ANNUAL OPERATING PLAN

Kansas River Projects

1966 Operations
1967 Outlook

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

February 1967

UNITED STATES DEPARTMENT OF THE INTERIOR

Stewart L. Udall, Secretary

BUREAU OF RECLAMATION

Floyd E. Dominy, Commissioner

Region 7 - Denver, Colorado

H. P. Dugan, Regional Director

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1966 OPERATIONS

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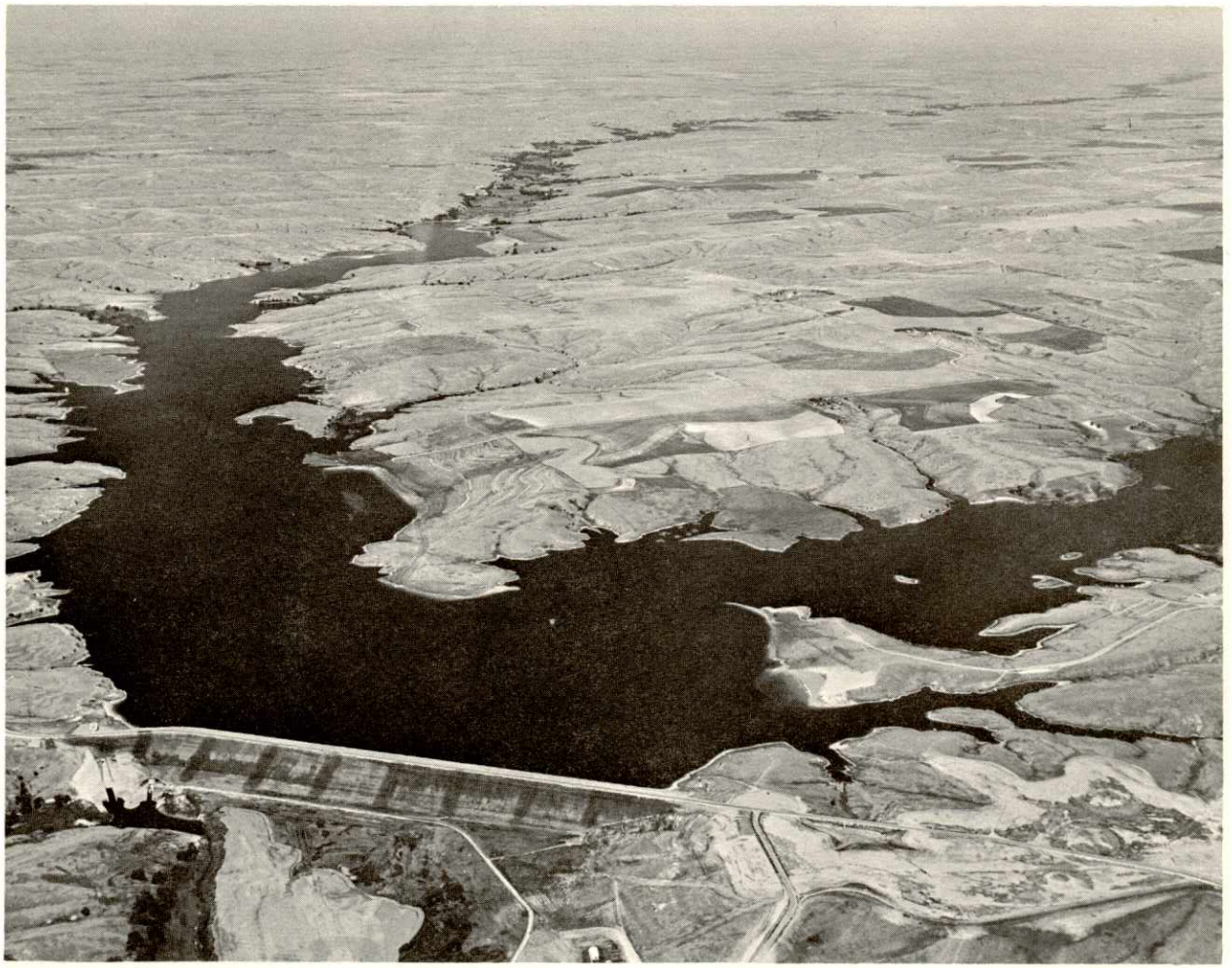
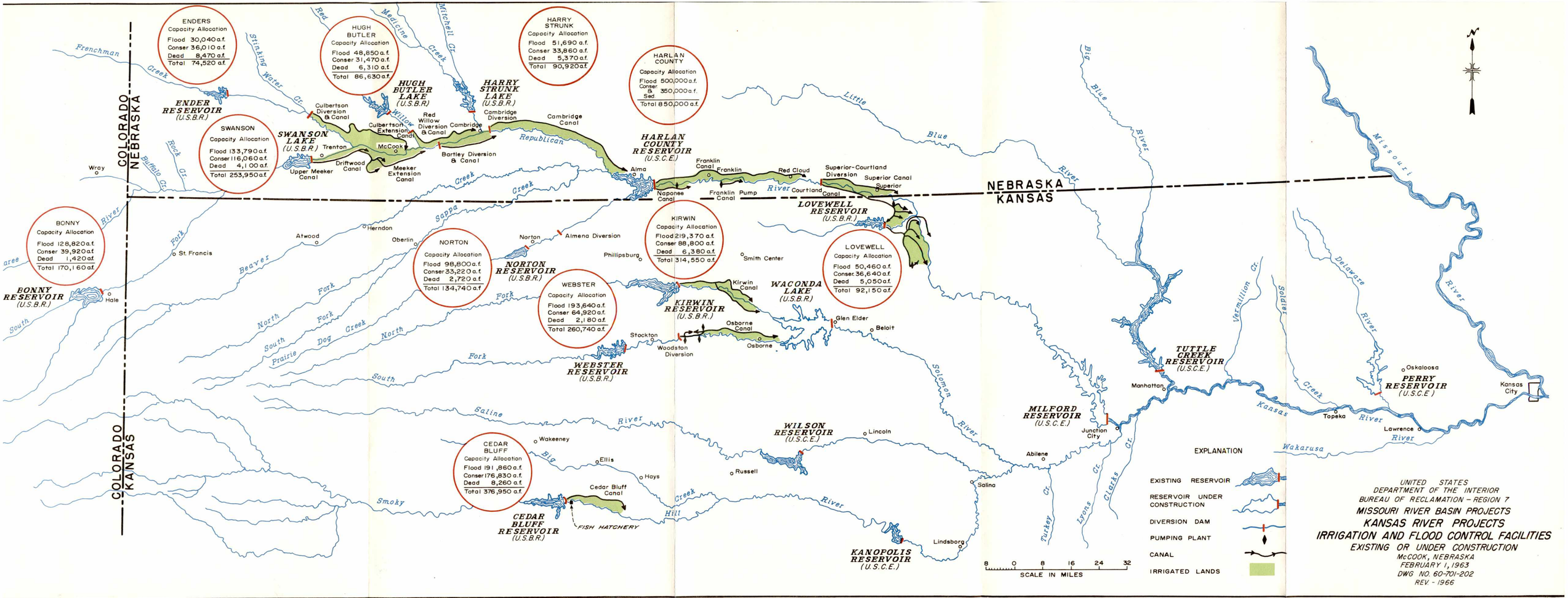


RED WILLOW DAM
AND
HUGH BUTLER LAKE



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SYNOPSIS

ANNUAL OPERATING PLAN -- KANSAS RIVER PROJECTS

1966 OPERATIONS -- 1967 OUTLOOK

GENERAL

This is the fourteenth Annual Operating Plan for the irrigation units in the Kansas River Projects area. The Kansas River Projects is an integral part of the Missouri River Basin Project and provides for the multipurpose benefits of irrigation, flood control, municipal water supply, recreation, fish and wildlife, stream pollution abatement and other uses. The dams and reservoirs constructed and operated by the Bureau of Reclamation or Corps of Engineers which serve the irrigation systems are within the scope of this report. Eleven of the reservoirs, sixteen canal systems and seven diversion dams are now in operation in the Kansas River Projects area. This will be the first year of operation for the Almena Diversion Dam and canal system.

This report describes the operations and defines the responsibilities of the Bureau of Reclamation and the Corps of Engineers in relation to the federally constructed and rehabilitated irrigation facilities in the Republican, Solomon and Smoky Hill River drainage basins. The irrigation operations are a responsibility of the Bureau of Reclamation, while the flood control operations are a responsibility of the Corps of Engineers.

The gross crop value plus additional revenue from conservation practices of the irrigated project lands in 1966 was $15,615,860. The flood damages prevented by reservoirs in the scope of this report during 1966 were $1,790,000.

Chapter I, the introduction, gives a description of the irrigation facilities in the Kansas River Projects area. Chapter II summarizes the 1966 operations, and Chapter III presents the plans of operation for 1967.

1966 OPERATIONS

The water supply was adequate to meet the 1966 irrigation requirements of 120,845 acres irrigated in the Kansas River Projects. The total precipitation for 1966 varied from 42 to 110% of normal across the project area. In general, the dams in the Smoky Hill River Basin measured precipitation from 10.1" to 14.6" (42 to 65% of normal), while those in the Republican River Basin measured from 14.7" to 22.5" (73 to 110% of normal). The diversion of irrigation water to canals in the Kansas River Projects averaged 2.52 acre-feet per acre while the farm delivery rate averaged 1.39 acre-feet per acre. Storage surplus to Project needs

in Norton and Bonny Reservoirs was made available as a supplemental water supply to 360 acres of lands in the Republican River Basin.

The conservation pools of Bonny, Enders, Harlan County, Lovewell, Kirwin, Webster and Cedar Bluff Reservoirs and Swanson and Harry Strunk Lakes were full prior to the 1966 irrigation season. The conservation pools of Hugh Butler Lake and Norton Reservoir did not fill.

1967 OUTLOOK

The conservation pools of Harry Strunk Lake, and Harlan County and Lovewell Reservoirs were full at the start of 1967. Swanson, Hugh Butler and Enders conservation pools are expected to fill with "reasonable minimum" inflows and Norton with "most probable" inflows. The carryover storage and the inflow that can reasonably be expected will be adequate to meet the 1967 irrigation, municipal and industrial demands. Irrigation facilities are completed to serve 156,325 acres, of which 130,654 acres are expected to be irrigated in 1967.

KANSAS RIVER PROJECTS
1966 OPERATIONS
1967 OUTLOOK

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ANNUAL OPERATING PLAN - KANSAS RIVER PROJECTS

1966 OPERATIONS - 1967 OUTLOOK

CHAPTER I - INTRODUCTION

PURPOSE OF THE REPORT

In addition to describing the responsibilities of the Bureau of Reclamation and the Corps of Engineers, this Annual Operating Plan advises water users, cooperating agencies, and other interested groups or persons of the actual operations during 1966 and serves as guide lines for the 1967 operations of the federally constructed and rehabilitated irrigation and storage facilities in the Republican, Solomon and Smoky Hill drainage areas in the Kansas River Projects area.

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 Rvier Basin, and of the conservation functions other than irrigation at the dams where they are the construction agency.

The States of Nebraska, Colorado and Kansas are responsible for administration and enforcement of the laws of their respective States pertaining to the rights and priorities of all parties concerned with benefical consumptive 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 Kansas River Projects are a part of the Missouri River Basin Project and include multipurpose reservoirs which provide storage for irrigation, flood control, municipal water supply, recreation, fish and wildlife, stream pollution abatement and other uses. Eleven storage facilities, constructed and operated by the Bureau of Reclamation or the Corps of Engineers which serve the irrigation systems covered in this report are as follows:

Constructed by the Bureau of Reclamation:

(a) Bonny, Enders, Norton and Lovewell Reservoirs; Swanson, Hugh Butler and Harry Strunk Lakes in the Republican River Basin.

(b) Kirwin and Webster Reservoirs in the Solomon River Basin.

(c) Cedar Bluff Reservoir on the Smoky Hill River.

Constructed by the Corps of Engineers:

(a) Harlan County Reservoir in the Republican River Basin.

Sixteen canal systems and seven diversion dams served by the above storage facilities are now in operation in the Kansas River Projects area. The Almena Diversion Dam and Canal system will be nearly completed and placed in operation on a preliminary basis by the Bureau of Reclamation in the spring of 1967. All diversion dams, canals and laterals except Almena will be operated and maintained by irrigation districts in 1967

The Bureau of Reclamation started construction of the Glen Elder Dam and pertinent facilities in 1964. This construction program will continue in 1967 with closure of the dam expected in June. The dam is expected to be placed in operation in 1968. Completion of the project is scheduled for 1969.

Capacity allocations for the eleven reservoirs presently serving irrigated areas are shown in Table 1. Tables 2, 3 and 4 show the forecasted inflows, 1966 operations and a comparison of 1966 precipitation with prior years. The reservoirs and main irrigation canals of the Kansas River Projects are shown on the general map of the Kansas River Projects.

IRRIGATION DISTRICTS

Nine irrigation districts in the Kansas River Projects have contracted with the Bureau of Reclamation for a water supply and repayment of the

construction of irrigation facilities. Table No. 5 shows the status of the repayment and water service contracts. Table No. 6 shows the acres irrigated in 1966 and the acreage expected to be irrigated in 1967 for each irrigation district.

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, the irrigation season is from May 1 to September 30.

Frenchman Valley Irrigation District and H & RW Irrigation District

Culbertson Diversion Dam and Canal were reconstructed and Culbertson Extension system 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 1890s. 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. 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 initiage 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 1967. 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 42,942 acres of land in the Frenchman-Cambridge Irrigation District was completed in July 1964. 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. Construction of the Almena Diversion Dam, canals and laterals was started in 1965 and will be nearly completed and ready for operation on an optional, temporary basis by the spring of 1967. 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 22,640 acres served in this Irrigation District is provided by Harlan County Reservoir. The Franklin, Naponee, Franklin Pump, Superior and Courtland (Nebraska) canal systems serve these lands which are in the Republican River Valley from Harlan County Dam to the Kansas-Nebraska State line. All of the major construction is completed.

Kansas-Bostwick Irrigation District No. 2

Construction work has been essentially completed with service available to 37,768 acres. 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.

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.

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. 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 No. 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.

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 has been 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.

City of Russell, Kansas

Cedar Bluff Reservoir provides storage to supplement the municipal water supply of the City of Russell, Kansas. A contract with the City has been executed for a storage supply not to exceed 2,000 acre-feet per year.

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.

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.

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 Projects. The regulated outflow to avoid unregulated spills will be of some advantage to farmers, industries, cities and other interests below all reservoirs in the Kansas River Projects.

CHAPTER II - SUMMARY OF 1966 OPERATIONS

PRECIPITATION

The precipitation for the Kansas River Projects ranged from 42% of normal at Webster Dam to 110% at Norton Dam. The winter and spring precipitation was below normal at most dams. Those stations measuring near or above normal precipitation received heavy rains during the late spring or summer months. These data are shown on Table 4.

RESERVOIR INFLOW

The inflows varied from 47% of the most probable at Webster Reservoir to 109% at Medicine Creek. Table 2 shows the 1966 inflows and forecasts for 1967. Exhibits 21 through 31 graphically show historical inflow records and 1967 forecasts.

RESERVOIR OPERATIONS

The conservation pools of the reservoirs except Hugh Butler and Norton were full at the start of 1966. Operations were within the scope of the Annual Operating Plan with the exception of Webster Reservoir where the pool level was below that forecasted for a reasonable minimum inflow condition. A full water supply was furnished to 120,845 acres of project lands. Table 3 shows the 1966 reservoir contents by months. The operation hydrographs are plotted on Exhibits 1 through 11.

The only flooding that occurred in 1966 was on the Prairie Dog Creek basin downstream from Norton Dam and upstream from Harlan County Reservoir in the Prairie Dog and Sappa Creek Basins. Control of these floods at Norton and Harlan County Dams prevented $1,790,000 of flood damages. Table 13 is the tabulation of flood damages through 1966.

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

Bonny Dam and Reservoir

The reservoir inflow for 1966 was 86% of the most probable. A spring drawdown of 6,300 acre-feet was made as planned. Natural flow bypasses as requested by the Colorado State Engineer were made to Hale Ditch from May 18 to October 20. One hundred eighty-eight acre-feet of storage was sold under Warren Act as a supplemental water supply for 200 acres served by Hale Ditch. The minimum pool level of elevation 3668.26 (34,140 acre-feet) was reached on July 25. This is 3.7 feet below the top of the conservation pool.

Trenton Dam and Swanson Lake

The reservoir inflow including transfers of storage from Bonny Reservoir for 1966 was 85% of the most probable with a maximum elevation of 2752.35 feet (121,910 acre-feet) reached on June 21. Controlled releases were also made during August to expose the spillway gates for repainting. During this period, a partial water supply was furnished to the Cambridge Canal.

The 18,244 acres irrigated under the Bartley and Meeker-Driftwood Canals were provided a full water supply from controlled spills and irrigation releases from Swanson Lake. A water supply of 75 acre-feet was released for water flood operations in the Sleepy Hollow Oil Field near Bartley, Nebraska. The lake was drawn down to elevation 2742.17 (76,200 acre-feet) by October 14, with an active conservation carryover storage of 62,220 acre-feet. No storage was available for sale under Warren Act Contract in 1966.

Enders Dam and Reservoir

The reservoir inflow for 1966 was 99% of the most probable, with a maximum elevation of 3113.61 (46,758 acre-feet) reached on April 2. This was 1.31 feet (2,278 acre-feet) in the flood control pool.

The reservoir storage was adequate to meet the demands of the 17,519 acres irrigated by the Frenchman Valley and H & RW Irrigation Districts. The reservoir was drawn down to elevation 3095.77 feet (21,588 acre-feet) on September 9 with an active conservation carryover storage of 11,223 acre-feet. No surplus storage was available for sale under Warren Act Contracts.

Red Willow Dam and Hugh Butler Lake

The reservoir inflow for 1966 was 93% of the most probable with a maximum elevation of 2581.47 (37,242 acre-feet) reached on April 27. This was 0.33 feet below top of the conservation pool. The reservoir storage was adequate to meet the demands of 3,204 acres irrigated under the Red Willow Canal. No surplus storage was available for sale under Warren Act Contracts.

Medicine Creek Dam and Harry Strunk Lake

The reservoir inflow for 1966 was 109% of the most probable. The reservoir reached a depth of 1.03 feet (1,943 acre-feet) in the flood control pool on June 13. Demands of Cambridge Canal irrigators resulted in the reservoir being drawn down approximately 2.99 feet (5,226 acre-feet) in the conservation pool by July 22. No storage was available for sale to Warren Act contractors.

Norton Dam and Reservoir

The reservoir inflow for 1966 was 47% of the most probable, with a maximum elevation of 2302.47 (32,099 acre-feet) reached on August 16. This was 1.83 feet below top of conservation pool. A Warren Act Contract was executed with the Almena Irrigation District for the sale of storage water not to exceed 2,000 acre-feet from Norton Reservoir. Under this contract, 258 acre-feet of storage water was delivered to lands served by private pumps from the Prairie Dog Creek.

The City of Norton, Kansas, used 744 acre-feet during 1966.

Norton Dam prevented $132,000 in flood damages in 1966. On June 24, heavy rains fell over the reservoir area and the Prairie Dog Creek Basin downstream from Norton Dam. Overbank flooding from side tributaries occurred within one mile of the reservoir outflow gaging station. Three thousand acre-feet of storage accumulated in Norton Reservoir during this storm.

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 conservation pool was full at the start of 1966. The total reservoir inflow for 1966 was 90% of the most probable. Irrigation demands lowered the reservoir elevation to 1945.23 (332,520 acre-feet) on June 7. The maximum elevation reached in 1966 was 1950.89 (412,300 acre-feet) on June 27. This was 4.89 feet (69,740 acre-feet) in the flood 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 1966, Harlan County Dam prevented $1,658,000 in flood damages. The details of the 1966 floods on Prairie Dog and Sappa Creek Basins above Harlan County Reservoir are described in the Corps of Engineers' Annual Operating Plan for Harlan County Reservoir.

Lovewell Dam and Reservoir

The reservoir inflow for 1966 was 125% of the most probable, of which 85% was from Courtland Canal and 15% from White Rock Creek. The maximum elevation of 1583.57 (44,660 acre-feet) was reached on June 20. This was 0.97 feet (2,970 acre-feet) in the flood control pool.

The inflows from Upper Courtland Canal and releases to Lower Courtland Canal were regulated to lower the pool level to elevation 1576.20 (25,410 acre-feet) by September 16, 1966, to facilitate an inspection of the spillway approach channel. The accumulated sediment deposits have affected the irrigation operations. Flushing 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 beginning in 1969.

Jewell County of Kansas has started relocation of a county road in the immediate vicinity downstream from the dam. A new bridge is under construction in the channel change between the Lovewell Dam spillway outflow channel and the outflow gage.

Kirwin Dam and Reservoir

The reservoir inflow for 1966 was 80% of the most probable. The 8,875 acres irrigated under the Kirwin Canal were provided a full water supply. The irrigation releases lowered the pool level to elevation 1723.98 (74,900 acre-feet) at the end of the season. This was 4.42 feet (20,280 acre-feet) below the top of the conservation pool. In 1965, it was necessary to regulate the flood control release from Kirwin and Webster Reservoirs so as not to exceed the 500 c.f.s. capacity of the haul road river crossing at Glen Elder Dam construction site. This operation restriction was relieved in 1966 with the construction of 2,000 c.f.s. capacity structures.

Webster Dam and Reservoir

The conservation pool of Webster Reservoir was full at the start of 1966. The reservoir inflow for 1966 was 47% of the most probable. The dry year demands of 6,763 acres in the Webster Irrigation District were greater than forecasted for a "reasonable minimum" inflow condition. The pool level at the end of the year was 13.55 feet (37,464 acre-feet) below the top of the conservation pool. This was 10.35 feet below the reasonable minimum reservoir stage forecast.

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.

Cedar Bluff Dam and Reservoir

The conservation pool was full at the start of 1966. The reservoir inflow for 1966 was 56% 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 from April 15 to Septmeber 16 to irrigate 5,314 acres in the Cedar Bluff Irrigation

District. The municipal water supply of Russell, Kansas, was supplemented by storage releases from Cedar Bluff Reservoir from May 27 to June 8 and June 30 to July 20. The water level was 4.70 feet (30,490 acre-feet) below the top of the conservation pool at the end of 1966.

IRRIGATION OPERATIONS SUMMARY

A total of 304,433 acre-feet of water was diverted into fifteen canal systems for irrigation of 120,845 acres of land in the Kansas River Projects. This is 80% of the acreage that had service available in 1966. 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) Norm.	Farm Del. (A.F./Ac) 1966	Total Income Per Acre
Frenchman Valley	6,426	21,469	3.34	1.50	2.44	$150.63
H & RW	11,093	30,486	2.75	1.50	1.48	131.55
Frenchman-Cambridge	34,548	71,055	2.06	1.36	1.05	143.52
Bostwick in Nebraska	20,058	49,396	2.46	1.43	1.11	125.82
Kansas-Bostwick	27,768	70,186	2.53	1.46	1.30	118.62
Kirwin	8,875	23,961	2.70	1.29	2.02	124.71
Webster	6,763	23,607	3.49	1.48	2.17	126.03
Cedar Bluff	5,314	14,273	2.69	1.57	1.49	85.35
Total - Kansas River Projects	120,845	304,433	2.52			$129.22

The total gross crop value plus additional revenue from conservation practices for the Kansas River Project in 1966 was $15,615,860.

Water diverted to the Hale Ditch totaled 2,415 acre-feet, of which 188 acre-feet of storage were sold as a supplemental supply under Warren Act Contract.

The acreage irrigated in 1966, the acreage estimated to be irrigated in 1967, and the acres for which service is available are shown in Table 6. A graphic representation of development by irrigation districts is presented in Exhibits 12 through 20.

Table 7 lists the 1966 monthly diversions and acres irrigated for each canal system. Table 8 tabulates the acreage irrigated and water diversion data for 1964 through 1966, together with estimates for 1967.

MUNICIPAL

The City of Norton, Kansas, used a water supply of 744 acre-feet of water from Norton Reservoir.

The City of Beloit, Kansas, required a supplemental water supply of 418 acre-feet from Webster Reservoir.

The City of Russell, Kansas, required a supplemental water supply of 716 acre-feet from Cedar Bluff Reservoir.

INDUSTRIAL

Contracts were completed 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 of Nebraska. Under the terms of these contracts, Midwest Oil Corporation started operations on November 1 and used a total of 66 acre-feet in 1966,and the Livingston Oil Company started on July 1 and used 11 acre-feet in 1966.

FISH HATCHERY

The Cedar Bluff National Fish Hatchery diverted 2,009 acre-feet from Cedar Bluff Reservoir. Of this, 825 acre-feet was returned to the Smoky Hill River below the Cedar Bluff Dam outflow gage.

OTHER USES

During the 1966 season, at the Bureau of Reclamation reservoirs and lakes, recreation areas and facilities drew 1,698,859 visitors to enjoy boating, water skiing, swimming, sight seeing, 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.

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 100,000 trees at Swanson, Hugh Butler and Harry Strunk Lakes and Enders Reservoir and constructed a swimming beach, gravel surfaced road and parking area, toilet facilities and a water well at Hugh Butler Lake.

