OFFICE OF THE STATE ENGINEER
COLORADO DIVISION OF WATER RESOURCES

ANALYSIS OF SELECTED WATER RIGHTS
LOWER ARKANSAS RIVER

PREPARED FOR
CLORADO DIVISION OF WILDLIFE
AND
COLORADO DIVISION OF PARKS AND OUTDOOR RECREATION

DPOR – doesn't want to lose sight of Trinidad lake, where they feel low water levels have caused drop in attendance

- DOW says Pichetwine still interested in selling water, despite recent take-it-or-leave-it
- DWR will do similar evaluation; will take some time since the data isn't as readily available; wants DOW to evaluate wildlife potential simultaneously
- Corps "found" an extra 10KAF in "silt pool" -- Q = what to do with it
  Ken willing to use RR if we want to influence Corps' decision

November 1991

TABLE OF CONTENTS

1862 JH

SUMMARY OF WATER RIGHTS ANALYSIS

Catlin Shares Owned by DOW:

(See Table 1 and Figure 1)

1. DOW owns 2,097.8 shares out of 18,645 total shares.

2. The Catlin shares owned by DOW will have an average yield of 4,160 AF per year of consumptive use (1940- 1985).

3. Value of shares would be primarily for agricultural use since Catlin Canal Company's by-laws prohibit transfer from Otero and Crowley Counties.

4. Catlin shares may be of more value if traded for other water rights such as Mt. Pisgah Reservoir, Larkspur Ditch, or Ft. Lyon Canal shares.

Mt. Pisgah Reservoir:

(See Table 1 and Figure 2)

1. Capacity approximately 3,000 AF.

2. Long-term average release (change in storage) is 989 AF per year (1928-1990).

3. The yield if delivered to John Martin Reservoir would be reduced by at least 25 percent due to transit losses. ⇒ ± 850AF

4. The reservoir's spillway is under order to be enlarged to pass 50 percent of the PMP. moderate (class 2) hazard

5. The owners of Mt. Pisgah Reservoir (Catlin Canal [6/7]) and Canon Heights Ditch Company (1/7) are having a consulting engineer perform an incremental damage analysis to determine if the present spillway may be adequate.

6. The value of the reservoir and surrounding land to DOW and DPOR must be determined. ~~X~~ 400 Ac DOW will enchance fishery

7. The Town of Cripple Creek is extremely interested in purchasing Mt. Pisgah Reservoir and may have made an offer. offered $1M; Mt Pisgah countered $2M

Larkspur Ditch:

(See Table 1 and Figure 3)

1. Transmountain diversion needing repair.

2. Long-term average diversion into Arkansas basin is 197 AF per year (1935-89).

3. Long-term average yield at Catlin Canal is 160 AF per year.

4. May be of more value to DOW as a supply for fish hatcheries such as the new one at Pueblo Reservoir. Grady says no; DOW merely operates the hatchery its owned by Bureau - SE Dist

GAMBLING is raising pressure on water resource market

5. May be possible to improve yield through maintenance and repair.

6. Decreed capacity is 10 cfs.

John Martin Reservoir Permanent Pool Evaporation:

(See Table 2, Table 3 and Figure 4)

1. The evaporation from the permanent pool has averaged 1,864 AF per year since 1980.

2. The evaporation could approach 4,932 AF per year if 10,000 AF is only water in reservoir, which is most unlikely if the 1980 operations agreement continues.

3. The present content of the permanent pool is approximately 2,800 AF so additional water is needed to restore permanent pool to 10,000 AF.

4. DOW has authority to maintain 10,000 AF in permanent pool without spill which will provide a surface area of 1,752 acres.

5. DOW can maintain an additional 5,000 AF in reservoir, but it would be subject to spill.

6. Surface area at 15,000 AF capacity is 2,111 acres.

7. For the 1980-91 period, 2200 AF of water would have been needed to maintain the permanent pool at 10,000 AF.

Keesee Ditch:

(See Table 1, Figures 5 and 6)

1. A Senior water right which is approximately 5 miles downstream of John Martin Reservoir.

2. Entire ditch owned by single owner.

3. Acres irrigated have averaged 1,845 acres.

4. Average diversion is 4,610 AF per year (1940-85).

5. Average consumptive use is 2,577 AF per year (1940-85).

Broyles interested in selling
- values it @ $2500/AF
- also interested in selling land or easement along river
- MShimin is Broyles' atty

6. Ditch is located along Arkansas River in bottom lands which could be good upland game habitat.

7. Institutional constraints to use for John Martin Reservoir evaporation.
   a. Change in use to storage must be obtained from water court. MShimin disagrees
   b. Storage in John Martin Reservoir must be approved by ARCA.
   c. Maintenance of historic return flows will be required and may require the use of a return flow storage account in John Martin Reservoir.
   d. Kansas will demand that wells under Keesee Ditch be abandoned since they are postcompact. could be held hostage

e. Kansas has declined to approve request by ditch owner to approve use of Keesee Ditch at or above John Martin Reservoir until compact litigation is resolved.
f. ARCA may impose 35 percent surcharge on any water stored in special accounts.
g. Storage under the 1980 agreement is limited to periods when conservation storage occurs and has averaged approximately 923 AF.
h. Keesee Ditch has an allocation of 2.03 percent of conservation storage pursuant to the 1980 agreement.

