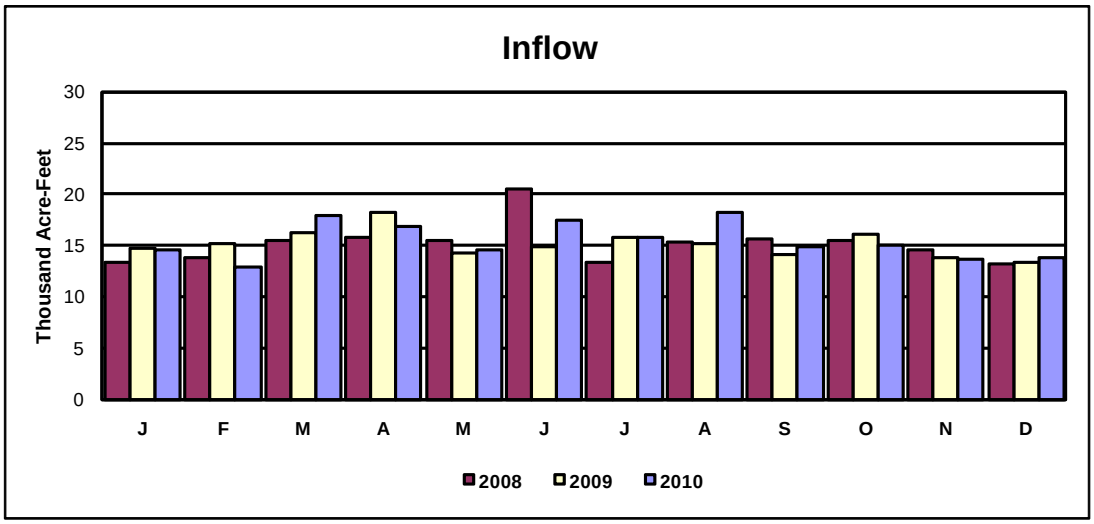
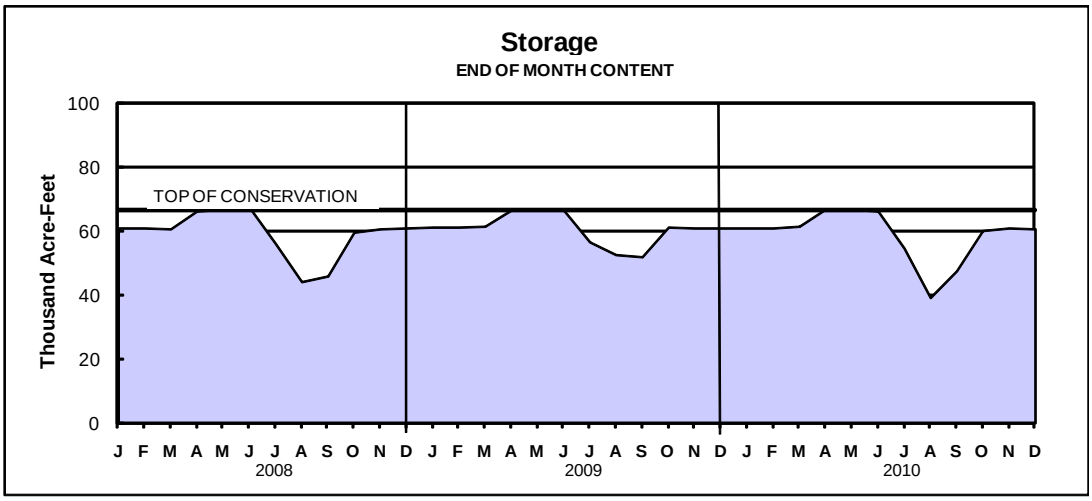


EXHIBIT 2A

MERRITT RESERVOIR

ACTUAL OPERATION





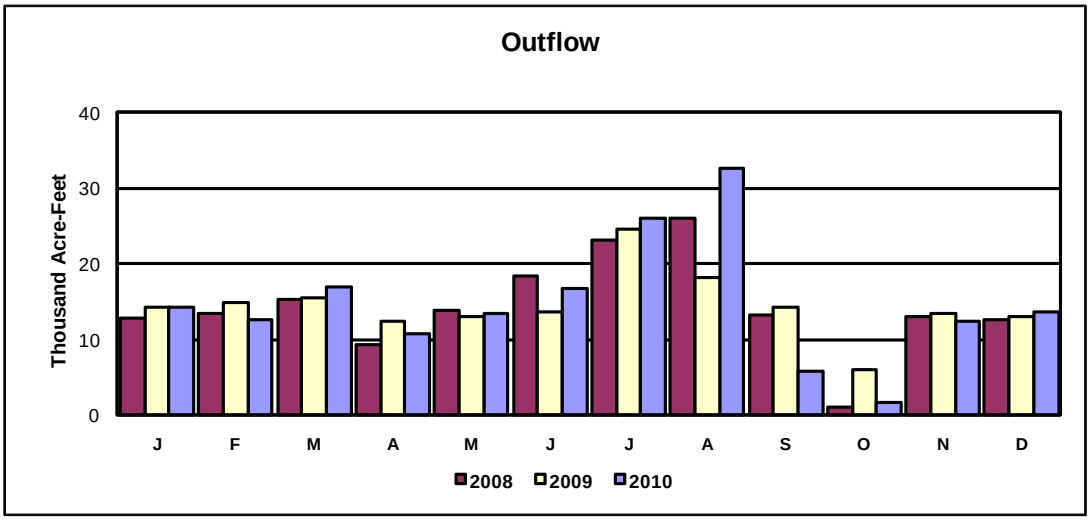
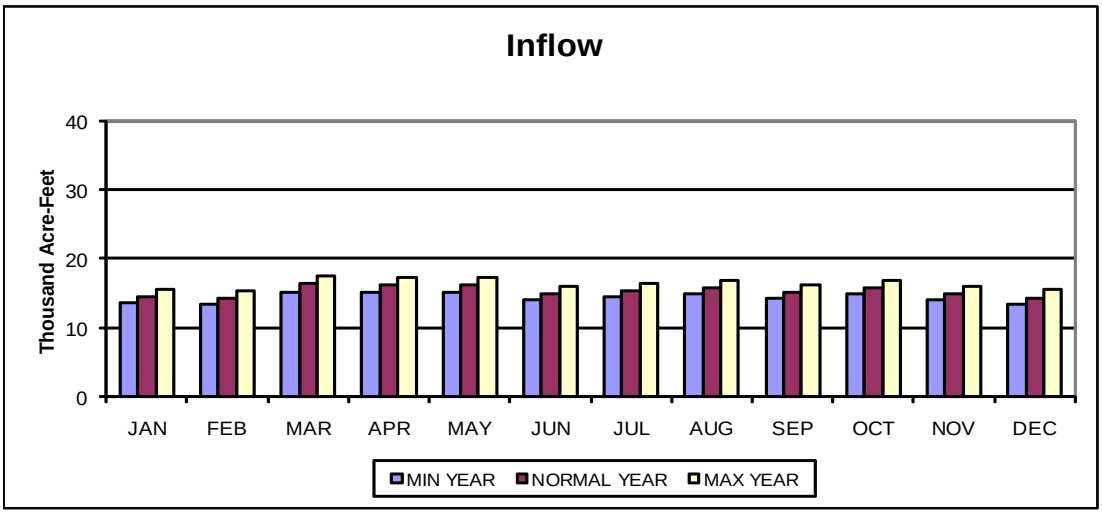
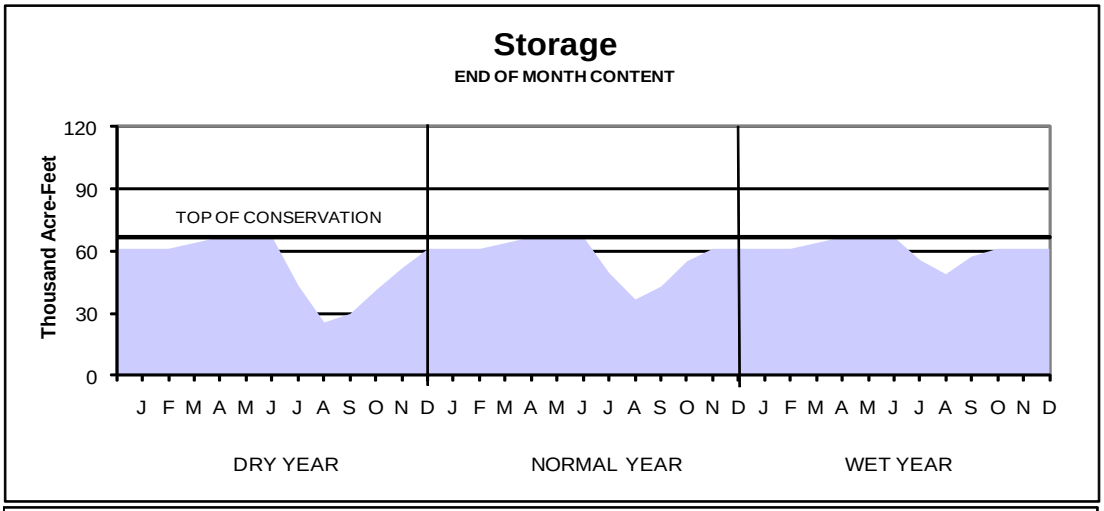


EXHIBIT 2B

MERRITT RESERVOIR

2011 OPERATION PLAN





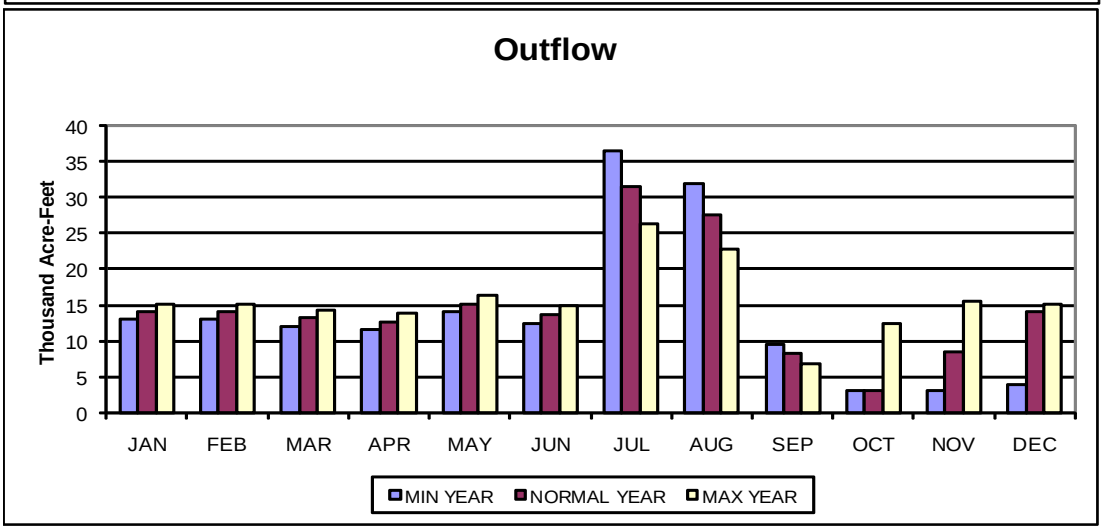
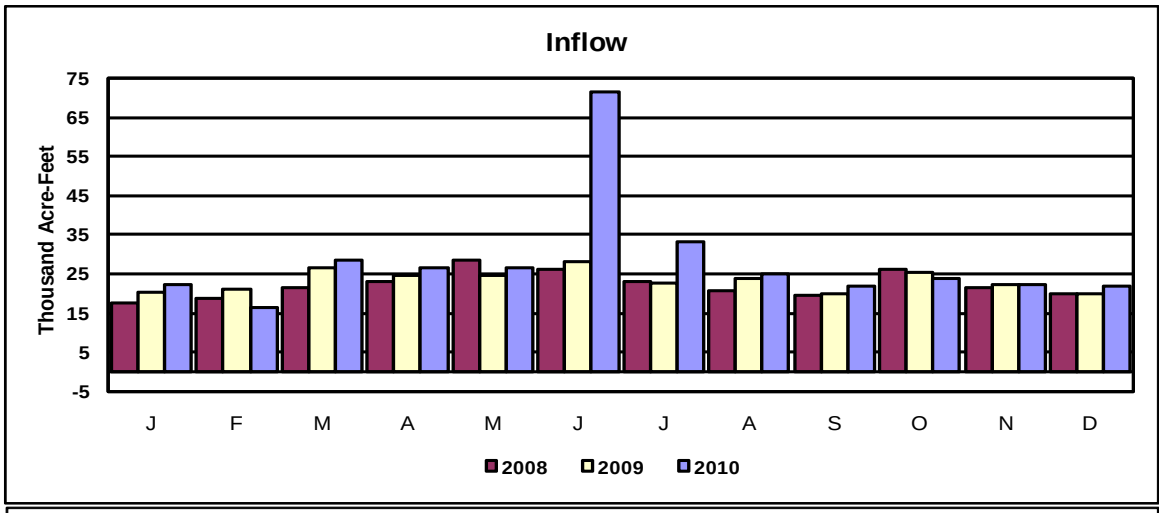
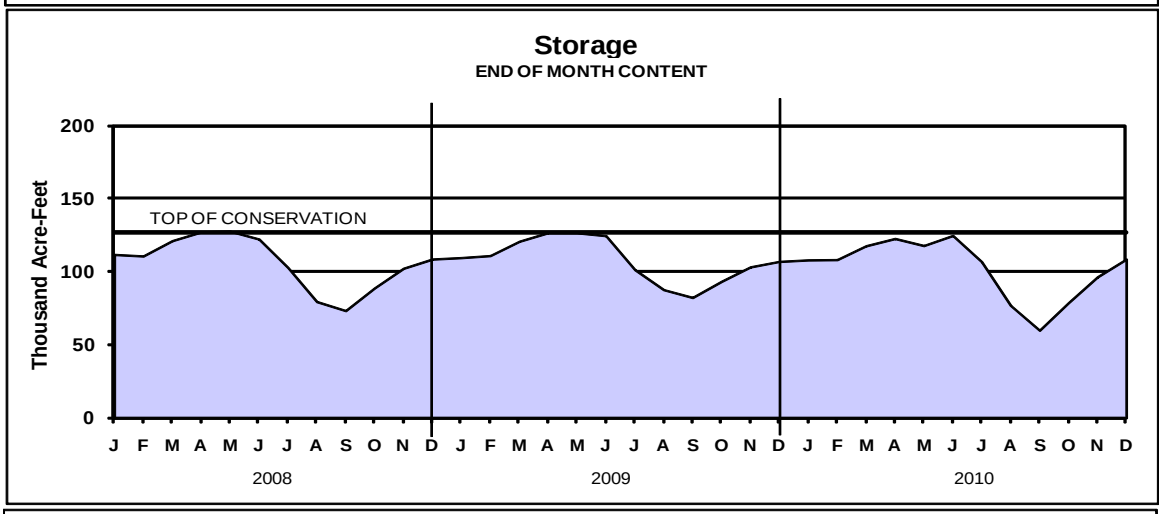


EXHIBIT 3A

CALAMUS RESERVOIR

ACTUAL OPERATION





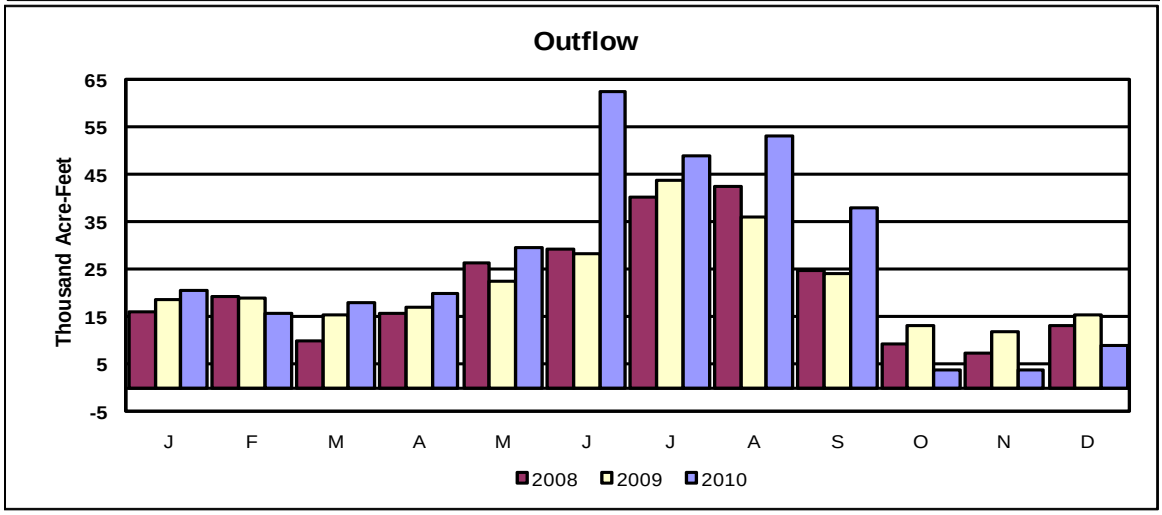
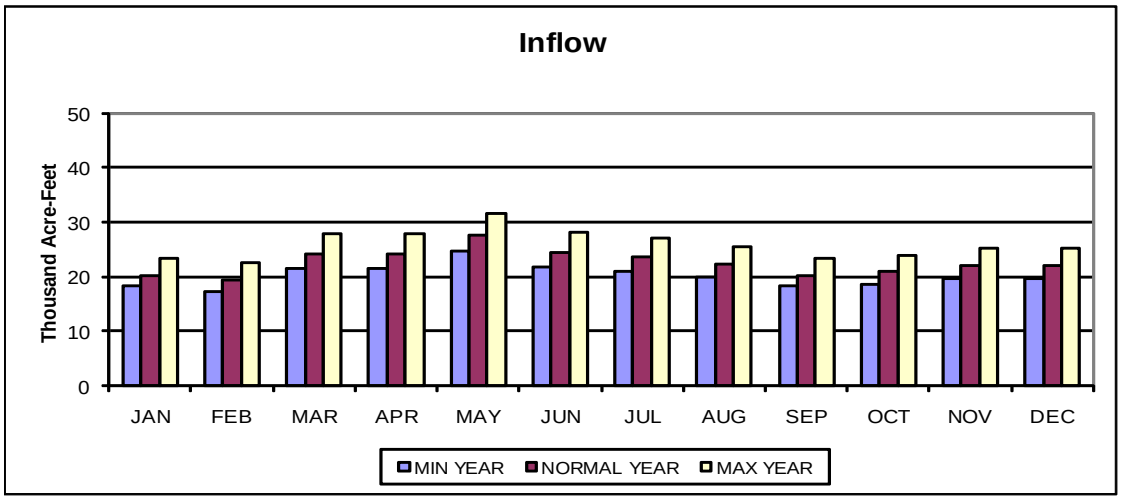
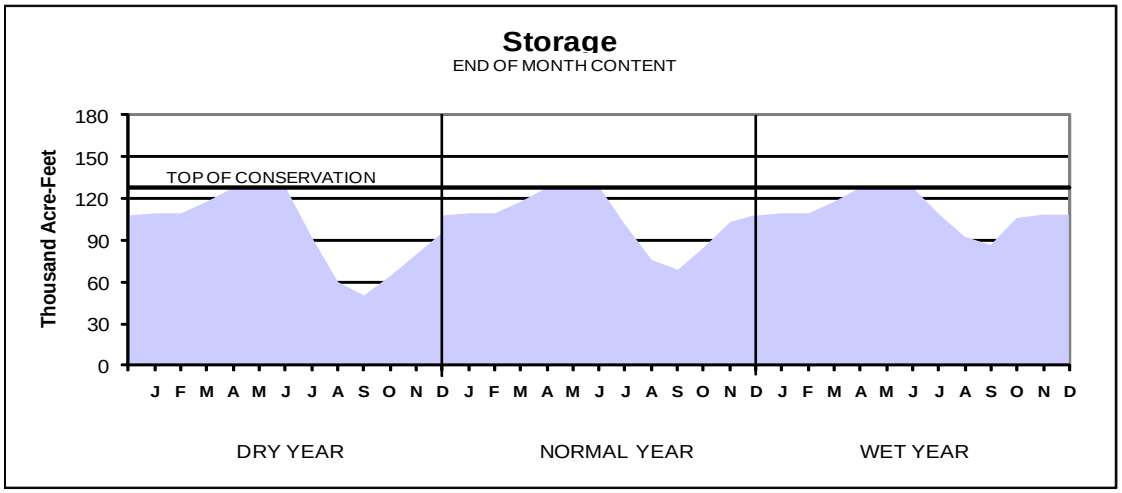


EXHIBIT 3B

CALAMUS RESERVOIR

2011 OPERATION PLAN





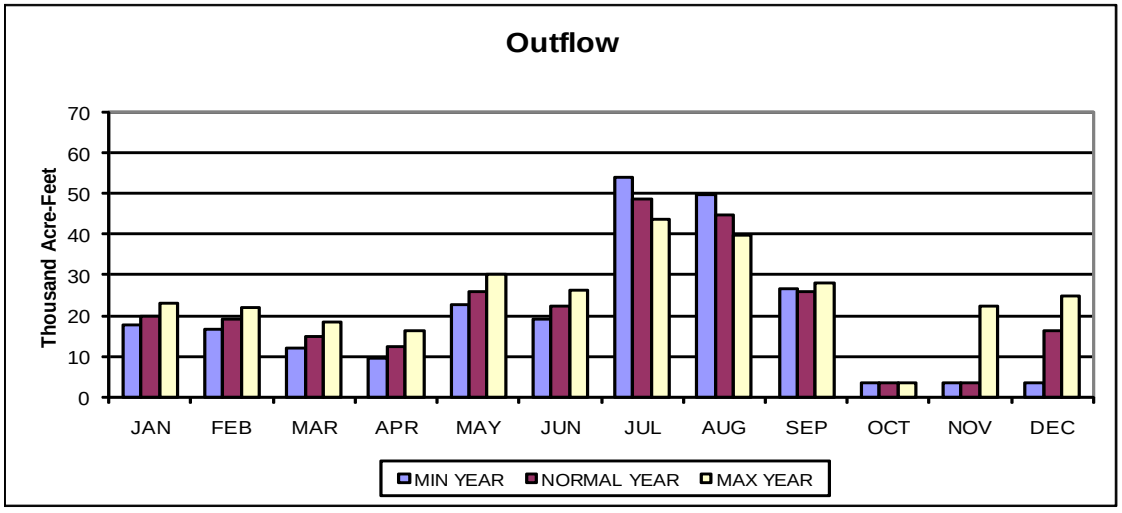
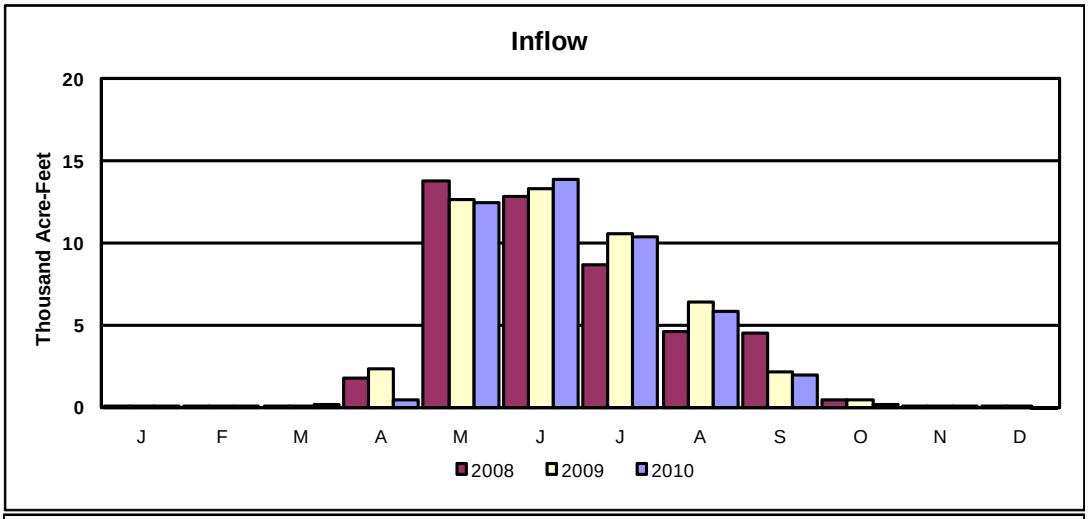
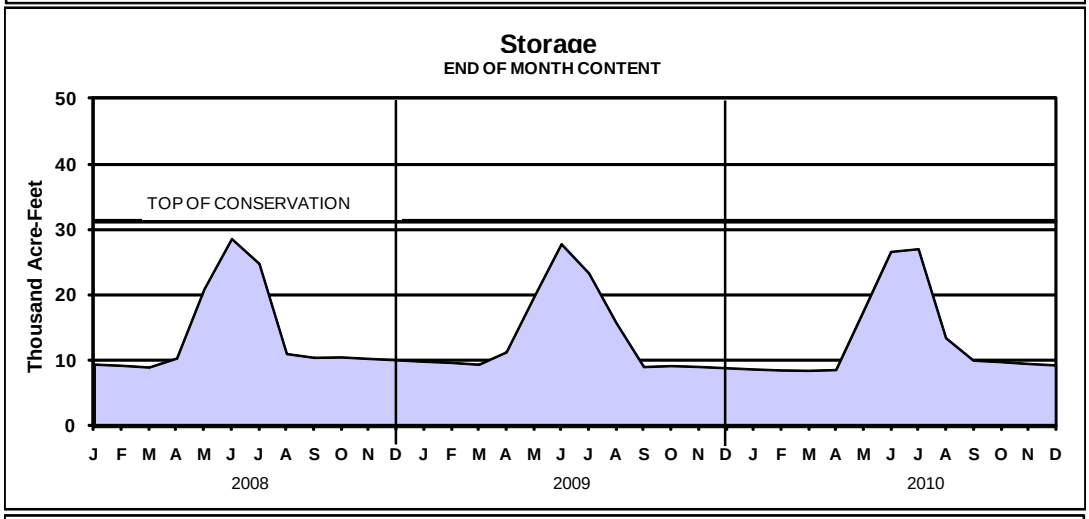