CHAPTER III - ANNUAL OPERATING PLAN FOR 1967

WATER SUPPLY

The water supply outlook for 1967 is fair to very good. Even under reasonable minimum conditions, we expect to be able to meet the irrigation requirements of 130,660 acres of Kansas River Project lands anticipated to be irrigated, the municipal demands of Norton, Beloit, and Russell, Kansas, and industrial demands. If the inflow to Webster Reservoir in 1967 is less than the reasonable minimum forecast and the Webster Irrigation District demands are greater than the dry year forecasts, a shortage may occur.

For forecasting purposes, values of annual inflows that will be statistically equaled or exceeded 10, 50 and 90 per cent of the time were selected from the probability curve to be "reasonable maximum," "most probable," and "reasonable minimum" inflow conditions. The estimates for 1967 are shown in Table 2 and are graphically compared with the historical inflow records in Exhibits 21 through 31. Operation analyses for the three conditions have been prepared for 1967 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.

Insofar as practicable, flood releases from Kirwin and Webster Reservoirs, combined with natural flow will be held to the capacity (2,000 c.f.s.) of the construction crossings at Glen Elder Dam until mid-summer. Tentative plans call for closure being made on Glen Elder Dam in June 1967. When the dead pool is filled, all additional inflows will be passed through the river outlet structure.

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 11 shows the probable effects on each reservoir for 1967 under "most probable," "reasonable minimum," and "reasonable maximum" inflow conditions.

Bonny Dam and Reservoir

The industrial demands for water flood operations of the Sleepy Hollow oil field in Nebraska will be met in full. Continuous winter releases

are undesirable because of the exposed Hale Ditch outlet pipe. 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 is lowered to elevation 3670.0 (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 or early October to draw the pool level down another foot to elevation 3669.00 (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 again be available to Hale Ditch irrigators under Warren Act Contracts as a supplemental water supply.

Trenton Dam and Swanson Lake

Irrigation requirements for 21,570 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 1967 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 13.0 feet (56,100 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 18,600 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 17.6 feet (24,100 acre-feet) below the top of the conservation pool.

Red Willow Dam and Hugh Butler Lake

Hugh Butler conservation pool is expected to be filled by the start of the 1967 irrigation season. Inflow and conservation storage will be more than adequate to meet the demands of senior appropriations and requirements of 3,400 acres expected to be irrigated under the Red Willow Canal system. The maximum expected drawdown under "reasonable minimum" conditions will be about 4.7 feet (7,200 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 1967; therefore, the carryover storage and available inflow will be adequate to meet the requirements of 14,230 acres expected to be irrigated by the Cambridge Canal system. The maximum expected drawdown under "reasonable minimum" conditions will be about 11.7 feet (17,200 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 2,850 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.

Harlan County Dam and Reservoir

Storage and natural flow will meet the irrigation requirements for 20,010 acres in the Bostwick Irrigation District in Nebraska, 9,250 acres above Lovewell Dam, and the partial requirement of 18,250 acres below Lovewell Dam in the Kansas-Bostwick Irrigation District. The reservoir conservation pool was full at the start of 1967; therefore, the carryover storage and available inflow will be adequate to meet irrigation demands. The maximum expected drawdown under "reasonable minimum" conditions will be about 7.9 feet (92,600 acre-feet) below the top of the conservation pool.

Lovewell Dam and Reservoir

The reservoir conservation pool was full at the start of 1967; 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 18,250 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 by the end of the irrigation season to elevation 1576 for a short period during August or September to replace cables on the spillway gates.

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 conservation pool was 4.5 feet (20,700 acre-feet) below the top of the conservation pool at the start of 1967. The inflow and carryover storage will be adequate to meet the irrigation requirements of 9,100 acres expected to be irrigated under the Kirwin Canal system in 1967.

Webster Dam and Reservoir

The storage in Webster Reservoir at the end of 1966 was 4.1 feet (9,600 acre-feet)below that forecasted for reasonable minimum inflows. The operation study for 1967 indicates that the dry year requirements of municipal and irrigation uses will, for all practical purposes, empty the conservation pool of Webster Reservoir by the end of 1967. Webster Irrigation District expects to irrigate 6,900 acres and the City of Beloit may require as much as 1,000 acre-feet.

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

Cedar Bluff Dam and Reservoir

Cedar Bluff conservation pool was 4.8 feet (30,500 acre-feet) below the top of the conservation pool at the start of 1967. The carryover storage and available inflow will be adequate to meet the irrigation requirements of 5,500 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 Fish Cultural Station. The maximum expected drawdown under "reasonable minimum" conditions will be about 11.0 feet (65,600 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 130,660 acres under the Kansas River Projects will be irrigated in 1967. Of this, 78,810 acres are in Nebraska and 51,850 acres in Kansas. The acres expected to be irrigated in 1967 are shown by canals in Table 6. The forecasted canal diversions for 1967 under the "normal," "dry" and "wet" years are shown graphically together with the acreage expected to be irrigated in Exhibits 12 through 20. The expected operations are discussed in the following paragraphs for each irrigation district.

Frenchman Valley and H & RW Irrigation Districts

The irrigated lands in these two districts are served by Enders Reservoir through the Culbertson Canal and the Culbertson Extension Canal systems which are operated under joint management. For 1967, 7,600 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 1967.

Frenchman-Cambridge Irrigation District

The Frenchman-Cambridge Irrigation District will operate and maintain the Red Willow, Bartley, Cambridge and Meeker-Driftwood systems. It is estimated that 39,200 acres will be irrigated by these four systems in 1967 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 System will continue during 1967 and 1968.

Almena Irrigation District No. 5

The Almena Diversion Dam and Canal System will be placed in an optional, temporary basis operation by the Bureau of Reclamation to irrigate an estimated 2,850 acres in the Almena Irrigation District. There will be no storage surplus to project needs available for sale under Warren Act Contract as in past years.

Bostwick Irrigation District in Nebraska

Franklin, Naponee, Franklin Pump and Superior systems and Courtland Laterals in Nebraska will be operated and maintained by the Bostwick Irrigation District in Nebraska with storage from Harlan County Reservoir. An estimated 21,000 acres will be irrigated in 1967. 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 district lands in Nebraska, Kansas-Bostwick Irrigation District lands 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 and the Bostwick Irrigation District in Nebraska.

Kansas-Bostwick Irrigation District No. 2

In 1967, 27,500 acres are expected to be irrigated in the Kansas-Bostwick Irrigation District No. 2, of which 9,250 acres are above Lovewell Reservoir and 18,250 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 and maintain the Kirwin system to irrigate an estimated 9,100 acres during the 1967 irrigation season from Kirwin Reservoir.

Kirwin and Webster Irrigation Districts are operated under joint management.

Webster Irrigation District No. 4

The Webster Irrigation District No. 4 will operate and maintain the Osborne system. Of the 8,500 acres available for service, 6,900 acres are expected to be irrigated in 1967. Webster Reservoir provides storage for this district.

The Irrigation District Board of Directors has 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 and maintain the Cedar Bluff system. An estimated 5,500 acres will be irrigated during the 1967 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

Water will be available from Webster Reservoir for diversion of 1,000 acre-feet to the City of Beloit, Kansas, until such time as storage is available from Waconda Lake.

City of Russell, Kansas

The municipal water supply demands 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 below Cedar Bluff Dam, and irrigation, and by releases from Cedar Bluff Reservoir. Demands of the City of Russell, Kansas, will be met in full during 1967.

INDUSTRIAL WATER

The Midwest Oil Corporation and the Livingston Oil Company water demands 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 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 1967.

TABLE 1

RESERVOIR DATA - KANSAS RIVER PROJECTS

RESERVOIR	CAPACITY ALLOCATIONS 1/ DEAD	LIVE CONSERVATION	FLOOD CONTROL	SURCHARGE CAPACITY
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				
Elevation (Ft.)	2552.0	2581.8	2604.9	2627.8
Total Acre Feet	6,310	37,780	86,630	162,605
Net Acre Feet	6,310	31,470	48,850	75,975
Harry Strunk				
Elevation (Ft.)	2335.0	2366.1	2386.2	2408.9
Total Acre Feet	5,370 2/	39,230 2/	90,920 2/	197,520
Net Acre Feet	5,370	33,860	51,690	106,600
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 2/	1946.0	1973.5	1975.5
Total Acre Feet	1,300	350,120 2/	850,000 2/	896,810
Net Acre Feet	1,300	348,820	499,880	46,810
Lovewell				
Elevation (Ft.)	1562.07	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
Total Storage (A.F.)	51,840	1,058,870	2,707,270	
Total Net Acreage Feet	51,840	1,007,030	1,648,400	

1/ Includes space for sediment storage.

2/ Resurveys were made in 1962 but space has not been reallocated.

TABLE 2
INFLOW INTO RESERVOIRS - 1966 RECORDS, 1967 ESTIMATES

Reservoir	1,000 Acre-Feet				
	1966 Inflows		1967 Estimates 1/		
	Computed	Adjusted 2/	Reasonable Minimum	Most Probable	Reasonable Maximum
Bonny	23.2		17.3	27.0	41.8
Swanson Lake	97.9	106.4 2/	71.0	115.0	200.0
Enders	58.7		48.8 3/	59.4 3/	69.7 3/
Hugh Butler Lake	19.1		14.5	20.5	28.7
Harry Strunk Lake	57.8		37.2	52.8	82.9
Norton	9.8		7.4	20.0	53.0
Harlan County	401.6	596.0 2/	253.0	446.0	796.0
Lovewell	9.4 4/	64.1 5/	4.6 4/	25.7 4/	68.5 4/
Kirwin	30.3		16.7	38.1	108.3
Webster	16.3		13.0	34.7	108.0
Cedar Bluff	24.0		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/ Includes reservoir pickup.
4/ Natural inflow from White Rock Creek.
5/ Includes total of White Rock Creek and inflow from Courtland Canal.

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

MONTH	TOTAL STORAGE END OF MONTH 1965	TOTAL STORAGE END OF MONTH 1966	TOTAL 1966 OUTFLOW	INFLOW 1966 ACTUAL*	INFLOW MOST PROBABLE	DAM AND RESERVOIR INFORMATION	
Jan.	39.1	39.1	0.4*	2.1	2.2	DAM: BONNY	
Feb.	40.8	41.0	0.4*	2.2	2.2	RESERVOIR: BONNY	
Mar.	36.3	41.7	1.4*	2.4	2.9		
Apr.	30.7	40.1	3.8*	2.8	2.5		RESERVOIR CAPACITY
May	23.9	36.8	3.8*	1.7	3.0		
June	38.6	35.4	1.0*	1.0	3.0		
July	40.2	35.4	1.0*	2.3	1.7	DEAD	1.4
Aug.	44.6	34.5	0.6*	0.7	1.8	LIVE CONSER.	
Sept.	41.5	34.8	0.8*	1.9	1.5	Inactive	1.4
Oct.	36.3	35.5	0.7*	2.1	1.7	Active	38.5
Nov.	35.5	36.9	0.4*	2.2	2.0	SUB-TOTAL	41.3
Dec.	37.3	38.2	0.4*	1.8	2.2	FLOOD	128.9
Total			14.7	23.2	26.7	TOTAL	170.2
Jan.	84.7	119.8	7.5	7.4	7.3	DAM: TRENTON	
Feb.	91.6	120.7	7.8	9.0	9.9	RESERVOIR: SWANSON LAKE	
Mar.	102.9	121.3	12.7	13.6	17.7		
Apr.	110.9	120.2	12.2	11.3	11.8		
May	112.5	116.8	8.3	7.3	14.7		RESERVOIR CAPACITY
June	125.2	120.8	5.3	12.0	13.3		
July	116.4	108.8	17.2	8.3	4.4	DEAD	4.1
Aug.	110.3	82.4	32.4	5.7	4.9	LIVE CONSER.	
Sept.	120.0	76.5	6.7	4.0	6.2	Inactive	9.9
Oct.	121.4	80.0	0.8*	5.5	3.5	Active	106.2
Nov.	120.5	86.4	0.1*	7.4	6.8	SUB-TOTAL	120.2
Dec.	120.0	92.0	0.2*	6.4	5.9	FLOOD	133.8
Total			111.2	97.9	106.4 a/	TOTAL	254.0
Jan.	32.5	41.3	0.6	4.2	5.2	DAM: ENDERS	
Feb.	36.1	44.5	0.6	3.7	4.5	RESERVOIR: ENDERS	
Mar.	39.2	46.7	2.3	4.4	4.7		
Apr.	40.2	46.5	3.3	3.8	4.5		RESERVOIR CAPACITY
May	40.9	45.0	4.6	4.0	4.4		
June	45.5	44.1	4.0	4.0	4.5		
July	39.5	29.8	21.1	7.8	4.1	DEAD	8.5
Aug.	24.4	21.8	13.6	6.3	3.9	LIVE CONSER.	36.0
Sept.	26.4	24.1	3.7	6.6	3.9	SUB-TOTAL	44.5
Oct.	30.5	28.2	0.4*	4.9	4.2	FLOOD	30.0
Nov.	33.9	32.1	0.5*	4.6	4.5	TOTAL	74.5
Dec.	37.7	35.9	0.5*	4.4	5.0		
Total			55.2	58.7	53.6		

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 1965	TOTAL STORAGE END OF MONTH 1966	TOTAL 1966 OUTFLOW	INFLOW 1966 ACTUAL*	INFLOW MOST PROBABLE	DAM AND RESERVOIR INFORMATION
Jan.	26.7	33.3	0.3	1.1	1.5	DAM: RED WILLOW
Feb.	27.8	34.8	0.2	1.7	1.6	RESERVOIR: HUGH BUTLER LAKE
Mar.	28.9	36.5	0.3	2.2	2.1	
Apr.	29.8	37.1	0.4	1.4	1.9	
May	30.0	36.0	0.3	1.2	2.3	RESERVOIR CAPACITY
June	31.7	35.4	0.9	1.4	3.1	
July	30.6	33.8	3.1	2.6	1.9	DEAD 6.3
Aug.	27.8	33.2	2.0	2.0	1.1	LIVE CONSER.
Sept.	29.3	32.5	1.1	1.2	1.0	Inactive 1.3
Oct.	30.6	32.8	0.8*	1.5	1.2	Active 30.2
Nov.	31.3	33.5	0.3*	1.4	1.4	SUB-TOTAL 37.8
Dec.	32.5	34.4	0.2*	1.4	1.6	FLOOD 48.8
Total			9.9	19.1	20.7	TOTAL 86.6
Jan.	31.4	36.7	4.1	3.8	3.6	DAM: MEDICINE CREEK
Feb.	34.6	37.2	6.4	7.0	3.8	RESERVOIR: HARRY STRUNK LAKE
Mar.	36.8	36.8	5.3	5.6	4.3	
Apr.	36.9	38.0	2.5	4.4	4.5	
May	37.3	38.3	2.1	3.7	5.4	RESERVOIR CAPACITY
June	37.5	38.5	3.1	4.6	6.8	
July	35.3	34.8	7.6	6.3	5.0	
Aug.	30.6	38.9	2.5	7.7	3.4	DEAD 4.9
Sept.	34.2	38.9	2.1	3.2	3.0	LIVE CONSER. 32.2
Oct.	37.1	39.0	2.7*	3.5	3.0	SUB-TOTAL 37.1
Nov.	37.0	37.2	5.6*	4.1	3.2	FLOOD 52.2
Dec.	37.1	37.1	3.7*	3.9	3.5	TOTAL 89.3
Total			47.7	57.8	49.5	
Jan.	0.1	30.4	0.1	0.2	0.6	DAM: NORTON
Feb.	0.2	31.4	0.1	1.0	0.9	RESERVOIR: NORTON
Mar.	0.4	31.0	0.1	0.6	0.9	
Apr.	0.5	30.3	0.1	0.2	1.0	RESERVOIR CAPACITY
May	1.1	29.0	0.2	0.2	2.9	
June	12.1	31.1	0.2	3.5	6.8	
July	15.3	30.8	1.0	1.9	4.0	DEAD 2.7
Aug.	14.6	31.5	0.3	1.8	2.1	LIVE CONSER. 33.2
Sept.	24.2	30.7	0.2	0.2	1.0	SUB-TOTAL 35.9
Oct.	32.3	29.8	0.1*	0.1	0.5	FLOOD 98.8
Nov.	31.1	29.3	0.1*	0	0.3	TOTAL 134.7
Dec.	30.6	29.1	0.1*	0.1	0.5	
Total			2.6	9.8	21.5	

* 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 1965	TOTAL STORAGE END OF MONTH 1966	TOTAL 1966 OUTFLOW	INFLOW 1966 ACTUAL*	INFLOW MOST PROBABLE	DAM AND RESERVOIR INFORMATION	
Jan.	218.5	336.9	32.9	27.0	13.2	DAM: HARLAN COUNTY	
Feb.	227.5	352.2	37.8	50.2	24.9	RESERVOIR: HARLAN COUNTY RESERVOIR	
Mar.	241.9	346.1	50.8	45.6	35.8		
Apr.	255.8	348.0	32.2	38.8	33.1		
May	296.4	339.4	22.4	20.8	47.3		CAPACITY
June	346.1	409.4	21.0	98.6	89.9	DEAD	0.9
July	331.6	345.9	84.6	27.0	24.9	LIVE CONSER. & SEDIMENT	
Aug.	303.8	349.1	20.1	28.9	13.6	Inactive	143.9
Sept.	366.3	347.3	15.5	19.8	3.2	Active	197.8
Oct.	358.3	343.8	11.1*	11.9	0	SUB-TOTAL	342.6
Nov.	339.9	344.2	13.9*	17.9	2.2	FLOOD	498.0
Dec.	341.9	349.1	7.7*	15.1	2.3	TOTAL	840.6
Total			350.0	401.6	290.4 a/		

a/ Inflow adjusted for upstream depletions.

Jan.	46.5	42.2	0	0.3	0.2	DAM: LOVEWELL	
Feb.	52.8	41.7	1.9	1.3	0.6	RESERVOIR: LOVEWELL	
Mar.	48.6	41.6	0.3	0.9	0.6		
Apr.	47.9	41.4	0	0.8	0.6		RESERVOIR
May	48.4	40.4	4.6	5.0	4.0		CAPACITY
June	42.8	43.6	6.0	10.6	8.4		
July	37.3	40.0	22.7	21.9	13.6	DEAD	5.1
Aug.	40.8	26.1	16.1	3.0	13.6	LIVE CONSER.	
Sept.	46.1	25.9	1.1	1.5	2.1	Inactive	11.7
Oct.	43.3	29.5	0.1*	5.1	0.7	Active	24.9
Nov.	41.6	41.6	0.1*	13.7	0.4	SUB-TOTAL	41.7
Dec.	42.0	41.5	0 *	0.1	0.2	FLOOD	50.5
Total			52.9	64.1 b/	45.0 c/	TOTAL	92.2

b/ Inflow from Courtland Canal - 54,728 A.F. Inflow from White Rock Creek - 9,388 A.F.

c/ Forecasted inflow from Upper Courtland Canal - 29,600 A.F. Forecasted inflow from White Rock Creek - 25,700 A.F.

Jan.	58.2	94.8	1.4	1.3	0.9	DAM: KIRWIN	
Feb.	59.1	96.6	5.9	7.2	1.8	RESERVOIR: KIRWIN	
Mar.	59.7	94.7	3.9	2.5	2.1		
Apr.	61.2	95.3	0.3	2.5	2.8		RESERVOIR
May	67.3	91.8	2.9	1.7	4.6		CAPACITY
June	82.1	92.8	3.0	6.6	10.3		
July	83.2	82.3	10.7	3.1	6.7	DEAD	6.4
Aug.	77.1	77.6	6.1	3.6	4.5	LIVE CONSER.	
Sept.	90.7	76.1	1.2	1.3	2.5	Inactive	3.4
Oct.	99.9	74.7	0 *	0	1.6	Active	85.4
Nov.	94.9	74.3	0 *	0	1.2	SUB-TOTAL	95.2
Dec.	95.0	74.5	0 *	0.5	1.0	FLOOD	219.4
Total			35.4	30.3	40.0	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 1965	TOTAL STORAGE END OF MONTH 1966	TOTAL 1966 OUTFLOW	INFLOW 1966 ACTUAL*	INFLOW MOST PROBABLE
Jan.	36.8	67.6	31.3	1.7	0.8
Feb.	37.8	67.1	7.7	7.5	1.7
Mar.	39.4	67.1	1.8	1.3	2.1
Apr.	40.4	68.5	0.5	3.3	2.9
May	40.3	62.7	5.0	1.1	6.4
June	51.1	56.3	5.1	0.8	10.4
July	59.6	42.0	11.7	0	4.6
Aug.	51.9	33.6	7.0	0.2	3.4
Sept.	54.9	30.7	2.0	0	2.3
Oct.	69.4	30.0	0 *	0.1	1.1
Nov.	66.2	29.6	0 *	0.1	1.0
Dec.	68.8	29.6	0 *	0.2	0.9
Total			72.1	16.3	37.6

DAM AND RESERVOIR INFORMATION	
DAM: WEBSTER	
RESERVOIR: WEBSTER	
	RESERVOIR CAPACITY
DEAD	2.2
LIVE CONSER.	
Inactive	1.1
Active	63.8
SUB-TOTAL	67.1
FLOOD	193.6
TOTAL	260.7

MONTH	TOTAL STORAGE END OF MONTH 1965	TOTAL STORAGE END OF MONTH 1966	TOTAL 1966 OUTFLOW	INFLOW 1966 ACTUAL*	INFLOW MOST PROBABLE
Jan.	159.2	184.1	1.3	0.1	0.8
Feb.	159.8	186.8	3.4	6.3	1.2
Mar.	158.9	186.1	1.7	2.3	1.3
Apr.	158.9	183.7	1.4	1.6	2.0
May	158.0	178.6	3.0	2.7	4.5
June	163.9	175.3	1.4	3.0	12.0
July	174.3	169.1	6.0	5.2	6.8
Aug.	167.1	163.9	4.1	2.2	4.7
Sept.	168.1	159.5	1.4	0	3.9
Oct.	191.3	156.8	0.3*	0.2	1.5
Nov.	184.8	155.2	0.2*	0	1.1
Dec.	185.8	154.6	0.2*	0.4	0.8
Total			24.4 a/	24.0	40.6

DAM AND RESERVOIR INFORMATION	
DAM: CEDAR BLUFF	
RESERVOIR: CEDAR BLUFF	
	RESERVOIR CAPACITY
DEAD	8.3
LIVE CONSER.	
Inactive	27.0
Active	149.8
SUB-TOTAL	185.1
FLOOD	191.9
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			
Mouth	Norm.	1964	1965	1966	Norm.	1964	1965	1966	Norm.	1964	1965	1966	Norm.	1964	1965	1966	Norm.	1964	1965	1966	Norm.	1964	1965	1966
Jan.	0.42	0	0.25	0.25	0.46	0	0.60	0.46	0.45	0	0.31	0.58	0.52	0	0.41	0.36	0.45	0	0.67	0.35	0.49		0	0.35
Feb.	0.48	0.19	0.46	0.21	0.61	1.00	0.91	0.17	0.52	0.96	1.16	0.13	0.65	0.67	0.24	0.25	0.54	0.51	0.18	0.48	0.61		0.58	0.81
Mar.	0.99	0.61	0.33	0.22	1.23	1.09	0.56	0.88	1.06	0.77	0.63	1.51	1.39	1.26	0.40	0.58	1.25	1.82	0.44	0.91	1.08		1.69	0.14
Apr.	1.64	2.16	0.25	1.93	1.91	2.79	0.06	1.00	1.88	3.73	1.09	0.91	2.04	2.74	0.73	1.00	2.00	3.30	0.97	0.88	2.05		0.79	1.03
May	2.53	3.22	2.25	0.34	3.24	1.80	2.86	0.11	3.46	1.18	3.13	0.31	3.10	0.78	3.08	0.02	3.40	0.63	5.85	0.17	3.29		3.70	0.18
June	2.52	2.86	8.09	2.20	3.08	4.58	4.71	4.06	3.37	3.39	5.33	2.83	3.22	2.40	4.01	2.78	3.36	2.62	3.94	4.42	3.55		6.23	7.03
July	2.57	0.97	3.39	3.17	2.66	4.06	4.47	4.40	2.39	1.37	6.04	5.38	2.73	2.75	4.64	5.67	2.32	3.46	3.59	6.67	2.91		5.42	5.31
Aug.	2.23	0.63	4.65	1.94	2.49	1.87	2.87	2.00	2.09	0.70	2.62	3.44	2.28	1.53	2.52	1.87	2.30	1.99	2.83	3.47	2.38		4.10	3.30
Sept.	1.23	0.82	3.26	3.01	1.58	1.12	5.30	2.37	1.65	0.97	4.52	3.45	1.61	0.90	6.56	1.63	1.57	0.90	6.64	2.11	1.72		6.06	2.73
Oct.	0.88	0.05	1.42	0.92	0.99	0.13	2.26	2.13	0.89	0.36	1.41	0.59	0.98	0.13	2.52	0.95	1.00	0.08	2.00	1.08	1.15		5.23	1.14
Nov.	0.43	0.17	T	0.31	0.65	0.18	T	0.36	0.55	0.24	T	0.21	0.69	0.05	T	0.18	0.52	0.02	T	0.03	0.72		0.09	0.13
Dec.	0.43	0.05	0.46	0.16	0.48	0.19	0.80	0.42	0.45	0.44	0.67	0.05	0.54	0.10	0.86	0.30	0.49	0.02	0.69	0.35	0.43		0.37	0.30
Total	16.35	11.73	24.81	14.66	19.38	18.81	25.40	18.36	18.76	14.11	26.91	19.39	19.75	13.31	25.97	15.59	19.20	15.35	27.80	20.92	20.38		34.26	22.45

