ANNUAL OPERATING PLAN

NIOBRARA, LOWER PLATTE and KANSAS RIVER BASINS

1967 OPERATIONS
1968 OUTLOOK

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
REGION 7
DENVER, COLORADO

FEBRUARY 1968

UNITED STATES DEPARTMENT OF THE INTERIOR

Stewart L. Udall, Secretary

BUREAU OF RECLAMATION

Floyd E. Dominy, Commissioner

Region 7 - Denver, Colorado

James M. Ingles, Regional Director

ANNUAL OPERATING PLAN

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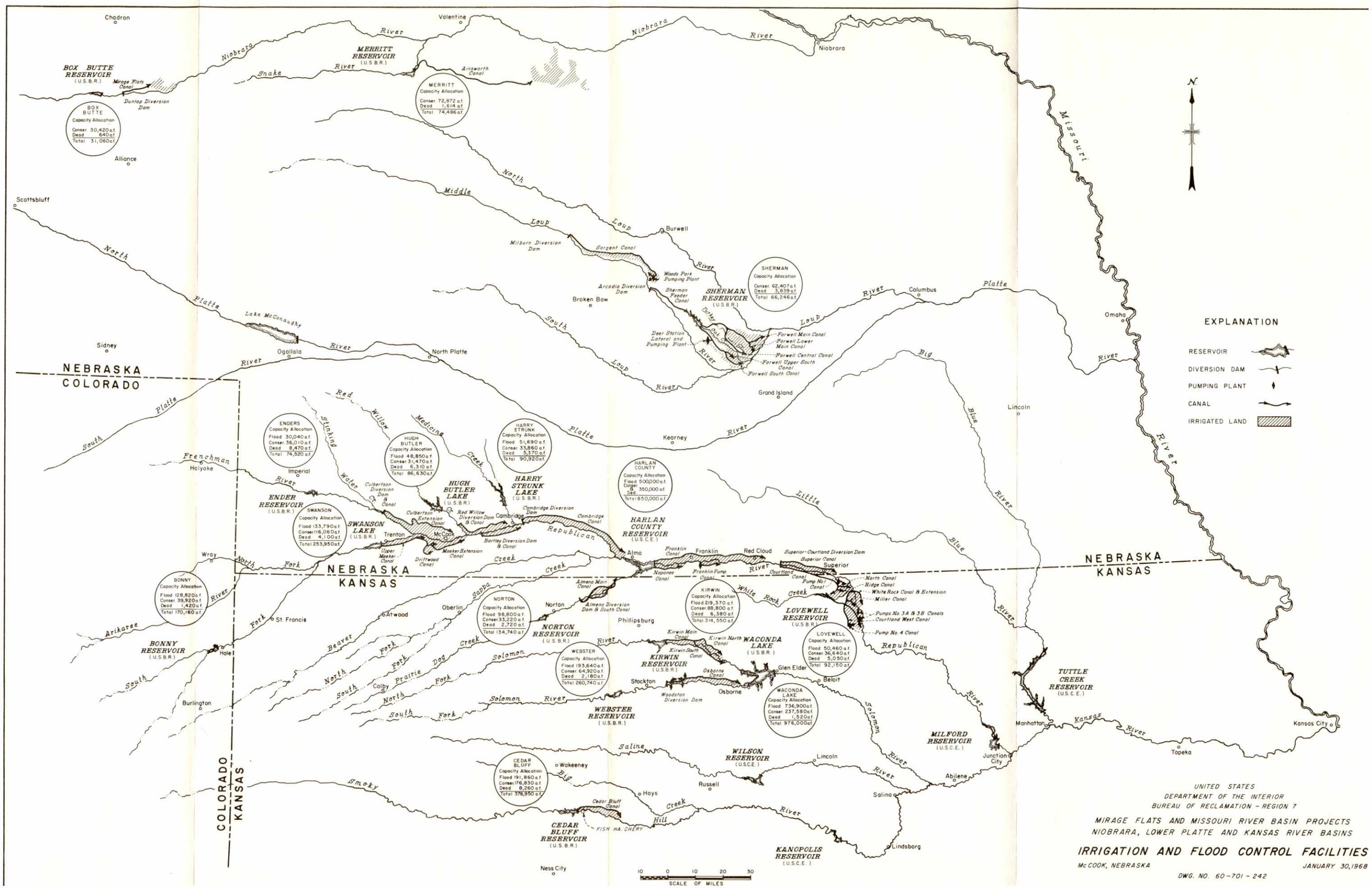
February 1968

KIRWIN DAM
AND
RESERVOIR



UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION - REGION 7

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

IRRIGATION AND FLOOD CONTROL FACILITIES

McCOOK, NEBRASKA — JANUARY 30, 1968

DWG. NO. 60-701-242

ANNUAL OPERATING PLAN

NIOBRARA, LOWER PLATTE AND KANSAS RIVER BASINS

1967 OPERATIONS -- 1968 OUTLOOK

SYNOPSIS - Description of scope of report.

CHAPTER I - The introduction, describes the features within the scope of this Plan in the Niobrara, Lower Platte and Kansas River Basins.

CHAPTER II - Chapter II summarizes the 1967 Operations.

CHAPTER III - Presents the Plan of Operation for 1968.

TABLES - Statistical and operational data.

EXHIBITS - Graphic presentations.

SYNOPSIS

General

This is the fifteenth Annual Operating Plan for the federally-owned storage dams, reservoirs, canals and diversion dams serving an irrigation function in the Kansas River Basin, and includes a plan for those facilities in the Niobrara and Lower Platte River Basins. These features are located in Colorado, Nebraska and Kansas as shown on the location map. The storage dams in the Kansas River Basin are operated by the Bureau of Reclamation or Corps of Engineers, and the storage dams in the Niobrara and Lower Platte River Basins are operated by Irrigation or Reclamation Districts. The canals, pumping plants and diversion dams are also operated by Irrigation or Reclamation Districts, with the exception of the Almena Diversion Dam and Canal System which was operated by the Bureau of Reclamation during 1967 and will be transferred to the Almena Irrigation District on April 1, 1968. There are fourteen storage dams and reservoirs, ten diversion dams and twenty canal systems in operation. Glen Elder Dam and Reservoir (Waconda Lake) will be placed in partial operation in 1968.

The features within the scope of this report serve irrigation, flood control, municipal, industrial, recreation, fish and wildlife, stream pollution abatement and other uses. The total value of crops plus additional income from conservation practices from irrigated project lands in 1967 was $21,613,964. The flood damages prevented by reservoirs in the Kansas River Basin in the scope of this report during 1967 amounted to $5,179,000. There were no flood damages prevented in the Niobrara and Lower Platte River Basins during 1967.

1967 OPERATIONS

The water supply was adequate to meet the irrigation requirements of 201,856 acres irrigated in 1967. The annual precipitation ranged from 85% in Central Kansas and North Central Nebraska to normal or above in Northern Kansas, South Central, Southwest and Western Nebraska and Eastern Colorado. The precipitation varied from 84% of normal at Sherman Dam to 135% at Norton Dam. The diversion of irrigation water to canal systems averaged 2.23 acre-feet per acre while the farm delivery averaged 1.26. There were no requests for surplus storage water under Warren Act Contract. There was 1,897 acre-feet of water used for municipal and industrial purposes, and 28,608 acre-feet was delivered to irrigate 12,520 acres of non-project lands.

The conservation pools of Merritt, Sherman, Bonny, Enders, Norton, Harlan County and Lovewell Reservoirs and Swanson, Hugh Butler and Harry Strunk Lakes were filled in 1967. The conservation pools of Box Butte, Kirwin,

Webster and Cedar Bluff Reservoirs did not fill. The dead storage pool of Waconda Lake was filled during October 1967, and the flows of the Solomon River were passed through the reservoir for the balance of the year.

1968 OUTLOOK

The conservation pools of Hugh Butler and Harry Strunk Lakes were full at the start of 1968. Bonny, Swanson, Enders, Harlan County, Lovewell, Merritt and Sherman conservation pools are expected to fill with reasonable minimum inflow conditions, and Norton with most probable inflows. The carryover storage and reservoir inflows that can reasonably be expected will be adequate to meet the 1968 irrigation, municipal and industrial demands with the exception of Webster Reservoir where the carryover storage and inflows expected under reasonable minimum conditions will be inadequate to fully meet the requirements of 6,975 acres of the Webster Irrigation District lands. Glen Elder Dam will be partially in operation by late June, and the accumulated storage in Waconda Lake is expected to be adequate to meet the demands of the City of Beloit, Kansas.

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CHAPTER I - INTRODUCTION

PURPOSE OF THE REPORT

In addition to describing the responsibilities of the Bureau of Reclamation, Corps of Engineers, and Irrigation or Reclamation Districts, this Annual Operating Plan advises water users, cooperating agencies and other interested groups or persons of the actual operations during 1967 and serves as guidelines for the 1968 operations of the federally constructed and rehabilitated irrigation and storage facilities in Niobrara, Lower Platte and Kansas River Basins.

OPERATIONAL RESPONSIBILITIES

The Bureau of Reclamation is responsible for irrigation operations at all Federal reservoirs in the Kansas River Projects area. Where the Bureau of Reclamation is the constructing agency, it is responsible for the employment of operation and maintenance personnel, safety of the structure, and all other conservation functions, such as recreation, fish and wildlife, municipal and industrial uses, sanitation and quality control not specifically associated with regulation of the flood control storage.

The Corps of Engineers is responsible for regulation of the flood control storage at all Federal reservoirs in the Kansas River Basin, and of the conservation functions other than irrigation at the dams where they are the construction agency.

By contractual arrangements with the Bureau of Reclamation, twelve irrigation or reclamation districts are responsible for the operations at irrigation facilities constructed or rehabilitated by the Bureau of Reclamation in the Niobrara, Lower Platte and Kansas River Basins with the exceptions of the reservoirs in the Kansas River Basin which are operated by the Federal Government.

The States of Nebraska, Colorado and Kansas are responsible for administration and enforcement of the laws of their respective States pertaining to the water rights and priorities of all parties concerned with the use of water.

The Republican River Compact was authorized on August 4, 1942, by Public Law No. 696 which was enacted by the 77th Congress. The Compact was

ratified by the States of Colorado, Kansas and Nebraska. This Annual Operating Plan is in accordance with the objectives of the Compact, which are: to provide for the most efficient and multiple-purpose use of the waters of the Republican River Basin; to provide for an equitable division of such waters; to remove all causes, present and future, which might lead to controversies; to promote interstate comity; to recognize that the most efficient utilization of the waters within the Basin is for consumptive use; and, to promote joint action by the States and the United States in the efficient use of water and the control of destructive floods.

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 in the scope of this report are a part of the Missouri River Basin Project and includes multi-purpose reservoirs, diversion dams, pump stations and canal systems. Fourteen storage facilities are now in operation as follows:

Constructed by the Bureau of Reclamation:

(a) Operated by irrigation or reclamation districts - Box Butte and Merritt Dams in the Niobrara River Basin and Sherman Dam in the Lower Platte River Basin.

(b) Operated by the Bureau of Reclamation - Bonny, Trenton, Enders, Red Willow, Medicine Creek, Norton, Lovewell, Kirwin, Webster and Cedar Bluff in the Kansas River Basin.

Constructed and operated by the Corps of Engineers:

(a) Harlan County in the Kansas River Basin.

There are nineteen canal systems, nine diversion dams and ten pump stations that are operated by irrigation and reclamation districts. The Almena Diversion Dam and Almena Canal System will be transferred to the Almena Irrigation District on April 1, 1968.

The Bureau of Reclamation started construction of the Glen Elder Dam and pertinent facilities in 1964. The closure of the dam was made in October of 1967 and partial operation is expected in 1968. The construction program will continue in 1968, and the completion of all facilities is presently scheduled for 1970.

Capacity allocations for the fourteen reservoirs presently serving irrigated areas are shown on Table 1. Tables 2, 3 and 4 show comparison

of inflow conditions, 1967 operations and a comparison of 1966 precipitation with 1967. The reservoirs, main irrigation canals and pump stations in the Niobrara, Lower Platte and Kansas River Basins are shown on the General Map on page iii.

IRRIGATION DISTRICTS

Fourteen irrigation districts and one reclamation district in the Niobrara, Lower Platte and Kansas River Basins have contracted with the Bureau of Reclamation for a water supply and construction of irrigation facilities. Table 5 shows the status of the construction repayment and water service contracts. Table 6 shows the acres irrigated in 1967 and the acreage expected to be irrigated in each irrigation district during 1968.

The normal irrigation season for Mirage Flats is April through September. The contracted irrigation season for Frenchman Valley, H & RW and Frenchman-Cambridge Irrigation Districts is from May 1 to October 15, and for all other districts it is May 1 to September 30.

Mirage Flats Irrigation District

Storage for the 11,662 acres served in this District is provided by Box Butte Reservoir on the Niobrara River. These lands lie along a twenty mile reach on the north side of the Niobrara River Valley from Dunlap eastward. Box Butte Dam and Reservoir, Dunlap Diversion Dam and Mirage Flats Canal System are operated by the District.

The water supply for this project is very limited, and studies are being made to determine feasibility of a supplemental water supply from wells.

Ainsworth Irrigation District

Merritt Reservoir provides storage from the Snake River for 33,960 acres of District lands. These lands generally extend from Johnstown to Long Pine along the southern part of the Niobrara River Basin in North Central Nebraska. Merritt Dam and Reservoir and Ainsworth Canal System are operated by the District. All of the major construction is completed.

Sargent Irrigation District

The water supply for the 12,753 acres of District lands is diverted from the natural flows of the Middle Loup River. These lands are along the north side of the Middle Loup River Valley from Milburn to Comstock. All of the major construction is completed.

Farwell Irrigation District

Storage for the 47,925 acres in the Farwell Irrigation District is provided by Sherman Reservoir. These lands are generally on the divide between the North and Middle Loup Rivers from Loup City to St. Paul. All major construction is completed.

Loup Basin Reclamation District

The Sargent and Farwell Irrigation Districts have made contractual arrangements with the Loup Basin Reclamation District for the operation of the facilities serving the 60,678 acres in both Districts. Loup Basin Reclamation District has contracted with the Bureau of Reclamation for water service to these lands. The District operates Milburn Diversion Dam, Sargent Canal System, Arcadia Diversion Dam, Sherman Storage Dam and Farwell Canal System.

Frenchman Valley Irrigation District and H & RW Irrigation District

Culbertson Diversion Dam and Canal and Culbertson Extension System were constructed to serve 9,600 acres in the Frenchman Valley Irrigation District, and 11,490 acres in the H & RW Irrigation District. The lands in the Frenchman Valley Irrigation District have been irrigated since the 1890's. Supplemental storage was first delivered to these lands under repayment contract in 1958. The lands in these Districts lie to the north of the Frenchman Creek and the Republican River and from Palisade to approximately three miles east of McCook, Nebraska.

These Districts are under a joint management which operates the Culbertson Diversion Dam, Culbertson and Culbertson Extension Canal Systems.

Enders Reservoir provides storage water for both Districts. The transportation of water from Enders Reservoir through 52 miles of the Frenchman Creek to the Culbertson Diversion Dam created an erosion problem that made it necessary to initiate a construction program in 1964 to restore private access, protect the private and public improvements, to stabilize various reaches of channel banks and to remove excess sediment from the canal at the headworks settling basin. This program is to be continued in 1968. The sediment load carried by the stream at the Culbertson Diversion Dam is several times the amount that was estimated in the original plan.

Frenchman-Cambridge Irrigation District

All of the major construction providing service to 43,190 acres of land in the Frenchman-Cambridge Irrigation District was completed in July of 1964. The District operates Meeker-Driftwood Canal System, Red Willow Diversion Dam and Canal System, Bartley Diversion Dam and Canal System and Cambridge Diversion Dam and Canal System. These lands are situated,

primarily, in the Republican River Valley extending from Swanson Lake to Harlan County Reservoir. Swanson, Harry Strunk and Hugh Butler Lakes provide storage for these lands.

Almena Irrigation District No. 5

Norton Reservoir provides storage for the irrigation of 5,350 acres of land in the Almena Irrigation District. All major construction is now completed, and the operation and maintenance responsibilities for the Almena Diversion Dam and Canal System will be transferred to the Almena Irrigation District on April 1, 1968. The Almena Irrigation District lands are located in the Prairie Dog Creek Valley extending from two miles southwest of Almena, Kansas, to three miles northwest of Long Island, Kansas.

Bostwick Irrigation District in Nebraska

Storage for the 22,787 acres served in this Irrigation District is provided by Harlan County Reservoir. The District lands are in the Republican River Valley from Harlan County Reservoir to the Nebraska Kansas State Line. The District operates Franklin, Naponee and Superior Canal Systems, Franklin Pump Canal System and the lateral distribution portion of the Courtland Canal System in Nebraska. All major construction is completed.

Kansas-Bostwick Irrigation District No. 2

Construction work has been essentially completed with service available to 37,768 acres. The construction of Pump No. 3 Canal System maybe completed by mid-summer, and 739 acres may receive water on a voluntary basis for part of the season. Minor construction during the next few years will increase the District acreage to about 40,000. Storage water for these lands is provided by Harlan County and Lovewell Reservoirs. Lovewell serves as both a regulating and storage reservoir. The Courtland Canal System above Lovewell Dam is constructed to serve 12,116 acres of District lands as well as to transport Republican River flows and Harlan County storage releases as required to Lovewell Reservoir. The Courtland Canal System below Lovewell Dam serves the remaining 25,652 acres of District lands. The Kansas-Bostwick Irrigation District lands are situated in the Republican River and White Rock Creek Basins from the Nebraska-Kansas State Line south of Superior, Nebraska, to five miles south of Courtland, Kansas. The District operates the Superior-Courtland Diversion Dam, the Main Canal of the Courtland System in Nebraska and all of the Courtland Canal System in Kansas.

Kirwin Irrigation District No. 1

Kirwin Reservoir provides storage for 11,435 acres of land served by

the Kirwin Main, North and South Canal Systems. The project area is about 1,500 acres larger than the area originally planned for irrigation with the available water supply. The successful irrigation operation will be dependent upon several years of carryover reservoir storage. These lands are in the valley of the North Fork of the Solomon River between Kirwin and Portis, Kansas. All of the major construction is completed.

Webster Irrigation District No. 4

Webster Reservoir provides storage for the 8,500 acres served by the Osborne Canal System. These lands are on the north side of the South Fork of the Solomon River from Woodston to approximately five miles east of Osborne, Kansas. All of the major construction is completed.

The Kirwin and Webster Irrigation Districts are under joint management to operate the Kirwin Canal System, Woodston Diversion Dam and Osborne Canal System.

Cedar Bluff Irrigation District No. 6

Cedar Bluff Reservoir provides storage for irrigation of 6,600 acres of Cedar Bluff Irrigation District lands on the north side of the Smoky Hill River from Cedar Bluff Dam to Antonino, Kansas. The District operates the Cedar Bluff Canal System. All of the major construction has been completed.

MUNICIPAL WATER

Three municipalities have executed water service contracts for full or supplemental water supplies. The status of these water service contracts is shown on Table 5.

City of Norton, Kansas

Norton Reservoir provides storage for the municipal water supply of Norton, Kansas. The repayment contract provides a maximum of 1,600 acre-feet annually to the City of Norton, Kansas. Initial delivery was made on September 6, 1965. The City takes their water supply directly from the outlet works of Norton Reservoir.

City of Beloit, Kansas

A contract has been executed to furnish a municipal water supply of 2,000 acre-feet to the City of Beloit, Kansas, from Waconda Lake when completed. An interim contract was executed for a supply of storage

water not to exceed 1,000 acre-feet per year from Webster Reservoir until such time as Glen Elder Dam is completed. Storage should be available from Waconda Lake commencing in July 1968; and, if so, the interim contract will no longer be in effect. The water for the city will be released into the Solomon River and diverted at their pump station at the City Water Plant.

City of Russell, Kansas

Cedar Bluff Reservoir provides storage not to exceed 2,000 acre-feet per year to supplement the municipal water supply of the City of Russell, Kansas. Water is released for the City from Cedar Bluff Dam outlet works into the Smoky Hill River. The City of Russell diverts the storage releases from the Smoky Hill River at their pump station near Pfeifer, Kansas, into Big Creek. The water is rediverted into the City Water Plant from their pump station on Big Creek located about seven miles southwest of the City.

INDUSTRIAL

In addition to the industrial uses of the three municipalities above, two oil companies have contracted with the Bureau of Reclamation for water service. Contracts were executed with the Midwest Oil Corporation on June 13, 1966, and the Livingston Oil Company on August 1, 1966, for a water supply for water flood operations in the Sleepy Hollow Oil Field in Red Willow County, Nebraska. Storage water is released from Bonny Reservoir to Swanson Lake where the water is regulated as required.

FISH HATCHERY

A United States Bureau of Sport Fisheries and Wildlife warm-water fish hatchery is in operation below Cedar Bluff Reservoir. A maximum of 4,000 acre-feet of reservoir storage per year is allocated for fish hatchery use. The releases are made from the Cedar Bluff outlet works directly into the fish hatchery water supply system.

OTHER FUNCTIONS

A "Statement of Operational Objectives" for Harlan County Reservoir was adopted by representatives of the Federal and State and local interests in June 1952. The statement sets forth the general operational objectives and the specific reservoir uses considered desirable, such as the fish and wildlife interests will be best served by high pool levels with minimum fluctuations and the regulation of outflow in excess of minimum requirements insofar as feasible. The statement recognizes that to assure realization of the greatest public benefits, operation plans should be

sufficiently comprehensive to permit the maximum integration of the secondary uses consistent with the primary purposes of flood control and irrigation.

Insofar as practicable, the above objectives are followed for operation of all reservoirs in the Kansas River Basin and also for Merritt Reservoir in the Niobrara River Basin. The regulated outflow to avoid unregulated spills will be of some advantage to farmers, ranchers, industries, cities and other interests below all reservoirs in the Kansas River Basin.

CHAPTER II - SUMMARY OF 1967 OPERATIONS

PRECIPITATION

The precipitation for the Niobrara, Lower Platte and Kansas River Basins ranged from 84% of normal at Sherman Dam to 135% at Norton Dam. The winter and early spring precipitation was below normal at most dams. These stations received heavy rains during the late spring, summer and early fall months. These data are shown on Table 4.

RESERVOIR INFLOW

The inflows varied from 32% of the most probable at Webster Reservoir to 147% at Hugh Butler Lake. Table 2 shows the 1967 inflows and forecasts for 1968. Exhibits 29 through 42 graphically show inflow records and 1968 forecasts.

RESERVOIR OPERATIONS

The conservation pools of all reservoirs except Kirwin, Webster and Cedar Bluff filled in 1967. The operations were within the scope of the Annual Operating Plan. A full water supply was furnished to 201,856 acres of district lands. Table 3 shows the 1967 reservoir contents by months. The operation hydrographs are plotted on Exhibits 1 through 14.

Reservoirs in the Kansas River Basin in the scope of this report prevented $5,179,000 in damages during the floods of June and July 1967. This flood period was the result of two weeks of widespread rains totaling eight to ten inches over most of the Kansas and lower Missouri River Basins. One day's rains as high as 5.30 inches at Minden, Nebraska and 3.40 inches at Beaver City, Nebraska were reported. Tributary damages, including almost $400,000 along Sappa Creek, were evident in the Kansas Basin. Flooding along the Big Blue River in Nebraska and along Stranger Creek and Wakarusa River in Kansas was extensive, totaling almost 4 million dollars in damages. Reservoirs and protective works in the Kansas River Basin, including those in the Kansas River Projects area, reduced the peak stage on the Kansas River two and one-half feet limiting damages to about $60,000. Further benefits were accrued to the Kansas River Projects by sharing in the protection of Kansas City and the mainstem Missouri River. The lower Missouri River peak stages were reduced about five and one-half feet through the combined efforts of Kansas Basin and Missouri River mainstem reservoirs and still about $20,000,000 in agricultural damages occurred. The damages prevented are prorated to all protective works on the basis of their proportional share of the peak reduction. The benefits to features included in this report are listed in Table 13.

No assessment of damages prevented by the operation of the features on the Niobrara and Lower Platte River Basins, if any, has been made.

The details of operation for each reservoir are described in the following paragraphs:

Box Butte Dam and Reservoir

The reservoir inflow for 1967 was 110% of the most probable. Above normal precipitation over the Mirage Flats Project area deferred the demand on the reservoir storage until July and the carryover of active storage of 14,486 acre-feet for the 1968 season is above normal. Of the 18,700 acre-feet measured at the Box Butte outflow gaging station, 17,235 acre-feet were diverted into the Mirage Flats Canal for irrigation of 10,923 acres of district lands. The maximum pool level of 4002.1 feet was reached on July 11 and the minimum low of 3988.0 feet on September 29.

Merritt Dam and Reservoir

The reservoir inflow for 1967 from the Snake River was 84% of the most probable, which is comparable to the precipitation measured at the dam. The maximum pool level of 2946.4 was reached on June 15. The reservoir outflow was 169,800 acre-feet, of which 50,480 acre-feet were released into the Ainsworth Canal to irrigate 19,665 acres of district lands. The pool level has been maintained at about elevation 2939.5 since the end of the irrigation season to facilitate the construction of relief wells and drains along the downstream slope of the dam embankment.

Sherman Dam and Reservoir

The water diverted through the Sherman Feeder Canal into Sherman Reservoir from the Middle Loup River was about normal. The top of the allocated conservation capacity is at elevation 2161.3. There were releases of 78,600 acre-feet into the Farwell Canal system to irrigate 32,100 acres of Farwell Irrigation District lands.

Bonny Dam and Reservoir

The reservoir inflow for 1967 was 90% of the most probable. A spring drawdown to elevation 3670 feet was made as planned. Natural flows of the South Fork of the Republican River were bypassed as requested by the Colorado State Engineer to Hale Ditch from April 21 to October 23. No requests were received for purchase of surplus storage under Warren Act Contract. A pool level of elevation 3668.40 feet (34,390 acre-feet) was reached on October 24. This is 3.6 feet below the top of the conservation pool.

The operation of Bonny Dam prevented $42,000 in flood damages in 1967. The accumulated total during the life of the project is nearly two million dollars.

Trenton Dam and Swanson Lake

The reservoir inflow including transfers of storage from Bonny Reservoir for 1967 was 72% of the most probable with a maximum pool elevation of 2754.06 feet (130,660 acre-feet) reached on July 14. This was 2.06 feet in the flood control pool.

The 18,585 acres irrigated under the Bartley and Meeker-Driftwood Canals were provided a full water supply from controlled spills and irrigation releases from Swanson Lake. Regulated releases of storage transferred from Bonny Reservoir were made to supply 1,133 acre-feet of water for water flood operations in the Sleepy Hollow Oil Field near Bartley, Nebraska. Swanson Lake was drawn down to elevation 2747.19 feet (97,520 acre-feet) by October 18, with an active conservation carryover storage of 83,540 acre-feet. No requests were received for purchases of surplus storage under Warren Act Contracts.

The operation of Trenton Dam prevented $182,000 of flood damages in 1967. The total prevented during the life of the project is about two million dollars.

Enders Dam and Reservoir

The reservoir inflow for 1967 was 106% of the most probable, with a maximum pool elevation of 3113.59 feet (46,723 acre-feet) reached on June 9. This was 1.29 feet in the flood control pool.

The reservoir storage was adequate to meet the demands of the 19,656 acres irrigated by the Frenchman Valley and H & RW Irrigation Districts. The reservoir was drawn down to elevation 3093.89 feet (19,580 acre-feet) on September 12 with an active conservation carryover storage of 9,215 acre-feet. No surplus storage was available for sale under Warren Act Contracts.

The operation of Enders Dam prevented $42,000 of flood damages in 1967. Nearly one million dollars of flood damages have been prevented since 1951.

Red Willow Dam and Hugh Butler Lake

The reservoir inflow for 1967 was 147% of the most probable with a maximum pool elevation of 2584.11 feet (41,634 acre-feet) reached on July 16. This was 2.31 feet in the flood control pool. The conservation capacity was filled for the first time since storage was commenced in 1961. The reservoir storage was adequate to meet the demands of 3,272 acres irrigated under the Red Willow Canal. No requests were received for the use of surplus storage under Warren Act Contracts.

The operation of Red Willow Dam prevented $42,000 of flood damages in 1967.

Medicine Creek Dam and Harry Strunk Lake

The reservoir inflow for 1967 was 141% of the most probable. The reservoir reached a depth of 3.77 feet in the flood control pool on June 22. Demands of Cambridge Canal irrigators resulted in the reservoir being drawn down 3.42 feet in the conservation pool by September 7. No requests were received for use of surplus storage under Warren Act Contracts.

The operation of Medicine Creek Dam prevented $129,000 of flood damages in 1967.

Norton Dam and Reservoir

The reservoir inflow for 1967 was 80% of the most probable, with a maximum pool level of 2304.63 feet (36,660 acre-feet) reached on June 27. This was the first time that the conservation capacity had been filled since storage was commenced in 1965. The available inflows and carry-over storage were more than adequate to meet the demands of the 3,446 acres irrigated in the Almena Irrigation District.

The City of Norton, Kansas, used 609 acre-feet during 1967.

The operation of Norton Dam prevented $885,000 in flood damages in 1967. This is the second year in a row that flood damages have been prevented. The damages prevented since storage commenced is over a million dollars.

In the fall, in cooperation with the State of Kansas and the Geological Survey, releases from the reservoir were withheld so that base flow characteristics from Norton Dam to the mouth of the Prairie Dog Creek could be studied.

Harlan County Dam and Reservoir

The total reservoir inflow for 1967 was 126% of the most probable. Irrigation demands lowered the pool level to 1943.25 feet (307,823 acre-feet) on October 14. The maximum pool elevation reached in 1967 was 1951.09 feet (415,356 acre-feet) on June 27. This was 5.09 feet (72,796 acre-feet) in the flood control pool.

At no time throughout the period June through September were minimum daily flows of the Republican River below the Superior, Nebraska, sewer outlet less than the desired minimum of 40 c.f.s. as outlined in the "1952 Statement of Operational Objectives for Harlan County Reservoir."

During 1967, the operation of Harlan County Dam prevented $3,539,000 in flood damages. The accumulated total of flood damages prevented during the life of the project is $11,631,000.

Lovewell Dam and Reservoir

The reservoir inflow for 1967 was 118% of the most probable, of which 69% was from Courtland Canal and 31% from White Rock Creek. A maximum pool elevation of 1584.55 feet (47,800 acre-feet) was reached on June 17. This was two feet in the flood control pool.

The inflows from Upper Courtland Canal and releases to Lower Courtland Canal were regulated during late August and early September to lower the pool level to approximate elevation 1577 feet by mid-September to facilitate maintenance work on the spillway gates. The accumulated sediment deposits in the spillway approach channel have affected the irrigation operations. Flushing of the outlet works is required at periodic intervals to maintain channel capacity. Removal of the deposit and stabilization of the right bank of the spillway approach channel have been programmed for fiscal year 1969.

Jewell County of Kansas has completed the construction of a county road in the immediate vicinity downstream from the dam. This provides better access between the Reservoir Superintendent's house and the outlet works.

Kirwin Dam and Reservoir

The reservoir inflow for 1967 was 78% of the most probable. The 9,834 acres irrigated under the Kirwin Canal were provided a full water supply. The irrigation releases, evaporation and reservoir losses lowered the pool level to elevation 1723.58 feet (73,200 acre-feet) by mid-December. This was 4.7 feet (21,980 acre-feet) below the top of the conservation pool. The conservation capacity did not fill in 1967, with the maximum pool elevation of 1726.22 feet (84,790 acre-feet) being reached on August 1.

The operation of Kirwin Dam prevented $191,000 in flood damages in 1967. The accumulated total of flood damages since 1957 is $1,583,000.

Webster Dam and Reservoir

The maximum pool level, elevation 1877.90 feet (33,760 acre-feet), was 11.7 feet below the top of the conservation pool. This was the second year with inflows less than 50% of the most probable. As a result of the diligent care exercised by the management personnel and irrigators of the Webster Irrigation District in their operations, the storage releases were kept to an absolute minimum. The reservoir inflow for 1967 was 32% of the most probable. The pool level at the end of the year was nearly 20 feet below the top of the conservation pool. This was about 11 feet above that forecasted for a reasonable minimum inflow condition.

During October, in cooperation with the State of Kansas and the Geological Survey, releases from the reservoir were withheld so that base flow characteristics from Webster Dam to the mouth of the South Fork of the Solomon River could be studied.

Webster Dam prevented $85,000 in flood damages in 1967. The accumulated damages prevented during the life of the project is nearly two million dollars.

Cedar Bluff Dam and Reservoir

The conservation capacity did not fill in 1967. The reservoir inflow for 1967 was 96% of the most probable forecast. Releases were made throughout the year to the Cedar Bluff National Fish Hatchery located below Cedar Bluff Dam. Releases were made during the period of April 3 to September 26 to irrigate 5,417 acres in the Cedar Bluff Irrigation District. The municipal water supply of Russell, Kansas, was supplemented by storage releases from Cedar Bluff Reservoir during late May. The water level was 4.80 feet (31,100 acre-feet) below the top of the conservation pool at the end of 1967.

The flood damages prevented by the operation of Cedar Bluff Dam in 1967 was $42,000. The accumulated total since storage was commenced in 1951 is $8,386,000.

IRRIGATION OPERATIONS SUMMARY

A total of 450,118 acre-feet of water was diverted into twenty canal systems for irrigation of 201,856 acres of District land in the Niobrara, Lower Platte and Kansas River Basins. This is 80% of the acreage that had service available in 1967. The irrigation operations for each of the irrigation districts are shown in the following table:

Irrigation District	Acres Irrig.	Diversion (A.F.)	Diversion (A.F./Ac.)	Farm Del. (A.F./Ac.)	Total Income Per Acre
Mirage Flats	10,923	17,235	1.57	0.93	$ 75.96
Ainsworth	19,665	50,480	2.57	1.71	101.89
Sargent	10,341	24,365	2.36	1.22	80.06
Farwell	32,100	79,894	2.49	1.25	97.82
Frenchman Valley	8,304	21,715	2.61	1.66	114.73
H & RW	11,352	26,560	2.34	1.17	123.31
Frenchman-Cambridge	35,773	69,970	1.96	1.13	111.59
Almena	3,446	6,642	1.93	1.16	128.95
Bostwick In Nebraska	19,751	44,111	2.23	1.17	118.46
Kansas-Bostwick	28,000	68,256	2.44	1.37	118.03
Kirwin	9,834	16,978	1.73	1.13	111.21
Webster	6,950	12,349	1.78	1.02	113.22
Cedar Bluff	5,417	11,563	2.13	1.21	92.63
Total	201,856	450,118			$107.08

The total gross crop value plus additional revenue from conservation practices for the Niobrara, Lower Platte and Kansas River Basins in 1967 was $21,613,964.

Natural flows of 2,738 acre-feet were passed through Bonny Reservoir to irrigate 700 acres of non-project lands served by Hale Ditch.

There were 25,870 acre-feet of water diverted at Arcadia Diversion Dam on the Middle Loup River and delivered to Middle Loup Public Power and Irrigation District to irrigate 11,820 acres of non-project land.

A graphic representation of development by irrigation districts is presented in Exhibits 15 through 28. Table 7 lists the 1967 monthly diversions and acres irrigated for each irrigation district. Table 8 tabulates the acreage irrigated and water diversion data for 1967, together with estimates for 1968.

MUNICIPAL

The City of Norton, Kansas, used a water supply of 609 acre-feet of water from Norton Reservoir.

The City of Beloit, Kansas, did not require storage releases from Webster Reservoir for a supplemental water supply in 1967. Closure of Glen Elder Dam was made during late October; and by close cooperation with the City of Beloit and the State of Kansas, no special provisions were required to pass water through the dam during this period. Because of the low storage conditions in Webster Reservoir, the Kirwin Irrigation District Board of Directors agreed to the use of storage releases from Kirwin Reservoir if needed to fill the dead storage capacity of Waconda Lake if supplemental water was needed by the City of Beloit. No releases were required.

The City of Russell, Kansas, required a supplemental water supply of 155 acre-feet from Cedar Bluff Reservoir.

INDUSTRIAL

The water flood operations in the Sleepy Hollow oil field near Bartley, Nebraska, were continued in 1967 with the Midwest Oil Corporation using 1,093 acre-feet and Livingston Oil Corporation 40 acre-feet.