EXHIBIT 4A

DAVIS CREEK RESERVOIR

ACTUAL OPERATION





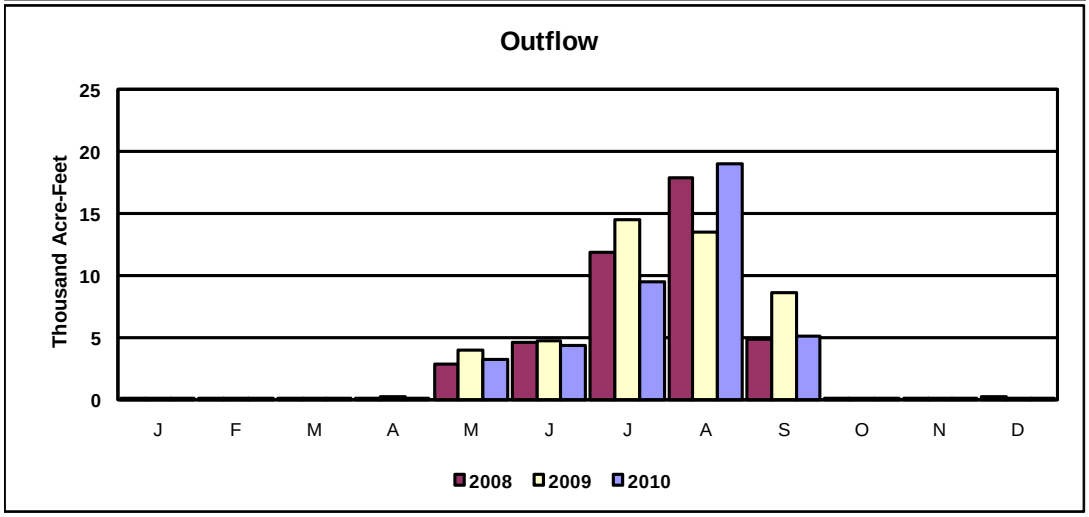
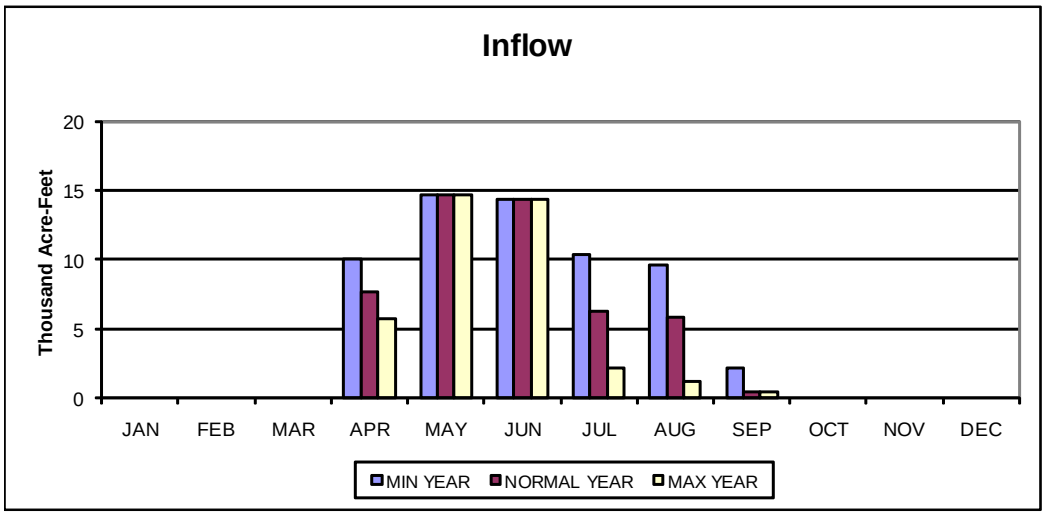
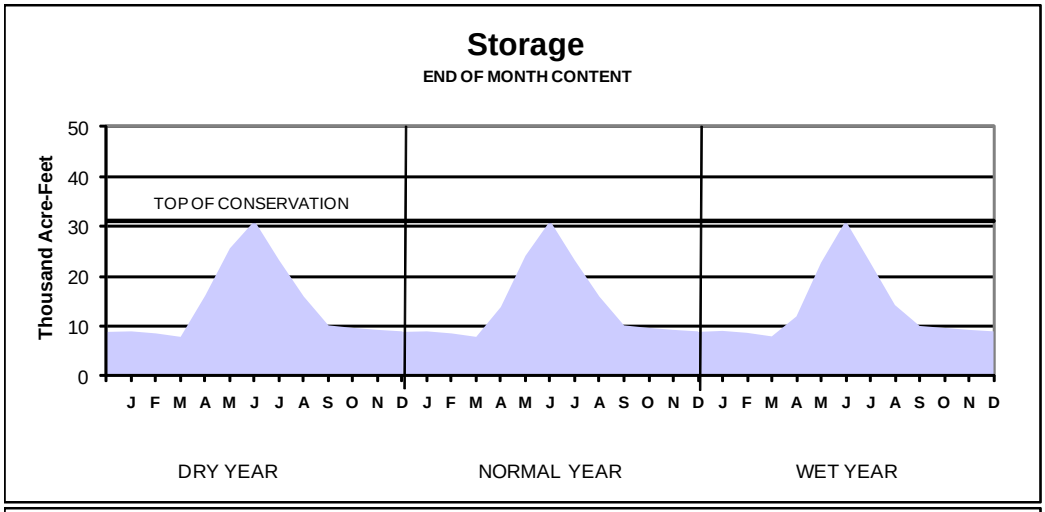


EXHIBIT 4B

DAVIS CREEK RESERVOIR

2011 OPERATION PLAN





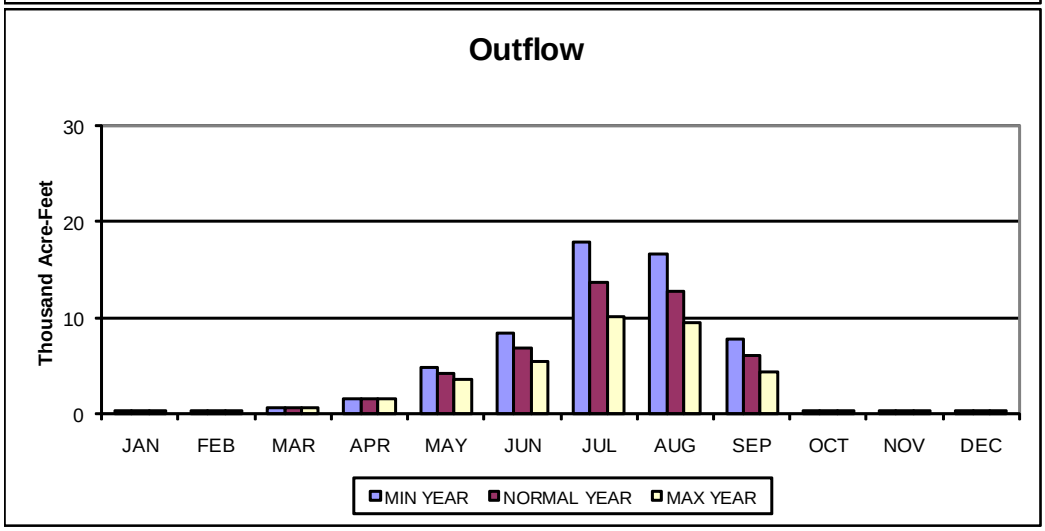
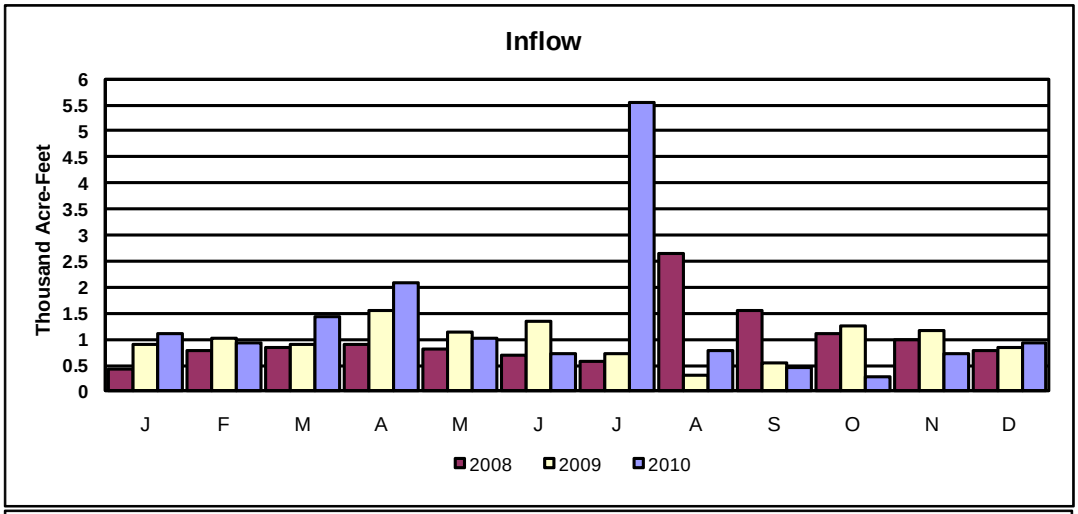
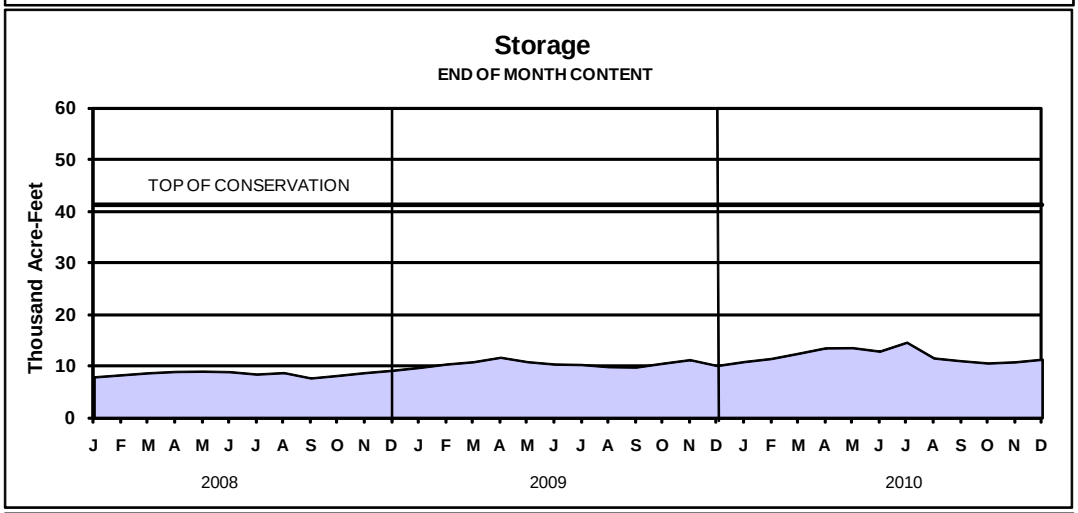


EXHIBIT 5A

BONNY RESERVOIR

ACTUAL OPERATION





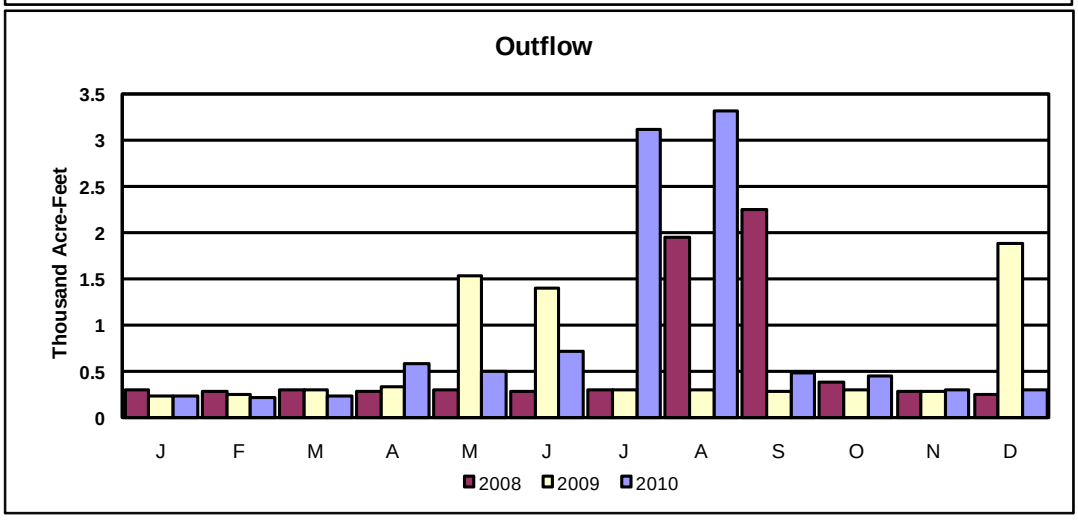
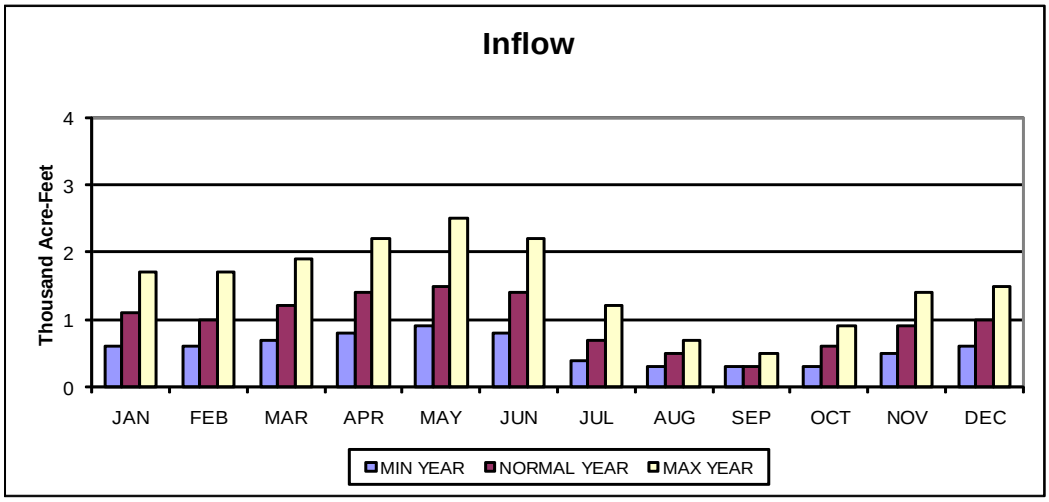
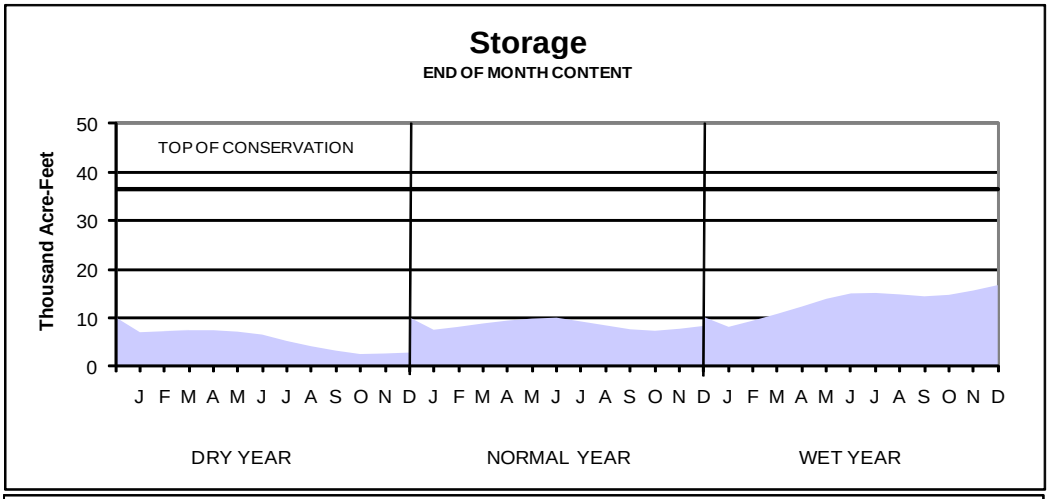


EXHIBIT 5B

BONNY RESERVOIR

2011 OPERATION PLAN





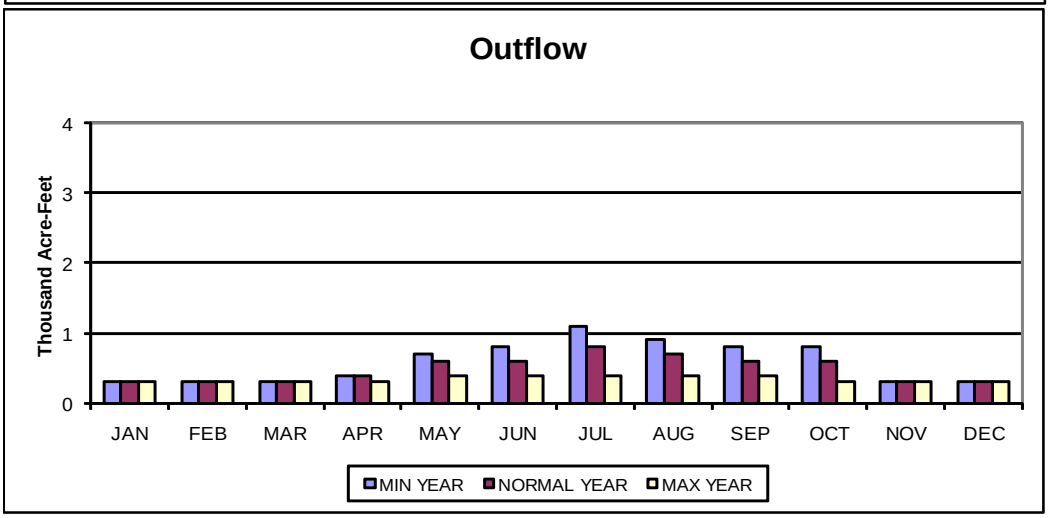
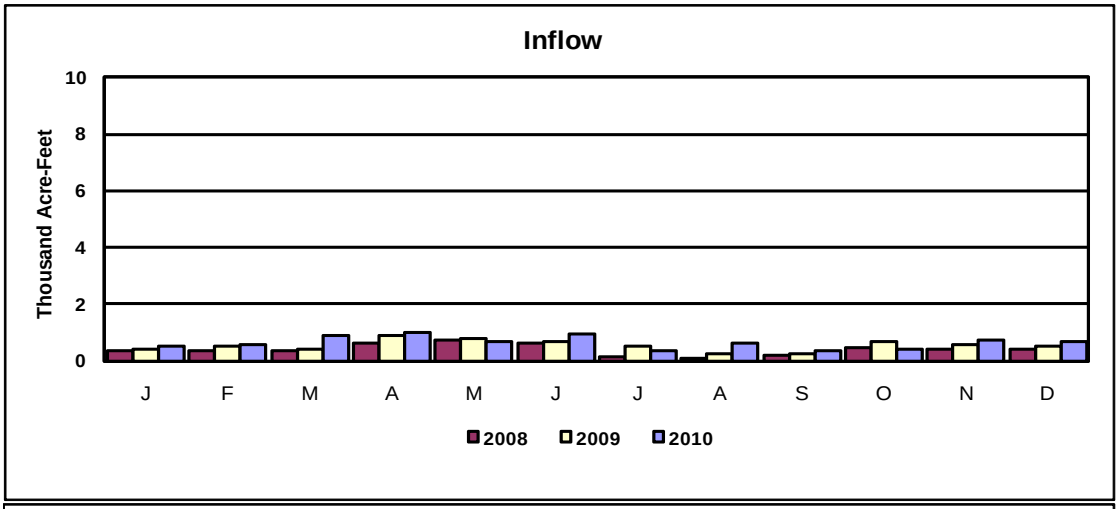
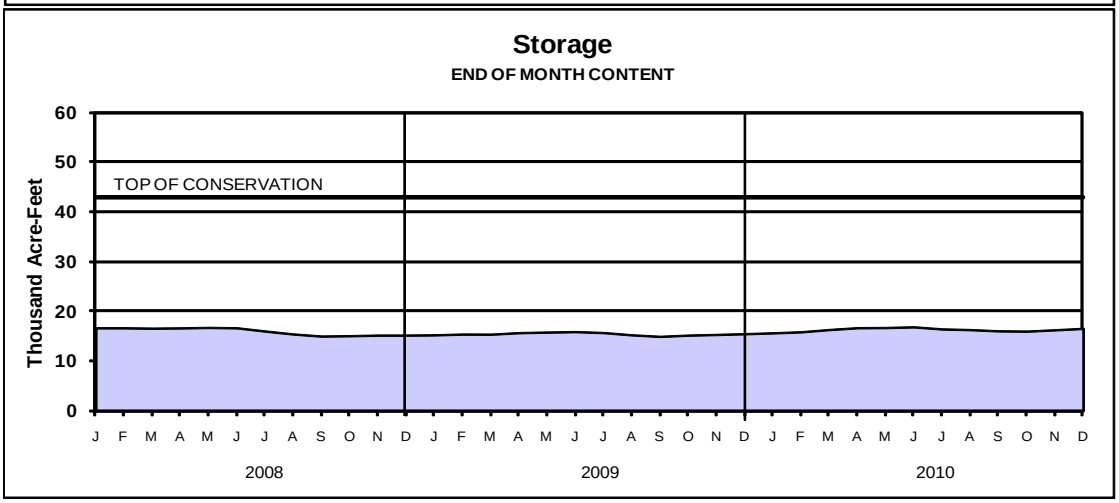


EXHIBIT 6A

ENDERS RESERVOIR

ACTUAL OPERATION





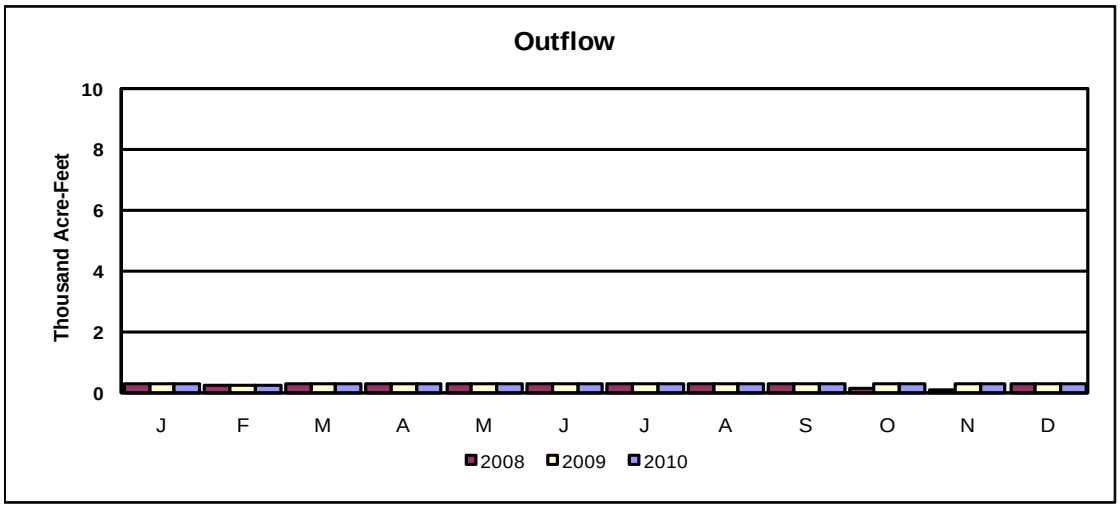
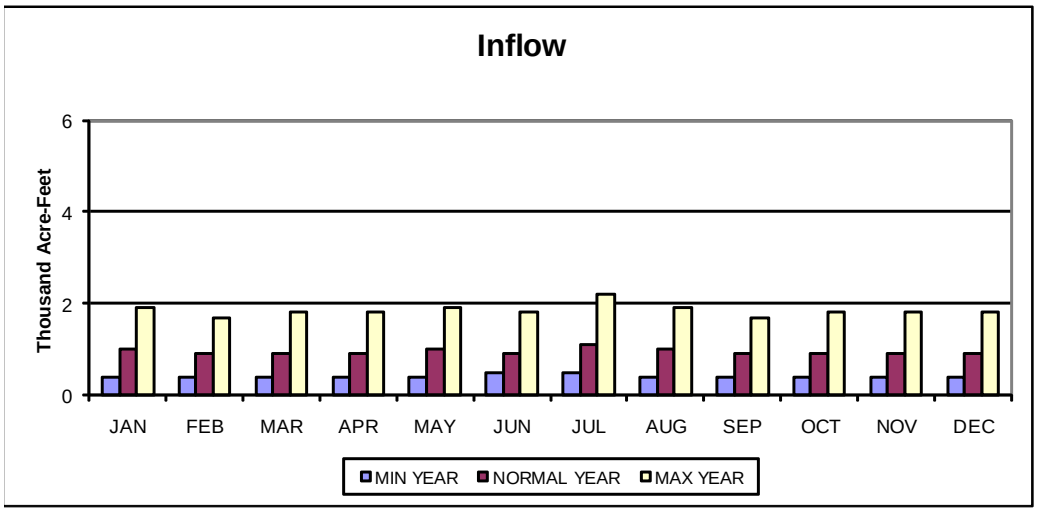
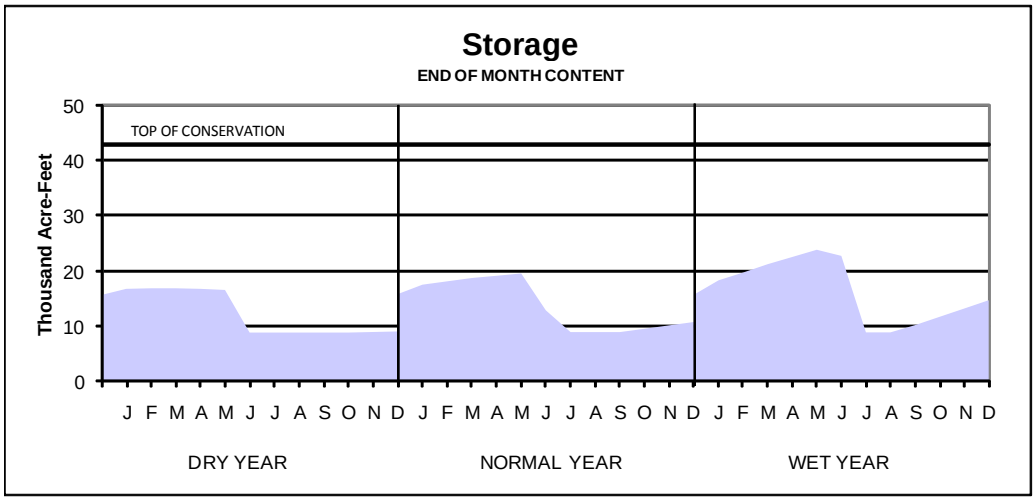