Las Animas Consolidated Ditch:

(See Table 1, Figures 7 and 8)

Ken planning to meet w/ Del Hock

1. Located immediately upstream of John Martin Reservoir.

2. Public Service Company of Colorado owns approximately 75 percent.

3. Change in use for domestic, municipal, recreation, and all other beneficial uses has been obtained in 80CW052.

4. Decree limits uses to present irrigated lands and at the power plant site near Las Animas.

5. Decreed average yield is 12,513 AF per year for Public Service Company's portion.

6. LACD has an Article III account of 5,000 AF for agricultural purposes in John Martin Reservoir. This is filled as part of the winter water-storage program. This account has produced about 4,000 AF per year after deduction of 35 percent for storage surcharge.

7. LACD would provide additional water for the Great Plains Reservoirs through exchange to Ft. Lyon Canal and delivery via the Kicking Bird Canal or pumping plant. This exchange would be best achieved through use of a storage account in John Martin Reservoir, but this may result in a storage surcharge of 35 percent.

8. Institutional constraints to use in John Martin Reservoir.
   a. Change in use to storage in John Martin Reservoir and exchange to Great Plains Reservoir must be obtained from the Water Court and may be difficult due to local objectors.
   b. Storage account in John Martin Reservoir for exchange to Great Plains Reservoirs must be approved by ARCA.
   c. Kansas may demand wells junior to compact be abandoned.
   d. ARCA may impose 35 percent surcharge on water stored in special account.

Short-Term Interim Possibilities for John Martin Reservoir Permanent Pool:

1. Water stored in District 67 ditch accounts may be leased on year-to-year basis and left in reservoir.

JMartin dam -> state line

2. LACD winter water-storage program water owned by Public Service Company could be leased and left in reservoir which may yield about 3,000 AF per year.

3. Transmountain water may be leased and delivered to John Martin Reservoir. This would include municipal return flows if available.

4. The transit loss account could provide some protection to the minimum reservoir content as it did this year and in previous years. About 9,000 AF was stored in it in 1990 and about one-half was carried over to October 31. This could happen again in 1991 if similar conditions occur.

TABLE-1 WATER RIGHTS YIELD ANALYSIS							
Description	**Catlin Canal**	**Las Animas Cons Dt**	**Keesee Dt**	**Ft. Lyon Canal**	**Larkspur Dt**	**Mt. Pisgah Res.**	**Total**
Shares-Total	18645	1828.5		93989			
Acres Irrigated							
Period of Data	1940-85	1940-85	1940-85	1940-85			
Average	17696	6917	1845	92631			
Maximum	19133	7179	2033	94664			
Minimum	16893	6502	1397	90665			
Diversion (Ac-ft)							
Period of Data	1940-85	1940-85	1940-85	1940-85	1935-89	1928-1990	
Average	82220	25816	4610	179970	197	989	
Maximum	112143	40804	6621	327934	627	2964	
Minimum	36980	14085	2452	80597	0	0	
Consumptive Use (ac-ft)							
Average	36973	13798	2577	102840	160	989	
Maximum	51898	17688	3710	173468	509	2964	
Minimum	19714	8899	1082	48091	0	0	
HG Diversion/share							
Average	4.41	14.12	4610	1.91	197	989	
Maximum	6.01	22.32	6621	3.49	627	2964	
Minimum	1.98	7.70	2452	0.86	0	0	
Consumptive Use/Share							
Average	1.98	7.55	2577.00	1.09	160	989	
Maximum	2.78	9.67	3710.00	1.85	509	2964	
Minimum	1.06	4.87	1082.00	0.51	0	0	
DOW share of Avg. C.U	**4159.93**						**4159.93**
	(2097.8 Shares)						
Catlin Share of Avg. C.U.					**160**	**847.71**	**1007.71**
					(100% ownership)	(6/7th ownership)	