	HARLAN CO. DAM				LOVEWELL DAM				KIRWIN DAM				WEBSTER DAM				CEDAR BLUFF DAM				GLEN ELDER DAM			
Month	Norm.	1964	1965	1966	Norm.	1964	1965	1966	Norm.	1964	1965	1966	Norm.	1964	1965	1966	Norm.	1964	1965	1966	Norm.	1964	1965	1966
Jan.	0.46	0	0.72	0.25	0.61	0.02	0.80	0.07	0.51	0	0.98	0.35	0.57	0.05	0.55	0.37	0.55	0	0.23	0.12	0.60		0.99	0.13
Feb.	0.63	0.51	0.79	0.94	0.84	0.39	1.69	1.72	0.75	0.60	1.07	1.01	0.87	0.77	0.81	0.62	0.69	0.45	0.66	0.12	0.77		0.24	1.14
Mar.	1.07	0.92	1.64	0.43	1.39	1.03	1.16	0.31	1.32	0.87	1.28	0.19	1.49	0.86	0.61	0.15	1.49	0.76	0.60	0.04	1.43		1.39	0.20
Apr.	2.29	0.79	0.85	1.51	2.13	2.21	1.18	0.94	2.34	1.40	3.03	1.45	2.23	1.39	1.20	1.35	2.05	0.58	1.20	0.49	2.28		0.84	2.15
May	3.26	0.82	5.06	0.11	3.57	1.65	2.99	0.93	3.22	1.51	8.25	0.26	3.55	2.05	5.19	0.05	3.60	3.36	3.66	0	3.90		5.16	0.03
June	3.63	6.80	6.35	5.27	4.57	3.14	6.48	3.28	3.74	3.83	5.17	4.16	4.43	2.67	7.93	1.29	3.87	6.82	5.91	2.49	4.14		6.34	2.46
July	2.71	1.57	6.12	2.48	2.94	2.54	3.69	4.10	2.81	1.40	2.01	1.89	2.86	1.43	2.75	1.80	2.43	2.24	4.40	3.75	3.51		2.55	3.40
Aug.	2.53	3.26	3.49	1.75	2.91	6.16	3.19	3.10	2.80	1.02	2.48	2.25	2.81	1.00	2.62	2.02	2.68	1.30	1.83	2.38	3.19		2.95	2.84
Sept.	2.12	1.29	7.81	1.36	2.73	3.21	6.59	2.10	2.14	1.12	3.56	1.98	2.21	0.91	3.67	0.95	2.07	1.26	2.73	1.43	2.46		4.87	2.35
Oct.	1.08	0.12	2.02	0.79	1.31	0.23	0.60	0.79	1.40	0.15	0.88	0.68	1.30	0.23	1.98	0.97	1.28	0.25	2.09	0.78	1.61		0.84	0.96
Nov.	0.70	0.43	0.07	0	1.01	1.40	0.12	0.17	0.79	0.81	0.03	0.02	0.92	0.90	0.05	0.08	0.80	1.62	0	0	0.92		0.04	0.10
Dec.	0.43	0.02	0.47	0.34	0.71	0.21	0.84	0.72	0.52	0	0.55	0.38	0.63	0	0.68	0.45	0.52	0.17	0.58	0.48	0.69		0.20	0.55
Total	20.91	16.53	35.39	15.23	24.72	22.19	29.33	18.23	22.34	12.71	29.29	14.62	23.87	12.26	28.04	10.10	22.03	18.81	23.89	12.08	25.50		26.41	16.31

TABLE 8
WATER USES UNDER WATER SERVICE CONTRACTS IN KANSAS RIVER PROJECTS

Irrigation District & Canal	Acres Irrigated 1964	Acre-Feet Used 1964	Acres Irrigated 1965	Acre-Feet Used 1965	Acres Irrigated 1966	Acre-Feet Used 1966	1967 Estimates: Acres to be Irrigated	1967 Estimates: Acre-Feet Dry Yr.	1967 Estimates: Acre-Feet Norm. Yr.	1967 Estimates: Acre-Feet Wet Yr.
Frenchman Valley										
Culbertson	8,122	21,958	6,950	19,857	6,426	21,469	7,600	21,800	15,300	9,600
H&RW										
Culbertson Extension	11,044	26,549	10,922	25,124	11,093	30,486	11,000	31,800	22,000	13,800
Frenchman-Cambridge										
Meeker-Driftwood	13,524	34,254	13,145	29,448	13,036	34,772	15,120	40,700	28,800	17,000
Red Willow	2,220	5,675	3,150	6,153	3,204	5,833	3,400	8,900	6,000	3,700
Bartley	5,281	11,296	5,219	9,112	5,208	7,710	6,450	16,700	11,700	6,700
Cambridge	13,269	30,454	13,952	21,142	13,100	22,740	14,230	35,900	24,100	14,200
	34,294	81,679	35,466	65,855	34,548	71,055	39,200	102,200	70,600	41,600
Almena										
Almena	--	--	--	--	--	--	2,850	8,300	5,100	3,100
Bostwick in Nebraska										
Franklin	9,674	28,463	10,388	20,719	10,342	28,090	10,080	33,800	22,500	11,300
Naponee	1,300	3,760	1,209	2,414	1,449	2,604	1,730	5,800	3,800	2,000
Franklin Pump	2,033	3,430	2,096	1,753	2,043	2,717	2,000	6,800	4,400	2,200
Superior	4,470	14,706	4,853	12,537	4,924	14,394	5,500	16,400	11,800	5,800
Courtland	1,380	2,166	1,280	1,410	1,300	1,591	1,700	4,300	3,300	1,600
	18,857	52,525	19,826	38,833	20,058	49,396	21,010	67,100	45,800	22,900
Kansas-Bostwick No. 2										
Courtland above Lovewell	7,884	22,556	8,037	25,101	10,035	26,622	9,250	23,800	17,100	8,300
Courtland below Lovewell	15,008	42,250	16,112	39,546	17,733	43,564	18,250	47,000	33,900	16,400
	22,892	64,806	24,149	64,647	27,768	70,186	27,500	70,800	51,000	24,700
Kirwin No. 1										
Kirwin	8,680	21,985	8,228	15,707	8,875	23,961	9,100	24,400	16,400	10,200
Webster No. 4										
Osborne	6,202	18,274	6,243	13,335	6,763	23,607	6,900	21,300	14,700	9,200
Cedar Bluff No. 6										
Cedar Bluff	4,017	12,821	4,910	12,700	5,314	14,273	5,500	17,000	12,000	7,800
TOTAL FOR DISTRICTS	114,108	303,597	116,694	256,058	120,845	304,433	130,660	364,700	252,900	142,900
Municipalities										
City of Norton	--	0	--	151	--	740	--			--
City of Beloit	--	50	--	0	--	418	--			--
City of Russell	--		--	0	--	716	--			--
Industrial										
Midwest Oil Corporation	--	0	--	0	--	66	--	--	--	--
Livingston Oil Company	--	0	--	0	--	11	--	--	--	--
Others										
Hale Ditch	400 E	3,456	590 E	2,201	590 E	2,415	590 E	--	--	--
Warren Act				587		446				
TOTAL USES	114,508	307,103	117,284	258,997	121,435	309,245	131,250	364,700	252,900	142,900

TABLE 5
STATUS OF REPAYMENT--WATER SERVICE CONTRACTS
KANSAS RIVER PROJECTS

Contracting Organization	Contracts			Development Period
	Number	Date Executed	Date Approved By Dist. Court	
Frenchman-Cambridge Irrigation District	I1r-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		
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	1/1/63-12/31/67
	Amendment No. 1	8/12/58		
Bostwick Irrigation District in Nebr.	I1r-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		
Kansas-Bostwick Irrigation District No. 2	I1r-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		

TABLE 5
STATUS OF REPAYMENT--WATER SERVICE CONTRACTS (Cont'd)
KANSAS RIVER PROJECTS

Contracting Organization	Contracts			Development Period
	Number	Date Executed	Date Approved By Dist. Court	
Almena Irrigation District No. 5	14-06-700-1579	3/7/58	11/20/58	
Kirwin Irrigation District No. 1	14-06-W55	6/9/53	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		
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 1966 Irrigation Season: Service Avail. 1/	Acres 1966 Irrigation Season: Actually Irrig. 2/	Acres 1967 Estimates: Service Available 1/	Acres 1967 Estimates: Expected to Be Irrigated	System Operations Calendar Years: Bureau of Reclamation	System Operations Calendar Years: Irrigation District
FRENCHMAN VALLEY IRRIGATION DISTRICT						
Culbertson	9,600	6,426	9,600	7,600	None	1958-Present 3/
H & RW IRRIGATION DISTRICT						
Culbertson Extension	11,490	11,093	11,490	11,000	1961-62	1963-Present
FRENCHMAN-CAMBRIDGE IRRIGATION DISTRICT						
Meeker-Driftwood	16,440	13,036	16,440	15,118	1957-59	1960-Present
Red Willow	4,150	3,204	4,150	3,402	1963	1964-Present
Bartley	7,000	5,208	6,516	6,454	1954-56	1957-Present
Cambridge	15,600	13,100	15,836	14,230	1951-56	1957-Present
Total	43,190	34,548	42,942	39,204		
ALMENA IRRIGATION DISTRICT						
Almena			5,350	2,850	1967	
BOSTWICK IRRIGATION DISTRICT IN NEBRASKA						
Franklin	11,267	10,342	11,039	10,075	1954-56	1957-Present
Naponee	1,533	1,449	1,734	1,725	1955-56	1957-Present
Franklin Pump	2,125	2,043	2,122	2,000	1953-56	1957-Present
Superior	6,021	4,924	5,788	5,500	1951-56	1957-Present
Courtland	1,841	1,300	1,957	1,700	1952-58 4/	1959-Present
Total	22,787	20,058	22,640	21,000		
KANSAS-BOSTWICK IRRIGATION DISTRICT						
Courtland (above Lovewell Reservoir)	11,863	10,035	12,116	9,250	1954-58 5/	1959-Present
Courtland (below Lovewell Reservoir)	25,615	17,733	25,652	18,250	1958	1959-Present
Total	37,478	27,768	37,768	27,500		

TABLE 6
IRRIGATION DEVELOPMENT AND OPERATION OF PROJECT CANAL SYSTEMS (Cont'd) Sheet 2 of 2

Canal System	Acres 1966 Irrigation Season: Service Avail. 1/	Acres 1966 Irrigation Season: Actually Irrig. 2/	Acres 1967 Estimates: Service Available	Acres 1967 Estimates: Expected to Be Irrigated	System Operations Calendar Years: Bureau of Reclamation	System Operations Calendar Years: Irrigation District
		KIRWIN IRRIGATION DISTRICT				
Kirwin	11,500	8,875	11,435	9,100	1957-59	1960-Present
		WEBSTER IRRIGATION DISTRICT				
Osborne	8,500	6,763	8,500	6,900	1960-61	1962-Present
		CEDAR BLUFF IRRIGATION DISTRICT				
Cedar Bluff	6,600	5,314	6,600 6/	5,500	1963-64	1965
TOTAL OF PROJECTS	151,145	120,845	156,325	130,654		

1/ Acres estimated for official program documents as of June 30, 1967.

2/ Determined by crop census.

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

4/ 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.

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

6/ 6,823 acres assessed on tax rolls.

TABLE 7
CANAL DIVERSION AND ACRES IRRIGATED
KANSAS RIVER PROJECTS
1966

Irrigation District and Canal	State	Diversion - Acre-Feet								Acres Irrigated
		April	May	June	July	Aug.	Sept.	Oct.	Total	
Hale Ditch (Includes 188 A.F. Warren Act)	Colorado	0	325	596	575	218	425	275	2,415 2414	590
Warren Act	Kansas Nebraska	0	0	0	258	0	0	0	258	200
FRENCHMAN VALLEY	Nebraska									
Culbertson Canal		2,299	2,566	1,789	7,295	6,415	1,105	0	21,469	6,426
H&RW	Nebraska									
Culbertson Extension Canal		0	3,474	3,666	11,893	8,292	3,161	0	30,486	11,093
FRENCHMAN-CAMBRIDGE	Nebraska									
Meeker-Driftwood Canal		0	4,151	3,864	13,252	9,217	3,548	740	34,772	13,036
Red Willow Canal		0	803	538	1,987	1,367	803	335	5,833	3,204
Bartley Canal		0	1,204	1,113	3,302	734	1,000	357	7,710	5,208
Cambridge Canal		0	2,729	2,648	9,604	5,165	2,489	105	22,740	13,100
Total		0	8,887	8,163	28,145	16,483	7,840	1,537	71,055	34,548
NEBRASKA-BOSTWICK	Nebraska									
Franklin		0	4,389	2,416	11,675	7,051	2,559	0	28,090	10,342
Naponee Canal		0	152	98	1,601	703	50	0	2,604	1,449
Franklin Pump Canal		0	0	187	1,996	479	55	0	2,717	2,043
Superior Canal		0	2,091	1,269	7,390	2,646	998	0	14,394	4,924
Courtland Canal		0	172	17	1,016	92	294	0	1,591	1,300
Total		0	6,804	3,987	23,678	10,971	3,956	0	49,396	20,058
KANSAS-BOSTWICK	Kansas									
Courtland Above Lovewell		0	4,354	2,726	11,931	7,086	525	0	26,622	10,035
Courtland Below Lovewell		0	4,506	4,748	22,637	10,574	1,099	0	43,564	17,733
Total		0	8,860	7,474	34,568	17,660	1,624	0	70,186	27,768
KIRWIN	Kansas									
Kirwin Canal		0	2,858	3,039	10,717	6,139	1,208	0	23,961	8,875
WEBSTER	Kansas									
Osborne Canal		226	3,681	3,723	9,301	5,407	1,269	0	23,607	6,763
CEDAR BLUFF	Kansas									
Cedar Bluff Canal		1,283	2,541	998	5,153	3,312	986	0	14,273	5,314
Total for Project Lands		3,808	39,671	32,839	130,750	74,679	21,149	1,537	304,433	120,845

TABLE 8
WATER USES UNDER WATER SERVICE CONTRACTS IN KANSAS RIVER PROJECTS

Irrigation District & Canal	Acres Irrigated 1964	Acre-Feet Used 1964	Acres Irrigated 1965	Acre-Feet Used 1965	Acres Irrigated 1966	Acre-Feet Used 1966	1967 Estimates: Acres to be Irrigated	1967 Estimates: Acre-Feet Dry Yr.	1967 Estimates: Acre-Feet Norm. Yr.	1967 Estimates: Acre-Feet Wet Yr.
Frenchman Valley										
Culbertson	8,122	21,958	6,950	19,857	6,426	21,469	7,600	21,800	15,300	9,600
H&RW										
Culbertson Extension	11,044	26,549	10,922	25,124	11,093	30,486	11,000	31,800	22,000	13,800
Frenchman-Cambridge										
Meeker-Driftwood	13,524	34,254	13,145	29,448	13,036	34,772	15,120	40,700	28,800	17,000
Red Willow	2,220	5,675	3,150	6,153	3,204	5,833	3,400	8,900	6,000	3,700
Bartley	5,281	11,296	5,219	9,112	5,208	7,710	6,450	16,700	11,700	6,700
Cambridge	13,269	30,454	13,952	21,142	13,100	22,740	14,230	35,900	24,100	14,200
	34,294	81,679	35,466	65,855	34,548	71,055	39,200	102,200	70,600	41,600
Almena										
Almena	--	--	--	--	--	--	2,850	8,300	5,100	3,100
Bostwick in Nebraska										
Franklin	9,674	28,463	10,388	20,719	10,342	28,090	10,080	33,800	22,500	11,300
Naponee	1,300	3,760	1,209	2,414	1,449	2,604	1,730	5,800	3,800	2,000
Franklin Pump	2,033	3,430	2,096	1,753	2,043	2,717	2,000	6,800	4,400	2,200
Superior	4,470	14,706	4,853	12,537	4,924	14,394	5,500	16,400	11,800	5,800
Courtland	1,380	2,166	1,280	1,410	1,300	1,591	1,700	4,300	3,300	1,600
	18,857	52,525	19,826	38,833	20,058	49,396	21,010	67,100	45,800	22,900
Kansas-Bostwick No. 2										
Courtland above Lovewell	7,884	22,556	8,037	25,101	10,035	26,622	9,250	23,800	17,100	8,300
Courtland below Lovewell	15,008	42,250	16,112	39,546	17,733	43,564	18,250	47,000	33,900	16,400
	22,892	64,806	24,149	64,647	27,768	70,186	27,500	70,800	51,000	24,700
Kirwin No. 1										
Kirwin	8,680	21,985	8,228	15,707	8,875	23,961	9,100	24,400	16,400	10,200
Webster No. 4										
Osborne	6,202	18,274	6,243	13,335	6,763	23,607	6,900	21,300	14,700	9,200
Cedar Bluff No. 6										
Cedar Bluff	4,017	12,821	4,910	12,700	5,314	14,273	5,500	17,000	12,000	7,800
TOTAL FOR DISTRICTS	114,108	303,597	116,694	256,058	120,845	304,433	130,660	364,700	252,900	142,900
Municipalities										
City of Norton	--	0	--	151	--	740	--			--
City of Beloit	--	50	--	0	--	418	--			--
City of Russell	--		--	0	--	716	--			--
Industrial										
Midwest Oil Corporation	--	0	--	0	--	66	--	--	--	--
Livingston Oil Company	--	0	--	0	--	11	--	--	--	--
Others										
Hale Ditch	400 E	3,456	590 E	2,201	590 E	2,415	590 E	--	--	--
Warren Act				587		446				
TOTAL USES	114,508	307,103	117,284	258,997	121,435	309,245	131,250	364,700	252,900	142,900

TABLE 9

RESERVOIR OPERATION FORECAST FROM SWANSON LAKE TO CAMBRIDGE DIVERSION DAM - 1967

(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	-1.5	1.7	1.8	4.1	5.9	3.6	1.5	0	2.1
	June	+2.6	-1.5	1.7	2.1	4.1	6.2	3.6	1.5	0	2.1
	July	-0.5	-1.1	5.0	8.1	12.2	20.3	10.7	1.5	0	9.2
	Aug.	-0.7	-0.8	5.0	8.0	12.2	20.2	10.8	1.5	0	9.3
	Sept.	-0.3	-0.7	2.5	5.0	6.0	11.0	5.4	1.5	0	3.9
	Oct.	+1.6	-0.8	0.8	1.5	2.1	3.6	1.8	1.5	0.2	0.5
	Total	+5.6	-6.4	16.7	26.5	40.7	67.2	35.9	9.0	0.2	27.1
Most Probable	May	+4.9	-0.7	0.6	0	1.4	1.4	1.1	1.5	0.3	0
	June	+5.1	-0.7	0.6	0	1.5	1.5	1.3	1.5	0.3	0.1
	July	+1.8	-1.9	4.1	5.7	10.0	15.7	8.5	1.5	0	7.0
	Aug.	+1.2	-1.1	4.6	6.0	11.5	17.5	9.7	1.5	0	8.2
	Sept.	+1.8	-1.0	1.2	1.9	2.9	4.8	2.4	1.5	0	0.9
	Oct.	+3.3	-1.1	0.6	0	1.5	1.5	1.1	1.5	0.3	0
	Total	+18.1	-6.5	11.7	13.6	28.8	42.4	24.1	9.0	0.9	16.2
Reas. Maximum	May	+5.4	-0.4	0.3	0	0.8	0.8	0.7	1.5	0.3	0
	June	+8.7	-0.4	0.3	0	0.9	0.9	0.7	1.5	0.3	0
	July	+4.0	-1.8	2.4	1.7	5.9	7.6	5.0	1.5	0	3.5
	Aug.	+3.0	-1.8	2.7	3.0	6.8	9.8	5.7	1.5	0	4.2
	Sept.	+4.3	-1.0	0.7	0	1.7	1.7	1.4	1.5	0.3	0.2
	Oct.	+3.9	-0.6	0.3	0	0.9	0.9	0.7	1.5	0.3	0
	Total	+29.3	-6.0	6.7	4.7	17.0	21.7	14.2	9.0	1.2	7.9

TABLE 10
ESTIMATED DEMANDS ON HARLAN COUNTY RESERVOIR - 1967
(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	4.5	2.7	2.7	6.4	0	1.2	0	1.2	5.7	4.5	12.1
	June	4.7	4.5	3.5	3.5	5.7	0	1.2	0	1.2	4.4	3.2	10.1
	July	13.9	13.3	0.8	0.8	26.4	0	1.2	0	1.2	14.1	12.9	40.5
	Aug.	16.3	15.5	0.5	0.5	31.3	0	1.2	0	1.2	9.0	7.8	40.3
	Sept.	6.9	6.7	0.8	0.8	12.8	0	1.2	0	1.2	1.2	1.2	15.2
	Oct.	0	0	0	0	0	0	0	0	0	0.7	0.7	0.7
	Total	46.4	44.5	8.3	8.3	82.6	0	6.0	0	6.0	35.1	30.3	118.9
Most Probable	May	1.4	1.6	7.0	1.6	1.5	5.4	0.6	3.5	3.5	0	0	2.1
	June	1.6	1.6	13.8	1.6	1.6	12.2	1.2	4.2	4.2	0	0	2.8
	July	12.3	12.8	7.8	7.8	17.3	0	1.2	0	1.2	0	0	18.5
	Aug.	12.3	12.9	5.0	5.0	20.2	0	1.2	0	1.2	8.5	7.3	28.7
	Sept.	3.1	3.3	2.7	2.7	3.6	0	1.2	0	1.2	17.2	16.0	20.8
	Oct.	0	0	0	0	0	0	0	0	0	0	0	0
	Total	30.7	32.2	36.3	18.7	44.2	17.6	5.4	7.7	11.3	25.7	23.3	72.9
Reas. Maximum	May	0.8	0.8	21.5	0.8	0.8	20.7	0.6	5.1	5.1	0	0	1.4
	June	0.8	0.9	37.5	0.9	0.8	36.6	0.6	6.9	6.9	0	0	1.4
	July	6.2	6.2	15.0	6.2	6.2	8.8	1.2	4.0	4.0	0	0	7.4
	Aug.	6.2	6.2	9.4	6.2	6.2	3.2	1.2	3.4	3.4	0	0	7.4
	Sept.	1.5	1.6	20.0	1.6	1.5	18.4	0	4.9	4.9	0	0	1.5
	Oct.	0	0	0	0	0	0	0	0	0	0	0	0
	Total	15.5	15.7	103.4	15.7	15.5	87.7	3.6	24.3	24.3	0	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
BONNY RESERVOIR OPERATION ESTIMATES - 1967
(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
								38.2		3670.4
REAS. MINIMUM	JAN	1.9	.2	.0	.4	.4	1.3	39.5	.0	3671.1
	FEB	1.9	.3	.0	.4	.4	1.2	40.7	.0	3671.7
	MAR	2.3	.4	.0	1.9	1.9	.0	40.7	.0	3671.7
	APR	2.0	.7	.3	3.0	3.3	- 2.0	38.7	.0	3670.7
	MAY	1.9	.9	.9	1.4	2.3	- 1.3	37.4	.0	3670.0
	JUN	1.3	1.1	.9	.4	1.3	- 1.1	36.3	.0	3669.4
	JUL	.7	1.3	.9	.4	1.3	- 1.9	34.4	.0	3668.4
	AUG	.4	1.1	.8	.4	1.2	- 1.9	32.5	.0	3667.4
	SEP	.4	.8	.6	.4	1.0	- 1.4	31.1	.0	3666.6
	OCT	1.1	.7	.5	.4	.9	- .5	30.6	.0	3666.3
	NOV	1.6	.4	.3	.4	.7	.5	31.1	.0	3666.6
	DEC	1.8	.3	.0	.4	.4	1.1	32.2	.0	3667.2
	TOTAL	17.3	8.2	5.2	9.9	15.1	- 6.0	.0	.0	
								38.2		3670.4
MOST PROBABLE	JAN	2.2	.2	.0	.4	.4	1.6	39.8	.0	3671.2
	FEB	2.2	.2	.0	.4	.4	1.5	41.3	.1	3672.0
	MAR	2.9	.3	.0	.4	.4	.0	41.3	2.2	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	3669.8
	TOTAL	27.0	6.4	3.8	12.9	16.7	- 1.1	.0	5.0	
								38.2		3670.4
REAS. MAXIMUM	JAN	2.7	.1	.0	.4	.4	2.2	40.4	.0	3671.5
	FEB	2.7	.2	.0	.4	.4	.9	41.3	1.2	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	3671.7
	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	3670.0
	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	- .8	.0	9.7	