FISH HATCHERY

The Cedar Bluff National Fish Hatchery diverted 2,224 acre-feet from Cedar Bluff Reservoir. Of this, 1,012 acre-feet was returned to the Smoky Hill River below the Cedar Bluff Dam outflow gage.

OTHER USES

During the 1967 season at the federally constructed storage and diversion dams, recreation areas and facilities were used by 2,636,358 visitors. The major uses of the facilities were boating, water skiing, swimming, sightseeing, camping, hunting and fishing. Table 14 shows the major recreation uses and the number of visitors participating in each use for each of the facilities reported by the administering agencies.

During the past year, the Kansas Park Authority provided additional recreational facilities at Norton, Lovewell, Webster and Cedar Bluff Reservoirs. Included in these facilities were bituminous surfaced roads and parking areas, information center shelters, toilet facilities and water systems.

Job Corps personnel planted 50,000 trees at Swanson, Hugh Butler and Harry Strunk Lakes and Enders Reservoir and cultivated the trees planted in 1966 and 1967. The Job Corps completed one access area at Swanson Lake and four at Hugh Butler Lake. These areas included roads, parking areas, gravel surfacing, guardposts, double pit toilets, hand pumps and water wells, fire pits and trash barrels.

CHAPTER III - ANNUAL OPERATING PLAN FOR 1968

WATER SUPPLY

The water supply outlook for 1968 varies from poor to very good. The water supply is adequate under reasonable minimum inflow conditions to meet the full requirement of 204,425 acres. However, a shortage of water supply will occur for 6,975 acres of Webster Irrigation District lands with reasonable minimum inflow conditions above Webster Reservoir.

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 curve to be "reasonable maximum," "most probable," and "reasonable minimum" inflow conditions. The estimates for 1968 are shown in Table 2 and are graphically compared with the historical inflow records in Exhibits 29 through 42. Operation estimates for the three conditions have been prepared for 1968 and are shown in Table 11.

RESERVOIR OPERATIONS

At the end of the irrigation season, the carryover storage in each reservoir and the reasonable minimum inflow are evaluated to determine if water in excess of that required to fill the conservation pool may be anticipated. If excess inflow is apparent, controlled releases will be made to accomplish maximum downstream benefits. However, this plan is not used for Bonny Reservoir as winter releases are undesirable.

Surplus storage from Bonny Reservoir will again be available under Warren Act Contract. It is not anticipated that surplus storage will exist in other reservoirs or lakes under reasonable minimum or most probable inflow conditions.

Exhibits 1 through 14 show the probable effects on each reservoir for 1968 under most probable, reasonable minimum and reasonable maximum inflow conditions.

Box Butte Dam and Reservoir

Box Butte Reservoir water level was 13.2 feet (17,200 acre-feet) below the top of the conservation pool, elevation 4007.0 feet (31,060 acre-feet), at the start of 1968. The reasonable minimum or most probable inflows will not fill the conservation pool in 1968. The irrigation requirements of 10,950 acres of Mirage Flats Irrigation District lands will be met if inflows are greater than those expected under reasonable minimum conditions.

The operation study for 1968 indicates under dry year conditions the conservation pool will be emptied.

Merritt Dam and Reservoir

The water level of Merritt Reservoir at the start of 1968 was being maintained at about elevation 2939.5 feet to facilitate construction of relief wells and drains on the downstream slope of the dam embankment. It is expected that additional storage may be accumulated after March 15, and the conservation pool will be filled by about May 1. Minimum flows of 15 to 20 cubic feet per second are maintained to the Snake River. The storage and available inflow will be more than adequate to meet the irrigation requirements of the 22,000 acres of Ainsworth Irrigation District lands that are expected to be irrigated. The protection on the upstream face of the dam will be replaced commencing about September 1. The pool level will be lowered to elevation 2925.0 feet to facilitate this construction. The storage level will be allowed to rise to elevation 2941.0 feet as soon as the construction program and inflows permit.

Sherman Dam and Reservoir

The conservation pool will be filled under all forecasted conditions in 1968. The storage and available inflow diverted from the Middle Loup River by Arcadia Diversion Dam will be more than adequate to meet the irrigation requirements of the 35,300 acres that are expected to be irrigated in 1968.

Bonny Dam and Reservoir

The industrial requirements of the Sleepy Hollow Oil Field in Nebraska will be met in full by Bonny Reservoir storage. Winter releases from Bonny Reservoir during freezing conditions are undesirable because of the exposed Hale Ditch outlet pipe which is an integral part of the Bonny Dam outlet works. Releases in extremely cold weather are not necessary if the pool level is at least three feet below the top of the conservation pool in the fall. To reduce the chances of a large fall drawdown, the reservoir pool level is lowered to elevation 3670.0 feet (37,390 acre-feet) after April 15 and maintained there or below throughout the spring and summer months except for flood control operation. During the dry years, the normal reservoir losses will lower the pool another two to three feet by September. During other years, it will be necessary to make special releases during September to early October to draw the pool level down another foot to elevation 3669.0 feet (35,500 acre-feet).

The natural flows of the South Fork of the Republican River and Landsman Creek above Bonny Reservoir will be released to Hale Ditch when requested by the Colorado State Engineer. Storage water will be

available to Hale Ditch irrigators under Warren Act Contracts as a supplemental water supply.

Trenton Dam and Swanson Lake

Irrigation requirements for 18,207 acres under the Meeker-Driftwood and Bartley Systems will be supplied by storage from Swanson Lake. The conservation pool will be full at the start of the 1968 irrigation season; therefore, the carryover storage and available inflow will be adequate to meet this demand. The maximum expected drawdown under reasonable minimum conditions will be about 11 feet (48,400 acre-feet) below the top of the conservation pool.

Enders Dam and Reservoir

The conservation pool of Enders Reservoir will fill under all conditions by the beginning of the irrigation season; therefore, the water supply will be adequate to meet the irrigation requirements of 19,000 acres expected to be irrigated by the Frenchman Valley and H & RW Irrigation Districts. The maximum expected drawdown under reasonable minimum conditions will be about 18.5 feet (25,000 acre-feet) below the top of the conservation pool.

Red Willow Dam and Hugh Butler Lake

Hugh Butler conservation pool was full at the start of 1968, and the inflow and carryover storage will be adequate to meet the demands of senior appropriations and requirements of 3,076 acres expected to be irrigated under the Red Willow Canal System. The maximum expected drawdown under reasonable minimum conditions will be about 4.2 feet (6,500 acre-feet) below the top of the conservation pool.

Medicine Creek Dam and Harry Strunk Lake

The conservation pool was full at the start of 1968; therefore, the carryover storage and available inflow is expected to be adequate to meet the requirements of 13,717 acres expected to be irrigated by the Cambridge Canal System. The maximum expected drawdown under reasonable minimum conditions will be about 10.8 feet (16,200 acre-feet) below the top of the conservation pool.

Norton Dam and Reservoir

Norton conservation pool is not expected to fill under reasonable minimum conditions. Reservoir storage will be more than adequate to meet the municipal water demands of Norton, Kansas, and irrigation requirements for 5,250 acres in the Almena Irrigation District.

The State of Kansas and the Geological Survey will continue their cooperative study of the base flows of the Prairie Dog Creek below Norton Dam and Reservoir in the fall of 1968.

Harlan County Dam and Reservoir

Carryover storage and natural flows of the Republican River will meet the irrigation requirements for 21,000 acres in the Bostwick Irrigation District in Nebraska; 10,500 acres above Lovewell Dam, and the partial requirement of 19,000 acres below Lovewell Dam in the Kansas-Bostwick Irrigation District. The conservation pool completed filling during January 1968. The lowest pool level expected under reasonable minimum inflow conditions will be about 8.2 feet (95,900 acre-feet) below the top of the conservation pool.

Lovewell Dam and Reservoir

The conservation pool will be filled in the spring of 1968 from White Rock Creek flows or diverted flows of the Republican River; therefore, normal operation of Lovewell Reservoir is planned for regulation of the Courtland Canal as well as the storage of natural flows of White Rock Creek. The irrigation requirements of 19,000 acres under the Courtland Canal below Lovewell Reservoir will be met with water stored from White Rock Creek flows and transfers of Republican River flows and storage releases, if required, from Harlan County Reservoir through the Upper Courtland Canal. The pool level will be lowered during the first half of September to elevation 1576.5 feet to facilitate maintenance work on the spillway gates and approach channel.

During periods of low water supply and when space is available in Lovewell Reservoir, Republican River flows not required by Superior and Courtland Canals and downstream water rights will be diverted into Lovewell Reservoir. Under prolonged drought conditions, these diversions could continue through all of the non-irrigation season except during severe ice conditions.

Kirwin Dam and Reservoir

Kirwin pool level was 4.7 feet (21,700 acre-feet) below the top of the conservation pool at the start of 1968. The inflow and carryover storage will be adequate to meet the irrigation requirements of 9,875 acres expected to be irrigated under the Kirwin Canal System in 1968.

Webster Dam and Reservoir

The storage level in Webster Reservoir at the end of 1967 was 19.9 feet (49,500 acre-feet) below the top of the conservation pool. The operation study for 1968 indicates that the carryover storage and reasonable minimum

inflows will be insufficient to meet the demands of 6,975 acres of Webster Irrigation District lands.

It is doubtful if the requirement for 1,000 acre-feet as a supplement to the municipal water supply for the City of Beloit, Kansas, will be needed in 1968 and ensuing years as storage is expected to be available from Waconda Lake after mid-June.

The State of Kansas and Geological Survey will continue their cooperative study to determine the base flow characteristics of the South Fork of the Solomon River below Webster Dam and Reservoir.

Glen Elder Dam and Waconda Lake

The natural flows of the Solomon River at Glen Elder are being passed through the Glen Elder Dam outlet works. This is expected to be continued until about mid-June when the construction program should permit storage to be accumulated to about elevation 1413.0 feet. It is expected that the pool level can again be raised about the first of September, if flows are available, to a maximum of 1425.0 feet and maintained there for the balance of the year. The accumulated storage by early July is expected to be adequate to meet the requirements of the City of Beloit for a supplemental water supply. The construction program on features of the Glen Elder Unit will be continued throughout 1968.

Cedar Bluff Dam and Reservoir

Cedar Bluff pool level was 5.0 feet (32,300 acre-feet) below the top of the conservation pool at the start of 1968. The conservation pool is not expected to fill in 1968 with reasonable minimum or most probable inflow conditions. The carryover storage and available inflow will be adequate to meet the irrigation requirements of 5,700 acres expected to be irrigated in the Cedar Bluff Irrigation District, supplement the municipal water supply of Russell, Kansas, and furnish a water supply for the Cedar Bluff National Fish Hatchery. The maximum expected drawdown under reasonable minimum conditions will be about 11.5 feet (67,800 acre-feet) below the top of the conservation pool.

The State of Kansas and Geological Survey will continue their cooperative study of water quality in the Smoky Hill River below Cedar Bluff Dam and Reservoir.

IRRIGATION OPERATIONS

It is estimated that 211,400 acres in the Niobrara, Lower Platte and Kansas River Basins will be irrigated in 1968. Of this, 154,100 acres are in Nebraska and 57,300 acres in Kansas. The acres expected to be irrigated in 1968 are shown by canals in Table 6. The forecasted canal

diversions for 1968 under the "normal", "dry" and "wet" years are shown graphically together with the acreage expected to be irrigated in Exhibits 15 through 28. The expected operations are discussed in the following paragraphs for each irrigation district.

Mirage Flats Irrigation District

Mirage Flats Irrigation District will continue to operate Box Butte Dam and the Dunlap Diversion Dam and Mirage Flats Canal to irrigate an estimated 10,950 acres of District lands.

The District is cooperating with the Bureau of Reclamation to test special paint to control algae growth on the Parshall flume measuring diversions into Mirage Flats Canal.

The District will add a polyethylene lining to 1,200 feet of Mirage Flats Canal as a part of the Open and Closed Conduit Committee Program of the Bureau of Reclamation.

Ainsworth Irrigation District

The Ainsworth Irrigation District expects to deliver water to 22,000 acres of District lands with diversions direct from Merritt Reservoir. Merritt Dam and Ainsworth Canal System are operated by the District.

The District is cooperating with the Bureau of Reclamation to evaluate vinyl base paint with a tributyl tin oxide additive for the control of algae in water measurement structures.

Loup Basin Reclamation District (Sargent and Farwell Irrigation Districts)

The Loup Basin Reclamation District will operate the Milburn Diversion Dam and Sargent Canal System to irrigate 10,850 acres of Sargent Irrigation District lands.

The Loup Basin Reclamation District will also operate Arcadia Diversion Dam, Sherman Feeder Canal, Sherman Dam and Farwell Canal System to deliver a water supply to 35,300 acres of Farwell Irrigation District lands.

Diversions into Sargent Canal in excess of the appropriated natural flow water right can be made if the excess is not greater than releases of storage from Sherman Reservoir or the amount of natural flow available in the Middle Loup River at the Arcadia Diversion Dam under water appropriations for the Farwell Unit.

As a flood control operation when flows in the Middle Loup River at Arcadia exceed 6,000 c.f.s., 850 cubic feet per second will be diverted into the Sherman Feeder Canal.

The Loup Basin Reclamation District is cooperating with the Bureau of Reclamation on a special tractive force research program on the Lower Main Farwell Canal.

Frenchman Valley and H & RW Irrigation Districts

The irrigated lands in these two districts are served by Enders Reservoir storage and from the Culbertson Canal and the Culbertson Extension Canal Systems which are operated under joint management. For 1968, 8,000 acres in the Frenchman Valley Irrigation District and 11,000 acres in the H &RW Irrigation District are expected to be irrigated.

In addition to meeting the irrigation requirements of the Frenchman Valley and the H & RW Irrigation Districts, approximately 150 acre-feet will be needed for sediment removal operation in the canal stilling basin below the Culbertson Diversion Dam. A bank protection program for Frenchman Creek to control the erosion of the channel will be continued in 1968.

Frenchman-Cambridge Irrigation District

The Frenchman-Cambridge Irrigation District will operate the Red Willow, Bartley, Cambridge and Meeker-Driftwood Canal Systems. It is estimated that 35,000 acres will be irrigated by these four systems in 1968 utilizing storage from Swanson, Hugh Butler and Harry Strunk Lakes.

The water use study initiated by the Bureau of Reclamation in 1964 in the area served by the Meeker-Driftwood Canal System will continue during 1968 and 1969. This study is conducted with the cooperation of the Frenchman-Cambridge Irrigation District and the appropriate landowners.

Almena Irrigation District No. 5

The operation and maintenance responsibilities of Almena Diversion Dam and Canal System will be transferred to the Almena Irrigation District on April 1, 1968. It is estimated that 5,250 acres of District lands will be irrigated.

Bostwick Irrigation District in Nebraska

Franklin, Naponee, Franklin Pump and Superior Canal Systems and Courtland Laterals in Nebraska will be operated by the Bostwick Irrigation District in Nebraska. An estimated 21,000 acres will be irrigated in 1968. The Kansas-Bostwick Irrigation District No. 2 will operate and maintain the Superior-Courtland Diversion Dam and Courtland Canal in Nebraska. The Courtland Canal supplies water for irrigation of Bostwick Division lands in Nebraska and Kansas and diversions to Lovewell Reservoir. Transportation loss in the Courtland Canal is shared on a water use basis. The

maintenance cost of the diversion dam and Courtland Canal in Nebraska is shared by the Kansas-Bostwick Irrigation District No. 2 and the Bostwick Irrigation District in Nebraska.

Kansas-Bostwick Irrigation District No. 2

In 1968, 29,500 acres are expected to be irrigated in the Kansas-Bostwick Irrigation District No. 2, of which 10,500 acres are above Lovewell Reservoir and 19,000 acres are below. Lovewell and Harlan County Reservoirs provide storage for this District.

Kirwin Irrigation District No. 1

The Kirwin Irrigation District No. 1 will operate the Kirwin Canal System to irrigate an estimated 9,875 acres during the 1968 irrigation season from Kirwin Reservoir.

Kirwin and Webster Irrigation Districts are under joint management to operate Kirwin Canal System, Woodston Diversion Dam and Osborne Canal System.

Webster Irrigation District No. 4

Of the 8,500 acres available for service, 6,975 acres are expected to be irrigated in 1968. Webster Reservoir provides storage for this District.

The Irrigation District Board of Directors have been contacted and the water supply situation, as explained in the first paragraph, Chapter III, has been brought to their attention.

Cedar Bluff Irrigation District No. 6

The Cedar Bluff Irrigation District No. 6 will operate the Cedar Bluff Canal System. An estimated 5,700 acres will be irrigated during the 1968 irrigation season from Cedar Bluff Reservoir.

MUNICIPAL WATER

City of Norton, Kansas

Water will be available to supply the maximum of 1,600 acre-feet contracted for by the City of Norton, Kansas.

City of Beloit, Kansas

Storage from Waconda Lake is expected to be available after June of 1968.

When storage in Waconda Lake has accumulated in sufficient quantity to meet the requirements of the City of Beloit, the interim contract with the Webster Irrigation District for 1,000 acre-feet of storage annually from Webster Reservoir will terminate.

City of Russell, Kansas

The municipal water supply requirements of the City of Russell, Kansas, will be supplied in full by return flows to the Smoky Hill River from the Cedar Bluff National Fish Hatchery and irrigation and by releases from Cedar Bluff Reservoir.

INDUSTRIAL WATER

The Midwest Oil Corporation and the Livingston Oil Company water requirements will be supplied in full from Bonny Reservoir storage. This storage is transferred to Swanson Lake where regulated releases are made to the Republican River to meet this requirement. The Midwest Oil Corporation may use as much as 3,000 acre-feet, and the Livingston Oil Company 300 acre-feet.

FISH HATCHERY

The Cedar Bluff National Fish Hatchery may use as much as 4,000 acre-feet from Cedar Bluff Reservoir.

OTHER USES

The reservoirs in the scope of this report will continue to provide excellent opportunities for fish, wildlife and recreation activities during 1968.

TABLE 1

RESERVOIR DATA - NIOBRARA, LOWER PLATTE AND KANSAS RIVER BASINS

RESERVOIR		CAPACITY ALLOCATIONS 1/ DEAD	LIVE CONSERVATION	FLOOD CONTROL	SURCHARGE CAPACITY
Box Butte	- Elevation Ft.	3969.0	4007.0	---	4016.0
	Total Acre-feet	640	31,060	---	47,800
	Net Acre-feet	640	30,420	---	16,740
Merritt	- Elevation Ft.	2875.0	2946.0	---	2949.8
	Total Acre-feet	1,610	74,490	---	86,130
	Net Acre-feet	1,610	72,880	---	11,640
Sherman	- Elevation Ft.	2118.5	2161.3	---	2169.7
	Total Acre-feet	3,840	66,250	---	92,670
	Net Acre-feet	3,840	62,410	---	26,420
Bonny	- Elevation Ft.	3635.5	3672.0	3710.0	3736.2
	Total Acre-feet	1,420	41,340	170,160	348,390
	Net Acre-feet	1,420	39,920	128,820	178,230
Swanson Lake	- Elevation Ft.	2710.0	2752.0	2773.0	2785.0
	Total Acre-feet	4,100	120,160	253,950	361,620
	Net Acre-feet	4,100	116,060	133,790	107,670
Enders	- Elevation Ft.	3080.0	3112.3	3127.0	3129.5
	Total Acre-feet	8,470	44,480	74,520	80,730
	Net Acre-feet	8,470	36,010	30,040	6,210
Hugh Butler Lake	- Elevation Ft.	2552.0	2581.8	2604.9	2628.0
	Total Acre-feet	6,310	37,780	86,630	163,415
	Net Acre-feet	6,310	31,470	48,850	76,785
Harry Strunk Lake	- Elevation Ft.	2335.0	2366.1	2386.2	2408.9
	Total Acre-feet	4,911	37,141	89,313	195,997
	Net Acre-feet	4,911	32,230	52,172	106,684
Norton	- Elevation Ft.	2275.0	2304.3	2331.4	2341.0
	Total Acre-feet	2,720	35,940	134,740	193,020
	Net Acre-feet	2,720	33,220	98,800	58,280
Harlan County	- Elevation Ft.	1885.0	1946.0	1973.5	1975.5
	Total Acre-feet	929	342,560	840,561	887,373
	Net Acre-feet	929	341,631	498,001	46,812
Lovewell	- Elevation Ft.	1562.1	1582.6	1595.3	1610.3
	Total Acre-feet	5,050	41,690	92,150	186,290
	Net Acre-feet	5,050	36,640	50,460	94,140
Kirwin	- Elevation Ft.	1693.0	1728.4	1757.3	1773.0
	Total Acre-feet	6,380	95,180	314,550	513,020
	Net Acre-feet	6,380	88,800	219,370	198,470
Webster	- Elevation Ft.	1855.5	1889.6	1923.7	1938.0
	Total Acre-feet	2,180	67,100	260,740	401,650
	Net Acre-feet	2,180	64,920	193,640	140,910
Cedar Bluff	- Elevation Ft.	2090.0	2144.0	2166.0	2192.0
	Total Acre-feet	8,260	185,090	376,950	730,180
	Net Acre-feet	8,260	176,830	191,860	353,230
Waconda Lake	- Elevation Ft.	1407.8	1455.6	1488.3	1492.9
	Total Acre-feet	1,520	239,100	976,000	1,149,000
	Net Acre-feet	1,520	237,580	738,420	173,000
Total Storage (A.F.)		58,340	1,459,361	3,670,264	5,437,285
Total Net Acre-feet		58,340	1,401,020	2,384,223	1,598,131

1/ Includes space for sediment storage.

TABLE 2
INFLOW INTO RESERVOIRS - 1967 RECORDS, 1968 ESTIMATES

Reservoir	1,000 Acre-Feet				
	1967 Inflows		1968 Estimates 1/		
	Computed	Adjusted 2/	Reasonable Minimum	Most Probable	Reasonable Maximum
Box Butte	24.5		18.0	22.1	31.5
Merritt	175.0		174.8	190.6	205.0
Sherman	117.6		145.8 3/	113.1 3/	90.1
Bonny	24.4		17.3	27.0	41.8
Swanson Lake	77.9	85.9 2/	71.0 4/	115.0 4/	200.0 4/
Enders	63.0		48.8 5/	59.4 5/	69.7 5/
Hugh Butler Lake	30.1		14.5	20.5	28.7
Harry Strunk Lake	74.2		37.2	52.8	82.9
Norton	15.9		7.4	20.0	53.0
Harlan County	398.4	523.0 2/	253.0 4/	446.0 4/	796.0 4/
Lovewell	24.4 6/	69.2 7/	4.6 6/	25.7 6/	68.5 6/
Kirwin	29.9		16.7	38.1	108.3
Webster	11.2		13.0	34.7	108.0
Cedar Bluff	40.8		15.0	42.6	140.1

1/ Values determined from inflow frequency curves. A value of 90% on curve = reasonable minimum conditions, 50% = most probable conditions, and 10% = reasonable maximum conditions.

2/ Computed records plus upstream depletions caused by operation of reservoirs and canals in Missouri Basin Projects.

3/ Sherman Reservoir is a regulating reservoir for the Farwell Canal System. Middle Loup River flows are diverted at the Arcadia Diversion Dam through the Sherman Feeder Canal to Sherman Reservoir

4/ Historical undepleted quantities.

5/ Includes reservoir pickup.

6/ Natural inflow from White Rock Creek.

7/ Includes total of White Rock Creek and inflow from Courtland Canal.

TABLE 3
RESERVOIR OPERATIONS
BOX BUTTE, MERRITT, AND SHERMAN RESERVOIRS
(Units in 1,000 Acre-Feet)

MONTH	TOTAL STORAGE END OF MONTH 1966	TOTAL STORAGE END OF MONTH 1967	TOTAL 1967 OUTFLOW*	INFLOW 1967 ACTUAL*	INFLOW MOST PROBABLE	DAM AND RESERVOIR INFORMATION
Jan.	15.7	12.4	0.1	2.0	2.3	DAM: BOX BUTTE
Feb.	17.0	14.2	0.1	2.0	2.4	RESERVOIR: BOX BUTTE
Mar.	21.6	16.1	0.1	2.5	3.4	
Apr.	24.1	16.8	0.1	1.2	2.9	
May	22.6	18.6	0.1	2.4	1.5	RESERVOIR CAPACITY
June	20.5	23.3	0.1	4.1	1.4	
July	9.1	17.6	5.8	2.1	1.1	
Aug.	4.8	8.3	10.2	1.4	1.0	DEAD 0.6
Sept.	5.3	8.6	1.8	1.1	0.7	LIVE CONSER. 30.4
Oct.	6.5	10.0	0.1	1.3	1.0	TOTAL 31.0
Nov.	8.5	11.9	0.1	2.2	1.9	
Dec.	10.4	13.9	0.1	2.1	2.5	
Total			18.7	24.4	22.1	
Jan.	58.4	61.4	12.1	12.3	16.2	DAM: MERRITT
Feb.	60.9	61.2	12.6	12.0	15.2	RESERVOIR: MERRITT
Mar.	61.2	61.4	14.1	13.1	17.4	
Apr.	60.9	68.6	6.0	15.2	16.9	
May	60.7	73.6	10.3	13.8	17.2	RESERVOIR CAPACITY
June	60.9	74.2	18.4	14.9	15.5	
July	51.2	66.1	20.6	12.4	14.8	
Aug.	47.8	52.0	25.3	11.8	14.8	DEAD 1.6
Sept.	53.9	53.9	11.0	11.4	14.8	LIVE CONSER.
Oct.	62.4	55.2	11.6	15.3	15.9	Inactive 1.5
Nov.	60.7	55.2	13.4	13.7	15.8	Active 71.4
Dec.	60.9	55.2	14.4	14.6	16.1	TOTAL 74.5
Total			169.8	160.5	190.6	
Jan.	54.7	50.8	0	0	0	DAM: SHERMAN
Feb.	53.2	49.0	0	0	0	RESERVOIR: SHERMAN
Mar.	51.1	46.9	0	0	0	
Apr.	63.2	56.9	2.0	16.0	2.0	
May	52.5	60.0	3.3	9.4	3.3	RESERVOIR CAPACITY
June	58.2	64.3	4.3	10.7	4.3	
July	40.7	47.6	26.2	12.0	26.2	
Aug.	40.9	24.6	32.4	12.5	32.4	DEAD 3.8
Sept.	31.7	41.5	10.4	31.2	10.4	LIVE CONSER. 62.4
Oct.	49.0	62.7	0	25.6	0	TOTAL 66.2
Nov.	55.2	60.5	0	0.2	0	
Dec.	53.0	56.7	0	0	0	
Total			78.6	117.6	78.6	

* Computed from Reservoir Operations Data.

TABLE 3
RESERVOIR OPERATIONS
BONNY, SWANSON AND ENDERS RESERVOIR
(Units in 1,000 Acre-feet)

MONTH	TOTAL STORAGE END OF MONTH 1966	TOTAL STORAGE END OF MONTH 1967	TOTAL 1967 OUTFLOW*	INFLOW 1967 ACTUAL*	INFLOW MOST PROBABLE	DAM AND RESERVOIR INFORMATION
Jan.	39.1	40.0	0.4	2.2	2.2	DAM: BONNY
Feb.	41.0	41.0	0.3	1.8	2.2	RESERVOIR: BONNY
Mar.	41.7	42.4	0.4	2.5	2.9	
Apr.	40.1	42.7	3.8	1.9	2.6	RESERVOIR CAPACITY
May	36.8	39.1	3.9	2.8	3.0	
June	35.4	38.0	3.1	4.0	3.1	
July	35.4	37.8	1.7	2.1	1.7	DEAD 1.4
Aug.	34.5	36.8	0.4	0	1.8	LIVE CONSER.
Sept.	34.8	35.3	0.7	1.2	1.5	Inactive 1.4
Oct.	35.5	34.8	0.9	1.4	1.7	Active 38.5
Nov.	36.9	35.9	0.3	2.4	2.1	SUBTOTAL 41.3
Dec.	38.2	37.3	0.4	2.0	2.2	FLOOD 128.9
Total			16.3	24.3	27.0	TOTAL 170.2
Jan.	119.8	99.8	0.1	7.9	7.8	DAM: TRENTON
Feb.	120.7	114.4	0.1	8.2	10.3	RESERVOIR: SWANSON LAKE
Mar.	121.3	114.4	0.1	8.1	13.2	
Apr.	120.2	118.6	1.0	7.4	12.8	
May	116.8	122.2	5.2	10.9	15.6	RESERVOIR CAPACITY
June	120.8	122.3	15.0	17.3	15.0	
July	108.8	120.9	15.7	2.5	4.7	DEAD 4.1
Aug.	82.4	103.7	15.6	1.0	4.9	LIVE CONSER.
Sept.	76.5	98.0	5.4	1.8	6.1	Inactive 11.4
Oct.	80.0	98.1	0.1	1.7	3.9	Active 104.7
Nov.	86.4	101.8	1.1	5.9	7.7	SUBTOTAL 120.2
Dec.	92.0	104.9	1.6	5.2	6.7	FLOOD 133.8
Total			61.0	77.9	108.7 a/	TOTAL 254.0
Jan.	41.3	39.7	0.5	4.3	5.5	DAM: ENDERS
Feb.	44.5	42.4	0.5	3.4	5.1	RESERVOIR: ENDERS
Mar.	46.7	44.9	0.5	3.4	5.2	
Apr.	46.5	44.5	2.8	3.2	4.9	RESERVOIR CAPACITY
May	45.0	45.1	3.2	4.3	5.0	
June	44.1	45.4	12.0	13.1	5.1	
July	29.8	38.2	12.9	6.5	4.7	DEAD 8.5
Aug.	21.8	23.9	19.1	5.5	4.5	LIVE CONSER.
Sept.	24.1	22.3	6.4	5.3	4.5	Inactive 1.5
Oct.	28.2	26.2	0.4	4.7	4.7	Active 34.5
Nov.	32.1	30.2	0.3	4.7	5.0	SUBTOTAL 44.5
Dec.	35.9	34.3	0.3	4.6	5.2	FLOOD 30.0
Total			58.9	63.0	59.4	TOTAL 74.5

a/ Inflow adjusted for upstream depletions.

* Computed from Reservoir Operations Data.

TABLE 3
RESERVOIR OPERATIONS
HUGH BUTLER, HARRY STRUNK AND NORTON RESERVOIRS
(Units in 1,000 Acre-feet)

MONTH	TOTAL STORAGE END OF MONTH 1966	TOTAL STORAGE END OF MONTH 1967	TOTAL 1967 OUTFLOW*	INFLOW 1967 ACTUAL*	INFLOW MOST PROBABLE	DAM AND RESERVOIR INFORMATION
Jan.	33.3	35.6	0.2	1.5	1.5	DAM: RED WILLOW
Feb.	34.8	36.5	0.2	1.3	1.6	RESERVOIR: HUGH BUTLER LAKE
Mar.	36.5	37.3	0.2	1.4	2.0	
Apr.	37.1	37.4	0.6	1.5	1.9	
May	36.0	38.3	0.4	2.0	2.4	RESERVOIR CAPACITY
June	35.4	38.1	5.3	5.9	3.1	
July	33.8	38.6	4.4	5.7	1.9	DEAD 6.3
Aug.	33.2	35.6	4.4	2.3	1.1	LIVE CONSER.
Sept.	32.5	37.2	2.3	4.7	1.0	Inactive 2.6
Oct.	32.8	36.7	0.8	0.9	1.2	Active 28.9
Nov.	33.5	37.5	0.2	1.7	1.4	SUBTOTAL 37.8
Dec.	34.4	38.2	0.2	1.2	1.5	FLOOD 48.8
Total			19.2	30.1	20.5	TOTAL 86.6
Jan.	36.7	37.4	3.9	4.2	3.6	DAM: MEDICINE CREEK
Feb.	37.2	37.2	3.9	3.8	3.8	RESERVOIR: HARRY STRUNK LAKE
Mar.	36.8	37.2	3.8	4.3	4.4	
Apr.	38.0	37.2	3.4	4.3	4.7	
May	38.3	37.7	3.5	4.6	6.1	RESERVOIR CAPACITY
June	38.5	41.2	16.9	21.2	7.6	
July	34.8	37.5	8.0	13.5	6.1	DEAD 4.9
Aug.	38.9	31.4	8.1	2.9	3.6	LIVE CONSER.
Sept.	38.9	34.6	1.0	4.8	3.1	Inactive 4.6
Oct.	39.0	36.6	0.6	3.0	3.1	Active 27.6
Nov.	37.2	37.0	2.8	3.8	3.3	SUBTOTAL 37.1
Dec.	37.1	37.2	3.3	3.8	3.4	FLOOD 52.2
Total			59.2	74.2	52.8	TOTAL 89.3
Jan.	30.4	29.1	0.1	0.1	0.4	DAM: NORTON
Feb.	31.4	29.1	0.1	0.1	0.7	RESERVOIR: NORTON
Mar.	31.0	29.8	0.1	0.1	0.8	
Apr.	30.3	27.5	1.0	0.6	0.9	RESERVOIR CAPACITY
May	29.0	26.5	1.0	0.8	2.4	
June	31.1	36.6	0.1	11.1	6.7	
July	30.8	34.4	2.5	1.4	4.4	DEAD 2.7
Aug.	31.5	30.6	3.1	0.3	1.8	LIVE CONSER.
Sept.	30.7	29.2	1.1	0.6	0.8	Inactive 2.6
Oct.	29.8	28.5	0.1	0	0.4	Active 30.6
Nov.	29.3	28.1	0.1	0.5	0.3	SUBTOTAL 35.9
Dec.	29.1	27.9	0.1	0.3	0.4	FLOOD 98.8
Total			9.4	15.9	20.0	TOTAL 134.7

* Computed from Reservoir Operations Data.

TABLE 3
RESERVOIR OPERATIONS
HARLAN COUNTY, LOVEWELL AND KIRWIN RESERVOIRS
(Units in 1,000 Acre-feet)

MONTH	TOTAL STORAGE END OF MONTH 1966	TOTAL STORAGE END OF MONTH 1967	TOTAL 1967 OUTFLOW*	INFLOW 1967 ACTUAL*	INFLOW MOST PROBABLE	DAM AND RESERVOIR INFORMATION
Jan.	336.9	355.9	7.8	14.5	9.3	DAM: HARLAN COUNTY
Feb.	352.2	349.5	25.8	20.4	17.0	RESERVOIR: HARLAN COUNTY RESERVOIR
Mar.	346.1	341.5	24.9	20.1	35.1	
Apr.	348.0	340.8	13.3	16.4	37.7	CAPACITY
May	339.4	344.4	8.1	19.5	54.6	
June	409.4	413.8	73.7	149.4	93.2	DEAD 0.9
July	345.9	353.5	144.7	92.0	24.7	LIVE CONSER. & SEDIMENT
Aug.	349.1	314.8	52.9	20.5	16.2	
Sept.	347.3	310.0	11.2	11.6	6.8	Inactive 143.9
Oct.	343.8	311.1	6.3	11.7	3.5	Active 197.8
Nov.	344.2	323.0	0.6	6.9	6.3	SUBTOTAL 342.6
Dec.	349.1	335.8	0.6	15.4	10.7	FLOOD 498.0
Total			369.9	398.4	315.1 a/	TOTAL 840.6

a/ Inflow adjusted for upstream depletions.

Jan.	42.2	41.4	0	0	0.3	DAM: LOVEWELL
Feb.	41.7	41.1	0	0.1	0.7	RESERVOIR: LOVEWELL
Mar.	41.6	40.9	0	0.2	1.1	
Apr.	41.4	40.8	0	0.8	1.2	RESERVOIR
May	40.4	39.7	0.7	0.8	4.8	CAPACITY
June	43.6	42.7	15.4	19.8	10.9	
July	40.0	39.5	15.7	13.9	15.3	DEAD 5.1
Aug.	26.1	30.6	25.2	17.2	11.9	LIVE CONSER.
Sept.	25.9	32.1	4.8	6.8	2.6	Inactive 11.7
Oct.	29.5	39.6	0.1	9.0	9.2	Active 24.9
Nov.	41.6	39.2	0	0	0.5	SUBTOTAL 41.7
Dec.	41.5	39.4	0	0.6	0.3	FLOOD 50.5
Total			61.9	69.2b/	58.8 c/	TOTAL 92.2

b/ Inflow from Courtland Canal - 44,814 A.F. Inflow from White Rock Creek 24,386 A.F.

c/ Forecasted inflow from Upper Courtland Canal - 33,100 A.F. Forecasted inflow from White Rock Creek - 25,700 A.F.