TABLE-2 JOHN MARTIN RESERVOIR EVAPORATION ANALYSIS								
		Total Res	Total			Total	DOW Share of Evaporation	
Account/Description	Elevation	Contents	Surface Area	Avg. Lake Evap.	Avg. Ppt.	Evaporation	10000 Ac-ft	15000 Ac-ft
	msl	(Ac-ft)	Acres	(In.)	(In.)	(Ac-ft)	(Ac-ft)	(Ac-ft)
Full Capacity	3870.00	608245	17151	46.19	12.41	48280.07		
Top of Coservation Pool	3851.85	348450	11640	46.19	12.41	32766.60	940.35	1410.53
DOW Pool @ Bottom of Res.	3798.42	15000	2111	46.19	12.41	5942.47		5942.47
DOW Pool @ Bottom of Res.	3795.87	10000	1752	46.19	12.41	4931.88	4931.88	

TABLE-3 PERMANENT POOL ANNUAL EVAPORATION FOR 10000 Ac-ft CONTENTS	
Irrig Year	**Evaporation Ac-ft**
1980	1866
1981	3301
1982	3625
1983	1794
1984	1478
1985	1185
1986	1349
1987	1197
1988	1468
1989	2339
1990	2786
1991	3728
Avg.	**2176**

Procedure:

1. Added difference of 10000 and actual contents of permanent pool to the actual contents of John Martin Reservoir
2. Computed prorated monthly evaporation of permanent pool using average monthly water surface area and John Martin evaporation data
3. Computed annual evaporation from monthly data