TABLE II
SWANSON LAKE OPERATION ESTIMATES - 1967
(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
								92.0		2745.9
REAS. MINIMUM	JAN	7.5	- 1.5	6.0	.4	.1	5.5	97.5	.0	2747.2
	FEB	9.5	- 1.5	8.0	.5	.1	7.4	104.9	.0	2748.8
	MAR	11.1	- .4	10.7	.8	.1	9.8	114.7	.0	2750.9
	APR	8.5	1.3	9.8	1.6	.1	5.5	120.2	2.6	2752.0
	MAY	7.7	.4	8.1	1.7	5.9	.0	120.2	.5	2752.0
	JUN	6.9	.0	6.9	2.1	6.2	- 1.4	118.8	.0	2751.7
	JUL	2.4	.5	2.9	3.0	20.3	- 20.4	98.4	.0	2747.4
	AUG	1.9	.7	2.6	2.5	20.2	- 20.1	78.3	.0	2742.7
	SEP	.5	.6	1.1	1.7	11.0	- 11.6	66.7	.0	2739.7
	OCT	2.6	- .2	2.4	1.4	3.6	- 2.6	64.1	.0	2739.0
	NOV	5.7	- .9	4.8	.8	.1	3.9	68.0	.0	2740.1
	DEC	6.7	- 1.4	5.3	.4	.1	4.8	72.8	.0	2741.3
	TOTAL	71.0	- 2.4	68.6	16.9	67.8	- 19.2	.0	3.1	
								92.0		2745.9
MOST PROBABLE	JAN	9.6	- 1.8	7.8	.3	.1	7.4	99.4	.0	2747.6
	FEB	12.0	- 1.7	10.3	.4	.1	9.8	109.2	.0	2749.7
	MAR	14.3	- .3	14.0	.6	.1	11.0	120.2	2.3	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	1.4	.0	120.2	13.3	2752.0
	JUN	15.7	- .7	15.0	1.5	1.5	.0	120.2	12.0	2752.0
	JUL	5.7	- 1.0	4.7	2.4	15.7	- 13.4	106.8	.0	2749.2
	AUG	6.0	- 1.1	4.9	2.1	17.5	- 14.7	92.1	.0	2746.0
	SEP	5.0	1.1	6.1	1.2	4.8	.1	92.2	.0	2746.0
	OCT	4.6	- .7	3.9	1.6	1.5	.8	93.0	.0	2746.2
	NOV	8.1	- .4	7.7	.8	.1	6.8	99.8	.0	2747.7
	DEC	8.5	- 1.8	6.7	.4	.1	6.2	106.0	.0	2749.0
	TOTAL	115.0	- 5.5	109.5	13.2	43.0	14.0	.0	39.3	
								92.0		2745.9
REAS. MAXIMUM	JAN	11.8	- 2.3	9.5	.2	.1	9.2	101.2	.0	2748.0
	FEB	14.5	- 1.1	13.4	.2	.1	13.1	114.3	.0	2750.8
	MAR	19.3	- .2	19.1	.2	.1	5.9	120.2	12.9	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	.8	.0	120.2	23.5	2752.0
	JUN	27.4	- .2	27.2	.8	.9	.0	120.2	25.5	2752.0
	JUL	29.3	.5	29.8	1.7	7.6	.0	120.2	20.5	2752.0
	AUG	18.3	- .8	17.5	2.1	9.8	.0	120.2	5.6	2752.0
	SEP	10.5	1.5	12.0	1.0	1.7	.0	120.2	9.3	2752.0
	OCT	8.7	- .5	8.2	1.6	.9	.0	120.2	5.7	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	- 4.0	196.0	9 3	22.3	28.2	.0	136.2	

TABLE 11
ENDERS RESERVOIR OPERATION ESTIMATES - 1967
(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
						35.9		3106.9
REAS. MINIMUM	JAN	4.5	.1	.6	3.8	39.7	.0	3109.4
	FEB	4.0	.2	.6	3.2	42.9	.0	3111.4
	MAR	4.0	.3	.6	1.6	44.5	1.5	3112.3
	APR	3.6	.6	.6	.0	44.5	2.4	3112.3
	MAY	4.0	.7	1.9	.0	44.5	1.4	3112.3
	JUN	4.2	.7	2.1	.0	44.5	1.4	3112.3
	JUL	3.9	1.1	13.6	- 10.8	33.7	.0	3105.4
	AUG	4.1	.7	13.7	- 10.3	23.4	.0	3097.4
	SEP	3.8	.5	6.3	- 3.0	20.4	.0	3094.7
	OCT	4.2	.4	1.3	2.5	22.9	.0	3096.9
	NOV	4.2	.3	.6	3.3	26.2	.0	3099.7
	DEC	4.3	.1	.6	3.6	29.8	.0	3102.5
	TOTAL	48.8	5.7	42.5	- 6.1	.0	6.7	
						35.9		3106.9
MOST PROBABLE	JAN	5.5	.1	.6	4.8	40.7	.0	3110.0
	FEB	5.1	.1	.6	3.8	44.5	.6	3112.3
	MAR	5.2	.2	.6	.0	44.5	4.4	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	9.9	- 6.0	38.5	.0	3108.6
	AUG	4.5	.8	11.9	- 8.2	30.3	.0	3102.9
	SEP	4.5	.4	1.3	2.8	33.1	.0	3105.0
	OCT	4.7	.5	.6	3.6	36.7	.0	3107.4
	NOV	5.0	.3	.6	4.1	40.8	.0	3110.1
	DEC	5.2	.1	.6	3.7	44.5	.8	3112.3
	TOTAL	59.4	4.6	28.5	8.6	.0	17.7	
						35.9		3106.9
REAS. MAXIMUM	JAN	6.1	.1	.6	5.4	41.3	.0	3110.4
	FEB	5.7	.0	.6	3.2	44.5	1.9	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	3.5	.0	44.5	1.4	3112.3
	AUG	5.5	.6	4.7	.0	44.5	.2	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	14.2	8.6	.0	43.7	

TABLE II
HUGH BUTLER LAKE OPERATIONS ESTIMATES - 1967
(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
						34.4		2579.7
Reas. Minimum	Jan	1.2	.1	.2	.9	35.3	.0	2580.3
	Feb	1.4	.1	.2	1.1	36.4	.0	2581.0
	Mar	1.7	.3	.2	1.2	37.6	.0	2581.7
	Apr	1.5	.6	.2	.2	37.8	.5	2581.8
	May	1.7	.6	.9	.0	37.8	.2	2581.8
	Jun	1.5	.9	.9	- .3	37.5	.0	2581.6
	Jul	1.1	1.1	2.7	- 2.7	34.8	.0	2579.9
	Aug	.8	.8	2.7	- 2.7	32.1	.0	2578.1
	Sep	.7	.7	1.3	- 1.3	30.8	.0	2577.2
	Oct	.8	.6	.4	- .2	30.6	.0	2577.1
	Nov	1.0	.3	.2	.5	31.1	.0	2577.4
	Dec	1.1	.1	.2	.8	31.9	.0	2578.0
	TOTAL	14.5	6.2	10.1	- 2.5	.0	.7	
						34.4		2579.7
Most Probable	Jan	1.5	.1	.2	1.2	35.6	.0	2580.4
	Feb	1.6	.1	.2	1.3	36.9	.0	2581.3
	Mar	2.0	.2	.2	.9	37.8	.7	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	2.1	- 1.0	36.8	.0	2581.2
	Aug	1.1	.7	2.4	- 2.0	34.8	.0	2579.9
	Sep	1.0	.5	.6	- .1	34.7	.0	2579.9
	Oct	1.1	.5	.3	.3	35.0	.0	2580.1
	Nov	1.4	.2	.2	1.0	36.0	.0	2580.7
	Dec	1.5	.1	.2	1.2	37.2	.0	2581.4
	TOTAL	20.5	4.4	7.2	2.8	.0	6.1	
						34.4		2579.7
Reas. Maximum	Jan	1.8	.1	.2	1.5	35.9	.0	2580.6
	Feb	1.9	.1	.2	1.6	37.5	.0	2581.6
	Mar	2.5	.1	.2	.3	37.8	1.9	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	1.3	.0	37.8	1.2	2581.8
	Aug	1.8	.6	1.4	- .2	37.6	.0	2581.7
	Sep	2.3	.4	.4	.2	37.8	1.3	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	4.9	3.4	.0	17.3	

TABLE II
HARRY STRUNK LAKE OPERATION ESTIMATES - 1967
(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
REAS. MINIMUM						37.1		2366.1
	JAN	3.0	.1	.3	.0	37.1	2.6	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	2.1	.0	37.1	.8	2366.1
	JUN	3.9	.8	2.1	.0	37.1	1.0	2366.1
	JUL	2.8	1.2	9.2	- 7.6	29.5	.0	2361.6
	AUG	2.8	.9	9.3	- 7.4	22.1	.0	2356.3
	SEP	2.2	.5	3.9	- 2.2	19.9	.0	2354.4
	OCT	2.5	.4	.5	1.6	21.5	.0	2355.8
	NOV	2.9	.3	.3	2.3	23.8	.0	2357.6
	DEC	2.9	.1	.3	2.5	26.3	.0	2359.4
	TOTAL	37.2	6.0	28.9	- 10.8	.0	13.1	
MOST PROBABLE						37.1		2366.1
	JAN	3.6	.1	.3	.0	37.1	3.2	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	7.0	- 1.8	35.3	.0	2365.1
	AUG	3.6	.7	8.2	- 5.3	30.0	.0	2361.9
	SEP	3.1	.5	.9	1.7	31.7	.0	2363.0
	OCT	3.1	.6	.3	2.2	33.9	.0	2364.3
	NOV	3.3	.3	.3	2.7	36.6	.0	2365.8
	DEC	3.4	.1	.3	.5	37.1	2.5	2366.1
	TOTAL	52.8	4.9	18.8	- .0	.0	29.1	
REAS. MAXIMUM						37.1		2366.1
	JAN	4.2	.0	.3	.0	37.1	3.9	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	3.5	.0	37.1	5.2	2366.1
	AUG	5.8	.6	4.2	.0	37.1	1.0	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	10.7	.0	.0	69.0	

TABLE II
NORTON RESERVOIR OPERATION ESTIMATES - 1967
(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
						29.1		2300.9
Reas. Minimum	Jan	.2	.1	.1	.0	29.1	.0	2300.9
	Feb	.4	.2	.1	.1	29.2	.0	2301.0
	Mar	.5	.3	.1	.1	29.3	.0	2301.1
	Apr	.5	.7	.1	- .3	29.0	.0	2300.9
	May	.9	.6	1.6	- 1.3	27.7	.0	2300.2
	Jun	2.2	1.2	2.1	- 1.1	26.6	.0	2299.6
	Jul	1.1	1.2	4.5	- 4.6	22.0	.0	2296.8
	Aug	.8	.9	4.2	- 4.3	17.7	.0	2293.8
	Sep	.3	.6	2.3	- 2.6	15.1	.0	2291.7
	Oct	.1	.4	.3	- .6	14.5	.0	2291.2
	Nov	.2	.2	.1	- .1	14.4	.0	2291.1
	Dec	.2	.1	.1	.0	14.4	.0	2291.1
	TOTAL	7.4	6.5	15.6	- 14.7	.0	.0	
						29.1		2300.9
Most Probable	Jan	.4	.1	.1	.2	29.3	.0	2301.1
	Feb	.7	.1	.1	.5	29.8	.0	2301.3
	Mar	.8	.2	.1	.5	30.3	.0	2301.6
	Apr	.9	.5	.1	.3	30.6	.0	2301.7
	May	2.4	.4	.1	1.9	32.5	.0	2302.7
	Jun	6.7	.7	.1	3.4	35.9	2.5	2304.3
	Jul	4.4	1.1	2.8	.0	35.9	.5	2304.3
	Aug	1.8	1.0	3.0	- 2.2	33.7	.0	2303.3
	Sep	.8	.8	.8	- .8	32.9	.0	2302.9
	Oct	.4	.7	.1	- .4	32.5	.0	2302.7
	Nov	.3	.4	.1	- .2	32.3	.0	2302.6
	Dec	.4	.2	.1	.1	32.4	.0	2302.6
	TOTAL	20.0	6.2	7.5	3.3	.0	3.0	
						29.1		2300.9
Reas. Maximum	Jan	.8	.1	.1	.6	29.7	.0	2301.2
	Feb	1.2	.1	.1	1.0	30.7	.0	2301.8
	Mar	1.8	.1	.1	1.6	32.3	.0	2302.6
	Apr	1.4	.2	.1	1.1	33.4	.0	2303.1
	May	9.1	.2	.1	2.5	35.9	6.3	2304.3
	Jun	16.2	.5	.1	.0	35.9	15.6	2304.3
	Jul	10.7	.8	.1	.0	35.9	9.8	2304.3
	Aug	5.2	1.0	.7	.0	35.9	3.5	2304.3
	Sep	3.1	.6	.1	.0	35.9	2.4	2304.3
	Oct	1.9	.5	.1	.0	35.9	1.3	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	1.8	6.8	.0	40.0	

TABLE 11
HARLAN COUNTY RESERVOIR OPERATION ESTIMATES - 1967
(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
								349.1		1946.5
REAS. MINIMUM	JAN	19.2	- 11.2	8.0	1.0	.6	- 6.5	342.6	12.9	1946.0
	FEB	24.3	- 13.3	11.0	.9	.6	.0	342.6	9.5	1946.0
	MAR	32.1	- 14.0	18.1	1.9	.6	.0	342.6	15.6	1946.0
	APR	28.0	- 7.2	20.8	5.2	.6	.0	342.6	15.0	1946.0
	MAY	36.5	- 15.3	21.2	4.8	12.1	.0	342.6	4.3	1946.0
	JUN	42.0	- 15.6	26.4	7.3	10.1	.0	342.6	9.0	1946.0
	JUL	15.4	- 1.7	13.7	10.2	40.5	- 37.0	305.6	.0	1943.1
	AUG	13.6	- .6	13.0	8.1	40.3	- 35.4	270.2	.0	1940.0
	SEP	6.2	- 1.2	5.0	5.0	15.2	- 15.2	255.0	.0	1938.6
	OCT	5.6	- 8.3	.0	4.0	.7	- 4.7	250.3	.0	1938.2
	NOV	13.2	- 10.6	2.6	2.3	.6	- .3	250.0	.0	1938.1
	DEC	16.9	- 12.1	4.8	1.0	.6	3.2	253.2	.0	1938.4
	TOTAL	253.0	-111.1	144.6	51.7	122.5	- 95.9	.0	66.3	
								349.1		1946.5
MOST PROBABLE	JAN	22.4	- 14.8	7.6	.7	.6	- 6.5	342.6	12.8	1946.0
	FEB	31.2	- 16.8	14.4	.7	.6	.0	342.6	13.1	1946.0
	MAR	38.0	- 13.0	25.0	1.2	.6	.0	342.6	23.2	1946.0
	APR	38.8	- 1.1	37.7	1.4	.6	.0	342.6	35.7	1946.0
	MAY	59.9	- 5.5	54.4	3.6	2.1	.0	342.6	48.7	1946.0
	JUN	106.6	- 11.1	95.5	6.0	2.8	.0	342.6	86.7	1946.0
	JUL	42.1	- 17.0	25.1	8.5	18.5	- 1.9	340.7	.0	1945.9
	AUG	26.6	- 10.5	16.1	6.4	28.7	- 19.0	321.7	.0	1944.4
	SEP	19.7	- 13.0	6.7	4.6	20.8	- 18.7	303.0	.0	1942.7
	OCT	16.4	- 13.1	3.3	3.4	.6	- .7	302.3	.0	1942.8
	NOV	20.8	- 14.7	6.1	1.6	.6	3.9	306.2	.0	1943.1
	DEC	23.5	- 12.6	10.9	.7	.6	9.6	315.8	.0	1943.9
	TOTAL	446.0	-143.2	302.8	38.8	77.1	- 33.3	.0	220.2	
								349.1		1946.5
REAS. MAXIMUM	JAN	28.1	- 18.2	9.9	.0	.6	- 6.5	342.6	15.8	1946.0
	FEB	42.6	- 19.4	23.2	.3	.6	.0	342.6	22.3	1946.0
	MAR	57.1	- 7.5	49.6	.8	.6	.0	342.6	48.2	1946.0
	APR	55.8	- .7	55.1	.2	.6	.0	342.6	54.3	1946.0
	MAY	105.5	- 3.3	102.2	2.0	1.4	.0	342.6	98.8	1946.0
	JUN	166.5	- 3.4	163.1	1.7	1.4	.0	342.6	160.0	1946.0
	JUL	105.4	- 22.3	83.1	7.2	7.4	.0	342.6	68.5	1946.0
	AUG	63.8	- 26.3	37.5	3.8	7.4	.0	342.6	26.3	1946.0
	SEP	75.0	- 4.5	70.5	4.2	1.5	.0	342.6	64.8	1946.0
	OCT	34.4	- 4.3	30.1	2.5	.6	.0	342.6	27.0	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	-110.7	685.3	24.2	23.3	- 6.5	.0	644.3	

TABLE II
LOVEWELL RESERVOIR OPERATION ESTIMATES - 1967
(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
								41.5		1582.5
Reas. Minimum	Jan	.1	.0	.1	.2	.0	- .1	41.4	.0	1582.5
	Feb	.1	.0	.1	.2	.0	- .1	41.3	.0	1582.5
	Mar	.2	.0	.2	.4	.0	- .2	41.1	.0	1582.4
	Apr	.2	.0	.2	.9	.0	- .7	40.4	.0	1582.2
	May	.9	5.7	6.6	.9	4.7	1.0	41.4	.0	1582.5
	Jun	1.6	4.4	6.0	1.4	4.7	- .1	41.3	.0	1582.5
	Jul	.7	14.1	14.8	1.9	14.1	- 1.2	40.1	.0	1582.1
	Aug	.4	9.0	9.4	1.4	16.4	- 8.4	31.7	.0	1578.9
	Sep	.3	1.2	1.5	1.0	7.1	- 6.6	25.1	.0	1576.1
	Oct	.1	.7	.8	.6	.0	.2	25.3	.0	1576.1
	Nov	.0	.0	.0	.4	.0	- .4	24.9	.0	1576.0
	Dec	.0	.0	.0	.2	.0	- .2	24.7	.0	1575.9
	TOTAL	4.6	35.1	39.7	9.5	47.0	- 16.8	.0	.0	
								41.5		1582.5
Most Probable	Jan	.3	.0	.3	.1	.0	.2	41.7	.0	1582.6
	Feb	.7	.0	.7	.1	.0	.0	41.7	.6	1582.6
	Mar	1.1	.0	1.1	.2	.0	.0	41.7	.9	1582.6
	Apr	1.2	.0	1.2	.5	.0	.0	41.7	.7	1582.6
	May	4.2	.6	4.8	.4	1.6	.0	41.7	2.8	1582.6
	Jun	9.7	1.2	10.9	.4	1.6	.0	41.7	8.9	1582.6
	Jul	2.6	1.2	3.8	1.2	13.5	- 10.9	30.8	.0	1578.6
	Aug	1.3	8.5	9.8	.8	13.7	- 4.7	26.1	.0	1576.5
	Sep	2.6	18.3	20.9	.7	3.5	15.6	41.7	1.1	1582.6
	Oct	1.2	.0	1.2	.5	.0	.0	41.7	.7	1582.6
	Nov	.5	.0	.5	.4	.0	.0	41.7	.1	1582.6
	Dec	.3	.0	.3	.1	.0	.0	41.7	.2	1582.6
	TOTAL	25.7	29.8	55.5	5.4	33.9	.2	.0	16.0	
								41.5		1582.5
Reas. Maximum	Jan	.6	.0	.6	.0	.0	.2	41.7	.4	1582.6
	Feb	1.7	.0	1.7	.1	.0	.0	41.7	1.6	1582.6
	Mar	3.3	.0	3.3	.1	.0	.0	41.7	3.2	1582.6
	Apr	3.6	.0	3.6	.1	.0	.0	41.7	3.5	1582.6
	May	8.5	.6	9.1	.1	.7	.0	41.7	8.3	1582.6
	Jun	20.8	.6	21.4	- .3	.9	.0	41.7	20.8	1582.6
	Jul	11.8	1.2	13.0	1.1	6.6	.0	41.7	5.3	1582.6
	Aug	4.0	1.2	5.2	.7	6.6	- 2.1	39.6	.0	1581.9
	Sep	8.3	.0	8.3	.4	1.6	2.1	41.7	4.2	1582.6
	Oct	3.9	.0	3.9	.4	.0	.0	41.7	3.5	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	3.6	72.1	2.9	16.4	.2	.0	52.6	

TABLE II
KIRWIN RESERVOIR OPERATION ESTIMATES - 1967
(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
						74.5		1723.9
REAS. MINIMUM	JAN	.2	.3	.0	- .1	74.4	.0	1723.9
	FEB	.9	.4	.0	.5	74.9	.0	1724.0
	MAR	1.4	.6	.0	.8	75.7	.0	1724.2
	APR	1.7	1.6	.0	.1	75.8	.0	1724.2
	MAY	2.2	1.7	2.5	- 2.0	73.8	.0	1723.7
	JUN	4.2	2.2	2.5	- .5	73.3	.0	1723.6
	JUL	2.8	3.0	7.3	- 7.5	65.8	.0	1722.0
	AUG	1.8	2.5	8.5	- 9.2	56.6	.0	1719.4
	SEP	.7	1.7	3.6	- 4.6	52.0	.0	1718.1
	OCT	.2	1.3	.0	- 1.1	50.9	.0	1717.8
	NOV	.3	.7	.0	- .4	50.5	.0	1717.6
	DEC	.3	.3	.0	.0	50.5	.0	1717.6
	TOTAL	16.7	16.3	24.4	- 24.0	.0	.0	
						74.5		1723.9
MOST PROBABLE	JAN	.8	.3	.0	.5	75.0	.0	1724.0
	FEB	1.8	.3	.0	1.5	76.5	.0	1724.4
	MAR	2.1	.4	.0	1.7	78.2	.0	1724.8
	APR	2.7	.7	.0	2.0	80.2	.0	1725.1
	MAY	4.3	1.3	.8	2.2	82.4	.0	1725.3
	JUN	10.2	1.8	.8	7.6	90.0	.0	1727.3
	JUL	6.4	2.5	6.6	- 2.7	87.3	.0	1726.8
	AUG	4.0	2.1	6.6	- 4.7	82.6	.0	1725.7
	SEP	2.4	1.6	1.6	- .8	81.8	.0	1725.6
	OCT	1.3	1.3	.0	.0	81.8	.0	1725.6
	NOV	1.2	.7	.0	.5	82.3	.0	1725.7
	DEC	.9	.3	.0	.6	82.9	.0	1725.8
	TOTAL	38.1	13.3	16.4	8.4	.0	.0	
						74.5		1723.9
REAS. MAXIMUM	JAN	2.0	.2	.0	1.8	76.3	.0	1724.3
	FEB	2.6	.2	.0	2.4	78.7	.0	1724.9
	MAR	3.3	.2	.0	3.1	81.8	.0	1725.6
	APR	5.2	.2	.0	5.0	86.8	.0	1726.7
	MAY	15.3	.7	.5	8.4	95.2	5.7	1728.4
	JUN	30.9	.7	.5	.0	95.2	29.7	1728.4
	JUL	15.2	2.3	4.1	.0	95.2	8.8	1728.4
	AUG	11.6	1.9	4.1	.0	95.2	5.6	1728.4
	SEP	12.6	1.1	1.0	.0	95.2	10.5	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	10.2	20.7	.0	68.4	

TABLE II
WEBSTER RESERVOIR OPERATION ESTIMATES - 1967
(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
						29.6		1876.0
Reas. Minimum	Jan	.3	.2	.0	.1	29.7	.0	1876.1
	Feb	.8	.2	.0	.6	30.3	.0	1876.4
	Mar	1.3	.4	.0	.9	31.2	.0	1876.8
	Apr	1.7	.9	.0	.8	32.0	.0	1877.2
	May	1.9	.9	2.9	- 1.9	30.1	.0	1876.3
	Jun	3.5	1.3	3.8	- 1.6	28.5	.0	1875.5
	Jul	1.7	1.5	8.5	- 8.3	20.2	.0	1871.2
	Aug	.6	1.0	9.6	- 10.0	10.2	.0	1864.6
	Sep	.8	.6	5.2	- 5.0	5.2	.0	1859.9
	Oct	.0	.3	.9	- 1.2	4.0	.0	1858.5
	Nov	.2	.2	.0	.0	4.0	.0	1858.5
	Dec	.2	.1	.0	.1	4.1	.0	1858.6
	TOTAL	13.0	7.6	30.9	- 25.5	.0	.0	
						29.6		1876.0
Most Probable	Jan	.8	.1	.0	.7	30.3	.0	1876.4
	Feb	1.7	.1	.0	1.6	31.9	.0	1876.7
	Mar	2.1	.3	.0	1.8	33.7	.0	1877.9
	Apr	2.9	.5	.0	2.4	36.1	.0	1878.9
	May	4.2	.6	.8	2.8	38.9	.0	1880.1
	Jun	10.0	1.0	1.0	8.0	46.9	.0	1883.1
	Jul	4.5	1.6	7.6	- 4.7	42.2	.0	1881.3
	Aug	3.2	1.2	7.6	- 5.6	36.6	.0	1879.1
	Sep	2.4	.9	2.2	- .7	35.9	.0	1878.9
	Oct	1.0	.7	.4	- .1	35.8	.0	1878.8
	Nov	1.0	.3	.0	.7	36.5	.0	1879.1
	Dec	.9	.2	.0	.7	37.2	.0	1879.3
	TOTAL	34.7	7.5	19.6	7.6	.0	.0	
						29.6		1876.0
Reas. Maximum	Jan	2.2	.1	.0	2.1	31.7	.0	1877.0
	Feb	3.3	.1	.0	3.2	34.9	.0	1878.4
	Mar	4.1	.1	.0	4.0	38.9	.0	1880.1
	Apr	6.5	.2	.0	6.3	45.2	.0	1882.5
	May	14.1	.4	.0	13.7	58.9	.0	1887.1
	Jun	25.9	.2	.0	8.2	67.1	17.5	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	37.5	.0	56.2	