Jan.	94.8	74.8	0	0.3	0.8	DAM: KIRWIN
Feb.	96.6	75.4	0	1.0	1.8	RESERVOIR: KIRWIN
Mar.	94.7	76.1	0	2.2	2.1	
Apr.	95.3	75.8	0.6	1.7	2.7	RESERVOIR
May	91.8	75.2	0.6	1.5	4.3	CAPACITY
June	92.8	82.2	0.7	9.1	10.2	
July	82.3	84.7	6.5	10.8	6.4	DEAD 6.4
Aug.	77.6	76.9	6.9	1.1	4.0	LIVE CONSER.
Sept.	76.1	74.9	1.7	1.2	2.4	Inactive 3.4
Oct.	74.7	73.4	0	0	1.3	Active 85.4
Nov.	74.3	73.3	0	0.4	1.2	SUBTOTAL 95.2
Dec.	74.5	73.5	0	0.6	0.9	FLOOD 219.4
Total			17.0	29.9	38.1	TOTAL 314.6

* Computed from Reservoir Operations Data.

TABLE 3
RESERVOIR OPERATIONS
WEBSTER AND CEDAR BLUFF RESERVOIRS
(Units in 1,000 Acre-feet)

MONTH	TOTAL STORAGE END OF MONTH 1966	TOTAL STORAGE END OF MONTH 1967	TOTAL 1967 OUTFLOW*	INFLOW 1967 ACTUAL*	INFLOW MOST PROBABLE	DAM AND RESERVOIR INFORMATION
Jan.	67.6	29.7	0	0.1	0.8	DAM: WEBSTER
Feb.	67.1	30.4	0	0.8	1.7	RESERVOIR: WEBSTER
Mar.	67.1	31.1	0	1.1	2.1	
Apr.	68.5	31.4	0	1.3	2.9	RESERVOIR CAPACITY
May	62.7	32.0	0	1.6	4.2	
June	56.3	33.6	0.9	3.5	10.0	
July	42.0	27.5	6.6	1.5	4.5	DEAD 2.2
Aug.	33.6	19.6	6.8	0.1	3.2	LIVE CONSER.
Sept.	30.7	18.3	1.5	0.8	2.4	Inactive 1.1
Oct.	30.0	17.9	0	0.3	1.0	Active 63.8
Nov.	29.6	17.7	0	0	1.0	SUBTOTAL 67.1
Dec.	29.6	17.6	0	0.1	0.9	FLOOD 193.6
Total			15.8	11.2	34.7	TOTAL 260.7
Jan.	184.1	154.6	0.1	0.1	0.7	DAM: CEDAR BLUFF
Feb.	186.8	154.0	0.1	0.4	1.2	RESERVOIR: CEDAR BLUFF
Mar.	186.1	152.8	0.1	0.9	1.6	
Apr.	183.7	150.7	1.8	2.6	2.7	RESERVOIR CAPACITY
May	178.6	149.2	1.4	3.0	5.4	
June	175.3	163.3	0.2	17.8	10.6	
July	169.1	174.0	1.5	15.5	8.0	DEAD 8.3
Aug.	163.9	163.6	6.4	0.3	4.6	LIVE CONSER.
Sept.	159.5	158.6	2.3	0.1	4.4	Inactive 27.0
Oct.	156.8	155.5	0.3	0	1.5	Active 149.8
Nov.	155.2	154.0	0.1	0	1.1	SUBTOTAL 185.1
Dec.	154.6	158.9	0.1	0.1	0.8	FLOOD 191.9
Total			14.4 a/	40.8	42.6	TOTAL 377.0

a/ Cedar Bluff outflow includes releases to fish hatchery.

* Computed from Reservoir Operations Data.

TABLE 4
PRECIPITATION DATA

	BONNY DAM			TRENTON DAM			ENDERS DAM			RED WILLOW DAM			MEDICINE CREEK DAM			NORTON DAM			HARLAN COUNTY DAM			LOVEWELL DAM		
Month	Norm.	1966	1967	Norm.	1966	1967	Norm.	1966	1967	Norm.	1966	1967	Norm.	1966	1967	Norm.	1966	1967	Norm.	1966	1967	Norm.	1966	1967
Jan.	0.42	0.25	0.07	0.46	0.46	0.17	0.45	0.58	0.22	0.52	0.36	0.11	0.45	0.35	0.18	0.49	0.35	0.12	0.46	0.25	0.14	0.61	0.07	0.04
Feb.	0.48	0.21	0	0.61	0.17	0	0.52	0.13	0	0.65	0.25	0.08	0.54	0.48	0	0.61	0.81	0	0.63	0.94	0	0.84	1.72	0.03
Mar.	0.99	0.22	0.55	1.23	0.88	0.04	1.06	1.51	0.08	1.39	0.58	0.01	1.25	0.91	0.01	1.08	0.14	0	1.07	0.43	0.03	1.39	0.31	0.51
Apr.	1.64	1.93	1.19	1.91	1.00	0.61	1.88	0.91	1.08	2.04	1.00	0.54	2.00	0.88	1.04	2.05	1.03	1.31	2.29	1.51	1.42	2.13	0.94	2.61
May	2.53	0.34	4.12	3.24	0.11	3.66	3.46	0.31	3.46	3.10	0.02	4.19	3.40	0.17	3.82	3.29	0.18	4.56	3.26	0.11	3.29	3.57	0.93	2.48
June	2.52	2.20	3.07	3.08	4.06	5.27	3.37	2.83	7.32	3.22	2.78	4.01	3.36	4.42	8.27	3.55	7.03	9.90	3.63	5.27	8.80	4.57	3.28	8.68
July	2.57	3.17	2.12	2.66	4.40	5.39	2.39	5.38	3.59	2.73	5.67	3.91	2.32	6.67	4.97	2.91	5.31	4.53	2.71	2.48	4.08	2.94	4.10	3.83
Aug.	2.23	1.94	0.70	2.49	2.00	0.71	2.09	3.44	1.59	2.28	1.87	1.77	2.30	3.47	1.65	2.38	3.30	2.28	2.53	1.75	1.37	2.91	3.10	0.31
Sept.	1.23	3.01	2.85	1.58	2.37	2.69	1.65	3.45	0.66	1.61	1.63	3.89	1.57	2.11	2.17	1.72	2.73	3.22	2.12	1.36	0.84	2.73	2.10	5.63
Oct.	0.88	0.92	0.81	0.99	2.13	0.67	0.89	0.59	0.35	0.98	0.95	0.66	1.00	1.08	0.49	1.15	1.14	1.12	1.08	0.79	1.75	1.31	0.79	0.66
Nov.	0.43	0.31	0.20	0.65	0.36	0.62	0.55	0.21	0.27	0.69	0.18	0.27	0.52	0.03	0.37	0.72	0.13	0.24	0.70	0	0.29	1.01	0.17	0.36
Dec.	0.43	0.16	0.23	0.48	0.42	0.33	0.45	0.05	0.28	0.54	0.30	0.11	0.49	0.35	0.10	0.43	0.30	0.20	0.43	0.34	0.45	0.71	0.72	0.97
Total	16.35	14.66	15.91	19.38	18.36	20.16	18.76	19.39	18.90	19.75	15.59	19.55	19.20	20.92	23.07	20.38	22.45	27.48	20.91	15.23	22.46	24.72	18.23	26.11

	KIRWIN DAM			WEBSTER DAM			CEDAR BLUFF DAM			GLEN ELDER DAM			BOX BUTTE DAM			MERRITT DAM			SHERMAN DAM		
Month	Norm.	1966	1967	Norm.	1966	1967	Norm.	1966	1967	Norm.	1966	1967	Norm.	1966	1967	Norm.	1966	1967	Norm.	1966	1967
Jan.	0.51	0.35	0.17	0.57	0.37	0.22	0.55	0.12	0.16	0.60	0.13	0.08	0.44	0.56	0.07	0.40	0.19	0.06	0.52	0.27	0.10
Feb.	0.75	1.01	0	0.87	0.62	0	0.69	0.12	0	0.77	1.14	0.10	0.43	0.62	0.07	0.56	0.35	0.09	0.53	0.86	0
Mar.	1.32	0.19	0.23	1.49	0.15	0.15	1.49	0.04	0.03	1.43	0.20	0.18	0.95	0.25	0.41	1.01	0.32	0.83	1.17	0.42	0
Apr.	2.34	1.45	1.65	2.23	1.35	1.86	2.05	0.49	1.43	2.28	2.15	3.12	1.91	1.61	1.61	2.00	1.04	1.09	2.00	1.45	0.87
May	3.22	0.26	2.96	3.55	0.05	3.87	3.60	0	2.82	3.90	0.03	3.37	2.90	0.26	4.04	2.67	1.02	2.87	3.36	1.08	2.84
June	3.74	4.16	5.06	4.43	1.29	4.63	3.87	2.49	5.55	4.14	2.46	9.72	2.79	3.98	6.15	3.11	6.48	7.22	3.91	4.84	5.90
July	2.81	1.89	6.99	2.86	1.80	4.12	2.43	3.75	5.39	3.51	3.40	4.52	1.70	2.42	2.33	2.52	3.89	1.45	2.72	3.71	3.56
Aug.	2.80	2.25	0.88	2.81	2.02	1.25	2.68	2.38	1.37	3.19	2.84	0.27	1.18	1.57	0.62	2.29	5.41	0.28	2.32	5.35	0.68
Sept.	2.14	1.98	4.07	2.21	0.95	3.46	2.07	1.43	1.57	2.46	2.35	5.51	1.30	2.17	2.00	1.25	1.70	0.23	2.05	1.66	1.35
Oct.	1.40	0.68	0.34	1.30	0.97	0.43	1.28	0.78	0.32	1.61	0.96	0.64	0.77	0.76	0.40	0.88	0.53	0.28	1.07	1.12	1.05
Nov.	0.79	0.02	0.23	0.92	0.08	0.33	0.80	0	0.20	0.92	0.10	0.29	0.49	0.25	0.50	0.49	0.10	0.30	0.63	0.08	1.00
Dec.	0.52	0.38	0.32	0.63	0.45	0.42	0.52	0.48	0.31	0.69	0.55	0.87	0.41	0.22	0.27	0.34	0.33	0.29	0.52	0.74	0.17
Total	22.34	14.62	22.90	23.87	10.10	20.74	22.03	12.08	19.15	25.50	16.31	28.67	15.27	14.67	18.47	17.52	21.36	14.99	20.80	21.58	17.52

TABLE 5
STATUS OF REPAYMENT--WATER SERVICE CONTRACTS
NIOBRARA, LOWER PLATTE AND KANSAS RIVER BASINS

Contracting Organization	Contracts Number	Date Executed	Date Approved By Dist. Court	Development Period
Mirage Flats Irrigation District (Water Conservation Project)	I81r-1415	12/28/50		1-1-46 - 12-31-50
	Amendatory No. 1	3/21/58		
	Amendatory No. 2	1/16/63		
	Amendatory No. 3	6/26/64		
Ainsworth Irrigation District (Repayment and Water Service)	14-06-700-1218	9/12/56	1/24/59	4/1/67 - 12/31/76
	Amendatory	3/31/67		
Sargent Irrigation District (Repayment Only)	14-06-W-72	9/11/54	12/18/58	1/1/59 - 12/31/68
	Amendatory No. 1	3/23/57		
	Agreement for Water Service	3/16/59		
Farwell Irrigation District (Repayment Only)	14-06-700-1372	3/23/57	12/9/58	1/1/66 - 12/31/75
	Agreement for Water Service	3/16/59		
	Supplement No. 1	11/10/59		
	Amendatory No. 1	5/4/66		
Loup Basin Reclamation District (Water Service Only)	14-06-700-1371	3/23/57	12/16/58	
	Supplement No. 1	11/9/59		
	Amendatory No. 1	3/30/66		

TABLE 5
STATUS OF REPAYMENT--WATER SERVICE CONTRACTS
NIOBRARA, LOWER PLATTE AND KANSAS RIVER BASINS

Contracting Organization	Contracts Number	Contracts Date Executed	Contracts Date Approved By Dist. Court	Development Period
Middle Loup Public Power and Irrigation District (Water Service Only)	14-06-700-2296	8/17/60		None
Frenchman Valley Irrigation District	14-06-700-1241	11/7/56	10/20/58	None
H & RW Irrigation District	14-06-700-1242	11/7/56	7/19/57	1/1/63 - 12/31/72
	Amendment No. 1	8/12/58		
	Amendatory	10/19/67		
Frenchman-Cambridge Irrigation District	Ilr-1500	5/29/47	7/19/50 (Rej)	Blk I 1/1/57 - 12/31/66
	Amendatory No. 1	7/19/51	2/11/56 (Appr)	II 1/1/60 - 12/31/69
	Amendatory No. 2	1/4/56		III 1/1/65 - 12/31/74
	Amendatory No. 3	11/1/57		
	Amendatory No. 4	8/9/63		
	Supplement No. 1	3/16/61		
	Supplement No. 2	6/12/67		
Almena Irrigation District No. 5	14-06-700-1579	3/7/58	11/20/58	4/1/68 - 12/31/72
Bostwick Irrigation District in Nebraska	Ilr-1079	2/21/49	2/28/55	1/1/57 - 12/31/66
	Amendatory No. 1	11/10/54		
	Amendatory No. 2	5/3/60		
	Supplementary	3/16/61		
	Amendatory No. 3	8/9/63		

TABLE 5
STATUS OF REPAYMENT--WATER SERVICE CONTRACTS
NIOBRARA, LOWER PLATTE AND KANSAS RIVER BASINS

Contracting Organization	Contracts Number	Date Executed	Date Approved By Dist. Court	Development Period
Kansas-Bostwick Irrigation District No. 2	Ilr-1584	4/20/51	3/9/53	Blk I 1/1/57 - 12/31/66
	Amendatory No. 1	9/1/56		II 1/1/60 - 12/31/69
	Amendatory No. 2	4/24/57	12/20/57	III 1/1/61 - 12/31/70
	Amendatory No. 3	4/18/60		IV 1/1/62 - 12/31/71
	Amendatory No. 4	8/9/63		
	Amendatory No. 5	8/17/65		
	Letter Agreement	3/30/66		
Kirwin Irrigation District No. 1	14-06-W55	6/19/53	5/26/54	1/1/60 - 12/31/64
	Amendatory No. 1	10/18/55		
	Amendatory No. 2	2/12/59		
	Amendatory No. 3	6/21/65		
Webster Irrigation District No. 4	14-06-700-1375	4/24/57	10/22/57	1/1/62 - 12/31/71
	Amendatory No. 1	8/17/65		
	Amendatory No. 2	10/7/66		
Cedar Bluff Irrigation District No. 6	14-06-700-2118	9/3/59	3/17/60	1/1/65 - 12/31/69
City of Norton, Kansas	14-06-700-1573	3/7/58	Not Required	Not Applicable
City of Beloit, Kansas	14-06-700-3212	5/24/62	Not Required	Not Applicable
	14-06-700-3213	5/24/62		

TABLE 5
STATUS OF REPAYMENT--WATER SERVICE CONTRACTS
NIOBRARA, LOWER PLATTE AND KANSAS RIVER BASINS

Contracting Organization	Contracts Number	Date Executed	Date Approved By Dist. Court	Development Period
City of Russell, Kansas	14-06-700-3930	4/23/63	Not Required	Not Applicable
Midwest Oil Corporation	14-06-700-6208	6/13/66	Not Required	Not Applicable
Livingston Oil Company	14-06-700-6250	8/1/66	Not Required	Not Applicable

TABLE 6
IRRIGATION DEVELOPMENT AND OPERATION OF PROJECT CANAL SYSTEMS

Canal System	Acres 1967 Irrigation Season: Service Avail. 1/	Acres 1967 Irrigation Season: Actually Irrig. 2/	Acres 1968 Estimates: Service Available 1/	Acres 1968 Estimates: Expected to Be Irrigated	System Operations Calendar Years: Bureau of Reclamation	System Operations Calendar Years: District
MIRAGE FLATS IRRIGATION DISTRICT						
Mirage Flats	11,662	10,923	11,662	10,950	1946-50	1951-Present
AINSWORTH IRRIGATION DISTRICT						
Ainsworth	33,960	19,665	33,960	22,000	1965-66	1967-Present
LOUP BASIN RECLAMATION DISTRICT 3/ (Sargent Irrigation District and Farwell Irrigation District)						
Sargent	12,753	10,341	12,753	10,850	1957-58	1959-Present
Farwell	47,925	32,100	47,925	35,300	1963-65	1966-Present
Total	60,678	42,441	60,678	46,150		
FRENCHMAN VALLEY IRRIGATION DISTRICT						
Culbertson	9,600	8,304	9,600	8,000	None	1958-Present 4/
H & RW IRRIGATION DISTRICT						
Culbertson Extension	11,490	11,352	11,490	11,000	1961-62	1963-Present
FRENCHMAN-CAMBRIDGE IRRIGATION DISTRICT						
Meeker-Driftwood	16,440	12,824	16,440	12,647	1957-59	1960-Present
Red Willow	4,150	3,272	4,150	3,076	1963	1964-Present
Bartley	7,000	5,761	7,000	5,560	1954-56	1957-Present
Cambridge	15,600	13,916	15,600	13,717	1951-56	1957-Present
Total	43,190	35,773	43,190	35,000		
ALMENA IRRIGATION DISTRICT						
Almena	5,350	3,446	5,350	5,250	1967	

TABLE 6
IRRIGATION DEVELOPMENT AND OPERATION OF PROJECT CANAL SYSTEMS (Cont'd)

Canal System	Acres 1967 Irrigation Season: Service Avail. 1/	Acres 1967 Irrigation Season: Actually Irrig. 2/	Acres 1968 Estimates: Service Available 1/	Acres 1968 Estimates: Expected to Be Irrigated	System Operations Calendar Years: Bureau of Reclamation	System Operations Calendar Years: District
BOSTWICK IRRIGATION DISTRICT IN NEBRASKA						
Franklin	11,267	9,897	11,267	10,075	1954-56	1957-Present
Naponee	1,533	1,399	1,533	1,725	1955-56	1957-Present
Franklin Pump	2,125	2,037	2,125	2,000	1953-56	1957-Present
Superior	6,021	5,034	6,021	5,500	1951-56	1957-Present
Courtland	1,841	1,384	1,841	1,700	1952-58 5/	1959-Present
Total	22,787	19,751	22,787	21,000		
KANSAS-BOSTWICK IRRIGATION DISTRICT						
Courtland (above Lovewell Reservoir)	12,116	10,025	12,116	10,500	1954-58 6/	1959-Present
Courtland (below Lovewell Reservoir)	25,652	17,975	25,652	19,000	1958	1959-Present
Total	37,768	28,000	37,768	29,500		
KIRWIN IRRIGATION DISTRICT						
Kirwin	11,435	9,834	11,435	9,875	1957-59	1960-Present
WEBSTER IRRIGATION DISTRICT						
Osborne	8,500	6,950	8,500	6,975	1960-61	1962-Present
CEDAR BLUFF IRRIGATION DISTRICT						
Cedar Bluff	6,600	5,417	6,600 7/	5,700	1963-64	1965
TOTAL OF PROJECTS	263,020	179,655	263,020	211,400		

TABLE 6
IRRIGATION DEVELOPMENT AND OPERATION OF PROJECT CANAL SYSTEMS (Cont'd)

Canal System	Acres 1967 Irrigation Season: Service Avail. 1/	Acres 1967 Irrigation Season: Actually Irrig. 2/	Acres 1968 Estimates: Service Available 1/	Acres 1968 Estimates: Expected to Be Irrigated	System Operations Calendar Years: Bureau of Reclamation	System Operations Calendar Years: District

1/ Acres estimated for official program documents as of June 30, 1968.

2/ Determined by crop census.

3/ Loup Basin Reclamation District is operating agency for Sargent and Farwell Irrigation Districts.

4/ District operated since 1890, but 1958 was first year operated as part of Kansas River Projects.

5/ Nebraska-Bostwick District has operated laterals since 1957. Kansas-Bostwick District has operated the main canal since 1959, and the Superior-Courtland Diversion Dam since 1960.

6/ Kansas-Bostwick District operated lateral system since 1957.

7/ 6,823 acres assessed on tax rolls.

TABLE 7

CANAL DIVERSIONS AND ACRES IRRIGATED - NIOBRARA, LOWER PLATTE, AND KANSAS RIVER BASINS - 1967

District	State	Diversion - Acre-Feet April	May	June	July	Aug.	Sept.	Oct.	Total	Acres Irrigated
NON-PROJECT										
Hale Ditch Company	Colorado	145	739	815	381	55	395	208	2,738	700
Middle Loup Pub. Pow. & Irr.	Nebraska	0	2,497	875	7,541	11,635	3,322	0	25,870	11,820
TOTAL NON-PROJECT		145	3,236	1,690	7,922	11,690	3,717	208	28,608	12,520
MIRAGE FLATS AND MISSOURI RIVER BASIN PROJECTS										
NIOBRARA RIVER BASIN										
Mirage Flats Irrigation	Nebraska	0	0	0	5,349	9,959	1,927	0	17,235	10,923
Ainsworth Irrigation	Nebraska	879	4,258	907	14,995	21,878	7,563	0	50,480	19,665
Subtotal - Niobrara		879	4,258	907	20,344	31,837	9,490	0	67,715	30,588
LOWER PLATTE RIVER BASIN										
LOUP BASIN RECLAMATION 1/	Nebraska									
Sargent Irrigation 1/		0	1,650	1,440	7,821	10,199	3,189	66	24,365	10,341
Farwell Irrigation 1/		2,057	3,316	4,342	26,616	32,983	10,580	0	79,894	32,100
Subtotal - Lower Platte		2,057	4,966	5,782	34,437	43,182	13,769	66	104,259	42,441
KANSAS RIVER BASIN										
Frenchman Valley	Nebraska	4,938	1,596	361	4,837	6,878	3,105	0	21,715	8,304
H & RW	Nebraska	0	1,659	1,587	7,251	12,315	3,748	0	26,560	11,352
Frenchman-Cambridge	Nebraska	3,432	4,814	2,604	15,202	32,885	9,685	1,348	69,970	35,773
Almena	Kansas	337	621	71	2,090	2,650	873	0	6,642	3,446
Bostwick in Nebraska	Nebraska	944	2,841	480	13,749	21,574	4,523	0	44,111	19,751
Kansas-Bostwick	Kansas	0	714	1,591	25,263	38,734	1,954	0	68,256	28,000
Kirwin	Kansas	557	629	692	6,512	6,926	1,662	0	16,978	9,834
Webster	Kansas	0	0	787	4,772	5,609	1,181	0	12,349	6,950
Cedar Bluff	Kansas	1,548	953	32	1,110	6,023	1,897	0	11,563	5,417
Subtotal - Kansas River Basin		11,756	13,827	8,205	80,786	133,594	28,628	1,348	278,144	128,827
TOTAL PROJECTS		14,692	23,051	14,894	135,567	208,613	51,887	1,414	450,118	201,856

1/ Loup Basin Reclamation District is the operating agency for the Sargent and Farwell Irrigation Districts.

TABLE 8
ACRES IRRIGATED IN 1967 AND ESTIMATES FOR 1968
NIOBRARA, LOWER PLATTE AND KANSAS RIVER PROJECTS

Reclamation or Irrigation District	Acres Irrigated 1967	Acre-Feet Diverted 1967	1968 Diversion Estimates: Acres to be Irrigated	Acre-Feet Dry Yr.	Acre-Feet Norm. Yr.	Acre-Feet Wet Yr.
NIOBRARA RIVER BASIN						
Mirage Flats Irrigation	10,923	17,235	10,950	21,800	13,800	7,000
Ainsworth Irrigation	19,665	50,480	22,000	83,800	61,600	39,200
	30,588	67,715	32,950	105,600	75,400	46,200
LOWER PLATTE BASIN						
Loup Basin Reclamation	42,441	104,259	46,150	135,000	89,500	60,200
KANSAS RIVER BASIN						
Frenchman Valley Irrigation	8,304	21,715	8,000	23,000	16,000	10,000
H & RW Irrigation	11,352	26,560	11,000	31,800	22,000	13,800
Frenchman-Cambridge Irrigation	35,773	69,970	35,000	90,900	62,800	37,200
Almena Irrigation No. 5	3,446	6,642	5,250	15,100	9,600	5,700
Bostwick in Nebraska Irrigation	19,751	44,111	21,000	66,900	45,800	22,900
Kansas-Bostwick Irrigation No. 2	28,000	68,256	29,500	76,000	54,900	26,500
Kirwin Irrigation No. 1	9,834	16,987	9,875	26,500	17,800	11,000
Webster Irrigation No. 4	6,950	12,349	6,975	21,700	14,800	9,200
Cedar Bluff Irrigation No. 6	5,417	11,563	5,700	17,700	12,500	8,000
	128,827	278,144	132,300	369,600	256,200	144,300
TOTAL FOR DISTRICTS	201,856	450,118	211,400	610,200	421,100	250,700
MUNICIPALITIES & INDUSTRIAL - NON-PROJECT IRRIGATION						
City of Norton	---	609	---	1.4	1.2	1.2
City of Beloit	---	0	---	1.0	0.5	0
City of Russell	---	155	---	1.2	0.2	0
Midwest Oil Corporation	---	1,093				
Livingston Oil Company	---	40				
Cedar Bluff National Fish Hatchery		2,224				
Middle Loup Public Power and Irrigation District	11,820	25,870	11,820	___	___	___
TOTAL	11,820	29,991	11,820	3.6	1.9	1.2

TABLE 9

RESERVOIR OPERATION FORECAST FROM SWANSON LAKE TO CAMBRIDGE DIVERSION DAM - 1968

(Units in 1,000 Acre-Feet)

	Month	Gain (+) or Loss (-) Trenton to Bartley	Affect of Hugh Butler Operation	Bartley Canal Req.	Total River Req.	Meeker-Driftwood Canal Req.	Total Release Req. from Swanson Lake	Cambridge Canal Req.	Avail. Pickup Passing Bartley	Water Admin.	Total Release Req. from Harry Strunk Lake
Reas. Minimum	May	+2.9	-1.4	1.4	1.4	3.4	4.8	3.4	1.5	0	1.9
	June	+2.6	-1.5	1.4	1.8	3.4	5.2	3.4	1.5	0	1.9
	July	-0.5	-1.1	4.3	7.4	10.2	17.6	10.3	1.5	0	8.8
	Aug.	-0.7	-0.8	4.3	7.3	10.2	17.5	10.4	1.5	0	8.9
	Sept.	-0.3	-0.7	2.2	4.7	5.1	9.8	5.2	1.5	0	3.7
	Oct.	+1.6	-0.8	0.7	1.4	1.8	3.2	1.8	1.5	0.2	0.5
	Total	+5.6	-6.3	14.3	24.0	34.1	58.1	34.5	9.0	0.2	25.7
Most Probable	May	+4.9	-0.7	0.5	0	1.1	1.1	1.1	1.5	0.3	0
	June	+5.1	-0.7	0.5	0	1.3	1.3	1.2	1.5	0.3	0
	July	+1.8	-1.9	3.5	5.1	8.3	13.4	8.2	1.5	0	6.7
	Aug.	+1.2	-1.1	4.0	5.4	9.6	15.0	9.3	1.5	0	7.8
	Sept.	+1.8	-1.0	1.0	1.7	2.4	4.1	2.3	1.5	0	0.8
	Oct.	+3.3	-1.1	0.5	0	1.3	1.3	1.1	1.5	0.3	0
	Total	+18.1	-6.5	10.0	12.2	24.0	36.2	23.2	9.0	0.9	15.3
Reas. Maximum	May	+5.4	-0.4	0.3	0	0.6	0.6	0.7	1.5	0.3	0
	June	+8.7	-0.4	0.3	0	0.8	0.8	0.7	1.5	0.3	0
	July	+4.0	-1.6	2.1	1.2	4.9	6.1	4.8	1.5	0	3.3
	Aug.	+3.0	-1.8	2.3	2.6	5.7	8.3	5.5	1.5	0	4.0
	Sept.	+4.3	-0.8	0.6	0	1.4	1.4	1.4	1.5	0.3	0.2
	Oct.	+3.9	-0.6	0.3	0	0.8	0.8	0.7	1.5	0.3	0
	Total	+29.3	-5.6	5.9	3.8	14.2	18.0	13.8	9.0	1.2	7.5

TABLE 10
ESTIMATED DEMANDS ON HARLAN COUNTY RESERVOIR - 1968
(Units in 1,000 Acre-Feet)

	Months	1 Total Demand by Franklin, Naponee & Franklin Pump Canal	2 Total Demand by Superior & Courtland Above Lovewell	3 Avail. Pickup	4 Pickup in Col. 3 used to satisfy Col. 2 1/	5 Total Releases For Demands Above Lovewell	6 Unused Pickup	Lovewell Reservoir Requirements 7 Operation Releases From Harlan County 2/	8 Usable Pickup From Col. 6 3/	9 Total Avail. Supply	10 Lovewell Inflow Req. From Courtland Canal	11 Total Demands on Harlan County for Lovewell	12 Total Demands on Harlan County Reservoir
Reas. Minimum	May	4.6	4.7	2.7	2.7	6.6	0	1.2	0	1.2	4.9	3.7	11.5
	June	4.7	4.7	3.5	3.5	5.9	0	1.2	0	1.2	4.7	3.5	10.6
	July	13.9	14.3	0.8	0.8	27.4	0	1.2	0	1.2	15.8	14.6	43.2
	Aug.	16.3	16.7	0.5	0.5	32.5	0	1.2	0	1.2	9.4	8.2	41.9
	Sept.	6.9	7.2	0.8	0.8	13.3	0	1.2	0	1.2	1.3	0.1	14.6
	Oct.	0	0	0	0	0	0	0	0	0	0.7	0.7	0.7
	Total	46.4	47.6	8.3	8.3	82.6	0	6.0	0	6.0	40.2	30.1	122.5
Most Probable	May	1.4	1.7	7.0	1.7	1.5	5.3	0.6	3.5	4.1	0.6	0	2.1
	June	1.6	1.7	13.8	1.7	1.6	12.1	1.2	4.2	5.4	1.2	0	2.8
	July	12.3	13.8	7.8	7.8	18.3	0	1.2	0	1.2	12.7	11.5	31.0
	Aug.	12.3	13.9	5.0	5.0	21.2	0	1.2	0	1.2	10.6	9.8	32.2
	Sept.	3.1	3.5	2.7	2.7	3.8	0	1.2	0	1.2	0	0	5.0
	Oct.	0	0	0	0	0	0	0	0	0	8.0	8.0	8.0
	Total	30.7	34.6	36.3	18.9	46.4	17.4	5.4	7.7	13.1	33.1	29.3	81.1
Reas. Maximum	May	0.8	0.8	21.5	0.8	0.8	20.7	0.6	5.1	5.7	0.6	0	1.4
	June	0.8	0.9	37.5	0.9	0.8	36.6	0.6	6.9	7.5	0.6	0	1.4
	July	6.2	6.7	15.0	6.7	6.2	8.3	1.2	4.0	5.2	1.2	0	7.4
	Aug.	6.2	6.7	9.4	6.7	6.2	2.7	1.2	3.4	4.6	1.2	0	7.4
	Sept.	1.5	1.7	20.0	1.7	1.5	18.3	0	4.9	4.9	0	0	1.5
	Oct.	0	0	0	0	0	0	0	0	0	12.1	0	0
	Total	15.5	16.8	103.4	16.8	15.5	86.6	3.6	24.3	27.9	15.7	0	19.1

1/ Available pickup can be used for Superior and Courtland Canals only.
2/ Maximum of 20 c.f.s. per day (1,200 A.F. per month) released to meet unexpected demands for irrigation and sudden increases in transportation losses. This extra amount may be diverted into Lovewell Reservoir through the upper Courtland Canal.
3/ Estimated from curve based on past records of flood durations as affected by canal capacity limitations for picking up flood flows.