EXHIBIT 6B

ENDERS RESERVOIR

2011 OPERATION PLAN





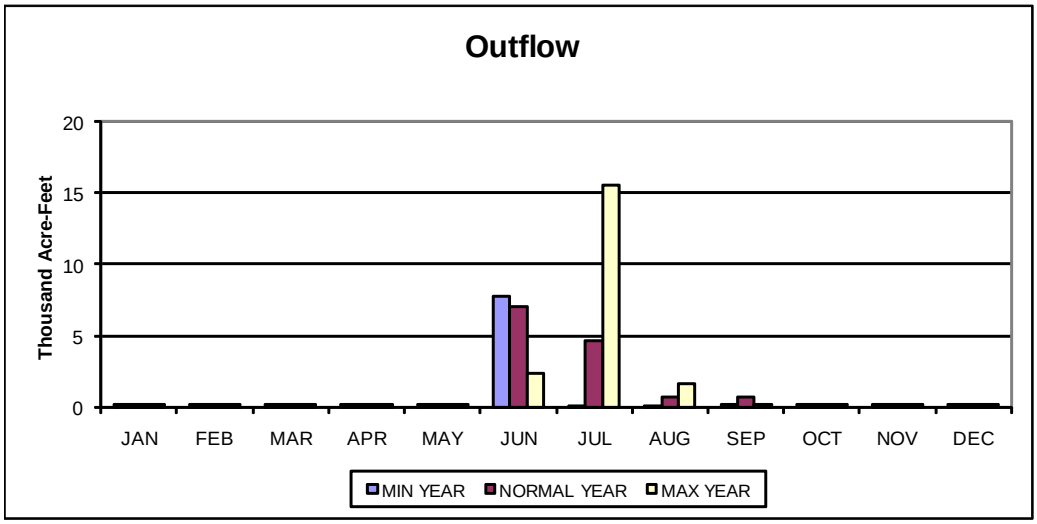
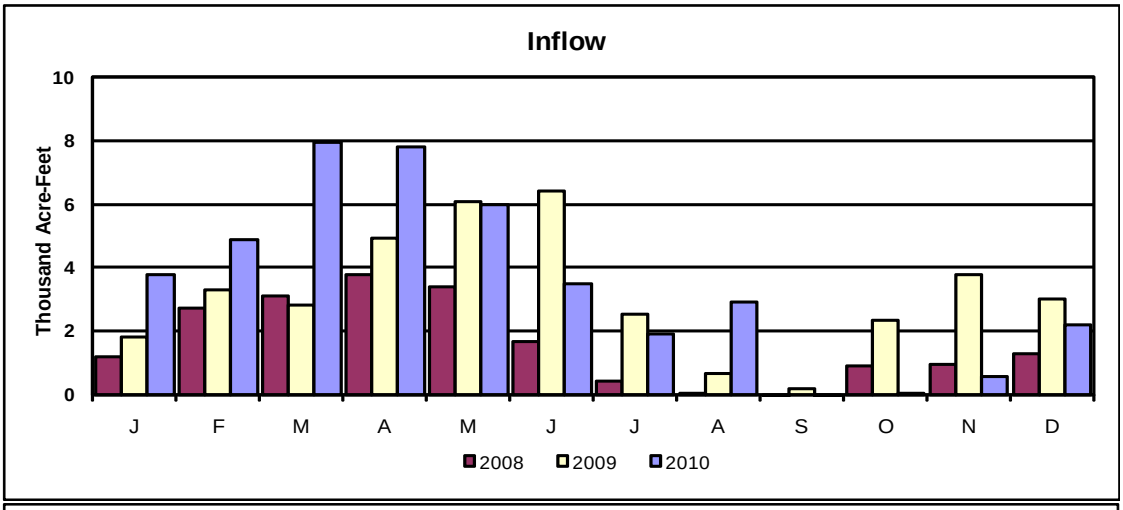
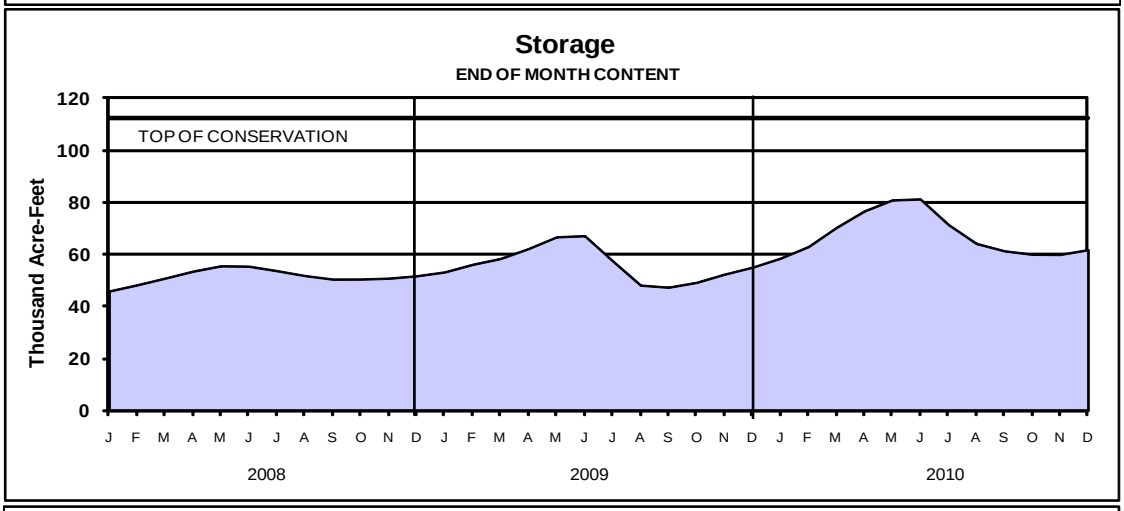


EXHIBIT 7A

SWANSON LAKE

ACTUAL OPERATION





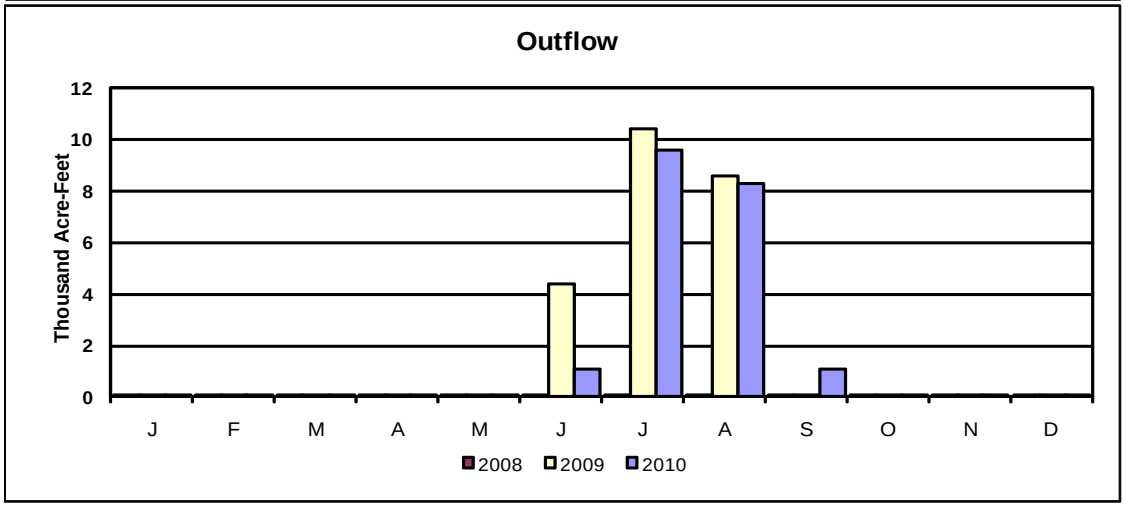
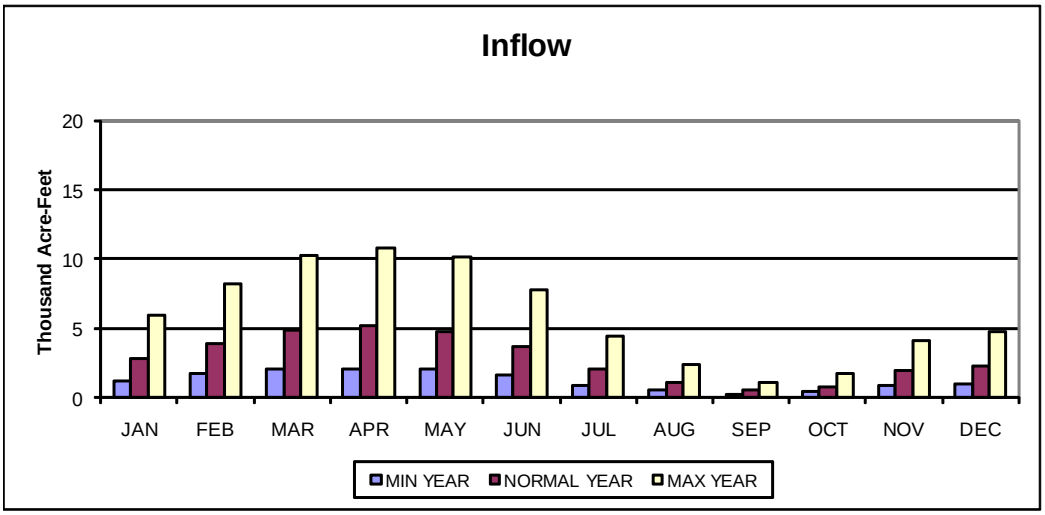
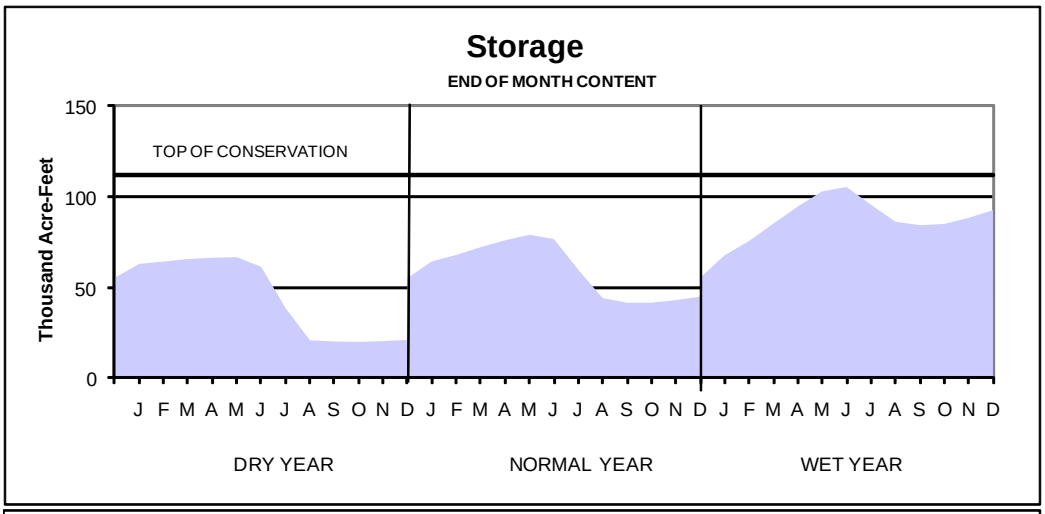


EXHIBIT 7B

SWANSON LAKE

2011 OPERATION PLAN





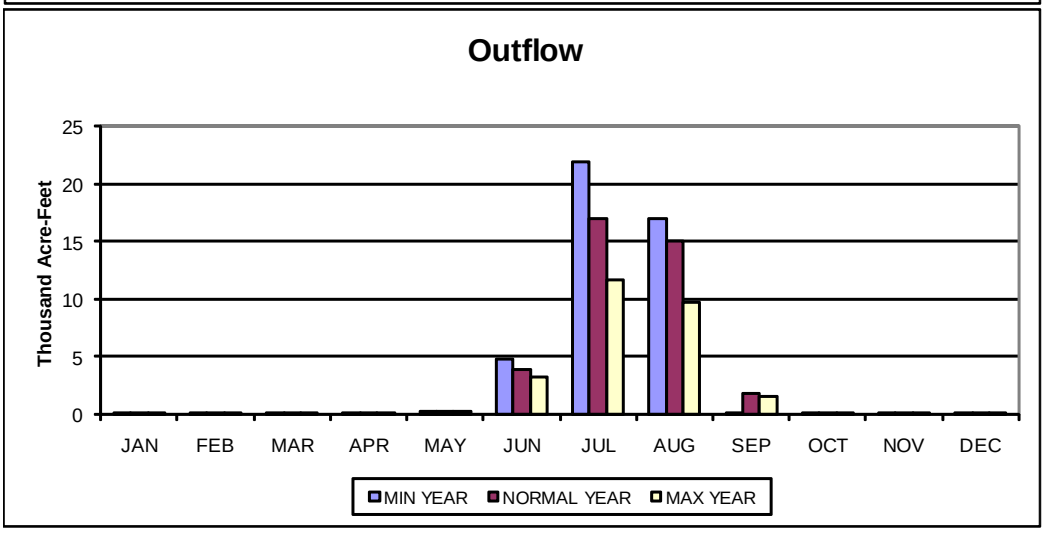
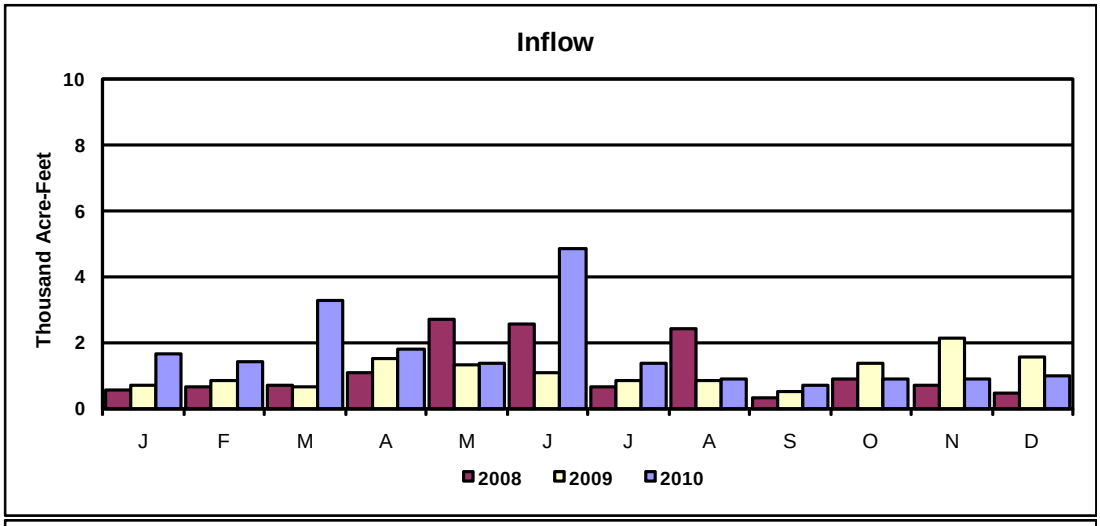
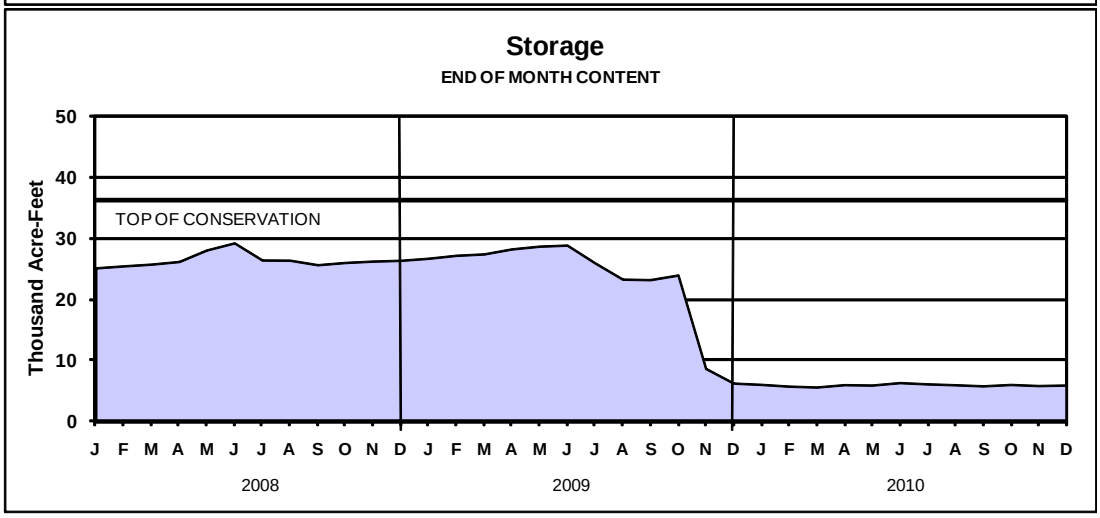


EXHIBIT 8A

HUGH BUTLER LAKE

ACTUAL OPERATION





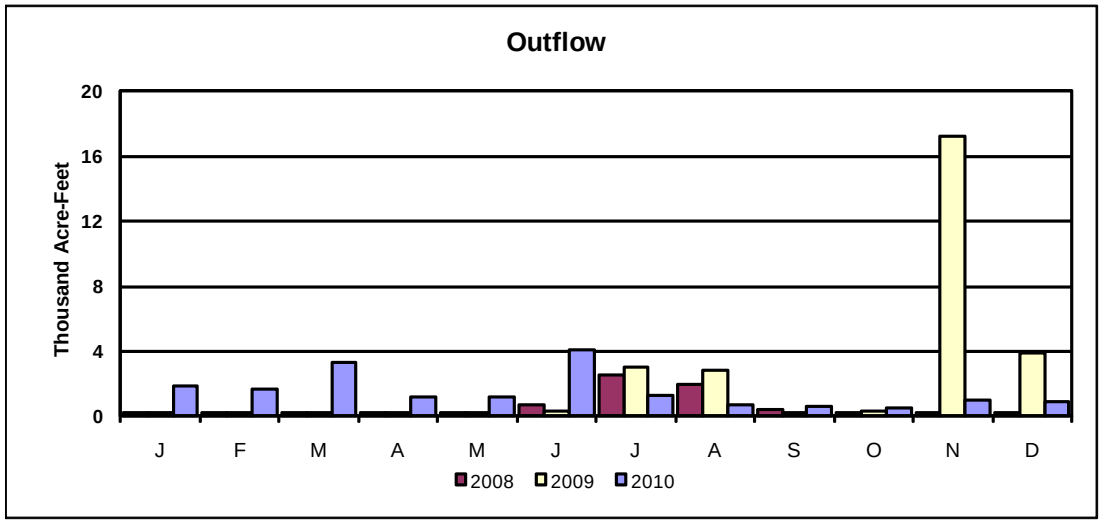
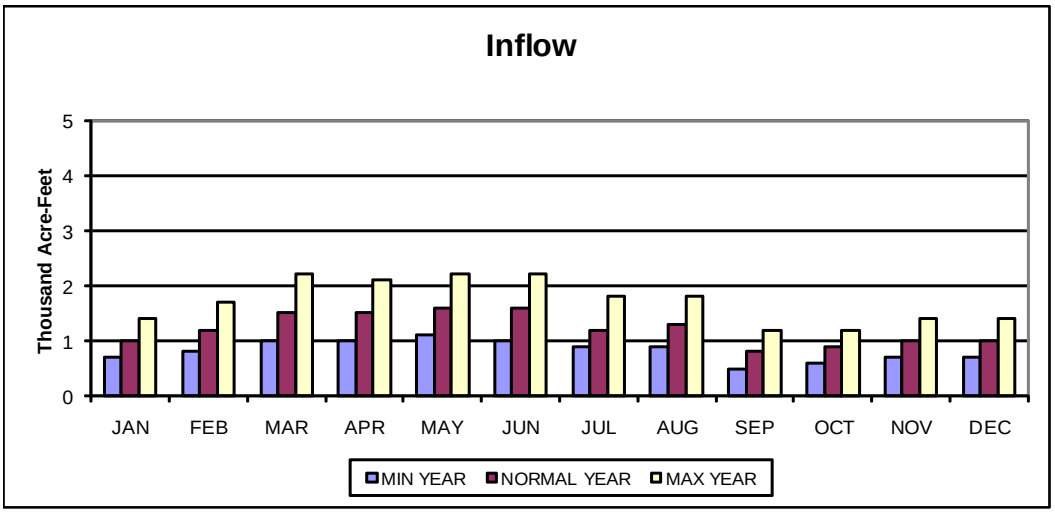
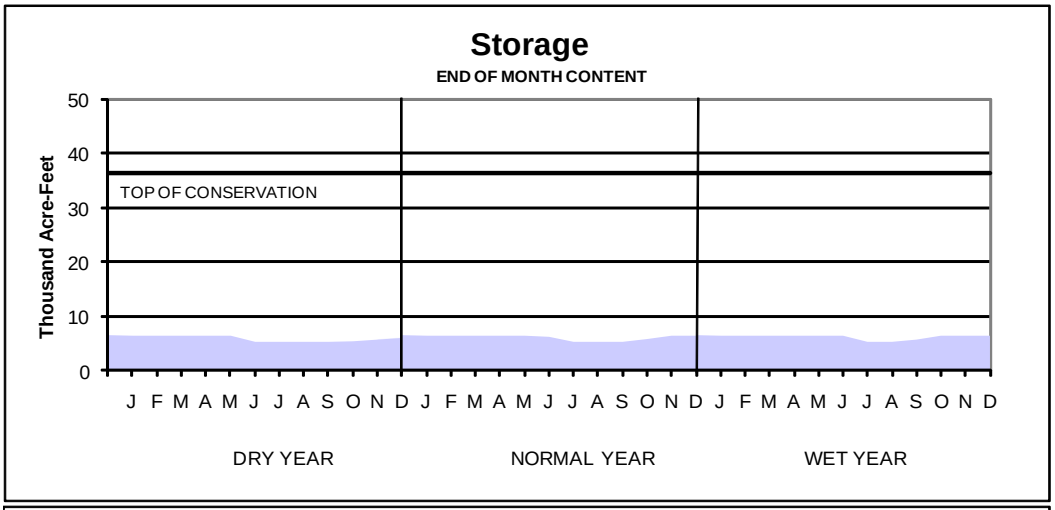


EXHIBIT 8B

HUGH BUTLER LAKE

2011 OPERATION PLAN





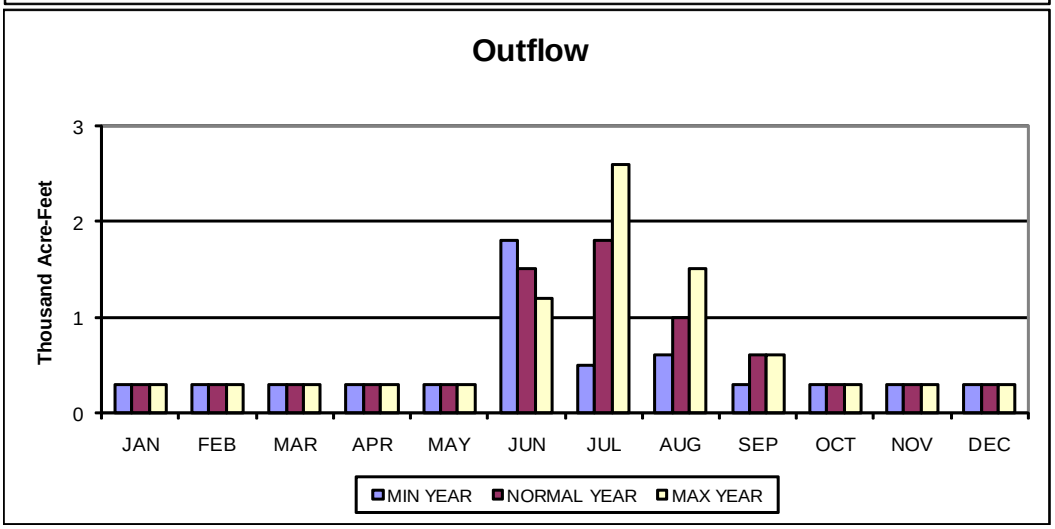
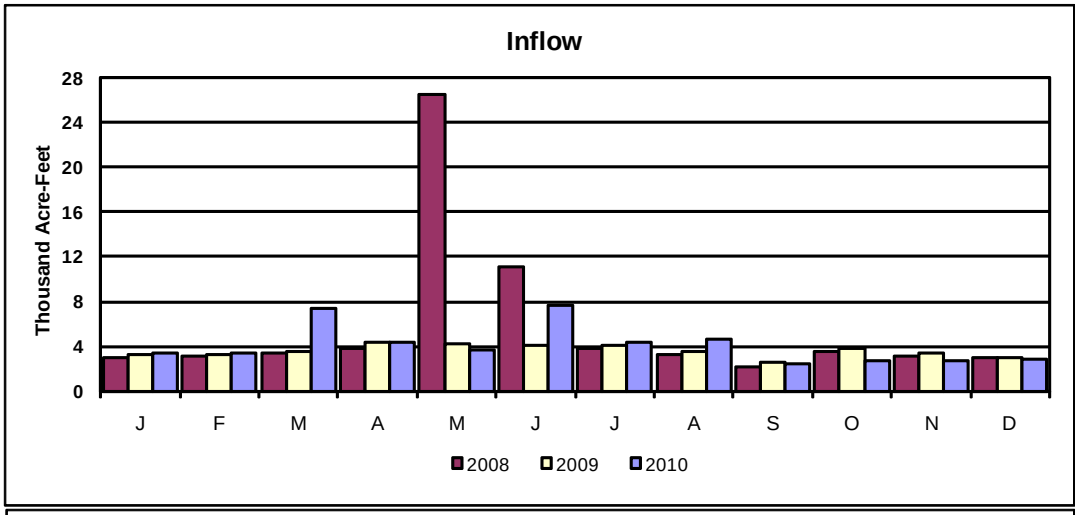
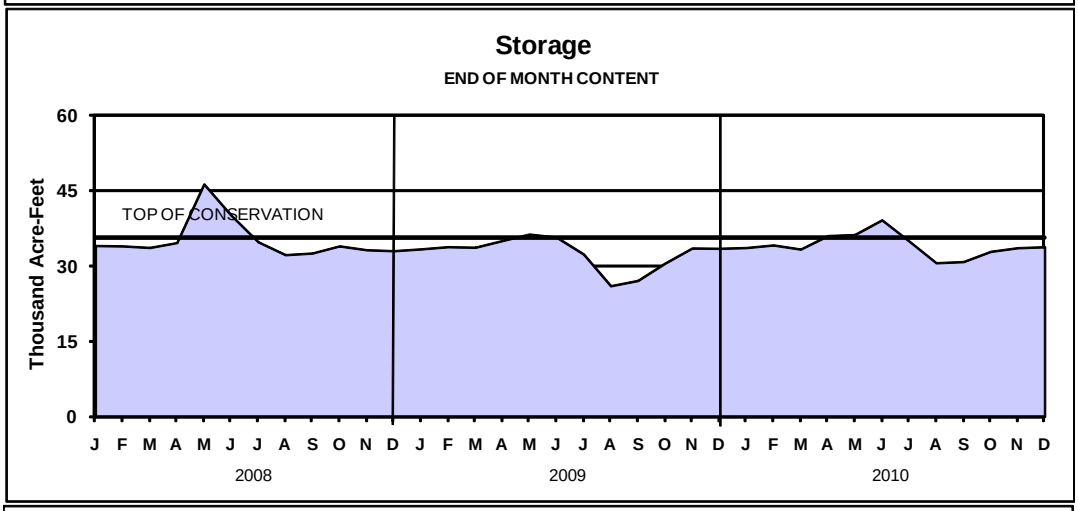