TABLE 11
CEDAR BLUFF RESERVOIR OPERATION ESTIMATES - 1967
(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
						154.6		2139.3
REAS. MINIMUM	JAN	.3	.6	.5	- .8	153.8	.0	2139.2
	FEB	.6	.7	.4	- .5	153.3	.0	2139.2
	MAR	.8	1.2	.6	- 1.0	152.3	.0	2138.9
	APR	1.1	2.4	.4	- 1.7	150.6	.0	2138.6
	MAY	2.1	2.4	2.3	- 2.6	148.0	.0	2138.2
	JUN	4.0	3.8	2.2	- 2.0	146.0	.0	2137.9
	JUL	2.6	4.4	5.6	- 7.4	138.6	.0	2136.6
	AUG	1.5	3.8	5.9	- 8.2	130.4	.0	2135.1
	SEP	.8	2.9	3.7	- 5.8	124.6	.0	2134.0
	OCT	.4	2.1	1.6	- 3.3	121.3	.0	2133.3
	NOV	.4	1.2	.4	- 1.2	120.1	.0	2133.1
	DEC	.4	.6	.4	- .6	119.5	.0	2133.0
	TOTAL	15.0	26.1	24.0	- 35.1	.0	.0	
						154.6		2139.3
MOST PROBABLE	JAN	.7	.5	.5	- .3	154.3	.0	2139.1
	FEB	1.2	.6	.4	.2	154.5	.0	2139.2
	MAR	1.6	.8	.6	.2	154.7	.0	2139.3
	APR	2.7	1.7	.4	.6	155.3	.0	2139.4
	MAY	5.4	1.6	1.2	2.6	157.9	.0	2139.9
	JUN	10.6	2.4	1.1	7.1	165.0	.0	2141.0
	JUL	8.0	4.1	4.7	- .8	164.2	.0	2140.9
	AUG	4.6	3.0	5.4	- 3.8	160.4	.0	2140.2
	SEP	4.4	2.4	1.8	.2	160.6	.0	2140.3
	OCT	1.5	1.9	1.1	- 1.5	159.1	.0	2140.1
	NOV	1.1	1.1	.4	- .4	158.7	.0	2140.0
	DEC	.8	.6	.4	- .2	158.5	.0	2139.9
	TOTAL	42.6	20.7	18.0	3.9	.0	.0	
						154.6		2139.3
REAS. MAXIMUM	JAN	2.0	.5	.5	1.0	155.6	.0	2139.5
	FEB	2.5	.4	.4	1.7	157.3	.0	2139.7
	MAR	3.3	.5	.6	2.2	159.5	.0	2140.1
	APR	6.7	1.1	.4	5.2	164.7	.0	2140.9
	MAY	22.3	1.0	1.0	20.3	185.0	.0	2144.0
	JUN	37.4	.5	.9	.1	185.1	35.9	2144.0
	JUL	20.2	3.5	3.2	.0	185.1	13.5	2144.0
	AUG	21.7	2.3	3.6	.0	185.1	15.8	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	13.6	30.5	.0	81.0	

TABLE 12
1966 EVAPORATION COMPARISON OF ACTUAL
WITH MOST PROBABLE FORECAST
(Units in 1,000 Acre - Feet)

	BONNY		SWANSON		ENDERS		HUGH BUTLER	
Month	1966 Evap.	Most Prob.	1966 Evap.	Most Prob.	1966 Evap.	Most Prob.	1966 Evap.	Most Prob.
Jan.	0	0.2	0.1	0.3	0	0.1	0	0.1
Feb.	0	0.2	0	0.4	0	0.1	0	0.1
Mar.	0.3	0.3	0.5	0.6	0.2	0.2	0.2	0.2
Apr.	0.6	0.4	1.5	1.0	0.5	0.4	0.5	0.4
May	1.1	0.5	2.8	0.9	0.8	0.4	1.0	0.4
June	1.3	0.7	2.9	1.5	1.0	0.5	1.1	0.4
July	1.4	1.0	3.4	2.5	1.0	0.8	1.1	0.8
Aug.	1.2	1.0	2.7	2.2	0.8	0.8	1.0	0.7
Sept.	0.7	0.7	1.5	1.3	0.5	0.4	0.5	0.5
Oct.	0.8	0.7	1.6	1.6	0.6	0.5	0.6	0.5
Nov.	0.4	0.4	0.9	0.8	0.2	0.3	0.3	0.2
Dec.	0.1	0.2	0.6	0.4	0.1	0.1	0.3	0.1
Total	7.9	6.3	18.5	13.5	5.7	4.6	6.6	4.4

	HARRY STRUNK		NORTON		HARLAN COUNTY		LOVEWELL	
Month	1966 Evap.	Most Prob.	1966 Evap.	Most Prob.	1966 Evap.	Most Prob.	1966 Evap.	Most Prob.
Jan.	0	0.1	0.2	0.1	1.0	0.7	0.2	0.1
Feb.	0	0.1	0	0.1	0	0.7	0	0.1
Mar.	0.2	0.2	0.3	0.2	3.6	1.2	0.7	0.2
Apr.	0.6	0.4	0.7	0.5	4.3	1.4	0.9	0.5
May	1.1	0.4	1.5	0.4	7.7	3.6	1.7	0.4
June	1.3	0.6	1.3	0.7	8.9	6.0	2.1	0.4
July	1.2	0.9	1.5	1.1	9.9	8.4	2.0	1.3
Aug.	1.2	0.7	1.1	1.1	8.8	6.2	1.3	1.1
Sept.	0.6	0.4	0.6	0.8	5.0	4.5	0.5	0.8
Oct.	0.7	0.6	0.8	0.7	5.2	3.4	0.7	0.5
Nov.	0.3	0.3	0.4	0.4	0.4	1.5	0.6	0.3
Dec.	0.2	0.1	0.3	0.2	2.4	0.7	0.2	0.1
Total	7.4	4.8	8.7	6.3	57.5	38.3	10.9	5.8

	KIRWIN		WEBSTER		CEDAR BLUFF	
Month	1966 Evap.	Most Prob.	1966 Evap.	Most Prob.	1966 Evap.	Most Prob.
Jan.	0.3	0.3	0.2	0.2	0.7	0.6
Feb.	0	0.3	0	0.2	0	0.6
Mar.	0.8	0.4	0.6	0.4	1.3	0.9
Apr.	1.5	0.8	1.2	0.8	2.5	1.9
May	2.7	1.5	2.0	0.9	5.3	1.8
June	2.6	1.9	2.3	1.3	4.9	2.7
July	2.9	2.6	2.3	0	5.7	4.4
Aug.	2.2	2.2	1.3	1.5	4.9	3.2
Sept.	0.9	1.7	0.8	1.2	2.5	2.6
Oct.	1.9	1.4	1.0	0.9	3.0	2.1
Nov.	0.7	0.7	0.5	0.4	1.4	1.2
Dec.	0.2	0.3	0.2	0.2	0.9	0.6
Total	16.7	14.1	12.4	10.0	33.1	22.6

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

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

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

HUGH BUTLER

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

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

NORTON

Year	Damages Prevented	Cumulative Total
1966	$132,000	$ 132,000

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	6,198,000
1964	182,000	6,380,000
1965	60,000	6,440,000
1966	1,658,000	8,098,000

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

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

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

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	19,701,000
1961	523,000	20,224,000
1962	241,000	20,465,000
1964	300,000	20,765,000
1965	1,772,000	22,537,000
1966	1,790,000	24,327,000

TABLE 14
OTHER USES OF BUREAU OF RECLAMATION RESERVOIRS IN KANSAS RIVER PROJECTS
During 1966
Annual Totals

Reservoirs	Visitors	Cars in Area	Water Craft	Sport Fish Caught	Season Take Ducks	Season Take Geese
Colorado						
Bonny	32,912	697	2,743	70,000	100	0
Kansas						
Cedar Bluff	433,105	72,200	2,245	96,000	500	20
Webster	247,250	70,000	2,550	17,000	150	75
Kirwin	176,584	70,173	4,230	45,000	420	125
Lovewell	178,500	53,786	3,100	17,500	200	15
Norton	114,459	35,768	2,500	0	1,500	15
Nebraska						
Enders	45,808	11,451	1,105	13,425		20
Swanson	175,871	43,962	3,593	86,680		16
Hugh Butler	240,500	60,125	8,100	91,074		3
Harry Strunk	53,870	13,507	2,027	39,426		
Total	1,698,859	431,669	32,193	476,105	2,870	289

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

BONNY RESERVOIR

1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 ACTUAL | 1967 ESTIMATES

INFLOW

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

30 — 20 — 10 — 0 — THOUSANDS OF ACRE FEET

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

160 — 120 — 80 — 40 — 0 — THOUSANDS OF ACRE FEET

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

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

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

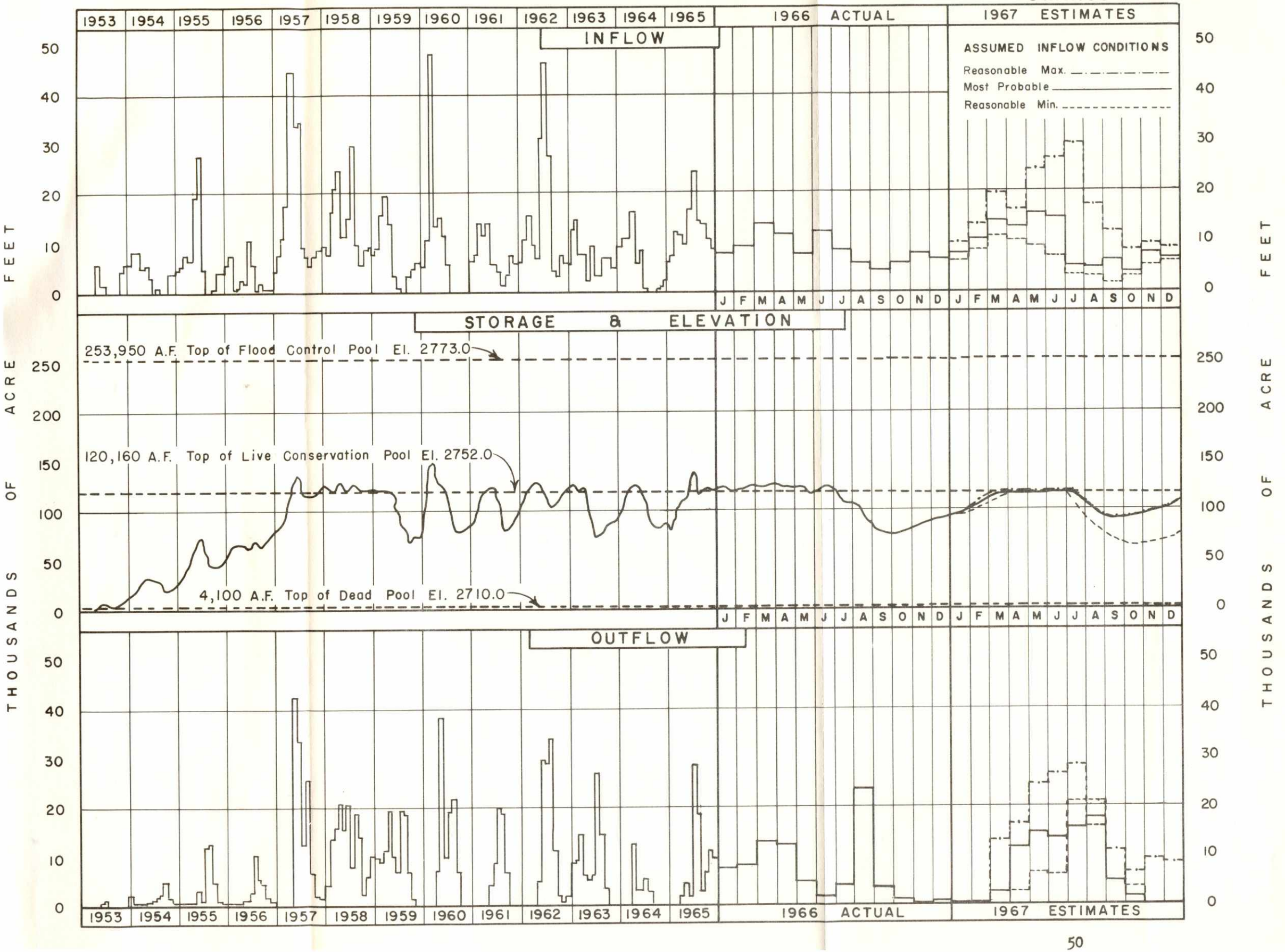
OUTFLOW

30 — 20 — 10 — 0 — THOUSANDS OF ACRE FEET

1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 ACTUAL | 1967 ESTIMATES

OPERATION HYDROGRAPHS

SWANSON LAKE



OPERATION HYDROGRAPHS

ENDERS RESERVOIR

1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 — 1966 ACTUAL — 1967 ESTIMATES

INFLOW

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

ACRE FEET — THOUSANDS OF

20 — 10 — 0 — 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

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

ACRE FEET — THOUSANDS OF

80 — 70 — 60 — 50 — 40 — 30 — 20 — 10 — 0 — 80 — 70 — 60 — 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

20 — 10 — 0 — 20 — 10 — 0

1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 — 1966 ACTUAL — 1967 ESTIMATES

Exhibit 4

OPERATION HYDROGRAPHS

HUGH BUTLER LAKE

1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 ACTUAL | 1967 ESTIMATES

INFLOW

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

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.

ACRE FEET / THOUSANDS OF ACRE FEET: 0, 20, 40, 60, 80

OUTFLOW

FEET: 0, 2, 4, 6, 8

1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 ACTUAL | 1967 ESTIMATES

Exhibit 5

OPERATION HYDROGRAPHS

HARRY STRUNK LAKE

1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 ACTUAL | 1967 ESTIMATES

INFLOW

THOUSANDS OF ACRE FEET

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

THOUSANDS OF ACRE FEET

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.

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

20
10
0

1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 ACTUAL | 1967 ESTIMATES

OPERATION HYDROGRAPHS

NORTON RESERVOIR

1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 ACTUAL | 1967 ESTIMATES

INFLOW

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

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

OUTFLOW

THOUSANDS OF ACRE FEET

0 – 20 – 40 – 60 – 80 – 100 – 120 – 140

1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 ACTUAL | 1967 ESTIMATES

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

Exhibit 7

OPERATION HYDROGRAPHS

HARLAN COUNTY RESERVOIR

1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 ACTUAL | 1967 ESTIMATES

INFLOW

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

200 – 150 – 100 – 50 – 0 — ACRE FEET

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.

800 – 600 – 400 – 200 – 0 — ACRE FEET

1300 A.F Top of Dead Storage El. 1885.0

THOUSANDS OF

OUTFLOW

200 – 150 – 100 – 50 – 0 — THOUSANDS OF

1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 ACTUAL | 1967 ESTIMATES

OPERATION HYDROGRAPHS

LOVEWELL RESERVOIR

1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 ACTUAL | 1967 ESTIMATES

INFLOW

37

32.3

20

ASSUMED INFLOW CONDITIONS
Reasonable Max.
Most Probable
Reasonable Min.

ACRE FEET — 0, 5, 10, 15, 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

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

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

4,359 A.F. Top of Dead Storage El. 1561.0

THOUSANDS OF ACRE FEET — 0, 20, 40, 60, 80, 100

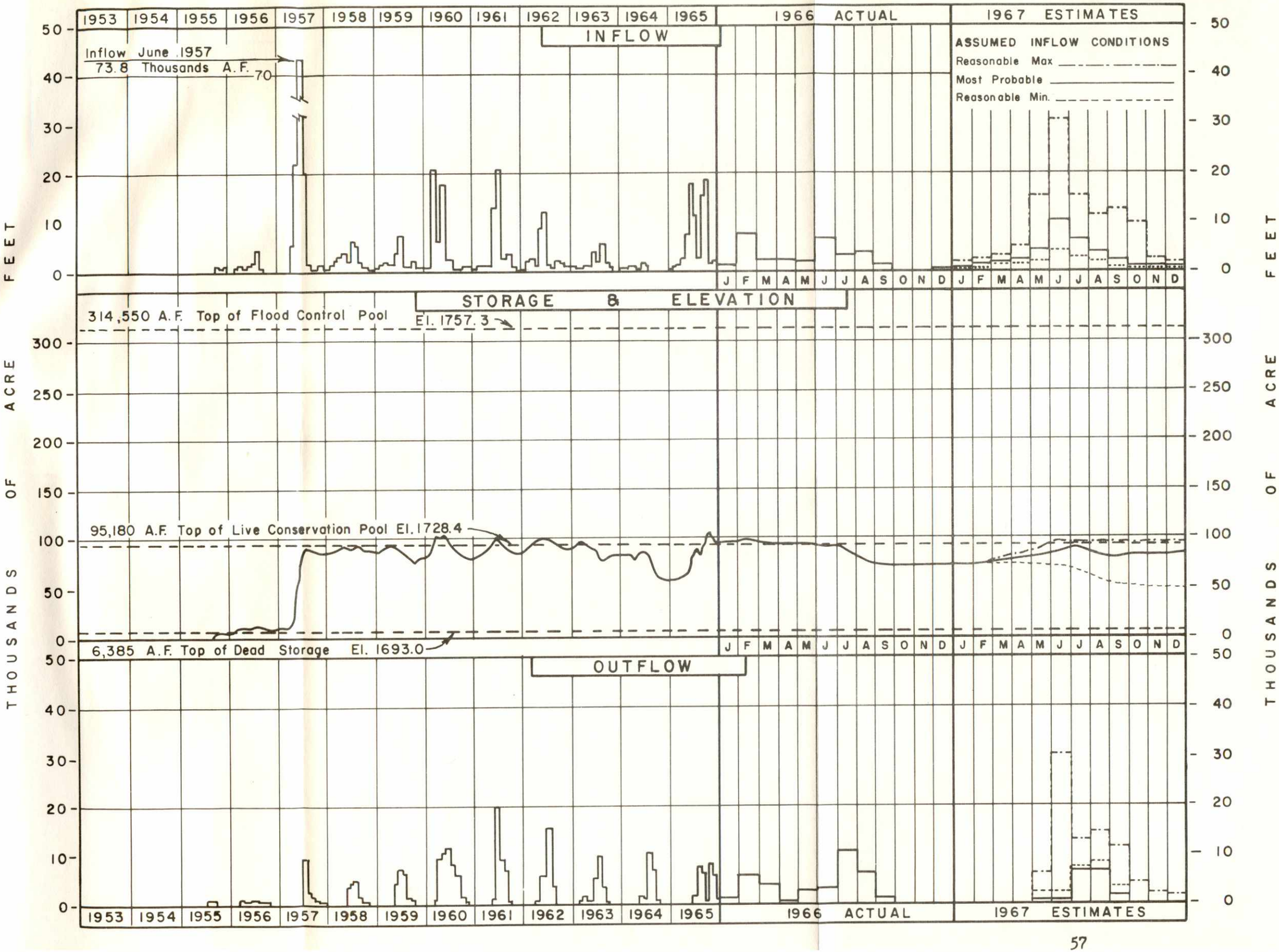
OUTFLOW

THOUSANDS OF ACRE FEET — 0, 5, 10, 15, 20

1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 ACTUAL | 1967 ESTIMATES

OPERATION HYDROGRAPHS

KIRWIN RESERVOIR



OPERATION HYDROGRAPHS

WEBSTER RESERVOIR

1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 ACTUAL | 1967 ESTIMATES

INFLOW

FEET

Inflow June 1957
58.7 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 OF THOUSANDS

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

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

ACRE FEET OF THOUSANDS

1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 ACTUAL | 1967 ESTIMATES

OPERATION HYDROGRAPHS

CEDAR BLUFF RESERVOIR

1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 — 1966 ACTUAL — 1967 ESTIMATES

INFLOW

100
Inflow June 1957
79.4 Thousands A.F.
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 | J F M A M J J A S O N D

FEET — 50 40 30 20 10 0

STORAGE & ELEVATION

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

ACRE FEET — 400 300 200 100 0

OUTFLOW

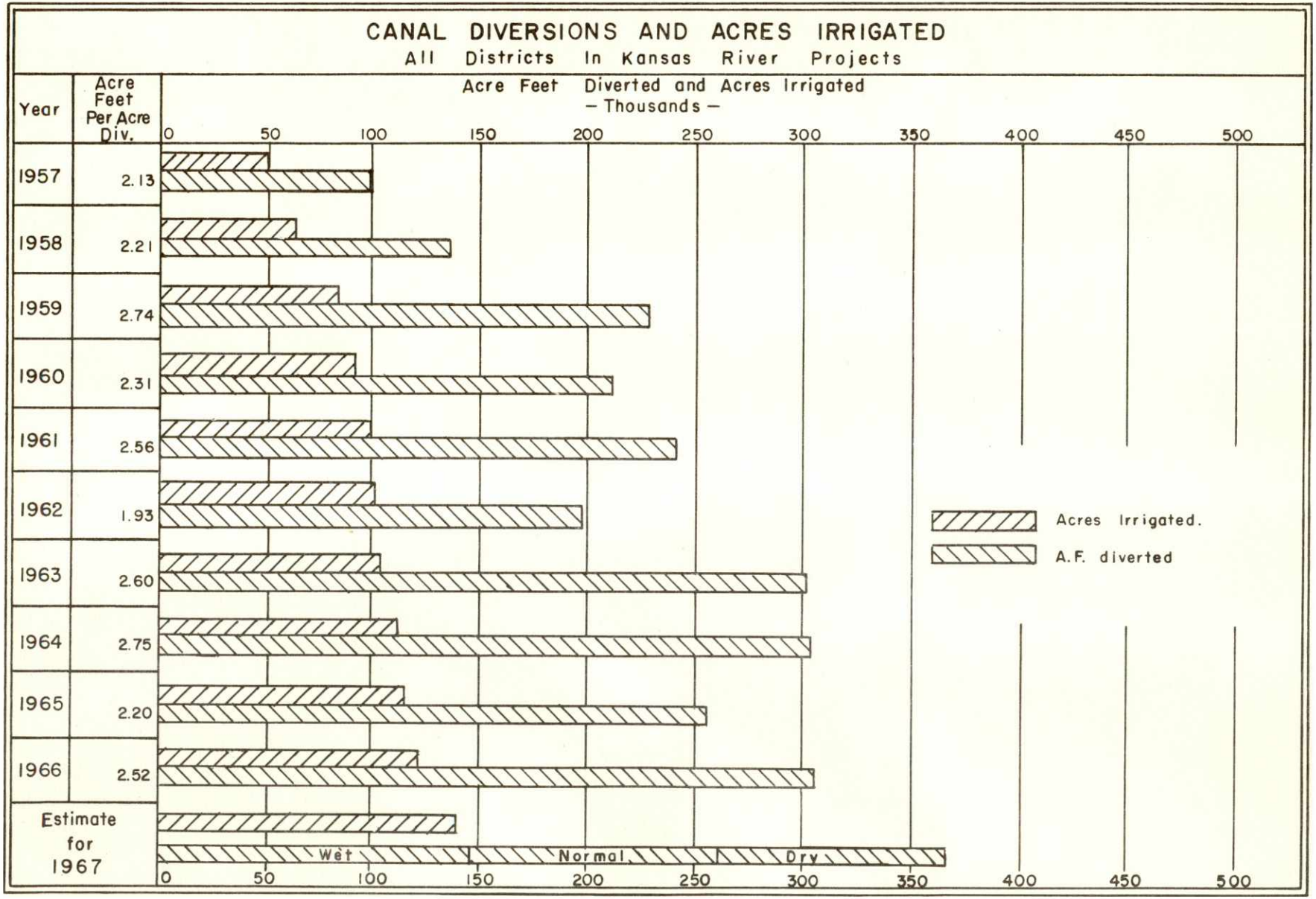
100
Outflow July 1957
93.7 Thousands A.F.
50

THOUSANDS OF — 50 40 30 20 10 0

1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 — 1966 ACTUAL — 1967 ESTIMATES