FIGURE-1 CATLIN CANAL DIVERSIONS & CONSUMPTIVE USE

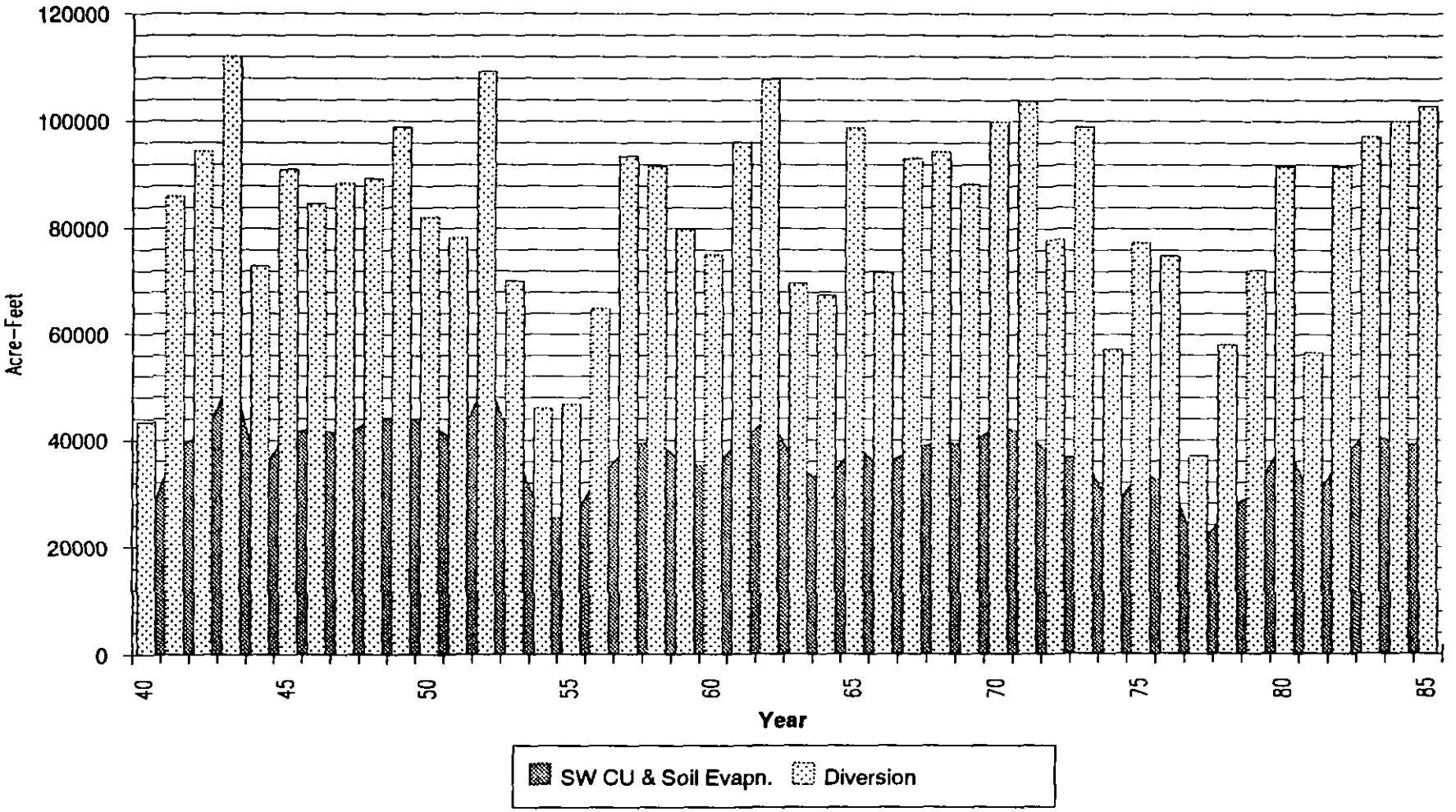


FIGURE-2 MOUNT PISGAH