EXHIBIT 9A

HARRY STRUNK LAKE

ACTUAL OPERATION





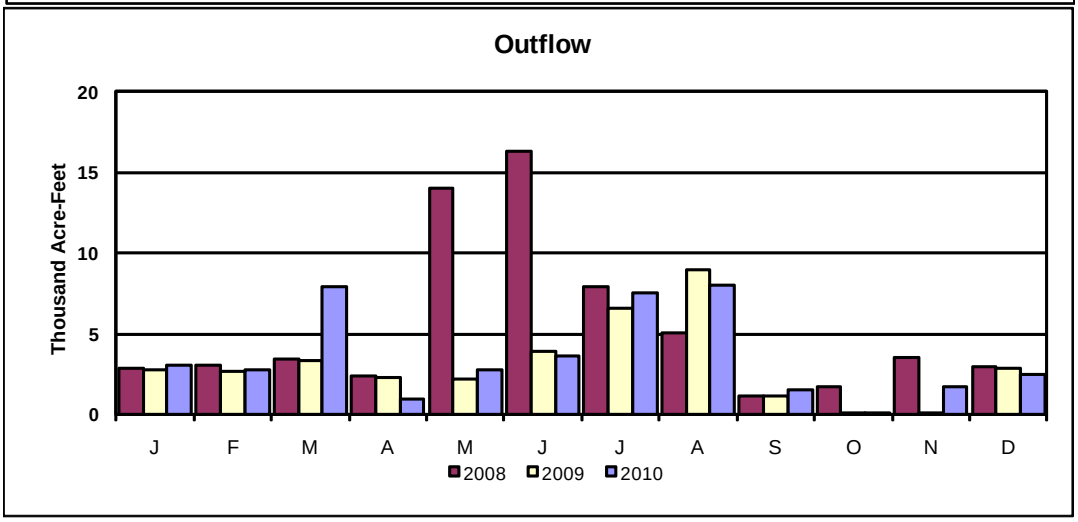
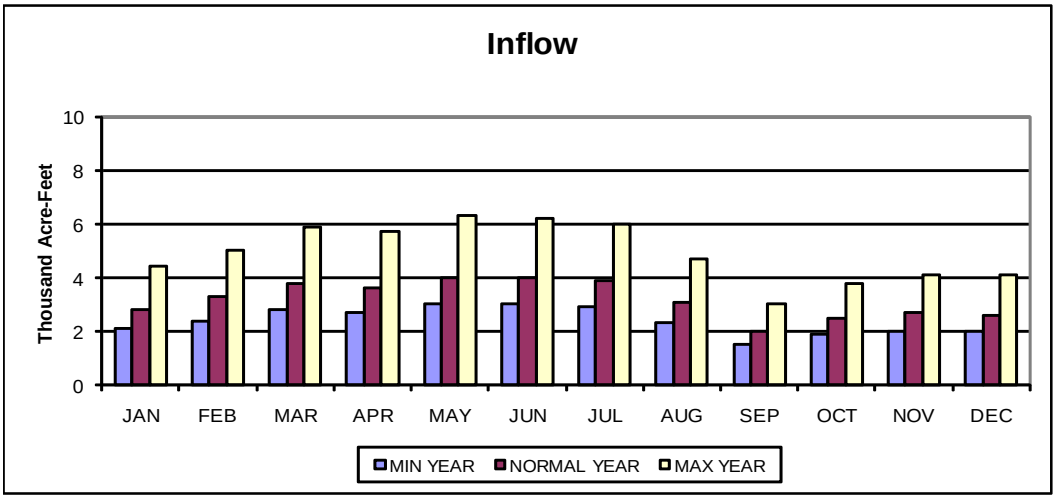
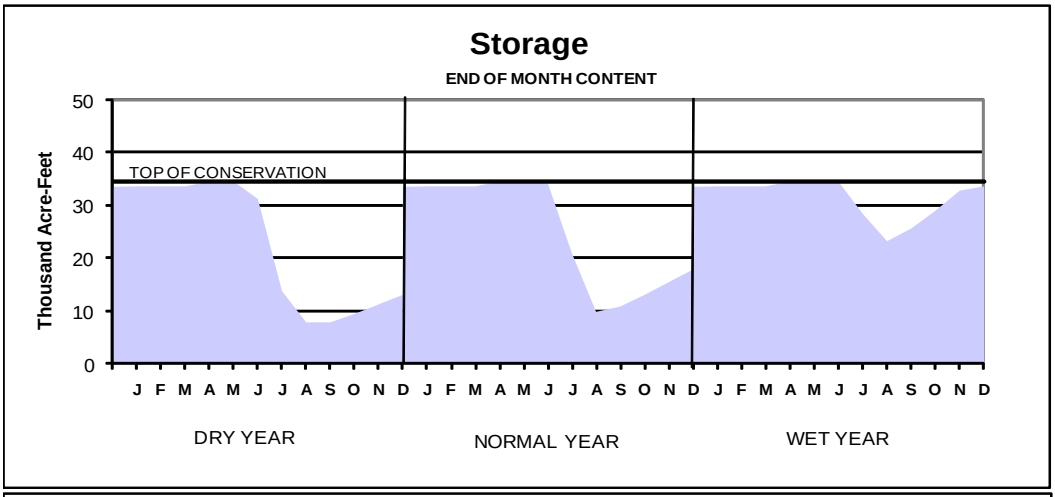


EXHIBIT 9B

HARRY STRUNK LAKE

2011 OPERATION PLAN





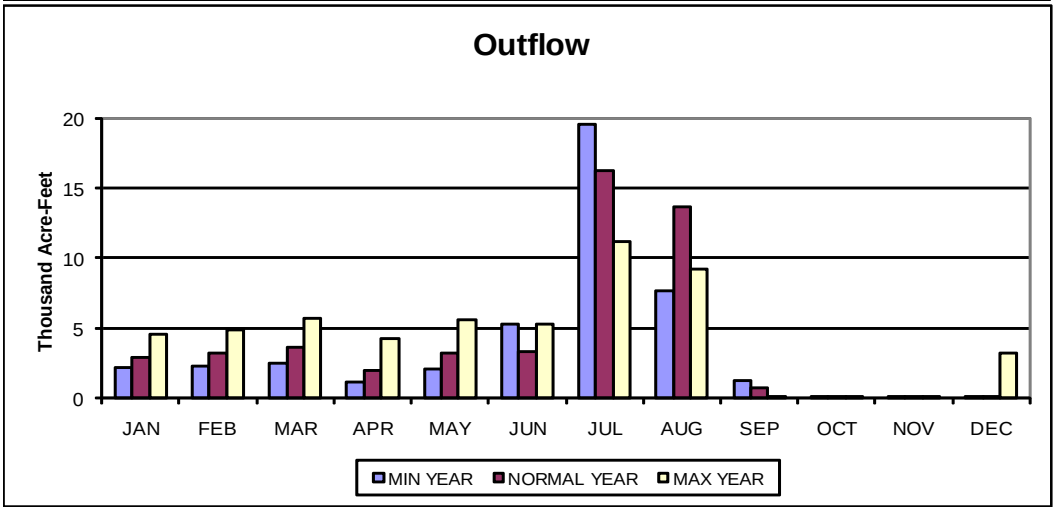
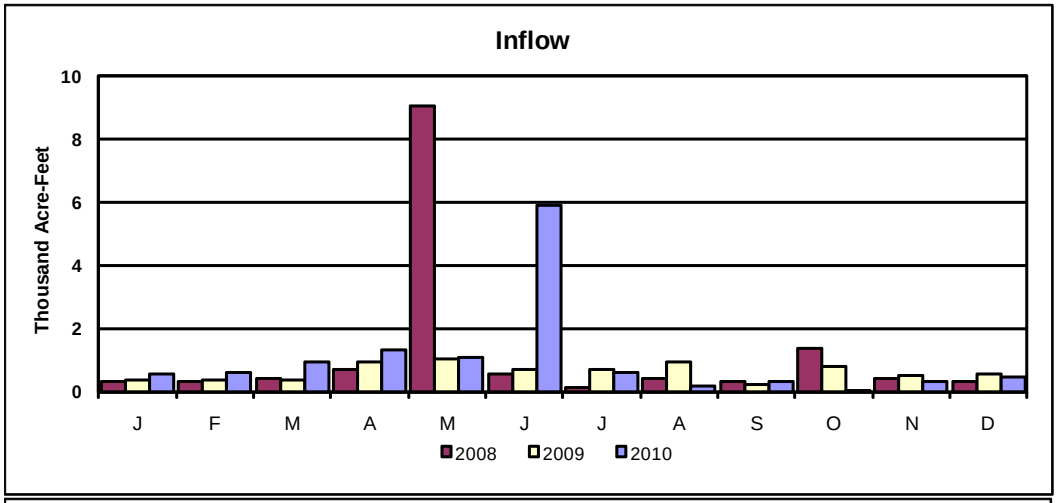
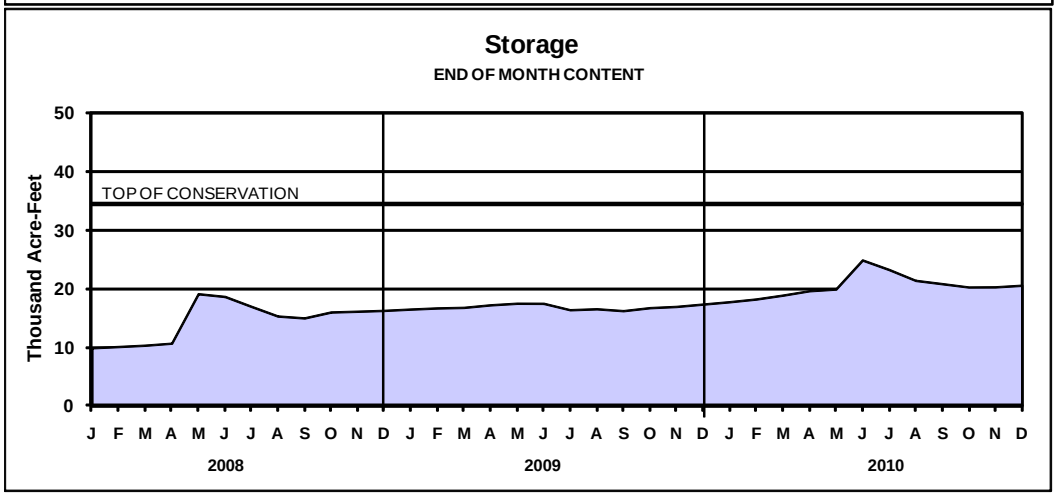


EXHIBIT 10A

KEITH SEBELIUS LAKE

ACTUAL OPERATION





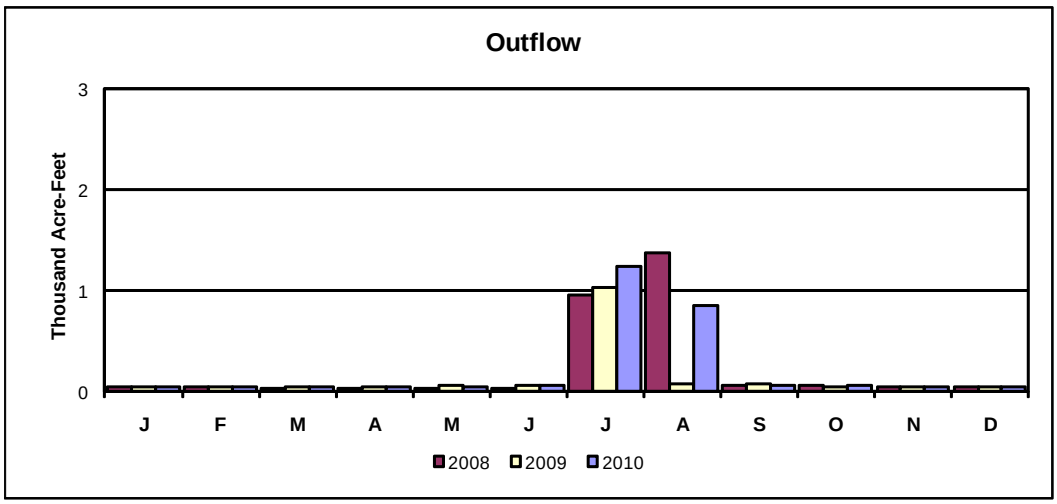
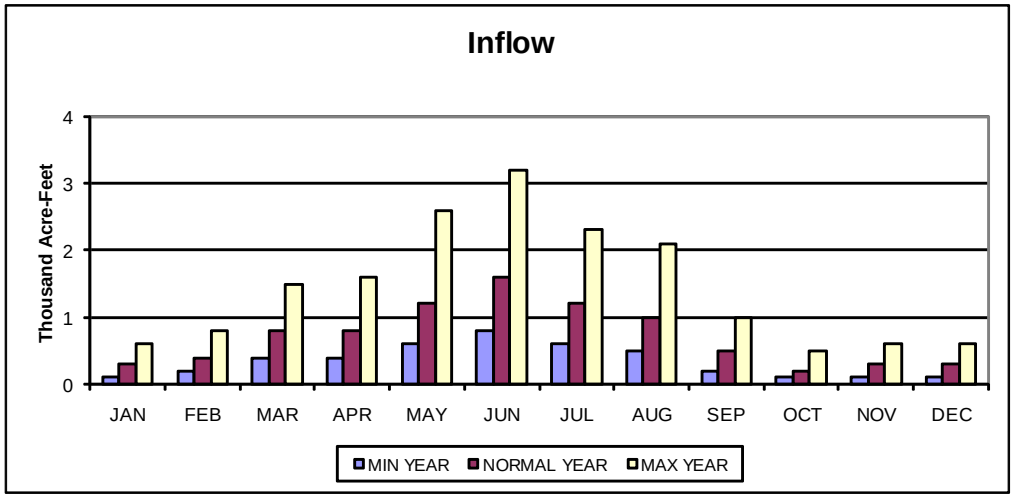
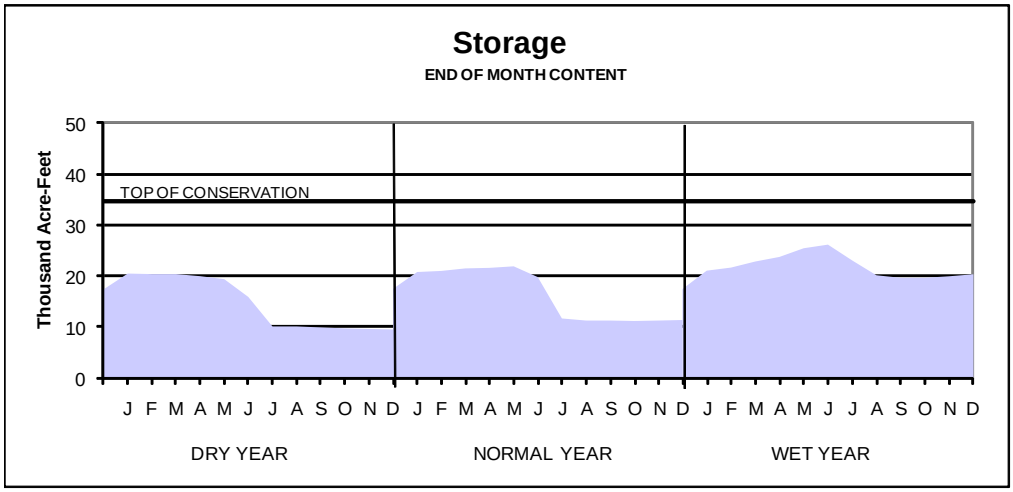


EXHIBIT 10B

KEITH SEBELIUS LAKE

2011 OPERATION PLAN





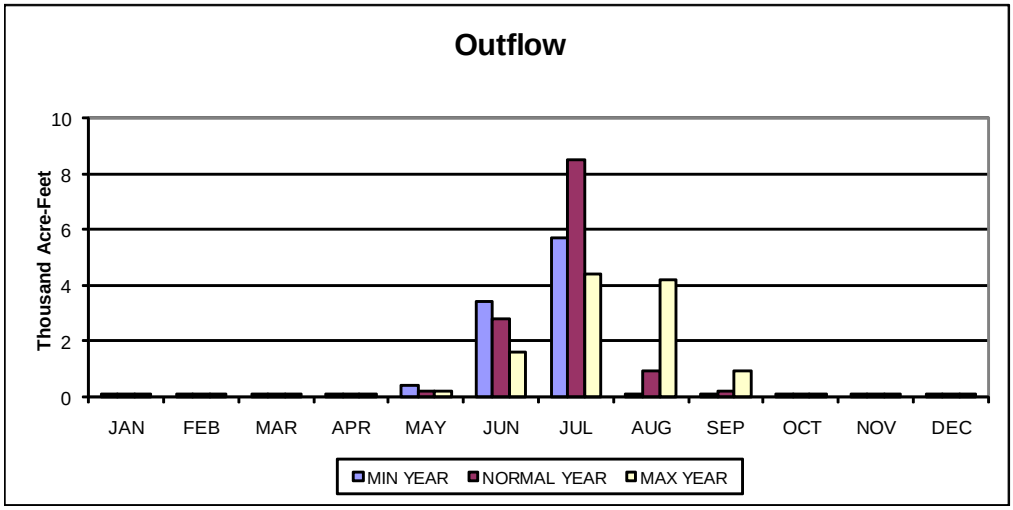
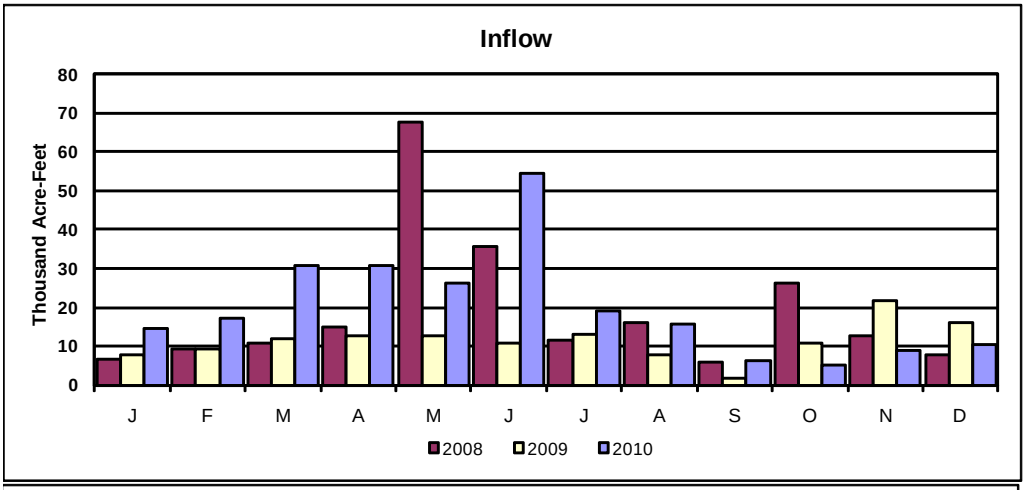
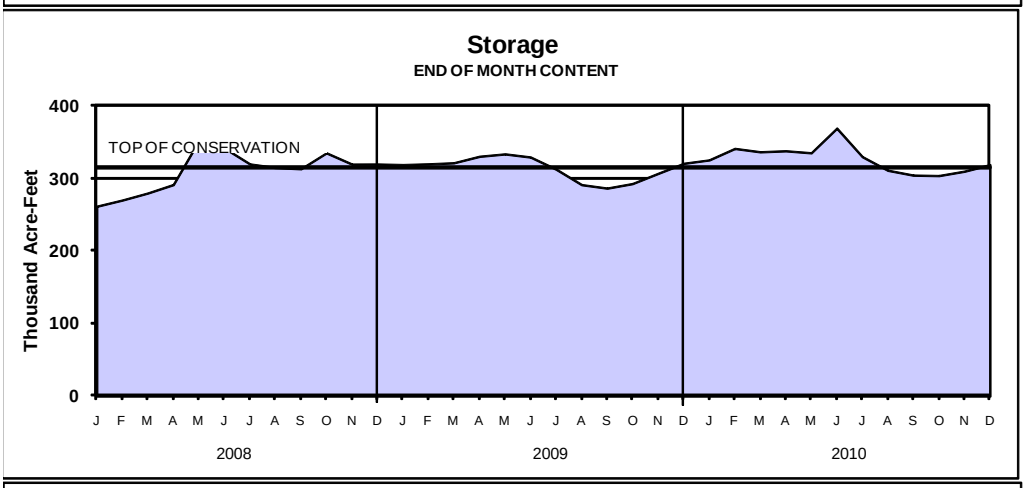


EXHIBIT 11A

HARLAN COUNTY LAKE

ACTUAL OPERATION





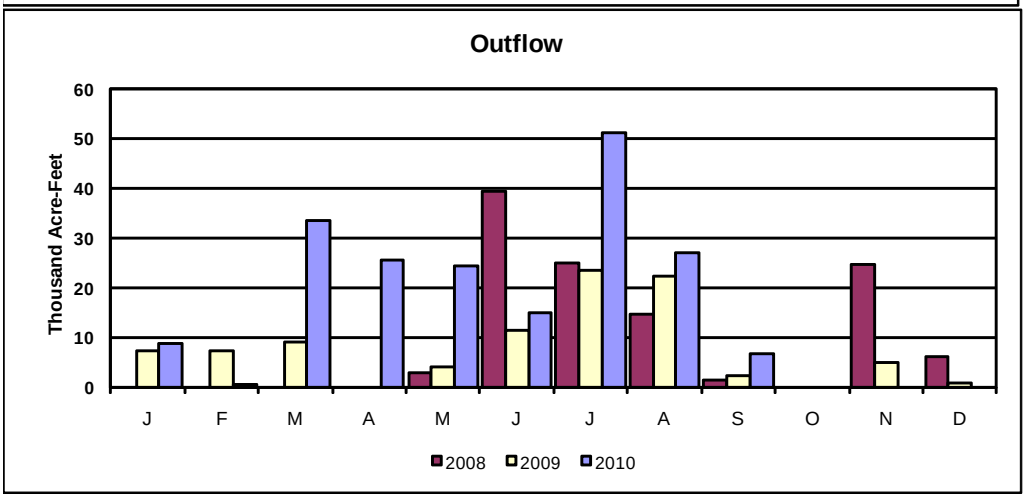
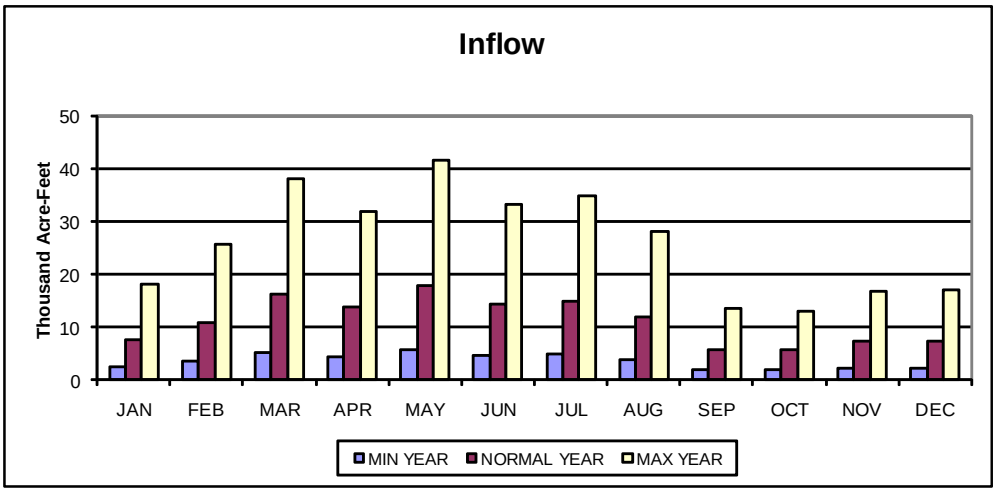
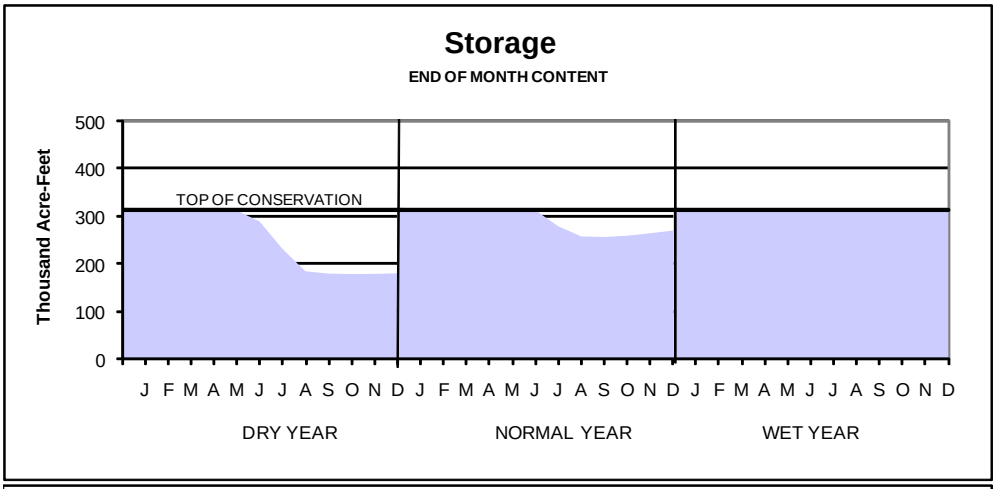