TABLE II
BOX BUTTE RESERVOIR OPERATION ESTIMATES - 1968
(UNITS IN 1,000 ACRE-FEET)

	Month	Hist. Inflow	Net Evap. AF	Total Release Req.	Res. Change	Res. Cont. at End of Month	Res. Spill	Res. Elev. at End of Month
						13.9		3993.8
Reas. Minimum	Jan	2.0	.1	.1	1.8	15.7	.0	3995.5
	Feb	2.1	.1	.1	1.9	17.6	.0	3997.2
	Mar	3.2	.2	.1	2.9	20.5	.0	3999.6
	Apr	2.6	.6	1.1	.9	21.4	.0	4000.3
	May	1.4	1.0	2.1	- 1.7	19.7	.0	3999.0
	Jun	.8	1.0	2.2	- 2.4	17.3	.0	3997.0
	Jul	.5	1.0	6.5	- 7.0	10.3	.0	3990.0
	Aug	.5	.6	6.5	- 6.6	3.7	.0	3980.0
	Sep	.5	.2	3.3	- 3.0	.7	.0	3969.5
	Oct	.7	.1	.1	.5	1.2	.0	3972.1
	Nov	1.5	.1	.1	1.3	2.5	.0	3977.1
	Dec	2.2	.0	.1	2.1	4.6	.0	3981.7
	TOTAL	18.0	5.0	22.3	- 9.3	.0	.0	
						13.9		3993.8
Most Probable	Jan	2.3	.1	.1	2.1	16.0	.0	3995.8
	Feb	2.4	.1	.1	2.2	18.2	.0	3997.7
	Mar	3.4	.2	.1	3.1	21.3	.0	4000.2
	Apr	2.9	.5	.7	1.7	23.0	.0	4001.5
	May	1.5	.8	.7	.0	23.0	.0	4001.5
	Jun	1.4	.9	.7	- .2	22.8	.0	4001.4
	Jul	1.1	1.1	4.8	- 4.8	18.0	.0	3997.6
	Aug	1.0	.9	5.5	- 5.4	12.6	.0	3992.5
	Sep	.7	.5	1.4	- 1.2	11.4	.0	3991.3
	Oct	1.0	.3	.1	.6	12.0	.0	3991.9
	Nov	1.9	.2	.1	1.6	13.6	.0	3993.5
	Dec	2.5	.1	.1	2.3	15.9	.0	3995.7
	TOTAL	22.1	5.7	14.4	2.0	.0	.0	
						13.9		3993.8
Reas. Maximum	Jan	2.6	.1	.1	2.4	16.3	.0	3996.1
	Feb	2.7	.1	.1	2.5	18.8	.0	3998.2
	Mar	4.7	.2	.1	4.4	23.2	.0	4001.6
	Apr	3.7	.4	.3	3.0	26.2	.0	4003.8
	May	2.4	.8	.3	1.3	27.5	.0	4004.7
	Jun	3.2	.7	.3	2.2	29.7	.0	4006.1
	Jul	2.1	1.1	2.5	- 1.5	28.2	.0	4005.2
	Aug	1.6	1.0	2.8	- 2.2	26.0	.0	4003.7
	Sep	1.3	.7	.8	- .2	25.8	.0	4003.5
	Oct	1.8	.4	.1	1.3	27.1	.0	4004.4
	Nov	2.5	.3	.1	2.1	29.2	.0	4005.8
	Dec	2.9	.2	.1	1.9	31.1	.7	4007.0
	TOTAL	31.5	6.0	7.6	17.2	.0	.7	

TABLE II
MERRITT RESERVOIR OPERATION ESTIMATES - 1968
(UNITS IN 1,000 ACRE-FEET)

	Month	Hist. Inflow	Net Evap. AF	Total Release Req.	Res. Change	Res. Cont. at End of Month	Res. Spill	Res. Elev. at End of Month
						57.2		2939.5
Reas. Minimum	Jan	14.5	.2	1.2	.0	57.2	13.1	2939.5
	Feb	14.1	.2	1.2	.0	57.2	12.7	2939.5
	Mar	16.6	.4	1.2	15.0	72.2	.0	2945.2
	Apr	15.3	1.5	1.2	2.3	74.5	10.3	2946.0
	May	15.8	1.9	9.6	.0	74.5	4.3	2946.0
	Jun	14.0	2.3	9.6	.0	74.5	2.1	2946.0
	Jul	13.3	2.4	26.2	- 15.3	59.2	.0	2940.3
	Aug	13.4	1.5	30.5	- 28.8	30.4	10.2	2925.0
	Sep	13.3	.8	13.7	- 1.2	29.2	.0	2924.1
	Oct	14.8	.5	1.2	1.2	30.4	11.9	2925.0
	Nov	14.6	.3	1.2	7.6	38.0	5.5	2930.0
	Dec	15.1	.1	1.2	.0	38.0	13.8	2930.0
	TOTAL	174.8	12.1	98.0	- 19.2	.0	83.9	
						57.2		2939.5
Most Probable	Jan	16.2	.2	1.2	.0	57.2	14.8	2939.5
	Feb	15.2	.2	1.2	.0	57.2	13.8	2939.5
	Mar	17.4	.4	1.2	15.8	73.0	.0	2945.5
	Apr	16.9	1.1	1.2	1.5	74.5	13.1	2946.0
	May	17.2	1.6	4.3	.0	74.5	11.3	2946.0
	Jun	15.5	1.8	4.3	.0	74.5	9.4	2946.0
	Jul	14.8	2.1	25.8	- 13.1	61.4	.0	2941.2
	Aug	14.8	1.4	25.8	- 31.0	30.4	18.6	2925.0
	Sep	14.8	.7	7.4	.0	30.4	6.7	2925.0
	Oct	15.9	.5	1.2	.0	30.4	14.2	2925.0
	Nov	15.8	.3	1.2	7.6	38.0	6.7	2930.0
	Dec	16.1	.1	1.2	.0	38.0	14.8	2930.0
	TOTAL	190.6	10.4	76.0	- 19.2	.0	123.4	
						57.2		2939.5
Reas. Maximum	Jan	17.3	.2	1.2	.0	57.2	15.9	2939.5
	Feb	16.3	.2	1.2	.0	57.2	14.9	2939.5
	Mar	18.7	.4	1.2	17.1	74.3	.0	2945.9
	Apr	18.8	.8	1.2	.2	74.5	16.6	2946.0
	May	18.4	1.3	3.2	.0	74.5	13.9	2946.0
	Jun	16.6	1.5	3.2	.0	74.5	11.9	2946.0
	Jul	16.3	1.8	16.8	- 2.3	72.2	.0	2945.2
	Aug	15.8	1.2	16.8	- 41.8	30.4	39.6	2925.0
	Sep	15.8	.6	5.2	.0	30.4	10.0	2925.0
	Oct	16.9	.5	1.2	.0	30.4	15.2	2925.0
	Nov	16.6	.3	1.2	7.6	38.0	7.5	2930.0
	Dec	17.5	.1	1.2	.0	38.0	16.2	2930.0
	TOTAL	205.0	8.9	53.6	- 19.2	.0	161.7	

TABLE 11
SHERMAN RESERVOIR OPERATION ESTIMATES - 1968
(UNITS IN 1,000 ACRE-FEET)

	MONTH	HIST. INFLOW	NET EVAP. AF	TOTAL RELEASE REQ.	RES. CHANGE	RES. CONT. AT END OF MONTH	RES. SPILL	RES. ELEV. AT END OF MONTH
						56.7		2157.7
REAS. MINIMUM	JAN	.0	.2	2.5	- 2.7	54.0	.0	2156.6
	FEB	.0	.2	2.5	- 2.7	51.3	.0	2155.5
	MAR	.0	.2	2.5	- 2.7	48.6	.0	2154.3
	APR	21.2	1.3	2.5	17.4	66.0	.0	2161.2
	MAY	14.3	1.8	12.5	.0	66.0	.0	2161.2
	JUN	14.7	2.2	12.5	.0	66.0	.0	2161.2
	JUL	30.0	2.4	36.9	- 9.3	56.7	.0	2157.7
	AUG	29.8	1.9	36.9	- 9.0	47.7	.0	2154.0
	SEP	32.3	1.5	12.5	18.3	66.0	.0	2161.2
	OCT	3.5	1.0	2.5	.0	66.0	.0	2161.2
	NOV	.0	.5	2.5	- 3.0	63.0	.0	2160.1
	DEC	.0	.2	2.5	- 2.7	60.3	.0	2159.1
	TOTAL	145.8	13.4	128.8	3.6	.0	.0	
						56.7		2157.7
MOST PROBABLE	JAN	.0	.2	2.5	- 2.7	54.0	.0	2156.6
	FEB	.0	.2	2.5	- 2.7	51.3	.0	2155.5
	MAR	.0	.2	2.5	- 2.7	48.6	.0	2154.3
	APR	20.9	1.0	2.5	17.4	66.0	.0	2161.2
	MAY	7.7	1.5	6.2	.0	66.0	.0	2161.2
	JUN	8.0	1.8	6.2	.0	66.0	.0	2161.2
	JUL	31.2	2.1	29.1	.0	66.0	.0	2161.2
	AUG	31.0	1.9	29.1	.0	66.0	.0	2161.2
	SEP	10.8	1.4	9.4	.0	66.0	.0	2161.2
	OCT	3.5	1.0	2.5	.0	66.0	.0	2161.2
	NOV	.0	.5	2.5	- 3.0	63.0	.0	2160.1
	DEC	.0	.2	2.5	- 2.7	60.3	.0	2159.1
	TOTAL	113.1	12.0	97.5	3.6	.0	.0	
						56.7		2157.7
REAS MAXIMUM	JAN	.0	.2	2.5	- 2.7	54.0	.0	2156.6
	FEB	.0	.2	2.5	- 2.7	51.3	.0	2155.5
	MAR	.0	.2	2.5	- 2.7	48.6	.0	2154.3
	APR	20.6	.7	2.5	17.4	66.0	.0	2161.2
	MAY	6.4	1.3	5.1	.0	66.0	.0	2161.2
	JUN	6.5	1.4	5.1	.0	66.0	.0	2161.2
	JUL	22.5	1.8	20.7	.0	66.0	.0	2161.2
	AUG	22.2	1.5	20.7	.0	66.0	.0	2161.2
	SEP	8.4	1.2	7.2	.0	66.0	.0	2161.2
	OCT	3.5	1.0	2.5	.0	66.0	.0	2161.2
	NOV	.0	.5	2.5	- 3.0	63.0	.0	2160.1
	DEC	.0	.2	2.5	- 2.7	60.3	.0	2159.1
	TOTAL	90.1	10.2	76.3	3.6	.0	.0	

TABLE 11
BONNY RESERVOIR OPERATION ESTIMATES - 1968
(UNITS IN 1,000 ACRE-FEET)

	Month	Hist. Inflow	Net Evap. AF	Rel. to Hale Ditch	Rel. to River	Total Release Req.	Res. Change	Res. Cont. at End of Month	Res. Spill	Res. Elev. at End of Month
								37.3		3670.0
Reas. Minimum	Jan	1.9	.2	.0	.4	.4	1.3	38.6	.0	3670.6
	Feb	1.9	.3	.0	.4	.4	1.2	39.8	.0	3671.2
	Mar	2.3	.4	.0	.4	.4	1.5	41.3	.0	3672.0
	Apr	2.0	.7	.3	3.0	3.3	- 2.0	39.3	.0	3671.0
	May	1.9	.9	.9	1.4	2.3	- 1.3	38.0	.0	3670.3
	Jun	1.3	1.1	.9	.4	1.3	- 1.1	36.9	.0	3669.7
	Jul	.7	1.3	.9	.4	1.3	- 1.9	35.0	.0	3668.7
	Aug	.4	1.1	.8	.4	1.2	- 1.9	33.1	.0	3667.7
	Sep	.4	.8	.6	.4	1.0	- 1.4	31.7	.0	3666.9
	Oct	1.1	.7	.5	.4	.9	- .5	31.2	.0	3666.6
	Nov	1.6	.4	.3	.4	.7	.5	31.7	.0	3666.9
	Dec	1.8	.3	.0	.4	.4	1.1	32.8	.0	3667.5
	TOTAL	17.3	8.2	5.2	8.4	13.6	- 4.5	.0	.0	
								37.3		3670.0
Most Probable	Jan	2.2	.2	.0	.4	.4	1.6	38.9	.0	3670.8
	Feb	2.2	.2	.0	.4	.4	1.6	40.5	.0	3671.6
	Mar	2.9	.3	.0	.4	.4	.8	41.3	1.4	3672.0
	Apr	2.6	.5	.4	3.0	3.4	- 1.3	40.0	.0	3671.3
	May	3.0	.5	.6	4.5	5.1	- 2.6	37.4	.0	3670.0
	Jun	3.1	.7	.6	1.8	2.4	.0	37.4	.0	3670.0
	Jul	1.7	1.0	.4	.4	.8	- .1	37.3	.0	3670.0
	Aug	1.8	1.0	.4	.4	.8	.0	37.3	.0	3670.0
	Sep	1.5	.7	.6	.4	1.0	- 1.8	35.5	1.6	3669.0
	Oct	1.7	.7	.6	.4	1.0	.0	35.5	.0	3669.0
	Nov	2.1	.4	.2	.4	.6	.0	35.5	1.1	3669.0
	Dec	2.2	.2	.0	.4	.4	1.6	37.1	.0	3669.9
	TOTAL	27.0	6.4	3.8	12.9	16.7	- .2	.0	4.1	
								37.3		3670.0
Reas. Maximum	Jan	2.7	.1	.0	.4	.4	2.2	39.5	.0	3671.1
	Feb	2.7	.2	.0	.4	.4	1.8	41.3	.3	3672.0
	Mar	3.5	.2	.0	.4	.4	.0	41.3	2.9	3672.0
	Apr	3.2	.4	.3	3.0	3.3	- .5	40.8	.0	3671.8
	May	5.2	.3	.5	6.2	6.7	- 1.8	39.0	.0	3670.8
	Jun	6.4	.4	.2	6.0	6.2	- .2	38.8	.0	3670.7
	Jul	4.2	.8	.2	4.6	4.8	- 1.4	37.4	.0	3670.0
	Aug	4.2	.6	.4	3.1	3.5	.1	37.5	.0	3670.1
	Sep	2.5	.5	.4	.4	.8	- 2.0	35.5	3.2	3669.0
	Oct	2.3	.5	.3	.4	.7	.0	35.5	1.1	3669.0
	Nov	2.4	.4	.3	.4	.7	.0	35.5	1.3	3669.0
	Dec	2.5	.2	.0	.4	.4	1.9	37.4	.0	3670.0
	TOTAL	41.8	4.6	2.6	25.7	28.3	.1	.0	8.8	

TABLE II
SWANSON LAKE OPERATION ESTIMATES - 1968
(UNITS IN 1,000 ACRE-FEET)

	MONTH	UNDEPL. INFLOW	CORR. FOR UPSTR. DEPL.	DEPL. INFLOW	NET EVAP. AF	TOTAL RELEASE REQ.	RES. CHANGE	RES. CONT. AT END OF MONTH	RES. SPILL	RES. ELEV. AT END OF MONTH
								104.9		2748.8
REAS. MINIMUM	JAN	7.5	- 1.5	6.0	.4	.1	5.5	110.4	.0	2750.0
	FEB	9.5	- 1.5	8.0	.5	.1	7.4	117.8	.0	2751.5
	MAR	11.1	- .4	10.7	.8	.1	2.4	120.2	7.4	2752.0
	APR	8.5	1.3	9.8	1.6	.1	.0	120.2	8.1	2752.0
	MAY	7.7	.4	8.1	1.7	4.8	.0	120.2	1.6	2752.0
	JUN	6.9	.0	6.9	2.2	5.2	- .5	119.7	.0	2751.9
	JUL	2.4	.5	2.9	3.0	17.6	- 17.7	102.0	.0	2748.2
	AUG	1.9	.7	2.6	2.5	17.5	- 17.4	84.6	.0	2744.2
	SEP	.5	.6	1.1	1.8	9.8	- 10.5	74.1	.0	2741.6
	OCT	2.6	- .2	2.4	1.5	3.2	- 2.3	71.8	.0	2741.1
	NOV	5.7	- .9	4.8	.9	.1	3.8	75.6	.0	2742.0
	DEC	6.7	- 1.4	5.3	.4	.1	4.8	80.4	.0	2743.2
	TOTAL	71.0	- 2.4	68.6	17.3	58.7	- 24.5	.0	17.1	
								104.9		2748.8
MOST PROBABLE	JAN	9.6	- 1.8	7.8	.3	.1	7.4	112.3	.0	2750.4
	FEB	12.0	- 1.7	10.3	.4	.1	7.9	120.2	1.9	2752.0
	MAR	14.3	- 1.1	13.2	.6	.1	.0	120.2	12.5	2752.0
	APR	12.0	.8	12.8	1.0	.1	.0	120.2	11.7	2752.0
	MAY	13.5	2.1	15.6	.9	1.1	.0	120.2	13.6	2752.0
	JUN	15.7	- .7	15.0	1.5	1.3	.0	120.2	12.2	2752.0
	JUL	5.7	- 1.0	4.7	2.5	13.4	- 11.2	109.0	.0	2749.7
	AUG	6.0	- 1.1	4.9	2.2	15.0	- 12.3	96.7	.0	2747.0
	SEP	5.0	1.1	6.1	1.3	4.1	.7	97.4	.0	2747.2
	OCT	4.6	- .7	3.9	1.6	1.3	1.0	98.4	.0	2747.4
	NOV	8.1	- .4	7.7	.8	.1	6.8	105.2	.0	2748.9
	DEC	8.5	- 1.8	6.7	.4	.1	6.2	111.4	.0	2750.2
	TOTAL	115.0	- 6.3	108.7	13.5	36.8	6.5	.0	51.9	
								104.9		2748.8
REAS. MAXIMUM	JAN	11.8	- 2.3	9.5	.2	.1	9.2	114.1	.0	2750.8
	FEB	14.5	- 2.0	12.5	.2	.1	6.1	120.2	6.1	2752.0
	MAR	19.3	- .2	19.1	.2	.1	.0	120.2	18.8	2752.0
	APR	16.3	.1	16.4	.2	.1	.0	120.2	16.1	2752.0
	MAY	23.1	1.5	24.6	.3	.6	.0	120.2	23.7	2752.0
	JUN	27.4	- .2	27.2	.8	.8	.0	120.2	25.6	2752.0
	JUL	29.3	.5	29.8	1.7	6.1	.0	120.2	22.0	2752.0
	AUG	18.3	- .8	17.5	2.1	8.3	.0	120.2	7.1	2752.0
	SEP	10.5	1.5	12.0	1.0	1.4	.0	120.2	9.6	2752.0
	OCT	8.7	- .5	8.2	1.6	.8	.0	120.2	5.8	2752.0
	NOV	10.1	- .4	9.7	.7	.1	.0	120.2	8.9	2752.0
	DEC	10.7	- 2.1	8.6	.3	.1	.0	120.2	8.2	2752.0
	TOTAL	200.0	- 4.9	195.1	9.3	18.6	15.3	.0	151.9	

TABLE II
ENDERS RESERVOIR OPERATION ESTIMATES - 1968
(UNITS IN 1,000 ACRE-FEET)

	Month	Hist. Inflow	Net Evap. AF	Total Release Req.	Res. Change	Res. Cont. at End of Month	Res. Spill	Res. Elev. at End of Month
						34.3		3105.8
Reas. Minimum	Jan	4.5	.1	.6	3.8	38.1	.0	3108.4
	Feb	4.0	.2	.6	3.2	41.3	.0	3110.4
	Mar	4.0	.3	.6	3.1	44.4	.0	3112.2
	Apr	3.6	.6	.6	.1	44.5	2.3	3112.3
	May	4.0	.7	2.0	.0	44.5	1.3	3112.3
	Jun	4.2	.7	2.2	.0	44.5	1.3	3112.3
	Jul	3.9	1.1	14.0	- 11.2	33.3	.0	3105.1
	Aug	4.1	.7	14.1	- 10.7	22.6	.0	3096.7
	Sep	3.8	.5	6.4	- 3.1	19.5	.0	3093.8
	Oct	4.2	.4	1.4	2.4	21.9	.0	3096.1
	Nov	4.2	.3	.6	3.3	25.2	.0	3098.9
	Dec	4.3	.1	.6	3.6	28.8	.0	3101.8
	TOTAL	48.8	5.7	43.7	- 5.5	.0	4.9	
						34.3		3105.8
Most Probable	Jan	5.5	.1	.6	4.8	39.1	.0	3109.0
	Feb	5.1	.1	.6	4.4	43.5	.0	3111.7
	Mar	5.2	.2	.6	1.0	44.5	3.4	3112.3
	Apr	4.9	.4	.6	.0	44.5	3.9	3112.3
	May	5.0	.4	.6	.0	44.5	4.0	3112.3
	Jun	5.1	.5	.6	.0	44.5	4.0	3112.3
	Jul	4.7	.8	10.2	- 6.3	38.2	.0	3108.4
	Aug	4.5	.8	12.2	- 8.5	29.7	.0	3102.5
	Sep	4.5	.4	1.4	2.7	32.4	.0	3104.5
	Oct	4.7	.5	.6	3.6	36.0	.0	3107.0
	Nov	5.0	.3	.6	4.1	40.1	.0	3109.6
	Dec	5.2	.1	.6	4.4	44.5	.1	3112.3
	TOTAL	59.4	4.6	29.2	10.2	.0	15.4	
						34.3		3105.8
Reas. Maximum	Jan	6.1	.1	.6	5.4	39.7	.0	3109.4
	Feb	5.7	.0	.6	4.8	44.5	.3	3112.3
	Mar	6.0	.1	.6	.0	44.5	5.3	3112.3
	Apr	5.6	.1	.6	.0	44.5	4.9	3112.3
	May	6.1	.2	.6	.0	44.5	5.3	3112.3
	Jun	6.6	.3	.6	.0	44.5	5.7	3112.3
	Jul	5.5	.6	3.7	.0	44.5	1.2	3112.3
	Aug	5.5	.6	4.9	.0	44.5	.0	3112.3
	Sep	5.7	.3	.6	.0	44.5	4.8	3112.3
	Oct	5.5	.5	.6	.0	44.5	4.4	3112.3
	Nov	5.6	.3	.6	.0	44.5	4.7	3112.3
	Dec	5.8	.1	.6	.0	44.5	5.1	3112.3
	TOTAL	69.7	3.2	14.6	10.2	.0	41.7	

TABLE II
HUGH BUTLER LAKE OPERATION ESTIMATES - 1968
(UNITS IN 1,000 ACRE-FEET)

	Month	Hist. Inflow	Net Evap. AF	Total Release Req.	Res. Change	Res. Cont. at End of Month	Res. Spill	Res. Elev. at End of Month
						38.2		2582.1
Reas. Minimum	Jan	1.2	.1	.2	- .4	37.8	1.3	2581.8
	Feb	1.4	.2	.2	.0	37.8	1.0	2581.8
	Mar	1.7	.3	.2	.0	37.8	1.2	2581.8
	Apr	1.5	.6	.2	.0	37.8	.7	2581.8
	May	1.7	.6	.8	.0	37.8	.3	2581.8
	Jun	1.5	.9	.8	- .2	37.6	.0	2581.7
	Jul	1.1	1.1	2.4	- 2.4	35.2	.0	2580.2
	Aug	.8	.9	2.4	- 2.5	32.7	.0	2578.5
	Sep	.7	.7	1.2	- 1.2	31.5	.0	2577.7
	Oct	.8	.6	.4	- .2	31.3	.0	2577.6
	Nov	1.0	.3	.2	.5	31.8	.0	2577.9
	Dec	1.1	.1	.2	.8	32.6	.0	2578.5
	TOTAL	14.5	6.4	9.2	- 5.6	.0	4.5	
						38.2		2582.1
Most Probable	Jan	1.5	.1	.2	- .4	37.8	1.6	2581.8
	Feb	1.6	.1	.2	.0	37.8	1.3	2581.8
	Mar	2.0	.2	.2	.0	37.8	1.6	2581.8
	Apr	1.9	.4	.2	.0	37.8	1.3	2581.8
	May	2.4	.4	.3	.0	37.8	1.7	2581.8
	Jun	3.1	.4	.3	.0	37.8	2.4	2581.8
	Jul	1.9	.8	1.9	- .8	37.0	.0	2581.3
	Aug	1.1	.7	2.2	- 1.8	35.2	.0	2580.2
	Sep	1.0	.5	.6	- .1	35.1	.0	2580.1
	Oct	1.1	.5	.3	.3	35.4	.0	2580.3
	Nov	1.4	.2	.2	1.0	36.4	.0	2581.0
	Dec	1.5	.1	.2	1.2	37.6	.0	2581.7
	TOTAL	20.5	4.4	6.8	- .6	.0	9.9	
						38.2		2582.1
Reas. Maximum	Jan	1.8	.1	.2	- .4	37.8	1.9	2581.8
	Feb	1.9	.1	.2	.0	37.8	1.6	2581.8
	Mar	2.5	.1	.2	.0	37.8	2.2	2581.8
	Apr	2.4	.2	.2	.0	37.8	2.0	2581.8
	May	2.9	.2	.2	.0	37.8	2.5	2581.8
	Jun	5.4	.2	.2	.0	37.8	5.0	2581.8
	Jul	3.0	.5	1.1	.0	37.8	1.4	2581.8
	Aug	1.8	.6	1.3	- .1	37.7	.0	2581.7
	Sep	2.3	.4	.3	.1	37.8	1.5	2581.8
	Oct	1.5	.4	.2	.0	37.8	.9	2581.8
	Nov	1.6	.2	.2	.0	37.8	1.2	2581.8
	Dec	1.6	.1	.2	.0	37.8	1.3	2581.8
	TOTAL	28.7	3.1	4.5	- .4	.0	21.5	

TABLE 11
HARRY STRUNK LAKE OPERATION ESTIMATES - 1968
(UNITS IN 1,000 ACRE-FEET)

	Month	Hist. Inflow	Net Evap. AF	Total Release Req.	Res. Change	Res. Cont. at End of Month	Res. Spill	Res. Elev. at End of Month
						37.2		2366.2
Reas. Minimum	Jan	3.0	.1	.3	- .1	37.1	2.7	2366.1
	Feb	3.3	.1	.3	.0	37.1	2.9	2366.1
	Mar	3.8	.3	.3	.0	37.1	3.2	2366.1
	Apr	3.6	.7	.3	.0	37.1	2.6	2366.1
	May	3.5	.6	1.9	.0	37.1	1.0	2366.1
	Jun	3.9	.8	1.9	.0	37.1	1.2	2366.1
	Jul	2.8	1.2	8.8	- 7.2	29.9	.0	2361.9
	Aug	2.8	.9	8.9	- 7.0	22.9	.0	2356.9
	Sep	2.2	.5	3.7	- 2.0	20.9	.0	2355.3
	Oct	2.5	.5	.5	1.5	22.4	.0	2356.5
	Nov	2.9	.3	.3	2.3	24.7	.0	2358.3
	Dec	2.9	.1	.3	2.5	27.2	.0	2360.1
	TOTAL	37.2	6.1	27.5	- 10.0	.0	13.6	
						37.2		2366.2
Most Probable	Jan	3.6	.1	.3	- .1	37.1	3.3	2366.1
	Feb	3.8	.1	.3	.0	37.1	3.4	2366.1
	Mar	4.4	.2	.3	.0	37.1	3.9	2366.1
	Apr	4.7	.4	.3	.0	37.1	4.0	2366.1
	May	6.1	.4	.3	.0	37.1	5.4	2366.1
	Jun	7.6	.6	.3	.0	37.1	6.7	2366.1
	Jul	6.1	.9	6.7	- 1.5	35.6	.0	2365.3
	Aug	3.6	.8	7.8	- 5.0	30.6	.0	2362.3
	Sep	3.1	.5	.8	1.8	32.4	.0	2363.4
	Oct	3.1	.6	.3	2.2	34.6	.0	2364.7
	Nov	3.3	.3	.3	2.5	37.1	.2	2366.1
	Dec	3.4	.1	.3	.0	37.1	3.0	2366.1
	TOTAL	52.8	5.0	18.0	- .0	.0	29.9	
						37.2		2366.2
Reas. Maximum	Jan	4.2	.0	.3	- .1	37.1	4.0	2366.1
	Feb	4.6	.1	.3	.0	37.1	4.2	2366.1
	Mar	5.7	.1	.3	.0	37.1	5.3	2366.1
	Apr	6.1	.1	.3	.0	37.1	5.7	2366.1
	May	8.3	.1	.3	.0	37.1	7.9	2366.1
	Jun	20.4	.2	.3	.0	37.1	19.9	2366.1
	Jul	9.5	.8	3.3	.0	37.1	5.4	2366.1
	Aug	5.8	.6	4.0	.0	37.1	1.2	2366.1
	Sep	6.4	.4	.3	.0	37.1	5.7	2366.1
	Oct	4.0	.6	.3	.0	37.1	3.1	2366.1
	Nov	3.8	.1	.3	.0	37.1	3.4	2366.1
	Dec	4.1	.1	.3	.0	37.1	3.7	2366.1
	TOTAL	82.9	3.2	10.3	- .1	.0	69.5	

TABLE II
NORTON RESERVOIR OPERATION ESTIMATES - 1968
(UNITS IN 1,000 ACRE-FEET)

	Month	Hist. Inflow	Net Evap. AF	Total Release Req.	Res. Change	Res. Cont. at End of Month	Res. Spill	Res. Elev. at End of Month
						27.9		2300.3
Reas. Minimum	Jan	.2	.1	.1	.0	27.9	.0	2300.3
	Feb	.4	.2	.1	.1	28.0	.0	2300.3
	Mar	.5	.3	.1	.1	28.1	.0	2300.4
	Apr	.5	.7	.1	- .3	27.8	.0	2300.2
	May	.9	.6	2.1	- 1.8	26.0	.0	2299.2
	Jun	2.2	1.1	2.5	- 1.4	24.6	.0	2298.4
	Jul	1.1	1.1	6.2	- 6.2	18.4	.0	2294.3
	Aug	.8	.7	5.9	- 5.8	12.6	.0	2289.4
	Sep	.3	.5	3.1	- 3.3	9.3	.0	2286.0
	Oct	.1	.3	1.3	- 1.5	7.8	.0	2284.1
	Nov	.2	.2	.1	- .1	7.7	.0	2284.0
	Dec	.2	.1	.1	.0	7.7	.0	2284.0
	TOTAL	7.4	5.9	21.7	- 20.2	.0	.0	
						27.9		2300.3
Most Probable	Jan	.4	.1	.1	.2	28.1	.0	2300.4
	Feb	.7	.1	.1	.5	28.6	.0	2300.7
	Mar	.8	.2	.1	.5	29.1	.0	2300.9
	Apr	.9	.4	.1	.4	29.5	.0	2301.1
	May	2.4	.4	.2	1.8	31.3	.0	2302.1
	Jun	6.7	.7	.1	4.6	35.9	1.3	2304.3
	Jul	4.4	1.1	4.0	- .7	35.2	.0	2304.0
	Aug	1.8	1.0	4.5	- 3.7	31.5	.0	2302.2
	Sep	.8	.7	1.3	- 1.2	30.3	.0	2301.6
	Oct	.4	.7	.7	- 1.0	29.3	.0	2301.0
	Nov	.3	.3	.1	- .1	29.2	.0	2301.0
	Dec	.4	.2	.1	.1	29.3	.0	2301.0
	TOTAL	20.0	5.9	11.4	1.4	.0	1.3	
						27.9		2300.3
Reas. Maximum	Jan	.8	.1	.1	.6	28.5	.0	2300.6
	Feb	1.2	.1	.1	1.0	29.5	.0	2301.1
	Mar	1.8	.1	.1	1.6	31.1	.0	2302.0
	Apr	1.4	.2	.1	1.1	32.2	.0	2302.5
	May	9.1	.2	.1	3.7	35.9	5.1	2304.3
	Jun	16.2	.5	.1	.0	35.9	15.6	2304.3
	Jul	10.7	.8	.5	.0	35.9	9.4	2304.3
	Aug	5.2	1.0	1.5	.0	35.9	2.7	2304.3
	Sep	3.1	.6	.1	.0	35.9	2.4	2304.3
	Oct	1.9	.5	.4	.0	35.9	1.0	2304.3
	Nov	.8	.2	.1	.0	35.9	.5	2304.3
	Dec	.8	.1	.1	.0	35.9	.6	2304.3
	TOTAL	53.0	4.4	3.3	8.0	.0	37.3	

TABLE II
HARLAN COUNTY RESERVOIR OPERATION ESTIMATES - 1968
(UNITS IN 1,000 ACRE-FEET)

	Month	Undepl. Inflow	Corr. For Upstr. Depl.	Depl. Inflow	Net Evap. AF	Total Release Req.	Res. Change	Res. Cont. at End of Month	Res. Spill	Res. Elev. at End of Month
								335.8		1945.5
Reas. Minimum	Jan	19.2	9.8	29.0	1.0	.6	6.8	342.6	20.6	1946.0
	Feb	24.3	- 12.3	12.0	.9	.6	.0	342.6	10.5	1946.0
	Mar	32.1	- 6.9	25.2	1.9	.6	.0	342.6	22.7	1946.0
	Apr	28.0	- 1.6	26.4	5.2	.6	.0	342.6	20.6	1946.0
	May	36.5	- 14.1	22.4	4.8	11.5	.0	342.6	6.1	1946.0
	Jun	42.0	- 15.5	26.5	7.3	10.6	.0	342.6	8.6	1946.0
	Jul	15.4	- 1.5	13.9	10.2	43.2	- 39.5	303.1	.0	1942.9
	Aug	13.6	- .4	13.2	8.1	41.9	- 36.8	266.3	.0	1939.6
	Sep	6.2	- 1.2	5.0	5.0	14.6	- 14.6	251.7	.0	1938.3
	Oct	5.6	- 8.0	.0	4.0	.7	- 4.7	247.0	.0	1937.9
	Nov	13.2	- 10.6	2.6	2.3	.6	- .3	246.7	.0	1937.8
	Dec	16.9	- 12.1	4.8	1.0	.6	3.2	249.9	.0	1938.1
	TOTAL	253.0	- 74.4	181.0	51.7	126.1	- 85.9	.0	89.1	
								335.8		1945.5
Most Probable	Jan	22.4	- 13.1	9.3	.7	.6	6.8	342.6	1.2	1946.0
	Feb	31.2	- 14.2	17.0	.7	.6	.0	342.6	15.7	1946.0
	Mar	38.0	- 2.9	35.1	1.2	.6	.0	342.6	33.3	1946.0
	Apr	38.8	- 1.1	37.7	1.4	.6	.0	342.6	35.7	1946.0
	May	59.9	- 5.3	54.6	3.6	2.1	.0	342.6	48.9	1946.0
	Jun	106.6	- 13.4	93.2	6.0	2.8	.0	342.6	84.4	1946.0
	Jul	42.1	- 17.4	24.7	8.3	31.0	- 14.6	328.0	.0	1944.9
	Aug	26.6	- 10.4	16.2	6.2	32.2	- 22.2	305.8	.0	1943.1
	Sep	19.7	- 12.9	6.8	4.5	5.0	- 2.7	303.1	.0	1942.9
	Oct	16.4	- 12.9	3.5	3.4	8.0	- 7.9	295.2	.0	1942.2
	Nov	20.8	- 14.5	6.3	1.5	.6	4.2	299.4	.0	1942.5
	Dec	23.5	- 12.8	10.7	.7	.6	9.4	308.8	.0	1943.3
	TOTAL	446.0	-130.9	315.1	38.2	84.7	- 27.0	.0	219.2	
								335.8		1945.5
Reas. Maximum	Jan	28.1	- 16.2	11.9	.0	.6	6.8	342.6	4.5	1946.0
	Feb	42.6	- 13.3	29.3	.3	.6	.0	342.6	28.4	1946.0
	Mar	57.1	- 1.3	55.8	.8	.6	.0	342.6	54.4	1946.0
	Apr	55.8	- .7	55.1	.2	.6	.0	342.6	54.3	1946.0
	May	105.5	- 9.5	96.0	2.0	1.4	.0	342.6	92.6	1946.0
	Jun	166.5	- 19.0	147.5	1.7	1.4	.0	342.6	144.4	1946.0
	Jul	105.4	- 30.9	74.5	7.2	7.4	.0	342.6	59.9	1946.0
	Aug	63.8	- 28.2	35.6	3.8	7.4	.0	342.6	24.4	1946.0
	Sep	75.0	- 6.6	68.4	4.2	1.5	.0	342.6	62.7	1946.0
	Oct	34.4	- 5.5	28.9	2.5	12.1	.0	342.6	14.3	1946.0
	Nov	31.4	.2	31.6	1.1	.6	.0	342.6	29.9	1946.0
	Dec	30.4	- 1.0	29.4	.4	.6	.0	342.6	28.4	1946.0
	TOTAL	796.0	-132.0	664.0	24.2	34.8	6.8	.0	598.2	

TABLE 11
LOVEWELL RESERVOIR OPERATION ESTIMATES - 1968
(UNITS IN 1,000 ACRE-FEET)

	MONTH	INFLOW FROM W.R.CR.	INFLOW FROM COURT.	TOTAL INFLOW	NET EVAP. AF	TOTAL RELEASE REQ.	RES. CHANGE	RES. CONT. AT END OF MONTH	RES. SPILL	RES. ELEV. AT END OF MONTH
								39.4		1581.8
REAS. MININUM	JAN	.1	.0	.1	.2	.0	- .1	39.3	.0	1581.8
	FEB	.1	.0	.1	.2	.0	- .1	39.2	.0	1581.7
	MAR	.2	.0	.2	.4	.0	- .2	39.0	.0	1581.7
	APR	.2	3.4	3.6	.9	.0	2.7	41.7	.0	1582.6
	MAY	.9	4.9	5.8	.9	4.9	.0	41.7	.0	1582.6
	JUN	1.6	4.7	6.3	1.5	4.9	- .1	41.6	.0	1582.6
	JUL	.7	15.8	16.5	1.9	14.6	.0	41.6	.0	1582.6
	AUG	.4	9.4	9.8	1.4	17.1	- 8.7	32.9	.0	1579.4
	SEP	.3	1.3	1.6	1.0	7.4	- 6.8	26.1	.0	1576.5
	OCT	.1	.7	.8	.6	.0	.2	26.3	.0	1576.6
	NOV	.0	.0	.0	.4	.0	- .4	25.9	.0	1576.4
	DEC	.0	.0	.0	.2	.0	- .2	25.7	.0	1576.3
	TOTAL	4.6	40.2	44.8	9.6	48.9	- 13.7	.0	.0	
								39.4		1581.8
MOST PROBABLE	JAN	.3	.0	.3	.1	.0	.2	39.6	.0	1581.9
	FEB	.7	.0	.7	.1	.0	.6	40.2	.0	1582.1
	MAR	1.1	.0	1.1	.2	.0	.9	41.1	.0	1582.4
	APR	1.2	.0	1.2	.5	.0	.6	41.7	.1	1582.6
	MAY	4.2	.6	4.8	.4	1.7	.0	41.7	2.7	1582.6
	JUN	9.7	1.2	10.9	.4	1.7	.0	41.7	8.8	1582.6
	JUL	2.6	12.7	15.3	1.3	14.1	- .1	41.6	.0	1582.6
	AUG	1.3	10.6	11.9	1.0	14.3	- 3.4	38.2	.0	1581.4
	SEP	2.6	.0	2.6	.7	3.6	- 12.1	26.1	10.4	1576.5
	OCT	1.2	8.0	9.2	.4	.0	8.8	34.9	.0	1580.2
	NOV	.5	.0	.5	.3	.0	.2	35.1	.0	1580.2
	DEC	.3	.0	.3	.1	.0	.2	35.3	.0	1580.3
	TOTAL	25.7	33.1	58.8	5.5	35.4	- 4.1	.0	22.0	
								39.4		1581.8
REAS. MAXIMUM	JAN	.6	.0	.6	.0	.0	.6	40.0	.0	1582.0
	FEB	1.7	.0	1.7	.1	.0	1.6	41.6	.0	1582.6
	MAR	3.3	.0	3.3	.1	.0	.1	41.7	3.1	1582.6
	APR	3.6	.0	3.6	.1	.0	.0	41.7	3.5	1582.6
	MAY	8.5	.6	9.1	.1	.8	.0	41.7	8.2	1582.6
	JUN	20.8	.6	21.4	- .3	1.0	.0	41.7	20.7	1582.6
	JUL	11.8	1.2	13.0	1.1	6.8	.0	41.7	5.1	1582.6
	AUG	4.0	1.2	5.2	.7	6.8	- 2.3	39.4	.0	1581.8
	SEP	8.3	.0	8.3	.4	1.7	- 13.3	26.1	19.5	1576.5
	OCT	3.9	12.1	16.0	.3	.0	15.6	41.7	.1	1582.6
	NOV	1.1	.0	1.1	.2	.0	.0	41.7	.9	1582.6
	DEC	.9	.0	.9	.0	.0	.0	41.7	.9	1582.6
	TOTAL	68.5	15.7	84.2	2.8	17.1	2.3	.0	62.0	