RESERVOIR CHANGE IN STORAGE

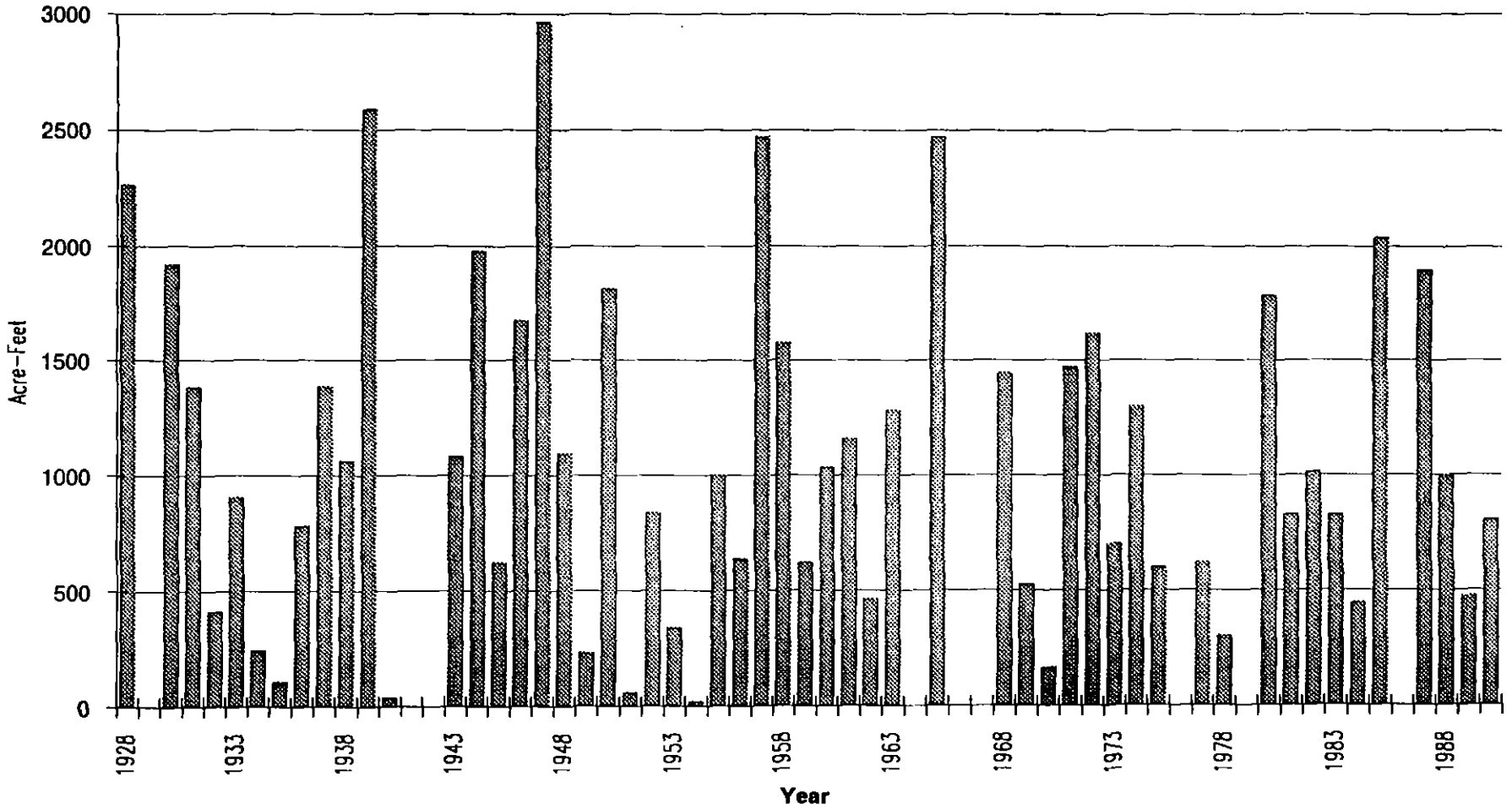


FIGURE-3 LARKSPUR DITCH DIVERSIONS & YIELD