EXHIBIT 11B

HARLAN COUNTY LAKE

2011 OPERATION PLAN





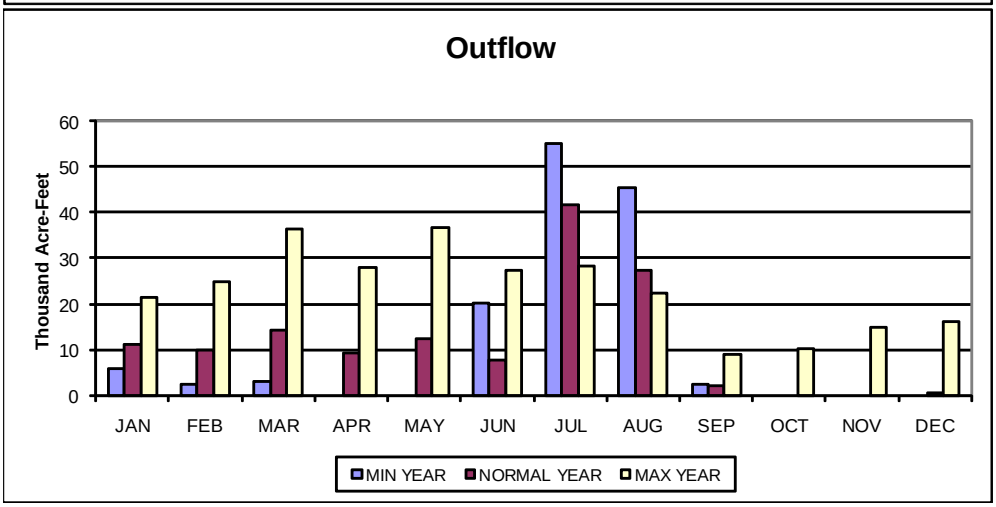
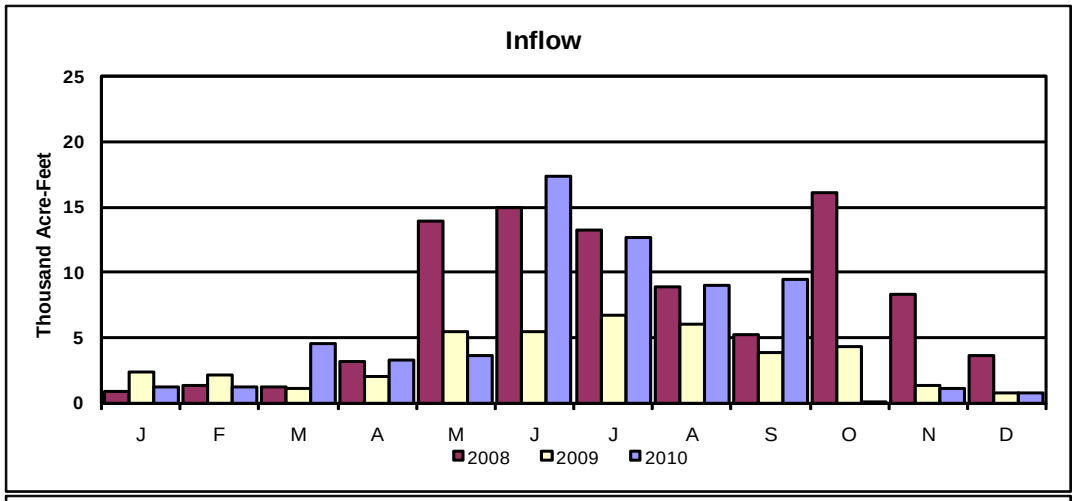
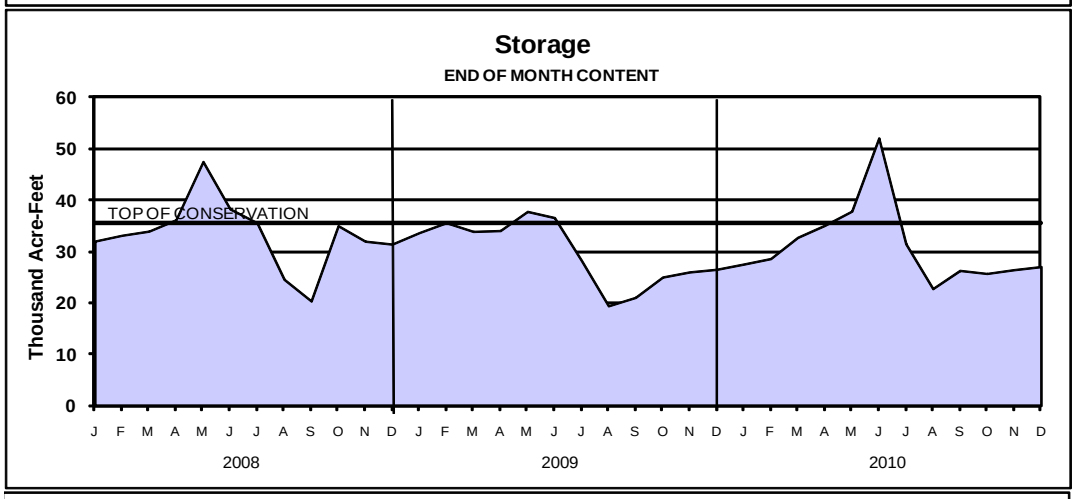


EXHIBIT 12A

LOVEWELL RESERVOIR

ACTUAL OPERATION





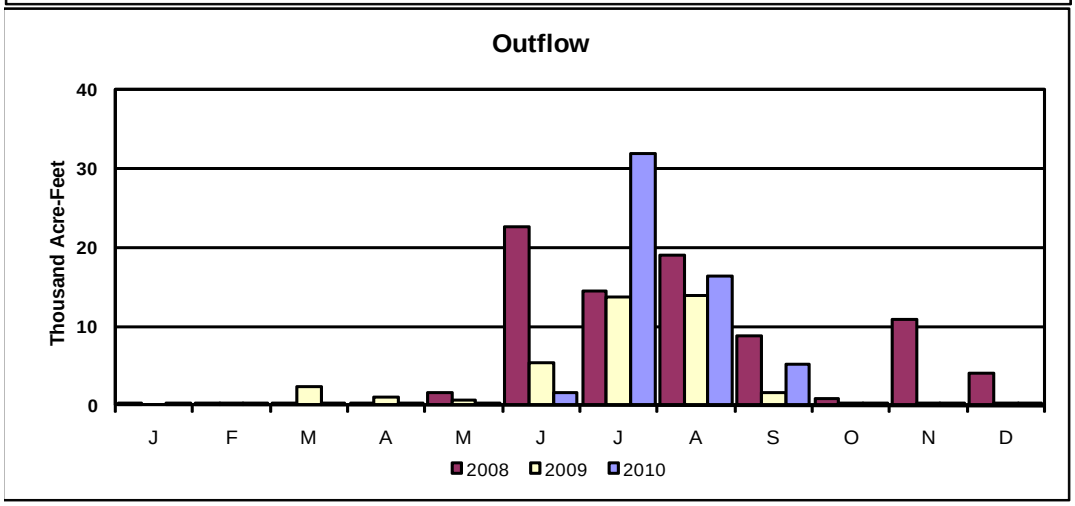
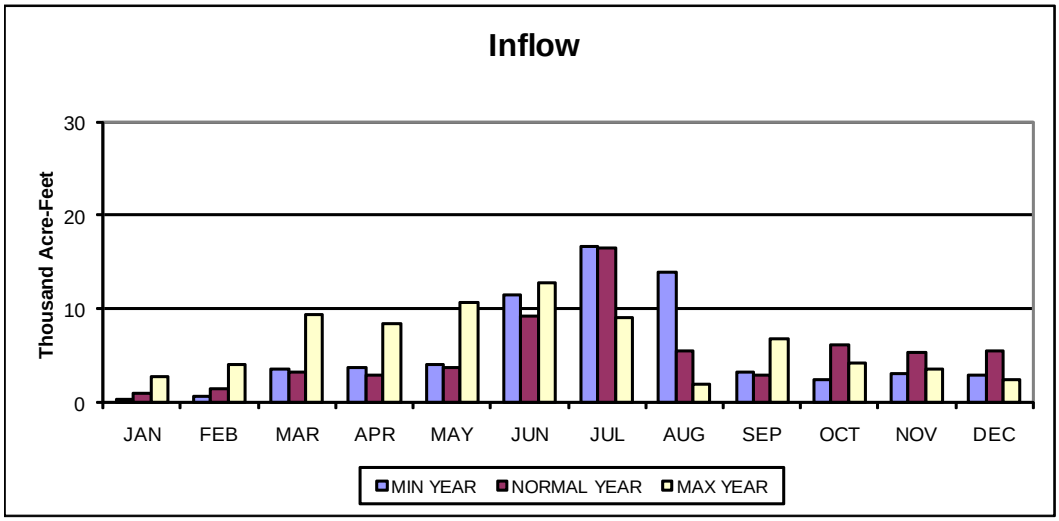
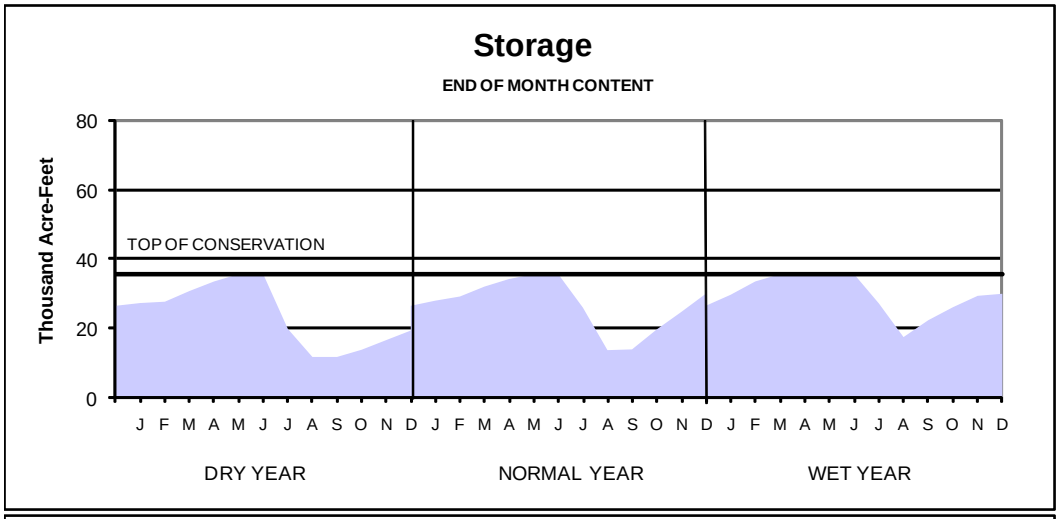


EXHIBIT 12B

LOVEWELL RESERVOIR

2011 OPERATION PLAN





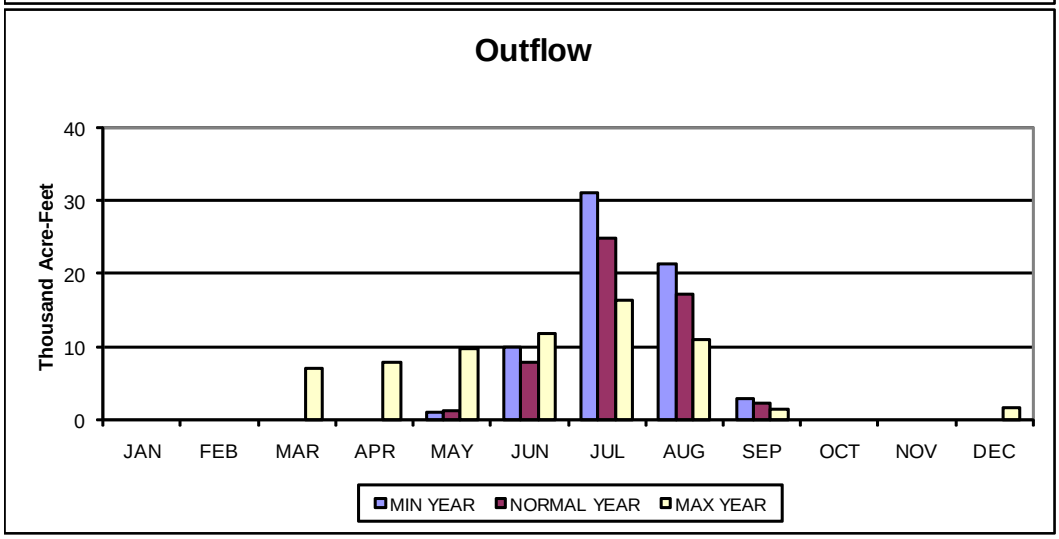
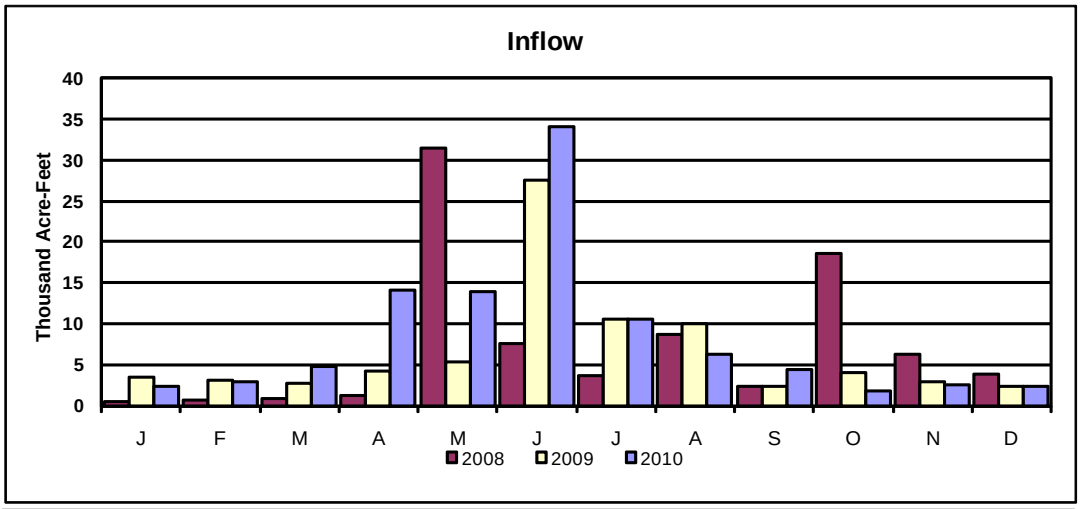
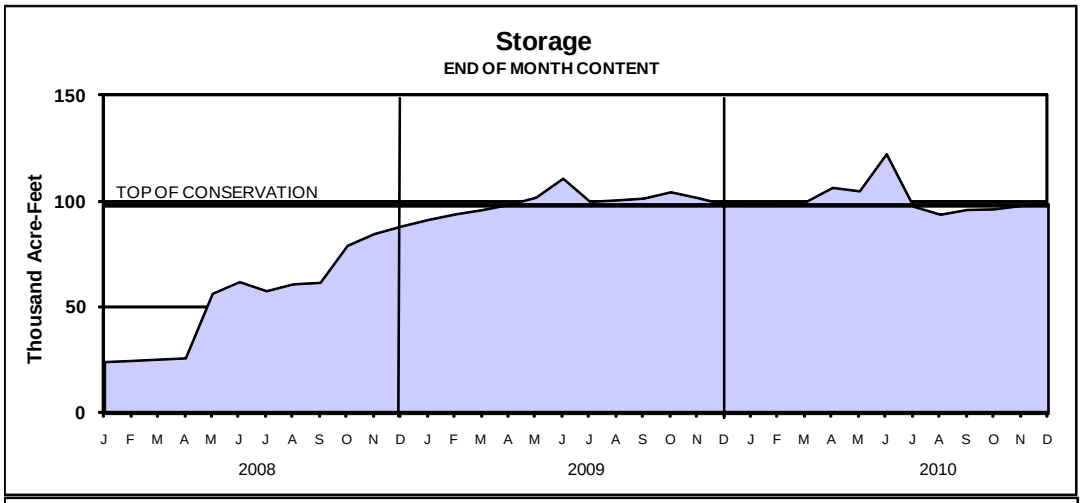


EXHIBIT 13A

KIRWIN RESERVOIR

ACTUAL OPERATION





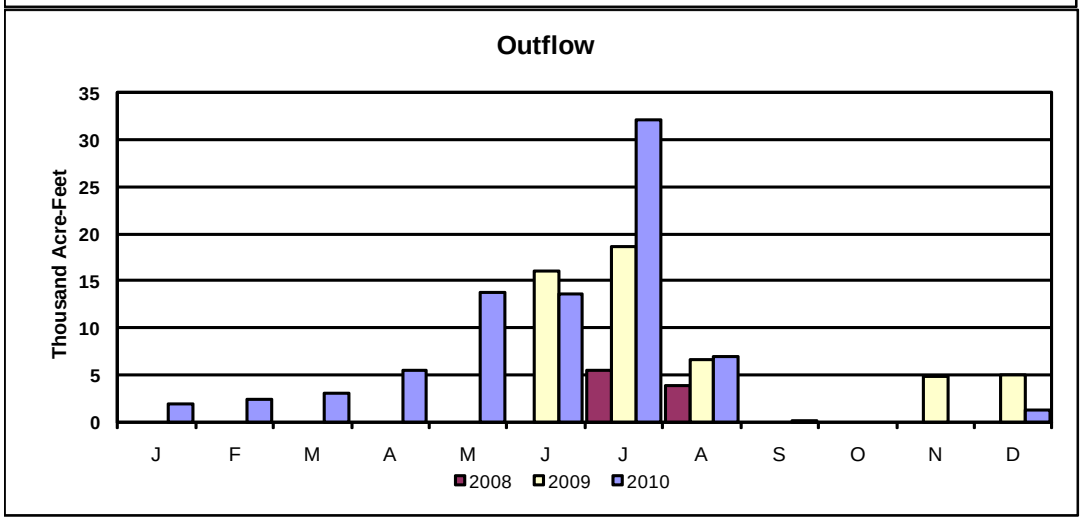
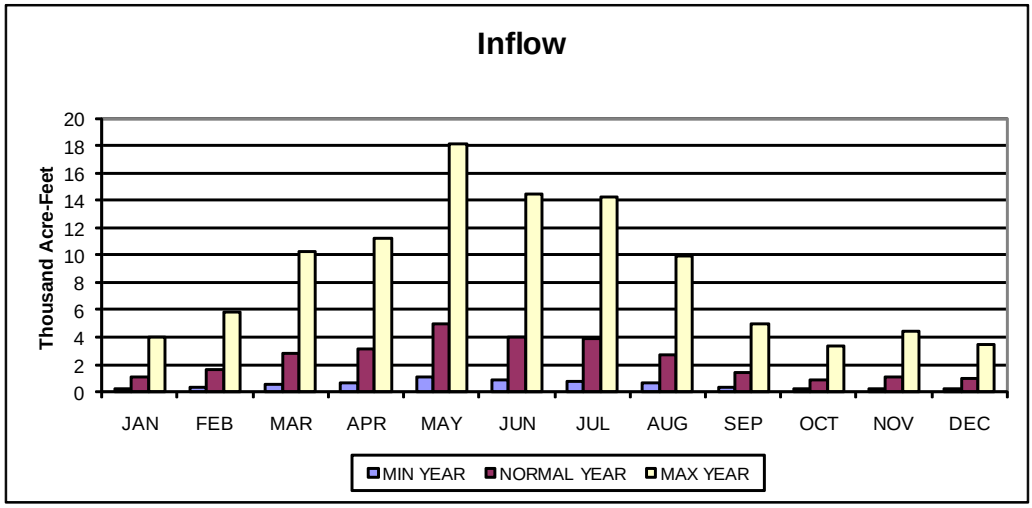
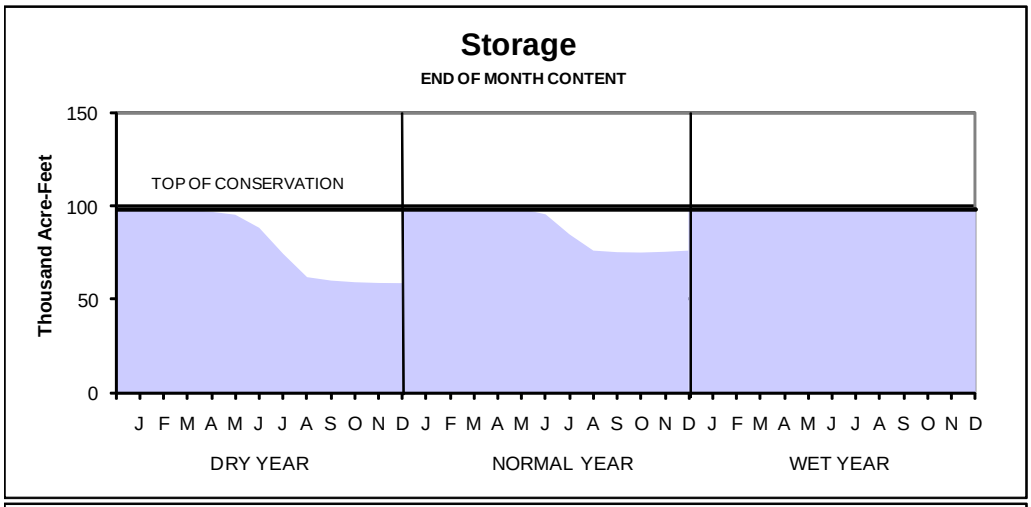


EXHIBIT 13B

KIRWIN RESERVOIR

2011 OPERATION PLAN





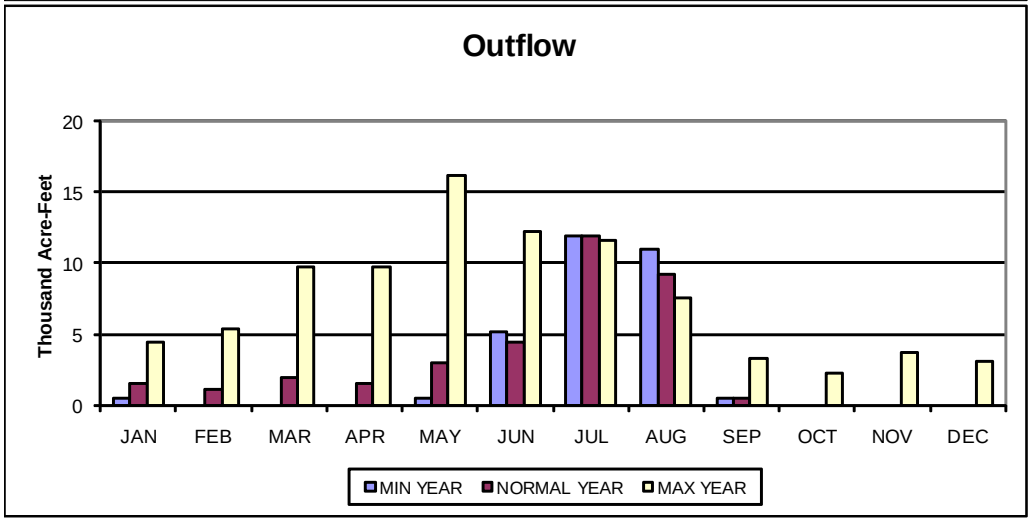
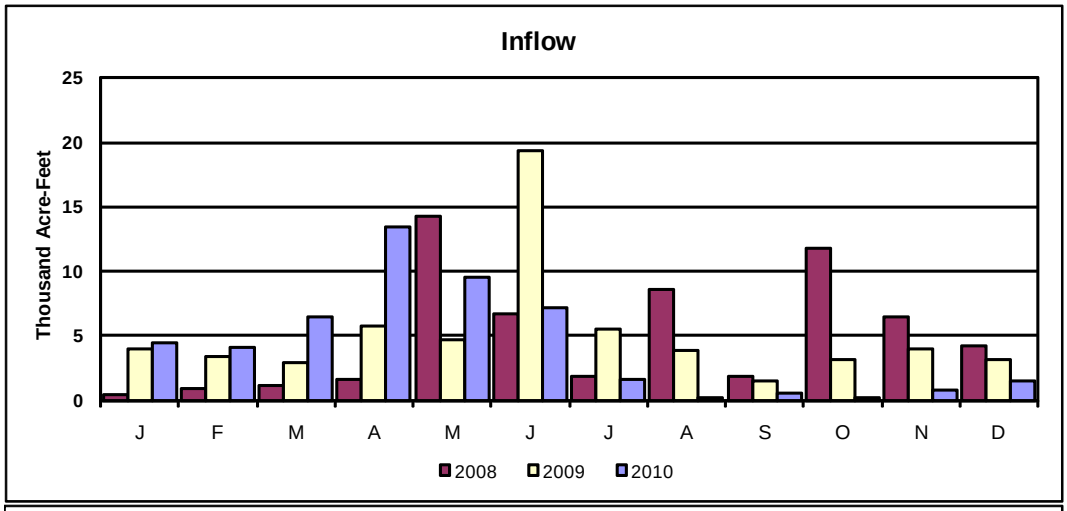
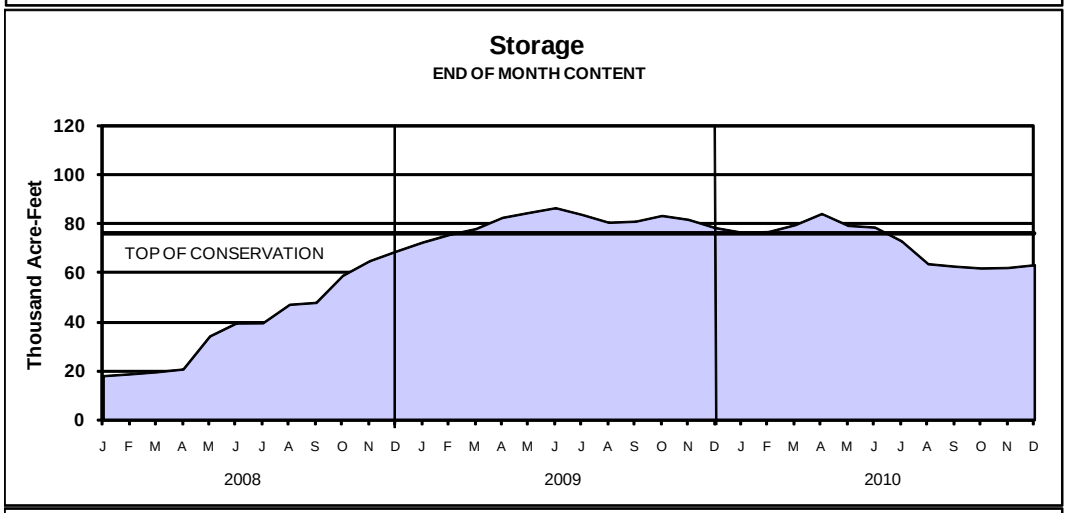