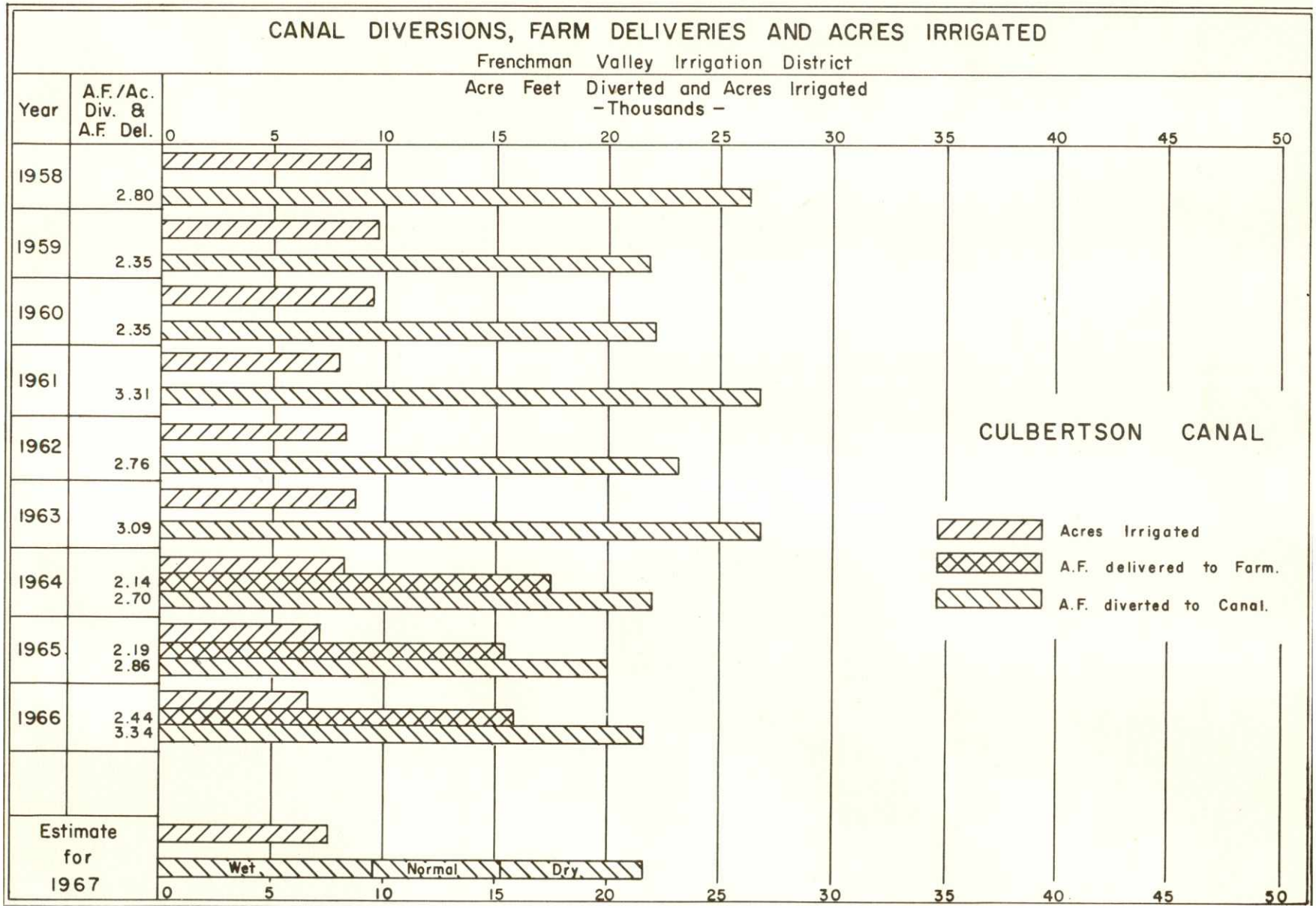
CANAL DIVERSIONS AND ACRES IRRIGATED

All Districts In Kansas River Projects



CANAL DIVERSIONS, FARM DELIVERIES AND ACRES IRRIGATED

Frenchman Valley Irrigation District



CANAL DIVERSIONS, FARM DELIVERIES AND ACRES IRRIGATED

H. and R. W. Irrigation District

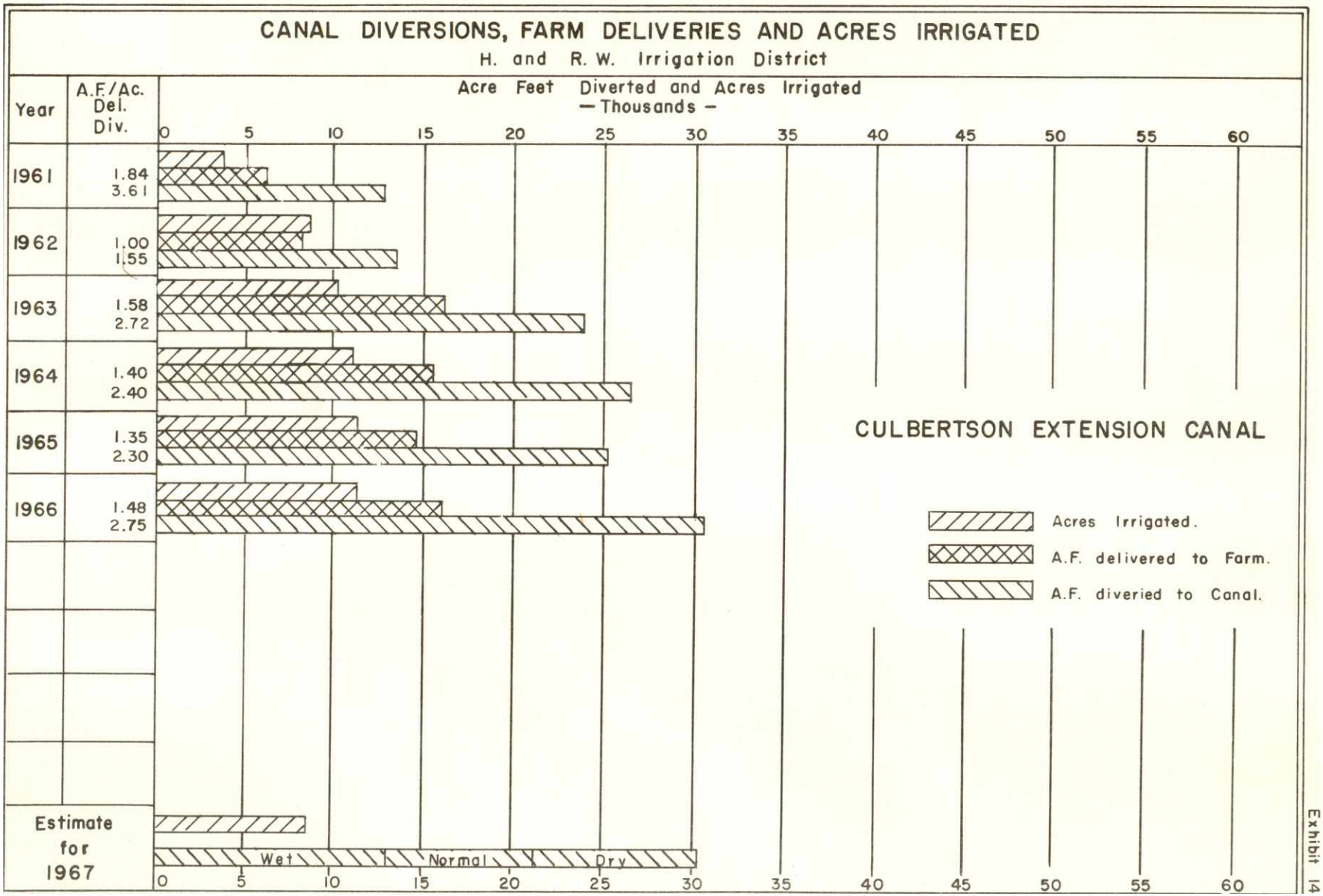


Exhibit 14

CANAL DIVERSIONS, FARM DELIVERIES AND ACRES IRRIGATED

Frenchman – Cambridge Irrigation District

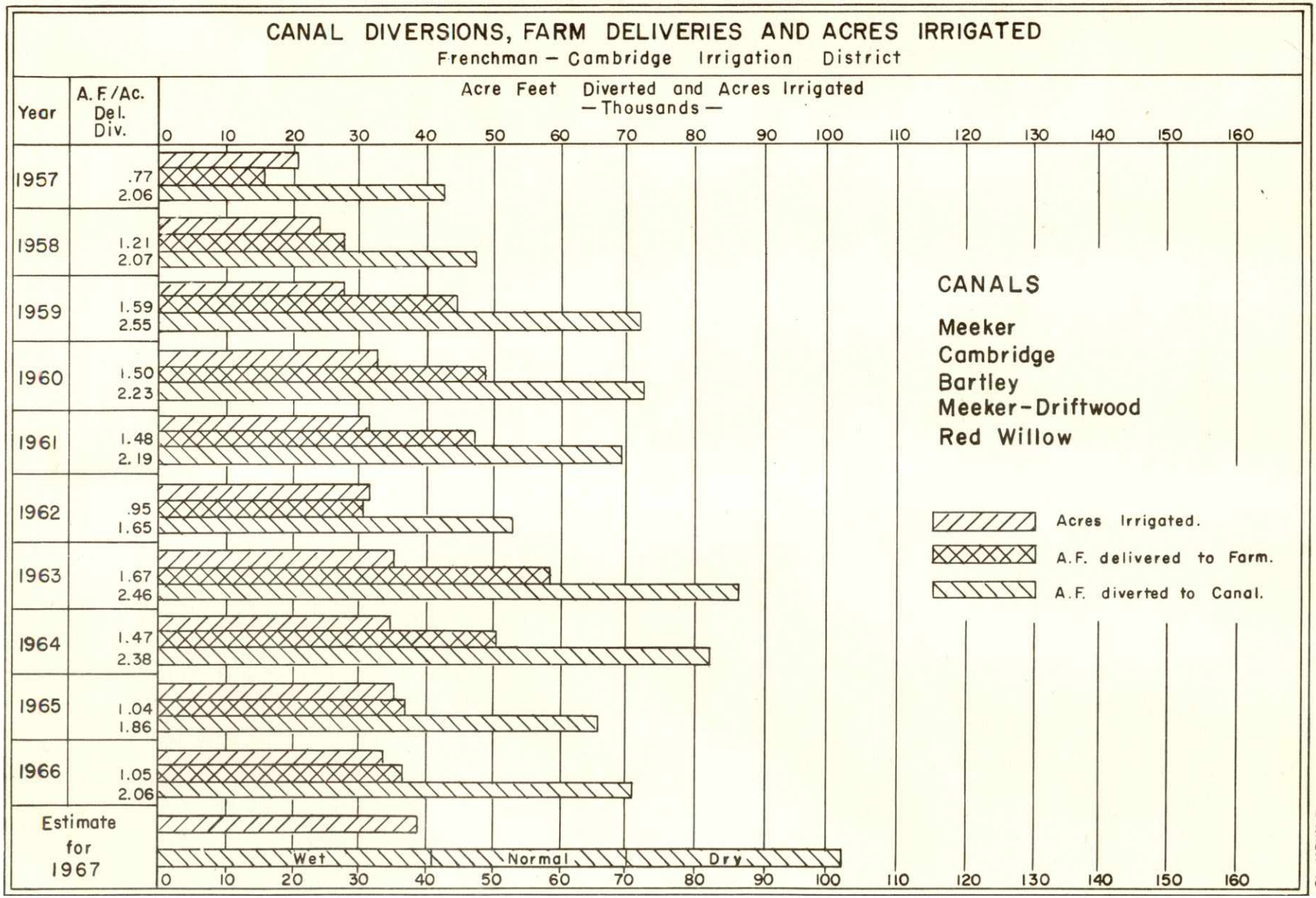
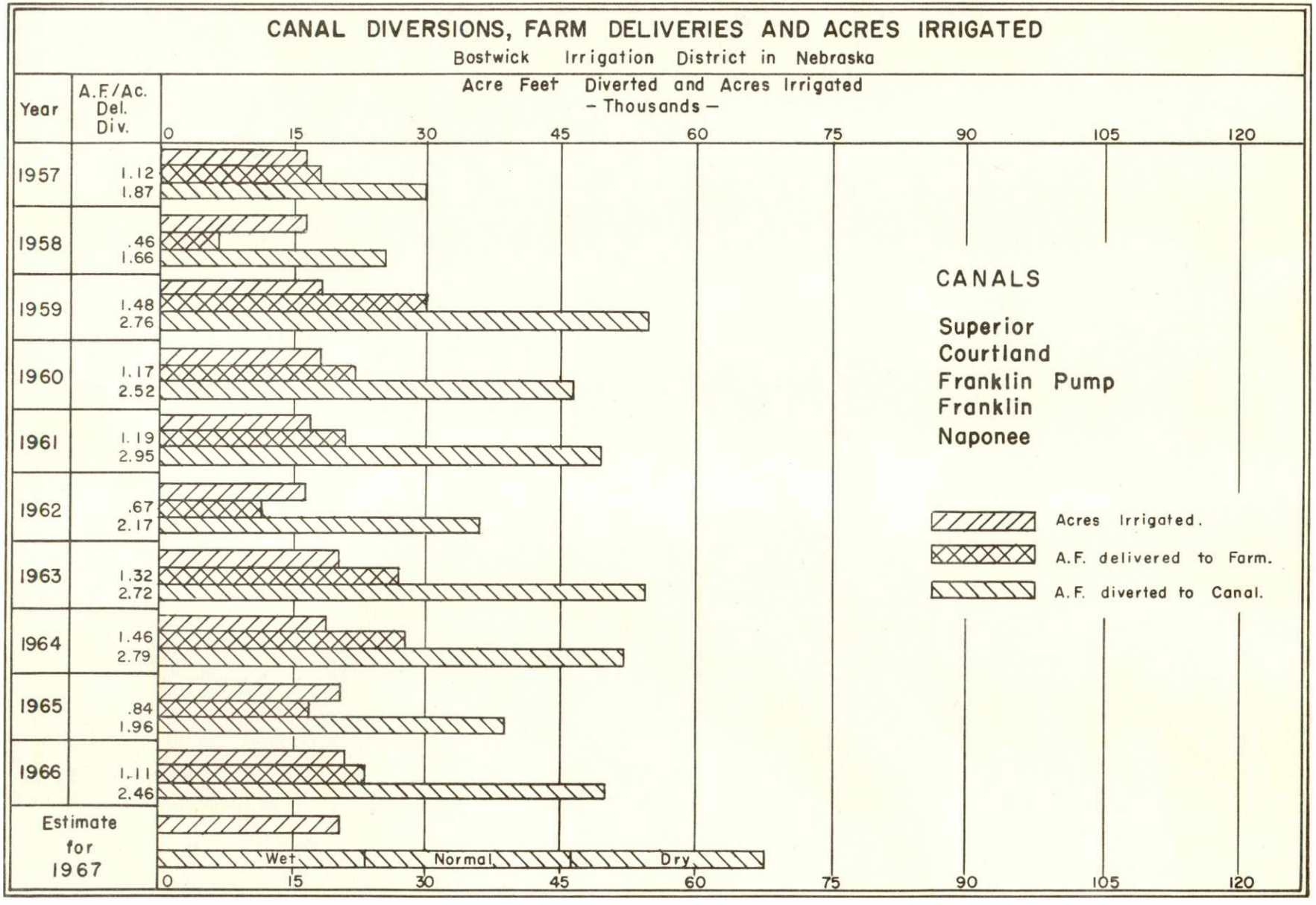


Exhibit 15


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
1957
1.12
1.87
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
Estimate for 1967
Wet
Normal
Dry
CANALS
Superior
Courtland
Franklin Pump
Franklin
Naponee
Acres Irrigated.
A.F. delivered to Farm.
A.F. diverted to Canal.

CANAL DIVERSIONS, FARM DELIVERIES AND ACRES IRRIGATED

Kansas — Bostwick Irrigation District

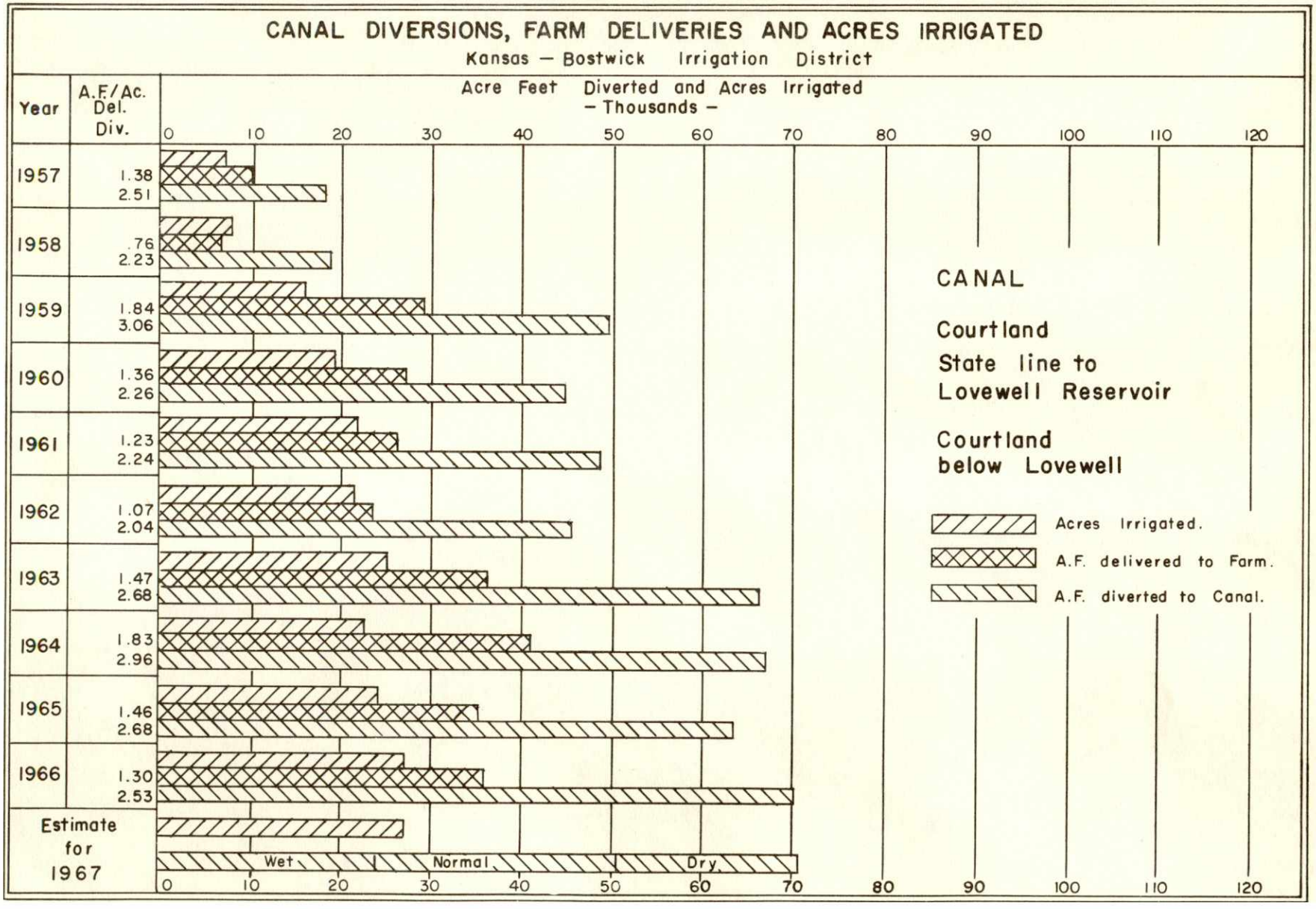
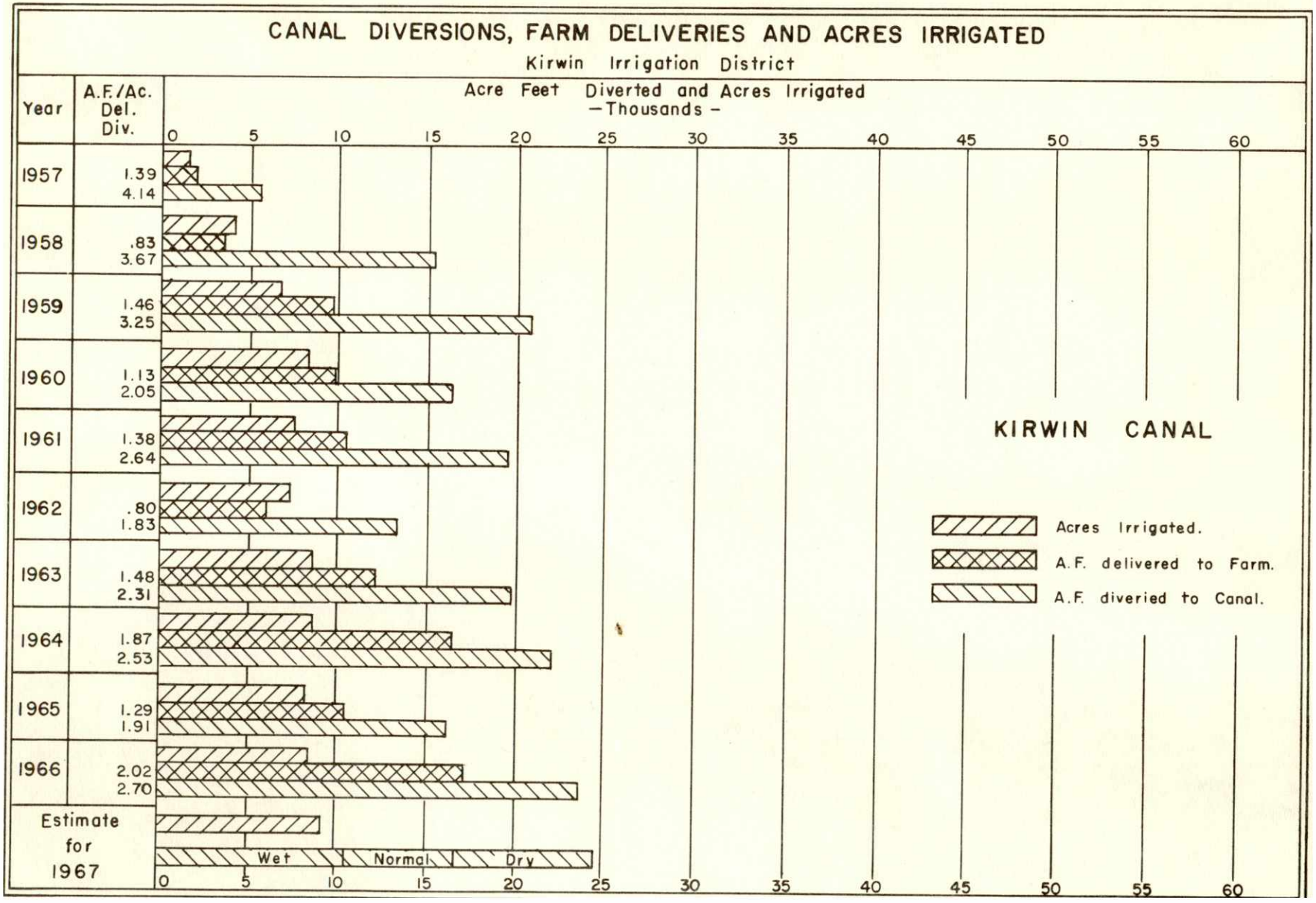


Exhibit 17


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
1957 1.39 4.14
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
Estimate for 1967
Wet
Normal
Dry
KIRWIN CANAL
Acres Irrigated.
A.F. delivered to Farm.
A.F. diveried to Canal.