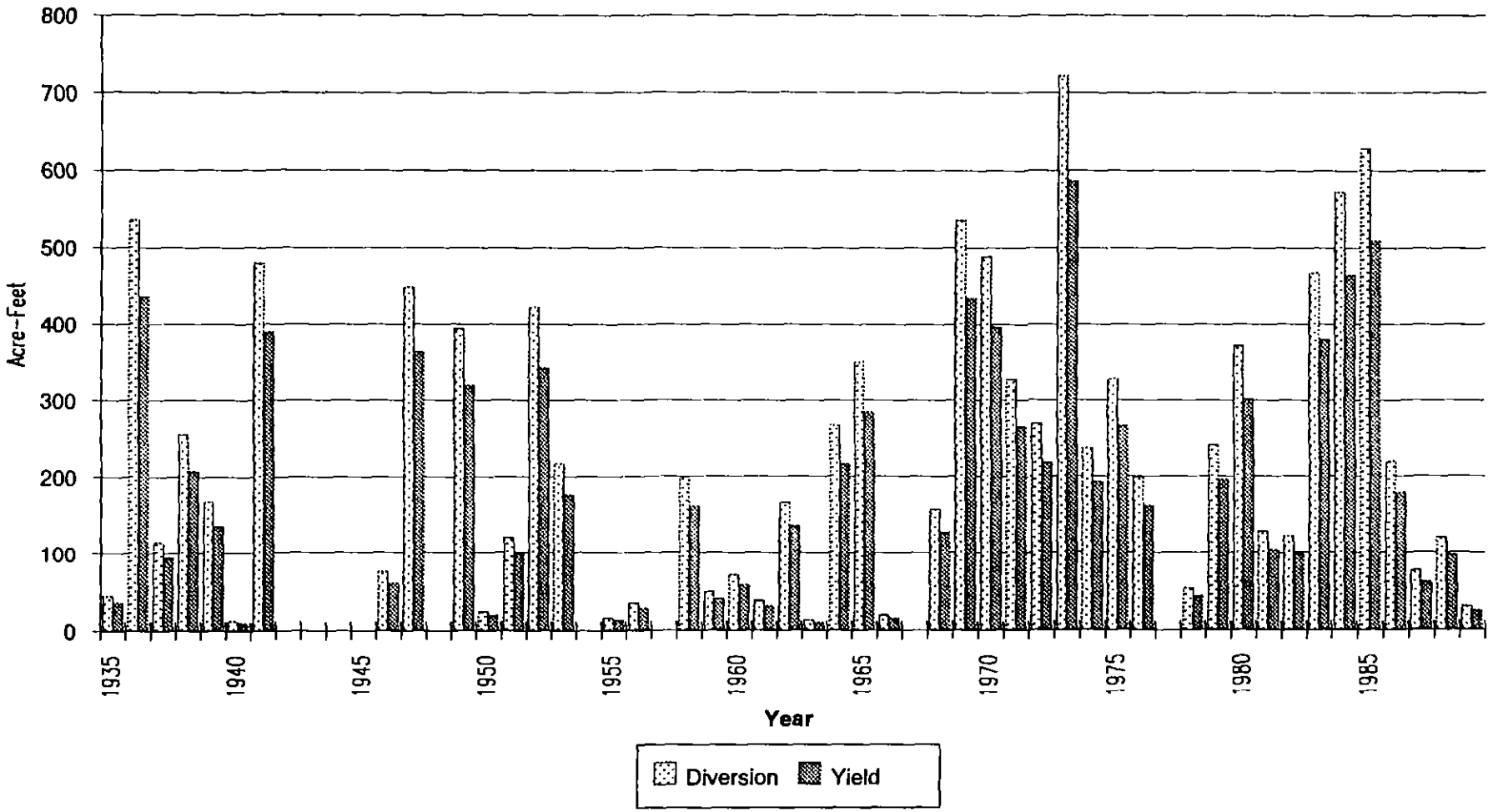


FIGURE-4 PERMANENT POOL ACCOUNT

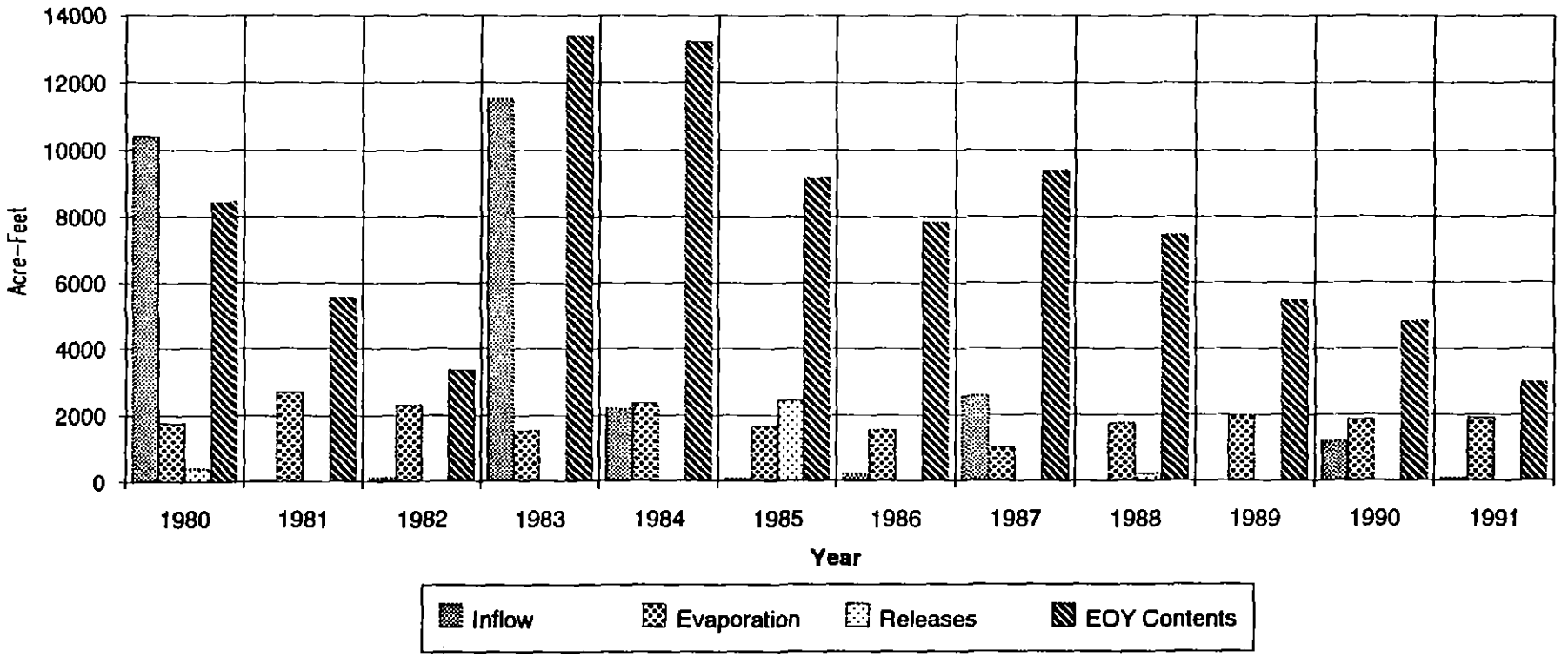