EXHIBIT 14A

WEBSTER RESERVOIR

ACTUAL OPERATION





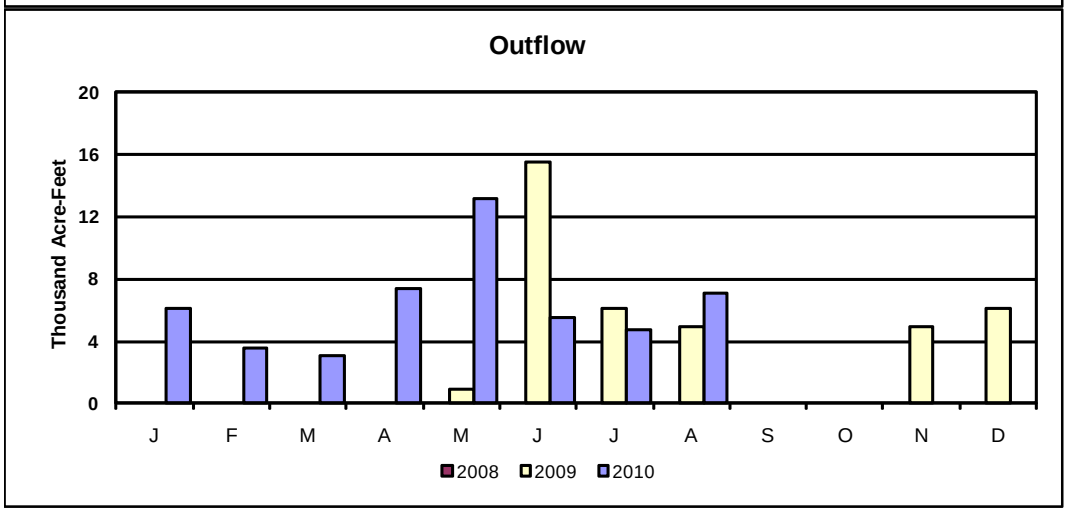
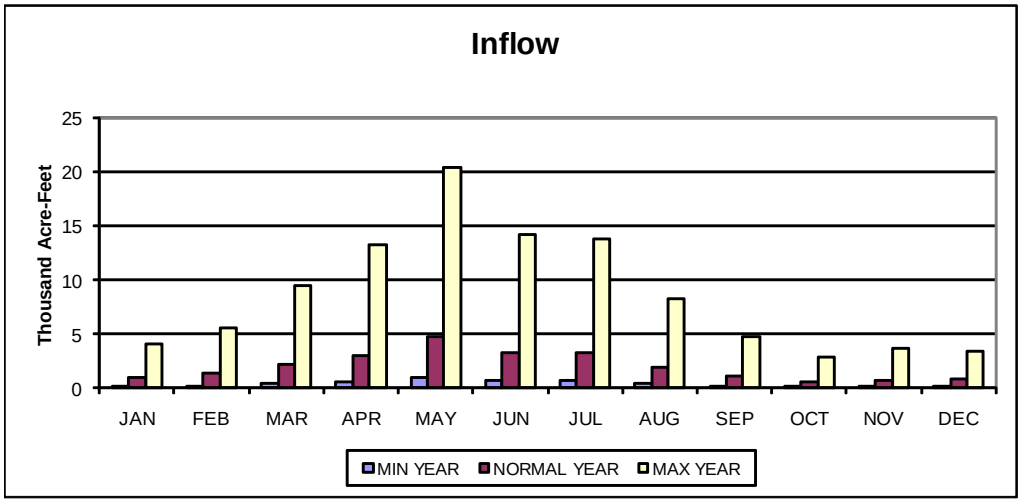
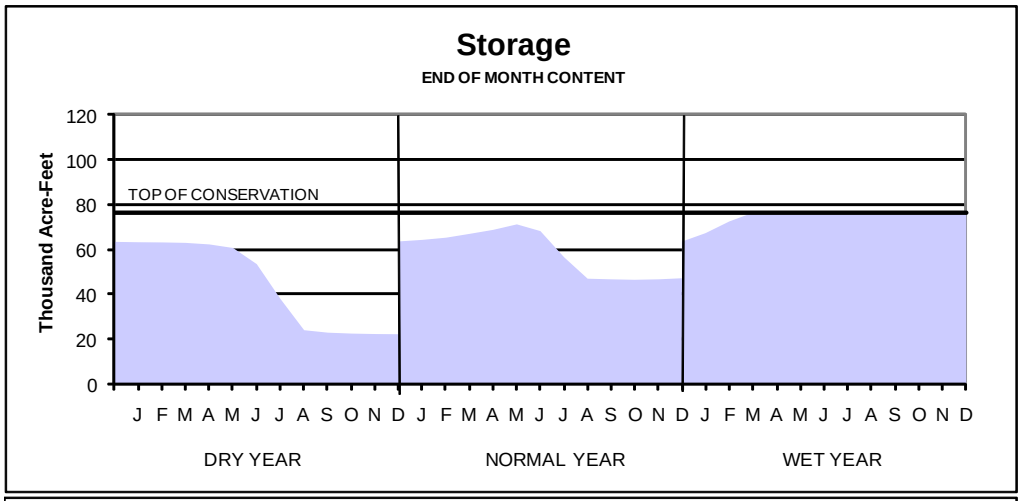


EXHIBIT 14B

WEBSTER RESERVOIR

2011 OPERATION PLAN





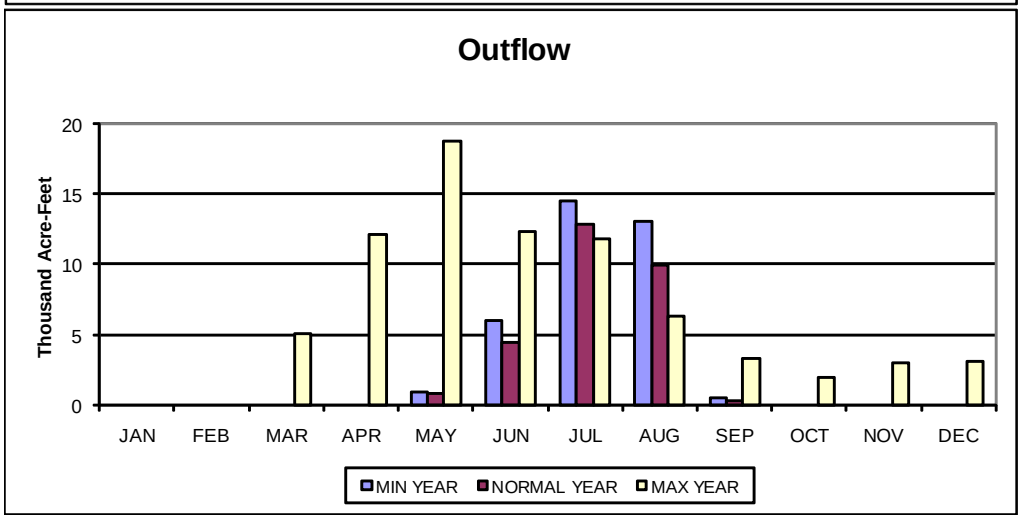
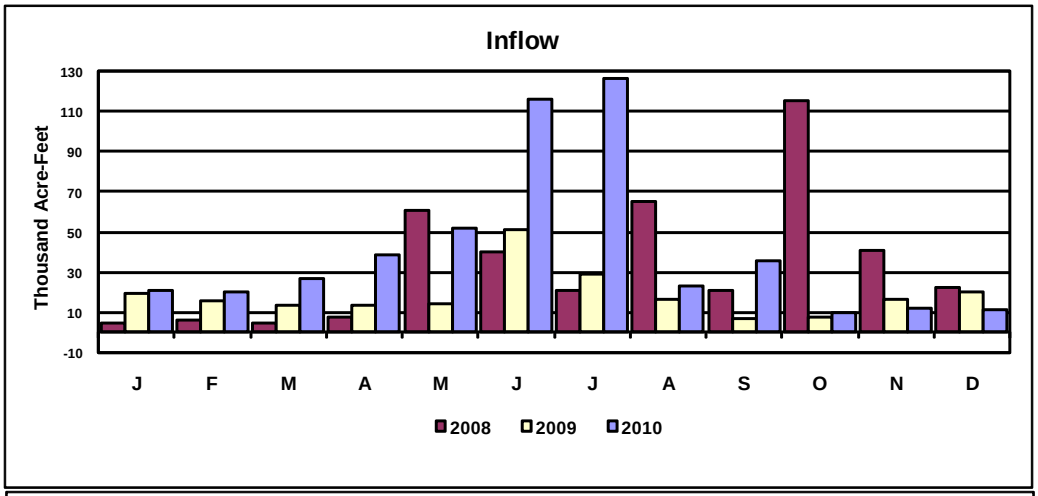
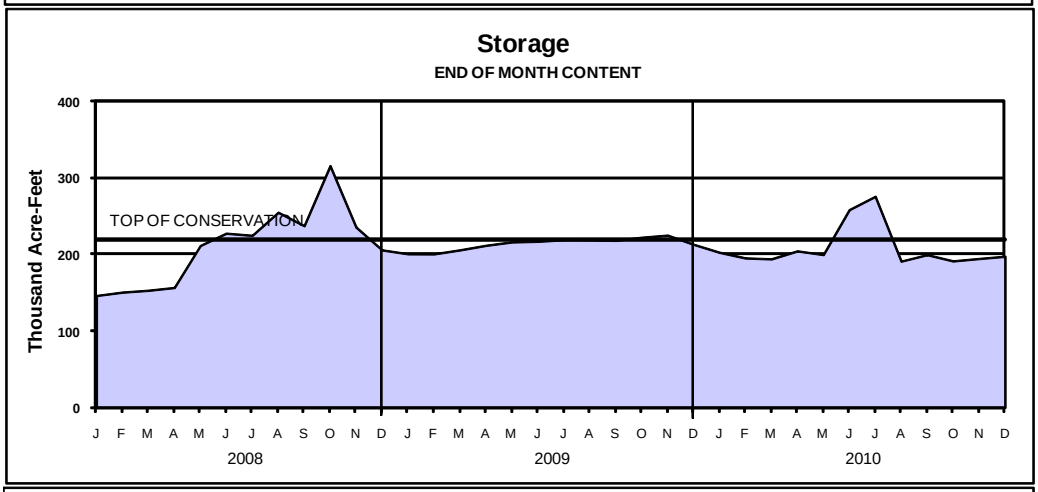


EXHIBIT 15A

WACONDA LAKE

ACTUAL OPERATION





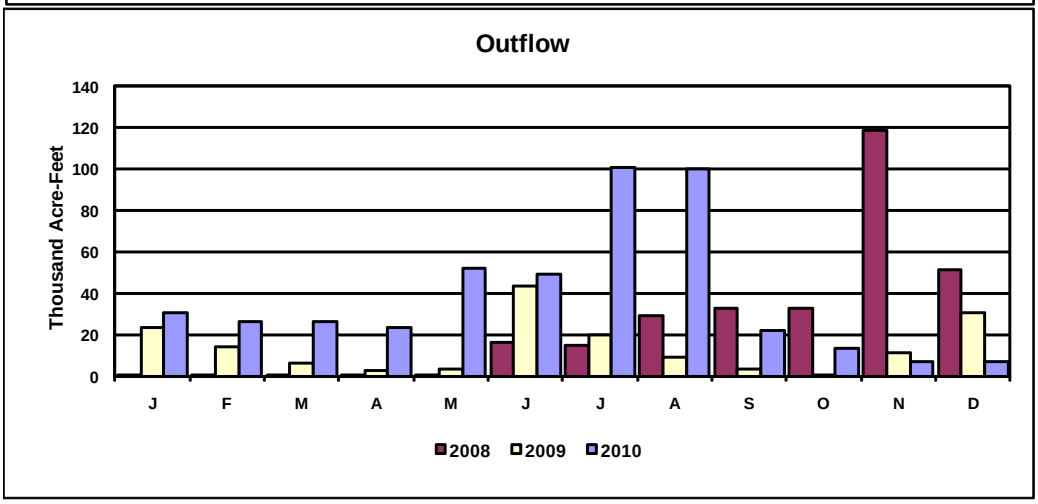
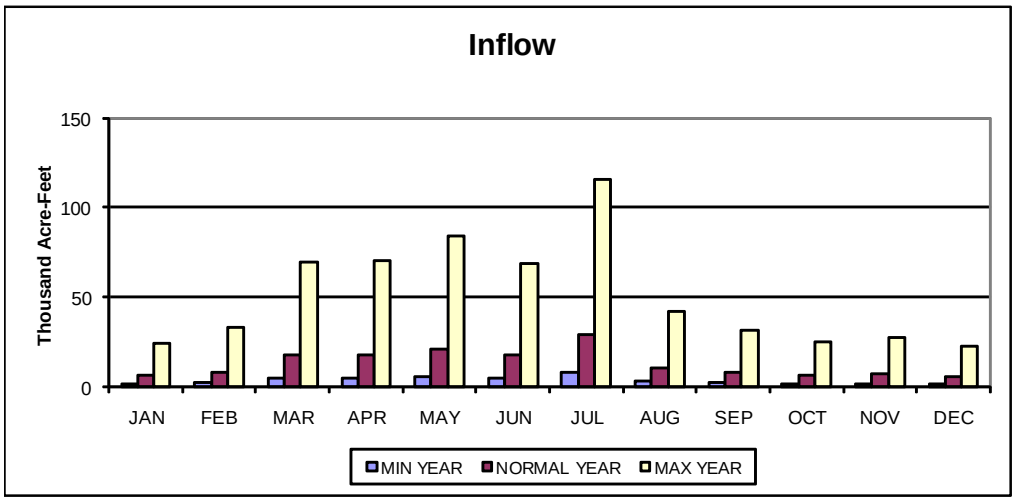
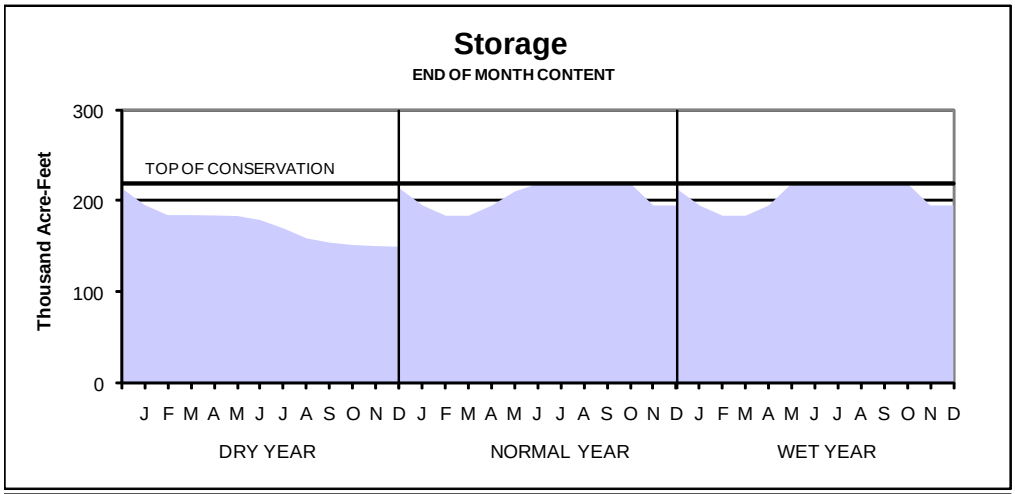


EXHIBIT 15B

WACONDA LAKE

2011 OPERATION PLAN





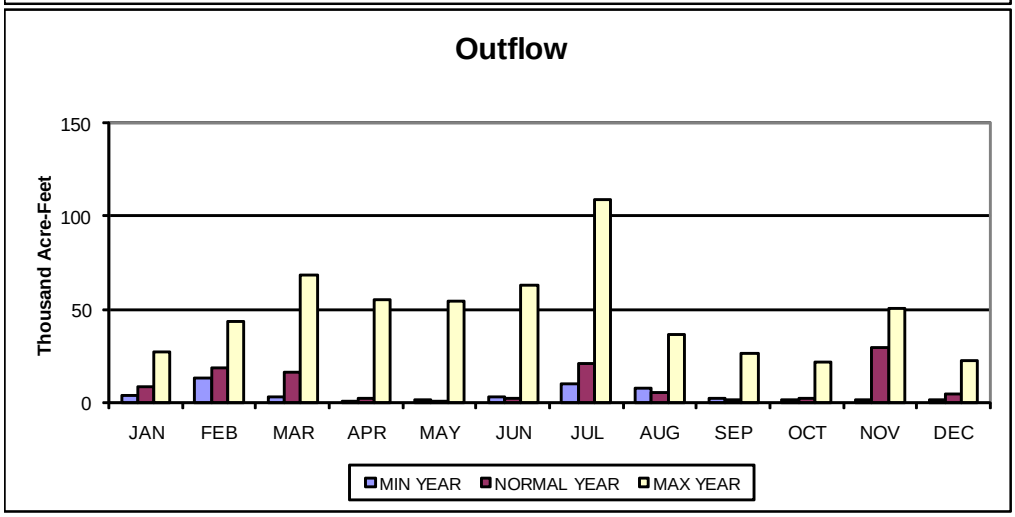
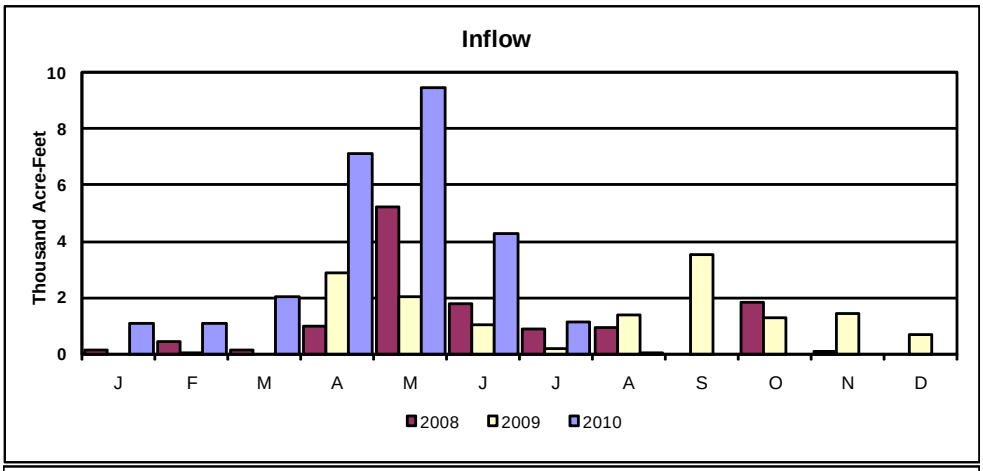
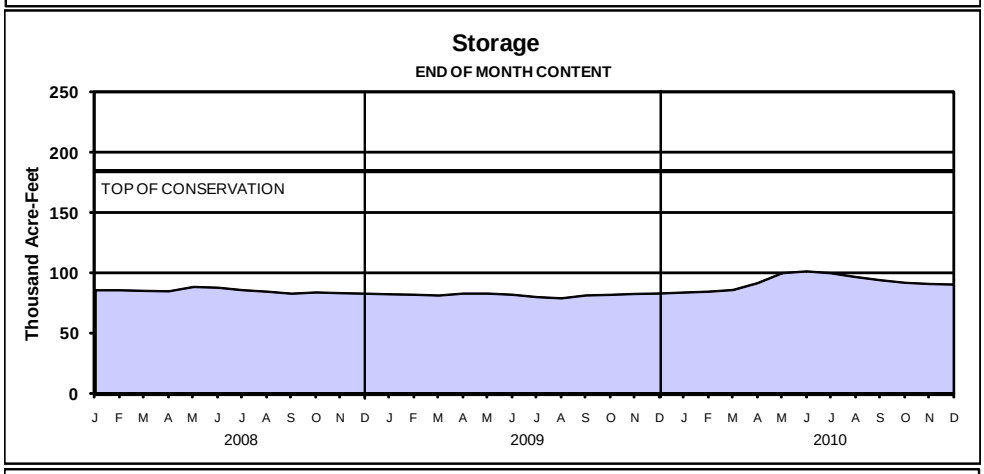


EXHIBIT 16A

CEDAR BLUFF RESERVOIR

ACTUAL OPERATION





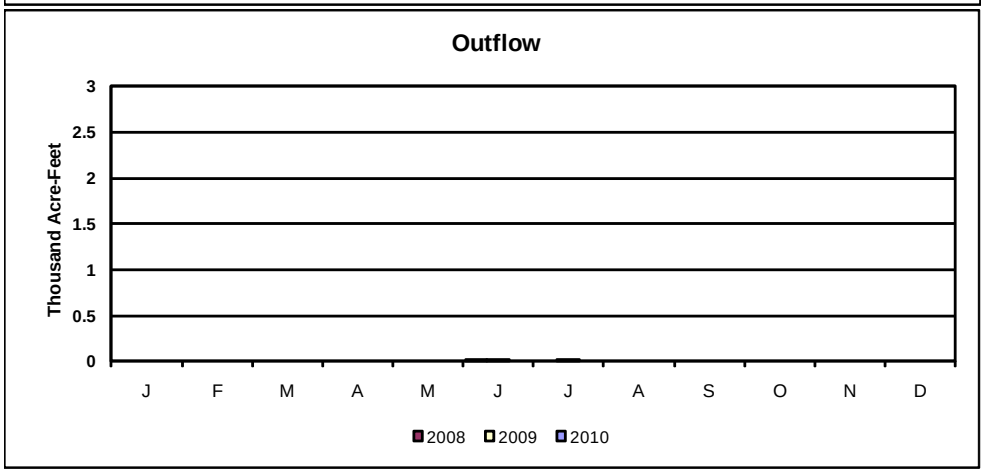
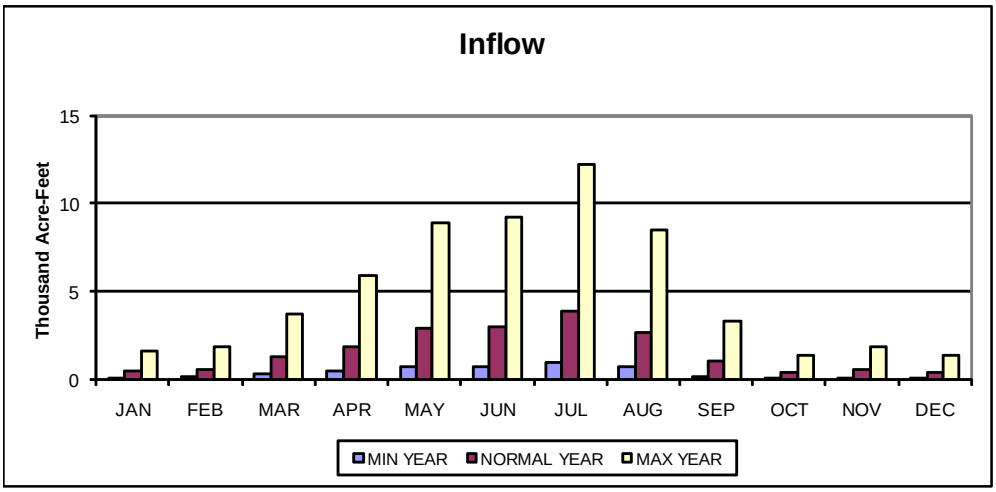
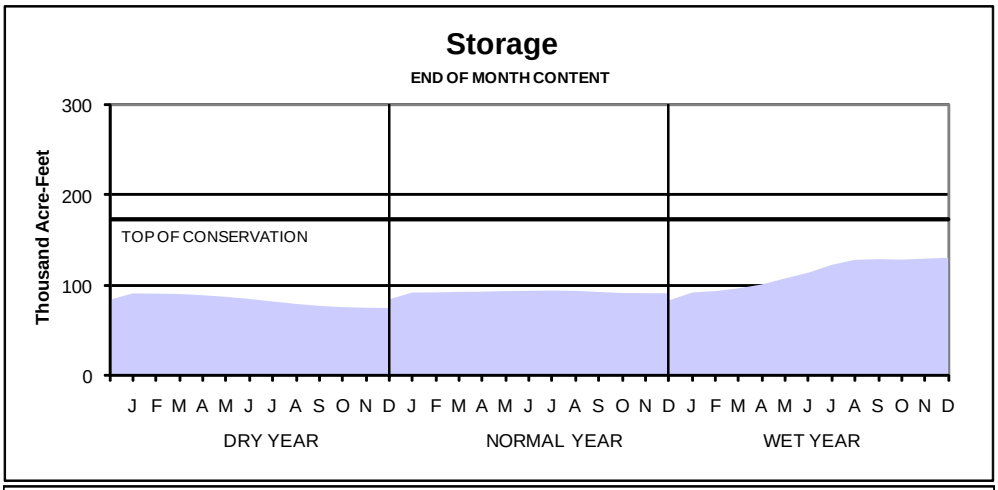