TABLE II
KIRWIN RESERVOIR OPERATION ESTIMATES - 1968
(UNITS IN 1,000 ACRE-FEET)

	Month	Hist. Inflow	Net Evap. AF	Total Release Req.	Res. Change	Res. Cont. at End of Month	Res. Spill	Res. Elev. at End of Month
						73.5		1723.7
Reas. Minimum	Jan	.2	.3	.0	- .1	73.4	.0	1723.6
	Feb	.9	.4	.0	.5	73.9	.0	1723.7
	Mar	1.4	.6	.0	.8	74.7	.0	1723.9
	Apr	1.7	1.6	.0	.1	74.8	.0	1724.0
	May	2.2	1.7	2.7	- 2.2	72.6	.0	1723.4
	Jun	4.2	2.2	2.7	- .7	71.9	.0	1723.3
	Jul	2.8	3.0	7.9	- 8.1	63.8	.0	1721.3
	Aug	1.8	2.4	9.2	- 9.8	54.0	.0	1718.6
	Sep	.7	1.6	4.0	- 4.9	49.1	.0	1717.2
	Oct	.2	1.3	.0	- 1.1	48.0	.0	1716.9
	Nov	.3	.7	.0	- .4	47.6	.0	1716.8
	Dec	.3	.3	.0	.0	47.6	.0	1716.8
	TOTAL	16.7	16.1	26.5	- 25.9	.0	.0	
						73.5		1723.7
Most Probable	Jan	.8	.3	.0	.5	74.0	.0	1723.8
	Feb	1.8	.3	.0	1.5	75.5	.0	1724.1
	Mar	2.1	.4	.0	1.7	77.2	.0	1724.5
	Apr	2.7	.7	.0	2.0	79.2	.0	1725.0
	May	4.3	1.3	.9	2.1	81.3	.0	1725.4
	Jun	10.2	1.8	.9	7.5	88.8	.0	1727.1
	Jul	6.4	2.5	7.1	- 3.2	85.6	.0	1726.4
	Aug	4.0	2.1	7.1	- 5.2	80.4	.0	1725.2
	Sep	2.4	1.6	1.8	- 1.0	79.4	.0	1725.0
	Oct	1.3	1.3	.0	.0	79.4	.0	1725.0
	Nov	1.2	.7	.0	.5	79.9	.0	1725.1
	Dec	.9	.3	.0	.6	80.5	.0	1725.3
	TOTAL	38.1	13.3	17.8	7.0	.0	.0	
						73.5		1723.7
Reas. Maximum	Jan	2.0	.2	.0	1.8	75.3	.0	1724.1
	Feb	2.6	.2	.0	2.4	77.7	.0	1724.6
	Mar	3.3	.2	.0	3.1	80.8	.0	1725.3
	Apr	5.2	.2	.0	5.0	85.8	.0	1726.4
	May	15.3	.7	.5	9.4	95.2	4.7	1728.4
	Jun	30.9	.7	.6	.0	95.2	29.6	1728.4
	Jul	15.2	2.3	4.4	.0	95.2	8.5	1728.4
	Aug	11.6	1.9	4.4	.0	95.2	5.3	1728.4
	Sep	12.6	1.1	1.1	.0	95.2	10.4	1728.4
	Oct	5.0	.9	.0	.0	95.2	4.1	1728.4
	Nov	2.6	.4	.0	.0	95.2	2.2	1728.4
	Dec	2.0	.2	.0	.0	95.2	1.8	1728.4
	TOTAL	108.3	9.0	11.0	21.7	.0	66.6	

TABLE II
WEBSTER RESERVOIR OPERATION ESTIMATES - 1968
(UNITS IN 1,000 ACRE-FEET)

	Month	Hist. Inflow	Net Evap. AF	Total Release Req.	Res. Change	Res. Cont. at End of Month	Res. Spill	Res. Elev. at End of Month	Req. Shortage
						17.6		1869.7	
Reas. Minimum	Jan	.3	.1	.0	.2	17.8	.0	1869.8	
	Feb	.8	.2	.0	.6	18.4	.0	1870.2	
	Mar	1.3	.3	.0	1.0	19.4	.0	1870.8	
	Apr	1.7	.7	.0	1.0	20.4	.0	1871.3	
	May	1.9	.7	3.0	- 1.8	18.6	.0	1870.3	
	Jun	3.5	1.0	3.9	- 1.4	17.2	.0	1869.4	
	Jul	1.7	1.1	8.6	- 8.0	9.2	.0	1863.8	
	Aug	.6	.7	9.6	- 5.9	3.3	.0	1857.5	3.8
	Sep	.8	.4	5.3	.0	3.3	.0	1857.5	4.9
	Oct	.0	.3	.9	- .3	3.0	.0	1857.0	.9
	Nov	.2	.1	.0	.1	3.1	.0	1857.2	
	Dec	.2	.1	.0	.1	3.2	.0	1857.3	
	TOTAL	13.0	5.7	31.3	- 14.4	.0	.0		
						17.6		1869.7	
Most Probable	Jan	.8	.1	.0	.7	18.3	.0	1870.1	
	Feb	1.7	.1	.0	1.6	19.9	.0	1871.0	
	Mar	2.1	.2	.0	1.9	21.8	.0	1872.1	
	Apr	2.9	.4	.0	2.5	24.3	.0	1873.4	
	May	4.2	.5	.8	2.9	27.2	.0	1874.9	
	Jun	10.0	.8	1.0	8.2	35.4	.0	1878.6	
	Jul	4.5	1.3	7.6	- 4.4	31.0	.0	1876.7	
	Aug	3.2	1.0	7.6	- 5.4	25.6	.0	1874.1	
	Sep	2.4	.8	2.3	- .7	24.9	.0	1873.7	
	Oct	1.0	.5	.4	.1	25.0	.0	1873.8	
	Nov	1.0	.3	.0	.7	25.7	.0	1874.1	
	Dec	.9	.1	.0	.8	26.5	.0	1874.5	
	TOTAL	34.7	6.1	19.7	8.9	.0	.0		
						17.6		1869.7	
Reas. Maximum	Jan	2.2	.1	.0	2.1	19.7	.0	1870.9	
	Feb	3.3	.1	.0	3.2	22.9	.0	1872.7	
	Mar	4.1	.1	.0	4.0	26.9	.0	1874.7	
	Apr	6.5	.2	.0	6.3	33.2	.0	1877.7	
	May	14.1	.4	.0	13.7	46.9	.0	1883.1	
	Jun	25.9	.2	.0	20.2	67.1	5.5	1889.6	
	Jul	17.2	1.6	3.8	.0	67.1	11.8	1889.6	
	Aug	12.9	1.2	3.9	.0	67.1	7.8	1889.6	
	Sep	9.6	1.1	.3	.0	67.1	8.2	1889.6	
	Oct	5.6	.8	.0	.0	67.1	4.8	1889.6	
	Nov	3.8	.3	.0	.0	67.1	3.5	1889.6	
	Dec	2.8	.2	.0	.0	67.1	2.6	1889.6	
	TOTAL	108.0	6.3	8.0	49.5	.0	44.2		

TABLE 11
CEDAR BLUFF RESERVOIR OPERATION ESTIMATES - 1968
(UNITS IN 1,000 ACRE-FEET)

	Month	Hist. Inflow	Net Evap. AF	Total Release Req.	Res. Change	Res. Cont. at End of Month	Res. Spill	Res. Elev. at End of Month
						152.8		2139.0
Reas. Minimum	Jan	.3	.6	.5	- .8	152.0	.0	2138.9
	Feb	.6	.7	.4	- .5	151.5	.0	2138.8
	Mar	.8	1.2	.6	- 1.0	150.5	.0	2138.6
	Apr	1.1	2.4	.4	- 1.7	148.8	.0	2138.3
	May	2.1	2.4	2.4	- 2.7	146.1	.0	2137.9
	Jun	4.0	3.8	2.3	- 2.1	144.0	.0	2137.5
	Jul	2.6	4.3	5.8	- 7.5	136.5	.0	2136.2
	Aug	1.5	3.7	6.1	- 8.3	128.2	.0	2134.7
	Sep	.8	2.9	3.8	- 5.9	122.3	.0	2133.5
	Oct	.4	2.1	1.6	- 3.3	119.0	.0	2132.9
	Nov	.4	1.1	.4	- 1.1	117.9	.0	2132.7
	Dec	.4	.6	.4	- .6	117.3	.0	2132.5
	TOTAL	15.0	25.8	24.7	- 35.5	.0	.0	
						152.8		2139.0
Most Probable	Jan	.7	.5	.5	- .3	152.5	.0	2139.0
	Feb	1.2	.6	.4	.2	152.7	.0	2139.0
	Mar	1.6	.8	.6	.2	152.9	.0	2139.0
	Apr	2.7	1.6	.4	.7	153.6	.0	2139.1
	May	5.4	1.6	1.2	2.6	156.2	.0	2139.6
	Jun	10.6	2.4	1.1	7.1	163.3	.0	2140.7
	Jul	8.0	4.0	4.9	- .9	162.4	.0	2140.6
	Aug	4.6	3.0	5.6	- 4.0	158.4	.0	2139.9
	Sep	4.4	2.4	1.9	.1	158.5	.0	2139.9
	Oct	1.5	1.9	1.1	- 1.5	157.0	.0	2139.7
	Nov	1.1	1.1	.4	- .4	156.6	.0	2139.6
	Dec	.8	.6	.4	- .2	156.4	.0	2139.6
	TOTAL	42.6	20.5	18.5	3.6	.0	.0	
						152.8		2139.0
Reas. Maximum	Jan	2.0	.5	.5	1.0	153.8	.0	2139.2
	Feb	2.5	.4	.4	1.7	155.5	.0	2139.4
	Mar	3.3	.5	.6	2.2	157.7	.0	2139.8
	Apr	6.7	1.1	.4	5.2	162.9	.0	2140.6
	May	22.3	1.0	1.0	20.3	183.2	.0	2143.7
	Jun	37.4	.5	.9	1.9	185.1	34.1	2144.0
	Jul	20.2	3.5	3.3	.0	185.1	13.4	2144.0
	Aug	21.7	2.3	3.7	.0	185.1	15.7	2144.0
	Sep	12.2	2.3	1.3	.0	185.1	8.6	2144.0
	Oct	7.1	1.5	.9	.0	185.1	4.7	2144.0
	Nov	2.6	.9	.4	.0	185.1	1.3	2144.0
	Dec	2.1	.5	.4	.0	185.1	1.2	2144.0
	TOTAL	140.1	15.0	13.8	32.3	.0	79.0	

TABLE 12
1967 EVAPORATION COMPARISON OF ACTUAL
WITH MOST PROBABLE FORECAST
(Units in 1,000 Acre-Feet)

Month	BOX BUTTE		MERRITT		SHERMAN		BONNY		SWANSON		ENDERS		HUGH BUTLER	
	1967 Evap.	Most Prob.	1967 Evap.	Most Prob.	1967 Evap.	Most Prob.	1967 Evap.	Most Prob.	1967 Evap.	Most Prob.	1967 Evap.	Most Prob.	1967 Evap.	Most Prob.
Jan.	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.3	0.1	0.1	0	0.1
Feb.	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.3	0.4	0.1	0.1	0.1	0.1
Mar.	0.1	0.1	0.3	0.3	0.1	0.2	0.2	0.3	0.4	0.6	0.1	0.2	0.1	0.2
Apr.	0.2	0.3	0.5	0.8	0.5	0.7	1.1	0.5	2.3	1.0	0.8	0.4	0.7	0.4
May	0.4	0.5	0.8	1.1	1.2	1.1	0.8	0.5	1.9	0.9	0.6	0.4	0.7	0.4
June	0.4	0.6	0.8	1.2	1.6	1.2	0.8	0.7	2.2	1.5	0.7	0.5	0.7	0.4
July	0.7	0.7	1.5	1.5	1.5	1.5	1.1	1.0	2.4	2.5	0.8	0.8	0.8	0.8
Aug.	0.4	0.5	1.2	1.4	1.0	1.3	1.2	1.0	2.8	2.2	1.0	0.8	0.9	0.7
Sept.	0.3	0.3	0.8	1.1	0.6	1.0	0.9	0.7	1.8	1.3	0.5	0.4	0.7	0.5
Oct.	0.2	0.2	0.6	0.8	0.6	0.7	0.8	0.7	1.4	1.6	0.4	0.5	0.6	0.5
Nov.	0.1	0.1	0.3	0.4	0.4	0.4	0.3	0.4	0.5	0.8	0.2	0.3	0.2	0.2
Dec.	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.1	0.1	0.1	0.1
Total	3.1	3.6	7.1	9.1	7.9	8.6	7.7	6.4	16.4	13.5	5.4	4.6	5.6	4.4

Month	HARRY STRUNK		NORTON		HARLAN COUNTY		LOVEWELL		KIRWIN		WEBSTER		CEDAR BLUFF	
	1967 Evap.	Most Prob.	1967 Evap.	Most Prob.	1967 Evap.	Most Prob.	1967 Evap.	Most Prob.	1967 Evap.	Most Prob.	1967 Evap.	Most Prob.	1967 Evap.	Most Prob.
Jan.	0.1	0.1	0.1	0.1	0.5	0.7	0.1	0.1	0.2	0.3	0.1	0.1	0.4	0.5
Feb.	0.1	0.1	0.1	0.1	0.5	0.7	0.1	0.1	0.2	0.3	0.1	0.1	0.4	0.6
Mar.	0.1	0.2	0.1	0.2	0.9	1.2	0.2	0.2	0.3	0.4	0.2	0.2	0.5	0.8
Apr.	0.9	0.4	0.9	0.4	5.3	1.4	0.9	0.5	1.5	0.7	1.0	0.4	3.1	1.7
May	0.7	0.4	0.8	0.4	6.2	3.6	1.3	0.4	1.5	1.3	0.9	0.5	3.3	1.6
June	0.8	0.6	0.9	0.7	6.4	6.0	1.2	0.4	1.4	1.8	1.0	0.8	3.0	2.5
July	1.0	0.9	1.0	1.1	7.4	8.3	1.4	1.3	1.6	2.5	1.1	1.3	3.6	4.1
Aug.	0.9	0.8	1.1	1.0	6.6	6.2	1.4	1.0	1.9	2.1	1.1	1.0	4.2	3.1
Sept.	0.6	0.5	0.8	0.7	4.9	4.5	0.8	0.7	1.3	1.6	0.7	0.8	3.0	2.5
Oct.	0.6	0.6	0.6	0.7	4.3	3.4	0.7	0.4	1.2	1.3	0.6	0.5	2.6	2.0
Nov.	0.2	0.3	0.2	0.3	1.1	1.5	0.2	0.3	0.5	0.7	0.2	0.3	0.7	1.1
Dec.	0.1	0.1	0.1	0.2	0.5	0.7	0.1	0.1	0.2	0.3	0.1	0.1	0.4	0.6
Total	6.1	5.0	6.7	5.9	44.6	38.2	8.4	5.5	11.8	13.3	7.1	6.1	25.2	21.1

TABLE 13
FLOOD DAMAGES PREVENTED BY KANSAS RIVER PROJECTS RESERVOIRS

BONNY

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

SWANSON

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

ENDERS

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

HUGH BUTLER

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

HARRY STRUNK

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

NORTON

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

HARLAN COUNTY

Year	Damages Prevented	Cumulative Total
1957	$1,045,000	$1,045,000
1960	4,853,000	5,898,000
1961	255,000	6,153,000
1962	39,000	6,192,000
1964	182,000	6,374,000
1965	60,000	6,434,000
1966	1,658,000	8,092,000
1967	3,539,000	11,631,000

LOVEWELL

Year	Damages Prevented	Cumulative Total
1957	$ 349,000	$ 349,000
1960	178,000	527,000
1961	165,000	692,000
1962	5,000	697,000

KIRWIN

Year	Damages Prevented	Cumulative Total
1957	$ 522,000	$ 522,000
1958	10,000	532,000
1960	499,000	1,031,000
1961	1,000	1,032,000
1962	1,000	1,033,000
1964	34,000	1,067,000
1965	325,000	1,392,000
1967	191,000	1,583,000

WEBSTER

Year	Damages Prevented	Cumulative Total
1957	$ 326,000	$ 326,000
1958	114,000	440,000
1960	1,018,000	1,458,000
1961	1,000	1,459,000
1962	1,000	1,460,000
1964	17,000	1,477,000
1965	325,000	1,802,000
1967	85,000	1,887,000

CEDAR BLUFF

Year	Damages Prevented	Cumulative Total
1951	$ 597,000	$ 597,000
1955	357,000	954,000
1956	19,000	973,000
1957	4,812,000	5,785,000
1958	829,000	6,614,000
1960	1,573,000	8,187,000
1961	101,000	8,288,000
1962	1,000	8,289,000
1964	17,000	8,306,000
1965	38,000	8,344,000
1967	42,000	8,386,000

PROJECT TOTALS

Year	Damages Prevented	Cumulative Total
1951	$1,124,000	$1,124,000
1953	135,000	1,259,000
1955	357,000	1,616,000
1956	123,000	1,739,000
1957	8,109,000	9,848,000
1958	953,000	10,801,000
1960	9,800,000	20,601,000
1961	523,000	21,124,000
1962	241,000	21,365,000
1964	300,000	21,665,000
1965	1,772,000	23,437,000
1966	1,790,000	25,227,000
1967	5,179,000	30,406,000

TABLE 14
OTHER USES AT FEDERALLY CONSTRUCTED STORAGE AND DIVERSION DAMS
NIOBRARA, LOWER PLATTE AND KANSAS RIVER BASINS
During 1967
Annual Totals

Features	Visitors	Cars in Area	Water Craft	Sport Fish Caught	Season Take Ducks	Season Take Geese
Colorado						
Bonny Reservoir	128,619	36,462	1,286	50,000	500	0
Kansas						
Norton Reservoir	334,820	74,338	8,250	120,000	850	10
Lovewell Reservoir	185,500	46,818	4,925	11,625	300	20
Kirwin Reservoir	153,412	56,996	7,860	80,000	554	319
Webster Reservoir	175,525	27,024	3,275	8,000	75	100
Woodston Diversion Dam	2,625	875	0	350	0	0
Cedar Bluff Reservoir	351,814	54,943	2,121	80,000	200	10
Nebraska						
Box Butte	25,850	7,170	1,200	12,000	Not Reported	
Merritt Reservoir	38,000	10,400	2,805	---	Not Reported	
Milburn Diversion Dam	5,430	1,050	0	3,000	Not Reported	
Arcadia Diversion Dam	12,395	6,250	0	19,000	Not Reported	
Sherman Reservoir	106,250	48,000	15,260	16,000	Not Reported	
Swanson Lake	145,177	36,294	3,500	63,750	Not Reported	
Enders Reservoir	36,443	10,413	1,270	16,112	Not Reported	
Hugh Butler Lake	242,531	60,825	8,910	82,000	Not Reported	
Harry Strunk Lake	49,552	12,388	1,805	35,091	Not Reported	
Harlan County Reservoir	642,415	190,765	---	200,000	200	35
TOTAL REPORTED	2,636,358	681,011	62,467	796,928	2,679	494

Visitors = Total visitor days which includes fishing, hunting, boating, skiing, camping, picnicking and sightseeing.

Water Craft = Boating days which includes rentals, inboards, outboards, rowboats and sailboats.

Exhibit I

OPERATION HYDROGRAPHS

BOX BUTTE RESERVOIR

1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 — 1967 ACTUAL — 1968 ESTIMATES

INFLOW

ASSUMED INFLOW CONDITIONS
Reasonable Max. — · — · —
Most Probable ———
Reasonable Min. – – – –

FEET

10
5
0

J F M A M J J A S O N D | J F M A M J J A S O N D

STORAGE & ELEVATION

31,060 A.F. Top of Live Conservation Pool El. 4007.0

640 A.F. Top of Dead Storage El. 3969.0

THOUSANDS OF ACRE

50
40
30
20
10
0

J F M A M J J A S O N D | J F M A M J J A S O N D

OUTFLOW

FEET

10
5
0

1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 — 1967 ACTUAL — 1968 ESTIMATES

THOUSANDS OF ACRE

10
5
0

Exhibit 2

OPERATION HYDROGRAPHS

MERRITT RESERVOIR

1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 ACTUAL | 1968 ESTIMATES

INFLOW

ASSUMED INFLOW CONDITIONS

Reasonable Max. _ _ _ _ _ _

Most Probable _____

Reasonable Min. _ _ _ _ _ _

THOUSANDS OF ACRE FEET

40 | 30 | 20 | 10 | 0

J F M A M J J A S O N D | J F M A M J J A S O N D

STORAGE & ELEVATION

No Flood Pool

74,486 A.F. Top of Live Conservation Pool El. 2946.0

1,614 A. F. Top of Dead Storage El. 2875.0

THOUSANDS OF ACRE FEET

100 | 80 | 60 | 40 | 20 | 0

J F M A M J J A S O N D | J F M A M J J A S O N D

OUTFLOW

56.4

THOUSANDS OF ACRE FEET

40 | 30 | 20 | 10 | 0

1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 ACTUAL | 1968 ESTIMATES

Exhibit 3

OPERATION HYDROGRAPHS

SHERMAN RESERVOIR

1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 ACTUAL | 1968 ESTIMATES

INFLOW

FEET

40 30 20 10 0

ASSUMED INFLOW CONDITIONS

Reasonable Max. _____

Most Probable _____

Reasonable Min. _____

J F M A M J J A S O N D | J F M A M J J A S O N D

STORAGE & ELEVATION

ACRE FEET OF

100 80 60 40 20 0

66,246 A.F. Top of Live Conservation Pool El. 2161.3

3839 A.F. Top of Dead Storage El. 2118.5

J F M A M J J A S O N D | J F M A M J J A S O N D

OUTFLOW

THOUSANDS OF ACRE FEET

50 40 30 20 10 0

1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 ACTUAL | 1968 ESTIMATES

Exhibit 4

OPERATION HYDROGRAPHS

BONNY RESERVOIR

1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 ACTUAL | 1968 ESTIMATES

INFLOW

ASSUMED INFLOW CONDITIONS
Reasonable Max. — . — . — . — .
Most Probable ———————
Reasonable Min. – – – – – – –

CUBIC FEET PER SECOND

30 — 20 — 10 — 0

J F M A M J J A S O N D | J F M A M J J A S O N D

STORAGE & ELEVATION

170,160 A.F. Top of Flood Control Pool El. 3710

41,340 A.F. Top of Live Conservation Pool El. 3672

1418 A.F. Top of Dead Storage El. 3635.5

ACRE FEET — THOUSANDS OF

160 — 120 — 80 — 40 — 0

OUTFLOW

CUBIC FEET PER SECOND

30 — 20 — 10 — 0

1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 ACTUAL | 1968 ESTIMATES

OPERATION HYDROGRAPHS

SWANSON LAKE

1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 | 1967 ACTUAL | 1968 ESTIMATES

INFLOW

FEET: 0, 10, 20, 30, 40, 50

ASSUMED INFLOW CONDITIONS
Reasonable Max. _ . _ . _ . _ . _
Most Probable _____
Reasonable Min. - - - - - - - -

J F M A M J J A S O N D | J F M A M J J A S O N D

STORAGE & ELEVATION

ACRE FEET: 0, 50, 100, 150, 200, 250

253,950 A.F. Top of Flood Control Pool El. 2773.0

120,160 A.F. Top of Live Conservation Pool El. 2752.0

4,100 A.F. Top of Dead Pool El. 2710.0

J F M A M J J A S O N D | J F M A M J J A S O N D

OUTFLOW

THOUSANDS OF ACRE FEET: 0, 10, 20, 30, 40, 50

1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 | 1967 ACTUAL | 1968 ESTIMATES

Exhibit 6

OPERATION HYDROGRAPHS

ENDERS RESERVOIR

1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 ACTUAL | 1968 ESTIMATES

INFLOW

ASSUMED INFLOW CONDITIONS
Reasonable Max. _ . _ . _ . _ . _
Most Probable _____
Reasonable Min. _ _ _ _ _ _ _

ACRE FEET — 0, 10, 20

J F M A M J J A S O N D | J F M A M J J A S O N D

STORAGE & ELEVATION

74,520 A.F. Top of Flood Control Pool El. 3127.0

44,480 A.F. Top of Live Conservation Pool El. 3112.3

8,467 A.F. Top of Dead Storage El. 3080.0

THOUSANDS OF ACRE FEET — 0, 10, 20, 30, 40, 50, 60, 70, 80

J F M A M J J A S O N D | J F M A M J J A S O N D

OUTFLOW

THOUSANDS OF ACRE FEET — 0, 10, 20

1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 ACTUAL | 1968 ESTIMATES

Exhibit 7

OPERATION HYDROGRAPHS

HUGH BUTLER LAKE

1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 ACTUAL | 1968 ESTIMATES

INFLOW

ASSUMED INFLOW CONDITIONS
Reasonable Max
Most Probable
Reasonable Min.

ACRE FEET — 0, 2, 4, 6, 8

J F M A M J J A S O N D | J F M A M J J A S O N D

STORAGE & ELEVATION

El. 2604.9 Top of Flood Control 86,630 A.F.
El. 25,818 Top of Live Conservation Pool 37,780 A.F.
El. 25,520 Top of Dead Storage 6,310 A.F.

THOUSANDS OF ACRE FEET — 0, 20, 40, 60, 80

OUTFLOW

ACRE FEET — 0, 2, 4, 6, 8

1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 ACTUAL | 1968 ESTIMATES

Exhibit 8

OPERATION HYDROGRAPHS

HARRY STRUNK LAKE

1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 ACTUAL | 1968 ESTIMATES

INFLOW

30
20
20
10
0

ASSUMED INFLOW CONDITIONS
Reasonable Max.
Most Probable
Reasonable Min.

20
10
0

J F M A M J J A S O N D | J F M A M J J A S O N D

STORAGE & ELEVATION

100
80
60
40
20
0

90,920 A.F. Top of Flood Control Pool El. 2386.2

39,230 A.F. Top of Live Conservation Pool El. 2366.1

5,370 A.F. Top of Dead Storage El. 2335.0

El. 2386.2
89,313 A.F.

NOTE: New area capacity data put in use Oct. 1, 1964

El. 2366
37,141 A.F.

El. 2335.0
4,911 A.F.

100
80
60
40
20
0

J F M A M J J A S O N D | J F M A M J J A S O N D

OUTFLOW

20
10
0

20
10
0

1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 ACTUAL | 1968 ESTIMATES

THOUSANDS OF ACRE FEET

THOUSANDS OF ACRE FEET

OPERATION HYDROGRAPHS

NORTON RESERVOIR

1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 ACTUAL | 1968 ESTIMATES

INFLOW

ASSUMED INFLOW CONDITIONS

Reasonable Max. _ . _ . _ . _ . _ .

Most Probable _____

Reasonable Min - - - - - - - - - - -

CFS FEET

60 40 20 0

J F M A M J J A S O N D | J F M A M J J A S O N D

STORAGE & ELEVATION

134,740 A.F. Top of Flood Control Pool El. 2331.4

35,935 A.F. Top of Live Conservation Pool El. 2304.3

2,720 A.F. Top of Dead Storage El. 2275.0

ACRE FEET THOUSANDS OF

140 120 100 80 60 40 20 0

J F M A M J J A S O N D | J F M A M J J A S O N D

OUTFLOW

CFS FEET

60 40 20 0

1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 ACTUAL | 1968 ESTIMATES

Note : Storage begin Oct. 6, 1964 (87 A.F. on Dec. 31, 1964)

Exhibit 10

OPERATION HYDROGRAPHS

HARLAN COUNTY RESERVOIR

1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 — 1967 ACTUAL — 1968 ESTIMATES

INFLOW

ASSUMED INFLOW CONDITIONS
Reasonable Max. — · — · —
Most Probable ———
Reasonable Min. - - - - -

ACRE FEET: 200, 150, 100, 50, 0

J F M A M J J A S O N D J F M A M J J A S O N D

STORAGE & ELEVATION

850,000 A.F. Top Flood Control Pool El. 1973.5

El. 1973.5
840,561 A. F.

NOTE: New area capacity data placed in use on Oct. 1, 1964

Top of Live Conservation Pool El. 1946.0
350,120 A.F.

El. 1946.0
342,560 A.F.

El. 1885.0
929 A.F.

1300 A.F Top of Dead Storage El. 1885.0

THOUSANDS OF ACRE FEET: 800, 600, 400, 200, 0

OUTFLOW

ACRE FEET: 200, 150, 100, 50, 0

1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 — 1967 ACTUAL — 1968 ESTIMATES

Exhibit 11

OPERATION HYDROGRAPHS

LOVEWELL RESERVOIR

1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 ACTUAL | 1968 ESTIMATES

INFLOW

37

32.3

ASSUMED INFLOW CONDITIONS

Reasonable Max.

Most Probable

Reasonable Min.

CFS FEET

20 15 10 5 0

J F M A M J J A S O N D J F M A M J J A S O N D

STORAGE & ELEVATION

92,150 A.F. Top of Flood Control Pool El. 1595.3

41,690 A.F. Top of Live Conservation Pool El. 1582.6

5054 A.F. Top of Dead Storage El. 1562.0

ACRE FEET

100 80 60 40 20 0

J F M A M J J A S O N D J F M A M J J A S O N D

OUTFLOW

THOUSANDS OF CFS

20 15 10 5 0

1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 ACTUAL | 1968 ESTIMATES

Exhibit 12

OPERATION HYDROGRAPHS

KIRWIN RESERVOIR

1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 ACTUAL | 1968 ESTIMATES

INFLOW

Inflow June 1957
73.9 Thousands A.F.

ASSUMED INFLOW CONDITIONS
Reasonable Max
Most Probable
Reasonable Min.

FEET

50 40 30 20 10 0

J F M A M J J A S O N D | J F M A M J J A S O N D

STORAGE & ELEVATION

314,550 A.F. Top of Flood Control Pool El. 1757.3

95,180 A.F. Top of Live Conservation Pool El. 1728.4

6,385 A.F. Top of Dead Storage El. 1693.0

ACRE FEET

300 250 200 150 100 50 0

THOUSANDS OF

OUTFLOW

50 40 30 20 10 0

THOUSANDS OF

1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 ACTUAL | 1968 ESTIMATES

OPERATION HYDROGRAPHS

WEBSTER RESERVOIR

1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 ACTUAL | 1968 ESTIMATES

INFLOW

Inflow June 1957
58.7 Thousands A.F.

ASSUMED INFLOW CONDITIONS
Reasonable Max. — · — · —
Most Probable ———
Reasonable Min. – – – –

FEET

STORAGE & ELEVATION

260,740 A.F. Top of Flood Control Pool El. 1923.7

67,100 A.F. Top of Live Conservation Pool El. 1889.6

2184 A.F. Top of Dead Storage El. 1855.5

ACRE

THOUSANDS OF

OUTFLOW

J F M A M J J A S O N D | J F M A M J J A S O N D

1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 ACTUAL | 1968 ESTIMATES

Exhibit 14

OPERATION HYDROGRAPHS

CEDAR BLUFF RESERVOIR

1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 — 1967 ACTUAL — 1968 ESTIMATES

INFLOW

FEET

50 — 40 — 30 — 20 — 10 — 0

100 / 50

Inflow June 1957
79.4 Thousands A.F.

ASSUMED INFLOW CONDITIONS
Reasonable Max. ———
Most Probable ———
Reasonable Min. ———

J F M A M J J A S O N D | J F M A M J J A S O N D

STORAGE & ELEVATION

ACRE FEET

400 — 300 — 200 — 100 — 0

376,950 A.F. Top of Flood Control Pool El. 2166.0

185,090 A.F. Top of Live Conservation Pool El. 2144.0

8,261 A.F. Top of Dead Storage El. 2090.0

THOUSANDS OF ACRE FEET

OUTFLOW

50 — 40 — 30 — 20 — 10 — 0

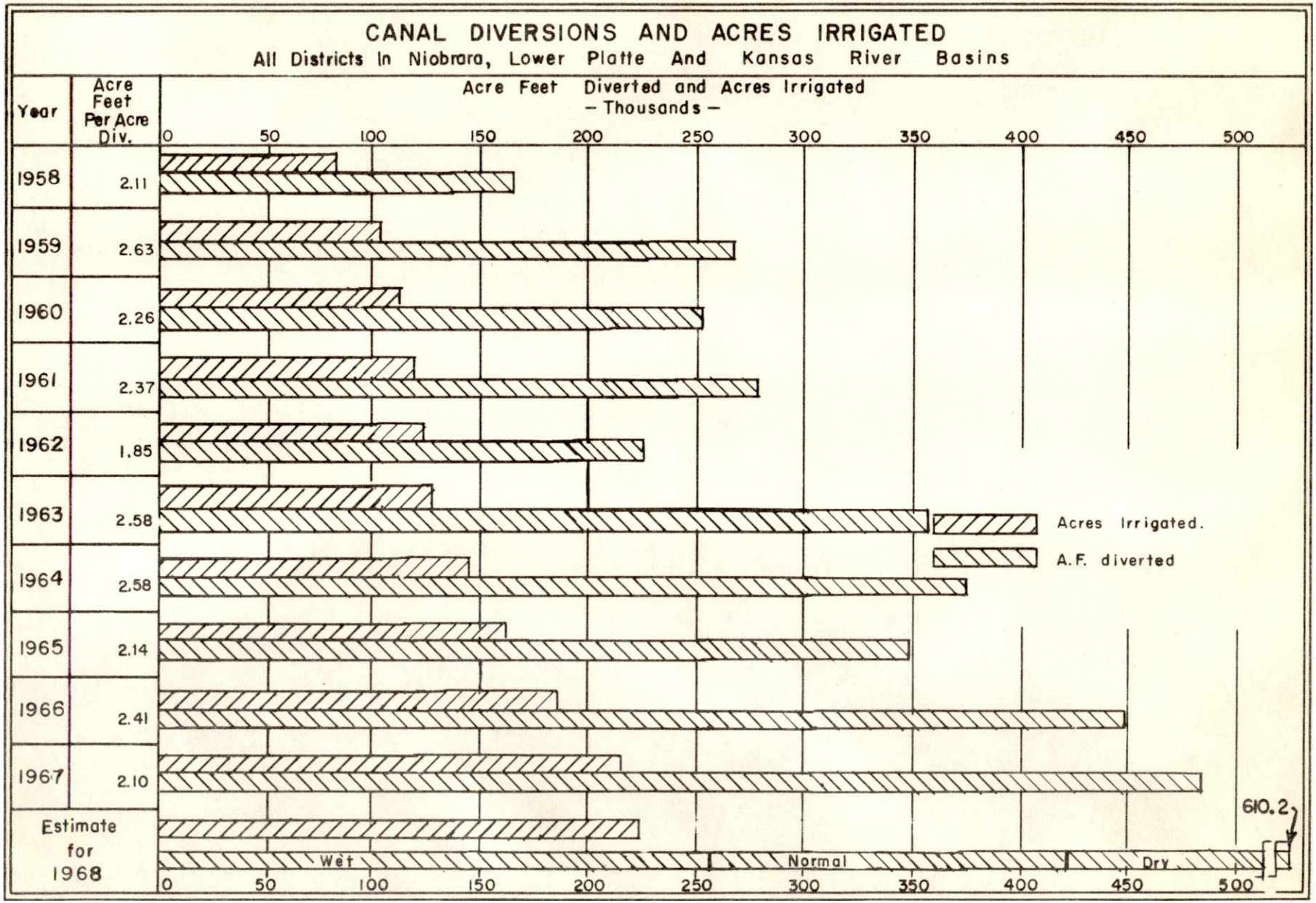
100 / 50

Outflow July 1957
93.7 Thousands A.F.