FIGURE-5 KEESEE DITCH DIVERSIONS & CONSUMPTIVE USE

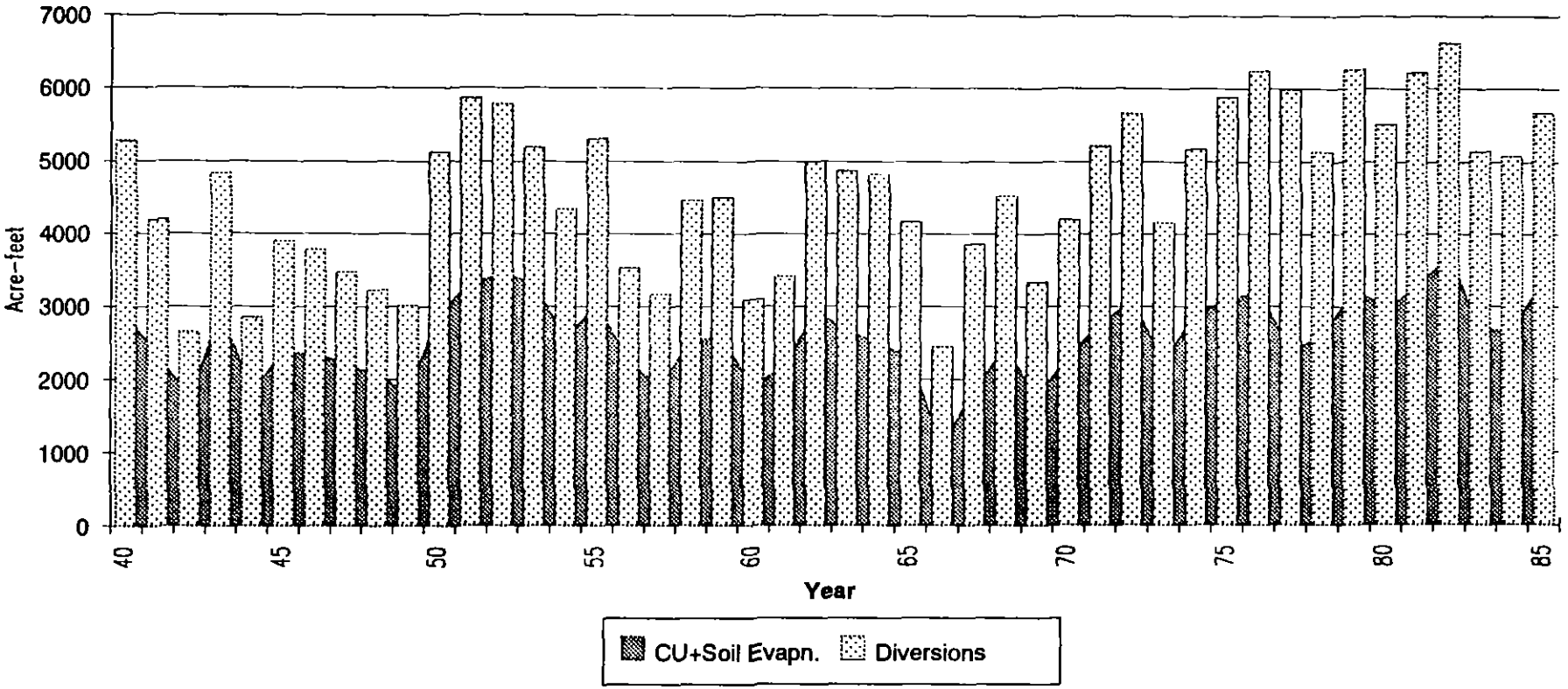
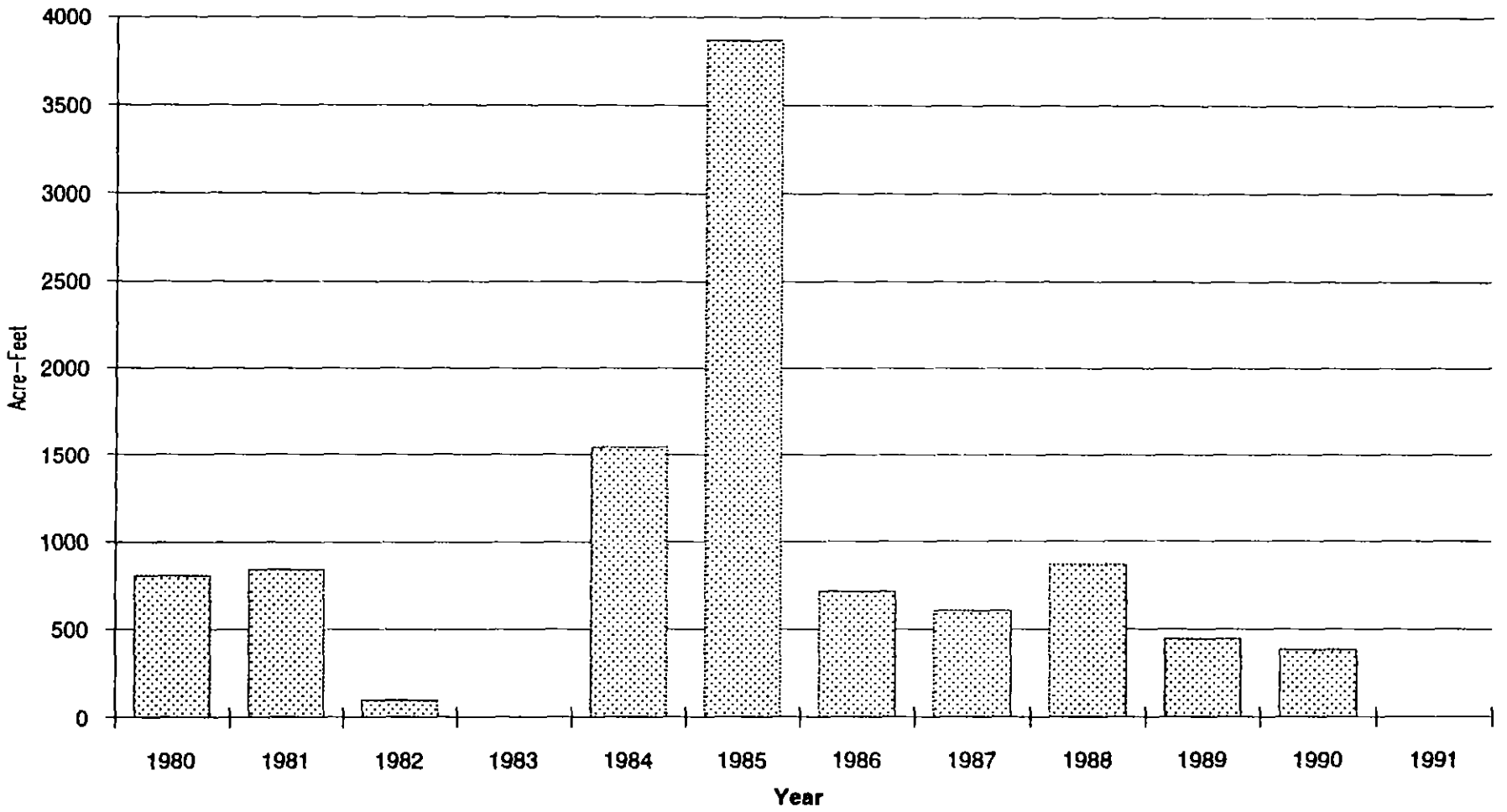