EXHIBIT 16B

CEDAR BLUFF RESERVOIR

2011 OPERATION PLAN





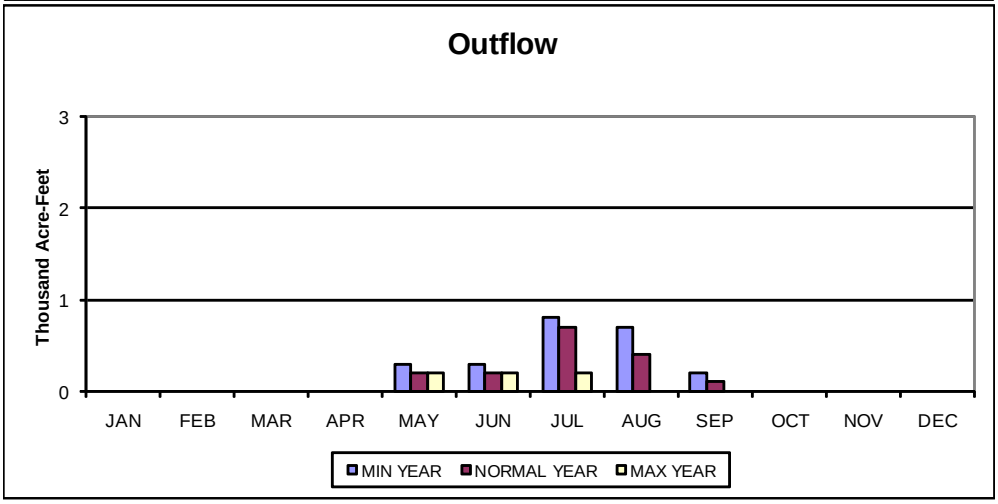
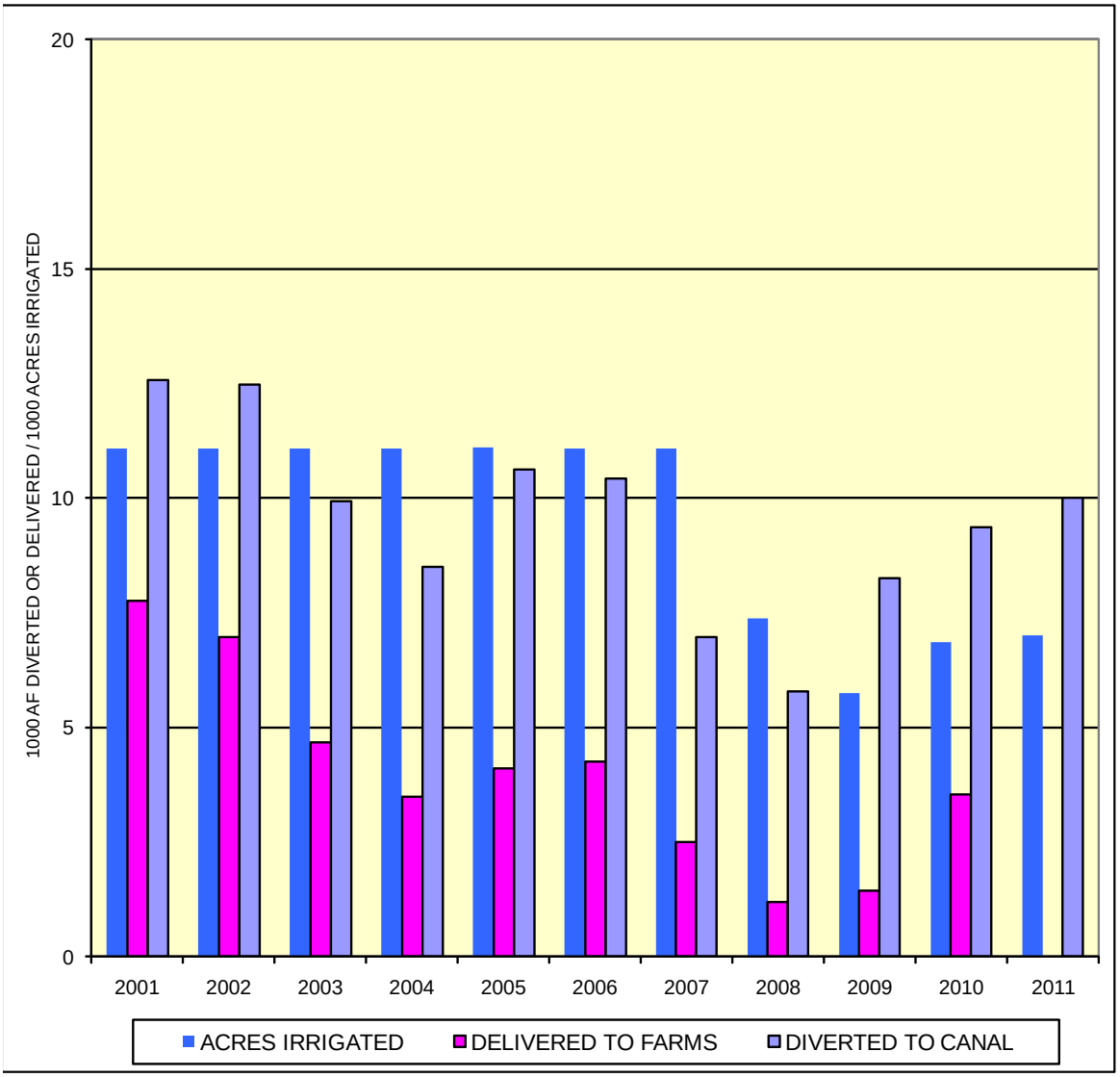


EXHIBIT 17

MIRAGE FLATS IRRIGATION DISTRICT

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



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
DIVERTED af/acre	1.13	1.12	0.90	0.77	0.96	0.94	0.63	0.78	1.44	1.37
DELIVERED af/acre	0.70	0.63	0.42	0.32	0.37	0.38	0.23	0.16	0.25	0.52
EFFICIENCY	62%	56%	47%	41%	39%	41%	36%	21%	18%	38%

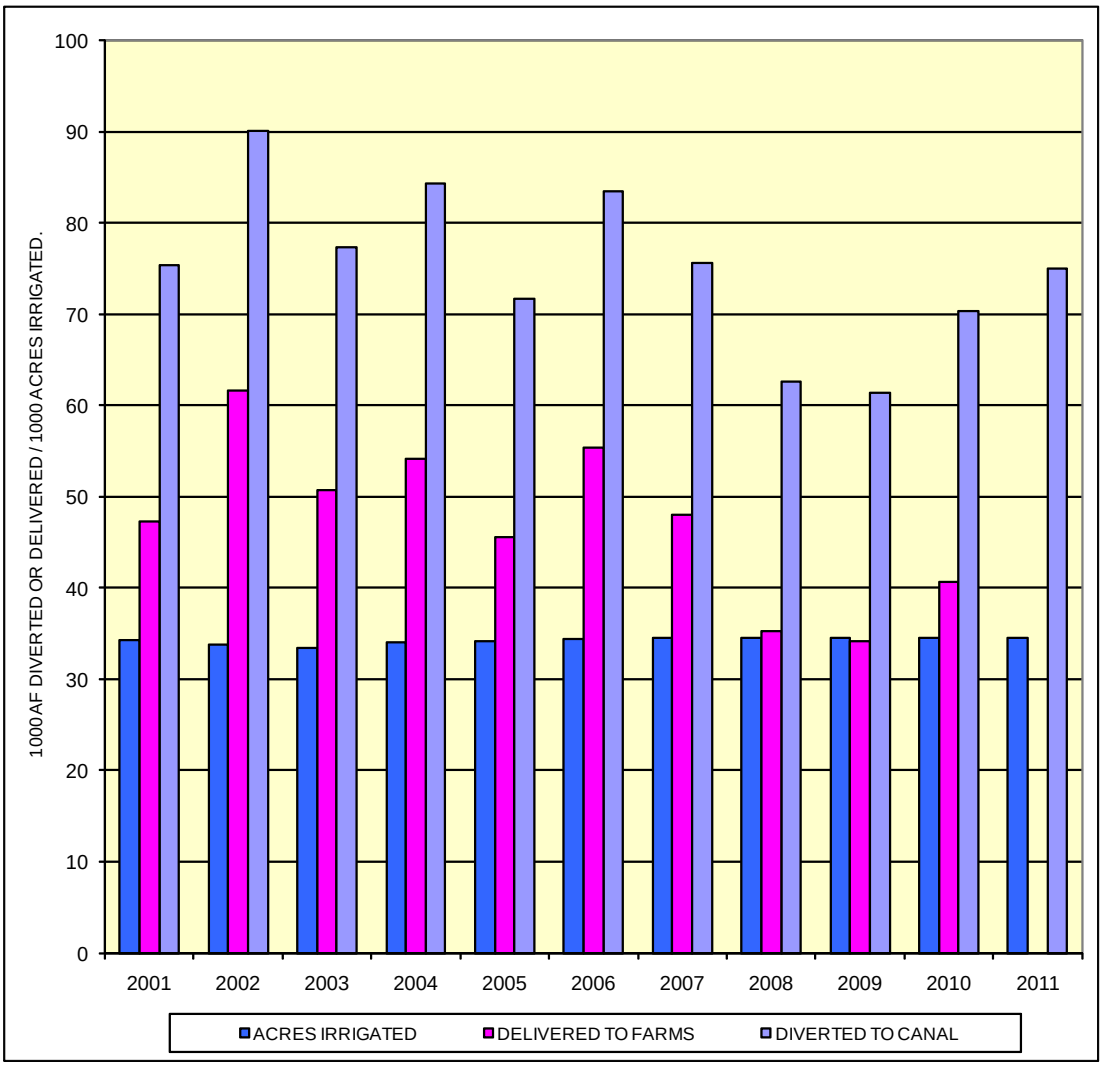
FORECASTED SHORTAGES (2011)

DRY YEAR	16,800 AF
NORMAL YEAR	8,100 AF
WET YEAR	0 AF

EXHIBIT 18

AINSWORTH IRRIGATION DISTRICT

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



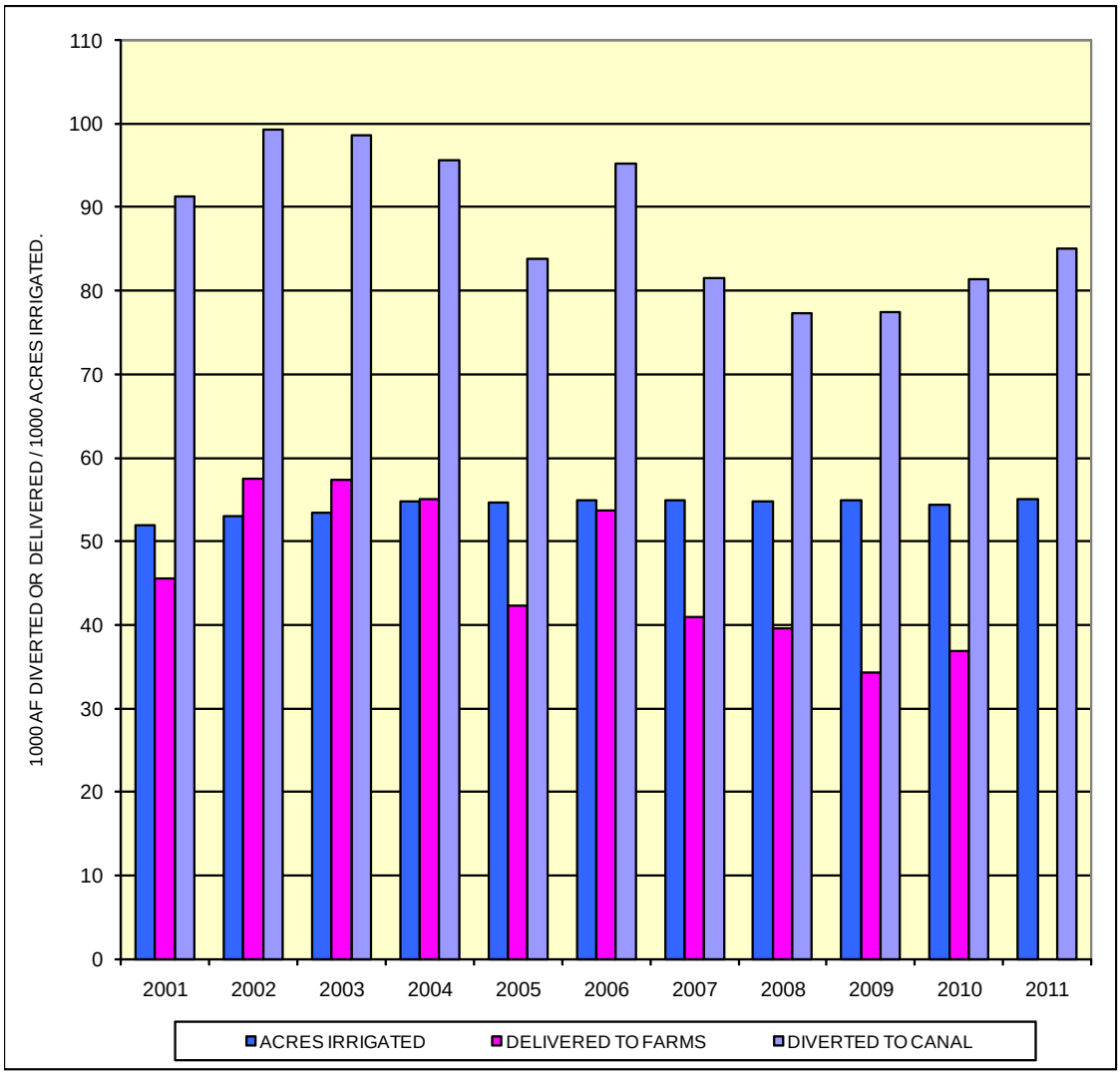
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
DIVERTED af/acre	2.20	2.67	2.31	2.48	2.10	2.42	2.19	1.81	1.77	2.03
DELIVERED af/acre	1.38	1.83	1.52	1.59	1.33	1.61	1.39	1.02	0.99	1.18
EFFICIENCY	63%	68%	66%	64%	63%	66%	64%	56%	56%	58%

FORECASTED SHORTAGES (2011)	
DRY YEAR	0 AF
NORMAL YEAR	0 AF
WET YEAR	0 AF

EXHIBIT 19

TWIN LOUPS IRRIGATION DISTRICT

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



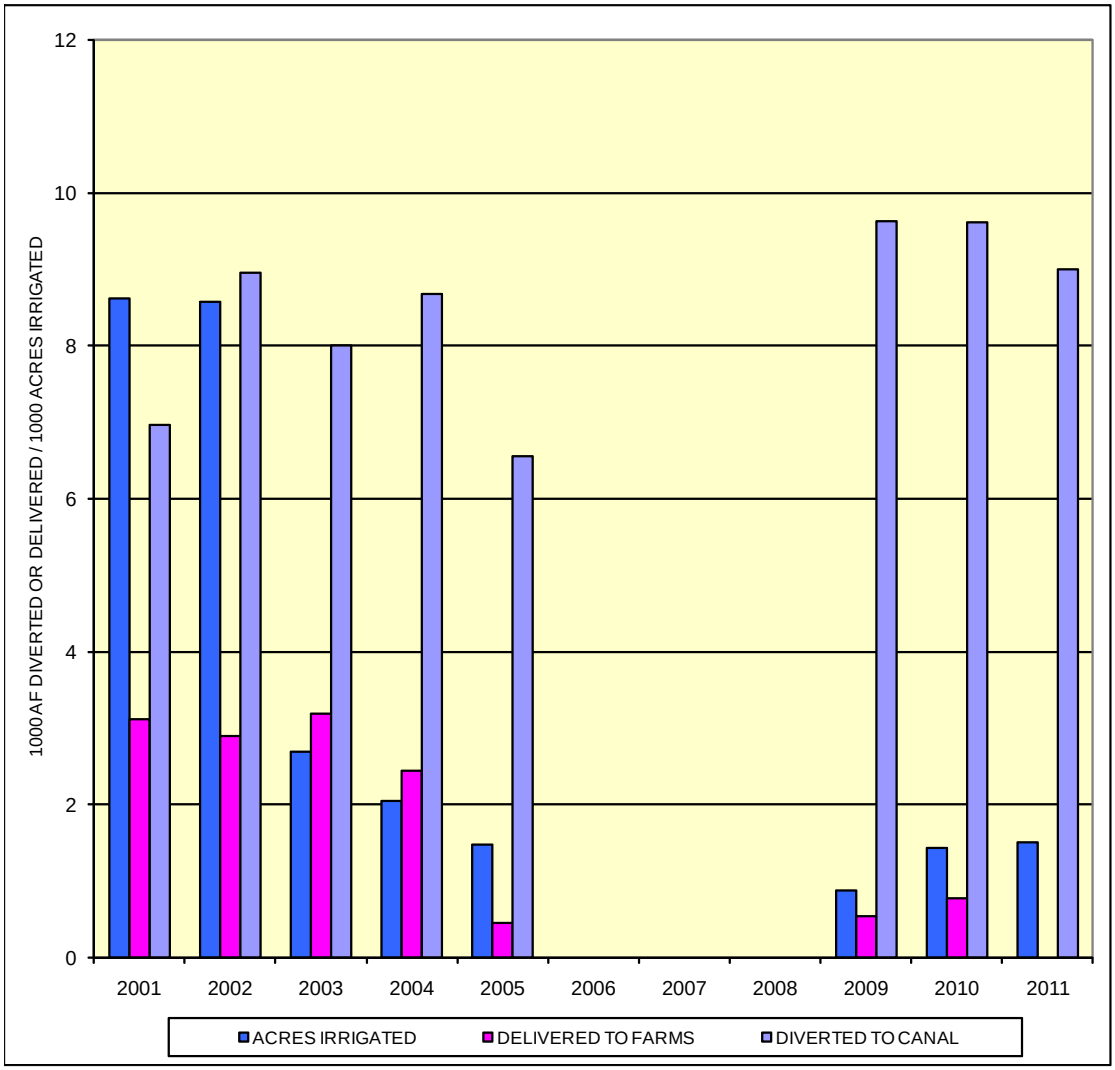
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
DIVERTED af/acre	1.76	1.87	1.84	1.75	1.53	1.74	1.48	1.41	1.41	1.50
DELIVERED af/acre	0.88	1.09	1.07	1.00	0.77	0.98	0.74	0.72	0.62	0.68
EFFICIENCY	50%	58%	58%	58%	50%	56%	50%	51%	44%	45%

FORECASTED SHORTAGES (2011)	
DRY YEAR	0 AF
NORMAL YEAR	0 AF
WET YEAR	0 AF

EXHIBIT 20

FRENCHMAN VALLEY IRRIGATION DISTRICT

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



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
DIVERTED af/acre	0.81	1.05	2.97	4.24	4.43	0.00	0.00	0.00	11.01	6.74
DELIVERED af/acre	0.36	0.34	1.18	1.19	0.30	0.00	0.00	0.00	0.61	0.54
EFFICIENCY	45%	32%	40%	28%	7%	0%	0%	0%	6%	8%

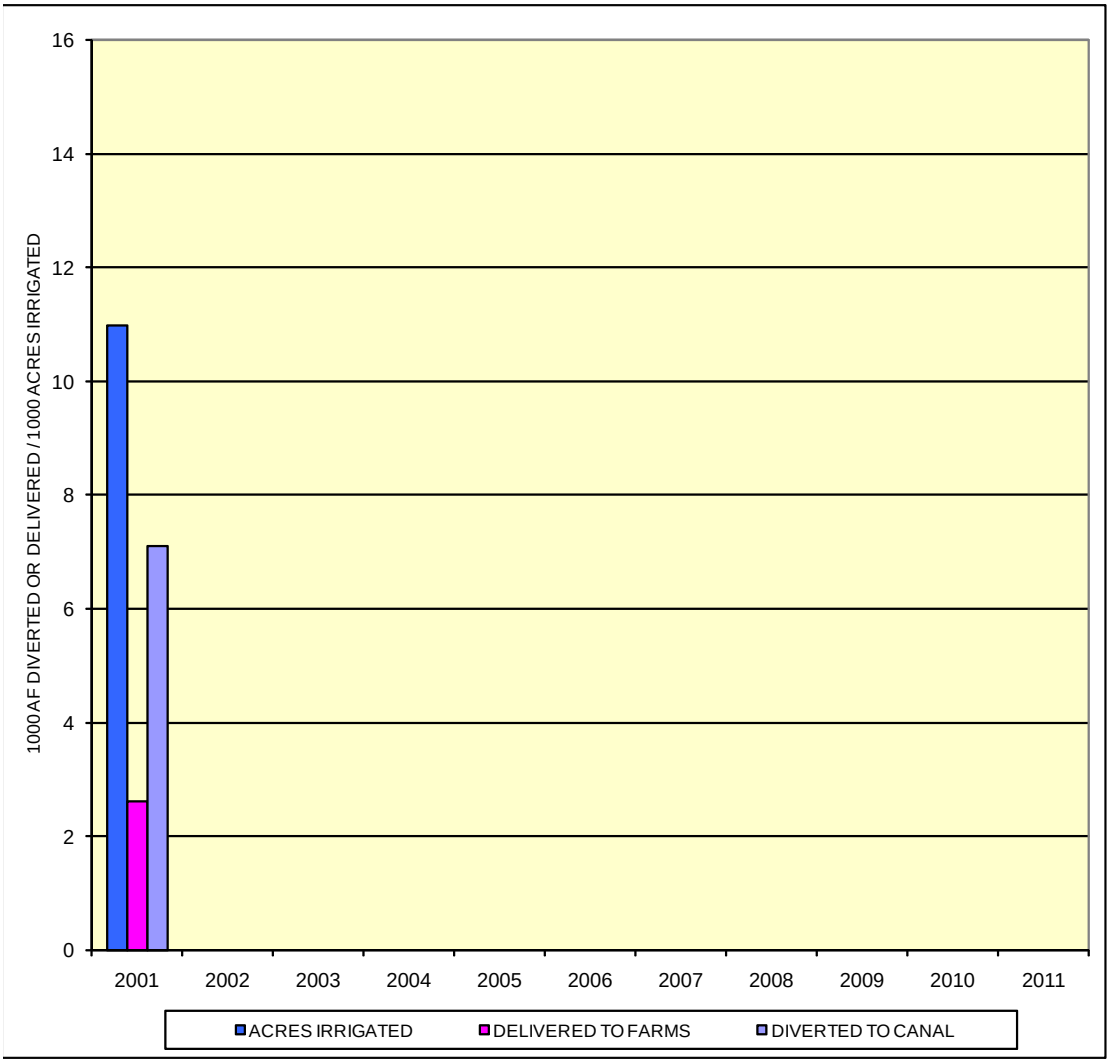
FORECASTED SHORTAGES (2011)

DRY YEAR	31,100 AF
NORMAL YEAR	22,000 AF
WET YEAR	6,700 AF

EXHIBIT 21

H AND RW IRRIGATION DISTRICT

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



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
DIVERTED af/acre	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DELIVERED af/acre	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EFFICIENCY	37%	0%	0%	0%	0%	0%	0%	0%	0%	0%

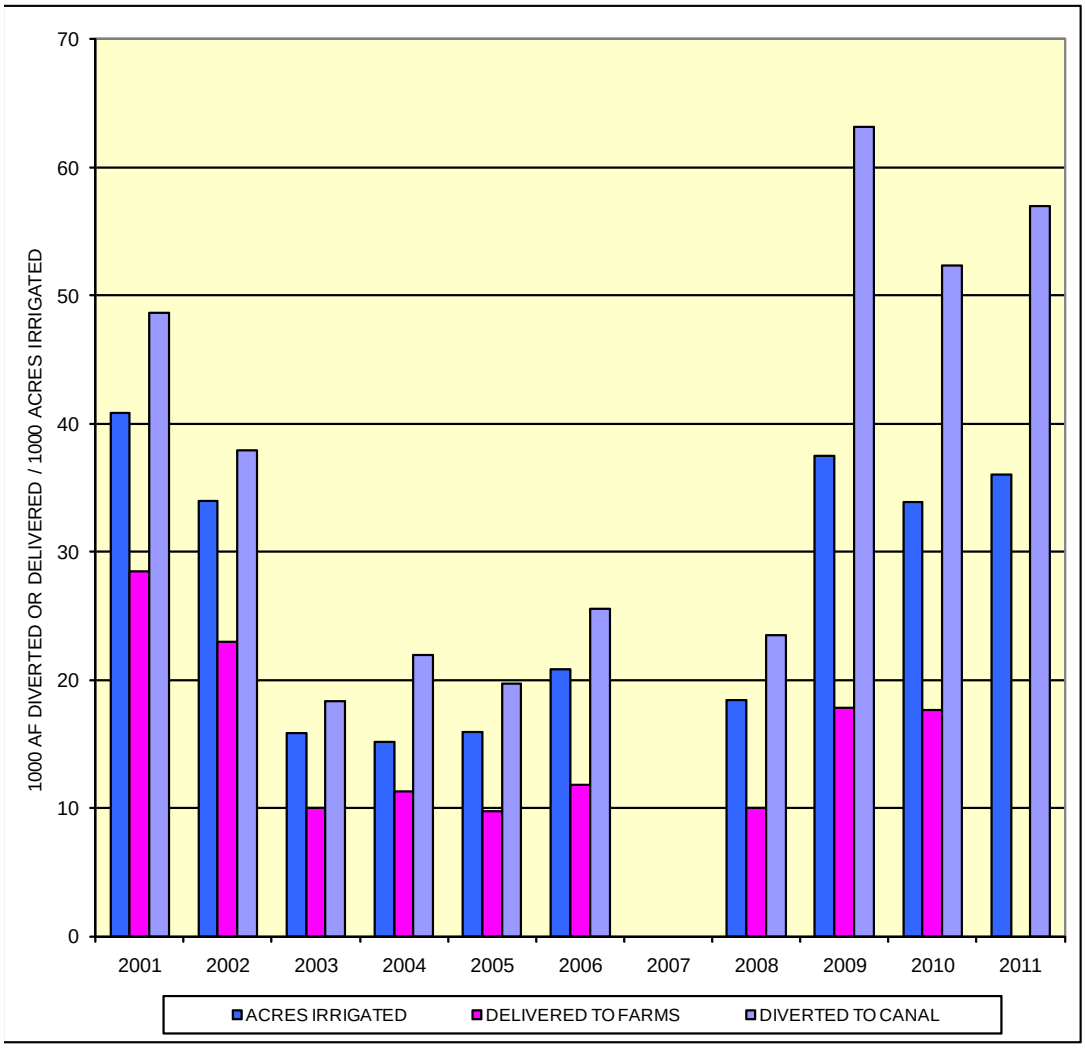
FORECASTED SHORTAGES (2011)