1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 — 1967 ACTUAL — 1968 ESTIMATES

CANAL DIVERSIONS AND ACRES IRRIGATED

All Districts In Niobrara, Lower Platte And Kansas River Basins



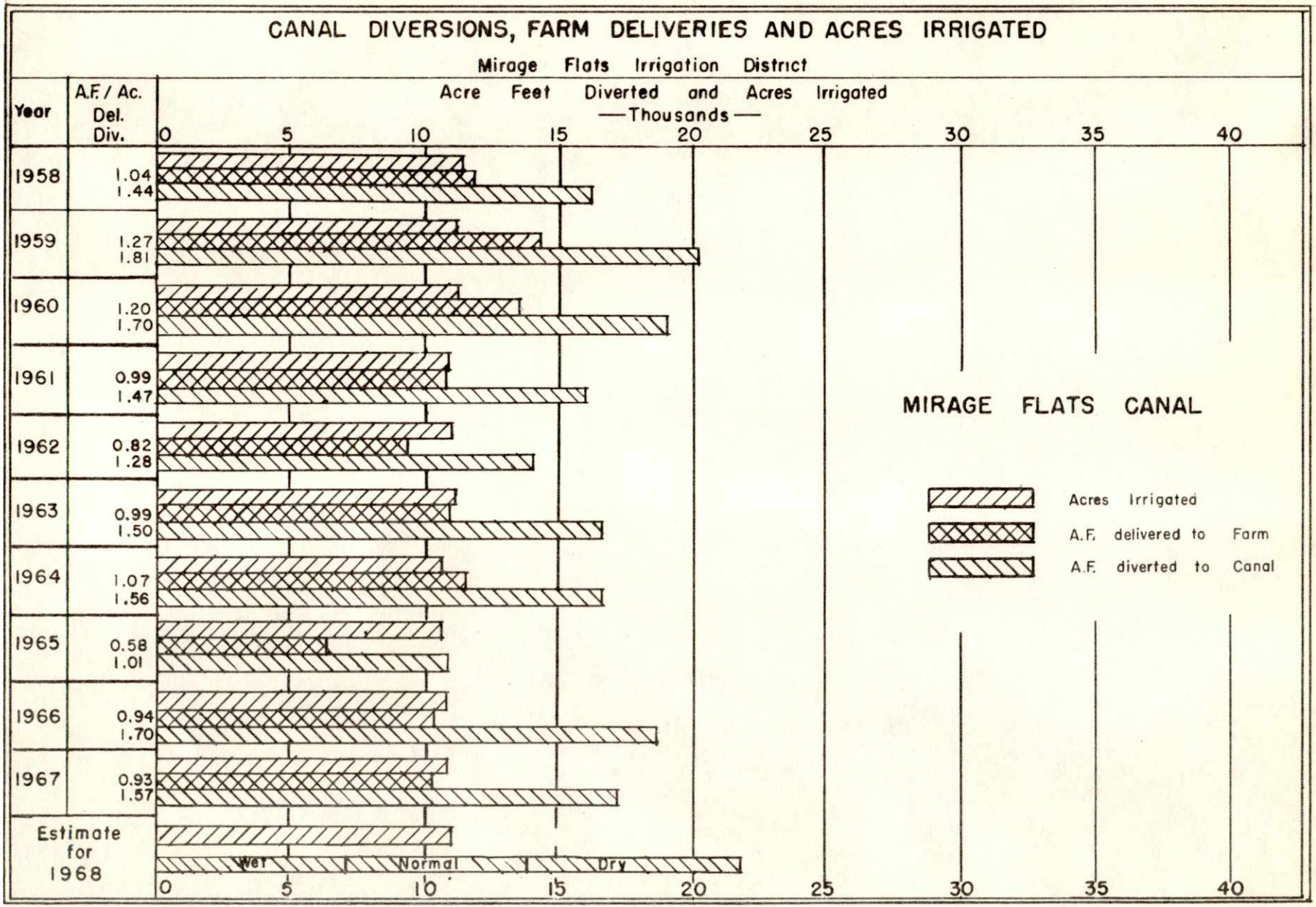

CANAL DIVERSIONS, FARM DELIVERIES AND ACRES IRRIGATED
Mirage Flats Irrigation District
Acre Feet Diverted and Acres Irrigated
—Thousands—
Year
A.F. / Ac. Del. Div.
0 5 10 15 20 25 30 35 40
1958 1.04 1.44
1959 1.27 1.81
1960 1.20 1.70
1961 0.99 1.47
1962 0.82 1.28
1963 0.99 1.50
1964 1.07 1.56
1965 0.58 1.01
1966 0.94 1.70
1967 0.93 1.57
Estimate for 1968
Wet
Normal
Dry
MIRAGE FLATS CANAL
Acres Irrigated
A.F. delivered to Farm
A.F. diverted to Canal

Exhibit 16

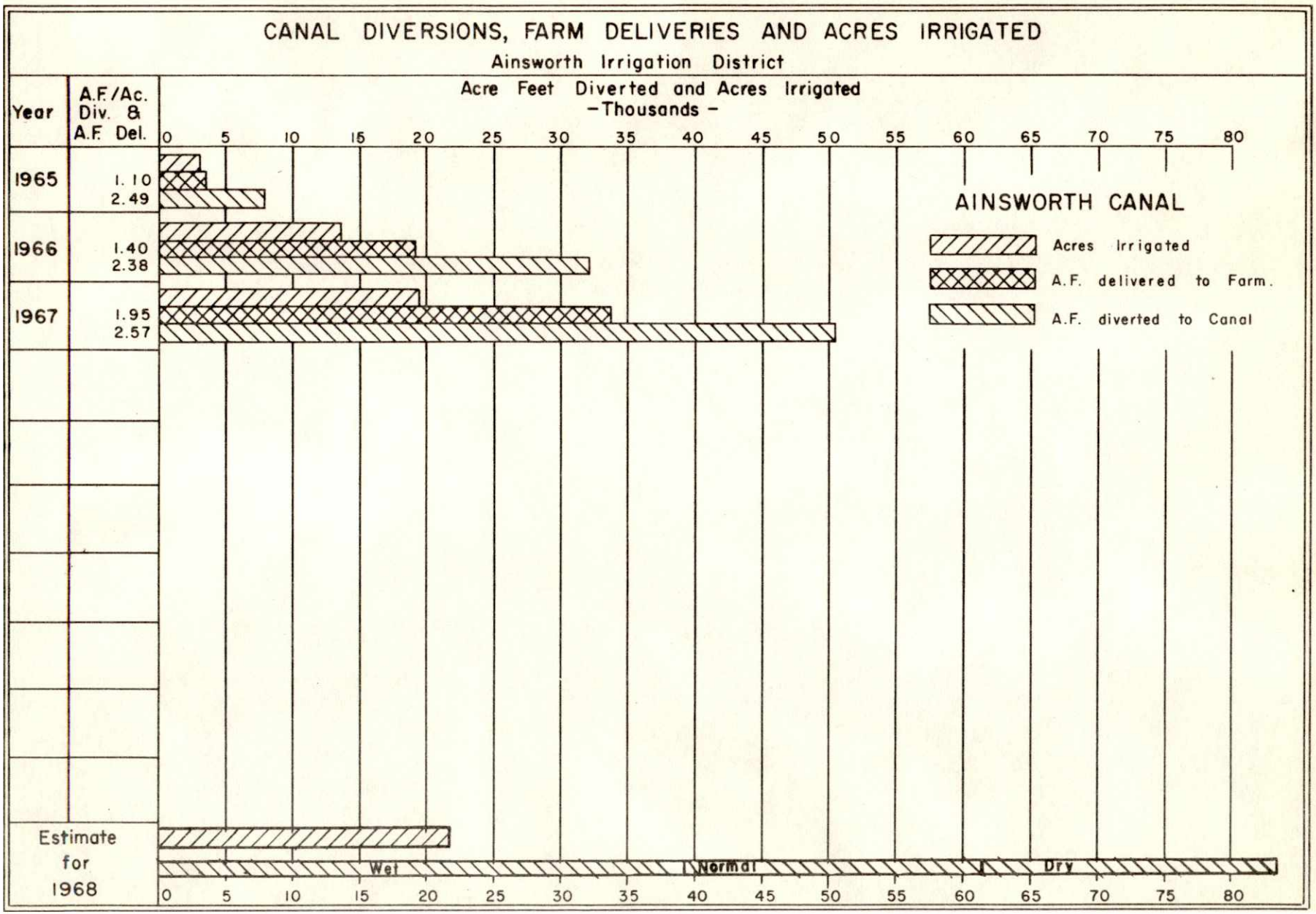

CANAL DIVERSIONS, FARM DELIVERIES AND ACRES IRRIGATED
Ainsworth Irrigation District
Year
A.F./Ac. Div. & A.F. Del.
Acre Feet Diverted and Acres Irrigated
-Thousands-
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80
1965
1.10
2.49
1966
1.40
2.38
1967
1.95
2.57
AINSWORTH CANAL
Acres Irrigated
A.F. delivered to Farm.
A.F. diverted to Canal
Estimate for 1968
Wet
Normal
Dry
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80

Exhibit 17

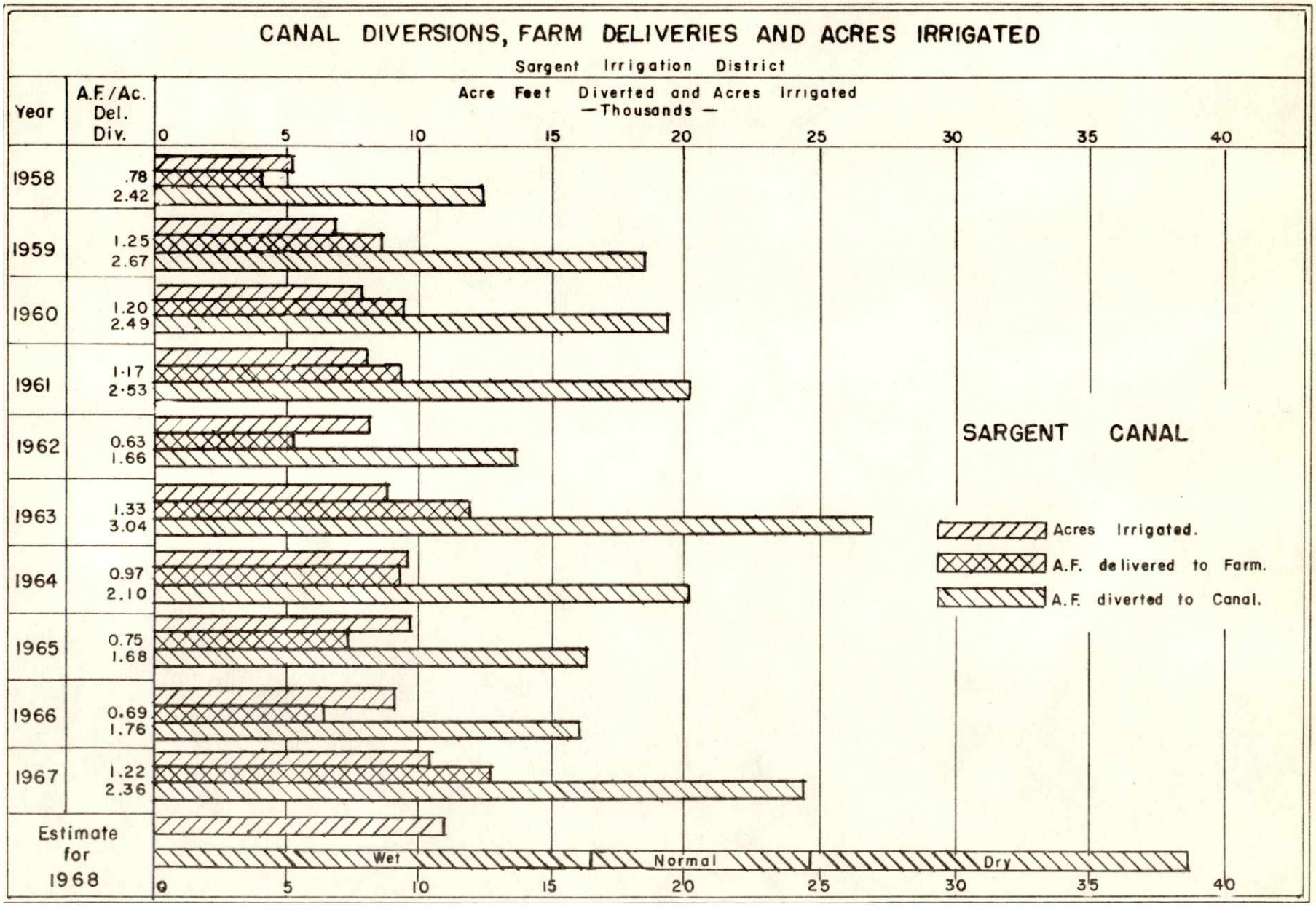
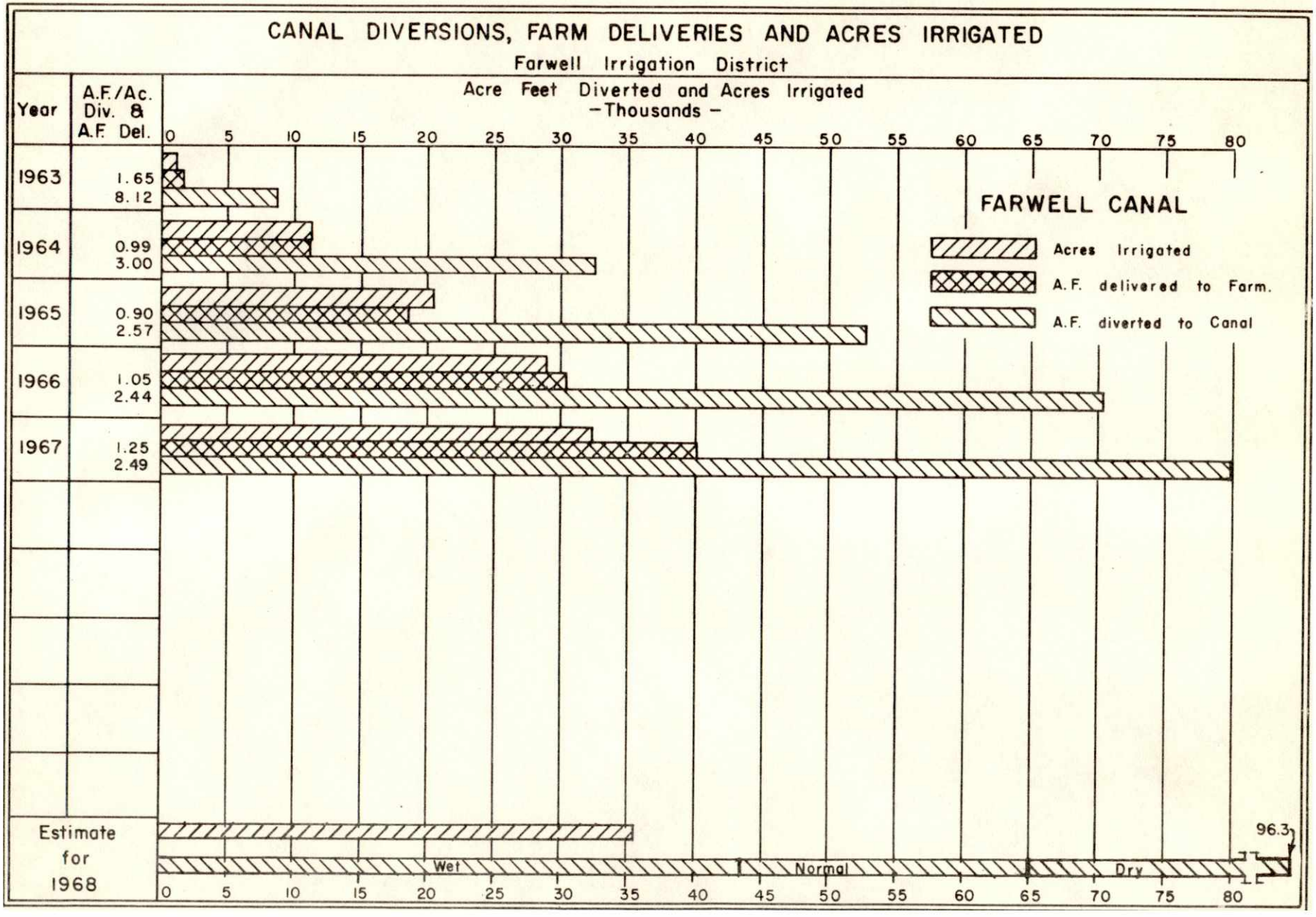

CANAL DIVERSIONS, FARM DELIVERIES AND ACRES IRRIGATED
Sargent Irrigation District
Year
A.F./Ac. Del. Div.
Acre Feet Diverted and Acres Irrigated
— Thousands —
0
5
10
15
20
25
30
35
40
1958
.78
2.42
1959
1.25
2.67
1960
1.20
2.49
1961
1·17
2·53
1962
0.63
1.66
1963
1.33
3.04
1964
0.97
2.10
1965
0.75
1.68
1966
0.69
1.76
1967
1.22
2.36
Estimate for 1968
Wet
Normal
Dry
SARGENT CANAL
Acres Irrigated.
A.F. delivered to Farm.
A.F. diverted to Canal.

Exhibit 18

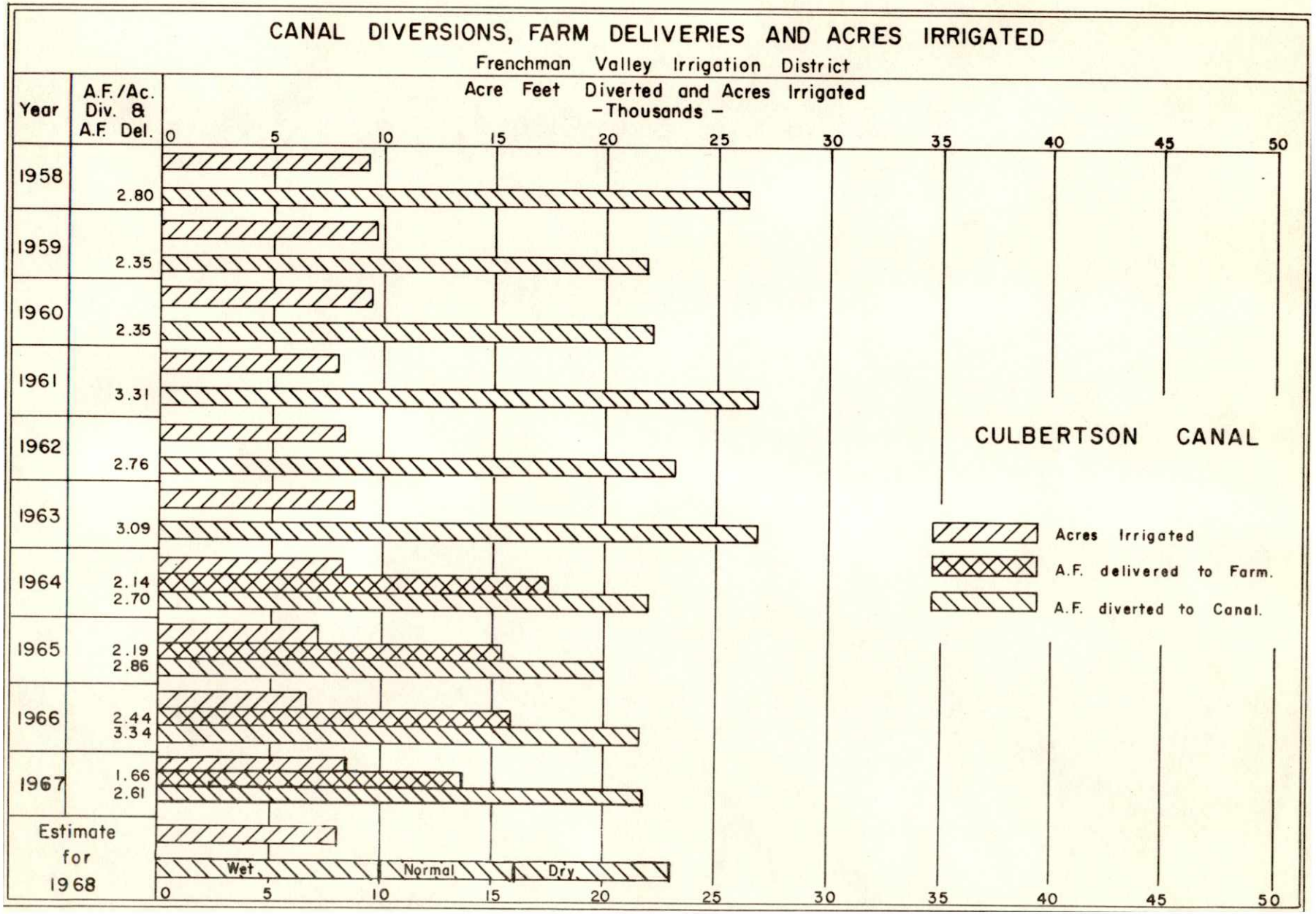
CANAL DIVERSIONS, FARM DELIVERIES AND ACRES IRRIGATED

Farwell Irrigation District



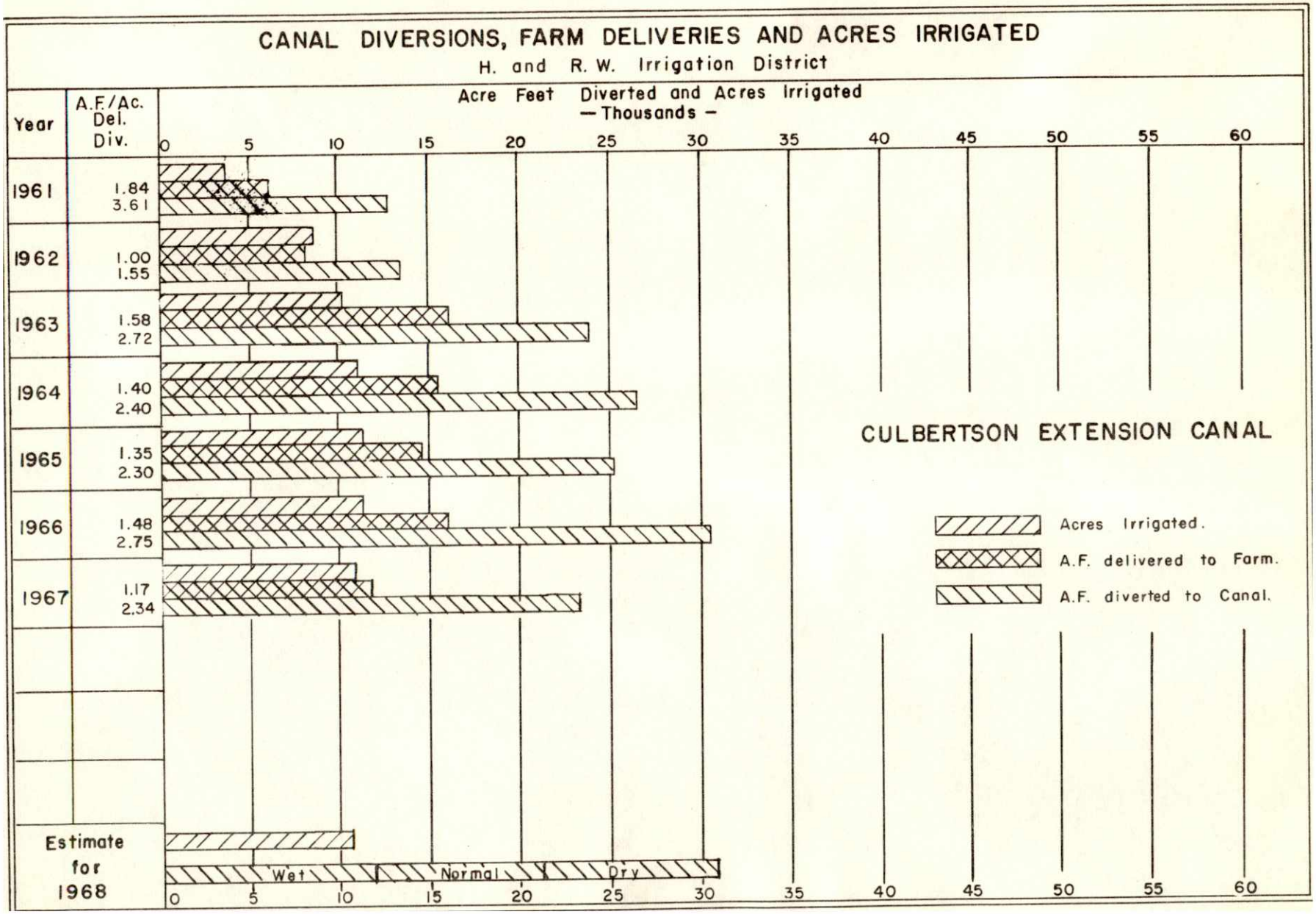
CANAL DIVERSIONS, FARM DELIVERIES AND ACRES IRRIGATED

Frenchman Valley Irrigation District



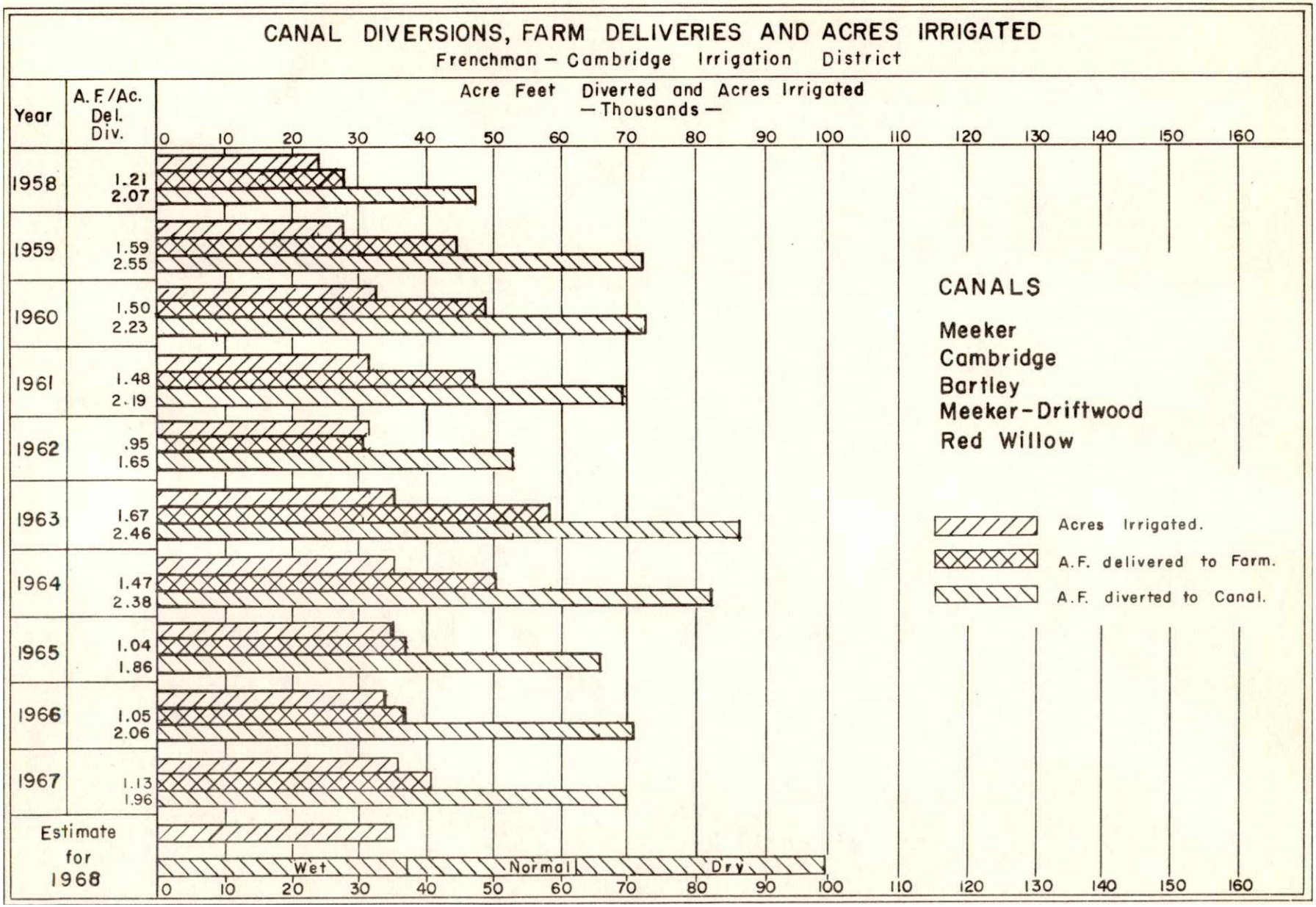
CANAL DIVERSIONS, FARM DELIVERIES AND ACRES IRRIGATED

H. and R. W. Irrigation District



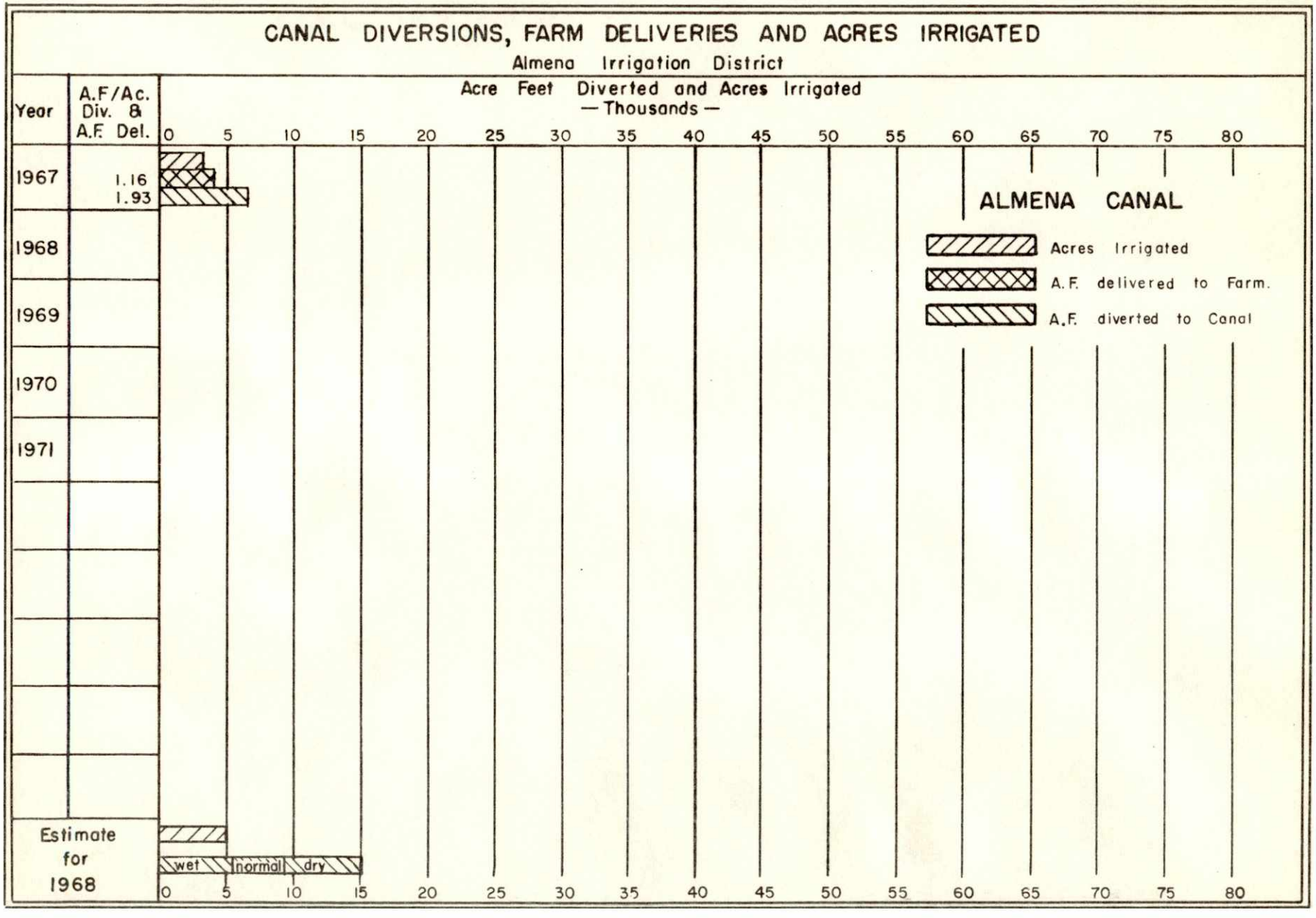
CANAL DIVERSIONS, FARM DELIVERIES AND ACRES IRRIGATED

Frenchman – Cambridge Irrigation District



CANAL DIVERSIONS, FARM DELIVERIES AND ACRES IRRIGATED

Almena Irrigation District



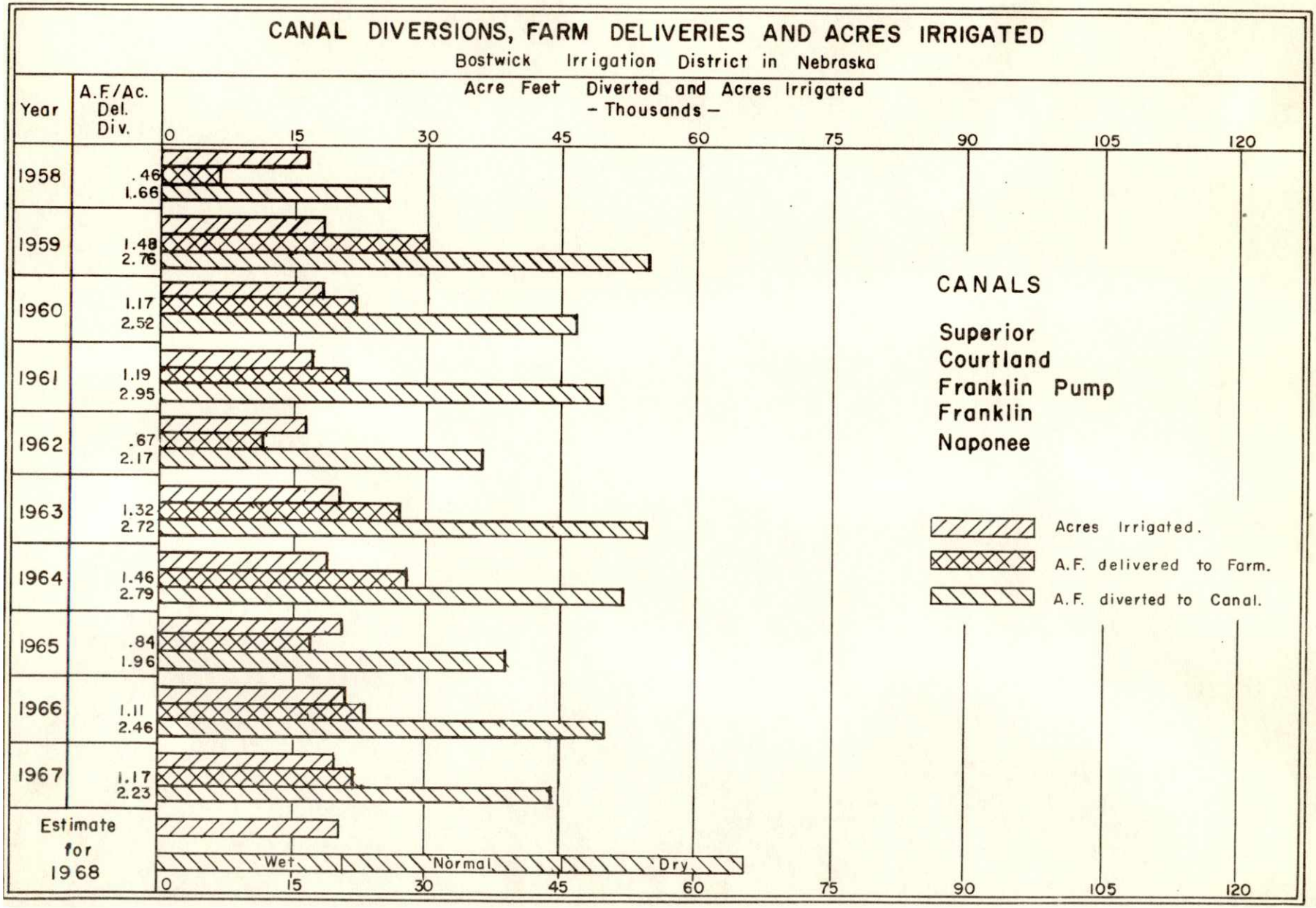
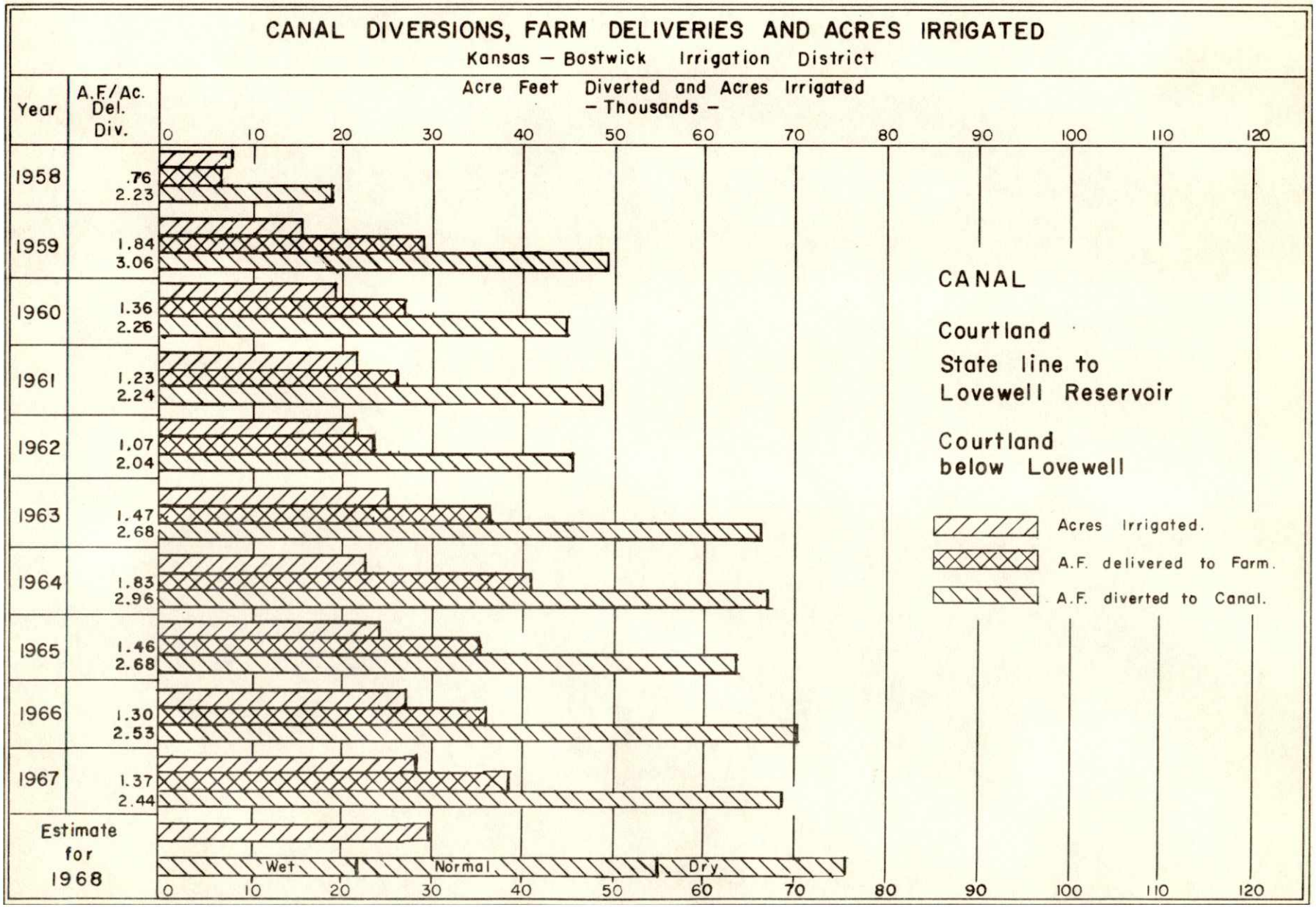

CANAL DIVERSIONS, FARM DELIVERIES AND ACRES IRRIGATED
Bostwick Irrigation District in Nebraska
Acre Feet Diverted and Acres Irrigated
- Thousands -
Year
A.F./Ac. Del. Div.
0
15
30
45
60
75
90
105
120
1958
.46
1.66
1959
1.48
2.76
1960
1.17
2.52
1961
1.19
2.95
1962
.67
2.17
1963
1.32
2.72
1964
1.46
2.79
1965
.84
1.96
1966
1.11
2.46
1967
1.17
2.23
Estimate for 1968
Wet
Normal
Dry
CANALS
Superior
Courtland
Franklin Pump
Franklin
Naponee
Acres Irrigated.
A.F. delivered to Farm.
A.F. diverted to Canal.