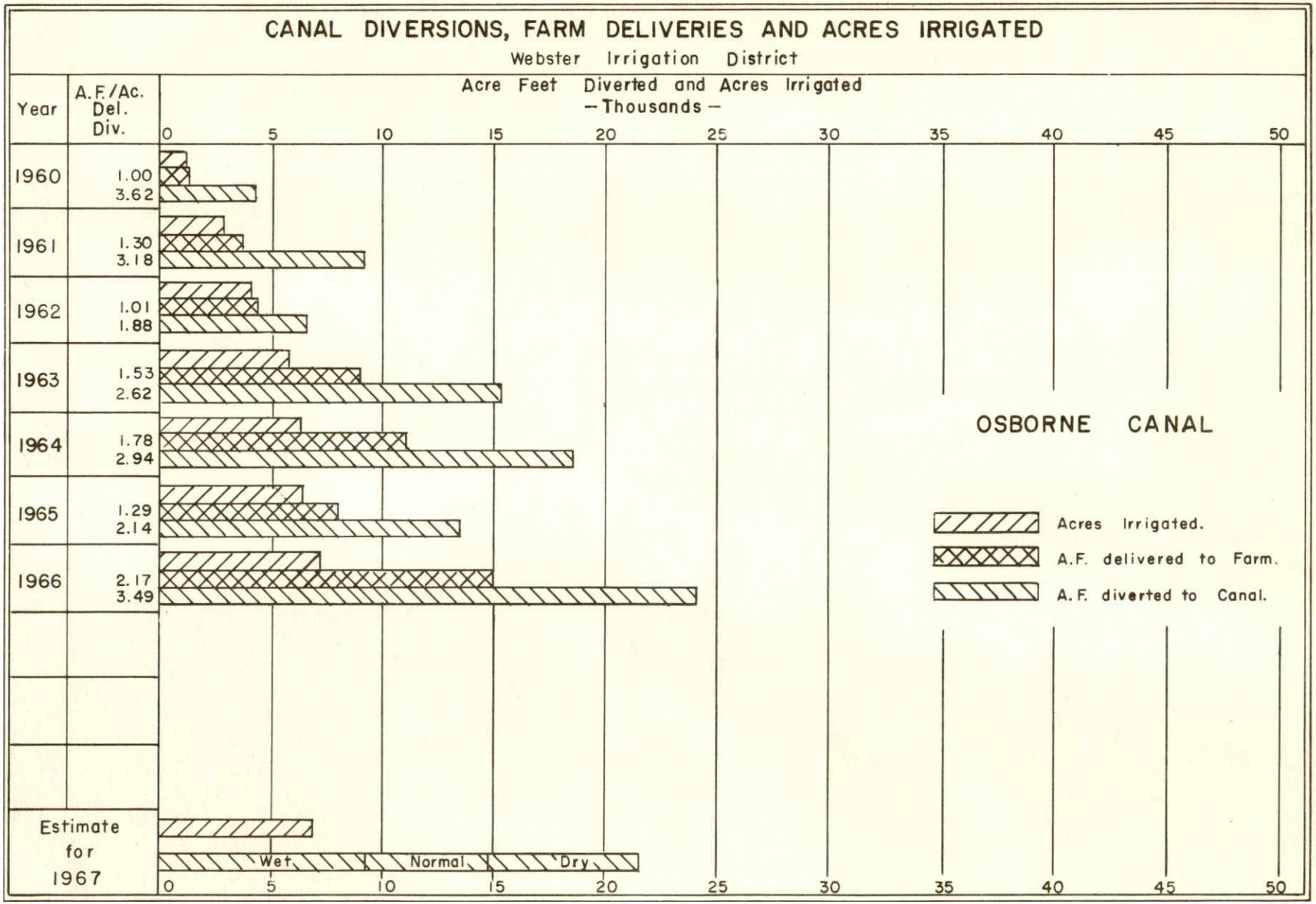
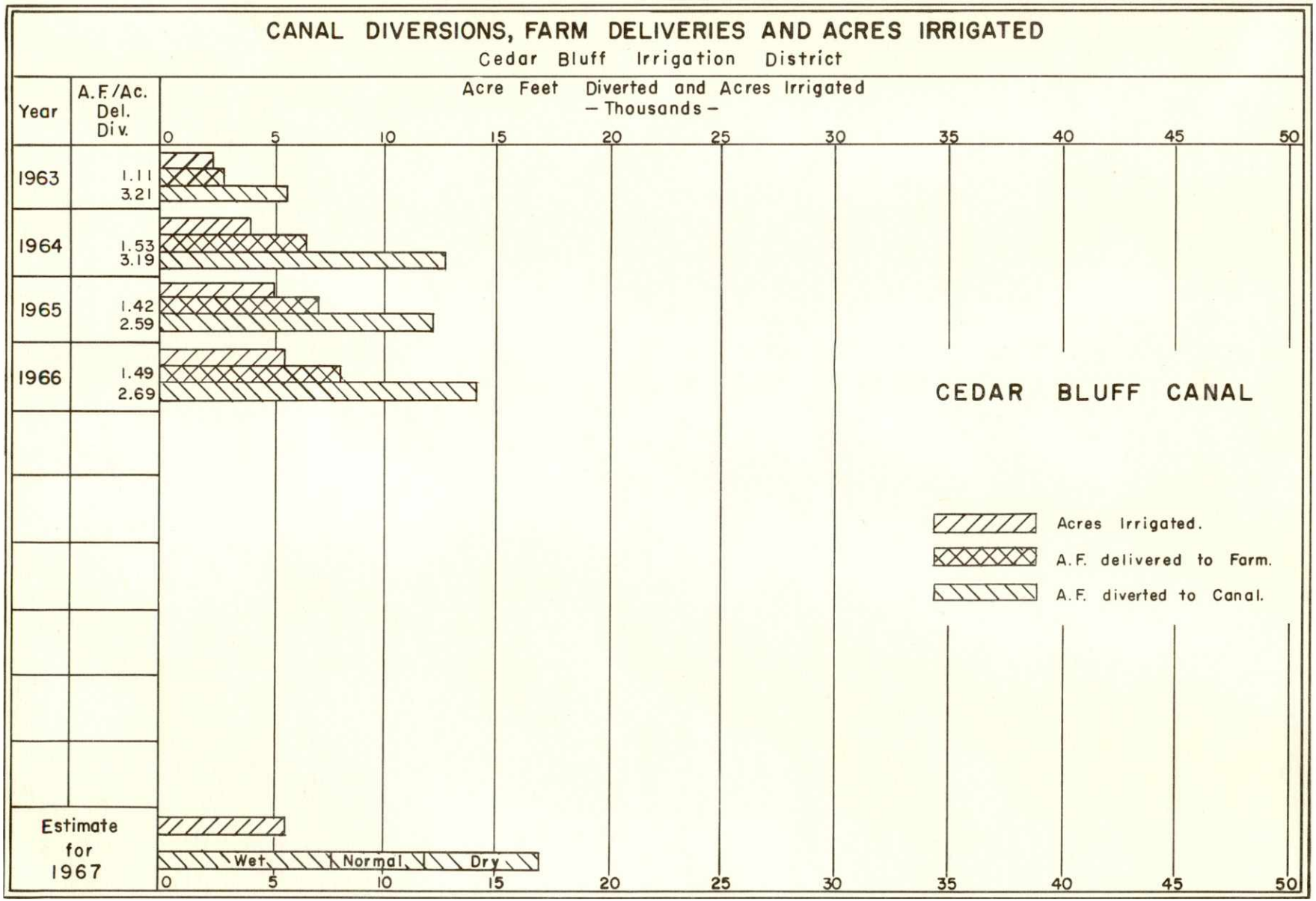
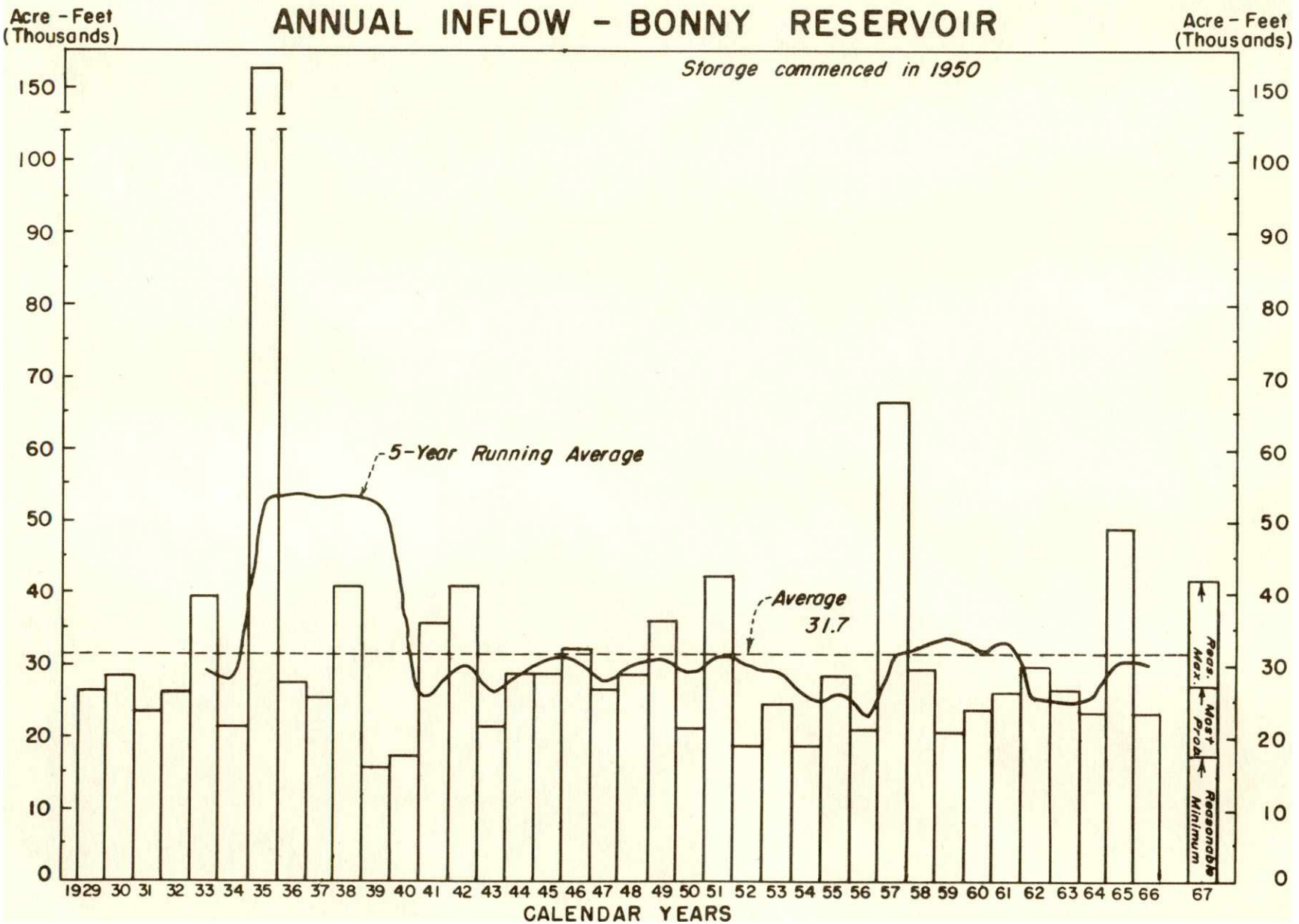

CANAL DIVERSIONS, FARM DELIVERIES AND ACRES IRRIGATED
Webster Irrigation District
Acre Feet Diverted and Acres Irrigated
— Thousands —
Year
A.F./Ac. Del. Div.
0 5 10 15 20 25 30 35 40 45 50
1960 1.00 3.62
1961 1.30 3.18
1962 1.01 1.88
1963 1.53 2.62
1964 1.78 2.94
1965 1.29 2.14
1966 2.17 3.49
Estimate for 1967
Wet
Normal
Dry
OSBORNE CANAL
Acres Irrigated.
A.F. delivered to Farm.
A.F. diverted to Canal.

Exhibit 19

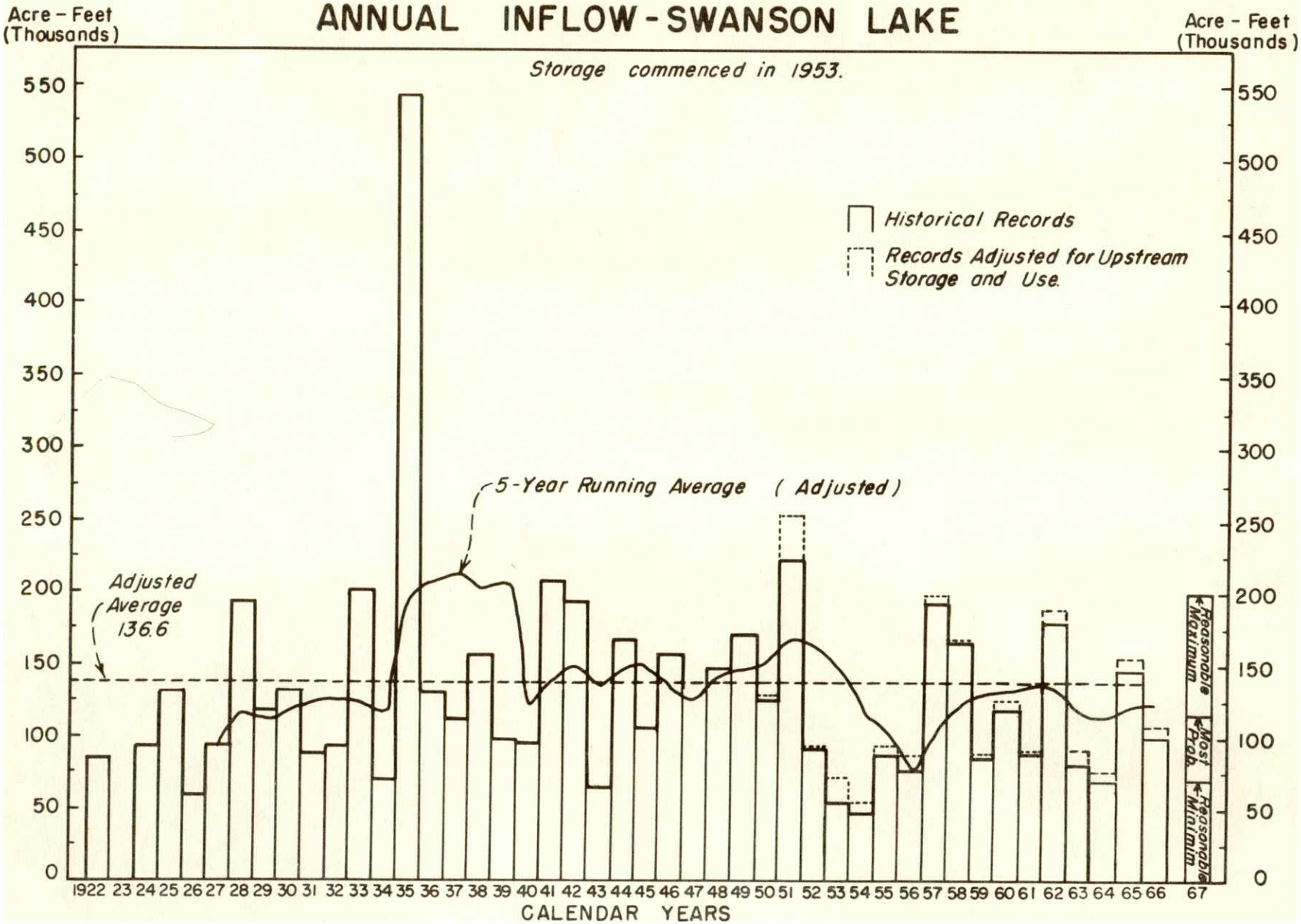
CANAL DIVERSIONS, FARM DELIVERIES AND ACRES IRRIGATED

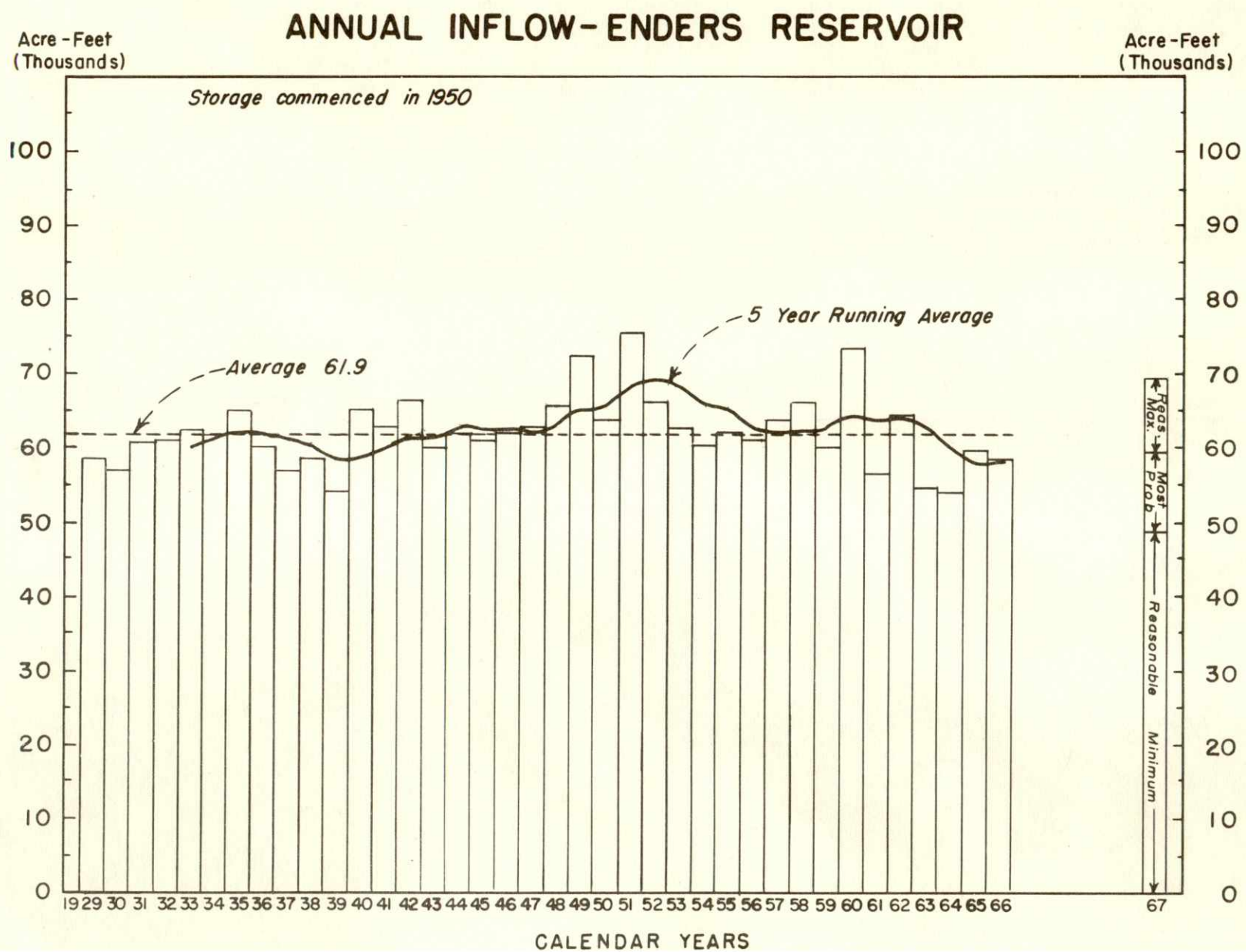
Cedar Bluff Irrigation District

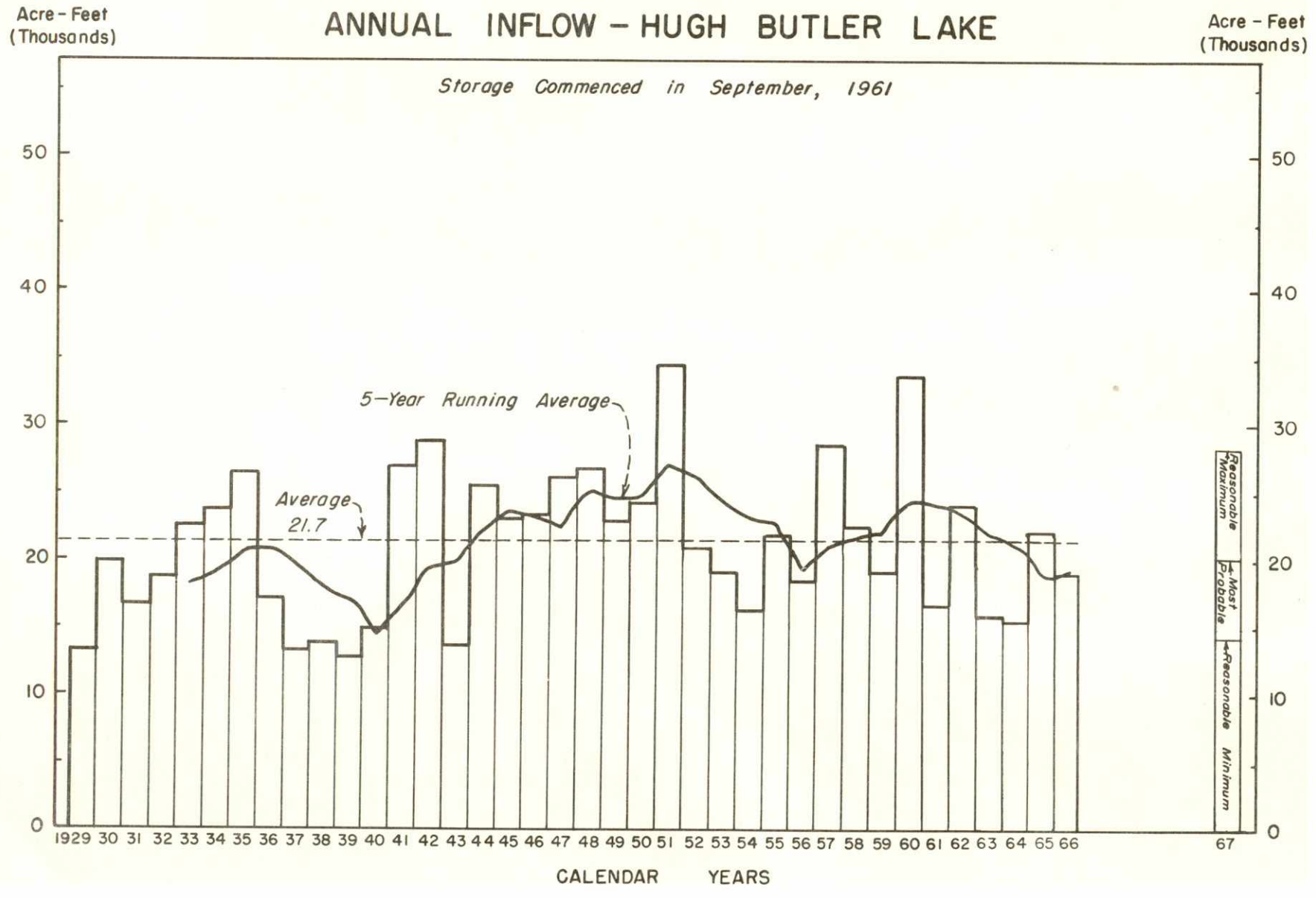


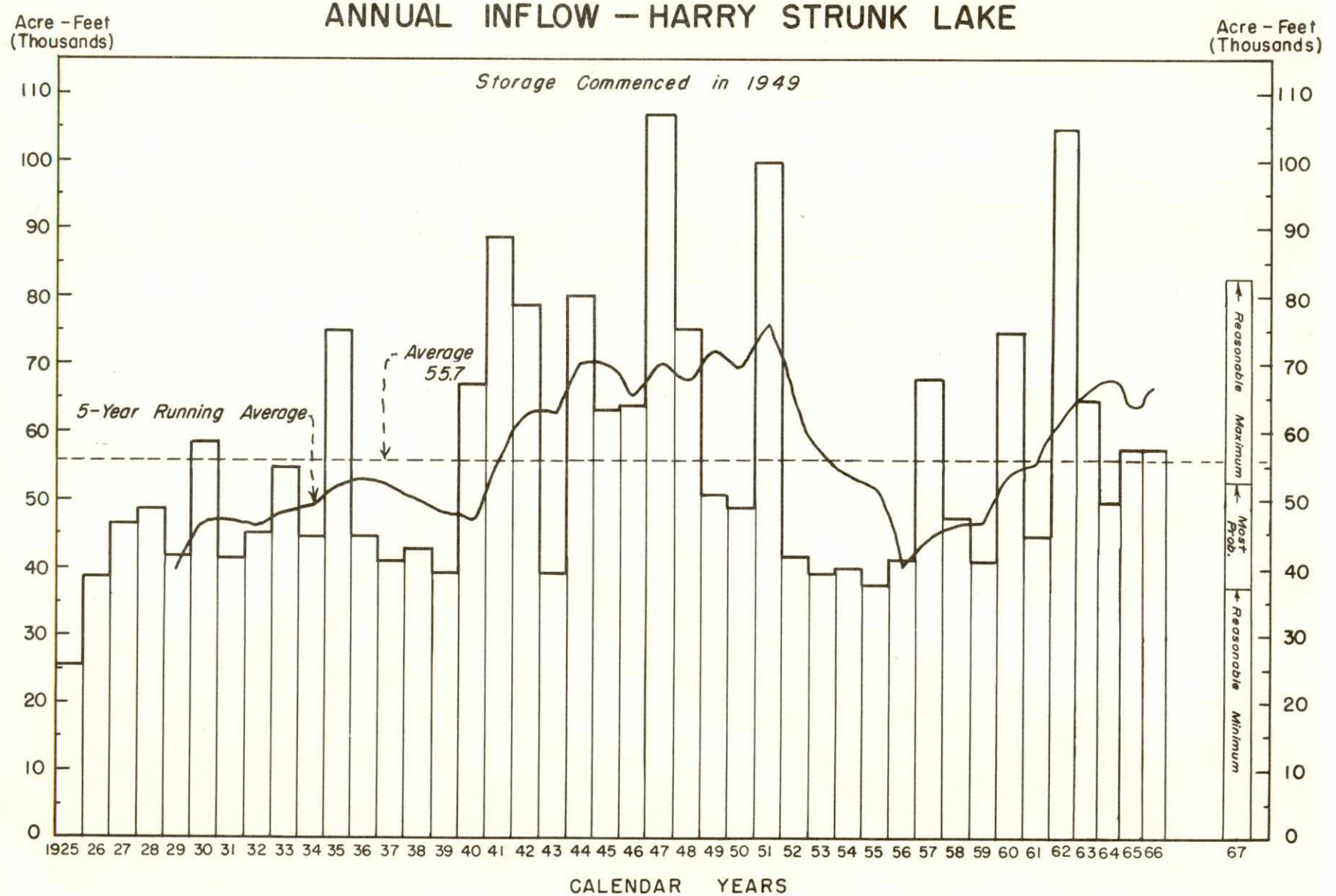

ANNUAL INFLOW - BONNY RESERVOIR
Acre - Feet (Thousands)
Acre - Feet (Thousands)
Storage commenced in 1950
5-Year Running Average
Average 31.7
Reas. Max.
Most Prob.
Reasonable Minimum
150
100
90
80
70
60
50
40
30
20
10
0
1929 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55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