DRY YEAR	39,600 AF
NORMAL YEAR	28,100 AF
WET YEAR	8,600 AF

EXHIBIT 22

FRENCHMAN-CAMBRIDGE IRRIGATION DISTRICT

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



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
DIVERTED af/acre	1.19	1.12	1.15	1.45	1.24	1.23	0.00	1.27	1.68	1.55
DELIVERED af/acre	0.70	0.67	0.63	0.74	0.61	0.57	0.00	0.54	0.47	0.52
EFFICIENCY	58%	61%	55%	52%	50%	46%	0%	42%	28%	34%

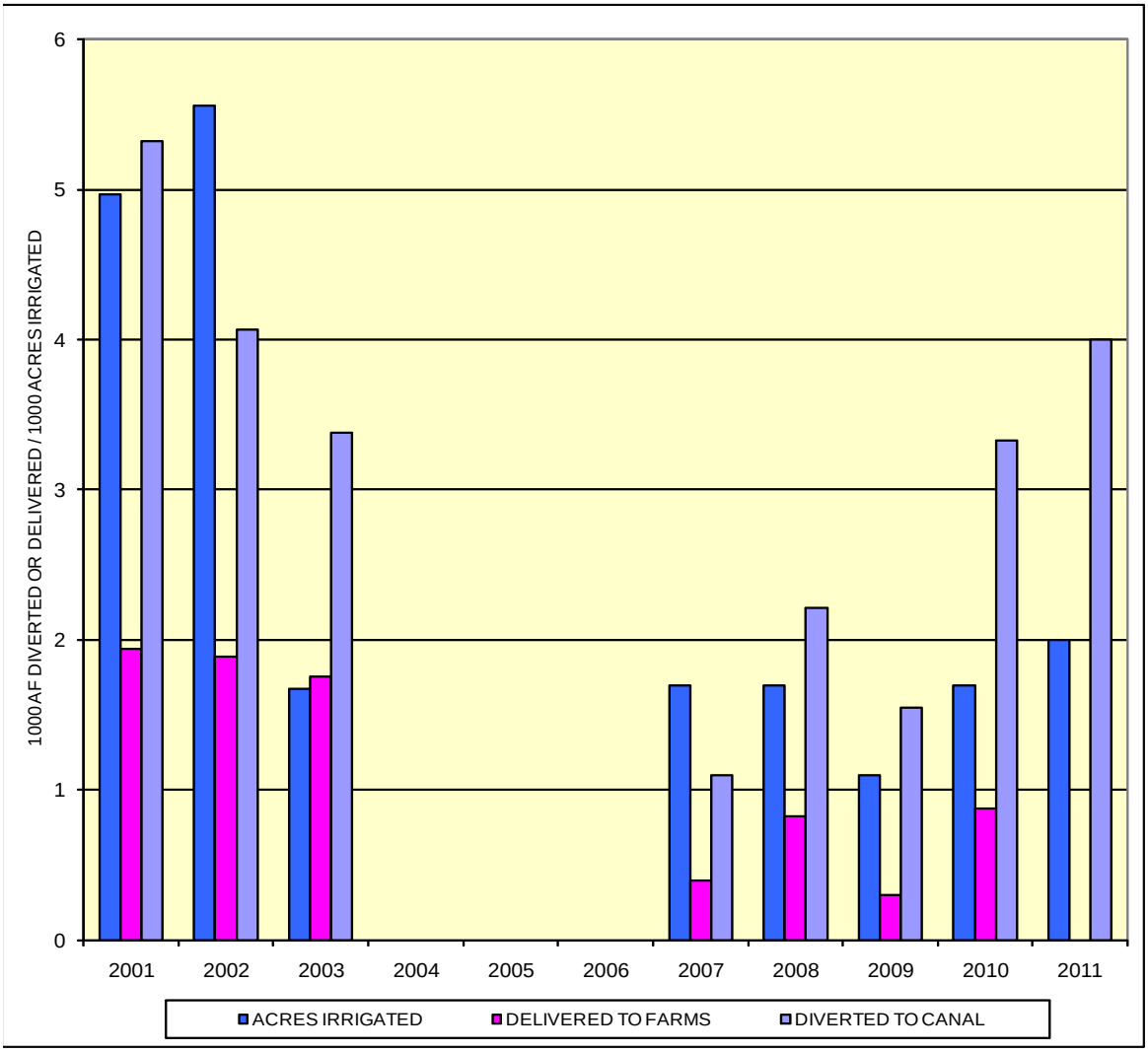
FORECASTED SHORTAGES (2011)

DRY YEAR	23,800 AF
NORMAL YEAR	4,700 AF
WET YEAR	1,400 AF

EXHIBIT 23

ALMENA IRRIGATION DISTRICT

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



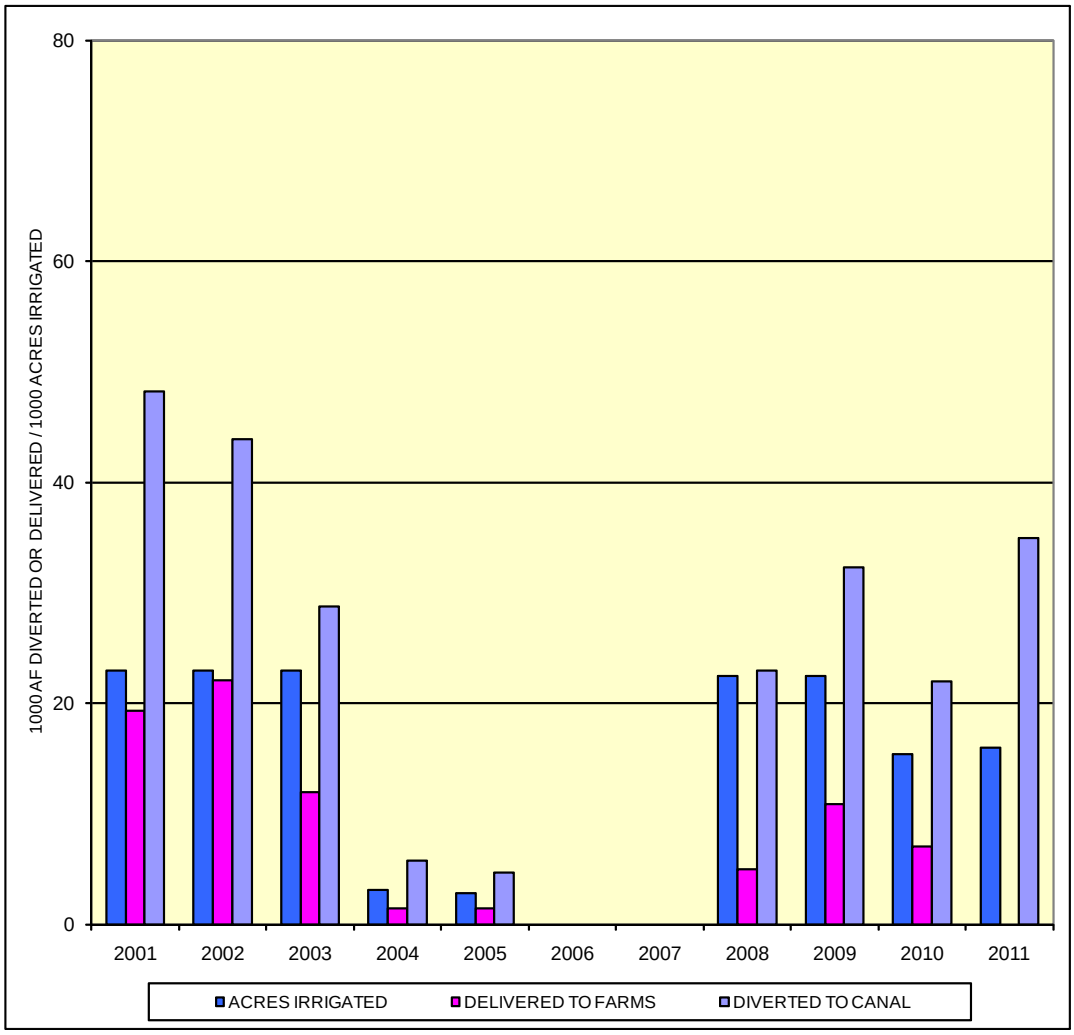
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
DIVERTED af/acre	1.07	0.73	2.02	0.00	0.00	0.00	0.65	1.30	1.41	1.96
DELIVERED af/acre	0.39	0.34	1.05	0.00	0.00	0.00	0.24	0.49	0.27	0.52
EFFICIENCY	36%	46%	52%	0%	0%	0%	36%	37%	19%	26%

FORECASTED SHORTAGES (2011)	
DRY YEAR	13,200 AF
NORMAL YEAR	7,100 AF
WET YEAR	0 AF

EXHIBIT 24

BOSTWICK IRRIGATION DISTRICT - NEBRASKA

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



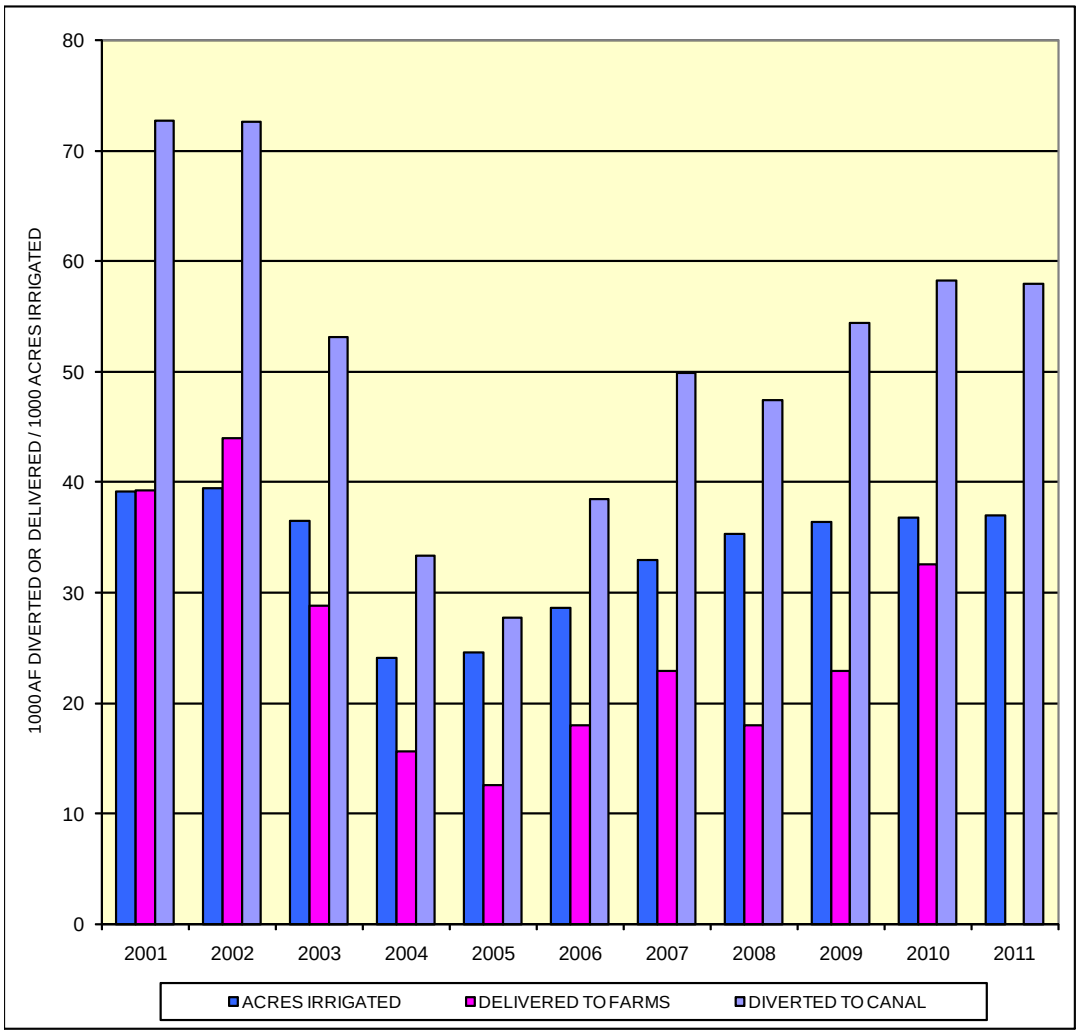
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
DIVERTED af/acre	2.10	1.91	1.25	1.85	1.68	0.00	0.00	1.02	1.44	1.43
DELIVERED af/acre	0.84	0.96	0.52	0.47	0.53	0.00	0.00	0.22	0.48	0.46
EFFICIENCY	40%	50%	42%	25%	32%	0%	0%	22%	34%	32%

FORECASTED SHORTAGES (2011)	
DRY YEAR	0 AF
NORMAL YEAR	0 AF
WET YEAR	0 AF

EXHIBIT 25

KANSAS-BOSTWICK IRRIGATION DISTRICT

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



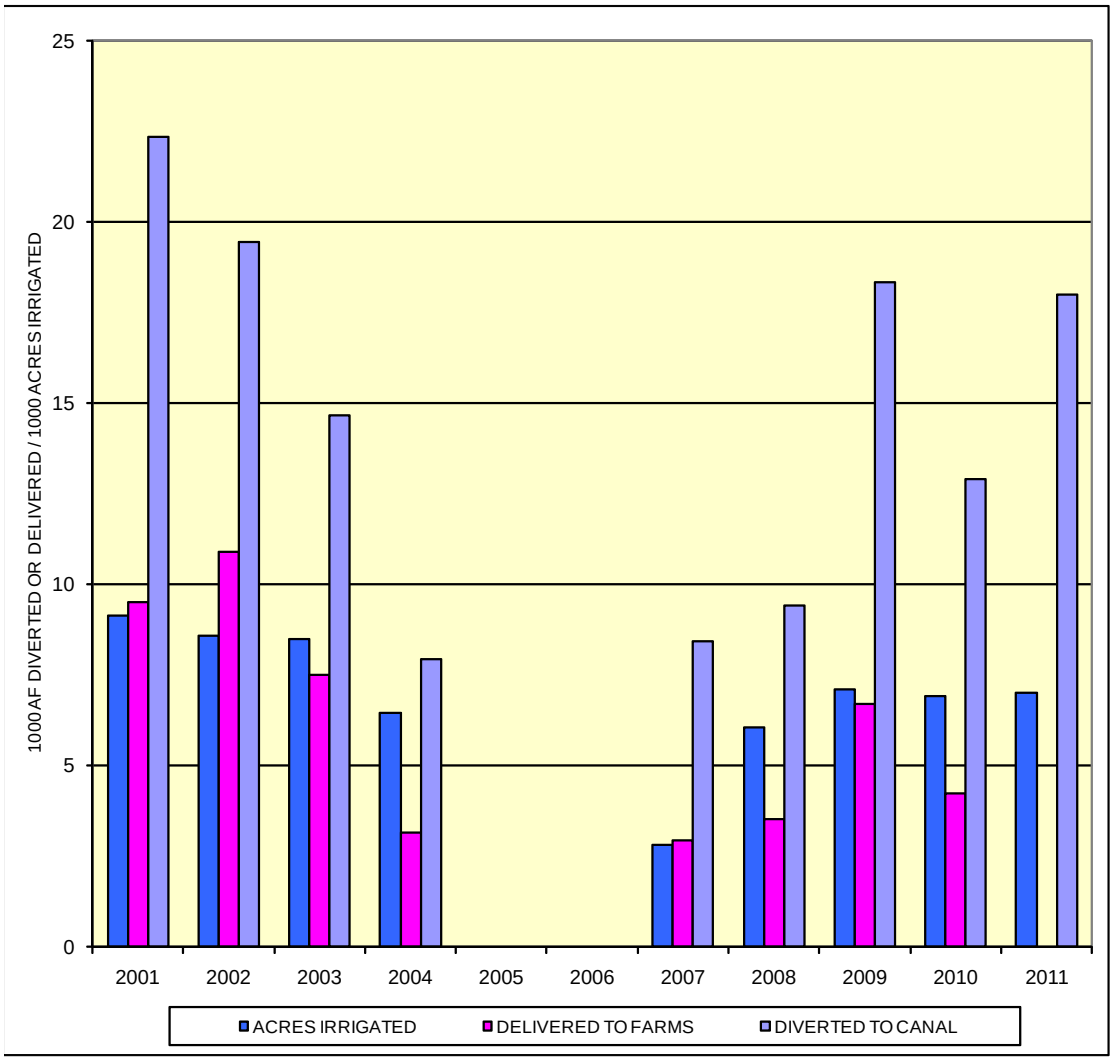
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
DIVERTED af/acre	1.86	1.84	1.46	1.38	1.13	1.35	1.51	1.34	1.50	1.58
DELIVERED af/acre	1.00	1.11	0.79	0.65	0.51	0.63	0.70	0.51	0.63	0.89
EFFICIENCY	54%	61%	54%	47%	45%	47%	46%	38%	42%	56%

FORECASTED SHORTAGES (2011)	
DRY YEAR	0 AF
NORMAL YEAR	0 AF
WET YEAR	0 AF

EXHIBIT 26

KIRWIN IRRIGATION DISTRICT

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



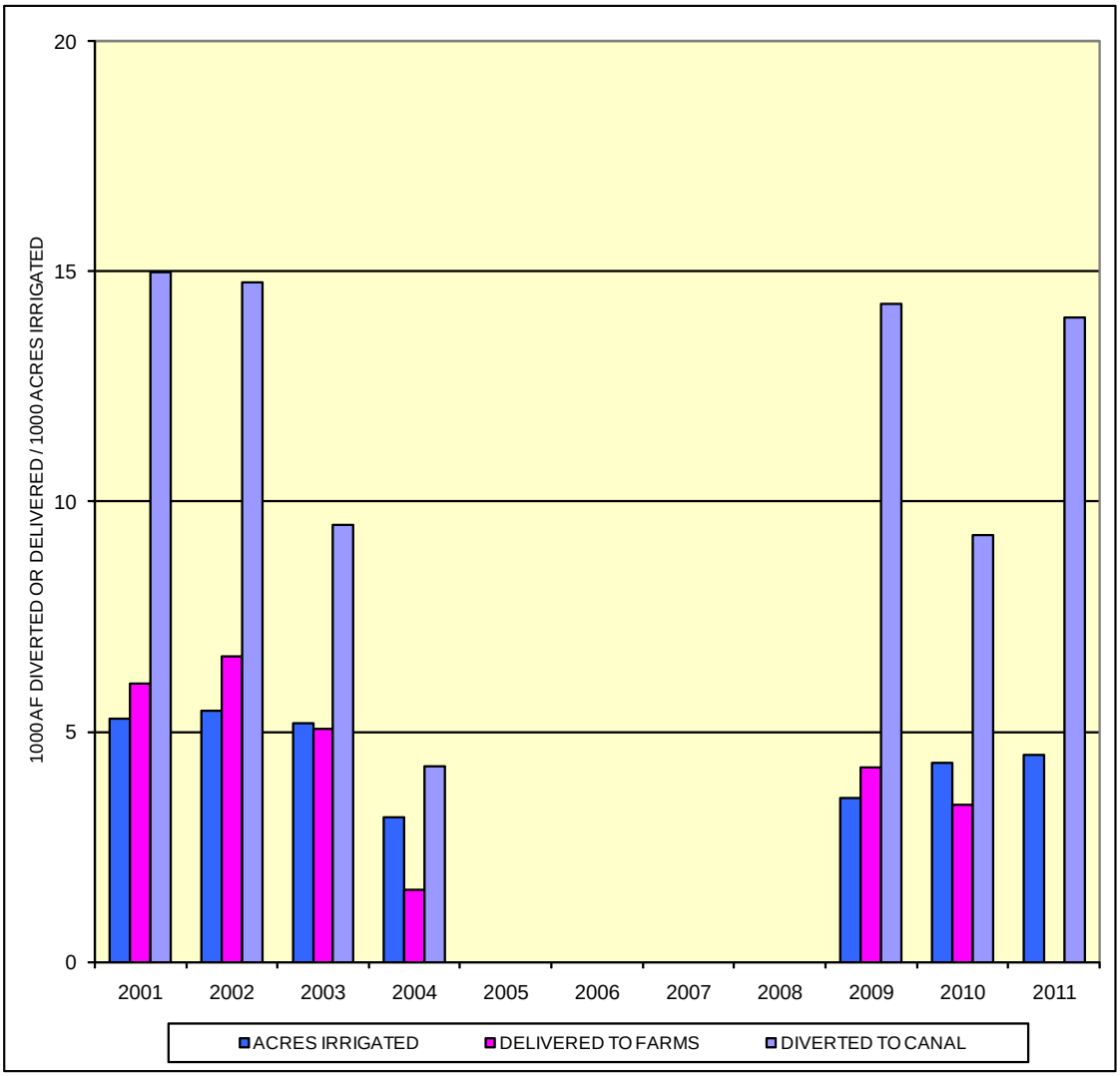
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
DIVERTED af/acre	2.44	2.27	1.73	1.23	0.00	0.00	3.00	1.56	2.58	1.87
DELIVERED af/acre	1.04	1.27	0.88	0.49	0.00	0.00	1.05	0.58	0.94	0.61
EFFICIENCY	43%	56%	51%	40%	0%	0%	35%	37%	36%	33%

FORECASTED SHORTAGES (2011)	
DRY YEAR	0 AF
NORMAL YEAR	0 AF
WET YEAR	0 AF

EXHIBIT 27

WEBSTER IRRIGATION DISTRICT

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



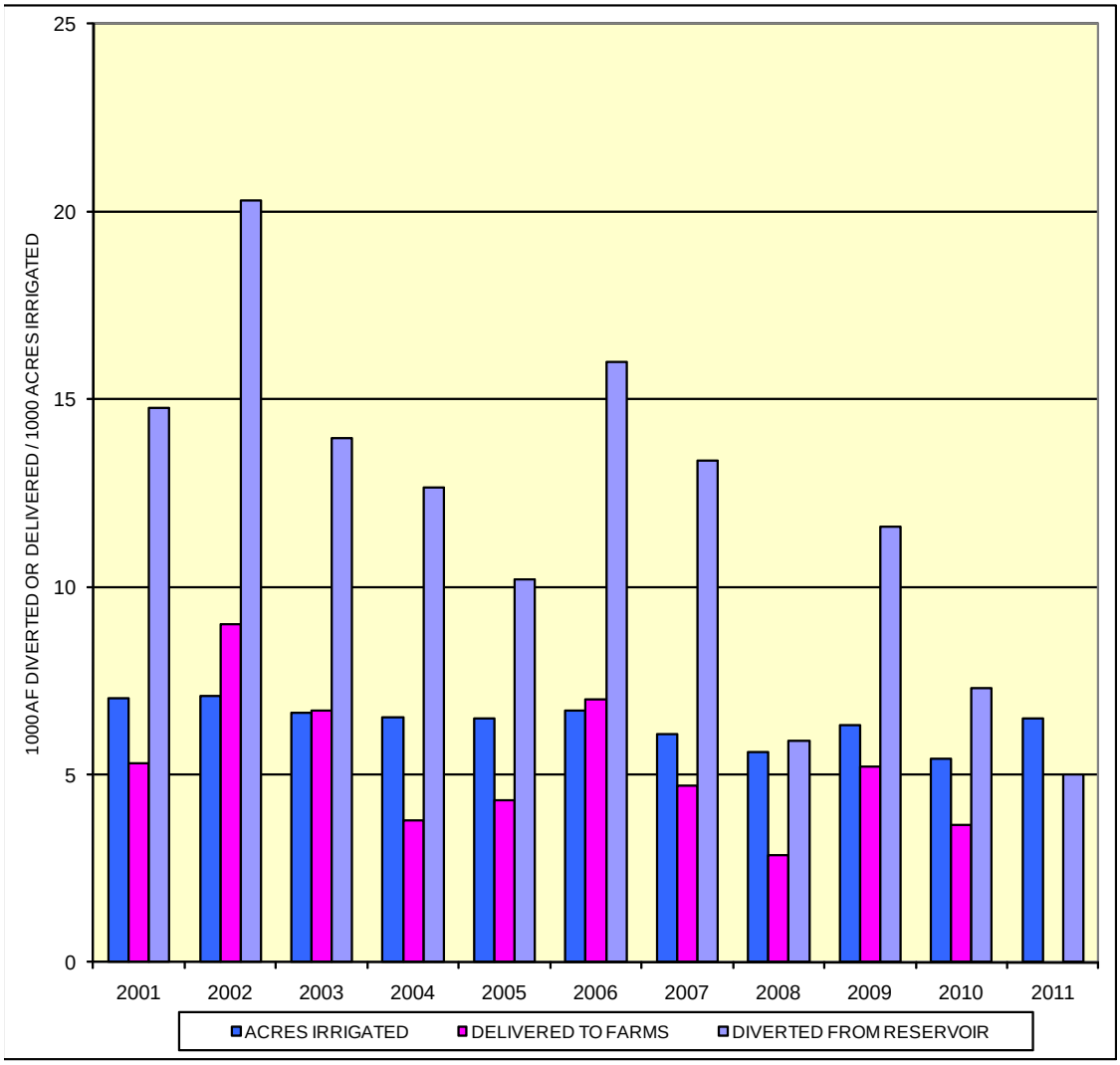
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
DIVERTED af/acre	2.83	2.71	1.83	1.35	0.00	0.00	0.00	0.00	4.00	2.14
DELIVERED af/acre	1.14	1.22	0.97	0.50	0.00	0.00	0.00	0.00	1.18	0.79
EFFICIENCY	40%	45%	53%	37%	0%	0%	0%	0%	30%	37%

FORECASTED SHORTAGES (2011)	
DRY YEAR	0 AF
NORMAL YEAR	0 AF
WET YEAR	0 AF

EXHIBIT 28

GLEN ELDER IRRIGATION DISTRICT

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



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
DIVERTED af/acre	1.00	1.00	1.00	1.93	1.57	2.39	2.19	1.05	1.83	1.35
DELIVERED af/acre	0.75	1.27	1.01	0.58	0.66	1.04	0.77	0.51	0.83	0.67
EFFICIENCY	36%	44%	48%	30%	42%	44%	35%	48%	45%	50%

FORECASTED SHORTAGES (2011)

DRY YEAR	0 AF
NORMAL YEAR	0 AF
WET YEAR	0 AF