Exhibit 24

CANAL DIVERSIONS, FARM DELIVERIES AND ACRES IRRIGATED

Kansas — Bostwick Irrigation District



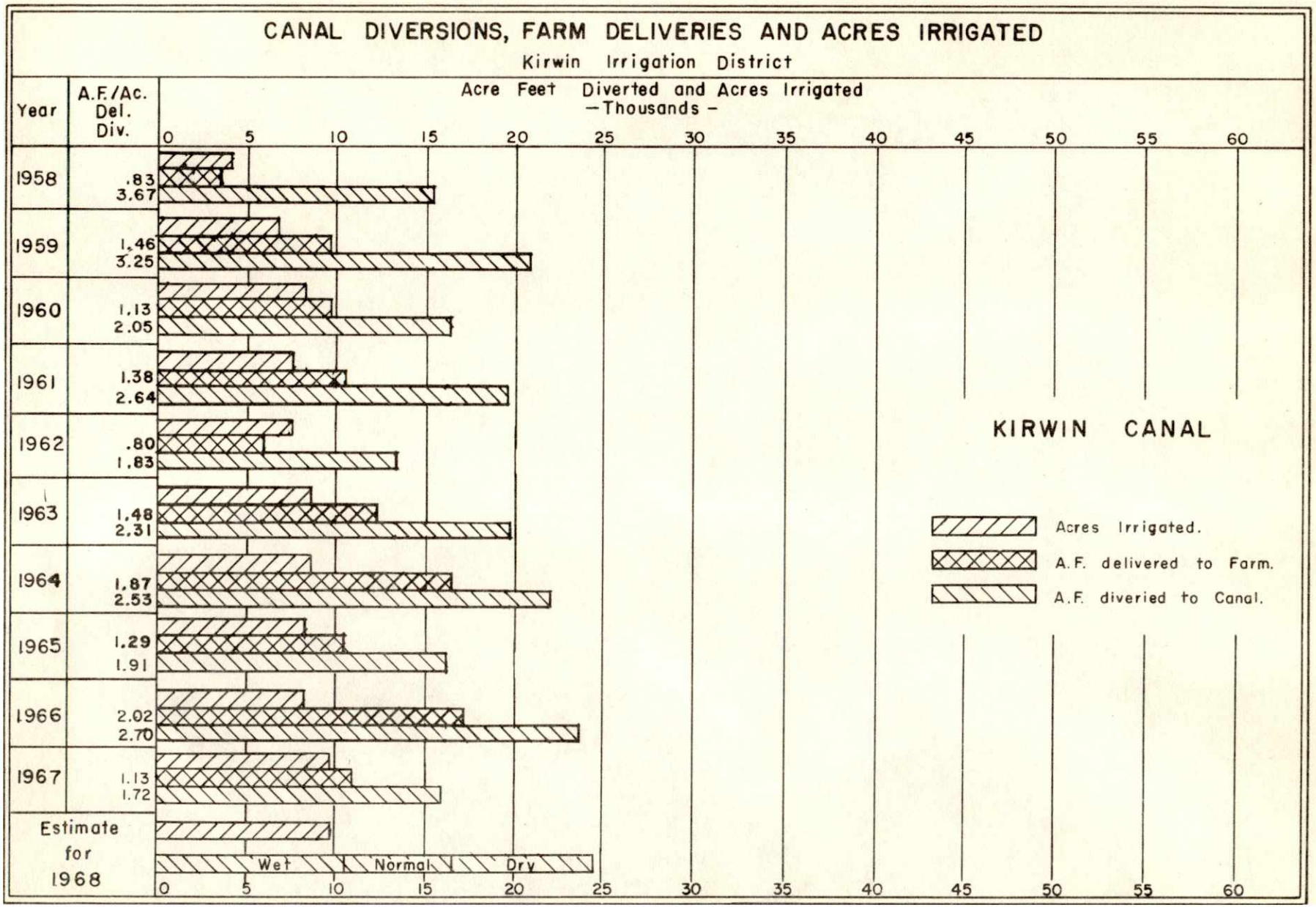
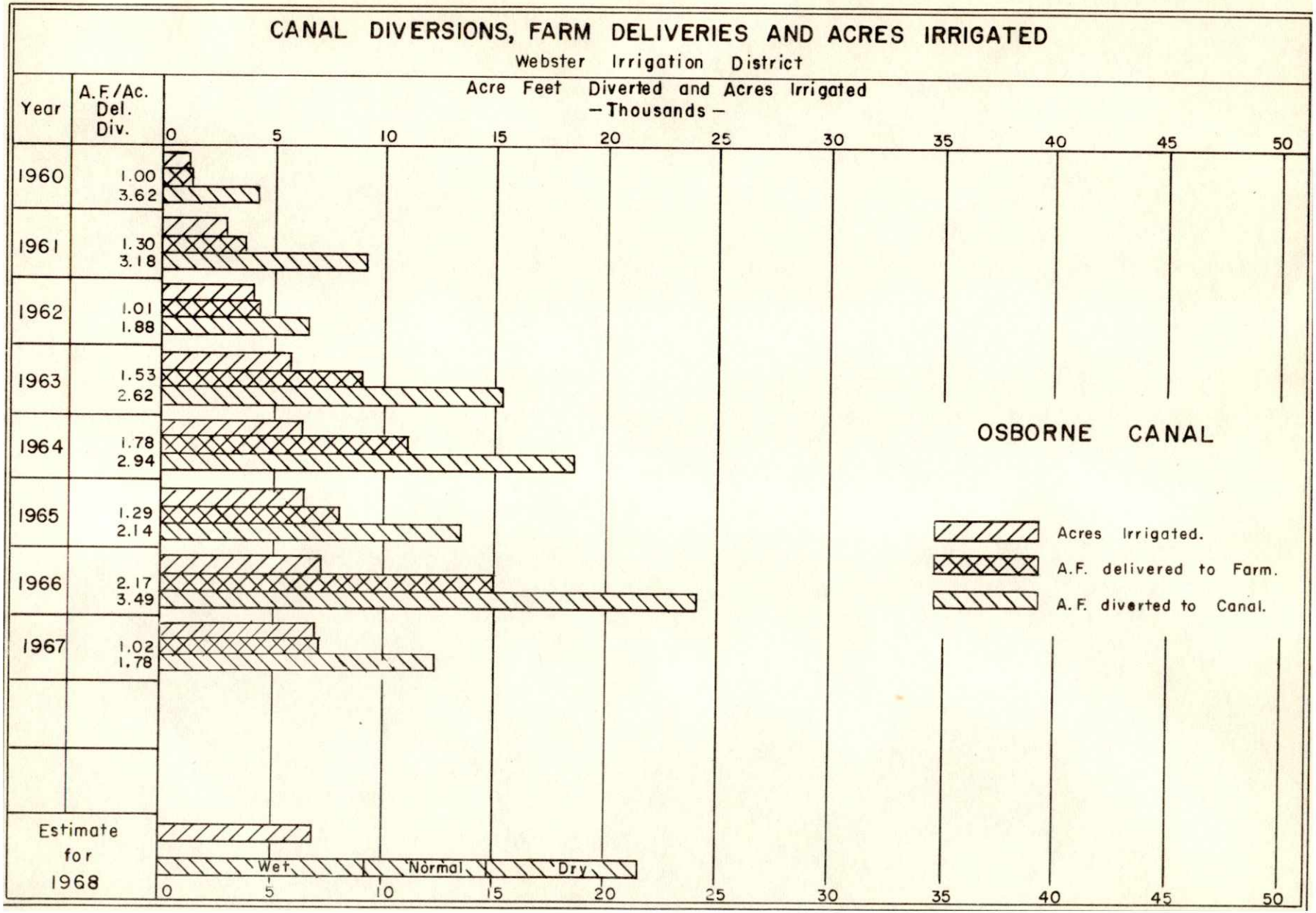

CANAL DIVERSIONS, FARM DELIVERIES AND ACRES IRRIGATED
Kirwin Irrigation District
Year
A.F./Ac. Del. Div.
Acre Feet Diverted and Acres Irrigated
—Thousands —
0 5 10 15 20 25 30 35 40 45 50 55 60
1958 .83 3.67
1959 1.46 3.25
1960 1.13 2.05
1961 1.38 2.64
1962 .80 1.83
1963 1.48 2.31
1964 1.87 2.53
1965 1.29 1.91
1966 2.02 2.70
1967 1.13 1.72
Estimate for 1968
Wet
Normal
Dry
KIRWIN CANAL
Acres Irrigated.
A.F. delivered to Farm.
A.F. diveried to Canal.

Exhibit 26

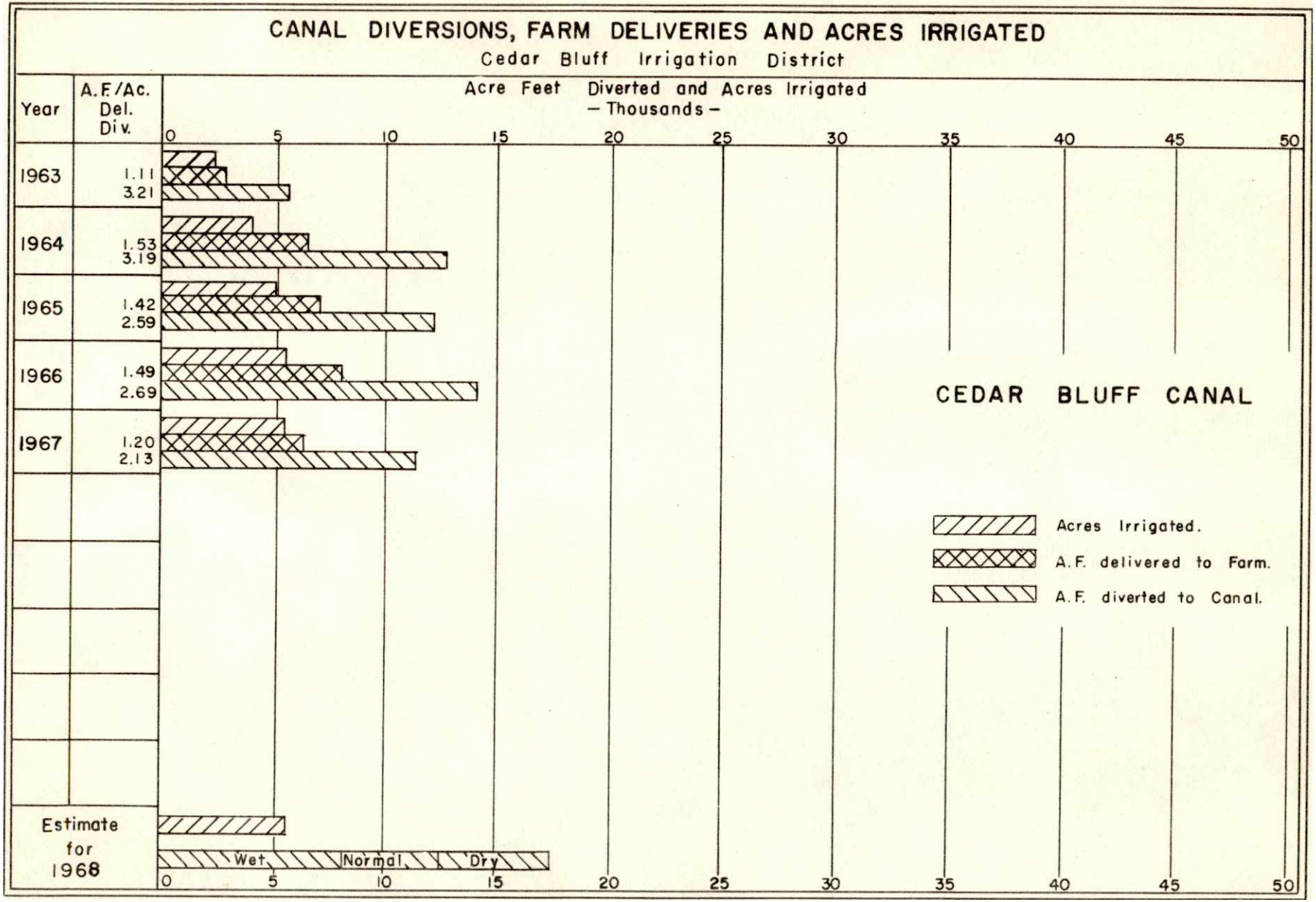
CANAL DIVERSIONS, FARM DELIVERIES AND ACRES IRRIGATED

Webster Irrigation District



CANAL DIVERSIONS, FARM DELIVERIES AND ACRES IRRIGATED

Cedar Bluff Irrigation District



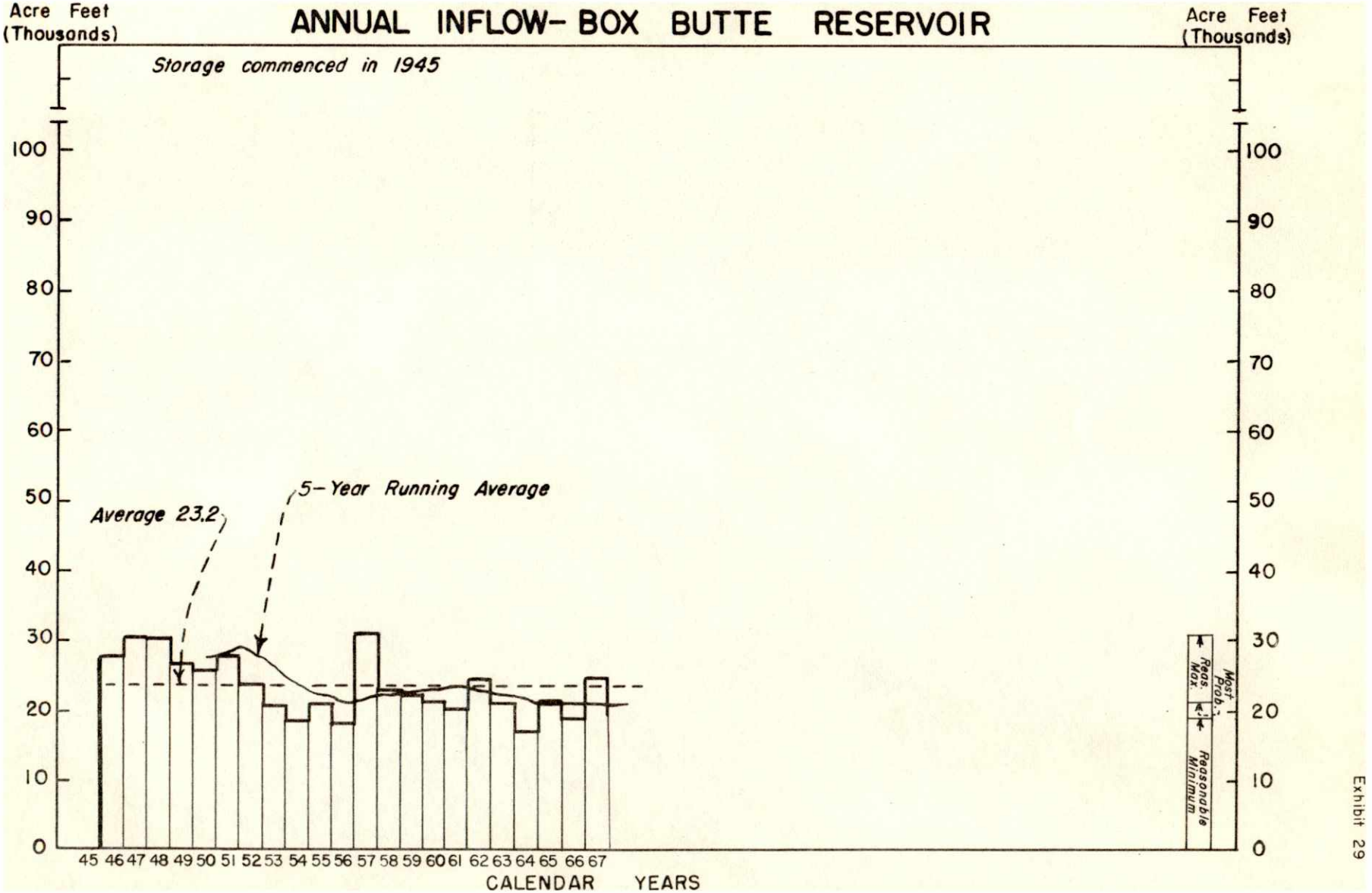

Acre Feet (Thousands)
ANNUAL INFLOW- BOX BUTTE RESERVOIR
Acre Feet (Thousands)
Storage commenced in 1945
100
90
80
70
60
50
40
30
20
10
0
Average 23.2
5-Year Running Average
Reas. Max.
Most Prob.
Reasonable Minimum
45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67
CALENDAR YEARS

Exhibit 29

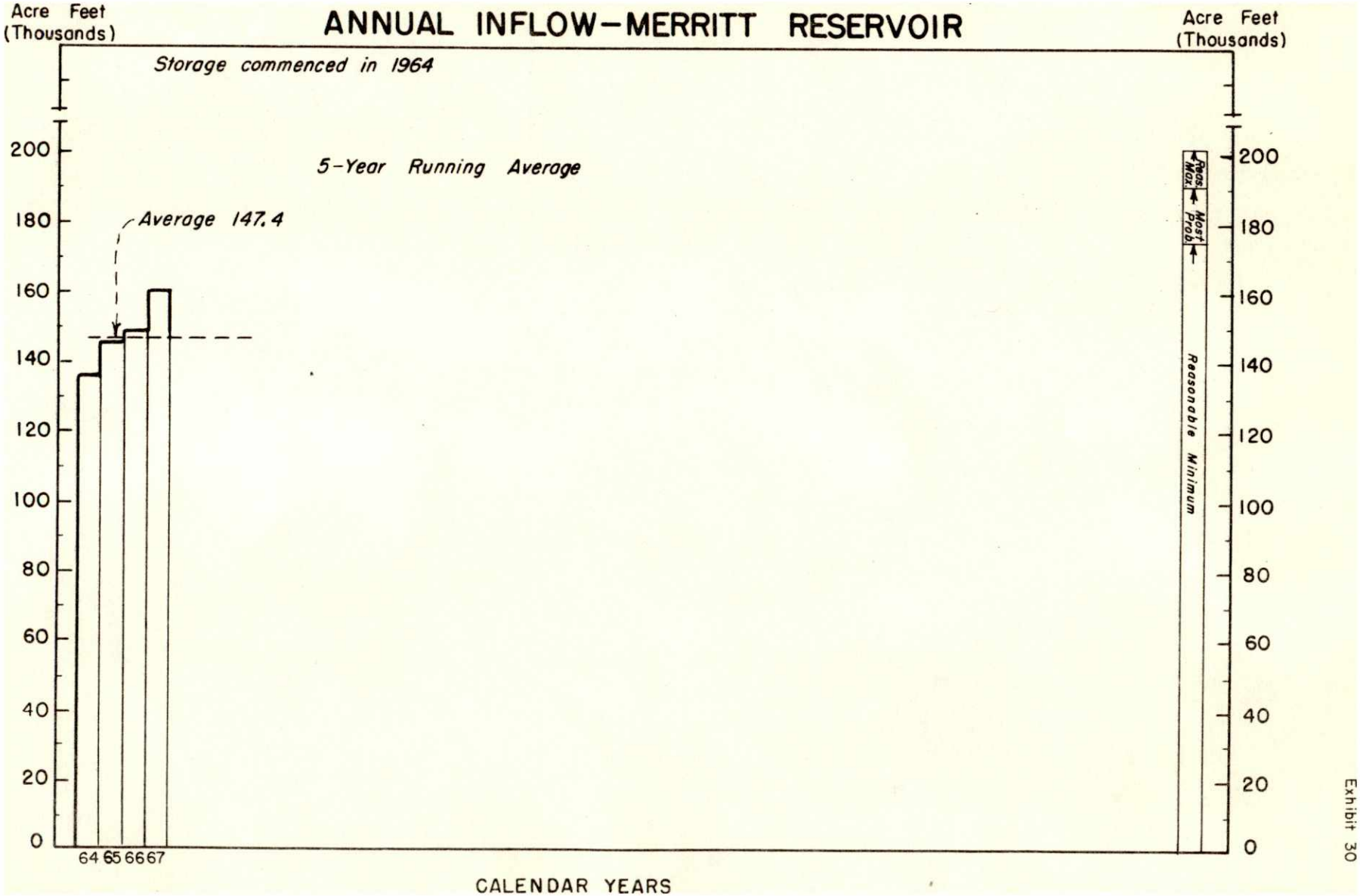
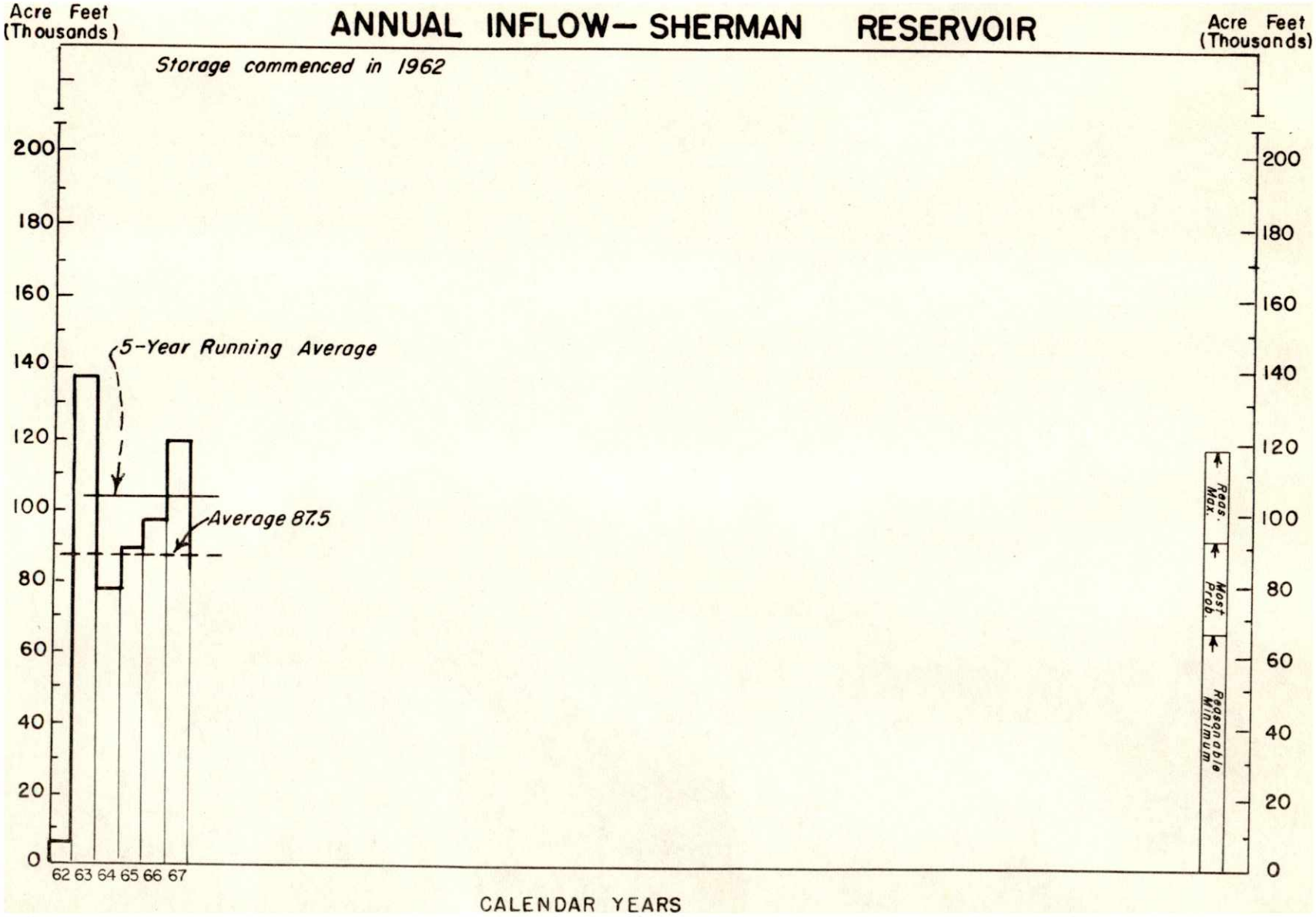
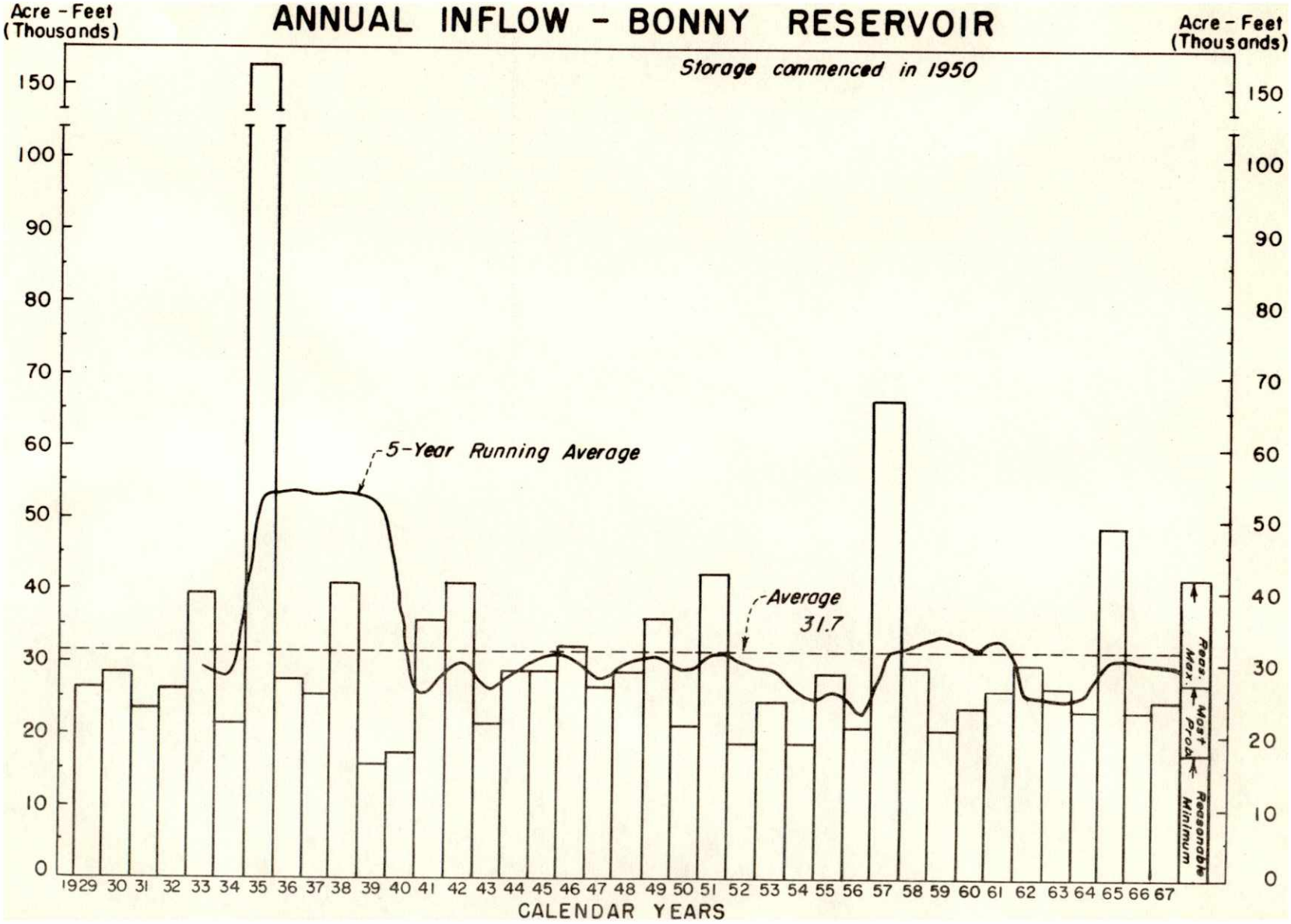
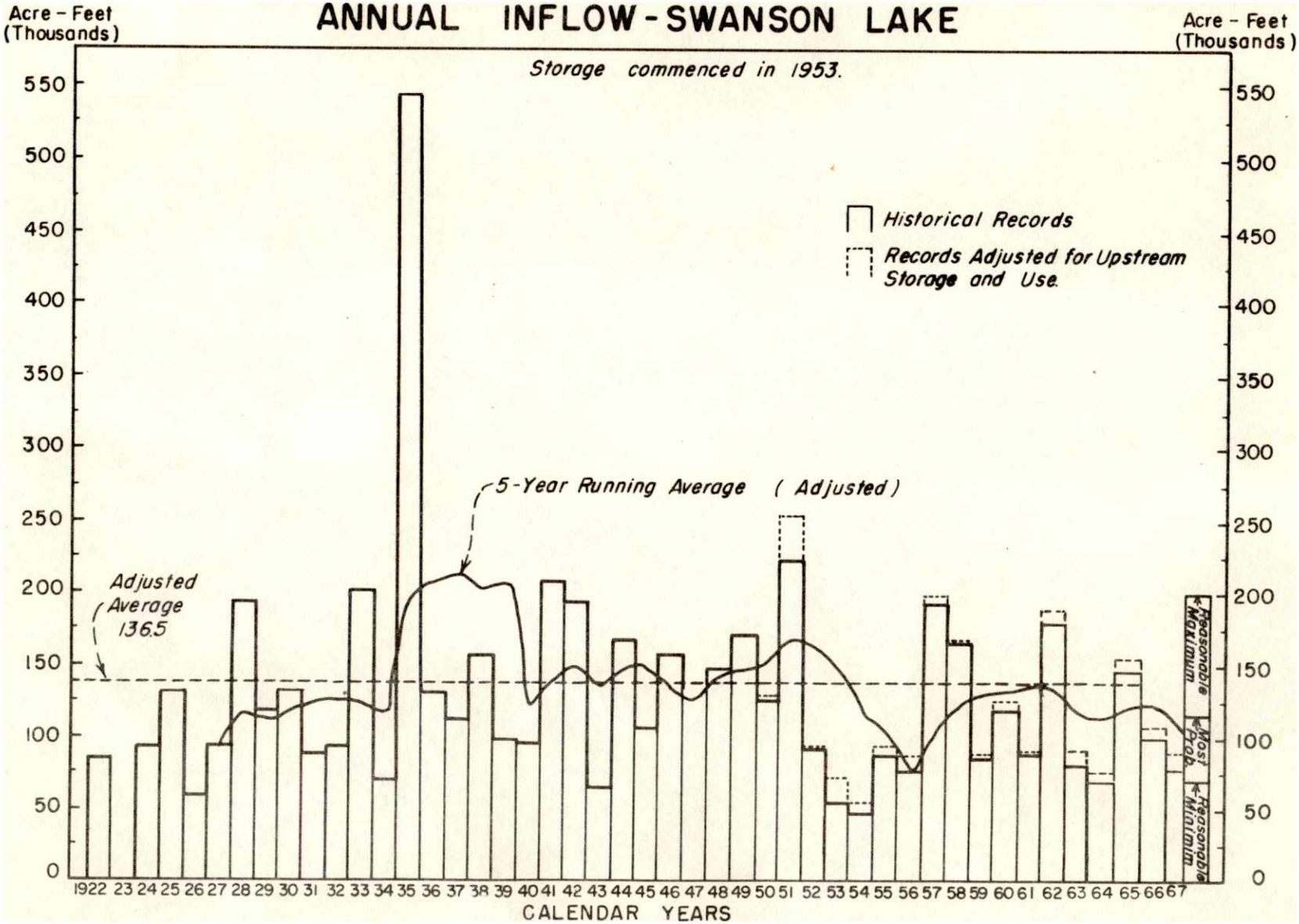

ANNUAL INFLOW—MERRITT RESERVOIR
Acre Feet (Thousands)
Acre Feet (Thousands)
Storage commenced in 1964
5-Year Running Average
Average 147.4
Poss. Max.
Most Prob
Reasonable Minimum
200
180
160
140
120
100
80
60
40
20
0
64 65 66 67
CALENDAR YEARS