FIGURE-6 KEESEE DT. WINTER STORAGE ACCOUNT IN JOHN MARTIN RES (May1)



902 AF average

FIGURE-7 LAS ANIMAS CONSOLIDATED DITCH DIVERSIONS & CONSUMPTIVE USE

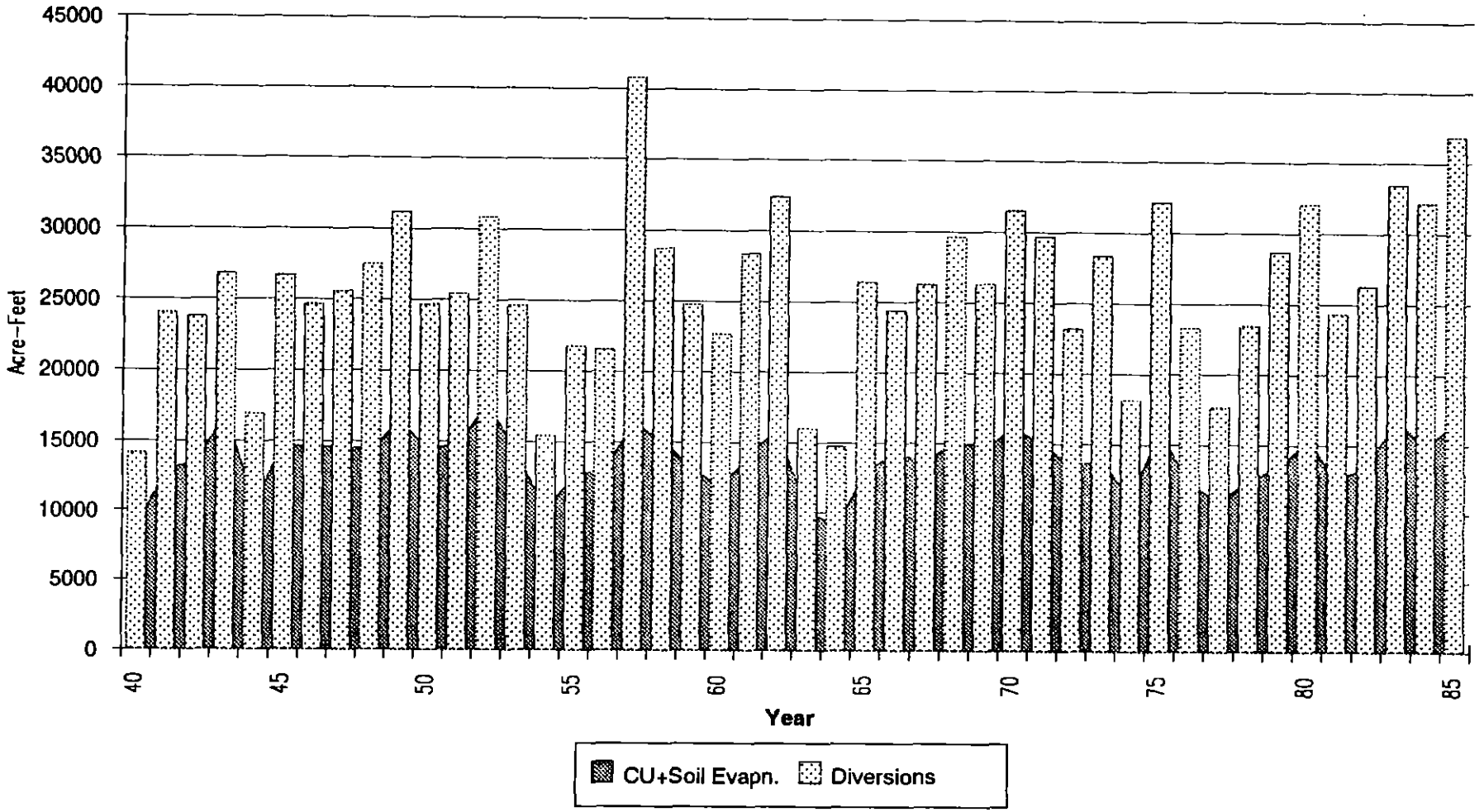


FIGURE-8 LAS ANIMAS CONSOLIDATED ARTICLE III ACCOUNT