ANNUAL INFLOW - SWANSON LAKE

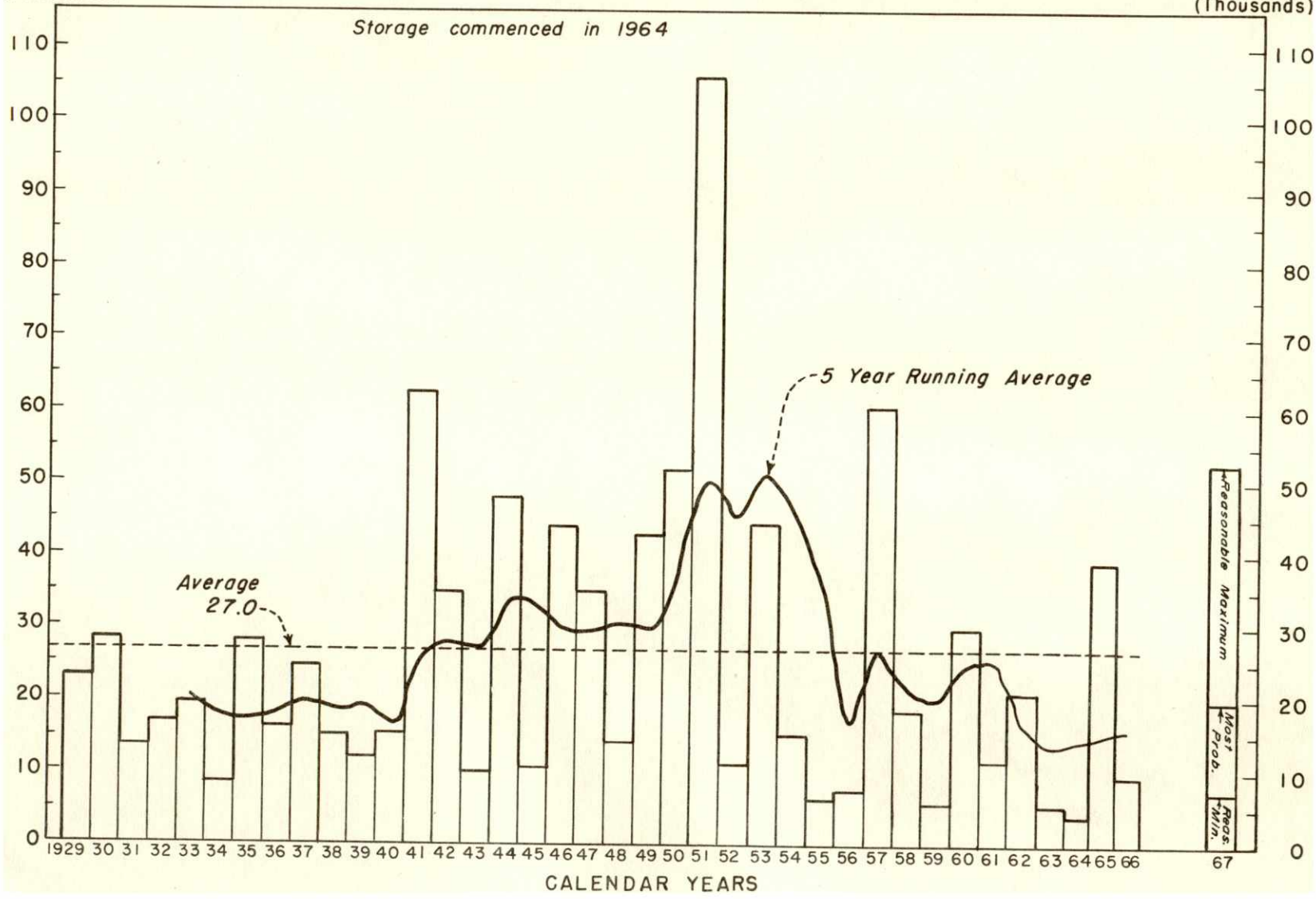



ANNUAL INFLOW - ENDERS RESERVOIR
Acre-Feet (Thousands)
Acre-Feet (Thousands)
Storage commenced in 1950
Average 61.9
5 Year Running Average
100
90
80
70
60
50
40
30
20
10
0
19 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66
67
Reas. Max.
Most Prob
Reasonable Minimum
CALENDAR YEARS

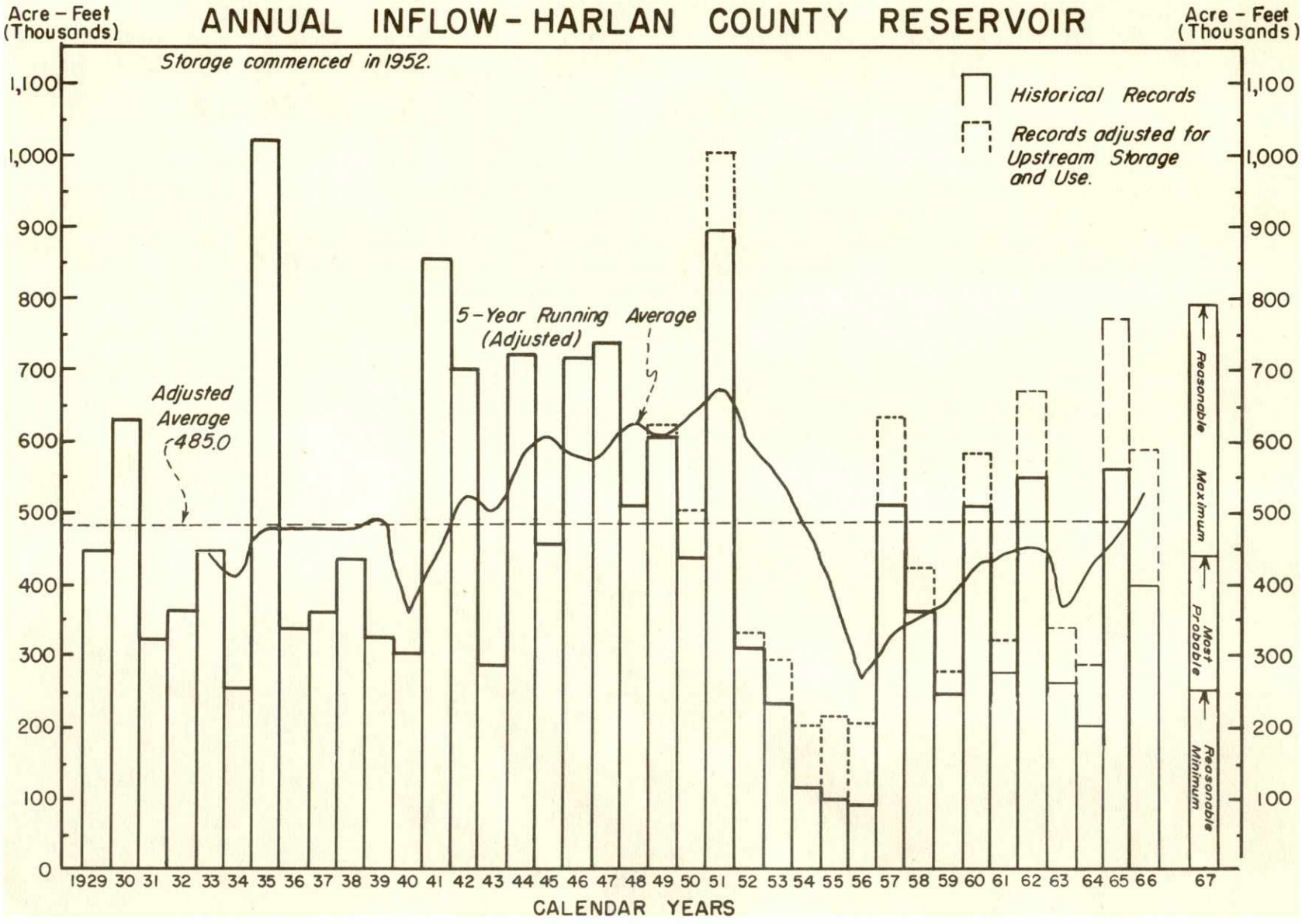

ANNUAL INFLOW – HUGH BUTLER LAKE
Acre – Feet (Thousands)
Acre – Feet (Thousands)
Storage Commenced in September, 1961
5–Year Running Average
Average 21.7
50
40
30
20
10
0
1929 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66
67
CALENDAR YEARS
Reasonable Maximum
Most Probable
Reasonable Minimum


ANNUAL INFLOW — HARRY STRUNK LAKE
Acre - Feet (Thousands)
Acre - Feet (Thousands)
Storage Commenced in 1949
Average 55.7
5-Year Running Average
Reasonable Maximum
Most Prob.
Reasonable Minimum
0
10
20
30
40
50
60
70
80
90
100
110
1925 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 - NORTON RESERVOIR



ANNUAL INFLOW - HARLAN COUNTY RESERVOIR



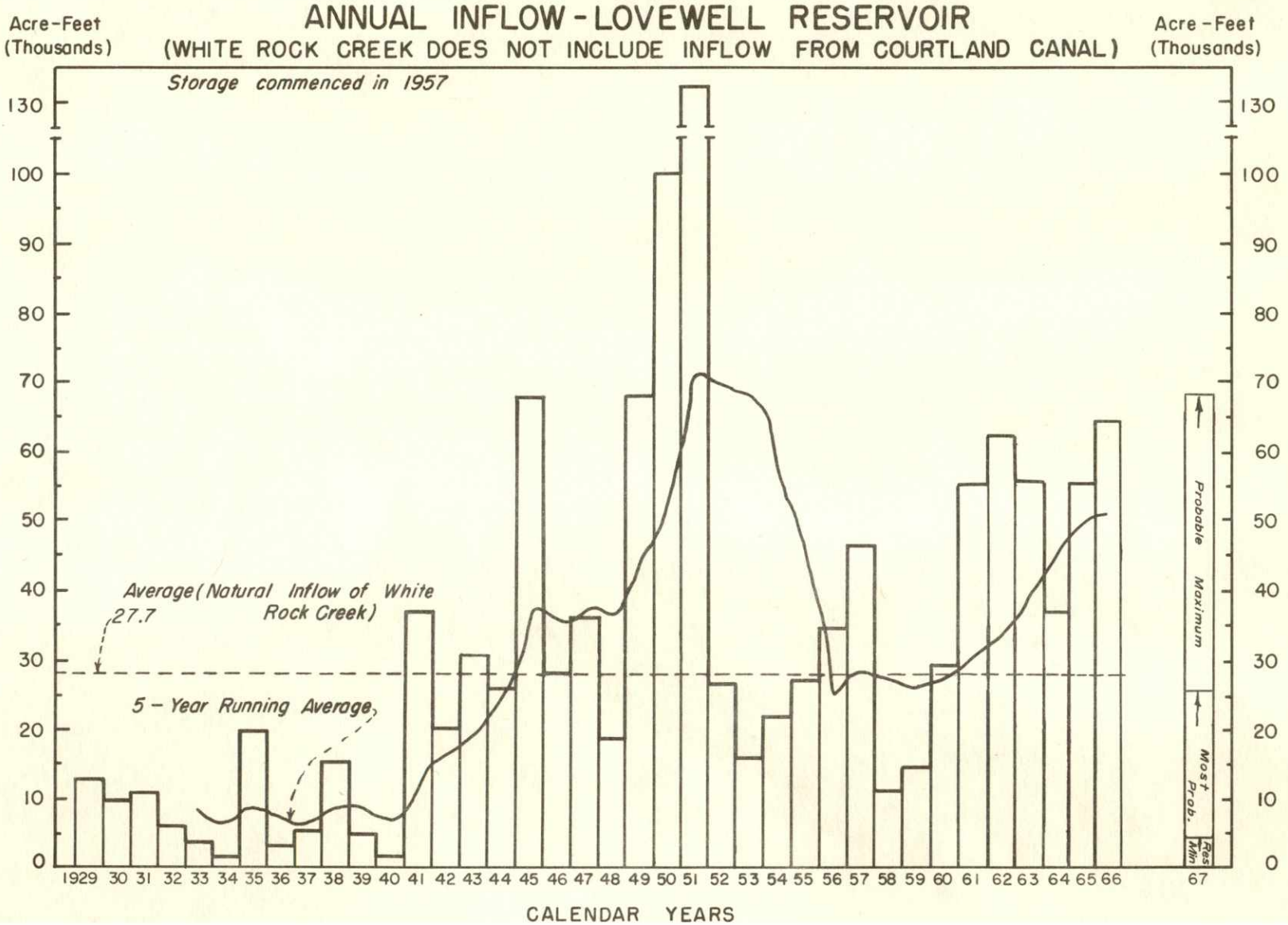

ANNUAL INFLOW - LOVEWELL RESERVOIR
(WHITE ROCK CREEK DOES NOT INCLUDE INFLOW FROM COURTLAND CANAL)
Acre-Feet (Thousands)
Acre-Feet (Thousands)
Storage commenced in 1957
Average (Natural Inflow of White Rock Creek) 27.7
5 - Year Running Average
Probable Maximum
Most Prob.
Res Min
130
100
90
80
70
60
50
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

Exhibit 28

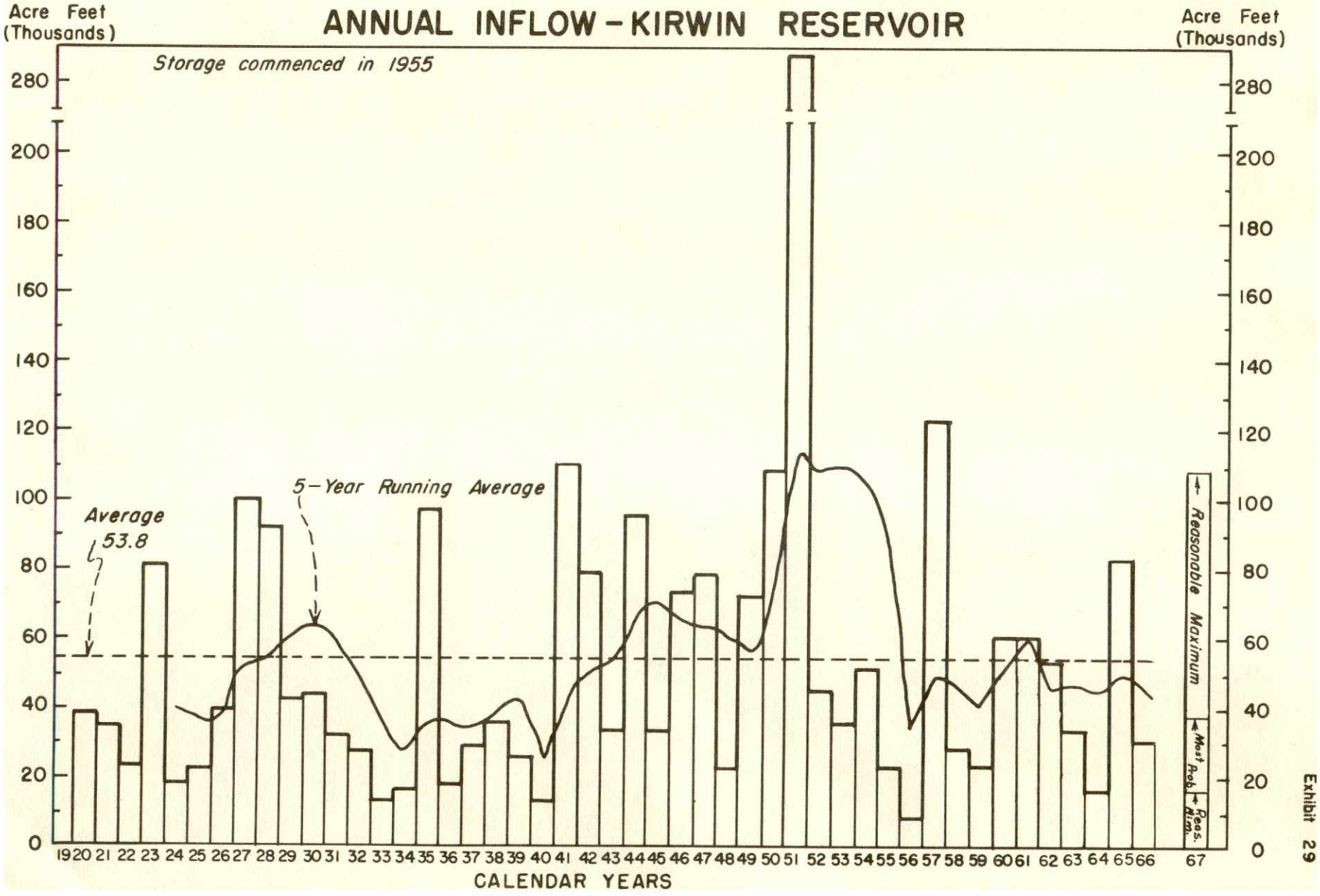
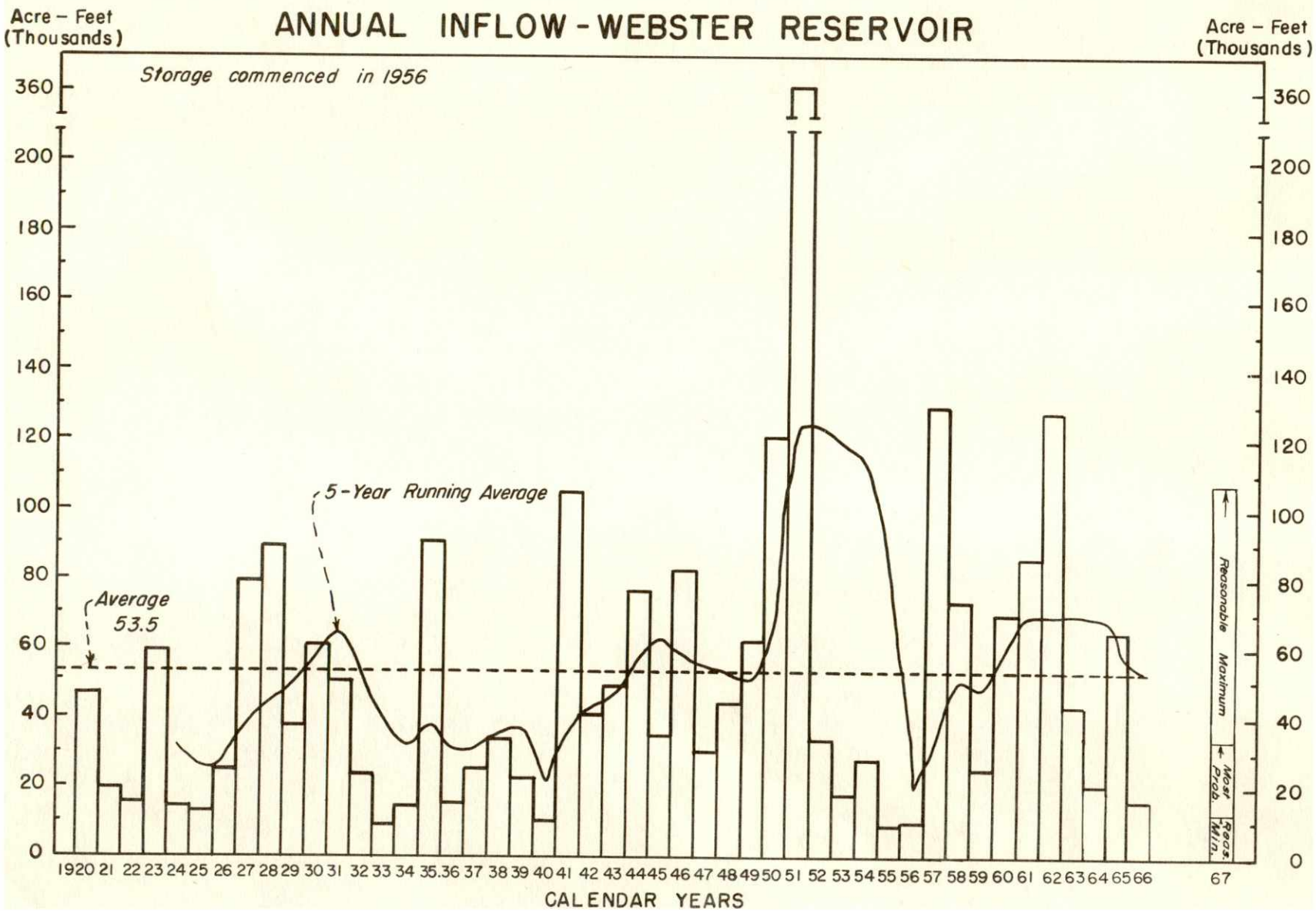
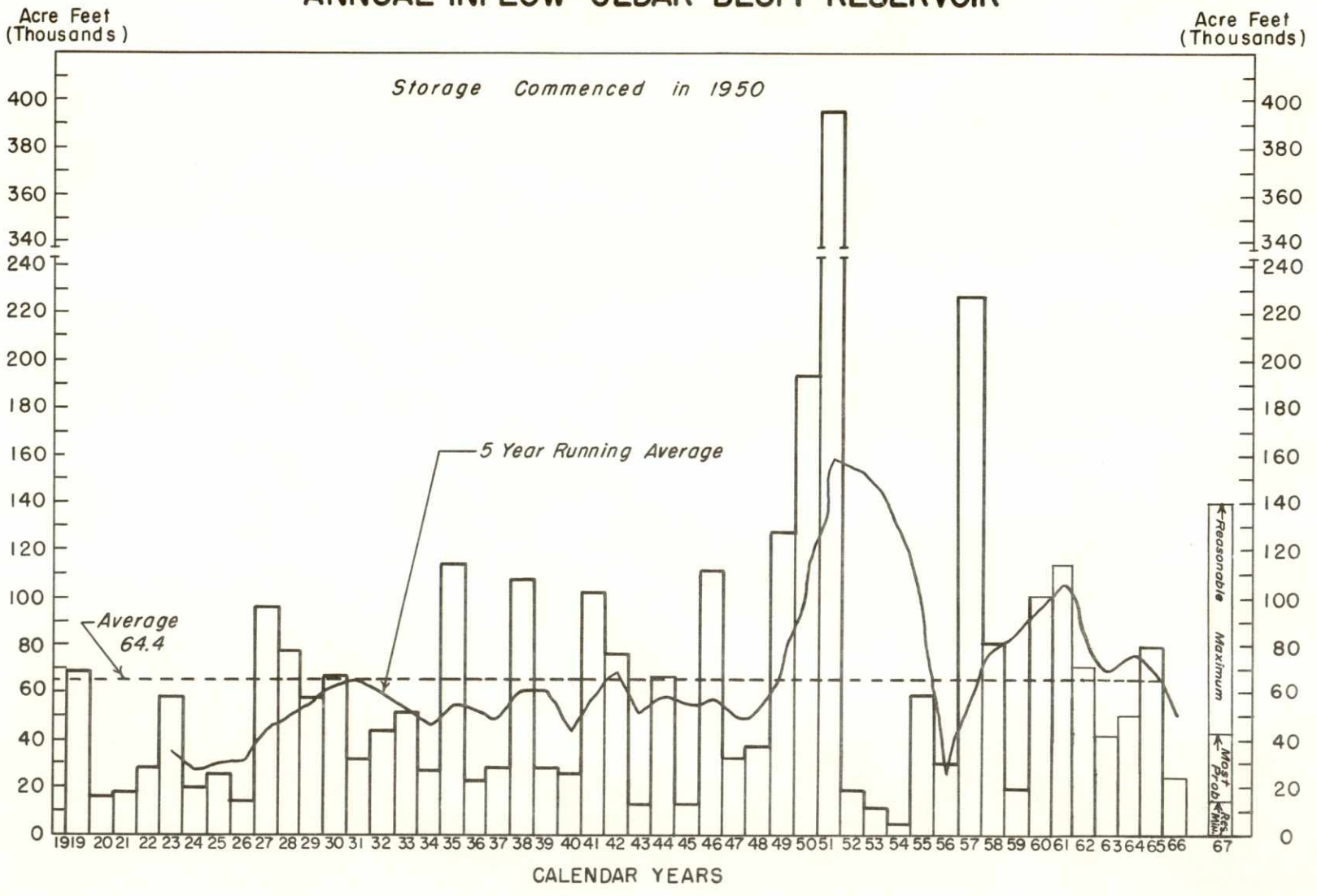

ANNUAL INFLOW - KIRWIN RESERVOIR
Acre Feet (Thousands)
Acre Feet (Thousands)
Storage commenced in 1955
Average 53.8
5-Year Running Average
Reasonable Maximum
Most Prob.
Reas. Min.
0
20
40
60
80
100
120
140
160
180
200
280
19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45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

Exhibit 29


ANNUAL INFLOW - WEBSTER RESERVOIR
Acre – Feet (Thousands)
Acre – Feet (Thousands)
Storage commenced in 1956
5-Year Running Average
Average 53.5
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



GPO 833-887

Exhibit 31