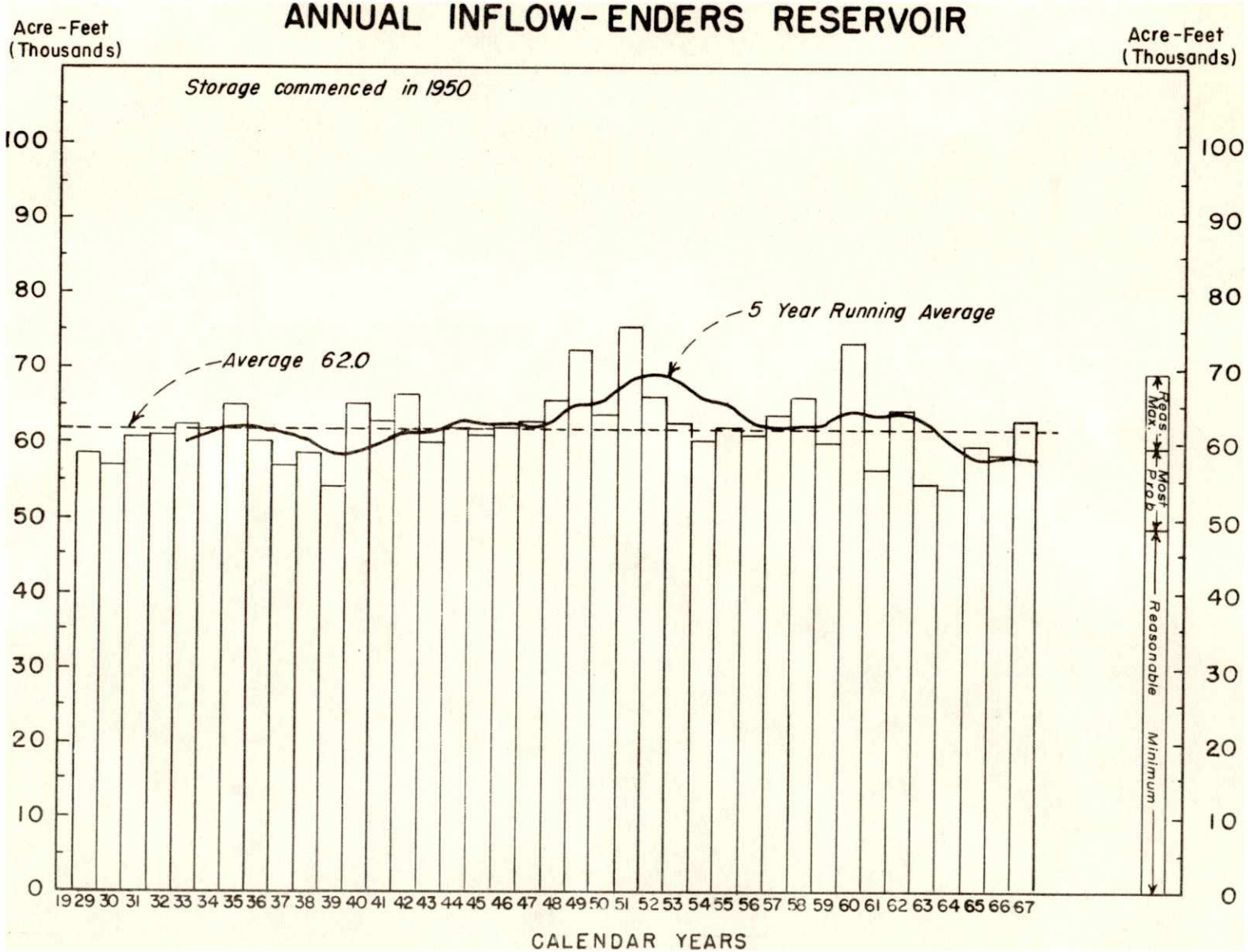
Exhibit 30


Acre Feet (Thousands)
ANNUAL INFLOW— SHERMAN RESERVOIR
Acre Feet (Thousands)
Storage commenced in 1962
200
180
160
140
120
100
80
60
40
20
0
5-Year Running Average
Average 87.5
Reas. Max.
Most Prob.
Reasonable Minimum
62 63 64 65 66 67
CALENDAR YEARS


ANNUAL INFLOW - BONNY RESERVOIR
Acre - Feet (Thousands)
Acre - Feet (Thousands)
Storage commenced in 1950
5-Year Running Average
Average 31.7
Reas. Max.
Most Prob.
Reasonable Minimum
150
100
90
80
70
60
50
40
30
20
10
0
1929 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67
CALENDAR YEARS


ANNUAL INFLOW - SWANSON LAKE
Acre - Feet (Thousands)
Acre - Feet (Thousands)
Storage commenced in 1953.
Historical Records
Records Adjusted for Upstream Storage and Use.
5-Year Running Average (Adjusted)
Adjusted Average 136.5
Reasonable Maximum
Most Prob.
Reasonable Minimum
550
500
450
400
350
300
250
200
150
100
50
0
1922 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67
CALENDAR YEARS

ANNUAL INFLOW - ENDERS RESERVOIR



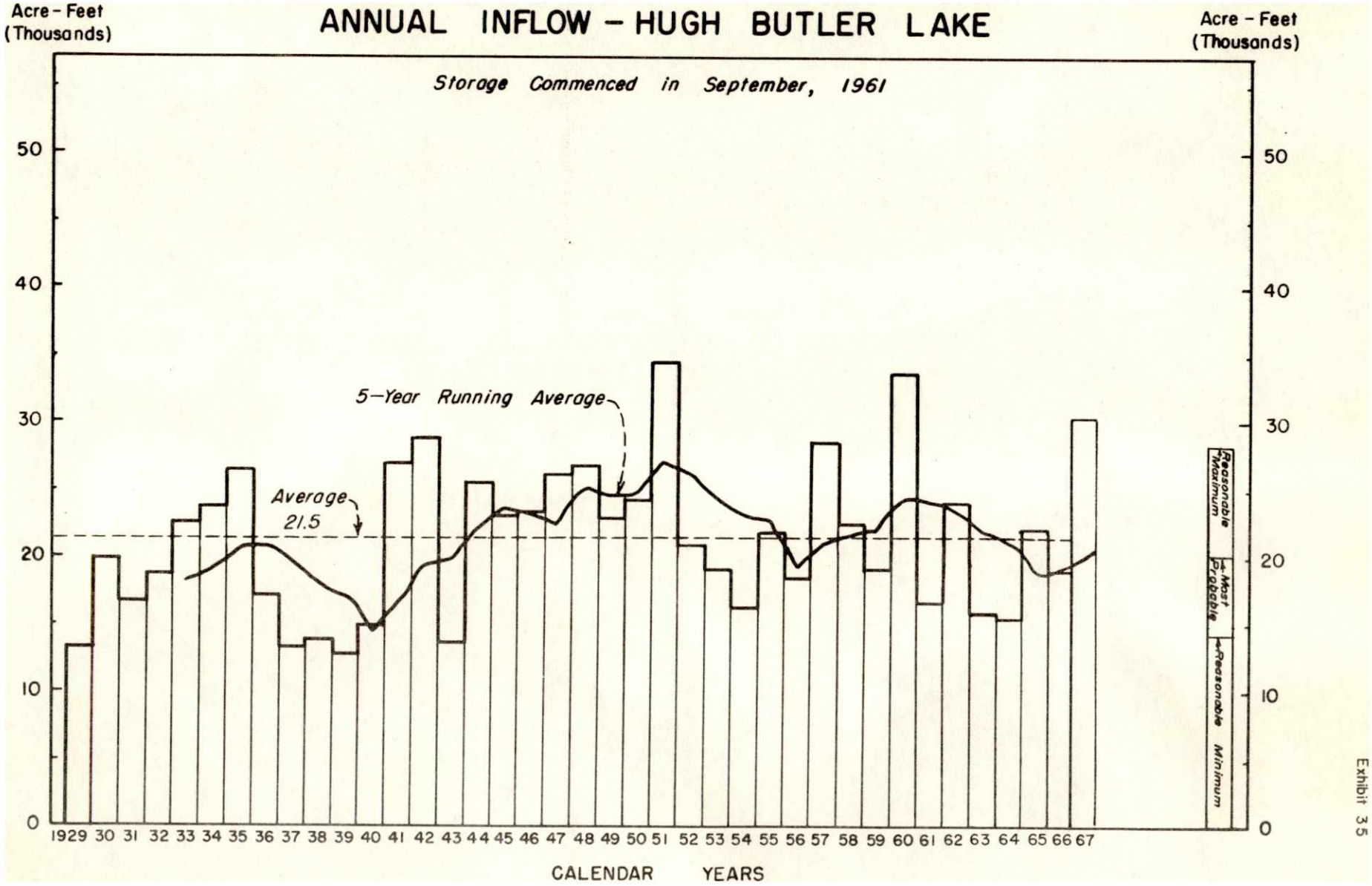
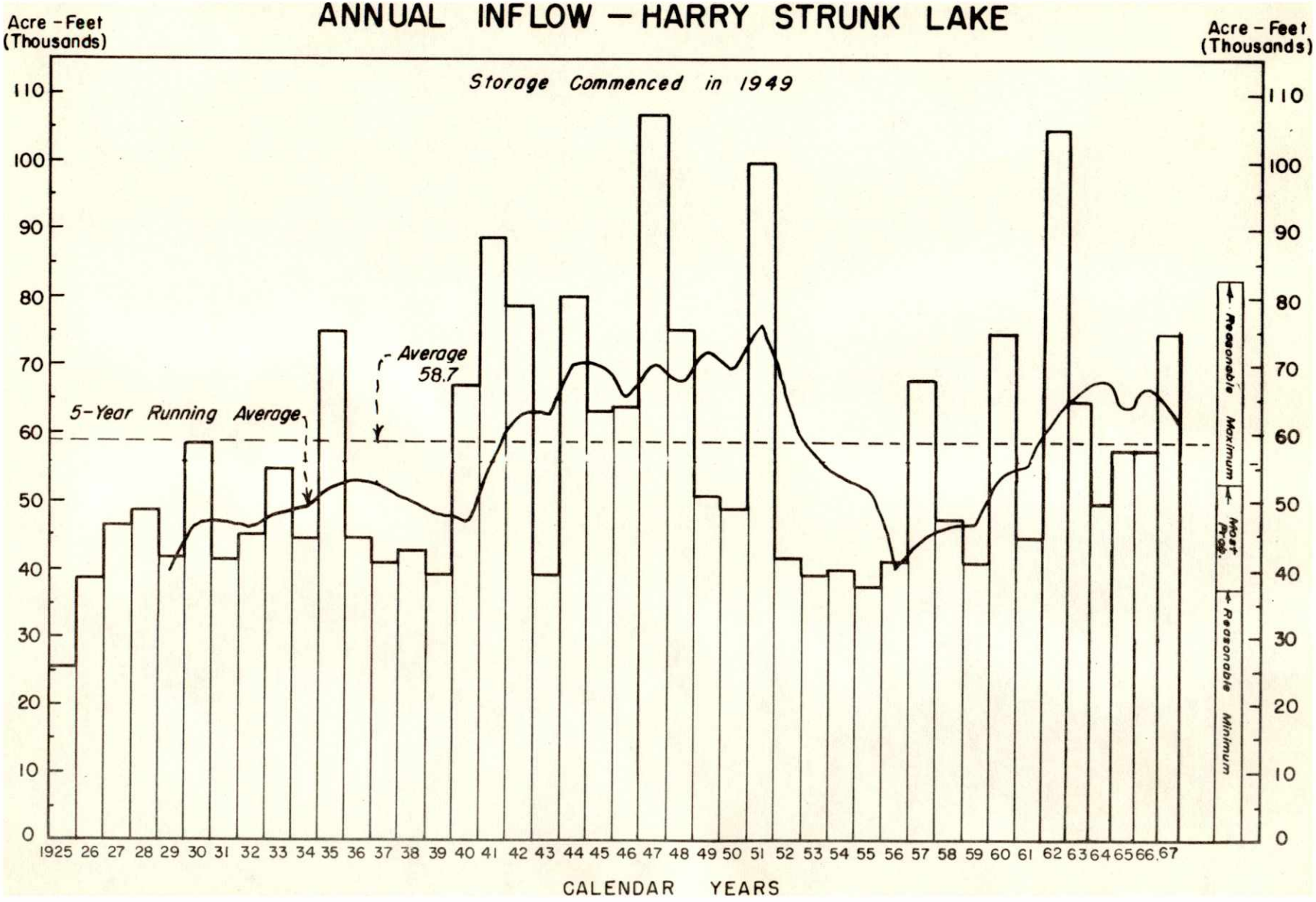
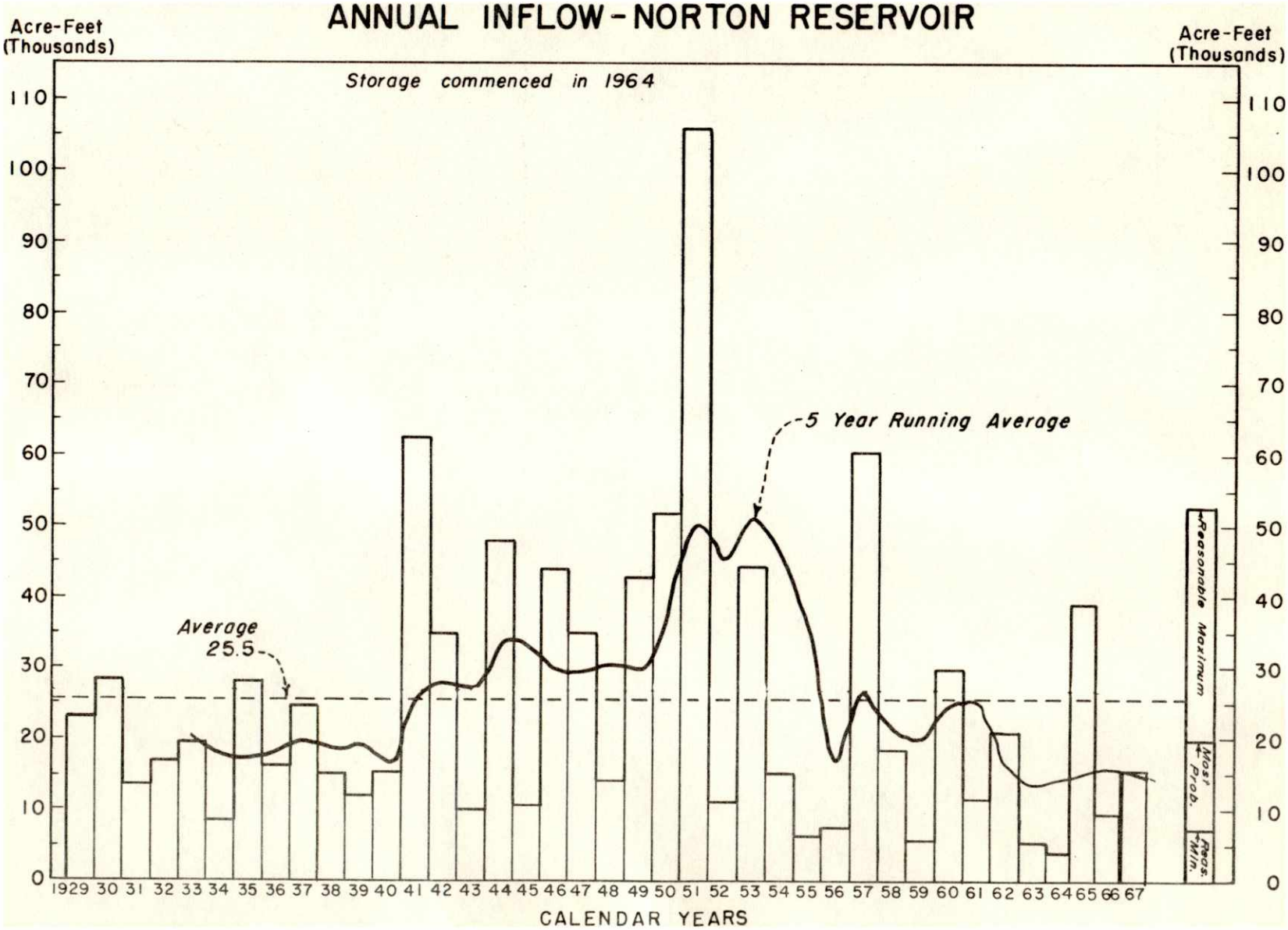

Acre - Feet
(Thousands)
ANNUAL INFLOW - HUGH BUTLER LAKE
Acre - Feet
(Thousands)
Storage Commenced in September, 1961
50
40
30
20
10
0
5-Year Running Average
Average
21.5
Reasonable Maximum
Most Probable
Reasonable Minimum
1929 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67
CALENDAR YEARS

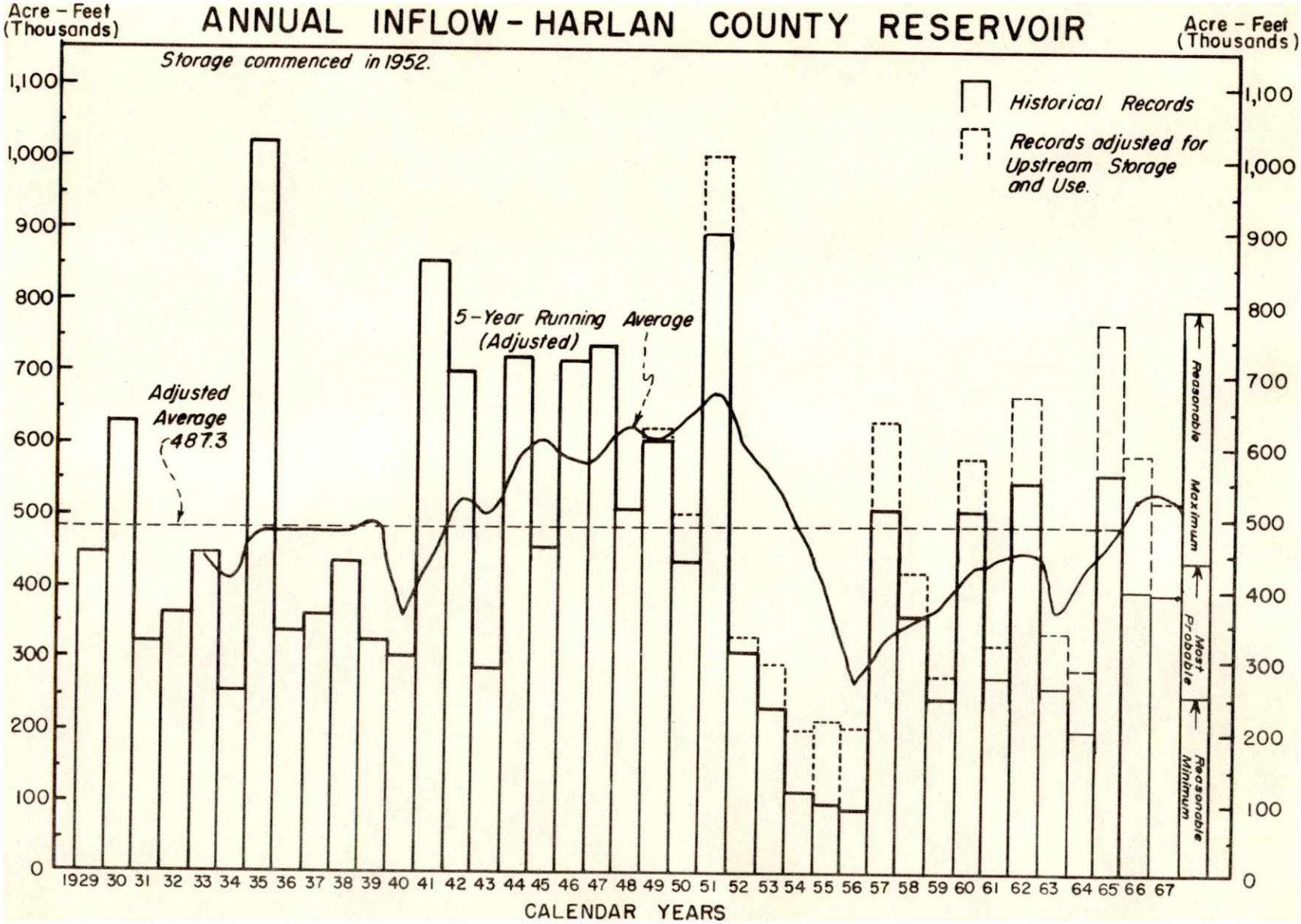
Exhibit 35

ANNUAL INFLOW — HARRY STRUNK LAKE



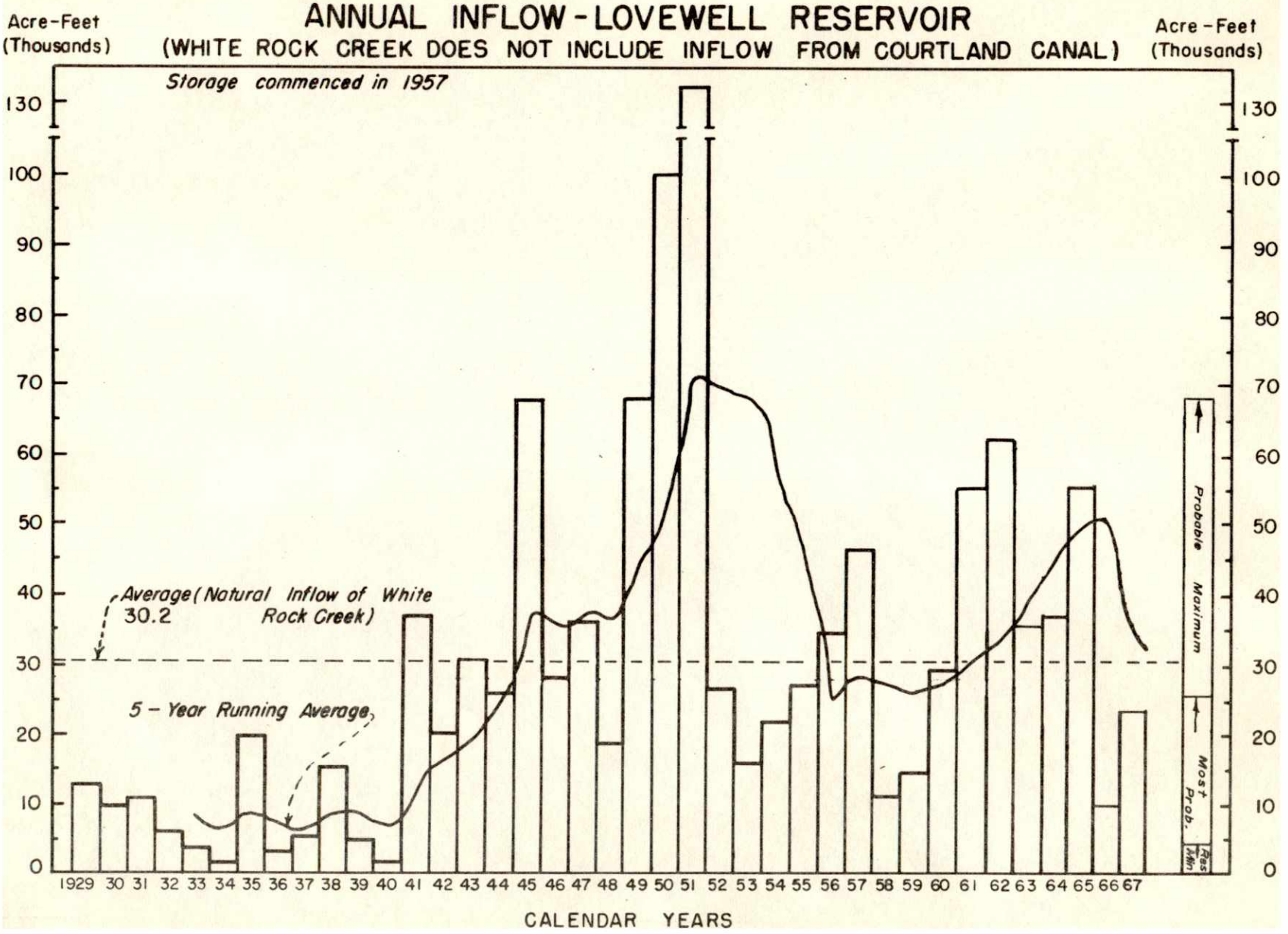
ANNUAL INFLOW - NORTON RESERVOIR

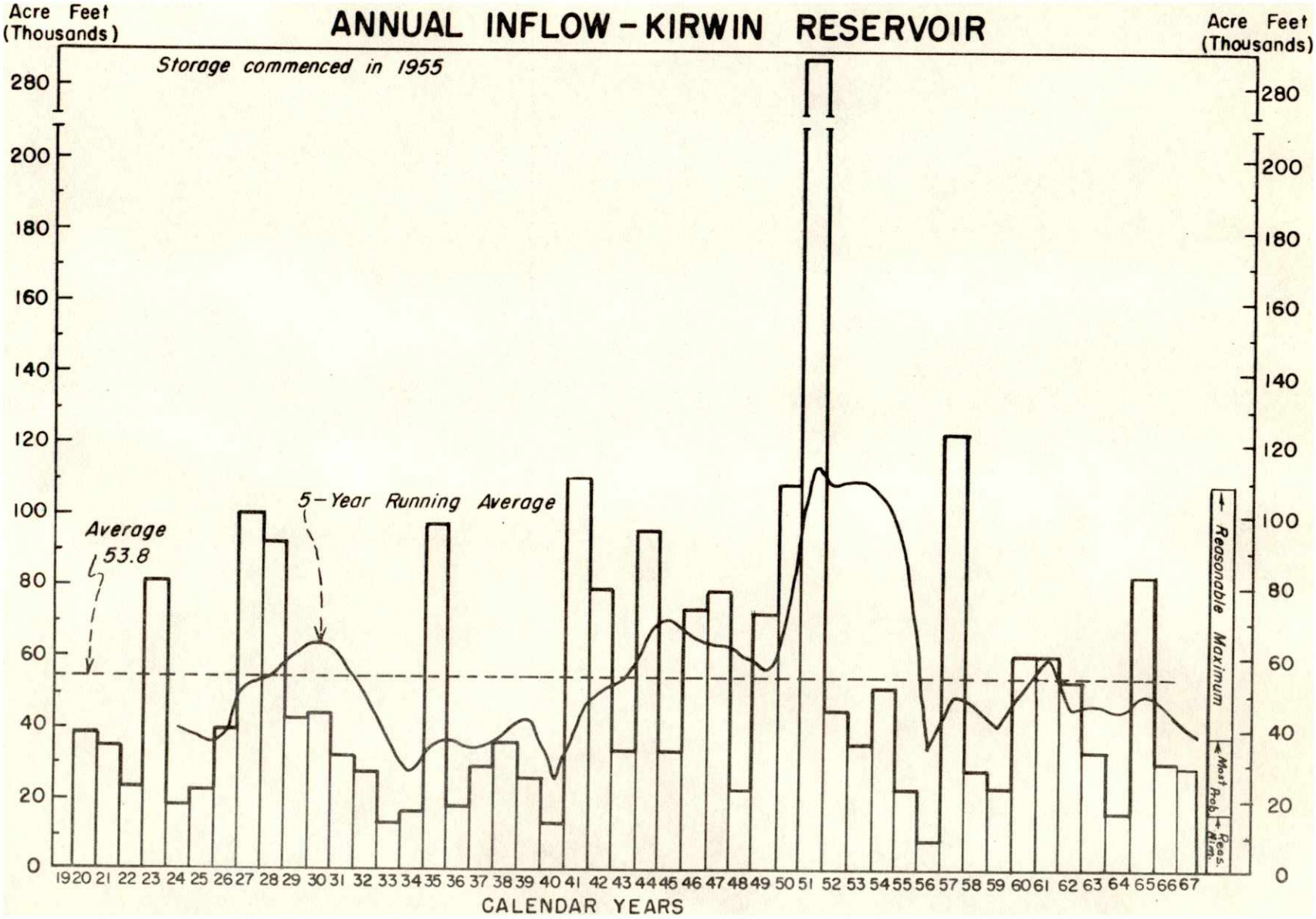


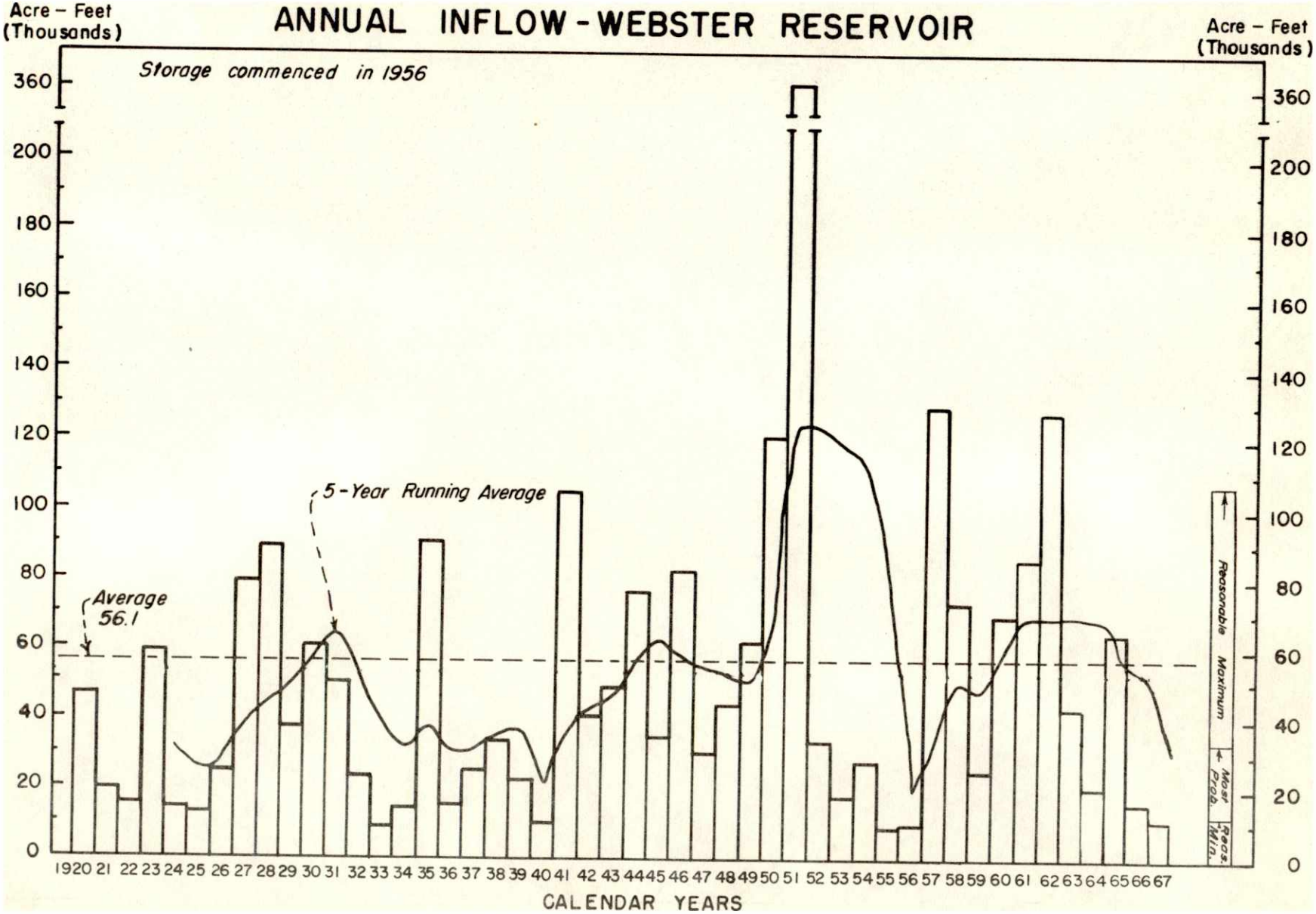

ANNUAL INFLOW - HARLAN COUNTY RESERVOIR
Acre - Feet (Thousands)
Acre - Feet (Thousands)
Storage commenced in 1952.
Historical Records
Records adjusted for Upstream Storage and Use.
5-Year Running Average (Adjusted)
Adjusted Average 487.3
Reasonable Maximum
Most Probable
Reasonable Minimum
0
100
200
300
400
500
600
700
800
900
1,000
1,100
1929 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67
CALENDAR YEARS

ANNUAL INFLOW - LOVEWELL RESERVOIR

(WHITE ROCK CREEK DOES NOT INCLUDE INFLOW FROM COURTLAND CANAL)




Acre Feet (Thousands)
ANNUAL INFLOW - KIRWIN RESERVOIR
Acre Feet (Thousands)
Storage commenced in 1955
280
200
180
160
140
120
100
80
60
40
20
0
Average 53.8
5-Year Running Average
Reasonable Maximum
Most Prob.
Reas. Min.
19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67
CALENDAR YEARS


ANNUAL INFLOW - WEBSTER RESERVOIR
Acre – Feet (Thousands)
Acre – Feet (Thousands)
Storage commenced in 1956
5 - Year Running Average
Average 56.1
Reasonable Maximum
Most Prob.
Reas. Min.
360
200
180
160
140
120
100
80
60
40
20
0
1920 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67
CALENDAR YEARS

ANNUAL INFLOW-CEDAR BLUFF RESERVOIR

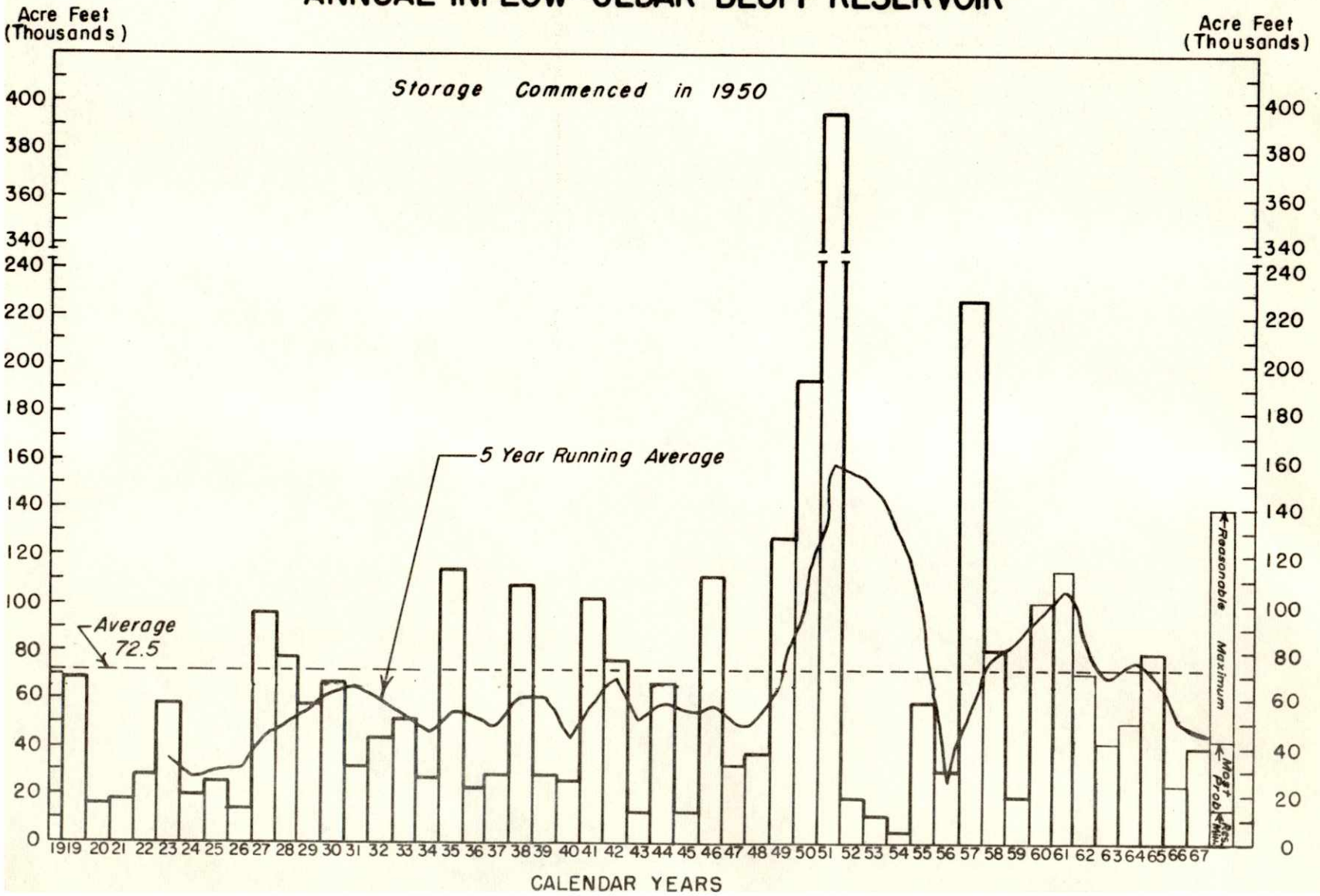


Exhibit 42